MARAD SERİSİ

Amerika Birleşik Devletleri'nde ***Mar***itime ***Ad***ministration tarafından geliştirilen sistematik bir seridir. Tasarlanan ana tekne formu, teknenin 3 farklı bölümü şeklinde tanımlanmıştır: giriş boyu, paralel gövde boyu ve çıkış boyu. Çıkış boyu da "başlangıç ve "bitiş" olarak iki farklı ofset oarak tanımlanmış olup, "başlangıç" tüm gemilerde aynıdır. Fakat çıkış boyunun "bitiş" kısmı 9 farklı form olarak verilmektedir. Daha sonra bunlar sistematik olarak birleştirilerek seri için gerekli genel form oranlarındaki parametrik değişiklikler elde edilmiştir. Bu metodun en belirgin özelliği, seçilen C_B ve L/B oranlarına uygulanmak üzere iki farklı giriş ve çıkış formu kullanılarak uygun tekne formu elde etmektir.

Geliştirilen 16 farklı tekne formunun hepsinde LCB, gemi boyunun %2.5'i kadar mastoriden başadır. "Hull A" olarak adlandırılan form, ana tekne formudur. Bu ana formdan, B/T, L/B ve C_B 'nin aşağıdaki kombinasyonları kullanılarak diğer formlar elde edilmiştir.

B/T	: 3.00	3.75	4.50
L/B	: 4.50-6.50		
C_B	: 0.800	0.850	0.875

Dolayısıyla MARAD serisini kullanırken kendi geminizin boyutsuz oranlarını kontrol ederek serinin sizin geminize uygun olup olmadığına karar verebilirsiniz. Daha sonra sizin geminize uygun olan boyutsuz ofset tablolarını kullanarak geminizin ofset tablosunu oluşturabilirsiniz. Ara değerler için lineer interpolasyon yapmak gerekebilir.

CHAPTER 2
HULL FORM DEVELOPMENT

The procedures used for selecting the parent, deriving the offspring forms, and establishing the range of parameters to be covered in the series differ from those used for the Taylor Series, Reference 5 and Series 60, Reference 6 and are described in detail in the following sections.

Parent Hull Form Selection

The background survey conducted at the beginning of the project revealed that little data were available regarding the relative merits of candidate ship designs having values of C_B of 0.85 or above in combination with values of L/B of 6.5 or below. Furthermore, it became apparent that no single set of existing lines would simultaneously satisfy both the objectives of the program series and practical design considerations over the range of L/B values contemplated. As an intermediate step, therefore, the development of a set of basic hull forms was undertaken to generate the parent and associated offspring forms for the series.

The basic hull forms adopted are defined as a related set of three hull segments - entrance, parallel midbody, and run - which can be combined systematically to obtain the parametric changes in overall hull proportions required for the series. A unique feature of the method is the use of two alternative run endings to obtain suitable hull forms for application over the entire range of selected C_B and L/B values. The lines for the basic entrance and run segments are presented in Figure 2-1.

The parent entrance developed for the series is a modified rounded or cylindrical bow concept, related to the entrance form used for the NSMB methodical series experiments of Reference 10 and the FDS models reported in Reference 11. Discussions with designers and operators of vessels fitted with similar bow forms have tended to corroborate the reported power savings.

Experience with these ships indicates that their seakeeping and directional stability characteristics are at least as good as those of comparable ships fitted with other bow types. The relatively simple geometry should result in lower construction costs than equivalent bulbous bow forms.

Adopting the rounded bow for the full-form entrance facilitates distributing the entrance displacement volume in a manner to minimize the hardness of the fore shoulder at the waterlines. Reasonably smooth shoulders are obtained at all waterlines for all hull forms within the range of interest, including those combining very high C_B with very low L/B values.

The selection of run configurations to delineate the forms for the series was based primarily on hydrodynamic considerations. Flow separation with attendant adverse effects on resistance and other hydrodynamic performance characteristics are matters of serious concern on full-form ships. Flow separation problems become progressively more acute as the run becomes fuller and shorter, such as when C_B is increased and L/B is decreased. For very low L/B values combined with high C_B values, conventional run geometry may not be satisfactory since the waterlines tend to become very steep and are prone to early flow separation. It was considered advisable, therefore, to develop two different run endings for generation of the hull forms for the series, one for each end of the range of L/B values to be covered.

The two runs developed, designated as the short run (L_R/B=1.6) and the long run (L_R/B=3.2), are shown in Figures 2-1b and 2-1c, respectively. Both are identical from Station 5 forward, and, therefore, the entire length of the long run is not shown. The profile endings for the two sterns are identical between points a and b when the offsets are normalized on the basis of full load draft, i.e., the ratios x/T, y/T. This procedure accomodates the typical rudder and propeller aperture arrangement for single-screw hull forms and satisfies practical ship design requirements over the entire range of L/B values for the series.

The two runs are distinctly different aft of Station 5. The short run, which is designed for low values of L/B, is essentially a buttock-flow stern. For hull forms with a relatively short full run, the buttock-flow geometry is expected to have less resistance than a conventional form stern. The flow tends to follow the buttock lines, which are of relatively gentle slope compared with the buttocks of an equivalent conventional stern, thus tending to delay flow separation. Further, because of the wide transom arrangement, the waterlines become relatively less steep over the run ending. The long run geometry is similar but tends toward a conventional form.

Derivation of Series Forms

The method of deriving parent and offspring hull forms consists generally in combining the entrance and parallel midbody with an appropriate run to obtain hull forms having defined values of the overall geometric parameters C_B, LCB, L/B, and B/T. It is the usual practice with a systematic series to define the hull geometry nondimensionally by basing the station spacings, waterline half breadths, and waterline heights on characteristic ship length, half maximum breadth, and full load draft, respectively. Thus, usually for given values of C_B and LCB, a single set of nondimensional waterline offsets on body plan stations is obtained for the entire hull length, independent of L/B and B/T. The same approach was adopted for this series for most of the hull length, but an additional step was taken to account for the changes in nondimensional waterline offsets that occur at the run ending due both to the use of the two basic runs and the constant profile length. Accordingly, the run sections will vary with L/B and B/T.

The geometric characteristics of the entrance, parallel midbody, and run are related to the primary geometric characteristics of the overall hull form by the following nondimensional expressions:

$$L' = L_E' + L_M' + L_R' \quad [1]$$

$$C_B = C_{BE}L_E' + C_{BM}L_M' + C_{BR}L_R' \quad [2]$$

$$(LCB)' = [C_{BE}L_E'(L_R'+L_M'+L_E'\overline{x}_E/L_E)+C_{BM}L_M'(L_R'+L_M'\overline{x}_M/L_M)$$

$$+ C_{BR}L_R'(\overline{x}_R/L_R)]\frac{1}{C_B L'} \quad [3]$$

where the LCB is measured from an origin at the AP; x_E, x_M, and x_R are the longitudinal centers of displacement volume (measured forward of the AP) of the entrance, parallel midbody, and run segments, respectively; and the prime denotes that the length is normalized on length between perpendiculars.

The series hull forms are derived from the basic hull forms of Figure 2-1 for which the values of C_{BE}, C_{BM}, C_{BR}, x_E/L_E, and x_R/L_R are held constant. Equations [1], [2], and [3] can be rewritten as follows:

$$1.0 = L_E' + L_M' + L_R' \quad [1a]$$

$$C_B = 0.723\ L_E' + 0.994\ L_M' + 0.742\ L_R' \quad [2a]$$

$$(LCB)'C_B = 0.723L_E'\ (L_R' + L_M' + 0.4005\ L_E')$$

$$+ 0.994\ L_M'(L_R'+0.5L_M') + 0.742\ L_R'\ (0.597\ L_R') \quad [3a]$$

For specified values of C_B and (LCB)', these three equations can be solved simultaneously to obtain the desired values of L_E', L_M', and L_R'.

Once the various geometric parameters are derived for any given offspring hull form, the section offsets and other data required to completely delineate the desired configuration can be generated. For this purpose, the entrances and runs of the basic hull forms are subdivided into a number of evenly spaced stations with fractional stations being taken as required toward the bow and stern endings. In accordance with the usual practice, the nondimensional offsets for the entrance for the parent and each offspring form of the series are the same at each station as for the basic hull form shown in Figure 2-1a. Similarly, the nondimensional offsets at each station for the forward eight stations of the run of the parent are the same for all derived forms. For both of these cases, the waterline offsets were taken directly from the body plan of the parent or basic hull.

The nondimensional offsets for the run ending of any given offspring form are determined by a somewhat different process. For this purpose, an interpolation procedure involving the use of the two alternative short and long runs was devised and programmed. In view of the nature of the body sections of the two run endings, the computer program was based on linear interpolation between corresponding offsets for each run ending, measured along the 45-degree diagonals shown in Figures 2-1b and 2-1c. The ratio L_R/B was used to define the relative length of run for interpolation purposes, where the values of L_R/B for the short and long runs of the basic hull are 1.6 and 3.2, respectively. For example, the parent hull form has an L_R/L of 0.346 and an L/B of 5.5, and therefore,

$$\frac{L_R}{B} = \frac{L}{B} \times \frac{L_R}{L} = 5.50 \times 0.346 = 1.903$$

and the linear interpolation factor is 0.303/1.6 = 0.189 from the short run end.

The nondimensional offsets for the run profile of the derived forms are also treated separately because of the condition imposed that the profile length between points a and b is a constant ratio with the beam B, i.e., length ab/B = 0.4333 in all cases regardless of the values of L_R/B. Consequently, points a and b do not occur at the same stations when L_R/B varies and the stern profile must be drawn from the information given in Figure 2-1.

Series Hull Form Parameters and Offsets

Table 2-1 presents the nondimensional hull form parameters derived by the foregoing process for each of the sixteen individual hull configurations which comprise the MARAD Series. Insofar as the overall hull parameters are concerned, all sixteen configurations have a common value for the LCB, 2.5 percent L forward of amidships. Hull A is considered to be the parent for the series. It was selected from the results of resistance tests with three models with values of LCB = 2.5, 3.0, and 3.5 percent of L forward, respectively, for common values of C_B = 0.875, L/B = 5.50, and B/T = 3.00. Results of these preliminary model tests are given in Chapter 4.

The sixteen hull configurations defined in Table 2-1 were selected to obtain maximum coverage of the range of geometric parameters of interest, with a practical minimum number of models. Characteristics of the sixteen model series are shown graphically in the diagram, Figure 2-2, showing combinations of three values of B/T = 3.00, 3.75, and 4.5; three values of C_B = 0.800, 0.850, and 0.875; and L/B values from 4.5 to 6.5.

Hulls A through F were chosen for an initial series of the program where L/B was the primary geometric variable. The original program included conduct of the entire investigation with hull forms having a common C_B = 0.875 and B/T = 3.00. It was decided later to include the lower values of L/B using the C_B = 0.850 forms, even though the C_B = 0.875 forms appeared to be satisfactory, at least at L/B = 5.5 and above. The decision to maintain constant B/T was made initially to minimize the number of models.

As shown by Figure 2-2, the ten additional configurations for models G through P were chosen to extend the series to include systematic variations in B/T for several combinations of C_B and L/B. The decision was made to extend the B/T range up to the relatively high value of 4.50 in anticipation of future interest in design studies of restricted draft hull forms. If the case of B/T = 4.50 combined with high C_B and low L/B proved to be impractical, it was assumed that accurate data for combinations of hull parameters involving lower values of B/T could be obtained by interpolation within the range covered. In addition to the B/T variations, it was considered desirable to extend the L/B range for the case of C_B = 0.850 and B/T = 3.00 from 5.50 to 6.50, to extend into the range of other comparable systematic series data.

The nondimensional parameters C_B, L/B, and B/T are the basis of the hydrodynamic design charts and tables given in subsequent chapters. However, other related geometric parameters are significant in the use and analysis of the data contained in these charts and tables. In particular, the wetted surface coefficient, $C_S = S/(\nabla L)^{1/2}$, is used to determine the dimensional values of wetted surface for both model and full scale in the treatment of the systematic resistance and propulsion data. The values of bare hull wetted surface coefficient, C_S, for the individual hull configurations of the series are listed in Table 2-1.

The nature of the variation of bare hull C_S with the basic hull form parameters for the series is clearly shown by the contours presented in Figure 2-3. The C_S values vary nearly linearly with L/B and C_B over the range covered; the variation with L/B amounts to less than 1 percent. The largest variation of C_S occurs with B/T; the variation is nonlinear, and the trend indicates that a minimum value would be reached in the vicinity of B/T = 2.00.

In the Taylor Standard Series, Reference 5, the volumetric coefficient $C_\nabla = \nabla/L^3$ is used in lieu of L/B as a basic hull parameter. The relationship among the coefficients L/B, C_B, B/T, and C_∇ is as follows:

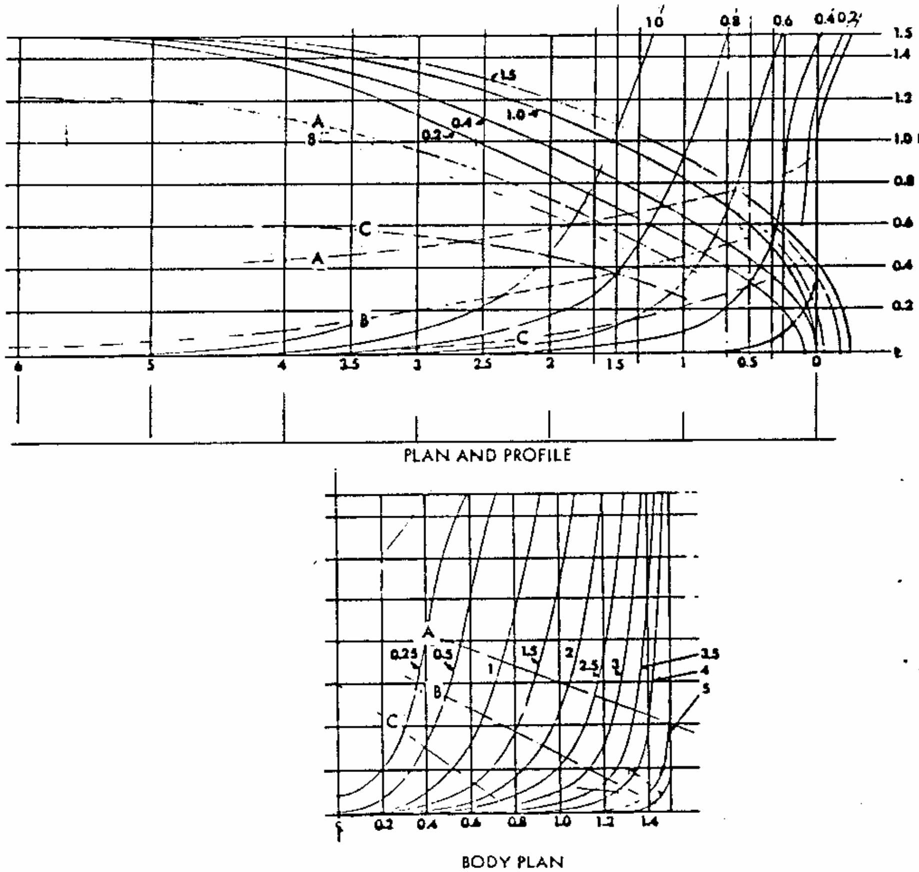
$$(L/B)^2 = \frac{C_B}{\frac{B}{T} C_\nabla}$$

Thus, with L/B and C_B held constant, C_∇ decreases when B/T increases. For example, comparing the characteristics of models E and L in Table 2-1, the value of C_∇ for B/T = 3.00 is 11.331 x 10^{-3} for B/T = 4.50. The volumetric coefficient C_∇ is also of interest in connection with dynamic stability analysis.

The nondimensional offsets expressed as the ratios of half breadths to half maximum breadth are given in Table 2-2 for each of the sixteen models. The nondimensional offsets were obtained from direct measurements at closely spaced waterlines from the shop plans or template drawings and accurately represent each of the models as built. Similarly, the offsets can be used to accurately produce the hull lines plans for full scale geometrically similar hulls for a wide variety of hull forms within and outside the range of the series.

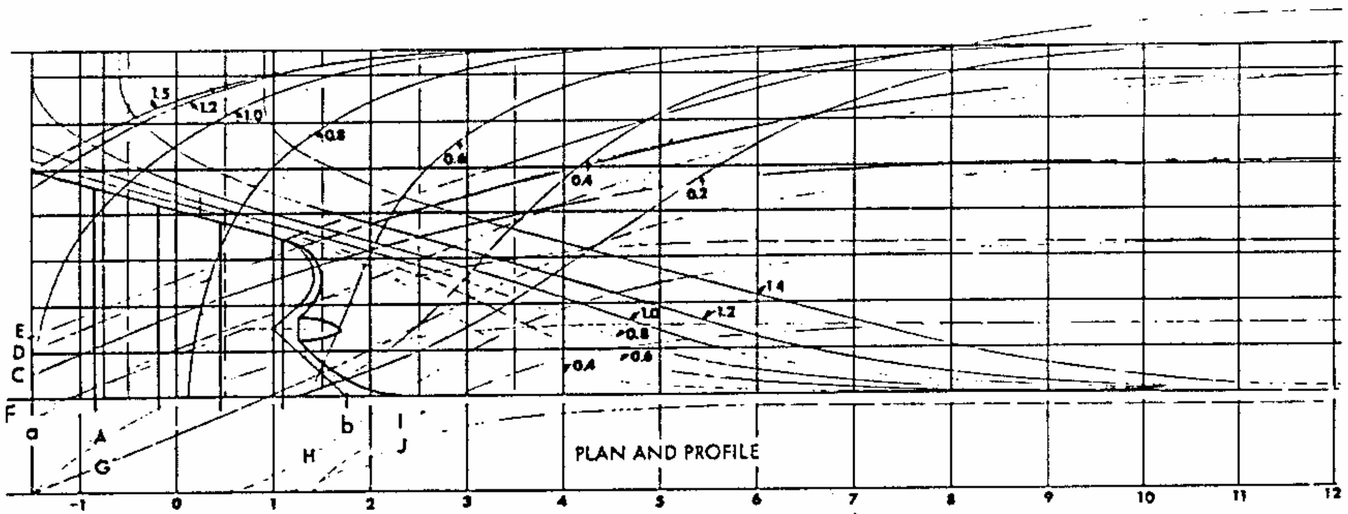
As noted earlier, all hull forms related to the series are obtained by combining the entrance, parallel midbody, and run in each case in accordance with the aforementioned generation process. This procedure results in obtaining the same nondimensional offsets for the entrance and the run beginning for all such forms regardless of the values of C_B, L/B, B/T, and LCB, as shown in Tables 2-2a and 2-2b. However, the offsets for the run ending are affected by the choice of L/B, C_B, and LCB, but not by B/T. All of the hull forms represented by Tables 2-1 and 2-2 have the same value for LCB and, therefore, the nondimensional offsets for the run ending vary only with L/B and C_B, as shown in Tables 2-2c through 2-2k. For those cases with constant L/B and C_B, but with different values of B/T, run ending offsets are identical.

Table 2-2 can also be used in conjunction with the specified generation process to produce the offsets, and thus the overall lines, for other series-related hull forms, provided the L_R/B values lie between 1.787 and 2.581, the range covered by Table 2-1. This is accomplished by means of linear interpolation using the sets of nondimensional offsets in Table 2-2 that are associated with the pair of run endings with L_R/B values which most closely span the L_R/B of the desired hull. The L_R/B for any hull configuration of interest is obtained by means of Equation [3a]. For hull forms with L_R/B values which lie beyond those of Table 2-1, it is necessary to use the pair of basic hull run endings given in Figures 2-1b and 2-1c.

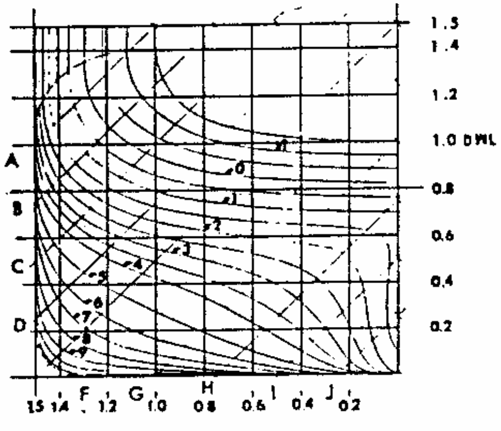


a. ENTRANCE

FIGURE 2-1 - LINES OF BASIC SHIP FORMS



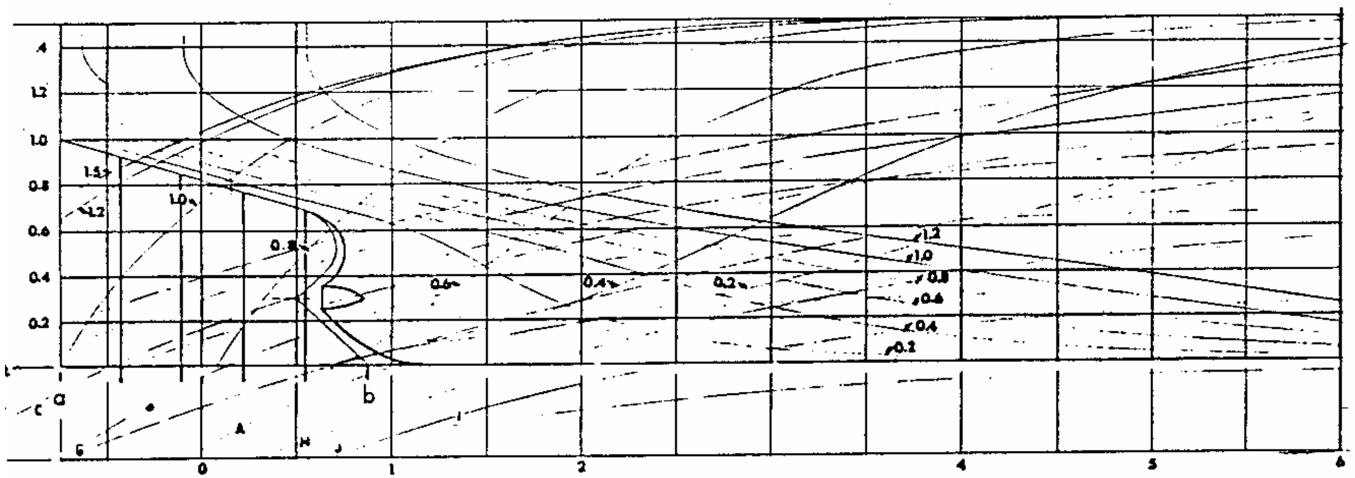
x / L_{ab}	y/t
0	1.000
0.2	0.925
0.4	0.850
0.6	0.775
0.8	0.700
1.0	0.000



$L_R/B = 1.6$

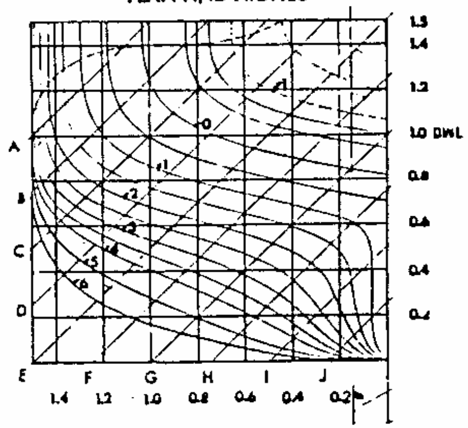
b. SHORT RUN

FIGURE 2-1 - CONTINUED



PLAN AND PROFILE

x/L_{ab}	y/t
0	1.000
0.2	0.925
0.4	0.850
0.6	0.775
0.8	0.700
1.0	0.000



BODY PLAN

$L_R / B = 3.2$

c. LONG RUN

FIGURE 2-1 - CONCLUDED

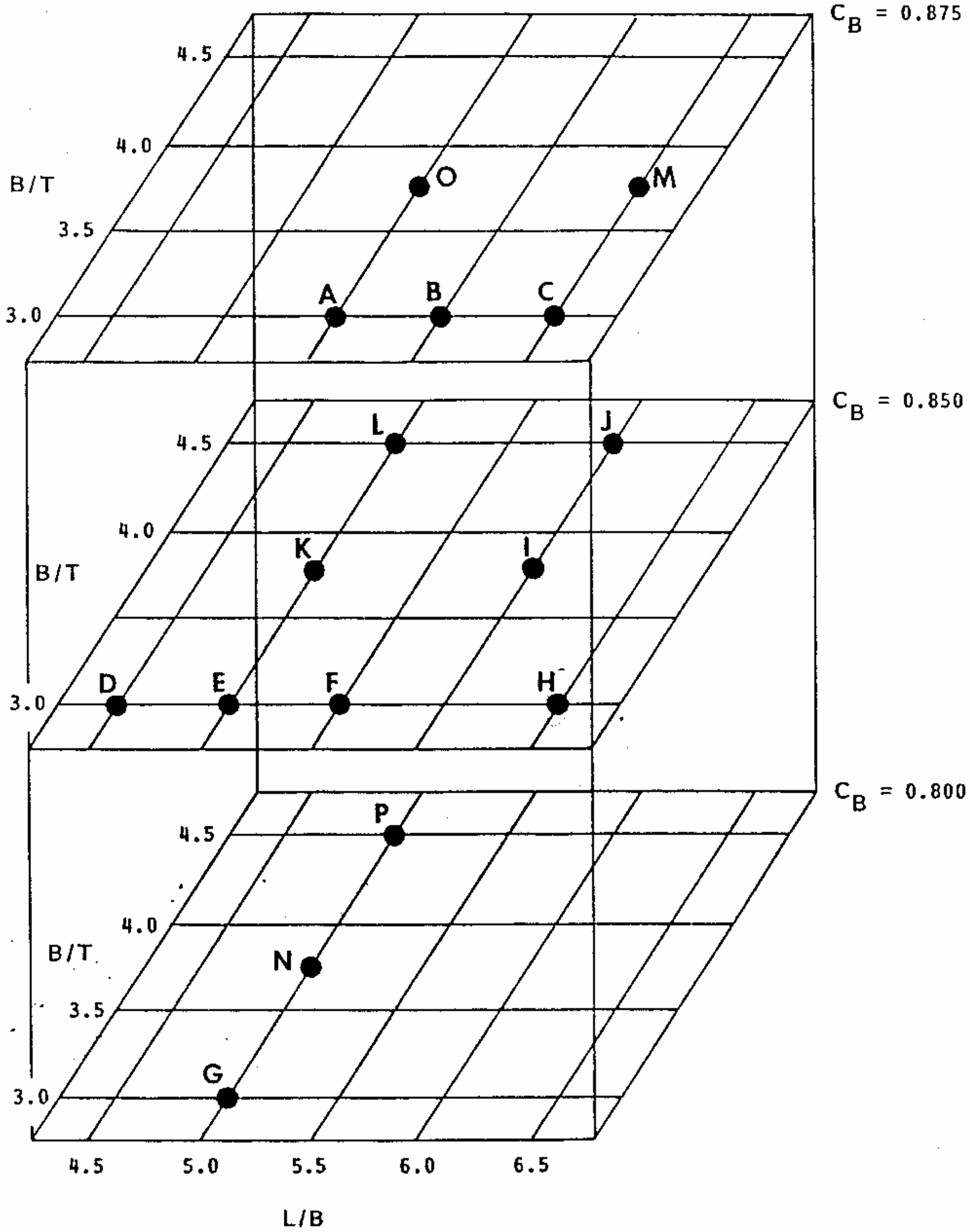
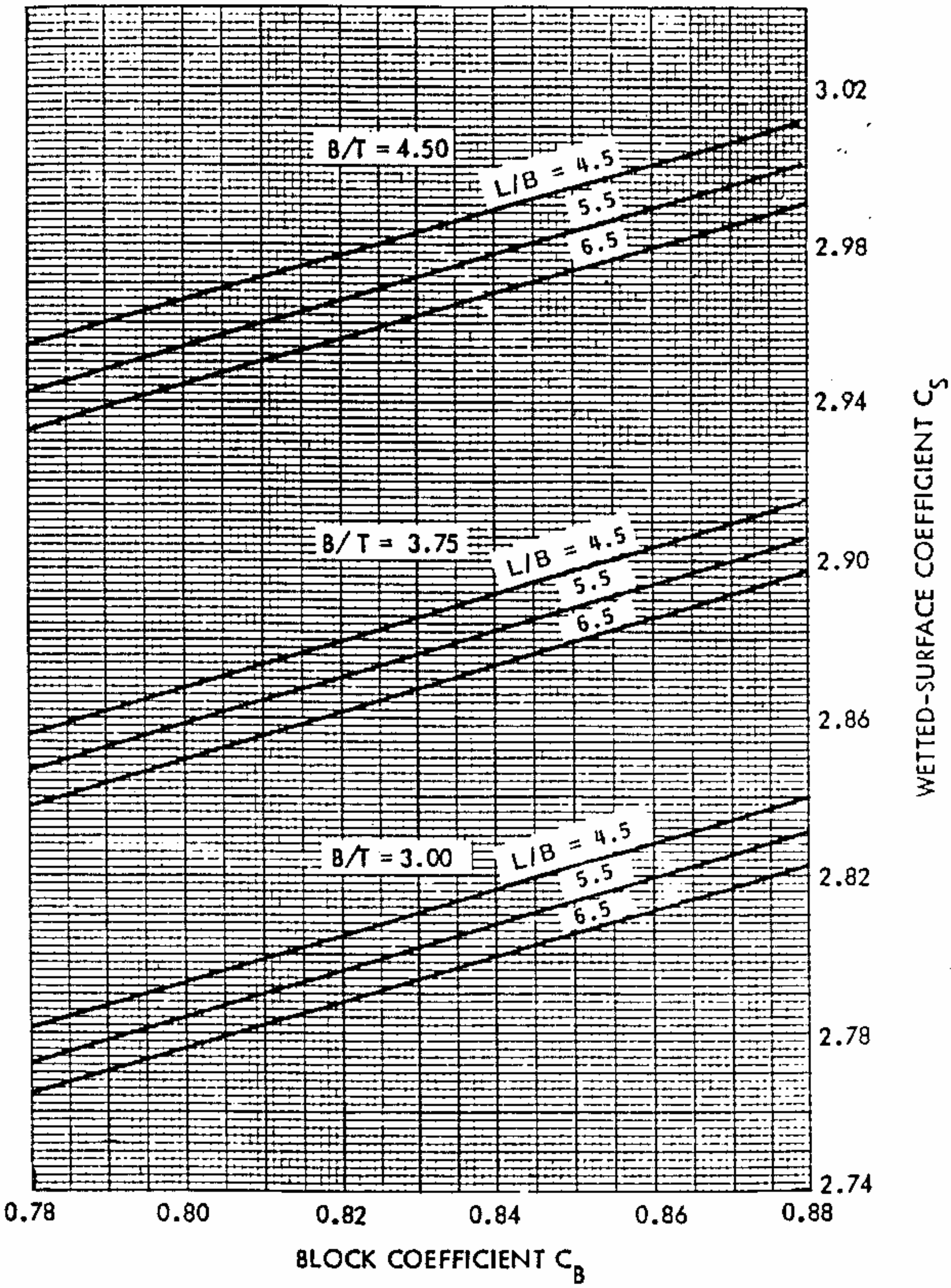
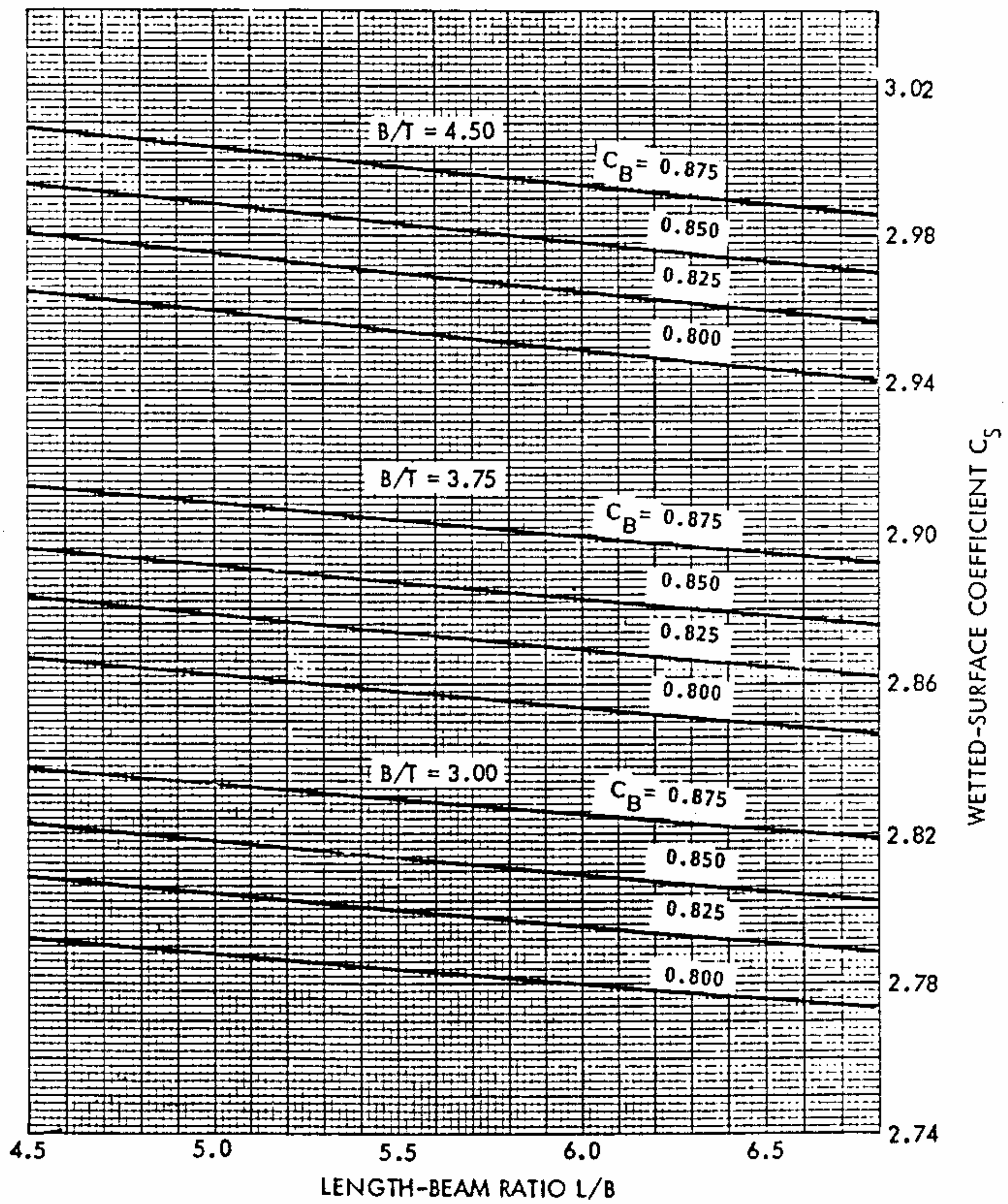


FIGURE 2-2 - DIAGRAM SHOWING RANGE OF SERIES GEOMETRIC PARAMETERS



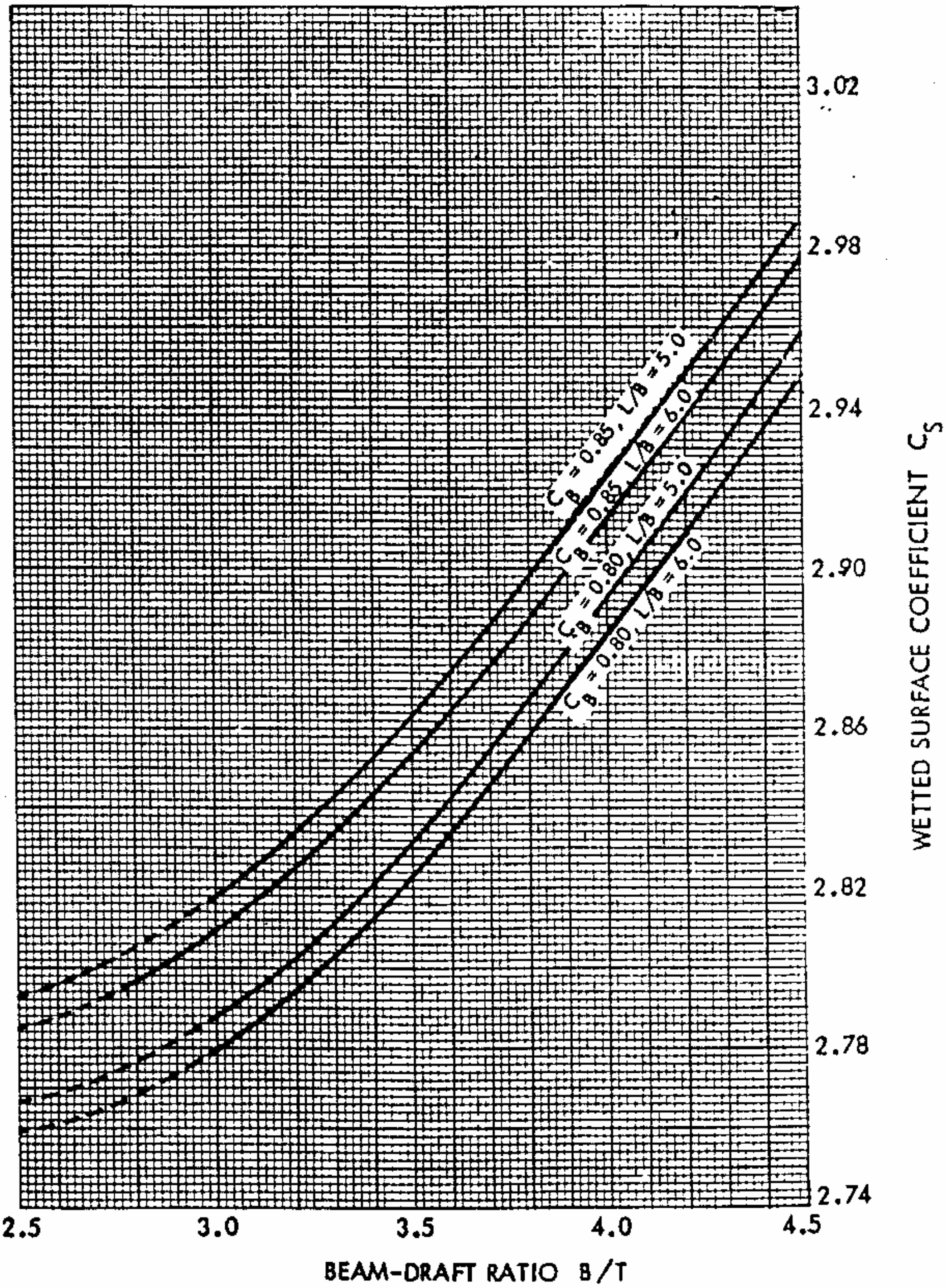
a. Variation with Block Coefficient C_B

FIGURE 2-3 - VARIATION OF WETTED SURFACE COEFFICIENT WITH HULL FORM PARAMETERS



b. Variation with Length-Beam Ratio L/B

FIGURE 2-3 - CONTINUED



c. Variation with Beam-Draft Ratio B/T

FIGURE 2-3 - CONCLUDED

TABLE 2-1

Nondimensional Hull Form Parameters for Series

Parameter	Designation															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
C_B	0.875	0.875	0.875	0.850	0.850	0.850	0.800	0.850	0.850	0.850	0.850	0.850	0.875	0.800	0.875	0.800
L/B	5.500	6.000	6.500	4.500	5.000	5.500	5.000	6.500	6.000	6.000	5.000	5.000	5.500	5.000	5.500	5.000
B/T	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.750	4.500	3.750	4.500	3.750	3.750	3.750	4.500
LCB	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
C_M	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994
$1000\ \nabla/L^3$	9.639	8.100	6.902	13.992	11.331	9.366	10.667	6.706	6.296	5.247	9.067	7.556	5.523	8.533	7.713	7.111
$S/\nabla^{2/3}$	6.243	6.302	6.463	5.749	5.946	6.127	5.942	6.457	6.706	7.144	6.376	6.745	6.883	6.331	6.533	6.750
$S/(\nabla L)^{1/2}$	2.828	2.824	2.820	2.822	2.818	2.813	2.788	2.804	2.882	2.978	2.892	2.988	2.894	2.862	2.904	2.960
L_E/L	0.117	0.117	0.117	0.160	0.160	0.160	0.245	0.160	0.160	0.160	0.160	0.160	0.117	0.245	0.117	0.245
L_X/L	0.537	0.537	0.537	0.443	0.443	0.443	0.251	0.443	0.443	0.443	0.443	0.443	0.537	0.251	0.537	0.251
L_R/L	0.346	0.346	0.346	0.397	0.397	0.397	0.504	0.397	0.397	0.397	0.397	0.397	0.346	0.504	0.346	0.504
L_R/B	1.903	2.076	2.249	1.787	1.985	2.184	2.520	2.581	2.382	2.382	1.985	1.985	2.249	2.520	0.1903	2.520
C_{BE}	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723	0.723
C_{BR}	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742	0.742
C_{BM}	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994

Notes: Length between perpendiculars, denoted as L, is used as the characteristic length for the hull parameters listed in this table. Values of these parameters apply to the design full-load condition. LCB is expressed as percentage of L forward of midships.

TABLE 2-2

Nondimensional Offsets for Series Hull Forms

(a) Entrance for All Series Hull Forms

	Station and x/L_E Measured from FP										
	¼	½	1	1½	2	2½	3	3½	4	5	6
Waterline	0.0417	0.0833	0.1667	0.2500	0.3333	0.4167	0.5000	0.5833	0.6667	0.8333	1.0000
0.00			0.0167	0.1200	0.2050	0.2979	0.3904	0.4792	0.5562	0.7717	0.8729
0.05		0.0921	0.2104	0.3008	0.3979	0.4983	0.5867	0.6862	0.7825	0.9175	0.9542
0.10	0.0529	0.1508	0.2687	0.3687	0.4662	0.5667	0.6621	0.7662	0.8471	0.9496	0.9812
0.15	0.0992	0.1925	0.3104	0.4187	0.5179	0.6179	0.7175	0.8095	0.8792	0.9675	0.9958
0.20	0.1312	0.2204	0.3417	0.4575	0.5587	0.6575	0.7542	0.8379	0.9000	0.9796	1.0000
0.25	0.1575	0.2421	0.3692	0.4862	0.5887	0.6883	0.7783	0.8546	0.9133	0.9850	1.0000
0.30	0.1767	0.2604	0.3921	0.5092	0.6129	0.7104	0.7962	0.8675	0.9225	0.9883	1.0000
0.35	0.1929	0.2779	0.4112	0.5279	0.6333	0.7283	0.8108	0.8767	0.9292	0.9917	1.0000
0.40	0.2046	0.2921	0.4262	0.5425	0.6492	0.7437	0.8217	0.8846	0.9342	0.9950	1.0000
0.45	0.2158	0.3067	0.4404	0.5571	0.6633	0.7558	0.8312	0.8917	0.9375	0.9979	1.0000
0.50	0.2250	0.3192	0.4529	0.5687	0.6778	0.7662	0.8387	0.8975	0.9408	0.9996	1.0000
0.55	0.2337	0.3308	0.4642	0.5804	0.6875	0.7758	0.8458	0.9021	0.9437	1.0000	1.0000
0.60	0.2412	0.3412	0.4758	0.5908	0.6979	0.7833	0.8517	0.9067	0.9467	1.0000	1.0000
0.65	0.2487	0.3504	0.4862	0.6008	0.7075	0.7904	0.8583	0.9108	0.9487	1.0000	1.0000
0.70	0.2546	0.3587	0.4954	0.6096	0.7158	0.7967	0.8637	0.9142	0.9517	1.0000	1.0000
0.75	0.2617	0.3671	0.5050	0.6196	0.7237	0.8033	0.8679	0.9179	0.9542	1.0000	1.0000
0.80	0.2687	0.3750	0.5142	0.6283	0.7312	0.8087	0.8721	0.9212	0.9567	1.0000	1.0000
0.85	0.2742	0.3817	0.5233	0.6371	0.7379	0.8146	0.8762	0.9242	0.9587	1.0000	1.0000
0.90	0.2796	0.3879	0.5308	0.6442	0.7433	0.8196	0.8804	0.9271	0.9604	1.0000	1.0000
0.95	0.2850	0.3950	0.5392	0.6517	0.7496	0.8250	0.8846	0.9300	0.9633	1.0000	1.0000
1.00	0.2917	0.4017	0.5467	0.6592	0.7550	0.8296	0.8883	0.9333	0.9646	1.0000	1.0000
1.10	0.3029	0.4133	0.5600	0.6721	0.7654	0.8379	0.8942	0.9383	0.9679	1.0000	1.0000
1.20	0.3187	0.4283	0.5754	0.6854	0.7754	0.8462	0.9008	0.9437	0.9725	1.0000	1.0000
1.30	0.3383	0.4433	0.5887	0.6971	0.7842	0.8533	0.9071	0.9479	0.9758	1.0000	1.0000
1.40	0.3629	0.4604	0.5937	0.7079	0.7925	0.8600	0.9133	0.9529	0.9787	1.0000	1.0000
1.50	0.3950	0.4833	0.6162	0.7187	0.8000	0.8658	0.9183	0.9562	0.9812	1.0000	1.0000

Note: Half-breadths of waterlines at each station listed in the table are given as fractions of half maximum beam. Waterline heights are given as fractions of design full-load draft.

TABLE 2-2 (Continued)

(b) Run Beginning for All Series Hull Forms

Waterline	Station and x/L_R Measured from AP							
	5 0.4167	6 0.5000	7 0.5833	8 0.6667	9 0.7500	10 0.8333	11 0.9167	12 1.0000
0.00	0.1092	0.1629	0.2000	0.2533	0.3187	0.3804	0.4400	0.8729
0.05	0.2871	0.3808	0.4862	0.6283	0.7746	0.8946	0.9408	0.9542
0.10	0.3833	0.5083	0.6687	0.8029	0.8987	0.9479	0.9721	0.9812
0.15	0.4683	0.6317	0.7812	0.8779	0.9262	0.9729	0.9879	0.9958
0.20	0.5462	0.7233	0.8454	0.9212	0.9679	0.9871	0.9967	1.0000
0.25	0.6212	0.7925	0.8883	0.9467	0.9812	0.9942	0.9992	1.0000
0.30	0.6908	0.8437	0.9183	0.9642	0.9892	0.9987	1.0000	1.0000
0.35	0.7554	0.8833	0.9400	0.9771	0.9937	1.0000	1.0000	1.0000
0.40	0.8158	0.9154	0.9579	0.9854	0.9967	1.0000	1.0000	1.0000
0.45	0.8646	0.9396	0.9704	0.9917	0.9979	1.0000	1.0000	1.0000
0.50	0.9046	0.9600	0.9804	0.9937	1.0000	1.0000	1.0000	1.0000
0.55	0.9333	0.9725	0.9879	0.9967	1.0000	1.0000	1.0000	1.0000
0.60	0.9562	0.9833	0.9933	1.0000	1.0000	1.0000	1.0000	1.0000
0.65	0.9721	0.9908	0.9967	1.0000	1.0000	1.0000	1.0000	1.0000
0.70	0.9829	0.9967	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.75	0.9925	0.9987	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.80	0.9967	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.85	0.9992	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.90	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.95	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.30	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.50	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

TABLE 2-2 (Continued)

(c) Run Ending for Series Hull Forms A and O

Waterline	Station and x/L_R Measured from AP											
	-1½ -0.1250	-1 -0.0833	-½ -0.0417	0 0	½ 0.0417	1 0.0833	1½ 0.1250	2 0.1667	2½ 0.2083	3 0.2500	3½ 0.2917	4 0.3333
0.00							0.0025	0.0042	0.0325	0.5000	0.0667	0.0833
0.05							0.0254	0.0487	0.0862	0.1262	0.1587	0.2012
0.10							0.0333	0.0658	0.1075	0.1579	0.2054	0.2612
0.15							0.0362	0.0779	0.1237	0.1821	0.2446	0.3146
0.20							0.0347	0.0871	0.1387	0.2071	0.2821	0.3679
0.25							0.0354	0.0937	0.1562	0.2350	0.3237	0.4271
0.30							0.0342	0.0996	0.1754	0.2671	0.3721	0.4917
0.35							0.0346	0.1050	0.1975	0.3058	0.4354	0.5604
0.40							0.0362	0.1137	0.2267	0.3562	0.5075	0.6383
0.45							0.0408	0.1312	0.2796	0.4371	0.5950	0.7229
0.50							0.0479	0.1612	0.3679	0.5521	0.6912	0.7950
0.55							0.0604	0.2242	0.4871	0.6767	0.7750	0.8508
0.60							0.0942	0.4329	0.6442	0.7687	0.8417	0.8967
0.65							0.3312	0.6154	0.7537	0.8383	0.8912	0.9304
0.70						0.2087	0.5625	0.7279	0.8242	0.8867	0.9250	0.9554
0.75						0.4987	0.6967	0.8017	0.8750	0.9229	0.9492	0.9750
0.80					0.4087	0.6550	0.7783	0.8521	0.9112	0.9467	0.9658	0.9867
0.85				0.2958	0.5975	0.7400	0.8308	0.8883	0.9342	0.9617	0.9775	0.9938
0.90			0.0562	0.5150	0.6958	0.7925	0.8662	0.9154	0.9508	0.9733	0.9854	1.0000
0.95			0.4271	0.6262	0.7521	0.8308	0.8946	0.9346	0.9621	0.9804	0.9908	1.0000
1.00		0.3267	0.5525	0.6929	0.7917	0.8642	0.8854	0.9492	0.9708	0.9867	0.9942	1.0000
1.10	0.3696	0.5479	0.6658	0.7642	0.8404	0.8992	0.9362	0.9642	0.9796	0.9917	0.9975	1.0000
1.20	0.5137	0.6267	0.7233	0.8033	0.8667	0.9167	0.9467	0.9717	0.9833	0.9937	0.9975	1.0000
1.30	0.5725	0.6696	0.7533	0.8221	0.8804	0.9233	0.9521	0.9725	0.9833	0.9937	0.9975	1.0000
1.40	0.5950	0.6842	0.7654	0.8296	0.8833	0.9250	0.9521	0.9725	0.9833	0.9937	0.9975	1.0000
1.50	0.5992	0.6858	0.7662	0.8300	0.8833	0.9250	0.9521	0.9725	0.9833	0.9937	0.9975	1.0000

TABLE 2-2 (Continued)

(d) Run Ending for Series Hull Form B

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0.00							0.0008	0.0025	0.0167	0.0354	0.0521	0.0646
0.05							0.0187	0.0479	0.0833	0.1242	0.1562	0.1996
0.10							0.0300	0.0671	0.1087	0.1583	0.2042	0.2637
0.15							0.0379	0.0804	0.1296	0.1833	0.2437	0.3179
0.20							0.0429	0.0900	0.1471	0.2083	0.2808	0.3696
0.25							0.0454	0.0983	0.1625	0.2375	0.3246	0.4287
0.30							0.0458	0.1050	0.1804	0.2717	0.3783	0.4921
0.35							0.0450	0.1121	0.2033	0.3121	0.4408	0.5617
0.40							0.0450	0.1200	0.2362	0.3683	0.5162	0.6442
0.45							0.0471	0.1362	0.2912	0.4471	0.6050	0.7242
0.50							0.0508	0.1700	0.3792	0.5633	0.7000	0.7942
0.55							0.0725	0.2571	0.5008	0.6775	0.7829	0.8508
0.60							0.1312	0.4450	0.6500	0.7700	0.8450	0.8958
0.65						0.0075	0.3571	0.6100	0.7575	0.8367	0.8908	0.9296
0.70						0.2367	0.5625	0.7271	0.8229	0.8837	0.9237	0.9550
0.75					0.0312	0.4892	0.6887	0.8000	0.8700	0.9195	0.9496	0.9733
0.80					0.4033	0.6395	0.7667	0.8479	0.9054	0.9433	0.9667	0.9846
0.85				0.2446	0.5762	0.7258	0.8208	0.8850	0.9300	0.9608	0.9779	0.9921
0.90				0.4796	0.6679	0.7817	0.8592	0.9129	0.9475	0.9725	0.9862	0.9967
0.95			0.3675	0.5908	0.7304	0.8217	0.8867	0.9317	0.9592	0.9800	0.9917	0.9987
1.00		0.2167	0.5042	0.6604	0.7742	0.8521	0.9079	0.9458	0.9683	0.9846	0.9946	1.0000
1.10	0.2679	0.4946	0.6287	0.7387	0.8250	0.8867	0.9308	0.9608	0.9775	0.9908	1.0387	1.0000
1.20	0.4542	0.5779	0.6871	0.7796	0.8512	0.9052	0.9417	0.9683	0.9833	0.9942	1.0387	1.0000
1.30	0.5217	0.6237	0.7179	0.7992	0.8654	0.9133	0.9454	0.9708	0.9854	0.9958	0.9983	1.0000
1.40	0.5512	0.6446	0.7329	0.8083	0.8704	0.9175	0.9462	0.9708	0.9854	0.9958	0.9983	1.0000
1.50	0.5575	0.6521	0.7392	0.8117	0.8717	0.9183	0.9462	0.9708	0.9854	0.9958	0.9983	1.0000

TABLE 2-2 (Continued)

(e) Run Ending for Series Hull Forms C and M

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0.00							0.0017	0.0062	0.0217	0.0417	0.0567	0.0717
0.05							0.0304	0.0500	0.0846	0.1258	0.1571	0.1979
0.10							0.0400	0.0692	0.1112	0.1596	0.2042	0.2625
0.15							0.0450	0.0837	0.1317	0.1867	0.2442	0.3171
0.20							0.0471	0.0950	0.1475	0.2117	0.2825	0.3717
0.25							0.0479	0.1037	0.1637	0.2421	0.3287	0.4308
0.30							0.0487	0.1104	0.1842	0.2758	0.3812	0.4896
0.35							0.0500	0.1162	0.2096	0.3158	0.4454	0.5629
0.40							0.0512	0.1262	0.2471	0.3733	0.5183	0.6454
0.45							0.0562	0.1487	0.3033	0.4542	0.6062	0.7242
0.50							0.0671	0.1975	0.3896	0.5662	0.6987	0.7954
0.55							0.0892	0.2875	0.5117	0.6754	0.7796	0.8508
0.60						0.0046	0.1546	0.4467	0.6392	0.7658	0.4275	0.8954
0.65						0.0379	0.3604	0.6021	0.7467	0.8329	0.8896	0.9296
0.70						0.2496	0.5450	0.7175	0.8162	0.8812	0.9242	0.9554
0.75					0.0708	0.4712	0.6775	0.7942	0.8662	0.9183	0.9492	0.9746
0.80					0.3704	0.6167	0.7575	0.8425	0.9033	0.9425	0.9667	0.9850
0.85				0.2150	0.5446	0.7104	0.8104	0.8796	0.9283	0.9592	0.9775	0.9921
0.90				0.4337	0.6467	0.7675	0.8521	0.9092	0.9462	0.9700	0.9854	0.9958
0.95			0.3025	0.5562	0.7100	0.8112	0.8833	0.9283	0.9575	0.9771	0.9900	0.9992
1.00		0.0854	0.4600	0.6375	0.7587	0.8437	0.9050	0.9429	0.9667	0.9829	0.9933	0.9992
1.10	0.1492	0.4429	0.5975	0.7180	0.8104	0.8775	0.9250	0.9567	0.9754	0.9883	0.9933	0.9992
1.20	0.3867	0.5371	0.6562	0.7583	0.8358	0.8946	0.9354	0.9633	0.9792	0.9904	0.9933	0.9992
1.30	0.4729	0.5833	0.6867	0.7775	0.8487	0.9033	0.9575	0.9642	0.9792	0.9904	0.9933	0.9992
1.40	0.5058	0.6100	0.7042	0.7883	0.8550	0.9075	0.9400	0.9642	0.9792	0.9904	0.9933	0.9992
1.50	0.5167	0.6192	0.7133	0.7933	0.8592	0.9092	0.9400	0.9642	0.9792	0.9904	0.9933	0.9992

TABLE 2-2 (Continued)

(f) Run Ending for Series Hull Form D

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0.00							0.0008	0.0017	0.0271	0.0521	0.0646	0.0742
0.05							0.0162	0.0446	0.0837	0.1262	0.1575	0.1992
0.10							0.0254	0.0521	0.1079	0.1579	0.2021	0.2612
0.15							0.0304	0.0742	0.1254	0.1804	0.2417	0.3162
0.20							0.0329	0.0825	0.1400	0.2033	0.2783	0.3696
0.25							0.0342	0.0900	0.1533	0.2312	0.3217	0.4296
0.30							0.0346	0.0954	0.1696	0.2630	0.3721	0.4925
0.35							0.0342	0.1000	0.1917	0.3030	0.4346	0.5612
0.40							0.0333	0.1058	0.2208	0.3575	0.5079	0.6412
0.45							0.0325	0.1187	0.2730	0.4412	0.5992	0.7250
0.50							0.0371	0.1504	0.3642	0.5617	0.6983	0.7971
0.55							0.0479	0.2304	0.4983	0.6791	0.7817	0.8529
0.60							0.0787	0.4250	0.6471	0.7695	0.8458	0.8952
0.65							0.3350	0.6200	0.7587	0.8383	0.8929	0.9304
0.70						0.1842	0.5737	0.7337	0.8279	0.8862	0.9254	0.9554
0.75						0.5150	0.7062	0.8058	0.8762	0.9212	0.9504	0.9737
0.80					0.4400	0.6658	0.7817	0.8546	0.9096	0.9467	0.9671	0.9850
0.85				0.3533	0.6171	0.7458	0.8317	0.8908	0.9329	0.9621	0.9779	0.9912
0.90			0.1837	0.5521	0.7062	0.7996	0.8696	0.9171	0.9483	0.9725	0.9858	0.9950
0.95			0.4675	0.6479	0.7600	0.8383	0.8962	0.9354	0.9600	0.9800	0.9904	0.9957
1.00		0.3850	0.5825	0.7083	0.8008	0.8683	0.9158	0.9492	0.9692	0.9854	0.9942	1.0000
1.10	0.0162	0.5754	0.6904	0.7792	0.8492	0.9025	0.9396	0.9654	0.9796	0.9921	0.9983	1.0000
1.20	0.5492	0.6479	0.7412	0.8162	0.8750	0.9212	0.9521	0.9742	0.9846	0.9937	0.9983	1.0000
1.30	0.5967	0.6858	0.7667	0.8354	0.8883	0.9296	0.9550	0.9758	0.9862	0.9937	0.9983	1.0000
1.40	0.6183	0.7033	0.7796	0.8429	0.8933	0.9308	0.9558	0.9758	0.9862	0.9937	0.9983	1.0000
1.50	0.6242	0.7087	0.7837	0.8433	0.8933	0.9308	0.9558	0.9758	0.9862	0.9937	0.9983	1.0000

TABLE 2-2 (Continued)

(g) Run Ending for Series Hull Forms E, K, and L

	Station and x/L_R Measured from AP											
	-1½	-1	-1½	0	½	1	1½	2	2½	3	3½	4
Waterline	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0.00							0.0008	0.0017	0.0246	0.0450	0.0550	0.0596
0.05							0.0195	0.0462	0.0842	0.1242	0.1575	0.2004
0.10							0.0296	0.0658	0.1092	0.1592	0.2037	0.2629
0.15							0.0350	0.0780	0.1279	0.1829	0.2442	0.3175
0.20							0.0396	0.0879	0.1437	0.2075	0.2817	0.3717
0.25							0.0417	0.0954	0.1587	0.2358	0.3233	0.4283
0.30							0.0429	0.1017	0.1770	0.2679	0.3742	0.4892
0.35							0.0433	0.1083	0.2004	0.3100	0.4371	0.5621
0.40							0.0425	0.1162	0.2321	0.3658	0.5142	0.6450
0.45							0.0450	0.1312	0.2829	0.4512	0.6054	0.7271
0.50							0.0508	0.1683	0.3737	0.5704	0.7029	0.7996
0.55							0.0642	0.2562	0.5112	0.6854	0.7858	0.8550
0.60							0.1054	0.4500	0.6550	0.7746	0.8483	0.8979
0.65							0.3621	0.6133	0.7587	0.8408	0.8942	0.9321
0.70						0.2212	0.5700	0.7287	0.8267	0.8875	0.9275	0.9567
0.75					0.0200	0.4895	0.6983	0.8033	0.8746	0.9217	0.9517	0.9750
0.80					0.4104	0.6467	0.7737	0.8537	0.9079	0.9458	0.9675	0.9854
0.85				0.2733	0.5900	0.7304	0.8275	0.8900	0.9325	0.9621	0.9792	0.9912
0.90			0.0312	0.4983	0.6821	0.7875	0.8650	0.9158	0.9479	0.9737	0.9875	0.9950
0.95			0.3958	0.6125	0.7400	0.8779	0.8912	0.9330	0.9600	0.9808	0.9925	0.9967
1.00		0.2658	0.5325	0.6779	0.7842	0.8583	0.9112	0.9475	0.9692	0.9862	0.9954	0.9992
1.10	0.3237	0.5196	0.6471	0.7525	0.8325	0.8917	0.9337	0.9625	0.9787	0.9912	0.9983	1.0000
1.20	0.4821	0.6012	0.7062	0.7921	0.8592	0.9117	0.9458	0.9704	0.9833	0.9942	0.9983	1.0000
1.30	0.5467	0.6442	0.7358	0.8117	0.8725	0.9200	0.9491	0.9717	0.9850	0.9942	0.9983	1.0000
1.40	0.5742	0.6642	0.7492	0.8204	0.8783	0.9208	0.9491	0.9717	0.9850	0.9942	0.9983	1.0000
1.50	0.5775	0.6700	0.7533	0.8212	0.8792	0.9212	0.9491	0,9717	0.9850	0.9942	0.9983	1.0000

TABLE 2-2 (Continued)

(h) Run Ending for Series Hull Form F

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0.00							0.0008	0.0058	0.0225	0.0408	0.0546	0.0717
0.05							0.0237	0.0508	0.0858	0.1250	0.1587	0.2033
0.10							0.0346	0.0704	0.1121	0.1596	0.2054	0.2654
0.15							0.0417	0.0837	0.1321	0.1875	0.2467	0.3192
0.20							0.0458	0.0937	0.1504	0.2130	0.2854	0.3742
0.25							0.0492	0.1033	0.1675	0.2421	0.3283	0.4325
0.30							0.0512	0.1100	0.1867	0.2758	0.3812	0.4950
0.35							0.0521	0.1171	0.2108	0.3171	0.4450	0.5650
0.40							0.0529	0.1262	0.2450	0.3737	0.5233	0.6492
0.45							0.0517	0.1458	0.2983	0.4575	0.6125	0.7308
0.50							0.0650	0.1892	0.3862	0.5754	0.7096	0.8021
0.55							0.0846	0.2812	0.5171	0.6887	0.7900	0.8575
0.60							0.1596	0.4550	0.6550	0.7787	0.8508	0.9008
0.65						0.0350	0.3646	0.6137	0.7587	0.8425	0.8954	0.9337
0.70						0.2462	0.5650	0.7254	0.8271	0.8879	0.9283	0.9575
0.75					0.0808	0.4892	0.6871	0.8017	0.8742	0.9212	0.9517	0.9742
0.80					0.3875	0.6342	0.7667	0.8512	0.9075	0.9442	0.9696	0.9867
0.85				0.2254	0.5667	0.7200	0.8208	0.8867	0.9312	0.9604	0.9808	0.9933
0.90				0.4592	0.6617	0.7767	0.8596	0.9129	0.9475	0.9725	0.9883	0.9983
0.95			0.3346	0.5783	0.7225	0.8175	0.8854	0.9321	0.9600	0.9800	0.9925	1.0000
1.00		0.1283	0.4833	0.6487	0.7667	0.8483	0.9062	0.9458	0.9683	0.9858	0.9971	1.0000
1.10	0.2208	0.4646	0.6117	0.7262	0.8171	0.8829	0.9283	0.9600	0.9787	0.9912	0.9983	1.0000
1.20	0.4104	0.5517	0.6692	0.7650	0.8429	0.9029	0.9392	0.9683	0.9837	0.9933	0.9983	1.0000
1.30	0.4879	0.5975	0.7004	0.7858	0.8562	0.9121	0.9437	0.9712	0.9842	0.9950	0.9983	1.0000
1.40	0.5237	0.6233	0.7167	0.7962	0.8621	0.9142	0.9446	0.9712	0.9842	0.9950	0.9983	1.0000
1.50	0.5312	0.6308	0.7217	0.8000	0.8625	0.9142	0.9446	0.9712	0.9842	0.9950	0.9983	1.0000

TABLE 2-2 (Continued)

(i) Run Ending for Series Hull Forms G, N, and P

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0							0.0025	0.0075	0.0183	0.0338	0.0567	0.0700
0.05							0.0342	0.0542	0.0888	0.1267	0.1583	0.2029
0.10						0.0096	0.0454	0.0775	0.1175	0.1617	0.2058	0.2662
0.15						0.0204	0.0538	0.0938	0.1400	0.1912	0.2462	0.3212
0.20						0.0288	0.0596	0.1058	0.1600	0.2204	0.2912	0.3788
0.25						0.0288	0.0629	0.1150	0.1779	0.2525	0.3396	0.4388
0.30						0.0342	0.0654	0.1229	0.2004	0.2900	0.3954	0.5038
0.35						0.0296	0.0667	0.1321	0.2271	0.3346	0.4583	0.5750
0.40						0.0275	0.0688	0.1467	0.2667	0.3946	0.5350	0.6579
0.45						0.0254	0.0767	0.1748	0.3250	0.4754	0.6267	0.7362
0.50						0.0262	0.0921	0.2254	0.3758	0.5871	0.7146	0.8050
0.55						0.0308	0.1183	0.3179	0.5362	0.6921	0.7921	0.8600
0.60						0.0433	0.2129	0.4721	0.6592	0.7792	0.8521	0.9029
0.65						0.0800	0.3800	0.6175	0.7521	0.8392	0.8979	0.9362
0.70						0.2700	0.5525	0.7217	0.8229	0.8871	0.9312	0.9604
0.75					0.0975	0.4646	0.6733	0.7917	0.8742	0.9229	0.9546	0.9762
0.80					0.3583	0.6046	0.7542	0.8442	0.9108	0.9467	0.9712	0.9875
0.85				0.1650	0.5196	0.6967	0.8088	0.8842	0.9338	0.9617	0.9825	0.9946
0.90				0.3858	0.6183	0.7525	0.8492	0.9117	0.9479	0.9204	0.9883	0.9971
0.95			0.2100	0.5162	0.6846	0.7954	0.8775	0.9283	0.9583	0.9788	0.9933	0.9992
1.00			0.3925	0.5922	0.7321	0.8288	0.8962	0.9408	0.9662	0.9338	0.9962	1.0000
1.10		0.3667	0.5483	0.6838	0.7933	0.8692	0.9212	0.9567	0.9758	0.9908	0.9979	1.0000
1.20	0.3054	0.4838	0.6183	0.7288	0.8175	0.8842	0.9292	0.9625	0.9796	0.9933	0.9979	1.0000
1.30	0.3979	0.5350	0.6504	0.7479	0.8292	0.8917	0.9325	0.9642	0.9808	0.9923	0.9979	1.0000
1.40	0.4433	0.5625	0.6654	0.7588	0.8362	0.8950	0.9329	0.9512	0.9808	0.9933	0.9979	1.0000
1.50	0.4550	0.5700	0.6717	0.7633	0.8396	0.8958	0.9329	0.9642	0.9808	0.9933	0.9979	1.0000

TABLE 2-2 (Continued)

(j) Run Ending for Hull Form H

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1240	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0							0.0042	0.0083	0.0208	0.0508	0.0683	0.0721
0.05							0.0329	0.0604	0.0888	0.1279	0.1592	0.1983
0.10							0.0450	0.0767	0.1150	0.1613	0.2075	0.2654
0.15						0.0142	0.0508	0.0883	0.1363	0.1908	0.2500	0.3246
0.20						0.0221	0.0529	0.0971	0.1542	0.2179	0.2904	0.3788
0.25						0.0267	0.0550	0.1063	0.1742	0.2488	0.3379	0.4408
0.30						0.0300	0.0563	0.1158	0.1950	0.2850	0.3917	0.5054
0.35						0.0275	0.0575	0.1279	0.2200	0.3308	0.4554	0.5758
0.40						0.0238	0.0613	0.1438	0.2588	0.3900	0.5317	0.6542
0.45						0.0217	0.0671	0.1679	0.3179	0.4917	0.6200	0.7350
0.50						0.0213	0.0792	0.2063	0.4033	0.5800	0.7029	0.8008
0.55						0.0263	0.1063	0.3050	0.5296	0.6817	0.7875	0.8588
0.60						0.0383	0.1792	0.4729	0.6588	0.7763	0.8558	0.9033
0.65						0.1075	0.4025	0.6217	0.7600	0.8450	0.9008	0.9358
0.70						0.7888	0.5583	0.7142	0.8263	0.8892	0.9308	0.9579
0.75					0.1429	0.4763	0.6833	0.7996	0.8746	0.9221	0.9542	0.9750
0.80					0.3804	0.6150	0.7638	0.8492	0.9067	0.9446	0.9696	0.9858
0.85					0.5792	0.7071	0.8167	0.8858	0.9296	0.9600	0.9808	0.9933
0.90				0.4175	0.6388	0.7683	0.8554	0.9121	0.9421	0.9704	0.9875	0.9975
0.95			0.2683	0.5375	0.7021	0.8079	0.8804	0.9296	0.9579	0.9779	0.9921	0.9992
1.00			0.4250	0.6154	0.7475	0.8375	0.9004	0.9425	0.9671	0.9833	0.9950	1.0000
1.10	0.0925	0.4075	0.5729	0.7004	0.8008	0.8729	0.9246	0.9583	0.9779	0.9908	0.9992	1.0000
1.20	0.3379	0.5075	0.6333	0.7417	0.8283	0.8917	0.9350	0.9650	0.9825	0.9946	1.0000	1.0000
1.30	0.4263	0.5546	0.6658	0.7633	0.8425	0.9013	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000
1.40	0.4675	0.5783	0.6833	0.7742	0.8479	0.9033	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000
1.50	0.4838	0.5888	0.6908	0.7783	0.8492	0.9033	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000

TABLE 2-2 (Concluded)

(k) Run Ending for Series Hull Forms I and J

Waterline	Station and x/L_R Measured from AP											
	-1½	-1	-½	0	½	1	1½	2	2½	3	3½	4
	-0.1250	-0.0833	-0.0417	0	0.0417	0.0833	0.1250	0.1667	0.2083	0.2500	0.2917	0.3333
0							0.0042	0.0083	0.0208	0.0508	0.0683	0.0721
0.05							0.0329	0.0604	0.0888	0.1279	0.1592	0.1983
0.10							0.0450	0.0767	0.1150	0.1613	0.2075	0.2654
0.15						0.0142	0.0508	0.0883	0.1363	0.1908	0.2500	0.3246
0.20						0.0221	0.0529	0.0971	0.1542	0.2179	0.2904	0.3788
0.25						0.0267	0.0550	0.1063	0.1742	0.2488	0.3379	0.4408
0.30						0.0300	0.0563	0.1158	0.1950	0.2850	0.3917	0.5054
0.35						0.0275	0.0575	0.1279	0.2200	0.3308	0.4554	0.5758
0.40						0.0238	0.0613	0.1438	0.2588	0.3900	0.5317	0.6542
0.45						0.0217	0.0671	0.1679	0.3179	0.4917	0.6200	0.7350
0.50						0.0213	0.0792	0.2063	0.4033	0.5800	0.7029	0.8008
0.55						0.0263	0.1063	0.3050	0.5296	0.6817	0.7875	0.8588
0.60						0.0383	0.1792	0.4729	0.6588	0.7763	0.8558	0.9033
0.65						0.1075	0.4025	0.6217	0.7600	0.8450	0.9008	0.9358
0.70						0.7888	0.5583	0.7142	0.8263	0.8892	0.9308	0.9579
0.75					0.1429	0.4763	0.6833	0.7996	0.8746	0.9221	0.9542	0.9750
0.80					0.3804	0.6150	0.7638	0.8492	0.9067	0.9446	0.9696	0.9858
0.85					0.5792	0.7071	0.8167	0.8858	0.9296	0.9600	0.9808	0.9933
0.90				0.4175	0.6388	0.7683	0.8554	0.9121	0.9421	0.9704	0.9875	0.9975
0.95			0.2083	0.5375	0.7021	0.8079	0.8804	0.9296	0.9579	0.9779	0.9921	0.9992
1.00			0.4250	0.6154	0.7475	0.8375	0.9004	0.9425	0.9671	0.9833	0.9950	1.0000
1.10	0.0925	0.1075	0.5729	0.7004	0.8008	0.8729	0.9246	0.9583	0.9779	0.9908	0.9992	1.0000
1.20	0.3379	0.5075	0.6333	0.7417	0.8283	0.8917	0.9350	0.9650	0.9825	0.9946	1.0000	1.0000
1.30	0.4263	0.5546	[illegible]	0.7633	0.8425	0.9013	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000
1.40	0.4575	0.5783	0.6833	0.7742	0.8479	0.9033	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000
1.50	0.4538	[illegible]	[illegible]	0.7783	0.8492	0.9033	0.9383	0.9658	0.9833	0.9950	1.0000	1.0000