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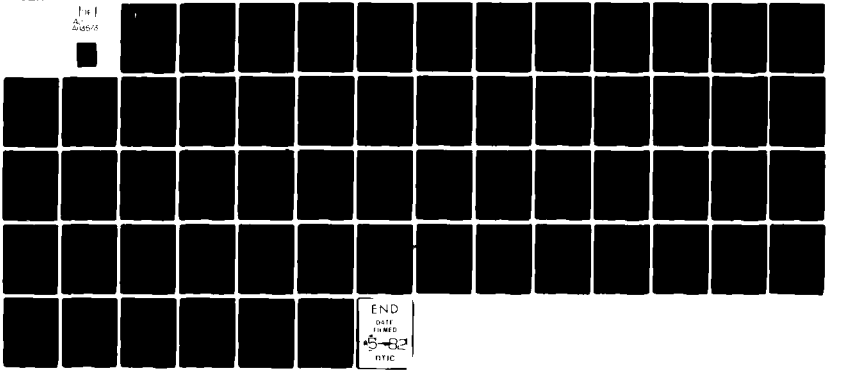

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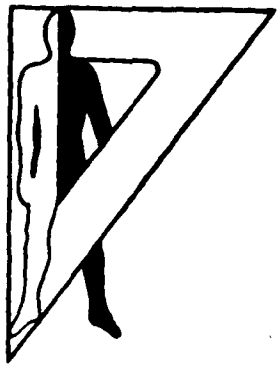

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Technical Memorandum 2-82

AMMUNITION TRUCK LOADING PROGRAM:

PART 1-PROGRAM DESCRIPTION

Gordon L. Herald

January 1982
AMCMS Code 612716.H700011

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

An interactive computer-based program is described by which Army Ammunition Supply Point Office personnel interact with a computer program and an ammunition data base to rapidly develop truck load configurations for ammunition resupply convoys.

Program data pertaining to ammunition type, quantity, storage location, vehicle type and number is acquired by developing a man-machine dialog with the user.

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20. ABSTRACT (Continued)

Program execution results in the printing of an ammunition stores slip which shows the types of ammunition and quantities to be loaded upon each convoy vehicle.

Mixed vehicle load capability is permitted and large load requirements are automatically continued to other available convoy vehicles, including different vehicle types, until the request is complete.

AMCMS Code 612716.H700011 Technical Memorandum 2-82

AMMUNITION TRUCK LOADING PROGRAM:

PART 1-PROGRAM DESCRIPTION

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January 1982

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PREFACE

The author wishes to acknowledge the contribution of Mike Thompson for coding the BASIC language version of the program, Jim Gombash for development of the interactive dialog and data base access methods, and SP6 Larry Stevens for his untiring efforts in coding the FORTRAN version and validating the program. The HELFAST team members counseling and advice kept us going straight; Mr. John Stephens, Chief, Combat Support Directorate, coordinated the efforts of two very dissimilar teams to keep the wheels turning.

This report will be provided in three parts. Part II will contain the program flow charts and code. Part III will provide an analysis of the man-machine interface and performance.

CONTENTS

INTRODUCTION 3

Background 3
Objectives 4

DISCUSSION 4

Program Features 4
Limitations 10
Operational Characteristics 11
Load Computation Process 12
Exception Handling 15
Hardware and Software Requirements 15

CONCLUSIONS 16

RECOMMENDATIONS 16

APPENDIXES

A. Ammunition Data Base 19
B. Loading Example 25
C. Truck Loading Program Predefined Vehicle Dimension Data . . . 53

FIGURES

1. Example of Vehicle Spanning, Mixed Loads, Gap Filling for Single Vehicle Type 6
2. Example of Vehicle Spanning, Mixed Loads, Gap Filling for Multiple Vehicle Types 7
3. Hardcopy Output 9
4. Illustration of the Differences Between Complex and Simple Staggered Load 10
5. Truck, Cargo 8-Ton, Section Definition 13
6. Outline of Cargo Loading Program 14

TABLE

1. Program Features 5

AMMUNITION TRUCK LOADING PROGRAM:

PART I-PROGRAM DESCRIPTION

INTRODUCTION

Background

Beginning in early 1978, the Combat Support Directorate, US Army Human Engineering Laboratory (HEL), has been actively engaged in human engineering problems related to logistics. The Human Engineering Laboratory Forward Ammunition Supply and Transfer (HELFAST) Team was formed to examine the operation of a field Ammunition Supply Point (ASP) to determine human engineering problems and to develop a data base of Materials Handling Equipment (MHE) operator performance.

In February 1980, in conjunction with the US Army Missile and Munitions Center and School (MMCS), the HELFAST Team conducted a week-long test to determine how long it took to process the paperwork from a customer ammunition convoy through the typical ASP office.[1] Although there are several steps in the process, the most time consuming effort is that of configuring the ammunition load for each vehicle in the convoy. In this test the average time for an individual clerk to complete the issuing paperwork process for seven battalion convoys was 76 minutes per convoy. The lowest average time for any of the individuals was 63 minutes.

Other studies conducted by the HELFAST Team indicate that in a typical European battlefield scenario, an ASP can expect a convoy to arrive every 10 minutes under some conditions with an average "Mean Time Between Arrivals" (MTBA) of every 42 minutes averaged over a 24-hour period.

Since the time required to complete the paperwork could not support the expected demand, a computer-based program has been developed which acts as an aid to the ASP office personnel in developing truck load configurations for the loading of large quantities of palletized cargo.

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[1] Mackey, D.S., & Davall, B.M. Human Engineering Laboratory test of paperwork processing within the ammunition supply point office for ammunition issue (HEL Letter Report 278). Aberdeen Proving Ground, MD: US Army Human Engineering Laboratory, March 1980.

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Objectives

The initial objectives of this task were as follows:

a. To develop a means to significantly improve the time required by the ASP stock records clerk to configure vehicle loads.

b. To develop a method which would merge with existing manual methods in current use in the ASP office operation but which would not destroy any advantages of the manual method.

c. Demonstrate a potential for ASP office manpower reductions.

d. Devise an approach which will perform on a small computer system.

e. Permit use by an unsophisticated user with no special training in computer terminal usage.

The first four objectives have been successfully met and even with the addition of a memory or disk resident ammunition data base, the program will perform on a small computer system. The program is within the scope of capability provided by the Division Level Data Entry Device (DLDED).

Interface requirements for the unsophisticated user have required a large portion of the resources (25% of source code dedicated to user interface) available on a small computer system. However, the man-machine dialog for this application carries a very high priority which has not been adequately defined by researchers for the caliber of user. Special testing efforts are underway to verify the integration as well as the adequacy of the dialog for the anticipated user.

DISCUSSION

Program Features

Table 1 lists the significant features incorporated into the truck loading program.

Load spanning is a feature which is performed automatically by the program. Additional pallets of ammunition that remain to be loaded, after the program has detected that a vehicle has "grossed out"[2] or "cubed out,"[3] are "spanned" or automatically loaded upon the next available vehicle.

---

[2]"Gross Out" is a term used to indicate that the computed load configuration has reached the load carrying capacity of the vehicle.
[3]"Cube Out" is a term used to indicate that the computed load configuration has reached the cubic space capacity of the vehicle.

TABLE 1

Program Features

- Load spanning across vehicles of the same or different types
- Gap filling
- Mixed load configurations permitted
- No vehicle overloading
- Loads not permitted to extend over vehicle sides
- Multiple vehicle types supported
- Ammunition data base
- Provision to develop loading and transportation data for items not included in ammunition data base
- Interactive dialog

Gap[4] filling is a program feature which allows ammunition to be placed in partially filled virtual row positions which would otherwise not be utilized. However, due to the creation of mixed-load conditions and load dimension variations which may affect safety lashing, the ASP clerk can grant or deny the use of gap filling.

Upon completion of a loading process in which a vehicle has the remaining capacity to carry ammunition in addition to that already assigned, the ASP clerk, through the interactive facilities of the program, may grant the loading of another ammunition type and create a vehicle load configuration consisting of a mixture of ammunition types.[5]

Program loading computations will not permit a load configuration which would cause a vehicle to become loaded beyond its rated capacity or to allow loads to extend over the vehicle sides.

[4]Gaps are incompletely filled virtual rows, detected by the program, which have resulted from a loading process in which all of the ammunition directed to be loaded has been assigned.

[5]Load mixing is not automatically performed since, among other hazards, hazardous load combinations could result through mixing without checking for compatibility.

The explanation of some of these features may be aided by the loading examples of Figures 1 and 2.

A vehicle loading example is shown in Figure 1. The vehicle has been defined to have a bed length of 135 inches and a bed width of 110 inches. The load capacity is 5000 pounds. The first cargo to be loaded is indicated by boxes marked with "1" and consists of 17 pallets each weighing 357 pounds and measuring 36 inches by 24 inches. The #1 cargo is automatically spanned to vehicle 2. With permission from the clerk to mix loads, the algorithm continues with cargo #2 and detects an unused area in the virtual row occupied by cargo #1 on vehicle 2 and loads that "GAP" with cargo type #2 which is defined as 20 pallets each measuring 20 inches by 35 inches and weighing 170 pounds each. Loading continues automatically across vehicle 2 until the maximum load capacity of the vehicle is reached and the remaining load is automatically spanned to vehicle 3.

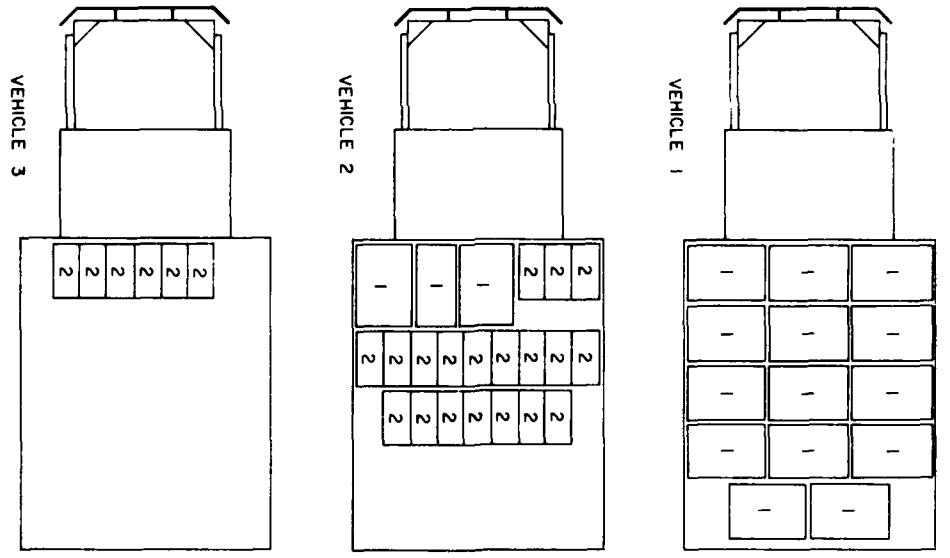


Figure 1. Example of vehicle spanning, mixed loads, gap filling for single vehicle type.

In Figure 2 a loading process has occurred which is similar to that of Figure 1; however, this example was selected to demonstrate load spanning across different vehicle types. Vehicles 1, 2, and 3 are the same as defined for the first example and vehicle 4 is a 5-ton M813A1 truck.

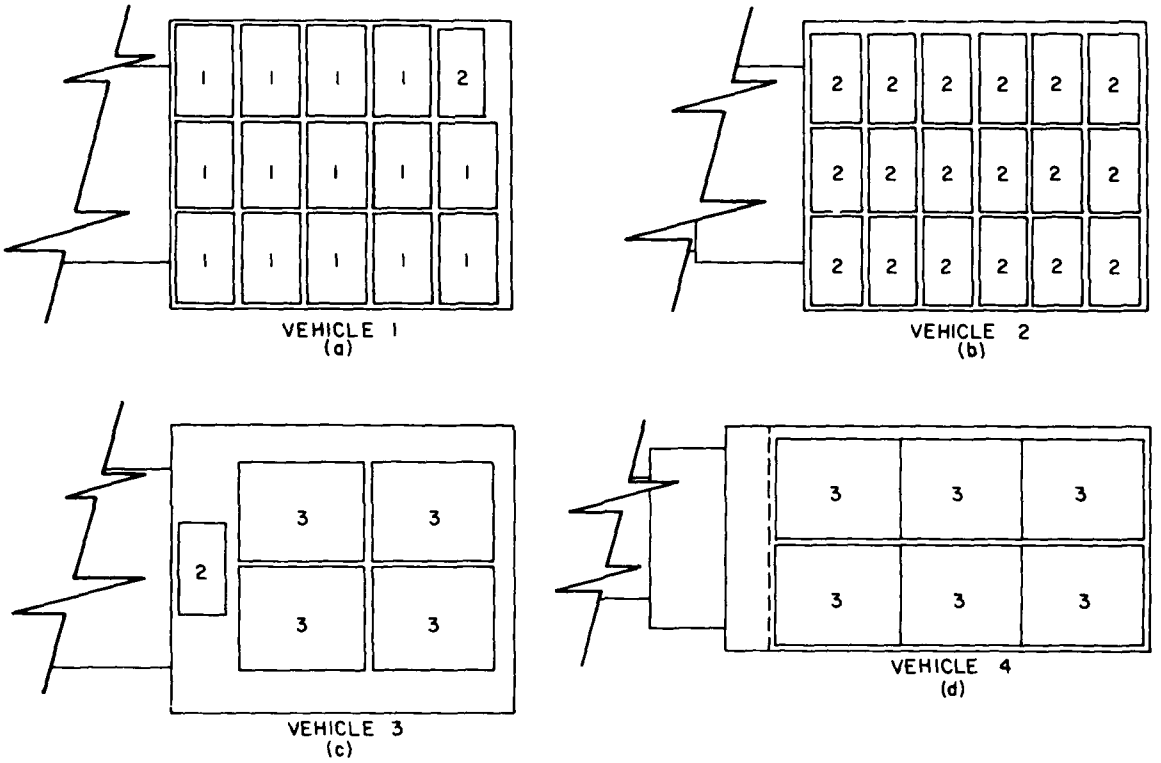


Figure 2. Example of vehicle spanning, mixed loads, gap filling for multiple vehicle types.

Four different US Army vehicle types have been predefined in the program. They are a (a) 2-1/2-ton truck, (b) a 5-ton truck, (c) an 8-ton GOER, and (d) a 12-ton S&P.

The ASP clerk can load any other vehicle type, not predefined, having a simple rectangular bed by interacting with the program to enter the appropriate bed length, bed width, and load carrying capacity.

Both a disk resident and memory resident ammunition data base (see Appendix A) is available which represent about 130 different Department of Defense Identification Codes (DODIC's) (selected by MMCS) and about 175 different National Stock Numbers (NSN's). There may be several NSN's per DODIC. The memory resident data base version has the advantage of being system independent but requires more memory.

Working interactively with the program the ASP clerk enters the requested ammunition by DODIC number and the program builds a temporary memory resident working file of ammunition to be issued by merging data from the data base with quantity, lot number, and location added through program interaction with the clerk.

Ammunition requested, but not found in the data base, is added to the temporary memory resident working file by interacting with the clerk to obtain packaging, transportation data, lot number, location, and quantity which the ASP clerk must supply from office documentation as would be the case if the manual method were in use.

The interactive dialog was designed with a number of objectives to improve the interface with the unsophisticated user. The objectives were as listed below:

1. Minimize verbage.

2. Relieve dialog of cryptic content.

3. Provide a friendly tone by removing hostile terms such as "invalid," "illegal."

4. Remove computer jargon.

5. Maintain consistent point of view; for example, is the computer an "I," "we," "you," "it?"

6. Provide a consistent menu format.

7. Provide dialog consistent with user requirements.

8. Utilize terminology familiar to the end user (ASP clerk).

9. Provide consistent response time; never more than 2 seconds response to a command.

The program interacts with the ASP clerk at his level of comprehension and in familiar terminology.

Hardcopy output is provided on paper as shown in Figure 3. This conforms to DA Form 3151-R for purposes of integration with the current manual system. The "ORIENT" column was added to aid the ammunition vehicle loaders to properly orientate the ammunition pallet when placing it on the vehicle. Orientation 1 requires that the long side of the pallet be aligned parallel with the long side of the vehicle bed. Orientation 2 requires that the short side of the pallet be aligned parallel with the long side of the vehicle bed.

AMMUNITION STORES SLIP AUTHORITY DATE:

FROM: ASP #602 NAME OF ACTIVITY:

TO: 121 AVN BN VEHICLE #: 212439

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( ) DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	TO	PLTS-BXS	TOTAL ROUNDS	INIT.	ORIENT.
1345-00-028-5118 K180 MINE AT(HV) M15	K14	4A		2	90		1
1345-00-028-5118 K180 MINE AT(HV) M15	K14	4A		1	45		2
1345-00-028-5118 K180 MINE AT(HV) M15	K14	4A		2	90		2

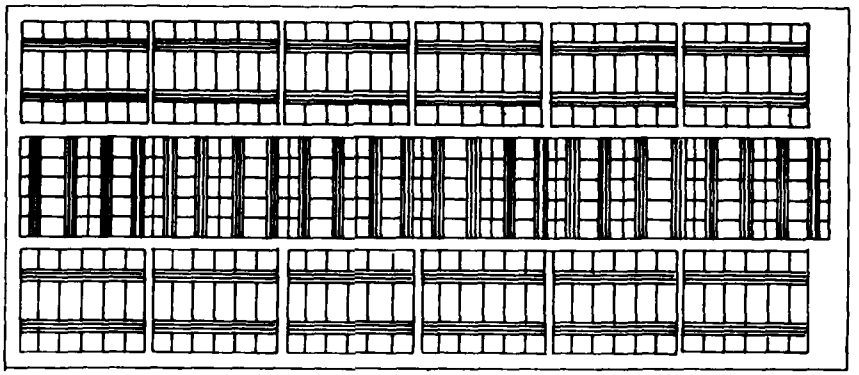
DATE SIGNATURE OF ISSUING CHECKER DATE SIGNATURE OF RECEIVING CHECKER

Figure 3. Hardcopy output.

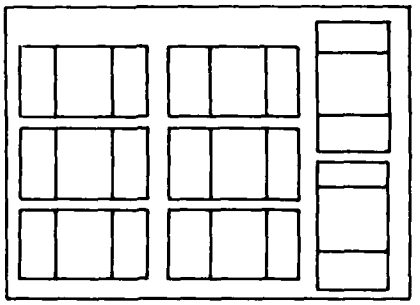
Limitations

The program is not all inclusive with respect to load configurations. First, it is designed primarily to handle large quantities of palletized ammunition; second, it does not provide for stacked load configurations; and third, optimization provides only limited stagger loading.

A complex mixed staggered load is shown in Figure 4a. Simple unmixed staggered loads may be developed by the truck loading program as shown in Figure 4b.



a. Complex mixed staggered load.



b. Simple unmixed staggered load.

Figure 4. Illustration of the differences between complex and simple staggered load.

The program relies upon the ASP clerk's experience and knowledge of ammunition when mixed loads are developed to prevent hazardous combinations and also to prevent creation of mixed loads that cannot be tied down securely.

No checking is done by the program for uneven load distribution conditions which could occur. This situation is likely to develop when mixed loads are permitted and whenever a vehicle gross weight limit is met before the cubic capacity is reached. Loaders and load checkers are depended upon to prevent this condition from occurring.

Operational Characteristics

The truck loading program initiates a dialog with the ASP clerk by prompting for ASP identification, requestor identification, and then prompts for the number and type of vehicle, which the ASP clerk can select from a displayed list of four predefined vehicles, to receive the first ammunition load.

The interaction continues with a prompt requesting the ASP clerk to enter the ammunition DODIC requested for issue. The ammunition data base is searched, and the packaging, transportation, and nomenclature is displayed at the clerk's terminal for all ammunition NSN's in the data base which are common to the DODIC number entered.[6] The clerk makes a selection, based upon availability, from the displayed list. Additional prompts request the clerk to enter the ammunition lot number, lot location, quantity requested, and quantity issued which is appended to the data from the selected item of the data base. Prompting continues for additional DODIC's until the clerk has processed the entire ammunition request.

The process of selecting ammunition from the data base to fill the issue request creates a temporary memory resident file of the entire ammunition request.

Upon completing the DODIC entry and selection process, the program will display the temporary memory resident file of ammunition and request the ASP clerk to select one of the items to be loaded. The selection process will be influenced by the location of the ammunition in the storage area and the route which the vehicles must use to pick up the load.

Selection of the ammunition to be loaded causes the loading algorithm to execute and configures the load for the vehicle type previously identified. As each vehicle is loaded, the program prompts the clerk for a vehicle "bumper number" and prints a vehicle loading document, DA Form 3151-R compatible output.

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[6]A single DODIC number may have several NSN's common to it. Usually only packaging dimensions and quantities vary among different NSN's.

Loads which require more than one vehicle are automatically spanned across vehicles. When loading of a selected ammunition type is completed, the program will prompt the clerk to select the next ammunition to be loaded from a displayed list of remaining ammunition requests. The last vehicle used for the previous load may have space and capacity to accept the next load, and loading will commence with the partially loaded vehicle if the clerk permits a mixed-load to be performed. Loading will continue until the request is completed or until all vehicles of the selected type are utilized. When all vehicles of a given type have been used, the program will prompt for identifications of additional vehicles of another type to be loaded. Thus loads may be spanned across vehicle types.

A detailed loading example is provided in Appendix B which illustrates the procedure, dialog, interaction, and hardcopy output. The example also illustrates the level of loading complexity by demonstrating (a) loads spanning vehicles, (b) loads spanning vehicles of different types, (c) simple staggered loading, and (d) mixed loads.

Load Computation Process

The process of loading a vehicle can be visualized as first computing the number of pallets of the selected ammunition type which can be loaded in the cargo space on a vehicle and also computing the number of ammunition pallets which can be carried by the vehicle based upon the vehicle gross weight capacity. The pallet count per vehicle is selected as the maximum from either of the two calculations but not more than that determined by the gross weight capacity. Loading of the vehicle may be visualized as placing ammunition pallets on the vehicle bed in a virtual row by row fashion with the first row starting at the front, left corner of the vehicle bed and proceeding across the vehicle bed, from left to right, toward the other side. When all pallets have been placed in the first row, the next row, closer to the tailgate of the vehicle, is started.

If loading exhausts the quantity of ammunition to be loaded before a row is completed, a "GAP" is declared and, if mixed loads are permitted, the "GAP" may be filled with another type of ammunition which will fit in the "GAP." The size of the "GAP" is the remaining unused row distance across the vehicle bed width by the row width which is the width of the last pallet in the incomplete row.

The ASP clerk, controlling the loading process, may decide not to use the "GAP" and loading can continue with the next row. If ammunition that remains to be issued cannot fit in the space remaining on the vehicle, loading will be automatically initiated for the next available vehicle.

The GOER, see Figure 5, is handled as a special case. The loading algorithm considers the sections marked A and B, delineated by a dashed line, as two separate compartments. Loading begins with the A (forward) compartment and, if vehicle gross weight is not exceeded, continues into the B (rear) compartment. The program will combine the A and B compartments to accommodate loads which exceed the A-compartment bed length.

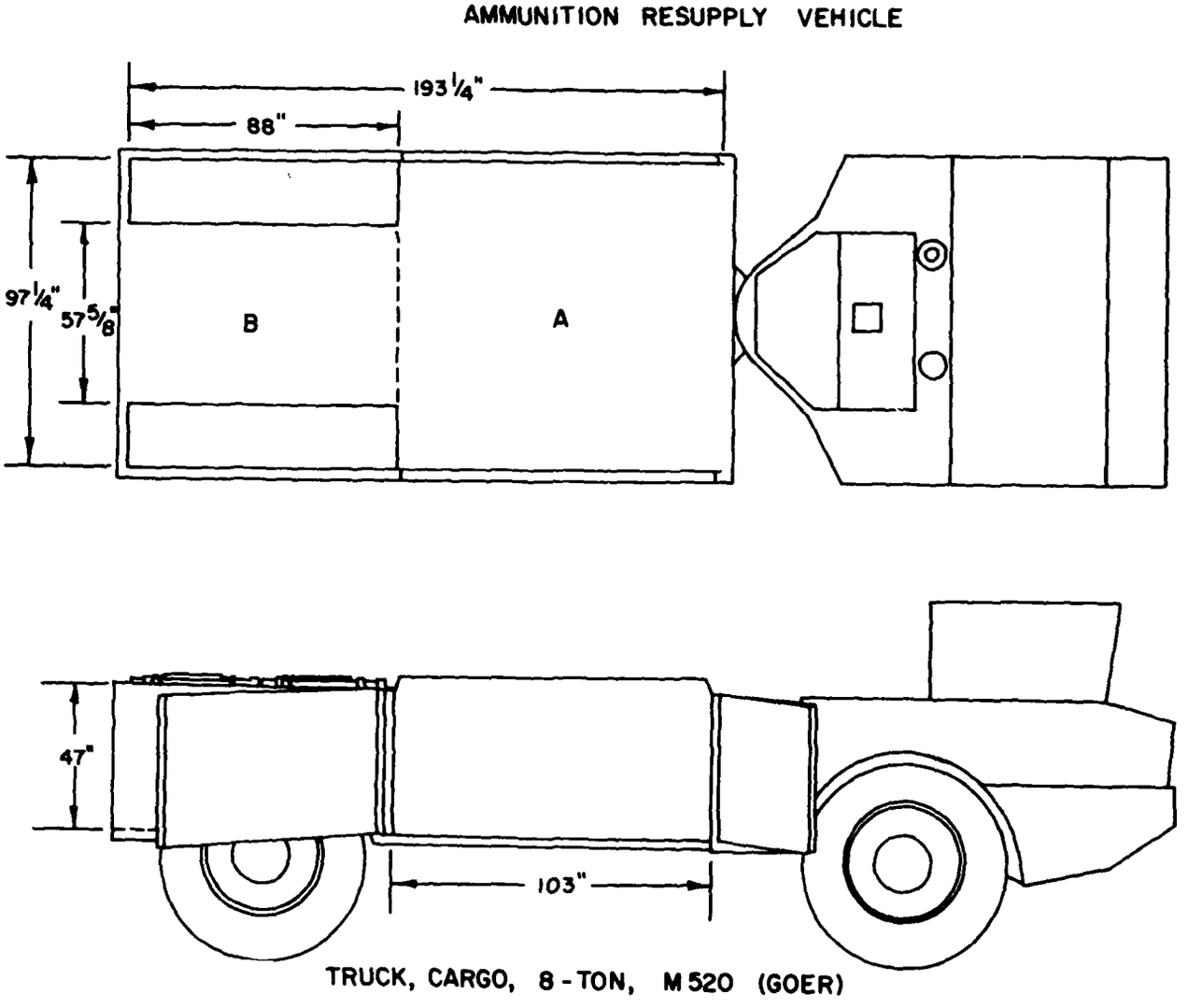

Figure 5. Truck, cargo 8-ton, section definition.

Figure 6 is a coarse outline of the truck loading algorithm which will aid in visualizing the loading process.

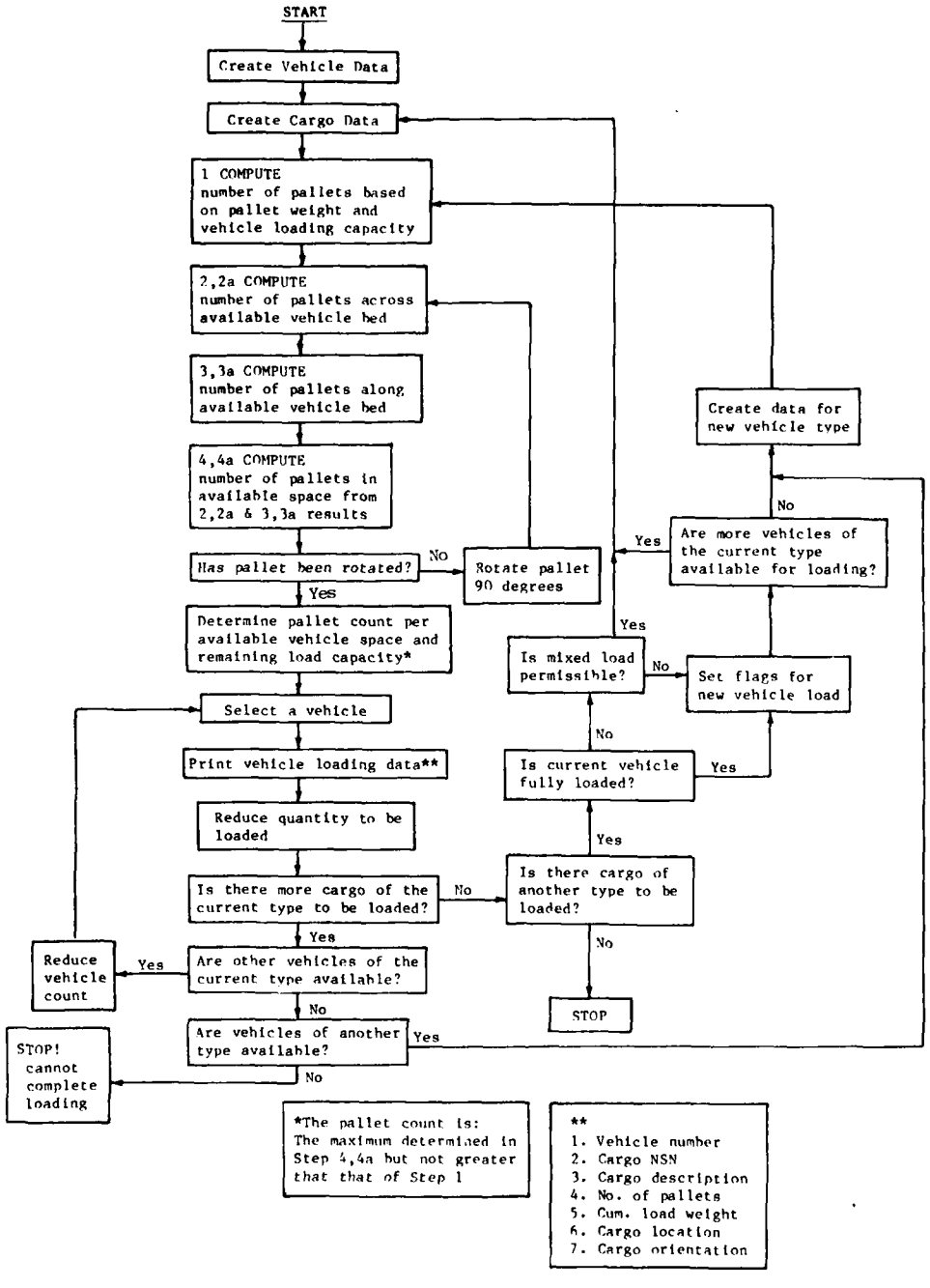

Figure 6. Outline of cargo loading program.

Exception Handling

The ammunition data base was created from a list of ammunition requirements most probably to be requested by combat units. Ammunition requirements for new weapon systems such as the Infantry Fighting Vehicle (IFV), Cavalry Fighting Vehicle (CFV), and the Division Air Defense Systems (DIVADS) have not been included. When requested DODIC's are not located in the data base, the ASP clerk is required to utilize available documentation, such as supply catalogs, to obtain and enter the NSN, packaging, transportation, and nomenclature data. When this is done, an entry is created in the temporary memory resident file for the convoy ammunition request as would have been the case if the requested DODIC were located in the data base. The data base is not extended and the program does not retain a permanent record of this entry.

Exceptions to the predefined list of vehicles are handled by the ASP clerk selecting vehicle type "OTHER." The ASP clerk will then be requested to enter the vehicle bed length and width dimensions plus the load carrying capacity of the vehicle. "OTHER" vehicle types are limited to vehicles having a simple rectangular load bed. Data entered for vehicle type "OTHER" is not permanently retained by the program and initial data will be lost when "OTHER" is reselected or the program restarted.

Small quantities of ammunition, that is quantities of less than one pallet, are handled as "Unassigned Loads." These are loads which would probably be package level quantities and would most likely be loaded manually. An issue document is generated without a vehicle assignment. Unused gaps, space at the sides or tail of a vehicle, or miscellaneous vehicles accompanying an ammunition convoy would carry these ammunition requests.

Hardware and Software Requirements

Software--The program is written in the FORTRAN IV computer language and requires approximately 43,000 bytes of memory. Storage requirements for the disk resident data base is 20480 bytes formatted. Binary format rather than ASCII format is used to improve disk record access time.

The minimum hardware configuration for a single user is:

a. Small computer with 64K bytes memory and 16-bit word size.

b. Disk storage device with 3.1 million byte capacity, 70 ms average access time and 1.44 million bites per second transfer rate.

c. Video terminal and keyboard with 24-line by 80-column output with 9600 band transmission rate.

d. Hardcopy output device with 120 character per second output rate and 80 characters per line.

Most minicomputer and 16-bit microcomputers are adequate for the computational and interactive requirements for a single user system. The HEL field test system will use a PDP11/24 computer.

Disk performance is critical. If transfer rates are reduced and access times increased beyond optimum value, data base search times become excessive and can seriously degrade the interaction between the user and computer system.

A video terminal with a high speed transmission rate is required to maintain a high rate of interaction with the user, especially when presenting the list of ammunition requests. Video terminals also reduce the amount of paper required since there is usually no need to maintain a record of user interaction with the system.

Hardcopy output, with multipart forms capability, is required to provide a DA 3151-R compatible (three copies) for vehicle loading and issue records. Print rates slower than 120 characters per second are not sufficient to prevent a hardcopy output bottleneck during peak activity.

CONCLUSIONS

Laboratory testing of personnel is in progress and preliminary results are favorable. Results so far indicate than even inexperienced personnel can develop ammunition vehicle loads faster than highly experienced personnel using the manual method. Variations in time to configure loads are greatly reduced among personnel of different capabilities due to the elimination of difficult and time consuming arithmetic calculations.

Unsophisticated users, personnel with little or no prior experience using computer terminals, successfully respond and interact with the program dialog.

The approach selected was successfully implemented on a small computer system of the scale and configuration which will be available in actual field units in the near future.

A fail-safe method of merging an automated process with a manual process has been achieved.

RECOMMENDATIONS

The truck loading program should be implemented with the Standard Army Ammunition System (SAAS) Level 4.

Future efforts should include a method to assist the ASP clerk to select a loading sequence which would optimize the movement of ammunition vehicles through the storage area. This would help to improve the overall ammunition handling time and reduce traffic congestion.

Graphics are needed in three areas:

1. During load configuration to help the ASP clerk select loads by graphically showing the vehicle loading as it is developed.

2. To help the ASP clerk select a loading sequence based upon ammunition location and traffic routes in the storage area.

3. To provide hardcopy graphic output to help the ammunition handlers properly configure vehicle loads.

APPENDIX A

AMMUNITION DATA BASE

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A068	1305-00-914-4719	430	500	380	3316	470	145	127	84	67	9	1640	48	C	5.56MM-TRACER
A071	1305-00-926-3930	430	500	380	3556	470	145	127	84	72	9	1680	48	C	5.56MM-BALL
A131	1305-00-143-7163	460	510	380	3796	460	174	115	81	77	9	800	48	C	7.62MM LINKED(COMB)
A131	1305-00-449-8068	460	510	380	3796	510	174	115	81	77	9	800	48	C	7.62MM-LINKED(COMB)
A146	1305-00-892-2335	460	510	380	3796	510	174	115	81	77	9	800	48	C	7.62MM LINKED TRACER
A151	1305-00-889-2169	460	510	380	3700	510	174	115	81	75	9	800	48	C	7.62MM LINKED(COMB)
A165	1305-00-926-3942	400	490	260	1516	290	186	8	146	118	13	1500	12	C	7.62MM LINKED(COMB)
A475	1305-00-028-6619	430	520	200	1800	250	148	105	86	68	7	1200	25	C	45 CAL-BALL
A479	1305-00-905-6788	430	500	220	2812	270	145	127	84	113	9	2000	24	C	50 CAL-TRACER
A556	1305-00-541-9834	400	500	390	3700	470	145	128	84	75	10	200	48	C	50 CAL-BALL - TRACER
A557	1305-00-028-6583	430	500	380	3700	480	145	127	84	75	9	200	48	C	50 CAL-BALL - TRACER
A557	1305-00-540-1056	430	500	380	3700	500	145	127	84	75	9	200	48	C	50 CAL BALL ; TRACER
A576	1305-00-028-6603	430	500	390	3700	470	145	127	84	75	9	200	48	C	50 CAL-API - API-T
A585	1305-00-618-2400	430	500	380	3700	470	145	127	84	75	9	200	48	-	CTG LINKED CAL,50,API-T
A589	1305-00-689-4709	430	500	380	3460	470	145	127	84	70	9	170	48	C	50 CAL-API - API-T
A593	1305-00-689-4752	430	500	380	3460	470	145	127	84	70	9	170	48	C	50 CAL-AP + TRACER
A653	1305-00-143-7034	400	490	350	2308	390	186	82	146	92	13	100	24	++	CTG 20MM LNKD 4HEI
A658	1305-00-152-3662	400	490	350	2308	390	186	82	146	92	13	100	24	++	CTG 20MM LNKD 7HEI
A658	1305-00-783-5482	400	490	350	2308	390	186	82	146	92	13	100	24	++	CTG 20MM LNKD 7HEI
A792	1305-00-926-9279	400	480	480	2890	530	186	82	146	93	13	100	30	++	CTG 20MM, HEI-T
A919	1305-00-892-4321	400	480	470	2400	520	186	146	86	92	13	100	25	A	20MM-HEI
B470	1310-00-143-8863	400	510	470	1372	550	257	163	68	53	17	50	24	A	40MMHE
B546	1310-00-992-0451	400	510	470	1372	550	257	163	68	53	17	50	24	++	CTG 40MM HE
B569	1310-00-979-3563	400	400	480	2008	530	0	0	0	0	0	72	36	A	40MM-HE
B632	1310-00-143-7021	400	480	470	1350	250	176	141	82	50	11	10	25	A	60MM-HE
C226	1315-00-143-7059	390	280	480	1235	300	282	131	66	55	14	3	21	A	81MM-ILLUM
C226	1315-00-965-0718	390	280	480	1235	280	282	133	62	60	14	3	21	A	81 MM-ILLUM
C236	1315-00-935-2003	340	480	480	2040	450	245	85	83	49	10	4	40	-	CTG HE W@O FUZE 81MM
C256	0000-00-000-0000	420	530	450	1936	530	261	138	66	51	14	3	36	A	81 MM-HE
C256	1315-00-935-1930	420	530	450	1936	570	261	138	66	51	14	3	36	A	81MM-HE
C256	1315-00-935-1932	420	530	450	1936	530	261	138	66	51	14	3	36	A	81MM-HE
C276	1315-00-574-7680	420	480	320	1171	380	261	139	66	51	14	3	21	A	81MM-SMOKE-WP
C276	1315-00-574-7681	480	480	320	1171	480	261	139	66	51	14	3	21	A	105 MM-HE
C443	1315-00-926-4054	360	370	440	1880	330	372	121	77	12	20	2	15	A	105MM-HE
C452	1315-01-031-0713	370	360	440	1900	310	373	119	76	120	20	2	15	A	105MM-SMOKE-HC
C454	1315-00-113-5741	360	370	480	2240	370	375	121	76	120	20	2	18	A	105MM-SMOKE-WP
C454	1315-00-143-7616	360	370	480	2240	370	367	121	70	121	17	2	18	A	105 MM,SMOKE-WP
C454	1315-00-439-6121	360	370	480	2240	370	372	121	77	120	20	2	18	A	105MM,SMOKE-WP
C462	1315-00-162-2006	360	370	430	1880	330	378	114	69	120	20	2	15	A	105MM-SMOK-HE
C462	1315-00-965-0739	360	370	430	1880	370	378	114	69	120	20	2	33	A	105MM-HE
C505	1315-01-030-6837	400	424	500	1920	490	399	141	87	122	28	2	15	++	105MM APDS-T
C505	1315-01-030-7490	400	424	500	1920	491	399	141	87	122	28	2	15	B	105MM-APDS-T
C506	1315-00-926-1872	420	380	500	2456	460	380	140	78	132	20	2	18	B	105MM-APDS-T
C508	1315-00-192-9557	430	460	460	2060	520	458	142	87	132	33	2	15	A	105MM-HEAT
C508	1315-00-756-2886	430	460	460	2060	520	458	142	83	132	33	2	15	A	105MM-HEAT
C508	1315-00-926-3989	430	460	460	2060	520	458	141	83	132	33	2	15	A	105MM-HEAT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
C512	1315-00-143-7183	440	440	500	2135	560	440	148	88	137	32		2	15	++ 105MM-SMOKE
C518	1315-00-728-0704	420	430	480	2135	500	435	140	85	137	30		2	15	A 105MM-HEP-T
C518	1315-00-935-6128	420	430	500	2135	520	435	140	85	137	30		2	15	A 105MM-HEP-T
C519	1315-00-143-6930	420	460	510	2180	550	467	143	90	140	35		2	15	++ 105MM-SMOKE
C519	1315-00-935-6154	430	460	500	2180	560	467	143	90	140	35		2	15	++ 105MM WP-T
C521	1315-00-038-6838	420	480	490	1930	580	477	141	86	122	34		2	15	B 105MM-APFSDS-T
C704	1315-00-028-5016	440	320	490	2048	390	321	112	72	82	15		2	24	A 4.2-HE
C704	1315-00-143-7178	440	320	490	2048	390	321	112	71	82	15		2	24	A 4.2-HE
C704	1315-00-926-1935	440	320	490	2048	390	321	112	72	82	15		2	24	A 4.2-HE
C705	1315-00-028-5107	450	320	410	1720	340	321	112	72	82	15		2	20	- CTG HE W@O FUZE FOR 4.2
C706	1315-00-028-5015	450	320	410	1760	340	321	121	72	82	15		2	20	- CTG ILL 4.2 IN MORTAR
C708	1315-00-028-5028	400	480	370	1820	410	321	112	72	86	15		2	20	A 4.2-SMOKE-WP
C708	1315-00-926-1935	400	480	370	1820	410	321	112	72	86	15		2	20	A 4.2 SMOKE-WP
C708	1315-00-965-0846	400	480	370	1820	410	321	112	72	86	15		2	20	A 4.2 SMOKE-WP
CHAP	1410-00-421-1632	1290	360	450	1402	360	0	0	0	0	0		4	1	A CHAPARRAL
D361	1320-00-926-3986	410	550	470	1904	0	0	0	0	0	0		1	16	- CHG PROP 175MM
D381	1320-00-143-6832	370	420	420	953	370	421	126	123	97	32		1	9	++ CTG 152MM HEAT-T-MP
D390	1320-00-926-4103	370	390	450	953	400	395	125	132	97	40		1	9	- CTG ANTIPERSONNEL 152MM
D505	1320-00-935-2091	271	136	320	862	60	0	0	0	0	0		8	1	B 155-ILLUM
D506	1320-00-926-9276	271	136	315	727	68	271	135	315	727	68		8	1	- PROJ 155MM HC SMOKE
D533	1320-00-143-6847	410	290	460	1330	310	292	82	82	50	11		1	25	B 155MM CHAR PROP WHIT BAG
D534	1320-00-767-9441	430	270	490	1196	320	277	73	73	31	8		1	36	- CHG PROP 155MM
D536	1320-00-775-1533	400	550	450	1492	570	550	98	98	87	30		3	16	- CHG PROP 175MM
D540	1320-00-028-4873	400	480	403	997	0	0	0	0	0	0		2	48	- CHG PROP 155MM 6B
D541	1320-00-028-4878	400	550	460	1600	590	275	77	77	30	8		1	50	B 155MM-CHARGE PROP,M4
D541	1320-00-284-4879	400	550	460	1600	590	275	77	77	30	8		1	50	B 155MM CHARGE,PRDP-M4
D541	1320-00-935-1923	400	550	460	1600	590	275	77	77	30	8		1	50	B 155MM CHARGE,PROP-M4
D544	1320-00-529-7331	271	136	320	797	60	271	136	320	797	68		8	1	A 155MM-HE
D544	1320-00-782-5532	271	136	320	797	68	0	136	320	797	68		8	1	A 155MM-HE
D544	1320-00-926-9319	271	136	320	797	68	271	136	320	797	68		8	1	A 155MM-HE
D550	1320-00-028-4883	270	140	320	830	70	271	271	136	830	67		8	1	A 155MM-SMOKE,WP

1. CODIC number
2. NSN
3. Pallet length (inches)
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5. Pallet height (inches)
6. Pallet weight (lbs)
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8. Package length (inches)
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10. Package height (inches)
11. Package weight (lbs)
12. Package volume (cu.ft.)
13. Rounds per package
14. Packages per pallet
15. DOT class
16. Description

Items in columns 3,4,5,7,8,9,&10 have a times 10 scale factor applied.

(Continued)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D550	1320-00-529-7339	271	136	320	830	60	271	136	320	830	68	8	1	A	155MM-SMOKE-WP
D550	1320-00-783-5828	271	136	320	830	68	320	136	320	830	68	8	1	A	155MM-SMOKE,WP
D561	1320-00-226-6147	271	136	320	831	68	271	136	320	831	68	8	1	++	155MM-HE
D561	1320-00-841-1057	271	136	320	831	68	271	136	320	831	68	8	1	++	155MM-HE
D562	1320-00-073-8847	271	136	320	831	68	271	136	320	831	68	8	1	++	155MM-HE
D563	1320-00-126-7339	271	136	320	831	68	271	136	320	831	68	8	1	A	155MM-HE
D563	1320-00-872-3164	271	136	320	831	390	271	136	320	831	68	8	1	A	155MM-HE
D570	1320-00-555-5126	450	340	450	1920	70	340	90	101	92	18	1	20	++	165MM-HEP
D572	1320-00-965-0571	256	168	422	948	106	256	168	422	948	106	6	1	-	PROJ HE 175MM
D579	1320-00-936-8276	270	140	320	830	670	315	271	136	830	67	8	1	A	155MM-HERA
D579	1320-00-936-8278	291	146	387	830	95	271	146	387	830	95	8	1	A	155MM-HERA
D651	1320-00-929-8389	285	192	395	1253	124	285	192	395	1253	124	6	1	-	PROJ 8 IN HE XM509
D675	1320-00-028-4374	440	520	500	1650	670	291	0	84	31	10	1	50	B	8 IN CHARGE,PROP
D675	1320-00-542-0132	440	520	500	1650	670	262	84	84	31	10	1	50	B	8IN-CHARGE,PROP
D676	1320-00-028-4375	410	580	470	1732	640	262	98	98	51	16	1	32	B	8 IN CHARGE,PROP
D676	1320-00-028-4378	410	580	470	1732	640	292	98	98	51	16	1	32	B	8IN-CHARGE,PROP
D680	1320-00-542-0728	285	190	395	1253	120	285	190	395	1253	124	3	1	A	8IN-HE
D684	1320-00-986-9731	285	192	395	1253	120	285	192	395	1253	124	6	4	A	8IN-HE
DRAG	1427-00-163-8959	470	800	690	1460	800	0	0	0	0	0	20	1	A	DRAGON
G881	1330-00-133-8244	400	480	390	1324	430	193	113	114	51	14	30	24	A	GRENADE-HEM6M
G890	1330-00-028-5839	400	510	500	1732	590	195	112	127	51	16	25	32	-	GRENADE M26
G937	0000-00-000-0000	400	480	500	2004	550	130	130	75	42	70	16	56	C	GREN-HD-RIFLE(SMOKE)-WP
G940	1330-00-028-5909	400	490	450	1528	510	158	132	73	42	90	16	42	C	SMOKE-GREEN
G945	1330-00-935-6122	400	490	450	1528	510	158	132	73	42	90	16	42	C	SMOKE-YELLOW
G950	1330-00-028-5916	400	490	450	1528	510	158	132	73	42	90	16	42	C	GRENADE-SMOKE-RED
G955	1330-00-301-1982	400	480	450	1192	500	158	132	73	42	90	16	42	IR	GRENADE-SMOKE-VIOLET
G963	1330-00-028-5908	400	490	480	1696	540	140	125	80	30	80	16	42	B	GRENADE-CS
H050	1330-00-930-8945	400	480	490	1380	540	193	180	108	80	22	8	16	A	LAUNCHER-GRENADE-SMOKE
H110	1340-00-132-0482	480	253	333	600	230	240	253	280	140	104	16	2	A	ROCKET,66MM-TPA-TEA
H459	1340-00-223-7224	430	620	330	2005	510	628	88	95	127	30	4	15	B	2.75-APERS
H487	1340-00-935-6198	360	460	440	1772	420	463	119	96	141	31	4	12	A	2.75-HEAT
H488	1340-00-143-7106	350	460	420	1732	0	0	0	0	0	0	3	12	-	ROCKET HE 2.75 IN
H490	1340-00-926-1945	350	460	420	1772	400	462	119	93	141	30	4	12	A	2.75-HE
H519	1340-00-143-7107	350	620	440	2112	550	628	88	95	127	30	4	16	A	2.75-SMOKE,WP
H519	1340-00-406-7327	350	620	440	2112	550	628	88	95	127	30	4	16	A	2.75 SMOKE-WP
H534	1340-00-191-3315	430	720	240	1720	440	728	87	95	162	35	4	10	A	2.75-HE
H555	1340-00-143-7032	310	330	480	464	270	331	331	140	128	89	15	3	++	ROCKET-HE, 66MM-M72A1
H555	1340-00-892-1561	310	330	480	431	260	327	314	135	118	80	15	3	++	ROCKET-HE, 66MM-M72
H555	1340-00-926-4086	310	330	460	431	270	328	314	135	117	80	15	3	++	ROCKET-HE, 66MM-M72
H568	1340-01-029-8012	420	380	500	2456	460	335	315	137	118	84	15	18	A	72MM-HEAT(VIPER)
H826	1340-00-689-4075	380	620	400	2132	0	0	0	0	0	0	4	16	-	ROCKET HE 2.75 IN
HAWK	0000-00-000-0000	1160	350	370	1900	350	0	0	0	0	0	1	1	A	HAWK
HELL	0000-00-000-0000	760	180	180	170	180	0	0	0	0	0	1	1	A	HELLFIRE
K092	1345-00-529-7303	400	460	480	2620	510	156	98	85	45	8	4	60	A	MINE-AP
K121	1345-00-096-3093	400	510	490	1450	590	198	173	88	46	17	90	30	A	MINE-AP
K143	1345-00-710-6946	400	480	500	1372	550	158	111	181	53	18	6	24	A	MINE-AP

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
K180	1345-00-028-5118	450	540	430	2305	600	180	151	80	49	18	1	45	-	MINE AT(HV) M15
K181	1345-00-729-4263	370	290	460	890	280	292	125	134	90	28	26	9	A	MINE-AT
K182	1345-00-782-5513	420	530	330	925	430	281	139	108	55	27	4	15	A	MINE-AT
K250	1345-00-324-1425	430	480	380	1804	450	164	104	160	72	16	2	24	-	MINE AT(NM) M19
K866	1365-00-598-5207	430	510	400	2356	500	129	108	115	47	10	1	48	C	POT-SMOKE,POT-HC
K867	1365-00-598-5220	450	480	510	1392	630	155	150	150	48	17	1	27	C	POT-SMOKE-HC
L305	1370-00-182-3408	520	447	462	1980	630	149	134	132	55	15	36	36	B	SIG ILL GND GREN STR
L306	1370-00-756-2591	400	480	450	1585	500	149	134	133	55	15	36	27	B	AL ILLUMGND RED STAR
L307	1370-00-756-2588	400	480	450	1585	500	149	134	133	55	15	36	27	B	SIG ILLUM GND WHITE STAR
L310	1370-00-965-0864	400	500	420	1588	480	183	125	134	54	18	30	24	B	SIGNAL GREEN STAR PARA
L311	1370-00-629-2336	400	480	450	1585	500	149	134	133	55	15	36	27	B	SIGNAL RED STAR PARA
L312	1370-00-756-1859	400	480	450	1585	500	149	134	133	55	15	36	27	B	SIGNAL WHITE STAR PARA
L314	1370-00-629-2335	400	480	450	1585	500	149	134	132	55	15	36	27	B	SIGNAL GREEN STAR PARA
L340	1370-00-926-1931	400	480	460	2116	510	153	135	101	56	12	240	36	B	SIGNAL SMOKEGROUND WHITE
L341	1370-00-926-1930	400	480	470	2116	630	151	135	101	56	12	240	36	B	SIGNAL SMOKEGROUND GREEN
L342	1370-00-926-1933	400	480	470	2116	630	151	135	101	56	12	240	36	B	SIGNAL SMOKEGROUND RED
L343	1370-00-926-1932	400	480	470	2116	630	151	135	101	56	12	240	36	B	SIGNAL SMOKEGROUNDYELLOW
L473	1370-00-088-5658	420	440	450	1772	480	443	143	66	94	30	2	18	B	FLARE AIRCRAFT PARA
L495	1370-00-028-5944	420	480	500	2324	580	213	144	110	51	19	16	24	-	FLARE TRIP M49
LANC	0000-00-000-0000	1610	390	430	3993	390	0	0	0	0	0	1	1	A	LANCE
M023	1375-00-724-7040	420	480	310	1792	360	140	115	86	47	8	20	36	A	CHARGE DEMO
M024	1375-00-728-5941	400	530	400	2180	500	177	134	80	52	10	192	40	A	CHARGE DEMO
M030	1375-00-926-9394	400	480	420	2116	460	180	165	100	71	17	100	24	A	CHARGE,DEMO-TNT
M031	1375-00-028-5140	440	480	470	2308	570	228	110	93	69	13	100	32	A	CHARGE,DEMO-TNT
M032	1375-00-028-5142	400	480	400	1804	440	226	114	96	71	14	50	24	A	CHARGE,DEMO-TNT
M039	1375-00-028-5145	440	270	430	1120	290	275	89	97	52	14	1	20	-	CHG DEMO 40# CRATERING
M060	1375-00-926-4108	390	430	370	1480	370	199	186	140	115	30	3	12	A	CHARGE-ROLL
M130	1375-00-756-1865	400	480	530	1504	580	272	202	175	114	52	900	12	A*	CAP,BLASTING,ELECTRIC
M131	1375-00-028-5226	410	480	540	2068	610	239	163	103	82	23	5000	24	A*	CAP,BLASTING,NONELECTRIC
M420	1375-00-028-5237	390	330	450	1120	350	331	95	104	66	18	4	16	A	CHARGE,DEMO SHAPED-M2
M420	1375-00-926-3939	420	330	450	1120	350	339	98	104	65	20	3	16	A	
M420	1375-00-935-1924	390	330	450	1120	350	331	95	104	66	18	3	16	A	CHARGE,DEMO-SHAPED,M-2
M421	1375-00-028-5241	410	530	520	2180	660	205	118	134	65	19	1	32	A	CHARGE,SHAPED-40-LB

1. DODIC number
2. NSN
3. Pallet length (inches)
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13. Rounds per package
14. Packages per pallet
15. DOT class
16. Description

Items in columns 3,4,5,7,8,9,&10 have a times 10 scale factor applied.

(Continued)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M456	1375-00-180-9356	390	330	390	773	290	334	118	111	77	25	3000	9	C	DET CORD
M591	1375-00-724-9613	410	480	510	2908	580	195	114	98	117	13	100	24	A	DYNAMITE
M626	1375-00-028-5178	420	400	450	1660	430	408	105	78	78	19	150	20	C	FIRING DEVICE,DEMO
M627	1375-00-028-5190	400	480	440	1764	480	199	119	95	52	13	200	32	C	FIRING DEVICE,DEMO
M629	1375-00-028-5188	420	520	500	1700	630	154	114	108	50	12	150	32	C	FIRING DEVICE,DEMO
M630	1375-00-028-5183	400	480	480	2200	530	155	100	85	35	7	150	60	C	FIRING DEVICE,DEMO
M670	1375-00-025-5246	460	520	360	658	490	301	151	149	94	39	8	9	C	FUZE,TIME-BLASTING
M757	1370-00-926-3985	400	480	430	1468	470	173	120	127	57	15	2	24	A	CHARGE,DEMO ASSY
M766	1375-00-691-1671	430	480	440	1612	520	216	119	131	56	20	300	24	C	IGNITER,TIMEBLASTINGFUZE
MLRS	0000-00-000-0000	1680	445	390	5172	445	0	0	0	0	0	6	1	A	MLRS
N248	1390-00-993-5619	430	500	430	2044	410	149	130	93	54	10	16	36	++	FUZE, MT
N248	1390-00-993-5691	430	500	430	2044	410	149	130	93	54	10	16	36	++	FUZE, MT
N276	1390-00-341-4184	410	520	420	2260	530	185	139	129	90	19	40	24	C	MT
N278	1390-00-889-2044	430	500	330	2080	410	149	130	93	55	10	16	36	A	FUZEMT WITH BOOSTER
N285	1390-00-805-0692	430	500	420	2260	520	149	130	93	56	10	16	48	C	FUZE MT ; SQ
N308	1390-00-143-7008	400	480	430	1612	470	149	130	93	42	10	16	36	-	FUZE PD M572
N311	1390-00-009-5572	430	500	330	2080	0	0	0	0	0	0	8	72	-	FUZEPOINT DET BOOSTER
N335	1390-00-892-4302	400	500	430	2080	410	149	130	93	55	10	16	36	A	FUZE PD
N335	1390-00-965-0824	430	500	430	2080	410	148	130	91	55	10	16	36	A	FUZE,PD
N402	1390-00-764-9124	430	510	510	2620	640	146	128	91	42	10	16	60	-	FUZE PROX M532
N462	1390-00-935-9246	400	480	420	1801	480	146	129	120	63	13	16	27	A	FUZE PROX
N463	1390-00-182-3132	430	510	440	2368	510	146	129	120	63	13	16	36	A	FUZE PROX
N477	1390-00-926-4055	430	480	420	1963	480	153	120	146	98	16	25	27	C	FUZE PROX
N523	1390-00-892-4202	400	480	510	1276	480	244	121	114	62	20	500	24	C	PERCUSSION
REDE	1425-00-183-5990	400	590	440	659	590	0	0	0	0	0	6	1	A	REDEYE-STINGER
SHIL	0000-00-000-0000	520	450	510	1187	450	0	0	0	0	0	9	1	A	SHILLELAGH
TOW	1410-00-087-1521	590	480	400	1126	480	0	0	0	0	0	12	1	A	TOW
Z996	1425-00-183-5990	400	590	440	659	590	0	0	0	0	0	6	1	++	REDEYE-STINGER
Z997	1410-00-087-1521	590	480	400	1126	480	0	0	0	0	0	12	1	++	TOW
Z998	1427-00-163-8959	470	800	690	1460	800	0	0	0	0	0	20	1	++	DRAGON
Z999	0000-00-000-0000	520	450	510	1187	450	0	0	0	0	0	9	1	++	SHILLELAGH
\\\\	\\\\\\\\\\\\\\\\	0	0	0	0	0	0	0	0	0	0	0	0	\\	\\\\\\\\\\\\\\\\\\\\\\\\

PIP>$
PIP>

1. DODIC number
2. NSN
3. Pallet length (inches)
4. Pallet width (inches)
5. Pallet height (inches)
6. Pallet weight (lbs)
7. Pallet volume (cu.ft.)
8. Package length (inches)
9. Package width (inches)
10. Package height (inches)
11. Package weight (lbs)
12. Package volume (cu.ft.)
13. Rounds per package
14. Packages per pallet
15. DOT class
16. Description

Items in columns 3,4,5,7,8,9,&10 have a times 10 scale factor applied.

(Concluded)

APPENDIX B

LOADING EXAMPLE

The example shows the dialog that occurs between the computer and "ASP clerk" in meeting a request from a fictitious 121st Aviation Battalion. Their request for 282 rounds of 2.75 HE Rockets (DODIC H488), 560 rounds of 2.75 HE Rockets (DODIC H826), 72 rounds of TOW, and 360 mines (DODIC K180) is to be loaded upon six 5-ton trucks and two GOERs.

This example was selected to demonstrate program capatilities and doesn't necessarily reflect the TOE and ammunition requirements of an aviation battalion.

Underlined items in the dialog indicate entries by the "ASP clerk." All other items are computer program responses or prompts.

An Ammunition Stores Slip DA 3151 compatible form is shown in Figures 1B through 8B which was developed in response to the interactive dialog and execution of the program. Figures 9B through 11B show the corresponding vehicle by vehicle load configuration required to satisfy the ammunition request.

```
ENTER DATE >>
05-OCT-81$
ENTER ASP ID NUMBER >>
ASP #602$
ENTER REQUESTING UNIT >>
121 AVN BN$

YOU HAVE ENTERED:
  DATE                05-OCT-81
  ASP ID NUMBER       ASP #602
  REQUESTING UNIT     121 AVN BN

ARE ALL ENTRIES CORRECT ??
Y$
```

Block 1
Program start
Accounting and forms data entered.

```
SELECT MENU # FOR VEHICLE TO BE LOADED
   2 = 2-1/2-TON TRUCK
   5 = 5-TON TRUCK
   8 = 8-TON GOER
  12 = 12-TON S+P TRUCK
   0 = NONE OF ABOVE >>
5$

ENTER # OF VEH OF SELECTED TYPE TO BE LOADED >>
6$

  6 VEHICLES ARE TO BE LOADED.
IS THIS CORRECT ??
Y$
```

Block 2
Ammunition carrying vehicle is identified. 5-Ton trucks are selected.

(Continued)

```
ENTER DODIC >>
H488$

#   NSN                LEN    WID    WT     RD/    PK/P   DESCRIPTION
1   1340-00-143-7106   35.0   46.0   1732     3    12     ROCKET HE 2.75 IN

0   NONE OF ABOVE

SELECT LINE # >>
1$

ENTER QUANTITY REQUESTED >>
282$
ENTER QUANTITY TO BE ISSUED >>
282$
ENTER LOT NUMBER >>
RSA22$
ENTER LOT LOCATION >>
2A$

YOU HAVE ENTERED:
  QUANTITY REQUESTED       282.
  QUANTITY TO BE ISSUED    282.
  LOT NUMBER               RSA22
  LOT LOCATION             2A

ARE ALL ENTRIES CORRECT ??
Y$
```

Block 3
Begin building a temporary memory resident file of the requested ammunition. Ammunition type identified by DODIC number.

Data base is searched and the ASP clerk is presented with a descriptive list of one or more NSN's common to the DODIC entered.

The ASP clerk selects an NSN, enters the number of rounds requested and the number of rounds available for issue.

(Continued)

```
DO YOU HAVE OTHER AMMO TO ISSUE ??
Y$


ENTER DODIC >>
H826$

#   NSN                 LEN    WID    WT     RD/    PK/P   DESCRIPTION
1   1340-00-689-4075    38.0   62.0   2132     4    16     ROCKET HE 2.75 IN

0   NONE OF ABOVE

SELECT LINE # >>
1$

ENTER QUANTITY REQUESTED >>
560$
ENTER QUANTITY TO BE ISSUED >>
560$
ENTER LOT NUMBER >>
SAB18$ :
ENTER LOT LOCATION >>
2B$

YOU HAVE ENTERED:
  QUANTITY REQUESTED       560.
  QUANTITY TO BE ISSUED    560.
  LOT NUMBER              SAB18
  LOT LOCATION            2B

ARE ALL ENTRIES CORRECT ??
Y$
```

Block 4
A second type of ammunition to be issued is identified for entry into the temporary memory resident ammunition file.

(Continued)

```
DO YOU HAVE OTHER AMMO TO ISSUE ??
Y$


ENTER DODIC >>
TOW$

#   NSN                 LEN    WID    WT     RD/    PK/P   DESCRIPTION
1   1410-00-087-1521    59.0   48.0   1126     12    1     TOW

0   NONE OF ABOVE

SELECT LINE # >>
1$

ENTER QUANTITY REQUESTED >>
72$
ENTER QUANTITY TO BE ISSUED >>
72$
ENTER LOT NUMBER >>
S17$
ENTER LOT LOCATION >>
2C$

YOU HAVE ENTERED:
  QUANTITY REQUESTED        72.
  QUANTITY TO BE ISSUED     72.
  LOT NUMBER              S17
  LOT LOCATION            2C

ARE ALL ENTRIES CORRECT ??
Y$
```

Block 5
A third type of ammunition to be issued is identified for entry into the temporary memory resident ammunition file.

(Continued)

```
DO YOU HAVE OTHER AMMO TO ISSUE ??
Y$


ENTER DODIC >>
K180$

#   NSN                 LEN    WID    WT     RD/    PK/P   DESCRIPTION
1   1345-00-028-5118    45.0   54.0   2305     1    45     MINE AT(HV) M15

0   NONE OF ABOVE

SELECT LINE # >>
1$

ENTER QUANTITY REQUESTED >>
360$
ENTER QUANTITY TO BE ISSUED >>
360$
ENTER LOT NUMBER >>
K14$
ENTER LOT LOCATION >>
4A$

YOU HAVE ENTERED:
  QUANTITY REQUESTED       360.
  QUANTITY TO BE ISSUED    360.
  LOT NUMBER               K14
  LOT LOCATION             4A

ARE ALL ENTRIES CORRECT ??
Y$
```

Block 6
A fourth type of ammunition to be issued is identified for entry into the temporary memory resident ammunition file.

(Continued)

```
DO YOU HAVE OTHER AMMO TO ISSUE ??
N$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   H488    35.0   46.0   1732     3    12     ROCKET HE 2.75 IN        1
 2   H826    38.0   62.0   2132     4    16     ROCKET HE 2.75 IN        2
 3   TOW     59.0   48.0   1126    12     1     TOW                      3
 4   K180    45.0   54.0   2305     1    45     MINE AT(HV) M15          4
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   H488    35.0   46.0   1732     3    12     ROCKET HE 2.75 IN        1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

Block 7

The issue procedure is complete. All ammunition requested for issue has been identified to the system.

The list of ammunition in the temporary memory resident ammunition file is displayed to the ASP clerk.

The ASP clerk can select any item from this list to begin the loading *procedure.*

The selected ammunition is displayed and an opportunity to load or reconsider is provided.

```
REQUESTED AMT OF   282. RDS REPRESENTS   7.83 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
8$

SELECTED QUANTITY IS      6. RDS MORE THAN ORDERED AMOUNT.
IS THIS OK ??
Y$
```

Block 8

The program computes the number of *pallets to be loaded and the ASP* clerk adjusts fractional quantities to whole pallet quantities. The program then computes the load configuration for the selected ammunition.

(Continued)

```
* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       1
*   DODIC           H488
*   DESCRIPTION     ROCKET HE 2.75 IN
*   # OF PLTS       5
*   LOAD WT         8660
*   ORIENTATION     1

* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       2
*   DODIC           H488
*   DESCRIPTION     ROCKET HE 2.75 IN
*   # OF PLTS       3
*   LOAD WT         5196
*   ORIENTATION     1
```

Block 9
A vehicle by vehicle load configuration is displayed at the ASP clerk's computer terminal.

Simultaneously, a DA 3151 (Ammunition Stores Slip) compatible output is printed (see Figures 1B and 2B).

The load is spanned across two 5-ton trucks.

```
A GAP IS AVAILABLE FOR LOADING;
THE DIMENSIONS ARE  52.0 BY  46.0 INCHES.
SELECT CARGO THAT WILL FIT.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   H826    38.0   62.0   2132     4    16     ROCKET HE 2.75 IN        1
 2   TOW     59.0   48.0   1126    12     1     TOW                      2
 3   K180    45.0   54.0   2305     1    45     MINE AT(HV) M15          3
 0   NONE OF ABOVE

ENTER LINE # >>
0$
```

Block 10
A GAP is identified by the program; however, none of the remaining unloaded ammunition will fit the GAP.

The ASP clerk elects to continue the loading process in the next virtual row.

```
GAP WILL NOT BE USED.
```

(Continued)

```
#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   H826    38.0   62.0   2132     4    16     ROCKET HE 2.75 IN        1
 2   TOW     59.0   48.0   1126    12     1     TOW                      2
 3   K180    45.0   54.0   2305     1    45     MINE AT(HV) M15          3
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   H826    38.0   62.0   2132     4    16     ROCKET HE 2.75 IN        1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

Block 11
The ASP clerk selects the next ammunition to be loaded.

```
REQUESTED AMT OF   560. RDS REPRESENTS   8.75 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
9$

SELECTED QUANTITY IS     16. RDS MORE THAN ORDERED AMOUNT.
IS THIS OK ??
Y$
```

Block 12
The program computes the number of pallets to be loaded and the ASP clerk adjusts fractional quantities to whole pallet quantities. The program then computes the load configuration for the selected ammunition.

(Continued)

```
* PARTIAL LOAD INFORMATION:
*
*   VEHICLE #       2
*   DODIC           H826
*   DESCRIPTION     ROCKET HE 2.75 IN
*   # OF PLTS       1
*   LOAD WT         7328
*   ORIENTATION     2

* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       3
*   DODIC           H826
*   DESCRIPTION     ROCKET HE 2.75 IN
*   # OF PLTS       4
*   LOAD WT         8528
*   ORIENTATION     1

* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       4
*   DODIC           H826
*   DESCRIPTION     ROCKET HE 2.75 IN
*   # OF PLTS       4
*   LOAD WT         8528
*   ORIENTATION     1
```

Block 13
A vehicle by vehicle load configuration is computed.

A DA 3151 compatible output is printed (see Figures 2B, 3B, and 4B).

The load is spanned across three vehicles of the same type.

(Continued)

```
DO YOU WANT TO MIX CARGO ON THIS VEHICLE ??
Y$
```

Block 14
The ASP clerk grants permission to mix ammunition on the last 5-ton truck and selectes the TOW for loading.

```
#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   TOW     59.0   48.0   1126     12     1    TOW                       1
 2   K180    45.0   54.0   2305      1    45    MINE AT(HV) M15           2
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   TOW     59.0   48.0   1126     12     1    TOW                       1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

```
REQUESTED AMT OF    72. RDS REPRESENTS   6.00 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
6$
```

Block 15
The program computes pallet quantities.

(Continued)

```
PALLET WILL NOT FIT;
SELECT PALLET SMALLER THAN  87.0 BY  26.0 INCHES.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   TOW     59.0   48.0   1126     12     1    TOW                      1
 2   K180    45.0   54.0   2305      1    45    MINE AT(HV) M15          2
 0   NONE OF ABOVE

ENTER LINE # >>
0$
```

Block 16
The program determines that the TOW pallet will not fit in the space remaining on the last used 5-ton truck.

An opportunity is provided to allow the ASP clerk to select another type of ammunition from the list of ammunition remaining to be loaded. None is found which will fit; therefore, the program will load ammunition on the next available 5-ton truck.

An ammunition selection is made and loading is directed.

```
NEXT VEHICLE WILL BE USED FOR LOAD.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   TOW     59.0   48.0   1126     12     1    TOW                      1
 2   K180    45.0   54.0   2305      1    45    MINE AT(HV) M15          2
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   TOW     59.0   48.0   1126     12     1    TOW                      1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

```
REQUESTED AMT OF    72. RDS REPRESENTS   6.00 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
6$
```

Block 17
The program computes the pallet quantities.

(Continued)

```
* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       5
*   DODIC           TOW
*   DESCRIPTION     TOW
*   # OF PLTS       3
*   LOAD WT         3378
*   ORIENTATION     1

* VEHICLE LOAD INFORMATION:
*
*   VEHICLE #       6
*   DODIC           TOW
*   DESCRIPTION     TOW
*   # OF PLTS       3
*   LOAD WT         3378
*   ORIENTATION     1
```

Block 18
A vehicle by vehicle load configuration is computed.

A DA 3151 compatible form is printed (see Figures 5B and 6B).

The load is spanned across two 5-ton trucks.

```
DO YOU WANT TO MIX CARGO ON THIS VEHICLE ??
YS
```

Block 19
The ASP clerk grants permission to mix ammunition on the last used 5-ton truck.

```
A GAP IS AVAILABLE FOR LOADING;
THE DIMENSIONS ARE  28.0 BY  48.0 INCHES.
SELECT CARGO THAT WILL FIT.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   K180    45.0   54.0   2305     1    45     MINE AT(HV) M15          1
 0   NONE OF ABOVE

ENTER LINE # >>
0S     ,
```

Block 20
The program identifies a GAP; however, the ammunition remaining to be loaded will not fit in the GAP. The ASP clerk cannot make a selection.

(Continued)

```
GAP WILL NOT BE USED.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   K180    45.0   54.0   2305      1   45     MINE AT(HV) M15          1
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   K180    45.0   54.0   2305      1   45     MINE AT(HV) M15          1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

Block 21
GAP is not to be used. The ASP clerk selects the remaining ammunition to be loaded in the next virtual row on the 5-ton truck.

```
REQUESTED AMT OF   360. RDS REPRESENTS   8.00 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
8$
```

Block 22
Pallet quantities are computed.

```
PALLET WILL NOT FIT;
SELECT PALLET SMALLER THAN  87.0 BY   6.0 INCHES.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION              #
 1   K180    45.0   54.0   2305      1   45     MINE AT(HV) M15          1
 0   NONE OF ABOVE

ENTER LINE # >>
0$
```

Block 23
The program determines that the remaining virtual row size (87x6) is too small to accept the selected ammunition pallet. No ammunition of a compatible size is left in the ammunition list and the ASP clerk elects not to select from the list.

(Continued)

```
IS ANOTHER VEHICLE TYPE AVAILABLE ??
Y$

SELECT MENU # FOR VEHICLE TO BE LOADED
   2 = 2-1/2-TON TRUCK
   5 = 5-TON TRUCK
   8 = 8-TON GOER
  12 = 12-TON S+P TRUCK
   0 = NONE OF ABOVE >>
8$

ENTER # OF VEH OF SELECTED TYPE TO BE LOADED >>
2$

  2 VEHICLES ARE TO BE LOADED.
IS THIS CORRECT ??
Y$
```

Block 24
The program determines that all available 5-ton trucks have been utilized. Since there is ammunition remaining to be loaded, the program prompts for identification of other vehicle types that may be available to receive the remaining ammunition.

```
NEXT VEHICLE WILL BE USED FOR LOAD.

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION          #
 1   K180    45.0   54.0   2305      1   45     MINE AT(HV) M15      1
 0   NONE OF ABOVE

ENTER LINE # >>
1$

#    DODIC   LEN    WID    WT     RD/    PK/P   DESCRIPTION          #
 1   K180    45.0   54.0   2305      1   45     MINE AT(HV) M15      1

SELECT MENU # FOR ACTION TO BE TAKEN
  1 = LOAD CARGO
  2 = MAKE ANOTHER SELECTION
  3 = REMOVE SELECTION FROM LIST >>
1$
```

Block 25
The ASP clerk identifies two GOER trucks as available.

```
REQUESTED AMT OF   360. RDS REPRESENTS   8.00 PLTS.
ENTER # OF PLTS TO BE ISSUED
TYPE 0 IF LESS THAN 1 >>
8$
LOADING GOER SECTION A.
```

Block 26
Pallet quantities are computed.

(Continued)

```
                    * VEHICLE LOAD INFORMATION:
                    *
                    *   VEHICLE #      1
                    *   DODIC          K180
                    *   DESCRIPTION    MINE AT(HV) M15
                    *   # OF PLTS      2
                    *   LOAD WT        4610
                    *   ORIENTATION    1
LOADING GOER SECTION A.
                    * PARTIAL LOAD INFORMATION:
                    *
                    *   VEHICLE #      1
                    *   DODIC          K180
                    *   DESCRIPTION    MINE AT(HV) M15
                    *   # OF PLTS      1
                    *   LOAD WT        6915
                    *   ORIENTATION    2
LOADING GOER SECTION B.
                    * PARTIAL LOAD INFORMATION:
                    *
                    *   VEHICLE #      1
                    *   DODIC          K180
                    *   DESCRIPTION    MINE AT(HV) M15
                    *   # OF PLTS      2
                    *   LOAD WT        11525
                    *   ORIENTATION    2
LOADING GOER SECTION A.
                    * VEHICLE LOAD INFORMATION:
                    *
                    *   VEHICLE #      2
                    *   DODIC          K180
                    *   DESCRIPTION    MINE AT(HV) M15
                    *   # OF PLTS      2
                    *   LOAD WT        4610
                    *   ORIENTATION    1
LOADING GOER SECTION A.
                    * PARTIAL LOAD INFORMATION:
                    *
                    *   VEHICLE #      2
                    *   DODIC          K180
                    *   DESCRIPTION    MINE AT(HV) M15
                    *   # OF PLTS      1
                    *   LOAD WT        6915
                    *   ORIENTATION    2
```

Block 27
A vehicle by vehicle load configuration is computed.

A DA 3151 compatible form is printed (see Figures 7B and 8B).

The load is spanned across two GOER trucks.

```
 IS YOUR REQUEST COMPLETED ??
 Y$

 END - FINISHED
 ASP  --  STOP
```

Block 28
The program determines that the list of ammunition remaining to be loaded is depleted. The ASP clerk has an opportunity to put additional items on the list that may have been overlooked the first time.

(Concluded)

AMMUNITION STORES SLIP

AUTHORITY

DATE: 5-OCT-81

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 724718

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	TO	PLTS-BXS	TOTAL ROUNDS	INIT. ORIENT.
1340-00-143-7106 H488 ROCKET HE 2.75 IN	RSA22	2A		5	180	

DATE SIGNATURE OF ISSUING CHECKER DATE SIGNATURE OF RECEIVING CHECKER

Figure 18. Vehicle 724718.

AMMUNITION STORES SLIP

AUTHORITY

DATE: 5-OCT-81

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 727489

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	TO	PLTS-BXS	TOTAL ROUNDS	INIT. ORIENT.
1340-00-143-7106 H488 ROCKET HE 2.75 IN	RSA22	2A	3	108		1
1340-00-689-4075 H826 ROCKET HE 2.75 IN	SAB18	2B	1	64		2

DATE SIGNATURE OF ISSUING CHECKER DATE SIGNATURE OF RECEIVING CHECKER

Figure 2B. Vehicle 727489.

AMMUNITION STORES SLIP

AUTHORITY

DATE: 5-OCT-81

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 976711

RECEIPT	ISSUE	OTHER(SPECIFY)
( )	( )	( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	PLTS-BXS TO	TOTAL ROUNDS	INIT. ORIENT.
1340-00-689-4075 H826 ROCKET HE 2.75 IN	SAB18	2B	4	256	1

DATE SIGNATURE OF ISSUING CHECKER

DATE SIGNATURE OF RECEIVING CHECKER

Figure 3B. Vehicle 976711.

AMMUNITION STORES SLIP AUTHORITY DATE:

FROM: ASP #602 NAME OF ACTIVITY:

TO: 121 AVN BN VEHICLE #: 874312

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( ) DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	PLTS-BXS TO	TOTAL ROUNDS	INIT.	ORIENT.
1340-00-689-4075 H826 ROCKET HE 2.75 IN	SAB18	2B	4	256		1

DATE SIGNATURE OF ISSUING CHECKER DATE SIGNATURE OF RECEIVING CHECKER

Figure 4B. Vehicle 874312.

AMMUNITION STORES SLIP

AUTHORITY

DATE:

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 712455

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	TO	PLTS-BXS	TOTAL ROUNDS	INIT.	ORIENT.
0000-00-000-0000 Z997 TOW	S17	2C	3	36		1	

DATE SIGNATURE OF ISSUING CHECKER

DATE SIGNATURE OF RECEIVING CHECKER

Figure 5B. Vehicle 712455.

AMMUNITION STORES SLIP

AUTHORITY

DATE:

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 517253

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	TO	PLTS-BXS	TOTAL ROUNDS	INIT.	ORIENT.
0000-00-000-0000 Z997 TOW	S17	2C	3	36		1	

DATE SIGNATURE OF ISSUING CHECKER

DATE SIGNATURE OF RECEIVING CHECKER

Figure 6B. Vehicle 517253.

AMMUNITION STORES SLIP

AUTHORITY

DATE:

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 212439

RECEIPT ( ) ISSUE ( ) OTHER (SPECIFY) ( )

DRIVER:

NSN--DODIC--NOMENCLATURE	LOT NO.	ACC	LOCAT. FROM	LOCAT. TO	PLTS-BXS	TOTAL ROUNDS	INIT. ORIENT.
1345-00-028-5118 MINE AT(HV) M15	K180	K14	4A		2	90	1
1345-00-028-5118 MINE AT(HV) M15	K180	K14	4A		1	45	2
1345-00-028-5118 MINE AT(HV) M15	K180	K14	4A		2	90	2

DATE SIGNATURE OF ISSUING CHECKER DATE SIGNATURE OF RECEIVING CHECKER

Figure 7B. Vehicle 212439.

AMMUNITION STORES SLIP

AUTHORITY

DATE:

FROM: ASP #602

NAME OF ACTIVITY:

TO: 121 AVN BN

VEHICLE #: 212597

RECEIPT ( ) ISSUE ( ) OTHER(SPECIFY) ( )

DRIVER:

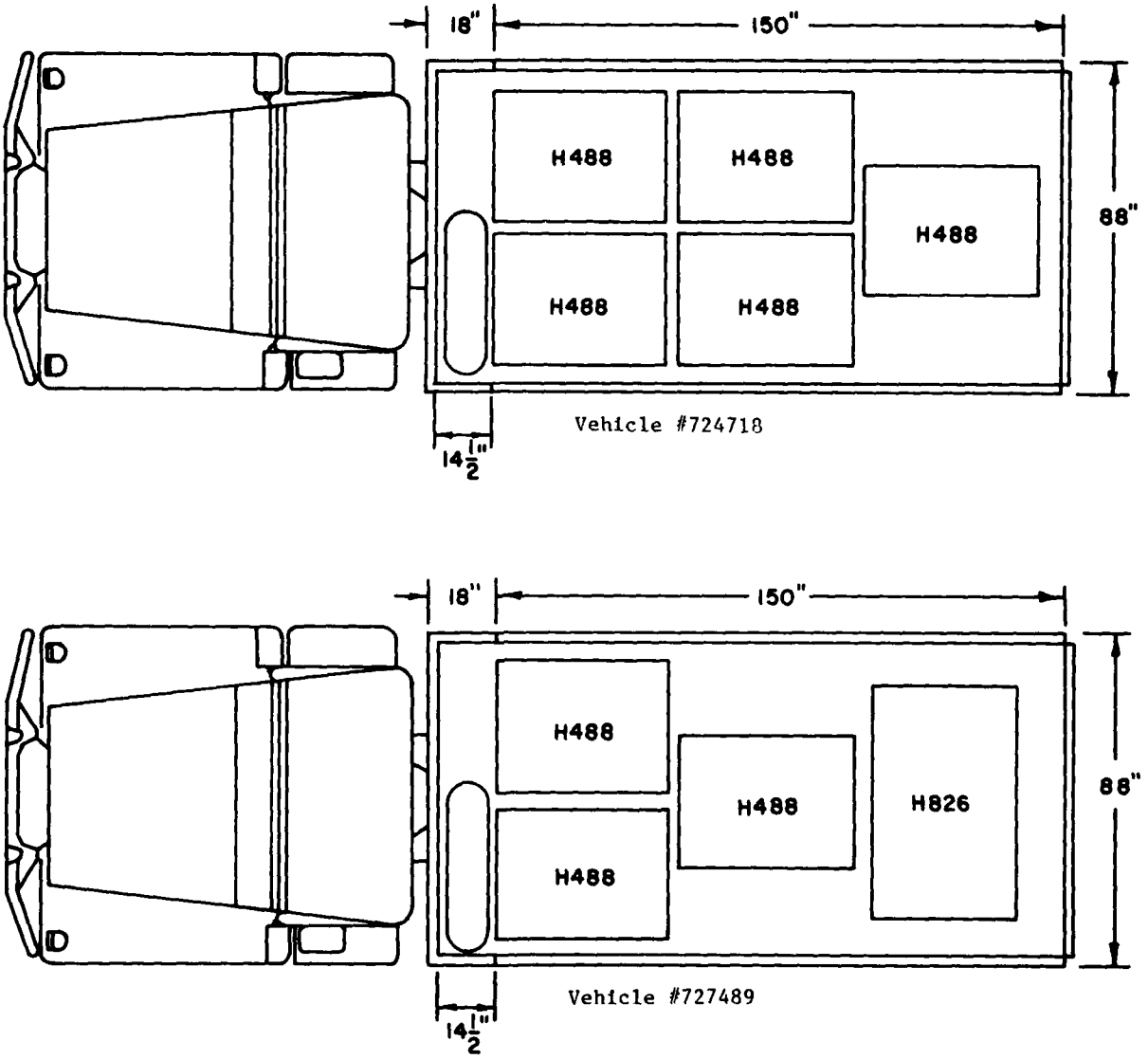
NSN--DODIC--NOMENCLATURE	LOT NO. ACC	LOCAT. FROM	LOCAT. TO	PLTS-BXS	TOTAL ROUNDS	INIT. ORIENT.
1345-00-028-5118 K180 MINE AT(HV) M15	K14	4A	2	90	1	
1345-00-028-5118 K180 MINE AT(HV) M15	K14	4A	1	45	2	

DATE SIGNATURE OF ISSUING CHECKER

DATE SIGNATURE OF RECEIVING CHECKER

Figure 88. Vehicle 212597.

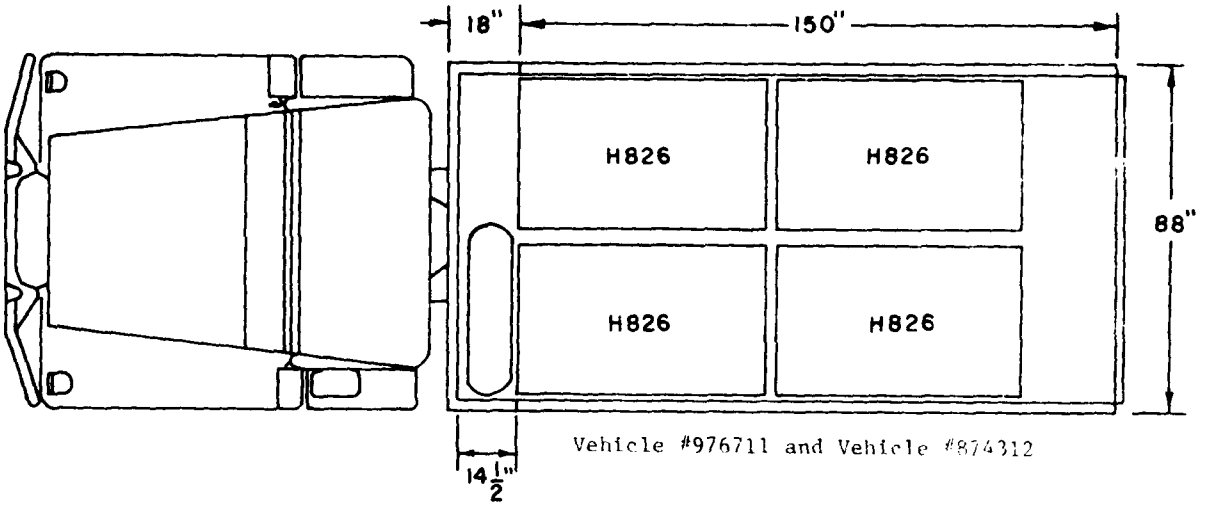
AMMUNITION RESUPPLY VEHICLE

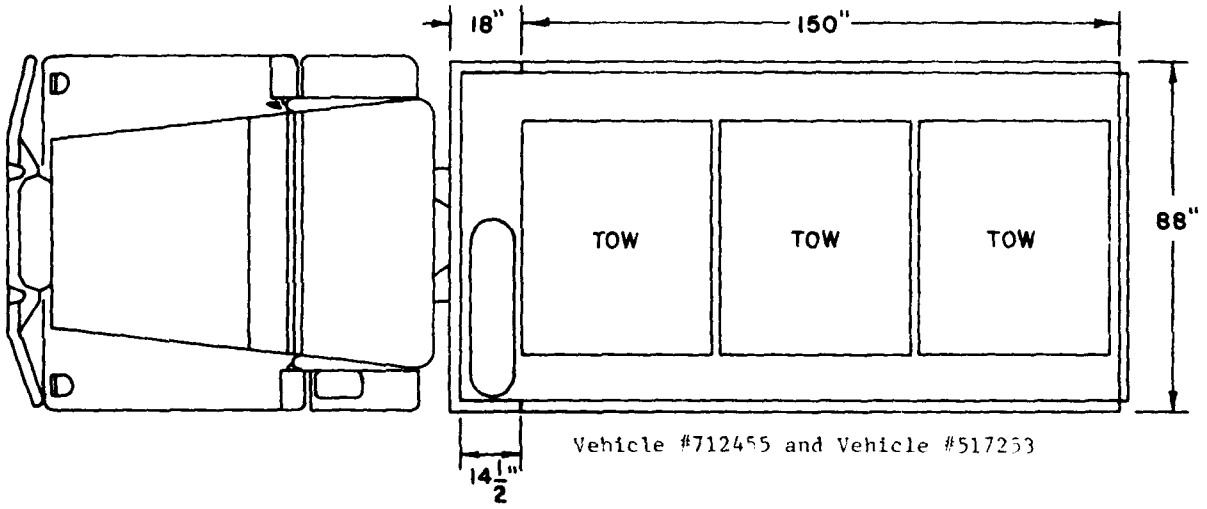


5-TON TRUCKS

Figure 9B. Load Configuration: H488 and H826.

AMMUNITION RESUPPLY VEHICLE

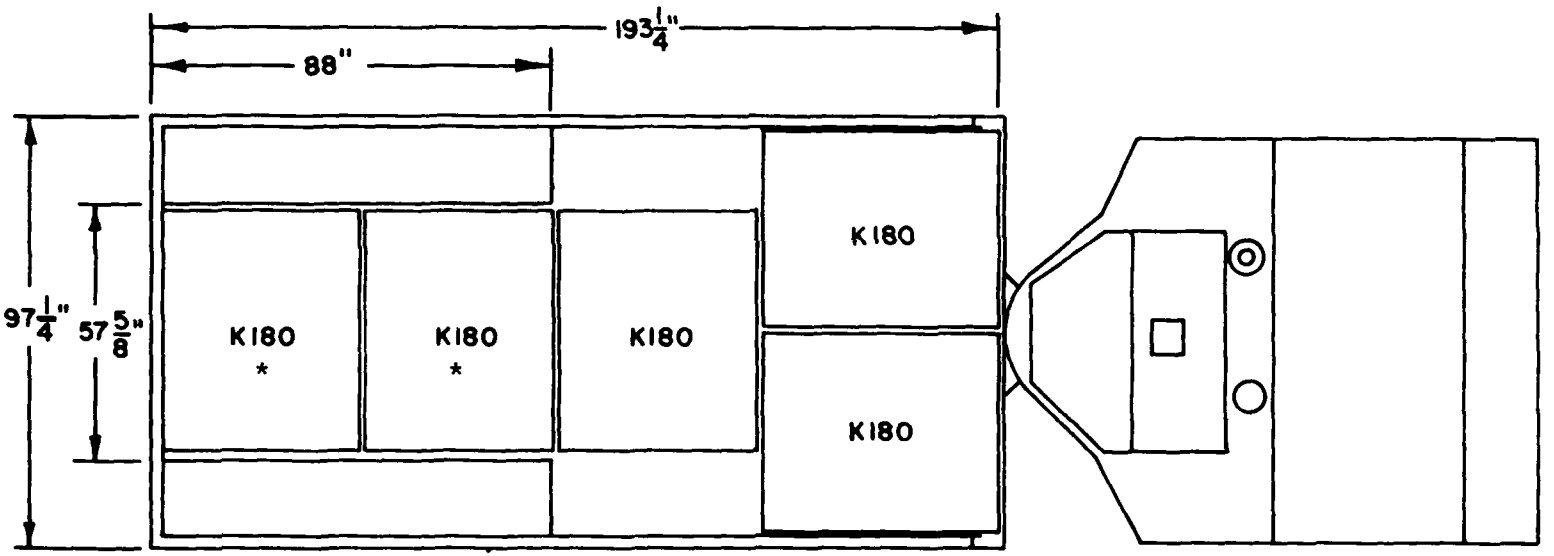




5-TON TRUCKS

Figure 10B. Load Configuration: H826 and TOW.

AMMUNITION RESUPPLY VEHICLE



Vehicle #212439 and Vehicle #212597

GOER

*Not loaded on Vehicle #212597

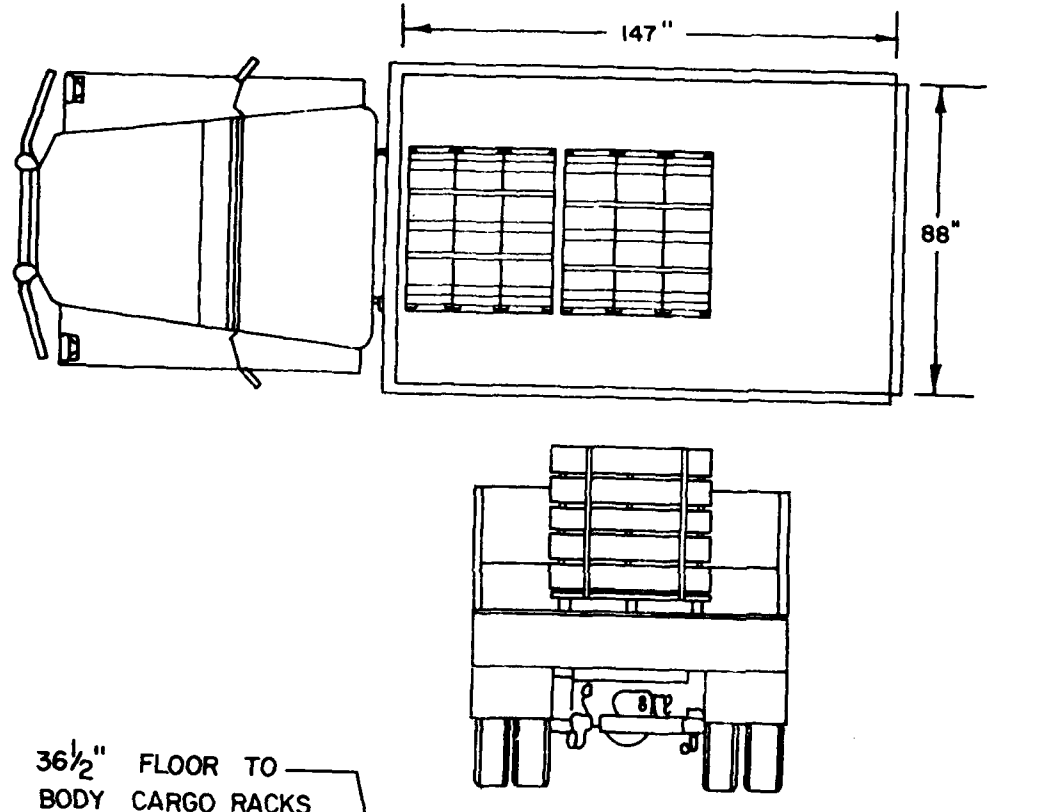
Figure 11B. Load Configuration: K180.

APPENDIX C

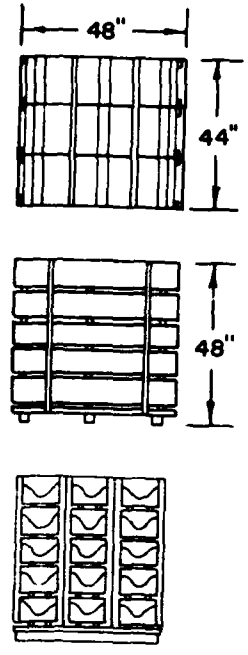
TRUCK LOADING PROGRAM PREDEFINED VEHICLE DIMENSION DATA

PRECEDING PAGE BLANK-NOT FILMED

AMMUNITION RESUPPLY VEHICLE

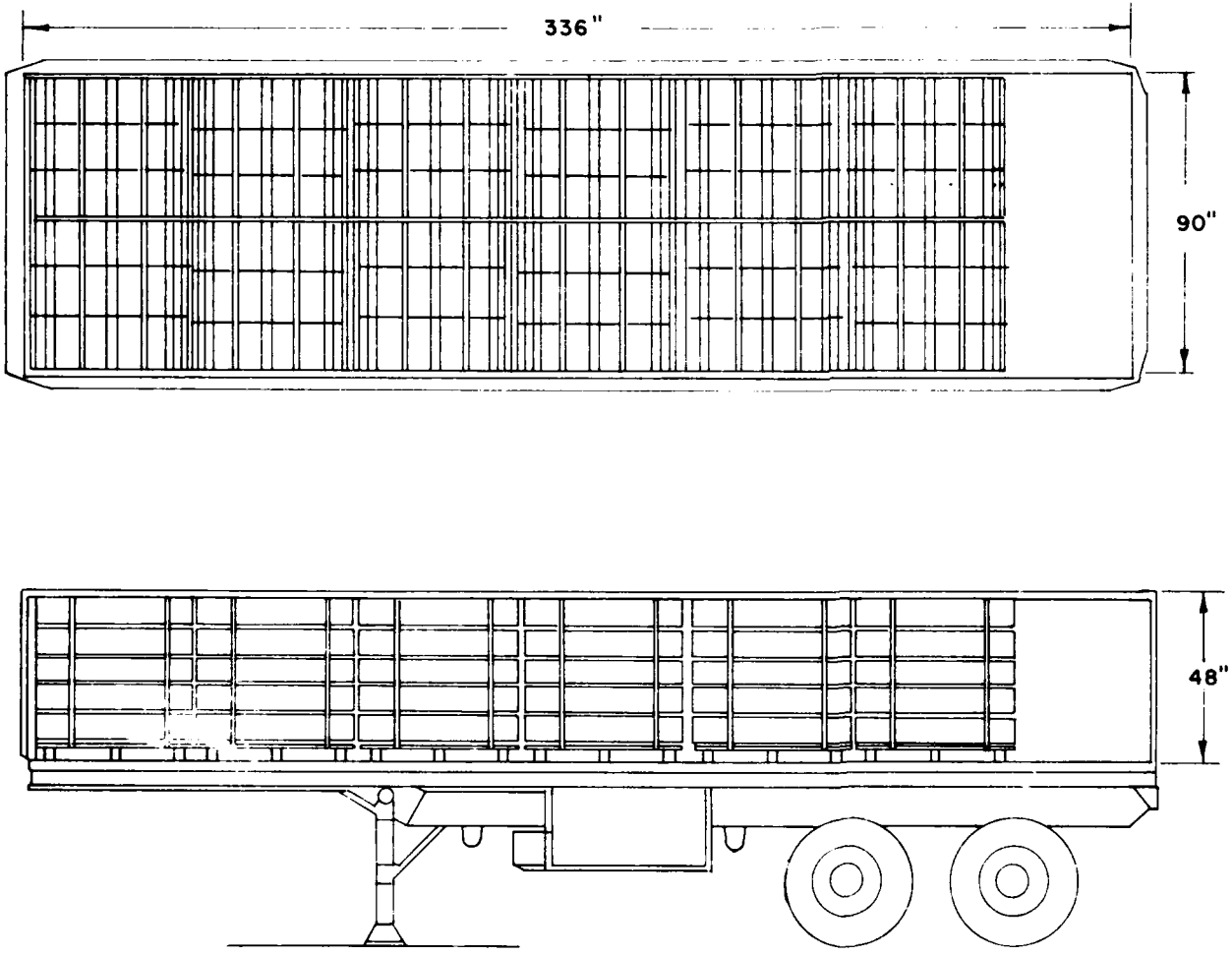


PALLETIZED 105 MM AMMUNITION

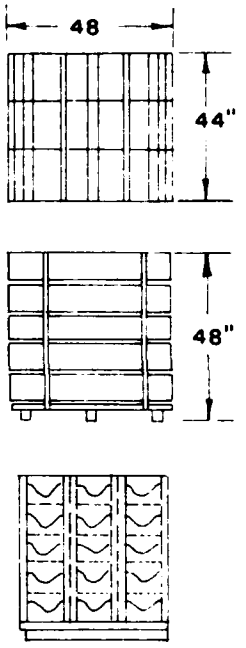


105 MM
2 ROUNDS / BOX
15 BOXES / PALLET
WT. 2200 LBS. (APPROX.)

Figure 1C. Truck, Cargo, 2-1/2-Ton, M35A2.



PALLETIZED AMMUNITION



105 MM
2 ROUNDS/BOX
15 BOXES/PALLET
WT. 2200 LBS (APPROX)

Figure 2C. Semitrailer, Cargo, S&P, 12-Ton, M127A1.

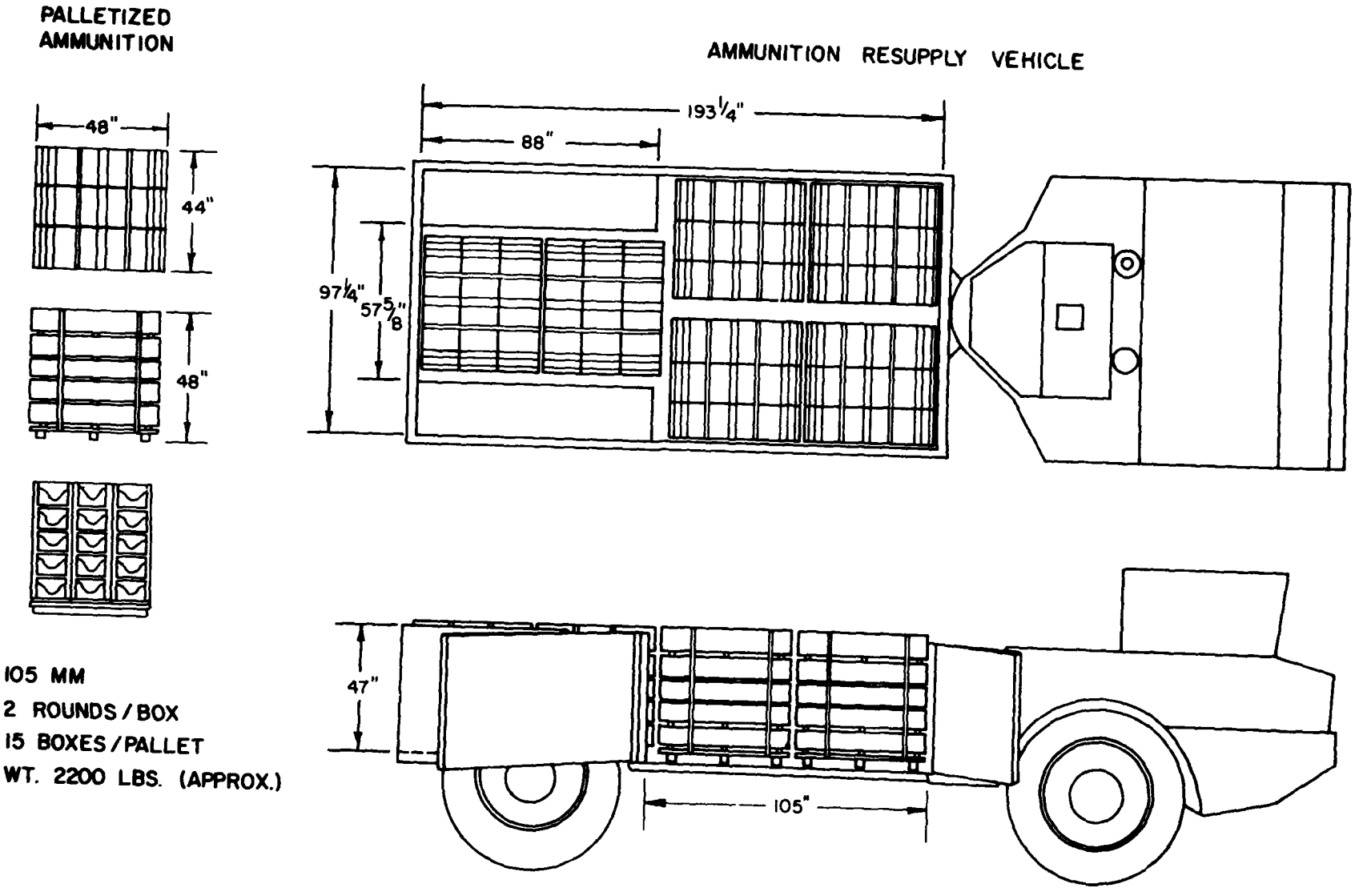


Figure 3C. Truck, Cargo, 8-Ton, M520 (GOER).

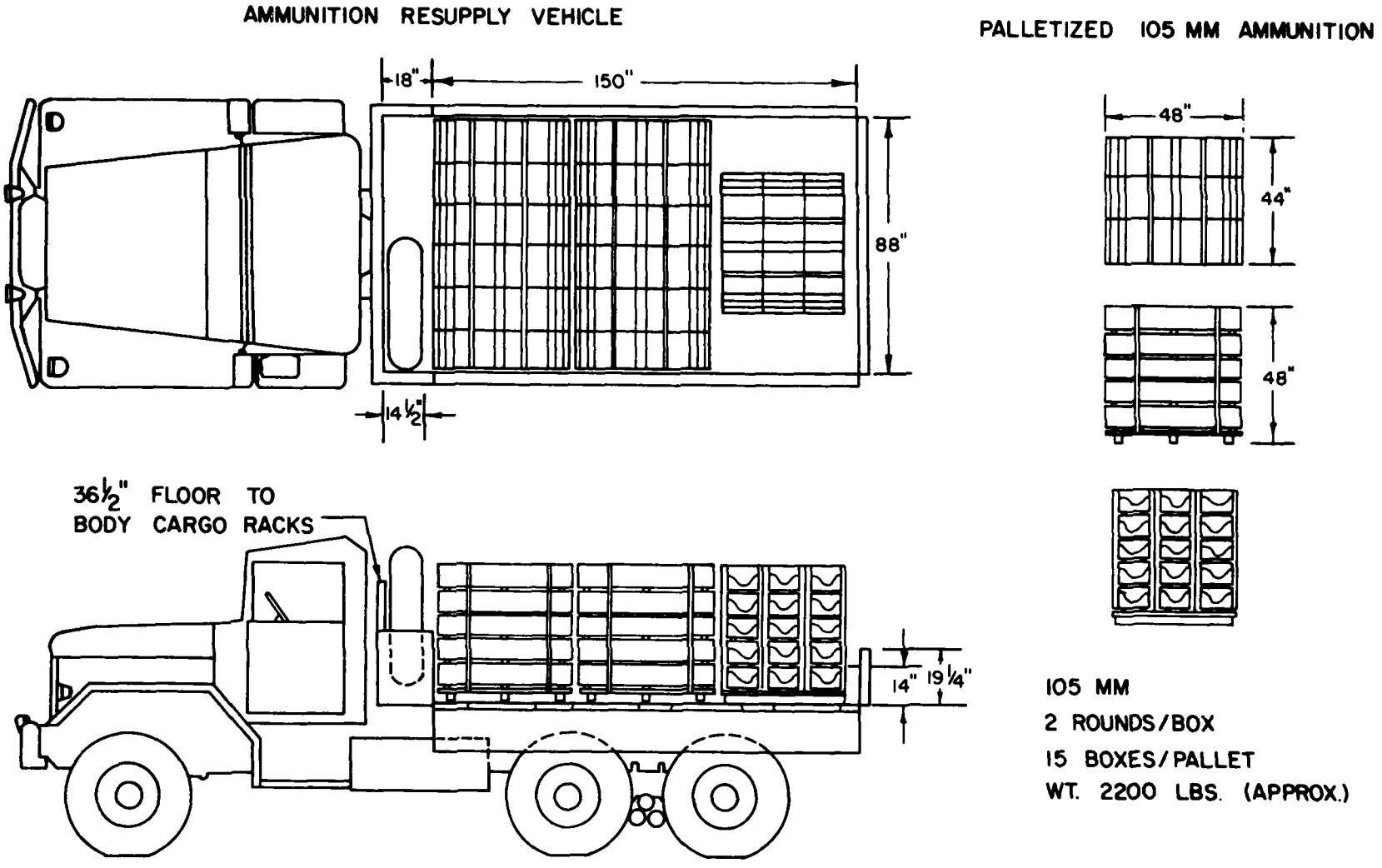
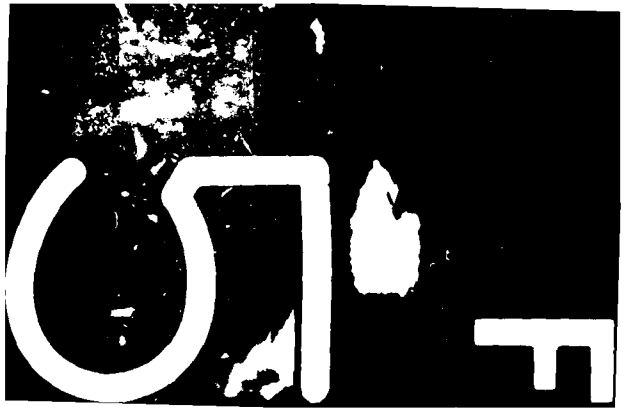



Figure 4C. Truck, Cargo, 5-Ton, Dropside, M813A1.