

TERAK

PN \_\_\_\_\_

BALL MONITOR TV-120  
INCOMING INSPECTION AND ALIGNMENT PROCEDURE  
REV X-2  
TERAK PROPRIETERY  
ISSUE DATE 9-FEB-81

APPROVED:

ENGINEERING: \_\_\_\_\_  
ENGINEERING: \_\_\_\_\_  
TEST ENGINEER: \_\_\_\_\_

DATE: \_\_\_\_\_  
DATE: \_\_\_\_\_  
DATE: \_\_\_\_\_

# CONTENTS

	<b>PAGE</b>
1. SCOPE	1
1.1 Purpose	1
1.2 Applicability	1
1.3 Distribution	1
2. REFERENCE DOCUMENTS	2
3. TEST PROCEDURE	3
3.1 Equipment Needed	3
3.2 Initial Inspection	4
3.3 Cabling	5
3.4 Power Up	6
3.5 Adjustments	7
3.6 Perimeter Non-Rectangularity Specification	9
3.7 Geometric Distortion	10
3.8 Final Inspection	10

## LIST OF FIGURES

<b>FIGURE</b>	<b>DESCRIPTION</b>	<b>PAGE</b>
1	AC Voltage Select For Ball Monitor	A-1
2	Monitor Adjustments Location	A-2
3	Raster and video Display	A-3
4	Use Of The Square Template	A-4
5	Use Of The Straight Line Template	A-5

## **1. SCOPE**

### **1.1 Purpose**

This document details the equipment and steps to be utilized to inspect Ball Brothers Model TV-120 Video Monitor for all electrical parameters and functionality determined to be necessary to insure reliable operation in a Terak 8532.

### **1.2 Applicability**

This document is applicable to all Ball Brothers Model TV-120 Video Monitors purchased to be used in a Terak 8532 monitor.

### **1.3 Distribution**

This procedure is Terak proprietary. Copies will be distributed to Terak personnel determined to have a need.

## **2. REFERENCE DOCUMENTS**

- Ball Brothers Data Display Monitor Service Manual 5-017-1035

### 3. TEST PROCEDURE

#### 3.1 Equipment Needed

- 1 Terak 8510/a with keyboard.
- 1 Terak Video Alignment Template consisting of square, straight line, and right angle overlays (Terak part no. 77-0118-001).
- 1 Terak Monitor test cable 83-0005-001 with switch to disable vertical sync.
- 1 Terak System Acceptance Diskette (95-0011-101)
- 1 Non-conductive flathead screwdriver
- 1 Non-ferrous, non-conductive hexagon coil adjustment tool.
- 1 mylar ruler marked in 0.050 inch gradients

### **3.2 Initial Inspection**

(Caution: Safety Glasses must be worn whenever carrying or handling monitor).

- 1) Inspect monitor for shipping damage or frayed wires and inspect screen for small burn marks or bubbles in the glass faceplate.
- 2) Assemble monitor into the steel base according to the assembly procedure.

### 3.3 Cabling

- 1) Verify the 8510 power switch is off and the disk drive door in the 8510 is open.
- 2) Connect the monitor test cable (to be assigned) to the 9 pin connector in the back of the monitor assembly.
- 3) Verify the "Normal/Test" switch mounted on the monitor test video cable, is in the "Normal" position.
- 4) While watching the relay mounted on the monitor assembly, momentarily turn on the 8510 and verify the contacts close.
- 5) Verify the Line Voltage Select Plug on the monitor has the 120 volt jumper plugged in (See figure 1).
- 6) Ensure the 8516 is off, then connect the AC line cord to the monitor



### 3.4 Power Up

- 1) Turn on the 8510 and observe the monitor tube filament glowing orange. See Figure 2 for all component locations. Wait 15 seconds for warm-up.
- 2) Reject monitor if and hissing or arcing sounds are coming from the tube, monitor board, or flyback transformer,
- 3) Carefully insert the System Acceptance Diskette into the 8510; long slot first, label up, and close the disk drive door.
- 4) Wait approximately 15 seconds until the disk light, on the disk drive door, goes out and stags out. Ignore the display, if any.
- 5) Press the "etx" key located in the lower right corner of the keyboard, twice.
- 6) Carefully type "R FRAME <cr>". The disk light should go on for about 2 seconds.
- 7) Press the "return" key three times.

## 3.5 Adjustments

### 3.5.1 Video Adjustments

- 1) Rotate the contrast control clockwise, as viewed from the rear, until it stops. See Figure 2 for all control locations.
- 2) Rotate the brightness control clockwise until the diagonal retrace lines are visible then counterclockwise till the diagonal retrace lines almost disappear.
- 3) If the left and right-hand edge of the raster cannot be seen then, using the hex adjustment tool, turn the horizontal width adjustment in whatever direction reduces the width. Adjust the horizontal width so that both raster edge are at least 0.100" in from the CRT edge.
- 4) Using the mylar ruler, ensure the raster is centered in the CRT to within 0.200 inches on all four edges. Adjust the ring magnets, located on the yoke, SLIGHTLY if needed. See figure 3A.
- 5) Re-adjust the contrast control counterclockwise until the seven horizontal lines do not extend beyond the bright vertical line on the right hand side of the screen See Figure 3B.
- 6) Re-adjust the brightness control whichever way is necessary to make the diagonal retrace lines and raster just disappear.
- 7) Hand-tighten the lock nut on the contrast control taking care not to move adjustment. This contrast control may have to be readjusted when the monitor is mated to the 8510/a due to slight difference in drive levels from system to system. See Figure 2 for all control locations.

### 3.5.2 Vertical Adjustments

- 1) Set the "Normal/Test" switch, on the video cable, to the "Test" position. Adjust the vertical hold until the picture rolls up about three times a second. The screen will Jump every second or so, this is normal. Return the "Normal/Test" switch to the "Normal" position to enable vertical drive and observe a steady non-rolling picture.
- 2) Adjust the vertical height control so that the squares in the center of the screen are one inch tall Use the square template. See figure 4
- 3) Adjust the vertical linearity control so that the squares at the top and bottom of the screen are one inch tall. Re-check the middle squares and re-adjust the vertical height control as needed. The vertical linearity, vertical height, and vertical hold controls all interact slightly, so a slight readjustment of these controls may be necessary to obtain a linear, stable vertical display. See Figure 2 for all control locations.

### **3.5.3 Horizontal Adjustment**

- 1) Adjust the horizontal width coil using the plastic hex adjustment tool, until the right hand squares are one inch wide.
- 2) Adjust the horizontal linearity coil until the left hand squares are one inch wide.
- 3) Check the center squares for width and readjust the horizontal width and horizontal linearity as needed.

### **3.5.4 Centering and Screen Adjustments**

- 1) Loosen the yoke clamp slightly and rotate the yoke until the display is level with the table. Do not level the display with the bottom of the picture tube.
- 2) Remove the power cable from the monitor assembly and mount the monitor in the plastic pedestal. Reinstall the power cable and wait 15 seconds for warm-up.
- 3) Using the plastic bezel as a guide, rotate the centering control till the video display is centered in the CRT left and right plus or minus 0.200 inches.
- 4) Rotate the yoke till the display is level with the bottom of the bezel. Retighten the yoke.
- 5) Using the mylar ruler, ensure the bottom line of the video display is no closer than .100 inches to the bottom bezel. The display need not be centered vertically.

### **3.6 Perimeter Non-Rectangularity Specification**

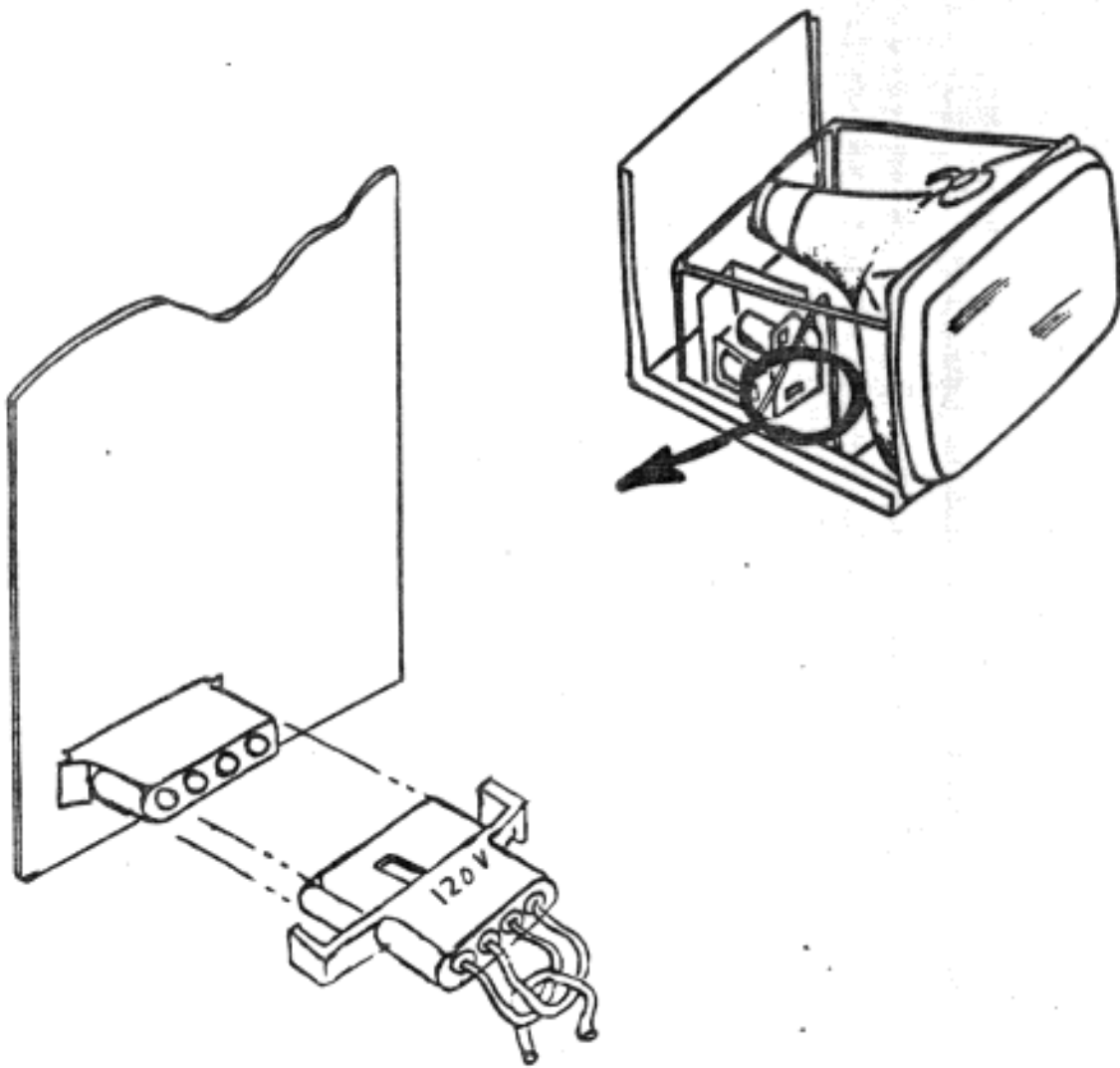
- 1) Using the straight line template (to be assigned) slot D, ensure that neither vertical edge of the display does not deviate from a straight line by no more than  $\pm 0.060$  inches. No more than half of the distortion may appear in and one inch of the vertical line. See Figure 5.
- 2) Using the straight line template (to be assigned) slot F, ensure that neither horizontal edge of the video display does not deviate from a straight line by no more than  $\pm 0.080$  inches. No more than half of the distortion may appear in any 1.500 inch section of the horizontal line. See Figure 5.

### **3.7 Geometric Distortion**

- 1) Using the inch square template (77-0118-001), ensure that each of the 48 squares on the screen fit inside the area defined by the template.

### **3.8 Final Inspection**

- 1) Press the "space bar" key and insure that the screen does not shrink or 'bloom' by more than 0.500 inches in either dimension when the screen goes from white on black to black on white.
- 2) Inspect the screen for bouncing. Jittering or other symptoms of an unstable display.
- 3) Remove Power and Cables.



AC VOLTAGE SELECT FOR BALL MONITOR  
FIGURE 1

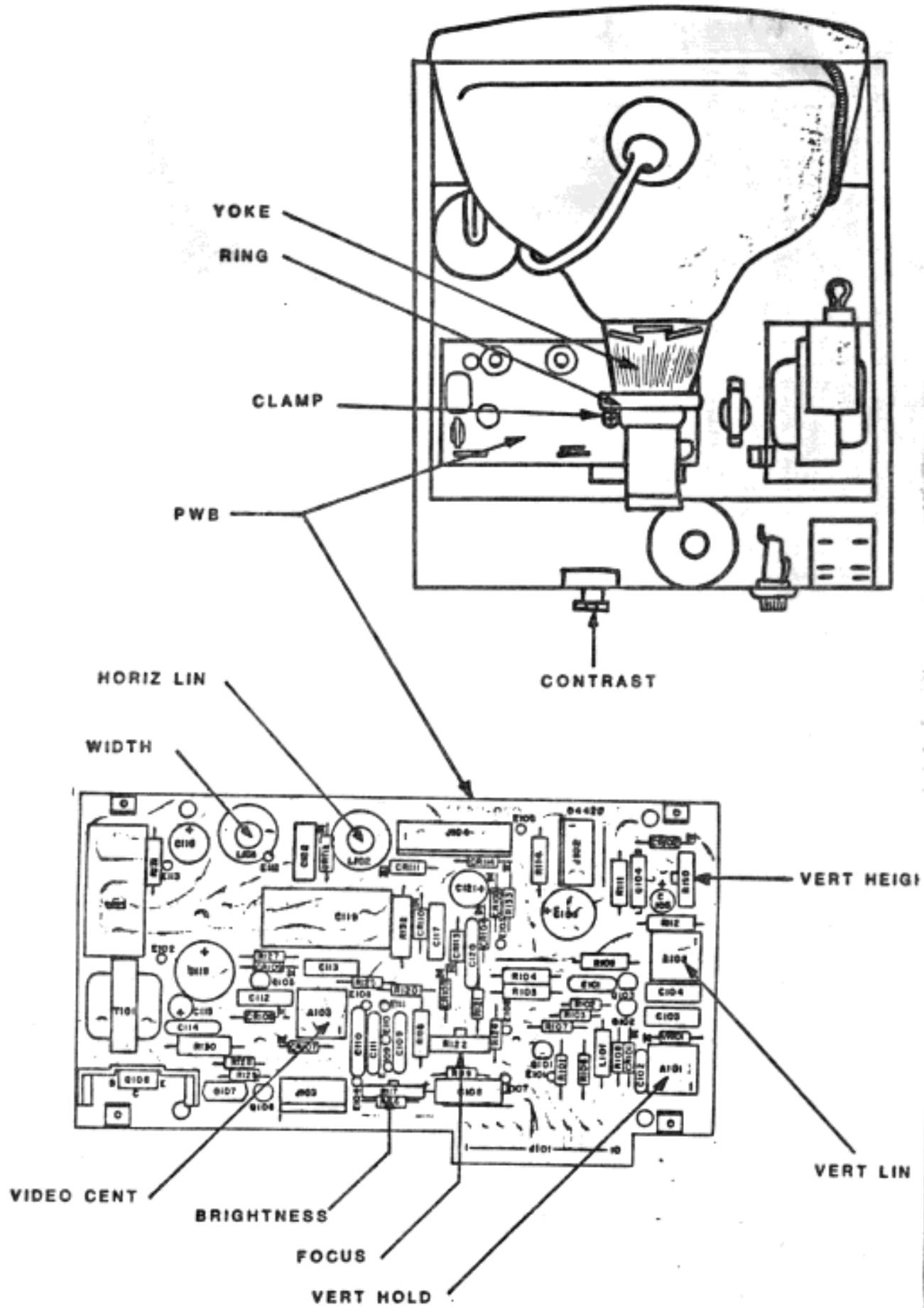
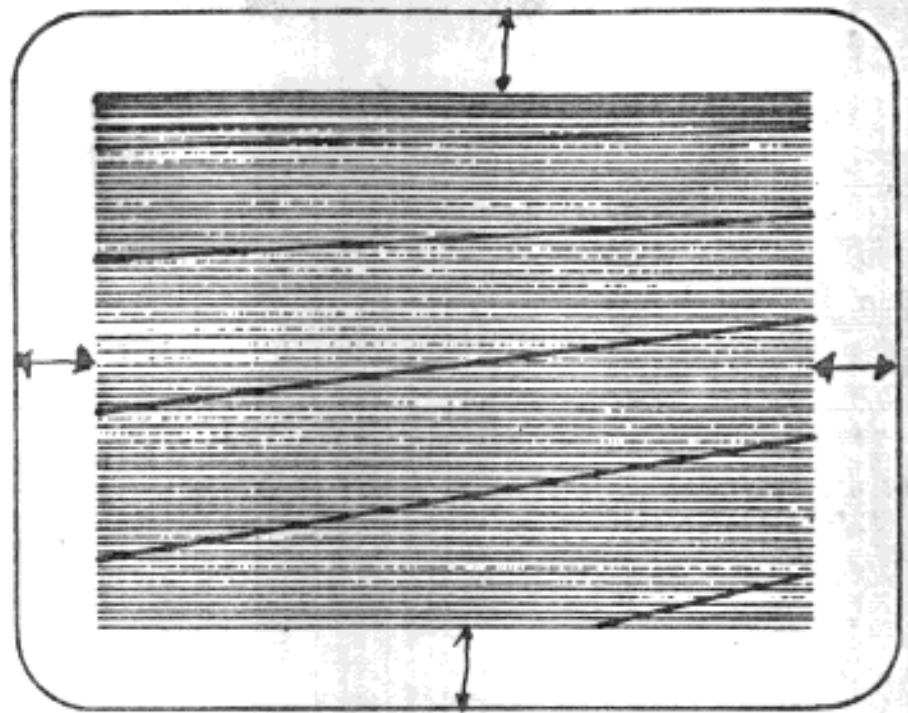


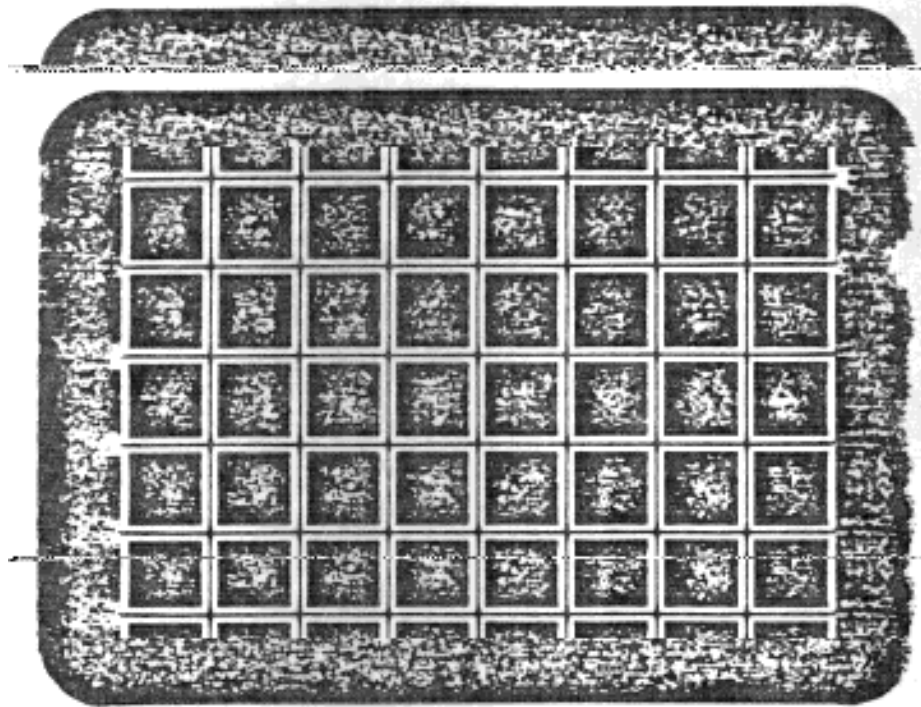
FIG. 2 - MONITOR ADJUSTMENT LOCATIONS

CENTER RASTER  
IN THE CRT  
PLUS OR MINUS 0.200"



3A

Raster Display

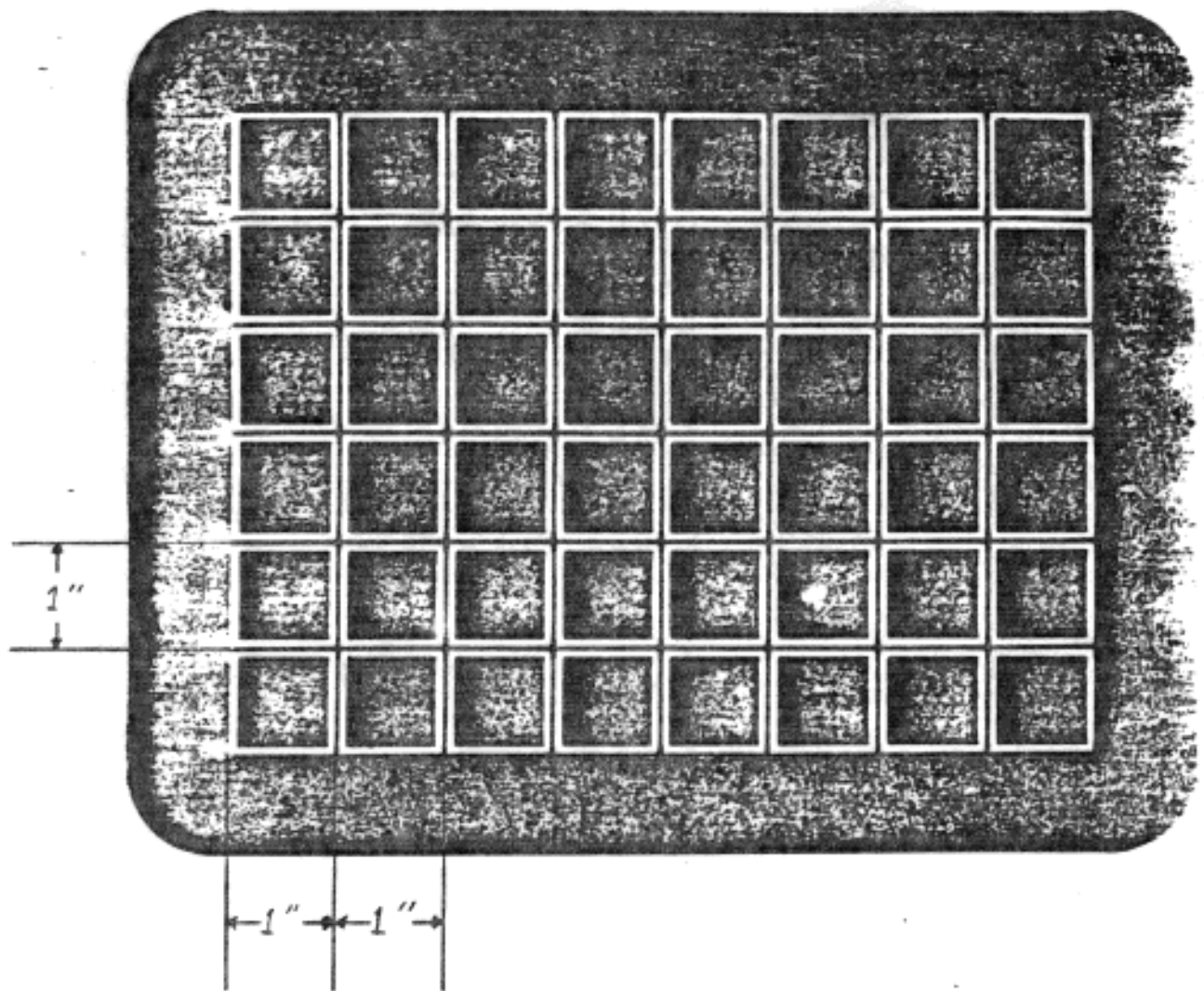


Video Alignment Display

3B

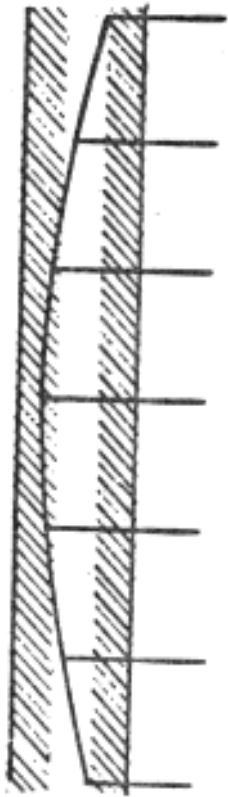
Figure 3



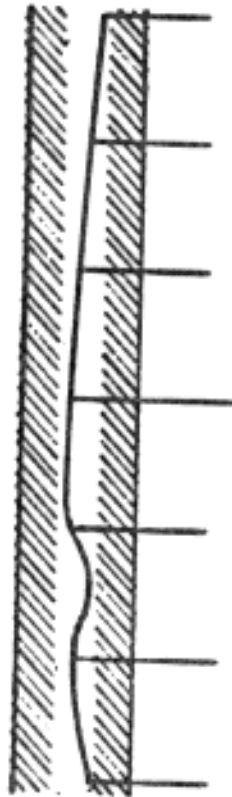


One inch squares are measured from black line to black line between the white squares. The actual size of the white squares is 0.950 n by 0.950 n .

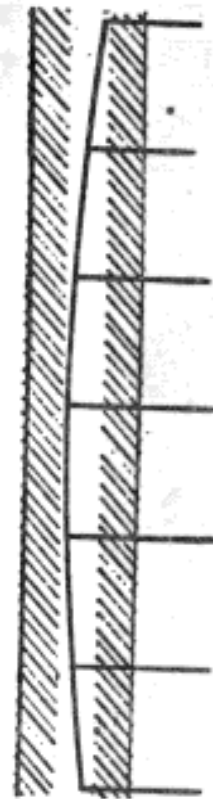
Use of the square template  
Figure 4



FAIL - (Because the edge of the video display will not fall in bounds of the template)



FAIL - (because more than half of the total distortion occurs in one sixth of the total length)



PASS - The edge of the video falls completely within the bounds of the template.

Use of the Straight Line Template  
Figure 5