



EQUIPMENT INSTALLATION MANUAL

For the

GDC23 DATA CONVERTER

P/N 1039-4000-01-001()

ARINC 575 TO ARINC 429

RELEASED

DAC International
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Austin, TX 78729

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INTRODUCTION:

This manual contains installation data, specifications and Instructions for Continued Airworthiness for the DAC International Model GDC23 Data Converter, Part Number 1039-4000-01-001().

DESCRIPTION:

GDC23 Data Converters with software version 001() are designed to convert data received from a Digital Air Data Computer in ARINC 575 format into ARINC 429 format.

PART NUMBERS:

The GDC23 Data Converter is available under the following part number:

1039-4000-01-001()

ARINC 575 to 429 Converter

|
Software part number, where () contains the number zero for initial release, or any letter, A – Z to denote a minor change.

REGULATORY COMPLIANCE:

Software

The Model GDC23 software was developed in accordance with RTCA/DO-178B to criticality level C.



SUPPLIED EQUIPMENT

Each Data Converter is shipped with the following items:

Part Number	Description	Qty
1039-4000-01-001()	GDC23 Data Converter	1
1039-4200-01	Installation Kit, GDC23 Data Converter	1

Complete installation kits are available under kit part number 1039-4200-01. Individual pieces are available under the part numbers shown. Contact DAC International sales to place orders.

Part Number	Description	Qty
1039-4200-01	Installation Kit, GDC23	
M24308/2-2F	Connector, Receptacle, 15 pin D-Sub	1
M39029/63-368	Socket, Crimp Style, female	15
P10053	Slide Latch Kit	1
P10067	Backshell, 15-Pin D-Sub	1
1039-2510-01	Equipment Installation Manual for the GDC23	1



SPECIFICATIONS:

Physical:

The GDC23 attaches to the airframe via four mounting holes. See the paragraph titled Outline Drawing for further details.

Height.....1.25”
Width.....5.22” (Includes mounting flange)
Depth.....3.54”
Weight.....0.4 lb.

Electrical:

Input Voltage28 VDC Nominal (10Vdc – 32Vdc operational)
Input Current.....0.05 Amp at 28 VDC

Data Input:

FormatARINC 575
Baud Rate.....12.5 kBaud

Data Output:

FormatARINC 429
Baud Rate.....12.5 kBaud

Reliability:

MTBF.....Greater than 10,000 hours.

OPERATION:

The GDC23 Data Converter fitted with software –001() converts the following ARINC 575 labels to ARINC 429 format:

<u>Label (Octal)</u>	<u>Description</u>	<u>Rate</u>
203	Altitude (Pressure)	62.5mS
204	Altitude (Barometric)	62.5mS
205	Mach (1)	125mS
206	Computed Airspeed, CAS	125mS
210	True Airspeed	500mS
212	Altitude Rate	62.5mS
213	Static Air Temperature (1)	500mS

Any other labels received from the ARINC 575 source are discarded.

(1) Non-standard ARINC 575 label. See Appendix A

The converted ARINC 429 data labels are transmitted at the rates described in the table above.

Timeout of Input Data

Labels not received for five (5) or more times shall be considered stale. The GDC23 shall halt transmission of stale data.

<u>Rate</u>	<u>Time-out</u>
62.5mS	312mS
125mS	625mS
500mS	2500mS (2.5 seconds)



REMOVAL AND REPLACEMENT

Removal

1. Open the circuit breaker powering the GDC23.
2. Remove the connector by disengaging the slide latch then pulling the connector free.
3. Remove four (4) screws securing the unit to the airframe.

Replacement

1. Open the circuit breaker powering the GDC23.
2. Attach the unit to the airframe with four (4) screws.
3. Seat the connector pressing on the engaging the slide to secure.
4. Close circuit breaker.
5. Perform operational test of the GDC23 as prescribed in the aircraft maintenance manual.

EQUIPMENT CHECKOUT

The GDC23 provides conversion of the ARINC 575 data produced by the DADC into ARINC 429 format for use by the Weather RADAR system. There are no operator controls associated with the GDC23 unit. The DADC and Weather RADAR must both be operational in order to perform this functional checkout.

1. Apply power to the DADC and Weather RADAR
2. Perform the functional test of the RADAR system according to existing, approved maintenance data.



CONTINUED AIRWORTHINESS:

This section provides data intended to assist the installer with establishing Instructions for Continued Airworthiness as required by FARs 23.1529, 25.1529, 27.1529 and 29.1529.

1. Maintenance Manual information for the GDC23, which includes system description, removal instructions, installation instructions and functional testing is contained in DAC International Installation Manual, 1039-2510-01 (this document).
2. Line Replaceable Unit (LRU) part numbers and other parts contained in the installation data package should be placed in the aircraft operator's appropriate airplane Illustrated Parts Catalog (IPC).
3. Wiring diagram information contained in the installation data package should be placed in the aircraft operator's appropriate airplane Wiring Diagram Manual.
4. Scheduled Maintenance Program tasks are as follows:
 - a. Recommended Periodic Scheduled Servicing: None required
 - b. Recommended Periodic Scheduled Preventive Maintenance Tests..... None Required
 - c. Recommended Periodic Inspections: None Required
 - d. Recommended Periodic Overhaul Period None Required
 - e. Special Inspection Requirements None Required
5. Application of Protective Treatments None Required
6. Special Tools..... None Required
7. Electrical Loads for this appliance are as specified in the DAC International Installation Manual, 1039-2510-01 (this manual).
8. There are no Airworthiness limitations associated with the installation of this appliance.

ENVIRONMENTAL:

The GDC23 meets the environmental test categories detailed below in accordance with RTCA/DO-160D, Environmental Conditions and Test Procedures for Airborne Equipment.

NOMENCLATURE: Model GDC23 Data Converter
 PART NO: 1039-4000-01-XXXX
 MANUFACTURER: DAC International
 ADDRESS: 6702 McNeil Drive, Austin, TX 78729

Section	Category	Remarks
4.0 Temperature and Altitude	D1	50,000 Ft Temperature controlled
5.0 Temperature Variation	B	Partially controlled temperature
6.0 Humidity	A	Standard Humidity
7.0 Operational Shock and Crash Safety	D	Fixed wing
8.0 Vibration	L, M, C	Fixed Wing – Turbojet, Turbofan, Turboprop and reciprocating
9.0 Explosion Proofness	X	Not Tested
10.0 Waterproofness	X	Not Tested
11.0 Fluids Susceptibility	X	Not Tested
12.0 Sand and Dust	X	Not Tested
13.0 Fungus Resistance	X	Not Tested
14.0 Salt Spray	X	Not Tested
15.0 Magnetic Effect	A	0.3 meter to 1.0 meter
16.0 Power Input	B	Alternator / Rectifiers
17.0 Voltage Spike	B	56 volts
18.0 AF Conducted Susceptibility – Power Inputs	B	Alternator / Rectifiers
19.0 Induced Signal Susceptibility	A	
20.0 Radio Frequency Susceptibility (Radiated and Conducted)	V	50 volts/meter
21.0 Emission of Radio Frequency Energy	B	
22.0 Lightning Induced Transient Susceptibility	X	Not Tested
23.0 Lightning Direct Effects	X	Not Tested
24.0 Icing	X	Not Tested
25.0 ESD	X	Not Tested

CONNECTOR PIN OUT:

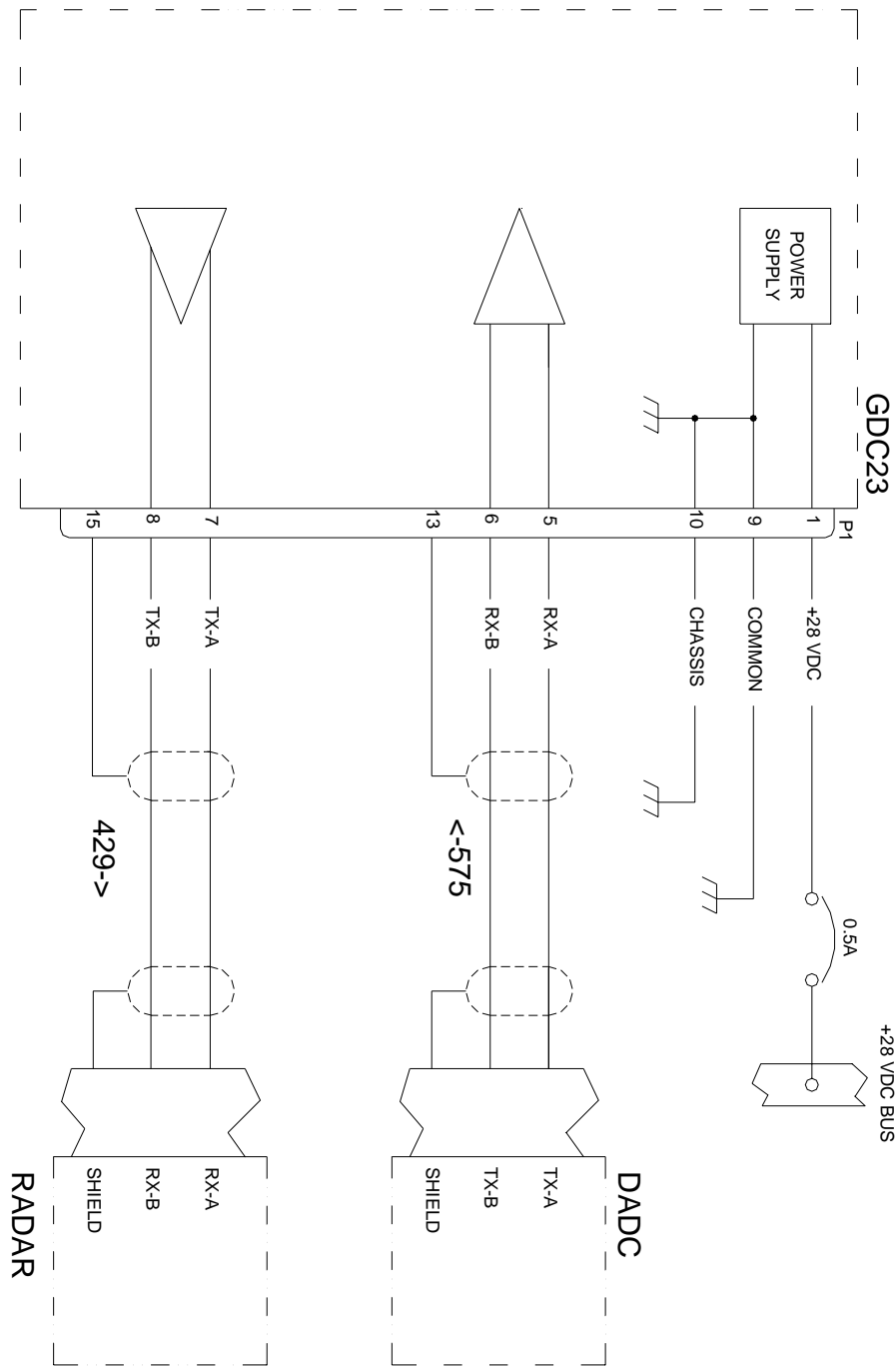
The GDC23 contains a single 15-pin male connector, J1, per MIL-C-24308, part number M24308/4-260F. The mating connector, P1, is described previously under the section “Equipment Supplied”.

Pin	Signal	Function
1	A+	28 Vdc Primary Power
2		Reserved (RS232 Output)
3		Reserved (RS232 Input)
4		Reserved (+12Vdc Vpp)
5	RX-A	575 Receive A
6	RX-B	575 Receive B
7	TX-A	429 Transmit A
8	TX-B	429 Transmit B
9	Power Common	28 Vdc Return
10	Aircraft Common	Chassis ground
11		Reserved (RS232 return)
12		Reserved (/PGM Enable)
13	Common	RX Shield
14		Spare (Common)
15	Common	TX Shield

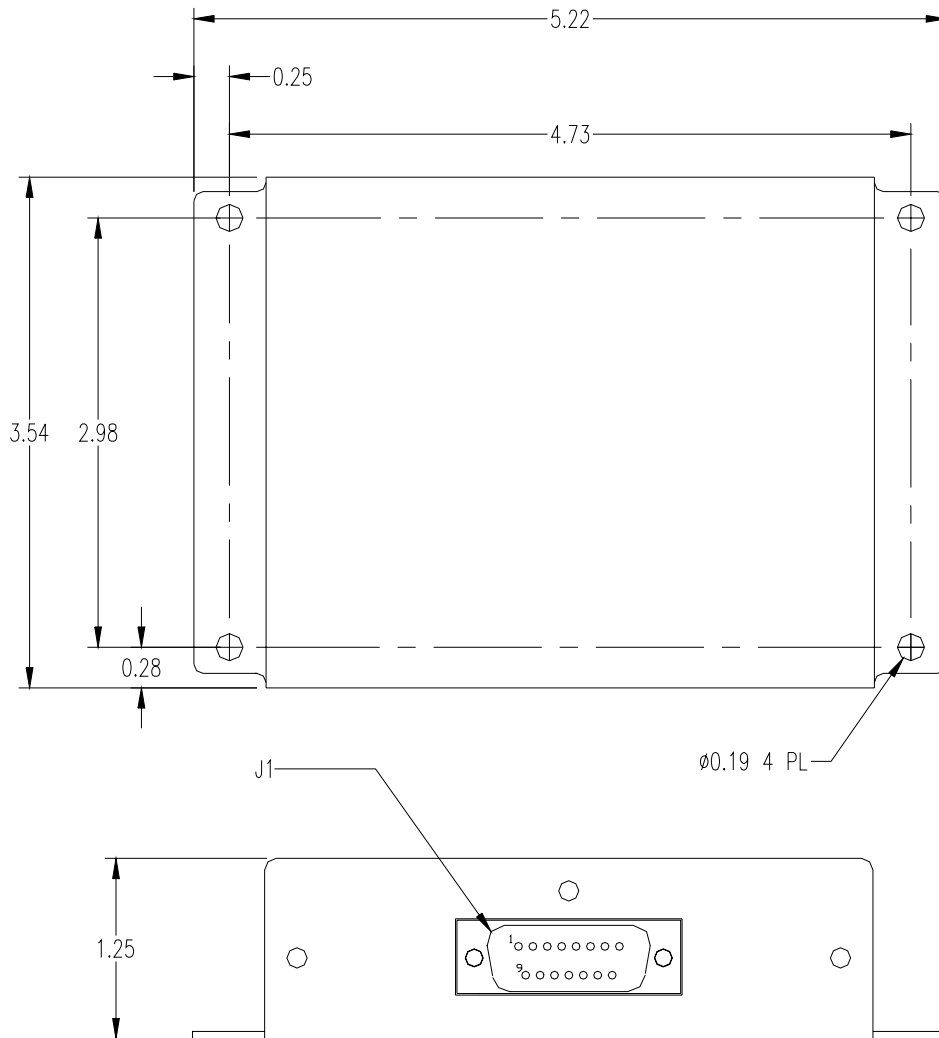
J1 Pin Description

NOTE: Do not use pins labeled Reserved. These are for factory test and In-Circuit-Programming

TYPICAL INTERCONNECT



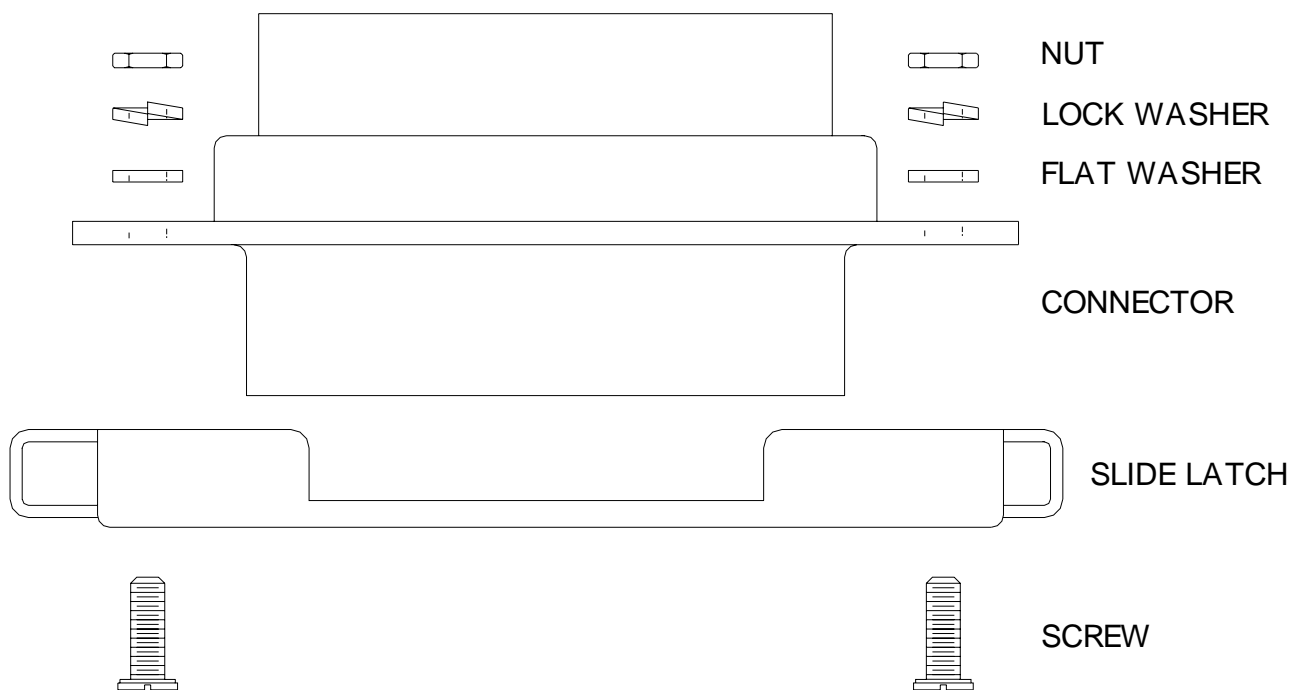
OUTLINE DRAWING



Note: Dimensions are in inches.

SLIDE LATCH ASSEMBLY

Assemble the slide latch mechanism, part number P10053, onto the mating connector as pictured using the hardware supplied with the slide latch.





APPENDIX A

Pressure Altitude Modifications

Pressure altitude shall be received as ARINC 575 BNR label 203. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	Altitude (2's compliment if negative)																pad				203 (octal)									

- P = odd parity
- SSM = sign status matrix
 - 00: positive
 - 01: fail/warning
 - 10: no computed data
 - 11: negative
- Resolution: 1.0 foot

Pressure altitude shall be transmitted as ARINC 429 BNR label 203. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	S	Altitude (2's compliment if negative)																0	SDI	203 (octal)										

- P = odd parity
- SSM = sign status matrix
 - 00: fail/warning
 - 01: no computed data
 - 10: test (not used)
 - 11: normal (input SSM positive or negative)
- S = sign bit, 0=positive
- SDI = Source Designation Indicator set to 00
- Range: +/- 131072
- Resolution: 1.0 foot



Baro-corrected Altitude Modifications

Baro-corrected altitude shall be received as ARINC 575 BNR label 204. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0		
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM		Baro Altitude (2's compliment if negative)															pad		204 (octal)											

P = odd parity

SSM = sign status matrix

00: positive

01: fail/warning

10: no computed data

11: negative

Operational Range: -1000 to 50,000 feet

Resolution: 1.0 foot

Baro-corrected altitude shall be transmitted as ARINC 429 BNR label 204. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	S	Baro Altitude (2's compliment if negative)															0	SDI	204 (octal)											

P = odd parity

SSM = sign status matrix

00: fail/warning

01: no computed data

10: test (not used)

11: normal (input SSM positive or negative)

S = sign bit, 0=positive

SDI = Source Designation Indicator set to 00

Range: +/- 131072

Resolution: 1.0 foot



Computed Airspeed Modifications

Computed Airspeed shall be received as ARINC 575 BNR label 206. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0			
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM		Airspeed (2's comp. if negative)														pad				206 (octal)										

P = odd parity

SSM = sign status matrix

00: positive

01: fail/warning

10: no computed data

11: negative

Operational Range: 30 to 450 knots

Resolution: 0.25 knots

Computed Airspeed shall be transmitted as ARINC 429 BNR label 206. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	S	Airspeed (2's compliment if negative)														pad			SDI	206 (octal)										

P = odd parity

SSM = sign status matrix

00: fail/warning (input SSM fail/warning or negative)

01: no computed data

10: test (not used)

11: normal (input SSM positive)

S = sign bit, 0=positive

SDI = Source Designation Indicator set to 00

Range: +/- 1024 knots

Resolution: 0.0625 knot



True Airspeed Modifications

True Airspeed shall be received as ARINC 575 BNR label 210. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0		
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM		Airspeed (2's comp. if negative)										pad					210 (octal)													

P = odd parity

SSM = sign status matrix

00: positive

01: fail/warning

10: no computed data

11: negative

Operational Range: 130 to 599 knots

Resolution: 1.0 knot

True Airspeed shall be transmitted as ARINC 429 BNR label 210. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM		S	Airspeed (2's compliment if negative)										pad					SDI	210 (octal)											

P = odd parity

SSM = sign status matrix

00: fail/warning (input SSM fail/warning or negative)

01: no computed data

10: test (not used)

11: normal (input SSM positive)

S = sign bit, 0=positive

SDI = Source Designation Indicator set to 00

Range: +/- 2048 knots

Resolution: 0.0625 knot



Altitude Rate Modifications

Altitude Rate shall be received as ARINC 575 BNR label 212. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM		Rate (2's comp. if negative)										pad										212 (octal)								

P = odd parity

SSM = sign status matrix

00: positive

01: fail/warning

10: no computed data

11: negative

Operational Range: +/- 20,000 feet/minute

Resolution: 20 feet/minute

Altitude Rate shall be transmitted as ARINC 429 BNR label 212. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	11	1	0	0	0	0	0	0	0	0	0	0
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2		0	9	8	7	6	5	4	3	2	1	
P	SSM		S	Altitude Rate (2's compliment if negative)										pad										SDI		212 (octal)						

P = odd parity

SSM = sign status matrix

00: fail/warning

01: no computed data

10: test (not used)

11: normal (input SSM positive or negative)

S = sign bit, 0=positive

SDI = Source Designation Indicator set to 00

Range: +/- 32768 feet/minute

Resolution: 16 feet/minute



Static Air Temperature Modifications

Static Air Temperature shall be received as ARINC 575 BNR label 213. The format transmitted to the GDC23 differs from standard ARINC 575 in that the data is shifted two places right. The input format is expected to be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	pad	Temperature (2's compliment if negative)										pad										213 (octal)								

P = odd parity

SSM = sign status matrix

00: positive

01: fail/warning

10: no computed data

11: negative

Operational Range: -99 to +50 degrees

Resolution: 0.5 degree

Note: This input format is not standard ARINC 575.

Static Air Temperature shall be transmitted as ARINC 429 BNR label 213. The transmit format shall be as follows:

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1
P	SSM	S	Temperature (2's compliment if negative)										pad										SDI	213 (octal)							

P = odd parity

SSM = sign status matrix

00: fail/warning

01: no computed data

10: test (not used)

11: normal (input SSM positive or negative)

S = sign bit, 0=positive

SDI = Source Designation Indicator set to 00

Range: 0 to 512 degees

Resolution: 0.5 degree C