

MINDSET®

Image Capture System User's Guide

Information in this document is subject to change without notice and does not represent a commitment on the part of Mindset Corporation.

MINDSET is a registered trademark of Mindset Corporation.

MS-DOS is a trademark of Microsoft Corporation.

Lumena is a trademark of Time Arts Inc.

Copyright 1985, Mindset Corporation.

All rights reserved.

Printed in U.S.A.

100739 001

LIMITED WARRANTY

Mindset Corporation ("Mindset") warrants the product it manufactures for a period of 90 days from the date of purchase. During the warranty period, Mindset at its option will repair or replace components that prove to be defective at no charge provided the product is returned to an authorized Mindset dealer.

This warranty does not apply if, in the opinion of Mindset, the product has been damaged by accident, misuse, misapplication, or as a result of service or modification by other than an authorized Mindset dealer.

NO OTHER WARRANTIES ARE EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE. IN NO EVENT SHALL MINDSET BE LIABLE FOR LOST PROFITS, LOSS OF GOODWILL, OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES.

This warranty gives you specific legal rights. You may also have other rights, or certain limitations herein may not apply to you under applicable state law.

**FEDERAL COMMUNICATIONS COMMISSION RADIO
FREQUENCY INTERFERENCE STATEMENT**

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Contents

Section 1

Introduction

The Mindset Image Capture System	1
What You Need	2
How to Use This Guide	3

Section 2

Setting Up and Using the Image Capture Module

Before Setting Up Your System	5
The Image Capture Module	5
How to Set Up the Image Capture Module	7
The Display Control Switch	10

Section 3

Capturing Images

Backing Up Your Image Capture Utility Diskette	11
Making a System Diskette From Your Image Capture Utility Diskette	12
Installing the Image Capture Utility on a Hard Disk	13
Loading the Image Capture Utility	14
The Utility Menu	15
Some Technical Information	19
Error Messages	20

Appendix A
Specifications

21

Figures

Figure 2-1:	The Image Capture Module	6
Figure 2-2:	Connecting the Image Capture Module	8

Section 1

Introduction

The Mindset Image Capture System

The Mindset Image Capture Module and its companion software, the Image Capture Utility, enables you to capture images from any standard NTSC video source: 1/2-inch (consumer-grade) and 3/4- or 1-inch (professional) videotape; a consumer or professional studio video camera; a video disk; a TV broadcast; even another Mindset Computer System. Because each image is captured through "flash digitizing"--that is, at NTSC field rate or in real time--your Mindset can "grab" images from a moving videotape or disk or off the air.

With a single composite monitor, the module's display control (C-X) switch allows you to alternate between viewing the external source video and the captured image. If you have two monitors, you can use the module's "loop-through" capability to view both the external source video and a captured image simultaneously.

The Image Capture Module is easy to connect to your Mindset Computer System. And without any adjustments, you can still use your Mindset as a fully-capable computer.

The Image Capture Utility software is a simple, menu-driven program. It allows you to capture an image with a single keystroke, map its colors in the way you want, and store it on diskette or hard disk for later use or enhancement using Mindset Lumena or Designer graphics software.

What You Need

Your Mindset Image Capture System consists of the following:

- o Mindset Image Capture Module
- o Mindset Host Adapter Interface Module
- o Mindset Image Capture Utility diskette
- o AC power adapter
- o One data cable with 37-pin connectors
- o Three standard phono jack cables

In addition, you need a Mindset System Unit and Expansion Unit with at least 256K total RAM and Mindset MS-DOS. And you need a source for the video images you want to capture: a videotape player/recorder or videodisk player, a television set with a composite video output jack, a video camera, or another Mindset Computer System.

To display your images, of course, you need a monitor. To use the "loop-through" capability of the module, you also need a second monitor, which must be composite.

You may also wish to connect a Mindset Mouse to your system for using the Image Capture Utility.

How to Use This Guide

In addition to this "Introduction," this guide consists of two sections and an appendix:

- o Section 2, "Setting Up the Image Capture Module," provides step-by-step instructions for connecting the module to your Mindset Computer.
- o Section 3, "Capturing Images," explains how to load the Image Capture Utility into your computer and how to use it to capture and manage images. Also included here is some technical information on how images are captured and stored, and a list of error messages you may get and what to do about them.
- o Appendix A, "Specifications," lists technical specifications for the Mindset Image Capture System.

Before you set up and begin using your Image Capture Module, it's very important that you first familiarize yourself with the normal set-up and operation of your Mindset Computer System—see your Mindset Computer System Operation Guide.

For convenience, place this guide under the Options tab in your Operation Guide.

Image Capture System User's Guide

Section 2

Setting Up and Using the Image Capture Module

Before Setting Up Your System

Before setting up and using your Image Capture Module, you should become familiar with your Mindset Computer System and with MS-DOS, the disk operating system used with the Mindset. If you have not already done so, set aside this manual until you've set up and learned to operate your Mindset.

The Image Capture Module

Figure 2-1 on the next page shows the front of the module, with the display control switch, and the various connectors on the rear panel of the module. All the connectors are clearly labeled on the bottom of the unit.

Image Capture System User's Guide

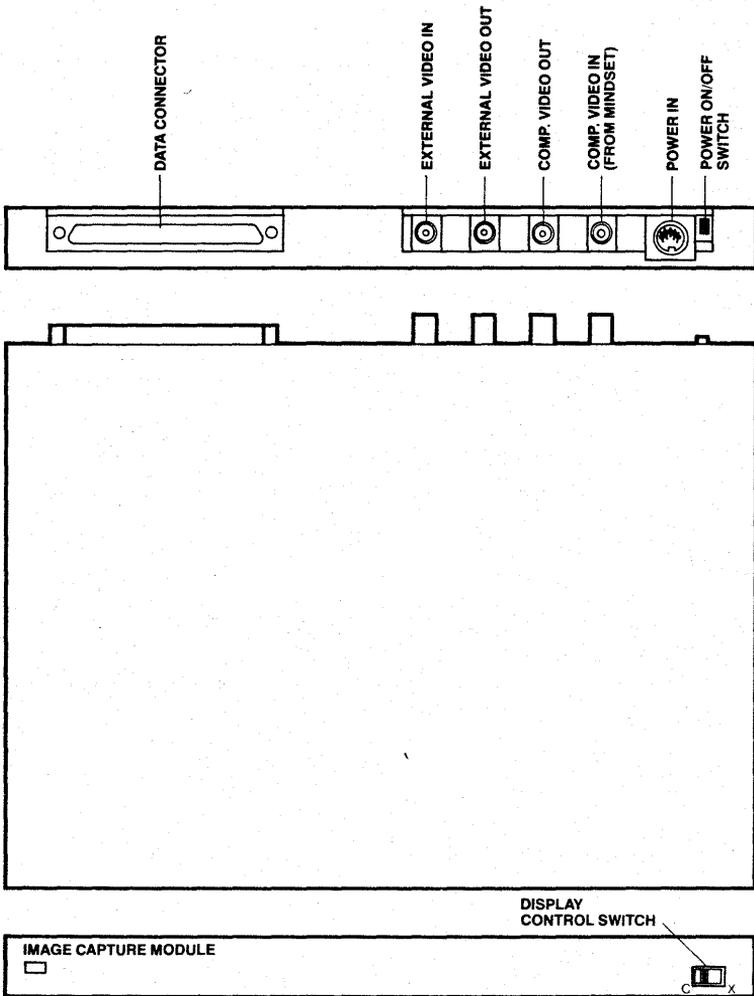


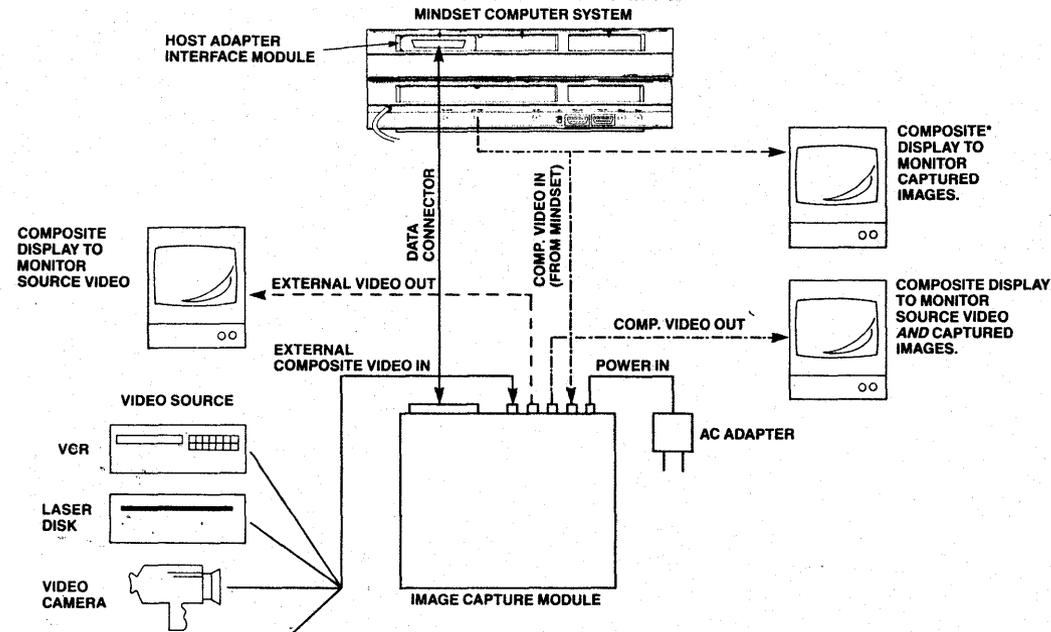
Figure 2-1: The Image Capture Module

How to Set Up the Image Capture Module

Follow these steps to set up your Image Capture Module in either of two ways: for switching between display of your external source video and a captured image on a single composite monitor, or for simultaneous display of the external source video and a captured image on separate monitors.

1. Turn off your Mindset.
2. Plug the Host Adapter Interface Module into the right-most I/O module port (as you look at the back of the unit) on the back of the Mindset System Unit or into any I/O module port on the back of the Expansion Unit. Make sure that the module is securely seated in the port.
3. Connect the 37-pin connector on one end of the Image Capture data cable to the matching connector on the Host Adapter Interface Module. Connect the 37-pin connector on the other end of the cable to the matching connector labeled DATA CONNECTOR on the rear panel of the Image Capture Module. Tighten the screws on both connectors and make sure that the cable is securely fastened.
4. Use a standard phono jack cable to connect your external video source to the EXTERNAL VIDEO IN connector on the rear panel of the Image Capture Module.

If you want to switch between display of your external source video and captured images on a single composite monitor, go to step 5 and



NOTES:

- CONNECT ONLY IF USING A SINGLE COMPOSITE MONITOR TO DISPLAY BOTH SOURCE VIDEO AND CAPTURED IMAGES.
- - - - - CONNECT IF USING TWO MONITORS - ONE FOR DISPLAYING SOURCE VIDEO AND THE OTHER FOR DISPLAYING CAPTURED IMAGES.

* IF AN RGB MONITOR IS USED FOR DISPLAYING THE CAPTURED IMAGES, CONNECT THE RGB MONITOR TO THE RGB VIDEO CONNECTOR ON MINDSET COMPUTER.

Figure 2-2: Connecting the Image Capture Module

omit step 6. If you want to use one monitor to display your captured images and a separate monitor for simultaneous display of your external source video, skip step 5 and go to step 6.

5. To allow switching between your external source video and captured images on a single composite monitor--

- a. Use a standard phono jack cable to connect the COMP VIDEO connector on the back of the Mindset System Unit to the COMP. VIDEO IN (FROM MINDSET) connector on the rear panel of the Image Capture Module.
- b. Use a second phono jack cable to connect the COMP. VIDEO OUT connector on the rear panel of the Image Capture Module to your composite monitor.

6. For simultaneous display of your captured images on one monitor and your external source video on a separate monitor--

- a. Connect the first monitor to the appropriate VIDEO connector (COMP VIDEO, TV/RF, or RGB VIDEO) on the back of your Mindset System Unit.
- b. Use a phono jack cable to connect the EXTERNAL VIDEO OUT connector on the rear panel of the Image Capture Module to your second monitor, which must be composite.

(You may also connect a composite monitor to the COMP. VIDEO OUT connector on the rear panel of the module; to display your external source video on this monitor, you must set the display

control switch [see below] to **X**.)

7. Plug the 5-pin DIN connector from the AC power adapter into the matching POWER IN connector on the rear panel of the Image Capture Module, and the standard AC power cord into a wall outlet.

8. Turn on your Mindset and your Image Capture Module.

The Display Control Switch

If you're using a single composite monitor for alternate display of your external source video and captured images, set the display control (C-X) switch on the Image Capture Module to **X** to view the external source video, to **C** to view a captured image.

If you have a separate composite monitor connected to the COMP. VIDEO OUT connector on your module for viewing the external source video, leave the display control switch set to **X**.

Capturing Images

Backing Up Your Image Capture Utility Diskette

Before you start using the Image Capture Utility, it's a good idea to make a backup copy. Then you can use the copy as your working utility diskette, and keep the original in a safe place, to use in case your working copy is damaged or lost. Here's how to make a copy:

1. Load Mindset MS-DOS into your computer. Set the date and time, if necessary (or press RETURN twice).

(If you're using an earlier version of MS-DOS than 2.11, you must format your blank diskette before using the DISKCOPY command to copy the utility. For complete details on formatting and copying diskettes, see your Introductory Guide to MS-DOS and MS-DOS Reference Manual.)

2. With your MS-DOS System Diskette in drive A, and the A> prompt on the screen, type DISKCOPY
A: B: and press RETURN. Follow the prompts that appear on the screen for placing your original utility diskette (the "source" diskette) in rrrrdrive A and a blank diskette (the "destination" diskette) in drive B.

When your backup copy is complete, label it. Store the original in a safe place, and use the backup as your working copy of the utility.

Making a System Diskette From Your Image Capture Utility Diskette

Unless you're installing the utility on a hard disk (see next page), you'll probably want to make your working copy of the utility into a system diskette. For everyday use, you'll then be able to load the utility without first having to load MS-DOS. All you need to do is copy a few DOS system files from your MS-DOS System Diskette. Here's how:

1. With MS-DOS loaded, your MS-DOS System Diskette in drive A, and the A> prompt on the screen, insert your working copy of the utility in drive B. (If you have a hard disk, boot MS-DOS from the hard disk--the C> prompt will appear.) Then type **SYS B:** and press RETURN.
2. When the A> (or C>) prompt reappears, type **COPY COMMAND.COM B:** and press RETURN.

(For complete details on transferring MS-DOS system files, see your MS-DOS Reference Manual.)

Your utility diskette now contains the DOS files needed to boot your system directly--without your having to load MS-DOS first.

Installing the Image Capture Utility on a Hard Disk

Here's how to install the Image Capture Utility on a hard disk:

1. Boot MS-DOS from your hard disk. Set the date and time, if necessary (or simply press RETURN twice).
2. To place the utility in an existing directory—with the C> prompt on your screen, type:

```
CD <directory name>
```

then press RETURN.

To make a directory for the utility, enter the following commands. Always wait for the C> prompt to reappear before typing in the next command in the sequence, and press RETURN after each entry.

```
CD \  
MD <directory name>  
CD <directory name>
```

3. To copy the utility onto the hard disk, place your utility diskette in drive A and, with the C> prompt on your screen, type:

```
COPY A:*. * C:
```

then press RETURN.

Loading the Image Capture Utility

Here's how to load the Image Capture Utility into your computer system from a diskette:

1. If you have not made your utility diskette into a system diskette, you must first load MS-DOS into your system. If you have made your utility diskette into a system diskette, simply place it in drive A and turn on your system (or press ALT-RESET, if your system is already on). Set the date and time, if necessary (or simply press RETURN twice).
2. With the A> prompt on the screen and your utility diskette in drive A, type **CAPTURE** and press RETURN. As the utility loads into your computer, a copyright screen appears, along with the prompt to press any key to continue. Press any key--the utility menu appears.

To load the Image Capture Utility into your computer system from a hard disk, first boot MS-DOS from the hard disk. Set the date and time, if necessary (or simply press RETURN twice). Change to the directory in which you placed the utility on your hard disk--with the C> prompt on your screen, type:

CD <directory name>

then press RETURN. Then, to load the program--with the C> prompt on your screen, type:

CAPTURE

then press RETURN. As the utility loads into

your computer, a copyright screen appears, along with the prompt to press any key to continue. Press any key--the utility menu appears.

The Utility Menu

A single main menu gives you access to all the functions of the Image Capture Utility. To select any command on the main menu, first position the cursor within the box containing the command you want to execute--you may use either a Mindset Mouse or the cursor direction keys at the lower right of your keyboard to guide the cursor. Then press either button on the mouse or the RETURN key on the keyboard.

To return from any command sub-menu to the utility main menu, press the ESC key on your keyboard. To exit from the utility main menu to MS-DOS, press the ESC key on your keyboard.

Following are instructions for using each command. It's recommended that you read through them before beginning to use the utility; as you become more experienced in using your Image Capture system, you'll develop familiar sequences of commands.

CAPTURE

Use this command to capture and display an image from your external video source. When you press RETURN on your keyboard (having first positioned the cursor in the CAPTURE box), the current image from your video source is instantly

captured in the Image Capture Module's memory buffer, transferred to the capture buffer in the Mindset system memory, mapped to the Mindset display mode, and displayed on your screen. How the image is mapped to the display mode can be controlled by the CONVERT and D MODE commands--- the default display mode is POPULAR (see below).

CONVERT

This command converts the image stored in your system's capture buffer to a display format, using the color palette selected through the D MODE command, and displays it on your monitor. When you execute CONVERT, each of the possible 4096 colors is mapped to one of the 16 colors of the palette chosen through D MODE, and the captured image is displayed accordingly.

VIEW

While the utility menu is onscreen, the colors of a captured image may be distorted. When you execute this command, the utility menu is removed from the screen to give you an unobstructed and undistorted view of a captured image. You may bring back the menu display by pressing either of the mouse buttons or any key on the keyboard; you can also toggle the menu on and off by pressing the space bar on the keyboard.

D MODE (Display MODE)

You use this command to select one of two modes for mapping the colors of a captured image for conversion from the capture buffer to display

(the mapping is executed prior to display when you execute the CONVERT command, described above). If you select the POPULAR mode, the system selects a 16-color palette based on the 16 colors most used in the captured image. If you select the FIXED mode, the system maps your image according to the current color palette. In turn, the current palette may have been selected from the previous image using the POPULAR mode, or may be a palette that you've loaded from diskette using the LOAD P command, described below. (POPULAR is the default mode.)

TV/MON

Use this command to toggle between the TV display mode (for television sets, composite monitors, and analog RGB monitors) and the monitor display mode (for TTL RGB monitors).

SAVE D (SAVE Display)

Use this command when you want to store the currently displayed image as a diskette (or hard disk) file. When you select SAVE D, the utility prompts you to specify the kind of file you want to create. Depending on the graphics software you want to use later to edit or enhance them, you may store images as Lumena, Designer, or MGI files—see the user's guide for the graphics software you want to use for details on filenaming conventions. If you give no extension when typing in the filename, the utility supplies the .PIX extension for Lumena files and the .PIC extension for Designer files. Press RETURN when you have typed in the filename.

SAVE F (SAVE File)

Use this command to save captured images in the capture buffer. In their "raw" form, images in the capture buffer may be composed of up to 4096 colors. Though the Mindset display modes cannot handle that many colors, you may wish to store images in their original form for output on high-resolution printing and other devices. See "Some Technical Information" (next page) for details on how captured images are formatted; and see SAVE D, above, for details on storing images for later editing or enhancement with Lumena, Designer, or MGI.

LOAD F (LOAD File)

This command loads a file stored using SAVE F (described above) into the capture buffer. You may then map the colors of the image and display it using CONVERT and VIEW (also described above).

SAVE P (SAVE Palette)

Use this command to save the current color palette (selected through the D MODE command, described above) as a Lumena color map. If you specify no extension when naming the file for storing the palette, the system supplies the standard Lumena .MAP extension. See your Lumena User's Manual for details on palettes and color mapping.

LOAD P (LOAD Palette)

This command loads a color palette stored with the SAVE P command (described above) into the

Image Capture system; you must specify the filename of the palette file.

Some Technical Information

The Image Capture Utility uses two basic data formats. The first is that of an image captured from an external video source, referred to in this guide as the contents of the capture buffer. This format consists of one data word for each of the 64,000 pixels captured (in 320 by 200 resolution) by the Image Capture Module. Each word consists of the following three fields:

bits 0 - 3	red
bits 4 - 7	green
bits 8 - 11	blue

(The remaining bits 12 - 15 are all 0.)

The second format is that of data actually displayed, which is stored in a 32,000-byte physical frame buffer referred to in this guide as the display buffer. Each byte in this format consists of two 4-bit nibbles, each representing a single pixel in the displayed image. Each 4-bit value serves as an index to the system color palette, determining the color representation for each pixel in the displayed image.

Error Messages

Listed here are the two error messages you may get when using the Image Capture Utility, with suggestions for correcting each problem. Any other error messages that appear are system-related—see your MS-DOS Reference Manual.

No Video Input

A timeout has occurred while the system was attempting to capture an image. Check all the connections in your system, and make sure that your external video source is operating properly.

File I/O

An error has occurred while the system was trying to store or retrieve a diskette (or hard disk) file. Check the filename you specified; if you're trying to save a file, there may be insufficient space to accommodate the file on your diskette.

Appendix

Specifications

Listed here are technical specifications for the Mindset Image Capture Module.

- o Video input: 75 ohm—any standard signal from:
 - 1/2-, 3/4-, or 1-inch videotape (consumer or broadcast grade)
 - video (laser) disk
 - video camera (consumer or broadcast grade)
 - TV broadcast
- o Video output: 75 ohm—video loop-through to allow viewing of image to be captured
- o Capture resolution: 320 by 200 by 12 (4096 colors per pixel)
- o Display resolution: 320 by 200 by 4 (16 colors displayed simultaneously from a palette of 512)
- o Capture time: 1/60 second
- o Color mapping time (Image Capture Utility): approximately 3 seconds
- o Dimensions: 12" wide by 10" deep by 1.1 inches high