

DAC International  
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**FAA APPROVED**  
**AIRPLANE FLIGHT MANUAL SUPPLEMENT**  
**FOR AIRCRAFT \_\_\_\_\_**  
**Listed on DAC International GDC31 Approved Model List**

**WITH**  
**DAC GDC31 ROLL STEERING COMPUTER**

Reg. No. \_\_\_\_\_

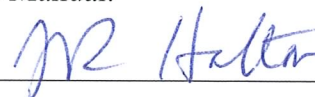
Serial No. \_\_\_\_\_

**RELEASED**

This supplement must be attached to the FAA approved Airplane Flight Manual when the DAC International Model GDC31 Roll Steering Converter has been installed in accordance with FAA STC SA10236SC .

The information contained herein supplements or supersedes the basic Airplane Flight Manual only in those areas listed. For limitations, procedures, and performance information not contained in this supplement, consult the basic Airplane Flight Manual.

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



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Special Certification Office  
Federal Aviation Administration  
Fort Worth, Texas 76193-0190

FAA Approved  
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**LOG OF REVISIONS**

Revision	Page	Subject	Approval	Date
IR	All	Initial Release	Rick Ritz	6/25/04
A	1	Reference Approved Model List	J.R. Holton	10/17/05

## **SECTION 1 - GENERAL**

### **A. GENERAL**

The GDC31 Roll Steering Converter provides autopilot coupling of the aircraft GPS unit to the aircraft autopilot's heading error channel. When the autopilot is operated in the Heading mode, a pilot operated switch selects between HSI /DG heading selector and GDC31 steering.

Provided the DAC GDC31 Roll Steering Converter (RSC) is receiving adequate data from the GPS, the RSC will provide lateral steering commands to the autopilot under these conditions:

1. GPS is selected on the A/P SEL switch.
2. Autopilot is in HDG mode.

GPS to autopilot coupling may be used for enroute, terminal and approach phases of flight.

## SECTION 2 - OPERATING LIMITATIONS

- A. Do not use the GDC31 below the published MDA during an approach.

**NOTE:**

*1) The GDC31 does not reduce or otherwise alter any existing safety features of the autopilot, such as bank limiting, rate limiting and protection from a hard over. The GDC31 provides lateral (roll) data only (no pitch data is supplied by the GDC31).*

*2) Refer to the autopilot AFMS for autopilot operating limitations. Operation of the GDC31 is subjected to the same autopilot limitations that apply to use of heading select, if any.*

- B. If the GPS does not support full guidance of course reversals and holding patterns, refer to Section 4, C and D. (Refer to the GPS Airplane Flight Manual Supplement.)

## **SECTION 3 - EMERGENCY/ABNORMAL PROCEDURES**

### **A. EMERGENCY PROCEDURES**

#### **1. Engine failure in a multi-engine aircraft:**

**NOTE:**

*In landing configuration below blue line, expect up to a 10° pitch down and up to a 30° bank angle.*

- a. Manually disengage the autopilot immediately.
- b. Disconnect auto-trim if engaged.

#### **2. In the event of a failure of the GDC31:**

- a. Maintain pitch and yaw control.
- b. Disengage the autopilot immediately.
- c. Regain control of the aircraft.
- d. Select HDG on A/P SEL switch.
- e. Do not attempt to use the GDC31 (GPS mode).

**NOTE:**

*A failure of the GDC31 will affect the lateral axis only of the autopilot, and only if the A/P SEL switch is in the GPS position. HDG hold mode is not affected by the GDC31 when the A/P SEL switch is in the HDG position.*

#### **3. Altitude loss during a malfunction and recovery.**

No change.

**SECTION 2 - EMERGENCY/ABNORMAL PROCEDURES Continued.**

**B. ABNORMAL PROCEDURES**

A blinking GPS Annunciator indicates a fault. The aircraft will roll wings level and WILL NOT follow course guidance from the GPS.

1. Disengage autopilot.
2. Establish aircraft on course.
3. Select HDG on A/P SEL switch.
4. Re-engage autopilot.

## SECTION 4 - NORMAL OPERATING PROCEDURES

### A. ANNUNCIATOR / SWITCH

1. A two-position toggle switch / annunciator labeled A/P SEL, located near the autopilot controller, selects the steering signal used by the Autopilot. Press the switch to toggle between HDG and GPS.



When the HDG annunciator is illuminated and HDG is selected on the Autopilot controller, steering is from the HSI heading selector.



When the GPS annunciator is illuminated, the autopilot is coupled to the GPS and the HSI heading selector is disconnected.

### B. OPERATION

1. Couple the GPS to the HSI / CDI.
2. Select GPS on the A/P SEL switch.  
Observe that GPS illuminates and is not blinking.
3. Engage the autopilot in the HDG mode.

#### **CAUTION:**

*The autopilot immediately begins tracking the GPS course. Expect up to a standard rate turn if the aircraft is not established on course when the mode is engaged.*

#### **NOTE:**

*To provide proper HSI display, set the HSI course selector to the Desired Track indicated by the GPS.*



## **SECTION 4 - NORMAL OPERATING PROCEDURES Continued.**

### **C. COURSE REVERSAL**

1. Couple the GPS to the HSI / CDI.
2. Select GPS on the A/P SEL switch.  
Observe that GPS illuminates and is not blinking.
3. Engage the autopilot in the HDG mode. Confirm that the autopilot tracks toward the FAF.

#### **CAUTION:**

*The autopilot immediately begins tracking the GPS course. Expect up to a standard rate turn if the aircraft is not established on course when the mode is engaged.*

4. At the FAF, the autopilot will track outbound from the FAF.
5. Select HDG on the A/P SEL switch. Use the HDG bug to maneuver the aircraft around the course reversal.
6. After the GPS track changes to the inbound course, select GPS on the A/P SEL switch.
7. Monitor tracking to the FAF then MAP.

#### **NOTE:**

*To provide proper HSI display, set the HSI course selector to the Desired Track indicated by the GPS.*

**SECTION 4 - NORMAL OPERATING PROCEDURES Continued.**

**D. HOLDING**

1. Couple the GPS to the HSI / CDI.
2. Select GPS on the A/P SEL switch.  
Observe that GPS illuminates and is not blinking.
3. Engage the autopilot in the HDG mode. Confirm that the autopilot tracks toward the holding fix.

**CAUTION:**

*The autopilot immediately begins tracking the GPS course. Expect up to a standard rate turn if the aircraft is not established on course when the mode is engaged.*

4. Crossing the holding fix, select HDG on the A/P SEL switch. Use the HDG bug to maneuver the aircraft around the outbound leg of the holding pattern.
5. After turning to within 90° of the inbound course, select GPS on the A/P SEL switch. Confirm that the autopilot tracks toward the holding fix.
6. Repeat 4 and 5.

**NOTE:**

*To provide proper HSI display, set the HSI course selector to the Desired Track of the inbound course as indicated on the GPS.*

**E. Power:**

1. A 2-amp circuit breaker labeled **RSC** powers the GDC31.

## **SECTION 5 - PERFORMANCE**

No Change

## SECTION 6 - SYSTEM DESCRIPTION

### A. EQUIPMENT DESCRIPTION

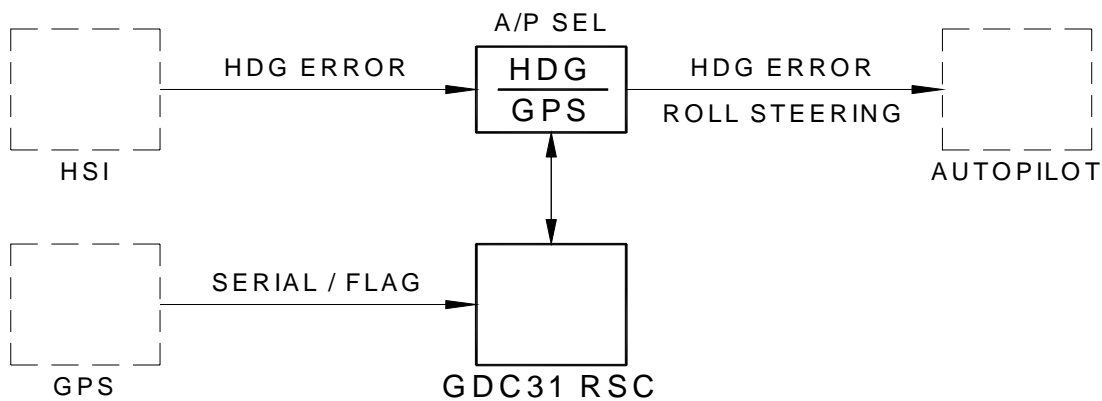
The GDC31 Roll Steering Converter provides autopilot coupling of the GPS to the autopilot.

When the autopilot is operated in heading mode, (HDG) annunciated on the autopilot controller, the pilot may select either heading bug or GPS as the steering source used by the autopilot. Mode selection is accomplished with the A/P SEL switch/annunciator located near the autopilot controller.

When A/P SEL annunciates HDG, the autopilot is coupled to the heading bug located in the HSI / DG.

When the A/P SEL annunciates GPS, the autopilot is coupled to the GPS course guidance through the GDC31 RSC. In the case of a fault, the GPS annunciator blinks when GPS mode is selected with the A/P SEL switch.

The GDC31 uses digital data received from the GPS to produce a commanded turn signal for use by the autopilot. The GDC31 does not reduce or otherwise alter any existing safety features of the autopilot, such as bank limiting, rate limiting and protection from a hard over. The GDC31 provides lateral (roll) data only (no pitch data is supplied by the GDC31).



**Block Diagram**