SHIMADZU

M517-E139A

Digital Angiography System

BRANSIST safire

DIGITEX safire SP

[VF17/VC17]

OPERATION GUIDE

General Description of Digital Angiography System BRANSIST safire / DIGITEX safireSP

BRANSIST safire/DIGITEX safire SP is the digital angiography system with direct conversion FPD (Flat Panel Detector).
BRANSIST safire/DIGITEX safire SP, a combination of high quality digital imaging with low dose exposures, provides fast and efficient operation for IVR and diagnostic studies.

This Operation Guide describes the basic operation of BRANSIST safire/DIGITEX safire SP briefly.

For detailed information, refer to the following "Operation Manuals".

DAR-9400f Operation Manual (M517-E063)

SYSTEM DISPLAY Operation Manual (M501-E068)

MH-200S Operation Manual (M523-E016)

MH-300 Operation Manual (M523-E014)

Please read and observe all safety precautions.

Symbols

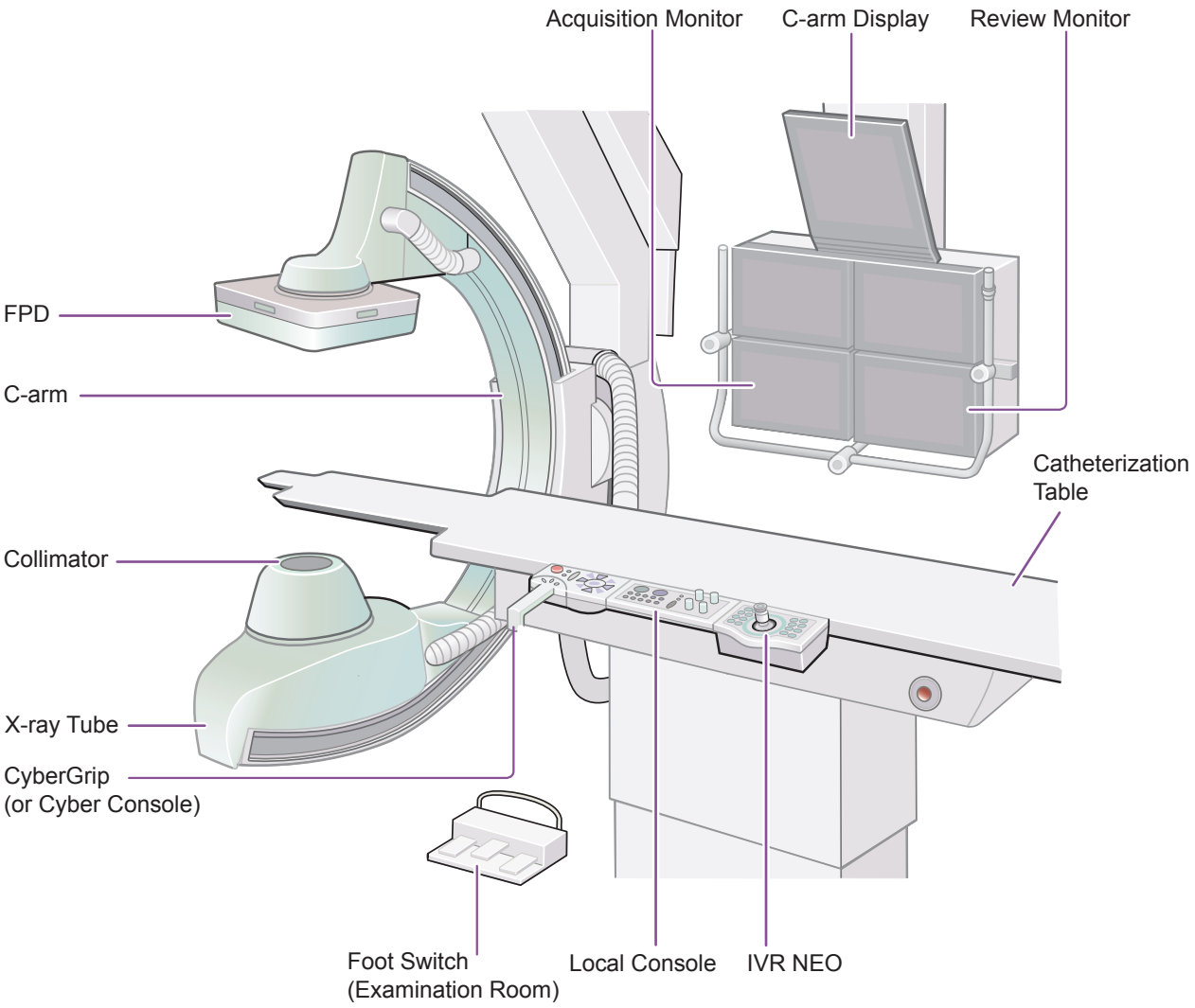
The following symbols are used in this Operation Guide.

Symbols	Meaning
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or possibly death.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury or equipment damage.
NOTE	Emphasizes additional information that is provided to ensure the proper use of this product.
1, 2, 3, ···	Indicates the operation in order.
1, 2, 3, ···	Indicates further details of above operation.
•	Indicates the operating description and items.
►	Indicates the result of operation.
☞	Describes the points, notices and references of operation.

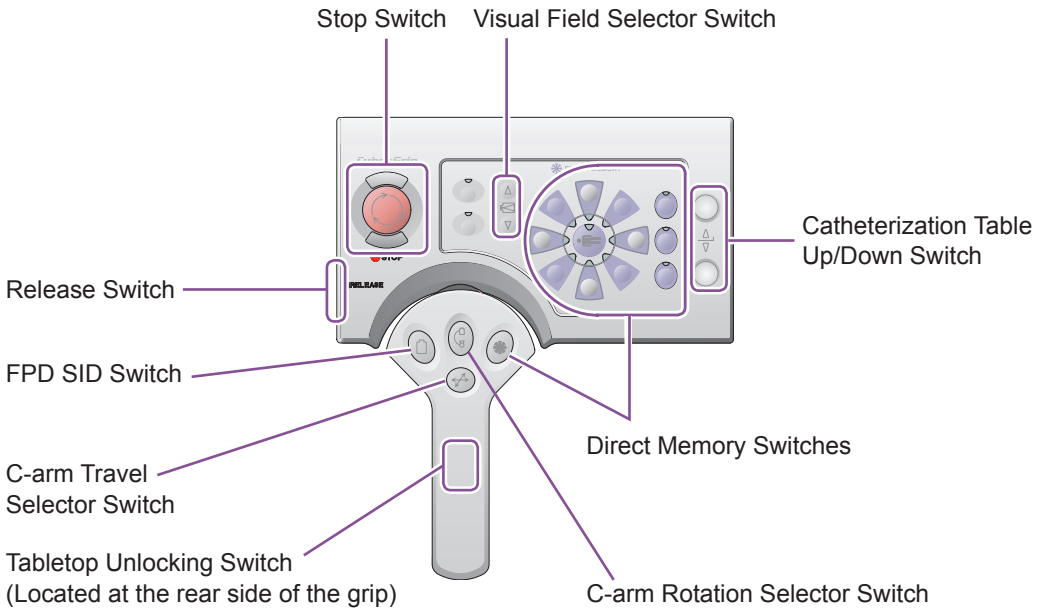
Contents

1 System Components

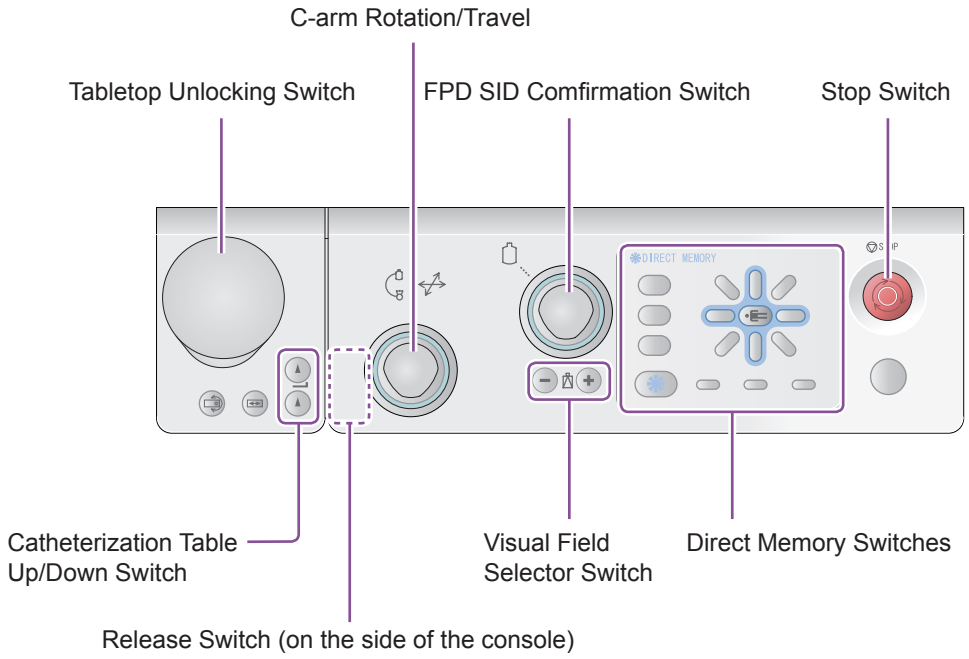
Examination Room



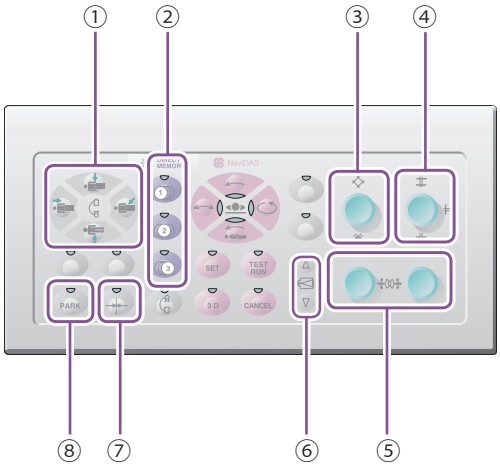
CyberGrip



Cyber Console

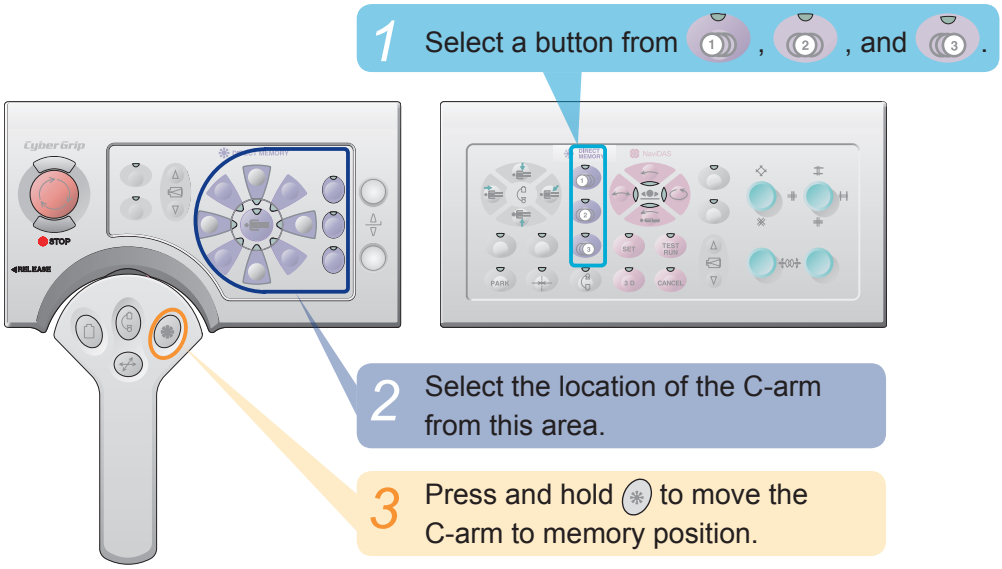


Local Console

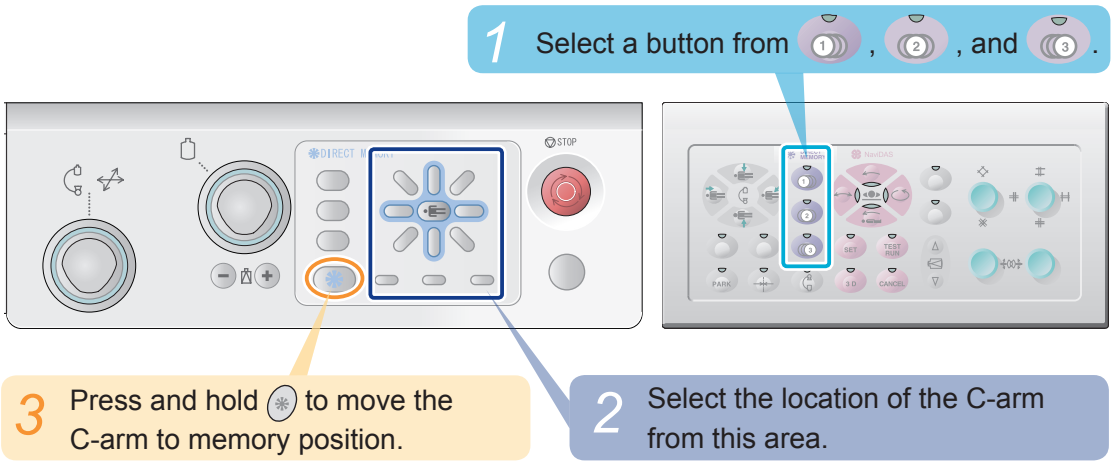


No.	Name or Explanation
①	C-arm Working Positions Switch
②	Direct Memory Switches
③	Operate the C-leaf of the Collimator by moving up and down.
④	Operates the H/V Collimation. The Collimator opens up when this is pressed down.
⑤	Operates the Compensation Filter in the Collimator.
⑥	Visual Field Selector Switch
⑦	Center Reset Switch
⑧	C-arm Parking Switch

∗ How to use Direct Memory Function (CyberGrip)

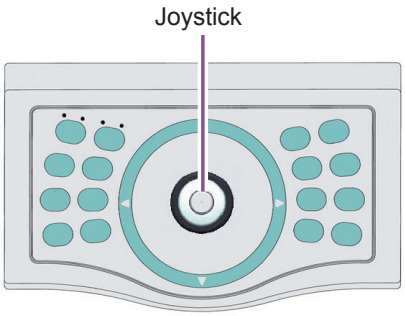


∗ How to use Direct Memory Function (Cyber Console)



IVR NEO

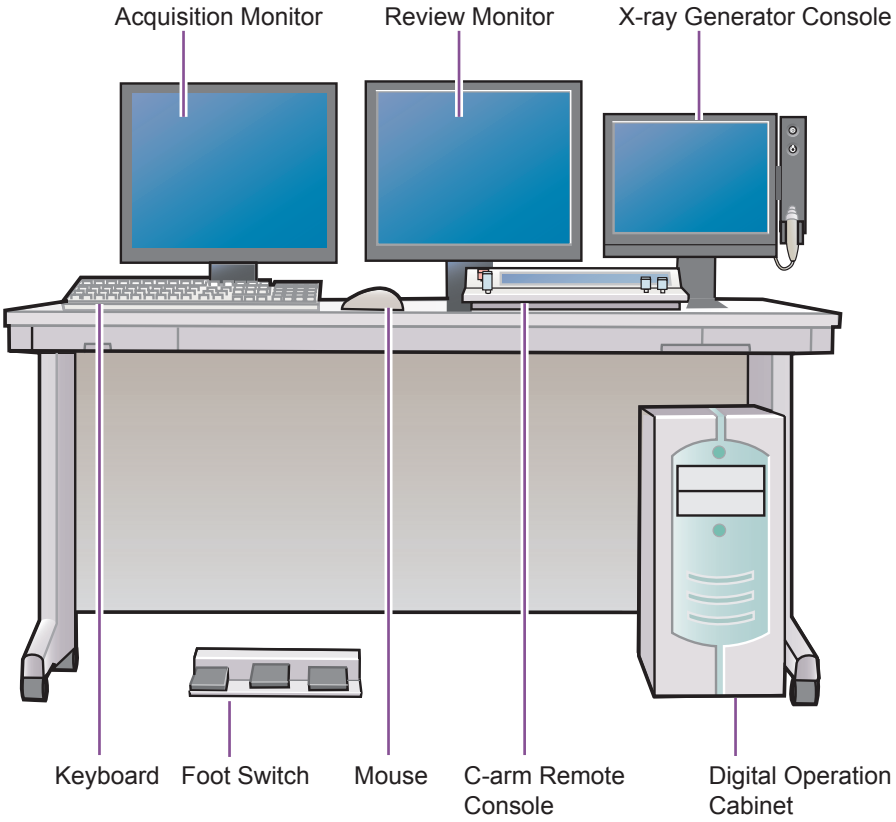
The IVR NEO features 16 buttons with LED indicators and a multi-function Joystick with button.



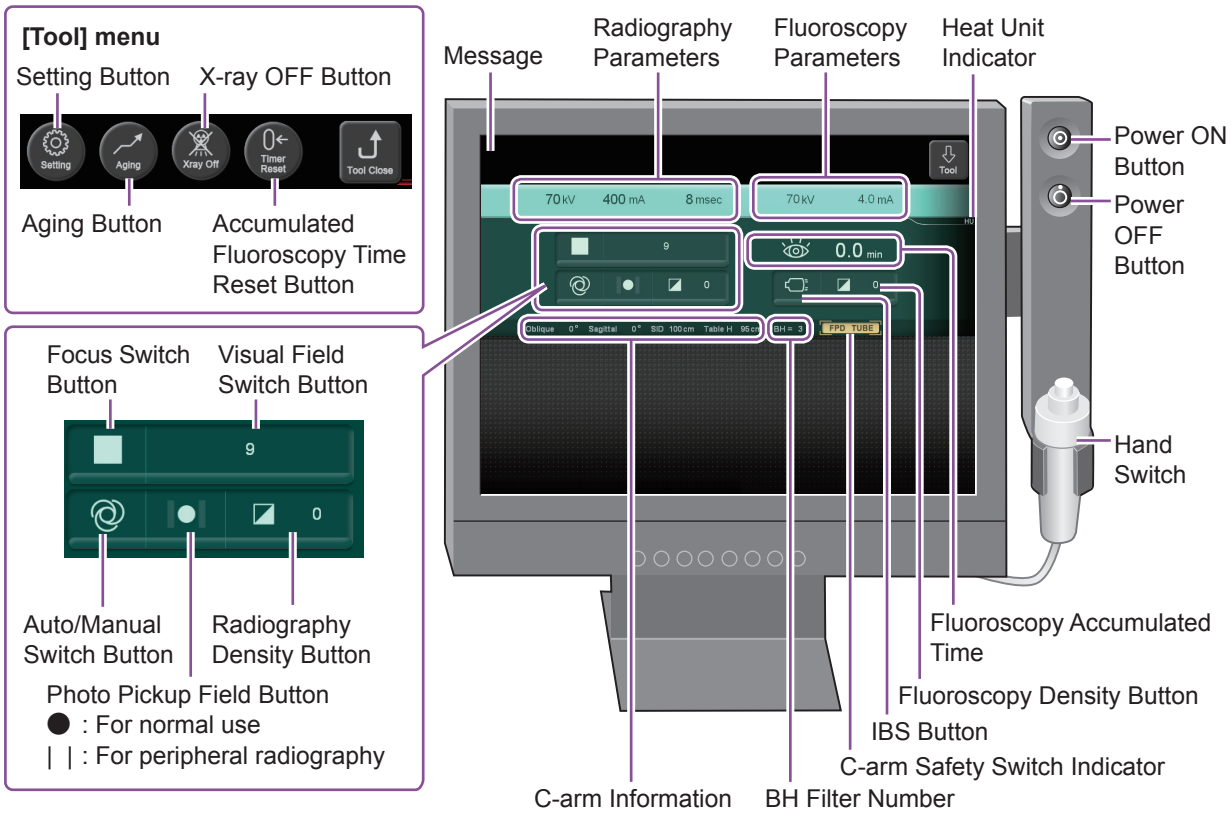
Category	Button	LED Meaning	A	R
Acquisition	Select Fluoro Program	ON=Fluoro menu displayed.		○
	Select Rad Program	ON=Rad menu displayed.		○
	Select Image Comment	ON=Comment menu displayed.		○
	Add Reference Image	ON=can add Reference Image.	○	○
	Fluoro Record (Last N Seconds mode)	ON=can record the latest fluoro loop (unavailable for Direct Fluoro Record mode ☞ "Recording Fluoroscopy Image" P.27)	○	○
	Start/Stop/Close Timer	ON=timer displayed on Acq. monitor.	○	
Image display	Monitor Select	ON=Acquisition monitor selected.	○	
	Single/Split Display	ON=Review monitor split vertically.		○
	Left/Right Focus	ON=right half of split Review monitor selected.		○
	Reference Mode	ON=Reference Mode.	○	○
	Cine Area Zoom	ON=Zoom the images only in the Examination room.	○	○
Other	Save Still Image	ON=can save still image (must be paused).		○
	16-up Selector	ON=Review monitor in 16-image select mode.		○
	LIVE	ON=display DSA LIVE image.		○
Linkage with C-arm	Positioning	ON=send projection angle of currently displayed image to the C-arm.		○
	Image Filter	ON=filter and display the projection angle of image as current C-arm angle.		○

A= Relevant to Acquisition monitor R= Relevant to Review monitor

Control Room

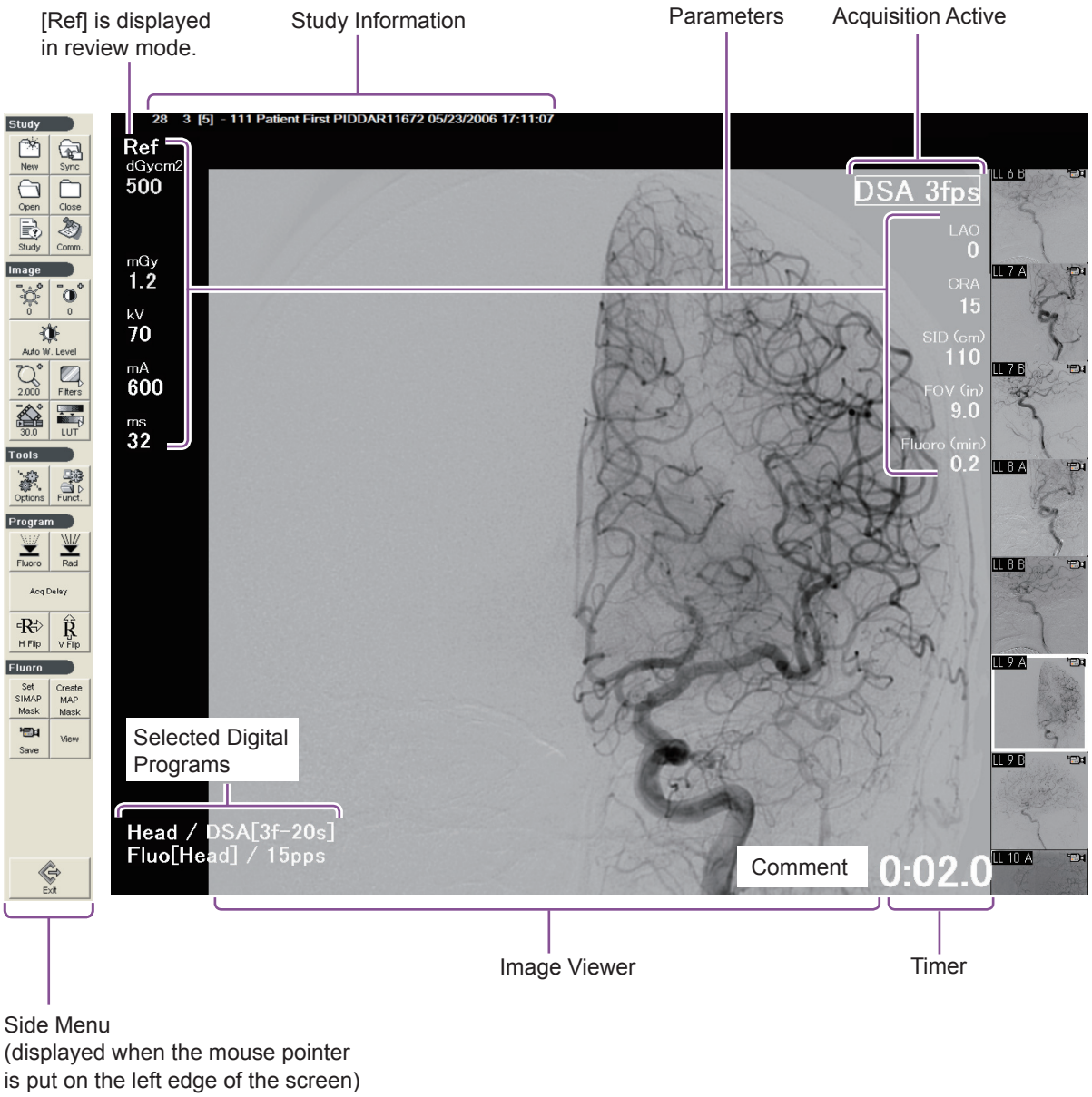


X-ray Generator Console

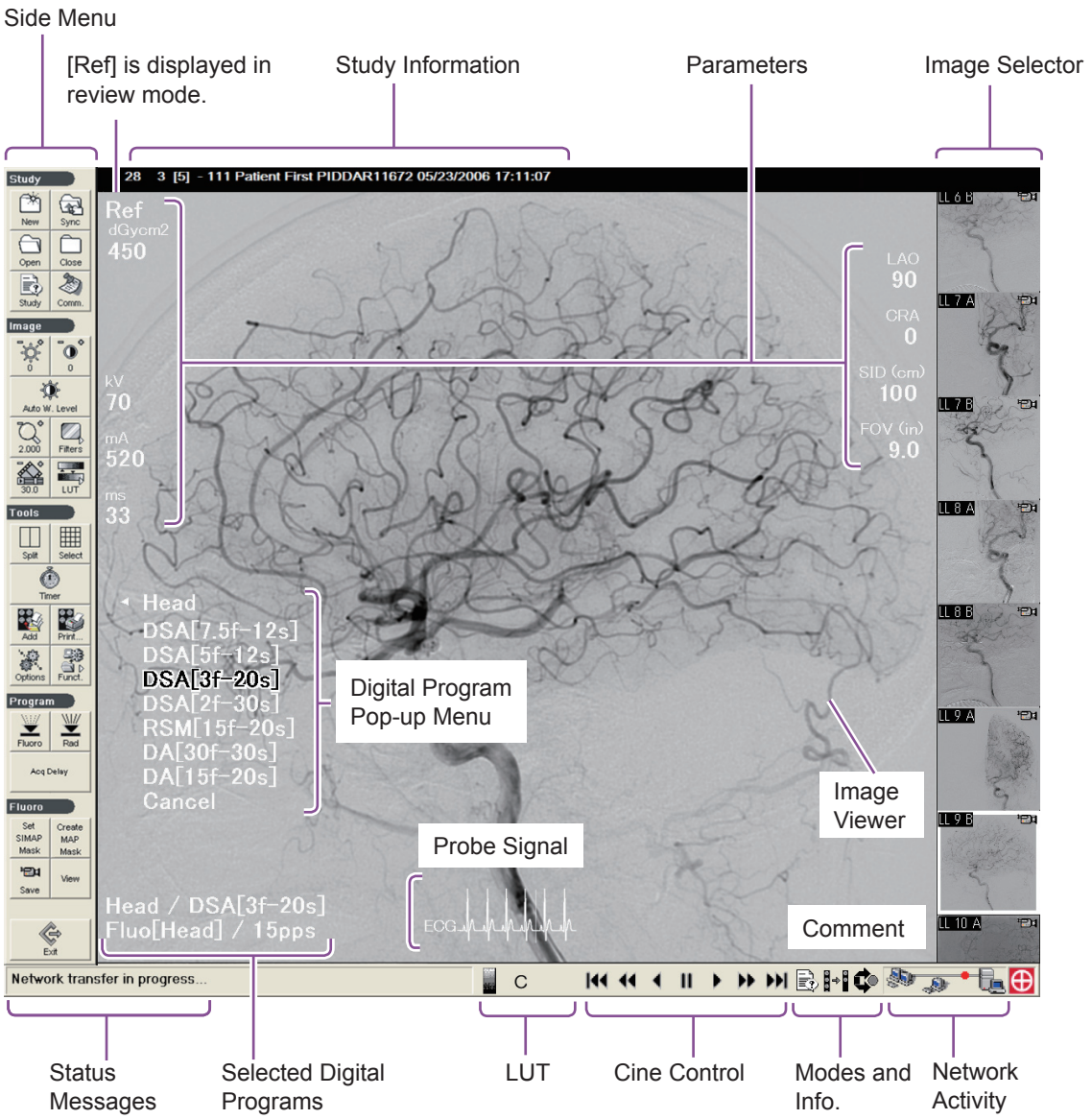


Main Window

Acquisition Monitor



Review Monitor



2 System Startup and Shutdown

Startup

NOTE

Be sure to perform daily inspection before patient use.

☞ "Daily Inspection" P.18

Circuit Breaker

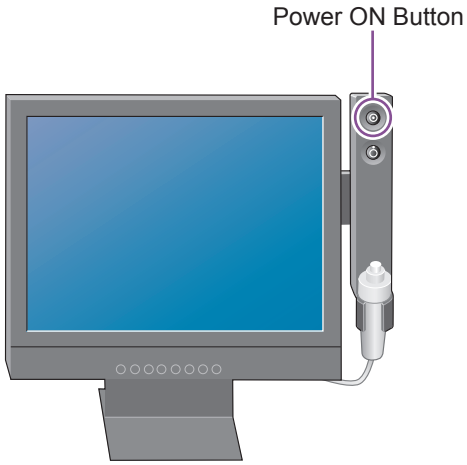
1 Turn on the X-ray high voltage generator circuit breaker

- Make sure that power OFF button of the X-ray generator console is lit.
- Ensure FPD, Digital Radiography System and X-ray tube power supply are always on.

X-ray Generator Console

2 Wait a minimum of 10 seconds after turning on the breaker, and then press ⏻ (ON)

► Starting up whole system.



X-ray Tube Aging

CAUTION

Be careful!

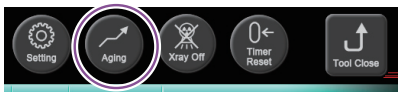
During aging, X-ray exposure is performed automatically without operating hand switch or foot switch.

NOTE

The aging procedure can be performed when C-arm is at the park position even though the "fluoroscopy at park position" setting is set to OFF. In this setting X-ray exposure by the foot switches and the hand switch is not available.

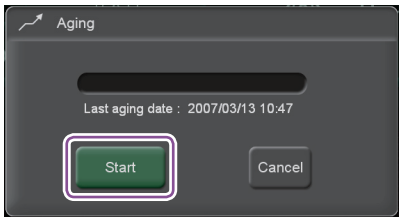
X-ray Generator Console

1 Press Aging on the [Tool] menu



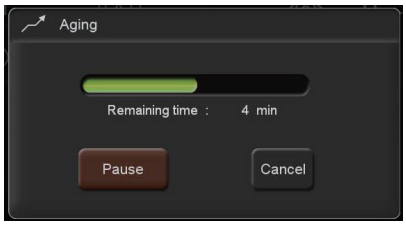
► Aging window is displayed.

2 Press Start

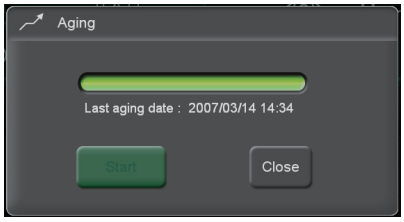


► Aging procedure is started.

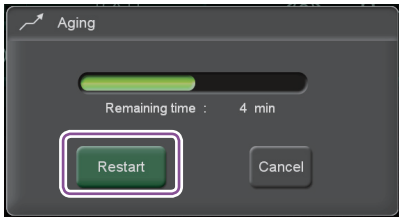
► The progress of aging is displayed.



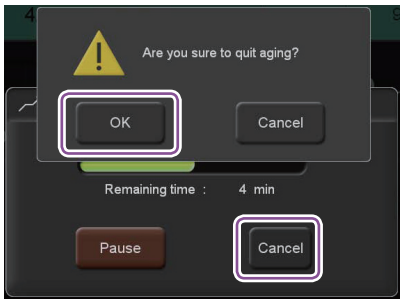
► When aging is complete, the progress bar displays full.



• Press Pause to pause aging.
Press Restart to resume.



• Press Cancel to cancel aging, and press OK to confirm.



FPD Calibration

⚠ CAUTION

Before calibrating FPD, make sure Xray Off (X-ray OFF) on the X-ray generator console is disabled.

1 Remove any object from FPD field of view

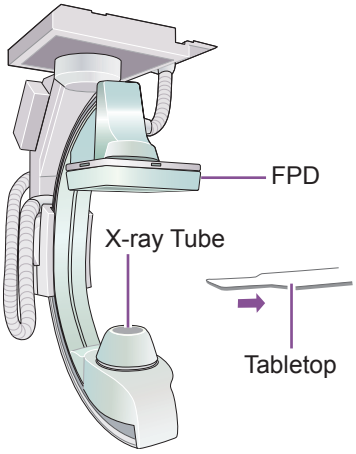
1 Make sure that [PARK] button on the local console is lit.

If [PARK] button is not lit, press until it is to park the C-arm.

2 Move the Compensation Filters to the outside.

► The Compensation Filters move away from the field of view.

3 Move the tabletop out of the FPD field of view.



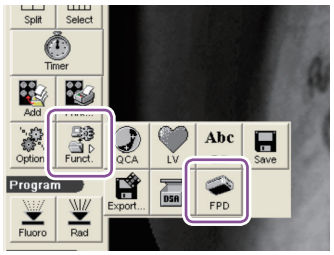
NOTE

Calibration data cannot be accurately acquired if there is any object between the X-ray Tube and FPD.

Perform fluoroscopy (☞ P.20) to confirm there is no object bettween the X-ray Tube and FPD.

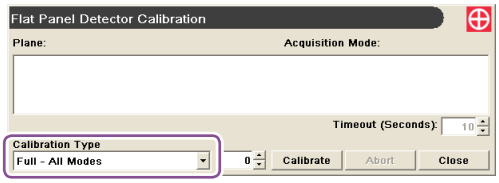
2 Select Funct. and click FPD on the side menu

► FPD calibration window appears.



3 Confirm the calibration type

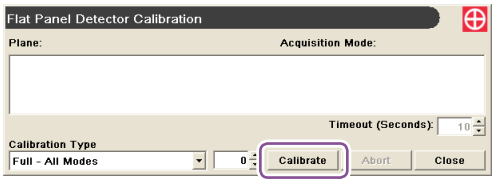
Confirm that [Full-All Modes] is selected.



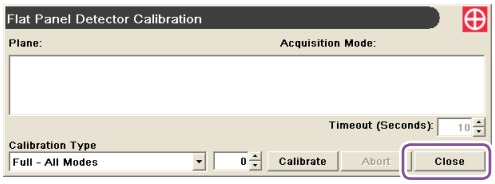
4 Click Calibrate

► Progress messages are displayed during calibration.

► Completion message is displayed when calibration is completed.



5 Click Close



CAUTION

Be careful!
X-ray exposure is automatic during calibration.

NOTE

Click Abort if you terminate the calibration before completing.
If you terminate the calibration, be sure to calibrate again before acquisition.

NOTE

To acquire accurate calibration data, do not depress either the fluoroscopy or radiography switches during calibration.

Shutdown

C-arm

1 Set the C-arm to the center position

Press and hold the Center Reset Switch until travel is completed.

2 Move the C-arm to the park position

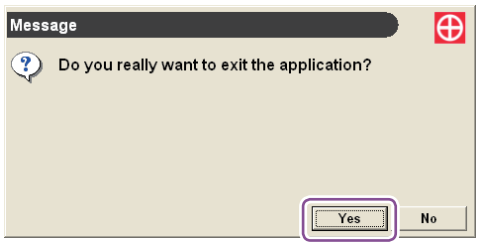
Press and hold the C-arm Parking Switch until travel is completed.

Digital Radiography System

3 Click Exit

► A confirmation message is displayed.

4 Confirm the message by clicking Yes



X-ray Generator Console

5 Press (OFF)

Make sure the OFF button is lit.

Circuit Breaker

6 Turn off the X-ray high voltage generator circuit breaker

- Wait at least 20 seconds after turning off the X-ray high voltage generator, then turn off the circuit breaker.
- Do not turn off power for the FPD, digital radiography system or X-ray tube.

Daily Inspection

Check the following items before using the system.

1 Before turning on the power switch. Ensure there is:

- No damage on the exterior.
- No Condensation or Water on the system.
- No twisting of the cables.

2 After turning on the power switch. Ensure there are:

- No abnormal sounds.
- No abnormal smells.
- No error messages on X-ray generator console, Acquisition monitor or Review monitor.

3 Check the operation of the C-arm and Catheterization Table.

Confirm that each operation functions correctly and there are no abnormal sounds.

- LAO-RAO / CAUD-CRAN operation of the C-arm.
- Change the position of the C-arm and move the FPD forward/backward.
- Up-and-down operation of Catheterization Table and Tabletop Lock Switches.

4 Check the Safety Switch operation.

- Actuation of the Safety Switch of the Collimator and FPD.
- Operation of Stop Switches.

5 Confirm the Image Field Size Selector.

- While performing fluoroscopy, change and confirm the field of view size of the FPD.

6 Confirm the operation of the Collimator.

- Check to be sure that the shutter of the Collimator is moving relative to the FPD field of view change.

7 Check to be sure that images are displayed.

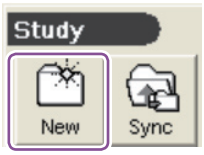
- Make sure that fluoroscopy/radiography images are displayed on monitors properly.

3 Start Study

Input Patient Information

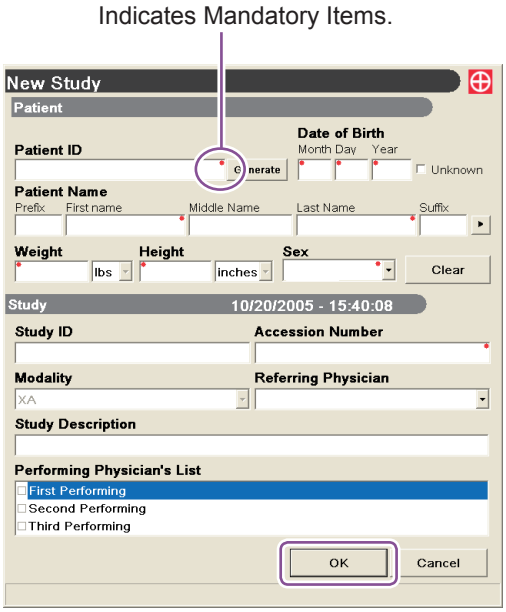
1 Click New from [Study] menu

► [New Study] window is displayed.



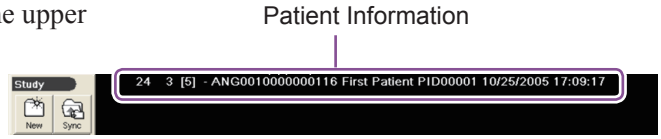
2 Input each items

Be sure to input the items with a dot.



3 Click OK

► Patient information will appear on the upper area of the main window.



4 Fluoroscopy/Radiography

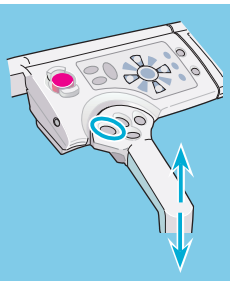
Operation of C-arm

CyberGrip

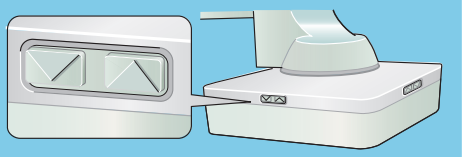
1 Backward/Forward Movement of FPD

Move the CyberGrip in the up and down direction while pressing .

► FPD moves according to the direction of the grip.



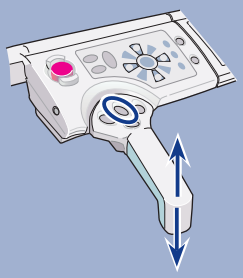
FPD movement is also operated with the switches on the side of FPD.



2 Rotation of C-arm (RAO/LAO)

Move the grip in the up/down direction while pressing .

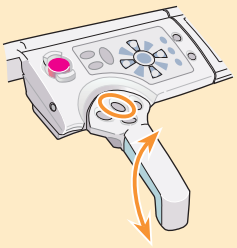
► C-arm rotates according to the direction of the grip.

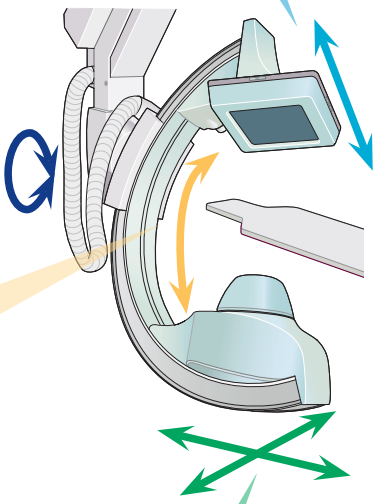


3 Rotation of C-arm (CRAN/CAUD)

Twist the grip in the left/right direction while pressing .

► C-arm rotates according to the direction of the grip.

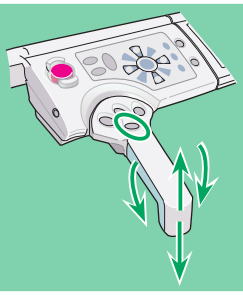




4 C-arm Travel

Move the grip in the up/down direction or twist it in the left/right direction while pressing .

► C-arm moves according to the direction of the grip.



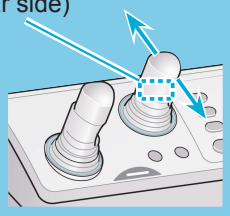
Cyber Console

1 Backward/Forward Movement of FPD

Move the FPD SID lever forward/backward while pressing confirmation switch.

► FPD moves according to the direction of the lever.

FPD SID Comfirmation Switch
(on the far side)

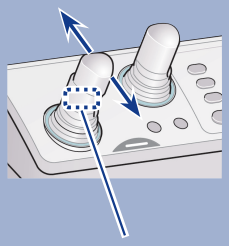


FPD movement is also operated with the switches on the side of FPD.

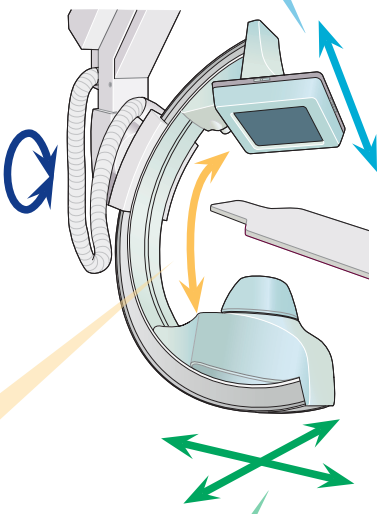
2 Rotation of C-arm (RAO/LAO)

Move the C-arm rotation/travel lever forward/backward while pressing C-arm rotation selector switch.

► C-arm rotates according to the direction of the lever.



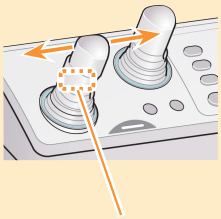
C-arm Rotation Selector Switch
(lower on the far side)



3 Rotation of C-arm (CRAN/CAUD)

Move the C-arm rotation/travel lever in the left/right direction while pressing C-arm rotation selector switch.

► C-arm rotates according to the direction of the lever.

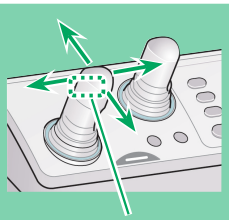


C-arm Rotation Selector Switch
(lower on the far side)

4 C-arm Travel

Move the C-arm rotation/travel lever forward/backward or in the left/right direction while pressing C-arm travel selector switch.

► C-arm moves according to the direction of the lever.



C-arm Travel Selector Switch
(upper on the far side)

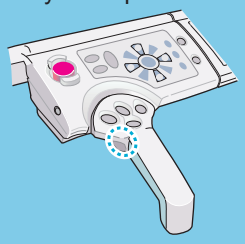
Operation of Catheterization Table

Horizontal movement or raising/lowering of catheterization table.

1 Horizontal Movement of Catheterization Table

Move the table manually while pressing the unlocking switch.

CyberGrip



Grip Switch

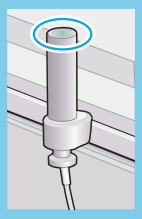
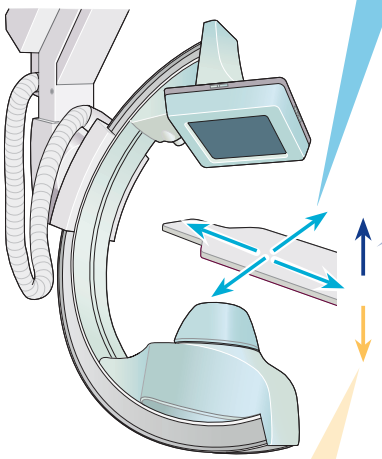


Table Console



2 Raising of Catheterization Table

Press △/▽ (Up) switch.

► Tabletop rises.

CyberGrip

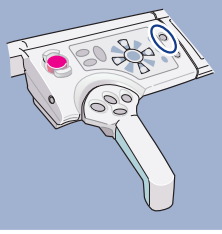


Table Console

3 Lowering of Catheterization Table

Press △/▽ (Down) switch.

► Tabletop lowers.

CyberGrip

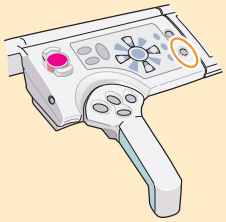


Table Console

Fluoroscopy/Radiography

Fluoroscopy

1 Confirm the fluoroscopy program

- Modify the condition as needed.

2 Confirm the visual field size.

- If needed, Change the size.

3 Press the fluoroscopy foot switch

Examination Room

Control Room

► When accumulated fluoroscopy time reaches to 5 minutes, alarm buzzer sounds and alarm stop button appears on the screen.

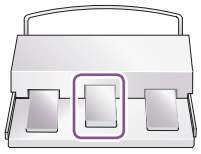
To stop the buzzer, press [alarm stop] button.

Radiography

1 Confirm the radiography program

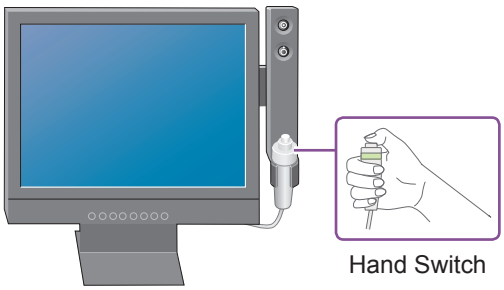
- Modify the condition as needed.
- Positioning shall be set by fluoroscopy. Perform fluoroscopy more than 3 seconds.

2 Press the radiography foot switch



Examination Room

Radiography can be performed with the hand switch on the X-ray generator console.
Depress the hand switch until the X-ray is exposed.



Hand Switch

Change Fluoroscopy/Radiography Program

Fluoroscopy/Radiography program presets and corresponding parameters are changeable. These parameters can be changed at the digital processing system in the control room or at the IVR NEO.

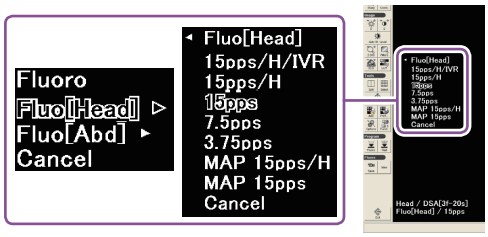
☞ "IVR NEO" P. 8

Change Preset Parameters

Fluoroscopy

1 Click Fluoro or Fluo on the IVR NEO

► Preset Fluoroscopy parameters will appear.



2 Select a parameter with either of the following operation

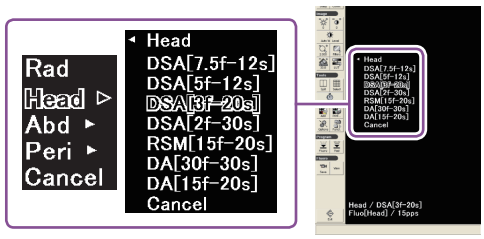
- Use ↑ , ↓ , ← or → key on keyboard to select with ↵ button.
- Use the IVR NEO joystick button to select.
- Use the mouse to select.

► Selected parameter is set.

Radiography

1 Click Rad or Rad on the IVR NEO

► Preset Radiography parameters will appear.



2 Select a parameter from either of the following operation

- Use ↑ , ↓ , ← or → key on keyboard to select with ↵ button.
- Use the IVR NEO joystick button to select.
- Use the mouse to select.

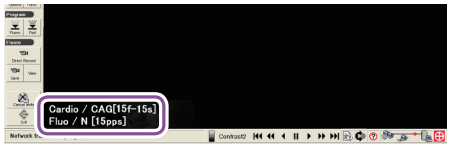
► Selected parameter is set.

Confirmation of Parameters

Fluoroscopy

1 Confirm

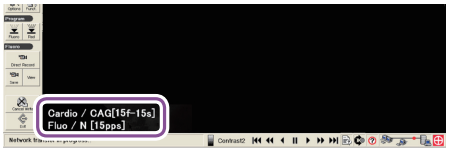
Make sure that selected Fluoroscopy Program is displayed.



Radiography

1 Confirm

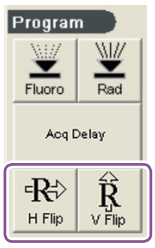
Make sure that selected Radiography Program is displayed.



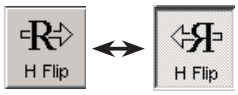
HV Flip

Flip and acquire the fluoroscopy and radiography images in the Horizontal or Vertical direction.

1 Click the flip buttons on the side menu to flip images

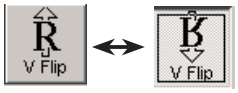


► Flip horizontal



(Click the button again to change the setting back to normal)

► Flip vertical



(Click the button again to change the setting back to normal)

2 Perform fluoroscopy or radiography

► Reversed image is acquired.

NOTE

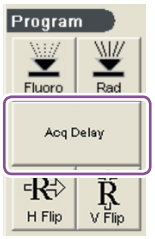
It is selectable during fluoroscopy or radiography, but it is valid on next acquisition. Note that the acquired image cannot be reversed.

Change Settings of Injection Delay

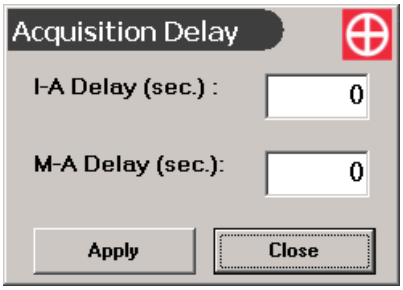
Injection-Acquisition Delay (the delay in seconds between injection and beginning of acquisition) and Mask-Acquisition Delay (the delay in seconds between end of mask acquisition and beginning of live acquisition) are set in advance for each acquisition program. These values can be changed temporary during study according to the following procedure.

1 Click [Acq Delay]

► [Acquisition Delay] window appears.



2 Enter the delay time by seconds to one place of decimal and click [Apply]



3 Click [Close]

NOTE

When select the acquisition program again, default values will be restored.

Recording Fluoroscopy Image

Last N seconds fluoroscopy record or Either Direct fluoroscopy record can be used.

> **NOTE**
>
> Default setting is Last N seconds fluoroscopy record. If you want to use Direct fluoroscopy record, system setting is required beforehand.

Last N seconds Fluoroscopy Record

1 Perform fluoroscopy

2 Click  or press  on IVR NEO

► The latest fluoroscopy loop will be saved.

Direct Fluoroscopy Record

1 Click 

Make sure that selected Fluoroscopy Program is displayed.

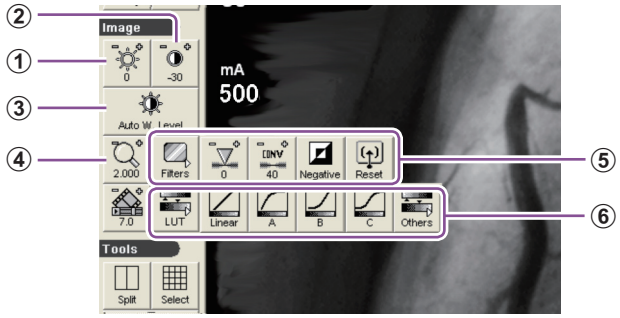
2 Perform fluoroscopy

► Fluoroscopy loop will be saved.

> **NOTE**
>
> Direct fluoroscopy record can be operated with the digital processing system, but not with the IVR NEO.

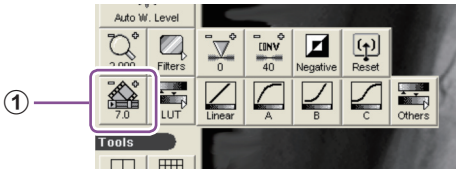
Adjusting Image

Display



No.	Button	Function
①		Adjust image brightness. Right-click: + (increase) Left-click: - (decrease) Click both mouse buttons simultaneously: 0
②		Adjust image contrast. Right-click: + (increase) Left-click: - (decrease) Click both mouse buttons simultaneously: 0
③		Optimize the brightness and contrast frame by frame.
④		Zoom in and out the displayed image. Right-click: + (increase) Left-click: - (decrease) Click both mouse buttons simultaneously: Return to default
⑤		Enhance the image.  Sharpness — Right-click: + (increase), Left-click: - (decrease), Click both mouse buttons simultaneously: 0  Convolution — Right-click: + (increase), Left-click: - (decrease), Click both mouse buttons simultaneously: 0  Negative/positive conversion.  Deactivate all filters.
⑥		Optimize the image brightness and contrast on the monitor.  Select any one of buttons.

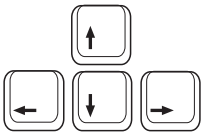
Playback



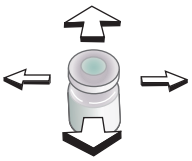
No.	Button	Function
①		Adjust the loop playback speed. Right-click: + (increase) Left-click: - (decrease) Click both mouse buttons simultaneously: Return to default

Controlling Image Playback

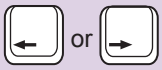
Control Bar



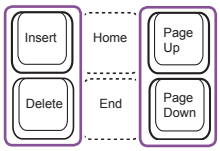
Keyboard



IVR NEO Joystick

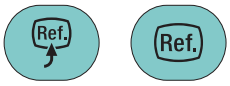
Control Bar	Keyboard	IVR NEO Joystick	Function
⏭			Play/show next loop/image.
⏮			Play/show previous loop/image.
⏸	 or	 (Press button)	Pause
▶			Advance to next frame. (when paused)
◀			Return to previous frame. (when paused)
⏩	 (Press more than 2 seconds)	 (Press button)	Resume forward play. (same speed as acquisition)
⏪	 (Press more than 2 seconds)	———	Resume backward play. (same speed as acquisition)
———	———	 (Tilt and hold to the right)	Play frame-by-frame forward according to the speed of joystick angle when paused. (Larger the tilt angle, higher the speed)
———	———	 (Tilt and hold to the left)	Play frame-by-frame backward according to the speed of joystick angle when paused. (Larger the tilt angle, higher the speed)

Adding, Deleting and Displaying Reference Images



Keyboard

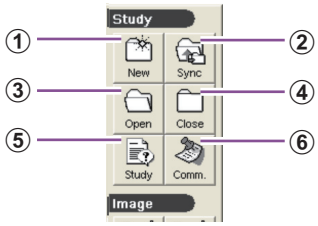
IVR NEO Joystick



IVR NEO Button

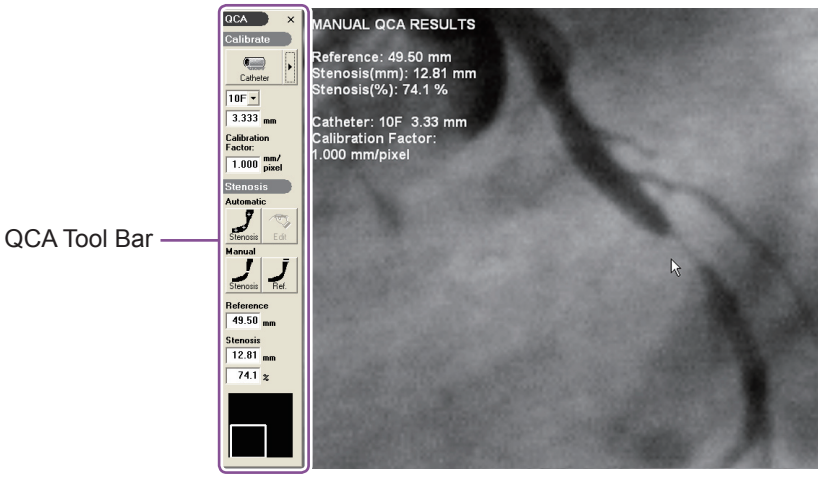
Keyboard	IVR NEO	Function
Insert	Ref.	Add Reference Image
Delete	———	Delete Reference Image
Page Down	(Tilt downward)	Go to next loop and pause
Page Up	(Tilt upward)	Go to previous loop and pause
———	Ref.	Switch Playback mode/Review mode

Related Operation for Study



No.	Button	Function
①	New	New study (Start examination)
②	Sync	Re-synchronize the Reference monitor display to the acquiring study.
③	Open	Open previous study.
④	Close	Close the study.
⑤	Study	Display study information.
⑥	Comm.	Display comment menu.

Stenosis Analysis



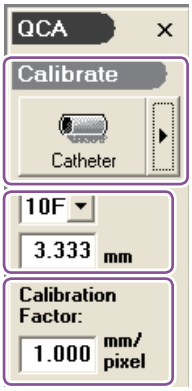
1 Click Funct. and select QCA

► QCA tool bar will appear.

2 Perform calibration

To perform calibration, display the image of reference object (such as a catheter) previously acquired with the same magnification as the analysis object. The smaller reference object (the thinner the catheter), the greater the analysis error.

1 Click Catheter button from [Calibration] menu.



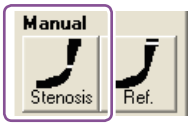
2 Select a catheter diameter on the image from the list, or input a value (mm).

3 Click on 3 points along the catheter.

► Calibration factor (mm/pixel) will appear.

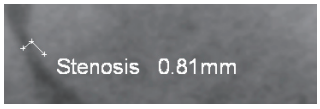
3 Specify the stenosed artery

1 Click Stenosis button from [Manual] menu.



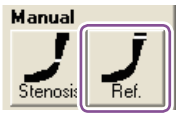
2 Click points on opposite sides of the narrowest part of the stenosed artery.

► The stenosis is measured and indicated on screen.



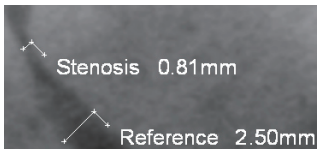
4 Specify the reference value

1 Click Ref. button from [Manual] menu.



2 Click points on opposite sides of the part of the un-stenosed artery.

► The reference distance and percent stenosis are displayed.



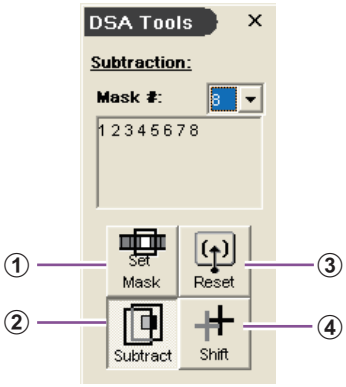
⚠ WARNING

Measuring a vessel diameter from angiography causes several errors.
Therefore, do not diagnose or treat based solely upon this analysis result.
Use the analysis result as a reference value.

Operating DSA Tool

1 Click Funct. and select DSA

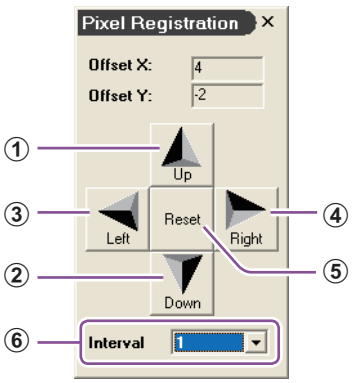
► [DSA Tools] bar will appear.



No.	Button	Function
①	Set Mask	Setting mask image.
②	Subtract	Switching ON/OFF of subtraction.
③	Reset	Resetting mask image.
④	Shift	Executing reregistration. (Shift the mask image)

2 Click Shift

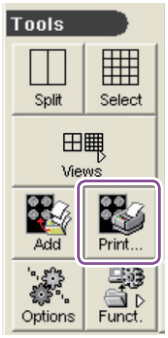
► [Pixel Registration] tool bar will appear.



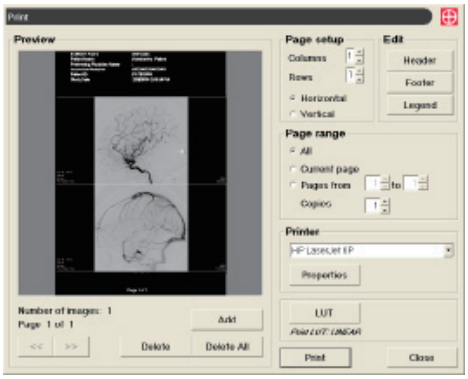
No.	Button	Function
①	Up	Moves the mask image upward.
②	Down	Moves the mask image downward.
③	Left	Moves the mask image left.
④	Right	Moves the mask image right.
⑤	Reset	Return the mask image to the default (0, 0) position.
⑥	Interval 1	Select the value when moving less than 1 pixel.

Printing Images

1 Click 



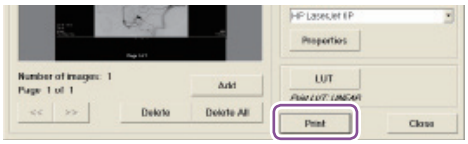
► Printer dialog will appear.



2 Setting any required items such as Properties

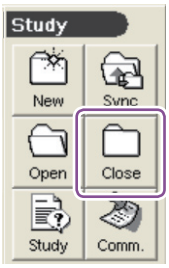
3 Click Print

► Printing is started.



Closing Study

1 Click  from [Study] menu

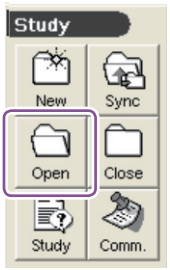


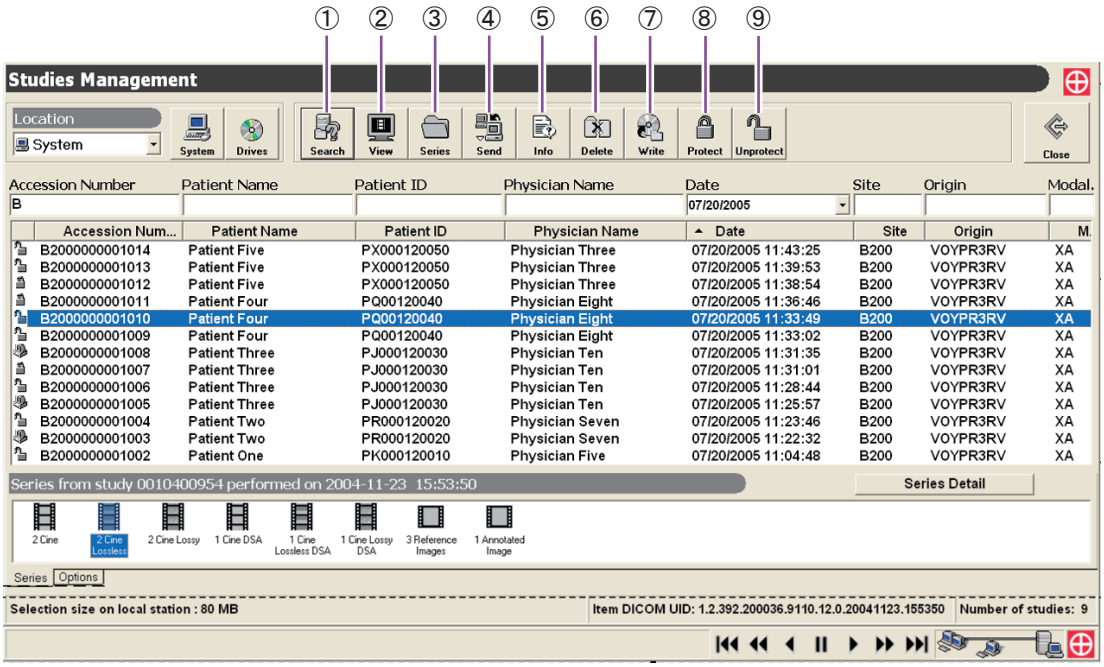
5 Administration

Managing Studies

1 Click Open from [Study] menu

► [Studies Management] window is displayed.





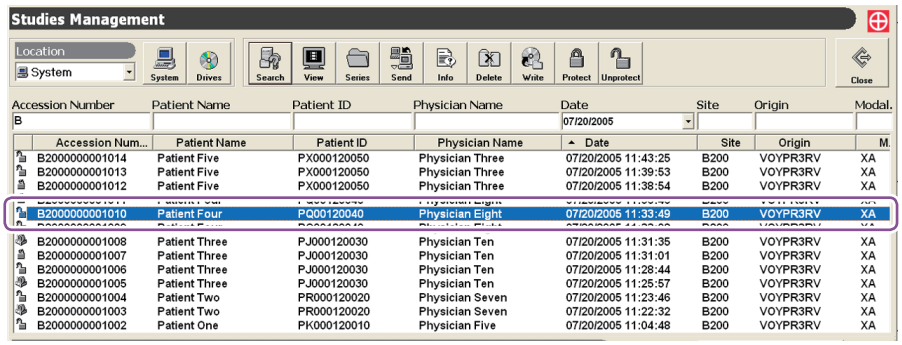
Accession Num...	Patient Name	Patient ID	Physician Name	Date	Site	Origin	M.
B2000000001014	Patient Five	PX000120050	Physician Three	07/20/2005 11:43:25	B200	VOYPR3RV	XA
B2000000001013	Patient Five	PX000120050	Physician Three	07/20/2005 11:39:53	B200	VOYPR3RV	XA
B2000000001012	Patient Five	PX000120050	Physician Three	07/20/2005 11:38:54	B200	VOYPR3RV	XA
B2000000001011	Patient Four	PQ00120040	Physician Eight	07/20/2005 11:36:46	B200	VOYPR3RV	XA
B2000000001010	Patient Four	PQ00120040	Physician Eight	07/20/2005 11:33:49	B200	VOYPR3RV	XA
B2000000001009	Patient Four	PQ00120040	Physician Eight	07/20/2005 11:33:02	B200	VOYPR3RV	XA
B2000000001008	Patient Three	PJ000120030	Physician Ten	07/20/2005 11:31:35	B200	VOYPR3RV	XA
B2000000001007	Patient Three	PJ000120030	Physician Ten	07/20/2005 11:31:01	B200	VOYPR3RV	XA
B2000000001006	Patient Three	PJ000120030	Physician Ten	07/20/2005 11:28:44	B200	VOYPR3RV	XA
B2000000001005	Patient Three	PJ000120030	Physician Ten	07/20/2005 11:25:57	B200	VOYPR3RV	XA
B2000000001004	Patient Two	PR000120020	Physician Seven	07/20/2005 11:23:46	B200	VOYPR3RV	XA
B2000000001003	Patient Two	PR000120020	Physician Seven	07/20/2005 11:22:32	B200	VOYPR3RV	XA
B2000000001002	Patient One	PK000120010	Physician Five	07/20/2005 11:04:48	B200	VOYPR3RV	XA

No.	Button		Function
①	Search	Search	Searches based on the search target set by the [System] and [Drives] buttons, plus all search criteria.
②	View	View	Displays the selected study or studies in the Image Viewer window.
③	Series	Series	When a study is selected in the Study List, Series displays all study series types contained in this study.
④	Send	Send	Sends selected studies to another server or system.

No.	Button		Function
⑤	Info	Info	Displays detailed information about the selected patient.
⑥	Delete	Delete	Permanently deletes the unprotected studies selected from the local system.
⑦	Write	Write	Prepares and writes the selected studies to CD/DVD.
⑧	Protect	Protect	Protects the selected studies from deletion.
⑨	Unprotect	Unprotect	Removes protection from selected studies.

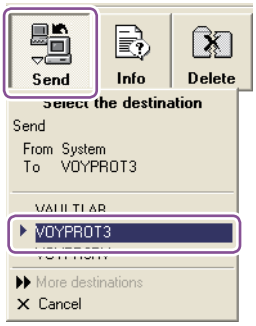
Sending Studies

1 Select the desired studies in the Study List



2 Click Send

► A list of destinations will appear.



3 Click the desired destination

4 When the confirmation window appears, click [OK]

Writing to CD/DVD

1 Select the studies

1 Select the desired studies from the Study List.

2 Click 

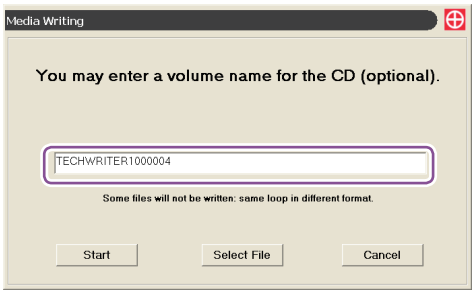
.

► Prompted to insert a blank disc to the writer.

3 Insert a blank disk.

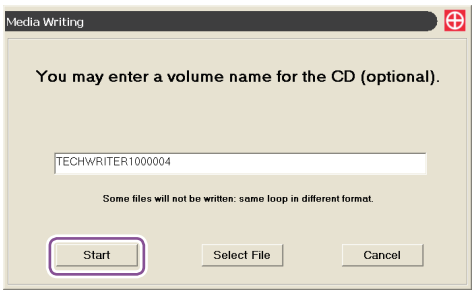
► Media Writing dialog box appears.

Volume name is changeable.



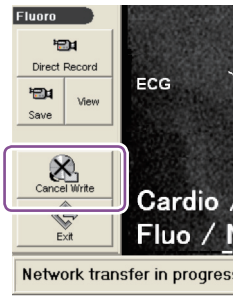
2 Click Start

► Writing is started.



To cancel a media write, click 

on the side menu of the Image Viewer window.



NOTE

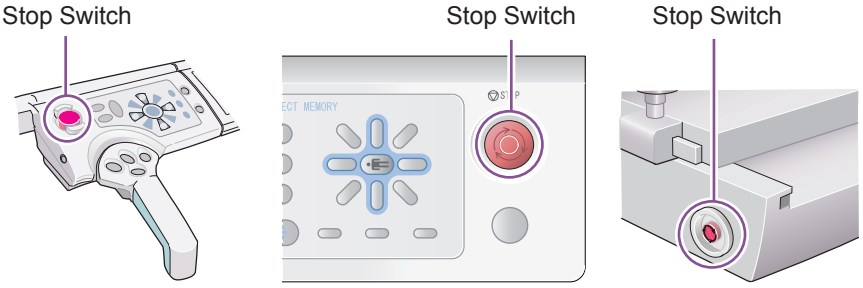
Do not write to media during a study, only write to media after study completion.

6 Trouble Shooting

Emergency Halt

Halting the C-arm

1 Press (Stop switch)



CyberGrip | Cyber Console | Catheterization Table

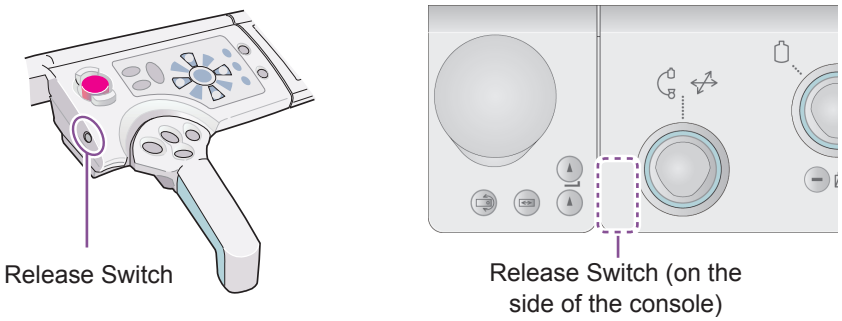
Resetting the Emergency Halt

1 Turn (Stop switch) clockwise

> **NOTE**
>
> When resetting, be sure to reset the pressed switch.
> Reset the STOP switch after the message "Stop Mode: Reset OK" is displayed on the X-ray generator console or the information display to ensure normal operation.

Safety Switch

Proximal sensors are mounted around the FPD and touch sensors are mounted on the FPD front cover and the collimator cover. When these sensors are tripped, the movement of C-arm and catheterization table stops. Use care and caution when operating the CyberGrip and pressing the release switch to free the C-arm from collision.
FPD backward movement is possible without release switch operation.



CyberGrip | Cyber Console

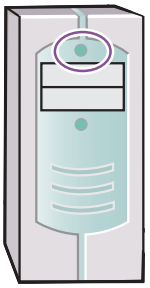
Shutdown Failure

If trouble occurs when trying to shut down the Digital Radiography System via [Exit] button (system does not shut down), shut down the system according to the following procedure.

Digital Operation Cabinet (Control Room)

1 Press and hold the Power button for at least 5 seconds

► The power goes off.

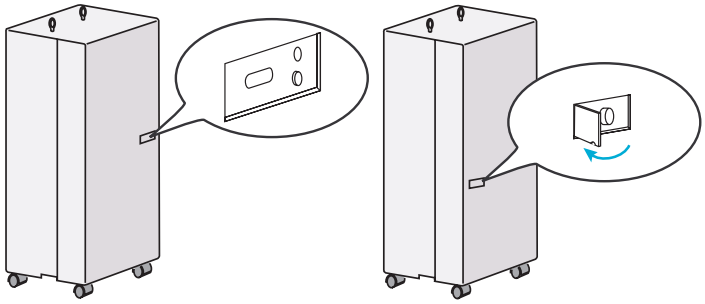


Digital Control Cabinet (Equipment Room)

2 Open the switch cover in front of the cabinet and press the Power button for at least 5 seconds

The location of the power button varies at different periods of delivery as following figures.

► Acquisition computer is turned off.



X-ray Generator Console

3 Press (OFF)

► X-ray high voltage generator and C-arm are shut down.

NOTE

To restart the system, wait 1 minute after turning off power to the X-ray generator, then press (ON) again.

NOTE

If the acquisition monitor is blank when restarting the system after shutdown failure, press the power button on the digital control cabinet in the equipment room to turn on the power.

If the review monitor is blank when restarting the system after shutdown failure, press the power button on the digital operation cabinet in the control room to turn on the power.

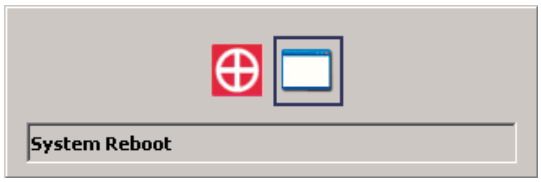
After the application screen is displayed on both acquisition and review monitors, shut down the system again by standard procedure and then restart the system.

Digital Angiography system application problem

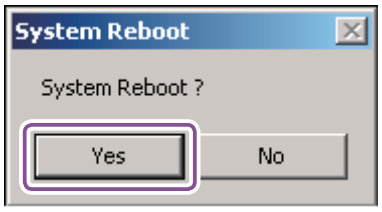
Image processing errors or unknown system problems

If image processing errors or unknown system errors occur, reboot the system.

1 Press and hold the [Alt] key and press the [Tab] key to select the [System Reboot] icon

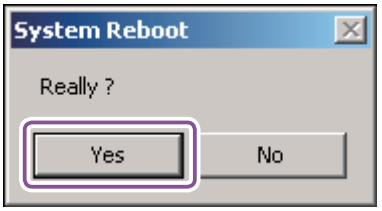


2 Click Yes



3 Click Yes

► The application reboots.

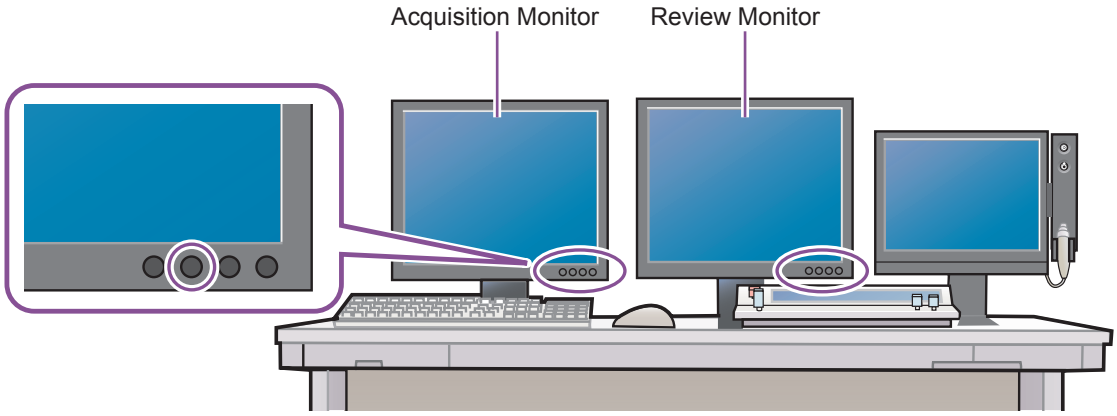


Mouse Pointer

If the mouse pointer is locked within one monitor, press the [Scroll Lock] key on the keyboard.

Monitor

If the screen is blank or gray-scale-like image is displayed, press the button shown in the figure below.



Power Failure

Reboot the Digital Radiography System according to the following procedure if needed (ex. Some trouble This system is protected from power failure with UPS (uninterruptible power supply system). If the power failure occurs suddenly such as thunderbolt, screen display disappears. When a momentary power failure (within 5 minutes) occurs, this system will automatically retrieve, and can be available in inactivity because that the screen redisplays.

If the power failure occurs for long time such as for more than 5 minutes or it is difficult to judge whether the momentary power failure occurs or the longer one, once shut down the system, and then re-activate the system according to the Startup procedure (☞ P.12) or "Chapter 3.3 described on DAR-9400f Operation Manual (M517-E063)".

NOTE

The system is designed to minimize data loss by power failure, however, it cannot be restored the acquisition image on power failure.

After the system restores, the previous study on power failure re-activates automatically.

Error Messages

Common error messages are described in this section.
For other error messages, refer to the operation manual of each system.

Digital Radiography System

The following error messages will appear on the system monitor.

Message	Action
An error occurred during cache. No available cache.	CD-R or DVD-R media are used as patient data archive, re-write all unsaved patient data to new CD-R or DVD-R. If not, please contact Shimadzu service representative.
Burn Operation Failed.	Insert a blank CD-R or DVD-R and re-execute the operation.
Cannot retrieve media information.	Confirm whether the media is inserted properly.
Cannot write DICOMDIR to CD-R (DVD-R). No patient has been added.	Confirm that writable media is inserted.
Character XX is not valid.	Try other characters.
Could not find the PPS Manager. Please configure your PPS Manager in the hosts table.	Please contact Shimadzu service representative.
Error: Invalid query criteria entered.	Input an appropriate value.
No DICOM media found in drive X.	Insert DICOM media.

Note: "XX" or "X" represents variable information.
Values and characters appear according to the error situation.

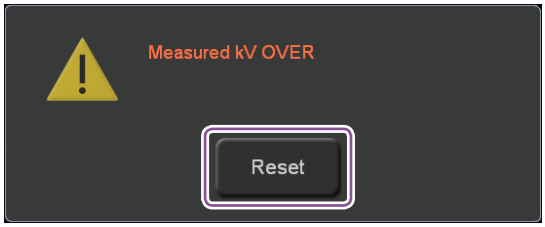
Error Messages Related to FPD

When "FPD ERROR" is displayed at upper left of the system monitor, errors in the following list are also displayed.

Message	Description	Action
[HV Power Supply]:Temperature Over	Error of HV power temperature of FPD.	Stop study immediately and contact Shimadzu service representative.
[HV Power Supply]:Over Current	Error of HV power electric current output of FPD. HV and DC power of FPD shut down immediately. Fluoroscopy and radiography become disabled.	
[DC Power Supply]:Overload	DC power of FPD is overloaded.	
[Sensor]:Temperature error	Error of sensor chassis temperature. HV and DC power of FPD shut down after 30 minutes.	
[HV/DC Power]:Emergency shutdown	HV and DC power of FPD shut down immediately. Fluoroscopy and radiography become disabled.	
[Cooling Unit]:Water flow error	Error of FPD cooling unit water flow. HV and DC power of FPD shut down after 30 minutes.	

X-ray High Voltage Generator

When the equipment detects errors, the error messages will appear on the touch panel.
When an error message is displayed, press Reset and take the appropriate action listed.



Messages Related to the X-ray high voltage generator

The following message is displayed.
Radiography is not possible while this message is displayed.

Message	Description	Action
Radio Over Current	Radiography tube current exceeded set value by +200 mA.	If this message appears repeatedly though pressing [RESET] key, contact Shimadzu service representative.
Measured kV Over	Measured tube voltage exceeded permitted range.	
Measured kV Under	Measured tube voltage fell below permitted range.	
Starter Error	Starter failure.	
I.F. Over	Abnormal filament heating current.	
Filament not ready		
No Filament S/L/Both	Abnormal filament.	If "No Filament S" or "No Filament L" appears, the focus is switched to normal one. if this message appears after rebooting the X-ray high voltage generator, contact Shimadzu service representative.

Message	Description	Action
Line Voltage OVER	Supply voltage exceeded permitted range.	Contact Shimadzu service representative.
Charge Volt Error	Abnormal charging voltage of primary smoothing capacitor.	
Power Down	Abnormal control circuit supply voltage.	
H.V.T. Not Connected	Abnormal connection to high-voltage transformer.	
Arcing Trouble	Repeated arcing occurred.	
Board status Error	Abnormal control board.	
kV adjustment board Error	Abnormal kV Adjust Board.	
Fluo I/F Error	Abnormal Fluo I/F Board.	
G.C. Error	Abnormal Grid Control Unit.	

Messages Related to the X-ray Tube

The following message is displayed.
Radiography is not possible while this message is displayed.

Message	Description	Action
HU Over Predicted	Value predicted to go out of range Continuing radiography with present setting will cause heat unit overrun.	Change the radiography conditions or cease operation until heat unit value reduces.
HU Full Stored	Heat units reached the permitted limit.	Stop the operation until the heat unit value reduces.
Thermal Over	X-ray tube unit temperature exceeded the permitted limit.	

Message	Description	Action
LX-Tube Water Flow Error	Water flow in heat exchanger of X-ray tube is stopped.	Radiography is not available while this warning displays. If this message appears repeatedly after resetting or rebooting the X-ray high voltage generator, X-ray exposure will be impossible in a few minutes. Stop study immediately.
LX-Tube Water Level Warning	Water volume of heat exchanger gets low	Contact Shimadzu Service Representative.(It' s possible to do exposure X-ray while this Warning displays.)
LX Tube Thermal Warning	X-ray tube unit temperature exceeded 70 celusius degrees. The continued use can be detect "Thermal Over".	Cease operation or decrease frequency of exposure X-ray. (It's possible to do exposure X-ray while this Warning displays.)
Starter is not working	The starter is in standby status.	Contact Shimadzu service representative.

Error Messages at Power ON

Message	Description	Action
Cabinet Battery Warning	The data recording battery in the control cabinet must be replaced soon.	Contact Shimadzu service representative.
Cabinet Battery Empty	The data recording battery in the control cabinet is empty.	
X-ray switch Error	Radiography switch was ON, when the high voltage system is ON.	Power OFF the high voltage system, and reset it after confirming the switch of fluoroscopy and radipgraphy is not ON.
Fluo switch Error	Fluoroscopy switch was ON, when the high voltage system is ON.	

Other Messages

The following message is displayed.
Radiography is not possible while this message is displayed.

Message	Description	Action
Door/Interlock	The examination room door is open.	Close the door.
FPD Water Flow Error	Heat Exchanger of FPD detects error.	Stop study immediately and Contact Shimadzu service representative. (It' s possible to do exposure X-ray for about 30 minutes while this Warning displays.)
Change Photo Pickup Field	Wrong combination of the photo pickup field and FOV size are selected.	Change photo pickup field or select larger FOV size.

C-arm

Message	Description	Action
Position Detect Error XXX	Mismatching of position detection and motor drive.	It is possible to operate the C-arm by holding down the release switch. Reset with the STOP switch or turn off and on the power again. If the equipment cannot be reset, contact Shimadzu service representative.
Potentio Error XXX	Detects disconnection of position detector circuit.	
Limit Error XXX	Detects the limit switch activation.	Ask Shimadzu service representative to readjust the limit switch.
Motor Error XXX	Motor command fail to drive the motor.	Reset with the STOP switch or turn off and on the power again. If the equipment cannot be reset, contact Shimadzu service representative.
Collimator Error XXX	Error of the collimator potentiometer.	
Collimator Rot Error	Error of collimator rotation potentiometer.	
Camera Rotation Error	Error of FPD rotation potentiometer.	

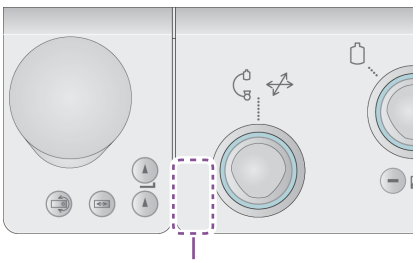
Message	Description	Action
Initial Input Error ! Release All Switches	Any switch may be pressed during startup.	Release all the switches and reset the equipment.
STOP Switch Error	Break in the stop switch circuit is detected.	One of the doubled circuits is out of order. Although the equipment is available for the temporary use, contact Shimadzu service representative immediately.
Low Battery	Drop of battery voltage.	Although the equipment is available, contact Shimadzu service representative.
Pos. Calibration Error	Incorrect installation setting of position detection.	Contact Shimadzu service representative.
Lever Calib. Error	Incorrect installation setting of the console.	
Interlink Error ! XXX	Detects disconnection of console.	

Note: "XXX" represents values and characters according to the error situation.

⚠ CAUTION

When operating the system by holding down the release switch, the collision prevention feature and safety switches are disabled.
This may result in equipment damage or patient contact. Operate carefully to ensure the STOP switch can be pressed immediately.

CyberGrip



Cyber Console

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