This operation guide is intended to compliment each "Operation Manual" of Sonialvision Safire II / Safire 17 and concisely describes its basic operations. Prior to using this guide, make sure to carefully read all "Operation Manual" booklets of Sonialvision Safire II / Safire 17 and fully understand them.

In case of Sonialvision Safire II,
- Digital Radiography System DAR-8000f Operation Manual (M517-E060)
- X-ray High Voltage Generator UD150B-40 Operation Manual (M501-E052)
- Remote-Controlled X-ray Diagnostic Table ZS-100I/IR Operation Manual (M506-E034)

In case of Sonialvision Safire 17,
- Digital Radiography System DAR-8000f Operation Manual (M517-E060)
- Remote-Controlled X-ray Diagnostic Table ZS-100I/IR Operation Manual (M506-E034)

### Notation

The following notation is used in this operation guide.

<table>
<thead>
<tr>
<th>Notation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>Denotes the contents of the operation</td>
</tr>
<tr>
<td>①, ②, ③ ...</td>
<td>Denotes the contents of the operation step by step</td>
</tr>
<tr>
<td>▶</td>
<td>Denotes the consequences of the operation</td>
</tr>
<tr>
<td>☢ Caution</td>
<td>Denotes a special notice of the operation</td>
</tr>
<tr>
<td>‼ Note</td>
<td>Denotes the information which helps operation</td>
</tr>
<tr>
<td>📌 Note</td>
<td>Denotes points and notices of the operation</td>
</tr>
</tbody>
</table>
1 System Overview

Configuration

- Control cabinet (Flat panel detector)
- Control cabinet (X-ray high voltage generator)
- Control cabinet (Diagnostic table)
- Subsystem control cabinet (Flat panel detector)
- Diagnostic table
- X-ray tube unit
- Automatic collimator
- FPD (Flat panel detector)
- Image monitor
- X-ray high voltage generator console
- Hand switch
- Mouse
- Keyboard
- Selector (attached mouse, monitor and keyboard)
- PCU (FPD control)
- Diagnostic table console
- Exposure switch
- Speaker unit
- Microphone
- Foot switch
- Control cabinet (Digital image processor)
### System Overview

- **R1 - R4** Selects the APR.
- **R1 - R4** Selects the APR.
- **Display panel**
- **Exposure indicator**
- **Exposure switch**
- **Oblique projection center switch**
- **Reverse the image vertically**
- **Reverse the image horizontally**
- **Stop switch**
- **L1 - L4** Selects the magnification size of FPD.
- **Table to the vertical position**
- **Table to the horizontal position**
- **SID selector switches**
- **F1 - F5** Sets up the Subdivisional Acquisition for SPOT radiography. Sets up the tomography parameter for tomography (Option).
- **Fluoroscopy selection switch**
- **Table/imaging unit control lever**
- **Adjusts the contrast of the image.**
- **Adjusts the brightness of image.**
- **Joystick**

#### Diagnostic table console

![Diagram of diagnostic table console with labeled controls]

- **Diag1**
- **Diag2**
- **Diag3**
- **Diag4**
- **Diag5**

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**Note:** The diagram includes various controls and switches, each identified with a label and a corresponding function description.
1 System Overview

X-ray high voltage generator console

- mA/mAs shuttle (Adjust in large increments)
- mA/mAs up/down button (Adjust in small increments)
- sec up/down button
- sec shuttle (Adjust in large increments)
- Focus button
- kV up/down button (Adjust in small increments)
- kV shuttle (Adjust in large increments)
- Power ON button
- Power OFF button
- Radiography program button
- Hand switch
- Touch panel
- Density up/down button
- X-ray radiography button
- Radiography preparation button
- Setup button

Digital image processor main screen

- Patient information
- Standard control panel
- Standard control panel/thumbnail display button
- Expanded control panel
1 System Overview

Start study P.13
Choose type of study P.15
Set Fluo/Rad condition P.16
Fluoroscopy/Radiography P.17
Print image P.20
Send by DICOM P.23
Close study P.24
Shut down system P.9

Operation flow chart

- Start up system P.8
- Calibrate FPD P.10
- Start study P.13
- Choose type of study P.15
- Set Fluo/Rad condition P.16
- Fluoroscopy/Radiography P.17
  * Repeat as required.
- Print image P.20
- Send by DICOM P.23
- Close study P.24
- Shut down system P.9
2 System startup and shutdown

1 Verify
- Image monitor of digital image processor and peripherals are turned OFF.

2 Press 🔐
- 🔐 will be illuminated after approx. 2 seconds.
- Image monitor, peripherals, and control cabinet are turned ON.

Digital image processor
- While the system is running the power up self-testing routine, a splash screen appears.
- Startup is completed when the following screen appears.

Stand-by indicator

Initializing ....

Main image area
### Shutdown

#### 1. Close active study

1. Click on the Standard control panel.  
   - A confirmation dialog appears.
2. Click [OK].  
   - The study is closed.

#### 2. Close the application program

1. Click on the Standard control panel.  
   - A confirmation dialog appears.
2. Click [Yes].  
   - The system will be automatically shut down and the control cabinet will be turned OFF.

#### 3. Turn OFF the X-ray high voltage generator

Press OFF.  
- ON lamp is turned off, and then OFF lamp is turned ON.

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**Caution**

After pressing the OFF button on the X-ray high voltage generator console, do not press the ON button for at least 10 seconds. If you do, the system may not operate properly.
FPD calibration

This operation maintains the quality of fluoroscopy/radiography images. Be sure to perform the FPD calibration once a day after system startup. Verify that no substance is located on the diagnostic table during FPD calibration. Approx. 15 minutes is required to complete the FPD calibration.

Auto FPD calibration on system startup

Perform when the system starts up.

1. Start up the system
   - After system startup, an FPD calibration dialog appears.

2. Press and hold the [SET] on the diagnostic table console
   - The diagnostic table moves to calibration position.
   - It sounds beep when the diagnostic table arrives in calibration position.
   - An FPD Calibration start dialog appears.
3 Click [Start]
- An FPD Calibration starts.
- [Close] button appears when FPD calibration is complete.

4 Click [Close]

⚠️ Caution
Make sure there are no personnel in the study room before performing FPD calibration procedure as the diagnostic table exposes X-ray during the procedure.
FPD Calibration from Right-click menu

Perform while the system is running.
Perform FPD calibration after the study is finished because the operation cannot be performed during study.

1 Right-click on the main image area
   ► The right-click menu appears.

   Select Patient...
   Configure
   Display Operation Manual
   Print Select
   Print Start
   FPD Calibration...

2 Select [FPD Calibration]
   ► The FPD Calibration dialog appears.
   ► The following procedures are same as auto FPD calibration in system startup steps.
3 Enter study

Defining usual study

Enter the patient information to start study.

1 Open Patient List window

① Click on the Standard control panel.

► A Patient List window appears.

② Click [New].

► A Patient Information window appears.

2 Enter patient information

● Patient Name
● Patient ID
● Patient DOB ...

.Fields indicated by an asterisk (*) are required.

3 Click [Open]

► The Patient Information window is closed, and then the study starts.

► A patient’s information appears on the upper left corner of main image area.
Defining patient information in an emergency

The system automatically sets a tentative data such as a patient’s name and patient ID when the time is pressing or the patient’s information is unknown during emergency medical service.

1. Open Patient List window
   ① Click on the Standard control panel.
      - A Patient List window appears.
   ② Click [Emergency].
      - The Patient List window is closed, and then the study starts.

      - The patient’s information appears on upper left of the main image area.

      - The following patient information is automatically defined.

      - Patient Name (Last Name): ELNMyyyymmdd
        - Current year/month/date is set.

      - Patient Name (First Name): EFNMhhmmss
        - Current hour/minute/second is set.

      - Patient ID: EPIDyyymmd-hhmmss
        - Current year/month/date-hour/minute/second is set.

      - Sex: OTHER

      - The tentative data must be corrected after the study.
Choosing types of study

1. **Choose [Cell Title] according to types of study**
   - The top 4 APRs according to type of study appear.

   ![Diagnostic table console display panel](image)
   - The top 4 APRs registered by digital image processor appear.
## Setting radiography condition

### 1 Select APR

**Diagnostic table console**
- Press any key of R1 - R4 on the console to select APR.

**Digital image processor**
- The APRs selected on the diagnostic table console appear on the Standard control panel.

**X-ray high voltage generator console**
- The radiography program associated with APR is displayed.

### 2 Select the magnification size

Press any key of L1 - L4 on the console to select FPD magnification size.
Radiography

Set the radiography condition prior to radiography as necessary.

SPOT radiography/SERIAL radiography

1 Verify
- Patient information
- Types of study (APR cell title and radiography item)

2 Select
① Select APR for SPOT or SERIAL radiography.

SPOT radiography
② Select Subdivisional Acquisition format from [F1] - [F4].
   - The selected Subdivisional Acquisition format is displayed inverted.

Fluoroscopy
① Verify that the fluoroscopy selection switch illuminates.
   - The X-ray is not exposed when the fluoroscopy selection switch is not illuminated even if the foot switch is pressed. Press the fluoroscopy selection switch to light.

② Press down the foot switch.
   - The exposure indicator illuminates.
   - The fluoroscopy image appears on the main image area of digital image processor.

Note
Confirm the [IBS] and [Pulse Fluoroscopy] are selected on touch panel of X-ray high voltage generator console ([IBS] lights up when ON).

4 Expose
Press exposure switch.

SERIAL radiography
- X-ray exposure terminates after images are acquired within preset time.
- Acquired images are serially displayed (Auto Replay: ON) or the last image appears (Auto Replay: OFF) after exposure.
- Releasing the exposure switch stops the image acquisition during exposure.
DSA radiography (Option)

1 Verify
- Patient information
- Type of study
  (APR cell title and radiography item)

2 Select
Select APR for DSA radiography.

3 Fluoroscopy
1. Confirm that the fluoroscopy selection switch 🍎 illuminates.
   - The X-ray is not exposed when the fluoroscopy selection switch 🍎 is not illuminated even if the foot switch is pressed. Press the fluoroscopy selection switch 🍎 to light.
2. Press down the foot switch.
   - The exposure indicator 🌇 illuminates.
   - The fluoroscopy image appears on the main image area of digital image processor.

4 Prepare injector

5 Expose
Press and hold down the hand switch.
- Mask images followed by live images are acquired (automatically).
- The DSA image appears on the main image area of digital image processor.
- X-ray exposure terminates after images are acquired within preset time.
  - Releasing the exposure switch stops the image acquisition during exposure.
Digital tomography (Option)

1 Verify
- Patient information
- Types of study
- SID1100 must be selected.

2 Select
Select APR for tomography.

3 Set up parameters
① To select a parameter, press [F2: Select].
② To change the value, press [F3: Value] or [F4: Value].
- The exposure time is automatically determined when the diagnostic table moves to the starting point of tomography.

4 Move diagnostic table to starting point
Press [F5: SET] until the key is highlighted.
- Press [F1: Cancel] for canceling the exposure operation.

5 Exposure
Press and hold down the hand switch.
- The tomography image appears on the main image area after each exposure.
- Hold down the hand switch until the table stops.
- When the hand switch is released during the process, the images for which the exposures have been completed are stored on the hard disk.

Returning angle of X-ray tube unit
Press the oblique projection center switch.
5 Process Images

Printing images

Do one of the following to print images.

- Click [Print Image] : Confirm the actual image displayed on the main image area and print the image.
- Select from right-click menu: Confirm the actual image on the main image area and select/deselect to print the image.
- Select from Patient List: Entire patient file or specific study can be printed.

1. Click 

   A mark "S" appears in the lower right corner on the main image area.
   The images will be printed when the number of frames reaches the quantity of film format (up to 12 frames).

2. Click

   The Print Layout menu appears.

3. Select [Eject Film]

   The images will be printed.

### Note

Printed images are saved in the "Print ShotSave" folder.
Print from Right-click menu

1 Right-click on the main image area
   - The Right-click menu appears.

2 Select [Print Select]
   - A mark "H" appears in the lower right corner of the main image area.
   - The mark "H" appears when the image to be printed is selected.
   - To delete the mark "H", select [Print Select] from Right-click menu again.

3 Select [Print Start]
   - The image will be printed.
Print from Patient List

1. Click [ ] on the Standard control panel
   ▶ The Patient List window appears.

2. Select patient file or study
   ▶ Either the patient file or specific study can be selected from Patient List window.

3. Click either [Print Patient] [ ] or [Print Study] [ ]
   ▶ The Configure Print Settings dialog appears.
   ▶ Clicking [Print Patient] [ ], all images in the selected patient file are printed.
   ▶ Clicking [Print Study] [ ], all images in the selected study are printed.

4. Change or set the configurations

5. Click [OK]
   ▶ All images are printed.
Sending by DICOM function

The images including study can be sent to CD-R or DICOM network (Option) in DICOM format in the following ways.

**CD-R**
- Export to DICOM CD from Patient List

**DICOM network (Option)**
- Manual DICOM Send
- Auto DICOM Send
- DICOM Send from Patient List
- DICOM Send from Thumbnail

This clause describes only Manual DICOM Send. For more DICOM exporting, refer to "DAR-8000f Operation Manual".

**Manual DICOM Send (Option)**

For manual DICOM send, open the patient file including image and allow that image to be displayed on the main image area.

1. **Click [ ] on the Standard control panel**
   - The DICOM menu appears.

2. **Choose [Send Study] or [Send ShotSave]**
   - Clicking [Send Study] sends the entire image in selected study.
   - Clicking [Send ShotSave] sends images in ShotSave folder.
   - The Archive Destinations dialog appears.

3. **Select the destinations**

4. **Click [OK]**
   - The Archive Destinations dialog is closed and a confirmation window appears.

5. **Click [OK]**
   - The image or patient files are sent.
   - The patient file is closed.
6 Close Study

Closing active study

1 Click \[ \text{on the Standard control panel} \]
   ► A confirmation dialog appears.

2 Click [OK]
   ► The patient file is closed.
Emergency stop the diagnostic table operation
Press the stop switch on either the diagnostic table console or diagnostic table.

- Diagnostic table console
- Diagnostic table

Recovery from emergency stop
To recover from emergency stop, be sure to turn the stop switch clockwise.

Caution
Ensure to pause 10 seconds or more between halt and recovery.
Error messages

• X-ray high voltage generator console
When the system detects a fault, an error message appears on X-ray high voltage generator console.
Touch the key to close the message screen, and then take action described below for the error message.

![Error Message](image)

Messages related to the X-ray high voltage generator

(fault indicator) on the console illuminates and one of the following error messages appears.
The system cannot expose while these messages are displayed.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio Over Current</td>
<td>Radiography tube current exceeded set value + 200 mA.</td>
<td>If this message appears repeatedly, contact Shimadzu service representative.</td>
</tr>
<tr>
<td>Measured kV OVER</td>
<td>Measured tube voltage exceeded permitted range.</td>
<td></td>
</tr>
<tr>
<td>Starter ERR</td>
<td>Starter is in abnormal situation or condition.</td>
<td></td>
</tr>
<tr>
<td>Starter is not working</td>
<td>Starter is not working when fluoroscopy.</td>
<td></td>
</tr>
<tr>
<td>I.F. OVER</td>
<td>Abnormal filament heating current.</td>
<td></td>
</tr>
<tr>
<td>Line Voltage OVER</td>
<td>Supply voltage exceeded permitted range.</td>
<td></td>
</tr>
<tr>
<td>Charge Volt ERR</td>
<td>Abnormal charging voltage of primary smoothing capacitor.</td>
<td>Contact Shimadzu service representative.</td>
</tr>
<tr>
<td>Power Down</td>
<td>Abnormal control circuit supply voltage.</td>
<td></td>
</tr>
<tr>
<td>H. V. T Not Connected</td>
<td>Abnormal connection to high-voltage transformer.</td>
<td></td>
</tr>
<tr>
<td>Arcing Trouble</td>
<td>Repeated arcing occurred.</td>
<td></td>
</tr>
</tbody>
</table>
### Messages related to the radiography conditions

⚠️ (caution indicator) on the console illuminates and one of the following error messages appears. The system cannot expose while these messages are displayed.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>mAs OVER</td>
<td>mAs value exceeded set value by 800 mAs.</td>
<td>Change the set value.</td>
</tr>
<tr>
<td>mAs too small</td>
<td>mAs value was less than 0.5 mAs. Or, tube current was below minimum value for mAs setting method.</td>
<td>Increase radiography tube voltage or reduce radiography tube current.</td>
</tr>
<tr>
<td>Emission OVER</td>
<td>Emission characteristics out of range.</td>
<td>Decrease radiography tube voltage or radiography tube current.</td>
</tr>
<tr>
<td>Generator Load OVER</td>
<td>Equipment ratings exceeded.</td>
<td></td>
</tr>
<tr>
<td>mAs/Time OVER</td>
<td>mAs value too large and radiography time exceeded 10 sec. Or, radiography time exceeded permitted range.</td>
<td>Reduce the set value of mAs or sec.</td>
</tr>
<tr>
<td>2 control range OVER</td>
<td>Setting out of range for mAs setting method.</td>
<td>Reduce the set value.</td>
</tr>
</tbody>
</table>

### Messages related to the radiography conditions

One of the following error messages appears. The system cannot expose while these messages are displayed.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>HU OVER Predicted</td>
<td>Value predicted to go out of range if the heat units increase from the current heat unit value according to the set radiography.</td>
<td>Change the radiography conditions or cease operation until heat unit value reduces.</td>
</tr>
<tr>
<td>HU Full Stored</td>
<td>Heat units reached the permitted limit.</td>
<td>Cease operation until heat unit value reduces.</td>
</tr>
<tr>
<td>Thermal OVER</td>
<td>X-ray tube unit temperature exceeded the permitted limit.</td>
<td></td>
</tr>
</tbody>
</table>
### Error messages at power ON

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel Battery WARNING</td>
<td>The data recording battery in the operation panel must be replaced soon.</td>
<td>Contact Shimadzu service representative.</td>
</tr>
<tr>
<td>Cabinet Battery WARNING</td>
<td>The data recording battery in the control cabinet must be replaced soon.</td>
<td></td>
</tr>
<tr>
<td>Panel Battery EMPTY</td>
<td>The data recording battery in the operation panel is empty.</td>
<td></td>
</tr>
<tr>
<td>Cabinet Battery EMPTY</td>
<td>The data recording battery in the control cabinet is empty.</td>
<td></td>
</tr>
<tr>
<td>X-ray switch ERR</td>
<td>The radiography button remains ON.</td>
<td></td>
</tr>
<tr>
<td>Fluo switch ERR</td>
<td>The fluoro foot switch remains ON.</td>
<td></td>
</tr>
</tbody>
</table>

#### Messages related to Communication (Option)

⚠️ (caution indicator) on the console illuminates and one of the following error messages appears.
The system cannot expose while these messages are displayed.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication ERR</td>
<td>Received radiographic conditions cannot be set for the equipment.</td>
<td>Change the setting at the external instrument.</td>
</tr>
</tbody>
</table>

#### Other messages

⚠️ (caution indicator) on the console illuminates and one of the following error messages appears.
The system cannot expose while these messages are displayed.

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door/Interlock</td>
<td>The examination room door is open.</td>
<td>Close the door.</td>
</tr>
<tr>
<td>AEC OVER</td>
<td>AEC failed and AEC backup was used during AEC radiography.</td>
<td>Increase radiography tube voltage or extend the radiography time.</td>
</tr>
<tr>
<td>The fluoroscopy table is not prepared</td>
<td>The fluoroscopy table is not prepared due to incorrect position of X-ray tube.</td>
<td>Confirm the diagnostic table configuration.</td>
</tr>
</tbody>
</table>
### Diagnostic table console

<table>
<thead>
<tr>
<th>Message</th>
<th>Meaning</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position Detect Error</td>
<td>Position detect error in operating parts</td>
<td>Reset by pushing STOP switch, or re-startup the system. If the system is not restored, contact Shimadzu service representative.</td>
</tr>
<tr>
<td>Error XXX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position Error XXX</td>
<td>Potentiometer break detect</td>
<td></td>
</tr>
<tr>
<td>Motor Error XXX</td>
<td>Motor error</td>
<td></td>
</tr>
</tbody>
</table>
Actions after power failure

In case of power failure due to lightning, UPS (Uninterruptible Power Supply) contained in control cabinet detects the power failure, and then automatically shuts down the FPD (PCU). Without automatic startup for FPD (PCU) after power failure recovery (backup by UPS), perform manual startup.

1 Turn ON the system
   ⇢ "Startup" P.8

2 Turn ON the power switch of PCU
   ▶ Application software "Xcat" for FPD control starts up automatically.
   ▶ Approx. 5 minutes is required to complete the startup.

3 Shut down the system
   Turn ON the system again

4 Verify the FPD power control condition
   Click [Tool], and then click [Power…].
   ▶ A HV Power Control dialog appears.
   • Verify that the check boxes of [Synchronize with the host system] and [Enable timer control] are filled.

Note
Battery backup time by UPS is approx. 3 minutes. It sounds beep from control cabinet while the power is being backed up by UPS. If the power fails because backup time for UPS expires, call a Shimadzu service representative.