



Panavision 3D System for NEC 2000C Projector

Installation and Operating Guide

Version 1.1

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DPVO_instruction.man_NEC2000C

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October 2011

Record of Changes

Manual Version / Date	Description
1.0 September 2011	Preliminary version
1.1 October 2011	Incorporated review comments

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Installing the Filter Wheel and Electronics Box

Important! Only well qualified service personnel should perform these procedures.

To install the Panavision® 3D filter wheel and electronics box perform the following procedures.

Procedure	Topic	Page
Unpack the 3D filter wheel system	Step 1: Unpack the 3D Filter Wheel System	5
Open the projector	Step 2 Open the Projector	8
Remove the heat shield	Step 3: Remove the Heat Shield	12
Install the 3D filter wheel	Important: Use a foot-long #2 Phillips screwdriver with magnetized tip. Step 4: Install the 3D Filter Wheel	16
Reinstall the safety and heat shields	Step 5: Reinstall the Safety and Heat Shields	20
Install the electronics box	Step 6: Install the Electronics Box	23
Test the installation with the rack unit	Step 7: Test the 3D Filter Wheel System	27
Close the projector	Step 8: Close the Projector	30
Test projector's 3D performance	Step 9: Verify the 3D Projector System	30

Tools Needed:

- One magnetized #2 Phillips screwdriver at least one foot in length.
- One jack screw wrench.

Step 1: Unpack the 3D Filter Wheel System

Perform the following steps to unpack the Panavision 3D filter system and prepare it for installation.

1. Remove the 3D filter system from the shipping carton.



Figure 1: NEC 2000C 3D Filter System and Electronics Box with Bracket

2. Remove the four screws on electronics box. (The electronics box is attached to 3D filter wheel system.)

Note: Only two of these four screws will be reused.

3. Remove tape on the cardboard.

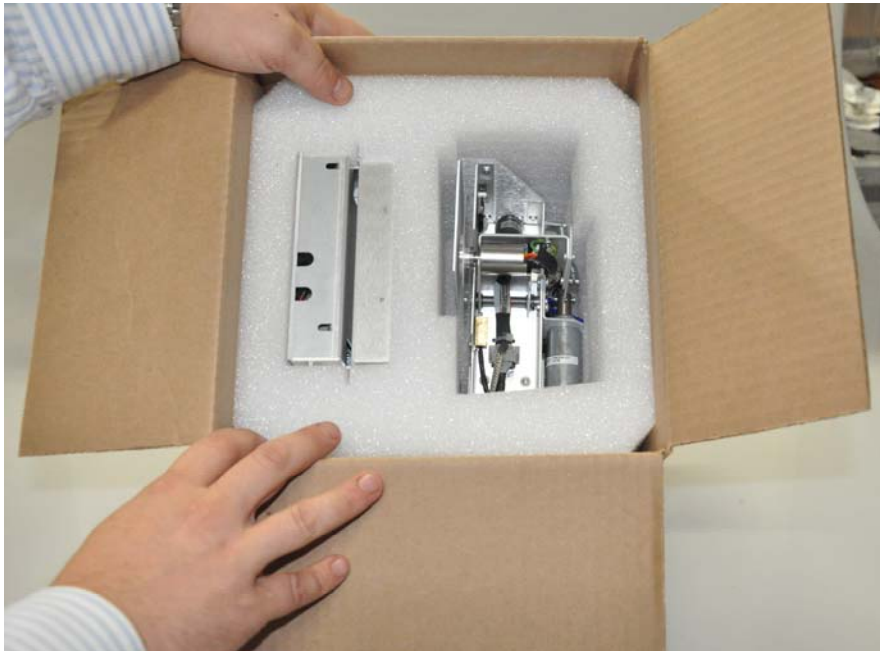


Figure 2: NEC 2000C 3D Filter System and Electronics Box with Bracket



Remove this tape.

Figure 3: Remove Packing Tape

Caution: Filter wheel is very fragile.

4. Remove cardboard protecting the filter wheel.

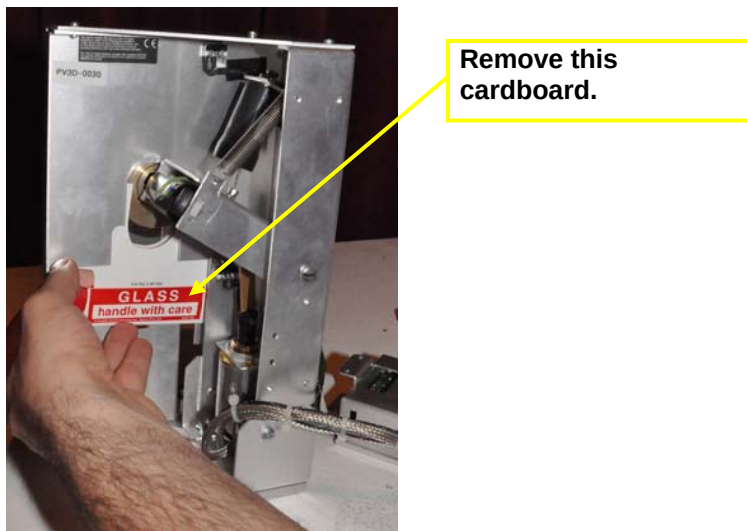


Figure 4: Remove Protective Cardboard Cover

Step 2 Open the Projector

To open the NEC 2000C projector, perform the following steps:

1. Remove the first side panel by removing the five captive screws using a Phillips screwdriver and turning the key.
2. Remove the second side panel by removing the five captive screws using a Phillips screwdriver and turning the key.



Figure 5: NEC 2000C Projector Left Side Panel



Figure 6: NEC 2000C Projector Left Side Panel, Removed



Figure 7: Right Side Panel



Figure 8: Right Side Panel -- Removed

3. Remove the top covers by removing the two non-captive screws with a Phillips screwdriver.

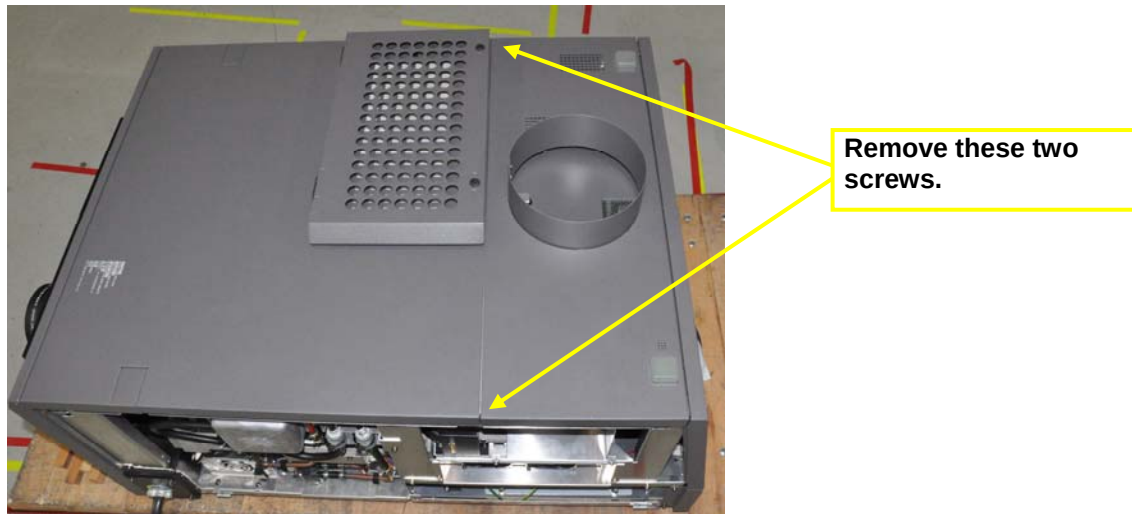


Figure 9: NEC 2000C Projector Front Top Panels



Figure 10: NEC 2000C Projector Front Top Panel, Removed



Figure 11: NEC 2000C Projector Back Top Panel

4. Remove the rear cover by removing the four non-captive screws.

Step 4: Install the 3D Filter Wheel

Follow the steps below to install the 3D filter wheel system.

1. Remove the safety shield (top plate) from the 3D filter wheel system.

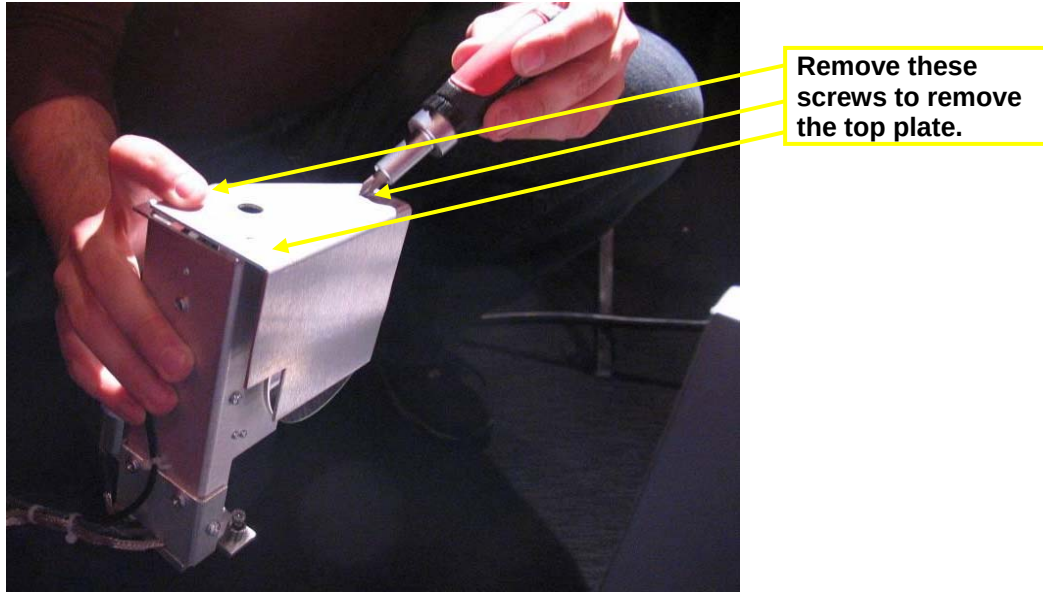


Figure 22: 3D Filter System Top Plate (Safety Shield)

2. Remove both screws from aperture as shown in Figure 23.

Note: One screw will be re-used to hold the filter wheel mount in place.

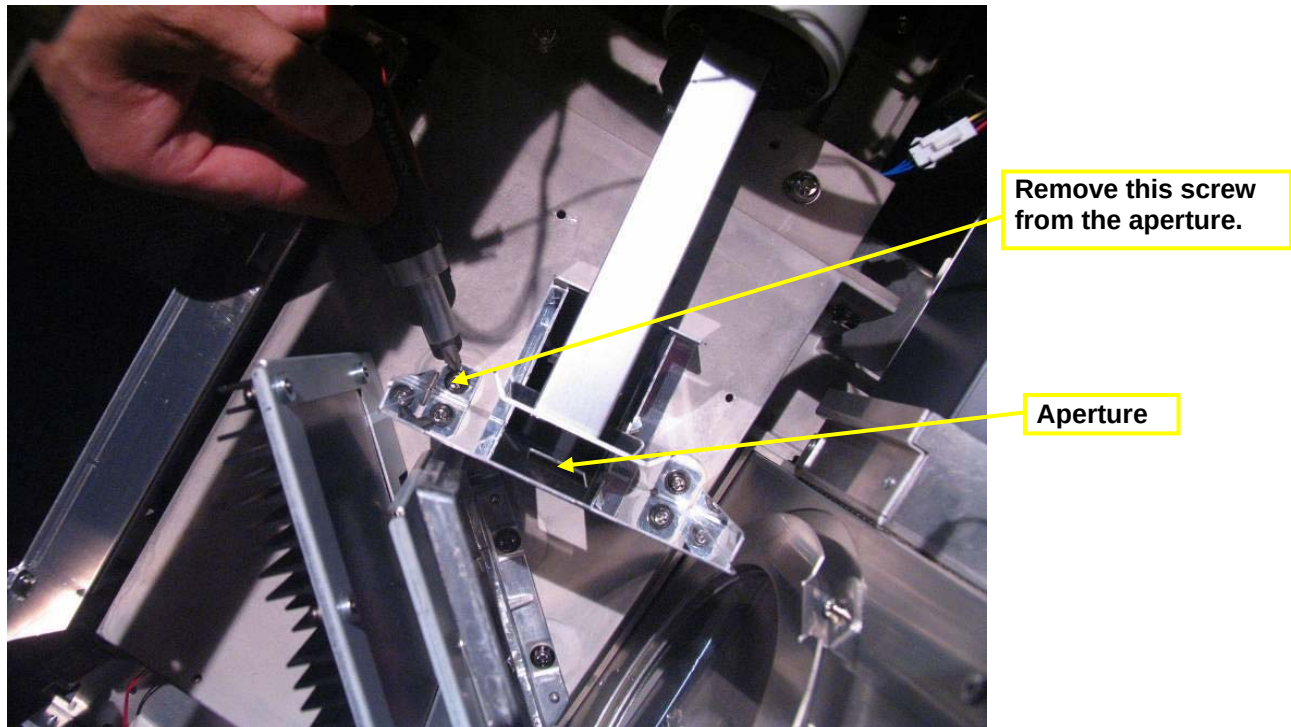


Figure 23: Projector Aperture

3. Set the filter wheel in the projector.
4. Attach filter unit very carefully with the screw removed from the aperture but do not fully tighten until after you have properly aligned it.

Caution: Be very careful when tightening the screw because the metal is soft and can be scripted.

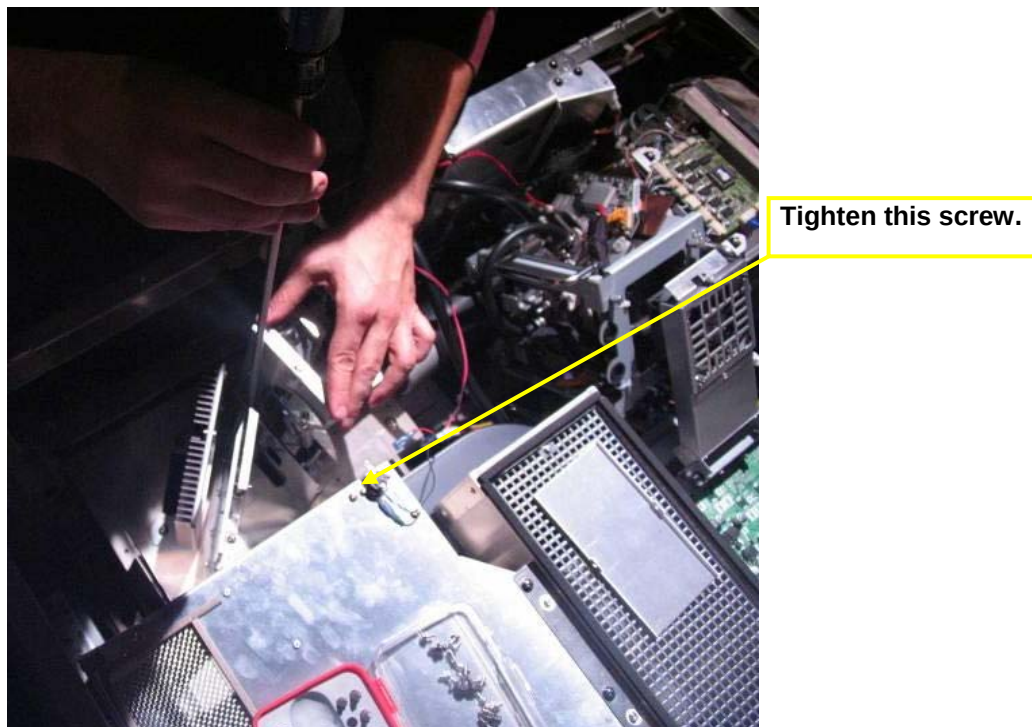


Figure 24: 3D Filter System Attachment Screw

5. Manually deploy the wheel by pushing down on the edge.

Caution: Touch only the edge of the wheel.

6. Rotate the wheel a few times to make sure it turns unhindered without resistance.
7. Tighten the screw attaching the filter unit. Make sure the wheel can still turn.

Step 7: Test the 3D Filter Wheel System

Follow the steps below to verify that the 3D filter system operates properly:

1. Temporarily attach female end of parallel 25-pin cable on the NEC 2000C projector

Caution: Make sure there is no operating AC power until all connections have been made.

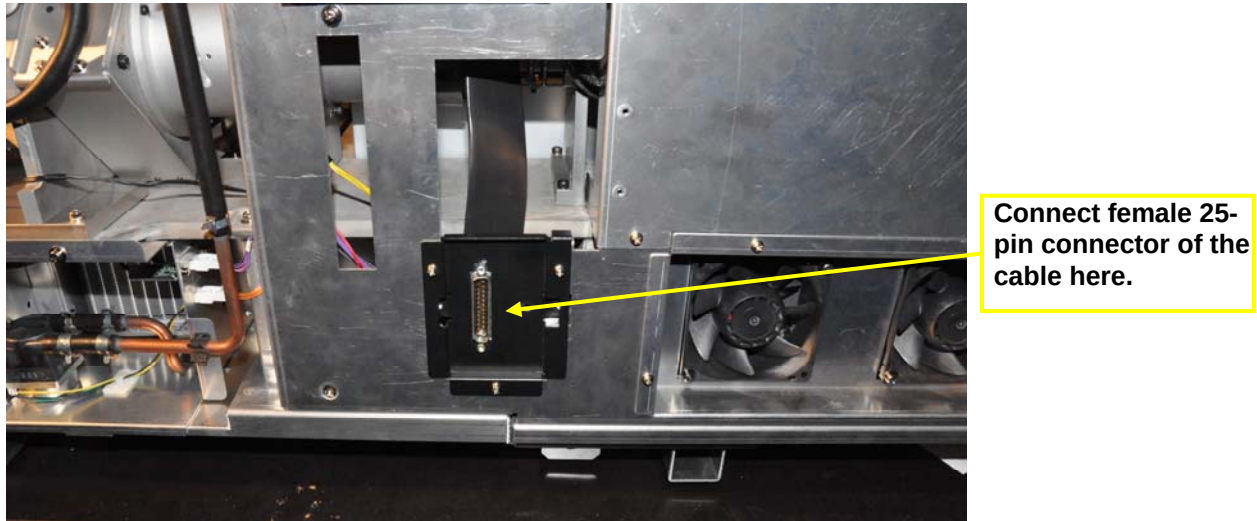


Figure 36: NEC 2000C 25-Pin Connector for Rack Unit Test

2. Connect the 25-pin cable to the **FILTER WHEEL** connector on the rack unit.

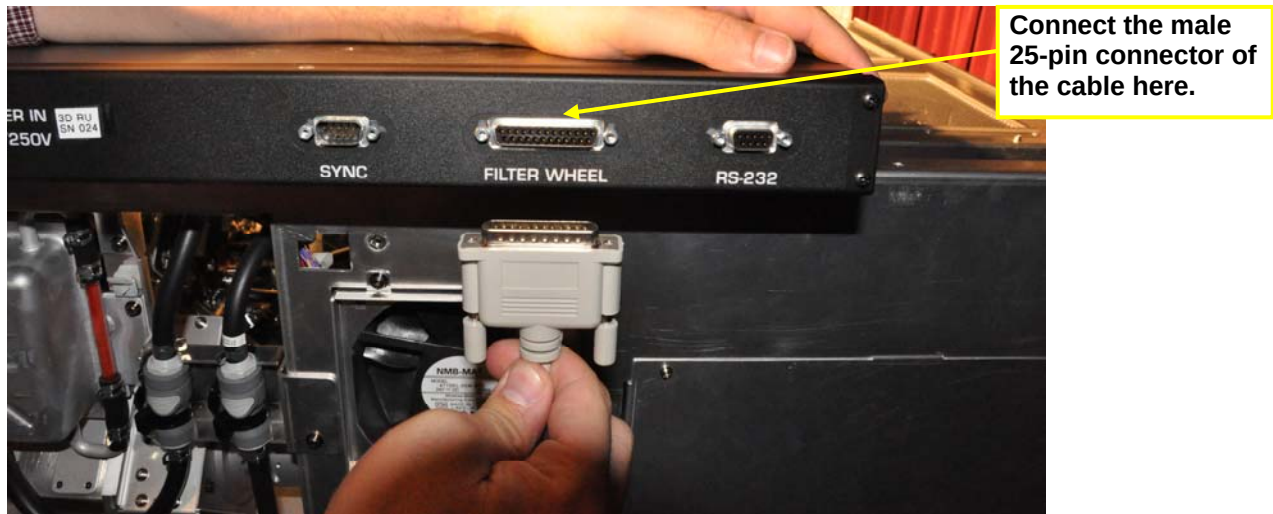


Figure 37: Rack Unit 25-Pin Filter Wheel Connector

3. Connect the GPIO/Sync cable to 9-pin **SYNC** connector on rack unit.

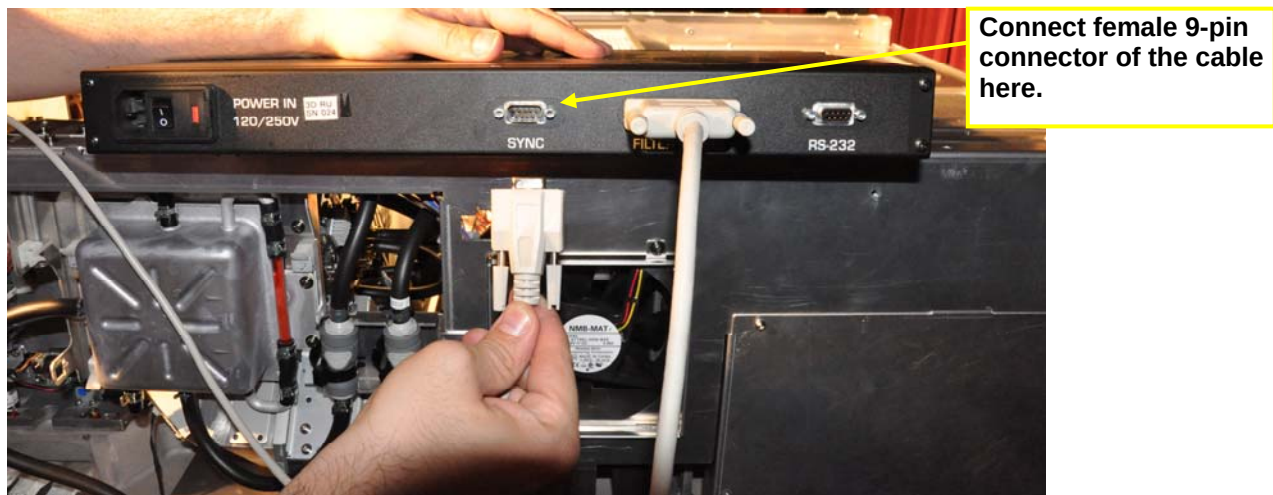


Figure 38: Rack Unit 9-Pin Sync Connector

4. Connect the GPIO/Sync cable to the GPIO connector on the rear panel of the NEC 2000C projector.



Figure 39: NEC 2000C GPIO Connector

5. Plug in AC power on the back of the rack unit.
6. Flip the master power switch on the back of the rack unit.

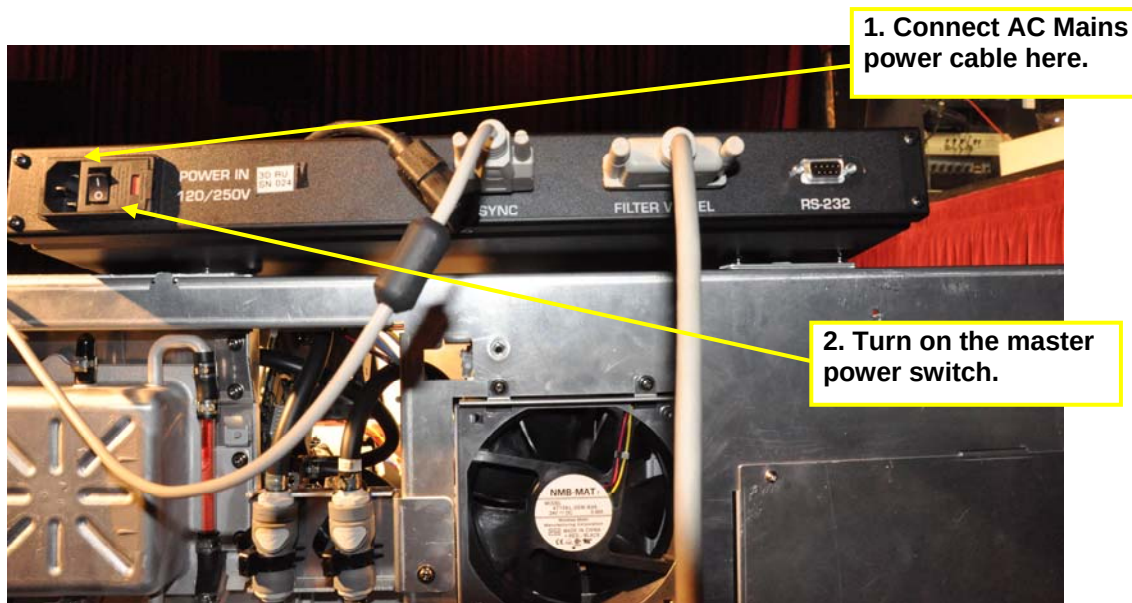


Figure 40: Rack Unit AC Power

7. Push the green power switch on the front of the rack unit. The button will illuminate.



Figure 41: Rack Unit Power Button

8. Push the **AUTO/DISABLE** button for seven seconds until it starts flashing. This deploys the filter wheel out of communication with the projector. You should hear the wheel deploy and start spinning.



Figure 42: Rack Unit Auto/Disable Button

9. Observe the filter wheel to confirm that it has deployed and is spinning.
10. Push the **AUTO/DISABLE** button once to disable the filter wheel.

11. Press the green button on the front of the rack unit to power OFF the unit.
12. Turn OFF the master power switch on the back of the rack unit.
13. Disconnect both cables.

Step 8: Close the Projector

To close the NEC 2000C projector, perform the following steps:

1. Attach the rear cover with the two captive screws and the key.
2. Attach the top covers using a Phillips screwdriver.
3. Attach the left side panel by with the five captive screws using a Phillips screwdriver and turning the key.
4. Attach the right side panel by removing the five captive screws using a Phillips screwdriver and turning the key.

Step 9: Verify the 3D Projector System

To complete installation of the 3D projection system of the NEC 2000C, perform the following tests:

- Perform the extinction procedure, which is described in 3D Extinction Procedure on page 31.
- Perform the calibration procedure, which is described in 3D Calibration on page 34.

Note: For complete details on the communication interface refer to the *NEC 2000C User's Manual*.

3D Extinction Procedure

Extinction demonstrates how well one eye blocks out the other eye when viewing a 3D movie. For example, if I cover my left eye my right eye should only see what's intended for the right eye. Perform the steps below to conduct the 3D extinction procedure.

1. Attach the sync cable from the content server to the GPIO connector on the projector.



Figure 43: NEC 2000C GPIO Connector

2. Enter the projector's password on the front panel.

Note: A password is required every time the projector is opened as an anti-piracy measure.



Figure 44: NEC 2000C Control Panel

3. On the front panel navigate to 3D file select.
4. Attach an Ethernet hub/switch to the LAN port on the projector.



Attach Ethernet cable here.

Figure 45: NEC 2000C LAN Port

5. Attach a laptop running the NEC extinction software to the Ethernet hub. (The extinction settings are found under *3D Controls*.)

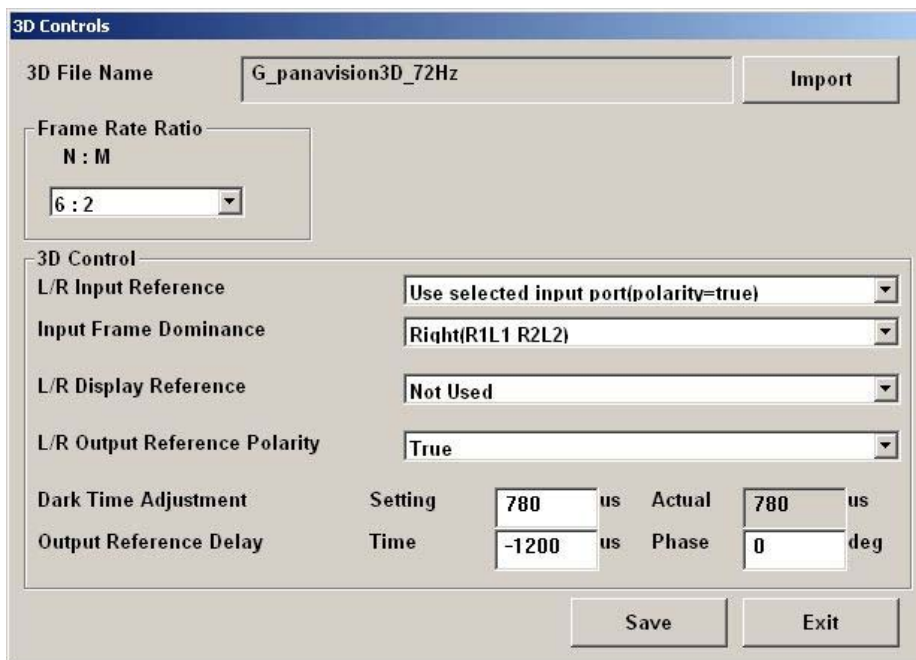


Figure 46: NEC Extinction procedure Software

6. Enter **780** in the **Dark Time Adjustment** field to set it to 780 milliseconds dark time.

Note: The dark time adjustment, which is determined by the size of the 3d filter wheel, prevents the seam between the left and right halves of the projector wheel from being projected.

7. Configure the output reference delay, which can be a positive or negative number, by performing the following steps:
 - A. Enter a number (1600, for example) in the **Output Reference Delay** field.

- B. Put on the Panavision 3D glasses.
- C. Cover your left eye and look the left vertical bar on the screen. It should have a value less than or equal to the 2% horizontal bar on the left-hand of the screen.

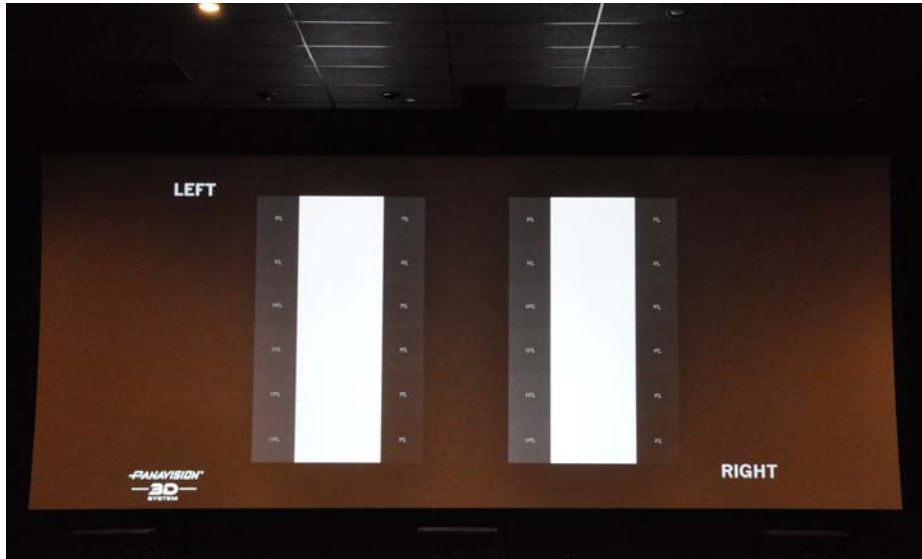


Figure 47: NEC 2000C Extinction Procedure Pattern

- D. Cover your right eye and look the right vertical bar on the screen. It should have a value less than or equal to the 2% horizontal bar on the right-hand of the screen.
- E. If either vertical bar is greater than 2% try different values in the **Output Reference Delay** field until they do.

3D Calibration Procedure

The 3D calibration procedure calibrates the colors projected by the NEC 2000C projector to ensure they conform to Digital Cinema Initiatives (DCI) specifications. Perform the steps below to conduct this test.

1. Attach the rack unit to the NEC 2000C projector by following the steps below:

For more information on using the rack unit, please refer to Step 7: Test the 3D Filter Wheel System on page 27.

- A. Temporarily attach the female end of parallel 25-pin cable on the NEC 2000C projector

Caution: Make sure there is no operating AC power until all connections have been made.

- B. Connect the 25-pin cable to the **FILTER WHEEL** connector on the rack unit.
- C. Connect the GPIO/Sync cable to 9-pin **SYNC** connector on rack unit.
- D. Connect the GPIO/Sync cable to the GPIO connector on the rear panel of the NEC 2000C projector.
- E. Plug in AC power on the back of the rack unit.
- F. Flip the master power switch on the back of the rack unit.
- G. Push the green power switch on the front of the rack unit. The button will illuminate.
- H. Push the **AUTO/DISABLE** button for seven seconds until it starts flashing.

2. Measure the native 2D colors of the projector by following the steps below:

- A. Point your spectroradiometer at the screen.

Your spectroradiometer must conform to the Society of Motion Picture and Television Engineers (SMPTE) document SMPTE-431-2 *D-Cinema Quality — Reference Projector and Environment*.

- B. Place the left 3D filter included in the 3D filter system kit over lens. (Alternatively, disassemble 3D glasses and tape the left lens onto the spectroradiometer.)
- C. Project the red, green, blue, and white test patterns from the projector.
- D. Enter the X and Y coordinates of each test pattern into the Microsoft Excel spreadsheet included on the USB thumb drive in the 3D filter wheel kit.
- E. Replace the left 3D filter on the spectroradiometer with the right 3D filter.
- F. Project the red, green, blue, and white test patterns from the projector.
- G. Enter the X and Y coordinates of each test pattern into the spreadsheet.

3. Create the Measured Color Gamut Data (MCGD) file by following the steps below:

The MCGD file is used to create a channel preset, which is used to display 3D content with the Panavision 3D System.

- A. Attach a laptop running the NEC calibration software to the projector. (The calibration software is *Digital Cinema Communicator (DCC) for S2*.)

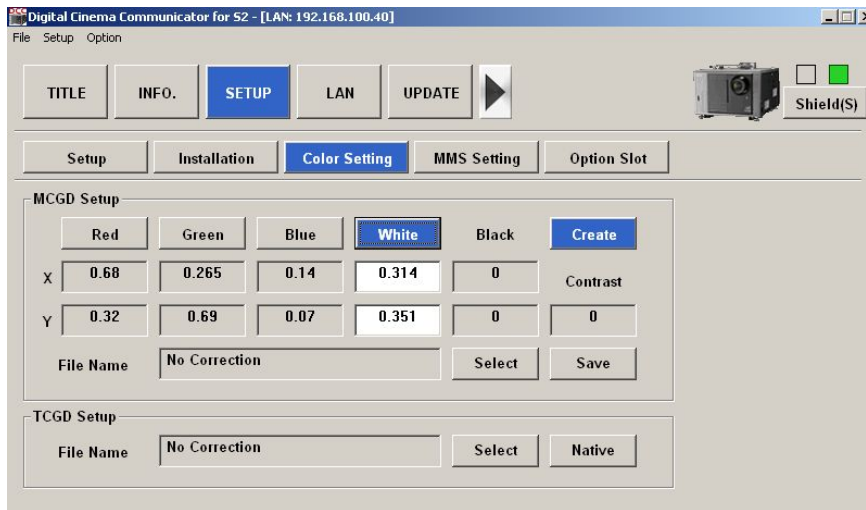


Figure 48: NEC Calibration Procedure Software

- B. Click **SETUP**.
 - C. Click **Color Setting**.
 - D. Click **Create**.
 - E. Enter the 3D red, green, blue, and white X and Y coordinates from the Excel spreadsheet by clicking **Red**, **Green**, **Blue**, and **White**, respectively.
 - F. Click **Select**.
 - G. Enter the name of your MCGD file.
 - H. Click **Save**.
4. Remove the rack unit by following the steps below:
 - A. Push the **AUTO/DISABLE** button on the rack unit once to disable the filter wheel.
 - B. Press the green button on the front of the rack unit to power OFF the unit.
 - C. Turn OFF the master power switch on the back of the rack unit.
 - D. Disconnect the cables connecting the rack unit to the projector.

End of installation and calibration procedures.