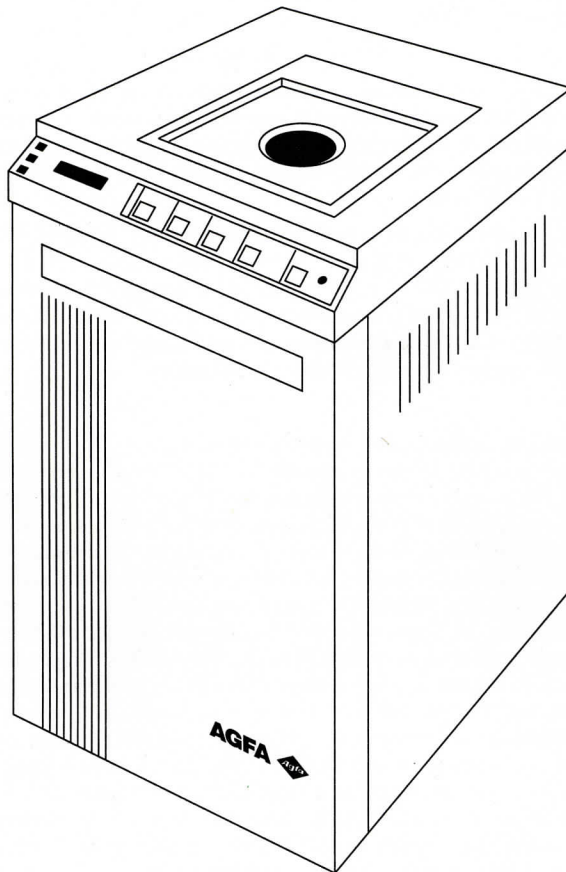


# ALTO

## User Guide

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Part Number  
209475-003

**AGFA** 

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## Index

# Preface

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# Purpose

This guide describes how to operate the Alto™ and Alto LS film recorders.

These film recorders are designed to meet the requirements of many applications, including presentation graphics, photography, scientific visualization, graphic arts and cinematography.

Imaging systems that support the Alto and Alto LS film recorders can be made up of many different combinations of hardware and software. It is not possible to describe them all in this guide. To use your film recorder most effectively, you need to understand all the components of your unique imaging system.

# Audience

This manual is written for operators who will use the Alto or Alto LS film recorder regularly as a production tool. It assumes that these operators are familiar with the following:

- Basic concepts of color photography.
- Operation of the front end computer.
- Operation of the programs in use on the front end computer.
- Operation of rasterizers such as the Agfa MVP Star-16™ or ChromaScript® or direct driver software that supports the Alto.

This basic knowledge is critical to the effective and successful operation of this film recorder.

# General Terminology

Throughout this manual the use of the term "Alto" is used for both the Alto and Alto LS film recorders, unless otherwise stated.

# Overview

Here are summaries of each chapter.

## *Chapter 1: Product Description*

Features and parts of the Alto film recorder.

## *Chapter 2: Installation and Setup*

System requirements, power connections, communication interface between the Alto and your front end.

## *Chapter 3: Basic Operations*

Starting up the Alto, status and control terminal, the Alto control panel and menus.

## *Chapter 4: Film Control Functions*

Loading, advancing, rewinding and other film handling functions.

## *Chapter 5: Command Functions*

Calibration, selecting imaging mode, setting pacing and delay at start values and other general controls.

## *Chapter 6: System Default Functions*

Film transport, module geometry, date/time, interface control, message tag and tagline control functions.

## *Chapter 7: Color Control Functions*

Basic controls for color adjustment: Intensity, color balance, gamma, toggle Dmax and default color.

## *Chapter 8: Red, Green, Blue Control*

Additional color control functions that give maximum adjustment.

## *Chapter 9: Diagnostics*

Software tests to verify that Alto is operating properly.

## *Chapter 10: Additional Information*

Status and error messages, reset procedure, maintenance, use of viewing filters, rasterizers, guidelines for viewing slides.

# Chapter 1: Product Description

---





# Introduction

The Alto Film Recorder includes many features previously found only on expensive service bureau-type systems.

These include:

- The capability to produce presentation-quality slides at 2K, 4K or 8K medium and large format imaging up to 16K.

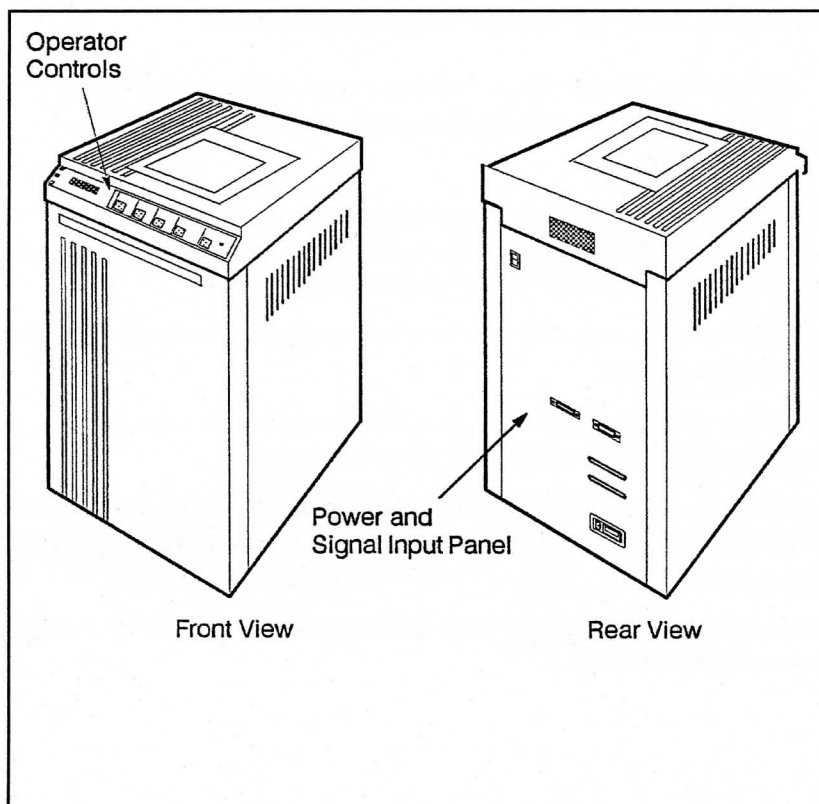
**Note:** The Alto LS does not have the ability to produce slides at 16K. It is limited to presentation-quality slides at 2K, 4K or 8K.

- Dual GPIB and SCSI interface connectors for compatibility with most PC and Mac rasterizers, including Agfa ChromaScript II™, Mac Conductor™, MVP Star™ and MVP Star-16™.
- Full 36-bit color capabilities for ultra-smooth gradients and accurate color response.
- An LCD display that provides you with simple function, status, and error messages in English and other languages.
- 4 megabyte of data buffer and a full “pacing” feature to optimize image quality and avoid imaging artifacts when using popular software rasterizers.
- Unique desk-side design with rolling casters, making it easy to share among users.

# Description

This section describes Alto's controls and connectors. Familiarize yourself with their location and function before you attempt to install or operate your new film recorder.

Figure 1.1 shows Alto's controls and connectors.



*Figure 1.1 Controls and Connectors*

## Front Panel

Alto's front panel provides easy access to the features and information you will need. Figure 1.2 highlights a top view of the Alto, and a key to the numbered items is found on the following page.

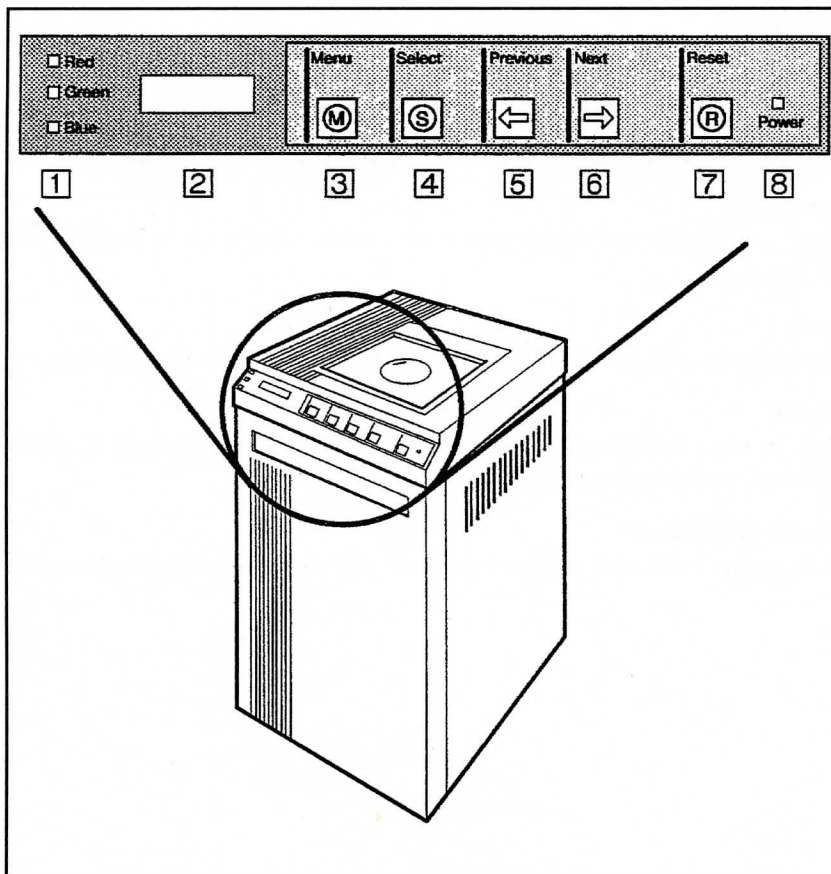


Figure 1.2 User Interface

1. **Red, Green, Blue Indicators**

Each of these lights up in turn as its corresponding color pass is being imaged.

2. **Message Window**

This 16-digit, 2-line LCD display shows status and error messages.

3. **Menu**

This key accesses the Alto's user menu.

4. **Select**

This key activates the function displayed in the message window.

5. **Previous**

This key causes the displayed menu or submenu to scroll backward (to the left).

6. **Next**

This key scrolls forward (to the right) through the displayed menu.

7. **Reset**

This button resets all the functions of the Alto. Use this if the film recorder stops operating.

8. **Power Indicator**

This green indicator lights up when you turn on the film recorder.



## Rear Panel Switches and Connectors

Figure 1.3 illustrates the Alto's back panel. The numbered items are explained on the following page.

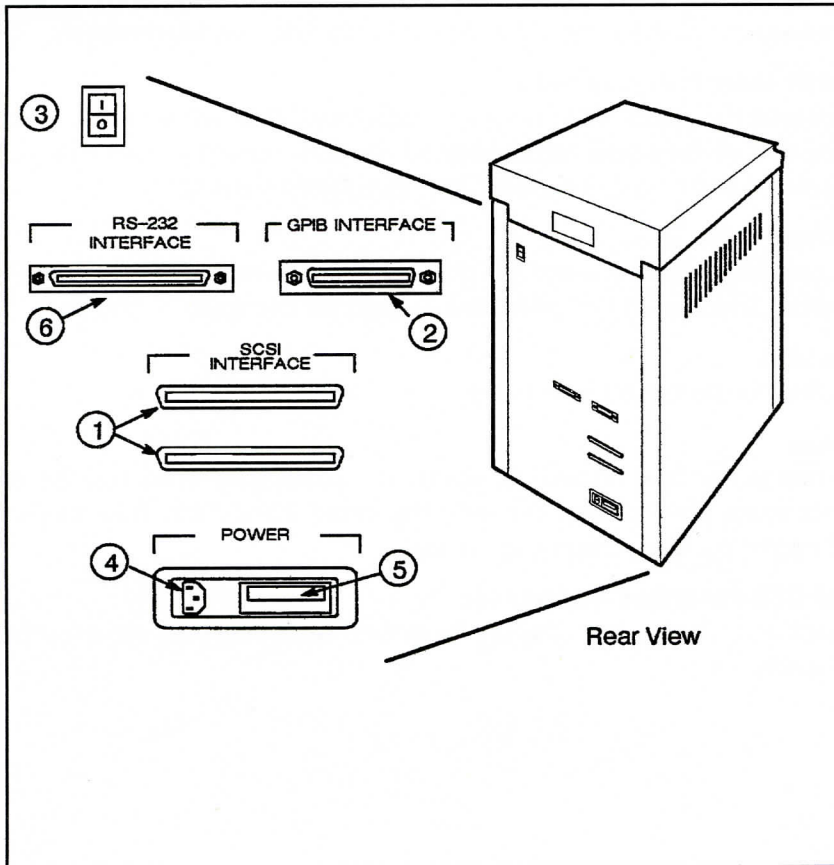


Figure 1.3 Rear Panel Switch and Connector Identification

1. **SCSI Interface Connector (IN/OUT)**

Connectors that accept computer interface cables allowing the transmission of data and commands to the Alto. Use these connectors if you are creating images on a SCSI host computer. You generally connect the SCSI cable to one connector and a SCSI terminator to the other. The Alto has no internal termination.

2. **GPIO Interface Connector**

Accepts the IEEE-488 computer interface cable allowing the transmission of data and commands to the film recorder. Use this connector if your host computer supplies GPIO output.

3. **Power Switch**

Press this switch upward ("I" position) to turn on the unit. Press this switch downward ("O" position) to turn off the unit.

4. **Socket**

Input connector for line power.

5. **Fuse**

Protects the film recorder's electrical systems by breaking the circuit when the current exceeds the rated value. The fuse value is stamped on the serial number tag.

6. **RS-232 Interface Connector**

Connects the status display terminal; also used for remote diagnostics.

## Space Requirements

The Alto measures 30.5" high, 15" wide, 18" deep, and weighs approximately 103 pounds (51 kg). Allow four (4) to six (6) inches of clearance behind the unit for dressing the power and input cables. Keep space clear in front of and above the unit to facilitate film loading.

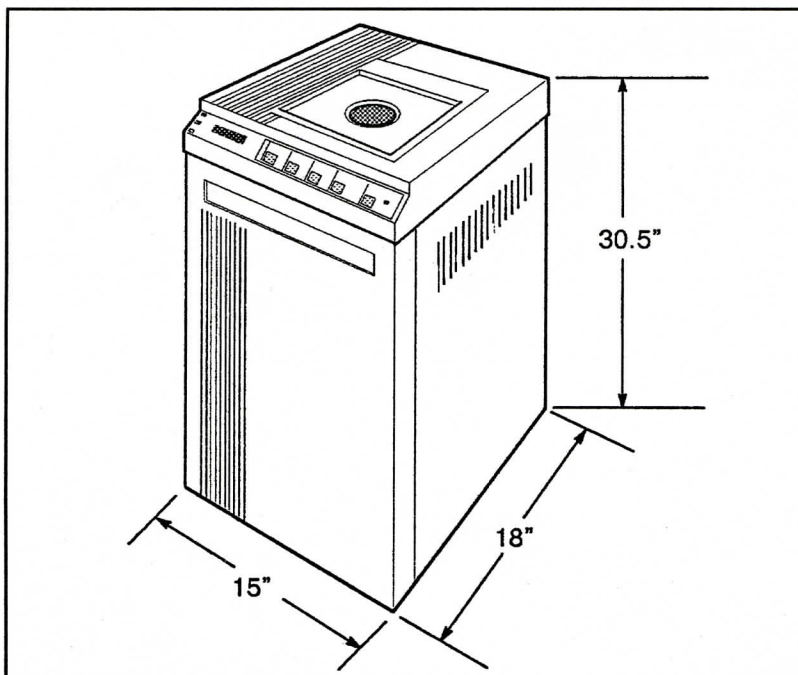


Figure 1.4 Alto dimensions



## Chapter 2: Installation and Setup

---



# Introduction

This chapter describes how to connect the power and interface links between the host system and the Alto.

Read all the installation instructions carefully before you plug in your Alto. Follow all the cautions and warnings, and keep this manual handy for reference.



# System Requirements

As part of your Alto system, you need the following:

- A computer to create your graphics (PC, Mac, mainframe, mini-computer or graphics workstation).
- Any application capable of generating images in a SCODL, PICT, POSTSCRIPT, TARGA, TIFF, or other format that is supported by one of the compatible rasterizers.
- A rasterizer to process the images with an appropriate GPIB or SCSI interface, and cables to connect it to the Alto film recorder. See the section *Rasterizers* in *Chapter 10: Additional Information*.
- A reliable power source. If your power system is subject to brownouts and surges, we recommend that you purchase a power line conditioner before installing Alto.

# Film Backs

The Alto can accommodate a 35mm 36-exposure, 35mm bulk, medium format camera (120 film), a single-sheet 4x5 module and an 8 x 10 camera module.

## Attaching the Film Back

To attach the film back, do the following:

- Step 1: Remove the protective lens cap from the module (if attached).
- Step 2: Align the camera back inside the recessed area on top of the Alto. The module fits tightly on the two registration pins on the film recorder, and it can only be positioned in one direction.
- Step 3: Turn both locking screws clockwise until they are tight.

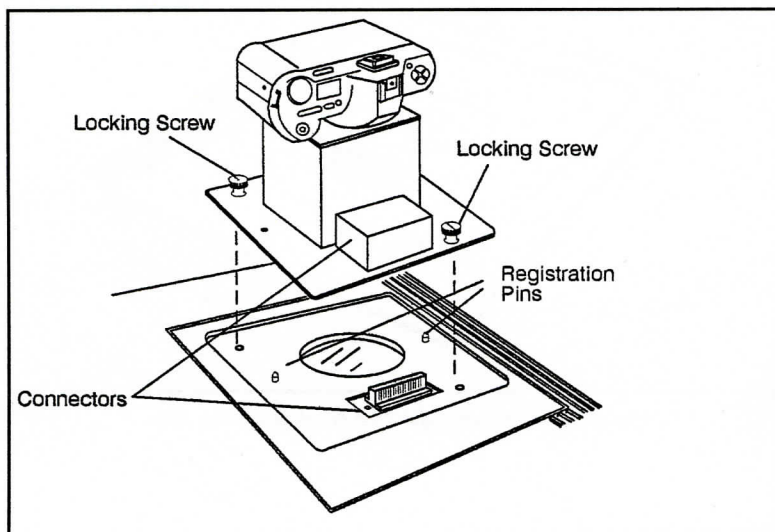
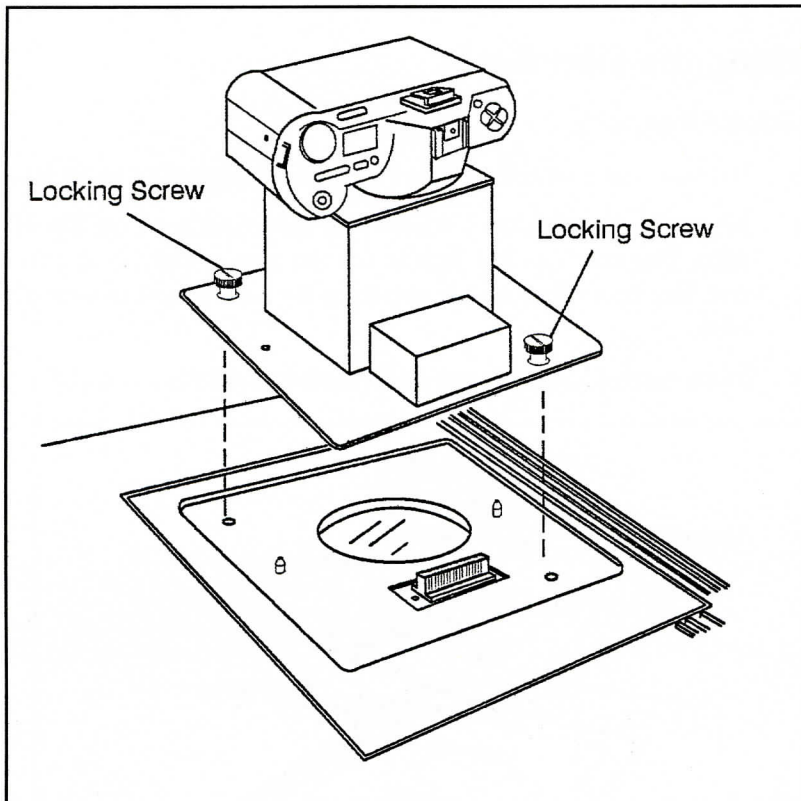


Figure 2.1 Attaching the film back

## Removing the Film Back

Locate the two locking screws on the opposite corners of the module plate. Turn the locking screws counterclockwise until they are loose. This releases the camera back from Alto.



*Figure 2.2 Removing the film back from the Alto*

# Power Requirements

The Alto can operate with 115 Vac or 230 Vac line voltages @ 50/

60 Hz. The Alto's power requirements are stated on the serial number identification label located on the rear of the unit.

**Note:** If the system power is subject to variations, such as transients of voltage sags and surges, use a power line conditioner to prevent transient voltage spikes from interrupting the Alto's operation. If you use an uninterruptible power supply with the Alto, ensure that the output is an AC sine wave. Never use uninterruptible supplies that produce a square wave output.

The Alto draws approximately .5 amp. @ 22v. Ensure that adequate power is available before installing the Alto. The film recorder is a precision electrical device, and you must adhere to these power requirements.

**Caution:**

Ensure that power is turned off before you connect the Alto to any other device in the imaging chain.

Alto's internal CRT uses magnetic coils to position an electronic beam. When selecting a location for the film recorder, avoid areas where large magnetic fields are present. Devices such as login drives, motors, and transformers can interfere with the Alto if they are located close to it.

## Connecting the Power Line

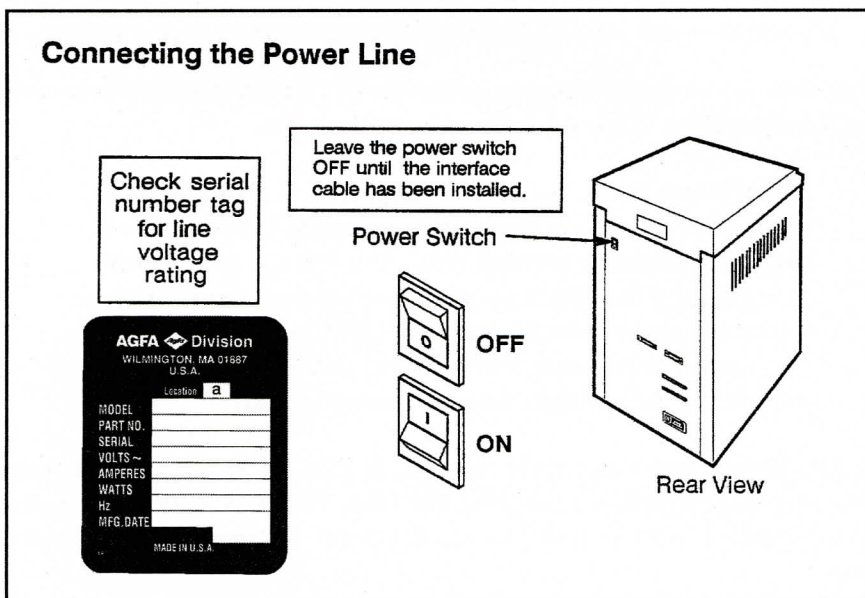


Figure 2.3 Power switch and connector location

To connect the Alto's power line:

- Ensure that the Alto's power switch is in the OFF position.
- Connect the female end of the power cord supplied with the film recorder to the three-pronged socket on the rear panel.
- Ensure that the wall current matches the power specifications stated on the film recorder's serial number tag. Plug the three-pronged male end into a standard power socket.

### **WARNING:**

Alto is electrically grounded and its power connector will only fit a grounded-type AC outlet. This is a safety feature.

If unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet.

## Changing the Fuse

Replace the primary input fuse if it blows or if you change the input line voltage. The power module's fuse block accepts a single fuse for North American applications or dual fuses for European applications.

### Caution:

If you use an incorrect fuse value, damage may result to the equipment. Table 2.1 on the following page lists the values for each line voltage.

To change the fuse:

- Step 1: Turn the unit off. Unplug the AC line cord from the receptacle on the power input module.
- Step 2: Open the power module cover with a small, regular screwdriver.
- Step 3: remove the existing fuse and replace it with a new one. Use the values specified in Table 2.1.
- Step 4: Plug the fuse housing back into the power module.

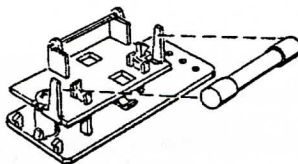


Figure 2.4 Replacing the Fuse

**Note:** changing the fuse is only necessary if the Line Voltage does not match the reading on the serial number tag.



AC Input (VAC)	Fuse	
	F1	F2
100	1.5A	Jumper
120	1.5A	Jumper
220	1.5A	Jumper
240	1.5A	Jumper
Note: Fuse ratings are U.S. Slow Blow rated.		

**Table 2.1 Fuse Ratings**

## Changing the Line Voltage

If you move the imager to a location where the line power is different, you must change its primary wiring and fusing. The imager's power input module has a voltage selector circuit board which you remove, rotate to the desired voltage, and replace.

To change the line voltage:

- Step 1: Power the video imager off. Unplug the AC line cord from the receptacle on the power input module.
- Step 2: A metal guard plate covers the top portion of the power input module. Loosen the button head screw that secures it, and rotate the guard 180 degrees.
- Step 3: Open the power module cover with a small, regular screwdriver and set it aside. Pull the voltage selector card straight out of the housing using pliers or a similar tool.
- Step 4: Position the card so the desired voltage is at the bottom, and position the indicator pin to point up opposite the desired voltage reading.



- Step 5: Return the card to the housing, with the printed side facing toward the line cord receptacle and indicator pin pointing to the cover.
- Step 6: Be sure to make any necessary fuse changes associated with voltage selection.

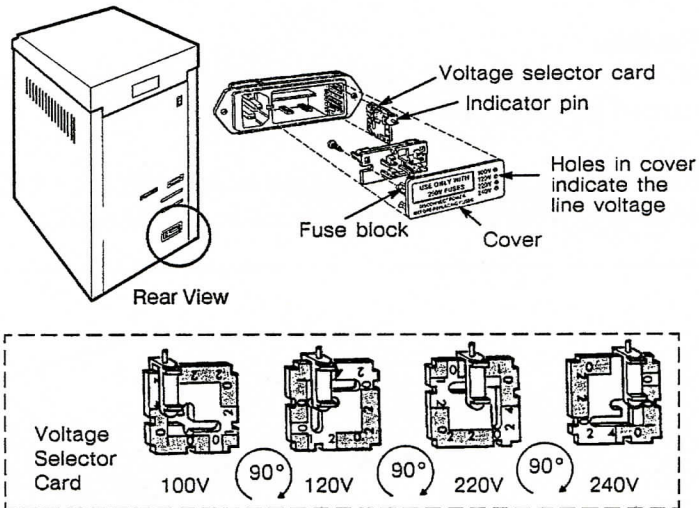


Figure 2.5 Changing the Line Voltage

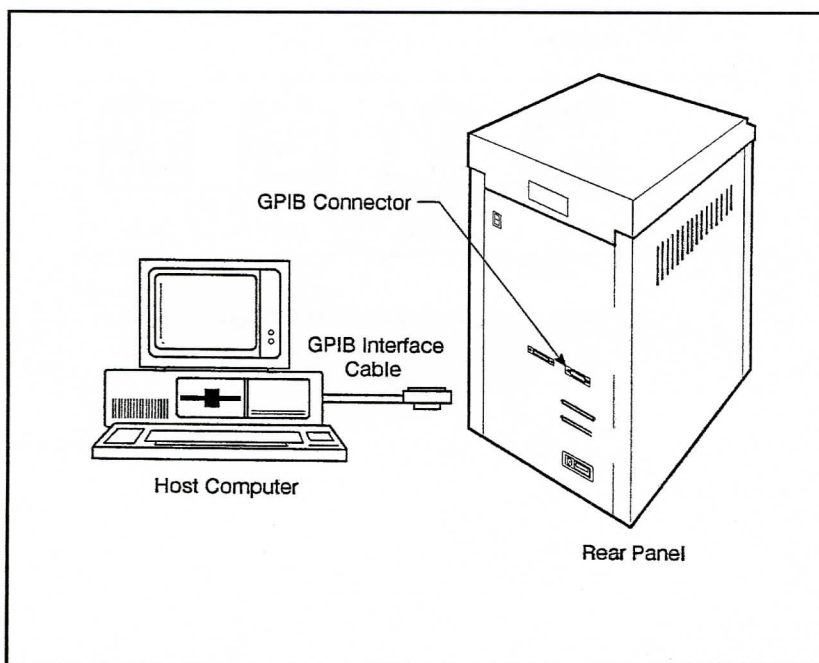
# Connecting to a GPIB Interface

You can connect the Alto to a MVP Star, MVP Star-16, ChromaScript II or similar interface that uses a GPIB (IEEE-488) communications protocol as shown in Figure 2.6. Either end of the GPIB cable can be connected to the film recorder.

**Caution:**

Make sure that your computer and film recorder are turned off when you attach the cables.

Instructions for setting Alto's GPIB address are in the section Setting the Device Address in this chapter.



*Figure 2.6 GPIB Interface Connection for a PC Host*

## Connecting to a SCSI Interface

This section provides instructions for connecting the Alto to a ChromaScript II or Macintosh computer through the SCSI bus. You will need the appropriate SCSI cable and an in-line cable terminator to complete the installation.

The SCSI system cable is the standard interconnecting cable for Apple Macintosh users. This short cable connects between the SCSI port on the Macintosh and the first device in the chain.

The cable extender has a 50-pin plug connector at one end and a 50-pin socket connector at the other end. This cable will receive a cable terminator or peripheral interface cable and plug into the next device in the chain.

The terminator is not a SCSI device; its purpose is simply to minimize signal reflections and noise in the interconnecting cables. Refer to the setup diagrams for specific configurations. The SCSI cable, extender, and terminator are illustrated in Figure 2.7.

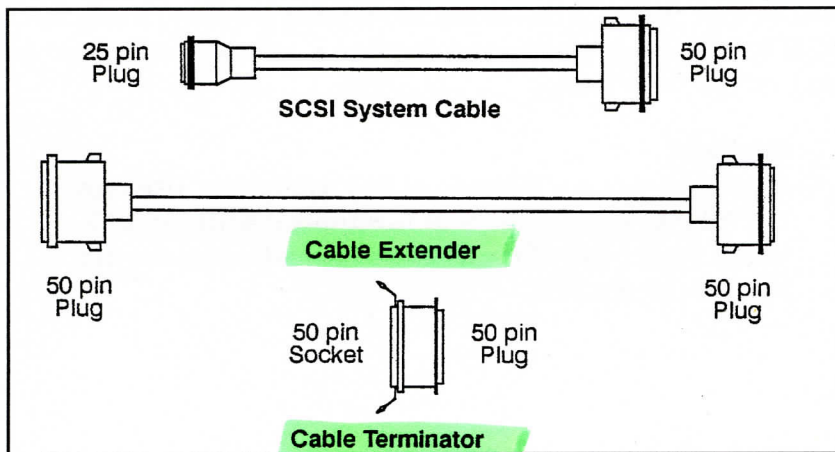


Figure 2.7 SCSI Interface Connector and Cables

## **SCSI Setup Guidelines**

- Be certain the host computer and film recorder's main power is turned off before connecting or disconnecting the SCSI cables.
- Do not exceed a total of six meters (19.7 feet) in combined cable length among all devices on the SCSI bus.
- Two suggested device layouts are provided on the following pages. Make sure that you terminate both ends of the SCSI bus for whichever arrangement you use.
- To guarantee secure cable connections between devices, fasten the interlocking wire clips or screws on the connector ends. Ensure that adequate strain relief is provided wherever cables connect into the devices.
- The Alto is not internally terminated. This allows it to be installed anywhere on the SCSI chain to any Macintosh computer. An appropriate terminator must be installed at the end of the SCSI chain.
- Alto senses the termination and the level of activity on the SCSI bus. If the Alto senses that it is not connected to a "live" Macintosh SCSI bus, or that the SCSI bus is not terminated properly, it sets its own SCSI interface bus off-line and displays a "check termination" message on the front panel.

### **Caution:**

If you are using a Macintosh IIFX computer, use only the "black" terminator that is supplied with the IIFX. Using other types of terminators could damage the film recorder or the IIFX.

## Alto SCSI Interface Configurations

Connect the film recorder on the SCSI bus using one of the configurations shown in the following illustrations:

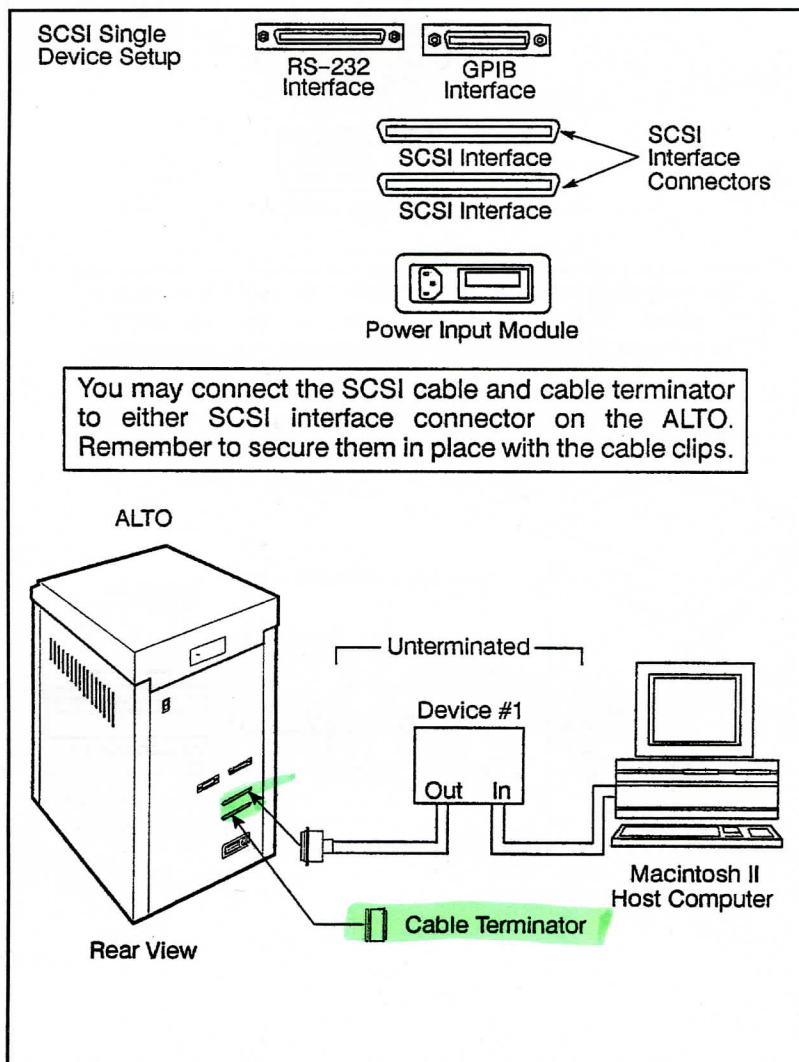


Figure 2.8 Single Device Setup, Host Terminated internally

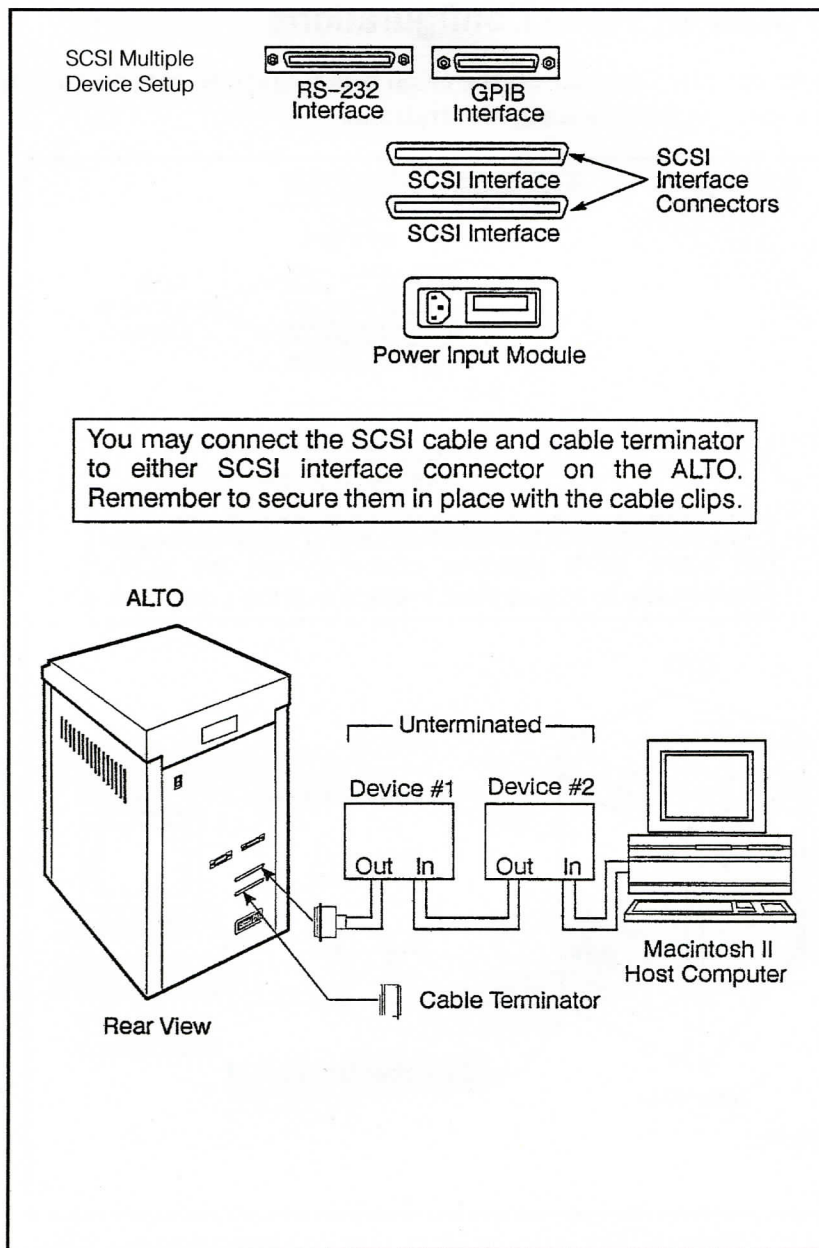


Figure 2.9 Multiple Device Setup, Host Terminated Internally



# Setting GPIB and SCSI Addresses

Alto is a “target” device for both commands and image data from the host computer. To ensure that the host talks with its “target,” each device in the imaging chain is assigned a unique device address which specifies a location or destination of information. During manufacturing, the Alto’s device address is preset with factory default settings as part of its communications protocol with the host computer.

You set the film recorder’s device address by using the controls and display menu on the Alto’s front panel.

## Device Address Guidelines

Before setting the Alto’s device address, note the following points:

- Set either or both of the device addresses, depending on whether you are using a SCSI or GPIB (IEEE).
- The factory GPIB default address is two (2). This is the appropriate address for use with the MVP in its default setting. If you are a PC user, the GPIB address is always an even number. The Alto’s LCD display panel will provide you with an actual address setting between zero (0) and 28.
- The factory SCSI default ID setting is one (1). Alto’s device address selection menu allows you to choose any SCSI address between zero (0) and 6. If you are connecting to either a Macintosh or an Agfa ChromaScript, do not set the Alto address to 0. This SCSI device address is reserved for the hard drive of the Macintosh and ChromaScript.



You should know the addresses of all the other devices in your imaging chain, and be certain not to set Alto's address to one that is already used by another device. The SCSI address can be checked using a program similar to SCSI probe on the Macintosh.

## Setting the Device Address

**Note:** To set the device address, you must turn on the Alto and use its front panel user controls to access the device address function. Before you program the Alto's device address, refer to Chapter 3 for a description of the warm-up sequence and the user controls.

After you determine the address that you want to use for Alto, set it as follows:

- Step 1: Make sure that Alto is ON and in the "ready" state.
- Step 2: Press MENU once, then use PREVIOUS or NEXT to advance to the SYSTEM DEFAULT sub-menu.
- Step 3: Press SELECT, then PREVIOUS/NEXT to advance to the INTERFACE CTL sub-menu.
- Step 4: Press SELECT, then use PREVIOUS/NEXT to display GPIB ADDRESS, SCSI ADDRESS, or LOCKOUT TIME. Press SELECT at the appropriate parameter.
- Step 5: Use PREVIOUS/NEXT to set the value of the parameter, and press SELECT to save it.
- Step 6: Use PREVIOUS/NEXT to change to another interface parameter, or press MENU three times to return to the ready state.

Chapter 3:

# Basic Operations

---



# Introduction

This chapter describes routine operating procedures including:

- Turning the Alto on.
- Understanding controls and main menu selections.

Familiarize yourself with the controls and connectors described in *Chapter 2: Installation and Setup* before you use the Alto.

# Turning on the Alto

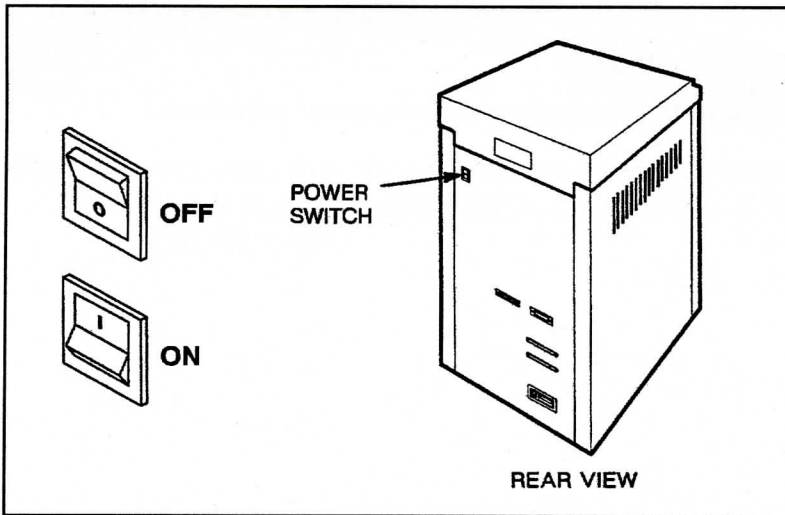


Figure 3.1 Power Switch Location

- Step 1: Locate the power switch on the rear panel (see Figure 3.1).
- Step 2: Turn on the Alto by pressing the top half of the power switch. The green power indicator on the front panel lights up.
- Step 3: After turning on the power switch, the Alto begins a warm-up process during which internal tests and CRT brightness calibrations are performed.

**Note:** Alto will periodically calibrate on its own. This is a normal operation that ensures the proper functioning of the unit. It will not interfere with the imaging process.

## User Interface

There are two ways to get access to the Alto Status and Control messages. The easiest way is to use the built-in LCD display window and front panel buttons to access status and control messages. Connecting a VT 100 terminal or VT 100 terminal emulator to the Alto RS 232

interface, which is located at the back of the unit, is an additional possibility. If you decide to connect an external terminal to the Alto, an RS 232 Cable and an RS 232 Null Modem Connector are needed.

## Warm-Up Period

Each time you power on Alto, it executes a warm-up diagnostic test and calibration sequence to determine whether the film recorder's internal electronic circuits are functioning properly. The diagnostic portion of the warm-up cycle takes approximately eight minutes to complete; then there is only an additional two-minute time period that the film recorder uses to calibrate all of its brightness levels. Although it is possible to record images within a few minutes after turning the power on, you should adhere to the following basic guidelines:

- If the film recorder is turned off for several hours, allow it to warm up for 30 minutes before you begin recording images. The additional warm-up time ensures that Alto's image quality is optimal.
- If you have been using the film recorder for several hours and turn it off for a few minutes, you do not have to allow a full 30-minute warm-up time when the unit is turned on again.
- If you experience a brown-out or power surge condition, turn the film recorder off. Severe line voltage fluctuations might damage Alto's power supplies and system electronics. Allow a full 30-minute warm-up after the brown-out or surge condition clears.
- Never turn the film recorder on-off-on in rapid sequence. Allow at least five to ten seconds between on-off cycles. By turning the power on and off in rapid succession, you risk damaging the equipment.
- It is recommended that you DO NOT bypass the warm-up diagnostic test and calibration sequence. Allow the film recorder to complete its warm-up period before proceeding. Poor color balance may occur if you shortcut the initial warm-up period or the unit may not calibrate.

## Bypassing Warm-up

You may bypass the warm-up cycle; however, it is not recommended if the machine has been off longer than 15 minutes.

**Note:** Poor color balance may occur if you shortcut the initial warmup period. This is true even if the unit was off for only a few minutes. Alto must have a ten minute warmup/calibration time to produce consistent colors. Alto may not calibrate until completely warmed up.

If you are using a Status and Control Terminal:

- Press SHIFT B (during warmup)
- Select the desired film type and resolution
- Press CTRL-C to reset (enable auto calibration)

If you are using the Alto Front Panel:

- Press Reset while warmup appears on the LCD.



# Status and Control Terminal

The status and control terminal provides you with comprehensive information on Alto's operational status, and allows you to select among a wide range of user options including film types and addressability mode. The terminal interface requires a VT-100 compatible computer terminal.

The following terminal protocol is provided to match your terminal with the requirements of the Alto.

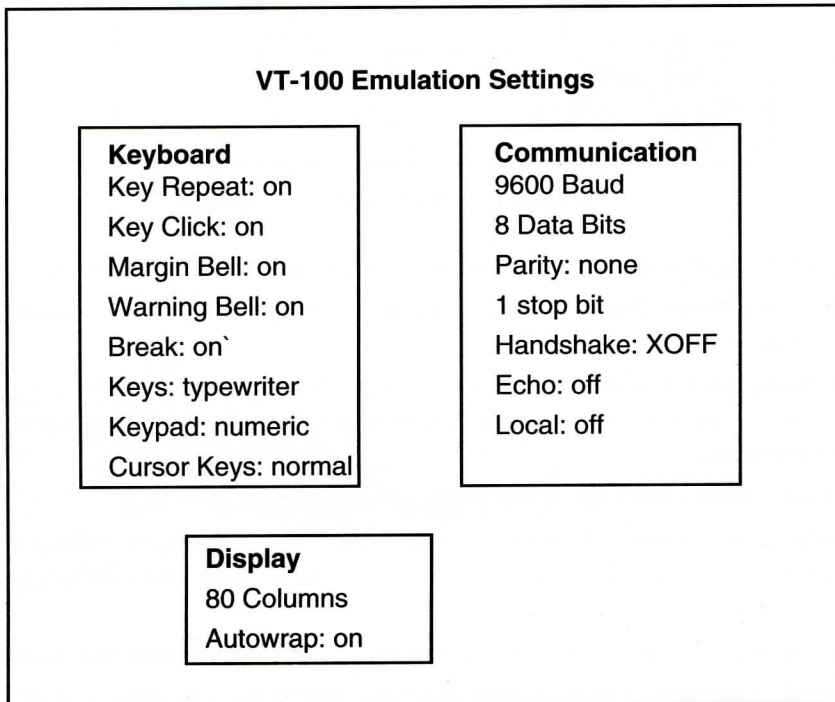


Figure 3.2 Terminal Protocol

# Terminal Menu Description

After the warm-up period, the following screen should appear:

Agfa Alto serial # Module ID			
Activity: Ready ①			
Mode: ② 4K	Module: 35mm	Filter Wheel	Main Menu ④
Start pixel -2048	Image Count ③ 0	>>Opaque	Film control ⑤
Pixels per line: 4096	Frame Count: 0	Red	Commands ⑥
Start line: 1366	To film end: 36	Green	System Default
Lines per scan: 2732	Auto Notch Disabled	Blue	Diagnostics
GPIB online ⑦ @ 2	Film Type:		
SCSI online ⑧ @ 1	Agfachrome RS100 Plus		
Lockout Time (min): ⑨ 0	Alto Code Version x.xx.xx		
Pacing ⑩ 3	Mar 01, 1993 14:30		
Start delay (sec) ⑪ 2			
Autocal: ⑫ on			
⑬			

Figure 3.3. Terminal Menu

1. **System Activity Line** – Indicates the current status of the Alto.
2. **Imaging Mode Data Field** – Indicates the imaging mode, imaging position, and scan size.
3. **Module Data Field** – Indicates the installed module type, film type, current frame position, filter wheel position, and bulk load notch information.
4. **Menu Level** – Indicates the current menu level selected.
5. **Selection Cursor** – Provides a means to make selections within the menu. The cursor is moved by the arrow keys. You make selections by pressing the RETURN key.
6. **Menu Selections** – Indicates the current choices within the menu.
7. **GPIB Interface Address and Status** – Indicates the selected GPIB address and status for host communication.
8. **SCSI Interface Address and Status** – Indicates the selected SCSI address and status for host communication.
9. **Lockout Time** – Displays the number of minutes left before the unused interface becomes available for data transfer. After the last data is sent over the Alto's GPIB or SCSI interface, this value counts down from the requested setting to zero. When the Lockout Time reaches zero, data can be transferred to the Alto via the other interface.

10. **Pacing Field** – Displays the current interline delay selected. The pacing value ranges from 3 to 255.
11. **Start Delay** – Sets the time between the rasterizer's start of an image and the opening of Alto's camera shutter.
12. **Autocal Field** – Displays if the automatic calibration feature is on or off.
13. **Data Input Field** – If a selection within a menu requires more data, the choices appear within this field.

Many of the status and control terminal parameters are stored within a battery backed up memory and saved even after turning the Alto off.

**Note:** If you power on the terminal after the Alto is started, the menu screen will not immediately appear. Press CTRL-R to update the status display.

**Note:** For those using terminal emulation on a PC: If you use a serial port previously connected to a mouse, make sure that the mouse driver has been removed from the configuration file "AUTOEXEC.BAT" and/or "CONFIG.SYS."

## Making Selections from the Terminal

Main menu selections are performed by moving the cursor, indicated by "> >" on the display, to the desired selection. The keyboard arrow keys will move the cursor. Once the cursor is properly positioned, press the RETURN key and the Alto will execute the command.

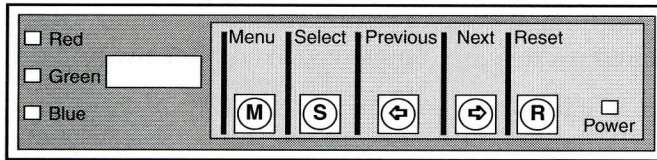
An alternate selection method is to enter the corresponding letter to a selection. The first capital letter in a selection followed by a RETURN executes the command. (F = Film control, C = Commands, S = System Default, D = Diagnostics)

- **CTRL-R** – Refreshes the screen
- Press **ESCAPE** to return to the main menu from any sub-menu.
- **CTRL-C** – resets Alto and refreshes the screen.

**Note:** Pressing CTRL-C will interrupt data transfer over the GPIB and SCSI interfaces. Imaging will also be interrupted if the status terminal is serviced during an imaging cycle.

# Front Panel User Controls

The Alto uses a 16-character, 2-line LCD message window to display menu options and easy-to-understand status and error codes. There are four control buttons on the front panel—MENU, SELECT, PREVIOUS, and NEXT—which allow you to easily scroll through the film recorder's user menus and select among a wide range of setup parameters and test routines. The reset button is also conveniently located on the front panel (see Figure 3.4).



*Figure 3.4 Alto's Front Panel*

Once the Alto finishes its warm-up cycle, the message window displays a "READY" message that indicates the last type of film that was selected, the status of the GPIB and SCSI interfaces, and the frame count.

<b>READY GPIB SCSI</b>	
<b>AGFA1</b>	<b>1</b>

You can view and/or change any of the user-selectable functions by pressing the MENU button once and selecting from any of the four main menus: FILM CONTROL, COMMANDS, SYSTEM DEFAULT, and DIAGNOSTICS. Scroll through the menus by pressing either the PREVIOUS or NEXT button and observe the message display.

Press the MENU button to access a particular menu display. Press the SELECT button to activate the current display function. This will either execute a command immediately or display a submenu offering further choices. Use the PREVIOUS or NEXT button to scroll through these selections.



# Main Menu

Four selections are available from the main menu; Film Control, Commands, System Defaults, and Diagnostics (see Figure 3.5 for sub-menu selections).

- **Film Control** – This sub-menu allows you to select the film type, load, advance, notch, unload, and rewind the film.
- **Commands** – This sub-menu controls calibration, selects addressability, pacing, and delay at start features, and GPIB and SCSI interfaces.
- **System Default** – This sub-menu allows you to access the color control menu. Film transport characteristics, module geometry, GPIB and SCSI addresses, date and time, and message tag data are also accessed from this menu.
- **Diagnostics** – Most of this sub-menu is reserved for service personnel. Various test patterns and images are also provided to align and test Alto's internal video circuits. The Extended Diagnostic selection is reserved for use by authorized Agfa service personnel. A password is required to gain access to this sub-menu.

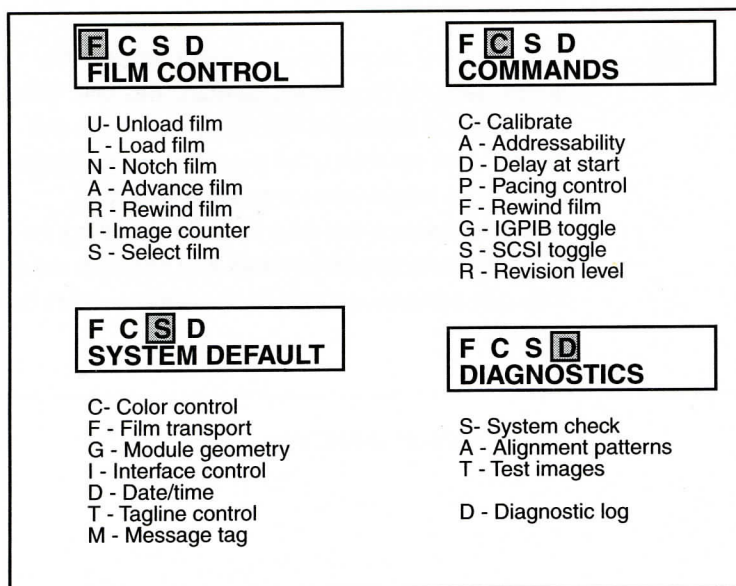


Figure 3.5 Menu Structure

Tables 3.1 through 3.4 describe the functions available in the four main menus.

MESSAGE WINDOW	DESCRIPTION
<b>U</b> L N A R I S UNLOAD FILM	This function allows film to be removed from the camera and resets the frame counter to zero.
U <b>L</b> N A R I S LOAD FILM	This function advances a new roll of film and resets the frame counter to "1."
U L <b>N</b> A R I S NOTCH FILM	This function sets the number of unexposed frames you wish to advance between the last exposed image on a bulk loading module.
U L N <b>A</b> R I S ADVANCE FILM	This function advances the film one frame but has no effect on the frame count.
U L N A <b>R</b> I S REWIND FILM	This function rewinds a used roll of film but has no effect on the frame count.
U L N A R <b>I</b> S IMAGE COUNTER	This function allows you to set the frame counter to any number between 0 and 9999 without advancing the film.
U L N A R I <b>S</b> SELECT FILM	This function allows you to select among the supported film types for a specific module. When you select a standard film type, Alto loads the default look-up tables for that film and calibrates its internal brightness level. User film type selection causes the Alto to calibrate using the currently selected brightness and contrast values. You can save these values to create custom film tables.

**Table 3.1 FILM CONTROL**

MESSAGE WINDOW	DESCRIPTION
<b>C</b> A D P F G S R CALIBRATE	This function calibrates the machine's internal brightness and contrast levels.
C <b>A</b> D P F G S R ADDRESSABILITY	This function allows you to select among a 2k, 4k, 8k or 16k resolution. The default setting is 4k.
C A <b>D</b> P F G S R DELAY AT START	This function provides a fixed time delay for imaging complex files and is measured in seconds. The value can be between 0 and 255; the default is 2.
C A D <b>P</b> F G S R PACING CONTROL	This function allows adjustment of imaging speed to better match rasterizer data transfer rates. The default value is 3. Refer to the Pacing Control section in Chapter 5 for a complete description.
C A D P <b>F</b> G S R FORTE ID	This feature allows the Alto to emulate a Forte. This function is either ON or OFF.
C A D P F <b>G</b> S R GPIB TOGGLE	This function sets the GPIB interface either on-line or off-line.
C A D P F G <b>S</b> R SCSI TOGGLE	This function sets the SCSI interface either on-line or off-line.
C A D P F G S <b>R</b> REVISION LEVEL	Selecting this function causes the display to read back the Alto's firmware revision number.

**Table 3.2 COMMANDS**

MESSAGE WINDOW	DESCRIPTION
C F G I D T M COLOR CONTROL	The function in this submenu allows you to adjust parameters such as CRT intensity, brightness, contrast, color balance, and gamma.
C F G I D T M FILM TRANSPORT	The functions in this submenu are used to define film notching parameters for a bulk-loading module and the number of frames per roll for either a 35mm or bulk loader. Default values can also be loaded.
C F G I D T M MODULE GEOMETRY	This function adjusts parameters such as horizontal and vertical offset and pincushion, size and tilt. Default values can also be loaded.
C F G I D T M INTERFACE CTL	This function sets the GPIB address, SCSI address, and the lockout time when changing interfaces.
C F G I D T M DATE/TIME	This function simply allows one to change the date and/or time on the display.
C F G I D T M TAGLINE CONTROL	The tagline printed on the output slides can be set for all, half, or off (no tag).
C F G I D T M MESSAGE TAG	An identifying message of up to 20 characters can be added to all output slides.

**Table 3.3 SYSTEM Default**



MESSAGE WINDOW	DESCRIPTION
S A T R D SYSTEM CHECK	This function runs several internal diagnostic checks.
S A T R D ALIGN PATTERNS	This function lets you select among several alignment patterns.
S A T R D TEST IMAGES	This function lets you select among several test images.
S A T R D RETURN SERIAL	This function reads back the unit's serial number.
S A T R D DIAGNOSTIC LOG	This function reads back the last 20 event/error messages.

**Table 3.4 DIAGNOSTICS**



Chapter 4:

# Film Control Functions

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# Introduction

The seven selections available under the “Film Control” sub-menu allow you to select a film type and perform various camera control functions including unload film, load film, notch film, advance film, rewind film, and image counter. Unaffected portions of the menu are shaded so that you can focus on those areas that impact only the film control.

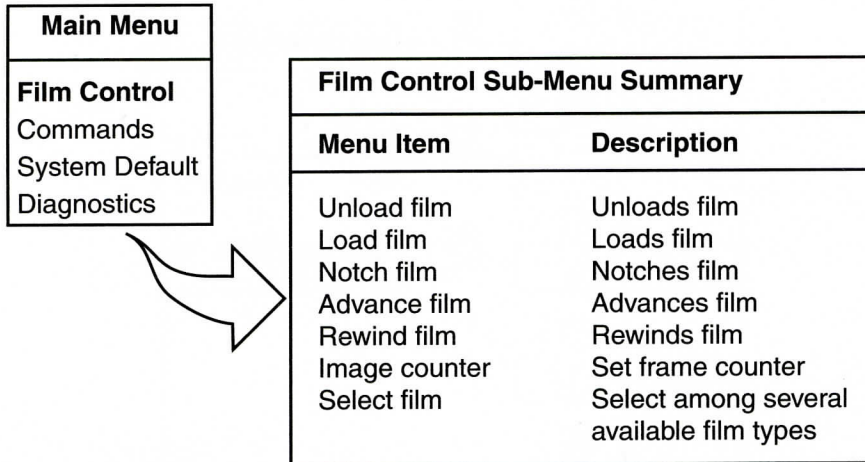


Figure 4.1 Film Control Sub-Menu

Figure 4.2 illustrates the front panel display for each of the FILM CONTROL selections.

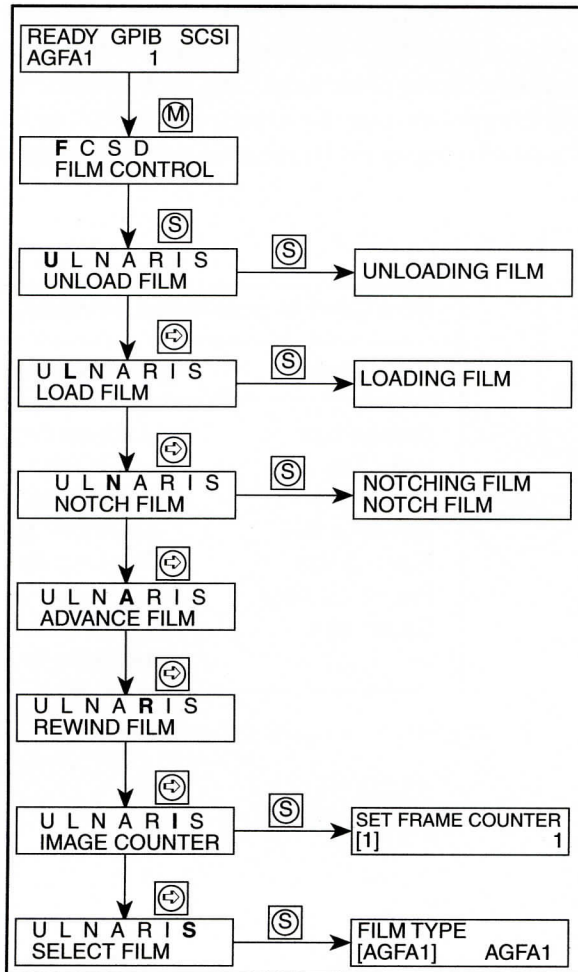


Figure 4.2 Film Control Sub-Menu Selections

## Unload Film

The “Unload Film” command is used only with the bulk loader option. Selecting “Unload Film” moves all of the exposed images out of the bulk loader and into the takeup magazine. Extra film is spooled into the takeup magazine so that you can raise the magazine a few inches. When the film is cut next to the magazine, you will have a leader that is long enough to thread back into the empty takeup magazine.

The display is updated as follows:

- The “Frame Count” number resets to zero (0).
- The “To film end” value decreases by the number of frames that were moved into the takeup magazine.

Before removing a used roll of film, press the MENU button once, select FILM CONTROL, then select UNLOAD FILM. Open the camera back to remove the used film. Press MENU twice to return to the ready message. Selecting this function resets the frame counter to zero (#0).



# Load Film

When you have a bulk loader option, selecting “Load Film” advances unexposed film from the supply magazine into the bulk loader module. The next image made will be on unexposed film.

The display is updated as follows:

- The “Frame Count” number resets to one (1).
- The “To film end” value is set to 750, depending upon the value set in “Frames/roll” in the “Film transport” sub-menu under System Default.

For the standard 35mm camera, selecting “Load Film” resets the Frame Count value to one (1).

After loading film into the 35mm camera, you can use the Alto’s front panel controls to initiate a load film sequence. To enable this function, first press the MENU button and select FILM CONTROL. Hit PREVIOUS or NEXT until the message window displays “LOAD FILM.” Press the SELECT button to initiate the film loading sequence. Press MENU twice to return to the ready message. The load film command advances the film one frame, resets the Alto’s frame counter to #1, and clears the end-of-film condition.

## Notch Film

This function is used with the bulk loading film module and sets the number of unexposed frames you wish to advance after the last exposed image.

When you have a bulk loader option, selecting “Notch film” initiates a notch sequence. This sequence consists of an advance of the film, a notch onto the film edge, and an advance of the film after the notch. The amount of film advanced is determined by the settings in the “Module Default” sub-menu.

The display is updated as follows:

- The “Image Count” number remains unchanged.
- The “Frame Count” number advances by the numbers in the “Before notch” and “After notch” settings.
- The “To film end” value decreases by the number of frames that is set in the “Before notch” and “After notch” selections on the “Module Default” sub-menu.

## Advance Film

When you have a standard 35mm camera or a bulk loader option, selecting “Advance film” advances one blank frame of film, increments the image count value by one, and reduces the “To film end” count by one.

The ADVANCE FILM function can be used to leave a blank slide between groups. To use this function, press the MENU button then select FILM CONTROL. Use PREVIOUS or NEXT until “ADVANCE FILM” is displayed in the message window. Press SELECT. The film in the camera will advance one frame, but the frame count displayed in the “ready” message remains unchanged. Press MENU twice to return to the ready message.

## Rewind Film

The rewind film command allows you to command the module to rewind the film in the camera.

Press MENU, then select FILM CONTROL. Use PREVIOUS or NEXT until "REWIND FILM" is displayed in the message window. Press SELECT.

## Image Counter

By using the "Image Counter" function, you can set the frame count for the mounted module to any number between zero (0) and 9999.

**Note:** Using this function to set the frame count does not advance the film in the camera module.

You will find this feature useful if you forget to execute the load film function or if the frame count on the terminal or front panel LCD does not match the actual frame that the camera is ready to expose.

Follow this procedure to set the frame number from the Alto front panel:

- Step 1: Press MENU once, then select FILM CONTROL.
- Step 2: Press PREVIOUS or NEXT until you reach the IMAGE COUNTER selection.
- Step 3: Press SELECT to display the SET FRAME COUNT submenu. Press the NEXT button to reach the desired number. Select "1" or greater for the counter to begin recording the number of frames that you have imaged.
- Step 4: Press the SELECT button to choose your frame number and exit the frame counter submenu.
- Step 5: Press the MENU button twice to return to the ready condition.

## Select Film

The Alto supports a number of film types for the available modules. The SELECT FILM function allows you to select among the supported film types that correspond to the camera module you are using.

This Command allows you to set the Alto's compensation for a specific film type.

When you select a film type, Alto loads the default look-up tables for that film and calibrates its internal brightness levels. A USER FILM TYPE selection (USER 0, USER 1, USER 2) allows customized brightness and contrast values to be created and saved in battery backed-up RAM.

Follow these steps to use SELECT FILM from the front panel:

- Step 1: Attach the camera module to the film recorder.
- Step 2: Press the MENU button once, then select FILM CONTROL.
- Step 3: Press PREVIOUS or NEXT until the display reads "SELECT FILM."
- Step 4: Press the SELECT button to choose this option. The display will show the currently selected film type.
- Step 5: Press NEXT/PREVIOUS to display the other supported film types (e.g., for a 35-mm camera module, EKTA1, AGFA1.). Three user designations are provided for customized film settings.
- Step 6: Once you reach the film selection that matches the film you are using, press SELECT. The unit will load the appropriate look-up tables and recalibrate.
- Step 7: After calibration is completed, press the MENU button twice to return to the ready condition.

**Step 8:** If USER (0,1,2) is selected, the Alto will calibrate using the customized brightness and contrast values. If one of your selected values exceeds the Alto's limitations, a calibration error could occur. Select new brightness/contrast values and try again. (Note: repeated calibration errors could indicate a hardware problem.)

**From the terminal:**

- Press the space bar or the arrow keys to scroll through the menu selections on the terminal. Once you reach the film type you are using, press RETURN to make a selection. Alto supports Agfachrome Optima, Ektachrome, and User (0,1,2) film types for all modules. It also supports a Polaroid film in 4x5 and 8x10 formats. EKTA and AGFA.
- Alto will calibrate itself if you select a new film type and auto calibration is on.
- The film types that are displayed in the comment bar at the bottom of the screen correspond to the film module that is attached to Alto. If no module is attached, the terminal will default to the 35mm film selections.



## Film Types

Tables 4.1 through 4.4 list the film types, by module, that the Alto supports. The columns show the abbreviated message that appears in the display and the corresponding film type.

**Note:** Normally you select the film type from within your rasterizer (i.e., MVP Conductor, Mac Conductor, or ChromaScript). However, if you are imaging the ALTO's built-in test slides, select the film type with the SET FILM TYPE function.

Name	Film Type
AGFA1	Agfachrome RS100 Plus Professional
EKTA1	Kodak Ektachrome 100 Professional EPN
OPTIM	Agfa Optima 125 negative
VER35	Vericolor III Type S Professional

**Table 4.1 Supported Film Types for 35mm Camera Module**

Name	Film Type
AGFA1	Agfachrome RS100 Plus Professional
EKTA1	Kodak Ektachrome 100 Professional EPN
OPTIM	Agfa Optima 125 negative
VER35	Vericolor III Type S Professional
POL	Polaroid Pro 100

**Table 4.2 Supported Film Types for 4 x 5 Camera Module**

Name	Film Type
AGFA1	Agfachrome RS100 Plus Professional
EKTA1	Kodak Ektachrome 100 Professional EPN
OPTIM	Agfa Optima 125 negative
VER35	Vericolor III Type S Professional

**Table 4.3 Supported Film Types for 120 Camera Module**

Name	Film Type
AGFA1	Agfachrome RS100 Plus Professional
EKTA1	Kodak Ektachrome 100 Professional EPN
OPTIM	Agfa Optima 125 negative
VER35	Vericolor III Type S Professional

**Table 4.4 Supported Film Types for 8 x 10 Camera Module**



## Chapter 5:

# Command Functions

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# Introduction

The commands sub-menu enables you to:

- Calibrate the Alto,
- Select the imaging mode,
- Toggle GPIB and SCSI operations on or off.
- Select the “Pacing” and “Delay at start” values.
- Read back the Alto’s software revision level.

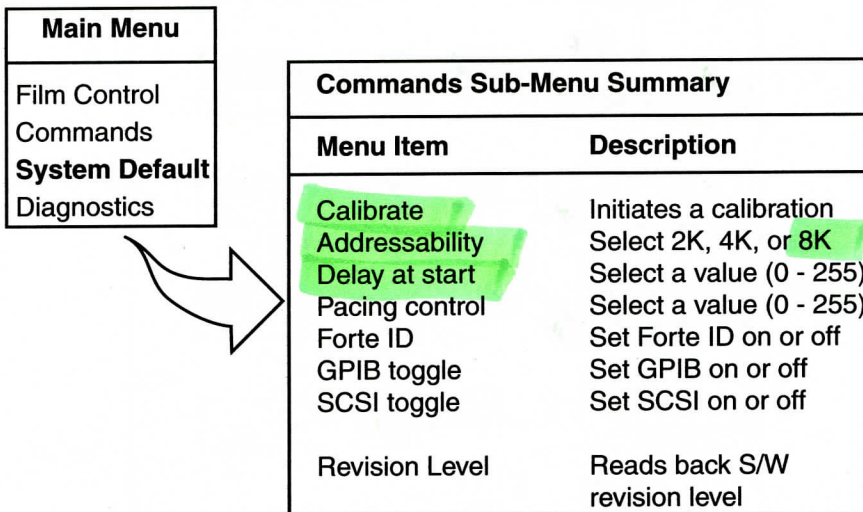


Figure 5.1 Commands Sub-Menu Selections

Figure 5.2 illustrates the front panel display for each of the COMMANDS selections.

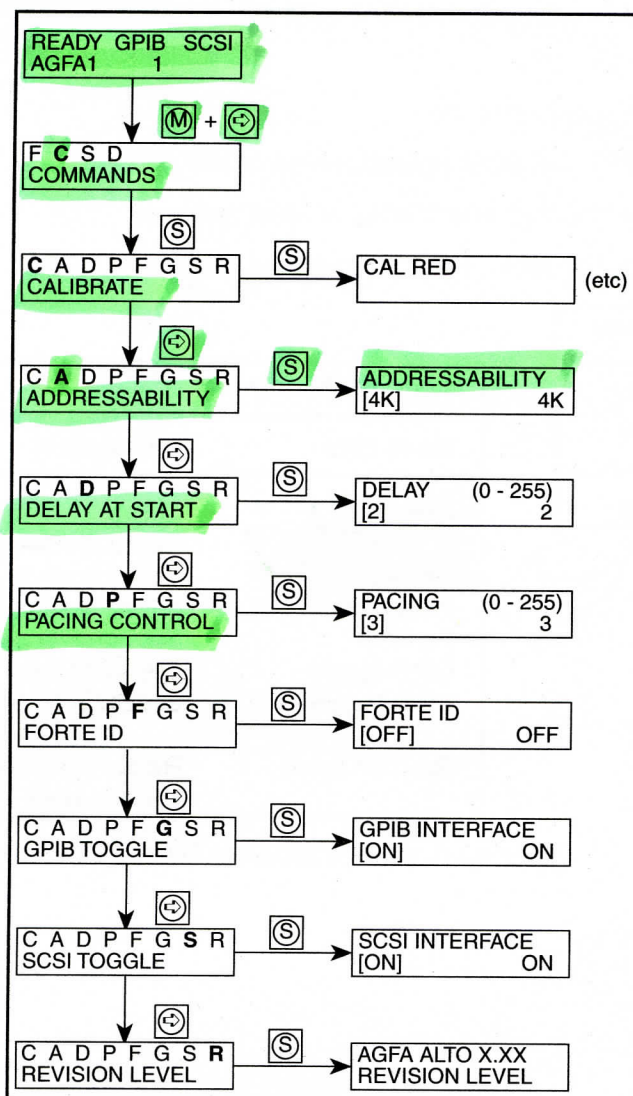


Figure 5.2 Commands Selections

## Calibrate

Selecting CALIBRATE causes Alto to adjust for the selected film type, format, and resolution. Alto's calibration level will vary for each combination of camera module, resolution, and film type.

Calibration times vary among the different camera modules. The nominal calibration time for the 4k 35mm format is approximately two minutes, but it can take up to five minutes. The first calibration after changing the module is the longest.

To calibrate the RGB brightness levels of your Alto, complete the following steps at the Alto front panel:

- Step 1: Press MENU once, then PREVIOUS/NEXT to advance to COMMANDS, and press SELECT to enter its submenu.
- Step 2: Press SELECT again while "CALIBRATE" is displayed in the message window. The red, green, and blue levels will be calibrated individually.
- Step 3: After the calibration is completed, press MENU twice to return to the ready condition.

**Note:** After a forced calibration, the message *Blue Cal*, last in the sequence of calibration status messages, disappears and the message *Ready* appears when the Alto has completed the operation.

# Addressability

**Alto** produces images at 2K, 4K, 8K, or 16K resolution. **Alto LS** produces images at 2K, 4K, or 8K resolution. This setting defines the number of individual data points or pixels the film recorder addresses and how quickly it completes an exposure.

## Alto Alto LS

2K mode – Typically used for lower resolution pixel images.

4K mode – Most commonly used for slides.

8K mode – Used to create 4x5 and 8x10 images without “jaggies.” Imaging time is typically twice as long as either 2K or 4K modes.

## Alto ONLY

16K mode – Used to create 4x5 and 8x10 images without “jaggies.” Imaging time is typically twice as long as either 2K or 4K modes.

Follow this procedure to change addressability at the front panel:

- Step 1: Press the MENU button once, then PREVIOUS/NEXT to advance to **COMMANDS**, and press SELECT to enter its sub-menu.
- Step 2: Press the NEXT or PREVIOUS button until the display reads **“ADDRESSABILITY.”**
- Step 3: Press the SELECT button to activate this choice, and then press NEXT/PREVIOUS to scroll through the 2K, 4K 8K, or 16K settings (2K, 4K or 8K Alto LS (4K is Alto’s default setting).
- Step 4: Press SELECT to choose the desired addressability setting. This will exit the ADDRESSABILITY sub-menu. Press the MENU button twice to return to the ready condition.

**Note:** Normally you select the resolution mode from within your rasterizer (i.e., MVP Conductor or Mac Conductor). However, if you are imaging the Alto’s built-in test slides, select the resolution using the ADDRESSABILITY function.

When you change the number of pixels per image, the mode and pixel information in the upper left corner of the terminal menu changes. Once you select the imaging mode, you return to the Main menu. Select Commands again to continue working in this sub-menu.



## Delay at Start

The "Delay at Start" command allows you to control the amount of time between the rasterizer's start of an image and the opening of Alto's camera shutter. A delay at start is especially useful if you are imaging with a rasterizer or driver that is slower than the Alto. Because of Alto's fast imaging time, it may empty its image buffer faster than the host can supply it with image data, causing image artifacts.

Setting a delay at start gives you further assurance that the image quality on film will be consistently good, regardless of the data rate. You can set the delay at start to any value between 0 and 255 seconds.

This command has an extra feature: if you set a delay of 50 seconds and the image data fills the Alto image buffer in 10 seconds, Alto skips the last 40 seconds of the start delay and begins imaging.

Follow this procedure to set the delay at start value from the front panel:

- Step 1: Press MENU once, then PREVIOUS/NEXT to advance to COMMANDS, and press SELECT to enter its submenu.
- Step 2: Press the NEXT or PREVIOUS button until the display reads "DELAY AT START."
- Step 3: Press the SELECT button to activate this choice, and then press NEXT/PREVIOUS to increase/decrease the value.
- Step 4: Press SELECT to choose the desired value and exit the submenu. Press MENU twice to return to the ready condition.

The default setting is two seconds.



# Pacing Control

Pacing Control allows you to slow down the film recorder so its speed matches the rate of data flowing from the rasterizer.

This controls the amount of time it takes Alto to scan each line in the image. Maintaining consistent line times is a key factor to producing quality images.

You can set the pacing value between 0 and 255 (milliseconds per line). The default is 3.

- The **Alto** can record 2K, 4K, 8K, or 16K images.
- The **Alto LS** can record 2K, 4K, or 8K images.

A 4K image can be recorded in just over one minute. However, some rasterizers may take longer to send depending on the complexity of the image. The Alto pauses when there is no image data and resumes imaging when the rasterizer sends more data. An interrupted or uneven flow of data from the rasterizer can result in artifacts on the recorded images.

Pacing provides a waiting period between each line of graphic data that Alto prints on the film, providing extra time for the host computer to send image data into Alto's image buffer. It also ensures consistent image quality regardless of the size of the image file.

## Guidelines for Estimating Pacing Values

Table 5.1 shows estimated imaging times that result from different pacing values. Rely on your own experience to select a pacing value that matches Alto's imaging speed to the speed and rate of your computer from which your rasterizer sends out data. Use this table as a guide for matching pacing values to the time your system needs to rasterize and send an image. Running an image with the film recorder set to high speed gives a reasonable imaging time from which to judge pacing values.

Pacing #	Imaging Time	Pacing #	Imaging Time
3	27 seconds	20	3.52 minutes
5	44 seconds	80	7.44 minutes
10	1.28 minutes	160	15.28 minutes
20	1.56 minutes		

**Table 5.1 35mm pacing example at 4K**

For example, you are using Alto with a brand x rasterizer on your clone 386 computer. The image you wish to make takes up to five minutes to process and send to Alto. You should select a pacing value that allows at least five minutes of imaging time. To be conservative, try a pacing value of 40. This sets Alto to spend approximately 6.66 minutes per image.

If using the MVP, Mac Conductor, or ChromaScript, and you are imaging very complex graphics with photo drop-ins or large amounts of text, you may get better results by using a pacing value of 7 to 15. This has a minimal impact on the total imaging time. With some third-party rasterizers, you may need to use somewhat larger pacing values depending upon the speed of your computer.

If using Mac Conductor, set the Pacing value in the FILM RECORDER PREFERENCES dialog. This is important, since Mac Conductor sets its own values for pacing before each image.

## Setting the Pacing Value

Follow this procedure to change the pacing value at the front panel:

- Step 1: Press MENU once, then PREVIOUS/NEXT to advance to COMMANDS, and press SELECT to enter its submenu.
- Step 2: Press the PREVIOUS or NEXT button until you reach the PACING CONTROL selection.
- Step 3: Press SELECT to enter the pacing submenu. Press the NEXT button to increase the pacing number (maximum of 255). Press PREVIOUS to lower the pacing number (default = 3).
- Step 4: Press the SELECT button to choose your pacing value and exit the pacing submenu. Press the MENU button twice to return to the ready condition.

## Forte ID

The "FORTE ID" toggle command allows the Alto to emulate a FORTE film recorder. This feature is useful when your GPIB device can only support the FORTE.

When a rasterizer requests information about which film recorder it is connected to, Alto identifies itself as a Forte.

For normal Alto operation, Forte ID emulation should be left off.

Follow this procedure to change the Forte ID emulation at the front panel:

- Step 1: Press MENU once, then PREVIOUS/NEXT to advance to COMMANDS, and press SELECT to enter its submenu.
- Step 2: Press the PREVIOUS or NEXT button until you reach the FORTE ID selection.
- Step 3: Press SELECT, then use PREVIOUS or NEXT to turn this function on or off.
- Step 4: Press SELECT to exit this submenu. Press the MENU button twice to return to the ready condition.

# **GPIB or SCSI Toggle**

The Alto is a “target” device for both commands and image data sent by a host computer. Depending on the type of host computer used, the corresponding interface must be set on-line; therefore the GPIB and SCSI Toggle commands can either be set ON or OFF.

These commands set Alto on-line for GPIB or SCSI operation. Press the space bar to set the interface off-line. To change the GPIB or SCSI address, you must exit the “Commands” menu and enter the “System Default” menu.

The on-line/off-line selection connects both GPIB and SCSI interfaces to Alto at the same time. Selecting both interfaces on-line allows Alto to choose the interface selection as it senses activity on the buses. Setting SCSI or GPIB off-line eliminates this selection process. You can force one interface to remain the on-line interface.

This command toggles the port from “on-line” to “off-line.” The Alto ignores any communication through the interface when you select “offline.”

If both GPIB and SCSI interfaces are selected “on-line,” Alto waits for activity on either bus. When Alto begins communicating with either interface, it temporarily disables the other. When communication over the active interface bus stops for approximately ten minutes, both are placed back “on-line,” unless forced off through the menu system.

## **Revision Level**

If you select this command, Alto’s current firmware revision number is displayed. Press the MENU button twice to return to the ready message.

## Chapter 6:

# System Default Functions

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# Introduction

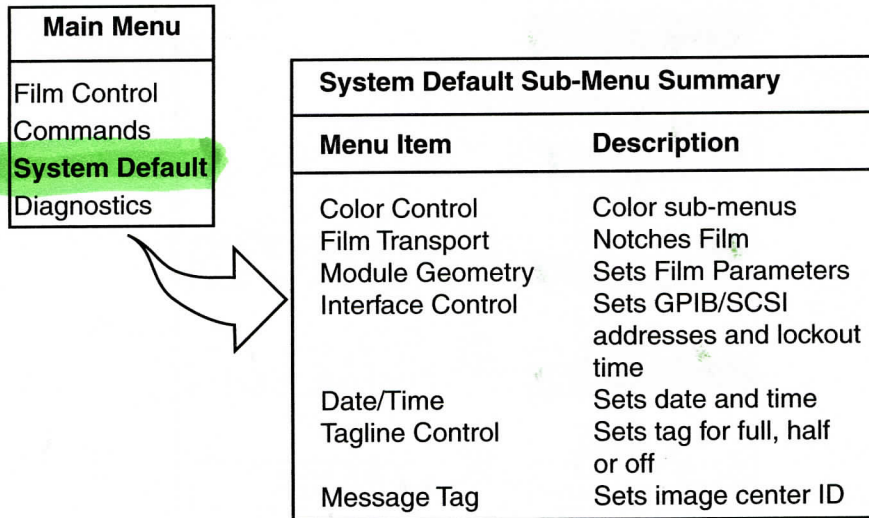


Figure 6.1 System Default Menu

The “Color Control” sub-menu allows very comprehensive control over many aspects of the Alto’s film exposure in all formats, all film types, and resolutions.

The “Module Geometry” sub-menu was designed to allow easy integration of third party modules with the Alto.

“Interface Control” allows configuration of the GPIB and SCSI addresses.

“Message Tag” allows an alpha-numeric message of up to 20 characters to be printed on each slide.

Figure 6.2 illustrates the front panel display for each of the SYSTEM Default selections.

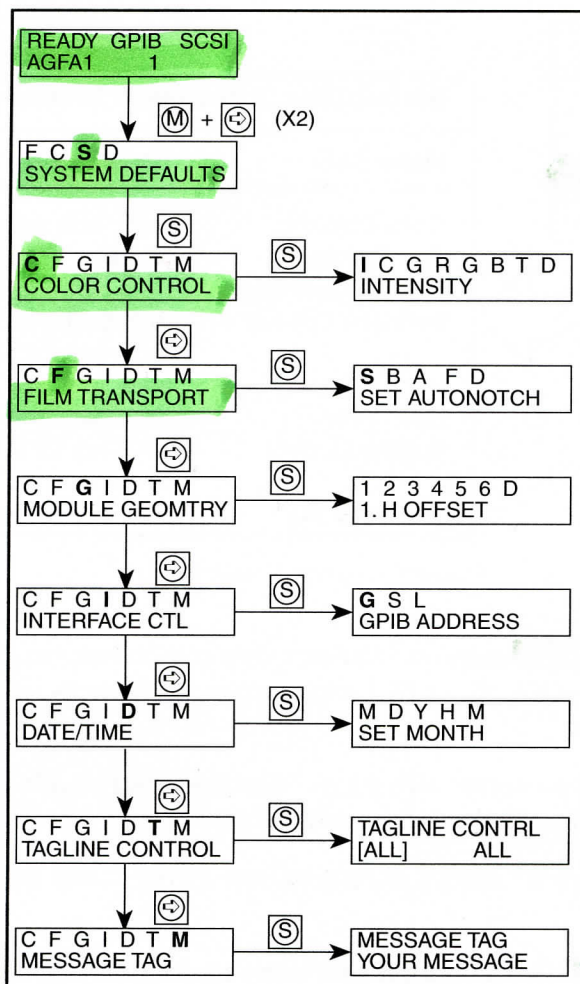


Figure 6.2 System Default Selections

## Color Control

Alto has an extensive and flexible system for color and exposure control. These functions, accessed through the Color Control function under the System Defaults menu, are described in *Chapter 7: Color Control Functions*.

# Film Transport

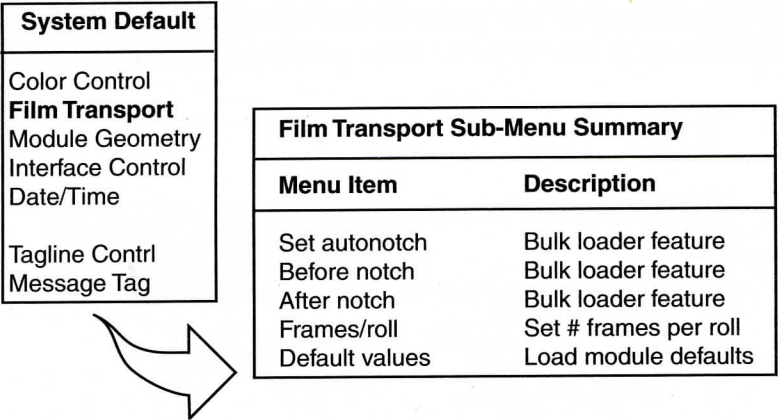


Figure 6.3 Film Transport Selections

Figure 6.4 illustrates the front panel display for each of the Film Transport selections.

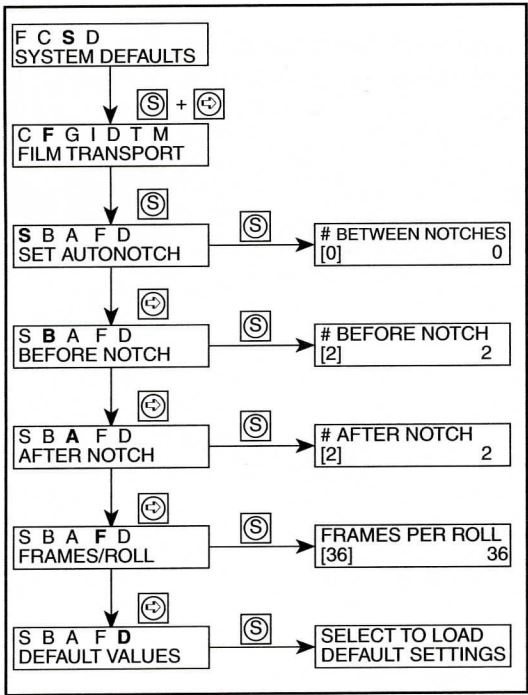


Figure 6.4 Film Transport Selections

## Set Autonotch

The "Set Autonotch" command sets the number of frames between notches for a bulk loader. The range of this selection varies from autonotch disabled (0) to 255 exposed frames between notches.

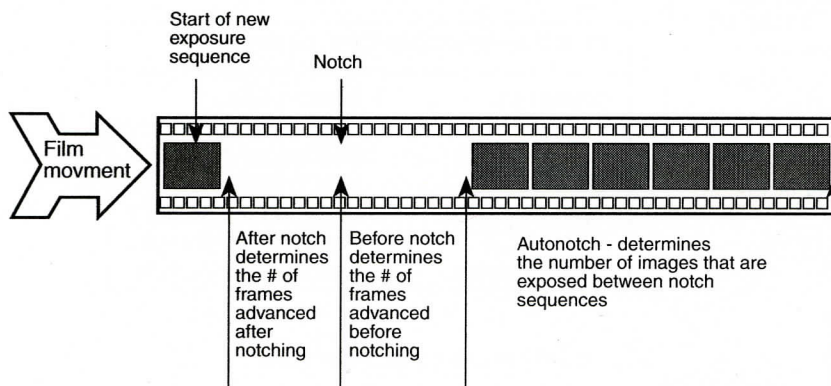


Figure 6.5 Set Autonotch

A notch is the dimple on the edge of the film between the sprocket holes. Your lab technician uses this notch to cut long film runs into strips of 36 frames.

## Before Notch

This command sets the number of unexposed frames you wish to advance between the last exposed image and the notch on a bulk loading machine.

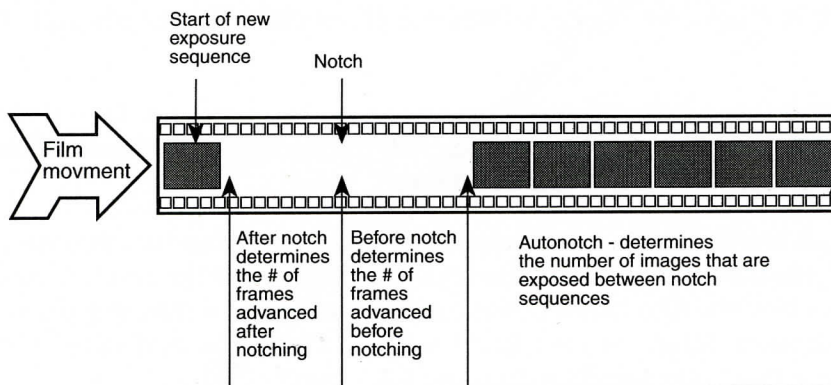


Figure 6.6 Before Notch

## After Notch

This command lets you choose the number of unexposed frames you wish to advance between the notch and the first exposed image frame on a bulk loading module.

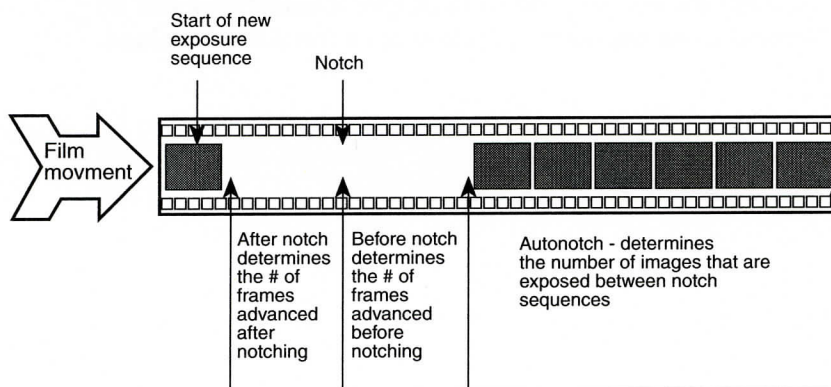


Figure 6.7 After Notch

## Frames per Roll

The frames per roll command is designed to tell you how much film is left on the roll as you use it.

This command operates with either the standard 35mm or 35mm bulk loading module. The range is from one (1) to 9999 frames per roll of film.

Changing this value will not change your count until you load film. When the "load film" function is selected, the "to film end" value on the screen is loaded with the "frames per roll" value.

The bulk loading module has a manual advance button that you may use to advance the film independently of the control terminal. If you use this button, Alto cannot monitor the number of remaining unexposed frames. Single frame advances should be performed using the "Advance film" selection found on the Film Control" menu.

Alto can expose images even if the "to film end" value reaches "0."

## Default Values

This command resets all camera module parameters to their factory default settings for the module that you are presently using.

**Note:** Use this option with care; all values that you have entered for the Module Default menu selections will be erased from memory when you load the default values.



# Module Geometry

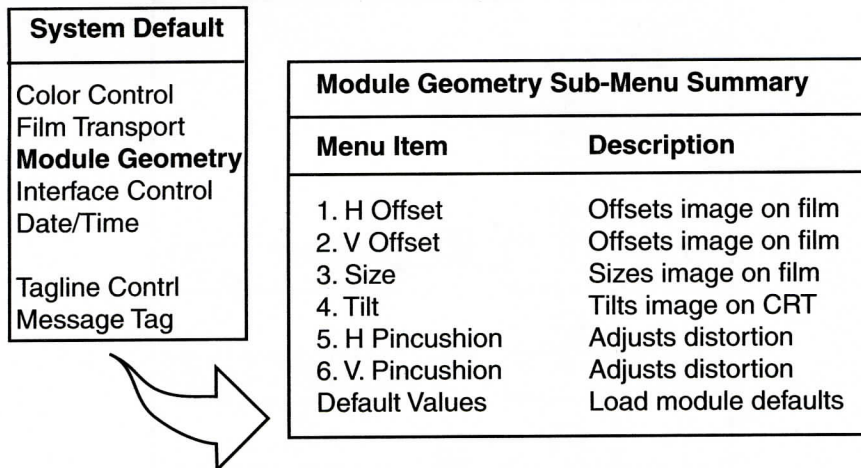


Figure 6.8 Module Geometry Menu



Figure 6.9 Illustrates the display for the Module Geometry selections.

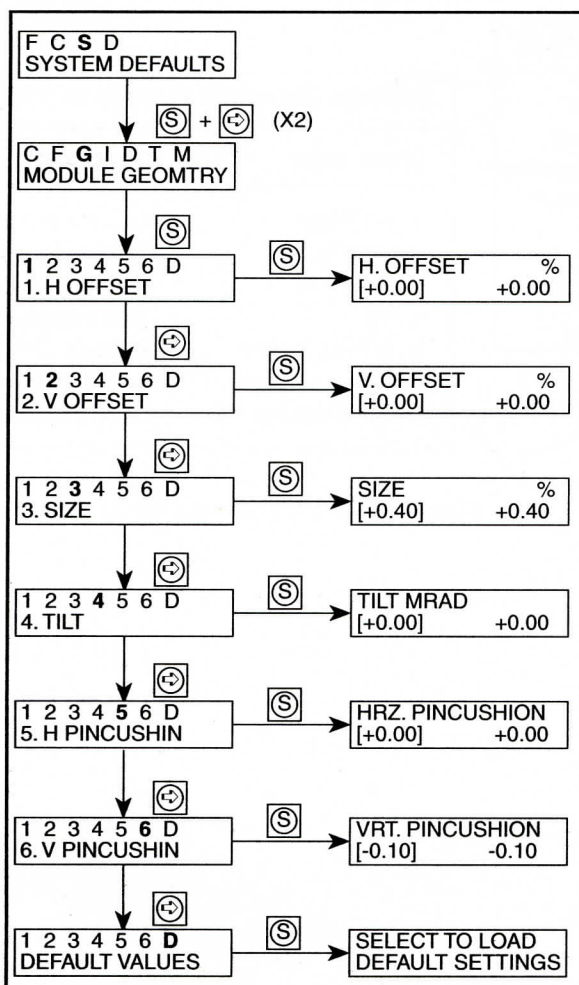


Figure 6.9 Module Geometry Selections

## Horizontal Offset

This command moves the image in a horizontal direction left or right.

The value can range between -5.0 and +5.0 in steps of 0.1.

The default value is 0. Increasing the values moves the image to the left of its center film position. Decreasing the values moves the image to the right.

All value changes are in % from the nominal image size.

## Vertical Offset

This command moves the image in a vertical direction up or down.

The value can range between -5.0 and +5.0 in steps of 0.1.

The default value is 0. Increasing the values moves the image down from its center film position. Decreasing the values moves the image up.

All value changes are in % from the nominal image size.

## Size

This command changes the size of the image in vertical and horizontal directions at the same time.

The values can range between -5.0 and + 5.0, in steps of 0.1.

The default value is 0. Increasing the values increases the size. Decreasing the values decreases the size of the images.

All value changes are in % from the nominal image size.

## Tilt

This command changes the tilt of the image related to the top border of the film.

The values can range between -9.9 and +9.0, in steps of 0.1.

This value will be adjusted at the factory to ensure proper alignment of the unit.

Increasing the values rotates the image in a clockwise direction.

All value changes are in mili radians (mrad). This adjustment should normally not be used.

All adjustments belong to that particular module and are stored in the module RAM.

## Horizontal and Vertical Pincushion

These commands allow you to correct for “pin cushion” or “barrel distortion” caused by the lens for a given camera module. The effect on film appears as curvature at the edges of the image (see example below). Pressing the space bar causes the value to increase in increments of 0.1 over a range of -0.5 to +0.5.

The horizontal correction affects the curvature of the lines shown from left to right while the vertical correction affects the curvature of the lines shown from top to bottom. A lower number produces a pincushion effect while a higher number produces a barreling effect.

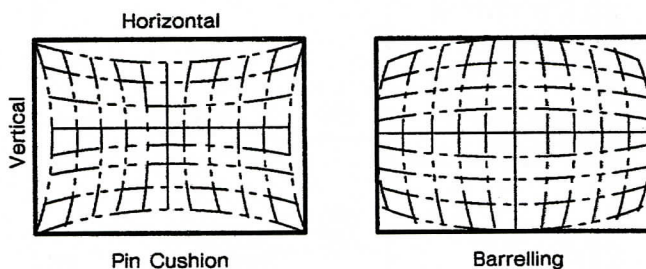


Figure 6.10 Pin Cushion and Barrelling

## Default Values

This command resets all camera module parameters to their factory default settings for the module that you are presently using.

**Note:** Use this option with care; all values that you have entered for the Module Default menu selections will be erased from memory when you load the default values.

# Date/Time

The Alto terminal displays the date and time, which can be set under the Date/Time command. Pressing the space bar increases the current reading.

Figure 6.11 illustrates the front panel display for each of the Date/Time selections.

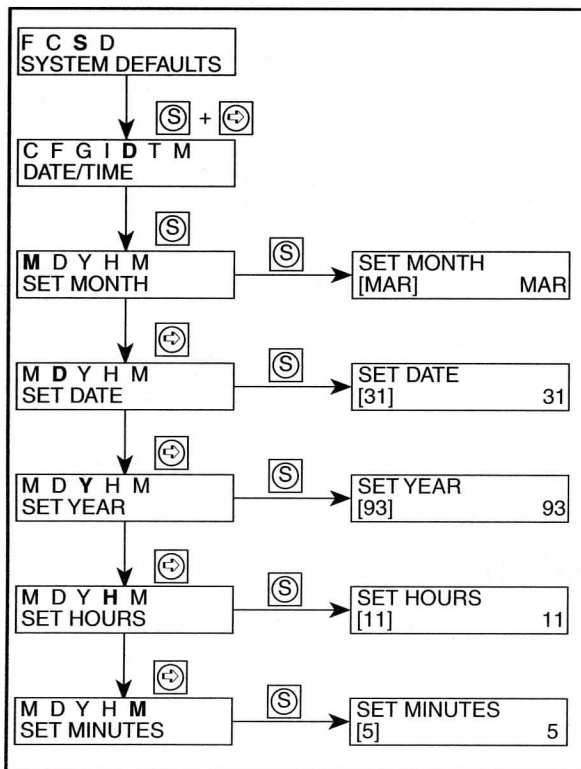


Figure 6.11 Date/Time Selections

# Interface Control

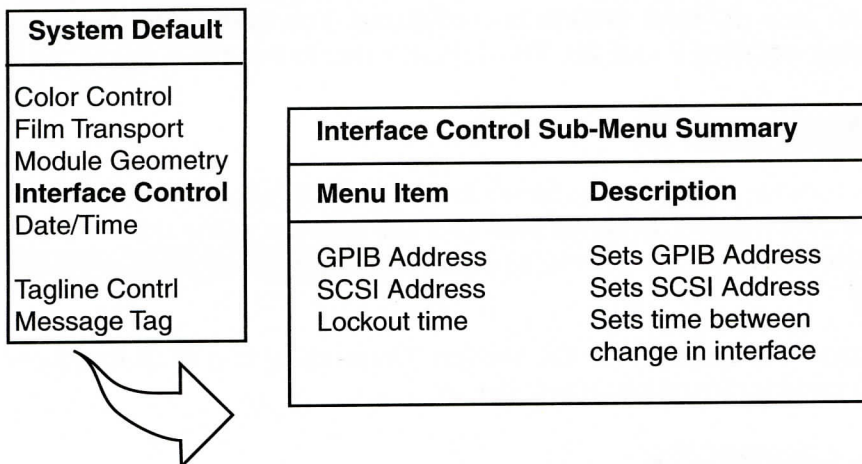


Figure 6.12 Interface Control Menu

Figure 6.13 illustrates the front panel display for each of the Interface Control sub-menu selections.

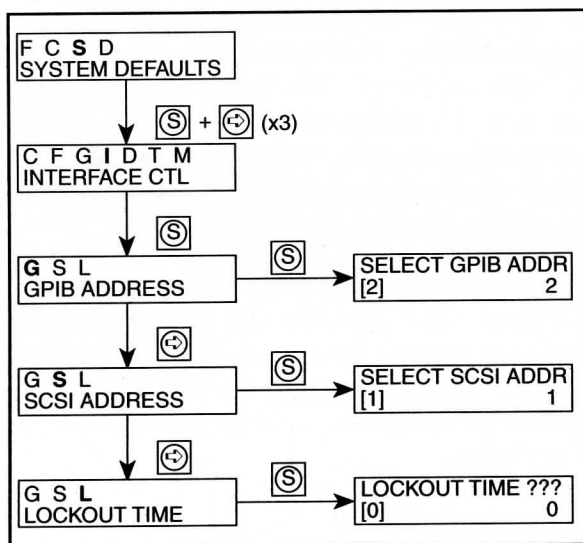


Figure 6.13 Interface Control Sub-Menu Selections



## GPIB Address

This command allows you to select Alto's even GPIB address depending on how the host system is configured. You may select any even number between 2 and 28. The default value is two (2).

## SCSI Address

This command allows you to select the Alto's SCSI address. You may select any number between zero and six. Select a value that is different from all other SCSI devices in your system. The default value is one (1).

For more information see the section "Connecting to a SCSI Interface" in Chapter 2: Installation and Setup.

## Lockout Time

This command allows you to select the time that the interface (GPIB or SCSI) not currently receiving data will be locked out after that interface stops receiving data. You may select any value between 0 and 240 minutes. After data is received via Alto's GPIB or SCSI interface, the other interface is "locked out" and cannot receive data. The interface that is locked out will remain locked out for as many minutes as has been set using this command. The "Lockout Time (mins)" display on the Status and Control Terminal will count down to zero, at which time both interfaces become on-line. When the original interface begins to receive data again, the Lockout time (mins) value will reset to whatever time has been entered via this command.

Choosing zero minutes has a special meaning to the Alto. If zero is entered as the Lockout Time, the Alto will permanently lock out the interface that does not receive data until an Escape is entered from the Status and Control Terminal or until the unit is shut off. This feature has been included for some very special applications, and we recommend you do not use it.



## Message Tag

With the message Tag command, you can enter up to 20 characters. The Alto writes these characters between the sprocket holes of the film. This is very useful for future reference. The message tag can be programmed remotely from the host.

## Tagline Control

The tag line control lets the user select between these options: all tag line, half tag line, and tag line off.

All tag line will image a tagline between the film sprocket holes that contains: a gray scale, the image title, the tag message, the color correction values, the resolution, the date, and the time.

Half tag line will image a tagline between the film sprocket holes that contains: a gray scale, the image title, the tag message, and the date.

Tag line off will not image a tag line.

The tagline does not rotate with the image but remains in a fixed location at the top of 4×5 and 8×10 images.



Chapter 7:

# **Color Control Functions**

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# Introduction

Alto has a very flexible and powerful system of exposure control that allows comprehensive control over color response for any module, film type, or resolution. You can customize the response of the system to support film types of your own choice. There are several reasons you may wish to alter the default film exposures available from the Alto.

1. Film processing variations
2. Film emulsion variations
3. Fine tune color balance of the film recorder/module
4. Modify basic color response
5. Match another film recorder's output
6. Support a custom film type

Of the above reasons, numbers 1 and 2 are ongoing procedures as normal variations occur. Step 3 is usually required only once when new equipment is received. The most sophisticated are steps 4 and 5, which can be performed at any time.

Different levels of control are available. Simple color balance or intensity shift is required in some situations. The "Color Balance" and "Intensity" options are used for this function. Altering the exposure values for red, green and blue independently allows more control of color.

These controls are described separately in *Chapter 8: Red, Green, Blue Control*.

# Exposure Tables

The Alto Color Control functions enable you to change the factory pre-set exposure tables. There is one exposure table for each combination of module/film type/resolution. Each table controls the key points of the Alto's exposure.

The following sections describe each of the exposure table adjustments available on the Alto.

All exposure tables can be viewed and altered from the front panel. The exposure tables are accessed through the "Color Control" sub-menu found under the "System Default" menu. Some of the parameters can be read and modified by the host computer. All parameters are saved permanently. Changing modules and turning the unit on/off will not have any effect.

You can change the values any time the unit is idle. Values can be reset to factory default using the "Default Color" option. Changing firmware revisions can alter the values.

You can either modify the standard film types or the extra film types provided. These extra film types are User 0, User 1, and User 2. User 0 is the only table that can be modified by a rasterizer or driver. Use it with caution. User 0/1/2 may not be supported by all of the rasterizers you are using. If your rasterizer does not support the user film types, we recommend modifying one of the supported film types that you do not use.

The exposure controls are presented in two sections: basic and power. The basic controls allow you to adjust overall brightness and color balance of a given format (module / film type / resolution combination). The power controls are adjustable for a specific format on a per-color basis (red, green and blue).

For the best and most consistent results, we suggest the following:

- Use film from the same film batch or emulsion number whenever possible. The best response and consistency will be obtained from the same film batch. Check the film batch data that is printed on the side of the film box.
- Store your film under the proper conditions. The film manufacturer states the best temperature and humidity conditions.
- Allow your Alto to warm up for at least 30 minutes so that its internal CRT will yield the most consistent results.

The following charts refer to the exposure tables for 35mm, 120/220, 4×5, and 8×10 films.

**Note:** 16K is not available on Alto LS models.

Film	Resolution
AgfaChrome RS 100 +	2K, 4K, 8K, and 16K
Ektachrome 100	2K, 4K, 8K, and 16K
Ektachrome 100 +	2K, 4K, 8K, and 16K
Optima 125	2K, 4K, 8K, and 16K
Vericolor III Type S	2K, 4K, 8K, and 16K

**Table 7.1 35mm Films**

Film	Resolution
AgfaChrome RS 100 +	2K, 4K, 8K, and 16K
Ektachrome 100	2K, 4K, 8K, and 16K
Ektachrome 100 +	2K, 4K, 8K, and 16K
Optima 125	2K, 4K, 8K, and 16K
Vericolor III Type S	2K, 4K, 8K, and 16K

**Table 7.2 120/220 Films**



<b>Film</b>	<b>Resolution</b>
AgfaChrome RS 100 +	2K, 4K, 8K, and 16K
Ektachrome 100 +	16K
Ektachrome 100	2K, 4K, 8K, and 16K
Optima 125	2K, 4K, 8K, and 16K
Polacolor Pro 100	16K
Vericolor III Type S	2K, 4K, 8K, and 16K

**Table 7.3 4x5 Films**

<b>Film</b>	<b>Resolution</b>
AgfaChrome RS 100 +	2K, 4K, 8K, and 16K
Ektachrome 100	2K, 4K, 8K, and 16K
Optima 125	2K, 4K, 8K, and 16K
Polacolor Pro 100	16K
Vericolor III Type S	2K, 4K, 8K, and 16K

**Table 7.4 8x10 Films**

# Color Control

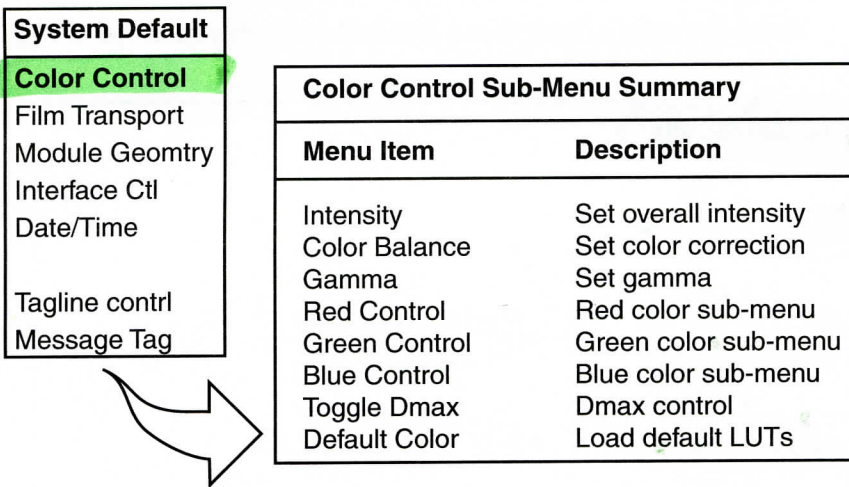


Figure 7.1 Color Control Menu

Figure 7.2 illustrates the front panel display for each of the Color Control selections.

**Note:** Pushing 1, 2, or 3 can be used as keyboard short-cuts.

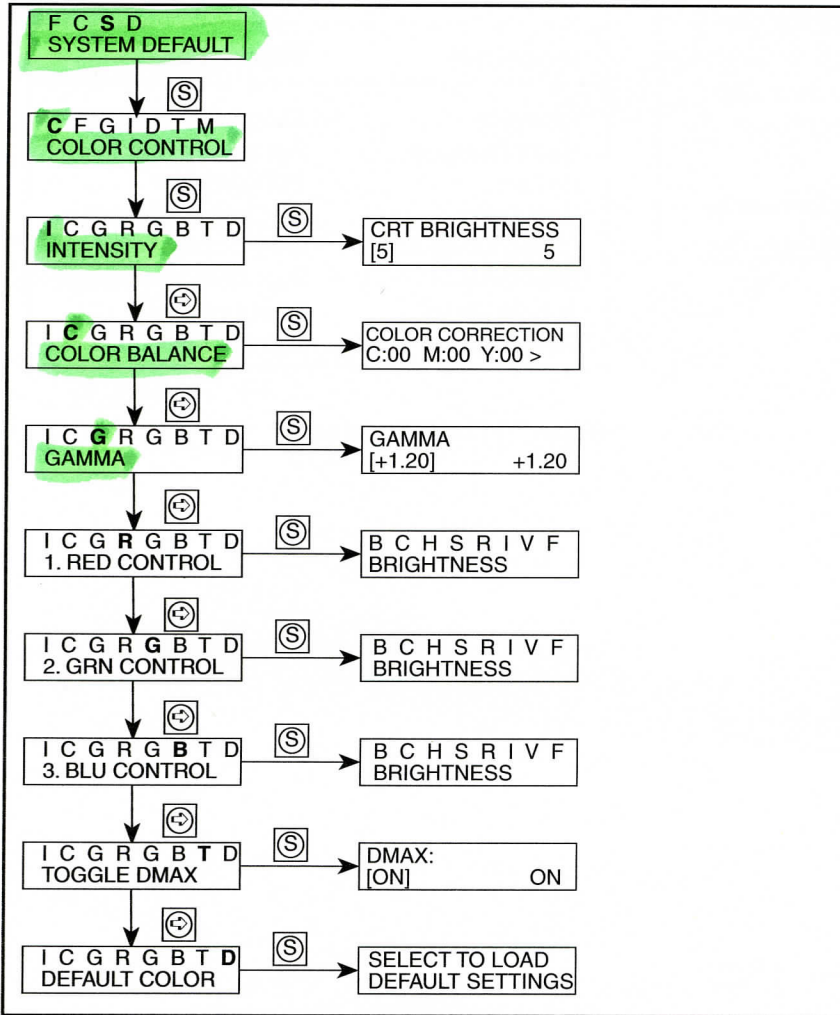


Figure 7.2 Color Control Selections

## Intensity

You can alter the overall intensity of the image with this command. The value for intensity can range from one (1) to 10. The default value for the intensity is five (5). Lower values will make the Alto images darker, while higher values will make Alto images brighter. The color balance is not affected by adjustment of this parameter.

**Note:** The amount of brightening for each color (red, green, blue) is affected by the sensitivity adjustment setting, described later. This command is not available over either of the GPIB or SCSI interfaces.

## Color Balance

This item allows you to correct color balance using the color filters provided. Typically, color correction is done on grey images. Grey tones are the most difficult colors to achieve because each of the three color components (red, green, and blue) must be exactly balanced.

However, achieving color correction by using the filters is not limited to grey images and certainly may be used to correct other types of color imbalances.

**Note:** Color correction must be performed for each combination of film type, module, and resolution.

To use the Color Balance function from the terminal:

- Step 1: Use the up and down arrow keys to move the cursor to a value that you want to change, then press RETURN.
- Step 2: Once you have done this, you can alter the value in question by using the arrow keys to add to, or subtract from, the value.
- Step 3: Press the RETURN key when the desired value is displayed.
- Step 4: Move on to another color or move the cursor left or right to the starting point.
- Step 5: When the cursor is back at the starting point, press RETURN one more time. The range of acceptable values for each parameter is zero (0) - 30.

The following steps provide an example of correcting skin tones of scanned images, working from the front panel:

Step 1: Shoot the internal grey scale test pattern on the chosen film for the module and resolution to be corrected.

Step 2: Put the image on a light box.

**Color Viewing Filters** — Consist of 18 filters mounted on six cards. Each card contains three filters of the same color but three different intensities. A description for using the filters is contained with the filter set.

Experiment with different filters over the image until the combination of the image and filter(s) create a grey you like. When using transparency film, use the side of the filters labeled "Hold this side toward you to view prints from color transparencies or from color prints," the black side.

**Note:** If you require more than 20 units of color correction for any color, you must use the advanced Red/Green/Blue brightness controls to make major corrections. Refer to the next section for detailed information.

Step 3: After selecting the combination of filters required, refer to the number/letter references at the bottom edge. These number/letter references are the color correction values that you will enter into the film recorder. The number refers to the amount of correction. The letter (C, M, or Y) refers to the colors cyan, magenta, and yellow. If you need two filters to correct the color balance, add all of the numbers together for each color listed.



**Example 1:** Your 35mm slide looks reddish. The lightest cyan filter made it look grey. The bottom edge of the cyan filter (lightest one) indicates "add 10C." Enter 10 at the "C" in the "color correction" sub-menu.

**Example 2:** Your 4x5 image looks brown. You find that it takes two filters to correct the image. The filters are the lightest green filter and the lightest yellow filter. The green filter says to add 10C and 10Y, and the yellow filter says to add 10Y. Add the two corrections, yielding a total of 20Y and 10C.

- Step 4: Enter the film recorder "Color Control" sub-menu and select the "Color balance" command. Once you execute this command, you can access a value by using the left/right cursor control and pressing the RETURN key at the color you want to change. You can then use the cursor keys to add or subtract to the count. The range of values is 0-20. Add the color correction numbers from step 3. Press the return key to move on to another color or to move the cursor back to the starting point on the right. When the cursor is back at the starting point, press RETURN one more time.
- Step 5: The Alto will pause to re-calculate the color correction values so that the smallest value is set to zero (0). This ensures that color balance is changed without affecting the overall density. If you run out of range in the "color balance" command, then a more complex procedure may be required for color balance (refer to the following section on brightness control).

## Gamma

The gamma control applies a gamma correction to all components of the CRT input data. Raising the gamma darkens the image; lowering the gamma lightens the image. The range of this adjustment is from 0.8 to 4.0 in 0.2 steps, with 2.20 as the default.

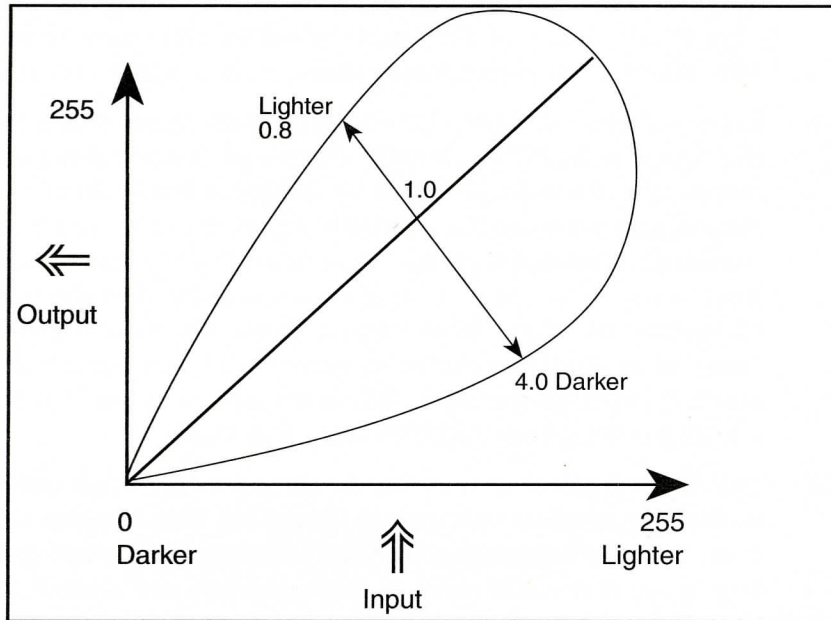


Figure 7.3 Gamma



# Red, Green, Blue Control Submenus

Figure 7.4 illustrates the front panel display for each of the Red, Green, and Blue Color Control selections.

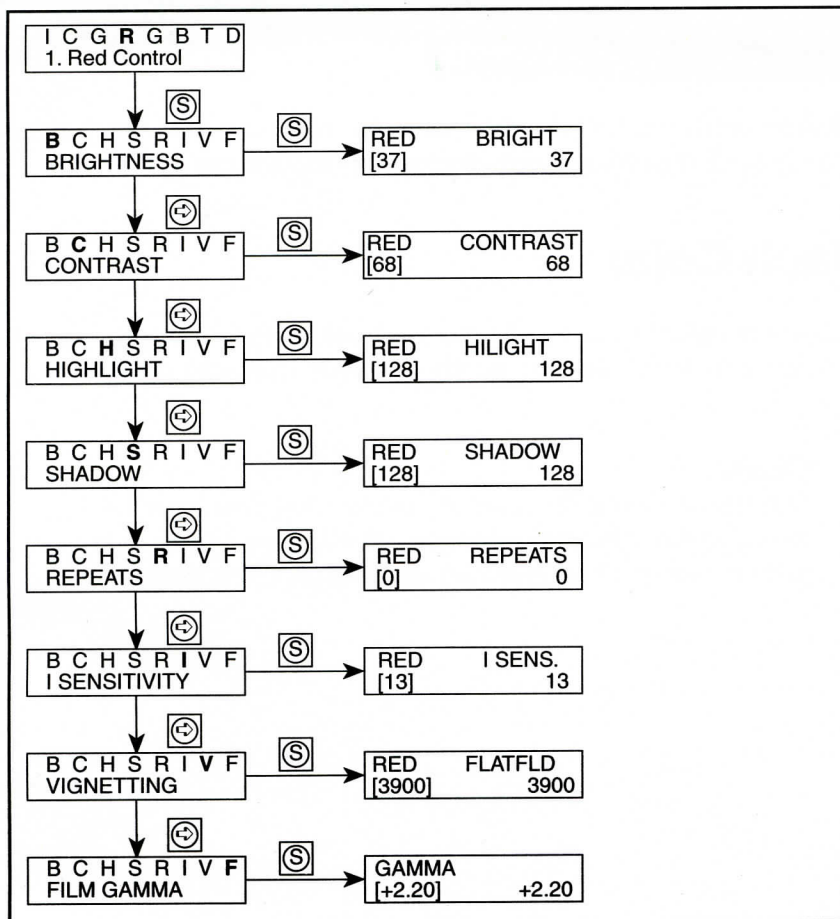


Figure 7.4 Color Control Selections

These functions are described in Chapter 8: *Red, Green, Blue Control*.



## Toggle Dmax

When Dmax is OFF, the Alto allows color control (shadow) over the darkest data input. This can be useful for users who want to have a color balanced black level. Setting Dmax ON allows a black background to use the darkest level the film recorder can achieve, even though it is typically unbalanced.

The default setting is OFF for all film types, modules, and resolutions. Externally loaded LUTs are not affected by this setting.

## Default Color

The “Default color” command resets all color control parameters to their factory default settings for the module that you are presently using.

**Caution:**

Use this option with care; all values that you have entered for the color control menu selections will be erased from memory when you load the default color values.

Chapter 8:  
Red, Green, Blue Control



# Introduction

The basic color control features can address a large number of color adjustment requirements. Those users who want maximum control will find this an important section. With the controls described in this chapter, you can support many black and white, color transparency, and negative films. You can also custom tune any of the existing exposure tables to perform best for specific applications.

**Note:** These controls are used on a “trial and error” basis. Selecting values for a new film type or customizing an existing film type can be time consuming.

**Input/Output Response:** Figure 8.1 is a curve that shows a generic response of the film recorder. This curve is only conceptual and will be used to show the effect of the various exposure table settings on film. Actual values of density achieved will strongly depend on the film type being used.

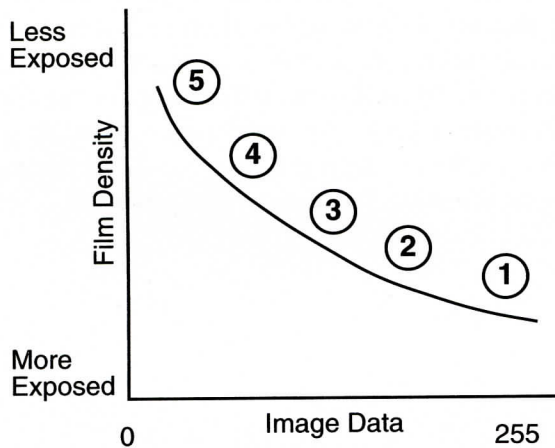


Figure 8.1 Film Recorder Input/Output Response

Each section of the curve is described briefly as follows:

1. **Highlight Control:** This section of the curve corresponds to the brightest section of the exposed image.
2. **Brightness Control Point:** This section is the point on the curve controlled by the brightness table settings.
3. **Contrast Control Point:** This section is the point on the exposure curve controlled by the contrast table settings.
4. **Shadow Control:** This section of the curve corresponds to the darkest section of the exposed image.
5. **Dmax:** Film response at this section of the exposure curve is usually determined mostly by film type, film emulsion, and film processing.

The following sections describe the functions of each of these five controls.

**Note:** If you change any of these values, the Alto will immediately initiate a calibration. If you plan to change several parameters, turn off automatic calibration (Menu: Commands, sub-menu Numeric, enter 31) to make alterations easier. You can turn automatic calibration on by either entering a value of 32 in the same sub-menu or pressing **CTRL-C** at the terminal.

# Red, Green, Blue Control

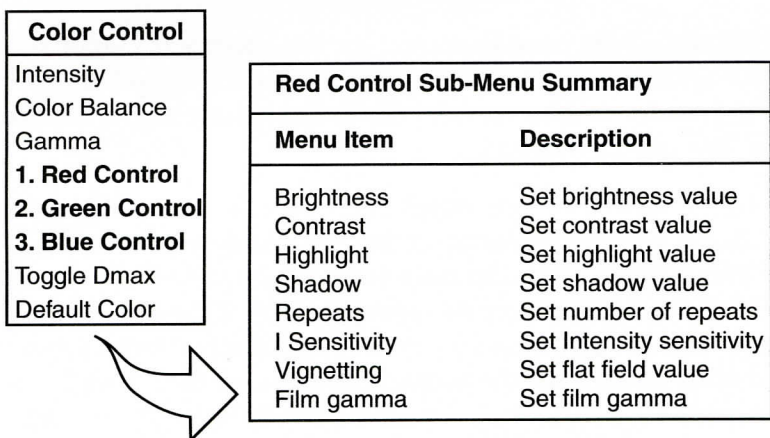


Figure 8.2 Color Control Menu

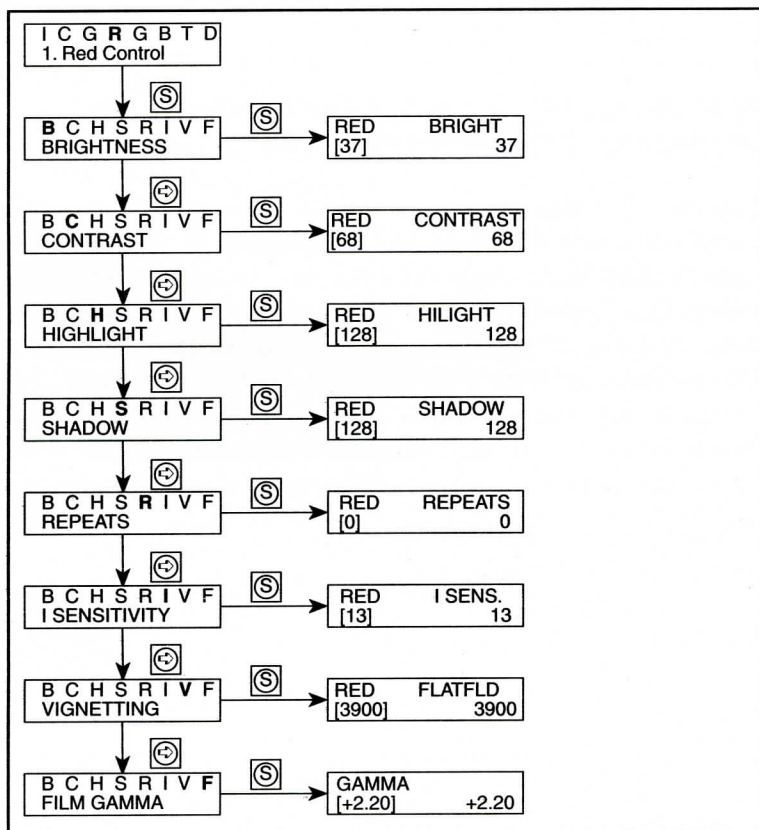


Figure 8.3 Color Control Selections



# LUTs

LUTs (look up tables) are used to correct for the nonlinear response of the film/CRT system. The LUT alters the input data supplied to the film recorder in order to generate the desired response curve on film. LUTs on the Alto are 12 bits wide.

The LUTs in the Alto operate differently than in other Agfa film recorders. This is required because of the adjustable contrast feature of the Alto. The LUT that the Alto uses is internal to the film recorder and not directly available to you. All internal LUTs of the Alto look like linear ramps. The Alto performs an internal transformation on the linear ramp in order to achieve the proper response on film. This transformation depends on the values in the currently selected exposure table and on the CRT installed in the system. If an external LUT is loaded, the Alto will perform the same transformation on that external LUT.

**Note:** Selecting a film type automatically loads the corresponding exposure table values and LUTs.

The default LUTs in the Alto are 12 bits wide. Host systems controlling the Alto are advised to use the 12-bit LUT commands if LUTs are being modified. Eight-bit LUT commands have been included for compatibility with previous film recorder drivers. When the Alto returns an 8-bit LUT to the host, it takes 12-bit LUT values and truncates the 4 LSBs. When the Alto receives an 8-bit LUT from the host, it sets the 4 LSBs of LUT values to 0 and stores the LUT internally as a 12-bit value. If the currently loaded LUT in the film recorder was loaded with 8-bit values, status byte number 32 is set to 0. Otherwise, it will be set to a 1.

# Brightness

The “Brightness” value determines the brightness of the CRT during exposure of the image. This value directly corresponds to a brightness table value. The lower the value of this number, the lower the density of the exposed film (the brighter the image looks).

This value affects the density at all exposure levels for the color selected. The brightness value must be between 36 and 220. While the density of the whole curve is affected, when developing LUTs, the brightness table value should be used to bring the LUT input value of 187 (box 12 greyscale pattern) to the desired density for that color.

This number is used by the Alto during the calibration. For these values to take effect, you must ensure that a calibration sequence occurs after altering them.

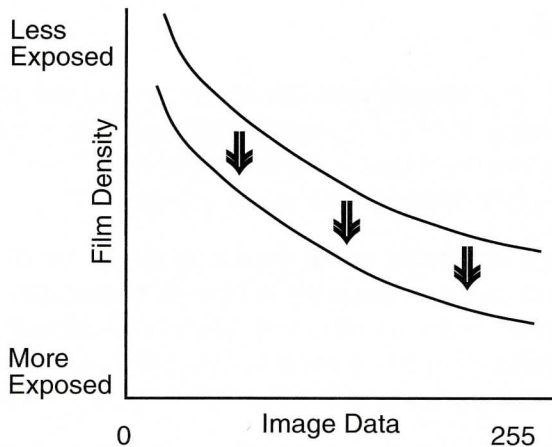


Figure 8.4 Effect of decreasing the brightness table value

The above figure shows the effect of decreasing brightness table values on densities for that color. The density shift is not linear; densities near  $D_{min}$  will be affected less than those higher on the density scale. While only the color being adjusted is affected, if density shifts are extreme, then some cross talk between colors may be observed. The cross talk primarily affects red-green combinations and green-blue combinations.

To adjust the brightness from the Alto front panel, complete the following steps:

- Step 1: Press MENU to advance to SYSTEM DEFAULT, then press SELECT to enter the submenu.
- Step 2: Press NEXT or PREVIOUS until the display reads "RED CONTROL."
- Step 3: Press SELECT to display the current brightness setting for red. Selectable values range from 36 (produces a brighter shade) to 220 (produces a darker shade). Press NEXT or PREVIOUS to scroll through your available choices. Press SELECT again to choose a value.
- Step 4: Press NEXT to view and adjust the green and blue settings as above.
- Step 5: After selecting values for all three colors, press MENU to return to the ready condition.

# Contrast

The contrast value determines the slope of the response curve and can vary from 45 to 150. The contrast for each film type is different, and the contrast required for each color of a particular film type is usually different.

The specified contrast number is a number related to the brightness table value. The contrast value causes the density curve to shift around the 187th LUT input value (box 12 of the standard greyscale pattern) when using the default LUTs of the film recorder. A higher contrast number will cause the curve to rotate clockwise, and the images will appear to have higher contrast. This number is used by the Alto during calibration of the unit. Changing this number must be followed by a calibration sequence for the change to have effect.

**Note:** You should force a calibration after altering these values.

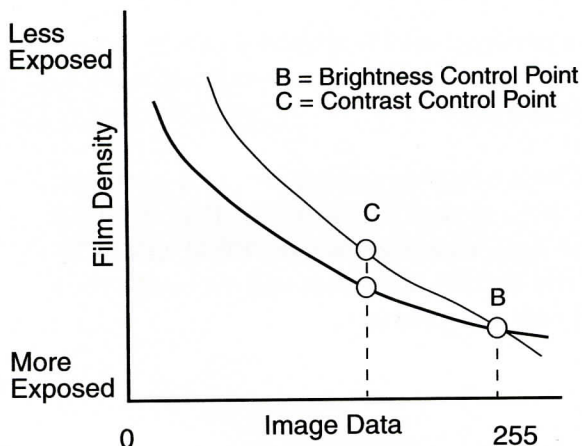


Figure 8.5 Effect of Changing the Contrast Value

To adjust the contrast from the front panel, complete the following steps:

- Step 1: Press MENU to advance to SYSTEM DEFAULT, then press SELECT to enter the submenu.
- Step 2: Press NEXT or PREVIOUS until the display reads "RED CONTROL," then press SELECT to enter its submenu.
- Step 3: Press NEXT or PREVIOUS to advance to CONTRAST (C).
- Step 4: Press SELECT to display the current contrast setting for red. Selectable values range from 45 (minimum contrast) to 150 (maximum contrast). Use NEXT/PREVIOUS to scroll through your available choices. Press SELECT again to choose a value.
- Step 5: Press NEXT to view and adjust the green and blue settings as above.
- Step 6: After selecting values for all three colors, press MENU to return to the ready condition.

After selecting the new contrast and brightness values, return to the "SET USER FILM" function. Alto will automatically calibrate and store these values into its memory.

**Note:** To use Alto's brightness and contrast settings, you must have them in the "USER 0, USER 1, or USER 2" location. The Agfa rasterizer's use "FILM SELECT" commands for the default films that will overwrite your brightness and contrast changes.

# Highlight

This setting controls the shape of the transformation curve at the low density section of the LUT. The minimum value for this parameter is 0 and the maximum value is 255. Lower numbers for this value cause lower density readings at this part of the curve. This number has no effect on calibration and will have an effect on film exposure even if no calibration sequence is performed after changing it. This number cannot be programmed remotely from the host.

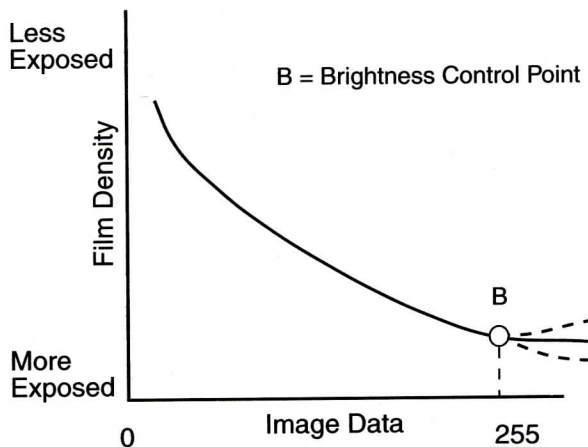


Figure 8.6 Effect of Changing the Highlight Value



# Shadow

This setting controls the shape of the transformation curve at the high density section of the LUT. The minimum value for this parameter is 0 and the maximum value is 255. Lower numbers for this value cause lower density readings at this part of the curve. This number has no effect on calibration and will have an effect on film exposure even if no calibration sequence is performed after changing it. This number cannot be programmed remotely from the host.

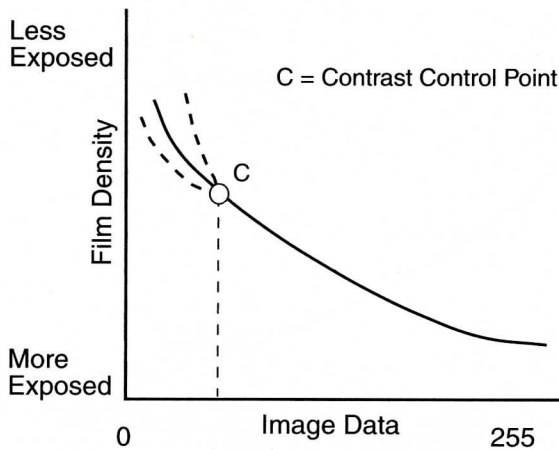


Figure 8.7 Effect of Changing the Shadow Value



# Repeats

The “repeat” function enables you to set the number of color passes it takes to record the red, green, and blue information onto the film. This means that you can lower the CRT brightness and compensate by making multiple exposures of the selected color passes.

The advantage is that with reduced CRT brightness levels, there can be a reduction in CRT spot size for better image quality.

This number controls the number of times each scan line is repeated during exposure of the film for the color pass. The total number of times each output scan is recorded equals the repeat value plus one. For large format film, the number of repeats may be substantial, up to 11 for some default film types. A repeat value of zero means that the Alto records each scan only once, without a repeat.

Increasing the number of line repeats increases the imaging time. Imaging time increases by one full unrepeated scan time for each repeat added. Doubling the number of scan lines imaged drops the film density (increases exposure) by about .30D (the equivalent of opening a lens by an f/stop). Increasing the number of repeats causes the brightness table value to increase for the same exposure level on film. At the same time, the achievable Dmin will decrease and the image time will increase.

When developing new film types, this parameter should be finalized before any of the others. Its impact on brightness and contrast tables is very significant.

To set the number of repeats at the front panel, perform the following steps:

- Step 1: Press MENU then PREVIOUS/NEXT to advance to SYSTEM DEFAULT. Press SELECT to enter its submenu.
- Step 2: Press SELECT to enter the Color Control submenu. Press NEXT or PREVIOUS until the display reads "RED CONTROL," then press the SELECT button to enter its submenu.
- Step 3: Press NEXT or PREVIOUS to advance to REPEATS (R), then press SELECT.
- Step 4: The display will read "RED 0." Press NEXT/PREVIOUS and choose a value from 0 to 127. Press SELECT to set that value. Press NEXT to view/change the value for green.
- Step 5: Repeat this procedure for blue and green repeat values.

## Sensitivity

This number is used by the Alto to determine the amount of brightness table change required to give a corresponding change in density on film. This is used by the color balance routine and the intensity routine to ensure that color balance changes predictably. This number cannot be programmed remotely from the host.

The range of sensitivities is from one (1) to 50.

## Vignetting

All lenses are less than perfect. The Alto features an electronic correction to adjust for a lens effect called "fall-off." This effect shows up on film as corners looking darker than the center. The "fall-off" factor varies for each camera module. Changing your f/stop will also change "fall-off" of a lens.

The "Vignetting" value is used by the Alto to determine the amount of CRT intensification in the corners of the image. The amount of CRT corner intensification required on each unit depends on the lens, the CRT focus, and the exposure table values. The range of this value is between zero (0) and 4095. The higher the number, the brighter the corner.

## Film Gamma

The film gamma value is a film dependent value. Changing the film gamma value is only necessary if you develop a new LUT for a non supported film. The film gamma can be measured with a gamma scope or calculated by plotting the density curve of the film. The film gamma value is used by the Alto to calibrate the user gamma control.

# Custom Film Types

The Alto firmware allows you to create a completely custom color response for a new film type. You need to know your target densities for a greyscale before starting. Use a densitometer to measure the densities at each of blocks 4, 8, 12, and 16 of the Agfa standard greyscale.

1. Adjust the brightness table values and repeat values to achieve the desired density values at block 12 (increasing a brightness table value increases the film density for that color). Note: brightness values must be above 36 and below 220. Be cautious as there is some degree of cross talk between colors. Ensure a calibration sequence is done after changing brightness or repeat values and before shooting images.
2. Adjust the contrast table values to achieve the desired density values at box 8. Increasing a contrast value increases the density at box 8 for that color. It has no effect on the density at box 12. All other densities will be affected. Box 12 will be the pivot point of the density shifts. Be sure to force a calibration sequence after changing contrast table values and before shooting images.
3. Adjust the Dmin and Dmax values to achieve proper densities at box 16 and 4, respectively. No calibration is required between changes in these values. The output on the Alto should now be closely matched for your new film type.

## Hints for Creating Full Custom Tables

The process of creating a full custom film table takes a number of trial exposures, a bit of patience, and experience. Here are some hints to help you along the way:

- **Establish a “scientific method”**

Each trial image is part of your color table development process. It is vital to have a “lab notebook” for careful record keeping of each image made, the settings used, and the density results from these images.

- **Estimating “next trial” settings**

The length of the custom table development depends on your ability to make the best “next guess” for the table values used on each image. Graphing your results can help make the best guess for the next setting. For example, if you were adjusting brightness, you would create three plots, one for each color. Each graph would plot brightness value versus density.

## Hints for Adjusting Red/Green/Blue Brightness

If you wish to achieve an overall increase or decrease in brightness without altering the color balance, try the following:

Adjust all three values by the same percent change. For example, if the present brightness values are Red = 40, Green = 50, and Blue = 60, try adjusting by using a 10% change on all three values. Add four (4) to Red, add five (5) to Green, and add six (6) to Blue.



# Alto Greyscale Test Pattern

The Alto's greyscale internal test pattern is an important image for a number of applications. It is extremely useful for judging color response and geometry correctness.

- The Alto Greyscale Test Pattern can be shot at 2k, 4k, 8k, or 16k on any film type and any module.
- The Alto LS Greyscale Test Pattern can be shot at 2k, 4k, or 8k, on any film type and any module.

The pattern below is numbered to show how boxes are referred to in our documentation. Box 16 is 100% white, box 8 is controlled by the R/G/B contrast values, and box 12 is controlled by the R/G/B brightness values. The 16 boxes are assigned the following input values on a scale of 1 – 256 and a scale of 1 – 100.

The procedure for executing a greyscale test pattern is described in *Chapter 9: Diagnostics*.

Box #	0-255 input	0-100% input	Box #	0-255 input	0-100% input
1	0	0	9	136	54
2	17	7	10	153	60
3	34	14	11	170	67
4	51	20	12	187	73
5	68	27	13	204	80
6	85	34	14	221	87
7	102	40	15	238	93
8	119	47	16	255	100

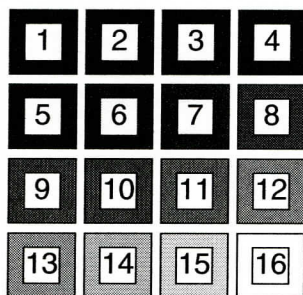


Figure 8.8 Alto Greyscale Pattern With Boxes Numbered

## Chapter 9:

# Diagnostics

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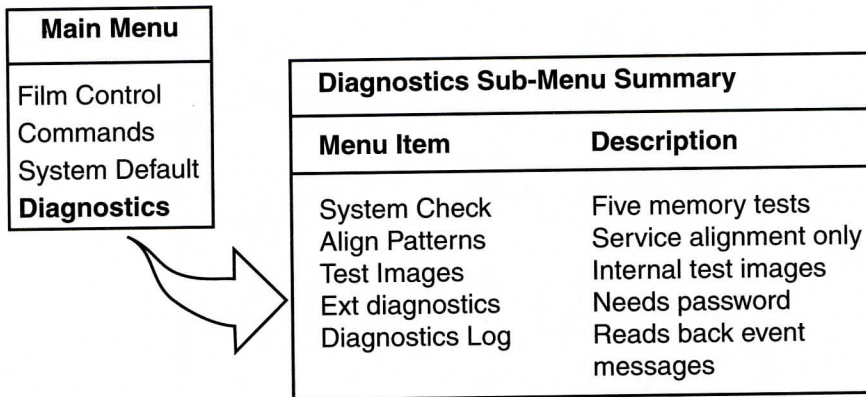


# Introduction

The Diagnostics function offers a number of test routines to verify whether Alto's hardware and memory circuits are functioning properly. It also contains a number of alignment patterns that only a qualified service person should use.

**Caution:**

Do not select any of the service alignment modes unless directed by a qualified service person.



*Figure 9.1 Diagnostics Menu*

Figure 9.2 illustrates the front panel display for each of the Diagnostics selections.

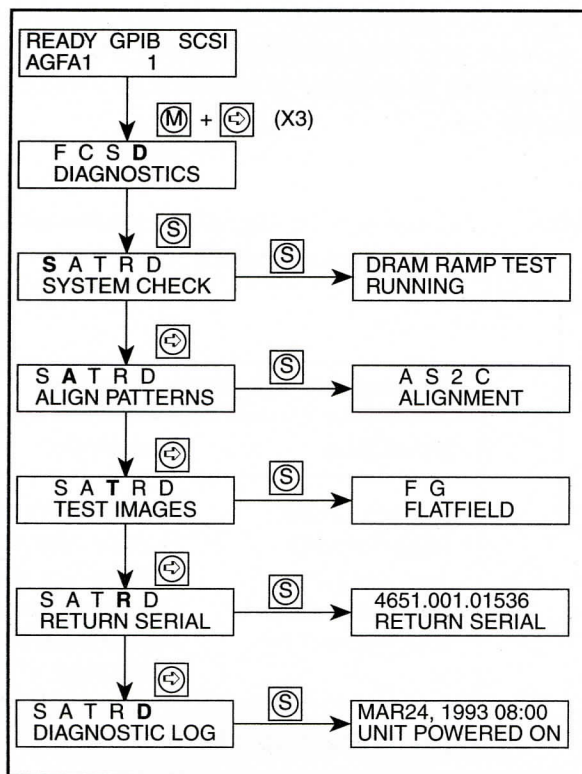


Figure 9.2 Diagnostics Selections

# System Check

Alto has built in self-test routines. When you select System Check, all memory and hardware will be checked with several tests that last approximately two hours.

## Alignment Patterns

These commands are used by manufacturing and service personnel to adjust Alto's focus, image size, and image geometry. The pattern may be useful in the alignment of certain camera module.

**Note:** Do not select any of the alignment patterns unless directed by a qualified service person.

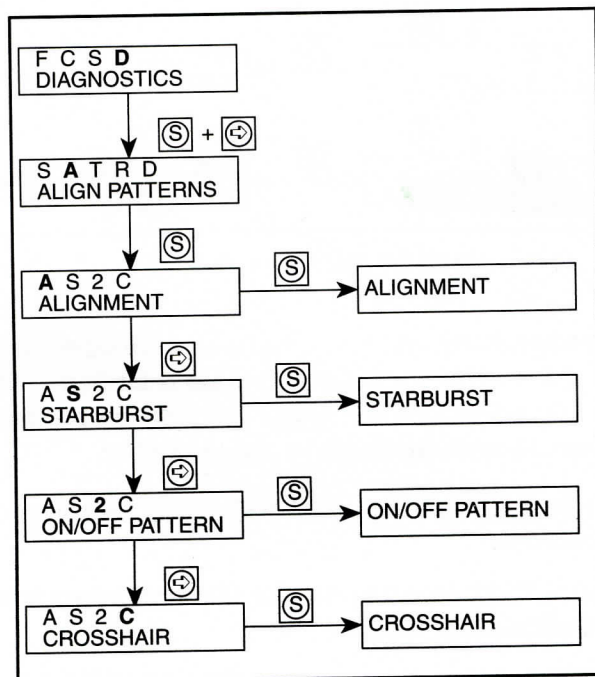


Figure 9.3 Alignment Patterns Selections

## Test Images

Alto has built in test images that you can expose onto film using simple commands from the film recorder's front panel. Test images provide a reference point for determining whether the Alto is functioning properly. They are especially helpful in troubleshooting problems that may occur when you are imaging with a host computer.

Figure 9.4 illustrates the front panel display for each of the Test Images selections.

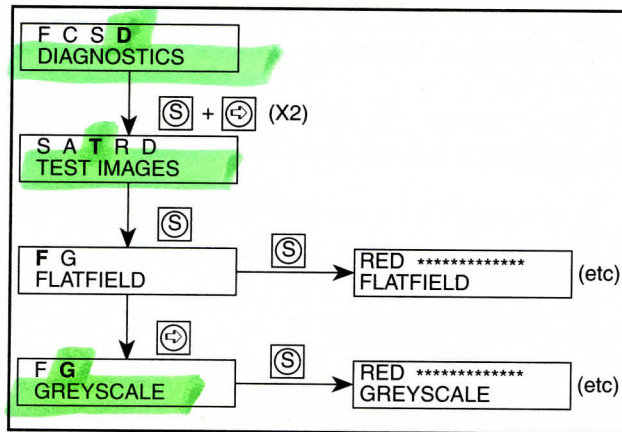


Figure 9.4 Test Images Selections

These two commands expose two internal test images on any camera module at 4K, 8K, or 16K resolution (ALto LS is limited to 4K or 8K resolution) with any selectable film type. The test images provide a very useful reference for evaluating Alto's image quality.

When you select a test pattern, Alto will create an image with any of the camera modules.

- **Alto** will print these images onto the film only when it is set for 4K, 8K, or 16K addressing modes.
- **Alto LS** will print these images onto the film only when it is set for 4K or 8K addressing modes.

Using the test pattern feature will cancel any custom look-up tables that were previously sent to Alto.

These internal test patterns provide you with a method to determine whether Alto is generating the proper image for the module and film type you have selected.

**Note:** To ensure proper color balance, you must select the correct film type before shooting images.

**Flat Field:** This command should produce an even grey across the film area. There are eight tick marks, two placed in each corner.

These marks provide alignment references for manufacturing and service personnel.

This image should appear smooth without any disturbances when viewed under an 8X magnifying loupe. The grey should appear neutral, and not biased toward any color.

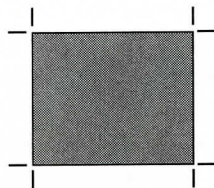


Figure 9.5 Flat Field

**Greyscale:** This image contains key information for color balance, white level, contrast, and geometry of your Alto. Specific densities may vary by module and film type. A typical density for the “white” box is about 0.25D. A properly operating Alto will produce an image with:

- balanced greys in the 16 box greyscale,
- lines that are straight,
- corners that are “square.”

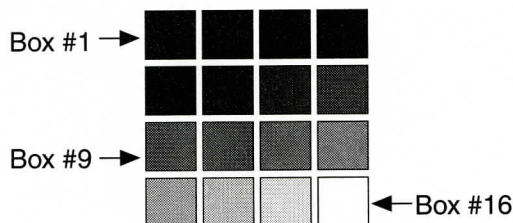


Figure 9.6 Greyscale Test Image



To use the test pattern feature from the front panel, complete the following steps:

- Step 1: Press **MENU** to advance to **DIAGNOSTICS**, then press **SELECT** to enter the submenu.
- Step 2: Press **NEXT** or **PREVIOUS** to advance to either **FLATFIELD** or **GREYSCALE**.
- Step 3: Press **SELECT** to execute the displayed test sequence. After the film recorder finishes exposing, the display will indicate "DONE," and you will hear four short "beeps" from Alto's audio alarm. Press **MENU** twice to return to the ready menu.

**Note:** When you expose test images, it is very important that you first select the resolution and film type with the film recorder's front panel controls. If you have been using custom film compensation tables that are loaded into the Alto's memory, your test images may exhibit poor color balance. Alto's internal test patterns are optimized for their corresponding internal default film compensation tables. By selecting the resolution and film type before you enter the test images submenu, you guarantee that the Alto will use the default film tables.

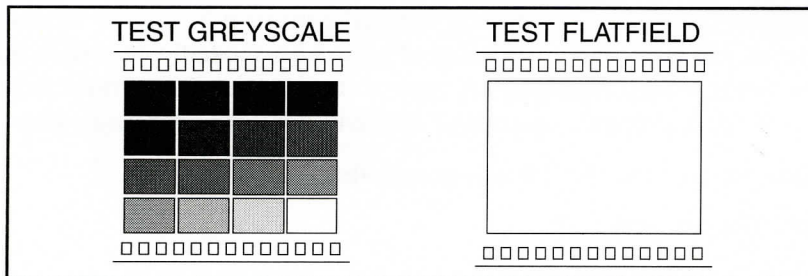


Figure 9.7 Test Images



## **Return Serial**

Selecting this function causes the unit to read back its serial number.

## **Extended Diagnostics**

This menu is used by qualified Agfa service personnel to perform certain diagnostics and tests. A password is required to access sub-menus for these diagnostics.

## **Diagnostics Log**

Alto records all diagnostic messages in a log file. Selecting the diagnostic log function causes the unit to read back the last 20 messages.



Chapter 10:  
**Additional Information**

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# Status and Error Messages

Table 10.1 shows several of the status and error messages and explains what they mean.

Message Window	Description
WARMING UP ROM OK RAM OK	Alto is executing a power on warm-up cycle that tests its internal electronics and calibrates its brightness levels.
CALIBRATING	The film recorder is calibrating its brightness levels.
READY GPIB EKTA1 1	This message indicates that the film recorder is ready to accept data and shows the selected film type and resolution settings. With film loaded "1" is the current frame count.
REMOTE	Indicates that the film recorder has received a command from the host computer, and that it is now under remote control
RED	Alto is recording the red component of a color image onto the film.
GREEN	Alto is recording the green color pass onto film.
BLUE	Alto is recording the blue color pass onto film.
END OF FILM	You have reached the end of film. Refer to the film loading and unloading instructions in this chapter for loading fresh film and clearing the end of film message.

**Table 10.1 Status and Error Messages**

# Resetting the Film Recorder

You should reset Alto if the host sends bad image data or if the film recorder has a fault condition that causes it to cease operating properly. Use the front panel RESET switch to do this.

## General Maintenance

The Alto is a relatively maintenance-free device. It should be kept clean, dry, and as dust-free as possible.

A non-abrasive household cleaner will remove dust and scuff marks from the outside panels. Avoid getting any chemicals on or near the camera back modules. These panels are painted. Do not use anything that might damage the paint.

## Cleaning the Camera Lens

Periodically check the lenses on the camera backs for dust build-up. Remove the camera module from the top of the film recorder and clean the surface of the lens with professional-grade, non-abrasive lens paper.

### **Caution:**

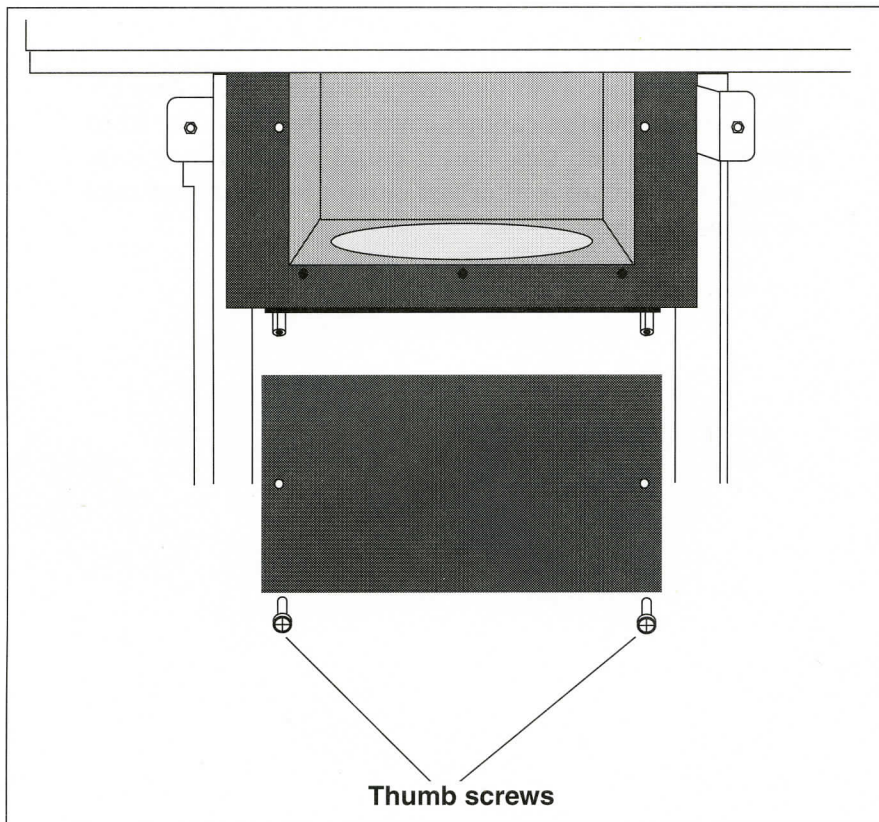
Do not use any cleaners on the lens or filters that are not approved for use on coated photographic lenses. If the camera back is removed from the Alto, cover the camera lens with its protective lens cap.

# Cleaning the CRT

A “quick opening” access door is provided to allow you to clean the CRT without removing the module from the Alto. The door has two thumb screws that secure it in place (see Figure 10.1).

Clean the CRT with either a small vacuum or with photographic quality lens tissue and cleaner. **DO NOT** use any cloth or wipe that is not specifically designed for photographic lenses.

Open the access door by turning the two thumb screws; close it by turning the two thumb screws



*Figure 10.1 Using The Access Door*



# Test Operations

Agfa Technical Support may suggest that you run various test and troubleshooting routines using Alto's internal diagnostics.

**Caution:**

Do not attempt to use these diagnostics without the assistance of a qualified service technician.

Do not attempt to run test routines while the Alto is actively controlled by the host computer. Local test routines will interfere with Alto's remote activities.

**WARNING:**

The Alto contains no user-serviceable parts. Any attempt to remove the cabinet covers, other than the front cover or the main fuse cover, could result in personal injury. Contact an authorized service agent if your unit requires repair.

# Viewing Filters

A set of viewing filters is provided with the Alto to aid in the color balance process. This section provides extra information on how the filters work relative to a densitometer and handling instructions.

The filters change the perceived color by affecting the light transmitted through the combination of image and filter. A red filter makes an image appear redder by increasing density of the green and blue component of the slide. The table below is a guide to the approximate densities of all filters.

Filter	Red	Green	Blue	(Density)
Red	10	.02	.12	.11
Red	20	.03	.22	.21
Red	40	.05	.43	.42
Green	10	.09	.03	.10
Green	20	.17	.05	.20
Green	40	.34	.09	.40
Blue	10	.11	.12	.03
Blue	20	.20	.21	.04
Blue	40	.36	.39	.07
Cyan	10	.10	.03	.02
Cyan	20	.19	.06	.02
Cyan	40	.34	.09	.03
Yellow	10	.01	.01	.10
Yellow	20	.01	.01	.19
Yellow	40	.01	.01	.37
Magenta	10	.02	.12	.02
Magenta	20	.03	.21	.04
Magenta	40	.05	.42	.06

**Table 10.2 Densities of Filters**

## Example

An Alto user images the internal greyscale test pattern at 4K, 35mm on Agfachrome film. The image appears to be too magenta. Using the viewing filters, the lightest green filter appears to eliminate the problem. Box 11 of the greyscale is measured at red = .95, green = 1.03, blue = .97. Using the lightest green filter adds the following densities to the image: red = .09, green = .03, blue = .10. The combined densities with the densitometer are: red = 1.04, green = 1.06, blue = 1.07. The .03 difference between red and blue is very small. It could be corrected by adding 2 or 3 units of yellow correction.

## Handling

The filters have a limited life. They should be stored in the plastic sleeve inside the original envelope. Keep them in a cool dry place. The filters will shift density due to humidity and exposure to light. We recommend replacing the filters each year for best accuracy. They can be ordered through most professional photography supply houses.

# Rasterizers

Several graphics packages, such as Mirage, RIO, and 35MM Express, contain “direct drivers” to generate slide output on Agfa film recorders.

Agfa cannot in any way guarantee compatibility or suitability for a particular purpose. Check with your authorized Agfa representative for the latest compatibility or suitability and for the latest compatibility information and guidance on choosing an appropriate rasterizer.

## Image Management Software

Alto users who image SCODL files through an MVP Star or MVP Star-16 may want to add Impresario image management software to their system. This easy-to-use software supports the Foreground mode of MVP. In this mode, you can enable spooling of up to four files, so that rasterization can take place while your film recorder is imaging. For typical business graphics, the rasterization portion of the total imaging process will virtually disappear for maximum throughput on the Alto.

## Software Compatibility

If you are using **Mac Conductor** software with the Alto, make sure that you have version 2.8 or later of this program. If you are using MVP Conductor software with Alto, make sure that you have version 1.13 or later of this program. If you are using ChromaScript II software with Alto, make sure you have version 3.2 or later of this program. Earlier versions of these two programs will not be able to identify and properly support the Alto.

# Viewing Your Slides

To take full advantage of the high quality and performance of the Alto, use a high quality projection system and screen to view your slides. The following suggestions may help you improve your presentations.

1. Use high-quality slide mounts; glass mounts provide better final image quality because they flatten the film, thereby preventing it from bowing inside the mount.

**Note:** Not all Alto 35mm camera modules are pin-registered. Check with your supplier to see which slide mounts are appropriate.

2. With glass-mounted slides, use a slide projector with a high-quality flat field corrected lens. Uncorrected lenses have a focal point that lies on a *circular radius* that is a fixed distance from the lens. A flat field corrected lens focuses the image over the length and width of a flat plane at some distance from the lens. With glassless slide mounts, use a curved field lens. As a rule of thumb, a professional fixed focal length lens is usually sharper than a zoom lens.
3. View your slides on a matte white or glass beaded projection screen, or a similar screen with high reflective properties, and not on a painted wall or a screen with poor reflective qualities. The texture and color of a painted wall tend to dull the colors in the image. The matte white screen will display your slides the sharpest. A glass beaded screen mounted flat to the wall provides optimal reflection of the image and produces the brightest image. Use a taut screen that does not bow at the edges.
4. Make your viewing area as dark as possible. When ambient light from windows, doorways, and light fixtures is added to the light from your projector, it tends to obscure the projected image.

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