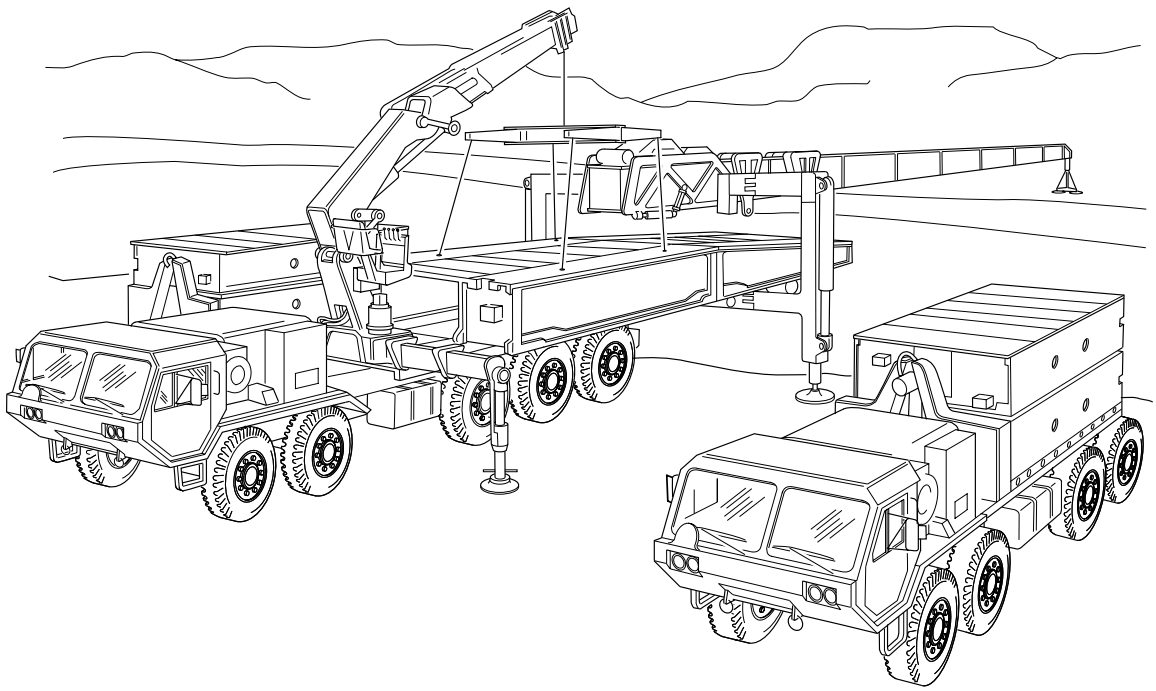
TM-5-5420-279-10

OPERATOR MANUAL

FOR

DRY SUPPORT BRIDGE (DSB)

(NSN 5420-01-469-7479)



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April 2003 **HEADQUARTERS, DEPARTMENT OF THE ARMY**

TECHNICAL MANUAL
TM 5-5420-279-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC., 8 April 2003

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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The chapters are sub-divided into sections. See the content lists at the start of each chapter for full details.

HOW TO USE THIS MANUAL

This manual is designed to help you operate the Dry Support Bridge and its launch vehicle.

It should be noted by the reader, that this manual is in a commercial format.

FEATURES OF THIS MANUAL

- A table of contents is provided at the beginning of this manual**.**
- WARNINGs, CAUTIONs NOTEs.

WARNING

A WARNING INDICATES A HAZARD, WHICH CAN RESULT IN DEATH OR SERIOUS INJURY.

CAUTION

A CAUTION is a reminder of safety practices or directs attention to usage practices that may result in damage to the equipment.

NOTE

A NOTE is a statement containing information that will make procedures easier to perform.

- Technical instructions include metric units as well as standard units, metric units are shown in brackets. A metric conversion chart is provided in CHAPTER 13.

FOLLOW THESE GUIDELINES WHEN YOU USE THIS MANUAL

- Read through this manual and become familiar with its contents before attempting to operate the DSB system.
- A Warning and Caution summary is provided at the front of this manual and should be read before attempting to operate the DSB system.

DESCRIPTION OF CHAPTERS

This manual is divided into 13 chapters and two Appendixes, each of which covers a broad topic. It is recommended that each member of the DSB operating crew becomes familiar with the chapters related to his or her tasks, before moving to the bridge site. In particular, all users must be completely familiar with the warnings and cautions associated with the various stages of deployment and retrieval. For Unit Level Maintenance Procedures at site and depot level, refer to the Maintenance Manual for the DSB TM-5-5420-279-24.

Chapter 1, INTRODUCTION, contains a high level overview of the features of the DSB system, guidance on the selection of, and preparation of, the bridging site. It also contains information on transportation of the DSB system to and from the bridging site.

Chapter 2, TECHNICAL DESCRIPTION AND DATA, contains descriptions of all the assemblies and components of the DSB. It also contains tables of technical data about DSB equipment and components.

Chapter 3, GENERAL DRILLS, contains operating procedures and practices for various facilities of the DSB, e.g. tail-lift, crane, launcher, bridge modules, etc. These detailed procedures should be practiced and understood by appropriate members of the crew, so that they have become second nature by the time that an actual bridge is being built.

Chapter 4, BRIDGE BUILDING, contains all the procedures necessary to build a DSB. Procedures covered include: positioning of launching vehicle and trailers at the bridge site, setting up the launching vehicle, building the launch beam, building the bridge roadway and retrieving the launch beam. It also covers post-build activities, such as bridge inspection and equipment stowage.

Chapter 5, BRIDGE RETRIEVAL, contains all the procedures necessary to retrieve a bridge after use.

Chapter 6, BUILD SEQUENCE FOR 40 METER BRIDGE, is a tabulated sequence of instructions for all the critical tasks necessary for constructing a DSB, 40 meters long.

Chapter 7, OPERATION IN BACK-UP MODE, provides an overview of the facilities available to the bridge crew in the event of loss of electrical power. It also includes procedures for manual operation of hydraulic controls.

Chapter 8, PREVENTIVE MAINTENANCE CHECKS (PMCS), contains illustrated tables detailing the sequences of checks to be carried out before, during and after DSB operation. It also contains general procedures for lubrication and fluid top-up operations.

Chapter 9, FAULT-FINDING & OPERATOR TROUBLE-SHOOTING, Introduces the Built-in-Test Equipment (BITE) facilities on the launcher vehicle and contains other miscellaneous procedures which can be used by the crew to isolate and diagnose faults.

Chapter 10, OPERATOR MAINTENANCE, contains procedures for replacing simple electrical or mechanical components and adjustments.

Chapter 11, DSB TRANSPORTATION AND LOADING PLANS, contains procedures for loading and securing the DSB components on the launching vehicle and trailers.

Chapter 12, OPERATION IN UNUSUAL CONDITIONS, contains procedures for operating the launch vehicle and bridge in severe conditions.

Chapter 13, SUPPORT INFORMATION contains reference material, BII list conversion factors etc.

Appendix A, FRACTURE CONTROL PLAN, details procedures for monitoring fatigue and cracks in the bridge modules.

Appendix B, OVERBRIDGING, details on building an overbridge.

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INTRODUCTION

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CHAPTER 1

INTRODUCTION

Section I. OVERVIEW OF DSB SYSTEM

1.1 INTRODUCTION

This manual describes the components, the operations and operational sequences required to load, transport, deploy and recover the 131.23 ft (40 m) dry support bridge. It also includes field repairs, field maintenance procedures and trouble shooting sections.

1.1.1 Scope

The manual is primarily intended for the 8-man crew who carry out the bridge building tasks. The loading, transport and maintenance sections will be relevant to other personnel who carry out those operations.

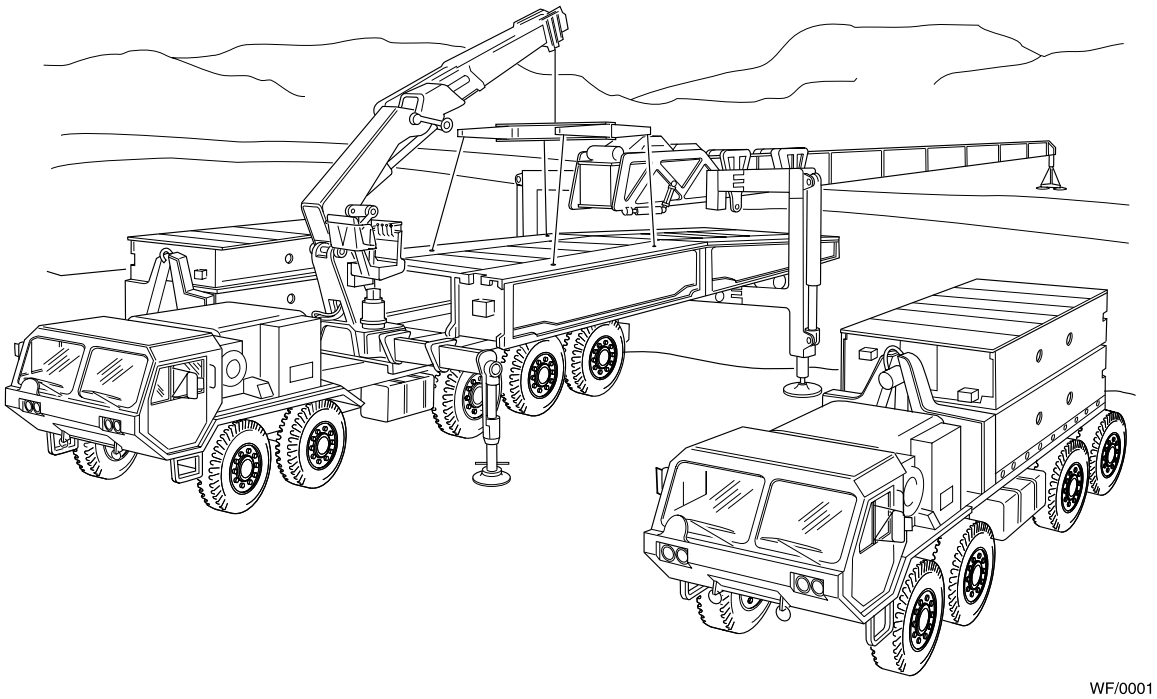

Figure 1. 1 Dry Support Bridge

1.1.2 General Description

NOTE

When an item on the vehicle or launcher is referred to as front or rear, left or right, the cab is taken as the front of the launcher vehicle, all references are taken as if personnel are looking forward towards the cab. Therefor if the left hand side A-frame leg is being discussed, the A-frame leg on the launcher vehicle's left hand side is the item being described, i.e. the driver's side.

When talking about the launch beam, the front of the beam is to be taken as the far bank and the rear is taken as the home bank. Similarly the far bank carriage is the one nearest the far bank and the home bank carriage is the one nearest the home bank.

1.1.2.1 The DSB system consists of a launcher vehicle and launcher, launch beam and bridging modules including end beams and approach ramps. It is compatible with the pallet loading system (PLS) and is transported on a total of seven PLS flatracks. It is lightweight in construction and easy to construct by a crew of eight personnel. It provides a bridging span of up to 131.23 ft (40 m) and 14 ft 1 in (4.3 m) wide. Table 1. 1 lists the capacity of the bridge and Table 1. 2 lists the vehicle crossing speeds.

Table 1. 1 Bridge Capacity

	NORMAL CROSSING	CAUTIOUS CROSSING
BRIDGE CAPACITY	MLC96W (wheeled)	MLC100W (wheeled)
	MLC70T (tracked)	MLC80T (tracked)
Approach ramp angle 1:9		

Table 1. 2 Vehicle Crossing Speeds

VEHICLE WEIGHT	CROSSING SPEED
Up to MLC 30	25 mph (40 kph)
Above MLC 30	15 mph (25 kph)
Exceptions: Vehicles with low ground clearance such as the Abrams mine plow must be limited to a crossing speed of 10 mph (16 kph).	
Vehicles with large front or rear overhangs must approach and exit the bridge with caution and at a slow speed to prevent contact with and subsequent damage to the bridge.	

1.1.2.2 The complete system is capable of constructing two 20 m bridges.

1.1.2.3 A launcher attached to the transport vehicle consists of a crane, a slide frame, a launch frame and a fold out A-frame for leveling and stabilization. The crane is operated separately while the launcher is operated via hydraulic circuits controlled from a chest pack. The chest pack includes two joysticks and illuminated panels to indicate the current action being or about to be executed. Leads from a control cabinet on the vehicle terminate at either end of the vehicle to facilitate connection of the chest pack lead.

1.1.2.4 The launch frame also carries the first section of the launch beam upon which the far bank and home bank carriages, used to support the bridge sections during assembly and placement, are already in place. The launch frame features a launch beam drive unit to move the launch beam forward or rearward as required. Winches attached to the launch frame, control the movement of the carriages and the raising or lowering of the bridge during deployment and recovery.

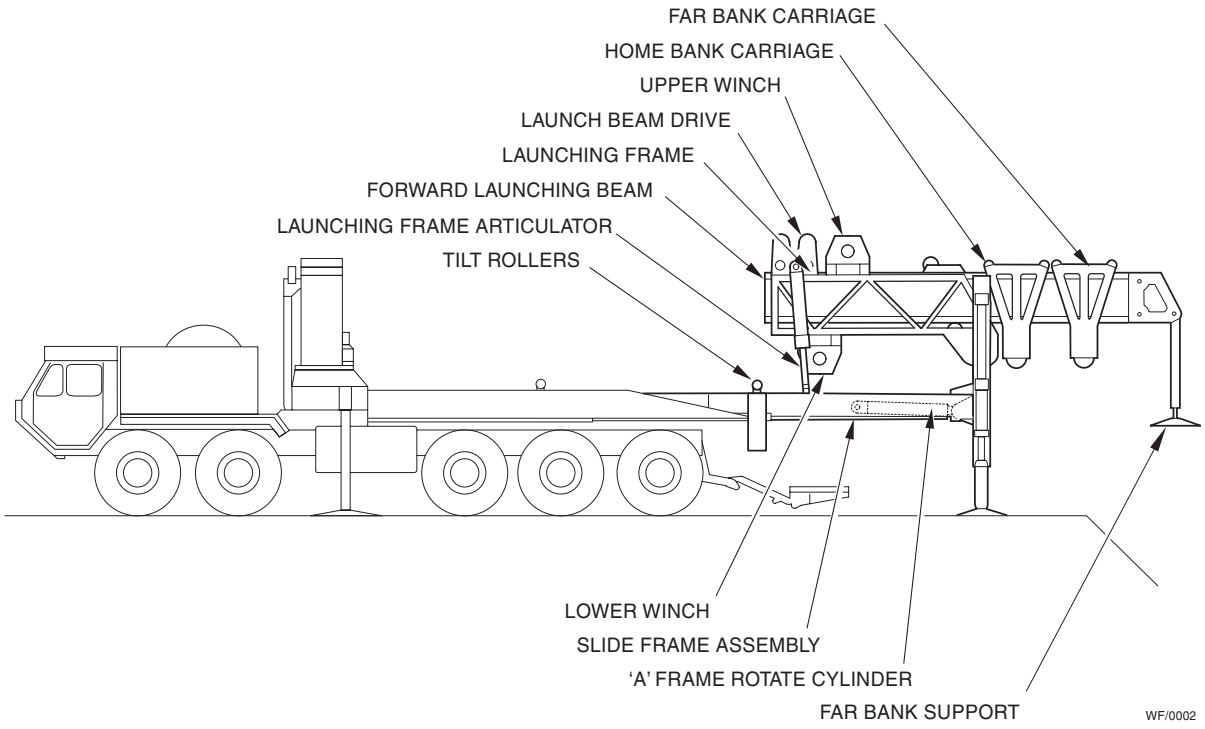

Figure 1.2 Launcher Vehicle Extended

1.1.2.5 The A-frame consists of fold-out support legs that allow the vehicle to be leveled and stabilized for bridge deployment and an upper beam that supports the launch frame. This upper beam is used in its lower position for launch beam deployment and is raised to provide clearance for the modular bridge sections during bridge deployment.

1.1.2.6 The operation of the drive mechanism, winches and hydraulic cylinders is controlled via the chest pack. The operator of the chest pack controls the whole bridge deployment operation, which relies on coordinated actions of the 8-man crew in order to achieve minimum deployment times.

1.1.3 Basic Operational Sequence (Deployment)

1.1.3.1 Upon arrival at the crossing, the build site is marked out in accordance with Figure 1. 12.

1.1.3.2 All vehicles are driven to the staging area and a number of palletized loads ground loaded.

1.1.3.3 The launcher vehicle is then partially prepared for use. The tail-lift is opened, the crane partially deployed and the A-frame unfolded and pinned.