

# ADC COMPACT DIGITIZER

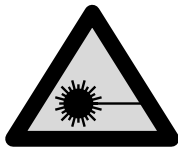


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# Safety Precautions



The ADC Compact Digitizer makes use of a 20 mW HeNe laser, classification class IIIb.

In normal operating conditions, when both doors are closed, there can be no laser radiation outside the unit. It is nonetheless imperative that the local radiation safety regulations regarding the protection of staff against scattered radiation are complied with, if the ADC Compact Digitizer is located in the immediate vicinity of an X-ray room.

For laser safety, only open up the front left and right doors as described in this manual to solve possible cassette or image plate jams. When the doors are opened, the main power supply is automatically disconnected to prevent laser radiation.

The ADC Compact Digitizer is a Class 1 Laser Product.

**WARNING**

***User interventions other than those described in this manual can be hazardous with regard to laser radiation.***

# General description of the ADC Compact Digitizer

## Functions and features of the Digitizer

The ADC Compact Digitizer scans the exposed ADC image plate, converts the information into digital data and automatically transfers the image to the image processing server for further processing and visualization. The ADC Compact Digitizer requires but little manual interaction.

All the user has to do, after exposure and identification of the cassette, is to place it in the input buffer of the ADC Compact Digitizer. You can deposit up to 10 cassettes of different sizes simultaneously in the input buffer. The Digitizer takes up the cassette(s) one by one. The Digitizer reads the demographic data and routing information from the RF-tag memory chip in the cassette, opens the cassette, removes the image plate and scans the latent image by means of a sweeping laser beam. The image is digitized and the cassette is returned to the output buffer for new exposures. After a full Digitizer cycle, the plate has turned 180° in the cassette.

Depending on the X-ray intensity that has affected the phosphor during the exposure, more or less visible light will be emitted during the laser scanning. The light is converted into an electrical signal. This signal is then converted into a digital bit stream. Once converted into digital form, the digitized image is transferred to the image processing computer for further processing and visualisation.

The display on the operating panel shows the Digitizer status and indicates possible problems. When the image has been scanned, the cassette is fed out to the output buffer. It is now ready for re-use.

You can treat emergencies by assigning an image the status of “emergency” when sending it to the image processing server.

Further features of the ADC Compact Digitizer include:

- Erase Feature

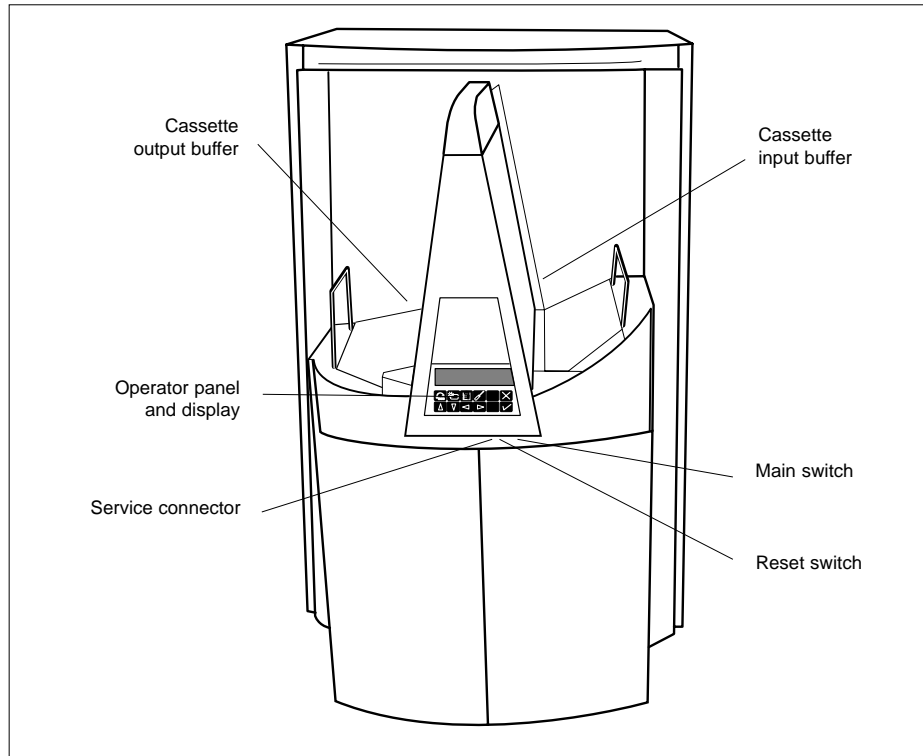
With this feature you can erase a batch of up to 9 image plates.

- Reset Feature

Some errors (except plate jams) can be solved by resetting the Digitizer. You can do so by pressing the reset switch or by switching the Digitizer off and then on again. Do not press the reset switch to solve communication problems with the image processing server (see also the sub-section 'Resetting the Digitizer').

## Main components of the Digitizer

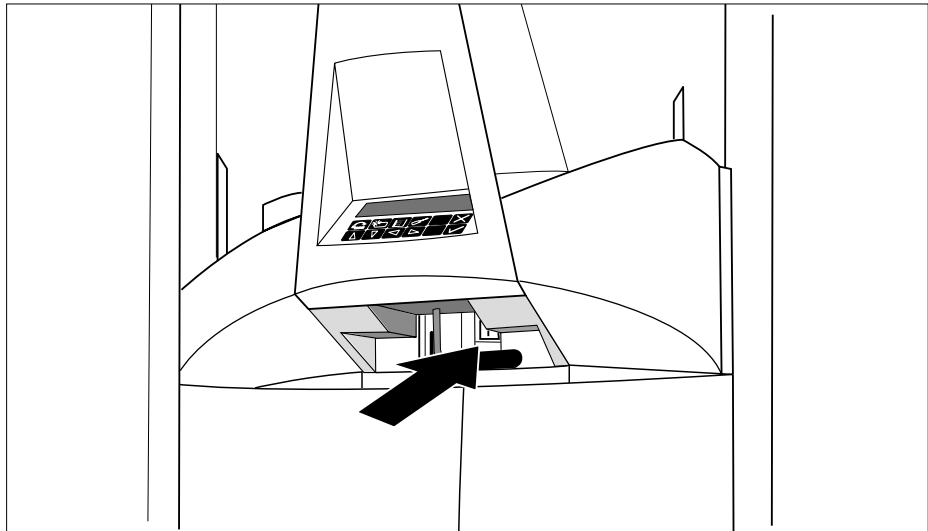
The illustration below shows the components of the Digitizer.



- The cassette input buffer accepts up to 10 cassettes, even of different sizes, to be digitized or up to 9 cassettes to be erased.
- Operating panel and display  
As the handling of the cassettes is fully automated, normal operation is a zero-button operation. You need not press any buttons at all. The keys on the operating panel are only used to activate special functions.
- The cassette output buffer receives cassettes that are fed out after being handled by the Digitizer.
- The reset key is only used in special cases, when the display prompts you to do so.

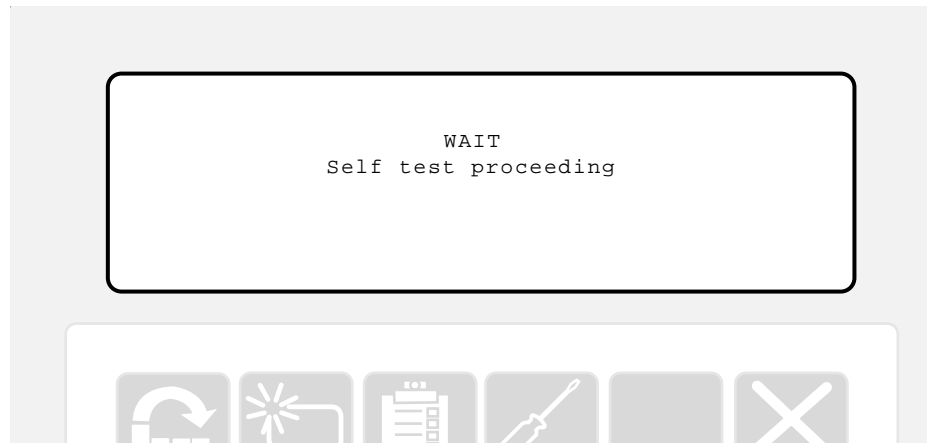
## Switching the Digitizer on

- 1 Make sure that the following conditions are met before you switch the ADC Compact Digitizer on:
  - A service technician has appropriately connected the ADC Compact Digitizer and has carried out a performance test.
  - You have read the safety precautions at the beginning of this chapter and you will observe them while working with the ADC Compact Digitizer.
  - You are acquainted with the basic functions of the Digitizer as well as with the complete ADC Compact system.
- 2 Switch the Digitizer on by switching the main switch at the front of the machine, under the operator panel, in the ON position.



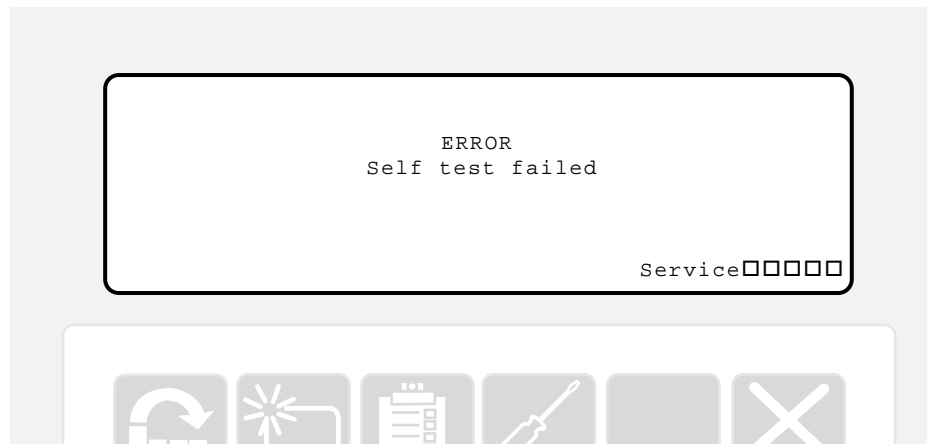
The ADC Compact Digitizer executes a self-test, initializes all the Digitizer components, goes through a laser warm-up procedure and checks for cassettes, image plates and images still to be transmitted in the image queue. If no error is detected in the system, the Digitizer switches to 'Operation' mode.

After the ADC Compact Digitizer has been switched on, the display returns the following message:



When the self-test sequence has been completed successfully, the operator main menu is displayed, which is an indication that the ADC Compact Digitizer is ready for use.

In case of any failure during the self-test procedure, there will be a beeping signal at regular intervals of time and the following message will be displayed:



For rectifying failures we refer to the Troubleshooting section.

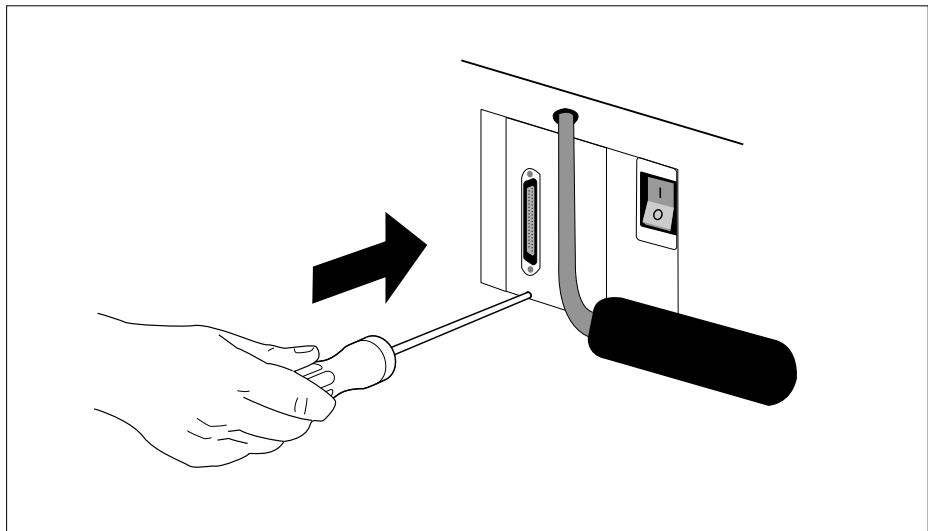
## Resetting the Digitizer

In exceptional circumstances you may be prompted to reset the ADC Compact Digitizer, either using the display panel of the Digitizer or as part of a procedure as set forth in this manual.

*Caution*

*Never reset the Digitizer to solve a plate or cassette jam. If you would do so, the plate inside the Digitizer might get damaged. In case of a plate or cassette jam, always follow the procedures that are described in the section 'Troubleshooting' further in this manual.*

To reset the Digitizer, insert a screwdriver into the reset switch opening as shown to activate the reset switch.

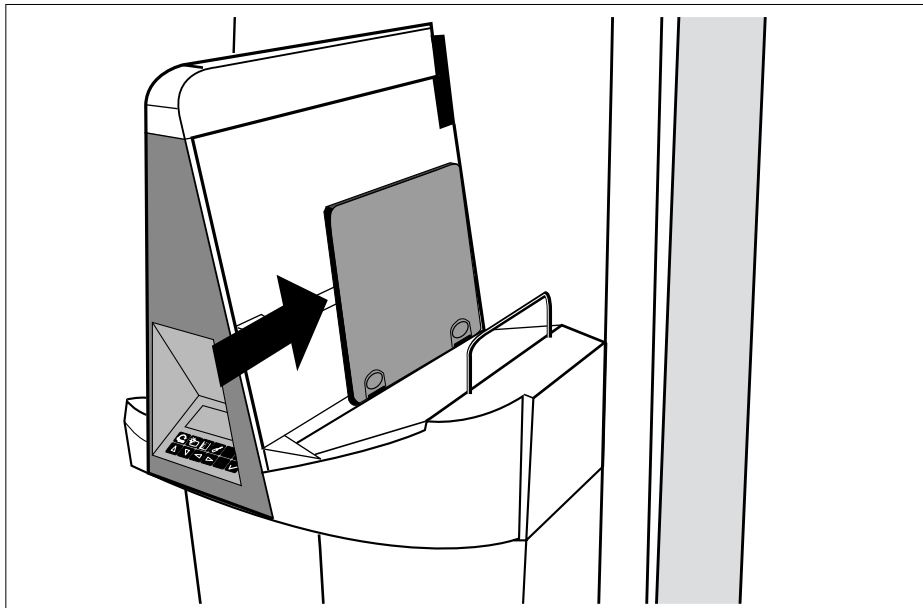


## Reading an image plate

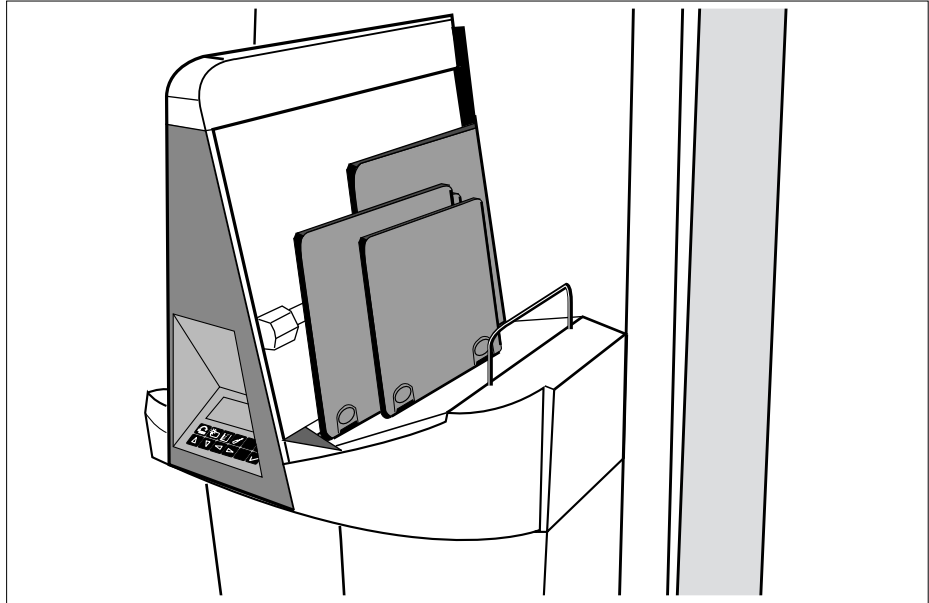
Proceed as follows to read an image plate, i.e. to scan it in the ADC Compact Digitizer, to send it to the image processing server and to display the image on the preview monitor.

Make sure that the cassette was properly identified in the ADC Compact ID Station (See ADC Compact ID Software manual).

- 1 Insert a cassette in the input buffer as shown below.



You can insert up to 10 cassettes, even of different sizes, as shown on the next illustration. Make sure that the cassette opening mechanism is at the bottom.



The Digitizer automatically picks up the first cassette, reads the image plate, and forwards the raw image data to the ADC Compact processing server.

- 2 After about one minute you can view and check the processed image on the preview monitor.

## Operating Panel and Display

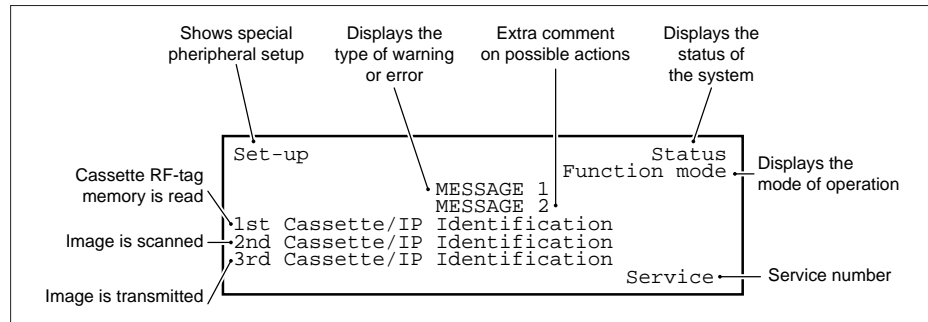
The operating panel of the ADC Compact Digitizer consists of a backlit LCD display and 10 keys, as illustrated below.



### Display

During normal operation, the system does not require any special user interaction to be displayed on the screen. Only when performing special operator functions or in the event of problems (e.g. if there is a cassette or image plate jam), the display automatically prompts you to perform certain actions.

The illustration below shows an overview of the lay-out of the Digitizer display.



When the system has been idle for 5 minutes, the backlit LCD display dims. The display shows again when:

- The display changes, e.g. if the Digitizer receives a message from the Processing station.
- A cassette is placed in the input buffer.
- You press a key of the operating panel.

#### Keys on the operating panel

Special functions can be accessed with the keyboard. When in use, the operating panel indicates by means of different acoustic signals, whether or not keyboard input is accepted:

- short beep: key is active and input is accepted
- long beep: key is not active or input is refused
- beep at regular time intervals: whenever there is a warning, a "Locked" message or an error condition.

The following table lists the operating panel keys and their functions:



- Gives an image the status of emergency when sending it to the image processing server.



- Starts erasing images without scanning them.



- Provides access to advanced key-operator functions.



- Gives access to service level functions.



- Quits the current function, exits a menu without saving modifications.



- Confirms the keyboarded input, or in case of some non-fatal errors, confirms that you have noticed this state. Goes back to the operator level when in the key-operator mode or goes back to service level main menu when in service mode, proceeds with the Digitizer operation when "LOCKED" condition has occurred.



- Moves the cursor one position up to the previous edit field, scrolls upwards or increments digits in a numeric entry field.



- Moves the cursor one position down to the next edit field, scrolls downwards or decrements digits in a numeric entry field.



- Scrolls backwards through multiple choices within a field, moves to entry position in a numerical field in descending order (from right digit to left digit) and toggles between values in a field.



- Scrolls forward through multiple choices within a field, moves to entry position in a numerical field in ascending order (from left digit to right digit) and toggles between values within a field.





- 3 In case you decide not to assign emergency status to a cassette after having pressed [EMERGENCY], you can quit the Emergency function by either pressing [ESCAPE] or by pressing the [EMERGENCY] key a second time ("toggle" key). During the Emergency procedure, no other keys will be active. Pressing any key at this stage will cause a long beep to be sounded.



**Note**

When a "WARNING" or "LOCKED" condition, which can be remedied by the operator without resetting the Digitizer, occurs during the Emergency procedure, the Emergency mode is not quit.

# Erasing an image plate

A plate that has not been used during 3 days should be erased before being used again in order to remove signals that are caused by cosmic radiation and intrinsic radioactive elements in the phosphor.

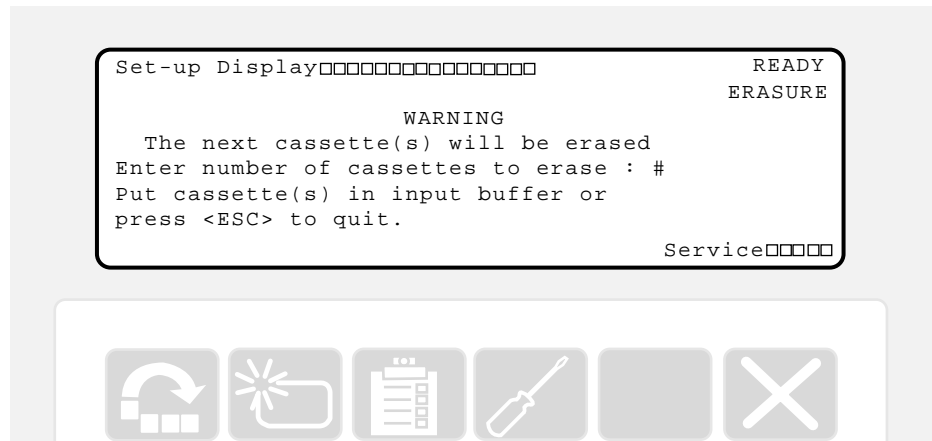
An accidental or exceptional X-ray overdose excites the phosphor crystals in deeper layers of the image plate. The deeper layers then still retain a latent image after erasure. This image is called a ghost-image. To remove the ghost-image from an image plate, leave the cassette for at least a day before you erase it again.

With the Erase feature you can erase an image plate or a batch of up to nine plates. In order to erase an image plate, proceed as follows:

- 1 Press the [ERASE] key on the operating panel of the Digitizer.



The system returns a display similar to the following one:



**Note** During the entire Erasure Mode, the above display remains active.

- 2 Enter the number of image plates to be erased, with a maximum of nine. The default value shown is 1. Change the number of image plates to be erased using the upward and downward arrow keys.



- 3 Place the cassettes that you want to have erased in the cassette input buffer as shown below. For each cassette that is read, the # digit on the display decreases by 1-step decrements until "0" is reached. The system then reverts to Normal Operator mode.



- 4 You may now add (exposed) cassettes to the batch of cassettes. The Digitizer will only erase as many cassettes as previously specified.

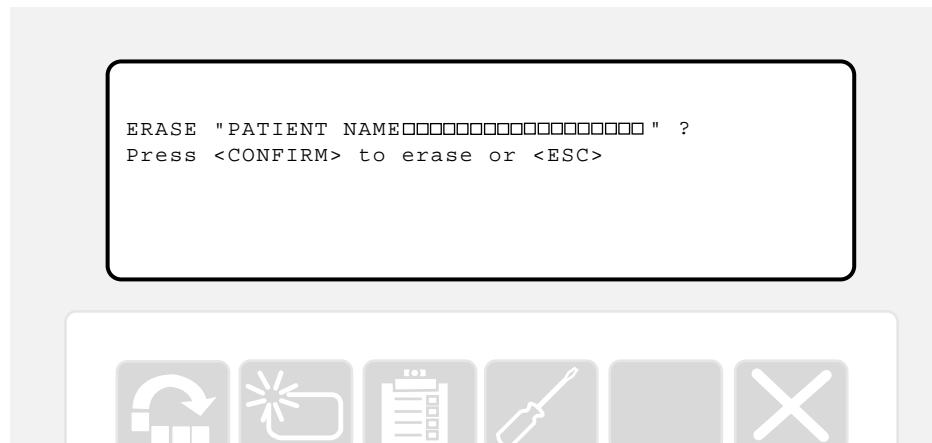
If you place fewer cassettes in the cassette input buffer than previously specified, the Digitizer will only erase the cassettes in the buffer and revert to normal mode after a time-out of 1 minute.

You can quit the Erase function by either pressing [ESCAPE] or by pressing the [ERASE] key a second time ("toggle" key). During the Erase procedure, no other keys will be active. Pressing any key at this stage will cause a long beep to be sounded.



*Caution*

*Entering an identified cassette in the Erase Mode results in a "LOCKED" condition, which is shown on the display in the following manner:*



When pressing the [CONFIRM] key, the "LOCKED" cassette will be erased.



If you press the [ESC] key, the system leaves the Erase Mode and all subsequent cassettes are handled as identified. Failure to respond to the system prompt as shown above will, within a 1-minute time-out, is put on a par with an [ESC] command. This does not apply however to cassettes that have been identified for "Erasure" in the ADC Compact ID station.



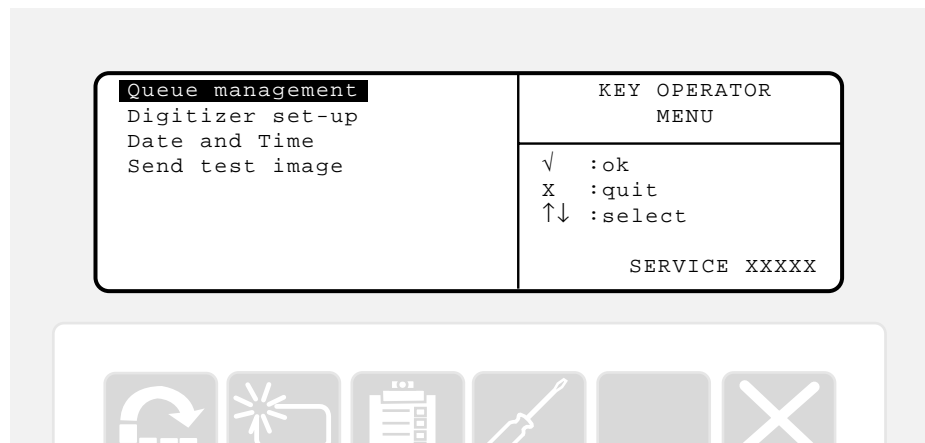
## Advanced key-operator functions

The key-operator menu can be accessed by pressing the [KEY-OPERATOR] key on the operating panel.



The key-operator main menu gives you access to a number of advanced operator functions. These useful menu-driven functions include:

- Queue Management
- Digitizer set-up
  - Data destination
  - Rerouting of destination
  - Enable/disable acoustic beeps
- Date and time
- Send test image



## Queue Management

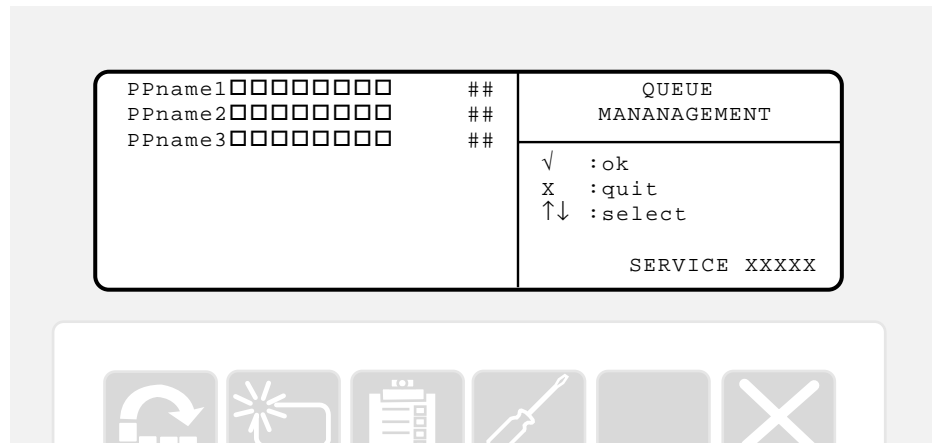
Once a cassette identified by the ADC Compact ID station is read by the Digitizer, an entry is made in the internal queue. The Queue Management function enables the key-operator to view a list of images residing in the image queue and their status for each installed destination, and to erase an image from the queue.

In order to access the Queue Management function, proceed as follows:

- 1 Select "Queue Management" in the key-operator main menu, using the upward and downward pointing arrows.



The Digitizer display shows a list of installed destinations (a maximum of 23 destinations) together with the number of images directed to them, as is shown in the sample menu below.



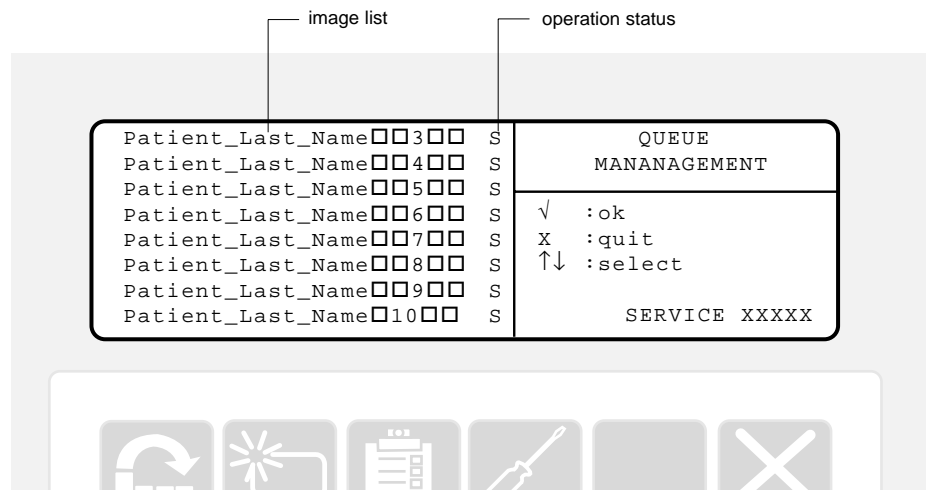
### Note

Ppname is the destination name of the ADC Compact processing station, whereas ## displays the number of images in the queue that are directed to the destination.

- 2 Select a destination using the upward and downward arrow keys and press [CONFIRM]. If only one destination has been installed, the image queue screen will be displayed straight away.



The Digitizer returns a list of maximum 10 queued images together with their respective operation status (S), as shown below.



Note

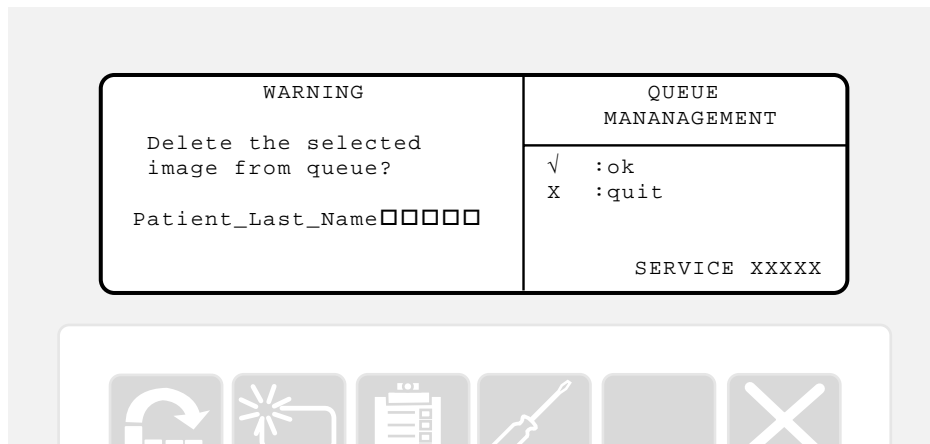
"S" indicates the operation status of the queued image

Q	Queued	Waiting in the queue to be transmitted
T	Transmit	Is actually being transmitted, waiting for acknowledgment
W	Warning	There is a problem with the destination
E	Exception	There is a problem with the image file, Cannot be transmitted
	OK	The image was successfully transmitted

- 3 Select the image using the upward and downward arrow keys and press [ERASE] to erase the selected image from the queue.



The system returns the following Confirmation screen:



- 4 Press [CONFIRM] to validate the deletion of the selected image from the queue, or press [ESC] or the [KEY-OPERATOR] key to cancel the erasure of the image and to return to the main Operator level menu.



**Note**

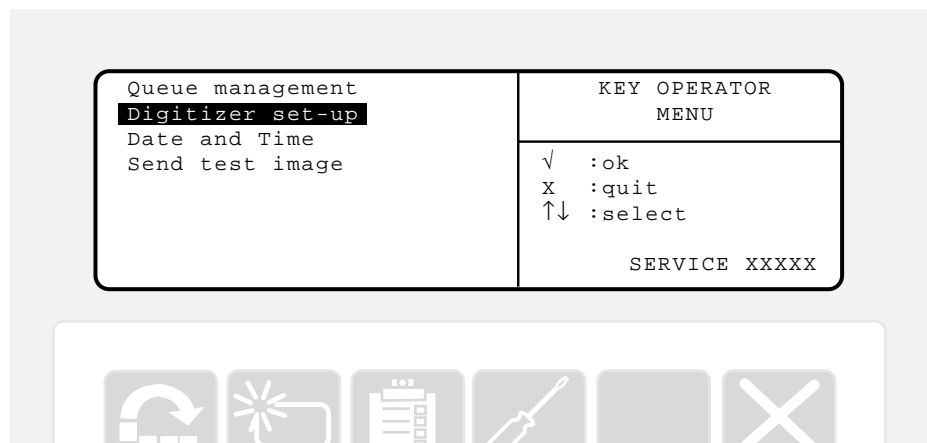
Only images having the 'Queued', 'Warning' and 'Exception' status can be erased from the queue.

## Digitizer Set-up

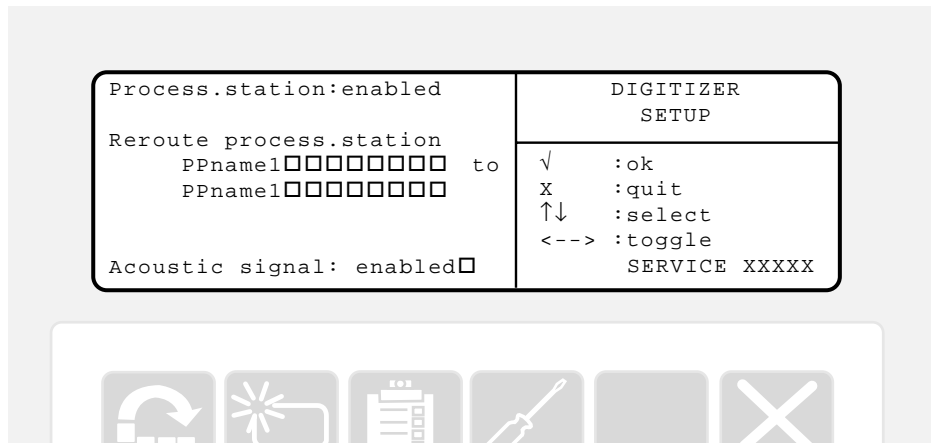
This function allows you to enable respectively disable the image transmission to the ADC Compact processing station and to reroute any of the configured processing stations. And finally, using the Digitizer Set-up function, you can enable respectively disable the acoustic warning beeps.

In order to access the functions offered by the Digitizer Set-up Mode, proceed as follows:

- 1 Select "Digitizer Set-up" in the key-operator main menu, using the upward and downward arrow keys



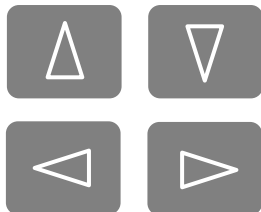
- 2 Select the desired set-up option using the upward and downward arrow keys.



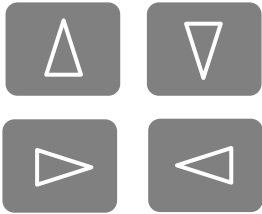
- 3 If you selected the "Process.station" option you can toggle between "enabled" and "disabled", using the left and right arrow keys. The default value is "enabled".



- 4 If you want to reroute the processing station, select "Reroute process. Station", using the upward and downward pointing arrow keys and toggle between the available processing stations using the left and right arrow keys.



- 5 For disabling respectively enabling the acoustic signals, the procedure is much the same. Use the up and down arrow keys for selecting "Acoustic signal" and toggle between "enabled" versus "disabled" using the right and left arrow keys.



- 6 Press [CONFIRM] to validate all changes made. The system returns to the main Operator level menu. Or press [ESC] to cancel the operation and quit.

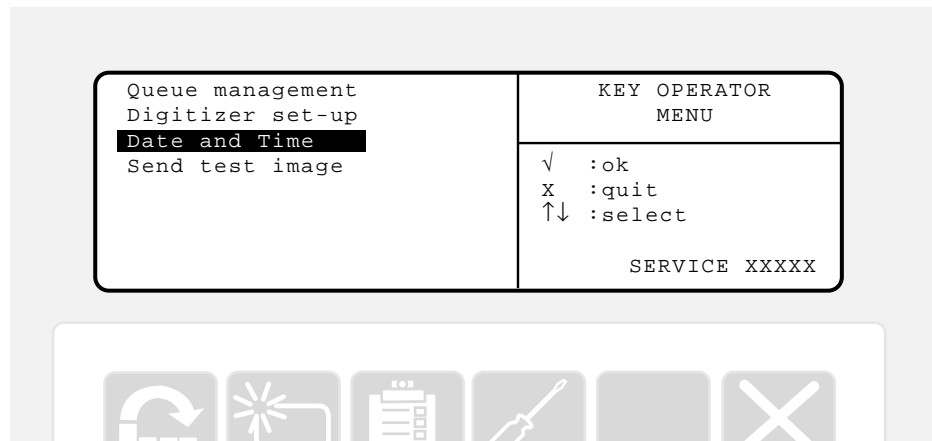


## Date and time

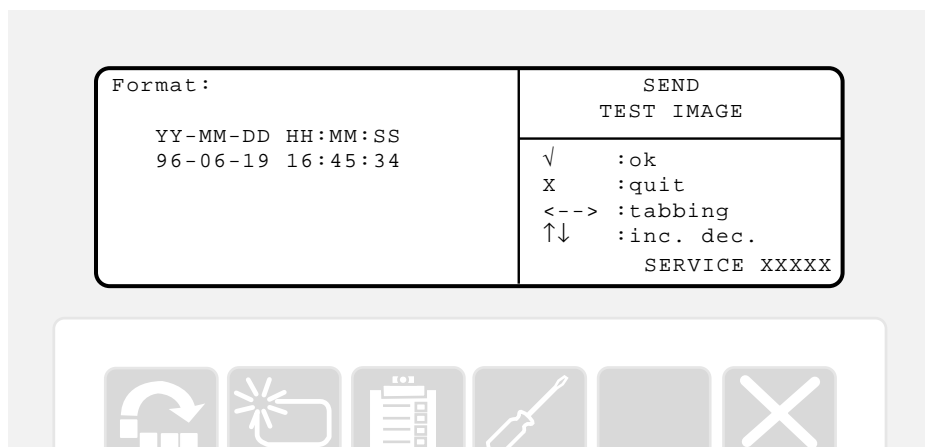
This function allows you to set the date and time of the ADC Compact Digitizer.

In order to access the functions offered by the Date and time option, proceed as follows:

- 1 Select "Date and time" in the key-operator main menu, using the upward and downward arrow keys



- 2 Move between the "Date" entry field and "Time" entry field using the left and right arrow keys.



- 3 Use the up and down arrow keys to increase respectively decrease the digit values.



- 4 Press [CONFIRM] to confirm all changes and to return to the main Operator level menu.



Press the [KEY-OPERATOR] key to quit the Key-operator level and to return to the Operator level or press [ESC] to cancel the operation and quit.

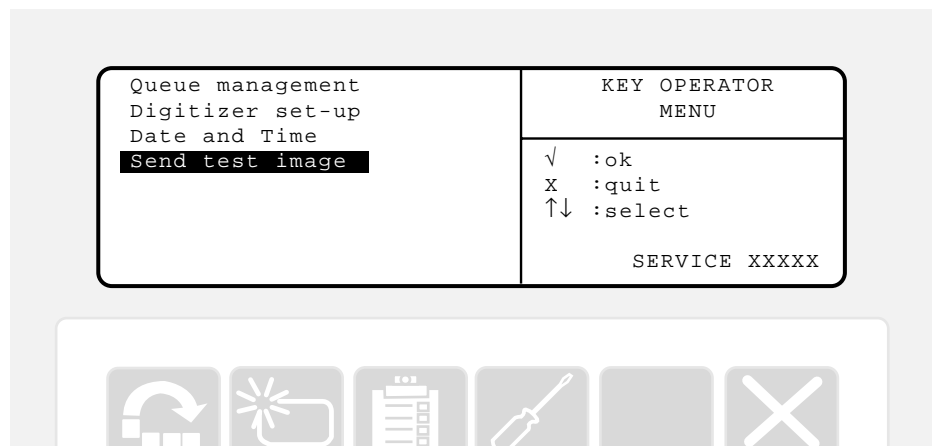


## Send test image

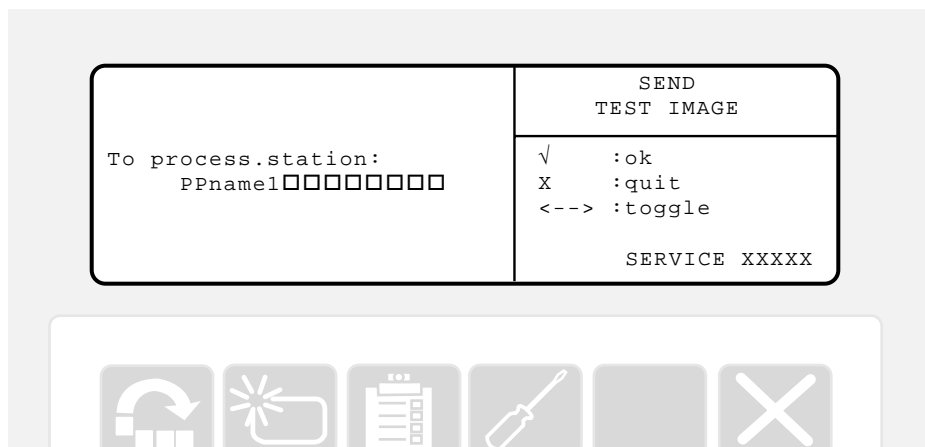
This function enables you to send a test image to the ADC Compact processing station in order to monitor the communication between the ADC Compact Digitizer and the processing station.

In order to access the functions offered by the Send test image option, proceed as follows:

- 1 Select "Send test image" in the key-operator main menu, using the upward and downward arrow keys.



- 2 Select the destination you want the test image to be sent to, using the "toggle" left and right arrow keys



- 3 Press [CONFIRM] to confirm the changes made and to return to the main Operator level menu.



Press the [KEY-OPERATOR] key to quit the Key-operator level and to return to the Operator level or press [ESC] to cancel the operation and quit.



In the event of an error condition during the Send test image procedure, a 'CODE XXXXX' or 'SERVICE XXXXX' message is displayed in the right lower section of the Key-operator menu screen.

# Troubleshooting

General procedure in case of malfunction

In exceptional situations the ADC Compact Digitizer display provides comprehensive information concerning errors and ways of correcting them. The Digitizer status changes from "READY" to one of the following:

- "WARNING"  
In case of a warning message, further operation is possible without impairing the image quality. The Digitizer display shows a detailed explanation on the possible cause and the appropriate solution. The warning disappears as soon as the problem has been solved.
- "LOCKED"  
The Digitizer operation is locked, which means that the Digitizer no longer takes cassettes at the input buffer. This condition can be repaired by operator intervention, without Digitizer Reset. Follow the instructions on the display.
- "ERROR"  
This status normally requires service or key operator intervention. Follow the instructions on the display.

Solving the "ERROR" condition

Basically, there are two types of errors:

- Errors which can only be corrected by the Key-operator, e.g. an image plate jam
- Errors that can only be repaired by a trained service engineer.

In order to solve an Error condition, proceed as follows:

- 1 If an error occurs, first check the display of the ADC Compact Digitizer.

If the display contains a message of the following type:

```
CODE   XXXXX
```

in which XXXXX represents a number, then follow the instructions on the screen.

If the error condition and attendant message persists, call the Agfa service engineer and communicate the error number.

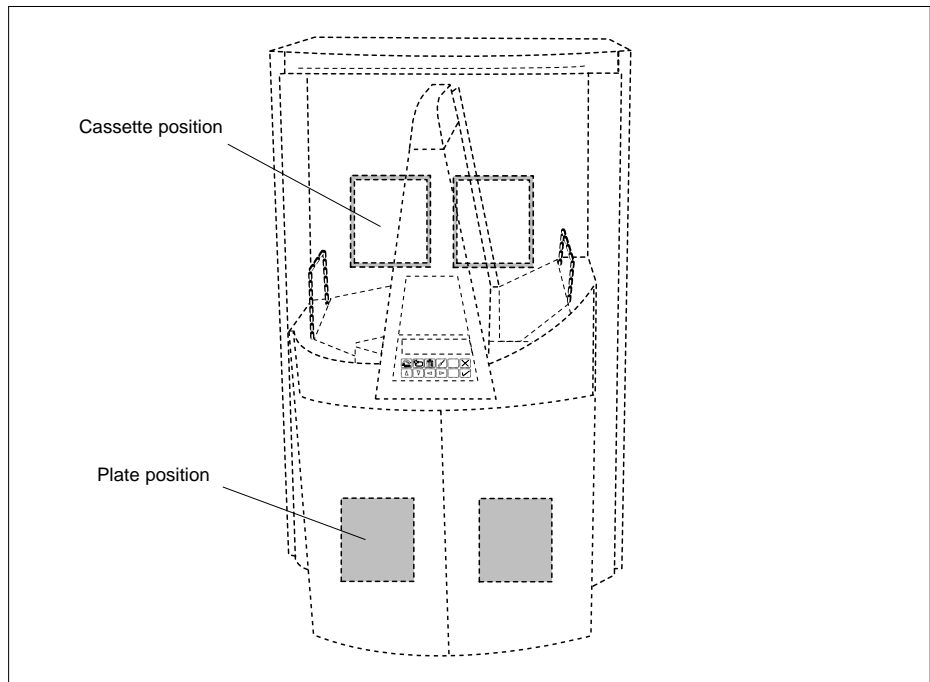
- 2 If the display contains a message of the following type:

```
SERVI CE   XXXXX
```

in which XXXXX represents a number, then switch off the ADC Compact Digitizer, wait 30 seconds and switch it on again.

If the message persists, call the Agfa service engineer and communicate the error number. Do not attempt to correct the error yourself.

- 3 Check whether the display shows a pictograph of the following kind:



This means that a cassette or an image plate has jammed inside the Digitizer. The hollow rectangle designates the current position of the cassette, whilst the filled rectangle designates the position of the image plate.

*Caution* Do not press the [RESET] button.

Follow the instructions on the operating panel to solve the problem. The display will tell you whether you need to open the front doors.

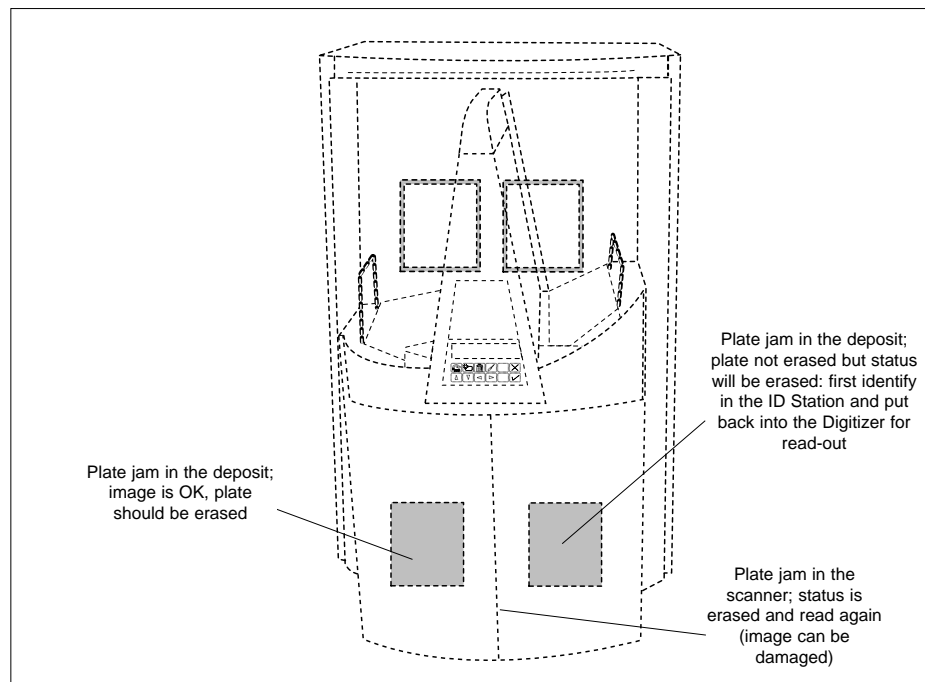
#### General guideline in case of a cassette jam

A cassette jam can occur during the input or the output procedure. If this is the case, you see a part of the cassette either in the input buffer or in the output buffer. To solve this jam, gently push or pull the cassette, following the procedure outlined below.

## General guideline in case of a plate jam

The ADC Compact Digitizer always reads and digitizes the plate first, then erases it and feeds it out. If a plate jam occurs before the plate is erased, there is a fair chance that you can recover the image by putting the plate back into the cassette and digitizing it again. When doing this you must take care to expose the jammed plate to daylight as little as possible.

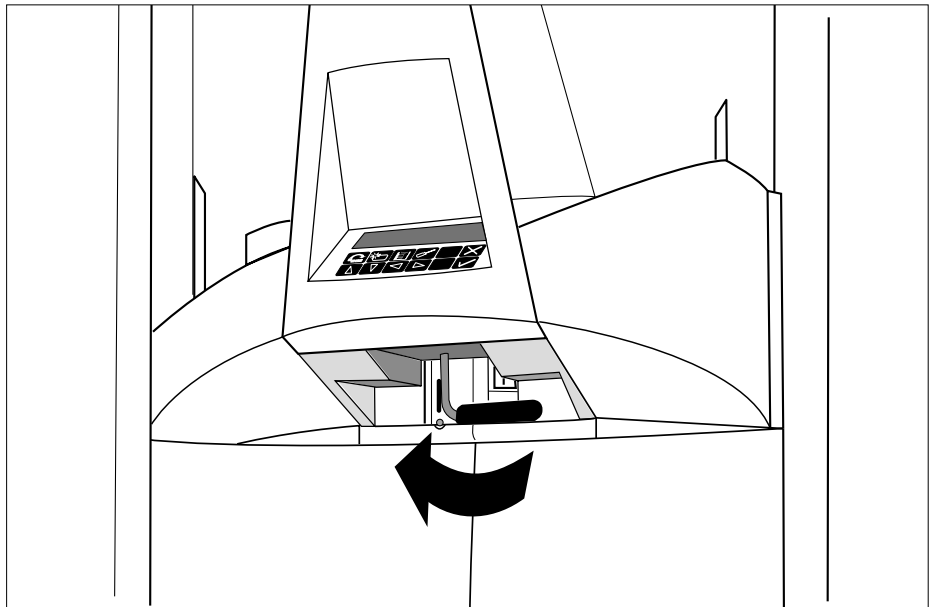
The diagram below shows the possible locations of a jammed image plate and the probable status of the image.



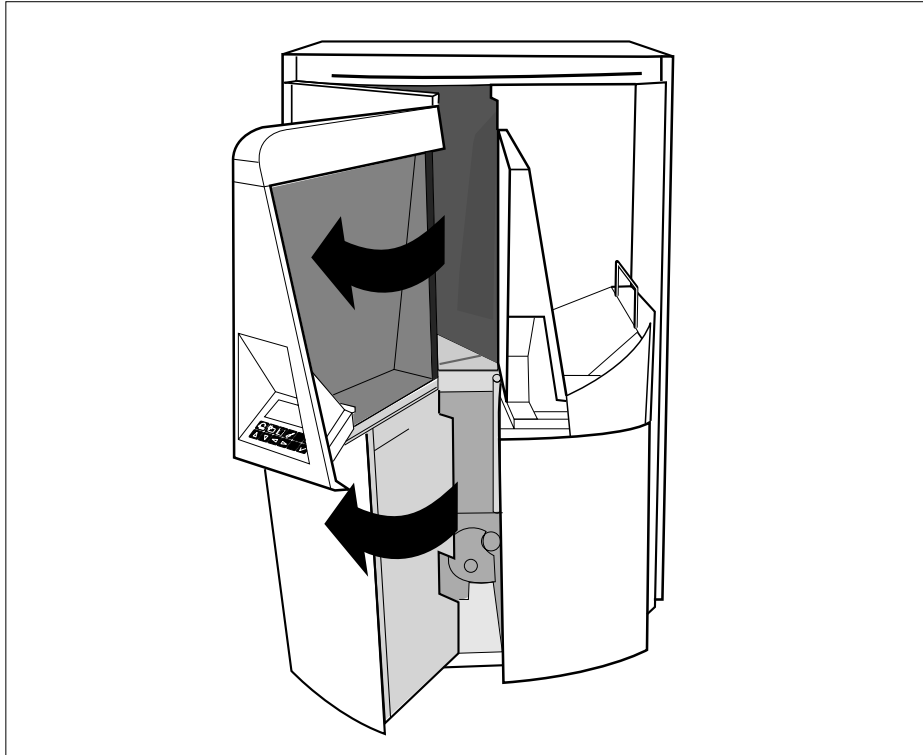
## Clearing cassette jams

In order to clear cassette jams, proceed as follows:

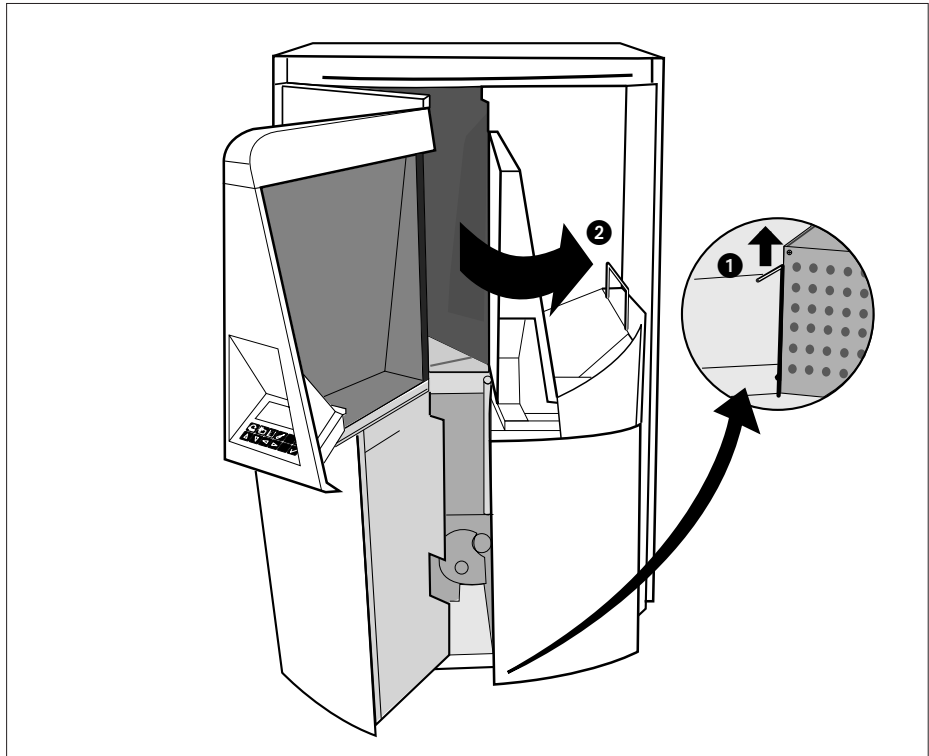
- 1 Switch off the power to the ADC Compact Digitizer.
- 2 Push the black handle that is located under the operating panel and display section gently to the left in order to open the front doors of the ADC Compact Digitizer, as is shown on the illustration below.



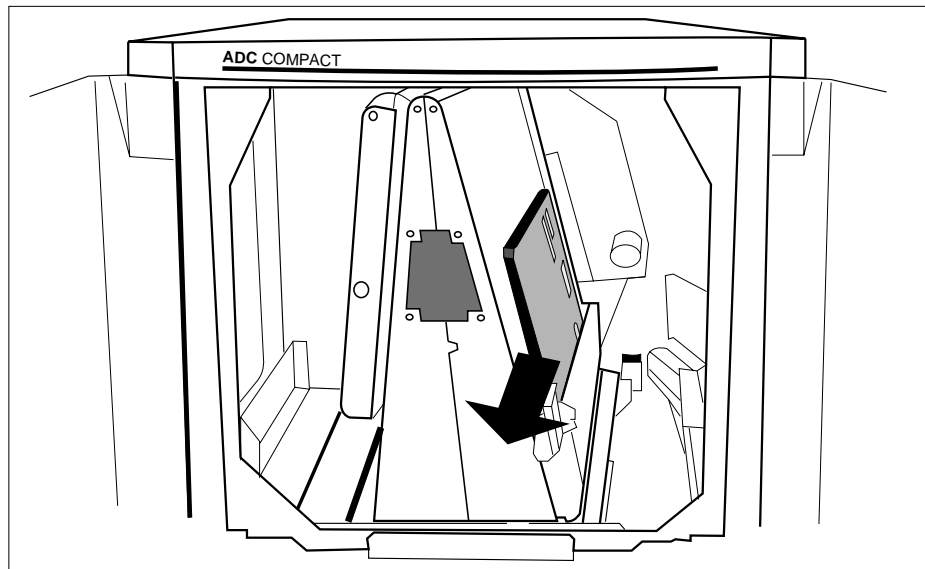
- 3 Open the left front door of the Digitizer. Make sure you open the left front door first. When opening the left front door, the power supply to the Digitizer is disconnected automatically.



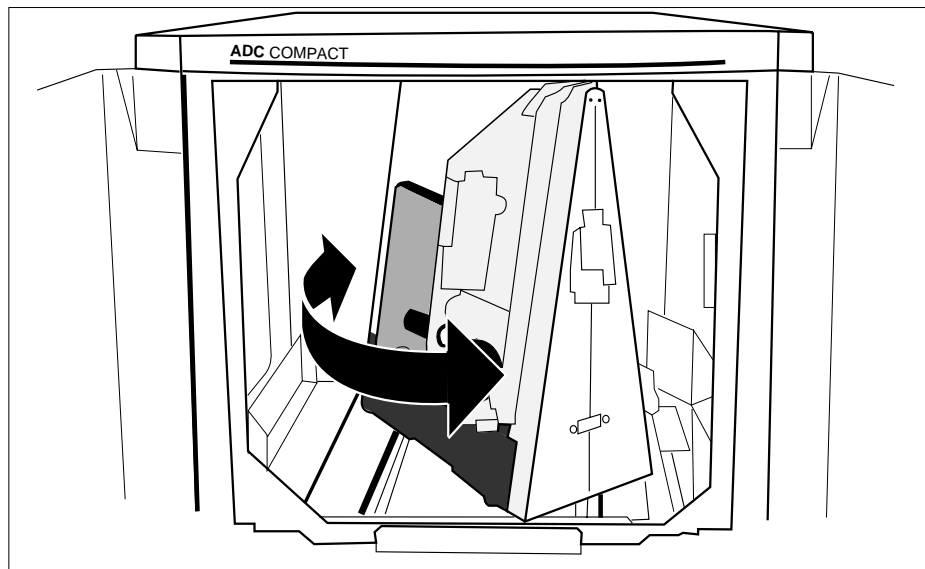
- 4 Lift the bottom door bolt and open the right hand side door, as shown in the illustration below.



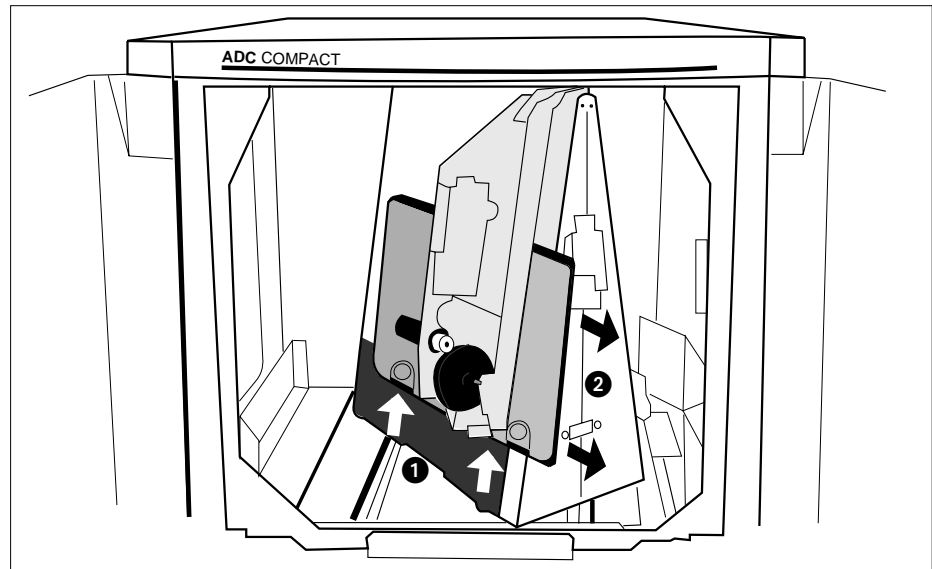
- 5 Gently remove the jammed cassette from the cassette input unit, as shown.



- 6 In case a cassette jam has occurred in the cassette output unit, the cassette might be hard to reach. In that case, swivel the cassette unit anti-clockwise so that the cassette can be easily accessed, as shown in the illustration below.



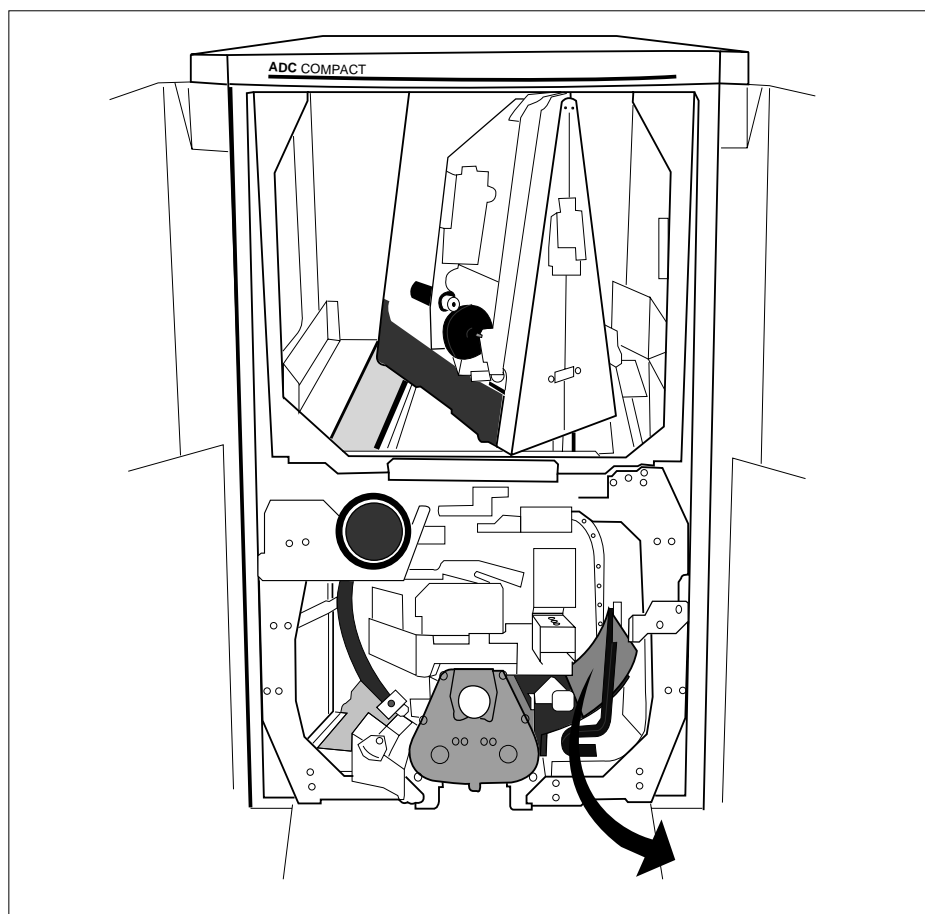
- 7 Remove the jammed cassette by pulling it towards you while gently lifting it upwards. If you cannot easily remove a cassette at this point, do not dismantle the unit any further. Call a service engineer.



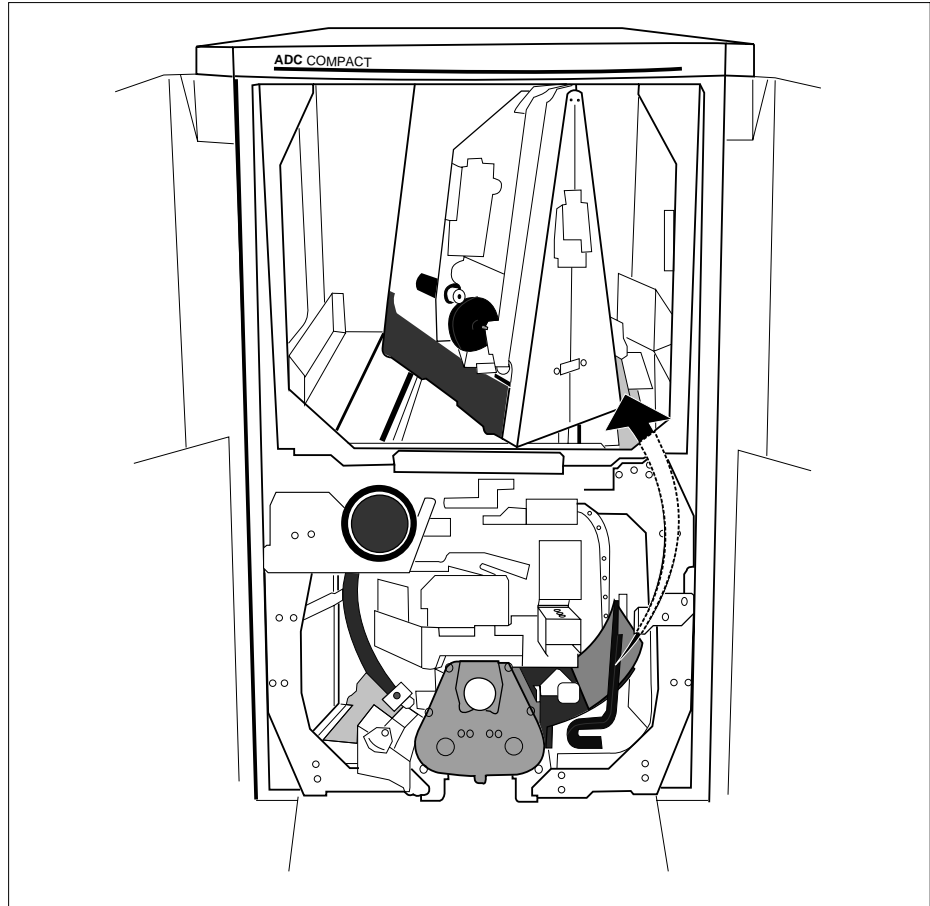
## Clearing image plate jams

In order to clear image plate jams, proceed as follows:

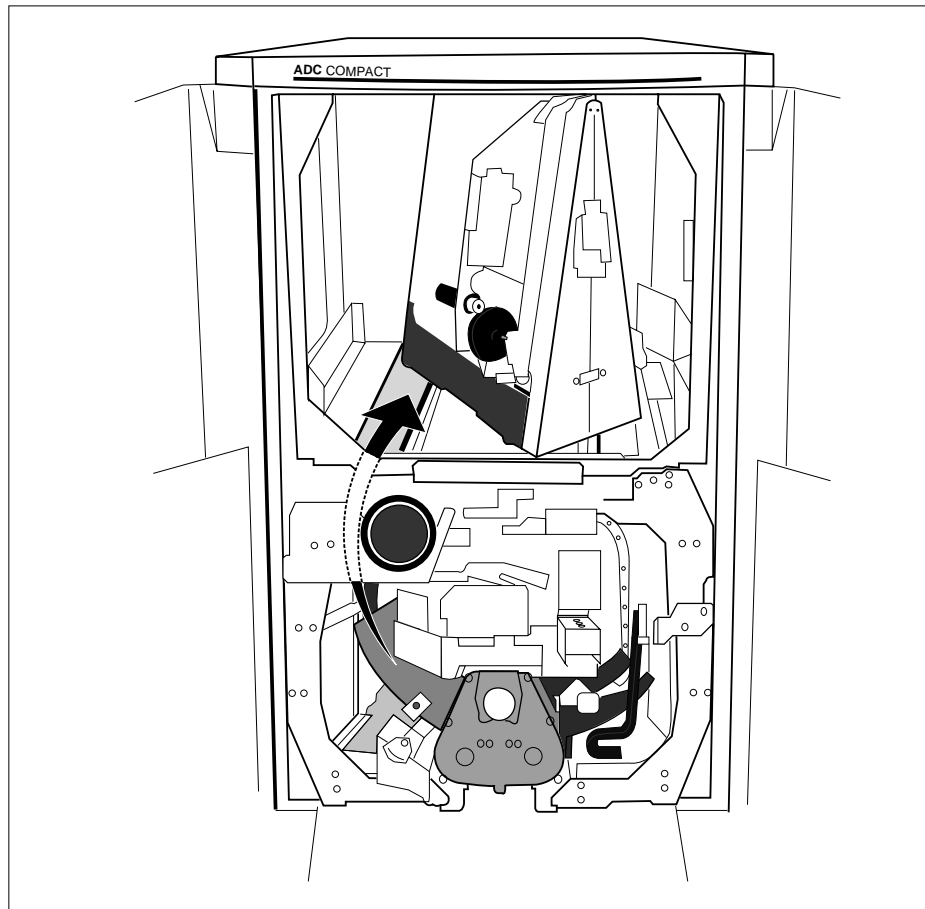
- 1 In case the image plate got jammed in the pre-scan unit, remove the jammed image plate by pulling it carefully towards you, as shown below.



If the image plate cannot be removed by pulling it towards you, you can lift the jammed plate and remove it through the upper part of the Digitizer, as shown on the illustration below.



- 
- 2 In the event of a image plate jam in the post-scan unit, the image plate probably cannot be removed by pulling it towards you, as the access is rather narrow. Therefore you will have to lift the jammed plate over the erase unit and have it removed through the upper section of the Digitizer, as shown on the illustration below.



If it is still not possible to remove the image plate, do not attempt to dismantle the unit any further. Call a trained service engineer.

# Technical Specifications of the ADC Compact Digitizer

## Cassette buffer capacity

- 10 cassettes of mixed sizes, both in input and output buffer

## Performance

- Throughput: 70 plates/h (size dependent)

## Accepted cassette sizes

- 35 x 43 cm (14 x 17")
- 35 x 35 cm (14 x 14")
- 24 x 30 cm
- 18 x 24 cm
- 15 x 30 cm
- 8 x 10"
- 10 x 12"

## LCD display

- Machine status and error conditions

## Grayscale resolution

- Data acquisition: 12 bits/pixel
- Output to processor: 12 bits/pixel

## Spatial resolution

### Reading sampling frequency:

■ 35 x 43 cm:	6 pixels/mm
■ 35 x 35 cm:	6 pixels/mm
■ 35 x 43 cm HR:	9 pixels/mm (option)
■ 35 x 35 cm HR:	9 pixels/mm (option)
■ 24 x 30 cm:	9 pixels/mm
■ 18 x 24 cm:	9 pixels/mm
■ 8 x 10":	9 pixels/mm
■ 10 x 12":	9 pixels/mm

### Pixel matrix size

■ 35 x 43 cm:	2048 x 2508
■ 35 x 43 cm HR:	3072 x 3763
■ 35 x 35 cm:	2048 x 2048
■ 35 x 35 cm HR:	3072 x 3072
■ 21 x 43 cm (partial scan of 35 x 43 cm cassette):	1792 x 3752
■ 24 x 30 cm:	2035 x 2560
■ 18 x 24 cm:	1520 x 2048
■ 15 x 30 cm:	1249 x 2560
■ 8 x 10":	1620 x 2048
■ 10 x 12":	2120 x 2560

### Dimensions

- 84 x 113 x 140 cm (W x D x H)

### Power

- 230-240 V +6% - 10% 50Hz 3~
- Line fuse max. 16A/phase
- 400 V +6% - 10% 50Hz 3~N
- Line fuse max. 16A/phase
- 208 V +6% - 10% 60Hz 3~
- Line fuse max. 20A/phase
- 240 V +6% - 10% 60Hz 3~
- Line fuse max. 20A/phase

### Environmental conditions

- Temperature: 15 ° - 30 °C
- Humidity: 15% - 75% RH
- Magnetic fields: less than 5 Gauss

### Environmental effects

- Noise level: max. 65 dB(A)

### Weight

- approx. 320 kg

## Safety standards

- EN 60950
- IEC 601-1-1: 1992
- UL 1950 2nd Edition 1993
- CSA C22.2 Nr. 0 and 950-M89/1989
- Laser safety      EN 60825  
                                  DHHS/FDA 21 CFR parts 1040.10 and 1040.11  
                                  ANSI Z 136-1980
- Approvals          TÜV – GS  
                                  UL + CUL





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