

“RECOMMENDED”
SHORING AND RESTRAINT REQUIREMENTS FOR THE
QUADRUPLE CONTAINERS SYSTEM (QUADCONS)

Revision 3

As of 6/20/02



**HAZMAT is NOT authorized for air shipment in
QUADCON units**

QUADCON RESTRAINT AND SHORING

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Published by 3 Aerial Port Squadron, Pope AFB, NC

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General Information:

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Load/Tie down/Shoring Preparation:

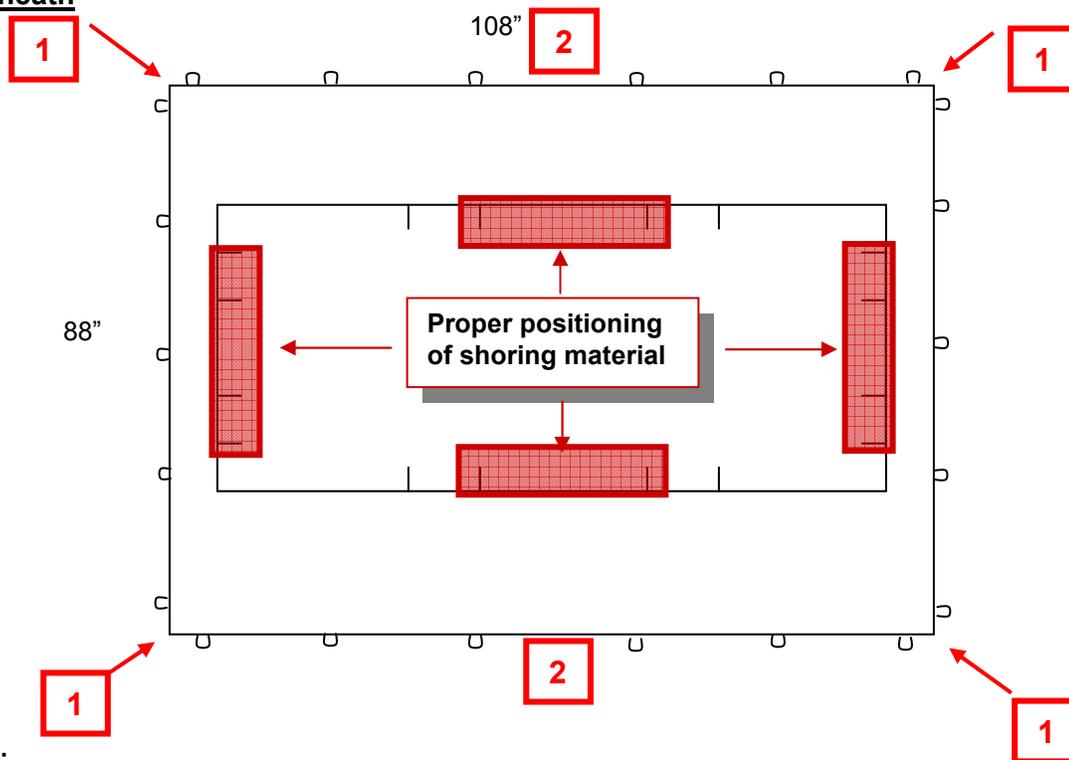
Load:

- Box must be clean (inside & out) with no dirt/sand/liquid or chemical present prior to loading anything inside.
- Inspect all corner tiedown and forklift points for any damage to box.
- Ensure door is operational – being able to close and lock completely.
- Preferred method for sealing QUADCON is to attach steel boxcar seal after completion of JI. If not available,
- If lock is used, then it must be accompanied by the key or combination.

NOTE

- Proper restraint will not be achieved unless QUADCON is centered on 463L pallet.
- Chain lengths must be symmetrical around unit to provide equal restraint in all directions.

Box Will be centered symmetrically (All four sides), in the center of 463L pallet, with appropriate shoring underneath



Tie Down Setup:

NOTE

TOTAL RESTRAINT REQUIRED FOR EACH QUADCON, 10 CHAINS – 10 DEVICES

1. Place 2 chains and 2 devices by each corner of the pallet
2. Place 1 chain and 1 device near the center of **each** 108" side of 463L pallet
3. Insure all Devices are fully extended (hook end is all the way out)

WARNING: MB1 Chains that are stamped "W Italy" on the hook are also BAD and should not be used.

NOTE: The following MB1 device is authorized for use:

Tie down, Cargo, Aircraft
TYPE: CGU4/E
ANCRA: 31272-4289-10
Manufactured Date: 5/83
Contract #: F41608-81-C-1272

NOTE: Verify the following information prior to restraint device usage!

Bad: Davis Manufacturing with a manufacture date 3/98, Contract # SPO470 98 C 5103

Good: Davis Manufacturing with a manufacture date 3/98R, Contract # **SCO400 10 253589**

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Load/Tie down/Shoring Preparation: Continued

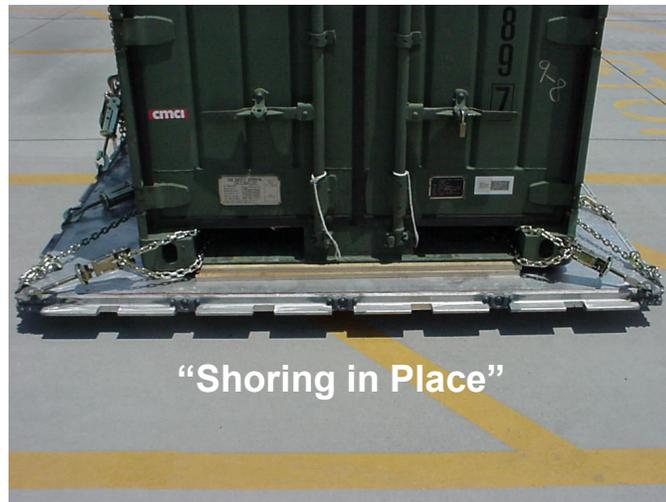
Shoring Requirements per QUADCON:

- Plank = 2" X 6" cut 42" long, 4 each required per QUADCON or,
- Plywood (1/2" thick) 8 pieces cut 6" X 42" doubled to equal 1" thickness or,
- Plywood (1" thick) 4 pieces cut 6" X 42"

- Shoring for 108" sides of QUADCON may be longer than 42" long, but must fit **between** corner posts.

- When cutting shoring, insure minimum 1" thickness is obtained.

- Shoring is cut to 42" lengths so that pieces are interchangeable around all sides of QUADCON for ease of application in the field.



Main consideration is to provide enough shoring equally around all 4 sides of QUADCON to get weight transferred from the 4 outside corners, to the side and end rails. The 4 outside corner legs/posts, must not contact the 463L pallet because this would exceed the limitations of the pallet and/or aircraft roller limitations.

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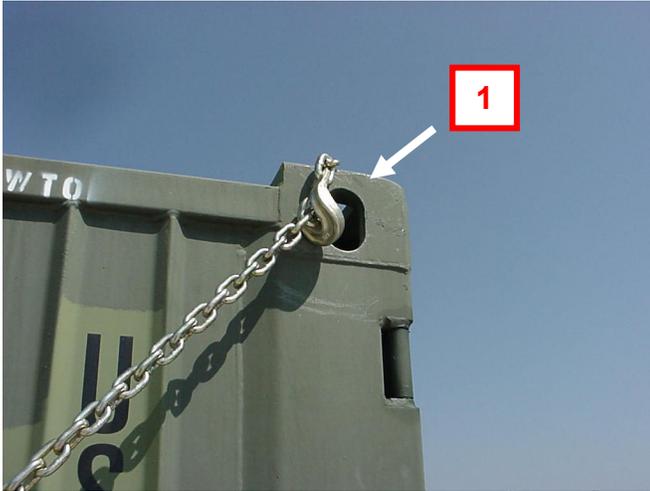
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Securing Load to pallet (Chain Method):

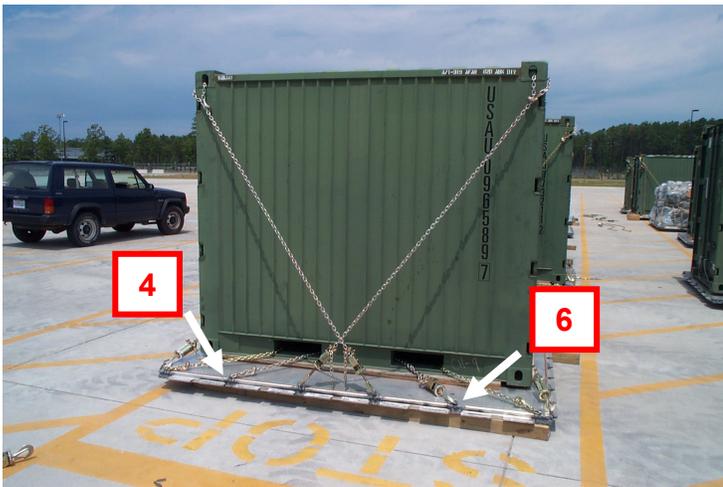
NOTE: Max container weight is 6,500 lbs

On the 108" side (Face)

1. Route chains through top corner QUADCON attachment points, and attach to itself as pictured.
2. Attach a Device on each of the two center 'D' rings (3 and 4), with hook facing outboard (away from box).
3. Cross chains over each other connecting to devices, secure and tighten.



4. Route chain through 2nd 'D' ring on 108" side, and hook it to itself
5. Route non-hook end of chain through left forklift position on the 108" side, around backside of center post, and out the right forklift position of the same side.
6. Connect Device with hook facing outboard to the 5th 'D' ring and connect chain to device. Secure and tighten.



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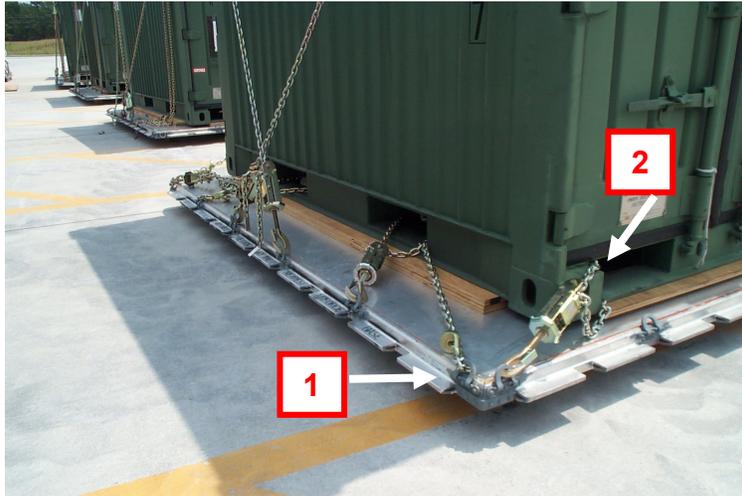
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Securing Load to pallet (Chain Method):

Continued

On the 108" side (Must be accomplished on ALL 4 Lower Corners)

1. Insert chain through outermost 'D' ring position (left or right) on 108" side, and hook to itself
2. Route non-hook end of chain through first forklift position on 108" side, and bring around so that it exits on the short (88") side of QUADCON under door.



NOTE

- Ensure non-hook end of chain that is routed out on 88" side is placed over the top of iron ledge under door hinges prior to attaching to device.
 - This routing provides additional directional restraint
3. Install Device to outermost D ring (Left or Right), on the 88" side of pallet, 90 degrees from hook attaching end of chain, with device hook facing outboard.
 4. Secure chain in device, and tighten.
 5. This process is repeated at each of the outside corners.



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	Weight per item	qty	weight subtotal
Cargo	4,736.00	1	4,736
QUADCON	1,764.00	1	1,764
QUADCON weight limitation w/cargo			6,500

	Weight per item	qty	weight subtotal
Chain	7.00	10	70
Device	3.50	10	35
Pallet	290.00	1	290
Cargo	4,736.00	1	4,736
QUADCON	1,764.00	1	1,764
Total gross weight limitation on scale			6,895

Statistics:

Length:	96
Width:	57
Height:	82
Weight (Empty):	1,764
Weight (Loaded)	6,500 gross weight of any/all equipment to be loaded into box)

QUADCONs can be secured to the 463L pallet using 10 each MB1 Chains and 10 each MB1 Devices. This method of restraint will satisfy all G-force requirements for C-130, C-17, and C-5 cargo aircraft for container weights up to 6,500 lbs

NOTE: Procedures in this guide will not satisfy current C-130J restraint requirements.

G-FORCE REQUIREMENTS FOR AIRLIFT

- 3 G's Forward
- 1.5 G's Aft
- 1.5 G's Lateral
- 2 G's Vertical

SHORING REQUIREMENTS

- **Chains:** 10
- **Devices:** 10
- **Shoring:** 2" x 6" x 42" boards (4 per box) being the preferred shoring standard **or** minimum 1" thick 6" x 42" plywood, (4 per box) **or** doubled ½" plywood cut 6" x 42" (8 per box).

Explanation:

Shoring must be used under each end and side of the QUADCON. The preferred shoring kit will consist of 4 planks of 2x6 board cut at 42" lengths. These planks will be centered under each of the four sides of the box prior to setting it (symmetrically) in the center of the 88x108 pallet. If planks are not available the following substitutes are acceptable:

1" plywood cut at 6" x 42" (or)

½" plywood cut at 6" x 42" doubled to make it equal 1" thick

NOTE: Excess chain will be taped up and out of the way with cloth backed tape to preclude it falling into the dual rail restraint system on the aircraft.

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Tiedown Chain: 1670-00516-8405

Tiedown Device: 1670-00-212-1149