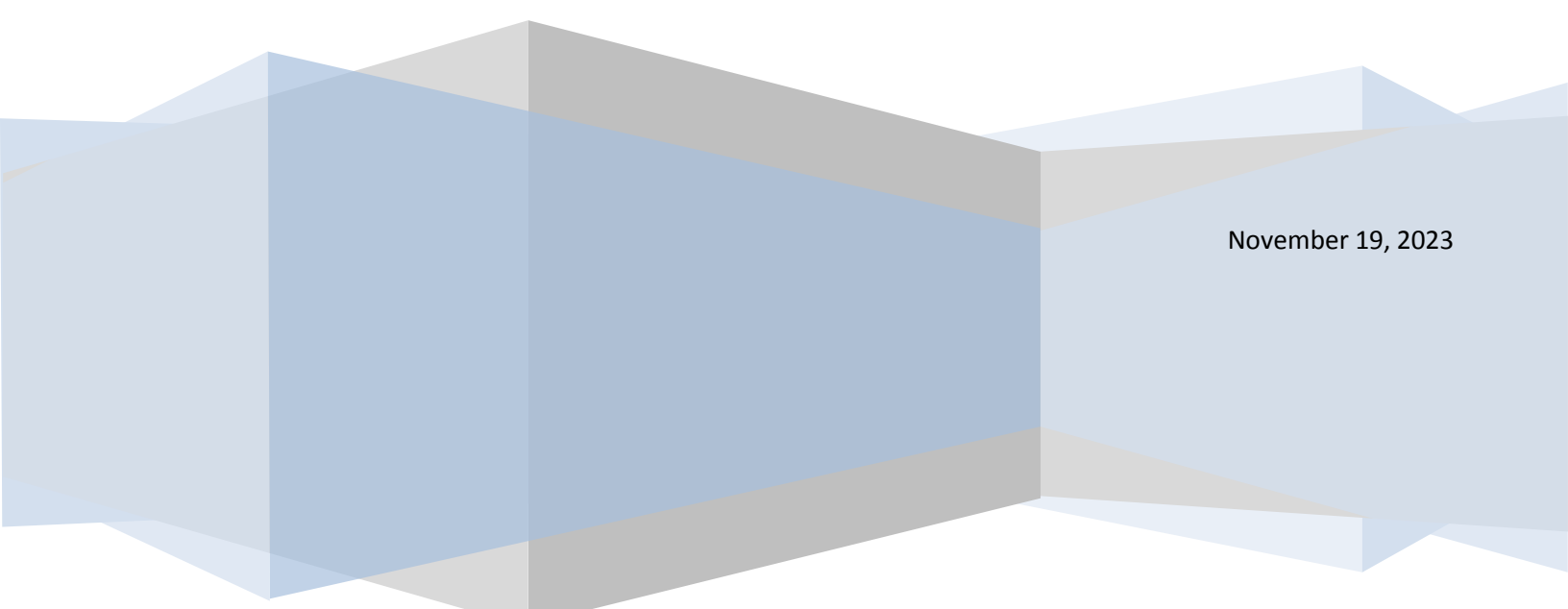


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NewScope-9x Operating Manual

For NewScope-9x LCD Kit Serial Number NS54200 and above

November 19, 2023

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.

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1 Introduction

The NewScope-9x 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 equipment. The Kit supports 8.0" IPS TFT color LCD with XGA (1024 x 768) resolution and a long-life LED back light. The key features of the Kit include:

- Bitmap font 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
- Color schemes and parallax correction can be toggled 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

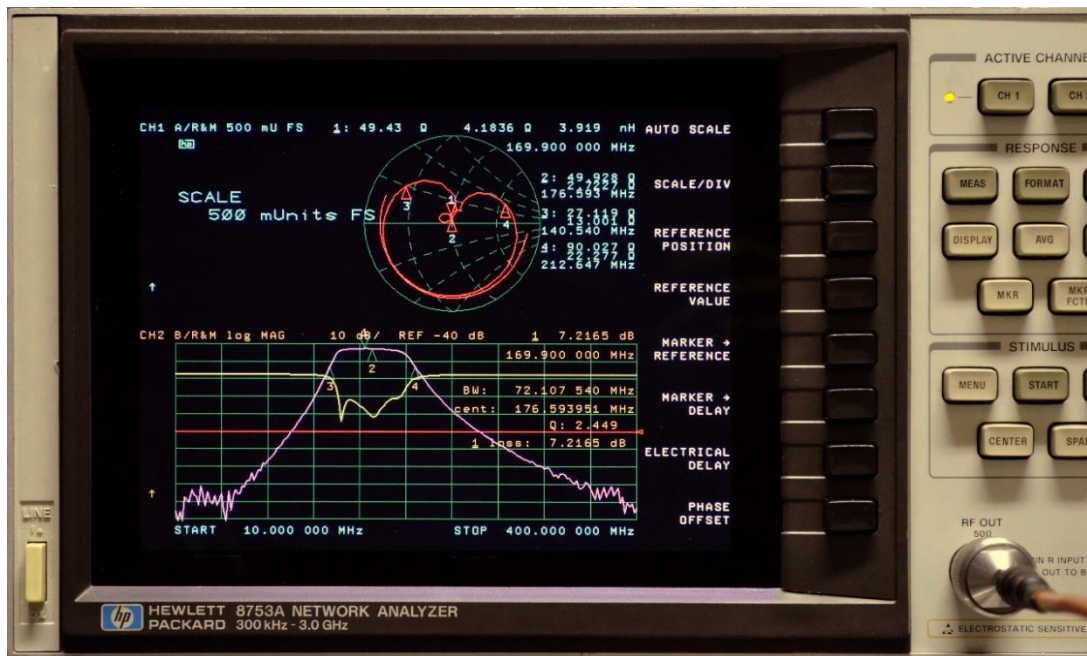


Figure 1 NewScope-9x 8.0" XGA Kit shown with default (NewScope) display scheme

2 Installation

2.1 Initial Inspection

Verify that all parts listed in the table corresponding to your kit are present.

Table 1 NewScope-9x Kit Content (8.0" XGA Kit)

Item	Qty	Reference	Description	Note
1	1	NewScope-9x	Main board, NewScope-9x LCD Kit	2
2	1	18-0001-008	Display Link Cable, LVDS, 20 Conductor, Shielded	
3	1	18-0001-015	Display Board Control Cable, 6-Conductor	
4	1	LCD-7B	Display Board for NewScope-9x kit	
5	1		LCD panel, 8.0 inch XGA for NewScope-9x kit	1
6	1	19-0001-006	NewScope-7B/C front plate	1
7	1	19-0001-019	NewScope-7B/C/D back plate	1
8	1	19-0001-001	1345A/1349A Main Board Bracket	2
9	4		6-32 x ¼" Flat-head Philips screw	
10	5		M3 x 8 Pan-head Philips screw	2
11	2		M3 x 6 Pan-head Philips screw	
12	1		Rubber foam seal, D-type, 9mmx5mm	
13	2		Jumper block, 0.1"	
14	2		Cable clamp	
15	1		Nylon wire tie 2.5x100mm	

Note:

1. Shipped pre-assembled as LCD panel assembly.
2. Shipped pre-assembled as Main board assembly.

2.2 Installation of the NewScope-9x Kit

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

The Kit installation time is between 30 minutes to an hour. Please refer to the 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, 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 trying to modify some parts that don'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 the two screws behind the key cap cover 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 need to be broken to get the glass out, use epoxy or hot glue to secure 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 the keyway or pin 1 on the data cable connector, as some of them are not keyed.

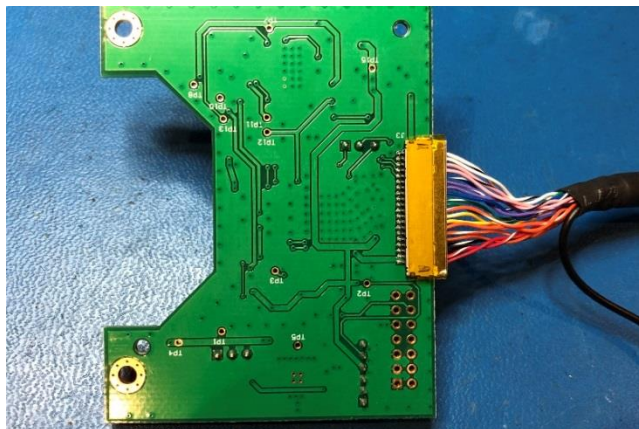
Remove the display. Dispose of display within your state's hazardous materials guidelines for CRT's and electronics.

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

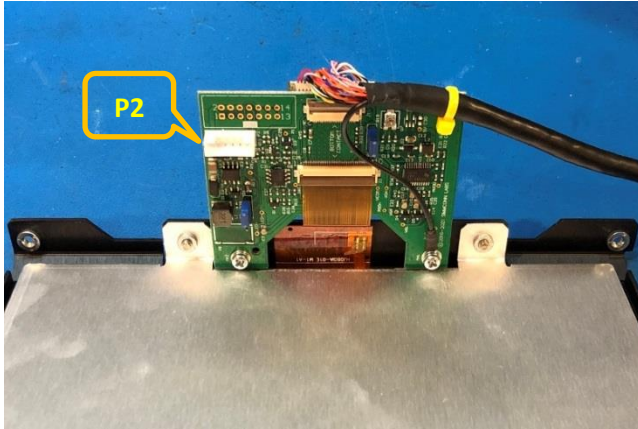
The LCD panel is shipped pre-assembled with the brackets. Use the following steps to connect the LCD-7B Display Board and cables.



Connect the LCD end of the Display Link Cable by aligning the metal band with J3 on the back of the LCD-7B board. Apply a piece of tape to prevent the connectors from loosening.



Secure the cable using the wire tie.



Route the LCD panel FPC cable through the opening to J2 on the LCD-7B display board. When connecting the FPC cable, first open the lever, insert the FPC cable end fully into the connector with contacts facing **DOWN**, and then gently close the lever. Do not force the lever to close.

Mount the LCD-7B display board to the front plate using two M3 screws. Secure the shield wire with the screw. Connect the Display Board Control Cable to P2.



Install the LCD panel assembly to the instrument chassis front frame using the provided 6-32 flat-head screws, two on the top and two on the bottom. The LCD-7B display board should be on the bottom.

Remove the protective shipping film from the LCD panel by pulling the tab.



OPTIONAL: If the glass filter has a tendency to fall out of the CRT bezel from the bottom, cut the rubber foam seal to 1/2" long pieces, remove the paper backing and attach to the slanted edges of the LCD front plate on the bottom.

If the glass is also loose on the top, the foam seal can be applied to the top as well. Keep them small as they will be visible through the glass.

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 2.2.3. Replace the key cap cover.

2.2.6 Install the NewScope-9x 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).

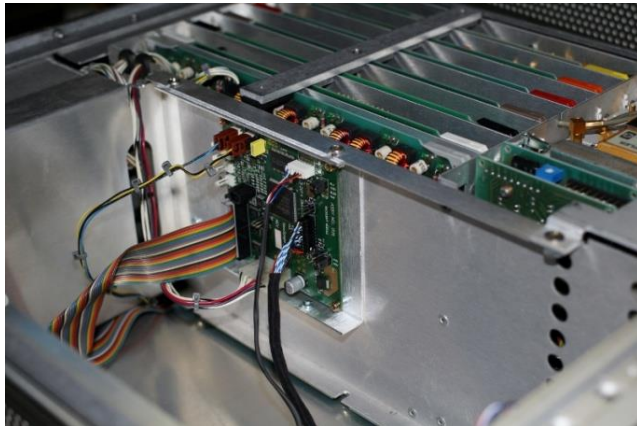


Connect the display link cable to P2 of the main board. Pin-1 locations are indicated with a white dot on the cable-end connector and a white triangle on the PCB.

Connect the unit's display unit power and digital bus cables to P7 and P6 of the main board, respectively. Connect the Display Board Control 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.



It is recommended to install the main board assembly at the rear location of the center frame in 8753A/B, 8702A and 8720A.



It is recommended 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 power cable to the main board.

Remove the plastic film on the adhesive backing of the cable clamps. Place the clamps inside the monitor cavity along the cable route and secure the cables.

2.2.7 Finishing installation

Re-install the top and bottom covers on unit.

3 Operation

3.1 Intensity control

The intensity control works as before. You may not be able to completely dim the backlight with the intensity knob. 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-9x display to switch between display schemes. There are four preset 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 2	See Figure 3	See Figure 4
Background	Black	Black	Black	Black
Label of active channel	Ivory	Ivory	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

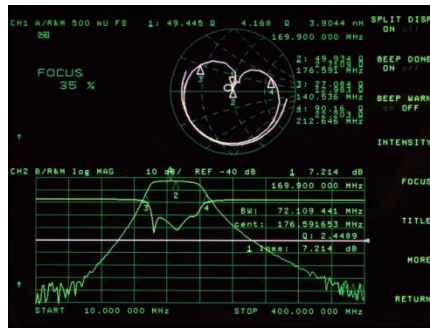


Figure 3 Original Mono with Parallax Correction



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 and display scheme settings 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.

Avoid leaving the focus pot fully CW or CCW on the 8757A. Instead, keep the pot in the middle of the range that selects the 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

The jumpers on NewScope-9x main board are explained in Table 3.

Table 3 NewScope-9x Main Board 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	Reserved
	2-4	Return to factory setting	Normal operation	Reserved
P17	1-3	LCD image scan direction line #1 High	LCD image scan direction line #1 Low	Change LCD image scan direction.
	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. NewScope-9x uses PWM dimming.
	2-3	Jumper installed on the left side		Use analog dimming.

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" XGA	No	Remove	Remove
1	8757A	8.0" XGA	Yes	Install	Remove

The jumpers on the Display Board are explained in Table 5.

Table 5 Display Board Jumper Settings

Jumper	Default	Position 1-2	Position 2-3	Note
P4	2-3	LCD image scan direction line #1 High	LCD image scan direction line #2 High	Function similar to P17 on the main board. The image scan direction should be set at only one place.
P5	2-3	Use analog dimming	Use digital (PWM) dimming	NewScope-9x uses PWM dimming.

3.5 Other Onboard Connectors

Other onboard connectors such as P8, P10 and P12 on the main board are reserved for factory use.

Revision History

Revision	Date	Notes
1.0	11/19/2023	Initial version based on NewScope-9 Operating Manual