BECKER®

Operating Instructions

VIA®-70

Video Image Marker

Accuracy by Design

P/N 700047

VIA®-70

Video Image Marker

User's Manual

BOECKELER®

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INTRODUCTION

The **VIA-® 70 video image marker**, created by Boeckeler Instruments, Inc., combines the features of a video marker and video typewriter. Connected between a video source and monitor, the **VIA-70** generates an invisible overlay on a live or stored video image. On this overlay, graphics and typed text may be positioned or aligned to annotate and compare various aspects of the image while it is displayed on the monitor -- all without altering that image.

When any of the marker keys are pressed, operators automatically enter the **Marker Mode**. Using these keys, operators can position and store a simple or complex combination of graphics called *markers* on a single overlay. Such markers are used to quickly annotate, frame and label the video image for storage retrieval or still frame printout. If desired, the **VIA-70** overlay may be turned off and the video camera image alone will be displayed on the monitor. Up to ten different marker overlays may be stored, with quick availability upon powering up. In addition, each overlay may be repositioned so that users can *align* markers with important features of the video image for comparison purposes or for quick go / no go inspections.

The marking tools available in the **VIA-70** include typed text and numbers, 10 different pointers (e.g., arrows, cross hairs), custom scales and grids, sizeable circles and boxes for framing, and a lines mode offering a selection of line thicknesses. Also, with the touch of a key, operators can display the current date, time or both. As easily as the markers are created, so are they easily erased -- either one at a time until the screen is clear, or all at once.

Markers and menus may be displayed in a variety of colors (or gray levels) which are custom designed in a color palette menu. This flexibility in color, brightness and background provides a means for users to obtain optimal contrast between markers with the video image.

While marking, users are aided with the availability of **on screen help.** A brief **demonstration of features** is also offered, should a quick overview of the **VIA-70** be needed in training other users.

Standard components of the **VIA-70** include a keyboard controller. Optional features include an LP-32 light pen which adds a freehand drawing capability to the **VIA-70**. Also available is the KS-30 knob controller or JS-40 joystick controller, both ergonomically designed for ease in quick and fine positioning of markers. An MP-30 mouse pen controller is also available. The **VIA-70** may be used with MS™ and Microsoft ™ mouse controllers.

The **VIA-70** is compatible with most common video standards, including composite RS-170 and NTSC cameras, monitors, recorders, video presentation products and other NTSC composite video equipment. Boeckeler video interfaces may be purchased to create brightly colored marker overlays for use with Y/C (S-Video) or RGB video equipment. An export model of the **VIA-70** is compatible with European CCIR and PAL video standards.

FEATURES

VIDEO IMAGE MARKER

- **Eight marking tools (in keyboard order), plus one optional marking tool:**

1. Typed Text	Label video images for video print, still image recorder or projection display. Useful in record keeping, presentations, video conferences, meetings and more. Upper and lower case characters are available and positionable anywhere on screen, in large or small size. The background of each label may be solid or clear. Text may be displayed in a variety of colors at the touch of a key.
2. Pointers	10 different pointers can assist in marking a video image to point out important aspects of the image under study. Pointers include four different arrows, standard cross hairs, pointed cross hairs, a target circle, a small circle, a target box and a small box. Each are positionable anywhere on screen.
3. Grids	Custom grids may be created in horizontal, vertical or box patterns (horizontal and vertical).
4. Scales	Size and position scales for dimensional measurements or subdivide scales with cross hairs for fine measurements. Sizeable horizontal and vertical scales available.
5. Circles	Sizeable circles and ellipses may be placed anywhere on screen.
6. Boxes	Sizeable boxes or rectangles may be placed anywhere on screen.
7. Lines	Horizontal, vertical or diagonal lines may be positioned in one of three different line thickness selections.
8. Date/Time	Set the date and time, then place the label anywhere on the screen. The date/time label will remain active even after the **VIA-70** is powered down.
+ Draw	With the optional LP-32 light pen, MP-30 mouse pen or other mouse controller, users can draw or write over the video image.

- **Align Mode** allows users to position markers in unison over important aspects of the video image. Marker alignment assists in quickly comparing features of objects being inspected or studied.

- **On screen display of marker position** displayed as X and Y pixel coordinates.

- **Battery backed up memory** allows many different markers to be combined and stored in ten different overlays, each of which can be recalled even after the unit has been powered down.

- **Easy adjustment of gray level or color of markers** for optimal contrast with the video image (color markers will be displayed only if an optional VIA-RGB or VIA-Y/C interface is being used). Up to three different marker colors (or gray levels) may be stored on an overlay.

- **Custom menu colors** may be designed by the user for optimal legibility. Options include a "see through" background if the video image needs to be more fully viewed along with the menu.

- **Hide or show stored markers** with the touch of a key to instantly view the video image alone or with the markers.

- **Erase markers** from the overlay all at once or one at a time.

- **RS-232C data output** transmits ASCII data for displayed marker coordinates and alignment data to printers or computers.

ADDITIONAL FEATURES

- **On screen Help** can be accessed at any time during marking.

- **A Demonstration of Features** can be activated to briefly show the various marking functions of the **VIA-70** should a quick overview be needed in training other users.

COMPONENTS

KEYBOARD CONTROLLER

The keyboard is the user's primary interface with the **VIA-70**. Figure **1.1** below depicts the **VIA-70** keyboard controller. In general, the keyboard is used to select, type, position, save and erase the markers on the video overlay. A few of these functions may also be controlled with a separately purchased light pen, joystick or knob controller, mouse pen or other mouse controllers (refer to "**Optional Components**" on page 8). General definitions of each function key on the keyboard are listed follow.

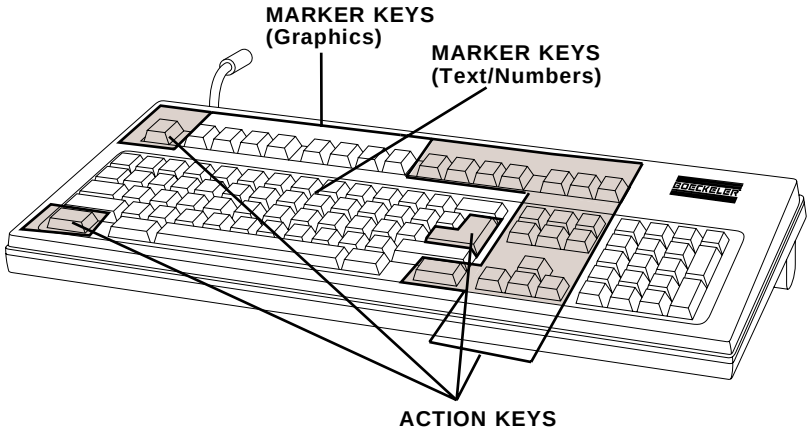


Figure 1.1
VIA-70 Keyboard Controller

Keyboard Controller Definitions

MARKER KEYS *(Graphics)*
These keys allow operators to select the graphics or *markers* desired and the appearance of those markers. Such keys include **POINTERS [F1]**, **SCALES/GRIDS [F2]**, **SHAPES [F3]**, **SIZE OBJECTS/TEXT [F4]**, **LINES [F5]**, **DRAW [F6]** and **SHOW DATE/TIME [F7]**. Auxiliary functions which support these keys are activated by pressing **CTRL + a marker key**. Auxiliary marker keys are those for **CALIBRATE LIGHT PEN** and **SET DATE/TIME**.

MARKER KEYS (*Text/Numbers)*
Text and number keys on the **VIA-70** keyboard controller perform as alphanumeric labels or *markers* which are immediately typed on the screen when pressed. Upper and lower case characters are avail-

able, and in large or small size. Each line of type may be freely positioned on the overlay until selected or *anchored*.

ACTION KEYS Action keys perform an action with regard to marking, such as moving to the next or previous overlay, erasing a marker, positioning and anchoring a marker or moving through menus and data lines. These keys include **ALL GRAPHICS ON/OFF [Esc]**, **CHANGE COLOR [F8]**, **SHOW MARKER COORDS [F9]**, **ALIGN [F10]**, **CLEAR ALIGN [F11]**, **SET RS-232C [F12], RS-232C TRANSMIT [Print Screen]**, **DEMO FEATURES [Scroll Lock]**, **HELP [Pause/ Break],** the **CTRL** key, the **ENTER** key, **DROP [Insert]**, **OVERLAY [Home], PREV OVERLAY [Page Up], UNDO [Delete]**, **CLEAR [End]**, **NEXT OVERLAY [Page Down]**, and the four **POSITIONING** keys (left, right, up and down).

Positioning and Sizing Markers

When operating the **VIA-70** with the keyboard controller, the active markers and cursors may be positioned vertically by pressing the up and down **POSITIONING** keys. These keys are located to the right of the **ENTER** key. Pressing the right and left **POSITIONING** keys moves the marker horizontally. Once the marker is positioned, operators may anchor and store the marker in the overlay by pressing the **DROP [Insert]** or **ENTER** key. For finer positioning, press the **CTRL** key along with one of the **POSITIONING** keys.

POSITIONING keys are not only used for positioning markers, but also for sizing the active markers before they are anchored. Pressing the up and down **POSITIONING** keys will change the height of the object. Pressing the left and right **POSITIONING** keys will change the width of the object. For finer sizing control, press the **CTRL** key while pressing a **POSITIONING** key.

Making Menu Selections

Moving through the menus with the **VIA-70** keyboard controller involves using only one of three types of keys. The **POSITIONING** keys move users from one option to the next. The option that is active will be highlighted. Some options can be made to display one of several choices. The **SPACE BAR** will toggle through the various choices in an option until the desired choice is displayed. The **ENTER** key selects the option that is highlighted and moves users to the next available option.

The **VIA-70** features four menus from which to make selections. These are the **Light Pen Calibration Menu**, **CTRL** + **DRAW [F6]**; the **Set Date/Time Menu**, **CTRL** + **SHOW DATE/ TIME [F7]**; the **Set Colors Menu**, **CTRL** + **CHANGE COLOR [F8]**; and the **RS232C Set Up Menu**, **SET RS232C [F12]**.

OPTIONAL COMPONENTS

LIGHT PEN CONTROLLER

Figure **1.2** below depicts the LP-32 Light Pen Controller. The controller functions as an auxiliary interface with the **VIA-70**. In general, the pen is used similarly to a writing utensil as it is pressed against the screen to position markers or to freehand draw directly on the monitor. Broad definitions of the light pen button functions are listed below. Refer to this section, if needed, when general instructions later in the manual ask users to anchor a marker, to position a cursor or to draw.

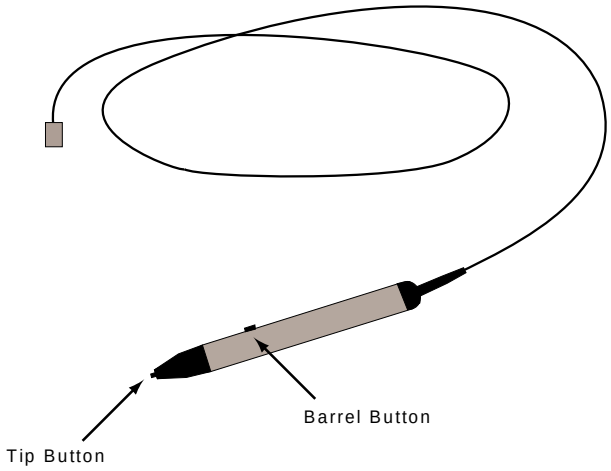


Figure 1.2
LP-32 Light Pen Controller

TIP BUTTON a button that positions active markers and cursors when lightly dragged across the screen. Also draws on the screen when the **DRAW [F6]** key is activated and when the pen tip is pressed into the screen to draw. When the *Tip Button* is quickly "clicked" into the screen, active markers will be anchored.

BARREL BUTTON inactive in the **VIA-70**.

Positioning and Sizing Markers

When operating the **VIA-70** with the optional light pen controller, the active marker may be moved anywhere on the screen by lightly dragging the light pen across the screen. The marker will follow this movement at a specified offset. For example, "dragging" the pen to the left on the screen will correspondingly move the marker to the left on the screen, one inch away from the pen tip if the offset was calibrated at one inch (calibration instructions follow). Pressing the pen into the screen will anchor an active graphic. Dragging the pen tip across the screen also serves to quickly size a marker if users have activated the sizing mode by pressing the **SIZE OBJECTS/TEXT [F4]** key. If concise sizing is desired, operators should use the keyboard **POSITIONING** keys instead of the light pen.

Drawing is accomplished similarly to positioning markers, except instead of dragging the pen tip across the screen, users will press the *Tip Button* into the screen and draw. Again, the drawing line will be offset from the pen tip in accordance to how the pen was calibrated.

To Calibrate the Light Pen:

1. Press the **CTRL** key together with the **DRAW [F6]** key until the light pen calibration screen appears displaying the **Light Pen Calibration Menu**.

   A cross hairs cursor will be displayed on the screen along with instructions.

2. If users wish to cancel this procedure without making any calibration changes, press any function key.

3. If the user wishes to continue calibration, press the *Tip Button* directly on the cursor for no offset margin. Or press the *Tip Button* at a desired distance from the cursor to create an offset margin.

   The offset margin is now automatically stored and the **Light Pen Calibration Menu** has been exited.

Making Menu Selections

The light pen has no effect in menu selections. Use the keyboard **POSITIONING** keys instead.

KNOB CONTROLLER

Although the **VIA-70** operates primarily with the standard keyboard controller, for quick and precise positioning the KS-30 Knob Controller is recommended (refer to Figure **1.3**). The knob controller operates simultaneously with the keyboard controller, and can operate simultaneously with optional light pen. In general, the knobs are used to quickly size and move the markers on the **VIA-70** overlay. Broad definitions of the five keys on the knob controller are listed below. Refer to this section, if needed, when general instructions later in the manual ask users to position, size or anchor a marker.

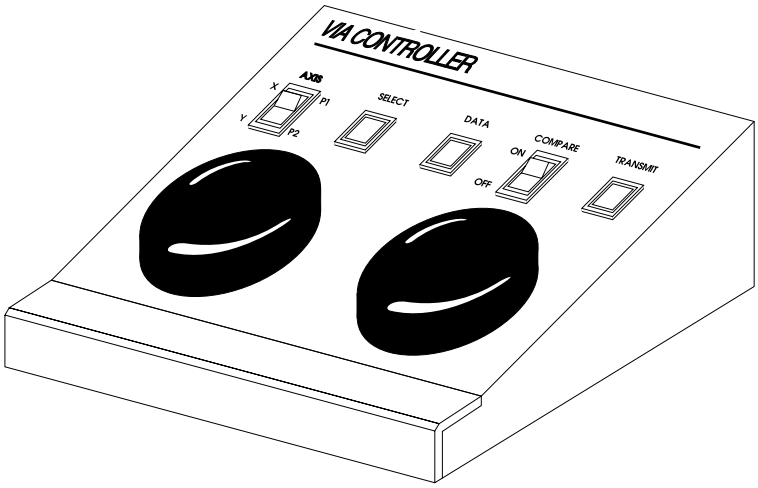


Figure 1.3
KS-30 Knob Controller

Knob Controller Key Definitions

AXIS	inactive on the **VIA-70**.
SELECT	a button which anchors the active marker in its current position.
DATA	inactive on the **VIA-70.**
COMPARE	inactive on the **VIA-70**.
TRANSMIT	a button which downloads current marker coordinates or alignment readings through the RS-232C serial port. Such data must be displayed before being transmitted.

Positioning and Sizing Markers

When operating the **VIA-70** with the knob controller, the active markers may be positioned vertically by rotating the left knob. Clockwise rotation moves the marker toward the bottom of the screen. Counterclockwise rotation moves the marker toward the top. Rotating the right knob moves the marker horizontally. Clockwise rotation moves the marker to the right side of the screen. Counterclockwise rotation moves the marker toward the left side of the screen. Once the marker is positioned, operators may anchor and store the marker in the

overlay by pressing the **SELECT** button. *Drawing can only take place with an optional light pen or mouse device.*

Sizing markers with the knob controller can be accomplished after pressing the keyboard **SIZE OBJECTS/TEXT [F4]** key. The left knob makes the object taller or shorter. The right knob makes the object wider or narrower. After objects are sized, users can save the size by pressing the **SELECT** button on the knob controller. Positioning of the sized object may now take place.

Moving through Menus

The knob controller has no effect in menu selections. Use the keyboard **POSITIONING** keys instead.

JOYSTICK CONTROLLER

The **VIA-70** may operate with either the joystick or knob controller, while the keyboard controller is connected. If all three controllers are connected, the **VIA-70** will automatically default to the joystick controller. Figure **1.4** below depicts the JS-40 Joystick Controller. This controller functions as the user's auxiliary interface with the **VIA-70**. In general, the joystick is used to position markers on the overlay. Broad definitions of the three keys on the joystick controller are listed below. Refer to this section, if needed, when general instructions later in the manual ask users to position, size and anchor a marker.

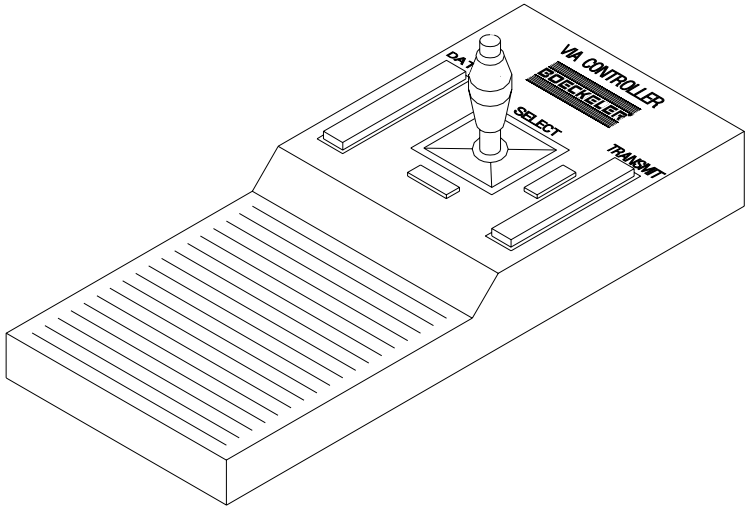


Figure 1.4
JS-40 Joystick Controller

SELECT a button which anchors the active marker in its current position.

DATA inactive on the **VIA-70**.

TRANSMIT a button which downloads displayed marker coordinates or marker alignment through the RS-232C serial port.

Positioning and Sizing Markers

When operating the **VIA-70** with the joystick controller, the active markers may be positioned vertically by tilting the joystick forward or backward. Tilting the joystick forward moves the marker toward the top of the screen. Tilting the joystick backward (toward the operator) moves the marker toward the bottom of the screen. Tilting the joystick left or right moves the marker horizontally. Once the marker is positioned, operators may anchor and store the marker in the overlay by pressing the **SELECT** button.

Sizing markers with the joystick controller can be accomplished after pressing the keyboard **SIZE OBJECTS/TEXT [F4]** key. Tilting the joystick forward and backward makes the object taller or shorter. Tilting the joystick left and right makes the object wider or narrower. After objects are sized, users can save the size by pressing the **SELECT** button on the joystick. Positioning of the sized object may now take place.

Moving through Menus

The joystick controller has no effect in menu selections. Use the keyboard **POSITIONING** keys instead.

MOUSE PEN CONTROLLER

Figure **1.5** below depicts the **VIA-70** MP-30 Mouse Pen Controller. The mouse pen functions as the user's auxiliary interface with the **VIA-70**. In general, the mouse pen is used to draw, write and position active markers on the video screen by tracing the pen on the mouse pad or other smooth surface (some operators even use the sides their legs). This allows users to mark on the monitor at a distance. The mouse pen can also be used to anchor and size markers on the screen, which is also a keyboard function. Definitions of the three keys on the mouse pen are discussed below. Refer to this section, if needed, when general instructions later in the manual ask users to position, size or anchor a marker.

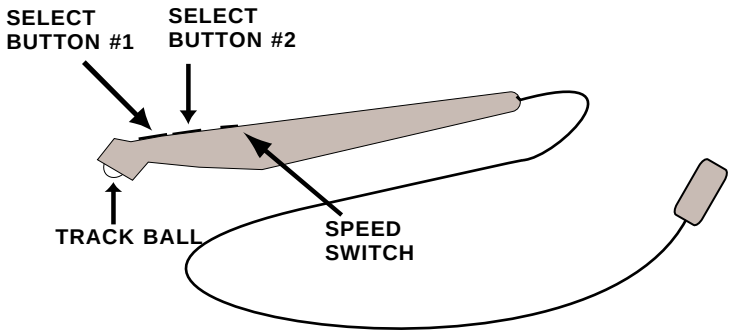


Figure 1.5
MP-30 Mouse Pen Controller

SELECT BUTTON #1 a button which anchors the active marker in its current position. Also selects which measuring line or cursor will be activated for positioning. While in the DRAW mode, this button is pressed as the pen is "drawn" across the mouse pad. A drawing line will be displayed accordingly on screen.

SELECT BUTTON #2 inactive on the **VIA-70**.

SPEED SWITCH switches the speed of the mouse pen track ball from slow to fast.

TRACK BALL moves the cursor or active markers anywhere on the screen according to how the ball is rolled across a smooth surface.

Positioning and Sizing Markers

When operating the **VIA-70** with the mouse pen controller, the active marker may be moved anywhere on the screen by lightly dragging the mouse pen across a smooth surface (such as a mouse pad or the side of one's leg). The marker will follow this movement. For example, dragging the pen to the left will correspondingly move the marker to the left on the screen. Pressing a *Select Button* will anchor an active graphic. Dragging the pen also serves to quickly size a marker if users have activated the sizing mode by pressing the

SIZE OBJECTS/TEXT [F4] key. If concise sizing is desired, operators should use the keyboard **POSITIONING** keys instead of the light pen or mouse pen.

Drawing is accomplished similarly to positioning markers except while in the DRAW Mode and dragging the pen, users will instead press a *Select Button* and draw.

Moving through Menus

The mouse pen controller has no effect in menu selections. Use the keyboard **POSITIONING** keys instead.

OTHER MOUSE CONTROLLERS

In general, when operating the **VIA-70** with other MS™ or Microsoft™ mouse controllers, using the buttons on the mouse should achieve the same functions as using the select buttons on the mouse pen (refer to above).

Section Two: Installation

INSTALLATION

To install the VIA-70 with composite monochrome EIA RS-170, monochrome CCIR, composite color (NTSC or PAL) video sources and monitors (refer to Figure **2.1**)**:**

1. Make all connections before applying power.

2. Video source connection:

   Connect a 75 OHM BNC coaxial cable between the video output of the video source and the CAMERA connector on the back of the VIA-70.

3. Video monitor connection:

   Connect a 75 OHM BNC coaxial cable between the MONITOR connector on the VIA-70 and the video monitor.

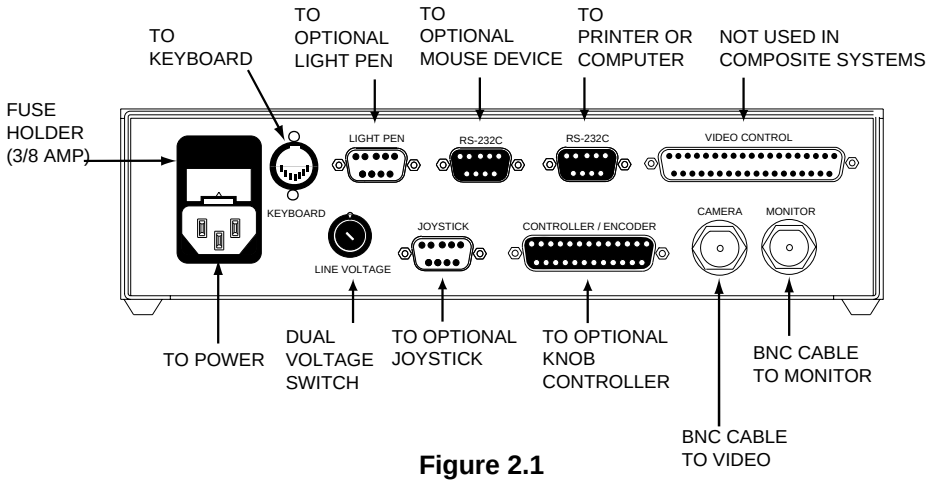


Figure 2.1
Back Panel of VIA-70
(for composite video systems)

4. Keyboard connection:

   Using the keyboard cable provided, **connect the VIA-70 keyboard to the KEYBOARD connector on the back of the VIA-70.**

5. Knob controller connection (optional):

   Using the 25-pin cable provided, **connect the optional KS-30 knob controller to the CONTROLLER/ENCODER connector on the back of the VIA-70.**

6. Joystick controller connection (optional):

   Using the 9-pin cable provided, **connect the JS-40 joystick controller to the JOYSTICK connector on the back of the VIA-70.**

   NOTE: If both a knob controller and a joystick controller are connected when power is initially applied, the **VIA-70** will default to the joystick controller. To use the knob controller, **power off, disconnect the joystick, and power up again.**

   The joystick or the knob controller may be used with the keyboard controller and with any of the optional mouse or light pen controllers listed below.

7. Mouse pen or other MS Mouse or Microsoft mouse controller (optional):

   Connect the mouse cable to the left-most RS-232 port on the back of the VIA-70 (the other RS-232 port is used for printer or computer output)**.**

8. Light pen connections (optional):

   A. Using the DB-9 connector at the end of the light pen, **connect the light pen to the LIGHT PEN port on the back of the VIA-70** (refer to Figure **2.1**)**.**

   NOTE: *For installing the optional light pen driver with extension cable, refer to special instructions beginning on page 25).*

   NOTE*: The light pen may be operated while other optional controllers are installed.*

9. Power supply:

   A. **Ensure that the DUAL VOLTAGE SWITCH is in the proper position to coincide with the incoming power supply.**

   B. **Plug the power cord into the back of the VIA-70 and then into a grounded outlet of the proper voltage and current rating**.

   C. **Plug the video source and monitor power cords into a grounded outlet of the proper voltage and current rating**.

   D. For optional light pen driver and extension: **Plug wall transformer into a grounded outlet of the proper voltage and current rating.**

   E. **Turn on the video source, monitor and VIA-70.**

   NOTE: *In order for the **VIA-70** to sync with the video, the video source must be turned on first.*

   After a moment, the monitor will display a video image of the object(s) in the field of view. A copyright message will briefly appear (refer to Figure **2.2**). This message will disappear and be followed by *overlay #1* or the overlay and mode users were last in before powering down. If either of these images are displayed, then the **VIA-70** is working properly and installation is complete. If these images are not properly displayed on the screen, refer to the *Troubleshooting Guide* in **Section Five: Appendices**.

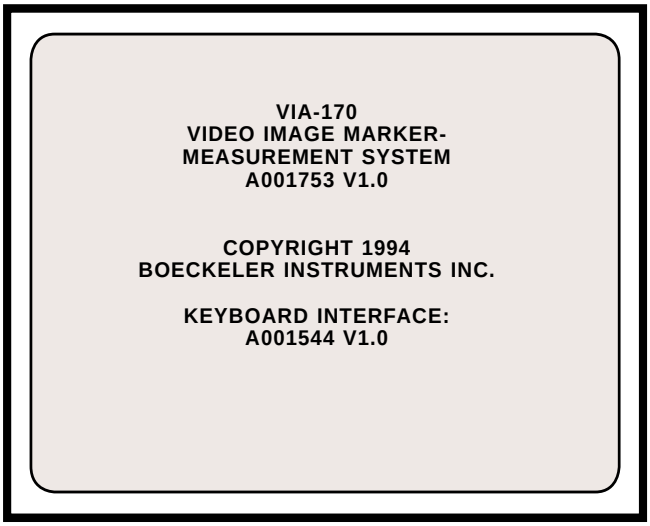


Figure 2.2
VIA-70 Sample Copyright Message
(version numbers may vary)

To install the VIA-70 with RGB (NTSC or PAL), or Y/C (NTSC or PAL) video sources and monitors (refer to Figure **2.3**)**:**

1. Make all connections before applying power.

2. VIA-RGB (or VIA-Y/C) interface placement:

   The Boeckeler **VIA-RGB** or Boeckeler **VIA-Y/C** video interfaces can be easily **stacked on top of the VIA-70 base unit**. ***NOTE:*** *Installations are the same for VIA-RGB-P and VIA-Y/C-P interfaces (PAL versions of the video interfaces).*

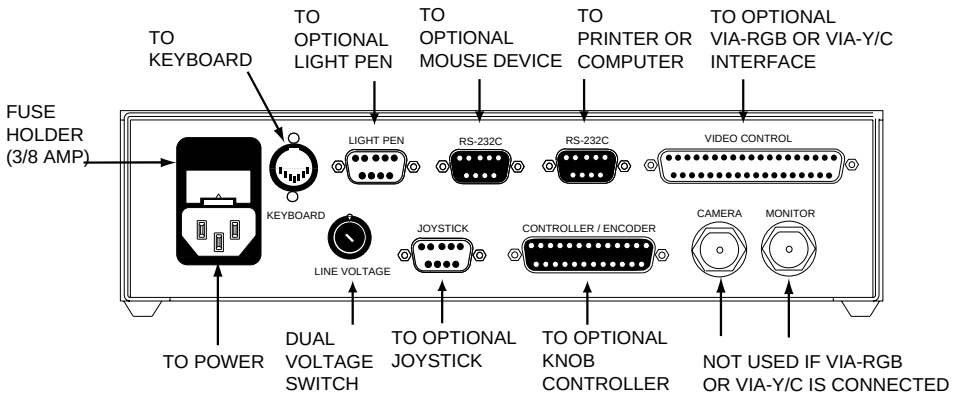


Figure 2.3
Back Panel of VIA-70
(for RGB, Y/C)

3. VIA-RGB (or VIA-Y/C) to video source connections:

   A. RGB systems:
   Connect the red, green, blue and sync lines from the video source to the corresponding red, green, blue and sync input connections on the back of the Boeckeler VIA-RGB interface unit (refer to Figure **2.4**). **Connect the video output end of the cable to the corresponding connection on the video source.**

   B. Y/C systems:
   Connect the Y/C cable from the video source to the corresponding input connections in the VIA-Y/C interface unit (refer to Figure **2.4**).

4. VIA-RGB (or VIA-Y/C) to monitor connections:

   A. RGB systems:
   Connect the red, green, blue and sync lines of the monitor cable to the corresponding output connection on the VIA-RGB interface. Connect the monitor end of the cable to the corresponding monitor input connections.

   B. Y/C systems:
   Connect the Y/C monitor cable to the corresponding output connection of the Boeckeler Y/C interface unit. Connect the monitor end of the cable to the corresponding monitor input connections.

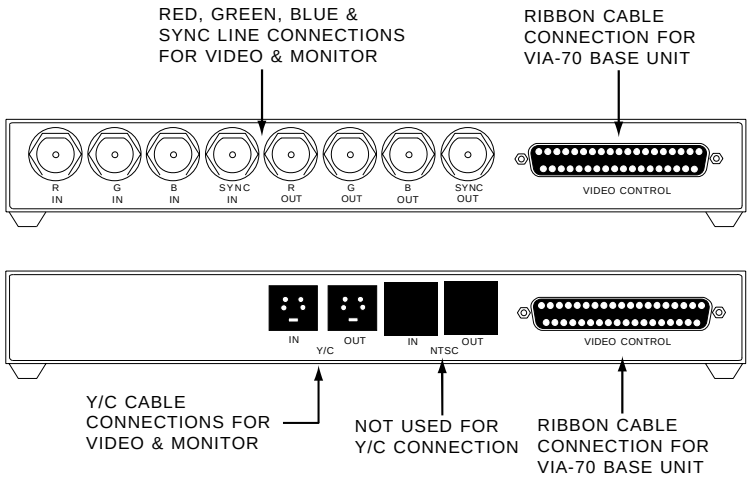


Figure 2.4
RGB Interface (top) and
Y/C Interface (bottom)

5. VIA-RGB (or VIA-Y/C) to **VIA-70** connections:

   Using the middle connection on the 37-pin ribbon cable provided, **connect the VIDEO CONTROL port of the Boeckeler VIA-RGB (or VIA-Y/C) interface to the VIDEO CONTROL port on the VIA-70.**

6. Keyboard connection:

   Using the keyboard cable provided, **connect the VIA-70 keyboard to the KEYBOARD connector on the back of the VIA-70.**

7. Knob controller connection (optional):

   Using the 25-pin cable provided, **connect the KS-30 knob controller to the CONTROLLER/ENCODER connector on the back of the VIA-70.**

8. Joystick controller connection (optional):

   Using the 9-pin cable provided, **connect the JS-40 joystick controller to the JOYSTICK connector on the back of the VIA-70.**

   NOTE: If both a knob controller and a joystick controller are connected when power is initially applied, the **VIA-70** will default to the joystick controller. To use the knob controller, **power off, disconnect the joystick and power up again.**

   The joystick or the knob controller may be used simultaneously with the keyboard controller or with any of the optional mouse or light pen controllers listed in **Section One: Getting Started**, *Optional Components*.

9. Mouse pen or other MS Mouse or Microsoft mouse controller (optional):

   Connect the mouse cable to the left-most RS-232 port on the back of the VIA-70 (the other RS-232 port is used for printer or computer output).

   NOTE: *The mouse may be operated while other optional controllers are installed.*

10. Light pen connections (refer to Figure **2.6**):

    A. Using the DB-9 connector at the end of the light pen, **connect the light pen to the LIGHT PEN port on the back of the VIA-70** (refer to Figure **2.1**)**.**

    NOTE: *For installing the optional light pen driver with extension cable, refer to special instructions beginning on page 25).*

    NOTE*: The light pen may be operated while other optional controllers are installed.*

10. Power supply:

    A. **Ensure that the DUAL VOLTAGE SWITCH is in the proper position to coincide with the incoming power supply.**

    B. **Plug the power cord into the back of the VIA-70 and then into a grounded outlet of the proper voltage and current rating**.

    C. **Plug the video source and monitor power cords into a grounded outlet of the proper voltage and current rating**.

    D. For optional light pen driver and extension: **Plug wall transformer into a grounded outlet of the proper voltage and current rating**.

    E. **Turn on the video source, monitor and VIA-70.**

    NOTE: *In order for the **VIA-70** to sync with the video, the video source must be turned on first.*

    After a moment, the monitor will display a video image of the object(s) in the field of view**.** A copyright message will briefly appear (refer to Figure **2.5**). This message will disappear and be followed by overlay #1 or the overlay and mode users were in last before powering down. If either of these images are displayed, then the **VIA-70** is working properly and installation is complete. If the images are not properly displayed on the screen, refer to the *Troubleshooting Guide* in **Section Five: Appendices**.

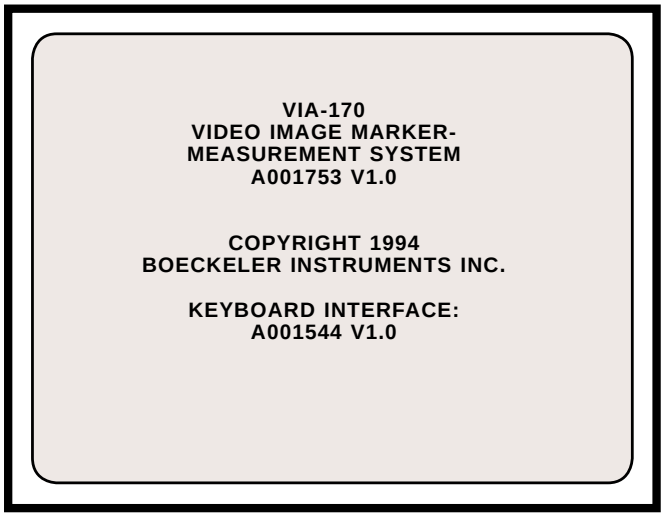


Figure 2.5
Sample Copyright Message
(version numbers may vary)

INSTALLATION FOR OPTIONAL LIGHT PEN EXTENSION

The **LPX-DRV** extension driver and **LPX-CBL** cable extensions are accessories provided by Boeckeler Instruments which extend the distance between the **VIA-70** and the light pen. This extension allows operators to use a light pen at the front of a large room, while the **VIA-70** is conveniently placed at the back of the room. In order to ensure that signal power remains strong throughout the length of the light pen cable, a transmitter, receiver and power supply are necessary components of the driver.

This section describes the installation procedures for the light pen, light pen extension cable and driver, the latter of which consists of a cable transmitter, cable receiver and cable power supply. Instructions for installation of the **VIA-70** to a video display and video source begin on page 23.

To install the VIA-70 with optional light pen driver and extension cable (refer to *Figure* **2.6**)**:**

1. **Make all connections before applying power**.

2. Extension Receiver to **VIA-70**:

    A. **Using the DB-9 cable provided, connect the LPX Extension Receiver to the LIGHT PEN port on the VIA-70.**

3. Extension Receiver to power supply:

    A. **Using the power cord attached to the power supply, connect the DC-9V connector on one side of the receiver to the power supply.**

4. Extension Cable Connections:

    A. **Connect one end of the beige extension cable to the RJ-45 connector on**

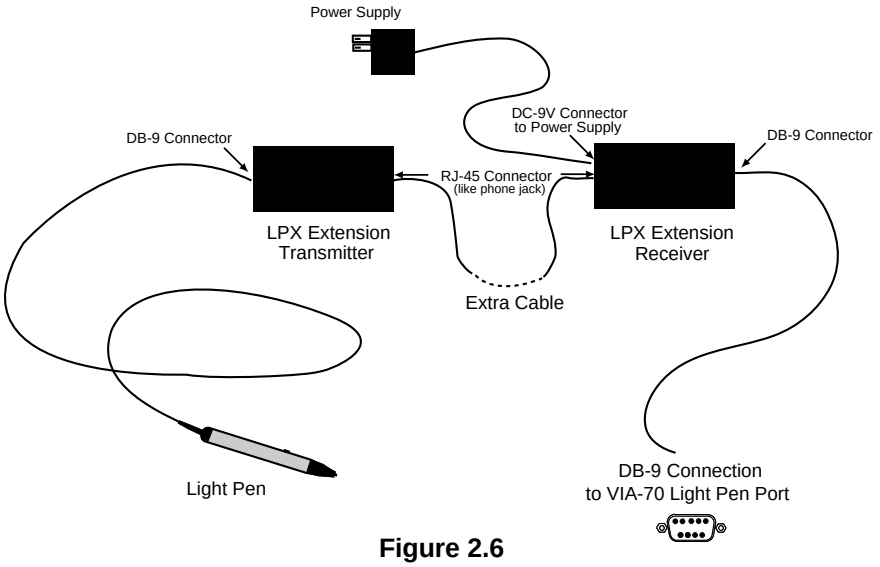


Figure 2.6
Configuration for the LPX Light Pen Extension Receiver, Transmitter and Related Cables.

the receiver. An RJ-45 connector is similar in appearance to a phone jack.

B. **Connect the other end of the beige extension cable to the input connector on the LPX Extension Transmitter box**.

5. Extension Transmitter to Light Pen Connections:

   A. **Using the DB-9 light pen cable attached to the light pen, connect the light pen to the other end of extension transmitter.**

6. Power connections:

   A. **Plug the LPX power supply into any grounded outlet.**

   B. **Follow other installation procedures for the VIA-70** which begin on page 18.

Section Three:
Video Marking

OVERVIEW

The **VIA-70** equips operators with a variety of graphics, called *markers*, which are placed over a video image to assist in analyzing or annotating the image. The markers available include typed text and numbers, 10 different pointers (arrows, cross hairs, pointed cross hairs, etc.), custom scales and grids, a date/time label, sizeable circles, boxes, and straight line drawing. Freehand drawing is also available with the addition of the optional LP-32 light pen. Any combination of these markers may be placed on the screen. Such a combination is called an *overlay*. Figure **3.1** below depicts a possible combination of **VIA-70** markers, including typed text, scales (placed end to end to create a ruler), a circle, a box, a handwritten approval and a date/time label.

While power is on, an overlay may be changed or erased. When powered down, the **VIA-70** will automatically store up to ten different overlays.

Markers must first be saved or *anchored* on an overlay before they are stored in the **VIA-70** memory. To anchor a marker, operators will press the **DROP** or **ENTER** key on the keyboard, or press the tip of the optional light pen into the screen. Until a marker is anchored in such a way, the marker remains freely positionable and is referred to as an *active* marker. Once a marker is anchored, it cannot be repositioned or changed. However, an anchored marker can be erased.

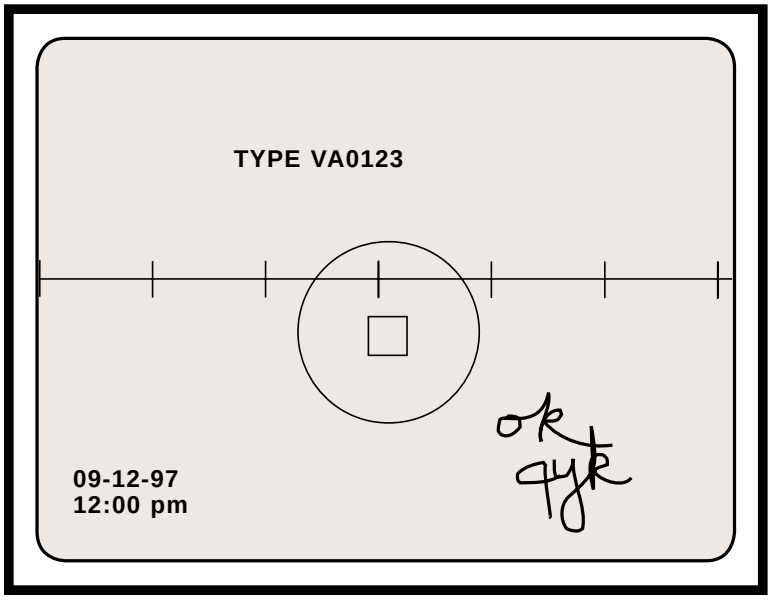


Figure 3.1
A combination of VIA-70 graphics.

USING THE MARKER KEYS

Figure **3.2** illustrates the **VIA-70** keyboard and the various function keys. The keyboard is basically divided into two types of functions keys: marker keys and action keys. The *marker keys* include graphics, text and number keys. All marker keys are used to annotate a video image in a variety of combinations for a variety of labelling functions.

Serving the functions in the **Marker Mode** are the *action keys* (refer to Figure **3.2**). These keys perform actions with regard to the positioning, anchoring and erasing the markers. Action keys also move users through the different marker overlays and menus, or begin RS-232C transmission.

A description of marking functions begins on the next page. Following the description of marking keys is a description of action keys and how they affect the marking functions.

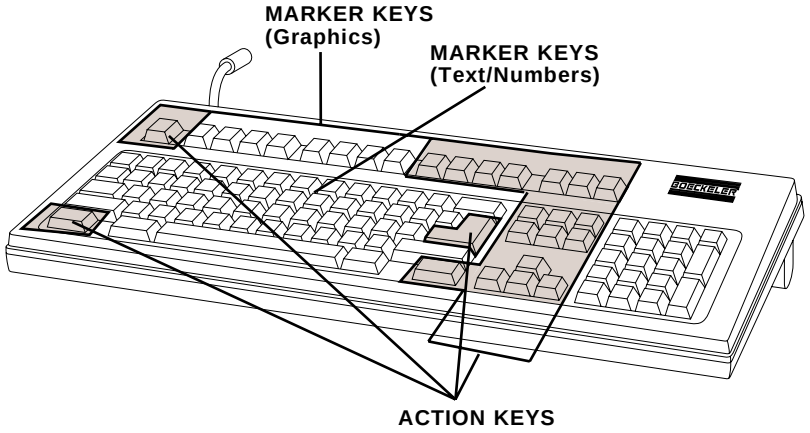


Figure 3.2
VIA-70 Keyboard Controller

General Marking Procedure

The following is a general procedure for selecting and placing a marker. Specific marker key functions are discussed in the following pages.

To select and place a marker:

1. **Press the desired marker key.**

2. If the coordinates of a marker are critical, **press the SHOW MARKER SIZE/ COORDINATES key combination CTRL + [F4]**. Grids do not display coordinates.

   NOTE: The coordinates display (X=, Y=) is based entirely upon pixel arrangements. Coordinates 0,0 represent the lower left corner of the screen. Pixel coordinates, depending on the camera and monitor, may be displayed as high as 1024 pixels by 482 pixels. Coordinates are given for the center point of an active shape, scale or cross hairs; for the end point of an active line, arrow or text label; or for the center point of the drawing cursor.

3. **Size the marker, if the marker is a scale, grid, circle, box or text label.**

   A. **Press the SIZE OBJECTS/TEXT [F4] key.**

   B. **Use the keyboard POSITIONING keys or other controller to size the marker.**

   NOTE: Text is simply selected as large or small by pressing the **SIZE OBJECTS/TEXT [F5]** key.

4. **Position the active marker on the overlay.** If desired, use the coordinates display to aid in positioning.

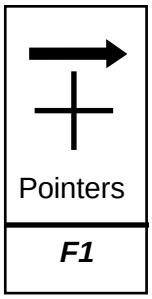
   A. For lines, **position the cursor at the point where the line is to begin. Press DROP or ENTER to anchor this point. Position the second cursor where the line is to end.**

5. **Anchor the active marker/cursor on the overlay by pressing DROP or ENTER.**

6. To select and place another marker, **repeat steps 1-5**.

7. To view the image without the marker overlay, **press the ALL GRAPHICS ON/OFF [Esc] key.**

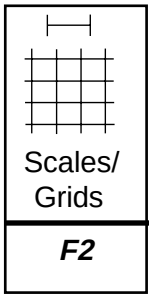
Marker Keys



POINTERS [*F1*]

Selects a different pointer each time this key is pressed. Arrow graphics available include four arrows, each pointing in one of four different directions. Following the sequence of four arrow graphics is a cross hairs pointer, a pointed cross hairs, a small target circle, small circle, small target box, and a small box.

Select a pointer by pressing the **POINTERS [F1]** key until the desired pointer is displayed. Position the pointer, then press **DROP** or **ENTER** to anchor the pointer in the marker overlay. To cycle backwards through the pointer selections press the **SHIFT** key plus the **POINTERS [F1]** key.



SCALES/GRIDS [*F2*]

Selects a different scale or grid each time this key is pressed. At the first press of the key, a horizontal scale will appear. The second press will display a vertical scale. At subsequent presses, a full box grid will appear, then a horizontal grid (horizontal lines only), followed by a vertical grid (vertical lines only). All scales and grids will be displayed where the last active marker was displayed. The active grid or scale will remain sizeable and positionable until anchored. To cycle backwards through the scale and grid selections press the **SHIFT** key plus the **SCALES/GRIDS [F2]** key.

To size a scale or grid, press the **SIZE OBJECTS/TEXT [F4]** key and use the **POSITIONING keys** or other controller to adjust the size. For fine sizing press the **CTRL** key along with the desired **POSITIONING key**. Pressing the **LEFT POSITIONING key** will make the grid narrower, while pressing the **RIGHT POSITIONING** key will make the grid wider. Pressing the **UP POSITIONING key** will make the scale or grid taller, while pressing the **DOWN** key will make the scale or grid shorter. Vertical scales are sized using the **UP** and **DOWN POSITIONING keys**. Horizontal scales are sized using the **LEFT** and **RIGHT POSITIONING keys**.

When the desired size is displayed, press **ENTER** to store the size. The sized grid or scale may now be positioned anywhere on the overlay. Anchor the grid or scale by pressing **DROP** or **ENTER**.

> **TIP**: use cross hairs pointers as tick marks on a scale to create custom rulers. First, size, position then anchor a scale at the edge of the screen. Press the **POINTERS [F1]** key. Select a cross hairs pointer, then position the cross hairs over the scale so that one of the cross hairs lines overlaps the line of the scale. Anchor the cross hairs pointer by pressing **DROP** or **ENTER**. Another cross hairs pointer of the same type can be placed along the scale at a desired distance from the first pointer. Anchor the second cross hairs pointer. This same procedure can be repeated to create as many tick marks on the scale as needed.
>
> Tick marks may also be created simply by placing sized scales end to end, either vertically or horizontally. Vertical and horizontal scales on the same overlay create a custom reticle (refer to Figure **3.3**).

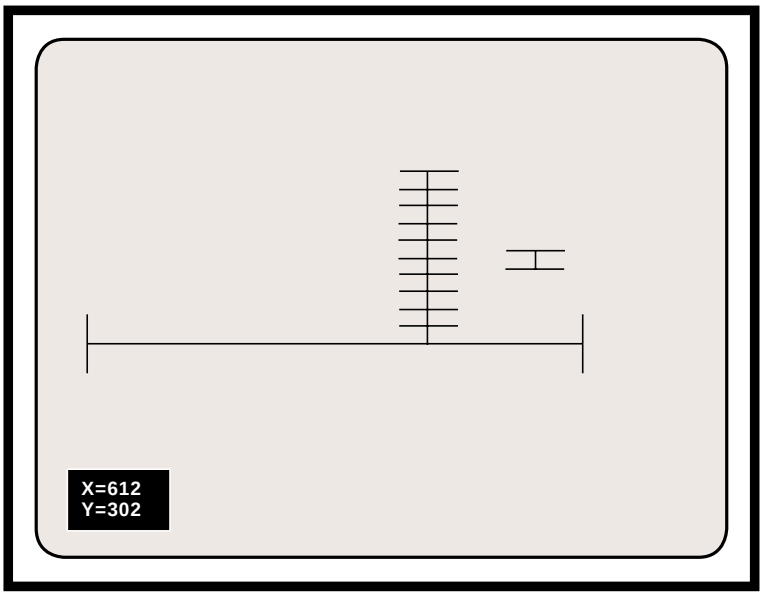
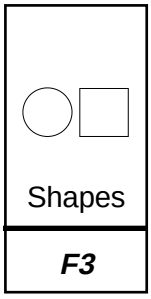


Figure 3.3
Creating a Custom Ruler or Reticle
Coordinates displayed at lower left are for the active scale (small scale to right of reticle).



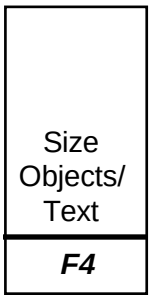
SHAPES [*F3*]

Selects a box or a circle each time this key is pressed. Circles and boxes will remain active (sizeable and positionable) until anchored.

To size an active box or circle, press the **SIZE OBJECTS/TEXT [F4]** key, then use the keyboard **POSITIONING keys**, or other controller, to adjust the shape. For fine sizing press the **CTRL** key along with the desired **POSITIONING key**. Pressing the **LEFT POSITIONING key** will make the shape narrower, while pressing the **RIGHT** key will make the shape wider. Pressing the **UP POSITIONING key** will make the shape taller, while pressing the **DOWN** key will make the shape shorter.

When the desired size is displayed, press **ENTER** to store the size. The sized circle or box may now be positioned anywhere on the overlay.

After positioning, anchor the circle or box by pressing **DROP** or **ENTER**.



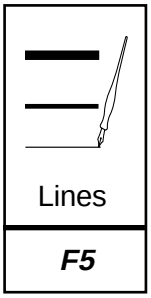
SIZE OBJECTS/TEXT [*F4*]

Activates the sizing mode for objects (scales, grids, boxes and circles) and text. Sizing may only take place for active objects or active text blocks. Once objects or text have been anchored, they may not be sized again.

To size objects, users must first have pressed the **SCALES/GRIDS [*F2*]** or **SHAPES [*F3*]** key, and an active marker must be displayed on screen. Press the **SIZE OBJECTS/TEXT [*F4*]** key to enter the sizing mode. Size objects by operating the **POSITIONING** keys on the keyboard. To rapidly size objects, use an optional controller. For finer control of sizing press the **CTRL** key while pressing a **POSITIONING** key.

To store the size and exit the sizing mode, press **ENTER**. The object may now be positioned.

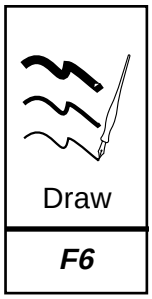
To size text, users must first have pressed a text or number key and a text cursor must be displayed on screen. Press the **SIZE OBJECTS/TEXT [F4]** key to sequence through the two available text sizes, small and large. Begin typing. After typing the first line, position it anywhere on the screen and anchor it. The next line of text may be sized and positioned independently from the previous line.



LINES [*F5*]

Activates straight line drawing and selects one of three line thickness cursors each time the key is pressed. Lines are available in fine, medium or bold thicknesses. To cycle backwards through the line thickness selections, press the **SHIFT** key plus the **LINES [F5]** key.

Select thickness cursor and position it where the line is to begin. Press **DROP** or **ENTER**. Reposition the cursor where the line is to end. A straight line will automatically be drawn and will follow the second cursor until the cursor is anchored. To anchor or save the line press **DROP** or **ENTER**.



DRAW [*F6*]

Activates freehand drawing/writing mode when users have installed the optional LP-32 light pen or MP-30 mouse pen. Also selects a different line thickness cursor each time it is pressed. To cycle backwards through the line thickness selections press **SHIFT** + **DRAW [F6]**. Select line width, then position the drawing cursor where the drawing is to begin. Draw or write with the drawing instrument (mouse pen, light pen, etc.). A drawing is automatically anchored on the overlay and may not be positioned. To erase a drawn segment press **UNDO [Delete]** or to erase an entire drawing and all other anchored markers press **CLEAR [End]**.

Ctrl +

DRAW [*F6*] = Calibrate Light Pen

Before drawing with the light pen, operators may wish to calibrate the pen. The **Light Pen Calibration Menu** is accessed by pressing the key combination **CTRL** + **DRAW [F6]**. The **Light Pen Calibration Menu** will be displayed on screen along with calibration cross hairs (refer to Figure **3.4).** Pressing any function key at this point will exit the **Light Pen Calibration Menu**. If operators wish to continue, press the light pen directly on the cursor for no offset margin **- OR -** press the light pen at a desired distance from the cursor to create an offset margin. Such calibration sets the offset margin between the point that the light pen touches the screen and the point that the drawing line or positionable markers will be "offset" from the pen tip. When the pen tip is pressed on the screen, the offset margin is automatically stored and the light pen calibration mode exited.

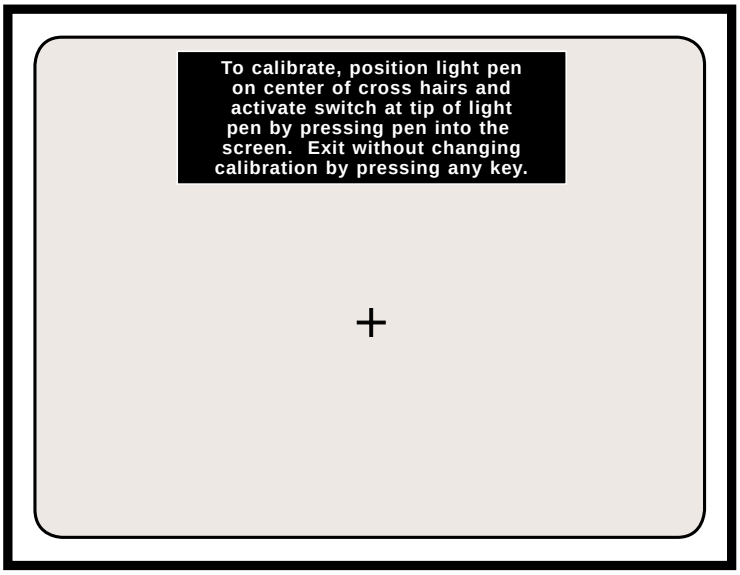


Figure 3.4
Light Pen Calibration Menu

09-12-97
11:38 AM

Show Date/Time

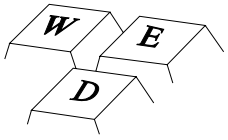
F7

SHOW DATE/TIME [*F7*]

Displays the current date and/or time, depending on which display mode was selected in the SET DATE/TIME mode. The **DATE/TIME** icon may be positioned anywhere on the marker overlay. To anchor or save the **DATE/TIME**, press **DROP** or **ENTER**. The date and/or time will be anchored on the screen and another icon will reappear for optional repositioning of the label. The anchored label will continue to display the current time and date. **NOTE:** Only one **DATE/TIME** display can be anchored or saved on each overlay.

Ctrl + SHOW DATE/TIME [*F7*] = Set Date/Time

To **SET DATE/TIME**, press the **CTRL key** while pressing **SHOW DATE/TIME [F7].** Enter the correct number displayed over the cursor, or press **ENTER** to move the cursor to the next data entry line (if available). Once the digit is changed, the cursor will automatically move to the next numeric position, ready for entry. Continue this process until all figures are correct. Press the space bar to select displaying the time only, date only or both date and time. Press **ENTER** to save and exit the **SET DATE/ TIME Mode**, or position the cursor over the CANCEL option if previous settings are desired.



TEXT/NUMBER KEYS

Pressing any of the 47 text/number keys will automatically activate the text mode. Text, in upper or lower case, will appear on screen wherever the last active marker or cursor was located. After typing one line, the text block may be positioned anywhere on the screen with positioning arrows or controllers. The text block may also be positioned before typing.

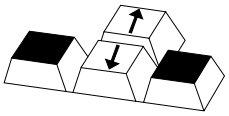
To select a small or large size of text, press the **SIZE OBJECTS/TEXT SIZE [F4]** key before anchoring the line of text.

To anchor or save the active text line, press **DROP** or **ENTER**. The text cursor will automatically save the current line and move down to the next line, which is now the active text line. Text does not wrap, so press **ENTER** at each line end.

To exit the text mode, simply press any other marking function key.

> **NOTE:** Text labels may be displayed in one of nine different background and color combinations. Users can toggle through the background and color selections by repeatedly pressing the **CHANGE COLOR [F8]** key. These colors are based on the three colors selected in the **Set Color Palette Menu**, which is accessed by pressing **CTRL + CHANGE COLOR [F8]**.

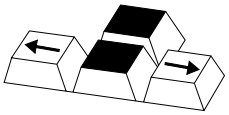
USING THE ACTION KEYS IN MARKING



UP/DOWN POSITIONING KEYS

Positions the active marker or cursor up or down one increment at a time, until the marker is anchored by pressing **ENTER** or **DROP**. For fine positioning, press the **CTRL** key together with the desired positioning key. In **ALIGN Mode**, positions all markers in unison up or down.

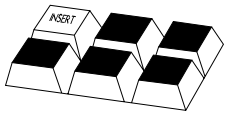
POSITIONING keys are also used with the **SIZE OBJECTS/TEXT [F4]** key to size objects vertically. These objects include horizontal grids, vertical scales, box grids, boxes and circles. Press the **UP POSITIONING key** to make the object taller. Press the **DOWN POSITIONING key** to make the object shorter. To save the size and exit sizing, press **ENTER**. The sized object may now be positioned anywhere on the screen.



LEFT/RIGHT POSITIONING KEYS

Positions the active marker or cursor left or right one increment at a time, until the marker is anchored by pressing **DROP** or **ENTER**. For fine positioning, press the **CTRL** key together with the desired positioning arrow. In **ALIGN Mode**, positions all markers in unison left or right.

This key is also used with the **SIZE OBJECTS/TEXT [F4]** key to size objects horizontally. These objects include vertical grids, horizontal scales, box grids, boxes and circles. Press the **LEFT POSITIONING key** to make the shape wider. Press the **RIGHT POSITIONING key** to make the shape narrower. To save the size and exit sizing, press **ENTER**. The sized object may now be positioned anywhere on the screen.



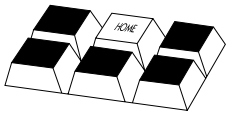
DROP [*Insert*]

Anchors or secures an active marker in its current location on the screen. Once dropped, a marker cannot be moved again or changed. However, markers may be removed from the screen by pressing **UNDO [*Delete*]** or **CLEAR [*End*]**.

Once an active marker has been anchored, another active marker of the same type will appear near the marker that was just anchored. This new active marker acts as a cursor or icon and can also be positioned and anchored, or it can be changed to another type of marker simply by pressing the desired marker key.

Anchored graphics are automatically stored in the current overlay and will be displayed on that overlay as placed even after the **VIA-70** has been powered up again. Multiple markers of the same type and combinations of other markers may be anchored on a single overlay.

In **Align Mode**, pressing **DROP** anchors all markers in the current offset position and exits the **Align Mode**.

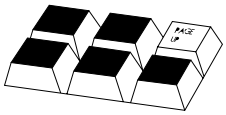


OVERLAY [*Home*]

Removes the cursor, active markers, marker coordinates and other data from the screen so that only the anchored graphics in the current overlay are visible.

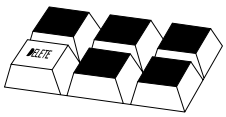
This option is usually desired before making a video copy.

To regain an active marker or cursor on the overlay, press the desired marker function key.



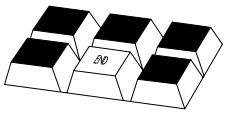
PREV OVERLAY [*Page Up*]

Displays the previous overlay and the markers stored in that overlay (if any). Pressing this key repeatedly will continue to display each previous overlay in descending order. The number of each new overlay will appear briefly at the bottom right corner of the screen. Ten different overlays may be stored. If the overlay had been aligned, the aligned markers will be displayed at their saved offset, but the **ALIGN Mode** will not be active. This means that the entire overlay will not be positionable until users activate the **ALIGN Mode**.



UNDO [*Delete*]

Erases markers one at a time, beginning with the most recently anchored marker. This key may be repeatedly pressed until all anchored graphics have been erased. The **UNDO** key will not remove the active marker or cursor. To remove the active graphic or cursor, press **OVERLAY [*Home*]**.



CLEAR [*End*]

Clears the overlay of all markers at once. A warning message will appear on screen to avoid an unintentional erase. To proceed with the clearing procedure, select the **CLEAR** option. To cancel the procedure and retain current markers, select **CANCEL**. After clearing, the active marker or cursor will remain on screen even when all graphics have been cleared. To remove the active marker or cursor, press **OVERLAY [*Home*]**.

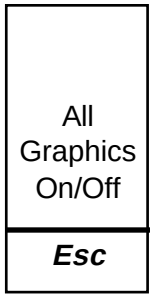
NEXT OVERLAY [*Page Down*]

Advances users to the next overlay and any markers stored in that overlay. Pressing this key repeatedly will continue to display the next overlay in ascending order. The number of each new overlay will appear briefly at the bottom right corner of the screen. Ten different overlays may be stored. If the overlay had been aligned, the aligned markers will be displayed at their saved offset, but the **ALIGN Mode** will not be active. This means that the entire overlay will not be positionable until users activate the **ALIGN Mode**.

ENTER

Anchors an active marker. Once dropped, a marker cannot be moved or changed. However, markers may be removed by pressing **UNDO [Delete]** or **CLEAR [End]**.

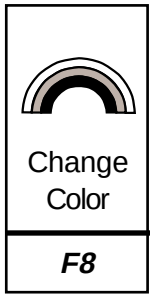
In **ALIGN** Mode, anchors all markers in the current offset position and exits **ALIGN** Mode.



ALL GRAPHICS ON/OFF [*ESC*]

Turns off the **VIA-70** overlay so that the video image may be viewed independently, without the markers. Pressing this key again, or any other function key, will turn on the **VIA-70** overlay and display the markers as they were before pressing **ALL GRAPHICS ON/OFF**.

This key is different from the **OVERLAY [Home]** key which allows users to view the image and markers without the cursor or active marker.



CHANGE COLOR [*F8*]

Changes the color or gray level of the active marker for optimum contrast with the video image or to contrast the current marker with other markers on the overlay.

Repeatedly pressing this key combination will cycle through the three different colors or gray levels that have been assigned to the palette by the user in the **Set Color Menu** (discussed below). When the active marker displays the desired color, the marker can be positioned and anchored in that color.

NOTE: If the color of the graphics does not change from black, the brightness level is too low and must be increased before selecting the color. Brightness is increased in the **Set Color Palette Menu**. *Consult the installation section of this manual to identify video interfaces which can create color markers for RGB and Y/C systems.*

Ctrl + CHANGE COLOR [*F8*] = Set Colors / Brightness

This key combination calls up two menus that assist users in 1) defining a three-color palette and, 2) designing menus using these three colors. By designing a palette and menus, the **VIA-70** markers and menus can be made to optimally contrast with the video image, thus reducing eye strain and increasing legibility.

The first menu displayed is the **Set Color Palette Menu** in which users choose three colors they would like to use for markers and menus (refer to Figure **3.5**). Colors available are red, green, blue, magenta, yellow, white and black. To select a color, press the **CHANGE COLOR [F8]** key until the desired color is displayed. All colors available for markers and menus will be based off the selections made in this menu. No two colors can be the same. For example, if Color #1 is black, colors sequenced through for #2 and #3 will skip over the black option. If black is desired for Color #2, operators need to change Color #1 from black to another color.

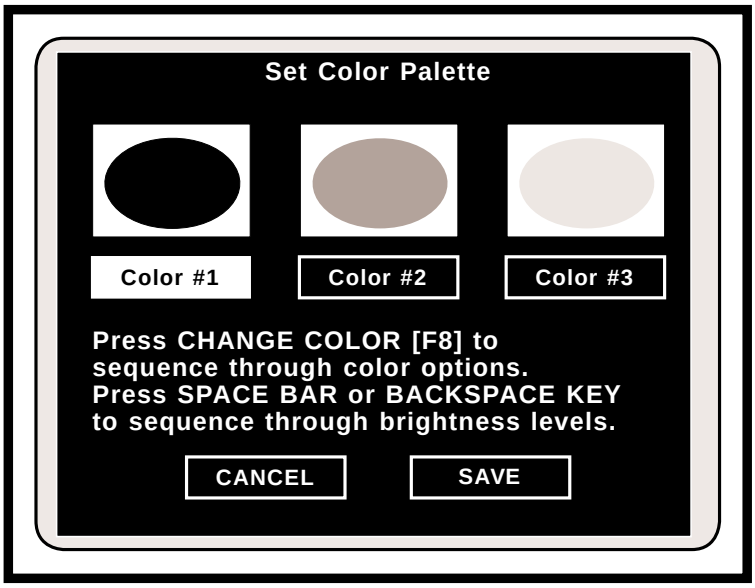


Figure 3.5
Set Color Palette Menu

Each color may be displayed in a range of brightness levels. If, for example, the color red is selected for Color #1, it can be displayed in one of five different brightness levels. To select a brightness level for a color, press the **SPACE BAR** or **BACKSPACE** key to cycle through the brightness levels. When the desired brightness level is displayed, move on to define Color #2 by pressing the **RIGHT POSITIONING** key. Repeat the procedure with Color #2 -- first select the color, then the brightness level, then move on to Color #3 and repeat. When all three colors are set, select SAVE. Users will exit the **Set Color Palette Menu** and will be presented with the **Set Menu Colors Menu** (refer to Figure **3.6**).

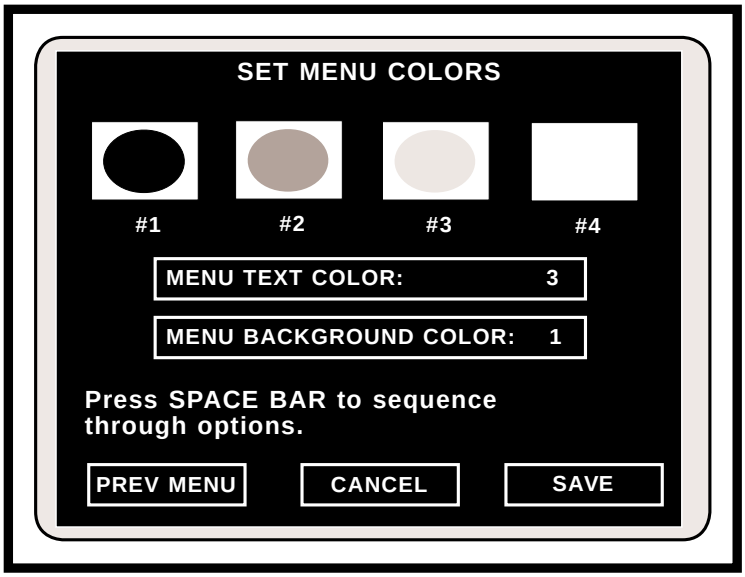


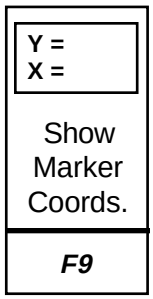
Figure 3.6
Set Menu Colors Menu

The **Set Menu Colors Menu** will display the three selected colors plus a "no fill" option. Follow instructions to select menu TEXT color and menu BACKGROUND color.

> **NOTE:** TEXT will not offer the "no fill" display, that is, it cannot be made to appear transparent. Also, the **VIA-70** ensures that the BACKGROUND color will be different than the text color by not offering an already-used color option.

If the menu BACKGROUND is #4 (no fill), all three colors will be available for menu TEXT.

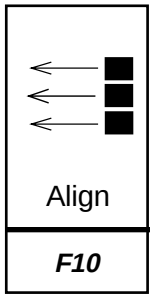
When menu colors have been selected, select SAVE. Colors will be saved and users will be returned to the marker overlay they were in before activating the color menus.



SHOW MARKER COORDINATES [*F9*]

Pressing this key while in the **Marker Mode** will toggle on or off the ***Marker Coordinates Display.*** Located in the lower left corner of the screen as **X=** and **Y=**, the display represents the horizontal and vertical coordinates for the center point of an active circle, box, cross hairs pointer or scale, or for the end point of an active line, drawn line, arrow or text label. The coordinates display is based entirely upon pixel arrangements fixed within the **VIA-70**. Coordinates 0,0 represent the lower left corner of the screen. Depending on the camera and monitor, pixel coordinates may be displayed as high as 1024 pixels by 482 pixels.

> ***NOTE:*** Coordinates for a shape or cursor represent the center point of that shape or cursor. Coordinates for an active arrow pointer represent the tip of the arrow. Coordinates for active scales represent the intersection of the base scale line and the left or top end line. For an active line of text or an active date/time label, coordinates represent the upper left corner of the display.



ALIGN [*F10*]

Aligns a marker overlay with an object in the field of view (i.e., to reposition all markers in unison). The **Offset Display** will appear if users have selected to display the marker coordinates by pressing **SHOW MARKER COORDS [F9]**. At the start, the **Offset Display** in the lower left of the screen reads **X = 0**, **Y = 0**, which represents a zero offset or no alignment in terms of pixel coordinates of the lower left corner of the overlay. Use keyboard **POSITIONING** keys or another controller to move the overlay left, right, up or down. The **Offset Display** will correspondingly reflect pixel coordinates of the lower left corner of each new alignment. Negative X values represent marker movement to the left of the default overlay position. Negative Y values represent marker movement below the default overlay position.

To save the offset and exit the **Align Mode**, press **ENTER** or **DROP [Insert]** or press any marker key. Markers may be added, erased or cleared at this point. A different offset can be attributed to each of the marker overlays (**#1** - **#10**).

Clear
Align
(offset)

F11

CLEAR ALIGN / OFFSET [*F11*]

Clears the offset (alignment) of markers in the current overlay so that coordinates will return to their default position (**Y = 0**, **X = 0**). A warning message will appear to avoid an unintentional clear.

Overlays that have not been aligned will not be affected by the **CLEAR ALIGN / OFFSET [F11]** key.

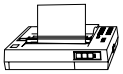
Set
RS-232C

F12

Set RS-232C [*F12*]

Displays the **RS-232C Menu** in which users set RS-232C parameters, including baud rate (300, 600, 1200, 2400, 4800, 9600) and a terminator carriage return (return only, or return plus line feed). The default settings are a baud rate of 9600 and a carriage return + line feed. After entering the choices, select **ENTER** to save the changes or select **CANCEL** to exit without saving changes.

To program a computer to accept the downloaded information, refer to **Section Four: Communication**.



RS-232C
Transmit

Print Screen

RS-232C TRANSMIT [*Print Screen*]

Transmits the active marker coordinates or alignment (**Offset Display**) through an RS-232C serial port to a computer or ASCII terminal. The **Coordinates Display** or the **Offset Display** must be visible on screen in order to print.

To display marker coordinates before printing, press the **SHOW MARKER COORDS [F9]** key. To display an alignment before printing, press the **ALIGN [F10]** key.

Demo
Features

Scroll Lock

DEMO FEATURES [*Scroll Lock*]

Activates a demonstration of the **VIA-70** features which may be useful in giving new users an overall orientation on the product. The demonstration is brief.

To cancel the demonstration while in progress, press any function key. To pause the demonstration, press the **HELP [Pause]** key. To speed up certain portions of the demonstration, repeatedly press the **DEMO FEATURES [Scroll Lock]** key until the desired feature is displayed.

?

Help

Pause/ Break

HELP [*Pause/Break*]

Activates the **HELP Mode.** Pressing **HELP [Pause/Break]**, then any other key will display information about the use of that key. Arrows in the upper right corner of the **HELP** screen indicate that an additional page of **HELP** is available. Press the **UP** or **DOWN POSITIONING** key to access that page.

To exit **HELP**, press **ENTER**.

Section Four: Communication

USE OF THE RS-232C PORT

BASIC OPERATION

Output is provided for most printers, terminals or computers that will accept data in ASCII format and meet **RS-232C** electrical specifications.

Before operators use the **RS-232C** data output, they must verify the parameters for their specific printer or computer. The **VIA-70 RS-232C** parameters are factory set at 9600 baud, 8 data bits, 1 stop bit, no parity, and CR data block terminator. All but two of these parameters are permanently fixed. Operators may select baud rates and a data block terminator of a carriage return with a line feed or a carriage return without a line feed. To change the factory setting for either of these two parameters, follow the instructions on the next page.

Also, before computers can use the **RS-232C** data output, they must be programmed to request the information. Program instructions are on page 46.

Set Up

Before using the **RS-232C** data output capability, operators must verify and/or set the parameters through the **RS-232C Set-Up Menu**.

To set up RS-232C communications:

1. **Press the SET RS-232C [F12] key.**

   The **RS-232C Set-Up Menu** will appear on the video screen (see Figure **4.1**). The BAUD RATE option will be highlighted (factory setting is 9600 baud).

2. To change the baud rate, **press the SPACE BAR to toggle through the available baud rates until the desired rate is displayed on screen**.

Figure 4.1
RS-232C Setup Menu

3. **Press ENTER**.

   The TERMINATOR option will be highlighted, ready for selection.

4. To change the terminator, **press the SPACE BAR to toggle through the available selections until the desired terminator return and line feed is displayed**.

   NOTE: Some printers require a line feed after the carriage return to advance the paper, some advance it automatically. Set terminator to suit specific needs.

5. **Select SAVE to save changes or select CANCEL to default to previous settings**.

   The **RS-232C Setup Menu** will automatically disappear and users will return to their current **Marker Overlay**.

Transmitting Data

While in the **Marker Mode**, operators may transmit the marker coordinates displayed in the lower left-hand corner of the marker overlay. While in the **Align Mode**, the **Offset Display** can be transmitted. The display must be present in order to be transmitted.

On the keyboard controller, the transmit function is operated by pressing the **RS-232C TRANSMIT [Print Screen]** key. On either the knob or joystick controller, the transmit function is operated by the button labeled **TRANSMIT**. At any time operators may simply press the **RS-232C TRANSMIT** key or button and any marker coordinates or offset coordinates displayed on screen will be transmitted through the **RS-232C** port.

When the **VIA-70** is in the **Marker Mode**, and the **Coordinates Display** is on screen, **X = xxx, Y = yyy** will be transmitted (xxx and yyy being the actual coordinates displayed on the screen). In the **Align Mode**, the coordinates are similarly transmitted, with one addition. Whenever negative values appear on screen, these also will be transmitted (e.g., **X = -178**, **Y = -62**).

Program to Test Port

To test the **RS-232C** computer connection to the **VIA-70**, a program will need to be written for the computer. The requirements for such a program are as follows:

1. a personal computer with at least one serial port.

2. a version of BASICA, GWBASIC or Quick BASIC installed on the computer (other versions of BASIC may or may not have the same syntax as the program printed below).

3. a cable to connect the **VIA-70 RS-232C** port to the computer port (**VIA-70** units have DB-9 connectors for **RS-232C** output).

4. the **VIA-70** powered up and in one of the **Marker Modes**, with camera and video monitor also operating (be sure the camera is turned on first).

The program is as follows:

```
10    REM PROGRAM TO TEST RS-232 INTERFACE ON VIA PRODUCTS
20    REM SET THE VIA FOR 9600 BAUD THRU ITS RS232 MENU
30    PRINT "NOW PRESS TRANSMIT BUTTON..."
40    OPEN "COM2:9600,N,8,1,DS"AS #1
50    INPUT #1, X$
60    PRINT X$
70    GOTO 50
```

Line 40 of this program can be changed to specify any COM port the user prefers.

When this program is run on the computer, users will be prompted to press the **RS-232C TRANSMIT [Print Screen]** key on the **VIA-70**. If the **VIA-70 RS-232C** connection is functioning properly, the coordinates on the **VIA-70** will be displayed on the computer monitor. If there are any questions, users are welcome to call the Service Department at Boeckeler Instruments, Inc., at (800) 552-2262.

RS-232C Connector Pin Out

The **RS-232C** connector is on the rear panel of the **VIA-70** and is a standard DB-9. If operators are connecting the **RS-232C** connector to a printer or computer, they will need a cable which has nine pins on one end and a connector on the other end compatible with the printer or computer. Such cables are available at most electronic stores or from your Boeckeler dealer. The following pin out is standard except for pin 9 which is unused in the EIA Standard.

> ***NOTE:*** when establishing an RS-232C communications link, the following table should be utilized. The most commonly asked pin out question is regarding pin #7.

Table 4.2
RS-232C Connector Pin Out

PIN #	NAME	DESCRIPTION
1	DCD	Data Carrier Detect. The **VIA-70** sets this control line to an active high.
2	RXD	Receive Data. The **VIA-70** transmits data on this pin.
5	GND	Signal Ground. ***This pin must be connected to signal ground at the remote device connector***.
6	DSR	Data Set Ready. The **VIA-70** sets this control line to an active high.
7	RTS	Request to Send. ***This control line must be set active high.***
8	CTS	Clear to Send. The **VIA-70** sets this control line to an active high.
9	SEND	Used as a foot pedal switch. This is not a standard **RS-232C** signal; pin 9 is not used in the standard fashion. Grounding this pin causes the interface to send a block of data. This is an optional method of initiating transmission when the **VIA-70** is connected to a computer.

Section Five: Appendices

TROUBLESHOOTING GUIDE

The quality inspectors at Boeckeler Instruments test each **VIA-70** for software and hardware performance prior to shipment. Therefore, most problems which operators encounter are related to installation. Table **5.1** below describes common problems and their solutions. If, after referring to this table, a problem still exists, call Boeckeler Instruments, Inc., at (800) 552-2262 and ask for technical assistance. There are no user serviceable parts in the **VIA-70**. Do not open the cabinet.

Table 5.1
Troubleshooting Guide

Symptoms	Possible Solutions
The green indicator light on the front of the **VIA-70** does not light up.	**1.** Check that the **VIA-70** is plugged into a live outlet. **2.** On the back panel of the **VIA-70** remove the plastic cover above the power supply connector and check for a blown fuse. Replace the fuse only with a BUSS MDL 3/8 amp slow blow.
Monitor does not light up.	**1.** Check that the monitor is plugged into a live outlet. **2.** Check that the monitor is switched on. **3.** Check that the monitor brightness control is properly adjusted.
Monitor displays a scrambled picture.	**1.** Check the horizontal hold control on the video monitor for proper adjustment. **2.** Check that the Dual Voltage Switch (110V/220V) located on the back panel of the **VIA-70** is properly set.

(continued on next page)

Table 5.1
Troubleshooting Guide
(continued)

Symptoms	Possible Solutions
Monitor lights up but does not display a picture.	**1.** Check that the video source and **VIA-70** are each plugged into a live outlet. **2.** Check that the video source and **VIA-70** are both switched on. **3.** Check that the coaxial cables are connected to the proper BNC connectors on the video source, the **VIA-70** and the monitor. Some cameras and monitors have multiple output and input connectors. Consult your video manuals for correct connection information. **4.** If the video source or monitor has a switch for 75 OHM or high Z, ensure this switch is in the 75 OHM position. **5.** On the back panel of the **VIA-70** remove the plastic cover above the power supply connector and check for a blown fuse. **6.** Bypass the **VIA-70** by connecting the monitor directly to the video source. If the video image still does not appear, have the video source and monitor checked.
The **VIA-70** graphics bloom.	**1.** Adjust system parameters on the video output device, monitor or camera (if in use) such as contrast, gain, brightness, color, light and intensity. **2.** Adjust the color or gray level of the **VIA-70**.
Video image on monitor scrolls.	**1.** If using composite input, ensure that the 37-pin ribbon cable between the **VIA-70** and Y/C or RGB interface is disconnected.
Light pen cursor or drawing line will not follow the light pen over the darker area of an image.	**1.** The image is too dark for the light pen to detect and alter the cursor/line position. Increase the brightness of the monitor.

GLOSSARY

ACTION KEY
- keyboard function keys which allow users to perform actions or begin a given process. These keys are used with marker keys.

ACTIVE MARKER
- the graphic or text block on the overlay which is positionable.

ANCHORED MARKER
- the opposite of an *active* marker. An anchored marker has been placed in a fixed position on the overlay and cannot be moved again. However, anchored markers may be erased or cleared.

ASCII
- the **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange is one of the standard formats for representing characters.

BAUD RATE
- the rate at which data is transmitted over a serial interface. The transmitting and receiving devices must be set at the same rate.

BLOOM
- markers which enlarge or blur on the monitor due to excessive brightness.

BNC COAXIAL CABLE
- a cable consisting of a tube of electrically conducting material surrounding a central conductor held in place by insulators and that is used to transmit high frequency television signals.

BOX
- a square or rectangular marker which may be sized and placed on a **VIA-70 overlay**, in any number or in combination with other markers.

CCIR
- the specifications describing monochrome television electrical performance standards issued by the International Radio Consultative Committee, an international telecommunications standards-setting body of the United Nations. The CCIR standard is used throughout most of Europe and Africa (except France and parts of northern Africa).

CIRCLE
- a circle or elliptical marker. In the **VIA-70**, circles may be sized into perfect or oval shapes. Such markers may be placed in an overlay in any number and in combination with other markers.

CLEAR
- the *action key* which allows operators to clear the overlay of all markers at once. A single active marker will remain on screen.

CONTROLLER
- a device which controls the creation, positioning and storage of markers on a **VIA-70** overlay, such as a keyboard, light pen or knob controller.

COORDINATES
- a set of numbers used to specify the location of a point on the video monitor.

CROSS HAIRS
- a symbol consisting of two perpendicular lines. In the **VIA-70**, there is a cross hairs pointer used in marking.

CURSOR
- in the **VIA-70**, a symbol used to designate the menu options or a point of positioning such as used in defining endpoints of a straight line. When the optional LP-32 light pen or mouse device is used, a cursor is displayed to position the starting point of a drawn line.

DRAW
- the capability to freehand draw or write on a **VIA-70** marker overlay. Drawn lines may be combined with other markers on a single overlay.

EIA RS-170
- the specifications describing monochrome electrical performance standards issued by the Electronic Industries Association (EIA). Also referred to as RS-170 (Recommended Standard # 170). The EIA standard is used in North and South America, Japan and most of Asia.

FIELD OF VIEW
- the live video image which can be observed within the boundaries of the video monitor.

GRAY LEVEL
- the degree of white, gray, or black used to display the **VIA-70** graphics on the video screen. When the **VIA-70** is used with RGB or Y/C cameras and monitors and with **VIA-RGB** or **VIA-Y/C** interfaces, gray level controls become color selection controls, used to create brightly colored markers and measuring lines.

GRID
- a marker consisting of several evenly spaced parallel lines. Vertical grids consist of vertical lines, horizontal grids consist of horizontal lines, and box grids consist of both horizontal and vertical lines.

LINES, MARKING
- graphic lines which are superimposed on a video image and positioned by operators to mark or annotate the object in the field of view. Marking lines are anchored, stored and erased. Once anchored, lines may not be repositioned, although they may be erased or cleared from the overlay.

MARKER
- graphic symbols (pointers, scales, grids, boxes, circles, date/time labels, freehand

drawings and text) which are superimposed on a video image and positioned by operators to mark or annotate the object in the field of view. Once anchored, markers may not be repositioned, although they may be erased or cleared from the overlay.

NONVOLATILE MEMORY
- memory which retains information whether or not power is being supplied to the unit.

NTSC
- the North American **N**ational **T**elevision **S**ystem **C**ommittee 525-line color-TV standard. The NTSC standard is used in North and South America, Japan and most of Asia.

OVERLAY
- a combination of one or more graphic symbols placed on the screen using the marking capabilities of the **VIA-70**.

PAL
- the European 625-line, 25-frame color TV **P**hase **A**lternate **L**ine standard. The PAL standard is used throughout most of Europe and Africa (except France and parts of northern Africa).

PIXEL
- condensed form of the phrase "picture element" used to describe a unit of visual data, usually applied to a video screen or video overlay.

POINTERS
- markers used to point at or draw attention to important aspects of a video image. In the **VIA-70**, these include arrows, cross hairs, pointed cross hairs, small boxes, small circles, target boxes and target circles.

RGB
- a video signal which is segregated into three or four picture component signals: red (**R**), green (**G**) and blue (**B**) signals. Synchronization information may be included with the G signal or may be separate.

RS-170
- see *EIA RS-170*.

RS-232C
- the specifications describing serial interface communication standards.

SCALE
- a linear marker with two end points expressing one unit of measure. In the **VIA-70**, scales may be sized vertically or horizontally, to any length. Scales may be placed on an overlay in any number and in combination with other markers. Placed end to end, or in combination with cross hairs markers, scales may be used to create custom rulers on an overlay.

TEXT BLOCK
- one line of text generated by the **VIA-70** keyboard and displayed on the marker overlay. A text block is positionable until it is anchored.

VIDEO SOURCE
- a device from which the **VIA-70** receives a video image. The **VIA-70** incorporates the

image with its graphic overlay capabilities, then outputs the image and graphics to the corresponding monitor. Examples of video sources include VHS recorders/players, macroscopic cameras and microscopic cameras.

VOLATILE MEMORY
- memory which is only retained when a continuous source of power is supplied to the unit.

Y/C
- a video signal which is segregated into two picture component signals: luminance or YIQ/YIV (**Y**) signals and chrominance or color (**C**) signals.

ABOUT BOECKELER INSTRUMENTS

From its beginnings as a small manufacturer of precision micrometer heads in the early 1940s to its cutting edge precision measurement products today, Boeckeler Instruments, Inc., has remained a cornerstone of innovation and reliability in the worlds of science and industry.

Possessing a team well-rounded in design, development and service, Boeckeler products have long been applied to fields as diverse as precision machining, aviation and aerospace, electronics, biomedical research, clinical diagnostics, metallurgy and forensics.

Over the decades, as Boeckeler grew, its creative staff introduced innovations such as a toolmaker's microscope to handle shop floor capacity with watchmaking precision and speed; digital micrometers and readouts; digital filar eyepieces for microscopic measurement; video image analysis systems and auto positioning systems for microscope stages controlled by computer.

If you are interested in Boeckeler's other products or in keeping informed of Boeckeler's latest developments, contact a Boeckeler dealer in your area or call Boeckeler Instruments, Inc., in Tucson, Arizona at *(800) 552-2262*.

Other Fine Boeckeler Products

* VIA-®20 Video Pointer
* VIA-®30J Video Crossline Generator
* VIA-®50 Video Image Marker
* VIA-®100 Video Measurement System
* VIA-®110 Video Hardness Measurement System
* VIA-®150 Video Image Marker-Measurement System
* VIA-®170 Video Image Marker-Measurement System
* Digital Readouts
* Digital Micrometers
* Mechanical Micrometers
* Linear Measuring Systems
* Digital Dial Indicators
* Digital Filar Eyepieces
* Digital Linear Gages
* Auto Positioning Systems
* *Pointmaker*® PVI-70 Multiple-sync Video Marker

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