Cloud Cap TECHNOLOGY

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Software-in-Loop (SIL) Checklist

July 15, 2009

For software versions 2.x.x and higher.

- ☐ **Load the software to the PC**
- ☐ **Start the Software-in-Loop Simulation from the Start menu on your PC**
- ☐ **Verify communication between Piccolo and the ground station**
- ☐ **Verify that AP Simulation is checked in the Simulator window**
- ☐ **From the Piccolo Command Center window, create a simple flight plan**
- ☐ **From the Simulator window, select the latest version of FlightGear.**
- ☐ **Enter the address of the FlightGear PC (if needed)**
- ☐ **Start FlightGear using the batch file *runfgfsnet-c172.bat***
- ☐ **Launch the aircraft from the Simulator window**

Note: *The **Start Software-in-Loop Simulation** button automatically launches all the software Simulation environment applications. This is a new feature update for 2.x.x software. If you do not have this feature, go to our website at www.cloudcaptech.com and download the latest Piccolo software.*

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Hardware-in-Loop (HIL) Checklist

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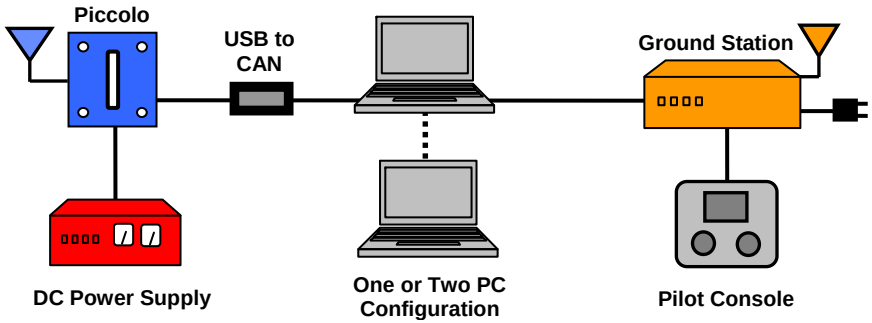

For software versions 2.x.x and higher.

- ☐ **Setup the autopilot, ground station, and PC connections**
- ☐ **Load the software to the PC**
- ☐ **Power-up the ground station and autopilot**
- ☐ **Start the Hardware-in-Loop Simulation from the start menu on your PC**
- ☐ **In the Aircraft window of the Piccolo Command Center, verify that the Piccolo in the HIL is set as the active pilot aircraft**
- ☐ **Verify communication between Piccolo and the ground station**
- ☐ **Verify CAN is checked in the Simulator window**
- ☐ **From the Piccolo Command Center window, create a simple flight plan**
- ☐ **From the Simulator window, select the latest version of FlightGear**
- ☐ **Enter the address of the FlightGear PC (if needed)**
- ☐ **Start FlightGear using the batch file *runfgfsnet-c172.bat***
- ☐ **Launch the aircraft from the Simulator window**

Note: *The **Start Hardware-in-Loop Simulation** button automatically launches all the hardware Simulation environment applications. This is a new feature update for 2.x.x software. If you do not have this feature, go to our website at www.cloudcaptech.com and download the latest Piccolo software.*

Troubleshooting Tips:

Troubleshooting Tip #1 - The Ground Station is at the San Francisco airport but the aircraft is at 000 Longitude and Latitude. A “Comms” error is displayed in Aircraft window.

Some Firewalls may not allow local TCP connections and could interfere with setting up a suitable SIL environment. If you have a Firewall on you computer, check the Firewall settings.

Troubleshooting Tip #2 - There is a “No Active Aircraft” message in the Primary Flight display window.

- In software version 2.0.4 the SIL uses Multicast by default to make TCP connections. This may cause problems with your internet connection, router and/or ISP. Try turning off the wireless connection to your local computer and restart the SIL sequence.
- If you do not have your SIL computer in a network, some versions of Windows do not allow the Multicast to work properly.
- Upgrade to the latest 2.1.x software for a permanent fix to the Multicast issues.

Troubleshooting Tips:

Troubleshooting Tip #1 - There is a “No Active Aircraft” message in the Primary Flight display window.

The ground station and autopilot are not communicating. Make sure the ground station is connected to the correct serial port of the PC. Check power to the autopilot and ground station. Check all the HiL connections. Close the PCC and start the HiL sequence again. If you still have not established communications with the avionics verify that the autopilot and ground station are communicating on the same channels. (See Troubleshooting Tip #2.)

Troubleshooting Tip #2 - The timestamps for the Piccolo and ground station are not incrementing.

The ground station and autopilot are not communicating. They may be set to different radio channels. To find out what channel the Piccolo is communicating on, you first need to communicate with the autopilot.

1. Connect the programming cable to the 6-pin MTE connector on the Piccolo interface cable.
2. Connect the DB-9 serial connector of the programming cable to the PC serial port. (For a connection diagram, see the *Piccolo Software Update Guide* for more information.)
3. Set the Program/User switch to User. Click the Reset button. Set the Program/User switch back to Program. This procedure will temporarily override any alternate protocol set on the Piccolo's program serial port, and set it to 'Piccolo no flow' at 57600 baud.
4. From the PCC main window open the System window. The Channel field displays the channel the Piccolo autopilot is using. Set the Piccolo channel as desired. Verify the Piccolo radio power output setting.
5. Unplug the programming cable from the PC (and Piccolo). Connect the DB-9 ground station cable to the PC. If you still do not have communications with the avionics, open the Ground Station window. Set the ground station to the same channel as the Piccolo. Verify the ground station radio power output setting.

Troubleshooting Tip # 3 - The Ground Station and the aircraft are at 000 Longitude and Latitude. A “Comms” error is displayed in Aircraft window.

The Simulator and Piccolo are not communicating. Check the USB to CAN module connections. Make sure you are using the correct CAN cable with the 3-pin connector to connect to the CAN module. Many people mistakenly connect a serial cable to the CAN module.

Troubleshooting Tip #4 - There is no small console next to the Aircraft icon to show that it is the pilot aircraft in the HiL.

Make sure Dynamic is enabled in the Aircraft window. If there was a previous autopilot set as the pilot aircraft in the ground station memory, you may see it in the Aircraft window autopilot list even though that autopilot is no longer physically connected in the HiL. To set the autopilot in the HiL as the pilot aircraft:

1. Click on the autopilot in the Aircraft window that is connected in the HiL.
2. Select Set Pilot and click OK.
3. Select Remove All and the “ghost” autopilot should disappear.

See the *Aircraft Window* section in the *Piccolo User’s Guide* for more information about this function.