If You Need Technical Assistance

For technical assistance, contact the distributor from whom you purchased ChipLab as listed in the Customer Letter in your Information Folder. For your convenience, record the distributor's name and phone number below.

Distributor Name_____ Telephone_____

July 1994 096-0147-002

Data I/O Corporation
10525 Willows Road N.E., P.O. Box 97046
Redmond, Washington 98073-9746 USA
(206) 881-6444

Acknowledgments:

Welcome to ChipLab

The information in this guide is organized into the following sections:

Preface

The Preface includes details about contacting your distributor for technical assistance, repair, and warranty services.

Technical Assistance

For solutions to installation problems, refer to the Installation Guide in the Information folder, and complete the steps in the flow chart.

If the problem persists and you need technical assistance, contact the distributor from whom you purchased ChipLab. Refer to the Technical Support sheet in the Information Folder to determine whom to contact.

If you have troubleshooting questions or other operation difficulties, your distributor can answer your questions and direct you to the appropriate Service Center, if necessary.

When calling the Technical Assistance number, please be at your ChipLab and computer when you call, and have the following information ready:

- Version number found in the Help/About information box
- Product serial number found on the bottom of ChipLab
- Detailed description of the problem you are experiencing
- Error messages (if any)
- Device manufacturer and part number (if device related)

Warranty Information

Data I/O Corporation warrants this product against defects in materials and workmanship at the time of delivery and thereafter for a period of one (1) year.

The foregoing warranty and the manufacturers' warranties, if any, are in lieu of all other warranties, expressed, implied or arising under law, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Data I/O maintains customer service offices throughout the world, each staffed with factory-trained technicians to provide prompt, quality service. For warranty service contact your distributor listed in the Technical Support Information Sheet.

Repair Service

After the warranty period expires, repair or replacement services are available through your distributor or at authorized Data I/O Service Centers.

Calibration

ChipLab is a state-of-the-art self-calibrating precision instrument. All calibration is performed by software and is compared to a laser-trimmed voltage reference.

ChipLab calibrates itself every time a complete self-test cycle is run. To ensure that your ChipLab remains fully calibrated, Data I/O recommends that you restart the ChipLab software and run a complete self-test cycle once every three months.

Optional Performance Evaluation

In addition to self-calibration, ChipLab may be returned to your distributor or a Data I/O Service Center for a complete performance evaluation.

This performance evaluation is exclusive of the calibration test.

Safety Summary

General safety information for operating personnel is contained in this summary. In addition, specific WARNINGS and CAUTIONS appear throughout this manual where they apply and are not included in this summary.

Definitions

WARNING statements identify conditions or practices that could result in personal injury or loss of life. CAUTION statements identify conditions or practices that could result in damage to equipment or other property.

Power

To avoid damage, operate the equipment only within specified line (ac) voltage. Use only the power supply supplied with your equipment (or an equivalent power supply certified in your country by an applicable safety agency).

Symbols

V~ This symbol stands for AC or DC.

Certificate of RFI/EMI Compliance with VDE 0871 Limit B

Data I/O certifies that this product complies with the Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) requirements of VDE 0871 Limit B, as required in German postal regulation number vfg 1046/1984, page 1943.

Data I/O further certifies that the German Postal Service (DBP) has been notified of Data I/O's intention to market this equipment in Germany. Data I/O acknowledges that the DBP reserves the right to retest this equipment to verify its compliance with the regulation.

Certificate of Compliance with FCC Part 15, Class B

Data I/O certifies that this product is designed to comply with Part 15, Class B of the Federal Communications Commission rules.

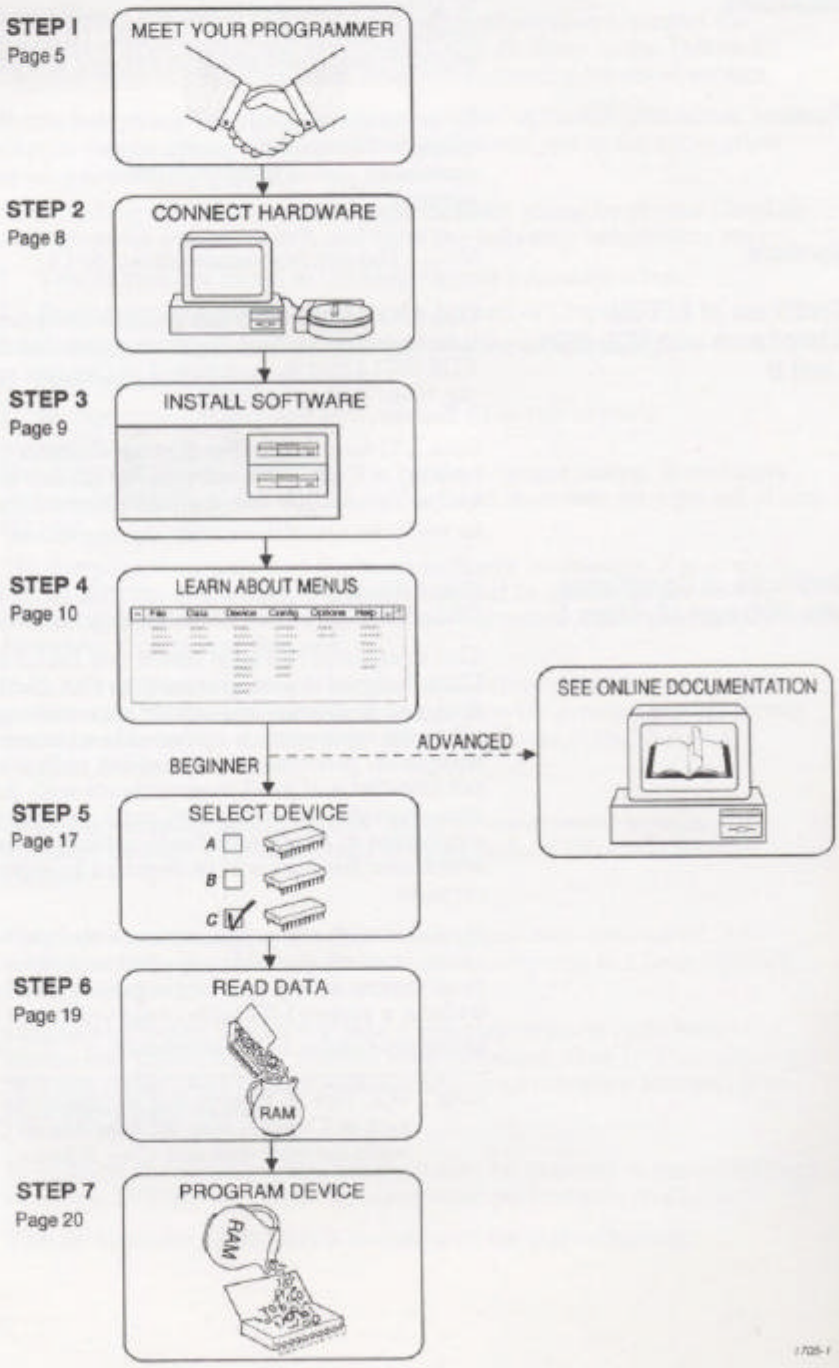
This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates,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

Do not modify the programmer or operate without properly shielded I/O cables (such as the cable supplied with your equipment). Modifying the programmer in any way not expressly authorized by Data I/O or using it without a proper I/O cable could void your authority to operate this equipment under FCC compliance.

Note: FCC Part 15 requires that all "Industrial and Commercial" equipment, such as ChipLab, meet the more relaxed Class A limits. However, ChipLab meets the more stringent Class B limits.

Getting Started

Steps 1 through 7, which begin on page 5, take you from opening the shipping container to programming a memory device.



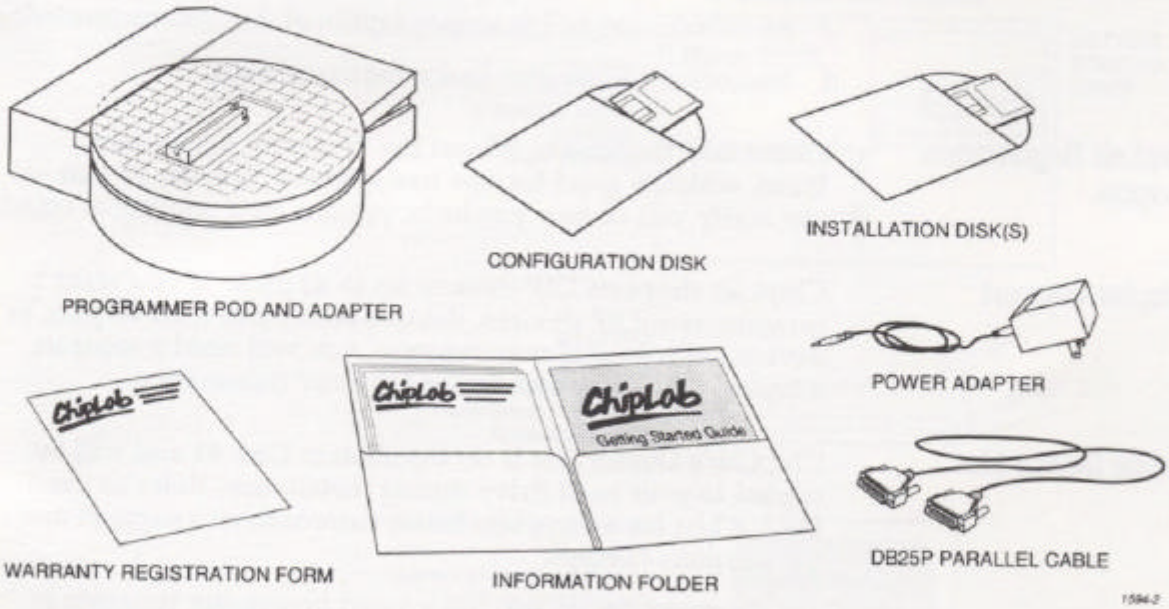
1. Meet ChipLab

Description

ChipLab is a compact programmer designed to meet your programming needs. ChipLab uses a DOS-based PC interface to provide an accessible programming environment, the PC's parallel port to communicate with the programmer, and device adapters to ensure that you get the specific device support you need for your programming application.

Package Contents

The following figure shows the contents of the ChipLab shipping container.



Note: ChipLab has one status light, which, when lit, indicates that power is applied.

CAUTION: Use only the power supply shipped with ChipLab to prevent damage to ChipLab and /or the power supply.

Installation Disk

After you install the ChipLab software on your PC, put the Installation and Configuration Disks in a safe place; you may need them for future use.

System Requirements

You need the following to use ChipLab with your PC:

- One free parallel port with nothing else attached
- Minimum 2 MB extended memory required
- IBM-compatible PC, 286 minimum (386 recommended) running DOS version 3.3 or higher
- 5 MB of free hard disk space for ChipLab drivers and programs
- 3.5-inch high density disk drive (5.25-inch disks can be special ordered using the request form in the Information folder)
- Microsoft-compatible mouse (optional, but recommended)
- Monochrome monitor (color recommended)

ChipLab Registration Coupon

Please take the time to fill out the Warranty Registration Form, which is good for one free software update, so that we can notify you of new products, options, and additional offers.

Adapter Support

ChipLab supports DIP devices up to 48 pins. If you want to program non-DIP devices, devices with more than 48 pins, or devices with special requirements, you will need a separate adapter. Call your distributor for more information.

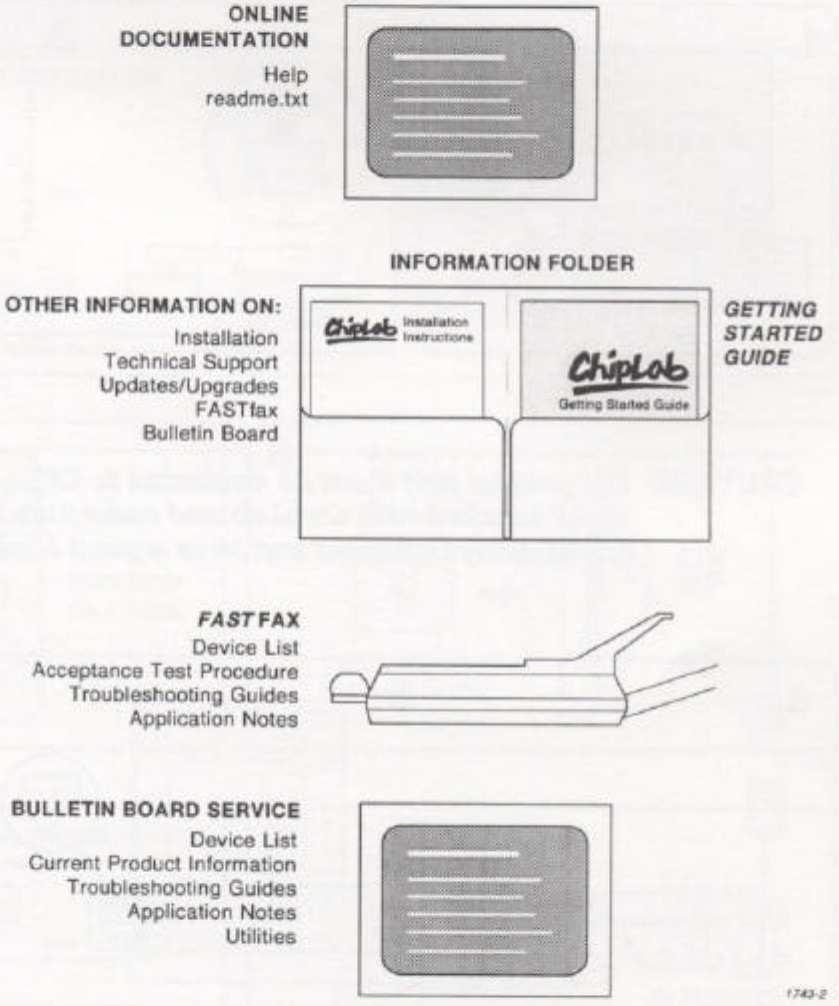
Online Device List

ChipLab's Device List is on Installation Disk #1 and will be copied to your hard drive during installation. Refer to the Device List for a complete list of current device support and the adapters needed.

For a printed device list, use a word processing program to print the **devices.txt** file.

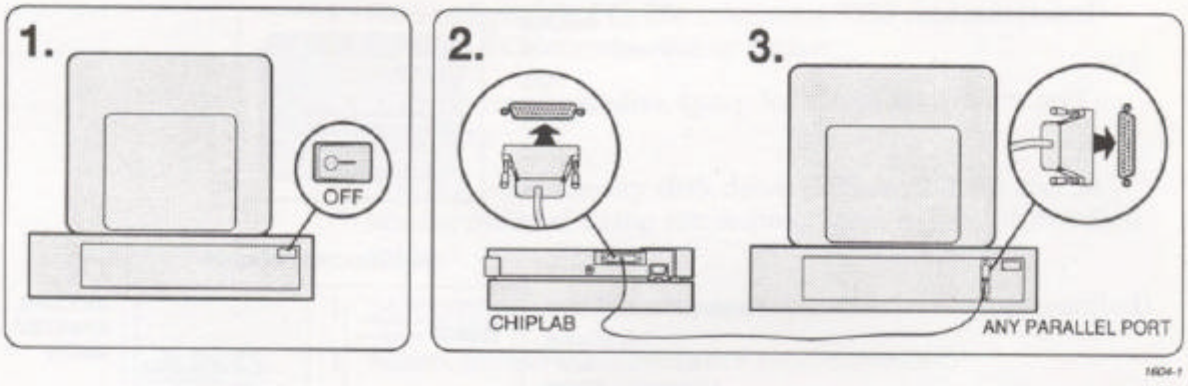
Documentation

The ChipLab documentation is shown in the figure below. In addition to this *Getting Started Guide*, the Information Folder contains information about ChipLab functions and options. Much of ChipLab's documentation is online or is available through the BBS or *FAST*fax. Instructions for using these services are included in the Information Folder.

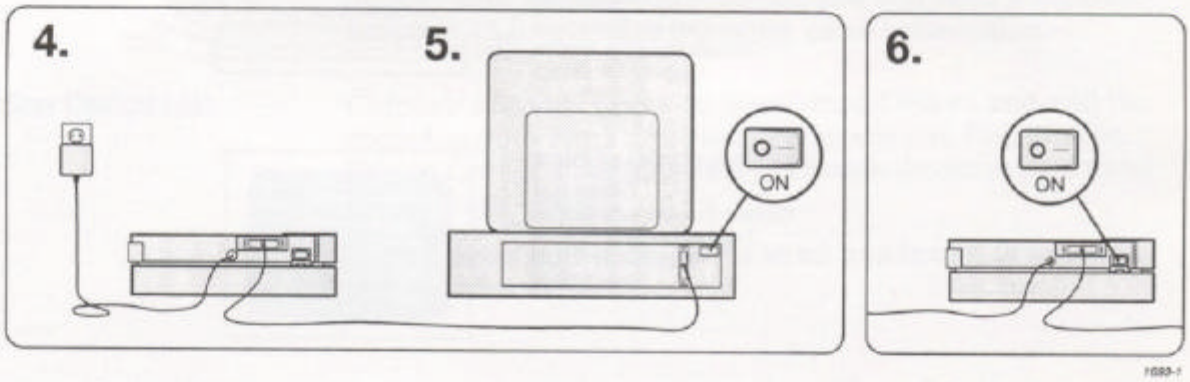


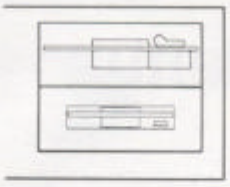
2. Connect Hardware

Set up your PC and ChipLab as shown in the following figures.



CAUTION: ***The parallel port must be dedicated to ChipLab operation only. Use the cable supplied with ChipLab and make sure that the connector screws are securely tightened and have a good chassis-to-chassis ground.***

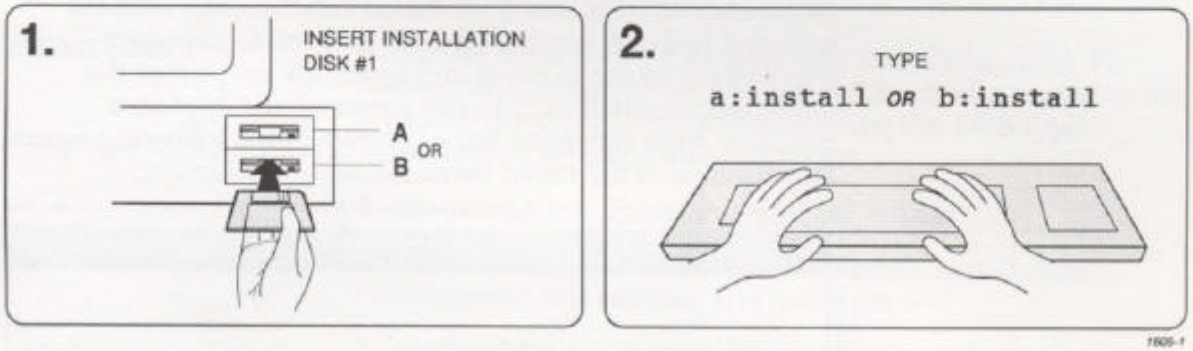


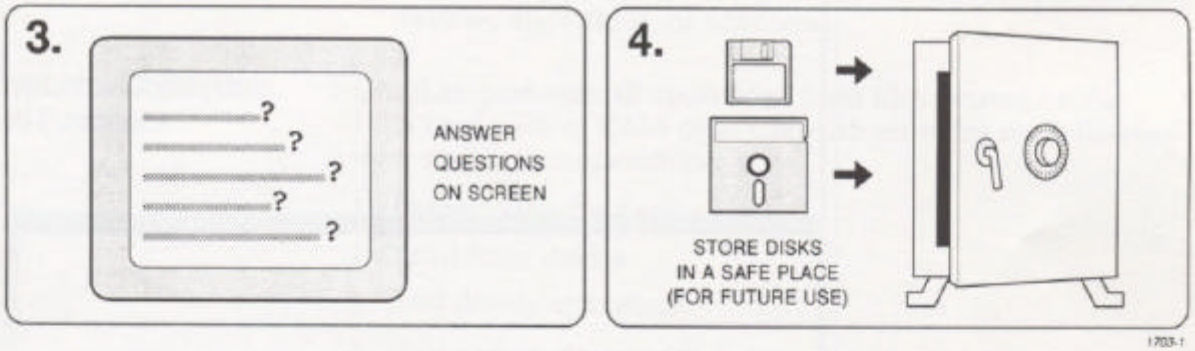


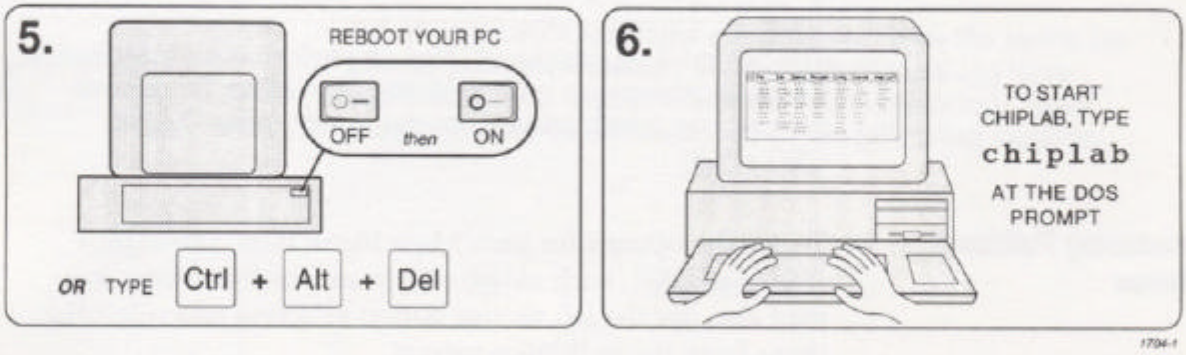
3. Install Software

Install the system software on your PC's hard drive as shown in the following figures. For more detailed information, see the Installation Guide in your Information folder.

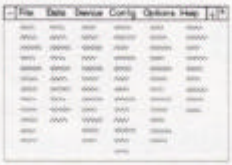
Note: ChipLab must be connected to your PC during installation.







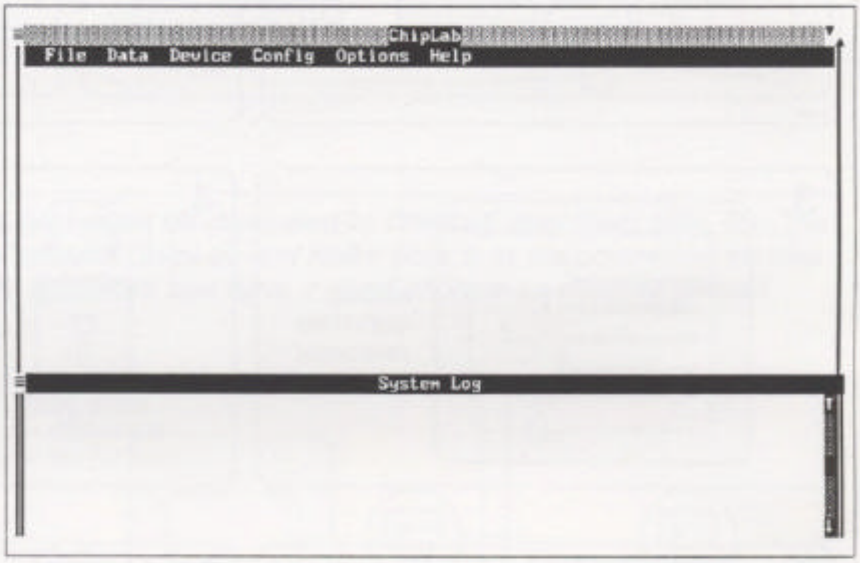
To resolve installation problems, follow the steps in the Installation Guide's flow chart and see the troubleshooting tips in the **readme2.txt** file on Installation Disk 1.



4. Learn About Menus

Online Menu Structure

ChipLab's user interface, which complies with SAA/CUA requirements, combines DOS-based functionality with the look and feel of a windowed environment. Complete descriptions of menu items and functions are part of the online documentation. You can access all of ChipLab's functions from the menu bar as shown in the following figure. Descriptions of the menu items follow.



The System Log provides ChipLab performance information. ChipLab powers up with System Log visible. To remove System Log information from the screen, press Esc or Ctrl + Tab .

Accessing Pulldown Menus

To see the options for each Main Menu item, press Alt + highlighted letter , such as Alt + F to see the File menu. You may also use the left mouse button to access and select the items from the pulldown menus.

How to Get Help

To get help when you are in the ChipLab user interface, press any of the following keys:

- F1
- ↵ on a highlighted word when you are in a help screen
- ESC to go to the main screen, where you can use the pulldown help menu to browse the Help Index

Readme Files

There are three readme files on your Installation Disk #1. During installation, these files are automatically copied to the ChipLab directory. View them by using the DOS **type** command or by using any text editor.

- **readme1.txt** — Contains copyright notices
- **readme2.txt** — Contains information on installation, command line utilities, and messages
- **readme3.txt** — Contains information specific to particular devices, algorithms, or adapters

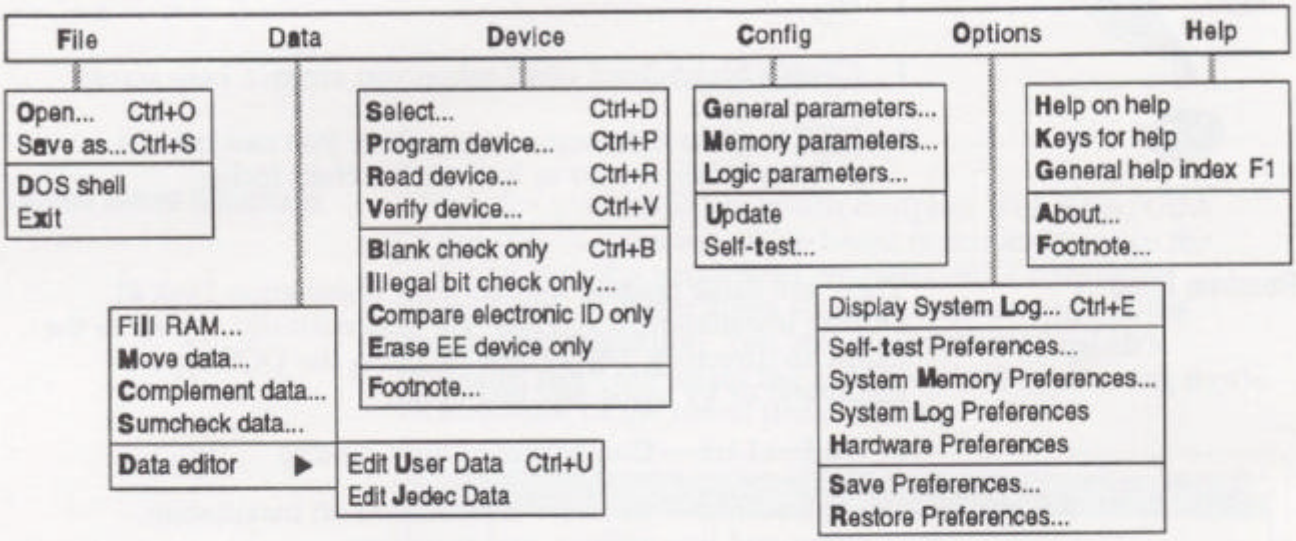
ChipLab's Commands and Functions

ChipLab performs all operations from files located on the PC's hard disk or RAM disk. ChipLab provides the following data and device operations:

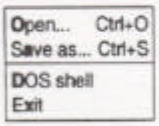
- Program/verify device
- Read from device
- Test device operations
- Edit and modify device data

All of ChipLab's functions are accessed from the menu bar and its pulldown menus. Items with ellipses (...) have sub-menus that appear when the item is selected. These pulldown menus are described in the following sections.

ChipLab's Main Screen
(showing the pulldown menus)



File Menu



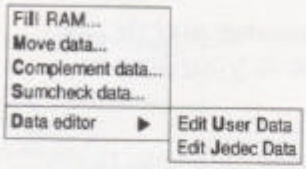
Open... Ctrl+O — Reads an existing data file name into user memory. A directory display box shows the files in the current directory.

Save as... Ctrl+S — Specifies a new name for the file you are currently editing and saves it as a separate file.

DOS Shell — Temporarily suspends ChipLab so you can work in the DOS environment. Type **exit** at the DOS prompt to return to ChipLab.

Exit — Terminates the current ChipLab session and returns to the DOS shell.

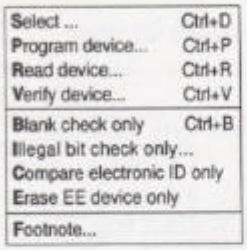
Data Menu



Fill RAM...	Fills a specified address range in user memory with a data byte.
Move data...	Moves a block of data from one address to another.
Complement data...	Converts each bit of data within the specified data block to its complement.
Sumcheck data...	Performs a sumcheck of the data in user memory.
Data editor...*	Displays a menu of data editors that can be selected.
Edit User Data * Ctrl+U	Modifies data in memory for a memory device.
Edit Jedec Data	Modifies logic data.

** See the readme2.txt file.*

Device Menu



Select... Ctrl+D
Specifies the manufacturer and device type you want to use as your target device.

Program device... Ctrl+P
Transfers user memory data into the device in the programmer socket.

Read device... Ctrl+R
Reads device data into user memory.

Verify device... Ctrl+V
Compares the data in the device in the programmer socket with the data in user memory to ensure that they match.

Blank check only Ctrl+B
Performs a blank check operation on the selected device by searching the device in the programmer socket for programmed locations.

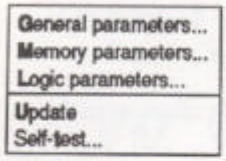
Illegal bit check only
Performs an illegal bit check on the selected device by comparing device data against user memory to determine if the device has programmed locations of incorrect polarity.

Compare electronic ID only
Performs an Electronic ID Check on the selected device by verifying that the Electronic ID in the device is compatible with the selected device.

Erase EE device only
Forces an erase of an electrically-erasable device.

Footnote...
Displays the footnote, if there is one, of the currently selected device.

Config Menu



General parameters... Sets general programming parameters for programmable devices.

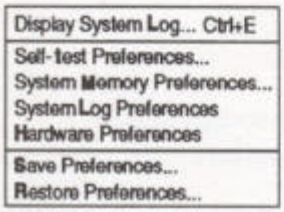
Memory parameters... Sets various programming parameters for memory and micro devices.

Logic parameters... Sets various programming parameters for logic devices.

Update Provides a screen where you can update your system software.

Self-test Activates an automatic ChipLab self-test. Sets various ChipLab test routines.

Options



Display System Log... Ctrl+E Displays ChipLab messages and system and device information in the lower portion of your screen.

Self-test Preferences... Selects the self-tests that are run when the programmer is powered up.

System Memory Preferences... Sets the size of User Memory and the size of the buffer to use when paging memory to disk. Specifies the location of the swap file.

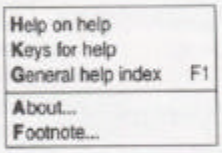
System Log Preferences... Sets the behavior and location of the system log, and sets the option to overwrite an existing system log.

Hardware preferences... Sets the parallel port ChipLab is connected to, and sets the port driver to use when communicating with ChipLab.

Save Preferences... Saves the current preferences to disk.

Restore Preferences... Restores previously-saved preferences disk.

Help



Help on help — Describes the ChipLab help system and how to use it.

Keys for help — Describes the keys ChipLab uses within its user interface.

General help index F1 — Displays an alphabetical list of ChipLab help topics. Select from the list to access help on the selected topic.

About... — Displays current version number and copyright. Press [ESC] to clear the screen.

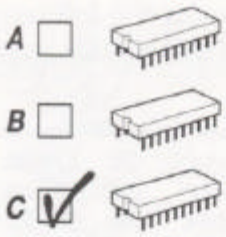
Footnote... — Displays the footnote, if there is one, of the currently selected device.

NOTE:

Novice users:
You may want to continue with steps five through seven, which take you through a typical device selection, programming, and verification procedure.

Experienced users:
You may want to skip the next three steps and go directly to ChipLab's menu and online documentation.

All users:
Don't forget the Reference Section at the back of this manual for update information, specifications, and a list of translation formats used by ChipLab.



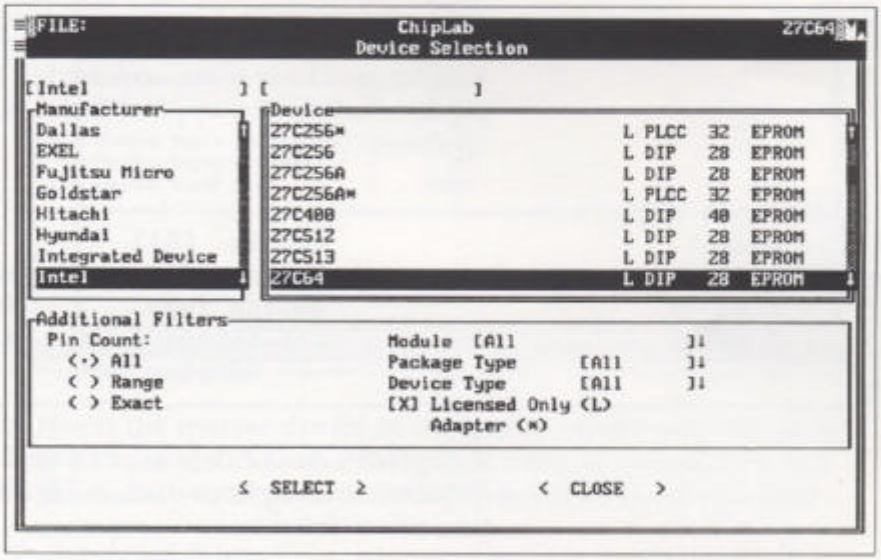
5. Select Device

Steps five through seven take you through the select, read, and program operations for a memory device. These steps are intended to familiarize you with ChipLab's user interface. For information about logic device selection and logic device operations, as well as all other specific operation and function information, refer to the online documentation.

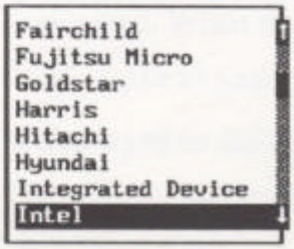
Selecting a Memory Device (Ctrl + D)

In this step you will select an Intel DIP EPROM 28-pin device.

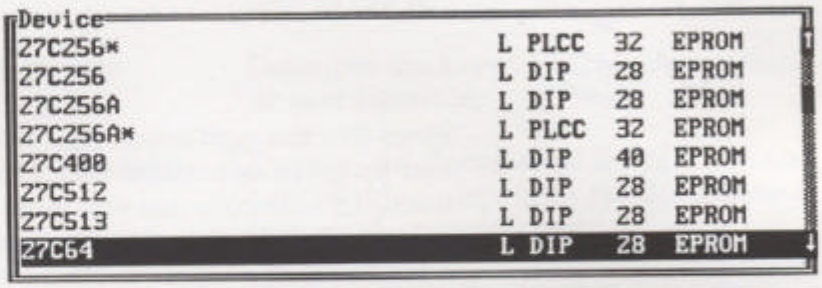
1. Press Ctrl + D from ChipLab's main screen to get the Device Selection screen, as shown below.



2. Using the left mouse button or arrow keys, scroll down the manufacturer selection box until Intel appears, as shown below.



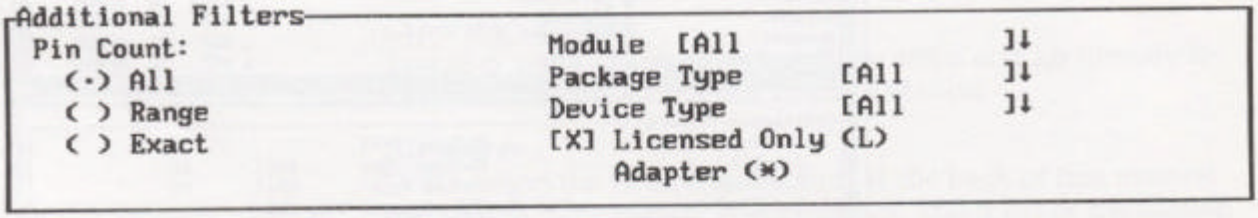
3. Scroll down the device selection box, using the left mouse button, until the DIP EPROM 28-pin 27C64 device appears, as shown below.



4. Place the mouse cursor on <SELECT> to select the Intel 27C64 device. You are returned to the main screen, and the selected device is displayed at the top of your screen.

Tip: Use the Selection Filter Criteria to Screen Choices

If you know the type of device and pin count that you need, to speed up the device selection process when you program your own devices, use the selection filter criteria dialog box to limit the choices that appear. By selecting the pin count, adapter, package type, and device type, you can narrow the device choices that appear in the device selection dialog box, as shown below.



Adapter — A device with an asterisk (*) after its name requires an adapter, which is identified in the footnote after you select the device.

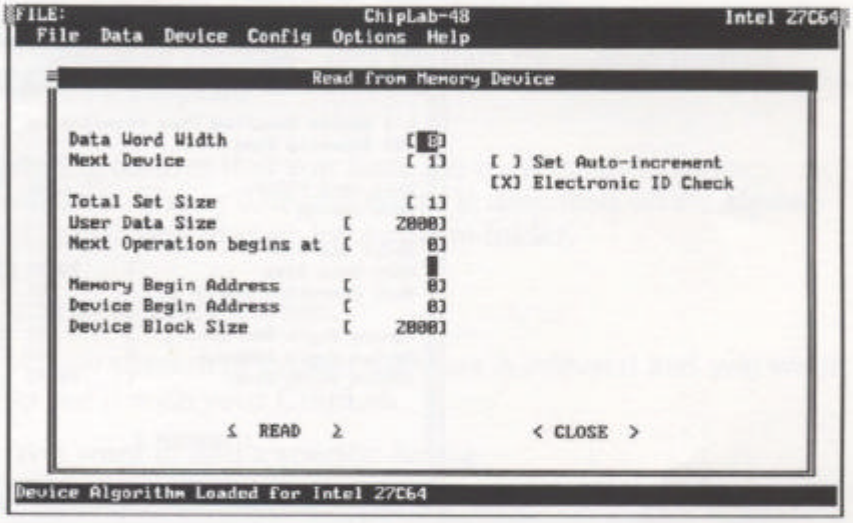
Licensed only: An "L" after a device's description in the Device Selection dialog box indicates that you have purchased the authority to use that device.

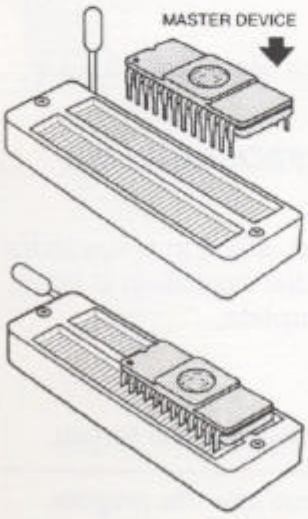
6. Read Data

In this step you will read data from a master device to user memory.

Reading from a Memory Device (Ctrl + R)

1. Press Ctrl + R from ChipLab's main screen to get the Read from Memory Device screen, as shown below. The values in the read memory device fields are the default values and are the ones you will use for this operation.

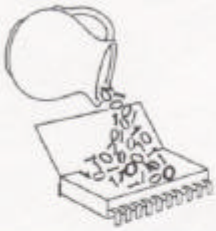




2. Insert the master device in the socket. Make sure the device is bottom justified and the socket lever is locked. You are now ready to read data from the master device into user memory.
3. Press ↵ or put the mouse cursor on <READ> and click the left mouse button.
4. While the device is being read, a box appears in the middle of your screen indicating that the operation is being performed. When the operation is complete,

   `Read Operation Successful`

   is displayed in the status bar at the bottom of the screen.
5. Press Esc to the main screen.

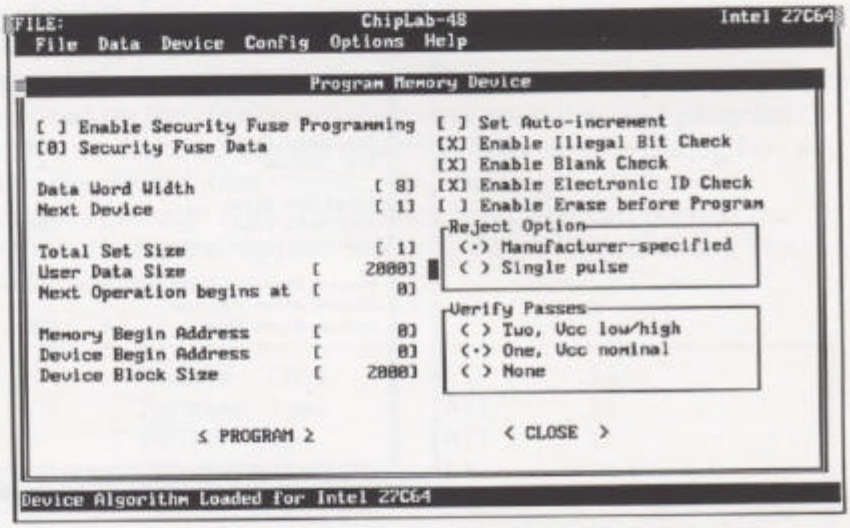


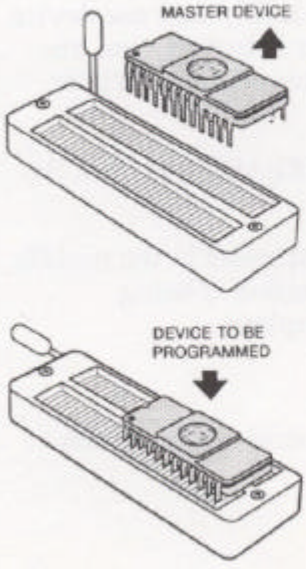
7. Program Device

In this step you will program a blank device with the data in user memory.

Programming a Memory Device (Ctrl + P)

1. Press Ctrl + P from ChipLab's main screen to get the Program Memory Device screen. The values in the program memory device fields are the default values and are the ones you will use for this operation.



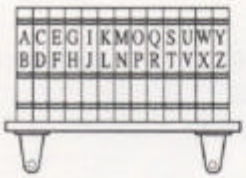


2. Remove the master device, and insert a blank Intel 27C64 device in the socket.
3. Press ↵ or put the mouse cursor on <PROGRAM> and click the left mouse button.
4. While the device is being programmed, a box appears in the middle of your screen indicating that the operation is being performed. When the operation is complete,

   `Program Operation Successful`

   is displayed in the status bar at the bottom of the screen.

Note: A verify operation is normally performed after the program operation.



Reference Material

The following information is contained in this section:

- **Update Information**—describes how and when to update current algorithms and when to add specific device support to ChipLab
- **Specifications**—describes ChipLab's power, physical, environmental, and safety specifications
- **Translation Formats**—lists the data translation formats used by ChipLab

How Do I Update?

Updating assures that you have the most current device algorithms. The update procedure is described on the Update Sheet contained in your Information folder.

When Do I Update?

You need to update when:

- A new version of system software is released and you want to use it with your ChipLab
- You want to add a specific device
- You want the latest version of a particular device algorithm

Specifications

Power Requirements	Input Voltage*	105–129 Vac 60 Hz 198–264Vac 50 Hz 90–110 Vac 50–60 Hz	
	ChipLab Voltage	24V≃ (ac or dc) ± 10%	
	ChipLab Current	ac = 1.67A maximum dc = 1.25A maximum	
Physical and Environmental	Dimensions	25h x 25w x 7.6d cm 9.75h x 9.75w x 3d inches	
	Weight	1.02 kg (2.25 lb)	
	Temperature	Operating:	+0° +40°C (+32° to +104°F)
		Storage:	-40° to +55°C (-40° to +130°F)
	Relative Humidity	Operating:	20% to 80% RH noncondensing
		Storage:	10% to 90% RH noncondensing
	Altitude	Operating:	To 5,000 meters (16,404 ft)
		Storage:	To 15,000 meters (49,212 ft)

Safety

ChipLab complies with the following safety standards.

Underwriters Laboratories — UL 1244 and UL 1950

Canadian Standards Association — CSA C22.2 No. 950

International Electrotechnical Commission — IEC 348, IEC 1010-1, and IEC 950.

Electromagnetic Emissions

ChipLab is certified to meet VDE 0871 Limit B.

Electrostatic Discharge (ESD)

IEC 801-2 ± 15 kV

FCC

ChipLab complies with Part 15, Class B of the Federal Communications Commission rules.

* *ChipLab is shipped with the appropriate power supply for your location. Verify that its input requirements are met before you use it.*

Translation Formats

Data translation formats represent different ways of encoding data in a data file. A data file contains the information to be programmed into a device.

ChipLab supports the following formats:

Format	Code
Formatted Binary	10
POF	14
Absolute Binary	16
LOF	17
Motorola Exorcisor	82
Intel Intellec 8/MDS	83
Motorola Exormax	87
Intel MCS-86 Hex Object	88
Jedec format (Full)	91
Jedec format (Kernel)	92
Motorola 32-bit	95
Intel Hex-32	99