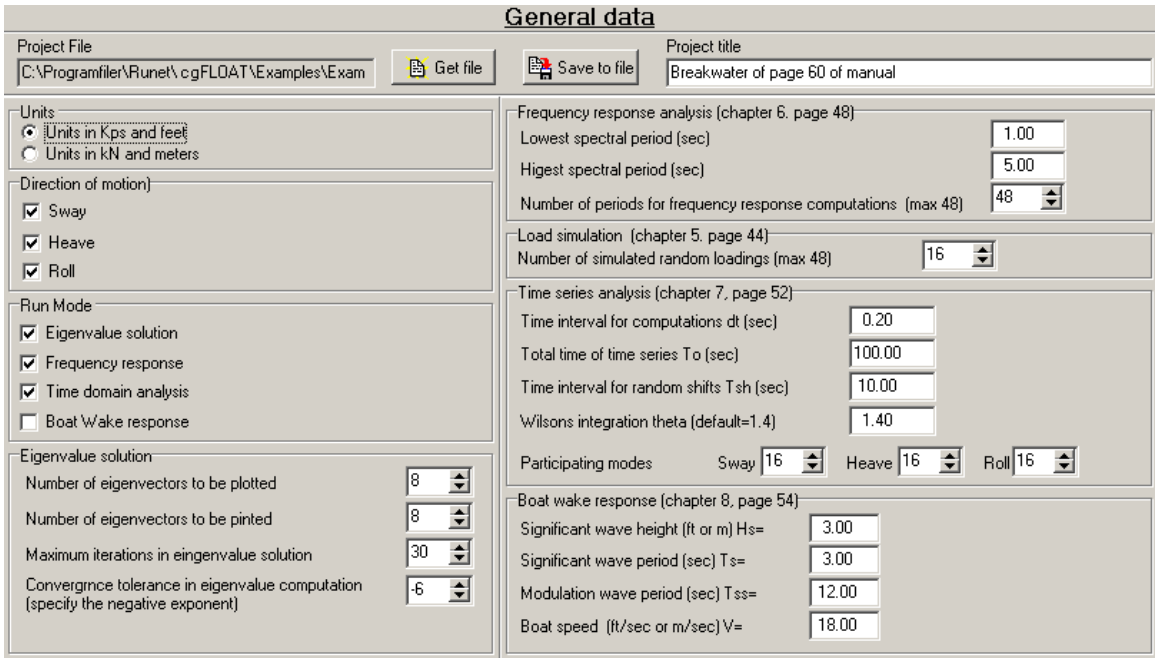
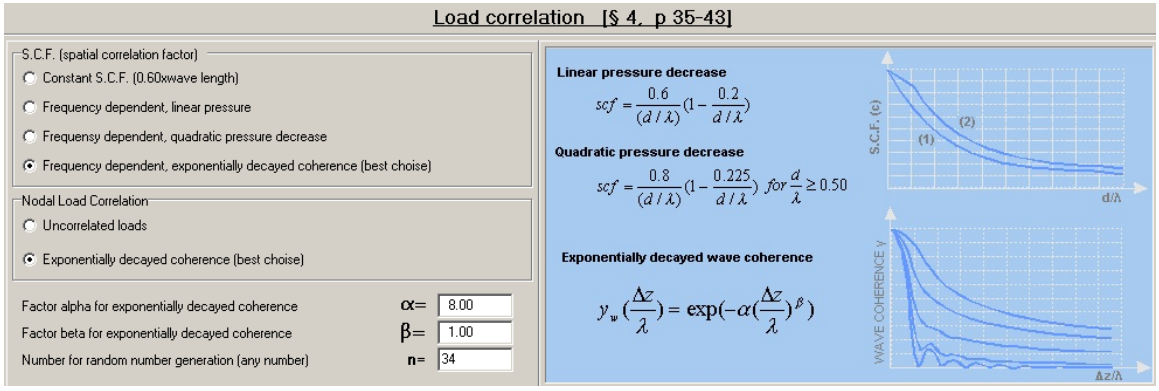
Example 003 (Breakwater with * pontoons Example of program Manual page 60)

Design of a continuous breakwater with 8 pontoons. Each pontoon is 75ft long and has a cross section with width B=16 ft, height H=5 ft, thickness t=4.75 in, draft T=3.55 ft. Mooring cables in the middle of each pontoon with a stiffness 4kps/ft. Wave spectrum of Pierson-Moskowitz type with peak wave period Ts=3 sec, and significant wave height Hs=3 ft. Short crested waves with directional spectrum $S(f,\theta)= S(f) \cos^{n}(\theta-\theta o)$.

From Table 4.1, page 37 of the manual we get for n=2 α=4, β=2.
The section properties are shown in pages 62,63 and 63 of the manual.
For the hydrodynamic coefficients we use B=16, T=3.55, and pressing the Generate Values button we get the table according to the table 3.1 page 21 of the manual. (in the values of the added mass the structural mass is added)
We complete the data in the pages of winFLOAT as shown in the next pages. Then we go in the last page Computations and Run Float. The FLOAT computational modulus is running and produces the output file. By pressing Output to NotPad we see the output.





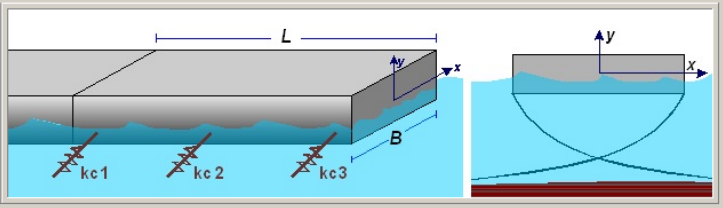
Pontoon properties [§ 2, p. 3-6]

Number of Pontoons: 8

Pontoon similarity
- (•) All pontoons are the same
- ( ) Pontoons are different

Modulus of Elasticity (kps/ft2 or kN/m2) E= 417000,00

Poissons Ratio ν= 0,220



n	L (length)	B (width)	Iyy	Ixx	J	mx,y	mt	Kc1	Kc2	Kc3	s.c.f	exp
	75,000	16,000	473,270	74,690	202,280	0,113	3,500	4,000		4,000	1,000	

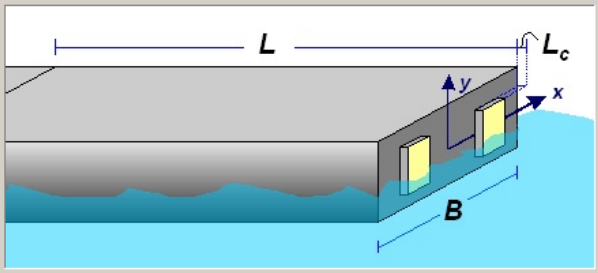
Connector properties [§ 2, p. 3-6]

Rigid or flexible connections between pontoons
- ( ) Rigid connections between pontoons
- (•) Flexible connections between pontoons

Pontoon similarity
- (•) All connectors are the same
- ( ) Connectors are different

Modulus of Elasticity (kps/ft2 or kN/m2) E_c = 1000.00

Poissons Ratio ν_c = 0.480



n	Lc (length)	Icyy	Icxx	Jc	Acxx	Acyy
	1.000	236.200	15.600	232.000	6.700	6.700

Hydrodynamic coeffisients [§ 3, p. 7-34]

Total number of supplied hydrodynamic coefficients (interpolation between) =7

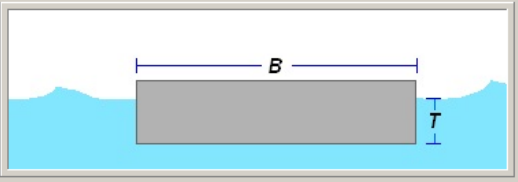
Number of middle period (used for eigenvalue and time series analysis) 3

Cross section width (ft or m) B= 16.00

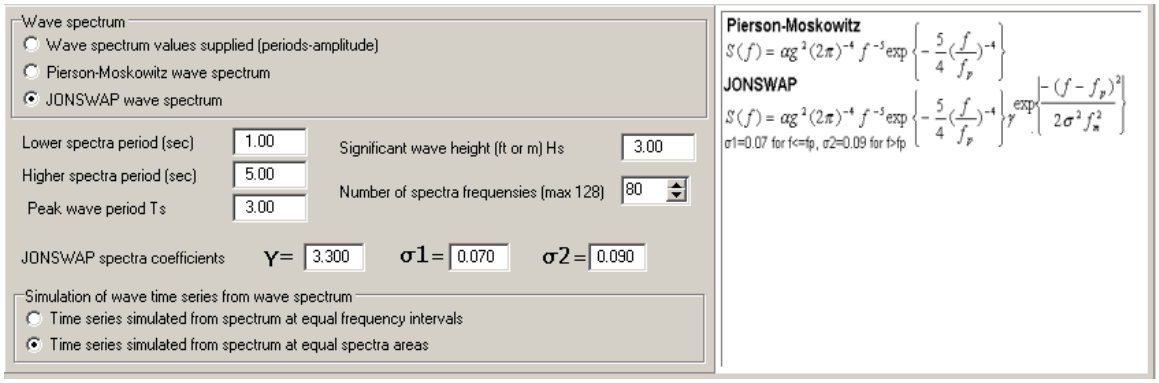
Cross section draft (ft or m) T= 3.55

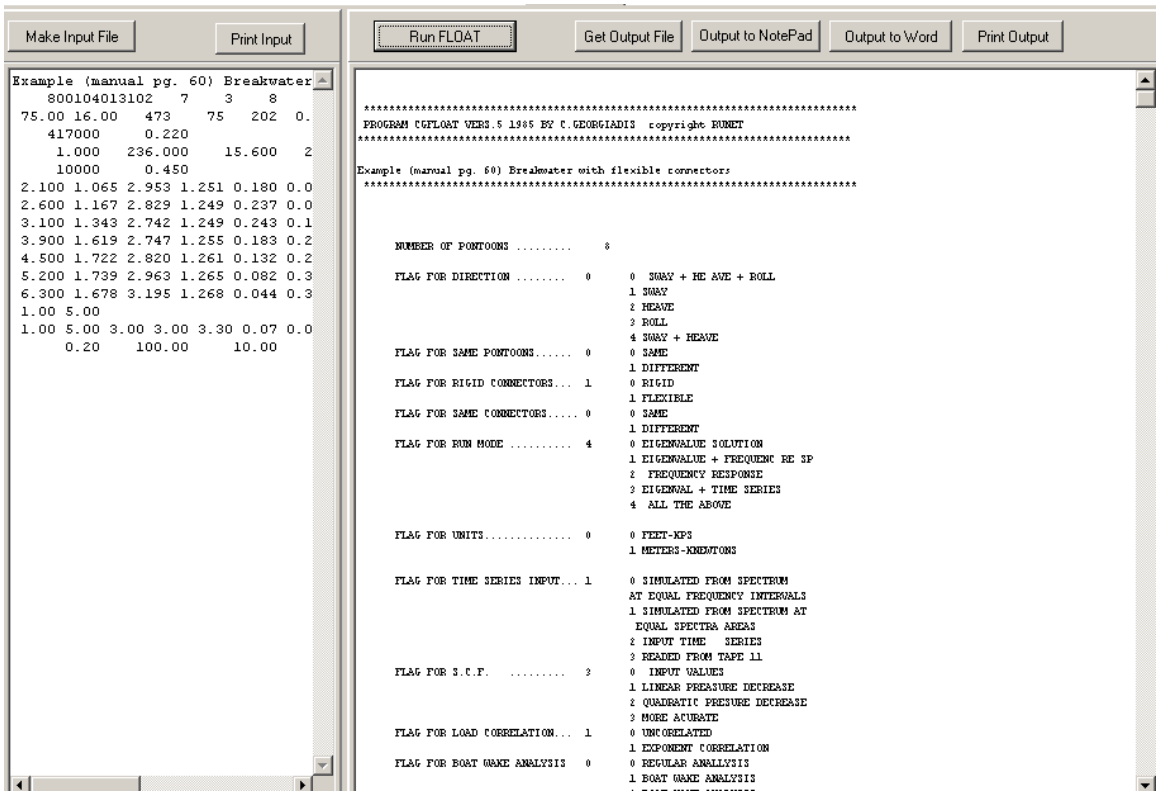
B/T= 4.507

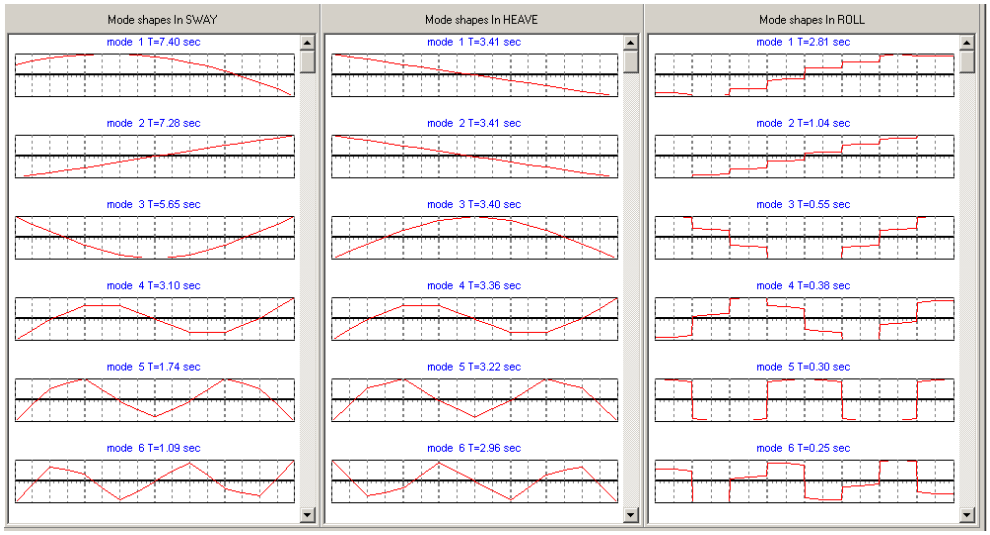
Generate Values

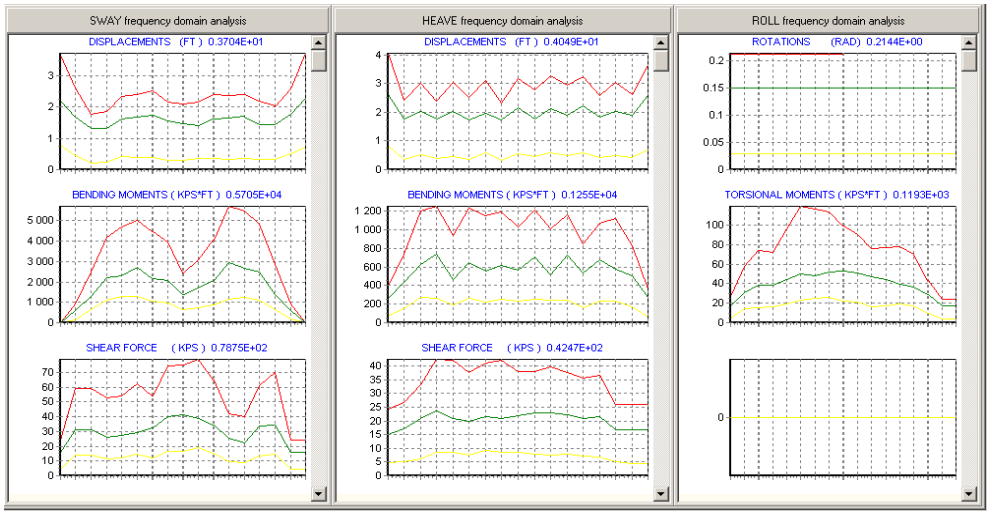


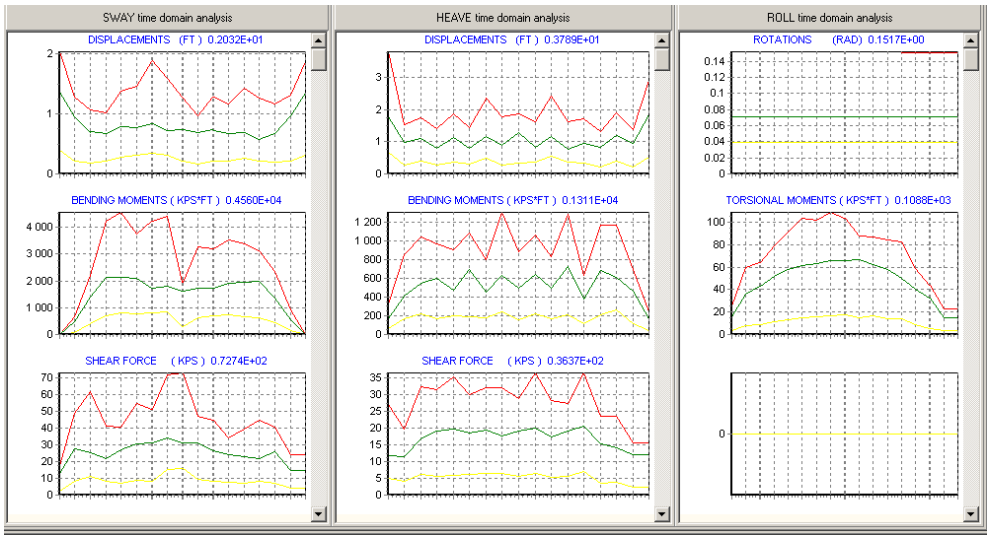
	T sec	BvS	BvH	BvR	ZvS	ZvH	ZvR	CfS	CfH	CfR
1	2.1	1.065	2.953	1.251	0.180	0.022	0.001	0.300	0.168	0.192
2	2.6	1.167	2.829	1.249	0.237	0.064	0.002	0.361	0.284	0.149
3	3.1	1.343	2.742	1.249	0.243	0.126	0.004	0.388	0.390	0.334
4	3.9	1.619	2.747	1.255	0.183	0.220	0.006	0.367	0.521	0.481
5	4.5	1.722	2.820	1.261	0.132	0.274	0.006	0.321	0.590	0.494
6	5.2	1.739	2.963	1.265	0.082	0.325	0.005	0.253	0.659	0.452
7	6.3	1.678	3.195	1.268	0.044	0.368	0.003	0.179	0.728	0.362


Wave spectrum
Wave spectrum values supplied (periods-amplitude)
Pierson-Moskowitz wave spectrum
JONSWAP wave spectrum
Lower spectra period (sec) 1.00
Higher spectra period (sec) 5.00
Peak wave period Ts 3.00
Significant wave height (ft or m) Hs 3.00
Number of spectra frequensies (max 128) 80
JONSWAP spectra coefficients γ= 3.300 σ1= 0.070 σ2= 0.090
Simulation of wave time series from wave spectrum
Time series simulated from spectrum at equal frequency intervals
Time series simulated from spectrum at equal spectra areas
Pierson-Moskowitz
JONSWAP
σ1=0.07 for f<=fp, σ2=0.09 for f>fp


Make Input File
Print Input
Run FLOAT
Get Output File
Output to NotePad
Output to Word
Print Output
Example (manual pg. 60) Breakwater
PROGRAM CGFLOAT VERS.5 1985 BY C.GEORGIADIS copyright RUNET
Example (manual pg. 60) Breakwater with flexible connectors
NUMBER OF PONTOONS 8
FLAG FOR DIRECTION 0
FLAG FOR SAME PONTOONS..... 0
FLAG FOR RIGID CONNECTORS... 1
FLAG FOR SAME CONNECTORS..... 0
FLAG FOR RUN MODE 4
FLAG FOR UNITS..... 0
FLAG FOR TIME SERIES INPUT... 1
FLAG FOR S.C.F. 2
FLAG FOR LOAD CORRELATION... 1
FLAG FOR BOAT WAKE ANALYSIS 0


Mode shapes In SWAY
mode 1 T=7.40 sec
mode 2 T=7.28 sec
mode 3 T=5.65 sec
mode 4 T=3.10 sec
mode 5 T=1.74 sec
mode 6 T=1.09 sec
Mode shapes In HEAVE
mode 1 T=3.41 sec
mode 2 T=3.41 sec
mode 3 T=3.40 sec
mode 4 T=3.36 sec
mode 5 T=3.22 sec
mode 6 T=2.96 sec
Mode shapes In ROLL
mode 1 T=2.81 sec
mode 2 T=1.04 sec
mode 3 T=0.55 sec
mode 4 T=0.38 sec
mode 5 T=0.30 sec
mode 6 T=0.25 sec


SWAY frequency domain analysis
DISPLACEMENTS (FT) 0.3704E+01
BENDING MOMENTS (KPS*FT) 0.5705E+04
SHEAR FORCE (KPS) 0.7875E+02
HEAVE frequency domain analysis
DISPLACEMENTS (FT) 0.4049E+01
BENDING MOMENTS (KPS*FT) 0.1255E+04
SHEAR FORCE (KPS) 0.4247E+02
ROLL frequency domain analysis
ROTATIONS (RAD) 0.2144E+00
TORSIONAL MOMENTS (KPS*FT) 0.1193E+03


SWAY time domain analysis
DISPLACEMENTS (FT) 0.2032E+01
BENDING MOMENTS (KPS*FT) 0.4560E+04
SHEAR FORCE (KPS) 0.7274E+02
HEAVE time domain analysis
DISPLACEMENTS (FT) 0.3789E+01
BENDING MOMENTS (KPS*FT) 0.1311E+04
SHEAR FORCE (KPS) 0.3637E+02
ROLL time domain analysis
ROTATIONS (RAD) 0.1517E+00
TORSIONAL MOMENTS (KPS*FT) 0.1088E+03