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<th>1. REPORT DATE</th>
<th>2. REPORT TYPE</th>
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<th>4. TITLE AND SUBTITLE</th>
<th>5a. CONTRACT NUMBER</th>
<th>5b. GRANT NUMBER</th>
<th>5c. PROGRAM ELEMENT NUMBER</th>
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<td>Ultrasound Imaging of TTCP Samples</td>
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<th>6. AUTHOR(S)</th>
<th>5d. PROJECT NUMBER</th>
<th>5e. TASK NUMBER</th>
<th>5f. WORK UNIT NUMBER</th>
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<td>William R. Davis</td>
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<tr>
<td>Naval Air Warfare Center Aircraft Division</td>
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<tr>
<td>22347 Cedar Point Road, Unit #6</td>
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<td>Patuxent River, Maryland 20670-1161</td>
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<th>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</th>
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12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:

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   SAR

18. NUMBER OF PAGES

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19a. NAME OF RESPONSIBLE PERSON

   William R. Davis

19b. TELEPHONE NUMBER (include area code)

   (301) 342-3761

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The Technical Cooperation Program (TTCP)

Technical Panel Annual Meeting

Materials Group TP-5

Evaluation of Samples Using Ultrasound Imaging

William R. Davis
Dr. Ignacio Perez

16 - 20 October 2000
RAH66 Quill Detector Face Drive Shaft (top), Quill Shaft (bottom left), small brace (bottom center), and flex beam (bottom right)
RAH 66 Quill Shaft 7/8” thick by 6” dia. By 1 1/8” high ring.
RAH 66 Quill Shaft is a 7/8” thick by 6” diameter by 1 1/8” high ring. A 1 MHz 1.5 ” diameter transducer was used in through transmission mode. This shows a full height disbond 1/2” wide.
TCCP Sample Evaluation

RAH66 Quill Detector Face (Dr) Shaft  Examined by through transmission. Thickness is 1/2 inch to 1 inch. Height 12.5 inch, 5 3/4 inch diameter
Quill Detector Face Bottom section – heavy thickness section examined by through transmission at 2.25 MHz
RAH66 Quill Detector Face (Dr) Shaft imaged using a 2.5 MHz 1.5” diameter transducer in through transmission. The thin Top Section is approximately 0.625 inch thick.
The RAH66 Flex beam, 1.125” thick x 5.25” x 2.375”
RAH66 Flexbeam imaged using Through Transmission at 2.25 MHz shows a darker line of marceling near the top
RAH66 Flex beam in tank. One sided imaging of the ultrasound by refection shows some near surface discontinuities near the end of the flex beam.
IAMT prepreg box, overhead and side views
LAMT prepreg box imaged in through transmission using 5 MHz for high resolution.
IAMT prepreg box imaged using the reflection camera in the tank. Back reflection imaging of the bottom of the part shows a discontinuity on one corner, and a surface discontinuity.
IAMT prepreg box imaged by reflection in the tank. Back reflection imaging with an increased time delay shows the triangular machined area and the 4 ribs.
3 cm thick balsa wood cored multilayer panel imaged using 5 MHz ultrasonic reflection camera in reflection