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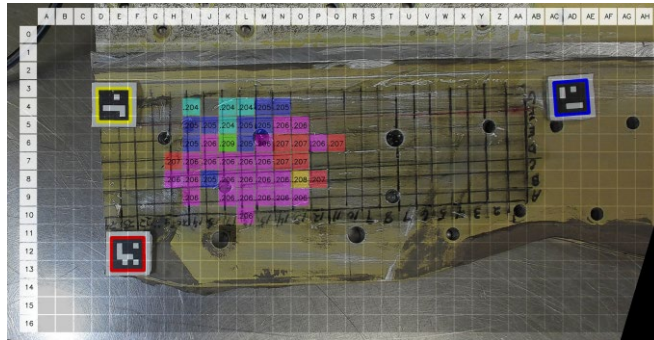


From Micro to Massive: Expanding the Practical Limits of Digital UT Grid Mapping with NDT Tracker

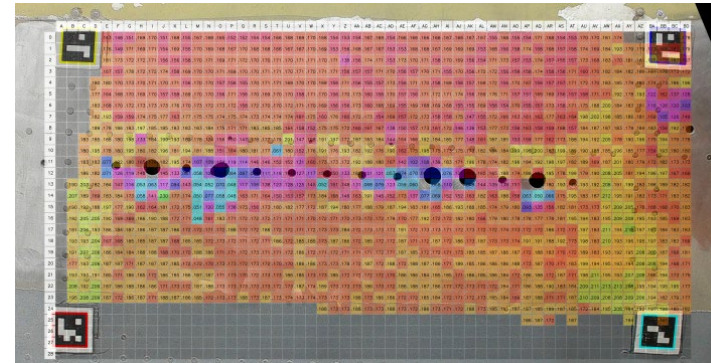
Kevin Tang, M.Eng., PMP
Research Engineer
Cybernet Systems Corporation

September 23, 2026

Hyatt Regency Tulsa, Oklahoma

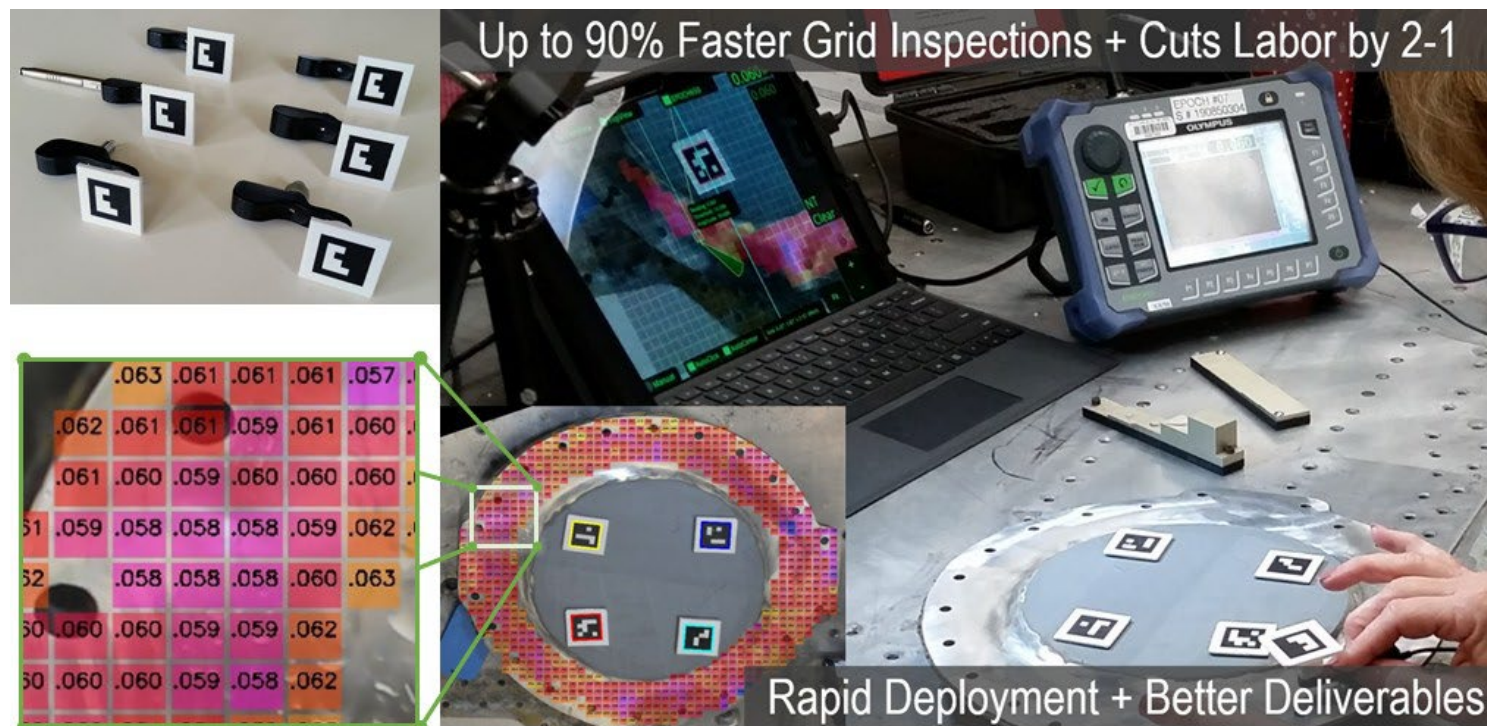


0.25" Grid, 45 thickness readings
0.5" barcode markers



0.5" Grid, 1323 thickness readings
1.5" barcode markers

From Introduction to Expansion



Four Years of NDT Tracker at A4A:

- 2023 “Mobile C-Scan Generation”
- 2024 “Updates from the Field”
(A4A/SAE Award Winner)
- 2025 “Operational Efficiency & ROI”
- 2026 “Expanding Practical Limits”

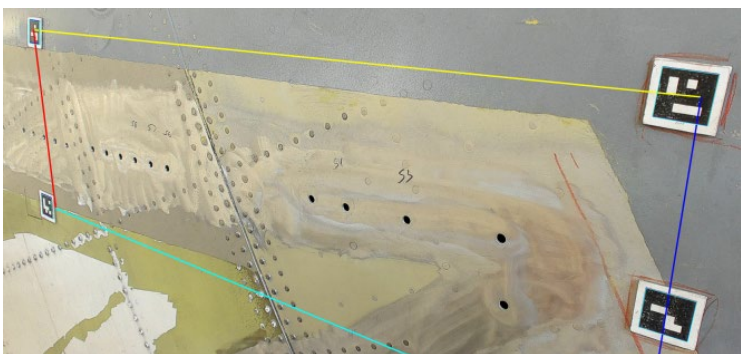
➤ **Expanding where digital UT grid mapping makes sense**

The Problem

Not Every UT Grid Inspection Looks the Same

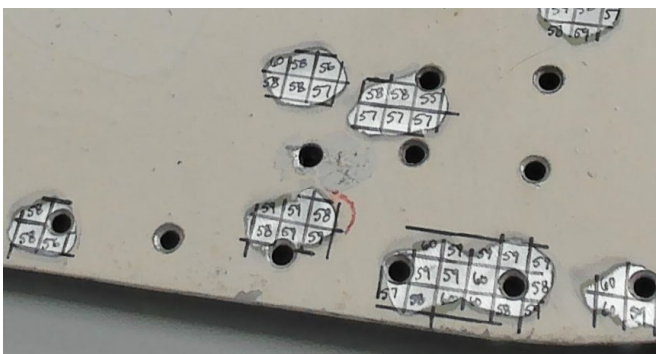
MASSIVE

- Large-area inspection
- Thousands of readings



MICRO

- Small-area inspection
- Multiple small patches



CONSTRAINED

- Limited physical access
- Unusual geometry

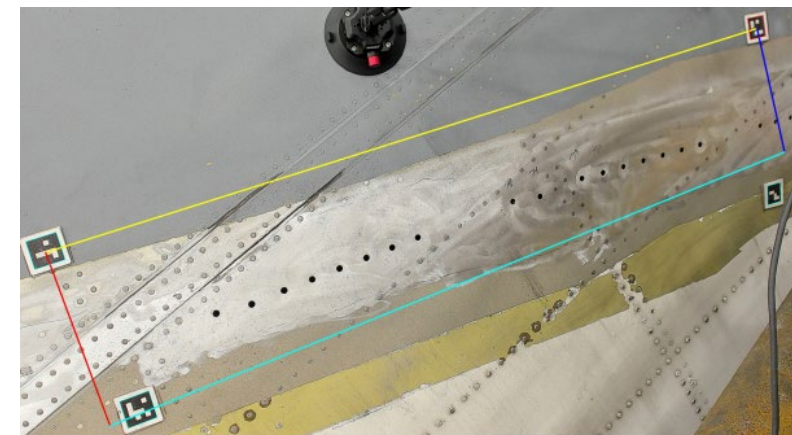
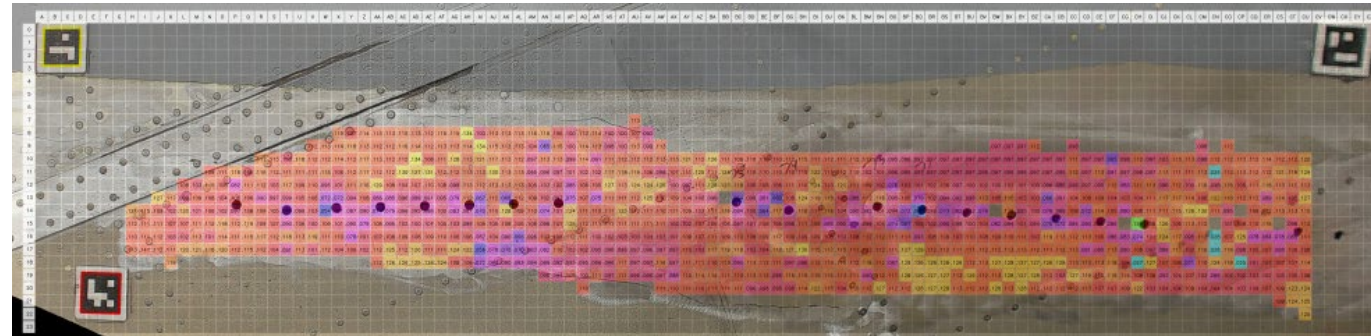


➤ The UT inspection method may be the same. The digital workflow cannot always be.

When the Grid Gets Massive

Challenges

- Large physical inspection areas
- Multiple grid regions
- Thousands or tens of thousands of readings
- Difficult to maintain spatial relationships



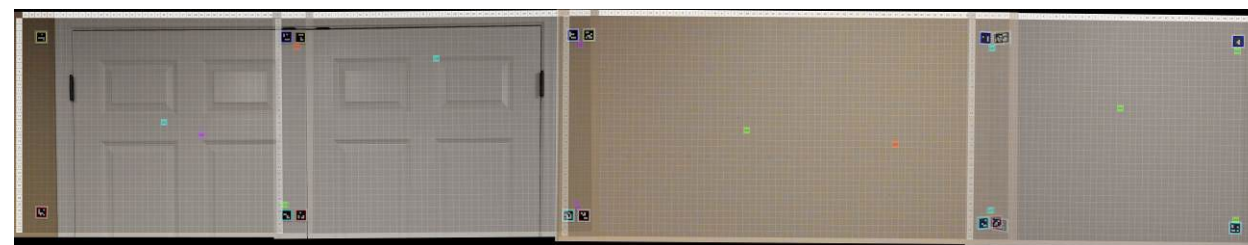
➤ Need a means to manage the inspection at scale.

Flexible Area Stitching

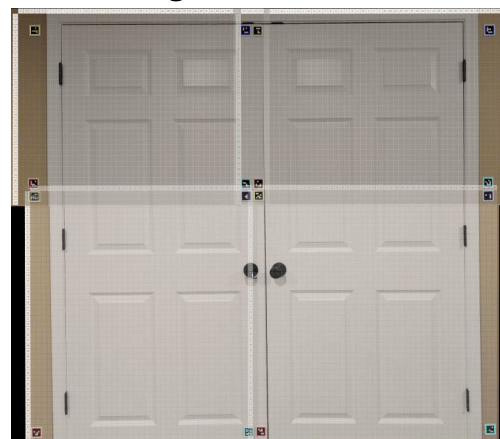
One Inspection. Multiple Grid Areas.

Large sessions can be stitched together using leapfrog markers.

Example mosaics: Creating 12x2ft long sessions



A large 6x6ft area:



Irregular shaped scan areas:

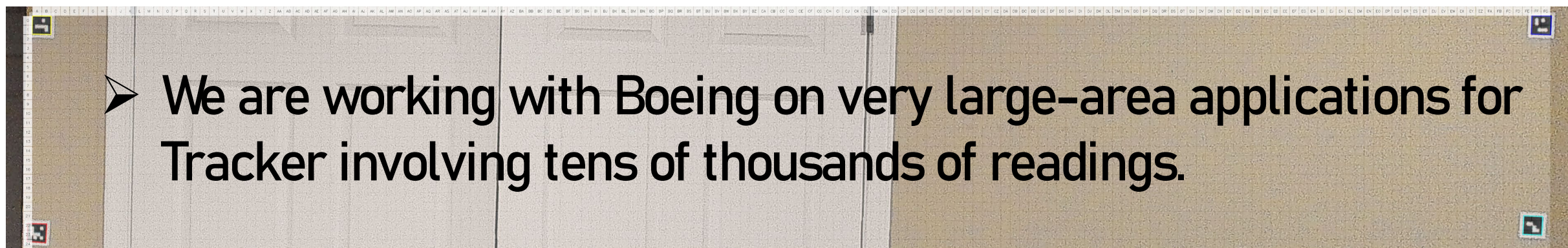
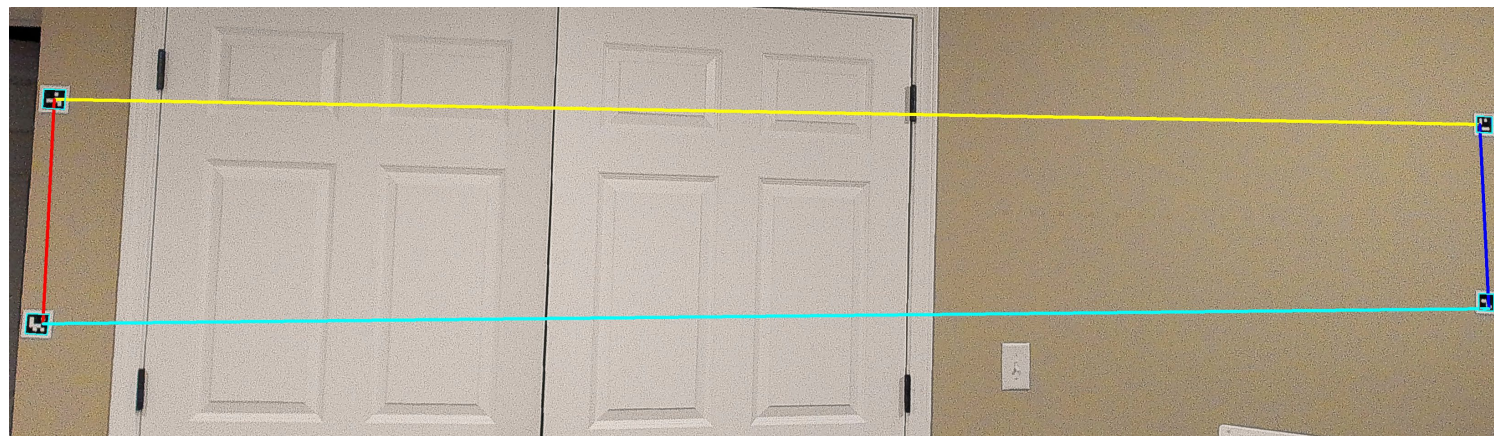


➤ Work in manageable sections without losing the overall inspection.

Scaling the Physical System

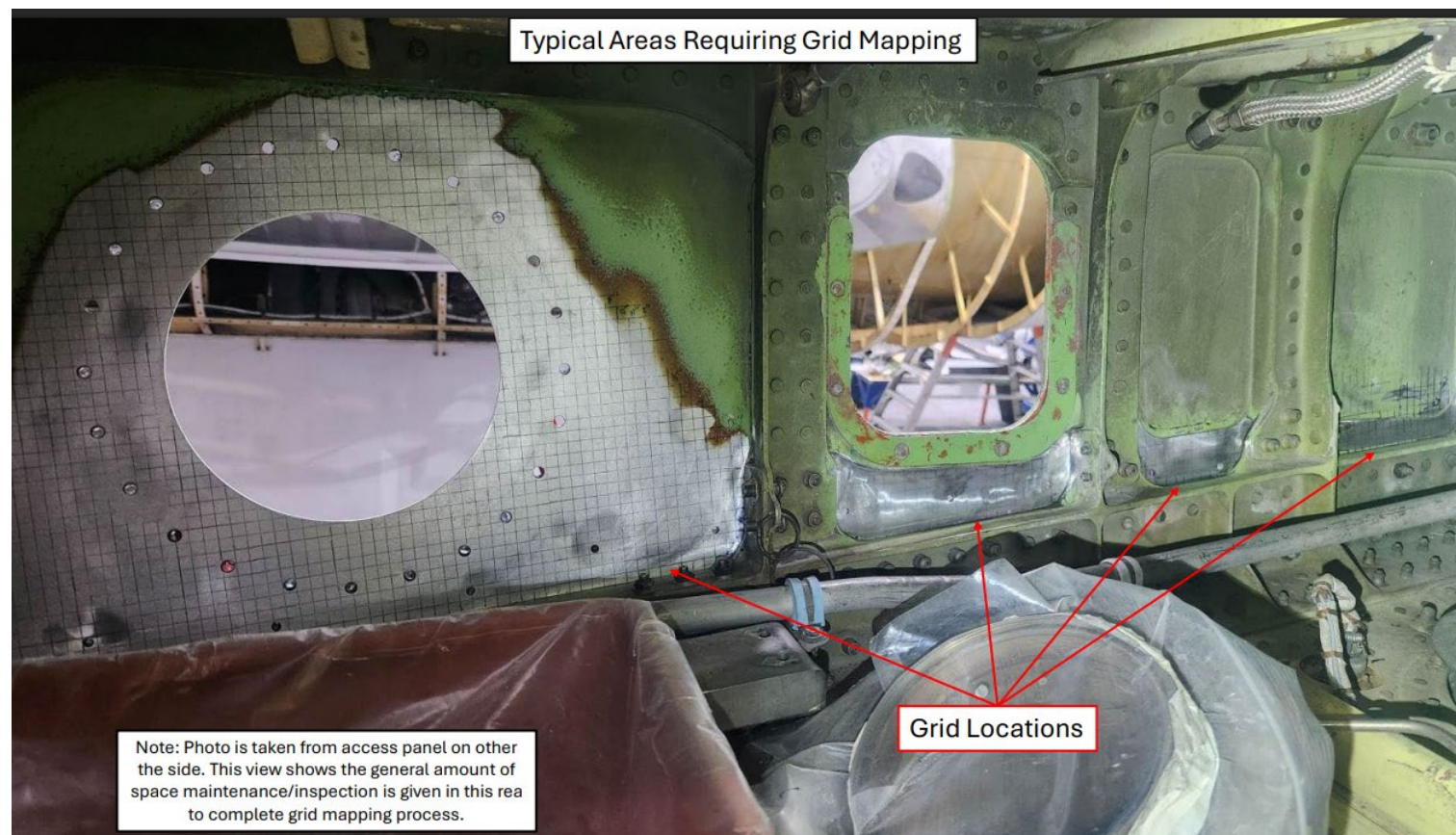
NDT Tracker PRO XL: Going Extra Large Requires More Than Software

- XL marker panels: ~9x9ft
- Longer reference distances
Example: 15x2ft stretch session
1" grid: 4,368 cells
0.25" grid: 75,712 cells



But Smaller Can Be Harder

- Large areas create a **scale problem**
- Small areas create a **geometry and workflow problem**
- Going smaller is not simply a matter of shrinking the grid.



Sometimes Simpler Is Better



Tracker LITE

- Small grids
- Quick inspections
- No camera setup
- No barcode markers
- No specialized attachments
- Simple workflow
- Can upgrade later

Tracker LITE: Small Grids

Fast & lightest, ideal for field work

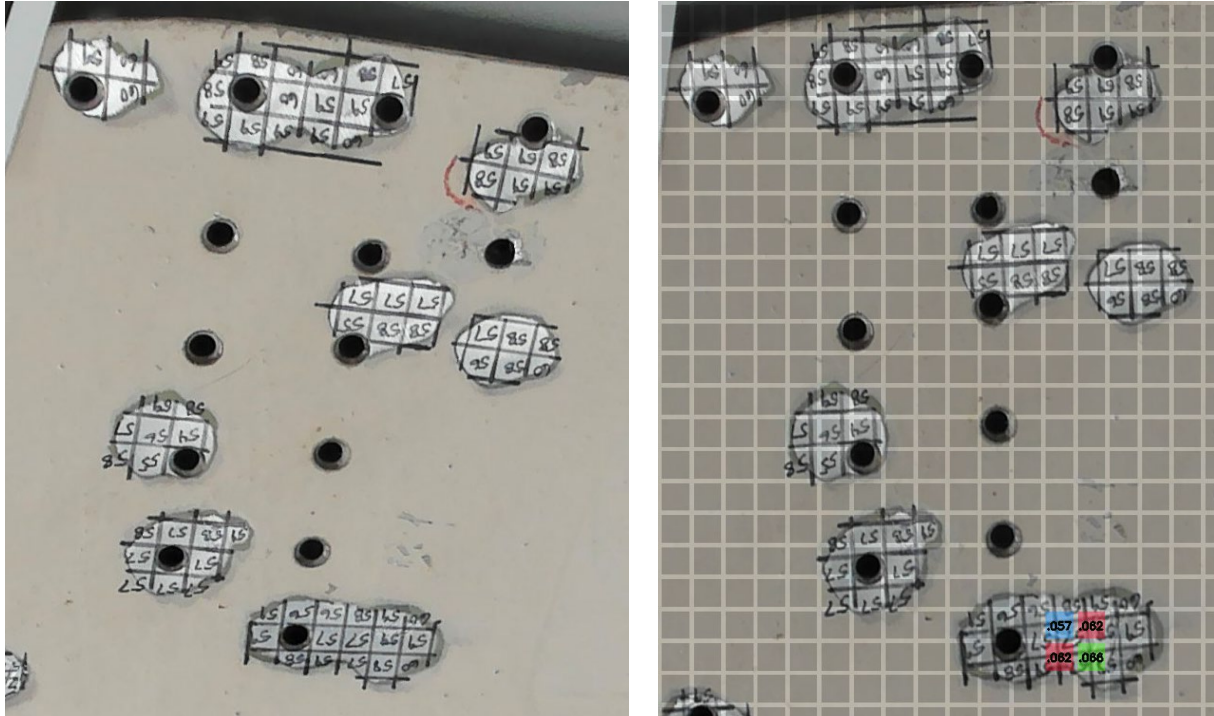


5lbs Tablet

Small Grids, Many Times a Day

Small inspections can be worth digitizing too

See Tracker LITE Demo (3min)
https://youtu.be/bJ9HC_Ga9QU



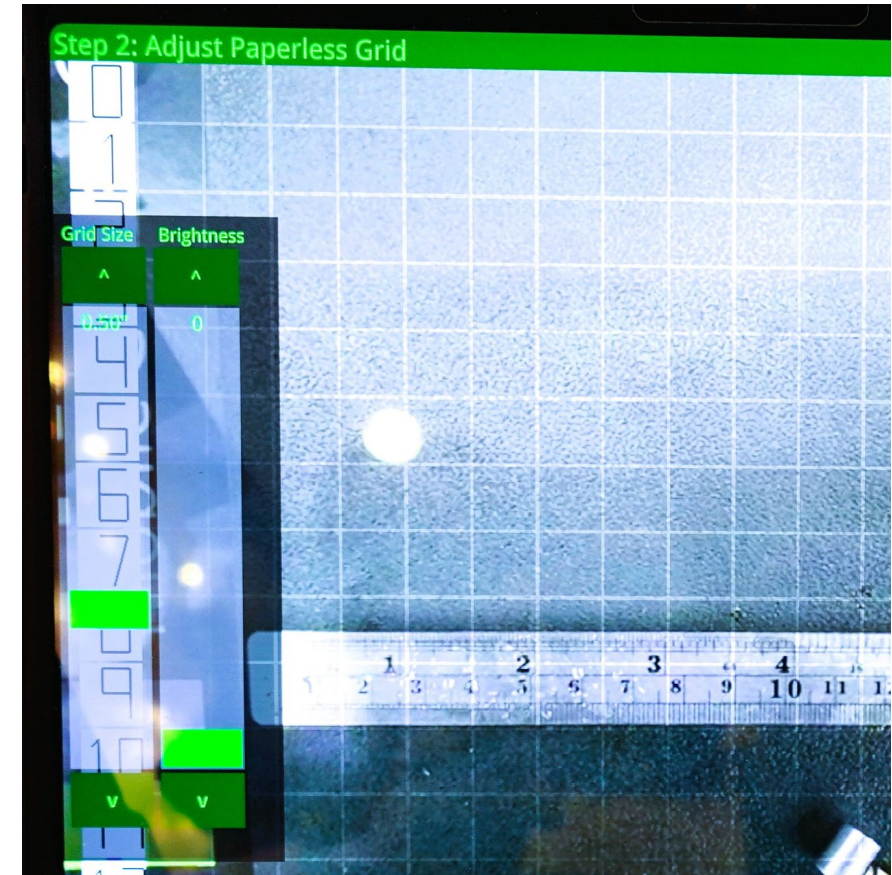
➤ Feedback on LITE has been very positive!
 “This one's the right fit for us”

Tracker LITE Workflow

Take picture of inspection area with Tablet's camera



Adjust Grid Cell Size



Tracker LITE Workflow

Tap on any grid cell to select

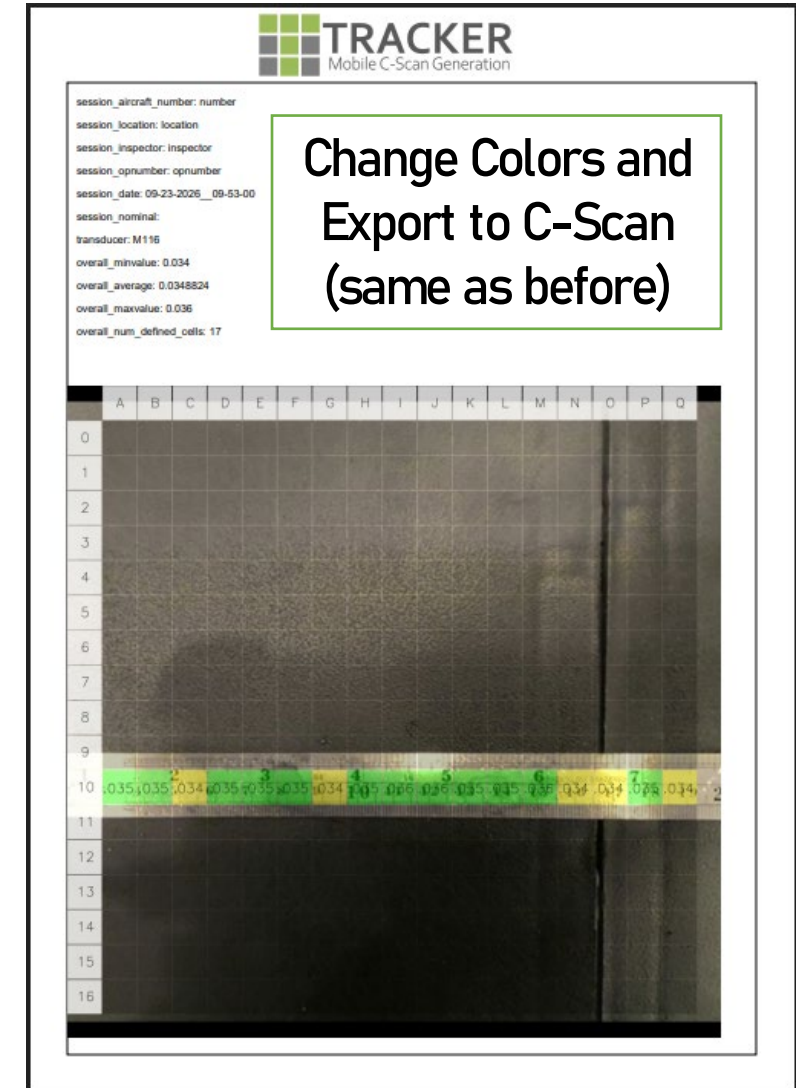


Take a reading and it will enter into the cell



Tracker LITE Workflow

Use Remote to arrow over to next cell (or tap on screen) and repeat



PRO Still Goes Smaller

Tracker Configurations

Best Fit

LITE

Small + simple + quick (up to 2x2ft)

PRO

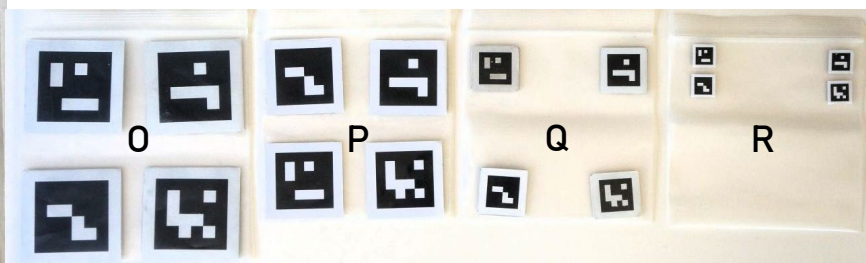
Small + complex + constrained (up to 4x4ft)

PRO XL

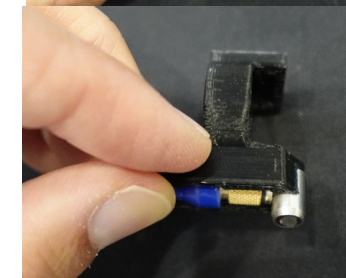
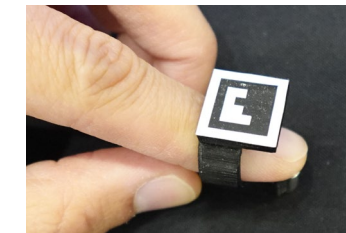
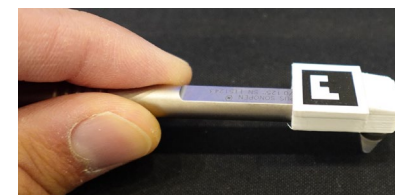
Large + massive (up to 9x9ft)



- K. 6-in Suction Cup with Extension Rod Mount
- L. 4.5-in Suction Cup with Articulating Arm Mount
- M. Small Clamp Mount
- N. Flexible Snake Light
- O. X-Large Markers (2.5-in)
- P. Large Markers (2-in)
- Q. Small Markers (1-in)
- R. Micro Markers (0.5-in)



0.5" Micro-markers and Target attachments support tight-space inspections



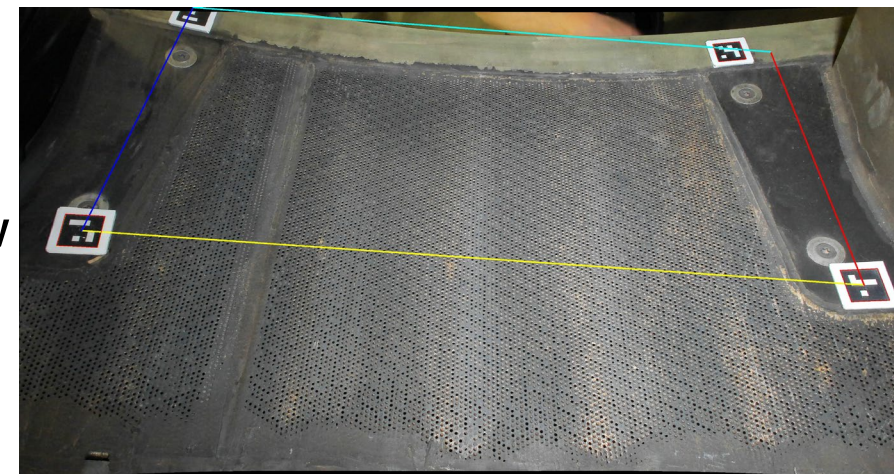
Expanding the Practical Limits of Digital UT
Grid Mapping with NDT Tracker

Inspecting Confined Spaces

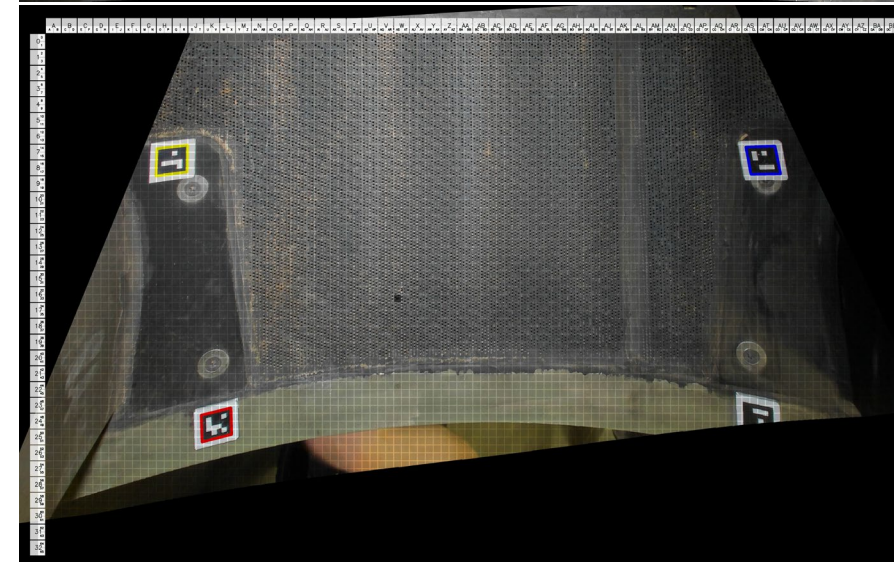
Camera can be as close in as 6-inches



CamView



TopView

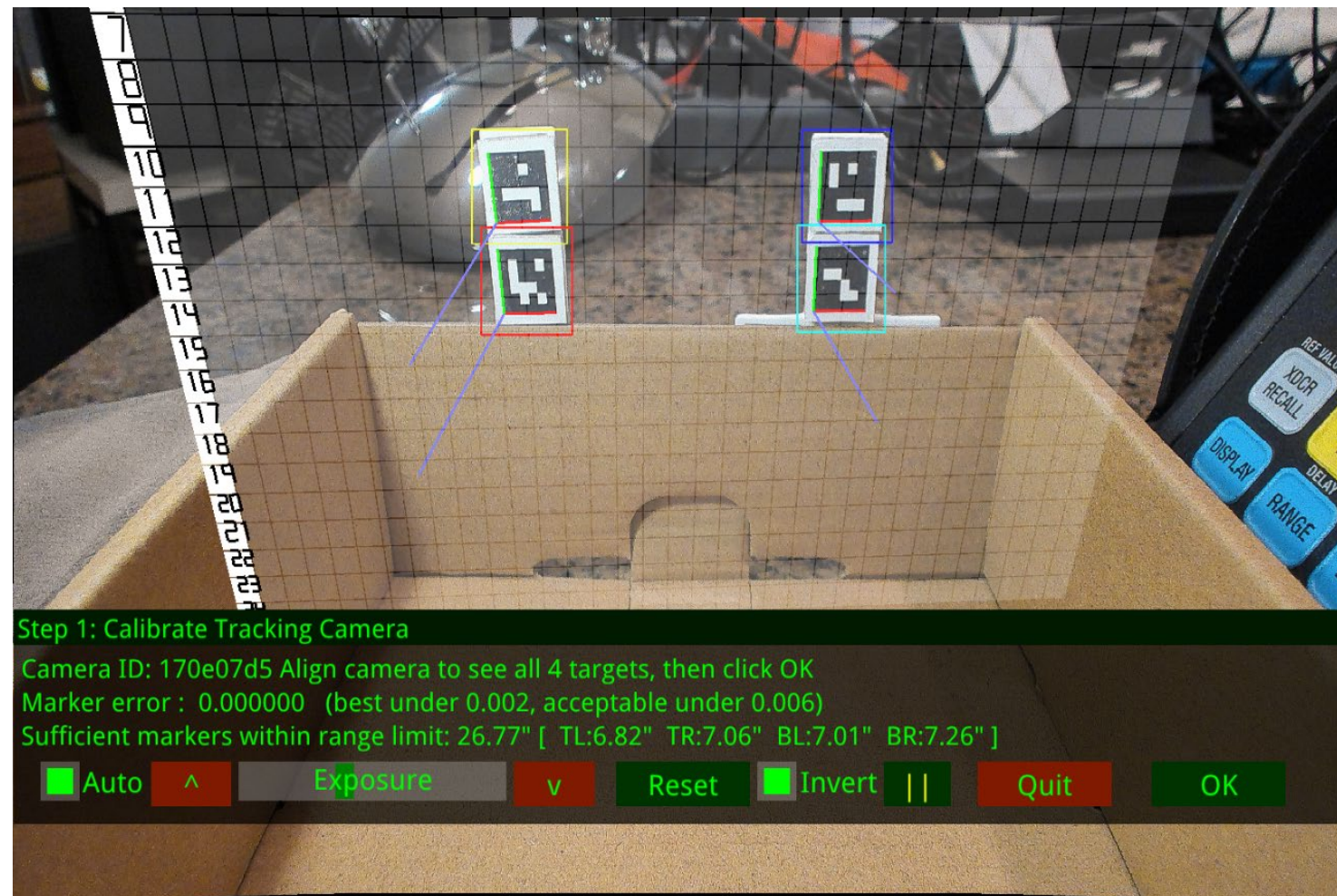


Inside-out Gridding

Barcode markers define the reference frame.

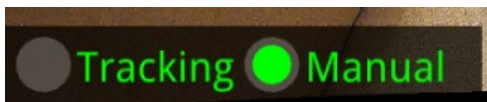
They do not have to border the inspection area if there's no space for them.

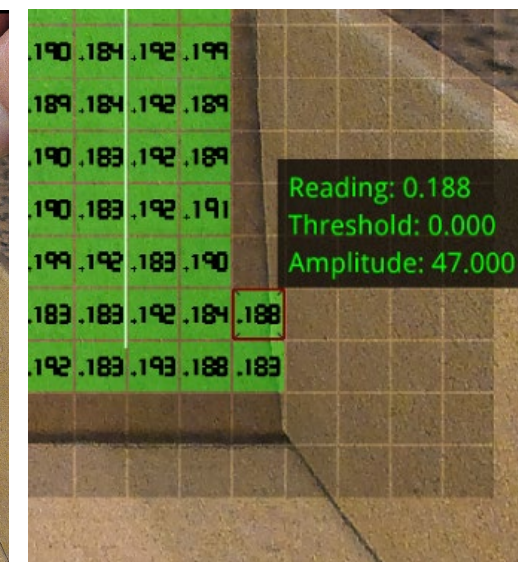
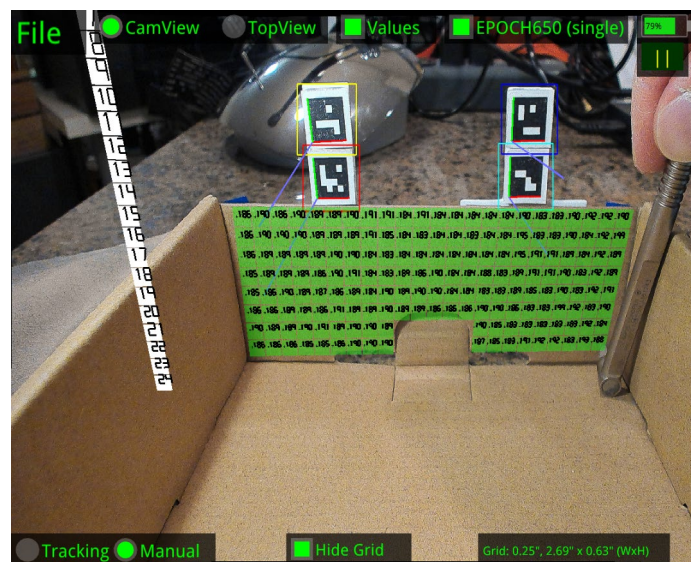
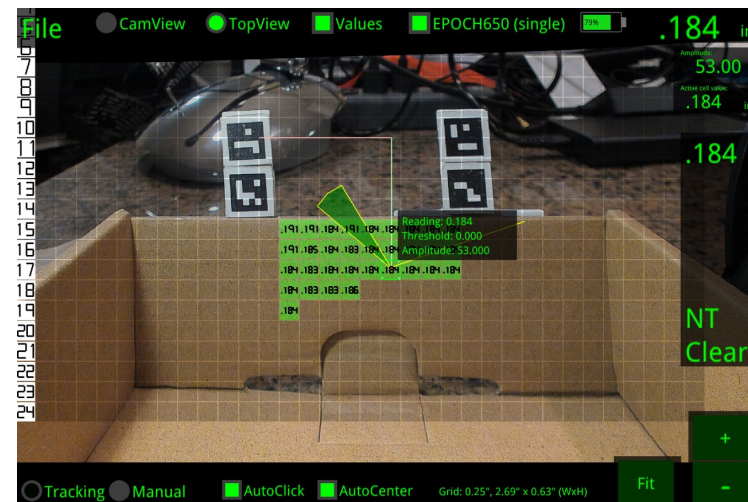
Only 3 markers are required.



Hybrid Cell Entry

When the Tracker Can't reach the Cell:

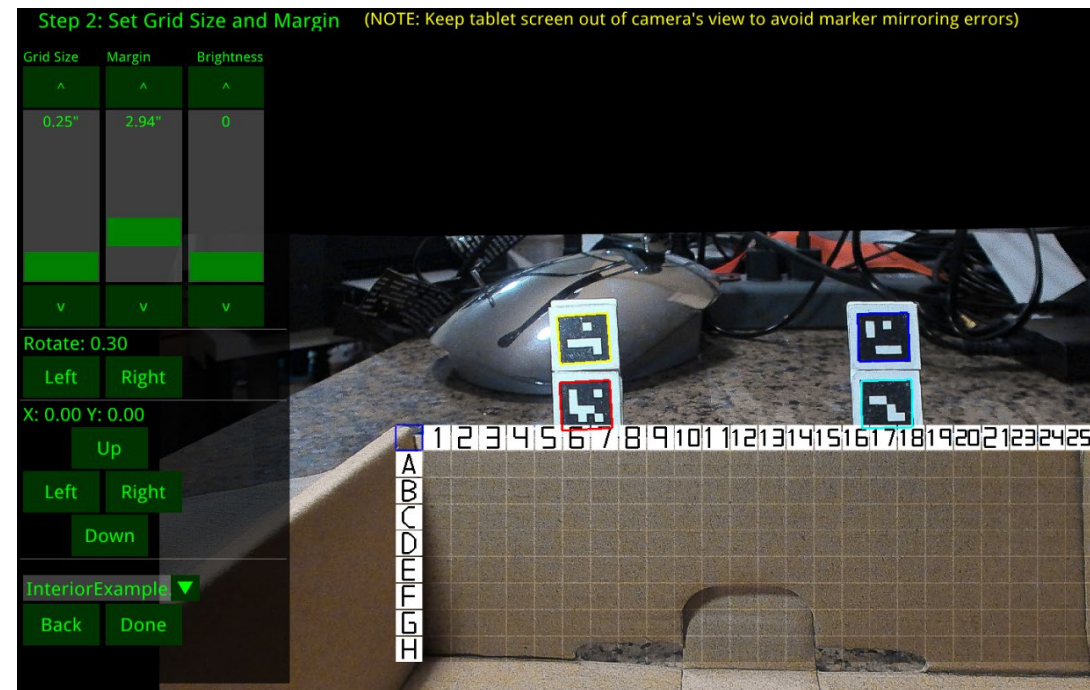
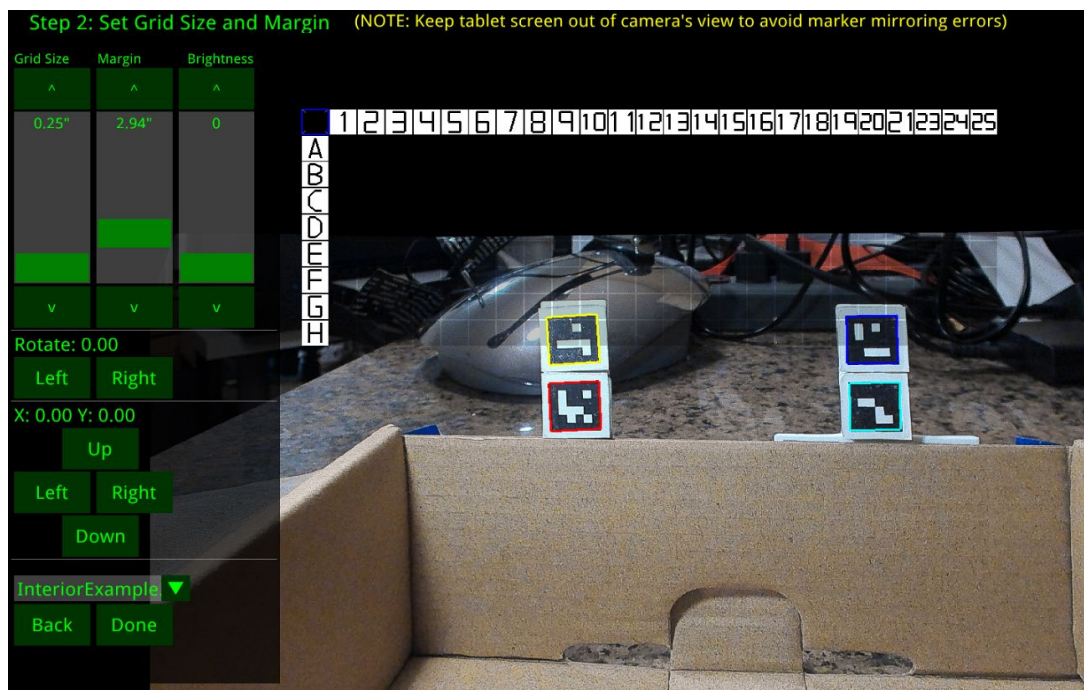
- Tracker establishes spatial reference
 - Probe reaches inaccessible location
 - Select Manual Mode: 
 - UT value entered into cell
- The digital workflow survives even when physical access is constrained.



Grid Size Templates

Customize grid templates to load, and size and position accordingly

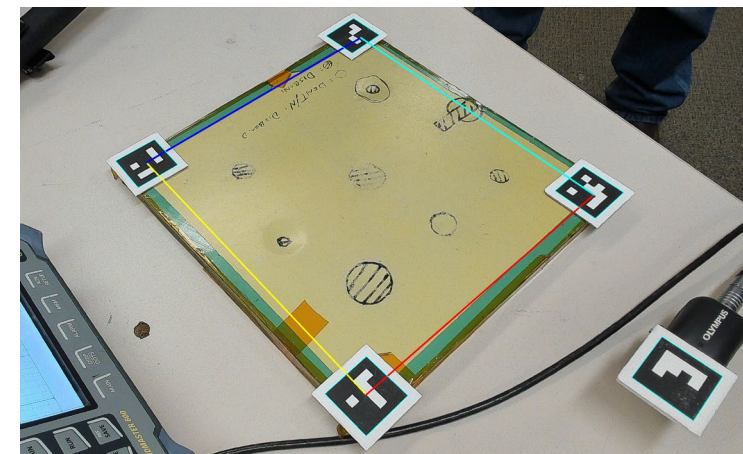
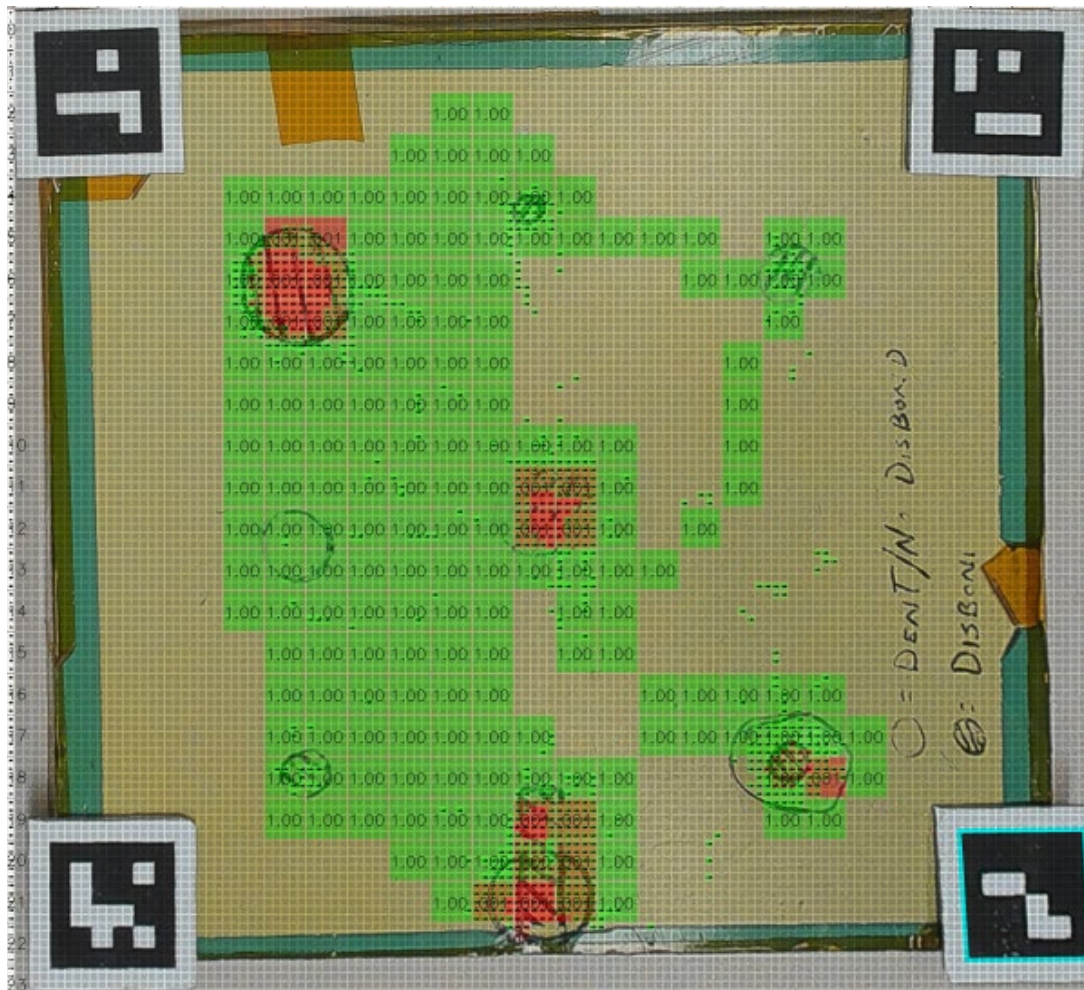
- Meet OEM requirements (e.g., Headings and number of cells)
- Meet grid size requirements (e.g., 5x5mm or 10x10mm)



Progressive Grid Refinement

Start Coarse. Refine Where it Matters

- Start with 1" grid
- Add a 0.25" grid layer (or smaller)
- The grid does not have to be one size for the entire inspection



From Micro to Massive

Recap:

- >> 0.1" cells (Bondmaster/Pitch-catch)
- >> 0.25" refined areas
- >> 1" survey grids
- >> Small / constrained areas
- >> Standard inspections
- >> Stitched extra large areas -> PRO XL

The Goal Has Not Changed

Make UT grid inspections:

- >> Faster
- >> Easier to document
- >> More useful digitally

What has changed is how far we can take that workflow

- ✓ One digital UT grid inspection workflow. Different scales, resolutions and constraints.

Applications Are Expanding



- **OEM:** Gulfstream, Boeing (military fighter jets and cargo aircraft)
- **MRO / Airline:** Growing evaluation and budgeting activity
- **U.S. Navy:** Multiple inspection applications being evaluated for military fighter jets, shipyards, and piping
- **U.S. Air Force:** Standardized Kit and Technical Order implementation

Some of the most interesting applications are ones I cannot show you today

Thank you! Questions?