

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT
AND GENERAL SUPPORT
AND DEPOT MAINTENANCE MANUAL

AIR CONDITIONER, BASE-MOUNTED,
SELF-CONTAINED LIGHTWEIGHT,
AIR-COOLED, 38,000 BTU/HR COOLING
AND 35,000 BTU/HR HEATING CAPACITY;
FAIRCHILD STRATOS MODEL VEA4-3A,
PN 107201 (FSN 4120-926-4280)

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**OPERATOR, ORGANIZATIONAL, DIRECT AND GENERAL SUPPORT
AND DEPOT MAINTENANCE MANUAL
AIR CONDITIONER, BASE-MOUNTED, SELF-CONTAINED
LIGHTWEIGHT, AIR-COOLED, 38,000 BTU/HR COOLING
AND 35,000 BTU/HR HEATING CAPACITY;
FAIRCHILD STRATOS MODEL VEA4-3A,
PN 107201 FSN 4120-92644280)**

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. These instructions are published for use by personnel to whom the air conditioner, base-mounted, self-contained, lightweight, air cooled, 38,000 BTU/hr (British Thermal Units per hour) cooling and 35,000 BTU/hr heating capacity, Model VEA4-3A (manufactured by Stratos Division, Fairchild Hiller Corporation, Bay Shore, New York) is issued. The equipment will hereafter be referred to as the air conditioner. Chapters 1 through 3 provide information on operation, preventive maintenance services and organizational maintenance of equipment, accessories, components, and attachments. Chapter 4 provides information for direct and general support and depot maintenance. Also included are descriptions of main units and their functions in relationship to other components.

b. Appendix A contains a list of publications applicable to this manual. Appendix B contains the list of basic issue items authorized the operator of this equipment and the list of maintenance and operating supplies required for initial operation. Appendix C contains the maintenance allocation chart. Organizational, direct and general support and depot maintenance repair parts and special tools are listed in TM 5-1420-287-25P.

c. Numbers in parentheses following nomenclature callouts on illustrations indicate quantity; numbers preceding nomenclature callouts indicate preferred sequence.

d. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

1-2. Record and Report Forms

a. DA Form 2258 (Depreservation Guide for Vehicles and Equipment).

b. For other record and report forms applicable to operator, crew, organizational maintenance, direct and general support and depot maintenance, refer to TM 38-750.

Note. Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicles Operator's Identification Card) which is carried by the operator shall be kept in a canvas bag mounted on equipment.

Section II. DESCRIPTION AND TABULATED DATA

1-3. Description

a. *General.* The air conditioning unit (figs. 1-1 and 1-2) is a lightweight, air transportable, vapor cycle air conditioning package specifically designed to provide conditioned air, vapor cycle air conditioning package specifically designed to provide conditioned air for guided missile ground support shelters. This unit may also be utilized in other vehicles having similar personnel and equipment cooling requirements. After initial installation on a trailer or in a shelter, the unit is capable of an air cooling load capacity of 38,000 BTU/hr utilizing a 416-volt, 6-pole motor, 7700 rpm (revolutions per minute), 8-hp (horsepower) motor compressor. The unit has

1-1

heating capacity of 35,000 BTU/hr (10.5 kw (kilowatts)). The air conditioning unit is contained in a single enclosure of compact sturdy construction built to rigid military specifications and standards. The enclosure is subdivided into a condenser section and evaporator section. The condenser section contains the compressor, condenser fan, and high-pressure refrigerant controls. The evaporator section contains the evaporator, evaporator fan, expansion valve, heaters, electrical controls, and temperature controls. Functionally, the air conditioning unit consists of a cooling subsystem and a heating subsystem regulated by either automatic or manual controls from a remote control box.

b. Electrical Tray Assembly. The electrical tray assembly (fig 1-3) contains the electrical power controls and relays. The front panel of the electrical tray assembly contains the circuit breaker, the system reset push button, the hourmeter, the control circuit fuse, the main power connector, and the remote control box assemble connector. Mounted within the electrical tray assembly are the motor control relays, the temperature control relays, the transformer, the phase sequence relay, and the rectifier. The 28-vdc (volts direct current) power required for the operation of the relays is obtained from the transformer and the rectifier.

c. Remote Control Box Assembly. The remote control box assembly (fig 1-1) contains the operating controls for the air conditioning unit. Mounted on the front panel is a four-position (HEAT, OFF, VENT, COOL) five-deck switch and a temperature control variable resistor (minimum setting COOL; maximum setting HEAT). The rheostat dial is continuously variable between the COOL and WARM positions, which corresponds to a return air temperature range of 60F to 90F.

d. Motor-compressor. The motor compressor (fig 1-4) consists of positive-displacement compressor which is directly driven by an integral 8-hp, 416-volt, 400-cycle, 3-phase, 4-wire induction motor with a designed speed of 7700 rpm. The compressor draws low pressure refrigerant vapor from the evaporator and compresses it to a high pressure, high temperature refrigerant vapor. The motor-compressor runs continuously when the air conditioner is operating in the COOL mode.

e. Thermostat. The thermostat (fig 1-3) is located in the evaporator compartment. The thermostat senses the temperature of the air entering the evaporator and provides control signals to maintain desired temperatures.

f. High-low Pressure Cut-out Switch. The high-low pressure cutout switch (fig 1-4) is a dual single pole, single throw switch which projects the cooling system from excessive compressor discharge pressure and low compressor inlet pressure. The high-pressure side of the switch is connected into the compressor discharge line; the low pressure side into the compressor inlet line. The switch has a rating of 2 amperes at 28 vdc. The high pressure side is set to close the switch (energizing the trip relay, which removes power from the compressor) when the pressure in the compressor discharge line increases to 260 to 265 psig (pounds per square inch gage). The switch will automatically reset when the discharge line pressure decreases to 200 to 220 psig. The low-pressure side is set to close the switch when the pressure in the compressor inlet line decreases to 20 to 21 psig. The switch will automatically reset when the inlet line pressure increases to 30 to 40 psig. The system trip relay is reset by pressing the system RESET switch (fig 1-3).

g. Condenser Fan. The condenser fan assembly (fig 1-5) provides cooling air for the condenser. As supplied, it is complete with its own bearings and seals and is permanently lubricated. The fan is a high-speed (5800 rpm) continuous duty, vane-axle type with a self-contained motor for use on 416-volt, 3-phase, 400-cycle, 4-wire power. The condenser fan is rated at 4120 SCFM (Standard Cubic Feet/Minute). The fan motor is constructed with an internal automatic reset thermal and overcurrent protector.

Note

The condenser fan discharge door must be open when unit is operating in cooling cycle. A Microswitch, activated by the door, prevents operation of compressor motor and condenser fan motor if door is closed.