STALKER

The World Leader in Speed Measurement

stalkerradar.com

STALKER
SPORT 2
THE baseball solution
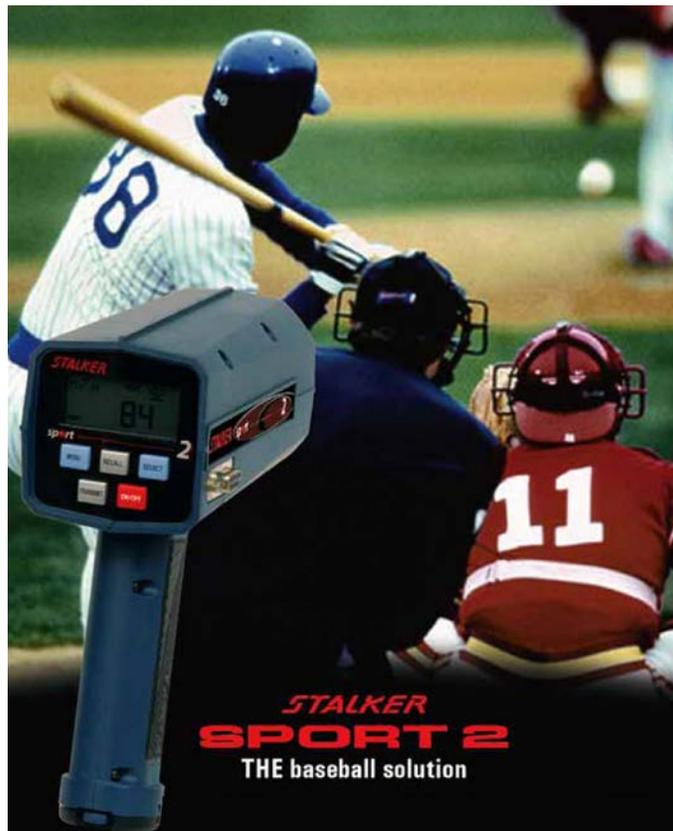
STALKER SPORT 2

Digital Sports Radar

Owner's Manual

Not intended for Law Enforcement use.

Table of Contents

Introduction

Congratulations! You have purchased the smallest and most accurate baseball gun system available. The Stalker SPORT 2 radar was designed specifically to measure the speed of balls thrown by baseball players.

The Stalker SPORT 2 radar sends out very high frequency radio waves and measures the change in the frequency after it bounces off a moving object. This is commonly referred to as *Doppler Radar*. This invisible radio wave is extremely low power (about 1/200th of a watt) and is completely safe for close and continuous operation.

The Stalker SPORT 2 is a true *digital* radar system. The SPORT 2 converts the reflected microwave signals into a digital stream of data. The gun's own computer then processes this data stream using sophisticated programming, to interpret, filter, and measure the speeds. This technology is closely related to the compact digital disc and modern personal computers. This type of radar system has the potential to provide substantially superior performance and accuracy over conventional radar systems.

While the technology in the Stalker SPORT 2 is extremely advanced, its operation is quite simple. You need only to press the ON/OFF key and pull the trigger to begin measuring baseball release speed and plate speed.

If you want to be a power user and try other features and settings, reading through this manual will help you to take full advantage of the other features and capabilities of the Stalker SPORT 2.

Have fun!

What's Included

The components included with your radar are listed below. If you are missing any parts or if you would like to upgrade your package, contact **Stalker Radar** at **1-877-782-5537**.

SPORT 2 Package #1

K-Band Radar Gun
6-AA Alkaline Batteries (NOT rechargeable)
Operator Manual
Rugged Shipping Box

SPORT 2 Package #2

K-Band Radar Gun
6-AA Nickel Metal Hydride (NiMH) Batteries (rechargeable)
Wall Battery Charger
Operator Manual
Rugged Shipping Box

SPORT 2 Package with Hard Case

K-Band Radar Gun
6-AA Nickel Metal Hydride (NiMH) Batteries (rechargeable)
Wall Charger
Operator Manual
Hard Case

Quick Start Instructions

The **STALKER** SPORT 2 has several features that allow the gun's optimal performance in baseball applications. With some basic understanding, the gun is very simple to operate.

Basic Operation

Power is supplied from 6 AA batteries installed in the handle.
Turn the gun **ON** by pressing the **ON/OFF** button.
Squeeze the trigger to begin operating (transmitting).

Important Settings

There are four buttons that control the radar gun functions: The two blue buttons work together, and the two silver buttons work together. The blue buttons are used for changing the settings, while the silver keys are operational keys.

MENU (Blue Button)	This button enters the MENU system to select a feature to be changed.
SELECT (Blue Button)	Once the MENU button has selected a feature, use the SELECT button to change the setting for that feature.
TRANSMIT (Silver Button)	Toggles the transmitter on and off (instead of the normal trigger activation).
RECALL (Silver Button)	Displays the last 5 speeds recorded and stored.

Turning the Transmitter ON and OFF

There are two ways to turn on the radar transmitter to begin operating:
- ❍ Trigger Transmit: Pull the trigger to transmit.
- ❍ Transmit Button: Press the silver TRANSMIT button to toggle the transmitter ON or OFF.

NOTE:

* The XMIT icon displays when the gun **IS** transmitting.
* The XMIT icon does not display when the gun
   IS NOT transmitting.
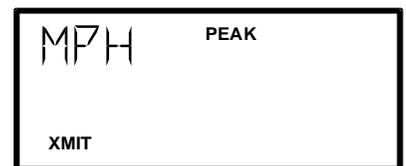
Controls and Indicators

LCD Display Icons

STORE	Is on when recalling speeds from the RECALL queue.
LO BAT	Indicates the batteries are low and need recharging or replacement. LO BAT blinks when batteries are approaching exhaustion.
XMIT	Indicates the gun is transmitting and is able to take readings.
PEAK	Indicates the Peak Mode window is "ON" allowing peak speed display.

LCD Display Windows

MESSAGE	Messages display in the upper left corner (e.g. MPH, KM/H, LOCK, RECALL).
PEAK SPEED	Indicates the peak speed (release speed) in large numbers on the lower right.
LAST SPEED	Indicates the active or last speed (plate speed) in the upper right corner.

9-Pin D Connector

The 9-Pin D Connector has the following pinout: Pin 1 is on the top right, and Pin 9 is on the bottom left.

1 AUX INPUT	Stopwatch trigger input
2 RS-232 TX	Transmit data-stream
3 RS-232 RX	Receive (not used at this time)
4 6.6 V OUT	Output (limited to 50 mA)
5 Ground	Ground
6 Charger Input	120V AC Wall Charger
7 RS-485-A	Transmit data-stream
8 RS-485-B	Transmit data-stream
9 Voltage Input	External voltage input, 6VDC to 16 VDC

Detailed Instructions

Providing Power to the SPORT 2

WARNING: Do **not** attempt to recharge Alkaline batteries if your SPORT 2 came with this type of batteries. Attempting to recharge Alkaline batteries may damage the SPORT 2 and will void the warranty.

Alkaline Batteries - The battery compartment in the <u>SPORT 2 Package #1</u> contains <u>6 Alkaline non-rechargeable batteries</u>. When new, a set of six alkaline batteries will power the gun for about 5 hours of continuous transmitting. The Alkaline batteries cannot be recharged. Attempting to recharge alkaline batteries may damage the SPORT 2 and will void the warranty.

Nickel Metal Hydride (NiMH) Batteries - The battery compartment in the <u>SPORT 2 Package #2</u> and the <u>SPORT 2 Package with Hard Case</u> contains 6 NiMH rechargeable batteries. When fully charged, one set of six batteries will power the gun for about 5 hours of continuous transmitting. The NiMH batteries can be recharged (in 12 hours) in the gun using the included Wall Charger. Optionally, the batteries can be removed and charged with a NiMH battery charger purchased at retail.

External - To power the SPORT 2 from an external 12VDC source instead of using batteries, use the optional 12V DC Cigar Cable attached to the 9-pin connector on the side of the gun. The 12V DC cigar cable does not charge the batteries while it is supplying power to the Radar.

Turning the Transmitter ON and OFF

The radar transmitter must be turned ON to measure speed. There are two ways to transmit: 1) Press the trigger, or 2) press the TRANSMIT button.

Trigger Transmit - Squeeze and hold the trigger in to transmit. In the Continuous trigger mode (default) when the trigger is released, the transmitter turns off and any current readings are left on the screen. Since the transmitter draws most of the power, trigger operation helps to save battery life. Other trigger modes are explained in the Option Menu section.

TRANSMIT Button - The silver Transmit button toggles the transmitter ON and OFF. Each time you push this button, it switches between transmit and hold. Using this button to turn on the transmitter allows the gun to continually operate automatically, without the need to press the trigger.

NOTE:

* The XMIT icon displays when the gun **IS** transmitting.
* The XMIT icon does not display when the gun **IS NOT** transmitting.

```
MPH        PEAK



  XMIT
```
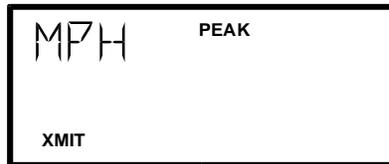
The Peak Function

The Peak option activates the automatic top speed display in the PEAK SPEED WINDOW. For example, when tracking a baseball pitch, the peak speed is the same as the release speed since a ball only slows down after it is thrown. When the Peak mode is ON, the PEAK icon appears on the display and only the highest speed for each target acquired displays in the Peak window. The active, changing target speed displays in the upper right window.

NOTE:

* The PEAK icon and speed window display when the Peak option IS selected.
* The PEAK icon and speed window do not display when the Peak option IS NOT selected.

```
MPH         82          MPH    PEAK  82
                                     89
  XMIT                     XMIT
```
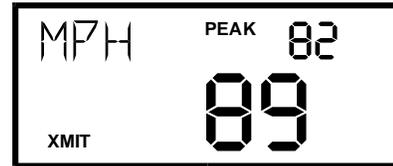
Using the Trigger to Lock Speeds

The trigger serves two functions. It can control the transmitter, or it can be used as a speed locking device.

When the gun is placed into continuous transmit mode using the silver TRANSMIT button or if the Trigger Option is on ʟoc (lock), the trigger does not affect the transmitter. Instead, press the trigger to lock the currently displayed speed to the main window. If Peak mode is on, the active speed and the peak speed just freeze in their respective windows. LOCK alternately displays in the upper left message window. Press the trigger a second time to unlock the readout.

This function is useful if the operator needs to manually hold readings**.**

```
LOCK
MPH      1248
         124.8
 XMIT
```
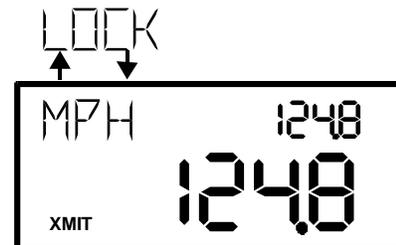
The Recall Key Function

The silver RECALL button redisplays the last five speed readings that were measured. The stored peak speed, last speed, and/or locked speed in the recall queue display in a sequential mode as the RECALL button is pressed. The MESSAGE WINDOW cycles through the Recall Number, speed units, and LOCK (if on). The STORE icon is on while recalled speeds are displayed.
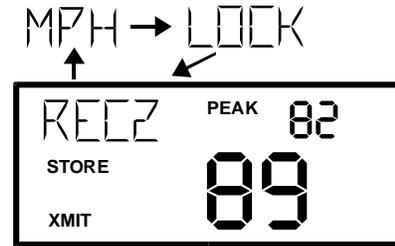
Setting Up the Radar Unit

Setting up the radar unit is fast and easy.

Briefly press the MENU key on the keypad to enter the OPERATOR MENU.
Briefly press the MENU key again to step through the features.
Press the SELECT key to change the settings.
Press the trigger at any time to exit the OPERATOR MENU and save all settings.

The factory default for each setting is indicated by the **bold underlined** setting.

The Operator Menu

Menu Step	Description	FEATURE Step down by pressing MENU key	SETTINGS Change using the SELECT key
MENU Step ORDER	Description	MESSAGE WINDOW	Main Window (bold indicates factory default)
1	Range	RANGE	1, 2, **3**
2	Peak On/Off	PEAK	OFF, **On**

The Range Setting

The Range setting affects the sensitivity (clocking distance) of the radar. The settings are:

3	Setting the range to 3 increases the gun's sensitivity and lengthens the clocking distance. It "looks" as far away as possible for targets and gives the gun the highest level of performance. This is the default setting.
2	Setting the range to 2 sets the gun to a medium range in its clocking distance.
1	Setting the range to 1 decreases the gun's sensitivity and shortens its clocking distance. The 1 range setting is handy for clocking objects close to the gun and when you want to restrict the gun from "seeing" objects farther out in the background.

Selecting Options

Selecting the options is more involved (but still easy), because there are 15 features to select. The SPORT 2 ships with the default (BOLD) settings indicated in the chart.
Enter the OPERATOR MENU as described on the previous page.
Press and hold the MENU key (while in the OPERATOR MENU) to enter the OPTION MENU. All display segments will briefly flash to indicate the change of menu.
Briefly press the MENU key again to step through the FEATURES. The SELECT key changes the SETTINGS.
Press the trigger at any time to exit the OPTION MENU, save all settings and return to normal operation.
Press and hold the MENU key to return to the OPERATOR MENU. All display segments will flash to indicate the change of menu.

The factory default for each setting is indicated by the **bold underlined** setting.

The Option Menu

MENU Step	Description	FEATURE Step down by pressing MENU key	SETTINGS Change using the SELECT key
MENU Step ORDER	Description	MESSAGE WINDOW	Main Window (**bold** indicates factory default)
1	Low Speed	LOW	OFF, 15, **30**
2	Units	MPH, KM/ H	Unit
3	Resolution	RES	onES, **tnth**
4	Auto-Clear Delay	CLEAR	0SEC, 1SEC, **2SEC**, 3SEC, 4SEC, OFF
5	Trigger Function	TRIG	**Con**, SS, Loc
6	Aux Trigger Function	AUX	**OFF**, StoP
7	Stopwatch Mode	STOP	**Std**, LAP, SPLt
8	Cosine Angle	ANGLE	**0**, 5, 10, 15, 20, 25, 30, 35, 40, 45
9	Serial Port Speed	BAUD	12, 24, 48, **96**, 192, 384
10	Serial Port Format	FOR	**-**, A, AP
11	Leading Zero	LEAD0	2Ero, **SPAC**, nonE
12	Message Termination	TERM	**Cr**, CrLF, u Cr, u CL
13	Peak Message Type	PKMSG	**Cont**, S in9
14	Reset	RESET	YES, **no**
15	Reset Confirmation	SURE?	YES, **no**

Options Defined

○ Low Speed: Setting values are different for each type of unit (MPH or KM/ H) selected. Those shown above are for the default in MPH units. See below for all values.

Units	Low Speed Settings
MPH	OFF, 15, 30
KM/ H	OFF, 25, 50

○ Resolution: Select onES to display speed in whole units, as 25 MPH, or tnth to display speed with tenths, as 25.4 MPH.

○ Auto-Clear Delay: The time the speed reading is held after the target is lost and before the display screen clears. If OFF, the speed displays until the next speed is acquired.

○ Trigger Function: The Trigger settings are Con (Continuous), SS (Start / Stop), and Loc (Lock). The trigger settings function as follows:

Transmit	Trigger Option	Action
ON / OFF	Con	Pull to transmit, release to hold.
ON / OFF	SS	Pull and release to transmit, pull and release to hold.
ON	Loc	Pull and release to lock speed(s), pull and release to release locked speed(s).

NOTE: When the Loc setting is selected in the Option MENU, the Transmit function is turned on as if the silver TRANSMIT button had been pressed. Clicking the trigger alternately locks and releases the current speed(s).

○ Aux Trigger Function: The Aux Trigger settings are: OFF = ignored, StoP = stopwatch.

❍ Stopwatch Mode: This feature is only displayed (in the OPTIONS MENU) if the Aux Trigger is set to 5toP. The Optional Stopwatch Cable is needed to use the stopwatch feature. The stopwatch may be set to standard, lap, or split timer. The timer displays in the MESSAGE WINDOW. Press and hold the stopwatch trigger for 1 second to stop the timer and go back to radar mode.

Stopwatch Timer Modes:

Standard Timer	Successive presses of the stopwatch trigger start the stopwatch at ⬜⬜⬜⬜⬜ or stop the stopwatch.
Lap Timer	Each press of the stopwatch trigger displays the time since the last trigger press, and resets the timer to ⬜⬜⬜⬜⬜ in the background.
Split Timer	Each press of the stopwatch trigger displays the current cumulative time.

Timer Display Under 10 minutes:
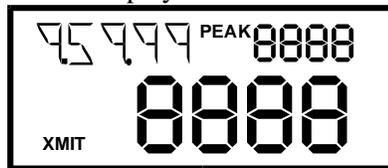
Timer Display Over 10 minutes:
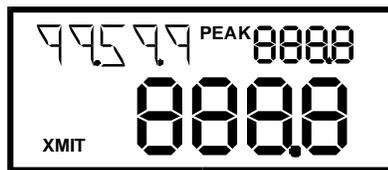
❍ Cosine Angle: The cosine angle is 0 – 45°. See the *Angle Error* topic for details.

❍ Serial Port Speed: 1200, 2400, 4800, 9600, 19200, or 38400.

❍ Serial Port Format: The "-" (dash) is for no serial output, the A format is for Active Target Speed, the AP format is for Peak Speed, and the Col format duplicates the output of the legacy **STALKER** Sport gun.

❍ Leading Zero: Zero =   090   090.1
(only if format = A or AP)   Space =   90   90.1
                             None =   90   90.1

❍ Message Termination: Cr = Carriage Return only (0x0D)
(only if format = A or AP)   CrLF = Carriage Return & Line

Feed (0x0D, 0x0A)
u Cr = units followed by Carriage Return
e.g. "MPH" 0x0D
u CL =units followed by Carriage Return &
Line Feed, e.g. km/h 0x0D 0x0A

❍ Peak Message Type: Continuous = continually streams peak speed
(only if format = AP) Single = sends one peak speed message per
acquired target

❍ Reset Confirmation: Steps display when the Reset option is set to YES.
If RESET = YES, then the confirmation SURE? displays.
To reset all settings to the factory defaults, select YES and then
pull the trigger to exit.
To not change the settings, select no and pull the trigger to exit.

Recommended Settings

Settings for Baseball Scouts

It is important that the gun is set correctly when measuring baseballs. Check
these settings:

Low Speed	30 MPH
Range	3 - Maximum sensitivity is needed
Peak ON/OFF	ON - This is for release speed numbers
Auto-Clear Delay	2 seconds – After loss of target tracking, holds the speeds on the display before clearing them

Battery Information

WARNING: Do **not** attempt to recharge Alkaline batteries if your SPORT 2 came with this type of batteries. Attempting to recharge Alkaline batteries may damage the SPORT 2 and will void the warranty.

The SPORT 2 uses 6-AA batteries. Squeeze and remove the end cap on the handle to access the battery compartment. The batteries' transmit time is approximately 5 hours when using Nickel Metal Hydride (NiMH) and 5 hours when using Alkaline batteries.

Operational Time using AA NiMH Batteries

The SPORT 2 draws the most current when it is transmitting, so the run time depends upon how often the gun is transmitting. The SPORT 2 also has a sleep mode to conserve battery life when it is not being operated. The sleep mode is automatically initiated after about 10 seconds of inactivity when the transmitter is off. Squeezing the trigger or pressing any key immediately "wakes" the gun and brings it back into operation.

Operational Status	Run Time
Continuous Transmitting	5 Hours
Typical Trigger Operation	10-11 Hours

Operational Time using Alkaline Batteries

The SPORT 2 operates the same way when using Alkaline batteries. Just remember, do not attempt to recharge Alkaline batteries.

Operational Status	Run Time
Continuous Transmitting	5 Hours
Typical Trigger Operation	10-11 Hours

Low Battery Warning

The **LO BAT** icon blinks when the battery runs low. The SPORT 2 operates for a short time after this. Operation is disabled when the battery voltage falls to an extremely low level. LoV displays in the large main window in this case. Now is the time to recharge the NIMH batteries or replace the Alkaline batteries.
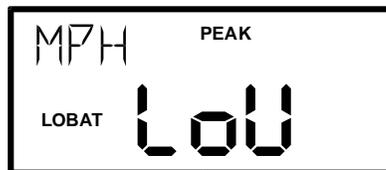
NOTE: WITH NiMH BATTERIES, DO NOT CHARGE THE BATTERIES UNTIL THE GUN DISPLAYS *LO BAT*.

Charging the Batteries

WARNING: Do **not** attempt to recharge Alkaline batteries if your SPORT 2 came with this type of batteries. Attempting to recharge Alkaline batteries may damage the SPORT 2 and will void the warranty.

Plug the connector of the wall charger into the 9-Pin connector on right side of the SPORT 2 when the **LO BAT** indicator blinks. Then plug the wall charger into a 110-120 volt wall outlet. The NiMH batteries should take about 12 hours to recharge.

NiMH batteries perform best when they are fully discharged and then fully recharged.

Auto-Shutdown Feature

The SPORT 2 has a 30 minute time-out auto-shutdown feature. After 30 minutes in sleep mode, the SPORT 2 automatically shuts off.

How To Save Battery Life

Since the transmitter has the highest current draw, turn the transmitter off whenever you are not taking readings.
If you use the trigger to start and stop transmitting, it's easy to save battery life.
If you tripod mount the gun, (and use the silver TRANSMIT button to transmit) then turn the transmitter off between sessions.

Angle Errors

The most common mistake made with all radar guns is trying to clock targets at angles.

All radar guns work on the Doppler principle and need to clock objects moving directly at or away from the gun. Clocking at an angle with a stationary radar gun results in angle error, and the gun displays a speed that is LOWER than the actual speed.

Cosine Angle Error Chart

	0 Degrees	5 Degrees	10 Degrees	15 Degrees	30 Degrees	45 Degrees	90 Degrees
True Speed	0% Error	0.4% Error	1.5% Error	3.4% Error	13.4% Error	29.3% Error	100% Error
25.0 mph	25.0 mph	24.9 mph	24.6 mph	24.1 mph	21.7 mph	17.7 mph	0 mph
50.0 mph	50.0 mph	49.8 mph	49.2 mph	48.3 mph	43.3 mph	35.4 mph	0 mph
75.0 mph	75.0 mph	74.7 mph	73.9 mph	72.4 mph	65.0 mph	53.0 mph	0 mph
100.0 mph	100.0 mph	99.6 mph	98.5 mph	96.6 mph	86.6 mph	70.7 mph	0 mph
125.0 mph	125.0 mph	124.5 mph	123.1 mph	120.7 mph	108.3 mph	88.4 mph	0 mph

150.0 mph	150.0 mph	149.4 mph	147.7 mph	144.9 mph	129.9 mph	106.1 mph	0 mph

Radar Gun Placement
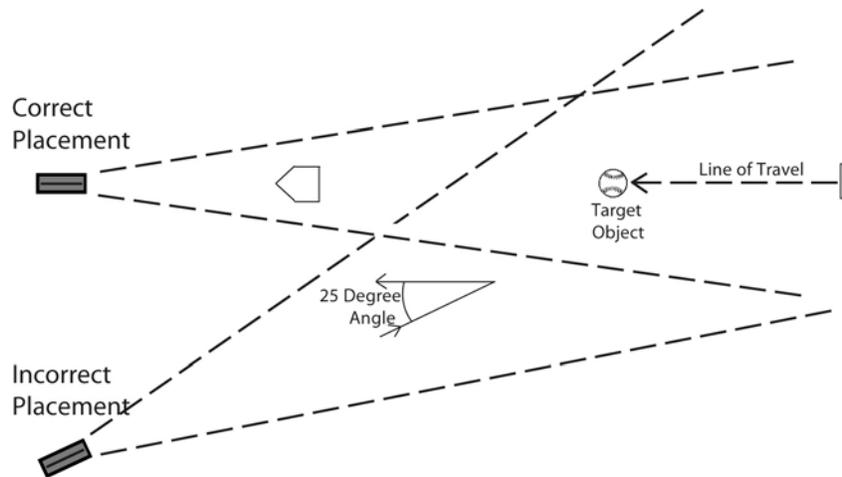
For accurate readings, the radar gun must be placed in the line of travel of the target. At slight angles, the error is very small; however, at larger angles, the error becomes substantial.

NOTE: The SPORT 2 can automatically adjust for angle error by changing the Cosine Angle settings in the Option MENU.

Calculating Angle Errors

If you know the angle at which you are clocking, you can calculate the actual speed by taking the radar reading and dividing by the cosine of the angle.

For example: if you are clocking at 30 degrees, and the gun displays 129.9 mph, take 129.9 and divide by the cosine of 30 degrees (0.866) to get a true speed of 150.0 mph.

Interference Problems

Interference Frequencies

The *STALKER* SPORT 2 radar transmits at a frequency of 24.125 GHz (24,125,000,000 Hz), using a K-Band Transmitter. The receiver is designed to read the Doppler frequency (the change in frequency) between 360 Hz and 11,000 Hz. There are very few devices other than another radar gun that could cause interference in a radar gun's transmission frequency range. However, there are a number of devices that could interfere with a radar gun in the receiver's frequency range.

What Does Interference Do?

Interference can cause a radar gun to read random readings, or make it harder for the radar gun to "see" the intended target.

Random readings are an obvious sign that there is interference. However, a loss of sensitivity can be subtle. A common situation occurs when a large number of professional baseball scouts operate many radar guns in close proximity.

A loss of sensitivity can cause the radar gun to be unable to "see" far enough away to get the ball speed right when it leaves the pitchers hand. Then, as the ball gets closer to the plate, the radar is able to get a reading, but only after the ball has slowed down. The result: the peak speed registers lower than it actually is.

Sources of Interference

There are two main sources that can cause ghost (random) readings in radar guns: electrical devices and objects that move or vibrate.

Electrical sources include television monitors, fluorescent lights, cellular phones, computers, some radio transmitters, and power transformers.

Moving or vibrating objects include ventilation fans, motors, and blowing debris that can produce a nearly constant speed reading.

How to Eliminate Interference

If you are experiencing erroneous readings, try these solutions:
Change your position to change where the gun is aimed.
Lower the sensitivity by changing the Range on the Operator MENU to **1** (low setting).
Change the Option MENU Low Speed setting to a setting with a higher low-speed cutoff if the readings are at low speeds (often interference from nearby motors).

SPORT 2 Accessories

The *STALKER* SPORT 2 radar gun has a host of optional accessories. For current pricing and availability, contact sales at **1-888-STALKER.**

Accessories

❍ Stopwatch Control Cable – a 4 foot cable with momentary switch that connects to the 9-Pin connector.

❍ 12VDC CIG Cable – Connects to the 9-Pin connector and plugs into a cigarette lighter receptacle.

❍ RS-232 Serial Cable that connects to the 9-pin connector for RS-232 data output.

Service Information

A Check List Before Servicing the SPORT 2 Radar

Check the Settings - If you are having a problem with your SPORT 2, first make sure that the settings are correct for your application. Read the Operator and Option Setup MENUS sections. Call Customer Service at 1-877-STALKER if you need help with this.

Check the Battery - If the SPORT 2 does not turn on, the problem is usually with the batteries. Try charging the batteries if they are NiMH batteries, replace the batteries if they are Alkaline. If it still does not turn on, you could use a volt meter to see if the batteries are producing at least 7.5 volts. You may need to order new batteries.

Call Customer Service - If the problem is not rectified with these steps, call Customer Service at 1- 877-STALKER for help. A service representative will determine if the gun needs to be sent to the factory.

Factory Service Center Address

Applied Concepts, Inc.
Attn. Repair Department
2609 Technology Drive
Plano, TX 75074
1-877-STALKER Toll Free
Phone: (972) 801-4807
Fax: (972) 398-3781

Warranty Information

The SPORT 2 radar is covered for One (1) Full Year, Parts and Labor, against defects in workmanship, parts, or materials, and is guaranteed to operate within specifications for that period.

STALKER Radar will repair or replace, at their option, any component or system found to be defective. The customer is responsible for shipping the defective product to the factory (freight prepaid), and **STALKER** Radar will pay for the return shipping via UPS ground service back to the customer. Any expedited air shipping charges are to be paid by the customer.

This full warranty does not cover damage due to dropping, water, salt, improper voltage, fire, charging Alkaline batteries in the unit, attempted repairs or modifications by an unauthorized service agent, or any other unusual treatment.

STALKER SPORT 2

Specifications

PERFORMANCE SPECIFICATIONS

Speed Range	5 - 150 MPH
Accuracy	$\pm$ 3% of reading
Max. Clocking Distances	300 Feet with unobstructed view

MICROWAVE SPECIFICATIONS

Operating Frequency	24.125 GHz (K-Band) +/- 50 MHz
Polarization	Circular Polarization
3 db Beam width	14 Degrees Nominal (15 Degrees Maximum)
Microwave Source	Gunn-Effect Diode
Receive Type	Schottky Barrier Mixer Diode
Power Output	10 Milliwatts Nominal

The STALKER SPORT2 Complies with Part 15 of the FCC rules.
FCC ID #IBQACMI005.

GENERAL SPECIFICATIONS

Product Type	Stationary Doppler Radar
Computer Processor	Digital Signal Processor
Display Type	Liquid Crystal
Operating Temperatures	-20F to +120F
Storage Temperatures	-40F to +140F

ELECTRICAL SPECIFICATIONS

Battery Capacity	7.5 VDC, 1.6 Ah, Ni-MH
Current Requirements	Transmitting - 0.35 Amps
(At 7.5 Volts DC)	Standby - 0.14 Amps
	Sleep Mode - 0.11 Amps

PHYSICAL SPECIFICATIONS

Weight (with batteries)	1.75 Pounds
Dimensions	8" H x 3" W x 6.5" L
Housing Material	ABS

Serial Communications Protocol

An **RS-232 or RS-485 Serial Cable** is required for data communications to speed display boards, computers, and other electronic devices. The data connector is on the side of the unit.

Serial Port Connector   9-PIN D-CONN
Mating Connector RS-232 or RS-485

Connector Signals:
1. Aux Input
2. RS-232 TX
3. RS-232 RX
4. 6.6 Volts (OUT)
5. GND
6. Charger Input
7. RS-485-A
8. RS-485-B
9. Voltage Input

BAUD Rate   1200 to 38400 BAUD – default =9600 BAUD
Data Format   8 Data Bits
                      No Parity
                      1 Stop Bit

Serial Port Message Format

A and AP Format (Active Target or Peak Speed Only) – Resolution = ones

Byte #	Description
1	Speed hundreds digit (ASCII)
2	Speed tens digit (ASCII)
3	Speed ones digit (ASCII)
4(+)	Carriage Return (0x0D)

A and AP Format (Active Target or Peak Speed Only) – Resolution = tenths

Byte #	Description
1	Speed hundreds digit (ASCII)
2	Speed tens digit (ASCII)
3	Speed ones digit (ASCII)
4	Decimal Point (0x2E)
5	Speed tenths digit (ASCII)
6(+)	Carriage Return (0x0D)

Col Format (Last or Peak) – Resolution = ones

Byte#	Content
1	Speed hundreds digit (ASCII)
2	Speed tens digit (ASCII)
3	Speed ones digit (ASCII)
4	ASCII Colon = 0x3A
5	ASCII Carriage Return = 0x0D

Col Format (Last or Peak) – Resolution = tenths

Byte#	Content
1	Speed hundreds digit (ASCII)
2	Speed tens digit (ASCII)
3	Speed ones digit (ASCII)
4	Speed tenths digit (ASCII)
5	ASCII Carriage Return = 0x0D

The Col format (named for the colon in byte 4) duplicates the format of the legacy **STALKER** Sport gun.

- It never sends more than 25 speed messages per second (no faster than once per 40 ms).
- If the speed isn't changing, it only sends a new speed message every 1/3 second as a "keep-alive" signal.

The **Leading Zero** setting affects formats A and AP:

When set to SPAC (default setting), ASCII spaces are used for leading zeros:
```
"500(CR)"   or   "500.0(CR)"
" 50(CR)"   or   " 50.0(CR)"
"  5(CR)"   or   "  5.0(CR)"
```

When set to ZEro, ASCII zeros are used for leading zeros:
```
"500(CR)"   or   "500.0(CR)"
"050(CR)"   or   "050.0(CR)"
"005(CR)"   or   "005.0(CR)"
```

When set to nonE, leading zero characters are not transmitted:
```
"500(CR)"   or   "500.0(CR)"
"50(CR)"    or   "50.0(CR)"
"5(CR)      or   "5.0(CR)"
```

The **Message Termination** setting affects formats A and AP:

When set to Cr (default setting), each message is terminated with only a carriage return: (0x0D).

When set to CrLF, each message is terminated with a carriage return and a line feed: (0x0D, 0x0A).

When set to u Cr, each message is terminated with the speed's units and a carriage return: "500MPH(0x0D)".

When set to u CL, each message is terminated with the speed's units, a carriage return and a line feed:"500MPH(0x0D0A)".