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THE GEORGE WASHINGTON UNIVERSITY

LOGISTICS RESEARCH PROJECT

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REPORT ON LOGISTICS PLANNING FACTORS

(Under ONR Contract N7ont-419 - Task Order 4)

(Revised 12 July 1951)

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THE GEORGE WASHINGTON UNIVERSITY
LOGISTICS RESEARCH PROJECT

REPORT ON LOGISTICS PLANNING FACTORS

(Under ONR Contract N7onr-419 - Task Order 4)

PREFACE

The George Washington University Logistics Research Project, operating under Contract Number N7onr-41904 to the Office of Naval Research, presents herein a group of logistics planning factors which have been compiled from sources within the Naval Establishment. Some of these factors, such as those referring to POL products, have been in use for a considerable period of time and their accuracy is reasonably reliable; others have been collected from the best sources available, but in general are untested and hence their reliability is uncertain.

The planning factors contained herein represent only the initial efforts of the Logistics Research Project to furnish a complete coverage of the logistics resupply problems which are the primary responsibility of the Navy. Other factors covering the requirements of the Navy Air Arm, Navy advanced bases, Marine, Air Force and Army units operating in the field are currently being assembled and will be released for test and check upon completion.

It is the earnest desire of the Logistics Research Project to revise and correct these planning factors as necessary in order that they may truly reflect the actual requirements of the forces

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afloat and may be used by logistic planners with reasonable assurance that the results will be accurate. This task cannot be fulfilled without the cooperation of the personnel using and testing these figures for the experience and background of officers trained in logistics, strategy and tactics are invaluable as a testing ground. Therefore, comments and criticisms, either favorable or unfavorable, are invited.

The Logistics Research Project desires to express its appreciation to the Naval War College for the assistance and cooperation which its faculty has rendered from the inception of this task. In particular, the criticisms, comments and encouragement given the project by Captain H. E. Eccles and members of his Logistics Department staff are gratefully acknowledged.

11 May 1951

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THE GEORGE WASHINGTON UNIVERSITY
LOGISTICS RESEARCH PROJECT

REPORT ON LOGISTICS PLANNING FACTORS

(Under ONR Contract N7onr-419 - Task Order 4)

1. Introduction. The purpose of this report is to make available in a convenient form a set of planning factors for the determination of requirements of an operation. The set of planning factors presented here is incomplete in that it covers only resupply requirements for naval vessels and is designed primarily for use at theater or task force levels. It is, however, sufficiently complete to illustrate the methods involved and to test the usefulness of the format.

The form and spirit of this work are based on C. B. Tompkins' paper *Numerical Simulation of an Operation*. It is strongly recommended that this paper be read thoroughly before any attempt is made to utilize the tables presented here. This report should be regarded as a supplement to Dr. Tompkins' paper in that it supplies the details and tables necessary to carry out a real problem.

2. Table of Independent Potentials. In order to determine the logistics requirements for an operation it is necessary to describe quantitatively the operation or those parts of it upon which the requirements depend. This description is precisely the function of the table of potentials given in Appendix II. The first column of this table is a list of organizational units such as battleships, cruisers,

etc. The remainder of the table consists of ten columns containing numbers which are additive and such that any particular row describes the potentiality of the corresponding organizational unit to consume commodities in a day of operations under specified standard conditions. Each of the columns is devoted to the consumption of commodities in a way essentially independent of the way described in other columns; here independence implies that the entry in no column is predictable with acceptable accuracy from the entries in the other columns by any formula not taking into account (in considerable detail) the type of organization. (For the present tables the above statement is not strictly correct. Because of the lack of more acceptable data the general stores column is a multiple of the complement column.)

This notion of independence can be made more explicit by comparing the potential for consuming food with the potential for wearing out clothing. Each depends directly on the total population available to eat the food or wear the clothes, and the consumption of either one can be obtained from the other. In this case the potentials are dependent. An example of a potential independent of either of the foregoing is the potential to consume ammunition which does not depend on the population but on the number and type of weapons that can be directed against the selected target.

Clearly in the case of dependent potentials either one of them could be chosen as the independent one. The set of independent

potentials that have been used is listed below:

NO.	POTENTIAL	UNIT
I	Consumption of Black Fuel	Average long tons consumed per day under standard operating conditions.
II	Consumption of Clean Fuel	Same as for I.
III	Complement	Number of men. This potential differs from the others in that it is not a consumption. However, it is a convenient description of many consumptions such as food and clothing.
IV	Consumption of men	Average number of men replaced per day under standard conditions.
V	Consumption of Spare Parts	Average number of measurement tons consumed per day under standard conditions.
VI	Consumption of Large Equipments (Deck Cargo).	Average number of square yards of large equipment consumed per day under standard conditions.
VII	Consumption of General Stores	Average number of measurement tons of general stores consumed per day under standard conditions.
VIII	Consumption of Ammo. Against Surface Targets	Average consumption in long tons per day under standard conditions.
IX	Consumption of Ammo. Against Subsurface Targets	Similar to VIII
X	Consumption of Ammo. Against Air Targets	Similar to VIII

For convenience the numbers in the table have been restricted to four digits and for this reason these numbers frequently differ from the above units by a power of ten. This difference is adjusted in the conversion factor.

3. The Table of Standard Conditions and List of Conversion Factors.

In the foregoing description of the potentials the consumption rates were based on certain undefined standard conditions. If a commander is to make a quantitative comparison of his situation with the standard one, it is necessary that the latter be explicitly stated. It seems possible to do this, but so far as can be determined it has never been done in a completely satisfactory way. The table in Appendix II is a preliminary attempt to state the standard conditions. It is incomplete and should not be regarded as fixed in format. Considerably more work will have to be done before it becomes clear what form such a table should take. In spite of these defects the table does define the numbers in the table of independent potentials and can be used as a basis for the estimation of judgment factors.

The list of conversion factors appearing in Appendix III is actually a list of planning factors. These factors convert the activity levels into logistics requirements. The list has four columns. The first column is devoted to a list of the commodity categories. These categories have been chosen on an arbitrary basis involving three things: convenience, type of shipping required, and existing planning factors. The second column gives

the independent potential upon which the consumption depends. The third and fourth columns contain the conversion factors and the units of measure.

4. The Three Factor Scheme -- A Sample Problem. The use of these tables to compute requirements is quite simple and is based on the following equation:

$$\text{Expected Consumption} = \text{Summary Potential} \times \text{Conversion Factor} \times \text{Judgment Factor}.$$

The summary potentials are found from the table of independent potentials in a way that will be illustrated later. The conversion factor is, of course, taken from the list of conversion factors in Appendix III. The judgment factor must be based on the estimate of the situation and the plan of action. This factor reflects decisions of the commander to exploit his forces' potentials to a greater or lesser degree than normal. For example, the commander might decide that since refrigerated ships were in short supply the refrigerated portion of normal rations should be reduced by fifty percent. This means simply that the judgment factor for refrigerated provisions would be 0.50. In general, that is, under standard conditions, the judgment factor should be unity.

To illustrate the methods involved a sample problem of relative simplicity is worked out below. The problem is quite unrealistic and unsophisticated and is designed to illustrate only the computation and the use of the tables.

The forces and the judgment factors have been assigned

arbitrarily. The following is a list of the forces:

Organizational Unit	No. of Units	Organizational Unit	No. of Units
BB61	3	DD421	3
BB55	1	DD692	6
BB57	2	DD425	20
CB1	2	DD710	4
CA32	1	DM23	5
CA134	3	DMS19	3
CL(AA)53	4	AM136	2

The BB's and the DD's (except all DD425) are to remain in operation for 60 days; while the CB's, CA's, and the CL(AA)'s will operate for 75 days; and the remaining vessels for 90 days.

The judgment factors are:

- 1.00 for Black Fuels, Clean Fuels, & their derivatives
- 1.00 for Personnel Replacement
- 1.20 for Spare Parts
- 1.00 for General Stores & Clothing & Small Stores
- 1.50 for all Ammunition
- 0.80 for Ships' Stores
- 1.00 for Dry Provisions
- 0.75 for Refrigerated Provisions

It should be noted that all of the judgment factors are unity except for Spare Parts, Ammunition, Ships Stores and Refrigerated provisions.

The summary potentials are obtained in Work Sheet 1 using the Table of Independent potentials in Appendix I.

4.1 Description of Work Sheet 1. The first column -- organizational number -- lists the number of the organizational unit for identification purposes. The second column -- unit days -- gives the number of days that the particular unit remains in operation. For example, the organizational unit numbered 0300 is a destroyer

of the DD421 class. In this case there were three DD421's each operating for sixty days. Thus the unit days are $3 \times 60 = 180$. The other column headings are the same as those of the Table of Potentials. To obtain the entries in these columns simply multiply the columns of the Table of potentials by the appropriate unit days. Then the total of each column gives a set of ten numbers called the summary potentials.

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WORK SHEET 1

SUMMARY POTENTIALS FOR RESUPPLY
(For a given period of operations)

ORG. NO.	UNIT DAYS	I	II	III	IV	V	VII	VIII	IX	X
0001	180	32,760	-	44,280	427,320	190,800	388,080	266,220	-	197,460
0010	60	11,640	-	12,900	134,760	58,200	112,860	87,000	-	51,480
0020	120	19,560	-	25,800	275,280	115,680	225,720	174,000	-	102,960
0100	150	23,400	-	30,000	251,250	131,100	262,050	75,900	-	99,300
0110	75	6,150	-	8,175	115,300	54,375	71,775	20,325	-	24,450
0140	225	19,800	-	36,675	553,950	189,675	320,625	69,975	-	83,475
0180	300	19,800	-	22,800	296,100	169,200	201,000	23,400	-	103,500
0300	180	8,820	-	5,040	85,320	44,460	43,560	3,960	2,160	13,140
0320	1,800	108,000	-	59,400	853,200	444,600	520,200	39,600	21,600	131,400
0330	360	21,960	-	12,600	190,080	100,080	110,160	10,080	360	47,160
0340	240	16,080	-	8,400	131,040	64,800	73,440	9,120	240	26,160
0510	450	16,650	-	14,950	277,200	81,900	130,500	15,750	-	16,650
0515	270	7,290	-	6,750	147,960	38,880	59,130	2,700	-	7,560
0520	180	-	360	1,800	32,220	18,900	16,380	720	-	2,340
TOTAL		311,910	360	289,470	3,771,480	1,702,650	2,535,480	798,750	24,360	907,035

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4.2 Description of Work Sheet 2. In Work Sheet 2 the summary potentials, the list of conversion factors and the judgment factors are combined to give the expected consumption in each of the fourteen selected categories. The first column of Work Sheet 2 is a list of the fourteen categories. The summary potentials upon which the particular consumptions depend are entered in the second column. Column three contains the judgment factors and column four lists the conversion factors.

The calculation of requirements is now quite easy and consists of taking the product of columns two, three and four and entering the result into column five. The numbers in column five are the expected consumption of the fourteen commodity categories.

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WORK SHEET 2

COMPUTATION OF RESUPPLY REQUIREMENTS

I COMMODITY	II SUMMARY POTENTIAL	III JUDGMENT FACTOR	IV CONVERSION FACTOR	V EXPECTED CONSUMPTION Col. II x Col. III x Col. IV	VI UNITS
Black Fuel	311,910	1.00	1	311,910	L.T. ¹
Clean Fuel	360	1.00	1	360	L.T.
Personnel	3,771,480	1.00	10 ⁻³	3,772	MEN
Spare Parts	1,702,650	1.20	10 ⁻³	2,043	M.T. ²
General Stores	2,535,480	1.00	10 ⁻³	2,535	M.T.
Ammunition Surface	798,750	1.50	10 ⁻³	1,198	L.T.
Ammunition Subsurface	24,360	1.50	10 ⁻³	37	L.T.
Ammunition Air	907,035	1.50	10 ⁻³	1,361	L.T.
Lube Oils	311,910	1.00	607 x 10 ⁻⁶	208	L.T.
Clothing & Small Stores	289,470	1.00	24 x 10 ⁻⁴	695	M.T.
Ships Stores	289,470	0.80	93 x 10 ⁻⁴	2,154	M.T.
Dry Provisions	289,470	1.00	23 x 10 ⁻³	6,658	M.T.
Refrigerated Provisions	289,470	0.75	21 x 10 ⁻³	6,079	M.T.

¹L.T. -- long ton = 2240 lbs.²M.T. -- measurement ton = 40 cubic feet~~SECRET~~

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APPENDIX I

TO LOGISTICS PLANNING FACTORS

TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.B.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0001	BB-45,000 TONS	0061	0182 ¹	0000	0246 ²	2374 ⁴	1060 ⁶	0000	2156 ⁵	1479 ³	0000 ³	1097 ³
0010	BB-35,000 TONS	0055	0194	0000	0215	2246	0970	0000	1881	1450	0000	0858
0020	BB-35,000 TONS	0057	0163	0000	0215	2294	0964	0000	1881	1450	0000	0858
0030	BB-32,400 TONS	0043	0083	0000	0213	2724	0840	0000	1865	0980	0000	0700
0040	BB-32,000 TONS	0045	0075	0000	0201	2724	0840	0000	1759	1110	0000	0846
0100	CB-27,000 TONS	0001	0156	0000	0200	1675	0874	0000	1747	0506	0000	0662
0110	CA- 9,950 TONS	0032	0082	0000	0109	1544	0725	0000	0957	0271	0000	0325
0120	CA-10,000 TONS	0045	0081	0000	0112	1412	0721	0000	0980	0300	0000	0549
0130	CA-13,600 TONS	0068	0075	0000	0153	1258	0734	0000	1339	0300	0000	0549
0140	CA-17,000 TONS	0134	0088	0000	0163	2462	0843	0000	1425	0311	0000	0371
0150	CL- 9,700 TONS	0040	0079	0000	0122	1564	0617	0000	1088	0304	0000	0210
0160	CL-10,000 TONS	0055	0086	0000	0121	1282	0632	0000	1058	0340	0000	0409
0170	CL-17,700 TONS	0144	0063	0000	0127	1326	0751	0000	1110	0439	0000	0224
0180	CL(AA)6,000 TONS	0053	0066	0000	0076	0987	0564	0000	0670	0078	0000	0345
0200	CVB-45,000 TONS	0041	0226	0000	0346	5278	1074	0000	3028	0129	0000	1153
0210	CV-27,000 TONS	0009	0177	0000	0264	3215	0913	0000	2307	0039	0000	0726
0220	CVL-11,000 TONS	0022	0113	0000	0137	1903	0579	0000	1201	0097	0000	0316
0230	CVL-14,500 TONS	0048	0121	0000	0144	1992	0646	0000	1257	0001	0000	0316
0240	CVE- 9,800 TONS	0009	0034	0000	0082	2032	0462	0000	0719	0143	0000	0505
0250	CVE-11,400 TONS	0026	0052	0000	0095	1539	0413	0000	0830	0170	0000	0364

¹Ref.-1³Ref.-3⁵Ref.-5²Ref.-2⁴Ref.-4⁶Ref.-6

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.R.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0260	CVE-7,800	0055	0059 ¹	0000 ¹	0061 ²	1328 ⁴	0435 ⁶	0000	0711 ⁵	0143 ³	0000 ³	0364 ³
0270	CVE-10,900	0105	0073	0000	0078	1177	0488	0000	0678	0010	0000	0498
0300	DD-1620	0421	0049	0000	0028	0474	0247	0000	0242	0022	0183	0073
0310	DD-1630	0423	0055	0000	0028	0474	0247	0000	0242	0022	0012	0073
0320	DD-2050	0425	0060	0000	0033	0474	0247	0000	0289	0022	0183	0073
0330	DD-2200	0692	0061	0000	0035	0528	0278	0000	0306	0028	0087	0131
0340	DD-2425	0710	0067	0000	0035	0546	0277	0000	0306	0036	0087	0109
0400	SS	0417	0000	0005	0008	0272	0096	0000	0070	0001	0041	0001
0420	SS	0339	0000	0005	0008	0223	0096	0000	0070	0001	0035	0001
0470	SSA	0317	0000	0005	0007	0222	0086	0000	0060	0001	0018	0001
0475	SSG	0346	0000	0005	0008	0222	0079	0000	0072	0001	0035	0001
0480	SSK	0001	0000	0005	0008	0222	0077	0000	0067	0001	0035	0001
0485	SSO	0362	0000	0005	0007	0218	0074	0000	0062	0001	0035	0001
0490	SSP	0313	0000	0005	0007	0222	0077	0000	0060	0001	0035	0001
0495	SSR	0419	0000	0005	0009	0226	0087	0000	0082	0001	0035	0001
0500	CM-5277	0005	0021	0000	0053	1364	0329	0000	0461	0010	0000	0125
0510	DM-2200	0023	0037	0000	0033	0616	0182	0000	0290	0035	0000	0037
0515	DMS-1630	0019	0027	0000	0025	0548	0144	0000	0219	0010	0000	0028
0520	AM-890	0100	0000	0005	0010	0229	0106	0000	0086	0004	0000	0013
0525	AM-651	0136	0000	0002	0010	0179	0105	0000	0091	0004	0000	0013
0530	AMS-270	0410	0000	0001	0003	0075	0194	0000	0029	0003	0000	0007
0550	DE-(T.E.)-1400	0051	0019	0000	0021	0422	0171	0000	0184	0035	0016	0091

1Ref.-1

3Ref.-3

5Ref.-5

2Ref.-2

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.B.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0555	DE-(T.E.)-1350	0339	0016 ¹	0000 ¹	0021 ²	0252 ⁴	0172 ⁶	0000	0184 ⁵	0035 ³	0016 ³	0091 ³
0560	DE-Diesel-1200	0099	0000	0010	0019	0476	0178	0000	0169	0007	0000	0026
0565	PC-295	0461	0000	0003	0007	0147	0073	0000	0058	0002	0007	0011
0570	PCE-640	0861	0000	0002	0009	0273	0273	0000	0082	0003	0000	0055
0575	PCS-251	1376	0000	0002	0006	0104	0073	0000	0048	0003	0000	0011
0580	T-33	0613	0000	0002	0002	0044	0005	0000	0017	0000	0001	0002
0600	AGC-7150	0001	0014	0000	0016	1318	0499	0000	0144	0005	0000	0090
0605	APA-10,210	0018	0031	0000	0033	0631	0236	0000	0289	0009	0000	0029
0608	APA-8429	0021	0024	0000	0033	0631	0236	0000	0289	0009	0000	0029
0610	APA-10,812	0025	0033	0000	0033	0631	0236	0000	0299	0009	0000	0029
0615	APA-8,100	0033	0027	0000	0038	0952	0244	0000	0336	0005	0000	0056
0620	APA-6,720	0117	0028	0000	0031	0296	0261	0000	0274	0033	0000	0053
0625	AKA-7,000	0012	0025	0000	0023	0616	0217	0000	0204	0009	0000	0040
0630	APD-1400	0037	0021	0000	0017	0379	0187	0000	0116	0002	0000	0024
0635	APD-1400	0087	0014	0000	0017	0283	0187	0000	0152	0002	0000	0024
0640	DEC-1400	DE217	0018	0000	0021	0312	0172	0000	0184	0035	0000	0091
0645	PCC-315	0463	0000	0001	0007	0152	0088	0000	0058	0002	0000	0011
0650	PCEC-640	0873	0000	0002	0009	0219	0099	0000	0082	0003	0000	0037
0655	LSV-5000	0001	0026	0000	0039	0592	0322	0000	0340	0008	0000	0036
0660	LSD-4490	0001	0045	0000	0035	0815	0255	0000	0307	0003	0000	0044
0665	LST-1625	0001	0000	0002	0011	0243	0142	0000	0099	0001	0000	0039
0670	LSM-520	0001	0000	0003	0036	0086	0094	0000	0052	0002	0000	0013

¹Ref.-1 ³Ref.-3 ⁵Ref.-5

²Ref.-2 ⁴Ref.-4 ⁶Ref.-6

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.R.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0675	LSIL & M-209	0351	0000 ¹	0001 ¹	0003 ²	0043 ⁴	0103 ⁵	0000	0028 ⁵	0001 ³	0000 ³	0000 ³
0680	LSFF, LSSL-234	0367	0000	0001	0003	0043	0103	0000	0030	0001	0000	0003
0685	LSU-143	0501	0000	0001	0001	0014	0049	0000	0011	0001	0000	0001
0700	AD-9, 450	0014	0023 ⁸	0000 ⁸	0108 ⁹	3565 ¹¹	1089 ¹²	0000	0942 ¹⁰	0011 ⁷	0000 ⁷	0071 ⁷
0701	AD	0016	0030	0000	0081	2399	1063	0000	0711	0002 ⁷	0000 ⁷	0038 ⁷
0702	AD	0020	0012	0000	0081	1954	1008	0000	0711	0008	0000	0076
0703	AD-8, 165	0022	0012	0000	0081	1964	1008	0000	0711	0008	0000	0090
0704	AD-8, 165	0026	0030	0000	0081	1964	1008	0000	0711	0002	0000	0038
0710	AE	0003	0000	0007	0027	0468	0210	0000	0232	0012	0000	0035
0711	AE	0010	0000	0009	0029	0523	0187	0000	0254	0007	0000	0035
0712	AE	0020	0000	0004	0027	0317	0181	0000	0232	0007	0000	0035
0713	AE-steam	0012	0016	0000	0028	0359	0239	0000	0242	0011	0000	0049
0720	AF-steam	0010	0014	0000	0024	0450	0217	0000	0207	0007	0000	0007
0721	AF-steam	0348	0006	0000	0024	0450	0204	0000	0206	0002	0000	0050
0722	AF	0011	0000	0005	0023	0510	0202	0000	0198	0001	0000	0005
0723	AF	0030	0000	0004	0008	0153	0183	0000	0070	0001	0000	0005
0730	AGB-3, 500	0001	0000	0013	0031	0728*	0224	0000	0274	0001	0000	0020
0731	AGS-steam	0015	0032	0000	0038	0247*	0187	0000	0336	0001	0000	0034

¹Ref.-1 ³Ref.-3 ⁵Ref.-5 ⁷Ref.-3 ⁹Ref.-2 ¹¹Ref.-4

²Ref.-2 ⁴Ref.-4 ⁶Ref.-6 ⁸Ref.-1 ¹⁰Ref.-5 ¹²Ref.-8

*NOTE: Figures obtained by interpolation.

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.B.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0732	(AOS)-AVP-1,695	0030	0000 ⁸	0006 ⁸	0022 ⁹	0524 ¹¹	0155 ¹²	0000	0194 ¹⁰	0005 ⁷	0000 ⁷	0041 ⁷
0740	AH-4,070	0012	0039	0000	0062	0674	0092	0000	0543	0001	0000	0001
0750	AK	0156	0000	0004	0008	0156	0185	0000	0066	0003	0000	0005
0752	AKL	0001	0000	0001	0004	0078*	0179	0000	0034	0001	0000	0001
0754	AKN	0006	0011	0000	0035	0682*	0075	0000	0304	0002	0000	0040
0756	AKS	0001	0016	0000	0021	1107	1059	0000	0184	0008	0000	0007
0760	AN-500	0006	0000	0001	0005	0096	0094	0000	0042	0002	0000	0003
0761	AN-545	0078	0000	0001	0005	0136	0097	0000	0042	0002	0000	0003
0770	A0	0022	0041	0000	0029	0469	0185	0000	0249	0008	0000	0062
0771	A0	0036	0033	0000	0026	0505	0178	0000	0223	0007	0000	0046
0772	A0	0041	0031	0000	0026	0456	0178	0000	0223	0007	0000	0046
0773	A0	0049	0031	0000	0026	0427	0178	0000	0223	0003	0000	0010
0780	AOS-2,020	0001	0000	0004	0012	0320	0148	0000	0104	0008	0000	0003
0781	A0G	0068	0000	0002	0012	0320*	0120	0000	0104	0008	0000	0002
0790	AP-22,900	0021	0120	0000	0072	0419	0297	0000	0631	0007	0000	0077
0791	AP-16,662	0074	0064	0000	0045	0639	0233	0000	0394	0023	0000	0070
0792	AP	0110	0055	0000	0046	0763	0270	0000	0405	0009	0000	0070
0800	APB	0035	0000	0001	0013	0215*	0094	0000	0116	0001	0000	0032
0802	APC	0096	0000	0001	0003	0051*	0217	0000	0027	0000	0000	0001
0804	APL	0002	0000	0002	0007	0107*	0005	0000	0062	0001	0000	0002
0810	AR-9,100	0005	0018	0000	0098	1666	0867	0000	0854	0010	0000	0055
0811	AR-9,600	0009	0017	0000	0095	4211	0835	0000	0828	0002	0000	0022

7 Ref.-3 9 Ref.-2 11 Ref.-4 *NOTE: Figures obtained by interpolation.
 8 Ref.-1 10 Ref.-5 12 Ref.-6

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.B.M. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0812	AR	0019	0009 ⁸	0000 ⁸	0062 ⁹	1341 ¹¹	0740 ¹²	0000	0543 ¹⁰	0004 ⁷	0000 ⁷	0045 ⁷
0820	ARB	0001	0000	0002	0026	0622	0446	0000	0226	0002	0000	0046
0822	ARG-4, 200	0002	0007	0000	0054	0762	0555	0000	0469	0006	0000	0022
0824	ARG	0018	0027	0000	0066	1958	0670	0000	0575	0002	0000	0037
0826	ARH	0001	0020	0000	0098	2029	0894	0000	0856	0008	0000	0054
0828	ARL	0001	0000	0002	0025	0440	0488	0000	0219	0001	0000	0046
0830	ARS	0006	0000	0002	0010	0206	0157	0000	0083	0001	0000	0016
0833	ARSD	0001	0000	0002	0006	0124*	0169	0000	0055	0001	0000	0001
0836	ARST	0001	0000	0003	0017	0161*	0134	0000	0147	0001	0000	0004
0840	ARV	0001	0007	0000	0036	0893	0239	0000	0317	0002	0000	0052
0842	ARVA	0005	0000	0003	0024	0525	0123	0000	0209	0001	0000	0034
0844	ARVE	0005	0000	0003	0024	0525*	0123	0000	0208	0001	0000	0032
0850	AS-steam-10,700	0022	0010	0000	0095	0911	0810	0000	0827	0008	0000	0026
0851	AS-steam	0023	0011	0000	0095	1192	0810	0000	0827	0008	0000	0026
0852	AS-9,250	0011	0000	0010	0113	2205	0909	0000	0991	0016	0000	0054
0853	AS	0013	0000	0008	0095	1887	0895	0000	0827	0008	0000	0008
0860	ASR	0005	0000	0003	0010	0010	0156	0000	0089	0004	0000	0003
0861	ASR-1,780	0007	0000	0003	0010	0222	0156	0000	0089	0004	0000	0003
0862	ASR	0012	0000	0003	0010	0153	0157	0000	0084	0002	0000	0001
0870	ATA-600	0121	0000	0001	0005	0097	0086	0000	0040	0001	0000	0003

7Ref.-3 9Ref.-2 11Ref.-4

8Ref.-1 10Ref.-5 12Ref.-6

*NOTE: Figures obtained by interpolation.

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TABLE OF INDEPENDENT POTENTIALS FOR RESUPPLY OF FLEET UNITS

I.B.N. Number	Short Title	Navy Serial or Type No.	I Black Fuel	II Clean Fuel	III Complement	IV Personnel Replacement	V Spare Parts	VI Deck Cargo	VII General Stores	VIII Ammo. Surface	IX Ammo. Subsurface	X Ammo. Air
0872	ATF-1,280	0067	0000 ⁸	0005 ⁸	0009 ⁹	0204 ¹¹	0102 ¹²	0000	0075 ¹⁰	0002 ⁷	0000 ⁷	0008 ⁷
0873	ATF-1,280	0096	0000	0004	0009	0184	0102	0000	0075	0302	0000	0008
0880	AV-8,625	0004	0017	0000	0084	1563	0368	0000	0731	0004	0000	0083
0891	AV-9,090	0007	0017	0000	0084	1378	0339	0000	0731	0010	0000	0111
0882	AV	0008	0013	0000	0078	1312	0313	0000	0631	0002	0000	0009
0883	AV	0010	0013	0000	0078	1304	0313	0000	0681	0001	0000	0033
0884	AV-9,000	0014	0013	0000	0078	1312	0296	0000	0681	0012	0000	0047
0890	AVP-1,695	0010	0000	0006	0022	0524	0182	0000	0194	0004	0000	0033
0892	AVS	0008	0007	0000	0024	0598	0237	0000	0214	0008	0000	0023
0895	AW	0003	0016	0000	0022	0368	0174	0000	0189	0008	0000	0039

7Ref.-3 9Ref.-2 11Ref.-4

8Ref.-1 10Ref.-5 12Ref.-6

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REFERENCES

1. *U. S. Navy Vessels Wartime Fuel Consumption*, (CNO Serial 00104-P40, 2/21/50) (SECRET)
2. *BUPers, List of Complements*. (RESTRICTED)
3. *Navord, Ammunition Allowance Lists*. (RESTRICTED)
4. *Mustor Roll Recapitulation Sheet*, (NavPers 605-D) (UNCLASSIFIED)
5. *Logistics Reference Data*, (NavSanda Publication 94, Par. 216, Table 216A, PP. 2-14) (CONFIDENTIAL)
6. (a) *Ordinance Equipment Lists*, (Navord O.D. ---) (RESTRICTED)
(b) *BuShips Spare parts* (from BuShips Code 453, 9 April 1948) (UNCLASSIFIED)
(c) *Fabulated Data of Vessel Electronic Maintenance Parts Stowage Requirements*, (from BuShips Code 961, November 1950) (RESTRICTED)

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APPENDIX II

STANDARD CONDITIONS

ORG. UNITS	TIME UNDERWAY % MO.	TIME NOT UNDERWAY % MO.	TIME IN REPAIR OVERHAUL % MO.	AVGE. SPEED KTS.	AMMO. CONSUMPTION RATE PER MONTH ¹
BB61	63	22	15	18.0	30
BB65	63	22	15	18.0	30
BB57	63	22	15	18.0	30
BB43	51	34	15	13.5	30
BB46	51	34	15	13.5	30
CB1	63	22	15	18.0	30
CA32	57	28	15	17.0	30
CA45	57	28	15	17.0	30
CA68	57	28	15	17.0	30
CA134	57	28	15	17.0	30
CL40	57	28	15	16.0	30
CL55	57	28	15	16.0	30
CL144	57	28	15	16.0	30
CL(AA)53	57	28	15	18.0	30
CVB41	63	22	15	18.0	30
CV9	63	22	15	18.0	30
CVL22	63	22	15	18.0	30
CVL48	63	22	15	18.0	30
CVE9	60	25	15	15.5	30
CVE26	60	25	15	15.5	30
CVE55	60	25	15	15.5	30
CVE105	60	25	15	15.5	30
DD421	60	30	10	19.0	30
DD423	60	30	10	19.0	30
DD445	60	30	10	19.0	30
DD692	60	30	10	19.0	30
DD710	60	30	10	19.0	30
CM5	20	72	8	16.0	13.34
DM23	50	40	10	15.5	13.34
DMS19	50	40	10	15.5	13.34
AM100	50	40	10	14.0	13.34
AM136	40	50	10	12.0	13.34
AMS410	40	50	10	9.0	13.34
AMS436	40	50	10	9.0	13.34
DE51	55	35	10	14.0	20
DE339	55	35	10	14.0	20
DE99	55	35	10	14.0	20
PC461	40	51	9	13.0	20
PCE881	40	51	9	13.0	20
PCS1376	60	30	10	10.0	20
PT613	30	60	10	20.0	20

¹The figures in this column represent the percent of total allowance of ammunition. See Ref.-3

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ORG. UNIT	TIME UNDERWAY % MO.	TIME NOT UNDERWAY % MO.	TIME IN REPAIR OVERHAUL % MO.	AVGE. SPEED KTS.	AMMO. CONSUMPTION RATE PER MONTH ¹
AGC1	20	70	10	15.0	13.34
APA18	40	50	10	16.5	13.34
APA21	40	50	10	16.5	13.34
APA25	40	50	10	16.5	13.34
APA33	40	50	10	16.5	13.34
APA117	40	50	10	16.5	13.34
AKA12	40	50	10	15.0	13.34
APD37	45	45	10	15.0	13.34
APD87	45	45	10	15.0	13.34
DEC217	40	50	10	16.0	13.34
PCC463	30	61	9	9.0	13.34
PCEC873	30	61	9	9.0	13.34
LSV1	50	41	9	15.0	13.34
LSD1	45	46	9	15.0	13.34
LST1	30	61	9	8.0	13.34
LSM1	30	61	9	8.0	13.34
LSIL&M351	30	61	9	8.0	13.34
LSFF367	30	61	9	8.0	13.34
LSSL1	30	61	9	8.0	13.34
LSU501	40	51	9	8.0	13.34
AD14	15	77	8	15.0	13.34
AD16	15	77	8	15.0	13.34
AD20	15	77	8	15.0	13.34
AD22	15	77	8	15.0	13.34
AD26	15	77	8	15.0	13.34
AS22	15	77	8	15.0	13.34
AS23	15	77	8	15.0	13.34
AS11	15	77	8	15.0	13.34
AS13	15	77	8	15.0	13.34
ASR7	10	82	8	15.0	13.34
ASR12	10	82	8	15.0	13.34
AR5	10	82	8	15.0	13.34
AR9	10	82	8	15.0	13.34
AR19	10	82	8	13.0	13.34
ARB1	10	82	8	9.0	13.34
ARG18	10	82	8	15.0	13.34
ARG2	10	82	8	10.0	13.34
ARH1	10	82	8	17.6	13.34
ARL1	10	82	8	10.0	13.34
AV7	15	75	10	14.0	13.34
AV14	15	75	10	14.0	13.34
AV4	15	75	10	14.0	13.34

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STANDARD CONDITIONS

ORG. UNIT	TIME UNDERWAY % MO.	TIME NOT UNDERWAY % MO.	TIME IN REPAIR OVERHAUL % MO.	AVGE. SPEED KTS.	AMMO. CONSUMPTION RATE PER MONTH ¹
AV8	15	75	10	14.0	13.34
AV10	15	75	10	14.0	13.34
AVP10	20	72	8	18.0	13.34
AVS8	35	55	10	11.0	13.34
ARV1	10	82	8	10.0	13.34
ARVA5	10	82	8	11.0	13.34
ARVE3	10	82	8	11.0	13.34
ARS5	10	82	8	13.0	13.34
ARSD1	10	82	8	12.3	13.34
ARST1	10	82	8	11.0	13.34
ATF67	50	42	8	12.0	13.34
ATF96	50	42	8	12.0	13.34
ATA121	35	57	8	10.0	13.34
AE3	35	55	10	14.0	13.34
AE10	35	55	10	13.7	13.34
AE20	35	55	10	11.0	13.34
AE12	35	55	10	14.0	13.34
AF10	35	55	10	11.0	13.34
AF28	35	55	10	11.0	13.34
AF48	35	55	10	11.0	13.34
AF30	35	55	10	11.0	13.34
AF11	35	55	10	11.0	13.34
AP21	48	42	10	18.5	13.34
AP110	48	42	10	18.5	13.34
AP74	48	42	10	18.5	13.34
APC86	35	55	10	10.0	13.34
A022	55	35	10	15.0	13.34
A049	55	35	10	15.0	13.34
A036	55	35	10	15.0	13.34
A041	55	35	10	15.0	13.34
A001	30	62	8	10.0	13.34
A0068	30	62	8	10.0	13.34
AK156	40	50	10	11.0	13.34
AKL1	30	60	10	10.0	13.34
AKN6	20	72	8	12.0	13.34
AKS1	30	60	10	12.0	13.34
AKS20	30	60	10	12.0	13.34
AW3	10	82	8	13.0	13.34
A0B1	50	40	10	13.0	13.34
A0S16	60	32	8	14.0	13.34
A0S (AVP30)	60	32	8	11.0	13.34
AN18	40	52	8	16.5	13.34

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STANDARD CONDITIONS

ORG. UNIT	TIME UNDERWAY % MO.	TIME NOT UNDERWAY % MO.	TIME IN REPAIR OVERHAUL % MO.	AVGE. SPEED KTS.	AMMO. CONSUMPTION RATE PER MONTH ²
AN6	20	72	8	8.0	13.34
AN78	20	72	8	8.0	13.34
APB35	10	62	8	8.0	13.34

FOR ALL TYPE SUBMARINES

Submarine data is not given in above form. Fuel consumption for submarines is computed on the basis of overhaul cycles.

AVGE. PATROL (DAYS)	TIME ENROUTE (DAYS)	TIME ON STATION (DAYS)	TIME UNDERWAY DURING CYCLE (DAYS)	LENGTH OF CYCLE (DAYS)	% OF TIME UNDERWAY
46	19	27	344	511	67.3

NOTE -- Standard Conditions for Spare Parts: 16.67% per month of total ordnance spare parts allowances; 33.33% per month of total electronic spare parts allowances; 8.33% per month of total ships' parts spare parts allowances.

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SECURITY INFORMATION

APPENDIX III

CONVERSION FACTORS

COMMODITY	INDEPENDENT POTENTIAL	CONVERSION FACTOR	UNITS OF MEASUREMENT
Black Fuel	I	1	L. T. / DAY
Clean Fuel	II	1	L. T. / DAY
Personnel	IV	10^{-3}	MEN / DAY
Spare Parts	V	10^{-3}	M. T. / DAY
Deck Cargo	VI	1	YDS ² / DAY
General Stores	VII	10^{-3}	M. T. / DAY
Ammo. Surface Targets	VIII	10^{-2}	L. T. / DAY
Ammo. Subsurface Targets	IX	10^{-2}	L. T. / DAY
Ammo. Air Targets	X	10^{-2}	L. T. / DAY
Clothing & Small Stores	III	$24 \times 10^{-4}^*$	M. T. / DAY
Ships Stores	III	$93 \times 10^{-4}^*$	M. T. / DAY
Dry Provisions	III	$23 \times 10^{-3}^*$	M. T. / DAY
Refrigerated Provisions	III	$21 \times 10^{-3}^*$	M. T. / DAY
Lubricating Oils	I	$367 \times 10^{-6}^{**}$	L. T. / DAY
Lubricating Oils	II	$19 \times 10^{-3}^{**}$	L. T. / DAY
Greases	I	384×10^{-5}	L. T. / DAY
Greases	II	104×10^{-5}	L. T. / DAY

*Based on Logistics Reference Data, Bayonne, New Jersey,
Table 202A.

**See APPENDIX I, Ref.-1, P. viii.

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