TECHNICAL MANUAL

UNIT, INTERMEDIATE DIRECT SUPPORT
AND INTERMEDIATE GENERAL SUPPORT
MAINTENANCE INSTRUCTIONS

ENVIRONMENTAL CONTROL SUBSYSTEM
FOR
LANDING CRAFT UTILITY (LCU)

NSN 1905-01-154-1191

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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. A reply will be furnished directly to you.

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CHAPTER 1

INTRODUCTION

SECTION I. GENERAL INFORMATION

1-1. Scope. The scope of this manual is as follows:

a. Type of Manual. Unit, intermediate direct support, and intermediate general support maintenance manual.

b. Model Number and Equipment Name. Environmental Control Subsystem, also referred to as the heating, ventilation, and air conditioning (HVAC) subsystem.

c. Purpose of Equipment. Provides heating and/or cooling of air taken into the craft and air circulated within the craft.

1-2. Maintenance Forms, Records, and Reports. Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA Pam 738-750, the Army Maintenance Management System.

1-3. Destruction of Army Materiel. Refer to TM 750-244-3 for instructions covering the destruction of Army materiel to prevent enemy use.

1-4. Reporting Equipment Improvement Recommendations (EIR). If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, U.S. Army Troop Support Command; ATTN: AMSTR-QX; 4300 Goodfellow Blvd.; St. Louis, Missouri 63120-1798. We'll send you a reply.

1-5. Preparation for Storage or Shipment. Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the Preventive Maintenance Checks and Services (PMCS) charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness. Repacking of equipment for shipment or short term storage is covered in paragraph 2-36.

SECTION II. EQUIPMENT DESCRIPTION AND DATA

1-6. General Description. The environmental control subsystem, also referred to as HVAC (heating, ventilation, and air conditioning), provides heating and/or cooling of air taken into the ship and air circulated within the ship. The subsystem maintains a clean, comfortable atmosphere in the living and working spaces, and provides air flow in other spaces to maintain proper temperature and ventilation. Spaces that produce excessive heat, such as the engine rooms, auxiliary machinery rooms, and galley areas; and vapor-producing spaces such as flammable liquid storerooms and paint mixing rooms, are served by the supply and exhaust ventilation systems, which vent to the outside air. The subsystem is an integrated system of fans, air conditioning and heating units, piping and ducting, and controls that are manually started and thermostatically control the subsystem.

1-7. Characteristics, Capabilities, and Features. The environmental control subsystem equipment, shown in FIGURE 1-1, is the equipment required to heat, ventilate, and air condition the living and working spaces aboard the vessel.

a. Heating System. The heating system consists of duct heaters, unit heaters, and convection heaters.

(1) Duct Heaters

Flanged type, mounted in supply air ducts
Metal sheath electric heating elements
Manual and automatic start
Thermostat controlled
Manual and automatic reset
Thermal cutouts
Heaters over 48 amps are individually fused
Liquid proof terminal box/sealed joints

(2) Unit Heaters

Self-contained, continuous duty space heaters
Wall or ceiling bracket mounted
Electric heating coils
Forced air (fan)
Manually operated
Paint locker heaters fitted with explosion proof motor
Manual and automatic reset
Built-in time delay fan
Built-in thermostat and controls
Built-in thermal overload protection
Totally enclosed unit

(3) Convection Heaters

Self-contained space heaters
Wall mounted
Electric heating coils

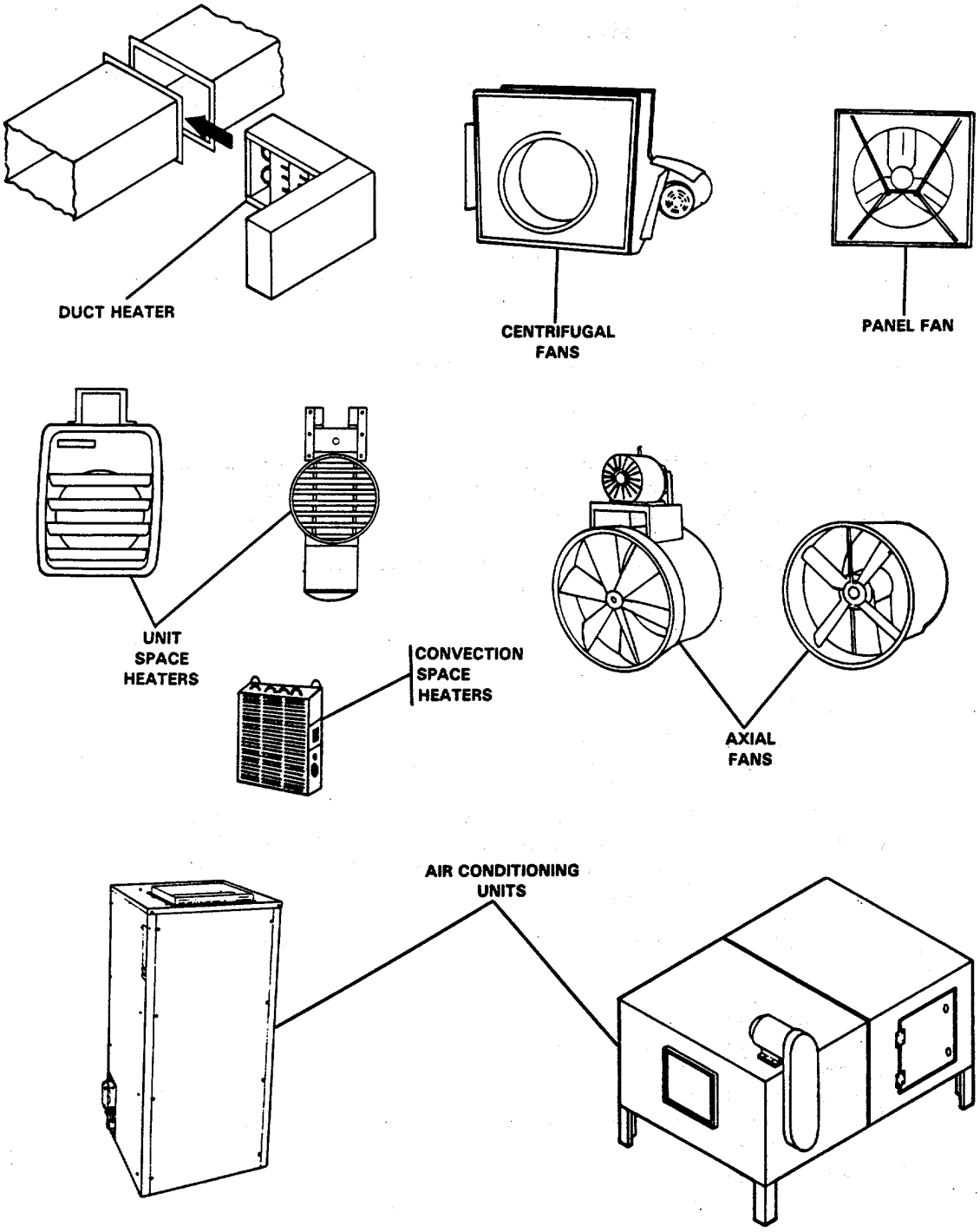

Figure 1-1. Major Components in Environmental Subsystem (HVAC).

Natural convection fan
Manual ON/OFF
Internal adjustable thermostat

b. Ventilation System. The ventilation system consists of the axial, centrifugal, and panel fans in the supply air and exhaust air systems.

(1) Axial Fans

Duct mounted
Electric motor
V-belts on belt drive fans are oil, heat, and static resistant
Manually started
Self-aligning
One-piece propeller and hub construction
Access doors for cleaning and maintenance

2) Centrifugal Fans

For small to medium exhaust and supply ventilation applications (toilets, galley hood, and A/C-emergency generator room)
Electric, easy access motor
V-belt drive
Hinged motor mount to aid in belt adjustment
Non-overloading backward inclined wheel (fan)
Manually operated

(3) Panel Fan

Small, blade type ring fan
Panel mounted with guard
Direct drive

c. Air Conditioning (Recirculation) System. The recirculation air system consists of three air conditioning units that provide local filtering and cooling of air to the pilothouse, equipment operating spaces (EOS), and living spaces on the vessel. The system contains two 3-ton units and one 16-ton unit.

(1) 3-Ton Koldwave refrigeration units (A/C-1, pilothouse; and A/C-3, engine control room)

Self-contained unit
Hermetic (sealed) compressor
Thermostat controlled
Manual and automatic start
Direct motor drive fan (blower)
Direct expansion coil
Condensate pump

Seawater cooled condenser
Replaceable air filters
High pressure cut-off solenoid

(2) 16-Ton McQuay/Carrier Refrigeration Unit (A/C-2, accommodations)

Seawater heat exchanger (condenser)
Thermostat controlled
Manual and automatic start
Belt driven fan (blower)
Thermostatic expansion valve
Filter/dryer (moisture collector)
6 cylinder semi-hermetic compressor with internal oil pump
Replaceable air filters
High and low pressure cut-offs
Hot gas defrost

1-8. Location and Description of Major Components. FIGURE 1-1 shows the major components in the environmental control subsystem. Tables 1-1 thru 1-6 list components, areas served, and electrical specifications of the components in the system. For the locations of ducting, duct component, and remote mounted controls, refer to TM 55-1905-223-10.

1-9. Equipment Data. Tables 1-1 through 1-6 list spaces served by the HVAC and reference data for the major components in the subsystem. Table 1-7 provides the manufacturer's names, model numbers, and other equipment data for the fans and heaters, listed by component unit number. Table 1-8 gives reference data for the air conditioning units. Also see the equipment data given in the operator's manual, TM 55-1905-223-10.

NOTE

Temperature settings are recommended reference points. Settings may require variations according to ambient temperatures.

Table 1-1. Duct Heaters (DH)

NO.	SPACE SERVED	KW REQD	VOLT/ PHASE	CFM	APERTURE DIMENSIONS WIDTH X HEIGHT
DH-1	Preheater/Accommodations Air Preheat Thermostat Settings; Thermostat 1-48°F Thermostat 2-42°F	19.10	240/3	1200	49.125 x 23.875 inch
DH-2	Pilothouse	12.00	240/3	1200	24W x 10H
DH-3	Galley (Make Up Air) Port Side	35.00	240/3	1725	24W x 10H
DH-4	Chief Engineer Stateroom	0.50	110/1	140	6W x 6H
DH-5	Crew SR 01 Level	1.00	240/3	155	8W x 6H
DH-6	Crew SR 01 Level	0.50	110/1	150	8W x 6H
DH-7	Crew SR 01 Level	1.00	240/3	200	8W x 6H
DH-8	Crew SR 01 Level	1.75	240/3	390	10W x 8H
DH-9	Laundry Room	0.50	240/3	65	12W x 8H
DH-10	Captain Stateroom	1.00	240/3	170	6W x 6H
DH-11	Mess Room	2.00	240/3	705	18W x 10H
DH-12	Galley	0.50	240/3	200	24W x 18H
DH-12A	Galley	0.50	240/3	200	24W x 18H
DH-13	Pantry	1.50	240/3	250	10W x 6H
DH-14	Arms Control Room	0.50	110/1	85	6W x 4H
DH-15	Sick Bay	1.50	110/1	200	8W x 6H
DH-16	Recreation Room	1.00	240/3	330	12W x 6H
DH-17	Engine Control Room	1.00	240/3	100	4W x 4H

Table 1-2. Unit Heaters (UH)

NO.	SPACE SERVED	KW	VOLT/PHASE
UH-1	Engine Room (Starboard)	15	240/3
UH-2	Engine Room (Port)	15	240/3
UH-3	Steering Gear Room	10	240/3
UH-4	Tunnel (Forward)	10	240/3
UH-5	Bowthruster Room	10	240/3
UH-6	Emergency Generator Room	1	240/3
UH-7	Bosun Storeroom	5	240/3
UH-8	Paint Locker (Storeroom)	5	240/3
UH-8A	Paint Locker (Storeroom)	5	240/3
UH-9	Machine Shop	5	240/3
UH-10	Tunnel (Aft)	10	240/3
UH-11	Machinery Storeroom	5	240/3

Table 1-3. Convection Heaters (CH)

NO.	SPACE SERVED	KW	VOLT/PHASE	CFM
CH-1	Crew Water Closet 01 Level	1.0	240/3	340
CH-2	Crew Water Closet 01 Level	0.5	110/1	90
CH-3	Stateroom WC 01 Level	0.5	110/1	60
CH-4	Sick Bay Water Closet	0.5	110/1	200