



CCT Product List

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1 Introduction

This document provides a complete list of Cloud Cap Technology, Inc. (CCT) products. For technical support, a formal quotation, or pricing please call (541) 387-2120 or email us at sales.cct@goodrich.com.

CCT is constantly developing new products that improve and expand on our current set of successful autopilots, payloads, and sensors. The latest development news, data sheets, and downloads for all of our products are posted on our web site at www.cloudcaptech.com.

Because of regular changes in our product list, updates of this list are periodically released to ensure that the latest information is provided to our customers.


2 Piccolo Family of Autopilots

2.1 Piccolo Export Regulations

Piccolo avionics and support items are export controlled under the regulations of the US Dept of State. Domestic customers do have export compliance responsibilities.

2.2 Piccolo System Kit Overview

Everything needed to build a Piccolo system is included in five basic items:

1. Piccolo Autopilot	With integrated radio data link, GPS, Piccolo operating environment and autopilot software. Configurations available support a range of advanced capabilities	Page 5
	Advanced Feature Upgrades (For existing Piccolo Customers) Existing Piccolo avionics units can be upgraded to higher levels of advanced feature capabilities	Page 6
2. Piccolo Ground Station Kit	Kits include the Ground Station assembly and all the required cables, antennas, and accessories for system operation	Page 8
3. Piccolo Developer's Kit	The Developer's Kit provides items required to complete the HiL simulation environment, update firmware, etc.	Page 9
4. Piccolo Command Center Licensing	The Piccolo Command Center has advanced control and operational support features that are available for licensing	Page 10
5. Aircraft Integration Items	CCT will work with customers to identify elements needed to support Piccolo Integration into their aircraft	Page 12
	Need help defining a complete Piccolo autopilot system? Use the Piccolo Configuration Wizard . This useful tool will help you define a full avionics solution, complete with an autopilot, ground station, and developer's kit customized to your particular application. The Wizard is linked from the Piccolo Products pages on our web site.	

2.3 Piccolo Autopilot Specifications

Piccolo Autopilots include the core autopilot, flight sensors, navigation, wireless communication, and payload interfaces. Part numbers for all available configurations are in the tables on the following pages.

The Piccolo Plus and Piccolo LT are no longer manufactured. If you are the original owners of these autopilots we will continue to support you through manufacturing, documentation, software and technical support.

Piccolo Plus	Piccolo II	Piccolo LT	Piccolo SL
RS232 Payload Interface			
<ul style="list-style-type: none"> Two 	<ul style="list-style-type: none"> Five 	<ul style="list-style-type: none"> Two 	<ul style="list-style-type: none"> Three
General I/O (including servo)			
<ul style="list-style-type: none"> Twelve (12) configurable GPIO lines 	<ul style="list-style-type: none"> Sixteen (16) configurable GPIO lines 	<ul style="list-style-type: none"> Seven (7) configurable GPIO lines 	<ul style="list-style-type: none"> Fourteen (14) configurable GPIO lines. Four with analog feedback.
Analog Inputs			
<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Four, 0-5V input, 10 bit conversion 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Optionally, four GPIO lines can be configured as Analog inputs, 0-5V input, 10 bit conversion
Other I/O			
<ul style="list-style-type: none"> CAN: Simulation / General Interface Flight Termination: Deadman output 	<ul style="list-style-type: none"> CAN: Simulation / General Interface Flight Termination: Deadman output 	<ul style="list-style-type: none"> CAN: Simulation / General Interface Flight Termination: Deadman output 	<ul style="list-style-type: none"> CAN: Simulation / General Interface Flight Termination: Deadman output
Integrated RF Data Link Options			
<ul style="list-style-type: none"> 900 MHz ISM, 1W 2.4 GHz ISM, 1W 320-390 MHz discrete, 1W 410-450 MHz discrete, 1W 1350-1390 MHz discrete, 1W 	<ul style="list-style-type: none"> 900 MHz ISM, 1W 2.4 GHz ISM, 1W 320-390 MHz discrete, 1W 410-450 MHz discrete, 1W 1350-1390 MHz discrete, 1W 	<ul style="list-style-type: none"> 900 MHz ISM, 1W 	<ul style="list-style-type: none"> 900 MHz ISM, 1W 2.4 GHz ISM, 1W 320-390 MHz discrete, 1W 410-450 MHz discrete, 1W 1350-1390 MHz discrete, 1W
Electrical			
<ul style="list-style-type: none"> Vin: 8 - 20 volts Power: 4 W (typical – including 900 MHz radio) 	<ul style="list-style-type: none"> Vin: 8 - 20 volts Power: 4 W (typical – including 900 MHz radio) 	<ul style="list-style-type: none"> Vin: 4.8 - 24 volts Power: 4 W (typical – including 900 MHz radio) 	<ul style="list-style-type: none"> Vin: 5 – 30 volts Power: 4 W (typical – including 900 MHz radio)
Mechanical			
<ul style="list-style-type: none"> Size: 142 x 46 x 62 mm unflanged (5.6 x 1.8 x 2.4 inches) Weight: 226 grams (7.9 oz) with 900 MHz radio 	<ul style="list-style-type: none"> Size: 142 x 46 x 62 mm unflanged (5.6 x 1.8 x 2.4 inches) Weight: 220 grams (7.7 oz) with 900 MHz radio 	<ul style="list-style-type: none"> Size: 130 x 59 x 19 mm unflanged (5.1 x 2.34 x 0.76 inches) Weight: 109 grams (3.8 oz) with 900 MHz radio 	<ul style="list-style-type: none"> Size: 130 x 59 x 19 mm (5.1 x 2.34 x 0.76 inches) Weight: 110 grams (3.9 oz) with 900 MHz radio
Environmental			
<ul style="list-style-type: none"> Operating Temperature: -40C to +80 (calibrated range, no case) 	<ul style="list-style-type: none"> Operating Temperature: -40C to +80 (calibrated range, no case) 	<ul style="list-style-type: none"> Operating Temperature: -40C to +80 (calibrated range, no case) 	<ul style="list-style-type: none"> Operating Temperature: -40C to +80C (calibrated Range, no case)

2.4 Piccolo Autopilot Advanced Features

The Piccolo II comes with the Standard Software Feature Set plus Peripherals at no additional charge. The Piccolo SL comes with the Economy Feature Set at no additional charge.

For customers with existing Piccolo avionics hardware, units can be upgraded to higher levels of advanced feature capabilities. Customers can purchase an upgrade license that is downloadable to an avionics through the PCC interface. Piccolo Advanced Feature Upgrades are licensed on a per-avionics serial number basis.

Advanced Feature Set Comparison Table						
Autopilot Advanced Features Supported	Economy Feature Set (Piccolo SL)	Standard	Laser Altimeter Autoland	DGPS Autoland	DGPS Autoland + Moving Net Recovery	VTOL Vehicle Support
Advanced flight planning. Allows updates during flight, drag and drop, definition of lost com plan, and automatic landing plans	✓	✓	✓	✓	✓	✓
Supported by full HW-in-the-Loop and Software Simulators	✓	✓	✓	✓	✓	✓
Support of TASE stabilized gimbal	✓	✓	✓	✓	✓	✓
Support for DGPS and WAAS corrections for built-in GPS		✓	✓	✓	✓	✓
Gimbal stabilization control for servo based pan-tilt cameras		✓	✓	✓	✓	✓
Support of MicroAir transponders		✓	✓	✓	✓	✓
Support of Iridium satellite communications		✓	✓	✓	✓	✓
Support of external magnetometer to support dead-reckoning in lost-GPS environment		✓	✓	✓	✓	✓
Support of Autoland using Latitude Engineering Laser Above Ground Sensor			✓	✓	✓	✓
Added Autoland accuracy using external Novatel RTK 2cm DGPS. Allows precision rolling takeoff and rolling or net capture				✓	✓	✓
Support of moving net recovery using external Novatel DGPS					✓	
Helicopter Support. Tech support provided by CCT partner GST. (Not available on Piccolo Plus)						✓

Autopilot Radio Options and Advanced Features Table						
Autopilot Radio Options	Economy Feature Set (Piccolo SL)	Standard	Laser Altimeter Autoland	DGPS Autoland	DGPS Autoland + Moving Net Recovery	VTOL Vehicle Support
Piccolo SL						
900 MHz Unlicensed ISM	900-90023-00-A	900-90023-00-B	900-90023-00-C	900-90023-00-D	900-90023-00-E	900-90023-00-I
900 MHz Australian Band	900-90023-03-A	900-90023-03-B	900-90023-03-C	900-90023-03-D	900-90023-03-E	900-90023-03-I
2.4 GHz Unlicensed ISM	900-90023-01-A	900-90023-01-B	900-90023-01-C	900-90023-01-D	900-90023-01-E	900-90023-01-I
310-390 MHz Licensed	900-90023-02-A	900-90023-02-B	900-90023-02-C	900-90023-02-D	900-90023-02-E	900-90023-02-I
405-425 MHz Licensed	900-90023-04-A	900-90023-04-B	900-90023-04-C	900-90023-04-D	900-90023-04-E	900-90023-04-I
1350-1390 MHz Licensed	900-90023-05-A	900-90023-05-B	900-90023-05-C	900-90023-05-D	900-90023-05-E	900-90023-05-I
Piccolo II						
900 MHz Unlicensed ISM	N/A	900-90010-00-A	900-90010-00-B	900-90010-00-C	900-90010-00-D	900-90010-00-H
900 MHz Australian Band	N/A	900-90010-03-A	900-90010-03-B	900-90010-03-C	900-90010-03-D	900-90010-03-H
2.4 GHz Unlicensed ISM	N/A	900-90010-01-A	900-90010-01-B	900-90010-01-C	900-90010-01-D	900-90010-01-H
310-390 MHz Discrete	N/A	900-90010-02-A	900-90010-02-B	900-90010-02-C	900-90010-02-D	900-90010-02-H
405-425 MHz Discrete	N/A	900-90010-04-A	900-90010-04-B	900-90010-04-C	900-90010-04-D	900-90010-04-H
1350-1390 MHz Discrete	N/A	900-90010-05-A	900-90010-05-B	900-90010-05-C	900-90010-05-D	900-90010-05-H

2.5 Piccolo Autopilot Advanced Feature Upgrades

(For Existing Piccolo Customers)

For customers with existing Piccolo avionics hardware, units can be upgraded to higher levels of advanced feature capabilities. Customers can purchase an upgrade license that is downloadable to an avionics through the PCC interface. Piccolo Advanced Feature Upgrades are licensed on a per-avionics serial number basis.

		Feature Sets				
Autopilots	Reduced Payload	Standard	Laser Altimeter Autoland	DGPS Autoland	DGPS Autoland + Moving Baseline Capture	VTOL Vehicle Support
Piccolo II	N/A	Standard Configuration	900-01321-00-B	900-01319-00-C	900-01581-00-D	900-01320-01-H
Piccolo SL	Standard Configuration	900-02271-00-B	900-02272-00-C	900-02273-00-D	900-02274-00-E	900-02275-00-I

2.6 Piccolo Ground Station Kit Options

All Ground Station (GS) Kits include a ground station with integrated radio data link, cables, antennas and other items required to set up the GS and connect to a computer. There are alternate hardware solutions that minimize the physical size requirements of the Piccolo GS available for customers who are developing a project specific Ground Station assembly.

The Desktop Ground Station is a limited-performance version and does not include options for military band radios, secondary links, or Iridium control.

Ground Stations			
Radio Options	Desktop	Portable	Portable w/ DGPS
Piccolo II / Piccolo SL			
900 MHz Unlicensed ISM	900-90002-00	900-90015-00	900-90015-40
2.4 GHz Unlicensed ISM	900-90002-01	900-90015-01	900-90015-41
310-390 MHz Discrete	N/A	900-90015-02	900-90015-42
405-425 MHz Discrete	N/A	900-90015-04	900-90015-44
1350-1390 MHz Discrete	N/A	900-90015-05	900-90015-45

2.7 Piccolo DGPS Upgrade Kits

NovAtel’s Advance RTK engine provides Added 2 cm autoland accuracy using external DGPS. The OEM V2 board from NovAtel allows precision rolling takeoff, rolling landing and net capture.

Novatel DGPS Upgrades	
Novatel - RTK GPS Upgrade Kits for PGS	CCT P/N
Upgrade, Portable Ground Station to add L1/L2 Novatel DGPS	800-01287-00
Novatel - RTK GPS Upgrade Kits for Avionics	CCT P/N
Aircraft Integration Kit, Includes Novatel DGPS, antenna, and cables	800-01299-00

2.8 AGL Upgrades

The Above Ground Laser (AGL) Sensor is a small, lightweight laser rangefinder with integrated power and communications interfaces for easy integration into UAV systems. It is designed to work with the Piccolo line of autopilots, running Piccolo software version 2.0 or greater.

AGL Upgrades	
Laser Altimeter	CCT P/N
AGL Sensor, Laser, 1Hz, RS232, 30cm accuracy	500-01377-00

2.9 Piccolo Developer Kit Options

The standard Piccolo Command Center (PCC) and Advanced PCC options provide cables, antennas and other items required to configure the Piccolo system in a Hardware-In-the-Loop setup. The kit also includes the Futaba controller, programming cable, system documentation and Binary software disc. The Standard kit includes the basic PCC feature set while the Advanced PCC includes the full-feature PCC set. For a complete list of features as well as a list of developer kit items go to www.cloudcaptech.com.

Piccolo Developer’s Kit Options		
Options	Standard PCC	Advanced PCC
Piccolo SL		
900 MHz Unlicensed ISM	900-02111-00	900-02111-10
900 MHz Australian Band	900-02111-03	900-02111-13
2.4 GHz Unlicensed ISM	900-02111-01	900-02111-11
310-390 MHz - 405-425 MHz Discrete	900-02111-02	900-02111-12
1350-1390 MHz Discrete	900-02111-05	900-02111-15
Piccolo II		
900 MHz Unlicensed ISM	900-90003-00	900-90003-10
900 MHz Australian Band	900-90003-03	900-90003-13
2.4 GHz Unlicensed ISM	900-90003-01	900-90003-11
310-390 MHz - 405-425 MHz Discrete	900-90003-02	900-90003-12
1350-1390 MHz Discrete	900-90003-05	900-90003-15

2.10 Piccolo Command Center Licensing

Starting with software version 2.1.0, the advanced user interface for the Piccolo system (the Piccolo Command Center) will require a seat license for access to the full set of interface features. Standard PCC software can still be downloaded at no cost from the web site and is fully operational without an advanced features license. Advanced PCC is enabled through entry of a user name and key number provided by Cloud Cap Technology at the time of purchase. For details on Advanced Piccolo Command Center Licensing, visit www.cloudcaptech.com.

Advanced PCC Licenses	
Advanced Capability Licenses	CCT P/N
Full Feature License, Per Seat, Piccolo Command Center	900-01434-00
Software License, Per Seat, TASE Gimbal Plug-In for PCC or stand alone ViewPoint.	900-01208-00
Software License, Per Seat, TASE Gimbal Object Tracker. Plug In for PCC or stand alone ViewPoint. Includes image enhancement functionality	900-01397-00
Software License, Per Seat, TASE Gimbal Image Stabilization Functionality. Plug In for PCC or stand alone ViewPoint.	900-01582-00
Software License, Per Seat, PCC Plug-In for Tracking Antenna Control	900-01568-00
Software License, Per Seat, PCC Plug-In to provide data strip chart displays.	900-01782-00
Software License, Per Seat, STANAG 4586 Piccolo Specific Module (PSM). Supports integration of STANAG compliant operator interfaces to the Piccolo system through a PC software application interfacing to the Piccolo GS. Partial STANAG command set implementation per published documentation.	900-01667-00
License Bundles <i>(These options bundle the Advanced PCC Licenses listed above)</i>	CCT P/N
LICENSE BUNDLE 1 – PICCOLO / TASE USER	
A package of licenses for the ground station including PCC, ViewPoint, and Object Tracker.	900-01924-00
LICENSE BUNDLE 2 – PICCOLO / TASE SUPER USER	
A FULL package of licenses for the ground station including PCC, Tracking Antenna Control, Strip Chart Displays, ViewPoint, and Object Tracker.	900-01925-00

Note: PCC features are licensed on a per-seat basis. Distribution of the software license User Name and Key Number to additional seats or any other organization is expressly prohibited without procuring a seat license(s) for the new seats / operator/owner.

2.11 Aircraft Integration

The following kits are provided as examples of aircraft integration items needed for installing a Piccolo system. A purchased set of integration items should be determined based on the specifics of each aircraft. Cloud Cap will assist in the definition of a custom per-aircraft integration item list or in self-sourcing integration items.

2.11.1 Recommended Aircraft Integration Kits

Aircraft Integration Kits	
Piccolo II, 900 MHz	CCT P/N
Antenna, 900 MHz ¼ Wave, Aircraft, BNC	500-00311-00
Antenna, Ground Plane for 900 MHz Aircraft	620-00561-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 20-inch	500-00312-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 45-inch	500-00312-45
Antenna, Piccolo Plus and II GPS, 20-inch with SMA Connector	500-00313-00
GPS Ground Plane	620-00562-00
Battery Pack, 4.8V 2700ma 4-Acell NIMH – Servo	790-00290-00
Battery Pack, 12V 2700ma 10-Acell NIMH – Piccolo	790-00291-00
Cable, Typical Piccolo Flight Harness	500-01045-00
Mounting Kit, Generic Piccolo Soft-mount	900-00493-00
Board, Deadman/Tach Engine Interface– 5V CDI	900-00590-00
Cable Set, Deadman Interface – CDI	800-01179-00
Air Data Kit, Carbon Fiber, Combined Pitot/Static Tube with 2 Port Hub	800-00593-00
Piccolo II, 2.4 GHz	CCT P/N
Antenna, 2.4 GHz ¼ Wave, Aircraft, SMA, 12-inch	500-00349-00
Antenna, Ground Plane for 2.4 GHz Aircraft	620-00630-00
Antenna, Piccolo Plus and II GPS, 20-inch with SMA Connector	500-00313-00
GPS Ground Plane	620-00562-00
Battery Pack, 4.8V 2700ma 4-Acell NIMH – Servo	790-00290-00
Battery Pack, 12V 2700ma 10-Acell NIMH – Piccolo	790-00291-00
Flight Harness, Typical Piccolo	500-01045-00
Mounting Kit, Generic Piccolo Soft-Mount	900-00493-00
Board, Deadman/Tach Engine Interface – 5V CDI	900-00590-00
Cable Set, Deadman Interface – CDI	800-01179-00
Air Data Kit, Carbon Fiber, Combined Pitot/Static Tube with 2 Port Hub	800-00593-00
Piccolo II, 310-450 MHz	CCT P/N
Antenna, 350-420 MHz ¼ Wave, Aircraft, BNC	500-00863-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 20-inch	500-00312-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 45-inch	500-00312-45
Antenna, Piccolo Plus and II GPS, 20-inch with SMA Connector	500-00313-00
GPS Ground Plane	620-00562-00
Battery Pack, 4.8V 2700ma 4-Acell NIMH – Servo	790-00290-00
Battery Pack, 12V 2700ma 10-Acell NIMH – Piccolo	790-00291-00
Cable, Typical Piccolo Flight Harness	500-01045-00
Mounting Kit, Generic Piccolo Soft-mount	900-00493-00
Board, Deadman/Tach Engine Interface– 5V CDI	900-00590-00
Cable Set, Deadman Interface – CDI	800-01179-00
Air Data Kit, Carbon Fiber, Combined Pitot/Static Tube with 2 Port Hub	800-00593-00
Piccolo SL, 900 MHz	CCT P/N
Antenna, 900 MHz ¼ Wave, Aircraft, BNC	500-00311-00
Antenna, Ground Plane for 900 MHz Aircraft	620-00561-00
Antenna, Cable, SSMA M to BNC Bulkhead F, 20-inch	500-01154-00

Antenna, GPS 20-inch with SSMA Connector	500-01153-00
GPS Ground Plane	620-00562-00
Battery Pack, 4.8V 2700ma 4-Acell NIMH – Servo	790-00290-00
Battery Pack, 12V 2700ma 10-Acell NIMH – Piccolo	790-00291-00
Cable, Interface, Flight Harness Piccolo LT	500-01152-00
Cable, Interface, Flight Harness Piccolo SL	500-2163-00
Board, Deadman/Tach Engine Interface – 5V CDI	900-00590-00
Cable Set, Deadman Interface– CDI	800-01179-00
Air Data Kit, Carbon Fiber, Combined Pitot/Static Tube with 2 Port Hub	800-00593-00

2.11.2 Aircraft Integration Accessories

Custom coaxial cable lengths available. Custom flight harness designs also available.

Aircraft Integration Accessories	
Communication Antennas, Ground Planes and Coaxial Cables	CCT P/N
Antenna, 900 MHz ¼ Wave, Aircraft, BNC	500-00311-00
Antenna, 2.4 GHz ¼ Wave, Aircraft, SMA, 12-inch	500-00349-00
Antenna, UHF Aircraft 310-450 MHz ¼ Wave, BNC	500-00863-00
Ground Plane for 900 MHz Aircraft	620-00561-00
Ground Plane for 2.4 GHz Aircraft	620-00630-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 20-inch	500-00312-00
Antenna, Cable, Piccolo Plus and II, SMA M to BNC F, 45-inch	500-00312-45
Antenna Cable, SL / LT, SSMA M to BNC Bulkhead F, 20-inch	500-01154-00
Antenna Cable, SL / LT, SSMA M to BNC Bulkhead F, 45-inch	500-01154-45
Cable, LT, SSMA to SMA BH 20-inch UHF	500-01155-00
GPS Antennas and Ground Plane	CCT P/N
Antenna, Plus or II GPS, 20-inch with SMA Connector	500-00313-00
Antenna, Plus or II GPS, 45-inch with SMA Connector	500-00313-45
Antenna, SL / LT GPS, 20-inch with SSMA Connector	500-01153-00
Antenna, GPS L1/L2, Aircraft (for use with NovAtel DGPS options)	500-01297-00
GPS Ground Plane	620-00562-00
GPS Antenna mounting screw (2.6mm x 5mm pan head) (Pack of 10)	620-00631-00
Power	CCT P/N
Battery Pack, 4.8V 2700ma 4-Acell NIMH – Servo	790-00290-00
Battery Pack, 12V 2700ma 10-Acell NIMH – Piccolo	790-00291-00
Power Board, Iridium 4.4V with Inhibit	800-00928-02
Piccolo Flight Harness	CCT P/N
Cable, Piccolo Plus or II, Typical Piccolo Flight Harness	500-01045-00
Cable, Piccolo SL, Interface, Flight Harness	500-02163-00
Cable, Piccolo LT, Interface, Flight Harness	500-01152-00
Cable, Piccolo II, 25 pin un-terminated micro-D pigtail	760-00636-00
Cable, Piccolo SL, 51 pin un-terminated micro-D pigtail	760-01937-00
Cable, Piccolo LT, 37 pin un-terminated micro-D pigtail	760-01085-00
Piccolo Mounting	CCT P/N
Mounting Kit, Generic Soft Mount, Piccolo / Navigator – New style with threaded isolators	900-02269-00

Mounting Kit, Generic Soft-mount, Piccolo Plus, II – Old style with foam isolator and inserts on plate (Includes carbon fiber mounting rails)	900-00493-00
Mounting Rails, Carbon Fiber Only (need two)	500-00491-00
Deadman/Tach - Cable sets include external kill switch harness and generic engine interface for deadman and tachometer interface to typical electronic ignition	CCT P/N
Board, Deadman/Tach Engine Interface – 5V CDI	900-00590-00
Cable Set, Deadman Interface – CDI	800-01179-00
Board, Deadman/Tach Engine Interface– Magneto	900-00591-00
Cable Set, Deadman Interface - Magneto	800-01180-00
Air Data System Kits (tube, reducer fittings, mounting hardware)	CCT P/N
Air Data Kit, Carbon Fiber Pitot Tube	800-00569-00
Air Data Kit, Stainless Steel Static Tube	800-00568-00
Air Data Kit, Carbon Fiber, Combined Pitot/Static Tube with 2 Port Hub	800-00593-00
UAV Transponder	CCT P/N
Transponder, MicroAir T2000 UAV-L with BNC	500-01231-00
Antenna, Transponder	500-01232-00
Cable Kit, Transponder Coax 50 cm	500-01233-00
NovAtel - RTK GPS Integration Kits	CCT P/N
Aircraft Integration Kit, Includes NovAtel DGPS, antenna, and cables	800-01299-00
Laser Altimeter	CCT P/N
AGL Sensor, Laser, 1Hz, RS232, 30cm accuracy	500-01377-00

2.12 Ground Station and HiL Simulation Items

All of the components in this Ground Station and HiL Support list are included as part of the Ground Station Kit and Developer’s Kit. Individual items may be purchased as spare or replacement parts.

Ground Station & HiL Support Items	
Ground Station Assembly	CCT P/N
Power Cord, AC (US)	500-00251-00
Antenna, 900MHz Ground Station 5dB, BNC	500-00253-00
Antenna, 2.4 GHz Ground Station 5dB, BNC	500-00350-00
Antenna, UHF (225-400 MHz) Ground Station, BNC (cut to size)	500-00830-00
Antenna, Desk –Top GPS , 114-inch, SMB	500-00229-00
Antenna, GPS L1/L2, Ground Station	500-01292-00
Antenna, Portable Ground Station GPS 114-inch, SMA	500-00260-00
Cable, Serial DB9M/DB9F	500-00250-00
Power Supply, Desk-Top Ground Station	500-00254-00
Cable Kit, Portable Ground Station DC Input	800-01177-00
Cable, USB To Serial	500-01332-00
HiL Setup	CCT P/N
Cable, Phytec USB to CAN Module	500-00252-00
Cable, CAN to USB Module	500-00259-00

Cable, Piccolo Plus or II Interface – Bench Test	500-00304-00
Cable, Piccolo Interface – Bench Test Power	500-00303-00
Antenna, 900MHz Avionics SMA for Bench HiL Testing	500-00261-00
Antenna, 2.4 GHz Avionics SMA for Bench HiL Testing	500-00351-00
Antenna, UHF (310-450 MHz) BNC for Bench HiL Testing	500-00830-00
RF Adapter, BNC Female to SMA Male	760-01885-00
Cable, Piccolo LT, Interface, Flight Harness	500-01152-00
RF Adapter, Piccolo LT, SSMA to SMA for HiL setup	760-01178-00
Power Supply, 12V Avionics HiL Power, Sermos Conn	500-01468-00
Manual Flight Console	CCT P/N
Console, Piccolo Pilot, (Futaba 10 Channel with Case)	500-00639-00
Cable, Pilot Console, (New Futaba to Desk Top GS), 24 feet	500-00640-00
Cable, Pilot Console, PGS, (New Futaba to PGS), 24 feet	500-00892-00
Cable, Pilot Console, PGS, (New Futaba to PGS), 90 feet	500-00892-90
Cable, Pilot Console, (Old Futaba DIN Connector to Desk Top GS), 24 feet	500-00256-00
Piccolo Programming	CCT P/N
Cable, Piccolo Programming	500-00257-00
Piccolo Manuals & Software	CCT P/N
CD, Piccolo System SW and documentation	900-00317-00

2.13 Piccolo Software Source Code

Since our development concept is based on end-user programmability, source code is available for all system components as outlined below. All source code sales are licensed on a per developer, per application basis. A signed software license agreement is required prior to delivery of source code.

Piccolo Software Source Code	
Source Code Component for Software v2.x	CCT P/N
Source Code License, MPC555 uBurst RTOS	900-00341-00
Source Code License, MPC555 Driver Libraries	900-00343-00
Source Code License, Piccolo Autopilot, with binary RTOS & drivers	900-01324-00
Source Code License, Piccolo Ground Station, with binary copy of RTOS and Driver libraries	900-01392-00
Source Code License, Piccolo Simulator (<i>PC application</i>)	900-01393-00
Source Code License, Piccolo 'Classic' Operator Interface (<i>PC app.</i>)	900-00347-00

2.13.1 Piccolo Source Code Exports

Source code is export controlled as technical data based on the International Traffic in Arms Regulations (ITAR). Customers are responsible for understanding and following all applicable export rules. For domestic customers there are export license responsibilities related to access to foreign national employees.

3 TASE Family of Stabilized Gimbals

3.1 TASE Gimbal Export Regulations

TASE gimbals and accessories are export controlled under the regulations of the US Dept of Commerce or the US Dept of State. Domestic customers do have export control responsibilities.

3.2 Gimbal Camera Options

All gimbals include integrated GPS, inertial sensors, gimbal operating environment and software. The currently supported list of TASE LT, TASE, TASE Duo, and T2 camera options are presented below. Contact Cloud Cap Technology for custom payload integration details.

			
TASE LT	TASE	TASE Duo	T2
Nose mount Pan / Tilt configuration fits within a 4.5 inch tube envelope	Single camera stabilized gimbal in a 4.4" diameter package weighing <1Kg	Dual camera stabilized gimbal in a 5" diameter package weighing 1.06K.	Dual camera stabilized gimbal in a 7" diameter package weighing 2.27K.

Note: When comparing camera options, please contact the camera manufacturers directly to get latest information to support your analysis.

3.3 TASE LT Camera Options

TASE LT Configuration Options					
TASE LT Cameras	Image Resolution	Lens	HFOV	NTSC Video CCT P/N	PAL Video CCT P/N
Sony FCB-IX11A EO	NTSC 380K Pixels	10x Optical	46°-5°	900-90020-00	900-90020-10
Configurations in Development					
IR Cameras					
FLIR Tau	320 x 240	19mm	24°	Call for Details	
		35mm	13°		
FLIR Photon 320	324 x 256	19mm	36.0°		
		35mm	20.0°		
Thermoteknix MIRICLE 110K	384 x 288	14.25mm	50.5°		
		32mm	23.7°		
SWIR Cameras					
Goodrich SU 320 KTX	320 x 240	16mm	30.5°	Call for Details	
		25mm	19.6°		
SWIR Cameras - Goodrich SWIR cameras are available upon request. Shortwave infrared linear arrays and near-infrared cameras meet many application needs in such diverse applications as defense, security, automated inspection, and spectroscopy.					

3.4 TASE Gimbal Camera Options

TASE Gimbal Configuration Options					
Cameras	Image Resolution	Lens	HFOV (deg)	NTSC Video CCT P/N	PAL Video CCT P/N
Daylight Cameras					
Sony FCB-EX480	380K pixels	16.1x Optical	46.6°-2.9°	900-90012-00	900-90012-10
Sony FCB-EX980	380K pixels	20.8x Optical	52.0°-2.5°	900-90012-12	900-90012-02
Sony FCB-EX1000	380K pixels	32x Optical	55.3°-1.7°	900-90012-06	900-90012-16
Sony FCB-H11(HD)	2M pixels	9.1x Optical	36.5°-4°	900-90012-08	
Prosilica GC Series	up to 5M pixels	C-mount	up to 5M pixels	900-90012-07 Gigabit Ethernet Output	
IR Cameras (LWIR) *Limited tilt range due to physical size of lens.					
FLIR Photon 320	324 x 256	19mm	36.0°	900-90012-21	900-90012-31
		35mm	20.0°	900-90012-01	900-90012-41
		*50mm	14.0°	900-90012-11	900-90012-51
Thermoteknix MIRICLE 110K	384 x 288	14.25mm or *32mm	50.5° or 23.7°	900-90012-X5	
Thermoteknix MIRICLE 307K	640 x 480	14.25mm or *32mm	58.6° or 28.1°	900-90012-X4	
SWIR Cameras - Goodrich SWIR cameras available upon request. Shortwave infrared linear arrays and near-infrared cameras meet many application needs in such diverse applications as defense, security, automated inspection, and spectroscopy. Call for details.					

3.5 TASE Duo Configuration Options

TASE DUO Configuration Options					
Cameras	Image Resolution	Lens	HFOV (deg)	NTSC Video CCT P/N	PAL Video CCT P/N
Standard Package 1					
EO: Sony FCB-EX980	380K pixels	20.8x Optical	52.0°-2.5°	900-90022-00	900-90022-10
LWIR: FLIR Photon 320	324 x 256	35mm	20.0°		
Standard Package 2					
EO: Sony FCB-EX980	380K pixels	20.8x Optical	52.0°-2.5°	900-90022-01	900-90022-11
LWIR: FLIR Photon 320	324 x 256	19mm	36.0°		
SWIR Cameras - Goodrich SWIR cameras available upon request. Shortwave infrared linear arrays and near-infrared cameras meet many application needs in such diverse applications as defense, security, automated inspection, and spectroscopy. Call for details.					

3.6 T2 Configuration Options

T2 Configuration Options					
T2 Cameras	Image Resolution	Lens	HFOV (deg)	NTSC Video CCT P/N	PAL Video CCT P/N
On-Board Image Processing					
Sony FCB-EX980	720 x 525	20.8x Optical	52.0°-2.5°	900-90021-10-1	900-90021-30-1
FLIR Photon 640	640 x 480	60mm	15.0°		
Sony FCB-EX980	720 x 525	20.8x Optical	52.0°-2.5°	900-90021-11-1	900-90021-31-1
FLIR Photon 640	640 x 480	Dual Field of View	22.5°-9°		
Ground-Based Image Processing (License for tracking software sold separately)					
Sony FCB-EX980	720 x 525	20.8x Optical	52.0°-2.5°	900-90021-10-0	900-90021-30-0
FLIR Photon 640	640 x 480	60mm	15.0°		
Sony FCB-EX980	720 x 525	20.8x Optical	52.0°-2.5°	900-90021-11-0	900-90021-31-0
FLIR Photon 640	640 x 480	Dual Field of View	22.5°-9°		
SWIR Cameras - Goodrich SWIR cameras available upon request. Shortwave infrared linear arrays and near-infrared cameras meet many application needs in such diverse applications as defense, security, automated inspection, and spectroscopy. Call for details.					

3.7 Gimbal Developer's Kit

The Gimbal Developer's Kit includes all the support items needed to operate the gimbal in a lab bench environment "out of the box" plus a seat license for the ViewPoint software. The Developer's Kit supports PCMCIA and PCI PC interfaces and is required with an initial gimbal purchase.

Gimbal Developer's Kits	
Description	CCT P/N
TASE LT Developers Kit	900-02117-00
Kit, TASE / TASE Duo Gimbal Developer's	900-90019-00
Kit, T2 Gimbal Developer's	900-90025-01

3.8 Gimbal Advanced Feature Software Applications

The ViewPoint application and advanced feature plug-in software are available for license on a per-seat basis.

Advanced Feature Software Licenses	
Gimbal Software Application	CCT P/N
Software License, Per Seat, TASE ViewPoint - provides a gimbal control and video display interface, which also records video and associated gimbal metadata.	900-01208-00
Software License, Per Seat, Object Tracker Plug-In - provides ground-based object tracking and image stabilization	900-01397-00
Software License, Per Seat, TASE Gimbal Image Stabilization Plug-In for PCC or stand alone ViewPoint - provides ground-based, electronic image stabilization	900-01582-00
Software License, Per Seat, Gimbal Sim/Training Plug-In - provides a laboratory environment with video and gimbal feedback for TASE gimbals	900-01399-00
License Bundles <i>(This option bundles the Gimbal Software licenses listed above)</i>	CCT P/N
LICENSE BUNDLE 3 – TASE SUPER USER A package of licenses for the ground station including ViewPoint, and Object Tracker.	900-01926-00

Note: ViewPoint software features are licensed on a per-seat basis. Distribution of the software license User Name and Key Number to additional seats or any other organization is expressly prohibited without procuring a seat license(s) for the new seats / operator/owner.

3.9 ViewPoint Software Source Code

Our development concept is based on end-user programmability; source code is available for the ViewPoint application. **Please call for details.**

3.10 3AX Deployment Mechanism

The TASE 3AX Camera Gimbal Deployment Mechanism provides a solution for the TASE gimbal to retract into the aircraft during launch, belly-landing and normal operations. The 3AX Deployment Mechanism and Soft Mount Kit are compatible with TASE or TASE Duo.

3AX TASE Deployment Mechanism	
Description	CCT P/N
TASE / TASE DUO 3AX Deployment Mechanism	900-01431-00
3AX Soft Mount Kit	800-01884-00

3.11 Video Processing System (VPS)

The VPS is an embedded video processing engine for both NTSC and PAL video standards engineered by Cloud Cap Technology.

The VPS hosts a number of video processing functions that can be used either passively such as providing a stabilized video stream tagged with metadata, or as an active feedback element in positioning systems such as providing object tracking rate commands to gimbals.

Vision Processing System (VPS)	
Video Processing	CCT P/N
Video Processing System Assembly	900-90026-00
VPS Programming Cable	500-02072-00

3.12 VPS Developer's Kit

The Developer's Kit provides first time VPS users all the parts needed for setting up the VPS in a lab environment for bench-top testing and facilitating vehicle integration.

VPS Developer's Kit	
Description	CCT P/N
VPS Developer's Kit.	900-02096-00

3.13 Gimbal Accessories

Firmware programming and bench interface items in the gimbal accessories list are included as part of the Gimbal Developer's Kit. Individual items may be purchased as spare or replacement parts.

Gimbal Accessories	
Aircraft Integration	CCT P/N
Antenna, GPS 20-inch, SSMA	500-01153-00
GPS Ground Plane	620-00562-00
Cable, 25 pin micro-D pigtail – Primary Gimbal I/O	760-00636-00
Cable, 37 pin micro-D pigtail – Secondary Gimbal I/O	760-01085-00
Cable, SMA M to BNC F, 20-inch Coax	500-00312-00
Cable, SMA M to BNC F, 45-inch Coax	500-00312-45
Bench Interface	CCT P/N
Antenna, GPS 114-inch, SMA	500-00260-00
Cable, Gimbal Interface TASE LT	500-02009-00
Cable, Gimbal Interface TASE / TASE Duo	500-01201-00
Cable, Gimbal Interface T2	500-01744-00
Power Supply, TASE / Duo/TASE LT bench test, 12V, 1.5A	500-01468-00
Power Supply, T2 bench test, 24V, 5A	500-01831-00
AC Power Cord 6 ft instrument cord	500-00251-00
Cable, Bench Test Power Adaptor, Sermos to Banana	500-00303-00
Cable, Serial DB9M/DB9F	500-00250-00

Controller, USB Game	500-01203-00
Changer, DB9 Gender, Null Modem for Piccolo HiL	500-01206-00
Antenna, RF adaptor SMA to SSMA for GPS	760-01178-00
Adaptor, USB to Serial	500-01332-00
Gimbal Firmware Programming	CCT P/N
Cable, Gimbal Programming	500-01202-00
Gimbal Retraction Device	CCT P/N
3AX Soft Mount Kit	800-01884-00
Deployment Mechanism, TASE / TASE Duo 3AX	900-01431-00
Gimbal Soft Mounts	CCT P/N
T2 Soft Mount Kit	800-01832-00
TASE / Duo Generic Soft Mount Kit	800-01686-00
Video Interface	CCT P/N
4-Channel USB Frame Grabber	500-02119-00
Video Card, Frame Grabber – PCMCIA	500-01209-00
Adapter, PCMCIA to PCI	500-01294-00
Cable, SMA to BNC-F Gimbal Video Out	500-01210-00
Adaptor, S-Video to BNC-Male (optional connection)	500-01211-00
Cable, PCMCIA Video Capture Card	500-01250-00
Video Cable TASE LT BNC-Male to SMA-Male LMR100 3 ft.	500-02118-00
Video Processing	CCT P/N
Cable, VPS GyroCam Interface	500-02017-00
Cable, VPS Interface	500-02070-00
Cable, 12" VPS Video	500-02071-00
Cable, VPS Programming	500-02072-00
Video Processing System Assembly	900-90026-00

4 Inertial Sensor Products

4.1 Crista Export Regulations

Crista inertial sensor products are export controlled under the regulations of the US Dept of Commerce. Domestic customers do have export control responsibilities.

4.2 Crista Inertial Sensors

Crista IMU products provide raw rate and acceleration data for use in customer applications. Units are calibrated for gain, misalignment and acceleration affects on gyros.

Crista Inertial Sensors	
Crista IMU Components	CCT P/N
Crista Inertial Measurement Unit - Small IMU with RS232 and CAN interfaces. Enclosure with 9 pin Dsub connector. PPS interface for data synchronization.	900-00458-00
Crista Sensor Head - Very small option for OEM applications - IMU with SPI interface to A/D and calibration data EEPROM. Solder (.050 through hole) mounting.	900-00466-00

4.3 Crista Developer's Kit

The Developer's Kit includes all the support items needed to operate the IMU in a lab bench environment "out of the box". Includes IMU, bench harness and IMU bench test software. Go to www.cloudcaptech.com for a complete list of developer kit items.

Crista Developer's Kit	
Description	CCT P/N
Crista IMU Developer's Kit. (Includes Crista IMU assembly)	900-90006-00

4.4 Crista IMU Sensor Accessories

Crista Accessories	
Description	CCT P/N
Cable, Crista IMU Developer's	500-00474-00
Cable, CAN to USB module	500-00259-00
Cable, Phytex USB to CAN module	500-00252-00
Cable, Serial DB9M/DB9F	500-00250-00
CD with application software and documentation (available on our website)	900-00494-00

4.5 Navigator

The Navigator is a GPS/INS navigation system that combines a GPS receiver and a 6 degree-of-freedom IMU in a miniature sensor package. The GPS and IMU measurements are fused by an Extended Kalman Filter (EKF) to provide optimal estimates of the platform's position, velocity, and attitude, regardless of GPS solution availability.

Navigator	
Description	CCT P/N
Navigator GPS/INS Navigation System	900-90027-00

4.6 Navigator Developer's Kit

The Developer's Kit provides first time Navigator users all the parts needed for setting up the Navigator in a lab environment for bench-top testing and facilitating vehicle integration.

Navigator Developer's Kit	
Description	CCT P/N
Navigator Developer's Kit	900-02120-00

5 Standard Payment Methods

- **Bank Check** – Shipment will be released at the time of confirmed check clearance.
- **Wire Transfer** – Shipment will be released at the time of receipt of the wire transfer. Bank information and account number will be given at the time a purchase order is received. Contact CCT for wire transfer account information.
- **Net 30 Terms** – To be considered for Net 30 day terms a customer will be asked to submit a completed and signed Cloud Cap Technology Credit Application for a Business Account. Upon approval of the credit information the customer will be notified of applicable credit conditions and limits. Note: Cloud Cap uses Dun & Bradstreet along with customer references in making credit decisions.
- **Shipping** – For any payment method, **Shipment Terms** for domestic sales will be FOB Hood River. CCT will ship using UPS and actual UPS shipping charges will be invoiced.
- Customers may also provide their courier account numbers (UPS, FedEx, DHL). CCT will ship using that account number and shipping charges will not be invoiced.
- **Exports** – For product exports, CCT has a separate policy sheet that defines payment and shipping terms.

6 Cloud Cap Warranty

- Cloud Cap equipment is warranted from manufacturer defect for a period of one year after delivery where any failure not due to customer mistreatment will be repaired free of charge.
- In the event of a flight problem (any cause), CCT technical support is available to assist in the analysis of the event. The Piccolo logs all system commands and data, and can be used in most instances to identify the cause of a flight problem. Customers send piccolo flight data files and flight descriptions (we post a Flight Log form for customers to use) and communicate the results of our analysis within 48 hours (usually faster). There is no cost for this analysis support.
- For units damaged as a result of customer action (flight problem, misuse in a ground check or laboratory environment), repair costs are the responsibility of the customer. Repair costs are billed on a simple time and materials actual cost basis. On notification of need for a return, CCT will provide a Return Material Authorization (RMA) number. Upon receipt of the damaged equipment, CCT will provide analysis for a small fee. Any repairs and/or materials used thereafter will be charged. Prior to repair work, a customer needs to provide a Purchase Order (or credit card #) to cover CCT analysis and repair. There may be cases where the equipment cannot be repaired, and customer would need to purchase new equipment.
- For autopilots repaired after being damaged in a crash, CCT recommends that the unit be used as a laboratory support unit and not, if at all possible, to be flown – this is because there is the possibility that there is latent board or component failures not caught in repair and re-test.