

**ENSTROM 480B OPERATOR'S MANUAL  
AND  
FAA APPROVED  
ROTORCRAFT FLIGHT MANUAL  
SUPPLEMENT  
APPAREO SYSTEMS VISION 1000**

\* \* \* \* \*

REPORT NO. 28-AC-067

\* \* \* \* \*

HELICOPTER SERIAL NO. \_\_\_\_\_

HELICOPTER REGISTRATION NO. \_\_\_\_\_

**THIS SUPPLEMENT MUST BE CARRIED IN THE HELICOPTER AT ALL TIMES IF EQUIPPED WITH THE APPAREO SYSTEMS VISION 1000. CHAPTERS 1, 2, 3, AND 4 ARE FAA APPROVED.**

FAA APPROVED  \_\_\_\_\_

MANAGER, SOUTHWEST FLIGHT TEST SECTION, AIR-713  
FEDERAL AVIATION ADMINISTRATION  
FT. WORTH, TX

DATE 3-23-18 \_\_\_\_\_

The Enstrom Helicopter Corporation  
2209 22<sup>nd</sup> Street  
Menominee, MI 49858, USA  
[www.enstromhelicopter.com](http://www.enstromhelicopter.com)


**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**LOG OF REVISIONS**

Rev. No.	Issue Date	FAA Approved / Date
-	3/16/18	 MAR 23 2018

**Approved by the Manager,  
Southwest Flight Test Section, AIR-713  
Federal Aviation Administration  
Ft. Worth, TX**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**EASA LOG OF REVISIONS**

Rev. No.	Date	EASA Approved	FAA Approval on Behalf of EASA

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT  
APPAREO SYSTEMS VISION 1000**

**TABLE OF CONTENTS**

<u>CHAPTER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
	Supplement Cover Page	
	Log of Revisions .....	i
	EASA Log of Revisions .....	ii
	Table of Contents.....	iii
	List of Figures.....	iv
	List of Tables .....	iv
	List of Effective Pages .....	v
	 INTRODUCTION	
Intro-1	General .....	INTRO-1
Intro-2	Contact Information .....	INTRO-1
Intro-3	Definition of Abbreviation .....	INTRO-2
 CHAPTER 1	 OPERATING LIMITATIONS	
1-1	General .....	1-1
 CHAPTER 2	 NORMAL PROCEDURES	
2-1	General .....	2-1
 CHAPTER 3	 EMERGENCY PROCEDURES	
3-1	General .....	3-1
 CHAPTER 4	 PERFORMANCE DATA	
4-1	General .....	4-1
 CHAPTER 5	 RESERVED	
 CHAPTER 6	 WEIGHT/BALANCE AND LOADING	
6-1	General .....	6-1
 CHAPTER 7	 SYSTEM DESCRIPTION AND OPERATION	
7-1	Description.....	7-1
7-2	Operation .....	7-2

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT  
APPAREO SYSTEMS VISION 1000**

**LIST OF FIGURES**

<u>FIGURE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
7-1	Vision 1000 Camera.....	7-1

**LIST OF TABLES**

<u>TABLE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
Intro-1	List of Abbreviations.....	INTRO-2
7-1	LED Status Indicators .....	7-3

**LIST OF EFFECTIVE PAGES**

<u>PAGE</u>	<u>DATE</u>
i	Mar 16/18
ii	Mar 16/18
iii	Mar 16/18
iv	Mar 16/18
v	Mar 16/18
vi	Mar 16/18
INTRO-1	Mar 16/18
INTRO-2	Mar 16/18
1-1	Mar 16/18
1-2	Mar 16/18
2-1	Mar 16/18
2-2	Mar 16/18
3-1	Mar 16/18
3-2	Mar 16/18
4-1	Mar 16/18
4-2	Mar 16/18
6-1	Mar 16/18
6-2	Mar 16/18
7-1	Mar 16/18
7-2	Mar 16/18
7-3	Mar 16/18
7-4	Mar 16/18

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**  
Report No. 28-AC-067

Mar 16/18



## INTRODUCTION

### Intro-1. General

This supplement contains the operating instructions, procedures, and limitations for the Appareo Systems Vision 1000.

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 Appareo Systems Vision 1000 is installed.

For additional information regarding the supplement format and text emphasis or definitions, refer to the Basic Flight Manual.

### Intro-2. Contact Information

Contact information is as follows:

Appareo Systems  
1810 NDSU Research Circle North  
Fargo, ND 58102 USA

Tel: +1 701-356-2200

E-mail: [support@appareo.com](mailto:support@appareo.com)

Website: [www.appareo.com](http://www.appareo.com)

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

INTRO-2 ENSTROM 480B RFM SUPPLEMENT

**Intro-3. Definition of Abbreviations**

Abbreviations noted in this supplement are listed in Table Intro-1.

**Table Intro-1. List of Abbreviations**

FAA	Federal Aviation Administration
GPS	Global Positioning System
LED	Light Emitting Diode
(O)	(Equipment) Option
RFM	Rotorcraft Flight Manual
SD	Secure Digital

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

## **CHAPTER 1. OPERATING LIMITATIONS**

### **1-1. General**

For all operational limits, refer to the basic RFM.

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**CHAPTER 2. NORMAL PROCEDURES****2-1. General**

1. The Vision 1000 does not require flight crew interface during aircraft operation.

**NOTE**

**On start-up, the LED indicator will illuminate blue for approximately 20 seconds and then illuminate green for approximately 35 seconds. If a fault was detected, the LED indicator will then illuminate yellow or red depending on the fault condition (refer to Table 7-1). If no fault was detected, the LED indicator will remain steady green.**

**NOTE**

**If the SD card is not installed or is not formatted correctly, the LED indicator will illuminate yellow.**

**NOTE**

**If GPS lock is not received, the LED indicator will illuminate yellow until the GPS signal is valid. If there is no other error, the Vision 1000 will be recording imaging, audio, and inertial flight data; however, the flight data will not include GPS information (speed, altitude, or vertical speed) until the GPS signal is locked and the LED status is green.**

2. Refer the basic RFM.

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

## **CHAPTER 3. EMERGENCY PROCEDURES**

### **3-1. General**

1. Refer to the basic RFM.

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18



## **CHAPTER 4. PERFORMANCE DATA**

### **4-1. General**

Refer to the basic RFM.

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

**INTENTIONALLY LEFT BLANK**

FAA Approved: **MAR 23 2018**

Report No. 28-AC-067

Mar 16/18

## **CHAPTER 6. WEIGHT/BALANCE AND LOADING**

### **6-1. General**

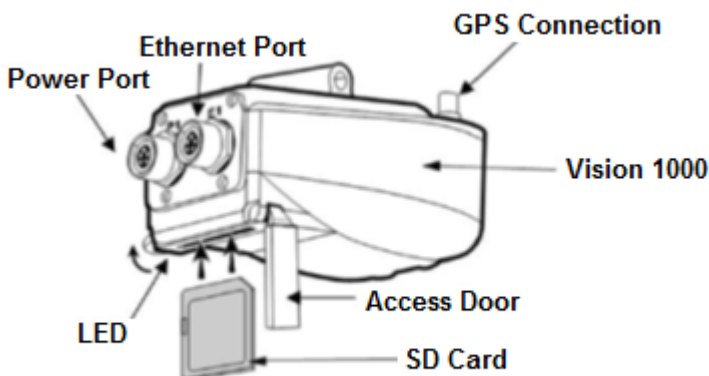
Refer to the basic RFM.

**INTENTIONALLY LEFT BLANK**

## CHAPTER 7. SYSTEM DESCRIPTION AND OPERATION

### 7-1. Description

1. Enstrom P/N 4220641 provides for installation of the Appareo Systems Vision 1000. The primary components include a camera mounted to the upper console and a GPS antenna mounted to the top of the instrument panel.
2. The Vision 1000 is a data gathering system utilizing data from GPS, image capturing, flight attitude acquisition, and ambient audio recording with the intent to aid flight safety and analysis. It will record the aircraft's airframe attitudes, rates, accelerations, GPS position and record cockpit audio and images to an SD card.
3. The Vision 1000 is powered by the aircraft electrical system and is protected by a 1 amp circuit breaker (**VISION 1000**) located on the left-hand side of the circuit breaker panel.
4. The features of the Vision 1000 camera are shown in Figure 7-1.



**Figure 7-1. Vision 1000 Camera**

## 7-2. Operation

### NOTE

**The Vision 1000 does not require flight crew interface during aircraft operation.**

### NOTE

**During low light operations, the quality of images may be reduced.**

### NOTE

**It may be necessary to reconfigure the Vision 1000 if it is bumped.**

#### Memory Card – To Insert (refer to Figure 7-1)

1. Open the access door on the Vision 1000.
2. Ensure proper orientation of the SD memory card and insert; push in to secure.
3. Check the status of the LED. Refer to Table 7-1 for possible LED status indications.
4. Close the Vision 1000 access door.

#### Data Retrieval

1. Refer to Appareo Systems *Vision 1000 Configuration Overview*, document number 600890-000009, for instructions regarding flight data management.

#### Configuring Vision 1000

1. Notify an authorized maintenance facility if the Vision 1000 requires reconfiguration.

**Table 7-1. LED Status Indications**

<b>LED Color</b>	<b>Status</b>
Blue	Booting
Green	Normal Operation
Red	Fault – Contact Appareo Systems
Yellow	1) SD card error 2) GPS signal lock not received; allow 15 minutes for complete signal reception 3) Accelerometer error – Refer to <i>Vision 1000 Configuration Overview</i> , document 600890-000009
Off	Not receiving power

**INTENTIONALLY LEFT BLANK**