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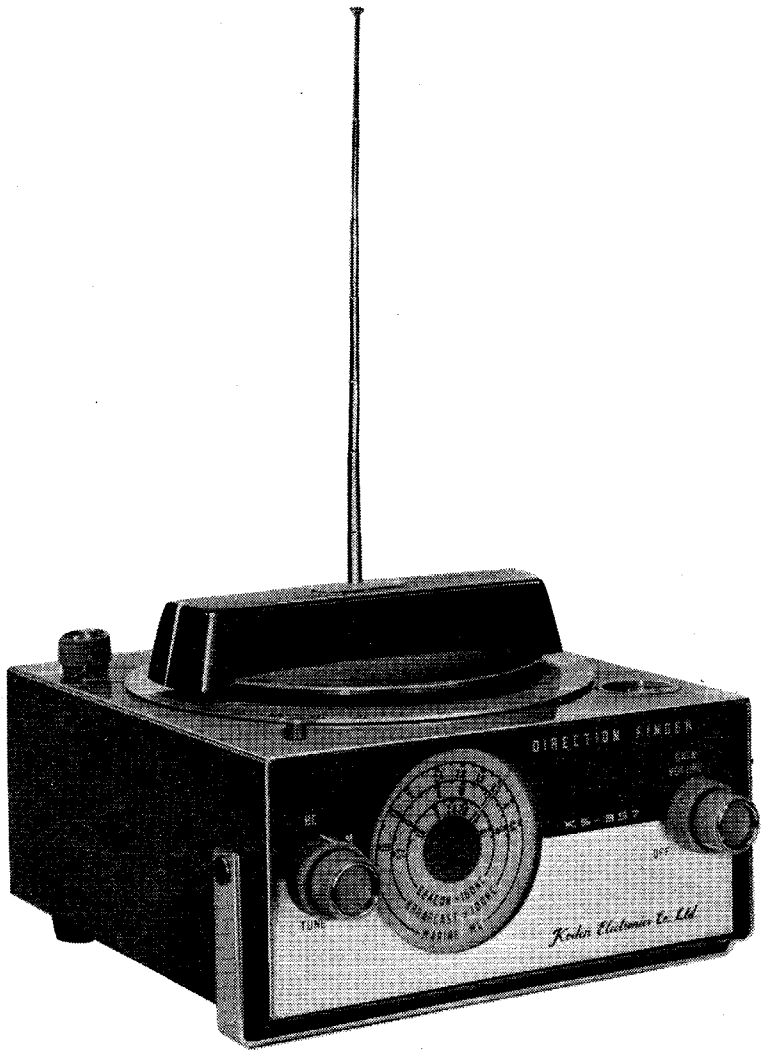
INSTRUCTION BOOK
FOR
KODEN

PORTABLE DIRECTION FINDER
TYPE KS-357



KODEN ELECTRONICS CO., LTD.

284, CHOJAMARU, KAMIOSAKI, SHINAGAWA-KU
TOKYO, JAPAN
CABLE ADDRESS : KOELEC TOKYO
TELEPHONE : TOKYO 441—1131

PREFACE

Koden's Portable Direction Finder Type KS-357 is a machine of small size, light weight yet at the same time highly dependable. It is capable of high sensitivity operation covering the frequency range from 150 KC/S to 4.4 MC/S. It has a built-in tone oscillator to facilitate the reception of beacon and telegraph signal waves. In order to be able to instantly pick up emergency signals and special communication signal waves the machine has been arranged to allow the insertion of three crystal local oscillators.

This instruction book has been prepared to give all the necessary information on this machine to enable its qualities of superb performance to be utilized to best advantage.

SPECIFICATION

Circuit :	12 transistor superheterodyne, 1RF, 3 IF stages.
Frequency range :	Beacon (B) 150~420 kc Broadcast (BC) 520~1650 kc Marine (M) 1.6~4.4 MC
Intermediate Frequency :	455 kc
I.F. band width :	5 kc within 6 db variation
Audio output :	500mW at 40% modulation
Batteries :	9V (6 flashlight batteries)
Antenna :	Ferrite core loop antenna & telescope type sense antenna.
Sensitivity :	Beacon — 30μV/m Broadcast — 15μV/m Marine — 7μV/m
Accuracy :	±2 degrees.
Image Rejection Ratio :	Beacon —in excess 100 db Broadcast —in excess 80 db Marine —in excess 60 db
Crystal Control :	3 crystal sockets in marine band for fixed frequency operation.
Dimensions :	Width 260 mm, Height 190mm, Depth 300 mm.
Weight :	3.8 kgs without batteries, 4.4 kgs with batteries.

INSTRUCTION MANUAL
FOR
PORTABLE DIRECTION FINDER
TYPE KS-357

1. General Precautions

(a) Always remove batteries before transporting this direction finder.

(b) The carton box which has been specially supplied for this unit must be used for transportation.

(c) Care must be exercised in handling the unit while transportation. It should be handled gently without using hooks for moving, hoisting and lowering the machine.

(d) In cleaning the unit surfaces, use a soft cloth and clean city water.

(e) Never force the knobs and other movable parts to move. Operate them gently.

(f) In inserting a battery make sure that its polarity is not reversed. An erroneous insertion of a battery may cause damage to the machine.

(g) Keep the volume properly controlled for economy of the batteries. The greater the volume the shorter will be the life of the battery.

(h) Remove the batteries when the unit is not in use for a period of more than a month. If this is not done, chemicals may leak from the batteries and these may cause damage to the machine.

(i) While operating, the unit should be kept in a reasonably level position.

(j) With this unit as is the case with all other direction finders, an error in direction measurement due to the environmental conditions and the nature of incoming waves will be unavoidable. Careful selection of an appropriate position to set up the finder in order to keep it away from disturbing factors such as masts, radio antennas and wires, and the correction of errors will render the measurement more accurate.

(k) The inside of the machine must not be touched by any one who is not well acquainted with the mechanism and operation of the unit.

(l) Oiling the loop antenna: To oil the loop antenna when it does not rotate smoothly, remove the rotary parts and wipe them lightly with a piece of cloth which has been dampened with good grease. Never grease them thickly.

(m) This machine is protected by patent rights against any manufacture and sale of the imitation units by any unauthorized persons.

2. Operation

(a) Remove two screws from the battery cover at the back of the cabinet, remove this cover and then insert the batteries making sure that the polarity of these is as indicated on the end. (Refer to Figure 1)

(b) Rotate the GAIN control clockwise to change the switch position from OFF to ON.

(c) After turning the switch FUNCTION to BATTERY check the battery voltage. If the meter shows voltage lower than the Green BATT, it will indicate that the batteries need replacement.

(d) Turn switch FUNCTION to DF.

(e) Set the switch CRYSTALS at OFF.

(f) Set the band switch at a desired band.

(g) Rotate GAIN and VOLUME control clockwise to raise sensitivity until sounds become audible.

(h) Set the dial TUNE at the desired radio signals. Adjust the dial to a fine point at which the meter needle indicates the maximum and the radio waves are received in the best condition.

1) When fixed frequency reception is desired of the marine (M) band by crystal control, set the switch CRYSTALS at the desired position and turn the dial TUNE close to the desired frequency.

2) If the desired radio signal is Non-Modulation, turning the switch FUNCTION to TONE will make the sound audible.

(i) Crystal frequency can be decided by the following method.

Crystal frequency to be obtained=Desired frequency of the radio wave+455 KC.

The type of crystal is HC 6U. (Refer to Fig. 2)

(j) By gently rotating the LOOP ANTENNA the angle (of the loop antenna) will be found at which the meter will return to 0° (the direction of NULL). Adjust the GAIN control until the accurate angle of NULL is found. When so adjusted, either the direction pointed by the arrow of the LOOP ANTENNA or the reverse direction will be the direction of incoming wave.

Turning of the LOOP ANTENNA may sometimes fail to show the angle of NULL when the received radio wave is too strong or the GAIN control has been turned clockwise as far as it goes.

(k) To determine sense, first see that the loop antenna is set at the angle of NULL following the procedures described under (j), then after pulling out the whip sense antenna to its full length, while depressing the SENSE button, turn the LOOP ANTENNA in the direction of the arrow on the disc and then in the reverse direction to the same angle from the NULL point in either direction. The angle should be from ±5 degrees to ±20 degrees depending on the location of the direction finder and the strength of the incoming waves. If, in this procedure, the pushing of the SENSE button makes the meter needle reach the maximum point toward 10, move the GAIN control a little counterclockwise. This is after all to adjust the GAIN control so that upon pushing the SENSE button the needle will indicate some point between 2 and 6. (Refer to Fig. 3)

If, in the above operation, the turning of the LOOP ANTENNA in the arrow direction on the disc moves the meter needle from a small figure to a larger figure, then the angle obtained in the arrow direction of the LOOP ANTENNA is that of the incoming waves. If, on the contrary, the dialing of the LOOP ANTENNA in the direction opposite the arrow on the disc, moves the meter needle from a small figure to a larger figure, then the angle obtained in the direction opposite to the arrow of the LOOP ANTENNA is that of the incoming waves.

(l) In taking a reading of the bearing of the incoming waves, either the relative bearing or the true bearing of the waves can be obtained by setting the 0° of compass plate to the direction of the ship's bow or to the North.

(m) The bearing of incoming waves, obtained by the method described in the first paragraph under (k), may sometimes not be correct, by reason of the disturbing factors outlined in paragraph (j) under General Precautions. In order to improve the measurement accuracy, therefore, a correction of this error will require to be made.

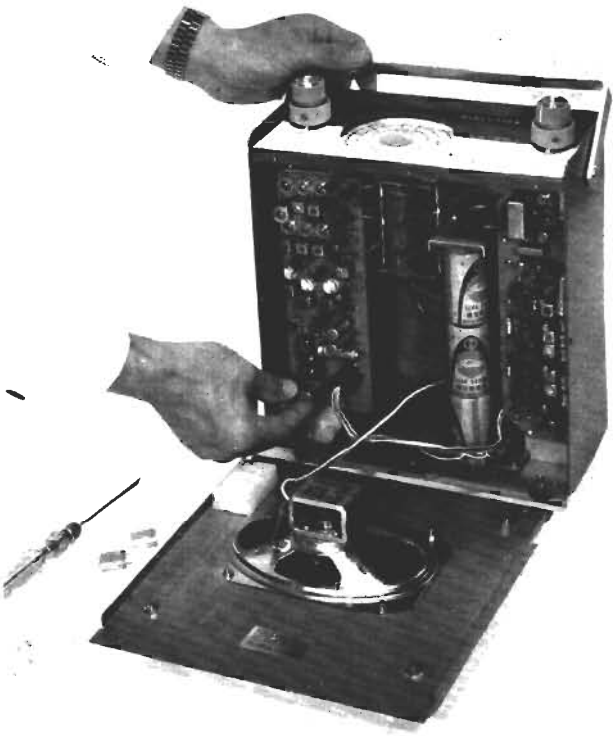
4. Maintenance

(a) In case the machine is to be left unoperated for any long period, the cabinet be cleaned with damp cloth, the batteries removed and stored in a cool, dry place.

(b) If any trouble develops with equipment, repairs shall be carried out only by a person well acquainted with the mechanism and operation of this machine. To facilitate inspection, the machine can be disassembled into several units as illustrated in Figures 10, 11, 12 and 13.

INSERTION OF BATTERIES

Figure 1



INSERTION OF CRYSTALS

Figure 2

DETERMINATION OF SENSE

Figure 3

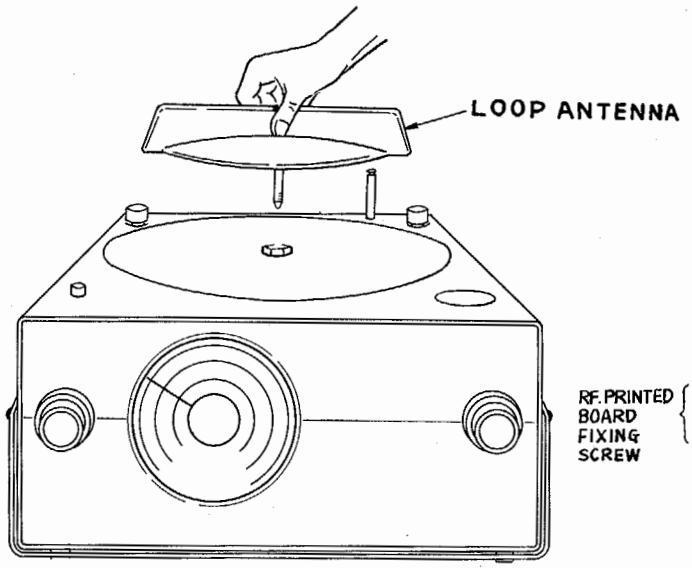


Figure 10

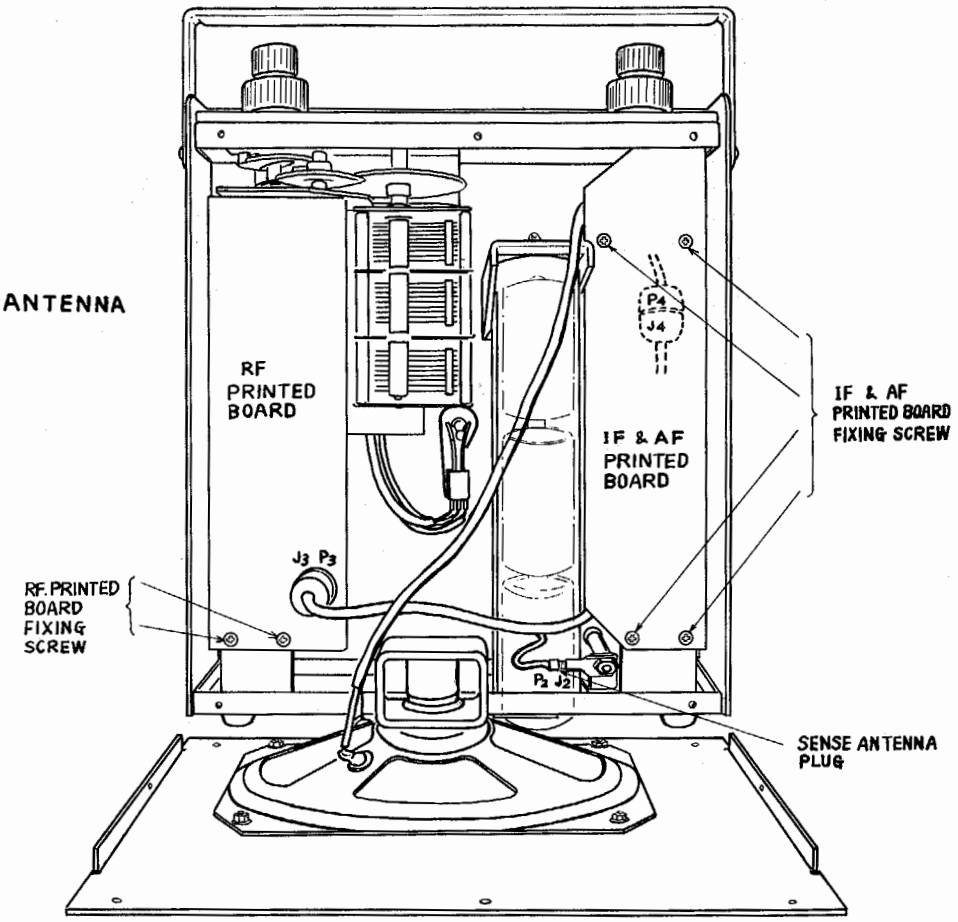


Figure 12

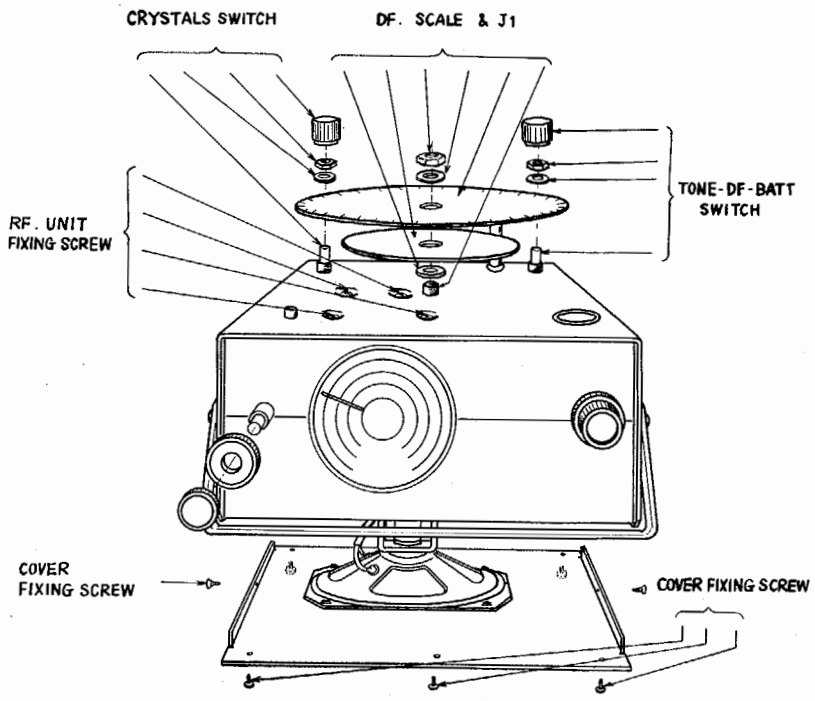


Figure 11

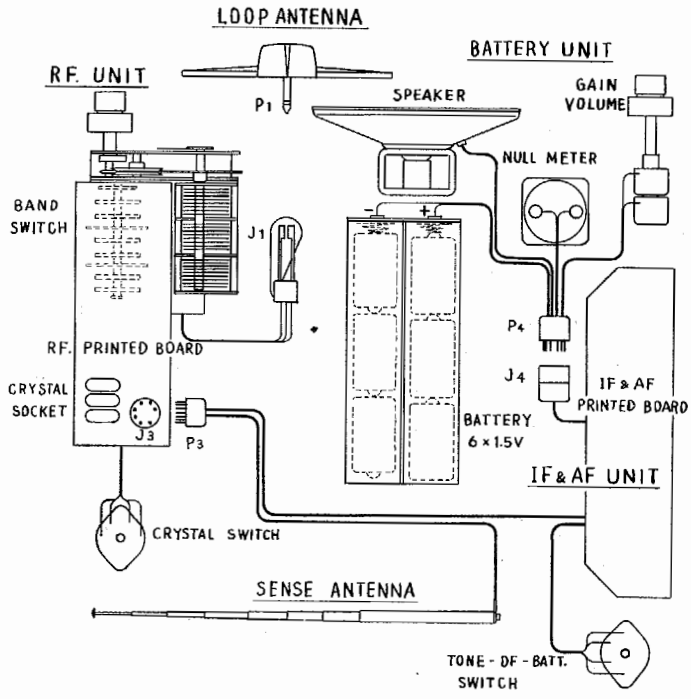


Figure 13

SCHEMATIC DIAGRAM
FOR
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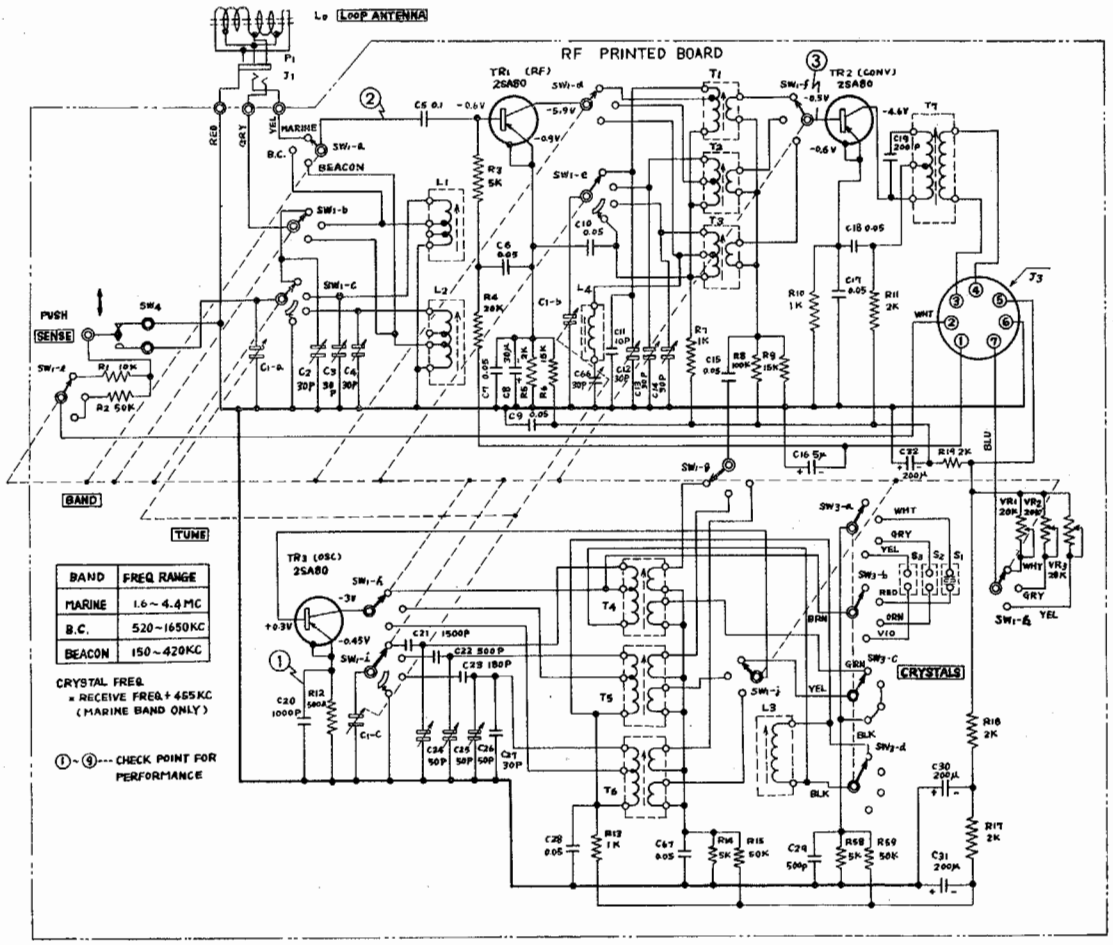
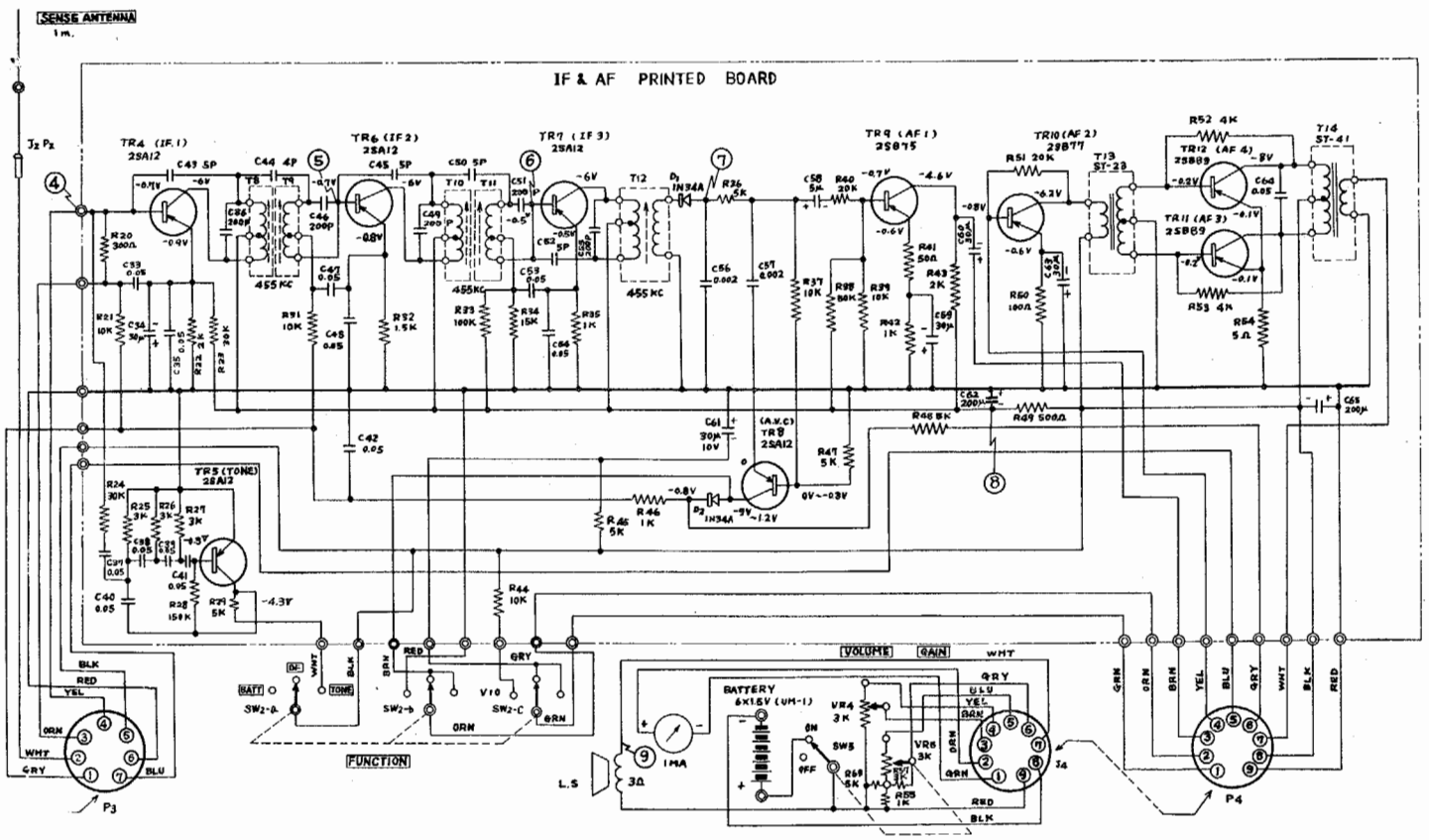
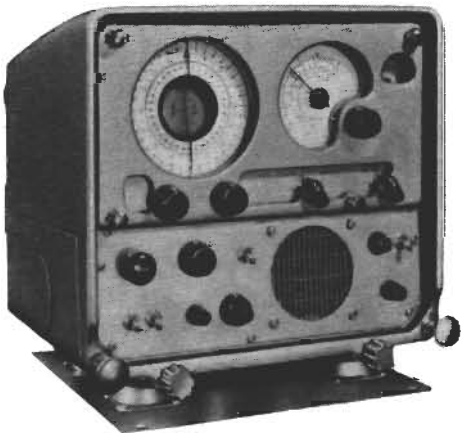
Type KS-357

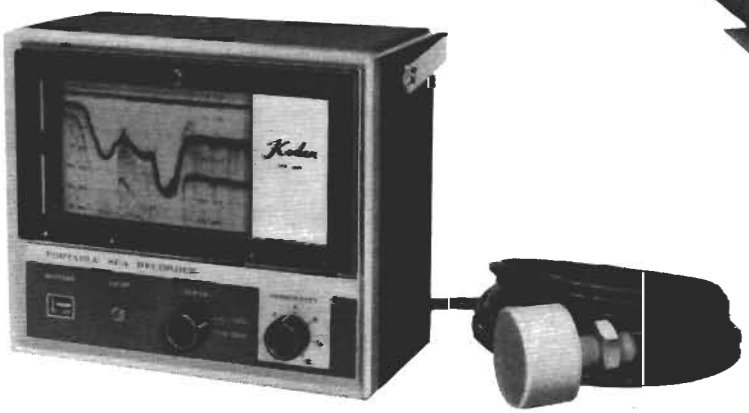




As to sister products of this portable radio direction finder KS-357, there are an AUTOMATIC VISUAL Direction Finder KS-321-UA and a portable fish finder (known as SEA RECORDER) KS-366, either of which proves to be very popular.



KS-321-UA



KS-366

KODEN ELECTRONICS CO., LTD.
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TOKYO, JAPAN
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TELEPHONE : TOKYO 441-1131～9