

KENWOOD

**CD-10**

**CALL SIGN DISPLAY**

Thank you for purchasing the new CD-10 Call Sign display. Please read this instruction manual carefully before placing your display in service.

This unit has been carefully engineered and manufactured to rigid quality standards, and should give you satisfactory and dependable operation for many years.

#### **Contents**

1. Features .....	3
2. Control functions .....	4
3. Installation .....	8
4. Operation .....	10
5. Troubleshooting .....	13
6. Maintenance .....	14
7. Block Diagram .....	15
8. Specifications .....	16

Mounting bracket . . . . .	1 piece
Flange nut . . . . .	2 pieces
Flat washer . . . . .	2 pieces
Spring washer . . . . .	2 pieces
Pan head screw . . . . .	2 pieces
Self Tapping screw . . . . .	2 pieces
Rubber feet . . . . .	1 pair
Bail . . . . .	1 piece
Power cord assembly . . . . .	1 assy.
Cord with plug . . . . .	1 piece
Cable assy. (mainiature phone plug both ends) . . . . .	1 piece
Conversion plug (miniature to subminiature) . . . . .	1 piece
5 pin DIN plug . . . . .	1 piece
Warranty card . . . . .	1 sheet
Operating Manual . . . . .	1 piece

## **DCS Data Decoding**

Decodes the digital ASCII Call Sign Data that is a portion of the DCS (Digital Coded Squelch) data string.

### **Compatible with non DCS receivers**

The CD-10 may be used with transceivers that are not equipped with DCS decoding.

### **CMOS 8-bit Microprocessor**

The microprocessor analyzes the call sign data transmitted from the DCS, corrects any data errors due to noise, etc., and displays the incoming call sign in alphanumeric characters. The microprocessor also controls various switching and memory functions, etc.

### **LCD display with 6-digit, 5 x 7 dot matrix**

The high visibility display provides a variety of information in addition to the 6 digit call sign.

### **The Speaker inputs**

Two speaker input jacks are provided so that the display may be connected to more than one receiver at a time. Speaker selection is provided by a front panel switch.

### **Memory function**

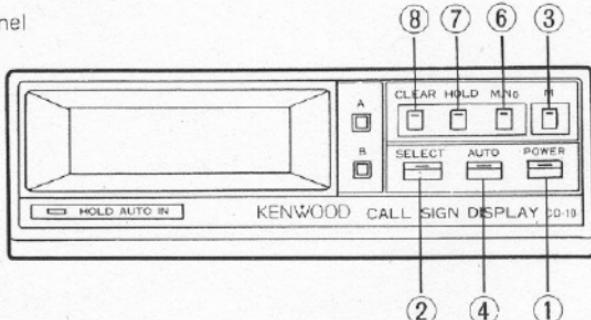
Up to 20 different callsigns may be stored in the resident memory. Memory backup is provided by a built-in Lithium battery.

### **Computer output port**

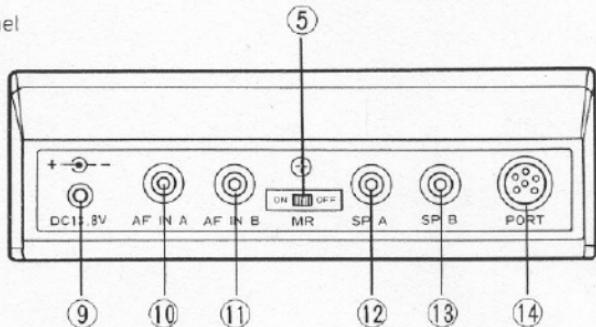
A computer output port is provided for interfacing to a personal computer. This port supplies call sign, and memory data in the form of serial output data. This handy function will allow automatic logging, etc.

## 2. CONTROL FUNCTIONS

Front Panel



Rear panel



**① POWER switch**

Turns the power ON or OFF. When the power is turned on the LCD display is backlit.

**② SELECT switch**

Selects the desired AF input date, A or B on the rear panel.

AF IN.A is selected and the A LED indicator will light.

AF IN.B is selected and the B LED indicator will light.

**③ M switch**

When this switch is depressed, call sign data from the display is entered into the next memory channel. When the switch is depressed for data entry into memory channel 18 or 19, the display will show "now 18" or "now 19" as a warning that the memory is almost full. When the 20th memory channel

has been entered, the display will show "full", indicating that there is no more memory space available. If you attempt to store more than 20 memories initial memory data may be lost. For example, trying to store the 21st memory will cause memory channel 1 to be overwritten.

**(4) AUTO switch**

When this switch is set to ON, the HOLD/AUTO IN LED will flash and each new call sign will be automatically stored in the next available memory channel. The microprocessor scans memory each time a call sign is received. If this call sign is already present in one of the memory channels, it is simply displayed on the LCD display. If this incoming call sign has not been stored previously, it will be stored in the next empty channel.

**(5) MR switch**

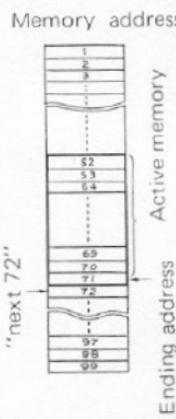
This switch is used to recall data from memory. It is used in conjunction with the M. No. switch on the front panel.

When this switch is turned on the LCD display will show "memory". Empty memory channels are displayed as " - - - " in the display. Pressing the CLEAR switch with the MR switch ON will cause all memory channels to be erased. When the switch is returned to OFF' the display will show the last call received.

**(6) M. No. switch**

This switch is used in conjunction with the MR switch. Pressing this switch with the MR switch on will cause the memory to advance, and the display will indicate which memory channel is next "next■■".

**Note:** The CD-10 incorporates a memory chip with 100 address locations, but only uses memory locations 52 thru 71, as shown in the accompanying figure. These memory locations are addressed by the CD-10 as 01-20. It is not possible to address any of the other locations.



Manual entry of more than 20 calls is possible, however, there is no method to recall this data. If entry is attempted past number 99, all memory data will be lost.

**⑦ HOLD switch**

When this switch is pressed the current call sign is retained, and no new data is accepted from the receiver. The HOLD/AUTO IN LED will light as a visual reminder. Pressing the switch again will return to normal functions.

**⑧ CLEAR switch**

When this switch is pressed the currently displayed call sign will be cleared and "-----" is displayed.

When this switch is pressed in the MR mode all memories are cleared, and "memo CL" is displayed while the switch is held in. Releasing the switch will cause "memory" to be displayed.

**⑨ DC 13.8V terminal**

DC power input terminal. Use the supplied power cord or connect the optional AC-10 AC adapter.

Input voltage requirement is 13.8 V. Pay attention to polarities: red (+) and black (-).

**⑩ AF IN. A terminal**

Audio input terminal. Connect to external speaker jack of transceiver A.

**⑪ AF IN. B terminal**

Audio input terminal. Connect to external speaker jack of transceiver B.

**⑫ SP. A terminal**

Connect a speaker of 8 ohms, so that audio from transceiver A may be heard.

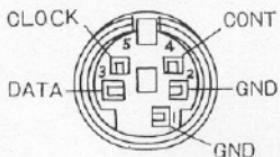
**⑬ SP. B terminal**

Connect a speaker of 8 ohms, so that audio from transceiver B may be heard.

**⑭ PORT terminal**

This port provides call sign data for interfacing with a personal

computer. The data supplied is "serial data", and is provided whenever the "CONT" terminal of the PORT plug is grounded. When the CONT terminal is grounded and a Call Sign is received, or recalled from memory, the call sign is displayed on the CD-10 display, and the data is simultaneously transferred to the computer, via the Port terminal.



### Output format

Synchronous system

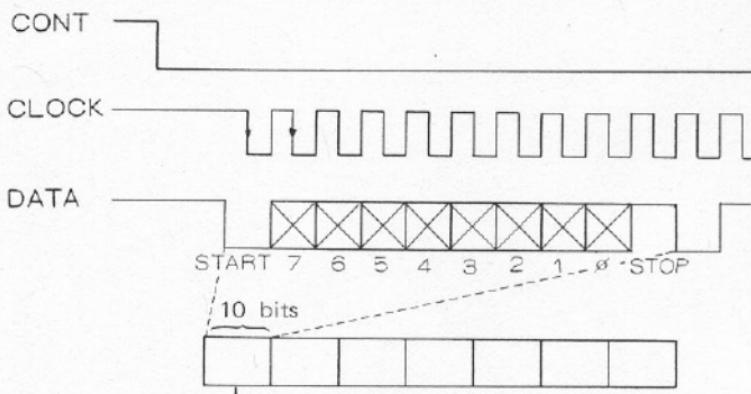
No parity bit

Start ..... 1 bit

Stop ..... 1 bit

Data ..... 8 bits

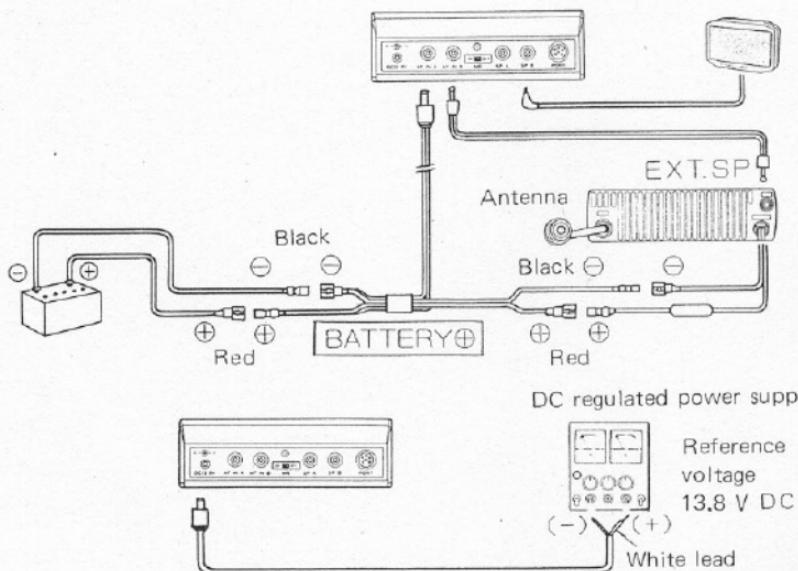
Data is sent from the MSB (most significant bit) to the LSB (least significant bit.)



SELECT switch at AF IN. A: Data from 00H is sent.

SELECT switch at AF IN. B: Data from 01H is sent.

Each letter and number of a call sign is composed of 10 bits of information, a start bit, 8 data bits, and a stop bit. Data and clock pulse output levels are TTL compatible. The transmission rate is 3600 BPS (bits per second). Refer to section four for additional information example.



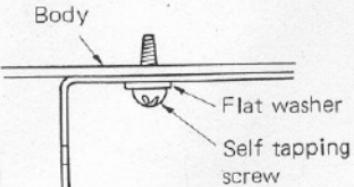
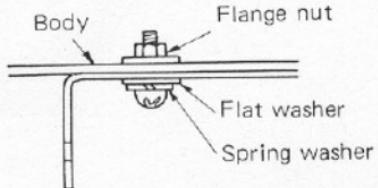
The reference voltage is 13.8 V DC. When using the same power supply to the transceiver and the CD-10 use the DC cable assembly, as shown in figure above. Do not reverse polarities as severe damage may result to the transceiver and the CD-10. Connect the end of the cable marked "BATTERY (+)" to the battery side.

When using a power supply or just powering the CD-10 alone, use the cable with the split end. The wire with the white insulation is connected to (+) positive, and the bare wire is connected to (-) negative.

An accessory AC adaptor the AC-10 is available as an alternate power source for the CD-10.

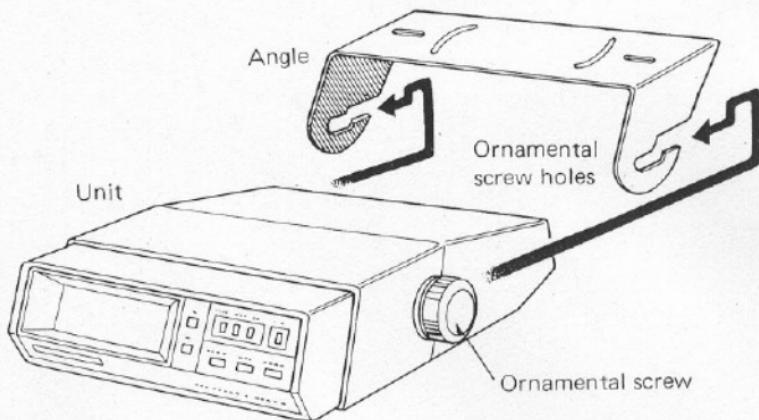
#### ■ Mounting bracket installation

Install the bracket as shown next. The bracket may be mounted in any convenient location.



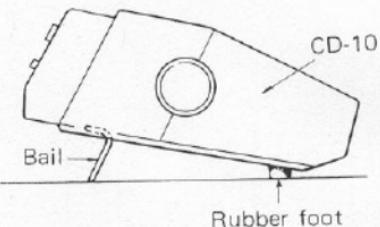
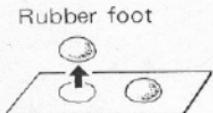
- **Installation of CD-10**

Insert the ornamental screws at both sides of the CD-10, and slide the CD-10 onto the bracket. The angle of the CD-10 may be adjusted for the most convenient viewing angle. Tighten the screws.

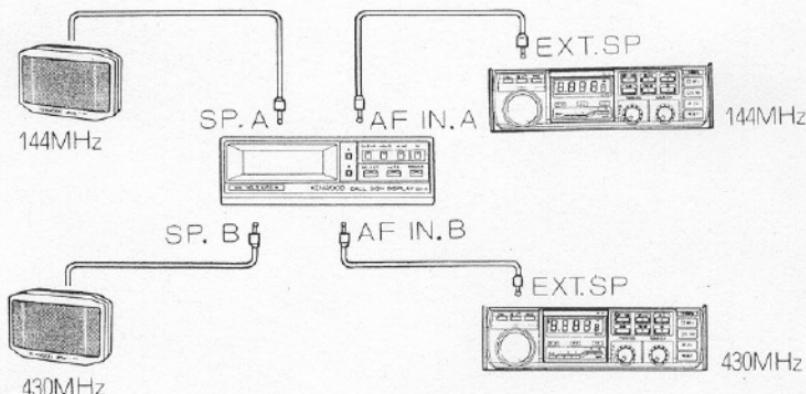


- **Installation of bail and feet**

Insert the bail into the two holes on the bottom of the CD-10. Attach the rubber feet to the bottom rear.



## 4. OPERATION



For EXT. SP terminals with a dia. of 2.5 mm,  
use the supplied conversion plug.

### Dual inputs

Two transceivers may be connected to the CD-10 at the same time. For example, a 144 MHz transceiver (such as the TM-211A/E) is connected to AF IN. A and a 430 MHz transceiver (such as the TM411A/E) is connected to AF IN. B.

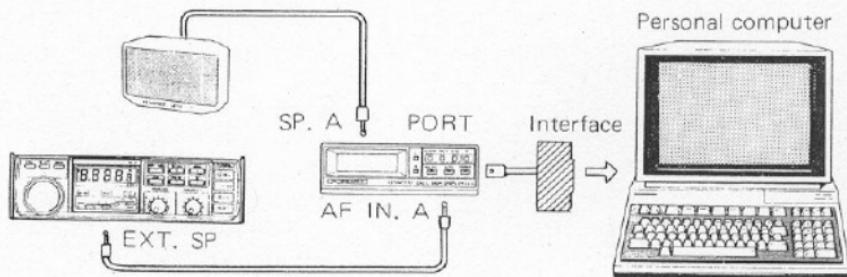
When used with either the TS-711A/E or the TS-811A/B/E audio may be obtained from the ACC connector. Pin 3 of the 13 pin ACC connector provides a constant level audio output. By connecting pin 3 to AF IN. A, or AF IN. B it is possible to use the internal speakers of these transceivers. Do not connect external speakers to the CD-10, when the accessory connector is used.

### DCS Signal Reception

Proper operation of the CD-10 depends on the audio level that it receives from the transceiver. If the call sign is not displayed when a DCS signal is received, try increasing the audio volume.

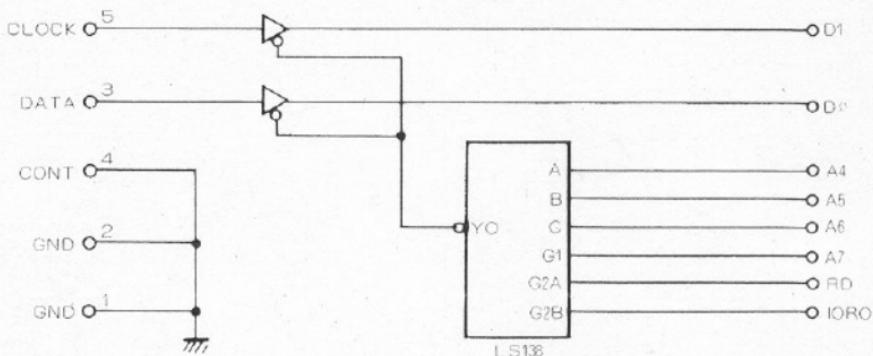
The CD-10 microprocessor only recognizes the letters A-Z, numerals 0-9 and a space. The microprocessor will not display any call sign when the other data is received.

- Personal Computer Interfacing



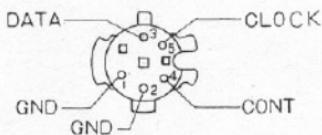
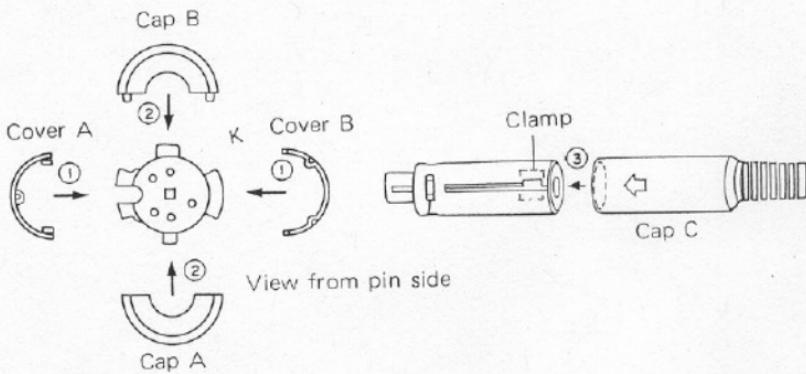
Whenever a Call Sign is received by the CD-10 it is shown on the display, and also sent out of the data PORT as a serial data string. This data can then be processed by a personal computer for logging purposes, etc.

- Interfacing Z-80 series computers (example)



The figure above is an example interface for the CD-10 to a Z-80 computer. The 74LS138 is used as an I/O address controller. It controls the Data input and Clock inputs. In this example, the I/O addresses are 80H – 8FH.

- PORT plug construction details



View from cable side

## 5. TROUBLESHOOTING

Use the following chart as a troubleshooting aid.

Symptom	Cause
CD-10 does not operate	<ul style="list-style-type: none"><li>• No DC cable attached</li><li>• Improper power cord polarity</li><li>• Voltage from supply too low</li></ul>
No call Sign is displayed	<ul style="list-style-type: none"><li>• No connection to AF IN. A or B</li><li>• Audio output from receiver too low</li><li>• MR switch ON</li><li>• HOLD switch ON</li><li>• SELECT switch does not match input</li><li>• Improper data input (other than A-Z, 0-9, or space)</li></ul>
No signal is sent from PORT terminal	<ul style="list-style-type: none"><li>• No ground applied to CONT terminal</li><li>• Short in PORT plug</li><li>• The plug is miswired</li></ul>
No audio is heard	<ul style="list-style-type: none"><li>• No speaker is connected to the CD-10</li><li>• The speaker is connected to the wrong output terminal</li></ul>

## 6. MAINTENANCE

### Lithium battery

A lithium battery installed for memory backup, so memories are retained even when power is removed from the unit.

#### Precautions:

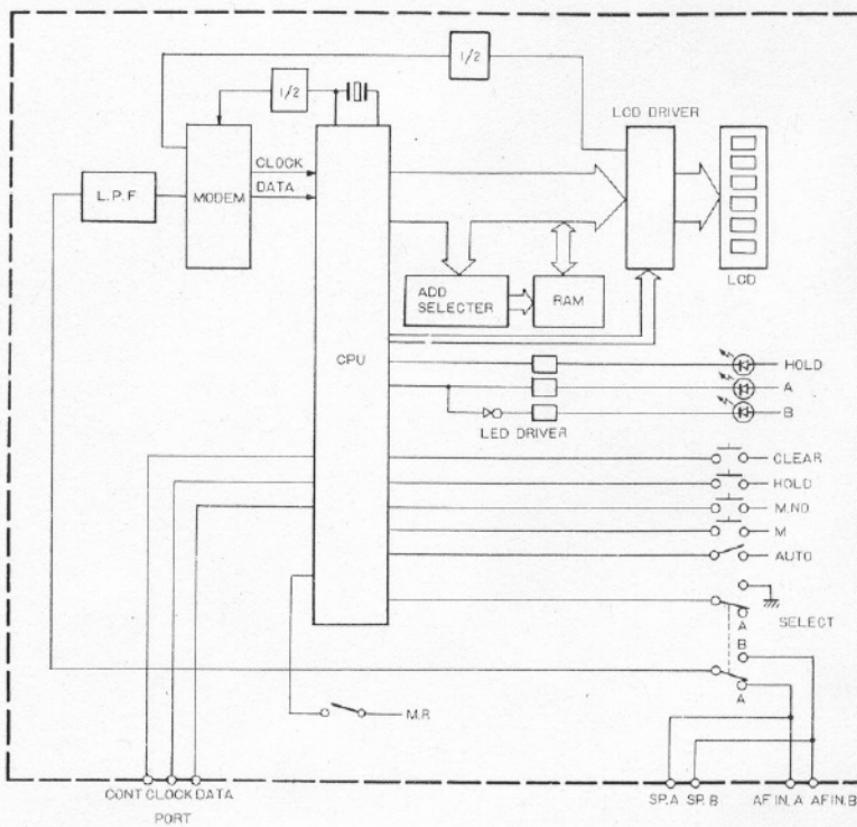
- The CD-10 cannot be operated without the Lithium battery installed.
- Replacement of the Lithium battery should only be performed by authorized Kenwood dealer, usually the one from whom you purchased this unit.

The CD-10 utilizes CMOS type circuits that are easily damaged by improper repair techniques, and should only be serviced by qualified personnel.

#### ■ Handling Precautions

- Do not place the CD-10 directly in the path of the heater outlet of your car.
- Do not reverse polarities of the power cord as severe damage may result.
- Do not attempt to power the CD-10 from 24 V systems without a DC to DC converter.
- Do not operate the CD-10 at high temperatures. If the vehicle has been parked in direct sunlight on a hot day, for example, let the interior temperature of the vehicle drop before operating.
- Do not place the CD-10 where it may be subjected to high humidity or direct sunlight.

## 7. BLOCK DIAGRAM



## 8. SPECIFICATIONS

### General

1. Semiconductors:	Microprocessor . . . . . 1
	IC's . . . . . 8
	Transistors . . . . . 6
	Diodes . . . . . 5
2. Supply voltage:	13.8 V ± 15%
3. Ground system:	Negative GND
4. Current consumption:	150 mA (13.8 V DC)
5. Operating Temperature range	-10°C to +55°C
6. Dimensions (excluding projections)	127(W) x 40(H) x 106(D) mm
7. Weight:	270 g

### Data Input Section

1. Input level (AF IN)	0.1 to 4V (8 ohm)
2. Input impedance	Greater than 10 kohms (Open SP terminal)
3. Data signal frequency: Mark signal frequency and deviation:	1200 Hz ± 200 PPM
Space signal frequency and deviation:	1800 Hz ± 200 PPM
4. Code transfer rate and deviation:	1200 BPS ± 200 PPM

### Output Port Section

1. Data signal level:	TTL level
2. Clock signal level:	TTL level
3. Code transfer rate:	3600 BPS

## TRIO-KENWOOD CORPORATION

Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan

TRIO-KENWOOD COMMUNICATIONS

1111 West Walnut Street, Compton, California 90220, U.S.A.

TRIO-KENWOOD COMMUNICATIONS

DIVISION OF TRIO-KENWOOD ELECTRONICS GmbH

Rembrucker Str. 15, 6056 Heusenstamm, West Germany

TRIO-KENWOOD ELECTRONICS, NV

Leuvensesteenweg 504, B-1930 Zaventem Belgium

TRIO-KENWOOD (AUSTRALIA) PTY. LTD. (INCORPORATED IN NSW)

4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia