ENSTROM 480 AND 480B OPERATOR'S MANUAL

AND

FAA APPROVED

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

SAFE FLIGHT®

POWERLINE DETECTION SYSTEM

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REPORT NO. 28-AC-042

HELICOPTER SERIAL NO._____

HELICOPTER REGISTRATION NO._____

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THIS SUPPLEMENT MUST BE CARRIED IN THE HELICOPTER AT ALL TIMES IF EQUIPPED WITH THE SAFE FLIGHT® POWERLINE DETECTION SYSTEM. CHAPTERS 1, 2, 3, AND 4 ARE FAA APPROVED.

FAA APPROVED BY: _____

CHARLES L. SMALLEY, MANAGER
CHICAGO AIRCRAFT CERTIFICATION OFFICE
CENTRAL REGION
FEDERAL AVIATION ADMINISTRATION

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THE ENSTROM HELICOPTER CORPORATION
2209 22ND STREET
MENOMINEE, MICHIGAN 49858-3515

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CHICAGO AIRCRAFT CERTIFICATION OFFICE
CENTRAL REGION
FEDERAL AVIATION ADMINISTRATION

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

POWERLINE DETECTION SYSTEM

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
	Supplement Cover Page	
	Log of Revisions	i
	Table of Contents	iii
	List of Effective Pages	v
	INTRODUCTION	INTRO-1
CHAPTER 1	OPERATING LIMITATIONS	1-1
CHAPTER 2	NORMAL PROCEDURES	2-1
CHAPTER 3	EMERGENCY PROCEDURES	3-1
CHAPTER 4	PERFORMANCE DATA	4-1
CHAPTER 5	RESERVED	5-1
CHAPTER 6	WEIGHT/BALANCE AND LOADING	6-1
CHAPTER 7	HELICOPTER AND SYSTEMS DESCRIPTION AND OPERATION	7-1

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LIST OF EFFECTIVE PAGES

PAGE	DATE	PAGE	DATE
i	Feb 24/11		
ii	Feb 24/11		
iii	Feb 24/11		
iv	Feb 24/11		
v	Feb 24/11		
vi	Feb 24/11		
INTRO-1	Feb 24/11		
INTRO-2	Feb 24/11		
1-1	Feb 24/11		
1-2	Feb 24/11		
2-1	Feb 24/11		
2-2	Feb 24/11		
3-1	Feb 24/11		
3-2	Feb 24/11		
4-1	Feb 24/11		
4-2	Feb 24/11		
6-1	Feb 24/11		
6-2	Feb 24/11		
7-1	Feb 24/11		
7-2	Feb 24/11		
7-3	Feb 24/11		
7-4	Feb 24/11		

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INTRODUCTION

Intro-1. General

This supplement contains operating instructions, procedures, and limitations for the Safe Flight® Powerline Detection System. The supplement is divided into two basic parts, the FAA approved RFM Supplement and Supplemental Data provided by the Enstrom Helicopter Corporation (Enstrom). Chapters 1, 2, 3, and 4 make up the FAA approved RFM Supplement. It is required by Federal Regulations that this supplement be carried in the helicopter at all times if the Powerline Detection System is installed.

For additional information regarding the supplement format and text emphasis or definitions, refer to the basic flight manual. Abbreviations noted in this supplement are listed in Table Intro-1.

Intro-1. List of Abbreviations

CW	Clockwise
PDS	Powerline Detection System
RFM	Rotorcraft Flight Manual
SENS	Sensitivity
VDC	Volt Direct Current

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CHAPTER 1. OPERATING LIMITATIONS

1-1. General

NOTE

The use of this device does not alter the published aircraft limitations in any way. Refer to Section 1 of the basic Rotorcraft Flight Manual.

1. The Powerline Detection System is designed for either 50 Hz or 60 Hz power lines. The aircraft must be equipped with the appropriate system for the power lines in its operational area.

2. The Powerline Detection System will not warn against lines, wires or strike hazards that do not emit an electric field at a power line frequency. Some examples are:

a. Guy wires.

b. Telecommunications cables.

c. Direct Current (DC) power lines.

d. Unenergized power lines.

e. 50 Hz power lines if equipped with a 60 Hz detector.

f. 60 Hz power lines if equipped with a 50 Hz detector.

3. Due to static electrical build up on the aircraft, the system may be unreliable at dew points below 0°C (32°F) and should not be relied upon.

1-2. Marking and Placard

1. The following placard is required to be installed in the aircraft, adjacent to the Powerline Detection System:

WARNING: THE PDS IS A PILOT AID ONLY AND SHOULD NOT BE RELIED UPON AS A SOLE MEANS OF AVOIDING POWER LINES

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CHAPTER 2. NORMAL PROCEDURES

2-1. General

1. The Powerline Detection System is meant to be a pilot aid.

2. The pilot should continue to use all other power line avoidance procedures.

2-2. Preflight

1. Check the antenna condition and security.

2-3. Prior to Engine Start

1. With electrical power applied to the aircraft, and the avionics master switch ON, a small green light mounted on the Powerline Detector will illuminate to indicate that electrical power is applied to the unit.

2. Rotate the **SENS** control CW to maximum.

3. Place the PDS TEST switch on the instrument panel to **TEST**.

4. The audio warning will activate. The visual warning light will activate on the front panel of the Powerline Detector.

5. Push the **WARN/MUTE** annunciator switch on the Powerline Detector to activate the mute function disabling the audio warning.

6. The yellow mute light will activate. Reset the mute by pushing the annunciator switch a second time and the yellow light will extinguish. Normally this latter, unmuted, condition is used during takeoff.

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CHAPTER 3. EMERGENCY PROCEDURES

3-1. Emergency Procedures

1. Refer to the basic RFM.

3-2. Abnormal Procedures

1. Loss of power to the Powerline Detection System will disable the unit. Fly the aircraft normally without the system operational.

2. If the Powerline Detection System fails with an inappropriate continuous warning and the mute switch fails to cancel this warning, pull the circuit breaker on the circuit breaker panel marked **PDS**.

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CHAPTER 4. PERFORMANCE DATA

4-1. General

1. Refer to the basic RFM.

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CHAPTER 6. WEIGHT/BALANCE AND LOADING

6-1. General

1. A new weight and balance should be recalculated per the instructions in Chapter 6 of the basic flight manual using the information provided in Table 6-1.

Table 6-1. Weight and Balance Information

Equipment	Weight (lbs)	Arm (in)	Moment (in-lbs)
Powerline Detector	0.80	71.64	57.3
Antenna	0.33	297.09	98.0
Antenna Coupler	0.25	300.34	75.1
Misc.; connectors, wire, etc.	0.50	185.00	92.5

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CHAPTER 7. HELICOPTER AND SYSTEMS DESCRIPTION AND OPERATION

7-1. General

1. The PDS warns the pilot by means of audio and visual warnings whenever a powered transmission line is detected. It accomplishes this by sensing the electric field that is emitted from active power lines. The electric field around a power line is a direct effect of the voltage on the power line. The field strength is a function of the voltage on the line, the distance from the line, and objects (trees, buildings, etc.) in the vicinity of the line. The electric field is detected by measuring the voltage differential between the aircraft skin and the PDS antenna. This voltage differential is affected by the electric field strength, electric field distortions around the aircraft, temperature, and humidity. Static electrical build up on the aircraft will cause distortions of the electric field and reduce the system sensitivity.

Thus, the ability of the PDS to detect a power line depends on the voltage on the line, the surrounding terrain and obstructions, the distance from the line, temperature, humidity, and static electricity on the aircraft.

To maximize the effectiveness of the system, pilots should observe the following:

a. The PDS will not work on un-energized lines. It will not detect guy wires or power lines that are not currently carrying electricity.

b. The warning distance is proportional to the voltage being carried in the line. The warning distance will be smaller for lower voltage lines.

c. If the pilot is flying in an area where power lines can be expected, such as low altitude, he should slow down to increase the time he has to react to a warning.

d. Pilots should be vigilant when flying in valleys or canyons as power lines can be suspended quite high above the valley or canyon floor. These lines are normally high tension and will provide the maximum warning, but they can also be difficult to locate once they are detected by the PDS.

e. Static electrical build up on the airframe will decrease the sensitivity of the system. Pilots should not rely on the system in conditions conducive to static build up: e.g. cold, dry weather, dusty conditions, etc.

2. Upon detection of a power line, a red **WARN** annunciator will illuminate and simultaneously an audio signal will sound. The pulsed audio signal increases in frequency as the aircraft approaches the power line and the frequency decreases as the distance from the power line increases. The unit is fitted with a mute switch that may be used to manually silence the audio. When the mute is in effect, a yellow **MUTE** annunciator is lit. A gain control is provided to decrease the sensitivity of the unit in electrically noisy areas.

3. The PDS is comprised of a panel mounted Powerline Detector, an antenna, antenna coupler, and associated wiring. The system is powered by 28 VDC through the **PDS** (1 Amp) circuit breaker.

7-2. Operation

1. The Powerline Detector display and controls are shown in Figure 7-1.

2. Press the **WARN/MUTE** switch to change the mute status. The normal state of the system is unmuted and for maximum benefit, it should be operated in that mode.

3. Rotate the **SENS** control to increase or decrease the sensitivity. The sensitivity control should be used to reduce nuisance alerts, and not through the use of the mute switch.

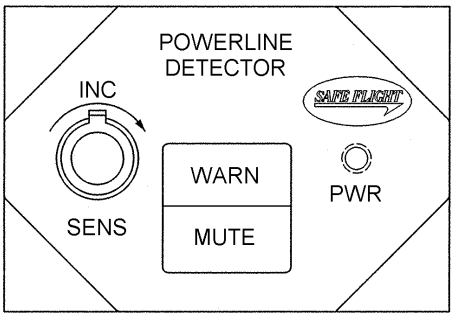

Figure 7-1. PDS Display

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