



Multi-purpose Handheld Sample Collection Registration & Tracking Device

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Patented Technology Ready for Licensing and Manufacturing



❖ U.S. Patent Number 6.947.866 B2

Handheld Sampler Gun

- ❖ State-of-the-art, multi-purpose sampling device
- ❖ Rapidly collects and tracks a wide variety of samples
 - Radiological
 - Chemical
 - Biological
- ❖ Adaptable sampling mechanism collects samples in various states
 - Solid
 - Liquid
 - Gaseous

Handheld Sampler Gun

- ❖ “Hands-off” design approach
 - Effectively eliminates the risk of human and sample cross-contamination
- ❖ Multitude of highly integrated sensors for real-time, electronic recording and tracking
- ❖ Extensible, modular design

One Device, Many Applications (Select List)

- ❖ Forensics
- ❖ Emergency Response
- ❖ Environmental Monitoring
- ❖ Industrial Hygiene
- ❖ Customs / Border Patrol
- ❖ Law Enforcement
- ❖ Fire Departments
- ❖ Military
- ❖ Agriculture
- ❖ Drug-Testing Programs
- ❖ Food Inspection
- ❖ Many more



Simulated application picture

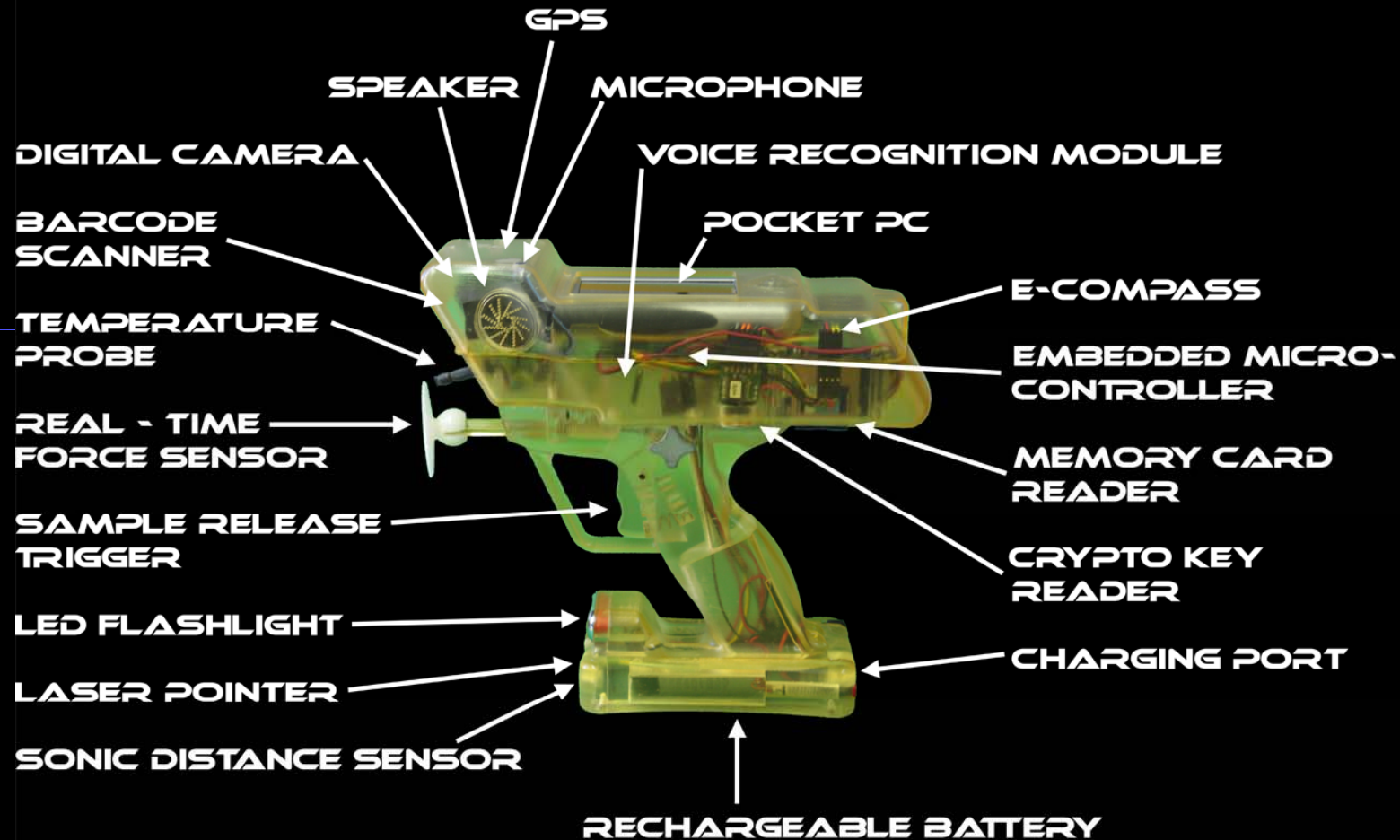
Inadequacies of Current Sampling Methods

- ❖ Field data acquisition usually done via pen and paper
- ❖ No automated data validation often resulting in incomplete and inconsistent field data
- ❖ Often requires time-consuming and error-prone post-collection data fusion in office/lab
- ❖ Usually requires multiple separate data acquisition devices
 - High operational overhead



*Traditional Method:
Time-consuming and error-prone
field data collection on paper*

Sampling Device Features



Revolutionary Advantages

- ❖ Handheld device that is lightweight and mobile
- ❖ Device is operated by a rechargeable battery allowing for 8 hours of continuous use
- ❖ Sample data acquired and registered only once
- ❖ Field data can be acquired 10 times faster than traditional methods
- ❖ Minimizes/eliminates sample cross contamination and human exposure to hazardous samples

Revolutionary Advantages

- ❖ Data integrity is ensured through high degree of device automation and integration
- ❖ Intuitive touch-screen interface provides effortless sample data collection
- ❖ Fully integrated multi-media (voice, video, text) for sample data acquisition and management
- ❖ Universal, XML-based data format is used to allow data export to virtually any back-office IT-system
- ❖ Removable memory card for transferring data from device to PC

Revolutionary Advantages

- ❖ Adaptable sampling mechanism supports a wide variety of common media, such as swabs, wipes, contact plates, filter paper, vials, etc.
- ❖ Pinpoint and track sample locations using built-in GPS and graphical information system software
- ❖ Precisely map sampling area using integrated sensors



*Cross-contamination free
sample media pick-up and
delivery*

Revolutionary Advantages

- ❖ Improved sampling QC through real-time monitoring of
 - Pressure applied to sample media/object
 - Environmental temperature
- ❖ Barcode scanner can read 1D and 2D barcodes for sample registration and tracking
- ❖ User can take digital pictures of handwritten labels and sampled object/scene



Barcoded sample media

Revolutionary Advantages

- ❖ Voice recognition enables user to speak commands for automatic, hands-off sample data registration
- ❖ Electronic scene sketching support
- ❖ Enhanced sample chain of custody support through software and hardware based authentication and encryption



User authentication with crypto button/key

Revolutionary Advantages

- ❖ Ad hoc air sampling [optional]
- ❖ Wireless data transmission [optional]
- ❖ Area being sampled is calculated using real-time tracking of sampling motion/patterns [optional]
 - Improved sampling QC
- ❖ Voice memos [optional]



Example of air sampling of a chemical storage cabinet.

Pocket PC Graphical User Interfaces (Set 1 of 3)

*Start-up / Login
screen*

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Exit Read Key

Please insert the crypto key into the key reader. Make sure it makes contact at the center and side.

Collection Info

Batch ID
345772

Select Current Collector
cblackhart

Select Current Location
TA-46 Bldg 42

Collect Samples

Set Default

Batch Location Collector

Collection Info

Location
LA Post Office

Location Name
LA Post Office Add

Location Information
Site of suspicious mail found with unknown powder

Clear Form Delete

Batch Location Collector

Collection Info

Collector
mfinkerdink

Username
mfinkerdink Add

First Name Last Name Phone
Mike Finkerdink 555-55

Organization Email
FBI mfinkerdink@fbi.

Clear Form Delete

Batch Location Collector

to Set 2

*Initial sample batch,
collector, and location
acquisition form*

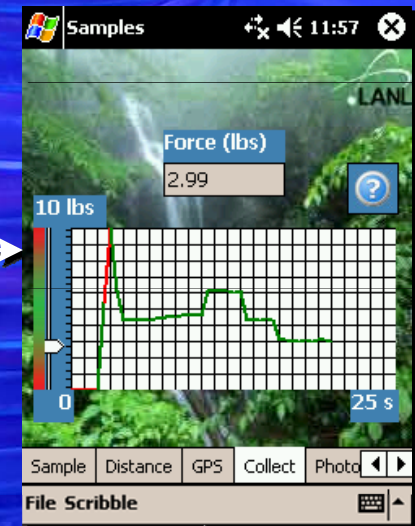
*Sampling location
acquisition form*

*Sample collector
registration form*

Pocket PC Graphical User Interfaces (Set 2 of 3)

Sample batch registration form

from Set 1



to Set 3

*Electronic compass
& sonar measurement
form*

*GPS data
acquisition form*

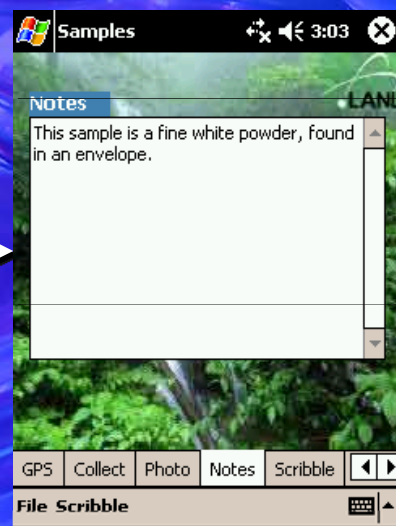
*Real-time
sampling pressure
feedback display*

Pocket PC Graphical User Interfaces (Set 3 of 3)

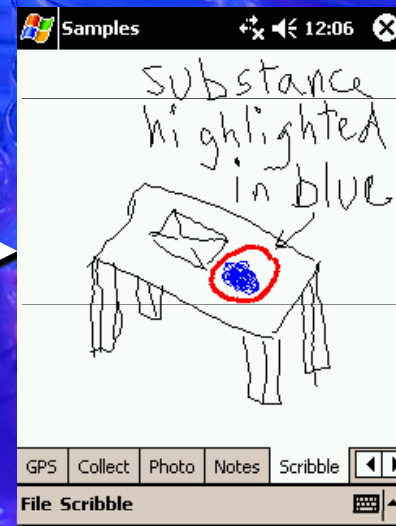
from Set 2



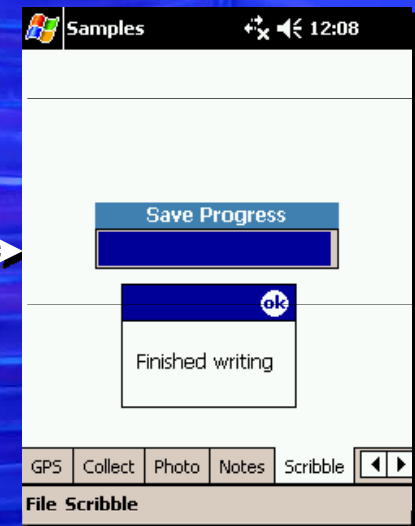
*Sample / scene
image acquisition
screen*



*Notes / comments
input form*

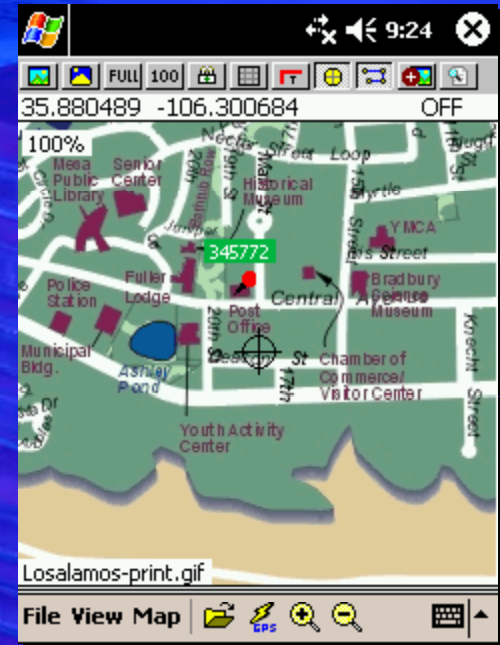
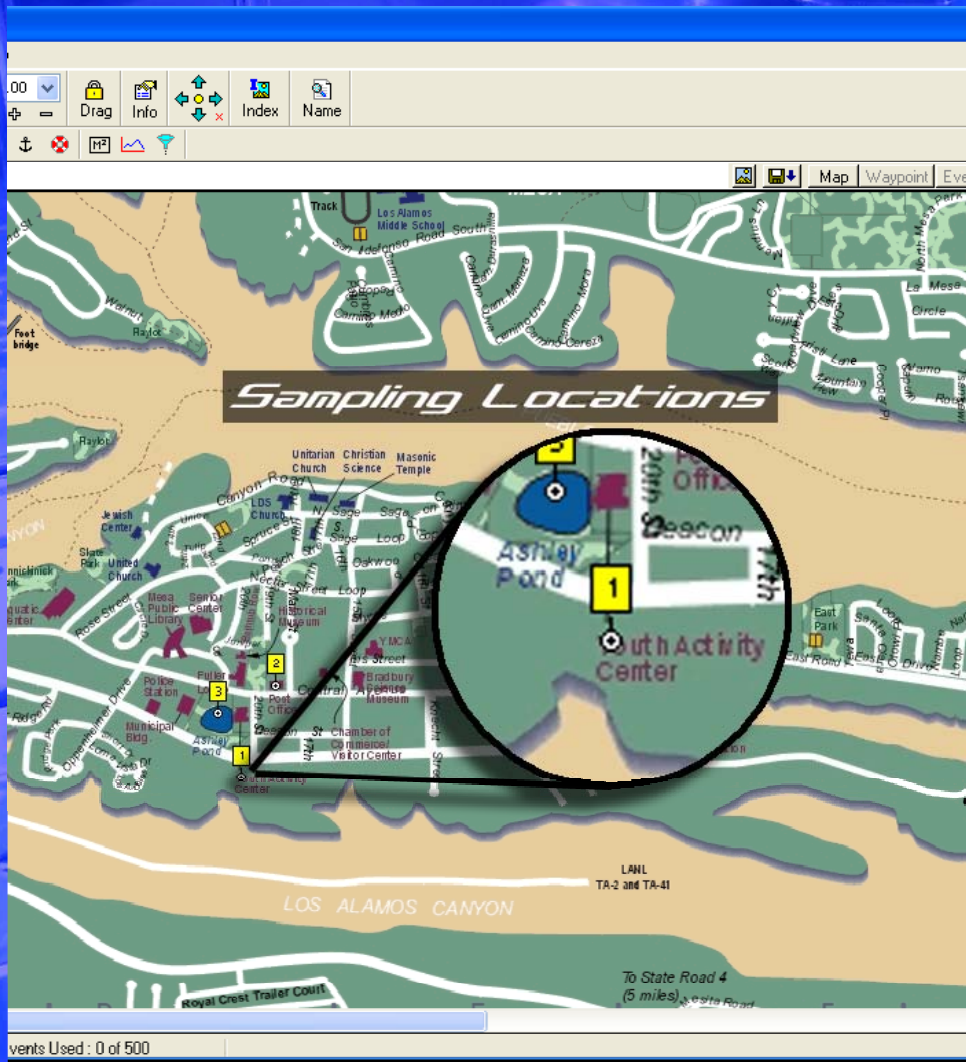


*Electronic scene
sketching form*



*Memory card data
export screen*

Geographic Information System (GIS) Interfaces



PC and Pocket PC versions allow user to track sampling locations graphically

Yellow boxes represent sampling location markers

PC Graphical User Interface

Sampler Gun Data

File

Sample Media

BatchId: test 4 Samples: 1111946

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Collector Info

First Name: Craig Last Name: Blackhart

Phone: 5-6588 Email: blackhart@lanl.gov

Location Info

Location Name: TA-46 Bldg 42

Organization: LANL **Username**: cblackhart **Location Description**: ESA-AET

Sample Info

Sample Id: 1111946

Orientation Info

Distance 1: 10 inches

GPS Info

SampleType	Distance 2	Longitude	Quality
Solid	10 inches	139° 44' 40" E	Invalid

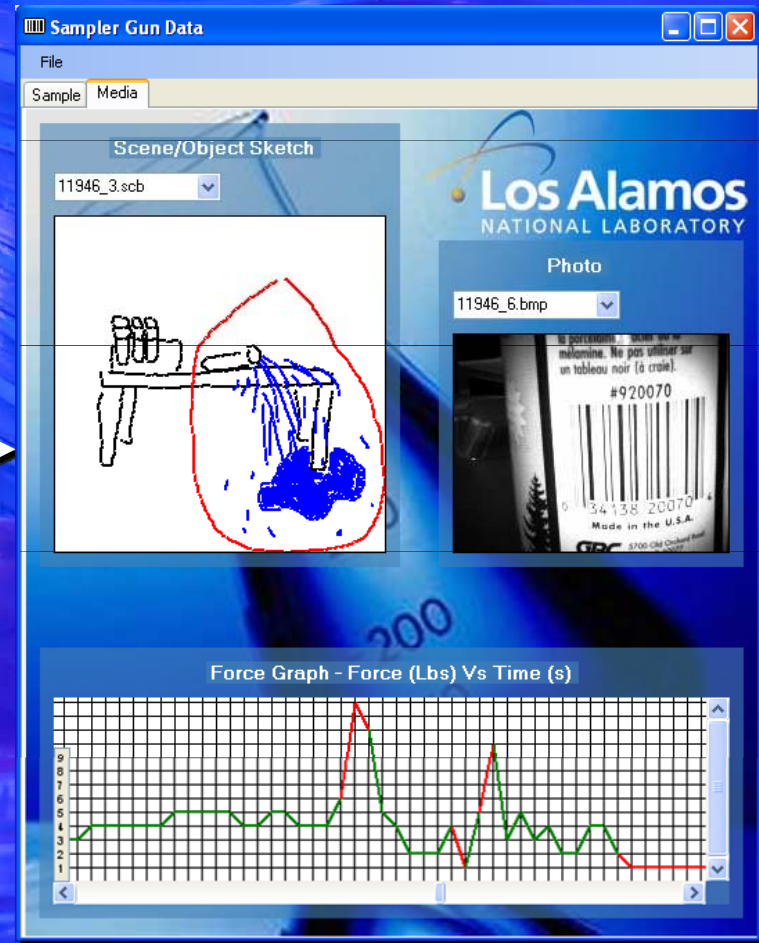
Temperature	Distance 3	Latitude	Altitude
70 °F	10 inches	35° 37' 50" N	0100 m

Date / Time	Heading	# Satellites Used	UTC Time
9/21/06 9:31:06 A	8° WNW	00	06:25:59

Notes

possible lead conamination
incident reported to occur by spilling of a vial of unknown liquid sent in for testing
one person had contact with possibly hazardous substance at time of incident

Sample registration form



Sketching, imaging, and real-time force display screen

Conclusions

- ❖ Faster, more accurate sample collection (speedup of 10x or higher)
- ❖ Minimizes risk of sample cross contamination
- ❖ Minimizes exposure risks to sampling personnel
- ❖ Simplifies field logistics and sample data acquisition
- ❖ Provides plug-n-play architecture to fit many domains
- ❖ Reduces required sampling staff by up to 50%
- ❖ Low total cost of ownership (one integrated device instead of N standalone field devices)

Contact

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