

SG300A Radar Gun



The radar gun is designed to be easy to use.

Press green “Y” button labeled “ON” to turn on the power.

To operate the gun, aim the gun at the desired moving object and pull and release the trigger button to start taking a measurements.

Accuracy.

The radar gun can measure speed to within plus or minus one KPH/MPH per hour provided the gun is placed in a such a position that the moving object is coming directly toward or directly away from the gun. If the object is moving at an angle to the gun, the COSINE effect will cause the measured speed will be slower than the actual speed. See description later in this document for a detailed description of cosine effect.

Quick Start

Initial Set Up

The SG300A gun is easy to use. Simply aim the gun in line (parallel) with the target, pull and release the trigger, and you are ready to record a speed reading.



Control Panel Functions

The control panel features an LCD display, six buttons, 4 LEDs and a sensor for an IR remote.

- The “**Y**” button turns the SG300A on.
- The “**N**” button turns the SG300A off.
- The “**Mode**” (Left arrow) button selects Peak, Peak/Last, Last or Continuous measurement modes.
- The “**History**” (Up/Down arrows) buttons are used to display historical speeds.

The LCD window displays the speed. When you turn the power on, a start-up message displays in the window for several seconds, then the Peak/Last Mode appears, indicating that the gun is in Peak/Last Speed mode. This is the default mode that the gun is always in when you power it up.

Clocking a Speed Reading

The SG300A radar gun detects targets moving either toward or away from it. The radar measures the true release speed with an accuracy of +/- 1 mph (+/- 1.6 kph).

For the most accurate reading stand to one side of the catcher and point the gun toward the pitch, so the radar beam is aligned straight across (parallel) from the ball, not at an angle. If you point the radar gun at an angle with the ball, you introduce an angular error known as the cosine correction error (see section on Angular Interference-Cosine Error Effect.) Also, you can stand behind the pitcher to position the radar.

The radar will detect speeds within a 180-foot range. However, when the gun is closer to the release pitch, the speed reading is more accurate.

Operating Modes

The SG300A gun has several operating modes. To switch modes, tap the “**Mode**” button. The “**Mode**” button toggles between Peak, Peak/Last, Last and Continuous Speed mode.

The radar beam becomes active once you pull the trigger.

Peak/Last Speed Modes

When the SG300A gun sees and displays the peak speed, the peak speed remains on the readout for a few seconds. In the Last mode, the Last speed is displayed.

The radar beam is always ready for the next pitch.

To stop taking measurements, pull and release the trigger.

Continuous Speed Mode

The SG300A gun continuously displays recorded speeds until you move the gun from the target's alignment to clear the last recorded speed. After a few seconds, the speed no longer appears in the display window. The SG300A gun is instantly ready for another pitch.

After a few seconds, the speed no longer displays, automatically clearing the display. After the speed clears, the SG300A gun is instantly ready for another pitch.

To stop taking measurements, pull and release the trigger.

Radar Gun Power

The SG300A radar gun is extremely durable and has an easy-grip handle. The gun uses 6-AA NiMH rechargeable batteries in the battery pack that is part of the handle. Alternatively, the radar gun can be connected to a wall adapter or connected to a readout that provides power.

- Tap the “**N**” button twice to show the charger status when operating from external power.
- When operating from battery, the battery status is shown.

When connected to external power the display shows:

External Power
Charge Slow

When **Low Battery** appears on the LCD display window, the batteries need to be re-charged.

Battery 5.88V
Low Battery

When the batteries are good, the LCD display shows:

Battery 7.21V
Battery Normal

When the radar is transmitting, it consumes roughly twice as much power than when it is not

transmitting.

External Power Connector

The AC/DC power connector performs the following functions. The 5.5mm/2.1mm coaxial AC/DC power connector may be used to operate the unit.

If using the SG300A for extended periods of time from external power, it is best to use an 11-12VDC wall adapter rather than a 15VDC adapter especially on hot days. The same 15VDC wall adapter that can be used to power the readout can be used to operate the SG300A.

When the SG300A is connected to an Alzatex radar gun readout, the readout provides power to the radar gun.

SG300A Front Panel

The SG300A Faceplate has six buttons, an LCD display and several LED status indicators.



LCD Display Window

The SG300A gun has a two-line back lit LCD readout. The LCD window displays the speed, mode and status.

Status LEDs

The SG300A gun has 4 front panel status LEDs. The status LEDs indicate the following:

- Green LED – Indicates that the radar gun is transmitting.
- Yellow LED – Indicates that a button was pressed on the IR remote. Yellow LED always on indicates the test / diagnostic mode is enabled.
- Red LED – Flashes any time a button is pressed. If a button is held, this LED stays on until another button is pressed.
- Blue LED – While transmitting, this LED flashes each time movement is detected. Indicates that the radar gun is detecting movement.

NOTE: While transmitting, if the Blue LED flashes at unexpected times, there may be a fan or other object causing interference possibly leading to false readings.

Control Buttons

The unit has six buttons on the Faceplate of the unit. In user mode, the buttons have the following functions.

- Press the “**Y**” button to turn the unit on or start and stop taking speed measurements.
- Pull and release the “**Trigger**” on the handle to start taking speed measurements.
- Press and hold the “**N**” button to turn the power OFF.
- The “**Up**” and “**Down**” arrows scroll through the History memory.
- The “**Mode**” button (“**Left**” Arrow) selects between Fast, Fast/Last, Last or Continuous Mode.
- The “**Right**” Arrow selects the various side menus.

Setup Mode

In setup mode, the buttons have the following functions.

- Press and hold the “**Mode**” button to enter the setup mode.
- The “**Left**” and “**Right**” arrow buttons toggle through the setup choices.
- Tap the “**Y**” button to enter the Edit mode.
- In Edit mode, the “**Up**” and “**Down**” arrows select the desired setup value.
- Press and hold the “**Y**” button to save the

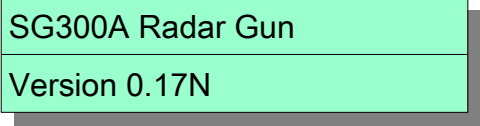
settings.

- Tap the “**N**” button once or twice to exit the setup mode.

Turning ON/OFF the Power

Tap the “**Y**” button to turn the unit on.

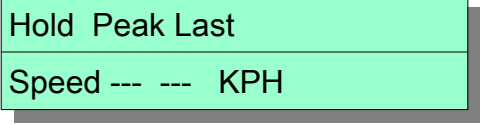
Press and hold the “**N**” button to turn the unit off.



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Version 0.17N

The unit will automatically turn itself off if the unit is operating off the Battery power, and the **Low Batt** display is showing and there is no activity for 30 seconds or more.

A start up message displays in the LCD window for several seconds, then the message **Peak** or **Peak/Last** appears indicating that the gun is in Peak/Last Speed mode.



Hold Peak Last
Speed --- --- KPH

Displaying Speed

Pulling the trigger button initiates a speed measurement.

The SG300A radar gun transmits and receives microwave energy and is ready to record a speed.



XMIT Peak Last
Speed 98 97 KPH

When the green LED on the front panel is lit the unit is in the **XMIT**, transmitting mode.

Trigger Modes

Peak, Peak/Last, Last Speed, continuous trigger modes.

- The **Peak** mode displays the fastest speed detected on a single measurement.
- The **Peak/Last** mode displays the fastest speed and the Last speed detected on a single measurement.
- The **Last** mode displays the last speed detected on a single measurement.
- The **Continuous** mode takes continuous measurements and displays the current speed.
- Tap the “**Y**” button to start taking speed measurements. Tap the “**Y**” button again to stop taking speed measurements.
- When in the history display mode, tap the “**Y**” button to re-display the most recently captured speed.

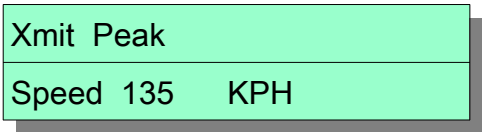
To select Peak, Peak/Last, Last or Continuous Speed mode, tap the “Mode” (“Left” arrow) button. The “Mode” button toggles between these modes. In each of the modes, the radar detects the speed of the pitch and displays it.

Peak Trigger Mode

Pull and release the trigger to change to XMIT. While transmitting, the display shows the speed.



When using the Peak mode, the radar detects the speed of the pitch and displays it.

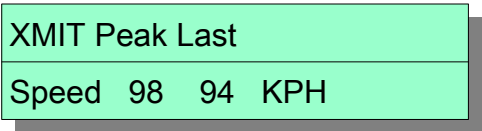


The readout will show the peak speed.



Peak/Last Trigger Mode

Pull and release the trigger to change to XMIT. While transmitting, the display shows the peak and last speeds.



The readout will show the peak speed.



When using the Peak-Last mode, the radar detects the pitch speed and the catch speed of the pitch and displays the peak speed.

The next speed reading detected will be recorded. The recorded speed will show in the window for the length of hold time that has been set. Once a reading is detected, the reading goes back to 0 the after several seconds of no further activity.

If no readings are detected, pull and release the trigger to turn off the XMIT.

Last Trigger Mode

Pull and release the trigger to change to **XMIT**.

While transmitting, the display shows the last (most recent) speed.

XMIT	Last
Speed	94 KPH

The readout will show the last speed.



When using the Last mode, the radar detects the catch speed of the pitch and displays it.

XMIT	Last
Speed	94 KPH

Continuous Mode

Tap the “**Mode**” button to select the **CONTINUOUS** mode.

XMIT Continuous
Speed 72 KPH

While transmitting, the display shows the current speed.



In this mode, the unit continuously takes speed readings.

XMIT Continuous
Speed 0 KPH

The current speed is shown on the LCD display.

NOTE: If you have Audio enabled, the speed cannot be played while transmitting.

If the **Power up ON** mode is set, the radar gun powers up and starts taking measurements without pressing the trigger button. The radar gun keeps taking measurements as long as the gun is ON.

If the display is in any other mode, ie: setup, history, etc, it goes to the power up default mode

when switching from **HOLD** to **XMIT**.

If the display is in one of the speed display modes, ie: **Peak**, **Last**, **Peak Last** or **Continuous**, the display mode does not change when switching from **HOLD** to **XMIT**.

IR Remote

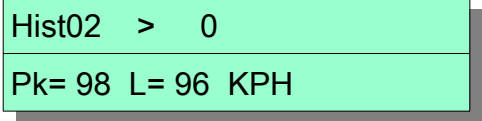


An optional infrared remote can be used to operate some of the basic functions of the radar gun.

- The **“MODE”** button selects between Fast, Fast/Last, Last or Continuous Mode.
 - The **“MENU”** button selects the appropriate sub-menu when there are multiple related menus.
 - Tap the **“OK”** button for to save the number to the selected history entry or to save time and date.
 - The **“CLK”** button is used to set the time and date. The time and date is stored along with any data stored on the USB drive.
 - The **“EXIT”** button exits the setup mode.
 - The **“0-9”** and **“A-F”** buttons permit numbers/letters to be entered for storing history notes or setting date and time.
-
- The **“UP”** button starts taking speed measurements.
 - The **“DN”** button stops taking speed measurements.
 - The **“BACK”** button displays the last speed recorded.
 - The **“LEFT”** and **“RIGHT”** buttons scroll through the History memory.

History Button

Press the History “Up” and “Down” buttons to display the most recently recorded speed. Press the History “Up” arrow button again to display the next most recently recorded speed. Each successive press of the history “Up” Arrow button will display the next older recorded speed. Each successive press of the history “Down” Arrow button will display the next newer recorded speed. When the end of the history memory is reached, it starts over at the beginning of the history memory again.



Hist02 > 0
Pk= 98 L= 96 KPH

Setting the Time and Date

When saving history memory to the USB drive it is helpful to have the correct time and date on the saved file.

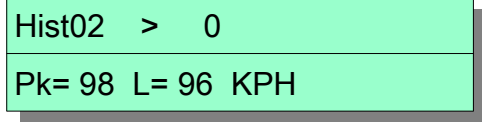
- Tap the “CLK” button on the IR remote to display the time and date. The arrow will be pointing towards the date.
- Use the “0-9” buttons to enter the desired date: **YYMMDD**.
- Example: “250519” for May 19, 2025.
- Tap the “OK” button for to save the to save the date.
- Tap the “CLK” button again on the IR remote to display the time and date. The arrow will be pointing towards the time.

- Use the “0-9” buttons to enter the desired time: HHMM.
- Example: “1409” for 14:09 (2:09 PM).
- Tap the “OK” button for to save the to save the time.

Adding notes to History Memory

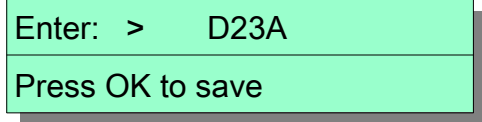
A short note can be added to a history memory. All subsequent measurements will have the same note. If the note is set to zero, then no note will be recorded.

- Tap the History “Up” or “Down” arrows to select the desired history memory.



Hist02 > 0
Pk= 98 L= 96 KPH

- Use the IR remote to enter a note.
- Tap the “0-9” and/or “A-F” buttons on the IR remote to enter a value. Up to 8 characters may be entered.



Enter: > D23A
Press OK to save

- Tap the “OK” button for to save the value to the selected history memory.
- Tap the “EXIT” button to exit the note save mode.

Saving History Readings

The history memory is automatically cleared each time the power is turned off.

The history memory can be saved to the USB drive. The radar gun must be in the idle mode (Not taking measurements).

- Tap the History “Up” arrow to display the history.
- Press and hold the “Up” Arrow for two to three seconds to save the history memory to the USB drive.
- The file will be saved in the “**history**” folder as “**history/hist1245.txt**”. Each time you save, the number will be the hour and minute of the day in the form **histhhmm.txt**
- **hist1306.txt** is saved at time **13:06**
- **hist1308.txt** is saved at time **13:08**, etc.
- Since the files are saved in Append mode, if you save to the same file more than once, the new data will be appended to the previous data.
- If you want to clear the local history memory, press and hold the “Up” arrow again for two to three seconds to clear the history memory.

NOTE: The history memory can be cleared before any other buttons are pressed after saving the history memory. The history memory is cleared each time the power is turned on.

Example History File:

- Open history File: history/hist1245.txt
- MinSpeed=8 Peak
- 00:12:46 Peak 69 KPH Last 69KPH
- 00:12:54 Peak 69 KPH Last 69KPH

Saving Speeds

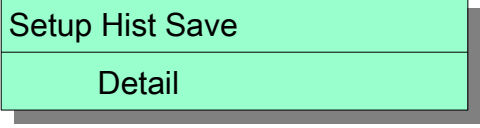
Speeds and/or detail can be saved to the USB drive. In addition to saving to the history memory, the speeds are saved directly to the USB drive as speeds are recorded.

- Press and hold the Setup (“Left” arrow) button to enter the setup mode.
- Tap the Setup (“Left” arrow) button several times until **Hist Save** is displayed.
- Tap the “Y” button to enter the Edit mode.
- Tap the “UP” and “Down” arrow buttons to select Save “**Speeds**” or do not save “**OFF**”.
- Press and hold the “Y” button to save the new setting.

Setup Hist Save

Speeds

- The file will be saved in the “**history**” folder as “**history/sped1245.txt**”. Each time you save, the number will be the hour and minute of the day in the form **spedhhmm.txt**
- **sped1306.txt** is saved at time **13:06**
- **sped1308.txt** is saved at time **13:08**, etc.



Setup Hist Save

Detail

In addition to saving speeds, signal, levels interference levels and other details are saved into the history memory. This feature is useful when trying to identify interfering objects and/or disturbances.

- The file will be saved in the “**history**” folder as “**history/dtal1245.txt**”. Each time you save, the number will be the hour and minute of the day in the form **dtalhhmm.txt**
- **dtal1306.txt** is saved at time **13:06**
- **dtal1308.txt** is saved at time **13:08**, etc.

Set to **OFF** if you do not need to save data.

Charging The Battery

Connect a 15VDC wall adapter to the power connector on the side of the unit. The SG300A defaults to **slow** charge mode when external power is applied. This is the preferred mode because it extends the life of the batteries.

If you need to charge the batteries in a hurry, put the charger into **fast** charge mode.

Use the following procedure.

- Tap the “**N**” button twice to display the charge status menu.
- Tap the “**Y**” button to change the charger to the **fast charge** mode. The fast charge will run for up to one hour.

- Tap the “**Y**” button again to change the charger to the **slow charge** mode. The slow charge will run for up to twelve hours.

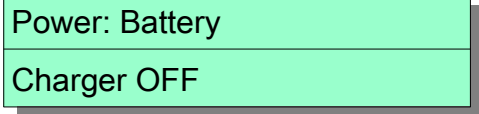
The upper LED is the charger status.

- Red-Green alternate – Radar gun is OFF, charging the battery.
- Red ON steady – Radar gun is ON, fast charging the battery for up to one hour.
- Red blinking – Radar gun is ON, charging the battery for up to 12 hours.
- Red-Green alternate – Radar gun is ON, last 10 minutes charging the battery. Then turns green.
- Green steady – The battery is full charge.

The lower LED is the power/data/transmit status.

- Red Flash – Serial data received on the RS232 port.
- Green Flash – Serial data sent on the RS232 port.
- Red rapid Flashing – Power supply voltage error.
- Green steady – The transmitting.

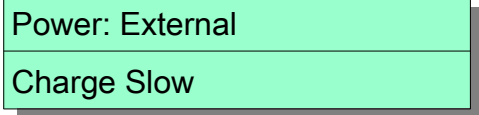
Power/Charger status display in battery mode.



Power: Battery

Charger OFF

Power/Charger status display when external power is applied.



Power: External

Charge Slow

Power/Charger status display when external power is applied and the battery is fully charged.

When a **Battery Full** condition is detected while in fast charge, the charger will revert to the slow charge mode for up to 12 hours, then turn off.

When a **Battery Full** condition is detected while in slow charge, the charger will turn off.

Power: External

Battery Full

Power status

- **Power: External** Operating from external power.
- **Power: Battery** Operating from battery.

Power/Charger status

Charger/Battery status messages

- **Charge OFF**. Typical charge current 0.00A.
- **Charge Fast**. Typical charge current up to 1.05A.
- **Charge Slow**. Typical charge current 0.05A to 0.16A.
- **Battery Full**. The battery is fully charged.
- **Battery None**. When attempting to charge the batteries, the battery is either missing or one or more cells is defective.
- **Battery Normal**. Normal.
- **Low Battery**. The battery needs to be recharged. The radar gun will shut off

after one minute.

- **External Power Low**. The external power is too low to charge the batteries. The radar gun operates properly, but cannot charge the batteries.
- **V3.3v Low**. The voltage is too low to operate the radar gun. [User Settings](#)

The SG300A has several user settings.

The unit has six buttons on the Faceplate of the unit. In setup mode, the buttons have the following functions.

In this mode, various settings can be changed.

- Press and hold the “**Left**” arrow button to enter the setup mode and view the settings.
- Tap the “**Left**” and “**Right**” arrow buttons to toggle through various settings.
- To change a setting, tap the “**Y**” button to enter the edit mode.
- While in Edit mode, the “**UP**” and “**Down**” arrows change the value.
- Press and hold the “**Y**” button to save the new setting.
- Tap the “**N**” button to exit the setup mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

NOTE: If, for some reason, the display did not change from **Save** to **Saved**, then to **Setup** after several seconds, repeat the save process.

- Tap the “**Y**” button to enter the edit mode.

- Press and hold the “Y” button to save the new setting.

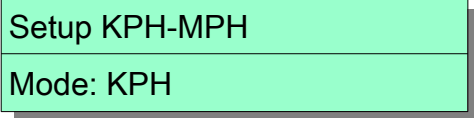
intentionally hidden to prevent it from accidentally being changed.

KPH-MPH mode

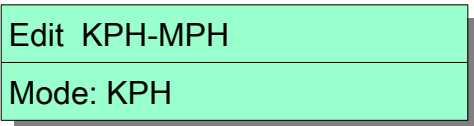
Display KPH or MPH.

- Press and hold the Setup (“Left” arrow) button to enter the setup mode.

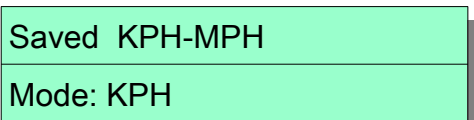
The KPH-MPH mode is displayed.



- Tap the “Y” button to enter the Edit mode.
- Tap the “UP” and “Down” arrow buttons to select either “ KPH ”, (kilometers per hour) or “ MPH ”, (miles per hour) display.



- Press and hold the “Y” button to save the new setting.



- When setup is completed, tap the “N” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “N” button twice.

NOTE: If you cannot find this setting, it may be

Default Display mode

Default display mode.

- Tap the “**Left**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to select the default mode:

Setup Power-Up

Mode: Peak

Setup Power-Up

Mode: Peak/Last

Setup Power-Up

Mode: Last

Setup Power-Up

Mode: Continuous

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

Default Power ON

Option 1) **Power up OFF** When power is applied to the radar gun, the radar gun remains in the off state until the **ON** button is pressed.

Option 2) **Power up ON** When power is applied to the radar gun, the radar gun turns **ON** and starts transmitting without pressing any buttons.

This feature is useful only when batteries are not installed and using external power to power the radar gun. If you leave the batteries installed without the external power connected, the batteries will go completely dead.

NOTE: The transmit can still be manually turned on or off using the trigger button or IR remote.

- Tap the “**Left**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to select the default mode:

Edit Power

Power up ON

Edit Power

Power up OFF

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap

the “N” button twice.

External Power Operation

When using the SG300A without a battery, a 12VDC power supply should be used. The SG300A operates much cooler in the hot sun with the lower voltage power supply.

When operating from external power without batteries, the external power voltage can be as low as 9VDC.

The SG300A has an internal safety circuit that will protect itself and shut down the power supply if an overheat condition is detected.

Battery Operation

Either the 12VDC or 15VDC power supply should be used when charging the batteries. The minimum voltage required by the battery charging circuit is 12VDC. In fast charge mode, the battery charges much faster when using a 15VDC power supply.

LCD Backlight Setup

The LCD back light can be set to one of several settings.

Setup LCD Backlite

OFF

- Tap the “Right” Arrow button go to the next setup mode.
- Tap the “Y” button to enter the Edit mode.

Edit LCD Backlite

Auto

You are now in the LCD Backlight setup mode.

- Press the “UP” and “Down” arrow buttons select the desired LCD backlight mode.

Modes are “ OFF ”, “ Auto ”, “ ON ”.

- Press and hold the “Y” button to save the new setting.
- When setup is completed, tap the “N” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “N” button twice.

NOTE: The most commonly used setting is “ ON ” to make the display easier to read in most lighting conditions.

Cosine Angle

Select the desired cosine angle: 0 to 45 degrees.

Setup Cosine Angle

Angle Deg: 0

- Tap the “**Right**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to select the cosine angle: 0 to 45 degrees in 5 degree increments.

Edit Cosine Angle

Angle Deg: 20

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

If the cosine angle is greater than zero, the LCD display will show the cosine angle **C=20**. The speed will be adjusted for the cosine angle.

C=20 Peak

Speed 104 KPH

The cosine effect cause the radar device to display a speed, which is lower than the actual

pitch-release speed. This condition exists whenever the target's path is not parallel to the gun's antenna. As the angle between the beam of the antenna and the target increases, the displayed speed decreases. An angle of zero degrees is best.

The following table shows the effect that an increasing angle has on a displayed speed.

Small angles (less than 10°) have little effect on accuracy. As the angle increases, the error increases. At 90°, the target speed is 0 grossly incorrect.

The radar gun will measure speed to within +/- one kilometer per hour provided the gun is placed in such a position that the moving object is coming directly toward or directly away from the gun. If the object is moving at an angle to the gun, the COSINE effect will cause the measured speed will be slower than the actual speed.

As the angle of incidence increases, the accuracy will decrease. The angle of incidence is the cosine of a right triangle, hence the cosine effect. If you knew the exact angle of incidence, you could take the measured speed multiplied by one divided by the cosine of the angle and compensate for the cosine effect to figure the actual speed.

The cosine setting on this unit is adjustable from 0 to 45 degrees in 5 degree increments.

- Distance off center at a 10-degree angle gives 1.5% error.
- Distance off center at a 20 degree angle gives 6% error.
- Distance off center at a 30 degree angle gives 13% error.

Speed Range

Select the desired speed range. The radar gun will ignore speeds outside of the speed range.

Speed range options:

- **LO-1** : 8-225 kph 5-140 mph
- **LO-2** : 24-225 kph 15-140 mph
- **HI-1** : 48-225 kph 30-140 mph
- **HI-2** : 75-225 kph 47-140 mph

Setup SpeedRange

HI-1 48-225KPH

- Tap the “**Right**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to set the speed range.

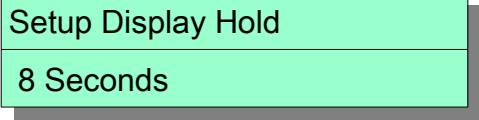
Edit SpeedRange

LO-1 8-225KPH

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

Display Hold Time

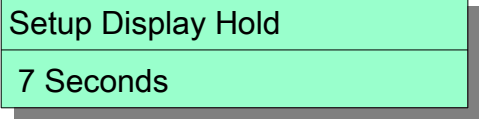
The display hold time can be set to anything between 2 and 15 seconds.



Setup Display Hold

8 Seconds

- Tap the “**Left**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to set the display hold time in seconds.



Setup Display Hold

7 Seconds

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

Audio Play Setup

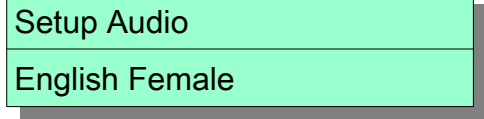
A PA amplifier or PC speakers can be connected to the Audio output of the SG300A. The speed will be played as an audio message.

Example audio message:

“**Your Speed Is 112 Kilometers per hour**”.

“**あなたの速度は時速 112 キロメートルです**”.

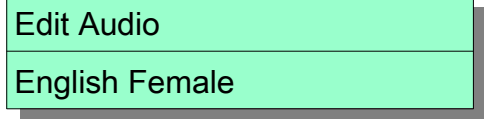
You can choose whether the Audio is ON or OFF and what language you would like to play. To use the audio, a USB drive must be plugged into the USB connector on the radar gun. You can use the standard set of files or create your own audio files.



Setup Audio

English Female

- Tap the “**Left**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.



Edit Audio

English Female

You are now in the Audio setup mode.

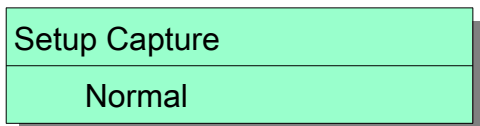
- Press the “UP” and “Down” arrow buttons select the desired audio mode.

Modes are:

- “ OFF ”
- “ English ”
- “ Spanish ”
- “ Japanese ”
- or any other language files that you install.
- Press and hold the “Y” button to save the new setting.
- When setup is completed, tap the “N” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “N” button twice.

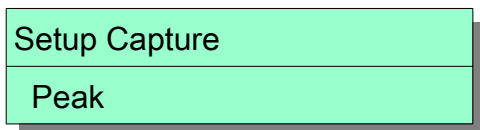
Capture Options

The capture options are set here. The choices are **Normal** or **Peak** captures. The **Normal** capture mode should be used for automobiles, while **Peak** should be used for measuring ball speeds.



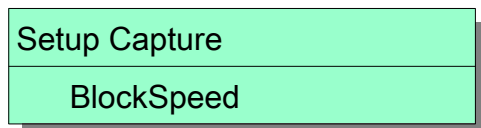
- Tap the **“Left”** Arrow button go to the next setup mode.
- Tap the **“Y”** button to enter the Edit mode.
- Tap the **“UP”** and **“Down”** arrow buttons to select the desired capture option.
- Press and hold the **“Y”** button to save the new setting.
- When setup is completed, tap the **“N”** button to exit the edit mode.

In the **Peak** mode, the first captured peak is recorded.

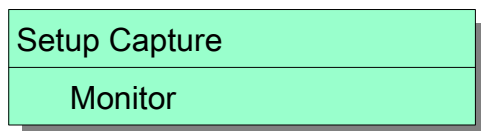


Block Speed

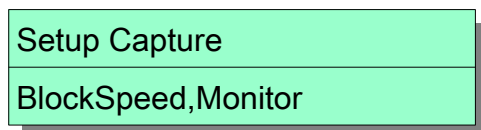
If there is a specific speed that is causing interference, it can be blocked. Be sure to select the speed to be blocked in the **BlockSpeed** menu.



The **Monitor** option sends the captured signal directly to the audio port. This is useful to help identify interfering signals.



Both the **BlockSpeed** and the **Monitor** options can be enabled at the same time.



Block Speed

If there is a specific speed that is causing interference, it can be blocked. The speed to be blocked is entered here.

When the blocked speed is detected, the Red LED flashes instead of the Blue LED. The measurement is ignored.

Block speed must be enabled to use this feature.

Setup

BlockSpeed 139K

- Tap the “**Left**” Arrow button go to the next setup mode.
- Tap the “**Y**” button to enter the Edit mode.
- Tap the “**UP**” and “**Down**” arrow buttons to select the speed to be blocked.
- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.

NOTE: The Speed can also be entered directly from the IR remote. Press “**OK**” to save.

NOTE: The speed just above and just below the blocked speed are also blocked. For example, if **139K** is blocked, then **138K** and **140K** are also blocked.

Detecting Interference

The audio port can be used to detect unexpected signals.



The **Monitor** option sends the captured signal out on the audio port. This can be used to monitor unexpected signals that may be causing false readings.

Setup Capture

Monitor

Both the **Monitor** and the **Block Speed** options can be enabled at the same time.

Setup Capture

Block Speed, Monitor

Baud Rate Setup

To change the baud rate for the readout, perform the following procedure.

Setup BAUD

Baud Rate: 1,200

Tap the “**Left**” Arrow button go to the next setup mode.

Tap the “**Y**” button to enter the Edit mode.

Edit BAUD

Baud Rate: 1,200

You are now in the baud rate selection mode.

- Press the “**UP**” and “**Down**” arrow buttons to select the desired baud rate.
- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.

The default is 1,200 baud rate. This baud rate is required for most readouts. The 115,200 baud rate is useful for debugging. If this baud is selected, the output from the **Error Level** setting will be sent out on the serial port.

Baud rate choices are:

- 1,200 (Default for most readouts)
- 2,400
- 4,800
- 9,600
- 19,200
- 38,400
- 57,600

- 115,200 (Special for debugging)

Mounting Configurations

The SG300A is designed for hand-held, stationary-only operation.

In addition you can mount the gun to a standard camera tripod. The gun has two locations that can be used as a tripod mount.

- The ¼-20 receptacle near the trigger handle.



- The ¼-20 receptacle at the bottom of the handle under the battery holder.



Performance Tips

Understanding potential radar interference and what you can do when it occurs can greatly increase the radar's performance.

USB connector

NOTE: The SG300A has a USB connector. The A type connector is for use with a USB drive only. The USB drive is typically used for data storage.



A history of all measurements for the day or event can be recorded. These measurements can be saved on the USB drive.

The USB drive is also used for storing audio messages.

How Radar Works

Determining a target's speed begins with the radar gun transmitting and directing a beam of microwave energy (radio waves) at an approaching (or receding) target. When energy from this beam strikes the target, a small amount of energy is reflected back to the antenna in the radar device. The reflected signal frequency shifts by an amount proportional to the speed of the target. This is known as the Doppler effect. The radar device then determines the target speed from the difference in frequency between the reflected and

transmitted signal.

Interference Sources and Remedies

When properly installed and operated, Doppler radar technology is extremely accurate and reliable. However, variations in the environment can cause situation and circumstances that cause spurious (erratic and unusually high or low) speeds to display.

- A reading appears when no target is in the operational range of the antenna.
- A target entering the operational range overrides the interfering signal, causing the display to change suddenly.
- Interference is irregular and does not provide a valid tracking history.

Electromagnetic Interference (EMI)

EMI can be produced while operating. To correct the interference, simply turn off its source.

Feedback Interference

When the radar beam is directed at laptop computer screens, streetlights, electric motors and other devices, it can display spurious speeds. To correct the interference, relocate the radar gun's antenna. If the problem disappears, the interfering event was in the beam before you moved the antenna.

Multi-Path Beam Cancellation

If multi-path beam cancellation occurs, the target

speed sporadically blinks and reappears at semi-random intervals. This type of interference occurs when the radar loses track of the target, because the target is reflecting two or more signals that are interfering with each other. Radar guns today such as SG300A gun are virtually immune to multi-path cancellation.

Radio Frequency Interference (RFI)

The system can inadvertently process radio energy as Doppler speeds, including that from cell phones, WiFi, Bluetooth, police radios, airport radar, microwave transmission towers, CB radio transmitters, and AM/FM transmission towers. For this type of interference to occur, the radar gun must be operating very close to the transmitter.

Scanning

The SG300A radar gun is designed to use while attached to a solid mount or hand held in a steady position. Moving or scanning the antenna past stationary objects can cause the system to detect motion and is considered deliberate misuse of the system. Obtaining a speed reading from scanning will not happen when you properly use the radar.

Tuning Fork Test

You can verify the signal processing accuracy of your radar gun with a tuning fork, which comes with it. Set the gun to Peak Speed mode. Pull and release the trigger. Tap the tines of the fork on a firm, non-metallic surface. The tuning

fork will ring audibly. Then place the tuning fork with the narrow side facing about 3 inches directly in front of the antenna. Pull and release the trigger again. Compare the speed in the display to the speed stamped on the fork.

If the difference is within +/- 1 mph (+/- 1 kph), the radar gun is working properly.

The SG300A gun is extremely sensitive to movement. If the displayed speed is incorrect, repeat the test. Make sure you hold the gun and fork perfectly still. If the radar gun does not display the expected speed, contact Alzatex, Inc at www.alzatex.com to arrange for service.

Only tap the tuning fork against hard plastic, wood and materials that are softer than metal.

Repeatedly tapping the tines on hard surfaces, such as metal and concrete, can damage the tines and invalidate the fork for future tests.

Environmental Conditions

Fog, rain, snow, and blowing dust can reduce the detection range.

Care, Cleaning / Storage

Avoid spilling food, beverages, and other liquids and substances on the radar device.

When you are not using or transporting the device, store it in its original packaging.

To clean the radar device, dust it with a soft clean cloth, which is free of cleaning solutions.

Remove the batteries when the radar gun is put into long term storage to prevent damage to the gun from corroding or leaking batteries

Warranty / Repair

Two year limited warranty.

Alzatex, Inc guarantees the SG300A radar gun to be free from defects in workmanship and materials and to operate within specifications for a period of two years. During this period, Alzatex, Inc. will repair or replace, at its option, any component (excluding batteries) found to be defective, without cost to the owner, providing you return the SG300A radar gun to the warranty service center, Alzatex, Inc.

The full warranty on parts and workmanship does not include normal wear and tear. Crushing, dropping, fire, impact. Immersion, or damage from attempted repair or modifications by unauthorized service agents.

For repairs, simply return the unit (transportation prepaid) directly to Alzatex, Inc. (the repair facility) by following the instructions in section Service Return Procedure.

Service Return Procedure

If your SG300A gun has a problem, first see the Frequently asked questions (FAQ). If the problem persists, contact Alzatex, Inc. Our customer service staff will try to solve the problem over the phone. If we can not, you will need to return your radar package in the original box, if possible. Please include a short note describing the problem. Be sure to include your name, phone number, and the address you want it returned to.

The customer is responsible for the shipping charges to send the system to Alzatex, Inc., the

authorized service center. The Alzatex authorized service center does not accept COD shipments and will return ALL COD shipments to the sender, unpaid.

The Alzatex authorized service center will pay the freight (up to \$10.00 US) for shipping the radar gun from the repair facility to the customer, provided the radar gun is still under warranty. The customer is charged for any shipping charges above the initial \$10.00. If you want to ship your package express mail or next day air, you will be invoiced for the freight charges, even though the gun is still under warranty.

If your radar gun is out of warranty and you would like to know the repair cost prior to the actual work being performed, Alzatex, Inc will be happy to give you an estimate. In most cases, we will charge a flat rate of \$200.00 to repair your gun. In a few rare cases where serious damage has occurred, the repair could be more expensive.

Regulatory Requirements

This device complies with part 15 of the FCC rules and ISED (Industry Canada) rules. Operation is subject to the following two conditions.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

SG300A Specifications

- Nominal transmission frequency: 24.200GHz Japan; 24.125GHz USA, Canada.
- Range of frequency: +/- 50 MHz
- Effective range is 60 meters.
- Minimum distance of reading: 1 Meter
- Rated output: 8mW
- Maximum aperture power density: 1 mW / cm²
- Input voltage at oscillator: 5VDC
- Polarization: Circular Polarization
- Horn antenna: 7.5CM diameter.
- Input amplifier bandwidth: 15KHz
- Gain 23dBic
- Nominal horizontal beam width: 12 degrees
- Microwave source: Gunn-Effect diode
- Receive type: Schottky barrier mixer diode
- Product type: Stationary Doppler radar
- Computer processor: 80MHz
- Display type: Back lighted liquid crystal.
- Range 8-225KPH, 5MPH-140MPH
- Internal Accuracy +/- 1 mph (+/- 1 kph)
- Sample rate: 45 updates per second

Power Requirements

The SG300A can be powered from any one of several power sources.

- Built in battery holder inside the handle holds 6-NiMH AA rechargeable batteries.
- Powered from wall adapter. Corded power input: 11-15VDC nominal.
- Powered from readout over RS232 serial cable. One 15VDC power supply connected to the readout powers both the display and radar gun.
- Current requirements transmitting 0.36 amps, standby 0.20 amps, sleep mode 0.001 amps or less.

Physical specifications

- Housing material: Metal enclosure.
- Weight: 1.9lbs (approx)
- Dimensions: 7.6" x3.25"x3.25" body. Handle 4.5" long. Handle plus battery holder is 6" long. Overall height with battery and handle 9" high.

NOTE: Specifications subject to change.

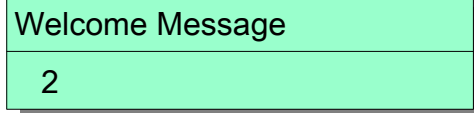
Play Welcome Message

A PA amplifier can be connected to the Audio output of the SG300A. A welcome message can be played to a PA.

Example audio message:

“Welcome to the Carnival”.

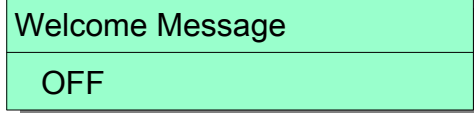
You can choose whether the Welcome Message is ON or OFF. You can replace the default message with your own welcome message on the USB drive. The file names are **“welcome1.mp3”** through **“welcome4.mp3”**.



Welcome Message

2

- Press and hold the **“Down”** Arrow button to go to the welcome message screen.
- Tap the **“Up”** Arrow button to select the desired welcome message **“1”** through **“4”** or **“OFF”** to turn this feature off.
- While the welcome message is enabled, tap the **“Down”** Arrow button to play the welcome message.
- Each time the unit is first powered up, the welcome message is **“OFF”**.



Welcome Message

OFF

Status Menu

This unit has several status menus.

- Tap the “**N**” button one or more times to display the desired group of status menus.

The primary status menus have side menus.

There are two ways to display the desired side menu.

- Tap the “**Right**” arrow button. The next side menu in the group will appear.
- Using the IR remote, tap the “**MENU**” button. The next side menu in the group will appear.

The primary status menus are:

- Speed.
- Power / Charger status.
- Signal Levels.
- USB Status.

Side Menu

Side menus for External Power.

- Power status. (main menu)
- External power voltage, charge voltage and current.
- Internal power supply voltages.
- Internal temperature.

Side menus for Signal Levels.

- Signal Levels. (main menu)
- Signal capture data.
- Version / Serial number.
- FCC ID.
- IC ID.

Side menus for USB Status.

- USB Status. (main menu)
- File status and file name.
- Error level.
- Test menu.

Side menus for Capture.

- Speed. (main menu)
- Sensitivity Test.
- Sampling Rate.
- Sample resolution
- Capture Detail.

Speed Menu

The speed test takes measurements and monitors the results. This test can run continuously or be set to run for 60 minutes then automatically stop and save the results.

Speed	0:06	1	
111	110K	1	10

- The amount of time that the transmitter has been transmitting in **MM :SS**
- The number of peak speed detections including the number of ghosts **22** is displayed on the top right.
- The most recent peak and last speed is displayed on the second line.
- The total number of successful measurements **20** is displayed on the bottom center.
- The total number of times the last speed was detected **12** is displayed on the bottom right.

*NOTE: The bottom right number will be zero **0** if the most recent measurement was a ghost and it was successfully blocked.*

Speed	3:47	22	
111	110K	20	12

The speed test is started as follows.

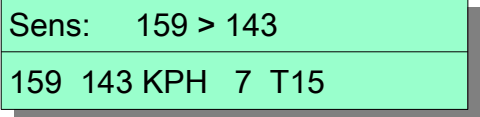
- Tap the “**Y**” Button or pull the Trigger to start the **Speed** test. The test will continue running until stopped.
- Tap the “**Y**” Button or pull the Trigger to stop the transmit or the results will not be saved on the USB drive.
- Press and Hold the “**Y**” Button to start the automatic **Speed** test. This test will run for 60 minutes and automatically stop and save the results on the USB drive.

Sensitivity Test

The sensitivity test simulates the tuning fork. It generates various speeds by sounding the internal beeper.

- Tap the “**N**” Button to go to the **Speed** menu.
- Tap the “**Right**” arrow button once to go to the **Sens** menu.

The expected and actual speeds are displayed.



Sens: 159 > 143
159 143 KPH 7 T15

The top line displays the expected speed.

The bottom line displays the actual speed.

The **7** indicates the number of successful tests. Each test takes multiple measurements. The **T15** indicates the number of detections for the current measurement. There are a variety of tests performed. Some of the tests will have higher numbers because some tests are longer duration while other tests are shorter duration.

- Tap the “**Up**” Arrow and “**Down**” Arrow buttons to select the next or previous test speed or using the IR remote, tap the “**MENU**” button to play the next test speed.
- Tap the “**Y**” button to replay the current test speed or using the IR remote, tap the “**BACK**” button to replay the test speed.

Note: The beeper does not generate pure

*speeds. As a result, the expected and actual speeds may vary widely. For example, **115** may appear as **192**.*

Auto Sensitivity Test

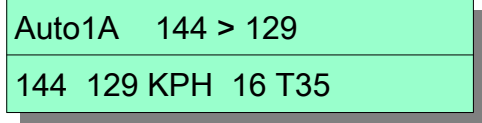
The automatic sensitivity test steps through **32** different speed sequences.

There are 4 groups of AUTO tests.

- AUTO1A - Longer Doppler test that is most realistic to the amount of time that a baseball is in the air after a pitch.
- AUTO1B - Medium Doppler test for realistic fast pitches.
- AUTO1C - Short Doppler test to test the extremes.
- AUTO1D - Basic set of tests.
- AUTO2A and AUTO3A are identical except that every test is run twice or three times.

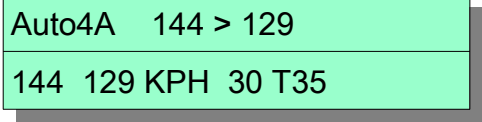
To initiate a test, do the following.

- Press and hold the “**Y**” Button for several seconds to start the automatic speed test.



Auto1A 144 > 129
144 129 KPH 16 T35

- Tap the “**Y**” button one or more times to select the desired test. Continue tapping to auto repeat each step of the test multiple times. Each tap adds one more repeated test to the sequence.



The expected and actual speeds are displayed.

The left top line displays the number of times each test will be repeated. The message **Auto4A** Indicates that each test will be repeated 4 times.

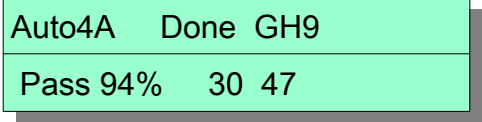
The right top line displays **144 > 129** the expected speed.

The bottom line displays **144 > 129** the actual speed and the number of successful measurements.

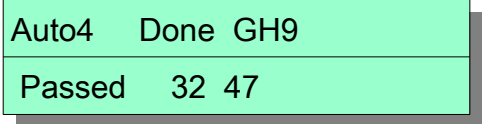
The **30** indicates the number of successful tests. Each test takes multiple measurements.

The **T35** indicates the number of detections for the current measurement.

Once the test completes, the **Pass 94%** and the percentage of tests passed will appear.



The message **Passed** will appear if all **32** test sequences were detected by the microwave transceiver.



The **GH9** indicates the average number of ghosts detected. Numbers above **GH15** indicate high speed ghosting.

On the second line, the **32** indicates the number of successful tests completed out of the **32**. The **47** indicates the total number of successful measurements.

A number less than **32** indicates that specific speed sequences were not detected indicating that the sensitivity at certain speeds may be lower. Re-run the test again to verify.

While this test is running, a second speed gun aimed directly at the speed gun under test should also detect the same speeds.

To view the history, exit from the **Sens:** menu, then tap the “**Up**” Arrow and “**Down**” Arrow buttons to view the history memory.

The test results are also saved on the USB drive.

NOTE: Not all tests will pass because of the limitations of the internal beeper especially at very low or very high speeds.

Signal Levels

This menu displays the noise level and various other measurement parameters.

- Tap the “N” button three times until the signal levels menu appears.
- Pull the trigger to start transmitting.

While data is being captured, several parameters can be monitored.

GH 3	T23	BL64
111K	68	

- The **GH 3** is the amount of high speed ghosting detected.
- The **T23** is the number of detections for the current measurement.
- The upper right number **BL64** is the baseline noise level.
- The **111K** is the most recent speed detected. After a few seconds of no measurements, this value returns to zero.
- The lower right number **68** is the average noise level.

NOTE: These measurements only update while transmitting.

NOTE: When speeds are being detected, the baseline noise levels and average noise amplitude pause updating.

- When the radar gun is powered on, it may take up to 20 seconds for the noise level to stabilize the first time the trigger is pulled.
- The **4** to **300** is the normal range.
- If the value is **300** or more, There may be background noise that can affect the speed measurement.

If an external radar gun is connected to this radar gun, the speeds **>111000<** observed from the external gun will appear here.

GH 3	T23	BL164
98Kph	>111000<	168

Signal Levels

Various signal levels are monitored.

Gh 6	T36	BL 22
111KpH	18	

- The **Gh 6** indicates the average number of false detections per second found.

*Note: If the number is over **GH 15**, the antenna horn may be generating ghosts.*

- The **T36** is the number of detections for the current measurement.
- There is always some amount of background noise detected. The **BL 22** is the background noise level when no signal is detected.
- The **18** is the average noise level.
- The **111KpH** is the actual speed detected.

Power/Charger status

Charger/Battery status message. See more details in the Charger section of the manual.

External Power

Charge Slow

If operating from batteries, the charge voltage and charge percentage will be displayed.

The display alternates between battery voltage and charge percentage every few seconds.

Battery 81%V

Battery Normal

The power supply voltages can be displayed.

- Tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The power supply voltage, charge voltage and charge current will be displayed.

Extern-S 14.24V

C= 8.27 I=0.124

- External power voltage **Voltage= 14.24V** if operating from external power.
- Charge voltage **C= 8.27** while charging.
- Charge current **I=0.124** while charging.

Battery 7.21V

C= 0.00 I=0.000

The display alternates between battery voltage and charge percentage.

- Battery voltage **Battery 8.65V** if operating from battery.
- Battery charge percentage **Battery 81%** if operating from battery.

Power and charge voltages

The charge voltage and charge current can be monitored from the charge menu. These values are automatically updated every 4 seconds.

Extern=S 14.24V

C= 8.27 I=0.124

- External power voltage **Extern-S 14.24V** when operating from external power.
- Charge voltage **C= 8.27** while charging.
- Charge current **I=0.124** while charging.

Battery voltage

The Battery voltage can be monitored from the charge menu when operating from battery.

Battery 7.87V

C= 0.01 I=0.000

- Battery voltage **7.87V** when operating from internal batteries.
- Charge voltage **C= 0.01** while charging.

- Charge current **I=0.000** while charging.

Battery 81%V

C= 0.01 I=0.000

- Battery percent of battery charge is monitored **81%V** when operating from internal batteries.

Internal voltages

- Tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The internal voltages will be displayed.

P5V = 5.02V

P3.3V= 3.31V

- The 5 volt power supply should be about **4.95V-5.12V** nominal.
- The 3.3 volt power supply should be about **3.3V-3.5V** nominal.

Internal Temperature

- Tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The internal temperature of the unit will be displayed.

Temperature

29.0C 84.2F

Signal Monitoring

The input signal from the microwave transceiver can be monitored.

- Tap the “**Down**” arrow button several times until the **GH** menu appears.

- Tap the “**Right**” arrow button. The pass menu will be displayed.

- When a no signal is detected random numbers spread across the band will appear.

Pass 93A 0KPH

0122354462433333

- When a signal is detected the speed is displayed. The **Pass** graph shows an estimate of the speed detected.

Pass 93A 111KPH

0000000001000000

- Also, any interfering speeds will appear. Notice that an interfering speed also appears.

Pass 93A 111KPH

0000000001002300

- If the low speeds are not being blocked properly, low speed ghosting will appear.

Pass 73A 26KPH

4453322110000000

- NOTE: If this menu has all ones, the circuit board may not be plugged all the way in or there is a hardware problem.

Pass 93A 0KPH

1111111111111111

SG300A version information

There are two software version numbers.

- The left number is the firmware version for the main processor PCB.
- The right number is the firmware version for the power supply PCB.
- The product serial number is displayed on the lower left.
- The microwave transceiver serial number is displayed on the lower right.

VerV0.16S 0.1A

SG10001 B03249

- Tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The FCC ID will be displayed.

FCC ID:

2BMBO-ALZASPEED

- Tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button again. The IC will be displayed.

IC:

33560-ALZASPEED

USB status

- Unmounted
- Mounted showing drive name.
- Unknown
- Number of audio files queued.
- Audio: Idle
- Audio: Paused

- Audio: Playing

USB: SG10001

Queued= 0 IDLE

- While in the USB Status menu, tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The **File Open** menu will be displayed.

Saving Data to the USB Drive

The **Setup Hist Save** menu will determine the type of data that will be saved.

Setup Hist Save

Speeds

File Menu

This menu shows the name of the last file written to the USB drive. It also shows whether the file is open or closed.

If file saving is enabled, each time the trigger button is pulled to start transmission, a file will be opened to record results.

Example of file open saving speeds to this file on the USB drive.

File Open:

Sped1053.txt

When the trigger button is pulled to stop transmission, the file will be closed.

When the menu shows **File Closed:**, the name of the file most recently closed will appear.

File Closed:

Sped1053.txt

Error Level

The serial port baud rate must be set to 115,200 for the Error Level output to be sent on the serial port.

- While in the USB Status menu, tap the “**Right**” arrow button or using the IR remote, tap the “**MENU**” button. The **File Open** menu will be displayed.
- Tap the button again. The **Error Level** menu will be displayed.
- Tap the button again. The **TEST** menu will be displayed.

NOTE: When the power is turned off, the setting reverts back to the error level set in the **sg311.ini** file on the USB drive. To change this setting permanently, modify the **sg311.ini** file.

In this file the choices are:

- **error level = Normal**
- **error level = Debug**

Changing the setting from the front panel.

- Tap the “**Y**” button to toggle between the **Normal** and **Debug** settings.
- **Error Level:Normal** This is the default. Only error/failure messages are recorded.

Error Level:

Normal

- Error and Debug messages are recorded. This is useful for troubleshooting various problems.

Error Level:

Debug

To see the Error and/or Debug information on the RS232 serial port, change the baud rate to 115,200. This is the only baud rate that passes this information.

Setup BAUD

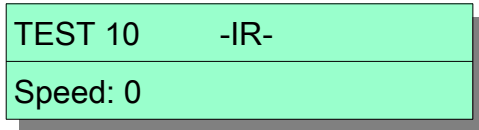
Baud Rate:115,200

Test and diagnostics

While in the test menu various actions can be taken.

- Test speeds can be sent to a connected readout by tapping the “**N**” button.
- IR remote commands will be displayed.
- The “**Left**” and “**Right**” arrows on the SG300A keypad will generate exception errors to test the exception processing system.
- Tapping the “**UP**” and “**Down**” arrows on the IR remote will send the speeds to the readout and play the corresponding audio message.

- Tapping the “**Left**” and “**Right**” arrows on the IR remote will display history readings.



Readout Test

Once the Test menu appears, tap the “**N**” to send test messages to the readout. The Yellow LED indicates that the test mode is enabled.

The following messages can be displayed. Send speed to the readout “**123**”



Send speed to the readout “**000**”, “**111**”, “**222**”, “**333**” - - - “**999**”. This sequence advances to the next number once per second, then stops.



Send all segments lit to the readout “**8.8.8**”



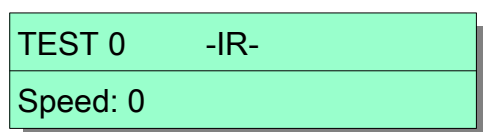
Send all blanks to the readout to make the readout go dark.

Play Hello Message

An amplifier and speakers can be connected to the Audio output of the SG300A. Various messages can be played.

You can replace the default hello messages with your own custom messages.

- While in the **TEST** menu various hello messages can be played.



- Press the “**UP**” button on the front panel to play various Hello messages. The file names are “**hello.mp3**”, “**hello1.mp3**” through “**hello4.mp3**”.

TEST Hello1 -IR-
Speed: 0

- Press the “**Down**” arrow button to exit the **TEST** mode.

Serial Setup

To change the serial output format for the readout, perform the following procedure.

NOTE: If you cannot find this setting, it may be intentionally hidden to prevent it from accidentally being changed.

Tap the “**Left**” Arrow button go to the next setup mode.

Tap the “**Y**” button to enter the Edit mode.

You are now in the serial port setup mode.

- Press the “**UP**” and “**Down**” arrow buttons to select the desired serial data format.
- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.

Setup Serial

sss000

Serial Default

The **sss000** option sends serial data output each time a new speed is measured. This is the default setting and is used with most readouts.

- 111000** Speed of 111 KPH sent to readout.
- 098000** Speed of 98 KPH sent to readout.

Setup Serial

Sss000

The **Sss000** option sends serial data output repeating at ten times per second while transmitting to keep updating the readout.

This is identical to the default setting except the output is continuously repeated while transmitting.

098000 While taking a measurement.

098000

098000

000000 While no signal is detected.

000000

000000

The **Sss<CR>** option sends serial data output repeating at ten times per second while transmitting to keep updating the readout.

098<CR> While taking a measurement.

098<CR>

098<CR>

000<CR> While no signal is detected.

000<CR>

000<CR>

Serial Unit address

The **Speeds** option and the **Details** option require the unit address to be setup.

Edit Serial

Speeds Addr=A00

The default unit address is **A00**. The unit address on the second readout will be **A10**. The unit address can be set to any address **A00** to **A09**. The unit address on the second readout will be **A10** to **A19**.

To change the unit address, tap the “**UP**” arrow button on the IR remote several times until the desired address is selected.

Tap “**OK**” on the IR remote to save the new unit address.

Serial Speeds

The **Speeds** option sends peak and last speeds to two separate readouts.

Edit Serial

Speeds Addr=A00

Peak speed on one readout and last speed on another readout.

- **"L0 124** Peak speed to readout 1.
- **"L@ 119** Last speed to readout 2.

NOTE: The default unit address is **A00**. The unit address on the second readout will be **A10**. The unit address can be set to any address **A00** to **A09**. The unit address on the second readout will be **A10** to **A19**.

Serial Details

The **Details** option sends serial data with extra details for testing the radar gun.

Edit Serial

Details Addr=A00

The unit address can be set to any address **A00** to **A09**.

"L0s 61 C 26 A2345 N103	A00
"L4s 61 C 16 A2155 N153	A04
"L5s 61 C 16 A1895 N153	A05
"L0l 61 C 8 A2667 N138	A00
"L0p 61 C 8 A2891 N138	A00
"L0r 61	A00

Description of fields.

"L0s	Unit address A00 . • s speed • p peak speed • l last speed
-------------	--

	• z means no speed detected • r speed measurement from a remotely connected radar gun.
61	Measured speed
C 26	The number of measurements at this speed.
A2356	The amplitude of the most recent measurement.
N103	Background noise level.

Two radar guns can be connected together. The speed of the remote radar gun can be shown on the top right corner of the display of this radar gun.

Set the serial mode to the **sss000** option on both radar guns.

While transmitting, tap the “**N**” button to display the remote radar gun speed.

The remote radar gun measured 98KPH. The local radar gun also measured 98KPH.

XMIT	Cont098000
Speed	98 KPH

NOTE: This feature works with either a wired cable or a wireless radar gun.



Peak/Last Display

Two radar guns can be connected together using a special connection cable. The speed of the remote radar gun can be shown on the top right corner of the display of this radar gun.

If the remote radar gun is setup to send **Details**, then the remote gun will appear as follows.

Hold	Cont	R098	w
98	94	KPH	

R	Remote radar gun sending details.
098	Speeds
w	The remote gun is connected using a wireless connection.

Serial Port Protocol

The serial output RS232 communications port is standard on all models. The communications port lets you connect and transmit data to a SG300A remote digital display or computer.

Baud rate: 1200 default. Baud rate is user settable to other baud rates for special applications. Data format: 8 data bits, no parity, 1 stop bit.

ASCII character string examples:

82 KPH	082000 <CR>
143 KPH	143000 <CR>
59 MPH	059000 <CR>
105 MPH	105000 <CR>

Serial port LED Status.

- The serial LED flashes GREEN each time serial data is sent from the RS232 port to the readout.
- The serial LED flashes RED each time serial data is received on the RS232 port.

Wireless

This optional feature adds a wireless connection to any readout. Wireless is available in two frequency bands.

- SG300A-RF2 adds a 2.4GHz transceiver. Range up to 200ft depending on conditions.
- SG300A-RF9 adds a 900MHz transceiver. Range up to 1000ft depending on conditions.
- Wireless models. The wireless models transmit data to a compatible readout with built in wireless receiver.
- The wireless transmitter is activated and a speed reading is sent to a wireless readout each time a measurement is taken.

IR Remote Readout Test

IR Remote features while in the **TEST** mode.

- Press the “**UP**” and “**Down**” arrow buttons on the IR remote to increment or decrement and display the test speed.
- Press the “**0**” to “**9**” buttons on the IR remote to direct enter a test speed. Press the

“OK” button to display the speed on the readout.

NOTE: If audio is enabled, the speed will also be played on the audio output.

TEST 10	UP
Speed: 69	

Exceptions

If the SG300A appears to freeze, an exception was detected, the error code will appear on the 4 LEDs. All functions will pause.

- Take note of which LEDs were lit.
- Tap the “Y” button to resume operation.

Use the following procedure to test and verify that the exception processing is working properly.

Testing the divide by zero exception.

TEST 3	-IR-
Speed: 0	

- Tap the “N” button several times until **TEST 3** appears in the menu.
- Tap the “Right” arrow button to generate a divide by zero exception. All four LEDs should light.
- Tap the “Y” button to exit the exception test mode and resume operation.

Exception:

Divide by Zero

Testing the Illegal address exception.

- Tap the “N” button several times until **TEST 3** appears in the menu.
- Tap the “Left” arrow button to generate an illegal address exception. The GRN, YEL and RED LEDs should light.
- Tap the “Y” button to exit the exception test mode and resume operation.

Exception:

Illegal Address

Always ON Feature

There are two ways to keep the power ON at all times. This feature is useful only when batteries are not installed and using external power to power the radar gun. To use this feature, enable the Default Power ON setting.

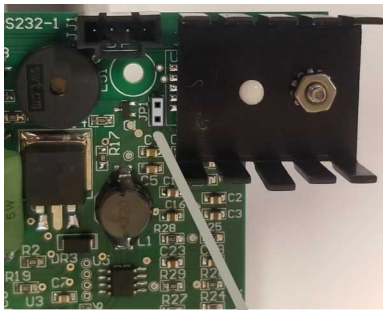
Edit Power

Power up ON

- Each time external power is applied, the radar gun turns ON.
- The power can still be turned off manually by holding the “N” button and can be turned ON using the “Y” button.

Hardware Power ON

- In hardware, a jumper can be installed on the power supply PCB inside the radar gun. With this jumper installed, the power can never be turned OFF unless the power cord is disconnected. When using this feature, do NOT install batteries, otherwise the batteries will go completely dead unless external power is applied.



Install jumper on JP1
Power always on feature

Hide Settings

Certain settings can be hidden so that the user does not inadvertently change them to incorrect values. These settings can cause the display to not show the correct information.

When enabled, the following settings are hidden.

- Auto Power ON setting.
- KPH/MPH.
- Baud rate.
- Serial mode.
- Audio Modes.
- Date and time settings.
- Some of the less used file save options.

Changing the baud rate to the incorrect setting or changing KPH/MPH setting can cause the display to not show the desired information.

- Tap the “**N**” button several times until **USB:** status appears.
- Tap the “**Right**” arrow button three times. The **TEST** menu will be displayed.

TEST -IR-

Speed: 0

- Press and hold the “**Left**” arrow button to show the **Settings Show/Hide** menu.
- Tap the “**Y**” button to enter the **Edit** mode.
- Tap the “**UP**” and “**Down**” arrow buttons to enable or disable the Show/Hide mode.

Edit Settings

Hide/Show

- Press and hold the “**Y**” button to save the new setting.
- When setup is completed, tap the “**N**” button to exit the edit mode.
- To exit the Edit mode without saving, tap the “**N**” button twice.