

©2013-2014 SIMMCONN Labs, LLC All rights reserved

NewScope-9 Operating Manual

For Kits with Main Board Serial Number NS51000 and above

March 29, 2015

A decorative graphic at the bottom of the page consisting of several overlapping, semi-transparent geometric shapes in shades of blue and grey, creating a layered, architectural effect.

NewScope-9 Operating Manual

1	Introduction	3
2	Installation	4
2.1	Initial Inspection.....	4
2.2	Installation of the NewScope-9 Kit	4
2.2.1	Read before installation	4
2.2.2	Prepare the unit for installation.....	5
2.2.3	Remove the metalized glass window.....	5
2.2.4	Remove the display unit	5
2.2.5	Install the LCD panel	6
2.2.6	Install the NewScope-9 main board.....	7
2.2.7	Finishing installation	9
3	Operations	10
3.1	Intensity control.....	10
3.2	Focus control.....	10
3.3	LEDs.....	11
3.4	Jumpers.....	11
3.5	Other Onboard Connectors	12

1 Introduction

The NewScope-9 Color LCD replacement Kit is designed to replace the HP® 1349A and 1349D monochrome CRT displays used in 8753A/B, 8757A, 8702A, 8720A and other test equipments. The Kit supports 8.0" or 8.4" TFT color LCD with SVGA (800 x 600) or XGA (1024 x 768) resolutions. The key features of the Kit include:

- Bitmap font with hand-optimized glyphs gives better clarity over the original vector font when rendered on a raster LCD panel
- Display items are differentiated by colors, similar to later models of the same test equipment family
- Parallax correction allows correct alignment between the soft menu items and the soft menu keys without affecting the rest of the picture
- Four display schemes selectable by the Focus adjustment (via pot or menu setting)
- The vector memory used on the 1349D can be enabled by a jumper
- The LCD display is powered from the regulated +5V and +15V dedicated for the 1349A/D display in the system

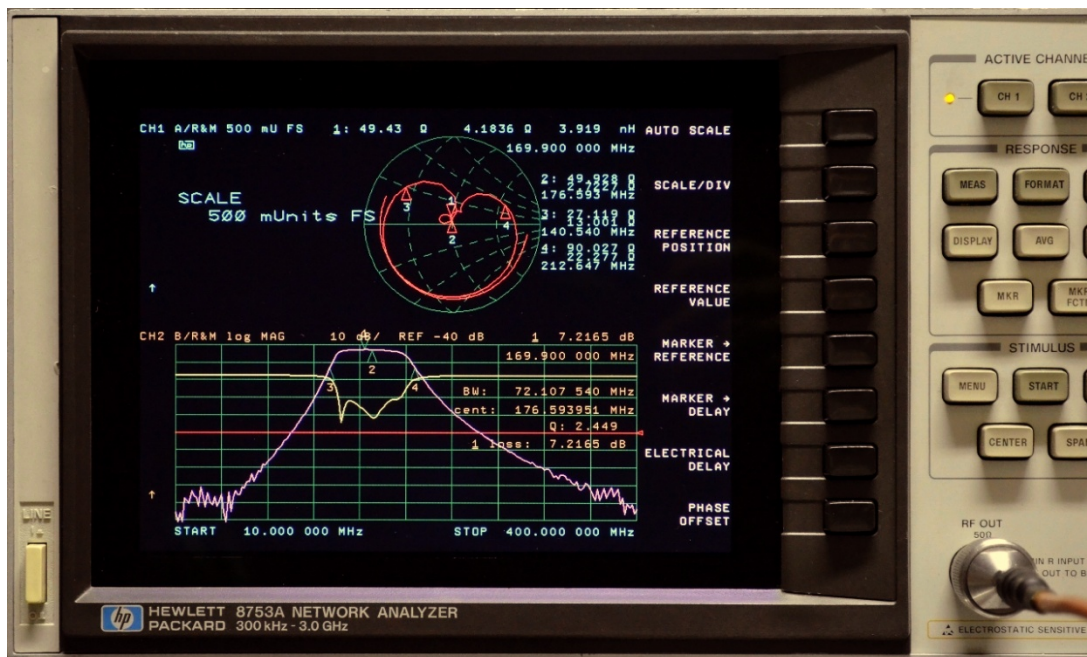


Figure 1 NewScope-9 8.0" SVGA Kit shown with default (NewScope) display scheme

2 Installation

2.1 Initial Inspection

The kits for different units may have different contents. Please check and make sure the kit you ordered match with the unit you are installing the kit into. Verify that all parts listed in the table corresponding to your kit are present.

Table 1 NewScope-9 Kit Content (8.0" SVGA Kit)

Item	Qty	Reference	Description	Note
1	1	NewScope-9	Main board, NewScope LCD Kit	1
2	1	18-0001-008	Display Link Cable, LVDS, 20 Conductor, Shielded	2
3	1	18-0001-009	LCD Backlight Inverter Power Cable, 6 Conductor	
4	1		CCFL Backlight Inverter	
5	1		LCD Panel, 8.0 Inch	2
6	1	19-0001-004	LCD Panel Bracket	2
7	1	19-0001-005	1349 Main Board Bracket	1
8	4		M2.5 x 8 Pan-head Philips screw	2
9	4		M2.5 x 12 x 6 Male-Female Hex standoff	2
10	4		6-32 x ¼" Flat-head Philips screw	
11	5		M3 x 8 Pan-head Philips screw	1
12	2		M3 x 6 Pan-head Philips screw	
13	1		Foam strip for 8.0" LCD panel	

Note:

1. Shipped pre-assembled as LCD panel assembly.
2. Shipped pre-assembled as Main board assembly with serial numbers NS51100 and above.

2.2 Installation of the NewScope-9 Kit

Installation should be performed by a qualified technical person who is familiar with the host test equipment.

The Kit installation time is approximately 30 minutes. Please refer to test equipment service manuals for location of the assemblies.

2.2.1 Read before installation

Please treat the parts and assemblies with care during installation. Take the following guidelines when installing the kit:

- 1) Do not use power tools to fasten screws. Use a manual screwdriver so that you can see and feel if something is not well aligned. If you meet considerable resistance when fastening a screw, back off and try again.

- 2) The connectors are fragile. If you meet resistance when trying to make a connection, wiggle the connector gently left and right, let it find its way and then gradually plug in. Do the same when disconnecting a cable.
- 3) Do not force anything into position. If something doesn't seem to fit, give it a little wiggle room and it will likely correct itself.
- 4) Before you try to modify some part that doesn't seem to fit, take a short break and read the manual one more time. Chances are some steps in the manual may not be very clear or well understood. Ask questions and we'll get back to you as soon as we can.

2.2.2 Prepare the unit for installation

Disconnect AC power cord. Remove the top and bottom covers from the equipment. Follow the manufacturer's ESD precaution guidelines in the unit's service manual.

2.2.3 Remove the metalized glass window

Refer to the test equipment service manuals for procedures to remove the front panel:



Carefully remove the key cap cover next to CRT by slowly lifting the cover from CRT side with fingernails.

Remove two screws for the CRT bezel cover assembly. Remove the bezel together with the metalized glass window. Save the parts for reinstallation. **Caution: The metalized glass window may be loose. Care must be taken when removing the bezel assembly so as not to break the glass panel.**

The glass window is held in place by plastic tabs that were melted into shape during assembly. You may choose to clean the glass while it is still in the bezel. If the tabs are already broken, or are to be broken to get the glass out, use epoxy or hot glue to fix the glass in place later during installation.

Clean the glass with glass cleaner.

2.2.4 Remove the display unit

Remove 12 screws that hold the CRT assembly in place. There are 6 each on top and bottom of the display. Save the screws for further installation.

Slowly remove the CRT out of the instrument about 25 % of the way. **Caution: CRT could have up to 20 KV potential on the anode. Use proper precautions when handling CRT Assembly.**

Disconnect all cables to CRT assembly. Make note of pin 1 location of the data cable connector as some of them are not keyed.

Remove the display. Dispose of display within your state's hazardous materials guidelines for CRT's and electronics.

Clean the inside subpanels of the CRT cavity with Isopropyl Alcohol and cloth of the high voltage dust residue.

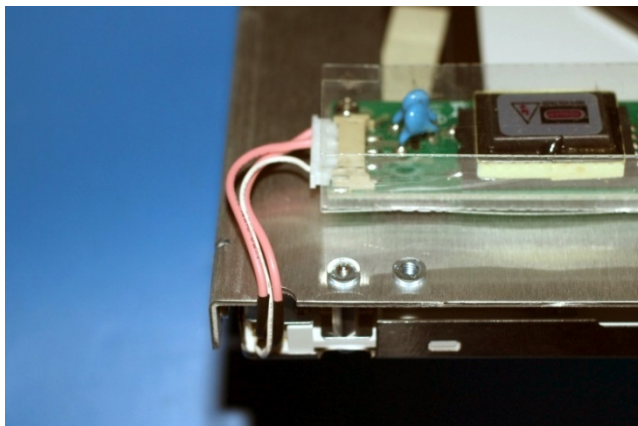
Remove the plastic trim strip on the top of the unit by inserting a small flat screwdriver into the slot and lifting upwards.

2.2.5 Install the LCD panel

Most panels give better contrast when viewed from 12 o'clock direction. Others perform better from 6 o'clock direction. If the image gray scale is reversed when the viewing angle changes from head-on to the most often used viewing angle, the panel can be turned 180 degrees for better results. To invert the image accordingly, change the main board jumper P17 setting (best setting may vary from LCD panel to panel).

If the LCD panel is shipped pre-assembled with the bracket and cable, skip the following 4 steps.

- 1) Install the display link cable to the LCD panel, observing the correct orientation. The metal contacts on the connector should face up when plugging in.
- 2) Install the Hex standoffs to the LCD panel. Use the M2.5 nuts for 8" LCD panel, or M3 nuts for 8.4" panel.
- 3) Install the LCD panel on the standoffs. The display link cable should make a 'U-turn' and route through the large cutout on the back. To optimize for viewing angle from above the unit, the LCD data connector should be on the left side of the unit.
- 4) Secure the drain wire of the display link cable shielding to the unused clinch nut on the LCD bracket.



Route the LCD panel backlight cable (white and pink) through the cutout near the corner of the LCD bracket. Connect the backlight cable to the CCFL inverter. Fasten the inverter to the LCD bracket panel using M3 x 6 Pan-head screws. Connect the 5-pin end of the inverter power cable to the inverter.



Install the LCD bracket to the front frame using supplied 6-32 ¼" flat-head screws, two on the top and two on the bottom. Make sure the half-circle cutouts of the LCD bracket are on the right side close to the soft menu keys.

On the 8720A, the thick foam strip under the front frame may need to be partly removed to gain access to the mounting holes on the frame.

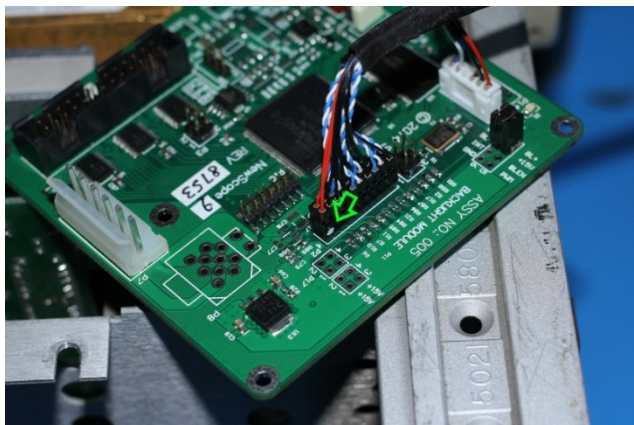
Remove the protective plastic shipping film from the front of the LCD screen. The protective film layer is indicated by a dark red arrow (circled in the picture above). Be careful not to scratch the LCD screen.

(Optional) Cut the dark foam tape to the width and length of the LCD panel. Apply foam strips to the metal bezel of the LCD panel on the front side. The foam strips may cover the black display area a little bit since there is a gap approximately 1.5mm wide between the metal bezel opening and the active pixel area on each side.

Place the metalized glass window into the CRT bezel if removed. Use epoxy or hot glue to fix the glass in place if necessary. Install the CRT bezel by fitting the ridge on the left side into the power switch bezel first. Install the two screws that were removed in section 2.2.2. Replace the key cap cover.

2.2.6 Install the NewScope-9 main board

Remove the main board assembly from the ESD bag. Install a jumper on header P1 pin 1-3 for 1349D (on 8757A). Leave P1 pin 1-3 open for 1349A (on 8753A/B, 8702A and 8720A).



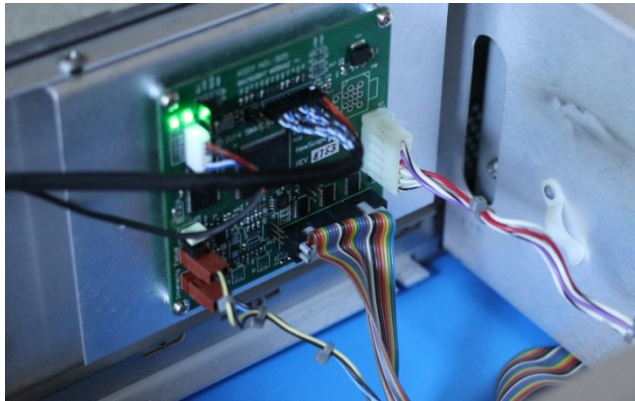
Connect the display link cable to P2 of the main board. Pin-1 locations are indicated with a white dot on the cable-end connector and a white triangle on the PCB.

Install the main board to the main board bracket using supplied M3 x 6 pan-head screws. With main board serial number NS51100 and above, the main board is shipped pre-assembled on the bracket.

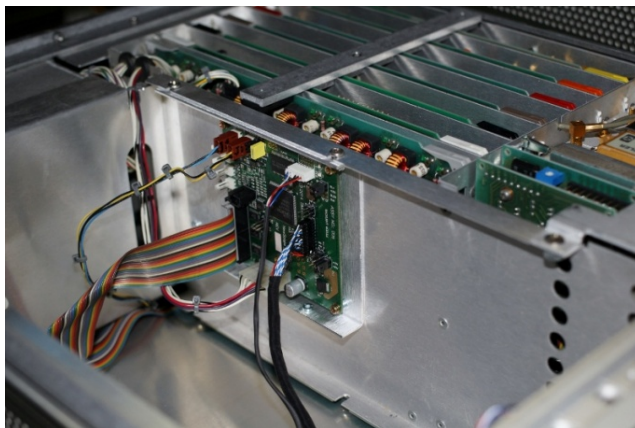
Connect the unit's display unit power and digital bus cables to P7 and P6 of the main board, respectively. Connect the backlight inverter cable to P19 of the main board.

Connect the Focus control connector from the unit to P4 on the main board, Intensity control connector to P5 on the main board. On the 8753A/B, 8702A or 8720A, the focus control wires are Yellow-Black. On the 8757A, the focus control wires are Yellow-Green-Blue.

Use the M4 screws saved from display removal process to mount the main board bracket to the unit. There are 8 possible positions the main board assembly could be installed. Refer to the following pictures on main board assembly installation locations.



For main board serial number below NS51100, the rear upper left corner of the CRT cavity is preferred for 8753A/B, 8702A and 8720A. The rear lower right corner is preferred for the 8757A.



For main board serial number above NS51100, it is preferred to install the main board assembly at the rear location of the center frame in 8753A/B, 8702A and 8720A.



For main board serial number above NS51100, it is preferred to install the main board assembly at the front location of the center frame in an 8757A. The cable clips securing the power cable need to be cut and removed in order to re-route the cable to the main board.

2.2.7 Finishing installation

Re-install the top and bottom covers on unit.

3 Operations

3.1 Intensity control

The intensity control works as before. You may not be able to completely dim the backlight with the intensity knob with LCD panels using CCFL backlight, due to the minimum operating current requirement of the CCFL tube. For extended LCD backlight life, it is recommended to set the intensity at 85% or lower.

A noisy intensity pot may cause surges in the backlight operating current. It should be cleaned or replaced.

3.2 Focus control

The Focus control is used by the NewScope-9 display to switch between display schemes. There are four preset, user configurable display schemes. Turning the pot clockwise with a screw driver (on units such as 8757A) or increase the focus level in the display menu (on units such as 8753A/B) will change the display scheme from 1 to 4. The preset display schemes are listed in Table 2.

Table 2 Default Display Schemes for 1349A Kit in 8753A/B

Display Items	NewScope	NewScope	Original Mono	Original Mono
Sample picture	See Figure 1	See Figure 3	See Figure 4	See Figure 5
Background	Black	Black	Black	Black
Label of active channel	Cyan	Cyan	Green	Green
Label of inactive channel	Orange	Orange	50% Green	50% Green
Soft menu labels, active	White	White	White	White
Soft menu labels, inactive	50% Yellow	50% Yellow	50% Green	50% Green
Reference Line	Red	Red	White	White
Active channel markers	Red	Red	White	White
Inactive channel markers	50% Green	50% Green	50% Green	50% Green
Smith Chart Curve	Red	Red	White	White
1 st trace in graph mode	Yellow	Yellow	Green	Green
2 nd trace in graph mode	Magenta	Magenta	75% Green	75% Green
3 rd trace in graph mode	Blue	Blue	63% Green	63% Green
4 th trace in graph mode	Green	Green	50% Green	50% Green
Graticule Lines	50% Green	50% Green	50% Green	50% Green
Graticule Style	Solid	Solid	Solid	Solid
Small Font (1.0x)	Vector	Bitmap+Vector ¹	Bitmap+Vector	Vector
Medium Font (1.5x)	Vector	Vector	Vector	Vector
Large Font (2.0x)	Vector	Vector	Vector	Vector
Large Font (2.5x)	Vector	Vector	Vector	Vector
Parallax Correction	No	Yes	Yes	No

¹ Most ASCII characters use bitmap font, special characters use vector font.

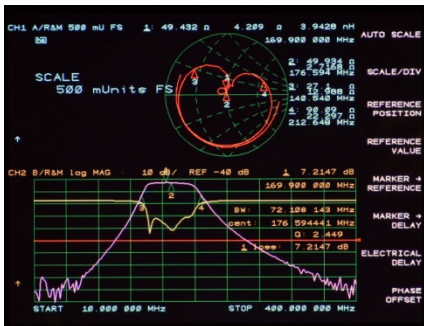


Figure 2 NewScope without Parallax Correction

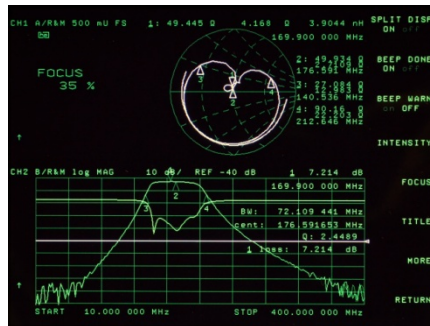


Figure 3 Original Mono with Parallax Correction

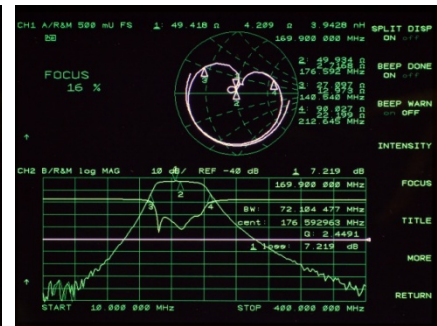


Figure 4 Original Mono without Parallax Correction

On the 8753A, focus and intensity correction settings may be saved in the EEPROM on the CPU board using the service test 49 procedure. Use the procedure outlined below to make the intensity setting and power-on default display scheme non-volatile.

- 1) Turn off the unit. Remove the A9 CPU board, move the jumper block on header J4 from the lower position pins to the upper position pins. Reinstall A9 CPU board. This enables the correction constants to be saved in the EEPROM.
- 2) Turn on the unit. Adjust Focus and Intensity to the desired brightness and display scheme on the second page of the Display menu.
- 3) Press **[SYSTEM] [SERVICE MENU] [TESTS] [4] [9] [x1]** to access the Focus and Intensity Correction Constant routine. The display should show "Foc/Int Cor".
- 4) Press **[EXECUTE TEST]** to begin the routine. Press **[YES]** at the prompt to store the intensity and focus correction constants. The display should now indicate "Foc/Int Cor:DONE".
- 5) Turn off the unit. Remove the A9 CPU board, move the jumper block on header J4 of the A9 CPU board back to its original position. Reinstall A9 CPU board. This prevents inadvertent changes to the correction constants.

Please don't turn the focus pot fully CW or CCW on the 8757A. Instead, keep the pot in the middle of the range that selects desired display scheme. Otherwise the main board may have difficulty "remembering" the setting.

3.3 LEDs

There are two LEDs on the main board, D1 and D2. D1 serves as 'activity' LED. Its duty ratio roughly indicates the display CPU utilization. The longer it stays on, the lower the utilization. D2 serves as 'FPGA configuration done', indicating a successful FPGA configuration.

3.4 Jumpers

There are two jumpers on NewScope-9 main board, P1 and P3. Their usage is explained in Table 3

Table 3 Jumper Settings

Jumper	Position	On	OFF	Note
P1	1-3	Enable Vector Memory Option for 1349D	Disable Vector Memory Option for 1349A	1349A setting is used on 8753A/B, 8702A and

				8720A. 1349D setting is used on 8757A.
	2-4	Reserved	Reserved	
P3	1-3	Alternate configuration #1	Alternate configuration #0	Set the target equipment configuration in conjunction with P1 1-3, see Table 4
	2-4	Return to factory setting	Normal operation	Used for recovery from unsuccessful firmware update only
P17	1-3	LCD image scan direction line #1 High	LCD image scan direction line #1 Low	Change LCD image scan direction. Some LCD panels require installing both jumpers to rotate image 180°. Other LCD panels require only one jumper. If image rotation is desired, try both jumpers until display image is satisfactory.
	2-4	LCD image scan direction line #2 High	LCD image scan direction line #2 Low	
P20	1-2	Jumper installed on the right side		Use Digital (PWM) dimming
	2-3	Jumper installed on the left side		Use Analog dimming. Type of dimming (PWM or Analog) is set at the factory to the LCD panel requirement.

Table 4 Main Board Configuration Options

Configuration	Target Equipment	LCD Panel Size	Vector Memory Option	P1, 1-3	P3, 1-3
0	8753A/B, 8720A, 8702A	8.0" SVGA	No	Remove	Remove
1	8753A/B, 8720A, 8702A	8.4" SVGA	No	Remove	Install
2	8757A	8.0" SVGA	Yes	Install	Remove
3	8757A	8.4" SVGA	Yes	Install	Install

3.5 Other Onboard Connectors

Other onboard connectors such as P8, P10 and P12 are reserved for factory use. P12 may be used by advanced users to update firmware and/or communicate to the main board. Its usage is described in the *NewScope-9 Programming Manual*

Revision History

Revision	Date	Notes
1.0	7/8/2014	Initial revision for serial numbers NS51000 and above
1.1	3/9/2015	Updated kit content table with pre-assembly information Added main board installation pictures for serial numbers NS51100 and above Added Service Test 49 procedure to store focus and intensity settings to EEPROM Updated jumper P17 pin positions in jumper settings table
1.2	3/29/2015	Added section 2.2.1 Read before installation. Minor edits to Service Test 49 procedure in section 3.2