INSTRUCTION MANUAL

FOR

MARINE QUARTZ CLOCK SYSTEM

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1. GENERAL

This clock system provided with an accuracy of weekly error of less than 2.1 second is constructed under the control of the master clock.

And designed for the use of vessels of the ocean service, deliberate consideration has been given to such conditions as vibration, temperature, humidity and handling.

2. WIRE CONNECTION

Use the convenient wire inlets for making connections, as they are provided at the backboard and the bottom of the case.

Put "AC" and "DC" switches of operating facilities to "OFF" positions before making connections.

Terminals for connection as follows;

AC 100V(8,9)	Input power source ; AC 100V 60Hz
	Use non interrupted power service.
DC 24V(-10,+11)	Input power source ; DC 24V
L4,L5	Logger circuit ; 30 second polarized signal
LC	Common for logger ; (+24V)
LR	Holding reverse ; (0V)
LA	Holding adjustment ; (0V)
EARTH(1)	Earth ; It is accommodated at the case of master clock.
30 SEC. (H1,H2,H3)	30 second polarized signal for 2 hands type slave clock.
	DC 24V, 1500Ω
	Up to 40 slave clocks connectable.
	There are two circuits, and either of connecting.
60Hz(4,5)	Standard time slave clock with sweep running second hand.
	AC 20V, 60Hz slave clock with second hand type up to 5.
ALARM(T₁,T₂)	External alarm circuit.
	Output of making contact points.
RADIO SIGNAL (P₁,P₂)	Signal of the monitor for the radio standard time signal.
	Use the speaker with ratings of 0.2W and 600Ω

3. OPERATION

Operating facilities are arranged in the small cover of the lower part of the door, and on the control PCB (Printed Circuit Board) in the case.

For the arrangement of operating facilities, Please refer to fig. 1.

Before using this clock system, put each operating facilities to following positions.

		(position)
①	"AC" power switch	" OFF "
②	"DC" power switch	" OFF "
③	"Dimmer" switch	" OFF "
④	"SEC.HAND" switch	" STOP "
⑤	"LOCAL TIME ADJ." switch of the hand directions	" ADV. "
⑥	"LOCAL TIME ADJ." digital switch	" 00 "
⑧	"LOCAL TIME ADJ." switch of change-over	" OFF"
⑨	"RADIO SIGNAL" volume dial switch	" OFF "
	"OPERATION" switch on the PCB	" QUARTZ "

* START

3-1   Put "AC" switch① to "ON" position.

3-2   Put "AC" switch② to "ON" position.

3-3   Put "SEC.HAND" switch④ for the second hand stopping to "NOR." position, then the second hand of STANDARD TIME begins to start.

3-4   Put "LOCAL TIME ADJ." switch⑧ for change-over to "NOR." position, then the master clock is to set the normal operation.

3-5   Operation change-over

Put "OPERATION" switch of control PCB to "SHIP'S" position, if the master clock stops operation because of the failure of quartz oscillator.

The master clock will supply the signal with rotating motor by receiving AC power service of vessel.

In this case, the clock accuracy depends on the generator of the vessel.

3-6   AC operation or DC operation

The clock system is usually operated by AC power but it can be kept on operating automatically by changing over to DC power in case of the failure of AC power service.

3-7   Dimmer

"Dimmer" switch③ can control the brightness of lighting on dial plate. It can be change into three state.

"BRIGHT", "DARK" and "OFF"

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3-8   Monitor for the radio standard time signal

In case of the second hand adjustment of the master clock,

it will be able to monitor the radio standard time signal by turning

"RADIO SIGNAL" dial⑨ to clockwise, and to adjust a volume by turning

the dial.

Turn the dial to "OFF" position at the normal operation which has

unnecessary to monitor the radio standard time signal.

4. TIME CORRECTING

4-1   Hands adjustment of STANDARD TIME

Second hand ;

The second hand stops running while "SEC.HAND" switch④ is turned to

"STOP" position, and to return to "NOR." position, the second hand is

to run again.

Hour and minute hands:

Open the door and set the hands by turnning the knob in the movement

for STANDARD TIME. Cf. fig. 2

4-2   Hands adjustment of LOCAL TIME

At first, set the hands of all slave clocks by the hands of master

clock's "LOCAL TIME" by turnning the knob of the movement. Cf. fig. 3

Advance ;

Set "LOCAL TIME ADJ." switch⑤ of changing the hand directions to

"ADV." position, and set the digital switch⑥ for time setting to

wanted time, then "LOCAL TIME ADJ." switch⑧ turn up to "ADJ." position.

(As the switch⑧ is rebound to "NOR." at once.)

It will add the elapsed time in the adjusting.

After adjusting to correct time, turn back to normal advance

automatically, so need not touch the switches.

Lighting LED⑦ in the adjusting.

Delay :

Set down "LOCAL TIME ADJ." switch⑤ to "REV." position, and set the

digital switch⑥ for time setting to wanted time, then "LOCAL TIME

ADJ." switch⑧ turn up to "ADJ." position.

It will reduce the elapsed time in the adjusting.

After adjusting to correct time, turn back to normal advance.

automatically, so need not touch the switches.

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Stop ;

    Set down "LOCAL TIME ADJ." switch⑧ to "OFF" position.

    All slave clocks and "LOCAL TIME" monitor are to stop the advance.

5. REPLACE THE LAMP

    When the filament of the lamp had off, open the front door, and the lamp
on the back side of the door exchange to the new one.

6. EXCHANGE FUSE

    When the fuse had off, alarm signal will be send out.

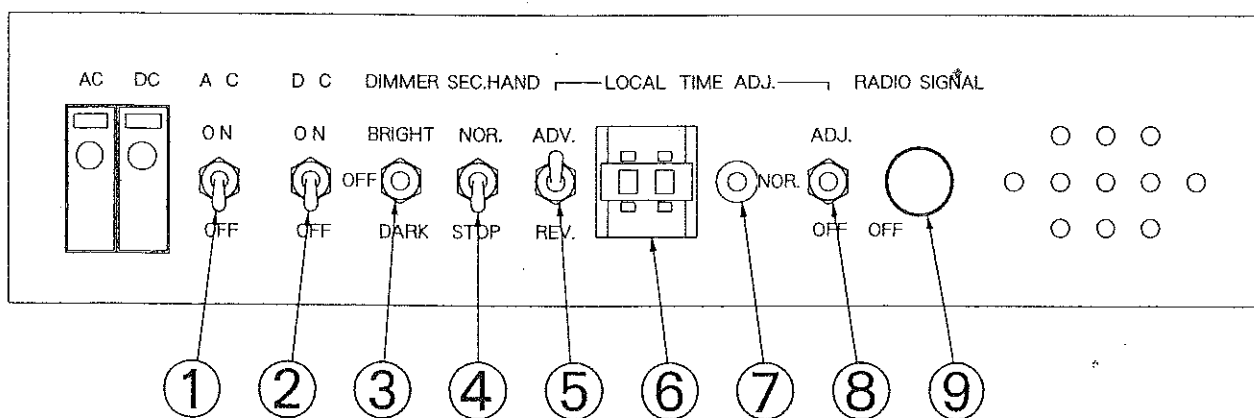   On that time, come out the white mark in front of the fuse.

.fig. 1

Fig. 1 Switches for control
    ① AC power switch
    ② DC power switch
    ③ Dimmer switch
    ④ Switch for second hand stopping
    ⑤ Switch for advance-reverse of the hand directions
    ⑥ Digital switch for adjusting time setting
    ⑦ Indicator (LED ; red) in the adjusting
    ⑧ Change-over switch for adjusting
    ⑨ Volume dial with switch of the monitor
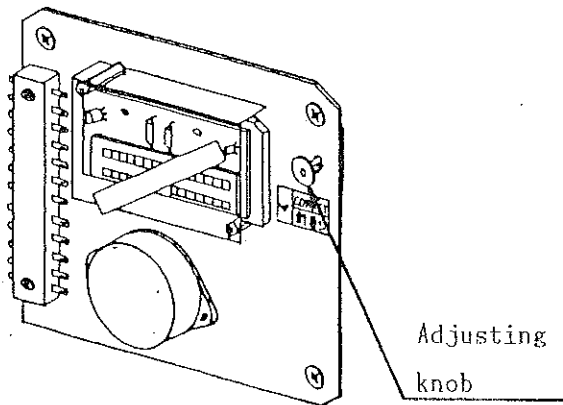   for the radio standard time signal

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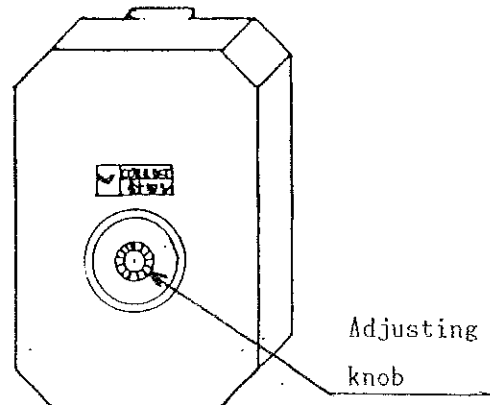Adjusting knob

fig. 2

Movement for STANDARD TIME

Adjusting knob

fig. 3

Movement for LOCAL TIME

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ITEM	ITEM for MAINTENANCE WORKS	CHECK INTERVAL	NOTE
Lamp	Switching by dimmer switch	Once per a month	
Quartz	Checking of oscillator	Once per six months	
Relay	Checking of contact-points	Once per a year	Cleaning & polishing of contact-points
Tighten screws	Tighten every screws	Once per a year	

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