EEG-9100A
EEG-9100J
EEG-9100K
EEG-9100G
EEG-9200A
EEG-9200J
EEG-9200K
EEG-9200G

ELECTROENCEPHALOGRAPH

Neurofax μ EEG-9100

Neurofax EEG-9200

0634-001584C

Contents

GENERAL HANDLING PRECAUTIONS

This device is intended for use only by qualified medical personnel.
Use only Nihon Kohden approved products with this device. Use of non-approved products or in a non-approved manner may affect the performance specifications of the device. This includes, but is not limited to, batteries, recording paper, pens, extension cables, electrode leads, input boxes and AC power.

Please read these precautions thoroughly before attempting to operate the instrument.

1. **To safely and effectively use the instrument, its operation must be fully understood.**

2. **When installing or storing the instrument, take the following precautions:**
   (1) Avoid moisture or contact with water, dust, extreme atmospheric pressure, excessive humidity and temperatures, poorly ventilated areas, and saline or sulphuric air.
   (2) Place the instrument on an even, level floor. Avoid vibration and mechanical shock, even during transport.
   (3) Avoid placing in an area where chemicals are stored or where there is danger of gas leakage.
   (4) The power line source to be applied to the instrument must correspond in frequency and voltage to product specifications, and have sufficient current capacity.
   (5) Choose a room where a proper grounding facility is available.

3. **Before Operation**
   (1) Check that the instrument is in perfect operating order.
   (2) Check that the instrument is grounded properly.
   (3) Check that all cords are connected properly.
   (4) Pay extra attention when the instrument is in combination with other instruments to avoid misdiagnosis or other problems.
   (5) All circuitry used for direct patient connection must be doubly checked.
   (6) Check that battery level is acceptable and battery condition is good when using battery-operated models.

4. **During Operation**
   (1) Both the instrument and the patient must receive continual, careful attention.
   (2) Turn power off or remove electrodes and/or transducers when necessary to assure the patient's safety.
   (3) Avoid direct contact between the instrument housing and the patient.

5. **To Shutdown After Use**
   (1) Turn power off with all controls returned to their original positions.
   (2) Remove the cords gently; do not use force to remove them.
   (3) Clean the instrument together with all accessories for their next use.

6. **The instrument must receive expert, professional attention for maintenance and repairs. When the instrument is not functioning properly, it should be clearly marked to avoid operation while it is out of order.**

7. **The instrument must not be altered or modified in any way.**

8. **Maintenance and Inspection:**
   (1) The instrument and parts must undergo regular maintenance inspection at least every 6 months.
   (2) If stored for extended periods without being used, make sure prior to operation that the instrument is in perfect operating condition.

(3) Technical information such as parts list, descriptions, calibration instructions or other information is available for qualified user technical personnel upon request from your Nihon Kohden distributor.

9. **When the instrument is used with an electrosurgical instrument, pay careful attention to the application and/or location of electrodes and/or transducers to avoid possible burn to the patient.**

10. **When the instrument is used with a defibrillator, make sure that the instrument is protected against defibrillator discharge. If not, remove patient cables and/or transducers from the instrument to avoid possible damage.**

WARRANTY POLICY

Nihon Kohden Corporation (NKC) shall warrant its products against all defects in materials and workmanship for one year from the date of delivery. However, consumable materials such as recording paper, ink, stylus and battery are excluded from the warranty.

NKC or its authorized agents will repair or replace any products which prove to be defective during the warranty period, provided these products are used as prescribed by the operating instructions given in the operator's and service manuals.

No other party is authorized to make any warranty or assume liability for NKC's products. NKC will not recognize any other warranty, either implied or in writing. In addition, service, technical modification or any other product change performed by someone other than NKC or its authorized agents without prior consent of NKC may be cause for voiding this warranty.

Defective products or parts must be returned to NKC or its authorized agents, along with an explanation of the failure. Shipping costs must be pre-paid.

This warranty does not apply to products that have been modified, disassembled, reinstalled or repaired without Nihon Kohden approval or which have been subjected to neglect or accident, damage due to accident, fire, lightning, vandalism, water or other casualty, improper installation or application, or on which the original identification marks have been removed.

In the USA and Canada other warranty policies may apply.

CAUTION

United States law restricts this device to sale by or on the order of a physician.

EMC RELATED CAUTION

This equipment and/or system complies with the International Standard IEC60601-1-2 for electromagnetic compatibility for medical electrical equipment and/or system. However, an electromagnetic environment that exceeds the limits or levels stipulated in the IEC60601-1-2, can cause harmful interference to the equipment and/or system or cause the equipment and/or system to fail to perform its intended function or degrade its intended performance. Therefore, during the operation of the equipment and/or system, if there is any undesired deviation from its intended operational performance, you must avoid, identify and resolve the adverse electromagnetic effect before continuing to use the equipment and/or system.

The following describes some common interference sources and remedial actions:

1.Strong electromagnetic interference from a nearby emitter source such as an authorized radio station or cellular phone:
Install the equipment and/or system at another location if it is interfered with by an emitter source such as an authorized radio station. Keep the emitter source such as cellular phone away from the equipment and/or system.

2.Radio-frequency interference from other equipment through the AC power supply of the equipment and/or system:
Identify the cause of this interference and if possible remove this interference source. If this is not possible, use a different power supply.

3.Effect of direct or indirect electrostatic discharge:
Make sure all users and patients in contact with the equipment and/or system are free from direct or indirect electrostatic energy before using it. A humid room can help lessen this problem.

4.Electromagnetic interference with any radio wave receiver such as radio or television:
If the equipment and/or system interferes with any radio wave receiver, locate the equipment and/or system as far as possible from the radio wave receiver.

If the above suggested remedial actions do not solve the problem, consult your Nihon Kohden Corporation subsidiary or distributor for additional suggestions.

The CE mark is a protected conformity mark of the European Community. The products herewith comply with the requirements of the Medical Device Directive 93/42/EEC.

The CE mark is only applied to the EEG-9100K/G and EEG-9200K/G Electroencephalograph.

This equipment complies with EUROPEAN STANDARD EN-60601-1-2 (1993) which requires EN-55011, class B.

Conventions Used in this Manual and Instrument

Warnings, Cautions and Notes

Warnings, cautions and notes are used in this manual to alert or signal the reader to specific information.

WARNING

A warning alerts the user to the possible injury or death associated with the use or misuse of the instrument.

CAUTION

A caution alerts the user to possible injury or problems with the instrument associated with its use or misuse such as instrument malfunction, instrument failure, damage to the instrument, or damage to other property.

NOTE

A note provides specific information, in the form of recommendations, prerequirements, alternative methods or supplemental information.

Explanations of the Symbols in this Manual and Instrument

The following symbols found in this manual/instrument bear the respective descriptions as given.

Power supply unit, SC-901A/AK/AG (for EEG-9100A/J/K/G)
Isolation unit, SM-930AA/AJ/AK (for EEG-9200A/J/K/G)

Symbol	Description	Symbol	Description
	Alternative current		Attention, consult operator's manual
	Equipotential ground terminal		Serial number
	Protective ground		Date of manufacture
	The CE Mark is a protected conformity mark of the European Community. The products herewith comply with the requirements of the Medical Device Directive 93/42/EEC.	EMC	The product complies with IEC60601-1-2 (1993) (for sales in Japan only)

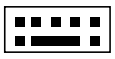
PC unit, CC-901AK (for EEG-9100A/J/K/G)

Symbol	Description	Symbol	Description
	Power/suspend indicator		RS-232C connector
	Num Lock indicator		Mouse connector
	Caps Lock indicator		USB connector
	Scroll Lock indicator		PRT connector
	Hard disk access lamp indicator		Unlock icon
	Battery charging indicator		Protective ground
	Power socket		Attention, consult operator's manual

Symbols on the PC unit differ according to model. Refer to the Operator's manual of the PC unit.
For the symbols of the following equipments, refer to each Operator's manual.

- Magneto-optical disk drive
- Printer

PC unit, CC-902AK (for EEG-9200A/J/K/G)

Symbol	Description	Symbol	Description
	Standby (power on/off)		USB connector
	Hard disk access lamp		Video connector
	Headphone connector		Network connector
	Printer port		Audio jack (Microphone)
	Serial port		Audio jack (LINE OUT)
	Mouse connector		Audio jack (LINE IN)
	Keyboard connector		Attention, consult operator's manual
	Protective ground		

Symbols on the PC unit differ according to model. Refer to the Operator's manual of the PC unit.

For the symbols of the following equipments, refer to each Operator's manual.

- Display
- Magneto-optical disk drive
- Laser printer

Options

Electrode junction box, JE-910A/AG, JE-911A/AG

Symbol	Description	Symbol	Description
	Type BF applied part		Attention, consult operator's manual

Flash lamp assembly, LS-703A/LS-706A

Symbol	Description	Symbol	Description
	Hot surface		Attention, consult operator's manual

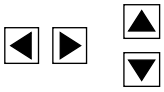
Photo control unit, LS-901AJ/AK/AG

Symbol	Description	Symbol	Description
	Attention, consult operator's manual		Serial number
	Alternative current		Date of manufacture
	Equipotential ground terminal		

Photo control unit (inside)

Symbol	Description	Symbol	Description
	High voltage		Ground
	Protective ground		

On screen

Symbol	Description	Symbol	Description
	Display of list box		Warning query that displays a warning or caution for operation.
	Scrolling of data, list and others		Warning message that displays a warning or caution for operation you to do something.
	Check box		Window maximize/resize minimize button
	Option button		Close button

Precautions for Input Jack Use

NOTE

Do not perform EEG measurement without the Z, C3, C4, A1 and A2 electrodes.

Use of input jack Z

Connect the lead from the electrode (Z electrode) attached on the patient's nasion to the input jack Z on the electrode junction box. The purpose of this input jack is to eliminate AC interference positively.

NOTE

The input jack Z is also used for checking electrode impedance.

Use of input jacks C3 and C4

Connect the leads from the electrodes attached on the positions C3 and C4 to the input jacks C3 and C4 respectively.

NOTE

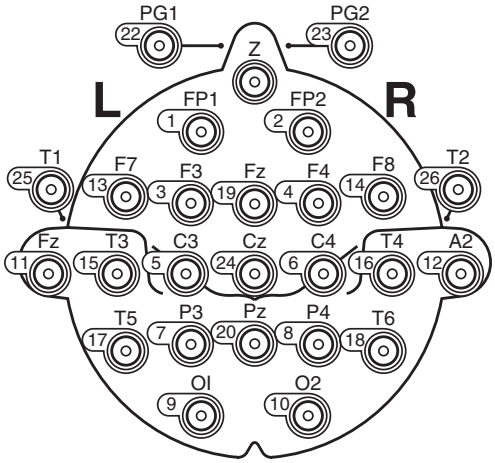
- **The C3 and C4 electrodes are the system reference electrodes for EEG measurement.**
- **The input jacks C3 and C4 must be attached for EEG measurement even when the C3 and C4 are not programmed in any montage.**

Use of input jacks A1 and A2 (or FP1 and FP2), C3 and C4 during skin-electrode impedance check

When checking each electrode impedance, connect the leads from the electrode attached on the positions A1, A2, C3 and C4 to the input jacks A1, A2, C3 and C4 respectively.

NOTE

- **The A1 and A2 (or FP1 and FP2) electrodes are the reference electrodes for skin-electrode impedance check.**
- **The input jacks A1 and A2 (or FP1 and FP2) in addition to the Z, C3 and C4 must be attached for the electrode impedance check.**



Checking original electrode potentials for all active electrodes

Check the original electrode potential for all active electrodes by programming a montage with the system reference (Select the 0 V button for reference electrode on the Montage dialog box). Refer to "Programming Patterns" in Section 4.
The digital EEG displays the EEG waveform in each channel by subtracting two electrode potentials selected to a montage. The subtracted result will be incorrect, if the electrode attachment is not correct, the original electrode potential is flat or unstable, or artifact is superimposed on the original electrode potential. Omit the measurement result if the displayed EEG waveform is incorrect.

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Section 1 General

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Introduction

This service manual provides useful information to qualified service personnel to understand, troubleshoot, service, maintain and repair this EEG-9100A/J/K/G and EEG-9200A/J/K/G Electroencephalograph (referred to as “instrument” in this service manual.

All replaceable parts or units of this instrument and its optional units are clearly listed with exploded illustrations to help you locate the parts quickly.

The “Maintenance” section in this service manual only describes the maintenance that should be performed by qualified service personnel. The Maintenance section in the operator’s manual describes the maintenance that can be performed by the user.

The information in the operator’s manual is primarily for the user. However, it is important for service personnel to thoroughly read the operator’s manual and service manual before starting to troubleshoot, service, maintain or repair this instrument. This is because service personnel needs to understand the operation of the instrument in order to effectively use the information in the service manual.

CAUTION

To turn the power off, follow the procedure in “Power Off Procedure” in Section 3 of the Operator’s manual. Do not press the power button on the PC unit. If the power button is pressed while a program is running, the program, data file in the hard disk and/or MO disk may be damaged.

General Information on Servicing

Note the following information when servicing the system.

CAUTIONS

Safety

- **There is the possibility that the outside surface of the system, such as the operation keys, could be contaminated by contagious germs, so disinfect and clean the system before servicing it. When servicing the system, wear rubber gloves to protect yourself from infection.**

- **There is the possibility that when the lithium battery is broken, a solvent inside the lithium battery could flow out or a toxic substance inside it could come out. If the solvent or toxic substance touches your skin or gets into your eye or mouth, immediately wash it with a lot of water and see a physician.**

Liquid ingress

The system is not waterproof, so do not install the system where water or liquid can get into or fall on the system. If liquid accidentally gets into the system or the system accidentally drops into liquid, disassemble the system, clean it with clean water and dry it completely. After reassembling, verify that there is nothing wrong with the patient safety checks and function/performance checks. If there is something wrong with the system, contact your Nihon Kohden representative to repair.

Environmental Safeguards

Depending on the local laws in your community, it may be illegal to dispose of the lithium battery in the regular waste collection. Check with your local officials for proper disposal procedures.

Disinfection and cleaning

To disinfect the outside surface of the system, wipe it with a non-abrasive cloth moistened with any of the disinfectants listed below. Do not use any other disinfectants or ultraviolet rays to disinfect the system.

- Chlorohexidine gluconate solution: 0.5%
- Benzethonium chloride solution: 0.2%
- Glutaraldehyde solution: 2.0%
- Benzalkonium chloride: 0.2%
- Hydrochloric alkyl diaminoethylglycine: 0.5%

Caution - continued

Transport

- **Use the specified shipment container and packing material to transport the system. If necessary, double pack the system. Also, put the system into the shipment container after packing so that the buffer material does not get into the inside of the system.**
- **When transporting a board or unit of the system, be sure to use a conductive bag. Never use an aluminum bag when transporting a board or unit which a lithium battery is mounted. Also, never use a styrene foam or plastic bag which generates static electricity to wrap the board or unit of the system.**

Handling the system

- **Because the outside surface of the system is made of resin, the outside surface of the system is easily damaged. So when handling the system, remove clutter from around the system and be careful to not damage the system or get it dirty.**
- **Because most of the boards in the system are multilayer boards with surface mounted electrical devices (SMD), when removing and soldering the electrical devices, a special tool is required. To avoid damaging other electrical components, do not remove and solder SMD components yourself.**

Measuring and Test Equipment

Maintain the accuracy of the measuring and test equipment by checking and calibrating it according to the check and calibration procedures.

Service Policy, Service Parts and Patient Safety Checks

Service Policy

Our technical service policy for this instrument is to replace the faulty unit, board or part or damaged mechanical part with a new one. Do not perform electrical device or component level repair of the multilayer board or unit. We do not support component level repair outside the factory for the following reasons:

- Most of the boards are multilayer boards with surface mounted electrical devices, so the mounting density of the board is too high.
- A special tool or high degree of repair skill is required to repair the multilayer boards with surface mounted electrical devices.

Disassemble the instrument or replace a board or unit in an environment where the instrument is protected against static electricity.

As background knowledge for repair, pay special attention to the following:

- You can reduce the repair time by considering the problem before starting repair.
- You can clarify the source of most of the troubles using the information from the troubleshooting tables. Refer to "Troubleshooting" of this manual.

Service Parts

Refer to "Replaceable Parts List" of this manual for the service parts for technical service that we provide.

NOTE

When ordering parts or accessories from your Nihon Kohden representative, please quote the NK code number and part name which is listed in this service manual, and the name or model of the unit in which the required part is located. This will help us to promptly attend to your needs. Always use parts and accessories recommended or supplied by Nihon Kohden Corporation to assure maximum performance from your instrument.

Patient Safety Checks

Periodic maintenance procedures and diagnostic check procedures are provided in this manual to ensure that the instrument is operating in accordance with its design and production specifications. To verify that the instrument is working in a safe manner with regard to patient safety, patient safety checks should be performed on the instrument before it is first installed, periodically after installation, and after any repair is made on the instrument.

For patient safety checks, perform the following checks as described in the IEC60601-1 “Medical electrical equipment - Part 1: General requirements for safety”:

- Protective earth resistance check
- Earth leakage current check
- Enclosure leakage current check
- Patient leakage current check
- Withstanding voltage check

Maintenance Equipments/ Tools

Test equipment

When repairing or calibrating the instrument, the following test equipment is required.

- Oscilloscope: 2 channels or more for input signal, 50 mV to 5 V input range, 1/10 attenuating probe and 100 MHz or more frequency response characteristic must be provided.
- Oscillator: standard type
- Digital voltmeter: standard type (An oscilloscope can be used instead of the digital voltmeter.)

Checking tool

When checking the internal noise of the electrode junction box and skin-electrode impedance check function, the checking tools are necessary. Refer to Section 7 “Maintenance”.

General Safety Information

WARNING

- **Never use this instrument in the presence of any flammable anesthetic gas or high-concentration oxygen atmosphere. Failure to follow this warning may cause explosion or fire.**

- **Never use this instrument in a high-pressure oxygen medical tank. Failure to follow this warning may cause explosion or fire.**

Using with an electrical surgical unit (ESU)

- **Never use this instrument near an ESU. The instrument may malfunction due to high-frequency noise from the ESU.**
- **When using this instrument with an ESU, refer to the instruction manual for the ESU. Before measurement, check that the return plate is correctly attached to the patient and check that the instrument operates correctly when using with the ESU. If the return plate is not attached correctly, it may burn the patient's skin where the electrodes are attached.**
- **Before using the ESU, remove all needle electrodes and silver ball electrodes from the patient. Failure to follow this warning may cause burn on the patient.**

MRI examination

- **Do not install this instrument in an MRI examination room. The instrument may not operate properly due to high-frequency magnetic noise from the MRI.**
- **When performing MRI tests, remove from the patient all the electrodes and transducers which are connected to this instrument. Failure to follow this warning may cause serious electrical burn on the patient due to local heating caused by dielectric electromotive force. For details, refer to the instruction manual for the MRI.**

When performing defibrillation

- **Before defibrillation, remove from the patient all electrodes and transducers which are connected to connectors that do not have a "⏚" or "⏚" mark. The discharged energy may cause serious electrical burn or shock to the operator.**
- **Before defibrillation, remove all electrodes and gel from the chest of the patient. If the defibrillator paddle touches electrodes or gel, the discharged energy may burn the patient's skin.**
- **Before defibrillation, all persons must keep clear of the bed and must not touch the patient or any equipment connected to the patient. Failure to follow this warning may cause serious electrical burn, shock or other injury.**

Installation

WARNING

- **Do not install the QP-0042/0043 EEG-9000 System program into a personal computer which is not specified by Nihon Kohden and use it for EEG measurement.**
  - **If the personal computer does not satisfy the performance specifications and safety standards which are required by Nihon Kohden, the patient and operator may get electrical shock.**
  - **Nihon Kohden does not warrant if hardware and/or software becomes defective after installation.**

- **Only use the provided power cords. If another power cord is used, it may cause electrical shock to the patient and operator.**

- **For patient safety, equipotential grounding of all instruments must be performed. Consult a qualified biomedical engineer.**

- **Use the SC-901A/AK/AG Power Supply Unit (EEG-9100A/J/K/G) or SM-930AA/AJ/AK Isolation Unit (EEG-9200A/J/K/G) to supply AC power to a PC unit, display (EEG-9200A/J/K/G only) and an MO disk drive. When two or more power supply units or isolation units are used, ground the power supply units or isolation units to the same equipotential ground and connect the power supply units or isolation units to the same AC outlet to prevent electrical potential difference between the power supply units or isolation units. Never use a locally available multi-power outlets. Failure to follow this warning may cause electrical shock to the patient and operator.**

Display (EEG-9200A/J/K/G only)

- **The display must comply with the IEC950 standard and CISPR11 Second Edition 1990-09 Group 1 and Class B standard, or the equivalent.**
- **Only supply AC power from the SM-930AA/AJ/AK Isolation Unit. Do not connect the display to a wall AC outlet. Failure to follow this warning may cause electrical shock to the patient and operator.**

Magneto-optical disk drive

- **The MO disk drive must comply with the IEC950 standard and CISPR11 Second Edition 1990-09 Group 1 and Class B standard, or the equivalent.**
- **Only supply AC power from the SC-901A/AK/AG Power Supply Unit (EEG-9100A/J/K/G) or from the SM-930AA/AJ/AK Isolation Unit (EEG-9200A/J/K/G). Do not connect the MO disk drive to a wall AC outlet. Failure to follow this warning may cause electrical shock to the patient and operator.**

Warning - continued

Printer

- **The printer must comply with the IEC950 standard and CISPR11 Second Edition 1990-09 Group 1 and Class B standard, or the equivalent.**
- **Mount the printer on the KE-910A Cart (EEG-9100A/J/K/G) or KD-024A Cart (EEG-9200A/J/K/G) and supply AC power from the SC-901A/AK/AG Power Supply Unit (EEG-9100A/J/K/G) or SM-800RJ/RK Isolation Unit (EEG-9200A/J/K/G) . Do not connect the printer to a wall AC outlet. Failure to follow this warning may cause electrical shock to the patient and operator.**
- **When the printer is not mounted on the KE-910A Cart or KD-024A Cart, locate the printer outside the patient environment (IEC60601-1-1 2.204*) and supply AC power from a medical isolation transformer. Do not connect the printer to a wall AC outlet. Failure to follow this warning may cause electrical shock to the patient and operator.**

* Patient environment
Any area in which intentional or unintentional contact between PATIENT and parts of SYSTEM or some other persons touching of the SYSTEM can occur.

- **Connect only the specified instruments to the connectors or socket marked with ⚠ , by following the specified procedure. Otherwise, electrical leakage current may harm the patient and operator.**

- **When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the LS-901AJ/AK/AG Photo control unit. To protect against shock, always connect the flash lamp assembly cable to this connector, or attach the PHOTOTIC LAMP connector cap to the PHOTIC LAMP connector even when the photic stimulation is not used.**

- **When connecting an external instrument to the connectors marked with ⚠, the external instrument and this instrument must be connected according to the IEC-60601-1-1 "Medical electrical equipment - Part 1-1: General requirements for safety - Collateral standard: Safety requirements for medical electrical systems". Failure to follow this warning may cause electrical shock to the patient and operator.**

Connecting to a Local Area Network

- **When connecting the instrument to a local area network, connect the instrument so that the instrument is electrically separated from the local area network according to the IEC-60601-1-1 "Medical electrical equipment - Part 1-1: General requirements for safety - Collateral standard: Safety requirements for medical electrical systems". Failure to follow this warning may cause electrical shock to the patient and operator.**
- **Check that there is no damage on the surface of the network cable. If it is damaged, it may cause electrical shock to the patient and operator.**

Warning - continued

- **Before connecting or disconnecting the DC input cable to the DC input connector on the JE-911A/AG Electrode junction box, make sure that the power of the external instrument is turned off or DC signal is not output from the external instrument. Failure to follow this warning may cause electrical shock to the patient and operator.**

CAUTION

- **When connecting the cables, make sure that each instrument is turned off.**
- **Connect only the CC-901AK PC unit and MO disk drive to the SC-901A/AK/AG power supply unit. If other equipment is connected, the power supply unit may not supply enough AC power and may cause malfunction.**
- **Connect only the CC-902AK PC unit, display and MO disk drive to the SM-930AA/AJ/AK Isolation Unit. If other equipment is connected, the isolation unit may not supply enough AC power and may cause malfunction.**
- **Only install the specified software in the instrument. Otherwise the system may malfunction.**
- **When moving the instrument, select a flat path and move it carefully to prevent the components from falling off or the cart from tipping over.**
- **If static electricity is applied to the connector for the optional hyperventilation unit, pulse noise may be superimposed on the waveform of the mark channel.**
- **When using the instrument in a high-frequency electric field, the displayed waveform trace may be thicker.**
- **Use a printer cable which does not emit an unwanted radio frequency signal (EMC protected).**

Caution - continued

Cart

- **Use only the KE-910A Cart (EEG-9100A/J/K/G) or KD-024A/025A (EEG-9200A/J/K/G) for this instrument. If any of these carts is not used, secure the components of the instrument so that they do not fall off or tip over.**
- **Do not sit or lean on the cart because it may tip over.**
- **Set the components of the electroencephalograph on the cart according to the specified procedures. Otherwise, the cart may break or the components may tip over.**

- **Align the cable with the cable tie or cable clamp so that the cable is not accidentally pulled or caught. Otherwise, the connector may be damaged or the components connected on the cart may fall off and cause injury.**

- **Do not use the SD-901AJ/AK/AG (EEG-9100A/J/K/G), SD-903AJ/AK/AG (EEG-9200A/J/K/G) Multiple Portable Socket Outlet if it is not secured to the cart. Otherwise, it may cause electrical shock to the patient and operator.**

- **When moving the cart,**
  - **make sure that the power of all components are turned off,**
  - **close the PC unit display (EEG-9100A/J/K/G - CC-901AK),**
  - **release the caster lock,**
  - **only grip the handle,**
  - **select a flat path and move the cart carefully to prevent tipping over, components falling or impact, and**
  - **take care so that the electrode junction box or flash lamp assembly does not bump into a surrounding instrument.**

- **Periodically check that the caster rotates smoothly and that no screw or knob bolt is loose.**

Operation

WARNING

- **When using the instrument for brain death diagnosis, before examination, check and adjust the date and time of the system. The date and time on the screen and on the recording result are part of important information for the medical record.**

- **Do not connect the Z electrode lead plug to a ground or equipotential ground. Otherwise, leakage current from another instrument cause electrical shock to the patient.**

- **When the JE-913A/AG mini junction box is not used, make sure that the multiple connecter cover is firmly attached to the electrode junction box. Failure to follow this warning may cause electrical shock to the patient and operator.**

- **All activation testing must be applied under the supervision of the physician in charge. Mouth gags, tongue depressors and gauze sponges must always be prepared for use to prevent the patient from biting his tongue or injuring himself during testing because any pattern of flash stimuli may induce seizure activity.**

- **Do not perform hyperventilation activation when the patient has serious heart disease, acute cerebrovascular disease or respiratory insufficiency.**

- **When performing the photic stimulation, If an abnormal waveform appears due to photo-paroxymal response, stop the photic stimulation immediately to prevent evoking seizure.**

When using the NE-224S Sub-dermal Straight Needle Electrode

- **Do not use the NE-224S sub-dermal straight needle electrode as a measurement electrode for the EEG or evoked potential measurement for any longer than one hour. When measuring the EEG or evoked potential for over one hour, use the EEG disk electrode.**
- **Do not check the skin-electrode impedance when using a needle electrode or intracranial electrode. Failure to follow this warning injures the patient because these electrodes will be damaged by electrolyzation inside the body.**
- **Only connect the respiration pickup which is specified by Nihon Kohden to the RESP F, C, A jack. If an unspecified respiration pickup, sensor or equipment is connected, electrical leakage current may harm the patient and operator.**

CAUTION

- **During measurement, do not change the date and time. This makes the order of the saved event data and the time of the saved waveforms incorrect.**

- **Do not use the photic stimulator continuously over 5 minutes in any mode. When photic stimulation is performed for a long time, the flash lamp assembly gets very hot and causes burn if touched. If the photic stimulator is continuously used for 5 minutes, do not use it for at least 20 minutes to let it cool down.**

- **Do not turn the instrument off when the program is running. When turning the instrument off, follow the procedure in "Power Off Procedure" in Section 2.**

- **Do not delete any system file in the hard disk. Otherwise the instrument may malfunction.**

- **Do not remove the optical disk or magneto-optical disk until the disk drive access lamp is off. Otherwise, the disk or disk drive may be damaged.**

- **Periodically back up the EEG data files to prevent loss of data when the hard disk or MO disk is damaged.**

NOTE

- **If any static electricity enters the electrode junction box or serial input terminal, spike noise may be superimposed on the waveform.**

- **If static electricity is applied to the connector for the optional hyperventilation unit, pulse noise may be superimposed on the waveform of the mark channel.**

- **When using the instrument in a high-frequency electric field, the displayed waveform trace may be thicker.**

Disinfecting or Sterilizing

CAUTION

Turn off the power before cleaning or disinfecting. Otherwise you may get an electrical shock or the instrument may malfunction.

Floppy Disk/CD-ROM Disk Handling and Storing

WARNING

The QP-0042/QP-0043 EEG-9000 System Program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this software, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

CAUTION

- **Keep floppy disks away from strong magnetic objects such as a magnet, TV set or speaker. Otherwise, data in the disk may be lost.**
- **Do not insert or remove a disk while the lamp on the disk unit is lit.**
- **During measurement, do not insert or remove a CD-R or CD-RW disk into the CD-RW drive. Otherwise, the Acquisition program may malfunction (EEG-9200A/J/K/G).**
- **Do not touch the disk surface of the recorded side (CD-ROM: opposite side of the label side). If the surface of the disk becomes contaminated with any foreign substances such as fingerprints, reading data may be impossible.**
- **Keep the disk away from direct sunlight and high temperature. Otherwise, the disk may become deformed.**
- **Do not handle the disk while smoking or eating.**
- **Do not get the disk wet.**
- **Do not put a label on top of another label. Remove the old label before applying a new label.**
- **Do not write on the label after the label is attached on the disk. Otherwise, the disk may be damaged and reading may be impossible.**
- **Do not bend the disk, put heavy material on the disk, or give a strong impact to the disk.**
- **Clean the disk with a disk cleaner. Do not use organic solvents such as acetone.**
- **This CD–ROM is not an audio CD and cannot be played with an audio CD player.**

NOTE

- **When using the EEG-9000 application program, close all other programs. Otherwise, the System Program may not function properly.**

- **Turn off any screen saver before opening the EEG-9000 application program.**

Specifications

Data Acquisition

Number of input jacks	
EEG inputs on electrode position layout:	25
Extra inputs:	4 (X1 to X4)
Reference input for feedback:	1 (Z)
Respiration inputs:	3 {RESP F (flow), RESP C (chest), RESP A (abdomen)}
Bipolar inputs	6 (3 pairs)
DC input:	4 (JE-911A/AG only)
Input impedance	100 MΩ
Input leakage current	less than 5 nA
Internal noise level	Less than 1.5 μVp-p (0.53 to 60 Hz)
CMRR	105 dB or greater (at 60 Hz)
Gain	×469.73
Low-cut filter	0.08 Hz (time constant: 2 s)
High-cut filter	300 Hz (-18 dB/oct)
Offset tolerance	±750 mV
A/D conversion	16 bits (97 nV/LSB)
Sampling and hold	All electrodes at the same time
Sampling frequency	1,000 Hz

Data Processing

Sensitivity	
EEG INPUT:	OFF, 1, 2, 3 (2.5), 5, 7, 10, 15, 20, 30, 50, 75, 100, 150, 200 μV/mm
DC INPUT:	OFF, 10, 15, 20, 30, 50, 70, 100, 150, 200 mV/mm
Time constant	0.001, 0.003, 0.03, 0.1, 0.3, 0.6, 1.0, 2.0 s
(Low-cut filter)	0.08, 0.16, 0.27, 0.53, 1.6, 5.3, 53, 159 Hz (-6 dB/oct)
High-cut filter	15, 30, 35, 60, 70, 120 (-12 dB/oct), 50 (RAPID), 300 Hz (-18 dB/oct)
AC filter	50 or 60 Hz, (rejection ratio: 1/25 or more)
Calibration waveform	
Waveform shape:	0.25 Hz step wave or 10 Hz sine wave
Voltage:	2, 5, 10, 20, 50, 100, 200, 500, 1,000 μV (×1000 for DC input signal)
ECG elimination filter	Available in acquisition and review programs
Impedance check	
Indication on the screen:	All electrodes are displayed on the screen in electrode position layout. Impedance for each electrode is displayed and electrodes with impedance higher than the preset impedance threshold are highlighted.
Indication on LED:	LEDs on the electrode junction box with impedance higher than the preset impedance threshold light.
Impedance threshold:	2, 5, 10, 20 and 50 kΩ
Pattern	36 sets of programmable montages combined with programmable individual amplifier settings
Reference electrode selector	A1 →A2, A1 ←A2, A1 ↔ A2, A1 + A2, VX, AV (with unsuitable electrode deletion function), Aav, Org, SD and OFF.
Marking signal	Photic stimulation mark, Hyperventilation mark

Display

Display resolution	1024 dots × 768 lines (EEG-9100)
	Up to 1600 dots × 1200 lines (EEG-9200)
Number of display channels	Up to 64 and one mark channel
Display modes	Overwrite and page-by-page
Waveform display color	16 colors
Waveform display on/off	Provided
Waveform position adjustment	Provided
Waveform freeze	Provided
Paient image display	Available when the optional QP-111A Camera Interface Board and/or QV-110AK Digital Video Unit, and video camera are used (EEG-9200 Only).
Waveform sweep speed	5, 10, 15, 20, 30, 60s or 5 min /page
Timing mark	0.1, 1 s
Time scale	off, 0.2, 1 s
Event mark	Displays at the bottom of the screen
EEG scale	Provided

Acquisition Program

Timer function	Manual timer, recording timer, HV timer
Data storage device	Hard disk drive (standard), magneto-optical disk drive (option)
Sampling frequency	100, 200, 500, 1000 Hz

Photic Stimulator

Maximum flash energy	0.64 J or more
Stimulation modes	3 automatic (30 steps, programmable), manual, and single
Mode of operation	Continuous operation with intermittent loading
Duty cycle	Max. 5 minutes continuous operation in 30 minutes
Automatic stimulation	
Stimulus rate	0.5, 1 to 33 (1 Hz steps), 50 and 60 Hz
Stimulation period	1 to 99 seconds in 1 second steps
Pause period	1 to 30 seconds in 1 second steps
Manual stimulation	Manually set frequency and stimulation period
Photic frequency	0.5 Hz, 1 to 33 Hz in 1 Hz steps, 50 and 60 Hz
Stimulation time	1 to 99 s in 1 second steps and continuous stimulation (FREE: Max. 5 min)
Pulse mode	Normal, random, and double
Random stimulation	1 to 33 Hz in 1 Hz steps within ±50%
Single stimulation	Manual key operation single stimulation or automatic single stimulation by external trigger signal.
Trigger input	TRIG. INPUT connector (1 to 5 V)
Trigger output	TRIG. OUTPUT connector (3 V or more)

Hyperventilation

Hyperventilation interval	1.5, 2, 2.5, 3, 4 or 5 s
Stimulation time	1, 2, 3, 4 or 5 min

Review Program

Changeable items	Montage, sensitivity, high-cut filter, time constant, reference electrode, and display speed
Jump functions	Specified event, page by page, and specified time
Display modes	Continuous, high speed, high speed with pause, manually page-by-page, manually second-by-second and manually waveform centering
Display information	Event, channel number, montage and comment

Safety

Safety standard	IEC 60601-1 (1988) IEC 60601-1 Amendment 1 (1991) IEC 60601-1 Amendment 2 (1995) IEC 60601-2-26 (1994) EN 60601-1-1 (1992-06) with AM1 (1995 - 10)
Type of protection against electric shock	Class I
Degree of protection against electric shock	Type BF
Degree of protection against harmful ingress of water	Not protected (IPX0)
Degree of safety of application in flammable gas	Not suitable for use in the presence of a flammable anaesthetic mixture with air or oxygen or nitrous oxide
Mode of operation	Continuous

Electromagnetic Compatibility

IEC60601-1-2 (1993)
CISPR11(1990) GROUP 1 CLASS B

Dimensions and Weight

EEG-9100A/J/K/G

CC-901AK PC unit: 319.5 (W) × 253.6 (D) × 36.8 (H) mm, 2.2 kg
The dimensions and weight differ according to model. Refer to the Operator's manual of the PC unit.

SC-901A/AK/AG Power supply unit
110 (W) × 200 (D) × 75 (H) mm, 3.0 kg

KE-910A Cart (option): 420 (W) × 746 (D) × 800 (H) mm, 18.5 kg

EEG-9200A/J/K/G

CC-902AK PC unit: 181 (W) × 447 (D) × 425 (H) mm, 12.7 kg
The dimensions and weight differ according to model. Refer to the Operator's manual of the PC unit.

Isolation unit
SM-930AA/AJ: 150 (W) × 250 (D) × 140 (H) mm, 7.5 kg
SM-930AK: 180 (W) × 320 (D) × 140 (H) mm, 12.5 kg

Cart (option)
KD-024A: 620 (W) × 850 (D) × 1300 (H) mm, 45.5 kg
KD-025A: 620 (W) × 850 (D) × 830 (H) mm, 36.0 kg

LS-901AJ/AK/AG Photo control unit

155 (W) × 300 (D) × 75 (H) mm, 3.9 kg

Multiple portable socket outlet

SD-901AJ	240 (W) × 60 (D) × 95 (H) mm, 0.6 k g
SD-901AK/AG	240 (W) × 63 (D) × 81 (H) mm, 0.75 k g
SD-903AJ	240 (W) × 60 (D) × 117 (H) mm, 0.6 k g
SD-903AK/AG	240 (W) × 63 (D) × 81 (H) mm, 0.75 k g

JE-910A/911A Electrode junction box

185 (W) × 72 (D) ×167 (H) mm, 1.0 kg (not including cables)

JE-913A/AG Mini junction box

85 (W) × 26.5 (D) ×113 (H) mm, 0.3 kg (not including cables)

Power Requirements

EEG-9100A/J/K/G

Line voltage	SC-901A:	AC 100 to 127 V
	SC-901AK/AG:	AC 220 to 240 V
Line frequency	50/60 Hz	
Power consumption	420 VA	

EEG-9200A/J/K/G

Line voltage	SM-930AA:	AC 117 V
	SM-930AJ:	AC 110 to 127 V
	SM-930AK:	AC 220 to 240 V
Line frequency	50/60 Hz	
Power consumption	750 VA (for PC unit, display and MO disk drive)	
	1 kVA (PC unit, diplay, MO disk drive and photo control unit)	

Operation Conditions

Temperature	10 to 35° C (50 to 95° F)
Humidity	30 to 80 % (no condensing)
Atmospheric pressure	70 kPa to 106 kPa

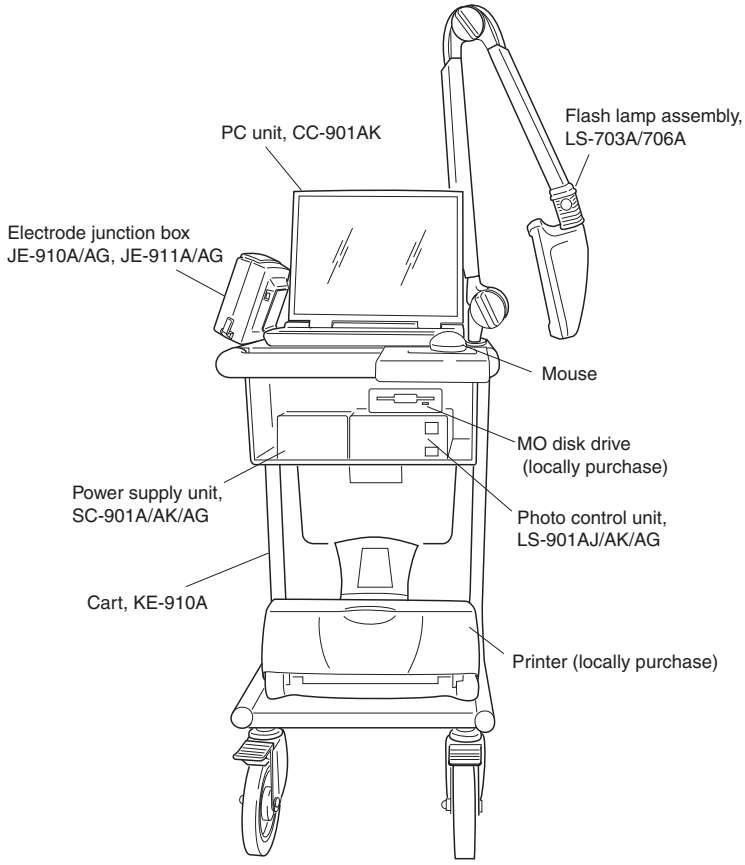
Transport and Storage Conditions

Temperature	-20 to 65° C (-4 to 149° F)
Humidity	EEG-9100A/J/K/G: 10 to 95 % (non-condensing)
	EEG-9200A/J/K/G: 20 to 80 % (non-condensing)
Atmospheric pressure	70 kPa to 106 kPa

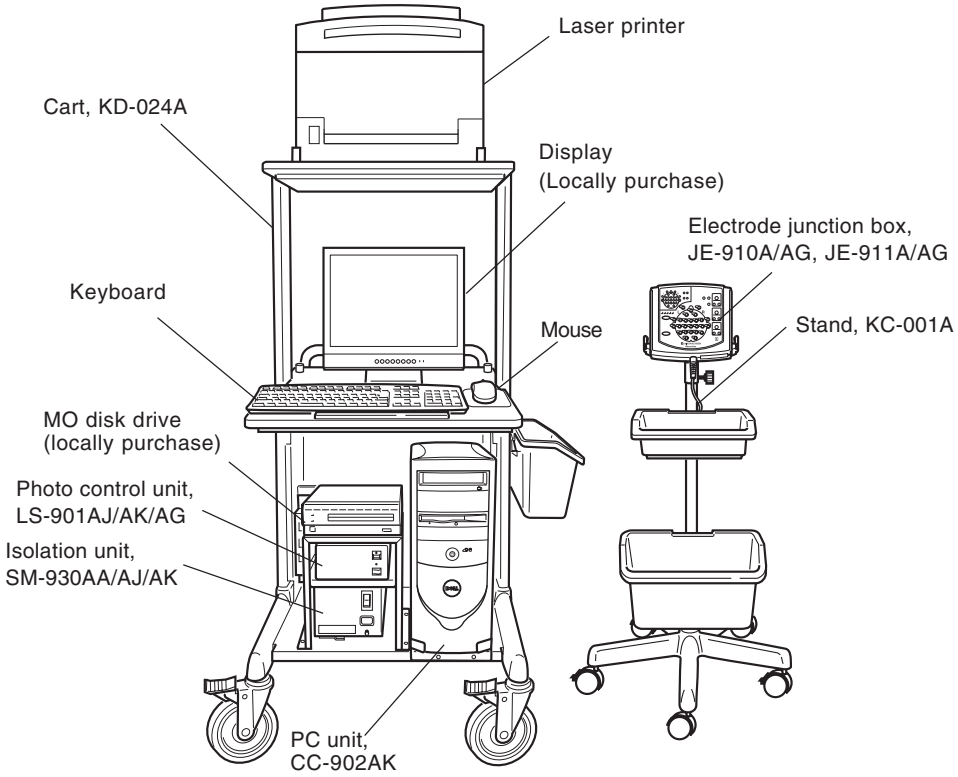
Panel Descriptions

Component Example

EEG-9100A/J/K/G



EEG-9200A/J/K/G

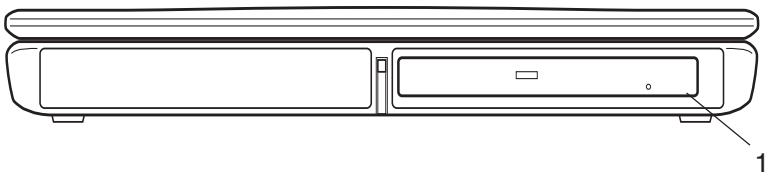


CC-901AK PC Unit (for EEG-9100A/J/K/G)

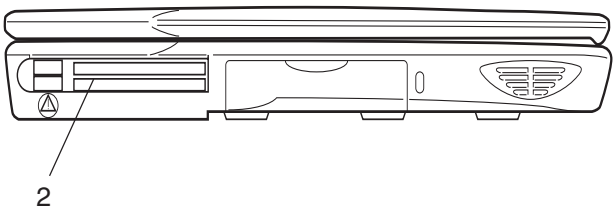
For the ⚠ mark, refer to the descriptions for “General Safety Information” and “Panel Descriptions” in Section 1 of the EEG-9100/9200 Operator’s manual.

The shape of the AC outlet differs according to the model.

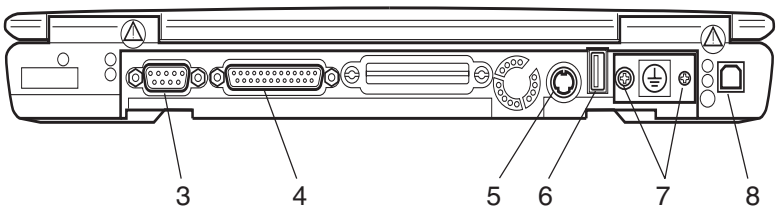
Front panel



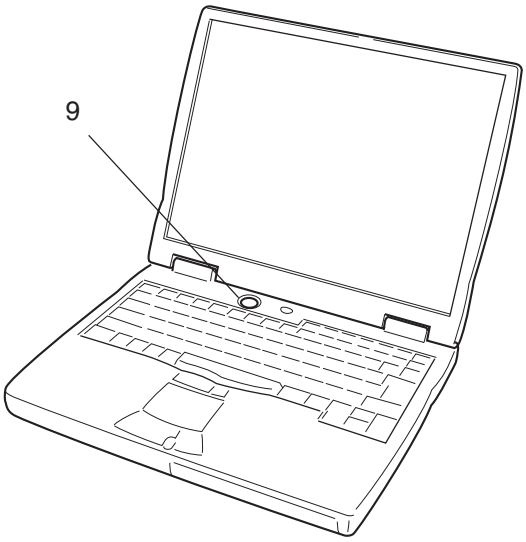
Left side panel



Rear panel



Front view



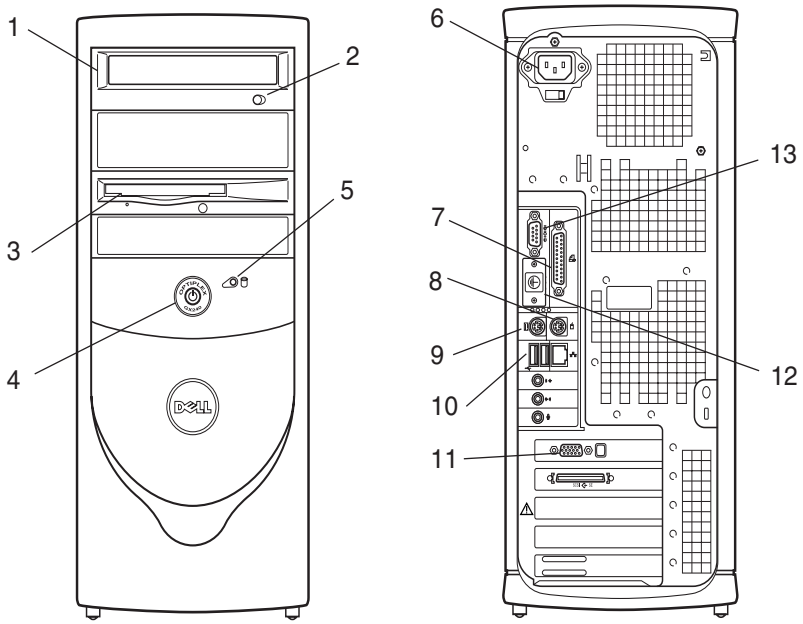
Name

1. CD-ROM drive
2. PC Card slot
3. RS-232C connector
4. PRT connector
5. Mouse connector
6. USB connector
7. Protective ground terminal
8. Power socket
9. Power button

CC-902AK (PC Unit for EEG-9200A/J/K/G)

For the ⚠ mark, refer to the descriptions for “General Safety Information” and “Panel Descriptions” in Section 1 of the EEG-9100/9200 Operator’s manual.

The shape of the AC outlet differs according to the model.



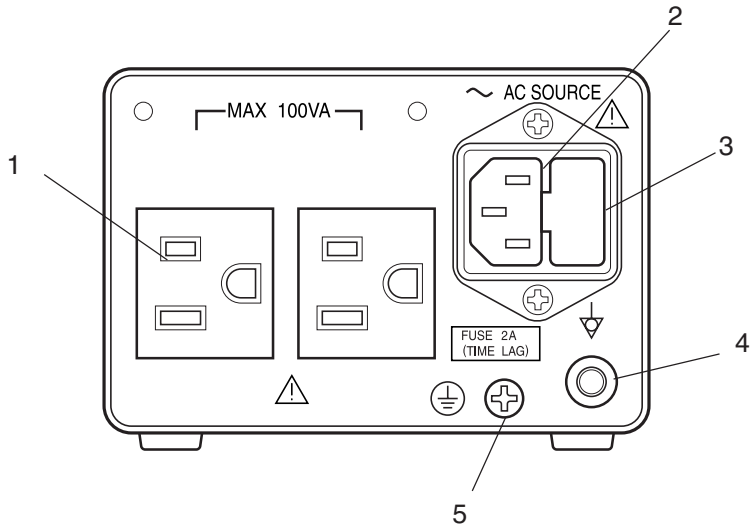
Name

1. CD-RW drive
2. CD-RW eject button
3. Floppy disk drive
4. PC power switch
5. Hard disk access LED
6. AC socket
7. Printer port
8. Mouse connector
9. Keyboard connector
10. USB connector
11. Video connector
12. Protective ground terminal
13. RS-232C connector

SC-901A/AK/AG Power Supply Unit (for EEG-9100A/J/K/G only)

For the ⚠ mark, refer to the descriptions for "General Safety Information" and "Panel Descriptions" in Section 1 of the EEG-9100/9200 Operator's manual.

The shape of the AC outlet differs according to the model.



Example: SC-901A

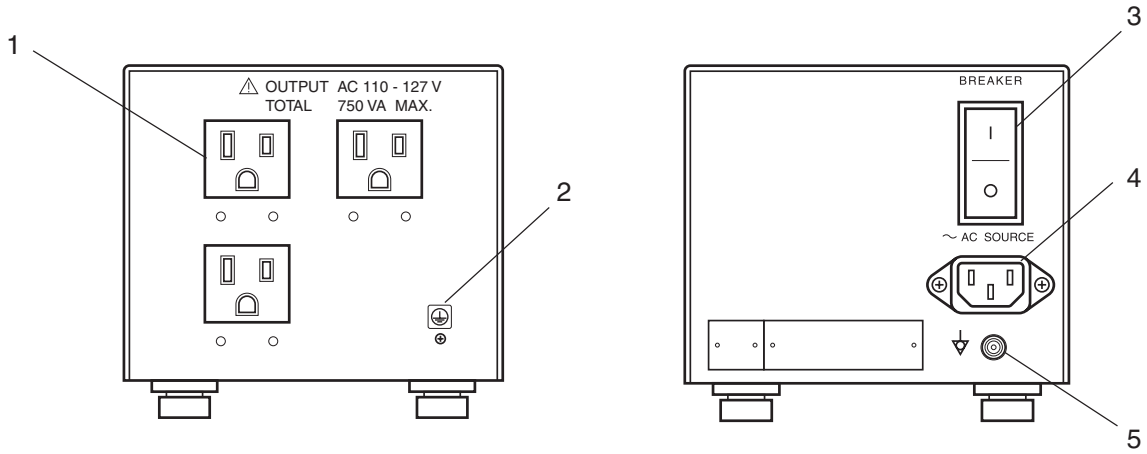
Name

1. AC outlets
2. AC SOURCE socket
3. FUSE holder
4. Equipotential ground terminal
5. Protective ground terminal

SM-930AA/AJ/AK Isolation Unit (for EEG-9200A/J/K/G only)

For the ⚠ mark, refer to the descriptions for "General Safety Information" and "Panel Descriptions" in Section 1 of the EEG-9100/9200 Operator's manual.

The shape of the isolation unit differs according to the model.



Example: SM-930AJ

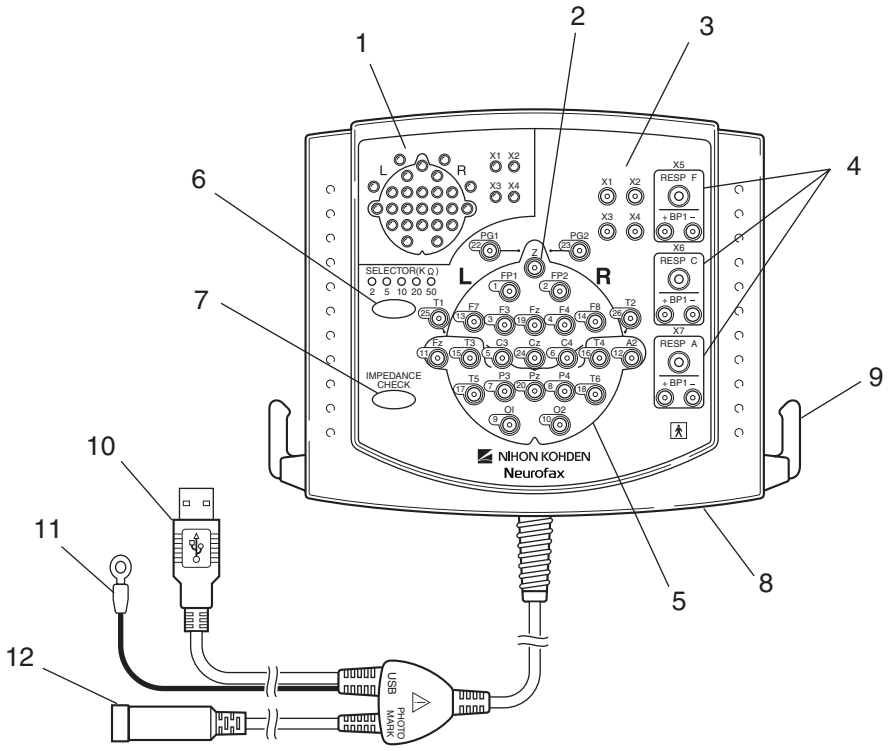
Name

1. OUTPUT (AC outlet)
2. Protective ground terminal
3. BREAKER
4. AC SOURCE socket
5. Equipotential ground terminal

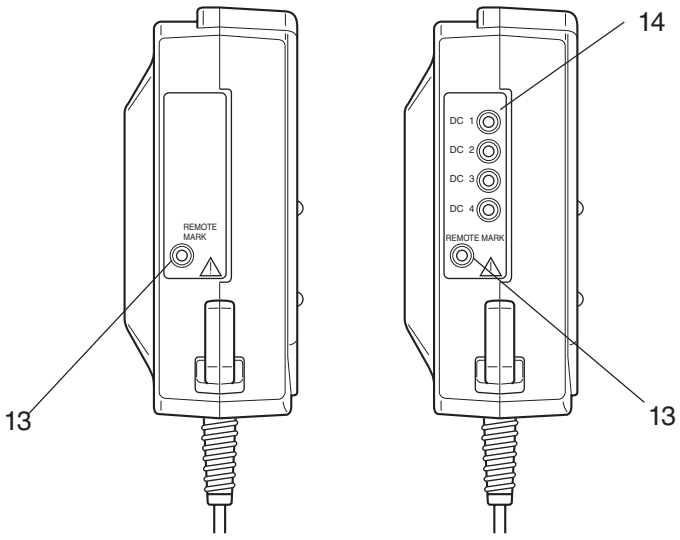
JE-910A/AG JE-911A/AG (Option) Electrode Junction Box

For the ⚠ mark, refer to the descriptions for “General Safety Information” and “Panel Descriptions” in Section 1 of the EEG-9100/9200 Operator’s manual.

Front panel



Left side panel



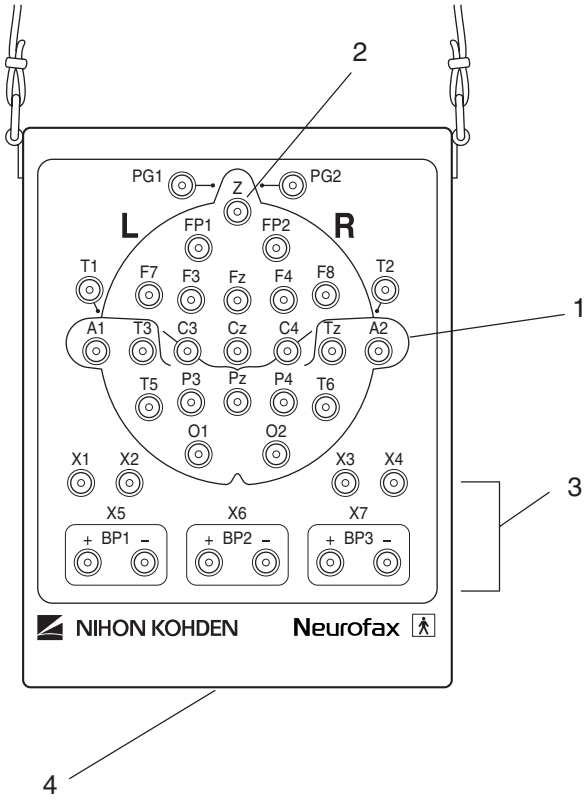
JE-910A/AG JE-911A/AG

Name

1. Impedance display LED
2. Z jack
3. Extra input jack
4. RESP F, C, A (Bipolar 1 to 3) jack
5. Electrode jack
6. 2, 5, 10, 20 50 K Ω SELECTOR (Impedance preset key)
7. IMPEDANCE CHECK key
8. Multiple connecter
9. Cord hanger
10. USB cable
11. Functional ground lead
12. Photo mark cable
13. REMOTE MARK connector
14. DC input connector (JE-911A/AG Only)

JE-913A/AG Mini Junction Box (Option)

For the ⚠ mark, refer to the descriptions for “General Safety Information” and “Panel Descriptions” in Section 1 of the EEG-9100/9200 Operator’s manual.

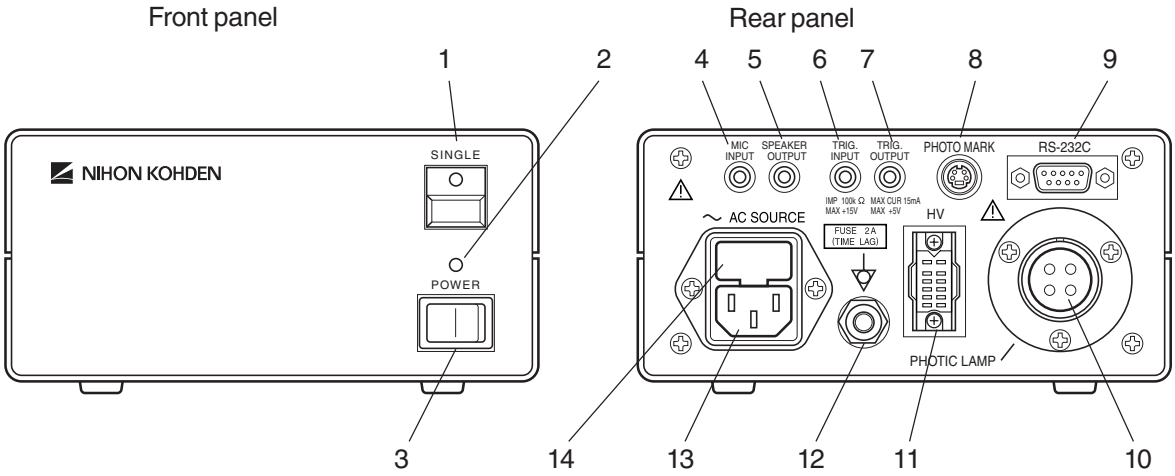


Name

1. Electrode jack
2. Z jack
3. Extra input jack
4. Multiple output connector

LS-901AJ/AK/AG Photo Control Unit (Option)

For the ⚠ mark, refer to the descriptions for “General Safety Information” and “Panel Descriptions” in Section 1 of the EEG-9100/9200 Operator’s manual.



Name

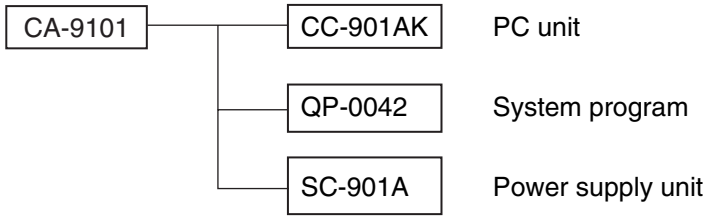
1 SINGLE button
2. Power indicator
3. POWER switch
4. MIC INPUT connector
5. SPEAKER OUTPUT connector
6. TRIG. INPUT connector
7. TRIG. OUTPUT connector
8. PHOTO MARK connector
9. RS-232C connector
10. PHOTIC LAMP connector
11. HV connector
12. Equipotential ground terminal
13. AC SOURCE socket
14. FUSE holder

Composition

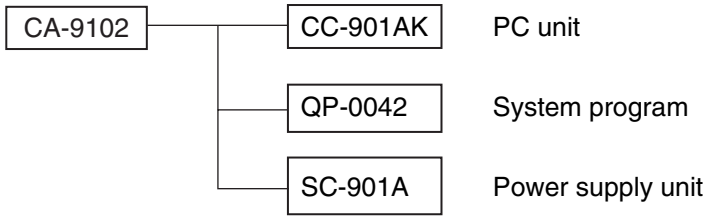
EEG-9100A/J/K/G

Standard Components

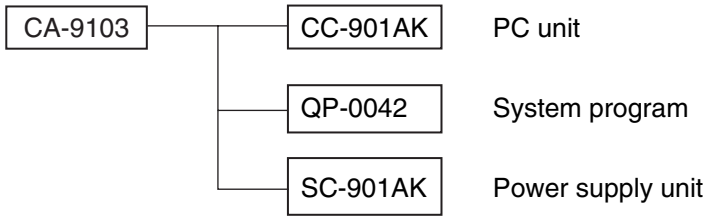
EEG-9100A



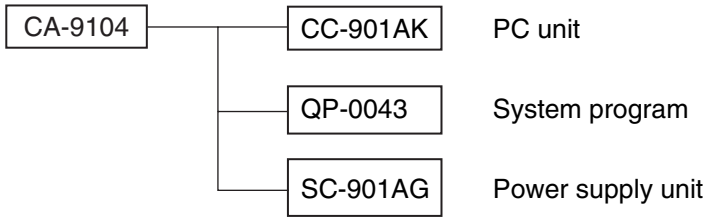
EEG-9100J



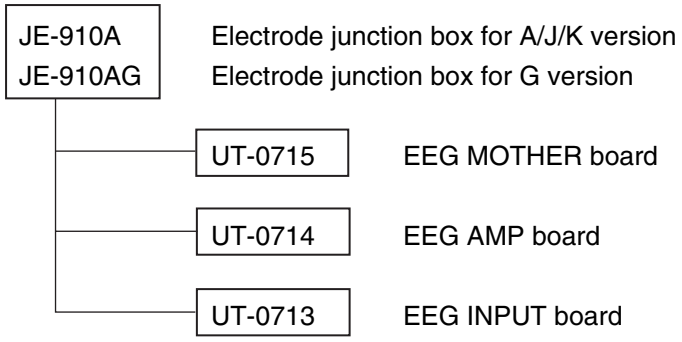
EEG-9100K

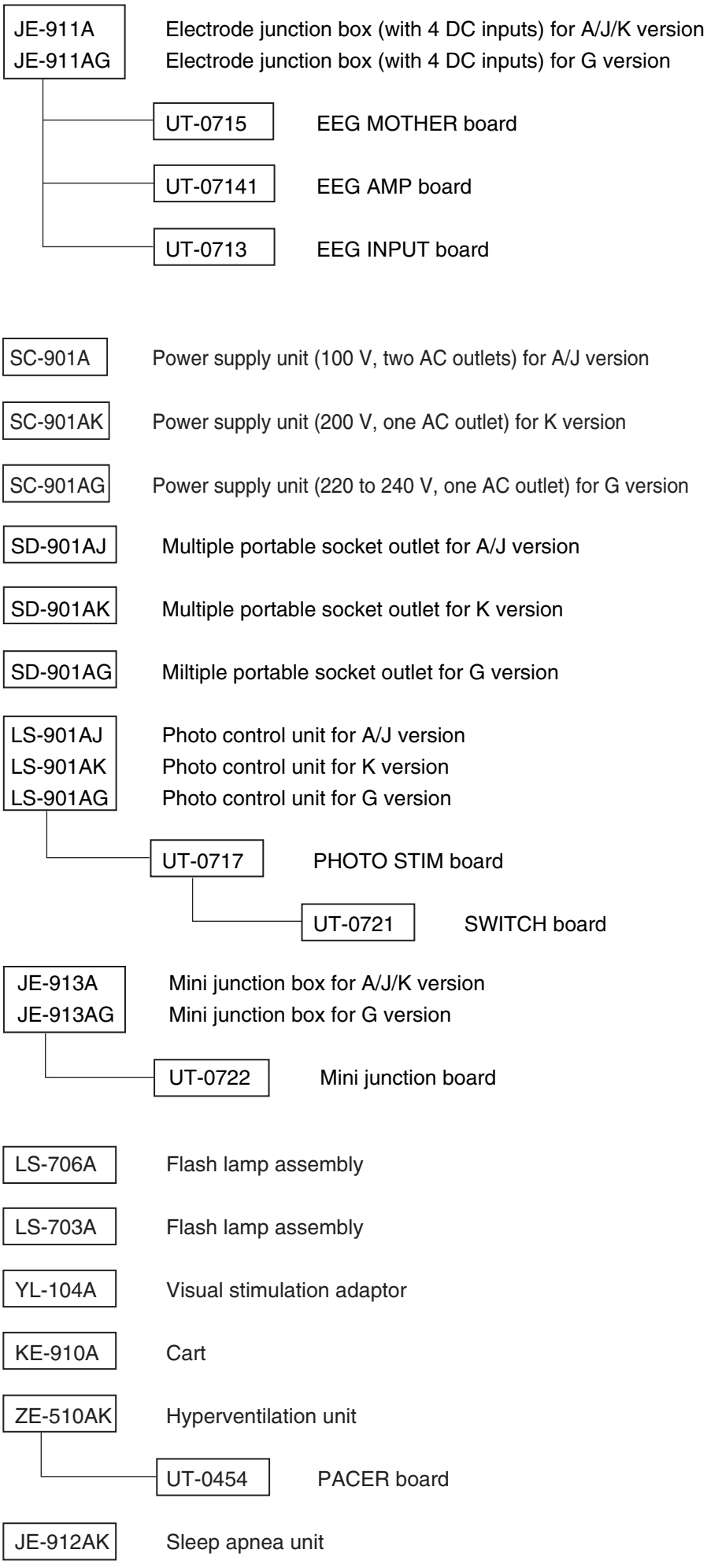


EEG-9100G



Options

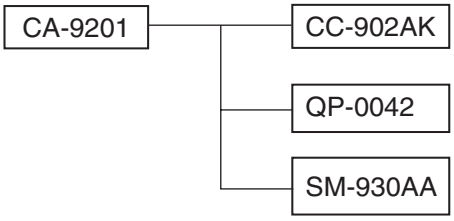



JE-911A
Electrode junction box (with 4 DC inputs) for A/J/K version
JE-911AG
Electrode junction box (with 4 DC inputs) for G version
UT-0715
EEG MOTHER board
UT-07141
EEG AMP board
UT-0713
EEG INPUT board
SC-901A
Power supply unit (100 V, two AC outlets) for A/J version
SC-901AK
Power supply unit (200 V, one AC outlet) for K version
SC-901AG
Power supply unit (220 to 240 V, one AC outlet) for G version
SD-901AJ
Multiple portable socket outlet for A/J version
SD-901AK
Multiple portable socket outlet for K version
SD-901AG
Miltiple portable socket outlet for G version
LS-901AJ
Photo control unit for A/J version
LS-901AK
Photo control unit for K version
LS-901AG
Photo control unit for G version
UT-0717
PHOTO STIM board
UT-0721
SWITCH board
JE-913A
Mini junction box for A/J/K version
JE-913AG
Mini junction box for G version
UT-0722
Mini junction board
LS-706A
Flash lamp assembly
LS-703A
Flash lamp assembly
YL-104A
Visual stimulation adaptor
KE-910A
Cart
ZE-510AK
Hyperventilation unit
UT-0454
PACER board
JE-912AK
Sleep apnea unit

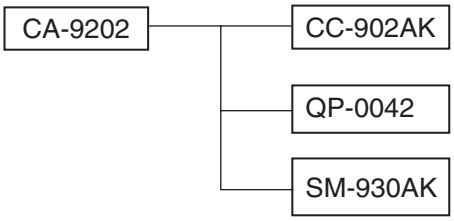
EEG-9200 A/J/K/G

Standard Components

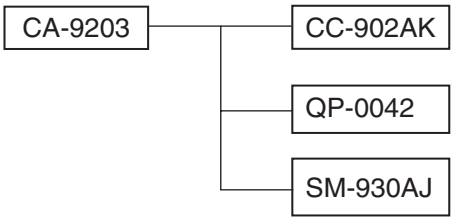
EEG-9200A



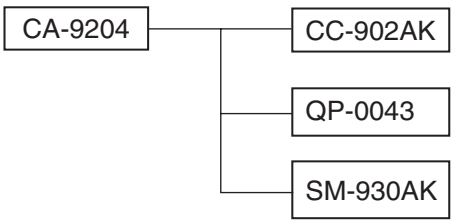
EEG-9200J



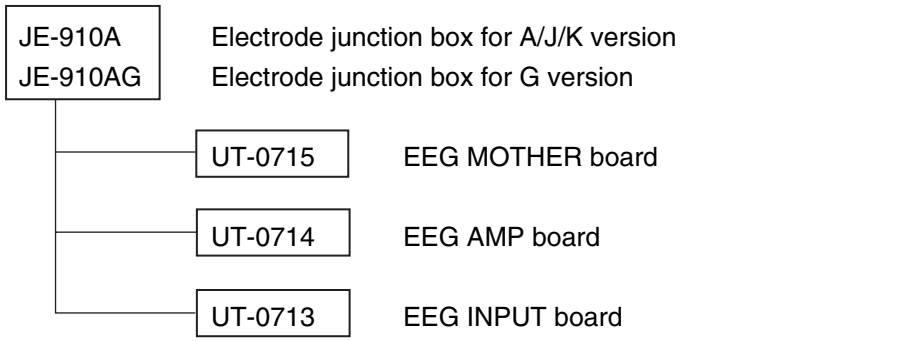
EEG-9200K

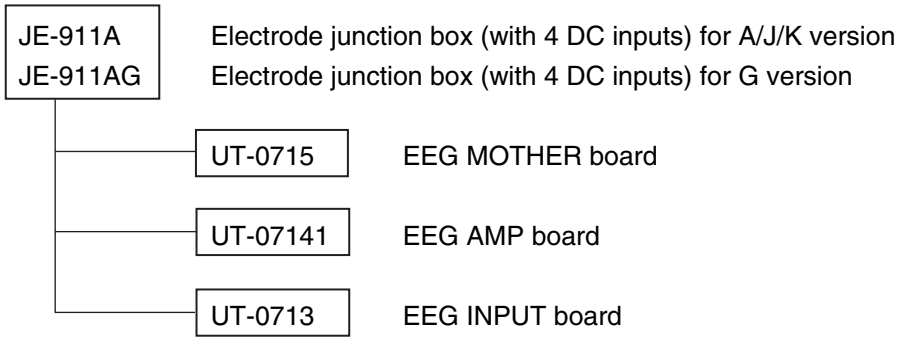


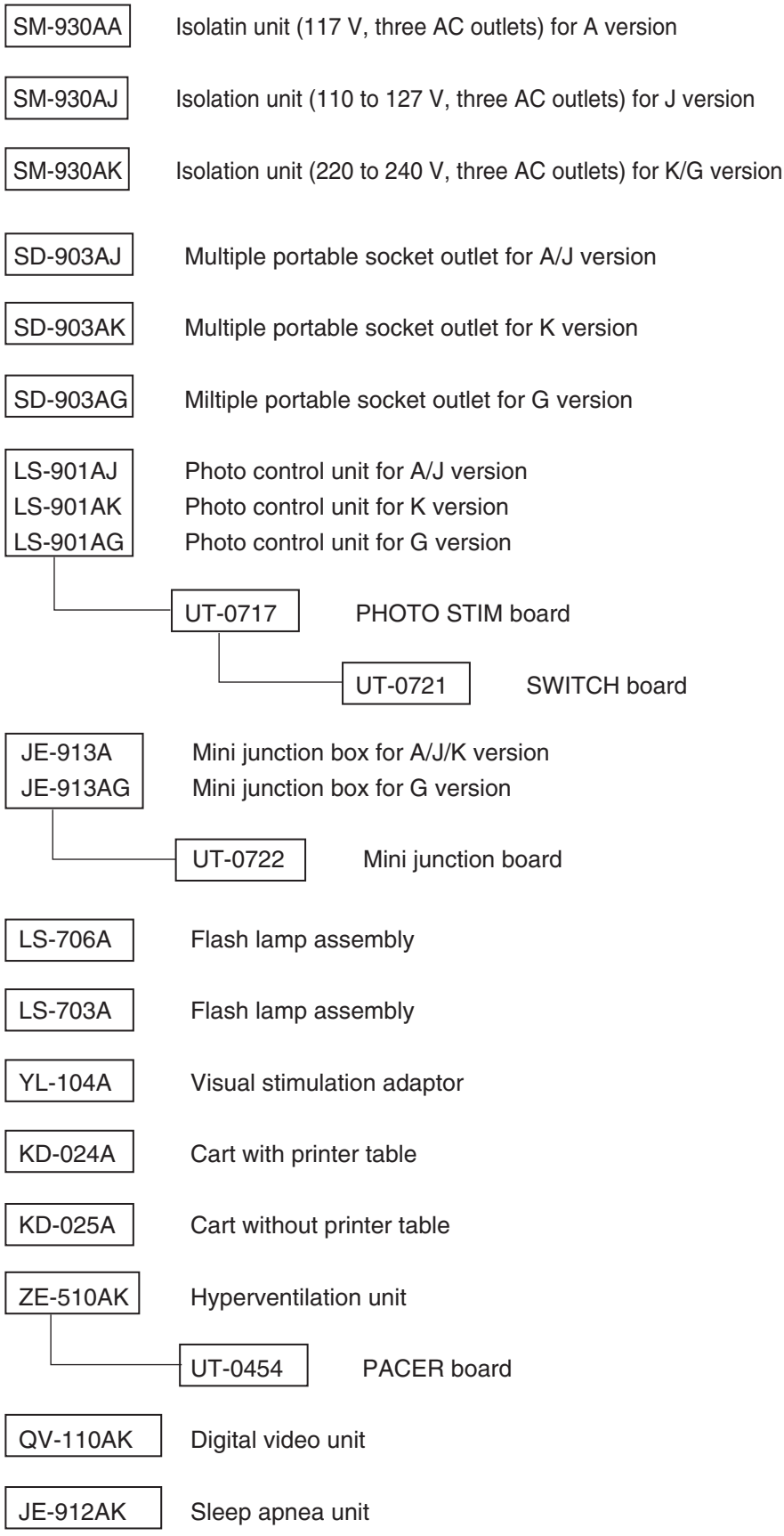
EEG-9200G



Options

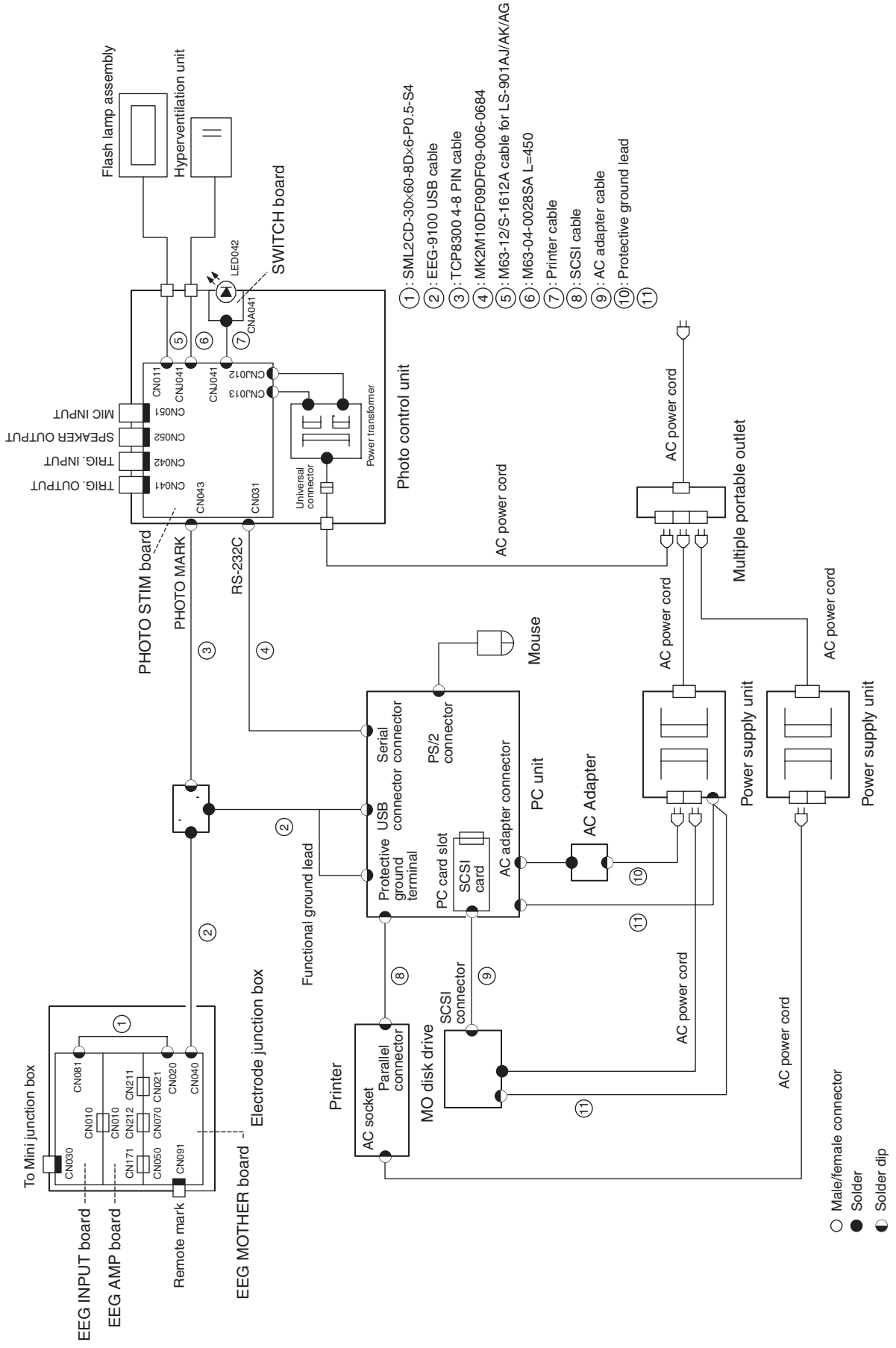




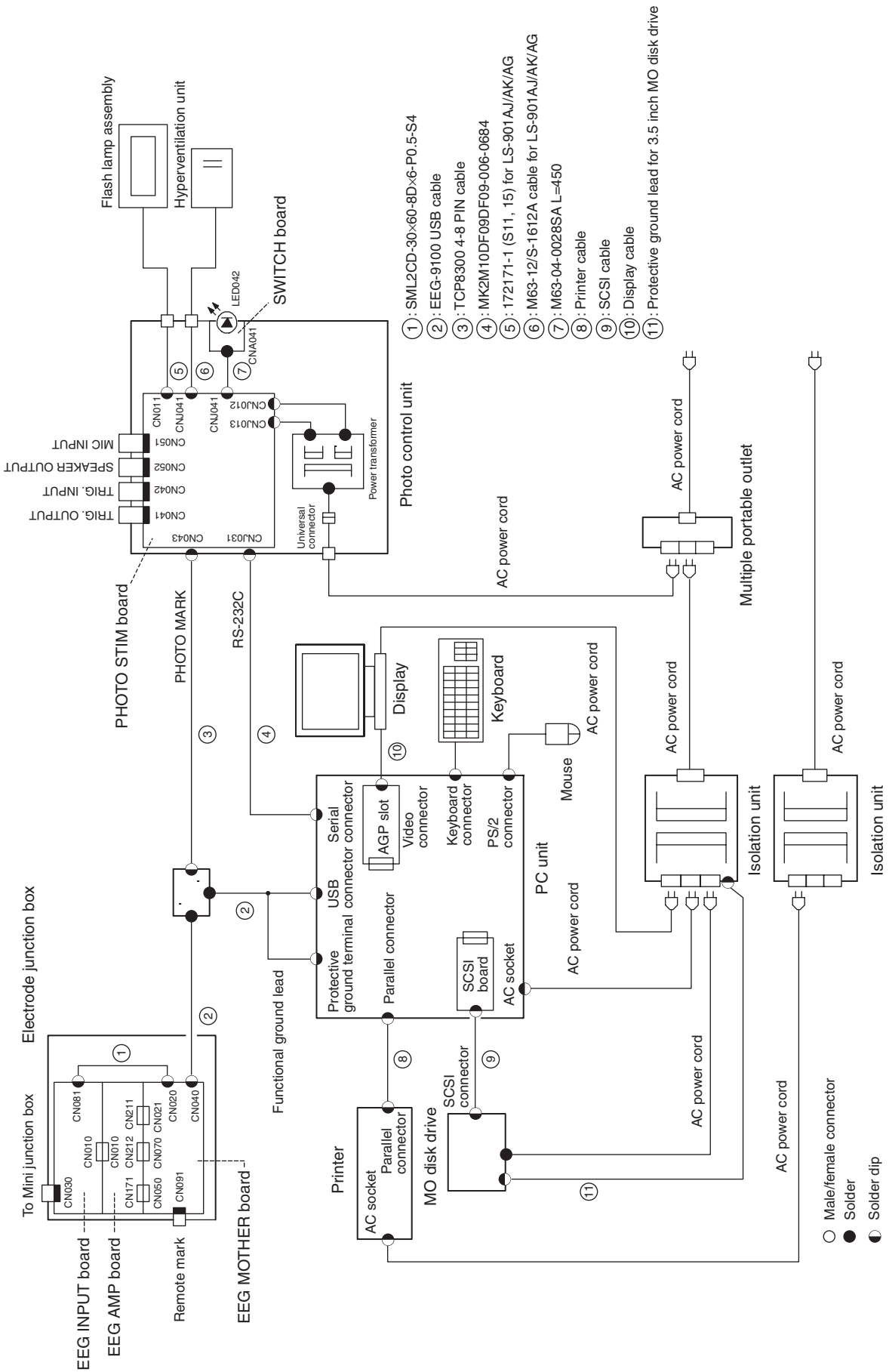

SM-930AA
Isolatin unit (117 V, three AC outlets) for A version
SM-930AJ
Isolation unit (110 to 127 V, three AC outlets) for J version
SM-930AK
Isolation unit (220 to 240 V, three AC outlets) for K/G version
SD-903AJ
Multiple portable socket outlet for A/J version
SD-903AK
Multiple portable socket outlet for K version
SD-903AG
Miltiple portable socket outlet for G version
LS-901AJ
LS-901AK
LS-901AG
Photo control unit for A/J version
Photo control unit for K version
Photo control unit for G version
UT-0717
PHOTO STIM board
UT-0721
SWITCH board
JE-913A
JE-913AG
Mini junction box for A/J/K version
Mini junction box for G version
UT-0722
Mini junction board
LS-706A
Flash lamp assembly
LS-703A
Flash lamp assembly
YL-104A
Visual stimulation adaptor
KD-024A
Cart with printer table
KD-025A
Cart without printer table
ZE-510AK
Hyperventilation unit
UT-0454
PACER board
QV-110AK
Digital video unit
JE-912AK
Sleep apnea unit

Connection Diagram

EEG-9100A/J/K/G



EEG-9200A/J/K/G



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Section 2 Changing Settings

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PC Unit Settings

E11CFG.ini Configuration File

In the E11CFG.ini configuration file, you can change the system settings which cannot be changed in the System Program. This configuration file manages advanced settings in the Acquisition and Review program

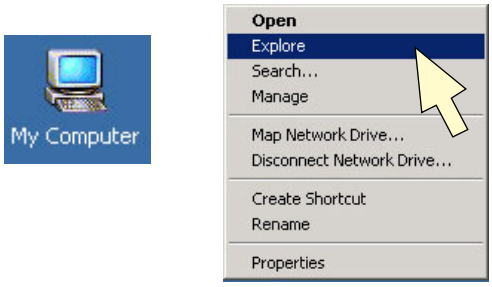
CAUTION

Only use the specified personal computer. Otherwise the EEG-9000 system program does not operate correctly.

NOTE

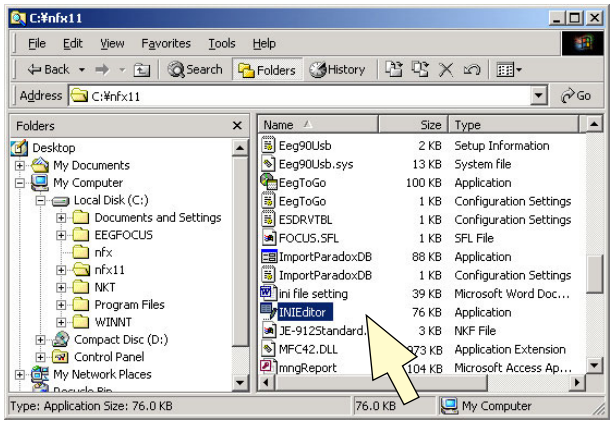
- **When changing the settings in the Configuration file, close the all EEG-9000 application programs.**
- **Before changing the contents of the E11CFG.ini configuration file, back up the original E11CFG.ini configuration file, just in case.**

Opening the Configuration Settings File Editor Window

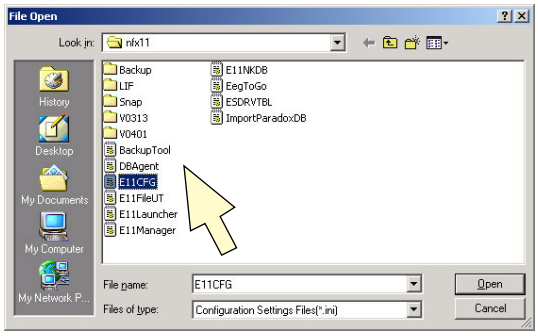


1. Right-click the My Computer icon on the desktop. The pop-up menu opens.

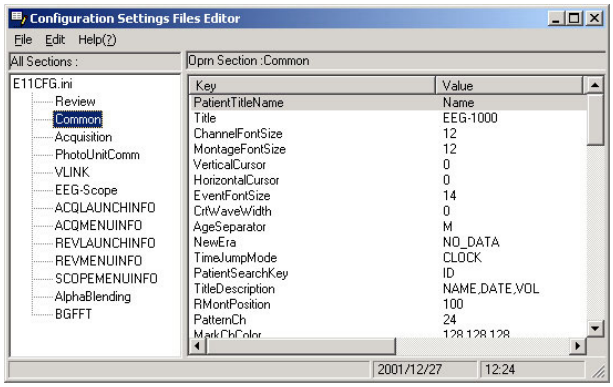
2. Select Explore. The My Computer window opens.



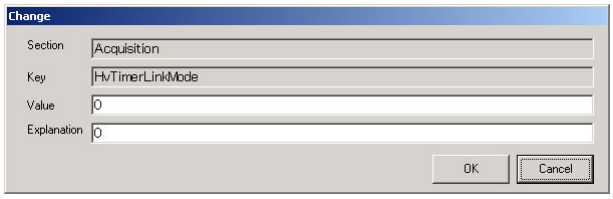
3. Double- click the **C:\nfx11\INIEditor.exe** file. The File Open dialog box opens.



4. Double-click the **E11CFG.ini** file. The Configuration Settings File Editor window opens.



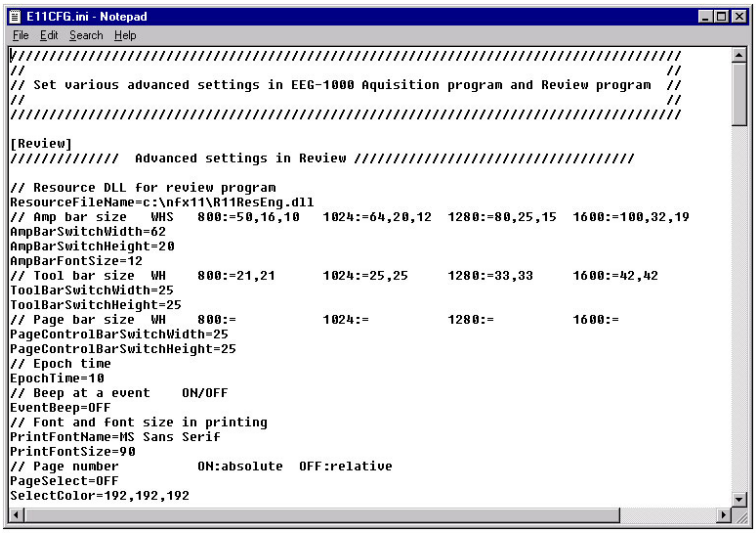
5. Double-click the item that you want to change. The Change dialog box opens.



6. Type the new setting in the Value text box and click the OK button.

   To cancel changing click the Cancel button.

You can change the configuration settings by opening the E11CFG.ini configuration file. To open the configuration file, type **C:/NFX11/E11CFG.INI** in the open text box (Start menu → Run→ Reun dialog box).



Configuration File List and Settings

The following describes the default settings of the configuration file.

```
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
//                                                                                                                              //
// Set various advanced settings in EEG-1000 Acquisition program and Review program                                            //
//                                                                                                                              //
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////


[Acquisition]
///////////////  Advanced settings in Acquisition ////////////////////////////
// Up to version 02-10
// Amp bar size              WHS          800:=48,18,10       1024:=72,22,14      1280:=90,28,17      1600:=112,34,21
AmpBarFontSize=14
// Auto record timer mode Increase/Decrease
AutoRecordTimer=Decrease
// Automatic file close interval (msec)
Backup_msec_Interval=2000
// Main patient database drive
MainDataBaseDrive=C
// Main patient database maximum size KB
MainDataBaseSpace=61440
// Mark event name
MarkerStartStatus=MARK ON
MarkerStopStatus=MARK OFF
// Show patient infomation dialog box at start. Clear items or not   OFF/Clear/NotClear
PatientDlgonNew=NotClear
// Resource DLL for acquisition program
ResourceFileName=c:\nfx11\A11ResEng.dll
// Pop up message box     StorageMsgMode     0:filing  1:not filing  2:record time
//StorageMsgInterval 1000:1 sec, ...5000:5 sec, 0:Do not display, 1:Do not blink
StorageMsgMode=1
StorageMsgInterval=2000
StorageMsgColor=0,0,128
StorageMessage=Filing
StorageStopMessage=Not Filing
StorageMsgFont=Arial Bold
StorageMsgSize=48
// CAL voltage in a EEG file         0-9   CODE5=50uV
StorageCalVolt=5
// Local patient database maximum size KB
// Tool bar size              WH           800:=23,23          1024:=27,27         1280:=35,35         1600:=45,45
ToolBarSwitchHeight=27
//Change display resolution automatically
WndResolution=0
// V0301
```

// Link HV unit and HV timer 0:Not link, 1:Link
HvTimerLinkMode=0
// Size for the LTM bar
LtmBarFontSize=16
LtmBarSwitchHeight=23
LtmBarSwitchWidth=77
// Size for the Photo and Timer bar.
PhotoAndTimerFontSize=14
PhotoAndTimerSwitchWidth=26
// V0310
// Adjust PC clock time to acquisition program clock time when file close 0:OFF, 1:ON 0:OFF, 1:ON)
AdjustClockTime=0
// If file must be saved after the setting time past (ON) ON or OFF
//=File must be saved after the setting time past. Unit min
// The automatic save function at the time of patient information change. (ON or OFF)
AutoPatientChange=OFF
// Time of operation when using the automatic save function. (Unit:Minutes)
AutoPatientChangeTime=20
// Impedance check time length in auto record (10) Unit:Second
AutoRecordImpchkTime=10
// Application name started at the time of WIF interface operation.
CreateProcess=
// Deterrence of a disk full message. (ON or OFF)
DisableDiskMsg=OFF
// Event String for Storage disk full.
DiskFull=Disk Full
// EEG-9000: Weight time of data reception processing of bulk-in transmission. (Unit:millisecond)
InputBoxDeviceBulkInSleep=3
// EEG-9000: Stole state recognition time. (Unit:millisecond)
InputBoxDeviceStallInterval=500
// EEG-9000: Automatic pipe reset at the time of stole detection. (ON or OFF)
InputBoxDeviceStallSw=OFF
// Event string for disconnecting Junction Box.
InputBoxDisconnect=JBox Disconnected
// EEG-9000: Time to deter ring buffer overflow from stole state detection. (Unit:Second)
InputBoxOverrunDisableTime=60
// File automatic review function after Acquisition. (ON or OFF)
QuickReview=OFF
// V0401
// Acquisition Priority (-3,-2,-1,0,1, 0:Default)
ChangePriority=1
// Dummy bar hight
DummyBarHeight=10
// Dummy bar width
DummyBarWidth=456
// Use dummy bar ON/OFF (Used to display EEG wave half of the desktop area when using camera window)
DummyBarSW=OFF
// DV region check application name
LTMDVIndicatorPath=

```
// Open/close Timer bar linked to Photo/HV bar .  0:Independent(Not link)  1:link
OpenCloseLinkPhotoAndTimer=0
// Pen recorder record timer.   0:Link to filing 1:Link to pen recorder
RecordTimerMode=0
// Show time in Camera window  0:Not show  1:show
ShowTimeInCameraWnd=1
// Show topographical montage top most mode
TopMostMontageMap=OFF
WriteBlockSize=1024 * 8
AmpBarSwitchWidth=72
AmpBarSwitchHeight=20
ToolBarSwitchWidth=29
PhotoAndTimerSwitchHeight=23
AutoFileSave=ON
AutoFileSaveTime=120
LTMExecDvtrJpn=c:\dvc\dvrec.exe /m:r /s:2
LTMExecDvtrUsa=c:\dvc\dvrec.exe /m:r /s:2
SubDataBaseSpace=10240
DelayTimePercentage=50
FileFlushCloseSw=ON
FileFlushCycleWriteInterval=0


[Common]
//////////////////////////////// Common settings ////////////////////////////
// Up to version 02-10
// ACC dialog auto close   ON/OFF
AccAutoClose=ON
// Separator between year and month in patient infomation
AgeSeparator=M
// Channel number font size              800:=11          1024:=12          1280:=13          1600:=14
ChannelFontSize=14
// Use same amp condition in all pattern   ON/OFF
ConditionFreeMode=OFF
// Wave width                 0:One line   1:                2:
CrtWaveWidth=0
// Create EEG-1000 registry when EEG registry not found
DummyRegistryCreate=1
//Color of EEG scale
EEGScaleColor=255,0,0
// Event dialog auto close      ON/OFF
EventAutoClose=ON
// Put event before current time (sec)
EventDelay=0
// Event character font size             800:=14          1024:=14          1280:=18          1600:=22
EventFontSize=14
// Horizontal cursor width
HorizontalCursor=0
// Mark channel wave color      R,G,B
```

```
MarkChColor=128,128,128
// Montage character font size          800:=12          1024:=12          1280:=14          1600:=18
MontageFontSize=14
// A name of era next to Heisei
NewEra=NO_DATA
// Patient search key                   ID/NAME/DATE/EEG
PatientSearchKey=ID
// Patient condition items (used for Acquisition, Launcher, Fileutility, Database Maneger.  not for Review)
//PatientTitleID=
PatientTitleName=Name
//PatientTitleSex=
//PatientTitleDOB=
//PatientTitleAge=
//PatientTitleHandedness=
//PatientTitleHeight=
//PatientTitleWeight=
//PatientTitleDate=
//PatientTitleEEGNo=
//PatientTitleInOut=
//PatientTitleReferDept=
//PatientTitlePhysician=
//PatientTitleOperator=
//PatientTitleComment=
//PatientTitlePatientCondition=
//PatientTitleSeizureType=
//PatientTitleSleepDisorder=
//PatientTitleMedicalHistory=
//PatientTitleMedication=
// Channel number in Pattern Table
PatternCh=24
// Right side montage position
RMontPosition=100
// Time jump mode          CLOCK/ELAPSED
TimeJumpMode=CLOCK
// Time mark color          R,G,B
TimerMarkColor=255,255,0
// 30 seconds time mark in 5 min/page     ON/OFF
TimerMarkof5min=ON
// Title in about dialog box
// Title description                    ID/NAME/DATE/EEG/VOL
TitleDescription=NAME,DATE,VOL
// Cursor width                         800:=0           1024:=0           1280:=1           1600:=1
VerticalCursor=0
// Wave color list for pattern setting
// WaveColor1-8 could not be changed because of EEG-2100 color
//WaveColor1=0,0,0
//WaveColor2=80,0,0
//WaveColor3=0,80,0
//WaveColor4=80,80,0
```

```
//WaveColor5=0,0,80
//WaveColor6=80,0,80
//WaveColor7=80,80,0
//WaveColor8=255,255,255
//WaveColor9=80,80,80
//WaveColor10=255,0,0
//WaveColor11=0,255,0
//WaveColor12=255,255,0
//WaveColor13=0,0,255
//WaveColor14=255,0,255
//WaveColor15=0,255,255
//WaveColor16=192,192,192
// Do not change following settings
// V0301
// Display type for the amp bar (0:Button , 1:Combobox)
AccSelectType=0
// Arrange the camera window and the Acquisition dialog automatically
// when opening the camera window. (0 or 1)
AutoWndArrangeWithCamera=0
// Font size of the time imformation displayed on the camera window.
CameraWndFontSize=24
// Width of the DC channel bar.
ChannelBarWidth=110
// Display Scale on the DC channel bar. (ON or OFF)
ChannelBarScaleDisp=ON
// Display limitation for the DC channel bar.
DcChannelLimit=10
// Width limitation for the DC channel bar. (ON or OFF)
DCWaveNoLimit=ON
// Select OS when using camera IF card 0:win98 1:win2k or later
// V0310
// Event color of the manual event. (R.G.B)
DefaultEventColor=128,128,128
// EEG filter is made to continue at the time of pattern change. (ON or OFF)
EcgFilterAutoOff=OFF
// Drawing method when an event line overlaps with the time scale. (ON:Overwrite, OFF:XOR)
EventLinePriorityOver=ON
// Style of the event line. (0:Solid,  1:Dash,  2:Dot,  3:Dash_Dot,  4,Dash_Dot_Dot)
EventLineStyle=0
// Thickness of the event line. (from 1 to 3)
EventLineWidth=1
// The 15Hz high cut filter is transposed to 1Hz. (ON or OFF)
ExHf15Mode=OFF
// String of the 15Hz when a setup of ExHf15Mode is set as ON.
ExHf15String=1
// Display the Event line at the time of Mark-ON event. (ON or OFF)
MarkOnEventLine=ON
// Line color of the Page Comennt. (R,G,B)
PComEventColor=255,255,0
```

// Width of a page comment preview screen.
PCommentPreviewWidth=50
// The application name started at the time of page comment editing.
PComLaunchApp=mspaint
//EEG-9000: Size of the USB storage buffer (Unit:Second)
// Waveform drawing margin. (Unit:%)
WaveDrawMargin=0
// V0401
// Montage font name and font size of impedance check dialog and average delete dialog
AmpListFont=Microsoft Sans Serif
AmpListSize=16
// Camera window time font color R,G,B
CameraWndTimeColor=0,0,0
// Camera window time area back color R,G,B (If no value sets, time area becomes transparent)
CameraWndTimeBkColor=192,192,192
// Minimum memory size when using BG FFT (Do not change)
MemoryCheck=120
// Montage focus move mode 0:G1->G1-> 1:G1->G2->G1->
MontageFocusMode=1
// Electrode font name and font size of pattern table and average delete dialog
MontButtonFont=Microsoft Sans Serif
MontButtonSize=14
// Show Fp1 and Fp2 electrode name in montage map
MontTopoFp1Fp2=ON
// Font name in montage map window
MontTopoFontName=MS Sans Serif
// Font size in montage map window (unit 0.01mm)
MontTopoFontSize=420
// Line width of the Topographical montage(unit 0.01 mm)
MontTopoLineWidth=10
// Show pattern name in Topographical montage window
MontTopoPattern=ON
// Font name and size of the montage setting dialog box in Pattern table
PattListFont=Microsoft Sans Serif
PattListSize=16
// Motage description shift (-1000-1000) 0:No shift(over lap on waveform)
ShiftMontageString=-20
UsbStorageBuffSize=20
StorageBuffSize=30
WaveBuffSize=30
UseAltCamera=1
WDMVideoDevice=0
WDMAudioDevice=0
WDMVideoInputSource=0
WDMMasterStream=-1
WDMUseFrameRate=1
WDMVideoSignalType=1
WDMVideoBrightness=128
WDMVideoContrast=128

```
WDMVideoHue=128
WDMVideoSaturation=128
WDMCameraImage=0
Title=EEG-9000
BackBuffSize=6
BackBuffSizeDSP=2


[Review]
//////////////  Advanced settings in Review ////////////////////////////////////
// Up to version 02-10
// Amp bar size          WHS      800:=50,16,10     1024:=64,20,12     1280:=80,25,15     1600:=100,32,19
// Epoch time
EpochTime=10
// Beep at a event    ON/OFF
EventBeep=OFF
// Page bar size         WH       800:=             1024:=             1280:=             1600:=
PageControlBarSwitchHeight=25
// Page number                    ON:absolute  OFF:relative
PageSelect=OFF
// Font and font size in printing
PrintFontName=Microsoft Sans Serif
// Resource DLL for review program
ResourceFileName=c:\nfx11\R11ResEng.dll
// Selected wave background color
// Tool bar size         WH       800:=21,21        1024:=25,25        1280:=33,33        1600:=42,42
ToolBarSwitchHeight=25
//Change display resolution automatically
WndResolution=0
// V0301
// Wave position for the Time information of FileMapping. (0-300)
FmapCurPos=0
// Font size of the Page comment.
PageCommentFontSize=15
// Background color of the Page comment. (R,G,B)
PageCommentBgColor=255,255,155
//V0310
// Application name started at the time of WIF interface operation.
CreateProcess=
// Coefficient for DC inputs exporting as ASCII file.
DcConvCoef=1.00
// Height of the Event jump bar.
EventBarHeight=90
// Width of the Event jump bar.
// Size of the Event jump bar.  (ON:Half size   OFF:Full Size)
EventBarHalfMode=OFF
// Hight of the button in the Event jump bar.
EventJumpBarButtonHeight=24
// Width of the button in the Event jump bar.
```

EventJumpBarButtonWidth=90
// Font size of the Event jump bar.
EventJumpBarFontSize=12
// Add events when printing waveforms. (ON or OFF)
PrintedEvent=OFF
// Width of the event line at the time of printing (1/100mm unit)
PrintEventLineWidth=15
// Font size at the time of printing (1/100mm unit)
PrintFontSizeEx=300
// V0401
// DSA redraw interval in Jump bar(ms)
DrawIntervalDSABar=10
// DSA Dlg redraw interbal(ms)
DrawIntervalDSADlg=50
// DSA drawing volume per a timer event
DsaCalcIterationCount=2
// Spectral edge line color
DsaColorEdgeLine=255,255,0
// Spectral peek line color
DsaColorPeakLine=0,255,255
// Rec off area color in DSA dlg
DsaColorRecOff=192,192,192
// No (stage) data area color in DSA dlg
DsaColorStageLost=0,255,255
// No data area color in DSA dlg
DsaColorStageOut=128,128,128
// Maximum DSA line in DSA Dlg(max=5)
DsaDlgBarSetCount=3
// Temporary saved DSA line bitmap image in background
DsaDlgBitimapStoreCount=24
// DSA voltage compress method when over lapped (1:peek 0:average)
DsaDrawType=1
// DSA height in DSA dialog
DsaEventHeight=25
// DSA height in jump bar
DsaHeight=50
// Time font size in DSA dialog Initial=13
DsaTimeScaleFontSize=13
// DSA window heignt in DSA dialog
DsaWndDlgHeight=50
// Digital video application name (This Item is set by Digital Video Installer)
DVLaunchPath=c:\dvc\dvplay.exe /s:2 /m:p /t:d
// Selected waveforms when stage changed in LIF review 0:Show dialog if save or not 1:Save 2:Not save (0 fixed)
ExportModeWhenChangingFile=0
// Set focus to the review after the review launched. Seconds after launched. 0:Not set focus
ForegroundTime=1
// Over write file when stage changed in LIF review. 0:Show dialog if overwrite or not 1:overwrite 2:Not Save (0 fixed)
LifAutoSave=0
// Maximum number of sample reference waveforms Initial value:100

MaxNumOfSampleData=100
// Maximum number of reference waveforms saved in drive C Initial:1000
MaxNumOfSnapData=1000
// Use waveform calculation Initial OFF
MeasureFunc=OFF
// Which mouse wheel direction is linked to page foward. 0:fold forefinger=page forwad 1:extension forefinger = page forward default 0
MouseWheelPageMode=0
// Printed out font size of montage map (unit 0.01mm)
MontTopoPrintFontSize=200
// Transparent montage map when pringing (ON / OFF(transparent))
MontTopoPrintPenetrate=OFF
// Printed out montage map position 0:center 1:right side down 2:left side down 3:right side up 4:left side up, (1)
MontTopoPrintPosition=1
// Printed out montage map size (unit 0.01mm)
MontTopoPrintSize=3500
// Selected area back color (R, G, B) (Initial 220,255,220)
SelectedAreaBKColor=220,255,220
// Show the time in camera window 0:do not show the time, 1:show the time (1)
ShowTimeInCameraWnd=1
// Show center line of the note wave ON/OFF (ON)
SnapMarkerLine=ON
// Note wave time length (unit second) (20)
SnapSampleLength=20
// Zoom window frame color (cannot use in V04-01)
WaveMeasureFrameColor=0,0,255
SelectColor=180,250,180
EventBarWidth=180
AmpBarSwitchWidth=58
AmpBarSwitchHeight=20
AmpBarFontSize=12
ToolBarSwitchWidth=24
PageControlBarSwitchWidth=22

[PhotoUnitComm]
// COM port configuration for the Photo control unit.(LS-901A)
PhotoUnitCommPortNo=1
PhotoUnitCommPortSts=19200,n,8,1

[VLINK]
AdjustTimeJumpFF=5
AdjustTimeJumpREW=5
AfterSearchMode=PLAY
CarrierSkipCount=4
CommandAutoRepeat=ON
ComWaitMin=100
FineAdjustment=4

LagTimePositive=2
LagTimeNegative=2
OverwriteDelay=0
TapeStopControl=ON
TimeCodeCommPort=1200,n,8,1
TimeCodeCommPortNum=2
TimeCodeErrorCount=8
VCRControlCommPortNum=3
//Controlling Additional VTR using LTM function.
//VCRControlCommPortNum2=
VCRControlCommPort=9600,o,7,1

// DVHS(JIIP) settings
DvhsControlCommPortNum=1
DvhsControlCommPort=9600,o,8,1
DvhsID1=1
DvhsID2=2
DvhsID3=3
DvhsID4=4
DvhsID5=5
// ALL TAPE WILL BE EJECTED
DvhsInitProcess1=08,41,60,00,00,00,00
// Time difference to the jump end point
JlipJumpFinishSec=40
// Time difference changing FF to Play FF
JlipJumpSlowSec=600
DvhsJump=ON

[EEG-Scope]
// Size for the Amp bar.
AmpBarFontSize=14
// Interval for the Auto refresh.
AutoRefreshInterval=5000
// Basic port number for the socket interface.
BaseSocketPort=2100
// Wait time for closing file
CloseWaitSec=10
// Intervals for connection
ConnectInterval=20
// Size for the Page control bar.
PageControlBarSwitchHeight=25
// Regtry count for the connection of socket interface.
PatientEditRetryCount=3
// Size for the Tool bar.
ToolBarSwitchHeight=25
//V0310
// Height of the Event jump bar.
EventBarHeight=90

```
// Width of the Event jump bar.
// Size of the Event jump bar.  (ON:Half size   OFF:Full Size)
EventBarHalfMode=OFF
// Font size of the Remote annotation.
EventDisplayMsgSize=30
// Font color of the Remote annotation. (R,G,B)
EventDisplayMsgColor=0,0,255
// Font of the Remote annotation.
EventDisplayMsgFont=MS Sans Serif
// Display time of the Remote annotation. (Unit:Second)
EventDisplayMsgTime=10
// Hight of the button in the Event jump bar.
EventJumpBarButtonHeight=24
// Width of the button in the Event jump bar.
EventJumpBarButtonWidth=90
// Font size of the Event jump bar.
EventJumpBarFontSize=12
// V0401
// FFT data number per a dot in DSA window of the jump bar
DsaAverageNum=1
// File access delay time (sec) after EEG-Scope getting a file name from acquisition
FileReadWaitTime=3
AmpBarSwitchWidth=68
AmpBarSwitchHeight=20
PageControlBarSwitchWidth=25
ToolBarSwitchWidth=25
EventBarWidth=180


[ACQLAUNCHINFO]
////////////////////////////// ACQLAUNCHINFO //////////////////////////////
MenuTitle=
count=
LAUNCHITEM1=
DVLAUNCHITEM=3,30002,0000,"C:\DVC\DVREC.exe /S:2 /M:R",SW_MINIMIZE


[ACQMENUINFO]
////////////////////////////// ACQMENUINFO //////////////////////////
MenuTitle="Option(&X)"
count=1
// EEG-Scope Comparison (Ver.03-01)
MENUITEM1="EEG Scope[Comparison]", 30001, 1040, "c:\nfx11\E11Rev.exe /M:C /A:0",SW_SHOWNORMAL


[REVLAUNCHINFO]
////////////////////////////// REVLAUNCHINFO //////////////////////////////
MenuTitle=
count=
```

```
LAUNCHITEM1=


[REVMENUINFO]
////////////////////////////// REVMENUINFO ////////////////////////
MenuTitle=
count=
MENUITEM1=


[SCOPEMENUINFO]
////////////////////////////// SCOPEMENUINFO ////////////////////////
MenuTitle="Option(&X)"
count=1
// QP/QV-110AK Digital Video remote review mode (Ver.03-01)
MENUITEM1="Digital Video Play", 30001, 0000, "c:\dvc\dvplay.exe /S:3 /M:P /T:D",SW_SHOWNORMAL


[AlphaBlending]
////////////////////////////// Transparent Dialog Box ////////////////////////
// Dialog name=***(Transparent ratio (0:Transparent - 255:Not Transparent)
//  Montage map dialog in Aquisition
AcqMontageMapDlg=255
// Aquisition Patient Dialog
AcqPatientDlg=255
// Auto record dialog
AUTODLG=255
// Pattern Table
PatternTableDlg=255
// Dsa Dialog in Review
RevDsaDlg=180
// Montage map dialog in Review
RevMontageMapDlg=255
// Review Patient Dialog
RevPatientDlg=255
// Not storaged (Blink) dialog
StorageDlg=180


[BGFFT]
//////////////////////  Background (online) FFT ////////////////////
// Cal Code using in FFT =CAL Code Number (5=50uV)
CAL=5
// HF Code using in FFT = HF Code Number(2=30Hz)
HF=2
// Maximum FFT channels
MaxNumOfBGFftCh=32
// TC Code using in FFT = TC Code Number(5=0.3sec)
TC=5
```

Changing the MO User Label When Installing Two or More Instruments in an Area or Connecting the Instrument to a Network

General

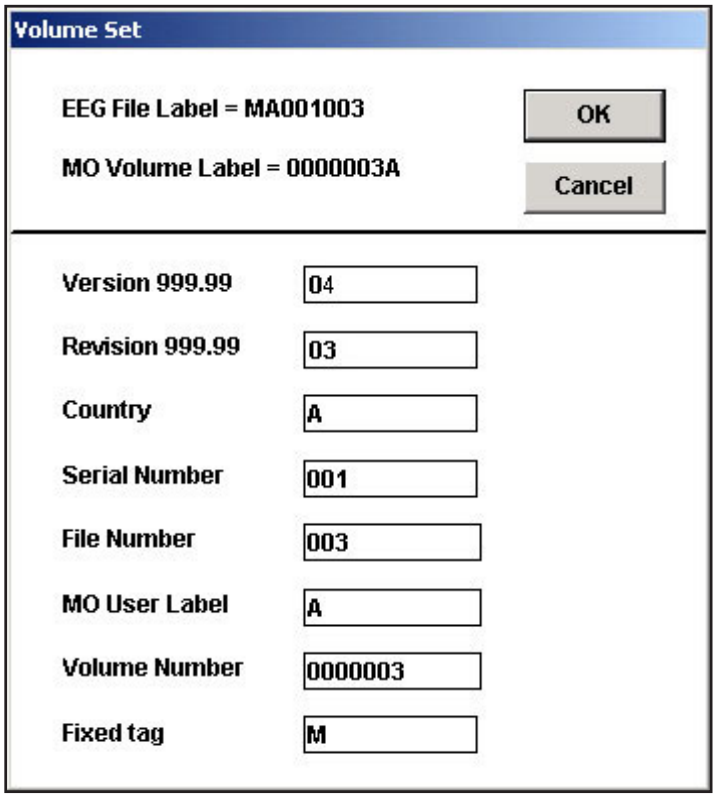
When installing two or more EEG instruments in an area or connecting the instrument to a network with other NK digital EEGs, assign the different MO disk volume number for each instrument. The default “MO User Label” in the MO disk volume number is “A”. Refer to “Writing Down the Data in the Volume Set Dialog Box Before PC Unit or Hard Disk Replacement” in Section 6.

Procedure

1. Click the Start button on the taskbar. The Satrt menu opens.

2. Click Run. The Run dialog box opens.

3. Type in C:\NFX11\VINST.EXE in the Open text box and click the OK button. The Volume Set dialog box opens.



4. Type in the MO disk volume number with a capital letter from “A” to “Z” in the MO USER LABEL text box.

5. Click the OK button.

   To cancel the change, click the Cancel button.

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Section 3 Troubleshooting and Error Messages

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How to Troubleshoot

Use this section to locate, identify and solve a problem in the instrument or an error message displayed on the screen. The troubleshooting tables in this section are divided into general problems and displayed error messages.

1. Determine which troubleshooting table to use.

2. In the "Problem" or "Error Message" column, find the trouble item that matches the problem or error message.

3. Do the action recommended in the "Action" column. (Do the first action recommended in the "Action" column).

4. If the problem or error message is not solved, do the next action recommended in the "Action" column. (If this does not solve the problem, do the next recommended sections.)

5. If none of the actions solve the problem, contact your Nihon Kohden distributor or representative.

WARNING

When checking a cable connection, close the EEG-9000 application program, turn off the power of the PC unit and all components, and unplug the AC power cord from the AC outlet (For the procedure, refer to the next page). Failure to follow this warning may cause electrical shock.

After checking the cable connection, turn on the power of all components, then restart the PC unit.

NOTE

Before contacting your NK distributor or representative for technical support, please complete a copy of the Maintenance Check Sheet (the original copy is provided at the end of the Section 6 "Maintenance"), and if possible, provide additional detailed information on the problem. Send the complete copy of the Maintenance Check Sheet to your NK distributor or representative. This will allow your NK distributor or representative to provide you with the best support.

Closing the Program and Shutting Down Windows

1. Open the Windows Task Manager.
   When the mouse does not operate:
   1) Press the Ctrl + Alt + Del key. The Windows Security dialog box opens.
   2) Select Task Manager to open the Windows Task Manager dialog box.

   When the keyboard does not operate:
   1) Right-click the task bar. The pop-up menu opens.
   2) Select Task Manager to open the Windows Task Manager dialog box.

2. Select the program to close.

3. Select the End Task button.

4. Shut down Windows.
   1) Select Shut Down from the Start menu. Or, press the Ctrl + Esc key, then press the U key. The Shut Down Windows dialog box opens.
   2) Select “Shut Down” in the “What do you want the computer to do ?” list box.
   3) EEG-9100:
      Click the OK button. The PC unit is automatically turned off.

      EEG-9200:
      Click the OK button. When the “It is now safe to turn off your computer” message appears, press the powr switch of the PC unit to turn off the PC unit.

Troubleshooting

Waveform Acquisition

NOTE

Before measurement, confirm the following:

- **The examination room is free from artifact-causing sources.**
- **The electrodes are firmly attached to the patient.**
- **The electrodes and electrode leads are not dirty, damaged or frayed.**

If not, pulse noise caused by static electricity or generated by a display may be superimposed on the EEG waveform. Refer to "Instrument Location" in Section 2 of the EEG-9100/9200 Operator's manual.

Problem	Possible cause	Action
Noise or artifact is superimposed on the waveforms.	The electrode lead is faulty.	Check the continuity of the electrode lead with a multimeter. If the electrode lead is faulty, replace it with a new one.
	One or more of the leads from the Z, C3 and C4 input jacks are not attached to the patient.	Attach these leads to the patient because the Z electrode and C3 and C4 electrodes are necessary for EEG measurement.
	The bed is not grounded.	If the bed is metal, ground it.
	The instrument is not grounded.	If the AC outlet on the wall does not have a ground terminal, ground the instrument with the provided ground lead.
	Several medical electronic instruments are used together.	Perform equipotential grounding for each instrument.
	There is an AC outlet or table tap near the patient or bed.	Arrange the measurement environment so that there is no influence from an AC power line.
	The PC unit or printer is placed near the patient or electrode junction box.	Arrange the measurement environment so that unwanted radio frequency does not affect the measurement.
	A desk lamp or fluorescent light is turned on.	Turn the desk lamp or fluorescent light off.
	The patient touched some metal part.	Prevent the patient from touching metal parts.
	The patient is using an electric blanket.	Turn the electric blanket off and unplug the AC power cord, then use another warming method.
	There is a cellular phone near the patient.	Turn the cellular phone off.

Problem	Possible cause	Action
The waveform is not stable.	One or more of the leads from the Z, C3 and C4 input jacks are not attached to the patient.	Attach these leads to the patient because the Z electrode and C3 and C4 electrodes are necessary for EEG measurement.
	New and old electrodes or different types of electrodes are used together.	Do not use new and old electrodes or different types of electrodes together. This may cause high polarization voltage.
The waveform sometimes becomes flat.	The skin electrode contact impedance of the C3 or C4 is high.	Clean the electrode attachment to reduce the impedance, and reattach the electrode.
During waveform acquisition the following message appears. “The disk is full. Close the current file to exit the acquisition program. Insert a new disk. [CAUTION] Do not turn off the power of the main unit or connected instruments (Photo Drive unit or MO drive). This can cause loss of EEG data and damage to the hard disk.”	The storage drive (the MO disk or hard disk which saves the EEG data file) is almost full.	Click the OK button on the message dialog box, then end the measurement and save the file. Refer to "Starting and Ending EEG Measurement - Ending the Measurement and Saving the File" in Section 5 of the Operator’s manual. After saving the file, prepare a new MO disk, or delete unnecessary files in the hard disk.
The waveform is not displayed.	The color of the waveform and background is the same.	Use a different color for waveform and background.
	The Display setting in the Pattern table is set to "OFF".	Set the Display setting to "ON" for necessary channels.
The waveforms do not sweep smoothly.	Many channels are displayed.	The PC unit cannot process all running programs. Reduce the channels to display or set the FFT analysis function to off.
	The FFT analysis function is set to on.	
The AC filter does not function.	The AC filter setting is not correct.	Select the correct AC filter setting (50 or 60 Hz) in the System program.
	Noise is not caused by AC line influence.	Use the proper filter according to the artifact.
Noise in AV derivation.	An unused electrode for AV derivation is selected in the AV Delete dialog box.	Delete unnecessary electrodes for AV derivation in the AV Delete dialog box.
The electrode name on the screen is indicated in red.	The electrode that is used for measurement is not selected for the storage electrode.	Select the electrode for the storage electrode in the Electrodes to be Saved dialog box of the System program.
	The electrode is selected for the AV derivation but not selected for the storage electrode.	Select all electrodes which are selected for the AV derivation for the storage electrode in the Electrodes to be Saved dialog box of the System program.

Problem	Possible cause	Action
The amplifier setting (sensitivity, time constant or high-cut filter) does not change with the Amp bar.	The amplifier setting is not set to "ACC".	Set the amplifier setting to ACC with the pattern table in the System program. You can temporarily change the amplifier setting in the Acquisition program and Review program.
The Acquisition program does not open.	---	When an error appears, follow the instructions on the dialog box.
	Faulty USB cable connection.	Turn off the power of the PC unit, then check that the USB cable from the electrode junction box is correctly connected to the PC unit.
	Faulty electrode junction box.	Replace the electrode junction box.
No calibration waveform appears on the screen.	Faulty EEG MOTHER board.	Replace the EEG MOTHER board or electrode junction box.
Artifact is superimposed on all calibration waveforms.		
Only baselines appear on the screen.		
No waveform appears on the screen.		
Artifact is superimposed on all signals input from the electrode jacks.	Faulty EEG MOTHER board if no SELECTOR (Impedance threshold display) LED on the electrode junction box lights.	Replace the EEG MOTHER board or electrode junction box.
	Faulty EEG AMP board.	Replace the EEG AMP board.
A specific electrode signal does not appear.	Faulty electrode lead.	Replace the electrode lead.
	Faulty EEG AMP board. An amplifier corresponding to the signal is faulty.	Replace the EEG AMP board or electrode junction box.
Artifact is superimposed on a specific electrode signal.	Faulty electrode lead.	Replace the electrode lead.
	Faulty electrode jack on the electrode junction box.	Replace the EEG INPUT board or electrode junction box.
	Faulty EEG AMP board. An amplifier corresponding to the signal is faulty.	Replace the EEG AMP board or electrode junction box.
No DC input signal appears on the screen.	Faulty EEG AMP board.	Replace the EEG AMP board or electrode junction box.
Artifact is superimposed on all DC input signals.		
A specific DC input signal does not appear on the screen.	Faulty EEG AMP board. An amplifier corresponding to the signal is faulty.	Replace the EEG AMP board.
Artifact is superimposed on a specific DC input signal.		

Skin-electrode Impedance Check

Problem	Possible cause	Action
The skin-electrode impedance check result does not appear.	Faulty IMPEDANCE CHECK key	Replace the EEG INPUT board or electrode junction box.
	Faulty EEG MOTHER board if no SELECTOR (Impedance threshold display) LED on the electrode junction box lights.	Replace the EEG MOTHER board or electrode junction box.
The skin-electrode impedance check result is faulty.	One or more of the following electrodes that are used for the impedance check are not attached to the patient: Z, A1 and A2 (or Fp1 and Fp2), C3 and C4.	Attach these electrodes to the patients firmly.
	Faulty EEG INPUT board. An electrode jack corresponding to the faulty impedance check result is faulty.	Replace the EEG INPUT board or electrode junction box.
	Faulty EEG AMP board. An amplifier corresponding to the signal is faulty.	Replace the EEG AMP board or electrode junction box.
	Faulty EEG MOTHER board.	Replace the EEG MOTHER board or electrode junction box.
A specific impedance display LED on the electrode junction box does not light.	Faulty LED.	Replace the EEG INPUT board.

Control

Problem	Possible cause	Action
When the power is turned on, the instrument does not start but the BIOS setup screen is displayed on the screen.	The settings in the BIOS setup screen are not correct.	Check and correct the settings in the BIOS setup screen according to “BIOS Default Setting” in Section 6.
When the power is turned on, nothing is displayed on the screen. (EEG-9100)	The AC adapter is not correctly connected to the power supply unit and PC unit, and the rechargeable battery of the PC unit is discharged.	Connect the AC adapter to the power unit and PC unit correctly.
	Faulty PC unit.	Replace the PC unit.
When the power is turned on, nothing is displayed on the screen (EEG-9200)	The power of the display is not turned on.	Press the power switch of the display to turn the display on.
	The brightness or contrast of the display is not appropriate.	Adjust the brightness or contrast. Refer to the Operator's manual of the display and PC unit.
	The display cable is not connected to the PC unit correctly.	Connect the display cable to the video connector on the PC unit correctly.
	The input line (BNC/D-Sub) is not correct.	Select the correct input line. Refer to the Operator's manual of the display.
	Dell Optiplex GX240 SMT: The display cable from the CRT display is not connected to the video connector on the QI-111A Camera Interface Board or display cable of the A/V input cable from the Camera Interface Board is not connected to the 15 pin video connector on the PC unit.	Connect the display cable from the CRT display and the display cable of the A/V cable correctly.
When the power is turned on, Windows does not start.	A floppy disk is inserted into the floppy disk drive.	Remove the floppy disk.
	Faulty electrode junction box.	1. Turn the power of the PC unit off. 2. Remove the USB cable from the PC unit. 3. Restart the PC unit. If Windows starts correctly, the electrode junction box is faulty. Replace the electrode junction box.
	The settings in the BIOS setup screen are not correct.	Check and correct the settings in the BIOS setup screen according to “BIOS Default Setting” in Section 6.
	Problem with the Windows operating system.	Reinstall Windows 2000 and EEG-9000 system program.
	Faulty PC unit.	Replace the PC unit.
The screen is dark.	The brightness or contrast is not appropriate.	Adjust the brightness or contrast. Refer to the Operator’s manual of the display or PC unit.

Problem	Possible cause	Action
The EEG-9000 application program does not work correctly.	A screen saver program is active.	Close the screen saver program.
	Another windows application program is active.	Close all Windows application programs. Or, delete the application program if it conflicts with the EEG-9000 system program.
	The USB cable from the electrode junction box is not connected to the PC unit.	Turn off the power of the PC unit, then connect the USB cable to the PC unit correctly.
	Problem with the EEG-9000 application program.	Reinstall the EEG-9000 system program.
	Faulty PC unit.	Replace the PC unit.
The mouse does not function (EEG-9100.	The mouse is not connected to the PC unit.	Turn off the power of the PC unit, then connect the mouse cable to mouse connector on the PC unit correctly.
	Program malfunction.	Use the Task Manager to close the program, then shut down Windows. Refer to “Closing the Program and Shutting Down Windows” in Page 3.2
	Faulty mouse.	Replace the mouse.
The keyboard does not function (EEG-9100).	Temporary error.	Turn off the power of the PC unit, then on again.
	The active window is behind an inactive window. The title bar of the active window is highlighted.	When the AC power cord of the PC unit is disconnected and the PC unit operates on battery power, this trouble occurs. Click the title bar of the window so that the window is active.
	Program malfunction.	Use the Task Manager to close the program or shut down Windows. Refer to “Closing the Program and Shutting Down Windows” in Page 3.2
	Faulty PC unit.	Replace the PC unit.
The mouse or keyboard does not function (EEG-9200).	The mouse is not connected to the PC unit.	Turn the power off, then connect the mouse cable to mouse connector on the PC unit correctly.
	The mouse is connected to the keyboard connector.	
	The keyboard is not connected to the PC unit.	Turn the power off, then connect the keyboard cable to keyboard connector on the PC unit correctly.
	The keyboard is connected to the mouse connector.	
	The displayed window is inactive. The title bar of the window is dimmed.	Click the title bar of the window so that the window is active.
	Faulty mouse.	Use the Task Manager to close the program or shut down Windows. Refer to “Closing the Program and Shutting Down Windows” in Page 3.2
	Faulty keyboard.	
	Program malfunction.	

Problem	Possible cause	Action
The manual mark (MARK ON, MARK OFF) does not appear	Faulty mark cord connection.	Connect the mark cord to the electrode junction box correctly
	Faulty mark cord.	Replace the mark cord.
	Faulty EEG MOTHER board.	Replace the EEG MOTHER board.
The layout of the window is changed.	The size of the window is changed. When the size of the window is changed, the position of the button changes.	Change the size of the window properly.
The date and time is not correct.	The date and time setting is not correct.	Set the correct date and time. Refer to the Windows online help.
	The backup battery of the PC unit is discharged.	Contact your NK distributor or representative.

Activation

Problem	Possible cause	Action
The flash lamp does not light.	The AC power cord is not connected to the photo control unit correctly.	Connect the AC power cord correctly.
	Faulty flash lamp assembly cable connection.	Check that the flash lamp assembly cable is correctly connected to the PHOTIC LAMP connector on the photo control unit.
	Faulty RS-232C cable connection	Check that the RS-232C cable is correctly connected to the photo control unit and PC unit.
	The power of the photo control unit is turned on after the Acquisition program opens.	1. Close the Acquisition program. 2. Turn on the photo control unit power. 3. Open the Acquisition program.
	The “Use photic stimulation" check box on the Photic Stimulation dialog box (System program) is not checked.	Check the “Use stimulation” check box.
	The photic stimulation mode is set to “Single”.	Select the correct photic stimulation mode.
	The flash lamp is faulty.	Replace the flash lamp.
The photic stimulation mark or HV mark does not appear.	The photo mark connection cable is not connected to the electrode junction box and the photo control unit correctly.	Turn off the power of the PC unit and photo control unit, then check that the photo mark connection cable is connected to the electrode junction box and the photo control unit correctly.
	Faulty photo mark connection cable.	Replace the photo mark connection cable.
	The flash lamp is faulty.	Replace the flash lamp.
	Faulty EEG MOTHER board	Replace the EEG MOTHER board.
	Faulty PHOTO STIM board.	Replace the PHOTO STIM board.

Power

Problem	Possible cause	Action
The PC unit operates on battery power (EEG-9100 Only).	Faulty isolation AC power on the power supply unit.	Check that the power fuse is not blown. If the fuse is not blown, replace the power supply unit.
The MO disk drive does not operate.		
The printer does not operate.		
The flash lamp does not light.	Faulty +5 VD and/or +12 VA on the PHOTO STIM board.	Check that the F012 fuse is not blown. If the fuse is not blown, replace the PHOTO STIM board.
The photo control unit is not recognized (The Display Activation Control button on the tool bar is dimmed).		
No pacing sound (SPEAKER OUTPUT) occurs.	Faulty –12 VA on the PHOTO STIM board.	Check that the F013 fuse is not blown. If the fuse is not blown, replace the PHOTO STIM board.
The photo control unit does not operate.	Faulty +5 VD and/or +12 VA on the PHOTO STIM board.	Check that the F012 fuse is not blown. If the fuse is not blown, replace the PHOTO STIM board.
	Faulty isolation AC power on the photo control unit.	Check that the power fuse is not blown. If the fuse is not blown, replace the photo control unit.
The flash lamp does not light.	Faulty +512 V on the PHOTO STIM board.	Check that the F011 and/or F014 is not blown. If the fuse is not blown, replace the PHOTO STIM board.

* The +5 VD power is generated from the +12 VA.

Printer

The following table explains general troubleshooting used with the instrument. For details, refer to the printer Operator's manual.

Problem	Possible Cause	Action
The printer does not operate.	The printer power cord is not connected to the power supply unit.	Connect the AC power cord correctly
	The printer cable is not connected to the PC unit or printer.	Connect the printer cable correctly.
The printer does not print correctly.	The printer driver is not installed or an incorrect printer driver is installed.	Install the correct printer driver.
	An error message appears on the printer.	Refer to the Operator's manual of the printer.
	The size of the recording paper does not match the size of the printing data.	Match the size of the recording paper and printing data.
Malfunction occurs during printing	The printer power cord is connected to the 3 prong outlet on the rear panel of the main unit.	Supply the printer power from a medical isolation transformer.
	Both the instrument and isolation transformer for the printer power cord are connected to the same AC outlet.	Use a different outlet for the instrument and transformer because the laser printer consumes a lot of AC power.

MO Disk Drive

The following table explains the general troubleshooting in combination with the instrument. For details, refer to the MO disk drive Operator's manual.

Problem	Possible Cause	Action
Cannot assign a volume number to the MO disk.	The MO disk is not a type specified by Nihon Kohden.	Use only the specified MO disk type (512 bytes/sector).
	The SCSI device ID number of the MO disk drive is not set to "4".	Set the SCSI device ID number to "4" and turn the instrument on again.
	The MO disk is write-protected.	Release the write-protect and try again.
	The MO disk is not formatted.	Format the MO disk and try again.
Cannot read/write a file from/to the MO disk.	The MO disk is not specified by Nihon Kohden.	Use only the specified MO disk (512 bytes/sector).
	The SCSI device ID number of the MO disk drive is not set to "4".	Set the SCSI device ID number to "4" and turn the instrument on again.
	The MO disk drive is not recognized by the instrument because the MO disk drive is not turned on or it was turned on after the PC unit was turned on.	Check that the MO disk drive is recognized as a Removable Drive in the My Computer. If not, turn the power switch of the MO disk drive on and turn the PC unit on again.
	The MO disk drive is not specified by Nihon Kohden.	Use only the specified MO disk drive.
	The same SCSI device ID number is used for more than one SCSI devices.	Set a different SCSI device ID number for each SCSI device. Refer to the Operator's manual of each device.
	A terminator is not connected to the end of the SCSI device.	Connect the terminator to the end of the SCSI device.
	The MO disk is write-protected.	Release the write-protect and try again.
	The MO disk is not formatted.	Format the MO disk and assign the volume number.
	The MO drive is not selected as the storage drive.	Select the MO disk drive as the storage drive in the System Setting dialog box of the System program.
	The SCSI cable is not connected to the PC unit or MO disk drive.	Connect the SCSI cable correctly then turn the power on again.
	The MO disk is faulty.	Use the Check Disk function to recover the MO disk.
		Clean the MO disk. Refer to the Operator's manual of the MO disk drive.
	The volume number is not assigned to the MO disk.	Assign the MO disk. Refer to "Formatting a MO Disk" in Section 3 of the Operator's manual.
The MO disk cannot be removed by pressing the eject switch on the MO disk drive.	The Enable library check box (Computer Management window → Optional Device Properties → General page) is checked.	Uncheck the Enable library check box. Refer to "Setting the Properties for 5 inch Magneto-optical Disk" in Section of the Operator's manual.

CD-RW Drive (EEG-9200 Only)

The following table explains the general troubleshooting. For details, refer to PC unit Operator's manual and CD-R/CD-RW recorder software online help..

Problem	Possible Cause	Action
Cannot assign a volume number to the CD-R/CD-RW disk.	The CD-R/CD-RW disk is not formatted as a Direct CD.	Format the CD-R/CD-RW disk with the Direct CD format utility and try again. Refer to "Formatting an Magneto-optical Disk, CD-R Disk and CD-RW Disk" in Section 3 of the Operator's manual.
Cannot read/write a file from/to the CD-R/CD-RW disk.	The CD-R/CD-RW disk is not formatted.	Format the CD-R/CD-RW disk with the Direct CD format utility and assign the volume number.
	The volume number is not assigned to the CD-R/CD-RW disk.	Assign the volume number to the CD-R/CD-RW disk.
	The CD-R/CD-RW disk is faulty.	Use the Scan Disk function of the Direct CD utility to recover the CD-R/CD-RW disk.
		Clean the CD-R/CD-RW disk.
	The CD-RW drive is not recognized by the Windows 2000 operating system.	Check that the CD-RW drive is recognized as a Compact Disk in the My Computer window. If not, the PC unit is faulty. Replace the PC unit.

Error Messages

Following is a list of error messages during operation or the power on self check for the PC unit. To solve the problem if an error message appears, find the displayed error message from the table, then do the action recommended in the Action column.

Acquisition Program/Review Program

Error Message	Possible Cause	Action
A communication error in the Photo Drive unit. Please restart the unit.	Faulty communication between the photo control unit and PC unit	Check that the RS-232C cable is correctly connected to the photo control unit and PC unit, then open the Acquisition program. If the same error message appears again, the PHOTO STIM board is faulty. Replace the PHOTO STIM board.
Acquisition or Review program is open. Please close it and start again.	You tried to open another EEG-9000 application program when the Acquisition or Review program was open. Only one EEG-9000 application program can be open at a time.	Close the Acquisition or Review program, then open the required program.
An error was detected by the diagnostic program of the Photo Drive unit. Please restart the unit.	Faulty RS-232C cable connection.	Check that the RS-232C cable is correctly connected to the photo control unit and PC unit, then open the Acquisition program.
	Faulty PHOTO STIM board	Replace the PHOTO STIM board.
An error was detected during operation of the Photo Drive unit. Confirm that the unit is connected and the power is on.	Faulty communication between the photo control unit and PC unit	Check that the RS-232C cable is correctly connected to the photo control unit and PC unit, then open the Acquisition program.
Another file with the same name was found in this disk. A new file name has been set. There was a possibility of abnormal exit last time. To be on the safe side, please check your disk and system with SCANDISK.EXE.	The Acquisition program did not close correctly and the registry settings are not correct.	Check for disk error with the Check Disk function. Refer to “Checking for Disk Damage Using Check Disk” in Section 3.
Another file with the same name was found in this disk. Overwrite the previous file?	You tried to save the ASCII file with a file name that already exists in the folder.	Use a different file name.
Another software of this EEG system is working. Please close it and start again.	You tried to open an EEG-9000 application program when another EEG-9000 application program was open. Only one EEG-9000 application program can be open at a time.	Close the EEG-9000 application program, then open the required program.
Can open the file no more.	You tried to open an EEG data file when four EEG data files were open.	No more than four EEG data files can be open at the same time.
Cannot access the patient register.	The database file cannot be opened.	Open the Acquisition program to recreate the database file.
Cannot access the selected file.	The drive which saves EEG data file of the selected patient has a malfunction.	Check the drive with the Windows Explore or Check Disk function.

Error Message	Possible Cause	Action
Cannot read the storage drive. Please verify that the drive door is closed and that the disk is formatted and free of errors.	The MO disk is write-protected.	Find the trouble source and correct it, referring to "Possible Cause" and check that a file can be saved in the MO disk with Windows Explore.
	The SCSI cable is not correctly connected to the PC unit and MO disk drive.	
	The SCSI ID of the MO disk is not correct.	
	The terminator setting of the MO disk drive is not correct.	
Cannot revise the multiple events at the same time.	Two or more events are selected when changing the event name.	Change the event name one by one.
Could not open the Communication port (#%d) for the Photo Drive unit. Confirm the COM port and the E11CFG.INI file setting.	The RS-232C port of the photo control unit is not recognized.	Close the Acquisition program, then check the description of the [PhotoControlComm] section in the E11CFG.INI file
Date or Date of Birth was not entered correctly. Please re-enter it using the date format in the Windows Control Panel.	You tried to enter the "Date" or "Date of Birth" in an incorrect format.	Check the format of the Date and Date of Birth in the Windows Control Panel.
<<DSP017>> Error found while checking waveform data buffer.	The system resources are low.	Restart the PC unit. If necessary add system memory.
Error found while saving data. Check the drive or media.	Faulty storage drive (the MO disk or hard disk which saves the EEG data file).	Check for disk error with the Check Disk function. Refer to "Checking for Disk Damage Using Check Disk" in Section 3.
Event was not created correctly.	The system resources are low.	Restart the PC unit. If necessary add system memory.
The %d channel is used for ECG trigger. Cannot set this channel to Off.	You tried to set the "Display" setting of the channel that is set to the trigger channel for the ECG filer to "OFF".	Do not change the "Display" setting to "OFF" when the channel is set to the trigger channel for the ECG filter.
The IMPEDANCE CHECK key on the electrode junction box has been pressed.	When the power is turned on, the IMPEDANCE CHECK key on the electrode junction box is pressed, or the IMPEDANCE CHECK key makes a short-circuit.	Do not press the IMPEDANCE CHECK key when the power is turned on. If the IMPEDANCE CHECK key is faulty, replace the EEG INPUT board.
The Photo Drive unit is not connected or the power is off.	Faulty RS-232C cable connection.	Check that the RS-232C cable is correctly connected to the photo control unit and PC unit, then open the Acquisition program.
	The photo control unit is not turned on.	1. Close the Acquisition program. 2. Turn the photo control unit on. 3. Open the Acquisition program. If the same error message appears again, check the fuses on the photo control unit.
	Faulty RS-232C cable	Replace the RS-232C cable.
	Faulty PHOTO STIM board	Replace the PHOTO STIM board.
	Faulty photo control unit	Replace the photo control unit.
The SELECTOR key on the electrode junction box was pressed during startup.	When the power is turned on, the SELECTOR key on the electrode junction box is pressed, or the SELECTOR key makes a short-circuit.	Do not press the SELECTOR key when the power is turned on. If the SELECTOR key is faulty, replace the EEG INPUT board.

Error Message	Possible Cause	Action
The disk is full. Close the current file to exit the acquisition program. Insert a new disk. [CAUTION] Do not turn off the power of the main unit or connected instruments (Photo Drive unit or MO drive). This can cause loss of EEG data and damage to the hard disk.	The storage drive (the MO disk or hard disk which saves the EEG data file) is almost full.	Click the OK button on the message dialog box, then end the measurement and save the file. Refer to "Starting and Ending EEG Measurement - Ending the Measurement and Saving the File" in Section 5 of the Operator's manual. After saving the file, prepare the new MO disk, or delete unnecessary files in the hard disk.
The file has not been saved yet. Save the file and open a new file? If you select [No], the data will be lost.	From the File menu, New is selected after the Starts/Stop Filing button is clicked.	Select the proper button on the dialog box. Refer to "Start and Ending EEG Measurement – Closing the File without Saving" in Section 5 of the Operator's manual.
The file has not been saved yet. Save the file? The data will be lost when you select [NO].	You tried to close the Acquisition program without saving the EEG data file.	Click the appropriate button on the message dialog box. Refer to "Starting and Ending EEG Measurement – Closing the File without saving" in Section 5 of the Operator's manual.
The file is being saved. Please wait for moment.	The EEG data file is being saved.	No operation can be done until this message disappears.
The following character cannot be entered. | '	You tried to enter the character " ' " or "|".	The characters " ' " and "|" cannot be entered.
The instrument is running on battery power. Connect AC power.	The AC adapter is disconnected from the PC unit.	1. Close the EEG-9000 application program. 2. Turn off the power of the PC unit and all components. 3. Connect the AC adapter to the PC unit correctly. 4. Turn on the all components and restart the PC unit.
The instrument temporarily running on battery power. Connect AC power.	The AC power cord of the AC adapter is disconnected.	1. Close the EEG-9000 application program. 2. Turn off the power of the PC unit and all components. 3. Connect the AC adapter to the PC unit correctly. 4. Turn on all components and restart the PC unit.
The maximum number of events have been registered. Cannot add more.	The number of saved events has reached 5000.	No more events can be added. Delete unnecessary events.
The number of information in the patient register is over the maximum number. Save the current register to a file and delete the register by using the Database Manager.	The maximum number of registered patient information in the system database has reached.	No more patient information can be added. Delete unnecessary patient information.
The printer driver is not installed. Please install the printer driver.	The printer driver is not installed.	Install the correct printer driver.
The specified Time has no EEG data. Type a new time "hhhh:mm:ss".	There is no waveform data corresponding to the specified time to jump to.	Enter the correct time corresponding to the waveform data.
The specified epoch number is not correct. Please input the epoch number again.	There is no epoch data corresponding to the specified epoch number.	Enter the correct epoch number corresponding to the epoch data.

Error Message	Possible Cause	Action
The starting option parameter is not correct. Please check the setting of the shortcut.	Invalid shortcut target or the target file does not exist.	Correct the shortcut target description in the Properties of the shortcut icon, or make a correct shortcut icon.
The value for Time is invalid. Type a new time "hhhh:mm:ss".	You tried to enter the time in an incorrect format.	Enter the time in the “hhhh:mm:ss” format.
There was a possibility of abnormal exit last time. To be on the safe side, check your disk and system with SCANDISK.EXE.	The EEG-9000 application program did not close correctly.	Check the disk damage with the Check Disk function. Refer to “Checking for Disk Damage Using Check Disk” in Section 3.
<< USB 901 >> The electrode junction box has been disconnected. The Acquisition program will be closed after saving the acquired data. Please connect the electrode junction box, and restart the program.	Faulty USB cable connection.	Check that the USB cable from the electrode junction box is correctly connected to the PC unit, then open the Acquisition program.
<< USB 902 >> No electrode junction box was detected. Confirm the electrode junction box is connected and restart the Acquisition program.	The electrode junction box is not recognized.	Check that the USB cable from the electrode junction box is correctly connected to the PC unit, then open the Acquisition program. If the same error message appears again, reinstall the electrode junction box driver, or replace the electrode junction box.
<< USB 903 >> The electrode junction box is disconnected or there is a data transmission error. After the Acquisition program closes, turn off the power, confirm the electrode junction box is connected and restart the Acquisition.	Faulty data communication between the electrode junction box and PC unit.	1. Close the Acquisition program. 2. Turn the PC unit off. 3. Check that the USB cable is correctly connected to the PC unit. 4. Restart the PC unit. 5. Open the Acquisition program.
<< USB 904 >> An overflow occurred during data transmission from the electrode junction box. Restart the Acquisition program	Overflow occurs during data transfer.	1. Close the Acquisition program. 2. Turn the PC unit off. 3. Check that the USB cable is correctly connected to the PC unit. 4. Restart the PC unit. 5. Open the Acquisition program.
Volume name was not found on the storage Drive. New volume name %s was created.	No volume number is assigned to the MO disk.	The volume number is automatically assigned.
Windows data format must be set to 4 digit year.	This message appears when a two digit year format will be used from the year 2009.	Change the year format to 4 digits (Control panel → Regional Options Data page → Short date area → Short date format).

File Utility Program

Error Message	Possible Cause	Action
Another program of this EEG system is working. Please close it and start again.	You tried to open the File Utility program when another EEG-9000 application program was open.	Close the other EEG-9000 application program, then open the File Utility program.
Cannot change file name.	You tried to change the file name when copying the file to a folder.	The file name cannot be changed when copying the file to a folder.
Cannot open database file.	The database file is faulty.	Reinstall the EEG-9000 system program.
Local Drive [***] has not been initialized. Please execute initialize.	No volume number is assigned.	Check the disk, then assign the volume number if necessary. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
Not enough disk space on the destination drive to copy your file.	There is not enough free disk space to copy the file.	Prepare a new MO disk, or delete unnecessary files in the hard disk
Not enough disk space on the destination drive to move your file.	There is not enough free disk space to move the file.	Prepare a new MO disk, or delete unnecessary files in the hard disk
Select a different drive.	You tried to copy the file to the same drive.	The file can only be copied to another drive.
	You tried to move the file to the same drive.	The file can only be moved to another drive.
The disk is write protected.	The MO disk is write-protected.	Release the write-protect.
	The MO disk drive that you want to copy a file to is write-protected.	
	The MO disk that you want to move a file to is write-protected.	
The selected drive has not been formatted.	The disk is not formatted.	Format the disk. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
This drive has already been initialized. Initialize canceled.	You tried to assign a volume number to a disk or folder that already has a volume number.	Check the volume number, then assign a new volume number if necessary. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
***.ini was not found. Close File Utility.	The initial file for the File Utility program is lost.	Reinstall the EEG-9000 system program.

System Program

Error Message	Possible Cause	Action
At least one electrode must be selected.	No electrode is selected and saved for waveform acquisition.	Select and save the proper electrodes. Refer to “Selecting and Saving the Electrodes for Waveform Acquisition” in Section 4 of the Operator’s manual.
Drive "D" is CD-ROM drive. Storage drive is set to "C".	The MO disk drive is not recognized.	Check that the SCSI cable is correctly connected to the MO disk drive and PC unit.
Drive "D" not found. Storage drive is set to "C".	The MO disk drive is not recognized.	Check that the SCSI cable is correctly connected to the MO disk drive and PC unit.
Please close Acquisition program before you start the System program.	You tried to open the System program when the Acquisition program was open.	Close the Acquisition program, then open the System program.
Please close Database Manager program before you start the System program.	You tried to open the System program when the Database Manager program was open.	Close the Database Manager program, then open the System program.
Please close File Utility program before you start the System program.	You tried to open the System program when the File Utility program was open.	Close the File Utility program, then open the System program.
Please close Review program before you start the System program.	You tried to open the System program when the Review program was open.	Close the Review program, then open the System program.
The storage folder and the automatic copy folder cannot be the same folder.	The same directory is selected for the “Storage drive” option and “Automatic copy after acquisition” option.	Change the directory for the “Automatic copy after acquisition” option, or uncheck the “Automatic copy after acquisition” option.
Time-out error (over 30 seconds). The settings file may be damaged.	The system setting file is faulty.	Reinstall the EEG-9000 system program.

Open File Dialog Box

Error Message	Possible Cause	Action
429ActiveX Component can't create Object.	Faulty "Data Access Object (DAO)" installation.	Install the DAO*, or install the EEG-9000 system program.
Cannot access the selected file. Confirm the selected drive.	The MO disk that has the selected EEG data file is not inserted into the MO disk drive.	Insert the correct MO disk into the MO disk drive.
Could not create new database. Exit application.		Reinstall the EEG-9000 system program.
Device not ready.	The selected drive is not recognized.	Insert the correct MO disk into the MO disk drive, or select the correct drive or folder in the hard disk.
Drive is write-protected. Open in read-only mode.	The disk is write-protected.	Release the write-protect, if necessary.
Dskvol21.vol not found in selected drive.	No volume number is assigned.	Check the disk, then assign a volume number if necessary. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
File is write-protected. Open in read-only mode.		If necessary, change the attribute of the file to "Archive" (Tools menu → Change File Attributes).
File not found.	The MO disk is not inserted into the MO disk drive.	Insert the correct MO disk, or select the correct drive or folder in the hard disk.
Initialize Error: could not write the E11Launcher.ini file. Exit application.	The E11Launcer.ini file is not found.	Check that the E11Launch.ini file exists in C:/NFX11. If it does not exist, reinstall the EEG-9000 system program.
No Data.	There is no EEG data file in the selected drive.	Insert the correct MO disk into the MO disk drive, or select the correct drive or folder in the hard disk.
No EEG folder in selected Drive	There is no folder to save EEG data files	Assign a volume number. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
No volume number for Dskvol21.vol.	No volume number is assigned.	Check the disk, then assign a volume number if necessary. Refer to "Formatting a Magneto-optical Disk - Assigning the Volume Number to a Magneto-optical Disk" in Section 3 of the Operator's manual.
Selected file is not on selected drive.		Insert the correct MO disk into the MO disk drive, or select the correct drive or folder in the hard disk.
This file is not entered.		Add the EEG data file to the system database. Refer to "Adding Files to the System Database" in Section 8 of the Operator's manual.
Too many files selected.	Four EEG data files have been opened.	Close unnecessary EEG data files.

* To install the DAO:

  Double-clicking C:\nfx11\VXXXX\Dao35\Setup.exe.

  The subdirectory name VXXXX differs depending on the software version.

  Example: V0310

Section 4 Board Description

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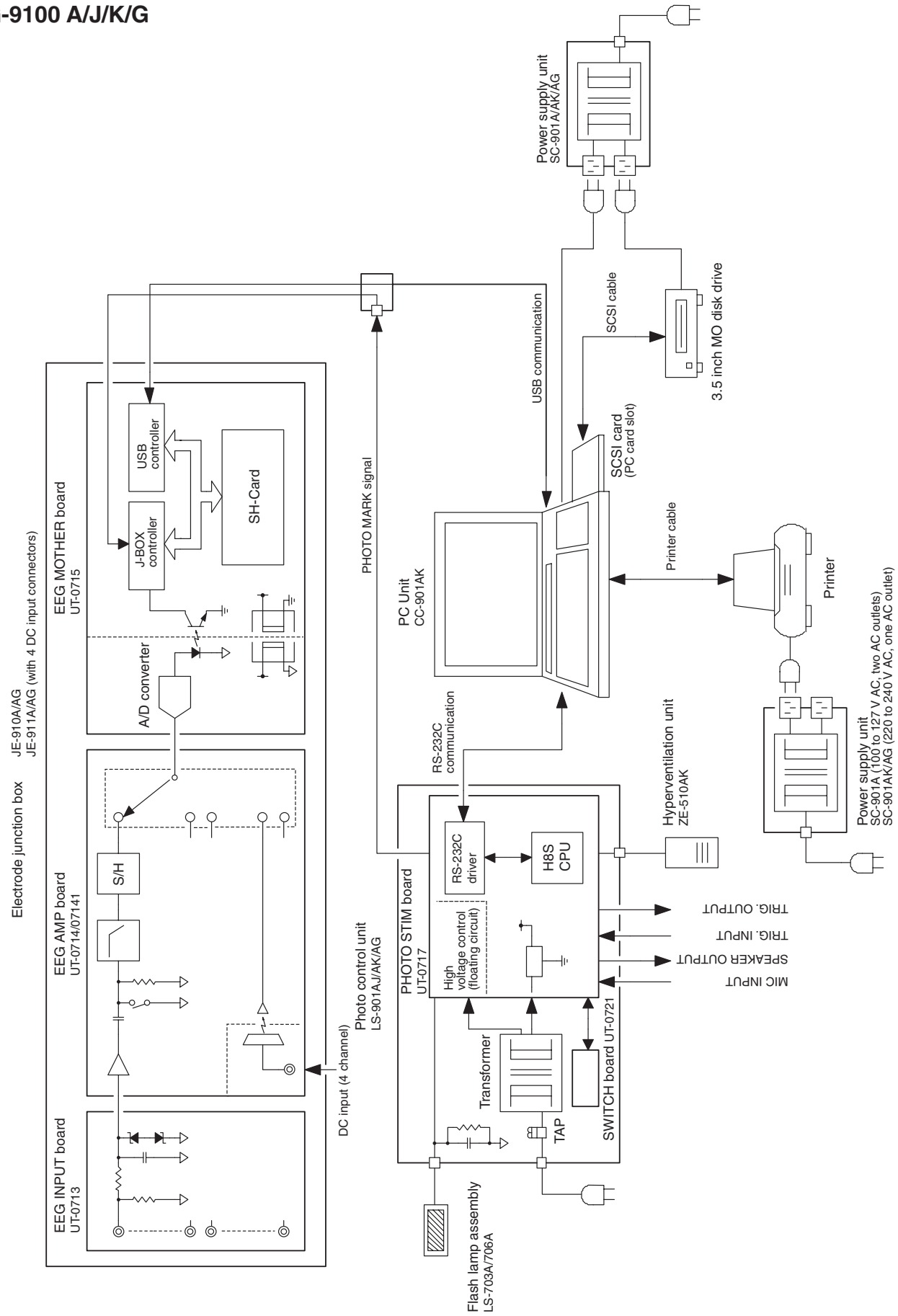
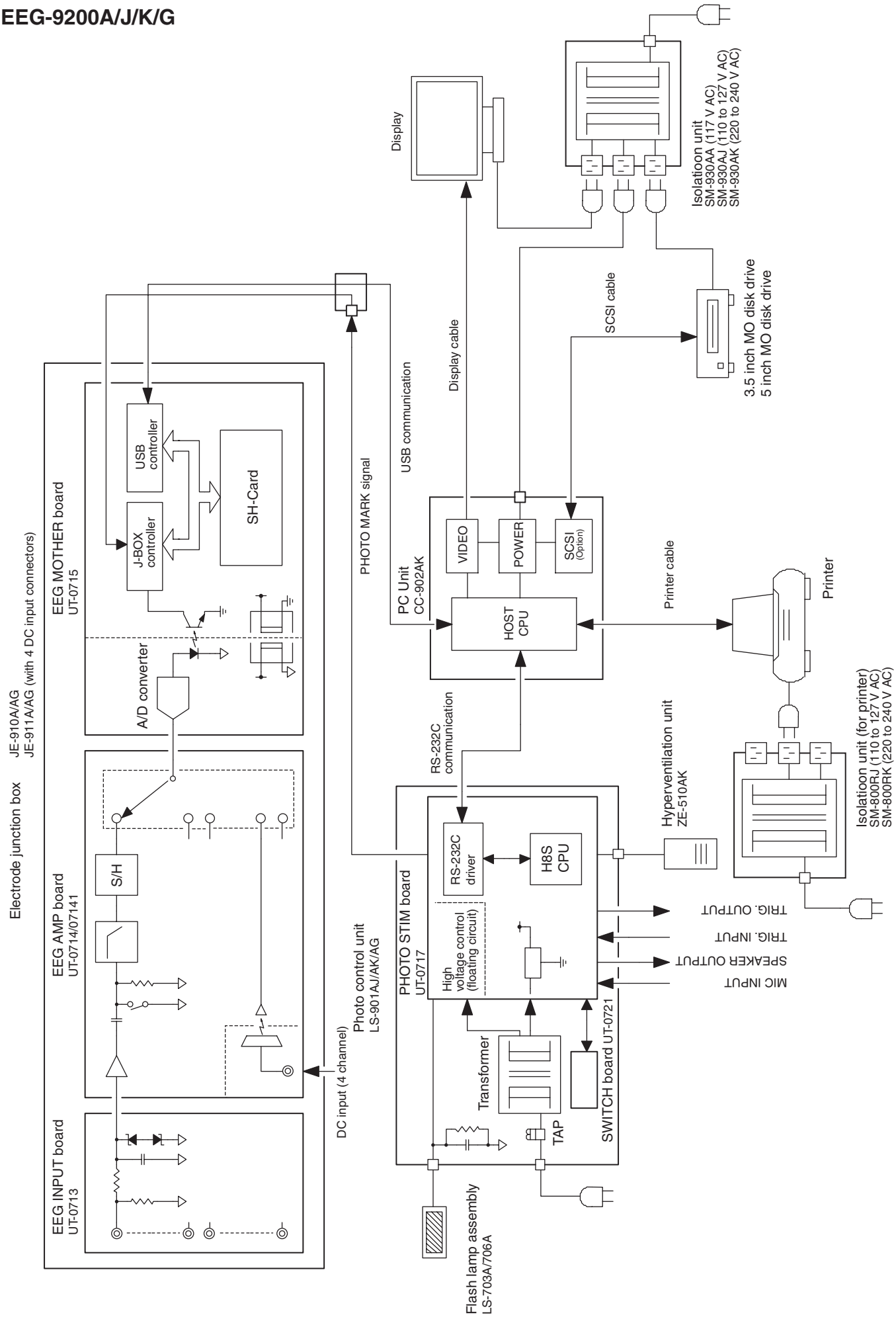
Block Diagram

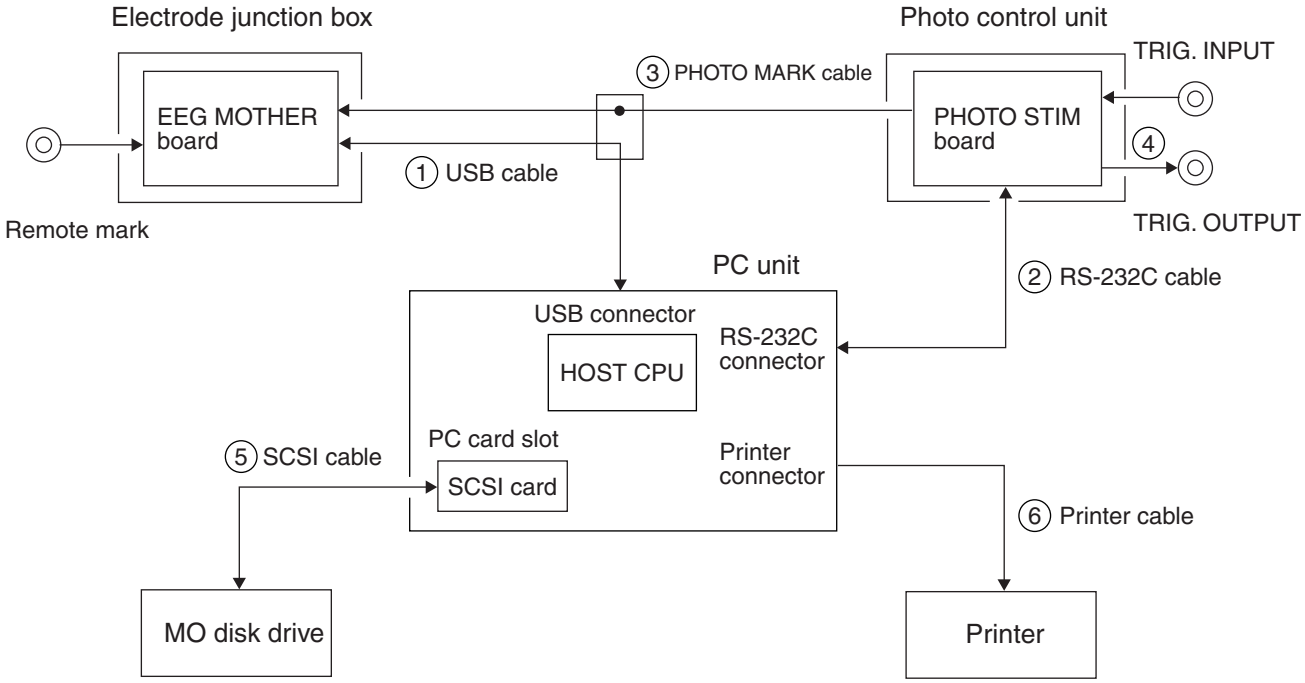
EEG-9100 A/J/K/G



EEG-9200A/J/K/G



Signal Flow



The host CPU in the PC unit controls all units and boards by sending and receiving the operation control signals and input/output signals.

1. The electrode junction box converts the acquired analog signals (EEG waveforms, respiration waveforms, ECG waveforms, DC input signals, remote mark on/off signals, etc.) to digital data and transfers the digital data to the PC unit as serial data by USB communication.

   The PC unit generates the electrode junction box control signals for functions such as resetting traces to the baseline, changing the reference electrodes and checking the skin-electrode impedance, etc.

2. The photo control unit controls the photic stimulation and hyperventilation pacing sound by receiving a command from the PC unit by RS-232C communication.

3. The photo control unit transfers the photo mark signal and hyperventilation mark signal to the electrode junction box.

4. The photo control unit outputs the photic trigger signal to the TRIG. OUTPUT connector.

5. The PC unit communicates with the MO disk drive to read/write EEG data files via the SCSI card.

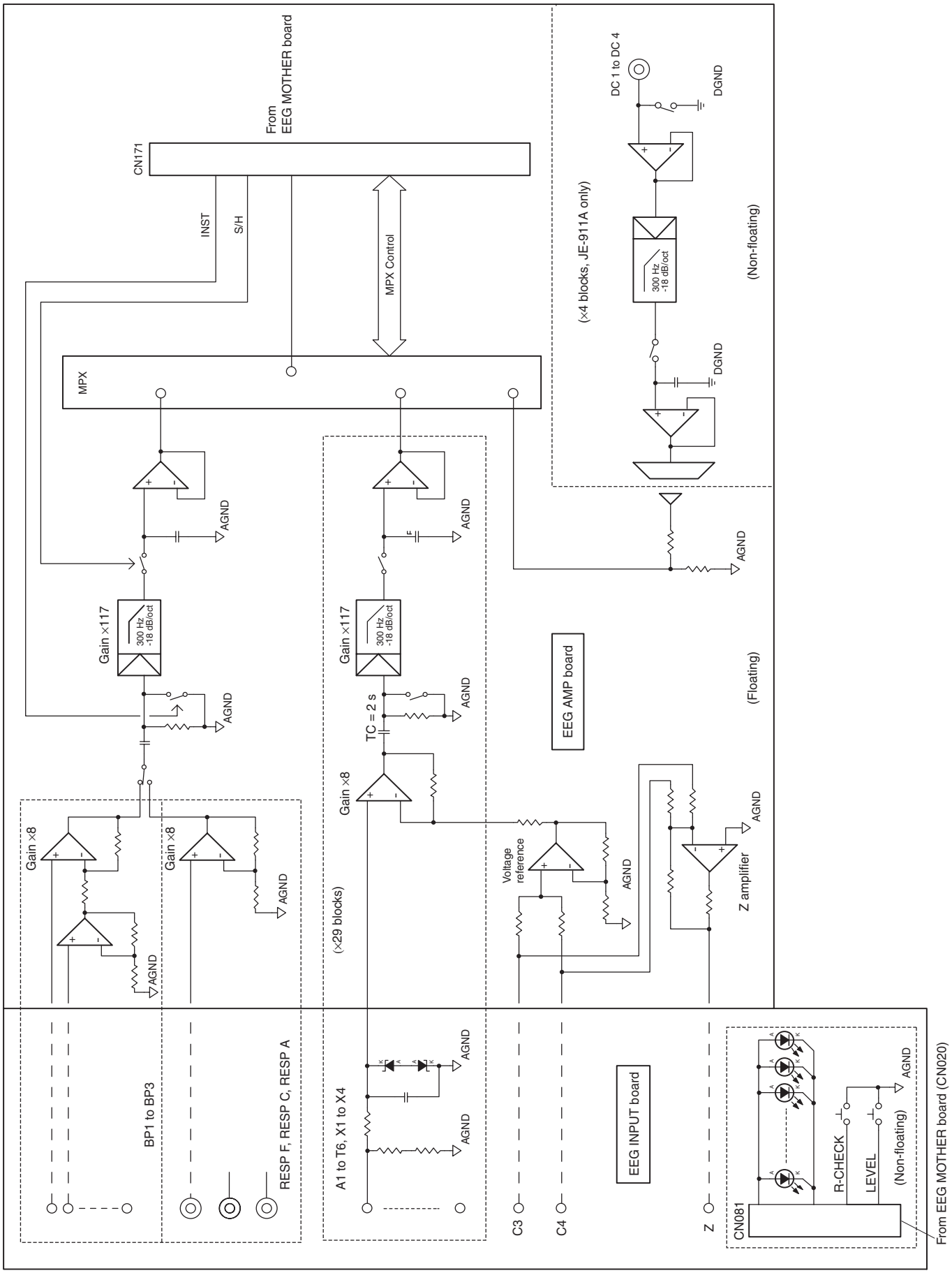
6. The PC unit communicates with the printer to print patient information, events and EEG waveforms.

Electrode Junction Box

The electrode junction box consists of the EEG INPUT board, EEG AMP board and EEG MOTHER board. The JE-911A/AG electrode junction box has 4 DC input connectors. The general functions of the electrode junction box are to:

- amplify the EEG signals picked up from the electrodes
- amplify the DC input signals from the DC input connectors (JE-911A/AG only)
- simultaneously sample the amplified signals at the frequency of 1 kHz,
- convert the sampled analog signals to digital serial data,
- convert the photo mark signals and HV mark signals from the photo control unit to digital serial data
- output the digital data to the PC unit by USB communication
- measure the skin-electrode contact impedance and display the skin-electrode contact impedance with the LEDs

EEG INPUT board/EEG AMP board block diagram



EEG INPUT board

The top of each EEG amplifier circuit and respiration pickup/bipolar deviation circuit has an input protection circuit to limit the input voltage within ±7 V.

Input Terminals

- Input jacks which connect the electrode lead plugs.
- Multiple connector to connect to the JE-913A/AG Mini junction box, BE-911A/912A EEG disk electrode (shielded type).

Impedance Check LEDs

Shows the result of the electrode impedance check.

Impedance Threshold LEDs

Shows the skin-contact impedance check threshold.

EEG AMP board

EEG Amplifier Circuits

- Primary operational amplifier (×8)
  Amplifies the difference between the two input signals 8 times.

- 2 second time constant circuit
  Provides a 2 second time constant.

- Reset circuit
  Resets the trace to the baseline.

- Secondary operational amplifier (×117)
  Amplifies the signals 117 times.

- Anti-aliasing circuit (300 Hz, -18dB/Oct)
  Filters any aliasing signal.

- Sample and hold circuit (1 kHz)
  Samples and holds signals at 1 kHz sampling frequency.

Respiration Pickup Circuit/Bipolar Derivation Circuit:

- Primary operational amplifier
  Respiration pick up circuit:
  Amplifies the respiration signals 8 times.

  Bipolar derivation circuit:
  Amplifies the difference between pair of input signals for bipolar derivation 8 times.

- 2 second time constant circuit
  Provides a 2 second time constant.

- Reset circuit
  Resets the trace to the baseline.

- Secondary operational amplifier (× 117)
  Amplifies the signals 117 times.

- Anti-aliasing circuit (300 Hz, -18dB/Oct)
  Filters any aliasing signal.

- Sample and hold circuit (1 kHz)
  Samples and holds signals at 1 kHz sampling frequency.

System Reference Voltage (VREF) Generation Circuit

Averages the electrode potential between C3 and C4 and amplifies 1.14 times. This voltage is used for the system reference voltage for the electrode junction box.

Z Signal Generation Circuit

Averages the electrode potential between C3 and C4. This voltage is fed back to the Z electrode to reduce artifact.

DC Input Circuit (JE-911A/AG only)

- Buffer amplifier
  Provides 1.5 MW input impedance

- Reset circuit
  Resets the trace to the baseline.

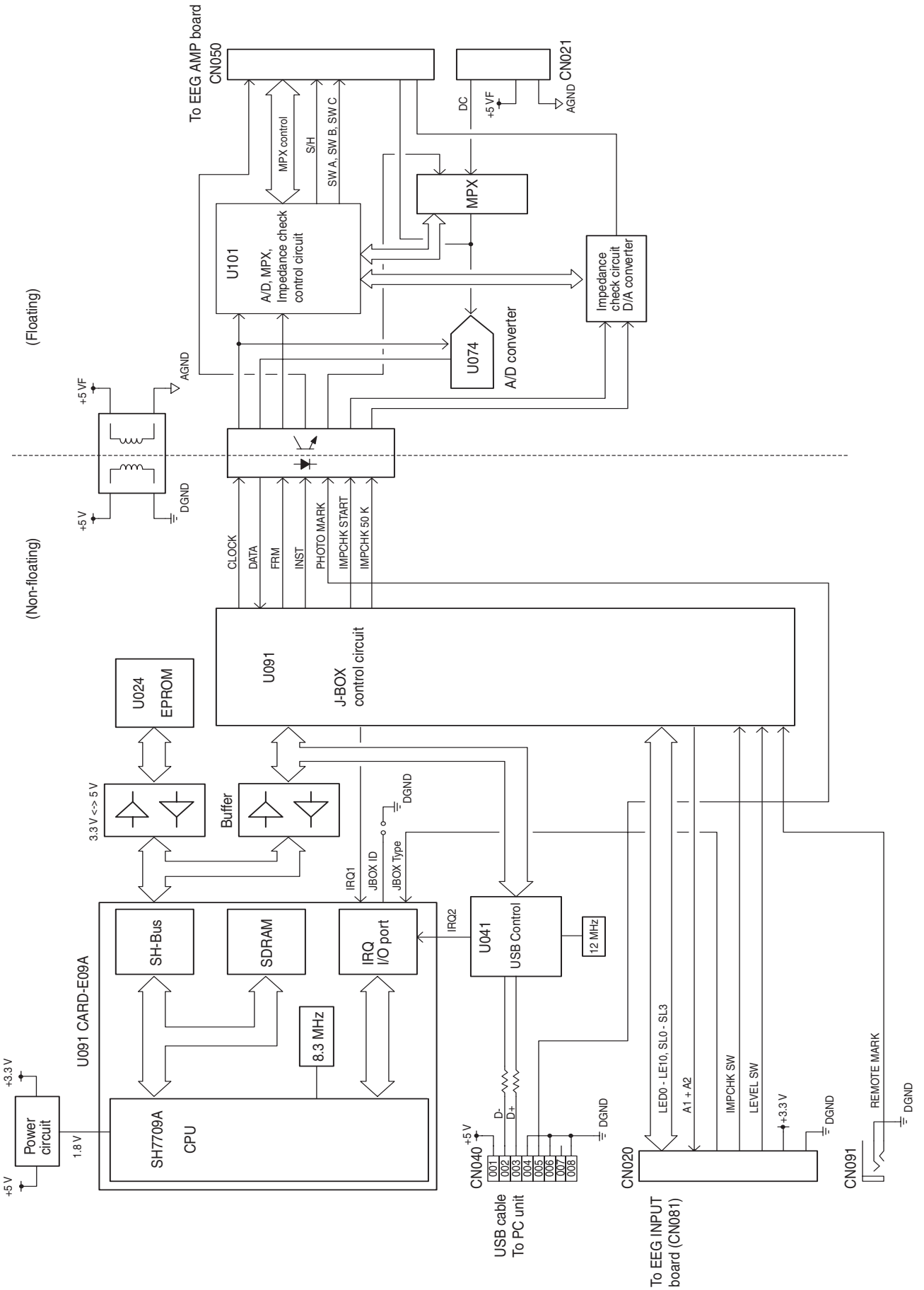
- Anti-aliasing circuit (300 Hz, -18dB/Oct)
  Filters any aliasing signal.

- Sample and hold circuit (1 kHz)
  Samples and holds signals at 1 kHz sampling frequency.

Multiplexing Circuit

Multiplexes the data from the sample and hold circuit and outputs it as serial data.

EEG MOTHER board block diagram



EEG MOTHER Board

Electrode junction box control circuit

- Controls the overall operation of the electrode junction box at 100 MHz clock frequency using a SH7709A CPU (U091 CARD-E09A). The EPROM (256 kB× 16 bit) contains the program to control the electrode junction box operation.
- Simultaneously controls the reset circuits of all the amplifiers in the electrode junction box.
- Outputs the A1 + A2 signal.
- Controls the impedance check function. The skin-electrode contact impedance is calculated and the check result is displayed on the LEDs on the EEG INPUT board and sent to the PC unit.

Power Supply Circuit

- On the non-floating circuit
  +5 V: Power supply from the PC unit
  +3.3V: Power supply for digital circuits
  +1.8 V: Power supply for CARD-E09A

- On the floating circuit
  The following powers are generated by the DC-DC converter.
  +5 VF: Power supply for floating circuits.

Isolation Circuits

The photocouplers are used for transferring the digital data from the floating circuit to the non-floating circuit.

A/D Conversion Control Circuit/Impedance Check Control circuit

- A/D conversion control circuit:
  Controls the three circuits in the EEG AMP board and EEG MOTHER board to convert the analog EEG signals and DC input signals (JE-911A/AG only) into digital signals. First, the analog EEG signal is sampled and held. Second, the sampled and held data is multiplexed. Third, the multiplexed data is converted into digital EEG signals with a 16 bit A/D converter.

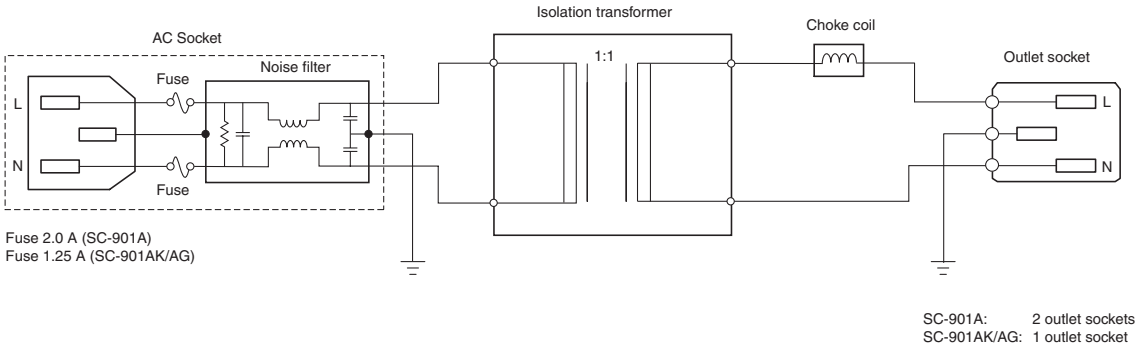
- Impedance check control circuit
  The impedance check current is generated by an 8 bit D/A converter.

USB Communication Control Circuit

Controls the communication between the electrode junction box and PC unit.

Power Supply Unit, SC-901A/AK/AG (for EEG-9100A/J/K/G only)

The power supply unit consists of an AC socket with fuse folders and noise filter, medical isolation transformer, choke coil and AC outlet socket to supply isolation power to a PC unit, locally purchased MO disk drive and printer.



Isolation Unit, SM-930AA/AJ/AK (for EEG-9200A/J/K/G only)

The isolation unit consists of an AC socket, circuit breaker, medical isolation transformer with thermal fuse, choke coil and three AC outlet sockets to supply isolation power to a PC unit, locally purchased display and MO disk drive.

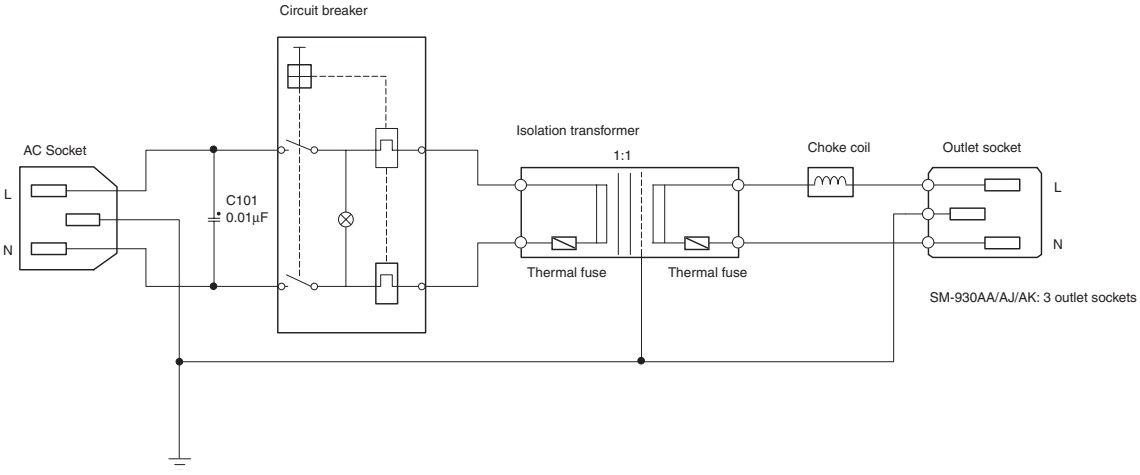
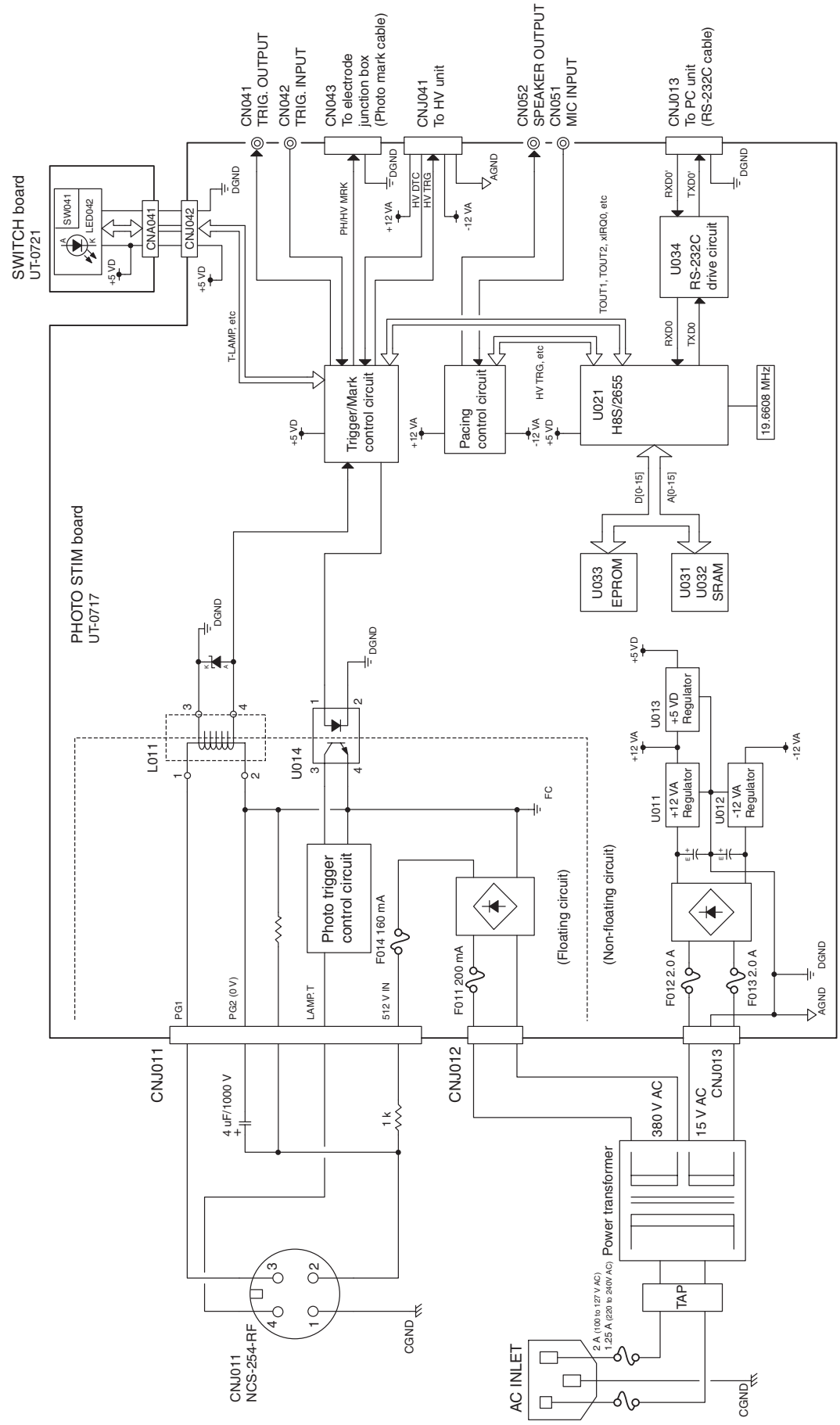


Photo Control Unit

Photo control unit block diagram



WARNING

- **Before connecting or disconnecting the flash lamp assembly cable, turn the power off. After the power is turned off, high voltage is present in the PHOTIC LAMP connector for several minutes.**
- **After the power is turned off, wait at least one minute to remove cables and disassemble the instrument. When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the photo control unit. To protect against shock, always connect the flash lamp assembly cable to this connector, or attach the PHOTIC LAMP connector cap to the PHOTIC LAMP connector even when the photic stimulation is not used.**

PHOTO STIM Board

Power Supply Circuit

- On the non-floating circuit

  +12 VA: Power supply for +5 VD regulator, pacing control circuit and ZE-510AK Hyperventilation unit.

  -12 VA: Power supply for pacing control circuit and ZE-510AK Hyperventilation unit.

  +5 VD: Power supply for digital circuits.

- On the floating circuit

  +512V DC: Power supply for photic lamp

Photo Control Unit Control Circuit

Controls the overall operation of the photo control unit by H8S/2655 16 bit CPU (19.6608 MHz clock frequency). The program memory is 64 kB× 16 bit EPROM and the data memory is two 32 kB´8 bit SRAMs. The CPU receives the activation control command via the RS-232C driver from the PC unit.

Trigger/Mark Control Circuit

Generates trigger pulses for photic stimulation and hyperventilation pacing sound, and outputs trigger signals and photo mark signals.

Pacing Sound Control Circuit

- Generates pacing sound for an external speaker.
- Amplifies the MIC INPUT signals and outputs the MIC INPUT signals to an external speaker.
- The pacing sound intensity and duration can be adjusted. Refer to "Adjusting the Pacing Sound" in Section 6.

512 V Generation Circuit

Changes the 380 V AC to 512 V DC and charges the 512 V DC to a high-voltage capacitor to drive a photic lamp. The trigger input circuit is isolated by a photocoupler.

Photo Lamp Lighting Detection Circuit

Detects the current when the photic lamp is lit. The detected photo current detection signal (PHOTO MARK signal) is sent to the electrode junction box and output to the TRIG. OUTPUT connector on the photo control unit.

SWITCH Board

When the power of the photo control unit is turned on, the LED042 POWER ON/OFF LED lights. You can check the photic stimulation by pressing the SW041 switch (Single button). When this switch is pressed, the photic lamp lights once and the LED on the SW041 lights synchronized with the photic trigger signal.

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Section 5 Disassembly

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The procedures in this section tell how to remove, replace and install major components in the instrument.

- To remove components from the cart, refer to the KE-910A or KD-024A/025A Cart Installation Guide or "Setting the Components on the Cart" on Section 2 of the EEG-9100/9200 Operator's Manual.
- To remove the connection cables, refer to "Cable Connections" in Section 2 of the EEG-9100/9200 Operator's manual.
- To remove, replace and install the components in the PC unit, refer to the personal computer documentation.

Before You Begin

Warnings, Cautions and Notes

Removing, replacing and installing major components should be done only by qualified service personnel.

WARNING

- **To avoid the possibility of injury to yourself or damage to the instrument, do not install or remove any component or change switch settings while the power is on.**
- **To avoid accidental discharge of static electricity which could damage the components of the instrument, use a grounded wrist strap when installing or removing any component of the instrument.**
- **Before connecting or disconnecting the flash lamp assembly cable, turn the power off. After the power is turned off, high voltage is present in the PHOTIC LAMP connector for several minutes.**
- **After the power is turned off, wait at least one minute to remove cables and disassemble the instrument. When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the photo control unit.**
- **Before connecting or disconnecting a cable, close the EEG-9000 application program, shut down Windows, turn off all components and unplug the AC power cord from the AC outlet.**

CAUTIONS

- **Fuses cut off the power when an abnormality occurs in the instrument. Eliminate the malfunction before replacing the fuse. Use the correct fuse only. The fuse rating is shown on the holder.**
- **Do not use or change the DIP switches or jumper settings or expand the system as recommended in the Product Guide of the personal computer because the DIP switches and jumper settings on the system board and CPU module and the installed hardware are specially set for the instrument. Changing these settings can affect the performance of the instrument.**

Caution - continued

- **Removal and replacement of any components in the instrument should only be done by qualified service personnel.**
- **Use only parts recommended by Nihon Kohden to assure maximum performance from your instrument.**

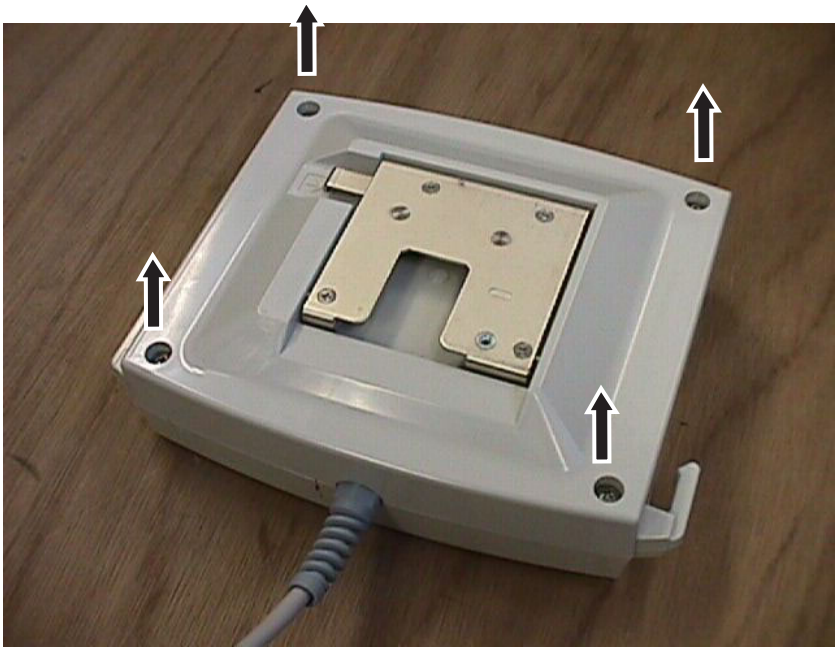
Required Tools

- Anti-static bench mat
- Wrist ground strap
- Phillips screwdriver (insulated type, for M3 and M4 screws)
- Hex socket driver (for 8 mm floating bolt, 5.5 mm spacer bolt and nut)
- Tweezers

Electrode Junction Box

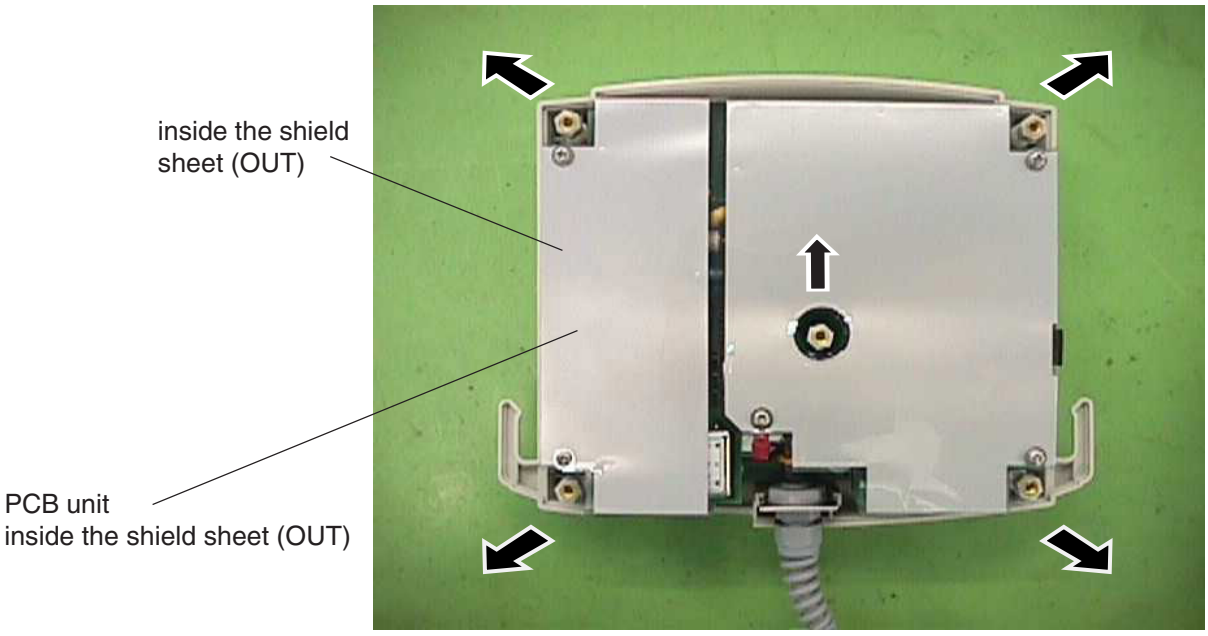
1. Turn the electrode junction box front side down.

2. Remove the four M4 binding head screws which fasten the rear cover to the front cover.



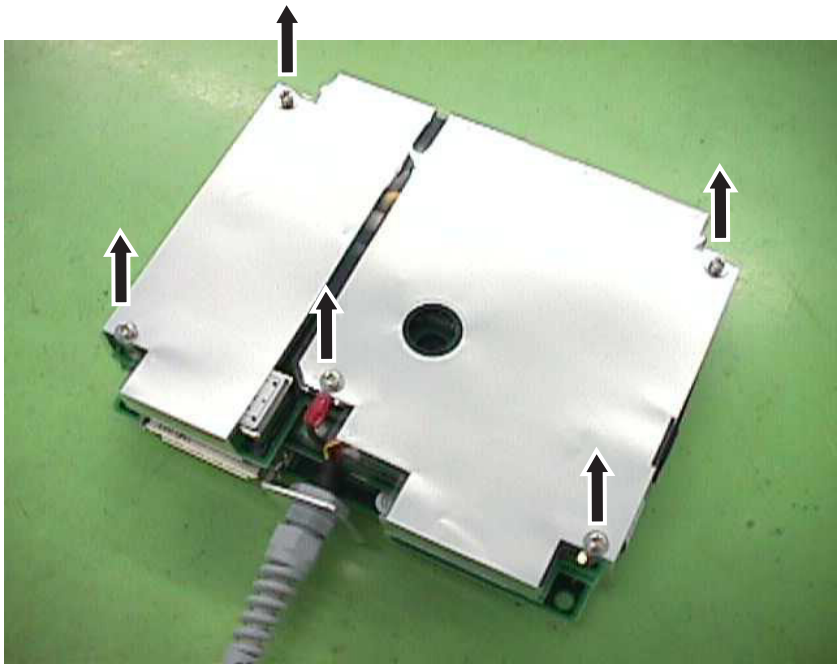
3. Remove the rear cover.

4. Remove the five 8 mm floating bolts which fasten the PCB unit to the front cover.

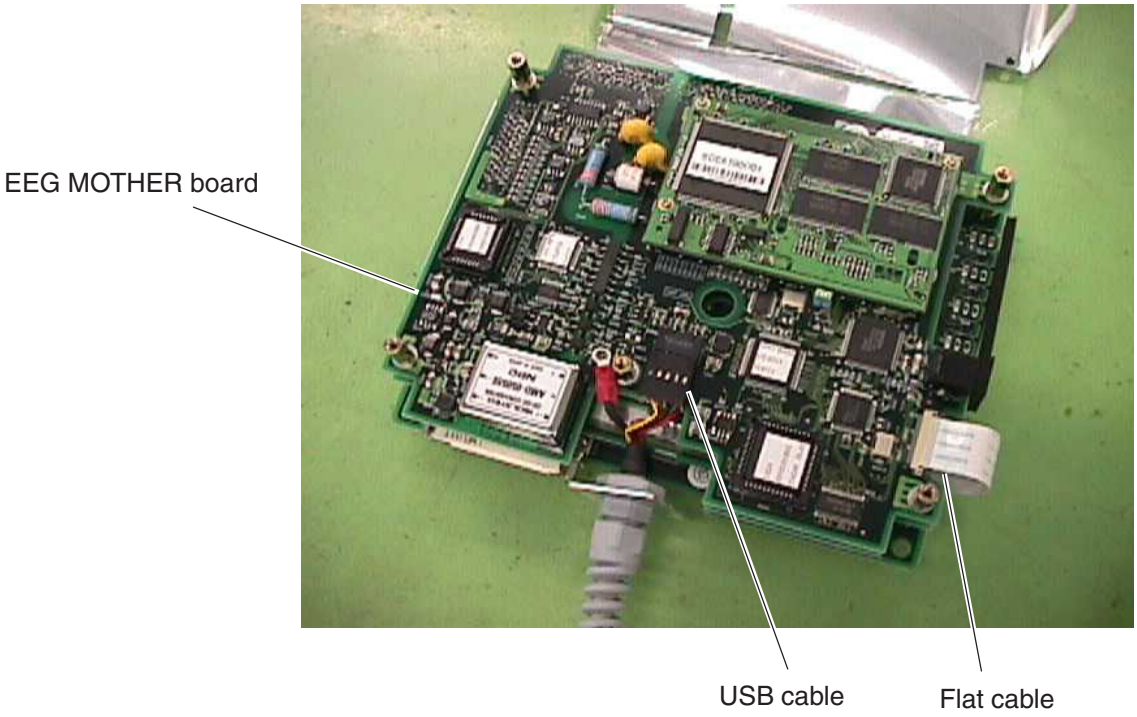


5. Remove the PCB unit from the front cover.

6. Remove the five M3 screws with spring washers and open the shield sheet (OUT).



7. Remove the flat cable and USB cable which are connected to the EEG MOTHER board.



The boards are connected with 5.5 mm spacer bolts and 5.5 mm spacer nuts.

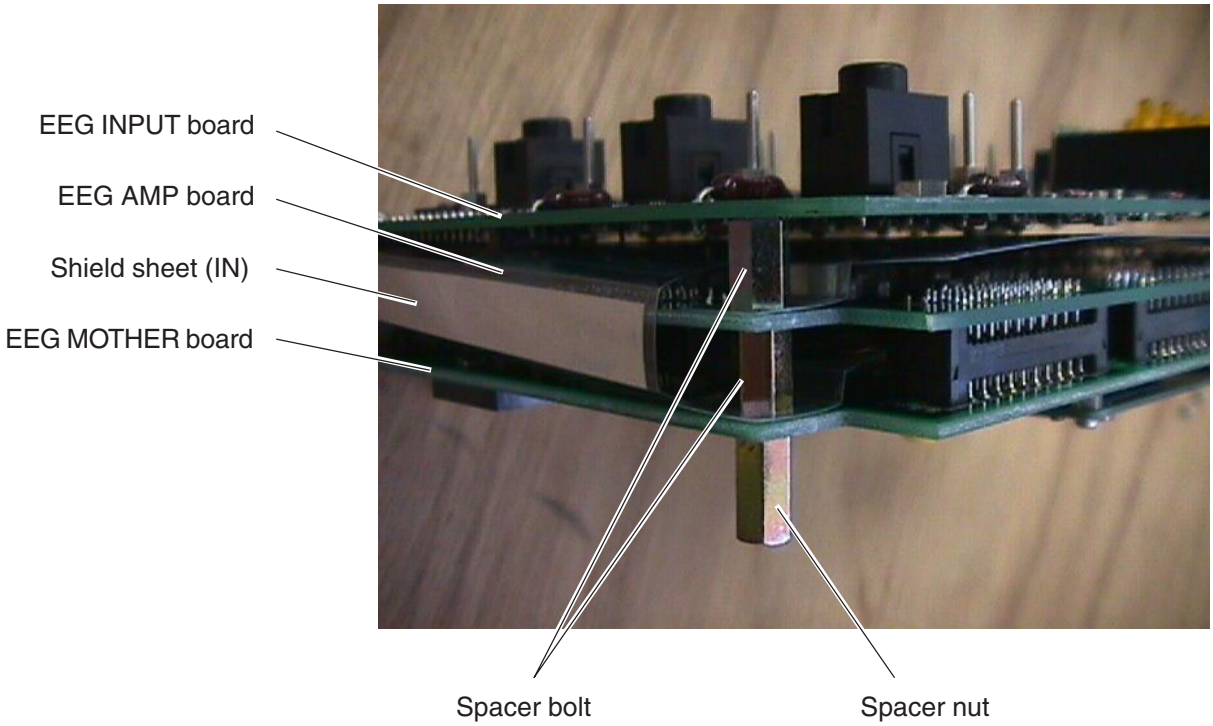


Photo Control Unit

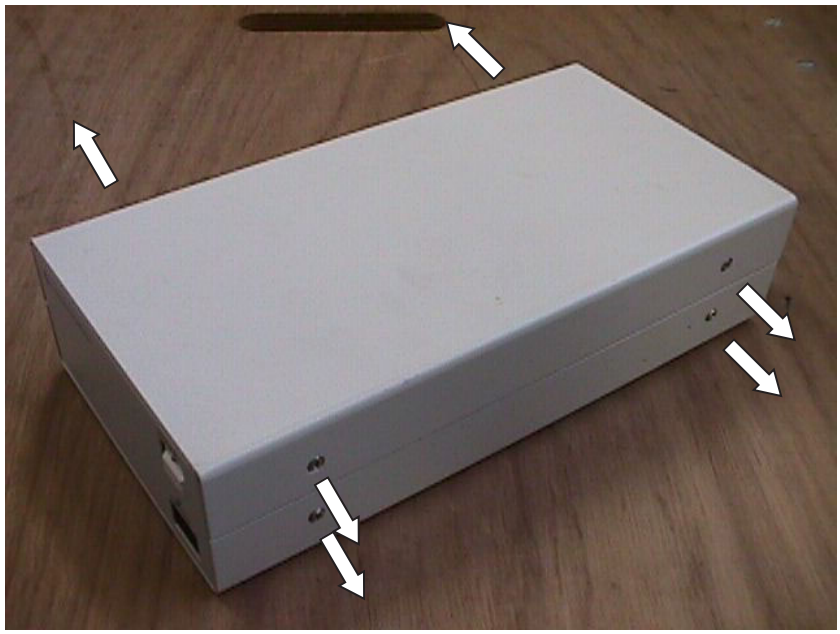
WARNING

- **Before connecting or disconnecting the flash lamp assembly cable, turn the power off. After the power is turned off, high voltage is present in the PHOTIC LAMP connector for several minutes.**
- **After the power is turned off, wait at least one minute to remove cables and disassemble the instrument. When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the poto control unit.**

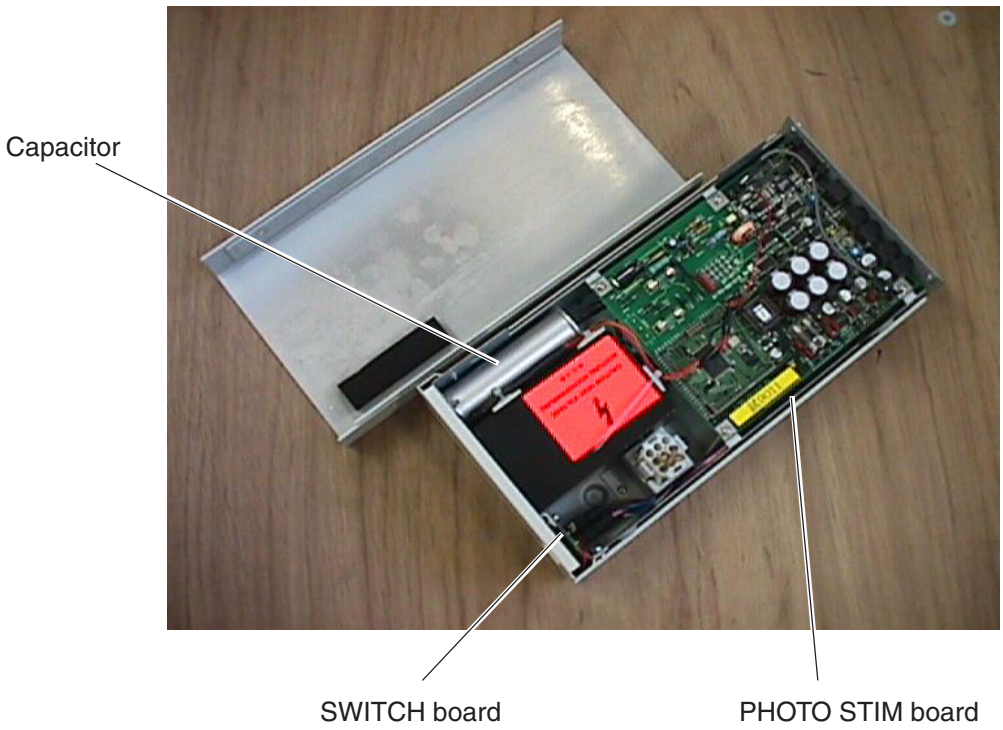
Removing the Top Cover and Bottom Cover

When only removing the PHOTO STIM board, remove only the top cover.

1. Remove the eight M4 binding screws which fasten the top cover and bottom cover to the chassis.

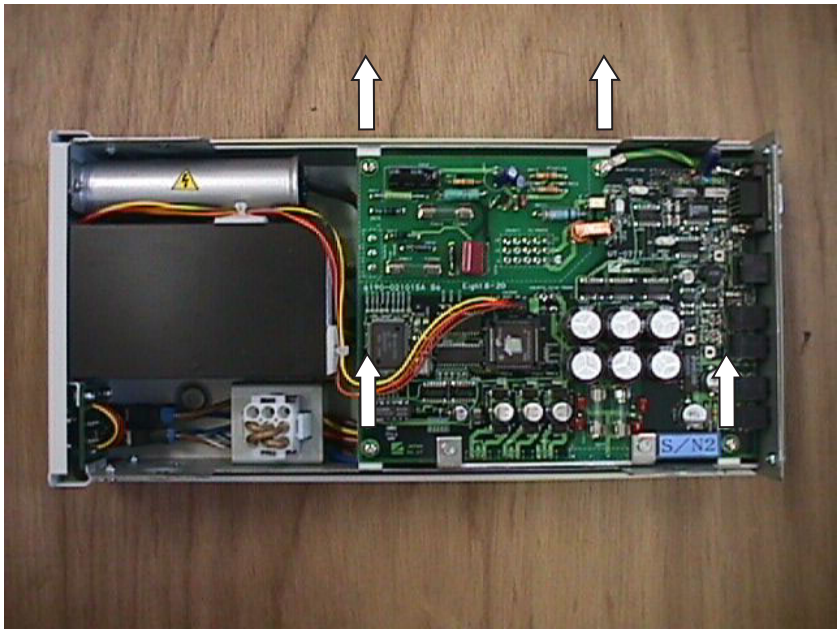


2. Remove the top cover and bottom cover.

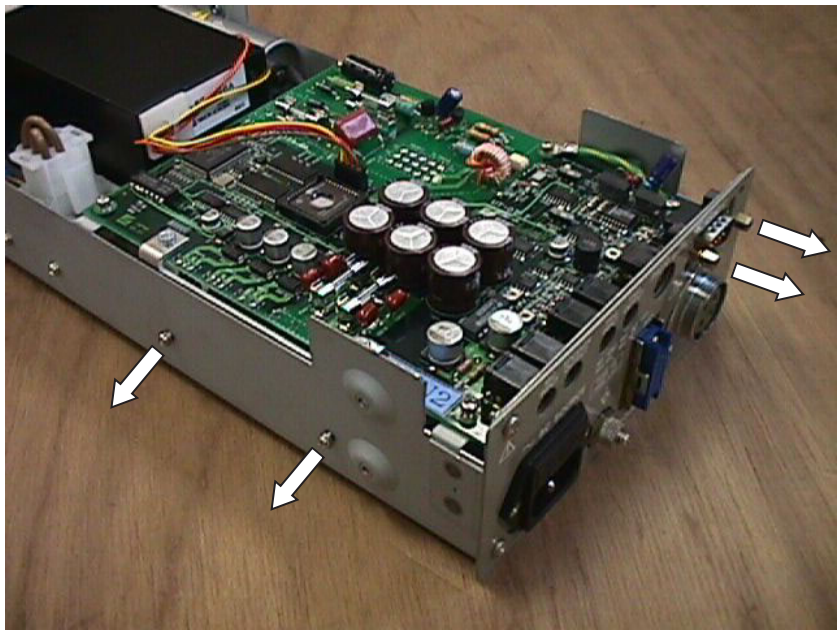


Removing the PHOTO STIM Board

1. Remove the four M3 screws with spring washers which fasten the PHOTO STIM board to the chassis.

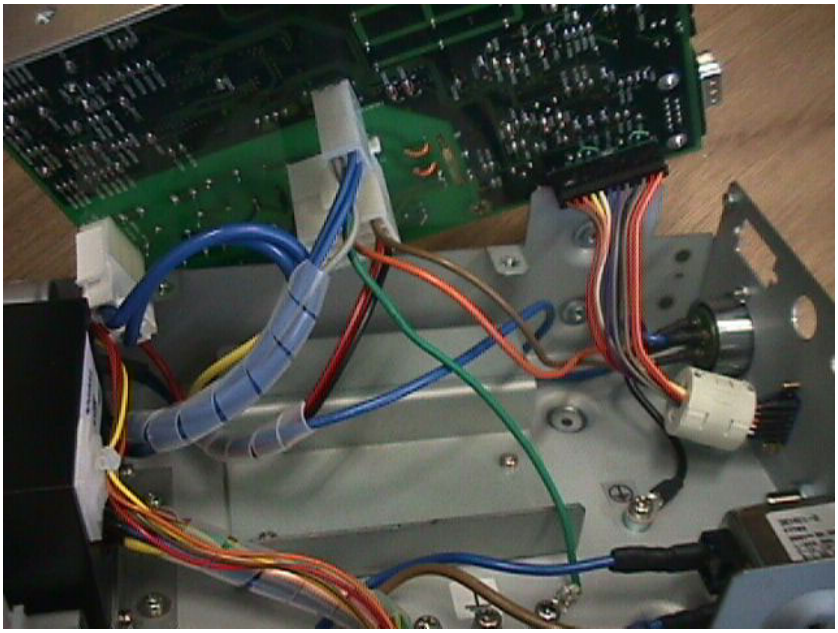


2. Remove the two M3 screws with spring washers which fasten the heat sink to the chassis.



3. Remove the two 5 mm jack posts of the RS-232C connector on the rear panel.

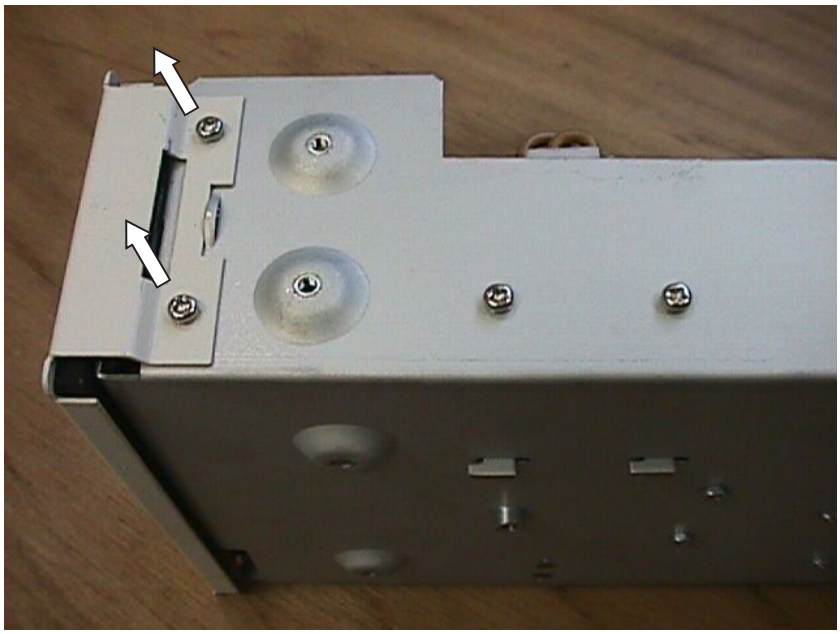
4. Pull up the PHOTO STIM board and remove all cables which are connected to the PHOTO STIM board.



Removing the SWITCH Board

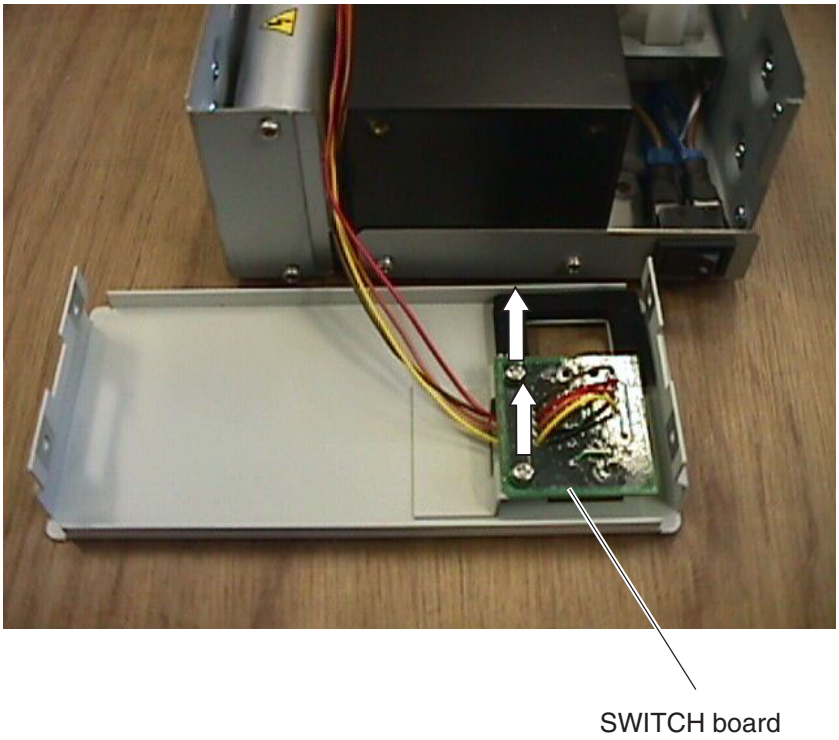
1. Remove the top cover and bottom cover. Refer to “Removing the Top Cover and Bottom Cover”.

2. Remove the four M3 screws with spring washers which fasten the front panel to the chassis.



3. Remove the front panel.

4. Remove the two M3 screws with spring washers which fasten the SWITCH board to the front panel.



5. Remove the cable which is connected to the PHOTO STIM board.

6. Remove the SWITCH board.

Section 6 Maintenance

Checking the Electrode Junction Box

Checking Noise

Use the EEG noise checker to check the internal noise of the electrode junction box. This checker shorts circuits all EEG inputs as shown in the circuit diagram. Assemble the EEG noise checker locally with parts that are purchased locally or from your Nihon Kohden distributor or representative.

1. Connect the EEG noise checker to the multiple connector of the electrode junction box with a connector adaptor cable.

2. Start the Acquisition program.

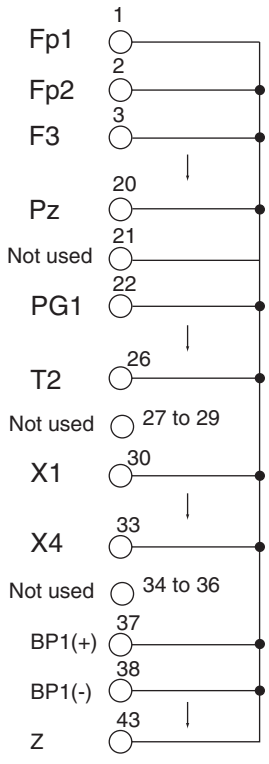
3. Set the EEG instrument to the following settings.
   High-cut filter: 60 Hz
   Time constant: 0.3 s
   Sensitivity: 1 µV/mm
   AC filter: Off
   Montage: Any montage except E lead connection pattern.

4. Check that the amplitude of the noise on the screen is less than 1.5 µVp-p.

Required Parts

Description	Qty	Code No.
Connector CNP S-1345-CEA (45 pin)	1	269852
Connector adaptor cable	1	YZ-0220

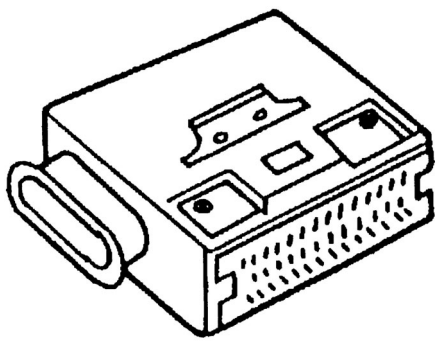
Circuit diagram



To Electrode junction box

Noise checker

Appearance



Checking the Skin-electrode Impedance Check Function

Use the EEG impedance checker to check the skin-electrode impedance check function. This checker shorts circuits all EEG inputs as shown in the circuit diagram. Assemble the EEG impedance checker locally with parts bought locally or from your Nihon Kohden distributor or representative.

We recommend assembling the five different checkers to perform the impedance check for the five different resistance values.

	Checker 1	Checker 2	Checker 3	Checker 4	checker 5
Resistor	2.0 kΩF	4.99 kΩF	10.0 kΩF	20.0 kΩF	49.9 kΩF

1. Connect the EEG impedance checker to the multiple connector of the electrode junction box with a connector adaptor cable.

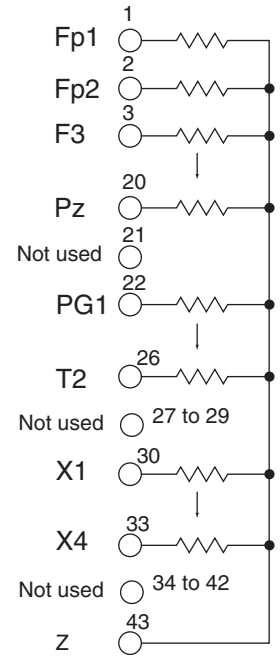
2. Start the Acquisition program.

3. Do the skin-electrode impedance check with the 5 different checkers. Refer to "Checking the Skin-electrode Impedance" in Section 5 of the EEG-9100/9200 Operator's manual.

Required Parts

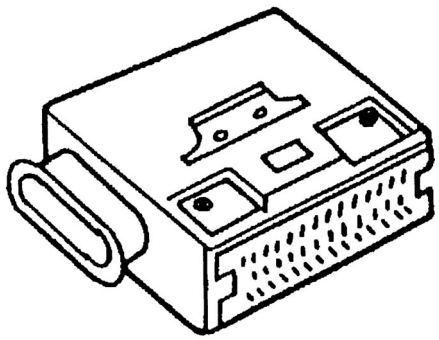
Description	Qty	Code No.
Resistor MRS25F2001 2.0 kΩF	29	227051
Resistor MRS25F4991 4.99 kΩF	29	227434
Resistor MRS25F1002 10.0 kΩF	29	227728
Resistor MRS25F2002 20.0 kΩF	29	228014
Resistor MRS25F4992 49.9 kΩF	29	228398
Connector CNP S-1345-CEA (45 pin)	1	269852
Connector adaptor cable	1	YZ-0220

Circuit diagram



To Electrode junction box Impedance checker

Appearance



Checking the EEG Input Circuit

Use the EEG input checker to check the EEG input circuits on the electrode junction box. This checker divides the applied signals to 1/10000. (Example: 500 mV to 50 µV). Assemble the EEG input checker locally with parts that are purchased locally or from your Nihon Kohden distributor or representative.

1. Connect the EEG input checker to the multiple connector of the electrode junction box with a connector adaptor cable.

2. Start the Acquisition program.

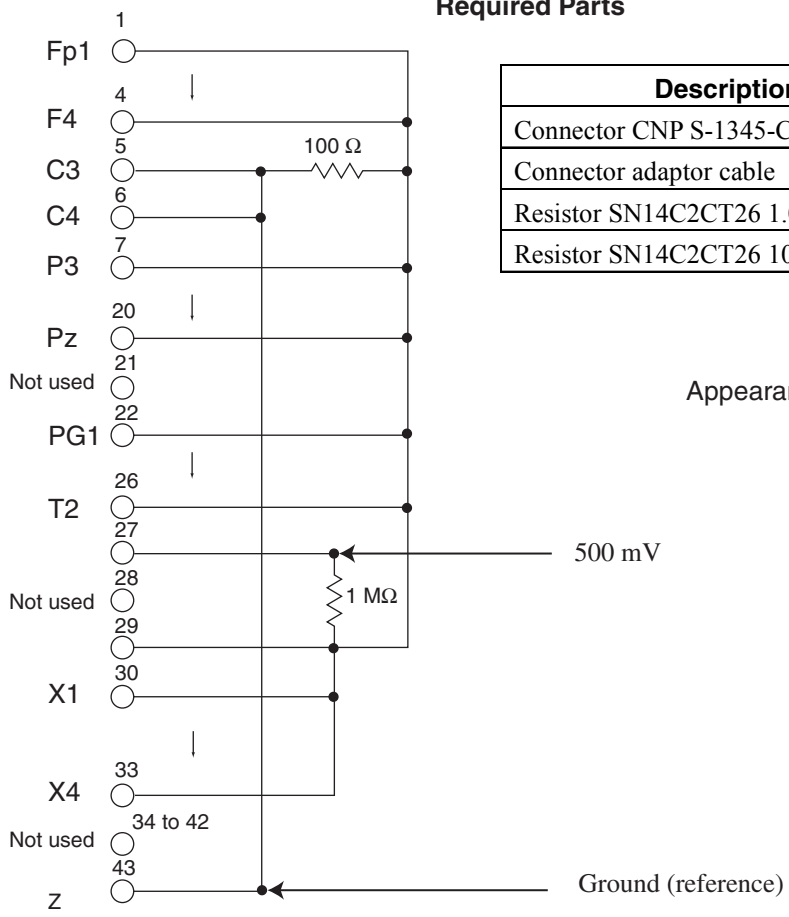
3. Set the EEG instrument to the following settings.

High-cut filter:	120 Hz	
Time constant:	0.3 s	
Sensitivity:	10 µV/mm	
AC filter:	Off	
Montage:	(G-)	(G+)
	Any electrode	0 V

4. Apply 500 mV sine waves between pin 27 (500 mV) and 43 (ground).

5. With the Voltage cursor, check that the amplitude of each channel is 50 uV/mm.
(The amplitude of C3-0V, C4-0V is 0 V: flat)

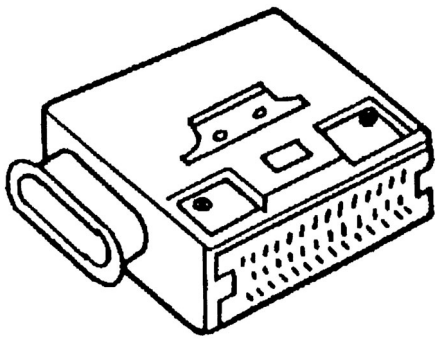
Circuit diagram



Required Parts

Description	Qty	Code No.
Connector CNP S-1345-CEA (45 pin)	1	269852
Connector adaptor cable	1	YZ-0220
Resistor SN14C2CT26 1.00MΩ	1	070086
Resistor SN14C2CT26 100 Ω	1	066242

Appearance



Checking the Power Supplies

Checking the AC Power Voltage Output from the Power Supply Unit (EEG-9100)

1. Measure the output voltage from the 3-prong AC outlet on the power supply unit.
2. Make sure that the measured voltage is not more than +10% of the line voltage.

NOTE

Before measurement, remove all AC power cord connected to the 3-prong AC outlet and

If the measured voltage is out of range, troubleshoot by following "Troubleshooting - Power" in Section 3. If the cause is a blown fuse on the primary circuit of the power supply unit, find the cause, fix the problem, then replace the blown fuse with a new one.

Fuse on the primary circuit of the power supply unit:

Model	NK Code No.	Description
SC-901A	104522	2A/250V (AC 100 to 127 V)
SC-901AK/AG	590959	1.25A/250V (AC 220 to 240 V)

Checking the AC Power Voltage Output from the Isolation Unit (EEG-9200)

1. Measure the output voltage from the 3-prong AC outlet on the isolation unit.
2. Make sure that the measured voltage is not more than ±10% of the line voltage.

NOTE

Before measurement, remove all AC power cord connected to the 3-prong AC outlet and

If the measured voltage is out of range, troubleshoot by following "Troubleshooting - Power" in Section 3.

Checking the Power on the Photo Control Unit

Make sure that the correct voltage is output from the test pins on the PHOTO STIM board after the power is turned on as shown below.

Test Pin	Reference Pin	Output Voltage	Tolerance
TP011 (+12 VA)	TP014	+12 V	±5%
TP012 (+5 VD)	TP014	+5 V	±5%
TP013 (-12 VA)	TP014	–12 V	±5%

If the measured voltage is out of range, troubleshoot by following "Troubleshooting - Power" in Section 3. If the cause is a blown fuse on the PHOTO STIM board, find the cause, fix the problem, then replace the blown fuse with a new one.

Symbol	NK Code No.	Description
F012 (for +12 VA)	332249	2A/250V
F013 (for -12 VA)	332249	2A/250V

Symbol	NK Code No.	Description
F011 (for +360 VAC)	503261	200mA/250V
F014 (for +512 VDC)	293389	160mA/250V

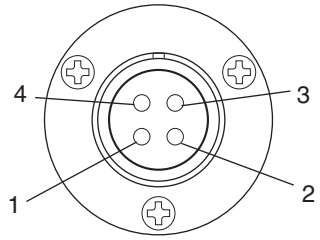
Power fuse in the fuse folder on the AC SOURCE socket:

Model	NK Code No.	Description
LS-901AJ	104522	2A/250 (AC 100 to 127V)
LS-901AK/AG	590959	1.25A/250V (AC 220 to 240 V)

PHOTIC LAMP Connector

WARNING

When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the LS-901AJ/AK/AG Photo Control Unit. To protect against shock, always connect the flash lamp assembly cable to this connector, or attach the PHOTIC LAMP connector cap to the PHOTIC LAMP connector even when the photic stimulation is not used.



Pin No.	Signal
1	CG
2	High Voltage, 600 V
3	PG
4	Lamp Trigger

Test Pin No.	Reference Pin No.	Output Voltage	Tolerance
2	3	512 V	±10%

Adjusting the Pacing Sound

Use the following volumes on the PHOTO STIM board of the photo control unit to adjust the pacing sound intensity, duration and input volume for MIC INPUT. Before adjusting the volumes, remove the ZE-510AK Hyperventilation unit. If it is connected, no sound can be output from the speaker.

Pacing Volume/Duration

1. Connect the speaker to the SPEAKER OUTPUT connector on the photo control unit.

2. Start the hyperventilation. For the hyperventilation, refer to “Photic Stimulation and Hyperventilation - Hyperventilation” in Section 5 of the Operator’s manual.

3. Adjust the pacing sound intensity and duration with the following volumes.
   VR052: pacing sound intensity
   VR051: pacing sound duration

Input Volume

1. Connect the speaker to the SPEAKER OUTPUT connector on the photo control unit and connect the microphone to the MIC INPUT connector on the photo control unit.

2. Speak to the microphone.

3. Adjust the input volume with the VR0510 volume.

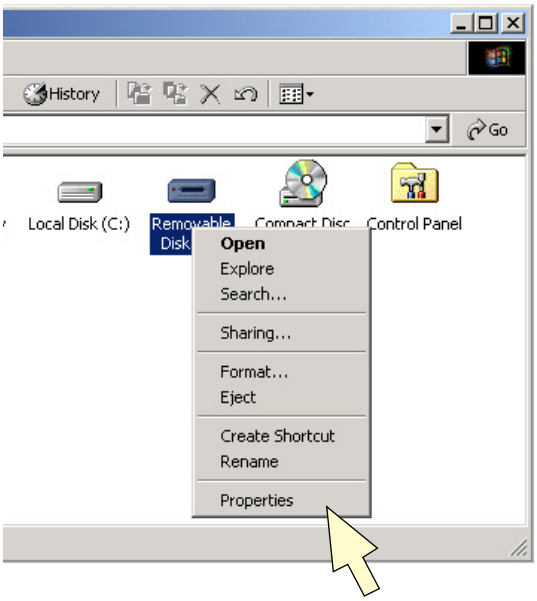
Checking for Disk Damage Using Check Disk

Run Check Disk once a month, or whenever your system has a problem, to check, diagnose and repair damage on the hard disk or magneto-optical disk.

NOTE

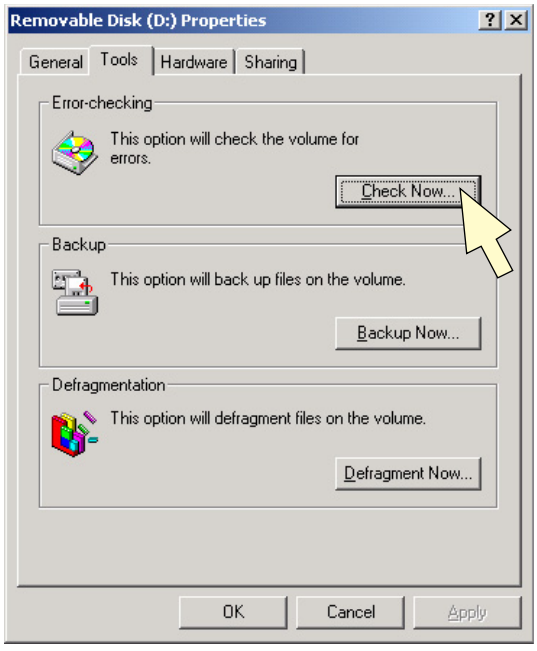
- **After formatting or assigning a volume number to a magneto-optical disk, run Check Disk on the magneto-optical disk to check that data can be properly saved.**
- **To check the CD-R/CD-RW disk, use the Scan Disk function of the Direct CD utilities (EEG-9200 only).**

1. Double-click the My Computer icon on the desktop. The My Computer window opens.



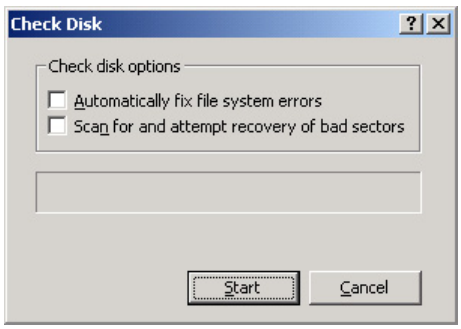
2. Right-click the drive icon that you want to check. The pop-up menu opens.

3. Select Properties. The Properties sheet opens.



4. Click the Tools tab. The Tools page opens.

5. Click the Check Now button in the Error-checking area. The Check Disk dialog box opens.



6. Click the Start button.

   We recommend that you do not select any options.

   To cancel checking, click the Cancel button.

7. During the disk check, if an error is found, a dialog box to opens to fix the error. Follow the instructions on the dialog box.

8. When the disk check is complete, the Checking Disk dialog box opens. Check the contents and click the OK button.

Magneto-Optical Disk

When the same MO disk is used for a long times, it become dirty. Clean the MO disk every 3 months with a locally available MO disk cleaning kit.

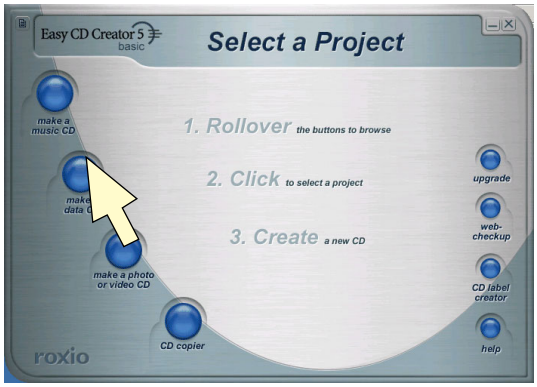
Checking for Disk Damage Using Scan Disk (EEG-9200 Only)

Run Scan Disk to check, diagnose and repair damage on the CD-R/CD-RW disk. This function is only available for the EEG-9200A/J/K/G Electroencephalograph.

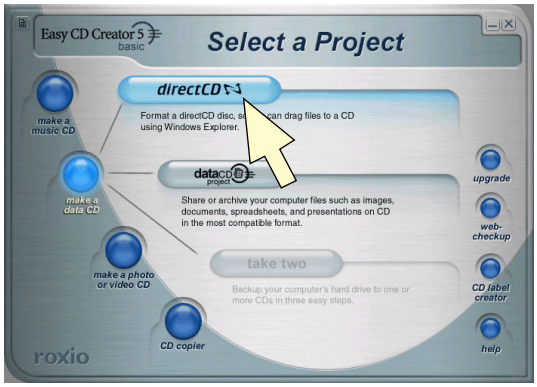
NOTE

After formatting or assigning a volume number to a CD-R/RW disk, run Scan Disk on the CD-R/CD-RW disk to check that data can be properly saved.

1. Double-click the Easy CD Creator 5 Basic icon on the desktop. The Easy CD Creator 5 Select a Project dialog box opens.



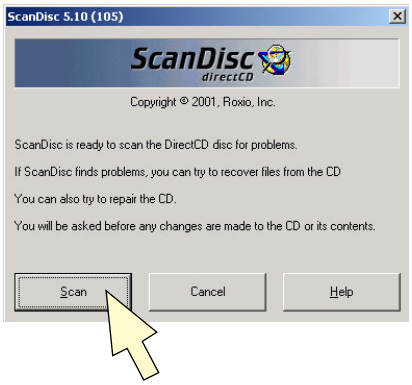
2. Move the mouse pointer to the make data CD button.



3. Click the direct CD button.

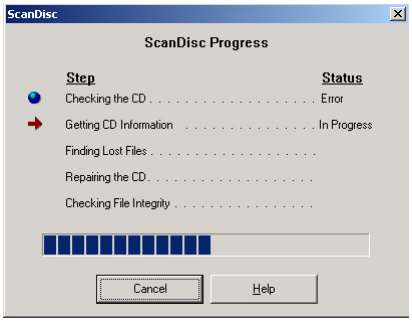
4. Click the CD utilities button. The direct CD - Utilities dialog box opens.

5. Click the ScanDisk button. The ScanDisk dialog box opens.

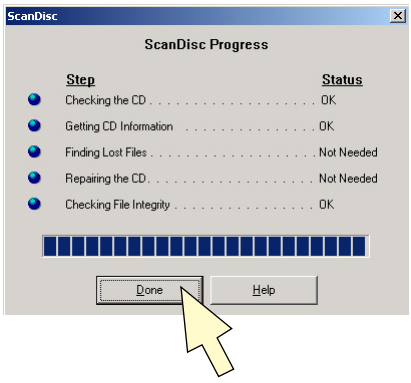


6. Click the Scan button. We recommend that you do not select any options.

   To cancel checking, click the Cancel button.



7. During the disk check, if an error is found, a dialog box opens to fix the error. Follow the instructions on the dialog box.



8. When the scan disk is complete, the Done button is displayed. Check the contents and click the Done button.

Writing Down the File and MO Data Before PC Unit or Hard Disk Replacement

General

The EEG waveforms, patient information and measurement settings can be saved as an EEG data file in a hard disk or MO disk in the Acquisition program or Review program. When a new EEG data file is saved or a new MO disk is used, a file name or MO disk volume number is automatically assigned (To assign the MO disk volume number, use the Initialize dialog box in the File Utility program). The new file name and volume number are based on the EEG data file name or MO disk volume number settings.

Problem

When you replace a PC unit or hard disk and reinstall the EEG-9000 system program, the current file name and volume number configuration data in the hard disk are lost. If this information is not restored, new files and MO disks may be assigned the same name or number as previous files and MO disks. If this occurs, it causes the following problems:

- If two or more files which have the same file name are used in an instrument, an EEG data file cannot be moved or copied in the File Utility program.
- If two or more MO disks which have the same volume number are used in the instrument, this causes conflict in the EEG database in the instrument and the instrument cannot recognize the EEG data files in these MO disks.

Solution

When replacing a PC unit or hard disk:

1. Before replacement, open the Volume Set dialog box and write down the six settings described in the following sections.
2. Replace the PC unit or hard disk.
3. Install the EEG-9000 system program.
4. Enter the six settings in the Volume Set dialog box.

When two or more NK digital EEGs are installed in the same area or connected to the same network, change the MO disk volume number identification number. Refer to “Changing the MO Settings When Installing Two or More Instruments in a Area or Connecting the Instrument to a Network” in Section 2.

CAUTION

Only use the specified personal computer. Otherwise the EEG-9000 system program does not operate correctly.

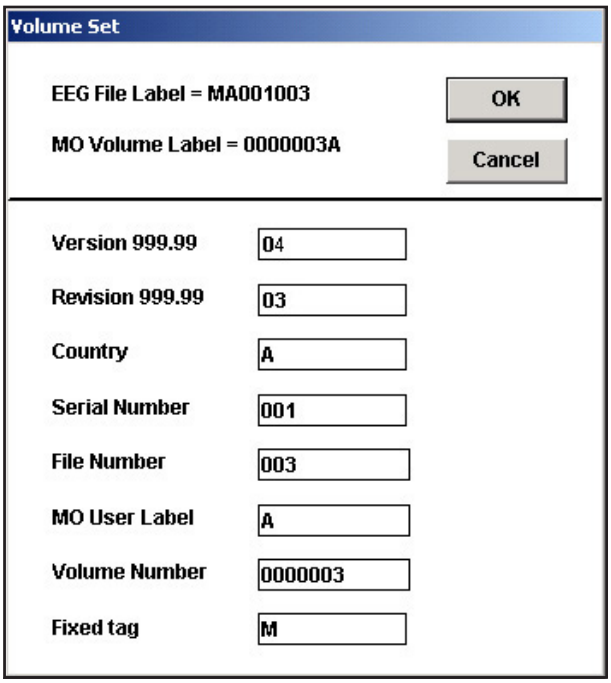
Procedure

When a PC unit or hard disk is replaced, some important registry data is lost. Before replacing the PC unit or hard disk, write down the file name configuration data for an EEG data file and volume number configuration data for a MO disk. After replacement, enter the data in the Volume Set dialog box.

1. Click the Start button on the taskbar. The Start menu opens.

2. Click Run. The Run dialog box opens.

3. Type **C:\NFX11\VINST.EXE** in the Open text box and click the OK button. The Volume Set dialog box opens.



4. Write down the following items

Country	Serial Number	File Number
MO User Label	Volume Number	Fixed tag

5. Click the OK button.

Explanation of Each Setting

The EEG data file name consists of the following four settings that are saved in the file name configuration data.

- Country
- Serial Number
- File Number
- Fixed tag

EEG data file name example: MA123456.EEG

The EEG data file name consists of:

1st digit:	Type of instrument in Fixed tag
2nd digit:	Language data in Country
3rd to 5th digits:	Instrument serial number in Serial Number
6th to 8th digits:	Total number of created EEG data files in File Number

The MO disk volume number consists of the following two settings that are saved in the volume number configuration data.

- MO User Label
- Volume Number

MO disk volume number example: 1234567A

The MO disk volume number consists of:

1st to 7th digits:	Total number of assigned volume numbers in Volume Number
8th digit:	MO disk volume identification data in MO User Label

Country

Identifies the language. This is used as the second digit when assigning a new EEG data file name.

A: English
C: Chinese
J: Japanese

Example:
In the file name “MA123456.EEG”, the second character “A” means that the language is English.

Serial Number

Displays the serial number of the instrument and is used as the third to fifth digits when assigning a new EEG data file name.
To change the setting, type in a three digit number from “001” to “999”.

File Number

Displays the total number of created EEG data files (including files which are opened in the Review program and saved as a different file) as a three digit code number. This three digit code number is used as the sixth to eighth characters when assigning a new file name. When a new file name is assigned, the three digit code number is automatically incremented by one. The default setting is “001”. When this three digit code reaches “zzz”, it resets to “001”.
To change the setting, type in a three digit number code number from “001” to “999”.

If the current total number of files is lost, estimate the total number of files created and type in one of the following three digit code numbers.

101: The total number of created files is 1,200 or less
201: The total number of created files is 2,400 or less
301: The total number of created files is 3,600 or less
……..
901: The total number of created files is 10,800 or less
….. ……
ZZZ: The total number of created files is 46,656 or less

Fixed tag

Identifies the type of instrument. This is used as the first digit when assigning a new EEG data file name.

A: EEG-2100/2110 Series digital EEG, digital EEG system (PC with the QP-223A/AK Acquisition program kit)
C: EEG-1100 Series digital EEG, digital EEG (PC with the QP-111AJ/AK Acquisition program kit)
M: EEG-9100/9200 Series digital EEG

Example:
In the file name “MA123456.EEG”, the first character “M” means the instrument is EEG-9100/9200 Series digital EEG.

MO User Label

Identifies the MO disk, CD-R disk and CD-RW disk volume number. The corresponding character is used as the eighth digit of the volume number when assigning a new disk volume number. The default setting is “A”.
To change the setting, type in a letter from A to Z.

When two or more NK digital EEGs are installed in the same area or connected to the same network, select a different character for each NK digital EEG.

Volume Number

Displays the total number of assigned MO disk, CD-R disk and CD-RW disk volume numbers. The total number is saved as a seven digit number. This seven digit number is used as the first to seventh digits when assigning a new volume number. When a new disk volume number is assigned, this number is automatically incremented by one. The default setting is “0000001”.

If the current volume number is lost, only type in the first digit.

Installing the EEG-9000 System Program

General

This section explains how to install the EEG-9000 system program and Windows 2000 Professional.

Caution - Before Installation

CAUTION

When you reinstall the EEG-9000 system program, the current EEG data file name and MO disk volume number configuration data in the registry is lost. If this information is not restored, new files and MO disks may be assigned the same name or number as previous files and MO disks. Write down the file name and volume number configuration data before installation and reenter the data after installation. Refer to "Writing Down the Registry Data Before PC Unit or Hard Disk Replacement" in this section.

NOTE

Windows 2000 Professional is installed in the instrument in the factory but the provided Windows in the Recovery disk is Windows 2000 Professional Service Pack 1 or more. Do not use the Recovery disk for windows installation. If it is used, the instrument may malfunction. When reinstallation is required, contact your Nihon Kohden distributor or representative to provide you the Windows 2000 Professional Recover Disk for this instrument. Please inform your PC unit model.

Procedure - EEG-9100

Installation Flowchart

Install the EEG-9000 system program according to the following steps 1 to 14.

- When installing Windows 2000 Professional, necessary device drivers and the EEG-9000 System program, do procedures 1 to 14.
- When installing just the EEG-9000 system program, do step 10.

For a printer driver, refer to the installation manual of printer.

1. Installing Windows 2000 Professional
2. Changing the screen resolution
3. Turning the display's energy-saving feature off
4. Changing the visual effects
5. Changing the hardware profiles
6. Changing the Workgroup setting
7. Checking the IDE disk settings
8. Changing the sound device setting
9. Changing the folder option settings
10. Installing the EEG-9000 system program
11. Making the EEG-9000 shortcut icon on the desktop
12. Changing the USB buffer size in the configuration file
13. Installing the electrode junction box driver
14. Changing the drive letter

Depending on the model of the PC unit, after Windows 2000 is installed, you must install device drivers with the device driver installation CD-ROM provided with the PC unit. Refer to the help files in the device driver installation CD-ROM.

Step 1 - Installing Windows 2000 Professional

1. Press the power button to turn the PC unit on.

2. When “Setup” appears on the upper right corner of the screen, press the F2 or Ctrl + Alt + Enter key. The BIOS (System) Setup screen appears. If you wait too long, the current operating system begins to load into memory. If this happens, let the system complete the load operation, then shutdown the system and try again.

3. Open Page 2 of 6 “Boot Configuration”.

4. Set “Boot First Device” to “CD/DVD/CD-RW Drive”.

5. Insert the “Windows 2000 Professional CD-ROM” into the CD-ROM drive.

6. Press the Esc key. The PC unit automatically restarts.

7. When the “Press any key to boot from CD …” message appears, press the Enter key.

8. When the “Welcome to Setup” screen appears, press the Enter key. The “END-USER LICENSE AGREEMENT” screen appears.

9. Press the F8 key (I agree). The information about the current partitions is displayed in the lower area.

10. Select “C:\FAT32” and press the D key. Or, select “C:\NTFS” and press the D key when Windows 2000 has been installed. This step is necessary to delete all the current partitions and format the hard disk with NTFS. The confirmation dialog box appears.

11. Press the Enter key. The confirmation dialog box appears again.

12. Press the L key. The information about current partitions and unused areas are displayed in the lower area.

13. Delete all partitions until only “Unpartitioned space” is displayed.

14. Select “Unpartitioned space” and press the C key.

15. Select the maximum partition size according to the available hard disk space and press the Enter key. A “C:\New (Unforrmatted)” partition is created.

16. Press the Enter key. The file format selection screen appears.

17. Select “NTFS” and press the Enter key. Formatting starts. After formatting, the necessary files to set up Windows 2000 are copied to the hard disk.

18. When the “Windows 2000 Professional Setup” screen appears, click the Next button. Device installation starts.

19. In the “Regional Settings” screen, click the Next button.

20. In the “Personalize Your Software” secreen, type the following and click the Next button.
    Name: EEG
    Organization: NK

21. When prompted to enter the product key, type the product key on the Windows 2000 Professional CD-ROM case and click the Next button.

22. In the “Computer name and Administrator password” screen, type the following.
    Computer name: EEG
    Administrator password: none (Don’t enter a password for Administrator)

23. In the “Date and Time Settings” screen, check the date and time and click the Next button.

24. In the Completing the Windows 2000 Professional Setup Wizard, click the Finish button. The computer restarts automatically.

25. When “Setup” appears on the upper right corner of the screen, press the F2 or Ctrl + Alt + Enter key. The BIOS (System) Setup screen appears.

26. Open Page 2 of 6 “Boot Configuration”.

28. Set “Boot First Device” to “Diskette Drive”.

29. Press the Esc key The PC unit automatically restarts.

30. In the Network Identification Wizard, click the Next button.

31. When the “Users of This Computer” screen appears,
    - Select “Windows always assumes the following user has logged on to this computer”.
    - Check that “User Name is set to “EEG1”.
    - Click the Next button.
      (Do not enter any password.)

32. In the Completing the Network Identification Wizard, click the Finish button.

33. In the “Getting Started with Windows 2000” dialog box, uncheck the “Show this screen at setup” check box and close it.

34. Remove the “Windows 2000 Professional CD-ROM” from the CD-ROM drive.

Step 2 - Changing the Screen Resolution

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Setting page, set the following and click the Apply button.
   Screen area: 1024 × 768
   Colors: High color [16 bit]

4. Exit the Display Properties by clicking the OK button.

5. Open the Display Properties again.

6. Click the Advanced button in the Setting page. The Advanced Properties opens.

7. In the Monitor page, set “Refresh Frequency” to “60Hz”.

8. Exit the Display Properties by clicking the OK button.

Step 3 - Turning the Display’s Energy-Saving Feature Off

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Screen Saver page, click the Power button in the Energy saving features of monitor area. The Power Options display box opens.

4. Set “Power schemes” to “Always On”.

5. Set the items in the Setting for Always On power scheme to “Never”.

6. In the Advanced page, check the “Always show icon on the task bar” check box in the Option area.

7. Exit the Display Properties by clicking the OK button.

Step 4 - Changing the Visual Effects

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Effects page, change the “Fade effect” to “Scroll Effect” and uncheck the “Show window contents while dragging” check box.

4. Exit the Display Properties by clicking the OK button.

Step 5 - Changing the Hardware Profiles

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Hardware page, click the Hardware Profiles button. The Hardware Profiles opens.
4. Check that the “Select the first profile listed if I don’t select a profile in” check box is checked.
5. Type 3 (3 seconds) in the list box and click the OK button.
6. In the Advanced page, click the Startup and Recovery button. The Startup and Recovery opens.
7. Uncheck the “Display list of operating systems for .....” check box.
8. Exit the Hardware Profiles by clicking the OK button.

Step 6 - Changing the Workgroup Setting

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Network Identification page, click the Properties button. The Identification Change opens.
4. Set “Workgroup or domain” to “EEG-GROUP1”.
5. Exit Identification Change by clicking the OK button.

Step 7 - Checking the IDE Disk Setting

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Hardware page, click the Device Manager button. The Device Manager opens.
4. Double-click “Primary IDE Channel” in the ”IDE ATA/ATAPI controllers” in the device list. The Primary IDE Channel Properties opens.
5. In the Advanced Setting page, check that “Transfer mode of the Device 0 and Device1” is “DMA if available”.
6. Close the Primary IDE Channel Properties.

7. Double-click “Secondary IDE Channel” in the ” IDE ATA/ATAPI controllers” in the device list. The Secondary IDE Channel Properties opens.

8. In the Advanced Setting page, check that “Transfer mode of the Device 0 and Device1” is “DMA if available”.

9. Close the Secondary IDE Channel Properties and Device Manager.

10. Restart the computer.

Step 8 - Changing the Sound Device Setting

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.

2. Select Properties. The System Properties opens

3. In the Hardware page, click the Device Manager button. The Device Manager opens.

4. Double-click “Sound, video and game controllers” in the device list.

5. In the sound devices, right-click “ESS Maestro PCI Audio”. The pop-up menu opens.

6. Select Disable.

7. Check that the selected sound device has the “×” mark beside the device name.

8. Close the device list and Device Manager.

Step 9 - Changing the Folder Option Settings

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.

2. Select Explore. The My Computer window opens.

3. From the Tool menu, select Folder Options. The Folder Options dialog box opens.

4. In the View page, set the following.
   - Show My Documents on the Desktop → OFF
   - Show hidden files and folders → ON
   - Remember each folder’s view setting → OFF
   - Hide file extensions of known file type → OFF

5. Close the Folder Options dialog box by clicking the OK button.

Step 10 - Installing the EEG-9000 System Program

CAUTION

- **If you add or change the user name, add this user name to the Administrator group before installing the EEG-9000 system program. Otherwise, the system program cannot be installed.**
- **After installing the system program, do not change or add the user name. If the user name is added or changed and this user name is not added to the Administrator group, the instrument does not operate. Even if this user name is added to the Administrator group, the system program has to be installed again.**

1. Insert the EEG-9000 system program CD-ROM into the CD-ROM drive.
2. From the Start menu, select Run. The Run dialog opens.
3. Type **X:\Software\Setup.exe** in the Open text box and click the OK button. X: is the CD-ROM drive. The EEG-9000 setup program starts copying the files.
4. Follow the instructions on the screen.
5. When the setup is complete, Restart the computer.

Step 11 - Making the EEG-9000 Shortcut Icon on the Desktop

1. Right-click the Start button. The pop-up menu opens.
2. Select Explore. The Start Menu window opens.
3. Drag the "EEG 9000" folder in **C:\Documents and Settings\All Users\Start Menu** to the desktop as the "EEG-9000" shortcut icon.
4. Close the Start Menu window.

Step 12 - Changing the USB Buffer Size in the Configuration File

1. From the Start menu, select Run. The Run dialog box opens.
2. Type **C:\NFX11\E11cfg.ini** in the Open text box and click the OK button. The E11CFG.ini configuration file opens.
3. Set "UsbStorageBufferSize" in the [COMMON] section to 20.
4. From the File menu, select Save.
5. Close the configuration file.

Step 13 - Installing the Electrode Junction Box Driver

When the electrode junction box has been connected to the PC unit before Windows 2000 is installed:

1. Right-click the My computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Hardware page, click the Device Manager button. The Device Manager opens.
4. Double-click “EEG-9000” in “Other devices” in the device list.
5. In the General page, click the Reinstall Driver button. The Upgrade Device Driver Wizard opens.
6. Click the Next button. The Install Hardware Device Drivers opens.
7. Select “Search for a suitable driver for my device” and click the Next button. The Locate Driver Files opens.
8. Check only the “Specify a location” check box in the search option and click the Next button. The “Install the manufacturer’s installation disk…” dialog box opens.
9. Click the Browse button. The Browse dialog box opens
10. In the Browse dialog box, select the **C:\nfx11\VXXXX\Eeg90Usb** folder. The subdirectory name VXXXX differs depending on the software version. Example: V0403
11. Check **EegUsb.inf** in the folder and click the Open button.
12. In the Install the manufacturer’s installation disk dialog box, click the OK button. The Driver Files Search Results dialog box opens.
13. Click the Next button. The Completing the Upgrade Device Driver Wizard opens.
14. Check that “EEG-9000 USB Target” is selected correctly and click the Finish button.
15. Close the “EEG-9000 USB Target Properties”, “Device Manager” and “System Properties”.
16. Restart the computer.

When the electrode junction box is connected to the PC unit after Windows 2000 was installed:

CAUTION

Before connecting the electrode junction box to the PC unit, turn off the power of the PC unit and all components and unplug the AC power cord from the AC outlet.

1. Connect the USB cable from the electrode junction box to the PC unit.

2. Turn on the power of all components, then press the power button to turn the PC unit on. When Windows 2000 starts, the electrode junction box is automatically detected as "EEG-9000" and the Found New Hardware Wizard opens.

3. In the Found New Hardware Wizard, click the Next button.

4. In the Install Hardware Device Drivers dialog box, select "Search for a suitable driver for my device" and click the Next button.

5. In the Locate Driver Files dialog box, only select "Specify a location" in the search option and click the Next button.

6. In the Install the manufacturer's installation disk dialog box, click the Browse button.

7. In the Browse dialog box, select the **C:\nfx11\VXXXX\Eeg90Usb** folder and click the Open button.
   The subdirectory name VXXXX differs depending on the software version.
   Example: V0403

8. In the Install the manufacturer's installation disk dialog box, click the OK button.

9. In the Driver Files Search Results dialog box click the Next button.

10. In the Completing the Upgrade Device Driver Wizard, check that the "EEG-9000 USB Target" is selected correctly and click the Finish button.

11. Restart the computer.

Step 14 - Changing the Drive Letter

When using the MO disk drive, do the following procedure. If not, skip this procedure.

1. Right-click the My computer icon on the desktop. The pop-up menu opens.

2. Select Manage. The Computer Management window opens.

3. Select "Disk Management" → "Storage" in the list. The drive information is displayed in the lower right side of the Computer Management window.

4. Right-click any of the drives. The pop-up menu opens.

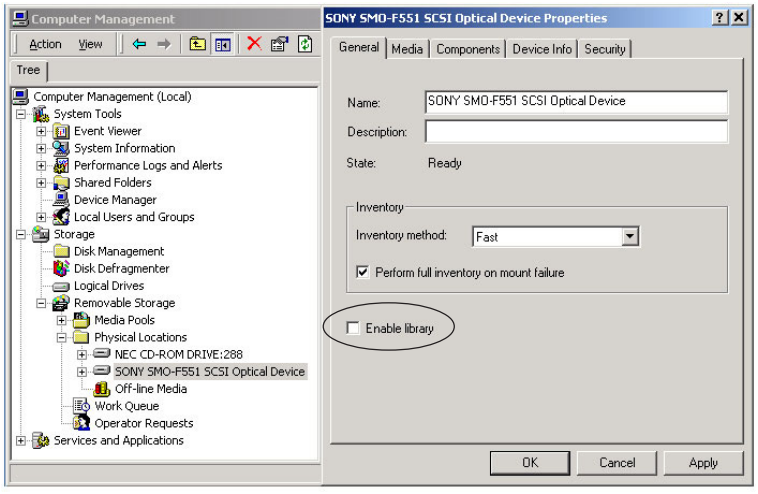
5. Select "Change Drive Letter and Path…". The "Change drive letter and path…" opens.

6. Click the Edit button and change the drive letter as follows.
   Drive C: Hard disk
   Drive D: MO disk drive
   Drive E: CD-ROM drive

7. Disable the library for the MO disk unit

NOTE

If a 5-inch MO disk is inserted into an MO disk drive and the power is turned on, you cannot remove the MO disk by pressing the eject switch on the MO disk drive. You can remove the MO disk from the Explore or My Computer but the removed MO disk is not recognized by Windows 2000 and EEG-9000 system when the MO disk is inserted. The MO disk is recognized by Windows 2000 and the EEG-9000 system when the MO disk is removed and inserted again or the next time the power is turned on. To prevent this trouble, do the following. This trouble does not occur for a 3.5 inch MO disk.



1) Right-click the Optical Device (Storage→ Removable Storage → Physical Locations). The Optical Device Properties opens.

2) Uncheck the Enable library check box on the General tab.

3) Click the Apply button.

7. Close the Computer Management window.

Procedure - EEG-9200

Installation Flowchart

Install the EEG-9000 system program according to the following steps 1 to 14.

- When installing Windows 2000 Professional, necessary device drivers and the EEG-9000 System program, do procedures 1 to 14.
- When installing just the EEG-9000 system program, do step 9.

For a printer driver, refer to the installation manual of printer.

Step 1 - Installing Windows 2000 Professional

Step 2 - Upgrading the Device Drivers

Step 3 - Changing the Screen Resolution

Step 4 - Turning the Display's Energy-Saving Feature Off

Step 6 - Changing the Hardware Profiles

Step 7 - Changing the Workgroup Setting

Step 8 - Changing the Folder Option Settings

Step 9 - Installing the EEG-9000 System Program

Step 10 - Making the EEG-9000 Shortcut Icon on the Desktop

Step 11 - Changing the USB Buffer Size in the Configuration File

Step 12 - Installing the Electrode Junction Box Driver

Step 13 - Changing the Drive Letter

Step14 - Installing Roxio Easy CD Creator® 5.1 Basic

Depending on the model of the PC unit, after Windows 2000 is installed, you must install device drivers with the device driver installation CD-ROM provided with the PC unit. Refer to the help files in the device driver installation CD-ROM.

Step 1 - Installing Windows 2000 Professional

1. Press the power button to turn the PC unit on.

2. When “Setup” appears on the upper right corner of the screen, press the F2 or Ctrl + Alt + Enter key. The BIOS (System) Setup screen appears. If you wait too long, the current operating system begins to load into memory. If this happens, let the system complete the load operation, then shutdown the system and try again.

3. Select “Boot Sequence” and press the Enter key.

4. Set “1. Diskette Drive” to “IDE CD-ROM Device”.

5. Select “Integrated Devices” and press the Enter key

6. Set “Sound” to “On”.

7. Insert the “Windows 2000 Professional CD-ROM” into the CD-RW drive.

8. Press the Esc key.

9. Select “Save Changes and Exit” and press the Enter key. The PC unit automatically restarts.

10. When the “Press any key to boot from CD …” message appears, press the Enter key.

11. When the “Welcome to Setup” screen appears, press the Enter key. The “END-USER LICENSE AGREEMENT” screen appears.

12. Press the F8 key (I agree). The information about the current partitions is displayed in the lower area.

13. If the “To repair the selected Windows 2000 installation, press R” and “To continue installing a fresh copy of Windows 2000 without repairing, press Esc” message appears, press the Esc key.

14. Select “C:\FAT32” and press the D key. Or, select “C:\NTFS” and press the D key when Windows 2000 Professional has been installed. This step is necessary to delete all the current partitions and format the hard disk with NTFS. The confirmation dialog box appears.

15. Press the Enter key. The confirmation dialog box appears again.

16. Press the L key. The information about current partitions and unused areas are displayed in the lower area.

17. Delete all partitions until only “Unpartitioned space” is displayed.

18. Select “Unpartitioned space” and press the C key.

19. Select the maximum partition size according to the available hard disk space and press the Enter key. A “C:\New (Unformatted)” partition is created.

20. Press the Enter key. The file format selection screen appears.

21. Select “NTFS” and press the Enter key. Formatting starts. After formatting, the necessary files to set up Windows 2000 Professional are copied to the hard disk.

22. When the “Windows 2000 Professional Setup screen” appears, click the Next button. Device installation starts.

23. In the “Regional Settings screen”, click the Next button.

24. In the “Personalize Your Software” screen, type the following and click the Next button.
    Name: EEG
    Organization: NK

25. When prompted to enter the product key, type the product key on the Windows 2000 Professional CD-ROM case and click the Next button.

26. In the “Computer name and Administrator password” screen, type the following.
    Computer name: EEG
    Administrator password: none (Don’t enter a password for Administrator)

27. In the “Date and Time Settings” screen, check the date and time and click the Next button.

28. In the Completing the Windows 2000 Professional Setup Wizard, click the Finish button. The computer restarts automatically.

29. When “Setup” appears on the upper right corner of the screen, press the F2 or Ctrl + Alt + Enter key. The BIOS (System) Setup screen appears.

30. Select “Boot Sequence” and press the Enter key.

31. Set as follows.
    1. Diskette Drive
    2. Hard Disk Drive C:
    3. IDE CD-ROM Device

32. Press the Esc key.

33. Select “Save Changes and Exit” and press the Enter key. The PC unit automatically restarts.

34. In the Network Identification Wizard, click the Next button.

35. When the “Users of This Computer” screen appears,
    - Select “Windows always assumes the following user has logged on to this computer”.
    - Check that “User Name is set to “EEG1”.
    - Click the Next button.
      (Do not enter any password.)

36. In the Completing the Network Identification Wizard, click the Finish button.

37. In the Getting Started with Windows 2000 dialog box, uncheck the “Show this screen at setup” check box and close it.

38. Remove the Windows 2000 Professional CD-ROM from the CD-ROM drive.

Step 2 - Upgrading the Device Drivers

1. Detecting the Devices
   1). Right-click the My Computer icon on the desktop. The pop-up menu opens.

   2) Select Properties. The System Properties opens.

   3) In the Hardware page, click the Device Manager button. The Device Manager opens.

   4) Right-click the “EEG/Computer/ACPI Uniprocessor PC”. The pop-up menu opens.

   5) Select Properties. The ACPI Uniprocessor PC Properties opens.

   6) In the Driver page, click the Upgrade Driver button. The Upgrade Device Driver Wizard opens

   7) Click the Next button. The “Install Hardware Device Drivers” screen appears.

   8) Select “Display a list of the known drivers for this device so that I can choose a specific driver.” and click the Next button.

   9) In the “Select a Device Driver” screen, select “Show all hardware of this device class”.

   10) Select the following and click the Next button.
   Manufactures are: Standard computers
   Models area: Standard PC

   11) The “Update Driver Warning” message is displayed. Click the Yes button.

12) In the “Start Device Driver Installation” screen, click the Next button.

13) In the “Completing the Upgrade Device Driver Wizard” screen, click the Finish button.

14) In the Standard PC Properties, click the Close button. The System Settings Change opens.

15) Click the Yes button. The computer restarts automatically.

16) Windows 2000 finds new hardware automatically several seconds after restarting.

17) In “the Found New Hardware Wizard” screen, click the Cancel button for all items.

18) If the System Setting Change dialog box opens, click the Yes button. The computer restarts automatically.

19) Right-click the My Computer icon on the desktop. The pop-up menu opens.

20) Select Properties. The System Properties opens.

21) In the Hardware page, click the Device Manager button. The Device Manager opens.

22) Two “Standard PC“ icons appear under the “EEG/Computer” in the Device Manager dialog box.

23) Right-click the upper “Standard PC”. The pop-up menu opens.

24) Select Uninstall. The Confirm Device Removal dialog box opens. Click the OK button.

25) Close the Device Manager and click the OK button in the System Properties.

2. Installing the Intel 800 Series Integrated ChipSet

1) Insert the “Dell Optiplex Resource CD for Reinstalling Device Drivers and Using Diagnostics, Utilities, and System Documentation CD-ROM” into the CD-RW drive.

2) The Resource CD Installation opens automatically. Click the OK button.

3) The InstallShield Wizard opens. Click the Next button.

4) In the “InstallShield Wizard Complete” screen, click the Finish button. The “Optiplex APCC Resource CD version:4.01” screen opens. Click the Next button.

5). In the “Software is available on this CD for the following devices:” screen, check and select that:
System Model: Optiplex GX240
Operating System: Windows 2000
Device Type: All
Topic: My Drivers

6) Click the “Intel 800 Series Integrated Chipset” of the System.

7) In the “Software is available on this CD for the following devices:> Intel 800 Series Integrated Chipset” screen, click the Extract button under the Installation Instructions. The Intel 800 Series Chipset INF Update Utility opens

8) Click the Continue button.

9) In the “Select the folder where you want to unzip the files to” dialog box, click the OK button.

10) In the “Folder ‘C:\dell\Drivers\0377C’ does not exist. Do you want to create it?” dialog box, click the Yes button.

11) In the “All files were successfully unzipped” dialog box, click the OK button.

12) In the “Intel(R) Chipset Software Installation Utility installs to ..... This is needed for the proper functioning of the following features.” screen, click the Install Now button. The File Download opens.

13) Select “Run this program from its current location” and click the OK button.

14) The Security Warning opens. Click the Yes button.

15) In the “Welcome to the InstallShield Wizard for Intel(R) Chipset Software Installation Utility” screen, click the Next button.

16). In the “License Agreement” screen, click the Yes button.

17). In the “Readme Information” screen, click the Next button. The “InstallShield Wizard Complete” screen appears.

18) Select “Yes, I want to restart my computer now.” and click the Finish button. The computer restarts automatically.

3. Installing the Intel Integrated Ultra ATA Controller
   1) Windows finds new hardware automatically several seconds after restarting.

   2) In the “Found New Hardware Wizard” screen, click the Cancel button.

   3) Click the Start button. The pop-up menu opens.

   4) Select Run. The Run dialog box opens.

   5) Type D:\AUTORCD.EXE in the Open text box and click the OK button.

   6) The Optiplex APCC Resource CD version:4.01 opens. Click the Next button.

   7) In the “Software is available on this CD for the following devices:” screen, check and select that:
      System Model: Optiplex GX240
      Operating System: Windows 2000
      Device Type: All
      Topic: My Drivers

   8). Click the “Intel Integrated Ultra ATA Controller” of the controller.

   9) In the “Software is available in this CD for the following device:> Intel Integrated Ultra ATA Controller” screen, click the Extract button under the Installation Instructions. The WinZip Self-Extractor opens.

   10) Click the OK button. The Dell Computer Self-Extracting Driver Installation opens.

   11) Click the Unzip button.

   12) In the “20 file(s) unzipped successfully” dialog box, click the OK button.

   13) In the “Intel Corporation Intel Ultra ATA Storage Driver” screen, click the Install Now button. The File Download opens.

   14) Select “Run this program from its current location” and click the OK button.

   15) The Security Warning opens. Click the Yes button.

   16) In the “Welcome to the InstallShield Wizard for Intel Ultra ATA Storage Driver” screen, click the Next button.

   17) In the “License Agreement” screen, click the Yes button.

18) In the “Choose Destination Location” screen, click the Next button. The “InstallShield Wizard Complete” screen appears.

19) Select “Yes, I want to restart my computer now.” and click the Finish button. The computer restarts automatically.

4. Installing the ATI Rage 128 Ultra 16MB Display Driver

1). Windows finds new hardware automatically several seconds after restarting.

2) In the “Found New Hardware Wizard” screen appears, click the Cancel button.

3) Click the Start button. The pop-up menu opens.

4) Select Run. The Run dialog box opens.

5) Type D:\AUTORCD.EXE in the Open text box and click the OK button.

6) The Optiplex APCC Resource CD version 4.01 opens. Click the Next button.

7) In the “Software is available on this CD for the following devices:” screen, check and select that:

System Model:	Optiplex GX240
Operating System:	Windows 2000
Device Type:	All
Topic:	My Drivers

8) Click the “ATI Rage 128 Ultra 16MB” of the Video.

9) In the “Software is available on this CD for the following devices:> ATI Rage 128 Ultra 16MB” screen, click the Extract button under the Installation Instructions.

10) The Video Driver for the ATI Rage 128 Ultra opens. Click the Continue button.

12) In the “Select the folder where you want to unzip the files to” dialog box, click the OK button.

14) In the “Folder ‘C:\dell\Drivers\3G153’ does not exist. Do you want to create it?” dialog box, click the Yes button.

15) In the “All files were successfully unzipped” dialgo box, click the OK button. The “Setup has finished copying files to your computer”

16) Select “Yes, I want to restart my computer now.” and click the Finish button. The computer restarts automatically.

5. Installing the Devices AD 1885 Integrated Audio Drivers.
   1) Windows finds new hardware automatically several seconds after restarting.

   2) In the Found New Hardware Wizard screen appears, click the Cancel button.

   3) Click the Start button. The pop-up menu opens.

   4) Select Run. The Run dialog box opens.

   5) Type D:\AUTORCD.EXE in the Open text box and click the OK button.

   6) The Optiplex APCC Resource CD version:4.01 opens, click the Next button.

   7) In the “Software is available on this CD for the following devices:” screen, check and select that:
      System Model: Optiplex GX240
      Operating System: Windows 2000
      Device Type: All
      Topic: My Drivers

   8) Click the “Analog Devices AD 1885 Integrated Audio” of the Audio.

   9) In the “Software is available on this CD for the following devices:> Analog Devices AD 1885 Integrated Audio” screen, click the Extract button under the Installation Instructions.

   10) In the Audio Drivers AC97 ADI188x opens. Click the Continue button.

   11) In the “Select the folder where you want to unzip the files to” dialog box, click the OK button.

   12) In the “Folder ‘C:\del\Drivers\99940’ does not exist. Do you want to create it?” dialog box, click the Yes button.

   13) In the “All files were successfully unzipped” dialog box, click the OK button.

   14) The Welcome opens Click the Next button. The Restarting Windows opens.

   15) Select “Yes, I want to restart my computer now” and click the OK button. The computer restarts automatically.

Step 3 - Changing the Screen Resolution

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Setting page, set the following and click the Apply button.
   Screen area: 1024 × 768
   Colors: High color [16 bit]

4. Exit the Display Properties by clicking the OK button.

5. Open the Display Properties again.

6. Click the Advanced button in the Setting page. The Advanced Properties opens.

7. In the Monitor page, set “Refresh Frequency” to “60Hz”.

8. Exit the Display Properties by clicking the OK button.

Step 4 - Turning the Display’s Energy-Saving Feature Off

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Screen Saver page, click the Power button in the Energy saving features of monitor area. The Power Options display box opens.

4. Set “Power schemes” to “Always On”.

5. Set the items in the Setting for Always On power scheme to “Never”.

6. Exit the Display Properties by clicking the OK button.

Step 5 - Changing the Visual Effects

1. Right-click anywhere on the desktop. The pop-up menu opens.

2. Select Properties. The Display Properties opens.

3. In the Effects page, change the “Fade effect” to “Scroll Effect” and uncheck the “Show window contents while dragging” check box.

4. Exit the Display Properties by clicking the OK button.

Step 6 - Changing the Hardware Profiles

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Hardware page, click the Hardware Profiles button. The Hardware Profiles opens.
4. Check that the “Select the first profile listed if I don’t select a profile in” check box is checked.
5. Type 3 (3 seconds) in the list box and click the OK button.
6. In the Advanced page, click the Startup and Recovery button. The Startup and Recovery opens.
7. Uncheck the “Display list of operating systems for .....” check box.
8. Exit the Hardware Profiles by clicking the OK button.

Step 7 - Changing the Workgroup Setting

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Network Identification page, click the Properties button. The Identification Change opens.
4. Set “Workgroup or domain” to “EEG-GROUP1”.
5. Exit Identification Change by clicking the OK button and restart the computer.

Step 8 - Changing the Folder Option Settings

1. Right-click the My Computer icon on the desktop. The pop-up menu opens.
2. Select Explore. The My Computer window opens.
3. From the Tool menu, select Folder Options. The Folder Options dialog box opens.
4. In the View page, set the following.
   - Show My Documents on the Desktop → OFF
   - Show hidden files and folders → ON
   - Remember each folder’s view setting → OFF
   - Hide file extensions of known file type → OFF
5. Close the Folder Options dialog box by clicking the OK button.

Step 9 - Installing the EEG-9000 System Program

CAUTION

- **If you add or change the user name, add this user name to the Administrator group before installing the EEG-9000 system program. Otherwise, the system program cannot be installed.**
- **After installing the system program, do not change or add the user name. If the user name is added or changed and this user name is not added to the Administrator group, the instrument does not operate. Even if this user name is added to the Administrator group, the system program has to be installed again.**

1. Insert the EEG-9000 system program CD-ROM into the CD-RW drive.
2. From the Start menu, select Run. The Run dialog opens.
3. Type **X:\Software\Setup.exe** in the Open text box and click the OK button. X: is the CD-RW drive. The EEG-9000 setup program starts copying the files.
4. Follow the instructions on the screen.
5. When the setup is complete, Restart the computer.

Step 10 - Making the EEG-9000 Shortcut Icon on the Desktop

1. Right-click the Start button. The pop-up menu opens.
2. Select Explore. The Start Menu window opens.
3. Drag the "EEG 9000" folder in **C:\Documents and Settings\All Users\Start Menu** to the desktop as the "EEG-9000" shortcut icon.
4. Close the Start Menu window.

Step 11 - Changing the USB Buffer Size in the Configuration File

1. From the Start menu, select Run. The Run dialog box opens.
2. Type **C:\NFX11\E11cfg.ini** in the Open text box and click the OK button. The E11CFG.ini configuration file opens.
3. Set "UsbStorageBufferSize" in the [COMMON] section to 20.
4. From the File menu, select Save.
5. Close the configuration file.

Step 12 - Installing the Electrode Junction Box Driver

When the electrode junction box has been connected to the PC unit before Windows 2000 is installed:

1. Right-click the My computer icon on the desktop. The pop-up menu opens.
2. Select Properties. The System Properties opens.
3. In the Hardware page, click the Device Manager button. The Device Manager opens.
4. Double-click “EEG-9000” in “Other devices” in the device list.
5. In the General page, click the Reinstall Driver button. The Upgrade Device Driver Wizard opens.
6. Click the Next button. The Install Hardware Device Drivers opens.
7. Select “Search for a suitable driver for my device” and click the Next button. The Locate Driver Files opens.
8. Check only the “Specify a location” check box in the search option and click the Next button. The “Install the manufacturer’s installation disk…” dialog box opens.
9. Click the Browse button. The Browse dialog box opens
10. In the Browse dialog box, select the **C:\nfx11\VXXXX\Eeg90Usb** folder. The subdirectory name VXXXX differs depending on the software version. Example: V0403
11. Check **EegUsb.inf** in the folder and click the Open button.
12. In the Install the manufacturer’s installation disk dialog box, click the OK button. The Driver Files Search Results dialog box opens.
13. Click the Next button. The Completing the Upgrade Device Driver Wizard opens.
14. Check that “EEG-9000 USB Target” is selected correctly and click the Finish button.
15. Close the “EEG-9000 USB Target Properties”, “Device Manager” and “System Properties”.
16. Restart the computer.

When the electrode junction box is connected to the PC unit after Windows 2000 was installed:

CAUTION

Before connecting the electrode junction box to the PC unit, turn off the power of the PC unit and all components and unplug the AC power cord from the AC outlet.

1. Connect the USB cable from the electrode junction box to the PC unit.

2. Turn on the power of all components, then press the power button to turn the PC unit on. When Windows 2000 starts, the electrode junction box is automatically detected as “EEG-9000” and the Found New Hardware Wizard opens.

3. In the Found New Hardware Wizard, click the Next button.

4. In the Install Hardware Device Drivers dialog box, select “Search for a suitable driver for my device” and click the Next button.

5. In the Locate Driver Files dialog box, only select “Specify a location” in the search option and click the Next button.

6. In the Install the manufacturer’s installation disk dialog box, click the Browse button.

7. In the Browse dialog box, select the **C:\nfx11\VXXXX\Eeg90Usb** folder and click the Open button.
   The subdirectory name VXXXX differs depending on the software version.
   Example: V0403

8. In the Install the manufacturer’s installation disk dialog box, click the OK button.

9. In the Driver Files Search Results dialog box click the Next button.

10. In the Completing the Upgrade Device Driver Wizard, check that the “EEG-9000 USB Target” is selected correctly and click the Finish button.

11. Restart the computer.

Step 13 - Changing the Drive Letter

When using the MO disk drive, do the following procedure. If not, skip this procedure.

1. Right-click the My computer icon on the desktop. The pop-up menu opens.

2. Select Manage. The Computer Management window opens.

3. Select “Disk Management” → “Storage” in the list. The drive information is displayed in the lower right side of the Computer Management window.

4. Right-click any of the drives. The pop-up menu opens.

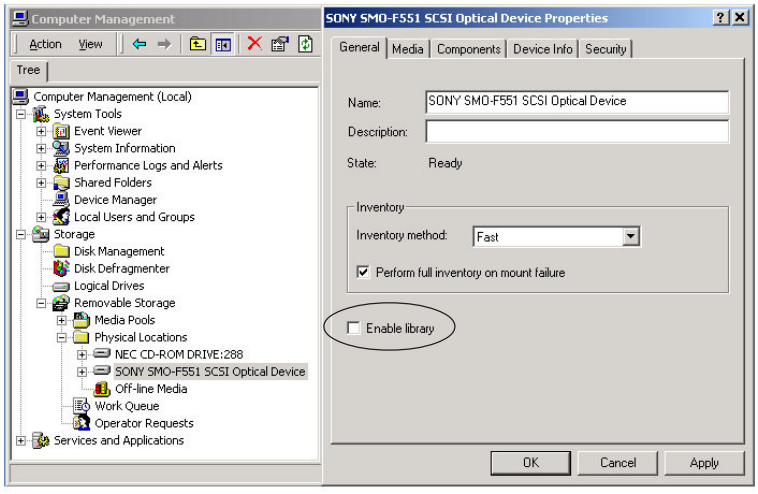
5. Select “Change Drive Letter and Path…”. The “Change drive letter and path…” opens.

6. Click the Edit button and change the drive letter as follows.
   Drive C: Hard disk
   Drive D: MO disk drive
   Drive E: CD-RW drive

7. Disable the library for the MO disk unit

NOTE

If a 5-inch MO disk is inserted into an MO disk drive and the power is turned on, you cannot remove the MO disk by pressing the eject switch on the MO disk drive. You can remove the MO disk from the Explore or My Computer but the removed MO disk is not recognized by Windows 2000 and EEG-9000 system when the MO disk is inserted. The MO disk is recognized by Windows 2000 and the EEG-9000 system when the MO disk is removed and inserted again or the next time the power is turned on. To prevent this trouble, do the following. This trouble does not occur for a 3.5 inch MO disk.



1) Right-click the Optical Device (Storage→ Removable Storage → Physical Locations). The Optical Device Properties opens.

2) Uncheck the Enable library check box on the General tab.

3) Click the Apply button.

7. Close the Computer Management window.

Step-14 Installing Roxio Easy CD Creator® 5.1 Basic

1. Insert the Roxio Easy CD Creator 5.1 Basic CD-ROM in to the CD-RW drive.

2. The Roxio Easy CD Creator 5 opens. Click the Yes button.

3. In the Choose Setup Language dialog box, select the language and click the OK button.

4. In the Welcome to the InstallShield wizard for Easy CD Creator 5 Basic screen, click the Next button.

5. In the Setup type screen, select Complete and click the Next button.

6. In the Ready to Install the Program screen, click the Install button.

7. In the InstallShield Complete screen, click the Finish button.

8. When the message prompting the restart system appears, click the Yes button. The computer restarts automatically.

Internal Switch Settings

Use this section to check the internal switch and jumper switch setting on the EEG MOTHER board and PHOTO STIM board.

NOTE

Do not change the following factory default settings unless necessary. In the tables, the factory default settings are underlined.

Electrode junction Box

EEG MOTHER Board, Jumper Switch, J012

The PC unit recognizes the electrode junction box by this jumper switch setting. When two electrode junction box are connected to the PC unit, set a different ID number for each electrode junction box.

Shorted: ID number = 1 (default setting)
Opened: ID number = 2

Photo Control Unit

PHOTO STIM Board, DIP Switch, SW042

ON: When the flash lamp lights correctly, the photo control unit outputs trigger signals to the PHOTO MARK and TRIG. OUTPUT connectors. (default setting)
OFF: Trigger signals are output even when the flash lamp does not light.

PHOTO STIM Board, DIP Switch, SW043

ON: The TRIG. INPUT connector is only available in the single photic stimulation mode (default setting) .
OFF: The TRIG. INPUT connector is always available in any photic stimulation mode.

BIOS Default Settings

The BIOS setting differs depending on the model of the PC unit. Refer to the PC unit Operator's manual.

PC Unit, CC-901AK (EEG-9100A/J/K/G)

Time:	(time display)	Page 1 of 6
Date:	(date display)	
Level 2 Cache:	128KB	
System Memory:	128MB	
Video Controller:	ATI M3	
Video Memory:	8MB	
Audio Controller:	ESS Maestro 3	
Primary Hard Drive:	6007MB	
Diskette Drive A:	Not Installed	
Diskette Drive B:	Not Installed	
Diskette Reconfig:	Any Time	
Modular Bay:	CD-ROM	
******** Boot Configuration ********		Page 2 of 6
Boot First Device:	Diskette Drive	
Boot Second Device:	Internal HDD	
Boot Third Device:	CD/DVD/CD-RW Drive →NONE	
Boot POST:	Minimal	
Boot Speed:	700MHz	
CPU Serial Number:	Disabled	
******** Dock Configuration ********		
Docking Status:	Unlocked	
Docking Ethernet:	Enabled →Disabled	
Docking IRQ:	Optimized	
Universal Connect:	Disabled	

***** Basic Device Configuration ***** Page 3 of 6

Serial Port:	COM1
Infrared Data Port:	Disabled
Parallel Mode:	ECP
Audio Mode:	Full Duplex
Click Volume:	[■]
Keyboard Click:	Disabled
Num Lock:	Disabled
External Hot Key:	Scroll Lock
USB Legacy:	Disabled
Pointing Device:	Touch Pad-PS/2 Mouse
Primary Video:	Dock Video Card

******** Battery Status ******** Page 4 of 6

******** Power Management ******** Page 5 of 6

	BATTERY	AC
Brightness	[■]	[■■■■■■■■]
Power Management	Disabled	Disabled
Display Close:	Active	Active
Ring/Event Resume:	Enabled →Disabled	
Alarm Resume:	Enabled →Disabled	
Wakeup On LAN	Disabled	
Auto On Mode:	Disabled	
Auto On Time:	00:00	

******** System Security ******** Page 6 of 6

Primary Password:	Disabled
Admin Password:	Disabled

**** Hard-disk drive password(s)****

System Primary:	Disabled

PC Unit, CC-902AK (EEG-9200A/J/K/G)

System Time:	(time display)
System Date:	(date display)
Diskette Drive A:	3.5 inch, 1.44MB
Primary Drive 0:	Hard Drive
Primary Drive 1:	OFF
Secondary Drive 0:	CD-ROM Reader
Secondary Drive 1:	OFF
	([ATAPI Device] When a 3.5inch MO disk drive is used.)

Boot Sequence:

1. Diskette Drive
2. Hard-Disk Drive C
3. IDE CD-ROM Device

Memory Information

Installed System Memory:	128MB SDRAM
System Memory speed:	133MHz
AGP Aperture:	64MB

CPU Information

CPU Speed:	Normal
Bus Speed:	100MHz
Processor 0 ID:	F12
Clock Speed:	1.80GHz
Cache Size:	256KB

Integrated Devices (LegacySelect Options)

Sound:	***Off (On)***
Network Interface Controller:	***Off (On)***
Mouse Port:	On
USB Emulation:	Off
USB Controller:	On
PCI Slots:	Enabled
Serial Port 1:	***COM1 (Auto)***
Serial Port 2:	***OFF (Auto)***
Parallel Port	
Mode:	ECP
I/O Address:	378h
DMA Channel:	Off
IDE Drive Interface:	Auto
Diskette Interface:	Auto
PC Speaker:	On
Primary Video Controller:	AGP
Video DAC Snoop:	Off

PCI IRQ Assignment

ATI Technologies Inc VGA adapter:	IRQ11
Intel Corp USB adapter:	IRQ11
Intel Corp serial bus:	IRQ10
Intel Corp multimedia:	IRQ10
3Com Corp network card:	IRQ11

IRQ Reservations

IRQ3:	Available
IRQ4:	Available
IRQ5:	Reserved
IRQ7:	Available
IRQ10:	Available
IRQ11:	Available
IRQ14:	Available
IRQ15:	Available

System Security

Password Status:	Unlocked
System Password:	Not Enabled
Setup Password:	Not Enabled
Chassis Intrusion:	***Disabled (Enabled or Detected)***
PXE BIS Default Policy:	Deny

Keyboard Numlock:	On
Report Keyboard Errors:	Report
Auto Power On:	Disabled
Remote Wake Up:	Off
AC Power Recovery:	***On (Last)***
Fast Boot:	On
System Mode:	S3

System Event Log

Current Event Log Status:	UNREAD
Display System Event Log:	
Clear System Event Log:	
Mark All Entries as Read:	

Asset Tag.....

Periodic Replacement Schedule

To maintain the performance of the instrument, the following parts must be periodically replaced by qualified service personnel.

Built-in lithium Battery (PC unit) **After 3 years**

This battery backs up the system clock. When the battery power is low, the time is not accurately displayed. Refer to the PC unit operator's manual.

Rechargeable Battery **After 2000 times recharging**
(PC unit, CC-901AK for EEG-9100A/J/K/G only)

Refer to the PC unit operator's manual.

CAUTION

Before disposing of the battery, check with your local solid waste officials for recycling options or proper disposal.

Maintenance Check Sheet

The maintenance check sheet is provided at the end of this subsection. Make a copy of this check sheet before using it. The check sheet contains the check items grouped as follows:

- Overview
- Power
- Input circuit and amplifiers
- Operation
- Activation
- Hard disk, MO disk drive and MO disk
- Safety

The rest of this section describes how to check each of the above items.

Overview

Item	Check Procedure	Action
Dirt	Check that the outside of the instrument is not dirty.	If the outside of the instrument is dirty, clean it with a cloth moistened with neutral soap or alcohol.
Loose screws	Check that there are no loose screws.	If any screw is loose, tighten it.
Damaged or bent parts	Check that there is no physically damaged or bent parts. This includes the pins on the connector or socket.	If any part is damaged or bent, replace it.
Installation	Check that the instrument is installed correctly.	If the instrument is not installed correctly, install it correctly.
Electrode lead	Check the continuity of the electrode lead wire with a multimeter.	If a signal discontinuity is found, replace the electrode lead wire with a new one.
Cords and cables	Check that the cords and cables are connected to their connectors.	If a cord or cable is not correctly connected, reconnect it.

Power

Item	Check Procedure	Action
Power cord	Check that a 3-prong power cord which has three terminals (hot, neutral and ground) is used.	If a 3-prong power cord is not used, replace it.
	Check that the power cord is not damaged.	If the power cord or connection cable is damaged, replace it.
Equipotential grounding	Check that the instrument is grounded to a dedicated equipotential ground terminal in the facility.	If the instrument is not grounded, use the provided ground lead to ground the instrument to a dedicated equipotential ground terminal.
Protective grounding	Check that the PC unit, electrode junction box and MO disk drive are grounded to the power supply unit or isolation unit with a protective ground lead.	If the PC unit, electrode junction box, and/or the MO disk drive is not grounded, use the provided ground lead to ground the instrument to a dedicated protective ground terminal on the power supply unit or isolation unit.
Equipment connected to power supply unit (EEG-9100A/J/K/G)	Check that no equipment other than the PC unit, printer and MO disk drive is connected to the 3-prong AC outlets on the power supply unit.	If other equipment is connected to the power supply unit, disconnect it.
Equipment connected to isolation unit (EEG-9200A/J/K/G)	Check that no equipment other than the PC unit, display and MO disk drive is connected to the 3-prong AC outlets on the isolation unit.	If other equipment is connected to the isolation unit, disconnect it.
Fuse in power supply unit and photo control unit	Remove the fuse from the fuse holder on the power supply unit and photo control unit and check the following: • There is no physically damaged area on the fuse. • Time-lag type. • The fuse rating is: 1.25 A for the following power supply unit SC-901AK/SC-901AG 1.25 A for the following photo control unit LS-901AK/LS-901AG 2 A for the following power supply unit SC-901A 2 A for the following photo control unit LS-901AJ	If any condition described in the left column is not satisfied, replace the fuse.
AC outlets on the power supply unit	Check that the output voltage of the 3-prong AC outlet is within the following range. Hot to neutral: not more than +10% of the line voltage.	If any condition described in the left column is not satisfied, contact your NK distributor or representative.
AC outlets on the isolation unit	Check that the output voltage of the 3-prong AC outlet is within the following range. Hot to neutral: not more than ±10% of the line voltage.	If any condition described in the left column is not satisfied, contact your NK distributor or representative.
Clock battery	Check that the clock of the PC unit works correctly.	If the clock of the PC unit does not work correctly, replace it with a new one. Refer to the PC operator's manual.

Input Circuit and Amplifiers

Item	Check Procedure	Action
Electrode lead input jack connection	Check that there are no loose electrode connections	If the electrode lead input jack terminal connection is loose, replace the electrode lead wire or the board which has input jacks in the electrode junction box or mini junction box.
Amplifier	Use the noise checker to check that the amplified noise of the instrument is below 1.5 µVp-p (high-cut filter: 60 Hz).	If the noise is above 1.5 µVp-p, replace the electrode junction box.
AC interference filter	Check that the AC noise on the waveform is reduced to 1/25 when the Acquisition program is open and the AC interference filter is turned On.	If the AC noise is not reduced, check the AC interference filter setting.
Time constant	Check that the time constant effect appears on the calibration waveform.	If the time constant effect does not appear on the calibration waveform, check the Acquisition program settings.
High-cut filter	Check that the high-cut filter effect appears on the calibration waveform.	If the high-cut filter effect does not appear on the calibration waveform, check the Acquisition program settings.

Operation

Item	Check Procedure	Action
Startup	Check that the PC unit correctly starts up after power on.	If the PC unit does not correctly start up after power on, restart it.
Keyboard	Check that the keyboard works correctly.	If the keyboard does not work correctly, 1. Check the cable connection (EEG-9200). 2. Restart the PC unit.
Mouse	Check that the mouse works correctly.	If the mouse does not work correctly, 1. Check the cable connection. 2. Restart the PC unit.
Display	Check that the screen displays correctly.	If the screen does not display correctly, 1. Check the brightness, contrast, AC power cord connection and display cable connection (EEG-9200). 2. Contact your NK distributor or representative.
Printing	Check that the instrument prints correctly.	If the instrument does not print correctly, 1. Check the cable connection. 2. Reinstall the printer driver. 3. Contact your NK distributor or representative.
Reset function	Check that all waveforms return to the baseline when the Reset button on the amp bar is clicked.	If all waveforms do not return to baseline, contact your NK distributor or representative.
Impedance check function	Use the impedance checker to check that the impedance check function operates correctly.	If the impedance check function does not operate correctly, 1. Restart the PC unit. 2. Replace the electrode junction box.
Marks on the mark channel	Check that the remote mark, photo mark and HV mark are displayed correctly.	If the remote mark is not displayed correctly, check the remote mark cable connection. If the photo mark or HV mark is not displayed correctly, 1. Check the photo mark cable connection. 2. Replace the EEG MOTHER board or photo control unit (PHOTO STIM board).

Activation

Item	Check Procedure	Action
Photic stimulation	Check that the flash lamp lights by pressing the SINGLE button on the photo control unit.	If the flash lamp does not light, replace the Xenon tube or flash lamp assembly.
	Check that the flash lamp lights according to the setting in the Activation dialog box of the Acquisition program.	If the flash lamp does not light, 1. Check that the flash lamp assembly cable is connected to the photo control unit correctly. 2. Turn the power of the photo control unit off, then on again. 3. Replace the PHOTO STIM board.
Hyperventilation	Check that the hyperventilation unit is working correctly by checking the hyperventilation pacing sound.	If the hyperventilation pacing sound does not occur, 1. Check that the hyperventilation unit cable is connected to the photo control unit correctly. 2. Turn the power of the photo control unit off, then on again. 3. Replace the PHOTO STIM board.

Hard Disk, MO Disk Drive and MO Disk

Item	Check Procedure	Action
Hard disk	Check that the data is read and written correctly.	If the data is not read and written correctly, use the Windows check disk function to check the hard disk.
	Check that there is no abnormal noise while reading or writing the data.	If there is any noise during reading or writing the data, replace the hard disk.
MO disk drive and MO disk	Check that the MO disk can be removed by pressing the eject button on the MO disk drive.	If the MO disk cannot be removed, use the MO disk remove pin to remove the MO disk. Refer to the MO disk drive operator's manual.
	Check that the data is read and written correctly.	If the data is not read and written correctly, use the Windows check disk function to check the MO disk.
	Check that there is no abnormal noise while reading or writing the data.	If there is any noise while reading or writing the data, replace the MO disk drive.

Safety

After replacing the board or unit, it is recommended to check the following items for electrical safety.

Item	Check Procedure	Action
Protective earth resistance	Check that the protective earth resistance is within 0.1 Ω of the prescribed range	If the protective earth resistance is out of range, find the cause and reduce it to within range.
Earth leakage current	Check that the earth leakage current is within 500 μA of the prescribed range	If the earth leakage current is out of range, find the cause and reduce it to within range.
Enclosure leakage current	Check that the enclosure leakage current is within 100 μA of the prescribed range	If the enclosure leakage current is out of range, find the cause and reduce it to within range.
Patient leakage current	Check that the patient leakage current is within 100 μA of the prescribed range.	If the patient leakage current is out of range, find the cause and reduce it to within range.
Withstand voltage	Check that the instrument can withstand the following prescribed withstand voltage. - (A-a1): 1,500 VAC for one minute - (B-d): 1,500 VAC for one minute	If the instrument cannot withstand the prescribed range, find the cause and reduce it to within range.

CD-ROM/CD-RW Disk Drive and CD-R/CD-RW Disk

Item	Check Procedure	Action
CD-ROM/CD-RW drive	Check that the compact disk can be removed by pressing the eject button on the PC unit.	If the disk compact cannot be removed, the CD-ROM or CD-RW disk drive is faulty. Replace the CD-ROM or CD-RW disk drive. To remove the compact disk, use the compact disk removal pin (EEG-9100 only).
	Check that there is no abnormal noise while the CD-ROM or CD-RW disk drive is operating.	If there is any abnormal noise, the CD-ROM or CD-RW disk drive is faulty. Replace the PC unit.
CD-R/CD-RW disk (EEG-9200 only)	Check that the data is read and written correctly.	If the data is not read or written correctly, use the Scan Disk function of the Direct CD utility to recover the CD-R/CD-RW disk.

Maintenance Check Sheet

(Refer to "Maintenance Check Sheet" of this section for details about individual check items.)

Date: _____

Customer: _____

Customer Address: _____

Service Personnel: _____ Service Company: _____

Instrument Name: _____ Instrument Model: _____

Instrument Serial Number: _____ Hardware Revision: _____

Software Revision: _____

Overview	Outside of instrument is clean.	Yes ☐	No ☐
	No loose screws.	Yes ☐	No ☐
	No physically damaged and has no bent parts.	Yes ☐	No ☐
	Instrument is installed correctly.	Yes ☐	No ☐
	Connection cables are connected correctly.	Yes ☐	No ☐
Power	3-prong power cord is used.	Yes ☐	No ☐
	Power cord is not damaged.	Yes ☐	No ☐
	Equipotential grounding is constructed for instrument.	Yes ☐	No ☐
	Correct equipment is connected to instrument.	Yes ☐	No ☐
	Undamaged and correct fuse is used for power supply unit.	Yes ☐	No ☐
	Undamaged and correct fuse is used for photo control unit	Yes ☐	No ☐
	Correct AC power is supplied.	Yes ☐	No ☐
	Clock of PC unit works correctly.	Yes ☐	No ☐
Input circuit	Electrode leads are securely connected to the input jacks.	Yes ☐	No ☐
and amplifiers	Amplifier noise of instrument is within acceptable range.	Yes ☐	No ☐
	AC line filter does not affect EEG waveforms	Yes ☐	No ☐
	Time constant works correctly.	Yes ☐	No ☐
	High-cut filter works correctly	Yes ☐	No ☐
Operation	PC unit starts up correctly.	Yes ☐	No ☐
	Keyboard works correctly.	Yes ☐	No ☐
	Mouse works correctly.	Yes ☐	No ☐
	Screen is displayed correctly.	Yes ☐	No ☐
	Instrument prints correctly.	Yes ☐	No ☐
	Reset function is correct.	Yes ☐	No ☐
	Impedance check function operates correctly.	Yes ☐	No ☐
	Marks on the mark channel are displayed correctly.	Yes ☐	No ☐
Activation	Flash lamp assembly works correctly.	Yes ☐	No ☐
	Hyperventilation unit works correctly.	Yes ☐	No ☐
Disk drives	MO disk drive head is clean.	Yes ☐	No ☐
	No abnormal noise during reading and writing of data.	Yes ☐	No ☐
	CD-ROM or CD-RW drive head is clean.	Yes ☐	No ☐
	Floppy disk drive head is clean.	Yes ☐	No ☐
Other	Electrode lead is not worn out.	Yes ☐	No ☐
	Hard disk and MO disk is tested with the Windows check disk function and has no bad sectors.	Yes ☐	No ☐

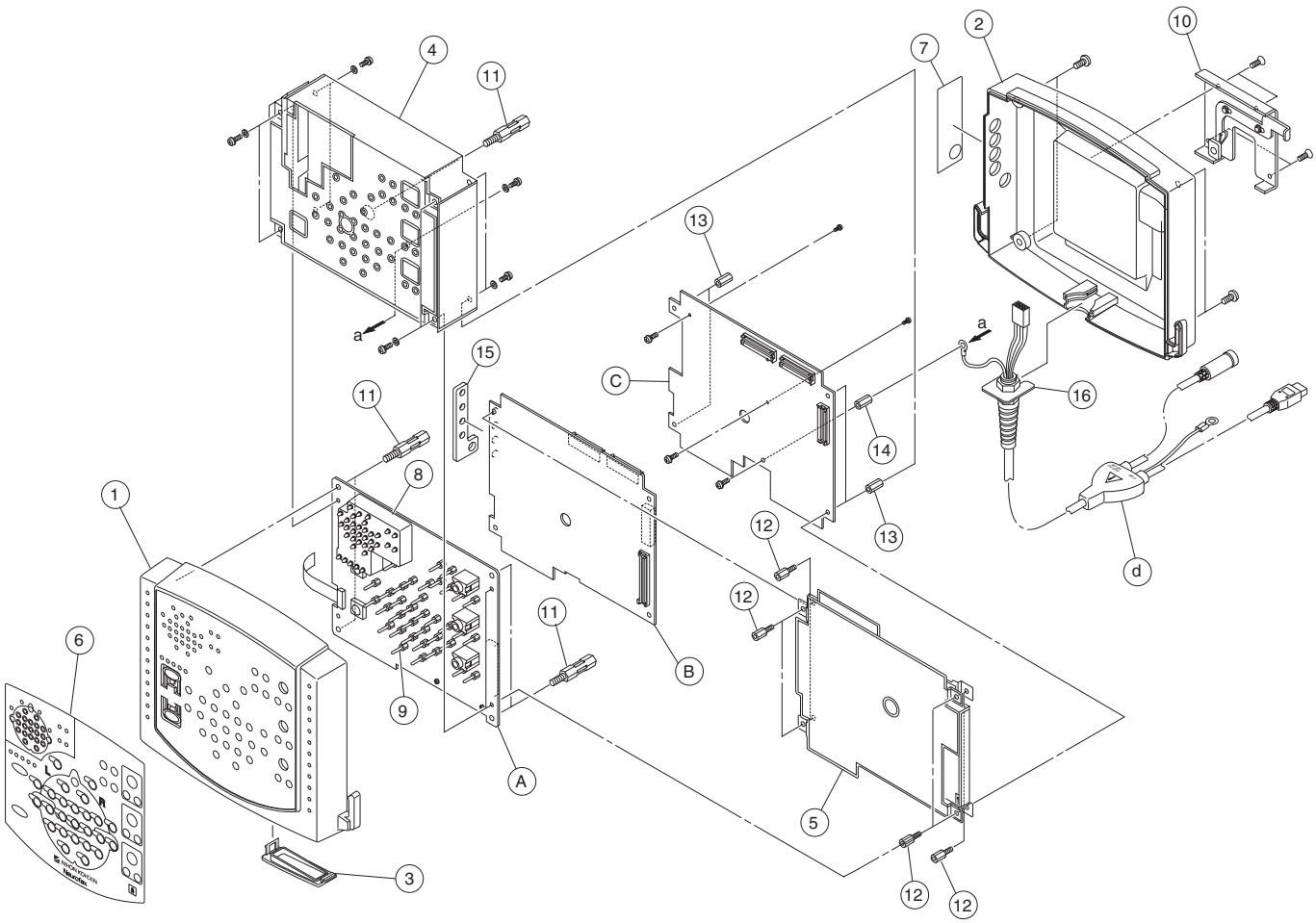
Section 7 Replaceable Parts List

This page is intentionally left blank.

When ordering parts or accessories from your nearest Nihon Kohden Corporation distributor, please quote the NK code number and part name which are listed in this service manual, and the name or model of the unit in which the required part is located. This will help us to promptly attend to your needs. Always use Nihon Kohden parts and accessories to assure maximum performance from your instrument.

Electrode Junction Box

Index	Code No.	Q'ty	Description
1	6112-014277B	1	Front cover
2	6112-014286B	1	Rear cover
3	6114-111809B	1	Conector cover
4	6112-014241B	1	Shiled sheet (OUT)
5	6112-014259A	1	Shiled sheet (IN)
6	6122-004786B	1	Front panel for JE-910A/911A
	6122-004991	1	Front panel for JE-910AG/911AG
7	6124-034421B	1	Remote mark panel for JE-910A
	6124-032412B	1	DC INPUT panel for JE-911A
	6124-033901	1	Remote mark panel for JE-910AG
	6124-033919	1	DC INPUT paenl for JE-911AG
8	6114-111792A	1	LED spacer
9	6114-005612	36	Electrode jack (DIN type)
10	6144-000668C	1	Holder attachment
11	6114-056263A	5	Floating bolt
12	127997	8	Spacer bolt (L9)
13	292015	4	Spacer nut (L12)
14	128069	1	Spacer nut (L9)
15	6114-117447	1	Sponge
16	6114-1114535A	1	USB cable holder
A	UT-0713	1	EEG INPUT board
B	UT-0714	1	EEG AMP board for JE-910A/AG
	UT-07141	1	EEG AMP board for JE-911A/AG
C	UT-0715	1	EEG MOTHER board
d	513535A	1	EEG-9100 USB cable


4
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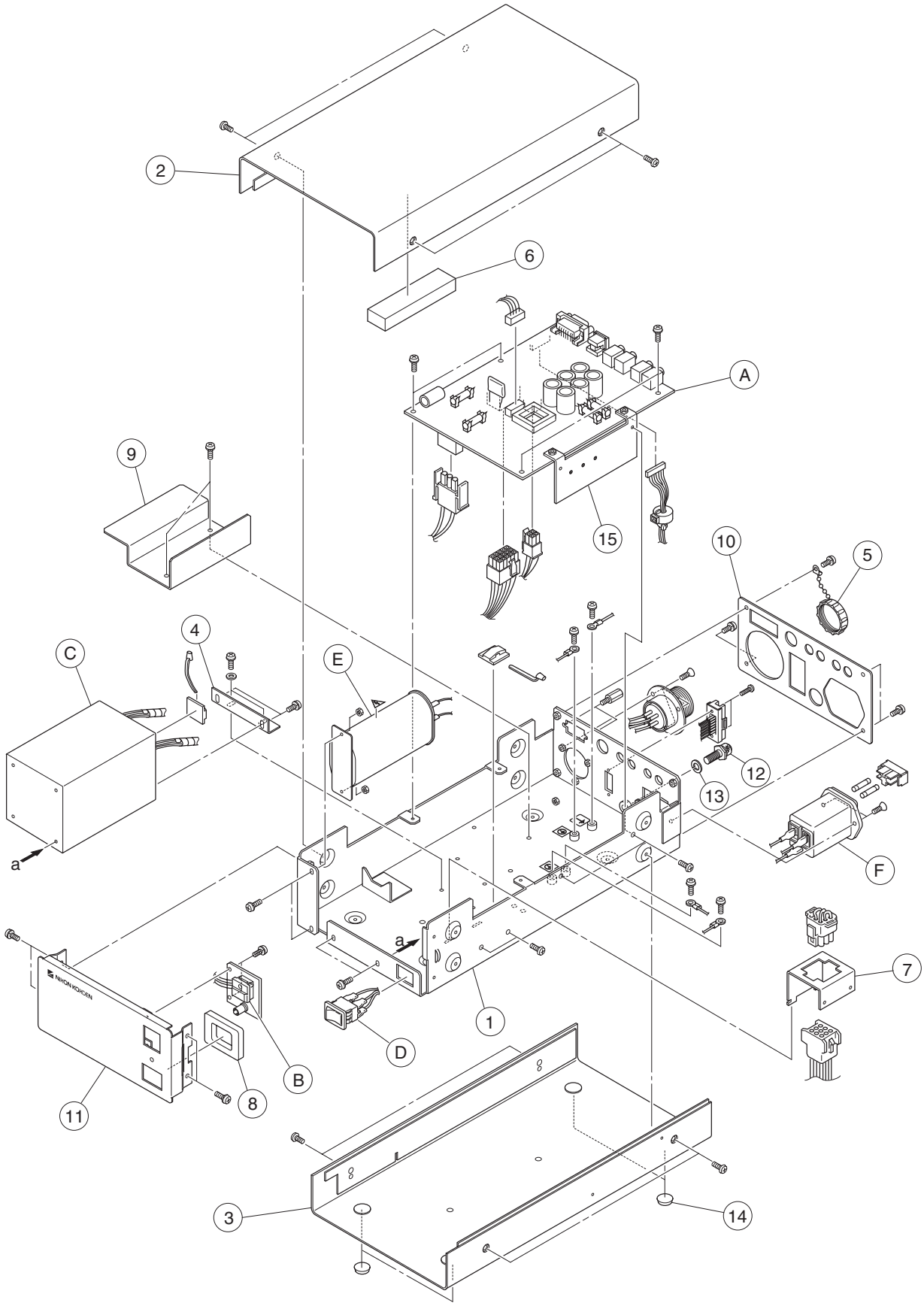
12

Photo Control Unit

Index	NK Code No.	Qty	Description
1	6111-006011B	1	Chassis
2	6112-014214C	1	Top cover
3	6112-014223C	1	Bottom cover
4	6114-008137B	1	Transformer holder
5	6114-008173A	1	PHOTO LAMP connector cap
6	6114-081137	1	Rubber for capacitor
7	6114-111426A	1	Connector holder
8	6114-111453	1	Switch holder
9	6114-113843A	1	Partition plate
10	6123-012115A	1	Rear panel
11	6123-012124A	1	Front panel
12	6144-005993A	1	Ground terminal for LS-901AJ/AK
	6114-081993	1	Ground terminal for LS-901AG
13	292194	1	Toothed lock washer
14	296386	4	Rubber foot
15	6114-113834A	1	Heat sink
A	UT-0717	1	PHOTO STIM board
B	UT-0721	1	SWITCH board
C	590496A	1	Power transformer
D	513393	1	Power switch
E	512705	1	Capacitor
F	580676	1	AC inlet with fuse holder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D
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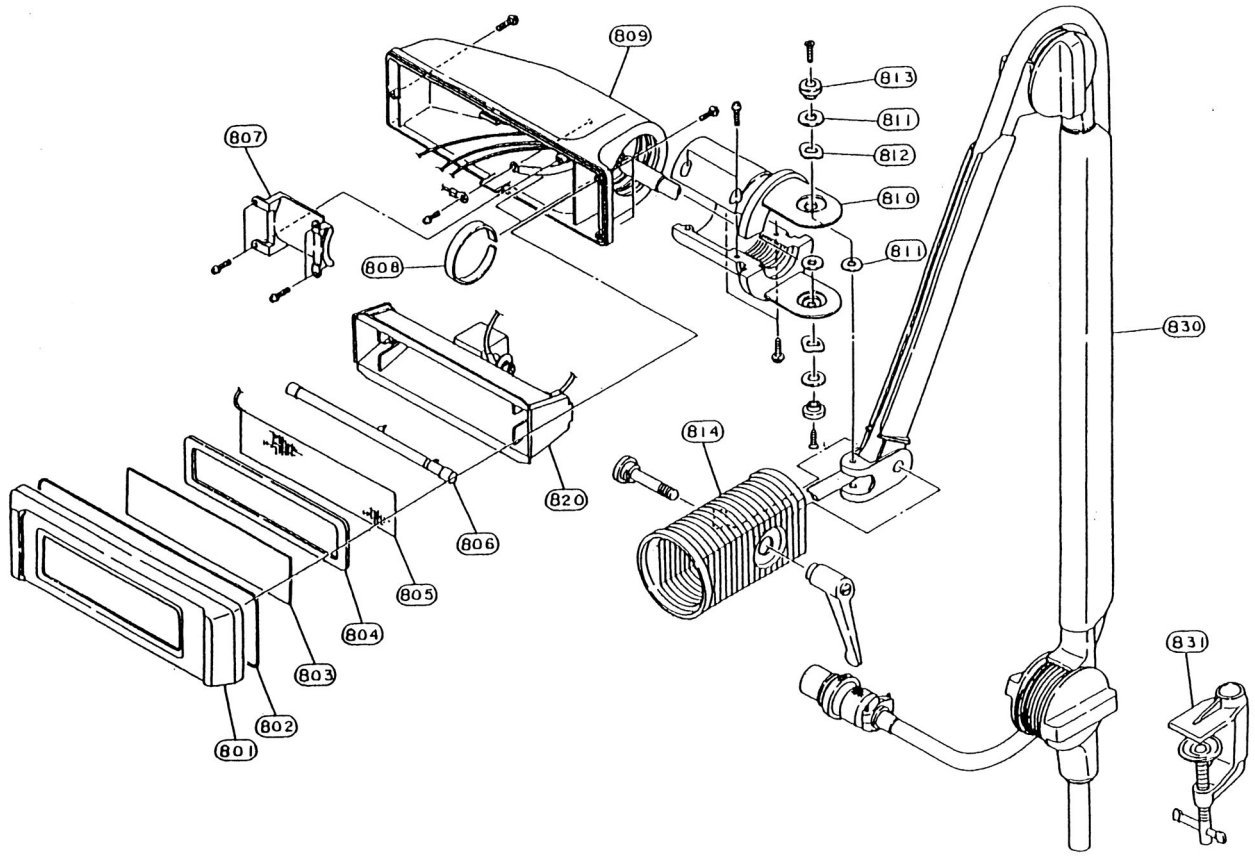
LS-703A Flash Lamp Assembly

Index	NK Code No.	Qty	Description
801	2112-008414C	1	Top cover
802	2114-074793	1	Shield wire
803	2114074784	1	Glass cover
804	2114-016606A	1	Rubber packing 1
805	2114-016678	1	Shielding mesh
806	208161B	1	Lamp tube XFS-160B
807	2113-024038A	1	Joint holder
808	2114-074757A	1	Ring
809	2112-008405C	1	Lamp housing
810	2113-024056B	1	Horizontal joint
811	2114-074775A	1	Joint washer
812	292898	1	Corrugated washer WW-8 SK (ACP)
813	2114-074766B	1	Joint shaft
814	2113-024047B	1	Bellows
820	2153-001371	1	Lamp reflector assy
820-1	2113-024092A	1	Reflecting plate
820-2	2114-016589	1	Socket base
820-3	2114-016633A	1	Trigger terminal base
820-4	2114-016651	1	Shielding plate
820-5	2144-002084	1	Socket assy
820-6	292782	1	Washer AC211
820-7	251479	1	Oscillation transformer T-41B (1:35)
830	2141-000065L	1	Flash lamp arm assy
830-1	6114-020988B	1	Vertical joint bolt
830-2	315214	1	Clamp lever MK-3LDF-6-SG
831	6114-052383	1	Clamp KH-801E (?)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Section 8 Connector Pin Assignment

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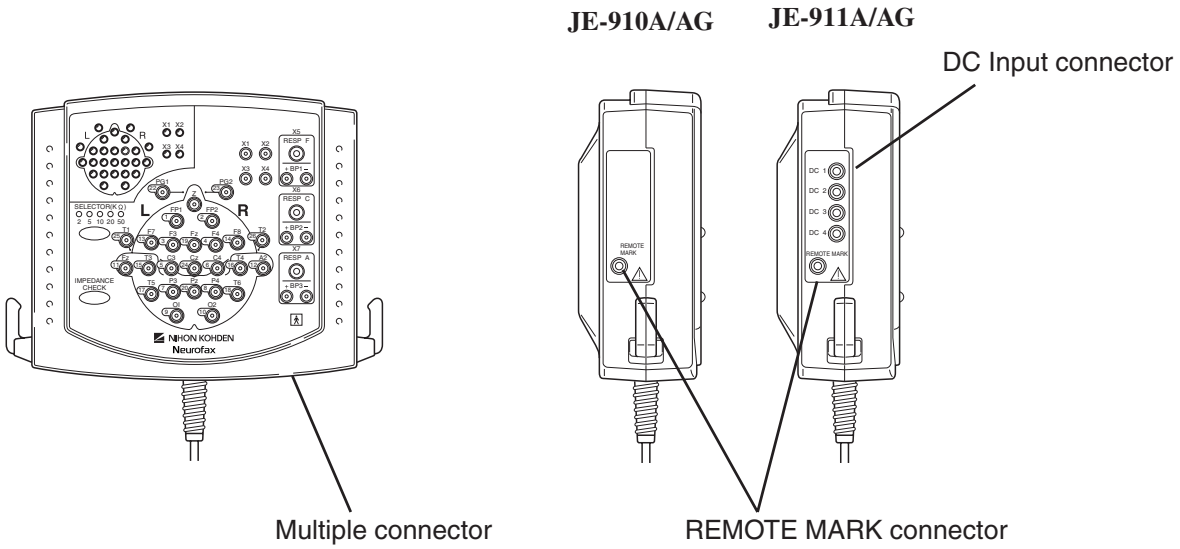
Input/Output Connector/Jack Pin Assignment

CAUTION

Connect only the recommended equipment to the instrument input/output connectors or jacks. Otherwise, there is a risk of electrical shock to the patient and operator.

JE-910A/AG, JE-911A/AG Electrode Junction Box



Multiple Connector

For mini junction box

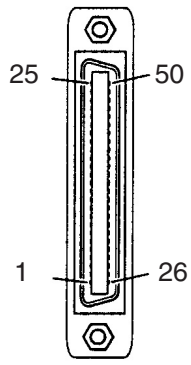
WARNING

When the JE-913A Mini junction box or BE-911A/BE-912A EEG disk electrode is not used, make sure that the multiple connecter cover is firmly attached to the electrode junction box. Failure to follow this warning may cause electrical shock to the patient and operator.

CAUTION

Only connect the JE-913A Mini junction box or BE-911A/BE-912A EEG disk electrode to the multiple connector. When another type of mini junction box is connected, the instrument may malfunction.

Multiple Connector



Pin No.	Signal	Pin No.	Signal
1	FP1	26	T2
2	FP2	27	Not used
3	F3	28	Not used
4	F4	29	Not used
5	C3	30	X1
6	C4	31	X2
7	P3	32	X3
8	P4	33	X4
9	O1	34	Not used
10	O2	35	Not used
11	A1	36	Not used
12	A2	37	BP1 +
13	F7	38	BP1 -
14	F8	39	BP2 +
15	T3	40	BP2 -
16	T4	41	BP3 +
17	T5	42	BP3 -
18	T6	43	Z
19	FZ	44	AG
20	PZ	45	AG
21	Not used	46	AG
22	PG1	47	Not used
23	PG2	48	Not used
24	CZ	49	Not used
25	T1	50	Not used

Junction box side: PCR-E50LMD-SLB1
(Code No.: 513713)
Cable side: Connector - PCR-E50FA
Housing- PCS-XEM50GLIU2N

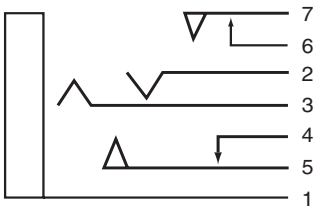
DC Input Connector

JE-911A only, Max. ±3 V, input impedance: 1.5 MΩ

Pin No.	Signal
1	Not used
2	DC INPUT
3	DGND

Junction box side: HJS1462-01-010 (Code No.: 608389)
Cable side: KP-2S (Code No.: 608406) ,
2.5 mm φ miniature jack

REMOTE MARK Connector

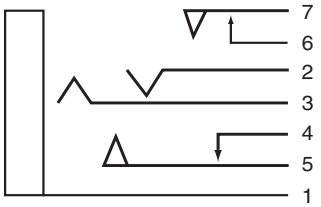


Pin No.	Signal
1	Not used
2	MARK INPUT
3	DGND
4	Not used
5	Not used
6	Not used
7	Not used

Junction box side: HSJ2000-01-010 (Code No.: 501503)
Cable side: 3.5 φ miniature jack (Code No: 606907)

LS-901AJ/AK/AG, Photo Control Unit

TRIG. INPUT/TRIG. OUTPUT Connector



Pin 2
Trigger input:
Max. +5 V, input impedance: 100 kΩ
Trigger output:
Max +5 V, output current: 1.5 mA

TRIG. INPUT connector

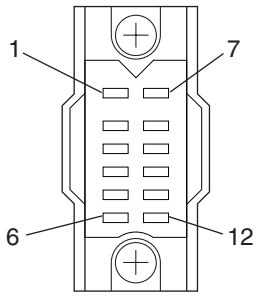
Pin No.	Signal
1	DGND
2	EXT TRIG IN
3	Not used
4	Not used
5	Not used
6	DGND
7	Not used

TRIG. OUTPUT connector

Pin No.	Signal
1	DGND
2	EXT TRIG OUT
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used

Unit side: HSJ2000-01-010 (Code No.: 501503)
Cable side: 3.5 φ miniature jack (Code No: 606907)

HV Connector



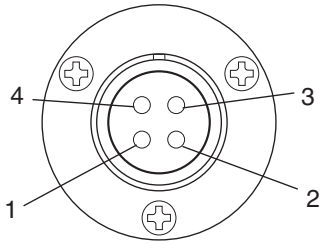
Pin No.	Signal	Pin No.	Signal
1	Not used	7	VOICE
2	-12 VA	8	+12 VA
3	Not used	9	DGND
4	HVDTC	10	+12 VA
5	HVTRG	11	AGND
6	Not used	12	SG

Unit side: SW-1612A-ST (Code No.: 271582)
Cable side: P-1620BA-C (Code No.: 269513)

PHOTIC LAMP Connector

WARNING

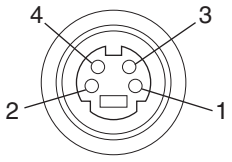
- **Before connecting or disconnecting the flash lamp cord, turn the power off. After the power is turned off, about 600 V is present in the PHOTIC LAMP connector for several minutes.**
- **When the instrument is turned on, about 600 V is present at pin 2 of the PHOTIC LAMP connector on the LS-901AJ/AK/AG Photo control unit. To protect against shock, always connect the flash lamp assembly cable to this connector, or attach the PHOTIC LAMP connector cap to the PHOTIC LAMP connector even when the photic stimulation is not used.**



Pin No.	Signal
1	CG
2	High Voltage, 600 V
3	PG
4	Lamp Trigger

Unit side: NCS-254-RF (Code No.: 269121)
Cable side: NCS-254-PM (Code No.: 268782)

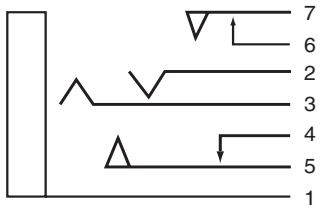
PHOTO MARK Connector



Pin No.	Signal
1	PS/HV MRK
2	DGND
3	Not used
4	Not used

Unit side: TCS7548-01-201 (Code No.: 504946)
Cable side: TCP8340

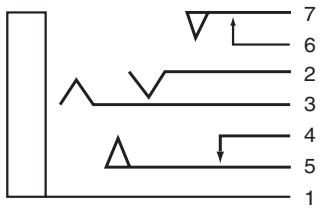
MIC INPUT Connector



Unit side: HSJ2000-01-010 (Code No.: 501503)
Cable side: 3.5 φ miniature jack (Code No: 606907)

Pin No.	Signal
1	AGND
2	MIC IN
3	Not used
4	Not used
5	Not used
6	AGND
7	Not used

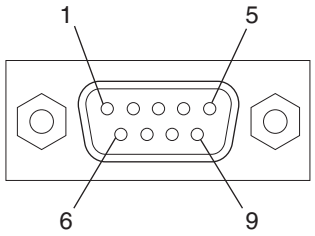
SPEAKER OUTPUT Connector



Unit side: HSJ2000-01-010 (Code No.: 501503)
Cable side: 3.5 φ miniature jack (Code No: 606907)

Pin No.	Signal
1	AGND
2	SPEAKER OUT
3	Not used
4	Not used
5	Not used
6	AGND
7	Not used

RS-232C Connector

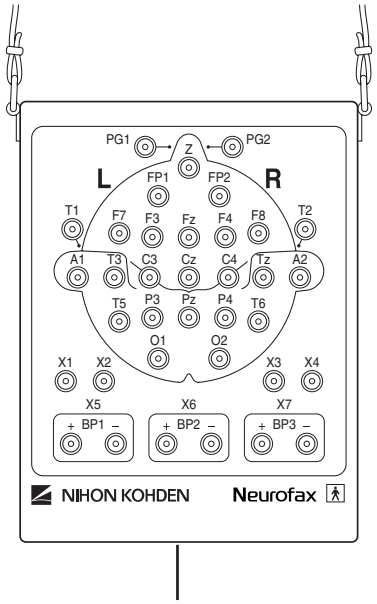


Unit side: DELC-J9PAF-10L9
(Code No.: 516987)
Cable side: Connector - DE-9SF-N
(Code No.: 383425)
Housing - DE-C4-J6

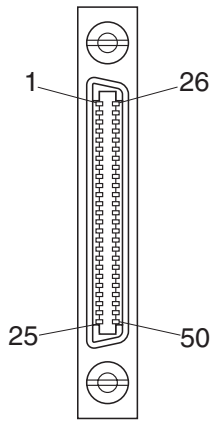
Pin No.	Signal
1	Not used
2	RXDO’
3	TXDO’
4	Not used
5	DGND
6	Not used
7	RTS
8	Not used
9	Not used

JE-913A/AG Mini Junction Box

Multiple output connector



Multiple output connector



Pin No.	Signal	Pin No.	Signal
1	FP1	26	T2
2	FP2	27	Not used
3	F3	28	Not used
4	F4	29	Not used
5	C3	30	X1
6	C4	31	X2
7	P3	32	X3
8	P4	33	X4
9	O1	34	Not used
10	O2	35	Not used
11	A1	36	Not used
12	A2	37	BP1 +
13	F7	38	BP1 -
14	F8	39	BP2 +
15	T3	40	BP2 -
16	T4	41	BP3 +
17	T5	42	BP3 -
18	T6	43	Z
19	FZ	44	AG
20	PZ	45	AG
21	Not used	46	AG
22	PG1	47	Not used
23	PG2	48	Not used
24	CZ	49	Not used
25	T1	50	Not used

Unit side: HDR-E50LFDT1-SLK
(Code No.: 521464)