

1 BOARD ALIGNMENT / SCREENING TEST

1.1 EQUIPMENT

Oscilloscope (Tek. TAS465)
Rasterizer (WVR500, Waveform / Vector Monitor, PAL/NTSC)
Monitor, Sony PVM-1344Q (Y/C, Composite, Component)
Video Output Switch Box
Coax Cables (RCA and Y/C)
Board Screening Fixture (Wood Fixture with Power supply)
TM3000 (NTSC)---2 EA
TM3000(PAL)---2EA
Leader Audio Generator LAG-120 ---2 EA

1.2 VIDEO SOURCES

Source Pattern Generators

(Tek TSG130A NTSC, TSG131A PAL)

Source Patterns 1 and 2 are distributed to each station's Patch Panel (PP).

Input		Source Patterns:	
		<u>NTSC</u>	<u>PAL</u>
Comp. Source 1:		Color Bars (PP)	Color Bars (PP)
Comp. Source 2:		Multiburst (PP)	Multiburst (PP)
Comp. Source 3:		+100 Hz (TM3)	+100 Hz (TM3)
Comp. Source 4:		-100 Hz (TM3)	-100 Hz (TM3)
Y/C Source 1:		Color Bars (PP)	Color Bars (PP)
Y/C Source 2:		Multiburst (PP)	Multiburst (PP)
Y/C Source 3:		+100 Hz (TM3)	+100 Hz (TM3)
Y/C Source 4:		-100 Hz (TM3)	-100 Hz (TM3)

1.3 SET UP

Place PC Board assembly to be tested in the test fixture. Connect all the video input signals (Composite and Y/C) to the video sources. Remove Y/C2 video input signal from the patch panel. Remove the GPI cable. Connect composite and preview output Video signals to the Switch Box. Connect YC1 output to the rasterizer. Connect Audio input to the audio sources and audio outputs to CH1 and CH2 (or CH3 and CH4) of the Oscilloscope. Connect a loop back plug to GPI connector. Connect a set of head phones to the head phone output connector.

2) Press button on the rasterizer. Patterns will be displayed on the screen



Set Rasterizer to PAL or NTSC to match with Unit Under Test. Connect the Input Video Signals (PAL or NTSC) accordingly to the patch panel and TM3 sources.

Set up Video Monitor to input A and Rasterizer to input B. On the Switch Box make Rasterizer selection to Preview and Monitor selection to OUT1. Select Picture on the rasterizer.

Set one audio generator frequency at 300 HZ and attenuation at 20 dB. Set second audio generator frequency at 600 HZ and attenuation at 20 dB.

1.4 POWER UP

While pressing the "Shift" and "Input Effects" keys, turn Power Switch on. Input Effects LED will turn on and a greenish screen will appear on the monitor.

1.5 TAKE BAR CALIBRATION

- 1) Position the Take Bar all the way forward and push 'Down Arrow' button. Audio LED should turn on.
- 2) Position the Take Bar all the way backwards (towards the Connectors Edge) and push 'Up Arrow' button. Video LED should turn on.
- 3) Press OK. A splash screen displaying MXpro will appear momentarily followed by Thumbnail menu.

1.6 VIDEO INPUT VERIFICATION

Note: Y/C 2 input is not connected.

Verify that the thumbnails from 3 Y/C input sources (1,3, and 4) are displayed.

2nd sub-screen (thumbnail) should be only the gray background, there should not be any screen with Black video.

Plug the YC2 input back in the patch panel, YC2 video should re-appear in the 2nd sub-screen from the left.

Plug the GPI cable to UUT.

1.7 MANUFACTURING TEST

While holding down Shift and Learn keys simultaneously , press FLIP<-> key to enter into the Manufacturing test. To run a test highlight the test on the screen by pressing arrow keys and then press OK key to run the test. Once the test is completed, the cursor will return to the test menu with next test highlighted. jump to the next test.

1.7.1 Graphics Video Test

Select test 1 from the manufacturing test menu. Test 1 has three different sub-tests in it.

- 1) Press OK to run the test, Graphic Color Bars will be displayed on the screen. Check that color bars are free from any abnormalities.
- 2) Press OK , a Crosshair Pattern will be displayed on the screen.



- 3) Press OK, a blue horizontal line near the top of the screen and a white vertical line in the center of the screen will be displayed.
- 4) By pressing OK again it will return back to test menu with test 2 highlighted.

1.7.2 Split Screen and Video Routing Test

Test 2 is comprised of 8 different tests. In these tests different inputs are routed through channels A and B, by pressing OK key it proceeds to the next test. At completion of the eight steps it returns to the test menu with test 3 highlighted. Video routing during these eight steps is as follow.

1.7.2.1 Video Routing Test 1

Press OK to enter to start Test 1. YC-1 is routed through channel B. In this test output video is adjusted by looking at YC-1 output and other outputs are also looked at to make sure that video levels are within specifications. Video outputs are tested as follow:

1.7.2.1.1 Y/C-1 Out

- 1) Select Input A on the rasterizer and see that color bars look good on the Monitor.
- 2) On the rasterizer select WFM and adjust RW1 to make Luma level 100 ± 3 IRE for NTSC and 700 ± 20 mV for PAL. Also make sure that Sync and Burst levels are 40 ± 2 IRE for NTSC and 300 ± 15 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 5\%$.
- 4) Set rasterizer back to Picture.

1.7.2.1.2 Y/C-2 Out

- 1) Move Y/C output cable from YC1 to YC2 output and see that color bars look good on the monitor.
- 2) On the rasterizer select WFM and check that the luma level is 100 ± 3 IRE for NTSC and 700 ± 20 mV for PAL from the black level. Also make sure that Sync and Burst levels are 40 ± 2 IRE for NTSC and 300 ± 15 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 5\%$.
- 4) Set rasterizer back to Picture.
- 5) On the RASTERIZER select Input B.

1.7.2.1.3 Composite-1 Out

- 1) On the switch box select OUT 1 (LED on) by pressing the push button marked RASTERIZER and see that color bars look good on the Monitor.
- 2) On the rasterizer select WFM and check that the luma level is 100 ± 5 IRE for NTSC and 700 ± 35 mV for PAL from the black level. Also make sure that Sync and Burst levels are 40 ± 2 IRE for NTSC and 300 ± 15 mV for PAL from the black level.



Set up Video Monitor to input A and Rasterizer to input B. On the Switch Box make Rasterizer selection to Preview and Monitor selection to OUT1. Select Picture on the rasterizer.

Set one audio generator frequency at 300 HZ and attenuation at 20 dB. Set second audio generator frequency at 600 HZ and attenuation at 20 dB.

2.4 INITIAL SYSTEM RESET

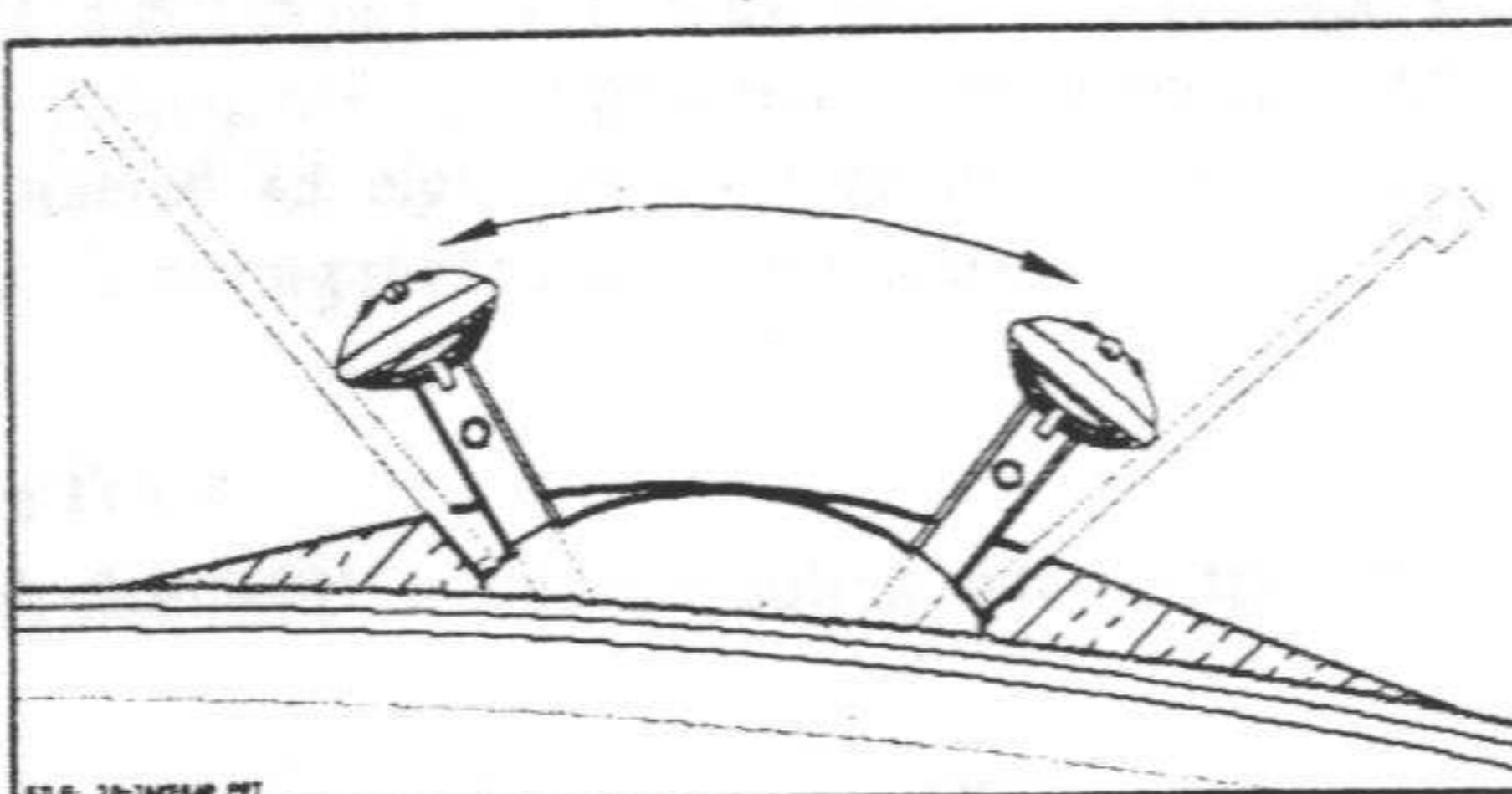
To reset the system to default values turn power on while holding "Shift" and "Set Up" keys. After completion of the boot cycle turn power off.

2.5 POWER UP

While pressing the "Shift" and "Input Effects" keys, turn Power Switch on. Input Effects LED will turn on and a greenish screen will appear on the monitor.

2.6 TAKE BAR CALIBRATION

- 1) Lay a Take bar shaft on the front end of take bar slot collar and move the Take Bar forward against this shaft. Push 'Down Arrow' button. Audio LED should turn on.
- 2) Lay a Take bar shaft on the backward end (towards the Connectors side) of take bar slot collar and move the Take Bar backward against this shaft. Push 'Up Arrow' button. Audio LED should turn on.
- 3) Press OK. A splash screen displaying MXpro will appear momentarily followed by Thumbnail menu.



2.7 VIDEO INPUT VERIFICATION

Note: Y/C 2 input is not connected.

Verify that the thumbnails from 3 Y/C input sources (1,3, and 4) are displayed.



2.8.8 LED Test

Select test 8 and press O.K., LED's should start flashing in a sequence. After completing approximately two cycles a checksum will be displayed on the screen. Compare this checksum with the checksum in section 3.1 Press OK to return to the test menu.

2.8.9 GPI test

Insert a loop back plug in the GPI connector. Highlight test 9 and press OK key. Screen should get refreshed and 0 under 9 should turn to 1 which indicates that the test is passed.

Manufacturing Test is complete. Turn power off to exit the test.

2.9 FINAL SYSTEM RESET

To reset the system to default values turn power on while holding "Shift" and "Set Up" keys.

2.10 DEMO TEST

Press CUT A and NEXT B keys. Press "Shift" and "Display" key simultaneously. It should start running a demo test. Make sure that there are not any abnormalities in the video display during the demo. Run the Demo program for 10-20 seconds. Press OK to terminate the demo test.



- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 7\%$.
- 4) Set rasterizer back to Picture.

1.7.2.1.4 Composite-2 Out

- 1) On the switch box select OUT 2 (LED on) by pressing the push button marked RASTERIZER and see that color bars look good on the Monitor.
- 2) On the rasterizer select WFM and check that the luma level is 100 ± 5 IRE for NTSC and 700 ± 35 mV for PAL from the black level. Also make sure that Sync and Burst levels are 40 ± 2 IRE for NTSC and 300 ± 15 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 7\%$.
- 4) Set rasterizer back to Picture.

1.7.2.1.5 Composite Preview Out

- 1) On the switch box select Preview (LED on) by pressing the push button marked RASTERIZER and see that color bars look good on the Monitor.
- 2) On the rasterizer select WFM and check that the luma level is 100 ± 8 IRE for NTSC and 700 ± 50 mV for PAL from the black level. Also make sure that Sync and Burst levels are 40 ± 3 IRE for NTSC and 300 ± 20 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 10\%$.
- 4) Set rasterizer back to Picture.
- 5) Press OK key to proceed to the next test.

1.7.2.2 Video Routing Test 2

Composite-1 is routed through channel A. In this test Only Comp-1 output is looked at for correct signal levels.

1.7.2.2.1 Composite-1 Out

- 1) On the switch box select OUT 1 (LED on) by pressing the push button marked RASTERIZER and see that color bars look good on the Monitor.
- 2) On the rasterizer select WFM and check that the luma level is 100 ± 8 IRE for NTSC and 700 ± 55 mV for PAL from the black level. Also make sure that Sync and Burst levels are 40 ± 3 IRE for NTSC and 300 ± 20 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 7\%$ squares.
- 4) Set rasterizer back to Picture.
- 5) Press OK key to proceed to the next test.



2nd sub-screen (thumbnail) should be only the gray background, there should not be any screen with Black video.

Plug the YC2 input back in the patch panel, YC2 video should re-appear in the 2nd sub-screen from the left.

Plug the GPI cable to UUT.

2.8 MANUFACTURING TEST

Press Shift and Learn keys simultaneously and then FLIP<-> key to enter into the Manufacturing test. To run a test highlight the test on the screen by pressing arrow keys and then press OK key to run the test. Once the test is completed, the cursor will return to the test menu with next test highlighted. jump to the next test.

2.8.1 Graphics Video Test

Select test 1 from the manufacturing test menu. Test 1 has three different sub-tests in it.

- 1) Press OK to run the test, graphic color bars will be displayed on the screen. Check that color bars are free from any abnormalities.
- 2) Press OK , a cross hair pattern will be displayed on the screen.
- 3) Press OK, a blue horizontal near the top of the screen and a white vertical line in the center of the screen will be displayed, (Shift Ok will draw the modulated ramp Pattern).
- 4) By pressing OK again it will return back to test menu with test 2 highlighted.

2.8.2 Split Screen Test

Test 2 is comprised of 8 different tests. In these tests different inputs are routed through channels A and B. By pressing OK key it proceeds to the next test. After pressing the OK key, once it has completed all eight steps, it returns to the test menu with test 3 highlighted. Video routing during these eight steps is as follow.

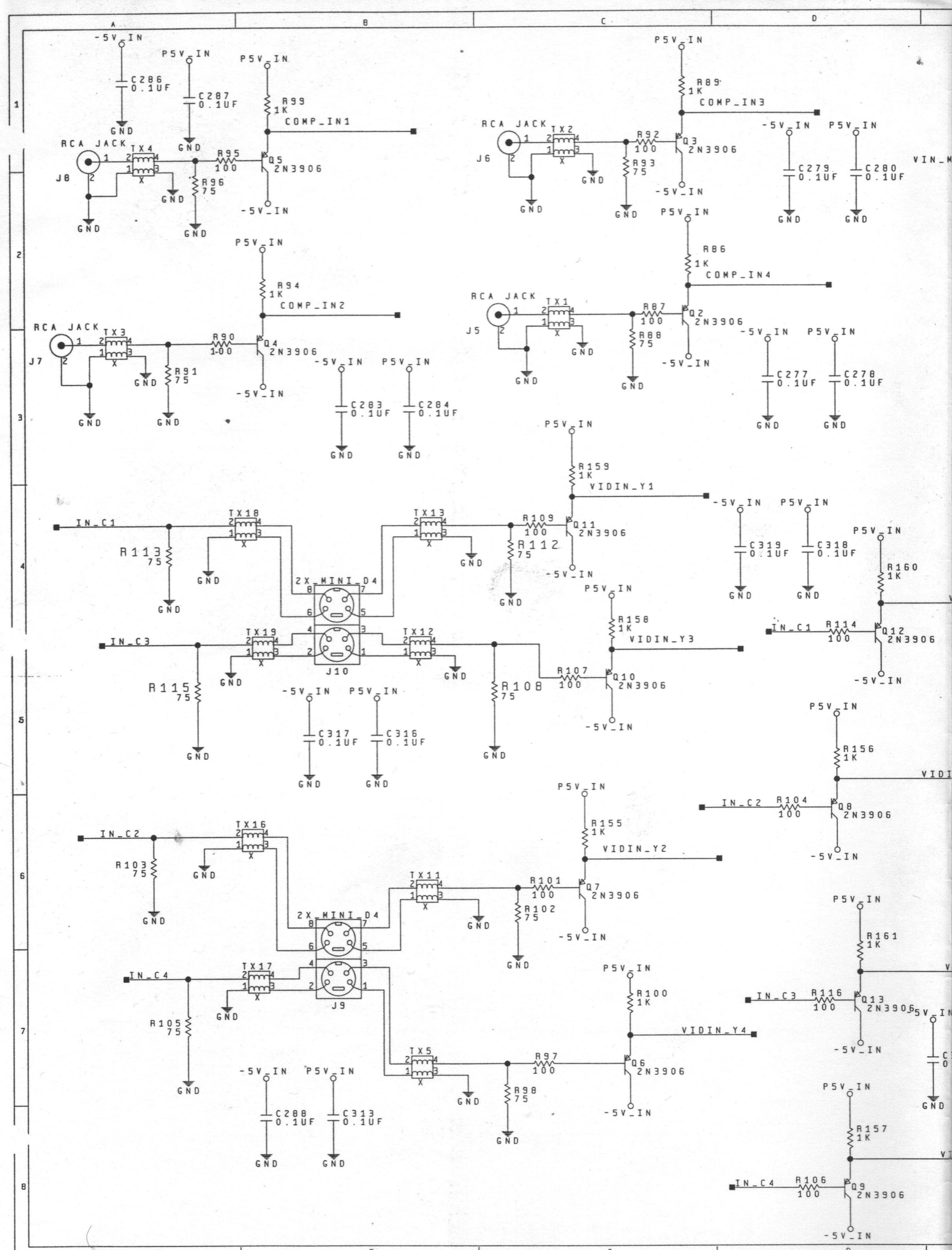
2.8.2.1 Video Routing Test 1

YC-1 is routed through channel B. In this test output video outputs are checked for their correct signal levels.

2.8.2.1.1 Y/C-1 Out


- 1) Select Input A on the rasterizer and see that color bars look good on the Monitor..
- 2) On the rasterizer select WFM and make sure that Sync level is 40 ± 1 IRE and 300 ± 7 mV for PAL. Also make sure that luma is 100 ± 3 IRE for NTSC and 700 ± 20 mV for PAL from the black level.
- 3) On the rasterizer select Vectorscope and make sure that all the color dots are within $\pm 5\%$ squares.
- 4) Set rasterizer back to Picture.





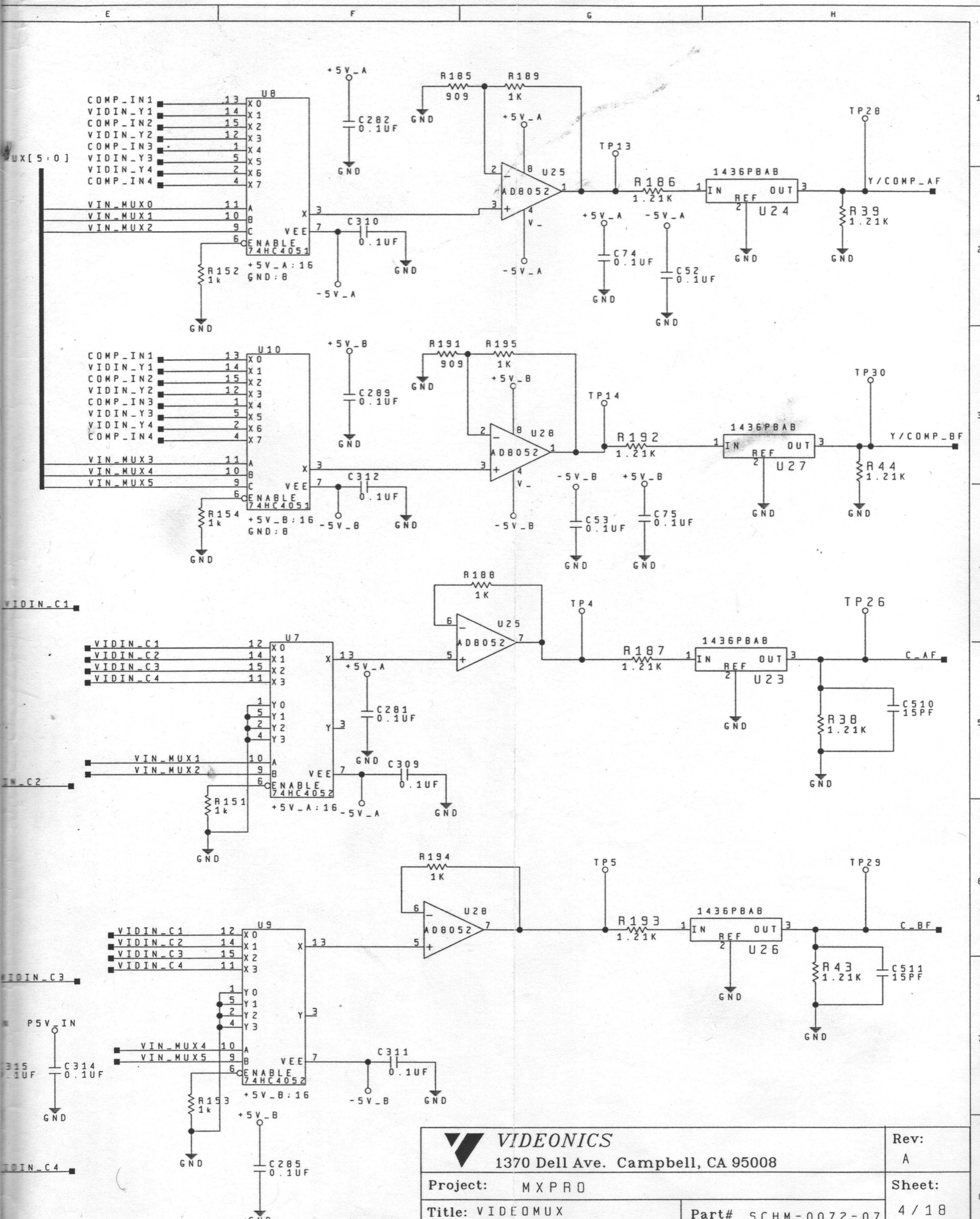
1.4 Appendix B

1.4.1 CPU Flow Diagram




MXPro Flow Diagram (CPU Section)

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1.4.2 Video Flow Diagram



MXPro Flow Diagram (Video Section)

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