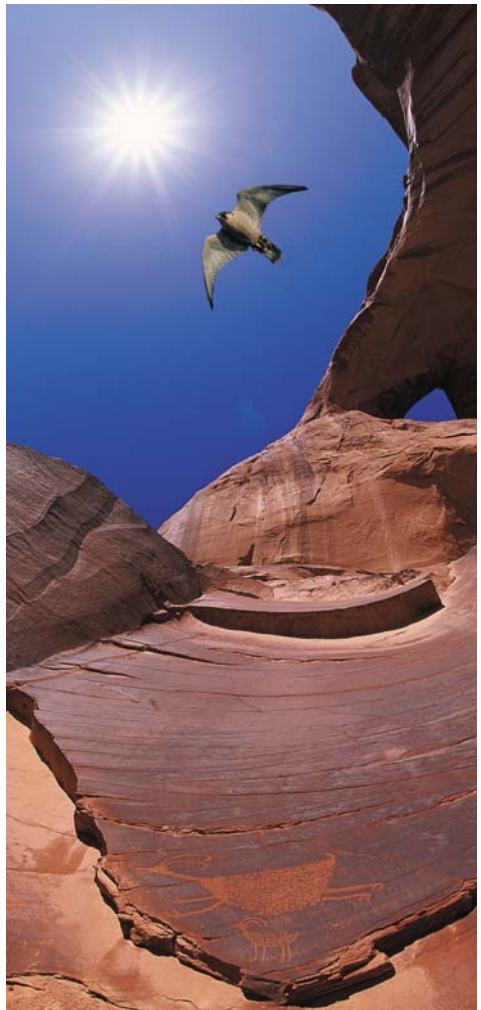


# R-400 Telemetry Receiver Operating Manual



**COMMUNICATIONS SPECIALISTS, INC.**

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## INTRODUCTION

Congratulations on purchasing the new R-400 Telemetry Receiver. This receiver is an exceptional value for a synthesized receiver covering any frequency between 216.000 and 220.000MHz with no gaps in coverage. This not only allows you to hunt with multiple birds transmitting at the same time, but multiple dogs also. The R-400 is supplied with a folding high gain, and very directional antenna which mounts directly to the receiver and rivals a Yagi in performance. No coax is required, allowing one handed operation. A standard 9 volt alkaline battery powers the unit and is easily changed using a fingernail. Not only is the R-400 extremely sensitive to hear the weakest telemetry signals, it also employs very effective filters to eliminate unwanted interference sources. The synthesized design provides excellent temperature stability with no drift in frequency settings. A three step attenuator allows full receiver sensitivity for longest range or reduced sensitivity for extremely close-in tracking to a few inches. The R-400 employs a large, full range, speaker for rich sounding loud audio. A very sensitive signal strength meter also doubles to let you know when the battery needs replacing. A rugged, light weight, aluminum case is standard as well as a 3.5 mm mono headphone jack and adaptor for the larger 1/4" headphone plugs. A standard circ., 5.5mm x 2.1mm, center positive, power jack allows the R-400 to be powered from an external 9-14VDC source.



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## TABLE OF CONTENTS

-R-400 SPECIFICATIONS	Page 2
-R-400 RECEIVER CONTROLS	Page 3
1. ANTENNA JACK	Page 4
2. METER	Page 4
3. RANGE SWITCH	Page 4
4. SPEAKER	Page 5
5. ON-OFF-BATTERY TEST SWITCH	Page 5
6. VOLUME CONTROL	Page 5
7. BATTERY COMPARTMENT	Page 5
8. TUNE CONTROL	Page 5
9. CHANNEL SWITCHES	Page 6
10. HEADPHONE JACK	Page 6
11. DC POWER JACK	Page 6
-ANTENNA	Page 7-8
-USING TELEMETRY TO FIND YOUR BIRD OR DOG	Page 9
-ORDERING	Page 10
-FCC COMPLIANCE INFORMATION	Back Cover
-ABOUT US	Back Cover
-WARRANTY	Back Cover

### SPECIFICATIONS

Frequency range: Continuous from 216.000 to 220.000MHz

Sensitivity: -150dBm

Channel steps: 10kHz with  $\pm 5$ kHz fine tuning

Antenna connector: BNC female

RF attenuator: -20dB or -50dB switchable

Battery: 9 volt replaceable alkaline

Size: 6.2"x3.5"x1.4", less projections

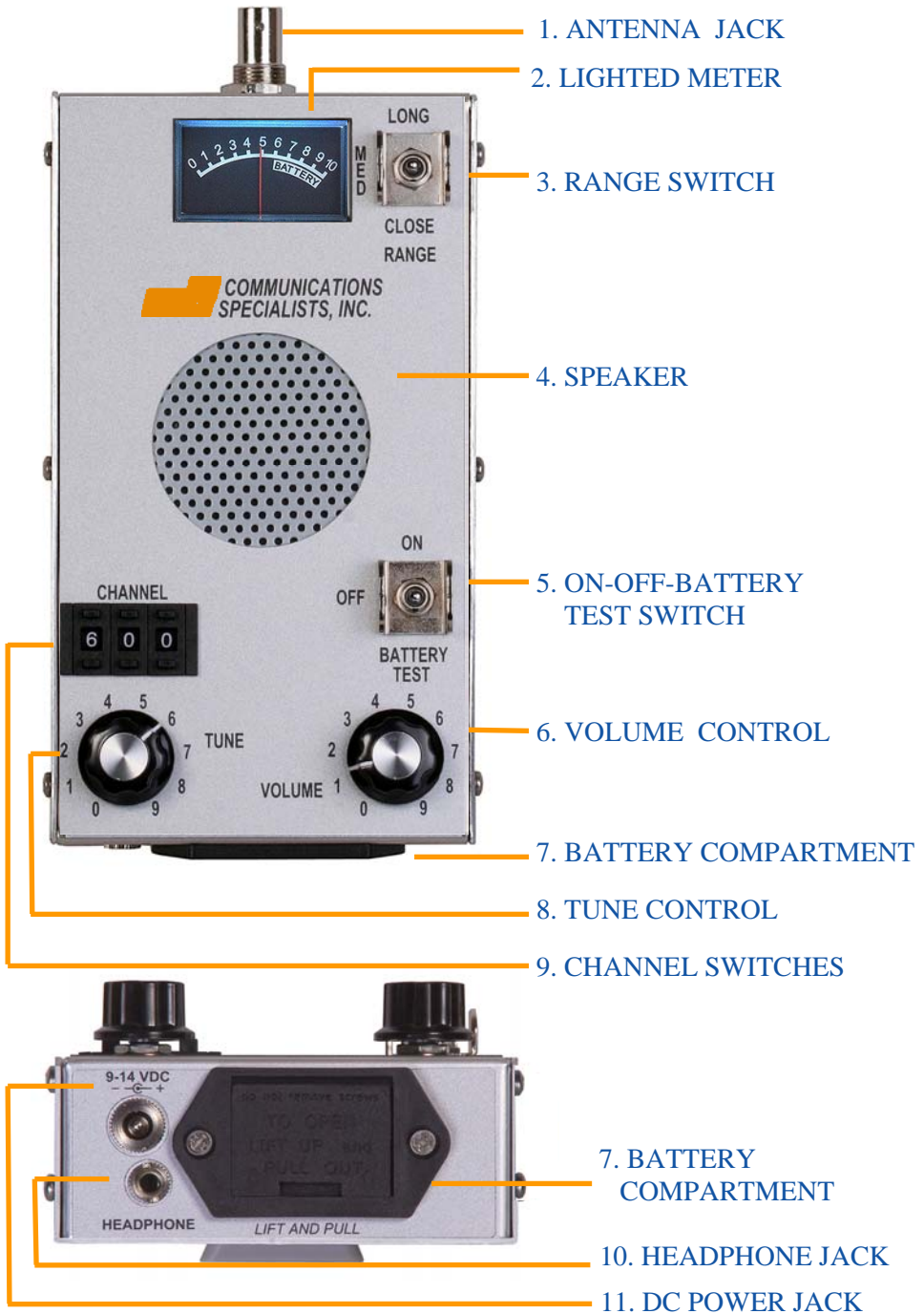
Overall size with antenna folded: 12"x4.75"

Overall size with antenna extended: 20.25"x11.25"

Weight: 18oz without antenna, 31oz with antenna

Supplied with pistol grip Yagi antenna that allows one handed operation, detaches and can be used alone, and folds for easy carrying

# R-400 RECEIVER CONTROLS



## 1. ANTENNA JACK

Industry standard BNC female antenna jack accommodates either the supplied directional antenna, standard coax lead with external yagi antenna, or auto rooftop antenna. Just push the plug into the jack and twist clockwise to lock into place. Twist counterclockwise and pull to remove.

## 2. METER

The lighted meter is used to measure the relative strength of the incoming signal. Use the volume control to set the meter in the center of the scale. Use the changes in upward meter movement while receiving your transmitters pulsed signals to help get good directional information from your antenna position. The meter is also used to measure battery condition when the ON-OFF-BATTERY TEST switch is in BATTERY TEST. The battery indication box on the bottom of the meter scale will indicate the battery voltage remaining in the battery. A 7 on the meter is 7 volts remaining (almost totally discharged battery), a 9 on the meter indicates 9 volts remaining (a good battery). Replace the battery when the needle falls below 7.

## 3. RANGE SWITCH

The RANGE SWITCH is a 3 position switch used to attenuate the signal going from the antenna to the receiver so the receiver is not overloaded by a strong signal. In LONG there is no attenuation, therefore the receiver is listening with full sensitivity. In the MED (or medium) position, approximately 20dB of attenuation is inserted between the antenna and receiver. In CLOSE another 30dB of attenuation is inserted for a total of 50dB. To DF your bird, always start in the LONG position to make sure it can be heard and you are satisfied with the pitch of the received tone (as set with the TUNE control). If you are able to hear your transmitter, change switch positions to MED and see if it can still be heard. If it can not, go back to LONG, reduce volume so the meter indicates half scale and turn around in order to find the strongest signal strength. This will show what direction your bird is. Walk or drive in that direction until you can move the RANGE switch to the MED position and still hear the signal. Continue to walk or drive in the direction of strongest signal strength until you can move the RANGE switch to the CLOSE position. When you can hear your bird in the CLOSE position, you are usually with sight of it.

#### 4. SPEAKER

A large, full audio range speaker is used to provide very good sound quality. Keep liquids, dirt, sand, and other foreign material from falling into the small holes in the speaker grill.

#### 5. ON-OFF-BATTERY TEST SWITCH

In the OFF position, no battery current is drawn. This is how the switch should be left when the receiver is not in use. When switched to the ON position, the receiver is active and drawing current from the battery. In the BATTERY TEST position, the condition of the battery under load is tested and the results are available on the meter.

#### 6. VOLUME CONTROL

The volume control is used to raise or lower the audio level to the speaker and meter circuit. Adjust it to suit your own preference. Note that it is easier to track a signal that falls about mid meter scale rather than one banging against the upper meter stop.

#### 7. BATTERY COMPARTMENT

The battery compartment on the bottom of the receiver houses the 9 volt alkaline battery in a pull-out drawer. To open the drawer, place one of your fingernails in the slot on the bottom edge of the drawer and lift up with your finger until the drawer snaps upward. Then pull the drawer out. **DO NOT REMOVE THE TWO SCREWS HOLDING IN THE BATTERY COMPARTMENT!** With the drawer in your hand, pop up the battery and replace it if it is discharged with a new alkaline battery. Be sure to note the proper battery polarity when placing the battery back in the drawer. If you force the battery in with reversed polarity, the receiver will not work but will not be damaged. Simply remove the battery drawer and flip the battery over. Battery life at moderate volume levels is approximately 4 hours. To conserve battery life, turn the receiver off when not in use. Keeping a spare battery in your pocket or vehicle is a good idea.

#### 8. TUNE CONTROL

The TUNE CONTROL is used to fine tune the receiver between the 10kHz increments shown on the CHANNEL SWITCHES (frequency select switches). Each number between 0 and 9 represent approximately 1kHz.

Adjust the TUNE CONTROL for a pleasant sounding audio tone. This tone is different for everyone but usually is between 500 and 1500Hz. You will notice that for any transmitter, there are 2 places the TUNE CONTROL can be adjusted that produce a changing audio tone with a dead gap, or zero beat, in between. Tune to the one that is loudest with your transmitter and note the number associated with it for future reference.

## 9. CHANNEL SWITCHES

The CHANNEL SWITCHES control the frequency synthesizer in the receiver so it operates on the selected frequency. The first digit on the far left shows the MHz range selected. It will be a 6 for 216MHz, a 7 for 217MHz, an 8 for 218MHz, or a 9 for 219MHz. **Any other number selected (0,1,2,3,4,5) will mute the receiver so no audio can be heard from the speaker.** The second or middle digit is for 100kHz increment selection within the MHz range selected by the first digit. The third digit to the right is for 10kHz increment selection within the 100kHz range selected by the second or middle digit. An imaginary decimal point is between the first and second digits. An imaginary 21 also precedes the first digit. An example might be to set the CHANNEL SWITCHES to the frequency of 216.055MHz. The first digit is set to 6, the second is set to 0, and the third is set to 5. The TUNE CONTROL is then used to select the last 5. It is very important to try out the transmitters you are going to use in the field before needing them. It is helpful to have a list of CHANNEL SWITCH and TUNE CONTROL settings that match with each of your birds and dogs.

## 10. HEADPHONE JACK

A standard 3.5 mm (1/8") mono headphone plug can be inserted into this jack for use in noisy environments. If a stereo headphone is plugged in, audio will be normally only be heard in one ear. When a plug is inserted into the jack, the internal speaker in the R-400 is disconnected. The QA-8 adaptor is supplied for headphones with the larger 1/4" male plug.

## 11. DC POWER JACK

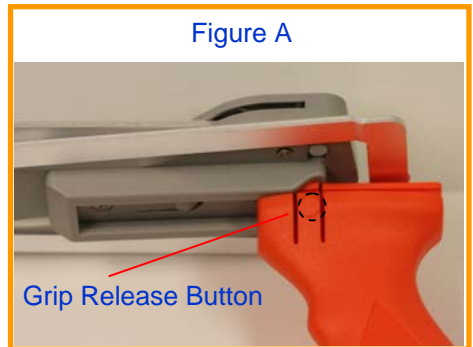
The DC power jack is used to power the R-400 with or without a battery in the BATTERY COMPARTMENT. Use the CM-1, 12vdc power cable, to connect to the cigarette lighter socket in the vehicle. If either an alkaline, NiMH, or Li-Polymer battery is installed, the battery is automatically bypassed and no current is drawn from it when this jack is used.

## ANTENNA

The R-400 is supplied with a high gain, directional antenna that attaches directly to the receiver. In order to find your birds direction, the antenna elements must be fully extended as shown below. You may change the polarity by rotating the receiver with your hand. The below photos show both vertical and horizontal polarization. Hold the R-400 as shown in the photos and try both vertical and horizontal polarization while turning your body around in a circle. See which polarity either gives the loudest signal or the most accurate bearing information.

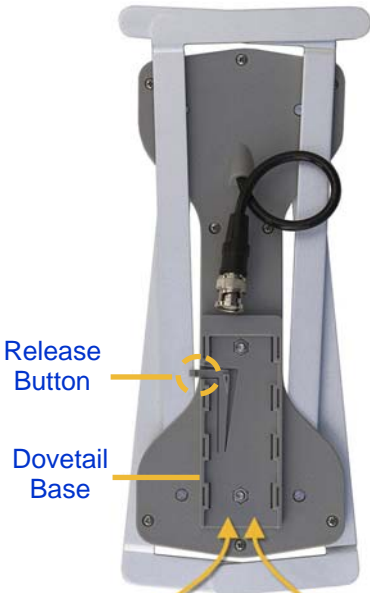
The directional antenna comes with a removable pistol grip handle. You can use the receiver with or without the grip. The grip slides into the bracket beneath the antenna and will lock into place with a small click. To remove the grip, depress the grip release button slightly and slide grip free as shown in Figure A.

A holster style carrying case is supplied with the receiver. It can be attached to a belt and worn while searching for your bird, or used to protect the receiver and antenna during storage. There is a small pocket on the case for storing spare 9 volt batteries.



To collapse the antenna elements, slide the numbered buttons shown in Figure B. Start with position 1 as you gently fold in the elements. Repeat for positions 2 through 4. When opening the antenna it does not matter which order the elements are unfolded.

Figure B



The directional antenna can be used in two ways. The R-400 receiver can be mounted on the FA-3 antenna for one handed operation or the CA-4 coax assembly can be attached so that the antenna and receiver can be separated.

To attach antenna, align the dovetail antenna slide from the receiver or cable assembly with the dovetail base on the antenna. Slide and push forward until a slight click is heard or felt. Pull back to make sure the latch is fully engaged. Install the BNC plug attached to the antenna coax.

To remove, depress the release button as shown and slide either backwards off the antenna slide.



Optional CA-4 Coax Assembly

## USING TELEMETRY TO FIND YOUR BIRD OR DOG

1. Install a working transmitter with a known good battery or batteries on your bird or dog.
2. Momentarily put the ON-OFF-BATTERY TEST SWITCH on the R-400 in the BATTERY TEST position and see if the battery tests O.K. on the meter. If questionable, be sure to carry a spare with you.
3. Unfold the FA-3 directional antenna. Turn the ON-OFF-BATTERY TEST SWITCH to ON and set the VOLUME CONTROL to a comfortable listening level.
4. Dial in the CHANNEL SWITCHES to the frequency shown on your transmitter. Use the TUNE CONTROL to fine tune the pitch of the received audio tone. You should be able to hear your transmitter, if it is close, with the RANGE SWITCH in the CLOSE position.
5. If you can not, find out why before you release your bird. It is absolutely imperative that you test out each transmitter before release. Remember, or better yet, write down the CHANNEL SWITCH and TUNE CONTROL settings for the transmitter you are now going to track or direction find (DF).
6. With the transmitter a reasonable distance away, place the RANGE SWITCH in the LONG position, hold the R-400 level in your hand, use vertical antenna polarity to start with and turn around in a full circle and see if you hear the transmitter. If you do not, try horizontal antenna polarity and try again. If you still do not, you will have to stand on a truck bed, building roof, close by hill, etc. in order to get a more line of sight path between the transmitter and receiver.
7. If you hear the transmitter, note its azimuth (direction) and head towards it. As the signal gets stronger, change the RANGE SWITCH to the MED or medium position. Raise or lower the VOLUME CONTROL to keep the meter indication around mid scale.
8. Recheck for proper direction and continue. When you get close to the transmitter, you can change the RANGE SWITCH to the CLOSE position and generally walk towards the strongest signal until you find it.
9. It is a very good idea to try a few dry runs having someone else hide the transmitter with you trying to find it using the above method.

## R-400 Telemetry Receiver \$499.95

Price includes:

- Folding directional antenna
- Holster style carrying case
- Headset adapter cable
- 9 volt battery.

### FA-3-C Carrying Case



## ACCESSORIES

- |          |   |          |
|----------|---|----------|
| * FA-3   | Folding directional antenna   | \$59.95  |
| * FA-3-C | Receiver/antenna case   | \$10.00  |
| * QA-8   | Mono headphone adaptor , 1/4" female to 3.5 mm male   | \$9.95   |
| CA-4     | Coax Assembly 5' long with molded BNC connectors, barrel connector, and clamps assembled on antenna slide so antenna can be used when detached from R-400 | \$11.95  |
| CM-1     | 12vdc Cigarette lighter power cable   | \$12.95  |
| RA-13    | Monaural headphone, comfortable, well padded, coiled cord, mono 3.5 mm plug, and separate level control for each ear                                      | \$36.95  |
| RA-216   | 216-220Mhz folded yagi antenna w/grip and 5' coax lead  | \$125.00 |
| RA-9     | Omni directional magnet mount auto rooftop antenna w/coax   | \$49.95  |

\* FA-3, FA-3-C and QA-8 are shipped at no extra cost with each R-400

## FCC COMPLIANCE INFORMATION

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference including interference that may cause undesired operation. Changes or modifications not expressly approved by Communications Specialists, Inc. could void the user's authority to operate the equipment.

## ABOUT US

Communications Specialists, Inc. has been building quality electronic products that the land mobile radio and wildlife telemetry industries have come to rely on for over 40 years. At our Orange California factory, we utilize the latest in surface mount assembly technology to assure consistent quality throughout our entire product line.

## WARRANTY

The R-400 is warranted to be free of defects in materials and workmanship for a period of one (1) year from the date of purchase. You may also return it within 30 days for a full, no questions asked, refund. If you need to take advantage of our warranty, follow these steps:

- 1- Securely repackage the R-400.
- 2- Include a note as to the nature of the problem, if known.
- 3- Include your shipping address and a daytime phone number or E-Mail address.
- 4- Ship to: Communications Specialists, Inc.  
426 W. Taft Ave.  
Orange, CA 92865



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