



# The “New” Hemisphere GPS

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## PART 1

- Who we are
- History / Milestones
- Markets & Applications
- Product lines

## PART 2

- Technology Highlights



## WE ARE...

A leading developer and supplier of GPS technology and application solutions for system integrators, OEMs and end users in various precision markets

## OUR FOCUS IS...

Market-leading *applications-based integration* of high-accuracy positioning, guidance, and machine control for:

- Precision farming
- Marine
- Mining equipment

- 1990 - Incorporated in 1990 as “Canadian Systems International Inc.” providing differential GPS products to the oil and gas industry
- 1996 - Initial Public Offering on the Toronto Stock Exchange (“TSX”) under the trading symbol “CSY”
- 1999 – Acquired the business assets of Satloc Inc. - moving into the GPS *applications* space – air and ground guidance for agriculture
- 2000 – Acquired Wireless business – Telematics / Fixed Wireless Telephones – changed name to “CSI Wireless Inc.”
- 2005 – Acquired the Outback distribution business
- 2006 – Divested the Fixed Wireless Telephone and Telematics businesses
- 2007 – Name change to Hemisphere GPS Inc. as pure play GPS company. Trading symbol changed to “HEM”
- 2007 – Acquired BEELINE Technologies Pty Ltd (Brisbane, AU).

**2006...*Transition***

**2007...*Stabilization***

**2008...*Breakout...***



- GPS **technology** design and expertise
- GPS **application** design and expertise
- Strong **market** knowledge
- **Easy-to-use** Products
- Established **Distribution** and Support Network
- World-Class **Outback® Customer Service** and Support
- **Retail** Marketing Expertise
- **Crescent® & Eclipse™** technologies offer superior performance, versatility and value
- Beeline **GPS/Inertial** systems & software platform
- **OEM** relationships



- 85% of revenues from agriculture
- Market share leader
- Substantial growth opportunities in precision agriculture
- Technology depth; core GPS and applications
- Scalable business model capable of significant profitability
- Projecting record revenue in 2007
- Offices in Calgary (HQ), Kansas, Arizona, Texas and Brisbane, AU
- 250 employees / 60 in Engineering



- Leading after-market supplier
- Market share leader (over 50%)
- Serving large mid-market segment
- Proven experience with OEM partners
- Well recognized and respected brands



- Building OEM relationships
  - **CLAAS** (Europe)
  - **Stara** (Brazil)
  - Agco - Beeline



## Vector Heading Sensor





## Key Strategic Objectives

- Applications based integration of positioning, guidance, and machine control (steering / heading / flow control)
- Increase market share in existing vertical markets
  - International expansion
  - New product innovation, market segmentation
- New vertical markets and applications
  - i.e. mining, construction, ports, survey
- Streamline operations for sustained profitability

## It's a huge growth opportunity

- Relatively new market - North American GPS adoption:
  - Autosteering < 5% penetration
  - Guidance < 25% penetration
- Approx 100k new tractors (40+HP) produced last year in the US, with less than 10% GPS-equipped
- 2.5M tractors operational in North America today
- International adoption increasing
- Strong macro agriculture economic factors  
(farmers are making record revenue, but high input costs)





**Ground Agriculture**

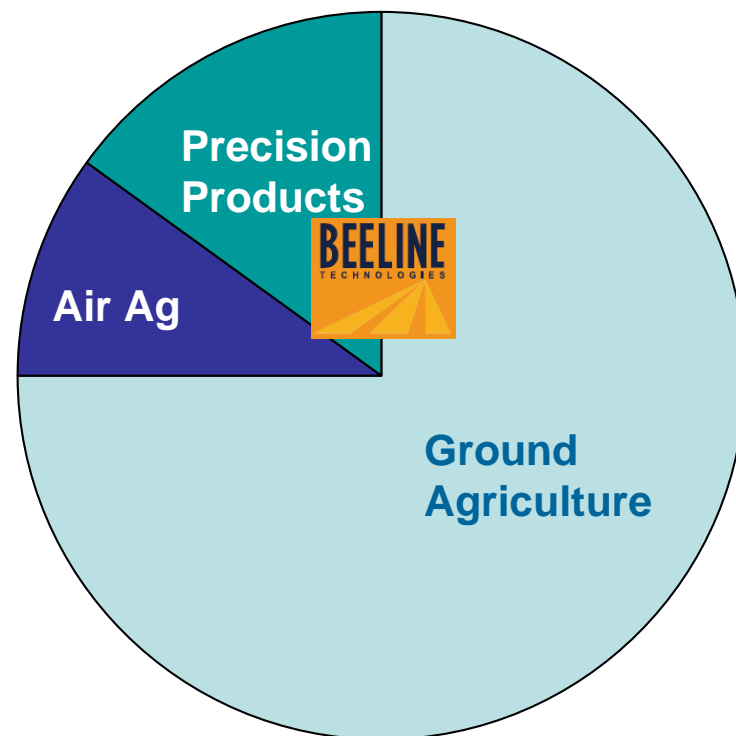


**Air Agriculture**



**Precision Products  
(new markets  
applications)**

## Revenue Distribution





S1 LITE



S2



AutoMATE



S3

Guidance & Automation



Patent pending

DriveTC



BaselineHD

Auto-Steer +/- 5 cm accuracy



Guidance & Automation Software Solutions

- Market leader in after-market ground guidance systems
- e-Commerce based North American distribution network supported by 350 dealers
- International distribution growth (Southern Hemisphere)
- OEM private label strategy

## Marine

- Vector - Heading sensor
- Low cost replacement for gyro-compasses
- OEM distribution channels



*Vector / Vector Sensor*

## Land Information Collection Products

- Geographic information systems – GIS

## OEM GPS Products

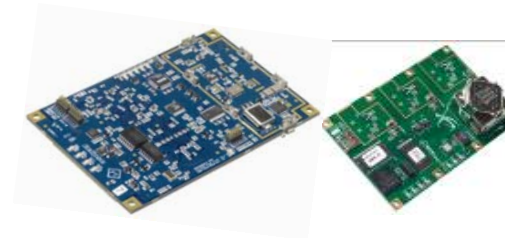
- Leader in DGPS receivers & antenna's
- Large OEM customer base



*Smart Antennas*



*GPS Receivers*



*OEM boards*

## Expanding Opportunities

- Mining, Construction and Ports equipment



## Air Guidance (Crop dusting)

- Established market
- Market share leader (70%+)



## Flying Flagman System



## Growth Opportunities

- Forestry, Fire fighting
- Advanced flow control – dry/wet

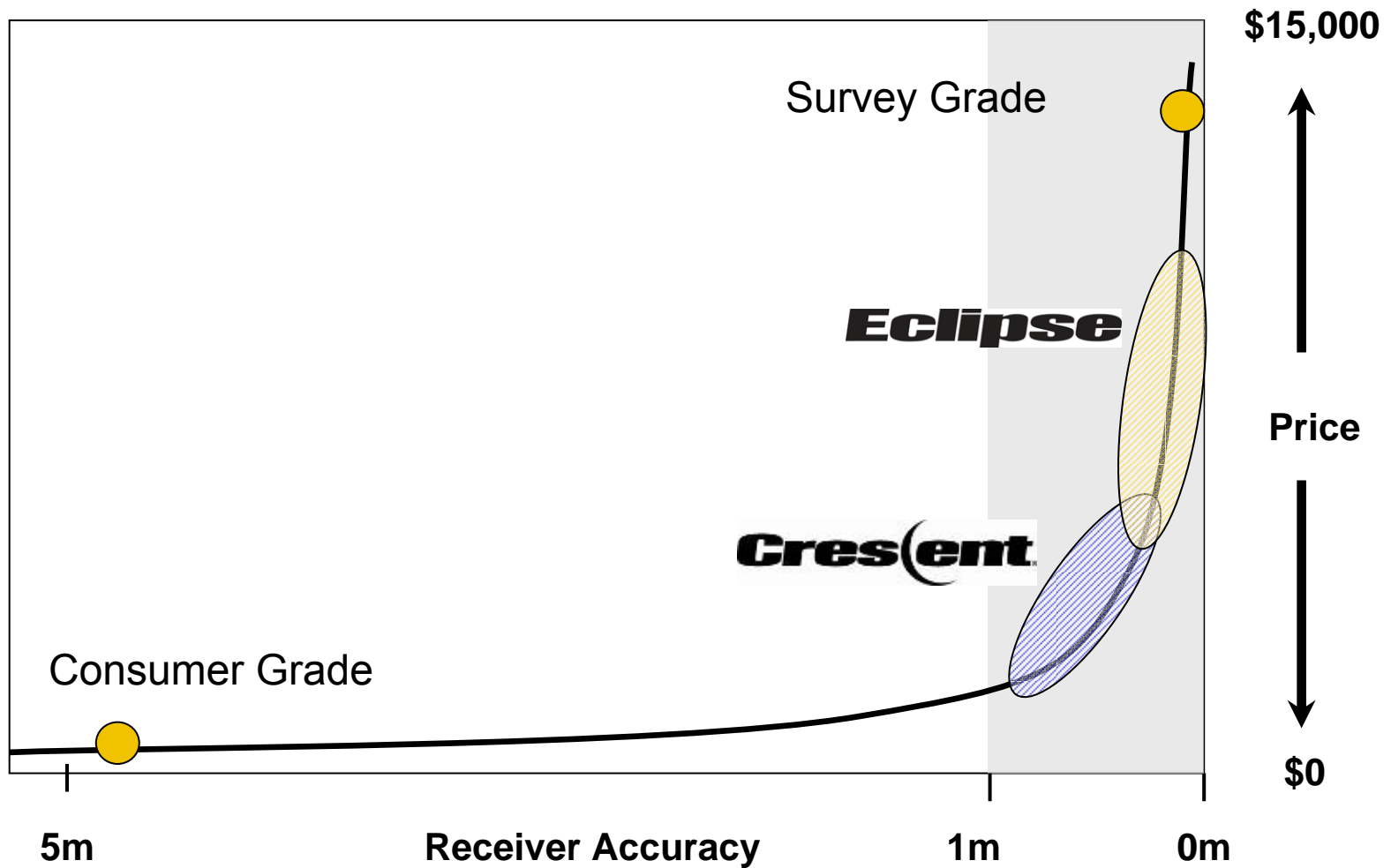


## PART 2

# Technology Highlights



## Positioned for Value



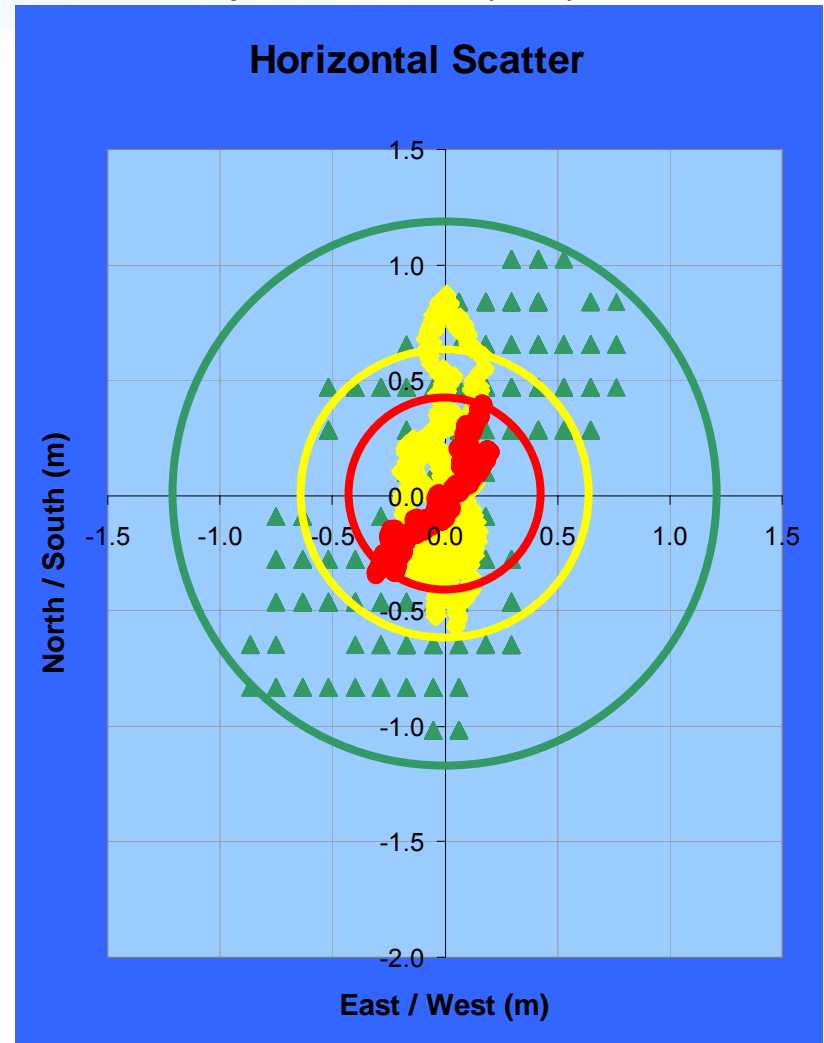
- **Performance** - the most accurate and robust L1 GPS technology available:
  - Hemisphere GPS ASIC
  - Exclusive techniques for reducing code measurement noise and mitigating multipath signals
  - Update rates to 20 Hz



## Specifications

- L1 C/A code with carrier phase smoothing
- 12 channels include 2-channel parallel tracking for SBAS
- Accuracy (2D @ 95%):
  - < 60 cm SBAS
  - < 28 cm L-Dif
  - < 2.5 cm RTK
  - < 2.5 m autonomous
- Includes 3 full serial ports, USB, PPS, Event marker, RTCM and NMEA 0183
- Size: 41 x 71 mm

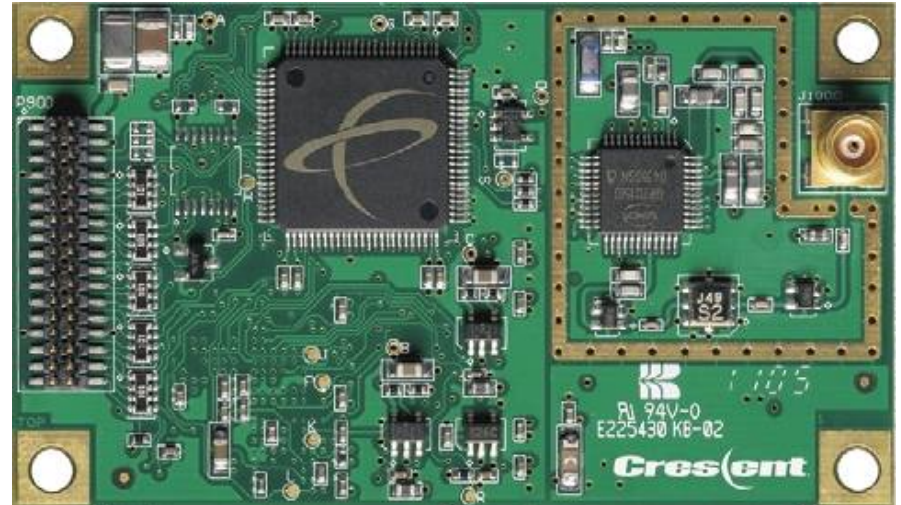
### WAAS Competitive Comparison Hemisphere GPS (red)





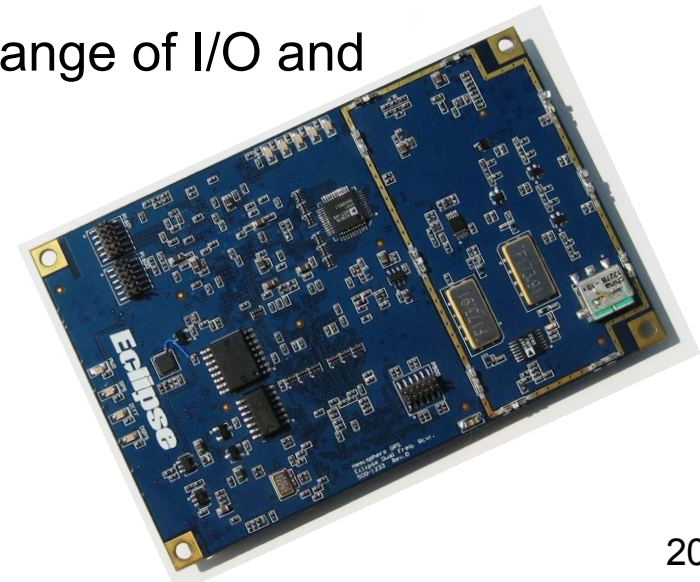
## Crescent Exclusive Firmware Features

- **COAST™** stability during temporary differential signal outage
- **e-Dif®** (extended Differential) for use where other differential solutions are impractical
- **L-Dif™** (Local Differential) supports decimeter-level accuracy
- Proprietary **RTK** delivers centimeter accuracy and on-the-fly solutions typically less than 5 minutes



## Unique Hemisphere GPS IP

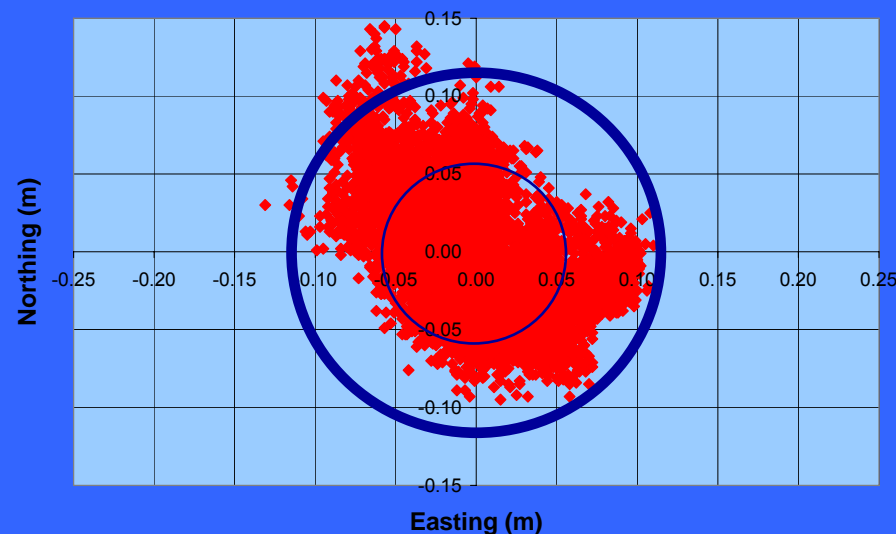
- **Performance** – dual-frequency GPS based on Crescent technology for low noise and multipath mitigation
- **Versatile** – supports various differential GPS solutions including RTK, OmniStar HP/XP, SBAS and others
- **Advanced RTK** – includes patented technique to use SBAS satellites (when available) in solution to improve satellite coverage and robustness
- **Flexible and Simple Integration** – wide range of I/O and upgradeable firmware and applications



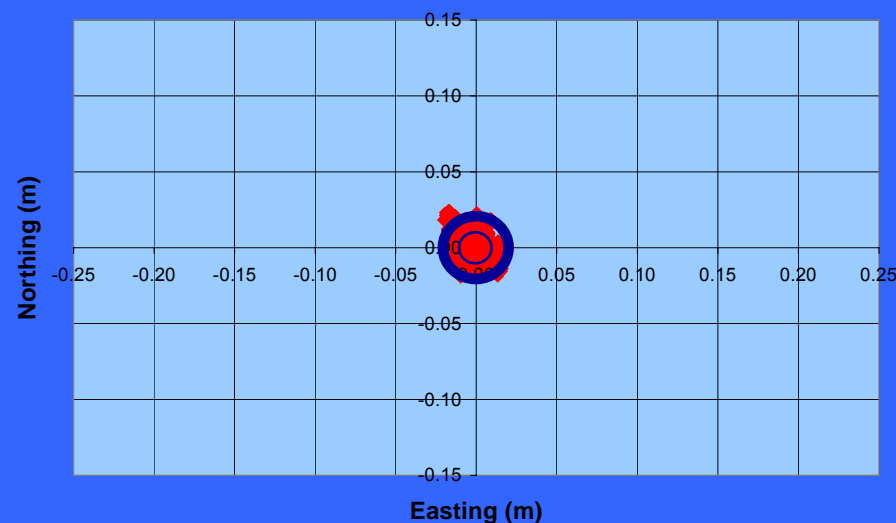
## Specifications

- 24 channels include 2-channel parallel tracking for SBAS
- Includes 4 full serial ports, USB Device and Host, PPS, Event marker
- Size: 71 x 109 mm
- L1/L2 C/A, P code with carrier phase (L2C upgradeable)
- Accuracy (2D RMS):
  - < 1 cm + 1 ppm RTK
  - < 10 cm OmniStar HP
  - < 30 cm WAAS

OmniStar HP Horizontal Accuracy (24 hours, 0.12m 95%)



Eclipse RTK Accuracy (0.019m 95%)





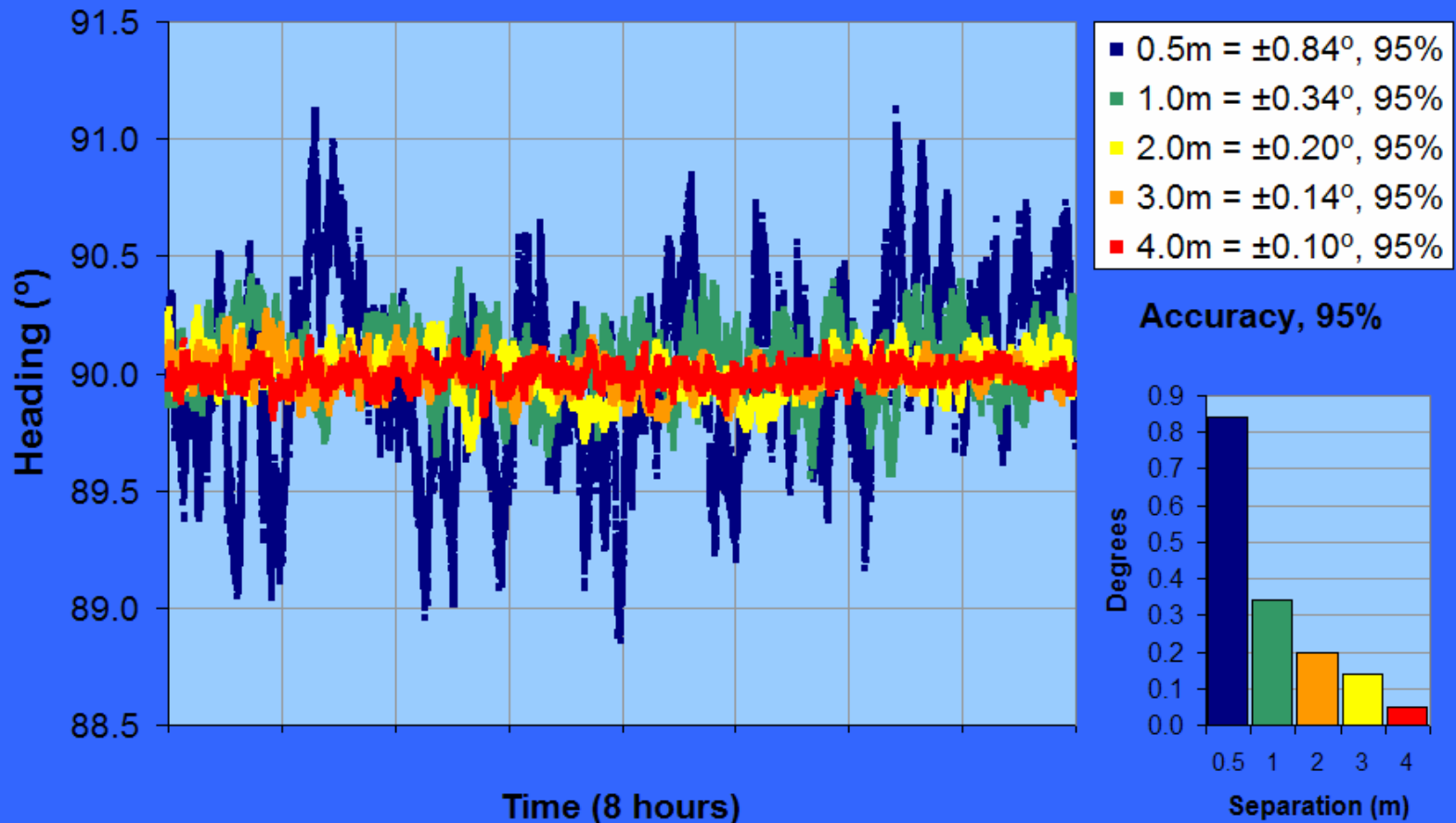
## Crescent Vector GPS Compass

- Position and Heading
  - Two Crescent OEM boards on one card
  - Tilt compensator
  - Gyro
  - RoHS compliant



# Vector Heading Accuracy

## VS100 Heading Accuracy







Thank You



Back-up Slides

## COAST Technology

- Available on Crescent-based products
  - Maintains accurate solutions for 40 minutes or more after loss of differential signal



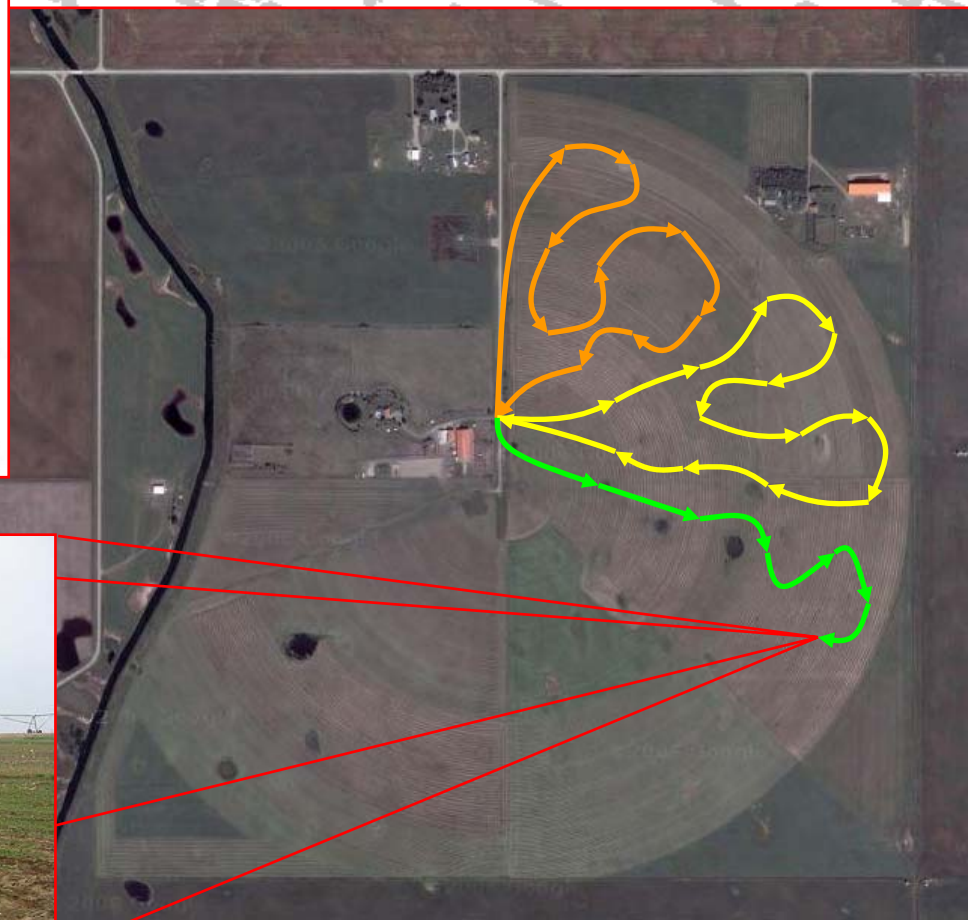
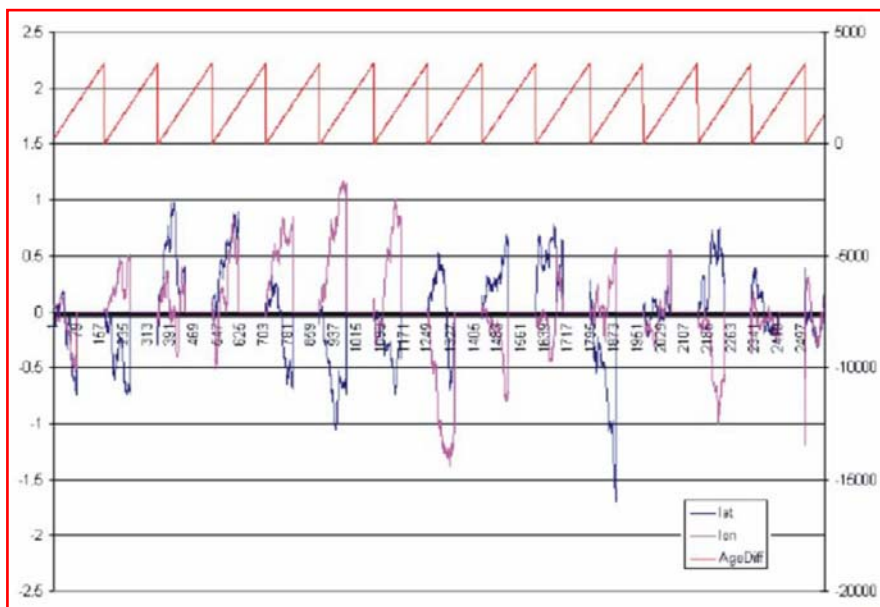
## Crescent Firmware Options

- e-Dif
  - Generate RTCM corrections
  - Two Modes
    - Mode 1
      - Provides base-station functionality for sub-meter performance
      - Typical application: Local DGPS correction source
    - Mode 2
      - Can work as a rover with no base, but correct to known coordinates for periodic point revisitation
      - Typical application: Soil Sampling



## Crescent Firmware Options

- e-Dif





## Crescent Firmware Options

- L-Dif
  - 30 cm Real-time navigation, 95%
  - Uses “floating” RTK technique
  - Suitable for distances from base to rover of up to 5km

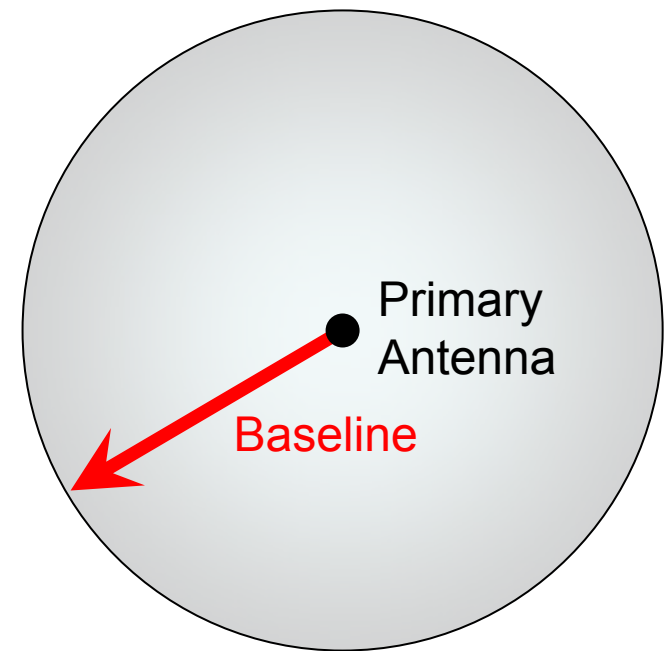
## Crescent Firmware Options

- L1 RTK

- 2.0 cm Real-time navigation, 95%
- Uses “fixed” RTK technique
- Suitable for distances from base to rover of up to 5km
- Provides L-Dif solutions when L1 RTK solutions are not available

## Crescent Vector OEM

- Primary antenna used for reference position
- Heading is location of Secondary antenna with respect to Primary
- Baseline distance between the antennas constrains solution for Secondary antenna to a sphere around the Primary antenna
- Recommended distance between antennas 0.5 – 4.0 meters



## Crescent Vector OEM

- Tilt sensor
  - Constrains the solution to a space shaped like a horizontal donut
  - Reduces startup and reacquisition time for heading
- Gyro
  - Defines wedge-shaped location on ring
  - If GPS lock is lost, gyro continues to output heading for up to 3 minutes with  $1^\circ$  accuracy
  - Reduces heading reacquisition times

