MetalMapper (MM) 2x2 Status: Industry and Government Perspective

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Outline

- ✓ MM 2 x 2 Status
- ✓ Industry Perspective
- ✓ Government Perspective

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Contributors

Owners

- ✓ ARCADIS
- ✓ Parsons – 2 (1 on Order)
- ✓ CH2M/Jacobs
- ✓ Exploration Instruments (EXI)
- ✓ FPM
- ✓ NAEVA
- ✓ USACE – Ft Ord

Additional Contributors

- ❑ ESTCP/SERDP
- ❑ NOVA Research
- ❑ Acorn
- ❑ USACE

Manufacturer

- ❑ Geometrics

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Recent Testing

Recent Testing

- ✓ Blossom Point, MD
- ✓ APG, MD - Validation Testing

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Recent Projects

Performed Projects

- ✓ Ft Pierce, FL – ARCADIS
- ✓ Ft Pickins, FL – ARCADIS
- ✓ Hawthorne Army Depot, NV – CH2M/Jacobs
- ✓ Ft Ord, CA - NAEVA

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Functionality

- ✓ Testing and Projects have shown data collected with a MM 2x2 is of sufficient quality to :

    1. To detect Targets of Interest (TOI), and
    2. To classify detected anomalies.

- ✓ The issues with the current version of the MM 2 x 2 are there are several known operational problems which impact both dynamic and static data collection.

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Current Status – Major Issues

- ✓ Overheating during dynamic data collection
- ✓ No Infield Inversion
- ✓ Infield Static Function Test (SFT) Failures
- ✓ Data acquisition crashes
- ✓ Data collection rate can spontaneously change
- ✓ There is a disconnect between the naming and content of the hdf5 files from the instrument and the expected naming and content of these files upon import into the UX-Analyze package

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Current Status – Overheating

- ✓ In dynamic mode, the unit can operate under ambient conditions for 1 – 3 hours before a significant rest break is required.
- ✓ Geometrics has redesigned the electronic box.
- ✓ Added additional larger heat sink and rearranged backpack.
- ✓ Geometrics heat chamber testing indicates new design can work in ambient temperatures up to 50 degree C.

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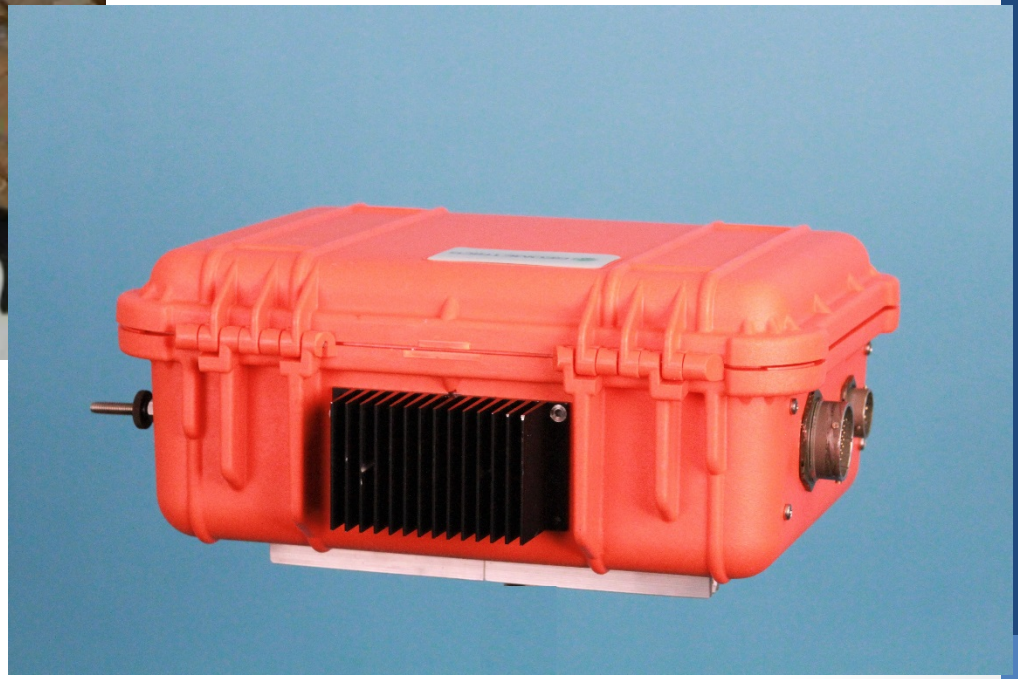
Current Status – Overheating

Previous Design



New Design

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Current Status – Overheating

- ✓ EXI system currently being retrofitted.
- ✓ Plan to have the system back by early April.
- ✓ The EXI system will be tested at Blossom Point by Nova Research as soon as system is back.
- ✓ If the Blossom Point testing is positive plan to take the EXI system to the APG blind test site for validation surveys.
- ✓ Parsons is also having a second system built which will have the new electronics box. Parsons plans to do testing in late April.

Current Status – Infield Inversion

- ✓ Data acquisition software has no infield inversion.
- ✓ Without infield inversion up to 25% recollects needed during cued data collection.
- ✓ Acorn is working on the infield inversion and said it should be done soon but no ETA.
- ✓ Geometrics hopes to send a MM 2 x 2 tablet to Acorn this week so they can do testing of the infield inversion with existing data.
- ✓ Geometrics said as soon as they get the infield inversion from Acorn they will get it incorporated into a new firmware update and get it to the MM 2x2 owners.

Current Status – Static Function Test

- ✓ Static Function Test (SFT)
- ✓ SFT on data acquisition software indicate a failed SFT in the field but when evaluated in Geosoft it passes.
- ✓ Geometrics discussing the infield inversion fix with Geosoft and others.
- ✓ Geometrics thinks the SFT fix is tied to the infield inversion module so the SFT fix will be made when infield inversion update is made.

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Addition Issues

- ✓ Data acquisition system crashes –
  - ✓ One cause of the crashes may be related to project size.
  - ✓ New firmware update will not crash but provide warning if data stream is interrupted.
  - ✓ Geometrics hopes to have new firmware update in next few weeks.
  - ✓ Will be tested at Blossom Point or APG.
- ✓ During dynamic data collection data collection rate can spontaneously change
  - ✓ Geometrics is trying to replicate
  - ✓ New firmware to fix in software update.
  - ✓ Will be tested at Blossom Point or APG.
- ✓ There is a disconnect between the naming and content of the hdf5 files from the instrument and the expected naming and content of these files upon import into the UX-Analyze package
  - ✓ Geometrics needs to coordinate with software companies.
- ✓ Does not support collection without GPS/RTS
  - ✓ Not high on priority list at this time

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New Battery Options

- ✓ Geometrics providing optional lighter batteries
- ✓ 40% lighter than original battery
- ✓ Original 14.5 lbs and new battery is 6 lbs.
- ✓ Will require 3 batteries than 2 batteries for standard day of data collection
- ✓ Smaller battery should do about 100 static measurements or collect dynamic data for 2-3 hours.

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Industry Perspective

- ✓ Initial release of system was spring 2016.
- ✓ The MM2x2 release was delayed from the early goal, but still was shipped before it was really ready.
- ✓ That led to recurring problems and shifted the testing effort to the first purchasers and government.
- ✓ Industry with support of government have spent a significant amount of time and investment to test and troubleshoot the MM 2x2 since it's initial release.
- ✓ ESTCP/SERDP has funded and continues to fund testing and evaluation of the MM 2x2 data with support from Nova Research, Leidos, and Acorn
- ✓ All the current MM 2 x 2 owners have spent time testing and trouble shooting the system with ARCADIS, EXI, and CH2M spending time at Blossom Point and APG supporting ESTCP/SERDP testing, troubleshooting, and validation.

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Industry Perspective

- ✓ This need for additional testing and troubleshooting from 2016 to the present has lowered confidence and increased weariness among Industry management in the hardware and made companies reluctant to invest in this expensive equipment.

- ✓ Availability of systems
- ✓ Repair and maintenance of systems over a long term project are still to be determined.
- ✓ Costs and schedule impacts on Firm Fixed Price (FFP) projects.
  - ✓ Proposal/Costing
  - ✓ Project implementation

- ✓ Hopefully new system fixes, testing/validation, and successful project use will improve this weariness.

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Government Perspective

- ✓ A commercial AGC sensor is absolutely needed
  - ✓ USACE has contracted AGC on over 25 projects
  - ✓ Across the board, cost savings have been seen
  - ✓ Data quality is orders of magnitude better
- ✓ Button pushing software -> button pushing instrument= it just works
  - ✓ Self QC-ing
- ✓ Flexibility
  - ✓ Multiple terrains and environments
  - ✓ Cued & dynamic capabilities
  - ✓ Arrays
- ✓ Durability
- ✓ Better documentation
  - ✓ User reports, bug reports, fixes, technical specifications
- ✓ Industry and government need to improve communication

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Thank You

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