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This product is warranted against defects for 1 year from date of purchase from Radio Shack company-owned stores and authorized Radio Shack franchisees and dealers. Within this period, we will repair it without charge for parts and labor. Simply **bring your Radio Shack sales slip** as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse or accidental damage.

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**RADIO SHACK**  
A Division of Tandy Corporation  
Fort Worth, Texas 76102

Please read before using this equipment.

**HTA-20**  
**VHF Amplifier with RX Pre-Amplifier**

**Radio Shack®**

## FEATURES

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Your Radio Shack HTA-20 VHF Amplifier with RX Pre-Amplifier is a high-power, filtered VHF band amplifier designed for use with transceivers in the 144 – 148 MHz FM frequency band. When your transceiver transmits, the amplifier amplifies the transmitted power.

Its features include:

**Bipolar Transistor High Power Amplifier** – increases a normal transceiver's output power from 0.5 – 5 Watts up to 30 Watts.

**Double Tuned Helical Band Pass Filter** – reduces out-of-band interference by allowing the received frequencies in the 144 – 148 MHz band to easily enter the receiver but attenuating all other frequencies.

**Low Noise GaAs Field Effect Transistor (FET) Pre-Amplifier** – normalizes insertion loss and provides clean received signal gain.

**Note:** This amplifier is designed to be used only with a high-power antenna.

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## PREPARATION

The most common place to mount an amplifier is under a vehicle's dashboard. Choose a specific location where:

- You can easily reach the amplifier.
- The amplifier's wires and RF cables reach their connection points and do not interfere with any of the vehicle's moving parts.
- The amplifier is not directly in front of air vents.

## MOUNTING THE AMPLIFIER

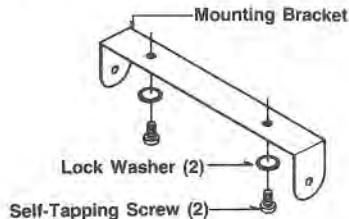
**Warning:** Mount the amplifier securely to avoid damage to the amplifier or vehicle and to prevent injury to anyone in the vehicle during sudden starts or stops.

Follow these steps to mount the amplifier.

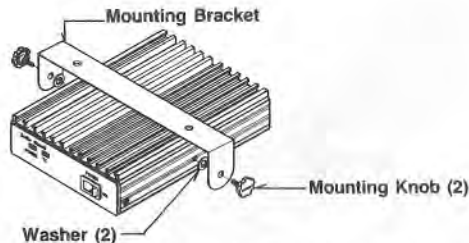
1. Mark the positions for the screw holes using the supplied mounting bracket as a template.
2. Drill the screw holes into the mounting surface at each marked location.

**Caution:** Be sure you do not drill into electrical wires behind the mounting surface or into any of your vehicle's moving parts.

3. Attach the mounting bracket to the mounting surface using a Phillips screwdriver and the supplied mounting screws and washers.



4. Attach the amplifier to the mounting bracket with the supplied mounting knobs.



**Note:** The mounting knobs are large and slotted so you can easily tighten them with either your fingers or a large flat-blade screwdriver. Do not over-tighten.

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## INSTALLING AN ANTENNA

Be sure to use the amplifier only with a high power antenna. Consult your local Radio Shack store for assistance in selecting an appropriate antenna.

**Caution:** Due to the amplifier's high power output, a low power antenna will get hot within a few minutes after starting transmissions. An over-heated antenna causes SWR (Standing Wave Ratio) degradation which can damage the RF power transistor, and in some cases, damage or destroy the antenna.

- When selecting the antenna's mounting location:
- Mount the antenna vertically and as high as possible on a vehicle.
- Mount the antenna and route the RF cable as far as possible away from electrical noise sources (ignition system, gauges, etc.).

Follow the mounting instructions supplied with the antenna, then route the antenna's RF cable to the amplifier.

**Caution:** Do not run the cable:

- Over sharp edges or moving parts that might damage the cable.
- Next to power cables or other communication unit's antenna cables.
- Through the engine compartment or other areas that produce extreme heat.

## MAKING THE CONNECTIONS

**Cautions:**

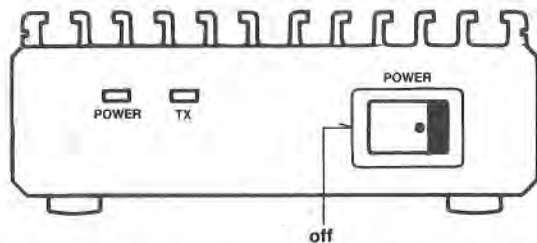
- When used in a vehicle, the amplifier is designed to work with a 12-volt, negative ground electrical system. If you are unsure about your vehicle's electrical system type, check with your vehicle's dealer.
- To avoid damage to the amplifier's RF power transistor when you use a DC power supply instead of a vehicle's 12-volt electrical system, use only a power supply (such as Cat. No. 22-120) that is fully protected against over-voltage and high frequency intrusion and is capable of supplying high current.

- To prevent damage to your amplifier, do not apply power to it until after you connect an antenna.

**Notes:** To achieve full rated power output when using:

- Your vehicle's electrical system, your vehicle should be running so the nominal input power to the amplifier is 13.8V DC.
- A DC power supply, set the output to 13.8 volts.

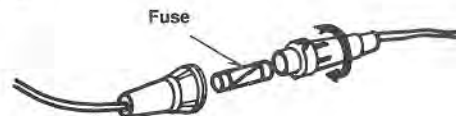
1. Set **POWER** to the off position.



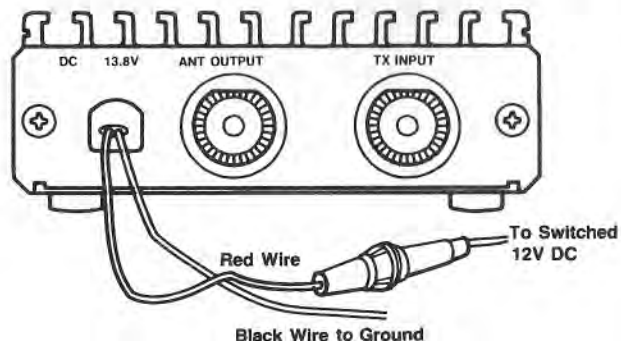
2. Remove the power source by doing one of the following:

- Disconnect your car battery's negative terminal.
- Turn off the DC power supply.

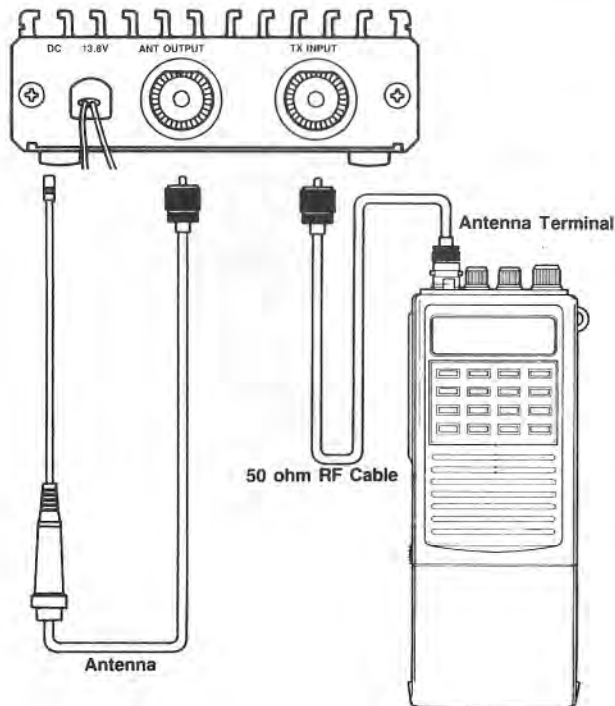
3. Push and turn counterclockwise the fuse holder in the amplifier's red wire, pull the holder apart, and remove the fuse.



4. Connect the amplifier's black wire to a metal part of your car, such as your transceiver's ground source.
5. Connect the amplifier's red wire to a source of 12-volt DC power, such as your transceiver's power source.



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6. Connect your transceiver's antenna RF cable to the **TX INPUT** connector on the back of the amplifier.



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7. Connect the antenna to the **ANT OUTPUT** connector on the back of the amplifier.
8. Place the fuse inside the fuse holder, then push the holder's ends together and tighten them by turning the holder clockwise.
9. Reapply the DC power source by doing one of the following:
- Reconnect your car battery's negative terminal.
  - Turn on the DC power supply.

## MATCHING THE ANTENNA'S STANDING WAVE RATIO (SWR)

After making all the connections and before you begin operating the HTA-20, test your transceiver and match your antenna's SWR for top performance using an SWR meter (not supplied).

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**Notes:**

- Make sure the SWR meter can measure the 144 – 148 MHz frequency band and an output power of at least 30 Watts.
- Verify the SWR using the transceiver's low power before turning on the amplifier to fine tune the SWR at high power.

Use the instructions supplied with the SWR meter to measure and adjust your antenna to the lowest SWR value. Ideally, the SWR should be as low as 1.0:1. To be acceptable, the SWR must be less than 1.3:1.

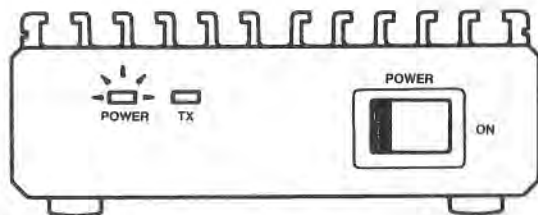
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## OPERATION

To turn on the transceiver, set **POWER** to **ON**.

Set **POWER** on the amplifier to on. The **POWER** indicator lights.



When your transceiver transmits, its low-power signal is sent to the HTA-20. The amplifier boosts the transmitted power and sends the signal to the antenna for transmission. The TX indicator lights during transmission.

When your transceiver receives, the received signals are routed through the amplifier's helical narrow band pass filter to reduce undesirable out-of-band signal interference, amplified by the low-noise GaAs FET pre-amplifier, then sent back to the transceiver.

## TROUBLESHOOTING

If your amplifier is not working as it should, follow these suggestions to see if you can eliminate the problem. If you cannot eliminate the problem, take the amplifier to your local Radio Shack store for assistance.

Symptom	Suggestion
No power to the amplifier.	Check the red and black wires' connections.  Check the power source (either vehicle battery or DC power supply) and the in-line fuse (replace only with an 8-amp fuse).
Cannot transmit and receive.	Check all cables and insure they are securely connected between the amplifier and the antenna and transceiver.  Check all cables and wires for short/open.
Output power is not amplified.	Check all cables for short/open and be sure they are connected.

Symptom	Suggestion
Output power is less than the rated level.	Check that the driving power from the transceiver is within the rated level (0.5 to 5 Watts).  Check the power source to insure it is a 12 volt source.



## MAINTENANCE

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### CARING FOR YOUR HTA-20

Your Radio Shack HTA-20 VHF Amplifier with RX Pre-Amplifier is an example of superior design and craftsmanship. The following suggestions will help you care for your amplifier so you can enjoy it for years.



Keep the amplifier dry. If it gets wet, wipe it dry immediately. Liquids contain minerals that can corrode electronic circuits.



Handle the amplifier gently and carefully. Dropping it can damage circuit boards and cases, and can cause it to work improperly.



Keep the amplifier away from dust and dirt, which can cause premature wear of parts.



Wipe the amplifier with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean it.

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Modifying or tampering with the amplifier's internal components can cause a malfunction and void your authorization to use it. If your amplifier is not performing as it should, take it to your local Radio Shack store for assistance.

### REPLACING THE FUSE

1. Set **POWER** on the amplifier to off and turn off the power source.
2. Hold the amplifier's in-line fuse holder by both ends, push and turn it counterclockwise, then pull it apart.
3. Replace a blown fuse with an 8-amp fuse of the same type and rating.
4. Push the holder's ends together and tighten them by turning the holder clockwise.

## SPECIFICATIONS

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Frequency Band	144 – 148 MHz VHF Band
Frequency Mode	F3 (FM)
RF Output Power	30 Watts
Input Power	0.5 – 5 Watts
Power Source	DC 13.8V
Negative Ground Max Current	6 Amp Max
Spurious Level	Less than -60 dB
Net Gain (Receiver with Helical Filter)	0 dB
Receiver Bandpass Filter	Double Tuned Helical
In/Out Impedance	50 Ohm
In/Out Connector	M Type
Dimensions (HWD)	1½ × 3¾ × 6¾ Inches
Weight	1¾ lbs

**Specifications are typical:** Individual units may vary. Specifications are subject to change and improvement without notice.

## NOTES

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