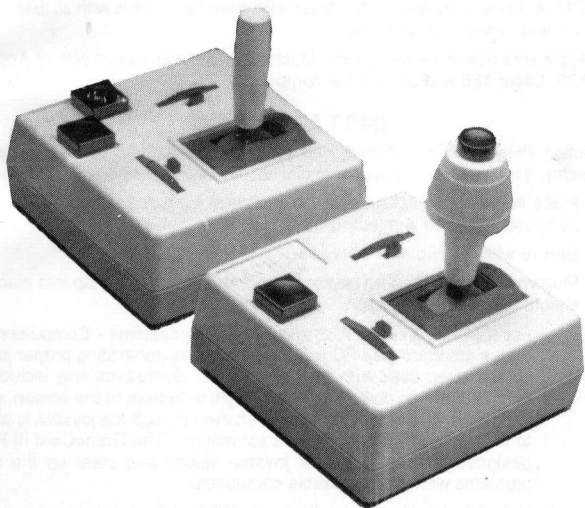


MACH I™ AND MACH I PLUS™

OPERATIONS MANUAL



Copyright © 1988 by CH Products, San Marcos, CA
All rights reserved

INTRODUCTION

All CH PRODUCTS JOYSTICKS are designed to provide you with precision cursor control and long life many times that of competing products. Mach I and Mach I Plus joysticks provide two axis precision cursor control and two pushbutton switches.

COMPATIBILITY

The IBM versions of the Mach I and Mach I Plus are compatible with all IBM PC, XT, AT, PS2 and compatible gameports.

The Apple versions of the Mach I and Mach I Plus are compatible with all Apple IIE, IIC, IIGS, Laser 128 and compatible computers.

INSTALLATION

A Friction Plug Lock is included with your joystick to hold secure the plastic connector. The plug lock is optional and is not needed for proper joystick operation.

1. Place the friction plug lock over the outside of the game I/O connector of your computer (9 pin for Apple and 15 pin for IBM).
2. Secure with the two #4-40 screws.
3. Plug your joystick in. The plastic joystick connector will snap into place and should be retained securely.

NOTE: (1) For IBM PC, XT, AT, PS2 and compatible systems - Computers other than a standard IBM PC will have problems generating proper joystick values when used with many programs. Symptoms may include: not being able to go completely to the right or bottom of the screen, cursor jumping to the left side of the screen even though the joystick is pushed to the right, and possibly no cursor motion. The GameCard III Plus is designed to provide proper joystick values and clear up the above problems with PC compatible computers.

- (2) Not all 9 pins (Apple) or all 15 pins (IBM) of the joystick connector are needed to make the joystick function properly. The joystick connector may actually have fewer pins. The phrase 9-pin and 15-pin connector refers only to the overall size of the connector, not the actual number of pins in the connector.

CONTROL FEATURES

Fine trim adjustments

Because all computers and their software are not created equal, each axis (X and Y) provide independent trim levers to enable the operator to finely adjust cursor positioning. The trim levers shift electrical center of the joystick and are used only when the stick is in the self-centering mode. The X axis trim shifts the cursor to the left or right and the Y axis trim shifts the cursor up and down. For proper centering, see the section titled, CENTERING ADJUSTMENTS AND CHECKOUT.

Push buttons

The Joystick contains two independent momentary contact push buttons. Push button functions are completely dependent on the software program. Consult the software manual to determine the function assigned to the push buttons.

Mode switches

The joystick contains two mode switches to the top and left of the stick (see Figure 1). These switches allow either spring-centering or free-floating modes of operation. In the self-centering mode the stick handle will return to mechanical center when released. In the free-floating mode the stick handle will remain where positioned. Most games require self-centering operation and drawing type programs work best if the joystick is in the free-floating mode. See your software manual for recommended mode.

Changing modes

Position joystick as pictured with cable extending out the back (see Figure 1).

1. To change from the self-centering to free-floating simply push the mode switch(s) down and to the left (X axis) and down and towards the back (Y axis).
2. To change back to self-centering simply push down and to the right (X axis) and down and towards you (Y axis). After you push the mode switch move the stick across the center of its travel and the mode switch(s) will pop up into place.

NOTE: It is best to leave the joystick in the self-centering mode when not in use.

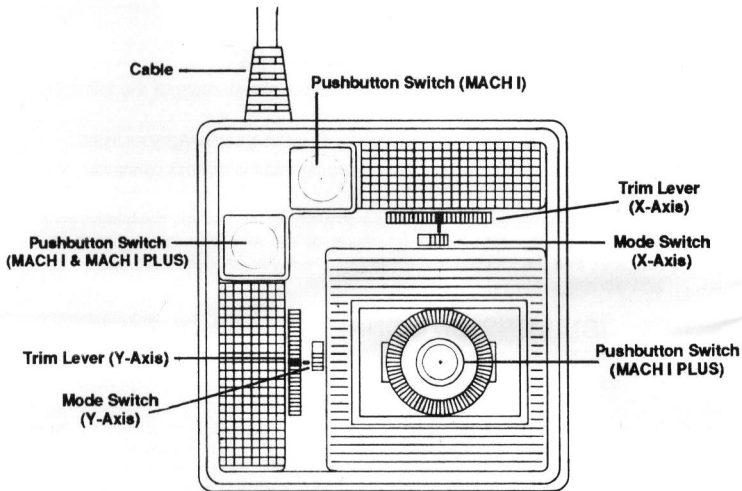


FIGURE 1

CENTERING ADJUSTMENTS AND CHECKOUT

The joystick is electrically centered and 100% tested at the factory. The following CHECKOUT PROCEDURES are needed only to gain additional familiarity with the operation of the joystick and to test a problem if suspected.

NOTE: Different software programs have different centering requirements. If the cursor drifts without engaging the stick handle, readjust the trim controls until the cursor stops drifting. For example if the cursor drifts to the left, push the X axis trim to the right to stop the drift. The trim levers provide a center indicator that are relative position only. Due to component variations within the computer, these indicators may or may not be exactly at center. This is normal and does not effect the performance of the joystick.

Checkout procedures

The following programs will display the X and Y axis values. Make sure the joystick is in the self-centering mode and the cable exits the rear away from you as pictured in Figure 1.

Apple II test program startup

1. Boot up your computer.
2. Consult your computer operating manuals for the procedure to be used to enter a Basic program.
3. Type in the following Basic program:

```
10 PRINT PDL (0),PDL(1):GOTO 10
```
4. Type RUN and press the return key.
5. Adjust the X and Y trim levers until both columns of numbers read 127, 127.
6. Move the joystick to the upper left corner and the numbers should read 0,0 or 1,1. To the bottom right the numbers should be 255, 255.

Note for Apple IIGS owners

Some of the older programs will not read the joystick properly when the computer is running "Fast." Change the speed to "Normal." The Apple IIGS user's manual appendix describes how to change the speed.

IBM test program startup

The following centering procedure requires the use of a short Basic program. Before you can enter the program you must load the Basic Interpreter into your computer. The Basic Interpreter is usually located on one of your DOS system disks which come with most computers. The name may be BASIC.COM, BASIC.EXE, BASICA.COM, GWBASIC.EXE, or a similar name. Any of these will work. There are some early versions of these interpreters which do not support joysticks. These can be identified by an error message such as DEVICE NOT AVAILABLE, or similar message, which is displayed when you try to run the program. Version numbers above 3.0 will work.

NOTE: Versions of Basic not compatible with your computer and several public domain joystick test programs produce inaccurate results. This does not mean there is a problem with your joystick. If you have a problem with the following procedures, try the joystick with other programs with which you know you have been able to use IBM compatible joysticks.

1. Boot up your computer.
2. Change to the disk drive and directory that contain your Basic Interpreter.
3. Start the Basic Interpreter by typing its name, such as BASIC, BASICA or GWBASIC.
4. After the interpreter is loaded and running you should see the prompt OK>. If this is not the case consult your computer Basic Language manuals for the correct procedure for starting the Basic interpreter.
5. Type in the following Basic program:
10 PRINT STICK(0),STICK(1):GOTO 10
6. Type RUN and press the enter or return key to start the program. Run the following tests while the program is running.
7. Move the X axis trim lever and stick handle all the way to the right and take note of the maximum value in the first column on the screen.
8. Release the stick handle so it returns to center and adjust the X and Y axis trims until both numbers (Column 1 and 2) are half the maximum X value.

Example: If the maximum X value was 200, then adjust both trims when the stick is at center to read 100.

NOTE: Different software programs have different centering requirements. If the cursor drifts without engaging the stick handle, readjust the trim controls until the cursor stops drifting. For example if the cursor drifts to the left, push the X axis trim to the right to stop the drift. The trim levers provide a center indicator that are a relative position only. Due to component variations within the computer, these indicators may or may not be exactly at center. This is normal and does not effect the performance of the joystick.

TROUBLE SHOOTING

If any of the above tests do not give the results described, recheck the following items:

1. List the Basic program to assure that it has been typed exactly as listed.
2. Be sure that the joystick is connected directly into the joystick connector, and that the connection is secure.
3. Try the joystick with other programs with which you know you have been able to use joysticks. Successful operation of the joystick with any program indicates that the joystick and other game adapter hardware are connected and working properly.

IBM VERSION CONNECTOR PINOUT

DB15 Pin No.	Signal Name
1	+5VDC
2	BUTTON 1
3	X-AXIS
4	GROUND
6	Y-AXIS
7	BUTTON 2
12	SHIELD
13	NO CONNECTION

APPLE VERSION CONNECTOR PINOUT

DB9 Pin No.	Signal Name
1	BUTTON 2
2	+5VDC
3	GROUND
5	X-AXIS
7	BUTTON 1
8	Y-AXIS

CH PRODUCTS

90 DAY LIMITED WARRANTY

This JOYSTICK is warranted to the original purchaser to be free from defects in materials and workmanship for a period of 90 days from the date of purchase. During the warranty period CH Products will at its option, repair or replace, at no charge, any component which is determined to be defective.

The liability under this warranty is limited to the repair of and/or replacement of the defect or defective part at our factory and does not include shipping expenses.

To obtain warranty services, send the JOYSTICK, postage prepaid, with a check for \$2.00 to cover shipping and handling, together with a dated proof of purchase to:

CH Products

Customer Service
1225 Stone Drive
San Marcos, CA 92069

The warranty does not apply if, in the opinion of CH Products, the JOYSTICK has been damaged by accident, abuse, improper usage, or as a result of service or modification by other than CH Products.

"NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CH PRODUCTS IS NOT RESPONSIBLE FOR CONSEQUENTIAL DAMAGES." Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.