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Lt Col F. W. Herberth. CGSC. 1946-47.

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METHODS OF SHIPMENT OVERSEAS SUPPLY

A STUDY OF THE WAYS SHIPS WERE
LOADED TO TRANSPORT SUPPLY
REQUIREMENTS OF OUR
TROOPS OVERSEAS

FRANK W. HERBERTH, JR.
LT. COL. T.C.

METHODS OF SHIPMENT-----OVERSEAS SUPPLY

I. HISTORICAL BACKGROUND AND STATEMENT OF THE PROBLEM

Methods of Shipment - Overseas Supply is a study of the various ways in which ships were loaded to transport the supply requirements of our troops overseas. It is a trite but true statement that a chain is as strong as its weakest link; and in the global war just ended, it might even be said that the whole United States Army was as strong as its supply chain. Since all active theaters of operation were overseas, the United States Army was wholly dependent upon ocean transport in making its strength effective against the enemy. World War II was often referred to as a "Battle of Shipping". With a war of the tremendous proportions of the one just completed, it is easy to over-simplify and generalize facts, but even considering the insatiable demands made upon every element of our nation's economy and every branch of our services, it is true that shipping stood at the forefront of difficulties encountered in the early stages of the war. The problems of shipping changed during the war in the same order that the fortunes of war varied and each new phase of warfare brought with it a new shipping problem of procedures and the methods of shipment.

" During the war there were 126,787,875 measurement tons of supply planned, handled, and moved. This went to 330 different ports and beaches.¹ This meant that domestic and foreign ports and facilities, trained personnel, proper equipment and quantities of ships were required. These factors had to be integrated into a well-regulated working machine run according to a well-developed plan. Our degree of UNpreparedness to meet these demands was absolutely astonishing. At the outbreak of the war in Europe, the Army Transport Service was operating only two ports of embarkation--one at New York, the other at

1: Report of the Chief of Transportation ASF World War II

San Francisco. Personnel and equipment were scarcely adequate to handle a peacetime basis of overseas supply for Puerto Rico, the Philippines, Hawaii, Panama, and Alaska.....and these only. A far cry from global war ! Besides this, the majority of the cargo to these ports moved by commercial steamship as the Army Transport fleet prior to World War II consisted of six combination troop and freight ships and two freighters!!. Our commercial fleet, too, was inadequate. On December 1, 1941 the ocean-going passenger, dry cargo, and tank vessels under the flag of the United States aggregated about 11,600,000 dead weight tons. When it is realized that during the war we built a total of 5280 ocean-going vessels aggregating 54,224,100 dead weight tons, it readily can be seen that ships themselves were a prime critical item.

The shortage of personnel was almost as critical a condition. Approximately 40% of the personnel of the ports of embarkation were employed in the loading of ships. At the outbreak of war this highly trained and specialized personnel was non-existent and had to be enlisted from commercial companies in order to properly handle, to properly receive, segregate, and stow cargo for overseas shipment.

To proceed with every requirement and tell that it was completely lacking can become merely repetitious; its only possible value being to emphasize. Let it suffice to say that statistics in each instance show the same unbelievable proportions and the amazing fact that we were beginning to supply a global war front of unequalled dimensions with the army supply services practically unburn. In not only the largest and most obvious items such as ships, but down to such small details as standard nomenclature and initial theater requirements, codes, and methods of markings, the system was virtually non-existent. To illustrate, let me relate an incident which occurred: A trainload consisting of organizational equipment arrived at a port of embarkation with a bill of lading marked

"1000 pieces Military Impedimenta". Upon examination of these cars it was found that they contained vehicles, guns, organizational equipment; in other words all the TE equipment for a unit plus their baggage. Arriving the same day and to be loaded aboard the same ship for a different destination was another unit with " Military Impedimenta". Neither unit thought it necessary to mark any of its equipment or to identify the contents of any of its boxes. The stress of meeting a deadline for the sailing of the vessel necessitated the loading of this cargo without marking; and to further complicate the situation, resupply cargo was arriving unmarked for the same destinations. It is no wonder that the ports of debarkations found it impossible to make proper deliveries to proper units and depots and that the theater commanders were confused. This incident multiplied many times gives one a picture of the situation.

It must be remembered that during this time vessels were carrying many types of cargo for units widely separated, for supply depots, and civilian supply for civilian populations, relief organizations, the American Red Cross, and lend-lease. In addition it was necessary for a single vessel to make ports of call at two, three, sometimes four destinations. The development of a satisfactory system to cover both shipments accompanying troop movements and routine supply shipments proved extremely difficult and no substantial progress was made until well into 1943. By then a system of shipment numbers to identify unit movements, shipping designators (four letter words) to indicate overseas areas, and colors to facilitate the identification of cargoes according to services was developed. Ports of embarkation then carefully inspected cargoes and markings to see that they were in accordance with instructions. No longer could everything arrive with no more detailed instruction than " Military Impedimenta".

Small wonder then that the first vessels to be loaded were less "loaded" than " filled". The lack of any formulated plan,

the lack of equipment and cargo to follow a plan had there been one, and a desire to send the fighting areas something... anything...everything...led to the practice of stowing the vessels with all the cargo it was humanly possible to place aboard. This type of loading is known as bulk shipments. Supply necessary to build up stock piles in England and Australia were rushed to destinations by this method. The unusual sizes and shapes of Army cargo coupled with the fact a considerable part of the equipment was shipped unboxed, created numerous handling and stowage problems which the stevedore does not encounter in peacetime. The fact that so many items were bulky in relation to weight made it difficult to get ships down to their marks. Another important factor which led to the unbalanced cargo and imperfect stowage in these early days was the speed with which some ships had to be loaded in order to meet urgent requests from the theaters or convoys. There was no time to wait for the cargo that would give a proper balance; what was already on hand and available had to fill the bill. In other words, ships were loaded to utilize the cubic capacity and on-deck space disregarding any planned movement. Deck loads continued to pyramid until ships lost their recognizable lines and it was found necessary to have platforms built on top of the bridge in order to see ahead. In spite of these radical departures from commercial loading, ports of embarkation never lost sight of the basic principle of ship stability. The loading of a ship is a fine art and one can never forget these time-proven factors.

The result of this type of loading was keenly felt by the theaters as it required extensive segregation at the port of debarkation where space and facilities were inadequate to handle this polyglot mixture of cargo. Cries of " Help" and " Sabotage " from the theater commanders brought about minor changes in loading such as top-stowing mail for first discharge

and recommendations for protection of deckloaded equipment and giving Air Corps supply top priority stowage. Groups were sent to the various theaters to study conditions and to recommend methods of alleviating the above mentioned problems but conditions in the ZI had not become stabilized enough to adopt all the methods suggested. Sometimes, too, the critical condition was aggravated in the theater itself. This was especially true in ship turn-around delay. Delays arose from ports that were poorly equipped both as to dock facilities and cargo handling equipment. Also there was a shortage of labor to unlead the ships and to transport the cargo to dumps or warehouses. Considerable effort was made to remedy these conditions but due to a fast moving war and with new ports being opened, a shortage resulted in train^{ed} troop units to supply the theaters. Native labor was sometimes inefficient in quality and insufficient in quantity to be of much assistance. The swift moving tactical situation often required ships to discharge critical items at ports and beaches other than the original destination.

In reality this defensive phase of the war was not all chaos and confusion. Out of trial and error something was taking shape, actually these early months of the war constituted the formative period of the logistical system. The parties responsible for shipping were discovering their possibilities and limitations; the theater commanders were learning how to anticipate their requirements. Each learned what the other needed to best accomplish their common purpose. Let it here be said that the personnel loading the ships never lost sight of their primary purpose and function, knowing that their job in the war was to deliver the kind of supplies the fighting men needed, where it was needed, on time, and in condition to use. Fully realizing this important fact the port commanders were constantly alert to the need of adapting supply methods

to meet changing conditions. This meant the necessity of developing special types of stowage planned and tailored to meet theater requirements under all conditions...plans that would be flexible enough to meet changes that were within the limits of our shipping capabilities.

II. METHODS OF SHIPMENT

A. BULK SHIPMENTS

As has been stated above, Bulk Loading, that is the utilization of the entire carrying capacity of the ship dis-
regarding the segregation of cargoes/^{either} by branch of service or commodity, was the type of loading used to supply the initial bases in Australia and England prior to any active combat. Bulk Loading allowed the carrying of the largest amount of cargo in the ships that were available because it meant the choosing of the cargo that completely filled the ship down to every last cubic foot regardless of the nature of the commodity that would fit the empty space. In spite of its undesirability, this method may have to be used again in the event that there is a shortage of critical shipping at a time of unusual stress.

B. COMMODITY SHIPMENTS

Commodity Shipments is that method of shipment which involves the filling of a vessel with a single type of supply or with supplies of a single service. Ammunition, Class I Supplies, lumber, boxed vehicles, and similar types of cargo were commodity loaded in order to minimize segregation in the theaters. In the case of ammunition a slight modification was used. If a Liberty ship were loaded entirely with ammunition a large percentage of free space would remain when the

vessel was loaded " down to its marks " or loaded to its weight capacity. To better utilize the full capacity of the ship, the weight of light bulky cargo such as aeroplanes was deducted from the ammunition tonnage and used as topping-off cargo without overloading the ship. In other words, a full ship of ammunition would be about 7,000 weight tons but if the ship were filled to weight capacity with ammunition only there would remain approximately 2,000 measurement tons of space and all the deck areas. By deducting, say, 500 tons ~~of~~ ~~space~~ for the weight of the aircraft and loading just 6,500 weight tons of ammunition, the remaining space as well as tonnage could be utilized.

Another type of combination-commodity shipments was used in the case of tankers where additional cargo could be shipped on the same vessel by creating additional space. A false deck, called a Mechano Deck, was placed over the pipes, valves, and outlets on a normal tanker deck. This false decking was used to carry light bulky cargo such as aeroplanes and landing craft. Altogether about five hundred American and British tankers were fitted in this manner and they carried 16,500 assembled and 4,000 crated aircraft as well as other types of cargo. ² Assembled aeroplanes for overseas delivery were also carried on Baby Flat-tops. ZEC's were converted Liberty ships with wide hatches and removable stanchions in the hold to accommodate aeroplanes. The transportation of so many aircraft by these ingenious modifications released a large amount of space on regular cargo ships for other purposes in addition to providing relatively safe passage for the aircraft. The combination-commodity shipments utilized space that would have been wasted under other methods of shipment and still kept the required commodity status.

One of the classic commodity type ships developed was the mule carriers. These " floating picket lines " were vessels converted for the sole purpose of transporting mules. The

ships were fitted with stalls and sanitary features and the hatch squares were kept clear so that there would be room to exercise the animals during the voyage. Hay, oats, and other necessary forage required by the animals during the voyage and after arrival at destination were stowed in the lower holds. Troops necessary to care for the animals during the voyage lived in " dog houses ", temporary quarters on deck.

Other types of ships used for particular commodities were the refrigerator ships and barges, marine repair ships, and technical service barges.

In certain types of commodity shipping the nature of the cargo will not fully utilize the carrying capacity of the vessel; as in, for example, the mule ships and the ZEC's. However, by adaptation of commodity loaded ships even this disadvantage can be somewhat diminished. The advantage of commodity shipments is that it enables the theater to discharge directly to depots without segregation or to take out that portion which they require and divert the ship to another port requiring the same type commodity.

The establishment of shipments not requiring segregation was an initial step which led to the future development of a type of loading known as block shipments. As the war progressed, block shipments themselves were improved and modified in many ways, but that phase of the subject will be discussed later in this paper.

C. PRESTOWED SHIPMENTS

Prestowed Shipments were shipments that were placed aboard the ships according to advance planning. The loading of a ship, as has been mentioned, is a fine art; calculations must be made in order to keep the vessel in trim and stable and to make sure that she is seaworthy. These calculations are made on the basis of weight and mass, that is a certain

percentage of weight must be in the lower holds of the ship to offset cargo carried in the upper holds and on deck. Similarly the proportion of weight forward and aft must be balanced. Keeping these basic principles in mind, the actual placement of cargo by type and commodity can be worked into a plan or prestowed prior to the actual loading of the vessel.

The development of prestowed shipments was first brought about by Coast Guard Regulations covering the loading of ammunition ships. The Coast Guard Regulations prescribe that certain classes of ammunition cannot be stowed together in the same holds or in adjacent holds. Furthermore, they prescribe that lockers must be built to segregate classes of ammunition. In order to load 7,000 tons of ammunition to a single vessel maintaining the desired lot segregation required by Ordnance plus the class segregation demanded by the Coast Guard, many hours of prestowing will be required prior to the actual loading. In fact, Coast Guard requires a preliminary stowage plan to be submitted for their approval prior to loading.

By expanding this prestowed idea to commodity, combat, and block shipments, the ports of embarkation soon found the need for a large Cargo-Planning Section in the Water Division which prepared advance stowage plans which showed where each item was to be loaded, keeping in mind such critical factors as unloading facilities at the ship's destination, the placing of heavy lifts in hatches with heavy lift booms, protection of pilferable cargo, safe stowage of hazardous or fire-potential cargo, refrigerated stowage for medical supplies such as serums, vaccines, and blood plasma, and the segregation and distribution of all cargoes required for the particular type of shipment.

Prestowed shipments corrected many of the faults developed in the ports, for here was a complete plan carefully worked out in advance by men who were experts in this type

of work and schooled in recognizing the army requirements. The preliminary stowage plans were sent to all military and civilian personnel having charge of the actual loading of the vessels and these plans were their guide for the loading of each vessel from beginning to end. If any change became necessary during the loading procedure, a supplement was issued as a correction.

The advantage of prestowed shipments was the introduction of a form of control over the port's loading procedure. Pertinent information as to amount and type of cargo, dimensions, destination, and priority coupled with the type of vessels available made the Cargo-Planning Section the best informed group to marry up the ships and cargo. Their careful study and final plan enabled the stevedoring group to physically administer the plan into the finished product...a vessel loaded entirely according to advance or preliminary stowage plans. In other words, all persons responsible for loading the ship during the entire operation were working from the same plan. Prior to the introduction of the prestowed plans the loading of each ship did not necessarily follow a set pattern and was subject to change by the pier officer who happened to be on duty. In many cases personnel working the day shift left the ship's space in such a poor condition that the night shift found it exceedingly difficult if not impossible to load the remaining cargo. Under prestowed shipments this condition cannot arise.

As we cover the next type of loading, Block Shipments, it will be seen that in order to meet the requirements of tailored loading it is necessary to prestow before the actual work is started if any workable solution is to be accomplished.

D. BLOCK SHIPMENTS

The attack phase of the war brought forth many new problems. In planning these operations, overseas commanders were finding it exceedingly difficult and awkward to reload supplies, ship them to new bases, then unload and store them again for each operation. The mounting of the combat units was difficult in itself but adding the resupply of these units to an already congested situation created a burden which exceeded the theaters' capabilities. What the theaters needed in order to resupply the combat missions was ships which were carefully prestowed and loaded with supply that would be readily available. Experience taught that just having the supplies aboard the vessel would not satisfy a critical demand. If troops ashore required 81MM mortar smoke shells or fuel for flame throwers they could not wait for tons of cargo to be removed or shifted before these items could be delivered. They needed it NOW ! The resulting procedure that came into being was a method of shipments known as Block Shipments. Of course, during this period of evolution the various types of shipments were not actually called block shipments; some were known as operational, special, echelon; others were called by code names or numbers. However, they all approximated the final definition of block shipments.....a method of shipment of supplies to an overseas theater to provide balanced stocks for an arbitrary balanced force for a specific number of days.

As has been mentioned, the rear bases were not developed nor had they the facilities and supplies to meet the requirements of such large operations. Therefore, it fell to the ZI ports of embarkation to meet the demand. Overseas commanders ordered supplies for a pending operation even before they had decided where they would want to receive the equipment. The ports gathered the supply and equipment setting aside certain

facilities in the port to receive and segregate the cargo so that it would not be lost amongst tons of other cargo moving through the port for other destinations. It can be seen that tailoring these shipments to meet theater requirements demanded a well thought out and carefully planned pre-stowage in order to permit rapid selective discharge.

The original shipments had defects that experience eliminated. It was found by the theaters that it was not practical to load each vessel with all essential items for all phases of an operation. Naturally in the early phase there was a heavy demand for Class V supplies. The need for Class III supplies was soon cared for by bulk tanker delivery. Consequently, selection of needed supplies involved removing cargo from several ships, and since no vessel was completely discharged of other cargo many partially loaded ships remained in the target area.

The next step for operational supply was the adoption of two types of Block Shipments. The initial stockage for dumps and depots was the Standard Block Shipments providing the first thirty days of supply of Classes I, II, III, and IV Supplies for all services. Class V was loaded as a commodity shipment. This thirty days of supply was to be followed by supplies furnished in solid block ships containing the following block types:

TYPES OF STANDARD-LOAD AND SOLID-LOAD RESUPPLY SHIPS

- Type A: Standard loaded with 30 D/S of classes I, II, III, and IV supplies, (less motor gasoline, Diesel and field range fuels, and CONSTRUCTION material), of all service for 25,000 troops.
- Type B: Solid loaded with 18^{D/S} of Quartermaster Class I supplies for 100,000 troops.
- Type C: Solid loaded with 30 D/S of balanced Class III supplies for 30,000 troops. (This type ship

to be employed only during early phases, until bulk storage is in operations).

- Type D: Solid loaded with 30D/S of Class III supplies for 175,000. (Contains greases, lubricants and fuels not stored in bulk installations. This ship to be employed after bulk storage is in operation.)
- Type E: Solid loaded with 30 D/S of Classes II and IV, quartermaster, signal, medical, chemical warfare and special service supplies, and engineer and ordnance spare parts and cleaning and preserving materials for 100,000 troops.
- Type F: Solid loaded with 0.5 U/F for all weapons of the ground combat elements of the force.
- Type G: Solid loaded with balanced engineer construction supplies and materials for 10 days estimated consumption.
- Type H: Solid loaded with balanced signal construction supplies and materials for 30 days estimated consumption.

Toward the end of the war there were thirteen types of block ships and by manipulation of the various types of blocks within the ships practically any desired combination of loads could be accomplished.

The block loading or grocery store system was used only during the combat phase of an operation. When an island was secured and changed to garrison status the block loading system was discarded because it was principally an expedient for the forward echelons in combat areas.

III. CONCLUSIONS

Methods of Shipment of overseas supply requires research and development just the same as a new tactical weapon. True, the basis of cargo movement may be found in commercial steamship practices but the tailoring and adaptation for army use to meet a world wide tactical situation demands a flexible plan to meet all exigencies.

When shipping is critical and fast building of supply is necessary, bulk shipments will provide the maximum tonnage. Certain supplies do lend themselves to commodity shipment providing the desired segregation and when carefully planned can utilize the full potential carrying capacity of the vessel. Block shipments is a MUST for the support of an operational mission. The extent to which these shipments are used is entirely dependent upon the situation and the number and types of ships available. If the operation be large and far-distant from the Zone of Interior, a large number of ships will be required to support the mission which will take a large percentage of available shipping. However, the converse may be true, such as the operation between England and France where the turn-around distance is short. In the case of short distances the loss of space in the vessel due to block shipments becomes negligible, as selection, accessibility, and reduced port time far outweigh the loss of space. In operations over long sea lanes our problem then becomes a matter of the vessel's productivity in relation to time. The long return trip produces nothing toward the war effort. The answer may be the establishment of large bases closer to the theater of operations, having personnel and facilities capable of loading block shipments. One factor that is essential and necessary for all type shipments is prestowage. This idea is tried and proved and should be an integral part of all shipments.

IV. RECOMMENDATIONS

1. That methods of shipments-overseas supplies be divided into two major classes: Regularly loaded ships and Specially loaded ships. Regularly loaded ships to be stowed to take full advantage of the ships' capabilities. Specially loaded ships to include three types: commodity loaded, balanced loaded, and selective discharge. Commodity loaded ships to include one commodity or predominantly one commodity with slight modification to take care of the ships' capacity. Balanced loads will be ships carrying a predetermined balanced supply for a fixed number of troops. Selective discharge will be ships loaded with predetermined required supply and stowed in such a manner as to be readily available upon call. Standardization of terms will aid all concerned in requisitioning the type load desired and those responsible for the loading will produce the type shipment required.

2. That active study be continued in the methods of shipment, incorporating current changes in the composition of equipment and supply for divisions and task forces.

3. That a study be made on ship designs determining the desired type to better meet the conditions required for the various types of army loading.

4. That air capabilities be included in the study to determine their portion of the supply lift to the total requirements for any operation.

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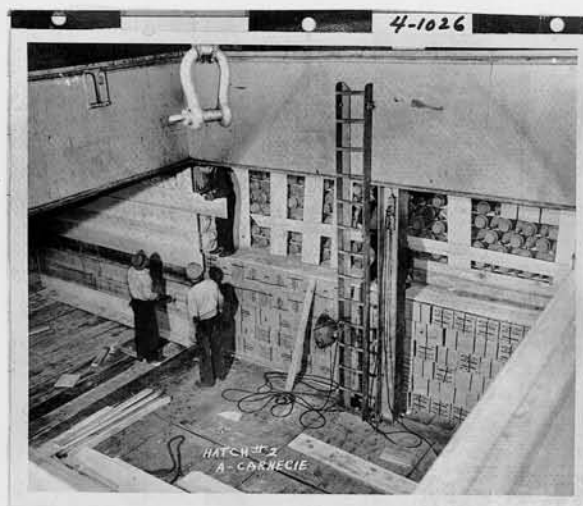


AMMUNITION
DISTRIBUTION
LOWER HOLD

SLIDES



AMMUNITION
DISTRIBUTION
TWEEN DECK



AMMUNITION - RATIONS
TWEEN DECK

PLAN - BLOCK LOADED
SHIP FOR SELECTIVE DISCHARGE

NOTE

Vessel has been planned to conform to Coast Guard Regulations and with fresh Water - No.2 deeps (NO.1 Hatch) only. Forward deep (NO.1's) may be used for some of the classes of smaller lots but they will not be selectively stowed.

To conform to the regulations the GWS item No.20 for P.S. smoke class II F amounting to 615 L/T, 725 M/T will have to go in one of the No.1 deep tanks. The same holds true of GWS items No.6 & 13 for 2 L/T, 1.6 M/T TH Incendiary class II J.

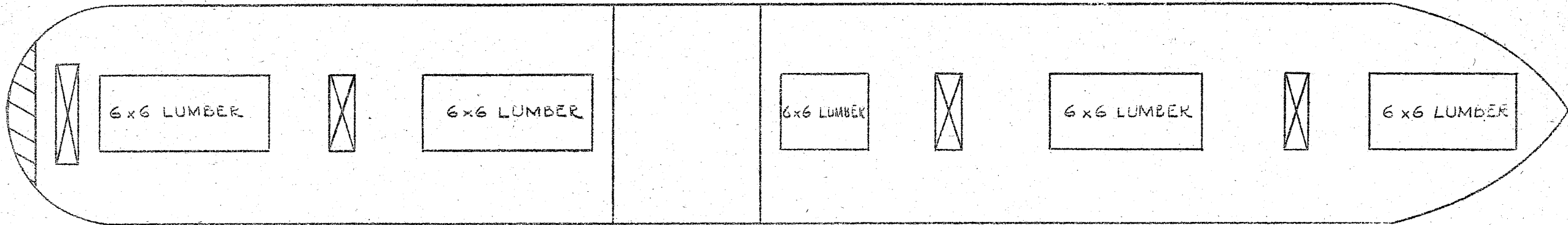
The class II J & II G could go in No.1 deep tank and II F in the other.

The cylinder's of CO 2 & Nitrogen may be stowed on deck.

If the class X 3.77 L/T, 3.56 M/T of mines and Bangalore torpedos - Class IX A .88 L/T, 1.55 M/T of flash Reducers - and class VIII 44 bxs Primers, go they will have to go on deck. A waiver will have to be granted for deck stowage. The Primers will have to be stowed where the 10' distance can be observed.

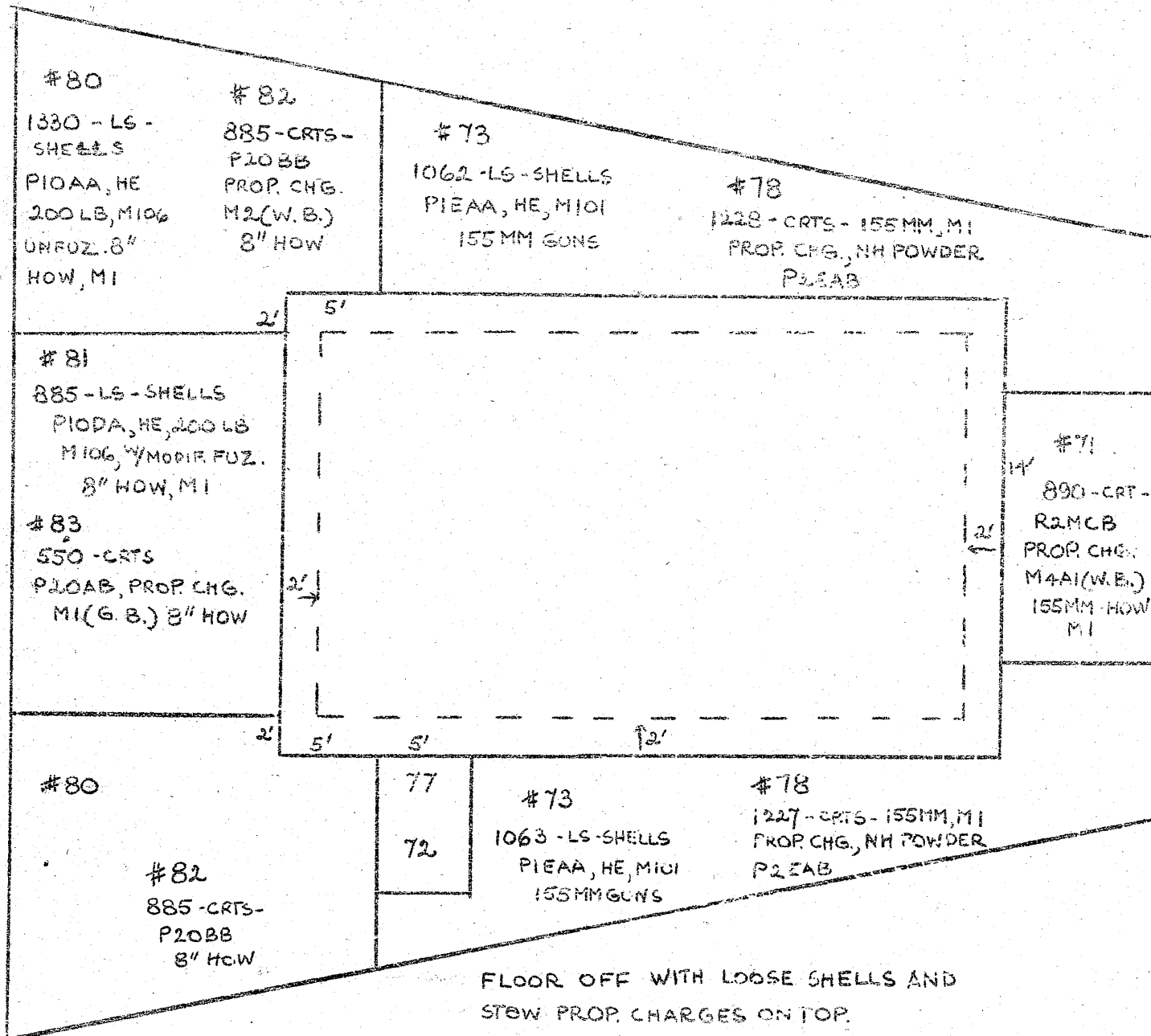
The 6x6 lumber should be stowed on deck over the squares of the Hatches.

ORDNANCE BLOCK 2 CLASS V } TWIG
 CWS 4



5		4		3		2		1	
CLASS I - IIC - IIE		CLASS III - IVA - IVB		CLASS IIB - IVB - VII		CLASS - INERT - I - IIB - IVA - IVB		CLASS IIB - IVB - VII	
S/ARMS CLEAR 298 1/2 T 227 M/T	PYRO-CHEMICAL - HC	FUZES CLEAR 398 1/2 T 338 M/T	FIXED & SEMI-FIXED AMMO	SMOKELESS POWDER CLEAR 345 1/2 T 297 M/T	PROP. CHGS. & SHELLS FIXED & SEMI-FIXED AMMO	S/ARMS CLEAR 494 1/2 T 450 M/T	FIXED & SEMI-FIXED & SMOKELESS PWDR. PROPS	PROP. CLEAR 419 1/2 T 323 M/T	CHGS. & SHELLS
CLASS IIB - IVB - VII		CLASS IIB - IVB - VII		CLASS IVB		CLASS IVB		CLASS IIB	
PROP. CHGS. & SHELLS SEMI-FIXED AMMO.		PROP. CHGS. & SHELLS FIXED & SEMI-FIXED AMMO.		FIXED & SEMI-FIXED AMMO.		FIXED & SEMI-FIXED AMMO.		W. P.	
843 L/T 626 M/T		1124 L/T 854 M/T		1241 L/T 995 M/T		1632 L/T 1296 M/T		607 1/2 T 507 M/T	
1141 L/T		1513 L/T		1556 L/T		3126 L/T		FRESH SEE NOTE ON	
								WATER ATTACHED SHEET	
								1026 L/T	

#1 - 1/0 - LIBERTY



NOTE:

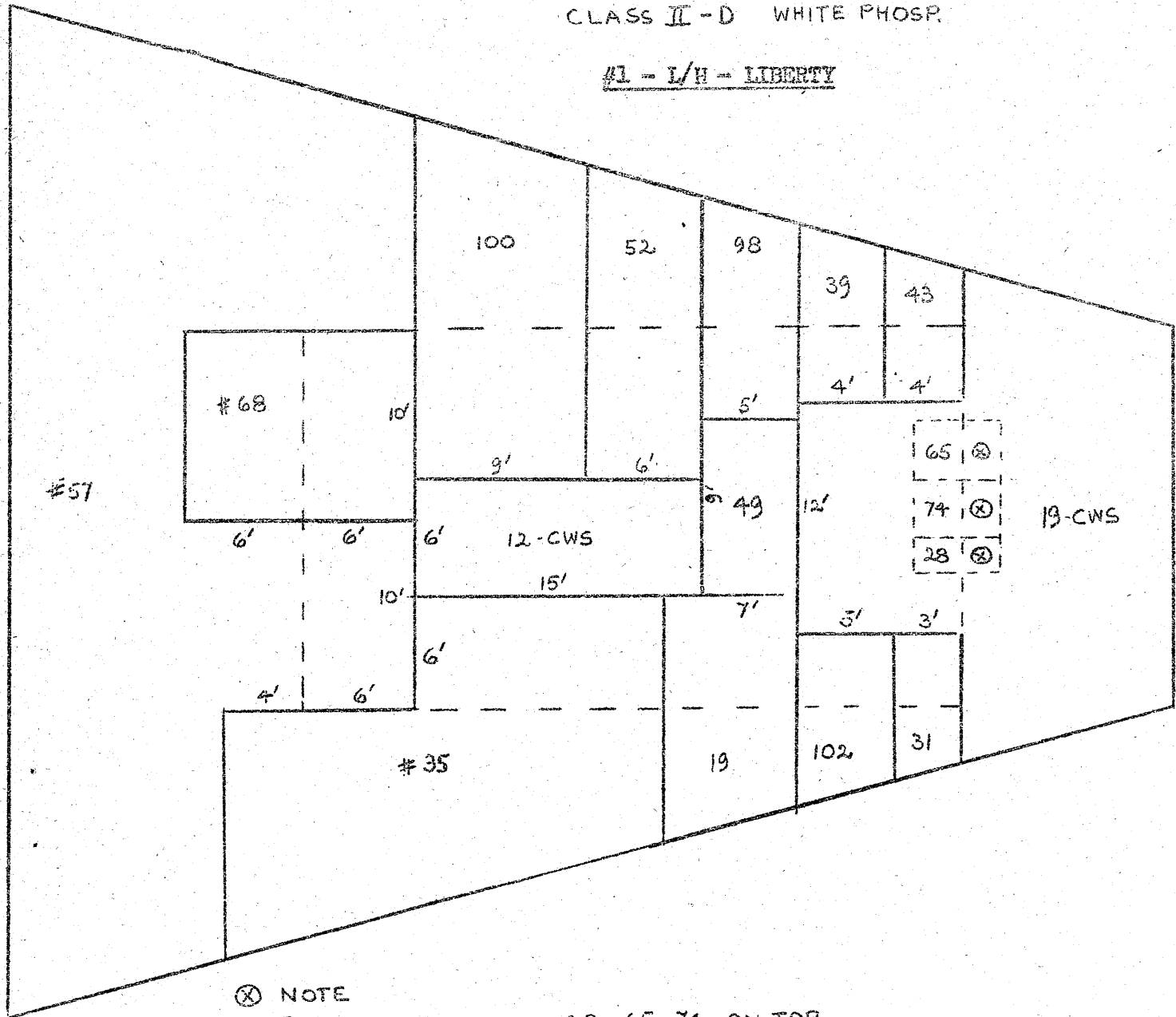
Item #72 - 350 Crts - 4.00 L/T - 8.00 M.T. Charge, propelling, M3 (B.B.) for 155mm How., M1 (Stock No. R2MAD)

Item #77 - 120 Lse. - 5.46 L/T - 1.8 M.T. Stock No. PLEMA Shell, illuminating, M118 for 155mm guns and How. M1.

TONNAGE RECAP. FOR #1 T/D:				
CLASS	Item No.	PKGS	L/T	M/T
IIB	71	890 Crts	12.00	19.70
IIB	72	350 "	4.00	8.00
VII	73	2125 Lse	90.21	36.12
IVB	77	120 "	5.46	1.80
IIB	78	2455 Crts	60.35	98.20
VII	80	1330 Lse	118.75	44.90
VII	81	885 "	79.41	33.20
IIB	82	1770 Crts	41.01	67.27
IIB	83	550 "	8.10	13.75
TOTAL			419.29	322.64

CLASS II - D WHITE PHOSP.

#1 - L/H - LIBERTY



⊗ NOTE
BLOCK STOW LGT NOS. 28 - 65 - 74 ON TOP
IN A SECURE AND ACCESSIBLE SPOT.

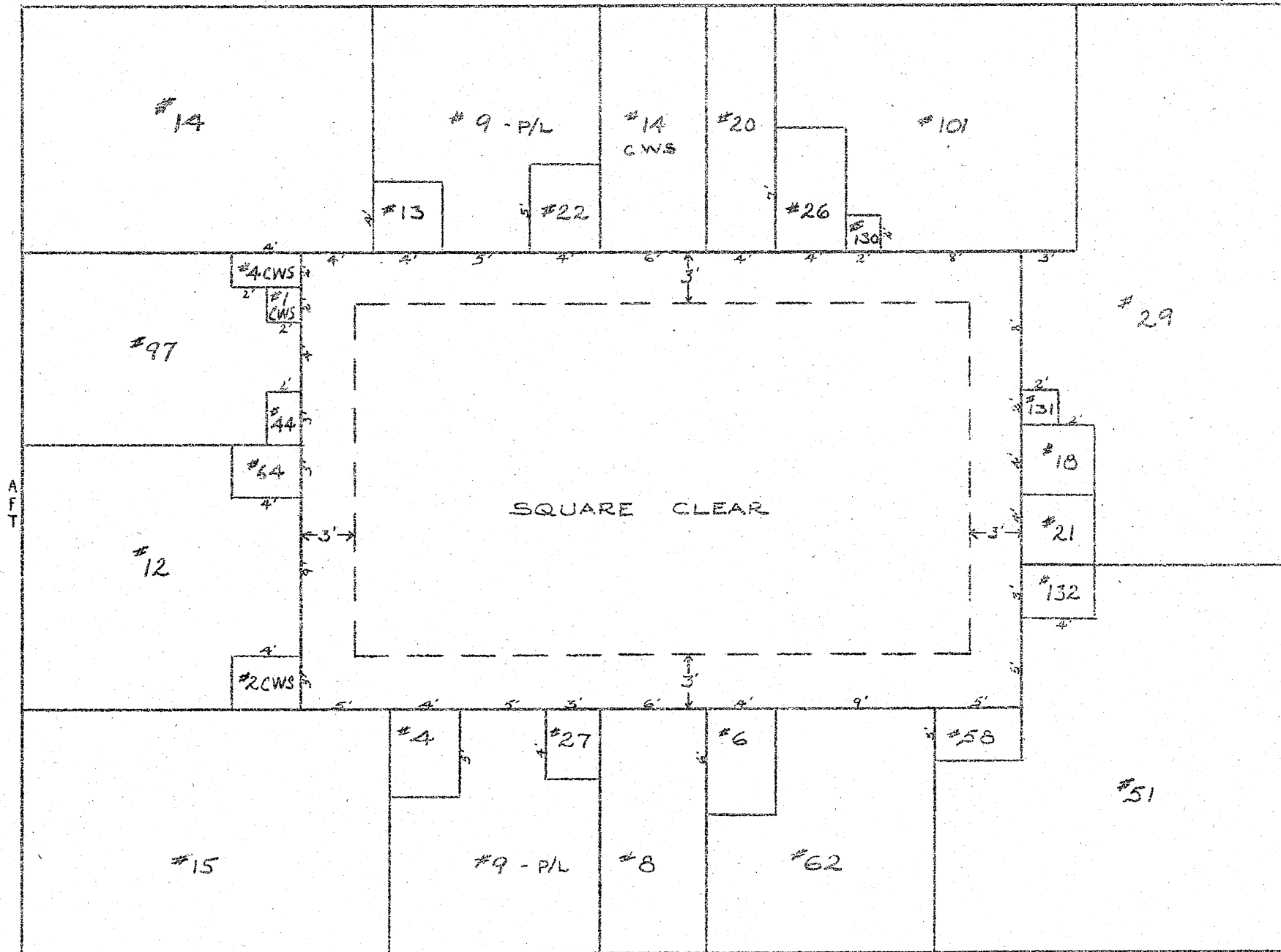
CLASS IID

NO.	STOCK NO.	PKGS. and NOMENCLATURE	L/T	M/T
CWS-12	212120	769 Exs. Grenade, smoke, WP, M15	16.13	19.80
CWS-19	213150	3279 " Shell, 4.2" Cml Mortar, WP	99.54	83.60
19	NLC	200 " Shell, fxd, smoke, WP, for 90mm guns	11.51	12.00
28	RLJAA	25 " Cart, smoke, WP, M308 (T23), w/ fuze, PD, M89 (T119E1) for 57mm rifle.	.47	.62
31	R4GJB	284 " Shell, smoke, WP, T6, (M302) w/ fuze, PD, M52BLE5 & Betr 15, 60mm mortar	6.21	6.40
35	R4FFM	7850 Mtl. Shell, smoke, WP, M57, Cntr. w/ f, PD, M52, 81mm Mtr.	105.13	80.47
39	R1RJM	650 " Shell, fxd, smoke WP, M64, for 75mm guns	9.22	6.50
43	RLTEA	130 Exs. Shell, fxd, smoke, WP T13E2, for 76mm guns	4.35	6.17
FWD 49	RLMIN	860 Mtl. Shell, semi-fxd, Cntr. smoke, WP, M64, for 75mm How.	11.90	6.82
52	RLNAA	440 Exs. Cart., smoke, WP, T40, w/ fuze PD, M57 for 75mm rifle	16.50	19.25
57	RLQJA	3965 " Shell, semi-fxd, smoke, WP, M60, for 105mm How.	217.72	178.42
65	RLSEM	200 Mtl. Shell, semi-fxd, Cntr. smoke, WP, M60, for 105mm How. M3	6.07	4.00
68	R2BDA	1600 Lse. Shell, smoke, phos. WP, M110, for 155mm How, M1	71.42	27.20
74	PLECA	180 " Shell, smoke, WP, M104, for 155mm guns	7.93	3.07
98	S9AMB	175 Exs. Rocket, smoke, WP, 2.36" M10A1	5.31	10.50
100	NLC	238 " Rocket, smoke, WP, T64, w/ fuze, complete for T66 Launcher	13.28	30.95
102	S4NIB	255 " Grenade, rifle, smoke WP, M19, (T5E1) or M19A5	4.14	9.57
			606.83	507.34

#2 T/D - LIBERTY

<u>ITEM NO.</u>	<u>CLASS</u>	<u>STOCK NO.</u>	<u>PKGS and NOMENCLATURE</u>	<u>L/T</u>	<u>M/T</u>
1-CWS	I		2 Bxs. Cart., Ignition for Cml Mtr.	.06	.05
2- "	IIB		25 " Chg, Prop., for Cml Mortar, M6	.60	1.00
4- "	I	416404	10 " Cylinder, Ignition for PFT	.21	.32
14- "	Inert	135215	622 Pks. NaPalm	5.97	17.00
4	I	TLEPO	140 Bxs. Cart., tracer, cal..30, M1, 5 rd. clips	2.60	2.45
6	I	TLEPP	192 " Cart., tracer, cal..30, M1, 8rd. clips	3.77	3.37
8	I	T2AAF	481 " Cartridge, ball, cal..45, M1911	14.38	8.42
9	I	TLIDF	1312 " Cart., API-T, cal..50, in MLB (4-1)	61.48	40.78
12	IVB	P5HUA	1112 " Cart., HE-T, Mk II, w/fuze Pd, Mk 27 (navy), 40mm gun AA (2870 F/S)	25.81	41.15
13	IVB	P5HJD	59 " Cart., AP-T, M31A1, 40mm AA guns	1.36	1.62
14	IVB	P5SBM	2360 Mtl. Shell, fxd, HE, M71, w/fuze Cntr. TM M43, 90mm guns	72.69	53.10
15	IVB	P5REM	2480 " shell, fxd, HE, M71, w/suppl chg & fuze TM M43, 90mm gun	77.50	55.80
18	IVA	NLC	35 Bxs. shot, fxd, HV, AP-T, T30E16 for 90mm gun	2.04	2.20
20	IVB	RLGBB	215 " Shell, fxd, HE, M63, for 37mm guns M3 and M6	3.55	7.00
21	IVA	RLGIC	98 " Shot, fxd, APC-T, M51, 2900 F/S for 37mm M3 and M6	2.23	2.70
22	IVA	RLGHC	78 " Canister, fxd, M2, for 37mm guns M3 and M6	1.77	2.05
26	IVB	RLJKS	150 " Cart., HE, M306 (T22), w/fuze PD, M39 (T119E1) for 57mm Rifle.	2.87	3.75
27	IVB	RLJFS	75 " Cart., HE, AT, M307 (T20E2), w/fuze, PI, M90 (T123E1), for 57mm rifle	1.43	1.87
29	IVB	RACAN	3775 Mtl. Shell, He, M49A2, for 60mm Cntr. Mortar	72.46	63.25
44	IVB	RLTHA	20 Bxs. Proj., fxd, illum, Mk 25, Mod 1, flashless, w/fuze T5Q M54, for 76mm guns	.60	.70
51	IVB	RLNFS	1325 " Cart., HE, AT, T39, for 75mm rifle	44.36	59.62
58	IVA	RLQHA	100 " Canister, semi-fxd, T18, for 105mm How.	2.81	2.80
62	IVB	RLSHV	1440 Mtl. Shell, semi-fxd, HE, M1, w/fuze Cntr. PD, M48A2 (.15) for 105mm How. M3	45.00	28.80
97	IVB	S9ALA	790 Bxs. Rocket, HE, AT, 2.36", M6A3C	19.04	27.85
101	IVB	SANBC	1130 " Grenade, rifle, AT, M9A1	16.88	31.07
130	IIB	RAQBA	1 " Increment, propellant, M3, 60mm mortar shell (120/Fbr cntr)	.01	.05
131	IIB	RAUDA	2 " Increment, propellant, M1, 81mm mortar (90/Fbr cntr)	.02	.25
132	IIB	RAVHA	19 " Increment, propellant, M2A1, 81mm mortar (80/Fbr cntr)	.54	1.52
TOTALS				482.04	460.54

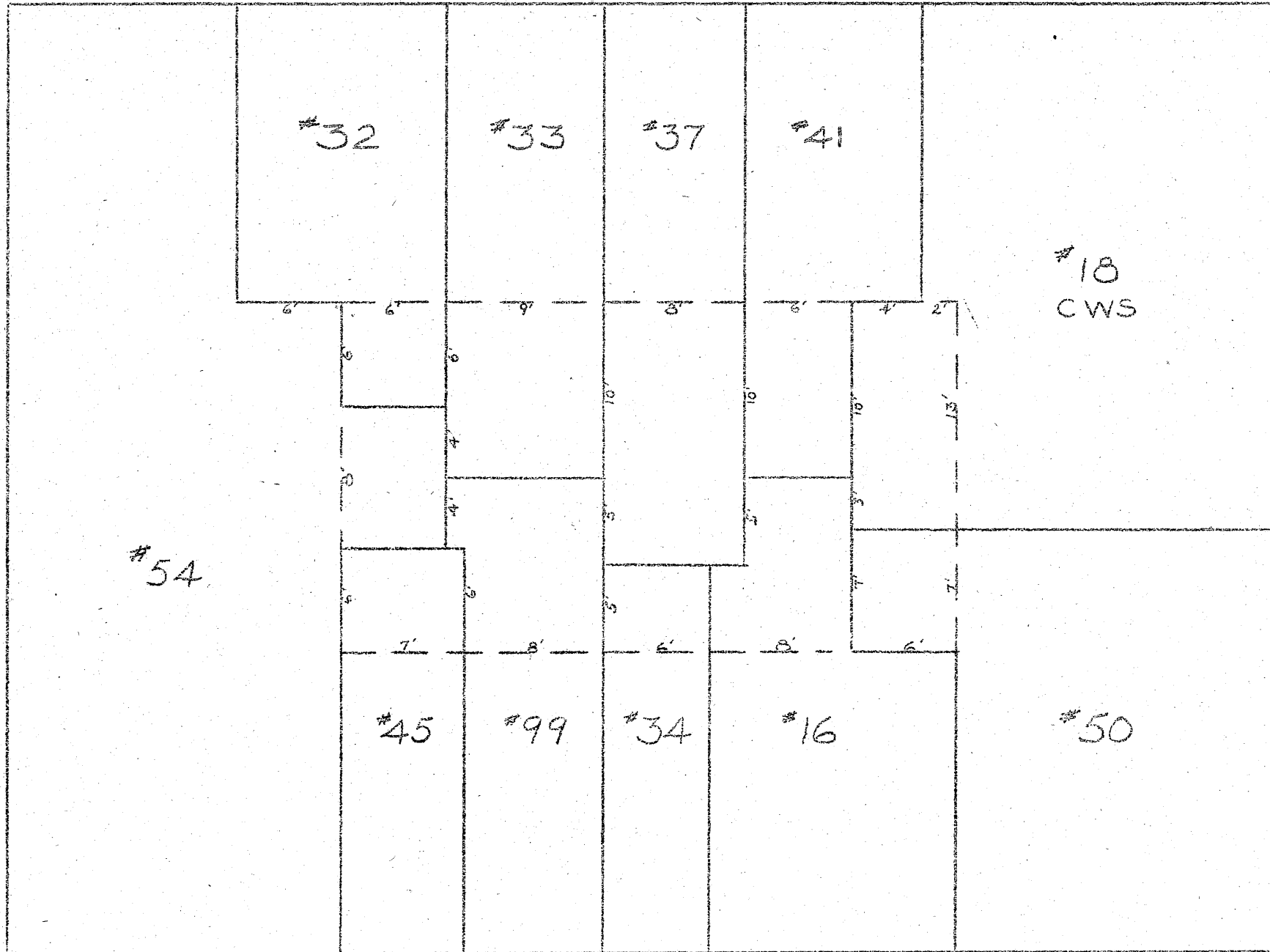
2 T/D - LIBERTY



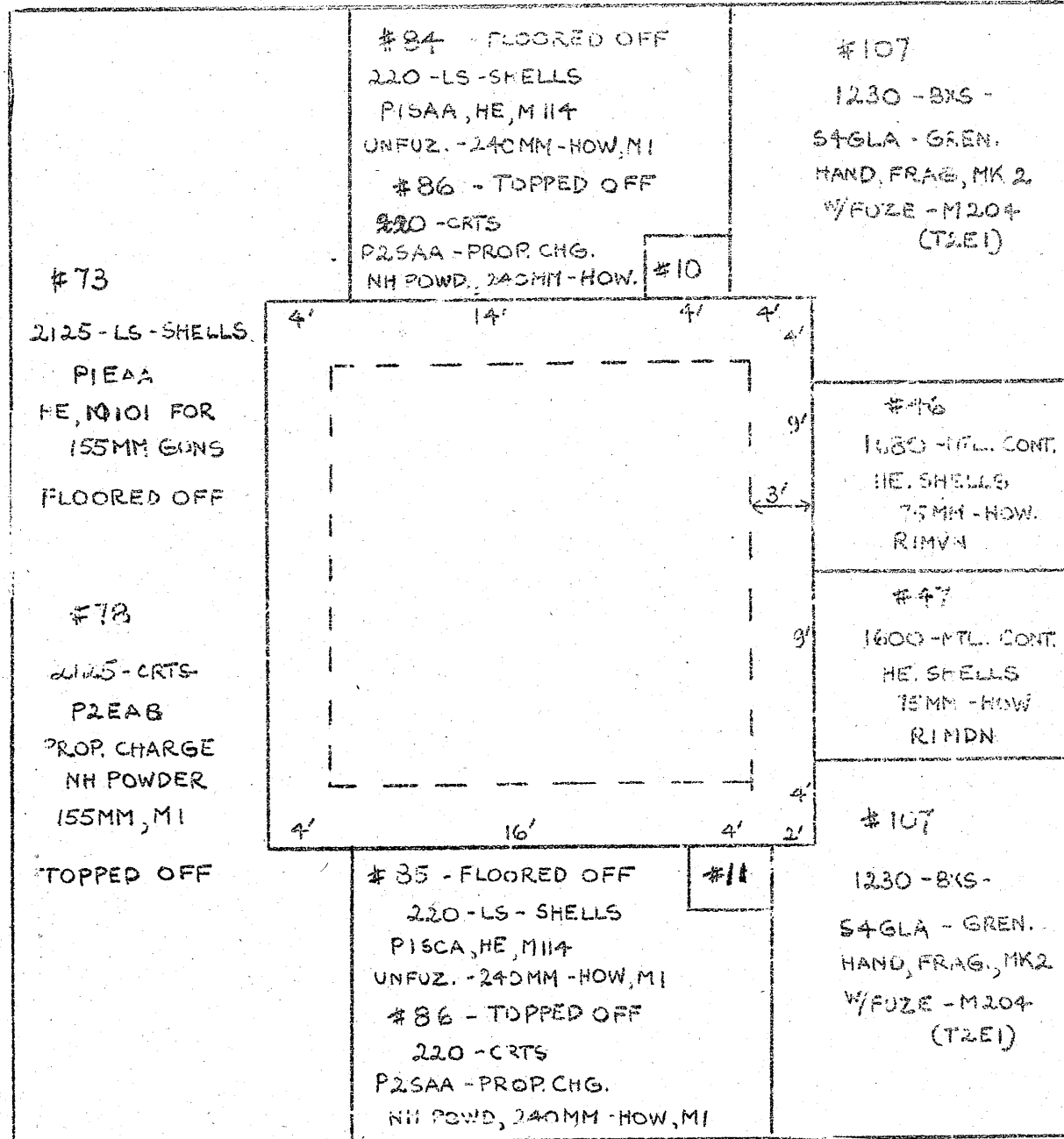
#2 L/H - LIBERTY

<u>ITEM NO.</u>	<u>STOCK NO.</u>	<u>PKGS and NOMENCLATURE</u>	<u>L/T</u>	<u>N/T</u>
<u>CLASS - IVB</u>				
16	P5RCA	1743 Exs. Shell, fxd, HE, M71, NH, w/suppl chg and fuze PD, M48A2 (.05), 90mm gun	100.37	104.60
18-CWS	273114	8197 " Shell, 4.2" Cml Mortar, HE	241.52	209.00
32	R4FCN	4900 Mtl. Shell, HE, M43A1, for 81mm Mortar Cntr.	114.85	84.53
33	R4FRM	10200 " Shell, HE, M56, w/fuze TSQ, M77, (or PDP M52), for 81mm mortar	136.61	76.50
34	R4FLK	4700 " Shell, HE, M56, w/fuze PD, M53-43B1 for 81mm mortar	60.42	37.60
37	R4BOM	11000 Exs. Shell, fxd, HE, M48, (30), w/fuze PD, M48A2 (.05) for 75mm guns	151.74	93.50
41	R4TFA	2215 " Shell, fxd, HE, M42A1, flashless, smokeless, w/fuze, PD, M48A2 (.05), for 76mm guns	70.30	77.52
45	R4MSN	5270 Mtl. Shell, semi-fxd, HE, M48, w/fuze PD, Cntr. M48A2 (.15) for 75mm How.	81.16	52.70
50	R4NKS	2650 Exs. R4NKS Cartridge, HE, T38, w/fuze, PD, M51A4 (M48A2), .05 sec. delay for 75mm rifle	97.00	119.25
54	R4QCA	8300 " Shell, semi-fxd, HE, M1, w/fuze TSQ M54, for 105mm How.	444.64	373.50
99	S9CKC	4275 " Rocket, HE, 4.5", T38B3 unfuzed for T66 Launcher	133.59	67.35
TOTALS			1632.20	1296.05

#2 L/H LIBERTY



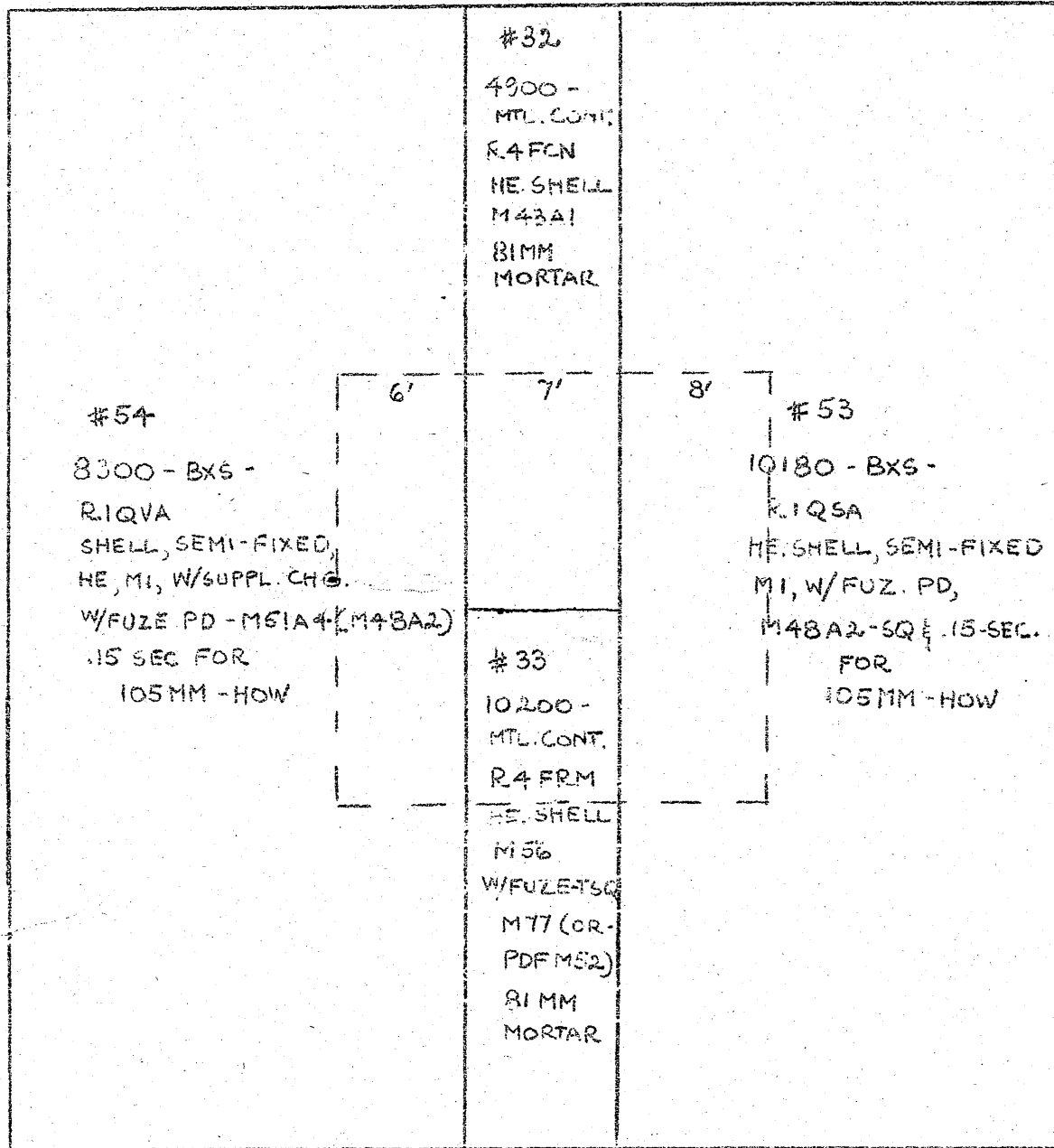
#3 - T/O - LIBERTY



CLASS	ITEM NO.	STOCK NO.	PKGS and NOMENCLATURE	L/T	M/T
IVB	10	NLC	15 Bxs. Cart., HE-I, (Navy) 20mm Oerikon	.63	.52
IVB	11	NLC	8 " Cart., HE-T, (Navy), 20mm Oerikon	.33	.30
IVB	46	RIMVN	1680 Mtl. Shell, semi-fnd, HE, Cntr. M8, w/suppl chg, w/fuze, PD, M8A2 (.15) for 75mm How.	26.85	16.80
IVB	47	RIMVN	1600 " Shell, semi-fnd, HE, M8, w/fuze T50 M8, for 75mm How.	25.71	16.80
VII	73	P1EAA	2125 Lse. Shell, HE, M101, for 155mm guns	90.22	36.13
IIB	78	P2EAB	2125 Crts. Charge, prop., NH, pwd, 155mm guns, M1	52.10	85.00
VII	84	P1SAA	220 Lse. Shell, HE, M114, unfuzed, 240mm How, M1	35.45	14.30
VII	85	P1SCA	220 " Shell, HE, M114, w/mod- ified fuze cavity and suppl chg, unfuzed 240mm How. M1	35.45	14.30
IIB	86	P2SAA	440 Crt. Charge, prop., base & 3 increments, NH pwd, 240mm How. M1, 360 lb. proj.	20.62	35.55
IVB	107	S4GLA	2460 Bxs. Grenade, hand, frag, M2, w/fuze M204 (T2E1)	58.09	77.50
TOTAL				345.45	297.20

AFT

#3 - L/H - LIBERTY



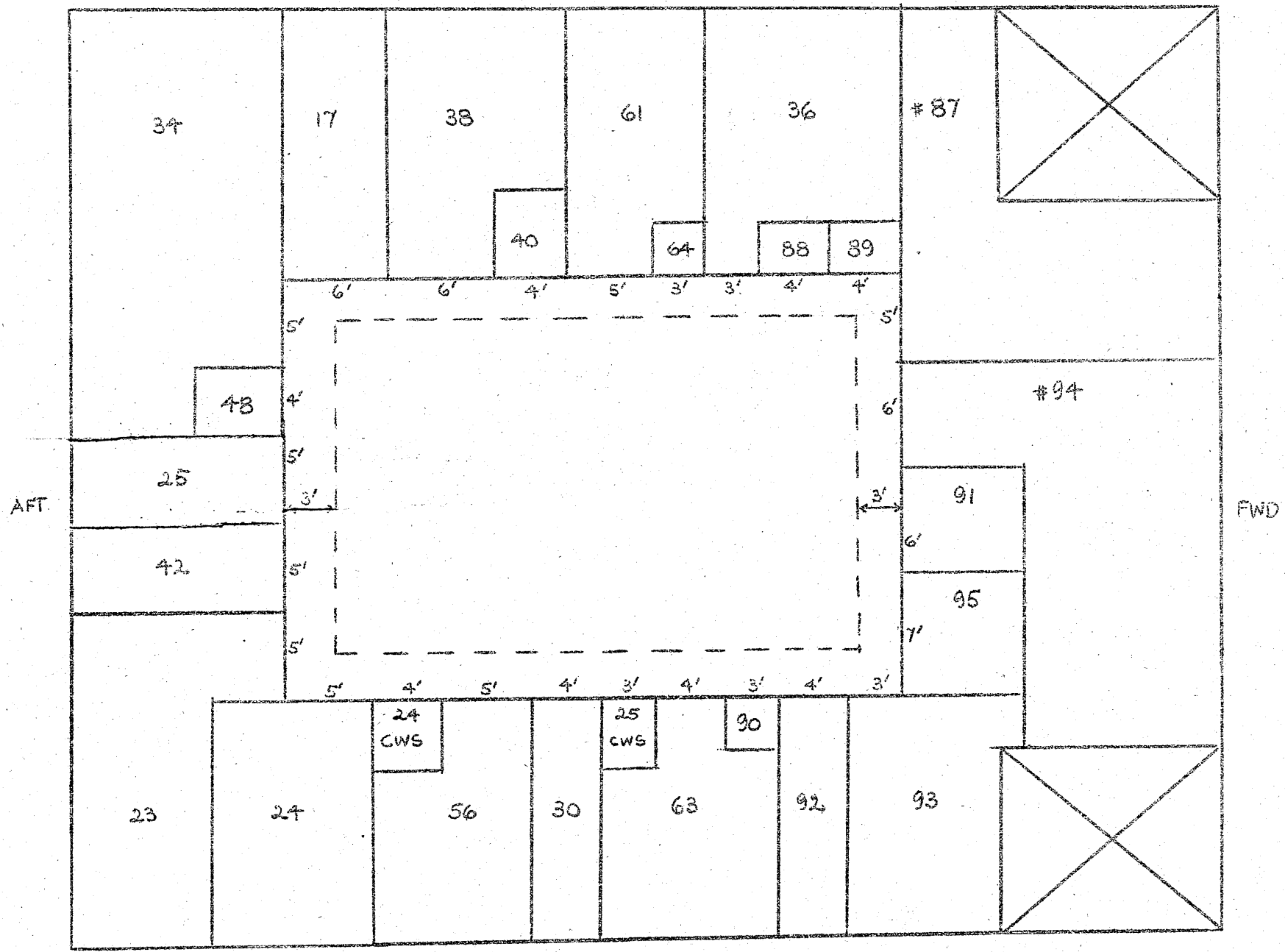
TONNAGE RECAP. #3 L/H

<u>Item No.</u>	<u>L/T</u>	<u>M/T</u>	<u>CLASS</u>
32	114.84	84.52	IVB
33	136.60	76.50	"
53	545.35	460.65	"
54	144.64	373.50	"
TOTAL--	1241.43	995.17	

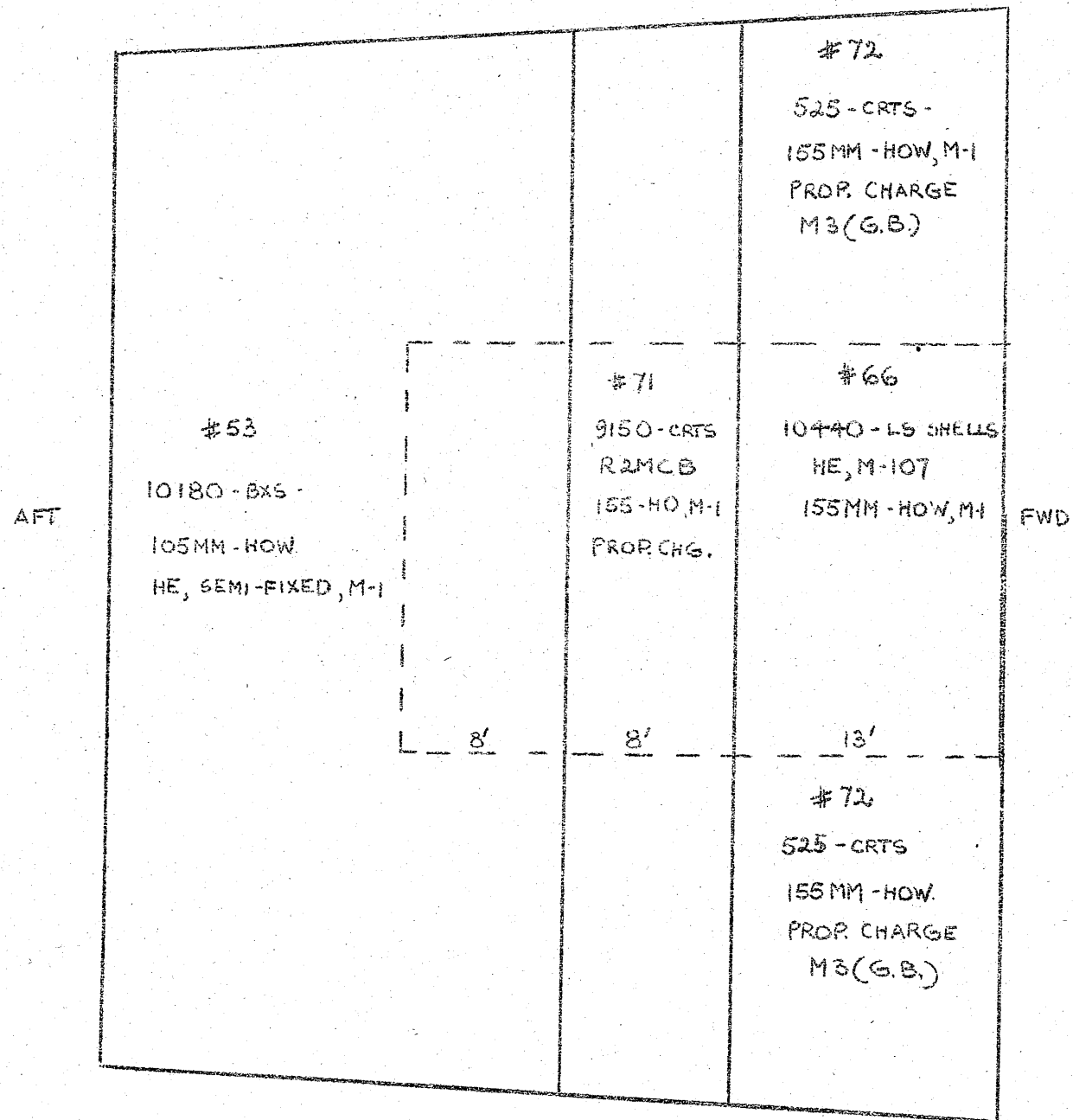
#4 T/D - LIBERTY

<u>ITEM NO.</u>	<u>STOCK NO.</u>	<u>PKGS and NOMENCLATURE</u>	<u>U/P</u>	<u>W/T</u>
<u>CLASS - III</u>				
24-CWS		76 Bxs. Fuse, Delay, M4	2.83	2.92
25-CWS		67 " Fuse, T & SQ, M5	1.31	2.08
87	R3FJB	1767 " Fuse, PD, M51A4 w/booster M21A4 (.15 sec. delay)	39.36	35.35
88	R3FHA	16 " Fuse, TSO, M55A3, w/booster, M21A4	.55	.60
89	R3EDB	19 " Fuse, time, mechanical, M67A3, w/booster, M21A4	.41	.40
90	R3BID	10 " Fuse, TSO, M54	.25	.12
91	R3FPE	163 " Fuse, GP M78 (T105) (.025 sec.) w/booster, M25 (T1E1)	5.74	3.87
92	R3BWB	148 " Fuse, PD, T7AE6	4.42	5.42
93	R3FSA	392 " Fuse, PD, T7AE9	11.72	15.70
94	R3FVA	1260 " Fuse, PD, T8OE9	38.28	47.37
95	S9IBB	265 " Fuse, PD, M48A2, SQ, .05 sec. w/booster M21A4	5.97	6.43
<u>CLASS - IVA (also see below)</u>				
42	RIPOA	265 Bxs Projectile, fixed, APC-T, M2A1, NH, for 76mm guns	8.87	9.27
<u>CLASS - IVB</u>				
17	P5SMN	730 Mtl. Proj., fixed, APC-T, M32, NH w/fuze BD, Cntr. M68 and tracer, 90mm gun (2800 lbs)	22.68	16.42
23	RLIJM	3590 " Cartridge, HE-T, T18E1, NH, w/fuze PD, T36, for 57mm guns	38.46	32.32
24	RLIBM	2500 " Cartridge, APC-T, M36, 2700 P/S, w/fuze BD, M72, for 57mm guns	28.01	22.50
30	R4CCM	310 " Shell, illuminating, M33A1, for 60mm Mtr.	5.95	5.42
34	R4FLM	4700 " Shell, HE, M36, w/fuze PD, M53-53E1, for 81mm mortar	60.42	37.60
36	R4FSB	1570 " Shell, illuminating, T18, for 81mm mortar	21.02	15.70
38	RLRIM	1300 " Proj., fixed, APC-T, M61A1, for 75mm guns	17.99	26.00
48	RLMAY	200 " Shell, fixed, HE, AT, M36, for 75mm How.	3.03	1.50
56	R3QEN	1110 " Shell, semi-fixed, HE, AT, M37 for 105mm How.	31.71	16.65
61	NLC	500 " Shell, semi-fixed, ill. T16, for 105mm How.	16.62	10.00
63	RLSON	550 " Shell, semi-fixed, HE, M1, w/fuze TSO, M54 for 105mm How. M3	16.94	11.00
64	RLSEN	25 " Shell, semi-fixed, HE, AT, M37 for 105mm How. M3	.73	.50
<u>CLASS - IVA (cont) (see item #42 above)</u>				
25	RLIKA	1100 Mtl. Cartridge, canister, T17, for 57mm guns Cntr.	12.76	11.00
40	RLRSA	200 " Canister, fixed, T30, for 75mm guns	2.85	2.00
TOTAL FOR #4 T/D			398.28	338.43

#4 - T/D - LIBERTY



#4 - L/H - LIBERTY



NOTE: #4 L/H Fwd.
 Floor off with loose shells, Item #66 &
 Stow Prop.Charges, Item #72, on top.

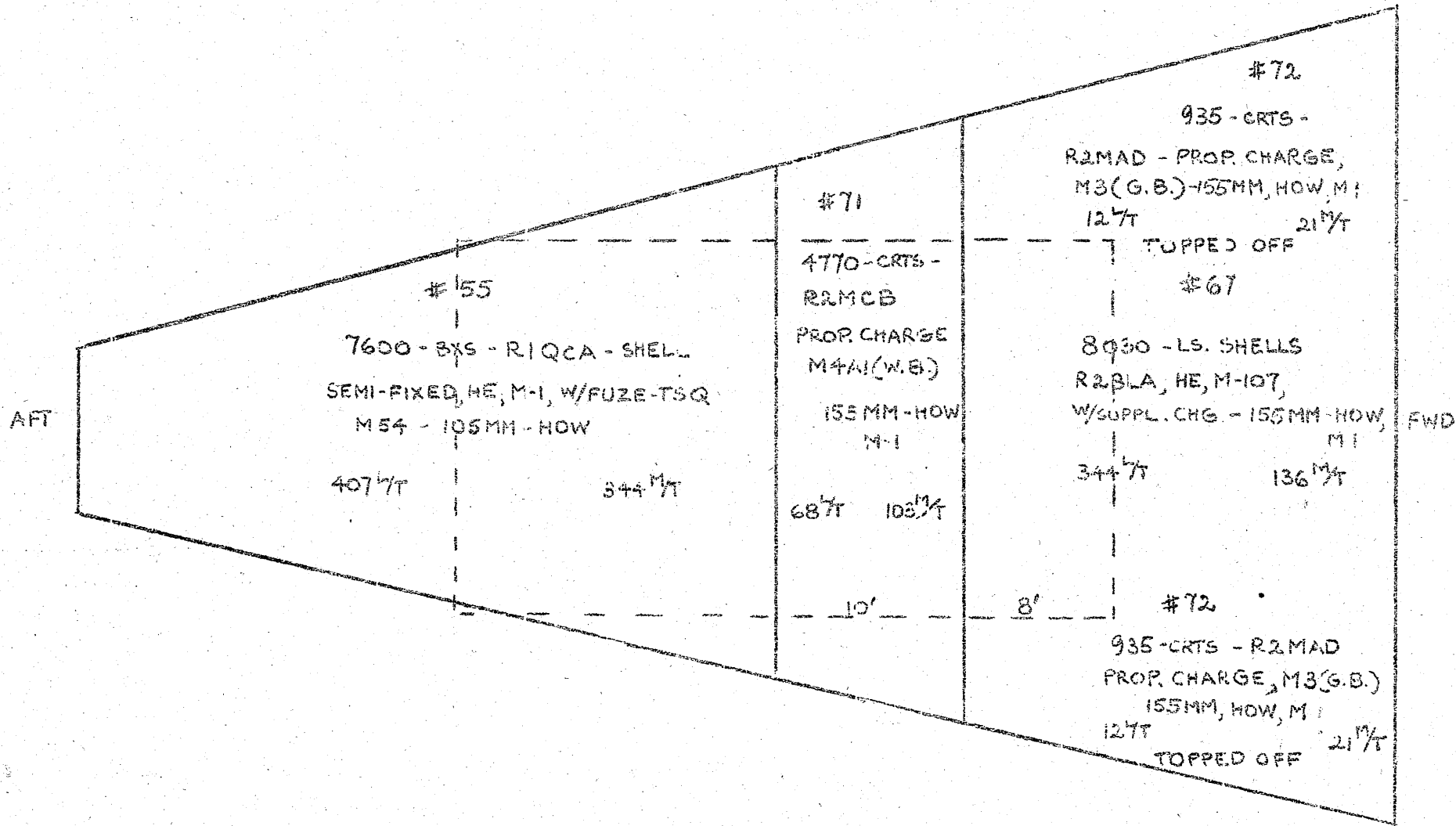
TONNAGE RECAP. #4 L/H

Item No.	L/T	M/T	CLASS
53	545.36	461.00	IVB
66	447.89	177.50	VII
71	117.70	195.30	IIB
72	13.23	20.60	IIB
TOTAL	1124.18	854.40	

#5 T/D - LIBERTY

<u>ITEM NO.</u>	<u>STOCK NO.</u>	<u>PKGS and NOMENCLATURE</u>	<u>L/T</u>	<u>M/T</u>
<u>CLASS - I</u>				
1	T1CAJ	1007 Bxs. Cart., ball, carbine, cal..30 M1	26.52	16.62
2	T1CBC	21 " Cart., tracer, carbine, cal..30, M16	.55	.35
3	T1CCA	1323 " Cart., AP, cal..30, M2, 5rd. clips	23.98	23.15
5	T1CCB	3646 " Cart., AP, cal..30, M2, r rd. clips	74.87	63.82
7	T1DDP	2195 " Cart., AP-T, cal..30, M18 (4-1)	75.45	48.85
9	T1DDF	1812 " Cart., API-T, cal..50, in M18 (4-1)	61.47	40.77
108	S4PAH	11 " Cartridge, rifle grenade, cal..30, M3	.18	.20
109	S4PBE	5 " Cartridge, rifle grenade, carbine, cal..30, M6	.06	.07
110	S4PCB	7 " Cartridge, grenade, auxiliary, M7	.06	.12
111	S4QFD	38 " Adapter, grenade-projector, M1A1	.72	1.62
112	S4QFA	2 " Adapter, grenade, projector, chem. T2	.03	.10
<u>CLASS - III</u>				
113	S5RND	6 Bxs. Signal, ground, amber star, clus. M22A1	.17	.27
114	S5ROC	6 " Signal, ground amber star, para. M21A1	.16	.27
115	S5RFB	6 " Signal, ground, green star, clus. M20A1	.17	.27
116	S5ROB	6 " Signal, ground, green star, para. M19A1	.16	.27
117	S5RTB	6 " Signal, ground, red star, parachute M51A1	.16	.27
118	S5RUB	6 " Signal, ground, red star, cluster, M52A1	.17	.27
119	S5RWB	6 " Signal, ground, white star, clus. M16A1	.17	.27
120	S5RSB	6 " Signal, ground, white star, para. M17A1	.17	.27
121	S5PCA	5 " Signal, aircraft, single star, green AN-M45	.18	.35
122	S5PHA	5 " Signal, aircraft, single star, red, AN-M43	.16	.35
123	S5PIA	5 " Signal, aircraft, single star, yellow AN-M44	.16	.35
128	S5IBB	225 " Flare, trip, parachute, M48 complete	4.21	6.75
129	S5IOB	56 " Flare, trip, M49	.97	1.97
<u>CLASS - IIE</u>				
7-CWS	222220	19 Bxs. Grenade, smoke, colored, M18, (green)	.30	.48
8- "	222420	47 " Grenade, smoke, colored, M18, (red)	.73	1.17
9- "	222520	19 " Grenade, smoke, colored, M18, (violet)	.30	.48
10- "	222620	39 " Grenade, smoke, colored, M18, (yellow)	.60	1.00
11- "	212415	27 " Grenade, smoke, HC, AN-M8	.50	.68
15- "	215409	30 " Pot. smoke, HC, M1	.60	.65
16- "	215438	24 " Pot. smoke, HC, M5	.60	.50
17- "	215427	24 " Pot., smoke, floating, M4A2	.50	1.25
59	R1QON	250 M1. Shell, semi-fixed, smoke, red, BE, M84, Cntr. for 105mm How.	7.92	5.00
60	R1QPN	250 " Shell, semi-fixed, smoke, yellow, BE, M84, for 105mm How.	7.70	5.00
69	R2BHA	50 Lsg. Shell, smoke, red, BE, M16, for 155mm How, M1	2.13	1.02
70	R2BIA	50 " Shell, smoke, yellow, BE, M16, for 155mm How., M1	2.12	1.00
75	P1EIA	10 " Shell, smoke, yellow, BE, M17, for 155mm guns	.42	.15
76	P1EIA	10 " Shell, smoke, red, BE, M17 for 155mm guns	.42	.15
103	S4NLS	7 Bxs Grenade, rifle, smoke, red, M22 (T8E1)	.10	.27
104	S4NFB	7 " Grenade, rifle, smoke, red, streamer T12	.10	.27
105	S4NMB	7 " Grenade, rifle, smoke, yellow, M22 (T8E1)	.11	.17
106	S4NOB	7 " Grenade, rifle, smoke, yellow, streamer T12	.10	.27
TOTALS			298.15	227.11

#5 - L/H - LIBERTY



TONNAGE RECAP. #5 L/H

Item No.	L/T	M/T	CLASS
55	407.14	343.90	IVB
67	344.50	136.50	VII
71	68.00	103.70	IIB
72	23.10	12.00	IIB
TOTAL	843.04	626.10	

