

CLIPPER User's Guide

DSA030010

January 1990

SSS0061, SSS0062, SSS0075, SSAD075

DSA03001S (Spine), DSA03001T (Bleed Tabs), DIXGDMRS1 (Binder)

INTERGRAPH

Warning

This equipment contains no user serviceable parts. Voltages and energy levels in this equipment may be harmful if accessed. Contact the Intergraph field service if the unit requires service.

Avertissement

Aucune des pieces de cet equipement ne peut etre entretenue par l'utilisateur. Certains voltages et niveaux energetiques dans cet equipement peuvent etre d'un contact dangereux. S'adresser au bureau d'entretien en clientele Intergraph si la machine necessite un entretien.

Warnung

In diesem Gerat sind keine Teile enthalten, die vom Benutzer repariert werden konnen. Im Inneren dieses Gerates treten Spannungen und Stromstarken auf, die gefahrlich sein konnten. Benachrichtigen Sie den Intergraph Aussendienst, wenn dieses Gerat Wartung benotigt.

Advertencia

En el interior de este equipo, no hay piezas que el usuario puede reparar. Los niveles de tension y potencia que existen en este equipo pueden resultar peligroso si se establece contacto. Si la unidad necesita alguna reparacion, comuniquese con la oficina de servicios de Intergraph.

Avvertenza

A l'interno di questo equipaggiamento non ci sono parti che possano essere riparate dall'utente. Voltaggio e livelli tensione energetici possono essere pericolosi si se tenta stabilire contatto. Si l'unita necessita di riparazione contatte l'ufficio de servizio d'Intergraph.

Frequency Interference

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for a class A computing device pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to take whatever measures are necessary to correct the interference, at his own expense.

The Power Cord for 27", 19" and 15" Monitors

The power cord normally provided with this unit is for use only in the United States and Canada. This cord set is rated at 120 VAC, 60 Hz, 15 Amps and should only be used when this kind of power is available. The cord set should be visually checked to verify if it is intended for use on North American units.

For units set to 120 V, a UL Listed Cord Set rated 15 A, 120 V is provided. The cord set should be visually checked to verify whether it is intended for use on North American units.

Caution:

If the cord set provided must be replaced, the replacement set must meet the following requirements:

- The cord must have a type with two conductors and a ground wire. Each conductor and ground must be multistranded with each conductor and the ground having a cross-sectional area no less than .75 mm square. The cord must not exceed 4.6 m in length. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed and marked HAR. The cord set must be rated for no less than 6 A, 240 V.
- The appliance inlet is an IEC-320/-C13 type connector. The power cord connector that mates to the appliance inlet connector must be an IEC-320/-C13 type connector.
- The cord and connectors must display the International Harmonization Mark <HAR> or the mark of the national safety testing laboratory for the country in which the unit is to be installed. The cord and connectors must be rated for no less than 240 VAC, 50 Hz, 6 Amps.
- The bulkhead receptacle is an IEC-320/-C13 type connector. The power cord connector that mates to the bulkhead connector must be an IEC-320/-C14 type connector. This monitor is not intended to directly connect to the building power. It is intended to connect to the Intergraph-supplied electronics cabinet.

Le Cordon Electrique:

Le cordon electrique fourni normalement avec cet appareil ne doit etre utilise qu'aux Etats-Unis et au Canada. Sa tension nominale est de 120 volts en courant alternatif, 60 Hz, 15 amperes et il ne doit etre utilise que sous ces conditions. Il faut verifier le cordon d'alimentation pour s'assurer qu'il est bien destine aux appareils nord-americains.

Attention:

Les caracteristiques du cordon d'alimentation, en cas de remplacement de celui-ci, doivent etre les suivantes:

- Le cordon doit etre du type a deux fils conducteurs et un fil de terre. Chaque fil, conducteur et de terre, doit etre a brins multiples et sa section doit etre d'0,75 mm carre au minimum. Il ne faut pas que la longueur du cordon depasse 4,60 m. Le cordon et les connecteurs doivent etre marques du symbols de standardisation international <HAR> ou estampilles par le Laboratoire National d'Essais du pays ou l'appareil va etre utilise. La tension nominale du cordon et des connecteurs doit etre d'un minimum de 240 volts en courant alternatif, 50 Hz, 6 amperes.
- La prise de la platine de raccordement est un connecteur de type IEC-320/-C13. Le connecteur du cordon electrique qui s'accouple au connecteur de la platine de raccordement doit egalement etre du type IEC-320/-C14.
- Ce moniteur n'est pas destine' a une connexion directe sur le reseau electrique. Il est destine a etre connecte sur l'alimentation distribuee dans le chassis electronique Intergraph.

Das Netzanschluss-Kabel für 19" und 15" Bildschirme

Das mit dieser Einheit üblicherweise zur Verfügung gestellte Netzanschluss-Kabel ist nur für den Gebrauch in den USA und in Kanada bestimmt. Dieser Netzanschluss Kabelsatz hat die Nennwerte von 120 VAC, 60 Hz und 15 Ampere und darf nur verwendet werden, wenn diese Bedingungen gewährleistet sind. Es muß genau überprüft werden, ob er für den Gebrauch an nordamerikanischen Einheiten vorgesehen ist.

Warnung:

Beim Auswechseln des beigegebenen Kabelsatzes muß der Austauschsatz folgenden Bedingungen entsprechen:

- Des Kabel muß zwei Leitungsdrähte und einen Erdungsdraht haben. Die Kabeladern müssen mehrfach verlitzt sein, sodaß die Querschnittfläche jeder Ader mindestens 0,75 qmm beträgt. Die Länge des Kabels darf 4,6 m nicht überschreiten. Das Kabel und die Stecker müssen das VDE-Zeichen für diese Einheit aufweisen. Die Nennwerte für Kabel und Stecker dürfen nicht unter 240 VAC, 50 Hz und 6 Ampere liegen.
- Die Gerätebuchse ist eine Verbindung vom Typ IEC-320/-C13. Der dazu passende Kabelstecker muß Typ IEC-320/-C14 sein. Dieser Bildschirm darf nicht an die allgemeine Spannungsversorgung angeschlossen werden. Er darf nur an Intergraph Geräte angeschlossen werden.

El Cable de Coneccion:

El cable de coneccion que se provee con esta unidad es para uso exclusivo en los Estados Unidos y Canada. Este cable es apto para 120 VCA, 60 Hz, 15 Amp y solo debe usarse con este tipo de corriente electrica. Antes de usarse, deberia verificarse que este cable este aprobado para uso en Norteamerica.

Precaucion:

En caso de que se necesite sustituir este cable, el cable que lo reemplace debe reunir las siguientes especificaciones:

- El cable debe tener dos conductores y una toma a tierra. Los conductores y la toma a tierra deben ser de filamentos trenzados con un area transversal de no menos de 0,75 mm cuadrados. Su longitud no debe exceder los 4.6 m. El cable y los enchufes deben tener la marca International Harmonization <HAR> o la marca del laboratorio nacional de controles de seguridad del pais donde se instale la unidad. El cable y los enchufes deben estar homologados para no menos de 240 VCA, 50 Hz y 6 Amp.
- El receptaculo de la unidad es del tipo IEC-320/-C13. El enchufe del cable de coneccion que se conecta al receptaculo debe ser del tipo IEC-320/-C14. Este monitor no debera enchufarse directamente a la red. Debera conectarse al armario de componentes electronicos, suministrado por Intergraph.

Il Cavo di Alimentazione

Il cavo di alimentazione, che viene normalmente fornito con questa unita, e per uso esclusivo negli Stati Uniti e Canada. Questo insieme di cavi e dimensionato per 120 VAC (tensione alternata), 60 Hz, 15 Ampere e dovrebbe essere usato soltanto quando questo tipo di energia e disponibile. L'insieme dei cavi dovrebbe essere controllato visualmente per verificare se sia per uso nelle unita statunitensi.

Attenzione:

Se l'insieme di cavi fornito deve essere sostituito, l'insieme di sostituzione deve essere conforme ai seguenti requisiti:

- Il cavo deve essere di un tipo avente due conduttori e un filo di terra. Ciascun conduttore e filo di terra deve essere intrecciato con piu fili a ciascun conduttore e filo di terra, avente una sezione incrociata non inferiore a 0,75 mm quadrati. Il cavo non deve eccedere 4,6 m di lunghezza. Il cavo e i connettori devono mostrare il Marchio di Armonizzazione Internazionale (HAR) o il marchio del laboratorio di controllo sicurezza nazionale per il paese nel quale l'unita deve essere installata. Il cavo e i connettori devono essere regolati per non meno di 240 VAC, 50 Hz, 6 Ampere.
- La presa dell'unita e un connettore di tipo IEC-320/-C13. Anche il connettore del cavo di alimentazione che si unisce al connettore dell'unita deve essere un connettore di tipo IEC-320/-C14. Questo monitor non e predisposto per essere connesso alla rete di alimentazione elettrica. Esso deve essere connesso soltanto alle apparecchiature fornite da Intergraph.

Warranties and Liabilities

All warranties given by Intergraph Corporation about equipment or software are set forth in your purchase contract.

The information and the software discussed in this document are subject to change without notice and should not be considered commitments by Intergraph Corporation. Intergraph Corporation assumes no responsibility for any errors that may appear in this document.

The software discussed in this document is furnished under a license and may be used or copied only in accordance with the terms of this license.

No responsibility is assumed by Intergraph for the use or reliability of software on equipment that is not supplied by Intergraph or its affiliated companies.

Trademarks

Intergraph is a registered trademark of Intergraph Corporation. Intergraph, InterPro, InterAct, InterServe, and InterView are registered trademarks of Intergraph Corporation. CLIPPER is a trademark of Intergraph Corporation.

Other brands and product names are trademarks of their respective owners.

Classifications

This equipment is designed to comply with the requirements in Part 15 of the FCC rules for a class A computing device.

Copyright

© 1990, INTERGRAPH CORPORATION
INCLUDING THIS DOCUMENTATION, AND ALL SOFTWARE AND ITS FILE FORMATS AND AUDIO-VISUAL DISPLAYS DESCRIBED HEREIN; ALL RIGHTS RESERVED; MAY ONLY BE USED PURSUANT TO THE APPLICABLE SOFTWARE LICENSE AGREEMENT; CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF INTERGRAPH AND/OR OTHER THIRD PARTIES WHICH IS PROTECTED BY COPYRIGHT, TRADE SECRET AND TRADEMARK LAW AND MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE WITHOUT PRIOR WRITTEN AUTHORIZATION.

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the United States Government is subject to restrictions as set forth in subdivision (c)(1)(ii) of the rights in technical data and computer software clause at 52.227-7013.

Unpublished—rights reserved under the Copyright Laws of the United States.

Intergraph Corporation
One Madison Industrial Park
Huntsville, AL 35807-4201

Physikalisch-Technische Bundesanstalt



Prüfungsschein

Nr. 6.22 - S 631

Gegenstand: Graphikterminal

Firmenbezeichnung: Inter Pro 32 *19 monitor*
++)
Type: FDSP1....
Fabr.-Nr.: 807009

Bildröhre: Hitachi
Type: M48 JNJ 23X36
Fabr.-Nr.: M7H360220

Betriebsbedingungen: +)
Hochspannung: max. 25,0 kV
Strahlstrom: 0,65 mA

Hersteller: Intergraph Corporation
One Madison Industrial Park
Huntsville, Alabama, USA

Antragsteller: Intergraph European Manufacturing
Tarweg 3
6503GB Nijmegen, Niederlande

Antragsunterlagen: Schaltpläne:
Nr. PS2530 vom 23.07.1986
Nr. HR250297 Rev. D vom 13.02.1985
Installation und Maintenance Manual
Inter Pro 32/32C
Nr. DFED0770 vom 15.12.1986

Datum der Prüfung: 14.04.1988

+) nach Angabe des Antragstellers

++) Die in der Typenbezeichnung durch Punkte erstetzten Ziffern und Buchstaben bezeichnen Zusätze, die den Strahlenschutz nicht betreffen.



Physikalisch-Technische Bundesanstalt

Blatt 2 zum PTB-Prüfungsschein Nr. 6.22 - S 631

Auf Grund von § 8 der Verordnung über den Schutz vor Schäden durch Röntgenstrahlen (Röntgenverordnung) vom 08.01.1987 (BGBl. I, S. 114) wurde das oben bezeichnete Bauartmuster geprüft.

Durchführung der Prüfung und Prüfungsergebnis:

Unter dem vom Hersteller angegebenen maximalen Betriebsbedingungen wurde mit einem Szintillationsdosimeter der Physikalisch-Technischen Bundesanstalt die Ortsdosisleistung in 10 cm Abstand von der berührbaren Oberfläche des Gerätes gemessen. Die maximale Ortsdosisleistung betrug weniger als 0,2 $\mu\text{Sv/h}$.

Die Vorschriften über die Bauart von Störstrahlern nach Anlage III Abschnitt 5 der Röntgenverordnung sind damit erfüllt.

Diese Vorschriften sind auch für die nachfolgend aufgeführten Geräte in Verbindung mit einer Hitachi-Bildröhre mit der Typenbezeichnung M48 JNJ 23X36 erfüllt:

Firmenbezeichnung:

Inter Pro 32C
Inter Pro 220
Inter Pro 240
Inter Pro 340
Inter Pro 360
Interview 32C
Interview 220
Interview 340

Typenbezeichnung:

FDSP1....
FDSP1....
FDSP1....
FDSP1....
FDSP1....
FDSP1....
FDSP1....
FDSP1....
FDSP1....

Braunschweig, den 27.05.1988
Im Auftrage

Balke

(Balke)



Physikalisch-Technische Bundesanstalt



Ergänzung zum

Prüfungsschein

Nr. 6.22 - S 631

Gegenstand:

Graphikterminal

Firmenbezeichnung:

Inter Pro 32
+)
Type: FDSP1....

Bildröhre:

Hitachi
Type: M48 JNJ 23X36

Betriebsbedingungen:

Hochspannung: max. 25,0 kV
Strahlstrom: 0,65 mA

Hersteller:

Intergraph Corporation
One Madison Industrial Park
Huntsville, Alabama, USA

Antragsteller:

Intergraph European Manufacturing
Tarweg 3
6503GB Nijmegen, Niederlande



Die Vorschriften über die Bauart von Störstrahlern nach Anlage III Ziffer 5 der Röntgenverordnung vom 08.01.1987 (BGBI. I, S. 114) sind auch für die nachfolgend aufgeführten Geräte in Verbindung mit einer Matsushita-Bildröhren mit der Typenbezeichnungen M48 JFJ 32X32 oder M48 JFJ 32X38 erfüllt:

Firmenbezeichnung:

Interview 120
Interview 120
Inter Act 32

Typenbezeichnung:

FDSP196F1
FDSP196G2
FDSP08906

+)

Die in der Typenbezeichnung durch Punkte erstetzten Ziffern und Buchstaben bezeichnen Zusätze, die den Strahlenschutz nicht betreffen.

Physikalisch-Technische Bundesanstalt

Blatt 2 zur Ergänzung des PTB-Prüfungsscheines Nr. 6.22 - S. 631

Firmenbezeichnung:

Typenbezeichnung:

Inter Act 32	FDSP12800
Inter Act 32C	FDSP11607
Inter Act 220	FDSP158K5
Inter Act 220	FDSP159K6
Inter Act 340	FDSP11203
Inter Act 340	FDSP13104
Inter Act 340	FDSP131J5
Inter Act 360	FDSP138K6
Inter Map Analytic	FDSP11001
Inter Map Analytic	FDSP11304

Kombinationen dieser Geräte und Bildröhren mit den im Prüfungsschein Nr. 6.22 - S 631 vom 27.05.1988 aufgeführten Geräten und Bildröhren sind ebenfalls zulässig.

Braunschweig, den 22.07.1988
Im Auftrage

Balke

(Balke)



Preface

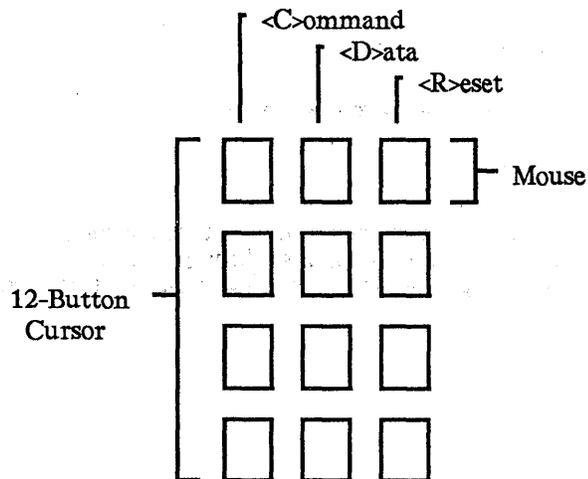
This guide is designed for the novice user to provide basic instructions needed to use and manage Intergraph workstations and servers daily.

This guide includes instructions for powering up, rebooting and shutting down the workstation, using basic input devices, and understanding the menus and screen display. It also includes an introduction to the System V operating system, common text editors, basic network concepts, queuing and printing through NQS, the floppy disk drive, and toolbox utilities.

Document Conventions

The following conventions and symbols appear in this guide:

- Command names and user actions appear in **bold** type.
- The *workstation* is an InterPro, InterAct, or InterView workstation, one of Intergraph's CLIPPER workstations.
- The *server* is an InterServe processor, which is Intergraph's CLIPPER multipurpose processor.
- The *cursor* is an input device, such as the mouse or 12-button cursor. The buttons on an input device are identified as the left <C> button, the middle <D> button, and the right <R> button.



- *Tap a button* means to press and immediately release a cursor button.
- *Press a button* means to press and hold a cursor button.
- *Screen cursor* describes the arrow or crosshair that appears on the workstation screen.
- *Select* means to position the cursor over the desired option and tap the middle <D> cursor button. When using alphanumeric menus, *select* means to use the arrow keys on the keyboard to highlight the desired option and press <Return>.
- *Identify* means to place the screen cursor over the element to be manipulated and tap the middle <D> cursor button.
- *Place a data point* means to position the cursor over the desired location on the screen and tap the middle <D> button.

- *Reset* means to tap the right <R> button on the cursor.
- *Key in* means to type in data at the keyboard and press <Return> to execute or enter the data.
- Various symbols appear in the text. They represent keys or cursor buttons as follows:

<Ctrl> Control key

<Ctrl-D> Unless otherwise noted in the text, you must hold down the <Ctrl> key while pressing the second key.

<Return> Return key

<Esc> Escape key

- **Warnings** emphasize potential physical danger.
- **Cautions** emphasize critical information or potential errors.
- **Notes** emphasize important information.
- Ethernet and IEEE 802.3 are physical layer standards that are almost interchangeable. The term Ethernet is used casually throughout this guide. However, the proper name when it is applied to the network is IEEE 802.3 rather than Ethernet.

Workstation/Server Documentation Kit

In addition to this *CLIPPER User's Guide* that you received in the packing box with your workstation or server, you will receive a separate box of additional documentation that will help you continue learning about the workstation. A brief description of each document is followed by a chart outlining when you will use each document.

- CLIPPER System Administrator's Guide*
- CLIPPER Release News*
- CLIPPER Software Delivery Guide*
- Intergraph Network Core User's Guide*
- InterPlot User's Guide*
- IGDS Plotting Guide*
- Network Queuing System User's Guide*
- Menubuilder User's Guide*
- Workstation Command Summary*
- Symbol Editor User's Guide*

We welcome any comments and suggestions you may have regarding the documentation. Please use the comment sheets located in the back of each document for this purpose.

If you need additional information about available documentation and training, refer to the *Customer Training Directory* delivered to all customers.

You can purchase extra documentation kits or individual documents through your Customer Engineer or Sales Account Representative within the United States. If you are at an international location, contact the Intergraph subsidiary or distributor from whom you purchased your workstation.

Document Descriptions

Additional documentation that you will receive with your workstation or server is described as follows:

CLIPPER System Administrator's Guide (DSA0299)

Provides system administrators with an understanding of the tasks involved in managing an Intergraph system. Topics include setting up a new system, starting up and initializing the system, creating user accounts, modifying the login environment, customizing the user interface, setting up a line printer, creating and maintaining file systems, monitoring processes, backing up files, using the Utility Pages to configure the system, and rebuilding and repartitioning the hard disk.

CLIPPER Release News (DSA0269)

Provides updated information on hardware and software for Intergraph's workstation/server products. The news is sent to workstation/server customers with each major software release.

CLIPPER Software Delivery Guide (DSA0263)

Describes the procedures for delivering Intergraph software products from an Intergraph VAX, floppy disk, cartridge tape, or CDROM to InterPro, InterAct, and InterView workstations or InterServe processors. In addition, a troubleshooting section is provided to help with possible delivery problems and answer commonly-asked questions.

Intergraph Network Core User's Guide (DSA0301)

Provides detailed information on using the Intergraph Network Core (INC)—the networking software delivered with each Intergraph system. This guide explains how to use the INC software utilities including **netaddr**, **clh**, **fmh**, **rlogin**, **xnsprt**, **rtape**, **rd**, **rpipe**, **incmon**, **insight**, **compress**, and **network mail**.

InterPlot User's Guide (DPA0253)

Provides workstation/server users with instructions for using the utilities available on Intergraph systems to print jobs.

IGDS Plotting User's Guide (DPA0296)

Provides IGDS plotting users with instructions for using the VPLOT, IPLOT, and VAXpath interfaces.

Network Queuing System User's Guide (DSA0254)

Provides workstation/server users with instructions for using the NQS product to print jobs.

Menubuilder User's Guide (DSYS004)

Explains how to create file-based menus using Menubuilder. This guide also describes how to modify and display menus used for VAX-based graphics applications.

Workstation Command Summary (DSYS016)

Provides a summary of commands used for the three operating modes of Intergraph workstations: UNIX System V, VMS 4.1, and PC-DOS 3.1

Symbol Editor User's Guide (DSYS131)

Explains how to use the symbol editor product for creating and modifying raster symbols and icons.

Using the Documents in the Kit

The following chart provides an outline of various tasks you may encounter and which documents provide the information you will need for completing that task:

When you want to...	Refer to...
Learn additional daily workstation skills such as VT220 emulation, manage user accounts and passwords and file permissions and protections	<i>CLIPPER System Administrator's Guide</i>
Load new software	<i>CLIPPER Software Delivery Guide</i>
Perform daily maintenance tasks such as backing up, monitoring disk use, cleaning and maintaining, and troubleshooting	<i>CLIPPER System Administrator's Guide</i>
Connect peripheral devices	<i>CLIPPER Hardware Setup and Maintenance Guide</i>
Customize your login environment and use the Utility Pages to configure your system	<i>CLIPPER System Administrator's Guide</i>
Rebuild the internal hard disk	<i>CLIPPER System Administrator's Guide</i>
Use Intergraph Network Core software	<i>Intergraph Network Core User's Guide</i>
Create menus	<i>Menubuilder User's Guide</i>
Produce hardcopies or submit plots other plot nodes	<i>Network Queuing System User's Guide</i>
Quickly reference and compare UNIX, VMS, and PC-DOS	<i>Workstation Command Summary</i>

Additional References

This guide refers to the *CLIPPER System Administrator's Guide* (DSA0299), which is available from Intergraph.

The UNIX System V documentation is useful reference material. The following Release 5.3 documents can be purchased individually or in sets from Intergraph:

Title	Release V.3
<i>AT&T UNIX System V User's Guide—CLIPPER</i>	DSYS08010
<i>AT&T UNIX System V Programming Guide—CLIPPER</i>	DSYS08410
<i>AT&T UNIX System V Administrator's Guide—CLIPPER</i>	DSYS08210
<i>AT&T UNIX System V User's Reference Manual—CLIPPER</i>	DSYS08110
<i>AT&T UNIX 5.3.1 User's Reference Addendum</i>	DSYS19410
<i>AT&T UNIX System V Administrator's Reference Manual—CLIPPER</i>	DSYS08310
<i>AT&T UNIX 5.3.1 Administrator's Reference Addendum</i>	DSYS19710
<i>AT&T UNIX System V Programmer's Reference Manual—CLIPPER</i>	DSYS08510
<i>AT&T UNIX 5.3.1 Programmer's Reference Addendum</i>	DSYS19510
<i>CLIX System Administrator's Reference Manual</i>	DSYS18310
<i>Addendum to CLIX System Administrator's Reference Manual</i>	DSYS18311
<i>Addendum to CLIX System Administrator's Reference Manual</i>	DSYS18312
<i>CLIX Programmer's & User's Reference Manual</i>	DSYS18410
<i>Addendum to CLIX Programmer's & User's Reference Manual</i>	DSYS18411
<i>Addendum to CLIX Programmer's & User's Reference Manual</i>	DSYS18412
<i>CLIX System Guide</i>	DSYS18510
<i>Addendum to CLIX System Guide</i>	DSYS18511
<i>Addendum to CLIX System Guide</i>	DSYS18512
<i>CLIX Permuted Index</i> (master index to CLIX and AT&T reference manuals)	DSA027410

Ordering and Support Information

To order any of these documents:

- If you are in the United States, contact your customer engineer or sales account representative.
- If you are at an international location, contact the Intergraph subsidiary or distributor where you purchased your workstation.

If you have trouble with the workstation/server or the procedures described in this guide, contact Intergraph Customer Support at 1-800-633-7248. International customers should contact the Intergraph subsidiary or distributor where the workstation/server was purchased.

Reference Bar Legend

Reference bars are provided on this page and at the beginning of each section to aid in locating a particular section. To use the bars, find the section listing on this page. Look at the edge of the document, find the corresponding bar, and open the document to that page.

Table of Contents

Chapter 1: Power-up, Reboot, and Shutdown Procedures

Chapter 2: Input Devices

Chapter 3: The Screen Display

Chapter 4: Introduction to the System V Operating System

Chapter 5: Common Text Editor

Chapter 6: Basic Network Communication

Chapter 7: Queuing and Printing

Chapter 8: The Floppy Disk Drive

Chapter 9: Toolbox Utilities

Glossary

Index



Contents

Chapter 1: Power-up, Reboot, and Shutdown Procedures

1.1	Powering Up	1-3
1.1.1	Turning on the Workstation or Server	1-3
1.1.2	Introductory Screen for Workstations	1-4
1.1.3	Introductory Screen for Servers	1-5
1.1.4	Loading the System V Operating System for Workstations	1-5
1.1.5	Loading the System V Operating System for Servers	1-5
1.2	Rebooting	1-6
1.2.1	Cold and Warm Boots	1-6
1.2.2	Reboot Procedure for Workstations	1-6
1.2.3	Reboot Procedure for Servers	1-6
1.2.4	Using the Boot/Reboot Button or Restart Switch	1-7
1.3	Shutting Down the System	1-8
1.3.1	Shutting Down the Workstation	1-8
1.3.2	Shutting Down the Server	1-8

Chapter 2: Input Devices

2.1	The Keyboard	2-3
2.1.1	Typewriter Keys	2-4
2.1.2	Numeric Keypad	2-4
2.1.3	Terminal Emulation Function Keys	2-4
2.1.4	Application Function Keys	2-4
2.2	The Mouse/12-Button Cursor	2-5
2.2.1	Using the Mouse	2-5
2.2.2	Using the 12-Button Cursor	2-6
2.2.2.1	Moving the Cursor	2-6
2.2.2.2	Learning the 12-Button Cursor Assignments	2-6

Chapter 3: The Screen Display

3.1	Entering the System Through the Workstation Login Menu	3-3
3.2	Understanding the Screen Display	3-3
3.2.1	Message Strip	3-4
3.2.2	Console Window	3-6
3.2.3	Local Window	3-6
3.2.4	Screen Working Area	3-7
3.3	Using the Screen Display	3-8
3.3.1	Understanding the Process ID	3-8
3.3.2	Using the Workstation Icon	3-8
3.3.3	Using the Primary Screen Icon for Dual-Monitor Workstations	3-11
3.3.4	Using the Virtual Screen Icon for Single-Monitor Workstations	3-12
3.4	Interacting with Windows	3-13
3.4.1	Active Processes	3-13
3.4.2	Window Manipulations	3-14

3.4.2.1	Moving a Window	3-15
3.4.2.2	Moving a Window from One Screen to Another Using Dual-Monitor Workstations	3-16
3.4.2.3	Modifying a Window	3-17
3.4.2.4	Popping a Window to the Top/Bottom of a Window Stack	3-17
3.4.2.5	Collapsing a Window	3-18
3.4.2.6	Moving a Collapsed Window	3-18
3.4.2.7	Restoring a Collapsed Window	3-18
3.4.2.8	Deleting a Window	3-19
3.4.2.9	Repainting a Window	3-19
3.4.2.10	Using the Setup Icon	3-19
3.4.2.11	Using the Catalog Icon	3-19
3.4.2.12	Using the Reset Icon	3-19
3.4.2.13	Using the Resize Icon	3-20
3.4.2.14	Using the Clear Screen Icon	3-20
3.4.2.15	Using Copy and Paste Icons	3-20
3.4.3	Scrolling Windows	3-20
3.5	Screen Menus and Menu Options	3-22
3.5.1	Pull-Down Menus	3-22
3.5.2	Pop-Up Menus	3-22
3.5.2.1	Data Entry Boxes	3-23
3.5.2.2	Checkboxes	3-23
3.5.2.3	Screen Buttons	3-24
3.5.2.4	Hierarchical Menus	3-24
3.6	Other Menus and Displays	3-25
3.6.1	Window Menus	3-25
3.6.2	Function Key Menus	3-25
3.6.3	Paper Menus	3-25
3.6.4	Roll-through Boxes	3-26
3.6.5	Toggle Switches	3-26
3.6.6	Alert Boxes	3-26

Chapter 4: Introduction to the System V Operating System

4.1	Logging On to System V	4-3
4.2	Logging Off from System V	4-4
4.3	The Operating System	4-5
4.3.1	Kernel	4-5
4.3.2	Shell	4-5
4.3.3	File System	4-6
4.3.3.1	Ordinary Files	4-6
4.3.3.2	Directory Files	4-6
4.3.3.3	Special Files	4-6
4.4	File System Structure	4-7
4.4.1	Commonly Referenced File Systems and Directories	4-8
4.4.2	Pathnames	4-9
4.4.2.1	Absolute Pathnames	4-9
4.4.2.2	Relative Pathnames	4-10
4.5	Manipulating Directories	4-12
4.5.1	Home Directories	4-12

4.5.2	Working Directories	4-12
4.5.3	Changing Directories	4-12
4.5.4	Listing Directory Contents	4-13
4.5.4.1	Long Listing	4-14
4.5.4.2	Common ls Command Options	4-15
4.5.4.3	Long Listing Examples	4-16
4.5.5	Creating Directories	4-16
4.5.6	Removing Directories	4-17
4.6	Manipulating Files	4-19
4.6.1	Naming Files	4-19
4.6.2	Displaying File Contents	4-19
4.6.3	Copying Files	4-20
4.6.4	Moving Files	4-21
4.6.5	Removing Files	4-21
4.6.6	Using Wildcards	4-22
4.6.7	Taking Filename Shortcuts	4-23
4.7	File Access and Permissions	4-24
4.7.1	Fields in a Long Listing	4-24
4.7.1.1	File Type	4-24
4.7.1.2	File Permission Mode	4-25
4.7.2	Determining Your User Type	4-25
4.7.2.1	User (Owner) Category	4-25
4.7.2.2	Group Category	4-26
4.7.2.3	Other Category	4-27
4.7.3	Permission Modes	4-27
4.7.3.1	Read Access	4-28
4.7.3.2	Write Access	4-28
4.7.3.3	Execute Access	4-28

Chapter 5: Common Text Editors

5.1	The Intergraph MicroEMACS Product	5-3
5.1.1	Creating, Editing, and Exiting MicroEMACS Files	5-3
5.1.2	Changing Modes	5-4
5.1.3	Moving the Cursor	5-5
5.1.4	Searching and Replacing Text	5-5
5.1.5	Deleting Text	5-6
5.1.6	Inserting Spaces, Blank Lines, and Files	5-6
5.1.7	Cutting and Copying Text	5-7
5.1.8	Changing Cases	5-7
5.1.9	Miscellaneous Commands	5-8
5.2	vi and vedit	5-9
5.2.1	Creating, Entering, and Exiting vi/vedit Files	5-9
5.2.2	Changing Modes	5-9
5.2.3	Cursor Movement Commands	5-10
5.2.4	Deleting Text	5-11
5.2.5	Replacing Text	5-11
5.2.6	Searching for Text Strings	5-11

5.2.7	Copying, Moving, and Appending Text	5-12
5.2.8	Setting Default Options	5-14
5.2.9	Miscellaneous Commands	5-15

Chapter 6: Basic Network Communication

6.1	General Network Information	6-3
6.1.1	Physical Components	6-3
	Coaxial Cable	6-3
	Transceiver	6-3
	Transceiver Cable	6-3
	Ethernet Multiplexer	6-4
	Etherjack	6-4
6.1.2	Network Configurations	6-4
6.2	Workstation Preparation	6-7
6.2.1	Network and Node Addresses	6-7
6.2.1.1	Network Address Example	6-7
6.2.1.2	Accessing a Network Address	6-7
6.2.1.3	Storing a Network Address on an Intergraph Workstation	6-8
6.2.2	Nodenames	6-8
6.2.2.1	Accessing a Nodename	6-8
6.2.2.2	Locating Other Nodenames in a Network	6-9
6.2.2.3	Assigning a Nodename to a Workstation	6-9
6.2.2.4	Assigning a Nodename to an InterServe Processor	6-10
6.3	Network Communications	6-11
6.3.1	File Management Utility	6-11
6.3.1.1	Starting fmu	6-11
6.3.1.2	Issuing fmu Commands	6-12
6.3.1.3	Accessing Help for fmu Commands	6-12
6.3.1.4	Exiting fmu	6-12
6.3.1.5	Available Commands	6-12
6.3.2	The visit Program	6-14
6.3.3	Intergraph Network Core Monitor	6-16
6.3.3.1	General Statistics Menu	6-17
6.3.3.2	Loopback Test Menu	6-17
6.3.3.3	Search Network Menu	6-17
6.3.3.4	Routing Information Menu	6-17
6.3.3.5	XNS Network Topology Menu	6-18
6.3.3.6	Multiple Node Analysis Menu	6-18
6.3.3.7	Clearinghouse	6-18
6.4	Additional Network Capabilities	6-19

Chapter 7: Queuing and Printing

7.1	Understanding Queues	7-3
7.1.1	Device Queues	7-3
7.1.2	Pipe Queues	7-3
7.1.3	Batch Queues	7-3

7.2	Understanding Devices	7-4
7.3	NQS Command Overview	7-5
7.4	Displaying Queue Status Information	7-6
7.5	Submitting Print Requests	7-7
7.6	qpr Examples	7-9
7.6.1	Submitting an ASCII Print File	7-9
7.6.2	Submitting a Plot Request	7-10
7.7	Deleting a Request	7-12

Chapter 8: The Floppy Disk Drive

8.1	Specifying Storage Capacity	8-3
8.2	Maintaining Floppy Disks	8-4
8.3	Inserting and Removing Floppy Disks	8-5
8.3.1	Inserting and Removing 3½-Inch Floppy Disks	8-5
8.3.2	Inserting and Removing 5¼-Inch Floppy Disks	8-5
8.4	Interpreting the Disk Activity Light	8-6
8.5	Accessing the Floppy Disk Drive	8-7
8.6	Formatting the Floppy Disk	8-8
8.6.1	Formatting from the Command Line	8-8
8.6.2	Formatting from the Utility Pages	8-9
8.7	Creating a Floppy Disk File System with the mkfs Command	8-10
8.8	Copying One Floppy's Contents to Another with the cpflop Command	8-12
8.9	Writing to Sequential Floppies with the fr_flop Command	8-13
8.10	Reading from Sequential Floppies with the fr_flop Command	8-14
8.11	Backing Up with the tar Command	8-15
8.12	Backing Up with the cpio Command	8-17

Chapter 9: Toolbox Utilities

9.1	Toolbox Overview	9-3
9.2	The Clock Utility	9-4
9.2.1	Displaying the Clock	9-4
9.2.2	iclock Command-Line Options	9-4
9.3	The Calculator Utility	9-6
9.3.1	Displaying the Calculator	9-6
9.3.2	Using the Calculator	9-7
9.3.3	icalc Command-Line Options	9-7
9.3.4	Additional Functions	9-7
9.4	The imag Utility	9-9
9.4.1	Creating and Manipulating the imag Window	9-9
9.4.2	Moving the imag Window	9-10
9.4.3	imag Window Behavior	9-10

9.4.4	imag Options	9-11
9.4.5	imag Information Fields	9-11
9.5	The colormap Utility	9-12
9.5.1	Entering colormap	9-12
9.5.2	RGB and HSV Color Systems	9-12
9.5.3	The Options Menu	9-13
9.5.4	Editing Colors in the Table	9-14
9.5.5	Interpolating	9-14
9.5.6	Using the File Menu	9-15
9.6	The cdaudio Utility	9-16
9.6.1	Entering cdaudio	9-16
9.6.2	cdaudio Command-Line Options	9-16
9.6.3	Using the cdaudio Interface	9-17
9.6.3.1	Status Box Fields	9-17
9.6.3.2	Slide Bars	9-18
9.6.4	Suggestions for Using cdaudio	9-18
9.7	The iedit Utility	9-19
9.7.1	Creating an iedit File	9-19
9.7.2	Inserting Text with iedit	9-19
9.7.3	Editing Text with iedit	9-19
9.7.4	Saving Files with iedit	9-20
9.7.5	iedit Command-Line Options	9-20
9.7.6	Upcoming iedit Features	9-21

Figures

6-1	An Intergraph Workstation Connected to a Remote Ethernet Network	6-5
6-2	Intergraph Workstations and Servers Connected to an EMUX	6-6
9-1	Analog and Digital Clocks	9-4
9-2	AOS and RPN Calculators	9-6
9-3	The imag Window	9-9
9-4	The cdaudio Interface	9-17
9-5	iedit Icons	9-19



Chapter 1: Power-up, Reboot, and Shutdown Procedures

This chapter provides you with the basic information needed to turn on, reboot, and shut down your workstation or server. If you need to reboot or shut down at any point in this guide, refer to 1.2, "Rebooting," and 1.3, "Shutting Down the System."

This chapter includes the following sections:

1.1	Powering Up	1-3
1.1.1	Turning on the Workstation or Server	1-3
1.1.2	Introductory Screen for Workstations	1-4
1.1.3	Introductory Screen for Servers	1-5
1.1.4	Loading the System V Operating System for Workstations	1-5
1.1.5	Loading the System V Operating System for Servers	1-5
1.2	Rebooting	1-6
1.2.1	Cold and Warm Boots	1-6
1.2.2	Reboot Procedure for Workstations	1-6
1.2.3	Reboot Procedure for Servers	1-6
1.2.4	Using the Boot/Reboot Button or Restart Switch	1-7
1.3	Shutting Down the System	1-8
1.3.1	Shutting Down the Workstation	1-8
1.3.2	Shutting Down the Server	1-8

1-2 Power-up, Reboot, and Shutdown Procedures

1.1 Powering Up

This section explains the steps involved in powering up your workstation or server.

Note:

Refer to 1.3, "Shutting Down the System," before turning off your workstation or server.

1.1.1 Turning on the Workstation or Server

Use the following procedure that is appropriate for your type of workstation or server to locate the power switch and turn on the unit. The initial beep after the unit is powered on indicates that the keyboard is working.

- **InterPro Desktop Workstations.** The power switch is on the front of the base between the keyboard plug and the floppy disk drive. Press the power switch to 1 (on).
- **InterPro Workstations with Electronics Cabinet.** Locate the power switch on the front panel of the electronics cabinet. Insert the key and turn the keyswitch to the **ON** or **NORMAL** setting.
- **InterAct Workstations.** The power switch is on the lower front right corner of the monitor head. Press the power switch to 1 (on).
- **Standard InterView Workstations.** The power switch is on the front right corner of the boom assembly. Press the power switch to 1 (on).
- **Desktop InterView Workstations.** The power switch is on the front of the electronics cabinet. Insert the key and turn the switch to the **ON** or **NORMAL** setting.
- **InterServe Processors.** The power switch is on the front of the unit. Insert the key and turn the keyswitch to the **ON** or **NORMAL** setting.

You can purchase the CIT terminal to use with an InterServe processor. The terminal's power switch is in the lower right corner of the video screen. Press the switch to turn it on.

Approximately three seconds after the first beep, you will hear another beep that signals the start of diagnostic tests. Diagnostic messages appear on the primary screen as each piece of hardware is tested. You do not need to respond to any of these messages unless the diagnostics stop.

Note:

Any devices connected to the RS-232 port must either be online or turned off when power-up diagnostics run. Diagnostics could fail if an RS-232 device, such as a printer, is offline. If diagnostics fail, turn the RS-232 device off and then perform a warm boot using the **Boot** button on the back of the workstation or server keyboard.

For more information, refer to 1.3, "Rebooting." Once the workstation is rebooted, turn the RS-232 device back on.

If all diagnostic software is not loaded on the workstation or server, the following message may appear at the end of the diagnostic test messages. This is not an error. The system will continue the power-up process.

Diagnostics boot failure

When you use a floating menu, if the cursor is on the floating menu instead of the digitizing table, the following message may appear under the Digitizer portion of the download diagnostics. This is not an error and will not jeopardize system performance in any way.

Mux Gain Bit not set, but coil was found

If the cursor is placed directly on the digitizing table, this message (which also is not an error message) appears:

The Table is a high Gain table

1.1.2 Introductory Screen for Workstations

When the diagnostic tests are complete, a blue introductory screen displays the Intergraph logo. The buttons at the bottom of the introductory screen are used to select the operating system, access the Utility pages, or access Help for these selections. The Utility pages are a series of menus used to configure the workstation system ports, hard disk, screen, and peripherals.

When the introductory screen displays, the screen cursor appears over the screen button for System V, the default operating system.

If the screen cursor is not moved within five seconds, the System V operating system begins loading. For now, do not move the cursor and let the System V operating system load. If the screen cursor accidentally moves off from the System V screen button, move it back over the screen button and tap the middle <D> cursor button.

1.1.3 Introductory Screen for Servers

When the diagnostics are complete, the following message appears:

```
Intergraph Corporation  
InterServe 200
```

```
Strike any key within 5 seconds to  
Access Startup Utility Menus.
```

Press any key on the terminal keyboard within five seconds to access the Utility Pages. Or, do not press any key to boot into the System V operating system.

1.1.4 Loading the System V Operating System for Workstations

When the System V operating system starts to load, the blue introductory screen disappears and the screen displays boot-up messages similar to the following:

```
UNIX System V Release 3.1 Clipper version 0 made 7/24/89  
Nodename  
Swap Space   · 24242 blocks  
Total real mem · 6283264 bytes  
Available mem · 4915200 bytes  
Copyright (c) 1989 AT&T - All rights reserved  
The system is coming up. Please wait.  
The system is ready.
```

1.1.5 Loading the System V Operating System for Servers

When the System V operating system starts to load, the introductory screen disappears and power-up diagnostics display. After the System V software has been loaded, you will receive a console login prompt.

Note:

For information on rebooting and shutting down InterServe processors, refer to 1.3 and 1.4. For other information on operating InterServe processors, refer to the *CLIPPER System Administrator's Guide*.

1.2 Rebooting

This section covers the procedures for rebooting the workstation or server.

1.2.1 Cold and Warm Boots

Rebooting the workstation or server reloads the system software. There are two types of boots: a *warm* boot and a *cold* boot. A warm boot typically refers to rebooting when the system is currently up, and a cold boot refers to booting when the system is not up. A warm boot simply reloads the software, while a cold boot performs diagnostic tests and reloads the software.

A reboot is needed under the following conditions:

- If you need to access the utility pages
- If the system will not accept cursor or keyboard input

1.2.2 Reboot Procedure for Workstations

When you need to reboot your workstation, follow these steps:

1. Log out of your user account.
2. If the console window has been deleted, create a new one.
3. Select the **reboot** option from the workstation menu.
4. A pop-up menu prompts you to confirm your request. Select **OK** to proceed.

1.2.3 Reboot Procedure for Servers

When you need to reboot your server, follow these steps:

1. Log out of your user account and log in to the **root** account.
2. Key in **reboot** and messages similar to the following then appear:

```
Init: New run level: 1
```

```
REBOOT PROGRAM
```

```
Process accounting stopped.
```

```
Error logging stopped.
```

```
All currently running processes will now be killed.
```

Syncing disks . . .
System reboot in progress . . .

The system beeps and then reboots. For workstations, select the desired screen button when the introductory screen appears. For servers, select the desired option when the Start-Up Configuration Utility menu appears.

1.2.4 Using the Boot/Reboot Button or Restart Switch

When possible, use the previous procedures to reboot the system. The reboot program syncs the disks and thus ensures an orderly halt for any processes that were running. Syncing the disks transfers all information stored in memory to the disks. Also, with these reboot procedures, the system bypasses file system checks for the next boot, which thereby shortens boot time.

However, if using the previous reboot options is not possible, boot by using the following procedure that is appropriate for your type of workstation or server:

- **InterAct, InterView, and InterPro Desktop Workstations.** Press the **Boot** button on the back of the workstation keyboard.
- **InterServe 200 and InterPro 245.** Press the **Reboot** button beside the keyswitch on the front of the electronics cabinet.
- **InterServe 300, 305, and 400, InterPro 340 and 360, and 3000- and 4000-Series Workstations/Servers.** Turn the keyswitch on the front of the cabinet to **Restart** and then return it to **On** or **Normal**.
- **InterPro 6000.** The keyswitch is on the front of the electronics cabinet. Keyswitch settings beginning at the top and moving clockwise to the bottom are as follows: **0** represents the off position, the triple-monitor icon is inactive at this time, **1** is the on position, and the **1** surrounded by a circular arrow is the restart position. To reboot the workstation/server, turn the keyswitch from the on position clockwise to the restart position and then turn it back to the on position.

Note:

On InterServe 300- and 400-series processors and InterPro 6000-series workstations/servers, the temperature light flashes when you reboot using the keyswitch. This is normal and does not indicate that the InterServe is overheating.

1.3 Shutting Down the System

Shutting down consists of shutting down the operating system properly and then switching off the power. Following the proper shutdown procedure is essential to protecting your workstation or server.

The system shutdown procedure accomplishes the following:

- Stops any running processes
- Syncs the disks, ensuring that all information stored in memory is transferred to the disks
- Parks the heads on all hard disks
- Halts the system

Properly shutting down bypasses the file system checks the next time the workstation or server is powered up, which thereby decreases the normal power-up time.

Notes:

- Always use the system shutdown procedure to ensure that the hard disk has been synced and the heads parked. Failing to sync the disks and park the heads could corrupt the file system.
- If you have a 6000-series workstation or server, turning the keyswitch to the off (O) position causes the system to perform an orderly shutdown automatically. Therefore, for these workstations/servers, you do not need to use the shutdown procedure.

1.3.1 Shutting Down the Workstation

Follow these steps to shut down the workstation:

1. Log out of your user account.
2. If the console window has been deleted, create a new one.
3. Select the **shutdown** option from the workstation menu.
4. Select the **OK** screen button when the pop-up menu appears and prompts you to confirm the request to power down.

1.3.2 Shutting Down the Server

Follow these steps to shut down the server:

1. Log out of your user account and log in to the root account.

2. Key in shutdown.

Messages similar to the following then appear on the screen:

```
INIT: New run level: 0
```

```
SHUTDOWN PROGRAM
```

```
Process accounting stopped.
```

```
Error logging stopped.
```

```
All currently running processes will now be killed.
```

```
Syncing disks . . .
```

```
Parking heads . . .
```

```
SCSI ID 0, LUN 0 : heads parked
```

```
System halted . . .
```

After these messages appear, turn the unit off by pressing the power switch to **O** (off) (on workstations without an electronics cabinet) or turning the keyswitch to the **OFF** position (on workstations or servers with an electronics cabinet).

1-10 Power-up, Reboot, and Shutdown Procedures



Chapter 2: Input Devices

Intergraph workstations provide two devices for data input and manipulation: the keyboard and cursor. This chapter explains each input device in detail and is divided as follows:

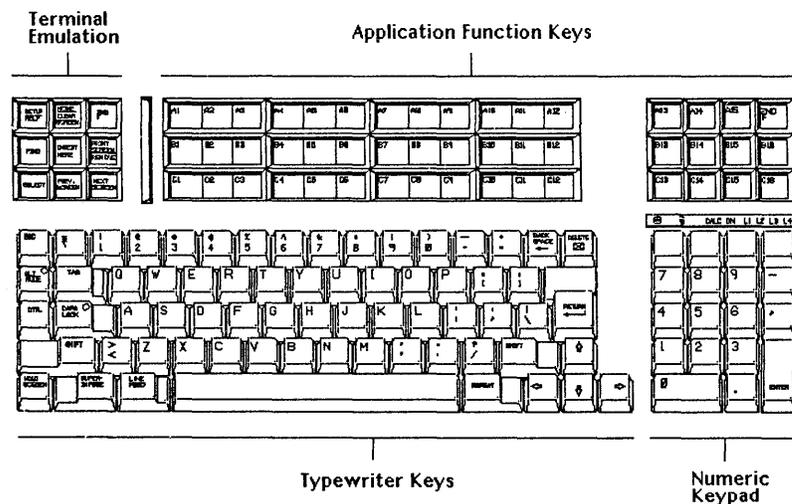
2.1	The Keyboard	2-3
2.1.1	Typewriter Keys	2-4
2.1.2	Numeric Keypad	2-4
2.1.3	Terminal Emulation Function Keys	2-4
2.1.4	Application Function Keys	2-4
2.2	The Mouse/12-Button Cursor	2-5
2.2.1	Using the Mouse	2-5
2.2.2	Using the 12-Button Cursor	2-6
2.2.2.1	Moving the Cursor	2-6
2.2.2.2	Learning the 12-Button Cursor Assignments	2-6

2.1 The Keyboard

Each Intergraph workstation uses the same multipurpose keyboard. This section provides an overview of the layout and multiple uses for each key grouping.

- Typewriter keys
- Numeric keypad
- Terminal emulation function keys
- Application function keys

The layout of the workstation keyboard is shown below. The workstation keyboard interprets user input according to the active emulation.



When the workstation operates under System V, the keyboard emulates the following:

- A VT220™ terminal keyboard when the VT220 emulation process is active. (VT220 PF keys are printed in black on the left side of the keys.)
- An InterAct graphics terminal keyboard when the InterAct Emulation process is active.
- A Tektronix® terminal keyboard when the Tektronix 4107™ emulation process is active.

2.1.1 Typewriter Keys

The typewriter keys are used to key in alphanumeric data. They provide all upper- and lowercase letters, numerals, and symbols found on a standard ANSI typewriter.

2.1.2 Numeric Keypad

The numeric keypad provides an alternate way to key in numbers and has keys for special VT220 and IBM PC functions. See your *CLIPPER System Administrator's Guide* for details.

2.1.3 Terminal Emulation Function Keys

The terminal emulation function keys are reserved for special terminal-related functions, such as the editing commands found on a VT220 terminal. Some keys are also for general functions, such as Help and setup. Eight keys are used specifically as function keys, while <2nd F> is a shift key.

Pressing the <2nd F> key before pressing another terminal emulation key initiates a secondary function, thereby doubling the number of functions available from this group of keys. See your *CLIPPER System Administrator's Guide* for details on how to use the terminal emulation features of your keyboard.

2.1.4 Application Function Keys

The application function keys are programmable membrane keys with functions that depend on the application program you are running. You can program them to serve as a function key menu for VAX™-based and standalone applications.

Of the 48 application function keys, 47 are programmable. The <2nd F> key allows you to assign two functions to each programmable key for 94 functions.

2.2 The Mouse/12-Button Cursor

Each workstation comes with a hand-held cursor. Your workstation will have either a mouse or 12-button cursor. This section covers both types of hand-held cursors.

2.2.1 Using the Mouse

The mouse is used (primarily with the InterPro workstation) to control screen cursor movement. The friction tracking ball on the underside of the mouse detects any motion and moves the cursor accordingly. Since the mouse is a cumulative (relative) tracking device, the cursor remains stationary when the mouse is picked up. This allows you to move the screen cursor around the screen using minimal desktop space.

For the best results from your mouse, follow these maintenance tips:

- Keep the mouse clean.
- Use light pressure when rolling the mouse.
- Keep the buttons facing straight ahead.

Throughout workstation documentation, you will commonly see the term *select*. Select always means to place the screen cursor over the desired option and tap the middle button.

The following table lists the general uses for mouse buttons. Because each application may use the mouse buttons differently, always check the application documentation for a description of the mouse button assignments.

<i>Tap the...</i>	<i>To...</i>
Left (command) button	Invoke hierarchical menus
Middle (data) button <D>	<ul style="list-style-type: none">- Select options from any menu or tutorial on the screen (including hierarchical)- Select icons and graphical elements- Manipulate windows- Place data points- Identify graphical elements- Activate windows (processes)
Right (reset) button <R>	<ul style="list-style-type: none">- Cancel commands- Reset commands- Reject element selections- Dismiss pull-down and hierarchical menus.

Note:

The three mouse buttons function exactly the same as the top row of buttons on the 12-button cursor.

2.2.2 Using the 12-Button Cursor

The 12-button cursor is an absolute tracking device used to move the screen cursor and to select from menus on the screen and digitizing surface.

2.2.2.1 Moving the Cursor

Screen cursor movement is controlled by movement of the 12-button cursor over an area of the digitizing table that corresponds to the area of the screen. This area of the digitizing table is called the tracking area. Depending on the size of your table, the entire area within the dark border around the edge of the table is active.

As you move the cursor in this area, notice that the screen cursor moves about two inches for every inch of cursor movement. This cursor movement feature allows you to control both screens with relatively short arm motions. It also leaves more of the digitizing table surface available for other purposes.

Note:

Some applications may redefine the tracking area size and location.

2.2.2.2 Learning the 12-Button Cursor Assignments

Throughout workstation documentation, you will commonly see the term *select*. Select always means to place the screen cursor over the desired option and tap the middle <D> button.

The following table lists the common uses for the cursor buttons. The functions of the top row of buttons are standard for most applications. The functions of the remaining buttons depend on the application running.

<i>Tap the...</i>	<i>To...</i>
Left button	<ul style="list-style-type: none">- Invoke hierarchical menus- Select commands from a paper or matrix menu
Middle button	<ul style="list-style-type: none">- Select options from any menu or tutorial on the screen (including hierarchical)- Select icons and graphical elements- Manipulate windows- Place data points- Identify graphical elements- Activate windows (processes)
Right button	<ul style="list-style-type: none">- Cancel commands- Reset commands- Dismiss pull-down and hierarchical menus- Reject element selections- Place tentative data points
Second row, middle button Second, third, fourth rows buttons 1-8	Select user-defined commands that have been assigned to these buttons

Note:

The top row of buttons on the 12-button cursor (<L>,<D>, and <R>) function the same as the three buttons on the mouse.



Chapter 3: The Screen Display

This chapter acquaints you with the basic screen components, windows, and menus available with Intergraph workstations. The following sections are included:

3.1	Entering the System Through the Workstation Login Menu	3-3
3.2	Understanding the Screen Display	3-3
3.2.1	Message Strip	3-4
3.2.2	Console Window	3-6
3.2.3	Local Window	3-6
3.2.4	Screen Working Area	3-7
3.3	Using the Screen Display	3-8
3.3.1	Understanding the Process ID	3-8
3.3.2	Using the Workstation Icon	3-8
3.3.3	Using the Primary Screen Icon for Dual-Monitor Workstations	3-11
3.3.4	Using the Virtual Screen Icon for Single-Monitor Workstations	3-12
3.4	Interacting with Windows	3-13
3.4.1	Active Processes	3-13
3.4.2	Window Manipulations	3-14
3.4.2.1	Moving a Window	3-15
3.4.2.2	Moving a Window from One Screen to Another Using Dual-Monitor Workstations	3-16
3.4.2.3	Modifying a Window	3-17
3.4.2.4	Popping a Window to the Top/Bottom of a Window Stack	3-17
3.4.2.5	Collapsing a Window	3-18
3.4.2.6	Moving a Collapsed Window	3-18
3.4.2.7	Restoring a Collapsed Window	3-18
3.4.2.8	Deleting a Window	3-19
3.4.2.9	Repainting a Window	3-19
3.4.2.10	Using the Setup Icon	3-19
3.4.2.11	Using the Catalog Icon	3-19
3.4.2.12	Using the Reset Icon	3-19
3.4.2.13	Using the Resize Icon	3-20
3.4.2.14	Using the Clear Screen Icon	3-20
3.4.2.15	Using Copy and Paste Icons	3-20
3.4.3	Scrolling Windows	3-20

3-2 *The Screen Display*

3.5	Screen Menus and Menu Options	3-22
3.5.1	Pull-Down Menus	3-22
3.5.2	Pop-Up Menus	3-22
3.5.2.1	Data Entry Boxes	3-23
3.5.2.2	Checkboxes	3-23
3.5.2.3	Screen Buttons	3-24
3.5.2.4	Hierarchical Menus	3-24
3.6	Other Menus and Displays	3-25
3.6.1	Window Menus	3-25
3.6.2	Function Key Menus	3-25
3.6.3	Paper Menus	3-25
3.6.4	Roll-through Boxes	3-26
3.6.5	Toggle Switches	3-26
3.6.6	Alert Boxes	3-26

3.1 Entering the System Through the Workstation Login Menu

As a security feature for Intergraph systems, the following login menu appears after the system boots. You are required to enter the username and password for any user account on the system before windows will be created.

The screenshot shows a window titled "Workstation User". At the top, there is a "Messages" section with a border containing the text "Please enter Username and Password". Below this are two input fields: "User Name" and "Password". Underneath the password field is a checkbox labeled "Execute Default Processes". At the bottom of the window are two buttons: "Cancel" and "OK".

This new login menu establishes a system user. All processes executing on the system will run under the protections/privileges established by the system user. A new entry in the Workstation Pulldown Menu (Wkst. User) can be used to check for the current system user. When you are finished using a system, use the log out feature on the Workstation Pulldown Menu.

If you want to bypass this menu and log directly in to the windowing environment of your workstation, you can edit the `/usr/ip32/smgr/wkstuser` file. Enter the login name of a user account in this file; only *one* login name can appear in this file. The system will boot directly into Screen Manager through the user established in this file instead of requesting a user login through the login menu.

Caution:

You will forfeit the security advantages of the login menu if you choose to bypass it with this method.

For more information on the Workstation Login and Pulldown Menus, refer to the `/usr/ip32/smgr/smgr.doc` file.

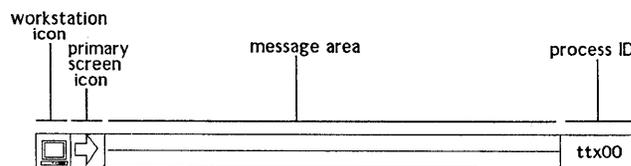
3.2 Understanding the Screen Display

After you enter the correct username and password on the Workstation User menu, the menu disappears and the standard workstation screen display (created by the Screen Manager software) appears. This section introduces the following basic features of the screen display:

- Message strip
- Console window
- Local window
- Screen working area

3.2.1 Message Strip

At bootup, the Screen Manager software automatically initializes the message strip and creates a local and console window. The message strip is composed of the following:

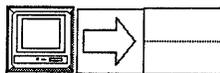


You can move the message strip from the top of the screen to the bottom by selecting the process ID field. Remember, *select* means to place the screen cursor over the desired element and tap the middle <D> button.

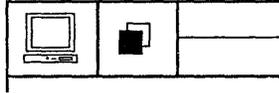
Note:

If you are using a single-monitor workstation, the virtual screen icon replaces the primary screen icon.

The primary screen icon appears as follows:



The virtual screen icon appears as follows:



The **workstation icon** is selected to display the workstation menu. From this menu you can create a terminal window and connect to a host computer, create a local window to access the System V operating system, run a process, or modify the workstation pull-down menu.

The **virtual screen icon** (on single-monitor workstations) is used to choose between virtual screens. The two virtual screens provide you with two different working areas. For example, you could run a graphics application program on one virtual screen and compile a program on the other. Selecting the virtual screen icon allows you to toggle between virtual screens.

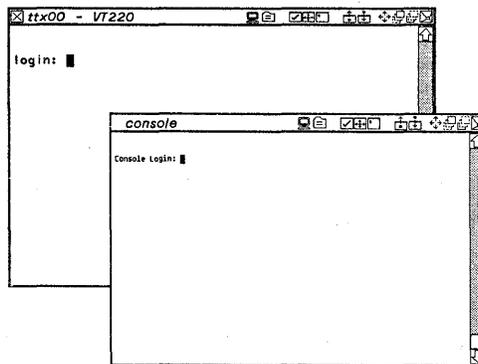
The **primary screen icon** (on dual-monitor workstations) is used to choose a primary screen. Selecting this icon changes the direction of the arrow, thus establishing the primary screen. When the arrow points to the right, windows you create appear on the right screen. When the arrow points left, they appear on the left screen.

The **message area** is where processes display messages, prompts, and user key-ins.

The **process ID** is the information box that tells you the current active process. A process is a program running on the workstation.

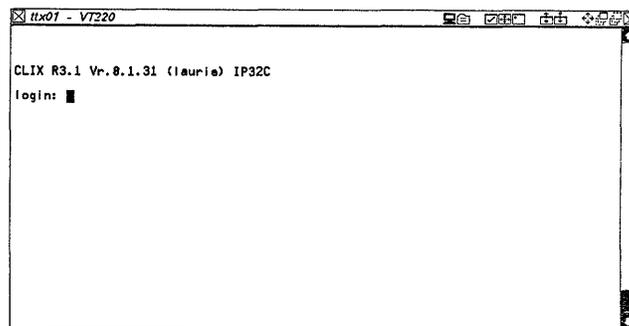
3.2.2 Console Window

The console window is used to display the System V operating system messages. The console window emulates a VT-220 terminal and is created automatically when you turn on the workstation. If the console window is uncollapsed, you can collapse it by selecting the collapse icon in the console window icon strip. You can restore the console window any time by selecting the console window icon. (See 3.4, "Interacting with Windows.")



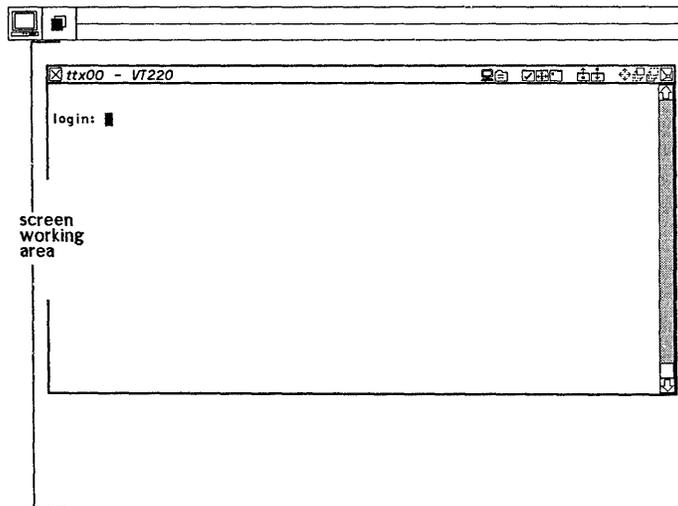
3.2.3 Local Window

The window that appears in the center of the working area also emulates a VT-220 terminal. It is called a *local* window because it is connected to the local System V operating system. It functions the same as the console window with two exceptions: unlike the console window, it does not display system messages, and you cannot log in to the local window as the root user.



3.2.4 Screen Working Area

The screen working area beneath the message strip is where windows display and application programs run.



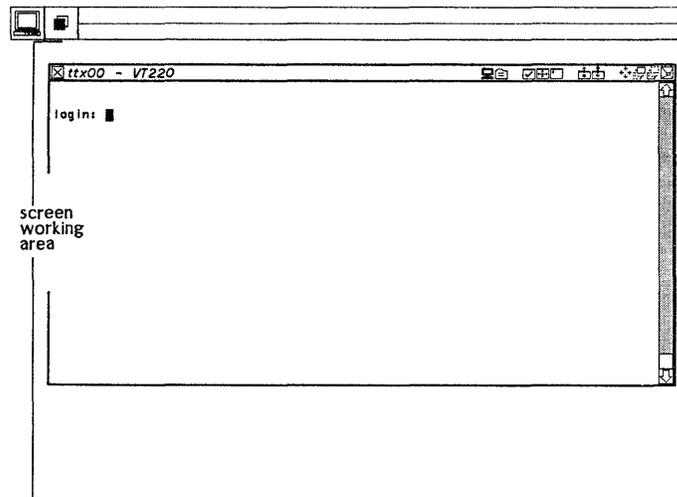
3.3 Using the Screen Display

This section shows you how to use the basic features of the screen display and manipulate windows. The following topics are discussed:

- Understanding the process ID
- Using the workstation icon
- Using the primary screen/virtual screen icon

3.3.1 Understanding the Process ID

The process ID identifies the active process. Only the active process can accept keyboard input. The process ID currently displays "ttx00" for the System V local window.



To move the entire message area from the top of the screen to the bottom, select the process ID field by positioning the cursor over the process ID field and tapping the middle <D> button.

3.3.2 Using the Workstation Icon

The following workstation icon also displays in the message strip.



Select this icon and the workstation menu similar to the following appears:



The workstation menu is a multilevel pull-down menu. Use your 12-button cursor to slide the cursor up and down the workstation menu. The different options highlight as you move the cursor over them. These options invoke specific programs associated with them.

Next, slide the cursor outside the workstation menu area and tap the right <R> button. Even though an option is highlighted, the menu disappears and no selection is made.

The following options are available on the standard workstation menu:

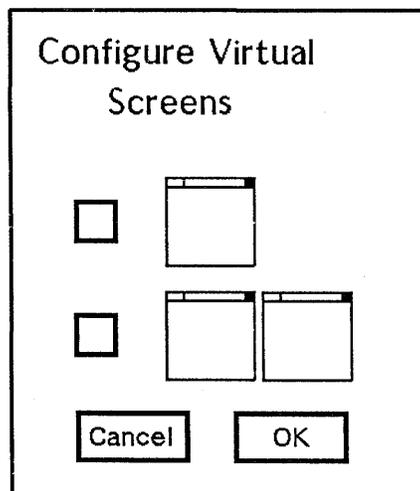
Terminal creates a window connected to a host system you specify and a pop-up menu. This menu allows you to create a VT-220 window connected to the local system, auxiliary port, or network node. You can also use a VT-220 window for executing commands.

Local creates a local VT-220 window, which allows you to work standalone in System V. When you select this option, a local window appears with a new process ID. The number following **ttx** in the process ID is increased by one for each local window created. For example, the process ID of the original local window automatically created when you boot the workstation is **ttx00**. The process ID for the next local window you create will be **ttx01**.

Shutdown activates the shutdown program that executes procedures needed for an orderly system shutdown. You should **always** shut down the system by selecting the **shutdown** option from the pull-down menu and waiting until you receive the "System halted..." message before turning off the workstation. If you turn off your workstation without selecting the **shutdown** option or before receiving the "System halted..." message, you may lose data.

Reboot activates the reboot program that automatically stops and restarts the system when you do not need to shut it down completely before restarting it.

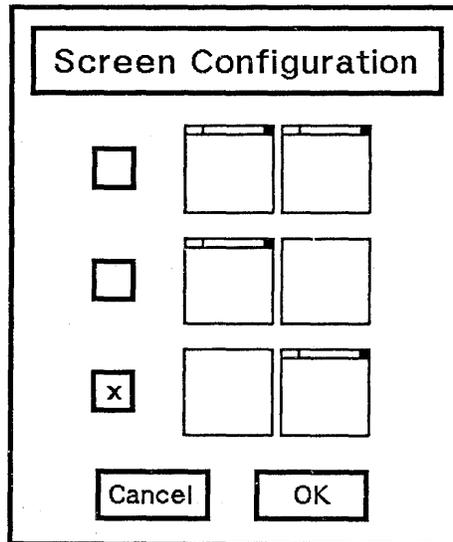
Configure configures the workstation pull-down menu, the background pattern, or the number of virtual screens. The **configure pull-down menu** option requires root (superuser) privileges. Refer to the *CLIPPER System Administrator's Guide* for information on using this option to alter the pull-down menu.



Note:

If the single-monitor workstation is configured for one virtual screen, the virtual screen icon disappears from the message strip.

The **configure virtual screens** option on dual-monitor workstations displays the Screen Configuration menu, which is used to set the default location for the message strips on the display screens. (The message strips may appear on both screens, on the left screen only, or on the right screen only.) Select the appropriate box and then select OK to dismiss the menu.



The **configure background pattern** option displays a menu of screen background patterns. The pattern you select determines the background pattern for the screens. Select a background pattern or select **Cancel** to dismiss the menu.

3.3.3 Using the Primary Screen Icon for Dual-Monitor Workstations

The primary screen icon (an arrow) identifies the primary screen as the left or right screen. All windows and processes will appear on the primary screen by default. You can change from one screen to another on dual-monitor workstations. For example, suppose the arrow on the icon points to the right as follows:



To switch from the right to the left icon, follow these steps:

1. Select the primary screen icon by placing the cursor over the icon and tapping the middle <D> button.

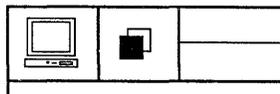
Notice that the arrow now points left, indicating that any window you create will appear on the left screen.

2. Select the local option from the workstation menu. A new local window appears on the left screen.
3. To return the right screen to primary screen mode, select the primary screen icon again.

3.3.4 Using the Virtual Screen Icon for Single-Monitor Workstations

The virtual screen icon allows you to switch between virtual screens. The two virtual screens supported by the single-monitor workstation provide you with different areas where you can organize and manipulate your work. (If your workstation is not configured for two virtual screens, review 3.2.2 for information on changing the screen configuration.)

To switch between the virtual screens, select the virtual screen icon by positioning the cursor over the virtual screen icon and tapping the middle <D> button.



The second virtual screen appears, and you now have a new screen working area. Select the virtual screen icon again to return to the first virtual screen.

3.4 Interacting with Windows

Windows are used as display devices for application programs. Using a local `ttX00` window, this section demonstrates the following:

- Active processes
- Standard window manipulations
 - Moving
 - Resizing
 - Popping
 - Restoring
 - Collapsing
 - Deleting
 - Repainting
- VT220 window manipulations
 - Resetting
 - Clearing the screen
 - Copying and pasting
 - Setting up
 - Using the catalog icon
- Scrolling windows

3.4.1 Active Processes

Although multiple windows can display when each window is running its own process, only one process can be active at a time. This process is called the *active* process. Some processes use more than one window for display purposes. A process can continue to run even when the process window is not active, but only the active process responds to keyboard input.

When a process is active, the following occurs:

- The window icon strip is highlighted.
- The process name appears in the process ID.
- The process menubar displays if the window has one. (A menubar is a list of choices for your application. Used for making selections for the active process, this list continuously displays beneath the message strip at the top of the screen.)
- The process receives input from the keyboard.

To activate a process, position the cursor in the window's working area and tap the middle <D> button.

3.4.2 Window Manipulations

The bar across the top of the window is called the window icon strip. Window manipulation icons and the window name appear within the window icon strip.

You can use these icons to manipulate windows in the following ways:

- Move a window
- Modify a window
- Pop a window to the top of a window stack
- Pop a window to the bottom of a window stack
- Collapse a window
- Move a collapsed window
- Restore a collapsed window
- Delete a window
- Repaint a window

The following VT-220 manipulations are also possible:

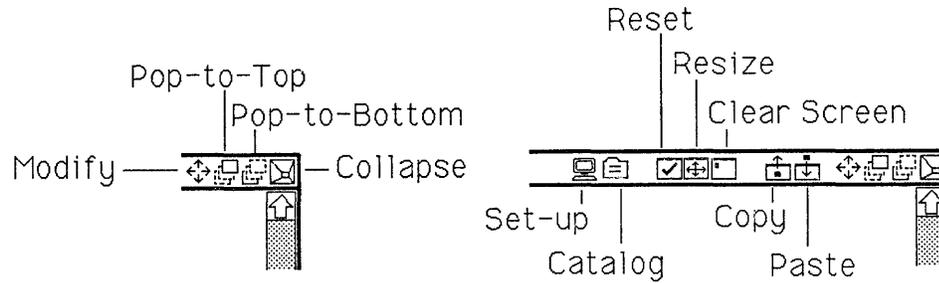
- Reset a window
- Clear the screen
- Copy and paste in another location

You can use these icons to modify nonactive windows as well as active ones. The following illustrations show where you can find the icons.

Only the **delete** icon is on the left side of the window.

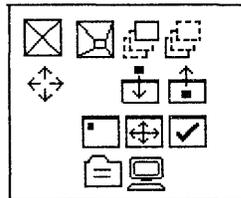


The remaining icons are on the right side of the window. Refer to the following illustration as you read descriptions of these icons.



When you create additional windows, they sometimes cover the manipulation icons of other windows. If you want to manipulate when its icons are covered, select the outline of that window at any point.

The manipulation icons of that window appear in a small box. You use them as you would the icons in the window icon strip.



3.4.2.1 Moving a Window

The **modify** icon (four arrows) is used to move and resize windows. To move a window, follow these steps:

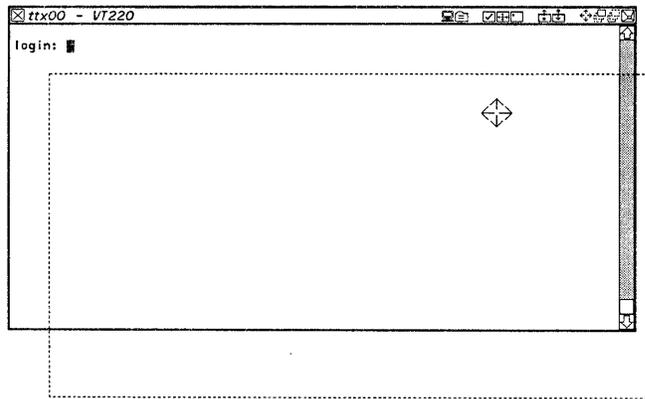
1. Select the **modify** icon.



When the cursor is on or near the border, it becomes a double arrow. As you move the cursor toward the center of the screen, it assumes the shape of the **modify** icon. The tentative window location becomes a dashed line called a marquee.

2. Position the **modify** icon inside the window. Press and hold the middle <D> button. The marquee changes to a solid line and the cursor disappears.

3. While holding the middle <D> button, move the cursor to move the outline on the screen. In this example, the outline is moved down and to the right.



4. When the window is where you want it, release the middle <D> button and the marquee reappears.
5. Tap the middle <D> button and the window is redrawn at its new location.

Note:

This method cannot be used to move windows from one screen to another on a dual-monitor workstation. See the next section for instructions on how to do this.

3.4.2.2 Moving a Window from One Screen to Another Using Dual-Monitor Workstations

To move a window to another screen, follow these steps:

1. Select the **modify** icon. The window border is replaced by the marquee (a dashed outline) and the cursor changes to the **modify** icon.
2. Move the cursor to the other screen. It reappears as the screen cursor.

3. Tap the middle <D> button. The marquee appears on the second screen and the cursor once again changes to the **modify** icon.
4. Position the **modify** icon at the center of the marquee. Press and hold the middle <D> button and the screen cursor disappears. While still holding the middle <D> button, move the 12-button cursor. The marquee moves as the 12-button cursor moves.
5. Release the middle <D> button when the window is positioned correctly. Tap the middle <D> button again and the window is redrawn.

3.4.2.3 Modifying a Window

The **modify** icon is also used to resize a window. To change the size of a window, follow these steps:

1. Select the **modify** icon. The cursor changes to the **modify** icon and the outline of the window changes to the marquee.
2. Move the **modify** icon to any edge or corner of the window. The arrows composing the **modify** icon show the direction in which the window size can be changed.
3. Press and hold the middle <D> button. The cursor disappears and the marquee becomes solid.
4. Move the edge or corner to increase or decrease the window size. The outline follows the cursor movement.
5. Release the middle <D> button. Tap the button again and the window is redrawn to the new size.

3.4.2.4 Popping a Window to the Top/Bottom of a Window Stack

The icons displayed to the right of the **modify** icon are the **pop-to-top** and **pop-to-bottom** icons. These icons are used to place a window currently covered by other windows on top or place a window currently on top beneath other windows. For example, to practice popping the console window to the top and then to the bottom of the **ttx00** window, follow these steps:

1. Select the **console** icon to restore the console window. The console window appears on top of the **ttx00** window. Notice that the console window is not active. The process ID still displays "ttx00," indicating that **ttx00** is still the active process.

2. Select the console window's working area. The console window icon strip highlights to show that the console window is now the active process.
3. Select the **pop-to-bottom** icon on the console window. The **ttX00** window appears on top.
4. Select the **ttX00** window's working area. The **ttX00** window icon strip highlights to show that it is the active window.
5. Select the **pop-to-top** icon in the console window. The window appears on top of the **ttX00** window.

3.4.2.5 Collapsing a Window

If you have many windows on your screen, you may want to collapse some of them so that you can organize the screen working area.

To collapse the local **ttX00** window, select the **collapse** icon in the **ttX00** window icon strip. The window collapses to a small rectangular shape.

Note:

When collapsed, the console window always appears in the lower right corner of the screen as the console window icon.

3.4.2.6 Moving a Collapsed Window

To move the collapsed window, follow these steps:

1. Position the screen cursor in the name area of the collapsed window. Press and hold down the middle <D> button.
2. Move the cursor to place the collapsed window to the desired location.
3. Release the middle <D> button to place the collapsed window at its new position.

3.4.2.7 Restoring a Collapsed Window

To restore a window to its uncollapsed size and location, select the **collapse** icon. The window then returns to its original size and position on the screen.

Note:

To restore a collapsed console window to its uncollapsed size and location, select the console window icon. The console window is restored automatically to display System V operating system messages.

3.4.2.8 Deleting a Window

The **delete** icon is used to delete a window in the screen's working area. You may want to delete a window when you are finished working with the process associated with that window.

Caution:

Deleting a window usually ends the process associated with it.

To delete the local **ttx00** window, select the **delete** icon. The window is deleted and the last remaining window defaults to the active process. In this case, the active process is the console window.

3.4.2.9 Repainting a Window

Some applications have a **repaint** icon in the window icon strip. The **repaint** icon, which appears as a small paintbrush, is used to repaint windows that are not automatically refreshed by the process that controls them. Such windows contain a grey pattern when not covered by another window or become distorted as the screen's elements are manipulated. (VT-220 windows are automatically refreshed and, therefore, do not have a repaint icon.)

To repaint such a window, select the **repaint** icon and the grey area disappears.

3.4.2.10 Using the Set-up Icon

Selecting the **set-up** icon displays the General Set-up menu used to customize the VT-220 virtual terminal emulation window. Refer to the *CLIPPER System Administrator's Guide* for information on setting the various terminal characteristics.

3.4.2.11 Using the Catalog Icon

Selecting the **catalog** icon displays the Catalog Terminal Environment menu, which is used to save your customized virtual terminals. Refer to the *CLIPPER System Administrator's Guide* for information on saving your customized virtual terminals.

3.4.2.12 Using the Reset Icon

The **reset** icon resets the terminal to the default characteristics defined in the set-up menus.

3.4.2.13 Using the Resize Icon

The **resize** icon returns a window to the standard 24-row x 80-column size after any sizes have been altered. You often need to resize a window when using a text editor such as **vi** or **emacs**.

3.4.2.14 Using the Clear Screen Icon

The **clear screen** icon clears the current window and places the cursor in the home position. Pressing <Return> displays the **\$** or **#** prompt.

3.4.2.15 Using Copy and Paste Icons

Any output from one section of a window can be copied and inserted at another location. For example, text and command lines can be copied from a file in one window and pasted in a file in another window.

To define the copy area, follow these steps:

1. Use the cursor to indicate the beginning of the output to be copied.
2. Press and hold the middle <D> button while moving the cursor up or down. The highlighted area indicates the text that will be copied. Release the middle <D> button.
3. Select the **copy** icon in the window icon strip.

To unhighlight (unselect) text, tap the reset <R> (or middle) button inside the window.

To paste a copied area, select the **paste** icon in the window icon strip of the desired window. The window does not need to be active. The area in the copy buffer is pasted to the bottom of the window buffer. (You can paste only if you are at the bottom of the window buffer.)

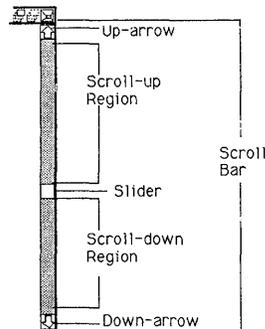
3.4.3 Scrolling Windows

The VT-220 windows provide scrolling capabilities. All window input and output that scrolls out of the window is stored in a sequential buffer in memory. This buffer's contents can be recalled with the scroll bar on the righthand side of the window. The number of screens available for scrolling is determined by the number defined in the Buffered Screens data-entry box in the Display Set-up menu. (This number defaults to 10. See your *CLIPPER System Administrator's Guide* for more information.)

The scroll bar consists of the up-arrow icon, scroll-up region, down-arrow icon, scroll-down region, and slider. The up arrow, down arrow, and slider are used to display output at a given position in the buffer. The slider's position in the scroll bar reflects the the current screen display's relative location as the display is stored in the buffer.

When the slider is at the top of the scroll bar, the window display reflects the output at the beginning of the buffer.

When the slider is at the bottom of the scroll bar, the window display reflects the output at the end of the buffer. If the window is active, any keyboard input is appended to the bottom of the buffer, regardless of the current screen display and buffer position.



To scroll down, place the cursor over the down-arrow icon and press and hold the middle <D> button. The slider in the scroll bar reflects the output's position in the buffer.

To scroll up, place the cursor over the up-arrow icon and press and hold the middle <D> button. The slider in the scroll bar reflects the output's position in the buffer.

To scroll one screen at a time, place the cursor inside the scroll-up or scroll-down region. Tap the middle <D> button below the slider to scroll down; tap the middle <D> button above the slider to scroll up. Each tap displays a new buffered screen.

To scroll to a specific section in the buffer, place the cursor over the slider and press and hold the middle <D> button. Moving the slider moves the buffer position as the position is reflected in the current screen display.

Scrolled screens can be recorded and stored in a viewable log file. Refer to the *CLIPPER System Administrator's Guide* for information on storing scrolled screens in a log file.

3.5 Screen Menus and Menu Options

This section discusses the following three most common screen menu types:

- Pull-down
- Pop-up
- Hierarchical

3.5.1 Pull-Down Menu

Pull-down menus are activated from the workstation icon or from a menubar beneath the message strip. Pull-down menus can either have a single level or multiple levels. These menus are used to initiate commands or display pop-up menus. A pull-down menu allows you to make one selection before the menu disappears.

As noted earlier, the workstation menu is an example of a multilevel pull-down menu.



3.5.2 Pop-Up Menus

A pop-up menu is invoked from another menu or icon and pops up in the center of the screen. Unlike pull-down menus, pop-up menus allow you to make several selections. No other screen functions can occur while a pop-up menu displays. A pop-up menu displays until you dismiss it with the **Cancel**, **OK**, or **Bye** screen button at the bottom of the menu.

To practice using some of the menu selection options commonly available on pop-up menus, you will use the VT-220 Terminal Emulation process. (See the *CLIPPER System Administrator's Guide* for more information on VT-220 Terminal Emulation.) The workstation uses this process automatically to create the console window and the local **ttX00** window. Now you will use it to create a VT-220 window connected to a host on the network.

Note:

The following example applies to a workstation connected to an Intergraph VAX, not to a standalone workstation. However, even if your workstation is not connected to a VAX, the information in this chapter will familiarize you with menu features.

Follow these steps to create a VT-220 window:

1. Select the workstation icon and the workstation menu appears.
2. Select the **terminal** option and the Create VT-220 pop-up menu appears.

The Create VT-220 pop-up menu contains the following features common to pop-up menus:

- Data entry boxes
- Checkboxes
- Screen buttons

3.5.2.1 Data Entry Boxes

Within this pop-up menu, three key-in boxes for network host parameters display. These boxes are called data entry boxes because they accept user key-ins. Follow these steps to use the data entry boxes:

1. Using the cursor, select the first host box. A cursor appears and prompts you for input.
2. Key in the node address or nodename of the VAX or other host to which you will connect your virtual terminal. (Consult your system manager for your VAX address.) The previous illustration of the Create VT-220 menu uses the node address, **08-00-36-12-34-56**.
3. Press <Return> to enter the information. A box appears in the checkbox beside the data entry box. This box signals the host to which you will connect.

3.5.2.2 Checkboxes

A checkbox appears to the left of each data entry box. Checkboxes allow you to select from a list of items. Select a checkbox different from the one that is currently checked. Notice that the box moves to the item you selected.

3.5.2.3 Screen Buttons

The **Cancel** and **OK** screen buttons are at the bottom of the menu. Screen buttons are used to initiate a menu command or dismiss a pop-up menu. You must dismiss a pop-up menu before you can proceed.

Select **OK** to dismiss the menu and create the terminal window to the specified host.

3.5.2.4 Hierarchical Menus

Hierarchical menus present one or more levels of options for command selection. These menus are most commonly found in some of the standalone and VAX-based applications.

The workstation menu acts like a hierarchical menu; however, the workstation menu is a multilevel pull-down menu. True hierarchical menus reside in an applications environment and are invoked when you tap the left button.

As you can with pull-down menus, you can select one option from the menu before it is automatically dismissed. You can dismiss a hierarchical menu or pull-down menu by tapping the right <R> button. Hierarchical menus appear in the screen's working area.

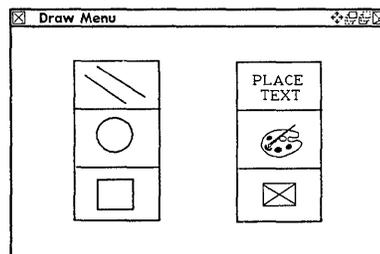
3.6 Other Menus and Displays

This section describes the following types of menus and displays available with the workstation:

- Window menus
- Function key menus
- Paper menus
- Roll-through boxes
- Toggle switches
- Alert boxes

3.6.1 Window Menus

Window menus are inside of movable windows. They are sometimes referred to as permanent menus and are most commonly used by applications to display frequently used commands. Once activated, window menus do not need to be dismissed so that you can continue working in the application. Window menus can be moved, collapsed, and deleted, but their size and proportions cannot be changed.



3.6.2 Function Key Menus

Function key menus are composed of the membrane keys at the top of the keyboard. These keys are programmed to activate specific commands when pressed and are predefined for some application programs. Other applications allow you to define your own function key menus. To help you remember the programmed uses for the keys, you can create a paper legend of the programmed keys and slide the legend in the function key menu slot on your keyboard.

3.6.3 Paper Menus

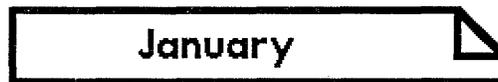
Paper menus are command selection menus placed on the workstation's digitizing surface. They are used to issue commands for application programs. For the Intergraph IGDS VAX-based graphics application and the MicroStation 32 standalone graphics application, the **AM=** command is used to attach the menu. After keying in the command, you then need to specify the menu origin. See the appropriate application documentation for details on attaching menus.

3.6.4 Roll-Through Boxes

Roll-through boxes are rectangular displays containing a series of data, such as the 12 months of the year. The months display one at a time, and you roll through the series of choices until the desired selection appears.

Roll-through boxes can be found in the workstation Utility pages and in some pop-up menus. To use roll-through boxes, follow these steps:

1. Select the roll-through box.

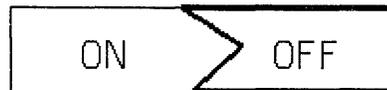


2. Continue selecting the roll-through until the desired option appears.

3.6.5 Toggle Switches

Toggle switches allow you to choose between alternatives. For example, toggle switches frequently allow you to make on/off and yes/no decisions. These switches show both alternatives with the selected alternative highlighted. Toggle switches are found in some application programs and in Utility page menus (for system management functions).

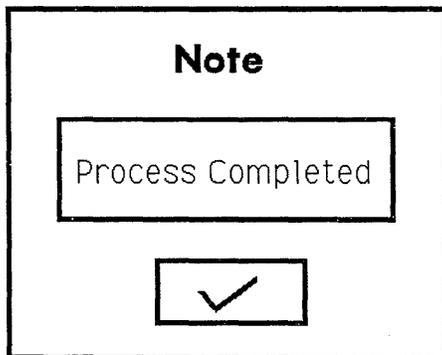
To use toggle switches, select the toggle switch and flip between the two selections.



3.6.6 Alert Boxes

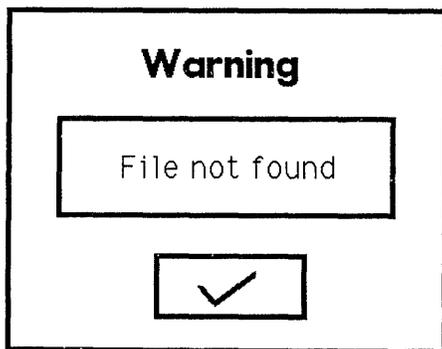
Alert boxes inform you of fatal errors, warnings, or system messages. Each type of box displays with its title in a distinct color (specified in parentheses by each box type).

Note (blue)



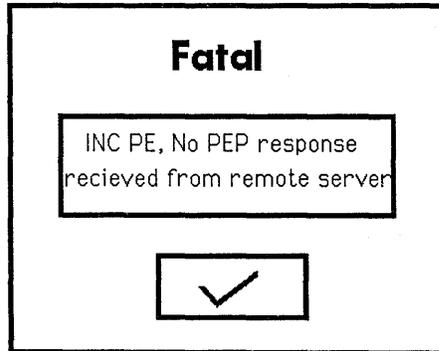
The note alert box provides you with useful information.

Warning (yellow)



The warning alert box informs you that a serious operation is about to occur.

Fatal (red)



The fatal alert box informs you that a serious system malfunction has just occurred or that some operation you requested was not successful.



Chapter 4: Introduction to the System V Operating System

This chapter introduces the novice user to the basics of the System V operating system. It first presents basic System V components. It then explains the file system structure and how to access files and directories in the structure. Finally, it introduces several file and directory manipulation commands. These topics are covered:

4.1	Logging On to System V	4-3
4.2	Logging Off from System V	4-4
4.3	The Operating System	4-5
4.3.1	Kernel	4-5
4.3.2	Shell	4-5
4.3.3	File System	4-6
4.3.3.1	Ordinary Files	4-6
4.3.3.2	Directory Files	4-6
4.3.3.3	Special Files	4-6
4.4	File System Structure	4-7
4.4.1	Commonly Referenced File Systems and Directories	4-8
4.4.2	Pathnames	4-9
4.4.2.1	Absolute Pathnames	4-9
4.4.2.2	Relative Pathnames	4-10
4.5	Manipulating Directories	4-12
4.5.1	Home Directories	4-12
4.5.2	Working Directories	4-12
4.5.3	Changing Directories	4-12
4.5.4	Listing Directory Contents	4-13
4.5.4.1	Long Listing	4-14
4.5.4.2	Common <code>ls</code> Command Options	4-15
4.5.4.3	Long Listing Examples	4-16
4.5.5	Creating Directories	4-16
4.5.6	Removing Directories	4-17
4.6	Manipulating Files	4-19
4.6.1	Naming Files	4-19
4.6.2	Displaying File Contents	4-19
4.6.3	Copying Files	4-20
4.6.4	Moving Files	4-21
4.6.5	Removing Files	4-21
4.6.6	Using Wildcards	4-22
4.6.7	Taking Filename Shortcuts	4-23
4.7	File Access and Permissions	4-24
4.7.1	Fields in a Long Listing	4-24
4.7.1.1	File Type	4-24
4.7.1.2	File Permission Mode	4-25

4-2 *Introduction to the System V Operating System*

4.7.2	Determining Your User Type	4-25
4.7.2.1	User (Owner) Category	4-25
4.7.2.2	Group Category	4-26
4.7.2.3	Other Category	4-27
4.7.3	Permission Modes	4-27
4.7.3.1	Read Access	4-28
4.7.3.2	Write Access	4-28
4.7.3.3	Execute Access	4-28

4.1 Logging On to System V

If your system is up and a login prompt appears on the screen, you can log in to the system. Ask your system manager for your login name and password (if you have one).

Note:

Always log in to a personal account unless you are performing system maintenance. Use the **sys** account to log in and perform system maintenance.

To log in to a personal account, key in your username (and password if required) at the appropriate prompts as follows:

```
login: joe
password: (does not display)
$
```

The **\$** is the standard UNIX operating system prompt. It indicates that the operating system is ready to accept commands.

4.2 Logging Off from System V

You should always log off after you finish working on the system. To log off, press <Ctrl-D> or key in **exit** at the prompt as follows:

```
$ exit  
login:
```

The login prompt reappears and displays until another user logs in to the system.

4.3 The Operating System

An *operating system* consists of programs that control your workstation's or server's overall operation. Intergraph workstations and servers are based on AT&T's UNIX System V operating system version 5.3.1. Intergraph has ported the System V operating system to the CLIPPER processor and enhanced it with Berkeley and Intergraph extensions.

This enhanced operating system is commonly called the CLIX operating system. For this reason, you will often hear the terms *System V* and *CLIX* used interchangeably when Intergraph workstations/servers are discussed.

The operating system mediates between you and the workstation/server and provides essential programs such as editors, command languages, and programs for copying and printing files. The operating system is based on these main components:

- Kernel
- Shell
- File system

4.3.1 Kernel

The kernel, the lowest level of the operating system software, performs the following functions:

- Allocates system resources
- Maintains file systems
- Manages memory
- Provides device drivers that control access to the workstation/server hardware

The kernel is a complex program with which you do not need to communicate directly. Usually, your commands are first routed through the shell; the shell, in turn, interfaces with the kernel.

4.3.2 Shell

The shell provides the interface between the user and the kernel. Think of the shell as a command interpreter; when you enter commands at the prompt, you are probably communicating with one of the shell programs. The shell program interprets your commands and communicates your request to the kernel. The shell then responds to let you know whether the command was successful.

Intergraph's operating system supports many different shells, each with unique advantages. The standard for System V, the *Bourne shell* (*sh*), is the default shell for the system administrator's root account. The *Korn shell* (*ksh*) is an enhanced version of the Bourne shell and is the default for user accounts generated with the Intergraph *addusers* utility. The *C shell* (*csh*) is commonly

used on Berkeley systems, and C programmers often prefer it because its syntax resembles syntax for the C programming language.

You can change default shells by keying in the shell acronym at the System V prompt. The following table lists these shells and their corresponding acronyms:

<i>To access this shell...</i>	<i>Key in...</i>
Korn Shell	\$ ksh
Bourne Shell	\$ sh
C Shell	\$ csh

Refer to the *CLIPPER System Administrator's Guide* for instructions in changing the default shell for a user account.

4.3.3 File System

The System V file system provides the structure for organizing files. All System V data is stored in files. (Section 4.4 describes the file system's structure.) System V has three types of files: *directory*, *ordinary*, and *special*. This section defines each type.

4.3.3.1 Ordinary Files

Ordinary files are the most common type. Ordinary files store information such as programs, design files, and raster graphics. Commands and executables are also ordinary files.

4.3.3.2 Directory Files

A directory is a file that, like a table of contents, contains the names of files and other directories. A directory could also be compared to a file cabinet in that it stores other files. To better organize your files, you can group related files in a common directory. You cannot execute a directory file.

4.3.3.3 Special Files

A special file is an input/output device, such as a peripheral device or a window. Special files are located in the */dev* (device) directory only.

4.4 File System Structure

You should understand the file system structure well so that you can effectively and efficiently create, access, and use files.

The System V file system has a *hierarchical* structure. A hierarchical file system has a layered, or tree-like, design; all files and directories stem from one main source, the *root* directory. The root directory branches into subdirectories and files, causing the file system to resemble the roots of a tree.

Figure 4-1 illustrates the hierarchical organization of the System V file system. You do not need to memorize the names of all directories in the file system.

Notice that most System V files are in lower-case letters. Since the System V operating system is case-sensitive, upper- and lower-case letters are interpreted differently. Most System V commands and files are written in lower-case letters.

Note:

The files on your workstation may differ.

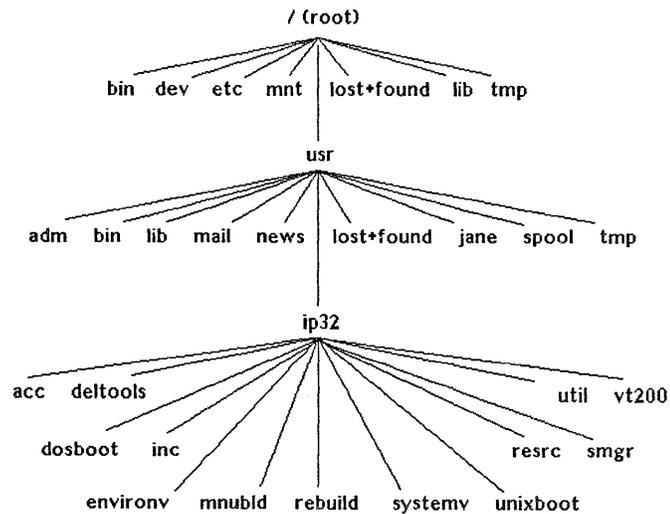


Figure 4-1. System V's Hierarchical Structure

Caution:

Manipulating files in the System V file system may interfere with your operating system or software packages.

4.4.1 Commonly Referenced File Systems and Directories

The System V file system has two major file systems, *root* and *usr*. Directories allow these file systems to manage all files. Directories are organized in a hierarchy of levels so that users can access them easily.

The directory on the highest level of the hierarchical file system is called the *root* directory and is denoted by a slash (/). The *root* directory consists of subdirectories and files in the top level of the System V hierarchy. These subdirectories contain files essential for the System V operating system, shell program processing, and system initialization (startup routines).

The */usr* directory includes a */usr/<login_name>* directory for each user, where *<login_name>* is the user's login name. For example, suppose that a user named Jane also has a login name of *jane*. Jane will store most of her files in her */usr/jane* directory. The name of the directory, */usr/jane*, is called the file *pathname* because it identifies a file by its location in the file system hierarchy.

The */usr* directory also contains directories that are essential for all users to access. For example, */usr/ip32* (which stores Intergraph software products) and */usr/bin* (which stores user commands) are located in the */usr* directory.

The */bin* (binary) directory contains System V commands (such as **sh**, **ksh**, and **csh**) essential to the operating system.

The */dev* (device) directory contains special files, or *device drivers*. Device drivers represent each supported I/O device in the system configuration.

The */etc* directory contains a set of System V commands (such as **addusers**, **sysadm**, and **fsck**) used primarily for system administration.

The */mnt* directory is used to mount a file system (such as a floppy disk file system) temporarily.

The */usr/bin* directory contains System V commands (such as **fm**, **vt**, and **regis**) commonly accessed by users. To invoke commands in this directory, you are not required to key in the full pathname because this directory is (by default) included in the *PATH* variable in each user's *.profile* file.

The `/usr/ip32` directory contains Intergraph software products. Each product is stored in a subdirectory of this directory. If you use the `-f` option in the `newprod` interactive environment to load a product to an alternate file system, the product will be symbolically linked to `/usr/ip32`.

4.4.2 Pathnames

Since the System V file system can contain hundreds of files, tracking each file's location may become cumbersome. A pathname describes the path taken through the hierarchy to reach a particular directory or file.

Refer to Figure 4-1. To reach the `vt200` file, you will move down the hierarchy from the root (`/`) directory, to `usr`, to `ip32`, and finally to `vt200`. Thus, the file's pathname is `/usr/ip32/vt200`.

System V has two types of pathnames, *absolute* and *relative*; these types are defined below.

4.4.2.1 Absolute Pathnames

An *absolute* pathname is often referred to as a *full* or *complete* pathname because it includes a full list of the file's parent directories, starting from the top of the hierarchy (root).

Since you start at the root directory, an absolute pathname always begins with a slash (`/`), which represents the root directory. The slash (`/`) also serves as a file delimiter.

For example, `/usr/frank/graph` is an absolute pathname beginning at root and ending at the file called `graph`. The following diagram breaks down this pathname.

```
/usr/frank/graph
| | | | |
| | | | |
| | | | |
| | | | filename
| | | | |
| | | | |
| | | | |
| | | | delimiter
| | | |
| | | home directory
| | |
| | delimiter
| |
| system directory
|
root
```

4.4.2.2 Relative Pathnames

Note:

Examples intended to clarify relative pathname concepts use the **cd**, **ls**, and **pwd** commands, which are covered in 4.5. The **cd** command changes your current working directory, the **ls** command lists a directory's contents, and the **pwd** command prints the absolute pathname for your current working directory.

A *relative* pathname allows you to identify a file or directory without specifying the full (absolute) pathname, thus shortening the pathname that you must key in. It is called *relative* because the relative pathname depends on your current directory position. Using a relative pathname, you can move forward or backward from your current working directory.

When you are moving forward in the system's hierarchy, you will not specify files and directories in your present working directory. Instead, you identify each element in the path of the file you are accessing. For example, if your present working directory is */usr/joe* and you want to list the files in the */usr/joe/graph/programs* directory (using the **ls** command), you can identify the directory by its relative pathname as follows:

```
$ ls graph/programs
```

Of course, you will achieve the same result if you specify the absolute pathname as the following example shows:

```
$ ls /usr/joe/graph/programs
```

Or, if your current working directory is */usr/joe* and you want to change to */usr/joe/mail*, you can key in the **cd** (change directory) command followed by the relative pathname as follows:

```
$ pwd
/usr/joe
$ cd mail
$ pwd
$ /usr/joe/mail
```

You can also move backward in the system's hierarchy using relative pathnames. The **..** directory is the parent directory for your current working directory. Thus, you can use **..** to move back one level. For example, if your current directory is */usr/ip32/vt200* and you want to move back to */usr/ip32*, you can use **..** as follows:

```
$ pwd
/usr/ip32/vt200
$ cd ..
$ pwd
/usr/ip32
```

To the `..` directory, you can append a path leading to a directory position forward in the hierarchy. For example, suppose you are in `/usr/ip32/john` and want to move to the file `/jane`, which is also in `/usr/ip32`. Instead of using the full pathname `/usr/ip32/jane` to move to `/jane`, you could use the relative pathname as follows:

```
$ pwd
/usr/ip32/john
$ cd ../jane
$ pwd
/usr/ip32/jane
```

4.5 Manipulating Directories

As you learned earlier, a directory file stores other files. This section describes some common commands that enable you to move around in the file system and manipulate directories. This section describes some common directory terms.

4.5.1 Home Directories

When you log in, the system automatically places you in a predefined directory. This default login directory is called your *home* directory. Your *home* directory is usually the same as your login name.

For example, if your login name is *joe*, your *home* directory is probably */usr/joe* or */usr2/joe*. You can create and store personal files in your *home* directory.

4.5.2 Working Directories

Your *working directory* is the directory you are currently working in. If you change directories, the directory to which you change is your working directory. The **pwd** (print working directory) command prints the absolute pathname for your current directory.

If you are not already logged in, log in now and key in the **pwd** command as follows:

```
login: joe
$ pwd
/usr/joe
```

Since you just logged in, your current directory is also your default login, or *home* directory.

You will often need to know the pathname of your current directory. When you forget your current directory, simply key in the **pwd** command.

4.5.3 Changing Directories

After you log in, you can easily change your directory using the **cd** (change directory) command. The **cd** command changes your position in the hierarchy to a specified directory.

For example, if your current directory is */usr/<login_name>*, you can easily change your directory to the Intergraph product directory, */usr/ip32*, by keying in the **cd** command followed by the pathname as follows:

```
$ pwd
/usr/joe
$ cd /usr/ip32
$ pwd
/usr/ip32
```

In this example the pathname */usr/ip32* is an *argument* to the **cd** command.

You do not always need to specify an argument when issuing a command. For example, if you do not specify a pathname after the **cd** command, the directory specification will default to your *home* directory as follows:

```
$ pwd
/usr/ip32
$ cd
$ pwd
/usr/joe
```

Note:

Only the **cd** command will change your current directory position. No other commands will.

4.5.4 Listing Directory Contents

You learned earlier that a directory file can contain other directories (subdirectories), ordinary files, and special files. The **ls** (list) command will list the files or subdirectories in a directory. When no argument is specified, the **ls** command lists the files in your current directory as the following example illustrates:

```
$ pwd
/usr/joe
$ ls
charts
memos
mail
$
```

To list files in another directory, key in the **ls** command followed by the directory name as follows:

```
$ pwd
/usr/joe
$ ls /usr/bill
records
test.dgn
prog.c
$ pwd
/usr/joe
$
```

The **ls** command does not change your current directory position.

Remember, you can also specify the relative pathname. The results will be the same for the previous example if you key in the following:

```
$ pwd
/usr/joe
$ ls ../bill
records
test.dgn
prog.c
$
```

4.5.4.1 Long Listing

System V *options* enhance many commands in the System V operating system. An option modifies a command's function or output. For example, the **ls** command supports many options that provide more specific information about the files in a directory. One commonly used option of the **ls** command is **-l** (long listing). The **ls -l** command displays detailed information about the directory's files, as the following example shows:

```
$ pwd
/usr/joe
$ ls -l charts
drwxr-xr-x 2 joe users 114 May 5 13:24 charts
$
```


These are some other commonly used options for the `ls` command:

Option	Function
<code>-l</code>	Displays a long listing
<code>-p</code>	Displays a slash (/) after each directory filename
<code>-F</code>	Displays a slash (/) after each directory filename and an asterisk (*) after each executable file
<code>-a</code>	Lists all filenames, including those beginning with a dot (.)
<code>-C</code>	Lists filenames in columns
<code>-i</code>	Lists the i-node number of files
<code>-d</code>	When combined with the <code>-l</code> option, displays a long listing of the directory itself, not of its contents (files and subdirectories)

4.5.4.3 Long Listing Examples

To display a long listing of the `/usr/ip32` directory, you can key in the following command:

```
$ ls -ld /usr/ip32
drwxrwxr-x 27 root sys 640 Sept 4 1989
/usr/ip32
```

To display all `/usr/joe/charts` files in columns, place a / after directory files and an * after executables as follows:

```
$ ls -CF /usr/joe
charts/      memos/      mail*
$
```

4.5.5 Creating Directories

The `mkdir` (make directory) command creates a new directory or subdirectory. You must specify an absolute or relative pathname when creating a directory.

In the following example, Joe creates a subdirectory of his `home` directory and calls the subdirectory `records`. (The `mkdir` command and the argument, or the new directory name, are separated by a space.)

```
$ pwd
/usr/joe
$ mkdir /usr/joe/records
$ pwd
/usr/joe
$ ls
charts
mail
memos
records
$
```

The `mkdir` command did not change the current directory position.

In the previous example, you could have created the directory by specifying the relative pathname. You can also create several subdirectories once as the following example illustrates:

```
$ pwd
/usr/joe
$ mkdir meetings finances
$ pwd
/usr/joe
$ ls
charts
finances
mail
meetings
memos
records
$
```

4.5.6 Removing Directories

The `rmdir` (remove directory) command deletes a directory. System V does not keep file versions. Deleting a directory file or any file removes all traces of the file from the disk. Before you can delete a directory, the following conditions must be true:

- The directory file must be empty; it cannot contain any subdirectories or ordinary files. If the directory is not empty, you must first move (`mv` command) or remove (`rm` command) the files. Section 4.6 covers these commands.
- The current directory position must be at least one level higher in the hierarchy; that is, you must be at least in the parent directory of the directory you want to delete.

The following example will remove the *finance* and *meetings* directories that we just created. First, the `ls` command will ensure that the directories are empty. Next, the directory will change to the parent directory.

```
$ pwd
/usr/joe
$ cd finance
$ ls
$ ls /usr/joe/meetings
$ pwd
/usr/joe/finance
$ cd ..
$ pwd
/usr/joe
$ rmdir finance meetings
```

4.6 Manipulating Files

This section describes some basic commands used to manipulate files in System V. For information on creating files using the `vi` text editor, refer to the System V documentation. For information on the `emacs` text editor, refer to the *Emacs Guide* that was included with the system.

Basic manipulations discussed in this section include the following:

- Moving or renaming files
- Copying files
- Removing files
- Displaying file contents

Note:

File permission modes may prevent you from manipulating other users' files or system files.

4.6.1 Naming Files

Before you create and manipulate files, study the following standard file naming conventions:

- System V filenames should not exceed 14 alphanumeric characters. This maximum applies only to the filename, not to the pathname.
- Any filename over 14 characters is truncated.
- Several System V characters are interpreted differently than standard alphanumeric characters are. You should **not** use the following special characters in the filename:

= ! * / \ ({ [< >] }) & ? \$ # @ " " + - .

- The System V operating system does **not** use different versions for each time a file is edited. Therefore, when naming a file, ensure that the filename does **not** exist in the same directory. If you give an existing name to a new file, you will **overwrite** the contents of the original file.

Note:

To prevent a file from being overwritten, always use the `ls` command to check a directory's filenames.

4.6.2 Displaying File Contents

The `cat` (concatenate) and `pg` (page) commands display a file's contents. Only ASCII files will display with these commands; you cannot use `cat` or `pg` to view a directory file or executable.

The following example illustrates the `cat` command, which prints all of the file's contents at once. When you use the `cat` command, stop and start text scrolling with the <Hold Screen> key.

```
$ cat /etc/motd
Today is Monday, May 15
$
```

The `pg` command allows you to view a file a screen at a time. Once a screen displays, a prompt (usually `:`) appears at the bottom of the screen.

The `pg` command has these useful interactive options:

<Return>	Another screen of text will display.
-	The screen of text skips backward one page.
/ <i><string></i>	The system searches for the string and the page containing the string will appear.

Here is an example for using the `pg` command:

```
$ pg /etc/motd
Today is Monday, May 15
: <Return>
$
```

4.6.3 Copying Files

The `cp` (copy) command creates a copy of a file. In the following example, *file0* is copied to *file1*

```
$ ls
file0
$ cat file0
This is a sample file.
$ cp file0 file1
$ ls
file0
file1
$ cat file1
This is a sample file.
$
```

The following example copies *file1* in */usr/joe* to */usr/mike* and renames it *test*. Since the absolute pathname is used, you can perform this procedure from any directory.

```
$ cp /usr/joe/file1 /usr/mike/test
```

If the present working directory is */usr/joe*, the key-in can be simplified as follows:

```
$ cp file1 /usr/mike/test
```

If the present working directory is */usr/mike*, the key-in would be the following:

```
$ cp /usr/joe/file1 test
```

4.6.4 Moving Files

The **mv** (move) command is used to move a file to another directory or to rename a file. If you do not specify a new filename, the file retains its old name. In the following example, *file0* is moved to a new directory but retains the same name:

```
$ mv /usr/joe/file0 /usr/mike
$ ls /usr/joe
charts
mail
$ ls /usr/mike
file0
```

The following example uses the **mv** command to assign a new name to *file0*. The new name is *newfile* and the file remains in the same directory.

```
$ ls
file0
file1
file2
$ mv file0 newfile
$ ls
file1
file2
newfile
```

The file did not actually move; it was simply renamed. For this reason, the **mv** command is often called the **rename** command.

4.6.5 Removing Files

The **rm** (remove) command removes a file. Remember, System V does not keep versions of files; once a file is removed (deleted) it cannot be recovered.

In the following example, the `rm` command deletes the file `test` from the current working directory:

```
$ pwd
/usr/joe
$ ls
test
file1
charts
$ rm test
$ ls
file1
charts
$
```

As you know, many System V commands have options that perform specific tasks. For instance, the `rm` command, when combined with the `-r` (recursive) command, deletes a directory and its contents.

However, `/usr/joe/charts` is a directory. Since it is not empty, you cannot delete the `/charts` directory using the `rm -r` command option. If you attempt to use this option, you will receive an error message as this example shows:

```
$ pwd
/usr/joe
$ ls charts
chart1
chart2
$ rmdir charts
ksh: charts not empty
```

The `rm -r` command, however, deletes the entire directory and any files in the directory as this example illustrates:

```
$ pwd
/usr/joe
$ rm -r charts
$ ls charts
$
```

4.6.6 Using Wildcards

Wildcards, indicated by an asterisk (*), can be used in some cases to shorten the amount of information that must be typed in. For example, both of the following command strings delete the files `memo1`, `memo2`, `memo3`, and `memo4`:

```
$ rm memo1 memo2 memo3 memo4
$ rm memo*
```

Note:

In this example, wildcards should have been used only when you wanted to manipulate all files beginning with the name "memo."

4.6.7 Taking Filename Shortcuts

You can use some shortcuts when keying in relative pathnames. A . (dot) can be used to represent the present working directory, and a .. (dot dot) can be used to represent the parent directory. Instead of specifying the directory name, you simply specify two dots (..).

For example, to change directories from */usr/joe/graph* to */usr/joe*, key in the following:

```
$ pwd
/usr/joe/graph
$ cd ..
$ pwd
/usr/joe
```

Or, to change from */usr/joe/graph* to */usr/joe/mail*, the command would be as follows:

```
$ pwd
/usr/joe/graph
$ cd ../mail
$ pwd
/usr/joe/mail
```

4.7 File Access and Permissions

The file permission mode determines how you can manipulate a file. This section describes how to interpret and change a file's permission mode.

File access depends on the following two factors:

- **Your user type.** You can be the file owner, a group user, or other user.
- **The file permission mode for your user type.** File permission includes the read, write, and execute accesses that determine how you can manipulate a file.

You can determine your user type and the permission mode for your user type by studying the fields in a long listing of the files.

4.7.1 Fields in a Long Listing

The fields displayed by a long listing of a file (`ls -l`) include the file type, file permission mode, file owner, and group.

Study the following long listing of the files in the `/usr/ip32/toolbox` directory:

```
$ ls -l /usr/ip32/toolbox

total 13
-rw-r--r--    1 root    sys      1968    Nov 21 1988    product.def
-rw-r--r--    1 root    sys      272     Mar  9 10:07    features.com
drwxrwxrwx    2 root    sys      112     Apr 15 09:52    icalc/
drwxrwxrwx    2 root    sys       96     Apr 15 09:52    iclock/
drwxrwxrwx    2 root    sys       96     Apr 15 09:52    imag/
-rw-r--r--    1 root    sys      384     Apr 12 15:12    product.def
-rwxr-xr--    1 root    sys      762     Oct  4 1988    remove.sh*
```

4.7.1.1 File Type

The first character (such as the `d` in `drwxrwxrwx` of the `icalc` file in the `/usr/ip32/toolbox` directory printout) in the first field of a long listing represents the file type.

First Character	File Type
d	Directory file
-	Ordinary file

4.7.1.2 File Permissions

The next nine characters in the first field of a long listing compose the *file permission mode*. (In the */usr/ip32/toolbox* directory printout, the *rwXrwxrwx* characters in the first field of the *icalc* file represent the file permission mode.) The file permission mode determines the read (r), write (w), and execute (x) access for the file or directory.

You can think of the file permission mode as three distinct categories of read, write, and execute (*rwX*) accesses. One *rwX* category is assigned for each type of user: user (the file's owner), group, and other.

The third field (*root* in the */usr/ip32/toolbox* directory printout) indicates the file's owner; the fourth field (*sys* in the */usr/ip32/toolbox* directory printout) indicates the file's group owner. The permission mode, file owner, and group determine how you can manipulate the file.

4.7.2 Determining Your User Type

Depending on the file, you fit in one of the following categories:

- The owner of the file (user)
- A member of the group that has group access to the file (group)
- Neither the owner nor a member of the group that has group access to the file (other)

The first set of *rwX* accesses determines how the *owner* can manipulate a file. The second set determines how *group* users can manipulate a file. The third set determines how *other* users can manipulate the file.

4.7.2.1 User (Owner) Category

You belong to the permission category *user* when you create or copy a file. For example, the owner of the file */usr/ip32/toolbox/features.com* is *root*. However, if you copy that file to your home directory as follows, you become the *owner*.

```
$ cp /usr/ip32/toolbox/product.def /usr3/jane
$ ls -l /usr3/jane
total 4
-rw-r--r--  1 jane  users   1989 May 28  13:35  product.def
$
```

If you belong to the permission category *user*, the first *rwX* access set determines how you can manipulate the file. As the user (owner) of a file, you have special file manipulation privileges that apply to you and superuser. Only the owner of a file (or superuser) can perform the following operations:

- Change the owner of a file
- Change the permission mode of a file
- Change the group of a file

4.7.2.2 Group Category

You are in the user type *group* when the following circumstances are true:

- You are not the owner of the file.
- You are a member of the group that has group access to the file.

If you are a group user of the file, the second *rwX* set determines how you can manipulate the file. In System V, you can be a member of several different groups. Groups are composed of users who need to access each others' files. *Group* is the fourth field (*sys* in the */usr/ip32/toolbox* directory printout) of a long listing. If you are currently a member of this group, you can access the file based on the second set of *rwX* accesses.

The */etc/group* file defines groups to which users can belong. Study the following sample */etc/group* file. Each line (called a record) identifies a different group. The last field is a list of users who belong to the group.

```
$ cat /etc/group
root:0:root,sysadm
other:1:
bin:2:root,bin,daemon
sys:3:root,bin
users:500:kt,edward,matt,peggy,psh,carla,missi,ginger,jane
$
```

Thus, since *jane* and *ginger* are in the group called *users*, they can each access the other's files based on the second set of *rwX* permissions.

To determine your current group, key in the *id* command as follows:

```
$ id
uid=83(jane) gid=500(users)
$
```

While you can belong to several groups, you can actively belong to only one group at a time.

4.7.2.3 Other Category

You are in the permission category *other* when the following conditions are true:

- You are not the owner of the file.
- You are not a member of the group that has group access to the file.

If you are in the category *other*, the third set of *rwX* codes determines how you can manipulate the file.

4.7.3 Permission Modes

For each file that you want to access, you must first determine whether you are in the category user (owner), group, or other. You can do so by studying the long listing.

Once you know your user type, you can determine how you can manipulate the file by studying the appropriate read (r), write (w), and execute (x) accesses.

One *rwX* set is associated with each user category (user, group, and other)

The *rwX* permissions determine how you can access and manipulate a file.

Permission Code	Permission Type
Read permission	r
Write permission	w
Execute permission	x
No permission; permission denied	-

If you are granted the privilege, the appropriate letter (r, w, or x) appears in the permission mode. If your user type is denied a read, write, or execute privilege, a hyphen (-) replaces the code letter in that field of the permission mode.

Each user type can have the following privilege types:

- All privileges (rwX)
- Any combination of privileges (r-x, r-, -x, etc.)
- No privileges (—)

Study this long listing:

```
$ ls -l /usr/ip32/toolbox
drwxr-xr-    2  root    sys    112   Apr 15 09:5   iclock
-rw-r--r-    2  root    sys    25    Mar 20 15:0   product.def
$
```

From the permission modes, you can derive the following information about the *iclock* file:

- *iclock* is a directory file.
- The owner has read, write, and execute permission.
- Group users have read and execute permission.
- Other users have only read permission.

You know the following information about the *product.def* file:

- *product.def* is an ordinary file.
- The owner has read and write access.
- The group and other users have only read access.

The combination of read, write, and execute accesses determines how each user type can access and manipulate the file. These manipulations differ depending on whether the file is an ordinary file or a directory file.

4.7.3.1 Read Access

If you have read (r) access to a *directory* file, you can read or list (ls) the contents of the directory; if you have read access to an *ordinary* file, you can display the contents of an ASCII file and copy it to your directory

4.7.3.2 Write Access

If you have write access (w) to a *directory file*, you can create or delete files in the directory. For directories, write access is effective only when you also have execute (x) access.

If you have write access to an *ordinary file*, you can modify or write to the file. Write access assumes that read access is also granted. If write access is granted and read access is denied, the file cannot be modified.

4.7.3.3 Execute Access

If you have execute access (x) to a *directory* file, you can change to the directory (using the `cd` command). You must have execute permission to access a directory file and manipulate any files in the directory. If you have execute access to an *ordinary* file, you can execute a compiled file or UNIX shell script. Execute access does not affect pure data files or ASCII files and, therefore, is not needed.

Note:

Execute access affects ordinary and directory files differently.

- You **must** have execute (x) access to a directory file before you can change to the directory (using the `cd` command) or manipulate any files in the directory.
- You do not need execute access to an ordinary file unless the file can be executed (an interpreted or a compiled file). By default, ordinary files are created without execute access. When you create an executable file, you must add execute access to the file permission mode.



Chapter 5: Common Text Editors

MicroEMACS and `vi` are text editors available in UNIX. Because they do not provide text formatting or graphics integration, they are not word processors or publishing systems. This chapter will include basic file creation and editing procedures for both MicroEMACS and `vi`.

This chapter includes the following sections:

5.1	The Intergraph MicroEMACS Product	5-3
5.1.1	Creating, Editing, and Exiting MicroEMACS Files	5-3
5.1.2	Changing Modes	5-4
5.1.3	Moving the Cursor	5-5
5.1.4	Searching and Replacing Text	5-5
5.1.5	Deleting Text	5-6
5.1.6	Inserting Spaces, Blank Lines, and Files	5-6
5.1.7	Cutting and Copying Text	5-7
5.1.8	Changing Cases	5-7
5.1.9	Miscellaneous Commands	5-8
5.2	<code>vi</code> and <code>vedit</code>	5-9
5.2.1	Creating, Entering, and Exiting <code>vi</code> / <code>vedit</code> Files	5-9
5.2.2	Changing Modes	5-9
5.2.3	Cursor Movement Commands	5-10
5.2.4	Deleting Text	5-11
5.2.5	Replacing Text	5-11
5.2.6	Searching for Text Strings	5-11
5.2.7	Copying, Moving, and Appending Text	5-12
5.2.8	Setting Default Options	5-14
5.2.9	Miscellaneous Commands	5-15

5.1 The Intergraph MicroEMACS Product

Intergraph® delivers three products in the MicroEMACS package: MicroEMACS, EMACS-tc, and MousEMACS.

- EMACS-tc is part of the EMACS Tool Chest, developed by AT&T Bell Laboratories.
- MicroEMACS is a public-domain, screen-oriented text editor.
- MousEMACS is an Intergraph-developed window and cursor interface to the MicroEMACS editor. Because MousEMACS is a graphics interface to MicroEMACS, it can only be used on Intergraph graphics workstations.

This section will cover the MicroEMACS editor. It will first instruct you in entering and exiting the editor and will then provide a quick reference for common MicroEMACS commands and command modes.

This section includes only basic text manipulation instructions. For a more in-depth study of the MicroEMACS editor, refer to the *EMACS Guides* delivered with the CLIPPER Documentation Kit.

5.1.1 Creating, Editing, and Exiting MicroEMACS Files

To create a file using MicroEMACS or to edit an existing file, key in **memacs** followed by the file name as follows. (Remember, UNIX will accept only 14 characters for filenames. Any extra characters will be truncated.)

```
$ memacs filename
```

You can now begin typing text in the file.

Once you have created or edited text, you can save your changes and/or exit the file with any of the following command sequences:

Operation	Command
Save File (do not exit)	<Ctrl-x> <Ctrl-s>
Exit MicroEMACS (do not save)	<Ctrl-x> <Ctrl-c>
Exit MicroEMACS (save file)	<Ctrl-x> <Ctrl-s> <Ctrl-x> <Ctrl-c>

Note:

The <Ctrl-s> sequence may be interpreted as a flow control character rather than a save command when you are editing on a remote workstation. However, the -y option of **visit** will override this interpretation. Therefore, if you will use MicroEMACS while visiting another workstation, key in -y after the **visit** command and before the nodename as follows:

\$ visit -y nodename

If you do not use the -y option with the **visit** command, your MicroEMACS edits may not be saved.

5.1.2 Changing Modes

MicroEMACS offers several modes that control how its functions operate. The active mode displays in the highlighted bar at the bottom of the screen. It appears after "MicroEMACS" and the version number, between the parentheses.

To activate a mode, key in <Ctrl-x>m and MicroEMACS will prompt you for the mode name. To turn off the mode, enter <Ctrl-x> <Ctrl-m> and MicroEMACS will prompt you for the mode that you will remove. For example, to enter the mode that allows you to overwrite text instead of inserting text before or after the existing characters, you would set the **OVER** mode as follows:

<Ctrl-x>m

Mode to add: **OVER**

You would then exit this mode as follows:

<Ctrl-x> <Ctrl-m>

Mode to delete: **OVER**

MicroEMACS allows you to operate in the following modes:

Mode	Operation
OVER	Replaces (overwrites) existing text rather than inserting characters.
WRAP	Automatically moves text to the next line when the end of the line is reached.
VIEW	Allows you to view a file but will not let you manipulate text.
ASAVE	Automatically saves the file each time 256 characters are typed.
EXACT	Recognize uppercase or lowercase in search and replace operations. For example, interpret "Mode" differently than "mode," finding only occurrences where the initial M is capitalized.

5.1.3 Moving the Cursor

The following commands enable you to move your cursor in various directions:

Cursor Direction or Location	Command
Move up to previous line	<Ctrl-p>
Move down to next line	<Ctrl-n>
Move right to next character	<Ctrl-f>
Move left to previous character	<Ctrl-b>
Move to beginning of paragraph	<Esc> p
Move to end of paragraph	<Esc> n
Scroll forward one screen	<Ctrl-v>
Scroll backward one screen	<Esc> v
Move to beginning of file	<Esc> <
Move to end of file	<Esc> >
Move to beginning of line	<Ctrl-a>
Move to end of line	<Ctrl-e>
Go to specific line	<Esc> g (and enter line number at Line to GOTO: prompt)

5.1.4 Searching and Replacing Text

MicroEMACS offers the following search and replace capabilities:

Function	Command
Search forward for specified text	<Ctrl-s>
Search backward for specified text	<Ctrl-r>
Replace all occurrences of one string with another string	<Esc> r

After you press <Ctrl-s> or <Ctrl-r>, you will be prompted for the string that you wish to search or replace. When you type in the search or replace string, you will press <Esc> instead of <Return>. Pressing <Return> after you key in the string will find occurrences where the string is at the end of a line.

If you wish to search for the previous string, you do not need to type it in again; when you press <Ctrl-S> or <Ctrl-r>, the last search string will appear in brackets after the prompt. You then need to only press <Esc> again.

5.1.5 Deleting Text

The following commands allow you to delete characters, words, and lines:

Function	Command
Delete previous character	
Delete next character	<Ctrl-d>
Delete previous word	<Esc>
Delete next word	<Esc> d
Delete line	<Ctrl-k>
Delete text between mark and cursor	<Ctrl-w>
Delete to end of line	<Ctrl-k>
Delete blank lines around cursor	<Ctrl-x> <Ctrl-o>
Delete paragraph	<Esc> w

5.1.6 Inserting Spaces, Blank Lines, and Files

When you open a MicroEMACS file, INSERT mode is active and you can insert text without overwriting existing text. If you want to replace the existing text rather than inserting text before or after it, you will need to activate OVER mode. (See 5.1.2.) You can also insert blank lines, spaces, and other ASCII files in your text by using the following commands:

Function	Command
Insert space to right of cursor	<Ctrl-c>
Insert blank line	<Ctrl-o> or <Return>
Insert blank line at cursor and indent same as previous line	<Ctrl-j>
Insert file at cursor	<Ctrl-x> <Ctrl-i> (and enter filename after Insert file: prompt)

5.1.7 Cutting and Copying Text

MicroEMACS allows you to perform the following cut-and-paste functions:

- Removing a block of text
- Copying a removed block to another location
- Removing a line
- Copying the removed line to another location.

Use the following procedure to remove a block of text.

1. Press <Esc> <spacebar> to begin marking the region you will remove.
2. Move the cursor to end of the area that you will remove.
3. Press <Ctrl-w> to remove the defined text and store it in a temporary buffer or <Esc> w to copy the text to the buffer but leave the original text intact.
4. Move the cursor to the location where the stored text will be inserted.
5. Press <Ctrl-y> to copy the text stored in the buffer to the cursor's location. Pressing <Ctrl-y> will copy the last text that was placed in the buffer. Once it is in the buffer it will remain there until new text is copied in the buffer. (The new text will overwrite the old text.) However, before new text is copied into the buffer, the current text can be copied to various locations an unlimited number of times.

5.1.8 Changing Cases

Use the following commands to transform characters from uppercase to lowercase or from lowercase to uppercase.

Function	Command
Uppercase entire word	<Esc> u
Lowercase entire word	<Esc> l
Capitalize initial letter of word	<Esc> c
Uppercase highlighted text	<Ctrl-x> <Ctrl-u>
Lowercase highlighted text	<Ctrl-x> <Ctrl-l>

5.1.9 Miscellaneous Commands

Use the following commands to perform functions such as transposing two characters, refreshing the screen, and converting spaces to tabs and tabs to spaces:

Function	Command
Transpose characters	<Ctrl-t>
Refresh screen	<Ctrl-l>
Abort command	<Ctrl-g>
Convert multiple spaces to tabs	<Ctrl-x> <Ctrl-e>
Convert tabs to equivalent in spaces	<Ctrl-x> <Ctrl-d>

5.2 vi and vedit

The **vi** editor is the standard UNIX text editor. Two variations of the **vi** editor include the following:

- **vedit** (displays the current mode, making **vi** easier for the beginner to learn)
- **view** (activates read-only mode)

5.2.1 Creating, Entering, and Exiting vi/vedit Files

To create a file using **vi** or to edit a file that has been created, key in **vi** followed by the filename as follows. (Remember that UNIX limits the number of characters in a filename to 14. Extra characters will be truncated.)

\$ vi filename

To edit a file using the **vedit** variation, key in the following command line:

\$ vedit filename

The following command allows you to read a file but will not let you save edits to the file. You should use this command when you need to read a file but want to ensure that you do not make any accidental changes while doing so.

\$ view filename

As you are editing a file, you may want to periodically save your changes without exiting the file. To do so, key in the following command:

:w!

After you have edited a file, you may save your changes and exit the file by entering the following:

<shift>ZZ

To quit the file without saving your changes, key in the following command:

q!

5.2.2 Changing Modes

vi has two basic operation modes: command and insert. Command mode allows you to execute commands and move the cursor throughout the file. Insert mode allows you to type text in the file. When you first enter a **vi** file, you are in command mode. You must change to insert mode before you can enter text.

When you are in command mode, the following commands will change the mode to insert and perform their corresponding functions.

Note:

You do not need to press <Return> after keying in the following commands. They are effective immediately after they are pressed.

Function	Command
Append text to the right of the cursor position.	a
Insert text at the current cursor position.	i
Open a new line below the current cursor position.	o
Open a new line above the current cursor position.	O

When you are finished inserting text and wish to return to command mode, press the <Esc> key. If you are using *vedit*, "insert" will disappear from the bottom of the screen

5.2.3 Cursor Movement Commands

The following commands enable you to move your cursor in various directions. For most of these commands, you can specify the number of characters, words, or lines to move by preceding the command with an integer. For example, *5w* moves the cursor five words forward.

Cursor Direction or Location	Command
Move cursor to left one character	h
Move cursor to right one character	l
Move cursor to next word to right	w
Move cursor to beginning of previous word	b
Move cursor to end of current word	e
Move cursor down one line	j
Move cursor up one line	k
Move cursor to end of current line	\$
Move cursor to beginning of current line	0 (zero)
Move cursor to first character in first line of file	h
Move cursor to middle line of text	m
Move cursor to last line of text	l
Move cursor to <i>nth</i> line in file	ng
Move cursor to last line in file	g
Move forward one screen	<Ctrl-f>
Move backward one screen	<Ctrl-b>
Scroll downward one screen	<Ctrl-d>
Scroll upward one screen	<Ctrl-u>

5.2.4 Deleting Text

The following commands allow you delete characters, words, and lines. For all of these commands, you can specify the number of characters, words, or lines to delete by preceding the command with an integer. For example `5dw` deletes the next five words.

Function	Command
Delete character on which cursor is positioned	<code>x</code>
Delete character to left of cursor	<code>X</code>
Delete word	<code>dw</code>
Delete current line	<code>dd</code>
Delete from cursor to end of line	<code>d</code>

5.2.5 Replacing Text

`vi` will suspend its insertion mode temporarily so that you can type over text that you wish to replace. For example, you can replace a character, word, or line of text with the following commands:

Function	Command
Replace (change) a word	<code>cw</code>
Replace a line	<code>cc</code>
Replace letter under cursor	<code>s</code>
Replace a line (same as <code>cc</code>)	<code>ss</code>
Replace letter under cursor (same as <code>s</code>)	<code>r</code>
Continue replacing until another command or insertion mode is invoked	<code>r</code>
Replace the letter under the cursor with the letter after it and replace the letter after it with the current letter (transpose)	<code>xp</code>

5.2.6 Searching for Text Strings

`vi` offers the following search and replace capabilities:

- Searching for a string of text
- Searching for a string of text and replacing it with a specified string
- Searching for all occurrences of a string of text and replacing each occurrence with a specified string

To search for a particular text string, press `/` followed by the word or group of words you want to locate as follows:

/I am searching for this string.

If you key in `n` after `vi` locates the first occurrence, `vi` will search for the next occurrence.

Note:

If you press `n` after you find the last occurrence in the file, `vi` will go the beginning of the file and search for the first occurrence again.

You can also search for a word or phrase and replace it with a string that you specify. To search for the first occurrence of a word or phrase and replace the word or phrase with a specified string, key in the following, where *search string* is the word or phrase to be located and *replacement string* is the word or phrase will replace the search string:

s/search string/replacement string

`vi` has a global search and replace function that allows you to search for all occurrence of a string and replace the occurrences with the specified string. Use this feature as follows:

g/search string/s//replacement string/p

5.2.7 Copying, Moving, and Appending Text

`vi` allows you to perform the following text manipulations:

- Moving specified lines to another location in the same file
- Copying specified lines to another location in the same file (while the lines remain intact in their original location)
- Appending the one file's contents to the end of another file
- Appending specified lines of one file to the end of another file
- Copying specified lines to a new file that has not been created yet

Most of these move and copy functions require that you specify the numbers for the lines you wish to manipulate. **vi** numbers each line in the file, but the numbers are hidden unless you press the **PF2** function key or enter **one** of the following commands:

se nu

OR

set number

Then, to redisplay the file without line numbers, key in **one** of the following commands:

se nonu

OR

set nonumber

Once you know the line numbers, you can move or copy text to any location in the current file or in another file. For example, to move text from one location to another, key in the number(s) of the first line in the block of text you want to move, a comma, and then the last line number. Follow these numbers with the **m** (move) command and then with the line number the moved lines will follow. Conclude the command with the **p** (print) command. The following example moves lines 4 through 9 so that they follow line 29:

:4,9m29p

To copy text from one location to another (so that the lines are copied to a new location but the original remains intact), you would follow a similar procedure. First, key in the number(s) of the first line in the block of text that you want to copy, a comma, and then the last line number. Follow these numbers with the **co** (copy) command and then with the line number the moved lines will follow. Conclude the command with the **p** (print) command. The following example copies lines 1 through 5 and places them after line 25:

:1,5co25p

To append the contents of one file to the end of another file, key in the following command, where *filename* is the name of the file to which you will append the file you are currently working in:

:w>>filename

To append specified lines of your current file to the end of another file, key in the following command, which specifies that lines 20 through 30 will be appended to *filename*:

```
:20,30w>>filename
```

You can also copy lines 20 through 30 of your current file to a new file that will be created when you key in the following command:

```
:20,30w newfilename
```

5.2.8 Setting Default Options

You can set several default options that control various vi functions. To see a list of these options, key in **set all**.

For example, tabs are automatically set to equal eight characters. However, you can change the default for your current file you are by entering the following options, where 4 represents the new default tab setting:

```
set shiftwidth=4
```

Each time you re-enter the file, you will need to re-enter this command unless you use the following procedure for a global tab setting:

1. Edit the *.exrc* file in your home directory.
2. Add the line "set tabstop=4" to this file.

Another option, **autoindent**, automatically indents text. If this option is set and you indent a line, all succeeding lines will automatically be indented to the same column. This option is useful for programmers using structured programming techniques. Activate this option as follows:

```
set autoindent
```

The **wrapmargin** option causes text to wrap to the next line. When the cursor reaches the specified number of characters before the right margin, words are shifted to the next line. For example, to set this option so that the words will wrap five spaces before the end of the right margin, enter the following command:

```
set wrapmargin=5
```

5.2.9 Miscellaneous Commands

Miscellaneous **vi** commands include the **u** (undo) command and the **<Ctrl-l>** key sequence.

You can return text to its condition before the most recent edit by keying in **u**. For example, if you accidentally delete a group of lines, you can key in **u** and the lines will reappear.

Also, you can refresh the screen using the **<Ctrl-l>** sequence.



Chapter 6: Basic Network Communication

This chapter discusses the equipment and procedures necessary for connecting an Intergraph workstation/server to an IEEE 802.3 network and for using the network. It includes procedures for setting node addresses and names of hosts, workstations, and servers. For more information on using the network, refer to the *Intergraph Network Core User's Guide*. This chapter contains the following sections:

6.1	General Network Information	6-3
6.1.1	Physical Components	6-3
	Coaxial Cable	6-3
	Transceiver	6-3
	Transceiver Cable	6-3
	Ethernet Multiplexer	6-4
	Etherjack	6-4
6.1.2	Network Configurations	6-4
6.2	Workstation Preparation	6-7
6.2.1	Network and Node Addresses	6-7
6.2.1.1	Network Address Example	6-7
6.2.1.2	Accessing a Network Address	6-7
6.2.1.3	Storing a Network Address on an Intergraph Workstation	6-8
6.2.2	Nodenames	6-8
6.2.2.1	Accessing a Nodename	6-8
6.2.2.2	Locating Other Nodenames in a Network	6-9
6.2.2.3	Assigning a Nodename to a Workstation	6-9
6.2.2.4	Assigning a Nodename to an InterServe Processor	6-10
6.3	Network Communications	6-11
6.3.1	File Management Utility	6-11
6.3.1.1	Starting fmu	6-11
6.3.1.2	Issuing fmu Commands	6-12
6.3.1.3	Accessing Help for fmu Commands	6-12
6.3.1.4	Exiting fmu	6-12
6.3.1.5	Available Commands	6-12
6.3.2	The visit Program	6-14
6.3.3	Intergraph Network Core Monitor	6-16
6.3.3.1	General Statistics Menu	6-17
6.3.3.2	Loopback Test Menu	6-17
6.3.3.3	Search Network Menu	6-17
6.3.3.4	Routing Information Menu	6-17
6.3.3.5	XNS Network Topology Menu	6-18
6.3.3.6	Multiple Node Analysis Menu	6-18
6.3.3.7	Clearinghouse	6-18
6.4	Additional Network Capabilities	6-19

6.1 General Network Information

The Ethernet port connects an Intergraph workstation/server to an IEEE 802.3 local area network (LAN). The Intergraph Network Core (INC) software provides access to all Intergraph workstations/servers and Intergraph VAXs on the network.

The latest INC software product must be installed on hosts and workstations/servers so that the network operates properly. To install the INC product on an Intergraph workstation, follow the steps for loading products with the `newprod` utility in the *CLIPPER Software Delivery Guide*.

6.1.1 Physical Components

The following descriptions explain various network components. Example network configurations follow these descriptions.

Coaxial Cable

This is the primary cable through which workstations/servers and hosts communicate. The coaxial cable normally runs through an environmental airspace, such as above a drop ceiling or under a raised floor, since an airspace usually provides the most direct access to rooms in a building.

Transceiver

This device has a tap for the coaxial cable and a connector for the transceiver cable(s). Once connected, this device handles signal transmission between nodes.

Transceiver Cable

This cable runs from the interface on the transceiver to the interface on the Intergraph workstation (Ethernet port). The transceiver cable is shielded and has 15-pin D-connectors on each end; each connector has a slide lock.

The following are two types of transceiver cables:

The **standard transceiver cable** must be used when it will be routed through an environmental airspace. A standard transceiver cable can be used to connect a transceiver to a node or a transceiver to an Etherjack.

The **office transceiver cable** is smaller in diameter than a standard transceiver cable and can be used in an office area. An office transceiver cable is used to connect a node to an Etherjack.

Ethernet Multiplexer

This device can be used on a transceiver and on an Intergraph VAX to allow up to eight transceiver cables to be connected.

Etherjack

This is an optional 15-pin wall outlet used to connect an office transceiver cable to a standard transceiver cable.

6.1.2 Network Configurations

The INC software allows Intergraph workstations/servers to communicate with other network nodes. The Intergraph workstation can run terminal emulation software that allows it to serve as a terminal for the host computer. The workstation can run programs to emulate the following:

- An Intergraph graphics terminal
- A DEC VT-220 alphanumeric terminal
- A Tektronix 4107 graphics terminal

By using the workstation as a terminal, you enable a full range of DEC and Intergraph applications on the host computer to run.

In the network environment, the InterServe processors function as server nodes that allow multiple workstation users to share files, programs, and printing and plotting devices. When configured as a plot server node to which one or more printing or plotting devices are attached, a server requires the device driver software for each device and the InterPlot software (purchased separately).

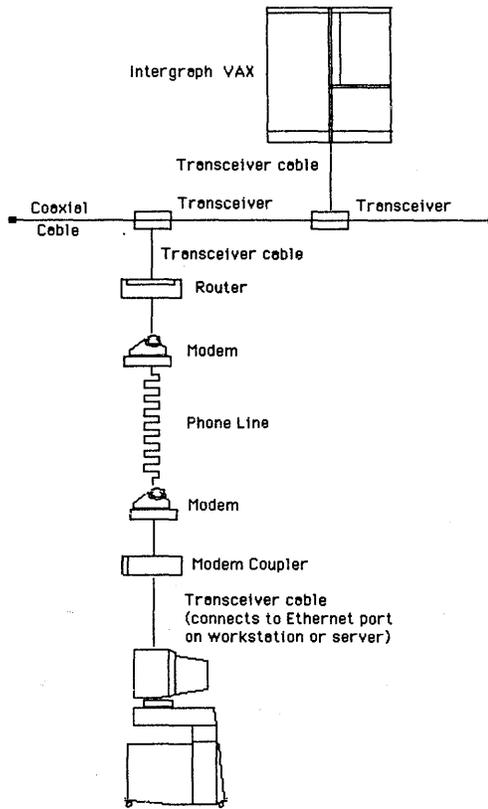


Figure 6-1. An Intergraph Workstation Connected to a Remote Ethernet Network

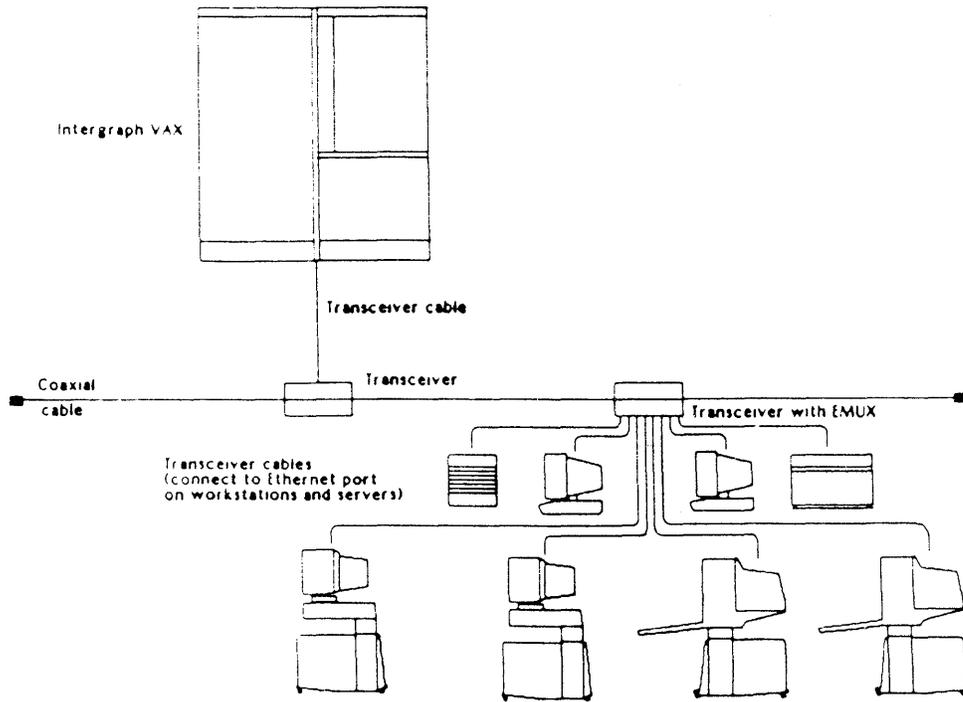


Figure 6-2. Intergraph Workstations and Servers Connected to an EMUX

6.2 Workstation Preparation

This section discusses how to set up a workstation or server to use on a network. The node addresses and nodenames assigned to each workstation/server and host are also described.

6.2.1 Network and Node Addresses

Each Intergraph workstation/server has an XNS node address assigned to it. A node is any addressable device (such as a workstation or server) connected to a network.

The node address, which is hard-wired on each manufactured node, is needed for each node to identify and communicate with another network node. The network address has the form shown in "Network Address Example," where 08-00-36-XX-XX-XX represents the node address. The network address combines the LAN number and the node address.

6.2.1.1 Network Address Example

Here is an example of a network address. In this example, 0013498 is the LAN number that the system manager assigns to a remote router (that is not hard-wired); 08-00-36 is the number that Xerox assigns to Intergraph; and XX-XX-XX represents a number to which Intergraph will assign a numerical value.

00013498.08-00-36-XX-XX-XX

6.2.1.2 Accessing a Network Address

To obtain the network address of an Intergraph workstation, key in the `netaddr` command.

Here is an example for obtaining the network address of an Intergraph workstation. In this example, 00013498 is the LAN number, and 08-00-36-12-34-56 is the node address.

```
# netaddr
00013498.08-00-36-12-34-56
```

Note:

The `netaddr` command also returns an Internet address (and possibly a subnet mask) if the TCP/IP protocols are running on your machine.

6.2.1.3 Storing a Network Address on an Intergraph Workstation

A pop-up menu, called Create Terminal, allows up to three node addresses (or nodenames) to be keyed in to data-entry boxes and saved. Storing this information reduces the number of steps to create a terminal window on an Intergraph workstation. The following procedures discuss how to save the node address on an Intergraph workstation.

1. Select the Terminal process from the Workstation menu.
2. When the Create Terminal pop-up menu appears, select the data entry box and key in the node address or nodename of the host computer.
3. After the addresses or names have been entered, exit the menu.
4. The next time you want to create a terminal window, select the terminal process from the Workstation menu.
5. When the Create Terminal menu appears, select the checkbox for the node to be accessed and exit the menu.

6.2.2 Nodenames

A *nodename* can be assigned to the node address of devices connected to a network so that these addresses are easier to remember. A nodename is an alias for an address. The nodename for Intergraph workstations can have a maximum of eight lowercase alphanumeric characters.

For example, a nodename for an Intergraph workstation/server might be **john** and the node address for that workstation/server might be 08-00-36-95-6A-00. A Clearinghouse database stores a node's address and name and translates this information when it is requested. When naming a node, use the Clearinghouse utility to verify that the same name is not already being used on the network.

6.2.2.1 Accessing a Nodename

To obtain the nodename of an Intergraph workstation or server, key in the **uname -n** command. Here is an example for obtaining the nodename of an Intergraph workstation:

```
$ uname -n  
sys34a
```

6.2.2.2 Locating Other Nodenames in a Network

To access another node on a network, you must have the other node's nodename or address. The Clearinghouse lookup option lists all nodenames on the network from which the associated node addresses can also be accessed.

1. Key in the following from your CLIX system:

```
# clh lookup *
```

A list with all nodenames on the network displays.

2. To access a list of all network nodes and the properties of each, key in the following:

```
# clh lookup * /full
```

3. To access the properties of a specific node, key in the following:

```
# clh lookup [nodename] /full
```

Note:

The Search Network feature of `incmon` can also be used to list all nodes currently on the network. See 6.3.3 for more information.

6.2.2.3 Assigning a Nodename to a Workstation

The following procedures describe how to assign a nodename to a workstation using the Utility Pages. To avoid duplicating a nodename, use the `clh lookup` command to locate other nodenames in the network.

1. Select the Utility screen button from the Introductory screen.
2. When the Utility page appears, select the Operating System Parameters screen button.
3. When the Operating System Parameters page appears, key in a lowercase nodename with less than eight characters in the Nodename data entry field.
4. Select the Save screen button to save this entry.
5. Select the System V screen button to boot the operating system.

6.2.2.4 Assigning a Nodename to an InterServe Processor

1. Key in the following to select the UTility option from the Startup Configuration Utility introductory menu. The Main Utility Menu displays.

Option: **UT**

2. Key in the following to select the Operating System option and display the Operating System Parameters Menu.

Option: **OS**

3. Key in NN and the desired nodename as an argument. The nodename can have a maximum of eight lowercase characters. For example, key in the following to designate **jdk_pn** as the nodename and display **jdk_pn** in the field next to the Node_Name option.

Option: **NN jdk_pn**

4. Key in the following to select the SAve option, which saves the operating system parameters that the menu displays.

Option: **SA**

6.3 Network Communication

This section provides an overview of the available commands and tools needed to ensure proper operation and effective use of the network. The file management utility (**fm**), Remote Login (**visit**), Intergraph Network Core Monitor (**incmon**), and Clearinghouse database (**clh**) programs are discussed.

6.3.1 File Management Utility

The file management utility (**fm**) allows an Intergraph workstation/server to communicate with any node on an IEEE 802.3 network. The procedure for initiating **fm** and examples for sending and receiving files follow. For more information on **fm**, see the *Intergraph Network Core User's Guide*

fm enables you to perform these tasks:

- Copy files from a remote system to a local system.
- Copy files from a local system to a remote system.
- Display a file located on a remote system.
- Open a session with one node after terminating a session with the current node.
- List a directory on a remote system.
- Delete files on a remote system.
- Change the default directory on a local or remote system.
- Execute a local or remote command.

6.3.1.1 Starting **fm**

To start **fm**, you must key in the command from a VAX/VMS system or UNIX System V operating system using the following format:

```
$ fm nodename.username.password
```

Here is an example showing how **fm** is invoked:

```
$ fm 08-00-36-12-34-56.john.dog  
fm>
```

If the nodename (or node address) is not specified on the command line, a **connect** command and nodename (or node address) must be issued to establish a connection with a particular node. A valid username and password must also be included for the remote system. To avoid displaying the password on the screen, follow the username with a period (.) and press <Return>. The password can then be keyed in at the password prompt and is not echoed on the screen.

Here is an example showing how **fm** is initiated without a password displaying (echoing):

```
$ fm 08-00-36-12-34-56.john.
Password
fm>
```

6.3.1.2 Issuing **fm** Commands

The command keyed in at the **fm**> prompt determines other needed information. The command and its appropriate arguments must be on the same line as shown in the following examples. Commands keyed in at the **fm**> prompt are not case-sensitive, but filenames are.

```
fm> send infile outfile

fm> send letters qs4:[32,100]letters
      |                               |
      System V file                 VMS file

fm> receive infile outfile
fm> receive qs4:[32,300]files /usr/joe/files
      |                               |
      VMS file                       System V file
```

6.3.1.3 Accessing Help for **fm** Commands

Once the **fm**> prompt displays, you can access Help for all **fm** commands by keying in the following:

```
fm> help
```

Or, you can obtain Help for a specific command by keying in the name of that command after **help** as follows:

```
fm> help <command>
```

6.3.1.4 Exiting **fm**

To exit **fm**, key in the following at the prompt:

```
fm> exit
```

6.3.1.5 Available Commands

Descriptions for 13 **fm** commands follow; an example is given for each.

Note:

Wildcards (*) can be used within **fm** for the **send** and **receive** commands. Because two different operating systems are being used, wildcards used within **fm** are handled differently in the UNIX operating system than they are in VMS.

The remote system controls wildcards used with the **command**, **delete**, and **directory** commands. The remote system manipulates these wildcards as it usually manipulates wildcards. To learn to use wildcards within **fm**, issue the **set verbose** command and experiment with various wildcard formations.

!

Executes a command on the local system. (This command is sometimes called the **bang** command.)

fm> **!ls /usr/ip32/util**

chdir

Changes the local working directory to the directory specified.

fm> **chdir /usr/file**

command

Executes a command on the remote system.

fm> **command show system**

connect

Terminates a session with the current node and opens a session with another node.

fm> **connect 08-00-36-12-34-56.john.dog**

delete

Deletes a remote file.

fm> **delete qs6:[1,6]file.xxx;x**

directory

Lists a remote directory.

fm> **directory qs6:[1,5]**

exit

Terminates communication with **fm** and returns to the local system prompt.

fm> **exit**

help

Lists commands available within **fm** and briefly describes each; specifying a command after **help** automatically prints a message for that command.

fm> **help**

OR

fm> **help send**

rchdir

Changes the remote working directory to the directory specified.

fm> **rchdir qs4:[1,33]**

receive

Receives a remote file.

fm> **receive qs6:[1,2]file1.xxx file1**

send

Sends a local file to a remote node.

fm> **send /usr/file2 qs6:[1,3]file2.xxx**

set

Establishes a mode for the terminal until the **set** command is used again when used with a specific option. The options available are **verbose** (which displays all informational messages) and **noverbose** (which turns off the verbose switch).

fm> **set verbose**

OR

fm> **set noverbose**

type

Displays a remote file.

fm> **type qs6:[1,6]file.xxx**

6.3.2 The visit Program

The **visit** program enables you to remotely log in to an Intergraph node on the network. This command, which can be issued from an Intergraph workstation or server, cannot be used for running graphics applications. The following requirements must be met before you can use **visit** on a host or workstation/server:

- Hosts must be connected through an IEEE 802.3 network.
- The INC product must be installed on hosts.
- The VT-220 product must be installed on the workstation/server.
- Intergraph workstation/servers must be configured to load and run IEEE 802.3 software.
- A valid address or name for the remote node must be known.

You can connect to an Intergraph VAX from another node using the **visit** command. The procedures are basically the same, even though the node might be a workstation/server or another Intergraph VAX. If you are initiating the **visit** command from a workstation, the command can be keyed in from a local or terminal window on the workstation. If an Intergraph VAX or server is connecting to an Intergraph VAX, you can initiate the **visit** command from a terminal or console.

Visiting another node does not create another window on a workstation once a connection is made to the Intergraph VAX. Instead, visiting uses the active terminal window from which the command was issued to run any processes from the Intergraph VAX.

Key in the **visit** command using the following format. In this example, 00013498 is the LAN number, and 08-00-36-XX-XX-XX represents the number that Intergraph will assign to the VAX or Intergraph workstation node address or nodename.

```
$ visit 00013498.08-00-36-XX-XX-XX
```

The following is an example of the messages and prompts you might see after keying in the **visit** command and node address or nodename of a remote VAX. After keying in the **visit** command and pressing <Return>, press <Return> again to receive the system prompt.

```
$ visit 08-00-36-12-34-45
```

```
The Microcode VAX : SYS_34A VMS 4.1
```

```
Username: JOE  
Password
```

```
Welcome to VAX/VMS version V4.1 on node SYS34A  
$
```

The System V prompt automatically reappears after you log off from the Intergraph VAX. Either the node address or nodename can be used with the **visit** command.

For more information on **visit**, refer to the *Intergraph Network Core User's Guide*.

6.3.3 Intergraph Network Core Monitor

The Intergraph Network Core Monitor (**incmon**) utility, a network monitor utility, can assist you in diagnosing network problems or can gather information relating to the current network load and performance. To learn more about the **incmon** utility, see the *Intergraph Network Core User's Guide*.

The **incmon** command can be keyed in from System V or VAX/VMS. When the command is issued, basic network integrity is checked. The network (LAN) number and node address automatically default to your address.

When **incmon** is keyed in, the following main menu appears:

```
Intergraph Network Core Monitor
Net 00000000  Addr 08-00-36-XX-XX-XX  Node

General Statistics
Loopback Test
Search Network
Routing Information
XNS Network Topology
Multiple Node Analysis
Socket Database
SPP Statistics
Monitor Set-Up
```

Use: Up, Down, Left, Right Arrows; Return to Execute; CTRL-Z to Exit

Use the arrow keys to move the cursor and highlight an option. Once an option is highlighted, press <Return> and the menu for that option appears. A general description of each option follows:

6.3.3.1 General Statistics Menu

The General Statistics menu displays statistics that provide information about how the node is functioning on the network and how the node's LAN is functioning. The parameters cannot be altered; that is, the speed of communication with the CP or the amount of data being sent to the CP cannot be changed.

Note:

Only Intergraph equipment has an `incmon` server that responds to the General Statistics request.

6.3.3.2 Loopback Test Menu

The Loopback Test menu allows you to send echo frames (units of data) from your local node to a specified node and monitor the frames' progress. You can wait for a response from the specified node for each frame received.

The Loopback Test can communicate with a particular Remote Router or 68K CP workstation before it boots. In addition, this test can determine how quickly data can be sent to a node on the network if you use a particular frame size. The loopback test also allows you to determine whether you can communicate with non-Intergraph nodes on the network.

6.3.3.3 Search Network Menu

The Search Network menu allows you to search the specified node's local LAN for all nodes that exist on that LAN. The Search Network menu provides the following information:

- Addresses for all LAN nodes
- CP uptime for each node
- CP version for each node
- CP image for each node

Note:

A network search can be executed on Intergraph VAX-based hosts or 300-series or higher workstations only.

6.3.3.4 Routing Information Menu

The Routing Information menu shows the Remote Routers that a specified node on a network can access. This menu also reveals the LANs and remote workstations/servers that can be accessed through those routers. The node is specified in the `Net`, `Addr`, and `Node` fields on the main `incmon` menu. The menu can also show the devices connected to a specified router's ports.

For more information on Remote Routers and the Routing Information menu, see the *Remote Router User's Guide* and the *Intergraph Network Core User's Guide*.

6.3.3.5 XNS Network Topology Menu

The Network Topology menu displays a network topology using a tree structure that starts from the specified node's local LAN. A Remote Router is directly connected to the local LAN through its transceiver port. This menu is relevant only if one or more Intergraph Remote Routers are connected to your local LAN.

6.3.3.6 Multiple Node Analysis Menu

The Multiple Node Analysis menu allows you to compare network statistics on several nodes at once.

6.3.4 Clearinghouse

Clearinghouse lets you translate the nodename to the node address. For example, when nodename SYS36A is entered, the system interprets this information as 08-00-36-12-34-56. This reduces the amount of information you must enter to connect to a network. For more information, see the *Intergraph Network Core (INC) Programmer's Guide*.

6.4 Additional Network Capabilities

The Intergraph network now supports the Internet address scheme that the TCP/IP suite of protocols uses. For more information about the TCP/IP software that you can purchase, refer to the *CLIX TCP/IP User's Guide* or the *VMS TCP/IP User's Guide*.

6.5 Using Mailx Electronic Mail

The **mailx** interactive electronic mail program allows you to send or receive mail from any system or workstation on the Intergraph local area network (LAN). This section briefly describes **mailx** commands available on workstation hosts. For detailed information, refer to the *Intergraph Network Core User's Guide* (DSA030110).

Additional **mailx** services are available on workstation hosts. For information on these services, refer to the *AT&T UNIX System V User Reference Manual*.

6.5.1 Sending Mail

You can send mail using one of the following methods:

- From the command line, key in **mailx** followed by the username(s) to whom you want to send the mail.
- From the **mailx** program at the ? prompt, issue the **mail** command followed by the username(s) to whom you will send the mail.

In either case, if the recipient does not have an account on your system, you must also specify the name of the destination system. The following is an example of command-line mode on a VMS host:

```
$ mailx system.<username>
```

Or, for a workstation host you would enter the command as follows:

```
$ mailx system!<username>
```

In the previous examples, **system** is the nodename or network address of the remote host to which you will send mail.

Note:

You must use the period (.) to delimit pathnames on a VMS host; use the exclamation point (!) to delimit pathnames on a workstation host.

In all command examples, italicized text indicates an optional argument and angle brackets (< >) indicate required information you must supply. Do not key in the brackets.

After keying in the command and system/username, press <Return> and you will be prompted to enter a subject. Then, enter a brief phrase indicating the subject of your mail message and press <Return>.

Now, you are ready to key in the text of your message. After completing your message, enter one of the following:

- `~.` to send the mail
- `~q` to cancel the message and save the message in your *deadletter* file
- `~x` to cancel the message and exit **mailx**

Notes:

- You cannot mail binary or encrypted (non-ASCII) files. On VMS systems you cannot send MASS-11 files.
- You can route mail through multiple networks by providing the network addresses separated by the appropriate delimiter.
- To send mail to more than one person, key in more than one system/username and delimit each with a space.

The following provides details on specifying mailpaths when sending mail.

MailPaths

Mailpaths are required when **mailx** messages are sent to a remote system; the mailpath on your local system is simply the recipient's username. To send mail to a remote system, you must know the following:

- The recipient's username
- The remote system name
- Whether your system can communicate with the remote system

Note:

Unless you enclose the mailpath in quotation marks on the VMS command line, use the period (.) as the mailpath delimiter. In all other cases, such as in your **mailrc** file or when using the mail command from within **mailx**, you can use either the period (.) or the exclamation point (!) as a mailpath delimiter.

However, on a workstation you must always use the exclamation point (!) as the mailpath delimiter.

For example, on a VMS system, the following command would send mail to user Bill on system sys34a:

```
$ mailx sys34a.Bill
```

The following is the same command on a workstation:

```
$ mailx sys34a!Bill
```

6.5.2 Receiving Mail

To check for **mailx** messages, key in the following command line:

```
$ mailx
```

If you have mail, **mailx** lists the number of messages and header information. You will also access the **mailx** interactive mode prompt, which is a question mark (?). At the interactive mode prompt, read mail by pressing <Return> or entering **mailx** commands to read mail and perform other **mailx** functions.

If you do not have mail, you will receive a "No mail for <username>" message and will return to the operating system prompt.

Note:

If you receive mail on a workstation, you will be prompted with a "you have mail in /usr/mail/<username>" message when you log in to the node.

If you receive mail on a VMS system, you will be prompted with a "MAILX-NEWMAIL New mail from [system.]<username> has arrived" message.

6.6 Mailx Command-Line Options

This section describes the available command-line **mailx** options. Use them as described below:

\$ mailx [options] [system.]<username>

The following **mailx** options can be used on the command line for VMS and workstation hosts, except where otherwise specified.

-?

Prints Help concerning command-line options (VMS only).

< <filename>

Copies mail text from the specified file. Use this option when sending mail directly from the **mailx** command line. After keying in the command line and pressing <Return>, you will return to the operating system prompt. For example, the following will send a message with a subject of records and text from the file `rec1.txt` to the user `cheryl`:

\$ mailx -s "personnel records" cheryl < rec1.txt

6.7 Mailx Commands

Once you invoke **mailx** you can use the following commands at the **mailx** prompt, which is a question mark (?). Enter a question mark (?) to obtain a list of commands.

On a VMS system, a Help screen is available for each command when you enter the command followed by a question mark (?). For example, the following prints Help information about the **folder** command.

folder?

In the following command descriptions a message list (msglist) can be a single message number, a list of messages separated by spaces or commas, or a range of messages separated by a dash. For example, to delete message numbers 2 through 8, you could enter any of the following:

```
d 2-8
d 2 3 4 5 6 7 8
d 2,3,4,5,6,7,8
```

A message list is optional when enclosed in square brackets and will default to the current message number. Many of the commands can be abbreviated to a single character.

The following list describes available **mailx** commands. Use these commands once you are in the **mailx** program at the **mailx** prompt, which defaults to ?.

?

Displays online Help for **mailx** commands.

copy [msglist] filename

Copies the current message or message list to a specified file. The message(s) will not be marked as saved and will not be deleted from your mailbox when you issue the **quit** command.

dp

Deletes the current message and prints the next message.

delete [msglist]

Deletes the current message or message list. Messages are marked for deletion but are not removed until the **quit** command is issued. The **undelete** command recovers messages.

exit

Exits **mailx** with no changes; messages that have been deleted, read, or saved will not be removed.

Forward [msglist] [system.]<username>

Forwards a received message to the specified **username**.

header [msglist]

Displays one or more specified message headers.

list

Lists all **mailx** commands but provides no explanation.

mail username(s)

Mails a message to the specified **username(s)**.

mbox [msglist]

Marks messages for storage in your *mbox* file. Messages are not moved until you issue the **quit** command.

next

Increments the message pointer to the next message and then displays it.

print

Prints the current message on your screen.

quit

Exits **mailx**, removes any messages that have been saved or deleted, and moves any messages that have been read to your *mbox* file.

Reply [msglist]

Replies to the sender of the message(s) in the message list. The subject is taken from the first message in the list. Issue the **Reply** command when reading a message, press <Return>, and then enter the reply message you want to return to the sender.

reply [msglist]

Replies to the sender of the current message(s) and to all recipients in the message list. The subject is taken from the first message in the list. Issue the **reply** command when reading a message, press <Return>, and then enter the reply message you want to send to the recipients.

save [msglist] filename

Saves the current message or message list to a specified file. The message will be marked as saved and will be deleted when you issue the **quit** command. This command saves the message header and body; to save the message body only, see the **write** command.

undelete [msglist]

Recovers the current message or message list that was previously marked for deletion. If no message numbers are provided, all messages marked for deletion will be recovered.

xit

Exits **mailx** with no changes; messages that have been deleted, read, or saved will not be removed. This command is the same as the **exit** command.

z +

Displays the next page of mail headers.

z -

Displays the previous page of headers.



Chapter 7: Queuing and Printing

This chapter covers basic information needed to route printing jobs to the printer using the Network Queuing System (NQS). You will learn the terms *queue* and *device* and become familiar with the different types of queues.

In addition, you will learn how to display a queue's contents using the `qstat` command, submit print requests to a queue using the `qpr` command, and delete a print request using the `qdel` command. The options available with the `qstat` and `qpr` commands are also listed. These topics are covered:

7.1	Understanding Queues	7-3
7.1.1	Device Queues	7-3
7.1.2	Pipe Queues	7-3
7.1.3	Batch Queues	7-3
7.2	Understanding Devices	7-4
7.3	NQS Command Overview	7-5
7.4	Displaying Queue Status Information	7-6
7.5	Submitting Print Requests	7-7
7.6	<code>qpr</code> Examples	7-9
7.6.1	Submitting an ASCII Print File	7-9
7.6.2	Submitting a Plot Request	7-10
7.7	Deleting a Request	7-12

7.1 Understanding Queues

A queue is a waiting line in which job requests reside until they are processed. NQS supports these three queue types:

- Device queues
- Batch queues
- Pipe queues

Each queue type is discussed briefly in this section. See your *NQS User's Guide* or your system administrator to determine which queues have been set up for you to use.

7.1.1 Device Queues

A device queue routes requests to a printer or plotter. Device queues exist only on NQS server nodes because only server nodes are connected to output devices.

7.1.2 Pipe Queues

A pipe queue routes requests to another queue the way a device queue routes requests to an output device. Pipe queues can accept any type of request: a batch request, a device request, or a request from another pipe queue.

A pipe queue interprets the request and pipes it to the first available queue that is in its destination list and that will accept the request. The destination list may contain any queue type. You must use pipe queues to submit jobs to remote nodes.

7.1.3 Batch Queues

A batch queue accepts requests to execute shell scripts or commands from the keyboard. The batch request executes as if the requester had logged in. The resulting output returns to the original requester's current directory when the job is submitted. You can request the output to remain on the executing node or return to a remote node.

7.2 Understanding Devices

Devices in NQS are the interfaces to the printers and plotters from which hardcopy output is produced. The queues discussed in the previous section service these devices. You must create a device interface for every physical printer or plotter. (Chapter 8 of the *NQS User's Guide* describes how to create devices.)

7.3 NQS Command Overview

The following NQS commands are available. Any NQS user can key in these commands from the system prompt.

- qsub** submits batch requests.
- qpr** submits print requests. (See 6.5.)
- qdel** deletes and signal requests. (See 6.7.)
- qstat** displays queue status without entering *qmgr*. (See 6.4.)
- qdev** displays device status.

See your *NQS User's Guide* for more information on the **qsub** and **qdev** commands.

7.4 Displaying Queue Status Information

The `qstat` command displays the status of one or more queues and the requests in those queues.

To display queue status information, key in the `qstat` command as follows:

```
$ qstat [-a] [-l] [-m] [-u username] [-x] [-b] [-d] [-p] [-r] [queue_name...] [queue@host..]
```

Keying in `qstat` with no options displays information about jobs that you own in all local queues. You may also display information about individual queues on multiple nodes. For example, the following command line displays information about the local queue `sysbatch`, the queue `sysprint` at node `red`, and all queues at node `blue`:

```
$ qstat sysbatch sysprint@red @blue
```

The following options are available with `qstat`:

Option	Description
<code>-a</code>	Displays all requests
<code>-l</code>	Displays requests in long format
<code>-m</code>	Displays requests in medium-length format
<code>-u <i>username</i></code>	Displays only requests belonging to the specified user
<code>-x</code>	Displays the queue header in extended format
<code>-b</code>	Displays only batch queues
<code>-d</code>	Displays only device queues
<code>-p</code>	Displays only pipe queues
<code>-r</code>	Recursively displays pipe queue destinations

The following example shows how to use the `qstat` command to display jobs in the queue called `sysprint` on node `bob`:

```
$ qstat sysprint@bob
```

Information similar to the following then displays:

```
sysprint@bob; type=DEVICE; [ENABLED, ACTIVE]; pri=16  
0 exit; 1 run; 0 stage; 0 queued; 2 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	Size
<1 job running>						
1:	JOB1	154.bob	bob	31	WAITING	766
2:	JOB2	155.bob	bob	31	WAITING	531

7.5 Submitting Print Requests

Print requests are spooled to an output device such as a printer or plotter. Devices may be connected to your node or to a node at a remote location on the network. Use the `qpr` command to submit print requests.

Key in the `qpr` command at the system prompt as follows:

```
$ qpr -q queue_name [-a date_time [-d name=value] [-e tag=filename] [-f
form_name] [-l "log_message"] [-mb] [-me] [-mu username] [-n copies] [-o
"filter_options"] [-p priority] [-r request_name] [-R] [-s] [-t input_type] [-x] [-z]
request_files
```

The following options are available with `qpr`. If no request files are specified, the standard input (keyboard) is used.

Option	Description
-a <i>date_time</i>	Executes the request after the specified time.
-d <i>name=value</i>	Defines an environment variable to be placed in the <code>devserver</code> environment.
-e <i>tag=filename</i>	Associates the tag with the filename and places it on the server node.
-f <i>form</i>	Prints the request on the stated form.
-l " <i>log_message</i> "	Logs the specified message in the accounting file if an accounting file is defined in the <i>devicecap file</i> .
-mb	Sends mail when the request begins executing.
-me	Sends mail when the request finishes executing.
-mu <i>username</i>	Sends mail about the request to the specified user.
-n <i>copies</i>	Prints the specified number of copies.

Option	Description
-o <i>filter_options</i>	Places the specified options at the end of the filter's argument list. Enclose the options in double quotes (" ").
-p <i>priority</i>	Specifies the intraqueue request priority.
-q <i>queue</i>	Submits the request to the specified queue.
-r <i>request_name</i>	Assigns the specified name to the request.
-R	Specifies that original files will be deleted after a request is spooled or transported.
-s	Specifies that the file will be symbolically linked to the spool directory instead of being copied to it.
-t <i>input_type</i>	Specifies the input type being sent.
-x	Copies the complete environment to the server node.
-z	Submits the request silently.

The `-q` parameter is the only required parameter besides the *request_file*. The `-q` parameter specifies the queue to which the request will be submitted. Using the `-q` parameter followed by the name of a pipe queue, you can submit requests to another workstation or server. Using the `-q` parameter followed by the name of a device queue, you can submit requests to a device connected to your machine. (You may set up a default queue. To do so, see Chapter 8 of the *NQS User's Guide*.)

For example, the following command line submits a request to the local pipe queue, *syspipe*. *syspipe* then routes the request to its destination queue on a remote node.

```
$ qpr -q syspipe print_file
```

7.6 qpr Examples

The following sections illustrate possible printing scenarios and the `qpr` command lines that you would use to submit requests in these situations.

7.6.1 Submitting an ASCII Print File

In this example, user Anna wants to submit an ASCII file named `anna.txt` from her node, `anna`, to a dot matrix printer attached to a server node. The server node is named `red` and is located across the hall from her office. The following conditions exist:

- The server's administrator used `pconfig` to create a device queue named `dot_mat`. This queue routes print requests to the dot matrix printer. The default data type for queue `dot_mat` is ASCII.
- All users can access the `rje` account on node `red`.
- Anna used `pconfig` to create a pipe queue named `to_red` on her client node. She set the destination queue to `dot_mat` on node `red`.
- Both the device and pipe queues are enabled and running, and the printer is online.

To send her file to be printed at server `red`, Anna follows these steps:

1. Anna keys in the following command line:

```
$ qpr -q to_red anna.txt
```

After several seconds, the following message displays:

```
Request 18.anna submitted to queue: hedge.
```

2. She checks her local pipe queue, `to_red`, to ensure that the request is queued by keying in the following command line:

```
$ qstat to_red
```

The following queue information then displays:

```
to_red@anna; type=PIPE; [ENABLED, ACTIVE]; pri=16  
0 depart; 1 route; 0 queued; 0 wait; 0 hold; 0 arrive;
```

Request Name	Request ID	Usr	Pri	State	PGRP
1: anna.txt	18.anna	anna	31	Routing	

3. Anna waits several seconds and then checks the server node to ensure that her job arrived. She keys in the following command line:

```
$ qstat @red
```

The following queue information then displays:

```
dot_mat@red; type=DEVICE; [ENABLED, ACTIVE]; pri=16  
  1 run; 0 queued; 0 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	SIZE
1:	anna.txt	18.anna	rje	31	Running	687

4. She sees that her request is running and retrieves it from the dot matrix printer at server **red**.

7.6.2 Submitting a Plot Request

In this example, user Bill wants to submit a postscript file named *rasfile* from his node, **bill**, to an ILP2217 laser printer attached to a server node. He wants to print three copies and receive mail when the request has finished executing. The following conditions exist:

- The server's administrator used **pconfig** to create a device queue named **il2217** on the server for the ILP2217 printer. The administrator set the default data type for queue **il2217** to **igds**. (Because the default is not **script**—the postscript data type—Bill will need to specify the data type in the **qpr** command line.)
- The **IP_Script** metafile interpreter is installed on the server node, **blue**.
- All users can access the **rje** account on node **blue**.
- Bill used **pconfig** to create a pipe queue named **to_2217** on his client node. He has set the destination queue to **il2217** on node **blue**.
- Both the device and pipe queues are enabled and running, and the printer is online.

To send his file to be plotted on server **blue**, Bill follows these steps:

1. Bill keys in the following command line:

```
$ qpr -q to_il2217 -t script -me -n 3 rasfile
```

After several seconds, the following message displays:

```
Request 20.bill submitted to queue: to_il2217
```

2. He checks his pipe queue, `to_il2217`, to ensure that the request is queued by keying in the following command line:

```
$ qstat to_2217
```

The following queue information then displays:

```
to_2217@bill; type=PIPE; [ENABLED, ACTIVE]; pri=16
  0 depart; 1 run; 1 route; 0 queued; 0 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	PGRP
1:	rasfile	18.bill	bill	31	Routing	

3. Bill waits several seconds and then checks the server node to ensure that his job arrived. He keys in the following command line:

```
$ qstat @blue:
```

The following queue information then displays:

```
IL2217@blue; type=DEVICE; [ENABLED, ACTIVE]; pri=16
  1 run; 1 queued; 0 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	SIZE
1	rasfile	18.bill	rje	31	Running	1221

4. Bill sees that his request is running and retrieves it from the ILP2217 at server blue.

7.7 Deleting a Request

After a request has been submitted, you can delete it using the `qdel` command. Before you can delete a request, at least one of the following conditions must exist:

- You must own the request.
- You must have NQS operator privileges.
- You must be logged in as the superuser.

To delete a request, key in the `qdel` command as follows:

```
$ qdel [-k] [signal] [-u username] request_id[@host]...
```

- The `-k` option sends a kill signal to a process already running a request in a queue. You do not need to use the `-k` option if the request is waiting in the queue.
- The `signal` option sends a numeric kill signal (such as the CLIX `-9`) to a process already running a request in a queue.
- The `-u` option allows you to specify the `username` of the request owner (if you have NQS operator privileges). You must use the `-u` option if you do not own the request you are deleting.
- The `request_id` is the request identification number obtained with the `qstat` command or the `qmgr show queue` command. Use the `@host` option and substitute the correct host name if the job resides on a remote machine. (However, you must have access to these nodes. See 3.3 for information on obtaining access to other nodes.)

For example, to delete a request from the queue named `il2217`, on node `bob`, follow these steps.

1. Show the queue to obtain the request identification number.

```
$ qstat il2217@bob
```

```
il2217@bob; type=DEVICE; [ENABLED, ACTIVE]; pri=16  
1 run; 0 queued; 1 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	Size
1:	JOB1	154.bob	bob	31	RUNNING	766
2:	JOB2	155.bob	bob	31	WAITING	531

2. Delete JOB2 by keying in the following command line:

```
$ qdel 155.bob@bob
```

3. Execute the `qstat` command again to confirm that JOB 1 has been deleted.

```
$ qstat il2217@bob
```

```
il2217@bob; type=DEVICE; [ENABLED, ACTIVE]; pri=16  
1 run; 0 queued; 0 wait; 0 hold; 0 arrive;
```

	Request Name	Request ID	Usr	Pri	State	Size
1:	JOB1	154.bob	bob	31	RUNNING	766

For a more complex example, suppose the local node is `bob` and the following command is given:

```
$ qdel 5 7@mac 8.merlin 12.aladdin@b11
```

If the node part of the Request ID is not specified, the local node is assumed. Similarly, if `@host` is not specified, the local node is assumed.

This command will delete the 5.bob and 8.merlin jobs on node `bob`, the 7.bob job on node `mac`, and the 12.aladdin job on node `b11`.



Chapter 8: The Floppy Disk Drive

InterPro 6000-series workstations come standard with a 3½-inch floppy disk drive (microfloppy). The 5¼-inch floppy disk drive is optional for these workstations. All other workstations and servers come standard with the 5¼-inch floppy disk drive. However, the 3½-inch floppy disk drive is not an option for for all other workstations and servers.

This chapter explains how to prepare a floppy disk drive for use, insert a floppy disk in and remove it from a floppy disk drive, maintain floppy disks, back up and restore files, store data on a floppy disk, and access data that is stored on a floppy disk. The following sections are included:

8.1	Specifying Storage Capacity	8-3
8.2	Maintaining Floppy Disks	8-4
8.3	Inserting and Removing Floppy Disks	8-5
8.3.1	Inserting and Removing 3½-Inch Floppy Disks	8-5
8.3.2	Inserting and Removing 5¼-Inch Floppy Disks	8-5
8.4	Interpreting the Disk Activity Light	8-6
8.5	Accessing the Floppy Disk Drive	8-7
8.6	Formatting the Floppy Disk	8-8
8.6.1	Formatting from the Command Line	8-8
8.6.2	Formatting from the Utility Pages	8-9
8.7	Creating a Floppy Disk File System with the mkfs Command	8-10
8.8	Copying One Floppy's Contents to Another with the cpflop Command	8-12
8.9	Writing to Sequential Floppies with the fr__flop Command	8-13
8.10	Reading from Sequential Floppies with the fr__flop Command	8-14
8.11	Backing Up with the tar Command	8-15
8.12	Backing Up with the cpio Command	8-17

8.1 Specifying Storage Capacity

Your workstation or server can accommodate high- and low-density 5¼- and 3½-inch floppy disks. High- and low-density floppy disks differ in their storage capacities. With a capacity of approximately 1.2 MB (2400 blocks) of data for 5¼-inch and 1.44 MB (2880 blocks) for 3½-inch floppy disks, high-density floppy disks can store more data than low-density floppy disks can. The 5¼-inch low-density floppy disks can store .36 MB (720 blocks) of data and the 3½-inch, .72 MB (1440 blocks).

The following table summarizes high- and low-density specifications for 5¼- and 3½-inch floppy disks:

	High-Density	Low-Density
5¼-inch	1.2 MB (2400 blocks)	.36 MB (720 blocks)
3½-inch	1.44 MB (2880 blocks)	.72 MB (1440 blocks)

8.2 Maintaining Floppy Disks

Floppy disks must be handled carefully so that damage to the disk's data can be avoided. When using a floppy disk, take the following precautions to ensure its safety:

- Do not touch the exposed surface of the 5¼-inch floppy disk. (3½-inch floppy disks are more durable than 5¼-inch floppy disks.)
- Do not bend the floppy disk.
- Do not write on the floppy disk.
- Keep floppy disks away from magnets and magnetic fields.
- Store the 5¼-inch floppy disk in its protective envelope. (3½-inch floppy disks do not have a protective envelope.)
- When mailing the floppy disk, protect it with cardboard on both sides or use a box or envelope designed for mailing floppy disks.

8.3 Inserting and Removing Floppy Disks

This section describes procedures for inserting and removing 3½- and 5¼-inch floppy disks.

8.3.1 Inserting and Removing 3½-Inch Floppy Disks

To insert the floppy disk in the 3½-inch floppy disk drive, gently push the floppy disk until it is securely in the disk drive.

Remove the 3½-inch floppy disk from the disk drive by pushing the button. The floppy disk then partially ejects from the disk drive, and you may remove it.

8.3.2 Inserting and Removing 5¼-Inch Floppy Disks

Follow these steps to insert a floppy disk:

1. Release the latch that locks the floppy disk in the floppy disk drive.
2. Gently insert the floppy disk in the disk drive with the label side facing the latch. Do not force the floppy disk or let it bend or buckle.
3. When the disk is completely in the slot, flip the latch down to secure the floppy disk in the disk drive.

When the disk activity light goes out, you can remove the floppy disk from the disk drive by flipping up the latch. The floppy disk partially ejects from the disk drive when the latch is raised.

8.4 Interpreting the Disk Activity Light

The disk activity light for the 3½-inch and 5¼-inch floppy disk is located in the upper righthand corner of the floppy disk drive. This activity light does not indicate disk activity for the 3½-inch floppy disk drive; it stays on continuously. However, on the 5¼-inch floppy disk drive, the disk activity light is on only when the disk is being read from or written to.

8.5 Accessing the Floppy Disk Drive

You can use one of the following four device files (depending on your device type) to access the floppy disk drive:

	Block Device	Character Device
5¼-inch	/dev/dsk/floppy	/dev/rdisk/floppy
3½-inch	/dev/dsk/uflop	/dev/rdisk/uflop

In addition, the */dev/dsk/fl* and */dev/rdisk/fl* files were created to specify the default floppy disk drive type for a system. For example, for 32C/100/200/300/3000/4000-series systems, the */dev(r)dsk/floppy* device file is linked to */dev(r)dsk/fl*. Likewise, for 6000-series systems, the */dev(r)dsk/uflop* device file is linked to */dev(r)dsk/fl*.

Thus, commands such as *format*, *mkfs*, *mf*, *uf*, *to_flop*, and *fr_flop* will automatically access the floppy disk drive through the */dev(r)dsk/fl* file.

Note:

6000-series systems come standard with a 3½-inch floppy disk drive. However, you have the option of adding a 5¼-inch floppy disk drive. If you add a 5¼-inch floppy disk drive to your 6000-series system, you will be required to use the */etc/setflop* command before you will be able to access the 5¼-inch floppy disk drive. This command links */dev(r)dsk/floppy* to */dev(r)dsk/fl*.

The syntax for this command is as follows, where the *f* option specifies 5¼-inch floppy and **2400** is the number of blocks for a high-density 5¼-inch floppy disk:

```
$ setflop -f 2400
```

After you finish accessing the 5¼-inch drive, use the */etc/setflop* command again to relink */dev(r)dsk/uflop* to */dev(r)dsk/fl*. This command will enable you to access the 3½-inch drive again. The syntax is as follows, where the *u* option specifies 3½-inch floppy and **2880** is the number of blocks for a high-density floppy disk:

```
$ setflop -u 2880
```

8.6 Formatting the Floppy Disk

You must format floppy disks initially before you can use them. However, once a disk has been formatted, you do not need to reformat. Formatting a floppy disk erases all data and rewrites the tracks and sectors to prepare the disk for holding data. Floppy disks can be formatted from the command line or from the System V Utility Pages.

Caution:

- Formatting destroys all data on a floppy disk.
- A floppy disk formatted for System V must be reformatted before it can be used in PC-DOS. Reformatting is needed because System V structures the disk differently than PC-DOS does.
- A high-density floppy disk should not be formatted as a low-density floppy disk and a low-density disk should not be formatted as a high-density floppy disk.

8.6.1 Formatting from the Command Line

Follow these steps to format a high-density floppy disk for System V using the `format` command:

1. Insert the high-density floppy disk in the floppy disk drive.
2. At the system prompt, key in the following:

```
$ /etc/format
```

The following messages appear:

```
Formatting high density floppy,  
total 512 blocks -2400  
Warning: All data on this floppy will be lost  
Insert floppy and hit return when ready
```

When the disk activity light goes out and the system prompt appears, the format procedure is complete.

Follow these steps to format a low-density floppy disk for System V using the `format` command:

1. Insert the low-density floppy disk in the floppy disk drive.
2. At the System V prompt, key in the following:

```
$ /etc/format -l
```

The following messages appear:

```
Formatting low density floppy,  
total 512 blocks -720  
Warning: All data on this floppy will be lost  
Insert floppy and hit return when ready
```

When the system prompt appears, the format procedure is complete.

8.6.2 Formatting from the Utility Pages

Follow these steps to format a floppy disk for System V using the Utility Pages (graphics workstations only):

1. Select the **Utility** screen button from the introductory screen.
2. Select the **Disk Maintenance Utilities** screen button from the Utility page.
3. When the Disk Maintenance Utilities page appears, insert the floppy disk in the floppy disk drive.
4. Set the **Floppy Density** toggle switch to **high density** (1.2 MB) or **low density** (360 KB), depending on the type of floppy being formatted.
5. Activate the floppy **FORMAT** button from the Floppy Disk area of the screen. When the disk activity light goes out on the floppy disk drive, the format procedure is complete.

8.7 Creating a Floppy Disk File System with the mkfs Command

The **mkfs** (make file system) command creates a file system on a floppy disk. Creating a file system allows a floppy disk to be used as a CLIX file system (such as */usr*). If you create a file system, standard System V commands can be used to create and manipulate directories and files on the floppy disk.

Follow these steps to create a file system on a floppy disk:

1. Insert a formatted floppy disk in the floppy disk drive.
2. For a high-density floppy disk, key in the following (specifying 2,400 as the number of blocks that a high-density, 5 $\frac{1}{4}$ -inch floppy disk stores or 2,880 as the number of blocks that a high-density, 3 $\frac{1}{2}$ -inch floppy disk stores):

```
# /etc/mkfs /dev/dsk/fl 2400
```

OR

```
# /etc/mkfs /dev/dsk/fl 2880
```

Key in the following (specifying 720 as the number of blocks that a low-density, 5 $\frac{1}{4}$ -inch floppy disk stores or 1,440 as the number of blocks that a low-density, 3 $\frac{1}{2}$ -inch floppy disk stores) for a low-density floppy disk:

```
# /etc/mkfs /dev/dsk/fl 2400
```

OR

```
# /etc/mkfs /dev/dsk/fl 2880
```

3. After creating a file system on a floppy disk, run the **labelit** program to attach a base directory name to the file system. For instance, to run **labelit** on the floppy disk, key in the following, where **mnt1** represents the mounted name of the file system and **mnt2** represents the (user definable) volume name:

```
# /etc/labelit /dev/dsk/floppy mnt1 mnt2
```

4. Like any file system, the floppy disk file system must be mounted before it can be accessed. The **mf** (mount floppy) command can be used to mount the floppy disk file system to the */mnt* directory (an empty directory used for temporarily mounting additional file systems). Key in the following to mount the floppy disk file system:

```
$ mf
```

5. Once the floppy disk file system has been mounted, change to the */mnt* as follows to access the floppy disk file system:

```
$ cd /mnt
```

You can now create, manipulate, and delete files located in the floppy disk file system directory.

6. When you finish accessing the floppy disk, you must use the `uf` (unmount floppy) command to unmount the floppy disk file system. To do so, first change to another directory besides `/mnt`. Then, key in `uf` to unmount the floppy disk file system.

```
$ cd
```

```
$ uf
```

8.8 Copying One Floppy's Contents to Another with the `cpflop` Command

The `cpflop` (copy floppy) command copies the entire contents of one floppy disk to another floppy disk, using the same drive. To use this command, key in `cpflop` at the system prompt, as shown in the following example:

```
$ cpflop
```

```
Insert source floppy and press <Return> when ready ...
```

```
Insert destination floppy #1 and press <Return> when ready ...
```

```
1228800 bytes read
```

```
1228800 bytes written
```

8.9 Writing to Sequential Floppies with the `to_flop` Command

The `to_flop` command copies input to the floppy disk drive, prompting the user to insert sequential floppy disks as needed. This command can be used with backup utilities such as `tar` and `cpio` to write multiple volumes of floppy disks. The following examples write the `/usr/chris` directory to one or more floppy disks:

```
$ tar cvf- /usr/chris | to_flop
```

OR

```
$ find /usr/chris -print | cpio -ov | to_flop
```

To restore files backed-up using `to_flop`, you must use the `fr_flop` utility described in the next section.

8.10 Reading from Sequential Floppies with the `fr_flop` Command

The `fr_flop` command reads data from one or more floppy disks. This command can be used with backup utilities such as `tar` and `cpio` to restore files located on multiple volumes of floppy disks. The following examples restore the `/usr/chris` directory to the hard disk:

```
$ fr_flop | tar xvf-
```

OR

```
$ fr_flop | cpio -ivmud
```

8.11 Backing Up with the tar Command

The tape file archiver utility (**tar**) is used to back up a file, directory, or entire file system. However, **tar** does not have any error handling capability. If a file in a **tar** saveset becomes corrupted, all files following that file cannot be recovered with **tar**. In addition, **tar** will not back up device files. When attempting to back up files, **tar** skips over device files.

tar output goes to floppy disk by default but can be directed to any device, pipe, or file on the system.

Caution:

The **tar** command is not compatible with floppy disk file systems. The **tar** command will destroy a floppy disk file system by overwriting it.

The **tar** command is best used as a secondary method for performing major backups or as a utility to back up noncritical information.

The format for the **tar** command is as follows:

```
$ tar [key] [option] [file]
```

Each component of this command line is defined as follows:

- **tar** is an executable command.
- **key(s)** designates a specific action for the command. (This parameter is optional.)
- **option(s)** is a command supplement. (This parameter is optional.)
- **filename(s)** represents the files that will be transferred. (This parameter is optional.)

Note:

The **tar** command format does not require a dash (-) in front of the key.

The following command backs up the */usr/john* account to floppy disk:

```
$ tar cv /usr/john
```

Each component of this command line is defined as follows:

- **c** specifies a create operation.
- **v** specifies verbose mode.
- **/usr/john** is the directory that will be backed up.

To list files saved on a floppy disk, use the **t** (table) option as follows:

```
$ tar tv
```

The following command recovers the data backed up previously:

```
$ tar xv
```

To recover a single file in this `tar` saveset, use the `x` option and specify the filename to extract as follows:

```
$ tar xv /usr/john/file1
```

The following example appends files to the same floppy disk. The `r` (read) option reads to the end of the tape and appends new files. The `c` (create) option would cause `tar` to begin writing at the beginning of the tape and thus overwrite existing data.

```
$ tar rv *.sh
```

The following example updates the `tar` saveset. The `u` (update) option copies any file with a more recent date *and* any new files.

```
$ tar uv *.sh
```

8.12 Backing Up with the cpio Command

The `cpio` (copy file archives in and out) command can back up any file, including device files. Output from `cpio` can be directed to any device, pipe, or file on the system.

The `cpio` command is a useful backup utility. The `cpio` command has some error handling capabilities and can write multiple volumes of tapes. This tape-writing ability offers more flexibility because you do not need to know how much tape will be needed to store the data.

Input for the `cpio` command must be a list of filenames. Thus, to write a saveset to `cpio`, you must use a command such as `ls` or (preferably) `find` and pipe the output to `cpio`. For example, to back up the `/usr/john` directory to a 3½-inch floppy disk, you could use the `cpio` command as follows:

```
# find /usr/john -print | cpio -ov >/dev/dsk/uflop
```

The following explanations define the components of this command:

- The `find` command searches the hard disk drive for the specified file or directory.
- `/usr/john` is the file or directory for which the `find` command searches (the file or directory you are saving on floppy disk).
- The `-print` command lists either the specified file or the names of the files in the specified directory.
- The `|` (pipe) symbol sends output for one command to the input of another. In this example, all files in the `/usr/john` directory will be piped into the `cpio` command.
- The `o` option copies the output.
- The `v` option represents verbose mode, which specifies that file lists will include extensive information about the files instead of merely listing them.
- The `>` (redirection) symbol directs output from the `cpio` command to the specified device file (`/dev/dsk/uflop` in this example).

Note:

To save files on a 5¼-inch floppy disk drive, substitute the `/dev/dsk/floppy` device file for `/dev/dsk/uflop` in the previous example.

To list files saved on a floppy disk, key in the following command, where the **t** (table) option lists files, the **i** option specifies input, and the **I** option specifies where input will be read from:

```
# cpio -ivt -I/dev/dsk/uflop
```

To recover files previously saved, issue the following command:

```
# cpio -iv -I/dev/dsk/uflop
```



Chapter 9: Toolbox Utilities

This chapter describes the Toolbox Utilities. The Toolbox features a clock (**iclock**) that displays in digital or analog style and a calculator (**icalc**) that functions in either AOS (Algebraic Operating System) or RPN (Reverse Polish Notation) mode. For application developers, the Toolbox provides the **colormap** Video Lookup Table (VLT) editor and the **imag** tool, which magnifies pixels and displays pixel screen coordinates.

The **cdaudio** utility allows CDROM users to use the audio function of the CD drive. Finally, a preliminary version of the **iedit** tool is provided to demonstrate a new easy-to-use text editor that requires no escape sequences or control characters. The final version of **iedit** will be delivered in the next software release.

This chapter includes the following sections:

9.1	Toolbox Overview	9-3
9.2	The Clock Utility	9-4
9.2.1	Displaying the Clock	9-4
9.2.2	iclock Command-Line Options	9-4
9.3	The Calculator Utility	9-6
9.3.1	Displaying the Calculator	9-6
9.3.2	Using the Calculator	9-7
9.3.3	icalc Command-Line Options	9-7
9.3.4	Additional Functions	9-7
9.4	The imag Utility	9-9
9.4.1	Creating and Manipulating the imag Window	9-9
9.4.2	Moving the imag Window	9-10
9.4.3	imag Window Behavior	9-10
9.4.4	imag Options	9-11
9.4.5	imag Information Fields	9-11
9.5	The colormap Utility	9-12
9.5.1	Entering colormap	9-12
9.5.2	RGB and HSV Color Systems	9-12
9.5.3	The Options Menu	9-13
9.5.4	Editing Colors in the Table	9-14
9.5.5	Interpolating	9-14
9.5.6	Using the File Menu	9-15
9.6	The cdaudio Utility	9-16
9.6.1	Entering cdaudio	9-16
9.6.2	cdaudio Command-Line Options	9-16
9.6.3	Using the cdaudio Interface	9-17
9.6.3.1	Status Box Fields	9-17
9.6.3.2	Slide Bars	9-18
9.6.4	Suggestions for Using cdaudio	9-18

9.7	The <code>iedit</code> Utility	9-19
9.7.1	Creating an <code>iedit</code> File	9-19
9.7.2	Inserting Text with <code>iedit</code>	9-19
9.7.3	Editing Text with <code>iedit</code>	9-19
9.7.4	Saving Files with <code>iedit</code>	9-20
9.7.5	<code>iedit</code> Command-Line Options	9-20
9.7.6	Upcoming <code>iedit</code> Features	9-21

9.1 Toolbox Overview

The Toolbox product contains six workstation tools designed to assist in application development and daily workstation use. Many of the Toolbox utilities resemble those found in another baseline product, Accessories. Although the Toolbox and Accessories product will both be delivered in this software release, only the Toolbox will be delivered in the next software release. However, the Accessories product will continue to be available to users who can access the Usenet network.

The Toolbox product is a baseline supplemental product delivered free with CLIPPER workstation standard system software, but it might not be installed on your workstation. Refer to the *CLIPPER Software Delivery Guide* if you need instructions on loading baseline supplemental products to a workstation/server.

Each Toolbox utility can be executed from the command line or added to the workstation pull-down menu. Use the following pathnames when you add the utilities to the pull-down menu (if you installed the Toolbox utilities in the default */usr/ip32* directory):

Utility	Pathname
clock (iclock)	/usr/ip32/toolbox/iclock/iclock
calculator (icalc)	/usr/ip32/toolbox/icalc/icalc
imag	/usr/ip32/toolbox/imag/imag
colormap	/usr/ip32/toolbox/colormap/colormap
cdaudio	/usr/ip32/toolbox/cdaudio/cdaudio
iedit	/usr/ip32/toolbox/iedit/iedit

The **cdaudio** utility can run from the command line on the alphanumeric console of an InterServe processor. However, no other Toolbox utilities will run from an alphanumeric terminal.

9.2 The Clock Utility

The clock utility displays a clock in either color or black and white, depending on your workstation type. The clock runs in a borderless Environ V window. As you can with all Environ V windows, you can manipulate the clock window with the window icons that appear when you tap the middle <D> cursor button on the clock's border.

Only one icon in the window icon box is specific to the clock utility; all others are standard Environ V icons. The icon that resembles a clock allows you to alternate between analog and digital display styles.

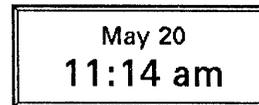
9.2.1 Displaying the Clock

To display the clock, select the clock option from the pull-down menu (if it resides there), or key in the following at the system prompt. (The ampersand (&) is the signal to execute as a background process.)

```
$ iclock &
```



Analog Clock



Digital Clock

Figure 9-1. Analog and Digital Clocks

9.2.2 iclock Command-Line Options

You can use the following options when executing the clock from the command line or adding specific options to your pull-down menu entry. (You can list these options online by keying in `iclock -?` at the system prompt.)

Option	Function
-a	Displays the clock with an analog face.
-d	Displays the clock with a digital face.

Option	Function
-s	Puts a sweeping second hand on the analog face and adds a seconds field to the digital face.
-t	Displays the time only with no date.
-m	Displays the time in military hours, which use a 24-hour clock (digital only).
-x <n>	Allows you to define the x origin for the clock window, where n is the screen coordinate.
-y <n>	Allows you to define the y origin for the clock window, where n is the screen coordinate.
-w <n>	Allows you to define the width of the window, where n is the width in pixels.
-h <n>	Allows you to define the height of the window, where n is the height in pixels.
-c	Allows you to display a clock with a window control strip.
-z <string>	Allows you to display the time in a different time zone. To use this option you must first have the following information: <ul style="list-style-type: none">• The difference (in hours) between your time zone and the one you want to display• Whether you must go forward or backward in time (because this will affect the date that displays)

The variable string should consist of the timezone name in quotation marks, the time forward or backward option (-f or -b), and the number of hours of time difference.

For example, London is six hours ahead of U.S. Central Standard Time (CST). To display the time in London (from a workstation/server set to CST), you would key in the following:

```
$ iclock -z "London" -f 6
```

9.3 The Calculator Utility

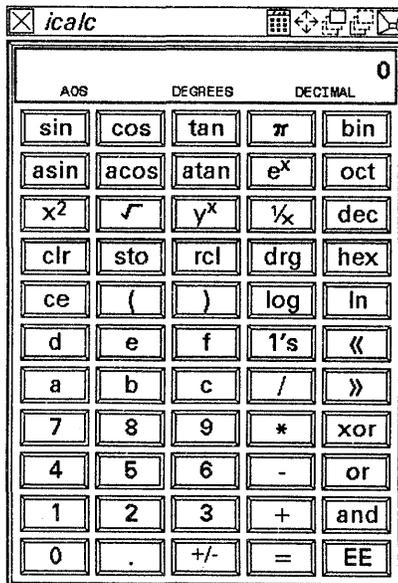
The calculator utility displays a calculator that functions in either AOS (Algebraic Operating System) or RPN (Reverse Polish Notation) mode. Two other groups of modes are available in AOS and RPN modes: trigonometric modes (degrees, radians, and gradians) and base modes (binary, octal, decimal, and hexadecimal). The decimal mode provides 64-bit, double-precision floating-point math; binary, octal, and hexadecimal use 32-bit unsigned integer math.

You can manipulate the calculator window with the icons that appear on the control strip of the calculator window. For example, the calculator window can be enlarged as can any other window. Enlarging the calculator will result in larger buttons and a larger display area capable of handling longer number strings. Only the icon that looks like a small calculator is specific to the calculator. This icon allows you to alternate between AOS and RPN modes.

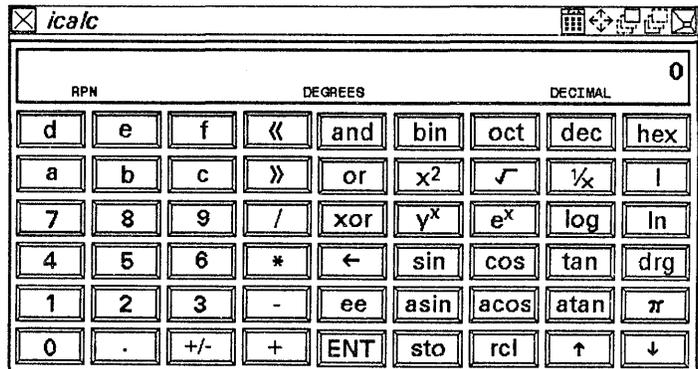
9.3.1 Displaying the Calculator

To display the calculator, select the calculator option from the pull-down menu (if it resides there), or key in the following at the system prompt. (The ampersand (&) is the signal to execute as a background process.)

`$ icalc &`



AOS Calculator



RPN Calculator

Figure 9-2. AOS and RPN Calculators

9.3.2 Using the Calculator

You can enter data in the calculator through the keyboard or by selecting the calculator keys with the middle <D> cursor button. You can use the keypad or the numeric typewriter keys on the keyboard to enter numeric data in the calculator. The alphabetic characters on the keyboard can be used to enter letters in hexadecimal notation.

9.3.3 icalc Command-Line Options

You can use the following options when executing the calculator from the command line or adding options to your pull-down menu entry. (You can list these options online by keying in `icalc -?` at the system prompt.)

Option	Function
-a	Displays the calculator in AOS style (Texas Instruments style)
-r	Displays the calculator in RPN style (Hewlett-Packard style)
-m	Displays the calculator in monochrome (not presently implemented)

9.3.4 Additional Functions

The following keyboard keys provide functions for the calculator:

Key	Function
Backspace, Delete	delete last character
<Ctrl-X>	clear entry
+	add
-	subtract
*	multiply
/	divide
=	equal
(left parenthesis
)	right parenthesis
?	help
s	square root
i	inverse (1/x)
r	reciprocal (1/x)
S	sine
C	cosine
T	tangent
n	negate (change sign) (+/-)
y	y to the x power
!	factorial
	or
&	and
^	xor

Key	Function
B	binary mode
O	octal mode
D	decimal mode
H	hexadecimal mode

To learn the function of a particular calculator key, you can key in a ? and then select that key. A brief, one-word description of that key's function will appear in the calculator display field.

9.4 The imag Utility

The `imag` utility is a developer's tool that allows you to magnify portions of images on the display screen. For example, programmers could use `imag` to determine the size and position of a window or check the location of text or graphics displayed in a window.

The `imag` utility consists of a window with a display area in which magnified portions of the screen can be viewed. A scroll bar on the side and bottom of the `imag` display area enables you to move horizontally and vertically in the screen portion that you selected to magnify. Below the `imag` display area you will find information on the position and color of pixels in the display area. You will also see an Options button that allows you to display the Options menu. These information fields and the `imag` options will be described shortly.

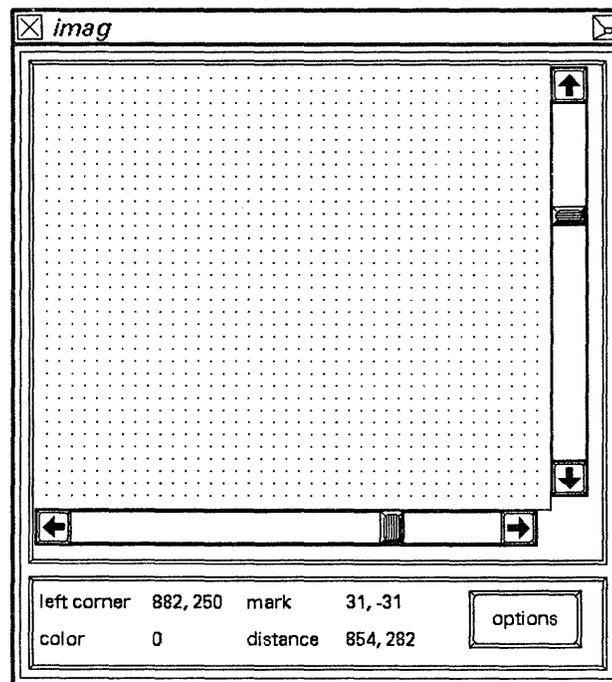


Figure 9-3. The `imag` Window

9.4.1 Creating and Manipulating the `imag` Window

To create an `imag` window, select the `imag` option from the pull-down menu (if it resides there), or key in the following at the system prompt:

```
$ imag
```

The *imag* window will first appear as a dashed outline (called a marquee) indicating the window location. You can either place the window where the marquee appears or move it elsewhere on the screen. You cannot magnify a screen item that is *beneath* the *imag* window, so you will want to place the window so that it does not cover the item you want to magnify.

To place the window, move the cursor inside the window and the cursor will change to the four-arrow modify icon. If you want to place the *imag* window where it appears, simply tap the middle <D> cursor button. To place the window elsewhere on the screen, press and hold the middle <D> button and drag the window to the location where you want it. Tap the middle <D> button to place it.

9.4.2 Moving the *imag* Window

To move an *imag* window after it has been created, place your screen cursor on an outer edge of the *imag* window and then press, hold, and drag the window to the location where you want to move it. The window will appear as a green outline while you are moving it. You can also move a window by redefining the window's screen coordinates on the Options menu.

After you move the window, part of the screen image will appear to be deleted. To restore the screen image, simply collapse and uncollapse the *imag* window one time.

9.4.3 *imag* Window Behavior

You may notice that the *imag* window does not appear to be active because the control strip is not highlighted. Actually, the window is *not* active. An active window's control strip is highlighted and the window will receive keyboard input. Since *imag* does not require either of these to perform its magnifying functions, it is not created as an active window. However, the window *will* be active while the Options menu displays.

You will also notice that no other windows on the workstation screen can become active (even though their control strip is highlighted) while the *imag* window displays. *imag* actually creates two windows: the *imag* window that you see and an invisible window that covers the entire screen (and all other windows).

imag must create the large invisible window to capture the screen data to display in the (visible) *imag* window. To activate other windows, you must first collapse the *imag* window. Collapsing the *imag* window deletes the invisible window and collapses the visible *imag* window to an icon.

9.4.4 imag Options

The following options are available to help you customize your **imag** window. You can select these options when you enter **imag** from the command line or from the Options menu after you have entered **imag**. You can list these options online by keying in **imag ?** at the system prompt.

Option	Function
-x	Defines where the left edge of the imag display will be placed on the screen.
-y	Defines where the top edge of the imag display will be placed on the screen.
-w [10-300]	Defines the width of the imag display area. Values can range from 10 to 300 pixels. Remember that your scale factor also affects your window's size. (See the -s option.)
-h [10-300]	Defines the height of the imag display area. Values can range from 10 to 300 pixels. Again, remember your scale factor.
-s [2-20]	Defines the magnification scale factor. Values can range from 2 to 20. The default setting is 10.
-g	Creates an imag display with a grid.
-ng	Creates an imag display without a grid.

9.4.5 imag Information Fields

The box below the display area provides information about the location and color of the pixels in the display area. The following information fields are provided:

left corner displays the pixel's screen coordinates (x,y) in the upper left corner of the display area.

mark displays the screen coordinates of the last point you selected in the display area.

color displays the VLT index number of the pixel that the cursor is on.

distance displays the distance from the mark to the pixel that the cursor is on. A common use for this function is for measuring the size (in pixels) of a screen image such as an icon. Select a corner or edge of an image displayed in the **imag** window and tap the middle <D> button to set a mark and clear the distance field to (0,0). Then, move the cursor to an opposite corner or edge and note the value change in the distance field.

9.5 The colormap Utility

colormap is a tool for developing color tables, also called Video Lookup Tables (VLTs), to use in application programs. With **colormap** you can easily create and modify the colors in a table, save the table, and then copy it to a program.

Intergraph CLIPPER workstations vary in the number of colors they can display, ranging from 32 colors (from a palette of 4096) on some low-end workstations to 512 (from a palette of 16 million) on many high-end workstations. **colormap** checks the number of available color planes on your workstation and displays a color table (VLT) using the number of available colors.

In addition, **colormap** can display a table with more color slots than are available on that workstation. This allows you to create or edit color tables that will be running on workstations with a higher color capacity. Although you can edit the values for a color slot that does not exist on that workstation, you cannot display the color in that slot; only colors slots available on that workstation will display colors in the table.

9.5.1 Entering colormap

To enter the **colormap** utility, select the **colormap** option from the pull-down menu (if it resides there), or key in the following at the system prompt:

```
$ colormap
```

The **colormap** display consists mainly of the color table with scroll bars and entry fields that enable you to create and edit colors in the table. You will also find the File and Options screen buttons, which allow you to access the menus, and the **interp** buttons, which allow you to interpolate colors.

When **colormap** appears on the screen, it displays the color table of the active process by default. However, you can load a different color table through the File menu, which we will discuss shortly.

9.5.2 RGB and HSV Color Systems

You will notice that **colormap** allows you to create and edit colors according to two different color systems: RGB (Red, Green, Blue) and HSV (Hue, Saturation, Value). Workstation hardware uses the RGB color system. Therefore, application programs that drive a color hardware device must provide RGB color data.

Although the workstation hardware must use RGB, the HSV color system is often easier to use because it is a more intuitive method of creating colors. Hue represents the color you want, saturation represents the hue's saturation level (or how far from gray), and value determines the hue's intensity (how dark or bright).

For example, to create a desired shade of yellow, you can select yellow by moving the hue scroll bar until you find a yellow you like. (Saturation and value should both be set all the way to the right when you select a hue). Once you find a yellow among the available hues, you can adjust the saturation and value to create the shade you want. Using RGB, on the other hand, you would need to experiment with the red, green, and blue values to find the combination that creates yellow.

`colormap` determines and displays RGB and HSV values simultaneously as you edit the color table. Therefore, you can use either color system to create the colors for your table, regardless of which color system you will be using in your application program.

9.5.3 The Options Menu

Select the **Options** screen button from the `colormap` window to access the Options menu.

The following fields appear on this menu:

- **Max RGB** allows you to redefine the maximum number of RGB values. The default maximum is 15 because Intergraph workstation hardware presently supports approximately 15 values.
- **Max HSV** allows you to redefine the maximum number of HSV values. The default maximum is 100 since approximately 100 hues can be created from all possible combinations of RGB values in the workstation hardware.
- **Reset** allows you to determine how to reset (unselect) highlighted slots during color table editing.

If set to **Auto** (the default setting), a highlighted slot becomes unhighlighted (unselected) when you select a new slot. You do not need to press **Reset** to unhighlight a slot, although pressing **Reset** will work too.

If set to **Manual**, a highlighted slot remains highlighted until you press **<R>** (or reselect the highlighted slot).

- **Interpolate** allows you to determine whether interpolation will be performed through RGB or HSV format.

- VLT allows you to select the size (in slots) of your color table. Available choices are 2, 16, 32, 256, and 512.

9.5.4 Editing Colors in the Table

The slot with the black and white box in the center is the active slot. The RGB and HSV values of the active slot display in the fields below the table. You can use the scroll bars or key-in fields at the bottom of the window to edit the color values of this slot.

Follow these steps to move the highlighted box to a different slot:

1. Place the cursor on another slot.
2. Press the middle <D> button.

Follow these steps to edit several consecutive slots at a time:

1. Select the first slot you want to change. The black and white box will appear in that slot.
2. Press and hold the middle <D> button and drag the cursor over the other slots you want to edit. A solid white box will appear in the center of each additional slot you select in this manner. Every change to the active slot will be reflected in every highlighted slot.
3. Press <R> to unhighlight all slots.

Follow these steps to change all highlighted slots to the same color as the active slot:

1. Highlight each slot as described previously.
2. Press <Enter> three times. Each time you press <Enter> you scroll through one of the three color value fields (in either RGB or HSV) and set it to the same value as active slot. Pressing <Enter> three times sets all three values to those of the active slot.
3. Press <R> to unhighlight all slots.

9.5.5 Interpolating

When you need a smooth progression of color in a series of slots, you can use the interpolate feature as follows:

1. Choose a beginning and ending slot. Set the colors you want in these slots.

2. Highlight all slots between the beginning and ending slot. (Place your cursor on the beginning slot, press and hold the middle <D> button, and drag the cursor to the ending slot.)
3. Select each of the three **interp** buttons at the bottom of the window. Each color value is interpolated separately so all three buttons must be selected for a complete interpolation.

9.5.6 Using the File Menu

Select the **File** screen button from the colormap window to access the File menu.

- To read (load) a color table, if you previously created and saved a color table that you want to load in colormap, key in the filename (pathname) of that table and select the **Read** screen button.
- To write (save) a color table, if you want to save the color table that you just created in this working session, key in a filename for this table and select the **Write** screen button.

9.6 The `cdaudio` Utility

If a CDROM drive is connected to your CLIPPER workstation or server, you can use the `cdaudio` utility to access the audio function of your CD drive. `cdaudio` allows you to control the CD drive as you would a CD player by providing screen buttons (or command-line options) for play, fast forward, fast backward, stop, eject, and other functions. `cdaudio` also supplies status information such as track position and time elapsed.

For CLIPPER workstations, `cdaudio` provides a graphics interface, which this section will focus on. `cdaudio` functions with CLIPPER servers through command-line options that are also described here.

If a CDROM drive is not connected to your workstation/server, you will receive an error message if you try to use this utility.

Note:

You should not try to use the CD drive for audio purposes while a file system is mounted from the CDROM drive. If you do, unpredictable results may occur.

9.6.1 Entering `cdaudio`

To enter the `cdaudio` utility, select the option from the pull-down menu or key in the following at the system prompt:

```
$ cdaudio
```

9.6.2 `cdaudio` Command-Line Options

You can use the following options when entering `cdaudio` from the command line or adding specific options to your pull-down menu entry. If a command-line option is entered with `cdaudio`, the option's function will be performed and `cdaudio` will exit without creating a `cdaudio` window. For example, the CD will be ejected if you key in `cdaudio -e`.

Option	Function
<code>-e</code>	Eject
<code>-p</code>	Play
<code>-P</code>	Pause
<code>-s</code>	Stop
<code>-t <n></code>	Begin play at a specific track, where n is the track number
<code>-v</code>	Print status

-V

Print a more verbose status. The following is an example of verbose status printout:

```
tracks 1-7
currently paused on track 1, time 0:00
track 1   length 6:52   start 0:02
track 2   length 8:10   start 6:54
track 3   length 4:02   start 15:05
track 4   length 8:50   start 19:07
track 5   length 8:36   start 27:23
track 6   length 6:02   start 35:59
track 7   length 7:18   start 42:02
```

9.6.3 Using the cdaudio Interface

This section covers the fields and screen buttons that appear on the `cdaudio` graphics interface. (The values shown in the fields below serve only as examples.)

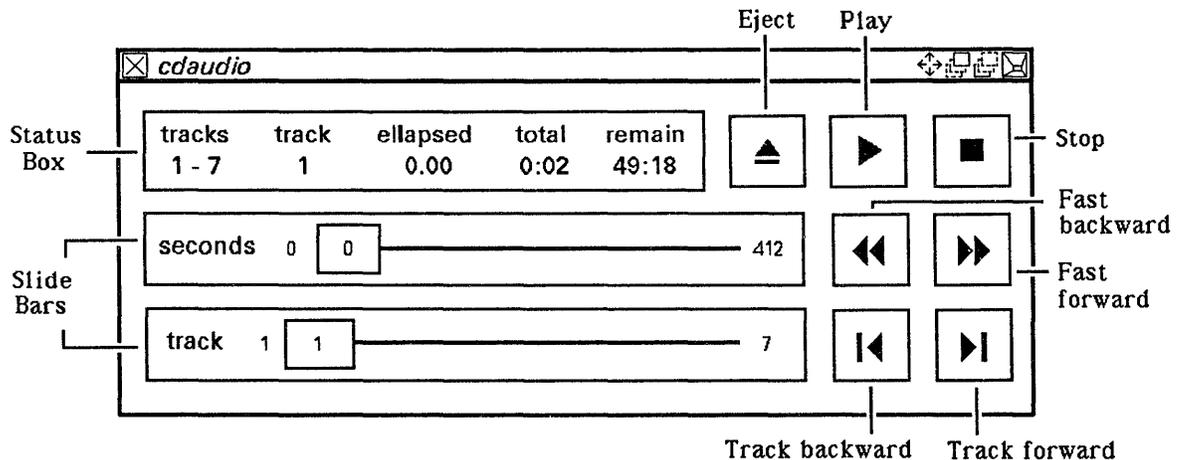


Figure 9-4. The `cdaudio` Interface

You will notice that the screen buttons have icons matching those on most CD players and other audio equipment. The other fields in the window are described as follows.

9.6.3.1 Status Box Fields

The following fields appear in the status box of the `cdaudio` interface:

- `tracks` displays the number of audio tracks on the CD presently inserted.

- **track** displays the track set to be played or the track playing when you select the **Play** button.
- **elapsed** displays the time elapsed on the current track.
- **total** displays the total time elapsed on the CD. The total time will not go lower than a few seconds since header information consumes a small amount of space at the beginning of the CD.
- **remain** displays the amount of time remaining on the CD.

9.6.3.2 Slide Bars

The following fields appear in the slide bars of the **cdaudio** interface:

- **Seconds slide bar** continuously displays the amount of time (in seconds) that has elapsed on the track. The number at the end of the slide bar displays the total number of seconds on that track. The slide bar can also be used to move fast-forward or fast-backward.

You can move the slide button forward or backward if you place the cursor on the slide button, press, hold, and drag. Note that the fast-forward and fast-backward buttons at the end of this slide bar perform the same function as moving the slide button.

- **Track slide bar** displays the track that is playing. You can change tracks by dragging the slide button with your cursor. The track-forward and track-backward buttons at the end of this slide bar perform the same function as moving the slide button.

Once you specify any desired settings in the **cdaudio** window and begin playing the CD, you can collapse or delete the **cdaudio** window: your CD will still continue to play. However, if the **cdaudio** program is restarted while the CD is playing, the information about the length of each track cannot be read. This information is updated as soon as the CD stops.

9.6.4 Suggestions for Using **cdaudio**

- When you select the **Stop** button once, the CD reinitializes to the beginning of the track. If you select the **Stop** button again, the CD reinitializes to the beginning of the CD.
- If you leave your **cdaudio** window displayed while your CD is playing, the disk light on your keyboard will flash continuously. This will occur as a result of the **cdaudio** utility constantly asking for and receiving input from the CD drive to keep the information in the **cdaudio** window updated. This continuous process consumes an extremely small amount of CPU time, but if it becomes annoying, you may want to collapse or delete the **cdaudio** window.

9.7 The `iedit` Utility

`iedit`, an easy-to-use text editor, requires no escape sequences or control characters to operate. Although `iedit` is still being developed, this release of the Toolbox product provides a preliminary version of `iedit` to demonstrate `iedit`'s capabilities.

You can manipulate the `iedit` window with the standard Environ V icons that appear on the control strip of the `iedit` window. The **Help**, **Save**, **Save New**, and **Cut** icons on the `iedit` window are specific to `iedit`. The **Copy** and **Paste** icons function similarly to the **Copy** and **Paste** icons on standard `vterm` windows.



Figure 9-5. `iedit` Icons

9.7.1 Creating an `iedit` File

To create a file in `iedit`, use the following syntax:

```
$ iedit <options> <filename>
```

9.7.2 Inserting Text with `iedit`

`iedit` is always in an insert mode. Therefore, enter text by placing the cursor where you want the text to begin and start typing. You can use the arrow keys to move the cursor.

9.7.3 Editing Text with `iedit`

You need only the following basic instructions for editing text with `iedit`:

1. Use the workstation mouse to place the cursor and select (highlight) text.
2. Replace currently selected text by simply typing or pasting in the replacement characters. Cut and copy functions operate similarly on the currently selected text.

For **emacs** users, several of the simple **emacs** control characters are supported, but certainly not required.

9.7.4 Saving Files with **iedit**

To save a file, select the **Save** icon. To save a file under a new filename, select the **Save New** icon. When you select either of these icons, a menu that allows you to select the directory in which you will save the file appears.

Also, if you select the delete icon for the **iedit** window, a menu will appear to prompt you if you want to save your changes so you cannot accidentally delete the window without having a chance to save first.

9.7.5 **iedit** Command-Line Options

You can use the following options when executing **iedit** from the command line or adding options to your pull-down menu entry. (You can list these options online by keying in **iedit -?** at the system prompt.)

Option	Function
-w	Word wrap; use this option with a text file that has a carriage return (linefeed) only after each paragraph, not after each line. This is the only way iedit can automatically wrap text.
-r	Read only; use this option if you do not want to modify the file.
-f 	Font; use this option to change the typeface of the font used for display. The default setting is mono821 . Other fonts can be chosen from the <i>/usr/ip32/resrc/bsfont</i> directory.
-s <size>	Font Size; use this option to define the size of the font used for display. The default setting is 20.
-O <xOrg> <yOrg>	Origin; use this option to place the iedit window where you want it on the screen by defining the <i>x</i> and <i>y</i> coordinates of the window origin.

Option	Function
-S <xSize> <ySize>	Size; use this option to define the size of the <code>iedit</code> window. <xSize> is the width (horizontal size) of the window in pixels, and <ySize> is the depth (vertical size) of the window in pixels.
-T <spaces><tabs>	Tabs; use this option to set the tab settings. <Spaces> defines each tab's width. <Tabs> defines the number of tabs.

9.7.6 Upcoming `iedit` Features

Features upcoming in later releases of `iedit` include search and replace, multiple file-opening, and conversion between the two types of text files (line break and paragraph break).



Glossary

This glossary defines unfamiliar terms used in the *CLIPPER User's Guide*.

Absolute Pathname

The pathname used to access any file in the file system. An absolute pathname begins at root (/) and works down through the hierarchy; the last name is the name of the file or directory.

Active Process

The VT220 window that controls the Process ID field, the message fields, the window control strip, and the keyboard. The active process has a highlighted window icon strip.

addusers Utility

System administrative utility that automates the process of adding user accounts.

Alphanumeric Character

An alphabetic or numeric character.

ANSI Color Escape Sequences

Command sequences that allow the text color and text blocks (the area surrounding each character) to be changed for VT220 window display.

ansitape Command

An ANSI-standard magnetic tape label program that reads, writes, and creates magnetic tapes conforming to the ANSI standard for magnetic tape labeling. The primary use for this utility is to enable tapes to be exchanged with those made with VAX/VMS. **ansitape** is useful for transferring design files to remote locations that do not have a network link.

ASCII

Acronym for American National Standard Code for Information Interchange. ASCII is a code that uses seven bits to represent graphic and control characters. Generally, this guide will refer to an ASCII file as a text file.

Auxiliary Port

RS-232-compatible serial port. Intergraph workstations/servers have three auxiliary ports labeled aux00, aux01, and aux02.

Background Process

A process initiated by a command line that ends in an ampersand (&) character. If a process is executing in the background, you do not have to wait for it to complete before issuing additional shell commands. (A process not executed in the background is a foreground process.)

Backup

A file or directory copy, usually saved on a storage device such as a tape or floppy disk. Backup files prevent data loss if the system crashes.

backup Command

A Berkeley command ported to the Intergraph workstation. This command is used with the Berkeley **restore** command; **backup** writes a tape and **restore** recovers the tape. **backup and restore are used only for backing up and recovering entire file systems.** These utilities have a helpful user interface and good error recovery mechanisms. In addition, **backup** and **restore** can write and read multiple-volume savesets.

Bad Blocks

Flawed areas on the hard disk. As the disk drive writes data to the disk, it calculates an Error Correction Code (ECC) for each block and stores the code at the end of each block. When the drive reads data from the disk, it calculates another ECC and compares it to the original stored value. If the codes match, the data stored in that block is healthy and uncorrupted. If the codes do not match, the drive generates an ECC error and the host displays a medium error (for 156-MB CDC disks) or a bad block message (for 355- and 670-MB Maxtor disks).

Baseline

Software delivered free-of-charge with an Intergraph workstation or server. There are two baseline categories: nucleus and supplemental. Baseline nucleus software must reside on the workstation/server before the System V operating system can run. Baseline supplemental software is delivered free, but does not need to be loaded on the workstation/server.

Baud Rate

Transmission speed, or the measure of the number of bits per second (bps) transmitted over a serial communication channel. This number is typically about ten times greater than the number of characters transmitted per second. The baud rate for a workstation depends on the device connected to the port. The default setting on an Intergraph workstation is 9600.

Block Device

A disk or tape drive that stores information in blocks of characters. The device file for a block device is stored in the */dev/dsk* directory. (If a device is not a block device, it is a character device.)

Block Major Number

The number that represents the disk SCSI address and unit. The block major is an argument in the **mknod** command, which creates a device file.

Block Minor Number

The number that represents the disk partition and modifier. The block minor is an argument in the **mknod** command, which creates a device file.

Boot

To power up a workstation/server, perform diagnostics tests, and load software. Also referred to as a *cold boot*.

Boot Partition

The partition that contains boot images, including the hardware diagnostics test, utility pages, communications processor, and System V kernel software. This partition contains 3,988 blocks for workstations with 80-MB hard disks and 7,988 blocks for all other hard disk sizes. You cannot access this partition on the Disk Partitioning Utility page because you cannot alter its size.

Bootable Images

The System V Boot Images, Plotter Boot Images, Diagnostics, Startup Utilities Menus, and Ethernet CP Images. The workstation/server bootable images are loaded in memory and executed when the system is powered up.

Bourne Shell (sh)

The standard System V shell. The system administrator's root account uses the Bourne Shell (sh).

Cartridge Tape Drive (optional)

A high capacity 1/4-inch tape drive that uses standard, readily available, 600-foot DC600A or equivalent tapes to store 60 MB formatted data. The recording format used is QIC-24, which is an industry standard.

Catalog Function

The feature that saves a customized virtual terminal window. If you used the Setup menus and **regis** color combinations to customize a window, you can save the window characteristics so that you can use the window regularly. The Catalog function allows you to save the characteristics of that virtual terminal. You can then add the cataloged file to the Workstation pull-down menu to access the cataloged window regularly.

CDROM (Compact Disk Read Only Memory)

A storage medium used to deliver software products. One delivery CDROM holds approximately 600 MB of data, allowing you to load software from only a few CDROMs rather than from many tapes or floppy disks. CDROM is *read-only*; you cannot write data to it.

Character Device

A raw device (usually a terminal, printer, or modem) that displays characters one at a time. The device file for a character device is stored in the */dev/rdisk* directory. (If a device is not a character device, it is a block device.)

Checkbox

Menu devices used to select from a list of items.

Clearinghouse

A utility that provides a means of translating the nodename to the node address.

CLIPPER Processor

The main processor for Intergraph workstations and servers.

CLIX

The operating system that Intergraph workstations/servers are based on. Intergraph ported AT&T's UNIX System V operating system version 5.3.1 to the CLIPPER processor and enhanced it with Berkeley and Intergraph extensions. This enhanced operating system is commonly called the CLIX operating system.

CLIX Resource Monitor (CRM)

A system monitor for the CLIX operating system. System managers and end users may use CRM to monitor either the system or individual processes in the system. Programmers may also use CRM during program development to analyze program behavior. CRM is delivered as part of the CLIPPER System Software that comes free with all Intergraph CLIPPER workstations and servers.

Coaxial Cable

The primary cable through which workstations/servers and hosts communicate.

Collapse Icon

The window manipulation icon used to compress the window area so that only the delete icon, the window name field, and the collapse icon display.

Command Line

A string of commands and arguments that execute the desired function. Usually, the user keys this string in at the system shell prompt.

Command Recall

A shell feature that allows you to recall previous commands without re-entering the command. The *history* file in the user's home directory stores all previously executed commands.

Communications Processor (CP)

The device necessary for Intergraph workstations/servers and Intergraph VAXs to qualify and function as nodes on an IEEE 802.3 Local Area Network.

Console Device

A serial line terminal connected to a host computer.

Console Window

A mechanism used to display the System V operating system messages. The console window emulates a VT220 terminal.

core Files

Image files written by System V when problems such as memory violations, illegal instructions, bus errors, and user-generated quit signals occur.

cpio Command

A System V command used to copy the specified input to a specified output device. (cpio stands for copy file archives in and out.)

cron (Commands Run On Notice)

The command that executes commands at specified dates and times.

CRT Bias

A voltage applied to the CRT to establish a reference level for operation. CRT bias adjusts the intensity of the raster display. Horizontal lines appearing across the display screen are signs that the CRT bias needs adjusting.

C Shell (csh)

The BSD standard shell ported to the Intergraph workstation/server. C Shell uses syntax similar to C; supports command-line substitution; and incorporates a history mechanism, job control facilities, and interactive filename and username completion.

Cursor

The arrow, block, or underscore that displays on the screen and indicates the point of input (from the mouse, 12-button cursor, or keyboard).

Data Entry Field

The field on a menu used to accept user-supplied data.

dd Command

The backup utility used to move raw binary data or files to and from the storage device (hard disk, tape, or floppy disk). This utility is useful for manipulating raw data transferred to a tape from another operating system or for imaging a disk drive by reading input from a raw partition.

def_proc File

A file that specifies system and user processes to be invoked automatically. The `/usr/ip32/smgr/def_proc` file specifies processes for all users, while the `/usr/<login>/def_proc` specifies processes for only one user.

Delete Icon

A window manipulation icon used to remove a window from the screen. You should stop the process owning the window before you delete the window. Deleting the window will usually stop the process.

Delivery Tools

A software product that contains a group of utilities that simplifies software delivery to the workstation/server. The utilities provided in the delivery tools are `newprod`, `menuprod`, `getmenus`, `fr_flop`, `dates`, `makenode`, and `compress`. Each of these utilities is linked to `/usr/bin` so that the full pathname does not need to be keyed in to invoke the utility.

Device File

A file in the `/dev` directory that allows you to access a hard disk partition or storage device such as a tape drive. Device files are also referred to as *special files*.

Diagnostics

Disk-resident tests performed on the hardware of the workstation/server when the system is powered up. During the diagnostic tests, messages reporting test results appear on the screen.

Digitizer Processor Board

The board that controls all digitizing table, 12-button cursor, and floating menu input/output. The I/O processor board (Intel 80186 or 80386) handles all digitizer processor data for the workstation/server in System V (workstation only).

Digitizing Table

A flat surface used for placing paper menus or tracing maps, drawings, and photos.

Directory

A logical structure that contains filenames and subdirectories. To better organize your files, you can group related files together in a common directory.

Disk Maintenance Utilities Page

The main hard disk utility page from which the following hard disk utility pages can be directly or indirectly accessed: Hard Disk Flaw Data Utility page, Verify page, and Format page.

Disk Partitioning Utility Page

The Utility page used to specify how a hard disk is to be partitioned.

Double Tap

To quickly press and release a cursor button twice.

ed

A UNIX line editor that manipulates text line-by-line.

EMACS

A screen editor that contains three components: EMACS-tc, MicroEmacs, and MousEmacs. The EMACS product is delivered free-of-charge with each workstation/server.

EMUX (Ethernet Multiplexer)

A device that can be used on a transceiver and on an Intergraph VAX to allow up to eight transceiver cables to be connected.

Environ V Library

The C language function library containing Intergraph-developed routines that programmers can use to develop their own applications.

Error Boxes

Areas that display system messages you must act on before continuing a process. Error boxes visibly inform you of fatal errors, warnings, or system messages.

Etherjack

An optional 15-pin wall outlet used to connect an office transceiver cable to a standard transceiver cable.

Ethernet Address

The unique identifier hard-wired on each node. The Ethernet address is needed for each node to identify and communicate with another node on the network. The Ethernet address is also referred to as the *network address*.

Ethernet Port

The IEEE 802.3 interface for the Intergraph workstations/servers. This port allows 15-pin transceiver cable plugs to attach to this port.

Fast File System (FFS)

A way of organizing data stored on a magnetic disk drive to enhance speed for disk read and write operations. The new file system clusters sequentially accessed data and provides two block sizes to allow fast access to large files while not wasting large amounts of space for small files. A Fast File System accesses files up to 10 times faster than the standard UNIX file system does.

features.com File

A product information file that provides a general product description, delivery constraints, delivery prompts, and related documentation. This file resides in each product's directory.

File Management Utility (fmu)

A software program that enables an Intergraph workstation/server to communicate with any node on an IEEE 802.3 network.

File System

A directory structure that allows users to access partitions. Examples of file systems include */usr*, */usr2*, and *root (/)*. There are two types of file systems: Fast File Systems (FFS) and standard file systems. The **newfs** command creates a FFS and the **mkfs** command creates a standard file system. Recreating a file system destroys any data in the existing file system. The Rebuild process creates a file system automatically.

find Command

A command for locating filenames that match qualifications specified on the command line.

fixes.com File

A product information file that contains information regarding any [B]changes to the latest Intergraph software delivery.

Floating Menu

A flat, rectangular tablet that allows you to attach a paper menu to its surface and then move the floating menu freely about the digitizing table without needing to reinitialize the paper menu. The floating menu is an optional peripheral for the InterPro and InterAct workstations. A floating menu comes with the digitizing table that is purchased separately for InterView workstations.

Floppy Disk Drive

A storage device, located in the monitor head, used to access and archive software for System V and PC-DOS. The floppy disk drive uses standard 5.25-inch floppy disks. It can use both high-density (1.2 MB) and low-density (360K) floppy disks.

Format

A process that destroys all data on the hard disk. The format process involves structuring the disk so that hardware and software can communicate with it. This process writes a test pattern on the disk and reads it to verify the pattern, checks for errors, and marks disk locations that cause errors. These flaws are recorded to prevent future writing to or reading from that location.

fr_flop Command

A filter command that allows you to retrieve data from a set of floppy disks created with the `to_flop` utility.

Frame Buffer Board

A board that stores the 6 MB data that defines all displayed pixels. This board also transforms this data into the red, green, and blue analog video signals sent to the monitor.

fsck Command

The command that checks file system consistency and interactively repairs it. This System V program is executed when the system is powered on or rebooted if the unit was not shut down properly.

Function Key Menu

A menu composed of the membrane keys at the top of the keyboard. These keys have been predefined for specific commands.

Function Keys

The 48 membrane keys located across the top portion of the keyboard. These keys are mapped for VT220 emulation and IBM-PC emulation.

getty (/etc/getty)

The second process invoked in the system initialization procedure. `getty` reads the `/etc/gettydefs` file to determine terminal settings and spawns the `login` process.

Graphics Resources

Software that provides video look-up tables (VLTs), text fonts, symbols, and standard system error messages. Graphics Resources are used in programs such as Menubuilder and Procasso, and are available to use in application programs being developed.

Group Name/Number (GID)

The identifier in the */etc/passwd* file that assigns new users to groups. The GID may range from 1 to 65,353. All user accounts created with **addusers** default to a GID of 500; those created with **sysadm** default to a GID of 1. Users with the same GID are able to access one another's files based on the second set of read, write, and execute permissions.

Hard Disk Drive

An internal storage device included with each Intergraph workstation/server. Intergraph provides 156-, 355-, 584-, and 670-MB hard disk drives for its workstations/servers. The 156-, 355-, and 670-MB hard drives are 5.25-inch Winchester disk drives. The 584-MB drive is an 8-inch Winchester disk drive.

Hard Disk Flaw Data Utility Page

The Utility page used to identify any hard disk flaws and to record flaws that need to be added (or removed) when the hard disk is formatted. The flaws are mapped to the addressed hard disk during formatting.

Help Facility

An online reference facility that provides quick access to application command definitions.

Hierarchical Menu

A menu type found in standalone and VAX-based applications. The menus are called up in the working area of the screen.

Hidden File

An ordinary file that begins with a period (.) character. The period (.) prevents the file from being listed with the **ls** command. You can, however, list all files including hidden files with the **ls -a** command.

Home Directory

The directory associated with a user's account. The home directory is normally the directory that the user logs in to.

I/O Processor Board

The PC board used by pre-6000-series Intergraph systems. This board controls input/output functions for both System V and PC-DOS, initiates power-up and reboot diagnostics, provides the clock/calendar for the date and time, and is the main processing unit for PC-DOS functions. For 6000-series Intergraph workstations and servers, these processes are performed by the CLIX kernel.

IEEE 802.3 Local Area Network (LAN)

The physical layer of cables that provide the hardware required to run network software. This software allows Intergraph workstations/servers and Intergraph VAXs to communicate.

init (/etc/init)

The first process invoked upon system initialization. **init** specifies the run level (as defined by the */etc/inittab* file) and invokes the **getty** process.

InterAct Workstation

An Intergraph graphics workstation with an attached digitizing table.

Intergraph Network Core Monitor (INCMON)

A network monitor utility that can assist in diagnosing network problems or can gather information relating to the current network load and performance.

Internet Address

The 32-bit address assigned to each host that uses the TCP/IP, NQS, NFS, or RFS products.

InterPro Workstation

An Intergraph graphics workstation without a digitizing table.

InterServe Processor

Intergraph's nongraphics server.

InterView Workstation

Intergraph's dual-monitor graphics workstation with a separate digitizing table.

Introductory Screen

The screen first seen at boot-up or reboot. This screen displays the Intergraph logo and four screen buttons: System V, PC-DOS, Utility, and Help.

Kernel

The lowest level of the System V operating system. The kernel allocates system resources, maintains file systems, manages memory, controls workstation access, and manipulates the workstation/server hardware.

Keyboard

The peripheral input device composed of terminal emulation keys, function keys, typewriter keys, and a numeric keypad. The keyboard is used for entering text and numbers, issuing special keyboard commands, and selecting function-key menu commands. The keyboard functions according to the requirements of the active emulation. This emulation can be an InterAct emulation, an alphanumeric terminal, or an IBM PC.

Korn Shell (ksh)

An enhanced version of the Bourne shell (the standard for System V). Korn shell (ksh) is the default for user accounts created with **addusers**.

Left (Command) Button

The left button on the 12-button cursor used to invoke hierarchical menus (single tap), place a 3D data point (double tap), or perform the same functions as the left button of the MicroSoft mouse (IBM PC emulation).

Local Window

A window connected to the local System V operating system rather than to a network host.

Login Account

A user account. This is the account the user is placed in when he/she logs in to the system. Each line or record in the */etc/passwd* file represents a different login account.

Login Directory

A user's home directory. When a user logs in to the system, he/she is placed in this directory automatically. If the user account was created with **addusers** or **sysadm**, the default login directory is */usr/<login>*.

lost+found Directory

The directory where files *found* by the **fsck** utility are placed. The **fsck** program runs automatically when the system boots if the system was not shut down properly. This program finds and stores files not linked orderly to the file system.

Logical Unit Number (LUN)

A means of identifying or addressing a hard disk connected to the workstation/server. If only one hard disk is connected to the workstation/server, the Logical Unit Number is 0.

Macro

A string of keystrokes or commands invoked with a single keystroke or command. For example, a series of keystrokes can be mapped to one key so that the key invokes a desired process.

mail/mailx

System V communication programs used to send messages and files to users across the network.

Main (UNIX) Processor/Dual Port Memory Board

The board that houses the main processor (Intergraph's CLIPPER) and serves as the central processing unit for System V operations.

makenode Utility

A software delivery utility that loads products in deliverable format on a workstation/server specified as a delivery source. This delivery source can then deliver products across the network to other nodes.

Manual Page

A System V command description from the System V Online Documentation product (sysvdoc). Each man page discusses a separate command or file. To read an online man page, key in **man <command>**. For example, to read the documentation for the **ls** command, key in **man ls** (assuming that the sysvdoc product has been loaded on your system).

Menubuilder

The software package used for creating and editing screen menus used in both VAX-based and standalone applications. Symbols and icons created with Procasso can be accessed and used in menus created with Menubuilder.

Menu Devices

Display devices that allow you to make choices and manipulate menus using the mouse and keyboard input. The devices are found in pop-up menus and the Utility Pages.

Menuprod

A menu-driven interface for downloading workstation software products through the **newprod** utility.

Message Strip

The area at the top of the workstation screen. The message strip contains the workstation icon, primary screen icon, message area, and process ID field. The message strip is initialized when the Screen Manager software is loaded.

Middle (Data) Button

The middle button on the 12-button cursor used to select from any menu on the screen, select an icon, manipulate windows, place a 2D data point, identify graphical elements, select from a screen tutorial, activate windows (processes), or select from an introductory screen.

Modifier Number

The subpartition number. For example, the partition number for the **usr** partition is 7.3. The 7 is the hard disk division number for UNIX and the 3 is the modifier number for the **usr** partition.

Modify Icon

The window manipulation icon used to change the size and location of a window.

mount Command

The command that connects a partition to an existing file system. A partition must be mounted on a file system before you can access any data on the partition. The `/etc/mount` command is used to mount a partition.

Multiuser Mode

The operating system mode established when file systems are mounted with the screen manager and the VT220 software. This is the default mode when the system is booted.

netaddr Command

The command used to obtain the node address of an Intergraph VAX or workstation.

Network Address

The unique identifier hard-wired on each node. The network address is needed for each node to identify and communicate with another node on the network. This address is also referred to as the *Ethernet address*.

Network Software

The network communication software, or INC product, that allows a workstation/server to communicate with other workstations/servers and host computers across an IEEE 802.3 network.

newprod Utility

The utility for installing Intergraph software products on the hard disk of an Intergraph workstation/server.

Nodename

A name that can be assigned to a node address of a network device so that it is easier to remember. The nodename for Intergraph workstations/servers can have a maximum of 8 alphanumeric characters while all other devices on the network allow up to 14 alphanumeric characters.

Nucleus Software

Software that must reside on the hard disk before the System V operating system can run. This software is delivered free-of-charge with each Intergraph workstation/server.

Numeric Keypad

The part of the workstation keyboard used for entering numbers and special keyboard commands.

Operating System

The set of programs that control the workstation/server's overall performance. Intergraph workstations/servers are based on the CLIX operating system, which is AT&T's UNIX System V version 5.3.1 operating system with additional Berkeley extensions. The System V operating system is based on three main components: the kernel, the shell, and the System V file system.

Operating System Parameters Page

The Utility page used to establish default parameters that are effective when the operating system is loaded.

Ordinary File

Any file that stores information such as programs, design files, raster graphics, and ASCII text. Commands and executables are also ordinary files.

Parity

A method by which transmitted data can be verified. Even parity indicates that each transmitted word will contain an even number of bits in a logic 1 state. Odd parity indicates that each transmitted word will contain an odd number of bits in a logic 1 state. A special bit referred to as the parity bit is either set or cleared when it is transmitted so the parity requirement is met. If the parity does not check correctly, the data was most likely corrupted during transmission.

Partition

A logical division of a hard disk. Internal hard disks are divided into **boot**, **root**, **swap**, and **usr** partitions. Each partition is used for a specific area of user and operating system functions. Intergraph delivers workstations and servers with predefined partitions. However, you may alter partition sizes to meet individual system requirements.

Partition Number

A number identifying a partition. For example, the partition number for the **usr** partition is 7.3. The 7 is the hard disk division number for UNIX and the 3 is the modifier number for the **usr** partition.

Passwd File (/etc/passwd)

The file that contains a record for each user account in the system. Each record in this file contains the following fields: username, password, user identification number, group identification number, miscellaneous information, home directory, and default login shell.

Pathname

A name that identifies files in the System V file system. The pathname indicates a file or directory's location in the file system hierarchy and provides a way of accessing that file or directory. The two types of pathnames are absolute and relative.

Peripheral Configuration Page

The Utility page used to establish settings for the screen, keyboard, plotter port and RS-232 port.

Permissions

The set of protection codes associated with each file (whether ordinary or directory). These protection codes determine which system users can access the file. Read (r), write (w), and execute (x) permissions are specified for the file owner, the user group the file owner belongs to, and other users.

Plotter Port

The port used to connect an Intergraph V80 plotter or a color thermal printer. Some other devices supported on this port include QCR and PCR film recorders and a laser printer.

PID

See *Process Identification Number*.

Pipe

The software utility that uses the output of one command as the input to another command.

Pop-To-Bottom Icon

The window manipulation icon used to place a window beneath all other windows on the screen.

Pop-To-Top Icon

The window manipulation icon used to place a window on top of any other window on the screen.

Pop-up Menu

The screen menu displayed constantly until a screen button that cancels or exits the menu is selected.

Power-Up

To flip the power switch of the workstation/server to the 1 (on) position.

Powerdown

To shut the workstation/server down, wait for the system halted message, and flip the power switch of the workstation to the 0 (off) position.

Primary Screen Icon

An arrow icon next to the workstation icon on dual-monitor workstations. This icon is used to switch the primary screen from one screen to the other. All windows and processes appear on the primary screen by default.

Process Identification Number

The sequential number that System V assigns to a process when it is initiated.

Process Name

The name of the process running in a particular window.

Prompt

The character or set of characters that indicate that the process is waiting for input from the user. The standard System V ksh prompt is the \$ symbol. The standard System V superuser prompt is the # symbol.

Pull-down Menus

Menus activated from the workstation icon or some window control strip options. Pull-down menus can either be single- or multicolumn.

Raster Operations Processor (ROP) Board

The board that performs window protection and clipping, vector generation, polygon fill, raster text generation, block raster/clip operation, cursor control, and hardcopy processing.

Reboot

To reload workstation/server software. A warm boot (to boot the system when it is already running) just reloads the software while a cold boot (to turn the system on) performs diagnostic tests in addition to reloading the software.

Rebuild Floppy Disks

Floppy disks required to rebuild the hard disk. The Rebuild Floppy Disk set consists of four diskettes: Rebuild Boot and Root for 100/32C/200 workstations/servers and Rebuild Boot and Root for 300/400/3000/4000 workstations/servers. To rebuild one workstation/server, you need only the Rebuild Boot and Root diskettes that correspond to your workstation/server model number. The Rebuild Boot diskette is used to boot the workstation/server into single-user mode, while the Rebuild Root diskette is used to restore the file systems.

Rebuild Process

The procedure required to rebuild a corrupted hard disk, repartition, or convert to Fast File System. This procedure includes booting into single-user mode with the Rebuild Boot diskette, restoring file systems with the Rebuild Root diskette, loading software through the **newprod** utility, and rebooting back into System V multiuser mode from the hard disk.

Redirection

The process of specifying where to send input and output to. The > and < symbols are used to redirect I/O in a command line.

regis Color Commands

The command used to customize VT220 windows. This command allows you to change the background color, text color, and highlighted text color.

Relative Pathname

The pathname of a file or directory in relation to the current working directory. A pathname can be specified relative to the current working directory, thereby minimizing the length of the pathname that is entered.

Repaint Icon

The window manipulation icon used to refresh a window. If this icon does not appear in the window icon strip, the window is refreshed automatically.

restore Command

A Berkeley command ported to the Intergraph workstation. This command is used with the Berkeley **backup** command, where **backup** writes a tape and **restore** recovers the tape. **backup** and **restore** are used only for backing up and recovering entire file systems. These utilities have a helpful user interface and good error recovery mechanisms. In addition, **backup** and **restore** can write and read multiple-volume savesets.

Restricted Shell

A shell that provides a controlled environment for a user. For example, the **sysadm** and **setup** accounts are initiated under a restricted shell.

Right (Reset) Button

The right button of the 12-button cursor. The reset button is used to cancel a command action, reject an element selection, reset a command, place a 3D tentative data point (double tapping), or, in IBM PC emulation, perform the functions of the MicroSoft mouse's right button.

Roll-Through Box

The menu device used to cycle through available choices.

Root Directory

The base directory (/) of System V and PC-DOS.

Root Partition

The partition that contains a major portion of the System V operating system. It is used mainly for system administrative tasks. By default, this partition contains 25,000 blocks. If you receive messages saying that the root (7.0) partition is out of space, you must add space to this partition.

RS-232 Port

The port used to connect standard RS-232 devices such as printers, modems, and plotters. This port can also be used to connect the workstation/server to an Intergraph VAX.

runcd Command

A shell script used to mount a CDROM and initiate the CDROM Menu. You can invoke **newprod** or **makenode** from the CDROM menu. To execute this shell script, key in **runcd** at the **#** prompt.

Run Level

A number describing the state of the operating system. The run level is used with the **init** command. The following lists possible run levels:

- 0 shutdown
- 1 single-user
- 2 multiuser, NFS support
- 3 multiuser, RFS support
- 4 not used
- 5 not used
- 6 reboot

For example, the command **init 6** reboots the system.

Saveset

All files backed up at a certain point in time using a backup command or utility. For example, if you used the **cpio** command to back up the **/usr** file system, the **cpio saveset** will be the **/usr** file system.

scpio Command (streaming cpio)

An enhanced version of the **cpio** backup command for streaming tape drives. It provides two major additions to the features of the **cpio** command: asynchronous input/output and multi-buffering, which allows faster processing. Furthermore, **scpio** includes a verify mode that confirms the integrity of input and archived files.

Screen Buttons

Menu devices used to initiate a menu action.

Sc[Breen Manager

System V software that controls processes on Intergraph graphics workstations.

Screen Menus

The six types of menus used to activate processes and initiate commands when using System V: menubar, pull-down, hierarchical, window, pop-up, and function key.

Scroll

To move up or down multiple lines on the screen.

SCSI Port

An industry-standard interface that allows devices, such as a hard disk drive or cartridge tape drive, to communicate with an Intergraph workstation I/O processor board.

Server

The InterServe processors, which are plot, compute, and communication server nodes. These processors allow multiple workstation users on an IEEE 802.3 (Ethernet) network to share files, programs, and printing and plotting devices. Servers use an alphanumeric terminal for a console device. They do not have graphics capabilities.

Shell

The System V command language interpreter. The shell maintains the two-way communication flow between the user and the kernel, manages information, and serves as a programming language.

Shell Script

A program composed of shell commands.

Shutdown

The procedure that you should run before you turn off an Intergraph workstation or server. If you do not shut down properly, data may be corrupted.

Single-User Mode

The operating mode where only the root file system is mounted. The Screen Manager and VT220 software is not loaded. The prompt for single-user mode is #.

1600/6250-bpi Tape Drive

A dual-density streaming tape drive that reads from and writes to ANSI-standard nine-track, half-inch magnetic tape in 6250- or 1600-bpi (bits per inch). It is a direct reel-to-reel servo tape drive consisting of a tape transport mechanism, tape motion control electronics, dual-density read/write circuitry, and data-formatting electronics.

Spawn

To initiate a process.

Special File

A device file. Special files allow you to access a hard disk partition or storage device such as a tape drive. These files reside in the */dev* directory.

Standard File System

Standard (S51K) file systems contain 1K-byte units, whereas Fast File Systems contain 8K-byte units.

Stash

A partition or physical memory required on your plot server to plot on most plotting devices. Physical memory may be used only if sufficient physical memory is available on the server.

Storage Device

A peripheral device such as tape drive or floppy disk drive used to archive files.

String

A sequence of characters.

Superuser Account

A privileged account required for system administrative utilities such as **addusers** (for adding user accounts to the system) and **newprod** (for installing software). Superuser is the account of the root user.

Superuser Mode

The mode that allows a user to read or modify any file on the system and bypass the normal file security checks. This mode is distinguished with a # prompt.

Supplemental Software

Software products that you received free-of-charge with your Intergraph workstation/server; these products are not required to run the System V operating system.

Swap Partition

The partition used for swapping portions of memory to the hard disk. By default, this partition contains 27,360 blocks for 80-MB hard disks and 71,000 blocks for all other hard disk sizes. Space can be taken from the swap partition to add to another partition. However, some applications will not run without a minimum amount of swap space. This minimum amount varies among applications.

sysadm Utility

System V utility that provides a menu interface for performing system administrative functions such as backing up files, setting up a new system, adding user accounts, and removing user accounts.

sys_proc (/usr/ip32/smgr/sys_proc)

A file that defines system processes to be invoked automatically. All processes invoked by this file will run as the *root* user. By default, the console window is the only process invoked by this file.

System V

A standard delivery product on the workstation/server. This product includes the basic file system, which consists of two **cpio** saveset images. One image is for the *root* file system, the source of the file system structure, and the other is for the */usr* file system.

Tapping a Button

To press and immediately release a button.

tar Command

The tape archive command used to back up any files except special files.

Terminal Emulation Keys

Membrane keys in the upper left-hand corner of the workstation keyboard reserved for special terminal-related functions such as the editing commands found on a VT220 terminal.

Terminal Window

A window connected to a host computer on a network.

to_flop Command

A filter command that allows a stream of data, greater than a floppy disk's capacity, to be written to sequential floppy disks.

Toggle Switch

The menu device used to switch between two alternatives.

Transceiver

A device that transmits signals between nodes. The transceiver has a tap for the coaxial cable and a connector for the transceiver cable(s).

Transceiver cable

The cable that runs from the interface on the transceiver to the interface on the Intergraph workstation/server (Ethernet port). The transceiver cable is a shielded cable that has 15-pin D-connectors on each end; each connector has a slide lock.

tty

A pseudo-terminal. (*tty* is an abbreviation for *teletypewriter*.)

12-Button Cursor

An absolute tracking input device used to move the cursor on the workstation screen.

Typewriter Keys

Keys that provide all the upper- and lower-case letters, numerals, and symbols found in a standard ANSI typewriter layout.

UID

See *User Identification Number*.

uname -n Command

The command used to obtain the nodename of an Intergraph VAX, workstation, or server.

UNIX Operating System

An operating system developed by AT&T Technologies.

umount Command

The command that unmounts a previously mounted file system contained on the block special device or directory.

User Account

A login account. This is the account the user is placed in when he/she logs in to the system. Each line or record in the */etc/passwd* file represents a different login account.

User Identification Number

A number that the */etc/passwd* file associates with a user account. This number is located in the third field of the */etc/passwd* file.

usr Partitions

The partitions (such as *usr*, *usr2*, and *usr3*) that contain all user directories, most products, and any other directories and files that users access.

Utility Pages

The [B]menus used to configure the workstation or server operating systems, hard disk(s), and peripheral ports.

uucp Command

The command used to exchange files between workstations/servers. (*uucp* stands for UNIX system-to-UNIX system copy.) With this command, you can place files directly in another user's directory.

Verify Program

The procedure that reads the hard disk and records all flaws to ensure that data is not written over flawed areas. It does not erase or change the data on the disk.

vi Editor

A UNIX screen-oriented display editor based on the UNIX *ed* line editor.

Virtual Screen

A screen that acts as its own workstation. InterPro (single-screen) workstations can be configured for one or two virtual screens. Configuring an InterPro workstation for two virtual screens enables you to run multiple processes on each virtual screen. Thus, even though the InterPro workstation has one physical screen, you can use two virtual screens.

visit

The program that provides the ability to log in to another network node. This program can be used only for purposes other than running graphics applications.

vmsbackup Command

The utility that reads VMS-generated backup format tapes. **Vmsbackup** cannot write VMS-generated savesets. This utility is useful for transferring design files across the VMS and CLIX operating systems.

VT220 Emulation Software

Software that allows the workstation to act as a DEC VT220 alphanumeric terminal. This software allows application programs to transfer standard ANSI escape sequences to and from the workstation.

vterm Command

The command that creates local and terminal VT220 windows. This command has many options that can be used to determine window characteristics.

Window Control Strip

The list of choices displayed beneath the message strip at the top of the screen. This strip displays only if the active process calls for it. The menu's display depends on the active process. A selection from this menu issues a command or displays another type of menu.

Window Icon Strip

The bar across the top of each window. This bar contains window manipulation icons and the window name.

Window Manipulation Icons

Icons located in the Window Icon Strip. These icons allow you to move a window, resize a window, pop a window to the top of a stack, pop a window to the bottom of a stack, collapse a window, move a collapsed window, restore a collapsed window, delete a window, repaint a window, clear the window screen, copy and paste text, or reset the window terminal.

Window Menus

Menus inside movable windows. Their appearance depends on the program that is running. Window menus can be moved, collapsed, and deleted, but their size and proportions cannot be changed.

Windows

Rectangular areas on virtual screens for graphics output and locator input. Each window is owned by a process currently executing under the System V operating system.

Working Directory

The directory in which a user is currently working.

Workstation

An Interpro, InterAct, or InterView graphics computer.

Workstation Icon

The icon used to activate the Workstation menu.

Workstation Menu

The menu initiated with the Workstation icon. This menu allows you to create a terminal window and connect to a host, create a local window to access the System V operating system, initiate an Intergraph-developed process, and edit the Workstation menu.



Index

A

absolute pathnames, 4-9
access permissions
 execute, 4-28
 read, 4-28
 write, 4-28
active processes, 3-5, 3-8, 3-13, 3-17 to 3-19
addusers utility, 4-5, 4-8
alert boxes, 3-25, 3-26
application function keys, 2-1, 2-3, 2-4

B

bang command, 6-13
boxes
 alert, 3-25 to 3-28
 checkboxes, 3-23
 data entry, 3-23
 roll-through, 3-25, 3-26
Bourne shell, 4-5

C

C shell, 4-6
calculator, 9-1, 9-3, 9-6 to 9-8
cat command, 4-20, 4-26
cd command, 4-10 to 4-3, 4-18, 4-23
cdaudio utility, 9-16
 command-line options, 9-16
 entering, 9-16
 using, 9-18
cdaudio interface, 9-17
 slide bars, 9-18
 status box fields, 9-18
chdir command, 6-13
Clearinghouse, 6-18
Clearinghouse database, 6-8, 6-11
clh lookup command, 6-9, 6-11
CLIX operating system, 4-5
clock, 9-1, 9-3, to 9-5
coaxial cable, 6-3
colormap utility, 9-12
 editing, 9-14
 entering, 9-12
 file menu, 9-15
 HSV color system, 9-12
 interpolating, 9-14
 options menu, 9-13
 RGB color system, 9-12
command command, 6-13
commands
concatenate, 4-19
connect command, 6-13

- console window, 1-7, 1-9, 3-4, 3-6, 3-17, 3-18, 3-19, 3-22
- copying files, 4-19, 4-20, 4-28
- cp command, 4-20, 4-21, 4-25
- cpflop command, 8-12
- cpio command, 8-17
- creating directories, 4-16
- csh command, 4-6, 4-8
- cursor
 - hand-held, 2-5
 - 12-button, 2-5, 2-6, 2-7

D

- data entry boxes, 3-23
- delete command, 6-13
- devices, 7-4
- directories
 - changing, 4-12
 - creating, 4-16
 - commonly referenced file systems and, 4-8
 - home, 4-12
 - listing contents, 4-13
 - manipulating, 4-12
 - removing, 4-17
 - root, 4-7 to 4-9
 - usr, 4-8
 - working, 4-12
- directory command, 6-13
- directory files, 4-6, 4-12, 4-13, 4-15, 4-16, 4-19, 4-24, 4-28, 4-29
- dual-monitor workstations, 3-11, 3-16

E

- EMUX, 6-6
- etherjack, 6-4
- ethernet multiplexer, 6-4
- exit command, 6-13

F

- file system, 4-6
 - root, 4-8
 - structure, 4-7
 - usr, 4-8
- filename shortcuts, 4-23
- files
 - access and permissions, 4-24
 - changing directories, 4-29
 - changing groups, 4-26
 - changing owners, 4-26
 - changing permission modes, 4-26
 - copying, 4-20
 - directory, 4-6
 - displaying contents, 4-19

- manipulating, 4-19
- moving, 4-21
- naming, 4-19
- ordinary, 4-6, 4-13, 4-17, 4-24, 4-28, 4-29
- organizing, 4-6
- permission mode, 4-25
- removing, 4-21
- type, 4-24
 - special, 4-6, 4-8, 4-13, 4-25
- floating menu, 1-4
- floppy disk drive
 - accessing
- floppy disks
 - backing up, 8-15, 8-17
 - creating a file system using, 8-10
 - disk activity light, 8-6
 - 5¼-inch, 8-3, 8-5, 8-7, 8-10, 8-12, 8-13, 8-17
 - formatting from the command line, 8-8
 - formatting from the utility pages, 8-9
 - inserting and removing, 8-5
 - maintaining, 8-4
 - reading from, 8-14
 - specifying storage capacity, 8-3
 - 3½-inch floppy disks, 8-3 to 8-10, 8-17
 - writing to, 8-13
- floppy disk commands
 - cpflop, 8-12
 - cpio, 8-17
 - fr_flop, 8-14
 - mkfs, 8-10
 - to_flop, 8-13
- fmul style="list-style-type: none;">- command, 6-11
- accessing Help for, 6-12
- issuing, 6-12
- prompt, 6-12
- exiting, 6-12
- starting, 6-11

- fmul style="list-style-type: none;">- bang, 6-13
- chdir, 6-13
- command, 6-13
- connect, 6-13
- delete, 6-13
- directory, 6-13
- exit, 6-13
- help, 6-14
- rchdir, 6-14
- receive, 6-14
- send, 6-14

- set, 6-14
- type, 6-14
- fr_flop command, 8-14
- function key menus, 3-25

G

- general statistics menu, 6-17
- group category, 4-26

H

- help command, 6-14
- hierarchical menus, 3-24

I

- INC, 6-3, 6-4, 6-15, 6-18
- icalc utility, 9-6
 - additional functions, 9-7
 - command-line options, 9-7
 - displaying the calculator, 9-6
 - using the calculator, 9-7
- iclock utility, 9-4
 - displaying the clock, 9-4
 - command-line options, 9-4
- icon
 - catalog, 3-13, 3-19
 - clear screen, 3-20
 - copy and paste, 3-14, 3-20
 - pop-to-bottom, 3-17, 3-18
 - pop-to-top, 3-17, 3-18
 - primary screen, 3-4, 3-5, 3-11, 3-12
 - reset, 3-19
 - resize, 3-20
 - set-up, 3-19
 - workstation, 3-1, 3-5, 3-8, 3-22, 3-23
- iedit utility, 9-19
 - command-line options, 9-20
 - creating a file, 9-19
 - editing a file, 9-19
 - inserting text, 9-19
 - saving a file, 9-20
 - upcoming features, 9-21
- imag utility, 9-9
 - information fields, 9-11
 - options, 9-11
- imag window, 9-10
 - behavior, 9-10
 - moving, 9-10
- incmon, 6-11, 6-16
- Intergraph Network Core, 6-3, 6-4, 6-15, 6-18,
- Intergraph Network Core Monitor, 6-11, 6-16

input devices, 2-1
introductory screen
 servers, 1-5
 utility pages, 1-5, 1-7
 workstations, 1-4

K

kernel, 4-5
keyboard, 2-3
 emulation, 2-3, 2-4
 layout, 2-3
keyswitch, 1-3, 1-8, 1-9, 1-10
Korn shell, 4-5
ksh command, 4-5, 4-6, 4-8

L

local window, 3-4, 3-5, 3-6, 3-8, 3-9, 3-12
long listing, 4-16, 4-24
loopback test menu, 6-17
ls command, 4-10, 4-13, 4-14, 4-15
 -a option, 4-16
 -C option, 4-16
 -d option, 4-16
 -F option, 4-16
 -i option, 4-16
 -l option, 4-14, 4-16, 4-24, 4-25, 4-28
 options, 4-15
 -p option

M

menu
 general statistics, 6-17
 function key, 3-25
 hierarchical, 3-24
 loopback test, 6-17
 multiple node analysis, 6-18
 options, 3-22
 paper, 3-25
 permanent, 3-25
 pop-up, 3-9, 3-22, 3-23, 3-24
 pull-down, 3-5, 3-9, 3-10, 3-22, 3-24
 routing information, 6-17
 screen, 3-22
 search network, 6-17
 window, 3-25
 workstation login, 3-3
 XNS network topology, 6-18
message area, 3-5
message strip, 3-4, 3-7, 3-8, 3-13, 3-22
MicroEMACS editor
 changing cases, 5-7
 changing modes, 5-4

- creating, editing, and exiting files, 5-3
- cutting and copying, 5-7
- deleting, 5-6
- inserting, 5-6
- miscellaneous commands, 5-8
- moving the cursor, 5-5
- product, 5-3
- searching and replacing, 5-5
- mkdir command, 4-16, 4-17
- mkfs command, 8-10
- mouse
 - button assignments, 2-5
 - cumulative, 2-5
 - friction tracking ball, 2-5
 - maintenance, 2-5
 - movement, 2-5
 - relative, 2-5
- multiple node analysis menu, 6-18
- mv command, 4-21

N

NQS

- command overview, 7-5

NQS commands

- qdel, 7-5, 7-12, 7-13
- qpr, 7-5, 7-7 to 7-9
- qstat, 7-5, 7-6, 7-9 to 7-13

network

- additional capabilities, 6-19
- addresses, 6-7
- communication, 6-11
- configurations, 6-4
- general information, 6-3
- preparation to use, 6-7

network address

- accessing, 6-7
- example, 6-7
- storing on a workstation, 6-8

network physical components, 6-3

- coaxial cable, 6-3
- etherjack, 6-4
- ethernet multiplexer
- transceiver, 6-3
- transceiver cable, 6-3

node addresses, 6-7

nodenames

- accessing, 6-8
- assigning to a workstation, 6-9
- assigning to an InterServe Processor, 6-10
- locating in a network, 6-9

numeric keypad, 2-2 to 2-4

O

OK screen button, 1-9
operating system, 4-5
ordinary files, 4-6, 4-13, 4-17, 4-24, 4-28, 4-29

P

paper menus, 3-25
pathnames
 absolute, 4-9
 relative, 4-10
permanent menus, 3-25
permission category
 group, 4-26
 other, 4-27
 user, 4-25
personal account, 4-3
pg command, 4-20
plot requests
 deleting, 7-12
 submitting, 7-10
pop-to-bottom icon, 3-17, 3-18
pop-to-top icon, 3-17, 3-18
pop-up menus, 3-22, 3-23, 3-26
power switch, 1-3, 1-10
power-up, 1-1, 1-4, 1-9
 diagnostic messages, 1-3, 1-4, 1-6
 workstation, 1-3, 1-4
 server, 1-3, 1-5
process ID, 3-4, 3-5, 3-8, 3-9, 3-13, 3-17
pull-down menus, 3-22, 3-24
pwd command, 4-10 to 4-14, 4-17, 4-18, 4-22, 4-23

Q

qdel command, 7-5, 7-12, 7-13
qpr command, 7-5, 7-7 to 7-9
qstat command, 7-5, 7-6, 7-9 to 7-13
queues
 batch, 7-3
 device, 7-3
 pipe, 7-3
 status information, 7-6
 understanding, 7-3

R

rchdir command, 6-14
reboot, 1-7
 button
 cold and warm, 1-7
 servers
 workstations, 1-7
receive command, 6-14
receiving files from a remote node, 6-12, 6-13
relative pathnames, 4-10

remote

- ethernet network, 6-5
- sending and receiving files, 6-12, 6-13
- rm command, 4-22
- rm -r command option, 4-22
- rmdir command, 4-17, 4-18, 4-22
- roll-through boxes, 3-25, 3-26
- root directory, 4-7 to 4-9
- routing information menu, 6-17

S

screen

- buttons, 2, 23, 24
- display, 1, 4, 8, 21
- manager, 4
- working area, 1, 4, 7, 12, 18
- scrolling windows, 3-13, 3-20
- search network menu, 6-17
- selecting
 - using the mouse, 2-5
 - using the 12-button cursor, 2-6
- send command, 6-14
- sending files to a remote node, 6-12, 6-13
- set command, 6-14
- set-up icon, 3-19
- sh command, 4-6, 4-8
- shell, 4-5
- shutdown, 1-1, 1-9, 1-10
 - workstations, 1-9
 - servers, 1-9, 1-10
 - system, 1-9
- single-monitor workstations, 3-4, 3-5, 3-10, 3-12
- special files, 4-6, 4-8, 4-13, 4-25
- superuser, 4-25, 4-26
- System V
 - and CLIX, 4-5
 - file system, 4-6, 4-8
 - hierarchical structure, 4-7, 4-9
 - loading for workstations, 1-6
 - loading for servers, 1-7
 - logging on, 4-3
 - standard shell, 4-5

T

- terminal emulation function keys, 2-3, 2-4
- to_flop command, 8-13
- toggle switches, 3-25, 3-26
- Toolbox utilities
 - cdaudio, 9-16
 - command-line options, 9-16
 - entering, 9-16

- interface, 9-17
 - slide bars, 9-18
 - status box fields, 9-18
- using, 9-18
- colormap, 9-12
 - editing, 9-14
 - entering, 9-12
 - file menu, 9-15
 - HSV color system, 9-12
 - interpolating, 9-14
 - options menu, 9-13
 - RGB color system, 9-12
- icalc, 9-6
 - additional functions, 9-7
 - command-line options, 9-7
 - displaying the calculator, 9-6
 - using the calculator, 9-7
- iclock, 9-4
 - displaying the clock, 9-4
 - command-line options, 9-4
- iedit, 9-19
 - command-line options, 9-20
 - creating a file, 9-19
 - editing a file, 9-19
 - inserting text, 9-19
 - saving a file, 9-20
 - upcoming features, 9-21
- imag, 9-9
 - information fields, 9-11
 - options, 9-11
 - window, 9-10
 - behavior, 9-10
 - moving, 9-10
- transceiver, 6-3
- transceiver cable, 6-3
- 12-button cursor
 - movement, 2-6
 - button assignments, 2-6, 2-7
- type command, 6-14
- typewriter keys, 2-3, 2-4

U

- UNIX operating system prompt, 4-3
- UNIX shell script, 4-29
- user category, 4-25
- user type, 4-25

V

- vi editor
 - appending, 5-12
 - changing modes, 5-9

- copying, 5-12
- creating, entering, and exiting files, 5-9
- miscellaneous commands, 5-15
- moving text, 5-12
- moving the cursor, 5-10
- replacing, 5-11
- searching, 5-11
- setting default options, 5-14
- virtual screen icon, 3-4, 3-5, 3-10, 3-12
- visit command, 6-15
- visit program, 6-14
- VT-220, 3-6, 3-9, 3-14, 3-19, 3-22, 3-23

W

- wildcards, 4-22

- windows

- collapsing, 3-18
- console, 3-4, 3-6, 3-17, 3-18, 3-19, 3-22
- deleting, 3-13, 3-19
- icon strip, 3-6, 3-13, 3-14, 3-15, 3-18, 3-19, 3-20
- interacting with, 3-13
- local, 3-6
- manipulating, 3-14
- modifying, 3-17
- moving, 3-15
- moving a collapsed, 3-18
- moving using dual-monitor workstations, 3-16
- popping to top, 3-17
- popping to bottom, 3-17
- resetting, 3-14,
- resizing, 15, 17
- restoring a collapsed, 3-18
- repainting, 3-19
- scrolling, 3-20

- window manipulations

- standard, 3-13
- VT220, 3-13

- window menus, 3-25

- workstation

- connected to a remote ethernet network, 6-5
- connected to an EMUX, 6-6
- icon, 1, 5, 8, 22, 23
- login, 1, 3
- login menu, 1, 3

- workstation menu options

- terminal, 3-9
- local, 3-9
- shutdown, 3-10
- reboot, 3-10

configure, 3-10
configure virtual screens, 3-11
configure background pattern, 3-11

X

XNS network topology menu, 6-18

