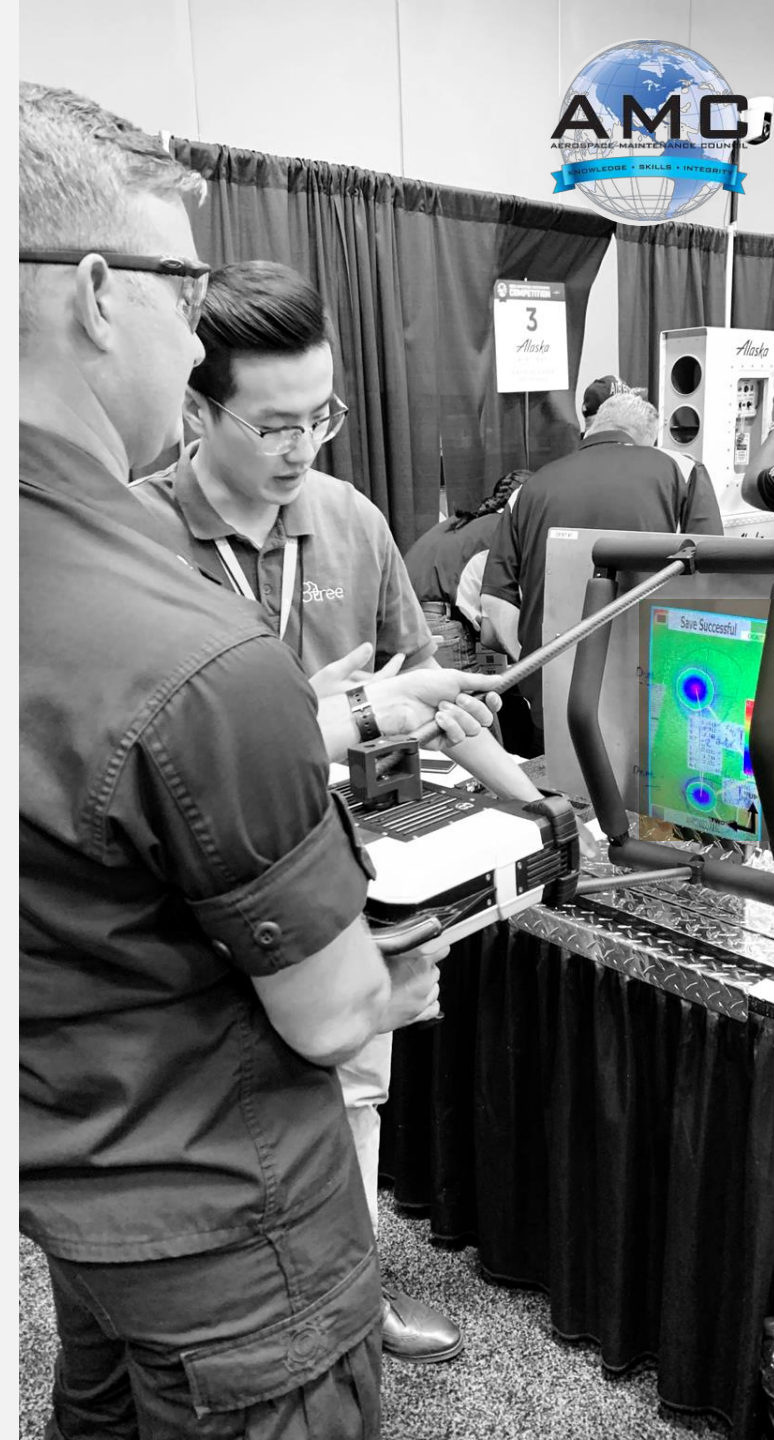


# dentCHECK vs. Traditional Methods

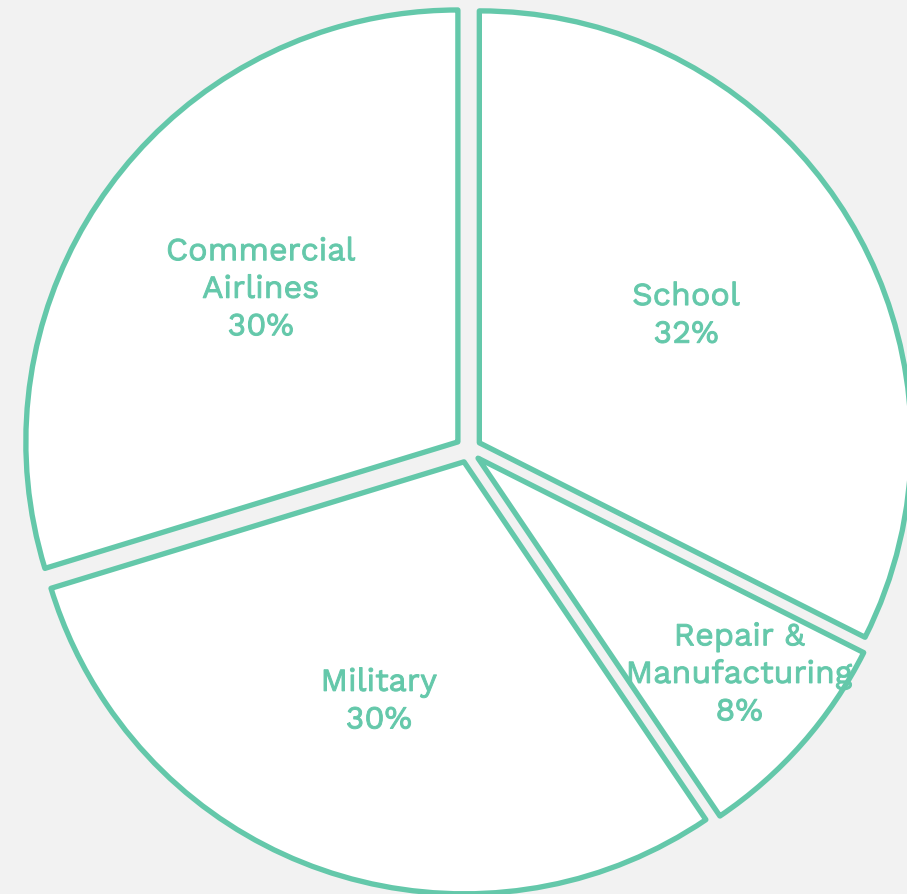
World's most comprehensive  
aviation dent-mapping study



# Aerospace Maintenance Competition (AMC)

- 2-day competition
- 73 teams of 5-6 members
- 27 events
  - 15-minutes task per event
  - “Airframe Damage Inspection” event, co-sponsored by 8tree and Alaska Airlines

## Participant Category in 2022

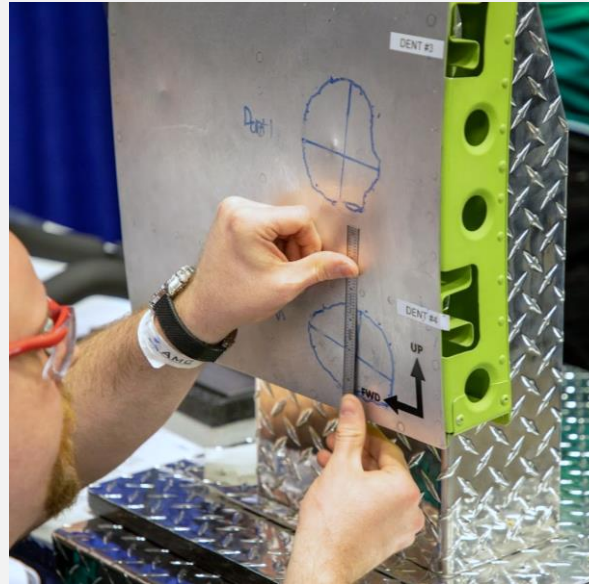
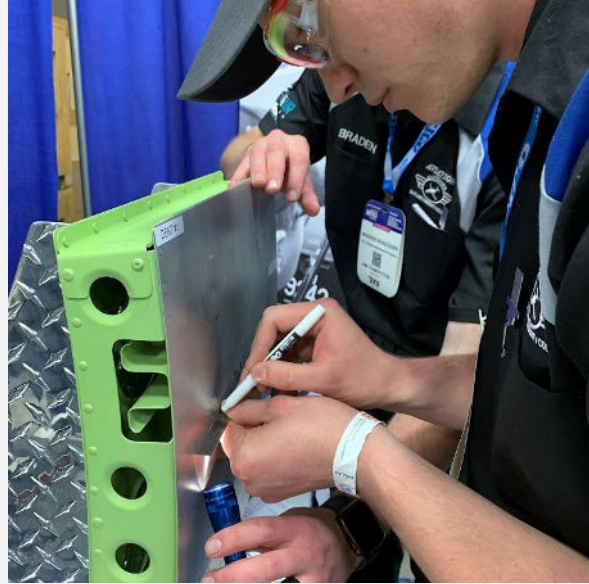




# What is the task?

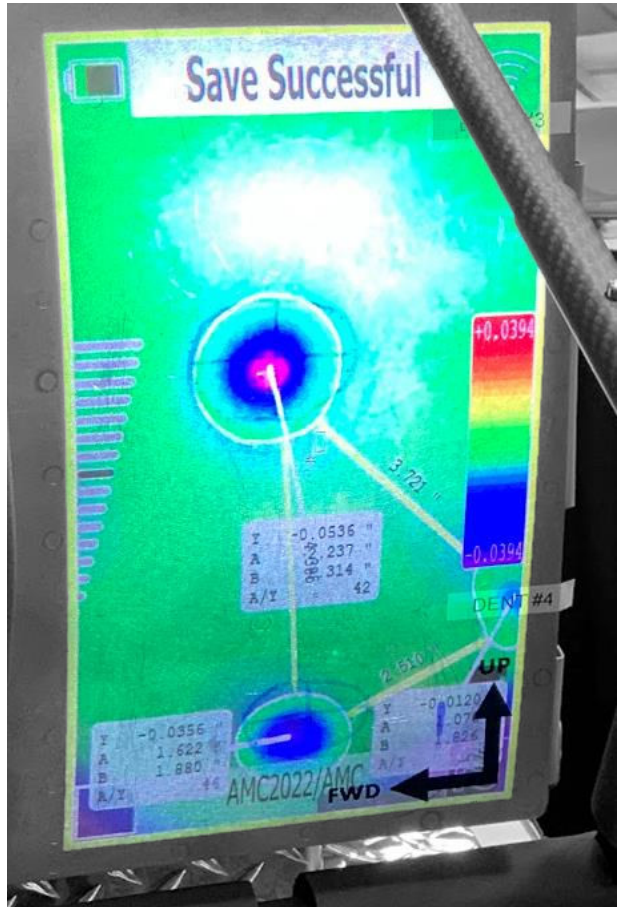
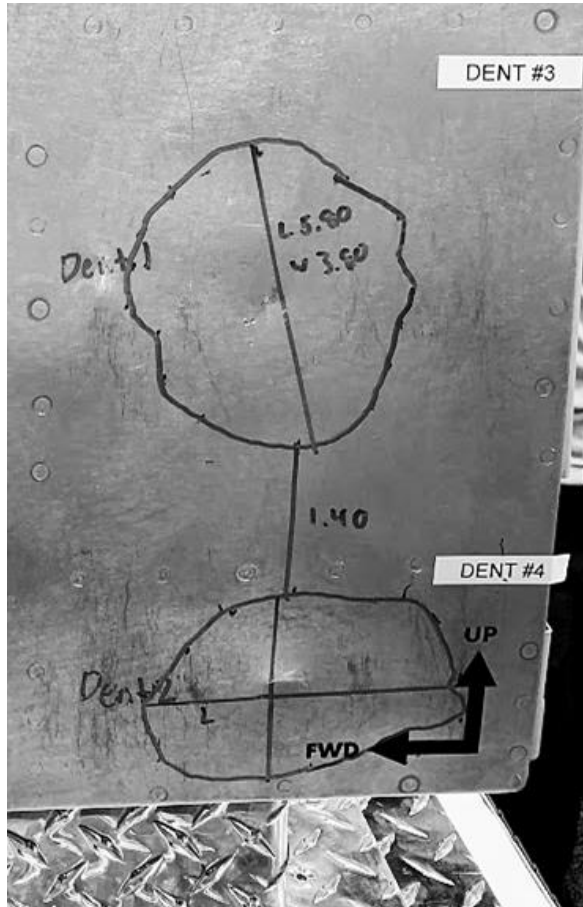
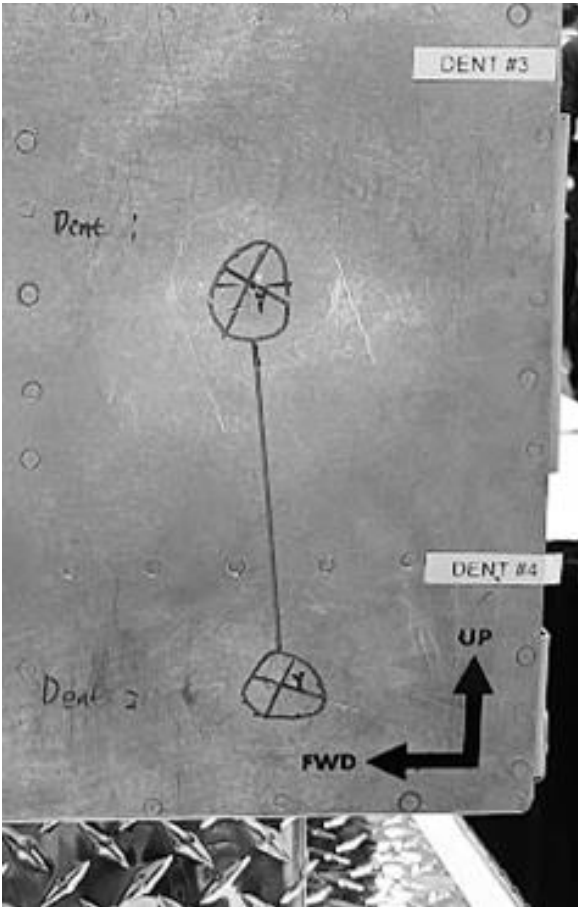
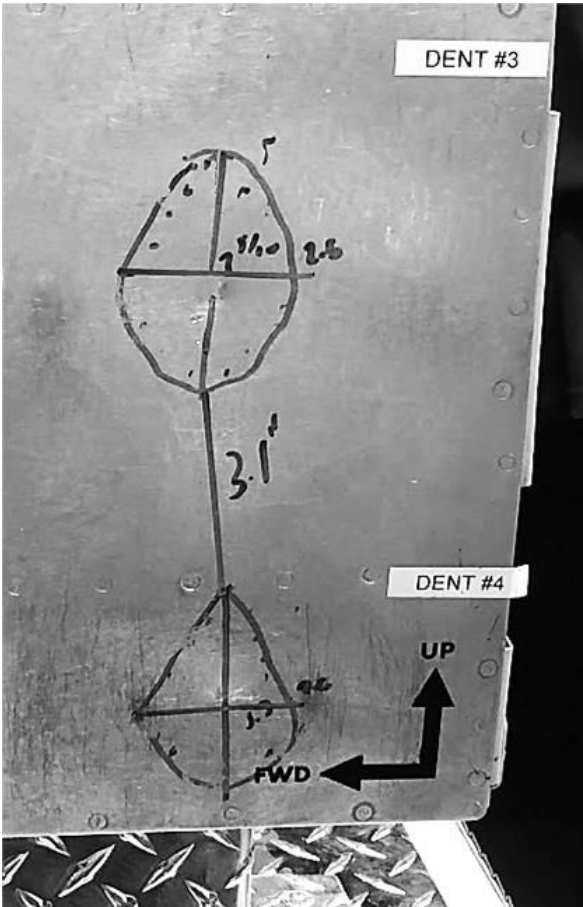
“Accurately map two dents using traditional methods and dentCHECK”

- 73 Teams / 146 Engineers
- 146 Dent Measurements
  - Depth (Y)
  - Width (A)
  - Length (B)
  - Critical Ratio (A/Y)
- 73 Inter-Dent Distance Measurements
- Measure with Traditional Tools
- Repeat Task with dentCHECK



*Traditional Tools: Flashlight, Marker, Depth Gauge, Straight Edge, Calculator, Pen & Paper*

# Traditional Method vs dentCHECK





# Summary - Key Findings

dentCHECK empowers -

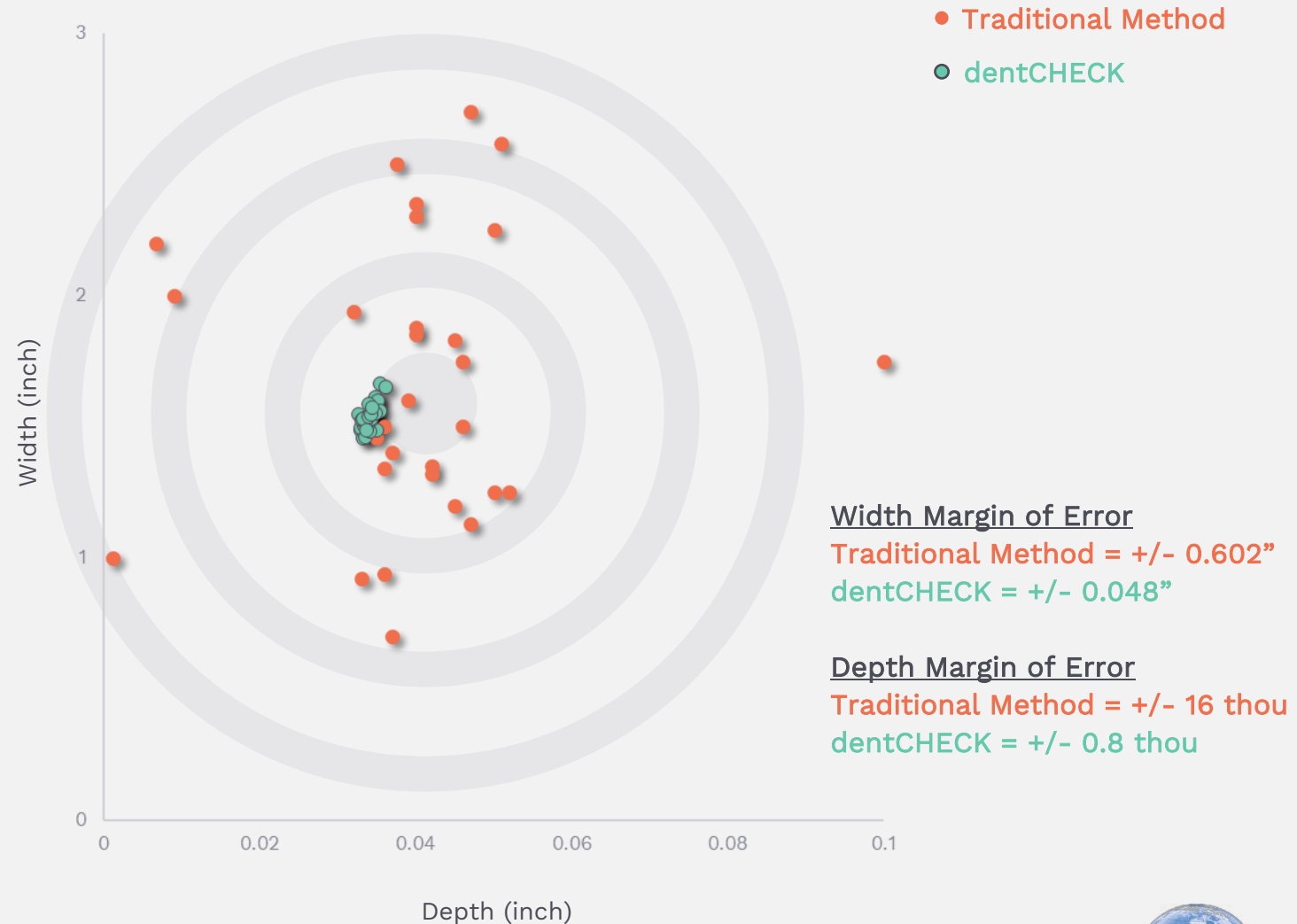
- 20x more consistent depth measurement
- 13x more consistent width measurement
- 13x more consistent inter-dent distance measurement
- 48x faster inspection time
- Improved Confidence when making “Go/No-go” decisions
- Uncovered top 3 errors associated with traditional method:
  - Tool handling error
  - Incomplete measurement
  - Record keeping error



# Double Digit Improvement in Precision

20x in depth measurement  
13x in width measurement

## Precision Chart for 1 Dent

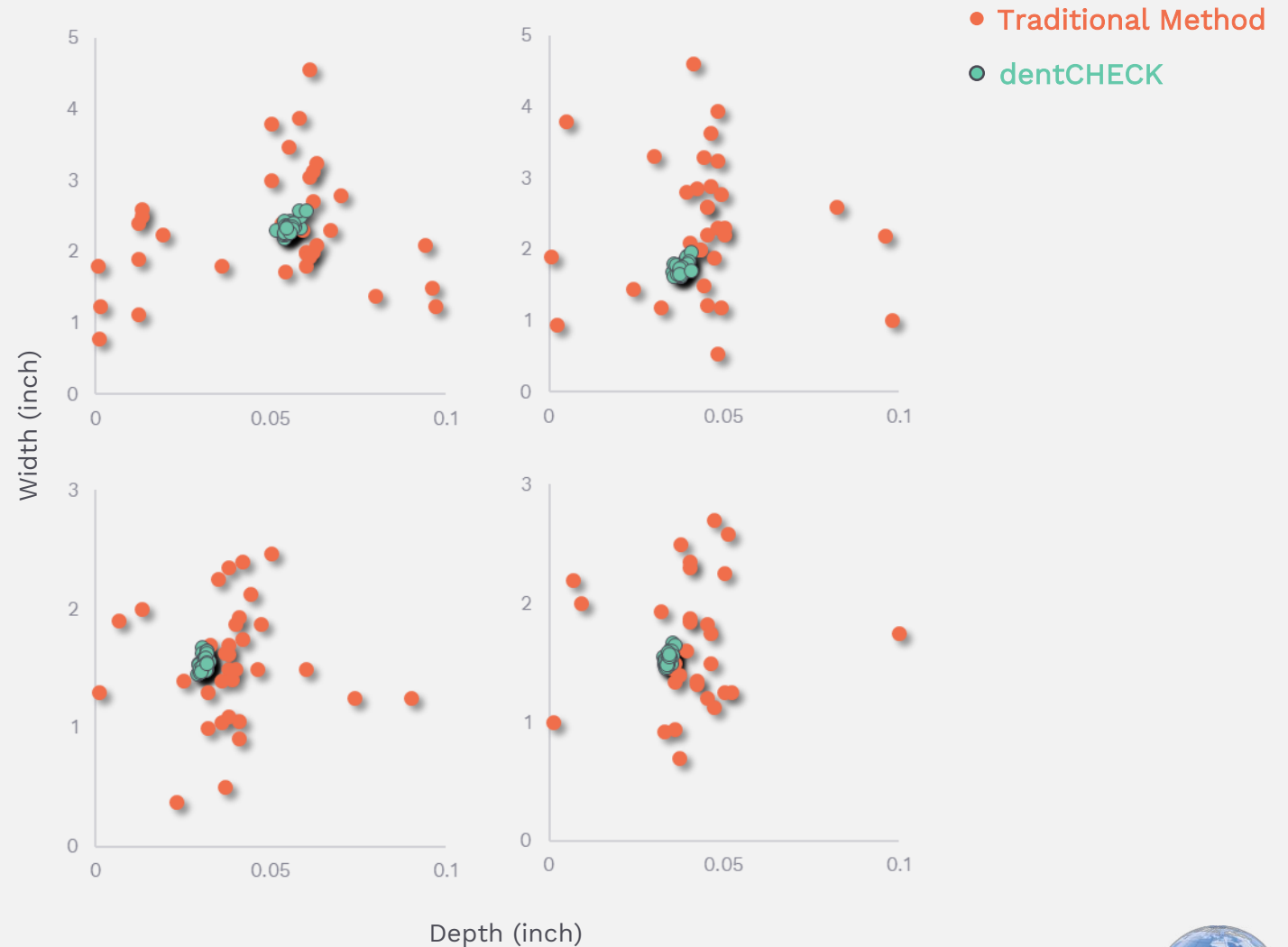


*Depths > 0.100" are considered outliers and are excluded from this study  
Background target used to illustrate precision. "True" width and depth is unknown*

# Supplement Slide

Precision Chart for all 4 dents

## Precision Charts for 4 dents

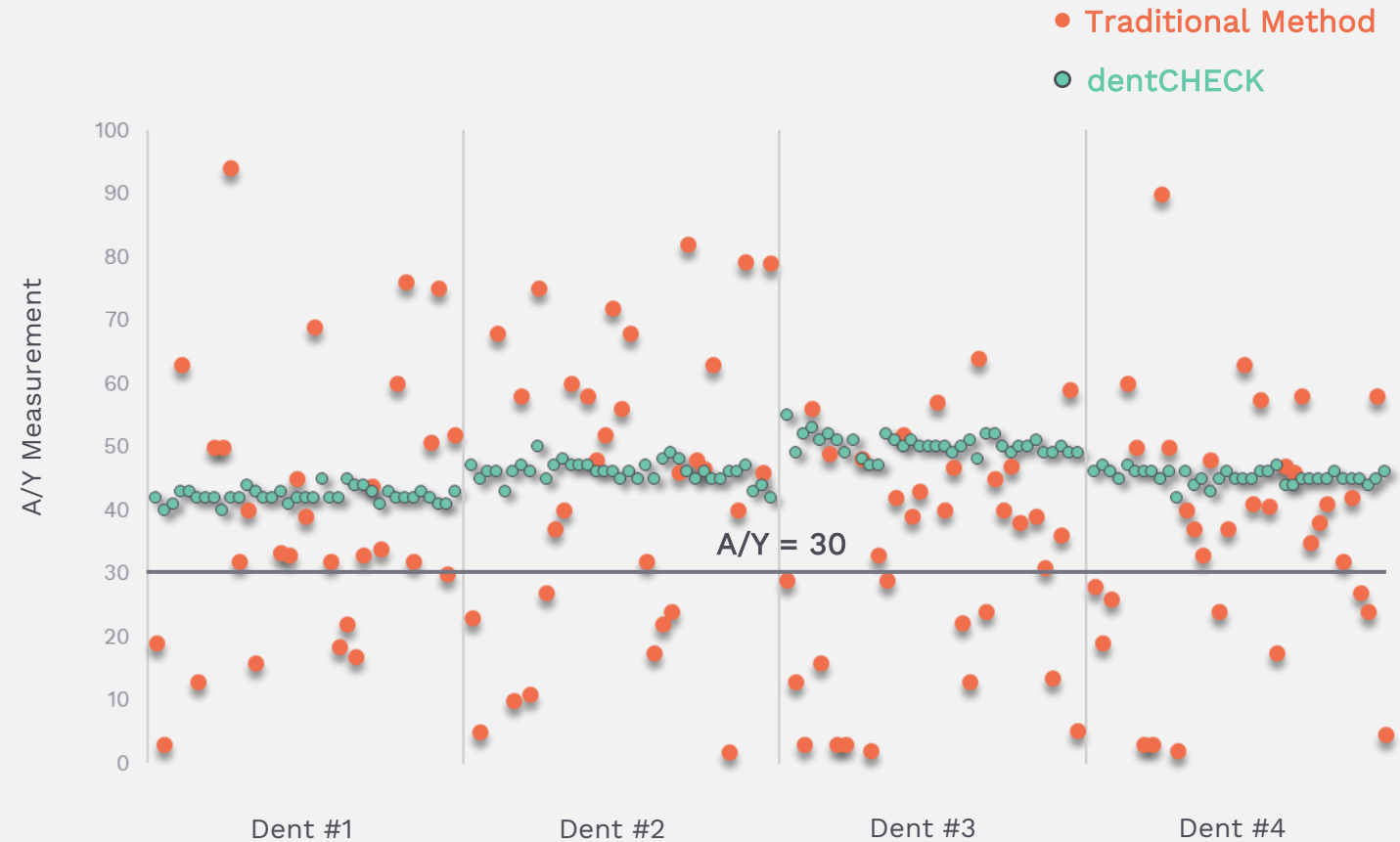


*Depths > 0.100" are considered outliers and are excluded from this study*

# "Go/No-go" decisions with improved confidence

dentCHECK caught 40 erroneous  
manual measurements

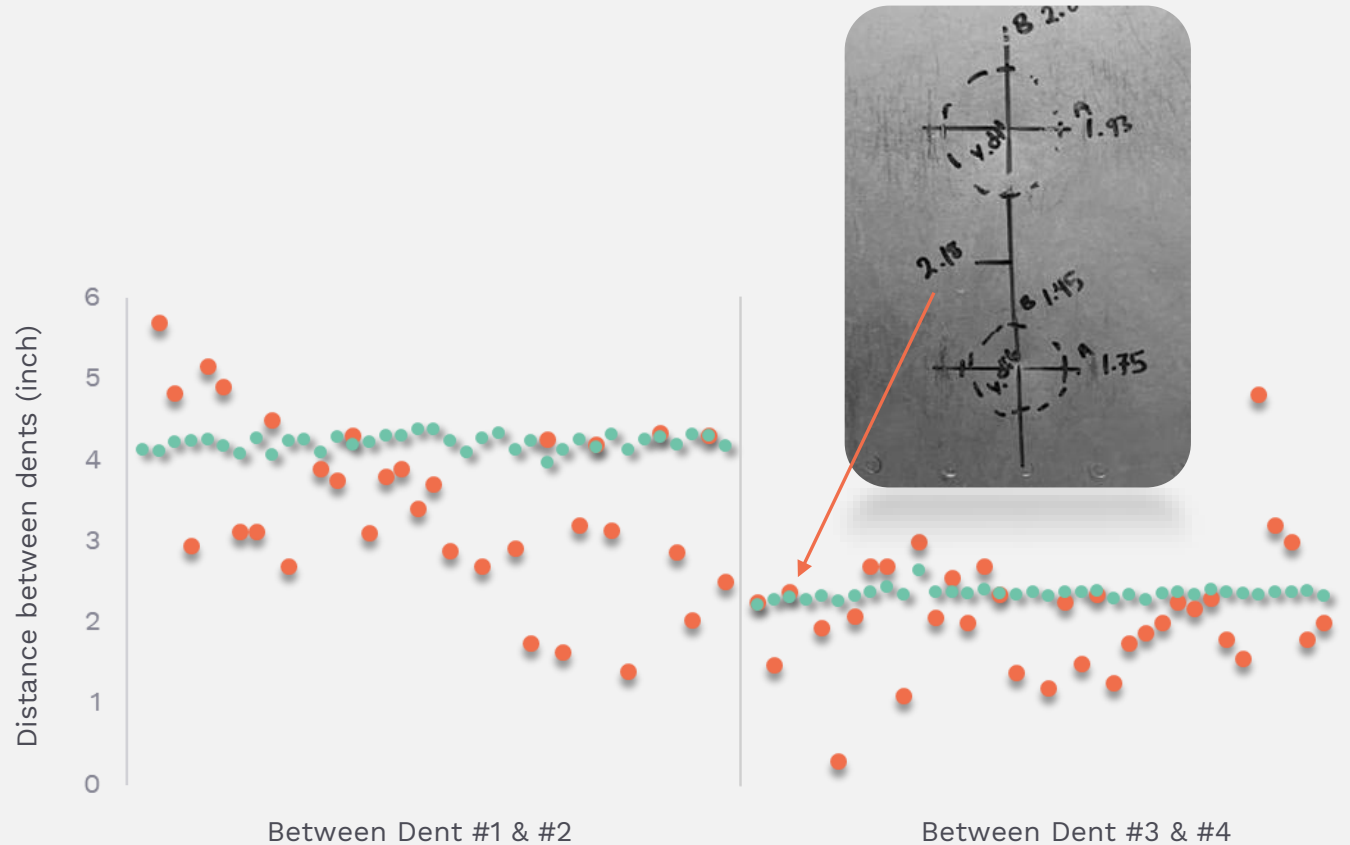
## A/Y Ratio Measurement for 4 dents





# 13x more consistent inter-dent distance measurement

## Inter-Dent Distance Measurement



### Margin of Error

Traditional Method =  $\pm 1.225''$

dentCHECK =  $\pm 0.094''$

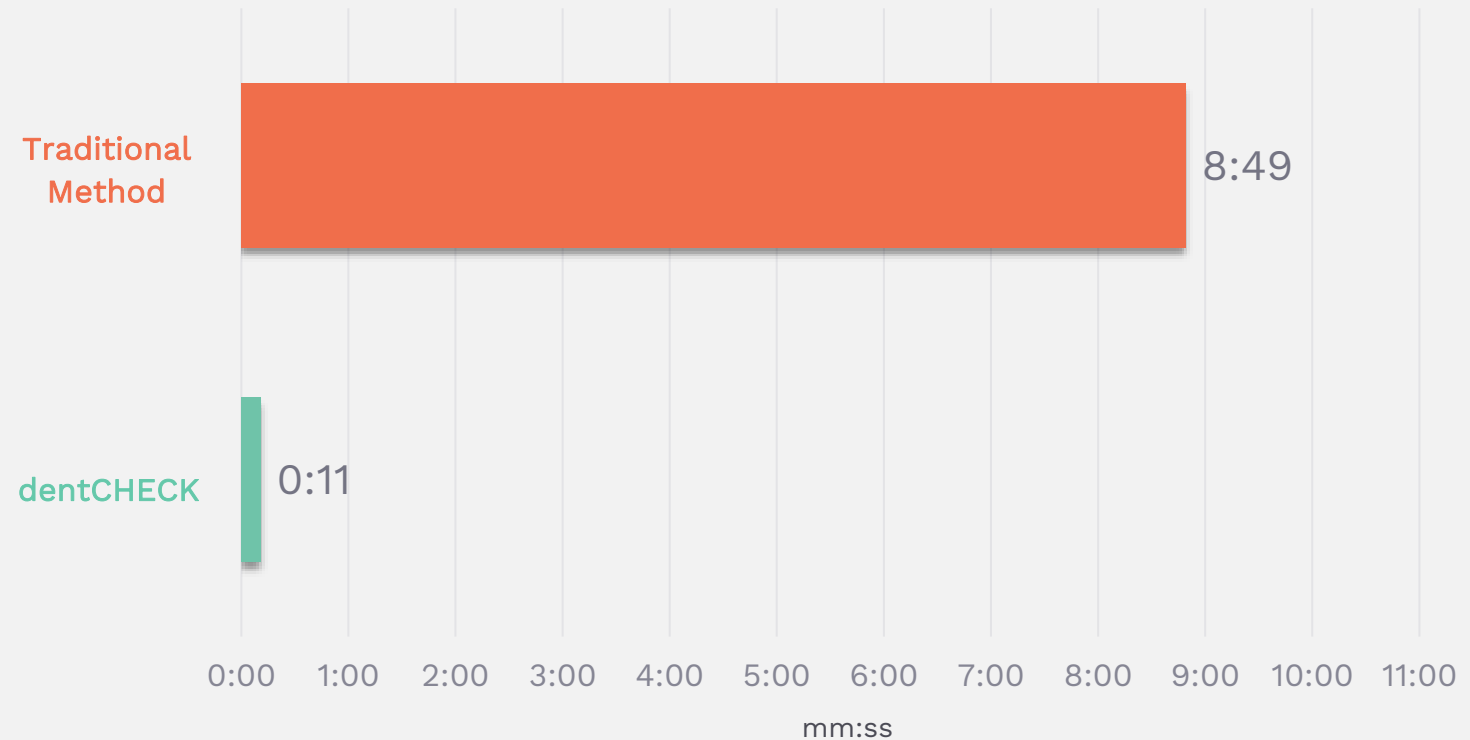
• Traditional Method

• dentCHECK

# 48x Faster Inspection Time

dentCHECK captures and measures  
both dents in a single scan

## Time taken to complete Inspection Task



# Top 3 Errors using Traditional Method

## #1 Tool Handling Error



## #2 Incomplete Measurement

Task Card	
Dents Measured By: [redacted]	
Dent #1 Measurements:	Depth (Y) 3 decimal points in inch <del>0.012</del>
	Width (A) 2 decimal points in inch 2.40
	Length (B) 2 decimal points in inch 2.34
	Critical Ratio (A/Y) 0 decimal points 200
Dent #2 Measurements:	Depth (Y) 3 decimal points in inch [redacted]
	Width (A) 2 decimal points in inch [redacted]
	Length (B) 2 decimal points in inch 3.16
	Critical Ratio (A/Y) 0 decimal points [redacted]
Distance between dents: 2 decimal points in inch [redacted]	

Incomplete Measurement

## #3 Record Keeping Error

Task Card	
Dents Measured By: [redacted]	
Dent #1 Measurements:	Depth (Y) 3 decimal points in inch .074"
	Width (A) 2 decimal points in inch 1.25"
	Length (B) 2 decimal points in inch 1.50"
	Critical Ratio (A/Y) 0 decimal points 3
Dent #2 Measurements:	Depth (Y) 3 decimal points in inch .036"
	Width (A) 2 decimal points in inch .94"
	Length (B) 2 decimal points in inch 1.44"
	Critical Ratio (A/Y) 0 decimal points 26
Distance between dents: 2 decimal points in inch 2.38"	

$1.25 \div 0.074 \neq 3$



# Participants Testimonials

“Did a 10-minutes job in about 30 seconds at most”

Cade Donley,  
Eastern Florida State University  
2022

“dentCHECK offers a simple, fast and accurate measurement compared to traditional methods”

Arturo Amezcua  
Spirit Airlines  
2022

“dentCHECK is one of the more innovative pieces of hardware that I’ve seen at the show and believe it should be a staple in every shop that works on aircraft”

Trenton Blackwood  
Tulsa Tech  
2019