Problem Statement

- Mechanical switches for pilot interaction
- Mechanical switches have low reliability
- Legends are fixed format
- Changing legends require extensive cost to modify or obsoletes the assembly
Current Technology

- Electromechanical switches located around perimeter of display
- Requires additional space to accommodate switches
- Increased pilot workload

Technology Description

- Interface has developed a patented tactile touch-screen technology
Technology Description

- COTS AMLCD display with NFI (Near Field Imaging) tactile touch-screen overlay:
  - Replaces electromechanical switches

Technology Description

- Touch-pad or “switch” layout achieved through software
- Tactile response by actuators
- Actuator response is software controlled
Advantages of Tactile Touch-screens

- Sensory combination of visual & tactile confirmation
  - Reliability >1 million actuations
  - Increased viewing angles
  - Improved human interface through eye-reduction workload
- Configurable and programmable for variety of mission profiles
  - Adaptable to variety of display sizes

Advantages of Tactile Touch-screens

- Reduction of life cycle costs
- Legends programmable through software
  - Changes to switches without modifying or replacing the bezel
  - Reduction of parallax
  - Systems growth
Benefits of the Technology

- No electromechanical switches or bezel assembly
- Programmable switch functionality
  - Touch switches dimensionally controlled through software
  - Configuration changes easily implemented
  - Programmable color coding or switch highlighting for system interface cueing

Benefits of the Technology

- Programmable pages provide multi-tasking capability within one display
  - Efficient use of displays thus reducing number of displays needed
Design Versatility — Typical Display Control Unit

Platforms That Can Use Tactile Touch-screens

- Avionics platforms
  - Displays used for flight, control and communications
- Marine Control Centers
- Command and Control

- Ground-based systems
  - Maintenance
  - Ground stations
  - Training centers
  - Simulators
Product Readiness

- Design completed
- Preliminary software/firmware testing completed
- Two prototypes built
- Product demonstrations available now

Target Opportunities

- Demonstration to following program offices
  - US ARMY
  - NAVY
  - AIR FORCE

Interface will manufacture custom tactile touch-screens to customer specifications and requirements
- Introduction of standard sizes, i.e. 10.4", 12.1" and 15"
The Company

- Customization and ruggedization of controls and displays for both commercial and military avionics
- Founded in 1976
- Modern 25,000 sq. ft. facility located in Oceanside, CA
- Certified small business

Core Capabilities

- Turn-key engineering
- CAD/CAM and Solid Works
- Complete manufacturing
  - Electromechanical assembly
  - Test (electrical, environmental, optical)
  - Machining centers
  - MIL-SPEC finishing
- ISO 9001 / AS9100 quality certification
Markets Supported

Military
- Military Ground Vehicles
- Central Control Centers

Commercial
- Simulation & Training Systems
- UAV- Ground Operator Stations

Customers Supported

➢ Military Programs: Teaming agreement with several companies

AAI Corporation  GEC-Marconi  Rockwell Collins
Avisys  Harris Corporation  SAIC
BAE Systems  Honeywell  SCI
Boeing Company  Lockheed Martin  Sikorsky
CAE  NAMRL  Smiths Aerospace
Coastal Systems  Northrop Grumman  Titan
Cubic Systems  Palomar Products  TEAC America
Dayton T. Brown, Inc  Raytheon Systems  US ARMY
Flight Safety
Customers Supported

Commercial Programs

- Alaska Airlines
- Air Shamrock
- Air Pacific
- AMS
- Boeing Company
- British Airways
- British West Indies Airline
- BMW-Rolls Royce
- China Airlines
- Continental Airlines COPA
- Daft fort Aerospace
- Futura Airlines
- Hapag-Lloyd Flug
- Honeywell
- Japan Air Systems
- Lan Chile
- Lufthansa Tecknik
- Midway Airlines
- Pacair Trading
- RADA
- Rockwell Collins
- Ryan Air
- Saudi Arabia Airlines
- Smiths Aerospace
- South African Airlines
- Southwest Airlines
- United Airlines
- United Parcel Service

Program Experience

<table>
<thead>
<tr>
<th>Customer</th>
<th>Program</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAI</td>
<td>A-10</td>
<td>LCD for weapon alignment</td>
</tr>
<tr>
<td>Allied Signal</td>
<td>V-22 SOA</td>
<td>MFD Switch Bezel assembly</td>
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<tr>
<td>AVISYS</td>
<td>A340-400</td>
<td>Electronic Warfare Processor Unit</td>
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<tr>
<td>BAE Systems</td>
<td>C-17</td>
<td>Custom LCDs for LoadMaster Panel</td>
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<tr>
<td>BAE Systems</td>
<td>C-17</td>
<td>Custom LCDs for Flight Director</td>
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<tr>
<td>BAE Systems</td>
<td>F-16</td>
<td>ATV R Control Unit</td>
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<tr>
<td>BAE Systems</td>
<td>F-15 / F-16</td>
<td>ECM Keypads and Panels</td>
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<td>Bell Helicopter</td>
<td>407</td>
<td>Caution/Warning Annunciator Panel</td>
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<tr>
<td>Boeing</td>
<td>C-40B</td>
<td>Data / Comm Panel</td>
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<tr>
<td>Boeing</td>
<td>C-40B / C-32A</td>
<td>Power Control Panel</td>
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<tr>
<td>Boeing</td>
<td>C-17</td>
<td>Control Display Unit (simulated)</td>
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<tr>
<td>Boeing</td>
<td>F/A-18</td>
<td>Upfront Control Unit (simulated)</td>
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## Program Experience

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<th>Customer</th>
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<tbody>
<tr>
<td>Boeing</td>
<td>C-130 AMP</td>
<td>QWERTY Keyboard</td>
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<tr>
<td>CAE</td>
<td>H-60</td>
<td>Control Display Unit (simulated)</td>
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<tr>
<td>CAE</td>
<td>C-130</td>
<td>SKE Panels (simulated)</td>
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<tr>
<td>Flight Safety Intl</td>
<td>C-17</td>
<td>Multi-Function Displays (simulated)</td>
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<tr>
<td>Honeywell</td>
<td>B747 / 757</td>
<td>Keypad assemblies</td>
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<tr>
<td>Honeywell</td>
<td>B727 / 747</td>
<td>Data Link Integrated Switch Panels</td>
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<tr>
<td>Hughes</td>
<td>E-6</td>
<td>Display Switch Bezel</td>
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<tr>
<td>Lockheed Martin</td>
<td>C-17</td>
<td>LCDs for Autopilot Flight Director</td>
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<td>Lockheed Martin</td>
<td>B-1</td>
<td>SATCOM CDU</td>
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<td>Lockheed Martin FS</td>
<td>LAMPS</td>
<td>MFD Switch Bezel</td>
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<td>Mathtech</td>
<td>Hawkeye</td>
<td>ICS Intercom Control System</td>
</tr>
<tr>
<td>NAWC</td>
<td>F/A-18</td>
<td>Control Display Unit (simulated)</td>
</tr>
</tbody>
</table>

## Current Programs

- MH-53E Mine Sweeper Control Display Unit
- Widebody Integrated Platform Protection System (WIPPS) CDU (Homeland Security)
Current Programs

RAH-66 Cockpit Instrumentation Display System

Health & Maintenance CCU

KC-135R Engine Monitor Display

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