
CRISP®

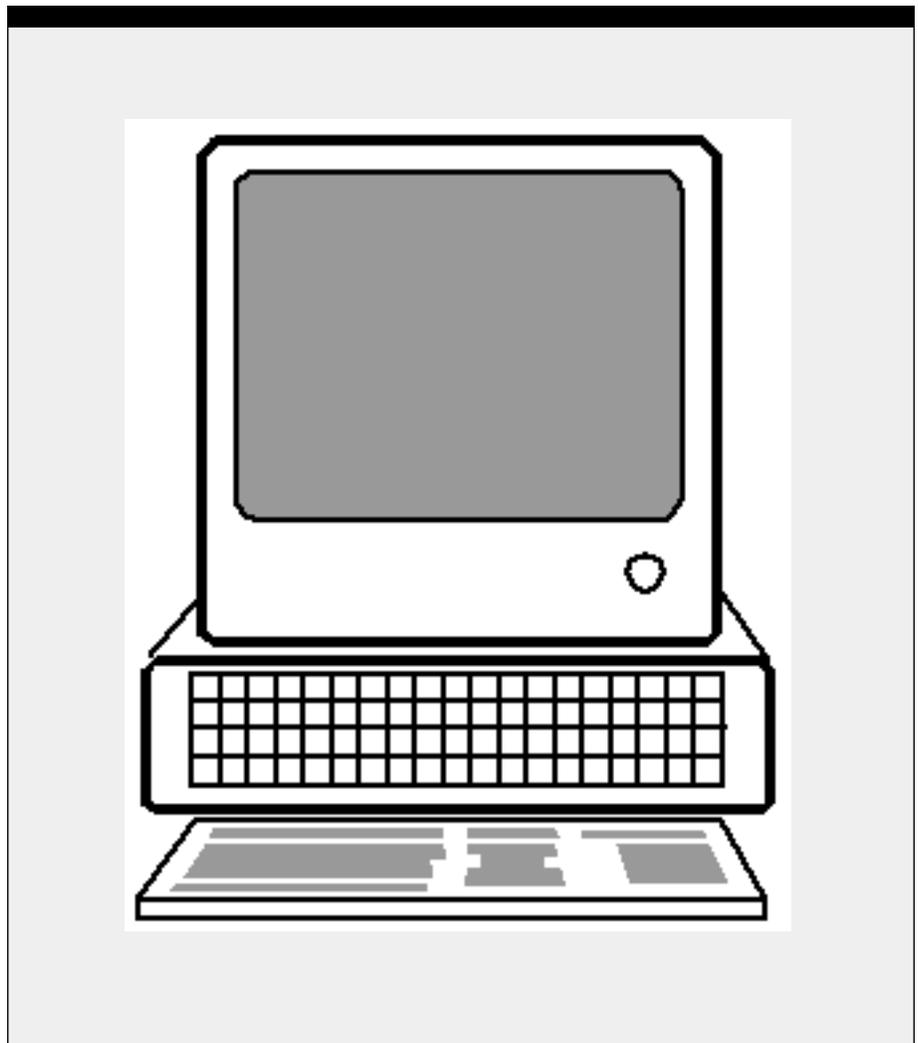
Color Workstation

User's

Guide



ARE D COMPANY
CRISP AUTOMATION SYSTEMS



CRISP®
Color Workstation User's Guide
Document number: 500 023 - 001

Copyright© 1987-1989 by
Square D Company
5160 Paul G. Blazer Memorial Parkway
Dublin, Ohio 43017
USA

All rights reserved including the right of reproduction
in whole or in part in any form.

CRISP® is a registered trademark
of Square D Company

I/ONYX® is a registered trademark of
Square D Company



Dedicated to Growth
Committed to Quality

CRISP®
Color Workstation User's Guide
Document number: 500 023 - 001

Copyright© 1988-1989 by
Square D Company
5160 Paul G. Blazer Memorial Parkway
Dublin, Ohio 43017
USA

(614) 764-4200



Dedicated to Growth
Committed to Quality

CRISP®
Color Workstation
User's
Guide



ARE D COMPANY
CRISP AUTOMATION SYSTEMS

CRISP®
Color Workstation User's Guide
Document number: 500 023 - 001 Rev. 5

Document History

Revision	Date	Pages affected/Description of change
1	06/01/88	ECN 2604: Initial release
2	1/15/89	ECN 2915: Updated for use with CRISP/32
3	3/1/89	ECN 3045: Reissue entire manual
4	6/1/89	ECN 3209: Reissue entire manual
5	11/20/89	ECN 3413: Added Appendix D, change pp. 8 & 10 of Security Addn.

Software Version: CRISP/32 Rev. 2.04B and later

This information furnished by Square D Company is believed to be accurate and reliable. However, Square D Company neither assumes responsibility for its use nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Square D Company. This information is subject to change without notice.

Copyright© 1988, 1989 by
Square D Company
5160 Paul G. Blazer Memorial Parkway
Dublin, Ohio 43017
USA

WARNING: Any unauthorized sale, modification or duplication of this material may be an infringement of copyright.

CRISP® is a registered trademark of Square D Company.

I/ONYX® is a registered trademark of Square D Company.

The following are trademarks of Digital Equipment Corporation: VMS, DEC, RSX-11M Plus, VAX, MicroVAX, and PDP-11.

Table of Contents

<i>01 - INTRODUCTION.....</i>	<i>1</i>
Connections.....	1
<hr/>	
<i>02 - MAIN MENU.....</i>	<i>3</i>
Description.....	3
Index to more info.....	3
Operation.....	4
Function Keys.....	4
Help.....	4
Remove.....	4
Gold / Select.....	4
Gold.....	4
<hr/>	
<i>03 - DISPLAY SCREEN.....</i>	<i>5</i>
Introduction.....	5
Function Keys.....	5
Arrow.....	5
SHIFT Arrow.....	5
DELETE.....	6
RETURN.....	6
GOLD DO.....	6
GOLD SELECT.....	6
GOLD PREV SCREEN.....	6
CTRL C.....	6
<hr/>	
<i>04 - DATABASE NODE TABLE.....</i>	<i>7</i>
Description.....	7
Stand-alone Workstations.....	7
Node Numbers.....	7
Redundancy.....	7
Node Number Assignment Rules.....	8
Purpose.....	8
The CRISP/32 Screen.....	9
The CRISP/SP Screen.....	9
Screen Fields.....	9
NAME (or I D).....	10
N.....	10
NODE.....	10
F.....	10
DESCRIPTION.....	10
SIG.....	10

Table of Contents

STATUS.....	11
Exit Screen.....	11
FUNCTION KEYS.....	11
arrow Keys.....	11
FIND.....	11
GOLD / FIND.....	11
/G.....	12
/L.....	12
/T.....	12

05 - SCREEN DIRECTORY..... 13

Introduction.....	13
Display.....	13
Modify.....	13
Function Keys.....	14
Page.....	14
GOLD Page.....	14
Next Screen.....	14
Prev Screen.....	14
Del L.....	14
Clear.....	14
GOLD Clear.....	14
DO.....	14
GOLD DO.....	14
Remove.....	14

06 - ERROR CODES..... 15

Error Codes.....	15
------------------	----

07 - LOCK/UNLOCK CRT..... 17

Description.....	17
Procedure.....	17

08 - SCREEN DIRECTORY..... 19

Description.....	19
Screen Names.....	19
Example.....	19

09 - PAINT SCREEN.....	21
Description.....	21
Exit Screen.....	21
Status Display.....	21
Function keys.....	22
Color Keys.....	22
Keypad.....	22
GOLD.....	22
GOLD Select.....	23
Bar.....	23
Extend.....	23
GOLD Find.....	23
Del L.....	23
GOLD UDel L.....	23
Page.....	23
Trend >.....	24
GOLD Trend <.....	24
Number.....	24
GOLD Bottom.....	24
GOLD Top.....	24
Cut.....	24
GOLD Paste.....	24
Del C.....	24
GOLD UDel C.....	25
Word.....	25
Repaint.....	25
Menu Sel.....	25
Menu.....	25
Mark.....	26
GOLD Reset.....	26
GOLD Enter.....	26
Space Bar.....	26
Compose Character.....	26
Cut and Paste.....	27
Cut and Paste Rules	
Cut Symbol Menu.....	28
Associating Cut Symbols With The Symbol Keys F1 through F5.....	29
Cut Symbol Menu Rules.....	30
Default Cursor Direction.....	30

10 - LINK SCREEN.....	31
Description.....	31
Entering Links.....	31
Function Keys.....	31
Link Switches.....	31
Direction.....	32

Table of Contents

Decimal.....	33
Flash.....	33
Start.....	33
End.....	33
Width/Height.....	33
Color.....	34
Log.....	34
Lock.....	34
Top.....	35
Key/Cursor.....	35
Index.....	35
Value/Color Point.....	35
Tab.....	36
Link Screen Functions.....	36
GOLD.....	36
Gold / Select.....	37
GOLD Find.....	37
FindNxt.....	37
Del L.....	37
GOLD UDel L.....	37
Page.....	37
Sort.....	37
Store.....	37
GOLD Recall.....	38
GOLD Clear.....	38
Auto Recall.....	38
Screen Desc.....	38
WildCard.....	38
GOLD Reset.....	38
Enter.....	39
GOLD Subs.....	39
ON/OFF.....	39
DO.....	39
GOLD letter.....	40
Invalid Links.....	40
User-defined Function keys.....	40
Resolving Links.....	42
# Link.....	42
Using the # Link on a dynamic number	
How to Link Screens.....	43
How to link a variable from database to character on the screen.....	44
Linking a Numeric Field.....	44
Linking a Valve.....	45
Linking a Bar.....	46
Linking Trends.....	46
Trending Operations.....	47
Specifying a Trend in the sample.TRC file.....	47

Table of Contents

11 - PAINT HELP PAGES.....	49
Description.....	49
Create HELP pages.....	49
Link HELP page to a Display screen.....	49
Multiple HELP files.....	49
HELP files on a CRISP/SP System.....	50
Swap HELP pages.....	50
<hr/>	
12 - UTILITY MENU.....	51
Description.....	51
Index to Info.....	51
<hr/>	
13 - COPY SCREENS.....	53
Description.....	53
Screen Fields.....	53
Source Filename or Node.....	53
Source Starting Number.....	53
Source Ending Number.....	53
Dest Filename or Node.....	53
Dest Starting Number.....	54
Number of Records To Copy.....	54
Set to GO to Start Copying.....	54
<hr/>	
14 - REPORT TREND REGION.....	55
Description.....	55
Screen Fields.....	55
TRO.....	55
STA.....	55
AGE.....	55
Z.....	55
A.....	55
SEQ.....	55
TYP.....	55
DB.....	55
<hr/>	
15 - RESOLVE SCREENS.....	57
Description.....	57
Resolve Screens.....	57
Resolve Screens With Report Files.....	57

Table of Contents

16 - SYSTEM PARAMETERS.....	59
Description.....	59
Screen Fields.....	59
Top Screen.....	59
Bottom Screen.....	59
Last Screen Number.....	59
Number of Character Menus.....	59
Number of User HELP Screens.....	59
CRT File Revision Level.....	59
Number of Display Save Slots.....	59
Default Screen Number.....	60
Automatic Node, Timeout Removal.....	60
Refresh Interval, Line Clock Ticks.....	60
Hard-Copy Format.....	60
Default Cursor Movement.....	61
Communications Device.....	61
Keyboard Type.....	62
Comm Timeout Time in 10 ms Ticks.....	62
Sequence Number Radix.....	62
Modification Security Level.....	62
Display File location.....	63
Locking Mask.....	63
Unlocking Mask.....	64
Startup Lock Mask.....	65
Startup Password.....	65

17 - READ DATE-TIME FROM HOST.....	67
Description.....	67

18 - EXIT THIS CRT PROCESS.....	69
Description.....	69

Table of Contents

19 - COPY CHARACTER MENUS.....	71
Description.....	71
Screen Fields.....	71
Source Filename or Node.....	71
Source Starting Number.....	71
Source Ending Number.....	71
Dest Filename or Node.....	71
Dest Starting Number.....	72
Number of Records To Copy.....	72
Set to GO to Start Copying.....	72
<hr/>	
20 - ENHANCED GRAPHICS TEST.....	73
Description.....	73
<hr/>	
21 - STANDARD GRAPHICS TEST.....	75
Description.....	75
<hr/>	
22 - KEYBOARD REDIRECTION TABLE.....	77
Description.....	77
<hr/>	
23 - ACCESS MCR.....	79
Description.....	79
<hr/>	
24 - SCREEN DETAILS.....	81
Description.....	81
Print Info.....	81
<hr/>	
25 - SAVED SCREENS.....	83
Description.....	83
Viewing Screens.....	83
Where Saved.....	83

Table of Contents

26 - HISTORIAN.....	85
Introduction.....	85
File management.....	85
Environment.....	85
File Name.....	85
Recording Mode.....	85
Maximum # of Records.....	86
Interval.....	86
Number of Samples.....	86
Variable Names.....	86
Data Recording.....	86
Wrap around.....	86
Repeated Recordings.....	86

27 - HISTORICAL TRENDING.....	87
Enter Historical Trending.....	87
Data Entry Table.....	87
FILENAME.....	87
TAG.....	87
START TIME.....	87
START RECORD NUMBER.....	87
NUMBER OF POINTS.....	87
LOW.....	87
HIGH.....	87
FILE TIME.....	87
FILE RATE.....	87
NUMBER OF TAGS.....	87
NUMBER OF RECORDS.....	87
STATUS.....	87
Plotting the Data.....	88
Displaying values.....	88
Replotting.....	88
Tag Name List.....	88

28 - HISTORICAL RECORDING.....	89
Description.....	89
Qualifiers.....	90
/WRAP.....	90
/RECORDS=MAX.....	90
/INTERVAL="d hh mm ss.cc".....	90
/AVERAGE=n.....	90
Symbol Names.....	90

Table of Contents

29 - HISTORIAN DATA STRUCTURES.....	93
Files.....	93
Header File.....	93
Identification Record.....	94
Symbol Record Definition.....	95
Data File.....	95

APPENDIX A - KEYBOARD LAYOUTS.....	97
Run-time Keyboard.....	98
Paint Screen Function Keys.....	99
Link Screen Function Keys.....	100
35 Programmable Keys.....	101

APPENDIX B - SYSTEM COMMANDS.....	101
INSTALLATION PROCEDURE.....	101
SYSTEM COMMANDS.....	103
CWS_INSTALL.....	103
CWS_CONFIG.....	103
CWSXLATE.....	104
DBTCMD.....	105
CWSXTEND.....	106
START_USER_CWS.....	106

APPENDIX C - SYSTEM FILES.....	107
SYSTEM FILES.....	107
ANN_INIT.DAT.....	107
CRTPRT.COM.....	108
SAMPLE.TRC.....	111
STARTCWSxxx.COM.....	112
STARTTND.COM.....	114

APPENDIX D - CONTROL DISPLAY.....	115
Introduction.....	115
Building the Display.....	115
Active Control Links.....	116
Monitor Links.....	117
How to Set it Up.....	117
Editing the Display.....	117
Sample Display.....	118

Connections

The Color Workstation connects to the process control computer for access to real-time information. The communications medium may vary from dial-up telephone modems to CRISPnet, depending upon the equipment as supplied in the system. In stand-alone systems, the database is in the same machine as the workstation and communications are not needed. In larger distributed configurations the database(s) reside in remote control-microprocessors and the workstation accesses real-time data via CRISPnet. If the communications are inoperable, the fields will no longer be updated but will be filled with question marks (?).

01 - Introduction

Notes:

02 - Main Menu

Description

When the Color Workstation is powered up, it will enter the MAIN MENU. The MAIN MENU presents all of the operating and display creation features of the Color Workstation.

Index to more info.

Each function accessible from the MAIN MENU is described in this User's Guide. To get more information on each of these functions refer to the pages shown on the chart below.

Function	page	Description
03 -DISPLAY SCREEN	5	Displays a screen with "live" data. Operator can change values from this screen.
04 -DATABASE-NODE TABLE	7	Permits CRISPnet node assignments.
05 -DISPLAY/MODIFY DATABASE	13	Permits direct access to database values.
06 - ERROR CODES	15	Lists and describes error messages.
07 - LOCK/UNLOCK CRT	17	Allows the assignment of security levels to variables and individuals.
08 - SCREEN DIRECTORY	19	Access to the customized Screen Directory.
09 - PAINT SCREEN	21	Allows the creation of screen graphics.
10 - LINK SCREEN	31	Allows linking of screen graphics to database variables.
11 - PAINT HELP PAGES	49	Allows the creation of HELP pages for the operator.
12 - UTILITY MENU	51	Gives access to several utility functions.
Chapters 13 though 23 explain the functions available through the UTILITY MENU:		
13 - COPY SCREENS		
14 - REPORT TREND REGION		
15 - RESOLVE SCREENS		
16 - SYSTEM PARAMETERS		
17 - READ DATE-TIME FROM HOST		
18 - EXIT THIS CRT PROCESS		
19 - COPY CHARACTER MENUS		
20 - ENHANCED GRAPHICS TEST		
21 - STANDARD GRAPHICS TEST		
22 - KEYBOARD REDIRECTION TABLE		
23 - ACCESS MCR		
24 - SCREEN DETAILS		
25 - SAVED SCREENS	83	Lists screens available for display at the workstation.
26 - HISTORIAN	85	Allows selection of variables for historical trending. Following chapters explain the HISTORIAN:

02 - Main Menu

27 - HISTORICAL TRENDING

28 - HISTORICAL RECORDING

29 - HISTORIAN DATA STRUCTURES

Operation

To select a feature, you must "highlight" the feature in yellow, then press the <SELECT> key. To select a menu option, press one of the arrow keys. Your selected feature will be highlighted in yellow. Any features that appear in dark blue are locked out to the user and can be unlocked with the proper password. Any features appearing in cyan (light blue) are features that can be selected.

Function Keys

When the Function Keys MAIN MENU is displayed, several Main MenuFunction Keys are active. These keys are described below. Refer to the Appendix for the location of these keys.

Help

You will notice that there is a <HELP> key on the keyboard. The <HELP> key gives you on-line access, at the workstation, to a condensed version of this manual.

Remove

The <Main MenuREMOVE> key will toggle you between the and the default screen. (The default screen number is set by using the SYSTEM PARAMETERS feature of the Utility Menu.)

Gold / Select

The <GOLD><SELECT> sequence of keystrokes will make a Screenhard copy of any hard copyscreen. The print destination is selected via the CRTPRT.COM file described in the Appendix to this manual. Make sure your HARD COPY FORMAT on the SYSTEMS PARAMETER Menu is properly selected for your printer.

Gold

The <GOLD> key is used with other keys to access additional functions. The GOLD function is indicated by the Gold LED. If you press the <GOLD> key by mistake, GOLDcancel it by using the <GOLD> key a second time.

03 - Display Screen

Introduction

The DISPLAY SCREEN feature displays a screen with its live data. This means that the operator can change variables on the screen via a cursor.

- 1) To display a screen from the MAIN MENU, press the arrow keys until the DISPLAY SCREEN feature is highlighted in yellow.
- 2) Type a screen number.
- 3) Press the <SELECT> key and the screen will be displayed on the Workstation.
- 4) Once your selected screen is displayed on the workstation, press the <REMOVE> key to return to the MAIN MENU.

If you select the DISPLAY SCREEN feature without supplying a screen number, the last screen that was operated upon will be displayed.

A question mark (?) will be displayed, instead of the value, if the linked variable resides in a database that is NOT AVAILABLE (refer to the DATABASE NODE TABLE for more details).

Function Keys The following keys are used when viewing screens with the DISPLAY SCREEN option. Refer to the Appendix for the location of these keys.

Arrow When a screen is displayed in the DISPLAY SCREEN mode, a flashing cursor will appear on the screen. You can move the cursor to any "unlocked" numerical field on the screen with the four arrow keys. (We will cover locked and unlocked variables later.) The cursor will jump to each dynamically updated field. This type of cursor movement is called *link-to-link*. This is the system default cursor option.

SHIFT

Arrow The combination <SHIFT><ARROW> keys will move the cursor one character at a time, outside of the numerical fields. This type of cursor movement is called *general*. You can alternatively select general cursor movement as the system default option. (See SYSTEM PARAMETERS for more information on setting up the cursor movement option.)

At the bottom of the screen is a blue bar which displays the "Modifiable Name" of the variable at which the cursor is presently positioned. Any change that you type will be displayed to the left of the blue bar. This gives you an opportunity to visually confirm your input.

DELETE

If you make a mistake, use the <DELETE> key to delete your change. (The <DELETE> key is above the <RETURN> key.)

03 - Display Screen

RETURN	The <RETURN> key will enter your change.
GOLD	DO The <GOLD> <DO> sequence of keystrokes will save a copy of this screen in the save scen file (see chapter 24 - SAVE SCREEN).
GOLD	SELECT The <GOLD> <SELECT> sequence of keystrokes will make a Screenhard copy of the screen. The print destination is selected via the CRTprt.COM file described in the Appendix to this manual Make sure your HARD COPY FORMAT on the SYSTEMS PARAMETER Menu is properly selected for your printer.
GOLD	PREV SCREEN The <GOLD> <PREV SCREEN> keys will recall the screen previously displayed. The Gold function is indicated by the "GOLD" LED. If you press the <GOLD> key by mistake, cancel it by using the <GOLD> key a second time.
CTRL C	A <Ctrl> <C> combination of keystrokes will exit to the MAIN MENU at any time.

04 - Database Node Table

Description

The DATABASE-NODE TABLE is an interactive screen in which the user links Database names with CRISPnet node assignments. With this information, you can access both local and remote variables by specifying just the Database ID and a variable name. When a variable is accessed via the Color Workstation, the internal software looks up the actual node address on the DATABASE-NODE TABLE, then makes the necessary network calls to retrieve the data value.

Unless a database has been entered into the DATABASE-NODE TABLE and made "AVAILABLE", no data from that database may be displayed on the Color Workstation.

Stand-alone

WorkstationsIn a Stand-alone configuration, the applications program and database are resident in the CPU to which the Color Workstation is connected. In this case, the database is referred to as a local database. The DATABASE-NODE TABLE described in this chapter allows access to local databases and databases which are not local. CRISP/SP systems, using only a local database and no network do not need to use the DATABASE-NODE TABLE.

In a distributed configuration, the databases are distributed among the various control microprocessors. The DATABASE-NODE TABLE provides the scheme to access these databases over CRISPnet.

Node Numbers

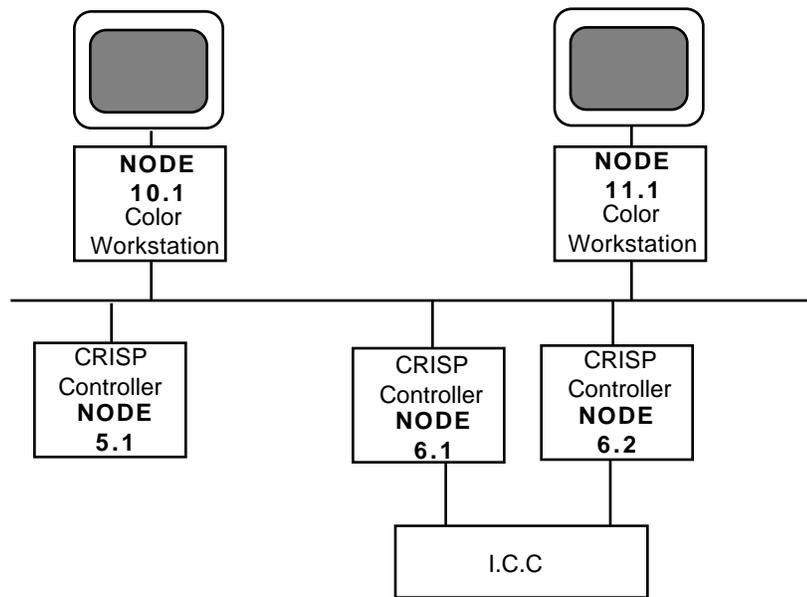
Each CPU on the network is assigned a *Node number*. This node-number assignment is made when you install the DECnet software.

Regardless of node number assignments, a local database is always shown as node 0.0 on the DATABASE-NODE TABLE.

Redundancy

Each CPU on the network can be . To accommodate this, CPU node numbers must be assigned according to the following convention: 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, and so forth. Where 1.1 and 1.2 are a redundant pair.

04 - Database Node Table



Node Number

Assignment Rules Color Workstations that do not have a resident database and applications program must be assigned an odd node number (like 1.1). This is the convention required by the workstation software; this preserves the potential for redundancy at a later date.

Purpose

Color Workstation graphic screens can be linked to any variable in any database on any CRISP Controller found in your system. You do this by identifying each variable with its Database ID followed by its variable name (separated with a colon). For example, C2:ALARM_01 identifies a variable "ALARM_01" in the "C2" database.

However when the variable value is retrieved at runtime, the Color Workstation software needs to know the DECnet node number of the CRISP Controller. The DATABASE-NODE TABLE allows you to associate each Database ID, of up to six characters, to a node on CRISPnet.

The CRISP/32 Screen

The DATABASE-NODE TABLE illustrated below is typical for CRISP/32.

DATABASE NODE TABLE

NAME	N	NODE	F	DESCRIPTION	SIG	STATUS
0 CRISP :	00	0.0	L (0.0)	I CRISP SYST	0	0
1 TSKDIR:	01	0.0	L (0.0)	I TASK DIRECTORY	151623	0
2 DBDIR :	02	0.0	L (0.0)	I DATABASE DIR	0	0
3 LOGDIR:	04	0.0	L (0.0)	I LOGIC DIRECTORY	0	0
4 CRTDIR:	03	0.0	L (0.0)	I CRT DIRECTORY	0	0
5	0	0.0	L (0.0)	I	0	NOT AVAIL 0
6	0	0.0	L (0.0)	I	0	NOT AVAIL 0
7	0	0.0	L (0.0)	I	0	NOT AVAIL 0
8	0	0.0	L (0.0)	I	0	NOT AVAIL 0
9 OVEN	10	0.0	L (0.0)	I OVEN DATA	177604	0
10	0	0.0	L (0.0)	I	0	NOT AVAIL 0
11 REACTR	10	1.31	A (1.31)	I REMOTE REACTOR	177676	0
12	0	0.0	L (0.0)	I	0	NOT AVAIL 0
13	0	0.0	L (0.0)	I	0	NOT AVAIL 0
14	0	0.0	L (0.0)	I	0	NOT AVAIL 0
15	0	0.0	L (0.0)	I	0	NOT AVAIL 0
16	0	0.0	L (0.0)	I	0	NOT AVAIL 0
17	0	0.0	L (0.0)	I	0	NOT AVAIL 0
18	0	0.0	L (0.0)	I	0	NOT AVAIL 0
19	0	0.0	L (0.0)	I	0	NOT AVAIL 0

The CRISP/SP Screen

The DATABASE-NODE TABLE illustrated below is typical for CRISP/SP.

DATABASE NODE TABLE

ID	N	NODE	F	DESCRIPTION	SIG	STATUS
0 LO :	0	0.0	L (0.0)	A DEFAULT	12243	0
1 OVEN :	0	1.2	A (1.2)	A RESIN	151623	0
2 REMIX :	0	1.3	L (1.3)	A RESIN	165732	0
3 REACTR:	0	2.3	L (2.3)	I RESIN 2	169530	0
4	0	0.0	L (0.0)	I	0	NOT AVAIL 0
5	0	0.0	L (0.0)	I	0	NOT AVAIL 0
6	0	0.0	L (0.0)	I	0	NOT AVAIL 0
7	0	0.0	L (0.0)	I	0	NOT AVAIL 0
8	0	0.0	L (0.0)	I	0	NOT AVAIL 0
9	0	0.0	L (0.0)	I	0	NOT AVAIL 0
10	0	0.0	L (0.0)	I	0	NOT AVAIL 0
11	0	0.0	L (0.0)	I	0	NOT AVAIL 0
12	0	0.0	L (0.0)	I	0	NOT AVAIL 0
13	0	0.0	L (0.0)	I	0	NOT AVAIL 0
14	0	0.0	L (0.0)	I	0	NOT AVAIL 0
15	0	0.0	L (0.0)	I	0	NOT AVAIL 0
16	0	0.0	L (0.0)	I	0	NOT AVAIL 0

04 - Database Node Table

17	0	0.0	L (0.0)	I	0	NOT AVAIL	0
18	0	0.0	L (0.0)	I	0	NOT AVAIL	0
19	0	0.0	L (0.0)	I	0	NOT AVAIL	0

Screen Fields The fields on this screen (vertical columns of data) are each explained below.

NAME (or I D) This is a Database ID which you can enter to identify the database. It can be up to six characters long, followed by a colon (:). Each ID must be unique.

N CRISP/32 This is the database number. This number is supplied when the database is located either by exiting the screen or by pressing the <FIND> key (you must do a FIND whenever a database has been added or removed). CRISP system databases are assigned numbers in the range of 0 - 9, user-defined databases are assigned numbers in the range of 10 and up. For any node in the system, the first user database installed is assigned the number 10. Database number 11 and up are assigned to additional user databases installed on that node.

CRISP/SP Since there is only one database per node in the CRISP/SP system, this number is always zero.

NODE Here you enter the node number on which the database is located. If the node is physically redundant, you can enter either the odd or even number here.

F This column allows you to "force" communications with specific CPU in a redundant pair. Enter an "A", "I", or "L" as follows:

- A - Forces communication with the Active CPU of a redundant pair.
- I - Forces communication with the Idle CPU of a redundant pair.
- L - Locks communication with whichever CPU is communicating at the time the Lock is issued.

To the right, the number enclosed in parentheses is the physical node that you are talking to. Therefore, if the node number is 6.1 then the number enclosed in parentheses could be 6.1 or 6.2.

The next column indicates whether the current CPU is either active (A), or Idle (I).

DESCRIPTION You may enter any 16-character description of your choice.

SIG The database signature of the node. This value is a random value which each screen stores to determine if the database has been recompiled. This number is supplied when the database is located either by exiting the screen or by pressing the <FIND> key.

STATUS The STATUS column displays either a TIMED OUT and the NOT AVAIL condition of the CPU. No message indicates that the CPU is available and communicating normally.

You can set a node as timed out with Function Key F19. This would be useful for testing purposes only. If the system is healthy (and AUTO NODE TIMEOUT REMOVAL is selected from the SYSTEM PARAMS menu), it will reset itself and clear the TIMED OUT flag.

The NOT AVAIL status flag indicates that a node is not communicating to the Color Workstation. You can set a node as unavailable with Function Key F18. The Color Workstation cannot access the database of an unavailable node. All fields linked to unavailable databases will display the question mark (?) character.

Exit Screen

After you are finished with the , you exit the screen by pressing the <REMOVE> key.

You are then asked if you wish to save your work to the disk or not. Select the desired answer using the arrow keys, then press the <REMOVE> key.

P IMPORTANT: You can save a changed DATABASE-NODE TABLE to disk, but it will not change the existing copy of this DATABASE-NODE TABLE resident in the workstation. This is because the DATABASE-NODE TABLE is normally read only when a CRT process starts up. To read the DATABASE-NODE TABLE to the workstation after start up, press the <REMOVE> key, then select the option "READ DATABASE-NODE TABLE FROM DISK".

04 - Database Node Table

FUNCTION KEYS

Several Function keys are used in the DATABASE NODE TABLE.
These are shown below:

arrow Keys Use the arrow keys to select a Database prior to pressing the <FIND> key or <GOLD> <FIND>.

FIND After selecting a database with the arrow key, you may press the FIND key; this causes the workstation to attempt to locate the databases.

GOLD / FIND After selecting a database with the arrow key, press <GOLD><FIND>; this causes a window to be displayed which lists all databases in the selected node. Now, use the arrow keys to select the name of the database that you want to use on this workstation, and press the <SELECT> key. This will return you to the DATABASE NODE TABLE and write the database name to the selected line.

On the Run-Time keyboard, there is no <FIND> key, use the key sequence <GOLD><PF3>.

/G After selecting a database with the arrow key, press the function key on the top row, marked /G to alternate its FORCED state between "A", "I", and "L".

/L After selecting a database with the arrow key, press the function key on the top row, marked /L to alternate its STATUS state between AVAILABLE (no description), "NOT AVAIL".

04 - Database Node Table

- /T* After selecting a database with the arrow key, press the </T> function key to clear a "TIMED-OUT" message.
-

05 - Display/Modify Database

Introduction

The DISPLAY/MODIFY DATABASE feature allows you to display and change variables without linking them to a graphic screen.

Select the DISPLAY/MODIFY DATABASE feature and a screen will appear with the following format:

DISPLAY/MODIFY DATABASE Page 1

NAME (Red=Off-Scan)	TYPE	SEQ	VALUE
LO: SECOND	INT	171	50
LO: STATUS	INT	172	1
LO: INTEGER1	INT	245	1320
LO: INTEGER2	INT	246	2
LO: INTEGER3	INT	247	33
LO: INTEGER4	INT	250	5
LO: INTEGER5	INT	251	44
LO: INTEGER6	INT	252	0
LO: INTEGER7	INT	253	1452
LO: INTEGER8	INT	254	6565
LO: INTEGER9	INT	255	6
LO: INTEGER10	INT	256	7
LO: INTEGER30	INT	257	55
LO: INTEGER50	INT	260	12
LO: REAL2ir	FLT	261	1.2999999
LO: REAL3ir	FLT	262	.4400000
LO: REAL4ir	FLT	263	345.3999996
LO: REAL5ir	FLT	264	234.8599910
LO: REAL6ir	FLT	265	5.4650001
LO: REAL7ir	FLT	266	44.4869995

Display

To add a variable to this screen for display, type the variable name and press the <RETURN> key. The variable will be displayed with its dynamic value. If the variable you wish to view is in a remote database, type its Database ID (up to 6 characters), a colon (:), followed by the variable name. To get the values from remote databases, the system looks up the node number on the DATABASE NODE-TABLE, then retrieves the value over CRISPnet.

In the example above, which is a typical of CRISP/SP, the variable SECOND was entered. Its "TYPE" and "SEQUENCE" are given as INT 171 because it is an Integer type variable and it is the 171st (octal) location in the database. Its present value is 50. The Database ID, "LO:" preceding the variable indicates that this variable comes from a *local* database (CRISP/SP only).

05- Display/Modify Database

Modify

There is a yellow cursor that you can move with the arrow keys. When the variable is highlighted, you can change the value of a variable by typing a new value and pressing the <RETURN> key.

If you type a variable name that does not exist in the database, it will be flagged as undefined with the letters UND in the TYPE column.

You can dynamically DISPLAY/MODIFY up to 20 variables per page while in this mode with a maximum of five pages.

Function Keys

When in the DATABASE DISPLAY/MODIFY screen, several Function Keys are active. These keys are described below. Refer to the Appendix for the location of these keys.

Page The <PAGE> key (key 7 on the run-time keypad) will scroll you through the up to five pages available in the DATABASE DISPLAY/MODIFY mode.

GOLD Page The <GOLD><PAGE> key (see above) will scroll in reverse order through the DATABASE DISPLAY/MODIFY mode.

Next Screen **Prev Screen** The <NEXT SCREEN> key and <PREV SCREEN> key display the next and previous variables in the database; i.e. variables that are declared in succession are placed in adjacent locations in the database.

Del L The <DEL L> (<PF4> on the run-time keypad) key will delete a variable at the current cursor position.

Clear The <CLEAR> (<-> (minus) on the run-time keypad) key on the right-most keypad will resolve all variables on the screen.

GOLD Clear The <GOLD> <CLEAR> sequence of keystrokes will clear the entire screen (see above).

DO An additional feature, *available in CRISP/SP only*, is the ability to turn variables "Off Scan" by underlining the variable with the cursor and pressing the <DO> key. This enables you to override an input or any computed variable from the local database (or in a distributed system, any remote database). When placed off scan, the variable will be flagged with a red background. To turn the variable back on scan, use the <DO> key again.

GOLD

05- Display/Modify Database

DO The <GOLD> <DO> sequence of keystrokes will save a copy of this screen in the save screen file (see chapter 24 - SAVE SCREEN).

Remove The <REMOVE> key returns you to the MAIN MENU.

06 - Error Codes

Error Codes

Error messages at the Color Workstation are generated either by CRISP software or the DEC operating system. CRISP error codes are positive numbers. The DEC error messages (PDP-11 only) are preceded by the >>>FDB prompt and consist of negative error code numbers.

DEC error codes fall into three classes and are distinguished as follows:

DIRECTIVE ERROR CODE	(D)
I/O ERROR CODE	(I)
COMMUNICATIONS ERROR CODE	(C)

ERR	TYPE	MEANING	ERR	TYPE	MEANING
0	(CRISP)	Request type code is invalid	- 7	(I)	Device not attached
1	(CRISP)	Invalid task name		(D)	Task not active
2	(CRISP)	CRT number - task name mismatch	- 8	(I)	Device already attached
3	(CRISP)	Unable to attach logic database		(D)	Directive inconsistent with task state
4	(CRISP)	Unable to attach comtn region	- 9	(I)	Device not attachable
5	(CRISP)	Unable to create window for comtn		(D)	Task already fixed/unfixed
6	(CRISP)	Unable to map to comtn region	-10	(I)	End-of-file detected
7	(CRISP)	Link address list overflow		(I)	Issuing task not checkpointable
8	(CRISP)	Undefined symbol error	-11	(I)	End-of-volume detected
9	(CRISP)	Invalid database sequence number		(I)	Task is checkpointable
10	(CRISP)	Status mismatch on modify request	-12	(I)	Write attempted to locked unit
11	(CRISP)	String static length overflow		(I)	Data overrun
12	(CRISP)	Too many CRT table requests	-13	(I)	A message is received before a receive QIO is issued, or the user buffer is too small to receive all of the data.
13	(CRISP)	Invalid data type for trending		(C)	
14	(CRISP)	Variable not being trended	-14	(I)	Send/receive failure
15	(CRISP)	File access error		(I)	Request terminated
16	(CRISP)	Invalid key link number	-15	(I)	Receive buffer too small
19	(CRISP)	Sequence number list length exceeded		(D)	The function has been aborted
20	(CRISP)	PID index error		(C)	
21	(CRISP)	No remote comm possible	-16	(I)	Privilege violation
22	(CRISP)	Physical comm failure		(D)	Privilege violation
- 1	(I)	Bad parameters		(C)	The specified line is not available for use by DLX
	(D)	Insufficient dynamic storage	-17	(I)	Sharable resource in use
- 2	(I)	Invalid function code		(D)	Resource in use
	(D)	Specified task not installed		(C)	The specified line is already in use
	(C)	The LUN is not assigned to NX	-18	(I)	Illegal overlay request
- 3	(I)	Device not ready		(D)	No swap space available
	(D)	Partition too small for task	-19	(I)	Odd byte count (for virtual address)
	(C)	The hardware device was not ready. The line was hung up and has not been reinitialized.		(D)	Illegal vector specified
- 4	(I)	Parity error on disk	-20	(I)	Logical block number too large
	(D)	Insufficient dynamic storage for send		(D)	Invalid table number
	(C)	An error has occurred on the line.	-21	(I)	Invalid UDC module number
- 5	(I)	Hardware option not present		(D)	Logical name not found
	(D)	Unassigned LUN	-22	(I)	UDC connect error
- 6	(I)	Illegal user buffer		(I)	System dynamic memory
	(D)	Device driver not resident	-23	(I)	Device full
	(C)	The transmit buffer is too large (applies only to PDP-11/44 or PDP-11/70 with extended memory)	-24	(I)	Index file full
			-25	(I)	No such file
			-26	(I)	Either you have entered an invalid line identification format, or the specified line is not in the system.
				(C)	
			-27	(I)	Locked from read/write access

06 - Error Codes

-28 (I)	File header full	-73 (I)	Connection rejected by user
-29 (I)	Accessed for write	-76 (I)	Bad tape format
-30 (I)	File header checksum failure	-77 (I)	Not ANSI "D" format byte count
-31 (I)	Attribute control list format error	-78 (I)	Not a network LUN
-32 (I)	File processor device read error	-79 (I)	Task not linked to specified ICS/ICR
-33 (I)	File processor device write error	(I)	interrupts
-34 (I)	File already accessed on LUN	-80 (I)	Specified task not installed
(C)	The specified LUN is already in use	(D)	Directive issued/not issued from AST
-35 (I)	File ID, file number check	-81 (I)	Device off line when off-line request was issued
-36 (I)	File ID, sequence number check		Illegal mapping specified
-37 (I)	No file accessed on LUN	-82 (I)	Invalid escape sequence
(C)	No file has been opened with the specified LUN	-83 (I)	Partial escape sequence
(I)	LUN	(D)	Window has I/O in progress
-38 (I)	File was not properly closed	-84 (I)	Allocation failure
-39 (I)	No buffer space available for file	(D)	Alignment error
-40 (I)	Illegal record size	-85 (I)	Unlock error
-41 (I)	File exceeds space allocated, no blocks	(D)	Address window allocation overflow
-42 (I)	Illegal operation on file descriptor block	-86 (I)	Write check failure
-43 (I)	Bad record type	(D)	Invalid region ID
-44 (I)	Illegal record access bits set	(C)	Task not triggered
-45 (I)	Illegal record attribute set	-87 (D)	Invalid address window ID
-46 (I)	Illegal record number - too large	(C)	Transfer rejected by receiving CPU
-47 (I)	Internal consistency error	-88 (D)	Invalid TI parameter
-48 (I)	Rename-two different devices	(C)	Event flag already specified
-49 (I)	Rename-a new file name already in use	-89 (D)	Invalid send buffer size (greater than 255)
-50 (I)	Bad directory file	(C)	Disk quota exceeded
-51 (I)	Cannot rename old file system	-90 (D)	LUN locked in use
-52 (I)	Bad directory syntax	(C)	Inconsistent qualifier usage
-53 (I)	File already open	-91 (C)	Invalid UIC
-54 (I)	Bad file name	(C)	Circuit reset during operation
-55 (I)	Bad device name	-92 (D)	Invalid device or unit
-56 (I)	Bad block on device	(C)	Too many links to task
-57 (I)	Enter-duplicate entry in directory	-93 (D)	Invalid time parameters
-58 (I)	Not enough stack space (FCS or FCP)	(C)	Not a network task
-59 (I)	Fatal hardware error on device	-94 (D)	Partition/region not in system
-60 (I)	File ID was not specified	-95 (D)	Invalid priority (greater than 250)
-61 (I)	Illegal sequence operation	(C)	A timeout condition has occurred
-62 (I)	End-of-tape detected	-96 (I)	Connection rejected
-63 (I)	Bad version number	(D)	Invalid LUN
-64 (I)	Bad file header	-97 (I)	Unknown name
-65 (I)	Device off line	(D)	Invalid event flag (greater than 64)
-66 (I)	Block check, CRC, or framing error	-98 (I)	Unable to size device
-67 (I)	Device on line	(D)	Part of DPB out of user's space
-68 (I)	No such node	-99 (I)	Media inserted incorrectly
-69 (I)	Path lost to partner	(D)	DIC or DPB size invalid
-70 (I)	Bad logical buffer	-100 (I)	Spindown ignored
-71 (I)	Too many outstanding messages		
-72 (I)	No dynamic space available		

07 - Lock/Unlock CRT

Description

This screen is used to enter a password to lock and unlock certain workstation functions. The functions that can be locked or unlocked from this screen are actually selected via the SYSTEM PARAMETERS screen from the UTILITY MENU. Locked functions appear in dark blue on the MAIN MENU and cannot be selected.

This screen is also used to password-protect variables whose link was ENTERed with a /L *lock switch*. (individual variables are locked in the LINK SCREEN mode.) With this type of lock, locked variables cannot be modified in the DISPLAY SCREEN mode or the DISPLAY/MODIFY DATABASE mode.

There is one level of password security.

Procedure

To Lock the workstation:

1. Select the LOCK/UNLOCK CRT feature on the MAIN MENU.

You will be prompted to enter the locking password. The password can be up to 8 characters long. Additional characters will be ignored.

2. Type your password and press the <RETURN> key. You will be returned to the Main Menu with the following message:

"CRT keyboard locked".

To unlock the keyboard:

1. Select the LOCK/UNLOCK CRT feature on the MAIN MENU. You will be prompted to enter the unlocking password.
2. Type the same password that you used to lock the workstation and press the <RETURN> key. You will be returned to the Main Menu with the following message:

"CRT keyboard successfully unlocked"

3. If you try to unlock the with the wrong password, you will be returned to the MAIN MENU with the following message:

"Wrong password...."

07 - Lock/Unlock CRT

Notes:

08 - Screen Directory

Description

The SCREEN DIRECTORY is a user-configured menu of all the screens resident in the Color Workstation. The screen numbers are automatically assigned by the system. You can type in a title of your choice next to each screen number. When the yellow cursor is placed on a screen number, the <SELECT> key will then display that screen.

The up and down arrow keys will move you through this scrolling Directory. The <PAGE> key (<7> on the run-time keypad) will scroll ahead a page at a time. The <GOLD> <PAGE> sequence of keystrokes will scroll back a page at a time.

Screen Names

The names of the screens are displayed. If you wish to change the name of a screen, you simply place your cursor on the name, type an new name, then press the <RETURN> key.

PIMPORTANT: After copying a screen, you must display the screen *once* in the PAINT SCREEN mode, before you can change its name.

Example

A typical Screen Directory is shown below.

<u>SCREEN</u>	<u>DESCRIPTION</u>
1	ALARM SUMMARY
2	
3	FLOW SHEET GRAPHIC
4	TEMPERATURE DISPLAY
5	16 LOOP GROUP
6	
7	8 LOOP GROUP
8	
9	8 LOOP GROUP
10	
11	LOOP 1
12	
13	TREND 1
14	
15	LOOP 2
16	

08 - Screen Directory

Notes:

09 - Paint Screen

Description

The PAINT SCREEN mode brings up on the screen the static portion of a graphic picture. Symbols and colors are selected from the keyboard to draw the desired static picture.

To enter the PAINT SCREEN mode from the MAIN MENU:

1. Highlight the PAINT SCREEN feature with the arrow keys.
2. Type a screen number to paint a 24-line screen, or
3. Type two screen numbers separated by a space or comma to paint a 48-line screen.
4. Press the <SELECT> key to enter the paint screen mode of your specified screen. For example,

5,6 <SELECT>

will paint screen 5 as the first 24 lines of your graphic and screen 6 as lines 25 through 48 of your graphic. Once a screen is brought up in 48-line format via the paint screen mode, the screen will remain in 48-line format for all modes until separated in the paint screen mode by specifying the second screen as 0. For example "5,0 <SELECT>" will paint screen 5 only.

Exit Screen

When painting is finished, the <REMOVE> key will save the current screen and PAINT SCREENexit to the MAIN MENU. A <CTRL> <C> can be used to abort most operations. When aborting the PAINT SCREEN session with a <CTRL> <C>, you will return to the MAIN MENU without altering the graphics file.

Status Display

At the bottom of the screen you will see a line of information (like the one shown below). This line is not changeable by you.

```
Screen 16      Bottom Screen 0      Default Direction >      CM00 FG BG >@  
  <          `          '          ^ ~ - †
```

1 - the screen number you are editing

Paint Screen

09 -

2 - the second screen number (this applies if you are

using the 48-line mode)

3 - the default direction of the cursor

4 - the character set menu that is being used

5 - the current foreground color

6 - the current background color

7 - the current keyboard character.

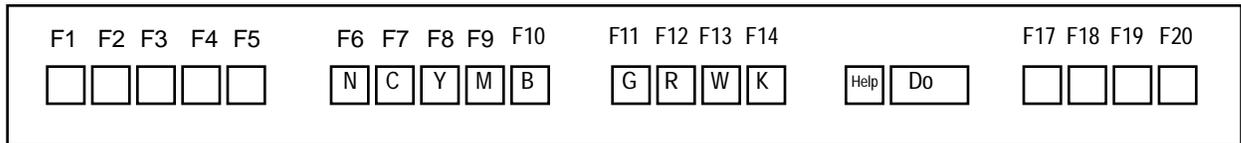
Function keys

Once you enter the mode, you are ready to build a graphic. Graphic characters will be placed on the screen where the cursor is

positioned. You can move the cursor with the four arrow keys. The painting of graphics is done using the on the workstation keypad.

Color Keys

All painting is done in two colors: a foreground color and a background color. The eight dark gray keys labeled with colors select the available foreground colors. The <GOLD><color> sequence of keystrokes select the eight available background colors.



Paint Function Keys

F 6	N - No Color	F11	G - Green
F 7	C - Cyan	F12	R - Red
F 8	Y - Yellow	F13	W - White
F 9	M - Magenta	F14	K - Black
F10	B - Blue		

Keypad

The rightmost PAINT SCREEN keypad has the following PAINT SCREEN functions:

Gold Key →

	Bar	Extend	Del L
		Find	UDel L
Page	Trend > Trend <	Number	
Bottom	Top	Cut Paste	Del C UDel C
Word	Repaint	Menu Sel.	Menu
		Mark Reset	

GOLD Pressing a function key will give you the function labeled on the top of that key. The <GOLD> key followed by any key in the keypad gives you the bottom function of that key (shown highlighted in the above illustration).

If you press the <GOLD> key by mistake, you can cancel the gold function with the <GOLD> key or the <RESET> key. The <GOLD> key is indicated by the "COMPOSE" LED.

GOLD Select The <GOLD> key followed by the <SELECT> key will make a screenhard copy of the screen. This <GOLD> <SELECT> hard copy function applies to any screen in any mode.

Bar The <BAR> key will produce the first character of a bar graph. Position the cursor on the screen and press the bar key. You will get an up-arrow symbol. This is the direction of the bar. If you repeat the <BAR> key, you will get the right, down and left directions.

Extend Once you have picked the Bar Graphdirection you want, using the <BAR> key, press the <EXTEND> key. This will Bar Graphextend the Bar Graph to the desired length.

GOLD Find The <GOLD> <FIND> keystroke sequence will set the character menu cross to intersect on the same character at which the cursor is resting.

Del L The <DEL L> key will delete the line from the cursor position to the right-most character on the screen. Also, any lines under the deleted portion will be moved upward one line.

GOLD UDel L The <GOLD> <UDEL L> sequence of keys will undelete or reinsert the deleted line (the last deleted line only) and move all lines beneath the undeleted portion downward one line.

This also works in the Compose Character Mode (explained later in this section).

Page When in the Paint Screen mode, the <PAGE> key will move you through the various screens in numerical order. The default cursor direction of up or right moves you in ascending numerical order. When the default cursor direction is set to down or left screens are accessed in descending numerical order.

Trend > If you want to draw group of bar graphs (to create a Trend region, or a vessel) trend, first draw a bar, then position the cursor on the direction symbol of the bar (the up-arrow symbol). Press the <TREND> key. Each time you press the <TREND> key, you will add another bar to the right of the original bar. You can make your trend up to 80 bars wide.

GOLD Trend < The <GOLD><TREND> keystroke sequence copies bar graphs leftward from an existing bar graph. <GOLD><TREND> acts as described above for the <TREND> key, except that it copies to the *left* of the original bar graph.

Paint Screen

09 -

Number Where a or a DisplayBoolean value; is to be displayed, the <NUMBER> key should be used, creating an image of the desired format. For instance, if a Real or Numeric variable is to be displayed with three places to the left of the decimal point and two places to the right, the field would look like " . ". Later, this screen location will be linked to a database variable (see LINK SCREEN). Then, at run time, the value of the variable will be displayed using the format created with the <NUMBER> key.

GOLD Bottom This positions the cursor at the bottom left-hand corner of the screen.

GOLD Top This positions the cursor at the top left-hand corner of the screen.

Cut This causes the highlighted symbol to be Cut into the "cut buffer." Complete information follows at the end of this section.

GOLD Paste This causes the symbol in the "cut buffer" to be display to the screen. Use the arrow keys to reposition the symbol, then press the <RETURN> key to "paste" the symbol permanently. Complete "Cut & Paste" information follows at the end of this section.

Del C The <DEL C> key will delete a column at the cursor position *and below*. This will not affect the column above the cursor. This also works in the Compose Character Mode (explained later in this section).

GOLD UDel C The <GOLD> <UDEL C> sequence of keys will undelete or reinsert the last deleted column of characters (only).

Word This moves the cursor to the next symbol (moving top-to-bottom, left-to-right).

Repaint The <REPAINT> key converts the foreground and background colors of the character at the cursor position to the currently selected colors and advances the cursor in the default cursor direction. (Currently selected colors are displayed in the 25th line of the screen.)

Menu Sel This key cycles through the available character menus. Character sets are handled differently in CRISP/SP and CRISP/32.

In CRISP/SP there are 7 available character menus (CM00 through CM06). This number can be expanded during system configuration time, however only one character menu can be used per screen to paint a graphic regardless of whether it is a 24-line screen or a 48-line screen.

In CRISP/32 there is only one global character set, CM00, (except when translating CRISP/32 systems from the Basic Workstation to the Color Workstation; see the command CWSXLATE in the Appendix). There is also one local character set available per screen (CMI).

Menu The Menu key will display the character menu. The character menu consists of four rows of characters (64 characters in each row). The characters in the menu are cyan. There is a blue bar which highlights one of the rows. You will also notice a vertical red bar at the left-hand side of the character menu. This red bar intersects with the blue bar forming a cross. If you press the <SELECT> key, the character at the cross intersection will be placed on the screen at the current cursor position. The four arrow keys will move the cross within the character menu when the <SHIFT> key is held down. Since the character menu is longer than the width of the screen, the menu will scroll until the cross reaches either end of the menu.

Remember, the <SELECT> key types the intersected character from the character menu. However, if you want alphanumeric text characters, use the keyboard as you would a typewriter.

Mark This allows you to select an area or symbol to be CUT into the "cut buffer." Complete information follows at the end of this section.

Paint Screen

09 -

GOLD Reset If you press the <GOLD> key by mistake, you can cancel the gold function with the <RESET> key.

GOLD Enter Allows you to copy a character set from one display to the current display file. The message "ENTER DISPLAY NUMBER FOR CHAR SET" is displayed in the lower left corner of the display. Enter the display number to copy the from and press <RETURN>.

Space Bar The SPACE BAR is the long bar at the bottom of the alpha-numeric keypad. The SPACE BAR "types" blank spaces onto the screen.

Compose Character

You can compose your own special characters. There are spare characters provided in each character menu. You can change any character in any character menu through the COMPOSE CHARACTER mode. The COMPOSE CHARACTER mode is a sub-mode of the PAINT SCREEN mode.

Care should be taken when composing characters. Normally, you would not want to change the characters in the first and second rows since these are your alphanumerics and bar-graph characters.

The <COMPOSE CHARACTER> Key enters the compose character mode.

You select a character to compose in the menu the same way that you would select a character to be put on the screen during the PAINT SCREEN mode by intersecting a character with the blue and red cross bars of the character menu. When you enter the compose character mode, the intersected character is displayed in the upper left-hand corner of the screen in an 8 x 10 "cell" format. Touching any key will turn a "cell" red. The red "cells" will create the new character. The space bar will erase a "cell".

The <SHIFT> <ARROW> keys will move you through the character menu while displaying each intersected character in its cell format.

The PF2 and PF3 keys on the right-hand keypad (labeled BAR and EXTEND on the Paint keypad) have a special function during the compose character mode. While composing a character, if you press the <BAR> key, the composed character will be stored. The

<EXTEND> key will replace the stored character back into any intersected composed character.

FOR PDP-11 Systems ONLY: While you are composing a character, you can also change character menus with the <MENU SELECT> key. Therefore, you can store a character from one menu, change menus with the <MENU SELECT> key, and replace the character into the new menu.

The <REMOVE> key or <COMPOSE CHARACTER> key leaves the compose character mode with your changes intact.

To abort a compose character, type a <CTRL> <C> combination. Once you leave the composed character with either the <COMPOSE CHARACTER>, <REMOVE>, or <SHIFT><ARROW> keys, the change is permanent.

Cut and Paste

The Cut and Paste feature allows you to "cut out" a portion of a graphic display (one or more characters), store it into a temporary buffer, and "paste" that portion back into your display or any other display at any position.

For example, you may have drawn a vessel with piping and valves. (We can refer to this collection of characters as "VESSEL".) You can then *cut* out and store VESSEL into a temporary buffer. You can "paste" VESSEL back into your display or any other display at any position and as many times as you wish.

The Cut and Paste feature utilizes three keys. The <CUT> key, the <PASTE> key and the <MARK> key.

To CUT out a symbol:

1. Position the cursor at some starting point.
2. Press the <MARK> key. The <MARK> key marks the beginning of the area to be cut out. At the bottom of the screen you will get a message:

```
Cutting in BLOCK mode, WITH links, cut name = "*TEMP*"
```
3. Move the cursor along the area you wish to cut. The cursor will highlight the area to be cut out in a block of rows and columns. If you highlight a row or column by mistake, use the cursor to re-trace and remove the highlighted area one row or column at a time.

4. Press the <DO> key to select TRACE or BLOCK mode (the <DO> key toggles between the two modes).
5. When you have highlighted VESSEL, press the <CUT> key. VESSEL is removed from the screen and stored in the temporary buffer.

To PASTE the symbol:

1. Press the <GOLD> <PASTE> sequence of keystrokes. The contents of the temporary buffer is placed on the screen.
 2. You can move the pasted symbol around the screen with the arrow keys.
 3. You can change the color of the symbol using the <COLOR> and <GOLD> <COLOR> keys.
 3. Press <RETURN> to permanently paste the symbol at the current position.
-

Cut and Paste Rules

The following rules govern the cutting and pasting.

- The temporary cut buffer can hold only one symbol at any time.
- The character menu number at the bottom of the screen will flash if you paste a symbol built from a character menu different from the character menu currently in use.
- When pasting, the <COLOR> keys and the <GOLD> <COLOR> keys change the symbol's foreground and background colors, respectively. This must be done after the PASTE operation, and before the <RETURN> key is pressed. The <N> key (NO-COLOR) returns the cut symbol to its original foreground and background colors.
- The <DO> key toggles you between Trace mode and Block mode while cutting. Trace mode highlights characters one at a time, tracing the cursor movement. If you make a mistake in trace mode, the <DELETE> key will automatically retrace the cursor's movement and remove the highlight one character at a time.
- The cut buffer holds a maximum of 1920 characters (one 24 line screen without links).
- When cutting out a symbol, the database linkages will also be moved with the symbol. Function key 17 will allow you to cut and paste without links.

- The <REMOVE> key or <CTRL><C> keys will cancel the current cut or paste action.
-

Cut Symbol Menu

Symbols may be cut, assigned a name, stored permanently in the CUT SYMBOL MENU, and associated with one of the first five function keys. This CUT SYMBOL MENU is available to all workstations on that node.

To place a symbol in the CUT SYMBOL MENU:

1. Highlight the symbol and press the <MENU> key. The CUT SYMBOL MENU will be displayed on the screen.
2. Move the cursor to the desired slot. There are a maximum of 128 slots available to store symbols.
3. Type in a name for your symbol (up to 8 characters per symbol name). You *must* type in the name even if the name is the same.
4. Press <RETURN>. Your symbol will be cut out, placed in the CUT SYMBOL MENU, and referenced by the symbol name.

To paste in a symbol from the CUT SYMBOL MENU:

1. Press <GOLD> <PASTE>
 2. Press <MENU>
 3. Underline the symbol name you wish to paste.
 4. Press <RETURN> Your symbol will be placed on the screen at the cursor position.
 5. You can move the symbol with the <ARROW> keys.
 6. Press <RETURN> to permanently paste your symbol or <CTRL> <C> to abandon the pasting operation.
-

Associating Cut Symbols F1 through F5

With The Symbol Keys

By default, the dark gray keys along the top of the keyboard (F1 through F5) perform the following functions during the PAINT SCREEN mode:

- | | |
|------------|-----------------------------|
| F 1 | Symbol Valve/Pump/Blower |
| F 2 | Symbol Elbow/Pipe/Tee |
| F 3 | Symbol Misc./Loop Templates |
| F 4 | Symbol Vessel |
| F 5 | Symbol User Defined |

You can change these symbols to be any symbols of your choice using the following procedure.

Paint Screen

09 -

1. Press <GOLD> <PASTE>.
2. Press the <MENU> key.
3. While the CUT SYMBOL MENU is displayed, press F1. Symbols connected to F1 will be highlighted in yellow. You will get a message at the bottom of the screen:

KEY F1 HIGHLIGHTED IN YELLOW

(This means that all symbols whose name turns yellow are connected with function key 1. When function key 2 is pressed, all symbols connected with it will turn yellow. Symbols not connected to the currently pressed function key will turn cyan.)

4. Position the cursor under a symbol name.
5. Press the <DO> key to connect or disconnect a symbol from a key.

Each key can hold any or all of the 128 symbols, but no symbol can be associated with more than one key.

To paste symbols to the screen, use the following procedure.

1. When in PAINT SCREEN mode, press <F1>.
2. The first symbol in the Cut Symbol Menu connected to <F1> will be pasted on your screen.
3. Press <F1> again. This displays the second symbol from the Cut Symbol Menu that is connected to F1 on the screen you are painting, and so on.
4. Press <RETURN> to permanently paste the symbol to the screen. <GOLD> <F1> will display symbols in the list in backward order.

Cut Symbol Menu Rules

The following rules govern the use of the Cut Symbol Menu.

- The Cut Symbol Menu can hold 128 cut symbols. Each cut symbol can be up to 1920 characters (one 24-line display without links).
- The character menu number at the bottom of the screen will flash if you paste a symbol built from a character menu different from the character menu currently in use.
- When pasting, the <COLOR> keys and the <GOLD> <COLOR> keys change the symbol's foreground and background colors, respectively. The <N> key (NO-COLOR)

returns the cut symbol to the foreground and background colors of the symbol, as stored in the cut buffer.

Default Cursor

Direction

The <GOLD> <ARROW> key sequence will set the default direction of the cursor in the Paint Screen mode. The default direction is displayed in the last line of the screen.

10 - Link Screen

Description

The LINK SCREEN mode allows you to display a screen, previously created in the PAINT SCREEN mode, so that you can "link" the screen to one or more database variables.

A *link* occurs when a spot or area on the screen is associated with a variable in such a way that the condition of the variable affects the way the linked area is displayed at run time. For example, the *number substitution fields* established in the PAINT SCREEN mode (using the <NUMBER> key) can now be linked to an actual database variable(s) so that the value of the variable will be displayed at run time.

It is not necessary that the workstation be connected to the process control computer to establish this linkage to program variables. However, at run time, the list of variables is sent to the appropriate computer(s) and their values are returned to the workstation for updating the screen. Please refer to the DATABASE NODE TABLE for complete details regarding the communication of data values between the workstation and the user databases.

To enter the LINK SCREEN mode from the MAIN MENU:

1. Highlight the LINK SCREEN feature with the arrow keys.
2. Type a screen number you wish to link.
3. Press the <SELECT> key.

Entering Links

s are entered at the cursor position by typing the command on the blue Link Bar at the bottom of the screen, followed by the variable name, followed by any qualifying switches (explained below).

Function Keys

The dark gray keys along the top of the keyboard are referred to as F1 through F20. On the optional PAINT/LINK keypad, these will be labeled according to their function. These LINK SCREEN Function keys are used to assign dynamic attributes and switches to the graphic links.

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F17	F18	F19	F20		
/D	/F	/S	/E	/W/H	N	C	Y	M	B	G	R	W	K	Help	Do	/G	/L	/T	/K/C

Workstation Keypad Function Keys

Link Switches We refer to the attributes assigned by the Function Keys as "switches" or "qualifiers". Some keys provide multiple switches. Keys F1 through F20 provide switches to set colors, flashing, etc.

Switches appear in the form /S:n where S represents the type of switch and n is a value, if appropriate. You can type switches in by

10 - Link Screen

hand or use the associated switch keys (if applicable) that do the typing for you.

Below, each Function key is shown, along with a short description of the switch associated with this key. In the text that follows, each of these switches is described in more detail.

Key	Switch	Switch Name	Description
F 1	/D	Direction	set link direction
F 2	/F:	Flash	flash when Logical variable is on (or off)
F 3	/S:	Start	set minimum value to n
F 4	/E:	End	set maximum value to n
F 5	/W:	Width	set field width of n (number of characters high on Trend links)
(press twice) F 5	/H:	Height	set field height of n
F 6	N	No Color	set no color change
F 7	C	Cyan	set color
F 8	Y	Yellow	set color
F 9	M	Magenta	set color
F10	B	Blue	set color
F11	G	Green	set color
F12	R	Red	set color
F13	W	White	set color
F14	K	Black	set color
F17	/G	Log	log operator changes
F18	/L:	Lock	set security level for data changes
F19	/T	Top	Pixel Trend (if equipped with VRW viuram) Display top of bar (if VRC viuram)
F20	/K:	Key	link logical variable to function key
(press twice) F20	/C:	Cursor	position cursor with function key
TAB	/Q	Tab	moves cursor to links with TAB key
	/A:	Average	number of samples to average for trend
	/N:	Number	Number of characters to the right Number of trend bars (if VRC viuram)
	/Z:	Sample Time	sample time for trend
	/P:	Value/Color Point	Allows cursor access on color link
	/I:		Index subscripted links - CRISP/SP only.

Direction The /D: switch, when followed by UP, RT, LT, DN (, , <, or > in CRISP/SP), specifies the Linkdirection of a link. The direction key toggles you around the four possible link directions of up, down, left and right and displays these directions with the , , <, and > symbols. You normally do not specify the direction except when you change the default direction. The default directions are:

- Color : left to right.
- Numeric : left to right.
- Bar or Trend : direction of the bar or trend established in Paint Screen Mode.

The Direction Switch applies to all links.

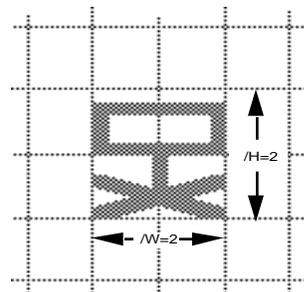
Decimal **CRISP/SP ONLY:** The /D: switch, when followed by a number, refers to the number of digits following a decimal point, in a number substitution field. For example, /D:4 would mean that four digits should follow a decimal point when the linked value is displayed (e.g. 233.4444).

Flash The /F: switch flashes a link when the logical variable has the value of 1 or 0. The <F2> key types the switch /F: and you would type a 1 or 0 to designate the logical value that invokes flashing. The LinkFlash Switch is incorporated into a color link. If flashing without color change is desired, use the <NO COLOR> key for color specifications. Only the foreground color flashes.

Start The /S: switch establishes a Linkstarting value, or lower limit, for a numeric, bar or trend link. This prevents the operator from typing in a value below that specified by START (except when /S and /E are equal). If a bar or trend link, the /S: switch sets the minimum scale. The <F3> key types the switch /S: and you must type the starting value in numeric form.

End The /S: switch establishes a Linkhigh limit (Linkend value) for a numeric, bar or trend link. If Starting and Ending value are equal, there is no operator limit on a numeric link. In the case of a Bar or Trend, the Start and End switches should never be equal. The <F4> key types the switch /E: and you must type the ending value in numeric form.

Width/Height The /W switch specifies the width of a linked field and /H specifies the height. Together they define the area that is to be linked.



Symbol is 2 x 2 (characters)

To specify the number of decimal places in a numeric link you must enter the link as follows: /W:5.3. In this example, the numerical field is five characters wide, including a decimal point and there are

10 - Link Screen

three digits following the decimal point (e.g. 1.345). If no /W value is specified the Linkfield width is automatically specified for you in numeric, bar and trend links based on the number of symbols typed to the screen. Assigning a width value of 0 to a numeric link will link the field but will display only the static portion of the graphic symbol.

For color links, if no width is specified, a default width of 1 is assumed.

Press the <F5> key once and the /W: switch will be typed, press twice and the /H: switch is typed.

Color Function Keys F6 through F12 cause Linkcolor qualifiers to be assigned to links. When the key is pressed, the color is set to the link. On the Paint/Link keyboard, these keys are labeled N, C, Y, M, etc.

F6 - N - No Color
F7 - C - Cyan
F8 - Y - Yellow
F9 - M - Magenta
F10 - B - Blue
F11 - G - Green
F12 - R - Red
F13 - W - White
F14 - B - Black

The <N>, no color key is used where you do not want to display color changes for certain states. i.e., multiple links on the same symbol where you change colors only on the true condition of the logical variables.

Log Logs operator interaction. When included in a numeric link, an automatic Link change logging message will print out on the designated printing device (CRISP\$TT in CRISP/32) whenever the variable is changed from the Color Workstation. A typical logging message is shown below. change values logging

```
Process DBASRV modified Intermediate OVEN:CHECK_CRTLOGDEST on 14-FEB-1989 15:32:45.52
from <True> to <False>
```

```
$
```

Lock The /L: switch locks individual links from being changed in the DISPLAY mode. When locked, the cursor will not even come to rest on the linked value. To lock a link, include /L:n in the switch list where n is a number whose value is greater than the Current

Security Level of the Workstation (set on the SYSTEM PARAMETERS screen). Bit 1 of the Locking Mask (see SYSTEM PARAMETERS) must be SET for the /L: switch to work. Pressing the <LOCK> key causes /L:4 to be written to the link. See also SECL in the User-Defined Function keys section, later in this chapter.

Top If the Color Workstation is equipped with the VRC (standard) viuram, the /T: switch causes a bar graph to be displayed with only the Linktop line of each field shown.

If the Color Workstation is equipped with the VRW (pixel) viuram, the /T: switch specifies that the link is to be a pixel trend, where each pixel represents one unit.

Key/Cursor The /K (Key) switch links a Linkfunction key to a logical, real or integer variable. When the function key is pressed during the Display Screen mode, the variable's value is made equal to 1.

It is the applications programmer's responsibility to set the variable's value back to 0. However, if the function key number is specified as a negative number, the variable's value is made equal to 1 as long as the key is held down. When the key is released, the variable's value is made equal to 0.

During Link Screen mode, the <K /C> key produces the /K: switch. You then must type in a key number. For location of the key numbers, refer to the Appendix.

If pressed again, the /C: switch is produced and will jump the cursor to the linked position in Display Screen mode when the specified key number is pressed.

Index **For CRISP/SP only:** The numeric value of this link becomes the Linksubscript value for all other links on this same spot. For example, if you want to link variable (X) on to the screen, where variable is a subscripted variable, and X is an integer, then first link variable (O) onto the screen. On the same location, link the variable X with the /I switch. The dynamic value of X will determine the subscript value of the variable.

Value/Color Point The <ON> and <OFF> keys enter the /1: and /0: switches respectively. These switches are used in conjunction with the color and flash switches.

This switch, when appended to a color link, allows:

- The to move to the color link position.

10 - Link Screen

- The modification of the value of the linked logical variable with the <ON> and <OFF> keys.
- The graphic display will not display the numeric value of the logical variable but will display the color changes.

For example, if the following link is entered:

```
ENTER VARIABLE/P /1:GK /0:RK /W:1
```

The graphic symbol will turn green with a black background when VARIABLE is true, red with a black background when VARIABLE is false, and the operator will be able to place the cursor on the linked symbol and change its value in the database by typing a 1 or 0 (or using the On or Off keys).

Tab The /Q switch is generated by the <TAB> key. When the <TAB> key is pressed during Display Screen mode, the will jump to each link which contains this switch in left-to-right order.

Link Screen Functions

The keys in the right-most keypad perform functions during the LINK SCREEN mode. Functions include entering, deleting and finding links.

Gold Key



		FindNxt Find	Del L UDel L
Page	Sort	Store Recall	Clear
		Auto Recall	
		Screen Desc.	Enter
Wildcard		Reset	Subs

GOLD Pressing a function key will give you the function labeled on the top of that key. The <GOLD> key followed by any key in the keypad

gives you the bottom function of that key (shown highlighted in the above figure).

If you press The <GOLD> key by mistake, you can cancel the gold function with the <GOLD> key or the <RESET> key.

Gold / Select The <GOLD><SELECT> sequence of keystrokes will make a Screenhard copy of any hard copyscreen. The print destination is selected via the CRTPRT.COM file described in the Appendix to this manual. Make sure your HARD COPY FORMAT on the SYSTEMS PARAMETER Menu is properly selected for your printer.

GOLD Find The Find/Findnext feature allows you to search through the link table for links whose variable name contains an alpha-numeric character or characters that you wish to search for. The <GOLD> <FIND> sequence of keystrokes prompts you to type in a character string to search for. The <RETURN> key will then place the cursor at the first link in the link table whose name contains the string. The matching string will be displayed in red.

Refer to <GOLD><SUBS> for a search and replace function.

FindNxt The <FIND NXT> key will find subsequent links which also contain the model found in the previous <GOLD> <FIND> sequence.

Del L The <DEL L> key will Linkdelete a link which is displayed in the blue Link Bar.

GOLD UDel L The <GOLD> <UDEL L> sequence will Linkundelete or insert the last deleted link at the current cursor position.

Page The <PAGE> moves you to the next screen (in numerical order according to the Screen Directory). When you exit a screen via the <PAGE> key, all changes to the screen made during that session are saved.

10 - Link Screen

Sort The <SORT> key resorts the links so that they are accessed in left-to-right, top-to-bottom order. This may be needed after cut/paste operations.

Store To avoid repetitive typing, you can store and recall a link or switches of a link using the following procedure.

1. Type the link or switches you wish to store.
2. Press the <STORE> key.
3. Press the <GOLD> <RECALL> keys to display the stored link under the blue link bar as if you had typed it.
4. A subsequently stored link or switch will replace the previously stored link or switch.

GOLD Recall The <GOLD> <RECALL> sequence of keystrokes will linkrecall a link or portion of a link that was saved with the <STORE> key.

GOLD Clear The <GOLD> <CLEAR> key sequence removes all links from the screen.

Auto Recall The <AUTO RECALL> key has the same function as the <RECALL> key with a <RETURN>.

Screen Desc. Type a screen number on the bottom line then press the <SCREEN DESC.> key. A menu is displayed with the current screen description from the SCREEN DIRECTORY. You can modify this by entering a 32-character descriptive name for the on the bottom line. This name is inserted into the SCREEN DIRECTORY.

You also use the SCREEN DESC menu to assign or change the a 48-line pair of screen displays. Type a screen number on the bottom line then press the <SCREEN DESC.> key. Using the arrow keys to select the top or bottom screen, then enter the screen number on the bottom line and press <RETURN>.

Wildcard The <WILDCARD> key produces the "/"* function which copies all of the switches currently showing on the blue Link Bar. If the "/"* switch is followed by one or more regular switch specifications, the switches copied by the "/"* are selectively overridden by the explicit

switches which follow it. The "wild-card" function is performed by the <WILDCARD> key.

GOLD Reset The <GOLD> <RESET> key sequence cancels the <GOLD> key.

Enter The <ENTER> Key allows you to enter a new link using the following procedure.

1. Press the <ENTER> key.
 2. The word "ENTER" will appear beneath the blue Link Bar.
 3. At this point you can type the variable name you wish to link to together with any of the switches.
 4. The <RETURN> key will process the variable name and the switches.
-

GOLD Subs The <GOLD> <SUBS> key sequence allows you to search for, and replace character strings in the variable names linked to the screen.

For example, if you had a screen where a portion of all the link names contained TIC1 and you wanted to change all of the links to TIC2, you would do this as follows:

1. Store the number 2 : 2 <STORE>
2. Find the number 1 : <GOLD> <FIND> 1 <RETURN>
3. Substitute 2 for 1 : <GOLD> <SUBS>. The number 2 will be substituted for 1 in the link name currently displayed in the blue bar at the bottom of the screen, and the next link in the link table containing a 1 in the name will be displayed.

The <GOLD> <SUBS> action works only on the currently displayed link. Therefore, you must repeat this sequence until all of the substitutions you wish to make are completed.

ON/OFF Color Switch Attributes are used in association with the <ON> and <OFF> keys to display foreground and background color changes on a symbol. Color changes are linked to logical variables only.

DO Any portion of an existing link may be changed with the <DO> key.

To modify a link:

1. Press the <DO> key.

10 - Link Screen

2. The word "MODIFY" will appear beneath the blue Link Bar.
 3. At this point you can retype the Database name followed by a colon (:) or the variable name or any of the switches.
 4. The <RETURN> key will replace the old variable name and/or switches with the new.
-

GOLD letter The <GOLD> key, followed by a letter will Linkremove the corresponding switch from the link. Refer to the list below.

Sequence	Remove this switch
<GOLD> <F>	/F: FLASH
<GOLD> <G>	/G: LOG
<GOLD> <H>	/H: HEIGHT
<GOLD> <I>	/I: INDEX
<GOLD> <L>	/L: LOCK
<GOLD> <T>	/T: TOP
<GOLD> <K>	/K: KEY
<GOLD> <C>	/C: CURSOR
<GOLD> <N>	/N: NUMBER OF BARS FOR TREND
<GOLD> <A>	/A: AVERAGE NUMBER OF SAMPLES FOR TREND
<GOLD> <Z>	/Z: TIME PERIOD FOR TREND
<GOLD> <Q>	/Q: TAB
<GOLD> <P>	/P: LOGICAL VALUE/COLOR POINT

Invalid Links

If an error is made in linking, the link will be marked "INVALID". For example, if you entered one or more links whose name did not appear in the database, or if the name was greater than 31 characters, or if the width of the link was off the screen, the following would take place:

When a screen is displayed on the workstation in the DISPLAY SCREEN mode and the screen contains one or more invalid links, a link error report is displayed on the screen listing the link's variable name, line and column number of the link position, and the type of error (i.e., undefined in database). Any key will then continue to run the screen with the errors. The <SELECT> key will print the link error report on the printer and then continue to run the screen with the errors. Also, each erroneous link would contain the ~INV notation directly after the variable type in the link. If you correct the link, the ~INV message will be removed only after you re-display the screen in the DISPLAY SCREEN MODE.

If you get an INVALID link message, you should check the DATABASE NODE TABLE to be sure that the database is enabled and AVAILABLE.

User-defined

Function keys In LINK Mode, the <COMPOSE CHARACTER> key takes you into a fill-in-the-blanks screen that allows you to Function Keydefine a Function key or an Annunciator Panel key. This allows you to a screen on the workstation via the Function key during Display Screen mode.

10 - Link Screen

You also set up the key associations for the <PREV SCREEN>, <NEXT SCREEN> and <HELP> keys on the middle keypad, specify hard-copy format and default database assignment.

Below is shown the screen that is used to set up user-defined keys.

```
KEYLINK DETAIL FOR SCREEN OR HELP PAGE 1

KEY SCR KEY SCR KEY SCR KEY SCR KEY SCR KEY SCR KEY SCR
1  -- 17  -- 33  -- 49  -- 65  -- 81  -- 97  -- 113  --
2  -- 18  -- 34  -- 50  -- 66  -- 82  -- 98  -- 114  --
3  -- 19  -- 35  -- 51  -- 67  -- 83  -- 99  -- 115  --
4  -- 20  -- 36  -- 52  -- 68  -- 84  -- 100  -- 116  --
5  -- HELP -- 37  -- 53  -- 69  -- 85  -- 101  -- 117  --
6  -- 22  -- 38  -- 54  -- 70  -- 86  -- 102  -- 118  --
7  -- 23  -- CHAR -- 55  -- 71  -- 87  -- 103  -- 119  --
8  -- 24  -- DFDB  -- 56  -- 72  -- 88  -- 104  -- 120  --
9  -- 25  -- SECL  -- 57  -- 73  -- 89  -- 105  -- 121  --
10 -- 26  -- 42  -- 58  -- 74  -- 90  -- 106  -- 122  --
11 -- 27  -- 43  -- 59  -- 75  -- 91  -- 107  -- 123  --
12 -- 28  -- 44  -- 60  -- 76  -- 92  -- 108  -- 124  --
13 -- 29  -- 45  -- 61  -- 77  -- 93  -- 109  -- 125  --
14 -- 30  -- 46  -- 62  -- 78  -- 94  -- 110  -- 126  --
PREV -- 31  -- 47  -- 63  -- 79  -- 95  -- 111  -- 127  --
NEXT -- 32  -- 48  -- 64  -- 80  -- 96  -- 112  -- 128  --
```

The arrow keys move the cursor around the screen. Also, using any of the Function keys will place the cursor at its associated screen number. The key numbers correspond to the function keys. The screen number is typed in by you. Although the screen displays 128 slots, there are actually only 35 function keys which can be re-defined (function keys 1 through 38). Refer to the Appendix of this manual for the location of these function keys. The unusable key numbers appear in dark blue are reserved to accommodate custom keyboards. Function keys 65 through 128 are for the annunciator panel.

You also use this screen to set up the key associations for the <PREV SCREEN>, <NEXT SCREEN> and <HELP> keys on the middle keypad. Type the screen number in the field next to "PREV" to assign a previous screen. Do the same for "NEXT" and "HELP".

A final function of this screen is to specify certain default settings for each screen.

CHAR Allows you to select the kind of hard-copy print-out that you will get when a <GOLD><SELECT> key sequence is issued. If this field contains a zero (--) then hard copies are printed using the default setting of the SYSTEM PARAMETERS feature of the UTILITY MENU. If this field is non-zero, then a full-graphic hard copy will be sent to

the printer (printer must be an LA-75, LA-50, or another printer capable of printing sixel graphics.) For more details, refer to the HARD COPY FORMAT description in the SYSTEMS PARAMETER section of this manual.

DFDB This specifies the default database. Press the <REPAINT> key and a list of available databases will be provided. Select the number of the database that you want to be the default database for this screen. Enter this number in the DFDB field. Any links you enter without specifying the Database ID will automatically be prefixed by the default Database ID.

SECL This allows you to prevent this screen from allowing data changes in the DISPLAY mode. To lock this screen the value entered in the SECL field must be equal to or greater than the Current Security Level set in the SYSTEMS PARAMETER screen. (Refer to the "MODIFICATION SECURITY LEVEL" in the SYSTEMS PARAMETER section of this manual.)

Individual links may be locked using the /L: link (refer to the LOCK discussion earlier in this chapter).

You can user-defined keyscopy the function key specifications from another screen by typing the command:

GET nn

where nn is the screen number from which you want to copy the key specifications.

The <EXIT> key returns you to the Link Mode.

You can set up default user-defined keys by choosing a screen which will store default keylinks, entering the keylinks as described above, then going to the SYSTEMS PARAMETER menu and assigning that screen as the DEFAULT SCREEN. Any keylink entered on a screen will supersede the default keylink for that same key.

Resolving Links

When a screen is first brought-up in the Display mode after compiling the database or linking the screen, the Color System Linkresolves the links with the database as follows:

Compares or "Resolves" the links on the screen to the database to insure that the linked variables do reside in the database.

If the screen contains links that it cannot resolve, an error report is printed to the screen detailing each invalid link.

10 - Link Screen

In addition to the <NEXT> and <PREV> keys, and the DISPLAY SCREEN feature of the MAIN MENU, this special link will allow you to move to various screens when linked to a number either statically drawn in the paint screen mode or substituted from a database variable.

To set up one of these links, use the following procedure.

1. Type the desired screen number (as listed in the SCREEN DIRECTORY) onto the screen (in the PAINT SCREEN mode).
2. Then, in LINK mode, enter the following link on the leftmost number you just painted.

<ENTER> # </W:> n

Where,

- <ENTER> is the Enter key
- # (<SHIFT> <3>) is a character reserved for this use.
- </W:> is the width switch, and
- n is the number of characters to link to.

This type of link is especially useful on a user configured screen menu or directory.

Example of a user configured screen menu;

```
2  OVERVIEW
3  GROUP
4  LOOP DETAIL
```

The Screen Menu Display is on screen number 1. The Overview display is on screen number 2. Entering Screen 1 in the Link Mode, the # link would be entered on the number 2 with a width of 12. In DISPLAY MODE, the cursor would underline "2 OVERVIEW". If the <SELECT> key is pressed, display 2 would be forced up on the workstation. It is the numeral "2" that associates the link with the screen. The name "OVERVIEW" is just included in the width of the link so that the cursor underlines the entire selection and makes for better visibility for the operator.

Using the # Link on a dynamic number:

First, place a diamond numeric substitution field on the screen in the PAINT SCREEN mode. Then, in LINK mode, link the dynamic variable to the diamond. Next, enter the # link on the leftmost numeric field of the number you just linked. Therefore, using the # Link on a dynamic number requires two links in one spot; the dynamic variable link and the # link.

How to Link Screens

Once you enter the LINK SCREEN mode, you are ready to link variables from the database to the characters that you have established on the screen during the PAINT SCREEN mode.

A blue link bar appears at the bottom of the screen.

If there are no links on the screen, it will display the message:

"ILLEGAL LINK TYPE OR NO LINKS PRESENT"

If there are links on the screen, the cursor will appear on the spot where the first existing link appears and the parameters of the first existing link will be displayed in the blue Link Bar.

You can position the cursor to all other existing links by touching the <NEXT SCREEN> or <PREV SCREEN> keys. (These keys have the auto-repeat feature.)

Use the arrow keys to position the cursor to the place where you wish to enter a new link.

How to link a variable character on the screen

from the database to a

There are four basic types of links:

- 1) A numeric link which displays the value of a number (real or integer) or the value of a logical (or bit) type variable (0 or 1), or a String variable.
- 2) The second type is a color link. Color changes associated with logical-type variables are normally linked to symbols (such as valves or pumps) or to prompting messages (for example, turn an alarm message red).
- 3) The third type is a bar link for indicating level on graphic displays or for process variables, setpoints and outputs on controller faceplates.
- 4) The last type is a trend link for historically trending numerical (real or integer) data.

Let's assume that you have already painted a screen with a valve, a numeric field with three places to the left of the decimal and two places to the right (XXX.XX), a bar and a trend. The following four examples show how to link all four types of graphics to the data base.

Linking a Numeric Field

To link to a Numeric field, use the following procedure.

- Position the cursor with the arrow keys to the leftmost character of the numeric field.
- Press the <ENTER> key. (You will notice that the word ENTER has appeared under the blue Link Bar.)

10 - Link Screen

- Type the name of the variable that you wish to link. Let's use the variable PI101 which is assumed to have been declared in the database as a real number. (What you type is displayed directly after the word ENTER under the blue Link Bar. Use the <DELETE> key if you make a mistake.)
- Press the <RETURN> key.

Your link now is entered and the blue Link Bar reads: PI101 FLT /D:>
/W:6 /D:2 /S:0. /E:0.

Where:

- PI101** is the variable name
- FLT** means it is a real (or floating point) type link (*returned by CRISP*)
- /D:>** the link is in the right direction
- /W:6** there are six characters linked to the variable PI101
- /D:2** there are two decimal places
- /S:0** the starting range is 0.
- /E:0.** the ending range is 0.

All of the above parameters of the link which follow a "/" character are called "switches". These switches can be added, deleted or modified by the user through use of the function keys described above.

Linking a Valve

To link to a valve symbol, use the following procedure.

- Position the cursor with the arrow keys to the leftmost character of the valve symbol.
- Press the <ENTER> key. (You will notice that the word ENTER has appeared under the blue Link Bar.)
- Type the name of the variable that you wish to link. Let's use the variable XCV101 which is assumed to have been declared in the database as a digital output. (What you type is displayed directly after the word ENTER under the blue Link Bar. Use the <DELETE> key if you make a mistake.)
- On the middle keypad, touch the <ON> key, then two color keys. (try Green and Black). This means that when XCV101 is on or true, the valve will turn the foreground and background colors of the two color keys you have selected respectively. (Green with a Black background)
- On the middle keypad, touch the <OFF> key, then two color keys. (try Red and Black).

- This means that when XCV101 is off or false, the valve will turn the foreground and background colors of the two color keys you have selected respectively.
- Touch the Width key and then type the number 2 (assuming your valve is two characters wide).
- Touch the <RETURN> key.

Your link now is entered and the blue Link Bar reads:

XCV101 COL /D:> /W:2 /0:RK /1:GK

Where:

- XCV101** is the variable name
- COL** means it is a color link (*returned by CRISP*)
- /D:>** the link is in the right direction
- /W:2** there are two characters linked to XCV101
- /0:RK** when XCV101 is false, the valve will be red with a black background
- /1:GK** when XCV101 is true, the valve will be green with a black background.

Linking a Bar

To link to a BAR symbol, use the following procedure.

- Position the cursor with the arrow keys on the direction character of the bar. (Assume it is a vertical bar 10 characters high)
- Press the <ENTER> key.
- Type the name of the variable that you wish to link. Let's use the variable PI101 again.
- You now must give the bar a range.
- Press the Start key (F3) and type a number to set the minimum value of the bar (use 0 for this example).
- Press the End key (F4) and type a number to set the maximum value of the bar (use 60 for this example).
- Press the <RETURN> key.

Your link now is entered and the blue Link Bar reads:

PI101 BAR /D:^ /W:10 /S:0. /E:60.

Where:

- PI101** is the variable name
- BAR** means it is a bar type link (*returned by CRISP*)
- /D:^** the link is in the up direction
- /W:10** there are ten characters in the bar

10 - Link Screen

/S:0. the starting value is 0.
/E:60. the ending value is 60.

Linking Trends

There are two methods of defining the variables to be trended and their trending parameters. One method is to specify a trend while in the Link Screen mode. The second method is to utilize a "jobname.TRC" file which contains the variable to be trended and its parameters. Either of these two methods can be used together or exclusively. Their differences are discussed below.

Trending Operations

Once a trending operation begins, the trending continues, in memory, even after the screen with the trend link is no longer displayed. The number of trends that can be tracked continuously is set, by default, at 32. Trends that are not being tracked in memory will start trending upon redisplay of that trend screen. To change this limit from 32 to a greater number, you must create a "sample.TRC" file as described below.

Specifying a Trend the sample.TRC file

The file "jobname.TRC" resides in the CRISP\$CWS directory. When a workstation process begins, it executes the command file CRISP\$CWS:STARTTND.COM. This starts the trend process, "CRISP\$CRT099". STARTTND.COM also contains the command line:

```
DEFINE /PROCESS TRENDFILE CRISP$CWS:SAMPLE.TRC
```

The purpose of this line is to "point to" the "SAMPLE.TRC" file, which contains certain trend parameters, as explained below. You can rename "sample.TRC" to any name you want and/or create a Trend file by that name. If you create a new .TRC file you must restart the process (type: "@ CRISP\$CWS:STARTTND" at the system prompt).

Trends that are specified in the "sample.TRC" file operate the same as ones that are linked for display on a screen.

A typical "sample.TRC" file is shown below:

```
40,15  
N:VARIABLE1,1,2  
N:VARIABLE2,5,10  
N:VARIABLE3,10,20,L
```

Where:

40: Specifies the number of trends to be held in the list of most often used trends. If no number is specified, the default is 32. This number is specified in multiples of 8.

- 15:** Is the number of pixel trends. If you don't have the pixel trending option, specify 0.
- N:** Is the node number of the logic machine which contains the database JOB.DBC where the variable resides. If not specified, a default of 0 is assumed and the system assumes that the database resides at the Color Workstation.
- VARIABLE1,1,2:** A variable to be trended. The following numbers 1 and 2 are equivalent to the Link Screen trend switches of /Z: and /A: which specify how often to sample, and the number of samples to average together, respectively. When linking a trend that has been specified in the "sample.TRC" file, the /Z: and /A: switches must match those parameters in the "sample.TRC" for the system to recognize them as continuously trended variables.
- L** specifies a pixel or long trend.
-

11 - Paint Help Pages

Description

Two types of HELP pages are provided with your system: *System*, and *User* HELP. The System HELP pages are supplied with the Color Workstation (CRISP\$CWS:SYSHELP.CWS) and provide information about the use of your CRISP System, specifically, your Color Workstation. This HELP file is displayed whenever the HELP key is pressed from the MAIN MENU, or the PAINT or LINK SCREEN modes. This file may not be altered by you.

The User HELP pages are provided so that you may create customized, specific to your application of the CRISP System. User HELP pages are displayed whenever the HELP key is pressed from the DISPLAY SCREEN mode.

In order for you to use the User HELP file facility you must first edit the User HELP pages in the PAINT HELP PAGES mode.

Create HELP pages

To access the PAINT HELP PAGES mode:

1. On the MAIN MENU, highlight the PAINT HELP PAGES feature.
2. Type a screen number and press <SELECT>.
3. Paint the screen as you normally would any other screen in the SCREEN PAINT mode.
4. If you want a NEXT or PREV page, press the <COMPOSE CHARACTER> key and type the HELP screen numbers in the appropriate fields.

P IMPORTANT: You cannot link HELP pages to database variables.

Link HELP page to a Display screen;

After you have created a HELP page, you must link that HELP page to one or more Display screens using the following procedure:

1. Bring up the Display screen in the LINK SCREENS mode.
 2. Press the <COMPOSE CHARACTER> key. This will display the KEYLINK DETAIL screen.
 3. Enter the HELP page number in the HELP field
-

Multiple HELP files;

Each Color Workstation can have its own HELP file. You can create multiple HELP files as follows:

1. Use the VMS COPY command to create one or more additional HELP files by copying either

11 - Paint Help Pages

- [CRISP.CWS]SYSD.CWS (the system display file) or [CRISP\$CWS]HELP.CWS (the user HELP file).
- Rename the file(s).
- For each Color Workstation, edit the START command file, CRISP\$CWS:STARTCWSnnn.COM, where 'nnn' is the Color Workstation process number. Change the \$DEFINE statement that calls out CRISP\$CWS:SYSHELP.CWS to call out the new HELP filename.
- STOP and RESTART CRISP.
- Edit the user HELP file in the PAINT HELP SCREENS mode as described above.

HELP files on a

CRISP/SP System You must have the file HELP.CRT in your account number. If you do not have this file, you can create it from the system console with the following command:

```
PIP =[77,11]HELP.CRT
```

HELP.CRT can support up to 32 HELP displays. (You can expand the number of help pages with the Modify Display File Size feature of the Utility Menu.)

The HELP screens are different from other graphic screens in that:

- You can only use character set CM00 to build a help page.
- You cannot link a help page except for NEXT and PREV screens. The <GOLD> <COMPOSE CHARACTER> sequence of keystrokes brings up the keylink screen. You can link function keys, the <PREV SCREEN> key and the <NEXT SCREEN> key to force other help pages.

Swap HELP pages

CRISP/SP Only: The <DO> key allows you to replace the current HELP page with a normal screen from your CRT file or with another HELP page. Press the <DO> key and you will be prompted with the following message:

Enter:

```
"Hnnn<RETURN> for another help page or  
"Snnn<RETURN> for a normal screen picture.  
<CTRL> <C> or EXIT will restore the current page
```

12 - Utility Menu

Description

Accessing the UTILITY MENU from the MAIN MENU brings up another "menu" screen from which you can select several options. These options are selected using the arrow keys just as you did in the MAIN MENU.

Index to Info.

Each option from the UTILITY MENU is described in detail in one of the following sections of this manual, as shown in the chart below.

Function	page	Description
13 - COPY SCREENS	53	Allows the user to copy one or more screens from one file to another.
14 - REPORT TREND REGION CONTENTS	55	Provided details regarding the trend region.
15 - RESOLVE SCREENS (W/ REPORT FILES)	57	Allows the means to link all screens after a compile.
16 - SYSTEM PARAMETERS	59	Provides access to numerous system-wide characteristics which may be set up.
17 - READ DATE-TIME FROM HOST	67	Allows you to set the local clock based on a remote CPU.
18 - EXIT THIS CRT PROCESS	69	Terminates the CRT process running this Color Workstation.
19 - COPY CHARACTER MENUS	71	PDP-11 ONLY. Provides access to several character sets.
20 - ENHANCED GRAPHICS TEST	73	Tests the CRT.
21 - STANDARD GRAPHICS TEST	75	PDP-11 ONLY. Tests the CRT.
22 - KEYBOARD REDIRECTION TABLE	77	CRISP/SP ONLY. Allows you to specify another keyboard.
23 - ACCESS MCR	79	PDP-11 ONLY. Provides access to MCR and PIP commands.
24 - SCREEN DETAILS	81	Provides information about screen-related items for any screen.

12 - Utility Menu

Notes:

13 - Copy Screens

Description

The COPY SCREENS utility allows you to copy existing screens or character menus. To copy screens either the source or destination CRT file must be in the workstation where the COPY SCREENS is issued.

The example below shows how to use the COPY SCREENS utility to copy three screens from one screen file to another. Copying one character menu to another works in the same way.

```
11:43:23          SCREEN COPY UTILITY          10-MAY-88

SOURCE FILENAME OR NODE      : SYO:CDEMO.CRT
SOURCE STARTING NUMBER      : 1
SOURCE ENDING NUMBER        : 3

DEST FILENAME OR NODE       : SAMPLE.CRT
DEST STARTING NUMBER        : 5
DEST ENDING NUMBER          : 7

NUMBER OF RECORDS TO COPY   : 3

SET TO "GO" TO START COPYING : WAIT
```

Screen Fields

Below each field on the SCREEN COPY UTILITY screen is explained.

Source Filename or Node

Enter the source file name or node number from which you want to copy screens or press <RETURN> to accept the default file name (jobname.CRT).

Source Starting Number

Type the first screen you want to copy from.

Source Ending Number

This field is computed from number of records to copy.

Dest Filename or Node

Enter the destination file name or node number to which you want to copy screens or press <RETURN> to accept the default file name (jobname.CRT)

13 - Copy Screens

Dest Starting Number

Enter the first destination screen number to copy displays into. You can copy more than one screen at a time or press <RETURN> to select the default value of one screen.

Number of Records To Copy

Source ending number and destination number are automatically computed.

Set to GO to Start Copying

When copying screens across the network, supply the DECnet area and node number. Screens will only be copied to/from the CRT file running on remote nodes. Screens can be copied to/from non-running CRT files in a local Color workstation.

14 - Report Trend Region Contents

Description

This utility reports information on the . This information is given in tabular format as shown below.

TREND REGION REPORT ON CRT12 15-FEB-89 14:29

TRO	DOFF	STA	AGE	Z	A	SEQ	TYP	DB:NAME
60S	DC0	P	3731	1	1	172	INT	TRAIN1:AI100_EU
COS	FOO		3276	1	1	257	TIM	TRAIN1:BLINK_TIME
120S	1040	ID	0	0	0	0	UND	:
180S	1180	ID	0	0	0	0	UND	:
1E0S	12C0	ID	0	0	0	0	UND	:
240S	1400	ID	0	0	0	0	UND	:
2A0S	1504	ID	0	0	0	0	UND	:
300S	1680	ID	0	0	0	0	UND	:
360S	17C0	ID	0	0	0	0	UND	:
3C0S	1900	ID	0	0	0	0	UND	:
420S	1A40	ID	0	0	0	0	UND	:
480S	1B80	ID	0	0	0	0	UND	:
4E0S	ICC0	ID	0	0	0	0	UND	:
540S	1E00	ID	0	0	0	0	UND	:
840L	2800		2734	1	1	172	INT	TRAIN1:AI100_EU
8A0L	3000		2734	1	1	257	TIM	TRAIN1:BLINK_TIME
900L	3800	ID	0	0	0	0	UND	:

Screen Fields

Each column on the screen contains information about your trends. These screen fields are described below.

- TRO** The trend region index. The "S" after the number indicates a Bar or Character Trend link, the "L" indicates a Pixel Trend link.
- STA** The station status. ID=idle AC=active P=permanent (specified in N.TRC file).
- AGE** How long the trend has been updated.
- Z** The trend sample rate in seconds.
- A** The number of averaged samples.
- SEQ** The database sequence number of the trended variable.
- TYP** The variable type being trended. (real, integer, logical.)
- DB** The database name in which the trended variable is defined.
-

14 - Report Trend Region Contents

Notes:

15 - Resolve Screens

Description

The two options from the UTILITY MENU: "RESOLVE SCREENS" and "RESOLVE SCREEN WITH REPORT FILES" are utilities which can be run after compilation of the database. Both cause the workstation to scan all screen links and attempt to locate (resolve) the variables linked to those screens.

Resolve Screens

The "RESOLVE SCREENS" option causes a link Linkerror reports to be logged to the system console, like this one:

```
$
Screen 15 had 1      link errors during resolving
```

Resolve Screens With Report Files

The "RESOLVE SCREENS WITH REPORT FILES" option causes link error reports to be logged to the system console, like the one shown below:

```
LINK ERROR REPORT FOR SCREEN 15
NAME                               LINE   COL   ERROR
TRAIN1:crtlog_mask16#             3     33   Undefined in database
```

You may assign any system device as the destination of this report. The destination device is determined by the LINKRPT: section of the command file CRTPRT.COM (See Appendix).

15 - Resolve Screens

Notes:

16 - System Parameters

Description	<p>Selecting the SYSTEM PARAMETERS feature brings up the SYSTEM PARAMETERS screen. This screen allows you to determine settings for each individual workstation.</p> <p>When you invoke the SYSTEM PARAMETERS feature, the first 6 parameters will appear in dark blue. The remaining parameters will appear in cyan, starting with DEFAULT SCREEN NUMBER. You can modify parameters appearing in cyan. To modify a parameter, highlight it in yellow (use the down arrow key to highlight a parameter) and press the <SELECT> key.</p>
Screen Fields	<p>You will be prompted to enter a response. In each case you will either use the arrow to the desired setting, then press the <SELECT> key to accept, or you may have to type an answer, like "Y" or "N" in response. On the following pages, each parameter is described in detail.</p>
Top Screen	<p>Displays the screen number screenlast displayed at the Workstation.</p>
Bottom Screen	<p>Displays the number of the second screen last displayed at the Workstation. This only applies if the last screen displayed was a 48-line screen. 0 indicates a 24-line screen.</p>
Last Screen	<p>NumberThe screenhighest screen number in the workstation graphics file.</p>
Number of	<p>Character MenusThe number of character menus in PAINT SCREEN Mode. The standard distribution allows seven menus. PDP-11 Systems ONLY.</p>
Number of	<p>User HELP ScreensThe last screen number in the HELP.CRT file. 0 indicates that there is no Help file.</p>
CRT File Revision	<p>LevelThe user workstation graphics file is automatically revised by the system upon up-grade of the Enhanced Graphics Package. This indicates which you are running under.</p>
Number of Display Save Slots	<p>This number is the number of Display Save Sets currently accessible.</p>
Default Screen	<p>NumberWhen the <SELECT> key is pressed from the MAIN MENU, this message will be displayed.</p>

16 - System Parameters

Prompt: Set a new DEFAULT DIRECTORY Screen.

Response: Any number from 1 to LAST SCREEN NUMBER.

Automatic Node, Timeout Removal

Allows you to set it up so that the "TIMED OUT" status messages are removed any time the MAIN MENU is displayed. When you SELECT this option, a message will appear which allows you to select between two options:

TIMED OUT NODES ARE RESET
TIMED OUT NODES ARE NOT RESET

Refresh Interval, Line Clock Ticks

Selects the time between CRT refreshes in multiples of line-frequency clock ticks. A response of 60 would set the refresh time to once per second in 60-Hz areas of the world. A response of 30 would set the screenrefresh time to once every half second, etc. Faster refreshes use more computer and communications time. Consequently, you should refresh the screen no faster than what is comfortable for the operator. A reasonable number is 50 which is a little faster than once a second.

Prompt: Set a new screen refresh interval.

Response: Any number between 2 and 240 to change the refresh rate.

Hard-Copy Format

Press the <SELECT> key to display a selection menu. This menu allows you to select between full graphics or alpha-numeric character screenhard copies. Full graphics (sixel) printing is supported when you have an LA-50, LA-75, or equivalent printer connected to the system. If you do not, you should select "Character Only" printing. In character only, non-printing characters will be substituted by the "+" character.

Refer also to the Key Link Detail Screen (accessible by pressing the <COMPOSE CHARACTER> key in the LINK SCREEN mode. A non-zero character in the CHAR field will override the SYSTEM PARAMETER setting.

Prompt: SELECT HARD COPY FORMAT
Full graphics Hardcopy
Suppress if FG=BG
Suppress Automatic Print Queuing
Suppress Annotation on Hardcopy

Response: You can select one *or more* of these options. To do this, use the arrow key to highlight one of the options; then select it by pressing the <ON> key. To deselect it, press the <OFF> key.

If Full Graphics is not selected, character mode printing is used.

When a hardcopy of the screen is printed, a temporary file is created and placed in the print queue. The file is deleted after printing. When you suppress automatic print queuing, a permanent file is created, which is not placed in the print queue.

Suppress if FG=BG means that the print copy will not print a pattern where the foreground and background are the same color but will print a contrasting pattern so that you can see the field.

Suppress Annotation on Hardcopy will suppress the time and date stamp and screen information that normally prints on the bottom of the hardcopy.

Default Cursor Movement

Selects the default movement when displaying a graphic screen. The choices are general or link-to-line. General movement means that the cursor can be moved to any area on the screen. Link-to-link means that the cursor will only move to each unlocked numerical field. After specifying the default, the alternate cursor movement is achieved by using the <SHIFT> <ARROW> keys.

Prompt: SELECT LINK-TO-LINK OR GENERAL CURSOR MOVEMENT.

Link-to-Link cursor movement
General cursor movement

Response: Select the preferred option using the arrow keys. Link-to-Link causes the cursor to move to each dynamically updated numerical field. General causes the cursor to move one character at a time.

Communications Device

Specifies which line of CRISPnet to use.

Prompt: SELECT NETWORK COMMUNICATION DEVICE

Use Both Network Devices
Use QNA0 only
Use QNA1 only

Response: Select QNA0 to use line 0 on CRISPnet. (If you don't have a redundant CRISPnet you would specify QNA0.) All DECnet activity should use QNA0. If you have a redundant CRISPnet you can force the Workstation to talk on line 1. Select both to use both lines. (On a redundant CRISPnet, you would specify B so that the Workstation could alternate networks).

Keyboard Type

Specifies the keyboard Keyboardnationality. This feature works similarly to the DEC VT220 keyboard type option.

Prompt: DEFINE KEYBOARD TYPE
ADVANCED WORKSTATION

16 - System Parameters

ADVANCED NUMERIC KEYPAD
 BASIC WORKSTATION
 NETHERLANDS
 BELGIUM (FLEMISH)
 FRANCE/BELGIUM

Response: Select the preferred option by using the arrow keys.
 Choose Advanced Workstation when using the Color Workstation.

Comm Timeout Time in 10 ms Ticks

Determines how long the Color Workstation will wait while trying to communicate to a node before it considers the node TIMED OUT.

Sequence Number

Radix Sequence numbers of database variables can be displayed in base 10, base 16, and base 8.

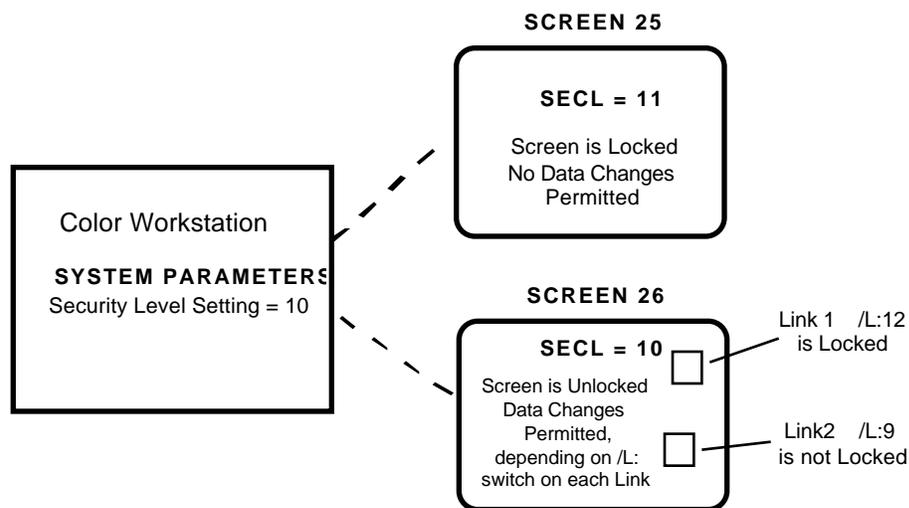
Prompt: SELECT RADIX FOR SEQUENCE NUMBERS
 Decimal
 Hexidecimal
 Octal

Response: Select the preferred option by using the arrow keys.

Modification

Security Level The security level of the Color Workstation can be any number. Its value is a relative value as compared to the other security settings in the system, of which there are three:

<u>Security Level</u>	<u>Specified by/in...</u>
WorkStation	SYSTEM PARAMETERS
Screen	KEYLINK DETAIL (LINK SCREEN mode)
Individual Link	/L: switch



Three values must be entered, like this: 10, 20, 10. These values represent, respectively,

- Starting Security Level - The security level which is assigned to the workstation upon startup. Make sure that this level allows you access where needed.
 - Maximum Security Level - An arbitrary number, provides a top limit to security level values.
 - Current Security Level - This number establishes the Security Level of the Color Workstation.
-

Display File location

The display file can be stored locally or on any node of CRISPnet. This parameter lets you identify the location of the Display File.

Prompt: SELECT DISPLAY FILE LOCATION

Display file = LOCAL

Remote are/node = 0.0

Active/Idle/Locked state = A

Response: Select the preferred option by using the arrow keys.

Locking Mask

From this screen, you can pick which features of the system will be locked with the LOCK/UNLOCK feature of the MAIN MENU.

Prompt: DEFINE LOCKING MASK

- 1 - Modifying of locked entries on screen
- 2 - All display editing
- 4 - DATABASE NODE TABLE menu selection
- 10 - MODIFY DATABASE menu selection
- 20 - reserved for future use
- 40 - EDIT HELP PAGE menu selection
- 100 - MODIFY SYSTEM PARAMETERS menu selection
- 200 - UTILITY menu selection
- 400 - Modify of lock parameters (this operation)
- 1000 - All modify of parameters from running screen
- 2000 - Hard copy print
- 4000 - Modify screen description

Response: Select the preferred option by using the arrow keys. The locking mask is an octal number. To provide the proper locking mask, add up the numbers under the column entitled "BIT" that appear next to the features you wish to lock out when the system is locked. Then type the number followed by the <RETURN> key. You will be placed back in the SYSTEM PARAMETERS screen. For example, the number 7777 would prevent operator access of all of the features listed above when the Color Workstation is locked. An explanation of each lockable feature is stated below:

BIT 1 - **Modifying of locked entries on screen.** All fields that are linked with the /L switch will not be cursor accessible.

BIT 2 - **All display editing.** You will not be able to paint or link a screen.

BIT 4 - **DATABASE-NODE TABLE menu selection.** Allows you to display but not change the DATABASE-NODE TABLE.

16 - System Parameters

BIT 10 - **MODIFY DATABASE menu selection.** Allows you to display but not modify the database for the DISPLAY/MODIFY DATABASE feature.

BIT 20 - **RESERVED FOR FUTURE USE.**

BIT 40 - **PAINT HELP PAGE menu selection.** Prevents access of the feature from the Main Menu.

PAINT HELP PAGE

BIT 100 - **MODIFY SYSTEM PARAMETERS menu selection.** Allows you to display but not modify the SYSTEM PARAMETERS feature from the UTILITY MENU.

BIT 200 - **UTILITY menu selection.** Prevents access of the UTILITY MENU feature from the MAIN MENU .

BIT 400 - **Modify of lock parameters (this operation).** Allows you to display but not change the locking mask.

BIT 1000 - **All modify of parameters from a running screen.** All variables are locked out to the operator as if each linked field was linked with the /L switch.

BIT 2000 - **Hard copy print.** Prevents the <GOLD> <SELECT> sequence of keystrokes from making a hard copy of the screen.

BIT 4000 - **Modify screen description.** Allows you to display but not change the SCREEN DIRECTORY feature of the Main Menu.

Unlocking Mask This feature is utilized in the same way as the Locking Mask feature. When the workstation is not locked, the features designated by the Unlocking Mask will be accessible to the operator.

Startup Lock Mask The Startup Lock Mask enables you to define a locking mask which will lock the system automatically in the event that the Color Workstation is re-started. This feature should be used in conjunction with the STARTUP PASSWORD feature.

Startup Password If you provide a Startup Lock Mask, you may also wish to specify a password to unlock the Color Workstation.

16 - System Parameters

Notes:

17 - Read Date-Time from Host

CRISP/SP only

Description

Allows you to set the date and time of the Color Workstation from any node of your choice. Since the CRISP System participates in a peer-to-peer communication scheme, the word "HOST" in this feature refers to the node of your choice.

Prompt: Enter two database letters or a database index specifying a logic machine from which to obtain the time-date

Response: The Database ID or the index number specified in the DATABASE-NODE TABLE. (The index number is the number appearing in dark blue in the left-most column of the DATABASE-NODE TABLE.)

17 - Read Date-Time from Host

Notes:

18 - Exit this CRT Process

Description

Selecting this option stops the CRT process running this workstation. This causes the process to stop immediately.

To restart the CRT process execute the USER_START_CWS procedure as follows:

```
@CRISP$EXE:USER_START_CWS
```

18 - Exit this CRT Process

Notes:

19 - Copy Character Menus

PDP-11 only

Description

The COPY CHARACTER MENUS functions in PDP-11 Systems **ONLY**. This utility allows you to copy existing character sets from existing screens.

The example below shows how to use the COPY CHARACTER MENU utility to copy character sets, from three display screens, from one screen file to another.

```
11:43:23      COPY CHARACTER MENUS UTILITY      10-MAY-88

SOURCE FILENAME OR NODE      : SYO:CDEMO.CRT
SOURCE STARTING NUMBER      : 1
SOURCE ENDING NUMBER        : 3

DEST FILENAME OR NODE       : SAMPLE.CRT
DEST STARTING NUMBER        : 5
DEST ENDING NUMBER          : 7

NUMBER OF RECORDS TO COPY   : 3

SET TO "GO" TO START COPYING : WAIT
```

Screen Fields

Below each field on the COPY CHARACTER MENU UTILITY screen is explained.

Source Filename or Node

Enter the source file name or node number from which you want to copy characters or press <RETURN> to accept the default file name (jobname.CRT).

Source Starting Number

Type the first screen from which you want to copy a character set .

Source Ending Number

This field is computed from number of records to copy.

Dest Filename or Node

Enter the destination file name or node number to which you want to copy or press <RETURN> to accept the default file name (jobname.CRT)

19 - Copy Character Menus

**Dest Starting
Number**

Enter the first destination screen number in which to copy the first character set. You can copy more than one screen at a time or press <RETURN> to select the default value of one screen.

**Number of Records
To Copy**

Source ending number and destination number are automatically computed.

**Set to GO to
Start Copying**

When copying character sets across the network, supply the DECnet area and node number. Character sets will only be copied to/from the CRT file running on remote nodes. Character sets can be copied to/from non-running CRT files in a local Color workstation.

20 - Enhanced Graphics Test

Description

This utility is used to test the current settings of the workstation.

When selected, the Color Workstation displays the Main Menu with a checker-board test pattern to test the dot-addressable video option.

Press the <SELECT> key again and an "hour glass" pattern will be superimposed.

20 - Enhanced Graphics Test

Notes:

21 - Standard Graphics Test

PDP-11 only

Description

This utility is used to test the current settings of the workstation.

When selected, will display the Main Menu to test the standard character video package.

21 - Standard Graphics Test

Notes:

22 - Keyboard Redirection Table

CRISP/SP only

Description

The KEYBOARD REDIRECTION TABLE works on CRISP/SP systems only. This allows you to specify another keyboard to drive the Workstation, other than the one connected to the Workstation.

22 - Keyboard Redirection Table

Notes:

PDP-11 Systems only

Description

This feature allows access to the RSX-11M+ Monitor Console Routine. Thus, this feature is available on PDP-11 systems **ONLY**. You can issue MCR and PIP commands from the workstation.

You must log into a user account each time this feature is selected. When you exit the ACCESS MCR feature, the terminal is logged out to prevent unauthorized access to MCR.

Features of this station are limited to printing terminal types of functions.

The recommended use for this feature is accessing the CRISP/SP Patching utility CLX. For more information on CLX, see the CRISP/SP Language Reference Manual.

23 - Access MCR

Notes:

24 - Screen Details

Description

The SCREEN DETAILS feature displays information pertaining to a screen's paint and link characteristics. A typical screenparameters screen is shown below.

```
Parameters for screen 1      22-MAY-86 12:56:43
Second screen number        :      0
Starting block number       :    161. (241)
Previous screen             :      13
Next screen                 :      3
Char menu number           :      0
Total number of links       :     14
Number of modifiable links :      0
Number of Locked Modifiable Links : 0
Screen description         :    ALARM SUMMARY
Hard copy                  :    Full Graphics
Default Database           :    LO:(0)
Database signature LO: (0)  :    4300
```

The link detail gives the screen screencoordinates (line and column number, respectively) in the first two columns, the variable type in the next column. Next the length and direction of the link are given (2 columns), followed by the link qualifiers. Finally, the variable is identified; first by database position, then Database ID and variable name.

Print Info

The <GOLD> <SELECT> sequence of keystrokes prints the report shown above *plus* the link detail report shown below:

Link detail....

```
 2    10    INT    1    RT /S=0./E=0.    000611 LO:ACK
 4    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
 5    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
 6    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
 7    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
 8    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
 9    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
10    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
11    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
12    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
13    10    INT    1    RT /S=0./E=0.    000610 LO:ALARM
21     0    STR   18    RT /S=0./E=0.    000453LO:STRMESSAGE
22     0    STR   18    RT /S=0./E=0.    000453LO:STRMESSAGE
23     0    STR   18    RT /S=0./E=0.    000453LO:STRMESSAGE
Key number 9                forces screen 9
Key number 15               forces screen 13
Key number 16               forces screen 3
```

24 - Screen Details

Notes:

25 - Saved Screens

Description

When a screen is being displayed at run-time, it may be desirable to save the image for later viewing. These "snapshots" are created when the <GOLD><DO> key sequence is pressed. Each time a screen is save and time-date stamp is placed on the bottom line of the screen image along with the screen description from the SCREEN DIRECTORY.

Viewing Screens

To view screens which have been saved, use the arrow keys to select SAVED SCREENS on the MAIN MENU.

To view other screens in the saved screen file, press the <PREV> and the <NEXT> keys. These keys will scroll through the file, displaying all the saved screens.

Where Saved

When a screen image is saved, it is written to the file CRISP.CWS:SYSD.CWS (the display file). Refer to Appendix B, "System Commands" to the command CWSXLATE for more information.

25 - Saved Screens

Notes:

CRISP/SP only

Introduction

The CRISP Historian package collects from local or remote CRISP databases and records it on disk. This data can then be displayed on the Color Workstation in a graphical format by invoking the HISTORICAL TREND feature of the MAIN MENU. HISTORIAN works with both CRISP/SP and CRISP/32.

For complete information on each of the functions of the HISTORIAN, refer to the pages shown on the chart below.

Function	page	Description
HISTORICAL TRENDING	87	Describes Historical Trending techniques.
HISTORICAL RECORDING	89	Describes how to set up HISTORIAN to record data.
HISTORIAN DATA STRUCTURES	93	This section describes the data storage file structure.

File management

Standard RMS files are used for all file operations, allowing files to be accessed locally or over DECnet.

The historian uses a standard data file format which allows analysis tools (the Color Workstation, high level languages and/or other 3rd party packages) to access the data.

The records in a historian data recording contain the current time in VAX/VMS format and data values of the points recorded. The size of the recording is directly proportional to the product of the number of points and the number of records.

Various file attributes and the actual data to be collected are defined by the user through the 'XXX.HST' file. This file can be generated using any standard DEC editor. The user defines:

Environment This refers to the CRISP System environment (CRISP/32 or CRISP/SP). The default is CRISP/32.

File Name The name of the data recording file. This is any legitimate DEC filespec, including network attributes. When specifying a file name, do not include the suffix (i.e. ".xxx")

Based on the name you specify, two recording files are produced, a header file and a data file. The suffixes to these files are determined by CRISP HISTORIAN to be ".HSH" and ".HSD", respectively.

Recording Mode The Historian recording mode determines the disposition of the recording and affects the maximum number of records.

Maximum This allocates enough file space for the specified number of records in the recording.

Interval The Historian interval at which the data is to be collected.

Number of Samples The Historian number of samples that will be averaged before writing a new record.

Variable Names The variables which are to be recorded.

Data Recording

The historian has two modes of recording:

-
- Repeated recordings

Wrap around The user defines the maximum number of records in the recording. After the last record has been written, the next record overlays the first record, which is also the oldest. Each successive new record replaces the oldest record previously recorded. The recording always contains the most recent MAX data points where MAX is the maximum number of records. No file management is required as the disk space utilized is fixed for a given application.

The recording will be pre-allocated with enough space for all records. This space will be filled with an "invalid" indicator prior to a pass of recording.

Repeated Recordings The user defines the maximum number of records in the recording. When the last record has been stored, the recording is closed and a new recording is opened, and the process is repeated. The recording name may be used to indicate the nature of the recorded data for recording management purposes. As in the case above, careful management is needed to prevent the disk space from being filled and causing other problems on the system as well as a loss of data recording.

27 - Historical Trending

CRISP/SP only

Enter Historical

Trending

Historical data values Trending is invoked by selecting the HISTORICAL TREND feature is selected from the MAIN MENU.

Historical Trending allows you to track up to four variables simultaneously. The plot of these variables is then displayed graphically on the screen. The screen display can be printed by pressing the <GOLD> then <SELECT> keys.

Data Entry Table

The PREV SCREEN and NEXT SCREEN keys will cycle you through four data entry tables. Each table is a different color (yellow, red, green and cyan). Data entered in the yellow table will display a yellow plot, data entered in the red table will display a red plot, etc. The data entry table allows you to specify:

FILENAME The historical recording file that you want to access. Use any standard DEC file specification.

TAG The database number and tag name. The database number refers to CRISP/32.

START TIME The time and date you would like to view CRISP will find the closest match. If no match is found, CRISP will display the earliest time.

START RECORD NUMBER Each pixel is a record of recorded data. The trend window is 500 pixels wide. Instead of specifying the Trendingtime and date, use function key 17 and 18 to cycle forward or backward in 500 record increments.

NUMBER OF POINTS Function keys 19 and 20 will reduce and increase the number of pixels to display, therefore you can expand or compress the displayed data.

LOW The low Trending engineering units range

HIGH The high engineering units range

FILE TIME Displays the date and time of the first and last record in the file.

FILE RATE The recording time of the file.

NUMBER OF TAGS The number of stored variables in the file.

NUMBER OF RECORDS The number of stored samples in the file.

27 - Historical Trending

STATUS Displays status and error messages. These are standard RMS messages.

Plotting the Data

After the data entry tables are filled in, Press the MODIFY key. A grid will appear and the data will be plotted. High and Low engineering units will appear on the left side of the grid in corresponding colors to the Trendingplots.

Once data has been plotted, the PREV SCREEN and NEXT SCREEN keys will cycle you through the four data entry tables and display the time and date pertaining to that table's at the bottom of the plot grid.

Displaying values

You can run a "vertical cursor" along the plot by using the combination SHIFT and ARROW keys. The system will display the data for the four plots at the vertical cursor in the following format:

Date	Time	Value	Database number	Tag name
------	------	-------	-----------------	----------

Replotting

You can change any combination of start time, start record, high engineering units value, low engineering units value, file specification and tag name for any or all data entry tables and replot by pressing the MODIFY key.

Tag Name List

You can display all Trendingtag names listed in the recording file by placing the cursor on the TAG field and pressing the SELECT key. To select a tag name for plotting, use the ARROW keys to highlight a tag name in yellow and press the SELECT key. When you return to the Data Entry Table, re-plot by pressing the MODIFY key.

28 - Historical Recording

CRISP/SP only

Description

The historian is Historian initialized by a user-defined file. This file defines the environment, Historian data file Historian parameters, and symbols to record. The input is in the form of DCL style commands, the grammar of which is defined below. The DCL comment delimiter ("!") and the DCL line continuation character ("-") perform their normal functions. Blank lines are ignored.

The name of this definition file is job.HST where job is the CRISP job name. This file may be edited with any of the DEC VMS editors.

The sample JOB.HIS file below defines data storage for variables in DECnet nodes 2, 6 and 4 with the following settings:

```
CRISP/SP
data files to be named DEMO.HSH and DEMO.HSD
nowrap
50 records
10 second interval
Average 5 variables before storing data

! Sample JOB.HIS file
SET ENVIRONMENT CRISP/SP
SET FILE DEMO/NOWRAP/REC=50/INT=0:0:10/AVE=5
SYMBOL -6:HOUR,MINUTE,SECOND
SYMBOL -2:SETPOINT1,SETPOINT2,SETPOINT3
SYMBOL -4:MEASUREMENT1,MEASUREMENT2,MEASUREMENT3
END
```

Environment

The historian will operate in either the CRISP or CRISP/SP environment. The user must inform the historian which environment it is in by entering one of the following commands.

```
HistorianSET ENVIRONMENT CRISP
SET ENVIRONMENT CRISP/SP
```

The default environment is CRISP/SP

Data File

The historian will operate in either the CRISP or CRISP/SP. The user defines the Historian data file using the following command.

28 - Historical Recording

SET FILE [filespec] [qualifiers]

"filespec" is any legal DEC RMS file specification. If any file extensions are supplied, the historian will ignore them. The historian will create two files. The header file will be named "filespec".hsh, and the data file will be named "filespec".hsd. If no filespecs are given the file names default to jobname.hsh and jobname.hsd.

Qualifiers

Qualifiers are used to define various parameters which define the data file and control the historian. Qualifiers are of the form "/qualifier[=option]".

/WRAP The HistorianWrap qualifier instructs the historian to use the wrap recording mode as described in the functional spec. This is the default recording mode.

/RECORDS=MAX The Records qualifier determines the Historianmaximum number of records in the data file. When MAX records have been written, the action of the historian depends on the recording mode.

/INTERVAL="dhhmmss.cc" The Interval qualifier determines the rate at which the historian will Historiansample data. The interval is specified in VMS delta time format with a resolution of one second. The default interval is one minute ("0 00:01:00").

/AVERAGE=N The HistorianSample Average qualifier specifies how many data samples should be averaged before a new record is written to the data file. The default is 1 which means a new record is written at each interval.

This feature is not currently implemented.

Symbol Names

The user defines which symbols are to be recorded by supplying as many of the following command as necessary.

SYMBOL [DB:]Symname[,DB:]Symname[,...]

"DB" is a CRISP/32 Database name or a CRISP/SP node number.
"Symname" is a CRISP/32 or CRISP/SP symbol name. The colon is required syntax if a database is specified. If no database is specified for a given symbol, the database defaults to the most recently specified database.

For CRISP/SP the standard node numbering convention applies. A positive even node number indicates the "active" machine of a pair. A positive odd node number indicates the "idle" machine of a pair. A negative node number indicates "locked" to that node. A node number of zero indicates that the local database should be accessed.

28 - Historical Recording

End

The user indicates the end of the input commands with the following command.

END

If the END command is not present, the historian will issue a warning and continue.

Notes:

29 - Historian Data Structures

CRISP/SP only

Files

The historian data recording will consist of two files: the header file and the data file. The Historianheader file will contain some file definitions, pointers, and symbol names. The .i.Historian:data file will contain a time stamp and the recorded data in floating point format. The header file will be named "X.HSH", and the data file will be named "X.HSD", where "X" is a name supplied by the user.

All recordings are in DEC standard RMS relative files. Files may reside and be accessed on the VAX/VMS or PDP-11/R SX systems. (However, the historian program will run on the VAX only. Therefore, DECnet will be required to manipulate a file residing on a remote VAX or PDP.)

When a file is open for recording, it will be opened for "shared read" so analysis tools may read the data while recording is in progress. The operating systems in general will not allow more than one "writer" of a file without complex record or bucket locking. When a data file is first opened for recording, it will be allocated to the final size and all records will be filled with a zero time stamp and each data value will have the "invalid" indicator consisting of -0 (00008000 hex).

Data items will be stored as single precision floating point values, regardless of type. Time stamping will be stored as a 64-bit VMS absolute time value. A record will consist of a time stamp and N floating point values where N is the number of points being recorded for this file. A special case can be made when all of the points are actually integers at the source of data, the data items may then be longwords to reduce recording overhead.

All points being stored in a single file will be recorded at the same interval. Additional file pairs may be defined for additional recording rates.

A data recording program may obtain data from a variety of sources before writing a record to the history file.

Header File

The header file will consist of 40-byte fixed length records containing various historian definitions, pointers into the data file, and symbol names of the data collected in the data file.

The first record contains a null terminated ASCII string identifying the creator of the recording. In this case, it is "HIST" followed by the version number of the historian in the form "V00.00-00"

29 - Historian Data Structures

The second record contains binary information describing the operation of the historian.

The remaining records contain the symbol information for all points being recorded. The data in the data file will be recorded in the exact order as the names appear in these symbol records of the header file which are in turn in the same order as those specified in the definition file.

Identification Record 40 Bytes , offsets (decimal)

Field Name	Offset	V'ble Name	Notes
ID STRING	0	RD.ID	"HIST V02.00-00<NUL>"

Historian Record Definition 40 Bytes, offsets (decimal)

Field Name	Offset	V'ble Name	Notes
FLAGS	0	RD.FLG	
RECORDING MODE	2	RD.RCM	
STARTING TIME	4	RD.STM	VMS Absolute time format.
RECORDING RATE	12	RD.RRT	VMS Delta time format (a negative value).
MAX. # OF RECORDS	20	RD.NRC	
# OF SYMBOLS	24	RD.NSM	
WRAP CONTEXT	28	RD.WCX	

FLAG BITS

RF.WRP = 1 Wrap has occurred at least once
RF.INT = 2 Values are longwords instead of real
RF.EDS = 4 Record storage is by event

RECORDING MODES

RM.WRP= 0 Data records are "wrapped" at EOF (default)
RM.OPE= 1 Data records are continuously appended
RM.REP= 2 Repeat data collection

Symbol Record Definition 40 Bytes, offsets (decimal)

Field Name	Offset	V'ble Name	Notes
DBNAME or NODE ID	0	RD.DB	6 characters space padded
	6	RD.COL	
SYMBOL NAME	7	RD.SYM	31 char space padded
VAR TYPE	39	RD.TYP	

Data File

The data file consists of fixed length records containing the time of recording in VMS Absolute time format, followed by all the data points in floating point format.

The number of points per record may be calculated as (record size - 8)/4.

Data Record

Field Name	Offset	V'ble Name	Notes
RECORD TIME	0	RD.RTM	VMS Absolute Time Format
FLOATING POINT DATA	8	RD.DAT	

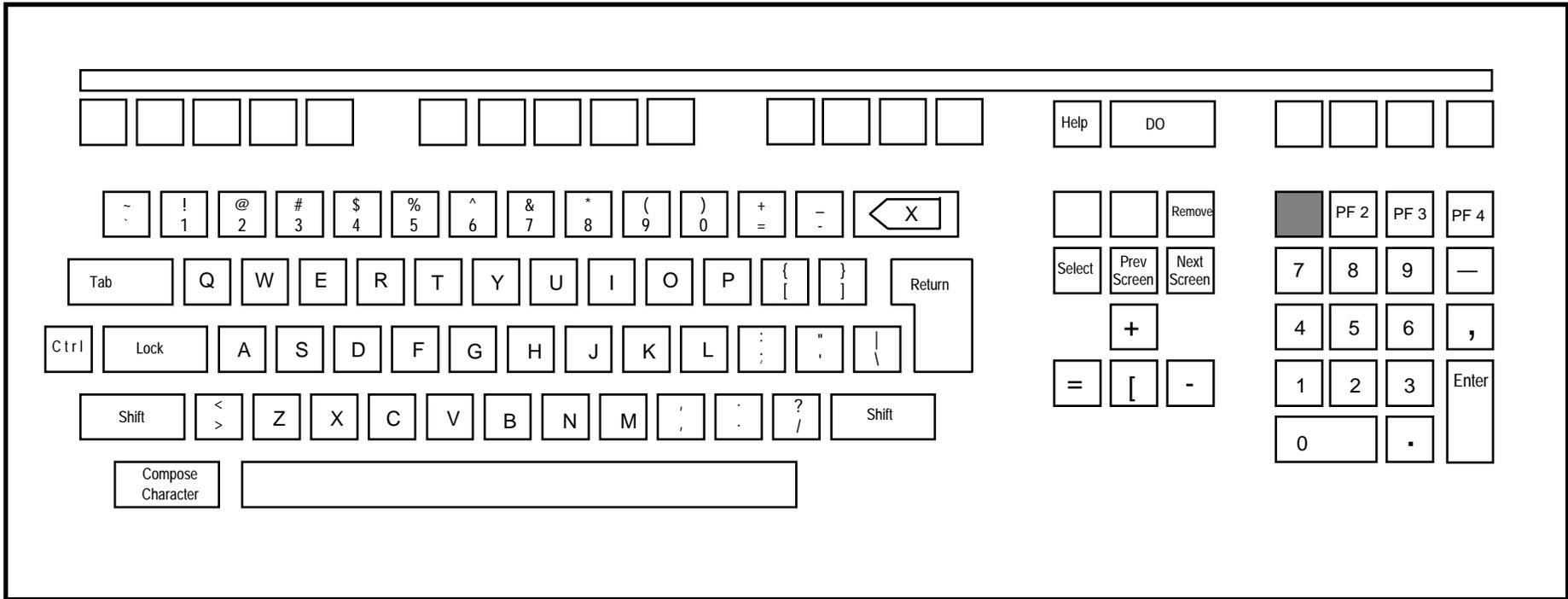
•
•
•

FLOATING POINT DATA	8	RD.DAT	
---------------------	---	--------	--

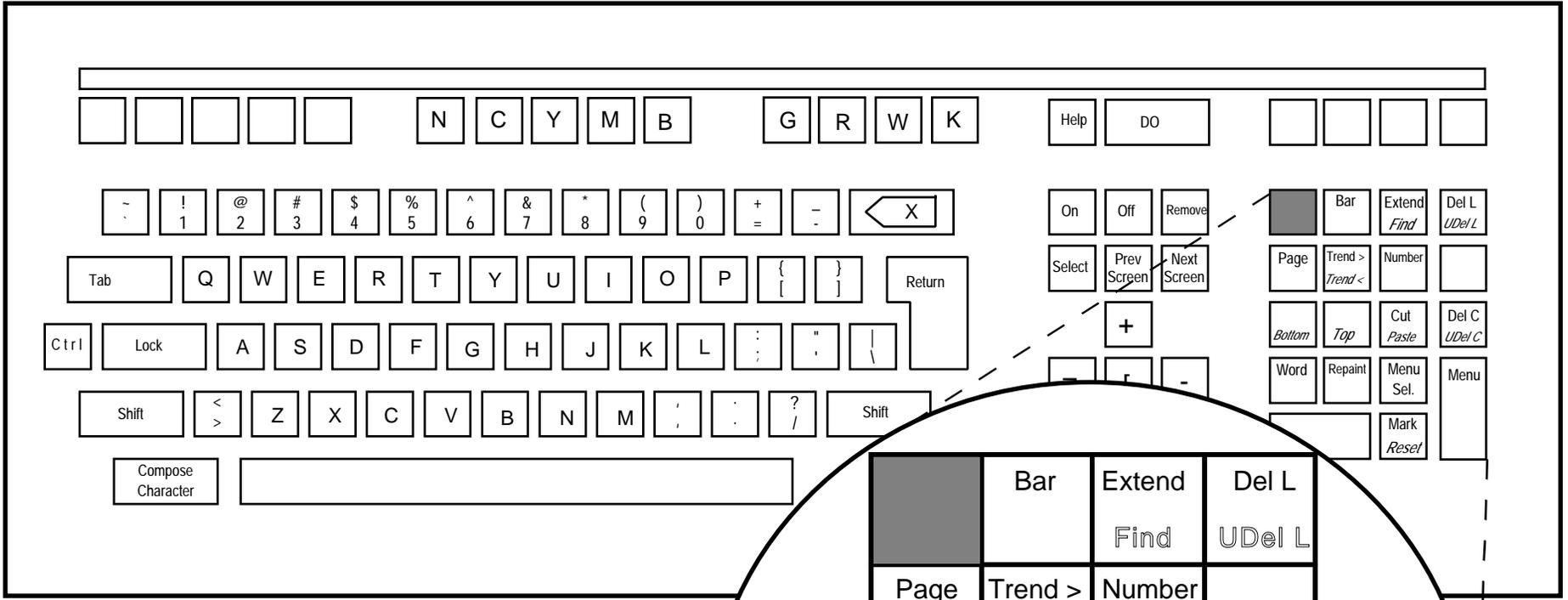
29 - Historian Data Structures

Notes:

Color Workstation Keyboard (Run-Time Layout)

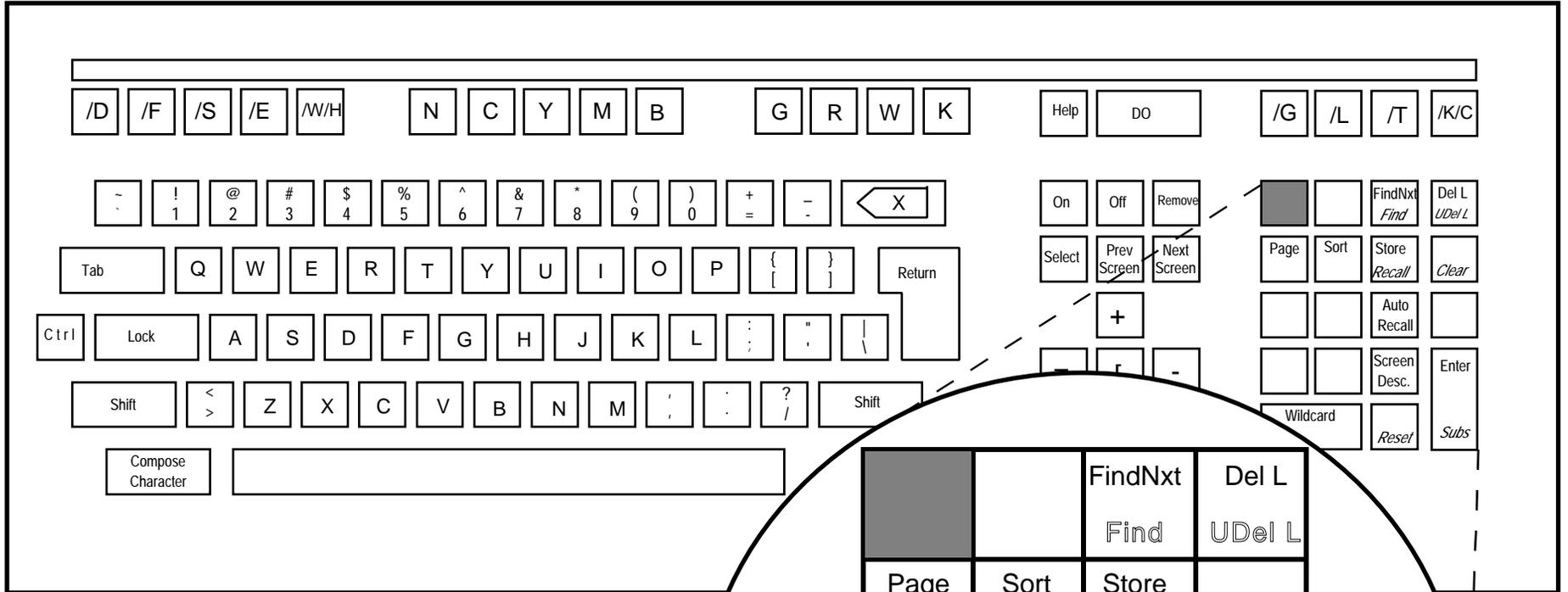


Color Workstation Keyboard
(Paint Screen Function Keys)

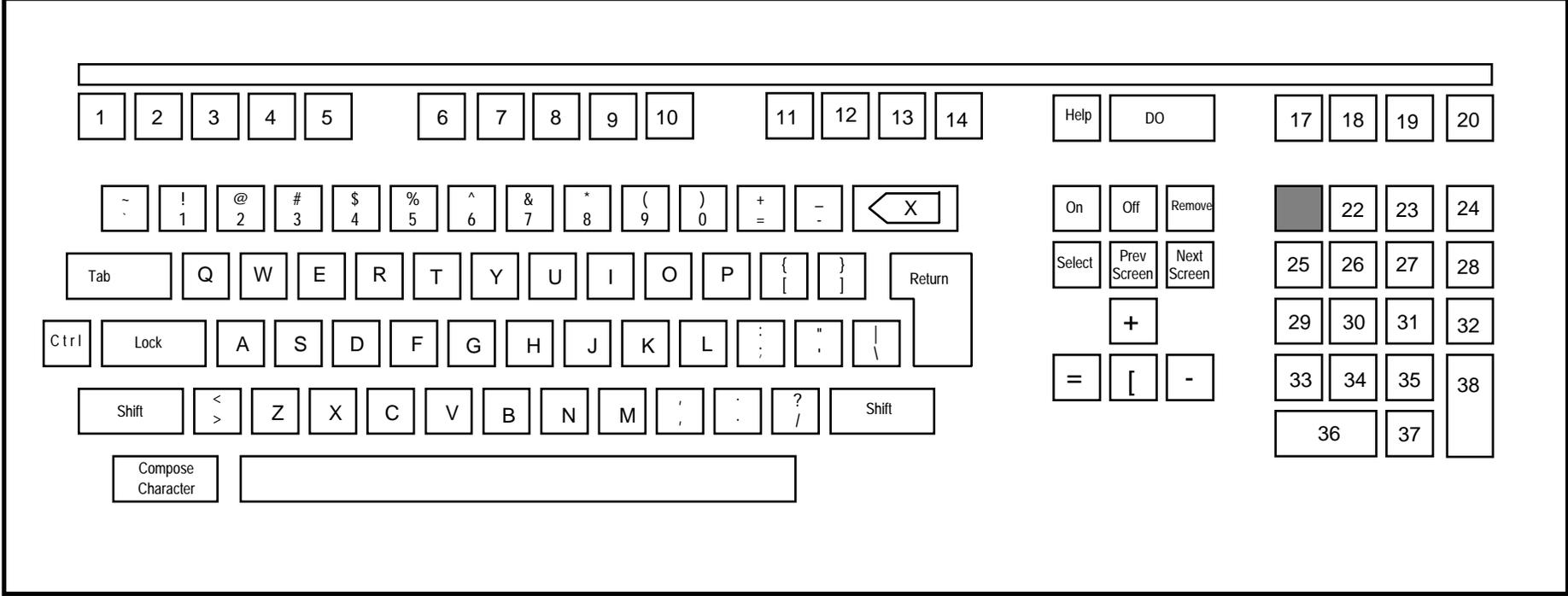


	Bar	Extend Find	Del L UDel L
Page	Trend > Trend <	Number	
Bottom	Top	Cut Paste	Del C UDel C
Word	Repaint	Menu Sel.	Menu
		Mark Reset	

Color Workstation Keyboard (Link Screen Function Keys)



Color Workstation Keyboard
(Showing 35 Programmable Keys)



Appendix B - System Commands

INSTALLATION PROCEDURE

The following provides a step-by-step installation procedure for CRISP Color Workstation systems. This procedure can be used for a new installation or for updating an existing workstation. Details regarding each command follows.

Step	Procedure
1	<p>Log in to the system manager's account.</p> <pre><Ret> Username: SYSTEM<Ret> Password: <Ret></pre>
2	<p>Load the CRISP Color Workstation distribution tape on the appropriate drive. Enter the following command to logically mount the tape; where, <code>ddcn</code> is the actual tape drive specification (e.g., MUA0).</p> <pre>\$ MOUNT /FOREIGN /NOWRITE ddcn:<Ret></pre>
3	<p>Enter the following command to load the CWS installation command procedure from the tape. Use the actual drive specification in place of <code>ddcn</code>.</p> <pre>\$ BACKUP /LOG ddcn:CWS.A []<Ret></pre>
4	<p>Enter the following command to begin the CWS installation. This command procedure performs the steps necessary to load the CWS software onto the target system.</p> <pre>\$ @CWS_INSTALL<Ret></pre> <p style="text-align: center;">NOTE:</p> <p>Since CWS requires approximately 10,000 free blocks of disk storage, it may be beneficial to determine the amount of free space available before entering <code>CWS_INSTALL</code>. This is accomplished via the <code>SHO DEV DU</code> command.</p>
5	<p>The user is prompted for the name of the device where the CWS software should be installed. The default device is the VMS system disk; however, CWS may be installed on any disk drive on the system, providing the drive contains sufficient free space. Enter the desired device name or just enter <code><Ret></code> to use <code>SYSSYSDEVICE</code>.</p>

Appendix B - System Commands

	<p>If this is an update to a new version of CWS, CWS_INSTALL checks for the files CWS_CONFIG_RESULTS.COM and START.COM. If located, they are purged to a single version and that remaining file is renamed to *.OLD.</p> <p>Enter the device name for CWS files [SYS\$SYSDEVICE]: device<Ret></p>
6	<p>The user is prompted for the device that contains the CRISP distribution tape. Enter the appropriate drive specification and press <Ret>.</p> <p>Enter the source of CWS distribution ddcn:</p>
7	<p>The user is prompted to verify that the tape is ready. Verify that the tape is loaded and ready; then type ES and press <Ret> to proceed. The CRISP/32 files are then loaded on the target</p> <p>Y</p> <p>disk. If this is an update, the new files are created with a version number one higher than the existing version of the same file. The user may purge the old files at an appropriate time.</p> <p>Is the CWS tape ready on ddcn:? Y<Ret></p>
8	<p>When the CWS_INSTALL procedure completes, the following message is displayed.</p> <p>%CWS-S-DONE, the CWS Install procedure is finished.</p>
9	<p>Enter the following command to dismount the tape; where, ddcn is the actual tape drive specification.</p> <p>\$ DISMOUNT ddcn:<Ret></p>
10	<p>Log out of the SYSTEM account and log into the CRISP account. If there was an existing CRISP account, a password may be required.</p> <p><Ret></p> <p>Username: CRISP<Ret></p>
11	<p>Enter the following command to configure the CWS system. The user is prompted regarding the configuration of the target VAX and CRISP/32 system hardware.</p> <p>\$ @CRISP\$CWS:CWS_CONFIG<Ret></p>

Appendix B - System Commands

NOTE:

This step should always be performed when updating to a new version of CCWS even if the hardware configuration has not changed.

Appendix B - System Commands

SYSTEM COMMANDS

The following commands are entered from a system console (VT-type), rather than from the Color Workstation, itself. Please note that a complete Color Workstation installation procedure follows; on the last two pages of this section.

CWS_INSTALL

Purpose: To transfer the Color Workstation software from the distribution tape, onto a drive where it can be used by the CRISP system software.

Syntax: @CWS_INSTALL

Operation: Enter the command as shown above; you will be prompted for:

- The destination device (system disk) name (SYSSYSDEVICE: is the default).
- The source device (tape drive) name (MUA0: is the default).

Please note that a complete Color Workstation installation procedure follows; on the last two pages of this section.

CWS_CONFIG

Purpose: To load the software required to operate the CRISP Color Workstation in an existing CRISP/32 system.

Syntax: @CWS_CONFIG

Operation: Enter the command as shown above; you will be prompted for:

- The quantity of Color Workstations you have.
 - The keyboard port number for each Workstation.
 - The Viuram type used for each Color Workstation. The default is "VCW" which is the Viuram which supports pixel trending. The other type of Viuram is "VRC".
 - If the Color Workstation(s) are equipped with Annunciators. If so, the name of the Annunciator Init File, and the Annunciator port number.
-

Appendix B - System Commands

CWSXLATE

Purpose: To translate one or more display screens from the Basic Workstation format into display screens that can be displayed on a CRISP/32 Color Workstation. This program will create a Color Workstation display file or it will add Basic Workstation screens to an existing Color Workstation display file.

Syntax: RUN CRISP\$EXE:CWSXLATE

Operation: Enter the command as shown above; you will be prompted for:

- The CRISP/32 file spec. You should enter the name of the Basic Workstation display file(s) to be translated. Wildcards are acceptable and the default extension is ".crt". The recommended specification for input files is shown below:

INPUT: D%.CRT, D%%.CRT, D%%%.CRT

The symbol "%" is a place-holding wildcard, and ensures that the input files will be read into the Color Workstation File in *numeric* order rather than *alpha-numeric* order (i.e. 1, 2, 3...; rather than 1, 10, 2, 3...).

- The output file spec. This is the name of the Color Workstation display file to be produced. If you do not provide an extension for this file spec, it will assign an extension of ".cws".
- The number of saved displays. This allows you to establish a maximum number of display "snapshots" that may be saved using the <GOLD><DO> key sequence at run time. Saved displays are stored in the display file along with display screens. A default is supplied which you may accept. If you have executed this command before, the previous response will be offered as the default. This value is stored as the symbol MAX_DISPLAY and may optionally be entered as a symbol.
- The number of global character sets. This allows you to establish a maximum number of global character sets used on the displays. (Each screen has its own character set—but these are not global character sets. Global character sets are CM00, CM01, CM02, etc.) A default is supplied which you may accept. If you have executed this command before, the previous response will be offered as the default. This value is stored as the symbol MAX_CSET and may optionally be entered as a symbol.
- The number of links per screen. This allows you to establish a maximum number of links allowed on each screen (permissible range is 183 to 640 links per screen). A default is supplied which you may accept. If you have executed this command before, the previous response will be offered as the default. This value is stored as the symbol MAX_LINKS and may optionally be entered as a symbol.

If you have not specified a sufficient number of links, CWSXLATE will issue a message to that effect and continue processing the next input file without processing the links for the errant Basic Workstation display file.

Appendix B - System Commands

All links are translated except softkey links where keys have been assigned the function of bringing up displays so you should record these links prior to running CWSXLATE.

The translation occurs in two phases: translation and linking. During the first phase, the graphics information in the Basic Workstation files is translated into the Color Workstation display format and a translation table is built which is used during the second phase to resolve the individual key links. This two phase approach is necessary since the screen numbers change during the translation.

"DO.CRT" is considered to be a special file and only the global character set is translated from this file.

DBTCMD

Purpose: To generate a database transfer list for CRISP/32 systems with Color Workstations. (CRISP/32 systems using the Basic Workstation effect database transfers using the COUPLE command).

Syntax: DBTCMD filespec

Operation: Before issuing the DBTCMD command, you must build a database transfer description file using a text editor. The database transfer description text file is specified as an argument to the DBTCMD command ('filespec'). DBTCMD converts the description file into a binary file that can be used by the CRISP/32 system software.

The Database transfer description file is a text file composed of one or more transfer command lines. Each transfer command line specifies a range of source variables, an initial destination variable (the first, in an array of variables, into which the source variable values will be written) and a conditional "trigger" variable. When the trigger variable changes from FALSE to TRUE the values in the source variables are transferred to the corresponding destination variables.

The syntax for the transfer command line is shown below:

```
TRANSFER /SOURCE=(db:var1,var_n) /TRIGGER=db:cond /DEST=db:var1
```

where 'TRANSFER', '/SOURCE=', '/TRIGGER=', and '/DEST=' are required keywords of the command line. Items shown in lower case must be substituted with the actual database and variable names of your system.

'/SOURCE=(db:var1,var_n)' indicates a range of data to be moved from the database 'db1'. All variables between 'var1' and 'var_n' will be transferred whenever 'db:cond' changes from FALSE to TRUE. All variables in a single transfer command line must be of the same variable type. The variable 'var1' must occur before 'var_n' in the database.

Appendix B - System Commands

'/DEST=db:var1' specifies the name of the variable into which the value of the first source variable will be written. The next source variable will be written into the next destination variable and so on until the transfer is complete.

Comments may be placed in the Database transfer description file delimited by an exclamation mark (!) at the beginning and a carriage return at the end.

A typical Database transfer description file is shown below.

```
! TRANSFER VARIABLES FROM THE STACKING PROCESS
transfer /source=(db11:int1,int3) /trigger=db10:int101 /dest=db10:int1
transfer /source=(db11:num1,num3) /trigger=db10:int101 /dest=db10:num1
transfer /source=(db11:long1,long3) /trigger=db10:int101 /dest=db10:long1
transfer /source=(db11:flt1,flt3) /trigger=db10:int101 /dest=db10:flt1
end
```

CWSXTEND

Purpose: To make the display file larger to accommodate more screens.

Syntax: RUN CRISP\$EXE:CWSXTEND

Operation: Enter the command as shown above; you will be prompted for:

- The file spec. This is the name of the Color Workstation to be extended.
- The number of screens to allow additional space for.

IMPORTANT NOTE: CRISP cannot be running if you are extending a file that is currently in use.

START_USER_CWS

Purpose: To restart a Workstation process.

Syntax: @CRISP\$EXE:START_USER_CWS

Appendix C - System Files

SYSTEM FILES

ANN_INIT.DAT

If you have a CRISP ANNUNCIATOR Panel, this file establishes the links between CRISP database variables and the keys of the Annunciator. This file must be defined in the STARTCWSxxx.COM file for each Color Workstation (described below).

```
Lamp 0          /Blink=db_name:LAMP_0_BLINK    /On=db_name:LAMP_0_ON
Lamp 0 /Lower   /Blink=db_name:LAMP_0L_BLINK   /On=db_name:LAMP_0L_ON

Lamp 1          /Blink=db_name:LAMP_1_BLINK    /On=db_name:LAMP_1_ON
Lamp 1 /Lower   /Blink=db_name:LAMP_1L_BLINK   /On=db_name:LAMP_1L_ON

Lamp 2          /Blink=db_name:LAMP_2_BLINK    /On=db_name:LAMP_2_ON
Lamp 2 /Lower   /Blink=db_name:LAMP_2L_BLINK   /On=db_name:LAMP_2L_ON

Lamp 3          /Blink=db_name:LAMP_3_BLINK    /On=db_name:LAMP_3_ON
Lamp 3 /Lower   /Blink=db_name:LAMP_3L_BLINK   /On=db_name:LAMP_3L_ON

Lamp 4          /Blink=db_name:LAMP_4_BLINK    /On=db_name:LAMP_4_ON
Lamp 4 /Lower   /Blink=db_name:LAMP_4L_BLINK   /On=db_name:LAMP_4L_ON

.
.
.

Lamp 60         /Blink=db_name:LAMP_60_BLINK    /On=db_name:LAMP_60_ON
Lamp 60 /Lower  /Blink=db_name:LAMP_60L_BLINK  /On=db_name:LAMP_60L_ON

Lamp 61         /Blink=db_name:LAMP_61_BLINK    /On=db_name:LAMP_61_ON
Lamp 61 /Lower  /Blink=db_name:LAMP_61L_BLINK  /On=db_name:LAMP_61L_ON

Lamp 62         /Blink=db_name:LAMP_62_BLINK    /On=db_name:LAMP_62_ON
Lamp 62 /Lower  /Blink=db_name:LAMP_62L_BLINK  /On=db_name:LAMP_62L_ON

Lamp 63         /Blink=db_name:LAMP_63_BLINK    /On=db_name:LAMP_63_ON
Lamp 63 /Lower  /Blink=db_name:LAMP_63L_BLINK  /On=db_name:LAMP_63L_ON

Alarm          /Blink=db_name:ALARM_BLINK          /On=db_name:ALARM_ON
```


Appendix C - System Files

§!

Appendix C - System Files

```
$!
$!
$ ! This command file executes when the CRT station task requests printing
$ ! of a print image file. Two parameters are supplied, P1 is a type string
$ ! describing the type of printing file and P2 is the print image file name.
$ !
$ ! if P1 is HARDCP then print request is from operator kb
$ ! if P1 is PRTSCR then print request is from logic PRTSCR function
$ ! if P1 is TNRDPT then print request is a trend region report
$ ! if P1 is SCRPRM then print request is a hard copy of screen parameters
$ ! if P1 is LNKRPT then print request is report of link errors
$ ! if P1 is SCRDIR then print request is a screen directory report
$ !
$      needed_privs = "CMKRNL, SYSNAM, DETACH, LOG_IO, PRMMBX, " + -
                    "SYSGBL, PFNMAP, SYSLOCK, SHARE, WORLD, GROUP"
$!
$      saveprv = f$setprv (needed_privs)
$      If f$privilege (needed_privs) then Goto PRIVOK
$      goto ABORT
$ PRIVOK:
$      IF P1 .EQS. "HARDCP" THEN GOTO HARDCP
$      IF P1 .EQS. "PRTSCR" THEN GOTO PRTSCR
$      IF P1 .EQS. "TNRDPT" THEN GOTO TNRDPT
$      IF P1 .EQS. "SCRPRM" THEN GOTO SCRPRM
$      IF P1 .EQS. "LNKRPT" THEN GOTO LNKRPT
$      IF P1 .EQS. "SCRDIR" THEN GOTO SCRDIR
$      GOTO EXIT
$!
$ HARDCP:
$ ! This part executes whenever the operator generates a hard copy
$ ! request from the color station keyboard. Parameter P2 contains the file
$ ! name of the print image file.
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' CRISP$TT:
$     DELETE 'P2';*
$     GOTO EXIT
$!
$ PRTSCR:
$ ! This part executes whenever a logic PRTSCR function is executed
$ ! referencing a CRT in this station. Parameter P1 contains the file name
$ ! of the print image file
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' LP:
$     GOTO EXIT
$!
```

Appendix C - System Files

```
$ TNRPT:
$ ! This part executes whenever the operator generates a trend report
$ ! request from the color station utility menu. Parameter P2 contains the file
$ ! name of the print image file.
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' CRISP$TT
$     DELETE 'P2';*
$     GOTO EXIT
$!

$ SCRPRM:
$ ! This part executes whenever the operator requests a print of screen parameters
$ ! request from the color station main menu. Parameter P2 contains the file
$ ! name of the print image file.
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' CRISP$TT
$     DELETE 'P2';*
$     GOTO EXIT
$!

$ LNKRPT:
$ ! This part executes whenever the operator starts an automatic screen
$ ! resolving with hard copy reports. Parameter P2 contains the file
$ ! name of the print image file.
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' CRISP$TT
$     DELETE 'P2';*
$     GOTO EXIT
$!

$ SCRDIR:
$ ! This part executes whenever the operator requests a printed screen
$ ! directory. Parameter P2 contains the file name of the print image file
$ ! Any option can be taken to dispose of the file.
$ !
$ ! To send it to a remote printer and delete, activate the following code
$ !     COPY 'P2' DFSRV::LPA0:
$ !     DELETE 'P2';*
$ !
$ ! To print locally and automatically delete, activate the following code
$     COPY 'P2' CRISP$TT
$     DELETE 'P2';*
```

Appendix C - System Files

```
$!  
$ EXIT:  
$     saveprv = f$setprv (saveprv)  
$     Exit  
$!  
$ ABORT:  
$     saveprv = f$setprv (saveprv)  
$     Exit %x1000002C
```

Appendix C - System Files

SAMPLE.TRC

This file is defined by the STARTCWS099.COM file(described below). Its purpose is as follows: the first two values in this file specify the number of trends to be performed in memory and how many of those trends are pixel trends. Pixel trending requires the optional VRC Viuram. The default trending capacity allows for resolution of 80 characters. Following these two values is a list of database variables that should be trended by the Color Workstation. See also the chapter on LINK SCREEN mode for additional ways to preform trends on a variable.

This file must be in the directory [CRISP.CWS]

```
D1:SECOND,1,5  
CWS22:SECOND,2,4  
ENG44:SECOND,2,2  
ENG44:LEVEL,2,3,L
```

P **IMPORTANT:** If changes are made, the trend process CRISP\$99CRT099 or CRISP must be stopped and restarted.

Appendix C - System Files

STARTCWSxxx.COM

This file is actually written by the command file CRISP\$CWS:CWS_CONFIG.COM during the configuration process. For each Color Workstation in your system there is a STARTCWSxxx.COM file. These command files execute at startup time and in order perform two functions:

- 1) Establish some defaults for each Workstation in your system
- 2) Start the Color Workstation process (CRISP\$EXE:CWSCRT).

This file is in the directory [CRISP.CWS] and can be started by USER_START_CWS in the [CRISP.EXE] directory.

```
$      verify - f$verify(01)
$!*****
$! CRISP$CWS:STARTCWS011.COM
$!
$! Written by CRISP$CWS:CWS_CONFIG.COM
$!*****
$!
$!   On control_y then, Exit %xl000002C
$!   Set noon
$!
$!       SET UP THE VIURAM ACCESS
$!       THIS IS A VRW VIURAM
$ DEFINE /PROCESS VIURAMADDR "162000"
$ DEFINE /PROCESS VRMEMADDR "177440000"
$!
$!
$!       Set up the required files
$ DEFINE /PROCESS DSPLYFILE DUAI:[CRISP.CWS]SYSD.CWS;
$ DEFINE /PROCESS SYSHLPFILE      CRISP$CWS:SYSHELP.CWS
$ DEFINE /PROCESS CUTPSTFILE      CRISP$CWS:CUTPASTE.CWS
$ DEFINE /PROCESS STRLNKFILE      CRISP$CWS:CDEMO.MCF
$ DEFINE /PROCESS BATCH_FILE      CRISP$CWS:SNDCLI.COM
$ DEFINE /PROCESS RPTFIL_DFLT     CRISP$CWS:
$ DEFINE /PROCESS BATCH_USER     CRISP
$ DEFINE /PROCESS BATCH_LOG      CRISP$CWS:SNDCLI.LOG
$ DEFINE /PROCESS CWSANNUN_FILE  CRISP$CWS:ANN_INIT.DAT
$ DEFINE /PROCESS CWSANNUN_KB    CRISP$CWS:???????
$!
$!       Set UF the network parameter
$ DEFINE /PROCESS SMC_SAP_BASE 4
$ DEFINE /PROCESS MMC_SAP_POOL 76
$!
$!       Set up the station keyboard
$ DEFINE /PROCESS CWSKEYBD TXAO:
$ SET TERM/PERM/NOECHO/EIGHT/NOBRO/NOAUTO/SPEED=4800 CWSKEYBD
$!
$!
$!Set up the crt number and crisp type by setting the process name
$ SET PROC/NAME=CRT011
$ IF F$STRNLNM("ABC$ROOT") .NES. "" THEN SET PROC/NAME=CRT011%ABC
$ IF F$STRNLNM("CRISP$DEVICE") .NES. "" THEN SET PROC/NAME=CRISP$CRT011
$!
$ SET NOON
```

Appendix C - System Files

```
$!  
$!      Save the name of the original display file  
$ OLD_DSPLYFILE - F$TRNLNM("DSPLYFILE")  
$!
```

Appendix C - System Files

```
$ SCRT:
$ RUN/NODEBUG CRISP$EXE:CWSCRT
$ STATUS = $SEVERITY
$!
$!   The CRT process image exits with a severity of 1, 2, 3 or 4
$!   Severity 1 is a normal exit
$!   Severity 2 is an exit on a display file fault, and if a previous
$!   display file name is available, then run, again with the
$!   old display file name. Else exit.
$!   Severity 3 is exit needing a new file, the logical DSPLYFILE has
$!   been changed. Run again with the new name.
$!   Severity 4 is a fatal fault; run again.
$ If f$mode() .eqs. "INTERACTIVE then SHO SYM STATUS
$ IF STATUS .EQ. 2 THEN GOTO RNNEWF
$ IF STATUS .EQ. 3 THEN GOTO RNNEWF
$ IF STATUS .EQ. 4 THEN GOTO SCRT
```

Appendix C - System Files

STARTTND.COM

This file is started indirectly by the STARTCWS099.COM file. CWS099 is the Color Workstation process dedicated to performing trends. This command file executes in order perform two functions: 1) to establish some defaults for trending, and 2) to start the Trending process (CRISP\$EXE:CWSTND).

This file is in the directory [CRISP\$EXE].

```
$ !
$ !SET UP THE REQUIRED FILES FOR TRENDING
$ DEF/PROC TRENDFILE DISK$USER:[CRISP.CWS]SAMPLE.TRC
$ DEF/PROC DSPLYFILE DISK$USER:[CRISP.CWS]SYSD.CWS
$ !
$ !SET UP THE NETWORK PARAMETERS
$ DEF/PROC SMC_SAP_BASE 4
$ DEF/PROC MMC_SAP_POOL 76
$ !
$ !SET PROCESS PRIVILEGES FOR WORKSTATION
$ SET PROC/PRIV=(SYSPRV,LOG_IO,PFNMAP,PRMMBX,SYSLCK,SYSGBL,SHARE,GRPPRV)
$ !
$ !SET UP THE PROCESS NAME
$ CRTN = 99
$ SET PROC/NAME=CRT'CRTN'
$ IF F$STRNLNM("ABC$ROOT") .NES. "" THEN SET PROC/NAME=CRT'CRTN'%ABC
$ IF F$STRNLNM("CRISP$DEVICE") .NES. "" THEN SET PROC/NAME=CRISP$CRT'CRTN'
$ !OPTIONAL DEBUG SETUP
$ !DEF/USER DBG$INPUT _TXA2:
$ !DEF/USER DBG$OUTPUT _TXA2:
$ IF F$MODE() .EQS. "INTERACTIVE" THEN GOTO RDEBUG
$ !Run in "no debug" mode
$ RUN/NODEBUG CRISP$EXE:CWSTND
$ EXIT
$ !Run in "debug" mode
$ RDEBUG:
$ DEF/USER DBG$INPUT TT:
$ DEF/USER DBG$OUTPUT TT:
$ RUN CRISP$EXE:CWSTND
$ EXIT
$
```

Appendix D - Control Display

Introduction

The CONTROL DISPLAY provides a way for the CRISP logic to control and monitor certain functions of the Color Workstation and the PC Workstation during run-time.

- p Note: The CONTROL DISPLAY is primarily intended for use where the Color Workstation is connected over the network. Workstations running on the same VAX as the CRISP control logic do not need to use the CONTROL DISPLAY since this functionality is provided through function calls SETDSP, RDDSP, and PRTDSP.

Using the Workstation CONTROL DISPLAY, the CRISP logic can read:

- The Top and Bottom Screen Number currently displayed.
- The Mode in which the workstation is currently operating.
- The Name of the user currently logged in and the Security Table number of the logged in user.

Using the Workstation CONTROL DISPLAY, the CRISP logic can cause:

- A Top and Bottom Screen to be displayed at the workstation
- The currently-displayed screen to be printed.

This is done by establishing certain variables which can pass values between the workstation software and the CRISP logic. These variables must be linked on a special screen called the CONTROL DISPLAY.

Building the display The CONTROL DISPLAY screen may be any screen on the workstation.

The screen must contain one or more of the following text strings:

```
%SET_TOP_DSP
%SET_BOT_DSP
%SET_PRT_DSP
%CUR_TOP_DSP
%CUR_BOT_DSP
%CUR_DSP_STA
%CUR_LOG_NAM
%CUR_LOG_NUM
```

The purpose of each of these text strings is to identify the location and function of the *control link* to the right of it. For example, immediately to the right of the text string %SET_TOP_DSP you would link a Numeric variable. This would be the control link which would determine the display screen to be displayed on the workstation.

Active Control Links Each of the special text strings is shown below and, to the right, the function of the corresponding control link.

TEXT STRING	DATA TYPE	CONTROL LINK EFFECT
-------------	-----------	---------------------

Appendix D - Control Display

%SET_TOP_DSP	Numeric	<p>When the linked variable changes, the new value is read by the workstation software and the corresponding display screen becomes the top display. The bottom display is determined by the value of the %SET_BOT_DSP control link (as described below).</p> <p>The workstation software writes a minus one (-1) into the variable when the operation is complete.</p>
%SET_BOT_DSP	Numeric	<p>The %SET_BOT_DSP variable determines which, if any, display screen becomes the bottom display. The Workstation software refers to this link only when the responding to a change in the %SET_TOP_DSP control link.</p> <p>If the value is zero 0 then a bottom display is displayed only if there is a 48-line pair associated with the specified top display.</p> <p>If the value is -1 then no bottom display is displayed—even if there is a 48-line pair associated with the specified top display.</p> <p>For any other value, the workstation software will attempt to display a 48-line pair using the specified screen as the bottom screen.</p>
%SET_PRT_DSP	Intermediate	<p>When the value at the control link changes to one (1) a copy of the current display screen is routed to the printer. The workstation software then writes a zero (0) to this variable.</p>

Monitor Links

Each of the special text strings is shown below and, to the right, the function of the corresponding workstation monitor link.

TEXT STRING	DATA TYPE	CONTROL LINK EFFECT
%CUR_TOP_DSP	Numeric	Each time a new screen is displayed, the workstation software writes the number of the current top display into this variable.
%CUR_BOT_DSP	Numeric	Each time a new screen is displayed, the workstation software writes the number of the current bottom display into this variable.
%CUR_DSP_STA	String	Each time the workstation changes modes, the workstation software writes the current mode name into this variable.
%CUR_LOG_NAM	String	This variable contains the name of the user logged into the workstation.
%CUR_LOG_NAM	Numeric	This variable contains the entry number on the Security Table, of the user logged into the workstation.

How to set it up

You must specify the number of the CONTROL DISPLAY when you run the CRISP_CONFIG procedure. The display screen number specified must contain one or more of the CONTROL DISPLAY fields as described above.

- p Note: If more than one Color Workstation is used, each workstation should have a different CONTROL DISPLAY number.

Editing the display

If you make a change to one of the links on the CONTROL DISPLAY, you must close the display, then redisplay it for the change to take effect. This is because the workstation software "reads" the CONTROL DISPLAY only upon CRSTART or when the CONTROL DISPLAY is "opened" for display.

Appendix D - Control Display

Sample Display

A typical CONTROL DISPLAY is shown below:

CONTROL DISPLAY		
Keyword	Link	VariableName
%SET_TOP_DSP	0	CRTDIR:CRT1_FORCE_?
%SET_BOT_DSP	0	CRTDIR:CRT1_FORCE_I
%SET_PRT_DSP	<u>0</u>	CRTDIR:CRT1_FORCE_PRINT
%CUR_TOP_DSP	***	CRTDIR:CRT1_TOP_SCI
%CUR_BOT_DSP	***	CRTDIR:CRT1_BOT_SCI
%CUR_DSP_STA	DD	CRTDIR:CRT1_MODE
%CUR_LOG_NAM	* AUTOLOGIN *	CRTDIR:CRT1_USER
%CUR_LOG_NUM	24	CRTDIR:CRT1_ACCOUNT

- p Note: The variable names shown in the right-most column do not need to appear on the screen. They are shown here for clarity. The actual control link is the first link to the right of the keyword.

The control link variables do not have to be in any particular database nor do they all have to be in the same database.

- %CUR_BOT_DSP 115
- %CUR_DSP_STA 115
- %CUR_LOG_NAM 115
- %CUR_LOG_NUM 115
- %CUR_TOP_DSP 115
- %SET_BOT_DSP 115
- %SET_PRT_DSP 115
- %SET_TOP_DSP 115
- /D 32
- /L 17
- 48-line screen 21
- ACCESS MCR 79
- ANN_INIT.DAT 107, 108
- ANNUNCIATOR Panel 107
- AUTO RECALL 38
- background color 22
- bar graph 23
 - direction 23
 - extend 23
 - top 35
- bar link 44
- Basic Workstation 104
- Block mode 28
- blue bar 5
- both local and remote variables 7
- bottom display 116, 117
- change values 39
 - logging 34
- change variables 5, 13
- CHAR 41
- character menu 25, 71
- character menus 59
- character set
 - copy 26
- CLEAR 38
- color link 44
- COMPOSE CHARACTER 26, 40
- connections 1
- copy a character set 26
- COPY CHARACTER MENUS 71
- COPY SCREENS 53
- CONTROL DISPLAY 115
- control link 115
- CRISP_CONFIG 117
- CRISPnet 7, 13, 61
 - node assignments 7
- CRSTART 117
- CRT process 69
- CRT refreshes 60
- CRTprt.COM 4, 6, 37
- current display 116
- Cursor
 - default direction 30
 - motion 35, 36, 42
 - motion, default 61
 - move 5
- Cut 24, 27
- Cut and Paste 27
- cut buffer 28
- CUT SYMBOL MENU 28
- CWS_CONFIG_RESULTS.COM 101
- CWS_INSTALL 101
- CWSXTEND 106
 - data collection 85
 - data recording 85
 - data values
 - Trending 87
- Database ID 7, 10
- database number 10
- database signature 10
- DATABASE-NODE TABLE 7
 - Exit 11
 - Purpose 8
- date and time 67
- Decimal 62
- decimal point 33
- DECnet 7
- DEFAULT DIRECTORY 60
- DEL L 37
- DELETE 6
- DFDB 41
- Display
 - Boolean value 24
 - numeric value 24
 - test 73, 75
- display file 63, 106
 - extend 106
- DISPLAY SCREEN 5
- DISPLAY/MODIFY DATABASE 13
- DO 14, 39
- ENTER 39
 - Link 31
- error codes 15
- FIND 23, 37
- FIND NXT 37
- Force communications with Active CPU 10
- Force communications with Idle CPU 10
- force display 115
- foreground color 22
- Function Key
 - define 40
- Function Keys 14
 - LINK SCREEN 31
 - MAIN MENU 4
 - PAINT SCREEN 22
- GET 42
- GOLD 36
 - cancel 4
- hard copy 64
 - screen 4, 37
- hard-copy 108
- hardcopy 61
- HELP 4, 40
 - customized 49
 - multiple HELP files 49
- HELP pages 49
- HELP.CRT 50, 59
- HELP.CWS 49

Index

- Hexidecimal 62
- HISTORIAN 85
 - data file 89
 - Data structures 93
 - header file 93
 - initialized 89
 - interval 86
 - maximum number of records 90
 - number of samples 86
 - parameters 89
 - recording mode 85
 - Sample Average 90
 - sample data 90
 - SET ENVIRONMENT 89
 - Wrap 90
 - Wrap around mode 86
- HISTORICAL TREND 85, 87
- installation procedure 101
- INVALID 40
- keyboard 25
 - lock 17
 - nationality 62
- KEYBOARD REDIRECTION TABLE 77
- keyboard type 62
- link 24, 31
 - bar 44
 - change logging 34
 - color 34, 44
 - copy 38
 - delete 37
 - direction 32
 - end value 33
 - Enter 31
 - error reports 57
 - field width 34
 - Flash 33
 - function key 35
 - high limit 33
 - invalid 40
 - numeric 44
 - recall 38
 - remove 40
 - resolve 42
 - screen overview 81
 - Search and Replace 39
 - sort 37
 - starting value 33
 - subscript value 35
 - top 35
 - trend 44
 - undelete 37
- Link Bar 31
- link detail report 81
- LINK SCREEN 31
 - Function keys 31
- local database 7
- lock 17
- lock parameters 64
- locked entries on screen 64
- log in 117
- MAIN MENU 3
 - Function Keys 4
 - Operation 4
 - REMOVE 4
- mark 26, 27
- MCR 79
- Mode 115, 117
- n.trc 55
- network 1
- NEXT SCREEN 40
- node number 13
- node-number 7
- NOT AVAIL 11
- numeric link 44
- Octal 62
- OFF 35, 39
- off scan 14
- ON 35, 39
- override an input 14
- PAGE 37
- PAINT SCREEN 21
 - exit 21
 - Function Keys 22
 - keypad 22
 - Status Display 21
- password 65
- password-protect 17
- paste 24, 27
- PIP commands 79
- PREV SCREEN 6, 40
- print 115
- qualifier 31
- RDDSP 115
- RECALL 38
- redundant systems 7
- remote database 13
- REPAINT 25
- Replace Link 39
- RESET 38
- RESOLVE SCREEN WITH REPORT FILES 57
- RESOLVE SCREENS 57
- SAMPLE.TRC 111
- Screen
 - coordinates 81
 - copy (to file) 6, 14
 - display saved screens (from file) 83
 - force display 40
 - hard copies 60
 - hard copy 4, 6, 23, 37
 - highest screen number 59
 - last displayed 59
 - naming 19, 38
 - parameters 81
 - refresh time 60
- SCREEN DESC 38
- SCREEN DETAILS 81
- SCREEN DIRECTORY 19, 38
- Screen Number 115
- SECL 42
- security 17, 64

- security level 62
- Security Table 115
- SEQUENCE NUMBERS 62
- SETDSP 115
- Software
 - revision level 59
- SORT 37
- SPACE BAR 26
- Stand-alone configuration 7
- START.COM 101
- STARTCWSxxx.COM 112
- STARTTND.COM 114
- Startup Lock Mask 65
- STORE 38
- SUBS 39
- subscript value 35
- switch 31
- SYS\$SYSDEVICE 101
- SYSD.CWS 49
- SYSHELP.CWS 49
- SYSTEM PARAMETERS 59
- test pattern 73
- TIMED OUT 11, 60, 62
- top display 116, 117
- Trace mode 28
- translate 104
- trend 24
- trend link 44
- Trending
 - engineering units range 87
 - plots 88
 - tag names list 88
 - time and date 87
- trending system
 - summary report 55
- trends 111
- UDEL L 37
- UND 14
- undelete 23
- unlock 17
- Unlocking Mask 64
- User-defined Keys 29, 41
 - copy 42
- USER_START_CWS 69
- UTILITY MENU 51
- WILDCARD 38
- ~INV message 40

Notes:
