



S SOLO 2

Digital Sports Radar

Owner's Manual

*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
received, including interference that may cause undesired operation.*

*Any changes or modifications not expressly approved by Stalker Radar / Applied Concepts, Inc., could void
the user's authority to operate the S SOLO 2.*

Not intended for Law Enforcement use.

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Introduction

Congratulations! You have purchased the finest sports radar system available. The *S* SOLO 2 K-band sports radar was designed to measure the speed of a wide variety of objects such as baseballs, carnival balls, cars, tennis balls and just about anything that moves.

The *S* SOLO 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 *S* SOLO 2 is a true *digital* radar system. The SOLO 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 *S* SOLO 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 *S* SOLO 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**.

SOLO 2 Package

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



Quick Start Instructions

The S SOLO 2 has several features that allow the gun to work well in a wide variety of applications. With some basic understanding, the gun is very simple to operate.

Basic Operation

Power is supplied from 6 NiMH cells 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

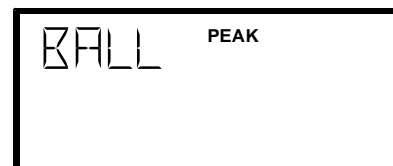
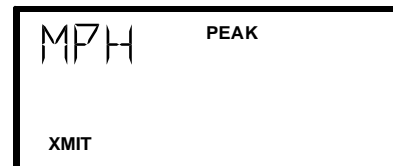
There are two ways to turn on the radar transmitter to begin operating:

- Trigger Transmit: Pull the trigger to transmit.
- Transmit Button: Press the silver TRANSMIT button to toggle the transmitter ON or OFF.

NOTE:

* When the gun **IS** transmitting, the XMIT icon displays and the unit of measure displays in the message window.

* When the gun **IS NOT** transmitting, the XMIT icon does not display and the target type displays in the message window.



The Target Types

Baseball

When configured for baseball mode, the SOLO 2 measures the peak (release) speed and the live (roll-down) speed of a baseball pitch. The ideal location for monitoring baseball speeds is behind the catcher and umpire with a clear view of the pitched ball's path.

Carnival

The SOLO 2 can be operated in carnival mode to report the speed of balls thrown at a backdrop target in a carnival booth setting. In this application the radar is usually mounted on a side support for the booth, so there is a large angle between the ball's trajectory and the radar's aim. The SOLO 2 can automatically adjust for the angle error to display true ball speed.

Carnival mode can also be used for other targets with short flight durations like bullets or BBs.

Car

Car mode is used to measure the speed of cars and other vehicles. The most accurate readings are acquired when the vehicle is traveling directly toward or away from the radar. Any angle between the vehicle's path and the radar's aim results in lower readings.

Tennis

Tennis mode is much like baseball mode in that the SOLO 2 measures the peak (served) speed and the decelerating live speed of a served tennis ball. Since tennis balls are served at a wide range of angles, a good compromise location to mount or run the radar is at the middle of each end of the court. From this spot, many serves travel directly toward or away from the radar down the center of the court, and the most accurate speeds are reported. Speeds for those serves traveling at a large angle to the radar's aim will be reported low because of the angle error.

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 is "ON" allowing peak speed display. (for baseball, carnival and tennis target types)

LCD Display Windows

MESSAGE	Messages display in the upper left corner (e.g. MPH, KM/H, LOCK, BALL).
MAIN	<p>The four large digits in the lower right corner display the main speed of interest.</p> <p>When the target type is set for Ball, Carnival, or Tennis: If PEAK mode is turned on, this window displays the current or locked peak speed. If PEAK mode is off, this window is blank or displays the locked live speed.</p> <p>When the target type is set for Car: This window always shows the live target speed.</p>
UPPER	<p>The four smaller digits in the upper right corner show a secondary speed.</p> <p>When the target type is set for Ball, Carnival, or Tennis: This window normally shows the live target speed. When PEAK mode is turned on and there is a peak speed, the live speed is this window freezes when speeds are locked. If PEAK mode is off, or there is no peak speed displayed, this window continues to show live speed, and the locked live speed moves to the MAIN window</p> <p>When the target type is set for Car: This window is blank or displays a locked live speed.</p>



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 or remote transmit 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 SOLO 2

WARNING: Alkaline batteries must **not** be used in the SOLO 2. Using alkaline batteries may damage the SOLO 2 and will void the warranty.

Batteries - The SOLO 2 handle contains a battery compartment. The SOLO 2 comes with 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 SOLO 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.

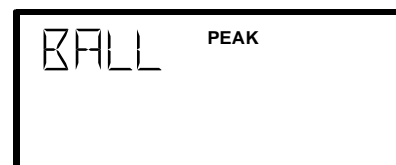
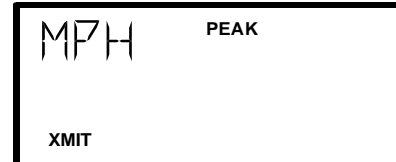
Trigger Transmit - Squeeze and hold the trigger in to transmit. In the Continuous trigger mode (default) when the trigger is released, the transmitter turns off and any current readings are left on the screen. Since the transmitter draws most of the power, trigger operation helps to save battery life.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

* When the gun **IS** transmitting, the XMIT icon displays, and the unit of measure displays in the message window.

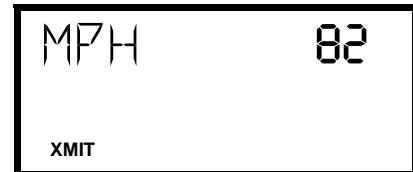
* When the gun **IS NOT** transmitting, the XMIT icon does not display, and the target type displays in the message window.



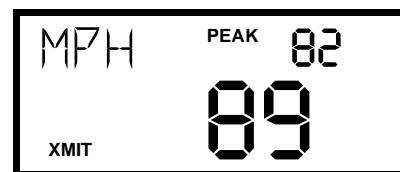
The Peak Function

The Peak option activates acquisition of the peak speed of targets. 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. Since Peak mode measures the peak speed of short duration targets, it is only available for baseball, carnival and tennis target types. It can not be enabled when target type is set for car.

When Peak mode is OFF, the PEAK icon is not displayed. The live, changing target speed shows in the Upper right window, and the Main window is blank.



When Peak mode is ON, the PEAK icon appears on the display and the highest speed for each target acquired displays in the Main window. The live target speed displays in the upper right window.

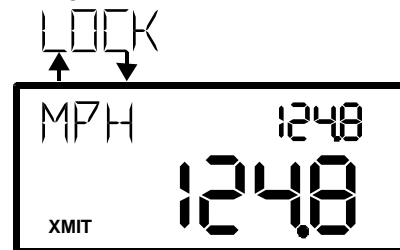


Using the Trigger to Lock Speeds

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 set for Lock (lock), the trigger does not affect the transmitter. Instead, press the trigger to lock the currently displayed speed(s). 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.

If Peak mode is off, the locked live speed will move to and freeze in the Main window while the live speed can continue to be tracked in the Upper speed window. If Peak mode is on, the live speed and the peak speed just freeze in their respective windows. Live speed cannot be tracked after locking in this mode.



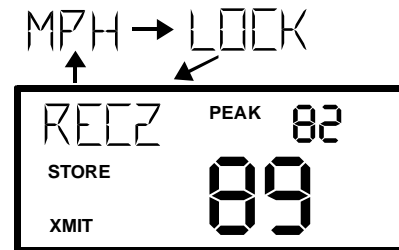
The Recall Function

The silver RECALL key redispays the last five speed readings that were measured. Speeds are added to the recall queue:

- when the trigger is released (the last speeds displayed will also be saved on the display until the next trigger pull),
- when they are locked,
- when they are cleared from the display after the Auto-Clear Delay has expired,

- or two seconds after the target is lost if the Auto-Clear Delay is set to OFF.

The stored peak, live and/or locked speeds in the recall queue display in a sequential mode as the RECALL key is pressed. The Message window display cycles through the Recall Number, speed units, and LOCK (if recalling a locked speed). 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 setting of a feature.

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, <u>3</u>
2 Note: this menu step is not available when Target Type is selected.	Peak On/Off	PEAK	OFF, <u>On</u>

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 17 features to select. The SOLO 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 once a feature is selected.

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, 5, 10, 15, 20, 30 , 50
2	High Speed	HIGH	OFF, 150 , 300
3	Units	MPH, KM/ H, KNOTS, M/ S	Un it
4	Resolution	RES	ones, tenths
5	Target Type	TARGET	ball , CARn, CAR, tEnn
6	Auto-Clear Delay	CLEAR	0SEC, 1SEC, 2SEC , 3SEC, 4SEC, OFF
7	Trigger Function	TRIG	Con , 55, Loc
8	Aux Trigger Function	AUX	OFF , Stop, tr i9
9	Stopwatch Mode	STOP	Std , LAP, SPLt
10	Cosine Angle	ANGLE	0 - 45
11	Serial Port Speed	BAUD	12, 24, 48, 96 , 192, 384
12	Serial Port Format	FOR	2 , A, bE, Co l
13	Format A Speed	A SPD	LAST , PER
14	Leading Zero	LEAD0	2Er0, SPAC , nonE
15	Message Termination	TERM	Cr , CrLF, u Cr, u Cl
16	Peak Message Type	PKMSG	Cont , 5 m9
17	Reset	RESET	YES, no
18	Reset Confirmation	SURE?	YES, no

Options Defined

- Low and High Speed: Setting values are retained separately for each Target Type, and each has its own defaults. The available settings also depend on the type of units selected. Those shown above are for the default BALL target type in MPH units. See the table below for the settings available for each unit of measure. The default settings for each target type are defined in the Recommended Settings section.

<u>Units</u>	<u>Low Speed</u>	<u>High Speed</u>
MPH	OFF, 5, 10, 15, 20, 30, 50	OFF, 150, 300
KM/H	OFF, 10, 15, 25, 35, 50, 75	OFF, 250, 500
KNOTS	OFF, 5, 10, 15, 20, 30, 50	OFF, 150, 300
M/ S	OFF, 3, 5, 7, 10, 15, 25	OFF, 75, 150

- Resolution: Select **ONE5** to display speed in whole units, as 25 MPH, or **TENTH** to display speed with tenths, as 25.4 MPH.
- Target Type: The target types available on the SOLO 2 are Ball, Carnival, Car and Tennis. Peak on/off status is displayed when changing target type. Peak speeds cannot be enabled when the target type is Car
- 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:

<u>Transmit</u>	<u>Trigger Option</u>	<u>Action</u>
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).

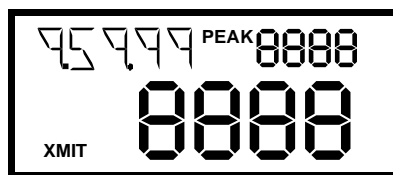
NOTE: When the **Loc** setting is selected in the OPTION MENU, the Transmit function is turned on as if the silver TRANSMIT button had been pressed. Clicking the trigger alternately locks and releases the current speed(s).

- **Aux Trigger Function:** The Aux Trigger settings are: OFF = ignored, STOP = stopwatch or TRIG = radar trigger. In radar trigger mode, the Optional Stopwatch Cable can be used as a remote trigger.
- **Stopwatch Mode:** This feature is only displayed (in the OPTIONS MENU) if the Aux Trigger is set to STOP. 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.

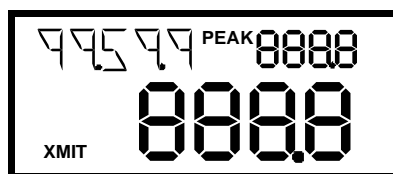
Stopwatch Timer Modes:

Standard Timer	Successive presses of the stopwatch trigger start the stopwatch at 0000 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 0000 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*.
- **Serial Port Format:** The “-” (dash) is for no serial output, the A format is for Selected Target Speed, the bE format is for multiple speeds, and the Col format duplicates the output of the legacy S Sport gun.
- **Format A Speed:** (only for Format A) Last speed or Peak speed.
- **Leading Zero:**

Zero =	090	090.1
Space =	90	90.1
None =	90	90.1

(only if format = A or bE)

- **Message Termination:**
(only if format = A)
 - ↳ = Carriage Return only (0x0D)
 - ↳LF = Carriage Return & Line Feed (0x0D 0x0A)
 - ↳ ↳ = units followed by Carriage Return e.g. "MPH"0x0D
 - ↳ ↳L = units followed by Carriage Return & Line Feed e.g. "km/h" 0x0D 0x0A

- **Peak Message Type:**
(only if format = A & Format A Speed = PEAK)
 - Continuous = continually streams peak speed
 - Single = sends one peak speed message per acquired target

- **Reset Confirmation:** The following steps reset the unit to factory default settings:
 - Set RESET to YES. Now, the only two Option Menu items are RESET and SURE?
 - Set SURE? to YES also, and pull the trigger to exit all menus and change all settings to factory defaults.
 - To exit without forcing factory defaults, set RESET and SURE? to NO and pull the trigger.

Recommended Settings

Settings for Baseball Scouts

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

Target Type	Ball
Low Speed	30 MPH (50 km/h, 30 knots, 15 m/s)
High Speed	150 MPH (250 km/h, 150 knots, 75 m/s)
Range	3 – For maximum sensitivity
Peak ON/OFF	ON - This is for release speed numbers.
Auto-Clear Delay	2 seconds – After loss of target tracking, radar holds the speeds on the display before clearing them.

Settings for Carnival Use

You can experiment with the Range setting depending on what motion and what rides are around the gun.

Target Type	Carnival
Low Speed	30 MPH (50 km/h, 30 knots, 15 m/s)

High Speed	150 MPH (250 km/h, 150 knots, 75 m/s)
Range	1 – To mask other nearby moving objects.
Peak ON/OFF	ON - To capture the highest speed of the target.
Auto-Clear Delay	2 seconds – After loss of target tracking, radar holds the speeds on the display before clearing them.

Settings for Vehicle Racing

Using a Low Speed cutoff of 30 MPH helps to ignore anyone walking around and other low speed motion.

Target Type	Car
Low Speed	10 MPH (15 km/h, 10 knots, 5 m/s)
High Speed	300 MPH (500 km/h, 300 knots, 150 m/s)
Range	3 – Use maximum sensitivity for greater distances
Auto-Clear Delay	2 seconds – After loss of target tracking, radar holds the speeds on the display before clearing them

Settings for Tennis

Using a Low Speed cutoff of 50 MPH helps to ignore anyone walking around and other low speed motion.

Target Type	Tennis
Low Speed	50 MPH (75 km/h, 50 knots, 25 m/s)
High Speed	150 MPH (250 km/h, 150 knots, 75 m/s)
Range	3 – Change to 1 or 2 if you track outside motion
Peak ON/OFF	ON - This is for serve speed numbers
Auto-Clear Delay	2 seconds – After loss of target tracking, radar holds the speeds on the display before clearing them

Battery Information

WARNING: Alkaline batteries must not be used in the SOLO 2. Using alkaline batteries may damage the SOLO 2 and will void the warranty.

The SOLO 2 uses 6-AA NiMH rechargeable batteries. Squeeze and remove the end cap on the handle to access the battery compartment. The batteries' transmit time is approximately 5 hours.

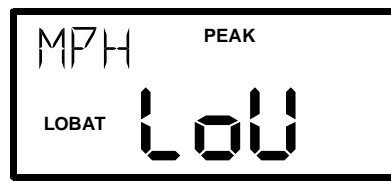
Operational Time using AA NiMH Batteries

The SOLO 2 draws the most current when it is transmitting, so the run time depends upon how often the gun is transmitting. The SOLO 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.

<u>Operational Status</u>	<u>Run Time</u>
Continuous Transmitting	5 Hours
Typical Trigger Operation	10-11 Hours

Low Battery Warning

The **LO BAT** icon blinks when the battery runs low. The SOLO 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 or change the batteries.



NOTE: DO NOT CHARGE THE BATTERIES UNTIL THE GUN DISPLAYS *LO BAT*.

Charging the Batteries

WARNING: Alkaline batteries must not be used in the SOLO 2. Using alkaline batteries may damage the SOLO 2 and will void the warranty.

Plug the connector of the wall charger into the 9-Pin connector on right side of the SOLO 2 when the **LO BAT** indicator blinks. Then plug the wall charger into a 110-120 volt wall outlet. The 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 SOLO 2 has a 30 minute time-out auto-shutdown feature. After 30 minutes in sleep mode, the SOLO 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

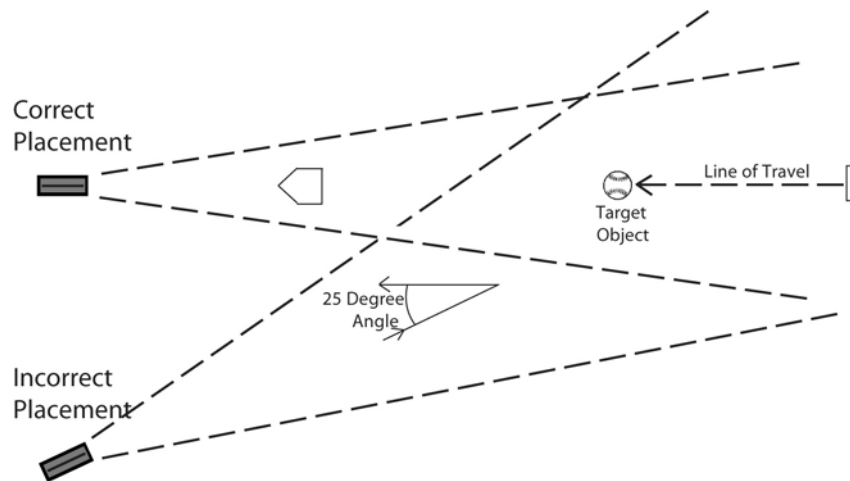
The most common mistake made with all radar guns is trying to clock targets at angles.

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
200.0 mph	200.0 mph	199.2 mph	197.0 mph	193.2 mph	173.2 mph	141.4 mph	0 mph
250.0 mph	250.0 mph	249.0 mph	246.2 mph	241.4 mph	216.5 mph	176.8 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.

Calculating Angle Errors

If you know the angle at which you are clocking, you can manually 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.

NOTE: You can configure the SOLO 2 to automatically adjust for angle error by changing the Cosine Angle setting in the Option MENU. In the above example, if the Cosine Angle setting is 30, the gun will display 150.0 MPH, and no manual calculations are necessary.

Interference Problems

Interference Frequencies

The S SOLO 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 just over 43 kHz. 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).

SOLO 2 Accessories

The S SOLO 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 SOLO 2 Radar

Check the Settings - If you are having a problem with your SOLO 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 SOLO 2 does not turn on, the problem is usually with the batteries. Try charging the batteries. 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 SOLO 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.

S 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 S 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.

S SOLO 2

Specifications

PERFORMANCE SPECIFICATIONS

Speed Range	5 - 600 MPH
Accuracy	± 0.1 MPH or 3% of reading, whichever is greater. In 0.005 resolution, round to the nearest integer; In 0.001 resolution, round to nearest tenth.
Max. Clocking Distances	300 Feet

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 S SOLO 2 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 (At 7.5 Volts DC)	Transmitting - 0.35 Amps 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 Format (Last or Peak) – Resolution = **ones**

Byte#	Content
1	Speed hundreds digit (ASCII)
2	Speed tens digit (ASCII)
3	Speed ones digit (ASCII)
4(+)	Carriage Return (0x0D) or alternate termination string determined by the message termination setting

A Format (Last or Peak) – Resolution = **tenths**

Byte#	Content
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) or alternate termination string determined by the message termination setting

bE Format

Byte #	Content
1	Message type = 0x88
2	Unit Config: Bit 7 = 0 (to force ASCII character) Bit 6 = 1 (to force ASCII character) Bit 5 = unused Bit 4 = Resolution: ones = 0, tenths = 1 Bit 3 = always 0 for directional radar Bit 2 = always 0 for stationary radar Bit 1 = Peak Speed not enabled = 0; Peak Speed enabled = 1 Bit 0 = always 0
3	Unit Status: Bit 7 = 0 (to force ASCII character) Bit 6 = 1 (to force ASCII character) Bit 5 = unused Bit 4 = unused Bit 3 = always 0 Bit 2 = always 1 Bit 1 = always 0 Bit 0 = always 0
4	ASCII 0 or space - disregard
5	ASCII 0 or space - disregard
6	ASCII 0 or space - disregard
7	Number of Speeds Reported (ASCII 1 or 2) – One for Last Speed + One for Peak Speed if enabled
For each speed reported – 15 ASCII bytes:	
1	Speed ID: ASCII 4: Last/Live Target Speed ASCII 5: Peak Speed
2	Zone Status: Bit 7 = 0 (to force ASCII character) Bit 6 = 1 (to force ASCII character) Bit 5 = always 0 Bit 4 = always 0 Bit 3 = always 0 Bit 2 = always 0 Bit 1 = Target Speed Direction (unused, disregard value) Bit 0 = Transmit = 1, Hold = 0
3	Speed hundreds digit (ASCII)
4	Speed tens digit (ASCII)
5	Speed ones digit (ASCII)
6	Speed tenths digit (ASCII)
7	Reserved (ASCII space)
8	Reserved (ASCII space)
9	Reserved (ASCII space)
10	Reserved (ASCII space)
11	Reserved (ASCII space)
12	Reserved (ASCII space)
13	Reserved (ASCII space)
14	Reserved (ASCII space)
15	Reserved (ASCII space)
Last Byte	ASCII 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 S 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 bE:

- When set to **SPACE** (default setting), ASCII spaces are used for leading zeros:

"500"	or	"500.0"
" 50"	or	" 50.0"
" 5"	or	" 5.0"

- When set to **ZERO**, ASCII zeros are used for leading zeros:

"500"	or	"500.0"
"050"	or	"050.0"
"005"	or	"005.0"

- For Format A, when set to **none**, leading zero characters are not transmitted

"500"	or	"500.0"
"50"	or	"50.0"
"5"	or	"5.0"

For Format bE, when set to **none**, ASCII spaces are used for leading zeros (as above for the **SPACE** setting) because Format bE uses fixed length fields.

The **Message Termination** setting affects format A:

- When set to **CR** (default setting), each message is terminated with only a carriage return: (0x0D).
- When set to **CR LF**, 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 CR LF**, each message is terminated with the speed's units, a carriage return and a line feed: ("500MPH" 0x0D 0x0A).

The S SOLO 2 Radar
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STALKER RADAR

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