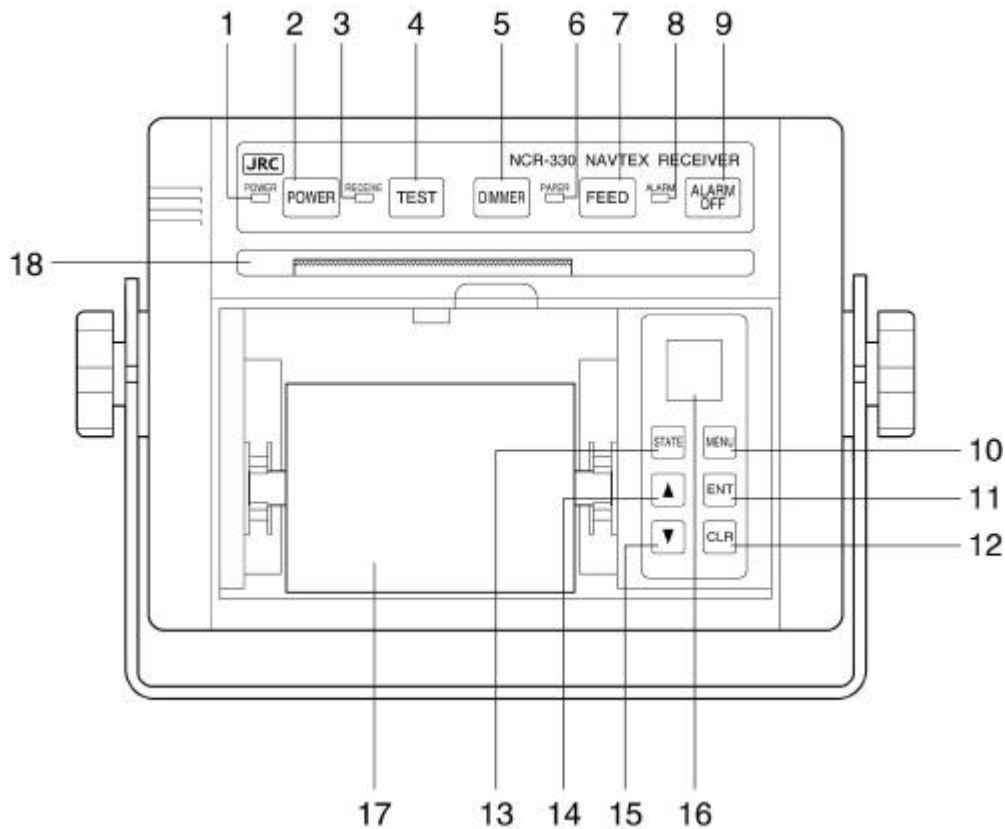


1. OPERATIONAL DESCRIPTION



No.	ITEM	OPERATION, INDICATION
1	Power lamp	Activate the green lamp to indicate that the power has been turned on.
2	Power on (Normal)	Press and hold POWER switch for at least two seconds.
	Power on (Initialize)	While holding down TEST switch turn power back on by pressing the POWER switch.
	Power off	Press and hold POWER switch for at least two seconds.
3	Receive lamp	This lamp turns on during signal detecting and blinks during message text receiving.
4	Self-diagnostic Test	Press TEST switch.
5	Setting of Illumination	Press DIMMER switch.
6	Paper lamp	This orange lamp blinks to indicate that equipment has run short of paper.
7	Feed the paper	Press FEED switch.
8	Alarm lamp	The red lamp blinks to indicate that an alert message is received.
9	Stop the Alarm	Press ALARM OFF switch.
10	Menu start / end	Press MENU switch.
11	Enable	Press ENT switch.
12	Disable	Press CLR switch.

13	Confirmation of Programmed Status	Press STATE switch.
14 15	Change the symbol Alphabet	Press Δ , ▽ switch.
16	Symbol Alphabet	Indicates the selected letter(B1 or B2). The lamp at the bottom right of the display Enabled: ON Disabled: OFF

FUNCTION SETTING

The equipment allows you to select a receiving coast station, a message type, and receiver status.

No.	ITEM	SWITCH	PRINT, INDICATE	NOTE
1	State start	MENU	STATE PROGRAM START	
2	Select station			
	Set	ENT	SET COAST STATION?	
	Change Station	Δ	Ascending order	
		▽	Descending order	
	Enable	ENT	Bottom right lamp turns on	
	Disable	CLR	Bottom right lamp turns off	
	Detect	MENU	**Disabled Area :	To No.3
3	No set	CLR	SET COAST STATION?	To No.3
	Select message			
	Set	ENT	SET MESSAGE TYPE?	
	Change message	Δ	Ascending order	
		▽	Descending order	
	Enable	ENT	Bottom right lamp turns on	
	Disable	CLR	Bottom right lamp turns off	
4	Detect	MENU	**Disabled Message Type:	
	No set	CLR	SET MESSAGE TYPE?	To No.4
	Select state			
	Set	ENT	SET STATE?	
	Alarm	ENT / CLR	ALARM SOUND ON? ON / OFF	ON : ENT OFF : CLR
5	Character size	ENT / CLR	CHARACTER SIZE LARGE? Large / Normal	L : ENT N : CLR
	No set	CLR	SET STATE? STATE END	State end
5	State end	MENU	STATE END	

2.1 Introduction

JRC NAVTEX Receiver, Model NCR-330 is designed in compliance with the IMO performance standard for narrow band direct printing telegraph equipment for the reception of navigational and meteorological warning and urgent information to ship.

JRC NAVTEX Receiver is composed of Receiver, Main Processor.

2.2 BLOCK DIAGRAM

The receiving signal on $518\text{kHz} \pm 85\text{Hz}$ input from antenna terminal is converted to the baseband signal in the CMN-2330 Receiver and output to the CDJ-2330 Main Processor.

The signal input to CDJ-2330 is bit-synchronized and frame-synchronized, then edited according to the procedures described on ITU-R. 476-5, 540-2, 625-3(B) respectively.

Then the edited message is output to the thermal printer.

The control signals generated by the control panel is input to CDJ-2330 Main processor, then control the functions of the equipment.

2.3 CMN-2330 RECEIVER

2.3.1 Composition

The CMN-2330 Receiver is composed of following section:

- 1) Power supply section
- 2) Receiver section
- 3) Input/Output section

2.3.2 Specification of input and output

1) Power supply section

Input voltage	: DC 10.8V~35V
Output voltage	: +5V +9V

2) Receiver section

Input frequency	: 518kHz
Input impedance	: 50Ω High-impedance
Output frequency	: 1,700Hz ± 85Hz 0dBm (600Ω, UNBAL.)

2.3.3 Description of operation

1) Power supply section

The power supplied through the terminal board (TB1-11,12) passes the fuses (F1,F2), the switching regulator of 5V (IC2) and contact point of the relay (K2), then enters to 9V regulator (IC9).

The power supply is turned ON by pressing the POWER key on the control panel which sets the D-Flip Flop (IC8) over 2 second and turns the power supply relay (K2) ON.

And as the power supply is ON, the power supply is turned OFF by pressing the POWER key over 2 second, which resets the D-Flip Flop (IC8).

When the polarity of the power supply is wrong, current flows through CD8 and F1, then blows the fuse F1.

All the digital circuit in the equipment function on 5V and analog circuit on 9V.

2) Receiver section

For 518kHz signal input, there are 3 ports namely HIGH-Z terminal to connect with the wire antenna etc., input terminal for 50Ω antenna and terminal for the dedicated Navtex Receiver Antenna unit (NAW-330).

Received input signal passes the protection circuit composed of diodes (CD17,18, CD13-16) and is supplied to the tuning circuit(T1,C70).

Then after passing further 2 stage of the tuning circuit, the signal is amplified by the FET AMP (TR1).

Then its bandwidth is limited to 518kHz ± 250Hz by the Mechanical filter (FL1) and the signal is amplified and mixed with BFO signal by IC1 and becomes signal of 1,700Hz ± 85Hz then appears to the FS OUT (ST1-1) as output.

The signal input from "FS IN"(ST1-2) is sent to the Main Processor.

The BFO consisted of crystal oscillator (X1) and transistor (TR6), oscillates the 4130.4kHz.

The generated signal is supplied to IC1 to get audio signal and the mixer IC (IC4) for self test.

In the self test circuit, 516.3kHz fed from BFO is mixed with $1,700\text{Hz} \pm 85\text{Hz}$ fed from Main Processor at the mixer (IC4) and $518\text{kHz} \pm 85\text{Hz}$ is obtained.

This signal is supplied to the receiver section via T3 to check the receiving circuit.

During self test, the break-in(BK) relay is turned ON to shut the input from outside.

The break-in(BK) circuit has purpose to protect the receiver against excessive input induced on the antenna.

This circuit consists of photocoupler (PHT1), transistor (TR3). To the BK terminals (TB-6,7) 12V ~ 24V can be input.

3) Input/Output section

The input/output section is to relay input/output between the Main Processor and external equipment. The input /output section is RS-422A, Current circuit and external alarm signals.

2.4 CDJ-2330 MAIN PROCESSOR

2.4.1 Composition

The CDJ-2330 Main Processor is composed of following section:

- 1) Demodulator section
- 2) CPU section
- 3) Printer section

2.4.2 Description of operation

1) Demodulator section

Demodulator section is composed of DSP(Digital Signal Processor), Codec and other IC. A part of input signal from FS IN (CMN-2330) is fed to the Codec IC(IC13) and DSP(IC2).

This circuit is the Digital Signal Processing IC which generates 0V when the input frequency is 1785Hz and +5V when the input frequency is 1615Hz.

2) CPU Section

CPU section is composed of CPU(Central Processing Unit), Oscillator, ROM (Read Only Memory) , RAM(Random Access Memory), EEPROM(Electrically Erasable Programmable Read Only Memory), PLD(Programmable Logic Device) and Driver.

The H8 CPU (IC1) processes the signals received and demodulated by DSP according to the program stored in IC3 (ROM) to transmit print data to the Printer. At the same time, the H8 supervises the state of the switch, and controls the state of the system.

The Oscillator (IC17) generates the clock signal to operate the CPU.

The Address Decoder (IC15) selects IC's according to the address data given by the CPU. The ROM (IC3) has the size of 64kB, and saves a program that controls the system. The RAM (IC7) has the size of 32kB.

It works as the buffer memory to store receiving data, and provides a work area. Necessary data including the information sent from the switch is preserved by the back-up battery for more than 24 hours after power-off. Timer in the CPU(IC1) generates interrupt signal for bit synchronization processing, ALARM signal, and self-diagnostic test signal.

The Output port in the CPU(IC1) outputs print data and control signal to the Printer, scan signal to the switch, and control signal to the DSP.

The Output port in the CPU outputs control signal to the led.

The input port inputs switch signal, state of the Printer and Paper-Out detection information.

3) Printer section

Printer section is composed of Driver(IC12), Printer(PRT1) and other IC. The driver(IC2) receives print data from CPU(IC1), and outputs signal to the Printer(PRT1).

The Printer(PRT1) prints out the receiving data, status etc.