

# Eggfinder LCD Users Manual

Rev 2.01c



## California Proposition 65 Warning

**WARNING:** This product contains chemicals (lead) known to the State of California to cause cancer and birth defects or reproductive harm.

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This kit includes a special low-temperature ultra-fine leaded solder wire. Including the solder with the kit ensures that you will have solder that can be used to mount the surface-mount parts in the kit. Leaded solders have been used for over a century in electronic assembly, but you should take the following precautions when using it (or just about any chemical, for that matter):

- Do not eat or drink while using it
- Wash your hands after handling it
- Keep it in the protective bag when you're not using it

The MSDS can be found at

<http://www.kester.com/download/245%20FluxCored%20Wire%20Lead%20Alloy%20SDS.pdf>

The European Union RoHS (Restriction on Hazardous Substances) regulations exempt kits such as the Eggfinder from its regulations, because they are not for resale and since it is well known that hand soldering with non-leaded solder is much more difficult and more damaging to heat-sensitive components.

(For information on EU/UK versions, please visit [www.EggtimerRocketry.com](http://www.EggtimerRocketry.com))

## Important Regulatory Information

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

**It is intended to be used ONLY for educational and experimental use in Class II/III amateur High Power Rockets which are classified as aircraft by the Federal Aircraft Administration (CFR 14 §101.25), and which must by FAA and NFPA regulations be operated at least 1,500' away from any populated buildings. Although unlikely, this device may cause interference with consumer devices that run on the unlicensed 902-928 MHz band, and therefore must not be used in residential areas.**

The Eggfinder uses RF modules in the 902-928 MHz ISM band manufactured by Hope RF, model HM-TRP-915. They are intended to be used only in the United States, Canada, Australia, and other countries in which this band (or a subset of it) is not subject to licensing. These modules have been tested by Hope RF to be compliant with the FCC Part 15 regulations for non-licensed intentional emitters, and as such have been permitted to be imported into the US. However, Hope RF (at the time of this document) has not obtained formal certification with the FCC. As a hobby kit, designed for educational and experimental purposes, the Eggfinder is considered by the FCC to be “generally exempt” from authorization requirements. Nonetheless, we have made a good faith attempt to comply with all technical regulations, and you should too by building it **exactly** as per the instructions, and by using only the antenna on the transmitter module that we recommend in the instructions, or a suitable replacement as outlined in the Appendix.

Because the Eggfinder runs on an unlicensed band, there is no protection against interference from other sources; basically, you get what you get. We’ve done substantial testing and are confident that your Eggfinder system is unlikely to be significantly affected by outside radio sources, but there’s no guarantee.

If your Eggfinder causes interference in a residential setting, or with licensed radio systems (such as TV or ham radio), you **must** stop using it until you correct the problem. This is extremely unlikely given the small amount of power and the “tightness” of the transmitter’s output, and in particular the distance from any population that HPR rockets must be flown. Nevertheless, you need to be aware of this, and be willing to abide by the rules. These are the same rules that govern other non-licensed transmitters, such as cordless phones, WiFi and Bluetooth® devices, and garage door openers.

## **Important Links:**

FCC Part 15 (governing unlicensed intentional emitters)

<http://www.ecfr.gov/cgi-bin/text-idx?SID=adb12f74b498e43ec453f7899e9ef0fd&node=47:1.0.1.1.16&rgn=div5>

FAA Regulations for Amateur Rocketry (Part 101)

<http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&rgn=div5&view=text&node=14:2.0.1.3.15&idno=14>

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## **Before You Start...**

- Go to our web site at [www.Eggtimerrocketry.com](http://www.Eggtimerrocketry.com) and download the latest Release Notes.
- Go to our web site at [www.Eggtimerrocketry.com](http://www.Eggtimerrocketry.com) and download the latest Assembly/Users Guide..
- Read them thoroughly before starting... it will save you some grief later, we promise!

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Thanks for buying an Eggtimer GPS Tracker! The Eggtimer is a hobby rocketry GPS tracker that uses a GPS module and a 900 MHz license-free transmitter module to broadcast your rocket's location in real-time to a computer or tablet. With appropriate GPS tracking software, which is available for free on the Internet, you can actually track your rocket in flight, and ultimately find out exactly where it landed.

Like other Eggtimer Rocketry products, we sell it as a kit, to keep costs down and provide an outstanding value. This means that you have to do a little work, of course, but considering that most hobby rocketeers that would use our products have some degree of electronics expertise, this should not be much of an impediment. If you do not have any experience soldering kits such as the Eggtimer, we recommend that you ask around... chances are that somebody in your rocketry club would be more than happy to assist you for a small bribe (beverages work well!).

The Eggtimer LCD receiver can be used with any of the Eggtimer Rocketry telemetry products: The Eggtimer TX and Mini GPS tracking transmitters, the Eggtimer TRS combination dual-output altimeter and GPS tracking transmitter, and the Eggtimer Telemetry Module for real-time telemetry from the Eggtimer Quark, Quantum, Flightlogger, and Proton altimeters. Depending on the device, it may display GPS-derived coordinate data and navigation directions, and when used with altimeters it can display real-time altitude, velocity, channel status, flight phase status, and other flight data.

## Meet the Eggfinder LCD Receiver

The Eggfinder LCD receiver receives the data from your Eggfinder GPS transmitter, and decodes the GPS data into readable (and usable) form. You get the GPS coordinates, the GPS altitude, the number of satellites in view, and a timer that shows how long it's been since your last valid fix (which ideally should be no more than a few seconds). With the addition of the LCD-GPS module, you can also get the compass heading of your rocket, its distance from you, and an arrow and bearing that point to your rocket.

If you are using the Eggfinder LCD with your Eggtimer Telemetry Module, it will show you whatever telemetry your altimeter can provide... typically real-time altitude, velocity, time of flight, and milestone data such as apogee and maximum velocity. You can also get status information such as deployment channel status, battery voltage, and temperature.

Once you familiarize yourself with the display and its options, it's pretty easy to use... there's only one button.

## Configuring Your Eggfinder LCD

You can configure the following parameters on your Eggfinder LCD:

- Device Type – Configures the Eggfinder LCD specifically for the transmitting device
- Display Units: Altitude and Distance can be displayed in either Feet or Meters.
- GPS Coordinates: Can be displayed in Degrees, Degrees:Minutes, or Degrees:Minutes:Seconds to match your navigation device/app.
- Frequency: Can be set to any Eggfinder frequency (909-925 MHz by 2 MHz)
- ID Code: Up to 8 codes can be used (Note: The original Eggfinder TX version B4 boards only supports ID Code zero).

**Note: Be sure to turn OFF your transmitter after you program your Eggfinder LCD receiver.**

Configuring your Eggfinder LCD is easy. When you see the status screen:

```
Status: 915 0  
G:D U:F 6.3V
```

HOLD the button down for about 2 seconds, then release it. You will then see the first of the configuration screens.

### Programming Mode Receiver Config

This menu configures the following parameters:

Device

Units

GPS Display Units (for GPS-enabled devices only)

If you tap the button, you will see the next programming menu:

### Programming Mode Frequency/ID

This menu will allow you to set the Frequency and ID (if supported) of your LCD receiver.

And if you tap it again, you'll get

### Programming Mode Both Menus

This selects both menus... simple enough.

To select the menu, hold the button down for about 3 seconds, then release it.

To change parameters, PRESS AND RELEASE the button for less than one second. The value will cycle to the next value, and you will hear a short beep. When the parameter is what you want, HOLD THE BUTTON for over two seconds then release it. You will hear a long beep to confirm that your selection is being saved, then the next screen will display. Repeat the procedure for the other screens, until you're done. If you want to keep the value that's displayed, just hold the button for over two seconds so that it saves the displayed value.

When the final screen has been saved, you will see

**OK**  
**Reset to Continue**

At this point, you need to turn off the power, then turn it on. It will start up with the new configuration, and you will be ready to go.

## **Configuration Screens:**

### **Device Configuration:**

**Programming Mode**  
**Device: TX/TRS**

#### Possible Values:

**TX/TRS** – (the default) Display coordinate/navigation data, auto-select for an Eggtimer TRS or an Eggfinder TX or Mini GPS transmitter

**TX/Mini** – Display coordinate/navigation data, skip the TRS “pairing” screen

**TRS** – Select for an Eggtimer TRS

**Quark** – Select for an Eggtimer Quark with the Eggtimer Telemetry Module

**Quantum** – Select for an Eggtimer Quantum with the Eggtimer Telemetry Module

**Proton** – Select for an Eggtimer Proton with the Eggtimer Telemetry Module

### **Units Configuration:**

**Programming Mode**  
**Units: Feet**

#### Possible Values:

**Feet** – Display GPS Altitude and distances in FEET

**Meters** – Display GPS Altitude and distances in METERS

**GPS Coordinates Configuration:**  
(skipped for Eggtimer Telemetry Module use)

**Programming Mode**  
**GPS Fmt: D**

Possible Values:

**D** – Display GPS Coordinates in DEGREES and fraction of degrees (5 decimals)  
Example: 34.12345, -115.19283

**D:M** – Display GPS Coordinates in DEGREES:MINUTES and fractions of minutes  
(2 decimals)

Example: 34:07.40, -115:11.57 (the “:” separates the Degrees and Minutes)

**D:M:S** – Display GPS Coordinates in DEGREES:MINUTES:SECONDS

Example: 34:07:24, -115:11:34 (“:” separates Degrees, Minutes, and Seconds)

**Frequency Configuration:**

**Programming Mode**  
**Freq: 915**

Possible Values:

909-925, by 2's (909, 911, etc...)

Note: This may vary by region... see the International Notes at the end of this guide.

**ID Configuration:**

**Programming Mode**  
**ID: 0**

Possible Values:

0-7

Note: Original Eggfinder TX transmitters version B4 and below (cir. 2014) do not support frequency programming, and were shipped with an ID of zero. If you have one of these, set your LCD's frequency to whatever was shipped with the TX, and set the ID value to zero. All Eggtimer TRS's, Eggfinder Mini's, and Eggfinder TX transmitters B6 and above support both frequency and ID configuration, as do all versions of the Eggtimer Telemetry Module.

# Using Your Eggfinder LCD with an Eggfinder TX/Mini

Note: This applies to using the Eggfinder LCD receiver with the Eggfinder TX or Eggfinder Mini GPS transmitters. Instructions for using the Eggfinder LCD receiver with the Eggtimer TRS Flight Computer are located in the Eggtimer TRS User's Guide. For instructions on using the Eggfinder LCD receiver with Eggtimer altimeters and the Eggtimer Telemetry Module, please skip to the section titled "Using Your Eggfinder LCD with the Eggtimer Telemetry Module".

Also, if you have the Eggfinder LCD-GPS Module option for your Eggfinder LCD receiver, please read the User's Guide for it after you have read the Eggfinder LCD User's Guide, it covers the additional navigation capabilities you get with that option.

The first step in using your Eggfinder system is to mount the transmitter board in your rocket. See the Eggfinder User's Guide for information on that, we won't go over it again here, except to repeat our mantra:

**KEEP THE ANTENNA AWAY FROM ANYTHING METALLIC!**

Enough said...

OK, we assume you've already tested the transmitter and the LCD after you finished building them, so you have an idea of how they work. We'll go into the display in detail first, before we talk about how you can use the data to find your rocket.

A typical Eggfinder LCD display looks like this:

33.12345 4■ 0  
-116.64738 1326

The first number on the top (**33.12345**) is the Latitude, the number of degrees above the equator (or below the equator, if negative). The ranges is 0-89.99999. It is taken out to 5 decimal points, accurate to about 3 feet. Note that you can also display the coordinates in Degrees:Minutes, or Degrees:Minutes:Seconds. We recommend that you use the Degrees setting if you can because it's the most accurate, but the others are available if the application on your handheld device requires one of them.

The second number on the top (**4**) is the number of active satellites, from zero to 9. In this example, it's "4". If you get really lucky and there are more than 9 active satellites in view, you will see a "\*" in it's place.

The block character after the number of satellites (■) is a bar graph that represents the Horizontal Dilution of Precision (HDOP). This is a number that is derived mathematically from the position of the satellites vs. an "ideal" position that would produce a fix of the highest precision. 1 is excellent, 2 is good, 3 is OK, 4 is fair, 5 or 6 is so-so, and anything higher means that your fix's resolution may not be so great. Rather than showing you another boring

number, we use a bar graph, but we normalize it so that bigger is better and smaller is not as good. If it's nearly to the top, that's good, if there's only a few bars, not so good. The reality is that with 4 or more satellites, it's almost always below 3.0 unless you happen to get unlucky and have a brief span of time in which the satellites are all mostly overhead. Even when that happens, if you wait a few minutes one usually shows up over the horizon and has a very good effect on the HDOP.

The final number on the top display (**0**) is the number of elapsed seconds since the last fix. If you're getting constant data, this is going to be a zero, and you will hear a nice beep every second or so. Once your rocket launches and you lose GPS lock under boost, the beeps will go away, and you'll see the counter start incrementing. Typically, in 5-20 seconds depending on the speed of your rocket you'll start hearing the beeps again, and the position will update. When that happens, the timer will reset to zero again.

On the second line, the first number (**-116.64738**) shows the Longitude, the number of degrees East of the Prime Meridian (or West, if the number is negative). The range is 0-179.99999. It is taken out to 5 decimal positions, accurate to about 3 feet. You can also display this number in Degrees:Minutes or Degrees:Minutes:Seconds if you select those display options.

Finally, the number at the end of the second line (**1326**) is the last reported GPS altitude. The default units are Feet, but you can also configure it to display in Meters. Now, it would be very nice if this number was updated in real-time during your flight so you could use it to find out your apogee and how quickly it's coming down, but unfortunately that's not the case. GPS is designed primarily for lateral/surface navigation in relatively slow-moving vehicles, so unless you have sophisticated GPS equipment beyond the capabilities of consumer-grade GPS units it's not going to do a very good job of resolving altitude in real-time for something fast-moving like a rocket. It DOES work well if the GPS unit doesn't move vertically very much, so you WILL get a "base" altitude while the rocket sits on the pad, and you should get a reasonably good reading while the rocket is coming down under parachutes.

Now, you may be wondering what good this number is if it's not terribly accurate. We have found that, as inaccurate as it is, it IS a good indication of whether your rocket has landed or not, as long as you're in range. In general, you will pick up the altitude at about 600' AGL or so, and you'll be able to see it drop until it either stabilizes or you lose the signal (typically somewhere below 100' AGL unobstructed assuming you're still within 3 KM range). Clear-view ground range is typically about 1/2 KM, more with an external antenna, so if you get a fix and it's at or near your launch ASL altitude then you can be sure it's on the ground even if you can't see it. You will also find that the altitude number is more likely to be accurate at higher altitudes, typically above 10,000' AGL.

## Using the Eggfinder LCD Data

There are several things you can do with this data, but you will need one other tool to use them... a GPS-enabled smartphone. Now, just about everybody has one of these nowadays, and you don't even need to have cellular data coverage to use it to find your rocket. (You DO need it if you want to display a pretty map of your launch site, but most launch sites don't look

like much anyway, so unless you have some roads that you can use as a reference they probably aren't going to help you much anyway.)

The general idea is that you are going to enter the GPS coordinates into your smartphone navigation app, create a waypoint (some apps don't require you to do this), and tell it to navigate to those coordinates or waypoint. The internal GPS in your smartphone will track your current location on the ground as you approach the rocket's location, and tell you which direction to go and how far it is. All you need to do is to follow the track, and voila! your rocket will be there.

As you approach the rocket, or if it never goes out of range, the beeper on the Eggfinder LCD will beep once per second to let you know that it's getting a fix from the Eggfinder TX transmitter. In the event that your rocket isn't quite where the initial coordinates said it was (i.e. because it got dragged on the ground by the wind, or a well-meaning fellow hobby rocketeer picked it up for you...) you'll be able to tell, because the coordinates in the display will change. Trust us, we've had this happen... many times!

## **Coordinate Memory Save**

Nothing would be worse than having the GPS coordinates on your display disappear because the batteries went dead, or if it accidentally got turned off. To help prevent this potential catastrophe, the Eggfinder LCD automatically saves every 10<sup>th</sup> valid fix into non-volatile memory. In addition, if you lose the coordinates for over 10 seconds, it will automatically be saved into the LCD's memory too.

This allows you to turn it off and save battery life if you find that the rocket landed some distance from you and it's going to take awhile to get to it. To recall the last saved coordinate, power-cycle the LCD receiver, and at the "Waiting for Fix" display hold the button down for 3 seconds then release it. The last received coordinates will display, along with the "\*\*\*" in the time-from-fix field that lets you know that it's "stale" data. If you receive a valid fix while the saved data is being displayed, the LCD receiver will start receiving packets normally, displaying the real-time coordinates, HDOP, etc., and of course it will save every 10<sup>th</sup> fix after that

## **Navigating with Compass Heading & Distance**

In addition to computing the latitude & longitude from the GPS, it can also calculate the compass heading and distance from a fixed point that you "set". Since the Eggfinder LCD doesn't have its own built-in GPS unit it can't give you that information from where you "are", but it can tell you what those values are from a starting point... typically, this would be your launch pad. Note: If you have the LCD-GPS module, please refer to the LCD-GPS Module User's Guide for differences between this screen and the one with the GPS module installed.

To display the Navigation screen, hit the button. You will see something that looks like this

**216**  
**10**

The top number is the compass point from the "home" point.

The bottom number is the rocket's distance from the "home" point, to the nearest 10'.

The first time that you press the button sets the home point, so you should not press the button until you reach the place that you want the compass and distance calculated from. For example, if you want to set the home point as the launcher, wait until your rocket is on the rod/rail before you press the button. If you want the home point to be your work table, press the button there. If you want the home point to be a particular observation point, press it when you get there. You get the idea...

## Using Your Eggfinder LCD with the Eggtimer Telemetry Module

In addition to decoding the GPS tracking data from an Eggfinder GPS transmitter, the Eggfinder LCD receiver can also decode the data from an Eggtimer Telemetry Module connected to a supported altimeter, giving you real-time flight information. Note that you can not use your Eggfinder LCD to receive BOTH GPS tracking data and telemetry data at the same time; you have to configure it for the transmitting device that you're going to be using. If you want to use an Eggfinder GPS transmitter and an Eggtimer Telemetry Module in the same rocket, you will need a separate LCD receiver paired to each transmitter, and we recommend that you set the Eggfinder GPS transmitter and the Eggtimer Telemetry Module to different frequency/ID channels.

Telemetry data is sent out by the altimeter every two seconds. The information that you receive on the display depends on the altimeter... here is a matrix of what you can get from each altimeter with an Eggtimer Telemetry Module connected:

	Quark (Pre-D3)	Quark (D3+)	Quantum	Proton
Realtime Altitude	X	X	X	X
Realtime Velocity			X	X
Realtime Acceleration				X
Deployment Status		X	X	X
Channels Enabled/Disabled			X	X
Elapsed Flight Time			X	X
Flight Phase		X	X	X
Apogee		X	X	X
Max Velocity			X	X
Temperature			X	X
Battery Voltage			X	X

In general, you'll get real-time altitude, flight status, apogee, and deployment channel status from all of the altimeters, with the Quantum and Proton you'll also get real-time and maximum velocity.

Details on the specific displays for the Eggtimer Telemetry Module are found in the Eggtimer Telemetry Module Assembly and Users Guide... please refer to that document for details.

# Optional Hardware Mods

## Using a HC-06 Bluetooth Module

Although the LCD display makes using the Eggfinder LCD a snap, if you want to be able to provide a real-time track feed into your laptop/tablet/phone from the Eggfinder LCD you'll need to use an HC-06 Bluetooth module. Conveniently, we have provided both a physical spot to mount the HC-06, as well as a connector to connect it to the board.

First, you'll need to get an HC-06 Bluetooth module. We recommend that you look on eBay, search for "HC-06 Bluetooth"... you'll find a lot of them, they are generally under \$10. Make sure you get one that already has the right-angle 4-pin connector; they will usually come with a 4-pin header-header cable too. Make sure you do NOT get the raw module without the carrier board; you won't be able to connect it to your Eggfinder LCD.

Now that you got your HC-06 module, here's how to mount/connect it:

\_\_\_ If you have already mounted the board/LCD in the case, remove the module from the case, and separate the board from the LCD module.

\_\_\_ Plug one end of the cable into the pins on the HC-06 module.

\_\_\_ Turn the HC-06 module over, you will see markings next to the pins. Record the color of the cable for each pin, so you can make sure that you match them up to the pins on the board later.

3.3V	_____
GND	_____
TXD	_____
RXD	_____

\_\_\_ With some double-stick tape (not included), mount the HC-06 module on the top of the board in the space provided just below the processor, so that the pins face the right edge of the board (the side with the RF module).

\_\_\_ Mount the LCD/board onto the case top (see the previous assembly instructions).

\_\_\_ Bend the cable back against the bottom of the board, then underneath itself in an "S" curve. Plug the cable into the 4-pin connector on the board, making sure that the cable isn't twisted and that the cable pins match up with the pins on the HC-06 module (i.e. top pin from the HC-06 goes to "3.3V", second pin to GND, etc. Make sure you match the colors of the cable up to the same pins on the bottom of the board as they were on the HC-06 module.

Now, you'll need to test it. In general, you will need to load the Bluetooth-serial driver for your device, and "pair" it with the HC-06. The pairing code for all HC-06 modules is "1234" (that should be easy enough to remember!). In the case of an Android device, you'll need to install the Bluetooth GPS software, which will allow the internal GPS in the Android device to be replaced with the remote GPS over the Bluetooth serial connection.

\_\_\_ Turn on your Eggfinder TX transmitter, then turn on the Eggfinder RX receiver.

\_\_\_ Turn on your laptop/tablet/phone, go to Bluetooth Devices (Windows) or install Bluetooth GPS (Android), and pair it to the HC-06 using the "1234" pairing code.

\_\_\_ Once it's paired, you should start seeing the light on the HC-06 blinking as data is transmitted through the Bluetooth connection. If you do NOT see the light blinking, chances are that you have the cables crossed up; turn off the Eggfinder LCD receiver and check your cable connections.

At this point, you'll need to install some kind of mapping software on your device, see the Eggfinder User's Guide for suggestions and general instructions on using mapping software with the Eggfinder system. If you have a Windows laptop, we recommend MapSphere; it's free and it does a very good job.

## **Installing a Backlight Switch**

The black-on-yellow reflective LCD display is designed to be highly readable in outdoor lighting conditions, and reasonably readable indoors with decent lighting. However, some of you brave souls may attend launches that have night-flight waivers. (If you've never seen a "sparky" motor at night, you should try to attend one of these launches... it's really cool!) Besides lighting, having a GPS tracker makes it MUCH easier to get your rocket back, but you'll need to be able to see the display at night. The Eggfinder LCD module has a built-in yellow backlight, which is normally not connected, but can be easily enabled.

To enable the backlight, you will need a small single-pole single-throw switch, and a little bit of wire. Micro-size toggle switches work fine, as do push-on push-off switches). Simply wire the terminals of the switch to the two pads near the top of the LCD module header labeled "BL". Mount the switch in the case appropriately. Turn on the Eggfinder LCD, flip the switch, and the backlight should come on. Note that the backlight draws a fair amount of power, so you should make sure it's turned off when you don't need it.

## **Installing an External Push Button**

If you have several different Eggtimer transmitters, an Eggtimer TRS, or the Eggfinder LCD-GPS module, you will find that having an external push button makes using it much easier. It keeps you from having to pop open the case just to change options, and allows you to "set" the home waypoint so you can use the navigation screen.

You can use just about any SPST momentary push button switch with your Eggfinder LCD. There are two pads marked "SW" right above the push button on the LCD board, you simply solder two wires to those pads and solder the wires to your switch. The switch will now work in parallel with the switch on the LCD board, so pressing either switch will have the same effect.

## Installing a RP-SMA Connector for an External Antenna

If you decide to install a RP-SMA connector for an external antenna on your Eggfinder LCD board rather than using the “stick” antenna, you will need to follow the directions below.

For each board on which you want to install a connector, you will need:

- \_\_\_ RP-SMA board-edge connector, straight, .062” (1.5mm) board thickness  
(Linx Wireless part number CONREVSMA003.062 or equivalent)

You can get these from Eggtimer Rocketry, and you can also get them from electronics distributors such as DigiKey, Mouser, and Future Electronics. They’re under \$5 each in small quantities.

If you look at the connector, you will see that there are two sides, separated by the thickness of the PC board. The TOP side has three pins, the BOTTOM side only has two (there is no center pin). Inside the outside-threaded connector is a pin; this is why it’s called a “reverse” connector, normally outside-threaded connectors have a socket in them and the matching connector (with inside-threads) has a pin.

- \_\_\_ Slide the RP-SMA connector on the edge of the board, so the three pins on the top line up with the pads on the top of the PC board. With some masking tape, tape it into place on the bottom of the board so it won’t move, leaving the pins and pads on the top untouched.

- \_\_\_ Solder ONE of the side pins on the top side to the pad on the top of the board. (Note: You may find that the solder that comes with the Eggfinder LCD kit is too fine for soldering these large pins to the board; if that is the case, use some “conventional” .032” 60/40 rosin-core solder for the outside pins, but you DO need to use the included solder for the center antenna pin.) Let it cool for at least 30 seconds.

- \_\_\_ Check the connector to make sure that it is straight. If it has gotten a little crooked, heat up the solder joint and gently move the connector into place.

- \_\_\_ Solder the other two pins to the pads on the top of the board.

- \_\_\_ Turn the board over, remove the masking tape, and solder the remaining two pins to the pads on the bottom of the board.

# Eggfinder LCD Quick Start

## Coordinate Screen (GPS Tracking default)

33.12345 4 ■ 0  
-116.64738 1326

33.12345 – Latitude

-116.64738 – Longitude

4 – Number of satellites in view

■ – HDOP bargraph (more bars = better quality fix)

0 – Time since last fix

1326 – GPS ASL (above sea level) altitude... best effort, accuracy is dependent on quality of fix

## Navigation Screen (without LCD-GPS Module)

Press the Button to toggle between the Coordinate and Navigation screens.

The FIRST time that you press the Button, it sets the “home” point for calculating the data (unless you have the LCD-GPS module... see its User’s Guide for details)

246  
1293

246 – Compass direction of the rocket **from your home point**

1293 – Downrange distance of the rocket **from your home point**

## Navigation Screen (with LCD-GPS Module)

Press the Button to toggle between the Coordinate and Navigation screens.

246                    240  
1293                  ← L12

246 – Compass direction of the rocket **from your LCD receiver**

1293 – Downrange distance of the rocket **from your LCD receiver**

240 – Your track (the compass direction that YOU are moving)

L12 – The direction and number of degrees to your rocket... L12 is “Left 12 degrees”