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MicroPilot Autopilot

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Abstract

The goal of this project was to program a MicroPilot 2128g autopilot device applying Horizon^{mp} software to achieve autonomous flight using an 8’ wingspan RC aircraft. The main focuses throughout this project were to modify aircraft construction to accommodate the autopilot unit, learn the functions of the software to communicate with the autopilot, and to determine the requirements for the autopilot device to work properly. One of the main difficulties encountered was establishing communication between the software and autopilot. For the software and autopilot to communicate properly Windows XP was required. In the software it was necessary to input GPS coordinates of a selected area; once this was achieved it was possible to insert waypoints for the autopilot to track using a GPS antenna. When in flight aircraft maneuvers can be monitored via laptop display using the software and wireless COM’s communication.

Introduction

The MicroPilot autopilot was obtained by Montana Tech roughly five years ago and has never been put to use. The goal of the project was to modify an RC aircraft to support the autopilot unit, learn the Horizon software and join the two together to achieve autonomous flight. Tom Moon was our mentor to assist in decision making and to pilot the RC aircraft. System contains numerous devices and are linked as shown in the block diagram in figure 2. The MP2128g autopilot (shown in figure 1) has a vast array of capabilities; it is fully integrated with 3-axis gyros, GPS, pressure altimeter, pressure airspeed sensors, and extensive data logging and telemetry. This package all combined allows the autopilot to direct an aircraft at set speeds and altitude between waypoints.

Figure 1 - MicroPilot 2128g autopilot unit

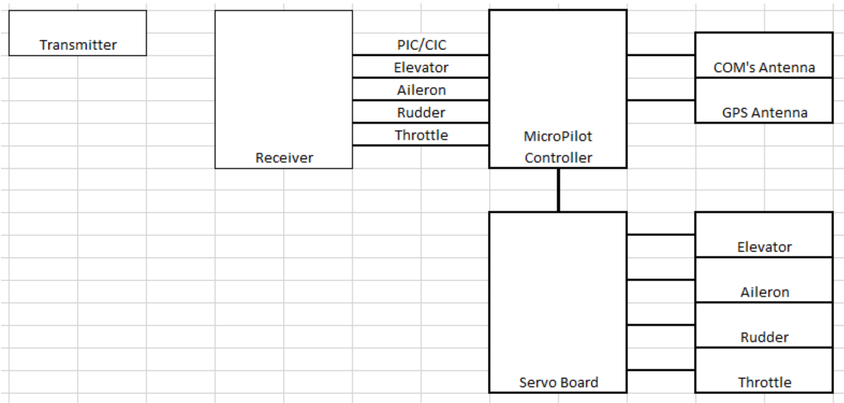

Figure 2 - System Block Diagram

Problem Statement

The main purpose of this project was to get the MicroPilot 2128g autopilot to be functional and to produce a simplified user manual. To achieve functionality of the autopilot, the air craft in our possession needed to be modified to house the unit, as well as the orientation of the servos needed to be relocated for balance. Battery switches were needed to charge the batteries mounted in the nose of the plane since they will be inaccessible.

Learning the Horizon^{mp} software is crucial to connecting the autopilot and making servo adjustments. It is also through this software that you will be able to monitor in flight plane orientation, elevation, and speed; as well as making inflight adjustments (shown in figure 3).

Success will be determined based on achieving autonomous adjustments of the autopilot when pitching and rolling the aircraft. In flight testing is the ultimate goal.

Figure 3 - Horizon software main screen

Constraints

The constraints encountered throughout this project include no access to technical support from MicroPilot; being that technical support costs roughly $750/year. Access to a computer that runs strictly Windows XP software. The communication link when hardwired to MicroPilot component requires a RS232 to USB converter with a FTDI chip (shown in figure 4).

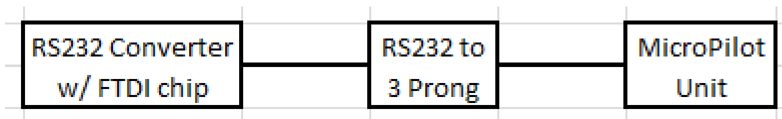

Figure 4 - Communication link

Safety

When flying an RC aircraft many safety precautions need to be considered. When turning on the aircraft; controller on first, aircraft on second; when turning off aircraft; aircraft off first, controller off second. Always stay clear of propeller when aircraft is being started and while in operation. Be sure there is plenty of room to fly the aircraft. Be sure to handle and store fuel safely, and always mark containers for identification. Be sure that all batteries contained in the aircraft have a proper charge so that the chance of losing control is reduced. Do not fly higher than 400 feet within 3 miles of an airport.

Resources

Fortunately most of the resources needed were easily obtained with help for Tom. Items that were obtained throughout the course of the project were a new propeller, materials to relocate servos, laser cutter to build a new platform for the autopilot device, covering tools to patch holes in aircraft, and a Windows XP laptop.

Testing

The current testing has predominantly been performed in a lab setting, and non-flight testing outdoors. We have achieved autonomous adjustments based on pitch and roll maneuvers; the autopilot attempts to correct the aircraft back to level flight. Wireless COM's communication has been achieved and GPS lock was successful. We performed a ground test with waypoints and walked the aircraft around the loop to test check point steering of the aircraft. During this exercise we

Figure 5 - Completed Aircraft

had trouble getting the GPS to lock on the waypoints; this is one of the final milestones besides in flight testing. We have not performed an inflight test; but the aircraft is at a point were in flight testing is possible after getting waypoints properly established.

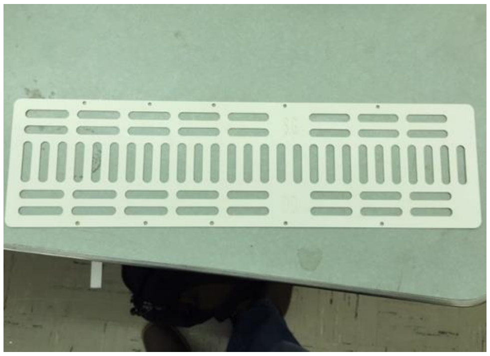

Figure 6 - Platform Template

Design

When beginning the project we obtained the MicroPilot device, Horizon^{mp} software, manuals for each and the 8' foot wingspan aircraft. The RC aircraft that we obtained hadn't been flown in years so the first step was to take the aircraft out to the air field and get it in the air and determine its capabilities. We determined that the plane was quite tail heavy and required full throttle to maintain elevation and speed.

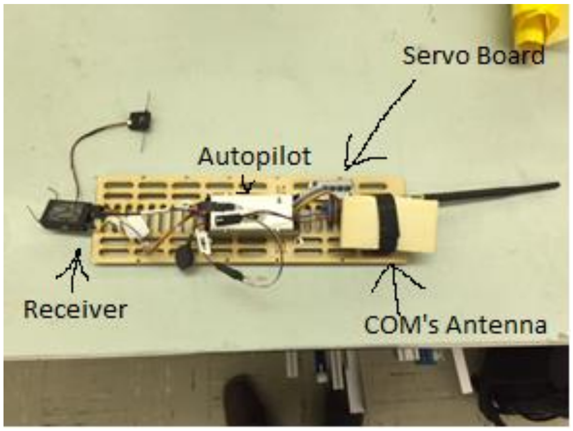

Figure 7 – Mounting platform with Components

After flying the aircraft without the autopilot we determined the aircraft needed to be more balanced and had to accommodate the autopilot device. We began by using the laser cutter to cut a new platform to mount the autopilot unit; this platform fits securely inside the body of the aircraft. We cut a template prior to using the wood material for the final platform (shown in figure 6).

The platform was cut and the autopilot unit was mounted in the center of the board (figure 7) with the servo board and COM's antenna mounted to the rear (right) and the receiver mounted at the front (left). These four devices were all connected together; the receiver is connected to the autopilot device via the throttle, elevator, rudder, ailerons, and control plugs; all of which are labeled. The autopilot has a single plug coming out the rear of the device that plugs in to the servo board; the white wire plugs in and aligns with J1 labeled on the servo board. The COM's antenna has two plugs one connects to the autopilot labeled PWR and a battery is plugged in to the remaining plug to power both the COM's and the autopilot unit.

Figure 8 - Servo relocation and Battery Switches

The laser cutter was used once again to cut the servo mounting board for the rudder and elevator. The two servos were mounted to the board with small mounting screws (shown in figure 8). Two rails were cut and glued in to the fuselage to mount the new servo board. Two battery switches were installed in the side of the aircraft to switch power on and off to the autopilot and receiver. The two switches also double as charging points for the two batteries mounted underneath the fuel cell.

For the new location of the servos, extensions were needed to reach the control horns mounted on the rudder and elevator (shown in figure 9).

The test flight of the aircraft without the autopilot showed that we had to fly the aircraft at full throttle to maintain speed and elevation; therefore we opted to replace the propeller. We obtained a propeller with more pitch to gain increased thrust in hopes to make it unnecessary to fly the aircraft at full throttle. The difference in propellers can be seen below in figure 10.

We mounted all components within the body of the aircraft, and used film to patch the holes that were remaining from the relocation of the servos.

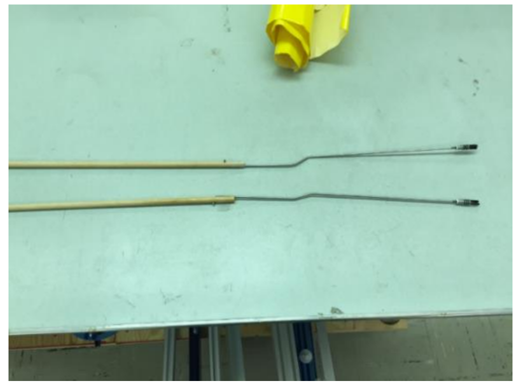

Figure 9 - Servo Extensions

Figure 10- New propeller with increased pitch (right)

Power

The MicroPilot autopilot can handle voltages ranging from 4.8V to 27V. We mounted two 6.6V batteries in the nose of the plane underneath the fuel cell; the batteries are padded and wrapped to avoid fuel contamination. These batteries power the autopilot, COM's antenna, and receiver. These two batteries are charged and controlled from two switches mounted on the exterior of the aircraft. The switch orientation is; when pulled out batteries are in a chargeable state and when pushed in power is being sent to the autopilot, COM's antenna, and receiver. The switch located closer to the front of the aircraft controls the receiver and the switch located further back powers the autopilot and COM's antenna.

A third battery is required to run the servo board; this is the power supply for all servo movement. This is a 4.8V battery mounted on the upper platform; this battery can be removed at operator's convenience.

Software

The software used to make adjustments to the MicroPilot autopilot is Horizon^{mp} software. This area of the project proved to be the most challenging; we were using a Windows 7 laptop with a Windows XP converter. After fighting this for roughly four weeks we learned that the convert was eliminating the license key. We needed a computer that ran strictly Windows XP to obtain

COM's connection. COM's communication is required to obtain aircraft control; in the software there is a connect button in the upper left corner of the screen. Press this after the power to the autopilot has been on approximately 1 minute. This waiting time is necessary for the autopilot to go through its initial checks; be patient during this process. Directions how to use this software is clearly defined within the user's manual located in Appendix A.

Documentation

When being introduced to this project very little information of previous work was available. Throughout this project we have documented all emails to and from MicroPilot, weekly progress reports, and produced a simplified manual to use the autopilot device. The emails, and progress reports are all contained within Appendix B of this report.

Conclusion

Producing autonomous movements of the aircraft was the main goal of this project; as well as developing a user friendly quick start guide. We started with an aircraft that was very tail heavy and needed modified to accommodate the MicroPilot autopilot. This autopilot has been in the possession of Montana Tech for roughly five years; therefore technical support was not available due to cost. Once the plane was modified; obtaining COM's connections was next on the list, this proved to be quite difficult. Numerous weeks were spent trouble shooting the connection problems; the solution was to use a computer running strictly Windows XP. We have successfully produced a simplified user manual and attained autonomous adjustments when pitching and rolling the aircraft. When the nose of the aircraft is pitched downwards the elevator lifts to correct the aircraft back to a level flight position. When rolled to the right; the right aileron moves downward, and the left aileron lifts to correct the roll of the aircraft back to a level flight orientation. I would consider the project a success, but flight testing is still a final confirmation of proper function, getting the aircraft in the air is truly the only determination of autonomous flight. Servo gains will most likely need to be adjusted when getting the aircraft in the air, those values will need to be determined through in flight testing.

Appendix A – User Manual

Installation of Autopilot

1.1 Autopilot

Before anything is done, make sure that the autopilot component is installed into the plane securely. This can be done by using screws and some washers so that it can sit up off the platform.

1.2 Receiver Connection

Once you have the autopilot installed, with the servo board, you can now connect it to the receiver. The receiver is labeled with the ports for each of the three prong wires. Once those are connected properly, you can connect the battery to the battery 1 port. Place the ground/black wire to the outside of the receiver to have proper connection.

1.3 Servo Connection

The on the servo board, ports 1, 2, 3, 4, and 6 will be the ports that you will use for each servo. When connecting the servo's to the ports, make sure that the ground/black wire is towards the back of the plane. The battery that will be connected to the servo board has its own port and the black/ground wire of the battery will be connected to the pin closest to the front of the plane.

1.4 Push/Pull Switch Connection

The push/pull switches that are mounted on the side of the plane for charging purposes are wired with the ground wire towards the back of the plane. When connecting the charger to the batteries, make sure that the switches are pulled out. When the switches are pushed in, the autopilot and receiver will have power.

MicroPilot Configuration Wizard (Setup Wizard)

Open up the setup wizard in the MicroPilot folder:

Click on start<<all programs<<MicroPilot Horizon 3.4<<Setup Wizard.

2.1 Determining COM Port

Once you have this opened, it will ask for the COM's port that the autopilot is using. You can find this by using the following instructions:

Click on start<<Control Panel<<Click on systems<<click on the hardware device<<click on ports/COM's<<Find the port/COM by removing the connection, and then reconnecting it. By doing this, if you keep watching when you replug it back into the computer, you will see the port/COM show up.

When you have the COM's port that you will be using, you then will select the baud rate that is compatible with the component that you have. You will use 9600 for the 2128g (15900 for the 2128LRC). Click connect to make sure that you can communication. This will take a few minutes so be patient and don't get frustrated. Once you have communication and it connected, you will then be moved to the page, figure 2.1 to select the units that you will use.

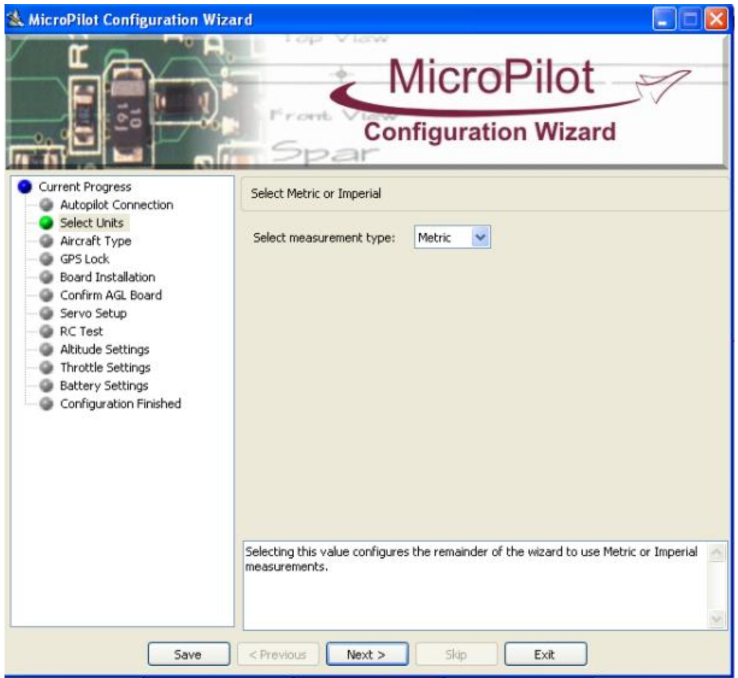

Figure 2.1

2.2 Aircraft Type

You will then be taken to the next page, figure 2.2 which will let you select whether it is a helicopter or fixed wing aircraft. Select the type that you will be using (this case, select Fixed Wing Aircraft).

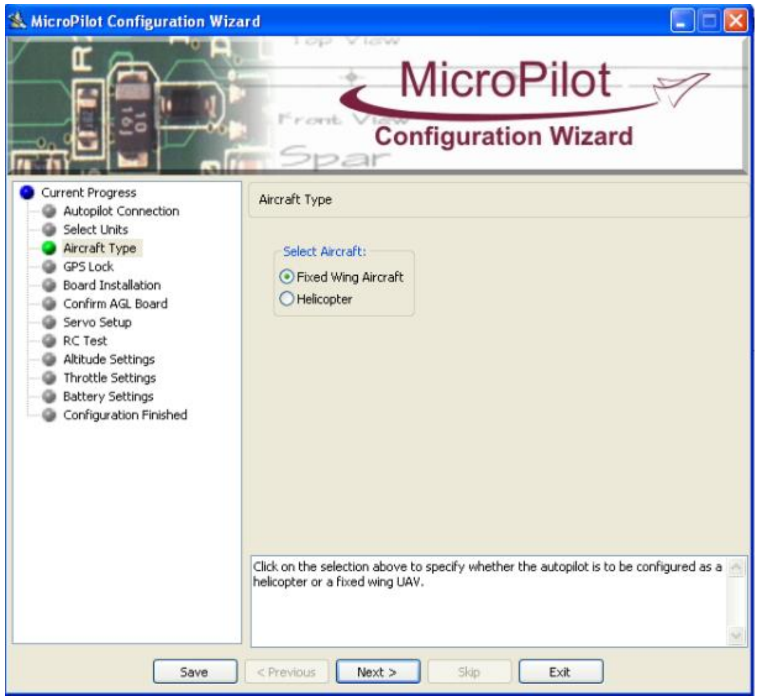

Figure 2.2

2.3 GPS Lock

The next page is the GPS Lock page, Figure 2.3. For the initial setup, you will click the "Fake GPS" so that you can do the configuration inside. Later you will have to get a GPS Lock, but for now, just Fake it.

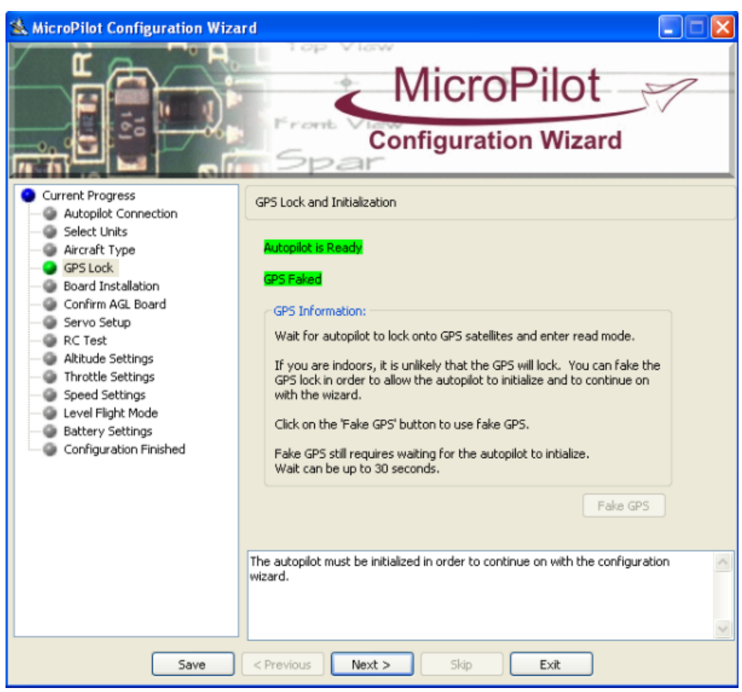

Figure 2.3

2.4 Board Installation

The next page is the board installation, figure 2.4. On this page you will have to do a couple of tests to make sure that the autopilot component is installed the plane correctly. The first test will be to tilt the plane to the left/right past 28 degrees (roll check). The next test is the pitch test, which you will point the nose of the plane past -28 degrees (pitch check). Once you have done both of these tests, you will get a "test is complete" and you will be able to click the "Next" button.

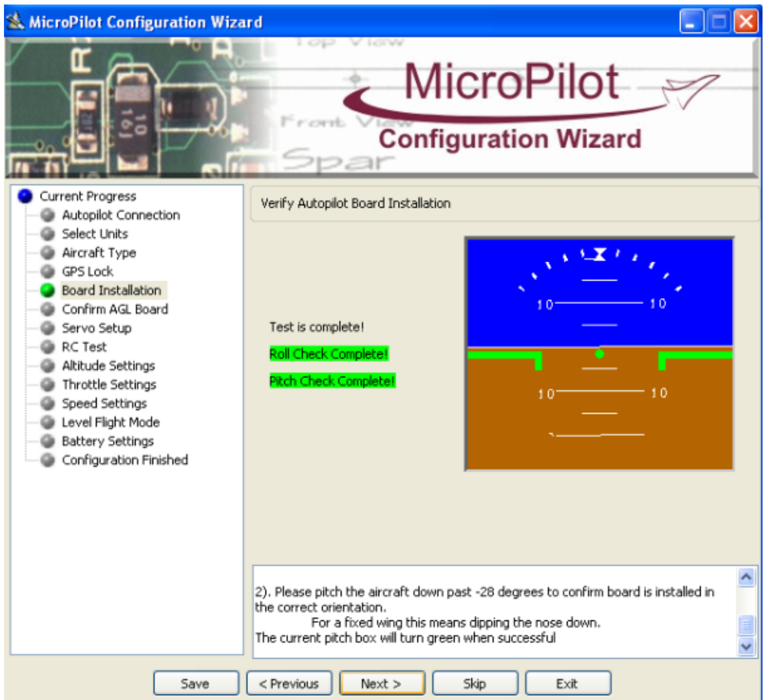

Figure 2.4

2.5 Determining AGL

You will then come to a page, figure 2.5. It will allow you to select whether or not you have an AGL installed (this case, we don't have an AGL).

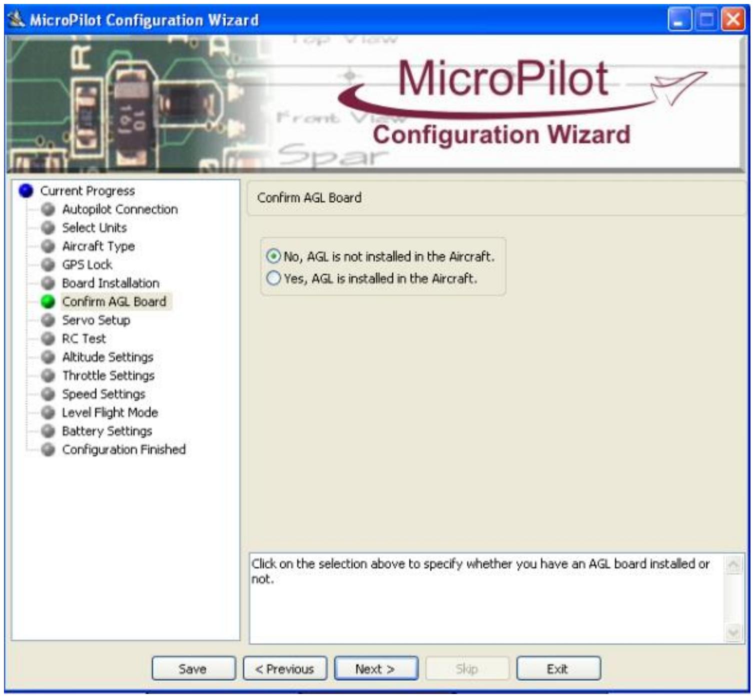

Figure 2.5

2.6 Servo Setup

This next page is an important page, figure 2.6, and you should make sure you know what type of plane you have. There are three choices:

1. No Flaps: the airframe has no flaps
2. Separate Flaps: the airframe has separate flaps and ailerons
3. Combined Flaperons: the airframe has one servo controlling each aileron independently.

Whichever plane type you have, it will show the servo's that you will have/need (this case, select the combined flaperons).

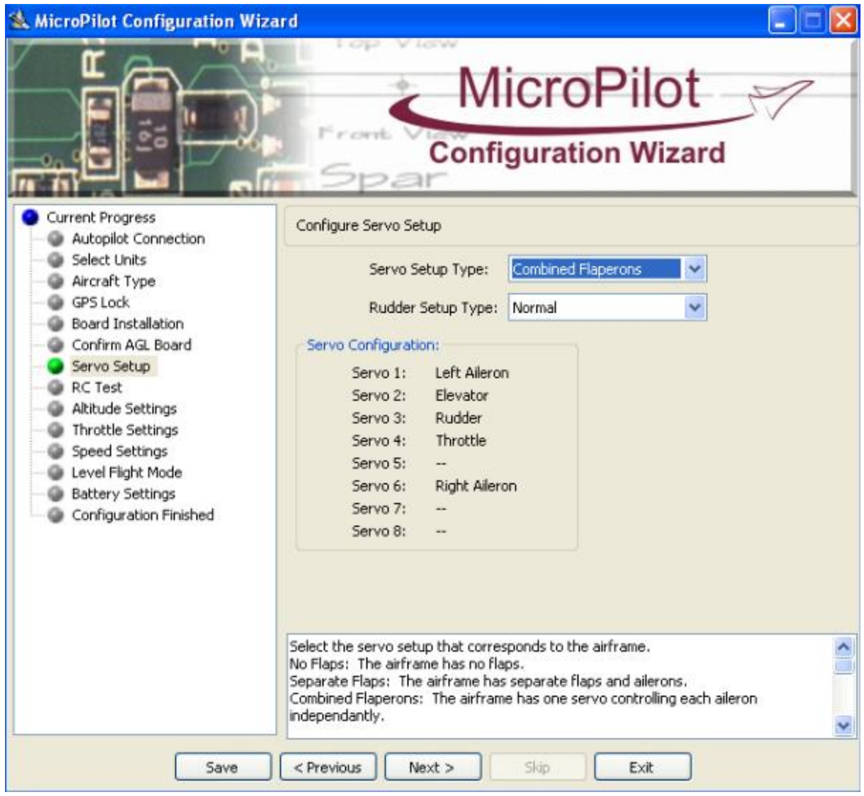

Figure 2.6

The next few pages, figure 2.7 – figure 2.11, will allow you to adjust the servo's to their zero position along with their max position. Find the zero position first so that will be the default of the servo. Then you can find the maximum range by adjusting the slide bar left or right and then you can test the min, max, and zero by clicking the test buttons.

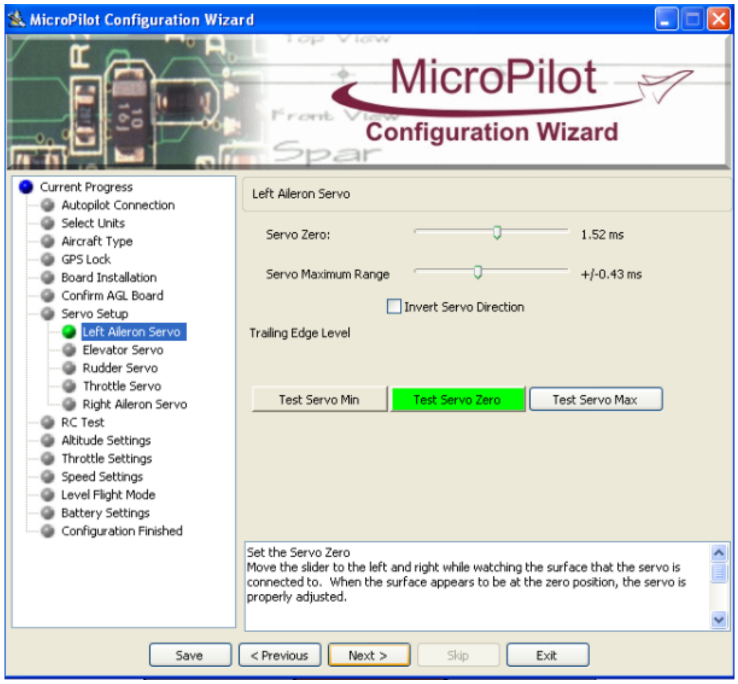

Figure 2.7

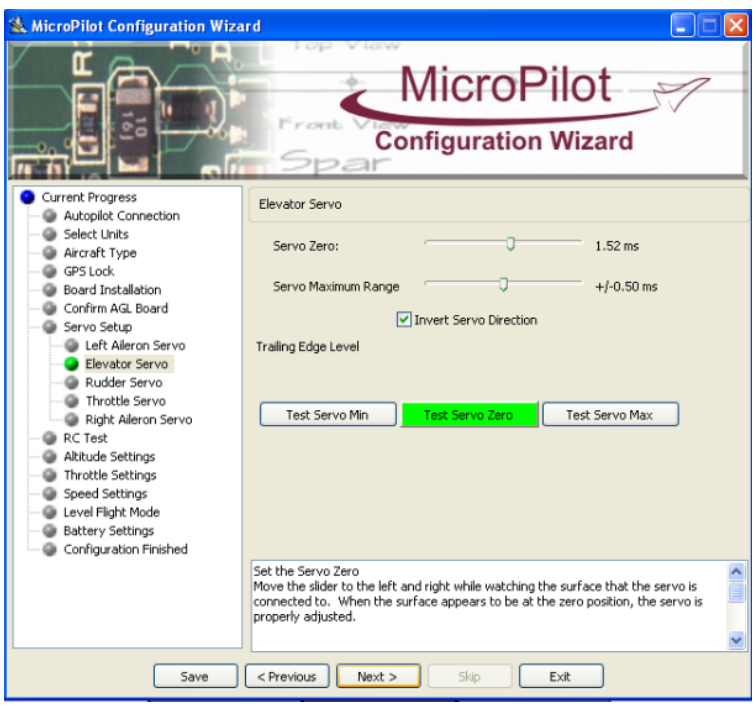

Figure 2.8

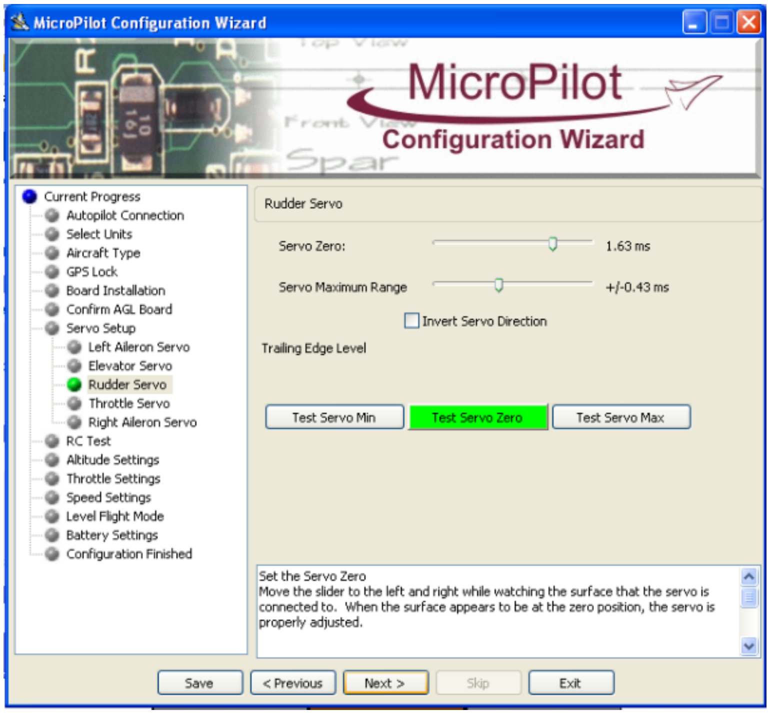

Figure 2.9

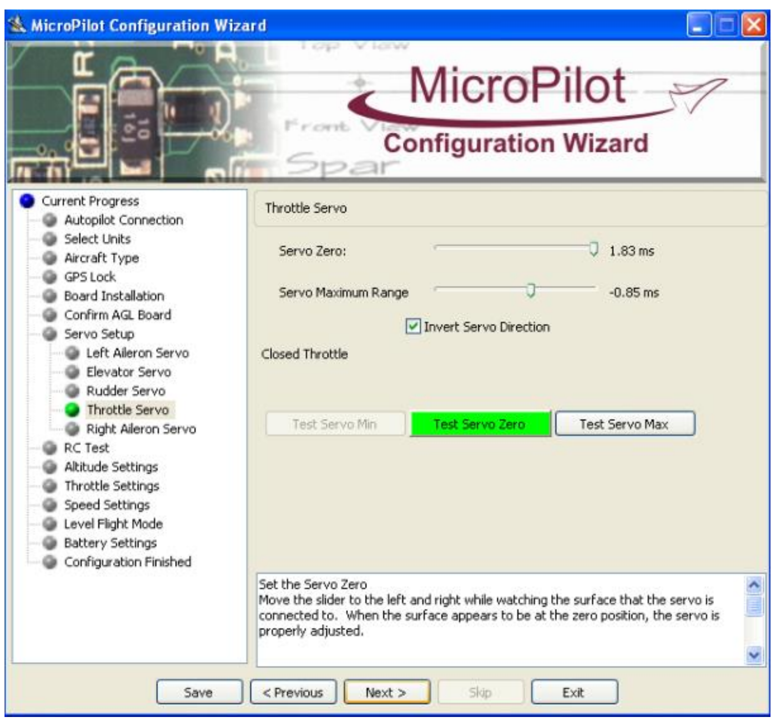

Figure 2.10

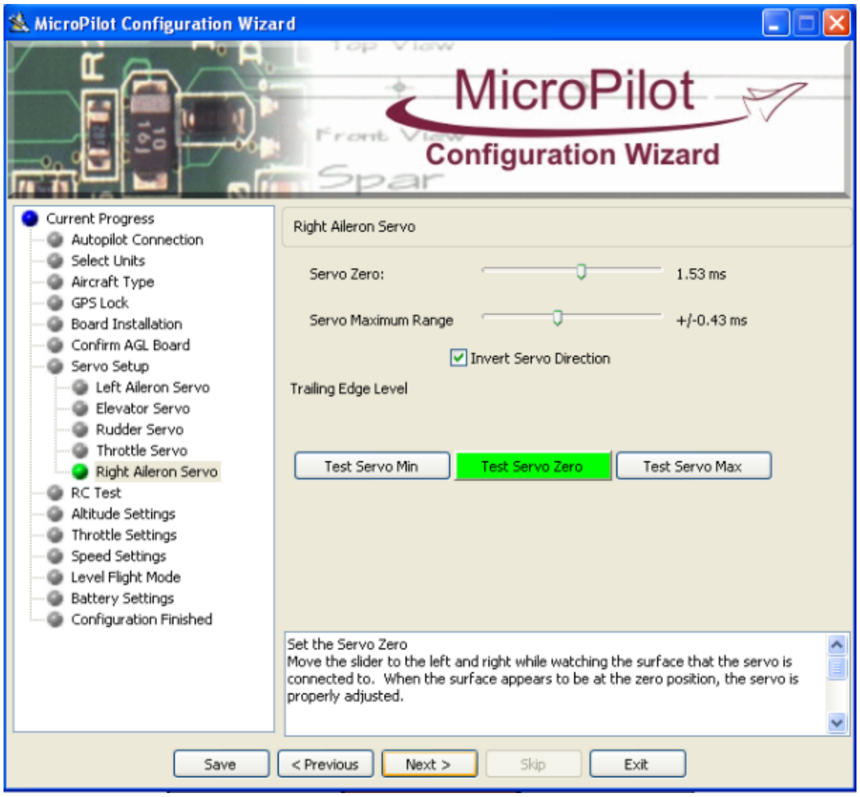

Figure 2.11

2.7 RC Test

The next page, figure 2.12 – figure 2.13, is the RC test which is testing the transmitter and the receiver and making sure that you can get communication between the two. When you turn on the transmitter, you should get a green "ON". If you don't then your transmitter has not connected, and you need to do this step before moving on. Once you get the green status, you can then switch modes from PIC to CIC. This will be a different switch for different transmitters (this case, switch gear 5 up or down to change the modes). Based on the transmitter that we have gear 5 down is CIC (computer in control), and gear 5 up is PIC (person in control).

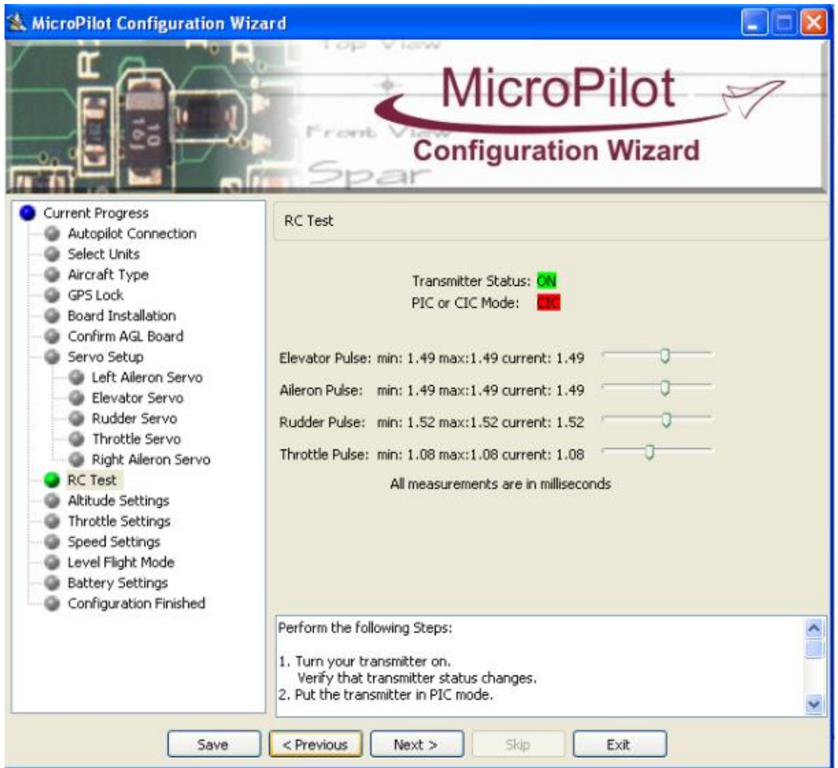

Figure 2.12

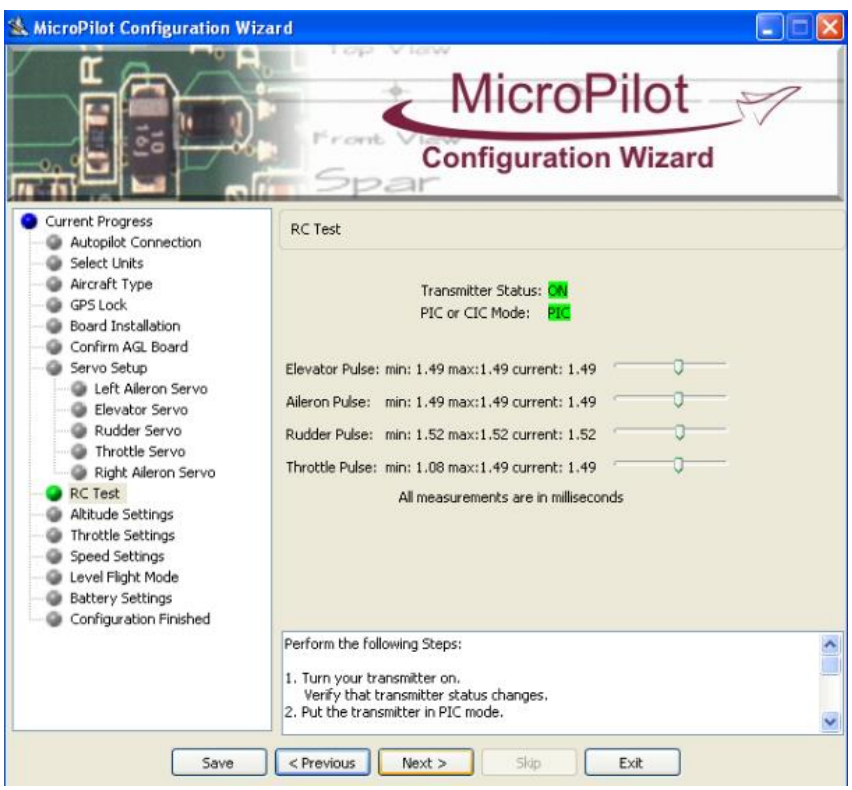

Figure 2.13

2.8 Altitude Settings

The next page, figure 2.14, needs some numbers that will be important to the autopilot component and the waypoints that you will pattern for the autonomous flight. These numbers are for the flare altitude which should be set to 1m, waypoint radius should be 10m and the circuit altitude should be 70m.

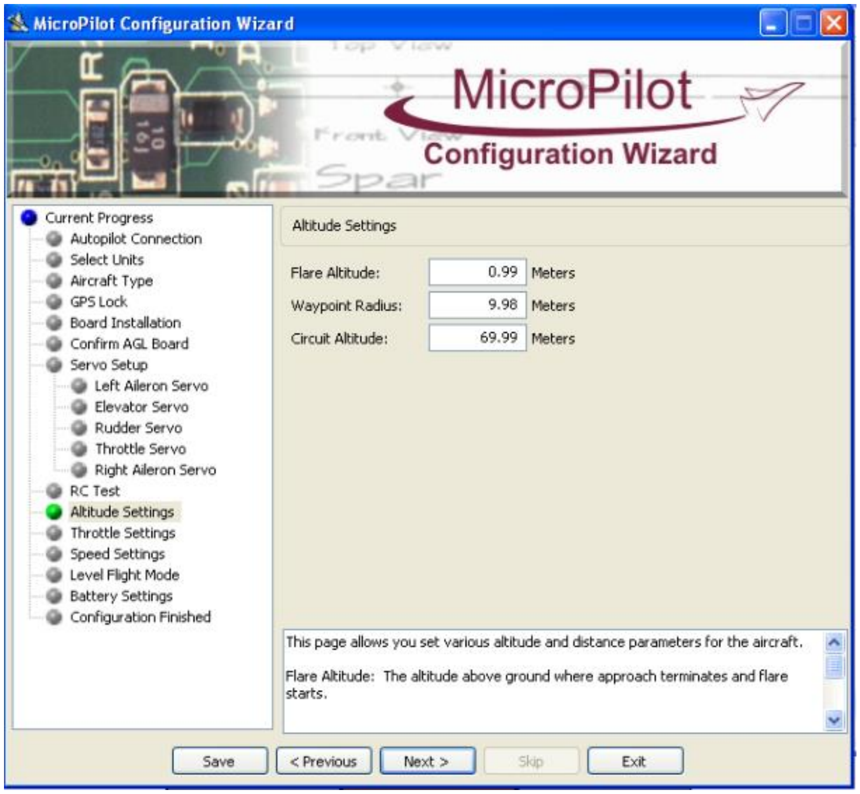

Figure 2.14

2.9 Throttle Settings

The next page, figure 2.15, is for the throttle settings. On this page, you will set the cruise, approach, climb, descent, idle, and takeoff throttles. These are all dependent on the type of plane and also the person that is flying the plane. Everyone has different flying techniques (this case, put these values in):

1. Cruise Throttle: 80%
2. Approach Throttle: 6%
3. Climb Throttle: 100%
4. Descent Throttle: 20%
5. Throttle Idle: 11%
6. Takeoff Throttle: 100%

Not all of these throttle controls will be used necessarily, but it all depends on the flight pattern you have whether you are taking off from the ground or if you are starting the autonomous flight in the air.

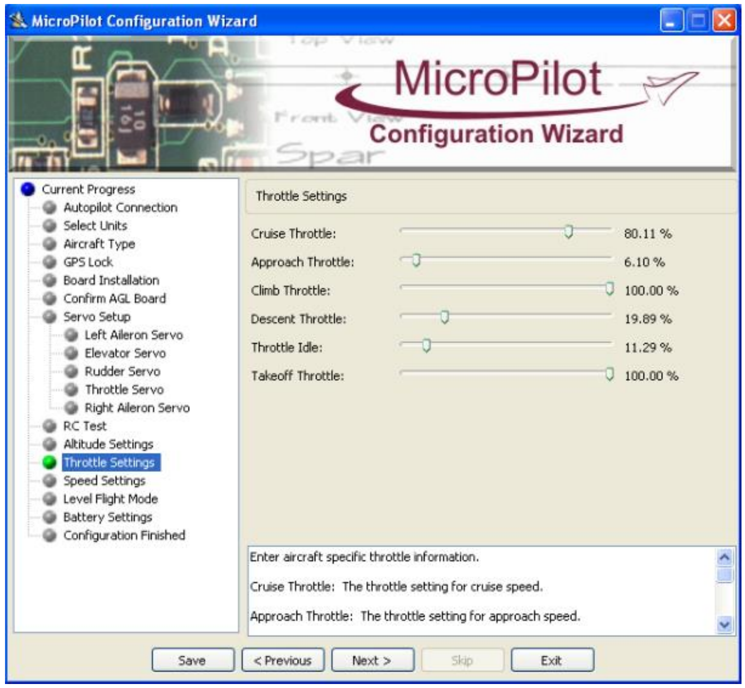

Figure 2.15

2.10 Speed Setting

The next page, figure 2.16, is the speed setting page. This page will depend on how fast you want your aircraft to climb, rotate, cruise, and a couple others that are necessarily important (this case, enter the numbers you see in figure 2.16).

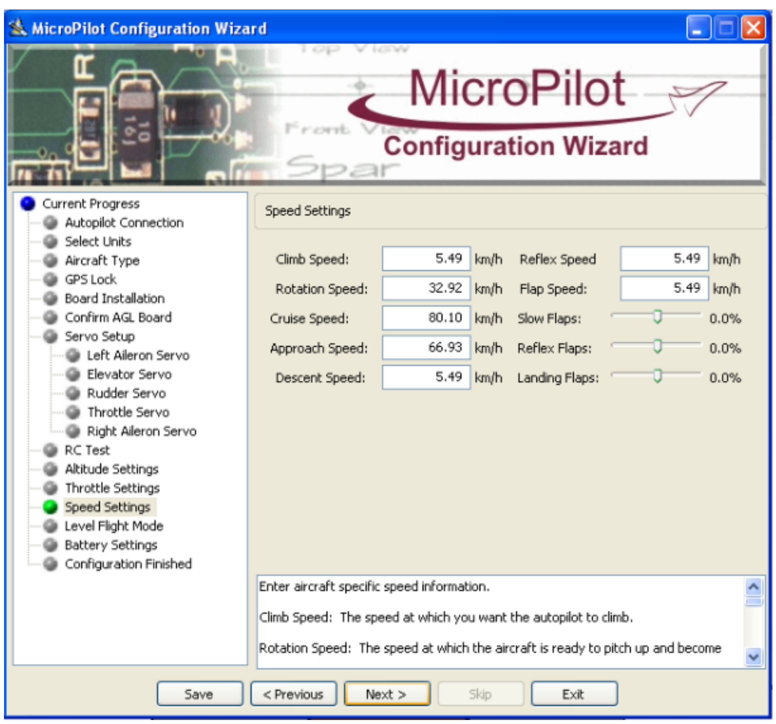

Figure 2.16

2.11 Level Flight Mode

This next page, figure 2.17, is the level flight mode which has a couple different options to choose from depending on the aircraft that you have (this case, select the Elevator Controls Altitude, Throttle Controls Airspeed). Also you can put in 10m for the climb margin.

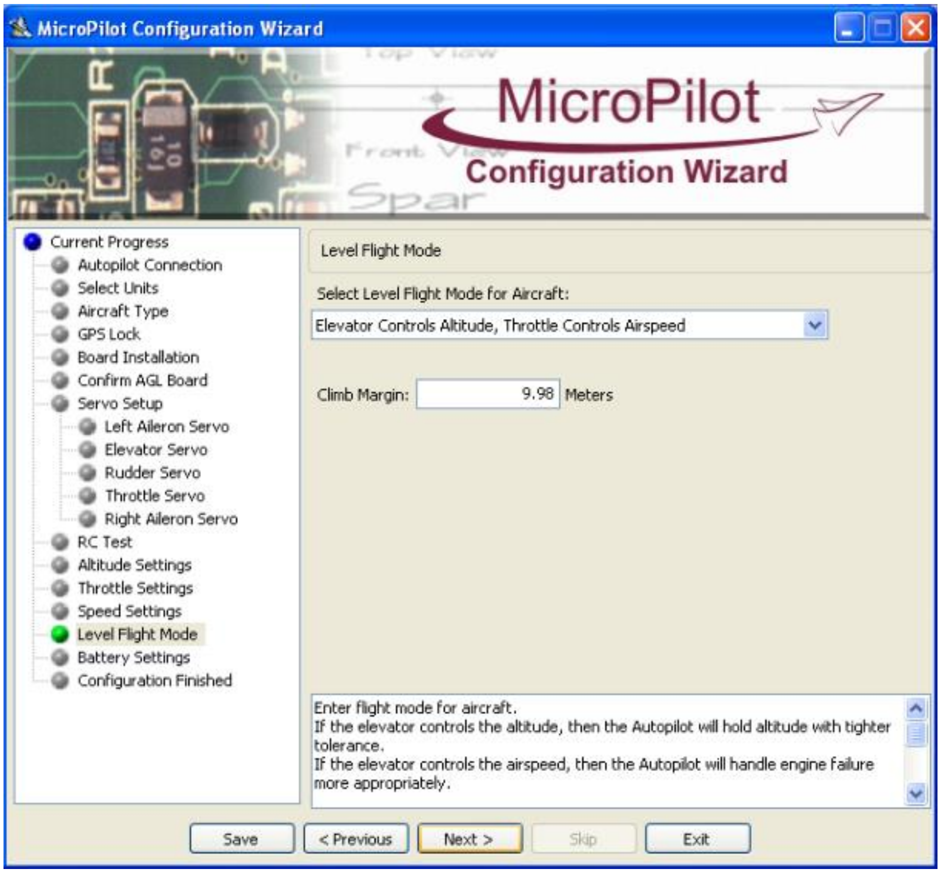

Figure 2.17

2.12 Battery Settings

Next is the battery page, figure 2.18. This page you will have to figure out what size of batteries you plan on using and what you want the low voltage to be for the error window, figure 2.19. The low voltage is mainly for the safety of the plane so that when you go to fly your plane, you don't have a battery die on you when it's up in the air. Once the voltage gets passed the low voltage setting, it sends an error message to that you have a low battery to the error window.

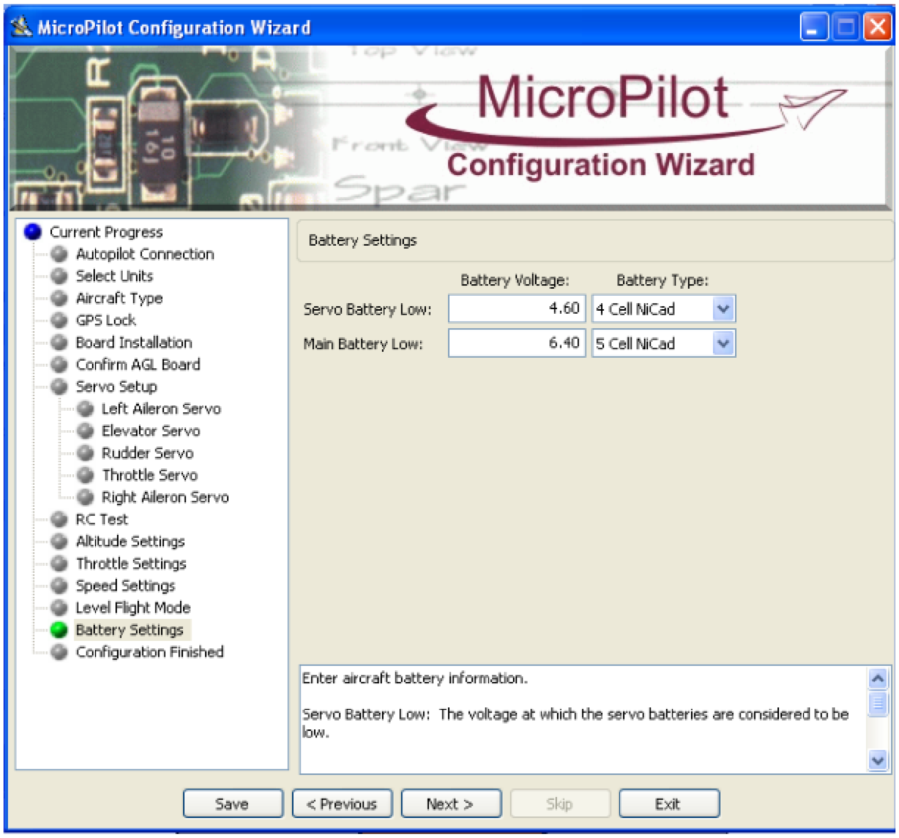

Figure 2.18

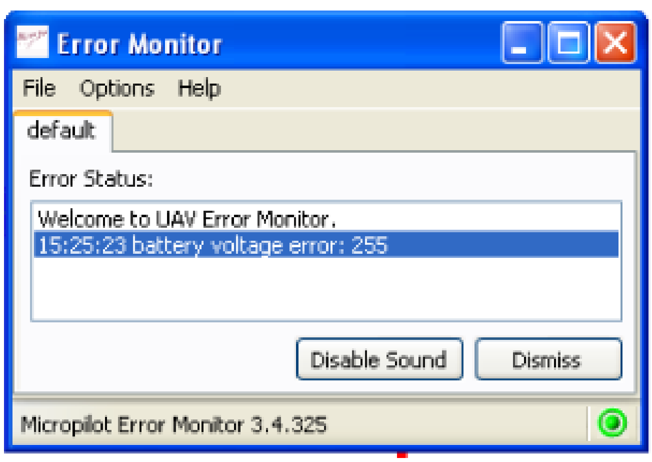

Figure 2.19

2.13 Configuration Complete

You have now finished the Wizard Configuration for your autopilot component, figure 2.20. Allow the program to save the file so that when you connect your component to the computer, it will use that configuration and so you won't have to complete it every time.

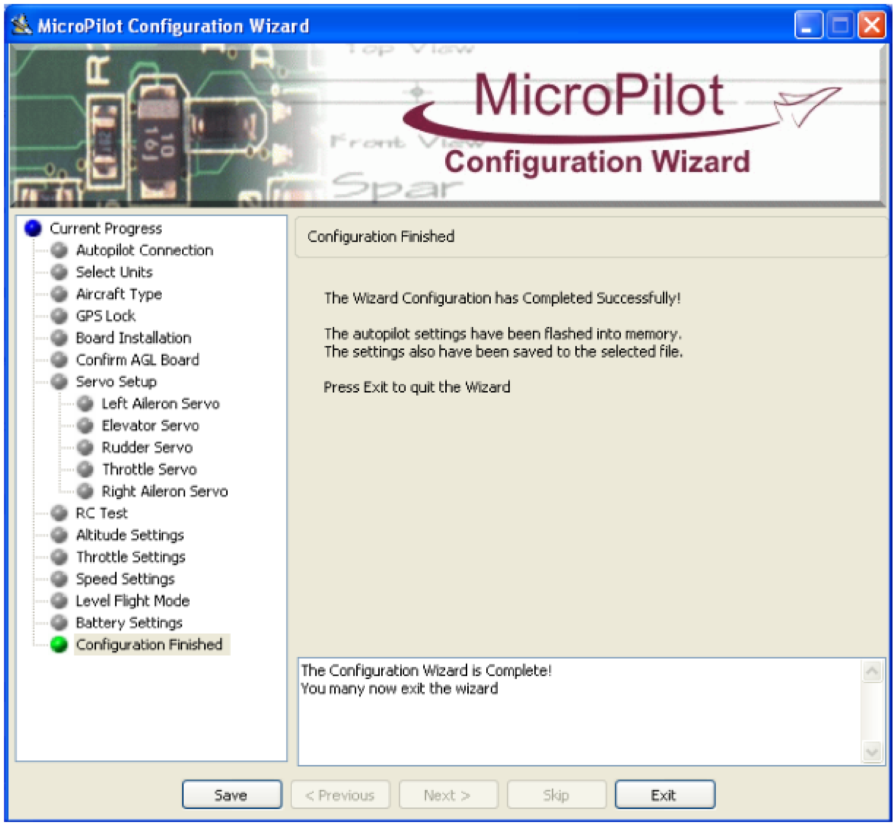

Figure 2.20

Horizon

Open up Horizon 3.4. Once you have Horizon open, in the upper left corner of the page, click the down arrow and select one of the UAV's (this case, select UAV – 01). Once that is selected, you will see a "Connect","Simulate", and "UAV" below it.

3.1 Horizon Settings

Now open up the Horizon settings window. You can do this by going to the setting tab, and then select Horizon settings. A window will open up with several tabs that you can change the setting for. The basic tabs that you will use at first are the "Sim" and "Comm" tabs.

3.1.a Sim Tab

First settings tab is the "Sim" tab, figure 3.1. In this tab you want to choose the Simulator type that you will be using (this case, select the 2128). This will insure that your component and Horizon will be on the same simulation type.

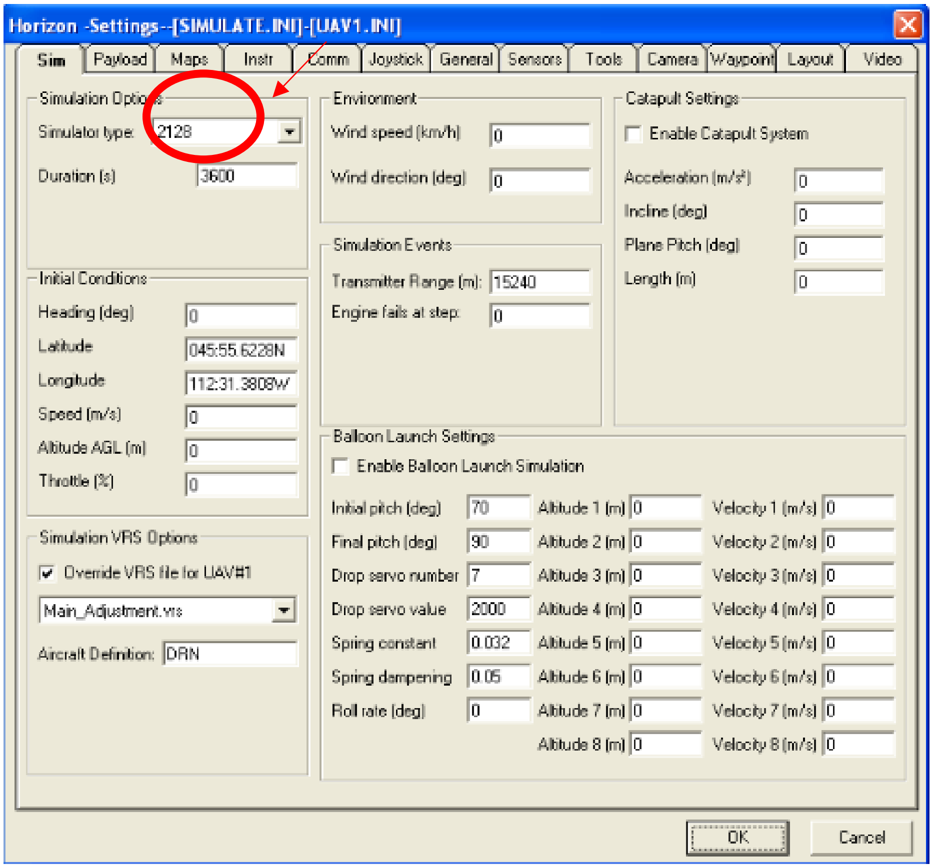

Figure 3.1

3.1.b Comm Tab

The next tab that will need to be formatted is the “Comm” tab, figure 3.2. This is an important tab because in here you will select the COM# Port that your autopilot component is connected to (this case, COM 5 @ 9600 bit rate is to be used). Also make sure that you have the enable COM port logging checked. With both of these, selected correctly will give you the communication that you want your autopilot component to see.

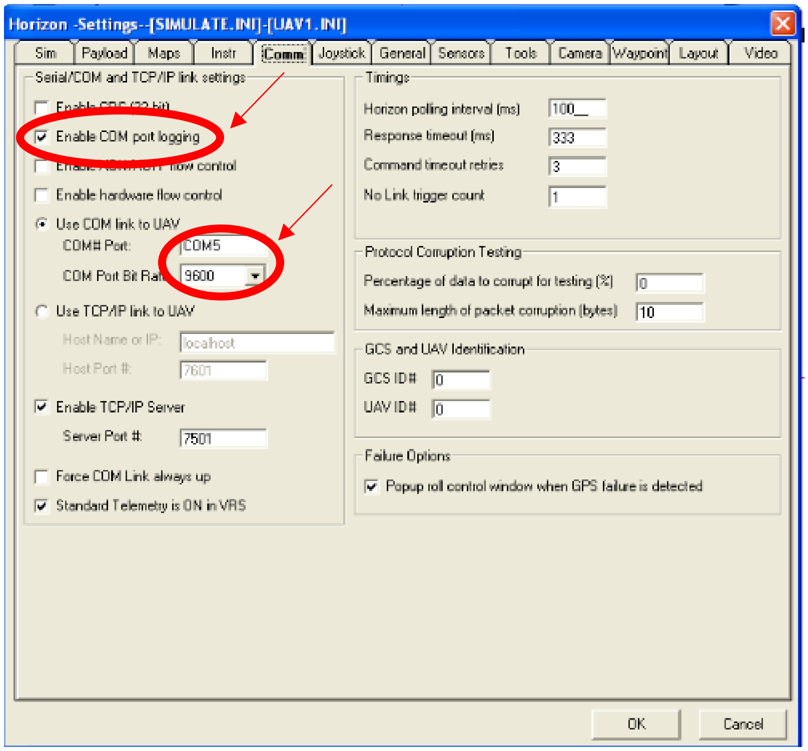

Figure 3.2

3.2 Save and Re-open

Now when you have these basic values/boxes checked, you will then hit OK and close the Horizon Settings window. Another window will put up saying, "you must close Horizon in order for your settings to be saved and applied." So select OK and then close Horizon. You can then re-open Horizon.

Map Installation/Upload

In this section, you will want to determine where you are going to fly your aircraft. A map from google images will be needed along with the GPS coordinates to that map.

4.1 Horizon Map Selector

Once in Horizon, go to the maps tab and under that select the "Horizon Map Selector". A window will pop up like the one below in figure 4.1. Once in this window, you will want to make sure you select the correct map size units that you want to use (in this case, select distance).

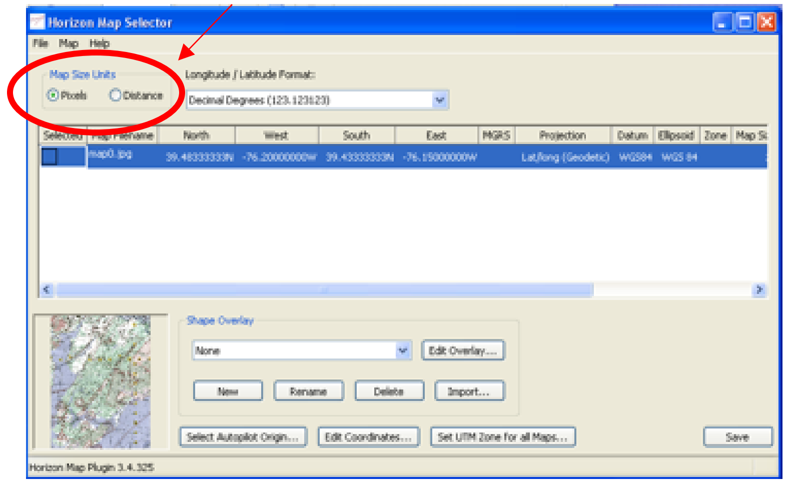

Figure 4.1

4.2 Add Maps

Go to the file tab and open the "Add Maps…" seen in figure 4.2.

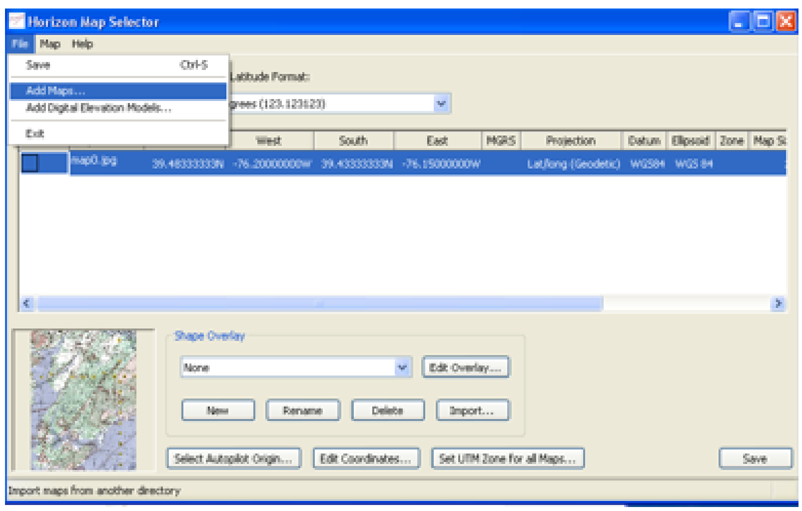

Figure 4.2

Now that you have this window open, you will want to select the set Projection Parameters so that you can set the UTM zone. This is important because you won't be able to enter in the coordinates to your map until you have the correct zone. Figure 4.3 shows the projection, datum, ellipsoid, and UTM Zone. You can determine the UTM Zone by Googling "UTM Zone maps" and just finding where you are located at (this case, enter 12 for the UTM zone for Butte, MT).

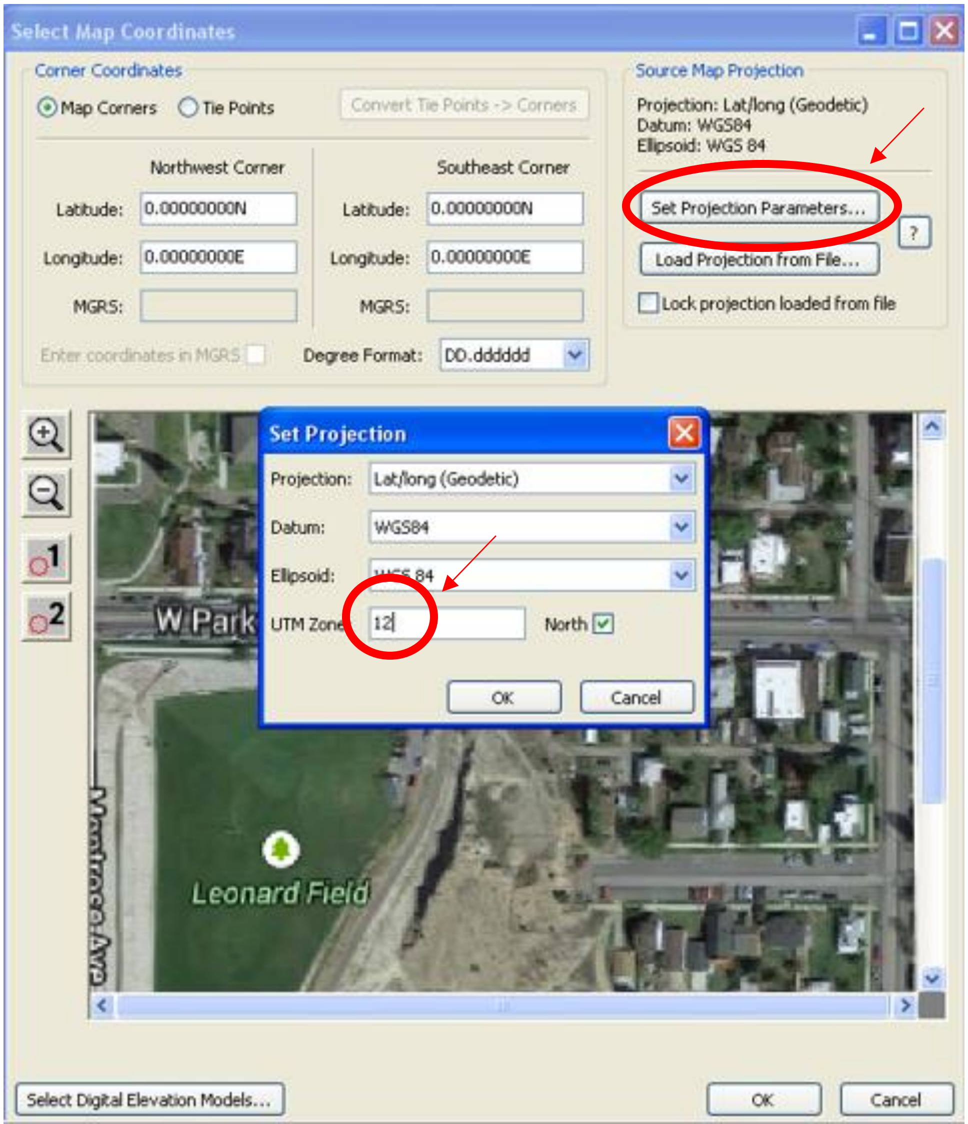

Figure 4.3

Once you have the UTM Zone located, you can now determine the coordinates of your map. Make sure that you get the coordinates for the “Northwest” and the “Southeast” corners of the map. This will allow you to get the correct coordinates for the flight pattern along with the GPS lock. The coordinates that you have, enter them in the latitude and longitude for the Northwest and Southeast corners, seen in figure 4.4.

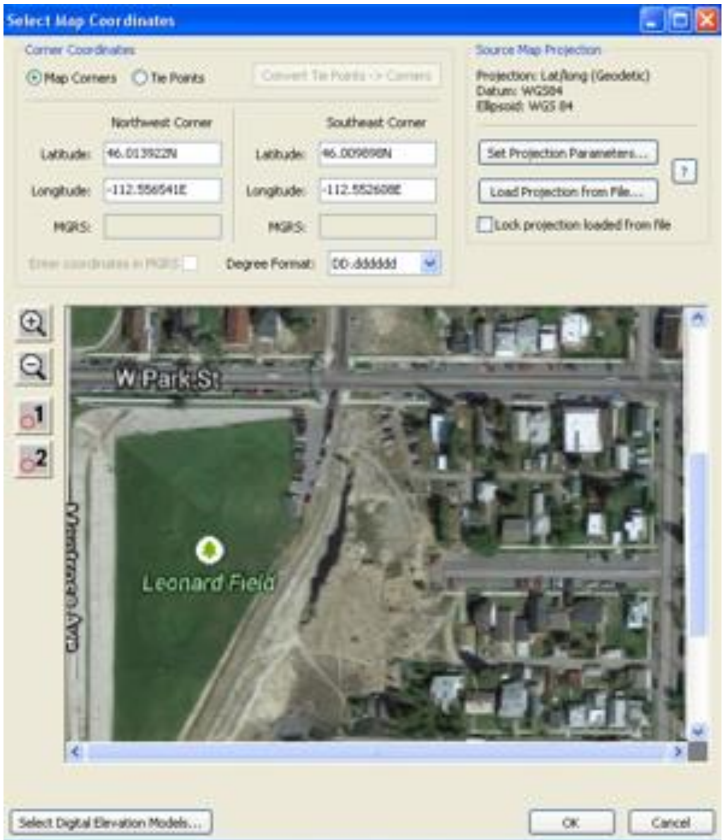

Figure 4.4

4.3 Origin Setting

When you have the map and GPS coordinates loaded and entered in, the next step is to determine the Origin of where you want to start. You can set this by selecting the "Select Autopilot Origin" button towards the bottom of the Horizon Map Selector window. Once you see the window in figure 4.5, you can select the origin by clicking the cross hair at the right of the window. Also make sure that you select the UAV that you are using so that it can load onto the map and as well as being able to load to the plane. When the Origin is set, save the origin and then exit the window going back to the Horizon Map Selector.

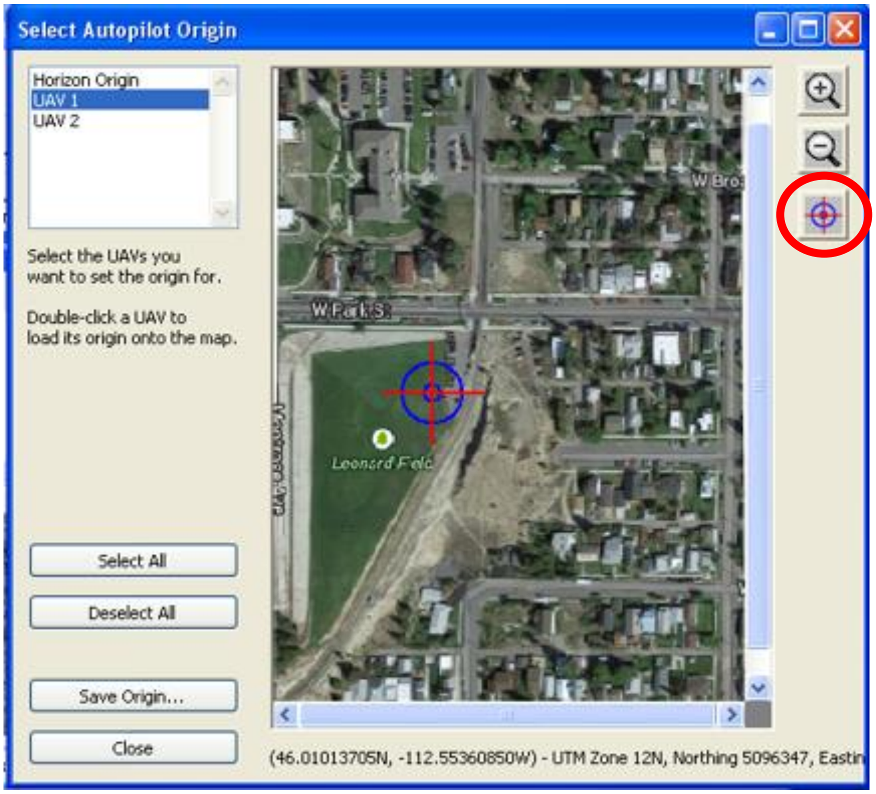

Figure 4.5

Uncheck all maps that you will not be using and make sure that the map you want to use is the only one selected. You now can exit this window and go back to the Horizon software.

Re-open the Horizon Settings window and select the Maps tab seen below in figure 4.6. This window will allow you to make sure that you have the map you wanted to be loaded onto your plane is checked and in this window. If not, go back to the start of the maps section and start over.

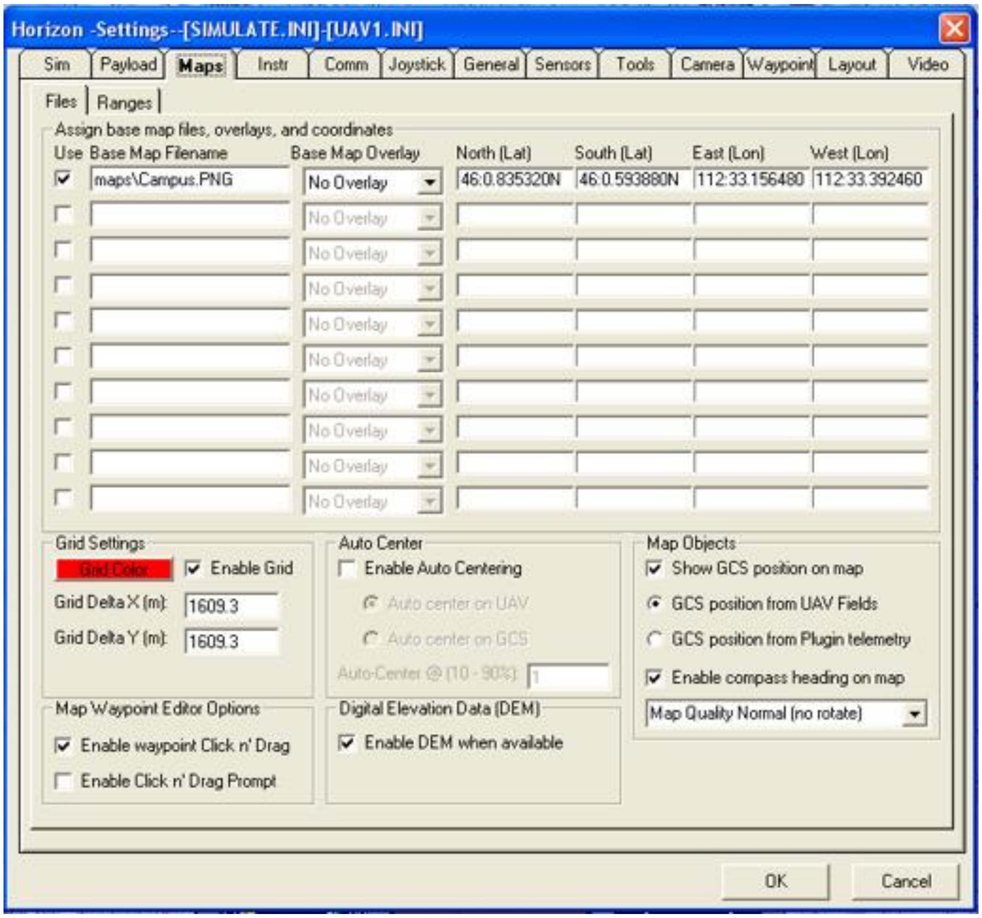

Figure 4.6

Waypoints

The reason there is waypoints, is so that once in flight you can flip the switch for the autopilot to take over and it will fly to each waypoint in order that it is designed.

Adding waypoints is simple as long as you have a basic pattern you want to have the plane fly. Add a waypoint where ever you want the plane to start its auto-flight. Do this by right clicking on the map and selecting the Append with the flyTo or fromTo which is seen below in figure 4.7. You will want to select the waypoint that has the units that you are using (this case, the waypoints with the GPS coordinates).

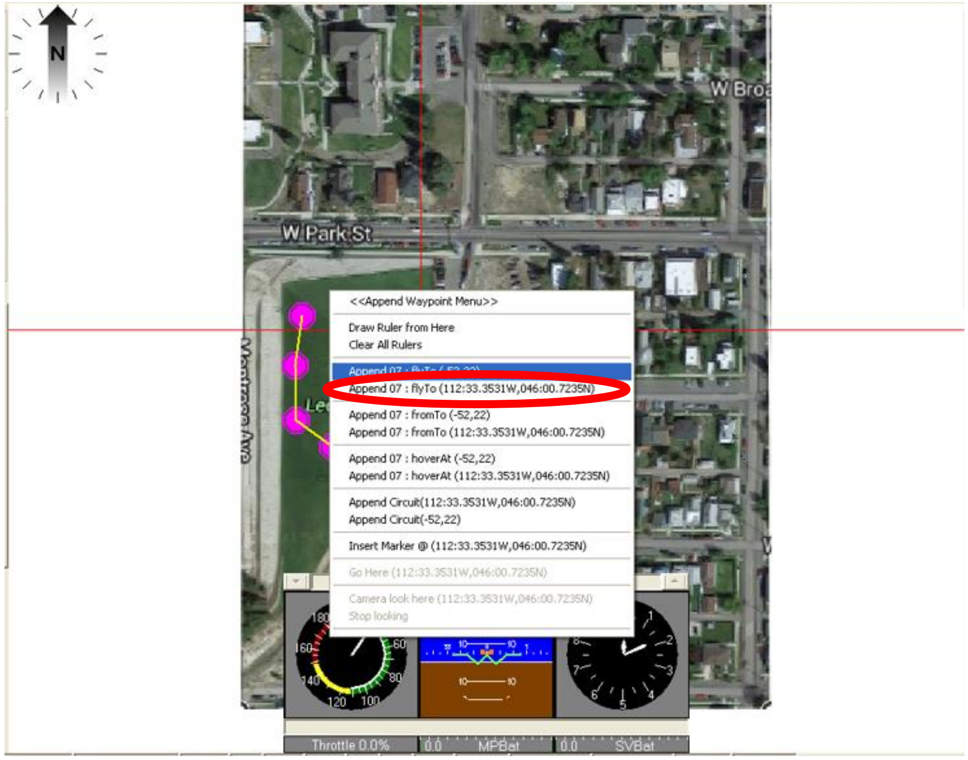
N
W Park St
<<Append Waypoint Menu>>
Draw Ruler from Here
Clear All Rulers
Append 07 : flyTo (112:33.3531W,046:00.7235N)
Append 07 : fromTo (-52,22)
Append 07 : fromTo (112:33.3531W,046:00.7235N)
Append 07 : hoverAt (-52,22)
Append 07 : hoverAt (112:33.3531W,046:00.7235N)
Append Circuit(112:33.3531W,046:00.7235N)
Append Circuit(-52,22)
Insert Marker @ (112:33.3531W,046:00.7235N)
Go Here (112:33.3531W,046:00.7235N)
Camera look here (112:33.3531W,046:00.7235N)
Stop looking
Throttle 0.0%
MPBat
SVBat

Figure 4.7

Appendix B – MicroPilot Emails

Yan Wang [ywang@micropilot.com]

Actions

To:
Ganley, Stephen
Senior Design

Thursday, February 19, 2015 1:58 PM

You replied on 2/23/2015 2:18 PM.

Hi Stephan,

Since Dick's email address is not valid, so I just direct send you the license.

site code: 6444 6DD5 FA10 CDB8 A5

Horizon License : 8284 708B 6BC8 4858 4752 3092 46

Yan
Micropilot Licence Team
license@micropilot.com

Ganley, Stephen

Actions

To:

Yan Wang [ywang@micropilot.com]

Sent Items

Monday, February 23, 2015 2:18 PM

Hi Yan,

The computer site key changed from the last time we tried running the license manager. The new computer site key is:

5492 C3DB 7A3E 8AA3 15

If we can get another License Key, we would appreciate it.

If this persists, we would like a phone number that we could contact in order to get the License Manager working properly.

Stephen Ganley
Electrical Engineering
Montana Tech
(406) 670-1766

Yan Wang [ywang@micropilot.com]

Actions

To:
Ganley, Stephen
Senior Design

Monday, February 23, 2015 2:41 PM

You replied on 3/27/2015 10:47 AM.

Hi Stepahn,

Here are new site code and Horizon license:

Site code: 5492 C3DB 7A3E 8AA3 15

Horizon License: E51D CAC3 0A06 F79F C729 B8FC 67

Yan

Ganley, Stephen

Actions

In response to the message from Yan Wang, 2/23/2015

To:
Yan Wang [ywang@micropilot.com]
Sent Items

Wednesday, February 25, 2015 2:39 PM

Hi Yan,

Our problem was that we were on Windows 7 and we needed to be on Windows XP. We have a converter that goes from Windows 7 to Windows XP. If we could get another Horizon License for this computer site key, that would be appreciated.

Site Code: CE8C 8898 3B5E 45FE 0F

If you could think any helpful tips to connect the MicroPilot to the software using the COM's port, we would appreciate the help.

Thanks again.

Kenneth Saborio [ksaborio@micropilot.com]

Actions

To:

Ganley, Stephen

Thursday, February 26, 2015 5:36 PM

You forwarded this message on 3/4/2015 12:07 PM.

Dear Mr. Ganley,

Greetings.

I was informed by a colleague at support that you need an RS232 to USB converter. I'd be glad to help you.

The price of one converter is $44 USD plus UPS shipping. Please note that for orders of less than $250, I’ll need to bill you a $50 handing fee.

MicroPilot’s customers usually purchase converters and other accessories along with autopilots. In these cases, the handling fee doesn’t apply.

According to support, the RS232 to USB converter must have a FTDI chip inside.

Even though MicroPilot hasn’t tested this converter http://www.digikey.ca/product-detail/en/CHIPI-X10/768-1138-ND/3103022, my colleagues at support ***think*** the converter will work because it’s manufactured by FTDI.

Please feel free to purchase the converter from MicroPilot or from Digikey.

Do contact me in case you should have questions or concerns.

Best regards,

Kenneth Saborío

Sales Administrator

MicroPilot Inc.

E-mail: ksaborio@micropilot.com

Website: www.micropilot.com

Skype: ksaboriomp

Evan Schellenberg [eschellenberg@micropilot.com]

Actions

To:
Ganley, Stephen

Monday, March 02, 2015 3:50 PM

Hello Stephen,

This is Evan from MicroPilot Support, Yan referred your e-mail to me, I apologize for the delay in replying.

I am not sure what you mean by using a converter, but running Horizon in Windows Compatibility mode for Windows XP will cause the license in Horizon to break. Newer Windows versions use a different filepath structure for where the license is saved so once Windows compatibility mode is used the license key usually stops working.

So if that is what you were using make sure not to use it with any Horizon applications and let it run in the normal Windows 7 environment.

If you haven't already received a license for that Site Key yet let me know.

Evan Schellenberg
MicroPilot Support

Kenneth Saborio [ksaborio@micropilot.com]

Actions

In response to the message from Kenneth Saborio, 2/26/2015

To:

Ganley, Stephen

Attachments:

(2)Download all attachments

inv005432 (ID 3719).pdf (48 KB)[Open as Web Page]; inv005562 (ID 9442).pdf (48 KB)[Open as Web Page]

Thursday, March 12, 2015 1:54 PM

You replied on 3/23/2015 2:17 PM.

Dear Mr. Ganley,

A colleague informed me that your organization may need technical support.

According to the attached invoices, Montana Tech's access to technical support expired on April 2011.

Could you please let me know briefly about the issues that you need help with?

The purpose is to consider options to better help you.

Best regards,

Kenneth Saborío

Sales Administrator

MicroPilot Inc.

E-mail: ksaborio@micropilot.com

Website: www.micropilot.com

Skype: ksaboriomp

Ganley, Stephen

Actions

To:

Kenneth Saborio [ksaborio@micropilot.com]

Cc:

Downing, Derrick G

Sent Items

Monday, March 23, 2015 2:17 PM

Mr. Saborio,

Sorry I didn't get back to you. We had our spring break this last week and didn't have time to work on it.

Our problem is that we are unable to communicate from the computer to the 2128 Micro-component via hard wire COM's connection. We just purchased a XCHIPI-X as recommended by tech support employee at MicroPilot. We have power to the receiver, MicroPilot unit, and the servo board. We have separate batteries for each of these, which are 6.8V batteries. So when we apply the power to the components, the servos twitch, and then go to a specified position and remain there. That is all the movement that we get right now. We are unable to control the servos via transmitter and can not receive a signal through COM's communication.

The software that we have right now, is MicroPilot Horizon 3.4 and HyperTerminal on Windows XP. Though we have not successfully used HyperTerminal, which is also new to us. We have received a license key for the Horizon software and it is active.

We are new to using this device and need some guidance in how to proceed forward.

Your help is greatly appreciated.

Thanks,

Stephen Ganley
Electrical Engineering
Montana Tech
(406) 670-1766

Kenneth Saborio [ksaborio@micropilot.com]

Actions

To:
Ganley, Stephen
Cc:
Downing, Derrick G

Monday, March 23, 2015 4:14 PM

Dear Mr. Ganley,

Thank you for your reply.

I'll get feedback from my colleagues at support and I'll get back to you as soon as possible.

Best regards,

Kenneth Saborío
Sales Administrator
MicroPilot Inc.

E-mail: ksaborio@micropilot.com
Website: www.micropilot.com
Skype: ksaboriomp

Kenneth Saborio [ksaborio@micropilot.com]

Actions

To:

Ganley, Stephen

Cc:

Downing, Derrick G

Attachments:

(2)Download all attachments

Horizon Setup Guide.pdf (1 MB)[Open as Web Page]; Horizon Users Manual.pdf (2 MB)[Open as Web Page]

Tuesday, March 24, 2015 12:49 PM

Dear Mr. Ganley,

As I mentioned before, the purchase of new autopilots includes access to MicroPilot's support services according to the following:

Technical support covers all aspects of integration of the autopilot into an airframe including post installation issues. Premium technical support is provided through email, phone, Skype, and remote viewing sessions. Live support is available during business hours Mon-Fri 9-5 CST.

MP2128g and MP2128g2 autopilots are sold with one year of technical support.

Montana Tech contacted MicroPilot in the years 2010 and 2011 to obtain technical support for autopilot serial number 14-00402.

MicroPilot does offer extended technical support at $750 per year per autopilot. This price increases (for the first year) according to the number of years an autopilot has been out of technical support.

Due to the number of years autopilot serial number 14-00402 has been without technical support, Montana Tech may consider to purchase a new autopilot at a discounted price. A new autopilot (MP2028g2 or MP2128g2) gets technical support from 6 to 12 months. This documenthttp://www.micropilot.com/pdf/brochures/brochure-MP2x28.pdf indicates the support service level for each autopilot on page 3.

If the purchase of a new autopilot isn't an option, you may download the latest autopilot manual from this link http://www.micropilot.net/docs/ap-manual.zip (the link will be available during the next 24 hours). I've also attached the manuals for MicroPilot's ground control software, Horizon.

Please contact me in case you should have questions or concerns.

Best regards,

Kenneth Saborío

Sales Administrator

MicroPilot Inc.

E-mail: ksaborio@micropilot.com

Website: www.micropilot.com

Skype: ksaboriomp

MP21283x autopilot - Triple redundancy with a Novatel Carrier Phase GPS receiver capable of 2 to 40 cm positional accuracy.

Kenneth Saborio [ksaborio@micropilot.com]

Actions

To:
Ganley, Stephen
Cc:
Downing, Derrick G

Tuesday, March 24, 2015 1:07 PM

Dear Mr. Ganley,

You wrote:

"Our problem is that we are unable to communicate from the computer to the 2128 Micro-component via hard wire COM's connection. We just purchased a XCHIPI-X as recommended by tech support employee at MicroPilot. We have power to the receiver, MicroPilot unit, and the servo board. We have separate batteries for each of these, which are 6.8V batteries. So when we apply the power to the components, the servos twitch, and then go to a specified position and remain there. That is all the movement that we get right now. We are unable to control the servos via transmitter and can not receive a signal through COM's communication.

"The software that we have right now, is MicroPilot Horizon 3.4 and HyperTerminal on Windows XP. Though we have not successfully used HyperTerminal, which is also new to us. We have received a license key for the Horizon software and it is active.

"We are new to using this device and need some guidance in how to proceed forward."

My colleagues at support wrote the following:

"… they may just not have set up the autopilot for Ch5 switching from CIC to PIC mode. Or there may be additional settings that are needing to be updated."

Best regards,

Kenneth Saborío
Sales Administrator
MicroPilot Inc.

E-mail: ksaborio@micropilot.com
Website: www.micropilot.com
Skype: ksaboriomp

Ganley, Stephen

Actions

In response to the message from Yan Wang, 2/23/2015

To:

Yan Wang [ywang@micropilot.com]

Sent Items

Friday, March 27, 2015 10:47 AM

Hi Yan,

The computer site key changed from the last time we tried running the license manager. The new computer site key is:

DA8A E945 5BCE 7CE1 9B

If we can get another License Key, we would appreciate it.

Stephen Ganley
Electrical Engineering
Montana Tech
(406) 670-1766