SEA KNIFE
ANALYSIS OF SELECTED SEAKEeping DATA.
VOLUME 2, FIGURES

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UNCLASSIFIED

ADA 081 565
# Sea Knife - Analysis of Selected Seakeeping Data Vol. II(U)

**Abstract**

This report presents the results of spectral analysis on a selection of seakeeping tests carried out on a 1/16 full size model of SEA KNIFE. SEA KNIFE is an experimental planing hull design.

- **Advanced Naval Vehicle Concepts**
- **Evaluation**
- **ANVCE**
- **Technology Assessment**
- **Sea Knife**

**Supplementary Notes**

Vol. I Report

Vol. II Figures

This report used by OP96V in their study:

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**Keywords**

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**DISTRIBUTION STATEMENT (of this Report)**

Unlimited and approved for Public release.

**DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)**

**SUPPLEMENTARY NOTES**

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**ABSTRACT (Continue on reverse side if necessary and identify by block number)**

This report presents the results of spectral analysis on a selection of seakeeping tests carried out on a 1/16 full size model of SEA KNIFE. SEA KNIFE is an experimental planing hull design.
SEAKNIFE TESTS NO.1 9/7 MAY '76 - RUN 878 HEAVE SPECTRUM - UNITS CENTIMETRES

SIG. VALUE = 7.573 UNITS
R.M.S. = 1.893 UNITS

FIGURE 4
SEAMKNIFE TESTS NO. 1 S/T MAY '76 - RUN 878 VERT G AT BOW SPECTRUM UNITS G-5

SIG. VALUE = 0.943 UNITS
R-M.S. = 0.205 UNITS

FIGURE 6
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN B79 PITCH SPECTRUM - UNITS DEGREES

SIG. VALUE = 3.181 UNITS
R.M.S. = 0.735 UNITS

FIGURE 8
S.111617.32.154

SIG. VALVE = 0.01223
R.M.S. = 0.024

FIGURE 10
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 679 ENCOUNTERED WAVE SPECTRUM - UNITS CMS

SIG. VALLE = 4.293 UNITS
R-M-S. = 1.073 UNITS

FIGURE 12
SEAMNIFE TESTS NO. 1 S/T MAY '76 - RUN BB3 PITCH SPECTRUM - UNITS DEGREES

SIG. VALUE = 4.544 UNITS
R.M.S. = 1.135 UNITS

FIGURE 13
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN B83 HEAVE SPECTRUM - UNITS CENTIMETRES

SIG. VALUE = 6.744 UNITS
R-K-S. = 1.686 UNITS

FIGURE 14

SPECTRAL DENSITY (UNITS SQ PER CYCLE PER SEC)

HANNED SPECTRUM FREQUENCY (CYCLES PER SEC)
S. AKN Tests No. 5/17 - Run BE Vert. G at C-E

Spectral Density Units (per cycle per sec)

Hann Window Spectrum Frequency (cycles per sec)

Sig. Value = 0.000 Units
R.M.S. = 0.000 Units

Figure 15
Figure 18

SIG. VALUE = 6.0 UNITS
R.M.S. = 1.533 UNITS
Spectral Density (units 50 & per cycle per sec)

Hannen Spectrum Frequency (cycles per sec)

SIG. VALLE = 0.5
R.M.S. = 0.1

FIGURE 19
FIGURE 20

SPECTRAL DENSITY (UNITS 50 PER CYCLE PER SEC)

HANNED SPECTRUM FREQUENCY ( CYCLES PER SEC )

SIGNAL VALUE = 0.040 UNITS
R.M.S. = 0 UNITS
SPECTRAL DENSITY (UNITS SQ PER CYCLE PER SEC)

HANNED SPECTRUM FREQUENCY (CYCLES PER SEC)

SIG. VALUE = 0.43 UNITS
R-M-S. = 0.35 UNITS

FIGURE 25
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN BED HEAVE SPECTRUM UNITS CENTIMETRES

SIG. VALUE = 4.964 UNITS
R.M.S. = 1.241 UNITS

FIGURE 28
SEANIFTE TESTS NO. 1 S/T MAY '76 - RUN 6000 VERT. G AT C-G SPECLUM UNITS G-S

SIG. VALUE = 1.820 UNITS
R.M.S. = 0.305 UNITS

FIGURE 29
SEAMNIFE TESTS NO.1 5/T MAY '76 - RUN 880 VERT. G AT BOW SPECTRUM UNITS G.S

SIG. VALUE = 1.105 UNITS
R.M.S. = 0.291 UNITS

FIGURE 30
SEAMNIFE TESTS NO.1 S/T MAY '76 - RUN 890 ENCOUNTERED WAVE SPECTRUM UNITS CMS

SIG. VALUE = 6.538 UNITS
R.M.S. = 1.634 UNITS

FIGURE 31
SEKNIFE TESTS NO 1 S/T MAY '76 - RUN 931 HEAVE SPECTRUM UNITS CENTIMETRES

SIG. VALUE = 5.354 UNITS
R.M.S. = 1.338 UNITS

FIGURE 32
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 691 VERT G AT BOW SPECTRUM UNITS G*S

SIG. VALUE = 1.205 UNITS
R.M.S. = 0.301 UNITS

FIGURE 34
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 801 ENCOUNTERED WAVE SPECTRUM UNITS OMS

SIG. VALUE = 6.800 UNITS
R.M.S. = 1.747 UNITS

FIGURE 35
Figure 36

Spectral Density (Units so per Cycle Per Sec)

Hannifu Spectrum Frequency (Cycles Per Sec)

E/3 Value = 14.403 Units

R-M.S. = 3.623 Units
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 699 ENCOUNTERED WAVE SPECTRUM UNITS CMS

\[ \text{SIG. VALUE} = 12.653 \text{ UNITS} \]

\[ \text{R.M.S.} = 3.163 \text{ UNITS} \]

FIGURE 39
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 894 VERT.G AT BOW SPECTRUM UNITS G/S

SIG. VALUE = 1.507 UNITS
R.M.S. = 0.376 UNITS

FIGURE 43
SEMISTATE TESTS NO. 1 MAY '76 - RUN 895 VERT. 5 AT C.G. SPECTRUM UNITS 6.5

SIG. VALUE = 1.75 UNITS
R.M.S. = 0.423 UNITS

FIGURE 47
SEAKNIFE TESTS NO. 1 5/76 – RUN 656 VERT·G AT BOW SPECTRUM UNITS G·S

SIG· VALUE = 1.789 UNITS
R·M·S· = 0.447 UNITS

FIGURE 48

HANNED SPECTRUM FREQUENCY (CYCLES PER SEC)
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 966 ENCOUNTERED WAVE SPECTRUM UNITS CMS

SIG. VALUE = 11.844 UNITS
R.M.S. = 2.951 UNITS

FIGURE 49
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 887 HEAVE SPECTRUM UNITS CENTIMETRES

SIG. VALLE = 11.654 UNITS
R.M.S. = 2.653 UNITS

FIGURE 51
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 857 VERT-G AT 80W SPECTRUM UNITS G-S

SIG. VALUE = 1.573 UNITS
R.M.S. = 0.353 UNITS

FIGURE 53
SEAMINE TESTS NO.1 S/T MAY '76 - RUN 837 ENCOUNTERED WAVE SPECTRUM UNITS CMS

SIG. VALUE = 10.839 UNITS
R.M.S. = 2.709 UNITS

FIGURE 54
PLANIFE TESTS NO. 5* MAY 173 - RUN 998 PITCH SPECTRUM 15* DEGREES

SIG. VALUE = 7.57 NITS
R.M.S. = 4.18 NITS

FIGURE 55
SLACK KNIFE TESTS NO. 1 5/78 - RUN 899 VER.1.0 AT C.G. SPECTRUM UNITS 5.5

SIG. VALUE = 1.000 UNITS
R.M.S. = 0.022 UNITS

FIGURE 56
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 838 VERT. G AT BOW SPECTRUM UNITS G+S

SIG. VALUE = 1.227 UNITS
R.M.S. = 0.306 UNITS

FIGURE 57
SEAKNIFE TESTS NO.: 5/7 MAY '77 - RUN B35 VERT-15 AT C+6  SPAN x MUM UNITS 0.5

SIG. VALUE = 1.633 UNITS
R.M.S.    = 0.423 UNITS

FIGURE 60
SEAKNIFE TESTS NO. 1 5/7 MAY '76 - RUN 889 VERT G AT BOX STREET. UNITS G-S

SIG. VALUE = 1.585 UNITS
R-M-S. = 0.386 UNITS

FIGURE 61
SEAWIFE TESTS NO. 5/7 MAY '76 - RUN 800 PITCH SPECTRUM 0-1 DEGREES

SIG. VALUE = 4 L-ITS
R.M.S. = 1.209 UNITS

FIGURE 63
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 900 ENCOUNTERED WAVE SPECTRUM UNITS CMS

SIG. VALUE = 7.942 UNITS
R.M.S. = 1.905 UNITS

FIGURE 67
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 908 VERT-G AT C.G. SPECTRUM UNITS G.5

SIGNAL VALUE = 2.095 UNITS
R.M.S. = 0.523 UNITS

FIGURE 68
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 308 VERT G AT 90W SPECTRUM UNITS G-S

Figure 69

SIG. VALUE = 1.929 UNITS
R.M.S. = 0.492 UNITS

SPECTRAL DENSITY UNITS PER CYCLE PER SEC.

HANDED SPECTRUM FREQUENCY (CHANNELS PER SEC)
SEAKNIFE TESTS NO. 1 S/MT MAY 76 - RUN 909 PITCH SPECTRUM UNITS DEGREES

**FIGURE 70**

- SIG. VALUE = 5.909 UNITS
- R.M.R. = 1.498 UNITS
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 903 VERT. G AT C.G. SPECTRUM UNITS G-S

SIG. VALUE = 2.163 UNITS
R-M-S. = 0.540 UNITS

FIGURE 71

SPECTRAL DENSITY UNITS SO PER CYCLE PER SEC

HANNED SPECTRUM FREQUENCY (CYCLES PER SEC)
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 909 VERT G AT 800W SPECTRUM UNITS G/S

SIG. VALLE = 1.952 UNITS
R.M.S. = 0.488 UNITS

FIGURE 72
SEAKNIFE TESTS NO. 1 S.T MAY '76 - RUN 909 ENCOUNTERED WAVE SPECTRUM UNITS CMS

SPECTRAL DENSITY (UNITS SQ. PER CYCLE PER SEL)

HORIZONTAL SPECTRAL FREQUENCY (CYCLES PER SEL)

FIGURE 73
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 924 PITCH SPECTRUM - UNITS DEGREES

SIG. VALUE = 7.299 UNITS.
R.M.S. = 1.619 UNITS

FIGURE 74
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 924 HEAVE SPECTRUM - UNITS CENTIMETRES

SIGMA VALUE = 6.229 UNITS
R.M.S. = 1.557 UNITS

FIGURE 75
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 524 VERT-G AT C-G SPECTRUM

SIG. VALUE = 0.415 G
R.M.S. = 0.103 G

FIGURE 76
SEAKNIFE TESTS NO. 1 5/7 MAY '76 - RUN 924 ENCOUNTERED WAVE SPECTRUM - UNITS CMS

SIG. VALUE = 7.475 UNITS
R.M.S. = 1.053 UNITS

FIGURE 78
SEAKNIFE TESTS NO. 1 5/7 MAY '76 - RUN 925 VERT-G AT C.G. SPECTRUM

SIG. VALUE = 0.429 G

R/M/S. = 0.105 G

FIGURE 79
SEAKNIFE TESTS NO. 1 5/T MAY '76 - RUN 925 VERT G AT 600Y SPECTRUM UNITS G-S

SIG. VALUE = 1.006 UNITS
R.M.S. = 0.251 UNITS

FIGURE 80
SIG. VALUE = 4.013 UNITS
R.M.S. = 1.003 UNITS

FIGURE 81
SEAKNIFE TESTS NO. 1 5/75 MAY '76 - RUN 829 HEAVE SPECTRUM - UNITS: CENTIMETRES

SIG. VALUE = 6.433 UNITS

R.M.S. = 1.609 UNITS

FIGURE 82
Spectral Tests No. 1 Sat May '76 - Run 928 Vert-G at C.G. Spectrum

SIG. VALUE = 0.722 G
R.M.S. = 0.180 G

Figure 83
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 526 ENCLOSED WAVE SPECTRUM - UNITS CMS.

SIG. VAL. = 6.623 UNITS
R.M.S. = 1.655 UNITS

FIGURE 85
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 229 PITCH SPECTRUM - UNITS DEGREES

EIG VALUE = 4.431 UNITS
R-M-S. = 1.128 UNITS

FIGURE 86
SEAKNIFE TESTS NO.1 S/T MAY '76 - RUN 300 HEAVE SPECTRUM - UNITS CENTIMETRES

SIG. VALUE = 6.807 UNITS
R.M.S. = 1.714 UNITS

FIGURE 87
SEAKNIFE TESTS N.1 5/7 MAY '76 - RUN 500 ENCOUNTERED WAVE SPECTRUM - UNITS CMS.

SIG. VALUE = 6.894 UNITS
R.M.S. = 1.723 UNITS

FIGURE 90
SEAKNIFE TESTS NO. 1 S/T MAY '76 - RUN 890 PITCH SPECTRUM - UNITS DEGREES

SIG. VALUE = 4.213 UNITS
R.M.S. = 1.059 UNITS

FIGURE 91
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<tr>
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<tr>
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</tbody>
</table>
SIG. VALUE = 6.996 UNITS
R.M.S. = 1.746 UNITS

FIGURE 100
SIGNAL TESTS NO. 1 SAT MAY '76 - RUN SEG PITCH SPECTRUM UNITS DEGREES

FIGURE 101
FIGURE 103

Spectral density units to per cycle per sec.
SEAKNIFE TESTS NO. 1 SAT MAY '76 - RUN 003 VERT G AT BOW SPECTRUM UNITS G-S

SIG. VALUE = 1.036 UNITS
R.M.S. = 0.406 UNITS

FIGURE 10A
Figure 106

Spectral density units so per cycle per std

Figure

S/N: Value = 5.157 Units

R.m.s. = 1.289 Units
SEAMNIFS TESTS NO. 1 5/T MAY '76 - RUN 936 VERT-G AT C.G. SPECTRUM UNITS G·S

SIG. VALLE = 1.117 UNITS
R.M.S. = 0.279 UNITS

FIGURE 108
SLANIFE TESTS NO.1 5/7 MAY '76 - RUN 618 PITCH SPECTRUM UNITS DEGREES

SIG. VALUE = 3.545 UNITS
R.M.S. = 0.866 UNITS

FIGURE 111
SEAWHLE TESTS NO.1 5/7 MAY '76 - RUN S37 HEAVE SPECTRUM UNITS CENTIMETRES

SIG. VALUE = 8.376 UNITS
R.M.S. = 2.034 UNITS

FIGURE 112