No. : OM-E4340-0F

FURUNO

OPERATOR'S MANUAL

A – D CONVERTER

MODEL AD – 100

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

920650KS (9206, shni)
PRINTED IN JAPAN

TABLE OF CONTENTS

SPECIFICATIONS OF AD-100 A-D CONVERTER

General

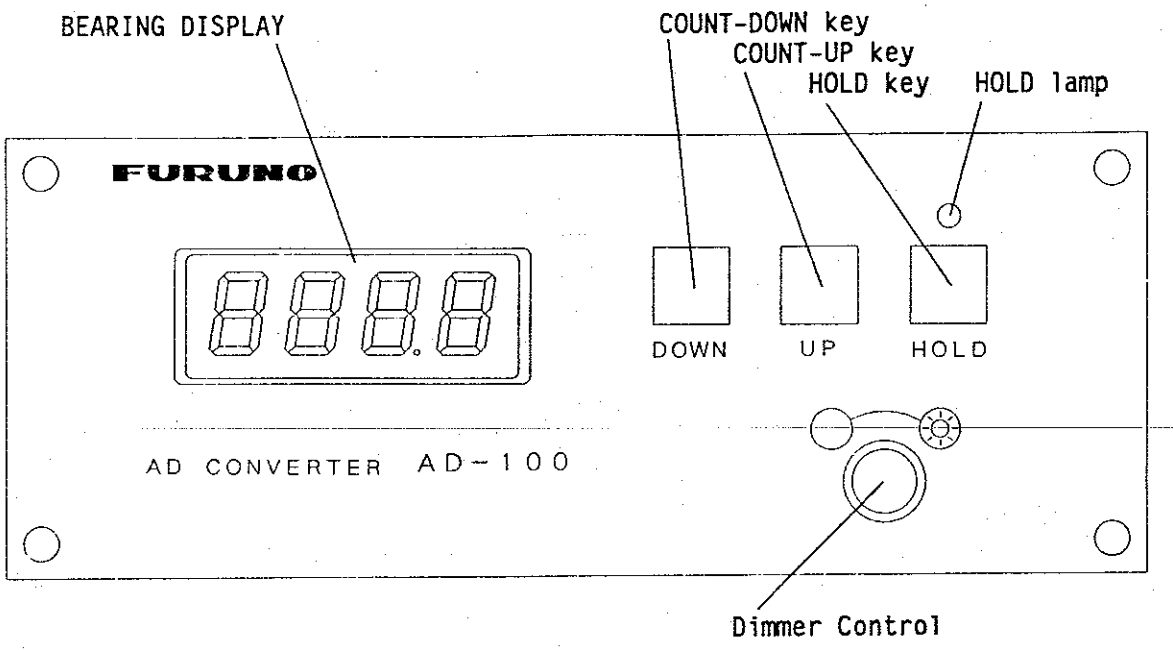
The AD-100 A-D converter converts the gyrocompass reading into digital coded bearing data and display it on a 4 digit LED display.
The digital bearing data output may be sent to navigation equipment such as radar, GPS navigator and autopilot.

Specifications

1. Input Signal	Gyro repeater signal (AC Synchro, DC Synchro or Step-by-Step) DIP switch provided to select input signal.
2. Input Voltage	AC Synchro Type -- 20VAC to 135VAC (Rotor) 20VAC to 135VAC (Stator) 50/60Hz, 400Hz or 500Hz DC Synchro Type -- 20VDC to 100VDC (Rotor) 20VDC to 100VDC (Stator) Step-by-step ----- 20VDC to 100VDC
3. Power Consumption	Less than 5W
4. Tracking Speed	30°/sec
5. Bearing Display	4 digit LED display
6. Data Output	AD-10S format --- Photo-coupler driver type, 4 digit BCD code, MSB transmission order. NMEA0183 -------- $AGHDT,xxx,T,<CR><LF> $AGVHW,xxx,T,,,,,,<CR><LF>
7. Output Ports	AD-10S format --- 6 ports NMEA0183 -------- 1 port
8. Data Transmission Interval	AD-10S format --- Switchable between 25ms and 200ms. Use 25ms for radar only. NMEA0183 -------- Switchable between 1s and 2s.
9. Color	Cabinet --------- 2.5GY 5/1.5 Newtone No.5 Front Panel ----- N3.0

CHAPTER 1 OPERATION

1. FRONT PANEL



FRONT PANEL

2. OPERATION

(1) Adjust the brightness of the Bearing Display and the backlighting of the keys with the Dimmer Control

(2) After the gyrocompass reading stabilizes, adjust the bearing display with the COUNT-UP or COUNT-DOWN keys.
Each pressing of the key changes the display by 0.1 degrees. For faster change, press and hold down the key to change the display in 1.0 degree steps.

(3) To freeze the display, press the Hold key. The HOLD lamp lights. To restart the display press the Hold key.
Since the computing circuit is disengaged from the gyrocompass during hold, readjust the display so it agrees with the gyrocompass reading.

3. CORRECTION OF THE BEARING DISPLAY

The bearing display is backed up by a battery when the power is turned off, so it is not necessary to adjust the display when you turn on the unit. However it is a good idea to check the display for correctness before each departure.

EQUIPMENT LIST

COMPLETE SET

No.	Name	Type	Code NO.	Qty	Remarks
1	Main Unit	AD-100	000-040-104	1	
2	Accessories	FP64-00400	000-040-107	1	
3	Installation Materials	CP64-00500	000-040-106	1	
4	Spare Parts	SP64-00400	000-040-105	1	

ACCESSORIES

No.	Name	Type	Code NO.	Qty	Remarks
1	Tapping Screw	5x20 SUS304	000-802-081	4	
2	Knob Bolt	KT-B M6x10	000-861-924	2	
3	Flat Washer	M5 SUS304	000-864-128	4	
4	Flat Washer	M6 SUS304	000-864-129	2	
5	Hanger Bracket	RUA-1003	380-010-030	1	

INSTALLATION MATERIALS

No.	Name	Type	Code NO.	Qty	Remarks
1	NH Connector Assembly	64-45 (5P)	004-441-960	6	
2	NH Connector Assembly	64-46 (3P)	004-411-970	1	
3	NH Connector Assembly	64-47 (5P)	004-411-980	1	
4	NH Connector Assembly	64-48 (3P)	004-411-990	1	
5	Heat-shrink Tube	5x0.25 0.1m	000-117-772	2	Black
6	Heat-shrink Tube	3x0.25 1m	000-568-172	1	Black

SPARE PARTS

No.	Name	Type	Code NO.	Qty	Remarks
1	Glass Tube Fuse	FGMB 2A 250V	000-122-000	4	

CHAPTER 2 MAINTENANCE

1. FUSE REPLACEMENT

To protect the unit from serious damage, four 2A fuses are provided on a P.C. board. The fuses protect against overvoltage or internal fault of the equipment. If a fuse blows, find the cause of the problem before replacing it.

CAUTION

Do not use a fuse rated more than 2A, since it may cause more serious damage to the equipment.

2. MINOR TROUBLESHOOTING

Operating problems are most likely caused by loose connectors or wrong setting of DIP switches. The table below provides simple troubleshooting which can be done by the operator.

Symptom	Possible Cause	Remedy
No display	*Dimmer control turned fully CCW. *Gyrocompass not on *External power supply is turned off. *Flat cable between the two P.C. Board is loose. is loose *Blown fuse *No power because of wrong jumper setting. *Gyrocompass not connected.	*Turn the control clockwise. *Turn on the power. *Turn on the power. *Reconnect. *Check supply voltage. Replace fuse. *Correct JP1, JP4 and JP5 to the right setting. *Connect gyrocompass.
Display is fixed on "000.0".	*DIP switch SW1 is set wrong.	*Correct the setting.
No data output	*Loose data output connector *JP6 and/or JP7 not connected.	*Tighten the connector *Connect JP6 and JP7
Bearing display is frozen.	*HOLD function is turned.	*Press HOLD key to release release the HOLD function

- continued -

Symptom	Possible Cause	Remedy
The bearing display deviates often.	*Jumpers and DIP switches are set wrong.	*Correct the setting.
Key input not accepted	*Defective keyboard	*Call for service.

The status of the LEDs on the Processor Board show equipment condition.

CR21	CR22	
OFF	OFF	No power
OFF	ON	Power supply less than 5V
BLINK	OFF	Defective CR22
BLINK	ON	Power supply and CPU are normal

3. SELF TEST

The AD-100 employs Self tests to check it for proper operation. These are as follows.

*Display LED test
*Analog Data Input Test
*DIP SW Setting Display
*Program Version Display
*Key Input Test

1) Sequence

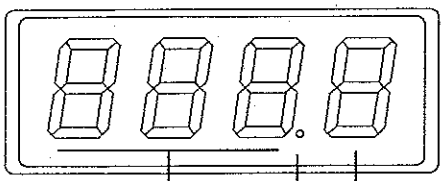
DISPLAY LED TEST

*The HOLD lamp and all the segments on the display lights for 1 sec.
*The display changes from "0000", "1111" -- "8888" "9999". every 1 sec.

ANALOG DATA INPUT TEST

*The input data of S1, S2, S3, R1, R2 alternately appears on the LED for 1 sec. (This test is for factory use only.)

LED Display



- Continued -

DIP SW Setting Display

*The value shown in the table on the next page appears for 1 sec.
*Refer to "2) LED status according to DIP SW setting"

Program Version Display

*Version number appears for 1 sec.

DIP SW2-5

"ON" — Continuous

*Continuous test

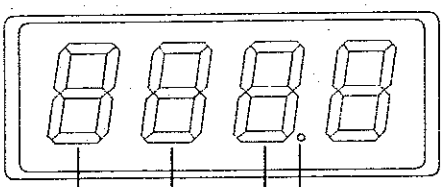
"OFF" — One Cycle

*Normal operation is restored upon completion of the test.

Key Input Test

The key input test may be done at any time during the Self test. Press the COUNT-UP key, COUNT-DOWN key or HOLD key to enable the key input test.

LED Display



Decimal point

Each pressing of the HOLD key displays "0" or "1".

Each pressing of the COUNT-UP key displays "0" or "1".

Each pressing of the COUNT-DOWN key displays "0" or "1".

To exit from the key input test and return to self test:

Press COUNT-UP and COUNT-DOWN keys together.

2) LED status according to DIP switch setting

LED for 100 degree place	SW1-1	SW1-2	SW1-3	REMARKS
0	OFF	OFF	OFF	360x
1	ON	OFF	OFF	180x
2	OFF	ON	OFF	90x
3	ON	ON	OFF	36x
4	OFF	OFF	ON	Not used
5	ON	OFF	ON	Not used
6	OFF	ON	ON	Not used
7	ON	ON	ON	Not used

LED for 10 degree place	SW1-4	SW1-5	SW1-6	REMARKS
0	OFF	OFF	OFF	AC/DC Synchro
1	ON	OFF	OFF	DC Step
2	OFF	ON	OFF	Full Wave Pulsating Current
3	ON	ON	OFF	Half Wave Pulsating Current
4	OFF	OFF	ON	Not used
5	ON	OFF	ON	Not used
6	OFF	ON	ON	Not used
7	ON	ON	ON	Not used

LED for 1 degree place	SW1-7	SW1-8	REMARKS
0	OFF	OFF	50/60Hz
1	OFF	ON	400HZ
2	ON	OFF	500HZ
3	ON	ON	DC

LED for 0.1 degree place	SW2-1	SW2-2	SW2-3	REMARKS
0	OFF	OFF	OFF	The setting of these three DIP switches is decided according to stator voltage and rotor voltage.
1	ON	OFF	OFF	
2	OFF	ON	OFF	
3	ON	ON	OFF	
4	OFF	OFF	ON	
5	ON	OFF	ON	
6	OFF	ON	ON	

CHAPTER 3 INSTALLATION

1. INSTALLATION

1) General notes on installation

This equipment provides its intended function only when it is installed properly. The installation site is important for proper operation and continued performance. Select it keeping the following points in mind.

1) Keep away from water spray.

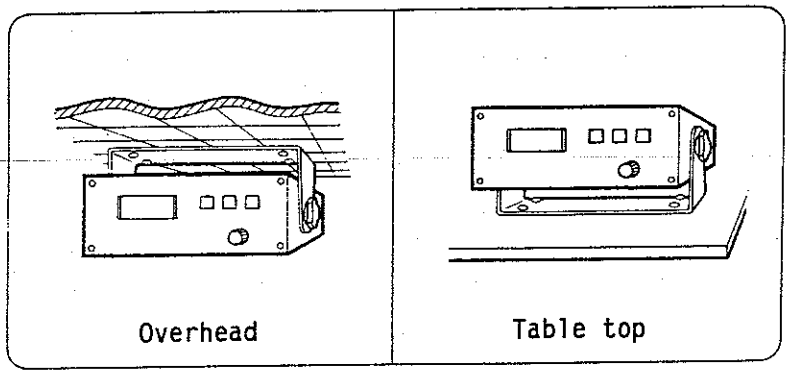
2) Select a clean and cool place.

3) Select a place where shock, vibration and noise are minimal.

> **NOTE**
>
> FURUNO will assume no responsibility for the damage caused by water spray.

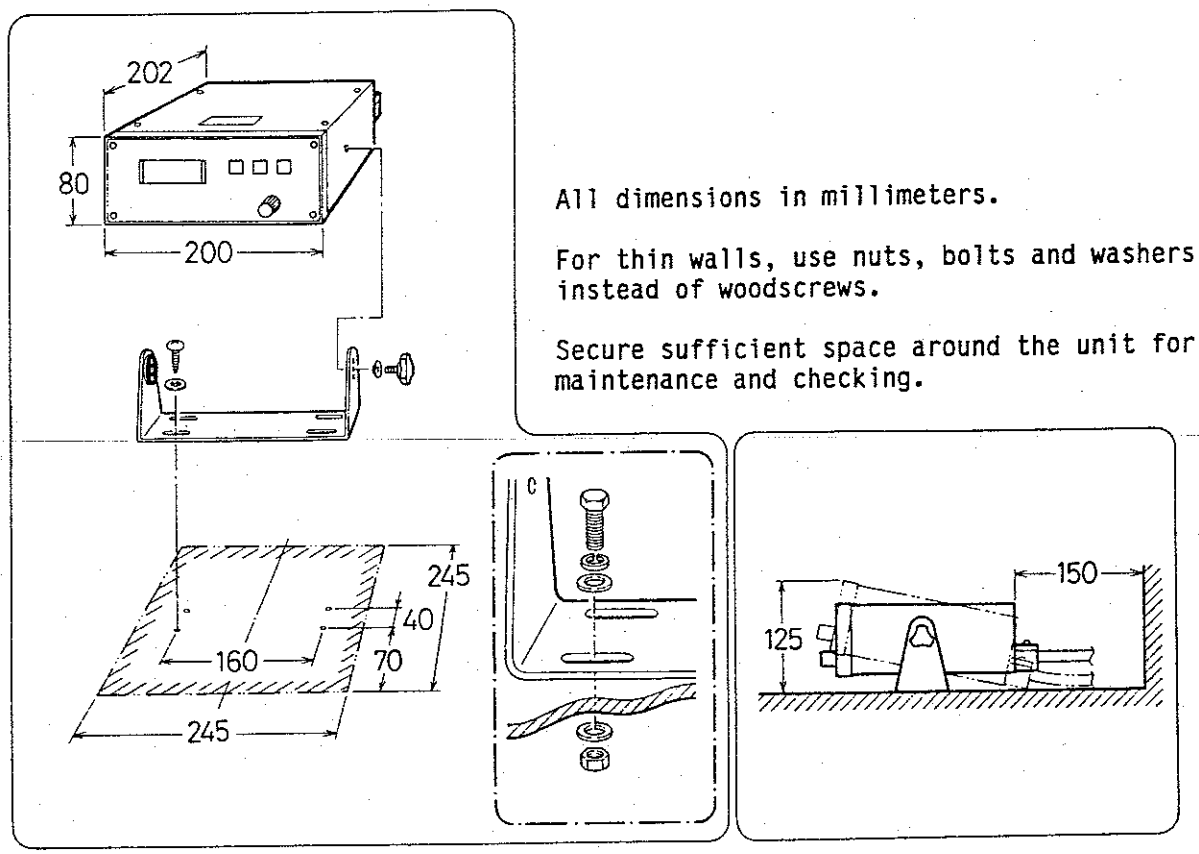
2) Mounting the unit

The equipment can be mounted on the overhead or a table top. Ensure the mounting location is strong enough to support the unit under the condition of shock and vibration normally encountered onboard the vessel. If necessary, reinforce the mounting location with a lining block or doubling plate.



Overhead | Table top

3) Mounting dimensions



All dimensions in millimeters.

For thin walls, use nuts, bolts and washers instead of woodscrews.

Secure sufficient space around the unit for maintenance and checking.

4) Mounting procedure

(1) Drill pilot holes for the hanger.

(2) Fix the hanger with tapping screws (supplied).
For thin walls, use bolts and nuts instead of the tapping screws.

(3) Set the equipment to the hanger. Orient the unit for optimum viewing angle and tighten the knob screws.

2. CABLE CONNECTION

The connection between the A-D converter and a gyrocompass requires a 5C cable (250V-MPYCS-5 or equivalent). For the connection between the A-D converter and radar, satellite navigator, GPS receiver, doppler sonar, current indicator, etc., 5P cable (CO-SPEVV-SB-C 0.2sq) is required.

1) Fabrication of 5C cable

(1) Remove the outer sheath by 70mm.

(2) Remove the armor and sheath by 30mm.

(3) Separate the cores from the braided shield.

(4) Expose the core for 3mm. Cut and solder unused cores to the shield.

(5) Dress the shield with vinyl tape leaving 3mm of the it exposed.

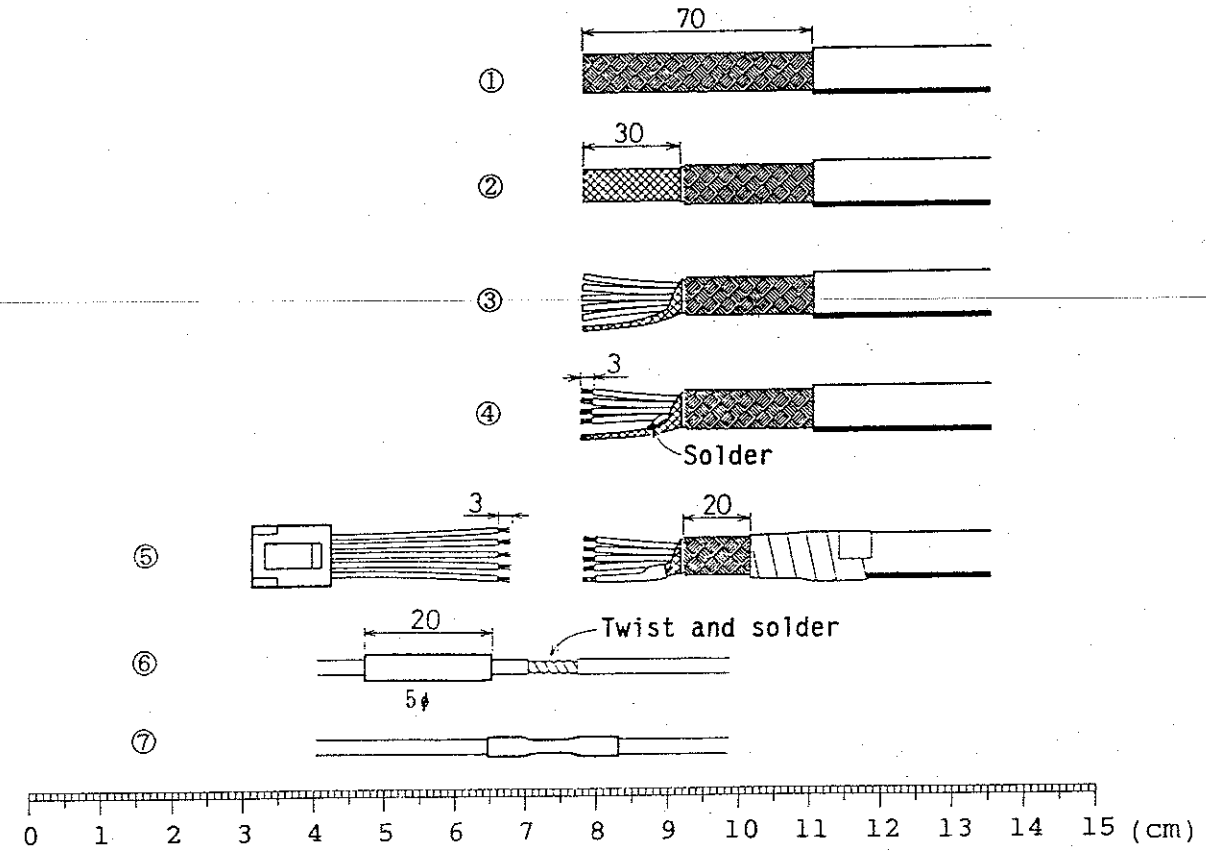
(6) Dress the end of armor with vinyl tape leaving 20mm of the it exposed.

(7) Remove the cable of VH connector (supplied) by 3mm.

(8) Pass the cable through heat shrink tube. Solder cable and core.

(9) Heat the heat shrink tube.

Note : Ground the armor through the cable clamp.



2) Fabrication of 5 pair cable

(1) Remove the outer sheath by 70mm.

(2) Remove the armor and sheath by 30mm.

(3) Separate the cores from the braided shield.

(4) Expose the cables for 3mm. Cut and solder unused cores to the shield.

(5) Dress the shield with vinyl tape leaving 3mm of the it exposed.

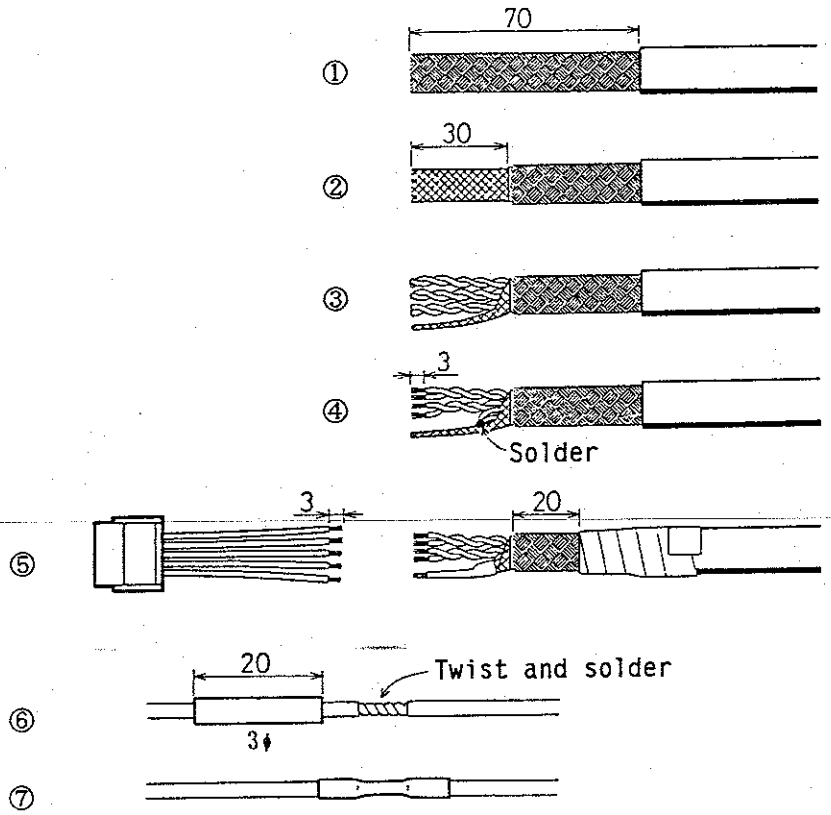
(6) Dress the end of armor with vinyl tape leaving 20mm of the it exposed.

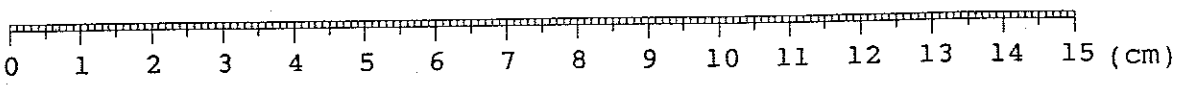
(7) Remove the cable of NH connector (supplied) by 3mm.

(8) Pass the cable through heat shrink tube. Solder cable and core.

(9) Heat the heat shrink tube.

Note : Ground the armor through the cable clamp.





3. EXTERNAL POWER SUPPLY

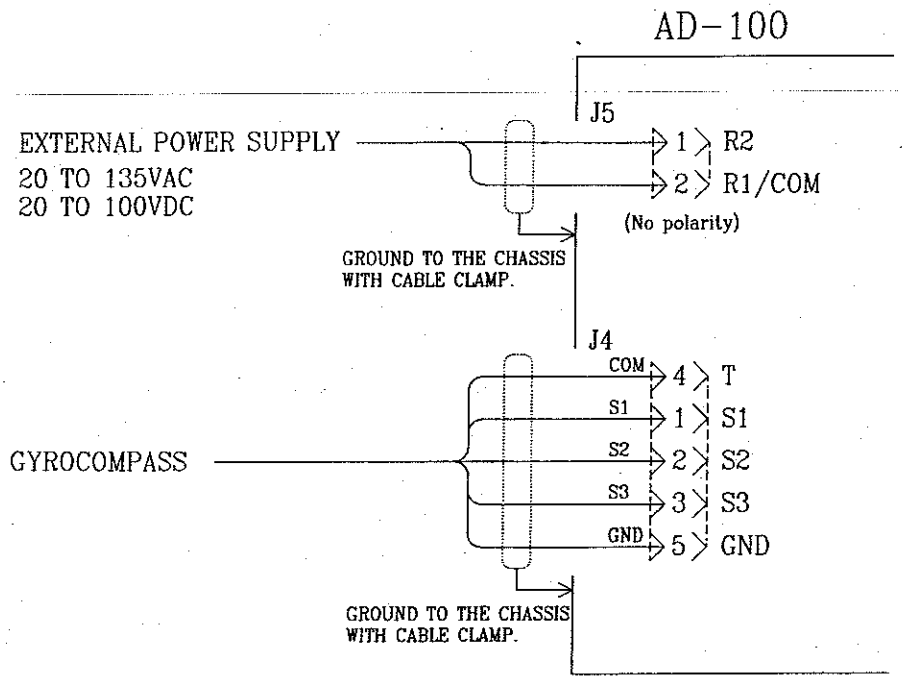
An external power supply is required when a DC Step-by-step gyrocompass is used since it cannot supply 5W or 20V.

1) Jumper wire

If an external power supply is used, remove jumper wire JP1.

2) Cable connection

Connect cables as shown below.



4. SETTING THE DIP SWITCHES AND JUMPER WIRES

The AD-100 can accommodate various brands and specifications of gyrocompasses by means of DIP switches and jumper wires. Below are the specifications of the gyrocompass it can accommodate and the next page shows DIP switch and jumper settings for various brands of gyrocompasses.

•AC synchro

*Frequency : 50/60Hz 400Hz 500Hz
*Rotor Voltage : _____VAC
*Stator Voltage : _____VAC
*Gear Ratio : 360x 180x 90x 36x

•DC synchro

*Frequency : 50/60Hz 400Hz 500Hz
*Rotor Voltage : _____VDC
*Stator Voltage : _____VDC
*Gear Ratio : 360x 180x 90x 36x

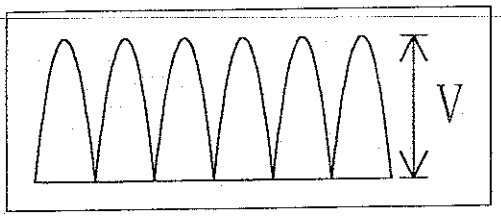
•DC step-by-step

*Supplied Power : _____VDC
*Gear Ratio : 360x 180x 90x 36x

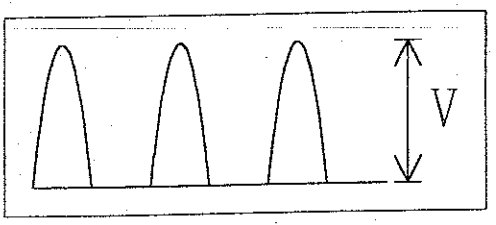
•Full/Half wave pulsating current

*Frequency : 50/60Hz 400Hz 500Hz
*Supplied Power : _____VDC
*Gear Ratio : 360x 180x 90X 36x

Full wave pulsating current



Half wave pulsating current



1) DIP switch and jumper wire setting

MANUFACTURER	MODEL	SPECIFICATIONS	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8	SW2-1	SW2-2	SW2-3	JP1	JP2	JP3	JP4	JP5
FURUNO	GY-700	DC STEP-BY-STEP 100V 180x 5 WIRES OPEN COL- LECTOR COUPLING	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	OFF	OFF	#4,#5,#6	#2	-	#1	#1
ANSCHUTZ	STANDARD 2/3	AC SYNCHRO 50/60Hz ROTOR :50/60V STATOR:22V 360x	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	#1,#2,#3	#2	#2	#1	#1
	STANDARD 4/6	AC SYNCHRO 50/60Hz ROTOR :50/60V STATOR:90V 360x	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	#1,#2,#3	#2	#1	#1	#1
YOKOKAWA NAVTEC [PLATH TYPE]	C-1/1A/2/3 A-55, B-55	AC SYNCHRO 50/60Hz ROTOR :50/60V STATOR:22V 360x	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	#1,#2,#3	#2	#2	#1	#1
	CMZ-100/200 C-Jr, D-1Z/1/3, IPS-2/3	AC SYNCHRO 50/60Hz ROTOR :100V STATOR:90V 360x	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	#1,#2,#3	#1	#1	#1	#1
	CMZ-250X/300	DC SYNCHRO 360x	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	-	ON	OFF	Detach	#2	-	*	*
PLATH	NAVGAT II/III	AC SYNCHRO 50/60Hz ROTOR :50/60V STATOR:68V 360x	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	#1,#2,#3	#2	#2	#1	#1
TOKIMEC [SPERRY TYPE]	ES-1/2/11 GLT-101/102/103/ 106K/107	AC SYNCHRO 50/60Hz ROTOR :100/110V STATOR:90V 36x	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	#1,#2,#3	#1	#1	#1	#1
	ES-11A TG-200 PR222R PR237L/H GH-21	AC SYNCHRO 50/60Hz ROTOR :100/110V STATOR:90V 90x	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	#1,#2,#3	#1	#1	#1	#1
	MK-14 MOD-1/2/T MK-EN, MK-EI	DC STEP-BY-STEP 70V 180x COM(-), 3 WIRES(+)	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	OFF	OFF	#4,#5,#6	#2	-	#1	#1
	SR-130/140	DC STEP-BY-STEP 70V 180x 5 WIRES OPEN COL- LECTOR COUPLING	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	OFF	OFF	#4,#5,#6	#2	-	#1	#1
	TG-100·5000 PR-357/130/140 ES17 GLT-201/202/203	DC STEP-BY-STEP 70V 180x COM(+), 3 WIRES(-)	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	OFF	OFF	#4,#5,#6	#2	-	#1	#1
	SR-120, ES-16, MK-20	DC STEP-BY-STEP 35V 180x COM(+), 3 WIRES(-)	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	ON	OFF	#4,#5,#6	#2	-	#2	#2
ARMABROWN	MK-10, MKL-1, SERIES 1351, MOD-4	DC STEP-BY-STEP 50V 180x COM(+), 3 WIRES(-)	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	OFF	OFF	#4,#5,#6	#2	-	#1	#1
ROBERTSON	SKR-80	DC STEP-BY-STEP 35V 180x COM(-), 3 WIRES(+)	ON	OFF	OFF	ON	OFF	OFF	ON	ON	-	ON	OFF	#4,#5,#6	#2	-	#2	#2

*: Set JP4 and JP5 according to the voltage of the external power supply.

2) Default setting

This unit is set at the factory for connection with the gyrocompass specifications tabulated below. This is the default setting for DIP switches and jumper wires; all DIP Switches off, all jumper wire set for #1.

1) Type	:	AC synchro
2) Frequency	:	50/60Hz
3) Rotor Voltage	:	Between 60VAC and 135VAC
4) Stator Voltage	:	Between 60VAC and 135VAC
5) Gear Ratio	:	360x
6) Supplied Power	:	Between 30VAC and 135VAC

3) Setting procedure

(1) Type of gyrocompass

Type	SW1-4	SW1-5	SW1-6	JP1
AC Synchro	OFF	OFF	OFF	#1, #2, #3
DC Synchro	OFF	OFF	OFF	#2, #3, #4
DC step-by-step	ON	OFF	OFF	#4, #5, #6
Fullwave pulsating current	OFF	ON	OFF	#4, #5, #6
Halfwave pulsating current	ON	ON	OFF	#4, #5, #6

(2) Frequency

Frequency	SW1-7	SW1-8
50/60Hz	OFF	OFF
400Hz	ON	OFF
500Hz	OFF	ON
DC	ON	ON

(3) Rotor voltage
This is for AC synchro type gyrocompass only. For the rotor voltage of the DC synchro type will be at step 6.

Rotor Voltage	SW2-1	JP3
20 to 45VAC	ON	#2
30 to 70VAC	OFF	#2
40 to 90VAC	ON	#1
60 to 135VAC	OFF	#1

(4) Stator voltage

Stator Voltage	SW2-2	SW2-3	JP2
20 to 45VAC	ON	OFF	#2
30 to 70VAC	OFF	OFF	#2
40 to 90VAC	ON	OFF	#1
60 to 135VAC	OFF	OFF	#1
20 to 60VDC	ON	OFF	#2
40 to 100VDC	OFF	OFF	#2

- Continued -

(5) Gear ratio

Gear Ratio	SW1-1	SW1-2	SW1-3
x360	OFF	OFF	OFF
x180	ON	OFF	OFF
x 90	OFF	ON	OFF
x 36	ON	ON	OFF

(6) Power supply voltage

Voltage	JP4	JP5
20 to 45VAC	#2	#2
30 to 135VAC	#1	#1
20 to 60VDC	#2	#2
40 to 135VDC	#1	#1

(7) Data transmitting interval of NMEA0183

Interval	SW2-4
2 second	ON
1 second	OFF

(8) Data transmitting interval of AD-10S format

Select data transmitting interval for each port by changing the proper jumper wire on JP6 or JP7.
NOTE : Use the interval 25ms. for radar only.

END

4) Function of DIP switches and jumper wires

The function of each DIP switch and jumper wire is as listed below. Set them according to the specifications of the gyrocompass connected. After setting, reset CPU or turn the power off and then on again to write setting into the CPU.

(1) DIP Switch SW1 (1/2)

Segment	Function	Setting
SW1-1, -2, -3	Gear Ratio x360 x180 x 90 x 36	SW1-1 SW1-2 SW1-3 OFF OFF OFF ON OFF OFF OFF ON OFF ON ON OFF
SW1-4, -5, -6	Type of Gyrocompass AC Synchro DC Synchro DC Step Full Wave Pulsating Current Half Wave Pulsating Current	SW1-4 SW1-5 SW1-6 OFF OFF OFF OFF OFF OFF ON OFF OFF OFF ON OFF ON ON OFF

DIP switch SW1 (2/2)

Segment	Function	Setting
SW1-7, -8	Frequency 50/60Hz 400Hz 500Hz DC	SW1-7 SW1-8 OFF OFF ON OFF OFF ON ON ON

(2) DIP switch SW2

Segment	Function	Setting
SW2-1	Rotor Voltage 20 to 90VAC 30 to 135AC	SW2-1 ON OFF
SW2-2, -3	Stator Voltage 20 to 90VAC or 20 to 60VDC 30 to 135VAC or 40 to 100VDC	SW2-2 SW2-3 ON OFF OFF OFF
SW2-4	Output interval of NMEA 2 second 1 second	SW2-4 ON OFF
SW2-5	Self test Continuous One Cycle	SW2-5 ON OFF
SW2-6, -7	Not used	
SW2-8	Reset CPU Normally OFF	Turn ON and OFF to reset CPU.

Jumper JP1

Segment	Function	Setting
#1, #2, #3	Type of Gyrocompass AC Synchro DC Synchro DC Step Full Wave Pulsating Current Half Wave Pulsating Current	 #1, #2, #3 #2, #3, #4 #4, #5, #6 #4, #5, #6 #4, #5, #6

Jumper JP2

Segment	Function	Setting
	Stator Voltage 20 to 70VAC or 20 to 100VDC 40 to 135VAC	 #2 #1

Jumper JP3

Segment	Function	Setting
	Rotor Voltage 20 to 70VAC 40 to 135VAC	 #2 #1

Jumper JP4

Segment	Function	Setting
	Power Supply 20 to 45VAC or 20 to 60VDC 30 to 135VAC or 40 to 100VDC	 #2 #1

Jumper JP5

Segment	Function	Setting
	Power Supply 20 to 45VAC or 20 to 60VDC 30 to 135VAC or 40 to 100VDC	 #2 #1

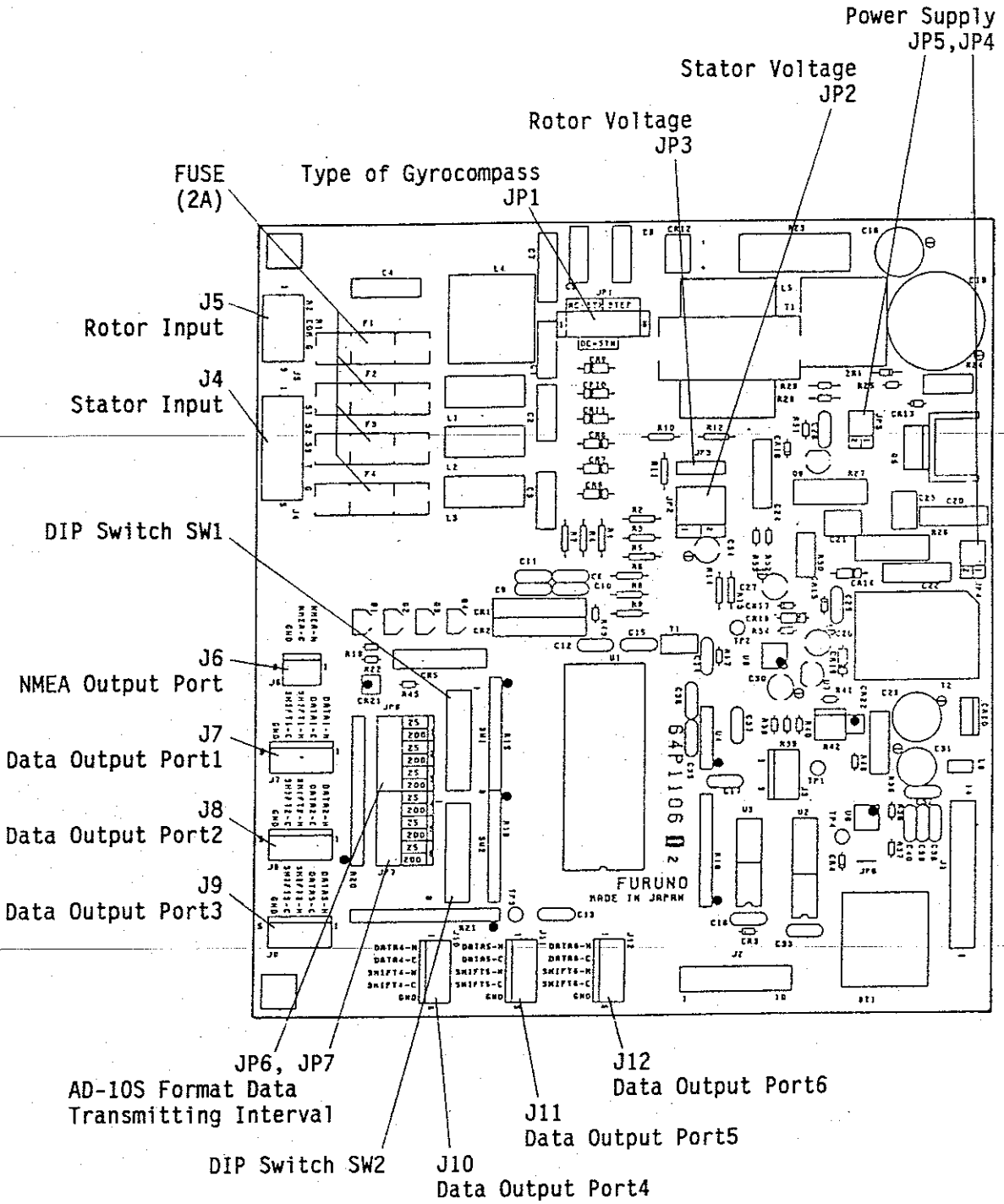
5. INITIALIZING THE UNIT

(1) Adjust the brightness of the Bearing Display and backlighting for the keys with the Dimmer Control.

(2) Press the HOLD key to disengage the computing circuit from the gyrocompass. The HOLD lamp lights.

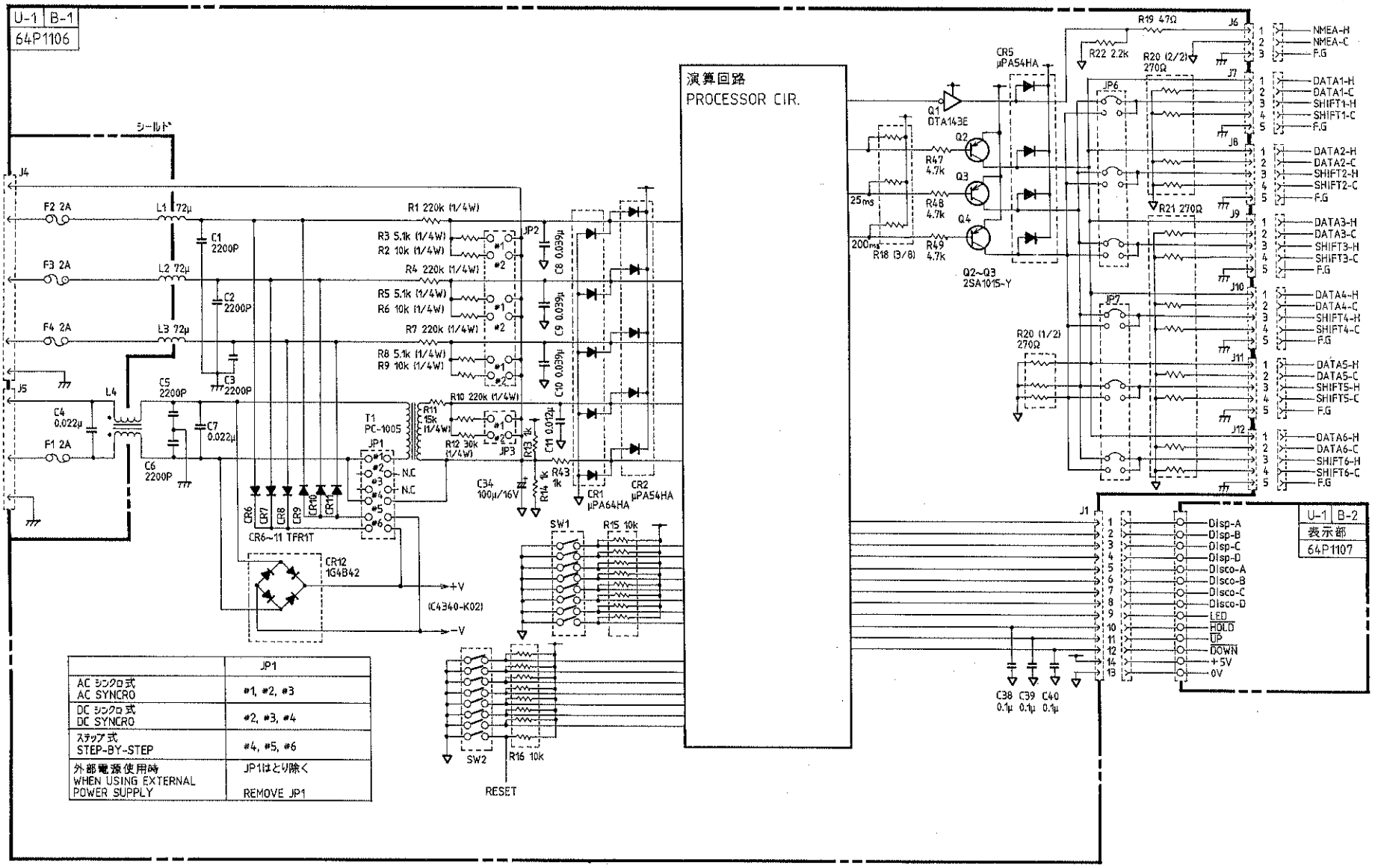
(3) After the gyrocompass reading stabilizes, adjust the bearing display with the COUNT-UP or COUNT-DOWN keys.
Each pressing of the key changes the display by 0.1 degrees. For faster change, press and hold down the key to change the display in 1.0 degree steps.

(4) To freeze the display, press the Hold key. The HOLD lamp lights. To restart the display press the Hold key.
Since the computing circuit is disengaged from the gyrocompass during hold, readjust the display so it agrees with the gyrocompass reading.



PROCESSOR BOARD 64P1106

FURUNO



	JP1
AC シンクロ式 AC SYNCRO	#1, #2, #3
DC シンクロ式 DC SYNCRO	#2, #3, #4
ステップ式 STEP-BY-STEP	#4, #5, #6
外部電源使用時 WHEN USING EXTERNAL POWER SUPPLY	JP1はとり除く REMOVE JP1

注意 ： 単位記入なき抵抗はΩ, コンデンサはF, コイルはHとする。

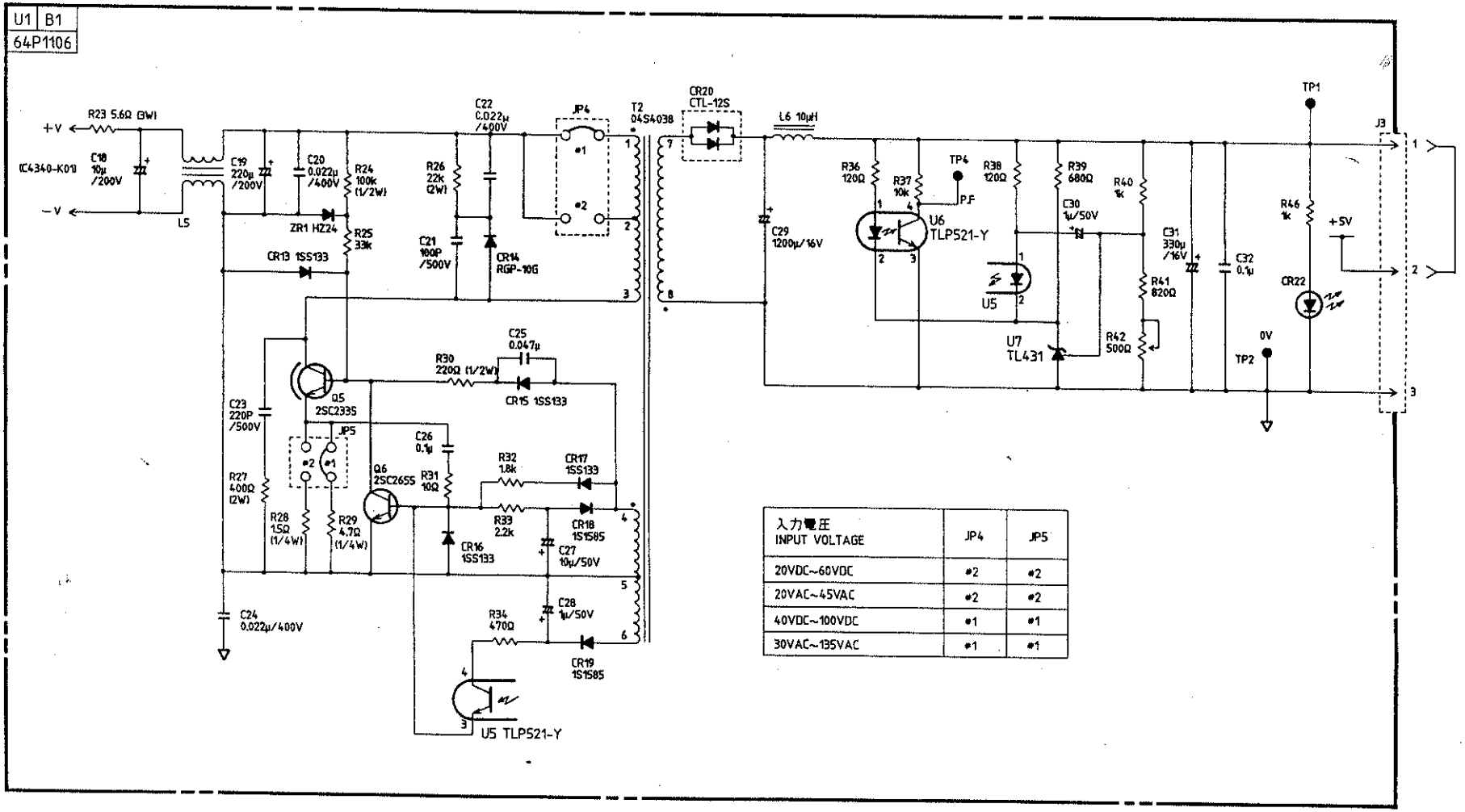
NOTE : UNLESS OTHERWISE SPECIFIED, RESISTANCE IN OHMS, CAPACITANCE IN FARADS AND INDUCTANCE IN HENRY.

承認 APPROVED	Sep. 4. '90 T.NAKAJO	名称 TITLE	AD-100 演算部基板(1/2) PROCESSOR BOARD (1/2)
検図 CHECKED	Sep. 4. '90 N.SAITO		
製図 DRAWN	Sept. 4. '90 S.Nishi	図番 DWG.NO.	C4340-K01-D

FURUNO ELECTRIC CO., LTD

FURUNO

U1 B1
64P1106



入力電圧 INPUT VOLTAGE	JP4	JP5
20VDC~60VDC	#2	#2
20VAC~45VAC	#2	#2
40VDC~100VDC	#1	#1
30VAC~135VAC	#1	#1

注意 : 単位記入なき抵抗はΩ, コンデンサはF, コイルはHとする。

NOTE : UNLESS OTHERWISE SPECIFIED, RESISTANCE IN OHMS CAPACITANCE IN FARADS AND INDUCTANCE IN HENRY.

承認 APPROVED	Sept. 4. '90 T. KAWAI	名称 TITLE	AD-100 演算部基板 (2/2) PROCESSOR BOARD (2/2)
検図 CHECKED	SEP. 4. '90		
製図 DRAWN	Sept. 4. '90 S. NISHI	図番 DWG. NO.	C4340-K02-B

FURUNO ELECTRIC CO., LTD.