
ADVANTEST[®]
ADVANTEST CORPORATION

Q8172
Optical Channel
Selector
Operation Manual

MANUAL NUMBER FOE-8324195C01

Safety Summary

To ensure thorough understanding of all functions and to ensure efficient use of this instrument, please read the manual carefully before using. Note that Advantest bears absolutely no responsibility for the result of operations caused due to incorrect or inappropriate use of this instrument.

If the equipment is used in a manner not specified by Advantest, the protection provided by the equipment may be impaired.

- **Warning Labels**

Warning labels are applied to Advantest products in locations where specific dangers exist. Pay careful attention to these labels during handling. Do not remove or tear these labels. If you have any questions regarding warning labels, please ask your nearest Advantest dealer. Our address and phone number are listed at the end of this manual.

Symbols of those warning labels are shown below together with their meaning.

DANGER: Indicates an imminently hazardous situation which will result in death or serious personal injury.

WARNING: Indicates a potentially hazardous situation which will result in death or serious personal injury.

CAUTION: Indicates a potentially hazardous situation which will result in personal injury or a damage to property including the product.

- **Basic Precautions**

Please observe the following precautions to prevent fire, burn, electric shock, and personal injury.

- Use a power cable rated for the voltage in question. Be sure however to use a power cable conforming to safety standards of your nation when using a product overseas.
- When inserting the plug into the electrical outlet, first turn the power switch OFF and then insert the plug as far as it will go.
- When removing the plug from the electrical outlet, first turn the power switch OFF and then pull it out by gripping the plug. Do not pull on the power cable itself. Make sure your hands are dry at this time.
- Before turning on the power, be sure to check that the supply voltage matches the voltage requirements of the instrument.
- Connect the power cable to a power outlet that is connected to a protected ground terminal. Grounding will be defeated if you use an extension cord which does not include a protected ground terminal.
- Be sure to use fuses rated for the voltage in question.
- Do not use this instrument with the case open.
- Do not place anything on the product and do not apply excessive pressure to the product. Also, do not place flower pots or other containers containing liquid such as chemicals near this

product.

- When the product has ventilation outlets, do not stick or drop metal or easily flammable objects into the ventilation outlets.
- When using the product on a cart, fix it with belts to avoid its drop.
- When connecting the product to peripheral equipment, turn the power off.

- **Caution Symbols Used Within this Manual**

Symbols indicating items requiring caution which are used in this manual are shown below together with their meaning.

DANGER: Indicates an item where there is a danger of serious personal injury (death or serious injury).

WARNING: Indicates an item relating to personal safety or health.

CAUTION: Indicates an item relating to possible damage to the product or instrument or relating to a restriction on operation.

- **Safety Marks on the Product**

The following safety marks can be found on Advantest products.



: ATTENTION - Refer to manual.



: Protective ground (earth) terminal.



: DANGER - High voltage.



: CAUTION - Risk of electric shock.

- **Replacing Parts with Limited Life**

The following parts used in the instrument are main parts with limited life.

Replace the parts listed below before their expected lifespan has expired to maintain the performance and function of the instrument.

Note that the estimated lifespan for the parts listed below may be shortened by factors such as the environment where the instrument is stored or used, and how often the instrument is used. The parts inside are not user-replaceable. For a part replacement, please contact the Advantest sales office for servicing.

Each product may use parts with limited life.

For more information, refer to the section in this document where the parts with limited life are described.

Main Parts with Limited Life

Part name	Life
Unit power supply	5 years
Fan motor	5 years
Electrolytic capacitor	5 years
LCD display	6 years
LCD backlight	2.5 years
Floppy disk drive	5 years
Memory backup battery	5 years

- Hard Disk Mounted Products**

The operational warnings are listed below.

- Do not move, shock and vibrate the product while the power is turned on.
Reading or writing data in the hard disk unit is performed with the memory disk turning at a high speed. It is a very delicate process.
- Store and operate the products under the following environmental conditions.
An area with no sudden temperature changes.
An area away from shock or vibrations.
An area free from moisture, dirt, or dust.
An area away from magnets or an instrument which generates a magnetic field.
- Make back-ups of important data.
The data stored in the disk may become damaged if the product is mishandled. The hard disc has a limited life span which depends on the operational conditions. Note that there is no guarantee for any loss of data.

- Precautions when Disposing of this Instrument**

When disposing of harmful substances, be sure dispose of them properly with abiding by the state-provided law.

Harmful substances: (1) PCB (polycarbon biphenyl)
(2) Mercury
(3) Ni-Cd (nickel cadmium)
(4) Other
Items possessing cyan, organic phosphorous and hexadic chromium and items which may leak cadmium or arsenic (excluding lead in solder).

Example: fluorescent tubes, batteries

Environmental Conditions

This instrument should only be used in an area which satisfies the following conditions:

- An area free from corrosive gas
- An area away from direct sunlight
- A dust-free area
- An area free from vibrations
- Altitude of up to 2000 m

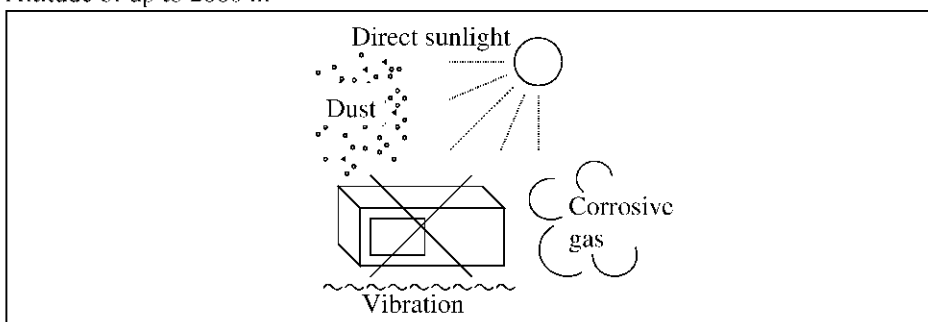


Figure-1 Environmental Conditions

- Operating position

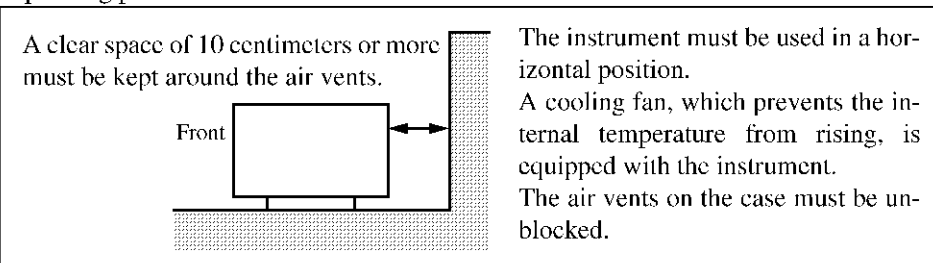


Figure-2 Operating Position

- Storage position

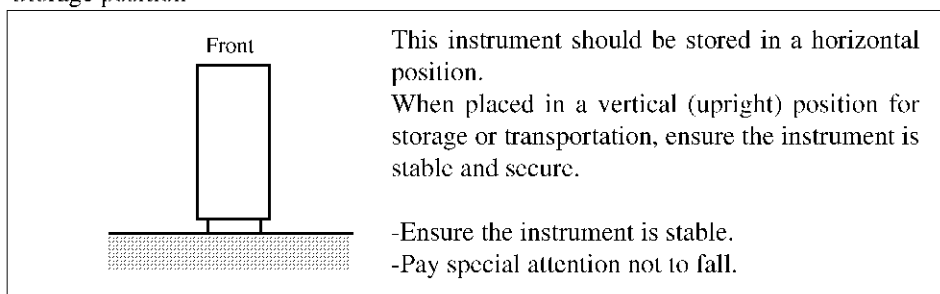


Figure-3 Storage Position

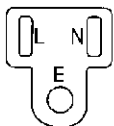
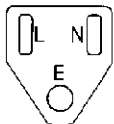
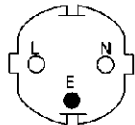
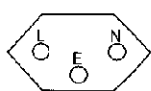
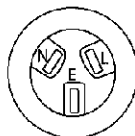
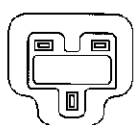
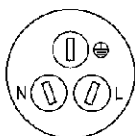
- The classification of the transient over-voltage, which exists typically in the main power supply, and the pollution degree is defined by IEC61010-1 and described below.

Impulse withstand voltage (over-voltage) category II defined by IEC60364-4-443

Pollution Degree 2

Types of Power Cable

Replace any references to the power cable type, according to the following table, with the appropriate power cable type for your country.

Plug configuration	Standards	Rating, color and length	Model number (Option number)
	PSE: Japan Electrical Appliance and Material Safety Law	125 V at 7 A Black 2 m (6 ft)	Straight: A01402 Angled: A01412
	UL: United States of America CSA: Canada	125 V at 7 A Black 2 m (6 ft)	Straight: A01403 (Option 95) Angled: A01413
	CEE: Europe DEMKO: Denmark NEMKO: Norway VDE: Germany KEMA: The Netherlands CEBEC: Belgium OVE: Austria FIMKO: Finland SEMKO: Sweden	250 V at 6 A Gray 2 m (6 ft)	Straight: A01404 (Option 96) Angled: A01414
	SEV: Switzerland	250 V at 6 A Gray 2 m (6 ft)	Straight: A01405 (Option 97) Angled: A01415
	SAA: Australia, New Zealand	250 V at 6 A Gray 2 m (6 ft)	Straight: A01406 (Option 98) Angled: -----
	BS: United Kingdom	250 V at 6 A Black 2 m (6 ft)	Straight: A01407 (Option 99) Angled: A01417
	CCC: China	250 V at 10 A Black 2 m (6 ft)	Straight: A114009 (Option 94) Angled: A114109

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Pages with ## are added.
Pages with () are deleted.

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1.1 Outline of Product

1. GENERAL

1.1 Outline of Product

Q8172 optical channel selector is the 2 x 5 optical switch for the single mode (SM10/125 μm) fiber of 1.3 μm and 1.55 μm bands. The switch can be changed over by operating the front panel keys or by changing over the optical path from channel 1 to channel 5 for COMMON A or COMMON B using, the GPIB command.

Generally, since Q8172 is equipped with GPIB, it can be operated externally by only connecting to the controller.

1.2 Inspection

When Q8172 is delivered to you, check that no breakage occurred during transportation.

The standard accessories of this unit are shown below. Check specifications and numbers.

Table 1-1 Standard Accessories

Name of article	Type name	Specification	Quantity
Power supply cable	MP-43B	PCB-DD2428X01	1
Conversion adapter	KPR-18	JCD-AL003EX03	1
Fuse for AC power supply		DFT-AHR15A	2
Operation manual		EQ8172	1

If the product is damaged or if the standard accessories are short or do not operate as specified, contact our CE Division (in CE center) or our nearest business office, business branch or agency.

Their addresses and Tel. Nos. are listed at the end of this manual.

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1.3 Preparation and Cautions Before Use

1.3 Preparation and Cautions Before Use

- (1) The supply voltage is set when shipped from the factory, and is indicated on the AC line connector of the rear panel. The supply voltage used is 90 to 132 VAC or 198 to 250 VAC, and the power frequency is 48 to 66 Hz.

Before turning on the power switch, check if the supply voltage and the power frequency coincide with that of the power supply used in this unit.

- (2) The ambient condition of the site where this unit is used shall be 0°C to + 50°C in temperature and 90% or less humidity.

As much as possible, use this product in a well ventilated place away from direct sunlight.

- (3) Handle the unit carefully so that it is never bumped strongly.

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1.4 Ground

1.4 Ground

To prevent electric shock, ground the central pin of the power supply connector of Q8172. The plug of the attached power supply cable is 3-pin, and the central round pin is the grounding pin.

This unit is grounded when connected to the three pole plug socket. When connection to the three pole plug socket is not possible, be sure to ground the grounding line (Figure 1-1(b)) coming from the adapter using the 3-2 pin conversion adapter (A09034) for this plug.

For A09034, widths A and B of the two electrodes of the adapter are different, as shown in (Figure 1-1(b)). When the plug is inserted into the plug socket, check the directions of the plug and the plug socket to connect them. When A09034 cannot be used, obtain the adapter KPR-13 sold separately. In this case, ground the grounding terminal located on the rear panel of this unit.

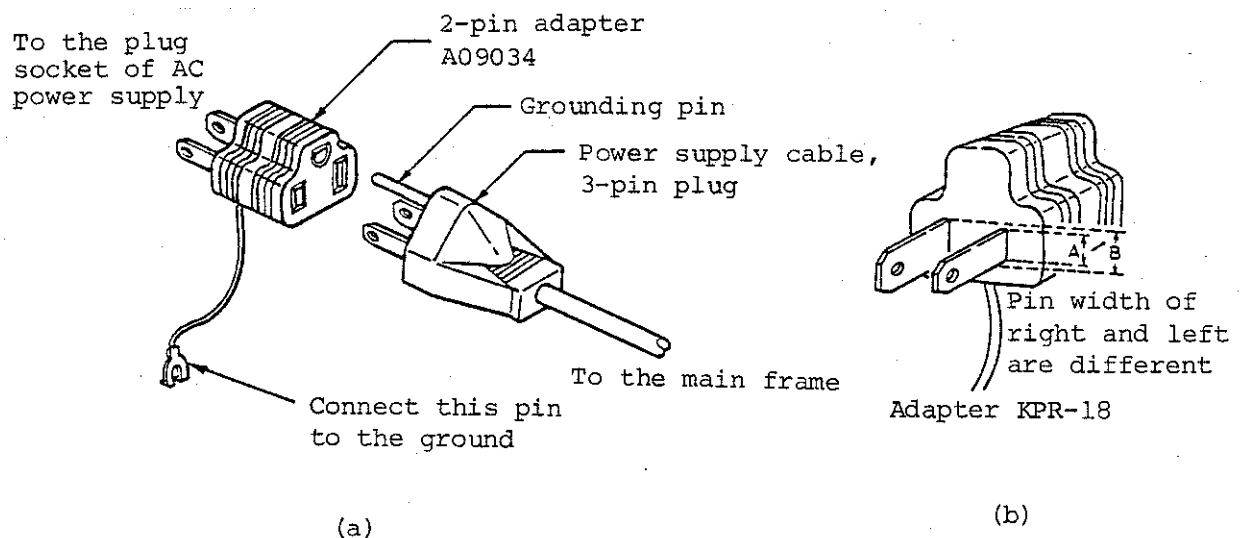


Figure 1-1 Power Supply Cable

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1.5 Replacement of Fuse

1.5 Replacement of Fuse

When the unit does not work even if the power switch is turned on, fusing of the power supply fuse is assumed. When the fuse is blown, replace the fuse.

AC100 V/120 V: Time lag 0.30 A

AC220 V/240 V: Time lag 0.15 A

Replacing method:

When replacing the power supply fuse, turn off the power switch first, and remove the power supply cable from the power supply connector.

Next, slide leftwards the plastic cover of the fuse box on the right of the power supply connector. When the lever where FUSE PULL is written is pulled forward, the fuse can be removed. (See Figure 1-2.)

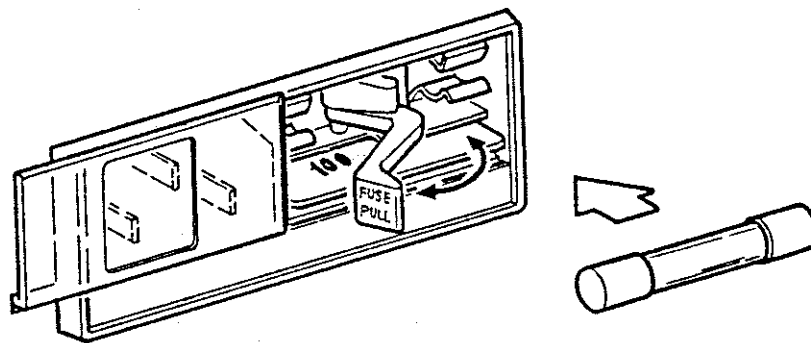


Figure 1-2 Replacement of Power Fuse

CAUTION

When fuses are replaced, be sure to check the above specifications because specifications differ depending on the supply voltage. Fuses shall be replaced after turning off the power switch and pulling out the power supply cable from the power socket.

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2.1 Front Panel

2. EXPLANATION OF PANEL SIDE

Refer to (Figure 2-1 and Figure 2-2). Explanations for each unit function are given here in the sequence of the numbers in the drawing.

2.1 Front Panel

(1) Power Supply Switch

When this switch is pressed, it becomes ON and power is supplied to all circuits. When this switch is pressed again, the switch returns to the original position to become OFF, and the power goes off.

(2) Power Supply Indicator

When the power supply switch is ON, the indicator lights.

(3) REMOTE Indicator (GPIB)

This indicator lights when controlled from the outside using GPIB.

(4) LOCAL Key

When controlled from the outside using GPIB, input using the panel keys becomes effective.

(5) COMMON I/O Connector

This is the I/O connector on the COMMON side. Connect the fiber connector to A or B to use.

(6) CHANNEL I/O Connector

This is the I/O connector on the CHANNEL side. Connect the fiber connector to 1 through 5 to use.

(7) COMMON Selection Key

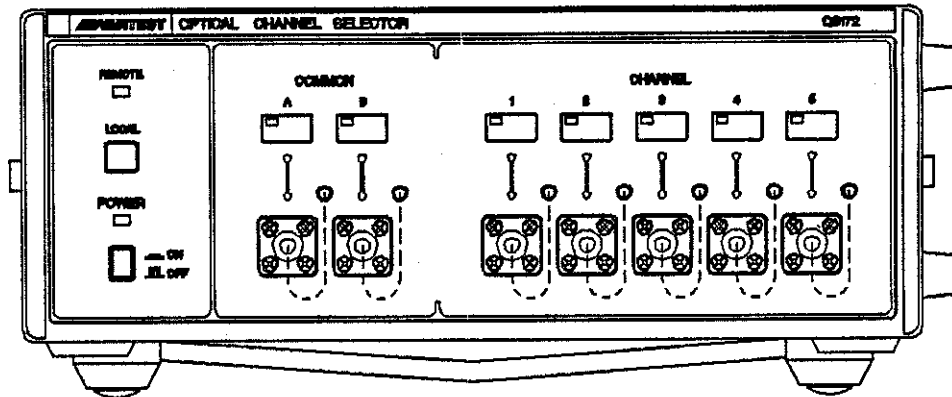
This is the key switch to select COMMON A or B. The side where the indicator in the key switch lights is connected to the CHANNEL side.

(8) CHANNEL Selection Key

This is the key switch to select CHANNEL 1 through 5. The side where the indicator in the key switch lights is connected to the COMMON side.

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2.1 Front Panel



FRONT VIEW

Figure 2-1 Explanation of Front Panel

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2.2 Rear Panel

2.2 Rear Panel

- (9) GPIB Connector
- (10) GPIB Address Switch
- (11) Power Supply Connector

This is the connector to connect AC power supply. Connect the attached power supply cable (MP-43B).

- (12) Power Supply Fuse

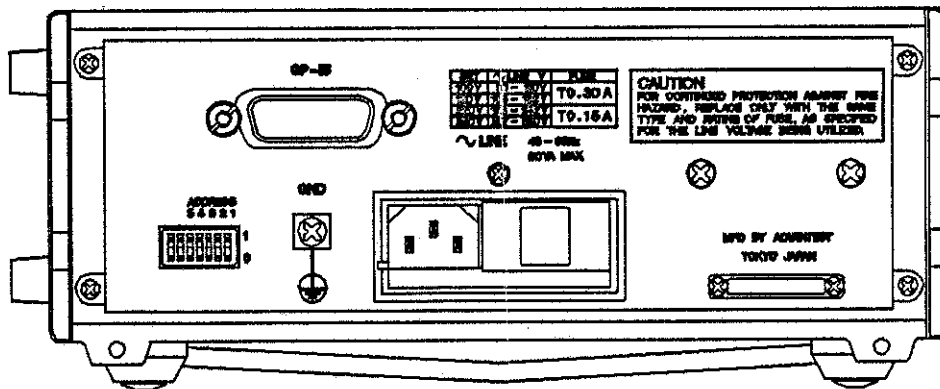
Before replacing the fuse, remove the power supply cable.

- (13) Supply Voltage Changing Card

When the supply voltage is changed, replace the card and set to the specified value. In this case, change the fuse capacity.

- (14) Ground Terminal

This is the terminal to ground the chassis of Q8172.



REAR VIEW

Figure 2-2 Explanation of Rear Panel

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3.1 Procedure for Start and Stop

3. BASIC OPERATION

3.1 Procedure for Start and Stop

(1) Start procedure

- ① Check that the power supply switch is OFF, and connect the power supply cable.
- ② Turn on the power supply switch. This unit is in the condition of COMMON A and CHANNEL 1.

(2) Stop Procedure

- ① Turn off the power supply switch.

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4.1 Performance

4. GPIB

4.1 Performance

Based on IEEE std, 488-1978.

4.2 Function

Table 4-1 GPIB Code List

Code	Function
SHO	No source handshake function
AHI	Acceptor handshake function
TO	No talker function
LI	Listener function
SRO	No service demand function
RLI	Remote/local changeover function
DTO	No device trigger function
DCI	Device clear function (SDC, DLC command usable)
PPO	No parallel poll function

Code used: ASCII code

Logic Level: Logic 0 (High state) + 2.4 V or more
Logic 1 (Low state) + 0.4 V or less

Driver specification: Tristate
Low state output voltage: 0.4 V or less 48 mA
High state output voltage: 2.4 V or more -5.2 mA

Receiver specification: Low state +0.6 V or less
High state +2.0 V or more

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4.3 Command

4.3 Command

Table 4-2 GPIB Command List

Code	Operation
OSA	COMMON A
OSB	COMMON B
OS1	CHANNEL 1
OS2	CHANNEL 2
OS3	CHANNEL 3
OS4	CHANNEL 4
OS5	CHANNEL 5

4.4 Address Switch

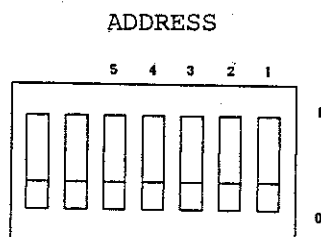


Figure 4-1 Address Switch

The address switch is used to set the address using the 5 lower bits.
(from 0 to 31)

The 6 bit and 7 bit are not used.

NOTE

Set the address switches before turning on the power switch.

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5.1 Cleaning Fiber Connector

5. METHOD OF CLEANING CONNECTOR, AND STORAGE OF THIS UNIT

5.1 Cleaning Fiber Connector

Wipe off any stains from the top and side of the connector ferule using lens cleaning paper or a degreased gauze dampened with alcohol.

5.2 Method of Cleaning Inside of Optical Output Connector

Blow off the dust using the inert gas spray for lens cleaning.

CAUTION

To prevent accidents, be sure to turn off the power supply beforehand.

5.3 Storing this Unit

When Q8172 has not been used for a long time, pack the unit using a vinyl cover or similar, place in a carton, and keep in a dry place direct sunlight.

The range for storage temperature is -20°C to $+55^{\circ}\text{C}$.

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6.1 Optical Specification

6. PERFORMANCE ITEMS

6.1 Optical Specification

Applied wave length	1.3/1.55 μ m
Applied fiber	Single mode fiber (SM10/125 μ m)
Applied connector	FC/PC type
Insertion loss	3.0/3.5 dB or less
Changeover repeatability	0.02 dB or less
Isolation	65 dB or more
Changeover time	0.1 sec. or less
Life	10 ⁶ times or more

6.2 General Specification

Range of use environment: Circumference temperature 0 to 50°C
Relative humidity 90% or less

Range of storage temperature: Circumference temperature -20°C to 55°C

Power supply:

Supply voltage: 90 to 110 VAC, 48 to 66 Hz

Change of supply voltage:

Option No.	Standard	32	42	44
Supply voltage	90 to 110 V	103 to 132 V	198 to 242 V	207 to 250 V

Power consumption: 30 VA or less

Outline dimension: Approx. 240 (W) x 88 (H) x 310 (D) mm

Weight: 4.5 kg or less

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7.1 Inspection

7. BEFORE REQUESTING REPAIR

7.1 Inspection

If there is any irregularity when using Q8172, contact our CE Division (in CE center), nearest business office, branch office, or agency after checking the following inspection items. The address and Tel. Nos. are listed at in the end of this manual.

Even if the repair only covers the the check items below, our company charges a repair fee; so be sure to check the operation manual and these checking items before requesting repair.

Table 7-1 Inspection Items Before Requesting Repair

Symptoms	Causes	Treatment
Power supply indicator does not light	Blown power supply fuse Just a visual inspection of the fuse is not enough. Be sure to check if the fuse capacity is less than 20 Ω using the digital voltmeter.	Replace the blown fuse with the attached fuse, referring to (Clause 1.5).
Optical output is not output, or the output is small.	Mistaken selection of COMMON or CHANNEL	Select again
	Disconnection of the connecting fiber cable	Replace the optical fiber cable.
	Stain on the fiber connector edge	See item (5.2) Method of cleaning inside of optical output connector.
Large fluctuation of optical output level	Stain on the fiber connector edge	See item (5.2) Method of cleaning inside of optical connector.
	Used in a place subject to large changes in ambient temperature.	Use the unit in a place where the changes in ambient temperature are small.

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8.1 Basic Operation

8. OPERATION

8.1 Basic Operation

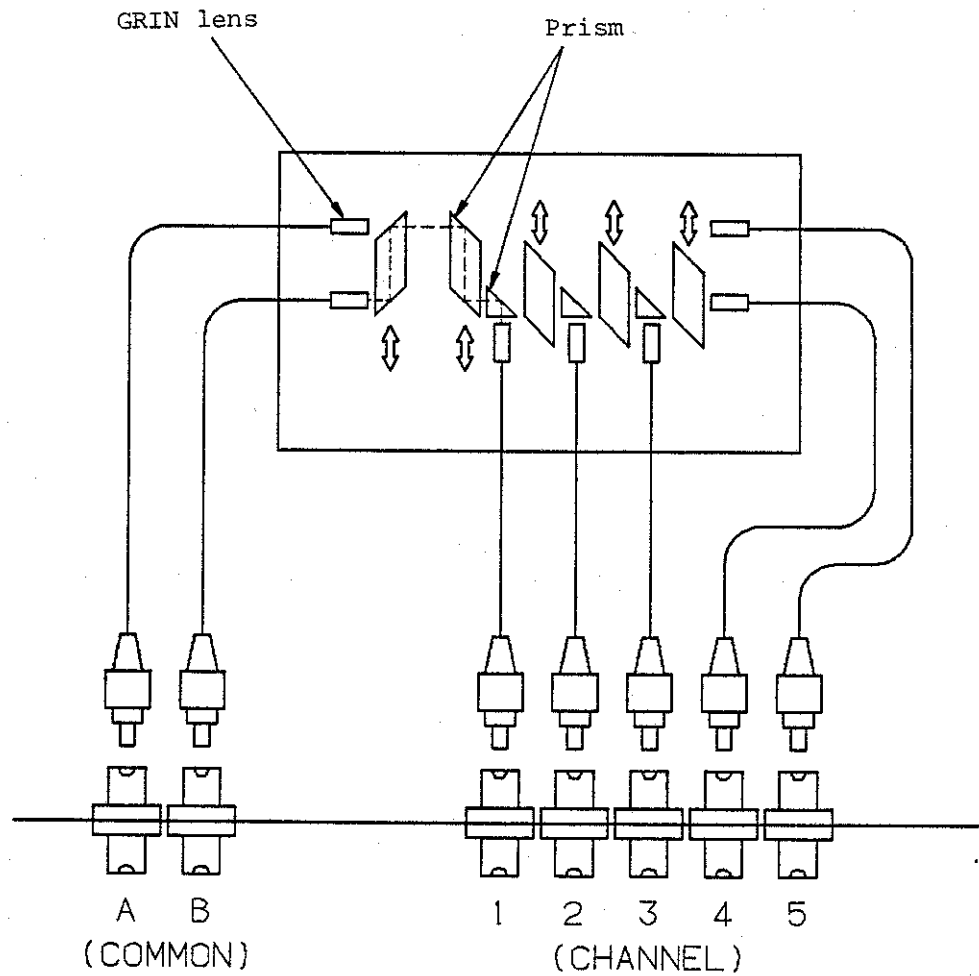


Figure 8-1 Internal Structure

Q8172 changes over a light path mechanically using the prism. Figure 8-1 shows the condition where COMMON B is connected to CHANNEL 1.

The distance between the changeover portion and the front panel is connected by a 1 m fiber cable. The connector located in the panel inside is a FC type connector with PC polished edge.

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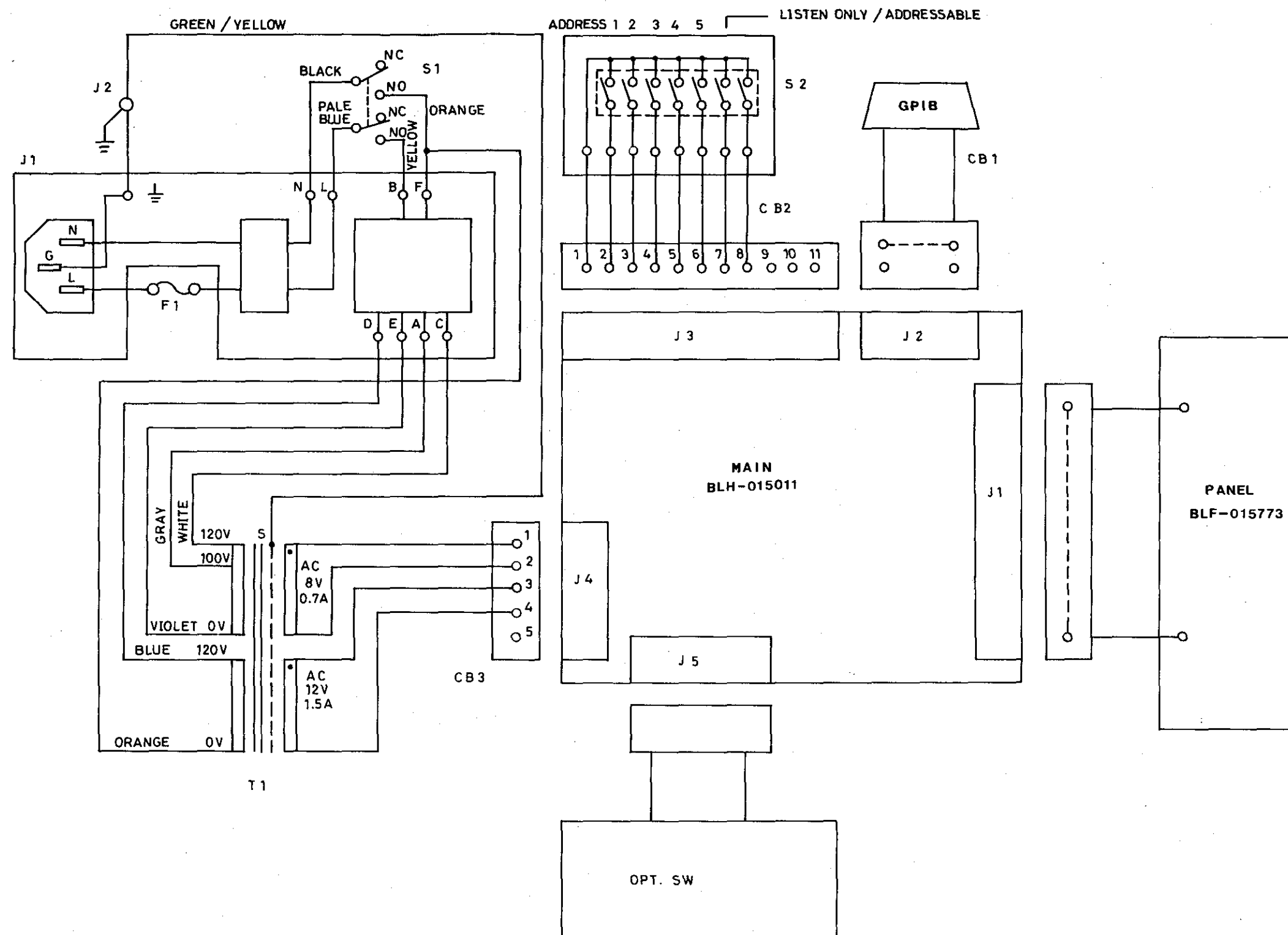


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Parts No.		ADVANTEST Stock No.	Parts No.		ADVANTEST Stock No.
D1	-9	NLD-000010			
R1		RCB-AG220			
S1	-8	KSP-000609			

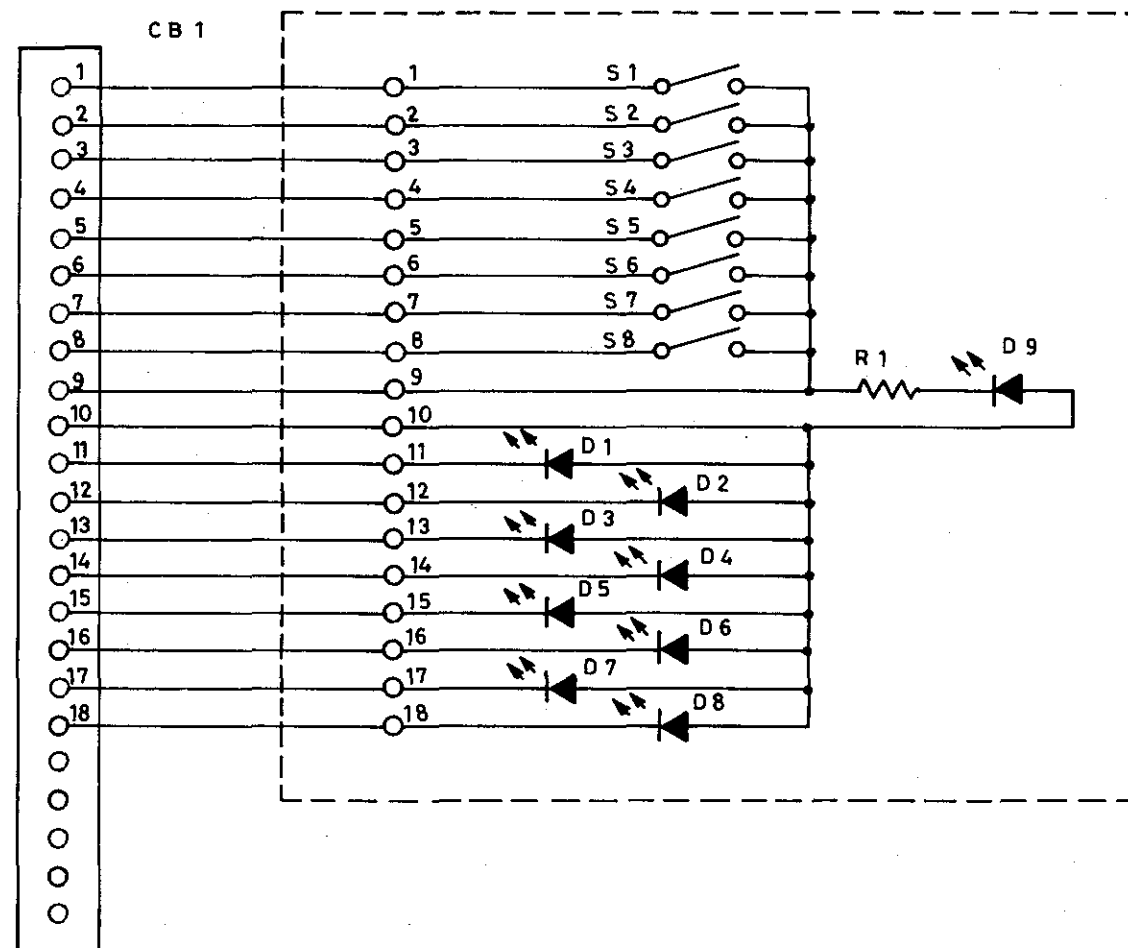
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Parts No.		ADVANTEST Stock No.	Parts No.		ADVANTEST Stock No.
C1	-2	CSM-AC22P50V	U14		SIM-74HC00
C3	-15	CTA-AC1U50V	U16	-17	SIM-74HC374
C16		CTA-AC1U50V	U19		SIA-393
C17	-20	CCK-BW2200U25V	U20		SIA-7805U
C21		CTA-AC1U50V	X1		DXD-000168
C22	-23	CCK-AR10U16V			
C24	-25	CSM-ACR1U50V			
C26	-27	CCK-BW2200U25V			
D3	-5	SDS-1S953			
D6	-7	SDS-RB402			
D8	-23	SDS-1S954			
D24	-31	SDS-1S954			
J1		JCP-AA024PX01			
J2		JCR-AV026PX02			
J3		JCP-AA012PX01			
J4		JCP-BH005PX01			
J5		JCP-AA024PX05			
L1		DNF-000851			
Q1	-12	STN-2SC1815			
Q13	-24	STN-2SC2983			
Q25	-36	STP-2SA965			
Q37		STN-2SC1815			
R1	-5	RCB-AG22K			
R6		RAY-AL10K8			
R7	-8	RAY-AK220Q4			
R9		RAY-AL10K6			
R11	-12	RCB-AG2R2K			
R13		RCB-AG1R8K			
R14		RCB-AG10K			
R15		RCB-AG1R8K			
R16		RCB-AG10K			
R17		RCB-AG3R3K			
R18		RCB-AG10K			
R19		RCB-AG100K			
R20	-31	RCB-AG4R7K			
R32	-43	RCB-AK100			
R44		RCB-AG10K			
R45		RCB-AG100K			
R46		RCB-AF1K			
U1		SIM-6303			
U2		SIM-74HC373			
U3		SMN-27C64			
U5		SIM-9914-2			
U6		SIT-75160			
U7		SIT-75161			
U8		SIM-74HC374			
U9		SIM-74HC244			
U10		SIM-74HC138			
U11		SIM-74HC139			
U12		SIM-74HC367			
U13		SIM-74HC32			



Q8172
SCHEMATIC SECTION
WBL-8172E

8172808-001-A

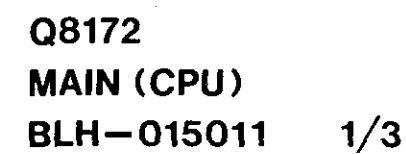


KSP - 000609	
S 1	ch - A
S 2	ch - B
S 3	ch - 1
S 4	ch - 2
S 5	ch - 3
S 6	ch - 4
S 7	ch - 5
S 8	LOCAL

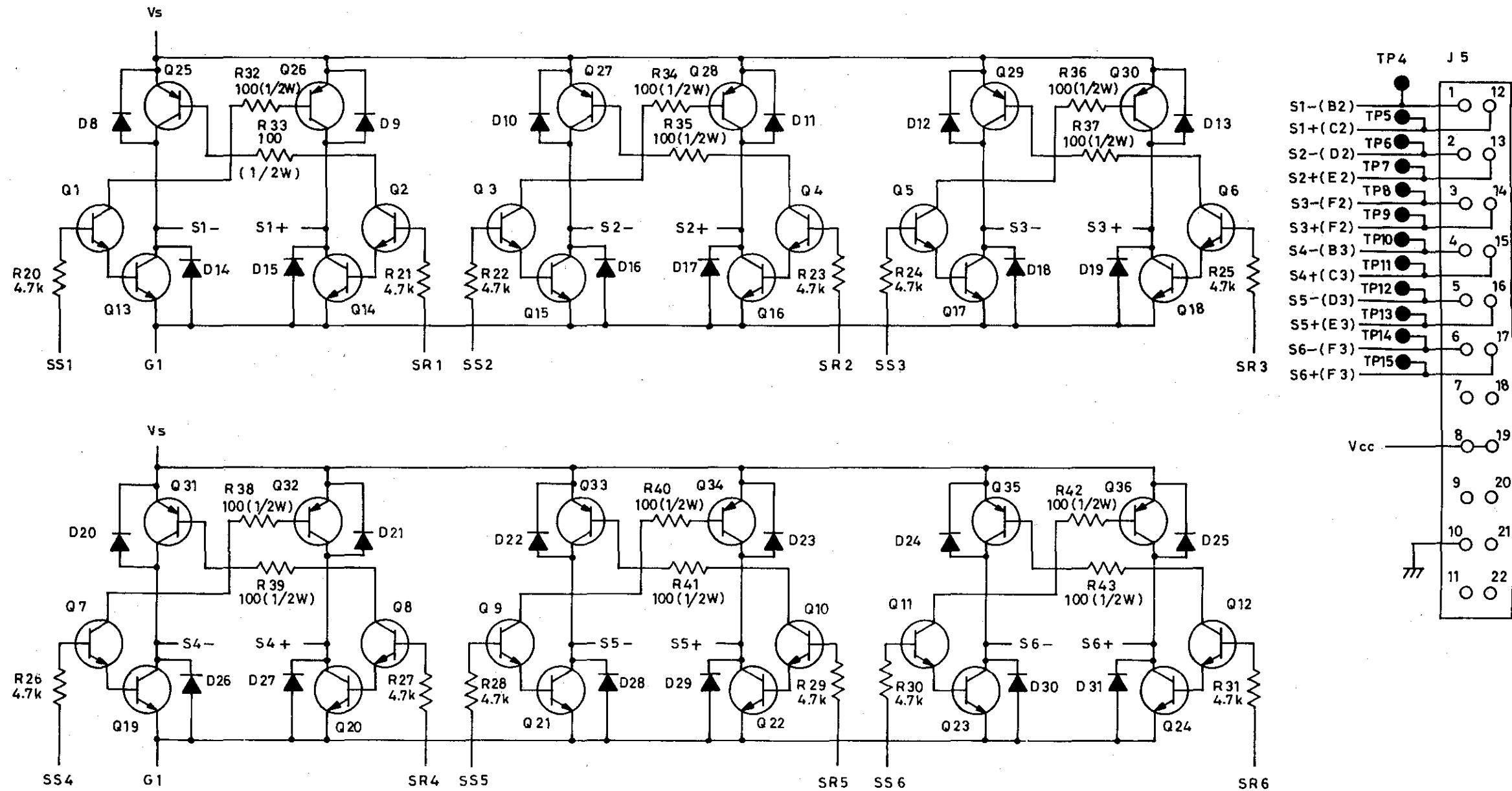
NLD - 000010	
D 1	ch - A
D 2	ch - B
D 3	ch - 1
D 4	ch - 2
D 5	ch - 3
D 6	ch - 4
D 7	ch - 5
D 8	REMOTE
D 9	POWER

Q8172
PANEL
BLF-015773

8172809-002-A

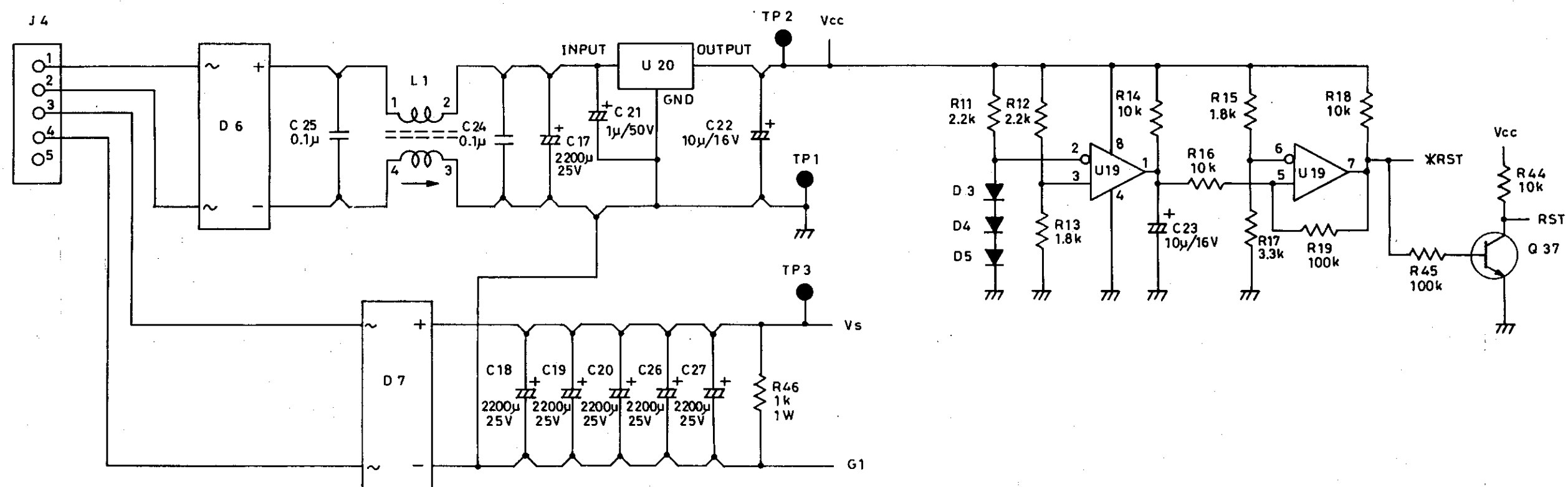


1/3

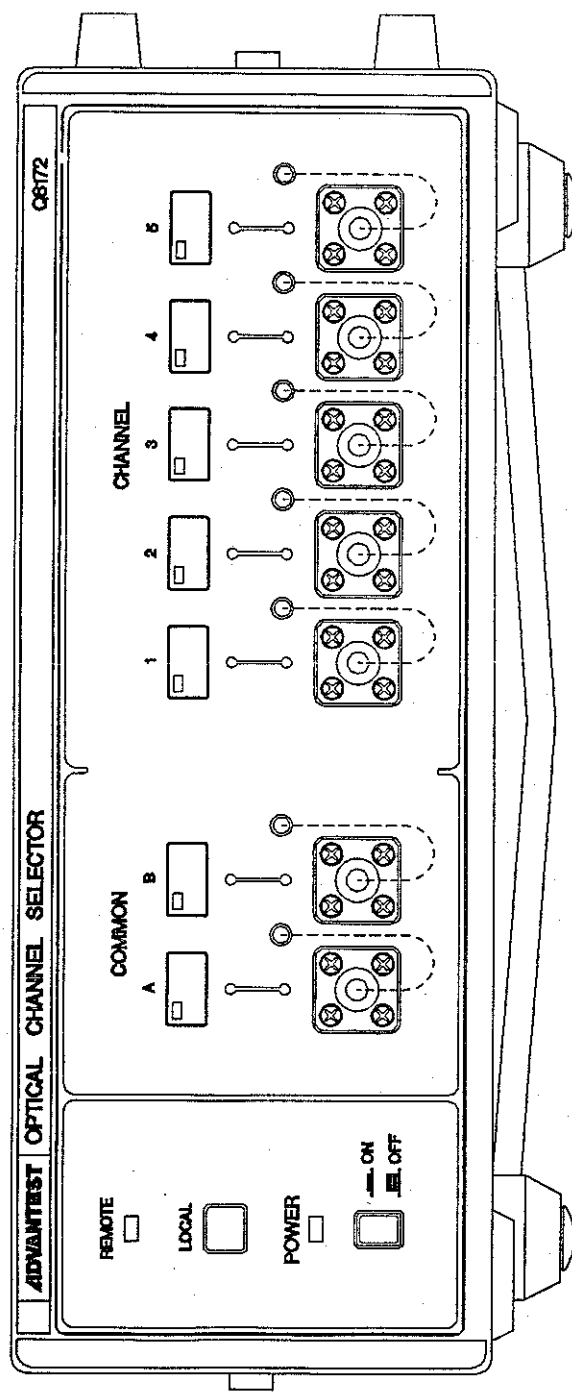


Q8172
 MAIN (OPT. SW. DRIVER)
 BLH-015011 2/3

8172809-004-A



8172809-005-A



Q8172 FRONT VIEW

Q8172EXT2-801-A



Q8172EXT3-801-A

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 - (d) use of the Product in connection with software, interfaces, products or parts other than software, interfaces, products or parts supplied or recommended by Advantest;
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Advantest's maintenance agreement provides the Purchaser on-site and off-site maintenance, parts, maintenance machinery, regular inspections, and telephone support and will last a maximum of ten years from the date the delivery of the Product. For specific details of the services provided under the maintenance agreement, please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest's sales representatives.

Some of the components and parts of this Product have a limited operating life (such as, electrical and mechanical parts, fan motors, unit power supply, etc.). Accordingly, these components and parts will have to be replaced on a periodic basis. If the operating life of a component or part has expired and such component or part has not been replaced, there is a possibility that the Product will not perform properly. Additionally, if the operating life of a component or part has expired and continued use of such component or part damages the Product, the Product may not be repairable. Please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest's sales representatives to determine the operating life of a specific component or part, as the operating life may vary depending on various factors such as operating condition and usage environment.

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