R-5000
TELEMETRY SYSTEM

Operating Manual

FEATURES

- Rugged metal case designed for heavy field use
- Mounted on a removable three element Yagi antenna, with pistol grip. Use one handed or slide the receiver from the antenna to use remotely. Antenna carrying case included.
- Fully synthesized coverage in 100Hz steps
- Contiguous coverage of a selected 4MHz spread between 148-174MHz or 5-6 MHz spread between 215-225MHz
- 999 Memory Channels, w/scanning
- Programmable with Keypad or PC (Windows 7, or later)
- Back Lit multi-function LCD Display and Keypad
- Excellent selectivity to allow close spacing of transmitters
- Excellent filtering to eliminate unwanted interference
- .5ppm TCXO for superior temperature stability with no frequency drift
- Peak reading sample and hold meter responds to 5ms wide pulses. See Page 8.

SPECIFICATIONS

- Frequency range: Any 4MHz wide segment between 148 - 174MHz or 5-6 MHz segment between 215-225MHz (see list below)
- Sensitivity: -150dBm
- Channel steps: 100 Hz
- Receiver Mode: CW
- Antenna Impedance: 50 ohms
- Antenna connector: BNC female
- RF attenuator: 17 steps (0-140dB)
- Battery: 7.5v NiMH battery pack. Not user replaceable.
- Size: 6.1" x 3.5" x 1.5"
- Overall size with antenna folded: 4" x 32"
- Overall size with antenna extended: 30" x 40"
- Weight: 19oz without antenna, 40oz with antenna
- Made in the USA

FREQUENCY RANGE LIST

148.000 - 152.000 MHz	161.000 - 165.000 MHz
149.000 - 153.000 MHz	162.000 - 166.000 MHz
150.000 - 154.000 MHz	163.000 - 167.000 MHz
151.000 - 155.000 MHz	164.000 - 168.000 MHz
152.000 - 156.000 MHz	165.000 - 169.000 MHz
153.000 - 157.000 MHz	166.000 - 170.000 MHz
154.000 - 158.000 MHz	167.000 - 171.000 MHz
155.000 - 159.000 MHz	168.000 - 172.000 MHz
156.000 - 160.000 MHz	169.000 - 173.000 MHz
157.000 - 161.000 MHz	170.000 - 174.000 MHz
158.000 - 162.000 MHz	215.000 - 220.000 MHz*
159.000 - 163.000 MHz	216.000 - 222.000 MHz*
160.000 - 164.000 MHz	217.000 - 223.000 MHz*

* Receivers programmed in the 215 - 225 MHz ranges are shipped with a compact folding Moxon antenna instead of the YAGI antenna. The antennas are equivalent in performance. See page 14 for details.

THE R-5000 TELEMETRY SYSTEM PRICED AT $1195.00

- R-5000 Telemetry Receiver
- Three Element Folding Yagi Antenna with Coax Cable and Handle
- Water Resistant Nylon Carrying Case with Shoulder Strap
- AC Wall Charger 90 - 220 VAC 50/60 Hz, with multiple plugs for International use
- 12 VDC Car Power Cord
- Mini USB to USB data cable
- Programming Software, driver and instruction manual on flash drive
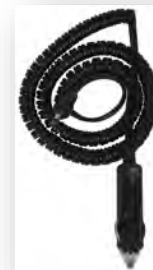
AC Wall Charger

Carrying Case

YAGI

YAGI Handle

DC Power Cord

Data Cable

Software

RECEIVER CONTROLS

Antenna Jack
BNC female antenna jack for use with standard coax lead for attaching antenna.

RF Gain Control Attenuates the signal from the antenna. There are 17 switch positions that determine the level of attenuation as indicated by the status bar in the top left corner of the display.

Always lower the RF Gain Control to the lowest position possible that still allows the signal to be heard so the receiver is not overloaded.

Memory To access memory bank, press MEMO and scroll through the channels by using the up, down, right or left arrows. To exit memory press CLEAR.

Scan The receiver will dwell on each channel in memory for 1 to 30 seconds. The default setting is 5 seconds. See Menu Programming on page 8 to change the scan dwell time setting.

Lamp Turns the LCD display backlight off and on. See Page 7.

Pass Will pass or skip over selected memory channels while in SCAN mode. See page 6.

Reboot Force quit without losing memory. See page 6.

Clear Exit the Menu, Memory, Scan or Programming modes. Also used to back up one space at a time during programming.

LCD Display Shows Gain, Volume and Battery Power levels. Displays frequency and transmitter ID information, as well as the Peak level meter.

Volume set the audio to a comfortable level after the RF GAIN CONTROL is in the lowest position possible that still allows hearing the signal.

Power Press once to power on, press and hold 2 seconds to power off.

Tune Control Fine tune the receiver frequency in 100 Hz increments. Adjust for pleasant sounding audio tone.

Navigation Arrows and Enter Use arrows to navigate through menus: up, down, right and left. The Enter key is used to finalize commands.

Program Access the programming menu to enter and edit transmitter frequency information. See page 8.

DATA Mini USB port used for PC Programming or charging. When the USB port is not in use, insert the protective cap to keep the data port dry and dust free as shown below. Spare caps are included.

Speaker
Keep liquids and debris away from speaker grill.

Power Jack for charging the batteries with the wall or car charger provided.

3.5 mm Headphone Jack For Mono headphones.

OPERATING INSTRUCTIONS

Basic Start-up

Press **POWER**.

Enter an individual frequency using the keypad (example 149.0005) and press **ENTER**. FREQ: 149.0005 MHz will appear in the display window until the frequency is changed by entering a new frequency. If you make a mistake, press **CLEAR** to back-up one space at a time.

Use the **+TUNE-** control if needed.

The +**GAIN-** control will serve as your attenuator. Push + for long range reception and - for close in tracking. Adjust the +**VOLUME-** as needed.

Storing Data in the Memory Bank Using the R-5000 Keypad

Store as many as 999 frequencies & alphanumeric comments in the memory bank. Data can be entered with the keypad or by connecting the receiver to a PC (Windows 7 or later). See page 9 for computer programming instructions.

Press **PROG**
The cursor will highlight CHANNEL
Press Right Arrow to assign channel number
Press **ENTER**
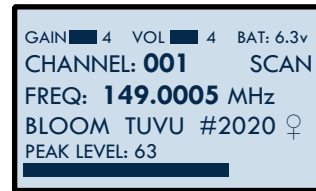
The cursor will highlight FREQ
Press Right Arrow and enter frequency with keypad.
Press **ENTER**

The cursor will highlight TXT
Press Right Arrow for virtual keyboard.
Using the directional arrows, enter a name or ID for this frequency. Press **ENTER** after each key. Symbols and Space key located below the alphabet. (To edit: press **CLEAR** to back up one character at a time.) When finished select Done and Press **ENTER**

Select SAVE to save this frequency to the memory.
Select DEL to delete
Select EXIT to return to main menu without saving frequency

See Page 9 for PC Programming.

If an out of range frequency is entered, the receiver will beep and the frequency field cleared. See side label on receiver to view the frequency range of receiver.

Accessing the Memory Bank

Press **MEMO**. Use the up, down, right or left arrows to scroll through the memory bank. The word MEMORY will appear to the right of the Channel Number

Scanning the Memory Bank

Press **SCAN**. The amount of time that the receiver pauses on frequencies is programmable between 1 and 30 seconds, see page 8. The word Scan will appear to the right of the channel number.

Press **CLEAR** to exit Scanning Mode or press **MEMO** during scan to stop on the current channel.

Changing Data in the Memory Bank

The data stored in the memory bank can be changed or deleted at any time. Press **PROG**. Use the right arrow to select the Channel Number then use the up and down arrows to select the channel to be changed. Press **ENTER**. Changes can then be made to the frequency and text fields.

Passing over Frequencies

The pass feature allows selected frequency channels to be omitted from the memory bank while in the scan mode.

To select a channel to pass, press **MEMO** and scroll through the frequencies with the up and down arrows or when paused on a channel during scan.

Press **PASS** when the desired frequency is displayed. The letter P will appear to the right of the frequency. The channel is now omitted from the scan list.

To add the channel back to the scan list, press **MEMO** then select the channel and press **PASS** again. The letter P will be removed, and the channel returned to the scan list.

Reboot

Low Battery may cause the microprocessor to hang-up, if this occurs it may not be possible to power off the receiver. Press and hold both **R** buttons at the same time to reboot the receiver and power off without losing any stored memory.

Clear Memory

This feature erases all frequencies stored in the memory bank. It is accessed through the programming menu and <u>can not</u> be undone. Press **MENU** and use the down arrow to the CLEAR MEMORIES? option. Use the right arrow to highlight the default option of NO. Press the up or down arrow 3 times to reveal the word YES. Press **ENTER.**

Lamp

Press **LAMP** to turn the light on and off on the LCD display screen. The Keypad lights are not controlled by the **LAMP** key. The Keypad lights are controlled through the Programming Menu. See next page.

Mono Headphone Jack

When an earphone or headphone is used, the internal speaker in the receiver is disconnected. If Stereo headphones are used, only one side will be active. A Bluetooth transmitter can be connected to the headphone jack for use with Bluetooth earbuds or headphones. There will be a slight delay in the audio when using Bluetooth.

Batteries and Charging

- A full charge will power the receiver for approximately 12 hours.
- Charging time: Wall or car charger in 3 hours. One hour of charging = 4 hours of operation. (USB data cable will take approximately 10 hours.)
- Charge battery before using if R-5000 has not been charged in the last 12 months.
- Battery can be fully depleted and re-charged over 2000 times.
- A portable power bank with 12v output can be used with the USB data cable.

The Battery is 95% charged at 7.1v. It is fully charged at 7.5v The charging circuit will stop charging the battery once it is fully charged. No damage will occur if the charger is left plugged in indefinitely.
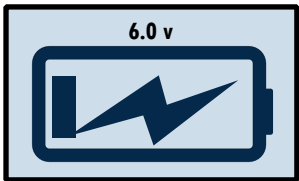
The display will show the battery power as it is charging while the receiver is powered off. Fluctuations of a point or two is normal during the charging cycle. The receiver will be warm while charging.

Start thinking about charging the receiver when the battery power is at 5.5v. When the receiver is in use and the battery power reaches 5.0v, the battery indicator will reverse out the word BAT and flash until the receiver has been sufficiently recharged. A partial charge of 15 minutes will provide enough power for an hour of use. The word BAT will change to CHG if the receiver is powered on during charging.
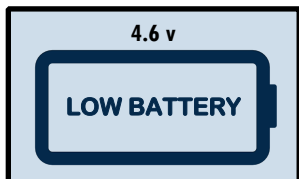
Battery is depleted at 4.5v. While using the R-5000 the Low Battery indicator will appear and the receiver will power off. After a minute or so the operation will resume for a brief time before the Low Battery indicator reappears. This will continue for approximately one hour.

PROGRAMMING MENU

Many of the R-5000 features can be customized by changing the default settings in the programming menu.

To access the menu, press the **MENU** key. Use the up and down arrows to move the cursor through the menu options.

When option is selected use the right arrow or the **ENTER** key to move to the programming parameter default field. Then use the up and down arrows to change the programming options.

A definition of each menu items is shown below. The default setting can be returned to the defaults by scrolling down to SET DEFAULTS? and selecting YES.

MENU		Definition	Programming Parameters
SCAN TIME	5s	Time receiver dwells on channel during scan	Between 1 and 30 sec.
FREQ STEP (kHz)	0.1	Change frequency steps	Between .1, .2, .5, 1.0, kHz
BEEP	ON	Audible feedback when any key is pushed	On or Off
KEYPAD BACKLIGHT	ON	Turn off the keypad backlight	On or Off
CONTRAST (%)	65	Adjust contrast/brightness of display	Between 1-100
PEAK LEVEL TIME	3s	Time that previous reading stays on display*	Off or .1 sec. to 99 sec.
SET DEFAULTS?	NO	Resets all MENU options to default	Yes or No
CONNECT TO PC?	NO	For PC programming with Data cable	Yes or No
CLEAR MEMORIES?	NO	Erases all stored memory channels**	Yes or No

*The R-5000 contains a peak reading sample and hold circuit that responds to telemetry pulses as narrow as 5ms wide. The PEAK LEVEL TIME sets how long the last received pulse level (0-100) on the bar graph display is held until replaced by the next pulse. The default of 3 seconds is fine for standard telemetry transmitters that are sending pulses at 30 beats per minute or faster.

Considerable transmitter battery can be saved by reducing repetition rate to less than 30 BPM. Without a peak reading sample and hold circuit, it is very difficult for your brain to remember the strength of the last pulse before repointing the antenna and comparing it to the next pulse when the pulses are more than 2 seconds apart.

Considerable transmitter battery can also be saved by narrowing the standard transmitter pulse width of 25ms or more. Below 20ms, the transmitter pulses will sound like ticks rather than the usual beeps or churps. Again, the brain can't accurately detect their level for comparison by sound alone and needs a very quick peak reading sample and hold circuit as a visual aid to determine signal strength.

Either of the above methods will increase battery life or reduce size and weight of transmitters by a one to one ratio allowing studies that previously could not have been accomplished.

***CLEAR MEMORIES? can not be undone.*

PROGRAMMING THE R-5000 USING A PC

Installing the R-5000 Software on your PC

Insert the USB flash drive into a USB port on PC
Double Click **CSI_R5000_Programmer_Setup_v1.4**
Follow the prompts to install the software.

Connecting the R-5000 to a PC

Launch the CSI R-5000 Programmer on your computer
Power on the R-5000
Plug the data cable into the DATA port on the receiver and USB port on PC
Press **MENU** on the R-5000
Press down arrow to CONNECT TO PC?
Press right arrow to move the cursor to the NO default, then press the up arrow to change to YES
Press **ENTER**
The R-5000 display window will show the connection status.

Click on **Read From R-5000**

> PC CONNECTION STATUS
>
> **CONNECTING…**
>
> **Press CLR to Exit**
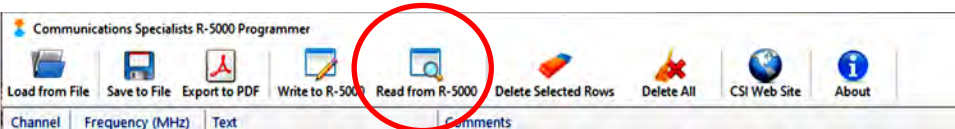
The receiver will beep twice and the connection status will change from CONNECTING… to CONNECTED TO PC. If the status does not change to connected, or reads R-5000 not found, you will need to install the Program Driver.

> PC CONNECTION STATUS
>
> **CONNECTED TO PC**
>
> **Press CLR to Exit**

Installing the Program Driver on your PC

Insert the Flash drive, Double Click on DRIVER-CDM21228_Setup and follow the prompts to Install the driver.

Repeat the steps listed under **Connecting the R-5000 to a PC**

After clicking on **Read From R-5000**, a prompt will appear reading **Download from R-5000 to Computer.**
Click on **READ**
Receiver will beep twice and display bar will show 100%
Click **CLOSE**
The data from your 5-0000 is now displayed on the computer to be saved or modified.

Entering New Data using a PC

Click in the Channel box and add channel #, tab to the next field and enter the frequency then the text and the optional 128 character comment line (the comments will not show on the R-5000 display). Continue entering up to 1000 channels.

Once data is entered on the computer it can be processed as Save to File, Export as a PDF, or Write to R-5000. See details on page 11.

Shortcut Keys Alt F and Alt M can be used for female ♀ and male ♂ symbols.

Managing Data

Icon	Description
Load from File	Loads a previously stored memory list from computer. Once loaded it can be copied to the R-5000 by clicking on Write to R-5000.
Save to File	Saves current memory list as a CSI Receiver Data File (*.rx) on computer. The file can then be shared or loaded again.
Export to PDF	Creates a PDF copy on your computer for printing. See example on next page.
Write to R-5000	Writes the current memory list to your R-5000 receiver. All previously stored data on the R-5000 will be removed.
Read from R-5000	Reads data from your R-5000 Receiver so that it can be saved as a CSI Receiver Data File (*.rx) to be loaded again or shared.
Delete Selected Rows	Click on each line to be deleted. A confirmation box will appear, select Yes or No. This action can not be undone.
Delete All	Deletes the memory list. A confirmation box will appear, select Yes or No. This action can not be undone.
CSI Web Site	Opens the Communications Specialists, Inc. website.
About	R-5000 Programmer information.

Always save the memory list entered on your R-5000 to your computer as a back-up. The list can also be edited, printed or shared from your computer.

Example of pdf document with detailed data:

Communications Specialists Inc.   05/22/2020

R-5000 Receiver Programming Interface   Test_11_Channels.pdf

Channel	Frequency	Text	Comment
001	148.0005 MHz	P BLOOM ♂ TUVU #5700	Banded 07-15-19 East side of 241 Toll Road Air Band #M5
002	148.0257 MHz	P BLOOM ♂ TUVU #5701	Banded 07-15-19 East side of 241 Toll Road Air Band #M6
003	148.2978 MHz	P BLOOM ♀ TUVU #5702	Banded 07-19-19 East side of 241 Toll Road Air Band #M7
004	148.3649 MHz	P BLOOM ♂ TUVU #5703	Banded 08-09-19 Irvine Lake Dam Air Band #L2
005	148.3999 MHz	P BLOOM ♂ TUVU #5704	Banded 08-10-19 Irvine Lake Dam Air Band #L3
006	148.7648 MHz	P BLOOM ♀ TUVU #5705	Banded 08-10-19 Irvine Lake Dam Air Band #L4
007	148.8054 MHz	P BLOOM ♂ TUVU #5706	Banded 08-13-19 Irvine Lake Dam Air Band #L5
008	148.8693 MHz	P BLOOM ♀ TUVU #5707	Banded 08-13-19 Irvine Lake Dam Air Band #L6
009	149.3792 MHz	P BLOOM ♂ TUVU #5708	Banded 09-01-19 Santa Ana River Lake Air Band #K7
010	149.4026 MHz	P BLOOM ♀ TUVU #5709	Banded 09-01-19 Santa Ana River Lake Air Band #K8
011	149.5833 MHz	P BLOOM ♂ TUVU #5710	Banded 09-05-19 Santa Ana River Lake Air Band #K9
012	149.8954 MHz	P BLOOM ♀ TUVU #5711	Banded 09-10-19 Santa Ana River Lake Air Band #R2
013	150.4925 MHz	P BLOOM ♀ TUVU #5712	Banded 09-10-19 Santa Ana River Lake Air Band #R3
014	150.6773 MHz	GARCELON ♂ GOEA #400	Banded 06-23-19 Santa Cruz Island
015	151.1450 MHz	GARCELON ♂ GOEA #401	Banded 06-25-19 Santa Cruz Island
016	151.1743 MHz	GARCELON ♀ GOEA #402	Banded 07-10-19 Santa Cruz Island
017	151.1974 MHz	GARCELON ♀ GOEA #403	Banded 07-11-19 Santa Cruz Island
018	151.2546 MHz	GARCELON ♂ GOEA #404	Banded 07-11-19 Santa Cruz Island
019	151.2864 MHz	GARCELON ♀ PEFA #700	Banded 05-16-19 Oceanside CA
020	151.3275 MHz	GARCELON ♀ PEFA #701	Banded 05-18-19 Oceanside CA
021	151.3618 MHz	GARCELON ♀ PEFA #702	Banded 06-15-19 Oceanside CA
022	151.3839 MHz	GARCELON ♂ GHOW #200	Banded 01-23-20 Bishop CA
023	151.4024 MHz	GARCELON ♂ GHOW #201	Banded 01-25-20 Independence CA
024	151.4326 MHz	GARCELON ♂ GHOW #202	Banded 02-26-20 Lone Pine CA
025	151.4750 MHz	GARCELON ♀ GHOW #203	Banded 02-27-20 Big Pine CA

Windows may not find the CSI R-5000 Programmer when first trying to open a .rx file. It may try to open it as a .pdf file or say it can't be opened. To fix this, Windows needs to know what program you want to use to open the file.

Windows 10: right click the .rx file and select "open with". If the CSI R-5000 Programmer is not listed, click on "choose another app" and locate the CSI Programmer in the program files.

Windows 7: if a Pop-up window reading "Windows can't open this file:" appears, select the option "Select a program from a list of installed programs". Then locate and select the CSI R-5000 Programmer.

If your computer detects the R-5000 Programmer software using an antivirus program such as Microsoft Defender or Malwarebytes, do the following: When the screen comes up and shows that the R-5000 Programmer has been detected as possible malware, uncheck it so it will not be quarantined. "Restore" it if it has been, and add it to the "allow list" or "always ignore" as a trusted file.

CLOSE-IN DIRECTION FINDING

Because the **GAIN** control has a very large attenuation range of -140dB, it has the ability to obtain directional information to within inches of a telemetry transmitter.

Start your search 50 meters or so away to make sure the antenna actually has good directivity with the **GAIN** control turned up as much as necessary to hear the signal. Adjust the **VOLUME** control to a comfortable level.

While walking in the direction of the strongest signal, turn down the **GAIN** control while advancing the **VOLUME** control so you can hear small changes in the signal strength. Sweep the YAGI antenna back and forth to make sure you are still heading in the direction of the strongest signal. When you are within a meter of the transmitter, the **GAIN** control will be almost fully down and the **VOLUME** will be fully up. If the transmitter is not visible (under litter or buried), sniff it out using the R-5000 in your hand with the coax and antenna removed.

When done with close-in direction finding, make sure the **GAIN** control is returned to full and the **VOLUME** control is returned to a comfortable level otherwise you will not be able to hear a new weak or distant transmitter.

RECEIVER AND HANDLE ATTACHMENTS

The handle slides into the bracket beneath the antenna and will lock into place with a small click. To remove handle, depress the release button and slide the grip free. Applying a lubricant such as Vaseline or silicone will make it easier to attach the handle.

To detach the receiver from the antenna, push the release latch on the antenna mount and slide the receiver from antenna. When re-attaching, slide the receiver forward until a small click is felt.

R-5000 Receivers tuned to the **215 to 225 MHz** ranges are supplied with the compact Moxon antenna shown above. The rugged Moxon is equivalent in performance to the Yagi and more convenient to transport and operate. A carrying case is included.
Overall size with antenna folded: 12" x 4.75"
Overall size with antenna extended: 20.25" x 11.25"
Weight of R-5000 with Moxon Antenna: 32 oz

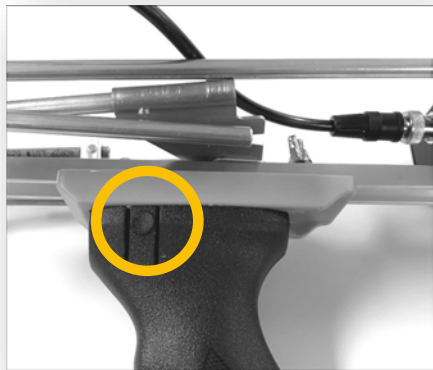215.000 - 220.000 MHz* Persian Gulf Region Falconry
216.000 - 222.000 MHz* Falconry, Hunting Dogs, Law Enforcement and Wildlife
219.000 - 225.000 MHz* Amateur, RC Models, Rockets, Domestic Pets.

OPTIONAL ACCESSORIES

RA-8 Mono headphone adapter, 1/4" female to 3.5mm male **$9.95**

RA-9 Omni directional magnet mount auto rooftop antenna with coax cable. Available in 148 - 174MHz or 215 - 225 MHz. **$69.95**

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 50 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-5000 Receiver is warranted to be free of defects in materials and workmanship for a period of two (2) years from the date of purchase. Guaranteed two week turnaround for both warranty and non-warranty repairs. Please call or email for instructions prior to returning the receiver for repair.