

TECHNICAL BULLETIN  
**Bell Helicopter**  
A Textron Company

No. 429-10-04  
Date Aug-30-10  
Page 1 of 15

DATE
REV

**MODEL AFFECTED:** 429

**SUBJECT:** ADIU, DU AND FCC SOFTWARE / HARDWARE, UPGRADE OF.

**HELICOPTERS AFFECTED:** Helicopter 57001 through 57026.

Helicopter 57001 through 57011, 57013 and 57014: Part 1, 3, 4, 5 and 6.

Helicopter 57012 and 57015 through 57026: Part 2 (or 1), 3, 4, 5 and 6.

[Helicopters serial number 57027 and subsequent will have the intent of this bulletin accomplished prior to delivery]

**COMPLIANCE:** Bell helicopter recommends accomplishment of this bulletin within the next 12 months.

**DESCRIPTION:**

This bulletin introduces:

- **Part 1:** ADIU P/N 429-005-005-103 / or -105 are replaced by new ADIU P/N 429-005-005-109 which features hardware and software improvements.
- **Part 2:** Software upgrade for ADIU P/N 429-005-005-715 which results in ADIU part number change to P/N 429-005-005-109.

**The ADIU replacement/upgrade improves the operational characteristic as follow:**

- Improved Caution/Warning processing and logic.
- Changed Altitude Select alert threshold from 1000 ft to 500 ft.
- Added "Altitude" aural alert which activates when either the 500 ft Or 200 ft Altitude Select alert is activated.
- Vne bug now shows autorotation Vne during prolonged collective Down, power off decent
- Improved Exceedance and chip history reporting
- Improved fault detection and reporting
- Improved recording accuracy of Take-Off/Landings

- Improved handling of negative fuel calibration factors
  - Improved accuracy of Engine1/Engine2 run time shown on log page
  - Added Fuel Type selection entry
- **Part 3: Software upgrade for DU P/N 429-375-004-101 and P/N 429-375-008-101 which results in DU part number change to P/N 429-375-004-103 and 429-375-008-103.**

**The DU software upgrade improves the operational characteristic as follow:**

- Improved display of localizer information after loss of heading.
  - New special Composite display format for use during CAT-A Maneuvers
  - Improved Heading Preset Mode operation near severe magnetic disturbances
  - Improved NAV source handling on power up.
  - Improved fault detection and reporting
  - Improved Caution message processing
  - Updated amount of trapped fuel shown on fuel qty display
  - Improved V-bar flight director cues on ADI
- **Part 4: Software upgrade for FCC P/N 429-005-026-101 which results into FCC part number change to P/N 429-005-026-103.**

**The FCC software upgrade improves the operational characteristic as follow:**

- Improved AFCS fault detection, handling, and reporting
- AFCS prevents airspeed beep beyond Vne
- Activated AFCS 4th axis (collective) capability.
- Improved Flight Director mode engagement, transition, and Annunciation
- Improved Flight Director tracking performance
- Added AFCS changes for capability with emergency floats
- Added AFCS capability for steep approaches (see flight manual)

**-NOTE-**

**The software upload procedure is only to be performed by Bell Helicopter Textron approved and authorized personnel.**

**-NOTE-**

**Pratt & Whitney Canada Service Bulletin S.B. No. 28321 Electronic Engine Control (EEC) – Replacement/Reprogramming Of, must be complied with concurrently with this Technical Bulletin.**

-NOTE-

Bell Helicopter Textron approved and authorized personnel may perform either Part 1 or Part 2 on Helicopter 57012 and 57015 through 57026, depending on asset availability and as long as it results in having an ADIU P/N 429-005-005-109 installed.

- **Part 5: Verifications.**
- **Part 6: Operational checks.**

-NOTE-

After completion of this Technical Bulletin; use DMITS software version 429-770-014-113 available on our web site at <http://www.bellcustomer.com/files/MaintenanceSW/>

**APPROVAL:**

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

**MANPOWER:**

Approximately 10 man-hours are required to complete this bulletin. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

**WARRANTY:**

Owners/Operators of Bell Helicopter who comply with the instructions in this Bulletin will be eligible to receive a credit for the replacement ADIU P/N 429-005-005-109.

To receive this credit:

- Comply with the instructions contained in this Bulletin no later than the applicable date in the “compliance section” of this Bulletin.
- Purchase replacement parts as required in the material section of this Bulletin from a Bell approved source.
- Submit an MMR to the Bell Warranty Department.

Customers who fail to comply with the instructions in this Bulletin before the 30<sup>th</sup> August 2011 will not be eligible for the special warranty credit listed above. There is no labor associated with this Bulletin.

Customer must Contact Bell Helicopter Product Support to coordinate software upload Part 2, 3, 4.

Product Support Engineering – Intermediate group  
Phone: 450-437-2077, Phone: 1-800-463-3036 (US AND CANADA) Phone: 1-800-463-1971 (CANADA)  
FAX: 450-433-0272  
Email: [pseinter@bellhelicopter.textron.com](mailto:pseinter@bellhelicopter.textron.com)

**MATERIALS:**

**Required Material:**

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

**PART 1**

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
429-005-005-109	ADIU	1

**Consumable Material:**

The following material is required to accomplish this bulletin; however this material is considered consumable (bench stock) material and may not require ordering depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>	<u>Reference</u>
Commercial 3950	Isopropyl alcohol Edge Sealer	A/R 1	C-285 C-349

**SPECIAL TOOLS:**

**No special tool is required.**

**WEIGHT AND BALANCE:**

**Not affected**

**ELECTRICAL LOAD DATA:**

**Not affected**

**REFERENCES:**

BHT-429-MM

**PUBLICATIONS AFFECTED:**

BHT-429-IPB  
BHT-429-FM-1

**ACCOMPLISHMENT INSTRUCTIONS:**

Prior to accomplishment of Part 1 through Part 6 of this Bulletin;

Step 1: Apply power on the aircraft using Ground Power Unit (GPU) and access the following maintenance pages (Ref: BHT-429-MM, Chapter 95) on the Center Display Unit

- CALIBRATION maintenance page
- CONFIGURATION maintenance page
- PARAMETER SET-UP maintenance page
- LOG maintenance page
- S/W REV maintenance page

Step 2: Record their respective settings and/or data.

**PART 1**

**ADIU replacement,**

1. Ensure all power is removed from the helicopter.
2. Pull ADIU CH A (3170CB1) and ADIU CH B (3170CB2) circuit breakers.
3. Gain access to aft avionics compartment access panel (400B).
4. Remove aft avionic compartment access panel (400B) (BHT-429-MM, Chapter 53).
5. Disconnect connectors, 3140A1P1, 3140A1P2, 3140A1P3, 3140A1P4 and ADMM connectors 3140A1P5 from ADIU unit.
6. Remove existing ADIU (3140A1) unit (BHT-429-MM, chapter 95).

7. Install new ADIU (P/N 429-005-005-109) (BHT-429-MM, chapter 95).
8. Connect ADIU connector, 3140A1P1, 3140A1P2, 3140A1P3, 3140A1P4 and ADMM connector 3140A1P5.

## **PART 2**

**ADIU software upgrade.** (The software upload procedure is only to be performed by Bell Helicopter Textron approved and authorized personnel).

1. Ensure all power is removed from the helicopter.
2. Gain access to aft avionics compartment access panel (400B).
3. Remove aft avionics compartment access panel (400B) (BHT-429-MM, Chapter 53).
4. Disconnect ADIU electrical connector 3140A1P1, 3140A1P2, 3140A1P3, 3140A1P4 and ADMM connectors 3140A1P5 from ADIU unit.
5. Remove ADIU unit from helicopter and perform software upgrade procedure as per document 429-099-147.
6. Once the above procedure is completed; Install ADIU P/N 429-005-005-109 (BHT-429-MM, chapter 95)
7. Connect ADIU connector, 3140A1P1, 3140A1P2, 3140A1P3, 3140A1P4 and ADMM connector 3140A1P5.
8. Pull ADIU CH A (3170CB1) and ADIU CH B (3170CB2) circuit breakers.

## **PART 3**

**DU software upgrade,** (The software upload procedure is only to be performed by Bell Helicopter Textron approved and authorized personnel).

1. Ensure all power is removed from the helicopter.

-NOTE-

The procedure is identical for all display units (3160DS1 3160DS2 and 3160DS3).

2. Remove right hand DU (3160DS2) (BHT-429-MM, Chapter 95).
3. Disconnect DU connectors, 3160DS2P2 and 3160DS2P1.
4. Interconnect right hand DU unit connector and the computer serial ports using the programming harness. Refer to document 9904-0292 from Rogerson Kratos.
5. Remove center (3160DS1) and optional left hand side (3160DS3) DU (BHT-429-MM, chapter 95)
6. Disconnect DU connectors 3160DS1P1, 3160DS1P2 and 3160DS3P1, 3160DS3P2.
7. Apply power to the Helicopter using ground power as required by the following step.
8. Carry out DU software upload procedure per Rogerson Kratos document P/N 9904-0292 on all Display Units (Center, Right Hand Side (pilot), and optional Left Hand Side (copilot)
9. Remove power from helicopter.
10. Connect DU connectors, 3160DS1P1, 3160DS1P2, 3160DS2P1 and 3160DS2P2, and (optional) 3160DS3P1 and 3160DS3P2.
11. Install 3160DS1 (Center DU), 3160DS2 (RHS DU) and optional 3160DS3 (LHS DU) (BHT-429-MM,, Chapter 95.)
12. Pull CTR DU PWR (3160CB3), EMERG CTR-DU (3160CB5), LH DU PWR (3160CB9) and RH DU PWR (3160CB4) circuit breakers.

#### **PART 4**

**FCC software upgrade.** (The software upload procedure is only to be performed by Bell Helicopter Textron approved and authorized personnel).

1. Ensure all power is removed from the helicopter.
2. Remove left hand Crew Belly Panel (200CL) (BHT-429-MM, Chapter 53).
3. Disconnect the electrical cap of J3 receptacle from FCC (Flight Control computer) (2210CM1).

4. Interconnect FCC unit connector J3 and the computer serial ports using the GAFCS S/W load box harness. Refer to document; 429-099-146 for proper connection.
5. Apply power to the helicopter using ground power as required by the following step.
6. Carry out FCC software upgrade per document 429-099-146.
7. Remove power from helicopter.
8. Remove GAFCS S/W load box harness from FCC.
9. Connect electrical cap J3 receptacle on FCC (2210CM1).
10. Remove right hand crew belly panel (200CR) (BHT-429-MM, Chapter 53).
11. Disconnect the electrical cap of J3 receptacle from FCC (Flight Control Computer) (2210CM2).
12. Interconnect FCC unit connector J3 and the computer serial port using the GAFCS S/W load box. Refer to document; 429-099-146 for proper connection.
13. Apply power to the helicopter using ground power as required by the following step.
14. Carry out FCC software upgrade per document 429-099-146.
15. Remove power from helicopter.
16. Remove GAFCS S/W load box harness from FCC.
17. Connect the electrical cap connector J3 receptacle on FCC (2210CM2).

## **PART 5**

### **Verifications**

1. Set ADIU CH A (3170CB1) and ADIU CH B (3170CB2) circuit breakers.
2. Set CTR DU PWR (3160CB3), EMERG CTR-DU (3160CB5), LH DU PWR (3160CB9) and RH DU PWR (3160CB4) circuit breakers.
3. Apply power to the helicopter using ground power unit.

4. Access S/W REV / FAULT HISTORY maintenance page on all Display Units installed on the instrument panel and verify/confirm the data shown on Table-1 is displayed on each of them. (BHT-429-MM, Chapter 95)

**S/W REV**

	<b>P/N</b>	<b>REV</b>	<b>CKSM</b>
DU CPU	0666-0236	2.0	4D9A7F63
ADIU OFP	429-770-001-105	CH-A	0EE8CB3B
		CH-B	0EE8CB3B
FCC1 OFP	429-770-003-105		E11EAD76
FCC2 OFP	429-770-003-105		E11EAD76

TABLE 1

5. Access the following maintenance pages (BHT-429-MM, Chapter 95) for each individual Display Unit to verify/check/enter their respective settings and/or parameter selections so they reflect what was previously recorded at the beginning of the Accomplishment Instructions:

- CALIBRATION maintenance page
- CONFIGURATION maintenance page
- PARAMETER SET-UP maintenance page
- LOG maintenance page

**PART 6**

**Operational checks**

1. Apply power to the aircraft using ground power unit.
2. Carry out Display Unit (DU) Built in Test (BIT) (BHT-429-MM, Chapter 95) for each installed display Unit (Left, Center and Right)
3. Verify (Amber) ADIU CH A and/or ADIU CH B cautions do not show on any of the Display Units (DU) in the Caution Advisory System (CAS) window.

-NOTE-

Hydraulic power is not required for the following operational check.

4. Press the TRIM switch to turn trim on (Collective Trim on if 4 axis Kit installed)

5. Press the AP-1 PBA to turn AP 1 on.
6. Verify that AFCS IBIT executes in FCC-1 by observing a flashing SCAS/ATT indication on the SACS/ATT switch and observing the movement of the SCAS actuators position indicated for FCC-1 on the AFCS Schematic page on the center DU.
7. Verify that no AFCS related warnings or cautions appear on the DUs upon completion of IBIT.
8. Press the AP-2 PBA to turn AP 2 on.
9. Verify that AFCS IBIT executes successfully in FCC-2 by observing a flashing SCAS/ATT indication on the SACS/ATT switch and observing the movement of the SCAS actuators position indicated for FCC-2 on the AFCS Schematic page on the center DU.
10. Verify that no AFCS related warnings or cautions appear on the DUs upon completion of IBIT.
11. Press the AP-1 PBA to turn AP1 off.
12. Press the AP-2 PBA to turn AP2 off.
13. Remove power from helicopter.
14. Install aft avionics compartment access panel removed previously (400B)(BHT-429-MM, Chapter 53)
15. Install left hand crew belly panel removed previously (200CL)(BHT-429-MM, chapter 53).
16. Install right hand crew belly panel removed previously (200CR) (BHT-429-MM, chapter 53).
17. Complete configuration forms for ADIU, DU and FCC, and Fax or Email to Bell Product Support Engineering - Intermediate Group.  
  
FAX: 450-433-0272  
Email: [pseinter@bellhelicopter.textron.com](mailto:pseinter@bellhelicopter.textron.com)
18. Annotate helicopter records to reflect compliance with this bulletin.

Aircraft Serial Number: \_\_\_\_\_

**Part 1** (ADIU replacement)

**ADIU removed**

ADIU Part number: \_\_\_\_\_

ADIU serial number: \_\_\_\_\_

**ADIU Replacement**

Replaced by: \_\_\_\_\_ Date: \_\_\_\_\_

ADIU Part number: \_\_\_\_\_

ADIU serial number: \_\_\_\_\_

Checksum from DU SW REV page: \_\_\_\_\_

OR

**Part 2** (ADIU Software upgrade)

**ADIU Unit (Pre Software upload)**

ADIU Part number: \_\_\_\_\_

ADIU serial number: \_\_\_\_\_

**ADIU Unit (Post Software upload)**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

ADIU Part number: \_\_\_\_\_

ADIU serial number: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

ADIU Label replacement performed by \_\_\_\_\_

Aircraft Serial Number: \_\_\_\_\_

**Part 3** (Display Unit software upgrade)

**RHS DU Unit (Pre Software upload)**

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

**RHS DU Unit (Post Software upload)**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

RHS DU Label replacement performed by \_\_\_\_\_

Aircraft Serial Number: \_\_\_\_\_

**Part 3** (Display Unit software upgrade)

**CTR DU Unit (Pre Software upload)**

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

**CTR DU Unit (Post Software upload)**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

CTR DU Label replacement performed by \_\_\_\_\_

Aircraft Serial Number: \_\_\_\_\_

**Part 3** (Display Unit software upgrade)

**LHS DU Unit (Pre Software upload) If equipped**

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

**LHS DU Unit (Post Software upload) If equipped**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Display unit part number: \_\_\_\_\_

Display unit serial number: \_\_\_\_\_

Hardware revision level: \_\_\_\_\_

software revision level: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

LHS DU Label replacement performed by \_\_\_\_\_

Aircraft Serial Number: \_\_\_\_\_

**Part 4** (FCC Software upgrade)

**FCC-1 Unit (Pre Software upload)**

FCC Part number: \_\_\_\_\_

FCC serial number: \_\_\_\_\_

**FCC-1 Unit (Post Software upload)**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

FCC Part number: \_\_\_\_\_

FCC serial number: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

FCC Label replacement performed by \_\_\_\_\_

AND

**FCC-2 Unit (Pre Software upload)**

FCC Part number: \_\_\_\_\_

FCC serial number: \_\_\_\_\_

**FCC-2 Unit (Post Software upload)**

Programmed by: \_\_\_\_\_ Date: \_\_\_\_\_

FCC Part number: \_\_\_\_\_

FCC serial number: \_\_\_\_\_

Checksum from DU SW REV page \_\_\_\_\_

FCC Label replacement performed by \_\_\_\_\_