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Personal Computer Enhancement Products

JE1049 Four Floppy Disk Controller Card User's Manual

118.DOC Revision 1.203 March 15, 1989

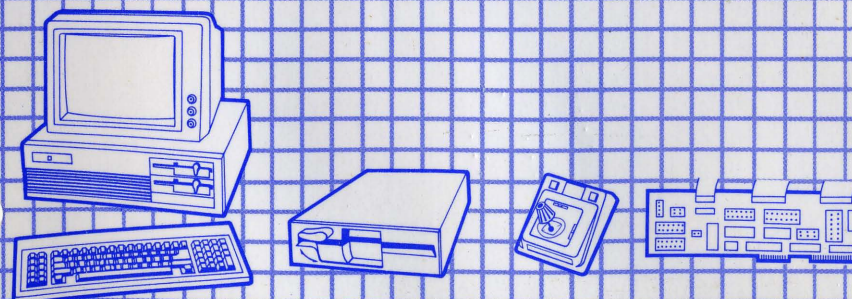




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JE1049
Four Floppy Disk Controller Card
User's Manual

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Federal Communications Commission (FCC) Statement

Warning: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer when this computer is operated in a residential environment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.

Instructions to User: This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio or television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

In many instances, shielded cables and connectors must be used for connection to peripherals. Proper cables are available from authorized dealers. The manufacturer is not responsible for any radio or television interference caused by using other than the recommended cables or by unauthorized modifications to this equipment; it is the responsibility of the user to correct such interference.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet prepared by the Federal Communications Commission helpful, "How to Identify and Resolve Radio-TV Interference Problems," available from the following:

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INTRODUCTION

1.1 Product Description

The JE1049 is designed to control up to four floppy disk drives (360K, 720K, 1.2M and 1.44M types). They can all be mounted internally, or two internal and two external.

There are two cables that are used to connect the JE1049 to the floppy disk drives. There is a 34-pin cable which carries the control signals to the floppy disk drive and returns status signals back to the JE1049. The cable also carries data between the floppy disk drive and the computer. If you will be connecting three or four drives, you will need an additional cable. If the third and fourth drives will be mounted internally, order cable TDC. If the third and fourth drives will be mounted externally, order cable ECC.

1.2 Product Features

- IBM PC, PC/XT, PC/AT and compatibles
- Compact size will fit in lower height cases
- Controls any combination of 360K, 720K, 1.2M and 1.44M floppy disk drives

The JE1049 is rated to work at bus speeds up to 12MHz. Limitations of some floppy disk drives on the market limit the speeds at which they can be reliably accessed.

1.3 Check List

You should have received the following items with the JE1049:

- JE1049 floppy disk drive controller card
- 34-pin floppy disk drive control/data cable

1.4 Terminology

Throughout this manual, a variety of common computer terms and abbreviations will be used. For your convenience, a glossary of standard computer terms has been included at the end of this manual.

1.5 Precautions

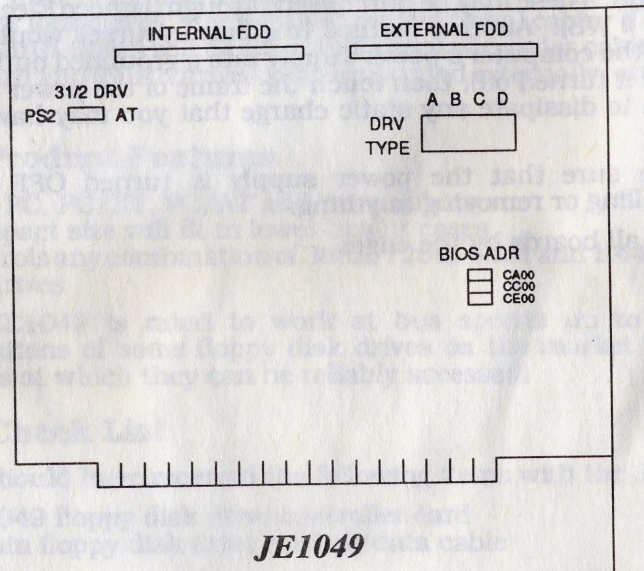
When working with any circuit board or IC, some precautions need to be observed for the safest installation. Many parts are static sensitive and may be easily damaged by static electricity that may have built up in your body. The best way to assure that no damage comes to your new equipment is to observe a few precautions:

1. Whenever you move your body, you can easily build up enough static electricity to damage a board. When handling a board or chips, ground yourself often. The best way to do this is with a grounding wrist strap that is properly connected to a frame ground. These may be purchased through Jameco Electronics (Part # WS). Another method to ground yourself would be to plug the computer's power supply into a grounded outlet (but leave it turned off), then touch the frame of the power supply often to dissipate any static charge that you may have built up.
2. Make sure that the power supply is turned OFF before installing or removing anything.
3. Hold all boards by the edges.

INSTALLATION

2.1 JE1049 Diagram

Throughout this manual, references will be made to certain locations on the JE1049. These references will be made as though you have the JE1049 already plugged into the computer, and you are looking at the component side. This means that the metal bracket would be on the rear side, the internal and external disk drive connectors would be at the top center of the board, and the card edge slot connector would be on the bottom right of the board. Please refer to the figure below.



2.2 Computer Preparation

If you have a PC, PC/XT or compatible, your computer will probably have jumpers or DIP switches that set the number

and/or type of floppy drives attached. Please check the documentation that came with your motherboard to confirm that it is set correctly.

If you have only one floppy disk drive installed in your computer, DOS will consider it to be both logical drive A: and logical drive B:. If you have two floppy disk drives installed in your computer, DOS will consider the first to be logical drive A: and the second to be logical drive B:. Refer to the glossary for a description of a logical drive and a physical drive.

2.2.1 Power down the computer and any external components attached.

2.2.2 Remove your computer case so you can access the motherboard and the drives. If you have a flip-top case, simply open the top of the case.

2.2.3 Remove any existing floppy disk drive controller cards, if applicable. The computer can only accept one floppy disk drive controller card.

2.2.4 Remove any existing cables which had connected the old controller card to your floppy disk drives, if applicable.

2.2.5 If you DO NOT have an IBM PC or compatible, you may continue with the next step.

The IBM PC has two switch blocks on the motherboard, labeled SW1 (near the center) and SW2 (near the power supply). Set the switches 1, 7 and 8 of SW1 as follows:

NUMBER OF DRIVES INSTALLED	SWITCH BLOCK SW1		
	SWITCH 1	SWITCH 7	SWITCH 8
One	OFF	ON	ON
Two	OFF	OFF	ON
Three	OFF	ON	OFF
Four	OFF	OFF	OFF

2.2.6 If you DO NOT have an IBM PC/XT or compatible, you may continue with the next step.

The IBM PC/XT and compatibles, have only one switch block on the motherboard. Set switches 7 and 8 of SW1 according to the table below:

NUMBER OF DRIVES INSTALLED	SWITCH BLOCK SW1	
	SWITCH 7	SWITCH 8
One	ON	ON
Two	OFF	ON
Three	ON	OFF
Four	OFF	OFF

2.2.7 If you DO NOT have an IBM AT or compatible, you may continue with the next step.

Certain AT compatible computers also have motherboard dip switch banks that need to be configured for your particular application. Consult your owner's manual for this information. The IBM AT and most AT compatible computers, including Jameco Electronics JE1003, JE1007, JE3005, JE3010, JE3020 and JE3025 motherboards, do not require this.

After installing the JE1049, you will need to run a setup program. If you have an IBM AT, this program may be found on the diagnostics diskette that came with your guide to operations manual. If you have an AT compatible with an Award or AMI BIOS, the setup program resides in the BIOS. To invoke the setup program from an Award BIOS computer, perform the following:

1. Turn the computer on. It will start to go through a power on self test (POST).
2. As soon as it appears to have finished the POST and before the computer accesses the drives, hit **Ctrl** **Alt** **Esc**. Release all three.

To invoke the setup program from an AMI BIOS computer, perform the following:

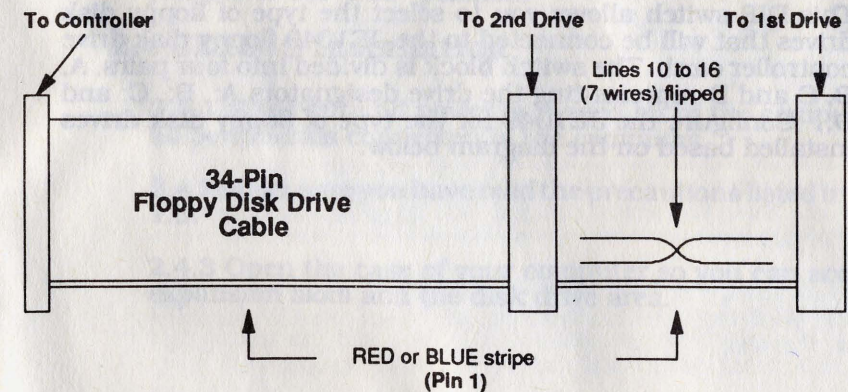
1. Turn the computer on. It will go through a power on self test (POST).
2. When it prompts to run setup, hit **[Del]**.

NOTE: In the setup program, the 360K drives may be referred to as double sided drives and the 1.2M drive may be referred to as high density or high capacity drives.

2.3 JE1049 Preparation

Throughout this section, references will be made to jumpers and jumper blocks. A jumper block is a set of two or more pins that can be electrically connected with a jumper. When two pins are connected with a jumper, the jumper block is considered closed. If there are two pins without a jumper across them, the jumper block is considered open. Please refer to the glossary for further information.

The cable that comes with the JE1049 will have a red or blue stripe signifying line #1. Make sure this red or blue stripe is facing pin #1 of each connector that it will be connected to. Please refer to the figure below.



2.3.1 BIOS Memory Address Select

This jumper block allows you to select the address of the ROM BIOS that is on the JE1049. On most computers, the factory default setting of CAXX will not cause conflicts. However, as more and more expansion options are developed, the possibility for two devices to address themselves at the same location increases. To accommodate this, the JE1049 can be addressed at either of two alternate memory addresses, should conflicts arise. These are locations CCXX and CEXX. If you are experiencing conflicts with another expansion board, try addressing the JE1049 at one of the alternate locations.

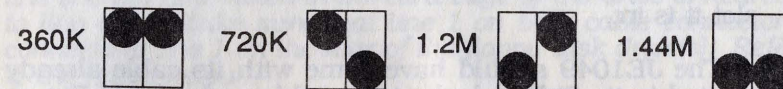
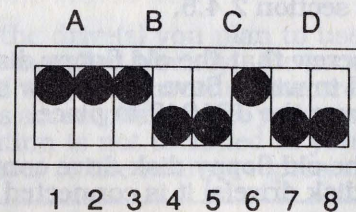
Address	Jumper Settings		
CAXX	Closed	Open	Open
CCXX	Open	Closed	Open
CEXX	Open	Open	Closed

NOTE: There can be only ONE address selected at any time. Jumping more than one set of jumper pins on this jumper block will cause conflicts.

2.3.2 Drive Type Select

This DIP switch allows you to select the type of floppy disk drives that will be connected to the JE1049 floppy disk drive controller card. The switch block is divided into four pairs, A, B, C and D representing the drive designators A:, B:, C: and D:. Configure the JE1049 for the type of floppy disk drives installed based on the diagram below.

DRIVE



For example: If Drive A was a 360K, Drive B a 1.2M and Drive C a 720K, the proper setting would be ON, ON, OFF, ON, ON, OFF, ON, ON. Switches 7 and 8 could be set to anything as there is no Drive D in this example.

If you will be using 3.5" disk drives from Toshiba, Mitsubishi or other Japanese and American companies, the "3 1/2 DRV" jumper should be left in the default "AT" position. If you will be using 3.5" disk drives from IBM, you will need to move the jumper to the "PS2" position.

2.4 JE1049 Installation

2.4.1 Make sure all power is turned off to the computer and all peripherals connected to the computer.

2.4.2 Make sure you have read the precautions listed in section 1.5.

2.4.3 Open the case of your computer so you can access the expansion slots and the disk drive area.

2.4.4 If the JE1049 is to be used as a replacement for an existing floppy disk drive controller, then complete steps A, B and C. If not, go to section 2.4.5.

1. Remove the screw that the old floppy disk drive controller is held in with. Save this screw since it will be used later to secure the JE1049 in place.

2. Disconnect the old floppy disk drive controller cable from the floppy disk drive(s) it is connected to.

3. Remove the old floppy disk drive controller from the slot it is in.

2.4.5 The JE1049 should have come with its cable already connected to it. Take a look at the cable and refer to Figure 4-1. You will notice a red or blue stripe on one side of the cable. This stripe signifies line one (1). You will also notice that between two of the connectors, the cable has been sliced and "flipped." The connector opposite this "flip" connects to the JE1049. If it is connected, take a moment to ensure that it is connected properly. If it is not connected to the JE1049, connect it now. Make sure the red or blue stripe on the cable, signifying line one (1), connects to the end of the header pin block marked one (1).

2.4.6 Select the slot the JE1049 is to be installed into. This can be any slot except the slot closest to the power supply in an IBM XT or compatible. If the JE1049 is to be installed in an IBM AT or compatible, it will not matter if it is installed in a short 8-bit slot or the longer 16-bit slots.

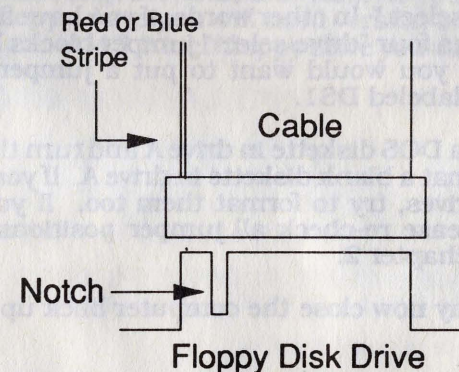
2.4.7 Remove the back plane bracket for the slot selected (if applicable). Save the screw since it will be used to secure the JE1049 in place.

2.4.8 Install the JE1049 into the slot that was selected in step 9 by firmly pushing the card into place. Make sure it is solidly seated in the slot.

2.4.9 Secure the JE1049 in place using the screw that was removed.

2.4.10 Install the drive(s) you plan to use into the computer if they are not installed already. Be aware that most drives will not work if they are mounted incorrectly. If you are not sure how this is accomplished, see your computer's manual(s). If this information is not included in your manuals, consult the manufacturer or the nearest representative.

NOTE: The red or blue stripe on one edge of the cable refers to line one (1). The notch in the card edge of the drive is nearest to line one. Make sure that line 1 on both cable connectors connects to line 1 on the rear of the floppy disk drive(s). Refer to the figure below.



WARNING! Connecting this cable backwards may cause irreversible damage!

2.4.11 Connect the cable from the JE1049 to the drive you plan to use as drive A. Make sure drive A attaches to the connector on the end of the cable opposite the JE1049 and that the red or blue stripe on the cable faces the correct direction.

2.4.12 If you plan to use a second floppy disk drive, which would be drive B, connect the cable to this drive now. Again, making sure drive B attaches to the connector in the middle of the cable and that the red or blue stripe on the cable faces the correct direction.

2.4.13 Drive C, if used, connects like drive A at the end of the second cable. (Either TDC for internal or ECC for external.) Drive D, if used, connects like drive B in the middle of the second cable.

2.4.14 Take the drives that you plan to use and find the "drive select" jumper block or shunt. They may be labeled one of many things on the drive (e.g. 0 through 3, 1 through 4, A through D, DS0 through DS3, D1 through D4, and so on). Make sure each drive connected to the JE1049 is set to the second "drive select." In other words, if you have an FD55GFV drive which has four "drive select" jumper blocks labeled DS0 through DS3, you would want to put a jumper across the jumper block labeled DS1.

2.4.15 Install a DOS diskette in drive A and turn the computer on. Try to format a blank diskette in drive A. If you have other floppy disk drives, try to format them too. If you have any difficulties, please re-check all jumper positions with those discussed in chapter 2.

2.4.16 You may now close the computer back up.

OPERATION

3.1 Disk Operating Systems

In order to use your JE1049 you will need a DOS (Disk Operating System). This is software that you can buy from most software mail order houses and software stores. The two most common types are MS-DOS and PC-DOS. In most cases, both should work fine with the JE1049.

PC-DOS is the operating system that is available for the PC, XT and AT computers made by IBM and is sold under the IBM name. MS-DOS is written for the IBM PC series of compatibles on the market (i.e. Compaq, Leading Edge, etc.).

Each of these types of DOS, PC-DOS and MS-DOS, have come in numerous versions (e.g. 2.1, 3.0, 3.3, etc.). If you plan to use a 720K 3.5 inch floppy drive you will need version 3.2 or higher. If you plan to use a 1.44M 3.5 inch floppy drive you will need version 3.3 or higher.

TROUBLESHOOTING GUIDE

4.1 Common Problems and Solutions

This section will be useful if, for some reason, your Jameco product fails to operate properly. Read through the troubleshooting guide as well as this documentation again--you may catch something you did not see the first time through. All possible problems should be checked prior to contacting Jameco Electronics for assistance.

4.1.1 Nothing appears on monitor.

- Brightness or contrast controls on the monitor need adjustment.
- Monitor DIP switches on the motherboard are set incorrectly.
- Power or signal cable not plugged in properly.

4.1.2 System will not power up and power supply fan does not turn.

- Remove the JE1049 and turn the computer system on, if power is restored the JE1049 may be defective.
- Power or signal cable not plugged in properly.

4.1.3 Completes the POST (Power on self test) but does not BOOT.

- Drive cable is backwards.
- Drive is upside down.
- Drive select jumpers set wrong.
- Drive mounted on wrong part of cable.
- Two floppy controllers installed.

4.1.4 Two (or more) disk drives are installed in the system and all drives become active at the same time.

- Check to verify that both disk drives have the proper Drive Select enabled. Refer to the manufactures documentation for instruction on properly setting the drive select setting for the drives you are using.

4.1.5 System will not Boot and comes up with "NON SYSTEM DISKETTE" or "MISSING COMMAND INTERPRETER".

- Try another KNOWN bootable diskette, it could be the diskette may not have had the system information or COMMAND.COM files copied to the diskette when it was formatted or the diskette is corrupted.

4.1.6 System Boots but will not format diskettes to full capacity or gets "BAD TRACK 0" error messages.

- Verify that the diskettes are HIGH CAPACITY diskettes.
- Verify that the diskette is not Write Protected.
- Verify proper drive configuration (see manufactures drive documentation).
- Verify the configuration of the JE1049 or try to set the JE1049 for the type of drives in your system.
- If your computer system is a multiple speed system try formatting the problem disk drive at a lower speed.

4.2 Additional Technical Assistance

Many problems can be resolved by referencing the manual and confirming configuration and installation. If you have exhausted all other options and are still encountering difficulty, our Technical Support Staff are available between 7am and 5pm, Pacific Time, Monday through Friday. When you call, please have the equipment in question handy, along with the necessary customer and order numbers. If appropriate, please write down DIP switch settings or other configuration data. The technicians may need all of this information to fully assist you. The phone number is (415) 592-9990.

Discrepancies in shipment, returns, exchanges and refunds are handled by our Customer Service Department. They are also available between 7am and 5pm, Pacific Time, Monday through Friday. Their number is (415) 592-8121.

If you are located outside the United States, you may find it more convenient to contact us by either FAX or Telex, both available 24 hours a day. Inquiries should be marked to the attention of either Customer Service or Technical Support. Our FAX numbers are (415) 592-2503 and (415) 595-2664. Our Telex number is 176043, answerback: JAMECO BLMT.

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GLOSSARY

BIOS—Basic Input/Output System. Normally stored in ROM, BIOS routines provide for the basic "housekeeping" chores for the hardware configuration. The CPU relies on the BIOS to provide information on interfacing to the various types of hardware.

Boot—Originally referred to "pull up by the bootstraps." Causing the CPU to re-initialize itself. See COLD BOOT and WARM BOOT.

CGA—Color Graphics Adapter. Provides RGB video at 320 x 200, 4 colors from a palette of 16.

Cold Boot—Causing the CPU to re-initialize by removing it's source of power. This can be accomplished either by turning the power off and on or pressing a RESET SWITCH.

CPU—Central Processing Unit. Often refers to the entire case and motherboard combination.

Daisy Chain—Describes similar devices connected along a single cable. Often, daisy chain cables contain "flipped" wires that differentiate one device from another on the cable.

DIP—Dual Inline Package. Describes integrated circuits, cables, connectors, etc. that utilize a dual row of pins layout.

DIP Switch—Usually a set of four or eight small switches that are set either on or off. Normally scanned only at time of BOOT, these often select system options.

DOS—Disk Operating System. DOS is responsible for the management of the computer and its software. In addition to standard DOS commands, many other utilities are often included. The two most popular versions of DOS for PC's are PC-DOS by IBM and MS-DOS by Microsoft.

EGA—Enhanced Graphics Adapter. Provides RGB video at 640 x 350 or 640 x 480, 16 colors from a palette of 64. Usually capable of emulating CGA and HGA.

HGA—Hercules Graphics Adapter. Provides TTL video at 750 x 348 in 2 colors (monochrome).

Jumper—A rectangular plastic casing (usually black) that measures approximately .100" x .200" x .250". It fits over two pins of a jumper block (.100" apart) to make an electrical connection between them.

Jumper Block—Two or more pins side by side protruding from a circuit board that can be electrically connected with a jumper. These are used to configure the circuit for different conditions.

Logical Drive—DOS assigns one or more logical drives to each physical drive and assigns them a unique alphabetic designator. Drive A: can be a floppy drive, drive B: can be a RAM disk, drive C: can be the first half of a hard disk drive, drive D: can be the second half of a hard disk drive, etc.

MDA—Monochrome Display Adapter. Provides TTL output, 80 x 25 text only, 2 colors (monochrome).

Motherboard—The main system circuit board. Sometimes referred to as the CPU board or the system unit board.

Physical Drive—This is the actual drive itself. A floppy disk drive itself would be considered one physical drive.

RAM—Random Access Memory. These are 16 or 18 pin chips that are part of the computers memory. You can think of this memory as the computers scratch pad. Once power is turned off to the computer, the RAM contents are lost.

ROM—Read Only Memory. This is memory that can't be changed (nor would you want to). When power is turned off and back on, the data are still there. Generally used for BIOS.

SETUP—This is a program (which can be stored in the BIOS ROM or on a disk) that is necessary to configure the parameters needed by the motherboard. Usually found only on AT style computers. These parameters tell the motherboard upon boot-up the following information: time, date, drive types, monitor type, memory amount and type.

Terminator—Terminating resistor pack. Used in disk drives to filter out line noise and terminate a data cable. Consists of a row of 220 to 330 ohm resistors molded together. This is usually installed in a socket. It is removed from all drives except the disk drive at the end of a DAISY CHAIN cable.

VGA—Video Graphics Array. Provides many RGB or Analog modes up to 800 x 560. Can display 256 colors from a palette of 262,000. Usually can emulate EGA, CGA and HGA.

Warm Boot—To reset the computer without removing power. The CPU is told to re-initialize itself. The procedure to invoke this is:

Press and hold the **(Ctrl)** key down.
Press and hold the **(Alt)** key down.
Press the **(Del)** key down.
Release all three.