

TECHNICAL MANUAL
OPERATOR'S MANUAL

This copy is a reprint which includes current
pages from Change 1.

WATER PURIFICATION UNIT,

REVERSE OSMOSIS,

600 GPH TRAILER MOUNTED,

FLATBED CARGO,

5 TON 4 WHEEL TANDEM

ROWPU MODEL WPES-1
(4610-01-295-2720)

AND

600 GPH SKID MOUNTED

(4610-01-300-0918)

MODEL WPES-3
(4610-01-295-2719)

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** This manual, together with TM 10-4610-215-10/TM 08580A-10/1 and
TM 10-4610-239-10/TM 08580B-10/1, supersedes TM 5-4610-215-10/
TM 08580A-10/1, 15 May 1987, including all changes.*

TECHNICAL MANUAL

NO. 10-4610-240-10

HEADQUARTERS.
DEPARTMENTS OF THE ARMY ND AIR FORCE
AND HEADQUARTERS. U.S. MARINE CORPS,
WASHINGTON, D.C., 5 March 1991

Operator's Manual

**WATER PURIFICATION UNIT, REVERSE OSMOSIS
600 GPH TRAILER MOUNTED, FLATBED CARGO,
5 TON 4 WHEEL TANDEM ROWPU
MODEL WPES-1 (4610-01-295-2720)
AND
600 GPH SKID MOUNTED ROWPU
MODEL WPES-2 (4610-01-300-0918) (Air Force)
MODEL WPES-3 (4610-01-295-2719) (Marine Corps)**

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

ARMY

You can help improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil>. A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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MARINE CORPS

Commander, ATTN: (Code 850), Marine Corps Logistics Bases, 814 Radford Blvd., Albany, GA 31704-1128.

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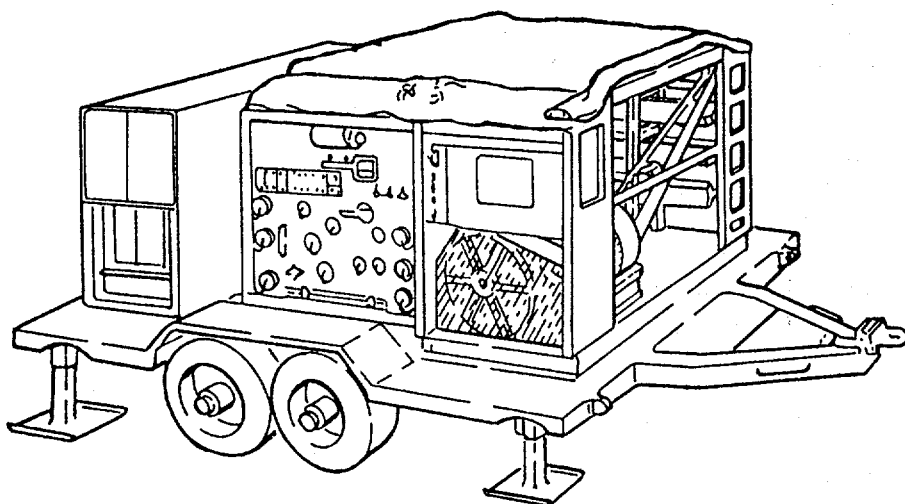


FIGURE 1-1. REVERSE OSMOSIS WATER PURIFICATION UNIT (ROWPU) (ARMY)

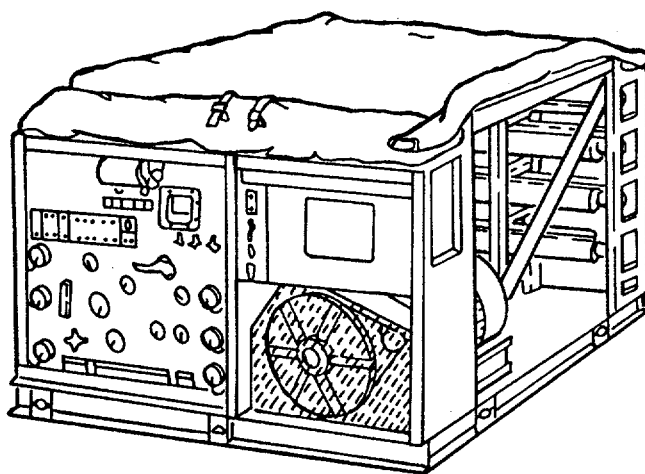


FIGURE 1-2. REVERSE OSMOSIS WATER PURIFICATION UNIT (ROWPU) (MC AND AF)

CHAPTER 1

INTRODUCTION

Section I.	General Information
Section II.	Equipment Description
Section III.	Technical Principles of Operation

Section I. GENERAL INFORMATION

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1-1. SCOPE.

This operator's manual describes the Operating and Operator's Maintenance Procedures for the 600 Gallon Per Hour (GPH) Reverse Osmosis Water Purification Unit (ROWPU). It should be noted that although a complete 600 GPH Reverse Osmosis Water Purification Equipment Set is described herein, certain components are not issued under the National Stock Number NSN 4610-01-295-2720 (ARMY) but are authorized under their own TOE Line Item Numbers and are listed in the Department of the Army Supply Catalog SC 4610-97-CL-E16 which describes the entire 600 GPH ROWPU Set. NSN 4610-01-295-2719 is the Marine Corps (MC) ROWPU designation. Air Force (AF) units are designated by NSN 4610-01-300-0918.

NOTE

Paragraphs not designated Army, Marine Corps (MC), or Air Force (AF) are applicable to all configurations. The following model numbers identify units covered in this manual.

- WPES-1 - Army Trailer Mounted Unit (ARMY)
- WPES-2 - Air Force Skid mounted unit (AF)
- WPES-3 - Marine Corps Skid mounted unit (MC)

1-2. MAINTENANCE FORMS AND RECORDS.

Good maintenance records must be kept. Department of Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS). Marine Corps personnel refer to TM 4700-15/1 for forms and records procedures. Air Force personnel refer to MAJCOM and local directives.

1-3. HAND RECEIPT. (ARMY).

A companion hand receipt technical manual has been issued with the ROWPU to aid in accounting for all of the end-item related equipment. The hand receipt manual is numbered with TM number of this manual (TM 10-4610-240-10) followed by "-HR". Hand Receipt Manual TM 10-4610-240-10-HR contains reprinted hand receipts for Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL): items. Additional HR manuals may be obtained from the U.S. Army Adjutant General Publications Center, ATTN: AGDL-OD, 2800 Eastern Blvd., Baltimore, MD 21220, in accordance with the procedures in DA PAM 25-30.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS).

If your ROWPU needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design. Tell us why a procedure is hard to perform. Put it on an SF-368 (Quality Deficiency Report). Mail it to us at:

Commander
US Army Aviation and Troop Command
ATTN: AMSAT-I-MDO
4300 Goodfellow Blvd.
St. Louis, MO 63120-1798

Marine Corps personnel submit EIR's in accordance with MCO 1650-17.
Air Force personnel submit AFTO Form 22 in accordance with T.O. 00-5-1.

Section II. EQUIPMENT DESCRIPTION

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Location and Description of Major Component	1-3
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Piping Identification	1-17

1-5. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. Characteristics. The ROWPU is a mobile water purifying unit needing a 30 KW power source, that supplies drinking water for troops in the field. (See figure 1-1 (ARMY) and figure 1-2 (MC and AF)).

b. Capabilities and Features.

(1) Flow systems within the ROWPU process raw water to make it drinkable. Special pumps, controlled by a built-in control panel, move the water through the ROWPU to produce as much as 10 gallons (37.8 liters) of drinking water per minute. This water is stored in a collapsible tank. The ROWPU can be transported by rail, road, or air.

(2) (ARMY) The flatbed cargo trailer and frame is designed to provide a mobile platform for the ROWPU. The trailer, when being transported by road, is towed by a towing vehicle through a lunette/pintle hookup. The trailer has four square leveling jacks with swivels, one on each corner, and is equipped with a spare wheel and tire carrier. The trailer incorporates service brakes which are air actuated and operated from the towing vehicle through an integral set of hoses. The trailer brake system also includes emergency and automatic parking brake functions that are activated when the air hoses are disconnected from the towing vehicle. An air tank is installed for the purpose of reserving air for this system when the trailer is disconnected from the towing vehicle. A 24-volt electrical system, consisting of a composite blackout-spotlight assembly, and tail light assembly, is installed on the trailer. Power is supplied through a cable connected to the electrical system of the towing vehicle. The frame houses the ROWPU and is capable of being separated from the trailer and transported or air lifted as an independent unit.

(3) The ARMY, AIR FORCE (AF) and MARINE CORPS (MC) units are essentially the same except that the MC and AF ROWPU units are mounted on a skid and do not incorporate a generator. The AF and the MC units have four forklift pockets.

1-6. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

The Army ROWPU is 18 feet (5.5 meters) long, 8 feet (2.4 meters) high, and 8 feet (2.4 meters) wide. It weighs about 8 1/2 tons (7.71 metric tons), including the generator set. Figure 1-3 shows the ROWPU from the top with its canvas cover removed. Take a close look at how all the necessary operating equipment is stored on the trailer for transport and shipment.

The Marine Corps and Air Force ROWPUs are 9.5 (2.9 meters) long, 5.6 feet (1.7 meters) high and 6.9 feet (2.1 meters) wide. They weigh about 3.65 tons (3 metric tons). Figure 1-4 shows top view of ROWPU with the canvas cover removed and equipment stored.

a. To provide room for all operating components, material is stored in layers (figures 1-3 and 1-4). The top layer consists of rolled-up (suction) hoses on top of three folded water tanks. Stored between the tanks is a sledge hammer and a collapsed telescopic aluminum paddle. Next to the tanks is a stack of five plastic pails. On the same side of the ROWPU you will find two storage boxes fastened with a strap under the tanks. The boxes contain various chemicals, tools, and installation items. Nine sections of suction hose are stored on the side of the frame.

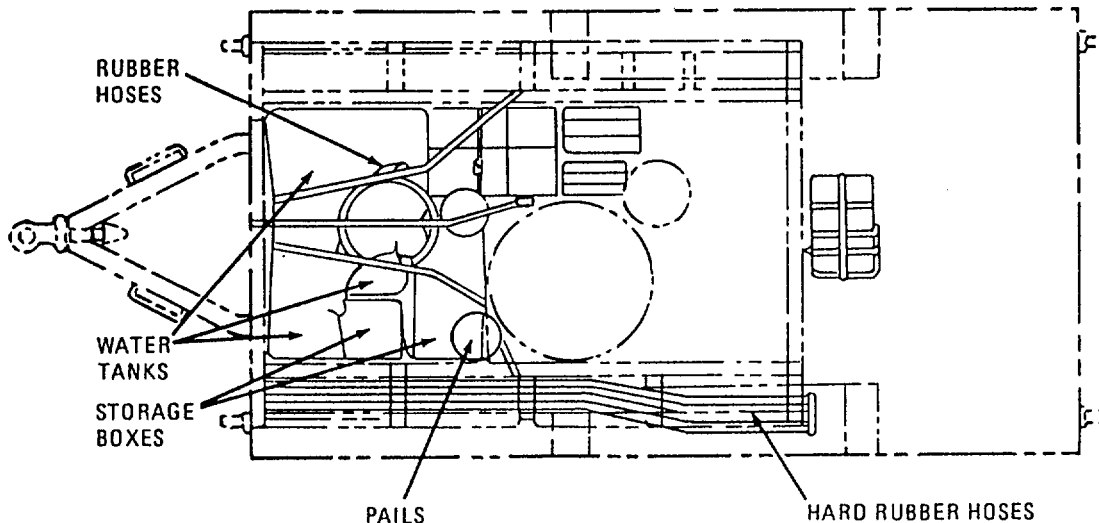


FIGURE 1-3. TOP VIEW OF ROWPU WITH OPERATING EQUIPMENT STORED (ARMY).

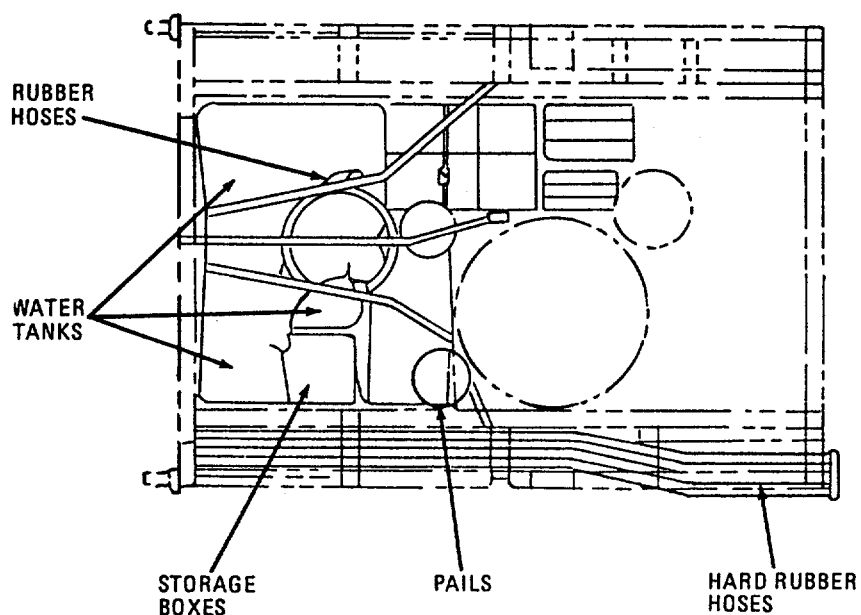


FIGURE 1-4. TOP VIEW OF ROWPU WITH OPERATING EQUIPMENT STORED (MC AND AF).

b. Second Layer. In the second layer you will find two raw water pumps and a backwash pump (figures 1-5 and 1-6). The pumps are covered with canvas and strapped down. (ARMY) A distribution pump is located at the rear of the unit next to the generator, but is not shown here (AF and MC are packed separately). Army ROWPU includes a portable step strapped down with distribution pump. On the right side are 1-1/2 inch and 2-inch diameter discharge (canvas) hoses, rolled-up. A raw water float is in the center of the ROWPU next to one nuclear, one biological, chemical (NBC) cylinders. Figures 1-7 and 1-8 show ROWPU with operating equipment removed.

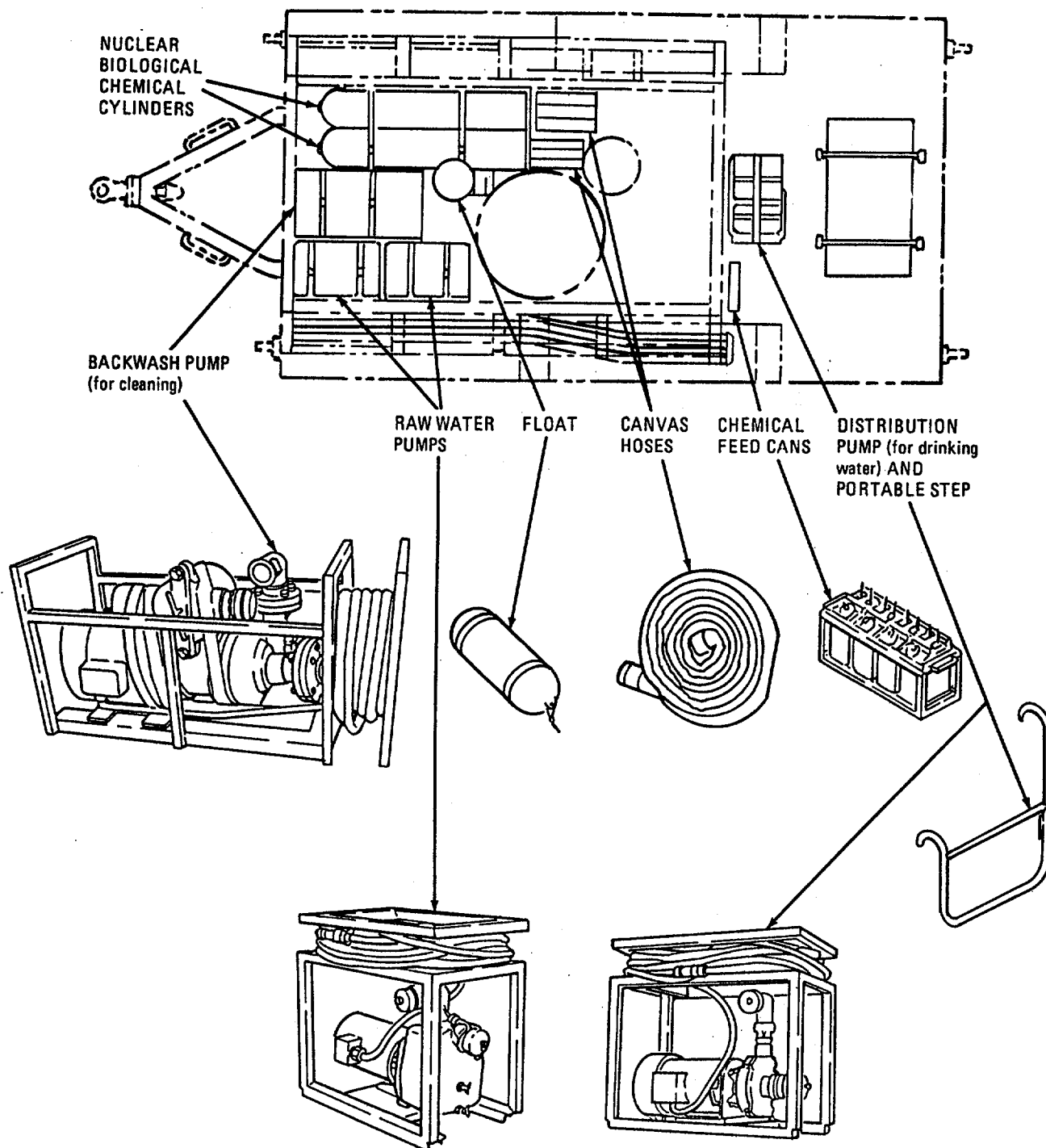


FIGURE 1-5. TOP VIEW OF ROWPU WITH PUMPS (ARMY).