



Users Manual

Version 2.1

**Copyright 2010, Pete Giarrusso, Inc.
D/B/A Chopper Design Services
All Rights Reserved**

Table of Contents

INTRODUCTION	4
USER AGREEMENT	5
WARRANTY	6
UNDERSTANDING HOW THE SYSTEM WORKS:	8
STOPPING WITH LEGUP®:	10
PULLING AWAY WITH LEGUP® DEPLOYED:	11
USER INSTRUCTIONS	13
COMPONENTS:	13
1) <i>Control Switch Box</i>	13
2) <i>Linear Actuator</i>	13
3) <i>On-board Computer Module</i>	14
4) <i>Proximity Sensor</i>	14
5) <i>Center Stand</i>	14
6) <i>Leg/Wheel System</i>	14
USING THE SYSTEM	15
<i>Turn on the computer:</i>	15
<i>Lowering the Wheels:</i>	15
<i>Raising the Wheels:</i>	16
<i>Normal riding:</i>	16
<i>Other Features and Operations:</i>	19
<i>Turn off Computer:</i>	19
<i>Maintenance Mode:</i>	19
<i>Using LegUp® as a Kick Stand:</i>	20
<i>Using LegUp® to Help you lower the Bike onto the Kickstand:</i>	21
<i>Using LegUp® to Help you raise the Bike off the Kickstand:</i>	21
<i>Pushing your bike with the wheels down:</i>	21

INTRODUCTION

The LegUp® system by Chopper Design Services is intended to act as a stabilization system for Harley-Davidson® touring motorcycles, Honda Gold Wings and other sizeable touring bikes. The system is NOT designed to be a 4-wheeled vehicle; stabilization, safety and convenience are the reasons to purchase and install LegUp®! The system allows your bike to function as it always has when underway. Your lean angle is not affected by this system, so you can enjoy motorcycling as you always have, and just get a little help at slow speeds.

If you have been looking for a system that will keep your feet on the pegs, this is **NOT** the system for you! On the other hand, if a system that will relieve you of the weight of the bike and help you avoid balance problems as you approach a stop, LegUp® is what you need.

LegUp® is very easy to use, and we will cover user controls in the text below. It is extremely important that you understand the function of the LegUp® System, before going out on the road with it. You must also sign and date the release form before using this system. LegUp® will help you enjoy your motorcycle more, but,

“YOU STILL ARE RESPONSIBLE FOR THE BALANCE OF THE VEHICLE!!”

There is one set of controls, mounted above your left switch housing that allows you to access the entire functionality of the LegUp® System. Please become familiar with these controls and indicators, so you may enjoy the benefits of LegUp® to the fullest.

Thanks for choosing LegUp®!

USER AGREEMENT

Users of the LegUp® system agree that **Chopper Design Services** is NOT responsible for personal injuries or damage to property arising from the use of the system. While we believe this system to be safe and reliable, the user is advised that: *'Use of LegUp® is done so at the users' own risk.'*

Use of the system implies agreement to the above statements.

All LegUp® systems are shipped with this manual and **'User Agreement'**. Not reading, signing or returning this document to Chopper Design Services, yet using/installing the LegUp® system constitutes acceptance of the terms above, and holds **Chopper Design Services** harmless in regards to anything but the LegUp® System and its components.

If you can't agree with the above, **Chopper Design Services** and its dealers would be happy to refund your full purchase price, before you use the LegUp® System.

Agreed to this day _____, 20__

End User Signature

End User Printed Name

Please return this signed document to: Chopper Design Services,
1365 Bennett Dr. Longwood, FL 32750,
Or sign, scan and email to info@LandinGear.com.

Warranty

Chopper Design Services warrants the LegUp® system for a period of 12 months from date of purchase. This warranty covers replacement parts and/or manufacturer defects. Incidental damages or costs are the responsibility of the purchaser.

Defective parts are to be returned to Chopper Design at the address below. Purchaser must contact Chopper Design to receive a Return Material Authorization, prior to returning defective parts to Chopper Design.

Abuse, improper installation or use, collisions or accidents, are not covered under this warranty. Replacement parts for this type of damage are available through Chopper Design.

Chopper Design Services
1365 Bennett Dr #101
Longwood, FL 32750

407-834-5007
LegUp@LandinGear.com

System Theory & Operation



READ THIS FIRST!!!!

It is **CRITICAL** that the user of the LegUp® system understands what it is and what it is **NOT**! The LegUp® LandinGear System is **NOT** a Trike kit! It is a ***Motorcycle Stabilization System*** that allows you to help balance the bike as you start, stop and maneuver slowly. You can and will drop the bike with the wheels down if you don't maintain the balance yourself! Please read and understand the following to allow you to get the most from you new LegUp® LandinGear!

Thanks!

UNDERSTANDING HOW THE SYSTEM WORKS:

Later in this manual we will detail the mechanics of using the system. Here we want to teach you the best methods and theories of operation. Some folks have their own ideas as to what LegUp® LandinGear is all about. We want to make sure new users understand the system and its capabilities as well as its limitations before using the LegUp® LandinGear! Please read the entire manual before attempting to use your new LegUp® LandinGear System.

The LegUp® System uses a computer to lower and raise a set of wheels, to **HELP** you balance your motorcycle. At installation time, the installer **'TEACHES'** LegUp® how low to lower the wheels, and how high to raise them. The system remembers these settings indefinitely.

The legs **DEPLOY** (lower) either manually (at speeds under 9 MPH), or semi-automatically (covered later) at 9 MPH. Similarly, the system **RETRACTS** (raises) the wheels manually, or automatically, by reaching 9MPH with the wheels deployed.

When the wheels begin to deploy as described above, the system will try to lower the wheels to the point it was taught for three seconds. If the bike is on level ground, the system will succeed to lower the wheels that far. In the event the bike is leaned one way or the other, the system will only try to push for those **three** seconds, and stop where it stops.

This is **VERY** important to understand! In the event you are stopping on ground banked one way or the other, you **CAN** allow LegUp® to help you keep your bike level, by leaning a small amount to the high side of the banking.



The system will **NOT** push the bike to the low side in this case, but will stop with the high-side wheel in touch with the ground, and the low side off the ground (picture at left). Your high side leg and the high-side wheel will combine for your stability and balance!

When **DEPLOYED**, the wheels allow you to lean a bit in both directions; they rotate on springs. This **Articulation** system lets you maneuver at slow speeds with the wheels down, and lean the bike as needed until the wheels retract. Using this capability, in the event the bike starts to wander as you leave a stop, you can and should lean the bike away from this misdirection, and the symptom will disappear!

EXAMPLE: You pull away from a stop with the wheels down. The bike starts to move to the right a bit. Lean to the left (photo at right)! The right side wheel will come off the ground; the left will flex or articulate. Soon the wheels will rise automatically, and you are on your way. Avoiding any wandering with the wheels lowered is **COMPLETELY within your control!** The system is designed to allow you to ride as you always have. If the bike is moving right; lean left, and vice versa. We will cover this more as we discuss leaving with the legs down.



STOPPING WITH LEGUP®:



When using the LegUp® LandinGear System, the rider should stop the bike the same way they always did, and basically ignore the LandinGear!

Using this methodology, your feet, **which you MUST always use**, will reach the ground at almost the same time as the LegUp® wheels (*notice Ben's feet are almost on the ground as the wheels are just down and the bike is basically just*

stopped). This reduces the time the wheels roll; eliminating any drifts, and makes the bike feel much lighter.

Paying attention to the wheels coming down, and stopping slower or longer than normal, can make you over dependent on the wheels, and allow them steer the bike needlessly. What you want here is for you to ride your bike as you normally do, and let the wheels **HELP** you balance. You will be pleasantly surprised how well they work when stopping, if you use the above approach! If the wheels reach the ground an instant before your feet; fine! If your feet come down first, and the wheels follow; also fine.

If you choose to bring the wheels down manually when you are having trouble balancing the bike after a stop, you can press the button (described later), hold onto your bike as best you can, and when the legs reach the ground, you and the LegUp® system can right the bike before it winds up on its' side. Many folks use this '**Emergency Only**' methodology to their advantage!

Keep in mind; LegUp® can support a bike that is balanced and make it feel lighter than it normally does.

LegUp® CANNOT balance a bike on its own; it is up to you to supply the balance!

The system WILL make it easier to balance the bike, but rest assured that without you supplying the balance the bike CAN and WILL go over!

PULLING AWAY WITH LEGUP® DEPLOYED:

Let's assume you are at a light or stop sign with the wheels down. First you will find it takes away a good amount of fatigue to not have to balance the bike very much while waiting for the light. LegUp® will **ALWAYS** raise its wheels automatically when a speed of about 9MPH is obtained!



As previously discussed, the wheels of the system allow some leaning left and right when they are deployed. When it is time to leave, pull away from the light or stop sign as you normally would. The slower you leave, the longer the wheels will remain in contact with the ground, and vice versa. Using a normal speed will typically get the wheels up in a matter of a second or two!

I usually like to lean a bit left or right as soon as I leave (assuming a straight line departure), so I have only one of the wheels on the ground and have the best control of the direction of the bike. On flat ground, you may not need this; only practice and your bike skills will help you determine the best way for you!

If your first maneuver upon leaving is a turn, you can lean into the turn as you always have (picture at right shows a turn as you leave... notice right wheel off the ground!). Depending on how sharp the turn is, LegUp® may allow you to lean over far enough to make the turn or not. **ALWAYS** be prepared to push the button and raise the legs manually in this case.



The instant you start the wheels up manually, the system will give you your full lean angle back.

Don't worry if you scrape the system a bit in turns of this sort. We built your LandinGear to take this type of scraping with no negative results. Your pegs don't mind and neither does LegUp®!

Of course you can raise the wheels before you leave at any time if you like! If you are concerned that your first maneuver, or an upcoming maneuver may need more lean than you can get with the wheels down, bring them up whenever you like! Manual retraction is available **anytime** the wheels are down!

Slow speed maneuvering in parking lots and in bumper-to-bumper traffic can be difficult; LegUp® can be a big help here. Caution must be used here to take advantage of this convenience.

You **MUST** realize that if you are relying on the wheels being down (keep your feet close to the ground please!), advancing your speed over 8MPH will raise the wheels! Do not get complacent! You are **ALWAYS** responsible to keep your bike balanced; mind your speed and be prepared to use your legs for balance.



In a parking lot, for example, you can lean on one wheel or another to help you make slow speeds turns that are otherwise more difficult (picture above). Straighten the bike up after the lean, and LegUp® will help support the bike. Please don't ever forget that if you lean over far enough with the wheels lowered, and don't supply balance to the bike, it **CAN** and **WILL** go over!

User Instructions

Here are the Specific instructions to enhance your new understanding of the systems capabilities. Again, please read and understand everything for your safety and success with LegUp® LandinGear!

The LegUp® system is very easy to use. Remember, LegUp® helps you maintain the balance of you motorcycle; it does **NOT** balance the bike for you!

COMPONENTS:

1) Control Switch Box

The '**Control Switch Box**' is mounted on your left handlebar switch housing. It contains two switches and two LED's.

The leftmost switch is the '**Activation**' switch and the rightmost switch is the '**Maintenance**' switch.

Between these switches, you'll find the LED's. The top LED, burns Red or Green. It indicates whether the legs are up (Green) or Down (RED). Once the system is turned on, this LED is

always on. The bottom LED, which is yellow, during normal operation, is on only when the legs are up, and it is safe to lower the legs.



2) Linear Actuator

The '**Linear Actuator**' is the power that lowers and raises the wheels that help you keep the bike upright. It is mounted on the left side of the bike, just in front of the left saddlebag. A combination of the on-board computer, and your input by the switches, allows the actuator to move the legs and wheels up and down as needed. The actuator tells the computer the exact location of the leg system at all times.

3) **On-board Computer Module**

The '*On-board Computer Module*' is an enclosure usually mounted inside your left saddlebag. It contains an extremely sophisticated computer, and a set of relays to power the Linear Actuator. The computer calculates speed, wheel/leg location and switch input to operate the LegUp® system. It has an on-board battery that allows the computer to remember specifics about your particular motorcycle.

4) **Proximity Sensor**

The '*Proximity Sensor*' is an electronic device, mounted on the left leg of the vehicles swing-arm, near the rear axle, or elsewhere. It reads the bolts on the rear wheel pulley, or a brake rotor, to inform the computer about vehicle movement.

5) **Center Stand**

The '*Center Stand*', is the attachment point for the LegUp® leg/wheel system. It bolts directly to the frame of the motorcycle.

6) **Leg/Wheel System**

The '*Leg/Wheel System*' is the centerpiece of the LegUp® system. It attaches to the Center Stand, to secure it to the bike. It includes a set of legs, and a set of wheel holders. The wheel holders attach the replaceable wheels and its sophisticated spring system. This spring system allows you the rider to actually lean the vehicle into a turn while the wheels are down, making slow speed turns much more normally than you would on a 3-wheeled motorcycle.



Using the System

Here we will cover how to use the LegUp® System. The basic steps are to turn on the computer, moving the legs up and down, and maintenance mode.

Practice each of these different functions before venturing out to use LegUp®.

Turn on the computer:

If you plan on riding the bike, you will need to start the vehicle before starting the computer of the LegUp®. The system is powered by the bike and will only function with the bike in ignition or accessory modes of the key switch. Starting the bike, takes so much battery power, that turning on the system before starting the bike, will likely turn the system off again, so **ALWAYS** start the bike before the system if you are planning to ride.

To turn on the system, make sure the key switch is in the on or accessory position. Press and hold the '**Maintenance Switch**' (the rightmost switch on the '**Control Switch Box**' on the handlebar). Continue to hold the switch down until the top LED is illuminated (red if the legs are down or green if they are up). It takes approximately 3 seconds for this to occur. This feature makes sure that you want to use the system, and others don't accidentally activate the system.

If this is the first time you turn the system on, you **MAY** see both LED's flashing. If this occurs, the on-board computer does not know the settings specific to your bike as to how far up and down to move the legs. Maintenance Mode will need to be run (later in this manual).

Lowering the Wheels:

Once the system is activated, the only switch you will use is the '**Activation Switch**', the leftmost switch. The computer knows if the legs are up or down and will tell you by a Green LED (UP) or a Red LED (Down). If the motorcycle is on the kickstand, and the legs are up, you can use LegUp® to help you get the motorcycle to stand up straight. Simply press the '**Activation Switch**' one time, and give some power toward the right with your arms or legs, and LegUp® will help you straighten up the bike. Remember; **At all times when the bike is still and supported by LegUp®, you MUST have your feet on the ground!!** While the LegUp® system can easily hold the bike upright, **you and you alone** are responsible for the motorcycles' balance. Chopper Design is **NOT** responsible for damage caused by your motorcycle tipping over at any time! This system will definitely help you keep

the rubber side down, but that is all it is designed to do; help. You will find that you will barely have to exert any strength to maintain this balance; that is the beauty of LegUp®.

Now that the bike is upright, you can drive off, push the vehicle around more easily than ever before, or now that it is balanced, manually raise the wheels!

Raising the Wheels:

To manually raise the wheels, another single press of the '**Activation Switch**', will raise the wheels. You may notice that whether lowering or raising the wheels, the top LED will flash Red/Green while the wheels are in motion. This occurs whenever the wheels are moving, something that is VERY handy when you allow LegUp® to automatically raise the wheels.

If you choose to just ride off when the wheels are lowered, you can do just that and raise the wheels in one of two ways. If you choose, as soon as the wheels start to turn and you are comfortable, you can manually raise the wheels as described above. Your other choice is to just drive off normally and allow LegUp® to raise the wheels for you. At approximately nine M.P.H., if you are accelerating, LegUp® will automatically raise the wheels. Again the top LED will flash red/green to tell you it is raising the wheels. Once complete, this LED will burn green to tell you the wheels are retracted. ***NOTE: If your first maneuver with the wheels down is a turn of any sort, you may wish to retract the legs early if you must turn more sharply than LegUp will allow. Simply press the button as soon as you start rolling, and the wheels will get out of your way quickly.***

If you find yourself in traffic with the wheels down, you can move the bike at slow speeds with them lowered (remember your legs are down as well, helping to balance the bike). Be Careful! If you are moving with the legs down and you get over nine M.P.H., the legs will raise themselves automatically. You will need to get used to how and when the legs will come up automatically, and monitor the LEDs to make sure where they are.

Normal riding:

During normal operation, LegUp® is unobtrusive. Riding down the road, the system does not get in the way of your lean angles or any other function of your motorcycle.

If you are riding and approaching a stop, you will want to be prepared to lower the wheels. LegUp® will only allow you to bring the wheels down at speeds under 10 M.P.H. The system will tell you by way of illuminating the lower (Yellow) LED on the **‘Control Switch Box’** when you are at a slow enough speed without any acceleration. Once this LED is lit you can press the **‘Activation Switch’** one time, and the legs will begin to lower.

Automatic lowering of the wheels is NOT Supported; Semi-Automatic lowering is... Read on! At any speed over 10 M.P.H. with the wheels up, if you press this switch, the Yellow (lower) LED will blink, indicating that the system will lower the wheels when your speed is reduced to approximately 9 M.P.H. Let’s call this **‘Ready Mode’**. In **‘Ready Mode’** the yellow LED will blink for as long as you maintain a speed over 10 M.P.H. You can cancel this by pressing the **‘Activation Switch’** again. The LED will stop blinking. Using **‘Ready Mode’** let’s you tell the system you want the wheels lowered at the next stop, allowing you to concentrate on controlling the motorcycle. Just stop as you normally would, and the wheels will come down in this semi-automatic fashion. It takes approximately two seconds for the wheels to lower.

We suggest making controlled stops, slowly approaching these stops as best you can, to make the transition to wheels down as seamless as possible. Again, if you ask the system to lower the wheels, you **MUST** be prepared to lower your legs as well for safety. ***ON ground that is not flat, the system will try to lean the bike parallel to the ground. Be Prepared for this! Use your legs! Once stopped, you can lean the bike against the UPHILL wheel easily, to get the bike in a perfectly upright stance. If you are prepared for this, you will find it is no big deal! We also covered how to lean away from downhill stops, earlier in this manual!***

A little practice and you will see how easy it is to adapt your riding style to the LegUp® system. **Practice; Practice; Practice** in a safe area at slow speeds to get used to LegUp®.

As discussed earlier, once stopped and balanced, you can raise the wheels manually if you wish, or leave them down until underway!

If the wheels are down, and your first maneuver under acceleration is a turn, you can lean into this turn a small amount (this avoids what we call trike syndrome) and drive off allowing LegUp® to raise the wheels at the appropriate speed. You may find it takes a little extra nudge for the bike to lean; this is normal as you are asking the springs in the wheels to compress! You will also find that LegUp® only allows a certain amount of lean (plenty for slow, non-aggressive turns), without scraping

the wheels system on the ground. Again, this is normal and the wheel system can take a good deal of punishment if you lean too far. Practice will show you how far you can lean into a turn with the wheels down. If this concerns you at all, consider raising the wheels before or as soon as you start moving to avoid this situation. Only you can learn how you might like using LegUp® to best suit your riding style. ***If at any time the bike wants to wander with the wheels down, leaning a bit away from the wandering direction will raise the inside wheel and STOP the wandering!!!***

In the event you choose to lower the wheels manually as described above (under 10 M.P.H. & Yellow LED Lit), and change your mind (the light changes or you decide to continue forward for whatever reason), another single push of the button, will raise the wheels immediately.

Things to remember:

Top LED Red – Legs are down

Top LED Green – Legs are up

Top LED Flashing – Legs are moving

TOP LED Green, Bottom LED Yellow – Legs are up and can be lowered If you wish.

Top led Green, Bottom LED not lit – Legs are up and you are traveling too fast to lower them.

Top led Green, Bottom LED blinking – Legs are up and you have initiated ***‘Ready Mode’***. The legs will lower automatically when your speed is reduced sufficiently.

ALWAYS help LegUp® balance your bike!

ALWAYS help LegUp® balance your bike!

Other Features and Operations:

Turn off Computer:

Typically you won't have to turn off the system. It is automatically turned off when you turn off the bike. In the event you wish to turn it off for another reason, it gets turned off in the same manner as it is turned on. Press and hold the '**Maintenance Switch**' (the rightmost switch on the '**Control Switch Box**' on the handlebar). Continue to hold the switch down until the top LED is extinguished. It takes approximately 3 seconds for this to occur.

Maintenance Mode:

Maintenance mode is a system that allows LegUp® to get to know your bike! It is used upon initial installation, whenever changes to the height of your motorcycle occurs (lowered shocks, heavy loads, etc.).

The purpose is to allow us to teach the LegUp® system what you consider to be 'Legs Down' and 'Legs Up'.

To enter 'Maintenance Mode', the system must be turned on. Assuming this is the case, first press and hold the '**Maintenance Switch**' and immediately press and hold the '**Activation Switch**'. Continue holding both switches until both LEDs start flashing, and release both switches. This double blinking of the LEDs indicates that '**Maintenance Mode**' has been started.

The next step is to balance the motorcycle as straight up as you can (get help with this if needed). Now press both buttons simultaneously for just an instant. This should make the lower (yellow) LED blink.

This system is now ready to set the '**Down Stop**'. If you press the left button momentarily, the legs will move down for as long as you hold it down. Similarly pressing the right button will raise the legs. Keep your weight off the seat, and set the legs down until it slightly raises the suspension of the bike or stops on its own. This will allow the actuator to press the legs onto the ground firmly during normal operation.

Once you are satisfied with the '**Down Stop**', you can set the '**Up Stop**'. Momentarily press both buttons. The Top LED should begin to blink. At this point, pressing the right button raises the legs, the left lowers them. We recommend raising the legs until they touch the bottom of your saddlebags

(don't worry, a rubber pad protects the paint). By raising the legs as high as possible, you have the best chance to be able to lean your bike over as far as you can without touching part of the LegUp® system in a steep lean.

If you are satisfied with the **'Up Stop'**, you can leave maintenance mode. **Caution:** the legs can lower unintentionally if you are not cautious, so be prepared for this. If you press both buttons momentarily, the system should return to its normal operating mode.

We recommend that you now sit on the seat, and test both the lower and upper stops while sitting still. If you are satisfied, you are done, if not, just start over as described above.

LegUp® will remember the settings you just made indefinitely, with or without power applied to the system. The new computer has no battery to wear out. Its memory does not require it!

ENJOY your LegUp®!!!

Using LegUp® as a Kick Stand:

The 'Actuator' of the LegUp® system, will remain in whatever position it is in when power is removed. With this in mind, you can store your bike in the upright position if you wish with the following cautions:

A bike with the wheels down **CAN** be pushed over!

We suggest you lower your kickstand, balance the bike, and lower the wheels, then turn your handlebars to the left slightly. Using this method, if something breaks, or the bike is bumped hard, it will land on its' kickstand.

Using LegUp® to Help you lower the Bike onto the Kickstand:

If you want to let LegUp® help you put the bike on the kickstand, all you need to do is have the wheels down when you get the bike to where you want it to be parked on its' kickstand. Assuming the system is on, balance the bike, lower the kickstand, and press the left button. LegUp® will lower the bike gently onto the kickstand.

Using LegUp® to Help you raise the Bike off the Kickstand:

If you want to let LegUp® help you raise the bike off the kickstand, all you need to do is have the system on with the bike on its' stand, and the wheels up. Straddle the motorcycle, press the left button, and lean the bike just a bit to the right. With just a little help from you, LegUp® will raise the bike fully upright!

Pushing your bike with the wheels down:

With Caution, you can push your bike out of parking spots, or move it forward or back to clean the tire/wheels. Understand that LegUp® will hold the bike up, but with the right nudge, over it can go!