

KAT-1

AUTOMATIC ANTENNA TUNER

INSTRUCTION MANUAL

SINTONIZADOR AUTOMATICO DE ANTENA

MANUAL DE INSTRUCCIONES

自动天线调谐器

使用说明书

KENWOOD CORPORATION

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CONTENTS

| | |
|--|---|
| INTRODUCTION | 1 |
| SPECIFICATIONS | 1 |
| SUPPLIED ACCESSORIES | 1 |
| INSTALLATION | 2 |
| ANTENNA CONSIDERATIONS | 2 |
| Fixed Stations | 2 |
| Vehicles | 2 |
| Ship Stations | 2 |
| GROUND CONSIDERATIONS | 3 |
| Fixed Stations | 3 |
| Vehicles | 3 |
| Ship Stations | 3 |
| ANTENNA COUPLER INSTALLATION | 3 |
| Antenna Coupler Orientation | 3 |
| Installation Using a U-clamp | 4 |
| Installation Using Self-tapping Screws | 4 |
| Installation Using Hex-headed Screws | 4 |
| ANTENNA COUPLER CONNECTIONS | 4 |
| TYPICAL INSTALLATION | 5 |
| Fixed Stations | 5 |
| Vehicles | 5 |
| Ship Stations | 5 |
| MANUAL TUNING | 6 |
| CIRCUIT DESCRIPTION | 7 |
| GENERAL | 7 |
| SENSOR CIRCUIT | 7 |
| DIGITAL CIRCUIT | 7 |
| SWITCHING CIRCUIT | 7 |
| INTERFACE CIRCUIT | 7 |
| MATCHING CIRCUIT | 7 |

INTRODUCTION

Thank you for purchasing the KAT-1 Automatic Antenna Tuner. This tuner provides a convenient method to match an antenna designed for the HF frequency range to a radiotelephone.

Please thoroughly read this Instruction Manual before installing and operating your new antenna tuner. It is also a good idea to save this manual for future reference.

SPECIFICATIONS

| | |
|-------------------------------|---|
| Frequency range: | 1.6 MHz ~ 30.0 MHz |
| Power capability: | 150 W PEP 100 W continuous |
| Input impedance: | 50 Ω |
| VSWR: | Less than 2.0 |
| Tuning power: | 10 W |
| Antenna required: | 7 ~ 23 m wire for 2 ~ 30 MHz (23 ~ 75 feet) 2.7 m whip for 3.5 ~ 30 MHz (9 feet) |
| Tune-up time: | Within 2 ~ 15 seconds (0.5 second or less on pre-tuned frequencies) |
| Power supply required: | 13.6 V DC \pm 15% (2 A max.) Negative ground (supplied by radiotelephone) |
| Operating temperature: | -30°C ~ +60°C (-4°F ~ +140°F) |
| Dimensions (WxHxD): | 258 x 433 x 90 mm (10.2 x 17.0 x 3.54 in) |
| Weight: | 2.8 kg |
| Case construction: | Weatherproof |
| Control cable: | 5-wire cable (not supplied) |

SUPPLIED ACCESSORIES

Carefully unpack your new equipment and examine it for visible damage. If the equipment has been damaged in shipment, notify the transportation company immediately. Save the boxes and packing materials for future shipping. In addition to the antenna coupler, the following accessories are supplied.

| Accessories | Part Number | Quantity |
|------------------------------|-------------|----------|
| 6-pin plug | E09-0672-XX | 1 |
| Plug pins | E23-0646-XX | 6 |
| Cap | F09-0427-XX | 1 |
| Rubber grommet (ϕ 7.5) | G53-0597-XX | 1 |
| Rubber grommet (ϕ 10) | G53-0592-XX | 1 |
| Mounting bracket | J21-4300-XX | 2 |
| U-bolt | N09-2095-XX | 2 |
| Hex bolt | N09-2096-XX | 4 |
| Screw kit | N99-0344-XX | 1 |
| Self-tapping screw | — | 4 |
| Nut | — | 8 |
| Spring washer | — | 8 |
| Flat washer | — | 12 |
| Instruction manual | B62-0563-XX | 1 |

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INSTALLATION

WARNING! A radiotelephone or antenna tuner that is incorrectly installed in a vehicle can interfere with the vehicle's microcomputer if you transmit while driving. When this interference occurs, the vehicle's engine can stop.

ANTENNA CONSIDERATIONS

WARNING! There is HIGH VOLTAGE at the antenna base. Do not touch the antenna base while transmitting.

The type of antenna used will greatly affect the performance of the equipment. Erect the antenna as

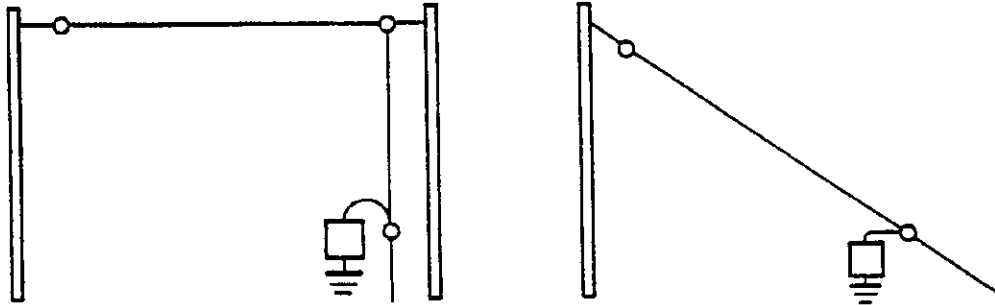
high as possible. Keep the antenna far away from objects, such as metallic masts or guy wires, that may interfere with the antenna's operation. Insulators must be able to withstand any leakage even in wet conditions.

Connect the base of the antenna to the lead-in insulator. Be aware that some lengths of the antenna element are difficult for the system to tune. Avoid element lengths that satisfy the following equation:

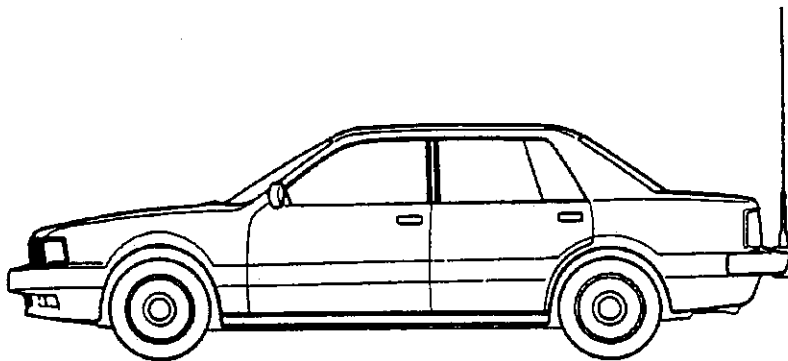
$$\text{Element length} = 300/f_{\text{operating}} \times 1/2 \times \text{Integer}$$

where $f_{\text{operating}}$ is the operating frequency in MHz.

■ Fixed Stations



■ Vehicles



■ Ship Stations



GROUND CONSIDERATIONS

Without a good ground, a radiotelephone cannot work satisfactorily with the KAT-1. In particular, it is extremely important to ground the antenna coupler unit. The mounting bracket for the KAT-1 is not connected to ground, so always directly connect a separate ground lead to the antenna coupler.

■ Fixed Stations

When used at a fixed station, the KAT-1 must be connected to a good earth ground. Never use a gas pipe or electrical conduit for your ground connection. Also, do not use the same electrical ground that you use for other major appliances such as air conditioners, stoves, etc. This may cause these devices to malfunction.

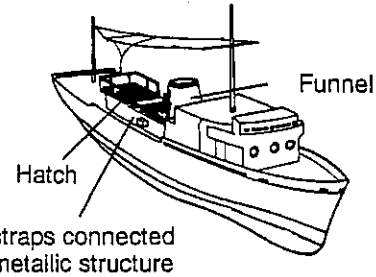
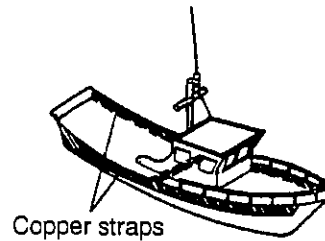
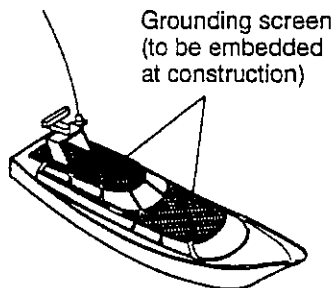
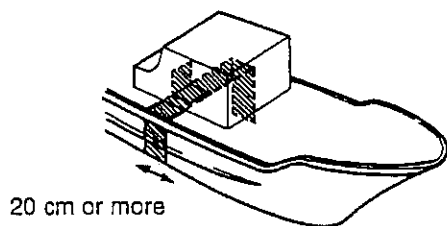
■ Vehicles

For a mobile installation, it is important to securely connect a low-resistance copper strap or large gauge wire from the KAT-1 ground terminal to the metal vehicle chassis. Always clean paint or dirt from the vehicle connection point and expose bare metal before connecting the ground.

■ Ship Stations

For maximum performance aboard a vessel, a good electrical ground is required. If the vessel has a good ground, connect to this ground using heavy gauge wire that is less than 2 m in length. If a length greater than 2 m is necessary, then use a copper strap. If a good ground is not available on the vessel, install a copper strap running from the outside of the vessel to the ground terminal of the antenna coupler.

Grounding Ideas for Non-Metallic Vessels



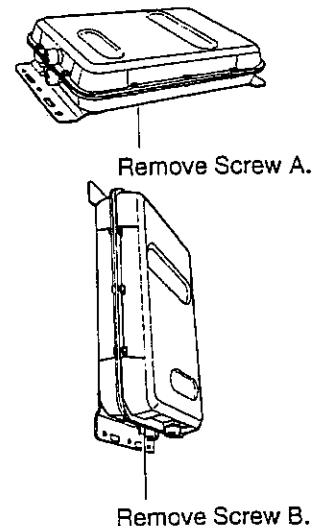
ANTENNA COUPLER INSTALLATION

The weatherproof-construction of the KAT-1 permits either interior or exterior installation. Before beginning to install the antenna coupler, consider the following:

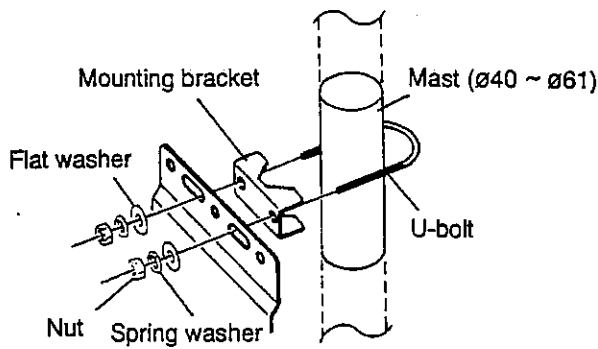
- Connection to a good ground is essential.
- Avoid installing the antenna coupler where water spray is present.
- There is HIGH VOLTAGE at the antenna base.
- Use caution when tightening the wing nut on the GND and antenna terminal. Over-tightening these nuts may cause the terminals inside the coupler to twist.

■ Antenna Coupler Orientation

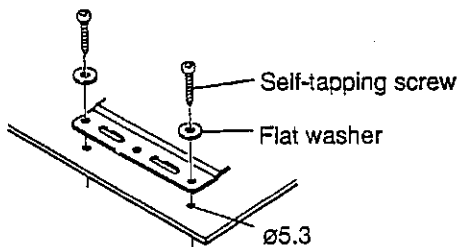
Two drain holes are provided on the antenna coupler. If the coupler is installed horizontally, remove Screw A. If the coupler is installed vertically, remove Screw B.



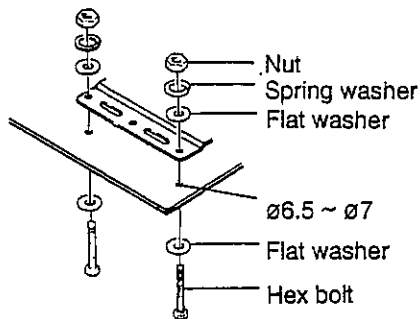
■ Installation Using a U-clamp



■ Installation Using Self-tapping Screws

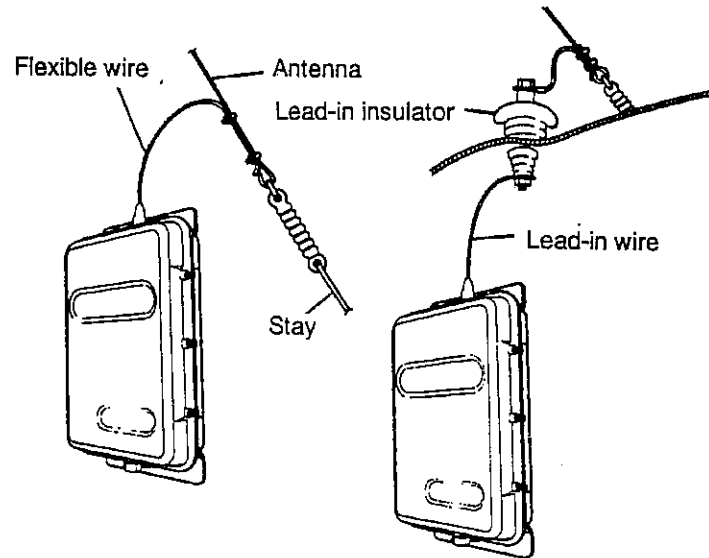


■ Installation Using Hex-headed Screws



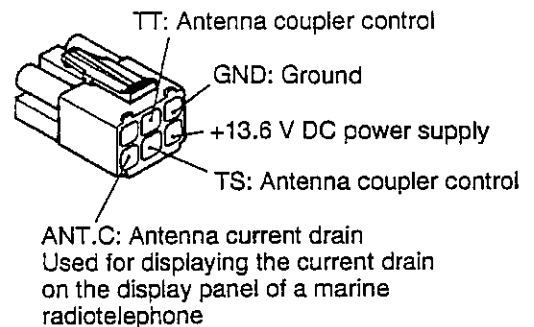
ANTENNA COUPLER CONNECTIONS

The lead-in insulator must be relieved from mechanical stress; therefore, the installation method shown below is recommended. Use a short flexible wire between the lead-in insulator and the base of the antenna. For example, the GTO15 insulator has a specification of 15 kV.

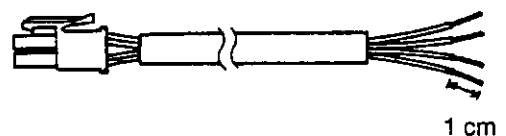


The KAT-1 requires a control cable consisting of 4 ~ 5 wires with a gauge of AWG24 or greater. The cable must be shielded.

- 1 Install the 6-pin plug on the end of the control cable. Next, connect this plug to the mating connector on the radiotelephone.
 - A 5-wire control cable is required if you want to connect the ANT.C pin. Please refer to the KAT-1 Service Manual for further information on this pin's function.



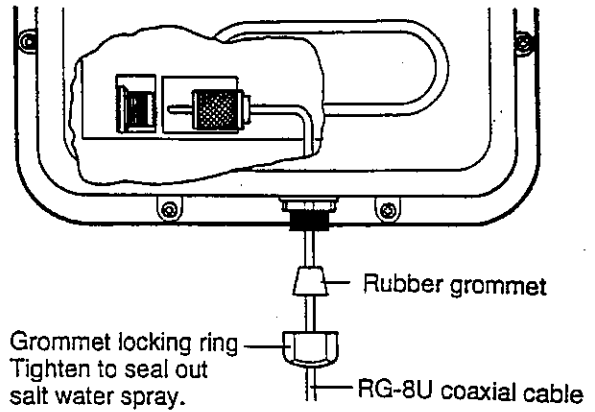
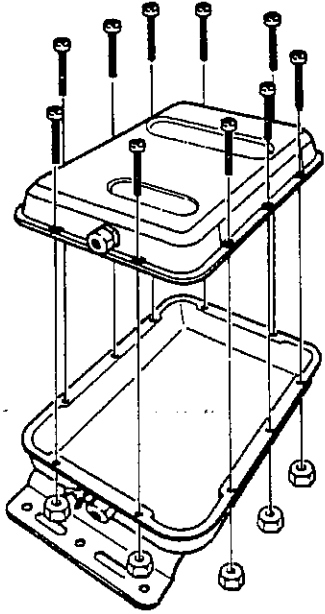
- 2 Strip the wires at the opposite end of the cable as shown below.



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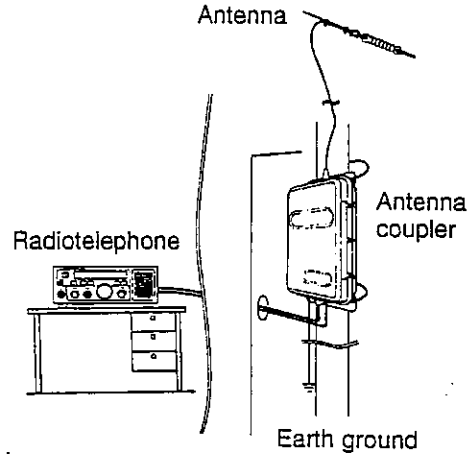
- 3 Open the antenna coupler. Slide the grommet locking ring and the rubber grommet onto the control cable, insert the control cable through the antenna coupler hole, and connect the control cable wires inside the antenna coupler. Also connect the ground lead and the antenna lead-in wire to the antenna coupler.

- Be sure that none of the wires short together.

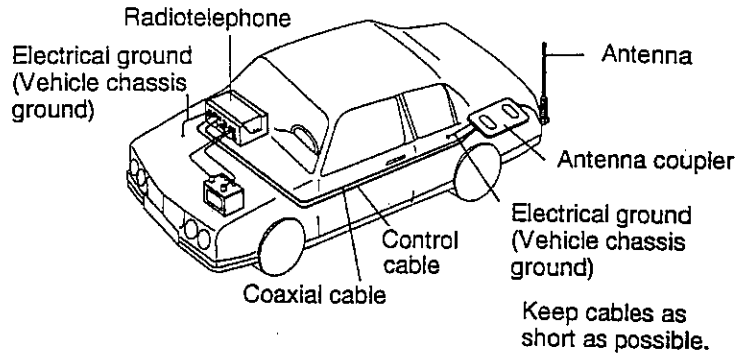


TYPICAL INSTALLATION

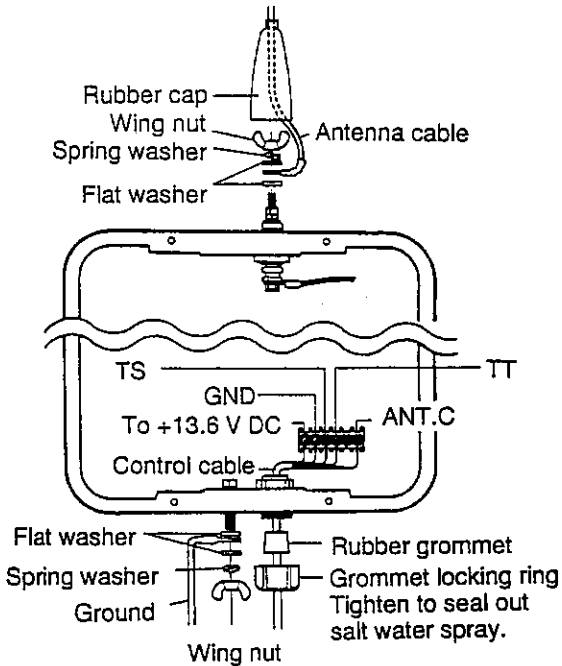
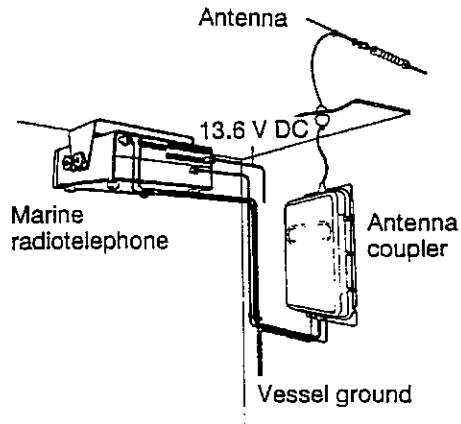
■ Fixed Stations



■ Vehicles



■ Ship Stations

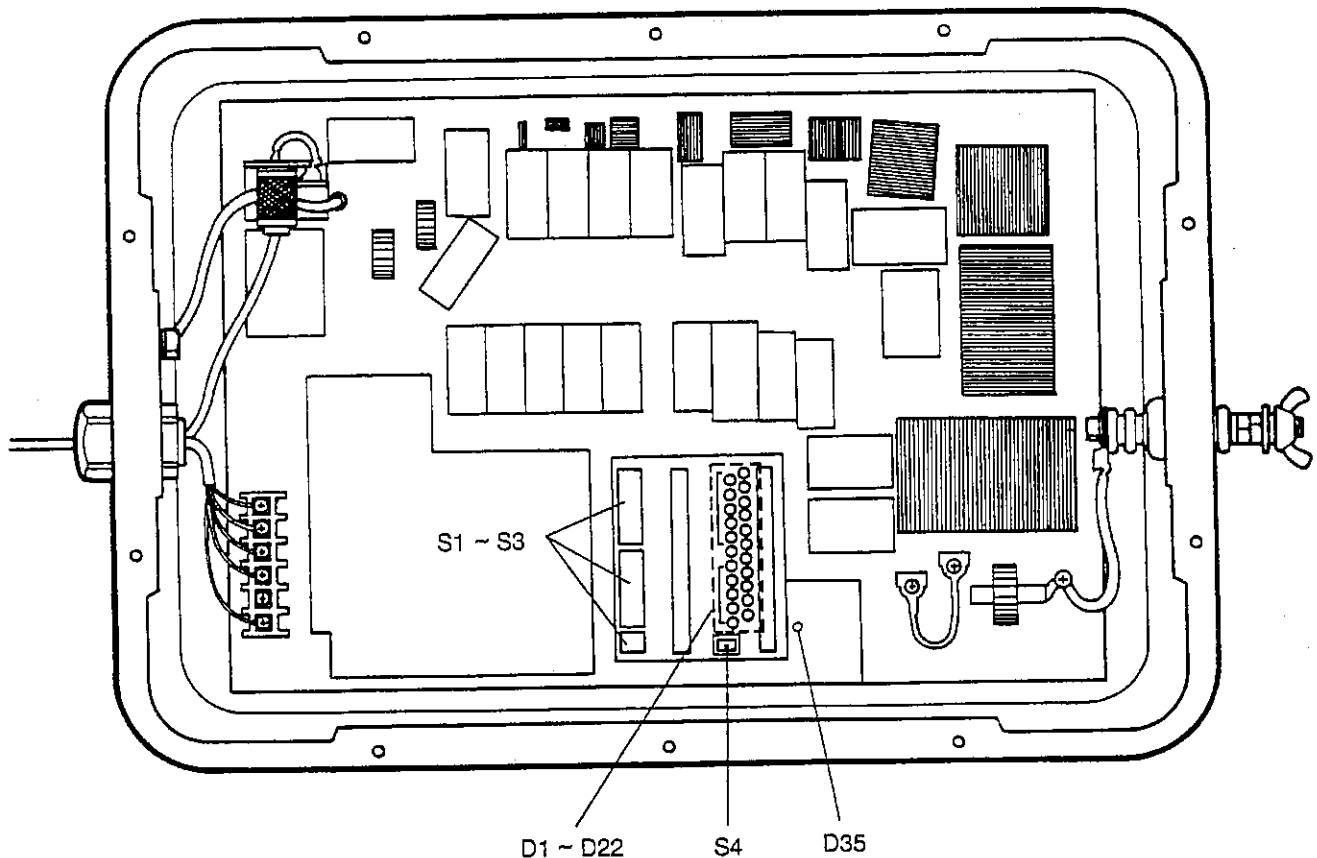


- 4 Slide the grommet locking ring and the rubber grommet onto the coaxial cable feedline from the radiotelephone, then insert the feedline through the antenna coupler hole. Install a coaxial connector on the end of the feedline, then screw the feedline connector to the mating connector inside the antenna coupler.

MANUAL TUNING

If the control circuit in the KAT-1 ever fails to function correctly, you can still transmit on one frequency (such as the Marine Mobile Emergency Channel of 2182 kHz) during an emergency by switching the antenna coupler to the Manual mode.

- 1 Switch OFF the radiotelephone power switch.
- 2 Remove the top cover of the antenna coupler.
- 3 Confirm that S4 is in the AUTO position.
- 4 Switch ON the radiotelephone power switch.
- 5 Select a channel, then press the **TUNE** key.
- 6 After tuning completes, the D35 LED indicator on the antenna coupler lights.
- 7 Record the ON/OFF status of the D1 to D22 LED indicators.
- 8 Set the S4 slide switch to the MANUAL position.
- 9 Set the S1 to S3 DIP switches to cause the ON/OFF status of the D1 to D22 LED indicators to be the same as recorded in Step 7.
- 10 Move the S4 slide switch between AUTO and MANUAL to confirm that the D1 to D22 LED indicators do not change.
- 11 Set S4 to the AUTO position.
- 12 Replace the top cover of the antenna coupler.



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