Selecting The Video Pattern

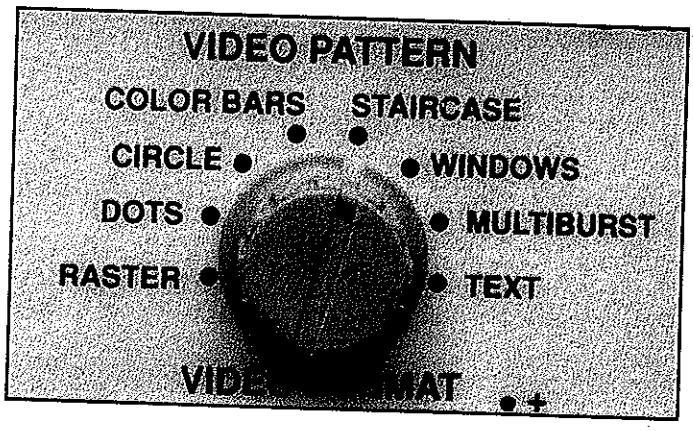

Fig. 18 The VIDEO PATTEN switch.

The VIDEO PATTERN Switch selects the RGB video signals at the SYNC & VIDEO OUTPUT Jack and the "Video" Drive Signal at the DRIVE OUTPUT Jack. Each pattern provides a special test of the monitor's operation. The "R," "G" and "B" VIDEO OUTPUT Buttons must be selected for a pattern to appear on the monitor. Turning any of these buttons "off" will change the displayed pattern. Unless otherwise noted, the patterns appear the same on both "Digital" and "Analog" monitor types. Following is a description of each pattern and its uses.

Note: *Use the "+" Video Format unless you are using the Raster pattern to test high voltage regulation.*

Raster - The Raster pattern produces a box, surrounded by a 1 pixel-wide border. Use this pattern to check color purity and high voltage power supply regulation. The box should be pure white with no color hue when all the "Video Output" Buttons are "on." It changes to black in "-" video polarity. In the "+" video polarity, the box edges should remain straight and ripple free. The outside white border should remain straight and unchanged in either video polarity.

Check color purity by turning each R, G, and B VIDEO OUTPUT "on", one at a time. For each color, the raster should be pure with no other color visible.

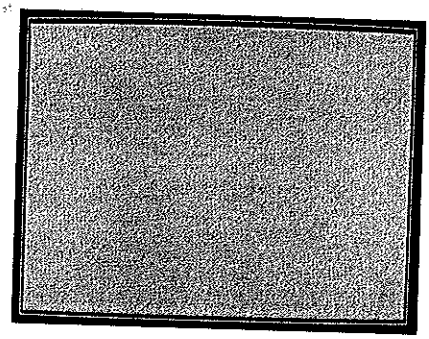

Fig. 19- The RASTER video pattern.

Dots - Use the DOTS pattern for checking static and dynamic convergence. Check for white dots with no visible color. A misconverged CRT will show colored dots, instead of white dots.

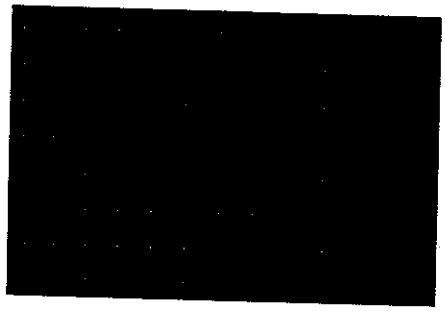

Fig. 20 - The DOTS video pattern.

Circle - The CIRCLE pattern provides a test of the monitor's linearity, and can be used to check dynamic convergence. Check that each line is straight and that each box is square and the same size throughout the raster. Also check that each circle is round with no visible distortion. If the CRT is converged properly, the lines will each be a single, white line instead of two or three colored lines.

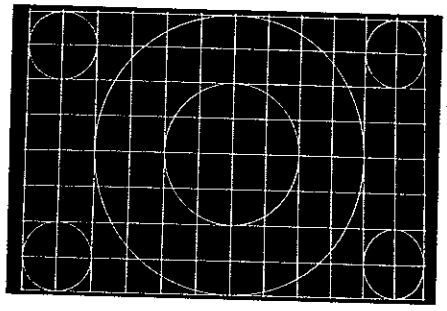

Fig. 21 - The CIRCLE video pattern.

Color Bars - The COLOR BARS pattern tests the monitor's ability to produce proper color. Check that each color bar is present. A missing bar, or wrong color sequence, may indicate that a video channel is connected incorrectly or is defective. Also check that the colors are uniform in intensity from top to bottom and left to right. Non-uniform bars may indicate problems in the video amplifiers.

The COLOR BARS sequence is shown in figure 14 ("+" video polarity) for "Analog" TYPE FORMAT. When the "Digital" TYPE is selected, the pattern changes slightly depending on the setting of the "I" line. With the "I" line "on," the bar sequence is similar to the "Analog" TYPE with the bottom row of bars being brighter than the top row. When the "I" line is "off," the top and bottom bars are the same brightness.

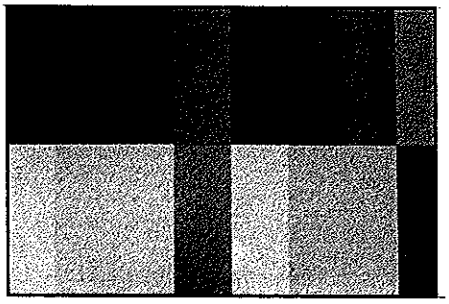

Fig. 22- The COLOR BARS video pattern.

Staircase - The STAIRCASE pattern tests the brightness and contrast linearity of analog, and monochrome digital monitors. A properly working and adjusted analog or monochrome digital monitor will display 16 evenly spaced bars ranging from black to 100% white (or amber or green, depending on phosphor). Each step should have a sharp and distinct transition. The bars should be pure shades of gray with no hint of color.

Note: *The STAIRCASE pattern is produced by changing the signal level on the RGB lines in 16 steps. Therefore, color digital monitors (which are only capable of 2 levels) will not reproduce this pattern. Instead, they will produce color bars having the same sequence as the bars in the COLOR BARS pattern except the top row of bars will be on the left half of the screen and the bottom row will be on right half of the screen.*

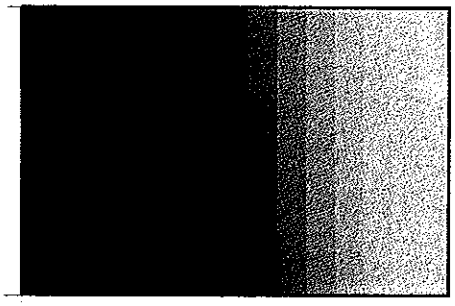

Fig. 23 - The STAIRCASE video pattern (analog and monochro digital monitors).

Windows - Use this pattern to test the monito power supply regulation. Check for a clear, disti transitions between the black and white portions. the white boxes should be the same brightness le and the entire screen should be free of ripple. T pattern should lock in with no "bounce" as you swi between "+" and "-" video polarity.

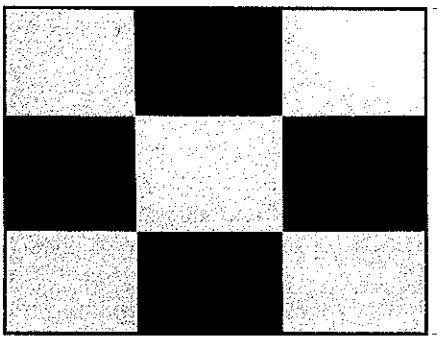

Fig. 24 - The WINDOWS video pattern.

Window - Monitor manufacturers often require WINDOW pattern for making internal contrast a brightness adjustments. The WINDOW pattern also helpful for brightness and color adjustme when the CM2125 is used together with a CRT Co Analyzer.

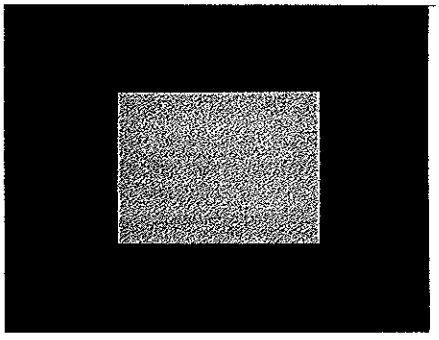

Fig. 25 - The WINDOW video pattern.

Example: changing the WINDOWS pattern to the WINDOW pattern.

1. Press [RECALL] [9] [8] [ENTER]

Now when you turn the VIDEO PATTERN knob to the WINDOWS video pattern a single window will appear in the center of the display. To change the CM2125 to again generate the WINDOWS pattern:

1. Press [RECALL] [9] [8] [ENTER]

Multiburst - The MULTIBURST pattern tests monitor resolution and bandwidth. The sets of vertical lines test horizontal pixel resolution and the sets of horizontal lines test vertical pixel resolution. The lines in each set are grouped according to pixel width. The lines in the first group are 1 pixel wide, the second group 2 pixels wide, the third group 3 pixels wide etc. The 1 pixel wide lines should be individually discernible on a properly operating monitor.

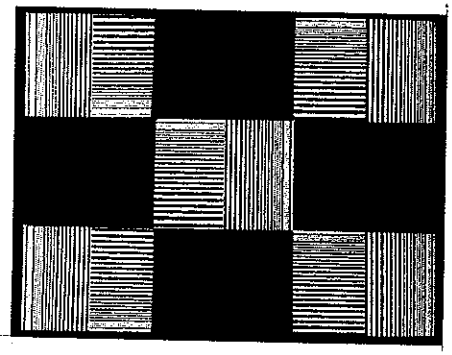

Fig. 26 - The MULTIBURST video pattern. The vertical lines test horizontal resolution and the horizontal lines test vertical resolution.

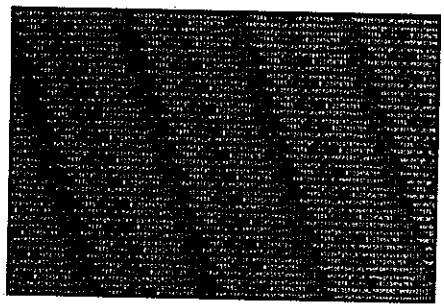

Fig. 27 - The TEXT video pattern.

Text - Use the TEXT pattern to make a final performance test on the monitor. This pattern fills the screen with upper and lower case text characters that duplicates user conditions. All the characters on the screen should be focused and easy to read.

TROUBLESHOOTING AND ANALYZING

The CM2125 provides special tests and signals to help you isolate problems to the defective stage. The Digital Display section provides a special Ringer test and signal measuring capabilities. The Drive Signal section provides signals to inject into the monitor circuits. This section explains how to use these troubleshooting and analyzing features of the CM2125. If you are not familiar with monitor troubleshooting, or need more information and examples on using the tests and Drive Signals, refer to the APPLICATIONS section of this manual.

Digital Display

The Digital Display section includes the DIGITAL DISPLAY Switch and the DIGITAL DISPLAY Readout. The DIGITAL DISPLAY Switch has three sections: 1) Ringer tests, 2) DVM, and 3) Drive Signal monitor. The DIGITAL DISPLAY Readout located directly above the switch shows the result of each test.

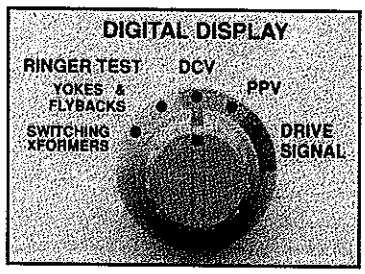

Fig. 28 The CM2125 provides tests and injection signals for troubleshooting defective monitors.

RINGER TEST

The Ringer Test detects shorted turns in deflection yokes, flyback transformers and IHVTs, and switching power supply transformers. It checks the coil's quality or "Q" and will locate shorted turns that cannot be detected by other troubleshooting methods. The Ringer test is the same patented test used in other Sencore Analyzers and "Z Meters."

Note: The Ringer Test may not show the same number of "Rings" as the Ringer in another Sencore unit. This is due to small variations in drive levels and autoranging steps. In all cases, coils with a shorted turn will read "Bad."

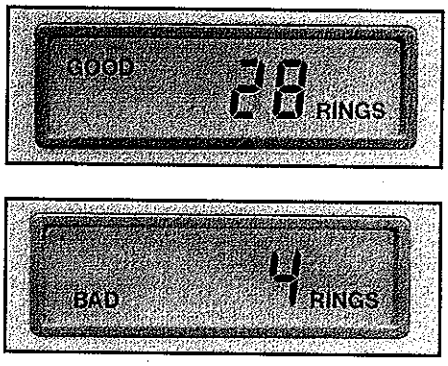

Fig. 29 Good yokes and transformers will ring greater than 10 (top), while a bad component will ring less than 10 (bottom).

Connecting the Test Lead to the coil places a capacitor in parallel with the coil. A pulse is applied to the cap/coil combination and the CM2125 automatically ranges the capacitor value to produce the highest number of "rings." The DIGITAL DISPLAY Readout shows the number of times the coil rings before it dampens out. A reading of "10" or more is "GOOD" and means that the coil does not contain a shorted turn. A "BAD" reading, less than 10 rings, indicates a shorted turn. The CM2125 provides two different Ringer Test positions that match the different types of coils found in monitors. Refer to the APPLICATIONS section for more details on ringing yokes and transformers.

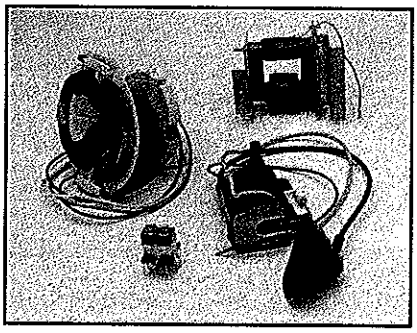

Fig. 30 Use the Ringer Test to locate shorted turns in switching transformers, yokes, flybacks and IHVTs.

Switching Xformers - Use this Ringer Test position to test the transformers used in switching power supplies. These transformers typically have a lower "Q" than yokes and flybacks and need to be tested at a different level. The transformer needs to be removed from the circuit to make the Ringing test.

Yokes & Flybacks - Use this Ringer Test position for testing deflection yokes, flyback transformers, and the flyback portion of IHVTs. Refer to the APPLICATIONS section for special details on ringing flybacks and yokes.

Ringer Fuse - The Ringer Test function is protected from externally applied voltage by a 1 amp, 250 volt Slo-Blo fuse, type 3AG. The fuse holder is on the rear panel of the unit. If the fuse blows, the Ringer Test will read "0 RINGS" on every coil you test.

To replace the Ringer fuse:

1. Press to release the snap-in fuse holder.
2. Pull the holder and the fuse out of the fuse holder base.
3. Replace the fuse with another of the same type and rating.
4. Insert the holder and fuse into the fuse holder base and snap it back into place.

CAUTION

The wrong Ringer fuse may damage the CM2125. Replace only with type 0.5 Amp, 250 Volt, Fast-Blo Type 3AG.

To do the Ringer Test:

1. Connect the supplied DIRECT TEST LEAD to the RINGER TEST Jack.
2. Set the DIGITAL DISPLAY Switch to the component type to be tested.
3. Connect the direct Test Lead to the component.
4. Read the test result in the DIGITAL DISPLAY.

A reading of "10" or more indicates that the component does not have a shorted turn.

Notes: *1) IHVTs develop may develop failures other than shorted turns. 2) If the vertical winding of a yoke contains damping resistors, remove them first. See "Testing Yokes" on page 43. 3) Flyback Transformers may develop shorts between windings. See "Testing Flyback Transformers" on page 46.*

DVM

The autoranged DVM portion of the DIGITAL DISPLAY section measures external DC and peak-to-peak voltages. Use the DIGITAL DISPLAY Switch to select the desired measurement. The DIGITAL DISPLAY Readout displays the voltage levels.

Use the supplied DVM TEST LEADS (39G264) to connect the external voltages to the PPV & DCV INPUT Jack. The input range limits are 2000 volts for both DCV and PPV, with the PPV frequency response extending from 30 Hz to 5 MHz. The measuring range of the DCV function is extended to 10 kV by the TP212 "10kV Transient Protector Probe" (optional), and to 50 kV with the (optional) HP200 "50kV High Voltage Probe."

WARNING

Over 1000 volts may be present at this terminal. Use extreme caution.

ATTENTION

Plus de 1000 volts peuvent étre present á cette terminaison. Faites trés attention.

To measure external DCV and PPV:

1. Set the DIGITAL DISPLAY Switch to either "DCV" or "PPV".
2. Connect the "Banana" ends of the supplied DVM TEST LEADS to the PPV & DCV INPUT Jack.
3. Connect the probe ends of the supplied DVM TEST LEADS to the circuit test points.
4. Read the level in the DIGITAL DISPLAY Readout.
5. A flashing "888" display indicates the applied signal is greater than 1999 volts.

DRIVE SIGNAL MONITOR

The "Drive Signal" position of the DIGITAL DISPLAY Switch allows you to monitor the level of the internal Drive Signals. The DIGITAL DISPLAY Readout shows the signal level at the DRIVE OUTPUT Jack. The readings are accurate for all signals and ranges.

Drive Signals

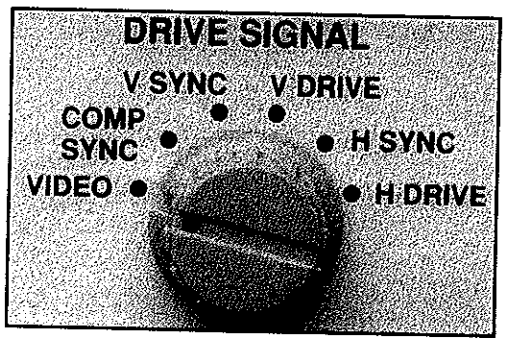

Fig. 31 - Use the drive signals to inject a known good signal into a defective stage in the monitor.

The Drive Signals provide a known good signal to substitute into the circuits to locate the defective stage. The Drive Signals are phase-locked to the RGB signals at the SYNC & VIDEO OUTPUT Jack to restore proper operation when substituting for the missing or wrong signal. Connect the monitor to the SYNC & VIDEO OUTPUT Jack and set the PARAMETERS and VIDEO FORMAT to match the monitor. Then, inject the substitute Drive Signals into the defective stages to restore normal operation. Specific information on troubleshooting using Signal Substitution and the Drive Signals is located in the APPLICATIONS section of this manual.

Use the supplied DIRECT TEST LEAD (39G221) to connect the DRIVE OUTPUT Jack to the circuit. The DRIVE OUTPUT Jack has a floating ground so you can use it independently of the other CM2125 Input or Outputs, and you can connect the "Ground" lead to points other than circuit ground.

Drive Signal Switch

The DRIVE SIGNAL Switch selects the signal available at the DRIVE OUTPUT Jack. The frequency of the Drive Signals match the RGB signals at the SYNC & VIDEO OUTPUT Jack and can be set with the PARAMETERS Buttons.

VIDEO - The "Video" Drive Signal provides the proper signal to inject into video stages, including the red, green and blue channels. The "Video" Drive Signal will produce the color of the channel it is injected into. Use the "Raster" VIDEO PATTERN with the "Video" Drive Signal for most troubleshooting applications.

The "Video" Drive Signal matches the green "Video Output" signal. Injecting using the "Color Bars" or "Staircase" video patterns into the red, green and blue channels will cause the color bars to appear in a different order.

COMP SYNC - This Drive Signal provides vertical and horizontal composite sync. Use it in monitors that contain sync separator stages. The frequencies match the SYNC & VIDEO OUTPUT signals. The "Interlace" VIDEO FORMAT Button turns interlace on and off.

V SYNC - The vertical sync Drive Signal provides the proper signal to inject into the vertical stages before the oscillator. The frequency matches the SYNC & VIDEO OUTPUT signal. The "Interlace" VIDEO FORMAT Button turns interlace on and off.

V DRIVE - The vertical drive Drive Signal closely matches the signal in the vertical output stages. Use it to inject into the vertical stages between the oscillator output and driver output.

H SYNC - The horizontal sync Drive Signal provides the proper signal to inject into the horizontal stages before the oscillator. The frequency matches the SYNC & VIDEO OUTPUT signal. This Drive Signal is also used to do the IHVT "Drive Test" explained in the APPLICATIONS section.

H DRIVE - The horizontal drive Drive Signal closely matches the signal in the horizontal output stages. Use it to inject into the horizontal stages between the oscillator output and the base of the output transistor.

Setting The Drive Level

The DRIVE RANGE and DRIVE LEVEL Controls adjust the peak-to-peak level of the signal at the DRIVE OUTPUT Jack. The DRIVE RANGE CONTROL provides a coarse adjustment of the output signal level. It sets the maximum output level at 3, 30, or 300VPP. The 3 & 30VPP ranges can drive a 100 ohm impedance before the output level drops, while the 300VPP range can drive a 10 kohm impedance.

***Note:** The "warning LED" will flash whenever the 300 VPP Drive Range is selected to warn you that the signal is sufficient to produce a shock.*

The DRIVE LEVEL Control provides a variable signal level within the range set by the DRIVE RANGE Control. The signal level at the DRIVE OUTPUT Jack is shown in the DIGITAL DISPLAY Readout when the DIGITAL DISPLAY Switch is set to "Drive Signal." The DRIVE LEVEL Control also sets the polarity of the output signal. Turning the DRIVE LEVEL Control clockwise produces positive polarity signals, while turning the control counter-clockwise produces negative polarity signals.

To use the Drive Signals:

1. Set the DIGITAL DISPLAY Switch to "Drive Signal."
2. Set the DRIVE LEVEL Control to "0."
3. Select the desired Drive Signal.
4. Connect the DIRECT TEST LEAD to the DRIVE OUTPUT Jack and connect the test clips to the circuit test point and circuit ground.
5. Set the DRIVE RANGE CONTROL to the lowest range that includes the required signal level.
6. Adjust the DRIVE LEVEL Control to the desired level while reading the output level in the DIGITAL DISPLAY Readout.

COMPUTER AUTOMATED OPERATION

Introduction

The CM2125 Computer Monitor Analyzer can be used for computer controlled, automated testing. A simple computer program can be developed that automatically "sets up" the CM2125's front panel controls as well as collects test data.

The CM2125 can be used with either the IEEE-488 Bus and the Sencore IB72 accessory, or the RS232 Bus and the Sencore IB78 accessory. Both accessories connect to the INTERFACE ACCESSORY JACK on the rear of the CM2125.

Note: *when using the CM2125 with the IB72 IEEE 488 Bus Interface, check if EPROM IC4 is version 2.0. If your IB72 has version 2.0, contact the Sencore Service Department for a replacement.*

The CM2125 can be used as either a "talker" or "listener." When the CM2125 is in the "listener" mode, the computer has control of the front panel setup. The computer can automatically set the sync and pixel parameters, the video pattern, video format, digital display controls and the drive signal.

Note: *the CM2125's drive signal level cannot be set by the computer.*

When the CM2125 is in the "talker" mode, it sends information to the computer. Upon the correct command from the computer program, the CM2125 will send all of its front panel settings as well as ringer test readings, DC volts readings and peak-to-peak volts readings.

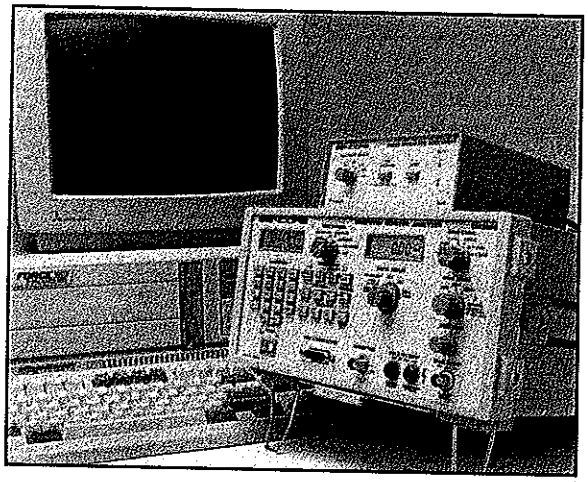

Fig. 32 - The CM2125 can be used for automatic testing by connecting an Interface Accessory and a computer.

CONNECTING THE CM2125 TO THE INTERFACE BUS

The CM2125 produces a specially formatted signal which must be translated by a Sencore Bus Interface Accessory. The interface accessory connects in series with the computer and the CM2125. A standard cable connects the computer and the interface accessory.

WARNING

Connect only the Sencore interface bus accessories to the INTERFACE ACCESSORY JACK on the rear of the CM2125. Do not connect other instruments or interface bus equipment to the CM2125 even if the connectors fit.

When the IEEE-488 bus system is used, the CM2125 must be assigned an address separate from the other products on the system. This enables the computer to select which instrument it talks or listens to (follow the individual instructions for the computer and interface accessory for connection and address requirements.)

WARNING

Do not apply power to the CM2125 or interface accessory until all connections have been made.

To connect the CM2125 to an automated test system:

1. Remove power from the CM2125, interface accessory, and the computer.
2. Set the slide switch on the rear of the IB72 IEEE-488 Bus Interface Accessory for the proper address assigned to the CM2125. No addressing is needed with the IB78.
3. Connect the interface accessory's male DIN connector to the INTERFACE ACCESSORY JACK located on the rear of the CM2125.
4. Connect the proper cable from the interface accessory to the computer.
5. Supply power to all units in the automated system, and verify all units have been turned on.

COMMAND DESCRIPTIONS

The same sequence of steps are required to use the CM2125 via the computer interface bus as are required for manual operation. The CM2125 uses an extensive series of commands to control the front panel setup. The entire command must be sent in order for the CM2125 to properly respond. Following is a listing of the control commands recognized by the CM2125:

The CM2125 As a Listener

HFQ XXX.X KHZ	set horizontal scan frequency (in KHz)
VFQ XXX.X HZ	set vertical scan frequency (in Hz)
HPX XXXX PIX	set horizontal pixel resolution
VPX XXXX PIX	set vertical pixel resolution
PAT RAS	select RASTER pattern
PAT DOT	select DOTS pattern
PAT CIR	select CIRCLE pattern
PAT BAR	select COLOR BARS pattern
PAT MLT	select STAIRCASE pattern
PAT STR	select WINDOWS pattern
PAT WIN	select MULTIBURST pattern
PAT TXT	select TEXT pattern
OUT DIG	set video output to digital
OUT ANA	set video output to analog
MOD INT	interlaced format mode
MOD NON	non-interlaced mode
VID+	set video to (+)
VID-	set video to (-)
HSY+	set horizontal sync to (+)
HSY-	set horizontal sync to (-)
VSY+	set vertical sync to (+)
VSY-	set vertical sync to (-)
RSY ON	place sync on red video
RSY OFF	take sync off of red video
GSY ON	place sync on green video
GSY OFF	take sync off of green video
BSY ON	place sync on blue video
BSY OFF	take sync off of blue video
RGN ON	turn red output on
RGN OFF	turn red output off
GGN ON	turn green output on
GGN OFF	turn green output off
BGN ON	turn blue output on
BGN OFF	turn blue output off
IGN ON	turn intensity output on
IGN OFF	turn intensity output off
STO XX	store setup in memory location XX
RCL XX	recall setup from memory location XX
DSP RYF	set the DIGITAL DISPLAY switch to RINGER TEST YOKES & FLYBACKS
DSP RSX	set the DIGITAL DISPLAY switch to RINGER TEST SWITCHING XFORMERS
DSP VDC	set the DIGITAL DISPLAY switch to DCV
DSP VPP	set the DIGITAL DISPLAY switch to PPV
DSP DRV	set the DIGITAL DISPLAY switch to DRIVE SIGNAL
DRV VID	set drive signal to VIDEO
DRV CMP	set drive signal to COMP SYNC
DRV VSY	set drive signal to V SYNC
DRV VDR	set drive signal to V DRIVE
DRV HSY	set drive signal to H SYNC
DRV HDR	set drive signal to H DRIVE
SPE	enable sync parameters change mode
SPD	disable sync parameters change mode
THS XXXX NS	set horizontal sync time
THF XXXX NS	set horizontal front porch time
THB XXXX NS	set horizontal back porch time
TVS XXXX US	set vertical sync time
TVF XXXX US	set vertical front porch time
TVB XXXX US	set vertical back porch time
CPO	resets the CM2125 to manual operation after a bus command has been received

The CM2125 As a Talker

CPS ALL	returns all of the front panel settings and readings (18 lines of data)
CPS MET	returns digital display reading
CPS LCD	returns frequency/pixel display (4 lines of data)
CPS DTM	returns display timings
CPS DSP	returns digital display function
CPS DRV	returns which drive signal is being generated
CPS HFQ	returns horizontal sync frequency
CPS VFQ	returns vertical sync frequency
CPS HPX	returns horizontal pixel resolution
CPS VPX	returns vertical pixel resolution
CPS MEM	returns the memory location (if it has been stored)
CPS HSY	returns horizontal sync polarity
CPS VSY	returns vertical sync polarity
CPS OUT	returns digital or analog monitor type
CPS MOD	returns interlaced or non-interlaced
CPS RGN	returns if the R gun on or off
CPS GGN	returns if the G gun on or off
CPS BGN	returns if the B gun on or off
CPS RSY	returns if the R sync on or off
CPS GSY	returns if the G sync on or off
CPS BSY	returns if the B sync on or off

DATA RETURNED BY THE CM2125 IN THE TALKER MODE

All data returned from the CM2125 is in a standard data format. Each string of data is the same length and contains information in four data fields. Your computer program can keep the entire string of characters together, or it can separate the fields for calculations or processing.

Each data string is 25 characters long. The four data string fields are: (1) header, (2) data, (3) alpha and (4) end terminator. Each field has the same number of characters for any function, allowing you to use the same subroutines to process any returned data.

Following are the details for each field:

(1) Header: Characters 0-2 identify the nature of the data being sent to the computer.

(2) Data: Characters 3-19 contain the data.

(3) Alpha: Characters 20-22 are the units for data sent (e.g. KHZ) or an indicator for the fi panel setup (e.g. ON/OFF, NEG/POS).

(4) End: Terminator: Character 23 contains carriage return (ASCII decimal 13) and characte contains the line feed (ASCII decimal 10). M computers respond to either, while others need line feed. A few computers may stop accepting d when the carriage return is sent, leaving the CM2 hung up and waiting to send its last line f character. If this happens, put an extra GET INPUT statement into your control program to let CM2125 send its last character into an unu variable.

Header			Data																	Alpha			End	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M	E	T	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	.	7	V	P	P	CR	LF
L	C	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	4	0	P	I	X	CR	LF
D	T	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	N	S		CR	LF
D	S	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	Y	F	CR	LF
D	R	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V	I	D	CR	LF
H	F	Q	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	.	5	K	H	Z	CR	LF
V	F	Q	-	-	-	-	-	-	-	-	-	-	-	-	-	6	0	.	0	H	Z		CR	LF
H	P	X	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	2	4	P	I	X	CR	LF
V	P	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	6	8	P	I	X	CR	LF
M	E	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	M	E	M	CR	LF
H	S	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	E	G	CR	LF
V	S	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	O	S	CR	LF
O	U	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	D	I	G	CR	LF
M	O	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	O	N	CR	LF
R	G	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	N		CR	LF
G	G	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F	F	CR	LF
B	G	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	N		CR	LF
R	S	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F	F	CR	LF
G	S	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	N		CR	LF
B	S	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	F	F	CR	LF

CR = carriage return
LF = line feed

Fig. 33 - This is an example of the data format the CM2125 sends to the computer.