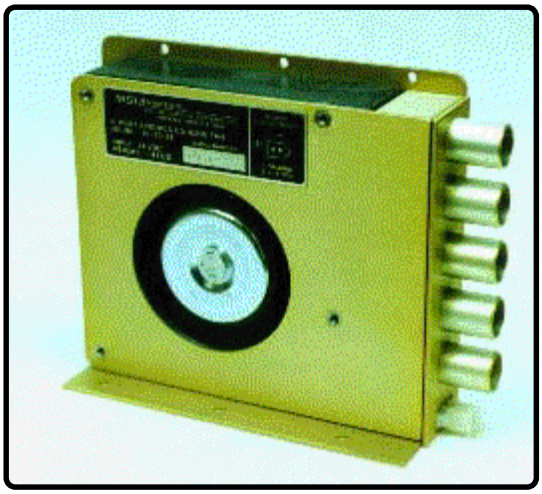
MSI 96-10514 / 96-10528
5-PORT AVIONICS COOLING FAN
(14 AND 28 VOLT MODELS)

INSTALLATION AND OPERATION MANUAL



MSI AVIONICS
Div. Microterm Systems, Inc.
Phoenix, Arizona USA

PRINTED IN U.S.A. INITIAL RELEASE DATE: December 1993 PUB. NO. MSI-96-10514/28 REV-

TABLE OF CONTENTS

DOCUMENT REVISION RECORD

ORIGINAL ISSUE DATE: 06 DEC 1993 APPROVED: WAF
REV-

LIST OF ILLUSTRATIONS

1 GENERAL DESCRIPTION

1.1 INTRODUCTION

The MSI 96-10514 and 96-10528 are five-port avionics cooling fan units. They are intended to provide supplemental cooling air to aircraft communication and navigation radios, GPS or LORAN receivers, and a variety of airborne electronics systems.

The model 96-10514 fan unit is designed for aircraft with 14 volt electrical systems. The model 96-10528 fan is for 28 volt systems.

The fan units are designed for remote mounting, and, because of their unique mounting tabs, may be mounted to either a vertical or horizontal surface.

The units features a powerful, quiet, brushless centrifugal blower motor. The electrical power connection is well filtered to prevent electrical interference to other onboard systems. The rugged aluminum housing is chem-coated to prevent corrosion.

The fan units interface with the standard 5/8 inch tubing and inlet ports on most radios and other avionic devices requiring supplemental cooling air.

1.2 TECHNICAL SPECIFICATIONS

1.2.1 MECHANICAL

Fan Overall Envelope Dimensions

Width:	5.80 inches
Height:	5.00 inches
Thickness:	2.00 inches
Mounting:	6-32 Pan Head Screws, (Stainless Steel Recommended)
Weight:	1.4 lbs

1.2.2 ENVIRONMENTAL

Temperature:	-40 to +70 Degrees C (Ambient)
Humidity:	95% Non-condensing
Airflow:	4.5 CFM per port (x 5 ports)

1.2.3 ELECTRICAL

Power requirements:	+14 VDC, 0.9 Amps (96-10514)
	+28 VDC, 0.6 Amps (96-10528)

1.2.4 INTERFACE

1.2.4.1 CONNECTOR

Connector:	2-pin, friction lock, polarized.

Mating Connector:

Housing:	MSI P/N 021-0371-001, 1 ea.
Pin, receptacle:	MSI P/N 022-0022-001, 2 ea. (Supplied with fan unit)

J1 Pin designations:

FAN J1 PIN NUMBER	SIGNAL NAME/DESCRIPTION
1	Ground (Aircraft Ground)
2	+ Power (14/28 VDC)

NOTE: THE POWER CONNECTOR IS REVERSED WITH RESPECT TO THE MARKINGS ON THE CONNECTOR BODY. ON THIS FAN, THE POINTED END OF THE CONNECTOR IS POS (+) AND THE SQUARE END IS NEG (-).

1.3 OPERATIONAL SPECIFICATIONS

The MSI 96-10514/28 Avionics Fan Unit, once installed, requires no adjustment or special operation by the pilot.

2 INSTALLATION CONSIDERATIONS

2.1 LOCATION

The avionics fan unit should be mounted in the area behind the instrument panel. For maximum airflow, the fan should be mounted as close to the equipment being cooled as is practical.

Locate a suitable mounting surface from which the fan unit, its electrical harness and air duct tubing will not interfere with the yoke or other flight controls.

Locate the fan unit such that the air inlet opening on the face of the fan unit will be, and will remain, unobstructed at all times.

2.2 NOTES AND CAUTIONS

DO NOT bundle the fan unit's power input lines with any RF, antenna or transmitter coax lines.

DO NOT bundle any of the fan unit's power input lines with any 400Hz synchro wiring, AC power lines or navigation instrument data (HSI/OBS) lines.

In all installations, use proper sized wire. The fan unit should be on a separate 2 Amp breaker, or have a separate, 2 Amp SLO-BLO, in-line fuse for protection. Failure to observe this procedure may result in damage to the electrical system, or fire.

In all cases, install and dress the wiring harness for the Fan unit in accordance with good aviation practices.

3 INSTALLATION PROCEDURES

3.1 UNPACKING AND INSPECTION

Remove the fan unit from the packing container, and verify that the fan unit, the installation and operation manual, and mating connector components were received.

Verify that all components are in good order and free of visible defects.

3.2 MOUNTING THE FAN UNIT

Locate a suitable place to mount the fan unit, in accordance with the considerations in section 2 of this manual.

Using the fan unit as a template, locate, drill and deburr (and optionally tap) the required mounting holes. The thread size should be at least 6-32 UNC-2B. If drilling and tapping are not appropriate to the installation, individual hex nuts and locking washers (not provided) may be used.

When drilling, take caution that metal chips and filings do not land in or on any other equipment. Vacuum thoroughly after drilling to clean all chips and filings.

3.3 WIRING HARNESS

3.3.1 PREPARATION OF THE WIRING HARNESS

Prepare the wiring harness in accordance with the wiring diagram in this manual. Observe all cautions and wire size specifications.

When measuring the cable length, be sure to leave sufficient extra cable so that there will be no strain on either the harness or the fan interface connector.

3.3.2 INSTALLATION OF THE WIRING HARNESS

Install the wiring harness in accordance with good aviation practice.

When installing the harness, connect the aircraft power and ground connections such that power will be supplied to the fan unit whenever the Avionics Master switch is on.

Dress the cable harness as appropriate and secure it as needed with appropriate cable ties or clamps. Dress the harness such that it will not interfere with the yoke or any other flight controls.

Be sure to leave a small service loop at the fan connector interface, so that the fan unit may be disconnected easily, if necessary.

NOTE: DO NOT CONNECT THE FAN UNIT TO ITS MATING CONNECTOR UNTIL ALL CHECKS AND TESTS IN SECTION 4.2.1 HAVE BEEN COMPLETED.

3.4 AIR DUCT TUBING

The output air from the fan unit is ducted to the individual radios or other equipment by means of flexible air duct tubing.

Tubing such as AERO-FLEX, 5/8 inch i.d. Neoprene Tubing, or other, similar tubing meeting MIL-R-6855 may be used for this installation.

3.4.1 INSTALLATION OF THE AIR DUCT TUBING

Cut, install and dress the air duct tubing in accordance with good aviation practice. Route the tubing from the fan unit to the equipment to be cooled, and secure it as needed with appropriate cable ties or clamps.

NOTE: INSURE THAT THE INTERIOR OF THE AIR DUCT TUBING IS FREE OF DEBRIS PRIOR TO AND DURING INSTALLATION.

Dress the tubing such that it will not interfere with the yoke or any other flight controls. When installing the tubing, insure that there are no kinks or sharp bends that will restrict airflow or pinch the tubing.

Secure the ends of the tubing to the ports on the fan unit using appropriate means, such as adhesive, a clamp or tie-wrap. Plug any and all unused ports on the fan unit using an appropriate means, such as a 5/8 inch caplug (not supplied).

NOTE: DO NOT SECURE THE OUTPUT END OF THE AIR DUCT TUBING TO THE EQUIPMENT TO BE COOLED AT THIS TIME.

4 POST INSTALLATION CHECKOUT

4.1 OTHER EQUIPMENT CONSIDERATIONS

At this point, verify and test, in accordance with the applicable installation/operation manuals, that all other equipment and related instruments are connected correctly, and are fully operational.

4.2 PRE-FLIGHT TESTS

4.2.1 POWER/GROUND TEST

With the Fan unit disconnected, from its mating harness connector, check PIN-2 of the fan mating connector for +14 or 28 volts (depending upon model) with respect to aircraft ground.

Using an ohm meter, check PIN-1 of the fan mating connector for continuity with aircraft ground. The continuity (resistance) measurement should be less than 0.5 ohm.

If appropriate, and using appropriate means, carefully check and verify all other (non fan-related) connections in the wiring harness. Do not connect the fan unit until all tests and checks are verified. Damage to the fan unit or other equipment could result.

Once the above steps are complete, connect the mating harness connector to the connector on the fan unit.

4.2.2 POWER ON TEST

With the fan unit connected into the wiring harness, turn on the avionics master switch. Verify visually that the fan unit is running.

Using an appropriate Ammeter, verify that the current draw to the fan is in accordance with the specifications in section 1.2.3 of this manual.

4.2.3 AIRFLOW TEST

Momentarily disconnect each output air duct tube from the individual radio (or other device) to be cooled, and insure that the proper airflow is detected.

Connect the individual air duct tubing to the intended radio (or other device) to be cooled. Secure as appropriate using adhesive, clamps or tie-wraps.

If all checks and tests pass satisfactorily, the aircraft can be released as serviceable. Be sure to make all appropriate entries into the aircraft log books.

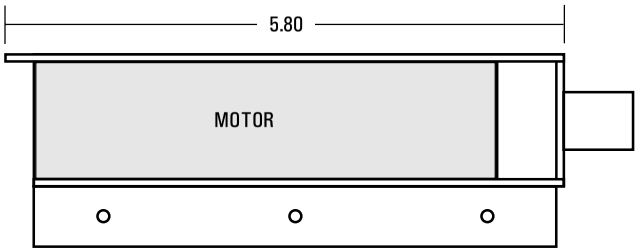
Section 1 of this manual should be appended to the Aircraft Flight Manual for reference.

REV	DESCRIPTION	DATE
	INITIAL RELEASE	07-08-96

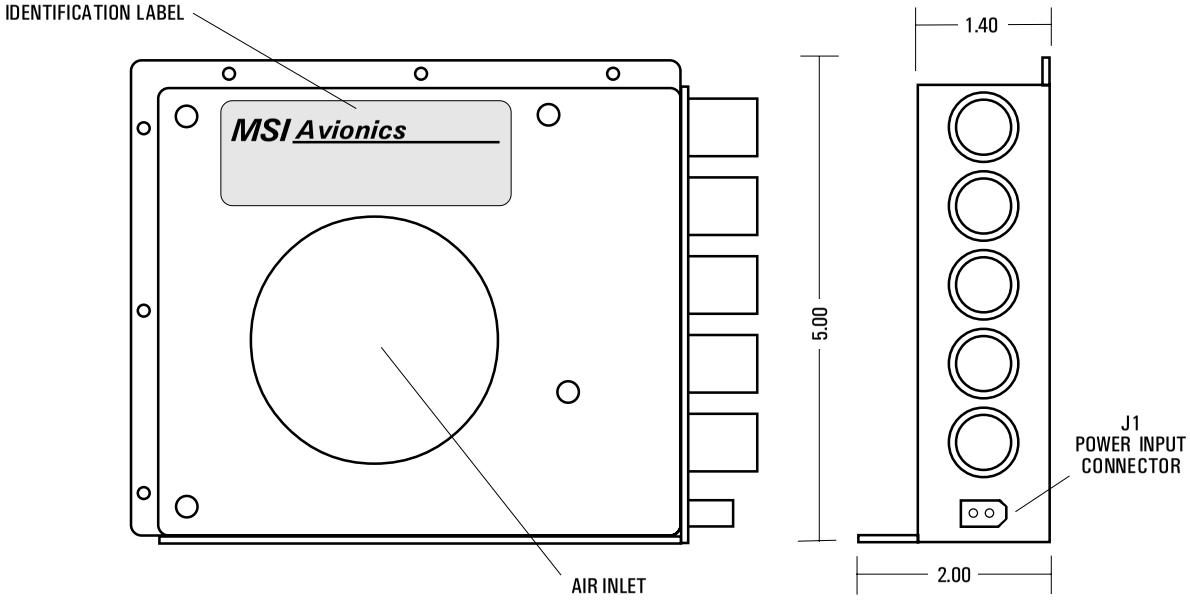
POWER CONNECTIONS

J1 (1 2)

1 GROUND
2 + 12-32 VDC



0.625 OD x 0.7 LONG
AIR CONNECTION PORT
(TYP 5 PLACES)

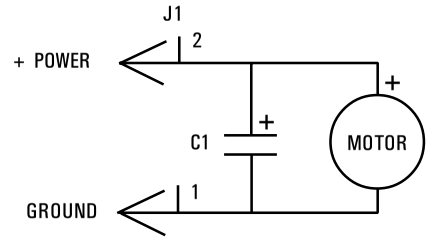


ELECTRICAL REQUIREMENTS
P/N 096-10514: 14 VDC AT 1.15 AMP (NOMINAL)
P/N 096-10528: 28 VDC AT .575 AMP (NOMINAL)
BOTH MODELS: INPUT VOLTAGE MAY VARY +/- 20%. BOTH MODELS USE BRUSHLESS DC MOTOR WITH INTERNAL CURRENT LIMITING AND AUTO-RESTART.

AIRFLOW
FREE AIR: 4.5 CFM PER PORT (X 5 PORTS)

MECHANIAL
DIMENSIONS: 5.8W x 5.0H x 2.0D, EXCLUDING PORTS
WEIGHT: 1.4 LBS

SCHEMATIC DIAGRAM



CAUTION:
THE POWER CONNECTOR IS REVERSED WITH RESPECT TO THE MARKINGS ON THE CONNECTOR BODY. ON THIS FAN, THE POINTED END OF THE CONNECTOR IS POS (+) AND THE SQUARE END IS NEG (-). REFER TO DETAIL ABOVE WHEN WIRING.

5-PORT AVIONICS COOLING FAN ASSY:
P/N 096-10514-001, 14 VOLT
P/N 096-10528-001, 28 VOLT

MSI Avionics
DIV. MICROTERM SYSTEMS, INC.
PHOENIX, ARIZONA, USA

TITLE:	5-PORT AVIONICS COOLING FAN		
DWG NO.:	96-10500-01		
DRW BY:	WAF	DATE:	07-08-96
CHK BY:	WAF	SHEET: 1	OF: 1

APPENDIX A WARRANTY DOCUMENTS

WARRANTY

Microterm Systems, Inc. (MSI) warrants this unit to be free from component and manufacturing defects for a period of one (1) year from the date of purchase.

In the event of a failure of this unit within the warranty period, MSI will, at its sole option, repair or replace the unit without charge. To obtain service under this warranty, the unit must be returned to MSI, freight prepaid, along with Customer's name, full mailing address, phone number, and proof of purchase of the unit.

MSI will repair the returned unit, or exchange it with a new or reconditioned unit of the same type. MSI will pay the return freight charges.

This warranty shall be considered void if there is any evidence of mis-use or abuse or faulty handling of this unit. Any opening of or disassembly of the unit, or any attempted repair by other than MSI will also void this warranty. If in MSI's opinion, this warranty has been voided, MSI will advise the customer as to the anticipated repair charges. If the warranty has been voided, the customer will be liable for return freight charges as well as any repair charges.

MSI assumes no liability other than that stated herein. MSI will not be liable for any consequential damage caused by the installation, use or mis-use of this unit. MSI makes no warranty or claim as to the suitability of this unit for any particular application or installation.

NOTE: Incandescent lamp bulbs (if used in this product) are specifically excluded from this warranty. Although MSI uses only the highest quality bulbs in our products, incandescent bulbs are subject to premature failure due to aircraft power surges, vibration, temperature cycling and other physical stresses. MSI offers bulb replacement at nominal charge. Contact MSI for details.

For return instructions and information, contact MSI at:

MSI Avionics div Microterm Systems Inc.
PO Box 86418
Phoenix, Arizona 85080-6418 USA
(602) 582-2202 Fax (602) 582-2856
e-mail: msi@msiavionics.com

APPENDIX B FLIGHT MANUAL SUPPLEMENTS

Section 1 of this manual may be appended to the Aircraft Flight Manual for in-flight reference.

APPENDIX C INSTALLATION NOTES

The installing agency shall describe any installation-specific details on this page (and/or additional pages), and append to the Aircraft Flight Manual and Logs for reference.