AIR COMM CORPORATION
3330 AIRPORT ROAD
BOULDER, CO 80301

DOCUMENTS FOR THE INSTALLATION OF THE BELL MODEL 429 CABIN AIR CONDITIONING SYSTEM

Revision 1

25 September 2009

RECORD OF REVISION

REVISION NUMBER	DATE	DESCRIPTION	BY	APPROVAL
0	9/25/09	Initial Release	RL	NS
1	01/26/11	Added 429EC-200-3 to weight & balance report	JB	

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LIST OF EFFECTIVE PAGES

LIST OF REVISIONS Revision 0 (Original Issue)...25 September, 2009

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CHAPTER 0
INTRODUCTION

This document contains information, which is required for the installation and operation of the Air Comm Corporation's air conditioning system installed in the Bell 429 series helicopter. After completion of the installation of the air conditioner system, the Weight & Balance Information, Flight Manual Supplement, and the Supplemental Type Certificate must be removed from this document and placed with the appropriate existing aircraft documents.

1. SCOPE

   The scope of this document encompasses the general procedures and reference documentation necessary to install the Air Comm Corporation air conditioning system in the Bell 429 series helicopter.

2. PURPOSE

   The purpose of this document is to provide the aircraft mechanic in the field the necessary information and documentation to install the air conditioning system.

3. ARRANGEMENT

   This document is arranged by chapters, which are broken down into paragraphs and sub-paragraphs. All of the chapters and paragraphs are listed in the front of this document in the Table of Contents, and are further identified by their individual page number.

4. APPLICABILITY

   This document is applicable to Bell Helicopter models 429 that are equipped with the Air Comm Corporation kit number 429EC-200 air conditioner system.

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CHAPTER 1
GENERAL INSTALLATION PROCEDURE & REFERENCE DOCUMENT

1. GENERAL INSTALLATION PROCEDURE

This section is intended to supplement the information contained on the installation drawings. All details and notes contained on the drawings should be reviewed carefully. As instructions for installation are provided on the installation drawing where appropriate, and are not repeated in this document.

It will be necessary to remove the transmission cowlings, the main cabin headliner, Chin bubbles, to facilitate the installation of this kit.

The system components and associated hardware are packaged separately. Prior to beginning the installation it is recommended that the hardware be inventoried and placed in separate (labeled) boxes to prevent mixing.

Care should be taken to prevent contamination of the air conditioner system! All plugs on the plumbing assemblies and system components should *not* be removed until just prior to installation of the part. The exception to this procedure is the installation of the receiver / drier bottle. The receiver / drier should be left capped and not installed until just prior to servicing the system with refrigerant. This prevents the desiccant inside the bottle from becoming saturated with water.

2. REFERENCE DOCUMENT

The approval basis of the system covered by this document is Supplemental Type Certificate SR00693DE

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CHAPTER 2
WEIGHT & BALANCE INFORMATION

This page must be removed and placed with the appropriate existing aircraft documents.

Weight breakdown – Bell 429 series air conditioning system:
Dwg. 429EC-200

Weight & Balance

Item	Wt (lbs)	X Arm (in)	X M (in-lb.)
429EC-202-1 Total Wt. (Single Fwd/Aft Evap)	84.54	185.4	15677
429EC-200-1& 200-3 Total Wt. (Dual Fwd/Aft Evap)	113.3	176.5	19998

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CHAPTER 3
FLIGHT MANUAL SUPPLEMENT

1. FLIGHT MANUAL SUPPLEMENT

The following document must be removed and placed with the appropriate existing aircraft documents.

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ACC Air Comm Corporation
3300 Airport Rd
Boulder, CO. 80301
Document Number 429EC-100M

FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT FOR THE BELL HELICOPTER MODEL B-429 WHEN EQUIPPED WITH THE CABIN AIR CONDITIONER SYSTEM

REGISTRATION #: _____ SERIAL #: _____

The information in this supplement is FAA approved material and must be attached to the FAA Approved Bell 429 Rotorcraft Flight Manual when the rotorcraft has been modified by the installation of Air Comm Corporation Cabin Air Conditioner System in accordance with:

STC # SR00693DE

The information contained herein supplements or supersedes the information in the basic Rotorcraft Flight Manual only in those areas listed herein. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Rotorcraft Flight Manual.

FAA Approved: Hien Tang

for Manager, Flight Test Branch, ANM-160L
Federal Aviation Administration
Los Angeles Certification Office
Transport Airplane Directorate

FAA Approved Date: September 4, 2009

LOG OF PAGES

Rev No.	Pg No	Date	Description of Change	FAA Approved
0	Cv r i 1-8	4 Sep 2009	Initial Release	Hien Tong for Mgr, Flight Test Br., ANM-160L FAA, Los Angeles ACO Transportation Directorate DATE: 9/4/2009
1	2 2-5 5 5 7	18 Oct 2010	Revised Description, Updated Fig. 1 Updated Fig. Numbering - Added Fig 0-4 - Added "color white" to Fig 1-4 - Added White Advisory Message - Added OEI or Generator Fail	 Mgr, Flight Test Br., ANM-160L FAA, Los Angeles ACO Transportation Directorate DATE: October 18, 2010

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SYSTEM DESCRIPTION

The 429 air conditioner is a vapor cycle system which utilizes R134a refrigerant. There are two available configurations of the 429 air conditioning system: 1. A dual evaporator system with two standard forward evaporators and two standard aft evaporators. 2. An optional single RH forward evaporator and single RH aft evaporator configuration. The main components of this system, which is shown by Figure 0-1, are listed below:

- Compressor Installation
- Condenser Installation
- Evaporator Installations: Dual - two forward standard, Single - one forward optional
- Evaporator Installations: Dual - two aft standard, Single - one aft optional
- Plumbing Installation
- Electrical System Installation

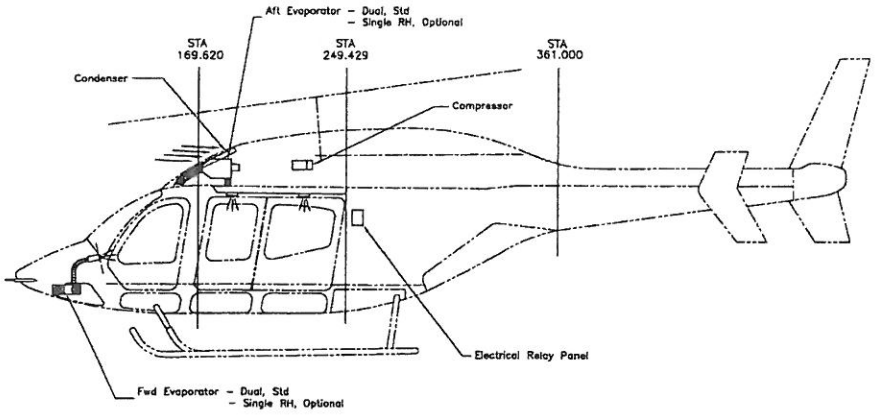

Figure 0-1. General Arrangement – Cabin Air Conditioner System

The compressor is belt driven and is mounted on the main rotor transmission.

The forward evaporator(s) is mounted on the side of the instrument panel support structure. Conditioned air is delivered to the crew by means of air outlets, which are located at the lower edge of the instrument panel (four places).

The aft evaporator(s) assembly is mounted above the cabin top. Conditioned air is provided to existing headliner ducting and air outlets.

The condenser is mounted inside the main rotor transmission fairing and is cooled by a DC blower.

The air conditioner controls include an AC-OFF-FAN switch; a temperature control selector; and separate fan speed controls for both the cockpit and the cabin, see Figure 0-2.

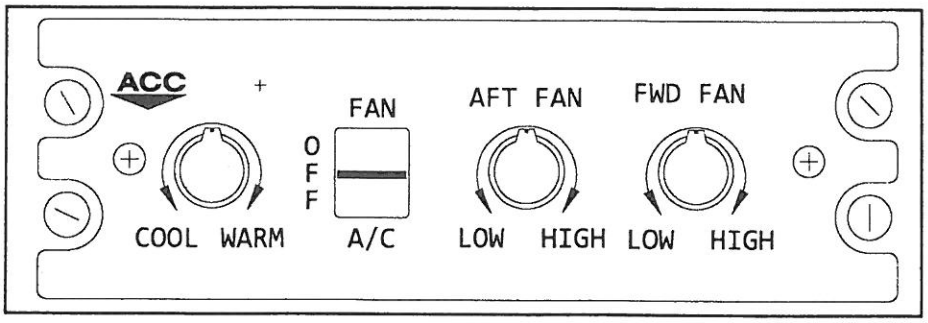

Figure 0-2. Air Conditioning Control Panel - Center Console Aft

In the FAN mode the cockpit and cabin fan are operated at the selected fan speed. In this mode the system can re-circulate cabin air.

The FWD & AFT FAN knobs control the fan speed. There is a lag in achieving the selected operating speed.

Fresh air can be circulated in the FAN mode by opening fresh air vents which are part of the aircraft type design. The VENT PULL control on the lower edge of the instrument panel allows fresh air into the cockpit and can be assisted by the FWD FAN blowers. The DEFOG PULL control should be in to divert air to the panel outlets.

Operation of the cabin overhead vent control, which is located in the crew overhead, allows fresh air to enter the cabin and can be assisted by the AFT FAN blowers.

In the AC mode all fans, including the condenser and the compressor are powered. In addition, the hot gas bypass valve meters refrigerant to the LH aft evaporator in response to operation of the COOL-WARM control knob, or the evaporator coil freeze switch.

The air conditioning system is connected to the non essential bus with circuit breakers located in the right-hand Power Distribution Panel in the baggage conmpartment, see Figure 0-3 & 0-4. The bus drops "off line" in case of a generator failure or an OEI occurrence and the air conditioning system is shed.

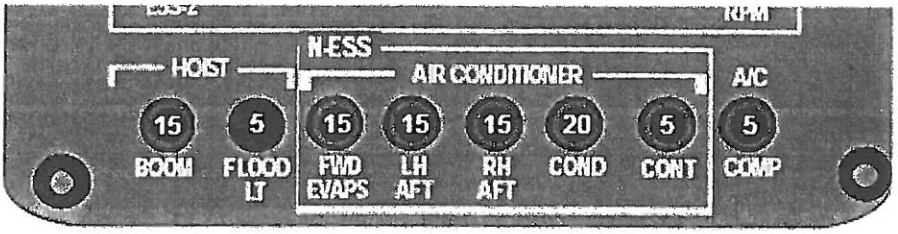

Figure 0-3. Standard Dual Evaporator AC Circuit System Breaker Panel

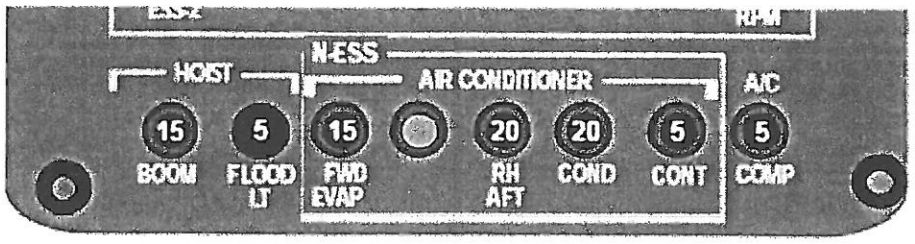

Figure 0-4 Optional Single Evaporator AC System Circuit Breaker Panel

The white message AIR COND FAIL illuminates on the DU as the result of loss of system refrigerant or excessive system discharge pressure. The compressor will disengage from the drive system, but the evaporator blowers will continue to operate.

Figure 0-5. "AIR COND FAIL" – located on DU

SECTION 1 – LIMITATIONS

No change to the basic manual

SECTION 2 – NORMAL PROCEDURES

ENGINE PRESTART

- Check A/C–OFF–FAN – OFF

BEFORE TAKEOFF & IN FLIGHT OPERATIONS

- A/C–OFF–FAN – As desired
- EVAP FANS – FAN SPEED SWITCH – As desired

NOTE

Total air conditioning system electrical load is less than 52 amps for the dual system & 38 amps for the single system. Monitor amps.

NOTE

Simultaneous operation of the cabin heater and air conditioner can be used to achieve cabin defogging

NOTE

If outlet air is not cool, place the A/C–OFF–FAN to the OFF or FAN position to preclude damage to the compressor.

SECTION 3 – EMERGENCY PROCEDURES

AIR COND FAIL advisory

- Place the A/C-OFF-FAN to the OFF or FAN position.

OEI or GENERATOR FAILURE

- Place the A/C-OFF-FAN to the OFF position.

NOTE

Loss of generator output will activate the air conditioner auto load shed circuitry, which will de-energize the entire air conditioning system, including compressor clutch.

NOTE

If outlet air is not cool, place the A/C–OFF–FAN to the OFF or FAN position to preclude damage to the compressor.

SECTION 4 - PERFORMANCE

When the air conditioner is operating, the performance data in the basic flight manual should be reduced as shown below:

RATE OF CLIMB DEGRADATION

Reduce the rate of climb in the basic Flight Manual by the amount shown below:

R/C Reduction ..... 54 ft/min (17 m/min)

HOVER CEILING IN GROUND EFFECT AND OUT OF GROUND EFFECT

Add 68 lb (31 kg) to the aircraft weight and determine the hover ceiling from the performance curves in the basic aircraft flight manual. If the aircraft is to be operated at gross weight the hover performance is to be extrapolated.

NOTE

Electrical loads are accounted for in the in the basic Flight Manual performance data.

CHAPTER 4
SUPPLEMENTAL TYPE CERTIFICATE

1. SUPPLEMENTAL TYPE CERTIFICATE

   The following document must be removed and placed with the appropriate existing aircraft documents.

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United States of America

Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

Number SR00693DE

This certificate, issued to **Air Comm Corporation**
3300 Airport Road
Boulder, Colorado 80301

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 27* *of the* Federal Aviation *Regulations* .*Certification Basis is set forth in Type Certificate Data Sheet R00003RD

Original Product—Type Certificate Number: R00003RD
Make: Bell Helicopter Textron
Model: 429

Description of the Type Design Change:

Installation of a Cabin Air Conditioning System Provisions in accordance with Air Comm Corporation Master Drawing List Report No DL-429EC, Section II, Revision B, dated June 05, 2009, FAA approved September 04, 2009, or later FAA approved revision.

Installation of a Cabin Air Conditioning System Components in accordance with Air Comm Corporation Master Drawing List Report No DL-429EC, Section I, Revision B, dated June 05, 2009, FAA approved September 04, 2009, or later FAA approved revision.

Limitations and Conditions:

1. FAA accepted Instructions for Continued Airworthiness, Document No. 429EC-200M-1, Revision 1, dated September 08, 2009, FAA accepted September 17, 2009, or later FAA accepted revision is required.
2. FAA Approved Flight Manual Supplement, Document No. 429EC-100M, Revision 0, dated September 04, 2009, or later FAA approved revision is required for Cabin Air Conditioning System Components installation.
3. Compatibility of this design change with previously approved modifications must be determined by the installer.
4. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 29, 2006 *Date reissued:*

Date of issuance: September 18, 2009 *Date amended:* September 25, 2009

By direction of the Administrator

Melissa Sandow *(Signature)*, Program Manager
Northwest Mountain Region
Denver Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68)