

# CHAPARRAL

PALLETIZED UNIT LOAD OF M 121  
ROCKET MOTOR (NAVY: MK50 MOD O),  
PACKED ONE PER PLYWOOD BOX

REVISION

REVISION NO. 1, DATED JUNE 1985, CONSISTS OF:

1. CHANGING PALLET.
2. CHANGING DRAWING FORMAT.

REVISIONS				DRAWN BY JRM	FIELD ENG 200/274	DRESS-UP m/kmd
1	JUN 85	WRF WRS	<i>GM 716-79</i> <i>William F. Ernst</i>	CHECKED RSM/BBF	LDR REVIEW OFFICER <i>William J. Hogue</i>	APPROVED, U.S. ARMY MISSILE COMMAND
				APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND (DARCOM) <i>John L. Reynold Jr.</i> U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL		
				<b>U. S. ARMY DARCOM DRAWING</b>		
				<b>JANUARY 1980</b>		
				CLASS	DIVISION	DRAWING
				<b>19</b>	<b>48</b>	<b>5243</b>
						FILE
						<b>20CH2</b>

**DO NOT SCALE**

## GENERAL NOTES

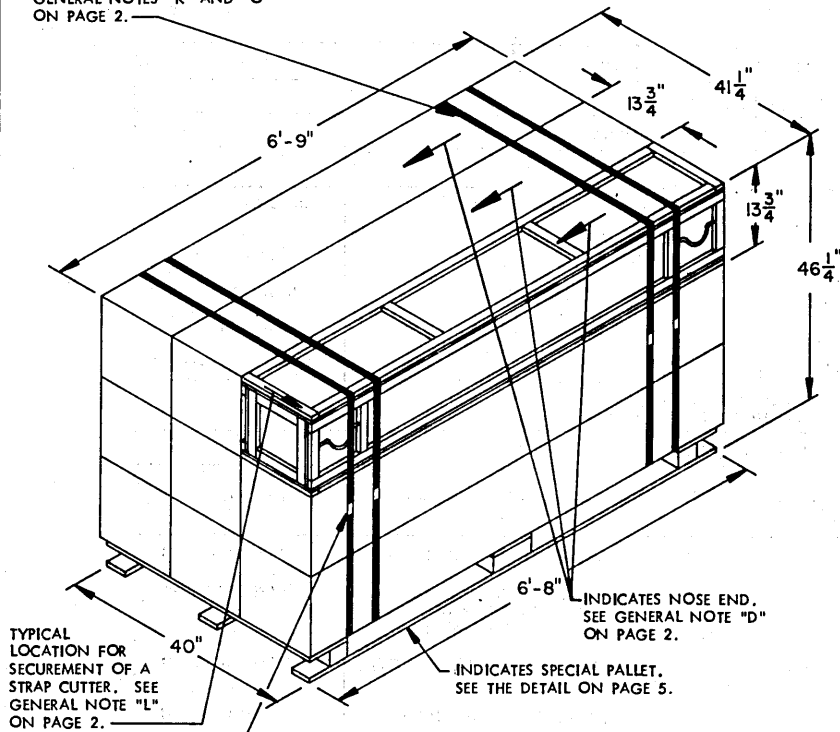
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5) AND CONFORMS TO MIL-STD-1660.
- B. DIMENSIONS, CUBE AND WEIGHT OF A PALLET UNIT WILL VARY SLIGHTLY DEPENDING UPON THE ACTUAL DIMENSIONS OF THE BOXES AND THE WEIGHT OF THE SPECIFIC ITEM BEING UNITIZED.
- C. FOR DETAILS OF PLYWOOD BOX, SEE DRAWING NO. 13060326:  
BOX DIMENSIONS -----81" LONG X 13-3/4" WIDE X  
13-3/4" HIGH.  
GROSS WEIGHT -----160 POUNDS (APPROX).
- D. CAUTION: ALL BOXES WILL BE PLACED ON THE PALLET BASE WITH THE NOSE END IN ONE DIRECTION.
- E. FOR OUTLOADING AND STORAGE OF THE PALLETIZED UNIT, SEE THE FOLLOWING LISTED DRAWINGS:
1. LOADING AND BRACING IN BOX CARS - DRAWING NO. 19-48-4123-5PA1003.
  2. LOADING BRACING IN TRAILERS (FOR HIGHWAY SHIPMENT) DRAWING NO. 19-48-4124-11PA1004.
  3. STORAGE IN IGLOO AND STRADLEY MAGAZINES - DRAWING NO. 19-48-4125-1-2-3-4-14-22PA1003.
- F. DIMENSIONAL LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF A NOMINAL SIZE, UNLESS OTHERWISE SPECIFIED. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE.
- G. A PLUS OR MINUS 1/4" IS ALLOWED ON OVERALL DIMENSIONS OF ANY DUNNAGE ASSEMBLY. HOWEVER, SIMILAR PIECES IN AN ASSEMBLY MUST BE WITHIN 1/8" OF THE SAME DIMENSION.
- H. WHEN ASSEMBLING A "SPECIAL PALLET", CARE SHALL BE TAKEN TO INSURE THAT THE BOXES ARE EVENLY ALIGNED SO THAT THE SIDES AND ENDS OF THE PALLET UNIT DO NOT EXCEED A 1/2" TOLERANCE.
- J. IN ORDER TO OBTAIN COMPACT (SOUND) UNITS, ALL STRAPS SHALL BE LOCATED IN PROPER ALIGNMENT AND TENSIONED UNTIL THEY CUT INTO THE EDGE OF THE PALLET DECK. AFTER TENSIONING, ALL STRAPS WILL BE SECURED USING ONE SEAL CRIMPED WITH TWO PAIR OF NOTCHES PER SEAL. ALL STRAPPING MUST BE STRAIGHT WITHIN 2" ON ANY SURFACE OF THE UNITIZED LOAD; I.E., TOP, BOTTOM, SIDES, OR ENDS THAT IT ENCOMPASSES.
- K. WHEN APPLYING ANY STRAP, CARE MUST BE EXERCISED TO ASSURE THAT THE END OF THE STRAP ON THE UNDERSIDE OF THE JOINT EXTENDS AT LEAST 6" BEYOND THE SEAL. THIS EXTRA MINIMUM LENGTH OF STRAP IS REQUIRED TO PERMIT SUBSEQUENT TIGHTENING OF LOOSENED STRAPPING. RETENSIONING CAN BE ACCOMPLISHED WITHOUT REPLACING STRAPPING OR SPLICING STRAPPING THROUGH THE USE OF A FEEDWHEEL TYPE TENSIONING TOOL, MANUAL OR PNEUMATIC, AND THE APPLICATION OF ONE ADDITIONAL SEAL.
- L. FOR THE METHOD OF SECURING A STRAP CUTTER TO THE PALLET UNIT, SEE DARCOM DRAWING 19-48-4127-20P1000.
- M. THE UNITIZATION PROCEDURES DEPICTED IN THIS DRAWING WILL REQUIRE THE USE OF A SPECIAL PALLET. SPECIFICATIONS PERTAINING TO THE MATERIAL TO BE USED IN CONSTRUCTION OF THE PALLET UNIT ARE CONTAINED ON PAGE 3. FOR CONSTRUCTION SPECIFICATIONS, SEE THE "SPECIAL PALLET" DETAIL AND KEY NUMBERS ON PAGE 5.
- N. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- O. INSTALL EACH TIEDOWN STRAP TO PASS UNDER THE TOP DECK BOARDS OF THE PALLET AND TO BE LOCATED AS SHOWN.
- P. THE LETTERS "PA" DENOTING PQ56 COPPER-QUINOLINOLATE OR "PB" DENOTING M-GARD W550 (ZINC NAPHTHENATE EMULSIFIABLE) MUST BE APPLIED TO A PRESERVATIVE TREATED PALLET. THE LETTERS WILL BE AT LEAST ONE-INCH HIGH AND WILL BE APPLIED ON THE OUTER FACE OF ONE OF THE CENTER POSTS.

MATERIAL SPECIFICATIONS FOR PALLET UNITS				
SPECIAL PALLET (SEE PAGE 5)				
NAME OF PART	KEY NO.	MATERIAL		SPEC NO.
		KIND	GRADE	
TOP DECK BOARD	1 & 2	WOOD CLASS 2 STRUCTURAL	GROUP III (SEE TABLE 1)	MIL-STD-731
POST	5 & 6	"	GROUP III (SEE TABLE 1)	MIL-STD-731
STRINGER BOARD	3	"	GROUP III (SEE TABLE 1)	MIL-STD-731
RUNNER	4	"	GROUP III (SEE TABLE 1)	MIL-STD-731
NAILS	1, 2 & 4	SEE KEY NO.'S		FED SPEC FF-N-105
PRESERVATIVE	WOOD PRESERVATIVE, PQ56 (COPPER-B-QUINOLINOLATE) OR M-GARD W550 (ZINC NAPHTHENATE EMULSIFIABLE).			
PALLET UNIT ASSEMBLY				
NAME OF PART	MATERIAL			SPEC NO.
	KIND	GRADE		
LUMBER	DUNNAGE	SEE TM 743-200-1, DUNNAGE LUMBER		FED SPEC MM-L-751
NAILS	COMMON	ALT: ANNULAR-RING TYPE NAIL OR PALLET TYPE (MECHANICALLY DEFORMED) NAIL OF THE SAME SIZE		FED SPEC FF-N-105
STRAPPING	STEEL, 3/4" X .035" OR .031"	CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH B (GRADE 2)		FED SPEC QQ-S-781
SEAL, STRAP	STEEL	TYPE D, STYLE I, II OR IV, CLASS H, FINISH B (GRADE 2)		FED SPEC QQ-S-781
STAPLE, STRAP	STEEL, 15/16" X 3/4" LEG LENGTH	TYPE III, STYLE 3		FED SPEC FF-N-105
FILLER ASSEMBLY				
MATERIAL				
KIND	GRADE			SPEC NO.
LUMBER	SEE TM 743-200-1, DUNNAGE LUMBER			FED SPEC MM-L-751
NAILS	COMMON. ALT: ANNULAR-RING TYPE NAIL OR PALLET TYPE (MECHANICALLY DEFORMED) NAIL OF THE SAME SIZE.			FED SPEC FF-N-105
PLYWOOD	GROUP B (CONSTRUCTION & INDUSTRIAL) WOOD, CLASS 2 STRUCTURAL, GRADE CD (INTERIOR WITH EXTERIOR GLUE)			FED SPEC NN-P-350

TABLE 1 WOOD GROUPS*		
GROUP I	GROUP II	GROUP III
TAMARACK HEMLOCK, WESTERN FIR, SILVER PINE, ALASKA FIR, DOUGLAS HEMLOCK, EASTERN MAGNOLIA CEDAR ASPEN LARCH, WESTERN SPRUCE CHESTNUT COTTONWOOD FIR, WHITE PINE, PONDEROSA	ELM, AMERICAN ASH (EXCEPT WHITE) PINE, SOUTHERN YELLOW GUM MAPLE, SOFT LARCH, WESTERN FIR, DOUGLAS (COAST) SYCAMORE TUPELO, WATER	HICKORY PECAN ELM, ROCK BIRCH, SWEET OR YELLOW HACKBERRY MAPLE, HARD ASH, WHITE BEECH LOCUST OAK

\* THE WOOD GROUPS AS IDENTIFIED ABOVE ARE ONLY APPLICABLE TO THE FABRICATION OF THE SPECIAL PALLET.

TIEDOWN STRAP, 3/4" X .035"  
OR .031" BY 14'-9" LONG STEEL  
STRAPPING (4 REQD). SEE  
GENERAL NOTES "K" AND "O"  
ON PAGE 2.



SEAL FOR 3/4" STRAPPING  
(4 REQD, 1 PER STRAP).  
CRIMP EACH SEAL WITH  
TWO PAIR OF NOTCHES.

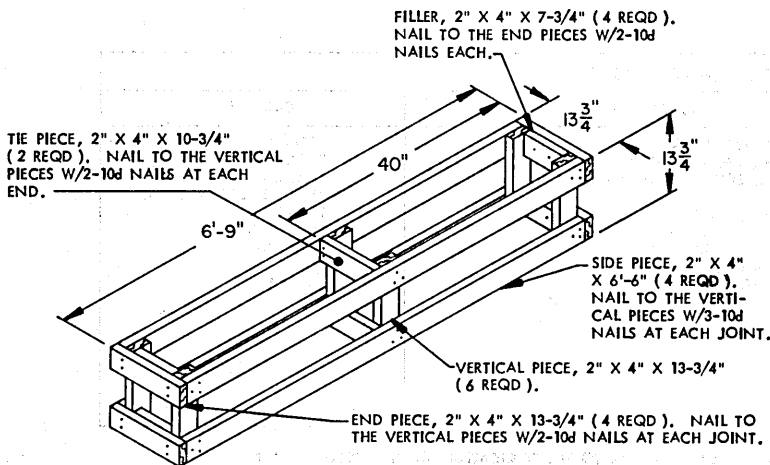
**PALLET UNIT**

SEE GENERAL NOTE "B" ON PAGE 2.

9 BOXES (ROCKET MOTOR, 1 PER BOX) @ 160 LBS	-----	1,440 LBS (APPROX)
DUNNAGE	-----	5 LBS
PALLET	-----	75 LBS
TOTAL WEIGHT		-----1,520 LBS (APPROX)
CUBE		-----89.4 CU FT (APPROX)

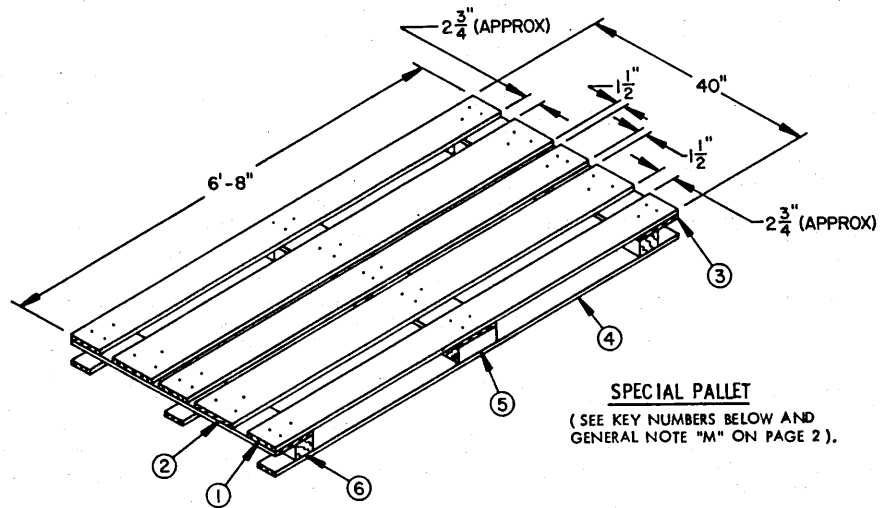
**BILL OF MATERIAL**

PALLET, 40" X 6'-8"	-----	1 REQD	-----	75 LBS	
STEEL STRAPPING, 3/4"	-----	59.00'	REQD	-----	4.21 LBS
SEAL FOR 3/4" STRAPPING	-----	4 REQD	-----	NIL	



**FILLER ASSEMBLY**

THE FILLER ASSEMBLY SHOWN ABOVE IS FOR USE WHEN ONE OR MORE BOXES ARE OMITTED FROM A PALLET UNIT.



#### KEY NUMBERS

- ① TOP DECK BOARD, 1" X 6" X 6'-8" (3 REQD). NAIL THRU STRINGER PIECE INTO POST W/3 NAILS (TYPE II-STYLE 18) 3" TO 3-1/4" LONG X .135" DIA AT EACH END AND IN THE CENTER USING A STAGGERED NAILING PATTERN.
- ② TOP DECK BOARD, 1" X 8" X 6'-8" (2 REQD). NAIL TO STRINGER PIECE W/3 NAILS (TYPE II-STYLE 18) 1-1/2" LONG X .120" DIA AT EACH END AND IN THE CENTER USING A STAGGERED NAILING PATTERN.
- ③ STRINGER, 1" X 8" X 40" (3 REQD). POSITION AS SHOWN.
- ④ RUNNER, 1" X 4" X 6'-8" (3 REQD). POSITION AS SHOWN AND NAIL TO POST W/4 NAILS (TYPE II-STYLE 18) 2-1/4" LONG X 0.120" DIA AT EACH JOINT USING A STAGGERED NAILING PATTERN.
- ⑤ CENTER POST, 3-1/2" WIDE X 2-3/4" HIGH X 7-1/2" LONG (ACTUAL) (3 REQD).
- ⑥ POST, 3-1/2" WIDE X 2-3/4" HIGH X 3-1/2" LONG (ACTUAL) (6 REQD).

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