

# **AUTOMATIC DIGITAL DIRECTION FINDER**

---

## **MODEL TD-L1100**

OPERATOR'S MANUAL



**TAIYO MUSEN CO.,LTD.**

20-7, 2-Chome, Ebisu-Nishi, Shibuya-ku, Tokyo 105, Japan

EDITION  
[ 2 ]

## TABLE OF CONTENTS

	Page
1. GENERAL DESCRIPTION.....	1
2. FEATURES .....	1
3. SPECIFICATIONS .....	2
4. OPERATION .....	3
4-1 Tunable reception .....	3
4-2 Crystal spotting .....	3
4-3 Azimuth display .....	4
4-4 Bearing display .....	4
4-5 Level indication .....	4
4-6 Dimmer .....	4
5. INSTALLATION .....	5
5-1 Loop antenna installation .....	5
5-1-1 Location .....	5
5-1-2 Assembling and installation .....	5
5-1-3 Check .....	6
5-2 Power line .....	6
5-3 Grounding of power line and earth wire .....	6
5-4 Speaker jack .....	6

## **1. GENERAL DESCRIPTION**

Taiyo, the recognized leader in the design and manufacture of automatic direction finders, proudly introduces their AUTOMATIC DIGITAL DIRECTION FINDER (ADDF), Model TD-L1100.

This revolutionary computer-controlled direction finder utilizes a unique micro-processor, offering a precision navigation instrument suitable for pleasure boats and small/medium fishing vessels.

The TD-L1100 provides both digital and direct bearing displays via 36 LED's. Bearings are fast and stable, even under adverse signal conditions. The direction finder/receiver range covers beacon, broadcast and marine frequencies which are displayed digitally. The equipment utilizes a unique Delta loop antenna design for outstanding reliability, accuracy and sensitivity.

## **2. FEATURES**

- a. Computer-controlled ADF requiring no motor or other moving components.
- b. Digital and direct bearing indicators.
- c. Digital display of selected signal frequency.
- d. Spot frequency reception on 3 crystal-controlled marine channel (SSB).
- e. Clear voice reception on DF and receiver modes.
- f. LED signal strength-distance from buoy indicator.
- g. Sensitive Delta loop with built-in sense antenna.
- h. Compact, simple to operate, requiring minimal of input power.

### 3. SPECIFICATIONS

Indicating System:	Digital Display
	Frequency Indication: 1 kHz
	Bearing Indication: 1°
Receiving System:	Superheterodyne
Frequency Range:	B Band: 190–420 kHz
	BC Band: 550–1600 kHz
	M Band: 1600–4500 kHz
Image rejection ratio:	More than 60 dB at B Band
Receiving Waveform:	A1, A2, A3 and SSB
Intermediate Frequency:	455 kHz
Measurable Minimum	
Field Strength:	B Band: 8μV/m
	BC Band: 7μV/m
	M Band: 5μV/m
Selectivity:	More than ±1 kHz at 6dB
	Less than ±7 kHz at 60dB
Radio Output:	3 Watts
Spot Reception:	3 built-in channels available for marine band
Power Supply:	DC 12/24/32V 0.8A
	AC power available on order
Loop Antenna:	Act as sense antenna
Dimensions and Weight:	Main unit 135(H) × 305(W) × 280(D) mm
	(5 <sup>5</sup> / <sub>16</sub> (H) × 12(W) × 11(D) inch)
	5.2 kgs.
	(11.5 lbs)
	Loop antenna 625(H) × 400(W) × 400(D) mm
	(24 <sup>5</sup> / <sub>8</sub> (H) × 15 <sup>5</sup> / <sub>8</sub> (W) × 15 <sup>5</sup> / <sub>8</sub> (D) inch)
	2.5 kgs.
	(5.5 lbs)

### 4. OPERATION

#### 4-1 Tunnable reception

Select a receiving band by the “BAND” switch (1), push “TUNE” button (2) on, and pull “POWER-VOLUME” (4). Adjust the “TUNE” knob (3) until the receiving frequency comes out on the frequency display (5). When “DF-RCV” switch (6) is “DF” side, the bearing comes out on bearing display (7) and a LED lights on the azimuth display (8). A1 type of receiving signal is selected by the knob (9). When the signal is SSB, “BFO” knob (10) must be adjusted to get clear voice. (Refer paragraph 4-2 CAUTION 2; 3) “GAIN” knob (11) is normally on maximum gain position. When the signal is very strong, or the noise is very strong, adjust “GAIN” knob (11) suitably.

#### CAUTION

1. To get clear voice on “DF” mode, adjust “TUNE” carefully to get most clear voice. The bearing indication is most accurate.
2. The displayed frequency is very accurate, and then A2, A3 station or radio buoy will be received on this mode.
3. On “DF” mode, when a signal is received, processor tone is activated until the bearing is got, and then the tone becomes 2 second pause 0.4 second operation. (On A2, A3 Waveform at Beacon/Broadcast reception)

#### 4-2 Crystal spotting

To receive by a crystal spotting, push “TUNE” (2) on, and adjust the “TUNE” knob (3) until the frequency readout (5) on comes out the crystal frequency ±5kHz. The push the crystal. The crystal frequency comes out on the display. When the tuning is not correct, the LEDs under frequency display light on the maximum gain (11), and the tuning knob must be readjusted to get LEDs gone off at maximum gain. After the tuning is completed, adjust “BFO” knob (10) to be clear voice for the SSB reception. Also adjust “GAIN” knob (11) for the better reception.

Note: When you adjust "GAIN" knob ⑪ for the better reception and reduce the signal sensitivity, the LEDs under frequency display light on sometimes, but if the above tuning is correct, it is no problem.

### CAUTION

1. For SSB signal, the frequency is displayed with +1kHz.
2. SSB signal must be received on crystal spotting.
3. "BFO" knob ⑩ is adjustable 5 rotations to get very clear SSB reception.

#### -3 Azimuth display

The lit LED corresponds each 0-9 degree from ahead. The azimuth card is set on compass readout, a true bearing may be read.

#### -4 Bearing display

The bearing display shows relative bearing.

#### -5 Level indication

When the power is pulled on, LEDs on window ⑫ light.

When a signal is received the LEDs lit according to the signal level.

Then the number of LEDs lit may be used for a measure of distance of the signal, which transmitter power and antenna are not varied such as radio buoy.

### CAUTION

To use the LEDs as a measure of distance. "GAIN" must be set on maximum.

#### -6 Dimmer

Knob ⑭ is for dimmer.

## 5. INSTALLATION

### 5-1 Loop antenna installation

#### 5-1-1 Location

The loop antenna should be installed at the topside area as free as possible from rigging or railing forming large closed metallic loops in the vertical planes. The maximum possible separation should also be maintained from existing transmitting and receiving antennas. The higher the installation site is, it is the better for its sensitivity and errors due to the hull, and the shorter the cable length is, the better for its sensitivity.

#### 5-1-2 Assembling and installation

Assembling of the loop antenna is depicted in Fig. 1. Inside the loop pedestal, there are terminals marked N1, S1, E1, W1, and V. End terminals of the loop cable are made also N1, S1, E1, W1, and V. These are connected to those of the terminals of the pedestal to the same mark each other.

The assembled loop antenna is fixed by one of the ways described as follows:

- (a) Directly to the roof of the vessel, Fig. 2 (a),
- (b) if there are railings, the loop should be mounted on a stanchion to keep the loop higher than the end of the railings by 1 meter or more, Fig. 2 (b),
- (c) by a supporting hardware to a wooden pole, Fig. 2 (c), (d),
- (d) if the above mentioned pole is metallic, the loop must be fixed on the top, Fig. 2 (d), or the length "L" shown in Fig. 2 (c) must be over 1 meter.

The loop cable from the loop pedestal is fixed to the pole and the hull by fixing bands.

5-1-3 Check

The loop made N and S must be carefully aligned with the fore and aft axis (Keel line) of the vessel, N to fore, S to aft, or by a constant displacement from the keel line, error will be introduced into the bearing display.

When there are large errors on taking some bearings of known transmitting stations, check the pedestal wiring referring to "Trouble Shooting" of Service Manual.

5-2 Power line

The power line is fixed as one of 12V/24V/32V at factory in accordance with customer's previous instruction. If no previous instruction from customer, the power line is fixed as 12V at factory. The power line is Available to change from 12V to 24V or 32V by cutting color wire on rear side of the main unit as follows.  
 12V to 24V : Yellow                      12V to 32V : Yellow and Red

When the power line is misconnected by its polarity (+) (-), the fuse on rear side blows out. Take care.  
 (+) is connected to white lead wire.

5-3 Grounding of power line and earth wire

The equipment has chassis grounded to (-) of the power line. Connect the ground terminal of main unit to vessel's ground with suitable earth wire.

5-4 Speaker jack

Speaker jack is on rear side. The impedance is 4Ω.

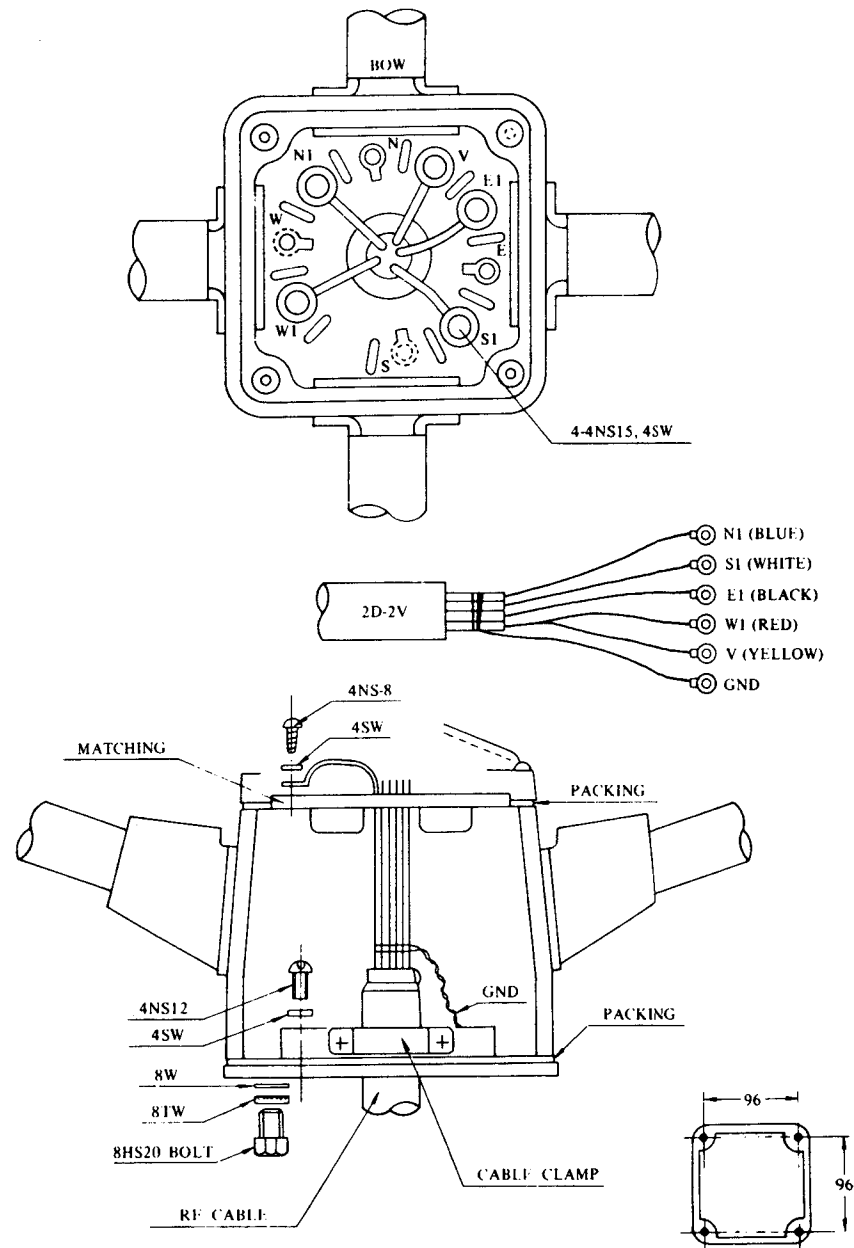


Fig. 1 Assembling of the loop antenna

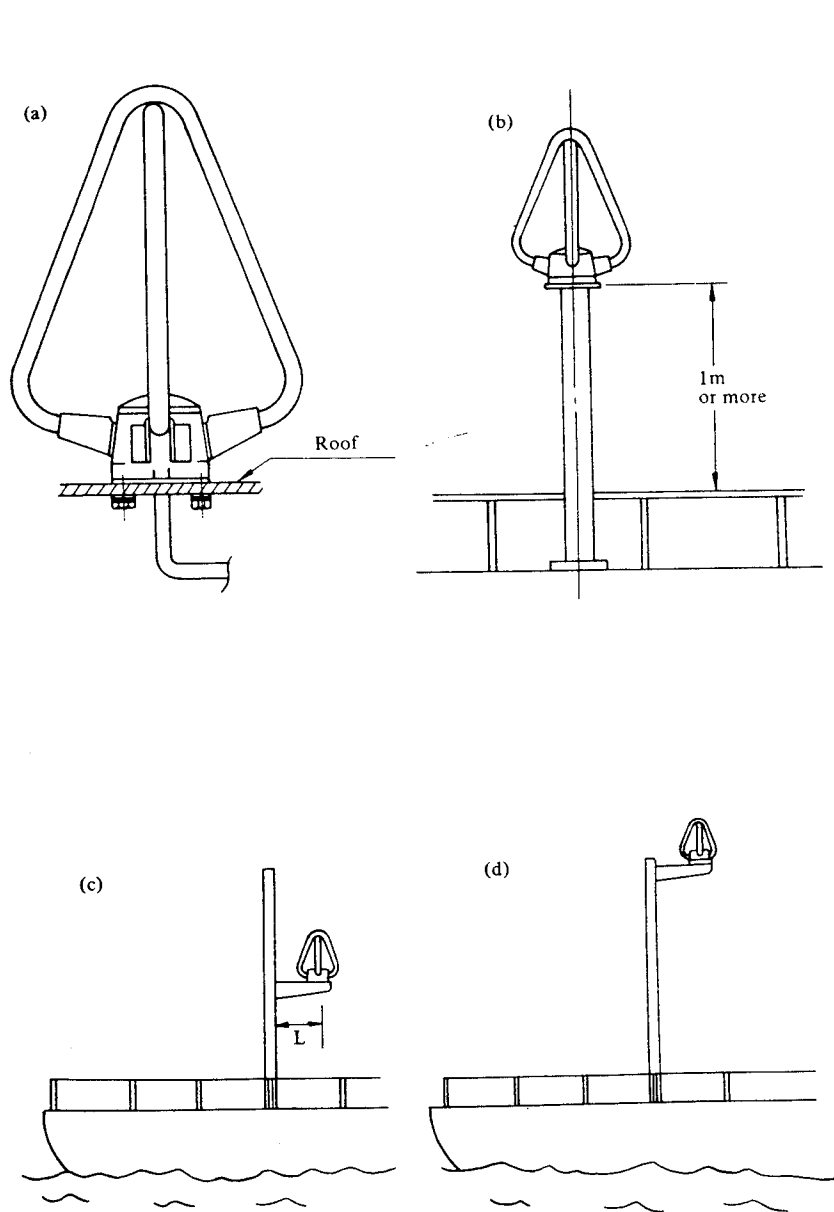
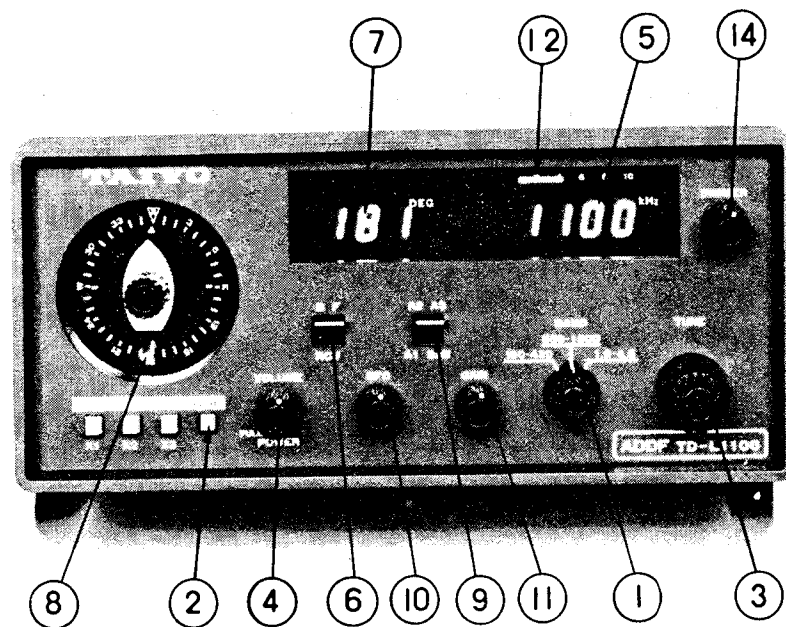


Fig. 2 Loop installation



**Description**

- ① : BAND
- ② : TUNE-CRYSTAL
- ③ : TUNING
- ④ : POWER-VOLUME
- ⑤ : FREQUENCY DISPLAY
- ⑥ : DF - RCV
- ⑦ : BEARING DISPLAY
- ⑧ : AZIMUTH DISPLAY
- ⑨ : WAVE FORM (A2·A3 - A1 SSB)
- ⑩ : BFO
- ⑪ : GAIN
- ⑫ : LEVEL INDICATOR
- ⑭ : DIMMER