HEWLETT®
PACKARD

HP 9100C Digital Sender

Service Manual
Rev.C

HP Digital Sender

TABLE OF CONTENT

1 REVISION HISTORY

DATE	REVISION	DESCRIPTION	PAGE(s) CHANGED
15-Oct-1998	B	Section 2.1 has changed	13
31-Mar-1999	C	Revision History added (page numbering has changed)	4

2 INTRODUCTION

This manual is mainly thought for Technicians and Customer Engineers (CE's) that will repair the product On Site.

It is a good reference document for the Repair Centers (RC's) too.

A Computer Based Training and more information about the product, literature and specifications can be found at the following HP internal web site:

http://bhc.italy.hp.com/marketing/mktg1/9100C/default.htm

Selecting **Manuals & Documents**, will bring you to the most updated documents available.

A list of spares parts is also provided there for your convenience.

The Digital Sender Marketing site is:

http://bhc.italy.hp.com/marketing   (old site http://quovadis.italy.hp.com/marketing)

[Entering the **Service~Support~Training** page and then selecting **Manuals & Documents**, you will get to the above mentioned page.]

All feedback should be forwarded to:

1- CCC (US Boise site or EU Amsterdam site)
2- ESCAMGR,BHC (CC:Mail address)
3- vinicio_deluca@hp.com (if none of the previous can be easily reached)

2.1 PRODUCT OVERVIEW

FRONT VIEW

① Integrated Scanner (IS or NB)

② Automatic Document Feeder (ADF)

③ Control Panel (CP)
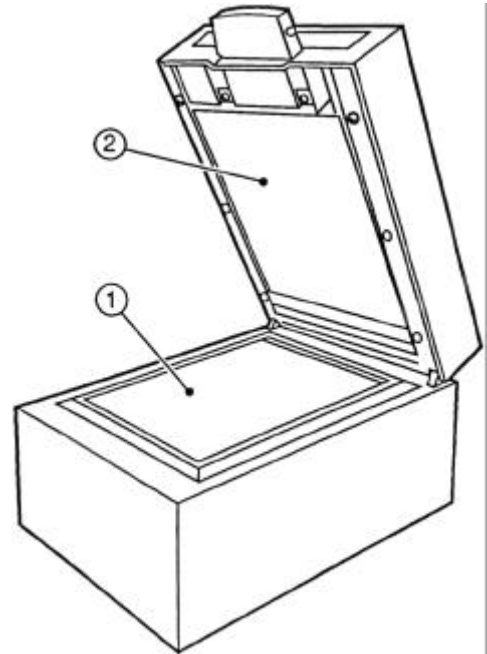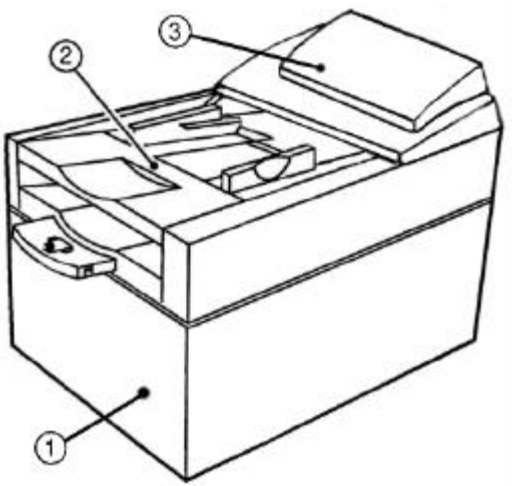
REAR VIEW

① ADF connector

② CP connector

③ External power inlet

④ Network Card (NC)

⑤ Continuos Scanning Switch hole
   (Used only under CCC directions, not documented)

⑥ Fan grid
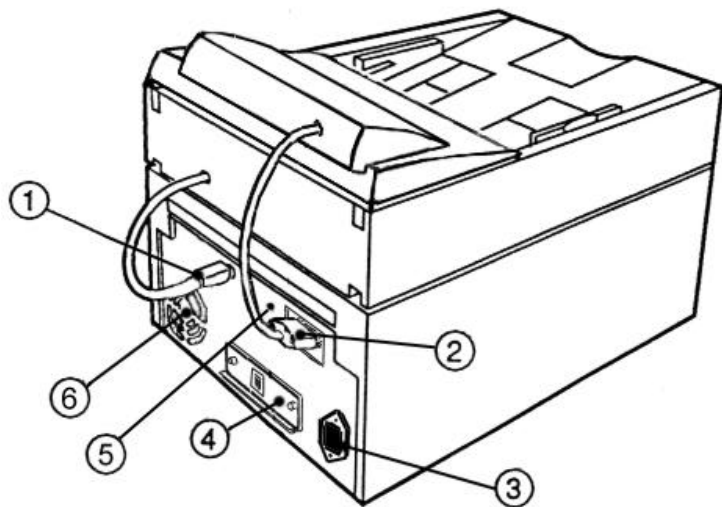
2.2 REPAIR OVERVIEW

Here are described the logical steps to repair the HP 9100C, and the related chapters.

② **SELF TEST (troubleshoot)**

④ **HW INTERVENTION**

② ③ **SELF TEST (verify)**

⑤ **RESTORE**

⑥ **DEMO**

2.3 Glossary

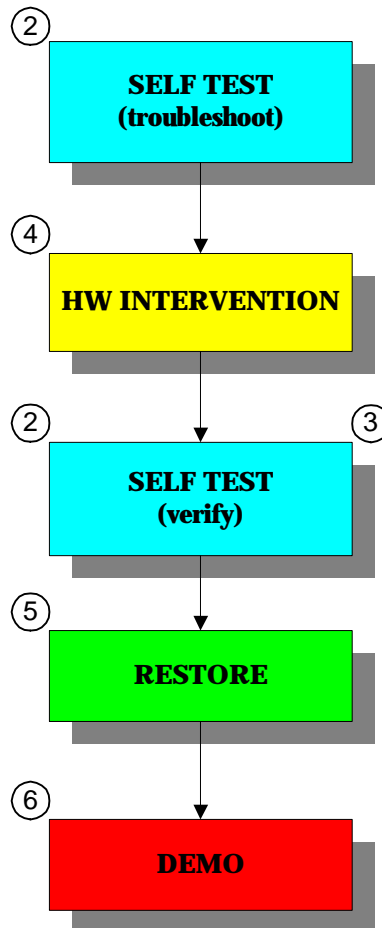|	
ADF	Automatic Document Feeder
API	Library of functions that allows to interface to lower hardware devices without knowing their details.
BHC	Bergamo Hard Copy Division.
CCC	Customer Care Center. These are the Support Centers customers will call for help about Software and Hardware problems.
CP	Control Panel.
DC	Distribution center.
DOA	Dead On Arrival: unit that doesn't function when arrives to the customer.
DOS	Microsoft MS-DOS operating system.
DSTS	Windows 32 bit application that manages test sessions for The HP 9100C, interfacing to it trough serial communication. Used in MFG only
EST	Extended Self Test utility integrated in The HP 9100C that allows to run diagnostics using the Control Panel's LCD and keyboard as user interface.
F1… F4	The four soft keys under the LCD display. They execute several commands depending upon the selected feature of the HP 9100C. The LCD indicates their function. When there is no indication the key is not active.
FW	Firmware
HDD	Hard Disk Drive
ISV	Indipendent Software Vendor, it could refer to applications not bundled with the product that can receive files from the HP 9100C
LAN	Local Area Network
LPCD	LaserJet Products Completion and Distribution. United States site where The HP 9100C is integrated and distributed.
NB	Network Box. This is the Scanner Engine with all the electronics (PCA, LAN Card, HDD…) and it is the bottom module of the unit.
PC	Personal Computer
PCA	Printed Circuit Assembly.
SFC	Shop Floor Controller: software that manages integration flow and logs integration, test and defect data.
S/N	Serial Number
SW	Software
UUT	Unit Under Test.
VERONA	Code name for the HP 9100C Digital Sender
VOLTERRA	Code name for the HP Network ScanJet 5.

3 HP 9100C User Interface

The user interface is simple as can be seen in the figure below. The keys that must be used to manage the self-test are highlighted.
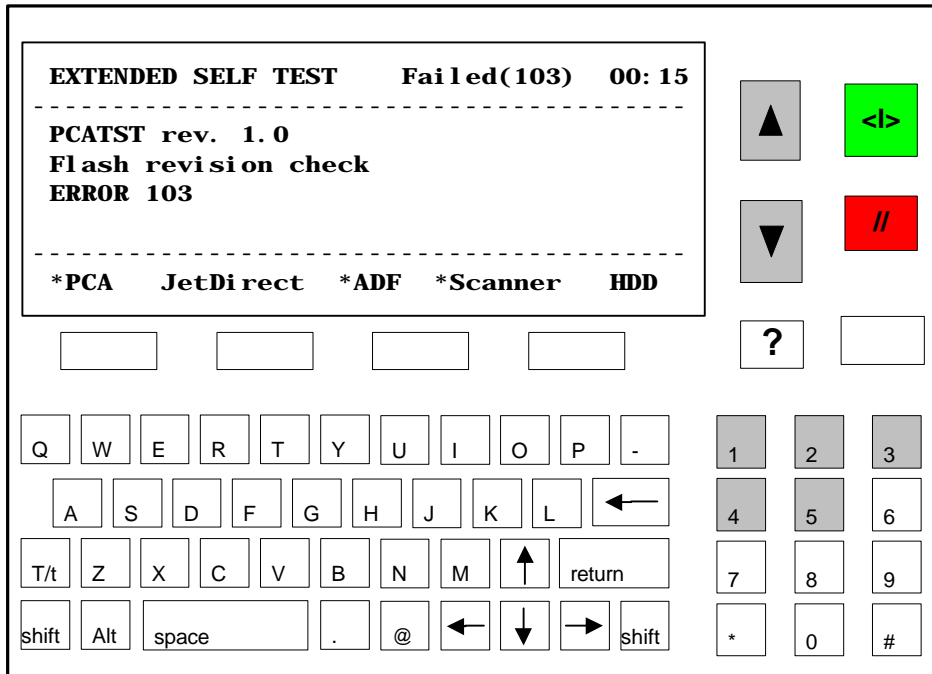
Figure 3-1 Control panel layout with example of self test screen after a test run.

After entering the test mode (see next section), the display will appear divided in three fields:

- status line   (first line)
- scrolling window   (four central lines)
- test list   (last line)

The status line shows the status of the self-test and the result of the last test session (if any).
The status can have the following values:

- (none)   Waiting for test selection / start. No tests executed so far.
- Passed   Last test passed; waiting for test selection / start.
- Failed (*xxx*)   Last test sequence failed with *xxx* error code;
                   waiting for test selection / start.
- Running   Test sequence running.

The elapsed time of the test session is shown on the right. It increases during test execution and it is frozen after the test session ends.

If status is "**Running**" but the elapsed time **STOPS,** this means that a fatal error has happened and the test session must be considered FAILED. This usually happens for defective JetDirect cards.

The four central lines are used as a scrolling window to display information (revision numbers, errors, etc) and to inform the user on the current state of test execution.

When the test session finishes, using the arrow keys on the right of the LCD it is possible to scroll this window up and down.

Last line contains the list of available tests. The selected ones have an asterisk (*) on the left.

3.1   ENTERING THE TEST MODE (SHIFT + ALT + D)

The Extended Self Test (EST) built in the product is able to detect with high level of confidence which hardware part is failing, providing a quick tool to troubleshoot.

Follow these steps to ENTER TEST MODE:

1. Connect Control Panel and ADF, connect power cord, unlock the scanner, power on the unit.
2. Wait until the control panel LCD is completely darkened.
3. As soon as the LCD starts clearing (curtains open), press simultaneously the keys
   SHIFT + ALT + D
   and release them only when the curtains are completely opened.
4. After approximately 30 second the LCD will display the EST window with keys usage directions.
   Press any key to continue. At this point the self test revision is displayed.
5. Select tests to be executed.
   To select/deselect a test, press its number using the numeric keypad (1 to 5).
6. If the **ADF** test is selected, **load** at least **7 paper sheets** in the ADF.
   If the **Scanner** test is selected and the **ADF** test **IS NOT** selected, **DO NOT** load any pages in the ADF.
   (The Scanner test will fail if the ADF has still pages on it. If the ADF test has been selected also, it will be executed first, and it will scan all pages in the ADF, so that when the Scanner test starts the ADF will be empty. If the ADF test IS NOT selected, you have to clear the ADF by yourself to avoid Scanner test failure)
7. Start the test session pressing the **green key**.

The execution order is from left to right. It has been set in this way to reduce waiting time in case of failure and to guarantee to correct sequence when testing both ADF and scanner.

In case of failure the test STOPS, the error code is displayed and on the last line a question is displayed: "Running test failed. Continue? (y/n)"

It is possible to continue the test session answering '**y**' or to stop it pressing '**n**'. The session will be considered failed anyway.

After a completed test session (passed or failed), it is possible to change the test selections and to restart the testing with the green key.

The following picture shows an example of the log displayed in the scrolling window after a full test session.

Most useful information:

- Each **diagnostic** shows its **revision** at the beginning of execution.
- **Firmware revisions** for **PCA**, **scanner** and **hard disk** are shown in the related tests.
- **Hard disk model** is shown.
- **Partition table** is listed. For each partition, displayed information are: type, starting sector, number of sectors.
- For ADF, scanner and hard disk tests, the longer ones, some progress information are displayed.

```
PCATST rev. 1.00
Bootblock fw rev. 1.0
Multiplexer fw rev. 0.6
Styx registers test
Giulietta registers test
Memory test
Dimm test
PCA test passed

JDTEST rev. 1.0
Configuring card…
Running BIST…
Waiting for CardReady…
Card ready
JetDirect test passed

SCNTST rev. 1.1
ADF status string: PP
Test n.1: 300 dpi, 24 bpp
Test n.2: 300 dpi, 1 bpp
Average feeding time (ms): 4160
ADF test passed

SCNTST rev. 1.1
Scanner FW: 3828
Test n.1: 600 dpi, 24 bpp
Test n.2: 300 dpi, 1 bpp
Scanner test passed

HDDTST rev. 1.2
QUANTUM FIREBALL SE2.1A
Part. 1:  6  63  [818433]
Part. 1:  6  818497  [2987711]
Part. 1:  6  3806208  [201600]
Part. 1:  131  4011840  [100800]
Firmware revision: 01.00.a
Scanning raw partition…
Scanning DOS partition 1…
Scanning DOS partition 2…
Scanning DOS partition 3…
Hard disk test passed
```

Figure 3-2   Example of Extended Self Test log

3.2   Hardware parts tested

The test affects all the top-level hardware components of the HP 9100C Digital Sender. They are:

- **Integrated scanner (NB)**, composed by:
    - Scanner Engine
    - HP 9100C PCA (PCA)
    - Hard Disk Drive (HDD)
- **JetDirect LAN card**
- **Automatic Document Feeder (ADF)**
- **Control Panel (CP)**
  (not part of the whole unit EST, must be launched separately, see par. 2.4)

3.3 Hardware Test List

The following table contains the list of tests available with indication of the key that must be pressed to enable/disable them, a brief description and the duration.

Test	Key	Description	Duration
PCA	1	Display FW revisions (Boot code and multiplexer code). Execute all tests listed in the paragraph 4.1.1	10"
JetDirect	2	JetDirect self-test (refer to 4.3.1). **NOTE**: this test can be executed only once after each power cycle, otherwise a timeout error will occur.	10"
ADF	3	Check internal ADF status. Check lid sensor. Check paper sensor. Scan 2 pages at 300 dpi 24 bpp filter on. Scan remaining pages (at least 5) at 300 dpi 1 bpp, calculating average feeding time.	50"
Scanner	4	Check internal scanner status. Display scanner firmware revision. Scan 1 page at 600 dpi, 24 bpp. Scan 1 page at 300 dpi, 1 bpp.	40"
HDD	5	Display hard disk model. Display partition table. Display FW revision. Read sequentially raw partition (firmware area). Read sequentially 1. DOS partition. Read sequentially 2. DOS partition. Read sequentially 3. DOS partition.	Approx. 4'

Table 3-1 Description of the tests available in the Extended Self Test.

3.4 CONTROL PANEL

The CP is not tested while running the EST. It has its own built-in self test. If an hardware loopback connector is used, the data interface can also be tested.

3.4.1 Control Panel Self Test Hardware Requirements

The CP cable must be plugged into the connector of the network box and the HP 9100C must be ready (boot phase completed).

[The CP could be connected also to some external source of power, such as a lab power supply. In this case, to execute the self test the unit needs only to be powered on (VCC +5V, GND 5V, VCC +24V, GND 24V) and its reset line should be pulled up to +5V. If the data lines and the interface need to be tested, a loop-back connector must be added between the scanner box and the control panel connector. The purpose of this connector is to connect the CPRDY line to the CPCLK line and the CP2AS line to the AS2CP line coming from the control panel, leaving only the power lines going from the scanner box to the control panel, in a way to provide the needed power source. The reset line should be pulled up. This process is not documented for the time being.]

3.4.2 CP Self Test description

1- Make sure the HP 9100C is running (boot phase completed)
2- Disconnect the CP cable from the rear of the HP 9100C
3- Re-connect the CP cable to power on again the CP
4- After the screen has become all black and the curtains open, press the keys ALT + SHIFT + 3 and keep them pressed until the curtains are completely opened. Then release the keys.

The screen becomes again completely black for 4 seconds and the leds will flash. In this phase the user can check the LCD pixels deterioration or white spots.

Then the screen opens again and the following message is displayed:

```
"|~~~~~~~~~|  o  o  |  VER  SELF  TEST  REV. 094"
"|  LCD  area  |  o  o  |  LCD  RAM : XX              "
"|_____|  o  o  |  KEYBOARD: XX             "
"  o    o    o    o          |  PWM=0xXX                   "
"ooooooooooo    ooo  |  TIME=XX: XX: XX  RAM0=XX"
"  ooooooooooo    ooo  |  DATE=XX/XX/XX  RAM1=XX"
"ooooooooooo      ooo  |                                "
"oo  o  oooooo    ooo  |                                "
```

Where:

LCD RAM =   OK or FAIL accordingly to the test results
KEYBOARD =   OK or FAIL accordingly to the test results
PWM =   from 0x00 to 0xFF, it is the contrast voltage setting
TIME =   is the time took from the real time clock in the format HH:MM:SS
DATE =   is the data took from the real time clock in the format YY:MM:DD
RAM0 and RAM1 =   are the first two RAM locations in the real time clock.
                            RAM0=80 means the battery of the clock is low and the clock stopped.

[If a loop-back connector is provided between the CPCLK line and the CPRDY, and between CP2AS and AS2CP, also the data interface will be tested.
The test will send out data and check what has just received. If the clock line is properly connected, the LCD zone drawn in the upper left part of the screen will start getting black and then again white, cycling from top to bottom.
If some errors are detected in the receiving line AS2CP, the display will signal it changing some pixels in the LCD area.]

Below the LCD area there are some 'o'. They represent the keys of the CP.
If a key is pressed, the corresponding 'o' in the LCD will be changed to 'x' permanently.

The user should press all the keys one at a time and change all the 'o' to 'x'.
Only the 'shift' key will return from 'x' to 'o' when released, because there are two shift keys to be tested.
The contrast level of the LCD and accordingly the PWM value can be changed by pressing the keys:
[ALT + ▲] or [ALT + ▼] on the right side of the LCD.
The backlit module can be switched on and off by pressing ALT + GO (green button) or ALT + ABORT (red button).

3.5 SPECIAL KEY LIST

This table describes all the special key sequences and when they are available.

Key Sequence	Description	Availability
SHIFT ALT **?**	Demo Mode	Blue Curtains[1]
ALT R	Hard Disk Recovery	Blue Curtains
SHIFT ALT F	Restore flash default parameters	Blue Curtains
SHIFT ALT **F1**	Toggle Boot FW Image	Blue Curtains
SHIFT ALT D	HW Diagnostics	Blue Curtains
SHIFT ALT **Go**	Configuration Menu	Main Window[2] or Login
SHIFT ALT **Duplex**	Self Test Page	Main Window or Login
SHIFT ALT N	Number of Scanned Pages	Test Page
SHIFT ALT T	Clear Address Book	Fatal Error State[3]
SHIFT ALT **▲**	LCD Contrast Darker	Any Time
SHIFT ALT **▼**	LCD Contrast Brighter	Any Time
SHIFT ALT **F4**	Task Status	Any Time
SHIFT ALT **F3**	Dito Control[4]	Any Time
SHIFT ALT W	Reset To Default	Fatal Error
SHIFT ALT **Abort**	Force Shutdown	Any Time
ALT **F4**	Events Sequencer	Any Time
ALT **F3**	Job Status	Any Time[5]
ALT 1	Trace Enabled	Blue Curtains[6]
SHIFT ALT 3	CP Self Test	Any Time[7]

---

[1] At the very beginning of the boot phase, before two blue "curtains" are opening.
[2] The control panel displays the home screen and the Go button is not blinking.
[3] The control panel displays a fatal error.
[4] "Dito" is a non documented SW application embedded in the HP 9100C CD ROM - used by CCC.
[5] It is equivalent to press the **?** button.
[6] ALT 2 and ALT 3 are allowed for further tracing.
[7] CP must be first turned Off / On by disconnecting / reconnecting the CP cable

4 Inside the Self Test

The two software tools referred to in this chapter are the Digital Sender Test Software (DSTS) and the Extended Self Test.

The former is a Windows NT application that interfaces to the scanner through the synchronous serial port and that uploads and runs diagnostics. It is used only in the manufacturing environment

The latter is a test kernel internal to the scanner that can be run without external hardware and that executes diagnostic programs stored in the hard disk.

4.1 DIMM Module

The Dual In line Memory Module (8MB currently) is mounted on the PCA and its test is performed when testing the whole board. Refer to the PCA testing for more information.

4.2 PCA

This is the main board located in the NB nearby the Power Supply.

4.2.1 Test description

The PCA diagnostic software (PCATST) includes tests that check some basic functionality of the ASICs and their connections. All life components (μP NEC VR4300, Styx, Juliet, SDRAM and Flash memory) will not be deeply tested, because in case of defect the whole test session could not be executed.

The implemented tests are:

- ASICs test
  - Styx registers test
  - Styx DMA transactions
  - Juliet registers test
  - Juliet mailboxes read/write test
  - Romeo registers test
- On board RAM test
- DIMM test
- Pipeline test (Juliet-Romeo-DRAM connection)

4.3 Hard disk drive

4.3.1 Types of failures

Hard disk failures belong to two classes:

- Drives not operating correctly
- Drives that cannot access all the data.

The first kind of failure is more evident, because the disk simply doesn't respond to commands, is not ready, can't reset and so on. Just trying to access it is possible to detect a problem in this class.

The second class is subtler and contains all the problems related to the disk surface or to the mechanical ability to reach each area of the disk itself.

Disks are however able to recover problems of the second type when they are restricted to very limited areas. There are in fact some spare tracks that are used when defective ones are found. Sometimes it is also possible to recover failures related to the surface (ECC errors) simply writing on the area that has the problem.

4.3.2 Hard disk partitioning

The following figure schematizes the HP 9100C hard disk partitioning structure.

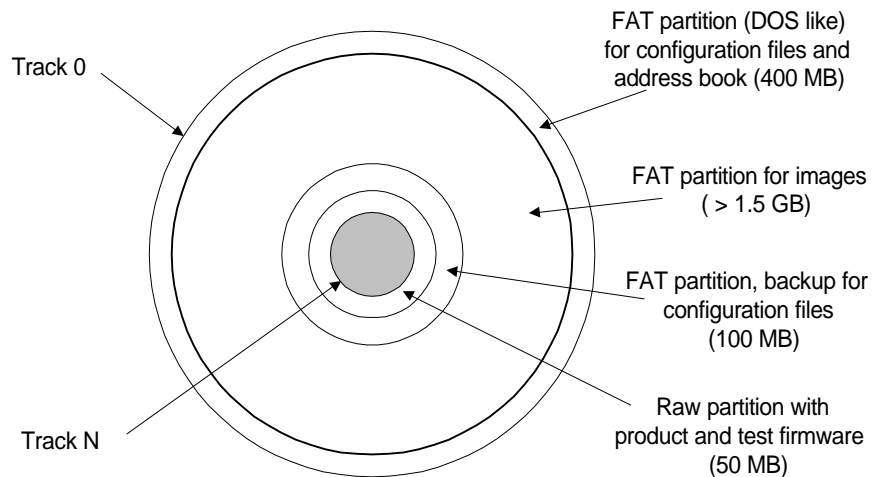**Figure 4-1   The HP 9100C hard disk partitioning structure**

4.4 JetDirect card

This is the card removable from the rear of the HP 9100C, without opening up the Network Box.

4.4.1 Types of failures

JetDirect testing is composed by two main blocks:

1- Functional test that verifies the card hardware functionality
2- Conformity test that ensures the right model and firmware revision is being used.

4.4.2 JetDirect self-test

The functional test is performed using the JetDirect self-test (BIST+extended self-test; refer to EIO specification). It can be executed just once after power-on and stores results in the Status Register and Error Register of the EIO memory space.

To run the test, a handshaking session must be performed acting on some registers in the network card. A timeout can be managed to detect "dead" cards that don't respond.

Duration is approximately 7 seconds.

Main tests run by self-test are:

- Midplane controller register test
- DRAM test
- EPROM CRC test
- Memory-to-memory copy/checksum test
- PROM checksum test
- FLASH station address test and, for Ethernet models
- Frontplane registers test
- Ethernet controller tests.

Only fatal errors are notified from JetDirect to peripheral (PCA), thus to the display on the CP.

4.5 Scanner engine and ADF

4.5.1 Scanner engine test

It verifies the ability of the engine to receive commands and checks some functionality related to electronics and mechanics. No optics tests are performed at all in this phase.

The scanner diagnostic verifies:

- Internal self-test status.
- Interface to PCA.
- Ability to reset and to get to home position.
- Lamp functionality (On/Off).
- Ability to execute commands and to reply to inquiries (SCL).
- Image acquisitions with different settings.

4.5.2 ADF test

The ADF test checks the following ADF functionality:

- Internal ADF status.
- Cover lid sensor (must be closed).
- Paper presence sensor.
- Ability to feed with different settings.
- Loading speed with the fastest scanning mode (15 pages/minute).

The sequence of tests is as follows:

1. Feeding of 2 sheets with this setting: 300 dpi, 24 bpp, enhancement filter on.
2. Feeding of the remaining sheets (at least 5) with this setting: 300 dpi, 1 bpp.

4.6   Boot phase

Each time The HP 9100C is powered on, the boot code performs some very brief tests, the initialization of the hardware and then checks which execution mode is requested. There are some specific events at the beginning of the boot phase that can trigger the execution of manufacturing test or software upgrade. This feature is hidden to the customer.

The picture below describes the boot phase of the HP 9100C, with the outlined pattern showing what happens with no actions at the CP during the boot phase.

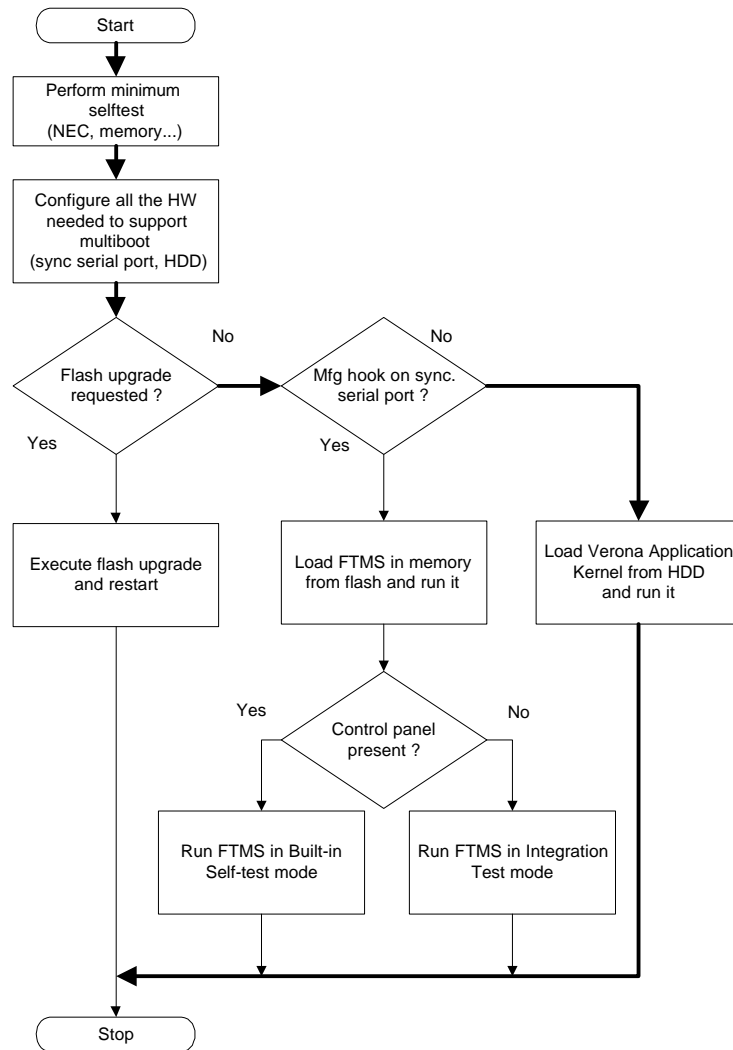**Figure 4-2   The HP 9100C boot phase**

The boot and the test codes are stored in the flash memory .

5 HARDWARE INTERVENTION

5.1 SHUTDOWN FIRST!

Any time you need to turn off the HP 9100C you should shut it down first!

Shutdown procedure is:

1- SHIFT + ALT + **ABORT**
2- Confirm shutdown [F1]
3- Wait for the ADF to adjust (about three seconds after step 2)
4- Turn off the power switch

5.2   CONTROL PANEL

To detach the CP from the scanner, act as follows:

1) unplug the CP connector (make sure the two security screws on the CP connector are unscrewed before unplugging)

2) open the CP rising its front edge (figure 3.1)

3) grab the CP as shown in figure 3.2 (inches on the upper face of the CP and the other fingers on the lower face of the CP)
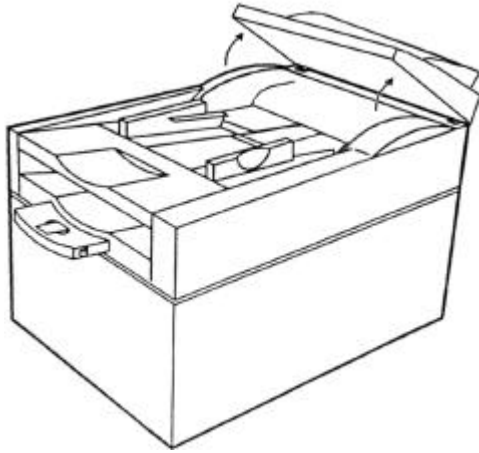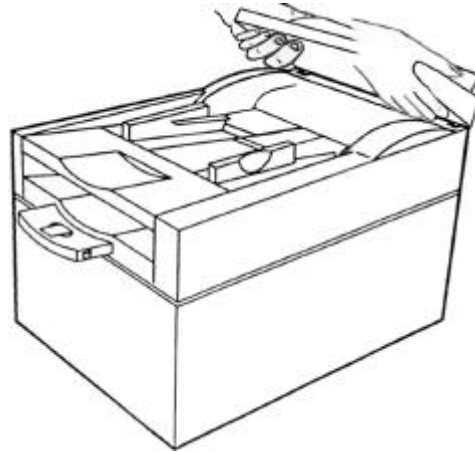
fig. 4.1   fig. 4.2

4) push down the CP front edge, while keeping fingers as described at point 3, until the rear CP hinges snap out. (figure 4.3)

5) move the CP toward left and then upward (fig 4.4)
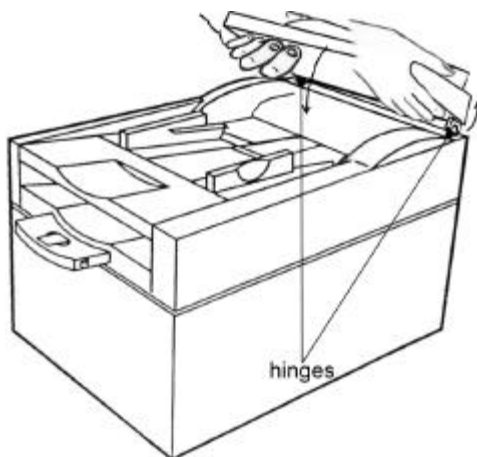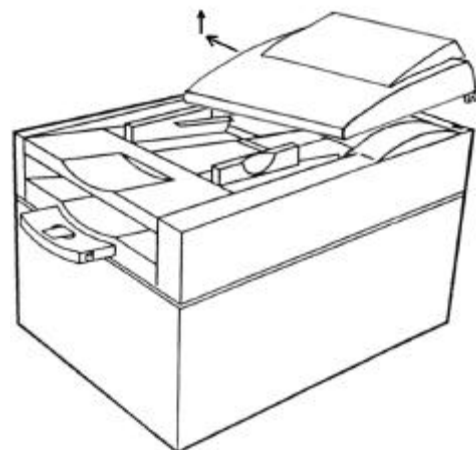
fig. 4.3   fig. 4.4

5.3 ADF

To detach the ADF from the scanner act as follows:

1) unplug both the ADF connector and CP connector. Make sure the CP connector screws are unscrewed before unplugging it.

2) open the ADF and pull it upward (see figure 4.5).
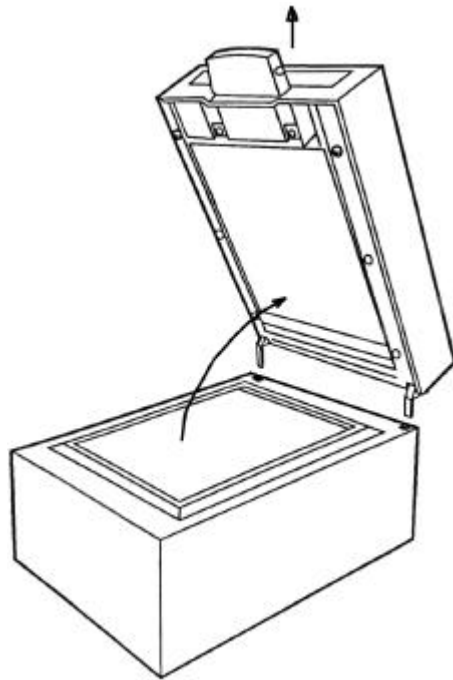
fig. 4.5

Once the ADF is detached, please pay attention to don't damage the white plastic background (see ① in figure 4.6) and the transparent scraper sheet (see ② in figure 4.6). Purpose of the former is to exert a uniform pressure on the page lying on the flatbed glass; scope of the transparent scraper window is to allow the light to reach the page when scanning from ADF. Figure 4.6 also shows the correct way to lay the ADF down on a table surface.
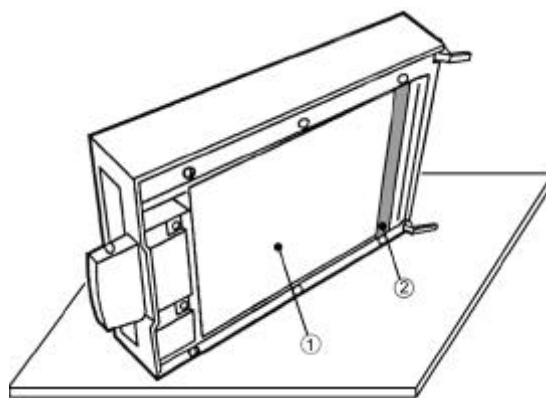
fig. 4.6

5.4 JetDirect LAN Card

In case you need to remove the NC, act as follows:

1) unscrew the two security screws (① in figure 4.7) and pull the NC, grabbing its lower edge (② in figure 4.7).
The NC will slide out from the scanner.
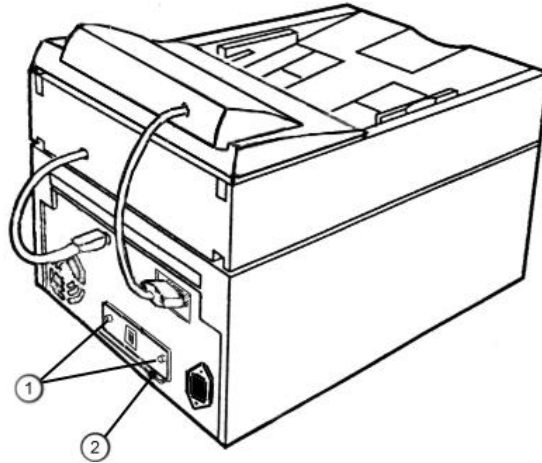
fig. 4.7

5.5 Accessing Integrated Scanner Internal Parts

All the electronics take place inside this box.
Here are the steps to follow in order to access the electronics:

1) Unplug both the CP connector and the ADF connector; make sure the two security screws are unscrewed before trying to unplug the CP connector).

2) unscrew the 5 screws marked with the carved "↑" symbols (see ① figure 4.8).

3) gently pull the sliding tray out for half of its length, grabbing the NC lower edge (see figure 4.9).

4) disconnect the connectors ① and ② (power and data lines connectors). shown in figure 4.9
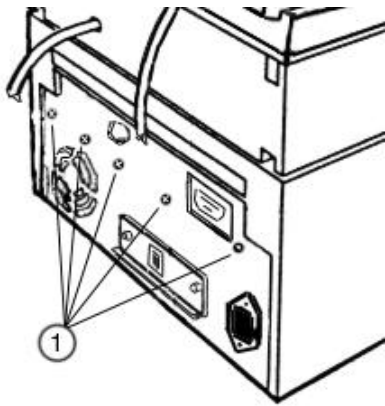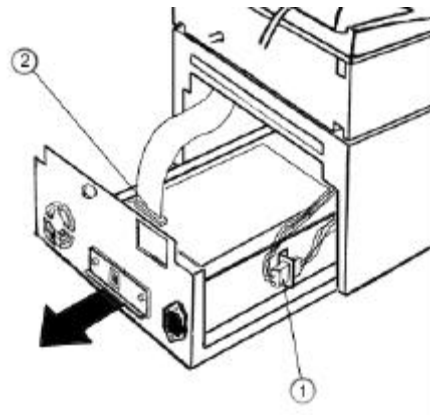
fig 4.8   fig. 4.9

5) pull the sliding tray completely out applying the double movement shown in figure 4.10: grabbing the tray in the middle and rising it up a bit ① and then pulling out ②.
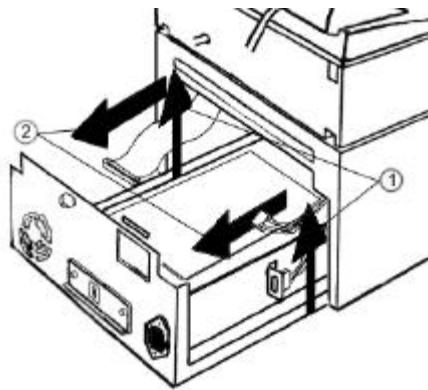
fig. 4.10

Following there is a list of the components in the tray (refer to figure 4.11, top view of the tray):

① Power Supply (PSU)
② ON/OFF Switch
③ Metal Shield
④ Power Line Connector (same as ① in figure 4.9)
⑤ Power Inlet Filter
⑥ Hard Disk (HD)
⑦ Hard Disk Support (HDS)
⑧ Hard Disk Power Connector (HDPC)
⑨ Hard Disk Data Connector (hard disk side) (HDDC)
⑩ Hard Disk-Data Connector (PCA side)
⑪ Fan
⑫ Fan Cables and Connector
⑬ Data-Line Connector (same as ②, figure 4.9) (DLC)
⑭ Printed Circuit Assembly (PCA)
⑮ PCA Power Connector (PPC)
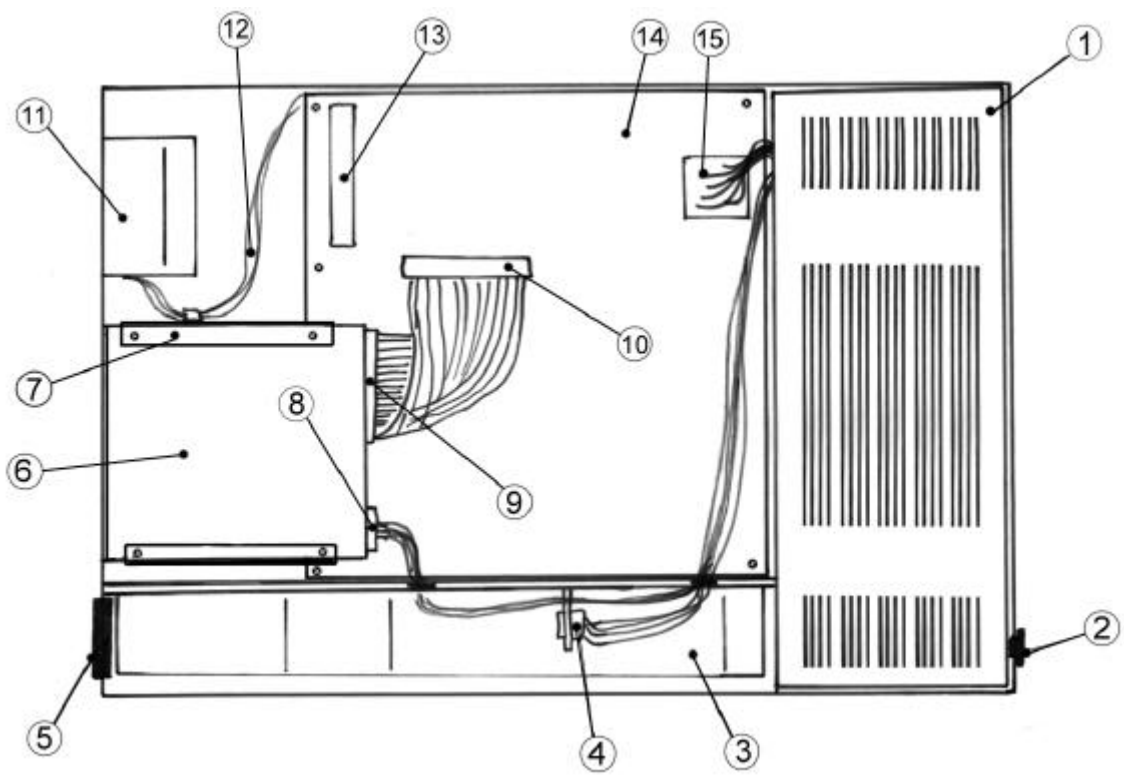
fig. 4.11

5.5.1 HDD

To remove the hard disk (refer to figure 4.11):

1) disconnect the HDDC and HDPC connectors

2) unscrew the four black screws on the HDS

5.5.2 PCA

To remove the PCA:

1) remove the NC

2) remove the HD (strongly suggested)

3) disconnect DLC and PPC connectors

4) unscrew the 5 screws and snap the PCA out from the 2 retention pins (the first retention pin is placed in the middle of the long side of the PCA, close to the PSU, the second is placed along the other long side of the PCA, under the HD).

Following is an explanation about how to access some of the optical devices (lamp & mirrors) for cleaning purposes:

1) remove ADF and CP (see figure 4.5 and 4.6)

2) slide out the tray for half of its length (see figure 4.8 and 4.9)

3) using a thin screwdriver, unlock the two snaps placed inside the same holes where ADF hinges were
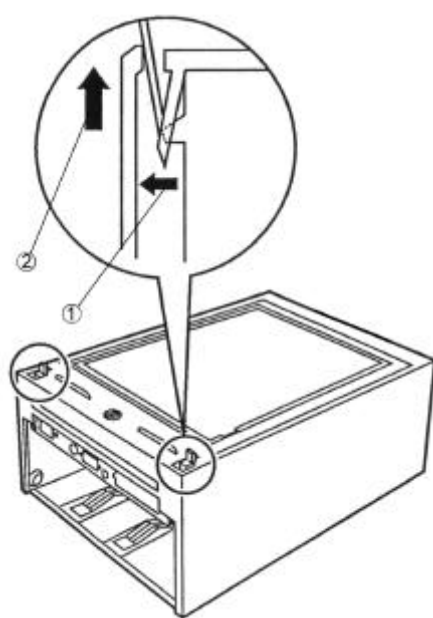
inserted, applying sequentially the movements ① and ② (see figure 4.12).

fig. 4.12

4) un-hook the two hooks in the front of the scanner (see ① in figure 4.6), applying sequentially the movements ② and ③. Lift the entire top plastic cover and remove it.
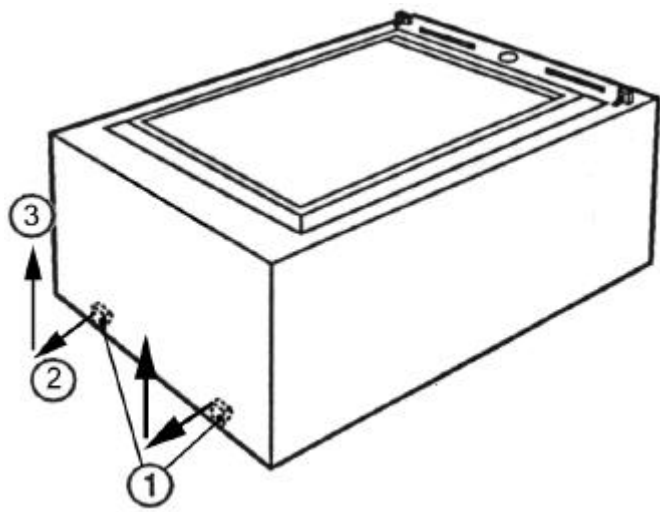
fig. 4.6

5) remove the flatbed glass.

6) clean the mirrors and the lamp (if needed) using a soft brush (the same used for cleaning camera lenses) and/or compressed air. DO NOT TOUCH OPTICAL STUFF WITH FINGERS. PERMANENT DAMAGE COULD OCCURR.

7) clean the glass using a soft cloth.

5.6 Accessing ADF Internal Parts

If manual intervention on ADF internal parts is needed, please refer to "CANON Service Manual for M12 Image Scanner".
More precisely, refer to:

- chapter 3, part IV A and B. (pages 3_23 to 3_29 and 3_40 to 3_42) for a detailed explanation about the paper pick-up and feeding system and electronics.
- chapter 4, part IV, V, VI and VII (pages 4_8 to 4_14) for a detailed explanation about how to dismount each single mechanical and electronic component.

For more details and documentation please refer to the Introduction paragraph where references are given.

6 RESTORING THE HP 9100C AFTER INTERVENTION

6.1 In General

Whenever any of the service part(s) is replaced, the EST must be launched with all test steps included, to verify that the unit has been correctly re-assembled.

However, when the CP or the ADF are replaced, there is no need for the EST to be launched completely, but only the CP or ADF step can be performed.
Remember that the CP has its own built-in self test which is not activated entering the EST mode, but as it is described in sec. 2.4.

6.2 Special Cases

When replacing the **HDD**, the **JetDirect Card**, the main **PCA**, the unit will loose some or all configuration parameters, and it will be no longer capable to operate in the customer's environment. It is thus necessary to restore those values.

The matrix summarizes the lost functionality after any replacements:

	JD	HDD	PCA	DIMM	CP	ADF
Send to e-mail	!	!!	!	*	*	*
Send to LAN FAX	!	!!	!	*	*	*
Copy	!	!!	!	*	*	*
JetSend	!	!!	!	*	*	*
Send to PC	!	!!	!	*	*	*
Send to ISV	!	!!	!	*	*	*

!! = always lost
 ! = lost in some cases
* = no problem

The following paragraphs will detail how to restore the lost functionality, when that's needed.

6.2.1 If the HDD has been replaced

After having re-assembled, the unit will boot automatically into the configuration mode, and at the CP display the list of the following parameters will appear.

The bolded ones are mandatory. The customer has to provide them in order to start up the machine.

Parameter	Needed for	Example	Notes
Date		Aug 10, 1998	
Time		17:33	
Paper Size	Setting up the scan area	A4	
CP Language		English	
IP configuration	**Any communications**	Manual	**Mandatory**
IP address	**Any communications**	15.156.88.112	**Mandatory**
Subnet Mask	**Any communications**	255.255.248.000	**Mandatory**
IP Gateway	**Any communications**	15.156.11.123	**Mandatory**
Administrator full name		Vinicio De Luca	
Administrator password	Locking the machine set up	Password	
Administrator e-mail	Receiving usage details	"my_email@hp.com"	
E-mail server address	**Any communications**	15.156.99.100	**Mandatory**
E-mail default from	**Any communications**	HP 9100C Digital Sender	**Mandatory**
E-mail default subject	Expediting e-mail sending	Hello	
E-mail quality	Expediting e-mail sending	Color	
E-mail file format	Expediting e-mail sending	PDF	
LDAP server address	LDAP usage	15.180.123.123	
LDAP search root	LDAP usage	O = hp.com	
LDAP service port	LDAP usage	389	
LDAP account name	LDAP usage	BHCLdap	
LDAP password	LDAP usage	Password	
PC quality	Expediting send to PC	BW	
JetSend	Sending to JS devices	On	
DNS server address	Using DNS features	15.150.88.93	
DNS domain	Using DNS features	Italy.hp.com	
WINS server address	Using WINS features	15.156.114.15	

After entering the **Mandatory** parameters, you can exit the configuration menu and e-mail to any internet address.

For all the other functionality, please remember the customer has to re-configure them using the Administrative Software (JetAdmin and ABM). Please refer to the Administrative Manual for further details on the HP 9100C configuration.

6.2.2 If the JetDirect Card has been replaced

There are two possibilities:

1- The customer uses DHCP (dynamic IP assignment). - **No action required.**
   The card will get the new address automatically.

2- The customer uses manual IP configuration - **Action required.**
   At the boot, the machine will show the configuration menu and the IP address will have to be entered. This is the only missing parameters needed for operating.

6.2.3 Conformity test (*SHIFT + ALT + DUPLEX*)

Simply entering in this mode, it is possible to read all configuration parameters.
It is then possible to verify that the JetDirect model is correct and its internal firmware has the approved revision number.

JetDirect FW Rev must be <u>G.07.03</u> or greater to work with the HP 9100C. Cards used on printers or other networked devices may not work because of the FW Rev.

Information contained in the HP 9100C self test page relatively to JetDirect are (written as they appear on the display):

PARAMETER	EXAMPLE

- JetDirect Prd. #   *J1310A*
- JetDirect Firmware revision   *G.07.03*
- MAC address   *0060B0438C6B*
- IP address   *15.156.81.90*
- TCP/IP status   *Ready*
- Gateway address   *15.156.88.11*
- …………
- JetDirect Timeout   *90*
- JetDirect ID   *3727372720s12*

6.2.4 If the main PCA has been replaced

The PCA loads its own FW from the HDD; in case a FW upgrade is occurred (FW2), the previous FW version (FW1) is still stored on the HDD **until 50 jobs are performed**.
To read which FW is running, enter the Self Test Page by hitting (SHIFT + ALT + DUPLEX), then scroll to the last row:
Running Image #: *1*

The PCA stores the current image #. A new PCA always stores image #1. If the unit has been upgraded, the old PCA might store image #2. It might be necessary to switch the new PCA to the image #2 to avoid old FW usage.

To swap FW image:

1- Shutdown the machine
2- Turn it off
3- Turn it on
4- While the curtains start opening on the display, hit (SHIFT + ALT + F1)
   (F1 is the leftmost soft key below the LCD display; there are four soft keys)
5- Release the keys when curtains are fully opened

The FW image has now swapped. This means if FW1 was running now FW2 is, or vice versa.

If there is no way to know in advance which image is the newest one, after mounting the new PCA you can compare the two FW version by doing the following:

1- After boot, when the machine is ready, enter the Self Test Page (SHIFT + ALT + DUPLEX).
2- Read the FW **date and version** (very first two rows)
3- Perform the **FW image swap**, go through step 1-2 and compare. Use the newest one.

7 DEMONSTRATION

After completion of the HW intervention and Restore of parameters / functionality, it must be shown to the customer that the unit is working, from the pure Hardware perspective.

Here below, **in order of simplicity**, the most immediate ways to demo are listed. Then the following paragraphs explain in details how to set up the demo and the required tools, when needed.

DEMO METHOD	REQUIRES	NOTES
• **Check Jobs**	▪ A document to be sent, any method	No need to check at the receiving end
• **Send via E-Mail**	▪ SMTP Server used by the post office ▪ Network TCP/IP protocol	Fastest way !
⇔ **Copy via JetSend**	▪ JetSend enabled printer	See related paragraph
″ **Send to PC**	▪ HP 9100C Client SW installed ▪ Customer cooperation/involvement	See related paragraph
″ **Send via LAN FAX**	▪ FAX services installed and already in use by the HP9100C	See related paragraph

7.1 Check Jobs

Provided that the unit is configured to send to any possible destination, right after sending the document it is possible to check the job status.

1- Hit the Information **?** key
2- Select **Jobs** (leftmost Soft key, **F1**)
3- Verify that the document has been sent

This function is always available.

7.2 Send via E-Mail

Provided that the customer has the compatible environment, when the mandatory minimum configuration steps have been performed, the post office IP address has been already configured in the HP 9100C.

It is then enough to position any document in the ADF and select the e-mail soft-key. Then, after typing the correct and most convenient internet e-mail address, the document can be sent. It is possible to follow the process right after sending the document with the **?** key (see par. 6.1).

If the post office was already used by the HP 9100C before intervention, it is almost impossible that the sending fails.

If the HP 9100C was not used to send messages to the post office before intervention, it is possible that post office permissions do not allow "new" IP addresses to connect. In this case the post office administrator must include the HP 9100C's IP address in the list recognized addresses for the post office.

7.3 Send Via JetSend

JetSend is a communication protocol which highly simplifies communication between networked devices. The HP 9100C is JetSend enabled; the functionality can be turned on/off entering the configuration screen (SHIFT+ALT+GREEN).

If the customer has a JetSend enabled printer, it is enough to select the JetSend soft-key on the CP, then enter the IP address of the printer and send a page.

7.4 Send to PC

This procedure requires that the customer has already installed the client SW and has defined at least one user.
Normally, the customer would know how to operate. In cases where the HDD has been replaced and no back up procedure was followed by the customer prior to intervention, he has to create users again with the Address Book Manager (ABM, see User/Admin Guides).

If the customer is not familiar with the **Send to PC** function, nor has ever installed the related SW, it is strongly suggested to use one of the other two methods, or call the HP CCC to go trough an Assisted Installation of the client SW.

7.5 Send via LAN FAX

The LAN FAX feature can only be configured using the administrator's SW, JetAdmin. Only if the customer was already using this feature, after restoring the machine it is possible to simply select a FAX destination, **unless the HDD has been replaced** (See par 5.2).

8   Error codes

8.1   Error Management

A global error list contains all the error codes that the set of diagnostic programs can produce. Each hardware component or subassembly has an error code range wide enough to keep all the possible error situations related to it.

The error codes are in the format XYY, where X is the error prefix (one digit) related to the component and YY is the numeric code that describes the error for that component.

Error prefixes are:

> **0   DSTS related errors (not considered as failures)**
> **1   PCA errors**
> **2   HDD errors**
> **3   JetDirect errors**
> **4   Scanner / ADF errors**
> 5   Test process errors (considered as failures because potentially caused by the UUT)

8.2   Error codes list

The following table lists all error codes that can be generated during extended self-test session.

Error code	Error description
PCA errors	
100	PCA: diagnostic timeout
101	PCA: bad parameter
102	PCA: bad revision for boot code
103	PCA: bad revision for multiplexer code
104	PCA: bad revision for manufacturing code
105	PCA: Styx register error
106	PCA: Styx DMA error
107	PCA: Juliet register error
108	PCA: on-board memory error
109	PCA: DIMM memory error

Hard disk errors	
200	Hard disk: diagnostic timeout
201	Hard disk: identify device error
202	Hard disk: bad parameter
203	Hard disk: raw partition not found
204	Hard disk: write error
205	Hard disk: read error
206	Hard disk: diagnose error
207	Hard disk: bad model
208	Hard disk: bad firmware revision
209	Hard disk: test information not found

JetDirect errors	
300	JetDirect: diagnostic timeout
301	JetDirect: configuration error
302	JetDirect: BIST timeout
303	JetDirect: POST timeout
304	JetDirect: fatal error
305	JetDirect: configuration timeout / card not detected
306	JetDirect: bad model
307	JetDirect: bad firmware revision

Scanner / ADF errors	
400	Scanner: diagnostic timeout
401	Scanner: internal error
402	Scanner: bad parameter
403	Scanner: lamp error
404	Scanner: home position problem
405	Scanner: communication problem
406	Scanner: bad command format
407	Scanner: bad answer format
408	Scanner: stuck during scanning
409	Scanner: electronics problem
410	Scanner: bad firmware revision
411	ADF: not detected
412	ADF: lid open
413	ADF: paper jam
414	ADF: paper not present
415	ADF: too slow
416	ADF: too few pages
417	ADF: electronics problem
418	ADF: tray problem
419	Scanner: motor torque problem
499	Scanner: undefined error

Test process errors (considered as failures)	
500	Unit not responding
501	Boot problem for unit under test
510	FTMS: bad command
511	FTMS: communication error
512	FTMS: communication timeout
513	FTMS: command timeout
514	FTMS: timer problem