

INTEGRATED FLIGHT SYSTEMS, INC.  
132 EAST MAIN STREET  
GRAND PRAIRIE, TX 75050

FAA APPROVED

HELICOPTER FLIGHT MANUAL SUPPLEMENT

FOR

McDONNELL DOUGLAS HELICOPTER SYSTEMS

MODEL: 369E and 500N

REGISTRATION NO.:

SERIAL NO.:

This supplement must be attached to the FAA approved Rotorcraft Flight Manual when an Integrated Flight Systems, Inc., air conditioning system is installed in accordance with Supplemental Type Certificate number SR09251RC. The information contained herein supplements the basic Rotorcraft Flight Manual only in those areas listed. For limitations, procedures, and performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

FAA APPROVED:

*Erwin J. Espinoza*  
for Mr. Carl Mittag

Manager, Southwest Region  
Certification Office ASW-170  
Ft. Worth, Texas 76193-170

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Integrated Flight Systems, Inc.  
132 East Main Street  
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Rotorcraft Flight Manual  
Supplement For 369E, 500N  
Air Conditioning

LOG OF REVISIONS

Original

Dated: July 10, 2000

<u>PAGE</u>	<u>REVISION NO.</u>	<u>APPROVAL</u>
1 thru 9	Original	<i>Spring J. Lopez</i>

NOTE: Revised portions of affected pages are identified by vertical black line in the margin adjacent to the change.

FAA APPROVED: July 10, 2000

Page 2 of 9

Integrated Flight Systems, Inc.  
132 East Main Street  
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Rotorcraft Flight Manual  
Supplement for: 369E, 500N  
Air Conditioning

INDEX

Log of Revisions.....	2
Index.....	3
1.0 General.....	4
2.0 Operating Limitations.....	4
3.0 Emergency Procedures.....	5
4.0 Normal Procedures.....	6
5.0 Performance.....	7
6.0 Weight & Balance.....	7
ii. Manufacturers Information.....	8
iii. Electrical Loading.....	9

## 1.0 GENERAL

### 1.1 System & Description

The air conditioning installation consists of a vapor cycle (R-134a) air conditioning system featuring a belt driven compressor.

The system as supplied, may be used without any heater installed. It is a stand alone system.

The air conditioning system provides for cabin comfort during all operations both on the ground and in flight. During ground operations when the engine is running, cooling may be provided. Controls for the air conditioning system are located forward of the pilot for ease of use.

Two switches are provided. The Master control Selector consists of a rocker type switch, labeled "A/C", "OFF", and "FAN". Selecting the "A/C" position turns on the system's evaporator fans, and after a delay of several seconds the condenser blower, and belt driven compressor clutch. The second rocker switch provides for "HIGH", "LOW" and "MED" evaporator fan speed selection for the cockpit.

A rocker switch in the aft cabin provides blower speed control for passengers.

## 2.0 OPERATING LIMITATIONS

The air conditioning system must be "OFF" during engine start.

Prior to turning "ON" air conditioner ensure ammeter indicates 50 amps or less.

Operation of the air conditioning system is prohibited if the total electrical load will exceed 85 amps, continuous (150 amps for ten minutes is allowed).

"MAG" compass deviation may be excessive with air conditioner or fans - "ON".

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132 East Main Street  
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Rotorcraft Flight Manual  
Supplement for 369E, 500N  
Air Conditioning

3.0 EMERGENCY PROCEDURES

In the event of an engine failure, turn air conditioner "OFF".

3.1 D.C. Generator Failure

Air conditioning - "OFF".

Note: Auto load shedding of the air conditioning system is not provided.

3.2 Excessive Temperature, Fire, Smoke.

In the event of any of the following, turn air conditioner "OFF".

1. Cabin or other fire.
2. Presence of smoke.

4.0 NORMAL PROCEDURES

4.1 Ground Operation - Generator ON

To turn air conditioner "ON" - Move switch to "A/C".  
Prior to "ON" ensure ammeter indicates 50 amps or less.

To turn air conditioner "OFF" - Move switch to "OFF".

For air circulation without cooling - Move switch to "FAN".

Select desired blower speed for cockpit.

Select desired blower speed for cabin.

4.2 Ground and Flight Operations

Ventilation Control - As desired. (Close windows for cockpit/cabin cooling.)

Air Conditioning Control Switch - As desired.

Air conditioning Fan Speed Control Switches - As desired. (cockpit and cabin)

Turn Air Conditioner - "OFF" to obtain correct Magnetic Compass heading.

Monitor Electrical Load to ensure that it remains within approved limits.

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Rotorcraft Flight Manual  
Supplement for 369E, 500N  
Air Conditioning

5.0 PERFORMANCE

With air conditioner - "ON" decrease rotorcraft Flight Manual data by:

Reduce Hover Gross Weight for Take Off and Landing by 100 pounds.

6.0 WEIGHT and BALANCE

6.1 Weight and Balance must be computed with air conditioning system installed.

ii. Manufacturers Information

The installed unit is a vapor cycle air conditioner. Refrigerant utilized is the EPA approved R-134a. The compressor is belt driven utilizing a "custom designed flat belt". Point of drive is an IFS pulley just forward of the rotor brake disc. Compressor is mounted on the upper deck aft of the mast.

The system features dual evaporators, one for the cockpit located forward of the radio/instrument console and another under the right side cockpit seat. Separate fans are provided for each evaporator. Each contains multi speed blower motors.

The condenser is mounted in the nose of the ship, forward of the evaporator. Thermostatic temperature control is not provided. Dual refrigerant pressure safety switches are provided.

A high pressure safety switch disengages the compressor and stops operation of the refrigeration cycle in the event of excessive pressure. This can occur due to failure of the condenser blower or restricted condenser air intake.

A low pressure switch of similar design protects the system due to loss of refrigerant. Both switches will automatically reset.

However, the system will NOT cycle on again when the safety pressures are again within the preset perimeters, as in older IFS designs. In the "new" design a 1 amp circuit breaker is "TRIPPED" by a single occurrence of either a low or high pressure fault. The pilot can not reset the circuit breaker in flight.

Service ports, both high and low, are provided on under the left side pilot's seat. A sight glass is also provided.

The evaporator fan system may be used anytime air circulation is desired. This is accomplished by placing the selector switch in the "FAN" position.

System electrical protection is provided by two (2) each 15 amp, one (1) each 25 amp and one (1) each 1 amp circuit breakers, labeled EVAP, EVAP, COND and RESET in the Air Conditioning Master Electrical Control Panel. This panel is located just below the horizontal shelf, forward of the radio console. A 50 amp Master Air Conditioning system circuit breaker is provided next to the A/C control switches located immediately in front of the pilot's position. If this circuit breaker is pulled for any reason, all electrical power to the air conditioning system is disconnected.



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ii. Manufacturers Information continued;

A "soft start mode" is provided electrically for this system. When the Master control selector labeled "A/C" is turned to "ON", both evaporator fans, having a total electrical requirement of 13 amps are immediately energized. A few seconds later, the condenser blower and compressor clutch are energized, which requires another 22 amps of electrical system capacity. Due to this "Delay Feature", electrical system "soft start" is provided.

iii. Electrical Loading

The maximum electrical requirements of the basic air conditioning system are as follows:

Condenser Blower	1 each @ 20 amps	= 20 amps
Compressor Clutch	1 each @ 2 amps	= 2 amps
Evaporator Fan	1 each @ 7 amps	= 7 amps (forward)
Evaporator Fan	1 each @ 6 amps	= 6 amps (aft)

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TOTAL SYSTEM      35 AMPS