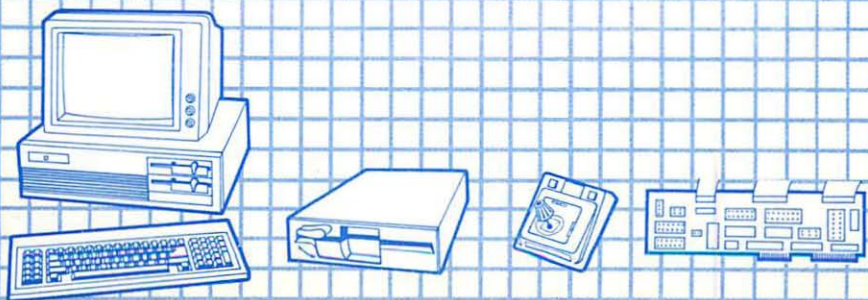
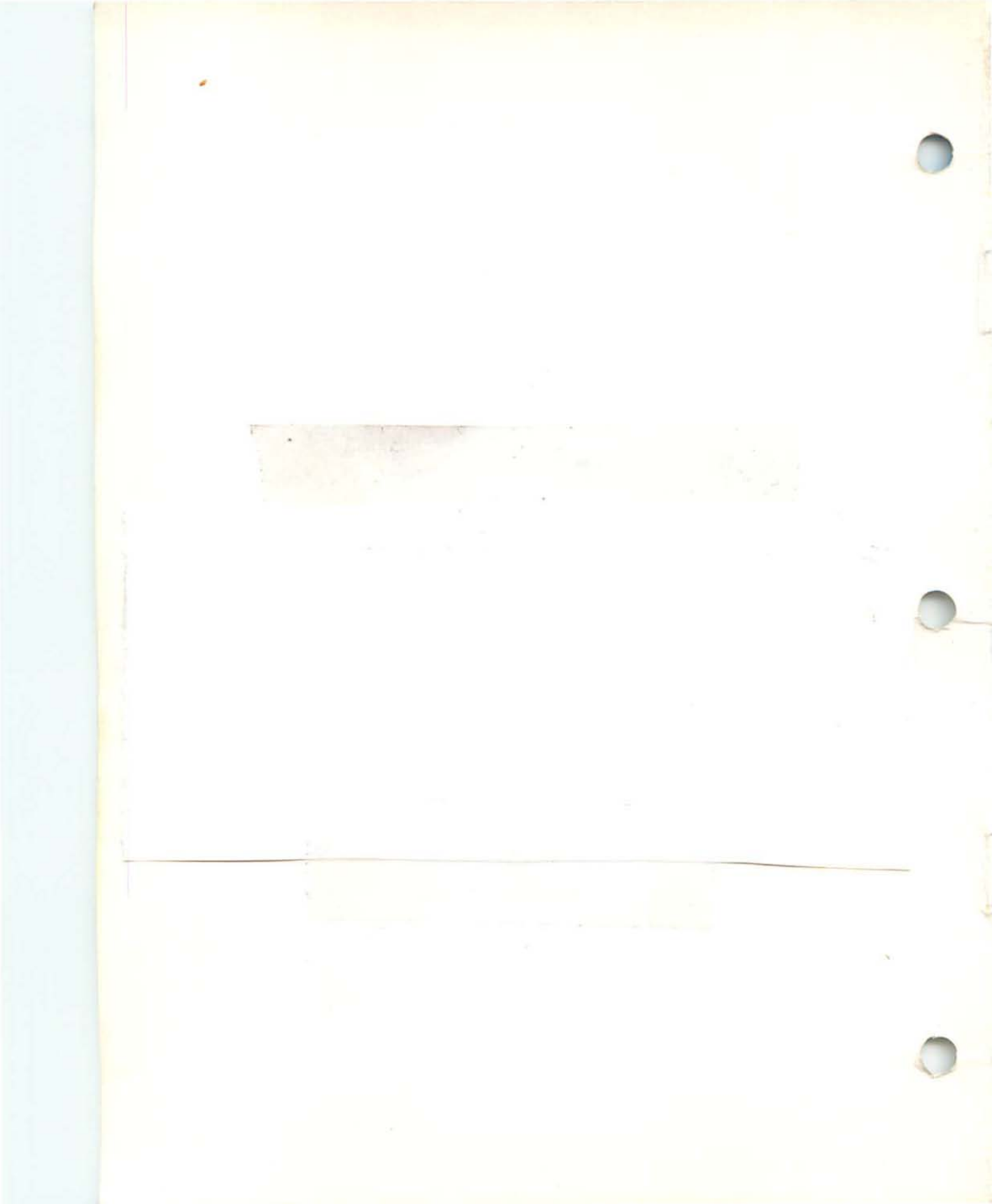


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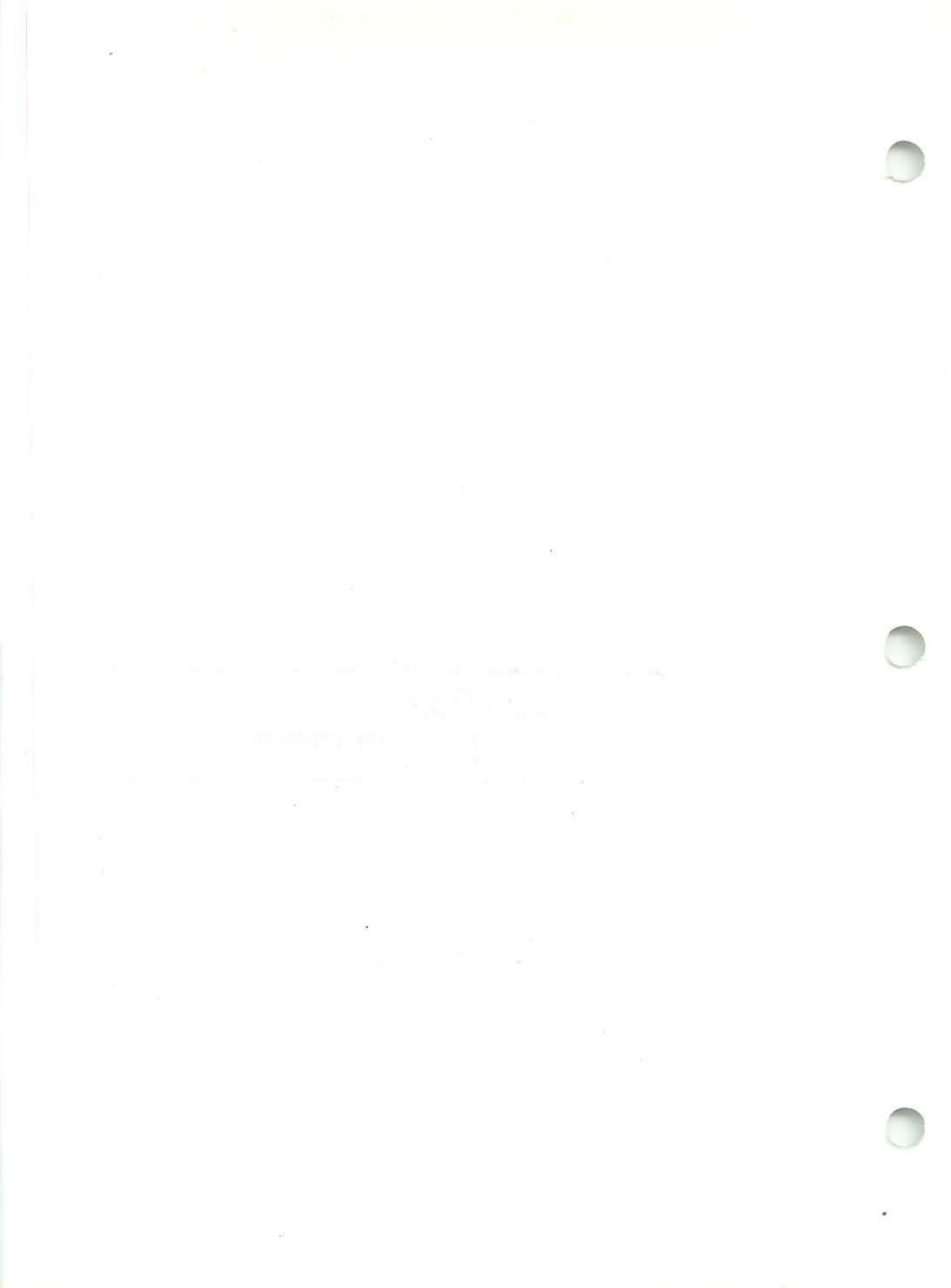




JE1052
Color Graphics Adapter/Printer Interface
User's Manual

135.DOC Revision 1.123 April 14, 1989

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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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Room 725
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Washington, DC 20554
(202) 634-1940

Consumer Assistance and Small Business Division
Room 254
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Washington, DC 20554
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Introduction

Congratulations on the purchase of your Jameco Electronics equipment. We realize that you will be anxious to get to work on your new equipment, but we ask that you please read the manual. Keep an eye open for any additional information that may have come in an addendum.

This is only one of many innovative new products available from Jameco Electronics, pioneers in the mail-order electronics industry since 1974. Look for a growing line of quality products in your latest Jameco Electronics annual catalog and seasonal flyers.

Description The JE1052 is comparable to the IBM Color Graphics Adapter (CGA). In addition to the video interface, a Centronics compatible parallel port is provided for interfacing a parallel printer.

Features

- IBM PC, PC/XT, PC/AT and 386 compatible
- Will directly drive an RGB monitor
- Will drive a monochrome composite monitor
- Will drive a TV when used with an RF modulator
- 40 x 25 text for composite monitors and TV
- 80 x 25 text for RGB monitors
- 320 x 200 graphics (up to 16 colors)
- 640 x 200 graphics (black and white)
- Two character modes available

Checklist

- JE1052 CGA w/Printer Interface
- Composite Video Signal Converter

Glossary 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.

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:

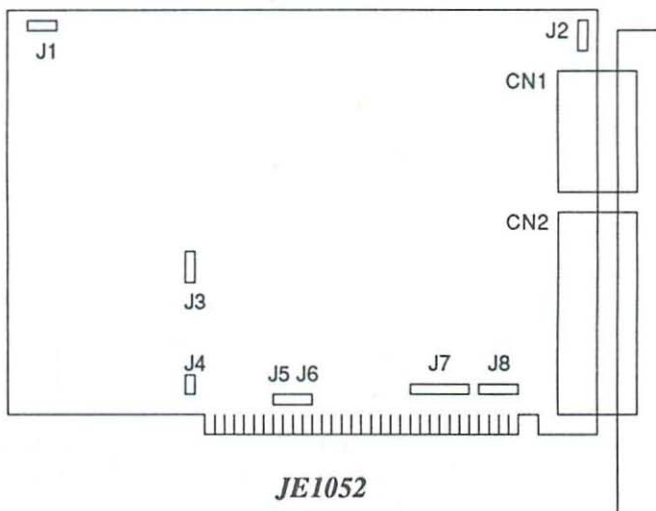
1. Whenever you move your body, you can easily build up enough static electricity to damage a board. When handling a board or chips, ground yourself often. The best way to do this is with a grounding wrist strap that is properly connected to a frame ground. These may be purchased through Jameco Electronics (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, avoiding contact with the numerous leads protruding from the boards.

Configuration

This section will cover the necessary hardware configurations and information. Diagrams and tables have been provided to clarify proper configuration. Default or recommended settings will appear in *italic* type.

All references to locations will be made as if it were placed in front of you, bracket to the right, gold bus connector pointing down. All pertinent jumpers, connectors and switches are labeled. Please refer to the following diagram.

Diagram



J1 Character Type

This jumper allows you to select one of two character sets built into the JE1052. When placed on the right pair of pins, a normal IBM character style will be displayed. When placed on the left pair of pins, a narrower (and often clearer) character style will be displayed.

J2 Monitor Select If you have an RGB or EGA monitor, place this jumper on the middle pin ONLY. If you have a monochrome composite monitor, first place this jumper on the lower two pins. On certain monitors, a very dim display may result in this setting. In this case, try the upper pair of pins. Whenever shorting a pair of pins with the jumper, you must use the supplied composite video signal converter.

J3 Parallel Port Address An IBM compatible computer can recognize up to three parallel ports which it designates LPT1, LPT2 and LPT3. Likewise there are three possible parallel port (hardware) addresses: 3BC, 378 and 278 hexadecimal. When the computer is first turned on, it checks these locations in this order to see if a parallel port exists. The following table shows how the LPT numbers are assigned, depending upon which port addresses are present.

3BCh	378h	278h
NONE	NONE	NONE
NONE	NONE	LPT1
NONE	LPT1	NONE
NONE	LPT1	LPT2
LPT1	NONE	NONE
LPT1	NONE	LPT2
LPT1	LPT2	NONE
LPT1	LPT2	LPT3

When J3 is on the upper pair of pins, the parallel port is configured for 378h. When J3 is on the lower pair of pins, it is configured for 278h. If neither of these locations is available, you will need to disable the parallel port with J4.

**J4 Enable/
Disable
Jumper**

If there are other parallel ports in your system with these addresses, you must disable the JE1052's parallel port or, change the address of the other port. If two parallel ports are set to the same address, neither port will work and damage may result. When J4 is jumpered, the parallel port is enabled. When J4 is on only one pin, it is disabled.

The JE1050 has a jumper that enables or disables the parallel port. To enable the port, the jumper (located in the top front corner) must be on pins 1 and 2. To disable the port, the jumper must be on pins 2 and 3.

J1 Pins Shorted	Printer Port
1 and 2	Enabled
2 and 3	Disabled

Computer

On most motherboards there is a set of DIP switches or a jumper that configures the motherboard for the primary display type. A primary display is the one used for output when the computer is first turned on. If there are no other adapters installed, the computer should be set for color as the primary display adapter. See the Video Port section for more information on using two display adapters.

IBM PC

There are two switch blocks labeled SW1 and SW2 each having 8 DIP switches. SW1 is closest to the middle of the motherboard. Setting DIP switches 5 and 6 of SW1 to OFF and ON selects 40 column operation. Setting DIP switches 5 and 6 of SW1 to ON and OFF selects 80 column operation.

**IBM PC/XT
JE1000
JE1001
JE1002**

There is only one switch block located near the power supply connectors that has 8 DIP switches. Setting DIP switches 5 and 6 of SW1 to OFF and ON selects 40 column operation. Setting DIP switches 5 and 6 of SW1 to ON and OFF selects 80 column operation.

- IBM PC/AT There is a small slide switch (labeled SW1) located near the power supply connector. Setting this switch to the ON position (toward the front) selects color as the primary display type.
- JE1003 There is a switch block (labeled SW1) located to the right of the RAM banks that has 4 DIP switches. Setting DIP switch 2 to the ON position selects color as the primary display type.
- JE1007 There is a switch block (labeled SW1) located to the right of the RAM banks that has 4 DIP switches. Setting DIP switch 3 to the ON position selects color as the primary display type.
- JE3005 There is a switch block (labeled SW1) located near the power supply connector that has 4 DIP switches. Setting DIP switch 4 to the ON position selects color as the primary display type.
- JE3010 There is a two-position jumper block (labeled SW1) located near the power supply connector. Setting this jumper to the RIGHT position (toward the power supply) selects color as the primary display type.
- JE3020
JE3025 There is a switch block located near the front left portion of the motherboard that has 3 DIP switches. Setting DIP switch 1 to the ON position selects color as the primary display type.
- JE3026 There is a switch block located on the right side of the power supply connectors that has 2 DIP switches. Setting DIP switch 2 to the ON position selects color as the primary display type.
- Other Computers Please consult the owner manual that came with your computer or contact your dealer for information regarding setting the motherboard for monochrome display operation.

Installation

WARNING: If there is a color display adapter installed in your computer already, you must remove or disable it. The computer will not function properly with two color display adapters installed.

Slot Selection

Locate an unused expansion slot. If you are installing the JE1052 in a PC/AT or 80286 compatible, you may want to install it in an 8-bit slot so as not to use up a valuable 16-bit slot unnecessarily. However, the JE1052 may be installed in a 16-bit slot if no 8-bit slots are conveniently available. If you are installing the JE1052 in a PC/XT or XT clone, you should not install it in the slot closest to the power supply (Slot 8). This XT slot has special signal capabilities that may interfere with cards not equipped to use them.

Remove the empty bracket and screw if necessary. Save the screw.

Mounting

Position the JE1052's edge connector over the slot and make certain that the connector fingers are correctly started in the motherboard connector. With a slight fore-and-aft rocking motion, firmly press the card into place. Do not rock it from left to right or damage to your slot may result. Check to see that it is fully and properly seated in the connector.

Some motherboards may be mounted too low in the case, or the rear panel may not be aligned correctly. This may cause the JE1052's bracket to become obstructed and prevent the JE1052 from being inserted completely. This may be corrected in one of the following ways:

1. Some cases allow for up and down adjustments of the rear panel; simply loosen its screws and adjust the panel to a lower position. Tighten the screws only after all expansion cards have been installed and attached to the rear panel.

2. If the motherboard is mounted with all metal standoffs, it may be possible to put insulated washers under each one to raise the motherboard slightly.

Secure the card to the rear panel with the screw you had removed previously.

Carefully examine your work, making certain that all internal cables are routed neatly where they will not be pinched or abraded by the case cover. Gently tilt the entire computer case on its side to ensure that there are no loose screws or other bits of hardware in the case. Inspect the top side of the motherboard for other loose hardware you may have accidentally dropped. When you are completely satisfied with the installation, close the case cover. Reconnect all peripherals.

Monitor

Connect the video cable from an IBM-compatible RGB color monitor to the 9-pin DE-9 connector on the JE1052. It is recommended that you tighten the two retaining screws on the cable connector, to prevent frustrating intermittent connections with your monitor that may otherwise result.

A monitor extension cable is available from Jameco Electronics; it is part number MEC6.

If you will be connecting the JE1052 to a monochrome composite monitor or TV via an RF modulator, you will need to use the composite video signal converter. Connect the monitor cable from your monitor or RF modulator to the converter. If you need a cable, our part number RCA10RCA is a 10 foot cable.

***Warning:** Do not connect any type of monitor except an IBM-compatible color type to the JE1052. Connecting a TTL Monochrome monitor to this card could result in irreversible damage to both card and monitor. Check with the documentation that came with your monitor to determine if it can operate safely with the JE1052 color display adapter card.*

Printer

Connect the cable from a parallel printer to the 25-pin DB25 connector on the JE1052. Again, it is recommended that you tighten the retaining screws on this cable connector.

A parallel printer cable is available from Jameco Electronics; it is part number PPC8.

Operation

For the safest operation, you should always turn on the peripheral devices (printer, modem, monitor, etc.) first and then turn the computer itself on. This is to protect the delicate computer circuitry from any transients caused by switching the other devices on. If your monitor is plugged into the rear of the computer and comes on when you turn the computer on, that is acceptable.

Power Up Turn on the computer's monitor and any other peripherals.

Turn on the computer itself.

Adjust front and rear controls of the monitor as necessary.

Insert a DOS boot diskette into floppy disk drive A: and close the door lever.

Output Configurations

CN1 RGB Interface

DE9 pins	Signal Name	Color Display
1	Ground	1
2	Ground	2
3	Red	3
4	Green	4
5	Blue	5
6	Intensity	6
7	Reserved†	7
8	Horizontal Drive	8
9	Vertical Drive	9

† Used for composite video signal with 9-pin to RCA adapter when enabled.

CN2 Printer Interface

DB25 pins	Signal Name	Centronics
1	-STROBE	1
2	D0	2
3	D1	3
4	D2	4
5	D3	5
6	D4	6
7	D5	7
8	D6	8
9	D7	9
10	-ACKNOWLEDGE	10
11	BUSY	11
12	PE	12
13	SELECT	13
14	-AUTO FEED	14
15	-ERROR	32
16	-INITIALIZE PRINTER	31
17	-SELECT INPUT	36
18-25	GROUND	16, 19-30, 33

J7 Light Pen Interface	J7	Signal Name	Light Pen
	1 2 3 4 5 6	Light Pen Input Not Used Light Pen Switch Chassis Ground +5 Volts +12 Volts	

J8 RF Interface	J8	Signal Name	RF Modulator
	1 2 3 4	+12 Volts Not Used Composite Video Logic Ground	

Obtaining Assistance

Many problems can be resolved by referencing the manual and confirming configuration and installation. Common problems and solutions are listed below for help in troubleshooting your system.

Common Problems

Computer will not load disk.

- Drive cable is backwards..
- Drive is upside down.
- Drive select jumper blocks set wrong.
- Drive mounted on wrong part of cable.
- The diskette is not formatted.

Hard disk drive will not boot.

- Go into FDISK, display the partition information, see if drive C is marked "Active". There should be an "A" under "Status". If it is not active, you can make it active by typing "2" from the main FDISK menu which is "Change Active Partition".
- You had typed `FORMAT C: [⊞]` without the `/S`. See DOS manual.
- Re-format the drive at a slower operating speed (i.e. 4.77 or 6MHz).

Computer does not come on or no display on the screen.

- Turn power off. Check to see that the computer, the monitor and all other peripherals are plugged into the AC wall outlet.
- Open the computer up and make sure all the cards are firmly seated in their expansion sockets.
- Make sure all the cables inside are still connected properly.

Technical Support 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 manual revision, customer and order numbers. If appropriate, please write down DIP switch settings and error or diagnostic messages you may have received. The technicians need all of this information to fully assist you. The phone number is (415) 592-9990.

Customer Service 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.

Foreign Customers 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.

Corrections If you run across any errors or omissions in this manual or the manual does not explain something thoroughly enough, please write to us and let us know. Feedback from our customers provides for consistently high quality now, and in the future. Please reference the document and revision numbers as well as the printing date (located on the cover of all Jameco Electronics documentation) when writing so that corrections can be made as easily as possible. Address correspondence to:

JAMECO ELECTRONICS
1355 Shoreway Road
Belmont, CA 94002
ATTN: Technical Support

Glossary

For your convenience, we have prepared this glossary of common computer terms. We have tried to include the most common (often slang) usage of the terms used in computer kit assembly. We hope you find this useful.

Analog Class of devices whose output varies continuously, as opposed to digital, whose output varies in steps. See DIGITAL, MONITOR, and JOYSTICK.

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.

Bus Group of conductors over which digital information is transmitted. In a computer, the bus allows communication between the different subsystems (CPU, memory, I/O,...)

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

Cold Boot Causing the CPU to re-initialize by removing it's source of power. This is accomplished by turning the power off and on.

Composite Video Signal A video signal containing both picture and sync information. Commonly used for VCRs and video games, composite video is seldom used with PC-style computer systems.

CPU Central Processing Unit. In PC and PC/XT machines, the CPU is an Intel 8088 or 8086. In PC/AT machines, the CPU is an Intel 80286. In 386 machines, the CPU is an Intel 80386.

Cylinder Refers to a set of tracks in a multiple surface disk drive which have corresponding locations and track numbers. For example, track 1 of surface 0, track 1 of surface 1, track 1 of surface 2, and track 1 of surface 3 combine to make cylinder 1.

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.

Digital Class of devices which operate in discrete increments (i.e., on-off or pulses). This is the most common form of signal in a personal computer.

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. On a motherboard, these switches are normally scanned only at time of BOOT, and 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, 16 colors from a palette of 64. Usually capable of emulating CGA and HGA.
Heads	A device used to detect and change fields on a magnetic surface. Serves as the read/write element in disk drives.
HGA	Hercules Graphics Adapter. Provides TTL video at 720 x 348 in 2 intensities (monochrome).
Interface	Circuitry and/or software which allows communication between two or more devices.
Joystick	Positioning device with a handle which can be moved forward, backward, left, right or any angular combination of these directions. The movements of the joystick can be interpreted through the analog I/O port to provide input to the computer.
Jumper	A rectangular piece of metal in a plastic casing, usually black, that fits over two pins of a jumper block 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 intensities (monochrome).
MFM	Modified Frequency Modulation. Data encoding method used on most standard hard disk systems (ST225, ST251, KC20B). Using this method, each cylinder is divided into 17 sectors of 512 bytes each.
Monitor	Output device used to display both alphanumeric characters and non-text graphics. TTL and RGB monitors require digital input and use 9-pin connectors. Analog monitors require a continuous logarithmic input and use 15-pin connectors.
Multi-I/O	Input/Output interface card which provides parallel, serial, game ports, and usually a real-time clock.
Multi-Scan Multi-Sync	Refers to video displays capable of handling a variety of input frequency signals. Normally can accommodate both TTL and Analog signals.
Parallel	A type of interface in which all bits of data are transferred simultaneously, using a separate data line for each bit.
Physical Drive	This is the actual drive itself. A floppy disk drive itself would be considered one physical drive.

RAM Random Access Memory. This is memory that the computer can change randomly. This is the part of memory that the computer uses for programs and data. Once power is turned off to the computer, the RAM contents are lost.

RLL Run-length-limited. A denser data encoding scheme which squeezes more sectors onto each track. Because of the higher density, only RLL rated drives should be used (ST238, ST277, KC30B).

ROM Read Only Memory. This is memory that cannot be changed. When power is turned off and back on, the data is not lost. Generally used for BIOS.

Serial Mode of transmission where data is transmitted along a single conductor, one bit at a time. Serial transmission requires more time. Most commonly used with a MODEM or a MOUSE.

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.

SIMM Singular Inline Memory Module. A compact expansion board containing RAM. SIMM normally refers to a memory module with a card edge connector.

SIPP Singular Inline Pin Package Memory Module. A compact expansion board containing RAM. SIPP normally refers to a memory module with protruding pins.

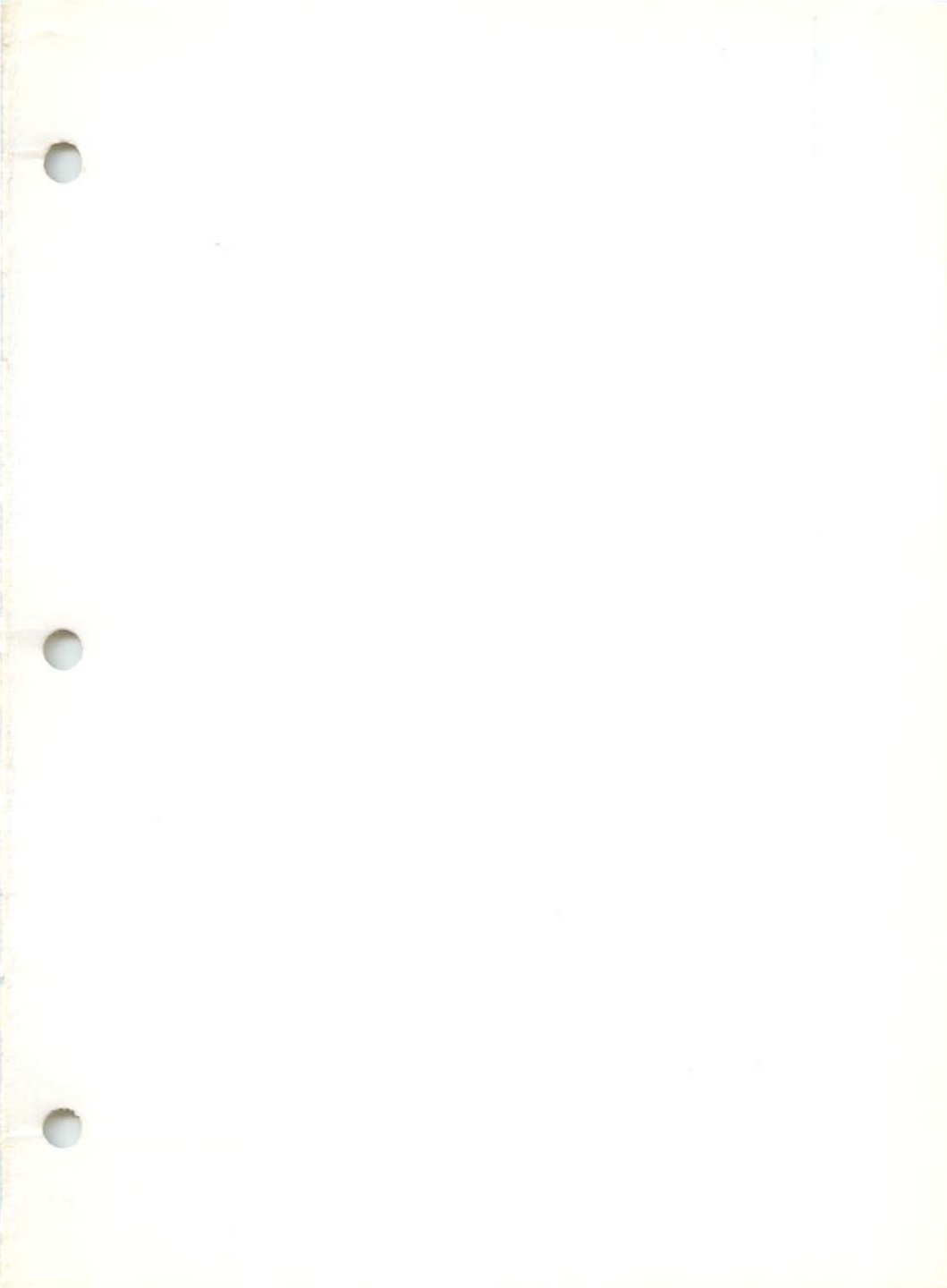
Terminator Terminating resistor pack. Used in disk drives to filter out line noise and terminate a data cable. Consists of a row of 220 to 330 ohm resistors molded together. This is usually installed in a socket. It is removed from all drives except the disk drive at the end of a DAISY CHAIN cable.

Tracks In a disk drive, data is arranged in concentric paths on the magnetic surface of the disk. These paths are called tracks.

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.





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