Presenting with Power:
Effectively and Dynamically Communicating Your Design Project

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80% of Your Presentation Will Be Forgotten

- People tend to remember
  - Tone
  - Pace
  - Nonverbal expressions

What? Why? Who? How?

- The purpose of a PDR is to communicate the technical details of the design
  - **WHAT** you have been working on
  - **WHY** it is important (the need?)
  - **WHO** is the customer
  - **HOW** much does it cost

Customize Content for the Audience

- Who will be in the audience?
- What are their expectations?
- Are you presenting new material or building upon prior knowledge?
- How many attendees?
- Will the talk be interactive?
- How much time is allotted for the talk?

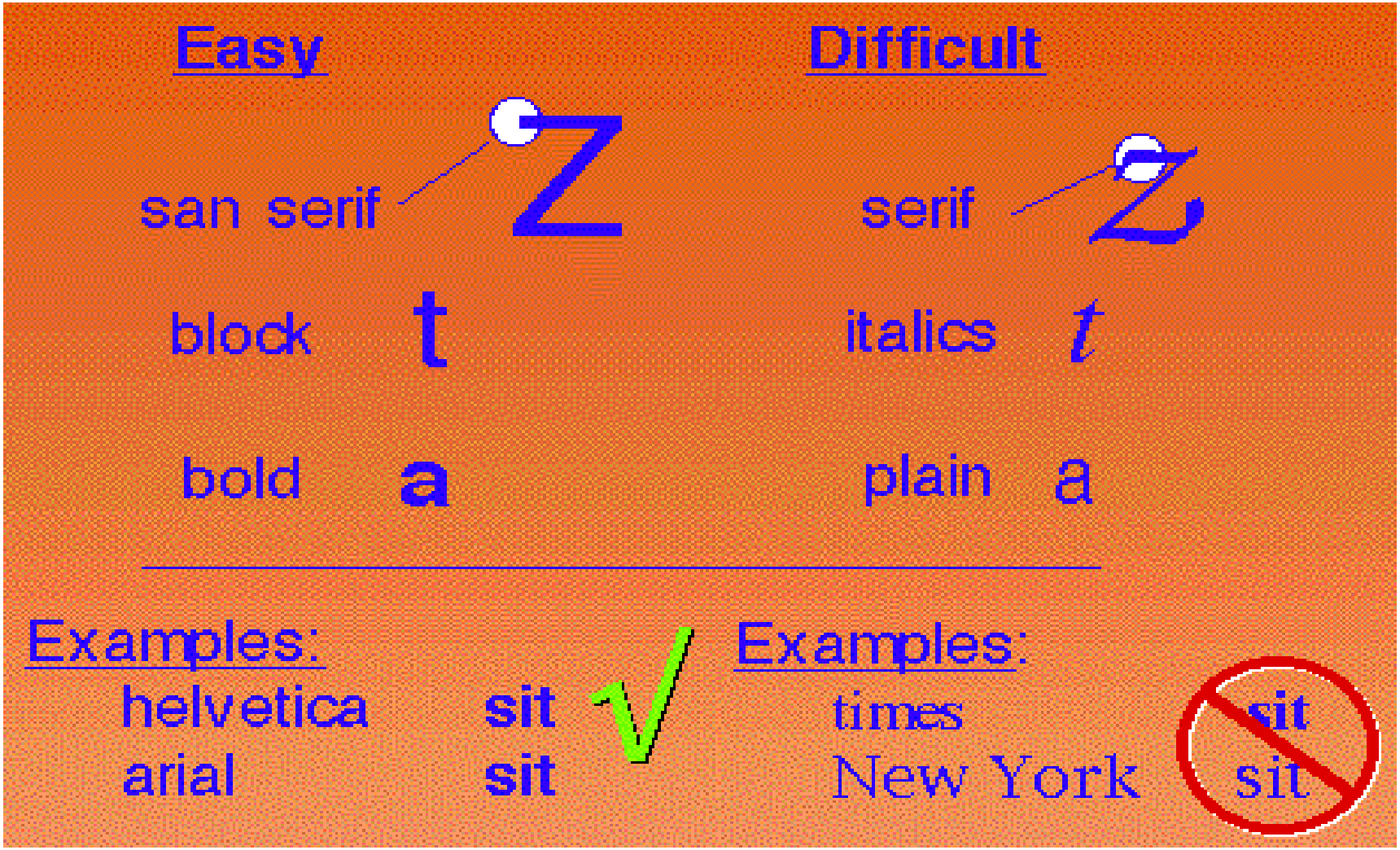
Content Guidelines for a Preliminary Design Review

- Title slide (highly descriptive title)
- Project overview: what, why, who, how much
- Design objectives
- Explanation and illustration of design
- Review of design approach
- Explanation of acceptance testing
- Problems/issues with design
- Project schedule and future work
- Current status of project

PowerPoint Do's

- Include a descriptive title/heading line on every slide.
- Keep slides simple and uncluttered by using short phrases, not long sentences.
- Use consistent capitalization and punctuation on all slides.
- Use consistent construction on all bullet items.

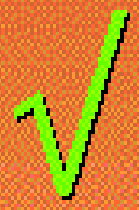
Choosing a Font



Effective Font Size

To Upper Case or to Lower Case, That is the Question

A MIXTURE OF UPPER AND LOWER CASE LETTERS IS EASIER TO READ QUICKLY AND ACCURATELY, AND TAKES UP LESS SPACE ON THE SLIDE.



A mixture of upper and lower case letters is easier to read quickly and accurately, and takes up less space on the slide.

Choosing the Right Contrast and Colors

- White background with dark text is the norm at professional conferences.
- Dark backgrounds with light text project well.
- Red, orange, or blue lettering become unreadable when projected on dark background.
- Avoid “busy” slide designs, those with distracting borders or graphics; keep it simple and “clean.”

When to Show & When to Tell

- Make use of visuals wherever you can!
- Show what you're doing:
  - Diagrams
  - Photos
  - Flow charts
  - Tables
- Use text when you present concepts that you can't show or when words help to describe the visual.

Let’s look at some examples of

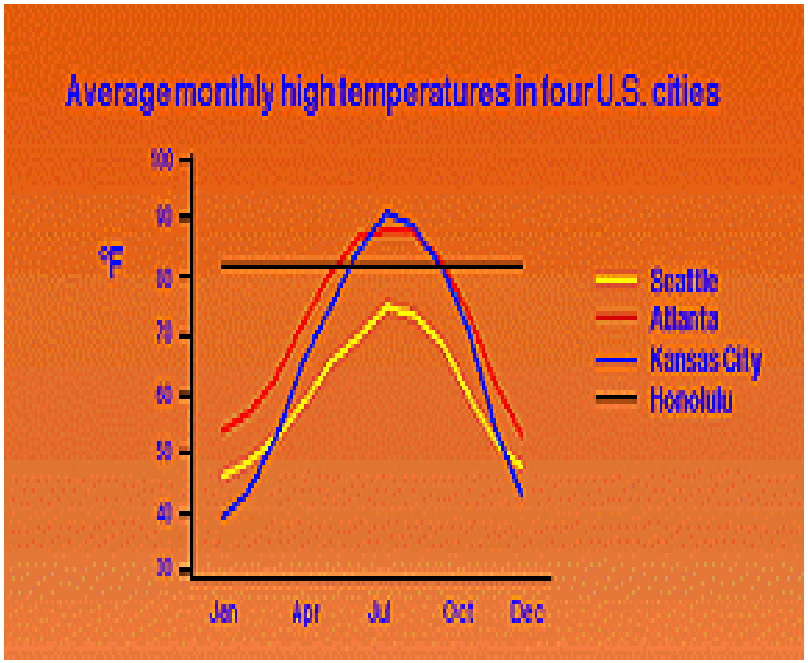
effective

use of graphics

Three Versions of the Same Info

Average monthly high and low temperatures in four U.S. cities

	Seattle	Atlanta	KansasCity	Honolulu
January	46/37	54/36	39/22	82/73
February	49/38	57/37	44/26	82/73
March	53/40	63/41	53/33	82/73
April	59/44	72/50	66/45	82/73
May	66/49	81/59	75/55	82/73
June	70/53	87/66	85/66	82/73
July	75/56	88/69	91/71	82/73
August	74/56	88/68	89/69	82/73
September	69/53	83/63	82/60	82/73
October	60/48	74/52	71/49	82/73
November	52/42	62/40	54/35	82/73
December	48/39	53/35	43/27	82/73

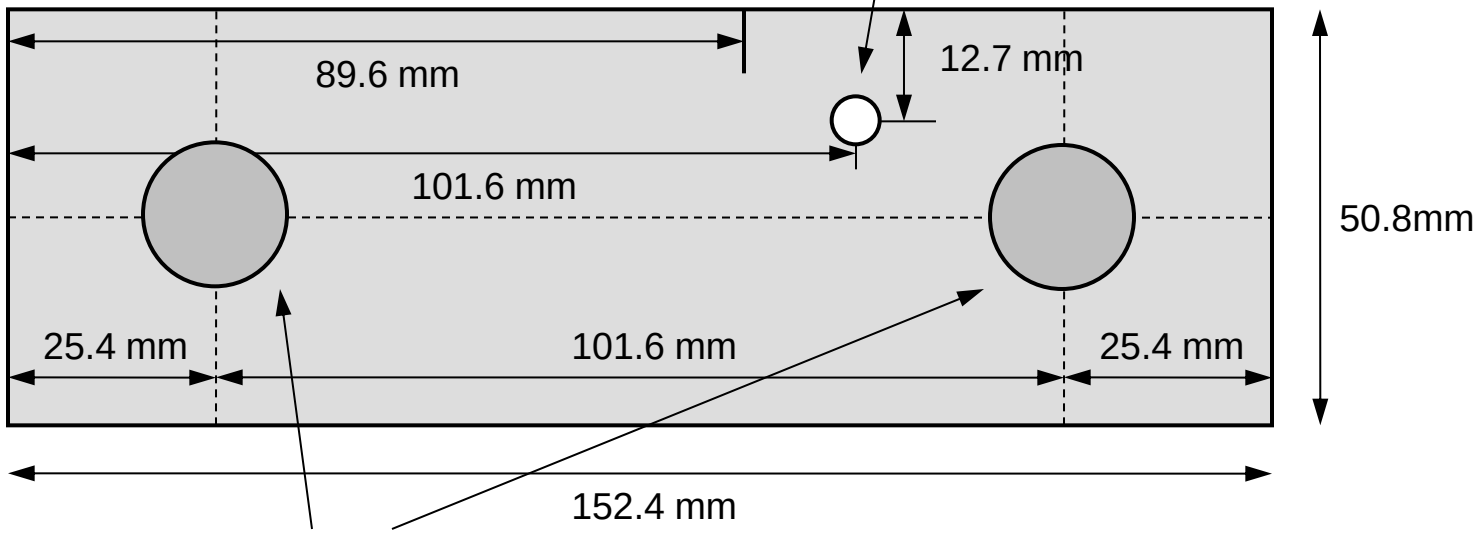


Average high temperatures for winter months in four U.S. cities

	Seattle	Atlanta	KansasCity	Honolulu
November	48	62	54	82
December	52	53	43	82
January	46	54	39	82
February	49	57	44	82

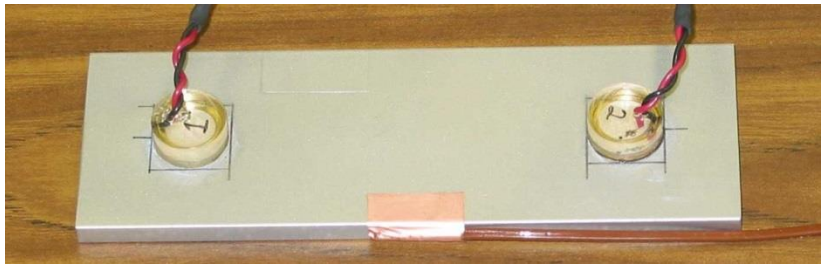
Specimen #1
6.35mm/0.25” long edge notch
introduced in 10 length increments
(notch width of 0.025mm/0.01”)

Specimen #2
6.35mm/0.25” diameter hole
drilled in 11 increments

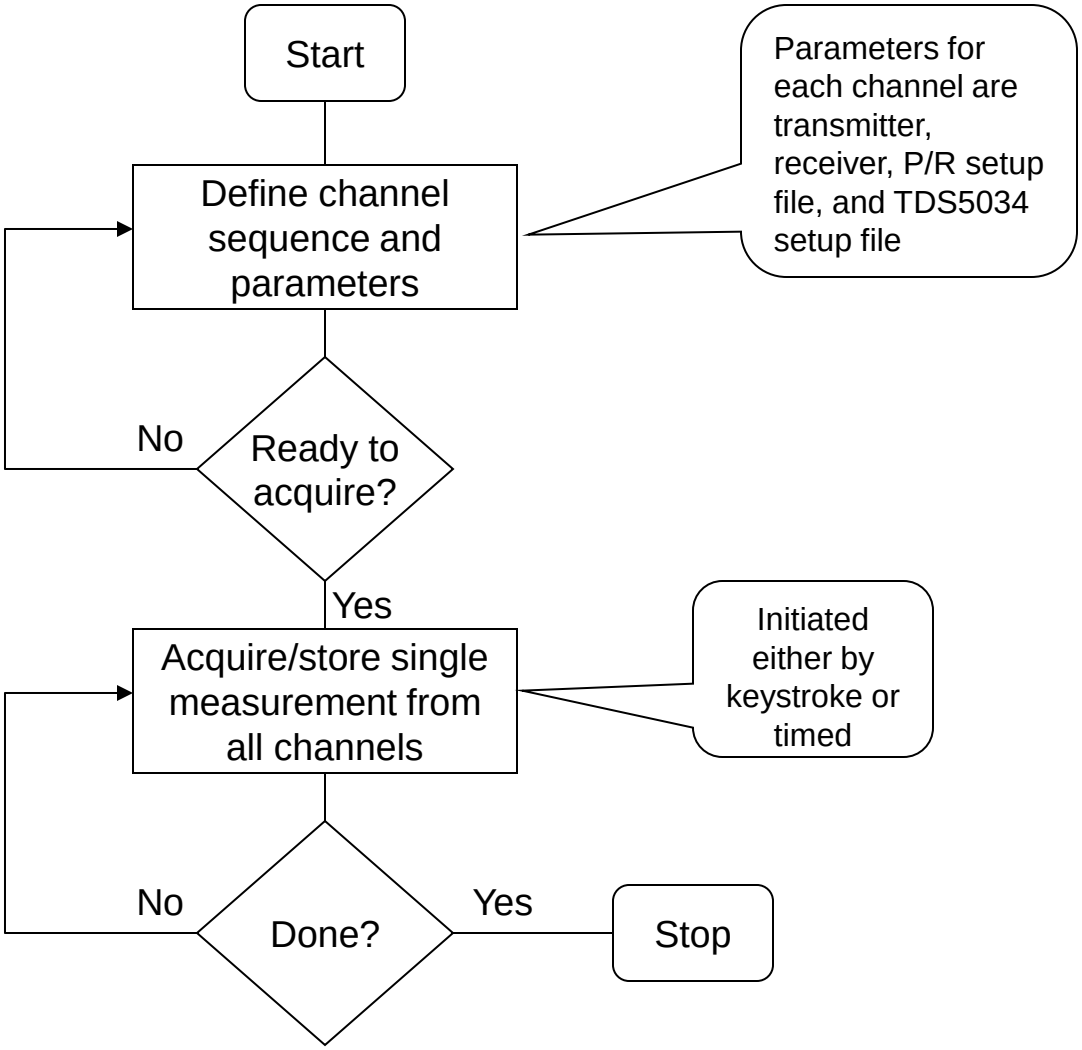


Aluminum
50.8mm x 152.4mm
x 4.76mm
(2” x 6” x 3/16”)

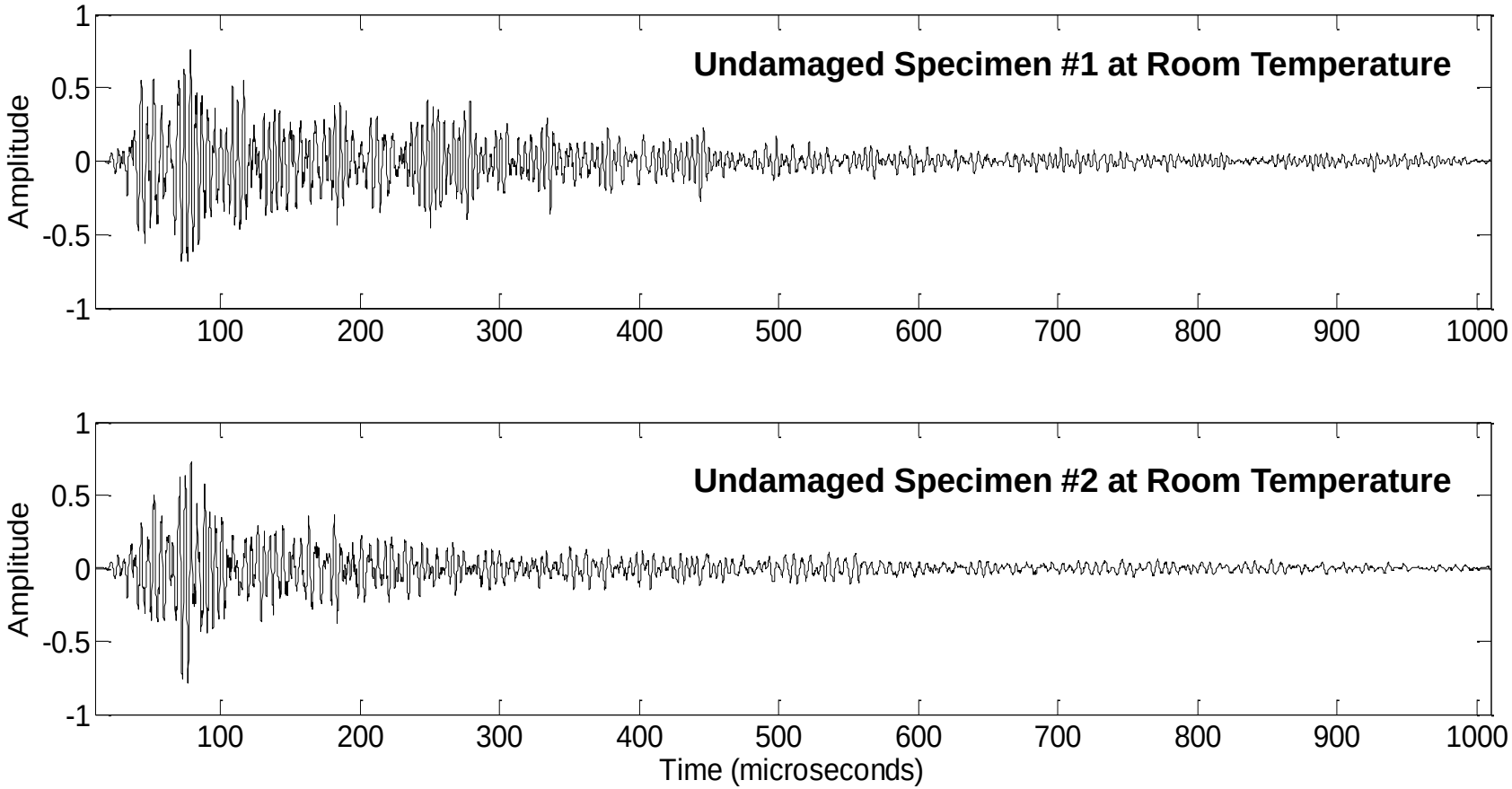
2.25 MHz, 12.7mm
diameter piezoelectric
discs bonded to top
surface



“High Level” Flow Chart



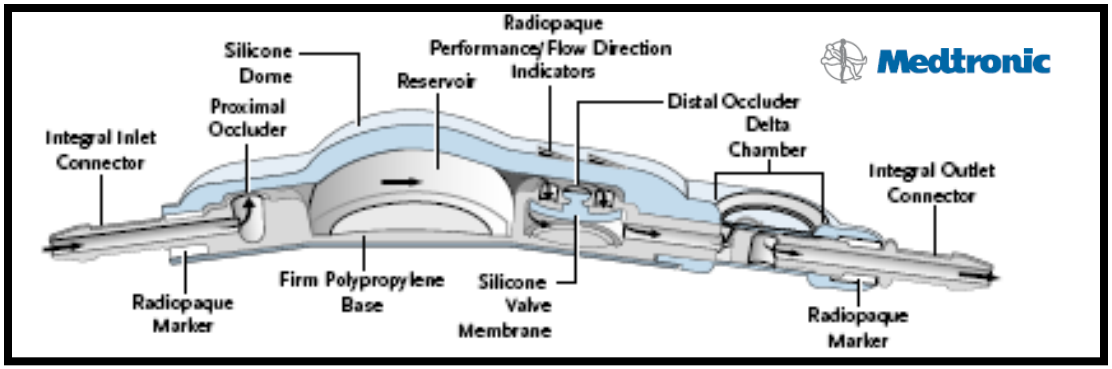
Ultrasonic Signals from Nominally Identical Samples



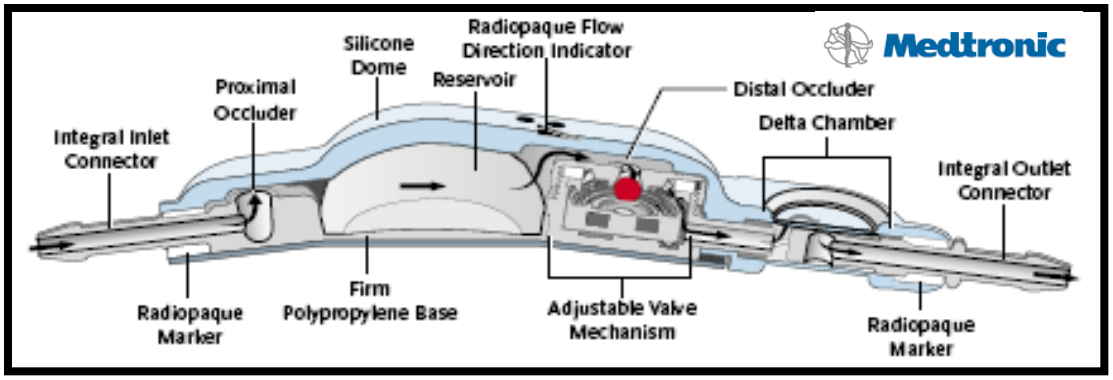
And here's what

doesn't work

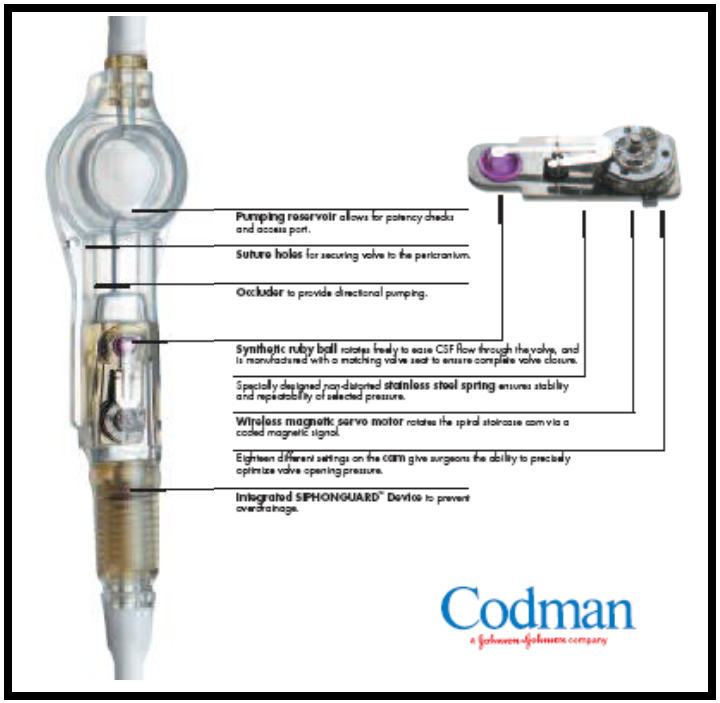
Ineffective!



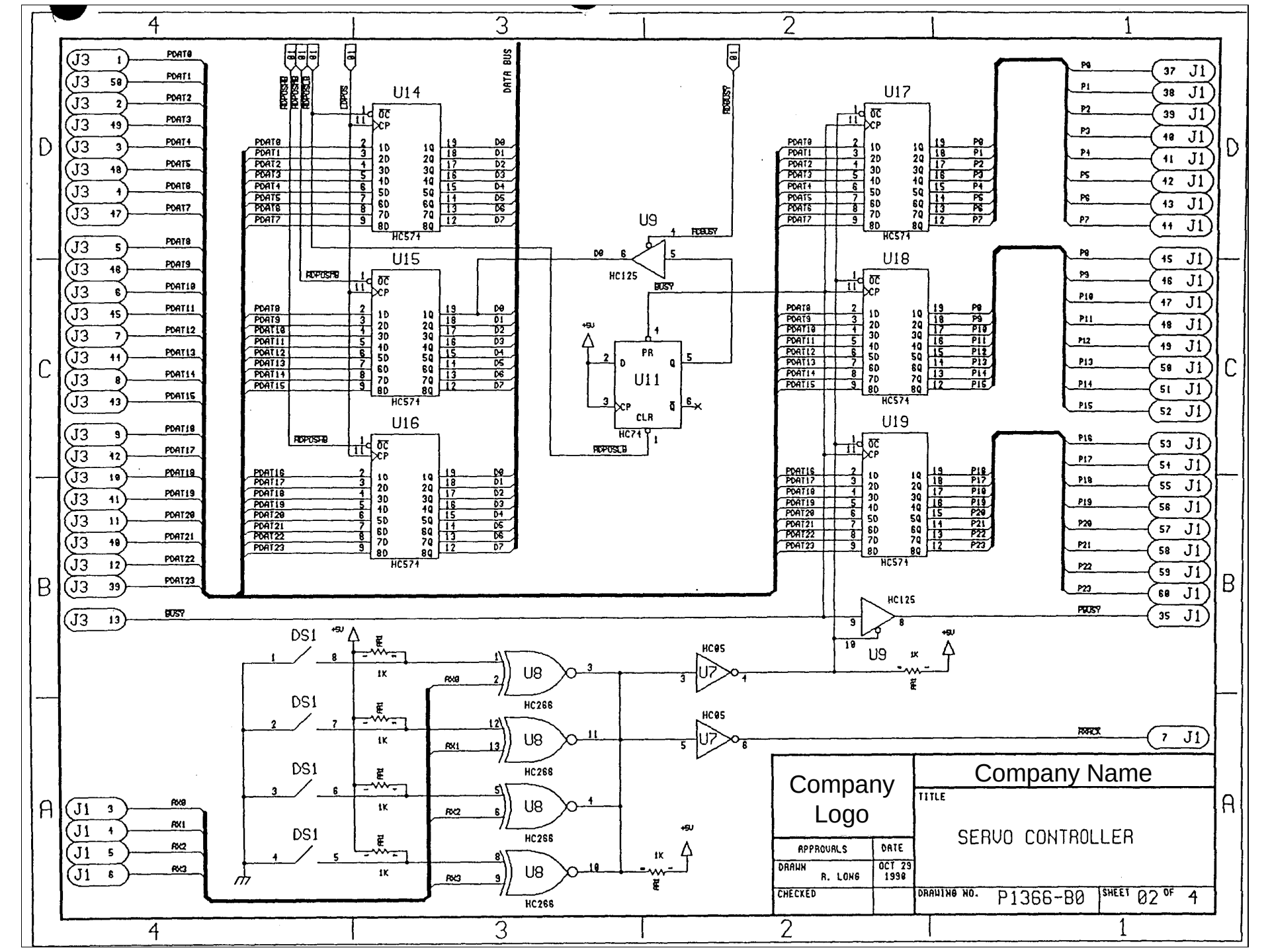
Medtronic Delta Valve



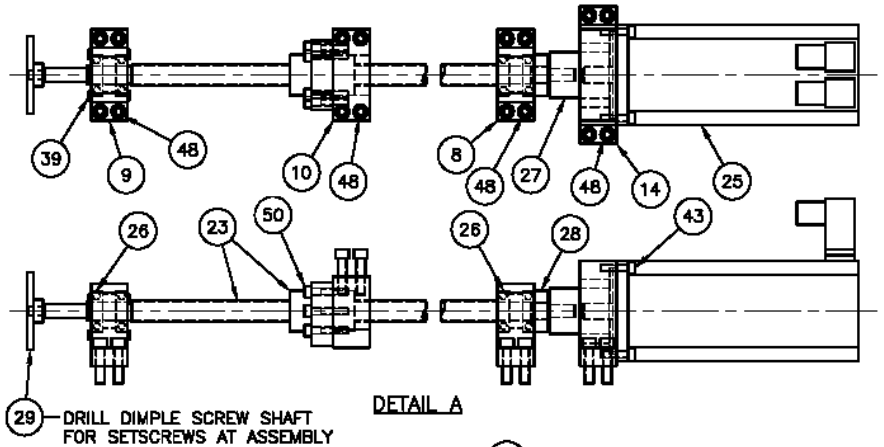
Medtronic Strata Valve



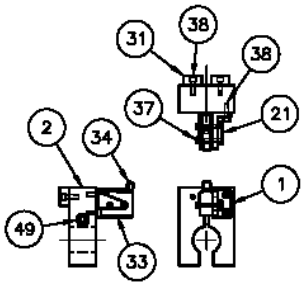
Codman Hakim Programmable Valve


Company Logo
Company Name
TITLE
SERVO CONTROLLER
APPROVALS
DATE
DRAWN R. LONG
OCT 29 1990
CHECKED
DRAWING NO. P1366-B0
SHEET 02 OF 4
DATA BUS
U14
U15
U16
U17
U18
U19
U9
U11
U8
U7
HC574
HC125
HC74
HC266
HC05
DS1
1K

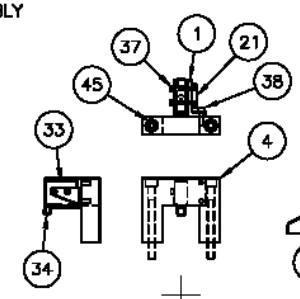
REVISIONS			
REV	DESCRIPTION	DATE	BY
B	P/N ITEMS 11, 12, 18, & 23 WAS -A.	7/18/00	REG
C	REVISED SCREW TO "STAR", GENERAL REVISIONS.	1/24/01	REG
D	P/N ITEM 29 WAS CN11-6	5/15/01	REG



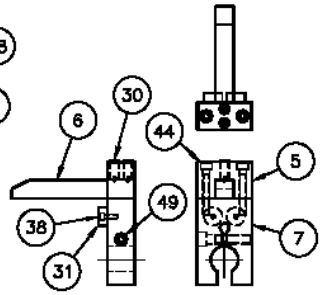
DETAIL A



DETAIL B
2 PLACES



DETAIL C
2 PLACES



DETAIL D
2 PLACES

ITEM	QTY	PART NUMBER	DESCRIPTION	MAT'L SPEC
42	18	10-32 X 1/2 LG	BUTTON HD SCREW	STAINLESS STEEL
41	24	8-32 X 3/4 LG	SOC HD CAP SCREW	STAINLESS STEEL
40	4	6-32 X 5/8 LG	SOC HD CAP SCREW	STAINLESS STEEL
39	6	6-32 X 1/4 LG	BUTTON HD SCREW	STAINLESS STEEL
38	16	4-40 X 3/8 LG	SOC HD CAP SCREW	STAINLESS STEEL
37	8	2-56 X 5/8 LG	SOC HD CAP SCREW	STAINLESS STEEL
36	4	6-32 X 1 1/4 LG	SOC HD CAP SCREW	STAINLESS STEEL
35	1	800MR-FX6A4S	EMERG STOP SWITCH	ALLEN-BRADLEY
34	4	JE-5	SWITCH ACTUATOR	HONEYWELL/MICRO SWITCH
33	4	1SE2	SE SWITCH	HONEYWELL/MICRO SWITCH
32	2	64-01-10	PADDLE LATCH	SOUTHCO
31	8	9540K51	BUMPER	McMASTER-CARR
30	4	SSMD55N	BALL PLUNGER	VLIER
29	1	CN11-6\8-32 SETSCREWS	HANDWHEEL	BERG
28	1	TCN-01-F	LOCKNUT	RULAND
27	1	DKN45/41-9-11	COUPLING	RIMTEC
26	4	R-8 ZZ	BALL BEARING	MRC
25	1	PMA22B-00100-00	SERVO MOTOR	PACIFIC SCIENTIFIC
24	1	48-5068-1-A	BALL GUIDE SPECS	THOMSON
23	1	30-5246-1-A	LEAD SCREW & NUT	REXROTH STAR
22	1	02-5267-2-A	CABLE CLAMP	ALUMINUM
21	4	04-5062-1-A	NUT PLATE-SWITCH	STAINLESS STEEL
20	1	03-5059-1-A	COVER-SCANNER	STEEL
19	1	02-5058-1&2-B	PLATE-SCANNER	ALUMINUM
18	1	02-5057-1-C	MAST-DISPENSING	ALUMINUM
17	1	02-5267-1-A	CABLE CLAMP	ALUMINUM
16	1	02-5054-1-A	ANGLE-MAST	ALUMINUM
15	1	02-5053-1-A	GUSSET-ANGLE	ALUMINUM
14	1	02-5051-1-A	BRACKET-MOTOR	ALUMINUM
13	1	02-5048-1-A	MOUNT-EMERG STOP	ALUMINUM
12	1	02-5046-1-C	ARM-CARRIAGE	ALUMINUM
11	1	02-5045-1-C	PLATE-CARRIAGE	ALUMINUM
10	1	02-5197-1-A	BRACKET-BALL NUT	ALUMINUM
9	1	02-5196-2-A	HOUSING-BEARING	ALUMINUM
8	1	02-5196-1-A	HOUSING-BEARING	ALUMINUM
7	2	02-5042-1-B	STOP-LIMIT	ALUMINUM
6	2	02-5041-1-A	SWITCHMAN	ALUMINUM
5	2	02-5040-1-A	ANCHOR-DETENT	ALUMINUM
4	2	02-5039-1-A	BRACKET-SWITCH	ALUMINUM
3	2	02-5038-1-A	SWITCHMAN	ALUMINUM
2	2	02-5037-1-B	STOP-LIMIT	ALUMINUM
1	4	02-5036-1-A	BRACKET-SWITCH	ALUMINUM

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	MAT'L SPEC
50	6	10-32 X 1 LG	SOC HD CAP SCREW	STAINLESS STEEL
49	4	1/4-20 X 1 1/4 LG	SOC HD CAP SCREW	STAINLESS STEEL
48	20	1/4-20 X 1 LG	SOC HD CAP SCREW	STAINLESS STEEL
47	16	1/4-20 X 3/4 LG	SOC HD CAP SCREW	STAINLESS STEEL

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	MAT'L SPEC
46	2	10-32 X 2 1/2 LG	SOC HD CAP SCREW	STAINLESS STEEL
45	4	10-32 X 2 LG	SOC HD CAP SCREW	STAINLESS STEEL
44	4	10-32 X 1 1/4 LG	SOC HD CAP SCREW	STAINLESS STEEL
43	28	10-32 X 3/4 LG	SOC HD CAP SCREW	STAINLESS STEEL

PARTS LIST

UNLESS SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
FRACTIONS: ±1/64
DECIMALS: ±.XX ±.015
±.XXX ±.005
ANGLES: ±.5°

MAT'L

FINISH

ASSEMBLY
SCANNER Y AXIS DRIVE

DRAWN	REG	DATE	5/00
ENG'R		DATE	
SCALE	1/2	DWG	C SIZE

DWG 80-5070-1-D
JOB P170PD SHT 1 OF 2

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Mechanical Assembly Drawing

Schedule of Due Dates

Recommended Presentation Content	Proposal Report September 15	Design Review Presentation By 24 October	Final Presentations Dead Week
1. Qualitative Project Goals (brief)	X	X	X
2. Quantitative Project Specifications	X	X	X
3. Background Research: State of the Art	X	audience relevant	X
4. Status	X	X	X
5. Schedule (GANTT or similar chart)	X	X	X
6. Budget	X	X	X
7. Results			X
Highlights:	Contrast candidate paths and commit	Status	Results with contrast to proposal
Duration		<10 minutes	< 15 minutes

Now let's look at some

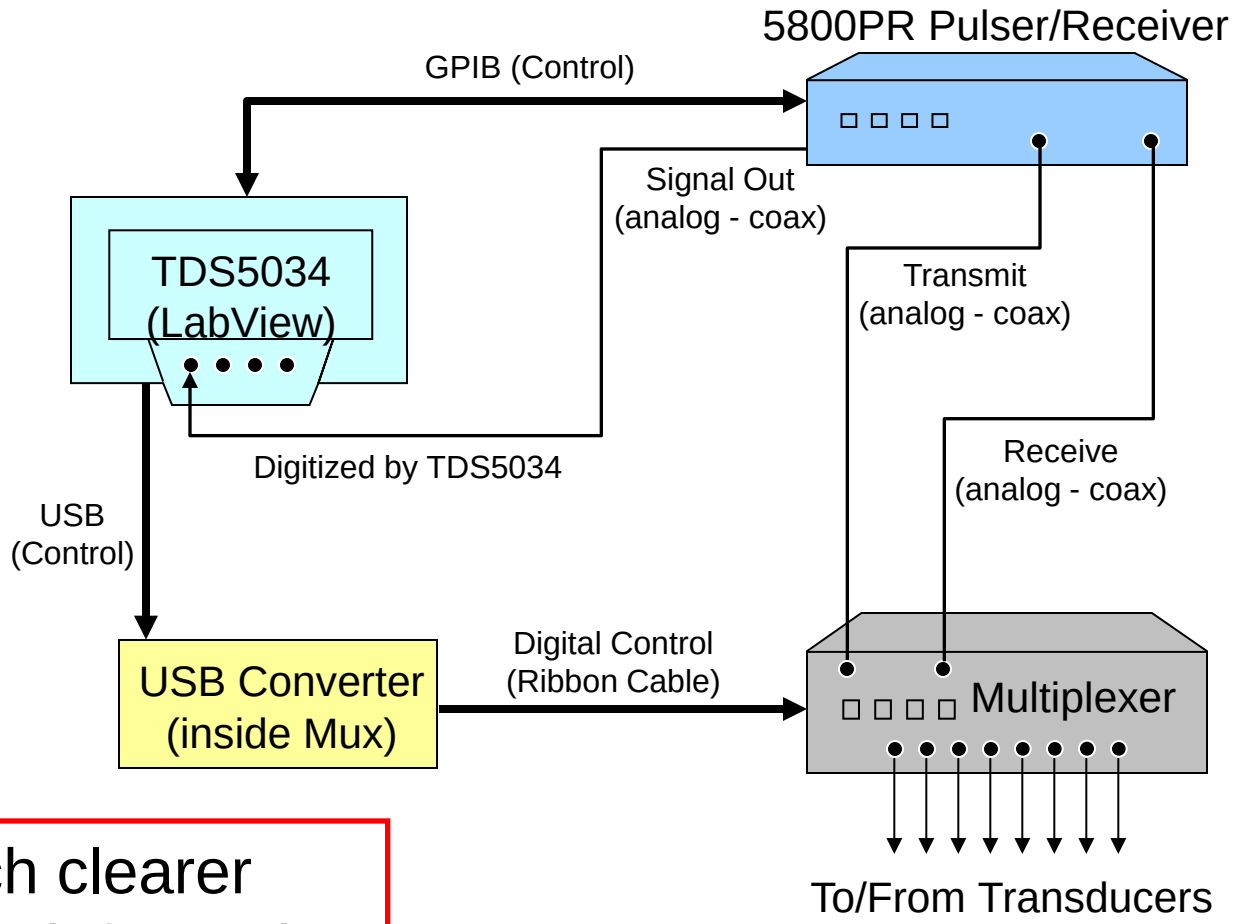
Before and After

examples

System Description

- PC-Based Oscilloscope (TDS5034)
  - Controls multiplexer via USB interface
  - Controls pulser-receiver via GPIB interface
  - Runs LabView
- Pulser Receiver
  - Signal output goes to scope input and is digitized
  - Transmit and Receiver are connected to the Mux
- Eight Channel Multiplexer
  - Supports up to 8 transducers
  - Routes Transmit and Receive to/from transducers
  - USB interface with scope PC

System Block Diagram

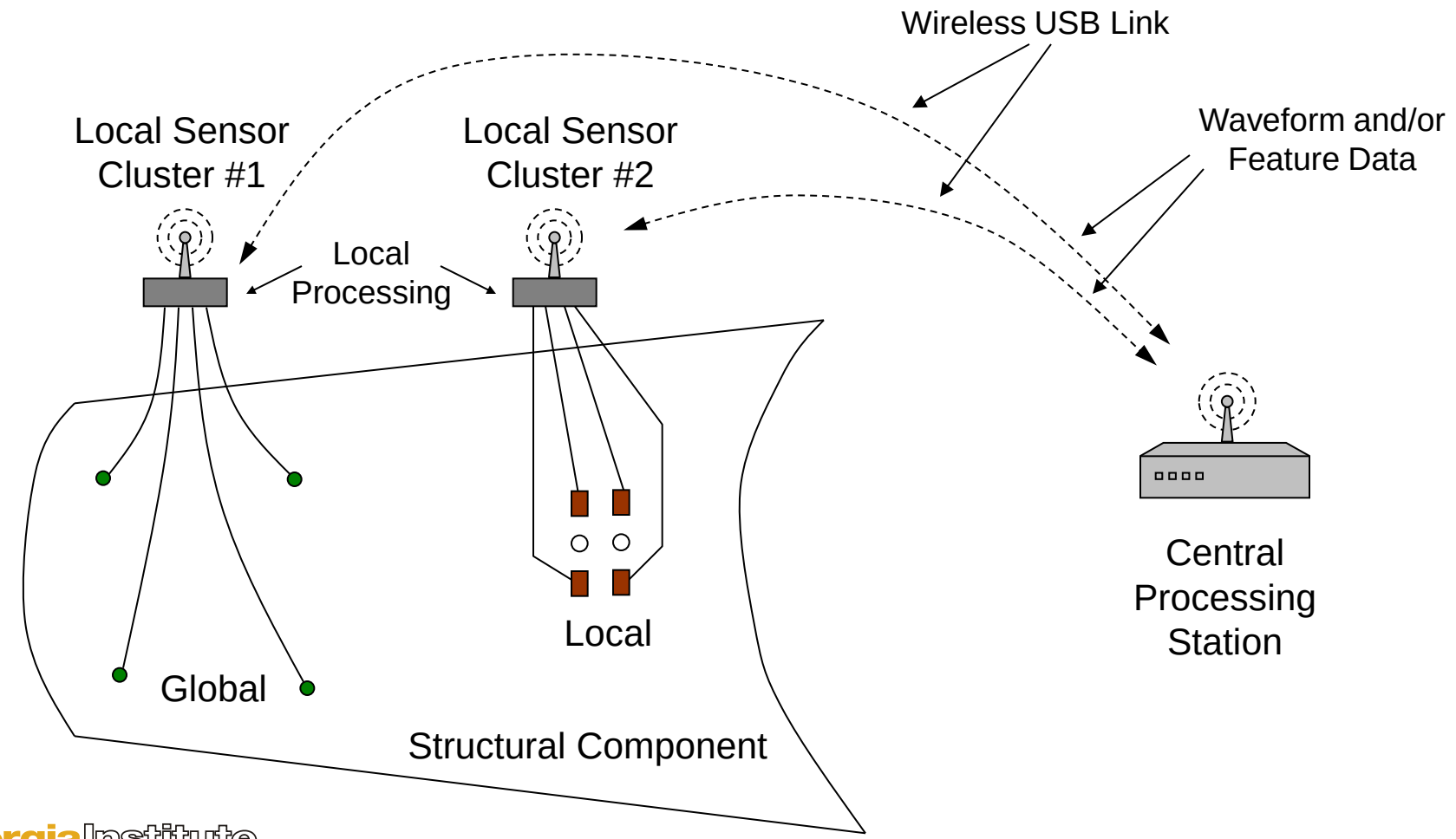


- Much clearer
- More information

Ultrasonic Structural Health Monitoring System

- Sensor Cluster
  - Multiple ultrasonic sensors (up to 16 per cluster)
  - Each sensor can operate as a transmitter or a receiver
  - Synchronization between all sensors in a cluster
  - Processing capabilities for local data analysis
- Structure with Multiple Sensor Clusters
  - Local sensors for monitoring small areas
  - Global sensors for monitoring large areas
- Wireless Link
  - Sends raw waveforms or processed data to base station
  - COTS USB link (2.4 GHz)
- Base Station
  - Further processing of data
  - Can link/combine data from multiple sensor clusters

Ultrasonic Structural Health Monitoring System



Remember These?

- Title slide (highly descriptive title)
- Project overview: what, why, who, how much
- Design objectives
- Explanation and illustration of design
- Review of design approach
- Explanation of acceptance testing
- Problems/issues with design
- Project schedule and future work
- Current status of project

Let’s look at a few more examples of

what works

and

what doesn’t

Methods for Quantifying Changes in Diffuse Ultrasonic Signals with Applications to Structural Health Monitoring

Jennifer E. Michaels, Yinghui Lu, and Thomas E. Michaels

Georgia Institute of Technology
School of Electrical and Computer Engineering

10th SPIE International Symposium
Nondestructive Evaluation for Health Monitoring and Diagnostics

March 6-10, 2005

Georgia Institute of Technology

Project Overview

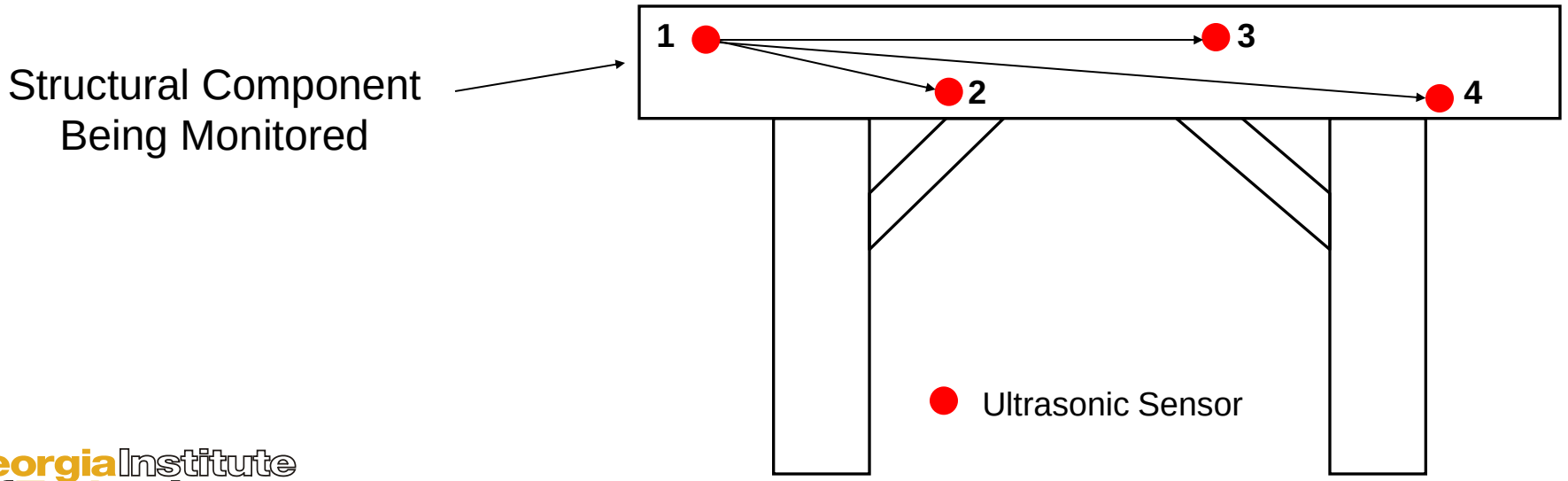
- Monitor continuously integrity of critical structures, using permanently attached ultrasonic sensors.
- Apply technology for monitoring commercial airliners, bridges, and buildings. Primary client is Air Force.
- Estimate development costs at $3 million; initial cost of a deployed system, including instrumentation and wiring, should be less than $150,000.

Design Objectives: Weak

- Monitor structures
- Have attached ultrasonic sensors
- Read sensors
- Record waveforms
- Determine condition of structure

Design Objectives: Better

- Monitor continuously health of critical structures (airplanes, buildings) in real-time
- Attach permanent ultrasonic sensors near, on, or in structure
- Interrogate sensors, record waveforms
- Analyze waveforms to determine if structure has developed internal flaws or pre-flaw conditions



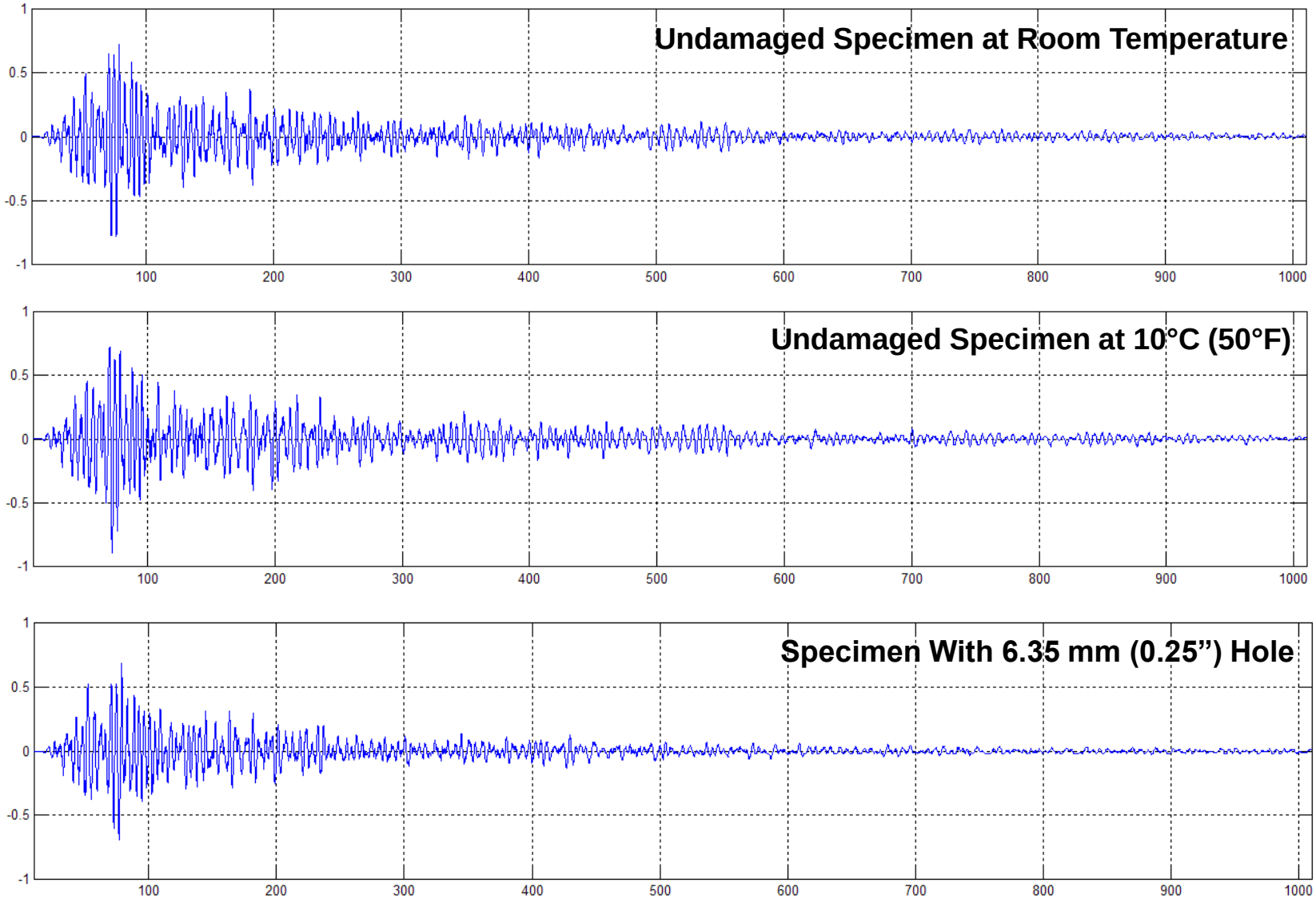
Technical Approach: Weak

- Pulse with transducer
- Flood with energy and look for diffuse waves
- Introduce temp. changes and defects
- Goal is to detect minimum flaw in the presence of temp. changes.

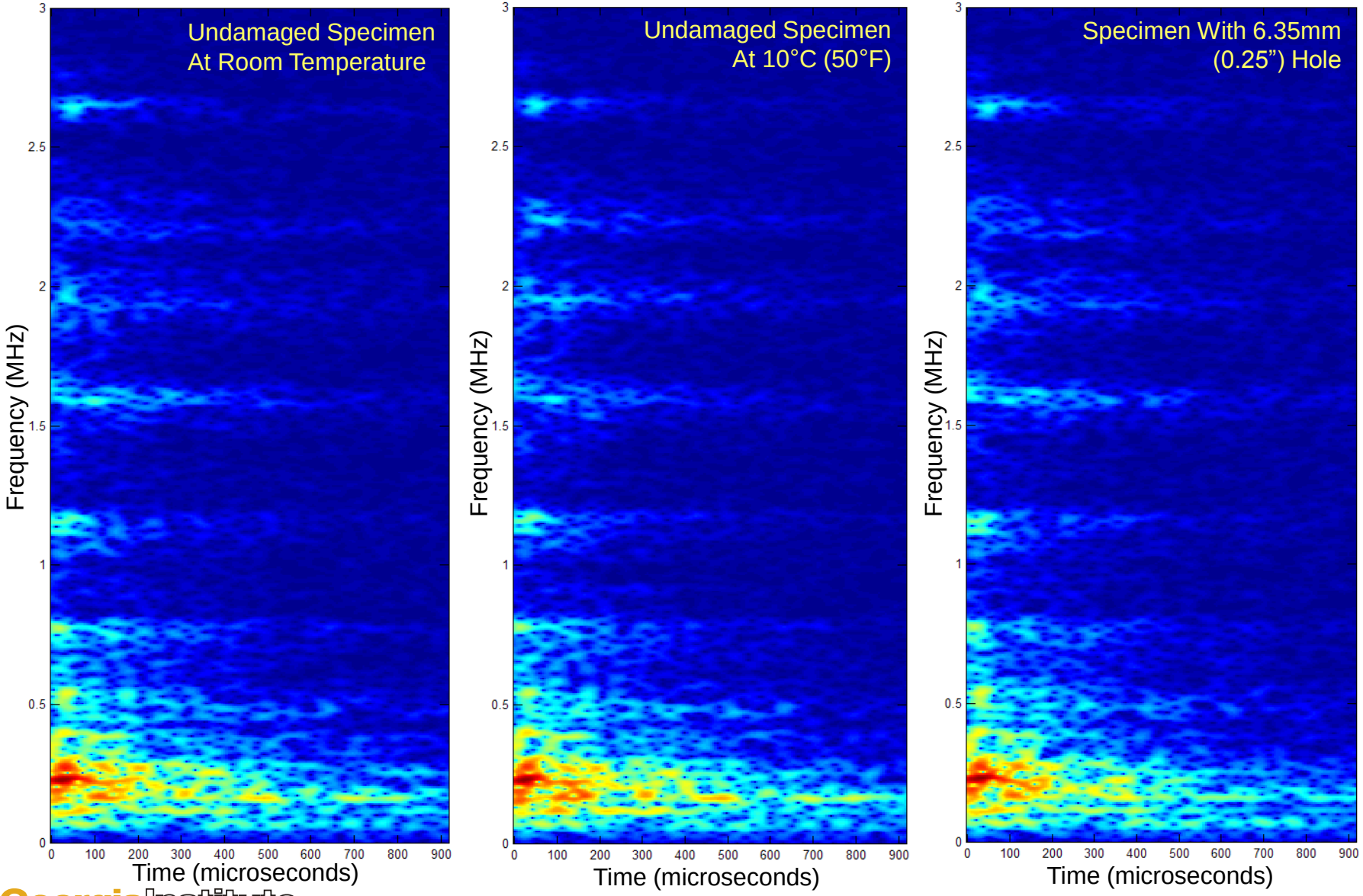
Technical Approach: Better

- Pulse with one transducer and receive with other
- Flood structure with energy, record response until energy has substantially died out (diffuse waves)
- Introduce temperature changes and artificial defects (separately and simultaneously)
- Goal is to discriminate between temperature changes and defects and to quantify minimum detectable flaw size in the presence of temperature changes

Measured Ultrasonic Signals



Short-Time Fourier Transform



Data: Weak

- Waveforms were recorded at various temperatures.
- Waveforms were recorded at various temperatures as notch was enlarged.

Experimental Data: Better

- Specimen #1
  - 65 waveforms recorded from undamaged specimen at various temperatures
  - 397 waveforms were recorded from damaged specimen at various temperatures as notch was enlarged from 0.025” to 0.25” in length
- Specimen #2
  - 98 waveforms recorded from undamaged specimen at various temperatures
  - 64 waveforms recorded from damaged specimen at various temperatures as t hole was enlarged from 5/64” to 0.25” in diameter
- Goal: detect damage while minimizing false alarms

Future Work

- Implement data fusion at feature level to improve detection performance
- Develop, implement methods for estimating flaw sizes
- Investigate effect of flaw type and location on detection sensitivity
- Consider more complicated specimens with real defects

Project Summary

- Four candidate methods for comparing diffuse ultrasonic signal to baseline have been identified and evaluated for detecting damage in presence of temperature changes

- All four methods perform reasonably well if large number of baseline waveforms span expected temperature range

Presenting With Style: Look as Good as Your Slides

- Press shirts and slacks/skirt.
- Wear an undershirt.
- Select same color for shoes and belt.
- Shine your shoes.
- Minimize accessories.
- Wear no logos.
- Think conservative.

Giving Your Talk

- 10 minutes is a short, formal talk.
  - Edit your comments.
  - Plan your comments for each slide.
  - Stick to your slides—don't digress.

- Use slides as prompt. Do not read.
- Project your voice.
- Maintain eye contact.
- "Make friends" with brief silences.
- Be prepared to answer questions.

Performance Techniques: Bring Your "A" Game

- Take a deep breath.
- Stand up straight, but relaxed.
- Maintain eye contact with your audience.
- Project your voice.
- Pace the rate of your speech at natural and moderate.
- Monitor gestures and avoid habitual behaviors.

Presentation Never's

- **Never** run over your time limit. Ever!
- **Never** apologize for any aspect of your presentation. If you have to apologize, you aren't prepared.
- **Never** respond aggressively to a question or comment. Even if you are right, the whole audience will resent you for picking on that poor questioner.

Top 5 Secrets of the Pros

5. Tour the space you'll be presenting in prior to your talk.

4. Make sure the room's technology is compatible with yours.

3. Stand to one side of the projection screen instead of behind the podium.

2. Use the "meteorologist chop" instead of a laser pointer or a cursor.

And the #1 Secret…

Practice!

A lot!