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Cat. No. 19-1004

OWNER'S MANUAL

Please read before using this equipment.

MTX-103

VHF Marine Transceiver

Radio Shack

FEATURES

Your Radio Shack MTX-103 VHF Marine Transceiver lets you transmit and receive on all United States and international channels in the VHF marine band, as assigned by the International Telecommunication Union (ITU). It also provides ten receive-only channels for weather information.

Your transceiver has the following features:

USA/International Channel Switch — lets you quickly switch from the USA channel mode to the International channel mode.

Emergency Channel 16 Switch — lets you immediately switch to Channel 16, the universal marine emergency channel.

Weather Channel Switch — lets you select from 10 weather channels.

PLL (Phase-Locked Loop)-Controlled Circuitry — provides accurate and stable channel selection.

Adjustable Squelch — helps eliminate noise between transmissions.

High/Low Power Button — lets you save power by selecting a suitable transmitting power for long or short distances.

Battery Low Indicator — shows the battery pack's condition.

Transmit and Receive Indicators — light when you transmit or receive.

Removable, Rechargeable Battery Pack — lets you use one battery pack while you charge another (additional packs available).

Supplied Battery Charger — conveniently recharges your transceiver's battery pack.

Speaker and Microphone Jacks — let you use an earphone or external speaker or microphone to help ensure understandable communication in noisy areas.

For your records, we recommend you record your transceiver's serial number in the space provided. The serial number is on the back of the transceiver.

Serial Number _____

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CAUTION	
RISK OF ELECTRIC SHOCK. DO NOT OPEN.	
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER OR BACK. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.	

Warning: To prevent fire or shock hazard, do not expose this product to rain or moisture.

This symbol is intended to alert you to the presence of uninsulated dangerous voltage within the product's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the product's case.

This symbol is intended to inform you that important operating and maintenance instructions are included in the literature accompanying this product.

FCC LICENSE REQUIRED

The Federal Communications Commission (FCC) requires you to have a license before you operate this transceiver. You must complete and submit FCC Form 506 — a copy of Form 506 is enclosed. Furthermore, you are required to understand Part 80 of *FCC Rules and Regulations*.

The Marine Radiotelephone Service is under the jurisdiction of the Federal Communications Commission (FCC). Any adjustments or alterations which would alter the performance of the transceiver's original FCC type acceptance or would change the frequency determining method are strictly prohibited.

Replacement or substitution of crystals, transistors, ICs, regulator diodes or any other part of a unique nature, with parts other than those recommended by Radio Shack, may cause violation of the technical regulation of the *FCC Rules* or violation of type acceptance requirements of the rules.

Before operating the radiotelephone, you must obtain your license. It is illegal to transmit without the appropriate license which can be obtained by submitting a completed FCC Form 506 (included) to the FCC. Furthermore, you are required to understand Part 80 of the *FCC Rules and Regulations* prior to the operation of your radiotelephone. It is the user's responsibility to see that this unit is operating at all times in accordance with the *FCC Rules and Regulations*.

FCC Form 506-A, Temporary Operating Authority, Ship Radio Station, is also included with your transceiver. Complete and post this temporary permit in accordance with the instructions.

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PREPARATION

CHARGING THE BATTERY PACK

The MTX-103 operates on a built-in rechargeable battery pack (supplied). You must charge the battery pack with the supplied battery charger before you use it the first time and when BAT lights steadily.

You can charge the battery pack while it is detached from or while it is attached to the transceiver.

To attach the battery pack, slide it onto the transceiver until the latch clicks.

To remove the battery pack, push the battery pack latch in the direction of the arrow, then slide the battery pack off the transceiver.

Follow these steps to charge the battery pack.

Caution: Do not use the transceiver while the charger is connected.

1. If the battery pack is attached to the transceiver, make sure **VOLUME** is turned fully counterclockwise so the transceiver is off.

2. Pull out the **CHG PWR** jack plug on the bottom of the battery pack. Plug the charger's barrel plug into the **CHG PWR** jack, then connect the charger to a standard AC outlet.

Note: Charging time is 14 to 16 hours.

Cautions:

- To prevent permanent battery power loss, never charge the batteries in an area where the temperature is above about 80°F. The charger does not operate at all at temperatures below 32°F or above 113°F.
- Never use any other charger to recharge the transceiver's battery pack. This could permanently damage your transceiver or the battery pack.

Important: This transceiver uses a rechargeable nickel-cadmium battery pack. At the end of the battery pack's useful life, it must be recycled or disposed of properly. Contact your local, county, or state hazardous waste management authorities for information on recycling or disposal programs in your area. Some options that might be available are municipal curb-side collection, drop-off boxes at retailers, recycling collection centers, and mail-back programs.

CONNECTING THE ANTENNA

Caution: To prevent damage to your transceiver, you must connect an antenna before you operate it.

1. Position the BNC antenna connector over the antenna jack on the top of the transceiver.
2. Place the slots in the antenna's connector over the tabs on the antenna jack, squeeze the base of the antenna, and push down and turn the antenna's base clockwise until it locks into place.

Instead of the supplied antenna, you can connect an optional antenna. The BNC antenna jack on your transceiver makes it easy to connect a variety of antennas, such as an external mobile antenna or an outdoor base antenna, available at your local Radio Shack store.

Caution: Never connect an antenna that is not specifically tuned for the transceiver's frequency range (156.025–162.275 MHz).

Warning: Use extreme caution when installing or removing a base station antenna. If it starts to fall, let it go! It could contact overhead power lines. If the antenna touches the power line, contact with the antenna, mast, cable, or guy wires can cause electrocution and death! Call the power company to remove the antenna. Do not attempt to do so yourself.

USING AN EARPHONE

To listen privately or to hear better in a noisy area, remove the plug from the **SPK** jack on the right of the transceiver and plug a monaural earphone (such as Cat. No. 33-175) into the jack. This automatically disconnects the internal speaker.

USING THE WRIST STRAP

Clip the supplied wrist strap to the wrist strap tab, as shown. Then simply slip the strap over your hand.

USING AN EXTERNAL SPEAKER/MICROPHONE

An external speaker/microphone (such as Cat. No. 19-310) can make it easier to use the transceiver when you clip it to your belt. Remove the plugs from the **MIC** and **SPK** jacks. Then plug the speaker/microphone's connector into the jacks. This automatically disconnects the internal speaker.

USING THE BELT CLIP

You can use the supplied belt clip to make the transceiver easier to use when you are on the go. Use the two supplied screws to attach the belt clip to the transceiver. Slide the belt clip over your belt or waistband.

OPERATION

RECEIVING

1. Turn **SQUELCH** fully counterclockwise.
2. Turn on the radio by turning **VOLUME** clockwise. Adjust **VOLUME** to the desired listening level.
3. Adjust **SQUELCH** to eliminate background noise between transmissions. Wait until there is no signal on the channel, then slowly turn **SQUELCH** clockwise until the background noise stops.
4. Raise the protective cover.
5. Use the channel thumbwheels to select the desired channel. The left wheel selects the first digit of the channel number; the right wheel selects the second digit.
6. Set **1W/5W** to select the desired output power.
   - Use **1W** for normal communication.
   - Use **5W** for emergency or long distance communication.

Note: In a marina or harbor, try to establish communications using the 1-watt setting before switching to the 5-watt setting.

7. The **USA/INT'L** switch must be set to **USA** if you are in United States waters. If you are outside the USA, set the switch to **INT'L**. Although the channel numbers are the same, the frequencies are different for USA and international channels. See "Channel Assignments."

8. Set the **NORM/CH16/WX** switch for the desired channel.

   - Use **NORM** to go to the channel selected by the channel thumbwheels.
   - Use **CH16** to quickly select Channel 16 in an emergency, regardless of the channel thumbwheel setting.
   - Use **WX** to monitor the available 24-hour weather channels. Select the desired channel using the channel thumbwheels. See "Channel Assignments" for the receive-only weather channels.

9. To turn off the radio, turn **VOLUME** counterclockwise until it clicks.

Note: To get the best communication range:

- Orient the antenna vertically.
- Move the transceiver away from shielding caused by nearby structures.
- Raise the transceiver as high as possible above the surrounding terrain.
- Try an external antenna.

Cautions:

- Receiving excessively strong signals might damage the transceiver. Do not use the transceiver close to a base station antenna or within 20 inches of another unit.
- Transmission without an antenna connected might cause damage to the transmitter.
- If the MTX-103 is accidentally subjected to water spray, immediately wipe it with a soft cloth. If the unit is contaminated with salt water, wipe it with a soft cloth moistened with fresh water. Then dry the radio.

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TRANSMITTING

When making a call using a marine transceiver, you must follow these calling procedures.

- Channel 16 is the universal calling and safety channel. Leave the radio set to Channel 16, unless a call is in progress on a different channel.
- Listen to Channel 16 for at least 2 minutes before making a call on it (to be sure the channel is not already in use).
- Press the push-to-talk button to talk; the TX indicator should light. Release it to listen; the RX indicator should light when a transmission is received.
- When you are ready for the other party to talk, end your sentence by saying "over."
- When you are ready to end communication, say "(*Your call sign or name of your boat)*, out."
- When in a marina or harbor, try first to make calls using the **1W** (1-watt) power setting. If you do not receive a response, switch to the **5W** (5-watt) setting.
- If you do not receive a response to a call after 30 seconds, wait at least 2 minutes before trying again. If you receive no response after the second try, wait at least 15 minutes before trying again.
- After making contact on Channel 16, switch to a different channel to continue the call — Channel 16 must be left open for other calls. See "Channel Assignments."

Calling Another Boat

1. Turn on the radio, and select Channel 16.
2. Hold the transceiver about 3 inches from your mouth, and press the push-to-talk button.
3. Say "*(Name of boat you are calling)*, this is (*your call sign or name of your boat)*."
4. Release the push-to-talk button and listen for a response.
5. After establishing communication, switch to a ship-to-ship channel. See "Channel Assignments."
6. When the call is complete, say "(*Your call sign or name of your boat)*, out."
7. Switch back to Channel 16.

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Making an Emergency Call

Emergency calls are made on Channel 16 because it is monitored by marine radio owners. In many areas, the Coast Guard monitors Channel 16 24-hours a day.

There are three levels of emergency calls:

- The *Mayday* distress signal is for the most severe situations and is used when there is grave and imminent danger to people and/or a vessel. Mayday has priority over all other calls.
- The *Pan-Pan* urgency signal is the second level of emergency and is used when people or vessels are in jeopardy.
- The *Security* safety signal is the third level of emergency and is used for messages about the safety of navigation or important weather warnings.

Follow these steps to make a distress call.

1. Turn on the radio, and select Channel 16.
2. Set the output power to **5W** (5 watts).
3. Hold the transceiver about 3 inches from your mouth, and press the push-to-talk button.
4. Say, "Mayday-Mayday-Mayday! This is (*your call sign and name of your boat)*, (*your call sign and name of your boat)*, (*your call sign and name of your boat)*, Mayday (*name of your boat).*"
5. Then give the following information:
   - Your location, including any navigational aids or landmarks
   - The nature of your emergency
   - The number of people on the boat and the condition of any injured
   - The estimated seaworthiness of your boat
   - A brief description of your boat length, type, color, and so forth
6. To end the message, say "I will be listening on Channel 16. This is *(your call sign or name of your boat).* Over."
7. Release the push-to-talk button and listen.
8. Someone should answer. If not, repeat the call beginning with Step 3.

Use this same basic procedure for transmitting urgent and safety signals, substituting *Pan-Pan* and *Security* in place of *Mayday*, and providing appropriate information.

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CHANNEL ASSIGNMENTS

Each of the 78 two-way communication channels and 18 receive-only channels is reserved for a specific type of transmission. Misuse of a channel is a violation of FCC regulations.

You can listen to any channel. But, with the Ship Radio Station License that you receive by filling out FCC Form 506, you can only transmit on Channel 16 and channels marked in the list that follows as “Non-Commercial” or “Public Correspondence (Public Corresp).”

Also, be sure to observe the ship-to-ship and ship-to-shore assignments of the channels.

The USA and international marine channels share the same channel numbers. They do not, however, always use the same frequencies. Also, many of the international channels use different frequencies for transmitting and receiving on a particular channel. Be sure that you set the **USA/INT’L** switch to the appropriate position.

IINSTALLED CHANNELS AND FREQUENCIES

USA VHF Marine Channels

Channel	Frequency (MHz)	
	TX	RX
01	156.050	156.050
02	–	160.700
03	–	160.750
04	–	160.800
05	156.250	156.250
06	156.300	156.300
07	156.350	156.350
08	156.400	156.400
09	156.450	156.450
10	156.500	156.500
11	156.550	156.550
12	156.600	156.600
13	156.650	156.650
14	156.700	156.700
15	–	156.750
16	156.800	156.800
17	156.850	156.850
18	156.900	158.900
19	156.950	156.950
20	157.000	161.600
21	157.050	157.050
22	157.100	157.100
23	157.150	157.150
24	157.200	161.800
25	157.250	161.850
26	157.300	161.900
27	157.350	161.950
28	157.400	162.000
60	–	160.625
61	–	160.675
62	–	160.725
63	156.175	156.175
64	–	160.825
65	156.275	156.275
66	156.325	156.325
67	156.375	156.375

Channel	Frequency (MHz)	
	TX	RX
68	156.425	156.425
69	156.475	156.475
70	156.525	156.525
71	156.575	156.575
72	156.625	156.625
73	156.675	156.675
74	156.725	156.725
77	156.875	156.875
78	156.925	156.925
79	156.975	156.975
80	157.025	157.025‘
81	157.075	157.075
82	157.125	157.125
83	157.175	157.175
84	157.225	161.825
85	156.275	161.875
86	157.325	161.925
87	157.375	161.975
88	157.425	157.425

International VHF Marine Channels

Channel	Frequency (MHz)	
	TX	RX
01	156.050	156.650
02	156.100	160.700
03	156.150	160.750
04	156.200	160.800
05	156.250	160.850
06	156.300	156.300
07	156.350	160.950
08	156.400	156.400
09	156.450	156.450
10	156.500	156.500
11	156.550	156.550
12	156.600	156.600
15	156.750	156.750
16	156.800	156.800
17	156.850	156.850
18	156.900	161.500
19	156.950	161.550
20	157.000	161.600
21	157.050	161.650
22	157.100	157.100
23	157.150	157.150
24	157.200	161.800
25	157.250	161.850
26	157.300	161.900
27	157.250	161.850
26	157.300	161.900
27	157.350	161.950
28	157.400	162.000
60	156.025	160.625
61	156.015	160.675
62	156.125	160.725
63	156.175	160.775
64	156.225	160.825
65	156.275	160.875
66	156.325	160.925
67	156.375	156.375

Channel	Frequency (MHz)	
	TX	RX
68	156.425	156.425
69	156.475	156.475
70	156.525	156.525
71	156.575	156.575
72	156.625	156.625
73	156.675	156.675
74	156.725	156.725
77	156.875	156.875
78	156.925	161.525
79	156.975	161.575
80	157.025	161.625‘
81	157.075	161.675
82	157.125	161.725
83	157.175	161.775
84	157.225	161.825
85	156.275	161.875
86	157.325	161.925
87	157.375	161.975
88	157.425	152.025
90	157.850	157.850
91	161.425	161.425
95	158.250	158.250
96	158.450	158.450
97	158.550	158.550

Comprehensive VHF FM Marine Radiotelephone Channels

Operating Channel Designations	Frequency (MHz)		Type Traffic	Ship/Ship	Ship/Shore
	Ship TX	Coast RX			
1	156.050	160.650	International Only	–	Yes
2	157.100	160.700	International Only	–	Yes
3	157.150	161.750	International Only	–	Yes
4	156.200	160.800	International Only	–	Yes
5	156.250	160.850	International Only	–	Yes
6	156.300	–	Safety	Yes	No
7	156.350	160.950	International Only	–	Yes
7A	156.350	156.350	Commercial	Yes	Yes
8	156.400	–	Commercial	Yes	No
9	156.450	156.450	Commercial	Yes	Yes
9	156.450	156.450	Non-Commercial	Yes	Yes
10	156.500	156.500	Commercial	Yes	Yes
11	156.550	156.550	Commercial	Yes	Yes
12	156.600	156.600	Port Ops, USCG	Yes	Yes
13	156.650	156.650	Locks, Canals,Pilots	Yes	Yes
14	156.700	156.700	Port Ops, USCG	Yes	No
15	156.750	156.750	Environmental	RX Only	RX Only
16	156.800	156.800	Distress Calling	Yes	Distress
17	156.850	156.850	State Control	No	Yes
18	156.900	161.500	International Only	Yes	Yes
18A	156.900	156.900	Commercial	Yes	Yes
19	156.950	161.550	International Only	Yes	Yes
19A	156.950	156.950	Commercial	Yes	Yes
20	157.000	161.600	Port Ops	No	Yes
21	157.050	161.650	International Only	–	Yes
21CG	157.050	157.050	USCG Restricted	Yes	Yes
22	157.100	161.700	International Only	–	Yes
22CG	157.100	157.100	USCG Restricted	Yes	Yes
23	157.150	161.750	International Only	–	Yes
23CG	157.150	157.150	USCG Restricted	Yes	Yes
24	157.200	161.800	Public Corresp	No	Yes
25	157.250	161.850	Public Corresp	No	Yes
26	157.300	161.900	Public Corresp	No	Yes
27	157.350	161.950	Public Corresp	No	Yes
28	157.400	162.000	Public Corresp	No	Yes
WE1	–	162.550	Weather	RX Only	RX Only
WE3	–	162.475	Weather	RX Only	RX Only
WE5	–	161.650	Weather	RX Only	RX Only
WE7	–	162.425	Weather	RX Only	RX Only
WE9	–	162.500	Weather	RX Only	RX Only

Operating Channel Designations	Frequency (MHz)		Type Traffic	Ship/Ship	Ship/Shore
	Ship TX	Coast RX			
60	156.025	160.625	International Only	RX Only	RX Only
61	156.075	160.675	International Only	RX Only	RX Only
62	156.125	160.725	International Only	RX Only	RX Only
63	156.175	160.775	International Only	RX Only	RX Only
64	156.225	160.825	International Only	RX Only	RX Only
65	156.275	160.875	International Only	Yes	Yes
65A	156.275	156.275	Port Ops	Yes	No
66	156.325	160.925	International Only	Yes	Yes
66A	156.325	156.325	Port Ops	Yes	Yes
67	156.375	–	Commercial	Yes	Yes
68	156.425	156.425	Non-Commercial	Yes	Yes
69	156.475	156.475	Non-Commercial	Yes	Yes
70	156.525	–	Non-Commercial	Yes	No
71	156.575	156.575	Non-Commercial	Yes	Yes
72	156.625	–	Non-Commercial	Yes	No
73	156.675	156.675	Port Ops	Yes	Yes
74	156.725	156.725	Port Ops	Yes	Yes
77	155.875	–	Commercial	Yes	No
78	156.925	161.525	International Only	Yes	Yes
78A	156.925	156.925	Non Commercial	No	Yes
79	156.975	161.575	International Only	Yes	Yes
79A	156.975	156.975	Commercial	Yes	Yes
80	157.025	161.625	International Only	Yes	Yes
80A	157.025	157.025	Commercial	Yes	Yes
81	157.075	161.675	International Only	–	Yes
82	157.125	161.725	International Only	–	Yes
83CG	157.175	157.175	USCG Auxiliary Only	Yes	Yes
84	157.225	161.825	Public Corresp	No	Yes
85	157.275	161.875	Public Corresp	No	Yes
86	157.325	161.325	Public Corresp	No	Yes
87	157.375	161.975	Public Corresp	No	Yes
88	157.425	162.025	International Only	Yes	Yes
88A	151.425	–	Commercial	Yes	No
WE2	–	162.400	Weather	RX Only	RX Only
WE4	–	162.275	Weather	RX Only	RX Only
WE6	–	161.775	Weather	RX Only	RX Only
WE8	–	162.450	Weather	RX Only	RX Only
WE10	–	162.525	Weather	RX Only	RX Only

CARE AND MAINTENANCE

Your Radio Shack MTX-103 VHF Marine Transceiver is an example of superior design and craftsmanship. The following suggestions will help you care for the transceiver so you can enjoy it for years.

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

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

Use and store the transceiver only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.

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

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

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

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IF YOU HAVE PROBLEMS

If your transceiver does not operate properly, check the following items first. If you still have a problem, bring the transceiver to your local Radio Shack store for assistance.

Important: Repair and/or adjustment of this transceiver must be performed by a technician with an FCC general-class commercial license.

- Check the battery pack condition.
- If you are using an external antenna, check the antenna cable and its connection at both ends.
- Check the connections of an external microphone or external speaker.
- Check the settings of the **VOLUME** control, **SQUELCH** control, **1W/5W** switch, **NORM/CH16/WX** switch, and the frequency channel thumbwheels.

FCC NOTICE

This device complies with Part 15 of *FCC Rules*. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Your transceiver might cause TV or radio interference, even when it is operating properly. To determine whether your transceiver is causing the interference, turn off your transceiver. If the interference goes away, your transceiver is causing the interference. Try to eliminate the interference by:

- Moving your transceiver away from the receiver
- Contacting your local Radio Shack store for help

If you cannot eliminate the interference, the FCC requires that you stop using your transceiver.

SPECIFICATIONS

GENERAL

Channels	All USA and International Channels Included, Plus Ten Weather Channels and CH90, 91, 95, 96, 97 for International Usage
Frequency Method	Phase Lock Loop
ETR Synthesizer Antenna Impedance	50 ohm
Power Input	12 Volt DC
Frequency Range	156.025–162.275 MHz
Operating Temperature	–4°F to 122°F (–20°C to 50°C)
Dimensions (HWD)	$1^{7}/_{8}$ ¥ $2^{5}/_{8}$ ¥ $7^{1}/_{4}$ Inches (47 ¥ 66 ¥ 184 mm)
Weight	1 lb. 3 oz. (1.09 kg)

TRANSMITTER

Power Output	1 or 5 Watts (Switch Selectable)
Modulation	FM
Hum and Noise Attenuation	40 dB
Audio Distortion	10% Maximum at 1 kHz with ±3.0 kHz Deviation
Spurious Suppression	60 dB

RECEIVER

Sensitivity	2 mV for 12 dB
SINAD	0.3 mV for 20 dB
Quieting Squelch Sensitivity	Threshold 0.15 mV Maximum for 6 dB
SINAD Receiver Attack Time	60 mSec Maximum
Adjacent CH Rejection	65 dB
Audio Power Output	300 mW at 10% THD
Spurious Response Attenuation	60 dB
Hum and Noise Attenuation	50 dB
Squelched Modulation Acceptance Bandwidth	±7.5 KHz Minimum

Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

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RADIO SHACK LIMITED WARRANTY

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.

EXCEPT AS PROVIDED HEREIN, RADIO SHACK MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

We Service What We Sell *9/94*

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Fort Worth, Texas 76102

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