

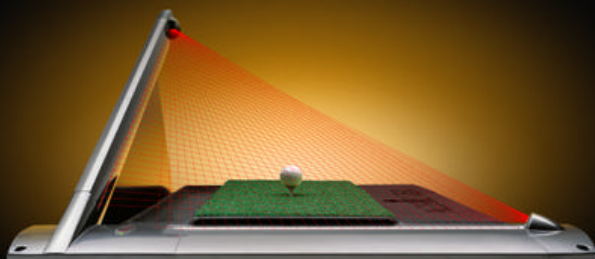


User Manual

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Model #95-0007-001

Achiever Software Version 1.019



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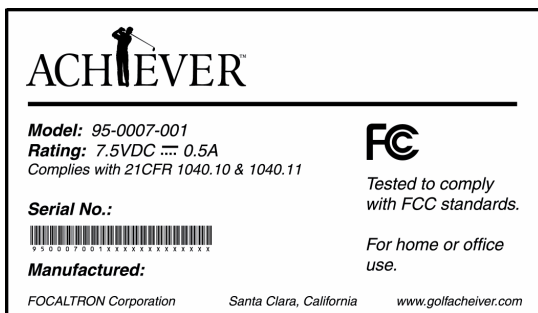
www.golfachiever.com

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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 interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this 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 the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

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Getting Started

Introduction

Thank you for choosing GolfAchiever®—the ultimate golf analyzer. With laser sharp precision, this break-through golf analyzer measures all of the important golf swing parameters and displays the feedback instantaneously.

To ensure that you obtain the highest accuracy and trouble-free operation, it is important to read this user's guide before you use GolfAchiever. Be sure to retain this guide as your convenient GolfAchiever information source.

Please take a moment now to complete the enclosed Warranty Registration Card and mail it to Focaltron.

System Requirements

GolfAchiever is designed to work with a personal computer that conforms to the following standards:

- **Operating System:** Windows 95 or later
- **RAM:** At least 16 Megabytes of RAM
- **Hard Drive:** At least 18 Megabytes of available hard disk space
- **Video:** Video resolution of at least 800x600 pixels with at least 256 colors
- **Ports:** One available serial (RS-232) interface, D- SUB 9-pin connector

Power Requirements

A wall-mount power adapter is provided. This adapter plugs into a wall socket that supplies USA-standard power (120 VAC @ 60 Hz.). If you are in a country that uses a different power standard, you will need a converter.

GolfAchiever may be powered by a battery. A 6-volt lead-acid leak-proof battery capable of delivering 0.5 amps is preferred. Other types of batteries (or direct-current sources) may be used so long as the voltage is within the range of 6 volts to 12 volts. Power cables for attaching GolfAchiever to a battery are not provided.

Focaltron offers a complete battery system (battery, cabling, and charger) for \$295. Call your Focaltron salesperson for details.

Safety Instructions

Read all of these instructions carefully. Save these instructions for later use.

- Follow all warnings and instructions marked on the product.
- Unplug the power adapter from the wall outlet before attaching or detaching any cables to the unit.
- Unplug the power adapter before cleaning GolfAchiever. To clean GolfAchiever, use only a damp cloth: do not use liquid cleaners or aerosol cleaners.
- Only plug the power adapter into an outlet that conforms to the type of power indicated on the marking label. If you are not sure of the type of power available, consult your local power company or dealer.
- Use only power adapters that provide low voltage direct current in accordance with the specifications for the unit.
- If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord's ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
- Do not allow anything to rest on the power cords or serial cord. Do not place the cords where people may walk on them.
- Do not place the product on an unstable cart, stand, or table. The product may fall causing serious damage to the product.
- Other than adjusting the alignment of the lasers as described in this manual, do not attempt to service this product yourself. Opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to properly trained and qualified service personal.
- Do not look directly into the laser.
- The following labels are attached to the GolfAchiever L-Frame in accordance with FDA regulations:



Care and Handling

This equipment uses lasers and other precision electronic and optical parts. To avoid malfunction or alignment problems:

- Do not drop the frame or subject it to mechanical shocks.
- Do not stress or apply pressure to the frame in a manner that would tend to bend the frame.
- When taking a swing, do not hit the metal frame with the club
- Do not step on the frame.
- Do not stand the frame in water.
- Keep the red plastic strips clean. A soft cloth and plastic cleaner is recommended.

Hardware Assembly and Setup

Unpacking GolfAchiever

Your GolfAchiever package should contain the following parts, as shown below:



1. The L-Frame
2. Four mat holders
3. One black rubber mat
4. One piece of artificial turf
5. One triangular leg
6. One power adapter
7. One serial cable
8. Software (CD)
9. Five rubber tees: yellow, blue, white, red, and green
10. User Manual
11. GolfAchiever Warranty (not shown)

If any parts are missing or appear damaged, please contact Focaltron immediately.

Be sure to keep your GolfAchiever packaging and shipping box in a safe place. The box is required for safe handling of the GolfAchiever system during shipment.

Picking a Place to Use GolfAchiever

GolfAchiever was designed to be a portable device, so you can move it to different locations with minimum effort. For the location, pick a flat level spot as the hardware and software have been optimized to show the ball's flight from a flat level field. GolfAchiever will work if tilted, but the results may vary.

The location should provide a firm footing for the L-Frame. A soft spot such as artificial turf or a carpet that has padding or long tufts may allow the frame to twist when anchored to the ground and to move when you take a divot. Such movement can cause problems with GolfAchiever's ability to record a swing or provide accurate results.

GolfAchiever works in most lighting conditions, both indoors and outdoors. However, bright sunlight that shines directly into the red plastic strips on the L-Frame (where the photodetectors are located) can interfere with operation. Repositioning the L-Frame to face away from the sun or shading the detectors from the sun will correct the problem.

Since GolfAchiever measures all the characteristics of ball and club just after impact, you can hit golf balls onto a range or into a net and the GolfAchiever results will be the same.

Setting Up GolfAchiever

Once you have picked a location, you are ready to setup the GolfAchiever hardware. Follow these easy steps:

1. **Attach Mat Holders to L-Frame:** To attach a mat holder to the frame, push the back of the mat holder into the slot on the base of the frame and then rotate the mat holder 90°. Slide the mat holders to the far opposite ends of the base slot.
2. **Attach Leg to L-Frame:** To attach the leg pass the keyhole slots in the leg over the two knurled screws in the bottom of the L-Frame's post. Slide the leg as far away from the L-Frame's elbow as it will go and tighten the screws by hand.
3. **Aim at Target:** Aim GolfAchiever at the intended target. To aim GolfAchiever; sight along an imaginary line from the center of the tee perpendicular to the L-Frame base.
4. **Anchor L-Frame to ground (optional):** Hitting the turf or mat with a club ("taking a divot") may move GolfAchiever so that it is no longer aimed at a target. You can prevent this by attaching the unit to the ground or floor. Pass large nails or screws through the 1/4" holes in each Mat Holder to attach GolfAchiever to the ground. Do not tighten the nails or screws too firmly - allow the Mat Holder to float up and down by a small amount.

5. **Insert Tee into Mat:** Select one of the rubber tees. From the bottom of the mat, push the tee into the hole in the center of the mat. Make sure the bottom of the tee is level with the bottom of the mat. *If you are using a tee that was not supplied with GolfAchiever, make a note of the tee height. You will need to enter this value into the system setup screen to ensure accurate results.*

Changing Tees During Use:



To prevent breaking the mat holders when changing tees, use one foot to stand on the GolfAchiever hitting mat close to the frame (base) to prevent movement or separation of the mat from the mat-holders and GolfAchiever L-Frame. After positioning your foot, curl the back of the mat upwards to expose the underside of tee currently in use.

To remove the tee, first push down on top of the tee and then reach under the mat to pull the tee out from the bottom. Insert the new tee from underneath the mat. Be absolutely sure to keep your foot in position on the front of the mat during this entire process.

6. **Attach Mat to L-Frame (Mat Holders):** Start with the mat holder on the outside of the L-Frame. Angle the mat away from the L-Frame so that the second mat holder is not covered. Fasten the mat to the first mat holder by inserting the mat holder into the hole on the underside of the mat. You may find it helpful to place your hand under the mat and mat holder to attach the first mat holder. Once you have attached the first matholder, slide the other side of the mat on top of the second mat holder and fasten the second mat holder into the second mat hole. Be sure that the mat holders are completely pushed into the holes located in the underside of the mat. **NOTICE:** *If the mat holders are not properly affixed to the mat holders and L-Frame, the GolfAchiever will be unable to provide accurate results.*
7. **Add Turf:** Place the Turf into its tray in the Mat. The Turf is not fastened to the mat and is allowed to “float” so that it can adsorb the mechanical shock of the club hitting the turf.
8. **Connect GolfAchiever to Your Computer:** Plug the serial cable into the 9-pin connector on the L-Frame. Plug the other end of the cable into the serial port on your computer.
9. **Connect Power:** Plug one end of the power adapter into the round power connector on the L-Frame. Plug the other end into a power outlet (120 VAC, 60 Hz, standard in the USA). The indicator in the oval on top of the L-Frame should light with a combination of yellow and green for a second and then change to yellow.

GolfAchiever Software

Installing GolfAchiever Software

Before you install the GolfAchiever software, make sure your computer meets the system requirements as listed on page 4.

Follow these steps to set up the GolfAchiever software from the installation CD:

1. Exit all programs to prevent conflicts with the Installation Software
2. Insert the GolfAchiever Software CD into the CD drive.
3. If the Installation Program does not automatically start upon inserting the CD, Click the Windows Start button and select RUN. Type "d:\setup.exe" and then press enter. *Replace "d:" with your CD drive letter if different.*
4. Follow the on-screen instructions to finish installing the GolfAchiever software.

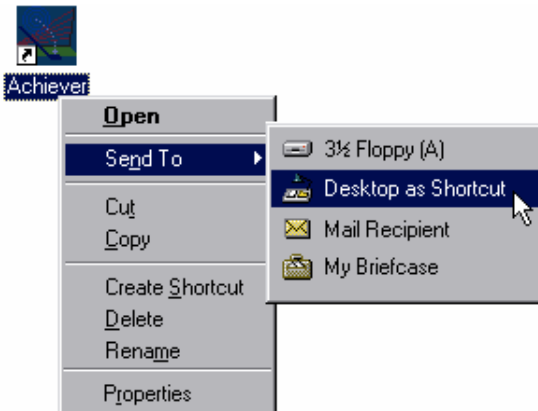
Creating a Shortcut to GolfAchiever (and Diagnostics)



Achiever

If you want, you can add an icon to your Windows desktop to use as a shortcut to starting the GolfAchiever software.

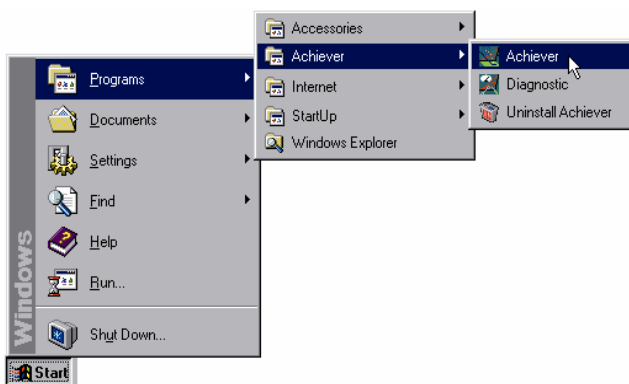
When the software installation is complete, it will leave a window open on your desktop with three icons: GolfAchiever, Diagnostics, and Uninstall GolfAchiever. With your right mouse button, click on the GolfAchiever icon. From the menu that pops up choose Send To > Desktop as Shortcut. You may also wish to use the same procedure to add a shortcut for the GolfAchiever Diagnostics Program at this time.



Starting the GolfAchiever Software

Before starting the GolfAchiever software, make sure the L-Frame is plugged in and connected to your computer with the included serial cable.

To start GolfAchiever, click on the Windows Start button and select Programs>Achiever>Achiever. *NOTE: If you have installed a shortcut to the GolfAchiever program, simply double click on the GolfAchiever program icon from your desktop.*



You will also see an icon for the diagnostic program that was installed with GolfAchiever. This can be used to recalibrate the sensors or to help if the lasers need to be realigned. Instructions for the Diagnostics program are included in Appendix II.

GolfAchiever Software Basics

The GolfAchiever software has two main screens, Down Range and Analysis. The Down Range and Analysis screens offer different perspectives on the ball's flight path and display slightly different information about each swing: you can use either screen when you want to swing a club.

The Down Range screen (left) and the Analysis screen (right) show you different perspectives of each shot. Use the button at the top right of either screen to switch screens.

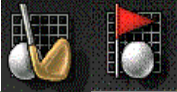


Before you take a shot, however, you will need to use the Setup screen to setup a player profile. A player profile includes information such as the golfer's name, height, stance, and the (customized) clubs the golfer will use. This information is essential to Achiever so that it can return the most accurate results.

Use the Setup screen to enter player name and choose which clubs are available to each player.



Getting to Know the Buttons

Button	Description
	Screen Selection Buttons: Switch/Toggle between the Down-Range screen and the Analysis screen. The button displayed depends on the current screen you are using.
	Setup: Opens the Setup screen. This button is disabled while
	Play: Use this button when you are ready to take a shot. This button has four modes: gray if the software is unable to locate the hardware, orange when it is in standby mode, green when it is ready for you to take a swing, flashing yellow while it is resetting from some thing breaking the laser grid (you will usually see this after placing the ball on the tee).
	Clear Stats: Clears the statistics box of the Down Range screen. Mulligan: <ALT + CLEAR STATS> removes the last shot from the statistics (<i>Down Range Screen</i>) and Printout.
	Clear Path: Clears the traces of the ball's flight path(s).
	Select Player: Select any of the players that have been entered through the Setup screen.

Button	Description
	Select Pin Distance: Select from the list of distances from tee to the pin (the flag stick is located in the center of the green).
	Select Club: Tell Achiever which club you are about to use. Only clubs in the current player's bag will be listed. To add/remove/customize clubs from a player's bag, go to <i>Set Up Screen (Customize Clubs)</i> .
	Select Ball: Select the type of ball you are using: wound, 2-piece, or foam.
	Select Tee Height: Select the height of the tee you are using.
	Set Environment: Set environmental factors, including wind speed and direction, grass conditions (wet or dry), temperature, and elevation. The higher the elevation, the further the simulated ball flight.
	Open Raw Data File: Opens a saved data file and displays the flight path and shot data for the saved swing.
	Save Raw Data File: Saves information about your shot. Environmental data is not saved.
	Print: Prints GolfAchiever's Last Ten Shots Statistical Report providing detailed per shot and averaged data for up to the last 10 shots. Print Preview: Press <ALT + PRINT icon> to send a Last Ten Shots Report to the Screen.
	Information: Shows Achiever software version. From the Analysis screen, press <ALT + ? icon> to view raw shot data instead of overhead view (see the Appendix I).
	Exit: Closes the GolfAchiever program.

Moving Around the Screens and Buttons

Like most Windows programs, you can use your mouse or your keyboard (or a combination) to access the different features of GolfAchiever. To use your mouse, just point and click on the buttons or options you want. To use your keyboard, press the <TAB> key to highlight different buttons or options and press enter to select the item. Hold down the <SHIFT> key while you press <TAB> to select items in reverse order.

Creating and Editing a Player Profile

Overview

Before taking a swing, you should use the Setup screen to setup a player profile. A player profile includes information such as the golfer's name, height, stance, and the clubs the golfer will use. Also use the Setup screen to edit an existing player profile or to change device settings such as the available tee heights.

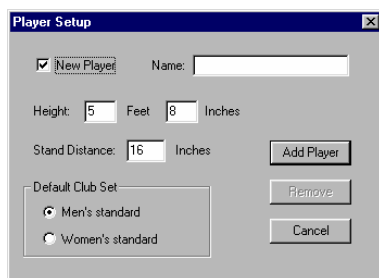
Creating a New Player



1. Click on the **Setup** button to open the Setup screen.



2. Click on the **Player Setup** button to open the Player Setup dialog.



3. Select the **New Player** checkbox and type a name for the player into the **Name** box.
4. Enter the height of the player.
5. Enter the typical stance width for the player.
6. Choose the player's default club set: men's or women's.

This club selection only provides a starting point for GolfAchiever. If the player has clubs that are different from a standard set, you can customize these clubs later.

7. Click **Add Player** to close the dialog and add the new player to GolfAchiever's player list.

Selecting Clubs

When you create or edit a player profile, you can choose which clubs are available to the player by adding and removing clubs from the player's bag in the Setup screen.

Adding Clubs to a Player's Bag

1. In the Setup screen, select the player from the Player's Name list.



2. From the Club Shop list, click on the club you want to add. Note that several of the club's statistics are displayed to the right of the Player's Bag list. If you want, you can customize the specifications for the club.
3. Click the **Add** button to add it to the Player's Bag.

Customizing a Club

1. In the Setup screen, select the player from the Player's Name list.
2. In either the Club Shop list or Player's bag, click on the name of the club you want to customize.
3. Click the Customize button to open the Club Customization screen. Of the most critical variables for attaining the greatest GolfAchiever accuracy includes the following:

CLUB FACTOR— Designed to help the GolfAchiever determine the center of gravity on the clubhead as it is swung, *club factor* is a relative number with a range of -2 to +6, and a default setting of 2.1. The general rule to effectively use club factor is that if the GolfAchiever simulation shows too much hook, you need to lower the *club factor*. Conversely, if the GolfAchiever simulation shows too much slice, you need to raise the number.

GEAR EFFECT— Determined to help the GolfAchiever understand each persons relative Gear Effect when the club is swung and the ball is struck on the toe or heel. A relative number with a range of -100 to +2000, and a default setting of 800, the *gear effect* should be higher with stronger swings and lower with softer swings.



4. Enter the custom specifications into this dialog and click **OK** to accept the new settings. These settings will apply to the club shown in both the Club Shop and in the player's bag. It will not affect the specifications of the club for any other players. *If you wish to add a description/name to the club, click **NEW**. This will enable the **Suffix** box where you can enter the title of the club. The limit is 12 characters.*

TIP: You may find it helpful to enter a company's fitting cart as a player name so that you may customize all of the 5 or 6-irons in that cart and add them to the "player's bag." The same concept can be used to list all of the drivers on your show floor that people frequently request into a player's bag named DEMO. This will save time from having to create/complete a player bag and customize clubs for each person that walks into your store hoping to demo equipment .

Removing Clubs from a Player's Bag

1. In the Setup screen, select the player from the Player's Name list.
2. From the Player's Bag list, click on the club you want to remove.
3. Click the **Remove** button to remove it from the Player's Bag list.

*Clubs removed from a player's bag remain in the Club Shop list for later use. If you wish to remove a club from the Club Shop list, highlight the club from the list and select **customize**. Select **Remove** from the customize window to remove the club from the Club Shop.*

Deleting a Player

1. Click on the **Setup** button to open the Setup screen.
2. Select the player from the Player's Name list.
3. Click the **Player Setup** button to open the Player Setup dialog.
4. Click the **Remove** button. GolfAchiever will open the Remove Player Name dialog to confirm that you want to remove the player from the list.
5. Click **Yes** in the Remove Player Name dialog to remove the player from the list.

Taking a Swing

Creating a Shot Log

The results data for all of the shots can be saved to a single text file by turning on the save option prior to making the shots.



1. Open the **Setup** screen.
2. Click on **Device Setup** to open the Set Physical Parameters box.



Set Physical Parameters - Advanced

☐ Save these Parameters for each time the program is run
☒ Use these Parameters only for this program session

Connection Type: ☒ Serial Port ☐ No Plug

Serial Port ID: COM3

☒ Save Swing Data. File:

☐ Replace the actual club used in saved files being replayed, with the current selected club:

Tee Position (inches):

Tees Back: Tees Side: ☐ ReEnable Tee and Club Winings

Base Tee: Low Tee: Mid Tee: High Tee: Revolution: 6.01 inches

Spin Calculation: K.A. Multiplier

Double Bounce and Roll: ☒

Physical Parameters:

Friction Coefficient: x10k: 1/sec² per (M/sec)²

Magnus Coefficient: x10k: 1/sec² per (M/sec) (cm/sec)

Spin Time Constant: sec

Buttons: OK, Reset Default, Cancel

3. Check the **Save Swing Data** box.
4. Enter the name of the file that you wish the data saved in; the default name is **PlayData.gsd**.

The data in this file is formatted in a way that can be easily imported into spreadsheet or database programs.

This feature just saves statistical data about the shots taken; it does not save the raw data and cannot be read back into GolfAchiever to display the shot. You can save the raw data for individual shots using the Save Raw Data feature (see **Save Raw Data File** on page 13).

***TIP:** You may find it easier to use GolfAchiever's "Print" Feature which provides a detailed statistical report of up to the last 10 swings. Please see page 13—PRINT.*

Setting up the Playing Conditions

If you are using tees that didn't come with GolfAchiever, you will need to set the new tee heights into the GolfAchiever to ensure accuracy. If you want to simulate different playing conditions, or if you are hitting outdoors and you want to set GolfAchiever to the same weather conditions, you can also set that up before you start hitting.

Using Different Tee Heights

The “on grass”, “low”, “mid”, and “high” tee positions used in the program are set for the tees included with your GolfAchiever hardware. If you are using a tee with a different height, you will need to replace one of the GolfAchiever tee heights with the new tee height.

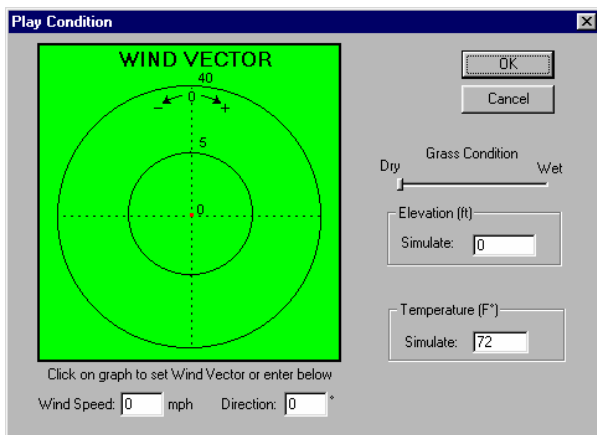
1. Click on the Setup button to open the Setup screen.
2. Click on Setup to open the Set Physical Parameters box.
3. Under Tee Position, replace one of the original GolfAchiever tee heights with your new tee height. *Be sure to use precision in your measurement of the actual tee height (example: GolfAchiever’s blue tee is 2.63” tall).*
4. Click OK.

Setting Weather Conditions

You can use GolfAchiever’s environment controls to simulate different weather conditions.



1. Click on the **Set Environment** button to bring up a dialog for entering weather conditions.



Play Condition

WIND VECTOR

40
0
5
0

Click on graph to set Wind Vector or enter below

Wind Speed: mph Direction: °

OK
Cancel

Dry Grass Condition Wet

Elevation (ft)
Simulate:

Temperature (F°)
Simulate:

2. Enter the wind speed and direction by either clicking on the wind vector graph or by typing in the values.
3. Select the ground condition by clicking and dragging the control between “wet” and “dry.” This setting only affects the ball’s bounce and roll (bounce and roll can be turned on or off through the Advanced Setup screen).
4. Enter values for elevation, and temperature. These will affect the ball’s trajectory.

Note that in the “Save Raw data File” operation covered below, these conditions are not saved and therefore shots can be read back under different conditions.

Setting Up the Shot



1. **Select a player:** Click on the **Player** button and select a player name from the list. To add a new player to the list, use the Setup screen.

Note: You cannot change the player while GolfAchiever is in Play mode and the Play button is green. Click the Play button to switch GolfAchiever to Wait mode (the Play button will turn orange).



2. **Select the distance to the pin:** Click on the **Flag** button to set the yardage from the tee to the pin.



3. **Select a club:** Click on the **Golf Bag** button and select a club from the list. To add or remove clubs from the player's bag, use the Setup screen.



4. **Select a ball type:** Click on the **Golf Ball** button and select the type of ball you are going to hit: foam, two-piece, or wound.



5. **Select a tee height:** Click on the **Tee** button and select a tee height: 'on grass' (even with the turf), 'low,' 'mid,' or 'high.' These settings are for the green, red, white, and blue tees that came with GolfAchiever. If you are using a different tee, you can use the Setup screen to adjust the tee height (see Page 18).

Taking a Swing



1. **Enter the Play mode:** Click on the large orange **Play** button to enter the Play mode. The button on the screen and the LED (light) on the L-Frame should both change to green.
2. **Place the ball on the tee:** A hand passing through the laser grid may cause the LED to temporarily switch to yellow and the Play button to flash the "Wait" signal; this is normal. *NOTE: You will see this when someone re-tees the ball after hitting a shot or if their wobble before the swing interrupts the laser grid. Don't worry, GolfAchiever's lasers will rearm before the next shot is hit.*
3. **Take a swing:** Take your normal swing at the ball. Both the ball and the club face must pass through the laser grid for a shot to register. Once this happens the GolfAchiever program will measure and calculate the ball trajectory and display it in near real time. At the end of GolfAchiever's ball flight simulation, the shot data will be displayed in both the Analysis screen and the Down Range screen.



NOTE: Occasionally with a perfectly normal shot the data image of the club and ball will be merged to the point that the program will not be able to separate the two (the Play button will flash). This happens mostly when a shot is slow with a high take-off angle and closed face. See “Appendix I: Viewing Raw Shot Data” on page 26.



4. **Save the Shot Data (Optional):** The raw data from any shot can be saved immediately following the shot, before anything else crosses the laser grid, by clicking on the **Save** button at the lower right of the screen. (The player’s name, club, ball type, and the tee height are saved along with the raw data.) After leaving the Play mode, this file can be read back under the same or different weather conditions.
5. **Take the Next Swing:** You can repeat these steps to take as many swings as you like. If the ball flight paths begin to clutter up the screen, you can remove them by clicking the **Clear Path** button. To reset the statistical data, click the **Clear Stats** button.

Opening a Saved Shot

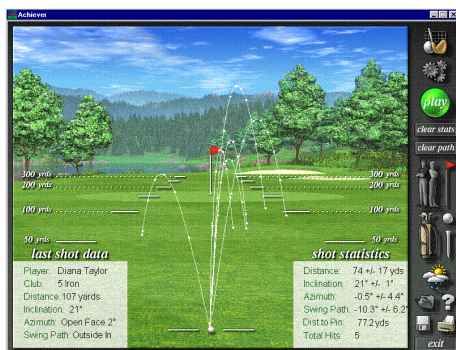


If you wish to view a saved shot, click on the **Open Folder** button (as seen to the left) . Only shots that were saved using the “Save the Shot Data” command will be available. The Club, Ball, and Tee information that was saved with the shot will be used to calculate the ball trajectory. The wind, grass wetness, temperature, and altitude that are currently set will be used since these are not saved with the data file.

Analyzing Your Swing(s)

Down Range Screen

The Down Range screen represents what the virtual driving range would look like from a point directly behind the tee. “Last Shot” data and “Statistical” data is displayed on this screen, as well as a trace of the ball’s simulated flight path.



The displayed height of the ball flight paths are approximately one fourth of the actual height of the calculated flight paths in order to keep most shot paths on the screen.

Last Shot Data

The Last shot data includes the player, club, clubhead speed, distance, ball take-off/launch angle, ball speed, club speed, and swing path.

Statistics

The Down Range screen’s shot statistics show the statistical averages and standard deviations of the different parameters. These values are reset when the player or club is changed, or when the Clear Stats button is clicked.

Analysis Screen

The Analysis screen shows two different views of the shot—overhead and side—and gives some more detailed shot data.



Swing Path, Club Face, and Take Off Angle

These three graphics demonstrate the respective angular measurements as calculated from the most recent shot. The information for the current shot appears just after the ball flight simulation has ended.

Specifications and Shot Data

This screen shows all the specifications and resulting data about the shot. This includes the player's name, the club, the ball, the tee height and the resulting measurements of club and ball speed, distance, off-line distance, distance to pin, maximum height, flight time, and face impact. *Please note the best results will be obtained when using a real golf ball (vs. cayman, foam, etc.).*

Printing Shot Data



All the data on up to the last ten shots with averages can be printed by clicking on the **Print** button at the lower right corner of the screen. This comprehensive report (as shown below) includes detailed per shot and statistical averages information on all parameters measured by GolfAchiever. *You can send this report to the screen as a print preview*



Date: 11/28/2000

Prepared By:

Player Setup

Player Name: Justin Brown
Club Used: 1 Wood
Tee Height: 2.63"
Ball Type: 2-Piece
Roll/Bounce: Off

Grass Condition: 0 % Wet
Elevation: 0 ft.
Temperature: 72°F
Wind Condition: None
Physical Params: Default

Last Ten Shot Data

	1	2	3	4	5	6	7	Last		Averages
Ball Speed	148	141	149	150	150	148	149	146		148 +/- 3 mph
Clubhead Speed	103	100	111	112	112	111	104	102		107 +/- 5 mph
Launch Angle	10.0°	6.7°	11.8°	10.9°	13.3°	11.8°	10.2°	8.8°		10.4° +/- 1.9°
Backspin	3123	2693	3011	3152	2948	3008	3139	3181		3032 +/- 150 rpm
Sidespin	553	186	-669	-841	-1277	-677	442	521		-220 rpm
Distance	246	223	254	252	253	251	250	236		246 +/- 10 yd
Swing Path	-2°	4°	8°	8°	12°	5°	1°	-2°		4° +/- 5°
Face Angle	-2.4°	-2.0°	0.9°	-0.7°	-2.6°	-2.5°	-0.8°	-2.7°		-1.6° +/- 1°
Face Impact	Heel	Heel	Cent.	Cent.	Cent.	Cent.	Heel	Heel		T/C 9/E 0/4/4
Off Line	5	-3	-17	-29	-52	-32	9	3		-14.5 +/- .20 yd
Dist. to Pin	20.5	83.6	50.4	85.8	156.6	94.4	28.3	43.2		20.3 ft
Flight Time	6.1	5.3	6.5	6.4	6.7	6.5	6.3	5.8		6.2 sec
Max Height	28	18	33	31	37	33	29	24		29.1 yd

exit

by holding down <ALT> as you hit the **PRINT** button.

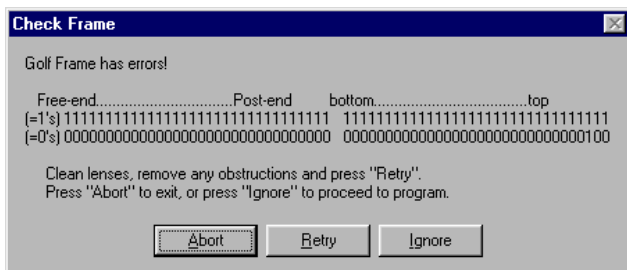
Exiting GolfAchiever

To exit the GolfAchiever software, click on the **Exit** button in the lower-right corner of the screen.

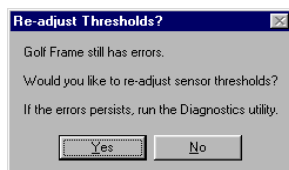
Troubleshooting

A “Check Frame” Message appears when starting GolfAchiever

When the program starts it searches the serial ports for the GolfAchiever hardware. If the program finds the GolfAchiever hardware it performs a simple hardware test to ensure proper operation. If the L-Frame’s sensor thresholds are out of adjustment or if something is blocking one or more sensors, this test will fail and the following “Check Frame” message will appear:



1. Check that nothing is blocking any part of the red plastic strips on the L-Frame (these strips cover the photodetectors).
2. Wipe the strips with a clean soft cloth.
3. Click **Retry** to retry the test. If it passes the second test, it will start the software. If it fails, the following window will open allowing you to recalibrate the sensors:



4. Click Yes to recalibrate the sensors.

If after recalibrating the sensor thresholds, erratic behavior occurs with continual false triggers or with many seemingly good shots resulting in Wait/Error indications, it may be necessary to exit the GolfAchiever program and run the Diagnostic program. The Diagnostic program may show that mechanical re-alignment of the lasers is required. Refer to Appendicies II and III for directions.

The Play button is gray and you cannot enter Play mode.

When the GolfAchiever program is started it searches for the L-frame and tests it. If GolfAchiever cannot communicate with the L-frame, the **Play** icon is turned gray and play mode is not permitted.

- Check the LED indicator on the L-Frame. If it is not on, the frame is not receiving power. Check that the power adapter is firmly plugged into the unit and that the adapter is plugged into an active power source (120 volts at 60 Hz). Then exit and restart the GolfAchiever program.
- Check that one end of the serial cable is connected to an active serial port on the computer and that the other end is connected to the L-Frame. Then exit and restart the GolfAchiever program.
- Check that the serial port on the computer is functioning properly. Connect another device to the computer's serial port and confirm that it functions as expected. If another device is set up to use the same serial port, change that device's settings to a different port or exit the program before starting GolfAchiever. *In many cases, a program such as "Palm Pilot" has control of the system's serial port, which does not allow the system to recognize the GolfAchiever hardware. To remedy this, simply exit Palm Pilot.*

Other Buttons are Gray and Unavailable

When you are in Play mode, several features are unavailable and their buttons are grayed out. Features that are unavailable in play mode include: opening the Setup screen, changing the player, and opening a saved shot.

Shots are not Displayed

Occasionally GolfAchiever cannot display a shot. This often happens with a bad shot such as topping the ball. The problem is often generated by the ball and the club going through the detection zone at the same time. When this happens, GolfAchiever cannot tell the ball from the club and the play button will briefly blink yellow. See the appendix on viewing raw shot data for examples of shots that GolfAchiever may not be able to display. Additional reasons GolfAchiever may fail to display a swing include the following:

- Remove any objects that may be in the detection zone, interfering with the lasers' beams or the red plastic lenses.
- Clean the red plastic lenses with a soft cloth and plastic cleaner.
- Make sure that the frame is on a flat surface with only its five rubber feet, and triangular leg, in contact with the surface.
- If the Mat Holders are fastened to the ground, make sure that the Mat Holders are free to move up and down on the fastener by a small amount. Applying downward force to the Mat Holders may apply pressure to the frame, causing it to warp and thus adversely affect the mechanical alignment of the lasers.

- Physically adjust the lasers so that their red beam of light illuminates all the photodetectors located behind the red plastic lenses. Refer to the “Aligning the Lasers” section of Appendix III for directions.

The ball did not land where GolfAchiever indicated.

GolfAchiever’s default setting is to simulate distance carried only. GolfAchiever’s bounce and roll setting can be enabled in the system set-up screen. If you find that you have problems with the distance carry reported by GolfAchiever, please check the following:

- Check that the height of the tee set in GolfAchiever matches the height of the tee installed in the mat.
- Check that the “Tee Back” in the Set Physical Parameters - Advanced window is set to 10.5 when you are hitting off the normal tee position.
- Check that the Tee Side is set to 0 when you are hitting off the normal tee position.
- Check that the frame sits on a level surface and is aimed at your target.
- GolfAchiever is designed to operate on a level field. Hitting to a hill will yield a difference between the actual ball landing position and what GolfAchiever displays.

Appendix I: Viewing Raw Shot Data



You can view a graphical representation of the raw shot data (the raw data does not include information such as the tee heights or weather conditions). While in the Analysis screen, hold down the <ALT> key and click on the Information button (?): the overhead view of the shot will change to show the raw data:



The Vertical axis is time, the left half of the image shows data from the post sensors and the right half represents the base sensors. For most shots, you should be able to discern the ball from the club shaft and head (the club will appear upside down). Hold down the <ALT> key and click on the Information button again to return to the normal view.

Examples:



A: The left side of the club shaft image is missing two data points from blocked or faulty sensors. The missing data results in a swing path calculated as minus 170 degrees.



B: This is a great shot with only one problem—there is no ball. Because of a sensor error, there is an abnormal break in the right-side image of the club shaft. The program acts as if the separated part of the right image is a ball. From this segment, it calculates the ball speed as 137 m.p.h. and proceeds with the simulation.



- C: Probably caused by a very slow swing or a low- angle shot, the right image of the ball is merged with the club face. GolfAchiever is able to calculate the ball speed from the left half of the image but, since the ball's position is calculated using both sides, some error is introduced and the shot reading will not be as accurate.



- D: Probably caused by a high take-off angle or a slow follow through, GolfAchiever is unable to separate the ball from the club head. GolfAchiever will indicate an error (the Play button will flash on the screen); it will not display a simulation or shot data.



- E: The club head crossed the sensors way before the ball. Probably caused by topping the ball.



- F: Another example resulting from a topped ball. Unfortunately this shot will not result in an error indication even though the ball speed will be incorrect (191 m.p.h. in this example) because the ball "length" is truncated on both sides by the image of the club. If the displayed shot is significantly longer than the actual shot, this is probably what occurred.



- G: An example of "noise" interfering with the reading of the shot, probably created by the club hitting the mat after ball impact. GolfAchiever can ignore noise that is on only one side of the data, but the problem here is that the lower set of noise occurs as the ball is being sensed, effectively increasing the size of the ball to the point where GolfAchiever rejects it, resulting in an error indication.



- H. This is an example of noise that starts before either the club or ball starts going through the laser grid. The club probably hit the turf way before contacting the ball. the resulting early noise is ignored since there is no matching object on the right side of the image. However, since the ball and club are delayed until the slower part of the graph there is significant loss in accuracy.



- I. This shows noise patterns resulting from strong hits to the turf, resulting in an error indication.

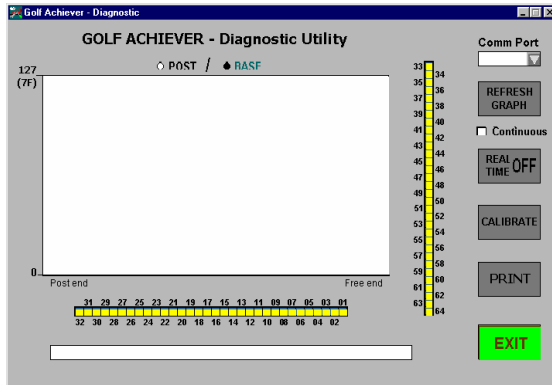


- J. In this shot the ball is hit by the tip of the club and driven into the post, causing ringing in the base and post laser. This shot results in an error since no ball was sensed by the base sensors (the noise at the top is “too big” to be sensed as a ball).

Appendix II: Diagnostics

Running the Diagnostic Program

1. Verify that GolfAchiever hardware is connected and powered up.
2. Open the Windows **Start** menu and select **Programs>Achiever>Diagnostics** to start GolfAchiever's Diagnostics program (or double-click on the Diagnostics icon from your system desktop if you created a shortcut for Diagnostics):

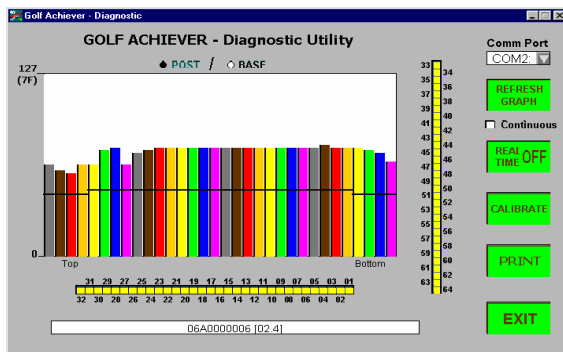


3. Click on the “Comm Port” list box on the upper right of the window and select the comm port that is connected to the L-Frame. If the program finds the GolfAchiever device, the serial number of that device is listed in the text box at the bottom of the Diagnostics window.

The Main Graph

At the top of the window, select either **Post** or **Base**, and then click the **Refresh** button to show a bar graph of the 32 device sensors, either the base sensors or the post sensors, depending on your selection:

The height of each bar represents the signal size on that channel .



Although the value of the main graph goes from zero on the bottom to 127 (7F hex) on top, an average comparator circuit within each device actually saturates at about 77. *GolfAchiever needs a device setting of at least 20 on each sensor/bar to work properly.* You may click on any bar to display its value in the box at the bottom of the window.

The Real Time Indicators

These indicators are along the bottom and to the right of the main graph. They are numbered to correspond with the actual sensor designators. After selecting a comm-port or after refreshing the main graph these are either blue (off) or yellow (on) depending on whether or not their signal strength is above or below their corresponding threshold.

The main use of the Real Time Indicators is in the Real- Time mode or the Alternate Real-Time mode as explained below.

The Buttons

Available buttons are green. When a button is inactive and cannot be selected, it is grayed out.

Refresh Graph: Clicking on this button starts a sequence of commands to the GolfAchiever device that determines the signal strength of each of the 64 sensors. During this sequence the other buttons are not active. Note that after the completion of this process both the Base and Post signal strengths will have been determined.

Continuous: Setting this check box before clicking on the **Refresh** button puts the device in a mode where it will continuously refresh the main graph. When turning this mode off please remember that changes will only be registered between each refresh.

Real Time: Click to enter the Real Time mode or hold down the Alt key and click to enter the Alternate Real Time mode. Both modes allow an object (a hand for example) to be run in front of the Base and Post sensors. In the standard mode the obstruction will appear yellow but will become invisible if it stops moving. In the Alternate mode the lasers are continually blinked so an obstruction, even if stopped, will appear blue on a background of yellow.

Calibrate: Click here to reset the thresholds. The thresholds are set to 3/4 of the minimum signal strength found in each group of eight sensors that use the same threshold.

Print: Prints the value of the signal strength of all 64 sensors along with the date/time. It also prints out the eight threshold values.

Appendix III: Maintenance

GolfAchiever is designed to maintain working condition with a minimum of attention. Keeping it dry and clean is the only requirement. If the unit is physically abused, such as dropping it or hitting it with a golf club, than additional adjustment may be required.

Check Frame Message

If the Check Frame window appears while starting the GolfAchiever software, there may be an object in the laser's path or the lens may be dirty. First remove all objects, press the turf down into the rubber mat, and clean the red plastic lenses using a soft cloth and plastic cleaner. Then click Retry in the Check Frame window. If a second Check Frame message appears, click on the Yes button to readjust the sensors' thresholds. If the Check Frame window still shows errors, the lasers may need adjustment.

Please be sure you have read and completely comprehend Appendixes II and III prior to beginning the laser tuning process. You may find it helpful to speak with a GolfAchiever customer service representative prior to tuning a laser for your first time. If you do not feel confident in tuning the lasers after reading Appendixes II and III, the unit may be returned to the manufacturer, packed in its original box, for service. A Return Materials Authorization (RMA) must be obtained from the factory before returning the unit.

Aligning the Lasers

GolfAchiever uses two lasers to illuminate a series of photodetectors. Each laser produces a line of red light so that it may illuminate a line of photodetectors. The lasers are housed at the ends of the L-Frame and are accessible for adjustment by removing the protective covers with a Number 1 Phillips screwdriver. The photodetectors are behind the red plastic strips in the post and base of the L-Frame. The photodetectors are not accessible.

Aligning the lasers consists of aiming the lasers so that their lines of light illuminate all the photodetectors. This is best done in a dim room so that the laser light is easily visible. The coarse alignment of each laser is done by observing the position of the line of light and adjusting the laser position so it is close to the center of the red plastic lens. As the line of laser light begins to appear centered on the row of sensors, you will then use the Diagnostic program, included with the GolfAchiever software, to *fine-tune* the laser's position.

Caution! While aligning the lasers do not let the laser beam shine directly into your eyes.

Tools

The following tools are required to align the lasers:

- Number 1 Phillips screwdriver
- A 7/64 ball-point hex key L-Wrench (Allen Wrench) with short arm less than 1/2" long (two are included with your GolfAchiever Package)
- Computer with Diagnostic program (the diagnostic program is automatically installed with the Achiever software)

Remove Covers

1. Remove the sheet-metal cover on the bottom of the end of the L-Frame's base by unscrewing the four Phillips flat-head screws.
2. Remove the plastic covers from the end of the L-Frame's post by unscrewing the two Phillips pan-head screws located in the plastic cover.

Connect Unit

1. Attach the serial cable to the L-Frame and to the computer
2. Attach the power-supply to power up the L-Frame.
3. Turn on the computer and start the test Diagnostic program (from the Windows Start menu, select Programs>Achiever>Diagnostics).
4. In the diagnostic program, select the proper comm port for the serial port connected to the L-Frame. The buttons on the computer's screen should turn green indicating that communications have been established.

Base-Laser Alignment (Low Post Sensor Levels)*

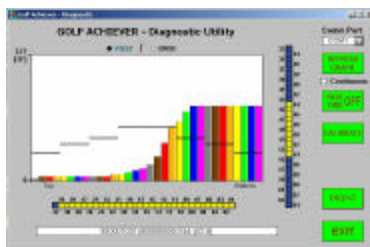


1. Place the L-Frame on a flat surface with the open base-laser cavity up (upside down).
2. Turn the base-laser on by clicking on the Diagnostic program's Refresh Graph button. The laser will blink for a short time (less than a minute), and then GolfAchiever will display a colored graph representing the detected laser signal strength (See Appendix II on page 29).
3. Click on "Post" at the top of the screen to view the graph of the Post detectors' performance. Each colored bar represents a single detector in the post, which is receiving the light from the base laser. If the base-laser is misaligned, the result will be low values (less than 40) for several detectors, and the graph will

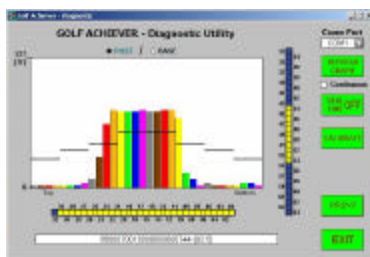
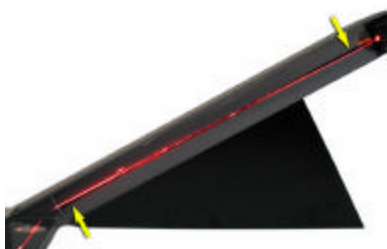
look similar to one of the pictures on the following pages:

***Reminder: When improving the "Post" graph, adjustments must be made to the base-laser.**

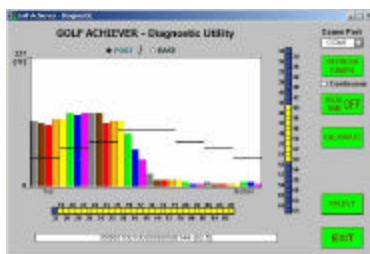
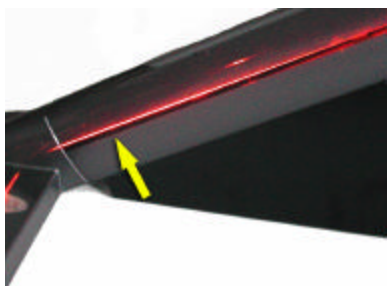
Below are a few examples of a misaligned base-laser with the corresponding post graph readings:



A: This base-laser is misaligned near the top of the post. The picture shows that the right side of the laser line (near the top) is below the lens of the unit and needs to be rotated upwards. This would be accomplished by slightly turning the base-laser rotation screws.*

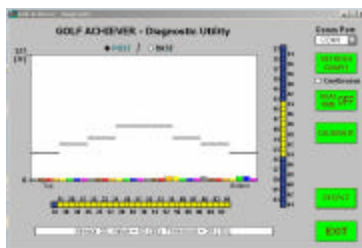


B: The above photo shows a base-laser that is misaligned on both ends, registering on only a few of the middle detectors, as can be seen by the graph. Adjusting the rotation screws of the base-laser will even the laser line back to the center of the lens.*



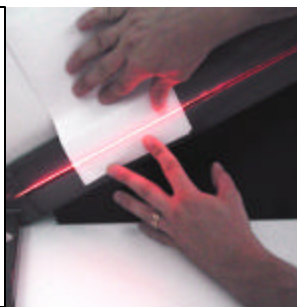
C: This base-laser is aimed above the lens near the bottom, accurately creating a graph that shows the levels falling off at the bottom of the post. Again, this can be corrected by adjusting the base-laser rotation screws.*

***See “Adjusting Rotation Screws” on page 35**



D: This is an example of a base-laser that is misaligned laterally. Notice how the entire laser is above the sensors and needs to come down to be correctly aligned. This would be accomplished by slightly turning the base-laser lateral screws.**

HINT: A helpful way to view where the laser is in relation to the sensor strip is to use a white piece of paper. Dimming the room lights is still the easiest way to see the laser, but when you are in a location where it is not possible to dim the lights (or when aligning your GolfAchiever outdoors), having a piece of paper on hand can help a great deal.



Base-Laser Alignment Continued...

BASE LASER SUB-ASSEMBLY



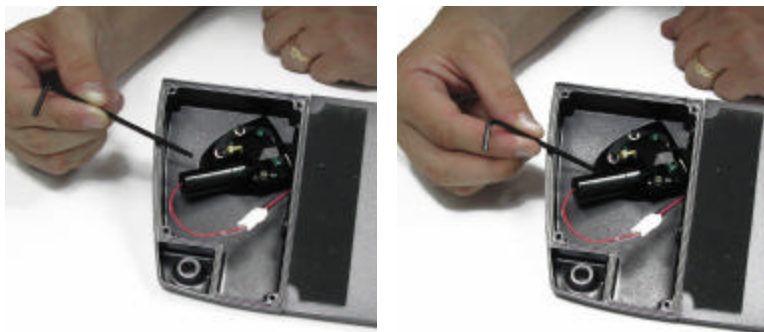
4. **IMPORTANT!!**

Loosen the laser by backing off the Rotation Lock screw about one half-turn counter-clockwise. The laser should remain snug in its holder. You should not be able to easily move the laser with your hand.

****See “Adjusting Lateral Screws” on page 35**

Adjusting Rotation Screws: The laser line rotates around a central axis point in a circular manner — if the left side goes up the right side will go down. When adjusting a laser's rotation, it is extremely important that you ***first loosen*** one Rotation screw and then tighten the other. Repeat this procedure until the beam is parallel with the red lens in the post. Finish by tightening up the screws just enough so that they are snug and apply a small amount of pressure on the bracket and the opposing screw. ***Do not over-tighten as this warps the bracket and may result in stripping the threads in the aluminum brackets or cracking the brackets.***

Adjusting Lateral (up and down) Screws: Loosen one Lateral screw and then tighten the other until the beam is in the center of the red lens and reflections can be seen from all photo-detectors. The screws should be tightened just enough so that they are snug and apply pressure on the bracket and the opposing screw. ***Do not over-tighten as this warps the bracket and may result in stripping the threads in the aluminum brackets or cracking the brackets.***



NOTE: To adjust the lower lateral screw, you will need to use the “ball-end” side of the allen wrench (see above photo)

5. Repeat the previous steps until the beam appears to be well positioned.
6. Tighten the Rotation Lock screw.

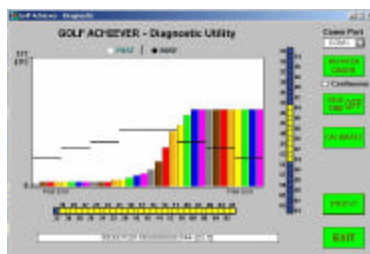
Click on Refresh Graph in the Diagnostic program. Wait for the laser to stop blinking and for the button to turn green, indicating that the test is finished. Observe the graph noting the value of the lowest detector. Repeat the base-laser alignment process until all the bars in the graph are at the highest possible value that you can obtain.

Post-Laser Adjustment (Low Base Sensor Levels)*

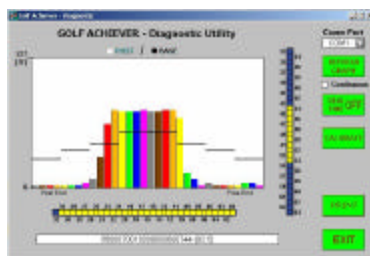
1. Turn the post-laser on by clicking on the Diagnostic program's Refresh Graph button. The laser will blink for a short time (less than a minute), and then GolfAchiever will display a colored graph representing the detected laser signal strength (See Appendix II on page 29).
2. Click on "Base" at the top of the screen to view the graph of the base-detectors' performance. Each colored bar represents a single detector in the base, which is receiving the light from the post-laser. If the post-laser is misaligned, the result will be low values (less than 40) for several detectors, and the graph will look similar to one of the following pictures:

***Reminder: When improving the "Base" graph, adjustments must be made to the post-laser.**

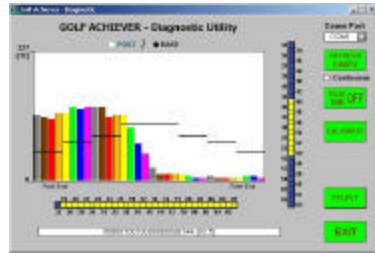
Below are a few examples of a misaligned post-laser with the corresponding base graph readings:



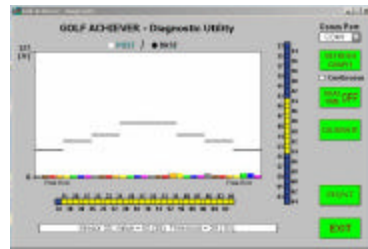
A: This post-laser is misaligned near the post-end of the base. The picture shows that the right side of the laser line (near the post) is below the lens of the unit and needs to be rotated upwards. This would be accomplished by slightly turning the post-laser rotation screws. **



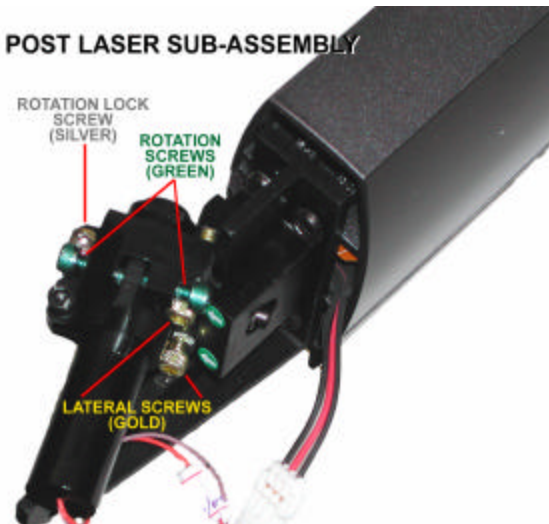
B: The above photo shows a post-laser that is misaligned on both ends, registering on only a few of the middle detectors, as can be seen by the graph. Adjusting the rotation screws of the post-laser will even the laser line back to the center of the lens. **



C: This post-laser is aimed below the lens near the free-end, accurately creating a graph that shows the levels falling off at the free-end of the base. Again, this can be corrected by adjusting the post-laser rotation screws. **



D: This is an example of a post-laser that is misaligned laterally. Notice how the entire laser is above the sensors and needs to come down to be correctly aligned. This would be accomplished by slightly turning the post-laser's lateral screws. ***



4. **IMPORTANT!!**
Loosen the laser by backing-off the Rotation Lock screw about one half-turn counter-clockwise. The laser should remain snug in its holder. You should not be able to easily move the laser with your hand.

****See "Adjusting Rotation Screws" on page 38**

*****See "Adjusting Lateral Screws" on page 38**

Adjusting Rotation Screws: The laser line rotates around a central axis point in a circular manner — if the left side goes up the right side will go down. When adjusting a laser's rotation, it is extremely important that you ***first loosen*** one Rotation screw and then tighten the other. Repeat this procedure until the beam is parallel with the red lens in the post. Finish by tightening up the screws just enough so that they are snug and apply a small amount of pressure on the bracket and the opposing screw. ***Do not over-tighten as this warps the bracket and may result in stripping the threads in the aluminum brackets or cracking the brackets.***

Adjusting Lateral (up and down) Screws: Loosen one Lateral screw and then tighten the other until the beam is in the center of the red lens and reflections can be seen from all photo-detectors. The screws should be tightened just enough so that they are snug and apply pressure on the bracket and the opposing screw. ***Do not over-tighten as this warps the bracket and may result in stripping the threads in the aluminum brackets or cracking the brackets.***

5. Repeat the previous steps until the beam appears to be well positioned.
6. Tighten the Rotation Lock screw.

Click on Refresh Graph in the Diagnostic program. Wait for the laser to stop blinking and for the button to turn green, indicating that the test is finished. Observe the graph noting the value of the lowest detector. Repeat the post-laser alignment process until all the bars in the graph are at the highest possible value that you can obtain.

TIP: When tuning the lasers, always start with the rotation angle. The goal of rotation is to create a laser line parallel to the strip of laser detectors. Once you have created a laser line parallel to the strip of laser detectors, then move to the lateral positioning (up and down) of the laser line. The lateral movement will align the parallel laser line into a position centered over the laser detectors.

Finishing Adjustment

1. Click on Refresh Graph to verify that both the post and base lasers are in good alignment.
2. Click on Calibrate to calculate new trigger levels and save them in Achiever's electronics. The black lines, indicating trigger levels, should be down about 1/4 of the way from the top of the lowest bar in its group of eight bars.
3. Replace both covers.

Declaration of Conformity

We, Focaltron Corporation, 830-A East Evelyn Ave., Sunnyvale, CA 94086 USA, Telephone 408 530-8588, declare under our sole responsibility that the product

GolfAchiever model no. 95-0007-001

complies with Part 15 of the FCC Rules. Operation is subject to the following 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.