Service Tests

4

Introduction

This chapter explains how to use the Controller Application, which is a PC-based tool that helps to troubleshoot and repair the printer.

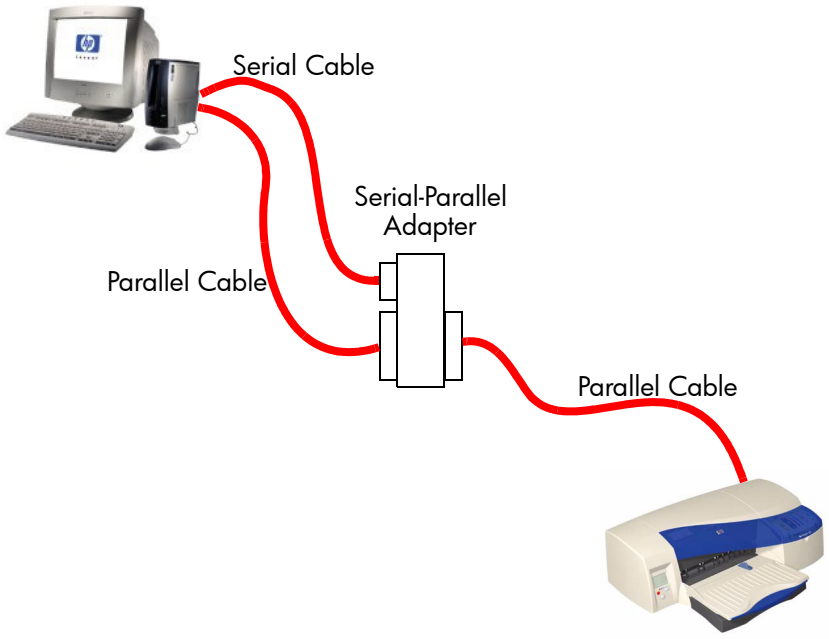
Diagnostics - Self Test

Initialization Sequences

Whenever the Printer is switched ON, it automatically performs a series of internal self tests and mechanical initialization sequences. If any of the parts fail, a system error will appear and you should consult *System Error Codes*.

Controller Application - Connection Instructions

In order to connect the computer to the printer, you will need a Serial to Parallel adapter, and you connect as shown in this illustration:



Controller Application - Explanation

The Controller Application consists of 5 different stations, each station serving a specific function:

1 **SE10** = Troubleshooting ⇒ Page *4-6*

The purpose of this station is to troubleshoot the different systems of the printer, which are:

- Paper-Axis (checks the skew and margins, Out-of-Paper Sensor and the Paper-Axis Accuracy).
- Scan-Axis (Checks the Scan-Axis Servo and the Scan-Axis length).
- Group Check (Checks Front Panel, Acumen, Door Sensors, Firmware Release and Calibration Values for the Color Calibration and Paper Advance Calibration).
- Service Station (Checks the functionality of the Service Station).

2 **SE20** = Repair ⇒ Page *4-13*

The purpose of this station is to perform the Paper Advance Calibration after the printer has been repaired and, if necessary, upgrade the printer firmware.

3 **SE30** = Final Setup ⇒ Page *4-17*

The purpose of this station is to prepare the printer for the final setup.

4 **SE40** = Modular ⇒ Page *4-19*

The purpose of this station is to exercise all the printer subsystems in order to detect any problems.

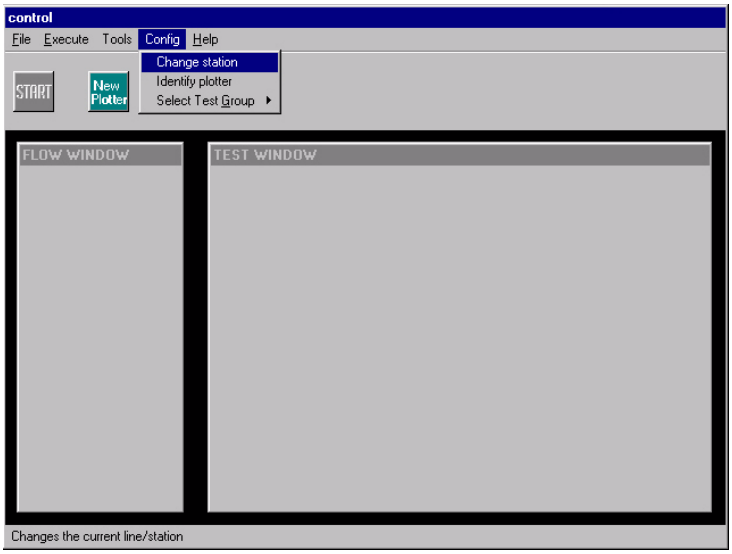
5 **SE50** = PRS Calibration ⇒ Page *4-24*

The purpose of this station is to adjust the PRS (pen-to-rib spacing).

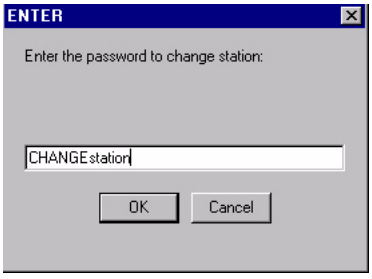
Controller Application - Using

1 Double-click on the controller icon to start the application.

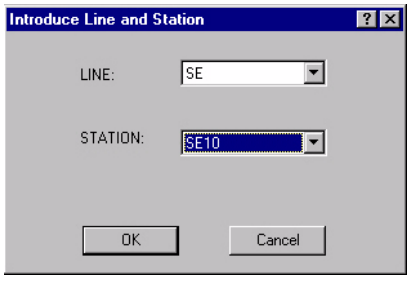
2 Click on **Config** and select **Change station.**



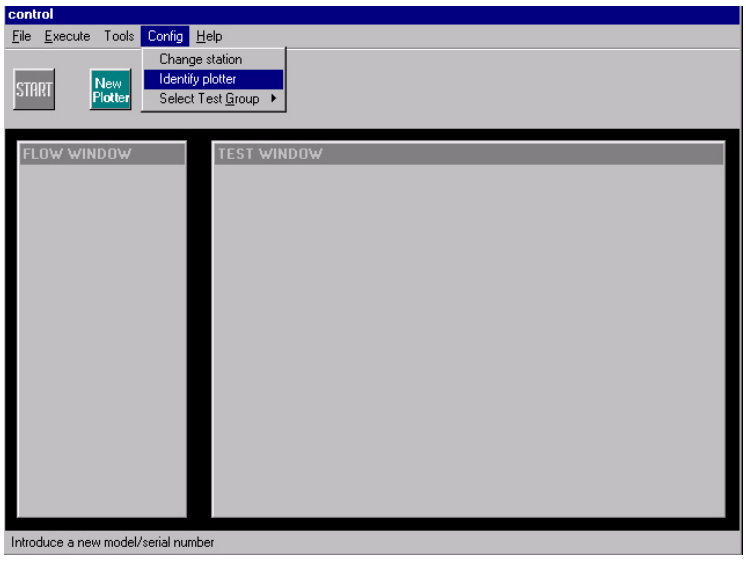
3 A "Enter the password to change station" message will appear. You must enter the following text and then press OK: CHANGEstation.



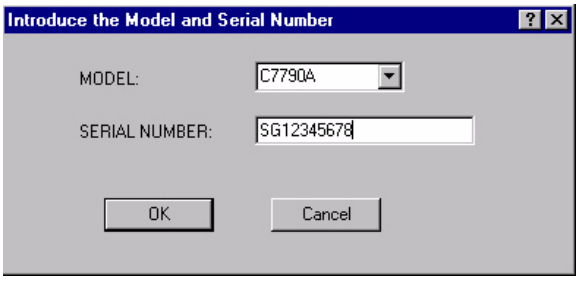
4 A box will appear prompting you to select the Line and Station. For the Line, select **SE** and for the Station, select the station that you require, either SE10, SE20, SE30, SE40 or SE50.



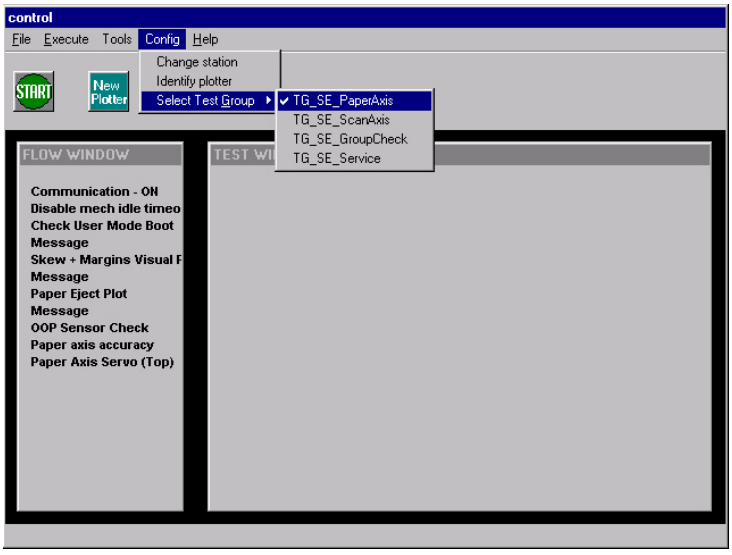
5 Click on **Config** and select **Identify plotter.**



6 A box will appear prompting you to select the Printer Model and to type in the Printer Serial Number.



7 Click on **Config**, then click on **Select Test Group** and then click on the test group required.



STATION SE10 = Troubleshooting

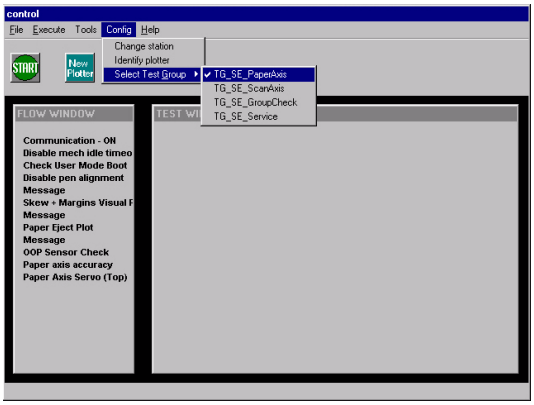
The purpose of this station is to troubleshoot the different systems of the printer, which are:

- **TG_SE_Paper-Axis** (checks the skew and margins, Out-of-Paper Sensor and the Paper-Axis Accuracy).
- **TG_SE_Scan-Axis** (Checks the Scan-Axis Servo and the Scan-Axis length).
- **TG_SE_Group Check** (Checks Front Panel, Acumen, Door Sensors, Firmware Release and Calibration Values for the Color Calibration and Paper Advance Calibration).
- **TG_SE_Service Station** (Checks the functionality of the Service Station).

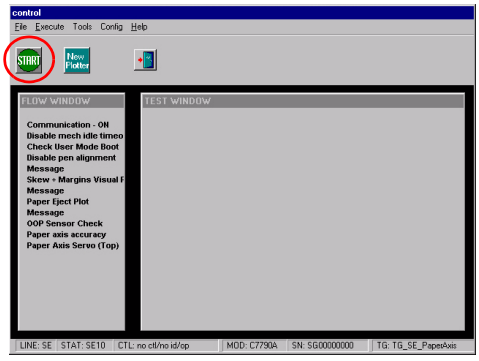
TG_SE_Paper-Axis

Perform the Paper-Axis test as follows:

1 Switch to Station **SE10** and select test group **TG_SE_Paper-Axis**.



2 To start the Paper-Axis test, click on Start.



3 The Paper-Axis test will perform the following tests:

- Skew and Print Margins - The printer will print an A3/B size plot containing a cross in each corner of the page. You have to manually align the top left cross with the top right cross and the bottom left cross with the bottom right cross.
- Out-of-Paper Sensor - The printer checks if media can correctly pass through the Paper Path and whether media is detected correctly.

- Paper-Axis Accuracy - The printer calculates any positioning error in the Paper-Axis. This check requires media loaded in tray 1.

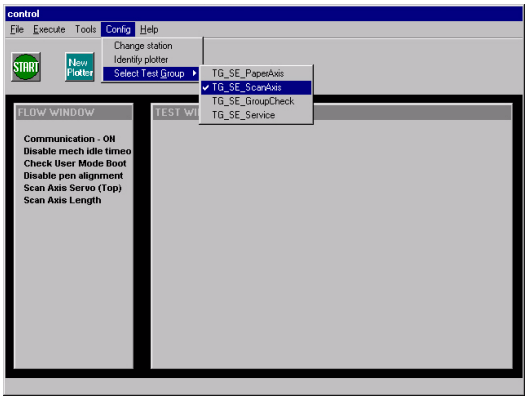
4 If during the Paper-Axis test an error message appears, refer to the following table in order to troubleshoot it:

TG_SE_Paper-Axis		
Test Flow	**Error Message**	**Troubleshooting**
Check User mode boot	Unit booted in mode 1 while expected 0	■ Check that the printer is in user mode and not in mfg mode.
OOP sensor check	Line sensor fail	■ Replace the Carriage Assembly
Paper axis accuracy	Unable to initialize paper axis!	■ Perform the Accuracy Calibration and try the test again. ■ Replace the Paper-Axis Drive Motor Assembly. ■ Replace the Encoder Disc. ■ Replace the Electronics Module.
Paper axis servo	Max pre-picking PWM out of limits:	■ Replace the Paper-Axis Drive Motor Assembly.
	Max picking PWM out of limits:	
	Max pre-picking PWM out of limits:	
	No valid data found!	■ Check that the Encoder Harness is connected correctly. ■ Replace the Electronics Module.

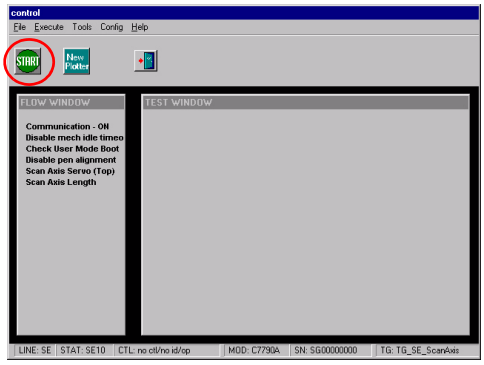
TG_SE_Scan-Axis

Perform the Scan-Axis test as follows:

1 Switch to Station **SE10** and select test group **TG_SE_Scan-Axis**.



2 To start the Scan-Axis test, click on Start.



3 The Scan-Axis test will perform the following tests:

- Scan-Axis Servo - The printer checks the movement of the Carriage through the Scan-Axis at 4 different speeds.
- Scan-Axis Length - This checks the length of the printer to make sure it is correct.

4 If during the Scan-Axis test an error message appears, refer to the following table in order to troubleshoot it:

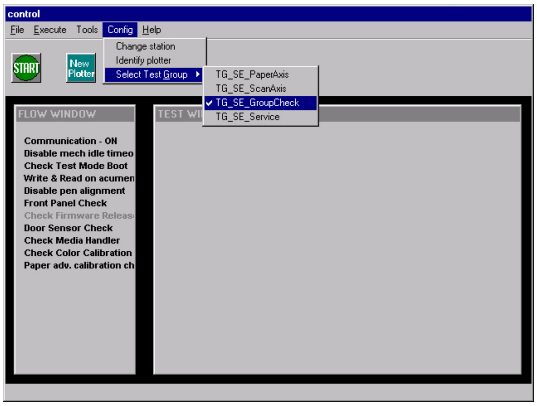
TG_SE_Scan-Axis		
Test Flow	**Error Message**	**Troubleshooting**
Check User mode boot	Unit booted in mode 1 while expected 0	■ Check that the printer is in user mode and not in mfg mode.

TG_SE_Scan-Axis		
Test Flow	**Error Message**	**Troubleshooting**
Scan axis servo	Detected Vref = 0 inside stable zone	■ Check that the Carriage Assembly is able to move out of the Service Station. ■ Replace the Carriage Assembly. ■ Replace the Carriage Belt. ■ Replace the Turnaround Assembly. ■ Replace the Carriage Rod. ■ Replace the Electronics Module.
	in average PWM at speed	
	in maximum PWM at speed	
	in stab. position at speed	

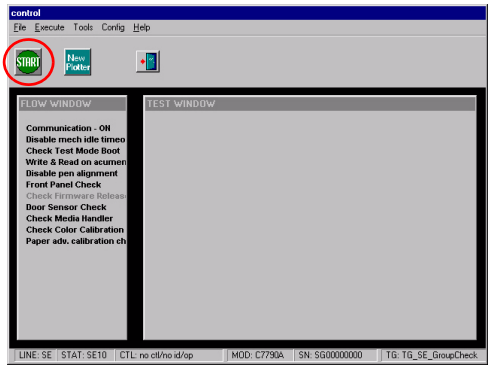
TG_SE_Group Check

Perform the Group Check test as follows:

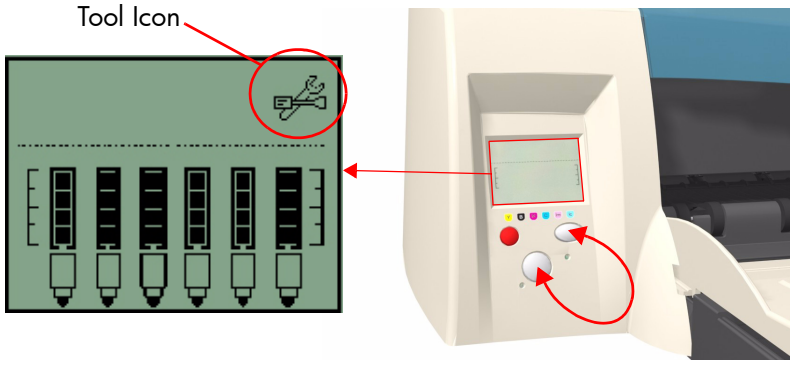
1 Switch to Station **SE10** and select test group **TG_SE_GroupCheck**.



2 To start the Group Check test, click on Start.



3 A message appears that asks you to put the printer in **MFG mode**. To do this, while the printer is switched OFF, press both the **resume** and **power** buttons together until the Tool icon appears on the front panel. Click on **OK** once the printer is in **MFG mode**.



4 The Group Check test will perform the following tests:

- Front Panel - The printer checks if the Front Panel LEDs and buttons function correctly.
- Acumen (write and read check) - The printer writes a bit to the Acumen and then tries to read it.
- Firmware Release - The printer checks the date and version of the firmware to make sure it is correct.
- Door Sensors - The printer checks to make sure that the Access and Printhead Door Sensors are functioning correctly.
- Check Media handler - The Printer checks that the media handler is functioning correctly
- Color Calibration - The printer checks whether the Color Calibration has been performed and stored correctly.
- Paper Advance Calibration - The printer checks whether the Paper Advance Calibration has been performed and stored correctly.

5 If during the Group Check test an error message appears, refer to the following table in order to troubleshoot it:

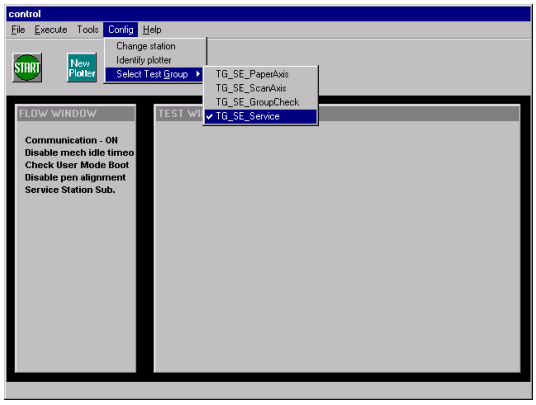
TG_SE_Group Check		
Test Flow	**Error Message**	**Troubleshooting**
Check test mode boot	Unit booted in mode 0 while expected 1	■ Check that the printer is in mfg mode and not in user mode.
Front panel check	Front panel key failed	■ Check that the Front Panel cable is connected. ■ Replace the Front Panel.

TG_SE_Group Check		
Test Flow	**Error Message**	**Troubleshooting**
Check firmware release	firmware tcl function sysGetFwRevision	■ Upgrade the Printer's firmware. ■ Check for a newer release of the Controller Application.
Check media handler	There is a media handler when there should not be.	
	There is no CLEANOUT in the unit	■ Check that the Cleanout is installed correctly. ■ Replace the Cleanout.
	There is no DUPLEXER in the unit	■ Check that the Duplexer is installed correctly. ■ Replace the Duplexer.
Check color calibration	Color sensor has not been calibrated	■ Replace the carriage Assembly.

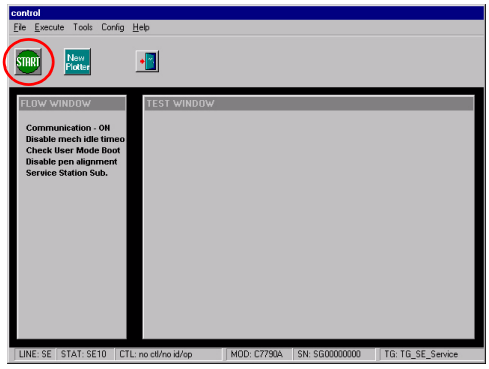
TG_SE_Service

Perform the Service test as follows:

1 Switch to Station **SE10** and select test group **TG_SE_Service**.



2 To start the Service test, click on Start.



3 The Service test will perform the following test:

- Service Station - The printer moves the Service Station to obtain the necessary values (maximum and minimum) and checks that these values are within the specifications.

4 If during the Service test an error message appears, refer to the following table in order to troubleshoot it:

TG_SE_Service		
Test Flow	**Error Message**	**Troubleshooting**
Check User mode boot	Unit booted in mode 1 while expected 0	■ Check that the printer is in user mode and not in mfg mode.
Service station sub	Error initializing Scan Axis subsystem	
	Resetting flag	

STATION SE20 = Repair

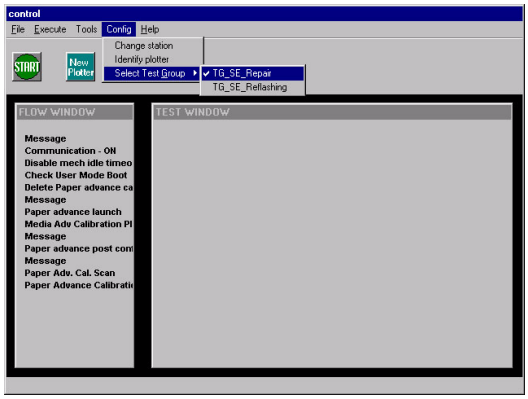
The purpose of this station is to perform the following test groups:

- **TG_SE_Repair** (perform the Paper Advance Calibration after the printer has been repaired).
- **TG_SE_Reflashing** (upgrades the firmware version of the printer).

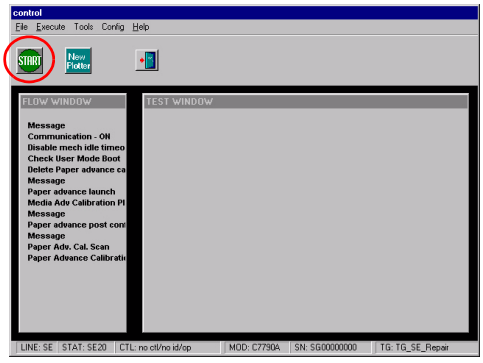
TG_SE_Repair

Perform the Paper Advance Calibration as follows:

1 Switch to Station **SE20** and select test group **TG_SE_Repair**.



2 To start the Paper Advance Calibration, click on Start.



3 This station will perform the Paper Advance Calibration in the following order:

- Delete Paper Advance Calibration - The printer deletes the old paper Advance Calibration values and activates the media loading process.
- Paper Advance Launch - The printer begins the Paper Advance calibration.
- Media Advance Calibration Plot - The printer prints the Paper Advance plot.
- Paper Advance Post Configuration - The printer activates the picking mechanism so that the Paper Advance plot that was created can be reloaded into the printer.
- Paper Advance Calibration Scan - The printer scans the Paper Advance plot in order to perform the calibration.

- Paper Advance Calibration - Once the calibration is finished, the printer checks that the values are within the specifications.

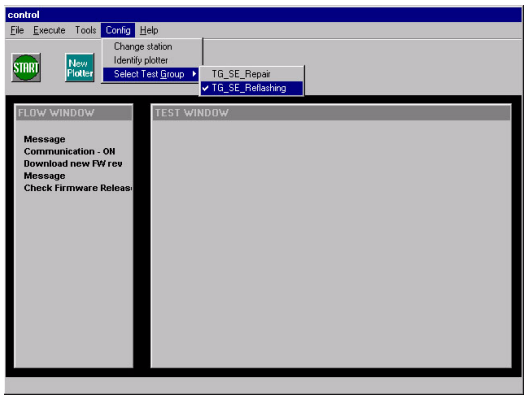
4 If during the Paper Accuracy Calibration an error message appears, refer to the following table in order to troubleshoot it:

TG_SE_Repair		
Test Flow	**Error Message**	**Troubleshooting**
Check user mode boot	Unit booted in mode 0 while expected 1	■ Check that the printer is in mfg mode and not in user mode.
Paper advance launch	Unable to find zero paper	
	Unable to enable picking	
	Unable to find zero paper	
	Unable to disable picking	
Paper advance post configuration	Unable to enable picking	
Paper advance calibration scan	Firmware tcl function paxPick	
	Can't calibrate sensor	■ Replace the Carriage Assembly.
	Can't fit valleys	
	Firmware tcl function paxEject	
	Firmware tcl function lsControlLeds	

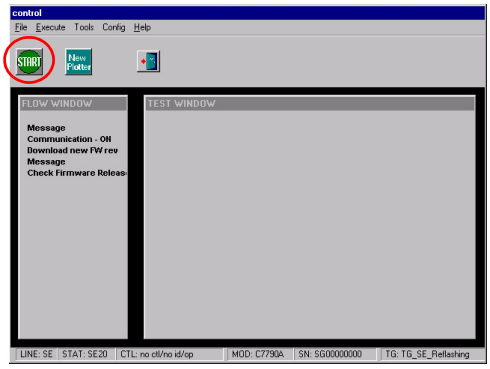
TG_SE_Reflashing

Upgrade the firmware version of the Printer as follows:

1 Switch to Station **SE20** and select test group **TG_SE_Reflashing**.

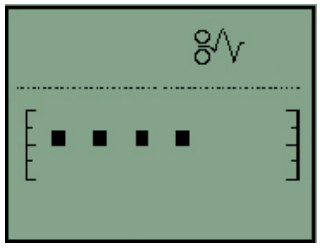


2 To start the firmware upgrade, click on Start.

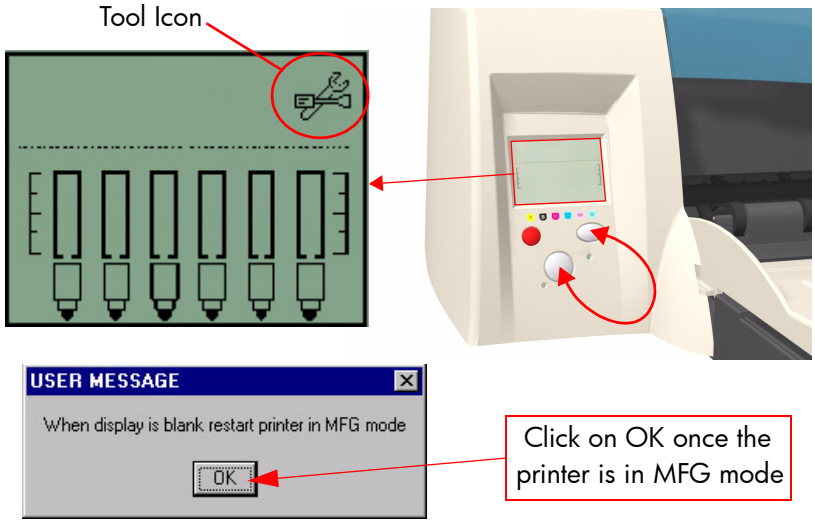


3 A message will appear requesting you to make sure that the computer is connected to the Printer via the parallel cable and that the Printer is switched On. Click on OK.

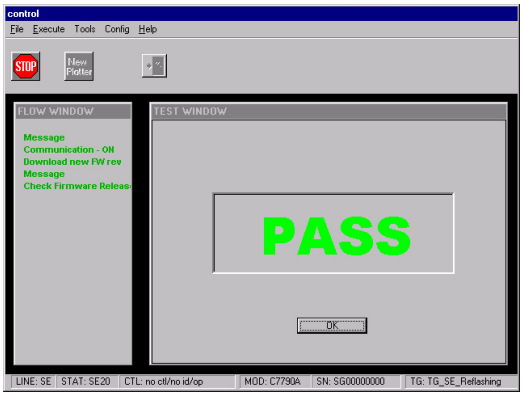
4 The firmware upgrade process will start and the Printer's front panel will show the progress (as shown below).



5 Once the printer's front panel display goes blank, restart the printer in **MFG mode**. To do this, while the printer is switched OFF, press both the **resume** and **power** buttons together until the Tool icon appears on the front panel. Click on **OK** once the printer is in **MFG mode**.



6 If the firmware is upgraded successfully, the following message will be displayed on your computer.



STATION SE30 = Final Setup

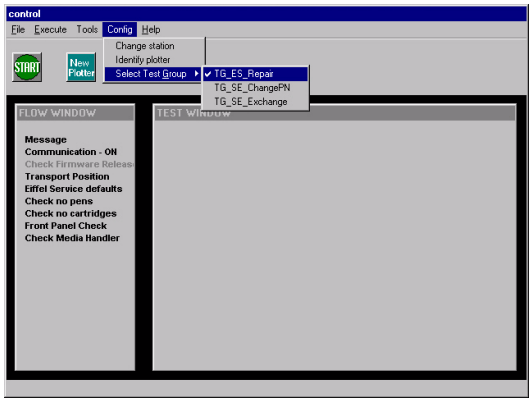
The purpose of this station is to prepare the printer for the final setup.

Test Group TG_ES_Repair should ONLY be performed when the printer is to be repaired and returned to the customer. Test Group TG_SE_Exchange should ONLY be performed when the printer is to be repaired and then exchanged.

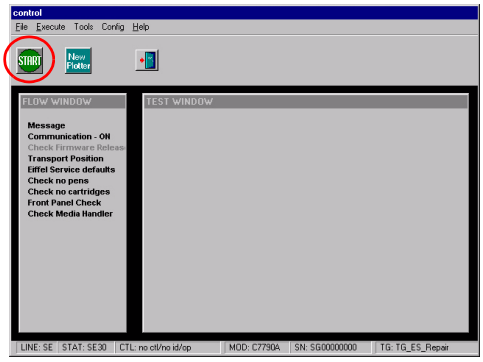
TG_ES_Repair

Perform test group **TG_SE_Repair** as follows:

1 Switch to Station **SE30** and select test group **TG_SE_Repair**.



2 To start the test group, click on Start.



3 The test group is performed in the following order:

- Firmware Release - The printer checks the date and version of the firmware to make sure it is correct.
- Transport Position - The printer ejects any media that is loaded and then puts the Carriage into the capping position. The printer then leaves the lifters in the up position and then activates the Pen Alignment so that it is automatically performed when Printheads are inserted into the printer.
- Eiffel Service Defaults - The printer records the model number and deletes the USB identifiers and everything else that is not required from the memory.
- Check no pens - The printer checks that no printheads are installed.
- Check no cartridges - The printer checks that no printheads are installed.

- Front Panel - The printer checks if the Front Panel LEDs and buttons function correctly.
- Check Media handler - The Printer checks that the media handler is functioning correctly.

4 If during this test group an error message appears, refer to the following table in order to troubleshoot it:

TG_ES_Repair		
Test Flow	**Error Message**	**Troubleshooting**
Check firmware release	firmware tcl function sysGetFwRevision	
Transport position	Unable to initialize!	■ Perform the Scan-Axis test (Station SE10).
	PROBLEMS moving to capping position	■ Visually check if the Service Station is broken. ■ Perform the Scan-Axis test (Station SE10). ■ Perform the Service Test (Station SE10)
	PROBLEMS pressurizing the ISS	■ Replace the Ink Supply Station.
Check no pens	Please, remove the pens!	The Printheads need to be removed.
Check no cartridges	Please, remove the cartridges!	The Ink cartridges need to be removed.
Front panel check	Front panel key failed	■ Check that the Front Panel cable is connected. ■ Replace the Front Panel.
Check media handler	There is a media handler when there should not be.	
	There is no CLEANOUT in the unit	■ Check that the Cleanout is installed correctly. ■ Replace the Cleanout.
	There is no DUPLEXER in the unit	■ Check that the Duplexer is installed correctly. ■ Replace the Duplexer.

TG_SE_Exchange

Refer to test group TS_ES_Repair for more information.

TG_SE_ChangePN

This test group allows the Model Number, Serial Number and Manufacturing Date to be reconfigured.

STATION SE40 = Modular

The purpose of this station is to exercise all the printer subsystems in order to detect any problems.

Make sure that the Ink Cartridges have been removed from the Printer before starting the Modular Test.

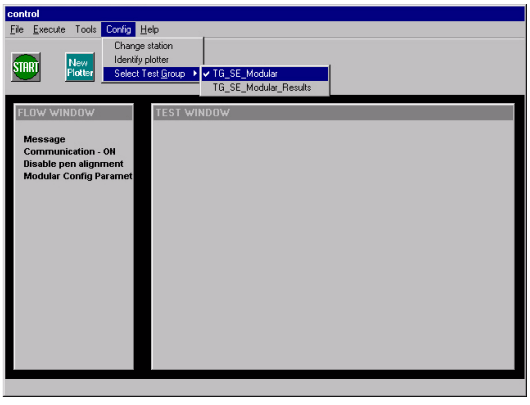
A few things you need to remember about the Modular Test:

- In order for the Modular Test to be finished successfully, it needs to complete 10 continuous cycles without a subsystem failing.
- If a subsystem fails, stop the Modular Test, resolve the problem with the failing subsystem and then repeat the Modular Test.
- The Printer cannot be taken out of the Modular Test mode until 10 continuous cycles have been successfully completed. Powering Off and On will NOT take the Printer out of the Modular Test.
- Once the Modular Test has been completed, you must execute test group **TG_SE_ModularResults** to completely finish the Modular test. If this is NOT done, every time you unplug the Printer and plug it in again, the Printer will start itself and run a cycle of the Modular Test.

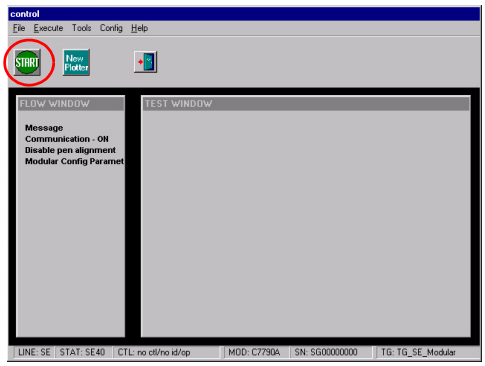
TG_SE_Modular

Perform the modular test as follows:

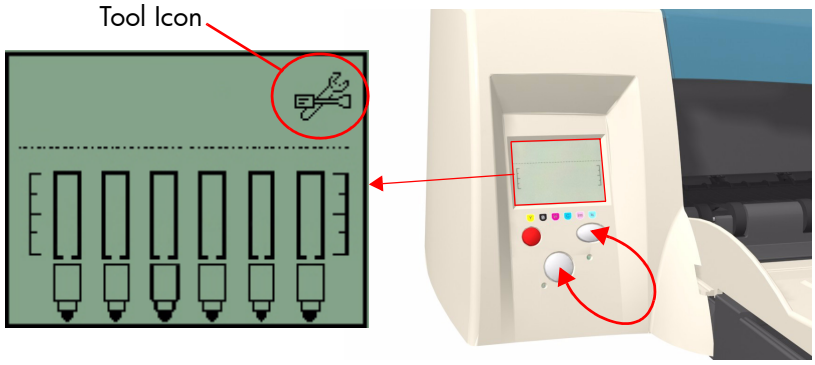
1 Switch to Station **SE40** and select test group **TG_SE_Modular**.



2 To start the test group, click on Start.

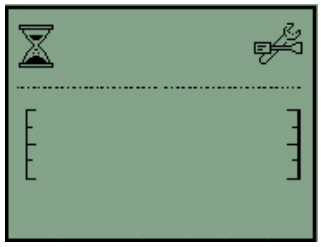


3 A message appears that asks you to put the printer in **MFG mode**. To do this, while the printer is switched OFF, press both the **resume** and **power** buttons together until the Tool icon appears on the front panel. Click on **OK** once the printer is in **MFG mode**.

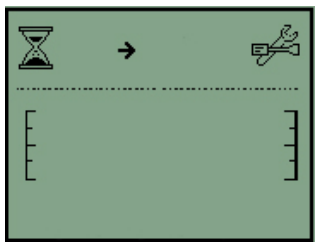


4 Unplug the printer and plug it in again in order begin the modular test.

5 Once the test starts, the front panel will display the following:

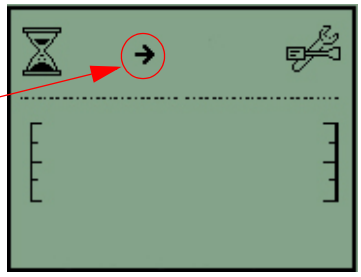


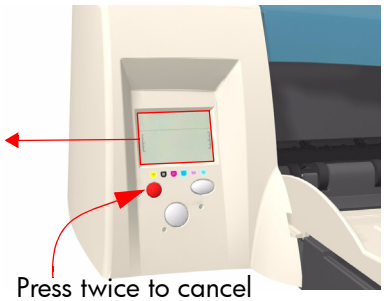
6 The modular test needs to finish 10 cycles without failing in order to be completed correctly. Each time a new cycle is started, the front panel will display the following:



7 If the modular test needs to be stopped, press the CANCEL button twice ONLY when the Arrow icon appears. If the CANCEL button is pressed once by mistake, press the RESUME button to continue with the modular test.

You can ONLY stop the test when the Arrow icon appears





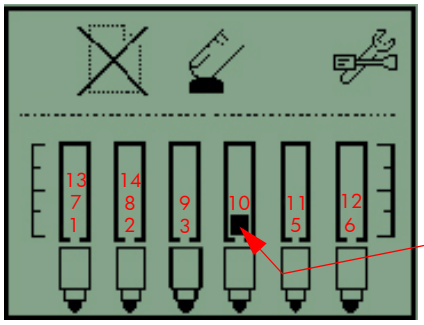
Press twice to cancel

8 Once the Printer actually stops the Modular Test cycles, you may get one of the following results:

- Faulty subsystem.
- Repaired subsystem without resetting.
- No faulty subsystem.

Faulty Subsystem

If one of the squares on the front panel is highlighted and the **no-paper** icon is displayed (as shown below), it means that the Modular Test has failed. In order to interpret the code (subsystems 1 to 14) you need to count the position of the highlighted black square reading from left to right, bottom to top. Once you have the code, refer to the table on Page *4-23* for the failing subsystem.

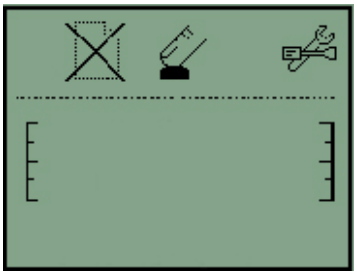


e.g. Subsystem 4 failure
Ink Supply Station

You should unplug the Printer and repair the failing subsystem. Once repaired, plug in the Printer and it will switch itself ON in the manufacturing mode and continue with the Modular Test. In order to setup the Modular Test again, you should cancel the Modular Test by pressing the CANCEL button twice ONLY when the Arrow icon appears. If you don't perform this step, it is possible that the Printer will never pass the Modular Test. Once the Modular Test is cancelled, use the Controller Application to switch to Station **SE40** and start test group **TG_SE_Modular**. Switch Off the printer and the Modular Test will automatically begin.

Repaired Subsystem Without Resetting

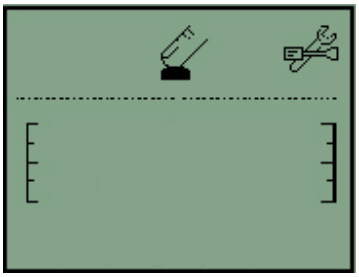
If none of the squares on the front panel is highlighted and the **no-paper** icon is displayed (as shown below), it means that the you have run the Modular Test, you have experienced a problem, you have repaired the Printer **but** you have not run test group **TG_SE_Modular** again in the Controller Application in order to setup the Modular Test.



Use the Controller Application to switch to Station **SE40** and start test group **TG_SE_Modular**. Switch Off the printer and the Modular Test will automatically begin. After 10 cycles the Printer will stop the Modular Test and the front panel will only show the **press continue button** and **tool** icons.

No Faulty Subsystem

If none of the squares on the front panel is highlighted and the **press continue button** and **tool** icons are displayed (as shown below), it means that the Modular Test has been completed corrected and that all the subsystems of the Printer are OK.



You should now use the Controller to execute the test group **TG_SE_ModularResults** to completely finish the Modular test by getting the test results. After this you can switch Off the Printer and it will not automatically switch itself On in the manufacturing mode in order to run the Modular Test.

If you switch Off or unplug the Printer before executing the test group **TG_SE_ModularResults**, you will have to wait until a cycle of the Modular Test ends because the Printer always starts itself and automatically performs a cycle if the Modular Test ended correctly.

If you execute the test group **TG_SE_ModularResults** when the Modular Test has not finished correctly, it will fail. But in this case, it will pass the Modular Test and the Printer will be removed from the manufacturing mode.

Modular Test Subsystem Code

Modular Test		
Subsystem Code	**Subsystem**	**Troubleshooting**
1	Trailing Cable	■ Replace the Carriage Assy.
2	Scan-Axis	■ Check that the Carriage Assembly is able to move out of the Service Station. ■ Replace the Carriage Assembly. ■ Replace the Carriage Belt. ■ Replace the Turnaround Assembly. ■ Replace the Carriage Rod.
3	Service Station	■ Replace the Service Station.
4	Ink Supply Station	■ Replace the Ink Supply Station.
5	Media-Axis	■ Replace the Paper-Axis Drive Motor Assembly.
6	PSU Fan	■ Replace the Power Supply Unit.
7	Ramps	■ Replace the Output Mechanism Assembly. ■ Replace the Ramp Motor Assy.
8	Not Used	■ Not Applicable.
9	PCI Bus	■ Replace the Electronics Module.
10	Carriage PCA	■ Replace the Carriage Assy.
11	Not Used	■ Not Applicable.
12	Main PCA ASICS	■ Replace the Electronics Module.
13	Main PCA EEROM	
14	Main PCA RAM	

STATION SE50 = PRS Calibration

The purpose of this station is to adjust the PRS (pen-to-rib spacing).

Refer to the PRS Adjustment document for further information.