

Low Cost, High Accuracy GNSS Survey and Mapping

FIG Presentation, Costa Rica 2007

INTRODUCTION



- GNSS use has increased worldwide for positioning and timing services
- GNSS receiver prices have declined while functionality has risen
- New algorithms allow lower-cost, single-frequency receivers to perform real-time, centimeter level, kinematic surveys and mapping projects

GNSS RECEIVERS REAL-TIME PERFORMANCE

	SINGLE-FREQUENCY RECEIVER	DUAL-FREQUENCY RECEIVER
ACCURACY	1 CM HORIZONTAL 2 CM VERTICAL	1 CM HORIZONTAL 2 CM VERTICAL
SKY OBSCURITY	OPEN SKY REQUIRED	PARTIAL SKY OCCLUSION POSSIBLE
TIME TO FIRST FIX (TTFF)	15 SECONDS TO 30 MINUTES	1 SECOND TO 1 MINUTE
BASELINE LENGTHS	UP TO 10 KILOMETERS	UP TO 40 KILOMETERS

TECHNOLOGY ADVANCES - BLADE™

- BaseLine Accuracy Determination Engine
 - Patented and Trademarked processing technique
 - For use in real-time and post-processing scenarios
 - Compatible with all current GNSS's
 - Computes SBAS ranges
 - Removes receiver and constellation biases
 - Real-time centimeter and decimeter solutions
 - Time To First Fix is reduced
 - 3D attitude determination

TECHNOLOGY ADVANCES

	1978	2007
FUNCTION	Detect satellite in space	Compute centimeter position in real-time and port information to application software
COST	US\$ 225,000	US\$ 8
USES	Military only	Global user base within hundreds of disciplines
SIZE	318 Kg (700 lbs)	0.05 Kg (0.11 lbs)

APPLICATIONS



- Surveying
- Construction
- GIS

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RETURN ON INVESTMENT

- Productivity
- Infrastructure
- Land use



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SUMMARY

- GNSS technology is efficient and reliable for precise positioning and timing
- Costs have declined while functionality has risen
- GNSS technology provides advantages that other techniques do not
- New satellite signal processing engines such as **BLADE™** allow lower cost systems to deliver performance nearly at the level of more expensive systems
- Application software has become applicable to more professions
- Lowering the cost barrier has created a wider audience of users

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- GNSS are becoming a world-wide infrastructure
- More devices will have GNSS receivers embedded for tracking and/or control
- Lowering the cost barrier will fuel this expansion
- GNSS engineers will continue to innovate and create new techniques to improve performance
- Productivity and usefulness will continue to increase
- The number of professions and users of GNSS will continue to grow



**GRACIAS
THANK YOU**

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