

C.B.

40-Channel Transceiver with AM/FM-Stereo Radio

TRC-470



OWNER'S MANUAL

PLEASE READ BEFORE
USING THIS EQUIPMENT

REALISTIC®



This file is for information only

CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

CAT. NO
21-1591

Your Realistic TRC-470 is a marvel of solid-state electronics and micro-electronics. Using advanced CMOS and TTL integrated circuitry, we've combined a 40-channel CB transceiver and an AM/FM-stereo radio into one compact case. Both transceiver and AM/FM-stereo radio are packed with features not often found in mobile sets.

The CB transceiver uses a sophisticated Phase Lock Loop Frequency Synthesizer for precise and stable operation over all 40 channels. The dual-conversion superheterodyne receiver has an extremely low-noise Dual MOS-FET front end for extra sensitivity, and two ceramic filters for superior selectivity. A switchable Noise Blanker and Automatic Noise Limiter make the unit especially suitable for tough, on-the-road conditions.

The sensitive AM and FM-stereo circuits let you enjoy music and news as well as CB. And a special monitor switch lets you receive CB calls while you're listening to AM or FM—so you don't miss an important call.

The TRC-470 is designed for either in-dash or under-dash installation in most vehicles. All necessary hardware, trim pieces and instructions are included. Installation is quite simple, so you can save extra money by mounting the Radio yourself.

Other exceptional features of your Radio include:

- * Bright Red LED Channel Display
- * Sliding Tone and Balance Controls
- * LED Indicators for AM, FM, FM-Stereo and CB Transmit Mode
- * Stereo/Mono Switch
- * Dynamic Plug-In Communications Microphone with locking connector
- * Includes Cables for Speaker and Power Connections
- * Functions in Either Positive or Negative-Ground 12 VDC systems

For your own protection, we urge you to record the Serial Number of this unit in the space provided. You'll find the Serial Number on the back panel of the unit.

Serial Number:

F.C.C. LICENSE (U.S.A.)

Before transmitting with your Transceiver, you must have an FCC Class D Citizens Radio Service License. If you don't have a license yet, you can fill out the Temporary Permit Form 555-B for a temporary license. Also fill out and mail in FCC Form 505 CB License Application to:

Federal Communications Commission
P.O. Box 1010
Gettysburg, Penn. 17326

You must also read and know Part 95 of the FCC Rules and Regulations; they apply to the operation of a Citizens Band unit. We've provided a copy of this regulation (along with the forms noted above).

NOTE: Units manufactured for sale in the U.S.A. cannot legally be used in Canada. Canadian models have been D.O.C. approved and will carry a D.O.C. approval label with its approval number.

D.O.C. LICENSE (CANADA)

Before transmitting with your transceiver, you must obtain a Department of Communication (D.O.C.) General Radio Service license. We've provided such an application form with your unit – complete it and mail with the appropriate fee to the Radio Regulation Office nearest you.

D.O.C. Approval Number: _____

NOTE: Units manufactured for sale and use in Canada are not identical to units type-accepted by the F.C.C. Canadian models have been approved by D.O.C. and are to be used only in Canada.

BEFORE YOU CALL FOR HELP . . .

Our repair centers receive many returned products which actually are **working perfectly**. Maybe the owner just didn't read the instructions, or overlooked something. Or perhaps the problem was a blown fuse that the owner could easily have replaced.

So read this manual carefully and be sure YOU understand all the basic features of this CB—and the special ones, too! And before you assume your Radio needs repair, refer to the Service and Maintenance section of this Manual, to see if the problem is something YOU can eliminate.

Enjoy your Realistic TRC-470!

SPECIFICATIONS

CB RECEIVER

Channels	: 40
Frequency Coverage	: 26.965 – 27.405 MHz
Sensitivity	: 0.5 μ V for 10 dB S/N
Adjacent Channel Selectivity	: 70 dB +/- 10 kHz
AGC Figure of Merit	: 80 dB
Squelch Range	: 0.5 μ V to 1 mV

CB TRANSMITTER

Channels	: 40
Frequency Coverage	: 26.965 – 27.405 MHz
Power Output	: 4 watts max.
Modulation Capability	: 90 – 100%
Spurious Suppression	: 70 dB
Frequency Tolerance	: +/- 0.001%
Antenna Impedance	: 50 ohms

AM RADIO

Frequency Coverage	: 530 – 1610 kHz
I.F. Frequency	: 262.5 kHz
Sensitivity	: 20 μ V
Image Rejection	: 55 dB

FM RADIO

Frequency Coverage	: 88 – 108 MHz
I.F. Frequency	: 10.7 MHz
Sensitivity	: 5 μ V
Image Rejection	: 40 dB
Spurious Rejection	: 70 dB
Stereo Separation at 1 kHz	: 26 dB

GENERAL

Audio Output Power at 10% THD	: 4 watts per channel
Speaker Impedance	: 4 ohms
Semiconductor Complement	: 1 LSI, 7 ICs, 4 FETs, 40 Transistors, 38 Diodes, 5 LEDs
Power Requirements	: 12 VDC negative or positive ground
Dimensions	: 2" x 7-1/8" x 5-15/16" HWD (5.1 x 18 x 15 cm)
Weight	: 3 lb. 12 oz. (1.7 Kg)

INSTALLATION

NOTE: In many cases it is easier to make some or all electrical connections before mounting the Radio. First plan exactly how you are going to mount it, and determine if some electrical connections should be made before the Radio is mounted.

Also, before the installation is complete, you'll need to adjust the **AM Antenna TRIMMER** as follows:

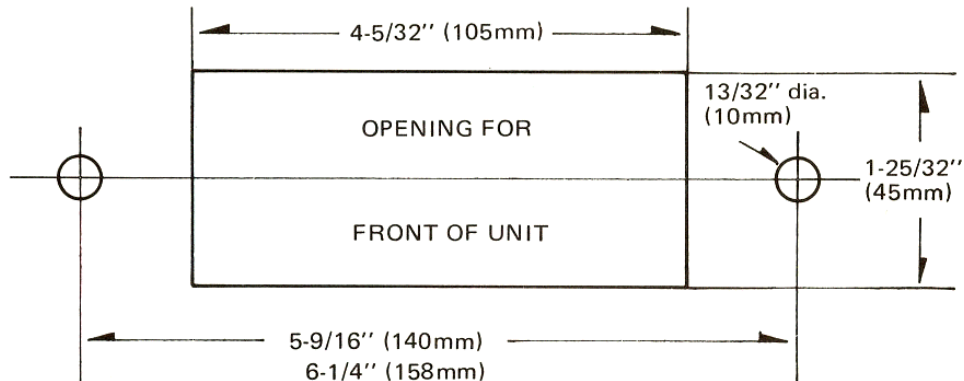
1. Connect power, speakers and AM/FM antenna. If antenna length is adjustable, set it to 32" (81 cm).
2. Turn AM radio on and tune it to a station near the top end of the dial (above 1300 kHz).
3. Using a small screwdriver, adjust **AM Antenna TRIMMER** (on right side of unit) for best reception.

The Radio has been designed for in-dash or under-dash installation. We have included all the mounting accessories you're likely to need for either kind of installation. All you need to purchase extra are a CB antenna and its accessories.

Before you start: check installation to be sure there's enough room for the unit. Be sure the Radio or mounting hardware, wiring, etc., won't interfere with other accessories and components inside the vehicle.

IN-DASH MOUNTING

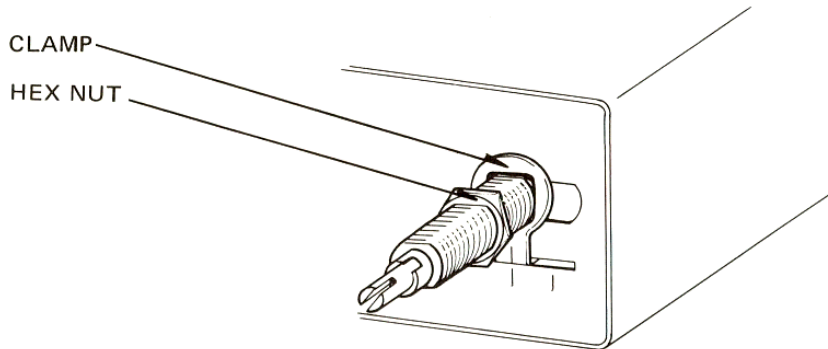
1. Remove existing radio, or if vehicle has no radio, remove the dummy face-plate covering the radio compartment.
2. If necessary, rework instrument panel to accommodate front of unit to dimensions indicated in Figure 1.



[As supplied, control shafts are separated 5-5/8" (142mm)]

Figure 1

- Before fitting unit into opening, check the shaft positions. The shaft width of this unit is preset to 5-5/8" (142mm) at the factory. If necessary, shaft may be moved outward or inward to adjust the spacing between shaft centers from 5-9/16" (140mm) to 6-1/4" (158mm) as shown in Figure 2. To adjust, loosen HEX NUT slightly to release CLAMP and move shaft as required. Reposition CLAMP and tighten HEX NUT.



(Illustration shows right front only, left side is similar.)

Figure 2

- Mount the unit in-dash as shown in INSTALLATION DIAGRAM, Figure 3. Note that the Metal Strap must be securely attached to some metal part of the vehicle (for example, the firewall). This will insure a good electrical ground for the Radio.

List of In-Dash Installation Accessories		
Key No.	Part	Q'ty
1	Gasket	1
2	Front Trim Plate	1
3	Adhesive Wood-Grain Sheet	2
4	Back-up Plate	1
5	Metal Strap	1
6	Volume Knob	1
7	Radio Tuning Knob	1
8	CB Channel Selector Knob	1
9	AM/FM/CB Selector Knob	1
10	Hex Nut (3/8" [10mm])	4
11	Flat Washer (3/8" [10mm] small size)	2
12	Flat Washer (3/8" [10mm] large size)	2
13	Hex Bolt w/Flat & Spring Washers	1
14	Washer Head Hex Self-Tapping Screw	1

NOTE: For GM cars, cut the Gasket at "GM CUT" line on the Gasket.

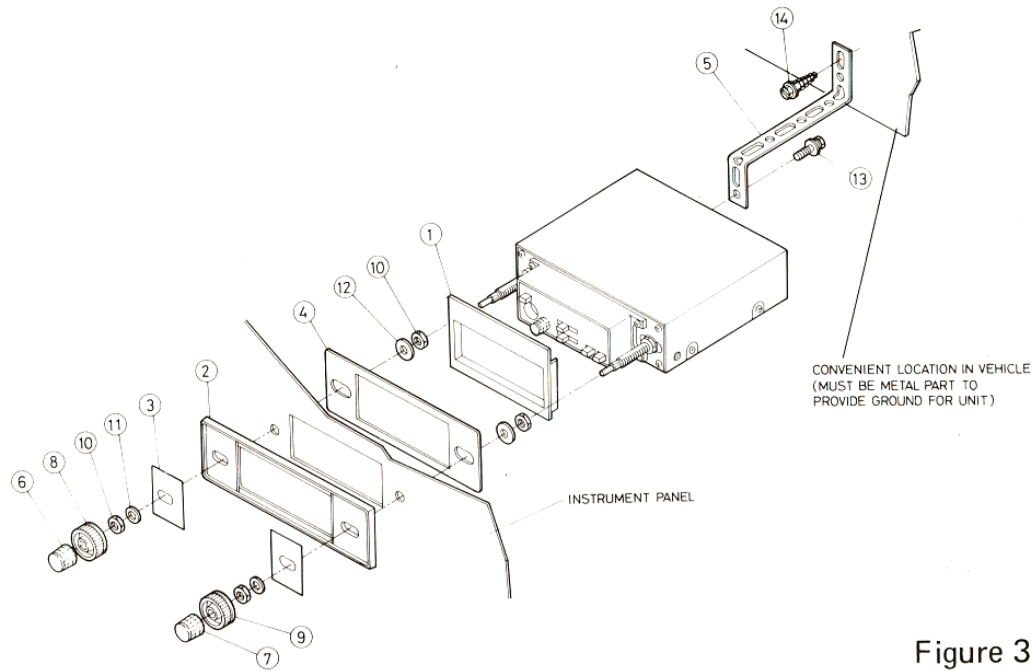


Figure 3

UNDER-DASH MOUNTING (Refer to Figure 4.)

Select a convenient location for the Radio. This is usually under the dashboard directly over the driveshaft hump. Do not mount the Unit in the path of the heater or airconditioning stream.

When you have determined the best location for under-dash mounting, mount the Front Panel to the front of the Radio with two hex nuts and two flat washers. Use the mounting bracket as a template to mark where the holes are to be drilled. Take care not to drill into existing wiring, trim or other accessories. Attach Mounting Bracket to the dash with self-tapping screws and spring washers. Use two wing screws to mount the Radio onto the mounting bracket.

Finally, mount knobs and microphone hanger as pictured in Figure 4.



List of Under-Dash Installation Accessories		
Key No.	Part	Q'ty
1	Front Panel	1
2	Mounting Bracket	1
3	Microphone Hanger	1
4	Self-Tapping Screw	4
5	Spring Washer	4
6	Wing Screw	2
7	Phillips Head Screw	2
8	Hex Nut (3/8")	2
9	Flat Washer (3/8" small size)	2
10	CB Channel Selector Knob	1
11	Volume Knob	1
12	Radio Tuning Knob	1
13	AM/FM/CB Selector Knob	1

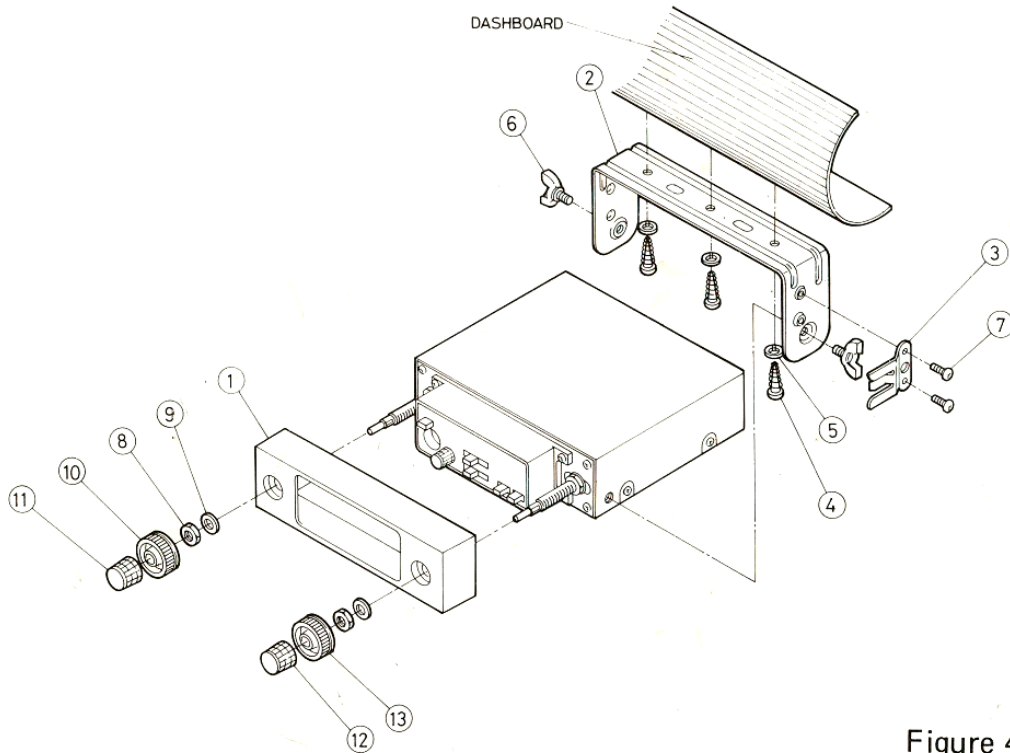


Figure 4

WIRING CONNECTIONS

Your unit is designed for use with either Negative or Positive Ground Electrical Systems.

It is vital that all electrical connections be made correctly. It is easy to make these connections — just follow the illustrations provided. However, if you feel hesitant to try to make these electrical connections, we urge you to have all wiring done by a competent electronics technician. Improper wiring can cause damage to your vehicle's electrical wiring.

Study Figure 5 and make all necessary connections as follows:

1. Disconnect ground cable from battery.
2. Attach speaker leads as indicated in Figure 5.
3. Make power connections as appropriate for your vehicle's ground system.

Negative Ground Systems:

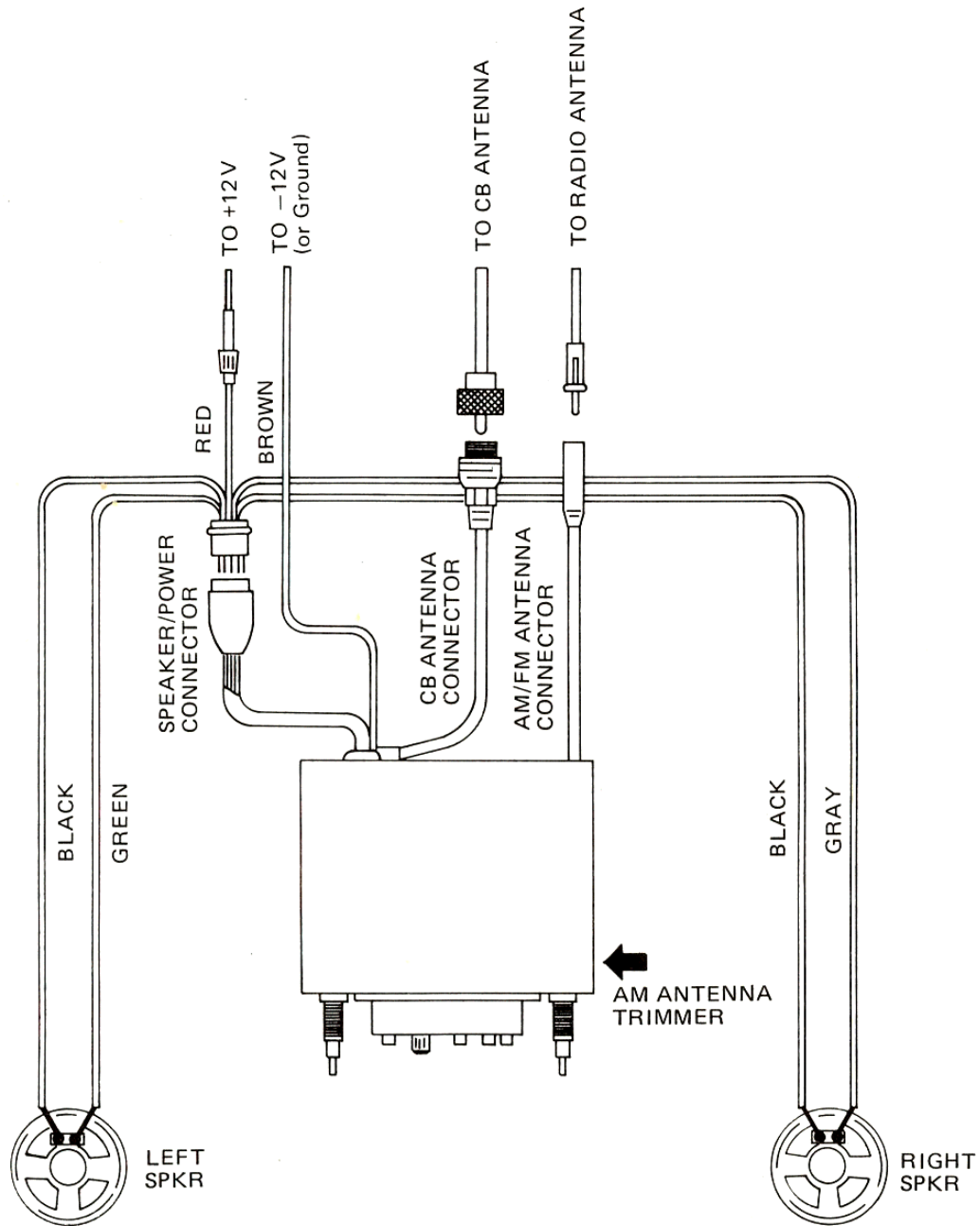
Connect the red fused wire to the positive (+) battery terminal (or to a fuse block or ignition switch or other convenient + connection point). The brown wire is negative and should be connected to the metal part of the vehicle body or (-) battery terminal.

Positive Ground Systems:

Connect the red fused wire to the positive terminal (+) of the battery (or to the metal part of the vehicle's body). The brown wire is negative and should be connected to the "hot" side of the ignition switch or directly to the negative terminal (-) of the battery.

4. Connect your car radio antenna to AM/FM Antenna Connector.
5. Connect CB antenna lead to CB Antenna Connector.
6. Reconnect battery ground cable.





IMPORTANT:
 Adjust **AM Antenna TRIMMER**
 for maximum output with a
 weak AM station around 1400 kHz
 before final installation.

Figure 5

USING YOUR TRANSCEIVER

Do not Transmit without a suitable antenna or load connected to the CB Antenna Connector.

For installation, refer to that section.

TO RECEIVE

1. Set **AM FM CB** Selector to "CB" (2 o'clock position).
2. Turn **SQUELCH** control fully counterclockwise.
3. Turn power "on" by rotating **VOLUME** clockwise. Channel display will come on, indicating power is applied to the Transceiver.
4. Select the desired channel by rotating **CB CHANNEL** selector to the desired position as indicated by the LED Channel Display.
5. Adjust **SQUELCH** to cut out annoying background noise when no signal is being received. To do this, set **CB CHANNEL** selector to a channel where no signals are present (or wait till signals cease on your channel). Then, rotate **SQUELCH** control clockwise to the point where the background noise just stops. Now, when a signal is present, you will hear it, but you will not be disturbed by noise between signals.

When properly set, **SQUELCH** will keep the receiver "dead" until a signal comes in on that channel. Do not set **SQUELCH** too high or weak signals will not be able to "open" the Squelch circuit. To receive weak signals, it is best to leave **SQUELCH** set to the minimum position (fully counterclockwise).

6. Adjust **VOLUME** for a suitable listening level.
7. If reception is noisy because of static-type interference, press **NB/ANL** button in. This will aid in reducing reception problems caused by impulse-type noise interference. For normal reception leave this button out.

TO TRANSMIT

Do not transmit unless you have a suitable antenna or load connected.

1. Be sure the Microphone is firmly connected to the jack on the front.
2. Select the desired channel of operation.
3. Press the push-to-talk button on the Microphone. Hold the mic at a slight angle about 2 ~ 3" (5 ~ 7.5 cm) from your mouth and speak in a normal voice. The **TX** Indicator light will glow red.



4. To Receive, release the push-to-talk button.

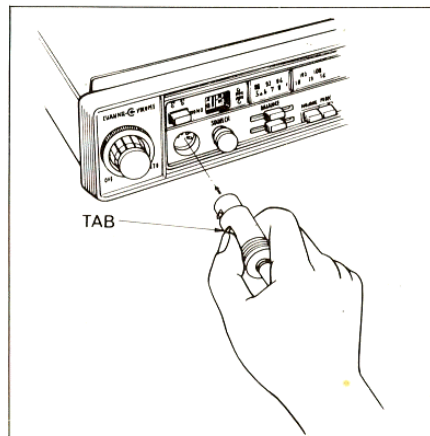
NOTE: Shouting into the Mic will not increase the power of your signal. An internal circuit automatically sets the mic signal for maximum modulation, so there is no need for loud speech — shouting may result in distortion (speech distortion going to the mic).

Connecting the Locking-Type Mic Plug

Your Transceiver features a new locking microphone connector. This insures that you won't accidentally pull out or loosen the plug connection (when extending the mic cable while moving about).

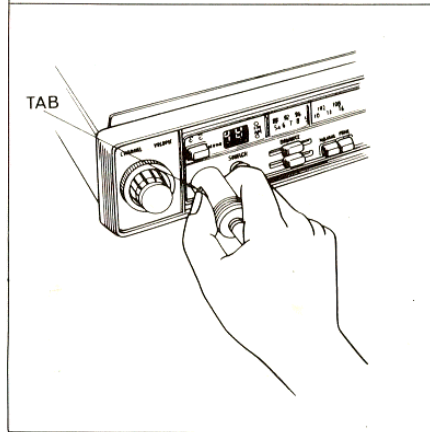
To connect the Mic plug:

Press the small tab on the side and insert plug into jack, taking care to align the plug and jack properly.



To release the Mic Plug:

You must press the small tab on the side, push plug in to release lock and then pull out.



USING YOUR AM /FM RADIO

NOTE: While listening to radio broadcasts, if you do not want to monitor the CB channel you've selected, leave **MONitor** push-button out (more on that later).

LISTENING TO FM

1. Set **AM FM CB** selector to "FM" (12 noon position). For stereo reception, leave **MONO** button out.
2. Turn the unit on by rotating **VOLUME** clockwise. The FM Indicator light will glow red.
3. Adjust **TUNING** for the desired station. The **STereo** Indicator light will come on if you are tuned to a station broadcasting in stereo.
4. Adjust **VOLUME**, **TONE** and **BALANCE** for best sound.
5. If an FM stereo station is weak, or you are far from it, the signal you receive will be weak and variable. Under these conditions, the **STereo** Indicator light will flicker and the signal will be noisy and lack stereo separation. Under these conditions, press **MONO** push-button to get better results.

NOTE: If the **STereo** Indicator light does not come on when you are tuned to an FM station (and **MONO** button is out), it means the station is not broadcasting in stereo; for these stations, press **MONO** push-button in.

LISTEN TO AM

Set **AM FM CB** selector to "AM" (10 o'clock position). The AM Indicator light will glow red. Adjust controls for the desired station and sound.

NOTE: **MONO** push-button has no effect on AM.

MONITORING CB SIGNALS

Let's say you want to listen to a radio broadcast (either AM or FM), but don't want to miss an important CB call. You can do that easily with your unit. Just set **CB CHANNEL** selector to the desired channel (while in CB mode); set **SQUELCH** to cut out background noise; switch to AM or FM, and tune the Radio for the desired station. Then press **MONitor** pushbutton in. Now, when a call comes in on the CB channel you selected, you'll hear its signal through the speakers. When the CB call stops, the unit will return to the radio program after about two seconds' delay.

NOTE: **MONitor** has no effect when you are using CB only. When using the Radio, with **MONitor** out, you won't be disturbed by CB signals; when you press **MONitor** in, you'll hear any CB signal on the channel you are tuned to. Be sure you have set **SQUELCH** properly when using the **MONitor** function, or you'll hear all the background noise on the channel.

CB ANTENNA SYSTEM

A mobile antenna system is not limited to the antenna itself; both the transmission line and the vehicle itself are important factors in the total antenna system. Therefore you must use the correct type of transmission line, and mount the antenna securely and properly.

Use coaxial cable with an impedance of 50 ohms. We suggest type RG-58/U for short lengths (under 100' [30m]), or RG-8/U for longer lengths. Generally speaking, you should keep the length of the transmission line to a minimum.

An SWR (Standing Wave Ratio) Meter can help you gauge the efficiency of your antenna system (how well it is matched to the Transceiver). Radio Shack carries several meters for measuring SWR, RF output power, etc.

The above discussion is as important for reception as it is for transmission. If a mismatch exists between the antenna and the receiver, the excellent sensitivity and signal-to-noise ratio of the receiver circuitry will be defeated.

MOBILE ANTENNAS

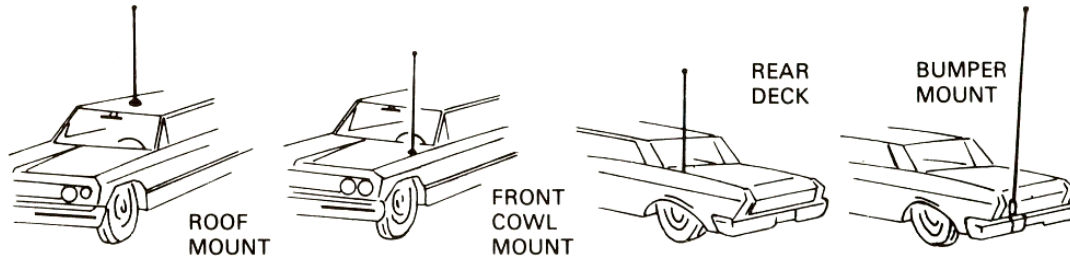
A few general rules should be followed for proper installation of any mobile antenna:

1. Keep it as far as possible from the main bulk of the vehicle.
2. Keep as much of it as possible above the highest point of the vehicle or boat.
3. During operation, it must be vertical. Thus, it should be mechanically rigid so it will maintain a vertical position when the vehicle or boat is in motion.
4. Mount it as far as possible from sources of noise (ignition system, gauges, etc.) and convenient for transmission line routing away from these noise sources.

An antenna mounted in a boat requires a ground. This can be either the metal hull or a ground made of tin-foil or copper sheeting. This ground should cover an area of 12 square feet (1 m²) or more. Be sure the transceiver has an adequate ground. Our Catalog Number 21-912 has been designed so no additional ground is needed, so if you use this antenna it will save you an extra bit of work.

There are two types of mobile CB antennas: a full-length whip or loaded whip. Your local Radio Shack store has a complete line of both types and the salesman can help you choose the best antenna for your needs. A vertically polarized whip antenna is best suited for mobile service. It is omni-directional and can be the loaded type or a full quarter-wave (quarter-wave being more efficient).

There are many possible antenna locations on a car. Four of the most popular are shown below.



Radio Shack has a complete selection of Antennas, cables, SWR/Power meters, connectors and other accessories to help you enjoy CB to its fullest.

Of course we also have a complete selection of goodies for the AM/FM Radio too; speakers, antennas, connectors, extra wire, etc. We even carry a couple of 3-band antennas (CB plus AM and FM) – one of them is a motorized “disappearing” unit.

NOISE

In Mobile operation, your vehicle or boat can be the cause of much noise interference. Since the receiver section of your transceiver is very sensitive, it will pick up even the smallest noise signals and amplify them. Any noise that you hear in the transceiver is almost totally from external sources. The receiver itself is exceptionally quiet. If the noise is continuous and relatively loud, it cannot be totally eliminated by the Noise Blanker and Automatic Noise Limiter circuits. You must solve the problem at its source.

To find out if the noise is from your ignition system, try this simple test. Turn off your ignition switch and set it to ACC (accessories). This turns off the ignition, but supplies power to the Radio. Most of the noise will probably disappear, indicating that the source of noise is your vehicle’s ignition or other electrical system.

IGNITION SYSTEM

Ignition-type noise can be identified by the fact that it varies with the speed of the engine. It consists of a series of popping sounds. There are a number of things that can be done to reduce this type of noise:

1. Use only “radio suppression type” high voltage ignition wire. Most new cars come already equipped with this type of wire.
2. Inspect the high voltage ignition wire and all connections made with this wire. Old ignition wire may develop leakage, resulting in hash.

3. If noise still persists, replace the spark plugs with spark plugs that have suppressor resistors built-in. Be sure to use the correct type for your vehicle.

Other sources of noise are: generator/alternator, regulator, gauges and static discharge. Most of these types of noise can be effectively reduced or eliminated by using bypass capacitors at the various output voltage points.

We suggest you check your Radio Shack store for a selection of noise reduction accessories.

SERVICE AND MAINTENANCE

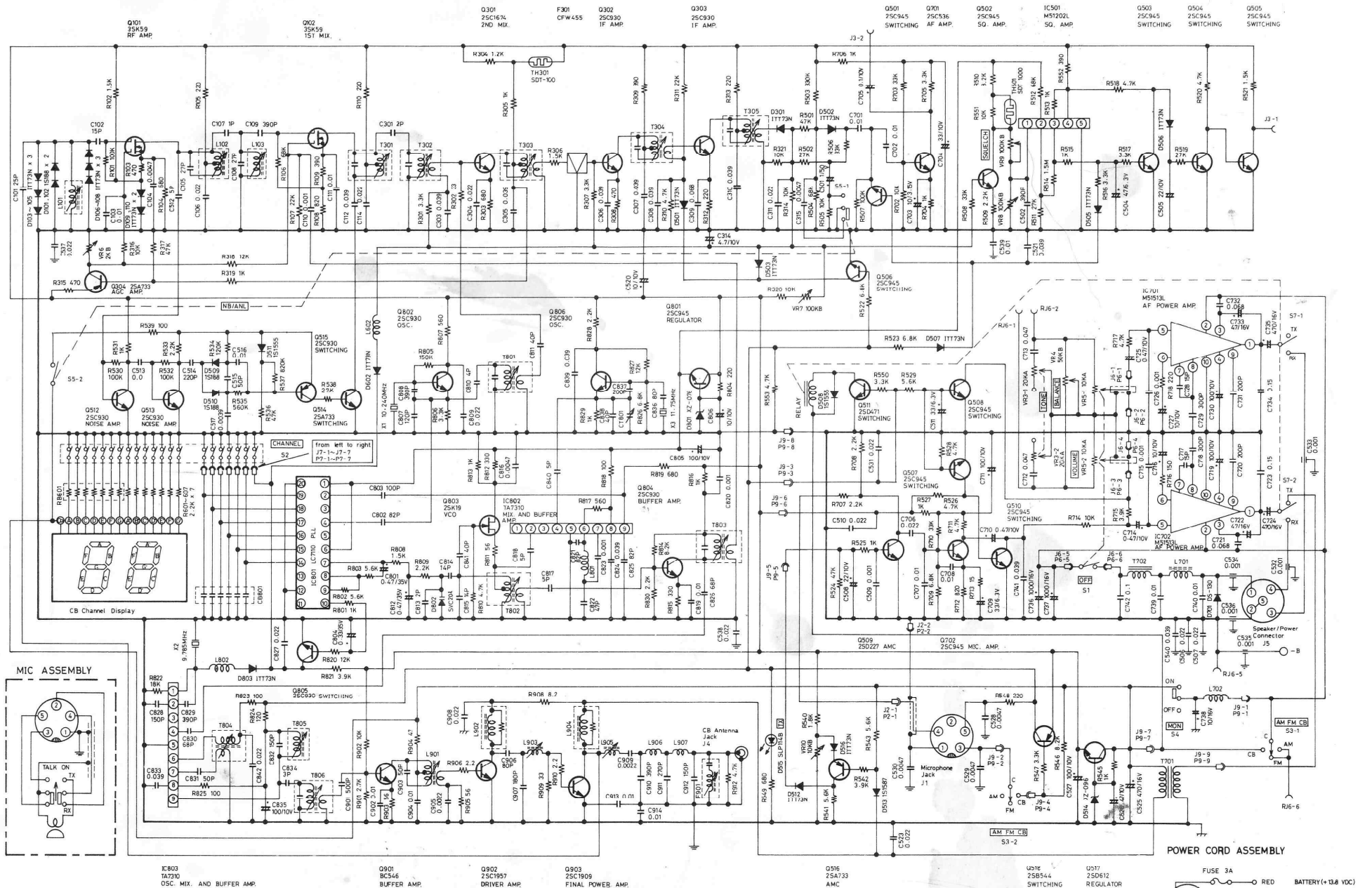
Your Transceiver/Radio has been built in accordance with Radio Shack's exacting quality control standards. However, it should be treated with reasonable care accorded any electronic equipment. Avoid exposing it to severe shock, dirt or moisture.

If you run into problems with the unit we recommend you check the following:

1. If trouble is experienced with receiving CB:
 - Check the **VOLUME** On/Off switch setting.
 - Be sure **SQUELCH** is adjusted properly. Is unit over-squelched?
 - Check if the unit is switched to an active channel.
2. If trouble is experienced with transmitting:
 - Check if the transmission line is securely connected to the Antenna Connector.
 - Check if the antenna is fully extended for proper operation.
 - Are all transmission line connections secure and free of corrosion?
 - Make sure you are fully pressing the Push-To-Talk Button on the Mic.
 - Be sure Mic plug is firmly pressed into its jack.
3. If the Transceiver is completely inoperative:
 - Check the power cable and in-line fuse. Replace only with identical 3 amp fuse.
4. If the Radio does not work normally:
 - Check control and button settings.
 - Check AM/FM antenna connections.

If these checks don't solve the trouble, do NOT attempt repairs or adjustments yourself. The unit should be serviced only by a qualified radio technician. Whenever possible, return the unit to the store from which it was purchased.

SCHEMATIC DIAGRAM



NOTES:

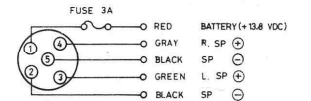
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED (K=1,000 OHMS, M=1,000 KOHMS).
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED (P=MICRO-MICROFARADS).
3. SWITCHES (S7-1 AND S7-2) ARE INCLUDED IN RELAY.
4. [AM FM CB] MARKED SWITCHES (S3-1 THRU S3-4) FUNCTION SIMULTANEOUSLY.

S3-3 AND S3-4 ARE SHOWN IN RADIO SECTION SCHEMATIC DIAGRAM.

5. CONNECTIONS BY USING MULTI-PIN CONNECTORS ARE AS FOLLOWS. REFER TO BOTH SCHEMATIC DIAGRAMS.

- P3 TO J3
- P4 TO J4
- P5 TO J5
- P6 TO J6
- P7 TO J7

6. ALL VALUES AND RATINGS ARE SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT NOTICE.



SCHEMATIC DIAGRAM (RADIO SECTION)

