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EFFECT OF LOW FREEBOARD ON THE BEHAVIOR OF AN AMPHIBIOUS VEHICLE-ETC(U)

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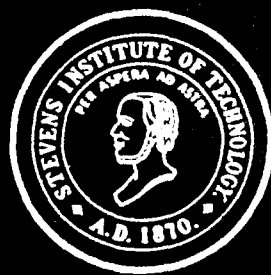
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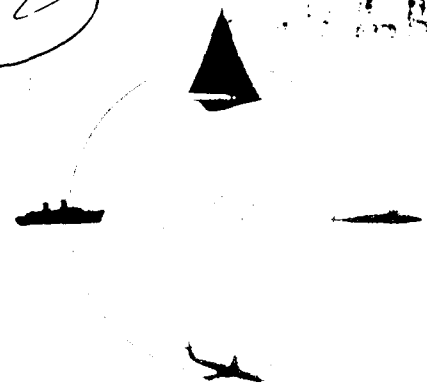
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DAVIDSON LABORATORY

Technical Report SIT-DL-81-9-2155
January 1981

EFFECT OF LOW FREEBOARD ON THE
BEHAVIOR OF AN AMPHIBIOUS VEHICLE IN HEAD SEAS

by
E. Numata and M.J. Chiocco

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Prepared for
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Daniel Savitsky
Deputy Director



• INTRODUCTION

The relatively low freeboard resulting from the low silhouette of the new generation of amphibious craft has raised questions relating to their waterborne performance. Existing configurations having greater freeboard have been speed-limited in smooth water when negative trim has caused bow swamping and loss of visibility. With decreased freeboard the attainable speed of the proposed vehicles may be reduced to an unacceptable level in smooth water and waves.

Under the guidance of Code 1120 of David W. Taylor Naval Ship R & D Center (DWTNSRDC), a model test program was initiated to study the behavior of a representative amphibious craft in an operational sea state. The following parameters were systematically varied to evaluate their effect on mean running freeboard, vertical acceleration and mean resistance as a function of vehicle speed in a head sea state 2. :

- a. Vehicle gross weight,
- b. Vehicle LCG location,
- c. Height over troop compartment,
- d. Deflection angle of water jet propulsor thrust,

The general objective was to define the operating boundaries of the vehicle. Accordingly, the matrix of parameter variations was trimmed as necessary to eliminate any combination of load, CG deck height and speed which would be likely to result in unacceptable behavior.

MODEL

The configuration of a representative amphibious vehicle used for the model is shown in Figure 1 with prototype dimensions in inches. A 1/8-scale model of the vehicle was constructed with a wood hull; plastic wheels, idlers and sprockets; and aluminum tracks. The designed height over the troop compartment of 72 in. was increased to 78 in. and 84 in. by inserting spacers between the lower hull portion and a removable deck and turret assembly, as shown in Figure 2.

Hydrostatic characteristics and loading data for the representative vehicle were as follows, where trim is referred to the baseline, Figure 1.

<u>Condition</u>	<u>LCG from bow, in.</u>	<u>Trim</u>
Combat loaded, no troops	155	by bow
Combat loaded, with troops	161	by stern

The shift in LCG between conditions was 6 in. over a vehicle length of 296 in. or 2 percent.

Code 1120 of DWTNSRDC suggested that gross weights of 42,000, 48,000 and 55,000 lb be used with three LCG positions, varying in increments of 6 in. (2 percent of length), for each gross weight. The 48,000 lb gross weight was close to the "with troops" loading of the representative vehicle and this load was assigned an LCG of 161 in. aft of the bow with a resulting trim by the stern; alternate LCG locations were at 155 in. and 167 in.

The 42,000 lb gross weight was assumed to represent a "no troops" loading with an LCG of 155 in. which produced trim by the bow; alternate LCG locations were 149 in. and 161 in.

Since the 55,000 lb "overload" condition had a minimal freeboard, a median LCG of 155 in. was chosen because it resulted in a near zero trim; alternate locations were 149 in. and 161 in.

LCG locations were also identified as a percentage of vehicle length L measured from the 155-inch location, as follows.

<u>In. from Bow</u>	<u>% of L</u>
149	2% Fwd
155	0%
161	2% Aft
167	4% Aft

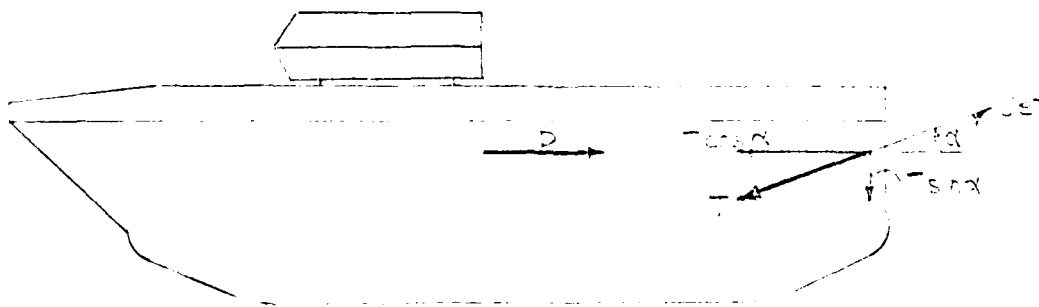
It was desired to evaluate the effect of vectoring the water jet propulsors to increase bow-up running trim. Since the water jets were not modeled, the following technique was employed to simulate jet vectoring.

With the water jet axis vectored α degrees upward, the longitudinal component of thrust $T\cos\alpha$ was assumed to equal the mean running drag D . The vertical component of thrust $T\sin\alpha$, which generates a bow-up trim moment, may be expressed in terms of D as follows:

$$T\cos\alpha = D \quad \text{or} \quad T = D/\cos\alpha$$

$$\text{Then } T\sin\alpha = D\sin\alpha/\cos\alpha = D\tan\alpha$$

Thus the vertical component of thrust was simulated by a weight at the transom equal to $D\tan\alpha$.



TEST INSTRUMENTATION AND PROCEDURE

The model was towed through a transverse pitch axis at the LCG, at a height of 48 inches above the baseline, equal to the height of the centerlines of the water jet propulsors. The frontispiece shows the model under tow in waves; the pitch axis pivots are below deck level and therefore not visible. The photo shows twin heave masts rolling on bearing wheels; the bearing wheels are mounted on a frame attached to the towing carriage. The lower ends of the heave masts are joined by a crossbar and a drag balance is attached to the underside of the bar; a tube connects the balance to the pitch pivot unit.

Linear and rotary transducers sensed vertical and angular displacements of the pitch axis. An inclinometer senses static trim angle. Vertical accelerations were sensed by an accelerometer located 161 inches aft of the bow. A wave elevation probe was suspended from a carriage ahead of the model.

Signals from the sensors were carried by cable to shore, passed through conditioners and recorded as time histories on chart paper and magnetic tape. The tank-side PDP-8e digital computer digitized the signals and performed statistical analyses of all the measured quantities at the end of each test run.

All tests were conducted in Tank 3 which is 313 ft x 10 ft x 9.4 ft in depth. The model was towed at constant speed into waves generated by a plunger-type wavemaker at the far end of the tank. Data were recorded over a distance of 140 ft corresponding to almost a quarter of a mile full-scale. The wavemaker control produced a reproducible sequence of 100 waves varying in length and height, and having an average of the third highest of 2.2 ft full-scale (Sea State 2). Numbers of waves encountered ranged from 70 at 4 mph to 40 at 8 mph.

All test runs were recorded on VHS-type videotape of model time scale.

• TEST RESULTS

Table 1, page 9, presents the matrix of test conditions and lists the corresponding run numbers; static trim angles are included.

Computer listings of statistical results are given on pages 20 through 65 in chronological order of run numbers; explanatory notes appear on page 25.

Following a review of preliminary test results, Code 1120 suggested that the measured statistics of pitch and heave motions be translated into equivalent freeboards (1) at the bow, (2) at the vehicle driver location 67 inches aft of the bow, and (3) at the transom. Each freeboard is a quasi-static quantity composed of the at-rest freeboard modified by the mean running heave and pitch measured in waves. A sample calculation is detailed in an Appendix, page 8.

Trends of running freeboard at the three locations versus vehicle speed, with LCG location as a parameter, are shown in Figures 3-13, pages 12 through 22.

<u>Figure</u>	<u>Gross Weight, lb.</u>	<u>Deck Height, in.</u>	<u>Water Jet Angle, deg.</u>
3	42,000	72	0
4	"	78	0
5	"	78	20
6	"	84	0
7	48,000	72	0
8	"	78	0
9	"	78	20
10	"	84	0
11	55,000	78	0
12	"	78	20
13	"	84	0

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Because of low freeboard, only one test condition was run at 72-inch deck height x 55,000 lb.

Figures 14 and 15 are charts of CG acceleration and mean drag, respectively, versus vehicle speed.

DISCUSSION OF RESULTS

Videotape records of the test runs were studied to identify those combinations of vehicle parameters and speed which resulted in the foredeck and driver's station being relatively dry except for an occasional large wave. Making a subjective determination of "relatively dry" is admittedly imprecise. However, it was found that all test conditions which met this arbitrary criterion were further characterized by,

- a. A speed of 6 mph or less, and
- b. A mean running freeboard at the bow of 1.5 ft or more.

The following table identifies by an (X) the vehicle parameters and speeds meeting the above arbitrary criteria:

<u>Deck Height, in</u>	<u>Gross Weight</u>	<u>LCG</u>	<u>Jet Angle</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
78	42,000	2'A	0°	x	x			
	48,000	4'A	0°	x	x	x		
		4'A	20°	x	x	x		
84	42,000	0'	0°	x	x			
		2'A	0°	x	x	x		
	48,000	2'A	0°	x	x			
		4'A	0°	x	x	x		

Thus, operation in a sea state 2 will result in a relatively wet foredeck and driver's station unless the configuration of this 70-inch height vehicle is modified. A modification which reduces deck wetness may be expected to extend the present speed limit of 6 mph in a sea state 2.

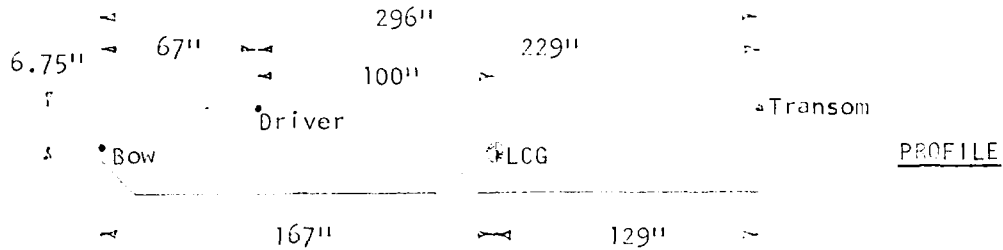
Figure 14 shows that vertical acceleration is relatively insensitive to variations in any of the parameters, including speed. Figure 15 indicates that mean drag in a seaway is relatively insensitive to changes in vehicle parameters and is primarily a function of speed.

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APPENDIX

CALCULATION OF MEAN RUNNING FREEBOARDS

Condition: Gross Weight 48,000 lb
 Deck Height 72 in
 LCG 45' aft
 Speed 4 mph



Measured: Static Baseline Trim 2.60 deg
 Freeboard at Transom 0.60 ft
 Mean Running Heave at LCG -.17 ft
 Mean Running Baseline Pitch 2.18 deg

Calculations:

Change in inclination = $2.18 - 2.60 = -.42$ deg

Vertical shift due to change in inclination

At transom = $129'' \sin 0.42^\circ = .95''$ or .08 ft
 At driver = $-100 \sin 0.42^\circ = -.73''$ -.06 ft
 At bow = $-167 \sin 0.42^\circ = -1.22''$ -.10 ft

Static freeboards

At driver = $0.6 \text{ ft} + (229 \sin 2.6) / 12 = 1.47 \text{ ft}$
 At bow = $0.6 \text{ ft} + (296 \sin 2.6) / 12 - 6.75 / 12 = 1.16 \text{ ft}$

Running freeboards

	<u>Bow</u>	<u>Driver</u>	<u>Transom</u>
Static freeboard	1.16	1.47	0.60
Inclination shift	-.10	-.06	.08
Heave	-.17	-.17	-.17
Running freeboard	<u>.89</u>	<u>1.24</u>	<u>.51</u>

Table 1
 AMPHIBIAN TEST MATRIX, SEA STATE 2

Deck Height in	Load lb	LCG	Static Trim deg	Jet Angle deg	Speed, mph																																	
					4	5	6	7	8																													
72 ↓ ↓ ↓	42,000 ↓	2% F	-2.6	0 ↓	9 2 4 17 14 10 18 22 53 19 24 38 28 34 47 48 41 45 87 80 82	3 5 7 8 15 16 11 12 13	7	8	8																													
		0%	-1.2																																			
		2% A	.4																																			
	48,000 ↓	0%	-1.0							17 14 10 18 22 53 19 24 38 28 34 47 48 41 45 87 80 82	3 5 7 8 15 16 11 12 13	7	8	8																								
		2% A	.8																																			
		4% A	2.6																																			
	55,000 ↓	2% F	-2.5												17 14 10 18 22 53 19 24 38 28 34 47 48 41 45 87 80 82	3 5 7 8 15 16 11 12 13	7	8	8																			
		0%	-.7																																			
		2% A	1.3																																			
78 ↓ ↓ ↓	42,000 ↓	2% F	-2.6	0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20	18 22 53 19 24 38 28 34 47 48 41 45 87 80 82	3 5 7 8 15 16 11 12 13	7	8	8																													
		0%	-1.2																																			
		2% A	.4																																			
		48,000 ↓	0%							-1.0	18 22 53 19 24 38 28 34 47 48 41 45 87 80 82	3 5 7 8 15 16 11 12 13	7	8						8																		
			2% A							.8																												
			4% A							2.6																												
	55,000 ↓	2% F	-2.5							18 22 53 19 24 38 28 34 47 48 41 45 87 80 82					3 5 7 8 15 16 11 12 13	7	8	8																				
		0%	-.7																																			
		2% A	1.3																																			
	84 ↓ ↓ ↓	42,000 ↓	2% F																-2.6		0 ↓	87 80 82	88 79 81 84	89 90	78 71 75	8												
			0%																-1.0																			
			2% A																.8																			
		48,000 ↓	0%																-1.0								87 80 82	88 79 81 84	88 79 81 84	89 90	78 71 75	8						
			2% A																.8																			
			4% A																2.6																			
		55,000 ↓	2% F																-2.5														87 80 82	88 79 81 84	88 79 81 84	89 90	78 71 75	8
			0%																-.7																			
			2% A																1.3																			

Test Run Numbers

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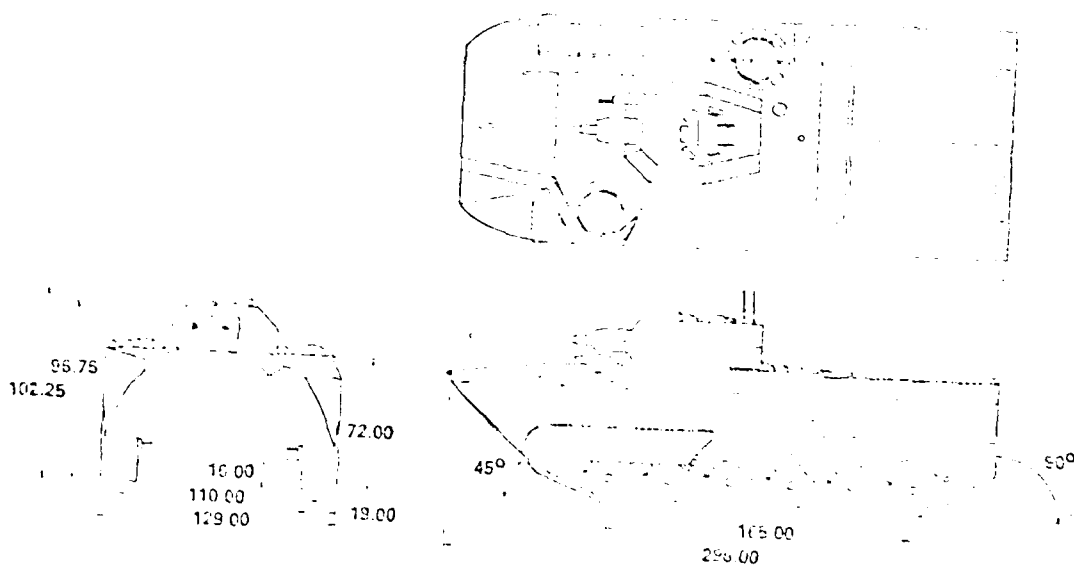


FIGURE 1

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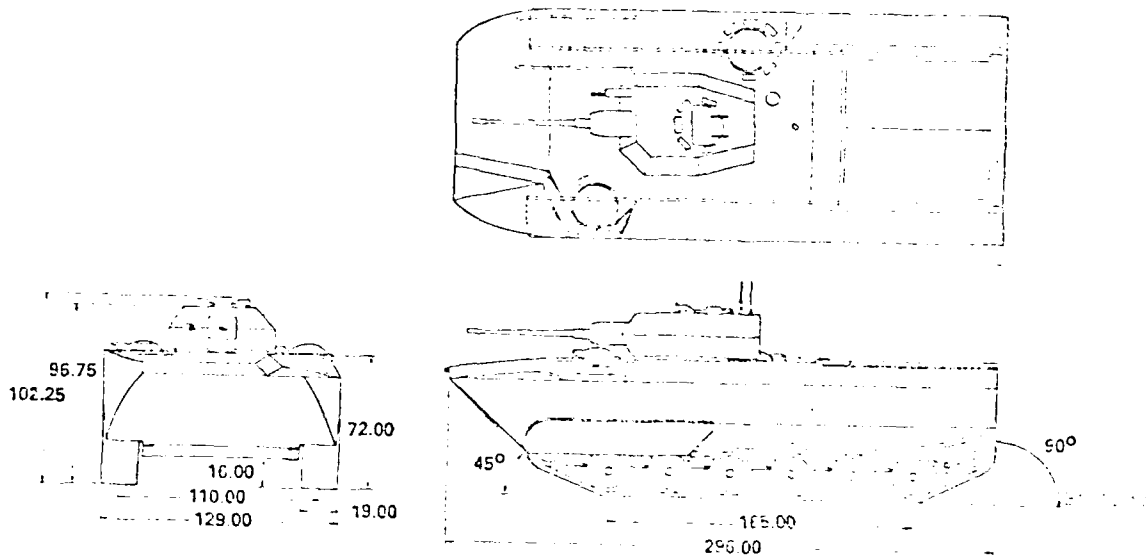


FIGURE 1

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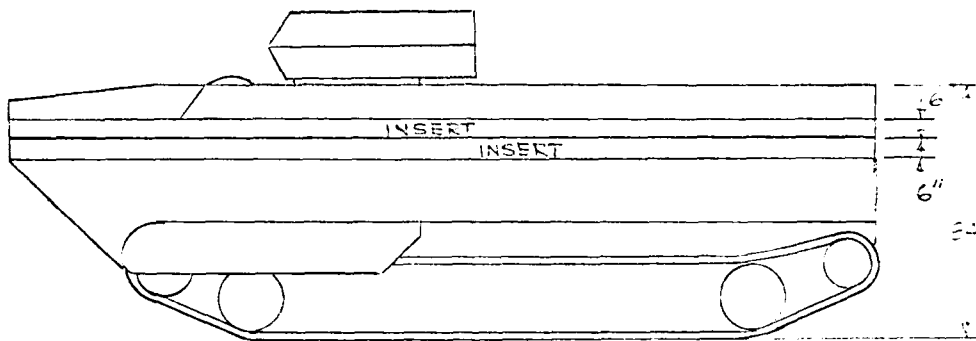


FIGURE 2
INSERTS TO INCREASE HEIGHT FROM 72" TO 78" AND 84"

R-2155

SEA STATE 2
DECK HEIGHT 72"
DISPLACEMENT 42,000 lb
WATER JET ANGLE 0°

LCG

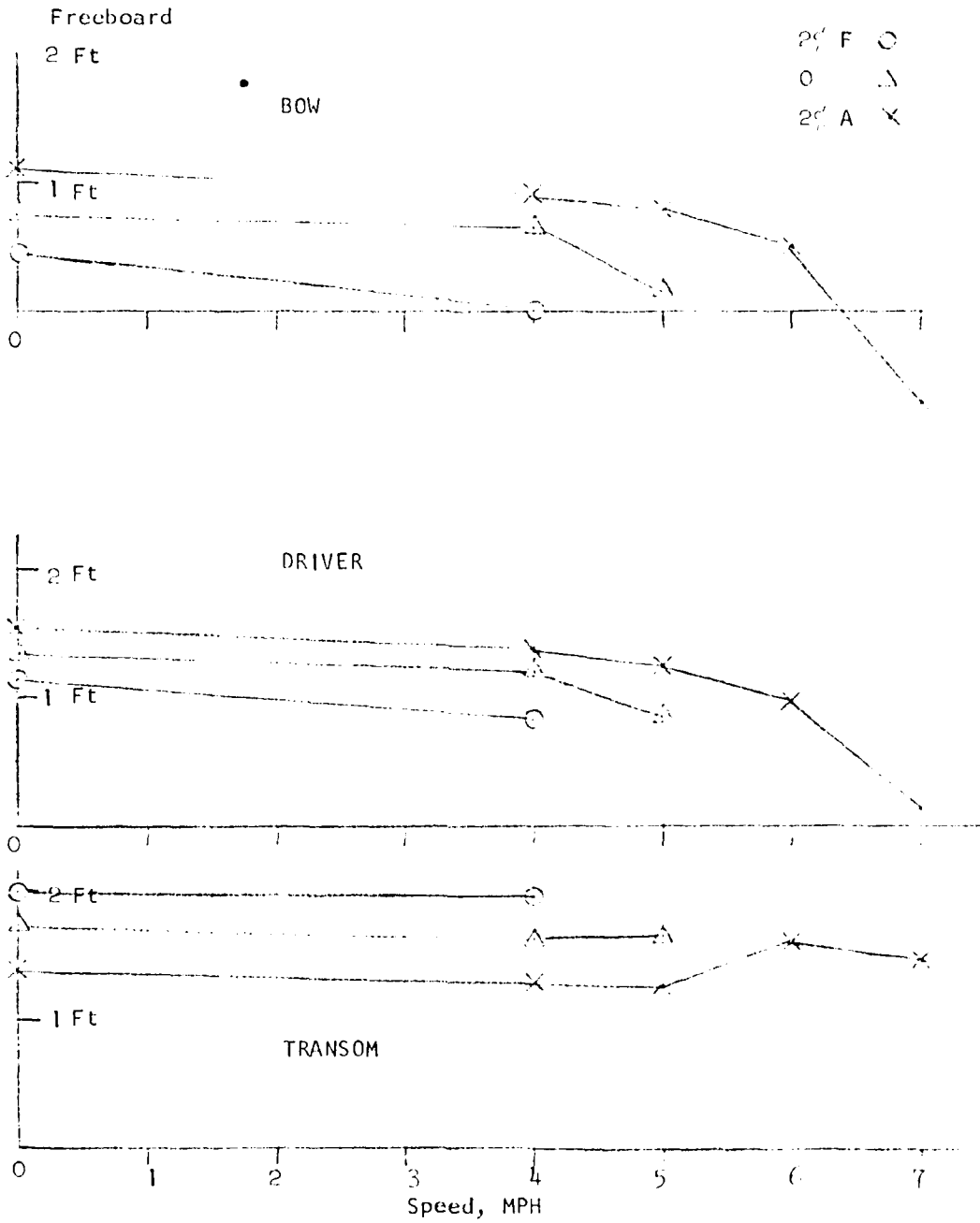


FIGURE 3

R-2150

SEA STATE 2
DECK HEIGHT 78"
DISPLACEMENT 42,000 lb
WATER JET ANGLE 0°

LOG
20F ○
0 △
20A ×

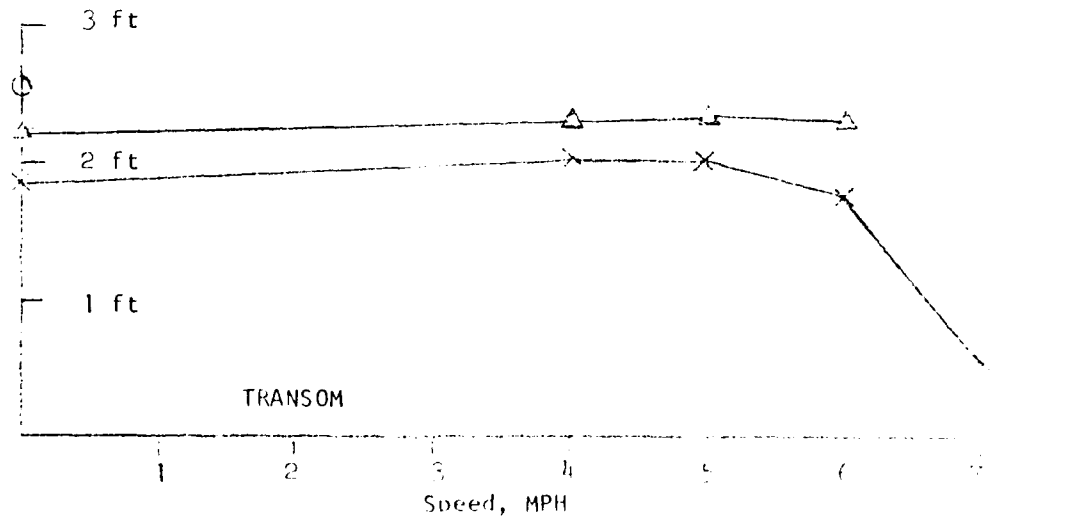
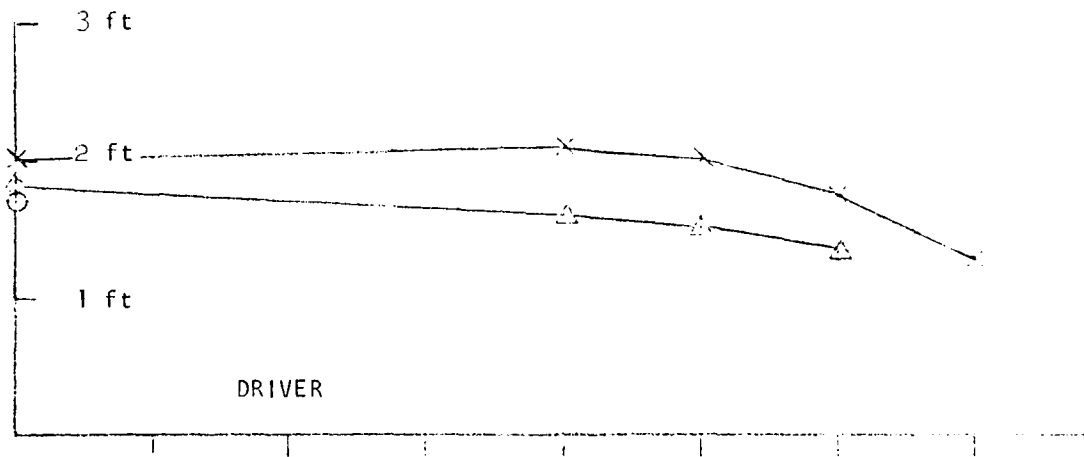
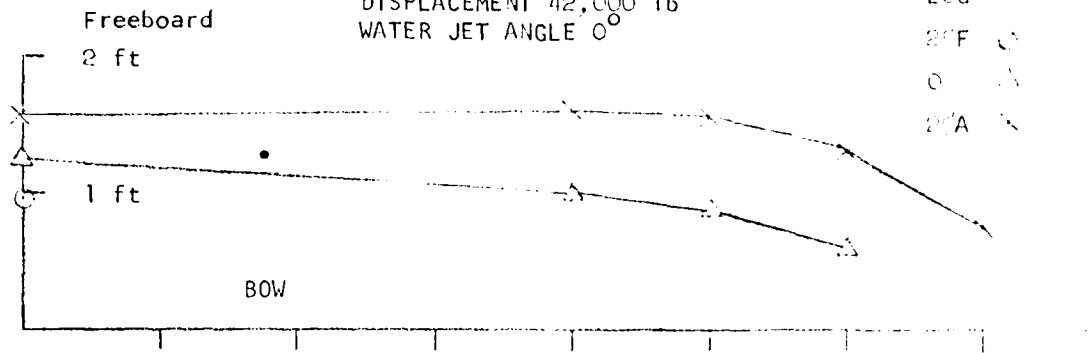


FIGURE 4

R=15'

SEA STATE 2
DECK HEIGHT 78"
DISPLACEMENT 42,000 lb
WATER JET ANGLE 20°

LCG
20F
0
20A

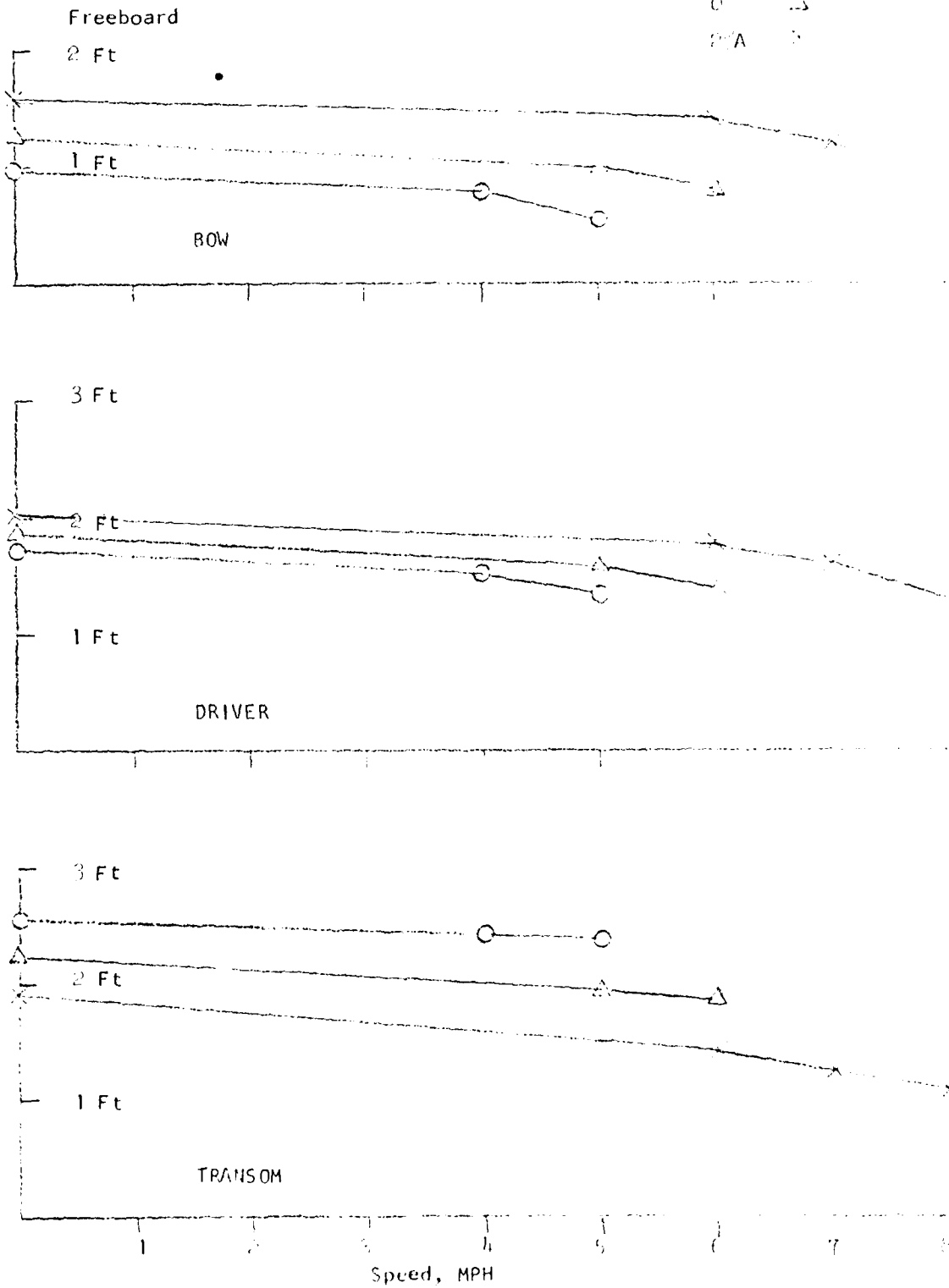


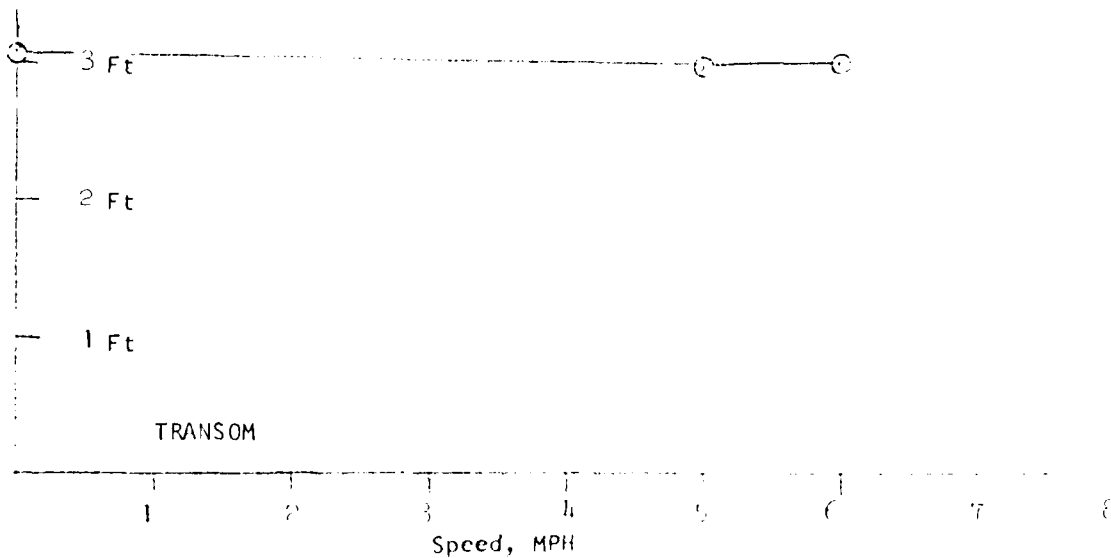
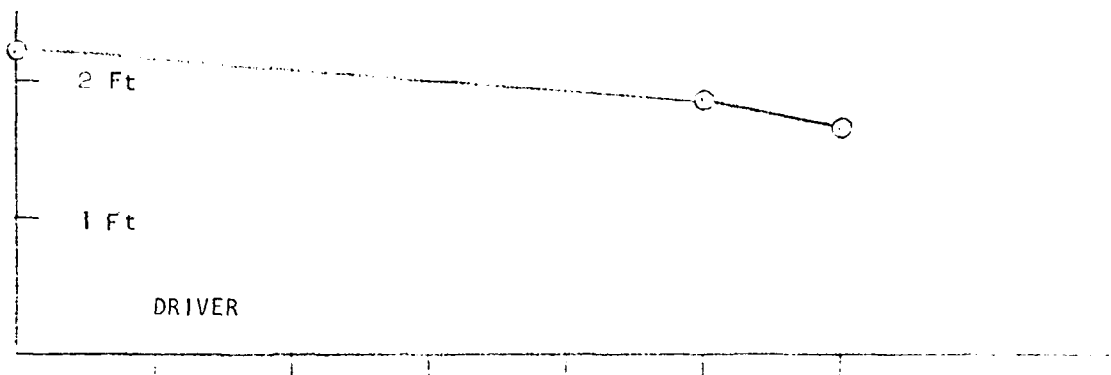
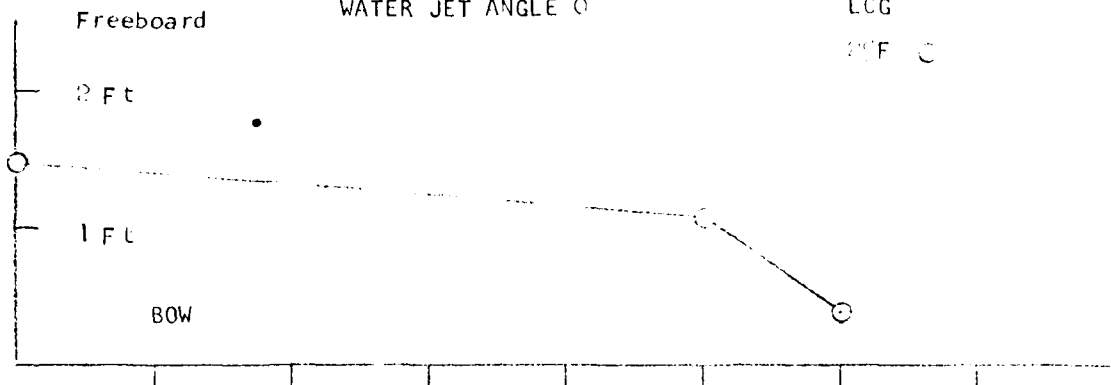
FIGURE 5

R-2155

SEA STATE 2
DECK HEIGHT 84"
DISPLACEMENT 42,000 lb
WATER JET ANGLE 0°

LCG

27F C



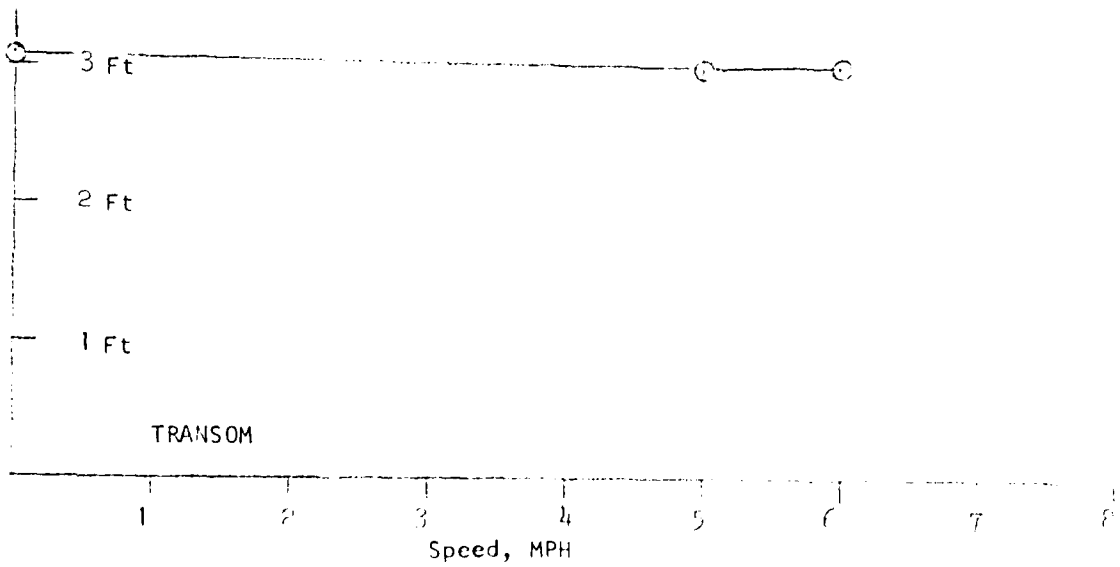
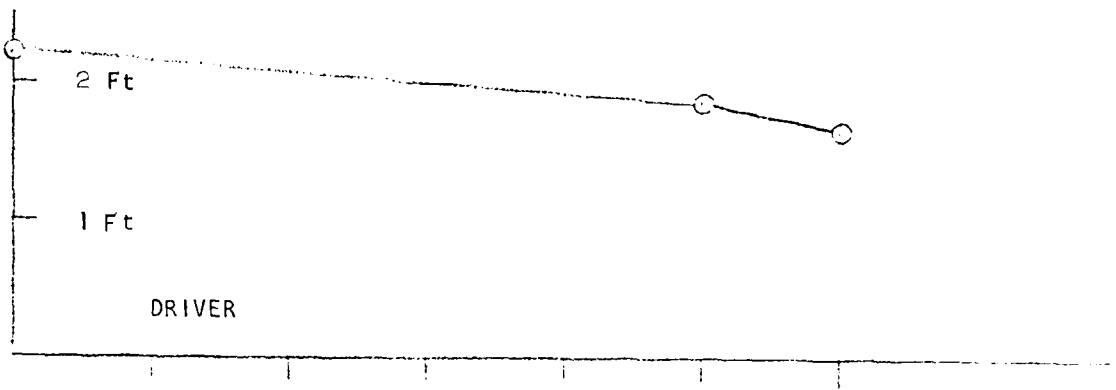
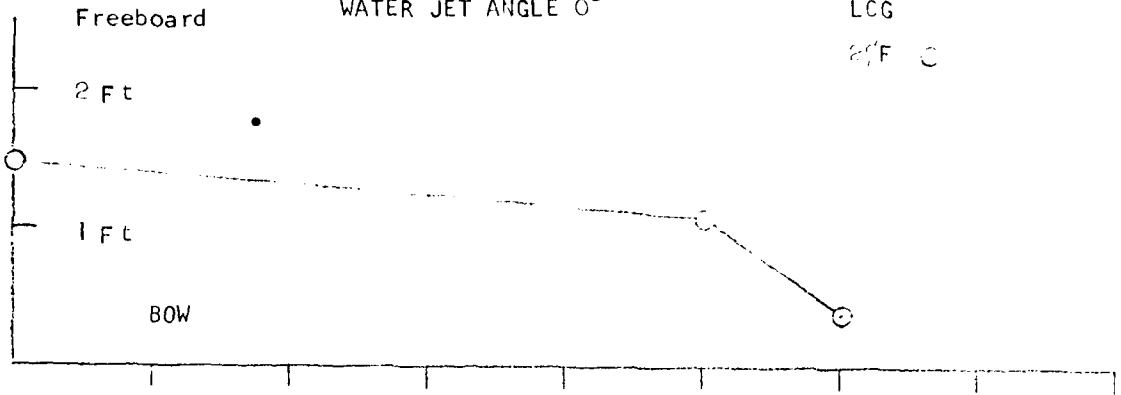
Speed, MPH

FIGURE 1

R-2155

SEA STATE 2
DECK HEIGHT 84"
DISPLACEMENT 42,000 lb
WATER JET ANGLE 0°

LCG
27' 0"



Speed, MPH

FIGURE 1

R-1155

SEA STATE 2
DECK HEIGHT 72"
DISPLACEMENT 48,000 LB
WATER JET ANGLE 0°

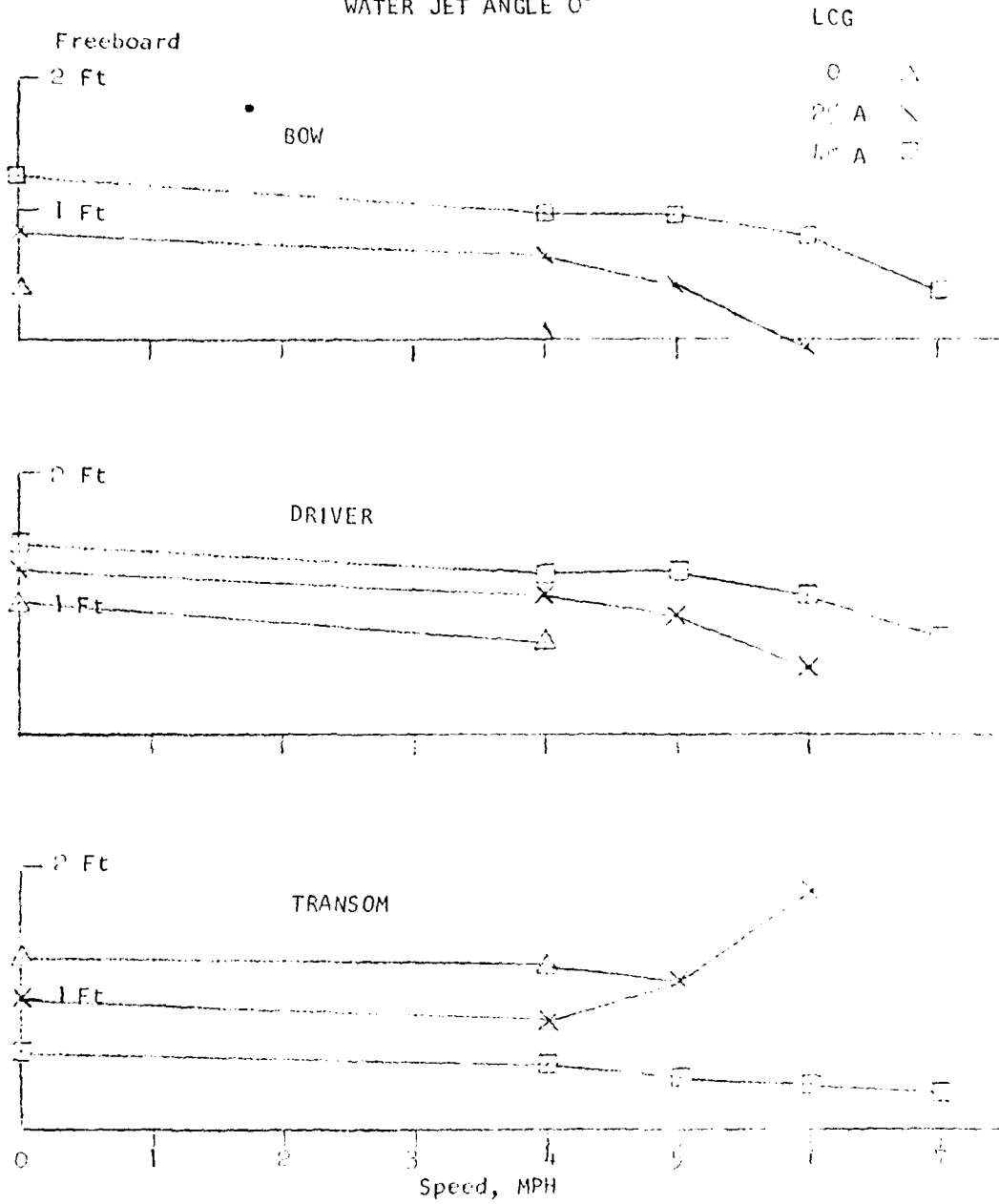


FIGURE 7

R-0114

SEA STATE 2
DECK HEIGHT 78"
DISPLACEMENT 48,000 lb
WATERJET ANGLE 0°

LCG

□

△

×

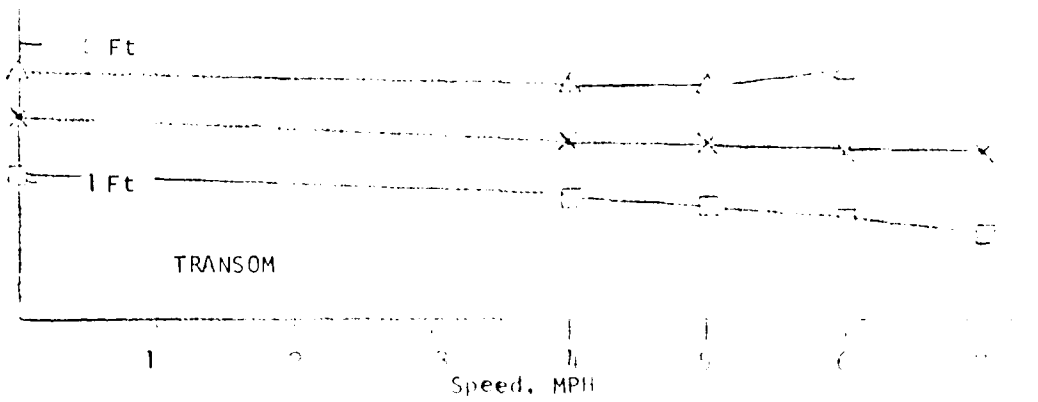
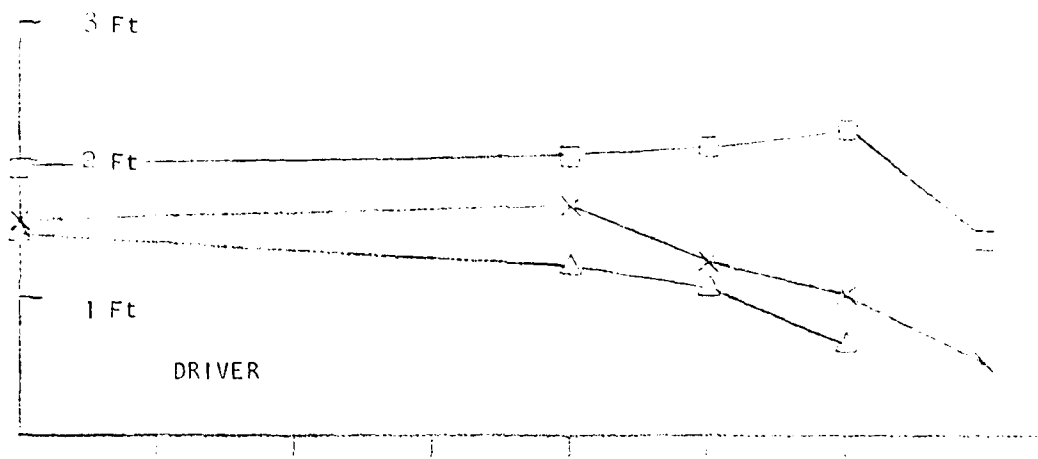
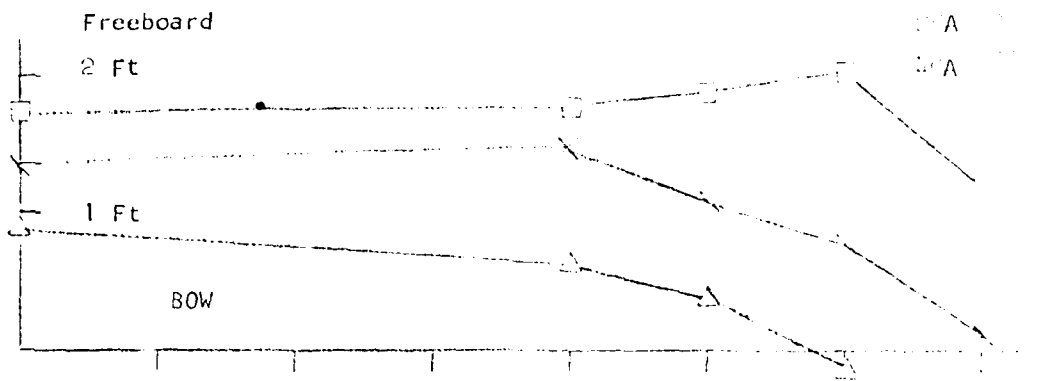


FIGURE 8

R-115

SEA STATE 2
DECK HEIGHT 18"
DISPLACEMENT 48,000 lb
WATER JET ANGLE 45°

LCG
C A
P/A X
M/A □

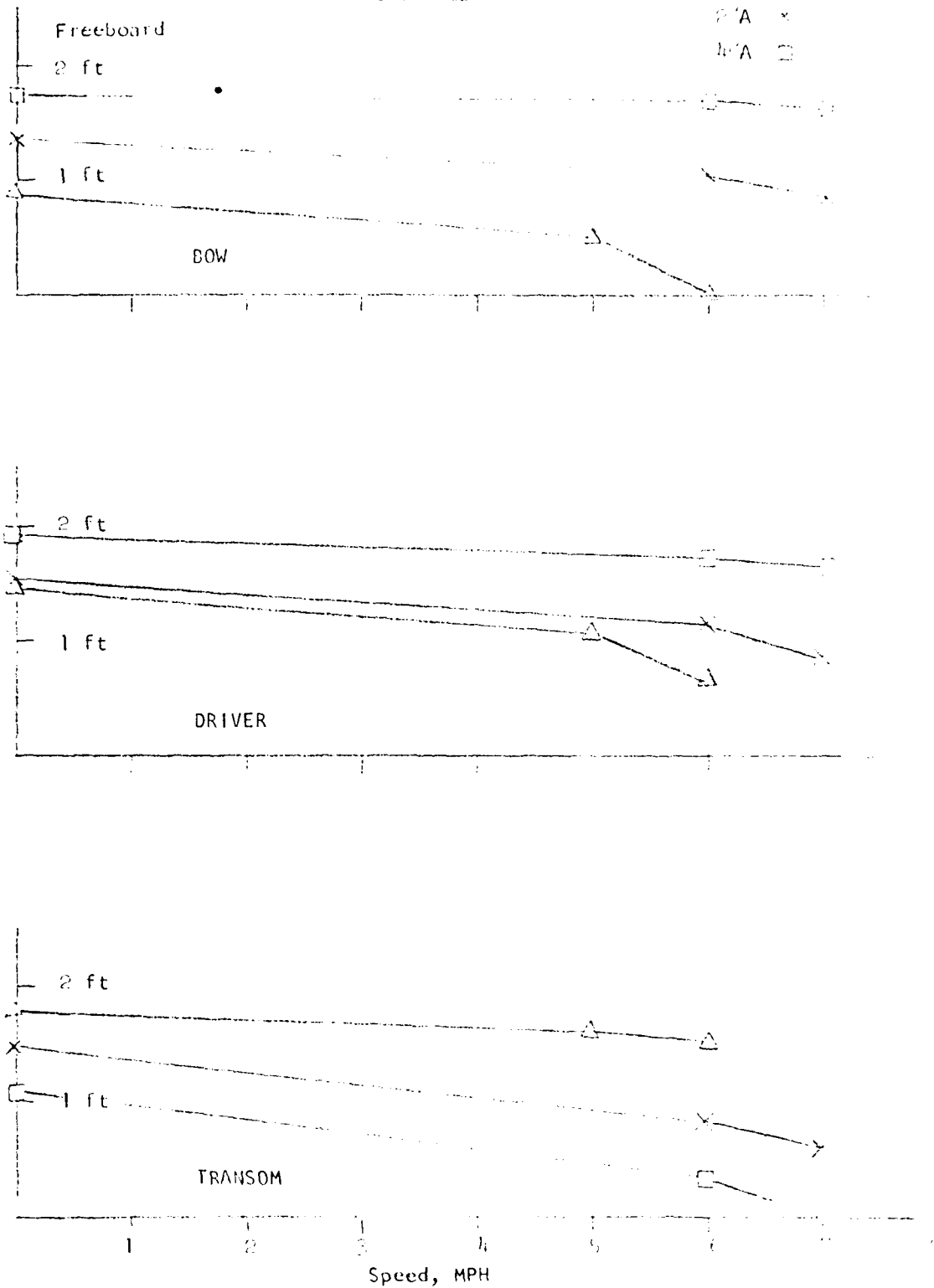


FIGURE 9

R-111

SEA STATE 2
DECK HEIGHT 14"
DISPLACEMENT 48,000 lb
WATER JET ANGLE 0°

LCG

0 A

0 A

0 A

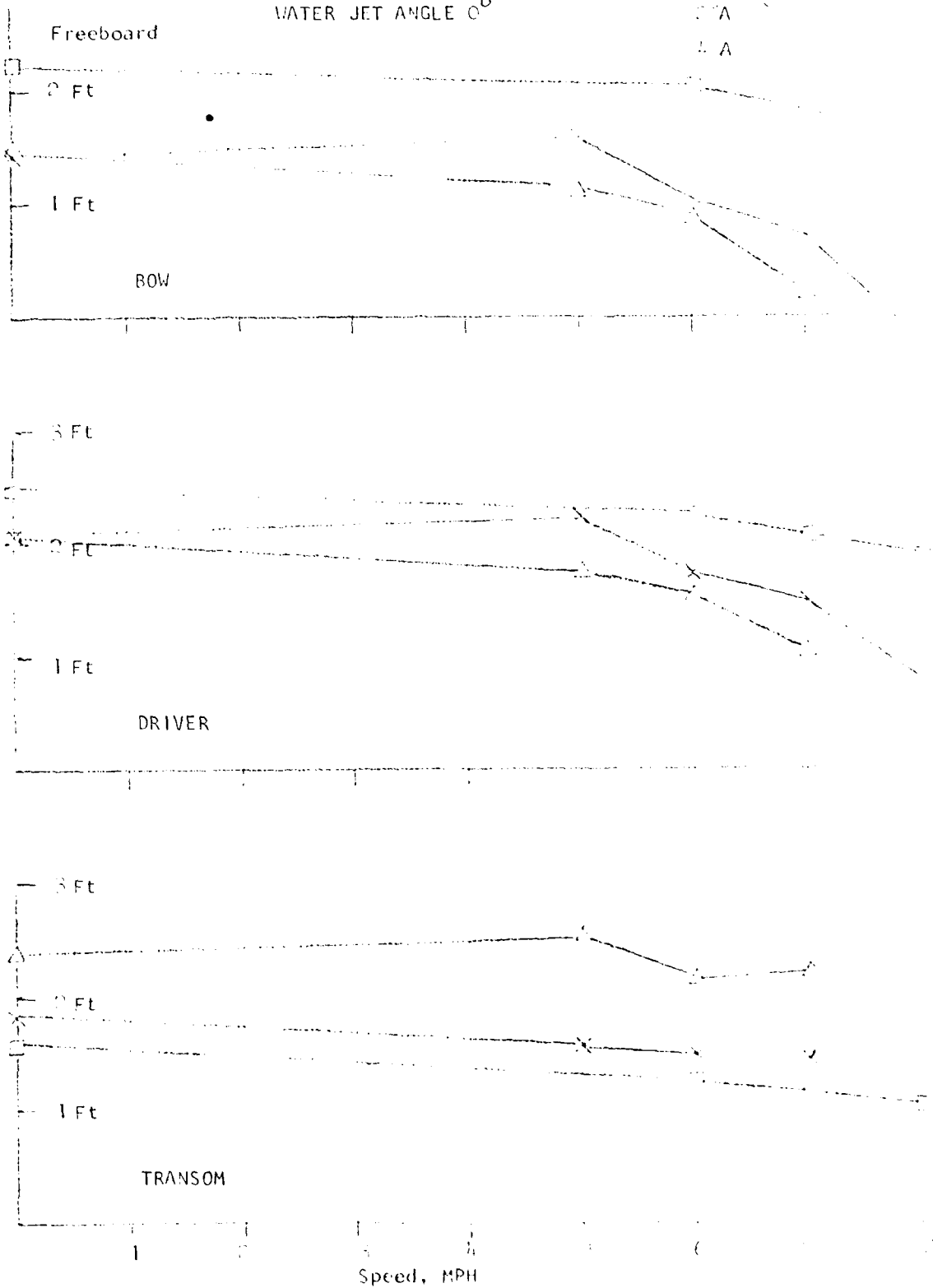


FIGURE 10

R-155

SEA STATE 2
DECK HEIGHT 78"
DISPLACEMENT 55,000 lb
WATER JET ANGLE 0°

LCG
27F C
0 N
27A >

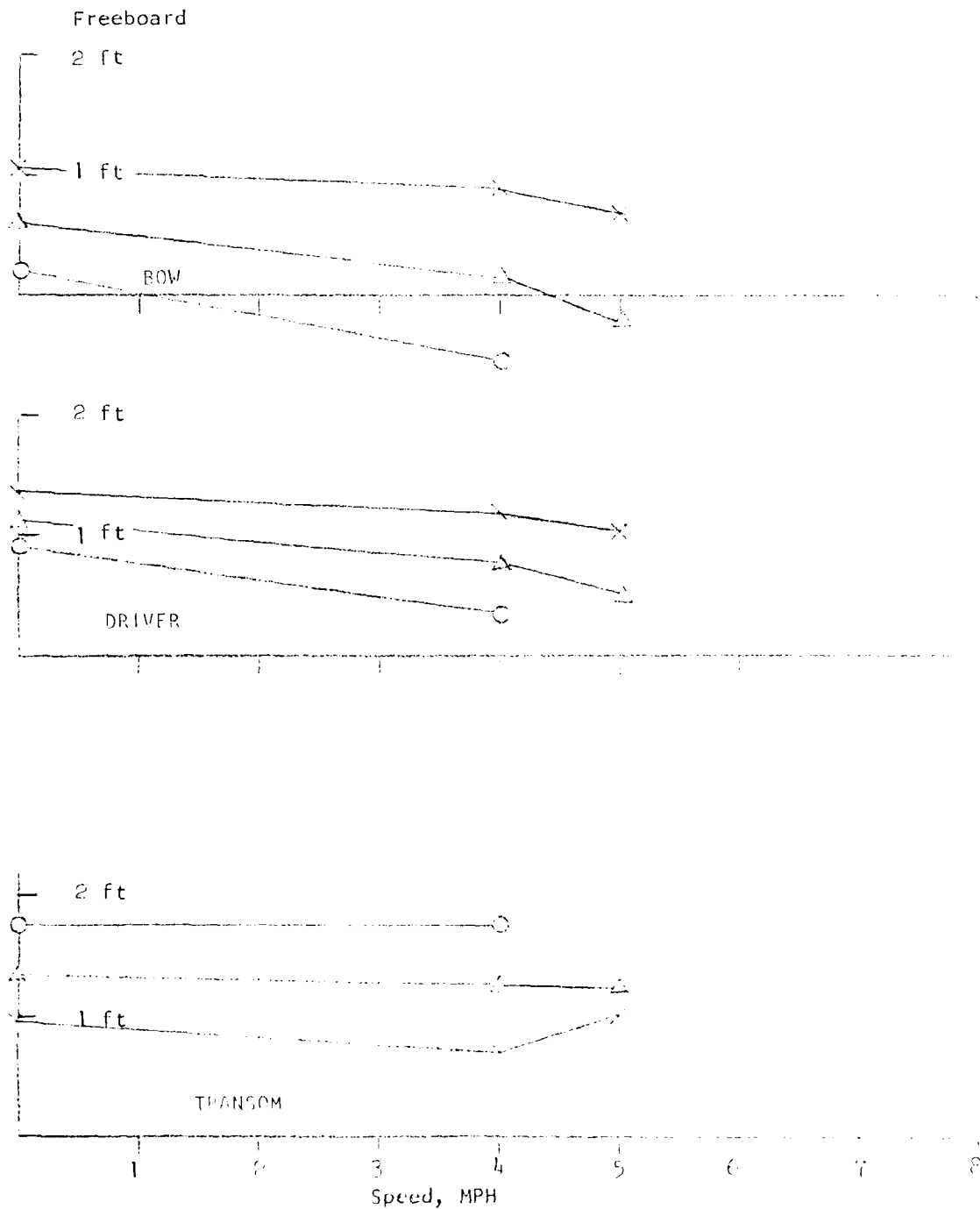


FIGURE 11

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SEA STATE 2
DECK HEIGHT 78"
DISPLACEMENT 55,000 lb
WATER JET ANGLE 20°

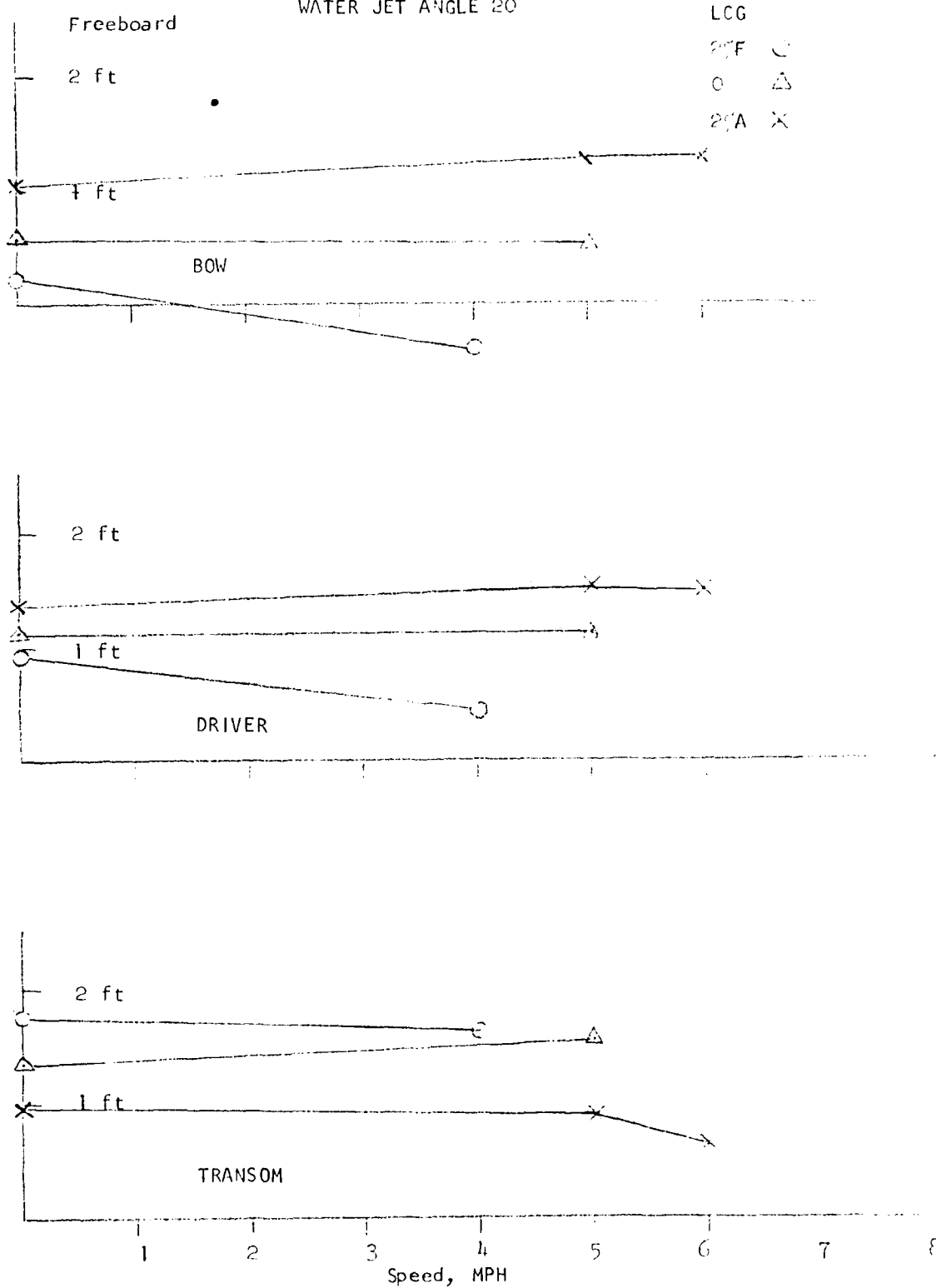


FIGURE 12

R-114

SEA STATE 2
DECK HEIGHT 84"
DISPLACEMENT 45,000 lb
WATER JET ANGLE 0°

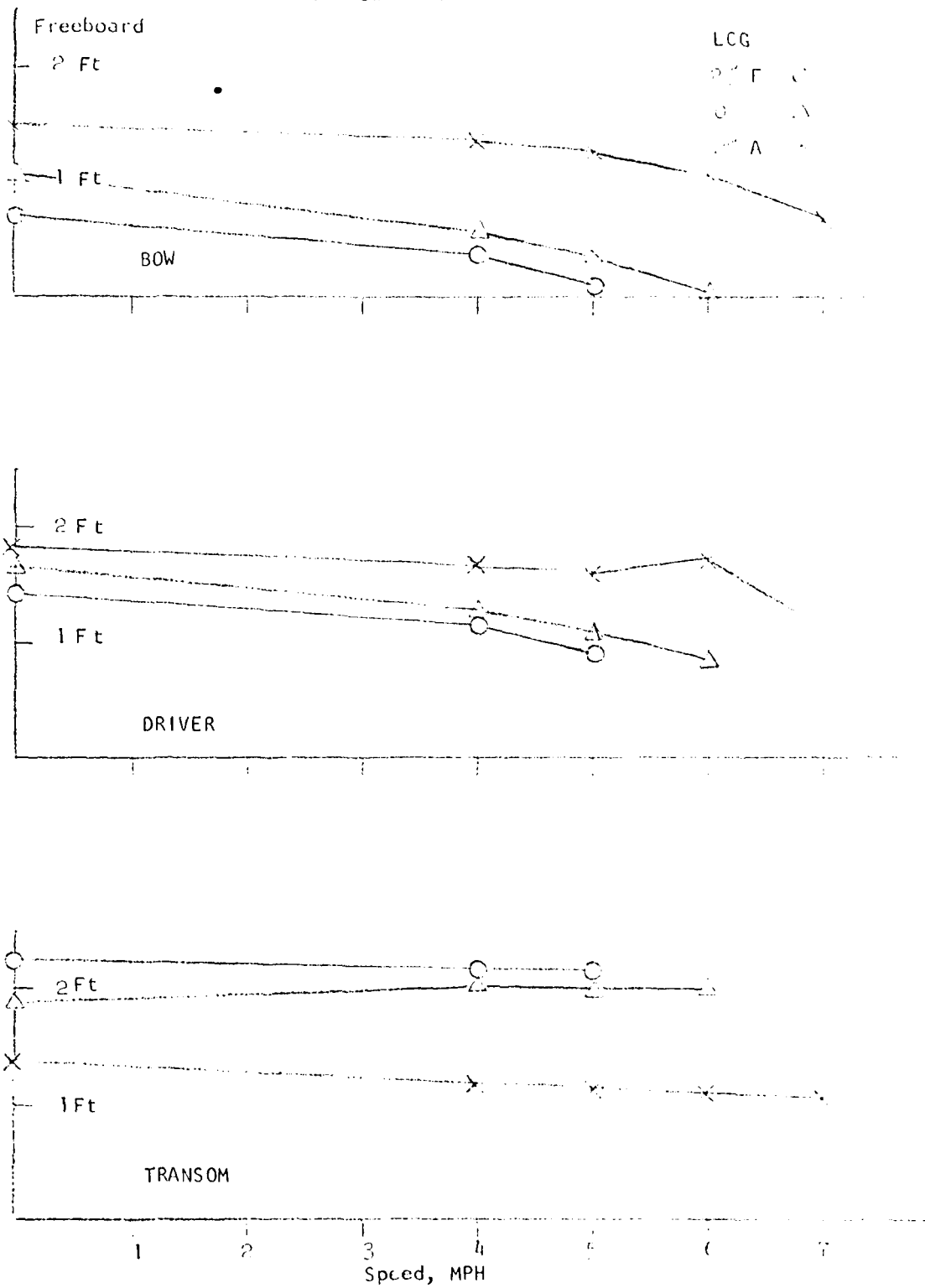
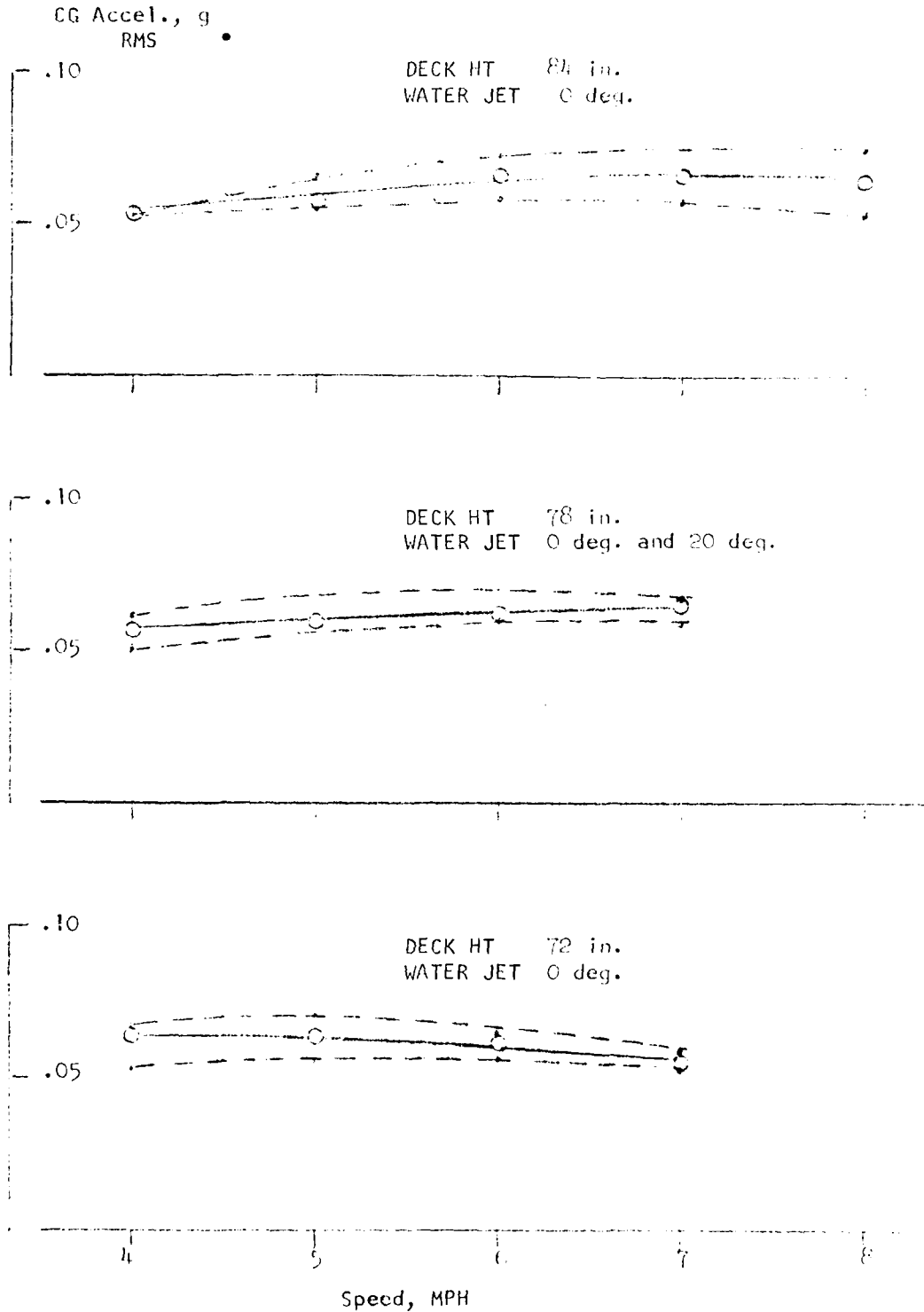


FIGURE 13

ALL DISPLACEMENTS, ALL CG POSITIONS
SEA STATE 2



Speed, MPH
FIGURE 14

ALL DECK HEIGHTS, ALL CG POSITIONS
SEA STATE 2

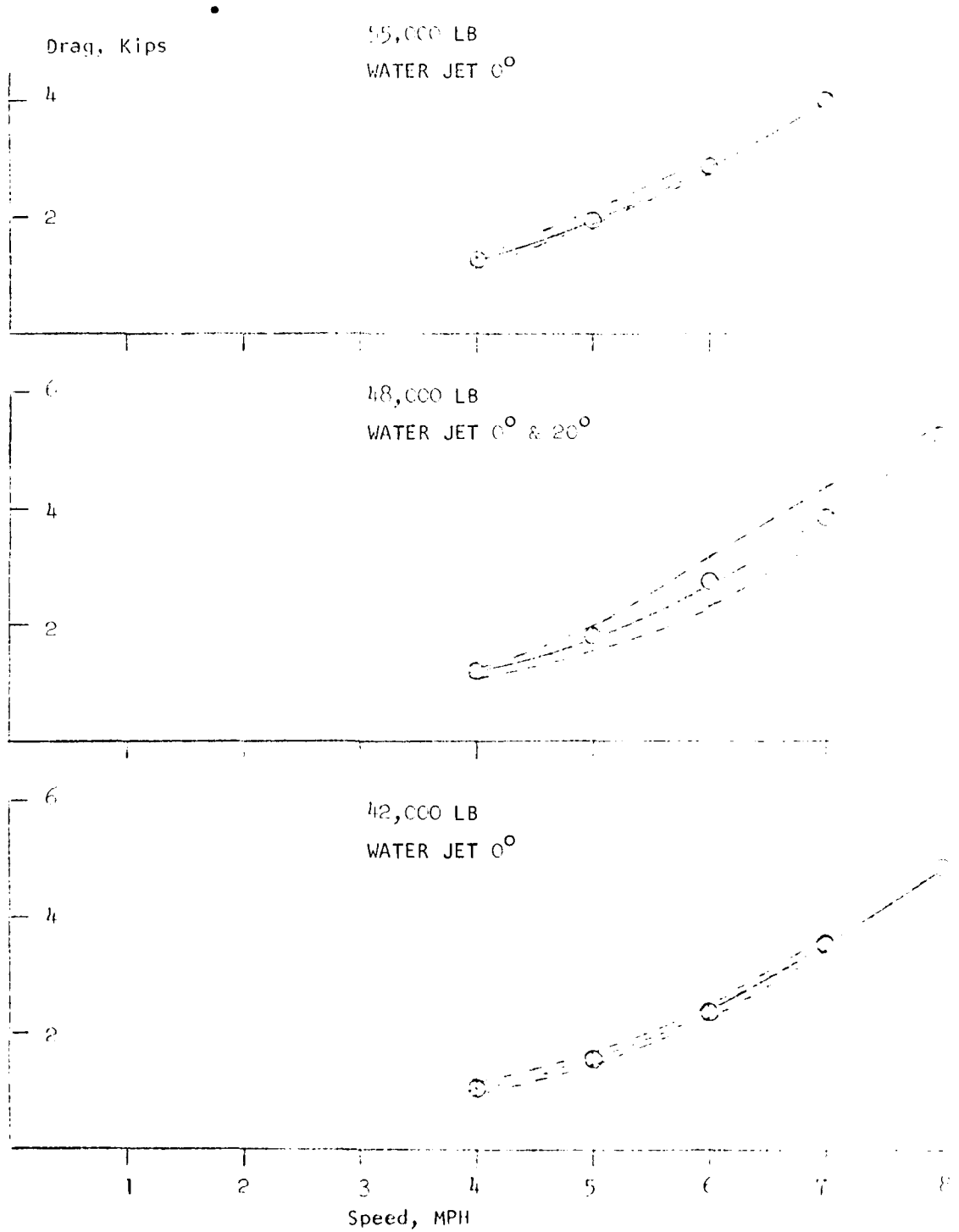


FIGURE 15

RESPONSES IN IRREGULAR WAVES

All values are for full-scale vehicle.

SPEED is in statute miles per hour

DRAG is mean resistance in waves in units of 1000 lb (kip)

LOAD is gross vehicle weight in units of 1000 lb (kip)

SIGNIFICANT WAVE HEIGHT is average of one-third highest crest-to-trough heights

LCG is inches aft of bow

PITCH is about a transverse space axis with bow up as positive

HEAVE at the CG is along a vertical space axis with up as positive

CG ACC is acceleration along a vertical body axis at 161 inches aft of the bow, with up as positive

All motion and acceleration statistics are referred to a still water datum.

MEAN is mean of all oscillations

RMS is root mean square of oscillations

OSC is number of oscillations used for averages; oscillations of less than the following limiting values, peak-to-trough, are not counted

Pitch	1.0 deg
Heave	0.1 ft
Vert. Acc.	0.05 G

AVG is average of all counted oscillations

1/3, 1/10 are averages of highest third and highest tenth of all counted oscillations

EXTREME are values, (+) and (-), encountered in the particular reproducible wave sequence used in the test, and should not be construed as the extremes in any other sea having the same significant height

DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME	
RUN 2 Deck Ht. 72 in Water Jet 0 deg SPEED 4.00 MPH WAVE ENCOUNTERS 72 DRAG 0.94 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT LOAD 42.00 KIP LCG 155.00 IN						
PITCH DEG	-1.724 2.984	72	2.04 -5.53	4.07 -7.61	5.59 -8.96	6.97 -10.84
HEAVE FT.	-0.177 0.425	62	0.35 -0.70	0.67 -1.02	0.92 -1.26	1.10 -1.57
CG ACC G	-0.002 0.058	73	0.08 -0.08	0.12 -0.12	0.15 -0.16	0.19 -0.19

MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME	
RUN 3 Deck Ht. 72 in Water Jet 0 deg SPEED 5.00 MPH WAVE ENCOUNTERS 59 DRAG 1.46 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT LOAD 42.00 KIP LCG 155.00 IN						
PITCH DEG	-2.359 2.564	59	0.70 -5.60	2.67 -7.67	3.98 -9.15	5.38 -11.25
HEAVE FT.	-0.314 0.433	49	0.21 -0.83	0.56 -1.21	0.90 -1.56	1.34 -1.98
CG ACC G	0.036 0.066	61	0.08 -0.09	0.13 -0.12	0.21 -0.15	0.24 -0.23

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN	4	Deck Ht. 72 in		Water Jet 0 deg			
		SPEED	4.00 MPH	WAVE ENCOUNTERS		86	
		DRAG	1.04 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	42.00 KIP	LCG 161.00 IN			
		MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.316	81	4.50	6.64	8.51	10.13
		3.295		-3.45	-6.07	-7.39	-9.60
HEAVE FT.		-0.143	70	0.36	0.66	0.94	1.17
		0.428		-0.62	-0.92	-1.27	-1.43
CG ACC G		-0.004	89	0.09	0.15	0.17	0.22
		0.067		-0.09	-0.12	-0.14	-0.19

RUN	5	Deck Ht. 72 in		Water Jet 0 deg			
		SPEED	5.00 MPH	WAVE ENCOUNTERS		67	
		DRAG	1.52 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	42.00 KIP	LCG 161.00 IN			
		MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.119	59	3.98	6.15	7.38	8.62
		2.953		-3.66	-5.56	-7.28	-8.94
HEAVE FT.		-0.225	53	0.28	0.63	0.86	1.10
		0.427		-0.73	-1.10	-1.28	-1.59
CG ACC G		-0.010	73	0.07	0.13	0.16	0.17
		0.070		-0.09	-0.13	-0.16	-0.22

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN 7 Deck Ht. 72 in Water Jet 0 deg

SPEED	6.00 MPH			WAVE ENCOUNTERS	60	
DRAG	2.31 KIP			SIGNIFICANT WAVE HEIGHT	2.20 FT	
LOAD	42.00 KIP			LCG	161.00 IN	

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-0.505	50	2.67	4.56	5.85	7.54
	2.589		-3.81	-5.67	-7.34	-10.35
HEAVE FT.	-0.379	43	0.16	0.52	0.76	0.89
	0.447		-0.92	-1.27	-1.54	-2.23
CG ACC G	-0.005	44	0.08	0.13	0.17	0.23
	0.062		-0.09	-0.14	-0.17	-0.19

RUN 8 Deck Ht. 72 in Water Jet 0 deg

SPEED	7.00 MPH			WAVE ENCOUNTERS	53	
DRAG	3.64 KIP			SIGNIFICANT WAVE HEIGHT	2.20 FT	
LOAD	42.00 KIP			LCG	161.00 IN	

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-3.862	38	-1.38	-0.14	0.71	1.54
	1.826		-6.36	-7.46	-8.12	-8.48
HEAVE FT.	-0.796	37	-0.36	-0.08	0.09	0.14
	0.349		-1.23	-1.47	-1.64	-1.76
CG ACC G	-0.007	38	0.07	0.11	0.13	0.16
	0.051		-0.08	-0.11	-0.13	-0.15

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DAVIDSON LABORATORY

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" AMPHIBIOUS VEHICLE

RUN 9 Deck Ht. 72 in Water Jet 0 deg

SPEED	4.00 MPH						WAVE ENCOUNTERS 72
DRAG	0.97 KIP						SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD	42.00 KIP						LCG 149.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	-3.431 2.586	72	-0.24 -6.74	1.46 -8.78	2.41 -10.04	3.91 -11.03
HEAVE FT.	-0.211 0.416	63	0.28 -0.71	0.61 -1.07	0.84 -1.32	1.00 -1.61
CG ACC G	-0.003 0.055	68	0.07 -0.08	0.11 -0.11	0.14 -0.14	0.19 -0.19

RUN 10 Deck Ht. 72 in Water Jet 0 deg

SPEED	4.00 MPH						WAVE ENCOUNTERS 74
DRAG	1.19 KIP						SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD	48.00 KIP						LCG 167.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	2.185 3.615	70	6.71 -2.41	9.43 -4.99	11.07 -7.03	14.40 -8.18
HEAVE FT.	-0.167 0.417	60	0.34 -0.67	0.69 -0.99	0.98 -1.31	1.11 -1.58
CG ACC G	-0.005 0.053	68	0.07 -0.09	0.11 -0.13	0.14 -0.16	0.19 -0.19

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AMPHIBIOUS VEHICLE

RUN	11	Deck Ht. 72 in	Water Jet 0 deg			
	SPEED	5.00 MPH	WAVE ENCOUNTERS		61	
	DRAG	1.71 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		167.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	2.435	58	6.38	9.19	11.58	13.32
	3.358		-1.66	-4.38	-6.35	-8.32
HEAVE FT.	-0.219	50	0.27	0.66	0.99	1.37
	0.425		-0.72	-1.11	-1.44	-1.72
CG ACC G	-0.007	58	0.07	0.12	0.16	0.21
	0.058		-0.09	-0.14	-0.19	-0.23

RUN	12	Deck Ht. 70 in	Water Jet 0 deg			
	SPEED	6.00 MPH	WAVE ENCOUNTERS		64	
	DRAG	2.49 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		167.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	2.094	52	5.88	8.10	9.66	11.21
	3.060		-1.63	-3.87	-5.34	-6.42
HEAVE FT.	-0.336	44	0.19	0.55	0.73	0.98
	0.445		-0.90	-1.27	-1.56	-1.83
CG ACC G	-0.004	51	0.09	0.15	0.21	0.29
	0.064		-0.09	-0.14	-0.18	-0.22

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DAVIISON LABORATORY

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AMPHIBIOUS VEHICLE

RUN 13 Deck Ht. 72 in Water Jet 0 deg

SPEED 7.00 MPH WAVE ENCOUNTERS 65
 DRAG 3.41 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
 LOAD 48.00 KIP LCG 167.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	1.339 2.313	43	4.13 -1.78	5.80 -3.24	6.56 -4.07	7.93 -4.77
HEAVE FT.	-0.563 0.391	42	-0.11 -1.04	0.21 -1.32	0.44 -1.46	0.54 -1.61
CG ACC G	-0.002 0.059	44	0.09 -0.09	0.14 -0.14	0.19 -0.18	0.27 -0.20

RUN 14 Deck Ht. 72 in Water Jet 0 deg

SPEED 4.00 MPH WAVE ENCOUNTERS 91
 DRAG 1.12 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
 LOAD 48.00 KIP LCG 161.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	0.665 3.326	70	4.83 -3.67	7.22 -5.91	8.82 -7.59	10.91 -9.48
HEAVE FT.	-0.188 0.428	61	0.33 -0.70	0.67 -1.06	0.87 -1.33	1.08 -1.56
CG ACC G	-0.006 0.053	66	0.07 -0.08	0.11 -0.12	0.14 0.14	0.18 0.19

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN	15	Deck Ht. 72 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	62	
		DRAG	1.59 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG		0.125	57	3.54	5.95	7.48	9.77
		2.851		-3.37	-5.81	-7.87	-10.23
HEAVE FT.		-0.269	48	0.26	0.64	0.93	1.42
		0.441		-0.80	-1.22	-1.57	-1.80
CG ACC G		-0.005	52	0.07	0.12	0.16	0.20
		0.056		-0.08	-0.13	-0.16	-0.22

RUN	16	Deck Ht. 72 in		Water Jet	0 deg		
		SPEED	6.00 MPH		WAVE ENCOUNTERS	57	
		DRAG	2.46 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG		-1.055	46	2.02	3.84	5.20	6.22
		2.414		-4.20	-5.72	-6.95	-7.52
HEAVE FT.		-0.492	41	0.01	0.34	0.50	0.68
		0.414		-1.00	-1.35	-1.55	-1.72
CG ACC G		-0.004	43	0.08	0.12	0.15	0.17
		0.056		-0.08	-0.12	-0.15	-0.17

DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN	Deck Ht.			Water Jet 0 deg		
17	72 in	SPEED	4.00 MPH	WAVE ENCOUNTERS	70	
		DRAG	1.16 KIP	SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP	LCG	155.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.744 2.702	71	1.54 -5.18	3.54 -7.28	4.67 -8.56	7.38 -10.17
HEAVE FT.	-0.224 0.418	61	0.28 -0.74	0.61 -1.07	0.87 -1.32	1.08 -1.47
CG ACC G	-0.002 0.055	67	0.08 -0.07	0.14 -0.11	0.23 -0.14	0.17 -0.16

RUN	Deck Ht.			Water Jet 0 deg		
18	72 in	SPEED	4.00 MPH	WAVE ENCOUNTERS	69	
		DRAG	1.37 KIP	SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	55.00 KIP	LCG	161.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	1.222 3.362	67	5.33 -2.97	7.71 -4.89	9.37 -6.24	10.37 -7.34
HEAVE FT.	-0.285 0.417	58	0.21 -0.77	0.49 -1.09	0.71 -1.33	0.85 -1.61
CG ACC G	-0.005 0.105	66	0.07 -0.07	0.11 -0.10	0.14 -0.12	0.17 -0.16

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN 19 Deck Ht. 78 in Water Jet 0 deg

SPEED 4.00 MPH WAVE ENCOUNTERS 68
DRAG 1.10 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 42.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-1.412 3.219	75	2.67 -5.44	5.10 -7.62	6.66 -8.81	8.52 -10.41
HEAVE FT.	-0.135 0.439	63	0.40 -0.66	0.73 -1.03	0.99 -1.28	1.24 -1.37
CG ACC G	-0.001 0.060	70	0.08 -0.08	0.12 -0.12	0.15 -0.15	0.19 -0.17

RUN 20 Deck Ht. 78 in Water Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 61
DRAG 1.57 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 42.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-1.821 2.861	59	1.71 -5.42	3.99 -7.72	5.72 -9.50	7.62 -10.45
HEAVE FT.	-0.232 0.443	53	0.28 -0.75	0.67 -1.15	1.02 -1.47	1.23 -1.76
CG ACC G	-0.003 0.065	59	0.08 -0.08	0.14 -0.14	0.10 -0.19	0.14 -0.24

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° AMPHIBIOUS VEHICLE

RUN	21	Deck Ht. 78 in		Water Jet 0 deg			
		SPEED	6.00 MPH	WAVE ENCOUNTERS		51	
		DRAG	2.42 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	42.00 KIP	LCG 155.00 IN			
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-2.466	51	0.59	2.59	3.85	5.20
		2.549		-5.64	-7.63	-9.02	-10.28
HEAVE FT.		-0.348	43	0.20	0.57	0.93	1.08
		0.457		-0.90	-1.30	-1.61	-1.90
CG ACC G		-0.002	48	0.09	0.14	0.19	0.21
		0.066		-0.09	-0.14	-0.17	-0.23

RUN	22	Deck Ht. 78 in		Water Jet 0 deg			
		SPEED	4.00 MPH	WAVE ENCOUNTERS		67	
		DRAG	1.09 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	42.00 KIP	LCG 149.00 IN			
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-2.091	73	1.64	3.82	5.45	7.21
		2.907		-5.69	-7.67	-9.07	-11.95
HEAVE FT.		0.174	65	0.69	1.09	1.37	1.53
		0.444		-0.34	-0.70	-1.03	-1.31
CG ACC G		-0.000	68	0.08	0.12	0.15	0.20
		0.058		-0.08	-0.13	-0.16	-0.19

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AMPHIBIOUS VEHICLE

RUN	23	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	58	
		DRAG	1.61 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	149.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-0.870	62	2.25	4.62	5.84	8.33
		2.619		-3.88	-6.06	-7.47	-9.58
HEAVE FT.		0.314	49	0.85	1.27	1.63	1.99
		0.450		-0.22	-0.58	-0.93	-1.31
CG ACC G		0.001	55	0.08	0.13	0.17	0.22
		0.061		-0.08	-0.13	-0.17	-0.21

RUN	24	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	4.00 MPH		WAVE ENCOUNTERS	66	
		DRAG	1.16 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.201	73	4.63	7.03	8.57	10.86
		3.506		-4.26	-6.92	-8.76	-9.84
HEAVE FT.		0.119	63	0.65	0.98	1.24	1.42
		0.432		-0.41	-0.73	-1.01	-1.23
CG ACC G		0.000	70	0.08	0.12	0.16	0.20
		0.058		-0.08	-0.13	-0.16	-0.18

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AMPHIBIOUS VEHICLE

RUN	25	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	57	
		DRAG	1.67 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.408	63	4.47	7.11	8.72	11.71
		3.430		-3.77	-6.71	-8.83	-10.52
HEAVE FT.		0.195	51	0.75	1.17	1.52	1.75
		0.463		-0.35	-0.75	-1.05	-1.54
CG ACC G		0.001	60	0.09	0.14	0.18	0.26
		0.065		-0.08	-0.14	-0.19	-0.23

RUN	26	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	6.00 MPH		WAVE ENCOUNTERS	49	
		DRAG	2.44 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.808	51	4.84	6.95	8.08	9.26
		3.078		-3.10	-5.05	-6.40	-9.68
HEAVE FT.		0.332	48	0.89	1.28	1.51	1.97
		0.484		-0.23	-0.61	-0.85	-1.27
CG ACC G		-0.000	50	0.10	0.15	0.18	0.27
		0.072		-0.10	-0.15	-0.17	-0.23

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AMPHIBIOUS VEHICLE

RUN	27	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	7.00 MPH		WAVE ENCOUNTERS	48	
		DRAG	3.43 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-0.961	43	2.18	4.03	5.16	6.70
		2.435		-4.15	-5.66	-6.74	-7.71
HEAVE FT.		-0.508	40	0.01	0.37	0.54	0.60
		0.432		-1.04	-1.33	-1.57	-1.80
CG ACC G		-0.001	42	0.09	0.14	0.16	0.21
		0.067		-0.10	-0.14	-0.17	-0.20

RUN	28	Deck Ht. 78 in		Water Jet	0 deg		
		SPEED	4.00 MPH		WAVE ENCOUNTERS	69	
		DRAG	1.25 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		0.876	72	5.51	7.93	9.26	11.83
		3.616		-3.73	-6.03	-7.24	-9.76
HEAVE FT.		-0.150	62	0.40	0.76	0.99	1.24
		0.447		-0.70	-1.03	-1.28	-1.43
CG ACC G		-0.002	67	0.08	0.12	0.14	0.18
		0.057		-0.08	-0.12	-0.15	-0.18

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AMPHIBIOUS VEHICLE

RUN 32 Deck Ht. 78 in Water Jet 0 deg

SPEED	7.00 MPH				WAVE ENCOUNTERS	46
DRAG	3.94 KIP				SIGNIFICANT WAVE HEIGHT	2.20 FT
LOAD	48.00 KIP				LCG	161.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	-1.689 2.233	42	1.20 -4.59	2.85 -5.96	3.78 -6.82	4.60 -7.66
HEAVE FT.	-0.650 0.390	37	-0.16 -1.14	0.12 -1.40	0.39 -1.53	0.51 -1.69
CG ACC G	-0.001 0.059	39	0.09 -0.08	0.12 -0.12	0.14 -0.14	0.17 -0.16

RUN 34 Deck Ht. 78 in Water Jet 0 deg

SPEED	4.00 MPH				WAVE ENCOUNTERS	73
DRAG	1.19 KIP				SIGNIFICANT WAVE HEIGHT	2.20 FT
LOAD	48.00 KIP				LCG	167.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	2.987 3.840	79	7.62 -1.88	10.44 -4.24	11.85 -5.41	13.09 -6.12
HEAVE FT.	-0.130 0.434	67	0.36 -0.67	0.72 -1.03	0.94 -1.29	1.25 -1.49
CG ACC G	-0.002 0.056	73	0.08 -0.08	0.12 -0.12	0.14 -0.14	0.18 -0.18

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AMPHIBIOUS VEHICLE

RUN 35 Deck Ht. 78 in Wave Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 52
DRAG 1.94 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 167.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	2.891 3.723	53	7.71 -1.91	10.20 -4.23	11.46 -5.73	12.09 -7.24
HEAVE FT.	-0.206 0.473	46	0.37 -0.78	0.76 -1.17	0.99 -1.42	1.27 -1.51
CG ACC G	-0.003 0.065	52	0.08 -0.09	0.13 -0.14	0.16 -0.17	0.18 -0.19

RUN 36 Deck Ht. 78 in Wave Jet 0 deg

SPEED 6.00 MPH WAVE ENCOUNTERS 53
DRAG 2.71 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 167.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	2.667 3.379	52	6.66 -1.55	9.23 -3.90	10.64 -5.59	13.41 -7.82
HEAVE FT.	-0.311 0.481	43	0.28 -0.88	0.69 -1.28	0.95 -1.59	1.12 -2.21
CG ACC G	-0.001 0.069	47	0.09 -0.10	0.14 -0.15	0.19 0.18	0.22 -0.21

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DAVIDSON LABORATORY

7-OCT-80

AMPHIBIOUS VEHICLE

RUN	37	Deck Ht. 78 in	Water Jet 0 deg			
	SPEED	7.00 MPH	WAVE ENCOUNTERS		43	
	DRAG	3.75 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		167.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	2.368	43	5.82	8.07	9.30	10.62
	2.783		-1.15	-2.92	-3.73	-4.81
HEAVE FT.	-0.469	37	0.10	0.44	0.61	0.66
	0.440		-1.03	-1.33	-1.57	-1.72
CG ACC G	-0.001	40	0.09	0.14	0.17	0.20
	0.068		-0.10	-0.15	-0.18	-0.19

RUN	38	Deck Ht 78 in	Water Jet 0 deg			
	SPEED	4.00 MPH	WAVE ENCOUNTERS		71	
	DRAG	1.12 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		155.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.374	72	2.59	4.81	6.12	8.63
	3.161		-5.44	-7.78	-9.31	-10.70
HEAVE FT.	-0.183	63	0.35	0.75	1.00	1.12
	0.449		-0.72	-1.05	-1.33	-1.59
CG ACC G	-0.002	65	0.08	0.12	0.15	0.19
	0.057		-0.08	-0.12	-0.15	-0.16

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DAVIISON LABORATORY

8-OCT-80

AMPHIBIOUS VEHICLE

RUN 39 Deck Ht. 78 in Water Jet 0 deg

	SPEED	5.00 MPH		WAVE ENCOUNTERS	61	
	DRAG	1.78 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
	LOAD	48.00 KIP		LCG	155.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.955 2.823	56	1.56 -5.60	3.74 -7.86	5.40 -9.46	6.31 -11.02
HEAVE FT.	-0.284 0.458	52	0.24 -0.80	0.66 -1.21	0.91 -1.55	1.27 -1.97
CG ACC G	-0.006 0.061	51	0.08 -0.09	0.13 -0.14	0.16 -0.17	0.21 -0.21

RUN 40 Deck Ht. 78 in Water Jet 0 deg

	SPEED	6.00 MPH		WAVE ENCOUNTERS	50	
	DRAG	2.76 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
	LOAD	48.00 KIP		LCG	155.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-3.264 2.388	47	-0.26 -6.39	1.55 -8.04	2.69 -9.26	4.26 -11.21
HEAVE FT.	-0.515 0.434	41	0.04 -1.05	0.37 -1.40	0.56 -1.65	0.78 -2.23
CG ACC G	-0.005 0.060	42	0.08 -0.09	0.13 -0.13	0.17 -0.15	0.19 -0.19

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN 43 Deck Ht. 78 in Water Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 60
DRAG 2.01 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-2.245 2.646	52	1.25 -5.63	3.43 -7.59	4.64 -8.98	5.87 -10.33
HEAVE FT.	-0.395 0.423	46	0.12 -0.91	0.45 -1.30	0.77 -1.61	1.13 -1.76
CG ACC G	-0.003 0.052	45	0.08 -0.07	0.12 -0.11	0.15 -0.14	0.18 -0.18

RUN 45 Deck Ht. 78 in Water Jet 0 deg

SPEED 4.00 MPH WAVE ENCOUNTERS 69
DRAG 1.35 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 161.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	1.540 3.634	69	6.06 -2.99	8.79 -5.66	10.81 -7.26	12.05 -10.01
HEAVE FT.	-0.190 0.428	59	0.32 -0.72	0.68 -1.08	0.90 -1.43	1.30 -1.56
CG ACC G	-0.003 0.051	63	0.07 -0.07	0.11 -0.11	0.14 -0.13	0.17 -0.19

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DAVIDSON LABORATORY

8-OCT-80

AMPHIBIOUS VEHICLE

RUN 41 Deck Ht. 78 in Water Jet 0 deg

SPEED 4.00 MPH WAVE ENCOUNTERS 70
DRAG 1.30 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-1.370 2.949	69	2.37 -5.21	4.50 -7.19	5.86 -8.49	7.56 -9.79
HEAVE FT.	-0.243 0.420	59	0.27 -0.77	0.62 -1.07	0.77 -1.28	0.92 -1.55
CG ACC G	-0.002 0.050	61	0.07 -0.07	0.11 -0.11	0.13 -0.12	0.16 -0.16

RUN 42 Deck Ht. 78 in Water Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 60
DRAG 2.01 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-2.130 2.692	56	1.20 -5.47	3.58 -7.50	4.75 -8.94	5.64 -11.07
HEAVE FT.	-0.389 0.422	46	0.12 -0.90	0.48 -1.27	0.75 -1.54	1.00 -1.85
CG ACC G	-0.002 0.052	49	0.07 -0.07	0.12 -0.11	0.15 -0.14	0.17 -0.18

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AMPHIBIOUS VEHICLE

RUN	46	Deck Ht. 78 in	Water Jet 0 deg			
	SPEED	5.00 MPH	WAVE ENCOUNTERS		56	
	DRAG	1.98 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	55.00 KIP	LCG 161.00 IN			
	MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME
FITCH DEG	1.032	55	5.25	7.92	9.80	11.38
	3.376		-3.19	-5.82	-7.55	-9.56
HEAVE FT.	-0.286	49	0.25	0.63	0.94	1.39
	0.453		-0.82	-1.22	-1.61	-1.72
CG ACC G	-0.001	50	0.08	0.12	0.16	0.18
	0.056		-0.08	-0.12	-0.16	-0.21

RUN	47	Deck Ht. 78 in	Water Jet 0 deg			
	SPEED	4.00 MPH	WAVE ENCOUNTERS		70	
	DRAG	1.25 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	55.00 KIP	LCG 149.00 IN			
	MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-4.298	68	-1.20	0.52	1.49	2.23
	2.494		-7.44	-9.46	-10.56	-12.55
HEAVE FT.	-0.346	59	0.13	0.48	0.66	0.77
	0.408		-0.84	-1.19	-1.50	-1.68
CG ACC G	-0.003	60	0.07	0.10	0.13	0.15
	0.049		-0.07	-0.10	-0.13	-0.15

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AMPHIBIOUS VEHICLE

RUN 48 Deck Ht. 78 in Water Jet 20 deg

SPEED 4.00 MPH WAVE ENCOUNTERS 67
DRAG 1.26 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 149.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-3.589 2.648	70	-0.29 -6.82	1.69 -8.74	3.12 -10.00	4.12 -10.94
HEAVE FT.	-0.355 0.397	58	0.12 -0.84	0.43 -1.18	0.64 -1.42	0.96 -1.61
CG ACC G	-0.003 0.049	58	0.07 -0.07	0.10 -0.10	0.13 -0.13	0.15 -0.15

RUN 49 Deck Ht. 78 in Water Jet 20 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 59
DRAG 1.96 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG	-1.226 2.973	54	2.28 -4.67	4.71 -7.18	6.21 -8.82	7.17 -10.16
HEAVE FT.	-0.439 0.445	47	0.08 -0.94	0.43 -1.34	0.70 -1.69	0.88 -2.13
CG ACC G	-0.003 0.058	48	0.07 -0.07	0.12 -0.11	0.15 -0.15	0.20 0.17

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AMPHIBIOUS VEHICLE

RUN	51	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	5.00 MPH	WAVE ENCOUNTERS		60	
		DRAG	2.04 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	55.00 KIP	LCG 161.00 IN			
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG		1.905	56	6.18	8.91	11.00	14.21
		3.505		-2.42	-5.20	-7.05	-8.65
HEAVE FT.		-0.360	46	0.23	0.61	0.87	1.30
		0.469		-0.93	-1.33	-1.65	-2.05
CG ACC G		-0.002	50	0.08	0.12	0.16	0.22
		0.056		-0.08	-0.13	-0.18	-0.19

RUN	52	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	6.00 MPH	WAVE ENCOUNTERS		51	
		DRAG	3.05 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	55.00 KIP	LCG 161.00 IN			
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
FITCH DEG		2.521	47	6.63	8.98	9.98	10.42
		3.231		-1.67	-3.61	-4.75	-6.05
HEAVE FT.		-0.503	42	0.02	0.37	0.52	0.72
		0.438		-1.04	-1.42	-1.62	-1.83
CG ACC G		-0.002	43	0.08	0.12	0.15	0.17
		0.058		-0.08	-0.12	-0.14	-0.18

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AMPHIBIOUS VEHICLE

RUN	53	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	7.00 MPH	WAVE ENCOUNTERS	46		
		DRAG	4.13 KIP	SIGNIFICANT WAVE HEIGHT	2.20 FT		
		LOAD	48.00 KIP		LCG 161.00 IN		
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		1.410	41	4.31	6.07	7.04	9.03
		2.353		-1.60	-3.29	-4.57	-7.28
HEAVE FT.		-0.738	37	-0.29	0.02	0.27	0.36
		0.397		-1.22	-1.56	-1.92	-2.36
CG ACC G		-0.004	40	0.07	0.11	0.14	0.18
		0.059		-0.08	-0.12	-0.15	-0.19

RUN	55	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	6.00 MPH	WAVE ENCOUNTERS	53		
		DRAG	2.94 KIP	SIGNIFICANT WAVE HEIGHT	2.20 FT		
		LOAD	48.00 KIP		LCG 161.00 IN		
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		1.579	46	5.43	7.64	9.26	10.65
		3.026		-2.25	-4.39	-5.93	-7.69
HEAVE FT.		-0.477	42	0.05	0.42	0.61	0.82
		0.448		-0.99	-1.41	-1.72	-2.35
CG ACC G		0.000	46	0.08	0.12	0.17	0.20
		0.058		-0.08	-0.12	-0.15	-0.18

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AMPHIBIOUS VEHICLE

RUN	56	Deck Ht. 78 in	Water Jet 20 deg			
	SPEED	7.00 MPH	WAVE ENCOUNTERS		47	
	DRAG	4.33 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		167.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	4.804	42	8.59	10.64	11.51	13.39
	2.896		1.05	-0.70	-1.51	-2.36
HEAVE FT.	-0.625	38	-0.11	0.22	0.43	0.51
	0.415		-1.14	-1.42	-1.61	-1.83
CG ACC G	-0.003	42	0.09	0.12	0.14	0.19
	0.064		-0.10	-0.14	-0.17	-0.22

RUN	57	Deck Ht. 78 in	Water Jet 20 deg			
	SPEED	6.00 MPH	WAVE ENCOUNTERS		50	
	DRAG	3.14 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
	LOAD	48.00 KIP	LCG		167.00 IN	
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	4.253	47	8.66	11.13	12.66	15.14
	3.519		-0.36	-2.61	-4.28	-6.79
HEAVE FT.	-0.434	40	0.14	0.51	0.79	0.88
	0.457		-1.02	-1.37	-1.70	-2.24
CG ACC G	-0.004	48	0.08	0.13	0.17	0.20
	0.063		-0.09	-0.14	-0.17	-0.20

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AMPHIBIOUS VEHICLE

RUN 58	Deck Ht. 78 in	Water Jet 20 deg				
	SPEED 6.00 MPH	WAVE ENCOUNTERS 51				
	DRAG 3.03 KIP	SIGNIFICANT WAVE HEIGHT 2.20 FT				
	LOAD 48.00 KIP	LCG 155.00 IN				
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.966 2.348	45	1.00 -5.05	2.74 -6.62	3.66 -7.67	5.24 -10.50
HEAVE FT.	-0.662 0.399	41	-0.18 -1.14	0.17 -1.46	0.37 -1.69	0.49 -2.17
CG ACC G	-0.002 0.051	39	0.07 -0.07	0.11 -0.11	0.14 -0.13	0.17 -0.14

RUN 59	Deck Ht. 78 in.	Water Jet 20 deg				
	SPEED 5.00 MPH	WAVE ENCOUNTERS 60				
	DRAG 1.96 KIP	SIGNIFICANT WAVE HEIGHT 2.20 FT				
	LOAD 48.00 KIP	LCG 155.00 IN				
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.000 2.827	56	2.42 -4.53	4.67 -6.84	5.71 -8.78	7.62 -11.10
HEAVE FT.	-0.394 0.455	47	0.15 -0.93	0.55 -1.37	0.70 -1.75	0.88 -2.24
CG ACC G	-0.003 0.053	48	0.08 -0.07	0.12 -0.12	0.16 -0.15	0.20 -0.17

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AMPHIBIOUS VEHICLE

RUN 60 Deck Ht. 78 in Water Jet 20 deg

SPEED 6.00 MPH WAVE ENCOUNTERS 54
DRAG 2.42 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 42.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.469 2.631	50	1.74 -4.81	3.72 -6.73	5.04 -8.29	6.84 -10.89
HEAVE FT.	-0.450 0.471	43	0.13 -1.02	0.50 -1.39	0.72 -1.72	0.86 -2.35
CG ACC G	-0.002 0.065	46	0.09 -0.09	0.13 -0.13	0.17 -0.17	0.23 -0.21

RUN 61 Deck Ht. 78 in Water Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 63
DRAG 1.64 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 42.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.124 2.896	58	2.45 -4.81	4.61 -7.12	6.34 -8.88	8.57 -10.83
HEAVE FT.	-0.293 0.451	53	0.22 -0.81	0.64 -1.21	0.93 -1.56	1.40 -1.71
CG ACC G	-0.002 0.060	56	0.08 -0.08	0.13 -0.13	0.17 -0.17	0.20 -0.23

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AMPHIBIOUS VEHICLE

RUN	62	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	5.00 MPH	WAVE ENCOUNTERS			62
		DRAG	1.60 KIP	SIGNIFICANT WAVE HEIGHT			2.20 FT
		LOAD	42.00 KIP	LCG			149.00 IN
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-3.155	58	-0.09	1.84	3.19	4.59
		2.543		-6.39	-8.56	-10.09	-11.54
HEAVE FT.		-0.318	53	0.17	0.58	0.86	1.23
		0.437		-0.82	-1.22	-1.56	-1.80
CG ACC G		-0.003	54	0.08	0.12	0.16	0.20
		0.059		-0.08	-0.13	-0.17	-0.21

RUN	63	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	4.00 MPH	WAVE ENCOUNTERS			71
		DRAG	1.07 KIP	SIGNIFICANT WAVE HEIGHT			2.20 FT
		LOAD	42.00 KIP	LCG			149.00 IN
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-2.760	72	1.03	2.85	4.28	5.95
		2.921		-6.55	-8.52	-9.73	-11.59
HEAVE FT.		-0.176	65	0.34	0.66	0.91	1.23
		0.438		-0.70	-1.04	-1.30	-1.50
CG ACC G		-0.002	67	0.08	0.11	0.15	0.19
		0.057		-0.08	-0.12	-0.14	-0.18

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AMPHIBIOUS VEHICLE

RUN	64	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	7.00 MPH		WAVE ENCOUNTERS	47	
		DRAG	3.53 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG		1.000	42	4.62	6.50	7.29	9.10
		2.752		-2.63	-4.64	-5.85	-6.91
HEAVE FT.		-0.528	38	0.05	0.39	0.62	0.70
		0.446		-1.08	-1.40	-1.61	-1.82
CG ACC G		-0.002	40	0.09	0.14	0.17	0.21
		0.070		-0.10	-0.16	-0.19	-0.23

RUN	65	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	6.00 MPH		WAVE ENCOUNTERS	51	
		DRAG	2.47 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG		1.110	53	5.02	7.70	9.20	11.29
		3.287		-2.79	-5.34	-7.10	-7.42
HEAVE FT.		-0.349	46	0.23	0.62	0.90	1.03
		0.492		-0.93	-1.35	-1.68	-2.15
CG ACC G		-0.002	48	0.10	0.15	0.20	0.22
		0.073		-0.10	-0.16	-0.20	-0.22

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AMPHIBIOUS VEHICLE

RUN	66	Deck Ht. 78 in		Water Jet 20 deg			
		SPEED	8.00 MPH		WAVE ENCOUNTERS	44	
		DRAG	4.82 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
FITCH DEG		0.672	38	3.64	5.33	6.05	6.18
		2.222		-2.21	-3.43	-3.93	-4.18
HEAVE FT.		-0.765	34	-0.26	0.08	0.29	0.38
		0.405		-1.27	-1.54	-1.65	-1.75
CG ACC G		-0.001	37	0.09	0.13	0.14	0.15
		0.064		-0.09	-0.13	-0.15	-0.15

RUN	67	Deck Ht. 84 in		Water Jet 0 deg			
		SPEED	5.00 MPH		WAVE ENCOUNTERS	61	
		DRAG	1.81 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG	161.00 IN	
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
FITCH DEG		0.863	58	5.06	7.71	10.27	12.11
		3.376		-3.31	-5.91	-7.78	-9.88
HEAVE FT.		-0.208	51	0.34	0.76	1.04	1.45
		0.462		-0.75	-1.18	-1.48	-1.73
CG ACC G		-0.002	57	0.08	0.13	0.18	0.23
		0.062		-0.08	-0.14	-0.18	-0.24

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DAVIDSON LABORATORY

9-OCT-80

AMPHIBIOUS VEHICLE

RUN 68 Deck Ht. 84 in Water Jet 0 deg

SPEED 6.00 MPH WAVE ENCOUNTERS 53
DRAG 2.64 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 161.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	0.721 3.336	51	4.73 -3.33	7.40 -5.93	9.13 -7.66	11.25 -9.95
HEAVE FT.	-0.327 0.517	43	0.28 -0.95	0.71 -1.39	1.01 -1.71	1.32 -1.89
CG ACC G	-0.001 0.072	47	0.10 -0.10	0.15 -0.16	0.20 -0.20	0.23 -0.26

RUN 69 Deck Ht. 84 in Water Jet 0 deg

SPEED 7.00 MPH WAVE ENCOUNTERS 49
DRAG 3.70 KIP SIGNIFICANT WAVE HEIGHT .20 FT
LOAD 48.00 KIP LCG 161.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	0.087 2.745	41	3.71 -3.54	5.60 -5.48	6.57 -6.71	8.50 -8.11
HEAVE FT.	-0.487 0.454	37	0.09 -1.07	0.43 -1.38	0.69 -1.64	0.86 -1.77
CG ACC G	-0.001 0.068	37	0.09 -0.10	0.14 -0.15	0.17 -0.18	0.20 -0.22

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DAVIDSON LABORATORY

10-OCT-80

AMPHIBIOUS VEHICLE

RUN 71 Deck Ht. 84 in Water Jet 0 deg

	SPEED	8.00 MPH		WAVE ENCOUNTERS			45
	DRAG	5.45 KIP		SIGNIFICANT WAVE HEIGHT			2.20 FT
	LOAD	48.00 KIP		LCG			161.00 IN
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME	
PITCH DEG	-2.408	37	-0.15	1.35	2.09	2.68	
	1.976		-4.79	-6.04	-6.91	-7.20	
HEAVE FT.	-0.839	35	-0.41	-0.05	0.13	0.25	
	0.376		-1.28	-1.55	-1.72	-1.92	
CG ACC G	-0.002	37	0.07	0.11	0.13	0.17	
	0.054		-0.07	-0.11	-0.12	-0.14	

RUN 73 Deck Ht. 84 in Water Jet 0 deg

	SPEED	6.00 MPH		WAVE ENCOUNTERS			48
	DRAG	2.85 KIP		SIGNIFICANT WAVE HEIGHT			2.20 FT
	LOAD	48.00 KIP		LCG			167.00 IN
	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME	
PITCH DEG	2.920	51	7.26	9.94	12.29	14.06	
	3.549		-1.52	-3.98	-5.58	-7.56	
HEAVE FT.	-0.259	44	0.33	0.73	1.02	1.42	
	0.487		-0.84	-1.24	-1.59	-2.08	
CG ACC G	-0.001	52	0.09	0.14	0.19	0.23	
	0.071		-0.10	-0.15	-0.19	-0.25	

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10-OCT-80

AMPHIBIOUS VEHICLE

RUN 74 Deck Ht. 84 in Water Jet 0 deg

SPEED 7.00 MPH WAVE ENCOUNTERS 47
DRAG 3.87 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 167.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	2.641 3.152	43	6.73 -1.43	8.67 -3.43	9.75 -4.76	11.77 -6.51
HEAVE FT.	-0.410 0.463	39	0.17 -0.98	0.53 -1.33	0.77 -1.56	0.96 -1.69
CG ACC G	-0.001 0.074	46	0.10 -0.10	0.15 -0.15	0.18 -0.19	0.20 -0.25

RUN 75 Deck Ht. 84 in Water Jet 0 deg

SPEED 8.00 MPH WAVE ENCOUNTERS 42
DRAG 5.05 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 167.00 IN

	MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
PITCH DEG	2.536 2.626	40	5.76 -0.87	7.46 -2.60	8.37 -3.63	9.16 -4.51
HEAVE FT.	-0.572 0.443	38	-0.05 -1.09	0.29 -1.44	0.48 -1.69	0.57 -1.86
CG ACC G	-0.001 0.074	40	0.09 -0.10	0.14 -0.15	0.17 -0.17	0.20 -0.18

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10-OCT-80

AMPHIBIOUS VEHICLE

RUN	76	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	61	
		DRAG	1.75 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG 1	.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-1.318	58	2.49	5.05	7.01	8.43
		3.080		-5.17	-7.60	-9.34	-11.32
HEAVE FT.		-0.237	53	0.29	0.72	1.01	1.40
		0.460		-0.75	-1.17	-1.55	-1.81
CG ACC G		-0.002	52	0.08	0.13	0.18	0.22
		0.062		-0.08	-0.13	-0.17	-0.22

RUN	77	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	6.00 MPH		WAVE ENCOUNTERS	52	
		DRAG	2.52 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	48.00 KIP		LCG 155.00 IN		
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-1.943	46	1.56	3.47	4.56	6.10
		2.734		-5.55	-7.52	-9.33	-10.19
HEAVE FT.		-0.381	42	0.19	0.57	0.80	1.03
		0.466		-0.95	-1.36	-1.64	-2.12
CG ACC G		-0.001	44	0.09	0.14	0.18	0.20
		0.065		-0.09	-0.14	-0.16	-0.20

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DAVIDSON LABORATORY

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AMPHIBIOUS VEHICLE

RUN 78 Deck Ht. 84 in Water Jet 0 deg

SPEED 7.00 MPH WAVE ENCOUNTERS 43
DRAG 3.82 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 48.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-3.581 2.106	42	-0.83 -6.38	0.41 -7.85	1.03 -8.52	1.62 -9.39
HEAVE FT.	-0.670 0.406	39	-0.16 -1.18	0.11 -1.44	0.26 -1.57	0.40 -1.67
CG ACC G	-0.004 0.057	38	0.08 -0.08	0.11 -0.11	0.13 -0.12	0.14 -0.14

RUN 79 Deck Ht. 84 in Water Jet 0 deg

SPEED 5.00 MPH WAVE ENCOUNTERS 63
DRAG 1.91 KIP SIGNIFICANT WAVE HEIGHT 2.20 FT
LOAD 55.00 KIP LCG 155.00 IN

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	-1.324 3.077	54	2.65 -5.17	5.28 -7.58	6.55 -9.50	8.38 -11.19
HEAVE FT.	-0.288 0.464	49	0.25 -0.84	0.66 -1.25	0.98 -1.68	1.40 -1.91
CG ACC G	-0.002 0.058	50	0.08 -0.08	0.13 -0.12	0.18 -0.16	0.21 -0.20

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AMPHIBIOUS VEHICLE

RUN	80	Deck Ht. 84 in		Water Jet 0 deg			
		SPEED	4.00 MPH	WAVE ENCOUNTERS		70	
		DRAG	1.31 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	55.00 KIP	LCG 155.00 IN			
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
FITCH DEG		-0.947	69	3.42	5.80	7.44	9.30
		3.394		-5.32	-7.69	-9.15	-11.31
HEAVE FT.		-0.164	61	0.38	0.74	0.96	1.27
		0.452		-0.72	-1.09	-1.37	-1.55
CG ACC G		-0.002	61	0.08	0.12	0.15	0.18
		0.055		-0.08	-0.11	-0.14	-0.19

RUN	81	Deck Ht. 84 in		Water Jet 0 deg			
		SPEED	6.00 MPH	WAVE ENCOUNTERS		49	
		DRAG	2.81 KIP	SIGNIFICANT WAVE HEIGHT		2.20 FT	
		LOAD	55.00 KIP	LCG 155.00 IN			
		MEAN/RMS	OSC	AUG	1/3	1/10	EXTREME
FITCH DEG		-2.123	47	1.18	3.22	4.33	5.75
		2.648		-5.50	-7.45	-9.18	-11.24
HEAVE FT.		-0.431	44	0.06	0.43	0.65	0.70
		0.430		-0.92	-1.33	-1.66	-2.20
CG ACC G		-0.002	43	0.08	0.13	0.16	0.19
		0.058		-0.08	-0.12	-0.14	-0.15

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AMPHIBIOUS VEHICLE

RUN 82 Deck Ht. 84 in Water Jet 0 deg

SPEED	4.00 MPH			WAVE ENCOUNTERS	66	
DRAG	1.36 KIP			SIGNIFICANT WAVE HEIGHT	2.20 FT	
LOAD	55.00 KIP			LCG	161.00 IN	

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	1.493 3.862	71	6.36 -3.39	9.24 -5.90	10.85 -7.27	13.30 -10.48
HEAVE FT.	-0.156 0.438	61	0.38 -0.69	0.73 -1.04	0.93 -1.33	1.23 -1.48
CG ACC G	-0.002 0.053	66	0.07 -0.08	0.11 -0.11	0.15 -0.14	0.17 -0.20

RUN 84 Deck Ht. 84 in Water Jet 0 deg

SPEED	5.00 MPH			WAVE ENCOUNTERS	62	
DRAG	1.94 KIP			SIGNIFICANT WAVE HEIGHT	2.20 FT	
LOAD	55.00 KIP			LCG	161.00 IN	

	MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG	1.417 3.585	58	5.81 -2.95	8.69 -5.67	10.55 -7.44	12.57 -9.11
HEAVE FT.	-0.235 0.437	50	0.28 -0.76	0.65 -1.12	0.94 -1.41	1.32 -1.76
CG ACC G	-0.002 0.058	54	0.08 -0.08	0.12 -0.12	0.16 -0.16	0.21 -0.19

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AMPHIBIOUS VEHICLE

MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME	
RUN 85 Deck Ht. 84 in Water Jet 0 deg						
SPEED 6.00 MPH		WAVE ENCOUNTERS 54				
DRAG 2.78 KIP		SIGNIFICANT WAVE HEIGHT 2.20 FT				
LOAD 55.00 KIP		LCG 161.00 IN				
PITCH DEG	0.967 3.227	46	5.17 -3.32	7.40 -5.44	8.50 -6.99	10.30 -9.15
HEAVE FT.	-0.343 0.463	44	0.21 -0.88	0.62 -1.28	0.84 -1.54	0.88 -2.16
CG ACC G	-0.002 0.063	45	0.08 -0.09	0.13 -0.13	0.16 -0.16	0.21 -0.19

MEAN/RMS	DSC	AVG	1/3	1/10	EXTREME	
RUN 86 Deck Ht. 84 in Water Jet 0 deg						
SPEED 7.00 MPH		WAVE ENCOUNTERS 44				
DRAG 4.00 KIP		SIGNIFICANT WAVE HEIGHT 2.20 FT				
LOAD 55.00 KIP		LCG 161.00 IN				
PITCH DEG	0.155 2.743	41	3.76 -3.42	5.54 -4.96	6.48 -5.88	8.37 -6.94
HEAVE FT.	-0.526 0.430	37	0.01 -1.07	0.32 -1.35	0.55 -1.52	0.81 -1.62
CG ACC G	-0.001 0.062	39	0.09 -0.09	0.13 -0.12	0.15 -0.15	0.19 -0.16

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AMPHIBIOUS VEHICLE

RUN	87	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	4.00 MPH		WAVE ENCOUNTERS	72	
		DRAG	1.17 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	55.00 KIP		LCG	149.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-3.137	69	0.39	2.46	3.69	6.01
		2.852		-6.82	-9.04	-10.63	-12.06
HEAVE FT.		-0.209	61	0.31	0.67	0.93	1.05
		0.435		-0.73	-1.09	-1.37	-1.58
CG ACC G		-0.002	62	0.07	0.11	0.14	0.19
		0.053		-0.07	-0.11	-0.14	-0.19

RUN	88	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	59	
		DRAG	1.82 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	55.00 KIP		LCG	149.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-3.767	54	-0.62	1.42	2.45	3.78
		2.524		-7.00	-9.11	-10.77	-11.96
HEAVE FT.		-0.356	47	0.14	0.51	0.82	1.18
		0.416		-0.85	-1.24	-1.57	-1.69
CG ACC G		-0.003	46	0.07	0.12	0.15	0.18
		0.053		-0.08	-0.12	-0.15	-0.18

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AMPHIBIOUS VEHICLE

RUN	89	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	5.00 MPH		WAVE ENCOUNTERS	61	
		DRAG	1.51 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	149.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-3.292	61	0.09	2.24	3.59	6.35
		2.757		-6.62	-8.78	-10.74	-12.48
HEAVE FT.		-0.246	51	0.30	0.72	1.06	1.52
		0.479		-0.81	-1.27	-1.62	-1.80
CG ACC G		-0.003	56	0.08	0.13	0.18	0.20
		0.064		-0.09	-0.14	-0.18	-0.24

RUN	90	Deck Ht. 84 in		Water Jet	0 deg		
		SPEED	6.00 MPH		WAVE ENCOUNTERS	54	
		DRAG	2.24 KIP		SIGNIFICANT WAVE HEIGHT	2.20 FT	
		LOAD	42.00 KIP		LCG	149.00 IN	
		MEAN/RMS	OSC	AVG	1/3	1/10	EXTREME
PITCH DEG		-3.997	50	-1.03	0.71	1.64	2.63
		2.460		-7.06	-9.01	-11.19	-11.96
HEAVE FT.		-0.384	42	0.18	0.56	0.76	0.96
		0.462		-0.95	-1.36	-1.66	-2.17
CG ACC G		-0.003	45	0.09	0.14	0.18	0.21
		0.065		-0.09	-0.14	-0.17	-0.21

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