ETC-2000 Automated Scanner

System Qualifications

UniWest QCP 6272

- Pratt & Whitney support equipment operations application procedure □ SEO-106
- Pratt & Whitney NDIP-986, JT8 engines
- Honeywell fan disk attachment slot eddy current inspection TFE731-5
- GE computer controlled eddy current inspection system specification 0 #NDT 174
- Snecma Moteurs CFM56 engine inspection SPM 70 38 1 1

Technical Specifications

Electrical Specifications

- Input power requirements: 85/265 vac, 47-63 Hz, single phase
- Recommend using at least a 1500 watt uninterruptible power supply with □ □ the ETC-2000 scanner system

Signal path specifications

- Operating temperature range: 0°c to +50°c
- Frequency range: 100 Hz to 10 MHz
- Probe drive
- Input resistance: 900 ohm to 1 100 ohm
- Output resistance: 7 ohm to 12 ohm
- Maximum input voltage: 8 volts peak to peak with 50 ohm to 1 k ohm load
- Gain: -0.1 dB to -2.1dB
- · Buffered probe drive
- Input resistance: 900 ohm to 1 100 ohm
- Output resistance: 145 ohm to 172 ohm
- Maximum input voltage: 8 volts peak to peak with 50 ohm to 1 k ohm load
- Gain: -0.1 dB to -2.1dB
- · Receive signals (receive 1 and receive 2)
- Input resistance: 900 ohm to 1 100 ohm
- Output resistance: 55 ohm to 67 ohm
- Maximum input voltage: 4 volts peak to peak with 50 ohm to 1 k ohm load - Maximum dif ference voltage between receive 1 and receive 2 is 300 🛛 🖓
- □ millivolts
- Gain: -0.1 dB to -2.1 dB
- **Computer Specifications**
- Minimum 20 Gb hard drive
- Minimum 1.8 GHz Pentium processor or equivalent
- 64 Mb video card
- 128 Mb memory
- Windows 98
- CD read/writer
- CD ROM
- 1.44 Mb floppy drive
- 15 inch LCD flat screen color monitor
- Rack-mounted capability
- Rack-mounted keyboard
- Track-ball
- All software necessary for scanner operation, data acquisition, data □ storage and display

Mechanical specifications

Ranges and capacities (horizontal positioning, usable inches including translation axis)

- ETC 4004 Large interface module:
- Maximum diameter 52 inches
- Minimum diameter 1 inch
- ETC-4003 Small interface module:
- Maximum diameter 32 inches
- Minimum diameter 1 inch
- Vertical positioning:
- ETC-4004 Large interface module:
- 32 inches usable including translation axis
- ETC-4003 Small interface module:



This project was a cooperative effort between UniWest and the Engine Titanium Consortium which includes the FAA, General Electric, Honeywell, Iowa State University and Pratt & Whitney.

Accuracy

- Translation axes X, R and M positioning:
- Vertical axis +/- 0.005"/foot
- □ Radial axis +/- 0.005"/foot
- Resolution
- □ Vertical axis 0.001"
- □ Radial axis 0.001"
- Backlash
- □ Vertical axis <0.001"
- □ Radial axis <0.001"
- Repeatability
- I Vertical axis 0.005"
- □ Radial axis 0.005"
- Straightness
- □ Vertical axis < 0.010"/foot
- \Box Radial axis < 0.010"/foot
- Rotational C axis
- I Vertical axis perpendicularity +/- 0.010"/foot
- \Box Angular positioning accuracy < +/-0.1 ∞ /revolution
- \Box Angular repeatability < +/- 0.1 ∞
- \Box Backlash < 0.1 ∞
- Horizontal axis parallelism +/- 0.010"/foot
- \Box Resolution 0.01 ∞
- Data Acquisition
- 16 single channel inputs or 8 differential channel inputs
- X and Y channels sample at up to 50,000 samples/second and provide 16 🛛 □ bit resolution for each channel
- Displays

- · Bolt hole: the display used for bolt hole inspections
- · Dasmulti: the display used for web and bore inspections
- PS display: a general use display routine
- Control and Display Software
- Motion Control for the X, C, R and M axis, looping, scanning, analysis, □□
- © commenting, messaging, and external program control.
- Find X enhances system intelligence to find a specific surface and stop.
- Drive allows drives to be enabled or disabled eliminating unwanted jog III □ movements

- 22 inches usable including translation axis
- Vertical translation axis X-axis: 17 inches
- Radial translation R axis:5.7 inches configurable at different zero offset III □ points
- Multiple axis actuator, M-axis
- Inspects vertical, horizontal, and angled
- Bolt hole
- Dovetail broach slots
- · Compatible with new tooling designs for future inspections
- Model ETC-2236 provides 9 inches of translation
- · Model ETC-2225 provides 21 inches of translation Rotational C axis
- · Rotational speed continuously variable and guaranteed to 12 rpm Interface modules, weight and range capabilities:
- ETC-4004 Large interface module:
- Work Piece usable diameter 52 inches
- Work Piece maximum weight 800 pounds ETC-4003 Small interface module:
- Work Piece usable diameter 32 inches
- Work Piece maximum weight 200 pounds

- Windowing is a post-procession algorithm that scans data for thresholds □ exceeding scan-plan parameters
- Command lines include motion control for X, C, R and M axis, looping, □□ □ scanning, analysis, commenting, messaging, and external program □ □ □ control

 ETC software is compatible with external post processing programs that I I may be used for data analysis and decision modeling

 Software Enabling allows off-line personnel training, analysis of data, and □ □ scan plan development

Premium Software Not Included

· Auto Calibration integrates fully automated system calibration

 Return-to-Indication re-scans regions previously found to have exceeded □ □ threshold parameters. This tool automatically shows the locale of any □□ □ found indication regions in scans for bores, webs, slots, and bolt-holes. SBindicate analyzes slot and broach scan data for indications. It III п

□ incorporates threshold, nominal length, and edge neglect parameters. □□ Edge Neglect improves edge detection for slot inspections.

These specifications are configured to UniWest's ETC-2000 Automated Scanner and US-450 eddy current instrument systems delivered after January 1, 2003