

REV NO. 2 APPROVED BY  
 MECH DIV AAR, THEIR LETTER  
 DATED 28 Mar 86 FILE LR-11e065  
 SIGNED *Charles J. Ellis*  
 DATE 11 Apr 1986  
 MTMCTEA, FT EUSTIS, VA.

# CHAPARRAL

## LOADING AND BRACING ON FLAT CAR OF GUIDED MISSILE SUB-SYSTEM INTERCEPT-AERIAL, CARRIER MOUNTED, M48 AND M48AI

THIS OUTLOADING PROCEDURAL DRAWING INCLUDES PROCEDURES FOR GENERAL SERVICE FLAT CARS (FM) AND FOR CUSHIONED FLAT CARS (FMS) EQUIPPED WITH SPECIAL CHAIN TIE-DOWN DEVICES OF VARIOUS DESIGN AND MANUFACTURE.

THIS DRAWING, INCLUDING REVISION 2, SUPERSEDES DRAWING 19-48-7174-GSE 5CH1, DATED JULY 1979 AND REVISION 1 THERETO, DATED JULY 1979.

**DO NOT SCALE**

REVISIONS				DATE	BY	APPROVED BY
2	JUN 85	WRF	<i>John L. Sygrod</i>	28 Mar 86	<i>Charles J. Ellis</i>	APPROVED, U.S. ARMY SINGLE COMMAND
						APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)
						U.S. ARMY DEFENSE ADMINISTRATION CENTER AND SCHOOL
						U.S. ARMY AMC DRAWING
						JUNE 1985
						CLASS DIVISION DRAWING FILE
				19	48	7174 GSE 5CH1

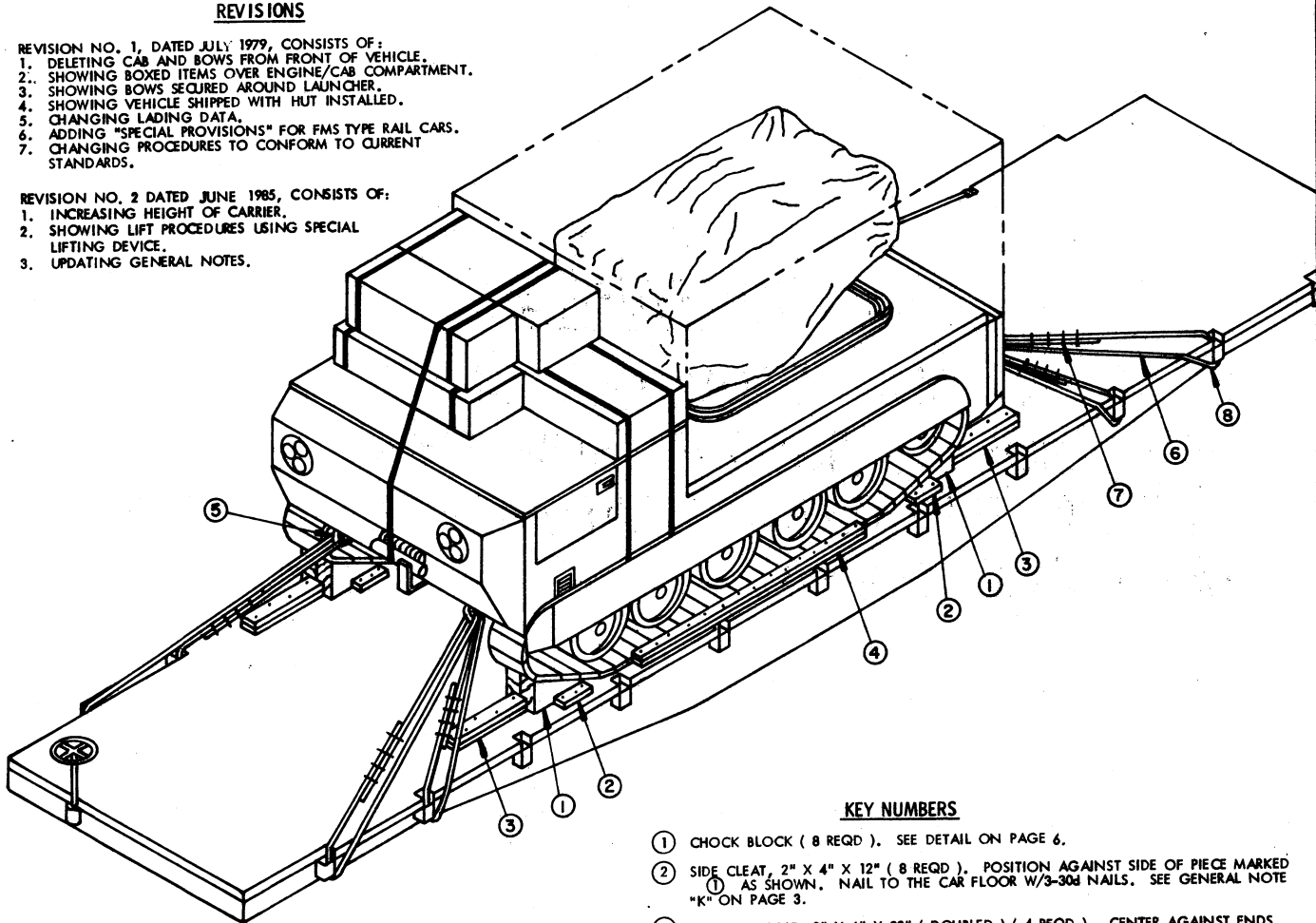
## REVISIONS

REVISION NO. 1, DATED JULY 1979, CONSISTS OF:

1. DELETING CAB AND BOWS FROM FRONT OF VEHICLE.
2. SHOWING BOXED ITEMS OVER ENGINE/CAB COMPARTMENT.
3. SHOWING BOWS SECURED AROUND LAUNCHER.
4. SHOWING VEHICLE SHIPPED WITH HUT INSTALLED.
5. CHANGING LADING DATA.
6. ADDING "SPECIAL PROVISIONS" FOR FMS TYPE RAIL CARS.
7. CHANGING PROCEDURES TO CONFORM TO CURRENT STANDARDS.

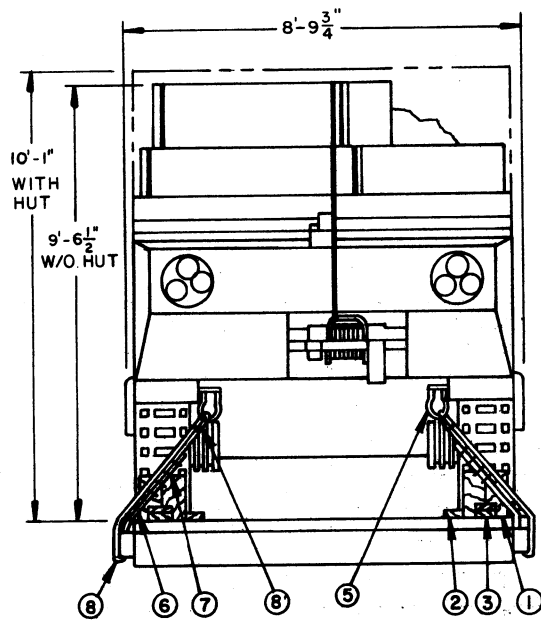
REVISION NO. 2 DATED JUNE 1985, CONSISTS OF:

1. INCREASING HEIGHT OF CARRIER.
2. SHOWING LIFT PROCEDURES USING SPECIAL LIFTING DEVICE.
3. UPDATING GENERAL NOTES.



### ISOMETRIC VIEW

PHANTOM LINES INDICATE VEHICLE WITH HUT.

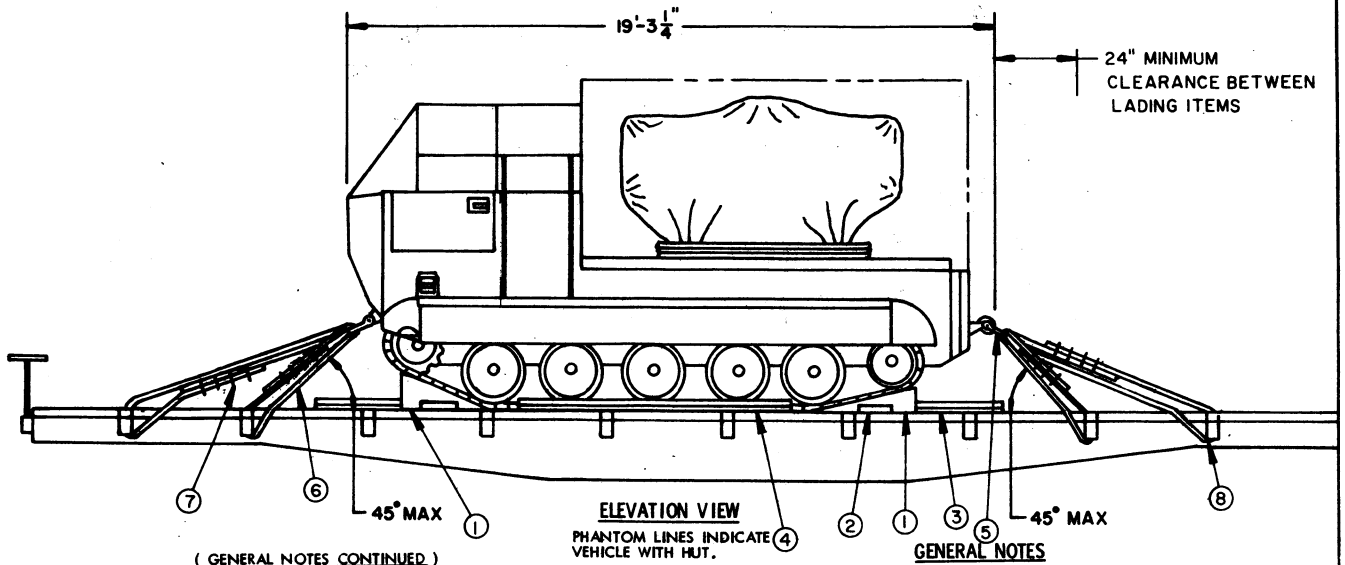


### FRONT VIEW

PHANTOM LINES INDICATE VEHICLE WITH HUT.

### KEY NUMBERS

- ① CHOCK BLOCK ( 8 REQD ). SEE DETAIL ON PAGE 6.
- ② SIDE CLEAT, 2" X 4" X 12" ( 8 REQD ). POSITION AGAINST SIDE OF PIECE MARKED ① AS SHOWN. NAIL TO THE CAR FLOOR W/3-30d NAILS. SEE GENERAL NOTE "K" ON PAGE 3.
- ③ BACK-UP CLEAT, 2" X 4" X 30" ( DOUBLED ) ( 4 REQD ). CENTER AGAINST ENDS OF PIECES MARKED ①. NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-30d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/4-60d NAILS.
- ④ SIDE BLOCKING, 2" X 4" X 8'-0" ( DOUBLED ) ( 2 REQD ). POSITION AGAINST THE OUTSIDE OF EACH TRACK AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-30d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑤ SHACKLE, SIZE 7/8" ( 4 REQD ). POSITION ONE EACH AT TWO FRONT AND TWO REAR TIE DOWN POINTS ON VEHICLE. NOTE: NOT REQUIRED IF VEHICLE IS ALREADY EQUIPPED WITH SHACKLES WHEN OFFERED FOR SHIPMENT. IF THE VEHICLE HAS TOW HOOKS ATTACHED TO THE TIE DOWN POINTS, THESE SHALL BE REMOVED AND STORED IN THE DRIVER'S COMPARTMENT. SEE GENERAL NOTE "H" ON PAGE 3.
- ⑥ STEEL WIRE ROPE, 1/2" DIAMETER, 11.5 TONS ( 8 REQD ). INSTALL CABLE AT 45° MAXIMUM ANGLES AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON CAR THRU LADING TIE DOWN DEVICE AND BACK TO STAKE POCKET. SEE GENERAL NOTES "E" AND "G" ON PAGE 3. NOTE: CABLE OF A LARGER SIZE MAY BE USED IF AVAILABLE WHEN SPECIFIED CABLE IS NOT AVAILABLE, OR IF A LARGER SIZE IS BEING USED FOR TIE DOWN OF OTHER ITEMS BEING SHIPPED.
- ⑦ CLIP, SIZE 1/2" ( 48 REQD ). USE FOUR ( 4 ) PER CABLE AND ONE ( 1 ) PER THIMBLE. SEE GENERAL NOTE "E" ON PAGE 3, AND KEY NUMBER ⑧ GUIDANCE BELOW.
- ⑧ THIMBLE, STANDARD, SIZE 1/2" ( 16 REQD ). USE ONE ( 1 ) PER STAKE POCKET AND ONE ( 1 ) PER LADING TIE DOWN DEVICE. SECURE TO WIRE ROPE MARKED ⑥ W/1-CLIP PER THIMBLE. A STANDARD THIMBLE AS SPECIFIED CAN BE SECURED TO A CABLE WITH A 1/2" CLIP. HOWEVER, IF DESIRED, OR IF THE 1/2" THIMBLE BEING USED IS OF A TYPE WHICH CAN NOT BE SECURED TO A CABLE WITH A 1/2" CLIP, A 5/8" CLIP MAY BE USED. SEE GENERAL NOTE "E" ON PAGE 3.



(GENERAL NOTES CONTINUED.)

- J. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE UNLESS OTHERWISE DIMENSIONED. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- L. 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.

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THE LOAD AS SHOWN IS BASED ON A FLAT CAR 9'-2" WIDE ( PLATFORM ); WIDER CARS CAN BE USED. ONLY ONE UNIT OF LADING IS SHOWN; HOWEVER MULTIPLES OF UNITS, AS SHOWN OR DISSIMILAR IN NATURE, MAY BE LOADED ON A CAR. THE NUMBER OF UNITS TO BE LOADED ON A CAR WILL BE DEPENDENT ON THE SIZE OF THE CAR USED OR THE QUANTITIES OF UNITS TO BE SHIPPED WITH THE VIEW OF FULL UTILIZATION OF CARRIER EQUIPMENT.

**NOTICE TO TRANSPORTATION OFFICER:**

IN LIEU OF REQUISITIONING A GENERAL SERVICE FM\* FLAT CAR AS DEPICTED HEREIN, EVERY EFFORT SHOULD BE MADE TO ACQUIRE AN FMS\* TYPE CAR. THIS IS A CUSHIONED CAR EQUIPPED WITH SPECIAL TIE DOWN CHANNELS AND MOVEABLE ANCHOR AND CHAIN ASSEMBLY TIE DOWN DEVICES\*\*\*, SUCH AS IS USED FOR TRANSPORTING AGRICULTURAL MACHINERY AND HEAVY, EARTH MOVING EQUIPMENT. SEE THE "SPECIAL PROVISIONS" ON PAGE 6 FOR GUIDANCE.

\*ASSOCIATION OF AMERICAN RAILROADS ( AAR ) MECHANICAL DESIGNATION FOR CAR TYPE. REFERENCE IS MADE TO "THE OFFICAL RAILWAY EQUIPMENT REGISTER".

\*\*A TYPICAL CAR OF THIS TYPE IS SHOWN BY FIGURE 88-8 OF SECTION 6 IN PUBLICATION OF AAR TITLED "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS AND TRAILERS".

**C. LADING DATA:**

ITEM	WEIGHT ( APPROX )	DIMENSIONS
GMSIA, CARRIER MOUNTED W/O HUT	24,778 LBS	19'-3-1/4" L X 8'-9-3/4" W X 9'-6-1/2" H
WITH HUT	25,578 LBS	19'-3-1/4" L X 8'-9-3/4" W X 10'-1" H

- D. FOR HANDLING AND LIFTING PROCEDURES, REFER TO PAGES 4 AND 5.
- E. REFER TO ORD DWG 19-48-ORDJU-588, "WIRE ROPE AND ANNEALED WIRE APPLICATION METHODS FOR SECURING LADING ON RAIL AND MOTOR CARRIER EQUIPMENT", FOR PROPER TIE DOWN APPLICATION.
- F. REFER TO ASSOCIATION OF AMERICAN RAILROADS MANUAL, "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS" FOR APPLICABLE LOADING RULES: PREFACE, 1-A, 2, 3, 4, 5, 9, 14, AND 15.
- G. TO ACHIEVE PROPER CABLE TENSION, EMPLOY TWO ( 2 ) CABLE "GRIPPERS" AND AN APPLICABLY SIZED "COME-A-LONG" TYPE MECHANICAL HOIST. NOTE: CABLES WILL BE TENSIONED SUFFICIENTLY TO CAUSE THE BODY OF THE TRACK VEHICLE TO DEPRESS APPROXIMATELY ONE INCH ( 1" ).
- H. MORE DISTANCE MAY BE REQUIRED BETWEEN THE DRILLED PADS AT THE OPEN END OF A SHACKLE SO THAT IT WILL FIT PROPERLY OVER THE THICKNESS OF THE TOWING/TIE DOWN BRACKET ON THE VEHICLE. TO PROVIDE THE NEEDED CLEARANCE, EQUAL AMOUNTS OF MATERIAL MAY BE REMOVED FROM THE SHACKLE PADS BY GRINDING OR MACHINING.

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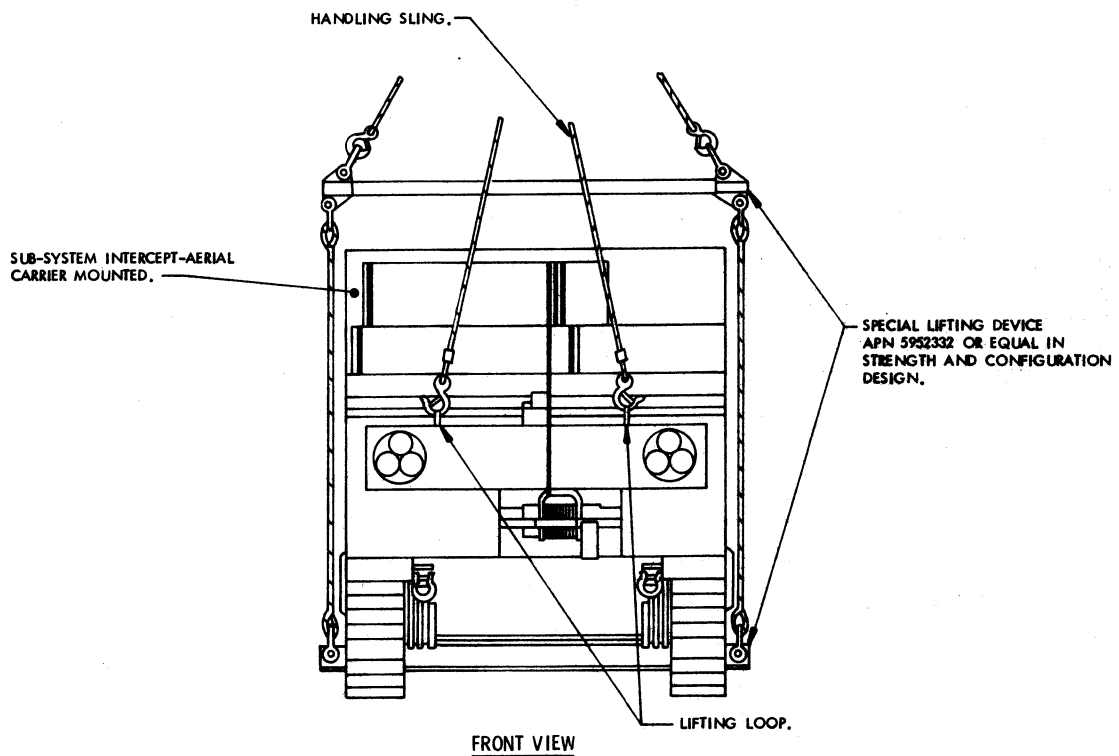
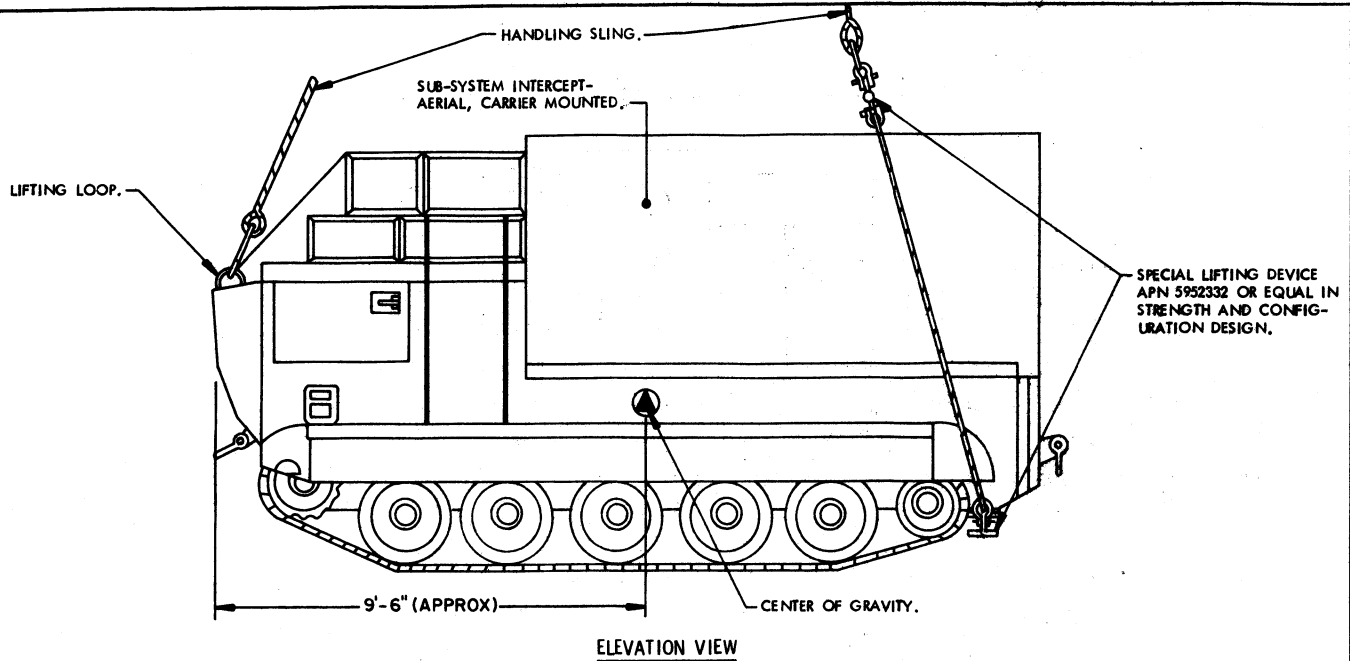
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	40	27
2" X 6"	20	20
6" X 8"	6	24
6" X 12"	5	30
NAILS	NO. REQD	POUNDS
30d ( 4-1/2" )	88	4-1/2
40d ( 5" )	32	2
60d ( 6" )	16	1-3/4
ROPE, STEEL WIRE, 1/2" DIA	160 <sup>1</sup> REQD	70 LBS
CLIP, 1/2"	48 REQD	21 LBS
CLIP, 5/8" ( ALT FOR 1/2", 16 REQD )		5 LBS
THIMBLE, STANDARD, 1/2"	16 REQD	4 LBS
SHACKLE, 7/8", SCREW PIN	4 REQD	9 LBS

**MATERIAL SPECIFICATIONS**

- LUMBER** --- DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS** --- COMMON, REF: FED SPEC FF-N-105.
- ROPE** --- STEEL WIRE, PLAIN, PREFORMED, REGULAR LAY, 11.5 TONS, 6 X 19, FLEXIBLE INWC, MACWHYTE WIRE ROPE CO. ( OR EQUAL ). REF: FED SPEC RR-W-410.
- CLIPS** --- "U" BOLT, CROSBY, HEAVY DUTY ( OR EQUAL ). REF: FED SPEC FF-C-450, TYPE 1, CLASS 1.
- SHACKLE** --- TYPE IV, CLASS 1. REF: FED SPEC RR-C-271.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
GMSIA, CARRIER MOUNTED ( W/O HUT )	1	24,778 LBS
GMSIA, CARRIER MOUNTED ( WITH HUT )	1	25,578 LBS
DUNNAGE		325 LBS
TOTAL WEIGHT ( W/O HUT )		25,103 LBS
TOTAL WEIGHT ( WITH HUT )		25,903 LBS



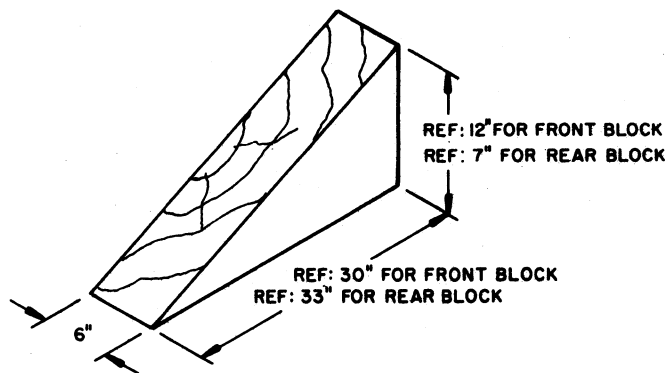
HANDLING AND LIFTING PROCEDURES:

- A. HANDLING OF THE CARRIER SHOULD BE ACCOMPLISHED BY USING THE "SPECIAL LIFTING DEVICE" ( APN 5952332 ) AND THE LIFT POINTS DESIGNATED HEREIN.
- B. THE HANDLING SLING SHALL BE OF A DESIGN AND CONFIGURATION TO LIFT THE ITEM IN SUCH A MANNER THAT THE CABLE LEGS DO NOT COME IN CONTACT WITH OR APPLY PRESSURE AGAINST THE FRAMING, SUPERSTRUCTURE OR OTHER MEMBERS OF THE ITEM WHEN BEING LIFTED.
- C. EACH LEG OF THE HANDLING SLING MUST BE SECURELY ATTACHED TO A LIFT POINT PRIOR TO LIFTING.
- D. ALTHOUGH DESIRABLE, A LEVEL LIFT IS NOT MANDATORY. THE CENTER OF GRAVITY OF THIS ITEM IS SHOWN TO ASSIST IN DETERMINING CABLE LENGTHS TO ASSURE A SAFE LIFT.

**SPECIAL PROVISIONS:**

LADING MAY BE SECURED ON A CUSHIONED FMS TYPE FLAT CAR WITH CHAIN TIE DOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIE DOWN MATERIALS PROVIDING THE FOLLOWING CONDITIONS ARE MET:

1. ONE ( 1 ) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIE DOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED (6). CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. ANCHOR DEVICES WILL BE LOCATED SO AS TO POSITION THE CHAINS WITHIN THE ANGULAR TOLERANCES SPECIFIED ON THE LOAD VIEWS.
2. BEFORE AND DURING INSTALLATION, THE ANCHOR DEVICES SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, AND WEAR IN THE CHAINS, AND FOR DAMAGED LOAD BINDERS OR WINCHES, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR NOT USING AN ANCHOR AND CHAIN ASSEMBLY.
3. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CHAINS ARE TO BE STRUCK WITH A HAMMER OR BAR AFTER TIGHTENING TO ELIMINATE ANY POSSIBLE MISALIGNMENT OF LINKS. FURTHER TIGHTENING MAY BE REQUIRED TO TAKE UP ANY SLACK THAT DEVELOPS DUE TO LINK ALIGNMENT.
4. TURNBUCKLES OR OTHER TENSIONING DEVICES NOT EQUIPPED WITH SELF-LOCKING DEVICES MUST BE WIRED OR PINNED TO PREVENT THEM FROM TURNING OR LOOSENING DURING TRANSIT.
5. OPEN HOOKS MUST BE SECURED WITH A WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.
6. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN THE CHAINS AND THE LADING AT ALL POINTS OF CONTACT EXCEPT AT DEFINITIVE TIE DOWN POINTS.



**CHOCK BLOCK**

USE TWO ( 2 ) EACH SIDE-BY-SIDE AT EACH BLOCKING LOCATION. LOCATE BEVELED END OF EACH BLOCK AGAINST TRACK. TOENAIL THRU HEEL OF A BLOCK TO THE CAR FLOOR W/2-40d NAILS. TOENAIL ONE ( 1 ) SIDE OF EACH BLOCK TO THE CAR FLOOR W/2-40d NAILS.