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MN9662A/9672A/9664A/9674A
Optical Channel Selector
Service Manual

First Edition

To ensure that this equipment is used safely, important safety items are explained in the MN9662A/9672A/9664A/9674A Optical Channel Selector Operation Manual. This manual explains important service items related to service. Read both the operation manual and this manual, and keep both with the equipment.

Measuring Instruments Division
Measurement Group
ANRITSU CORPORATION

Document No.: M-W1489BE-1.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Insure that you clearly understand the meanings of the symbols BEFORE using the equipment.
Some or all of the symbols may not be used on this equipment. In addition, when drawings are included in this manual, labels on the equipment may not be shown on them.

Safety Symbols Used in Manual

DANGER ⚠ This indicates a very dangerous procedure that could result in death or serious injury if not performed properly.

WARNING ⚠ This indicates a hazardous procedure that could result in death or serious injury if not performed properly.

CAUTION ⚠ This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and/or in Manual

The following safety symbols are used inside or on the equipment near operation locations, and/or in manual to provide information about safety items and operation precautions. Insure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.





These indicate that the marked part should be recycled.

MN9662A/9672A/9664A/9674A
Optical Channel Selector
Service Manual

12 February 1999 (First Edition)

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For Safety

For safety, do not open the equipment covers.

If repair is required, contact the sales representative, branch office, or agent at the telephone number and address given in this document or in the equipment operation manual.

Although not recommended by Anritsu Corporation, if it is really imperative to open the covers for emergency repair, take great care not to touch any dangerous parts. Always request repair by a trained engineer who understands the hazards.

Anritsu Corporation will not accept liability for any injuries sustained as a result of opening the equipment covers.

For Safety

WARNING ⚠

1. Laser radiation warning
   - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment. If laser radiation enters the eye, there is a risk of injury.
   - Laser Radiation Markings on a following page show the Laser Safety label attached to the equipment near the cable connector.



or



2. When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, before supplying power to the equipment, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Repair

WARNING ⚠

3. This equipment cannot be repaired by the user. DO NOT attempt to open the cabinet or to disassemble internal parts. Only Anritsu-trained service personnel or staff from your sales representative with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision parts.

Falling Over

4. This equipment should be used in the correct position. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.

For Safety

CAUTION ⚠

Changing Fuse

CAUTION ⚠

1. Before changing the fuses, ALWAYS remove the power cord from the poweroutlet and replace the blown fuses. ALWAYS use new fuses of the type and rating specified on the fuse marking on the rear panel of the cabinet.

   T___A indicates a time-lag fuse.
   ___A or F___ A indicate a normal fusing type fuse.

   There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.

Cleaning

2. Keep the power supply and cooling fan free of dust.
   - Clean the power inlet regularly. If dust accumulates around the power pins, there is a risk of fire.

Changing memory back-up battery

This equipment uses a lithium battery to back-up the memory. This battery must be replaced by a service engineer when it has reached the end of its useful life; contact the Anritsu sales section or your nearest representative.

Note: The battery used in this equipment has a maximum useful life of 7 years. It should be changed before this period has elapsed.

Part Names & Part Numbers

Please specify the part numbers shown in the parts list when making inquiries or when ordering parts. There may be a difference between the names of parts used in this manual and the parts actually used in the equipment or supplied for repair. This is because equivalent parts with the same functions, performance and reliability as the parts specified in the circuit diagrams and parts list have been used or supplied. Since the parts are equivalent, they have absolutely no adverse effect on the equipment specified functions, performance or reliability.

Equipment Certificate

Anritsu guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within 1 year after shipment due to a manufacturing fault, provided that this warranty is rendered void under any or all of the following conditions.

- The fault is outside the scope of the warranty conditions described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster including fire, flooding, earthquake, etc.
- The fault is due to use of non-specified peripheral equipment, peripheral parts, consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation will not accept liability for equipment faults due to unforeseen and unusual circumstances, nor for faults due to mishandling by the customer.

Anritsu Corporation Contact

If this equipment develops a fault, contact Anritsu Corporation or its representatives at the address in this manual.

CE Marking

Anritsu affix the CE Conformity Marking on the following product (s) in accordance with the Council Directive 93/68/EEC to indicate that they conform with the EMC directive of the European Union (EU).

CE Conformity Marking

CE

1. Product Name/Model Name

Product Name: Optical Channel Selector

Model Name: MN9662A, MN9664A, MN9672A and MN9674A

2. Applied Directive

EMC : Council Directive 89/336/EEC

Safety: Council Directive 73/23/EEC

3. Applied Standards

EMC:

Electromagnetic radiation:

EN55011 (ISM, Group 1, Class A equipment)

Immunity:

EN50082-1

		Performance Criteria*
IEC801-2 (ESD)	4 kVCD, 8 kVAD	B
IEC801-3 (Rad.)	3 V/m	A
IEC801-4 (EFT)	1 kV	B

*: Performance Criteria

A: No performance degradation or function loss

B: Self-recovered temporary degradation of performance or temporary loss of function

Safety: EN61010-1 (Installation Category II, Pollution Degree 2)

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Section 1 General

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1.1 Introduction

This service manual describes the repair of the MN9662A/9664A/9672A/9674A Optical Channel Selector.

Section 2 describes how to disassemble Optical Channel Selector, and the internal configuration.

Section 3 describes how to troubleshoot and repair when a problem occurs during measurements or when abnormalities are detected during performance checks.

Refer to the separate Operation Manual for details on operating procedures.

1.2 Safety Precautions

CAUTION ⚠

Do not disassemble the optical switch.

If optical switch is disassembled, performance may not meet specification.

Section 2 Mechanical Configuration

2.1 Introduction 2-2
2.2 Precautions 2-2
2.3 Mechanical Parts List 2-3
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2.1 Introduction

This section describes the mechanical structure, the position of the internal units, and the procedure for removing these units to disassemble and reassemble the Optical Channel Selector.

2.2 Precautions

CAUTION ⚠

Failure to follow this safety procedure may cause fire and electrical shock hazards that could result in personal injury.

Always follow the procedure steps below before disassembly and reassembly.

Step	Procedure
1	Turn Off the MN9662A/9664A/9672A/9674A power switch.
2	Unplug the plug for the AC outlet.

2.3 Mechanical Parts List

Table 2-1 shows mechanical parts list of MN96☐☐A Optical Channel Selector.

Table 2-1 Mechanical parts list

No.	Drawing No.	Parts name
1	W32B11595	Panel sheet of MN9662A
1	W32B11820	Panel sheet of MN9672A
1	W32B11580	Panel sheet of MN9664A
1	W32B11579	Panel sheet of MN9674A
2	W32B11588	Front panel
3	W42B31910	Switch mounting plate
4	W4E32006	Power switch key top
5	W4B31912	Acrylics plate
6	W4Y33266	Cover
7	32E11769	Frame
8	34E11805	Left front foot
9	34E11805B	Right front foot
10	34E11806B	Left front foot holder
11	34E11806	Right front foot holder
12	34E11807B	Left rear foot
13	34E11807	Right rear foot
14	34E11808	Left rear foot holder
15	34E11808B	Right rear foot holder
16	W32B11589	Right panel
17	W32B11590	Left panel
18	W42B31913	Mounting plate
19	W34B11582	Rear panel
19	W34B11597	Rear panel of option 01
20	332E32855	Key top
21	33E32854	Key top
22	332E33541	Pair of key tops
23	W32B11586	Chassis (1)
24	W4B31911	Power unit plate
25	34H39510	M3-B2 support
26	W43B31989	Plate
27	W22B3149	Chassis (3)

2.4 Cabinet Disassembly

Fig 2-1 to 2-3 shows cabinet disassembly of MN96□□A Optical Channel Selector.

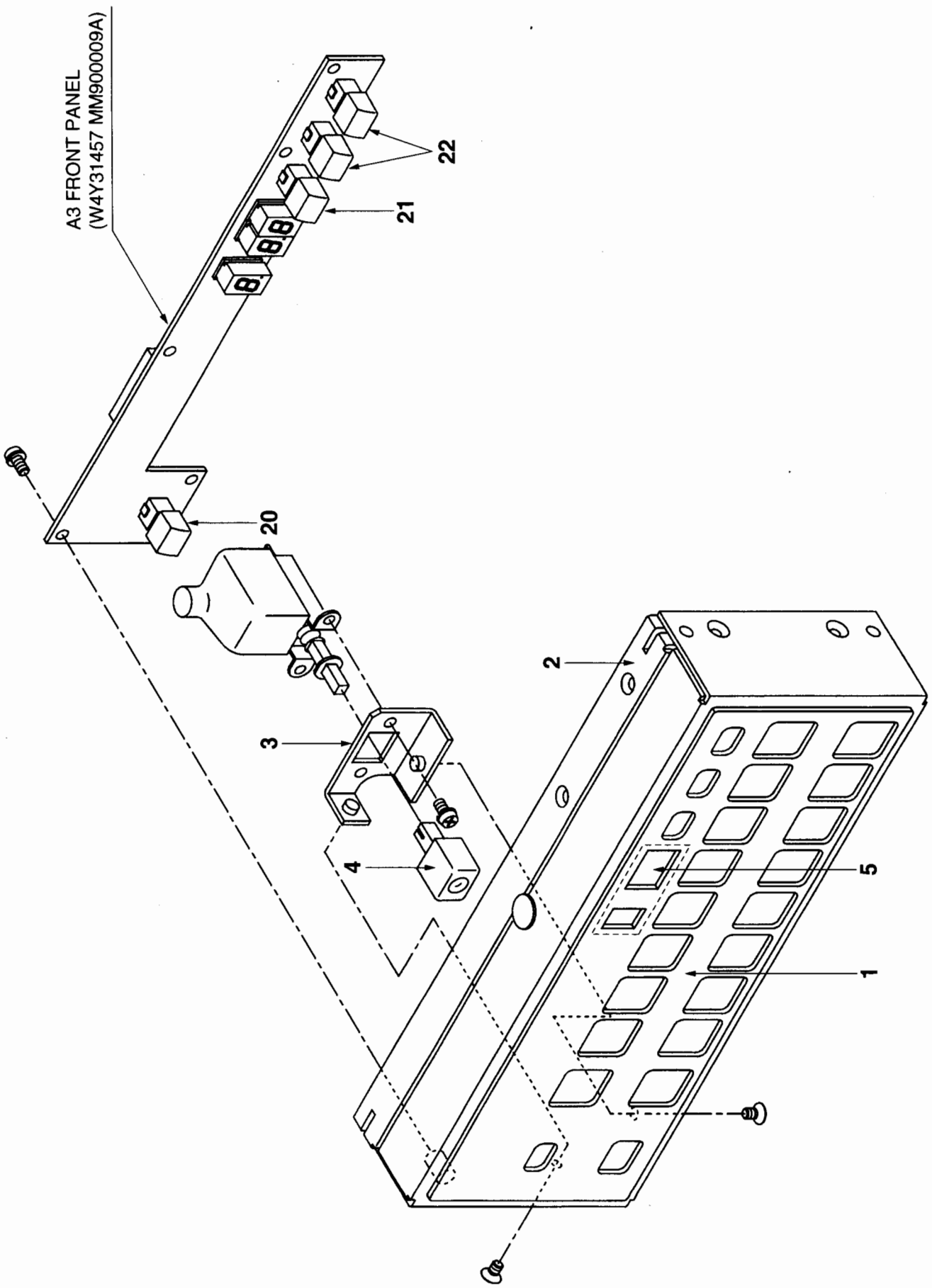


Fig. 2-3 Front Assembly

Section 3 Electrical configuration

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3.1 Introduction

This section describes the block diagram, circuit diagram, and the parts list in the Optical Channel Selector.

3.2 Block Diagram

Fig. 3-1 shows Block Diagram of Optical Channel Selector.
Printed circuit boards (P.C.B) are same in each model. In MN9662A with option01, rear panel is different from standard model.

Power unit generates DC +5 V and +12 V.
Control P.C.B has CPU, ROM, RAM, interface for remote control, and interface for display.
Rear panel P.C.B has connectors for remote control, power supply, and connection of P.C.B and switches for setup remote control and external control.
Rear panel P.C.B with option 01 has Parallel and Contact output connector instead of GPIB and External Control.
Front panel P.C.B has key and LED for display.
Switch drive P.C.B has interface for optical switch and switch to recognize model.
Optical switch is different according to model.
MN9662A has 1 × 8 optical switch.
MN9664A has 1 × 16 optical switch.
MN9672A has 1 × 2 optical switch and 1 × 8 optical switch.
MN9674A has 1 × 2 optical switch and 1 × 16 optical switch.

3.3 Circuit Diagram and Parts List

Fig 3-2 to 3-6 shows overall circuit diagram of MN96□□A Optical Channel Selector.
Table 3-1 to 3-5 shows parts list of M N96□□A Optical Channel Selector.

Table 3-1

W4W31440 1/1

Parts List of : MN9662A
OPTICAL CHANNEL SELECTOR
OVERALL CIRCUIT DIAGRAM

Ref. No.	Part Code	Description	Rating	Qty	Note
A 1	W4Y31453	P.C.B MM900007A CONTROL		1	
A 2	W4Y31455	P.C.B MM900008A REAR PANEL		1	
A 3	W4Y31457	P.C.B MM900009A FRONT PANEL		1	
A 4	W4Y31459	P.C.B MM900010A SWITCH DRIVE		1	
A 5	W29H3189 D	OPTICAL SWITCH MM900013A OPT.SWITCH	1×8 channels	1	
F 1	Z4F100060	FUSE T1A250V	AC250V	1	
F 2	Z4F100060	FUSE T1A250V	AC250V	1	
S 1	34S92030 B	PUSH BUTTON SWITCH ESB70702V		1	
W 1	W4J31463	CABLE W4J31463 VHR CABLE	8p-5p	1	
W 2	S4J10039	CABLE DF1B-12S2.5R24-20C-1	12p	1	
X 1	44E87532	TERMINAL GND TERMINAL		1	
X 2	84J90186	CONNECTOR VHR-5N	5p	1	
Z 1	S4Z10176	NOISE FILTER ANF365-4-F2	250V	1	
Z 2	NO1397	POWER UNIT LWD30-0512		1	

Dep.

*: Selected at factory | DRAWING No. W4W31440 - 02 1/1

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Table 3-2

W4W31442 1/1

Parts List of : MN9672A
OPTICAL CHANNEL SELECTOR
OVERALL CIRCUIT DIAGRAM

Ref. No.	Part Code	Description	Rating	Qty	Note
A 1	W4Y31453	P.C.B MM900007A CONTROL		1	
A 2	W4Y31455	P.C.B MM900008A REAR PANEL		1	
A 3	W4Y31457	P.C.B MM900009A FRONT PANEL		1	
A 4	W4Y31459	P.C.B MM900010A SWITCH DRIVE		1	
A 5	W29H3189 C	OPTICAL SWITCH MM900014A OPT.SWITCH	2×8 channels	1	
F 1	Z4F100060	FUSE T1A250V	AC250V	1	
F 2	Z4F100060	FUSE T1A250V	AC250V	1	
S 1	34S92030 B	PUSH BUTTON SWITCH ESB70702V		1	
W 1	W4J31463	CABLE W4J31463 VHR	8p-5p	1	
W 2	S4J10039	CABLE DF1B-12S2.5R24-20C-1	12p	1	
X 1	44E87532	TERMINAL GND TERMINAL		1	
X 2	84J90186	CONNECTOR VHR-5N	5p	1	
Z 1	S4Z10176	NOISE FILTER ANF365-4-F2	250V	1	
Z 2	NO1397	POWER UNIT LWD30-0512		1	

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Table 3-3

W4W31444 1/1

Parts List of : MN9662A*01
OPTICAL CHANNEL SELECTOR
OVERALL CIRCUIT DIAGRAM

Ref. No.	Part Code	Description	Rating	Qty	Note
A 1	W4Y31453	MM900007A CONTROL		1	
A 2	W4Y32037	MM900015A REAR PANEL		1	
A 3	W4Y31457	MM900009A FRONT PANEL		1	
A 4	W4Y31459	MM900010A SWITCH DRIVE		1	
A 5	W29H3189	OPTICAL SWITCH	1×8 channels		
D		MM900013A OPT. SWITCH		1	
F 1	Z4F100060	FUSE	AC250V		
		T1A250V		1	
F 2	Z4F100060	FUSE	AC250V		
		T1A250V		1	
S 1	34S92030	PUSH BUTTON SWITCH			
B		ESB70702V		1	
W 1	W4J31463		8p-5p		
		W4J31463 VHR		1	
W 2	S4J10039		12p		
		DF1B-12S2.5R24-20C-1		1	
X 1	44E87532	TERMINAL			
		GND TERMINAL		1	
X 2	84J90186		5p		
		VHR-5N		1	
Z 1	S4Z10176	NOISE FILTER	250V		
		ANF365-4-F2		1	
Z 2	N01397				
		LWD30-0512		1	

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Table 3-4

W4W31448 1/1

Parts List of : MN9664A
OPTICAL CHANNEL SELECTOR
OVERALL CIRCUIT DIAGRAM

Ref. No.	Part Code	Description	Rating	Qty	Note
A 1	W4Y31453	P.C.B MM900007A CONTROL		1	
A 2	W4Y31455	P.C.B MM900008A REAR PANEL		1	
A 3	W4Y31457	P.C.B MM900009A FRONT PANEL		1	
A 4	W4Y31459	P.C.B MM900010A SWITCH DRIVE		1	
A 5	W29H3189 B	OPTICAL SWITCH MM900011A OPT.SWITCH	1×16 channels	1	
F 1	Z4F100060	FUSE T1A250V	AC250V	1	
F 2	Z4F100060	FUSE T1A250V	AC250V	1	
S 1	34S92030 B	PUSH BUTTON SWITCH ESB70702V		1	
W 1	W4J31463	CABLE W4J31463 VHR CABLE	8p-5p	1	
W 2	S4J10039	CABLE DF1B-12S2.5R24-20C-1	12p	1	
X 1	44E87532	TERMINAL GND TERMINAL		1	
X 2	84J90186	CONNECTOR VHR-5N	5p	1	
Z 1	S4Z10176	NOISE FILTER ANF365-4-F2	250V	1	
Z 2	N01397	POWER UNIT LWD30-0512		1	

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*: Selected at factory | DRAWING No. W4W31448 – 02 1/1

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Table 3-5

W4W31450 1/1

Parts List of : MN9674A/A1
OPTICAL CHANNEL SELECTOR
OVERALL CIRCUIT DIAGRAM

Ref. No.	Part Code	Description	Rating	Qty	Note
A 1	W4Y31453	P.C.B MM900007A CONTROL		1	
A 2	W4Y31455	P.C.B MM900008A REAR PANEL		1	
A 3	W4Y31457	P.C.B MM900009A FRONT PANEL		1	
A 4	W4Y31459	P.C.B MM900010A SWITCH DRIVE		1	
A 5	W29H3189 A	OPTICAL SWITCH MM900012A OPT.SWITCH	2×16 channels	1	
F 1	Z4F100060	FUSE T1A250V	AC250V	1	
F 2	Z4F100060	FUSE T1A250V	AC250V	1	
S 1	34S92030 B	PUSH BUTTON SWITCH ESB70702V		1	
W 1	W4J31463	CABLE W4J31463 VHR CABLE	8p-5p	1	
W 2	S4J10039	CABLE DF1B-12S2.5R24-20C-1	12p	1	
X 1	44E87532	TERMINAL GND TERMINAL		1	
X 2	84J90186	CONNECTOR VHR-5N	5p	1	
Z 1	S4Z10176	NOISE FILTER ANF365-4-F2	250V	1	
Z 2	NO1397	POWER UNIT LWD30-0512		1	

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*: Selected at factory | DRAWING No. W4W31450 – 02 1/1

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Section 4 Troubleshooting

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4.3.1 Flowchart symbols 4-3
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4.4 Adjustment 4-13

4.1 Introduction

This section describes how to detect failure module.

4.2 Recommended Test Equipment

Equipments require to check, are showed Table 4-1.

Table 4-1 Required Equipment's

No.	Equipment		Recommend Model
1	Oscilloscope Dual trace, 100 MHz		
2	Multi meter	Voltage 0 to 400 VAC/VDC Ampere 0 to 0.3 ADC Resistance 0 to 1 MΩ	

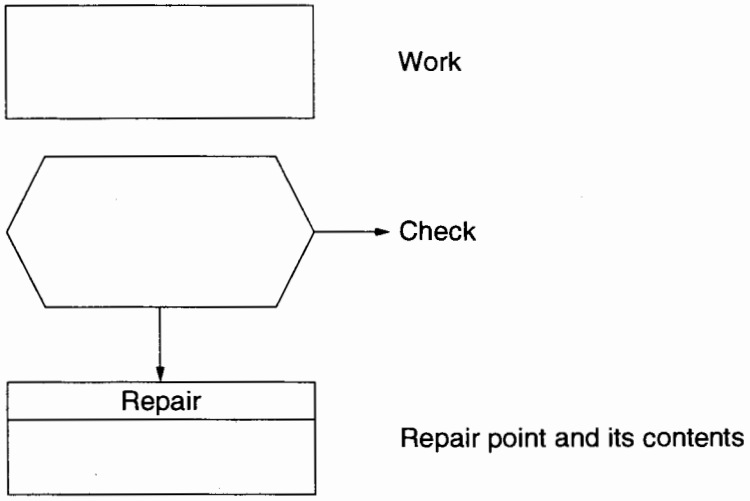
4.3 Troubleshooting

This section describes brief explanation of exchangeable modules and procedures to decide faulty module.

4.3.1 Flowchart symbols

The flowcharts in the section 4 use the symbols shown below to explain the trouble-shooting procedure.

Fig. 4-1 Symbols in Flowchart



Note:

Explanations described below the figures inside ⬭ the symbols are setting conditions for the Optical Channel Selector.

4.3.2 Exchangeable module

Optical Channel Selector employs exchangeable module system for maintenance.
Label on P.C.B shows module model such as MM90001A, and version.
Table 4-1 shows exchangeable modules in MN9662A/9664A/9672A/9674A Optical Channel Selector.

Table 4-1 Exchangeable Modules in Optical Channel Selector

Model	Name	Function
MM900007A	Control	Control I/O, memory backup, process data, Interfaces for GPIB · RS-232C · switch drive · panel key · External Control.
MM900008A	Rear Panel	Connect Power, MM90007A and MM900010A. Mount GPIB connector, RS-232C connector and External Control Connector.
MM900009A	Front Panel	Display channel and remote status. Mounts key.
MM900010A	Switch Drive	Interface for Optical Switch. Setup number of channels.
MM900011A	Optical Switch	Connects light 2 common channels to 16 channels. MN9674A only.
MM900012A	Optical Switch	Connects light common channel to 16 channels. MN9664A only.
MM900013A	Optical Switch	Connects light 2 common channels to 8 channels. MN9672A only.
MM900014A	Optical Switch	Connects light common channel to 8 channels. MN9662A only.
MM900015A	Rear Panel	Connect Power, MM90007A and MM900010A. Mount Parallel connector, RS-232C connector and Contact Output. MN9662A option01 only.
LWD30-0512	Power Unit	Generates +5 and +12 DC.

Table 4-2 shows explanation of check terminal on MM900007A

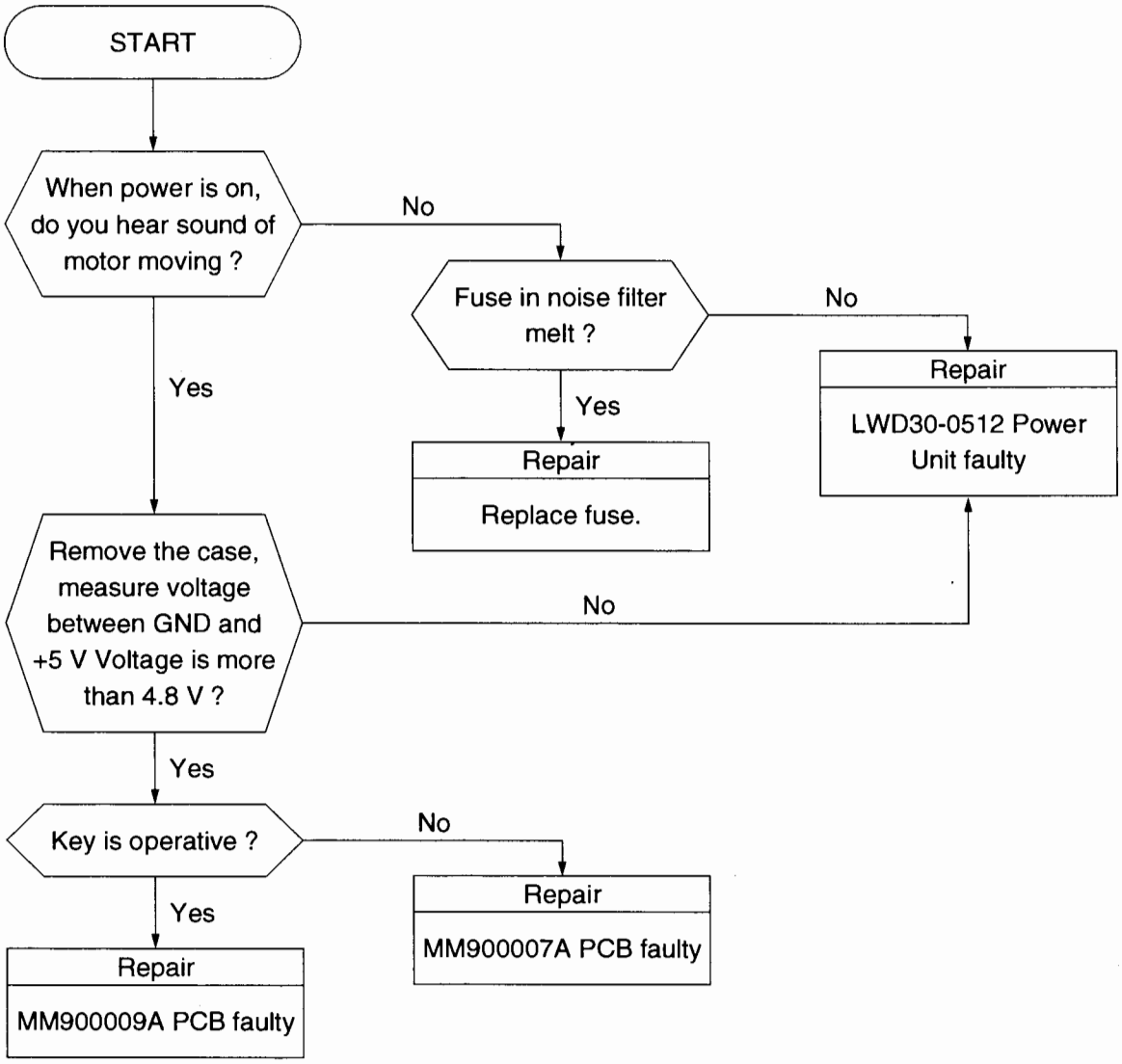
Table 4-2 Explanation of check terminal on MM900007A

Name	Explanation
+5 V	Voltages of the power supply.
24.576 MHz	Clock from CPU.
6.144 MHz	Clock for CPU. This clock is multiplexed 4 times in CPU.
40 MHz	Clock for GPIB interface.
24 MHz	Clock for External control interface.
BATT	Voltage of battery for memory backup.
RESET	Reset voltage. When this is Low level, CPU resets.
RX	Received signal from External Control.
TX	Transmission signal to External Control.
RD	Read strobe for data.
WRL	Write strobe for low byte data.
WRH	Write strobe for high byte data.
GND, GNDA, GNDB, GNDC	Voltage of the ground. Each ground is separated by noise filter.

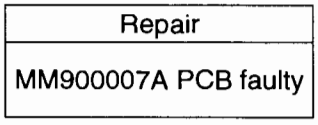
4.3.3 Trouble shooting and repair

(1) Display doesn't light.
(2) Initial display doesn't end.
(3) Keys on panel are disable.
(4) RS-232C control is disable.
(5) GPIB control is disable.
(6) Channel memory backup is abnormal.
(7) External control is disable.
(8) Optical specification performance is out-of-specification.
(9) Parallel control is disable.
(10) Contact output is disable.

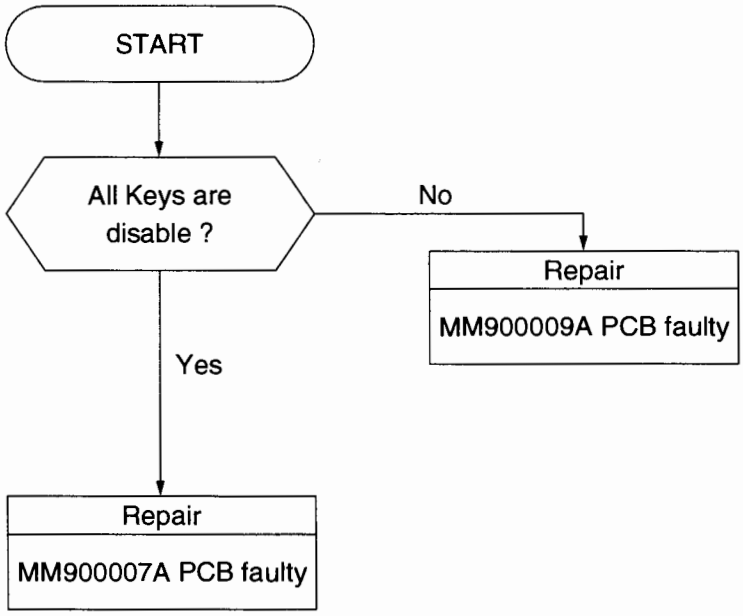
(1) Display doesn't light



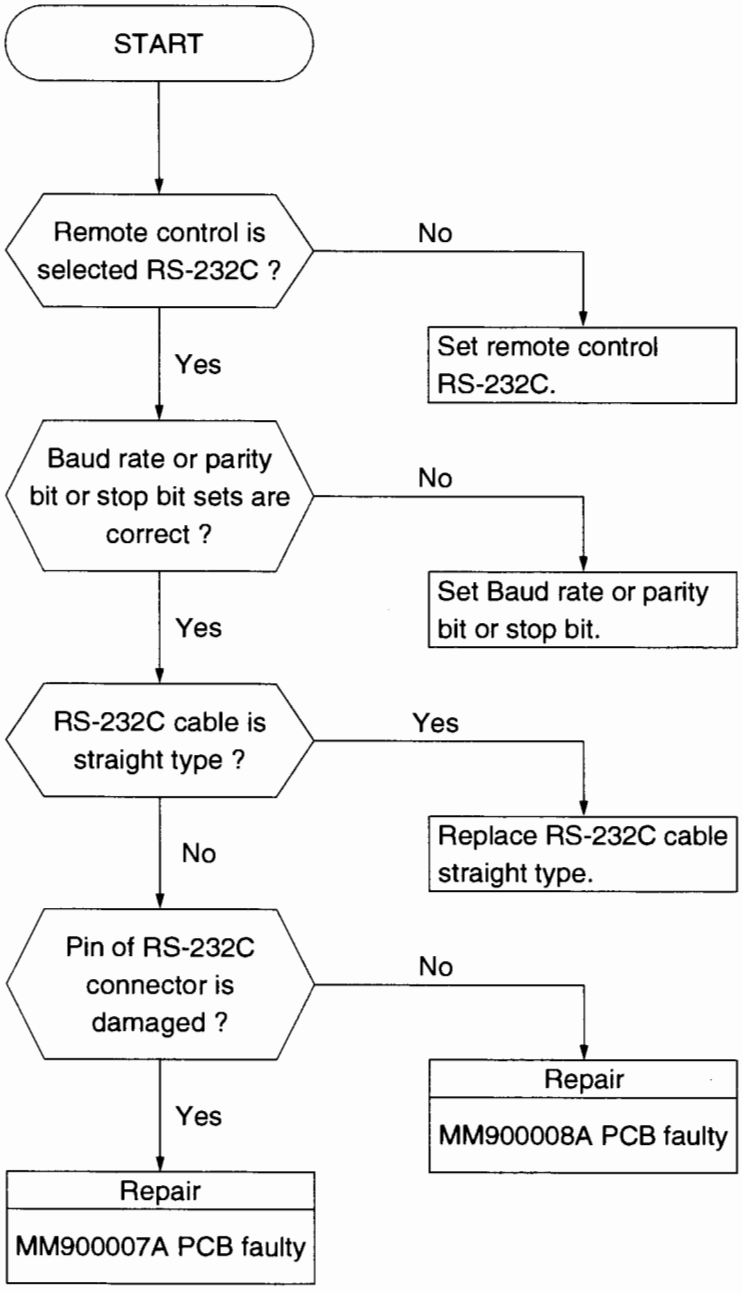
(2) Initial display doesn't end.



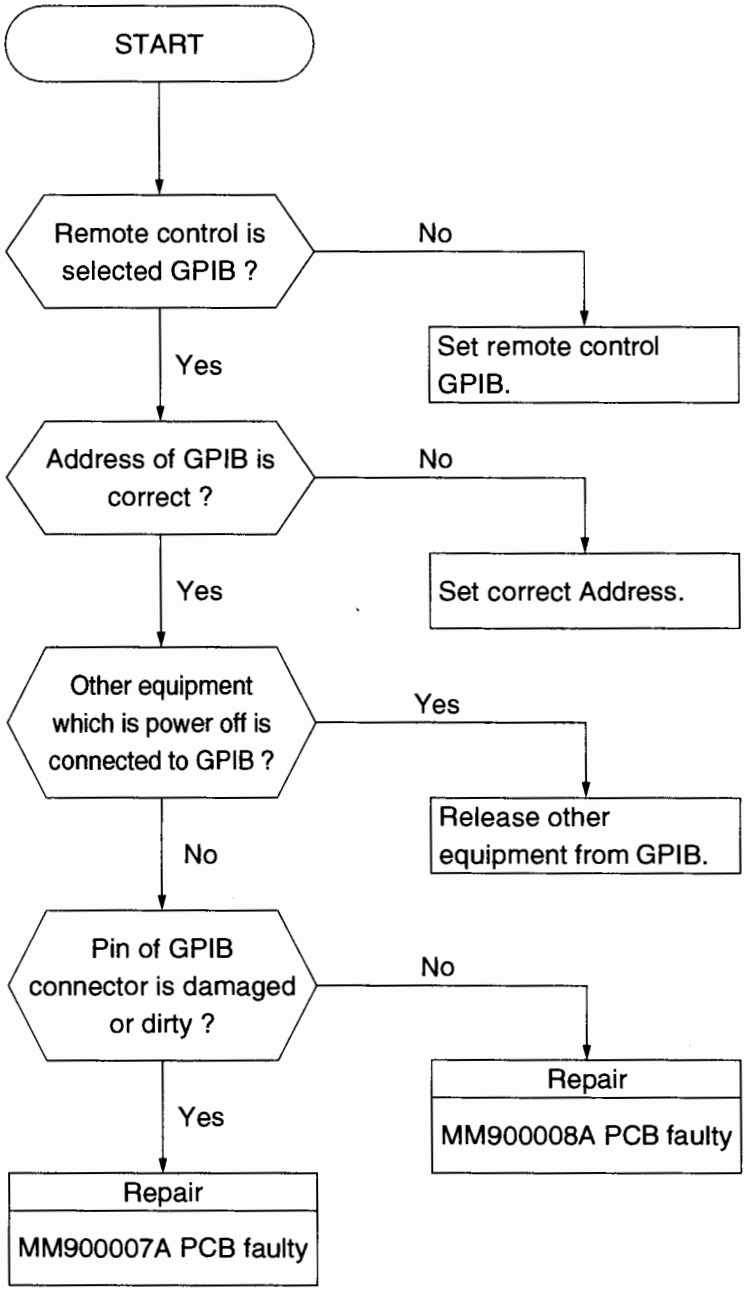
(3) Keys are disabled.



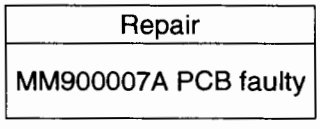
(4) RS-232C control is disabled.



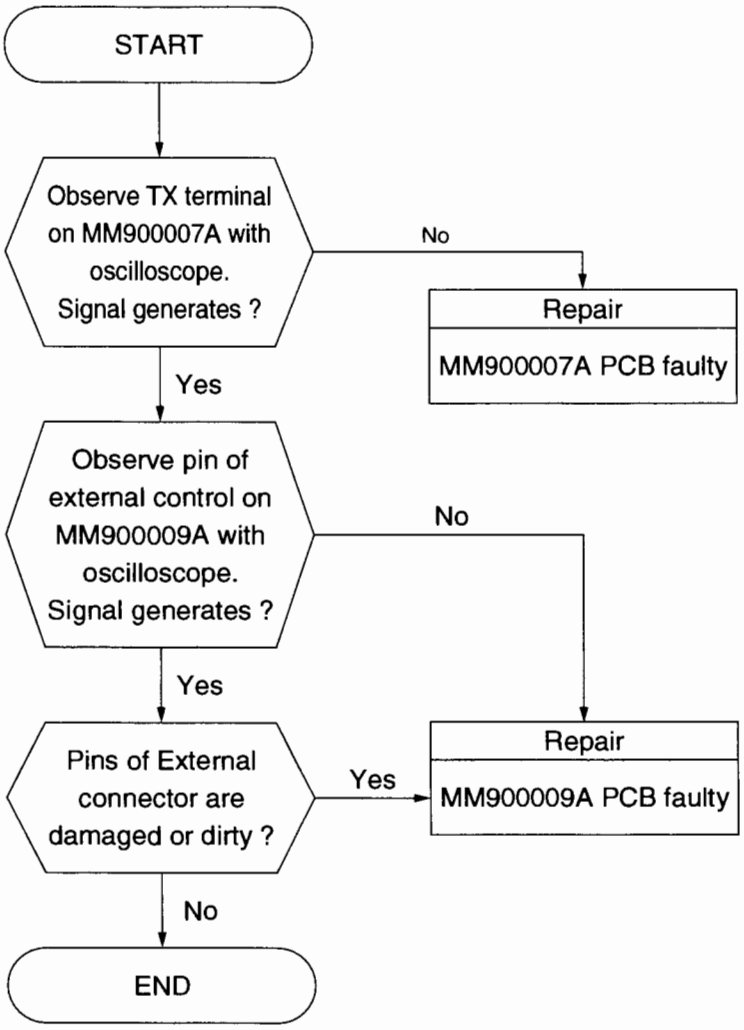
(5) GPIB control is disabled.



(6) Channel number backup is abnormal.



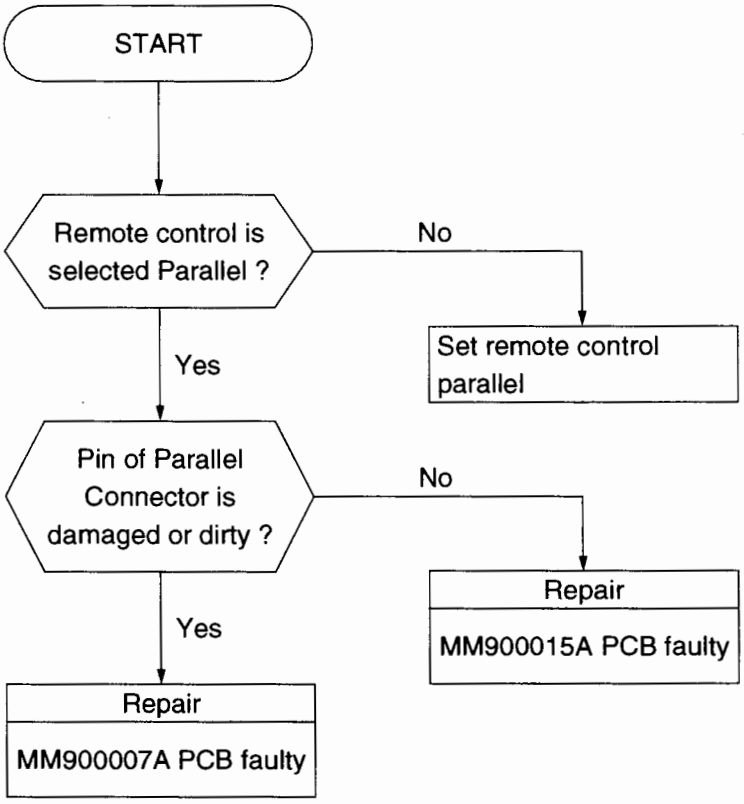
(7) External Control is disabled.



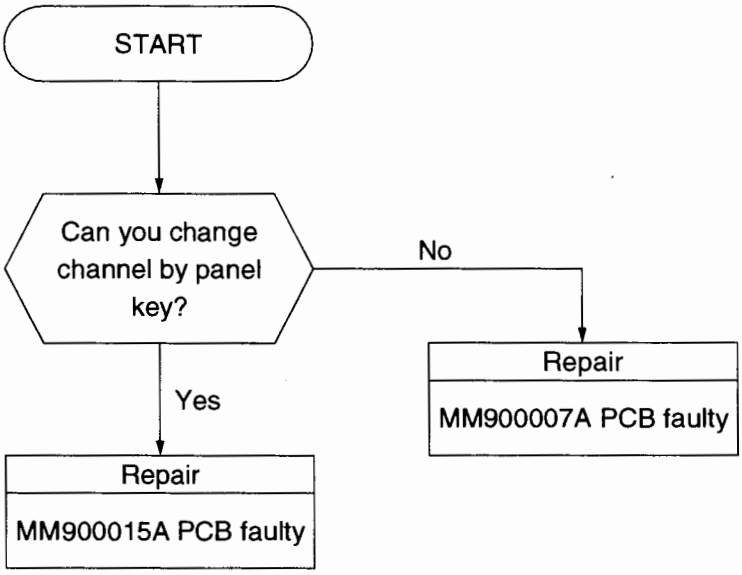
(8) Optical specification performance is out of specification.

Repair
MM900011A/MM900012A/ MM900013A/MM900014A Optical switch faulty

(9) Parallel control is disable.



(10) Contact Output is disable.



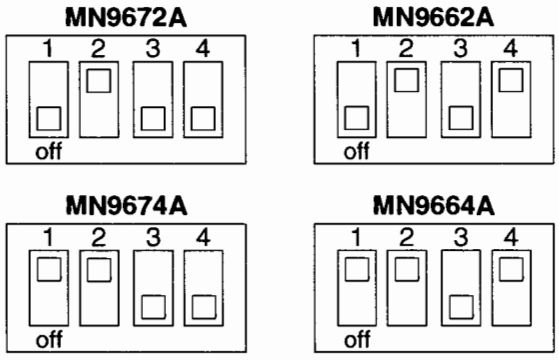
4.4 Adjustment

There are no adjustable parts on each P.C.B.

If you replace MM90010A, set DIP switch depends on model.

Fig 4-2 shows setting of DIP switch on MM900010A.

Fig. 4-2 Setting of DIP Switch



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