SERVICE MANUAL

Panoramic Radiograph

Bel-Cypher N

SAFETY INSTRUCTION TO SERVICE PERSONNEL

- Be sure to read this “Service Manual” before starting repair work.
- Be sure to keep this “Service Manual” handy while performing repair work.

TAKARA BELMONT CORPORATION

Before Starting Repair Work

Please be sure to read this “Service Manual” before starting repair work and fully understand the contents. Some repair works involve risks in adjustment, confirmation, etc. So be very careful about the safety when performing such works. The repair works shall be performed by a qualified personnel or a person who completed the training specialized in repair at our company.

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01. INTRODUCTION

1. Before starting repair work, be sure to read Operation Manual of the equipment.

2. The operating procedure of panoramic radiography forms the basis of all operations. So become fully familiar with its procedure before taking other radiograph.

3. Be sure to observe the warnings and prohibited matters in the body of this Service Manual strictly.

4. Read this Service Manual from the beginning in the order it is written. If you read from the middle of this manual and do the repair work, it may cause an accident, breakage of this equipment etc. due to an incorrect repair work.

5. If you find any unclear point during a repair work, read this Service Manual again to check about it and restart the repair work.

6. Exemption from Responsibility
   Be sure to observe the contents of Service Manual. The accident and breakage of this equipment due to an incorrect repair work are out of the scope of our responsibilities.

7. Warranty Period for Equipment
   The warranty period is three years from the date of purchase. The charge-free warranty will be applied only to the cases where breakage, failure, etc. of this equipment occurred through normal use.

8. Available Period for Repair Parts and Service Parts
   The repair parts and service parts are available for 10 years after discontinuing this product.

10. The disinstallation and disposal of equipment are within the scope of responsibilities of the customer. In the case to disinstall the equipment, consult with the dealer you purchased from or with us.

02. WARNINGS

⚠ WARNING

When you perform a repair work, read this "Service Manual" and follow its instructions.
If repaired wrongly, it may cause a breakage of the equipment or an accident.
Especially, be sure to comply with the instructions following the signal words DANGER, WARNING and CAUTION.

NOTE

In this "Service Manual", the meanings of signal words are defined as follows:

⚠ DANGER

Indicates a direct risk that is predicted to result in death or serious injury, serious property damage such as total loss of equipment and fire if you do not avoid it.

⚠ WARNING

Indicates an indirect risk that is predicted to result in death or serious injury, serious property damage such as total loss of equipment and fire if you do not avoid it.

⚠ CAUTION

Indicates a risk that has a potential to result in minor injury or moderate injury, partial damage of equipment and extinction of computer data if you do not avoid it.

⚠ NOTE

Indicates helpful information in using this equipment.

⚠ DANGER

Liquids on this equipment will cause electric shock accident or equipment damage.
This equipment is electric equipment. Keep liquids away from this equipment.

⚠ DANGER

Shock hazard. This equipment is electric equipment and has some high-voltage portions inside.
Turn off the power of equipment and unplug power cable from electrical outlet before opening cover of equipment for repair work.

⚠ DANGER

Some repair works involve risks. Only qualified or trained persons may do repair works.

⚠ DANGER

Some repair works involve risks. Service personnel must give instructions to outsiders to stay away from repair work area.

⚠ WARNING

Do not make alterations to medical electronics equipment!

Alterations by user are prohibited.
Also, relevant pharmaceutical affairs law imposes following regulations on manufacturers.
That is, medical equipments need item-specific approval for manufacture, and “application for partial modification approval” is required when making functional changes in medical equipments.
So unauthorized alterations are prohibited.

⚠ WARNING

Radiation Protection in Dentistry

Comply with the contents of each clause regarding protection against radiation exposure prescribed in relevant medical regulations when installing and using dental X-ray equipments.

⚠ WARNING

This equipment for radiograph can cause hazard to service personnel if safe exposure conditions and how to use are not complied with.

⚠ WARNING

Be sure to sterilize equipment portions to be touched by patient or operator before starting repair work. After completing the repair work, sterilize equipment portions touched by service personnel.

⚠ WARNING

While repairing, do not place anything that can be an obstacle within the range of equipment.

⚠ WARNING

To avoid damages to equipment, measuring instruments, etc. and electric shock, service personnel must not remove covers of equipment except when necessary.

⚠ WARNING

To avoid damages to equipment, measuring instruments, etc. and electric shock, turn off power of equipment and take extra care not to short-circuit with other circuit when connecting lead wire of measuring instrument to a circuit within the equipment during repair work.

⚠ WARNING

To avoid damages to equipment, measuring instruments, etc. and electric shock, be sure to turn off power of equipment and use the parts specified by us when replacing machine parts and electric parts of the equipment.

⚠ WARNING

To avoid X-ray exposure due to carelessness, be sure to install lead plate for X-ray protection on X-radiation aperture of X-ray generator when radiating X-rays during repair work.

⚠ WARNING

Be sure to use positioning attachment specified for each exposure mode when positioning patient.

⚠ WARNING

Be sure to make patient and nursing attendant to wear X-ray protective clothing. (Nursing attendant in this sentence means a person allowed by doctor.)

⚠ WARNING

Be sure to operate X-ray exposure switch from outside of X-ray room.

⚠ WARNING

Operator must instruct patient not to move while X-raying.

⚠ WARNING

Watch patient, nursing attendant and equipment constantly while X-raying, and release X-ray exposure switch immediately if you find something abnormal.

⚠ WARNING

Contact the dealer you purchased from when scraping this equipment.

⚠ WARNING

After completing repair work, be sure to turn OFF power for safety.

⚠ CAUTION

When X-raying patient after completing repair work, take extra care for patient safety when positioning patient.

⚠ CAUTION

Damage etc. inside X-ray generator cannot be repaired on site. Depending on service personnel's judgment, the equipment will be returned to factory for repair or replacement.

⚠ WARNING

Responsibility for managing the use and maintenance of medical equipments lies with the user (hospital or clinic). This equipment must be used by doctor or qualified person only.
As repair or check inside equipment involves risks, contact the company you purchased from.

⚠ WARNING

When earthquake warning is issued, do not use this equipment.
After an earthquake, be sure to conduct maintenance check of the equipment and confirm no abnormality before use. Default of the check and/or confirmation can harm patient.

⚠ WARNING

Be sure to set up X-ray examination room and install the equipment body in the X-ray examination room.

⚠ WARNING

Do not place anything that can be an obstacle within the range of equipment movement.

⚠ WARNING

X-raying and approach to equipment must be done under the responsibility of user when repairer, patient, or nursing attendant allowed by doctor has a pacemaker etc.

⚠ WARNING

Be sure to use positioning attachment specified for each exposure mode when positioning patient.

⚠ WARNING

Be sure to make patient and nursing attendant to wear X-ray protective clothing.
(Nursing attendant in this sentence means a person allowed by doctor.)

⚠ WARNING

Operator must instruct patient not to move while X-raying.

⚠ WARNING
Be sure to sterilize and disinfect equipment portions touched by patient or operator after X-raying and at daily closing time.

⚠ WARNING
Contact our sales office near you when scraping this equipment.

⚠ WARNING
After using equipment, be sure to turn OFF power for safety.

⚠ WARNING
Keep everyone out of X-ray room except repairer when radiating X-rays for repair.

⚠ WARNING
To avoid equipment failure, do not rotate arm by hand.

⚠ WARNING
Keep patient unmoved until arm reset operation completed after X-raying.

⚠ CAUTION
Take extra care for patient safety when positioning patient.

⚠ CAUTION
Take extra care for patient safety when moving sliding unit up and down.

⚠ CAUTION
Do not look straight at positioning laser beam for your safety. Also, give this caution to patient and nursing attendant.

03. PREPARATION FOR REPAIR WORK

1. Manuals

- This Service Manual on Bel-Cypher N
- Operation Manual on Bel-Cypher N

2. Measuring Equipments

1) Digital multi-meter
2) Oscilloscope
3) Lead wire for measurement
4) Insulation-resistance meter
5) X-ray detecting paper
6) Scale

3. Tools

1) Phillips-head screwdrivers (Large-size and small-size)
2) Flathead screwdriver (Small-size, insulated-type)
3) Box drivers (for M3, 4, 5, 6 screws)
4) Hexagonal wrench (a set of wrenches)
5) Nipper
6) Long-nose pliers
7) Electric soldering iron (insulated-type), solder
8) Taps for thread
9) Tap handle
10) Electric drill
11) Drill
12) Crimp tool (for crimping terminal)

4. Jigs for Adjustment

1) Test piece for Bel-Cypher N
2) Lead plate with thickness of 3mm or more (for X-ray protection)
3) Brass plate filter
4) Aluminum filter with thickness of 35mm
5) X-ray detecting paper

5. Repair and Service Parts

1) Depending the contents of repair, please prepare necessary boards, parts, wire harness, etc.

6. Other

1) Depending the contents of repair, please prepare screws, nuts, crimping terminals, grease, etc.
2) Alcohol for disinfection
3) Cloth
4) Clearing solvent

04. SPECIFICATION

Product Name	Panoramic Radiograph
Model Name	Bel-Cypher N
Power Voltage	120Vac 60Hz
Power Capacity	11A
High Voltage Generator	High-frequency inverter system (100kHz)
X-ray Tube Voltage	60kV~ 80kV (1kV step)
X-ray Tube Current	2 to 8mA (2mA step)
Exposure Control	Manual
X-ray Tube	D-052SB (made by Toshiba Corp.)
X-ray Tube Focus	0.5mm
Total Filtration	2.8mmAl (minimum)
Exposure Mode	Panoramic radiography — Adult / Child TMJ Lateral 4 sections Panoramic Bitewing — Adult / Child
Exposure Time	Panorama : 10 sec Panoramic : 4.6 sec Bitewing TMJLateral 4 sections : 2.5 sec (X4)
Magnification	Panorama : 1.2 to1.3 Panoramic : 1.2 to 1.3 Bitewing TMJ Lateral 4 sections : 1.2
Beam for Patient Positioning	3 beams
Dimensions (mm)	W: 906×D:1,126×H:2,200
Weight	Approx. 364lb(165kg)

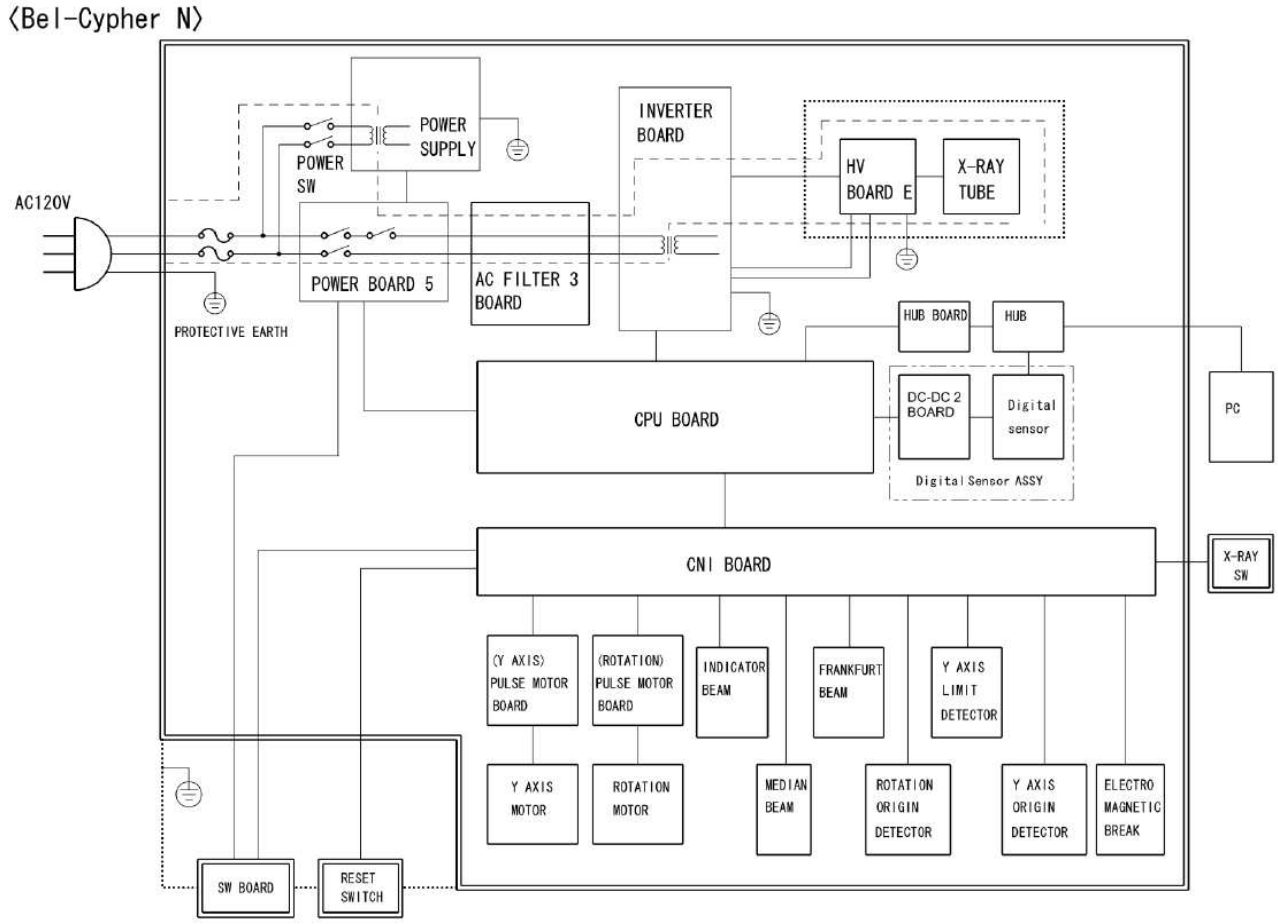
System Requirements
Temperature : 5 ~ 35°C
Humidity : 30 ~ 85%
Pressure : 700 ~ 1060 hPa

Storage Environment
Temperature : –10 ~ 60°C
Humidity : 10 ~ 95%
Pressure : 700 ~ 1060 hPa

Transportation Environment
Temperature : –10 ~ 60°C
Humidity : 10 ~ 95%
Pressure : 700 ~ 1060 hPa

05. EQUIPMENT COMPONENTS

Block Diagrams

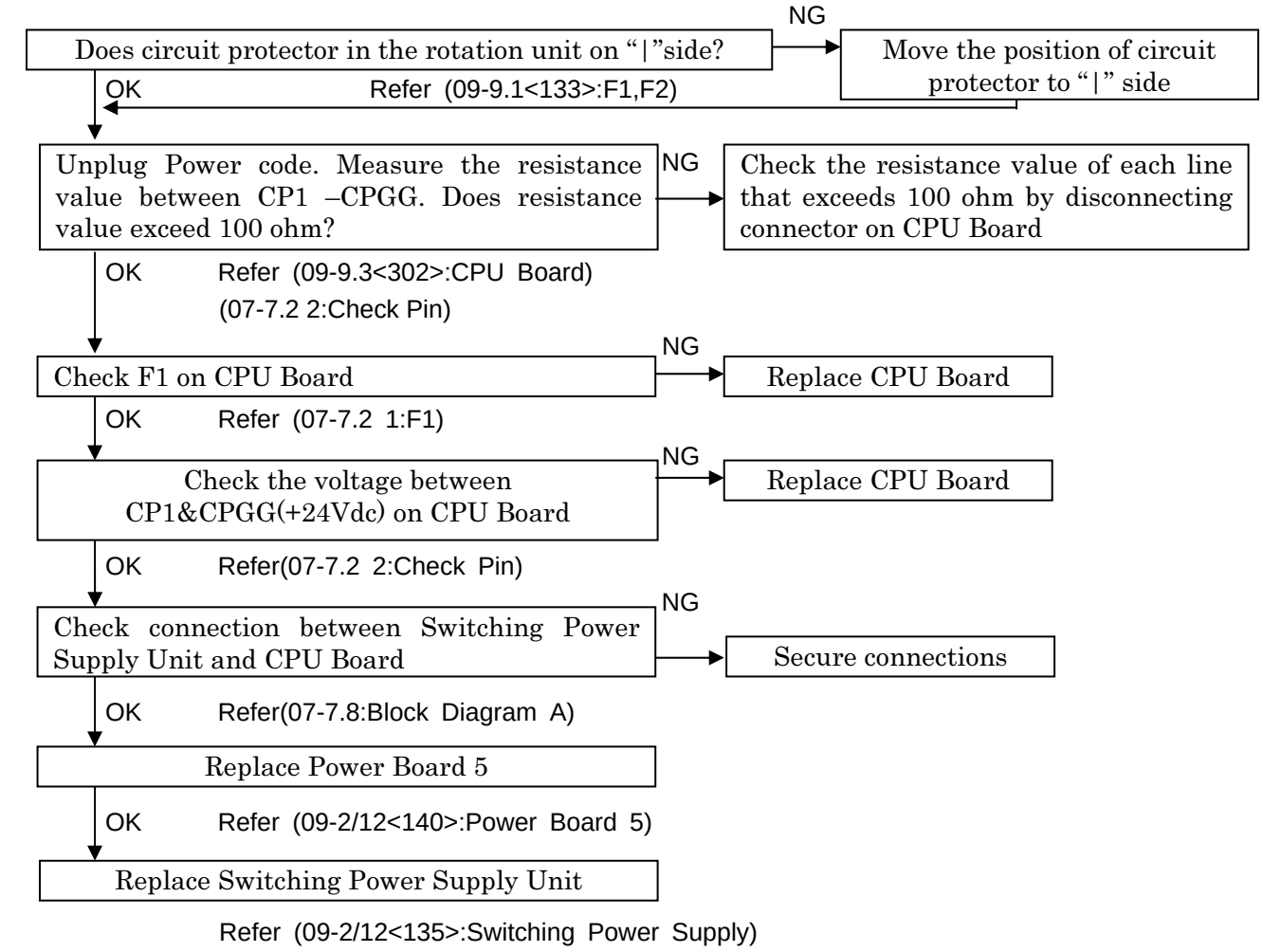


6. TROUBLESHOOTING

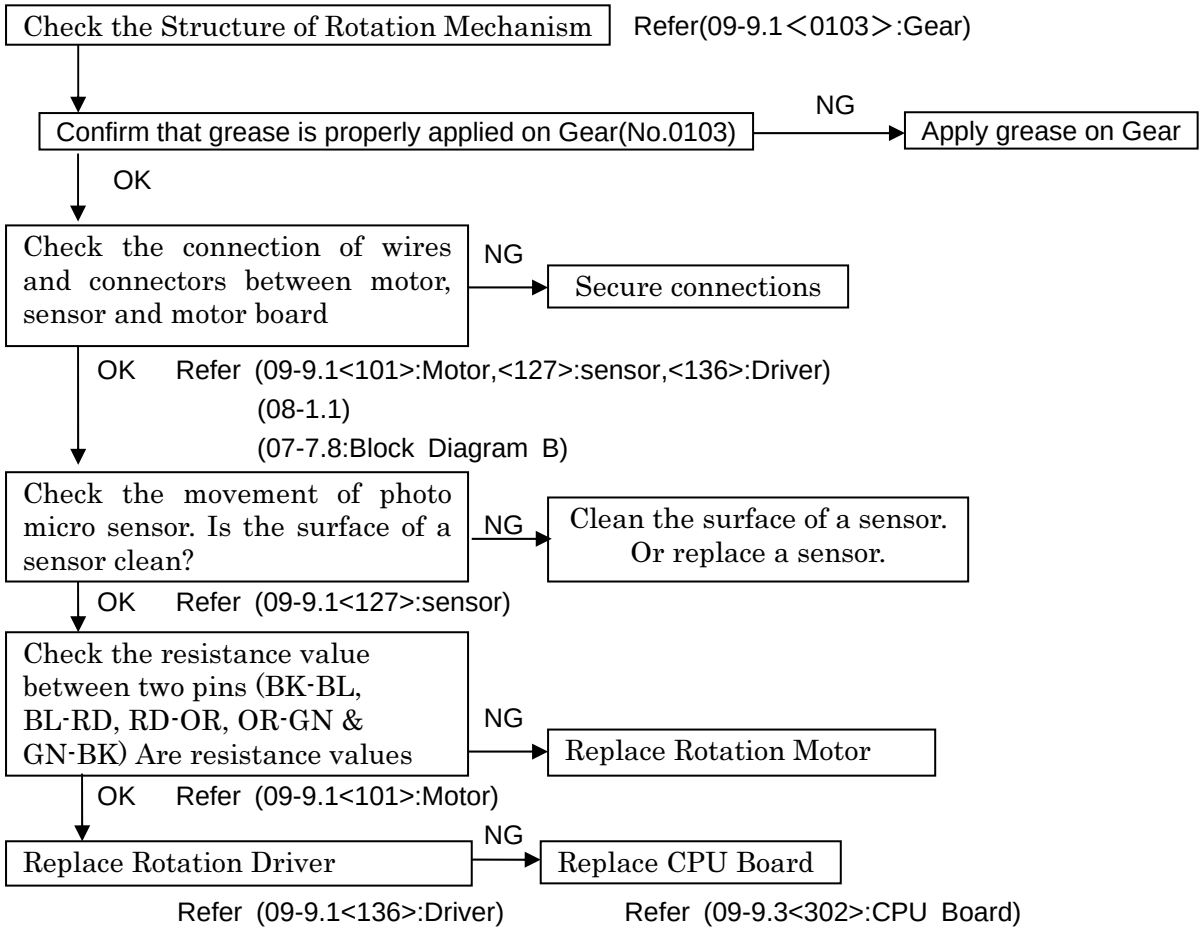
6.1 Unable to Turn On Power
6.2. Arm doesn’t rotate
6.3. Y-axis doesn’t Move
6.4. Tube Temperature Error, Unable to irradiate X-Ray
6.5. Positioning Beam doesn’t Lit
6.6. Unable to Irradiate X-rays
6.7. Exposure Switch doesn’t work
6.8. Communication Error between PC and Main CPU Board
6.9. Sliding unit doesn't move up or down
6.10. Saving a file takes long time.
6.11. Horizontal lines at equal interval on the image
6.12. Lines on the top and bottom portion of the image
6.13. Upper or bottom portion of the image is not displayed
6.14. The image stretches from the certain point
6.15. Shrank dentition in the image
6.16. Vertical lines on the image
6.17. Nothing is shown in the image
6.18. How to adjust X-ray exposure field

6.1 Unable to Turn On Power

Follow “OK” if problem is not resolved



6.2. Arm doesn't rotate



6.3. Y-axis Doesn't Move

Check ball screw on Y-axis — Refer(09-9.1<115>:all screw)

Rotate No.0120 by hand and confirms that No.116 moves — NG → Tighten set screws that fix No.0120. Confirms that No.0116 moves.

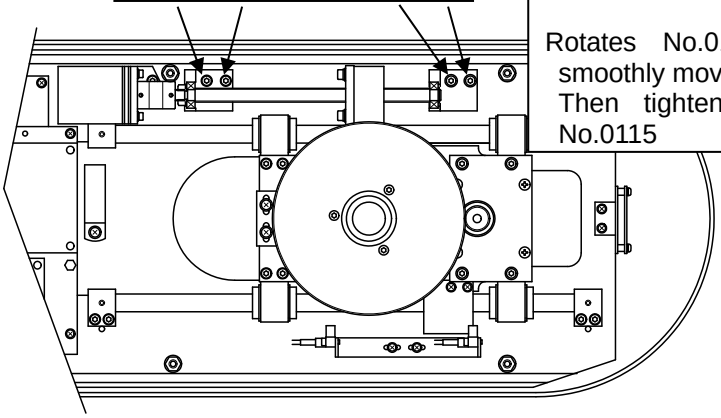
OK

While checking above, confirms that No.116 smoothly moves back and forth — NG → Slightly loosen hex head screws that fix No.0115. Refer left drawing.

*Do not loosen screws completely. Loosen screws to the extent No 1116 moves when force is applied

Rotates No.0120 by hand until No.0116 smoothly moves back and forth.
Then tighten hex head screws that fix No.0115

OK



Check the connection of wires and connectors between motor, sensor and motor board — NG → Secure connections

OK Refer (09-9.1<121>:Motor,<124>:sensor,<136>:Driver)
(08-1.1)
(07-7.8:Block Diagram C)

Check the movement of photo micro sensor. Is the surface of a sensor clean? — NG → Clean the surface of a sensor. Or replace a sensor.

OK Refer (09-9.1<124>:sensor)

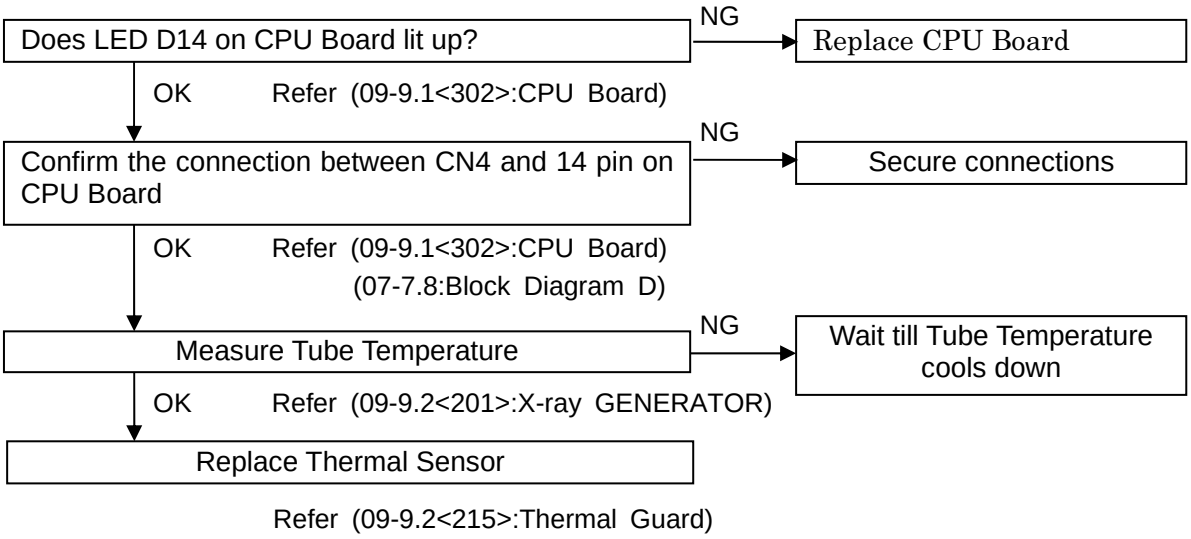
Check the resistance value between two pins (BK-BL, BL-RD, RD-OR, OR-GN & GN-BK) Are resistance values the same? — NG → Replace Rotation Motor

OK Refer (09-2/12<121>:Motor)

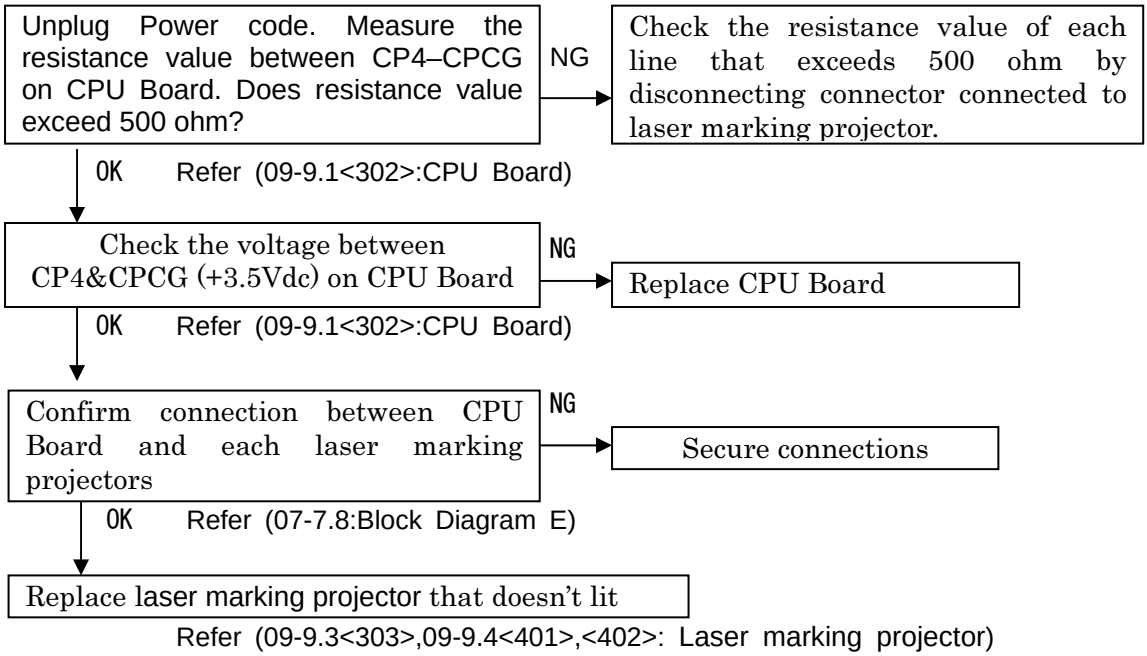
Replace Y-Axis Driver — NG → Replace CPU Board

Refer (09-9.1<136>:Driver) Refer (09-9.3<302>:CPU Board)

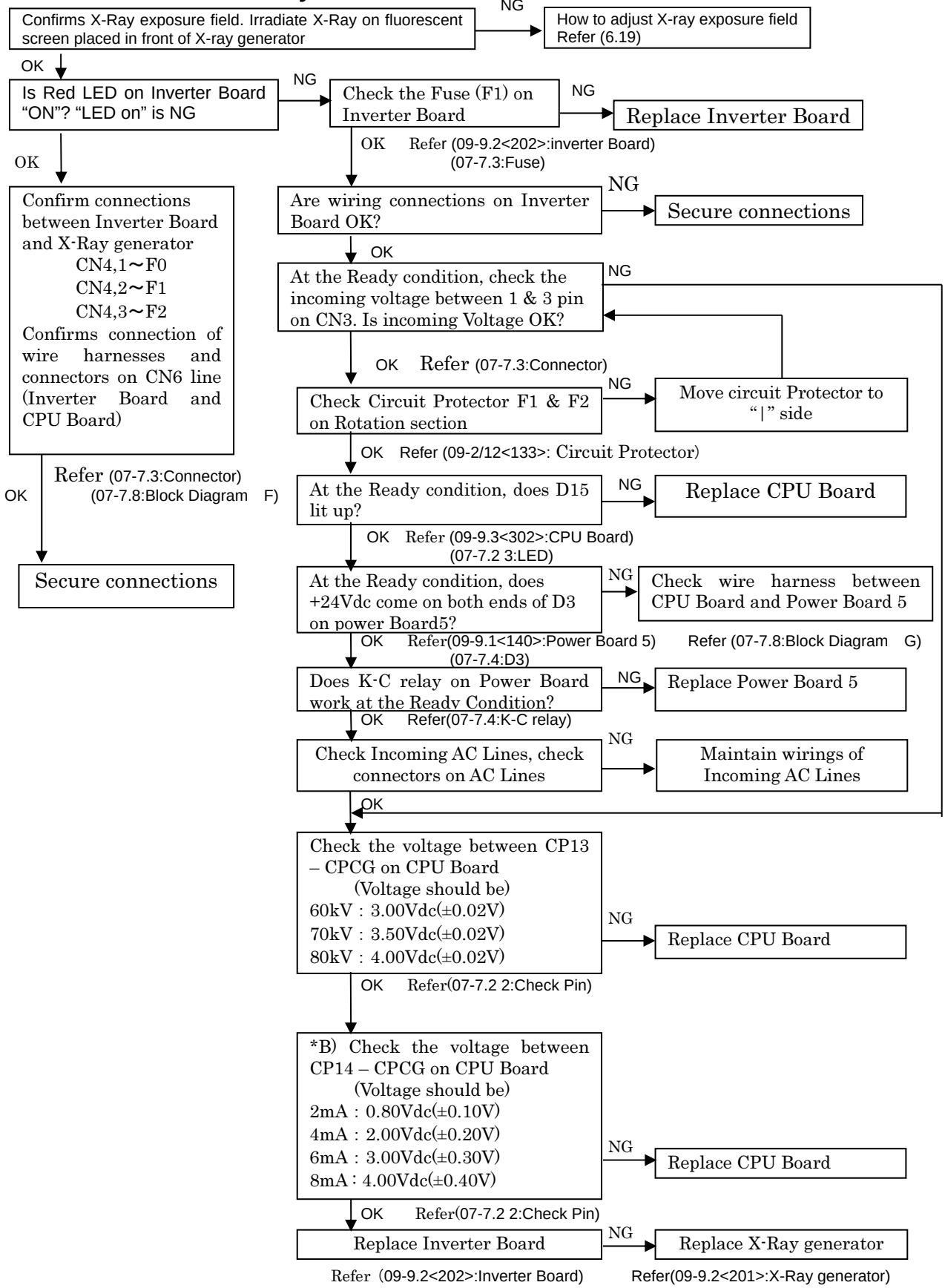
6.4. Tube Temperature Error, Unable to irradiate X-Ray



6.5. Positioning Beam Doesn't Lit

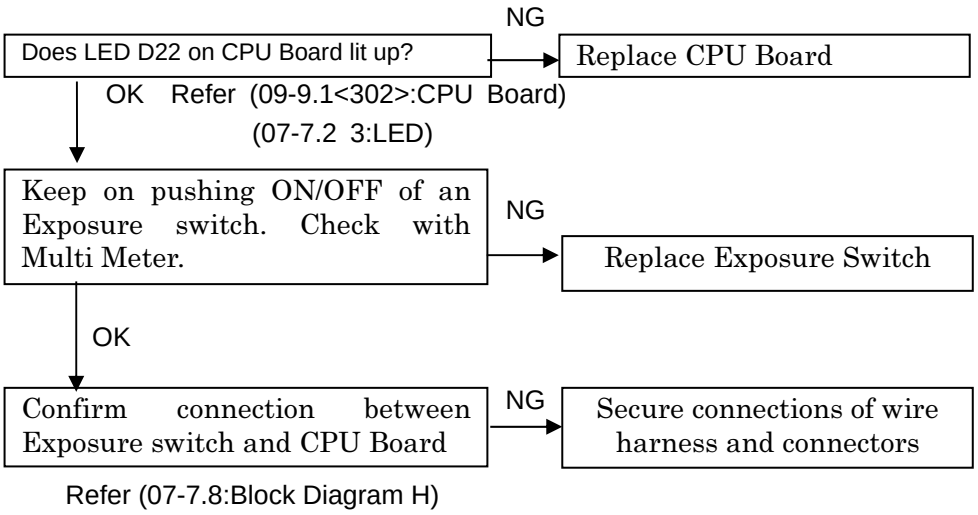


6.6. Unable to Irradiate X-rays

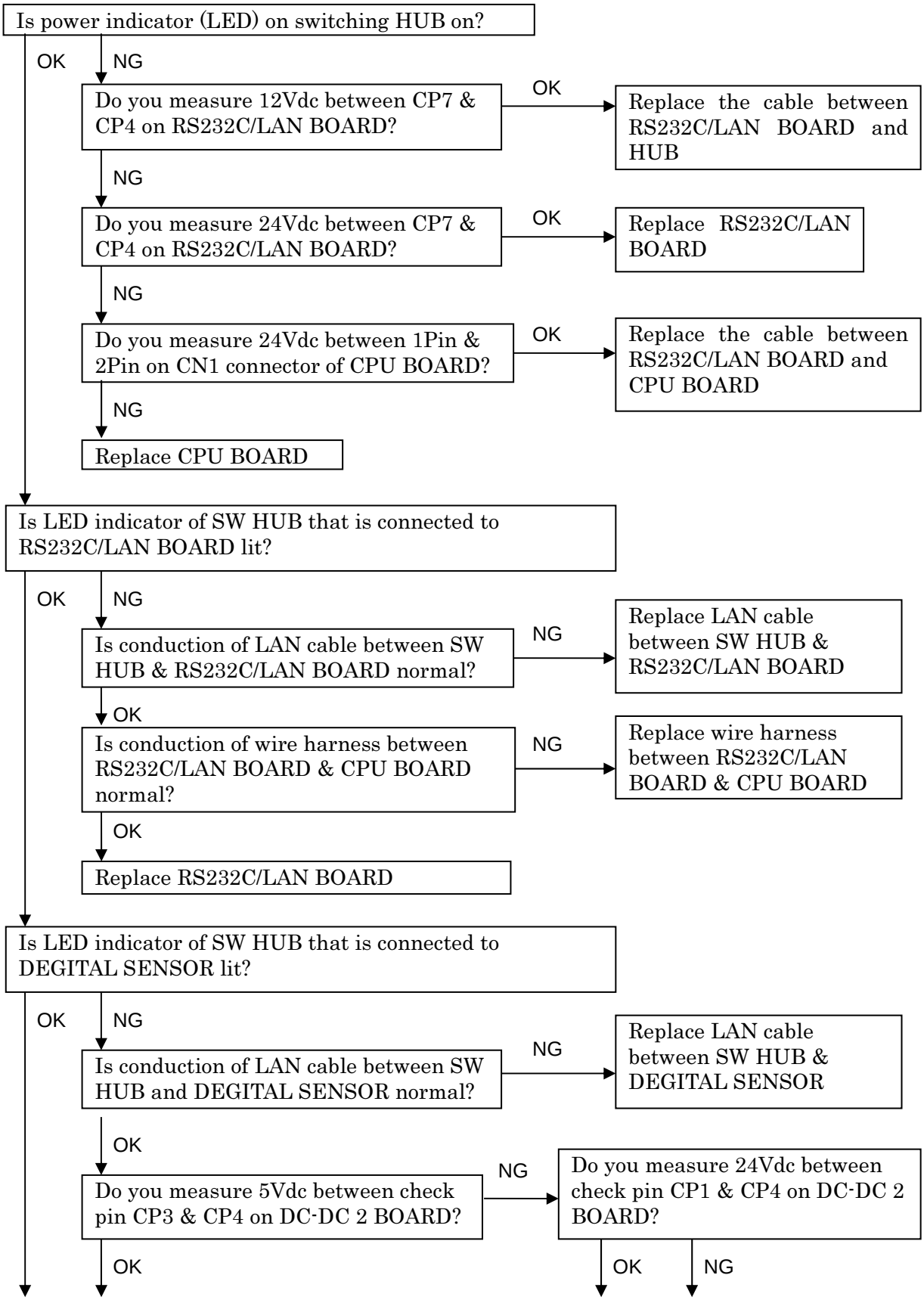


Remarks: *A) If Circuit Protector is returned to " | ", always check *B).
When part is replaced, always confirms Tube current and feedback voltage of X-ray tube.

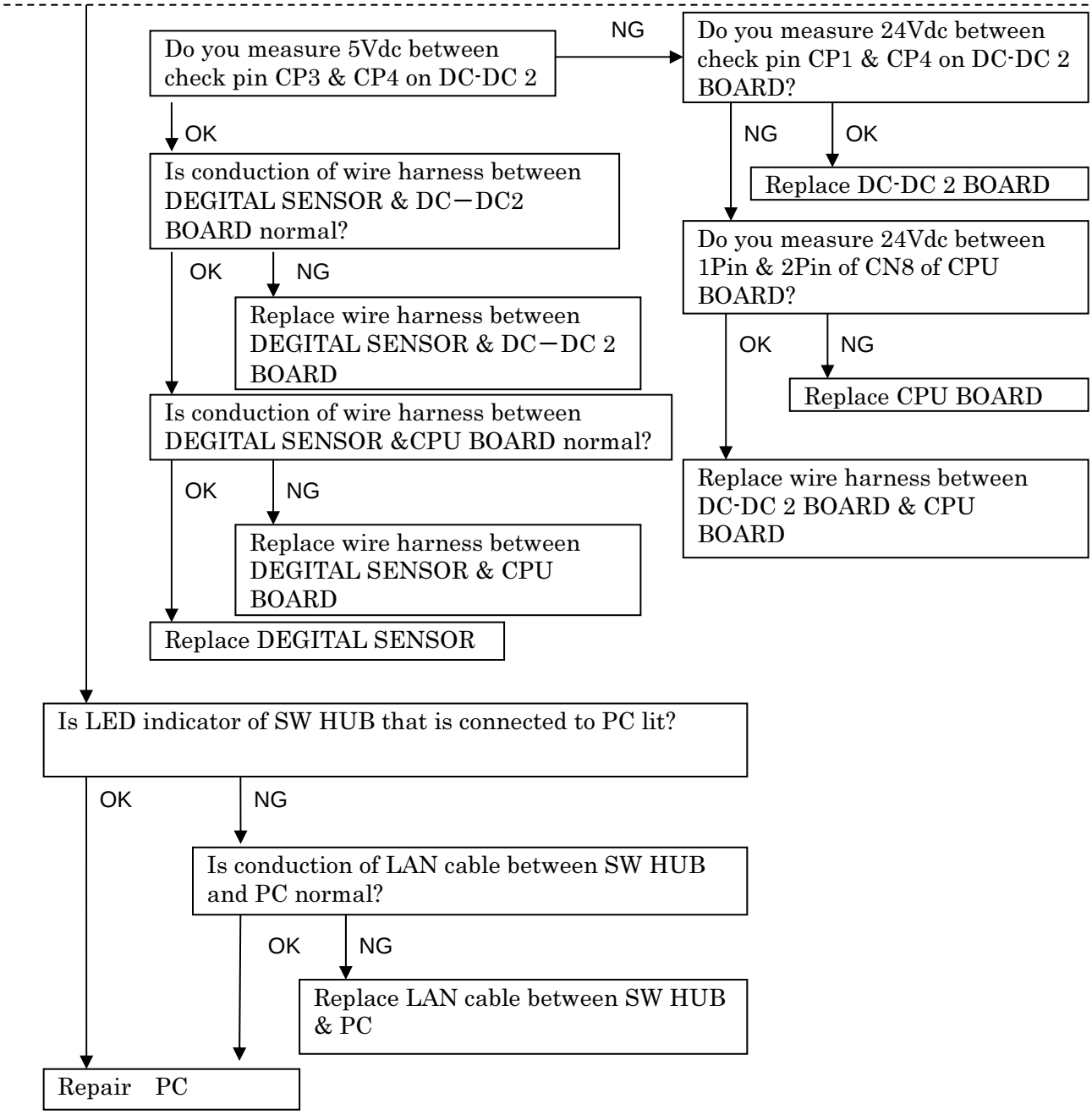
6.7. Exposure Switch doesn't work



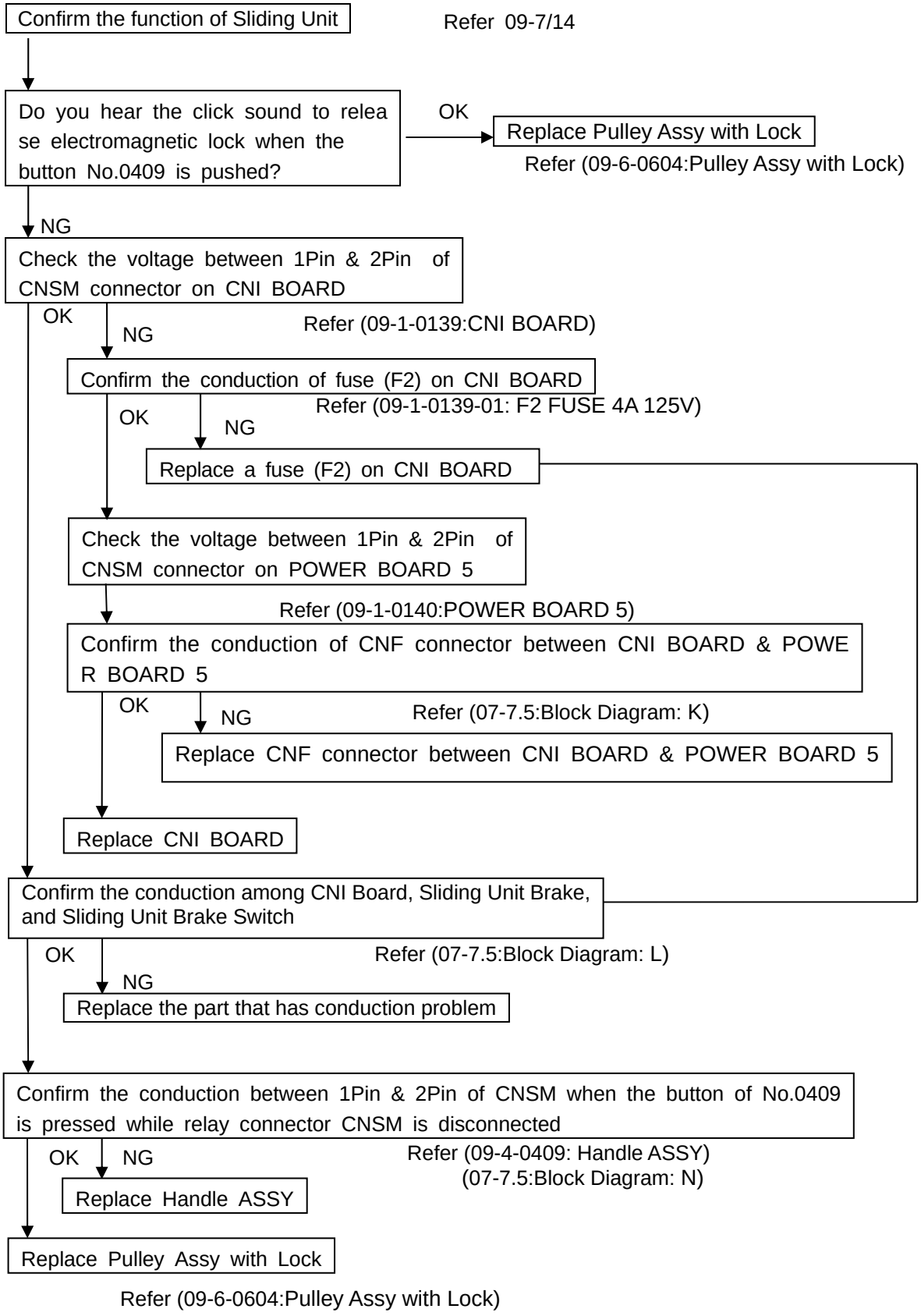
6.8. Communication Error between PC and Main CPU Board



Continue to next page


Do you measure 5Vdc between check pin CP3 & CP4 on DC-DC 2
NG
Do you measure 24Vdc between check pin CP1 & CP4 on DC-DC 2 BOARD?
OK
NG
OK
Replace DC-DC 2 BOARD
Is conduction of wire harness between DEGITAL SENSOR & DC－DC2 BOARD normal?
Do you measure 24Vdc between 1Pin & 2Pin of CN8 of CPU BOARD?
OK
NG
OK
NG
Replace wire harness between DEGITAL SENSOR & DC－DC 2 BOARD
Replace CPU BOARD
Is conduction of wire harness between DEGITAL SENSOR &CPU BOARD normal?
Replace wire harness between DC-DC 2 BOARD & CPU BOARD
OK
NG
Replace wire harness between DEGITAL SENSOR & CPU BOARD
Replace DEGITAL SENSOR
Is LED indicator of SW HUB that is connected to PC lit?
OK
NG
Is conduction of LAN cable between SW HUB and PC normal?
OK
NG
Replace LAN cable between SW HUB & PC
Repair PC

6.9. Sliding Unit doesn't move up/down



6.10. After irradiation of X-ray, it takes long time before save file screen Comes up

Possible cause	Loose connection of LAN cable between PC and CMOS sensor

Check the connection of LAN cable by using LAN tester → NO → Replace LAN cable

YES ↓

Refer (09- 6/14<301>)
Refer (09-14/14<702>)

Insert LAN cable connector till you hear a click sound

Possible cause	Connected at 100Mbps

Replace NIC, Switching Hub and LAN Cable to Gigabit type

06

6.11. Horizontal lines at equal interval on the image

Possible cause	Image is not corrected because right calib files are not used. (Calib files for other Bel-Cypher is used)

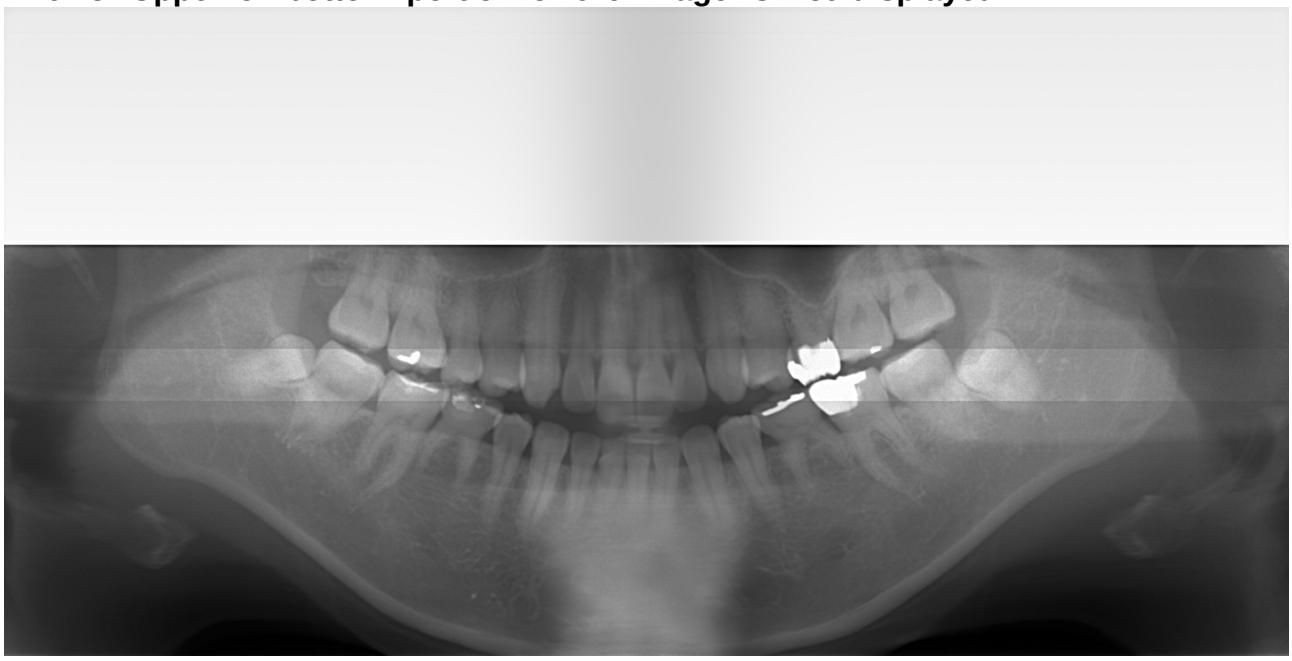
Copy “max_data” folder stored in calib folder in the CD supplied with Bel-Cypher N to C:¥BelCypherN	NO →	Create Calib files by referring to 12. How to create Calib data

6.12. Lines on the top and bottom portion of the image

Possible cause	Wrong ini file is used. (ini file for other Bel-Cypher is used)

Copy “BEL_CYPHER_C.ini” stored in calib folder in supplied Twain Driver CD to C:¥BelCypherN

6.13. Upper or bottom portion of the image is not displayed



Possible cause	Unable to initialize CMOS sensor

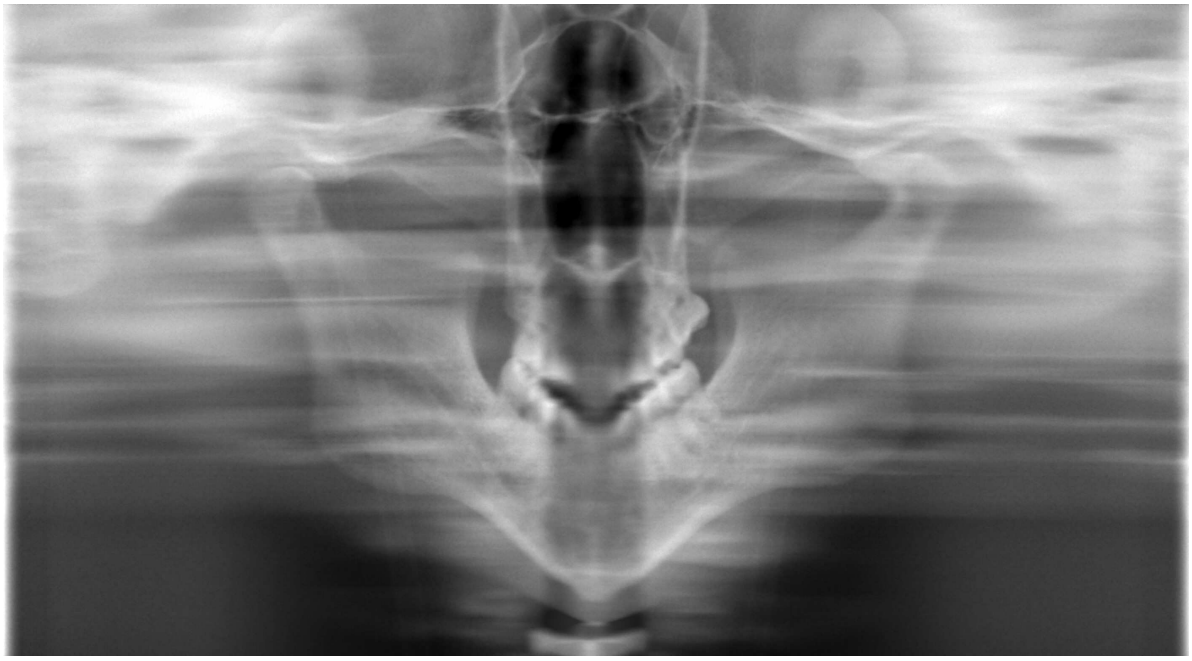
Turn off / on the power of Bel-Cypher N → NO → Replace CMOS sensor

6.14. The image stretches from the certain point

Possible cause	Rotation stops in the middle of shooting

Follow the Trouble Shooting**.** 6.2. Arm doesn't rotate

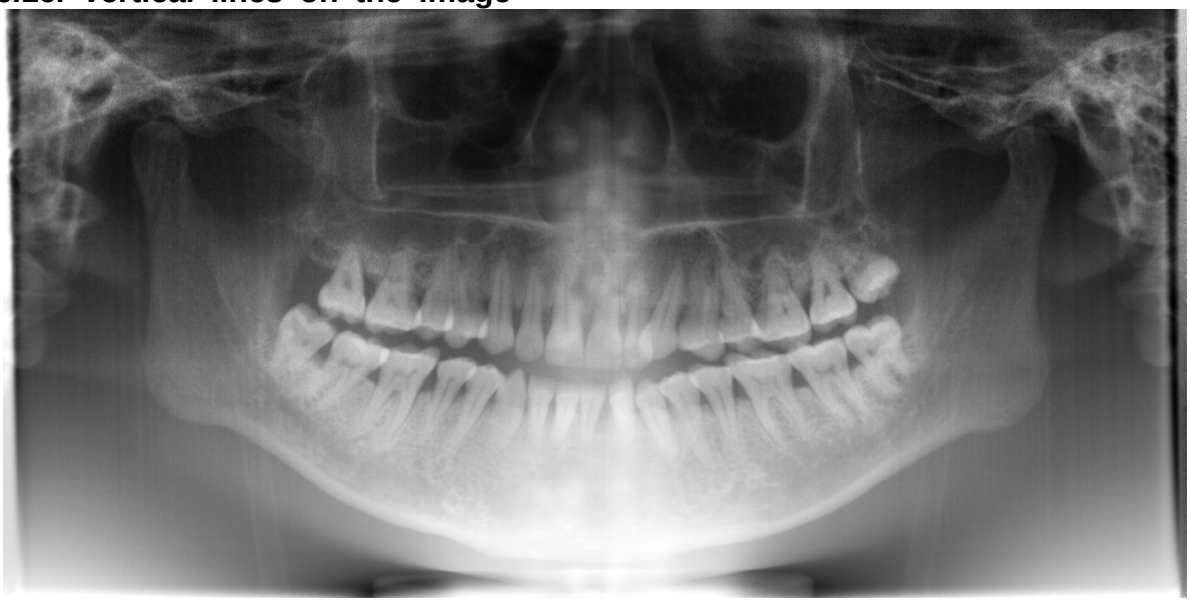
6.15. Shrank dentition in the image



Possible cause	The movement of Y-axis is stopped in the middle of shooting

Follow the Trouble Shooting**.** 6.3. Y-axis Doesn't Move

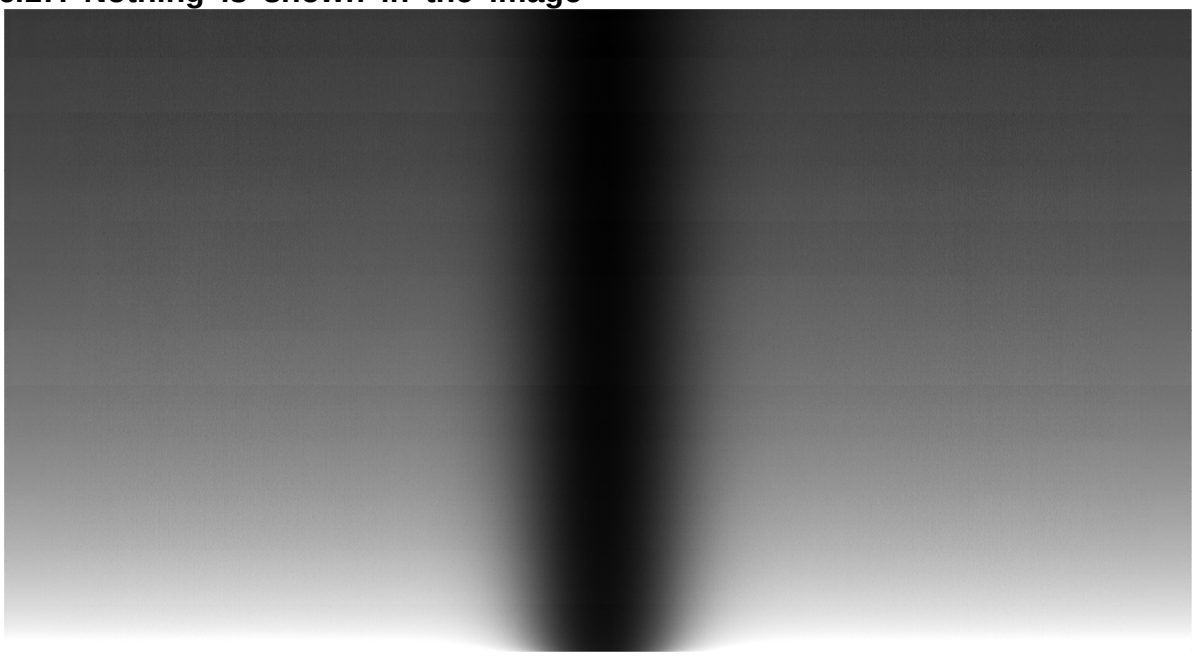
6.16. Vertical lines on the image



Possible cause	The mask is not properly adjusted

Follow the Trouble Shooting. **Method of X-ray radiation field**

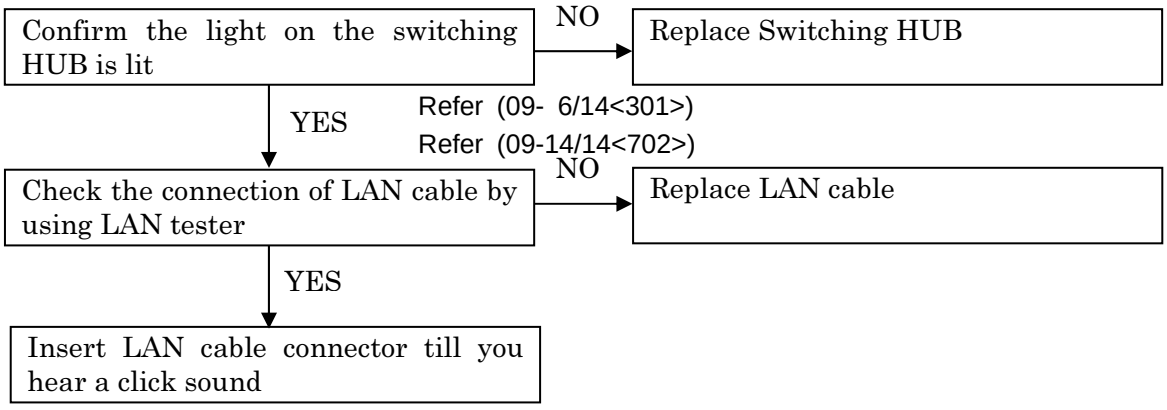
6.17. Nothing is shown in the image



Possible cause	There is a possibility that X-ray didn't irradiate.

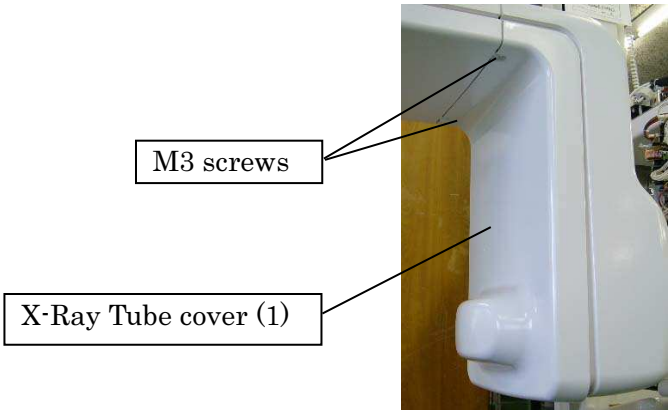
Follow the Trouble Shooting. 6.6. Unable to Irradiate X-rays

Possible cause	LAN connection between PC and CMOS sensor is not stable.

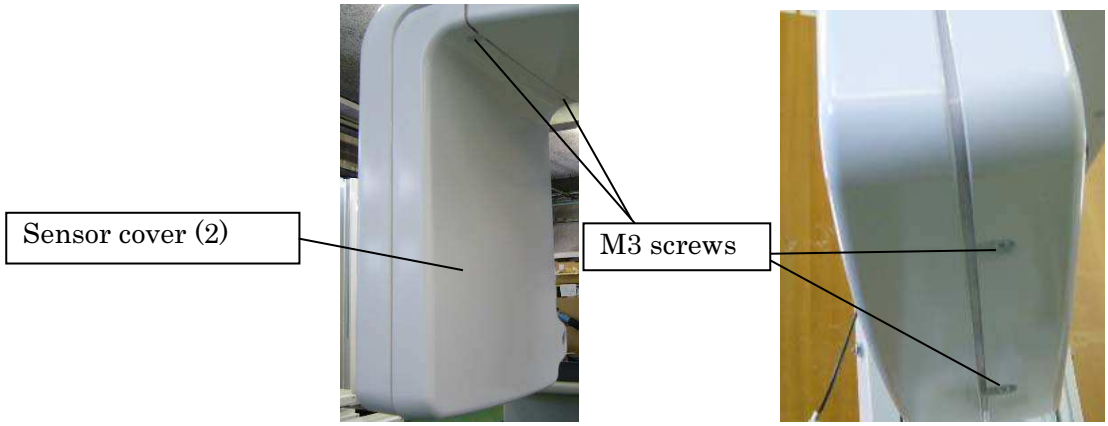


6.18. How to adjust X-ray exposure field

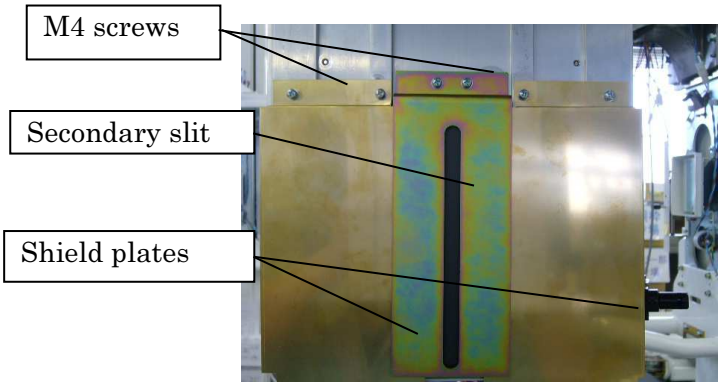
1. Remove X-Ray Tube cover (1)



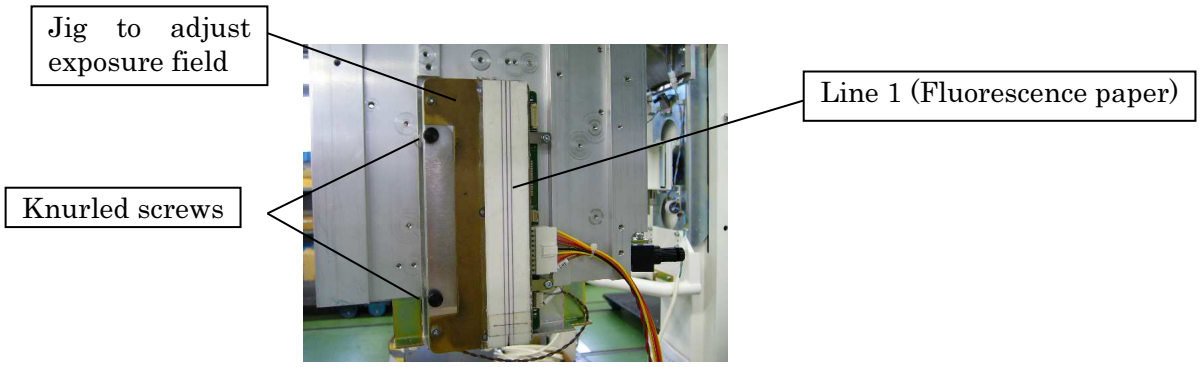
2. Remove sensor cover (2)



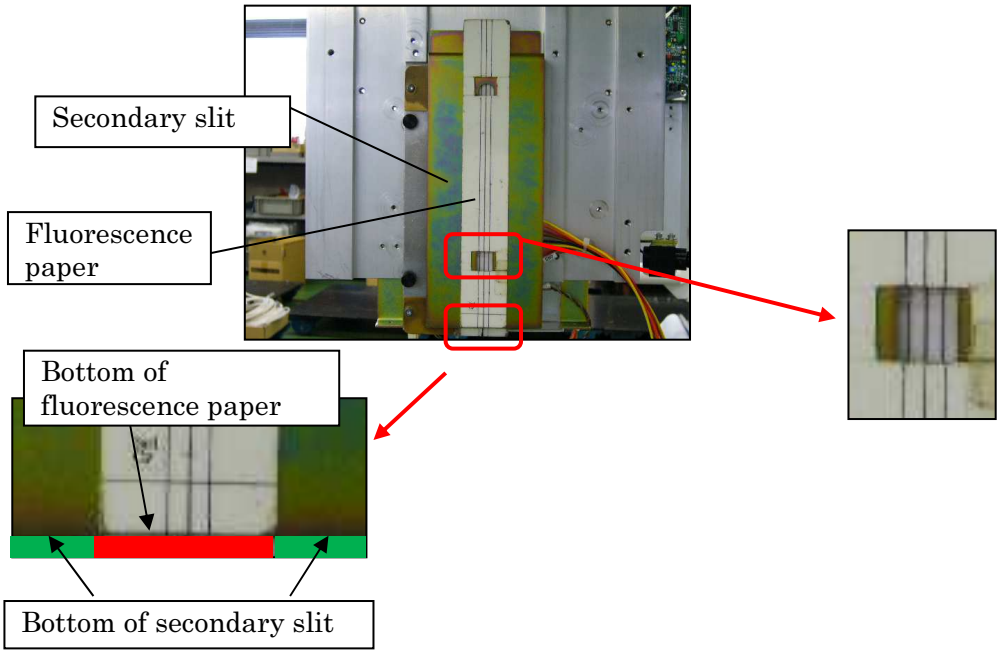
3. Remove the secondary slit and two shield plates



4. Attach the Jig that adjust exposure field
   1 Remove two M3 screws that hold sensor
   2 Fix the Jig that adjust exposure field by two knurled screws



5. Attach secondary slit
   - Align the center line of secondary slit with the center of line 1
6. Paste fluorescence paper on the secondary slit
   1 Align the bottom of fluorescence paper with the bottom of secondary slit
   2 Align the center of pasted fluorescence paper with the center of fluorescence paper on the Jig

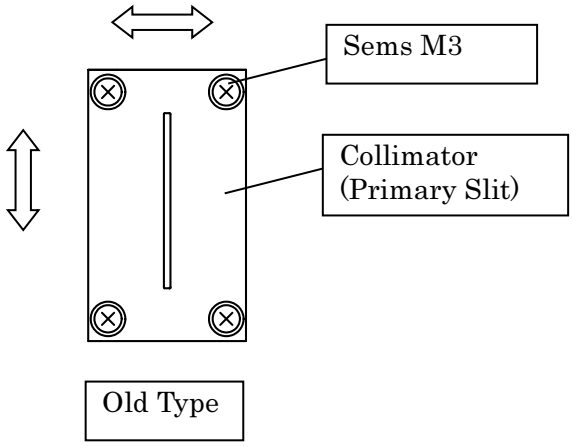


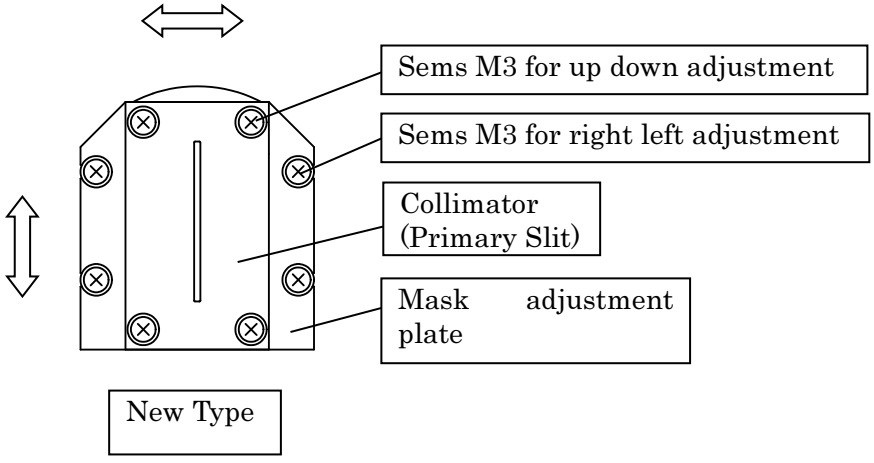
7. Turn on the power of Bel-Cypher N
8. Start TWAIN and choose panorama
9. Go into Test mode to disable arm rotation
   (Hit Ctrl+Alt+T simultaneously)
10. Set exposure settings as 64kV, 8mA
11. Darken the surrounding area of sensor
    (i.e. turn off the light)
12. Click READY and push exposure switch
13. Confirm the position of X-ray radiation by looking at florescence paper

14. Adjust collimator (primary slit) to align the center of florescence paper with center of X-ray radiation
    1 Scribe the outer frame of collimator by using a pencil
    2 Remove four M3 x 10 sems screws
    3 Remove collimator (primary slit)
    4 Thoroughly wipe collimator
    5 Temporarily attach collimator along scribed line (1)
    6 Adjust the error difference confirmed at "13"
    7 Tighten sems screws to the extent that spring washer works

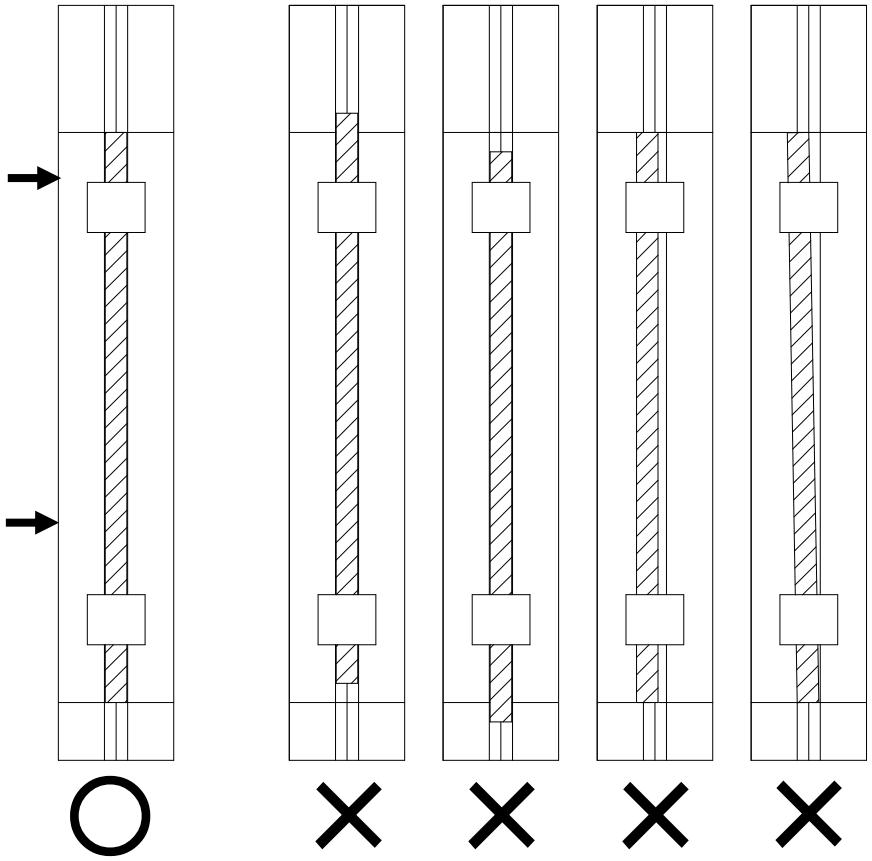
Rem: There are two types of collimators depends on manufacturing period. And adjustment methods are different.

- Old type: Adjust exposure field by moving collimator right and left & up and down
- New type: Adjust exposure filed by moving collimator up and down. Adjust exposure field by moving mask adjustment plate right and left.





15. Confirm whether the center of florescence paper and center of X-ray beam are aligned or not by irradiating X-ray



*Caution: If you make more than two X-ray irradiations, irradiate X-ray for less than 3 seconds to avoid malfunction of X-ray tube

16. If not aligned, repeat from 13
17. If aligned, remove florescence paper and Jig
18. Fix sensor by two screws
19. Attach two shield plates
20. Attach covers
21. Turn the power off

7. RESPONSE TO ERROR MESSAGE

When an error occurred in the equipment, the error message appears on the PC Screen. Take a measure to resolve the error.

1. Inverter Error
2. Tube Temperature Error
3. Y Axis Motor Error
4. Rotation Motor Error
5. X-Ray Switch Error
6. Communication Error between PC and Main CPU
7. <Cypher.Cypher It occurred error when opening TCP/IP circuit.Turn on the the power of the X-ray equipment again. err>
8. Communication Error. Communication is not established.(1) MSG : Sensor is not connected
9. Could not read INI file, Set default.
10. Communication with equipment is unavailable.Confirm power on of the equipment
11. The program can't start because PvDevic64.dll is missing from your computer.
12. Unable to load DLL"NeoDCAM64.dll"

07

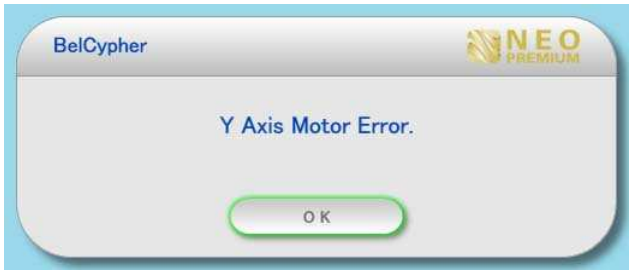
1. Inverter Error

Follow the Trouble Shooting 6.6. Unable to Irradiate X-rays

2. Tube Temperature Error

Follow the Trouble Shooting 6.4. Tube Temperature Error, Unable to irradiate X-Ray

3. Y Axis Motor Error



Follow the Trouble Shooting**.** 6.3. Y-axis Doesn't Move

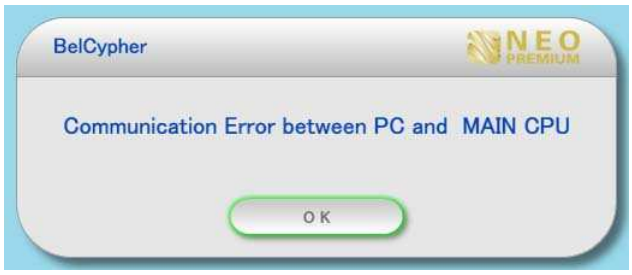
4. Rotation Motor Error

Follow the Trouble Shooting**.** 6.2. Arm doesn't rotate

5. X-Ray Switch Error

Follow the Trouble Shooting**.** 6.7 Exposure Switch doesn't work

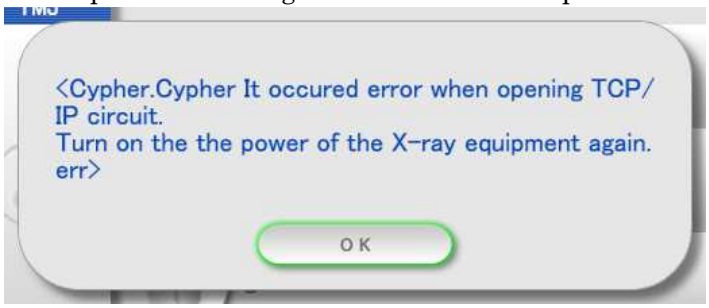
6. Communication Error between PC and Main CPU



Follow the Trouble Shooting**.** 6.8. Communication Error between PC and Main CPU Board

7. <Cypher.Cypher It occurred error when opening TCP/IP circuit. Turn on the the power of the X-ray equipment again. err>

Below error comes up after clicking OK on "Confirm power of the equipment"



Possible cause	Communication failure between PC (NIC) and Bel-Cypher N (RS232C/LAN board)

Confirm that LAN cable is firmly connected to PC

YES

Check the connection of LAN cable by using LAN tester

NO → Replace LAN cable

YES

Refer (09- 6/14<307>)
Refer (09-14/14<702>)

Confirm the light on the switching HUB is lit

NO → Replace Switching HUB

YES

Is LED indicator of LAN board lit?

If you change the IP address, confirm the correct IP address are written in "BEL_CYPHER_C.ini" file by referring 14. Change IP address

Replace LAN board

Is LED indicator of RS232C/LAN board lit?

NO

Replace RS232C/LAN board

Confirm IP address of NIC and RS232C/LAN board belong to the same network class.
Default IP address of NIC: 169.254.87.101
Default IP address of RS232C/LAN board: 169.254.0.181
If they don't belong to the same network class, change IP address setting of NIC to obtain IP address automatically, and set IP address of RS232C/LAN board by referring to "14. Change IP address" of this service manual. After setting is done, set IP address of NIC to "use the following IP address".

8. Communication Error. Communication is not established.(1) MSG : Sensor is not connected

Below error occurs when Ready is clicked.

Possible cause	Communication problem between PC and CMOS sensor

Confirm that LAN cable is firmly connected to PC

YES

Check the connection of LAN cable by using LAN tester

NO → Replace LAN cable

YES

Refer (09- 6/14<301>)
Refer (09-14/14<702>)

Confirm IP address of NIC and CMOS sensor belong to the same network class.
Default IP address of NIC: 169.254.87.101
Default IP address of CMOS sensor: 169.254.87.181
If they don't belong to the same network class, change IP address setting of NIC to obtain IP address automatically, and set IP address of CMOS sensor by referring to "14. Change IP address" of this service manual. After setting is done, set IP address of NIC to "use the following IP address".

NO

Confirm whether you can get an image or not by referring to 11.ExCap

NO

Replace NIC

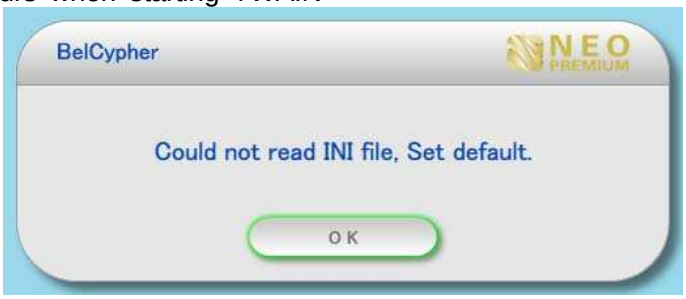
NO

Replace CMOS sensor

07

9. Could not read INI file, Set default.

Below error occurs when starting TWAIN



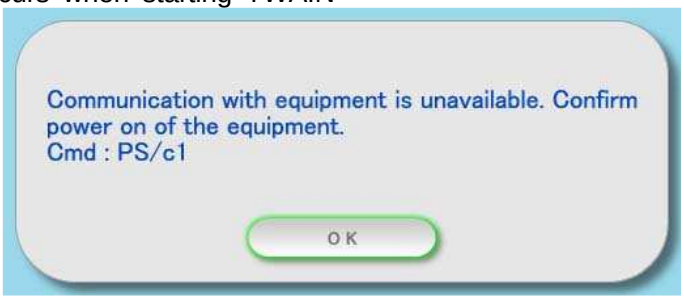
Possible cause	Ini file doesn't exist in C:¥BelCypherN folder

Copy "BEL_CYPHER_C.ini" and "BelCypher_Save.ini" in calib folder of TwainDriverCD came with Bel-Cypher N to C:¥BelCypherN

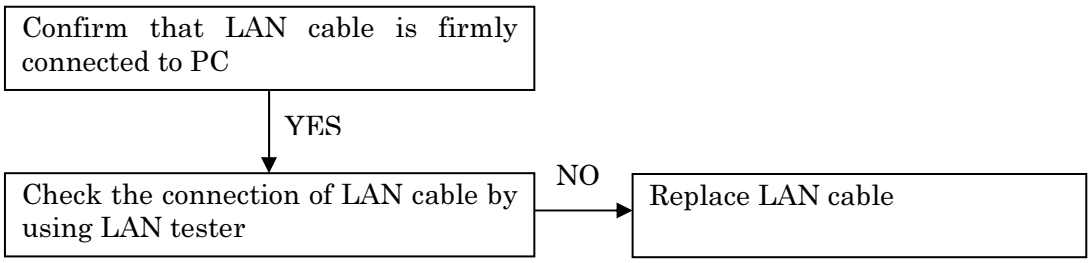
07

10. Communication with equipment is unavailable. Confirm power on of the equipment

Below error occurs when starting TWAIN



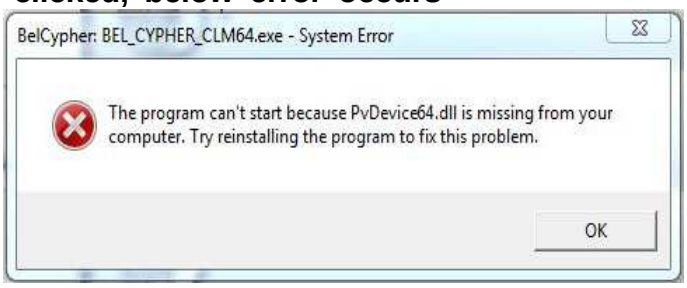
Possible cause	Communication problem between PC and RS232C/LAN board



Refer (09- 6/14<307>)
Refer (09-14/14<702>)

07

11. When Ready is clicked, below error occurs



*In case of 32bit OS, PvDevice.dll is missing

Possible cause	TWAIN was installed by using LibraryCD（No.01）and TwainDriverCD（No.02～）

Uninstall following programs
（GenlCam v2.2 / DCAM-API for GigE / Bel-CypherN Twain）
Delete C:¥BelCypherN folder
Reinstall TWAIN by referring to installation manual

Possible cause	TWAIN was installed by using LibraryCD（No.02～）and TwainDriverCD（No.01）

Uninstall following programs
（DCAM-API Drivers for GigE Cameras / Bel-CypherN Twain）
Delete C:¥BelCypherN folder
Reinstall TWAIN by referring to installation manual

Possible cause	After uninstalling TwainDriverCD(No.001), installed TWAIN by using TwainDriverCD（No.02～）without deleting :¥BelCypherN folder

Uninstall TwainDriverCD
Delete C:¥BelCypherN folder
Reinstall TWAIN by using TwainDriverCD

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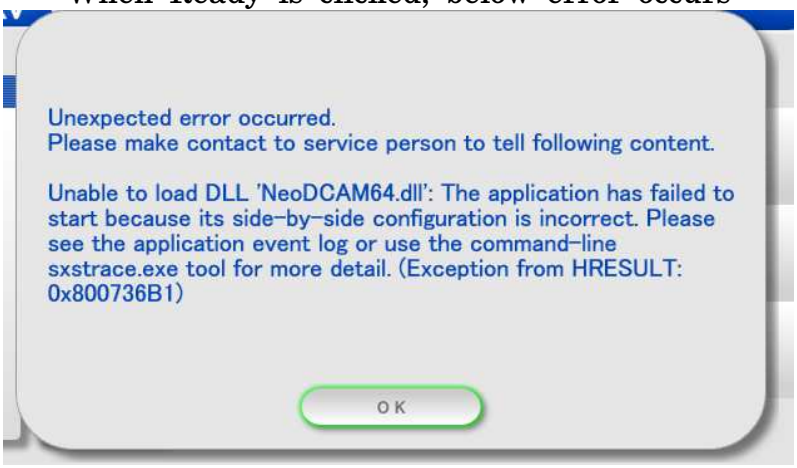
12. Unable to load DLL"NeoDCAM64.dll"

When Ready is clicked, below error occurs



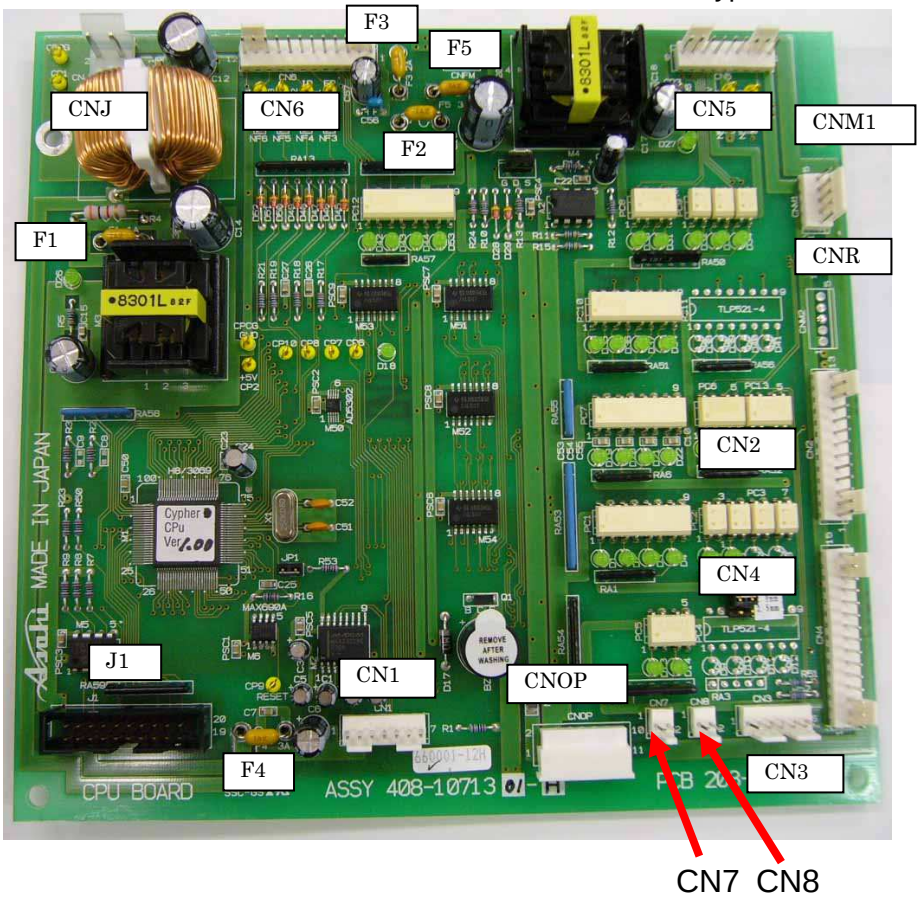
*In case of 32bit OS,NeoDCAM.dll is missing

Possible cause	32bitOS : vcredist_x86.exe is not installed 64bitOS : vcredist_x64.exe is not installed

32bitOS : Install “vcredist_x86.exe” stored in TwainDriverCD →”Setup_x32”→”vcredist_x86” folder
64bitOS : Install “vcredist_x64.exe” stored in TwainDriverCD →”Setup_x64”→”vcredist_x64” folder

7.2 CPU Board of Bel-Cypher

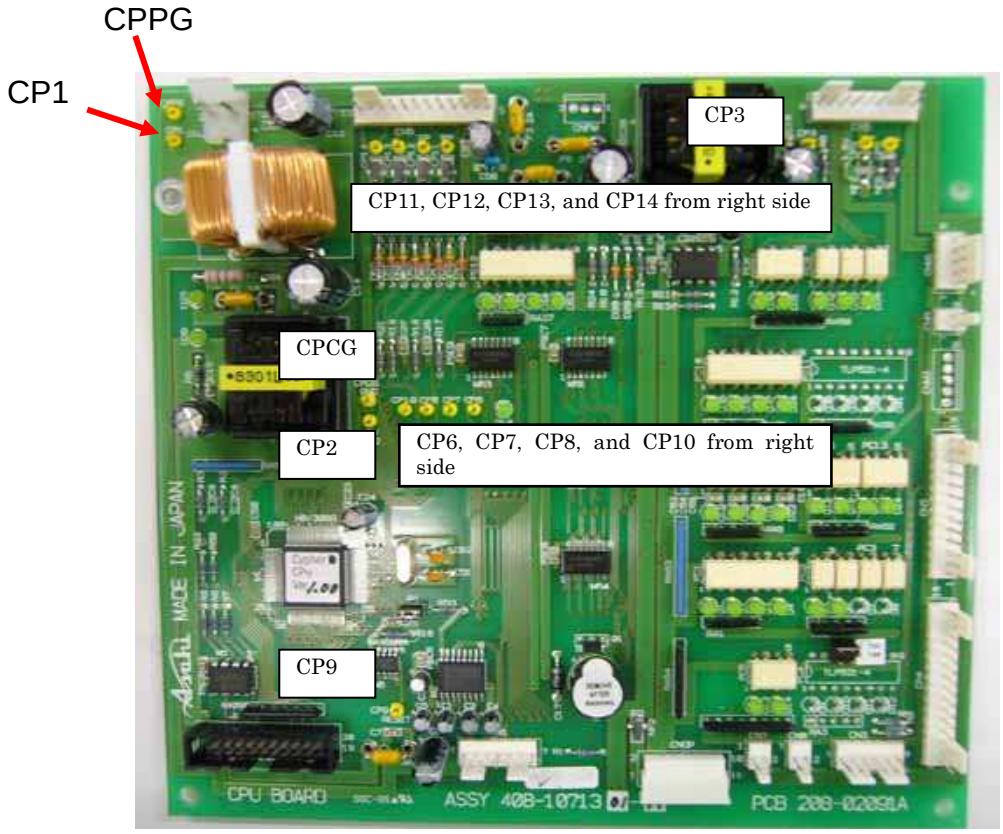
1 . Position of connectors and fuse on CPU Board of Bel-Cypher



Name of connector	Function	Where to be connected
CNJ	+24V Input	Switching Power Supply
CN6	Inverter interface	Inverter Board
CN5: 1 CN5: 5 and 6 CN5: 7, 8, and 9	Each Sensor and Output of power source for motor Output of power source for Each indicator beam Output of control output for Y Axis Motor	CNI BOARD
CNM1	Output of control for Rotation Motor	CNI BOARD
CNR	Signal for READY Signal for POWER OFF	POWER BOARD 5
CN 2	Input of Origin Sensor for Rotation	CNI BOARD
CN2: 5 CN2: 6 CN2: 7 CN2: 13	Input of Origin Sensor for Y Axis Input of Limit Sensor for Y Axis X-RAY ON LED (YW) X-RAY SW signal	CNI BOARD
CN4: 14 and 15	Input of signal for Thermal Switch	Relay connector CNTH
CN3	NC	NC
CN8	+24V	DC-DC 2BOARD

CN7	Output of Power Source for Cooling Fan of Inverter	Relay connector CN7
CNOP	Connector to connect with Operation Panel for Test	Operation Panel for Test
CN1: 1 and 2 CN1: 3, 4, and 5 CN1: 6 and 7	Output of power source Communication with RS232C Output of start signal to obtain image	CCD Sensor
J1	Writing of inside software of CPU	NC

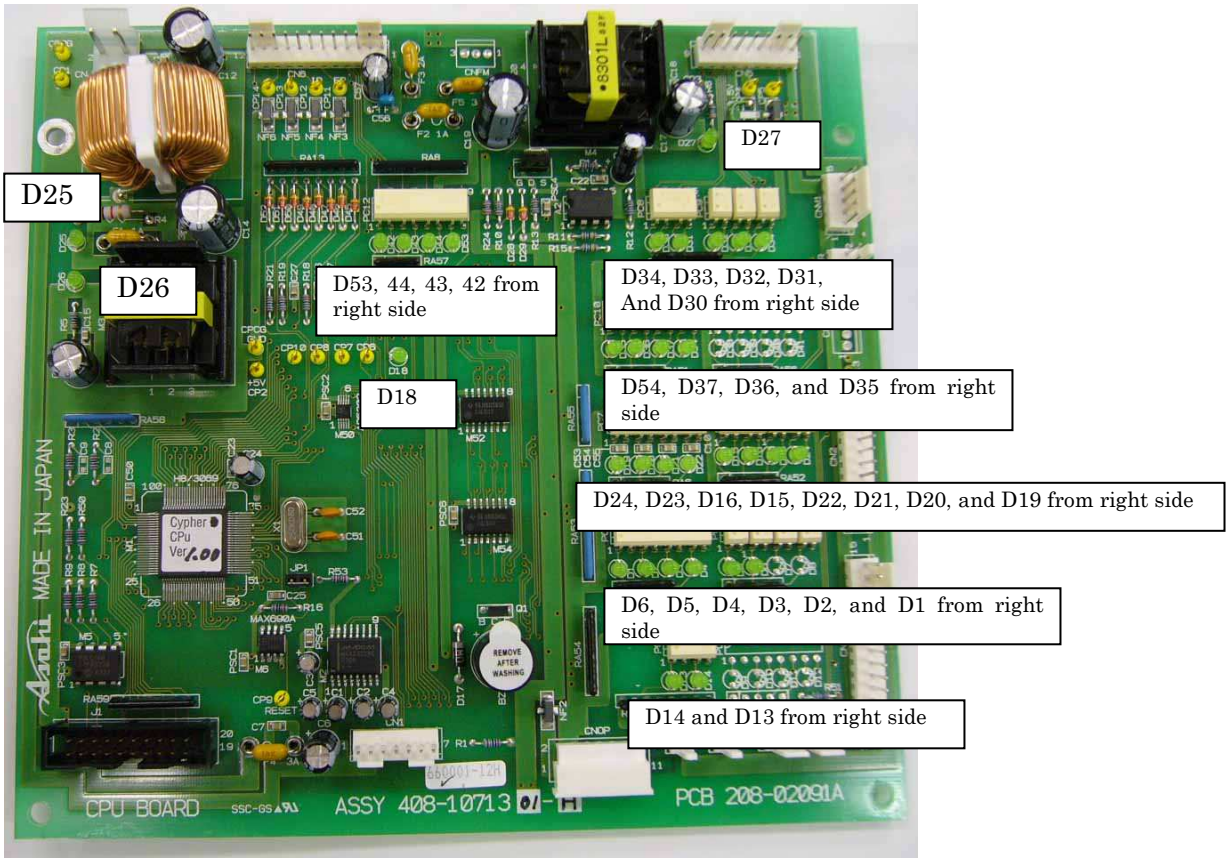
2 . Position of Check Pin for Bel-Cypher



Pin Number	Function
CPCG	Ground for Signal
CPPG	Ground for Power
CP1	+24 Vdc
CP2	+5 Vdc（inside of CPU Board）
CP3	+5 Vdc (For P.C.Boards outside of CPU Board）
CP4	+3.5 Vdc (For Laser Beams)
CP5	No needs to check (Circuits around CP5 are not used)
CP6	Clock signal for Y Axis Motor (Output)
CP7	Clock signal for Rotation Motor
CP8	No needs to check (Circuits around CP5 are not used)
CP9	RESET
CP10	Start signal for X-ray exposure (Output)

CP11	Feedback signal for Tube Voltage (Input)
CP12	Feedback signal for Tube Current (Input)
CP13	Setting signal for Tube Voltage (Output)
CP14	Setting signal for Tube Current (Output)

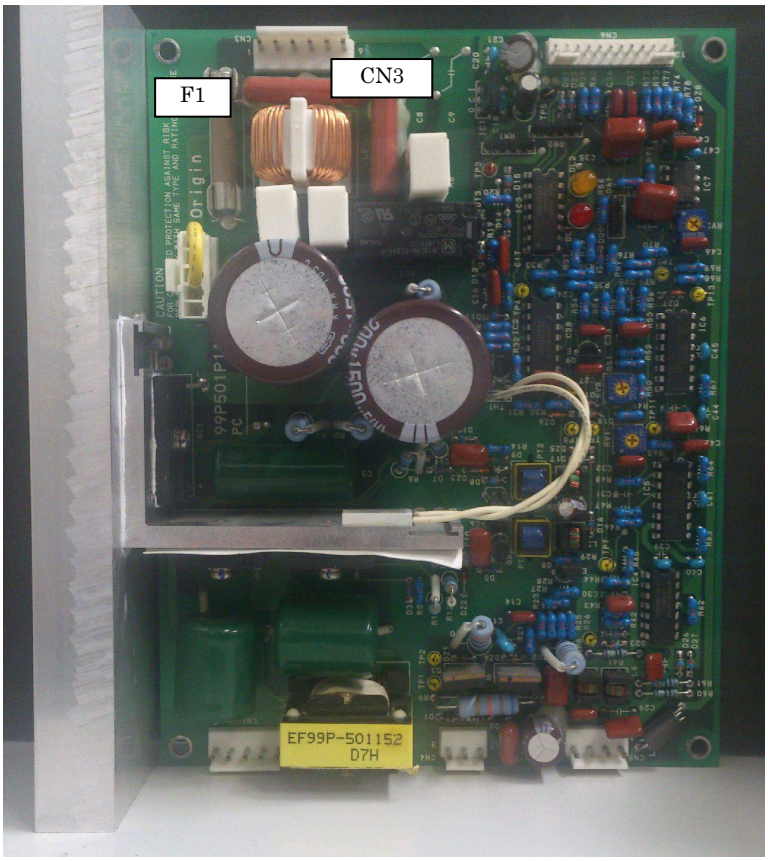
3 . Position of LED for Bel-Cypher



Number of LED	Function (Working of LED)
D1	Not used
D2	Not used
D3	Not used
D4	Origin for Rotation: LED is lighted ON when sensor is shaded
D5	Origin for Y Axis: LED is lighted ON when the sensor is shaded.
D6	Limit for Y Axis: LED is lighted ON when the sensor is shaded.
D13	Not used
D14	Thermal Switch: LED lights OFF when the switch works.
D15	Signal for READY ON: LED is lighted ON at time of READY.
D16	Signal for Auto Power OFF: LED lights ON when the signal is output.
D18	Start signal to fetch images: LED lights ON when the signal is output.
D19	Beam Right Side Switch: LED lights ON while the switch is being pushed.
D20	Beam Left Side Switch: LED lights ON while the switch is pushed.
D21	RESET Switch: LED lights ON while the switch is pushed.
D22	X-RAY Switch: LED lights ON while the switch is pushed.

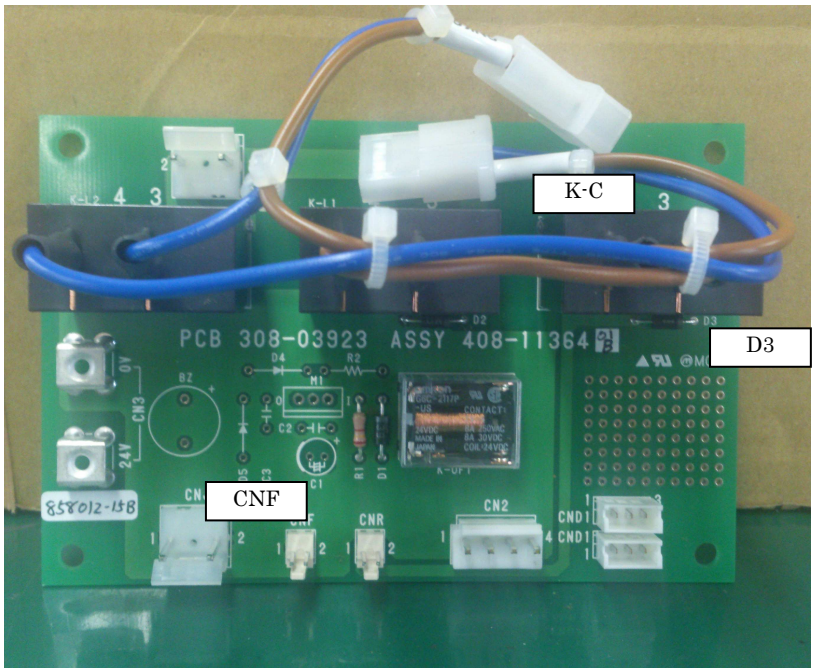
D23	X-RAY On LED(YW): LED lights ON while X-ray is exposed.
D24	No usage
D25	+24V Input:: LED is lighted ON while +24V is being input.
D26	+5V Output(inside of CPU): LED lights ON while +5V is input.
D27	+5V Output(outside of CPU): LED lights ON while +5V is being input.
D30	No usage
D31	No usage
D32	CLK signal for Y Axis Motor: LED repeats to light ON and OFF when the motor works.
D33	CW/CCW signal for Y Axis Motor: LED lights ON when the origin moves.
D34	ENABLE signal for Y Axis Motor: LED lights OFF when the motor is locked.
D35	CLK signal for Rotation Motor: LED repeats to light ON and OFF when the motor works.
D36	CW/CCW signal for Rotation Motor: LED lights OFF when the origin moves.
D37	Enable signal for Rotation Motor: LED lights OFF when the motor is locked.
D42	Signal for X-ray CONT: LED lights ON when the signal is output.
D43	Signal for Prehead: LED lights ON when the signal is output.
D44	Signal for Inverter Alarm Reset: LED lights ON when the signal is output.
D53	Signal for Inverter Alarm: LED lights ON when the signal is input.

7.3 INV BOARD of Bel-Cypher



Number of parts	Function
CN3	Connector:I+24V Input
F1	Fuse:INPUT AC Voltage

7.4 POWER BOARD 5 of Bel-Cypher

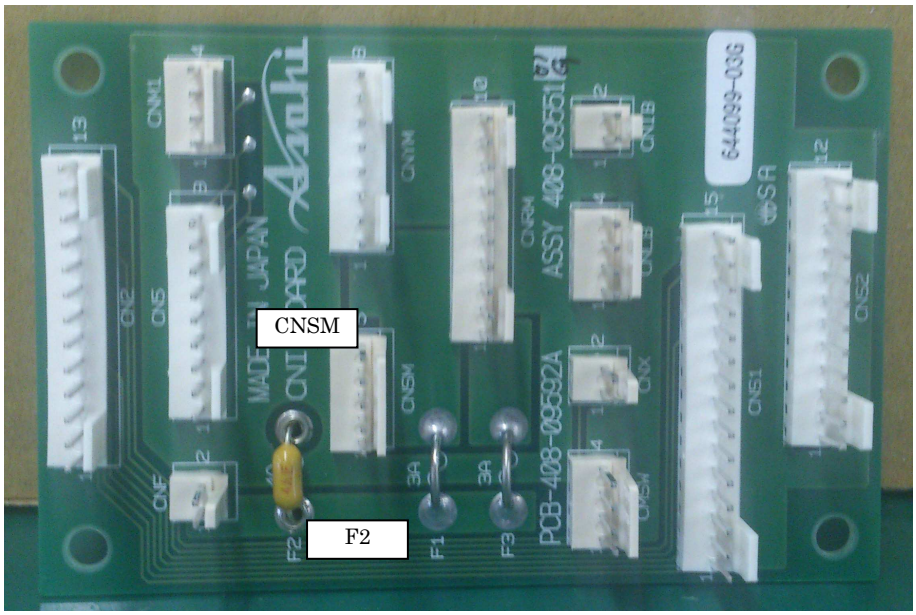


Number of parts	Function
D3	Diode : At the Ready condition, does +24Vac come on.
K-C	Relay : At the Ready condition INPUT AC Voltage
CNF	Connector : +24Vdc

7.5 DC-DC BOARD of Bel-Cypher

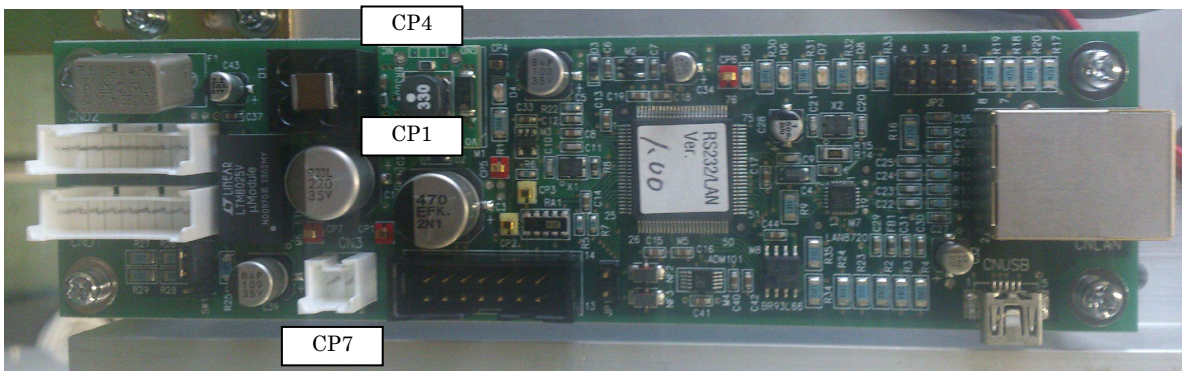
Number of parts	Function
CP1	Check Pin:+24V
CP3	Check Pin:+5V
CP4	Check Pin:GND

7.6 CNI BOARD of Bel-Cypher



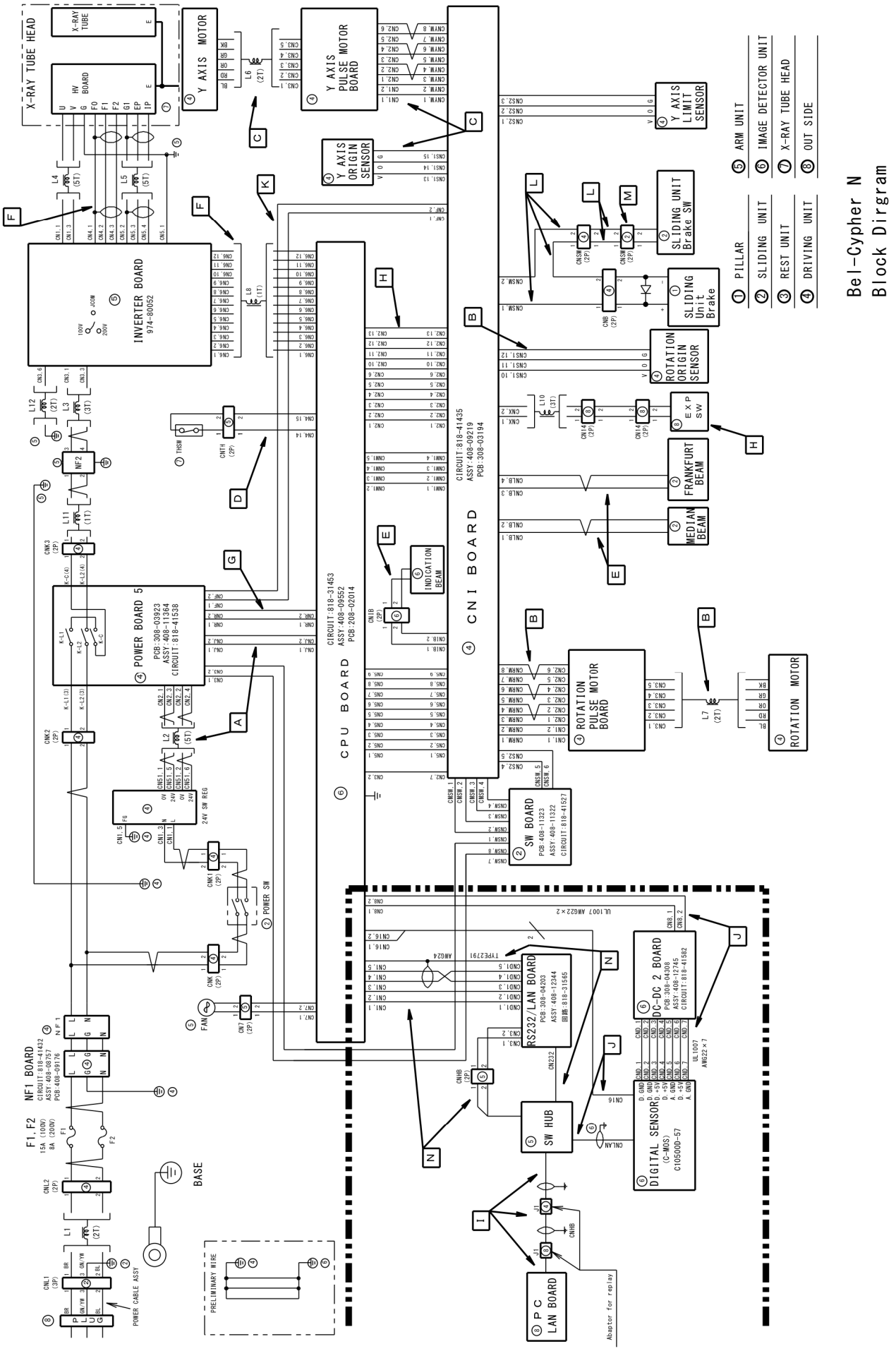
Number of parts	Function
F2	Fuse :protective 24Vdc line
CNSM	Connector :+24Vdc

7.7 RS232C/LAN BOARD of Bel-Cypher



Number of parts	Function
CP1	Check Pin:+24V
CP4	Check Pin:GND
CP7	Check Pin:+12V or 5 V if Jumper SW1 is moved

7.8 Block Diagram of Bel-Cypher

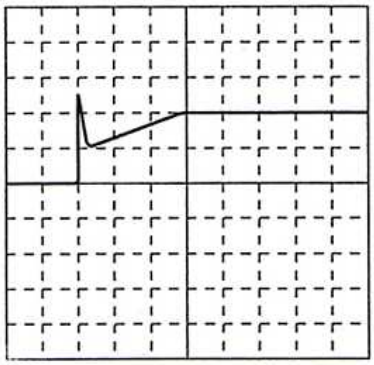


7.9 Adjustment of Tube Current

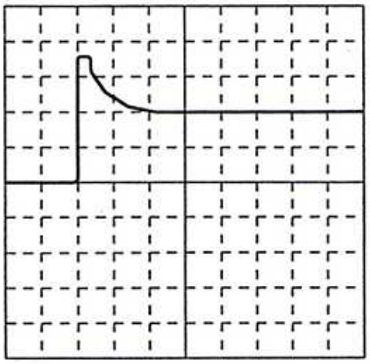
Preheat level can be adjusted by RV1(Adjusting Resistor) on Inverter Board.

Adjusting Method:
1. Hit & Hold CTL+ALT+T to get into Test mode.
2. Click Rest on PC Screen
3. Set Exposure conditions as Panorama, Adult, 70kV & 4mA
4. Click Ready on PC Screen
5. Confirms wave shown on the oscilloscope.
Connect probes of storage oscilloscope to CP12 and CPCG on CPU Board.
Adjust RV1 on Inverter Board to change preheat level.
To rise preheat turn the knob to CW direction. If Inverter Error occurs, turn the knob to CCW direction.
6. When adjustment is completed, hit & hold CTL+ALT+T to get out from Test mode.

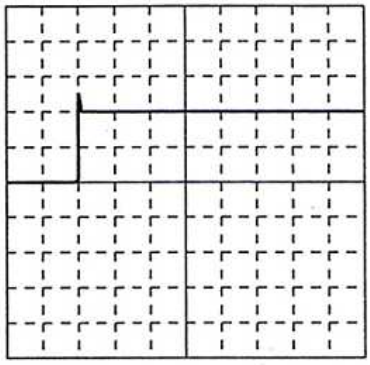
PH is not enough



Too much PH



Adequate PH



Scale 100ms/DIV at horizontal line, 1V/DIV at vertical line

7 After adjustment is done, confirm voltage is set within ranges.

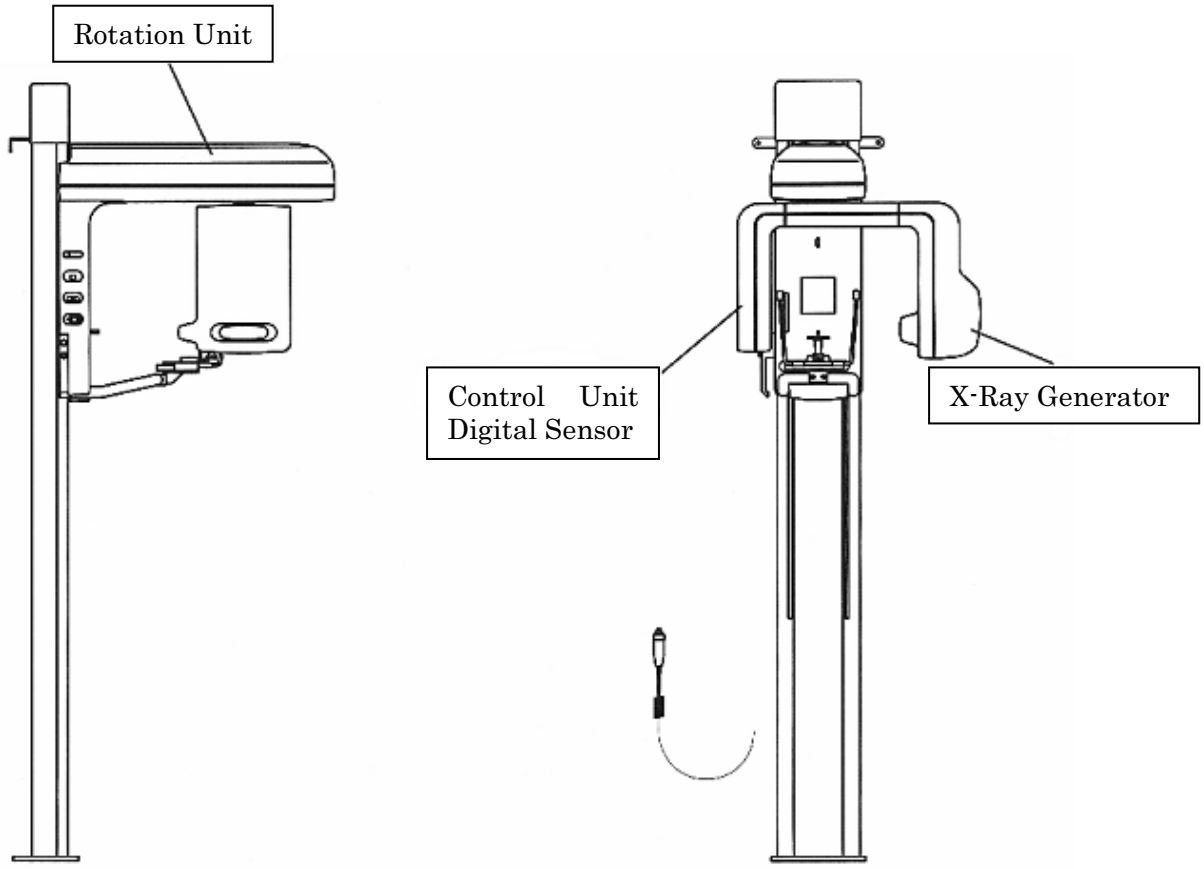
Measuring Point	Tube Voltage	Tube Current	Measured Voltage (Vdc)
Between CP12 & CPGG on CPU Board	70	2	1.0±0.1Vdc
		4	2.0±0.1Vdc
		6	3.0±0.1Vdc
		8	4.0±0.1Vdc

Measuring Point	Tube Voltage	Tube Current	Measured Voltage (Vdc)
Between CP11 & CPGG on CPU Board	60	8	3.0±0.1Vdc
	70		3.5±0.1Vdc
	80		4.0±0.1Vdc

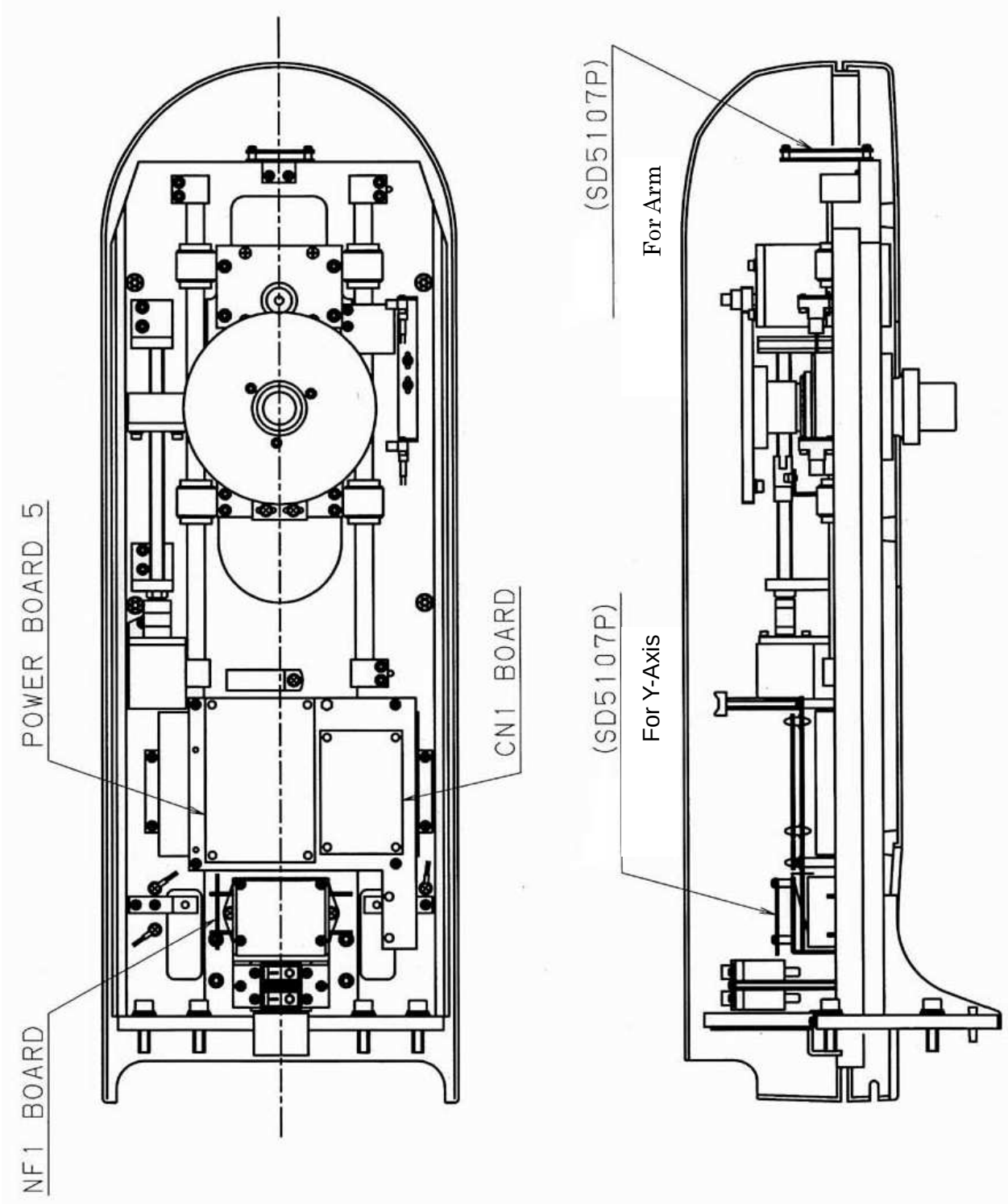
8. PRINTED CIRCUIT BOARD LAYOUT DRAWING

1. Overall View

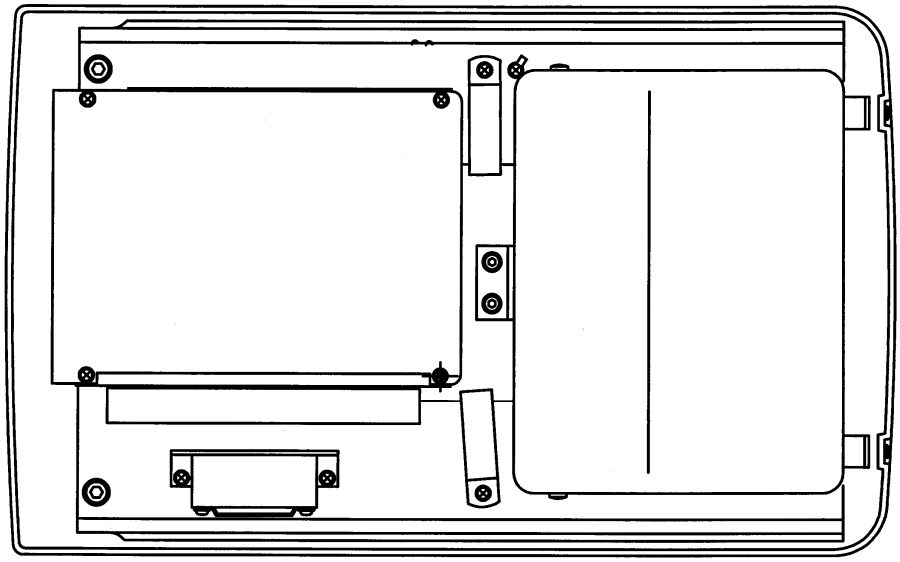
The printed circuit board assemblies are housed in the portions shown in the drawing.

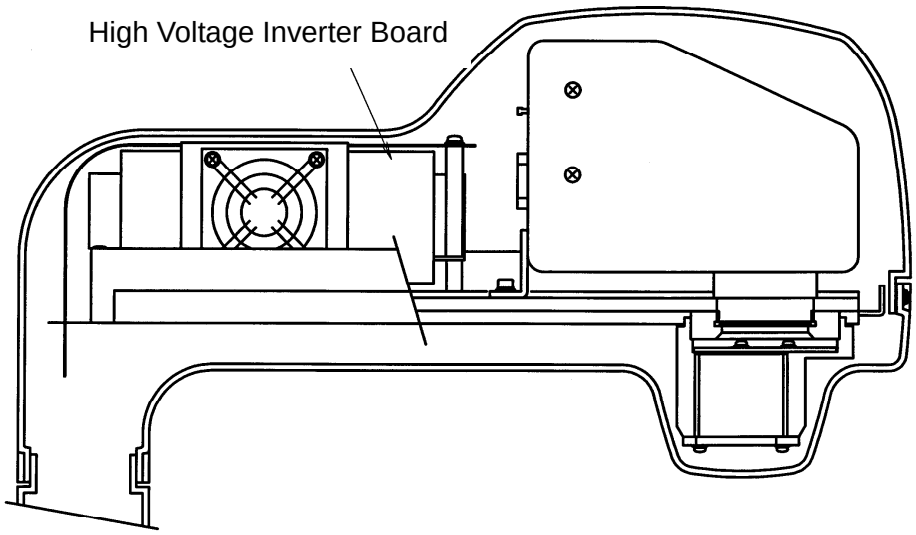


1.1 Rotation Unit

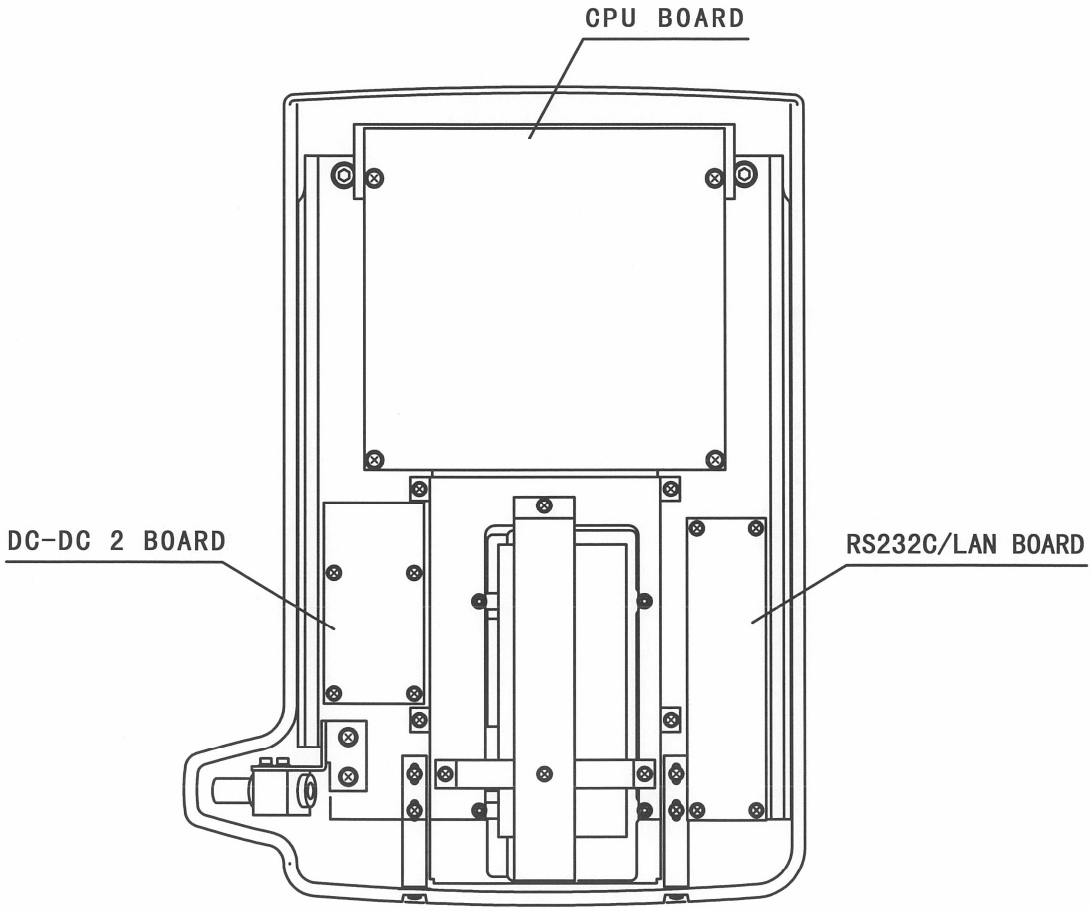


1.2 Arm Section (High Voltage Inverter side)

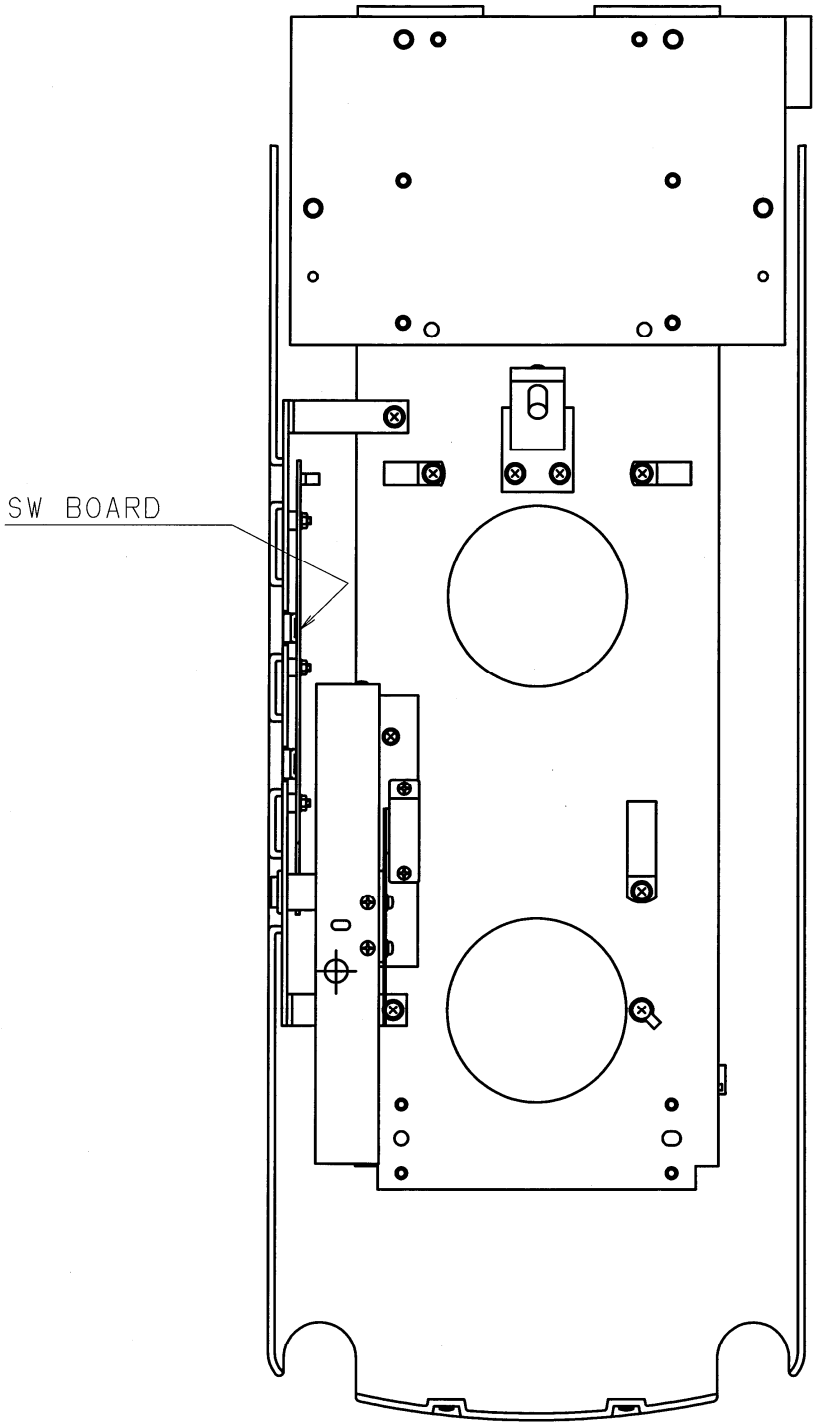




1.3 Arm Section (CMOS Sensor side)

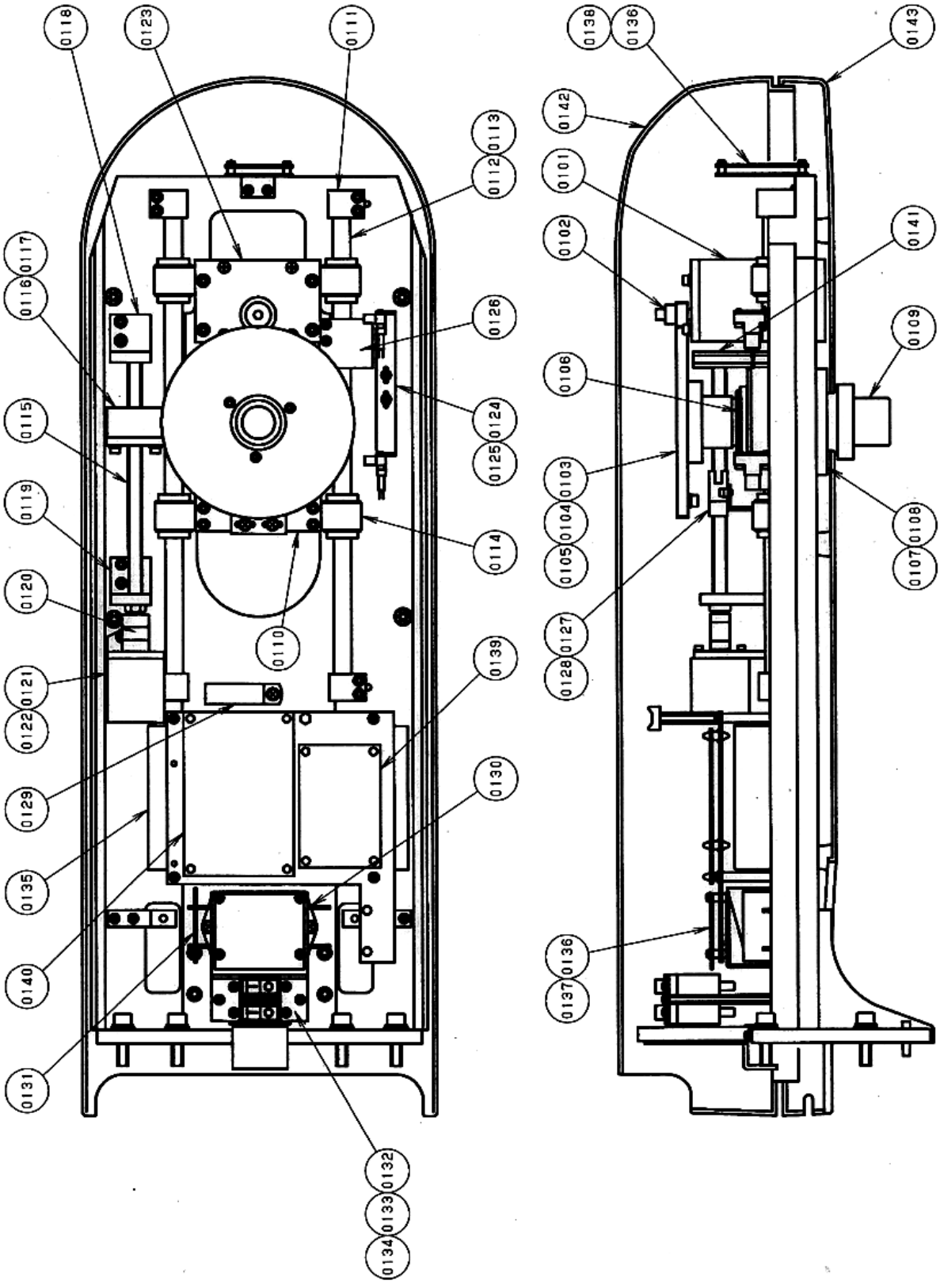


1.4 Sliding Unit



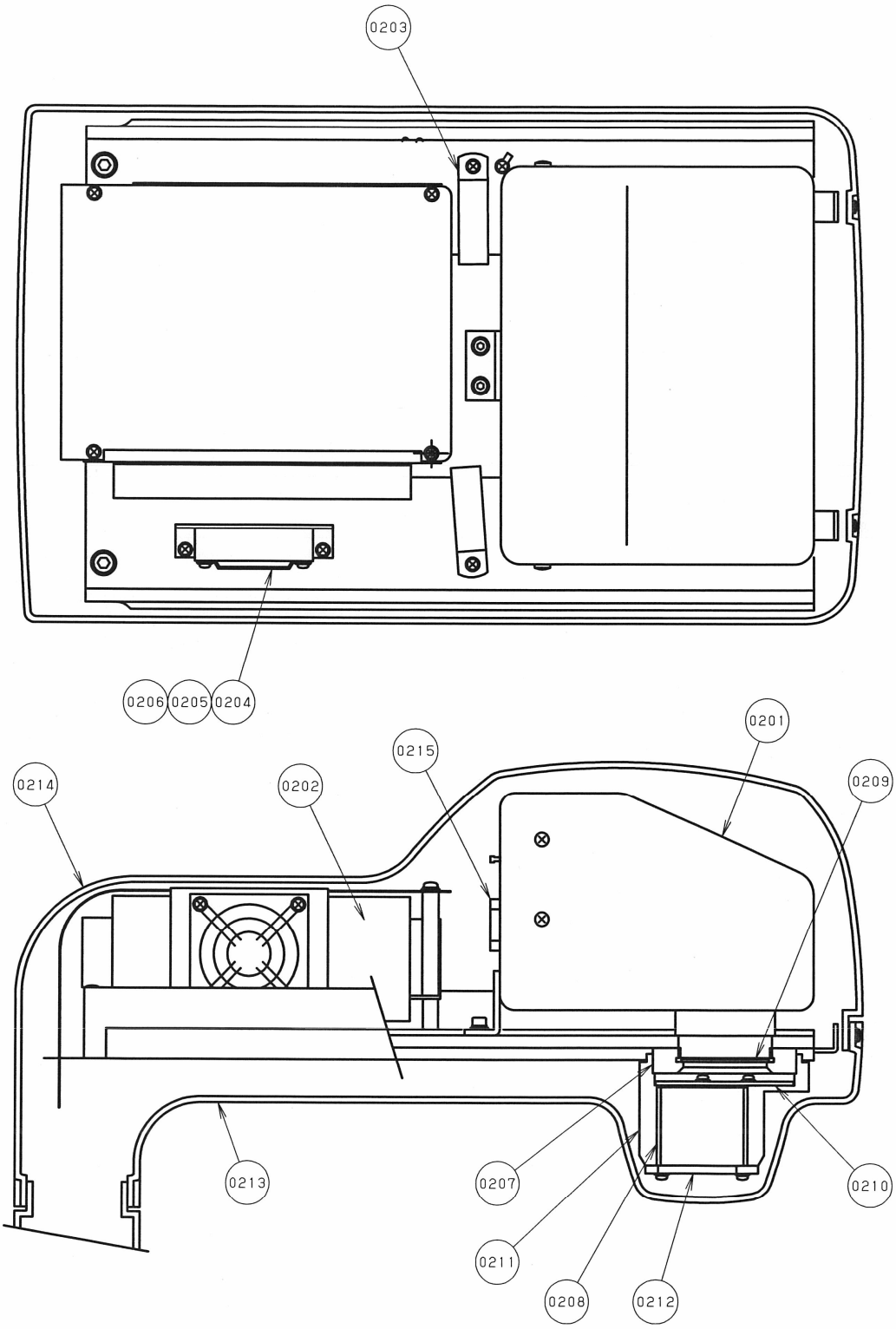
9. Parts List

1. Rotation Unit



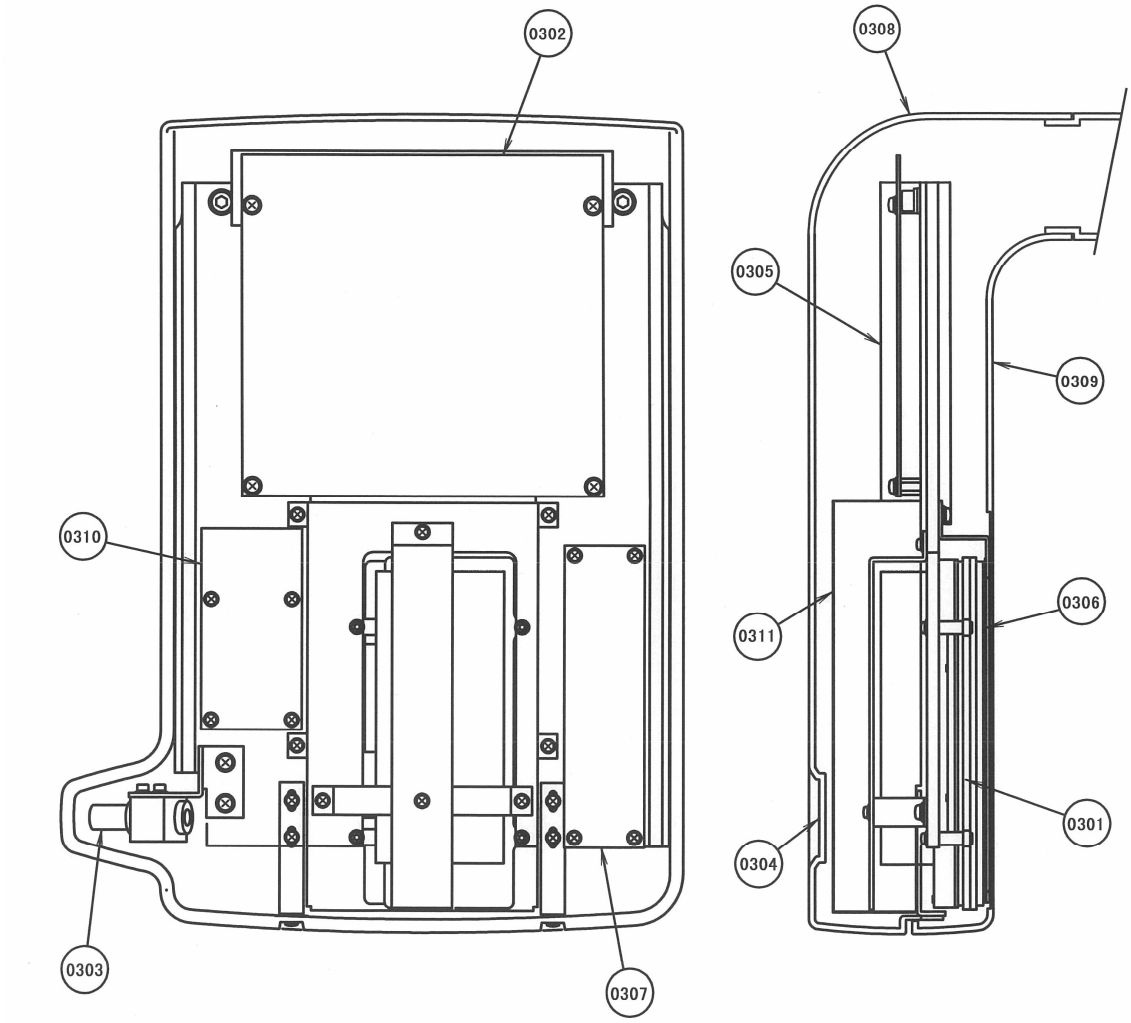
NO.	Drawing No.	Part Name	Quantity
0101	977-79024-03	Motor(PK564AN-TG20)	1
0102	408-09683	Gear(Small)	1
0103	308-03385	Gear(Large)	1
0104	308-03302	Boss(B)	1
0105	408-07104	Key	1
0106	923-92004-08	Fine U-Nut(FU07SC)	1
0107	930-00017-04	Bearing(6007ZZ)	2
0108	308-03359	Boss	1
0109	308-03360	Axis Suspension	1
0110	308-03352	Base	1
0111	408-09671	Pillow Block(2)	4
0112	408-11348	Shaft	2
0113	931-03004-07	Linear Ball Bearing (LM-13)	4
0114	408-09672	Bearing Holder	4
0115	931-50011	Ball screw	1
0116	408-09670	Nut Holder	1
0117	408-09673	Mounting Plate	1
0118	408-11351	Shaft Holder (B)	1
0119	408-09667	Shaft Holder (A)	1
0120	932-41003-06	Coupling(NB-08)	1
0121	977-79021-05	Motor(PK545-NA)	1
0122	408-09669	Motor Bracket	1
0123	408-09679	Motor Base	1
0124	978-60004-04	Photo micro sensor (EE-SX672)	2
0125	408-11350	Sensor Bracket (B)	2
0126	408-11350	Fin	1
0127	978-60004-07	Photo micro sensor (EE-SX672)	1
0128	408-09678	Sensor Bracket (A)	1
0129	075-08003-03	Noise Filter (ESD-R-38D)	1
0130	975-00003-03	Noise Filter (GT215J)	1
0131	408-08757-03	NFI Board Assy･	1
0132	408-11782	Bracket	1
0133	965-85022	Circuit Protector (IN-1-A8E-13-1B)	2
0134	937-38018-68	Spacer(ASB-395)	2
0135	974-80061-01	Switching Power Supply (PM110-14A)	1
0136	977-79023-01	Driver(SD5107P)	2
0137	408-11345	Bracket	1
0138	408-09680	Bracket	1
0139	408-09551	CNI Board	1
0139-01	972-05052-09	F2 FUSE 4A 125V	1
0140	408-11364-01	Power Board 5 Assy･	1
0141	937-38026-10	Spacer(BSF655)	2
0142	108-01244	Rotation unit cover (1)	1
0143	108-01245	Rotation unit cover (2)	1

2 Arm Section (High Voltage Inverter side)



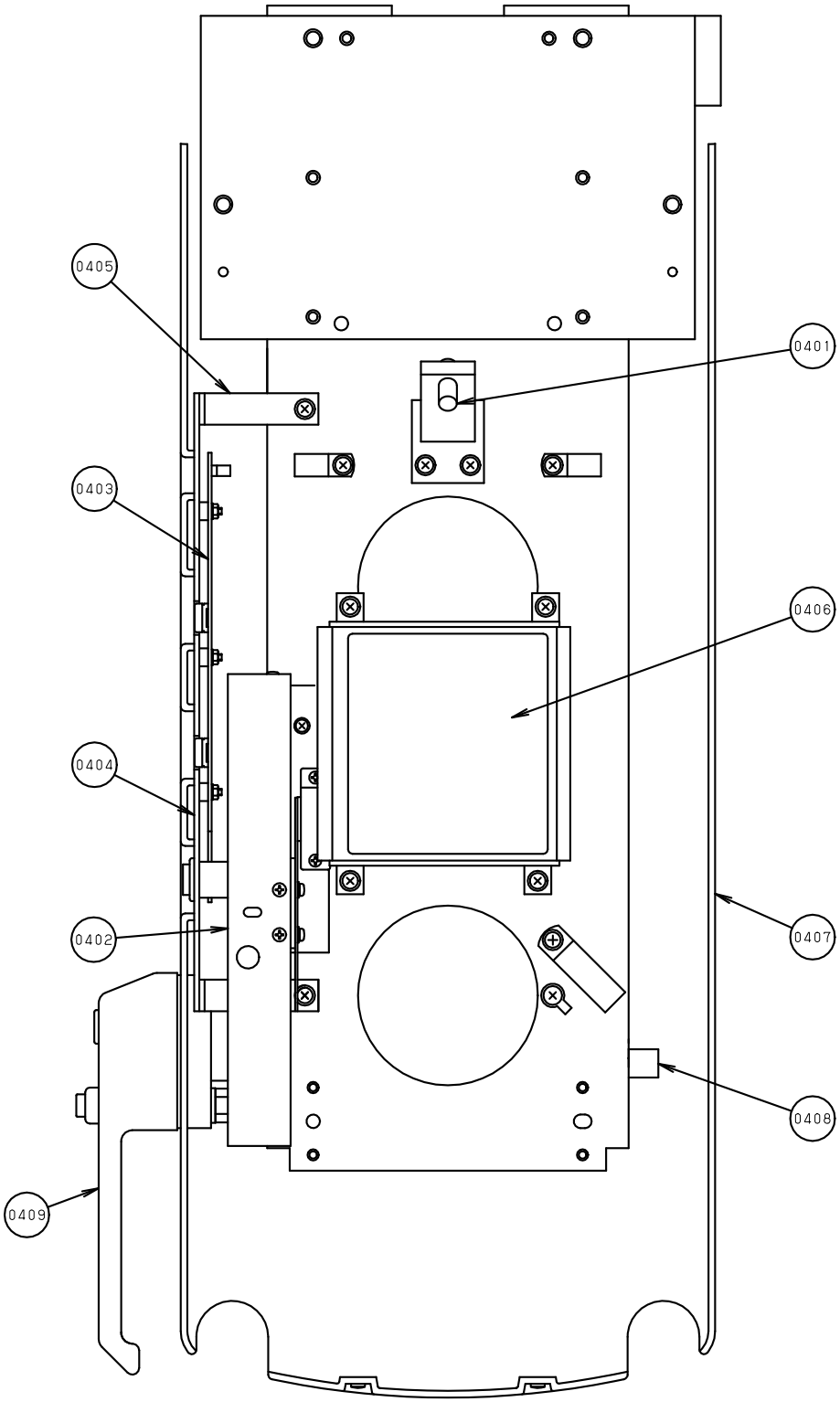
No.	Drawing No.	Part Name	Quantity
0201	208-02025	X-ray generator Assy	1
0202	974-80052-00	Inverter Board	1
0202-01		F1 FUSE 15A 125V	1
0203	075-08003-01	Line Filter	2
0204	408-07867	Fan Bracket	1
0205	942-60019-04	Fan 109R (109R0624H402)	1
0206	942-60013-03	Fan Guard (FG6B)	1
0207	408-11368	Fixing Plate for Front Panel	1
0208	408-11366	Shielding Tube	1
0209	408-07408	Filter	1
0210	408-11365	Shielding lead	1
0211	308-03924	Tube	1
0212	408-12692-02	Mask adjustment plate	1
0213	208-02141	Head Cover (2)	1
0214	208-02142	Head Cover (1)	1
0215	961-00020-54	Thermal Guard (OHD3-55B)	1

3 Arm Section (Digital Sensor side)



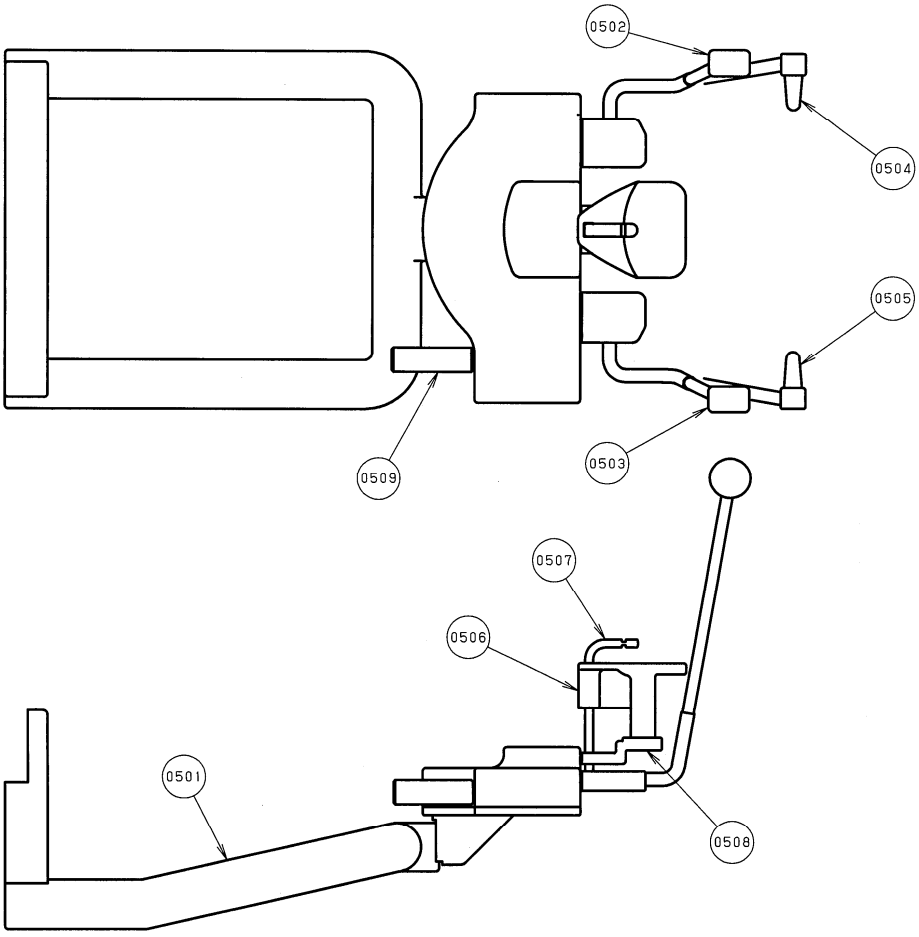
No.	Drawing No.	Part Name	Quantity
0301	988-50229	CMOS Sensor	1
0302	408-10713	CPU Board Assy	1
0302-01	972-05052-03	F1 FUSE 1A 125V	1
0302-02	972-05052-03	F2 FUSE 1A 125V	1
0302-03	972-05052-05	F3 FUSE 2A 125V	1
0302-04	972-05052-07	F4 FUSE 3A 125V	1
0302-05	972-05052-07	F5 FUSE 3A 125V	1
0303	308-03920	Laser marking projector Assy	1
0304	408-12108	Logo sheet	1
0305	208-02181	Frame	1
0306	408-09709	Secondary Slit	1
0307	408-12344	RS232C/LAN Board Assy	1
0308	108-01246	Sensor Cover (1)	1
0309	108-01247	Sensor Cover (2)	1
0310	408-12745	DC-DC 2 Board Assy	1
0311	308-04324	Shield Plate 5	1

4 Sliding Unit



No.	Drawing No.	Part Name	Quantity
0401	408-09712	Laser marking projector Assy	1
0402	308-03373	Laser marking projector Assy	1
0403	408-11322	Power Switch Assy	1
0404	308-03919	Frame	1
0405	408-09723	Fixing Plate	2
0406	408-11343	Mirror	1
0407	108-01243	Sliding Unit Cover	1
0408	408-06102-01	Strain Relief	1
0409	308-03592	Handle ASSY	1

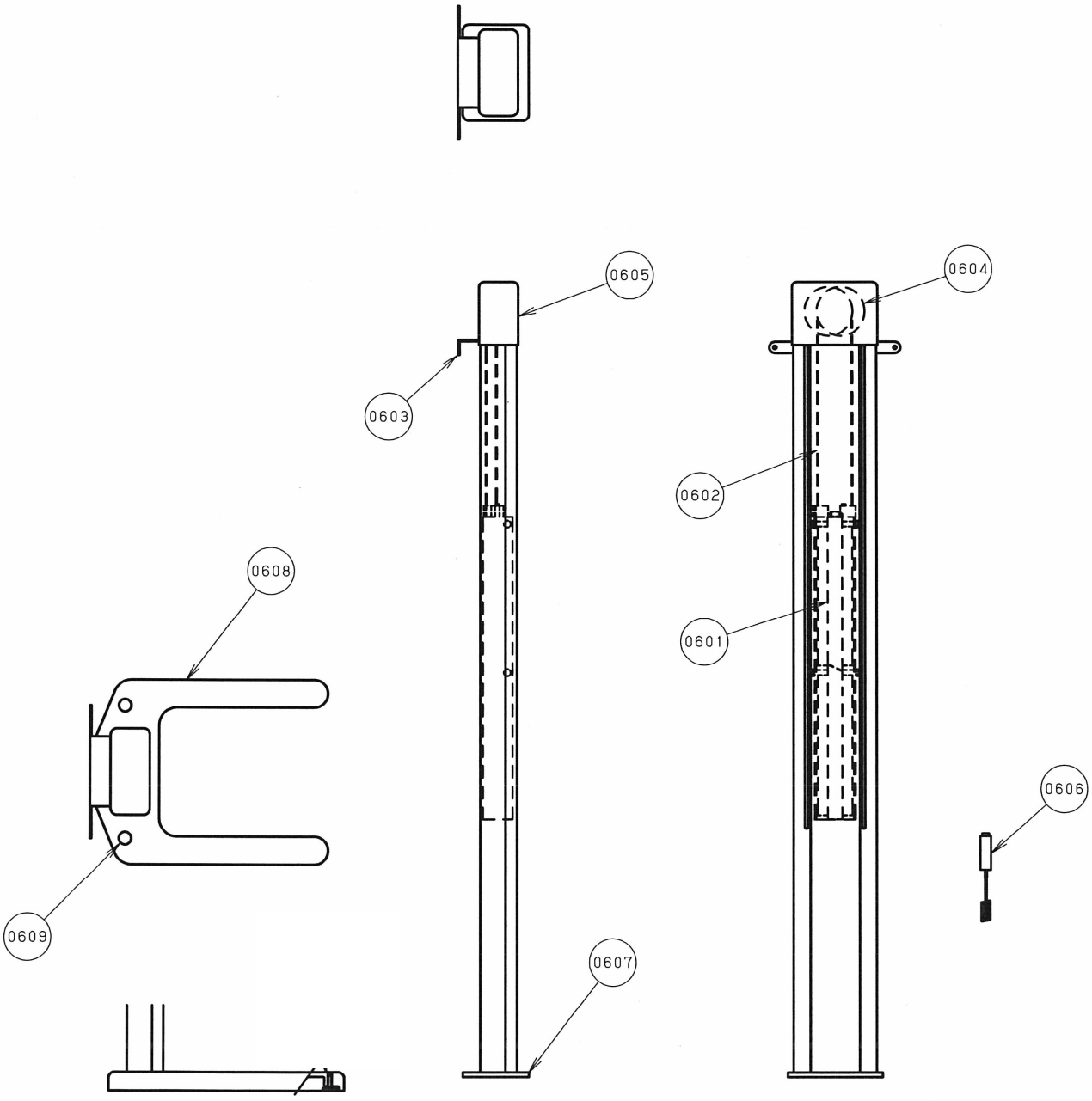
5 Chinrest Assy.



09

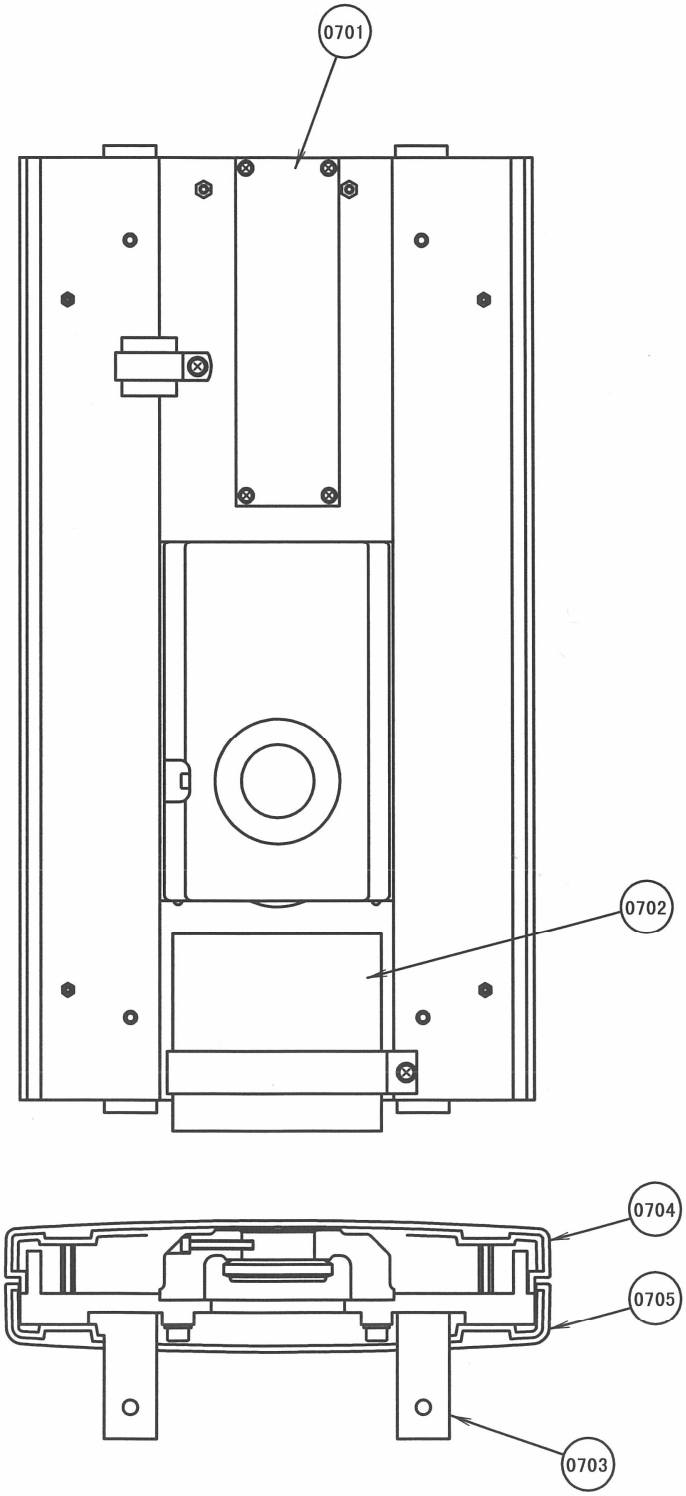
No.	Drawing No.	Part Name	Quantity
0501	208-02035	Handle (Grip)	1
0502	308-02320-01	Head holding Assy (Right)	1
0503	308-02320-02	Head holding Assy (Left)	1
0504	308-02321-01	Year rod Assy (Right)	1
0505	308-02321-02	Year rod Assy (Left)	1
0506	308-03083	Bite fork	1
0507	408-05861	Bite fork	1
0508	408-06085	Holder	1
0509	408-06071	Knob	1

6 Stand



No.	Drawing No.	Part Name	Quantity
0601	308-3597	Counter Weight Assy.	1
0602	408-09665-01	Wire Assy.	1
0603	408-10412	Bracket	1
0604	308-03596	Pulley Assy with Lock	1
0605	408-09756	Top cover	2
0606	964-50055	Exposure Switch	1
0607	408-09863	Flange	1
0608	208-02043	Free Standing Base	1
0609	942-40002-17	Hole for anchor	2

7 Arm Unit



09

NO	Drawing No.	Part Name	Quantity
0701	408-11325-01	AC FILTER 3 Assy	1
0702	408-10578-01	HUB Assy	1
0703	918-02005	Bracket	4
0704	208-02143	Arm Cover (1)	1
0705	208-02144	Arm Cover (2)	1

10. MAINTENANCE CHECK

⚠ WARNING

High voltage is applied to some parts inside the equipment. Take extra care when removing the covers.
Before beginning repair work, turn OFF the power of equipment and unplug from electrical outlet.
After unplugged the equipment, wait for 10 minutes or more before starting a repair work.

Specialized knowledge, experience and special measuring instruments are required to check this equipment. To maintain the performance of equipment, please perform daily check (with eyes) and implement periodic maintenance by dealer service personnel.

Dental X-ray Equipment Maintenance Check List

Maintenance by service personnel: 1 or 2 times/year

Check Item	Purpose of Check	Contents of Check	Method
Electricity Condition	Check power supply voltage range	Check the compatibility between the power supply voltage connected to the equipment and the specified voltage for the equipment.	○
Appearance and Indication	(1) Appearance of equipment	a. Deformation, flaw, nameplate b. Cautions	○
	(2) Inside of equipment	Check defacement and dust.	○
Installation Environment	Temperature, humidity, gas	Check the compatibility of environmental ambient of the place where the equipment will be used.	●
	Levelness of equipment	Check the effect on the equipment	●
	Floor and equipment stabilizing condition	Check vibration and movement stability of the equipment.	●
	Check obstacles	Check that there is no obstacle within the movement range of the equipment.	○
	Rust development condition	Check the condition of rust development functional safety.	○
Operation Test	Operation test before check	Check operating condition of the equipment.	◉
	Operation test after check	Check operating condition of the equipment.	◉
Safety Test for Electric Shock	Insulation resistance	Check resistance between power line and the earth.	●
	Leaked current from the outer cover	Check the current leaking from the outer cover of the equipment to the earth.	●
	Earthing resistance	Check the resistance between exposed metal portion of the equipment and the earthing point.	●
	Resistance of earthing wire	Check the resistance between the earth terminal of the equipment and earthing point.	●

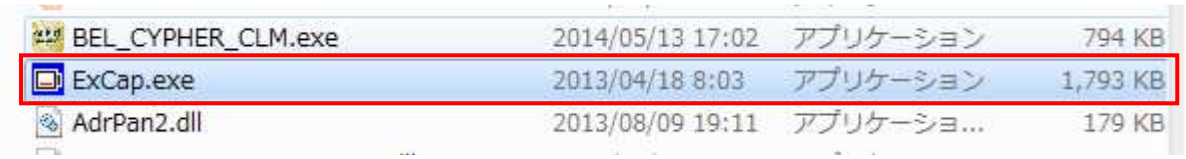
Check Item	Purpose of Check	Contents of Check	Method
Operation Accuracy of Equipment	Check operation of power supply circuit	Check the voltage of power supply circuit.	●
	Check operation of radiographic circuit	Check the operating waveform and setting values of control circuit.	●
	Check operation of operation circuit	Check operation of operation sequence.	●
	Accuracy of positioning mechanism	Check deterioration of the positioning mechanism.	●
	Check operation of protection circuit	Check the setting values and operating condition of protection circuit.	●
	Check operating condition indicator	Check the circuit function to indicate the operating condition.	●
Indication during X-ray irradiation	Check irradiation of X-ray and the indication are in sync	Check the operation of indicator during X-ray irradiation.	◉
X-ray Generator	X-ray tube housing	Check leakage of insulating oil.	○
	Low voltage cable	Check wear, flaw, tension and twist.	○
	Irradiation cone	Check looseness, deformation and damage.	○
	Filter	Check coming off and damage.	○
	Slit Plate (Collimator)	Check off-alignment of irradiation field and irradiation width.	○
Radiographic Mechanism	Rotation and movement of X-ray generator	Check slip, abnormal sound and stopping accuracy.	◉
	Movement of arm		
	Patient positioning mechanism	Play, looseness, operationality and stability.	●
	Positioning Beams	Check the brightness and positioning accuracy.	○
Elevating Mechanism	Wire rope	Check breaking of wire and end portion.	○
	Braking mechanism	Check the movement.	◉
	Electromagnetic lock		
	Upward and downward movement condition	Check smoothness of movement	○
X-ray Output	X-ray tube voltage	Check X-ray tube voltage.	●
	X-ray tube current	Check X-ray tube current.	●
	Exposure time	Check exposure time.	●

Symbol	Checking Method
○	Check with eyes
●	Check by using measuring instruments etc.
◉	Check by operating the equipment.

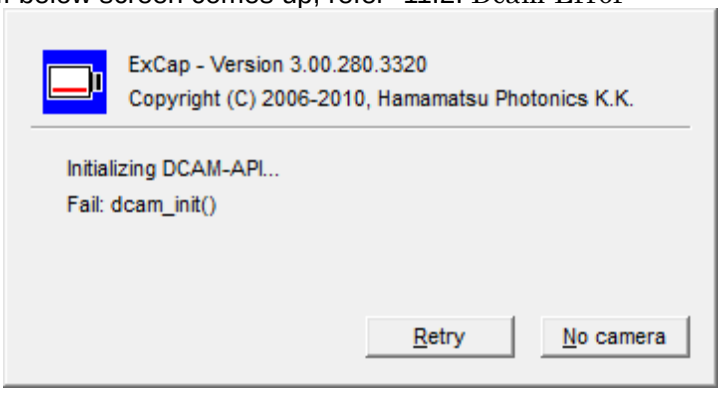
11. How to use ExCap.exe

11.1. How to use ExCap.exe

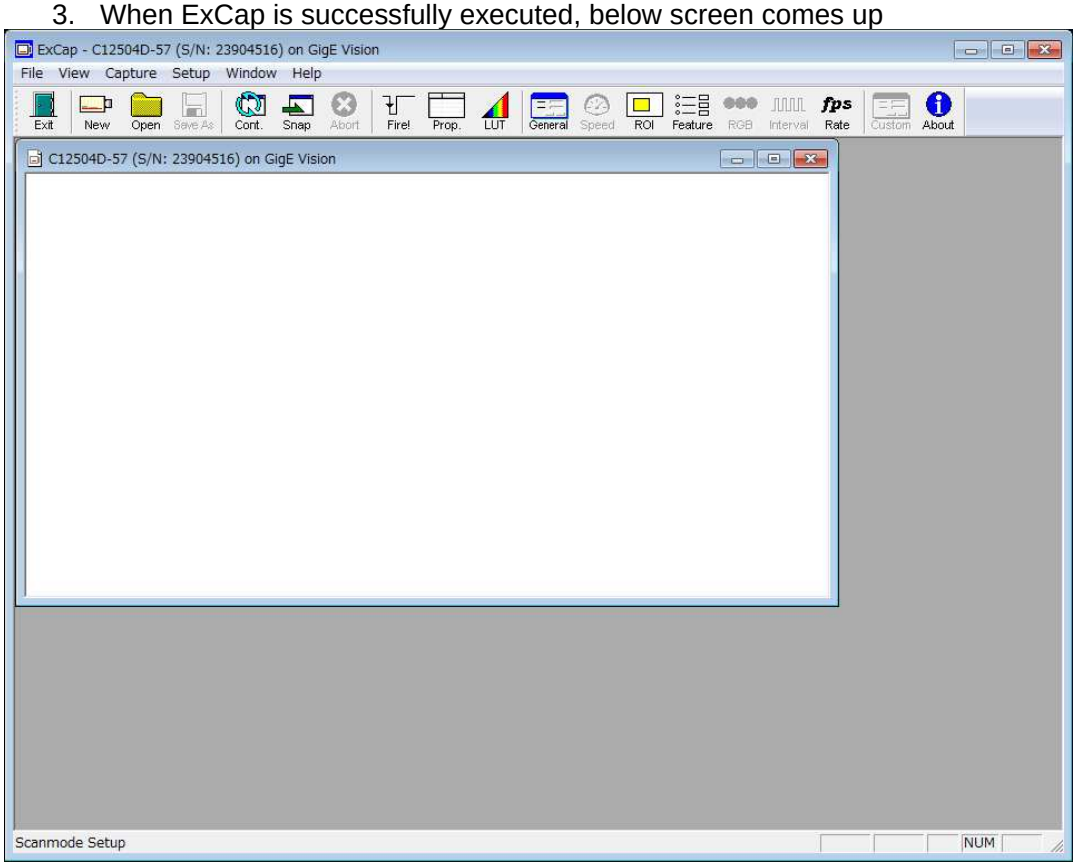
1. Run C:¥BelCypherN¥ExCap.exe



2. If below screen comes up, refer “11.2. Dcam Error”

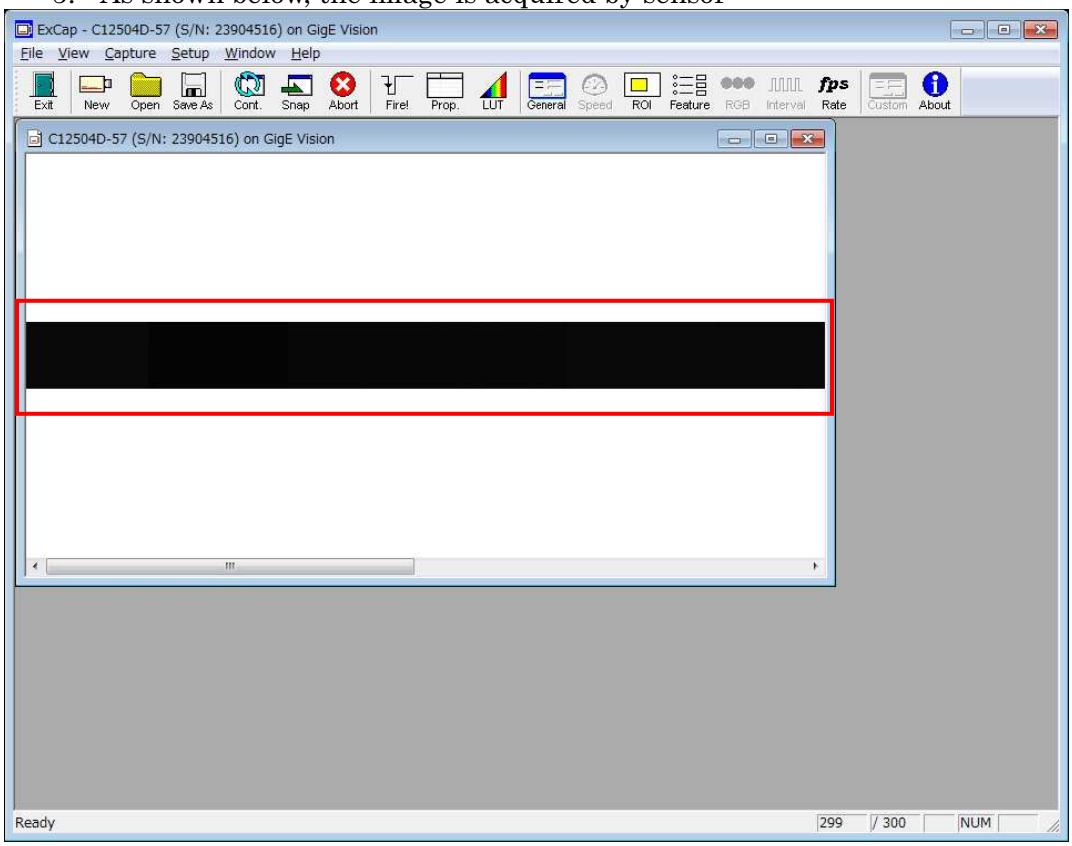


3. When ExCap is successfully executed, below screen comes up

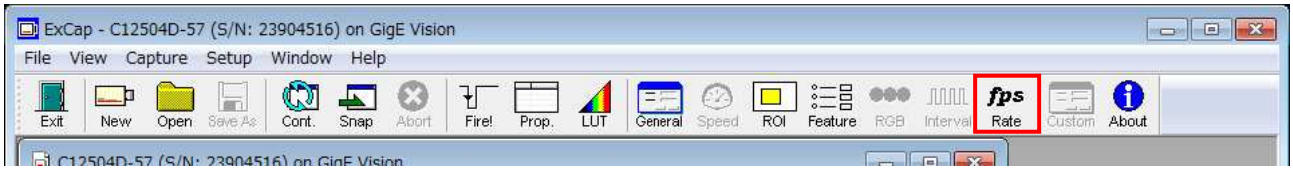


4. Click “Cont.” icon

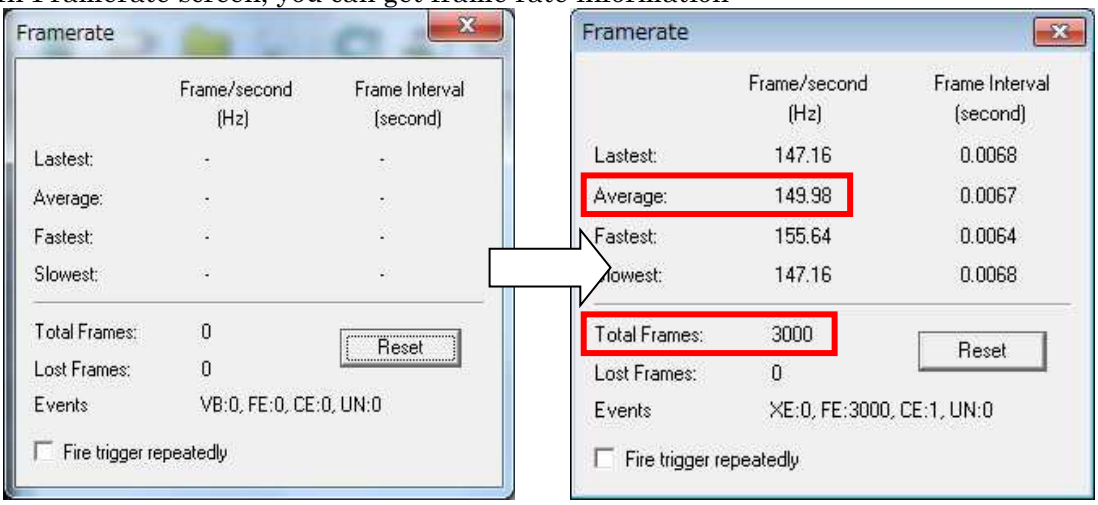
5. As shown below, the image is acquired by sensor



6. Click “Rate” icon

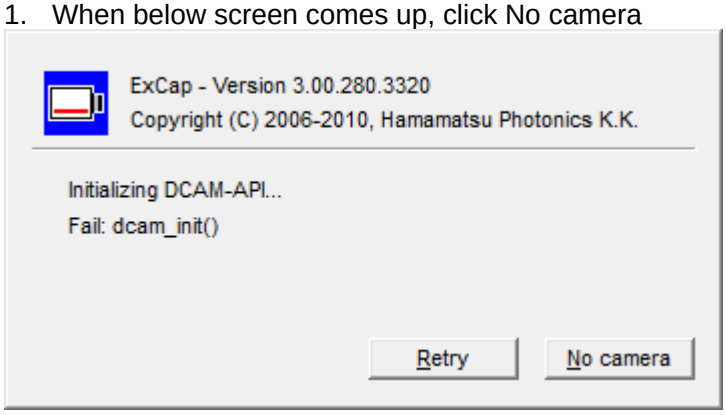


7. In Framerate screen, you can get frame rate information

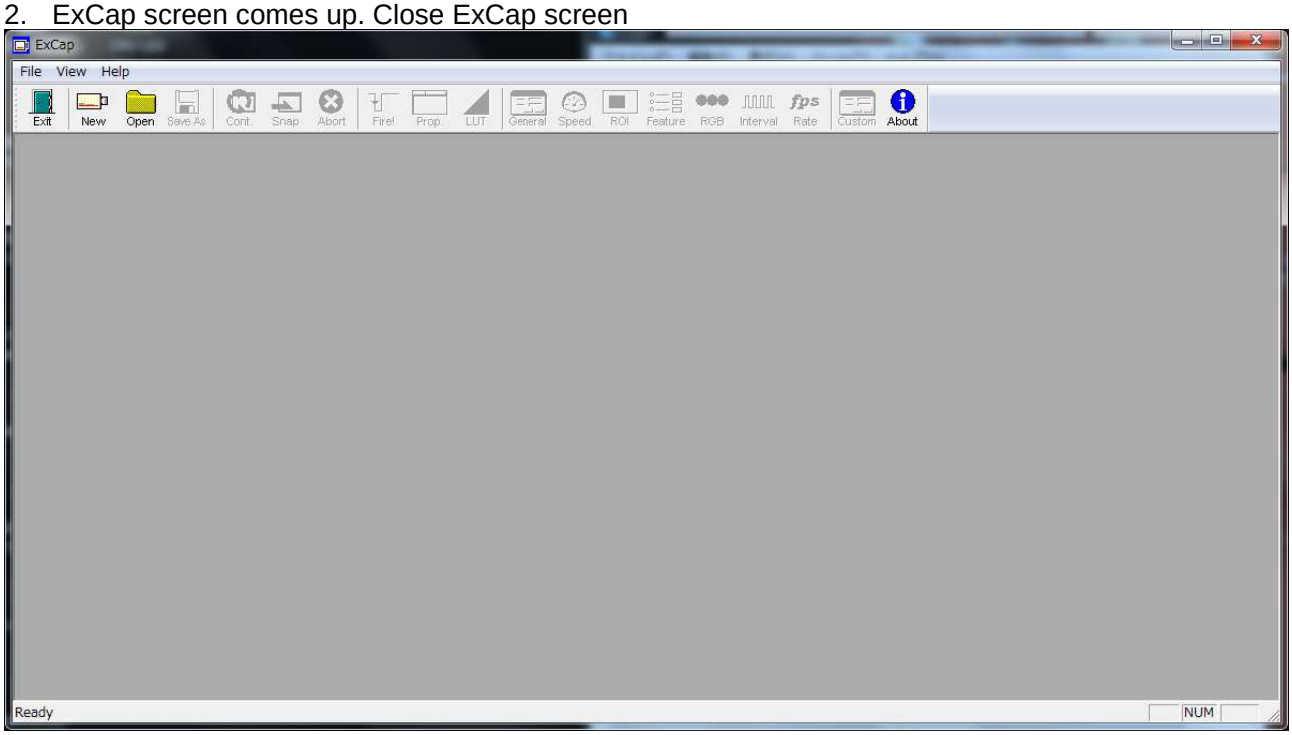


11.2. Dcam Error

1. When below screen comes up, click No camera



2. ExCap screen comes up. Close ExCap screen



- If you run ExCap.exe right after powering Bel-Cypher N on, the communication error between PC and Bel-Cypher N may occur.
  Wait for a while, and restart ExCap.exe

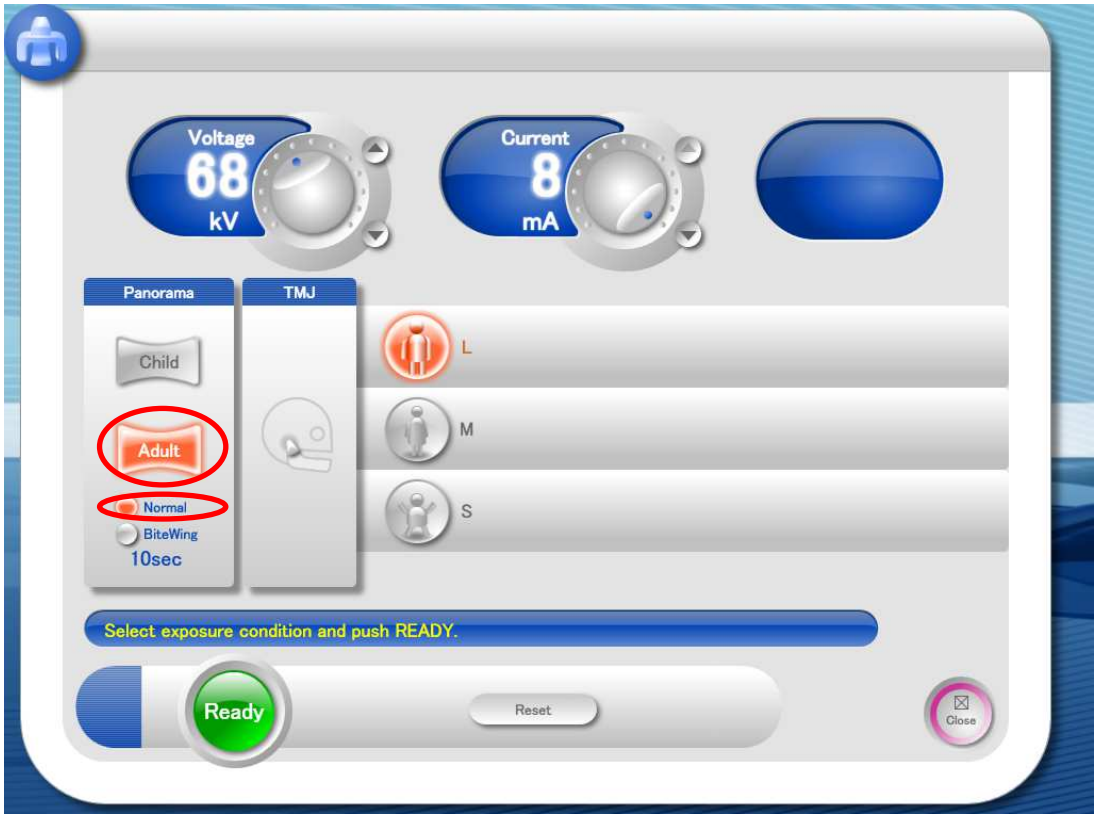
- If above doesn't solve the problem, reset both PC and Bel-Cypher N and run ExCap.exe

- If above two doesn't solve the problem, check IP address of PC and Bel-Cypher N.
  You may also need to check the LAN communication.

12. How to take Calib image

12.1. Calibration file update

1. Remove the ear rod or the chin rest if these are put on
2. Start TWAIN



3. Click Rset
4. Choose “Adult” and “Normal”
5. Hit [Ctrl]+[Alt]+[c] simultaneously. Confirm 1Sec CalibMode is displayed

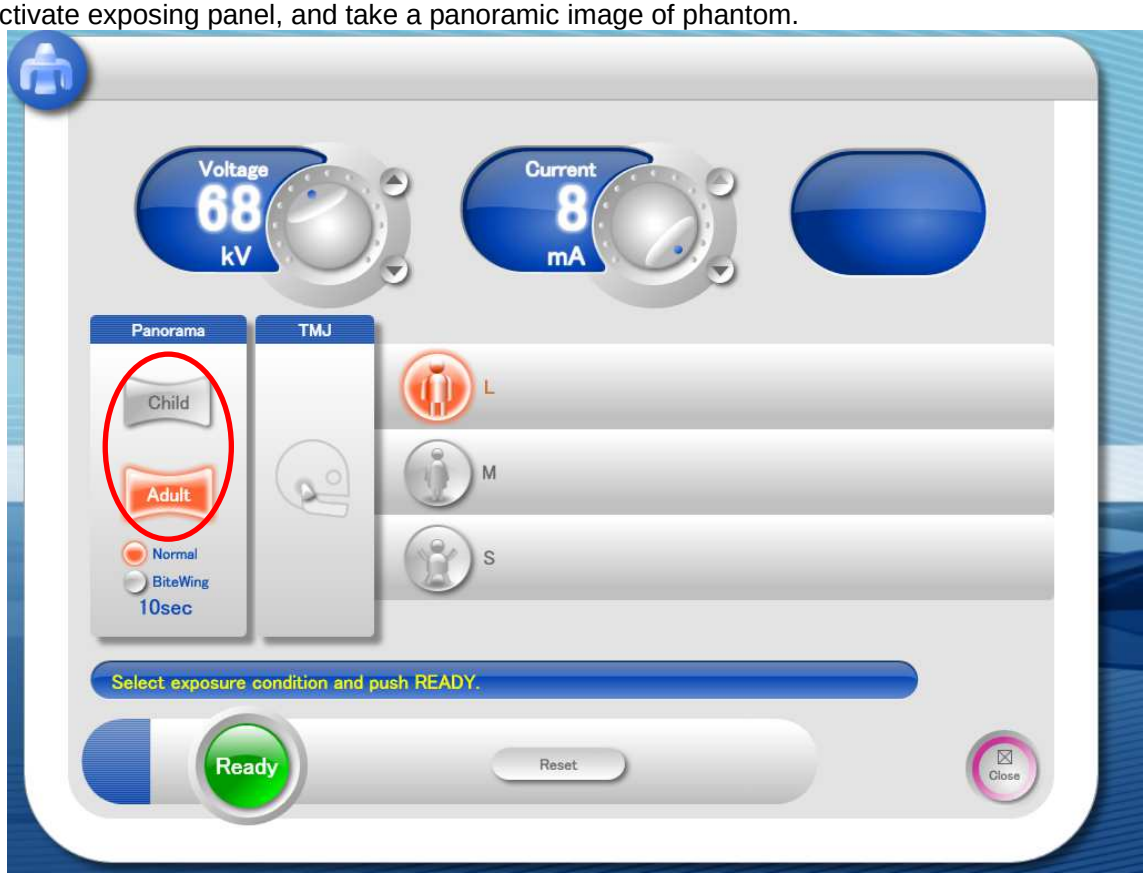
6. Click Ready and take a radiograph

7. Confirm 0001.raw and 0002.raw are saved in C:¥BelCypherN¥max_data folder

13. Initial value setting of image process

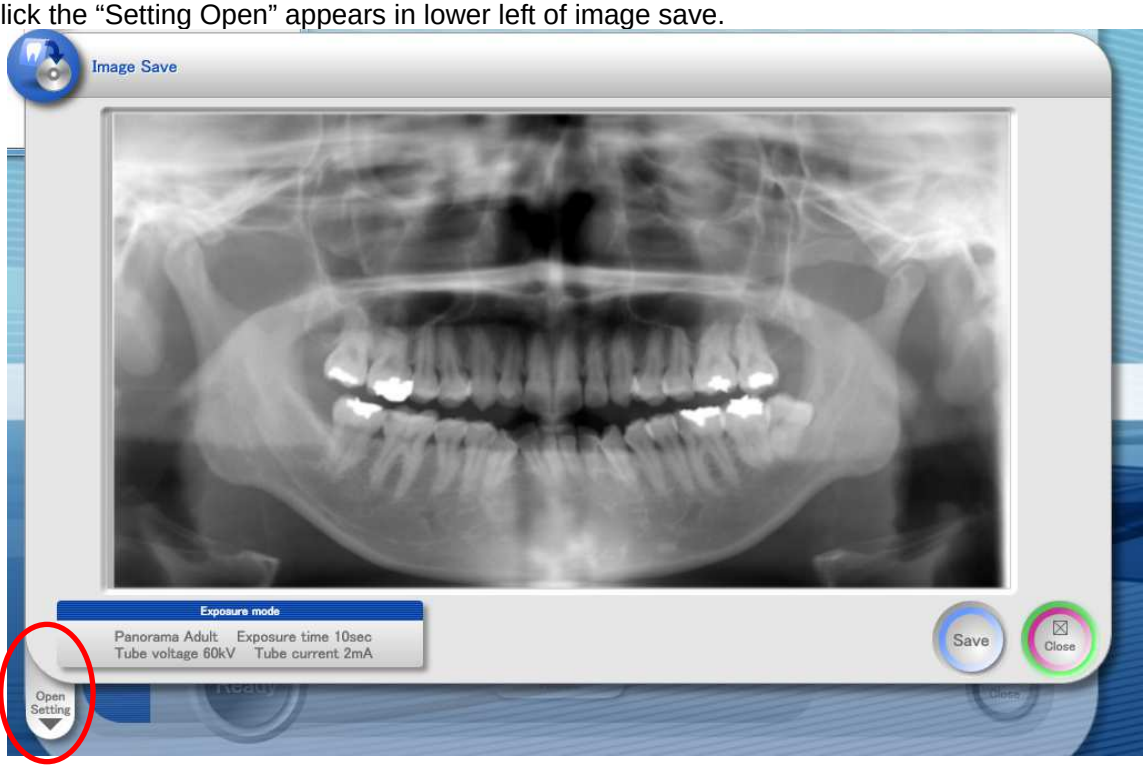
How to set the initial value of image process.

1. Activate exposing panel, and take a panoramic image of phantom.

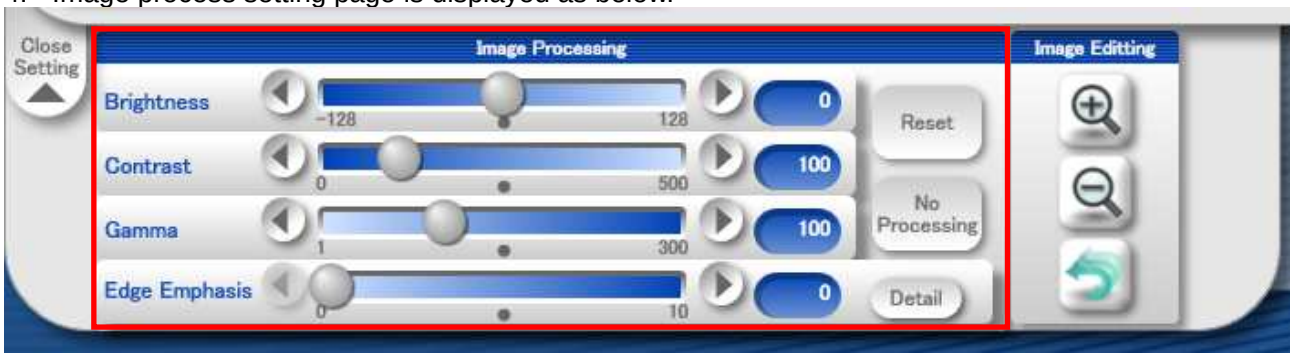


2. After exposing, image save screen is appeared.

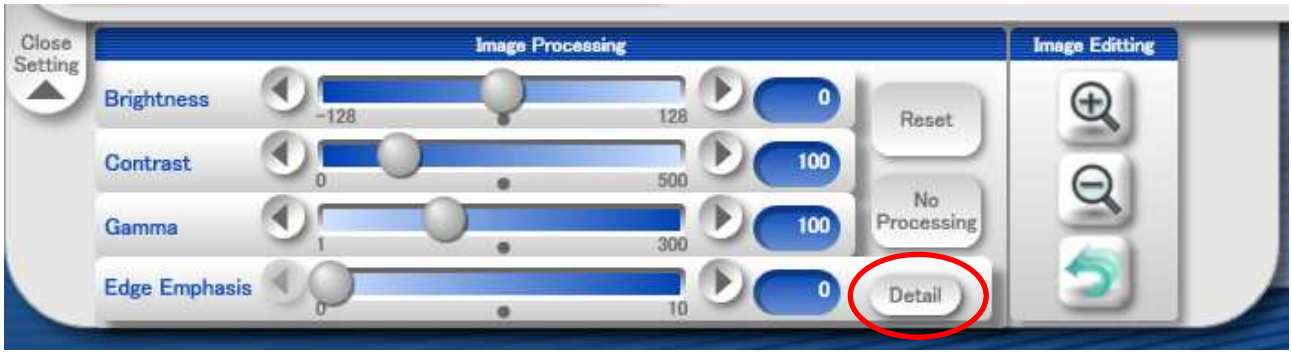
3. Click the “Setting Open” appears in lower left of image save.



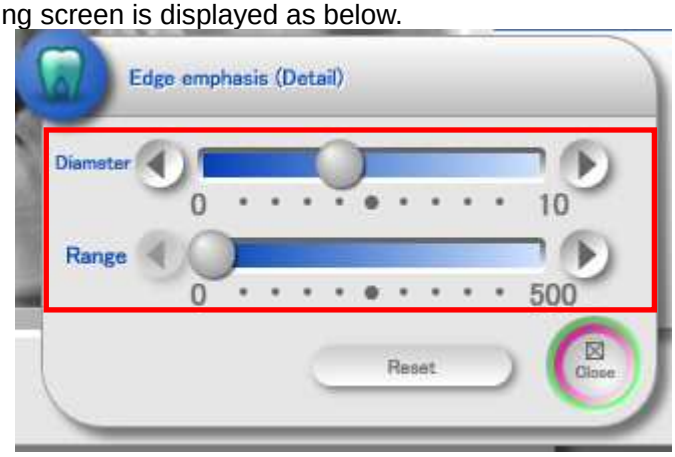
4. Image process setting page is displayed as below.



5. With the slider, set Brightness, Contrast and Gamma to the value which is used for initial value.
6. Click a Detail bottun.



7. Edge emphasis setting screen is displayed as below.



8. Set the Diameter・Range to the value for initial value.

9. After finishing the image process setting, open "C:¥BelCypherN¥BelCypher_Save.ini".

10. As per below [PanoImageProcess], change the value of BrightnessDefault・ContrastDefault・GammaDefault to the value which is set in previous clause.
The value of Brightness has to be more than -100 and less than 100.
The value of Contrast has to be more than 0 and less than 200.
The value of Gamma has to be more than 1 and less than 500

[PanoImageProcess]
BrightnessDefault=( ) → Initial value of Brightness.
ContrastDefault=( ) → Initial value of Contrast.
GammaDefault=( ) → Initial value of Gamma.

11. As per below [PanoEdgeHighlight], change the value of RadiusDefault・RangeDefault to the value which is set in previous clause.
The value of Radius has to be more than 0 and less than 10.
The value of Range has to be more than 0 and less than 500 and change the value in multiples of 50.

[PanoEdgeHighlight]
RadiusDefault=( ) → Initial value of Diameter.
RangeDefault=( ) → Initial value of Range.

12. Boot up exposing panel, and take a TMJ image of phantom.

13. After exposing, when saving image is appeared, execute 3) to 9) over the TMJ image.

14. As per below [TMJImageProcess], change the BrightnessDefault・ContrastDefault・GammaDefault to the value which is set in previous clause.
The value of Brightness has to be more than -100 and less than 100.
The value of Contrast has to be more than 0 and less than 200.
The value of Gamma has to be more than 1 and less than 500.

[TMJImageProcess]
BrightnessDefault=( ) → Initial value of Brightness
ContrastDefault=( ) → Initial value of Contrast
GammaDefault=( ) → Initial value of Gamma

15. As per below [TMJEdgeHighlight], change the value of RadiusDefault・RangeDefault to the value which is set in the previous clause.
    The value of Radius has to be more than 0 and less than 10.
    The value of Range has to be more than 0 and less than 500 and change the value in multiples of 50.

    [TMJEdgeHighlight]
    RadiusDefault=( ) → Initial value of Diameter.
    RangeDefault=( ) → Initial value of Range.

- **BEL_CYPHER_C.exe Ver1.0.1.0 and later can set the default parameters for BiteWing**
- **BEL_CYPHER_C.exe Ver1.0.0.0 has one default setting that apply on both panoramic and bitewing**

16. Boot up exposing panel, and take a BiteWing image of phantom.

17. After exposing, when saving image is appeared, execute 3) to 9) over the BiteWing image.

18. As per below [BiteWingImageProcess], change the BrightnessDefault・ContrastDefault・GammaDefault to the value which is set in previous clause.
    The value of Brightness has to be more than -100 and less than 100.
    The value of Contrast has to be more than 0 and less than 200.
    The value of Gamma has to be more than 1 and less than 500.
    [BiteWingImageProcess]
    BrightnessDefault=( ) → Initial value of Brightness
    ContrastDefault=( ) → Initial value of Contrast
    GammaDefault=( ) → Initial value of Gamma

19. As per below [BiteWingEdgeHighlight], change the value of RadiusDefault・RangeDefault to the value which is set in the previous clause.
    The value of Radius has to be more than 0 and less than 10.
    The value of Range has to be more than 0 and less than 500 and change the value in multiples of 50.
    [BiteWingEdgeHighlight]
    RadiusDefault=( ) → Initial value of Diameter.
    RangeDefault=( ) → Initial value of Range.

14. Change IP address

Caution!

※1 : Change IP address only when it is required
※2 : When you change IP address, do「6.1 Change IP address of sensor」、「6.2 Change IPaddress of Bel-Cypher N」&「6.3 Change IP address of NIC」according to the order

Below are default IP address and default subnet mask

Default IP address / Subnet mask for sensor
IP address : 169.254.87.181
Subnet mask:255.255.0.0

Default IP address / Subnet mask for Bel-Cypher N
IP address : 169.254.0.101
Subnet mask:255.255.0.0

Default IP address / Subnet mask for PC(NIC)
IP address : 169.254.87.101
Subnet mask:255.255.0.0

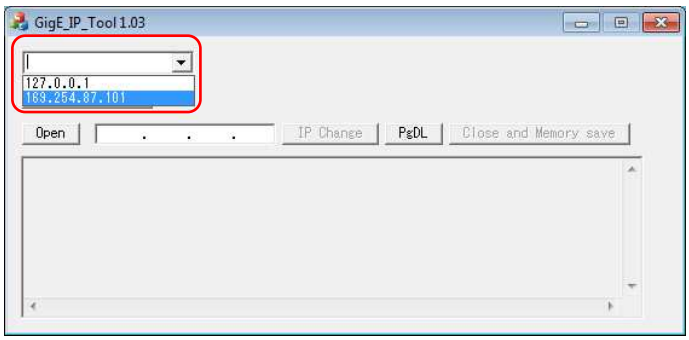
14.1. Change IP address of sensor

※ Set up for PC and set up for Bel-Cypher should be completed before changing IP address

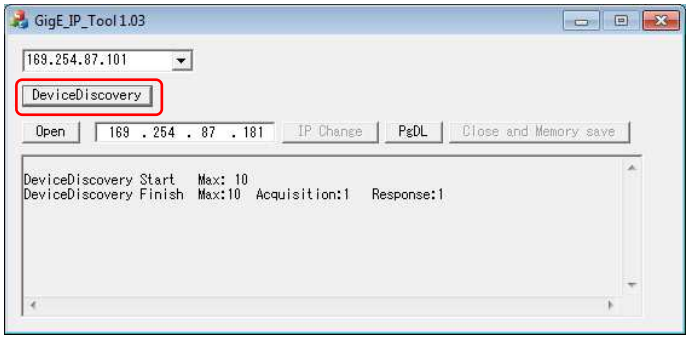
1. If Operating System is 32bit, copy 「GigE_IP_Tool_*_**.exe」(*is version number) in 「32bit」→「GigE_IP_Tool」of Libraly CD to Desktop
2. If Operating System is 64bit, copy 「GigE_IP_Tool_*_**_x64.exe」(*is version number) in 「64bit」→「GigE_IP_Tool」of Libraly CD to Desktop

3. If OS is 32bit OS run「GigE_IP_Tool_*_**.exe」. If OS is 64bit run 「GigE_IP_Tool_*_**_x64.exe」

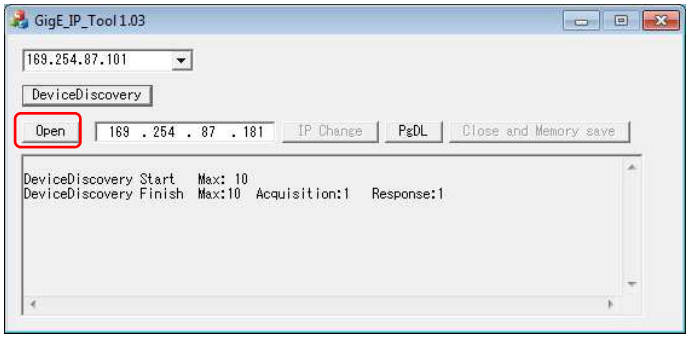
4. Choose IP address for NIC that is connected to Bel-Cypher N from pull down menu



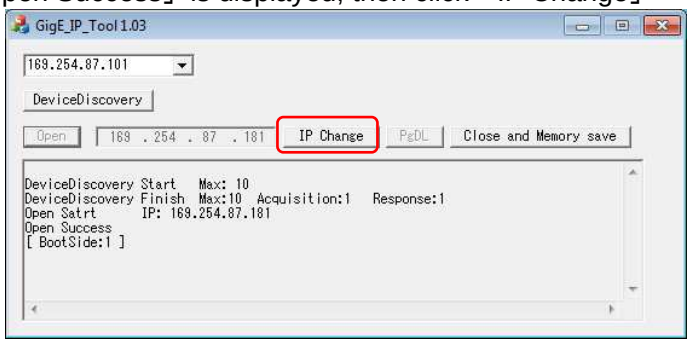
5. Click「DeviceDiscovery」



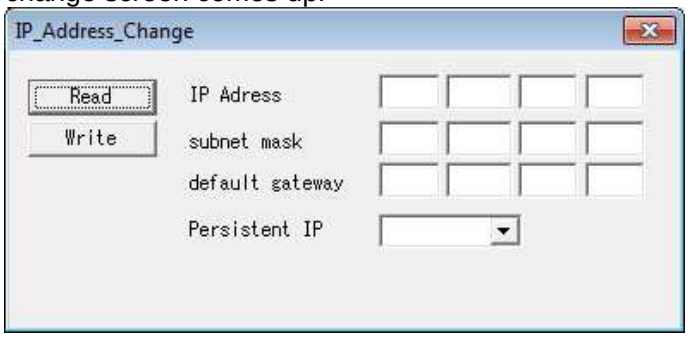
6. When IP address for sensor is displayed, click「Open」



7. When 「Open Success」is displayed, then click「IP Change」



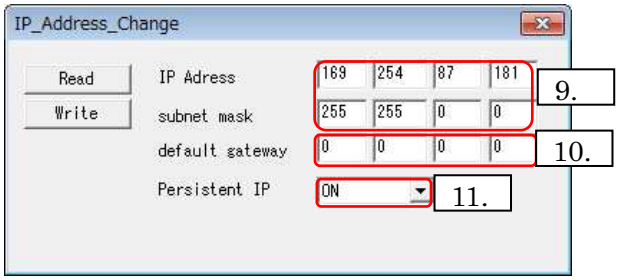
8. IP address change screen comes up.



9. If you click Read, preset values are shown. Enter values in IP Address & subnet mask.

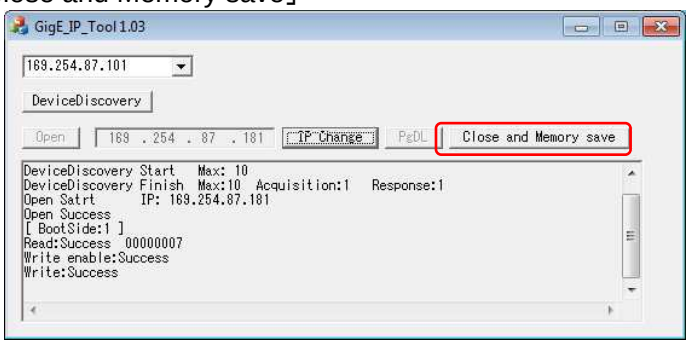
10. Values for default gateway should be all 0.

11. Set persistent IP ON.



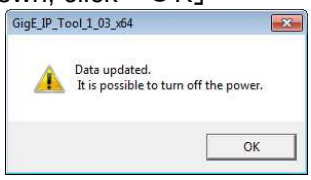
12. Click 「Write」 then close window by clicking 「×」 on upper right corner to close IP_Address_Change screen

13. Click「Close and Memory save」



14. Click 「×」 on upper right corner to close GigE_IP_Tool_*_**.exe(if OS is 64bit, GigE_IP_Tool_*_**_x64.exe)

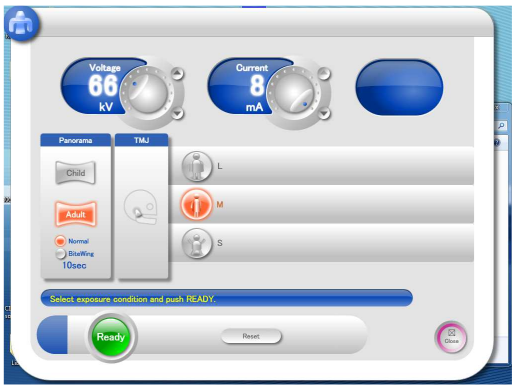
15. Below message will be shown, click「OK」



16. Wait at least two seconds, then turn on the power of Bel-Cypher N after closing GigE_IP_Tool_*_**.exe(or GigE_IP_Tool_*_**_x64.exe)

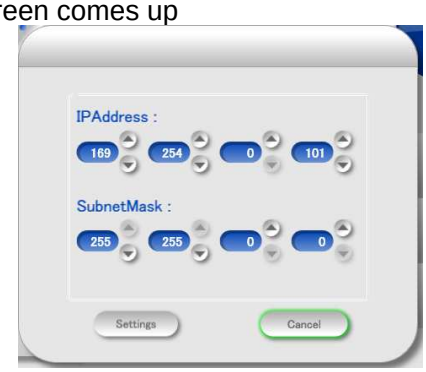
14.2. Change IP address of Bel-Cypher N

1. Start TWAIN program of Bel-Cypher N



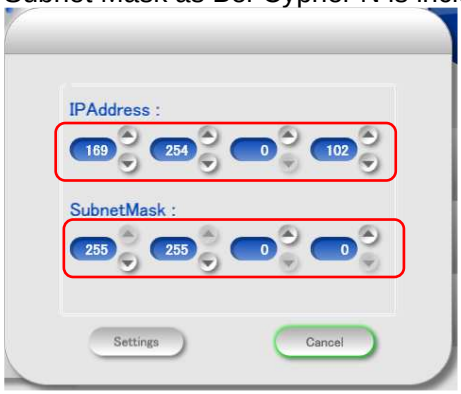
2. When above TWAIN screen is shown, click L, M or S, then hit 「Ctrl」+「Alt」+「i」 simultaneously

3. IP address set up screen comes up



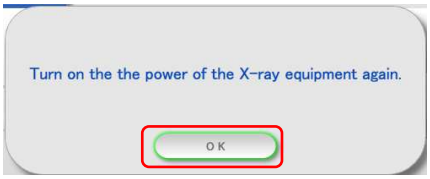
4. Enter new IP Adress and SubnetMask

※ Set IP address and Subnet Mask as Bel-Cypher N is included within sensor network.



5. Click「Settings」

6. When「Turn on the the power of the X-ray equipment again.」is displayed, then turn off and on the power of Bel-Cypher N



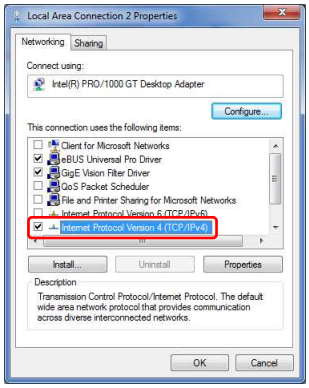
14.3.Change IP address of NIC

※ Change IP address of NIC, after you changed IP address of Bel-Cypher N and IP address of sensor.

1. Go to 「Control Panel」→「Network and Internet」→「Network and Sharing Center」→「Change adapter settings」

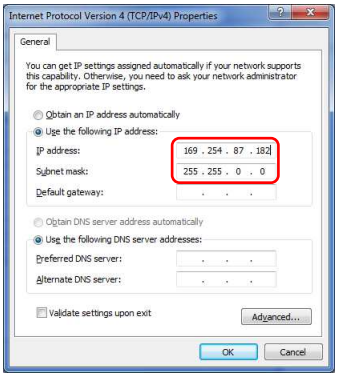
2. Right click LAN Connection that is connected to Bel-Cypher N. Choose property.

3. Double click 「Internet Protocol Version 4(TCP/IPv4)」in 「The connection uses the following items:」



4. Enter IP address and Subnet mask

※ Set IP address and Subnet Mask as NIC is included within sensor and Bel-Cypher N network.



5. Enter only IP address and Subnet Mask. Click「OK」to close windows.

6. Open 「BEL_CYPHER_C.ini」in「C:¥BelCypherN」by text editor like notepad

7. Change SFLFIP=(in [ADR_PAN_NPX] section) to IP address of NIC.
   Below sample shows “changing IP address to「169.254.87.182」”

   [CMOS]
   …
   SELFIP=169.254.87.182
   …

8. Save BEL_CYPHER_C.ini

15. Explanation of BEL_CYPHER_C.ini

[ADR_PAN_NPX]
Output the original image. (1=output, 0=no output)
Original image will be saved in C:¥ORG_PIC folder
// Whether or not to output the original image (1: output, 0: not output)
SaveOrgPic=0

Enable or disable tomosynthesis function (1:Enable, 0:Disable)
// Whether or not to display the tomosynthesis button (1: display, 0: not display)
EnabledTsBtn=0

Display “Close” icon in the image save screen (1: display, 0: not display)
// whether or not to display the Close button in the Save screen (1: display, 0: not display)
UseCloseButton=1

IP address of NIC is recorded
If you want to change the IP address of NIC, change the value
//IP address of the NIC
SELFIP=169.254.87.101

IP address of RS232C/LAN board is recorded
If you change the IP address of RS232C/LAN board, IP address change software automatically change the IP address in ini file.
You are not needed to change IP address manually.
//IP address of the device
IP=169.254.0.101

Subnet mask of RS232C/LAN board is recorded
If you change the subnet mask value of RS232C/LAN board, IP address change software automatically change the subnet mask value in ini file.
You are not needed to change subnet mask value manually.
//Subnet mask of the device
Subnetmask=255.255.0.0

By entering the value in each of following lines, you can trim the image.
Cut_Top and Cut_Bottom have values to prevent the shade of the mask is shown in the image.
If you enter smaller value in Cut_Top and Cut_Bottom, the shade of the mask may be shown.
[IMAGE_CUT]
Cut_Top=0 →Trim margin of Top portion
Cut_Bottom=0 →Trim margin of Bottom portion
Cut_Left=0 →Trim margin of Left portion
Cut_Right=0 →Trim margin of Right portion

The serial number of CMOS sensor is recorded.
If you change CMOS sensor, put the new serial number of the sensor
[CALC]
SensorNumber=00000000

16. CONTACT INFORMATION

Please contact our sales office or a distributor near you.

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17. Revision data of this manual

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