

# CB 40-CHANNEL MOBILE TRANSCEIVER

## TRC-473



### 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.  
21-1537

Radio Shack has combined superb workmanship and modern styling together with the very latest state-of-the-art circuitry to bring you the TRC-473 Citizens Band Transceiver.

Although compact in size, it has been specially designed to give you maximum performance and reliability.

In order to obtain maximum performance from your new Transceiver, we suggest that you read very carefully "Transceiver Installation" and "Operation" instructions contained in this manual before attempting to install or operate the Transceiver.

Your REALISTIC TRC-473 is a completely solid-state Transceiver, designed for Class D 27 MHz Citizens Band use. It uses a frequency synthesizing circuit with digital phase lock loop techniques to provide crystal-controlled transmit and receive operation on all 40 channels. The PLL circuitry assures ultra-precise frequency control.

**Exceptional features include:**

- Digital Phase Lock Loop (PLL) circuitry assures precise channel frequency operation
- RF Gain control optimizes reception in weak and strong signal areas
- Tone control lets you adjust the sound quality to your liking
- Public Address and Monitor capabilities at the touch of a switch
- Switchable Automatic Noise Limiter
- Emergency Switch lets you "jump" to Channel 9 – instantly
- Antenna Warning Indicator lets you know when your antenna system has a problem (mismatching, shorting, etc.)
- LED modulation indicator helps you tell how fully your voice is modulating the Transmit carrier
- Bright red LED channel indicator
- Operates in any 12V DC positive or negative ground system

**And much, much more!**

For your own protection, we urge you to record the serial number of the unit in the space provided.

You'll find the serial number on the rear panel of the unit.

<b>Serial Number:</b>
-----------------------

## **NO FCC LICENCE REQUIRED (USA)**

The FCC does not require a license for operation of this unit. However, you are required to read and know part 95 of the FCC rules and regulations. They apply to the operation of A class D citizen's band unit. We've provided a copy of these regulations with your unit.

**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 carry a D.O.C. approval label with its approval number.

# SPECIFICATIONS

## RECEIVER

<b>Frequency Coverage:</b>	26.965 MHz to 27.405 MHz, 40 channels
<b>Sensitivity:</b>	0.5 $\mu$ V for 10 dB S/N
<b>Adjacent Channel Selectivity:</b>	65 dB
<b>Audio Output:</b>	5 watts (maximum)
<b>Audio Distortion:</b>	2% at 500 mW
<b>Intermediate Frequency:</b>	10.695 MHz and 455 kHz
<b>Squelch:</b>	Adjustable from 0.5 $\mu$ V to 1000 $\mu$ V
<b>Spurious Rejection:</b>	60 dB
<b>Image Rejection:</b>	70 dB
<b>I.F. Rejection:</b>	70 dB
<b>Current Drain:</b>	250 mA to 800 mA (from no signal to max. output)

## TRANSMITTER

<b>Frequency Coverage:</b>	26.965 MHz to 27.405 MHz, 40 channels
<b>RF output:</b>	4 watts maximum
<b>Frequency Tolerance:</b>	0.0005%
<b>Spurious Radiation:</b>	Better than -65 dB
<b>Antenna Impedance Required:</b>	50 ohms (SO-239 connector mates with PL-259 cable plug)
<b>Current Drain:</b>	950 mA to 1,550 mA (From no modulation to 80% modulation)

## PUBLIC ADDRESS

<b>Audio Power Output at 10% Distortion:</b>	4 W
<b>Microphone Sensitivity for 4 watts output:</b>	4 mV
<b>Frequency Response +/-6 dB:</b>	450 Hz to 2500 Hz

**POWER REQUIREMENTS:** 12 volts DC, positive or negative ground

**DIMENSIONS:** 2.2 x 7.5 x 6.1 inch (HWD)  
(5.5 x 19 x 15.4 cm)

**WEIGHT:** 2.9 lb (1.3 kg)

# TRANSCIEVER INSTALLATION

## WARNING

This Transceiver will operate only with 12 volt DC electrical systems. If an attempt is made to operate the Transceiver on 6 volt DC, 110 or 120 volt AC power sources, severe damage may result.

### Location:

Location of your new Transceiver is very important. Installations in cars are usually made somewhere under the dash panel. Things to consider when planning its location are:

1. Will you bump your knees getting in or out of passenger or driver's side?
2. Will the microphone be easy to reach while you are driving?
3. Will the mounting bracket bolts that go through the dash panel interfere with any electrical or mechanical operation in the car?
4. Will the Transceiver block the air conditioning or heater venting into your car?

After you have satisfied yourself that you have selected the most desirable location, proceed as follows:

1. Use the mounting bracket (see Figure 1) as a template to mark the position for the mounting holes.

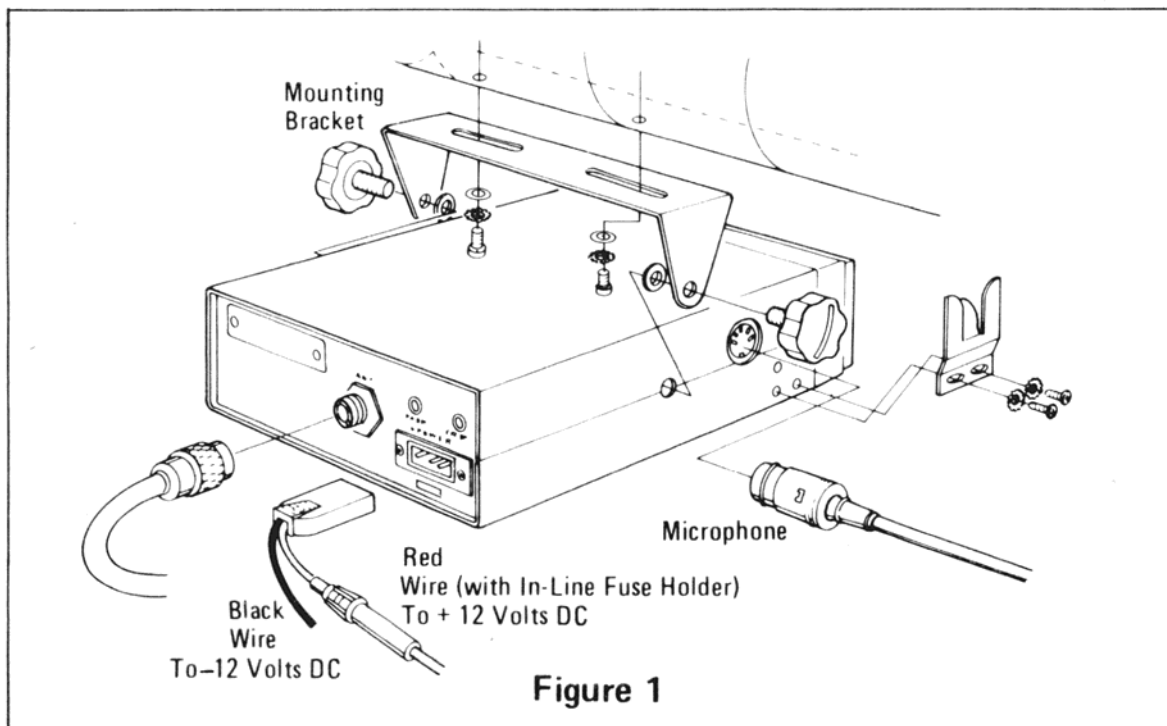


Figure 1

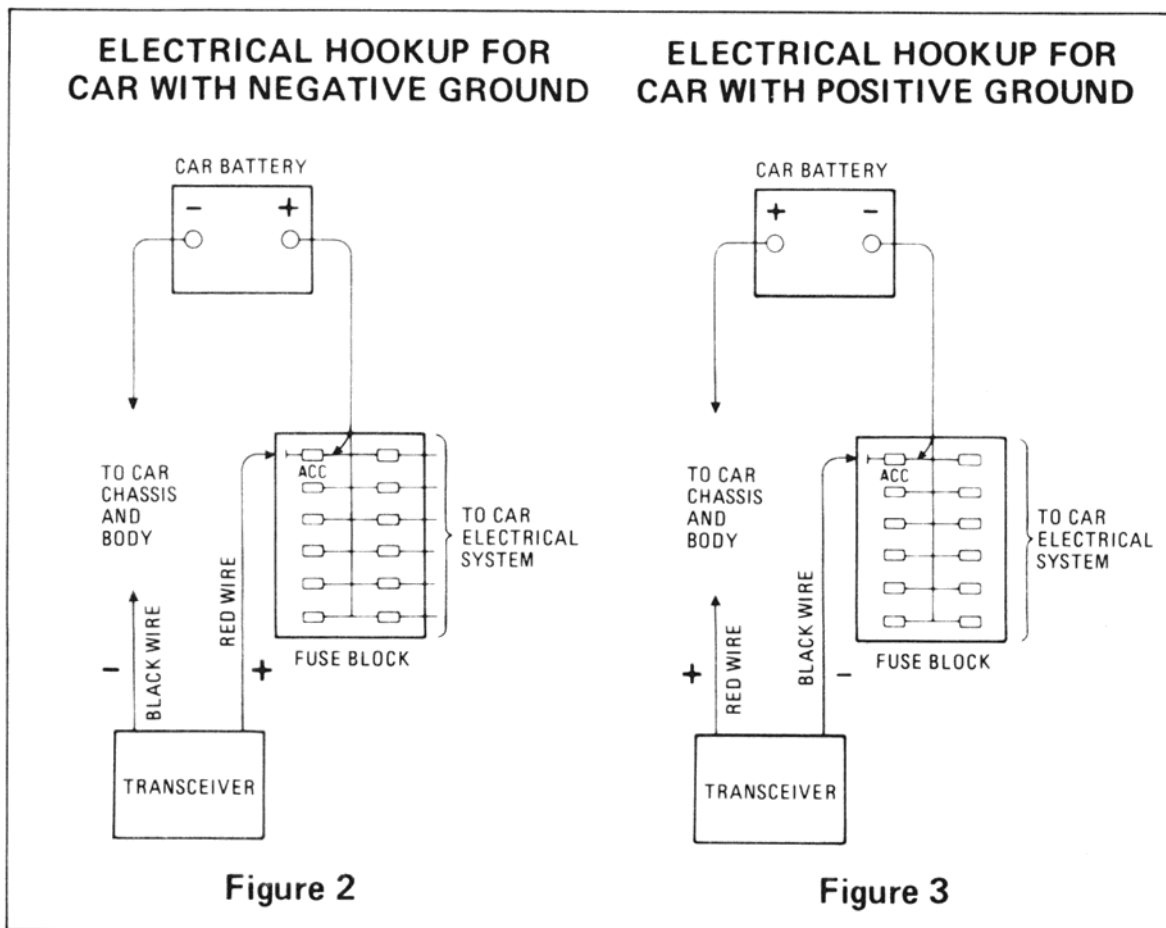
2. Observe the size of the mounting bolts, choose a drill that will make the bolts fit snugly, holding the mounting bracket tight against the dash.
3. Drill mounting holes taking great care not to damage wiring trim, or other accessories.
4. Secure mounting bracket to dash panel using mounting bolts.
5. Install Transceiver into mounting bracket using thumb screws as shown and mount the microphone bracket in a convenient location.

**Note:** Before proceeding with electrical power hookup, verify that OFF/VOLUME power switch is rotated to OFF.

6. Determine if your car has a negative or positive ground. This can be done by simply raising the hood and observing which post on your battery is connected to the engine block or car body. If it's the positive post, you have positive ground; otherwise you have negative ground system.

**Note:** Most late model cars have negative ground systems.

7. Using the appropriate Figure (2 or 3) as a guide, complete the electrical hook-up to your Transceiver.



8. If your antenna has already been installed, attach the PL-259 cable plug from your antenna to the ANTenna connector at the rear of your Transceiver.

## BASE STATION OPERATION

To operate the Transceiver from your home or office, using the regular house current as the power source, you will require a separate power supply capable of supplying two (2) amps at 13.8 volt DC. Simply connect the red (+) and black (-) leads of the Transceiver to the corresponding terminals of the power supply.

**Note:** Do not attempt to operate this Transceiver by connecting directly to 120V AC. When a DC power supply is used with the Transceiver for base station operation, any citizens band beam, dipole, ground plane or vertical antenna may be used. A ground plane vertical antenna will provide the most uniform coverage.

**Warning:** When installing or removing base station CB antennas, use extreme caution. If the antenna starts to fall, let it go as 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.

Your local Radio Shack store has DC power supplies and base station CB antennas suitable for your TRC-473. Stop by and talk with your salesperson about your needs.

If the antenna has been installed, refer to "Operation" for a detailed explanation as to the function of all the controls and indicators.

## OPERATION

**Note:** Do not transmit unless you have a suitable load or antenna attached to the Transceiver.

The OFF/VOLUME Control is used to apply and remove power from the Transceiver and to control the sound level coming from the receiver section.

The SQUELCH Control is used to eliminate receiver background noise in the absence of an incoming signal. This control is very effective in accomplishing its task. However, as the control is adjusted clockwise, effective sensitivity is decreased, thereby eliminating weaker signals which you would otherwise receive. To properly adjust the control proceed as follows: With no incoming signals, turn control fully counter-clockwise, then, slowly clockwise until the receiver noise abruptly stops.

Any signal to be received now must be slightly stronger than the average on-the-air noise. Only very strong signals will be heard when the control is set in its maximum clockwise position.

The RF GAIN control is used to adjust your Transceiver's receiver section to the signal strength in your location. Adjust as required to receive the weakest signals. With strong local signals, rotate counterclockwise to avoid overloading the front-end of your Receiver.

The TONE control is used to adjust the sound quality. Turn clockwise to emphasize high frequencies and counterclockwise to emphasize low frequencies. TONE can be particularly helpful when listening to noisy signals; set for low frequency emphasis and you'll find that the noise is not so objectionable.

The Channel Selector is used to select the channel on which the Transceiver transmits and receives.

The PA-MON-CB switch selects the mode of operation for the Transceiver. Don't set it to PA position unless an 8 ohm, 5 watt speaker is attached to PA SP jack located on the rear panel of the Transceiver. In the PA position the Transceiver operates as a public address system. In the CB position the unit operates as a Transceiver (transmitter and receiver). In the MONitor position, the Transceiver operates as a public address system and yet you can monitor CB signals so that you won't miss an important call.

The ANL OUT switch, when in the ANL position, activates an automatic noise limiter circuit which helps to eliminate low-level impulse-type external noise. When the switch is in the OUT position the automatic noise limiter circuit is deactivated.

The CH9-OUT switch enables you to set your TRC-473 instantly to channel 9, the emergency channel. Thus, in an emergency you don't have to spend time turning the channel selector until you reach channel 9.

Simply set the CH9-OUT switch to CH9 the channel display will disappear and the CH9 indicator will light you are on channel 9. Move the switch down to OUT to return to the previously selected channel.

**Note:** Channel 9 has been reserved by the FCC for emergency communications involving the immediate safety of life of individuals or immediate protection of property. Channel 9 may also be used to render assistance to motorists.

The RF/S Meter measures input signal strength when receiving and RF output power when transmitting.

The MODulation Indicator LED (to the left of the Channel Display) flashes as the Transceiver transmits. The brightness of the LED is directly proportional to the percentage of modulation.



The AWI (Antenna Warning Indicator), comes on if you operate the transmitter with an open transmission line, or high SWR.

The TRC-473 will not be damaged under such conditions, but your signal will not be getting out with much "punch".

Check your antenna system. Be sure the coax cable is not damaged.

Be sure you are using 50 ohm cable and antenna.

When the push-to-talk switch (on mic) is pressed, the Transmitter is in operation. When released, the Receiver is operating.

## TRANSCEIVER SETUP FOR OPERATION

1. Check that 12 volts is applied to the Transceiver (through the in-line fuse and red wire).
2. Check that an antenna is attached.
3. Set the channel selector to the channel on which you have selected to transmit and receive.
4. Rotate SQUELCH to extreme counterclockwise position.
5. Rotate RF GAIN maximum clockwise.
6. Set PA-MON-CB to the CB.
7. Set CH9-OUT to OUT.
8. Rotate OFF/VOLUME clockwise and adjust sound level for a comfortable listening level.
9. Rotate SQUELCH clockwise slowly (while receiving no signals), until the background noise abruptly disappears. The SQUELCH control is now set properly.
10. If signals are noisy (noise interference caused by static or any impulse-type noise), set ANL on. This will help to cut out noise interference.
11. Make sure that the microphone is plugged firmly into its socket.
12. Press the push-to-talk switch on the microphone and while holding the microphone at a slight angle to your face (about 1" to 4" [2.5–10 cm] away) speak into the microphone in a normal tone of voice. If you raise your voice you won't increase modulation at all (a special circuit has been built into your Transceiver to assure maximum modulation, without overmodulating). As a matter of fact, if you should, your voice may distort right at the mic – and your signal will sound "garbled": rather than improving intelligibility, you reduce it.
13. Release the push-to-talk switch and the Transceiver will received any incoming signal on the channel you have selected.

## PUBLIC ADDRESS OPERATION

**Note:** Do not set the PA-MON-CB switch to PA unless an 8 ohm (5 watts or more) speaker is attached to the PA SP jack on the rear of the transceiver.

Attach an 8 ohm speaker to the PA SP jack on the rear of the Transceiver. Set the PA-MON-CB switch to PA. Insure that this speaker is at least 6 feet (1.8m) away from the microphone and pointing away from the microphone. Press the push-to-talk switch on the microphone and speak at a normal level. If a shrill whistle is heard, the volume level is set too high. Adjust the VOLUME control to a lower level until the whistle disappears when the push-to-talk button pressed.

If you want to hear CB signals while using PA function, set PA-MON-CB switch to MON position. If you do not, set it to PA.

## REMOTE SPEAKER OPERATION

An 8 ohm, 3 – 10 watt speaker should be used for this function. Plug the speaker into the EXT. SP jack at the rear of the Transceiver.

When the external speaker is plugged in, the internal speaker is disconnected. You can now monitor all incoming signals from your remote speaker location.

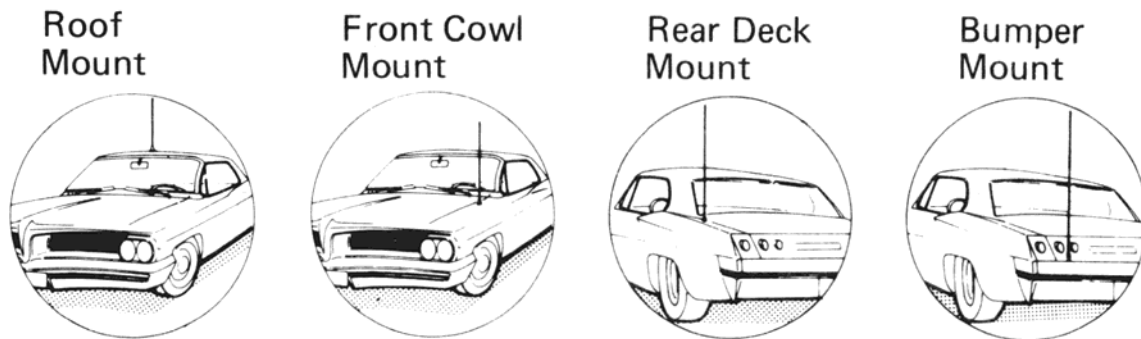
## MOBILE ANTENNAS

**Note:** We recommend RG-58/U cable assembly, catalog number 278-968, for use with your mobile antenna.

There are two types of mobile CB antennas: a full-length whip or a loaded whip. Your local Radio Shack store has a complete line of both types and the salesperson 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 as follows:



**Figure 4**

**Roof Mount** — In this position the antenna radiates equally in all directions. Since the normal 1/4 wavelength whip antenna is too long [102'' (2.6m)] for roof mounting on a vehicle, the antenna is shortened and a loading coil is utilized to provide the proper electrical length. Our fiberglass roof-mount is a good durable antenna.

**Front Cowl Mount** — The radiation pattern is slightly greater in the direction of the rear fender opposite the side on which the antenna is mounted. However, this position offers a number of advantages. The CB antenna can be easily mounted. It can double as both the CB and the standard radio antenna by employing a two-way coupler. Ask about our front cowl mount antenna which is designed for CB, AM and FM operation.

**Rear Deck Mount** — The radiation pattern is strongest in the direction of the front fender opposite the side on which the antenna is mounted. In this position you can use a full quarter-wave antenna or a shorter, loaded whip. Here you might consider one of the full [102'' (2.6m)] whips.

**Bumper Mount** — The antenna radiates in a pattern directly in front of, and to the rear of the vehicle, with maximum radiation directly away from the vehicle, in a horizontal plane. Despite its fairly irregular pattern, a bumper mounted full-length whip antenna will normally give the best results. Removing the antenna is simple and will leave no holes in the car. We suggest you try our bumper mount fiberglass whip.

A few general rules should help you install any mobile antenna properly.

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.
3. During operation, it should be vertical. Thus, it should be mechanically rigid so it will remain vertical when the vehicle is in motion.
4. Mount it as far as possible from sources of noise (ignition system, gauges, etc.) and keep the transmission line away from these noise sources.

An antenna or transceiver mounted in a boat requires a ground. This can be either a metal hull or a ground made of tin-foil or copper sheeting. This ground should cover an area of 12 square feet (approx. 1m<sup>2</sup>) or more. Be sure the Transceiver and antenna have an adequate ground.

## **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 fairly loud, it cannot be totally eliminated by the Automatic Noise Limiter (ANL) Circuit. 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 Transceiver. Most of the noise will probably disappear, indicating that the source of noise is your vehicles ignition or other electrical systems.

### **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" high voltage ignition wire. Most new cars are 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 persists, replace the spark plugs with plugs that have built-in suppressor resistors. Be sure to use the correct type for your vehicle.

Other sources of noise are: alternator/generator, regulator, gauges and static discharge. Most types of noise can be effectively reduced or eliminated with bypass capacitors at the output voltage points. Check your Radio Shack store for a selection of noise reduction accessories.

# SERVICE AND MAINTENANCE

Your Transceiver 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.
  - Check the VOLUME ON/OFF switch setting.
  - Be sure SQUELCH is adjusted properly. Is it over-squelched?
  - Check if the unit is switched to an operating channel.
  - Check setting of PA-MON-CB switch.
2. If trouble is experienced with transmitting.
  - Check if the transmission line is securely connected to the ANTENNA connector.
  - Check if the antenna is set up 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 connector is firmly pressed into its jack.
  - Check setting of PA-MON-CB switch.
3. If the Transceiver is completely inoperative.

Check the power cable and in-line fuse (2A).

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.

## WARNING

**Do not open the Transceiver to make any internal adjustments.** Any internal adjustments can be made only by (or under the direct supervision of) a person holding an FCC 1st or 2nd Class Radio Operator's License.

Internal adjustments and/or modifications can lead to illegal operation as defined by FCC Rules and Regulations, Part 95. Such illegal operation can lead to very serious consequences.

### TO BE SAFE AND SURE:

1. You should never open up the case of your Transceiver.
2. Never change or replace anything in your Transceiver.

# 10-CODES

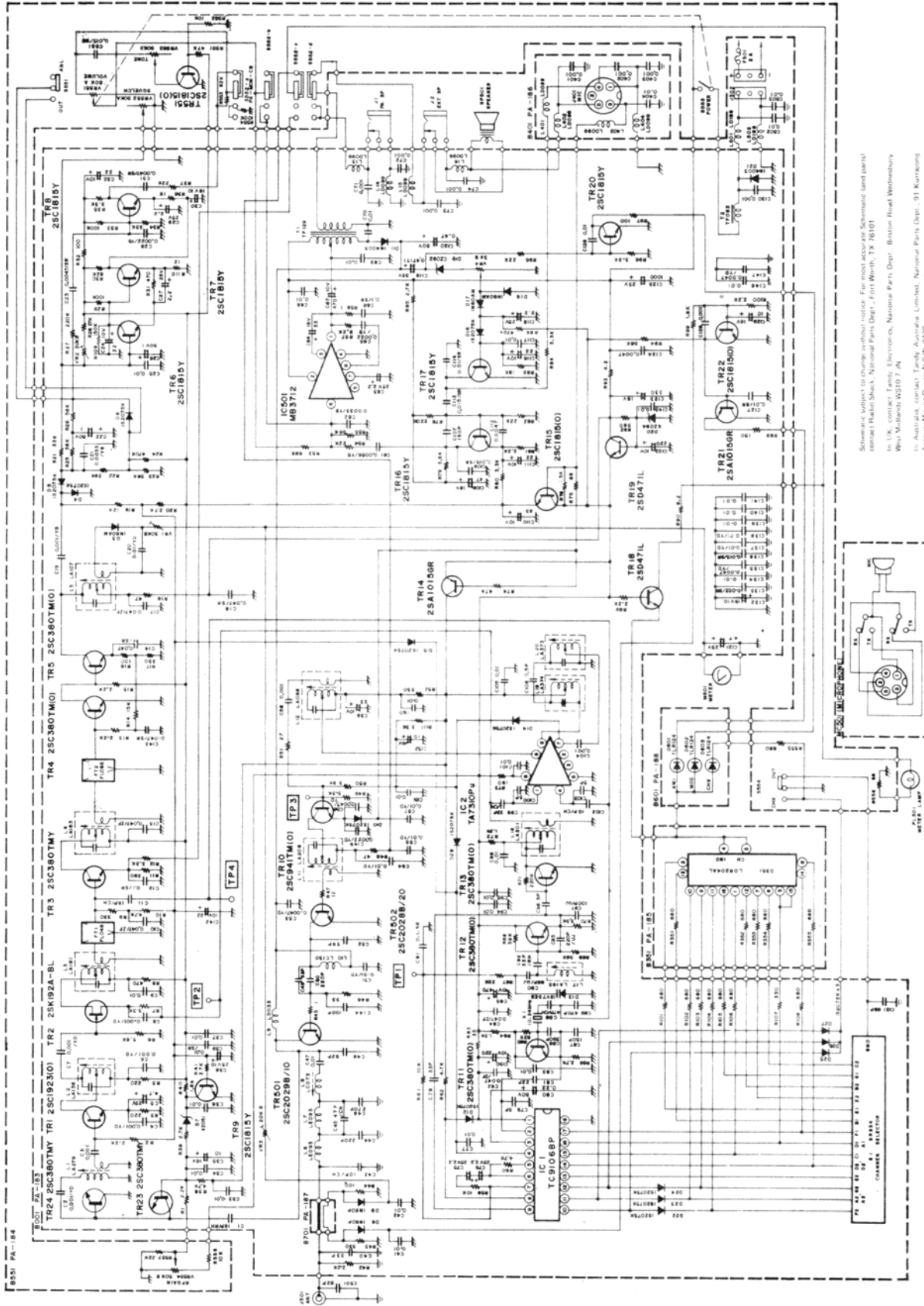
Citizens band radio operators have largely adopted the 10-code for standard questions and answers. Its use permits faster communication and better intelligibility in noisy areas. The following table lists some of the more common codes and their meanings.

Code	Meaning	Code	Meaning
10-1	Receiving Poorly	10-10	Standing By
10-2	Receiving Well	10-13	Advise Road/Weather Conditions
10-3	Stop Transmitting	10-20	What is Your Location
10-4	OK	10-33	Emergency Traffic
10-7	Out of Service	10-36	Correct Time
10-8	In Service	10-41	Switch to Channel. . . . .
10-9	Repeat	10-62	Cannot Copy You

## SOME HINTS TO HELP YOU ENJOY YOUR CB

- Wait for a pause in transmission before asking for break.
- If you don't receive an answer after a second call to another station, sign off and allow others to use the channel – wait a while, ask for a break and try again.
- Do not dead key (hold transmitter button in).
- Assist callers with directions, road conditions or other requested information.
- Keep harassment off the air. This is unnecessary and causes problems for everyone including you.
- Be courteous – treat others the way you wish to be treated.

# SCHEMATIC DIAGRAM



Schematic subject to change without notice. For most accurate Schematic (and parts) contact Haskins-Shack, National Parts Dept., Fort Worth, TX 76101  
 In U.K. contact: Lundy Electronics, National Parts Dept., Bliton Road Westbury  
 Wilt. Wiltshire, WS197 3JN  
 In Australia contact: Tandy Australia, Limited, National Parts Dept., 91 Kurrumbidgee  
 Avenue, Mount Druitt, N.S.W. 2770

### RADIO SHACK LIMITED WARRANTY

This product is warranted against defects for 90 days 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 WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. 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*

### RADIO SHACK, A DIVISION OF TANDY CORPORATION

**U.S.A.: FORT WORTH, TEXAS 76102**  
**CANADA: BARRIE, ONTARIO L4M 4W5**

---

#### TANDY CORPORATION

AUSTRALIA

---

91 KURRAJONG AVENUE  
MOUNT DRUITT, N.S.W. 2770

BELGIUM

---

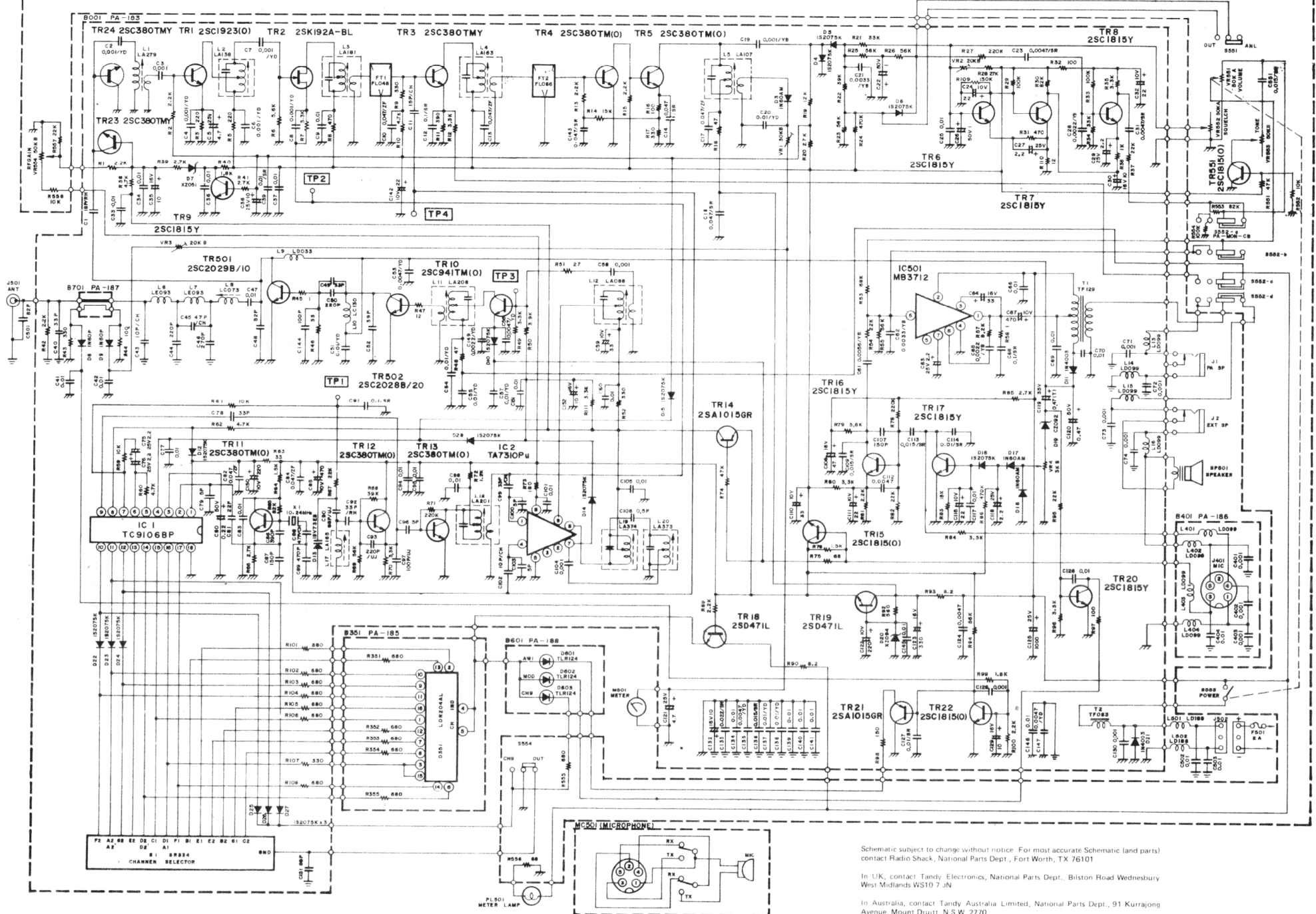
PARC INDUSTRIEL DE NANINNE  
5140 NANINNE

U. K.

---

BILSTON ROAD WEDNESBURY  
WEST MIDLANDS WS10 7JN





Schematic subject to change without notice. For most accurate Schematic (and parts) contact Radio Shack, National Parts Dept., Fort Worth, TX 76101

In UK, contact Tandy Electronics, National Parts Dept., Bilston Road Wednesbury West Midlands W510 7 JN

In Australia, contact Tandy Australia Limited, National Parts Dept., 91 Kurrajong Avenue, Mount Druitt, N.S.W. 2770