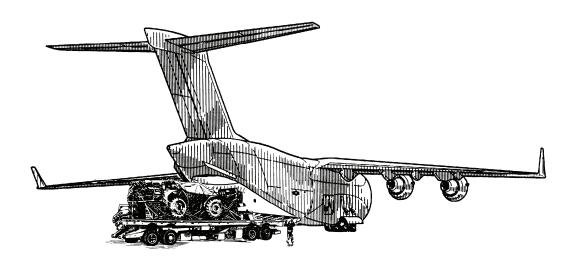
FM 4-20.142 (FM 10-542) MCRP 4-11.3P NAVSEA SS400-AD-MMO-010 TO 13C7-51-21 September 2007

Airdrop of Supplies and Equipment: Rigging Loads for Special Operations



DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited

Headquarters, Department of the Army
United States Marine Corps
Department of the Navy
Department of the Air Force



*FM 4-20.142 (FM 10-542) MCRP 4-11.3P NAVSEA SS400-AD-MMO-010 TO 13C7-51-21

Field Manual No. 4-20.142 (10-542) MCRP No. 4-11.3P Naval Sea Command No. SS400-AD-MMO-010 Technical Order No. 13C7-51-21 Headquarters
Department of the Army
United States Marine Corps
Department of the Navy
Department of the Air Force
Washington, DC, 19 September 2007

AIRDROP OF SUPPLIES AND EQUIPMENT: RIGGING LOADS FOR SPECIAL OPERATIONS

Contents

		Page
	PREFACE	v
	INTRODUCTION	vii
Chapter 1	RIGGING HIGH SPEED LOW LEVEL AERIAL DELIVERY SYSTEM CONTAINER LOADS	
	Section I-Rigging the Container	1-1
	Description of Load	
	Preparing Container	1-2
	Loading Container	1-4
	Constructing Container Straps	1-5
	Closing Container and Stowing Parachute	1-6
	Equipment Required	1-10
	Section II-Modifying and Packing the 22-Foot and 28-Foot Cargo	
	Extraction Parachutes	
	Modifying Cargo Extraction Parachute Deployment Bag	1-11
	Attaching Static Line and Bridle Loop Breakcord	1-14
	Stowing Suspension Lines	1-16
	Packing Parachute	1-16
	Stowing Static Line	1-17

Distribution Restriction: Approved for public release; distribution is unlimited.

19 September 2007 i

^{*}This publication supersedes FM 10-542/NAVSEA SS400-AD-MMO-010/TO 13C7-51-21, 7 October 1987.

Chapter 2	RIGGING COMBAT RUBBER RAIDING CRAFT	2-1
	Section I-Rigging Single Zodiac F470U Boat	2-1
	Description of Load	2-1
	Preparing the Platform	2-1
	Installing Suspension Slings	2-9
	Stowing Sandbags	2-10
	Attaching Lashings to the Platform	2-11
	Building, Placing and Securing Honeycomb Stacks	.2-12
	Preparing Boat	2-14
	Positioning Boat	2-19
	Preparing, Placing, and Securing Accompanying Load	2-20
	Installing Load Cover and Lashing Boat	.2-26
	Safety Tieing Suspension Slings	2-27
	Stowing Parachute	2-28
	Stowing the G-12 Cargo Parachute and 15-Foot Cargo Extraction Parachute	e 2-33
	Installing Parachute Release	2-35
	Installing Flotation Device	2-36
	Marking Rigged Load	2-37
	Equipment Required	2-38
	Section II-Rigging Double Zodiac F470U Boat	.2-40
	Description of Load	
	Preparing the Platform	
	Installing Suspension Slings and Stowing Sandbags	
	Placing and Securing Honeycomb Stacks	
	Preparing Boats	
	Positioning First Boat	
	Preparing and Stowing Accompanying Load	
	Leveling, Covering, and Lashing First Boat and Accompanying Load	
	Placing and Loading Second Boat	
	Lashing Second Boat to Platform	
	Safety Tieing Suspension Slings	
	Stowing Parachutes	
	Installing Parachute Release	
	Equipment Required	
	Marking Rigged Load	
Chapter 3	RIGGING ZODIAC F470U IN A-22 CARGO BAG	3_1
Onapter 5	Description of Load	
	Adapting A-22 Cargo Bag	
	Constructing Engine Protection Box	
	Preparing Skid and A-22 Cargo Bag and Placing Engine Box	
	Preparing Engine and Securing Engine in Box	
	Preparing Boat and Inflation System	
	Collapsing and Folding Boat, Completing Inflation System Connection and	17
	Loading Fuel Tanks	3-21
	Securing A-22 Cargo Bag	
	Modifying Type IV Link Assembly for use with Hydraulic Release	
	Installing Parachute Release and Parachutes	
	•	

	Installing Flotation Devices and Chemical Lights (Optional)	. 3-41	
	Marking Rigged Load		
	Equipment Required	. 3-44	
CHAPTER 4	RIGGING THE NAVAL SPECIAL WARFARE (NSW) RIGID INFLATABLE BOAT (RIB) FOR LOW-VELOCITY AIRDROP4-1		
	Description of Load		
	Preparing Platform	4-2	
	Installing the Platform Release System	. 4-10	
	Installing Extraction Force Transfer Coupling (EFTC)	. 4-13	
	Lifting and Positioning Boat	. 4-16	
	Preparing Boat	. 4-18	
	Preparing the Sponson Inflation System	. 4-26	
	Installing the Water Activated Parachute Release	. 4-27	
	Installing the Boat Cover, Sponson, Ties, and Sponson Covers	. 4-28	
	Preparing Suspension Slings		
	Installing Parachute Stowage Platform	. 4-35	
	Installing Cargo Parachutes		
	Installing M-2 Cargo Parachute Release		
	Installing Parachute Restraints		
	Installing Sponson Activation Lanyard		
	Preparing and Testing the NSW RIB Restraint System		
	Connecting M-21 Cutter Arming Wire Lanyards		
	Securing G-12E Parachute Static Line		
	Placing Extraction Parachutes		
	Marking the Rigged Load		
	Equipment Required	. 4-50	
CHAPTER 5	RIGGING THE ADVANCED RESCUE CRAFT (ARC) ON A COMBAT EXPENDABLE PLATFORM (CEP)	5-1	
	SECTION I-RIGGING THE GP 800 ARC	5-1	
	Description of Load	5-1	
	Building the Combat Expendable Platform		
	Preparing the Platform	5-4	
	Preparing and Positioning Honeycomb	5-6	
	Positioning the ARC	5-8	
	Preparing the ARC		
	Lashing the ARC		
	Safety Tieing Suspension Slings		
	Stowing Parachute		
	Installing the Automatic Cargo Parachute Release		
	Stowing the Extraction Parachute		
	Attaching Flotation Devices for Training Loads		
	Marking the Rigged Load		
	Equipment Required		
	SECTION II-RIGGING THE XL1200 ARC		
	Description of Load		
	Building the Combat Expendable Platform		
	Preparing the Platform	. 5-27	

FM 4-20.142/MCRP 4-11.3P/NAVSEA SS400-AD-MMO-010/ TO 13C7-51-21

19 September 2007 iii

	Preparing and Positioning Honeycomb	5-29	
	Positioning the ARC	5-31	
	Preparing the ARC	5-32	
	Lashing the ARC	5-36	
	Safety tieing Suspension Slings	5-39	
	Stowing Cargo Parachute	5-40	
	Installing the Automatic Cargo Parachute Release	5-41	
	Stowing the Extraction Parachute	5-42	
	Attaching Flotation Devices for Training	5-44	
	Marking the Rigged Load	5-45	
	Equipment Required	5-46	
CHAPTER 6	RIGGING THE WIND SUPPORTED AERIAL DELIVERY SYSTEM (WSADS) SNOW GOOSE6-1		
	Description of Load		
	Installing Air Launch Parachute		
	Installing Pyrotechnic Cutters		
	Recovery Dispatch Pin Placement	6-14	
	Securing Landing Gear	6-16	
	Installing Propeller Brake	6-18	
	Installing Deflector Lanyards	6-19	
	Equipment Required	6-21	
	GLOSSARY	Glossary-1	
	REFERENCES	References_1	

Preface

SCOPE

This manual tells and shows how to rig the following airdrop loads for special operations:

- Four different High Speed Low Level Aerial Delivery System (HSLLADS) container loads rigged for airdrop from the MC-130 aircraft.
- Two different inflated Combat Rubber-Raiding Crafts (CRRC) rigged on a Combat Expendable Platform (CEP) for low-velocity airdrop from a C-130 or C-17 aircraft.
- The Rigging Alternate Method Zodiac (RAMZ) is rigged in an A-22 container for low-velocity airdrop from a C-130 or C-17 aircraft.
- The Naval Special Warfare Rigid Inflatable Boat (NSWRIB) is rigged for low-velocity airdrop on a specially designed platform from a C-130 or C-17 aircraft.
- Two different Advanced Rescue Crafts (ARC) rigged on a combat expendable platform (CEP) for low velocity airdrop from a C-130 or C-17 aircraft.
- The Wind Supported Aerial Delivery System (WSADS) Snow Goose is a low-cost, reusable, fully autonomous, Unmanned Aerial Vehicle (UAV) that can be used to carry out a variety of missions at otherwise inaccessible locations for low velocity airdrop from a C-130 or C-17 aircraft.

APPLICABILITY

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the United States Army Reserve unless otherwise stated.

USER INFORMATION

The proponent of this publication is the United States Army Training and Doctrine Command (TRADOC). You are encouraged to report any errors or omissions and to suggest ways of making this a better manual.

Army personnel, send your comments on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) directly to:

Director

Aerial Delivery and Field Services Department

USA Quartermaster Center and School

710 Adams Avenue

Fort Lee, Virginia 23801-1502

Marine Corps. Readers of this publication are encouraged to submit suggestions and changes through the Universal Need Statement (UNS) process. The UNS submission process is delineated in Marine Corps Order 3900.15A, *Marine Corps Expeditionary Force Development System*, which can be obtained from the Marine Corps Publications Electronic Library Online (universal reference locator:

<u>http://www.usmc/directiv.nsf/web+orders</u>). The UNS recommendation should include the following information:

• Location of change Publication number and title

FM 4-20.142/MCRP 4-11.3P/NAVSEA SS400-AD-MMO-010/ TO 13C7-51-21

19 September 2007 v

Current page number

Paragraph number (if applicable)

Line number

Figure or table number (if applicable)

• Nature of change

Addition/deletion of text

Proposed new text

MCCDC will consolidate changes and forward to:

Director

Aerial Delivery and Field Services Department

USA Quartermaster Center and School

710 Adams Avenue

Fort Lee, Virginia 23801-1502

Navy personnel send all correspondence to the (PEO LMW) Program Office.

Program Executive Officer,

Littoral and Mine Warfare (PMS NSW)

614 Sicard St. SE

Washington Navy Yard, DC 20376-7210

PEO LMW will consolidate changes and forward to:

Director

Aerial Delivery and Field Services Department

USA Quartermaster Center and School

710 Adams Avenue

Fort Lee, Virginia 23801-1502

Air Force personnel, send your reports on AFTO Form 22 through your respective command Weapons and Tactics to:

Headquarters

Air Mobility Command (AMC/A3DT)

402 Scott Drive, Unit 3AI

Scott AFB, Illinois 62225-5302

Air Force personnel in Special Operations Command, send your reports on AFTO Form 22 (*Technical Order Publication Improvement Report*). HQ AMC/A3DT will consolidate and forward changes to:

Director

Aerial Delivery and Field Services Department

USA Quartermaster Center and School

710 Adams Avenue

Fort Lee, Virginia 23801-1502

Also, send an information copy of AFTO Form 22 to:

584 CBSS/GBMUDE

380 Richard Ray Blvd

STE 104

Robins AFB, Georgia. 31098-1640

vii

Introduction

DESCRIPTION OF ITEMS

The descriptions of the items rigged in this manual are given below:

- **High Speed Low Level Aerial Delivery System (HSLLADS):** The HSLLADS container is an adjustable container made of an A-21 cargo cover and other airdrop items. The dimensions and weight capacity of the container is determined by the load being airdropped.
- Zodiac F470U Combat Rubber Raiding Craft (CRRC): The inflated Zodiac 470U boat is airdropped singly or in pairs. Each boat is 75 inches wide, 22 inches high, 185 inches long and may be airdropped utilizing a roll-up floor or hard deck. A single boat weighs approximately 322 pounds.
- Zodiac F470U Combat Rubber Raiding Craft rigged in an A-22 Container or Rigging Alternate Method Zodiac (RAMZ): The boat is rigged in an A-22 container rigged for low-velocity airdrop over water. The boat is deflated and rigged for rapid inflation and deployment once in the water.
- Naval Special Warfare Rigid Inflatable Boat (NSWRIB): The NSWRIB is 108 inches wide, 100 inches high and 432 inches long. The boat rigged on its platform can weigh a maximum of 20,640 pounds.
- Advanced Rescue Craft (ARC): The ARC is rigged on a 48- x 87-inch combat expendable platform for low-velocity airdrop. The load can be rigged with or without a 20-man life raft and a rescue board, a rucksack, and an aid bag. The ARC is 70 inches high, 48 inches wide and 111 inches long. The ARC is 1,140 pounds when rigged.
- **Snow Goose:** The Wind Supported Aerial Delivery System (WSADS) Snow Goose is a low-cost, reusable, fully autonomous, unmanned aerial vehicle (UAV) that can be used to carry out a variety of missions at otherwise inaccessible locations. It is quickly configurable for air or ground launch deployable missions.

SPECIAL CONSIDERATIONS

CAUTION

Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped. Only ammunition and supplies approved for high velocity or HSLLADS airdrop may be airdropped by HSLLADS. When a dangerous material is being rigged, the container must be marked, labeled and comply with AFMAN 24-204(I)/TM 38-250/NAVSUP PUB 505/MC0 P4030.19H/DLAI 4145.3. A copy of this manual must be available to the joint airdrop inspectors during the before and after loading inspections.

HSLLADS Container. The following items apply to the HSLLADS container:

- A multiple drop of four HSLLADS containers may be airdropped on one pass provided the total weight of the load does not exceed 2,200 pounds.
- The type XXVI nylon webbing used to secure multiple HSLLADS loads will be furnished by the US Army.
- HSLLADS containers are airdropped from the MC-130 aircraft only.

19 September 2007

Note. For Air Force use only. A HSLLADS container weighing at least 250 pounds may be airdropped for continuance training purposes only, provided the 35 pounds per square foot minimum is maintained. For unilateral training loads honeycomb is not required.

Boats and Parachutists. The following items apply to boats and parachutists:

- At no time will the total number of static lines on the anchor line cable for personnel and cargo exceed 20.
- The total rigged weight of rubber raiding craft loads on CEP must be a minimum of 2,100 pounds. Sandbags or other ballast may be added to the platform for this purpose.

Chapter 1

Rigging High Speed Low Level Aerial Delivery System (HSLLADS) Container Loads

SECTION I-RIGGING THE CONTAINER

DESCRIPTION OF LOAD

1-1. The HSLLADS container (Figure 1-1) is an adjustable container made of an A-21 (nylon) cargo cover and other airdrop items. The assembled items are rigged to ensure that the container will withstand the shock of the parachute opening when airdropped at high speeds.



Figure 1-1. High Speed Low Level Aerial Delivery System (HSLLADS)

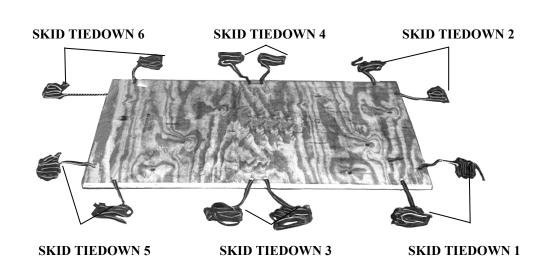
FM 4-20.142/MCRP 4-11.3P/NAVSEA SS400-AD-MMO-010/ TO 13C7-51-21

PREPARING CONTAINER

1-2. Dimensions of the load base in these procedures are typical. The size of the load base may change to fit other supply loads. Prepare the load base and HSLLADS container as shown in Figures 1-2 and 1-3.

CAUTION

When a container is rigged for delivery from Air Force aircraft, the rigged weight divided by the largest surface area (measured in square feet) must be a minimum of 35 pounds per square foot.



- 1. Drill 1/2-inch diameter holes 4 inches from each corner and 1 inch from the edge of a 3/4-by 30- by 48-inch piece of plywood.
- 2. Center two additional 1/2-inch diameter holes on each 48 inch side of the skid 4 inches from each other and 1 inch from the edge.
- (3.) Thread a 12-foot length of 1/2-inch tubular nylon webbing through each pair of holes in the skid. (Doubled, type III nylon cord may be used).

Note. Denoted skid tiedown numbers are referred to in Figure 1-7.

Figure 1-2. Skid Prepared

FM 4-20.142/MCRP 4-11.3P/NAVSEA SS400-AD-MMO-010/ TO 13C7-51-21

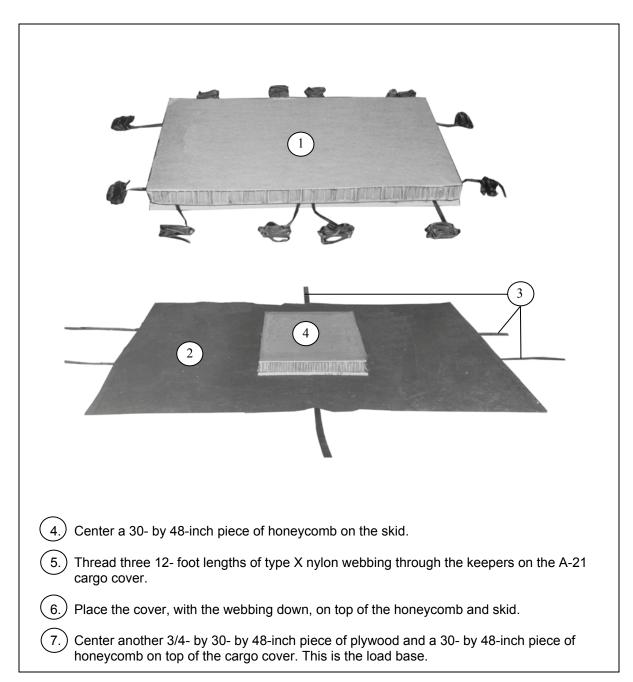


Figure 1-3. A-21 Honeycomb, Container Cover and Load Base Placed on Skid

19 September 2007 1-3