



## Genesys Control Panel (GCP) Component Description

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## Section 1 Physical Description

The Genesys Control Panel (GCP) provides a dedicated control interface for the GDR family of radios. One or multiple GDRs radio may be controlled via a GCP depending on system configuration. The GCP may be user configured for audio control of the radio. This is normally used for a single pilot system when an audio panel is not installed because audio control in this manner affects all users.

The GCP consists of a LED dot matrix display, a dual concentric encoder knob with a center push function, and a numeric keypad. The GCP is a dumb terminal, which reports the activation of the encoders and buttons to an external GDR or IDU over a serial bus. The processed results are returned over the serial bus and displayed on the LED display. Thus, the software that that interprets the encoder and button actuations with the resulting LED displayed information resides outside of the GCP with the exception of the dimming function. Operation may differ depending on connection to an IDU or a GDR radio.

Up to eight GCPs may be installed with an IDU and may be configured to control multiple GDR radios. The GCP RS-422 address is controlled by pin strapping in the wiring harness. Only a single GCP can be directly connected to a GDR radio and in this instance only one GDR is controlled by the GCP.

The GCP utilizes the SDI discrete strapping from the GDR radio to determine automatically which GDR radio number is displayed when connected directly to a GDR. When connected to an IDU, multiple GDR radios may be controlled by a single GCP and the IDU determines what radio number is displayed. Due to this difference, pages of the GCP may function differently depending on IDU or GCP control. The GCP interfaces to a GDR using the RS-232 bus and an IDU using the RS-422 bus.

All references of controller in this document refer to an external device that is designed to interface with the GCP, which at this time is either a GDR or an IDU.

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The GCP has a signal bayonet connector located on the rear of the box for all connections.  
The GCP is designed for a standard DZUS mounting rack.



**Figure 1-1: GCP**

## Section 2 Part Numbers

Table 2-1: Part Numbers	
Unit	Part Number
Genesys Control Panel (GCP)	42-041001-0001
GCP Install Kit	42-041003-0001

## Section 3 Applicable TSOs

The GCP meets the requirements of the following TSO.

Table 3-1: TSOs and MOPS		
TSO	Title	MOPS
TSO-C113b	Airborne Multipurpose Electronic Displays	SAE AS8034C

## Section 4 Functions/Performance

The GCP's functionality is generally determined by the external controller. This includes how the encoder and key inputs are interpreted and what resulting messages are displayed. Therefore, details of the functionality must be considered at a system level and operation may vary slightly depending on the controller. The User Manual is the controlling document for this purpose.

**Table 4-1: Typical GCP User Interface Functionality**

Encoder/Button	Function
Numbers '0-CH' to '9' buttons	The numeric keypad is used for making numerical entries as defined in the User's Manual. Primarily these are for frequency or stored channel number entry. Any entry starting with a '0-CH' is interpreted as a channel number. Otherwise, this button is used for entering a numeric zero.
Back '<X' button	<ol style="list-style-type: none"> <li>1) Pressing the "&lt;x" button during a numeric entry may be used to correct an error by erasing and moving backward to the previous entry digit.</li> <li>2) Pressing the "&lt;x" button simultaneously with the "□□" button activates the "Dimming Mode".</li> <li>3) Pressing the "&lt;x" button anytime while in dimming mode, exits the dimming mode.</li> </ol>
'□□' button	<ol style="list-style-type: none"> <li>1) Pressing the "□□" button will swap the active and standby frequencies of the currently selected radio function.</li> <li>2) Pressing the "□□" button simultaneously with the "&lt;x" button activates the "Dimming Mode".</li> <li>3) Pressing the "□□" button anytime while in dimming mode, exits the dimming mode.</li> </ol>
'MENU' button	Pressing the 'MENU' button will access or exit the sub-menu for the currently selected function.
Dual concentric rotary encoder, outer knob, 'FUNC'	Rotating the outer encoder knob, 'FUNC', will scroll through the various functions available on the current page. Normally the function or active display line is indicated by a preceding '▶' symbol. Additional functions may come into view when the bottom of the page is reached.
Dual concentric rotary encoder, inner knob, 'CTRL'	The inner encoder knob 'CTRL' controls the currently selected function, e.g., volume. This also adjusts the brightness of the GCP when the "Dimming Mode" is active.

**Table 4-1: Typical GCP User Interface Functionality**

<b>Encoder/Button</b>	<b>Function</b>
Dual concentric rotary encoder, push function	The rotary inner knob has a push function. This is normally used to toggle functional modes of the currently selected line, e.g. Marker sensitivity. Refer to the user manual for full functionality.



## Section 5 Unit Dimensions

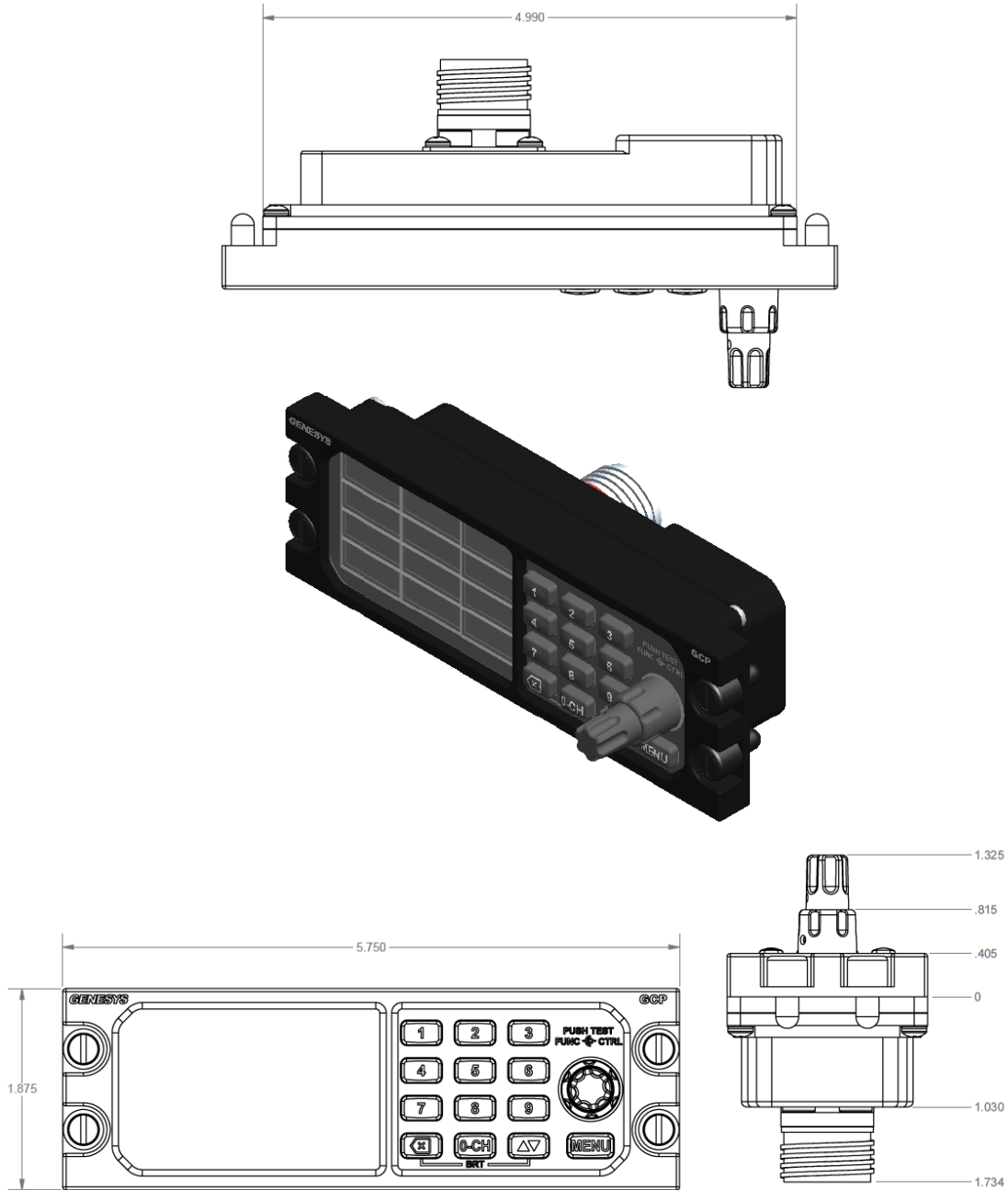


Figure 5-1: GCP

## Section 6 3D Model

Forthcoming

## Section 7 Installation Manual

Forthcoming

## Section 8 Weight

Table 8-1: Weight	
Component	Weight
GCP	1.2 lbs.

## Section 9 Electrical Aspects

The GCP operates from 9 VDC to 32 VDC.

Table 9-1: Electrical Characteristics	
Component	Power Consumption
GCP	10 Watts @ 28VDC

## Section 10 Thermal Aspects

No external cooling is required when used in a habituated cargo space.

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## **Section 11     Lighting and NVG Compatibility**

The GCP is equipped with four rows, 12 columns dot-matrix-LED display. Each character element is a 5 x 7 dot matrix supporting 48 characters. The display provides a variable brightness level.

The GCP has two dimming bus inputs for independent control of the button backlight and LED display via the aircrafts' master dimming bus(es). Multiple standard lighting curves are selectable and a custom lighting curves is supported. Independent dimming by the GCP front panel's control is also available and will be enabled when the dimming bus is absent.

The GCP is NVG compatible and a NVG lighting curve is enabled when the NVG Mode discrete input pin is pulled low.

## **Section 12     Electrical Interfaces**

The GCP has a single 22 pin connector, which includes A/C power input, two dimming bus inputs, identification strapping, three discrete programmable outputs, an RS-422 bus, and an RS-232 bus.

There are two GCP lighting bus inputs to connect to the aircraft's dimming system, which provided independent dimming of the bezel and LED display. The remote backlighting can be configured for 5 VDC or 28 VDC dimming buses.

An NVG Mode input discrete pin allows remote enabling of an NVG lighting curve. This is normally connected to an instrument panel NVG enable switch.

Three discrete output pins are available, which their state may be programmed via software.

## Section 13 Environmental Characteristics

Section	Conditions	Cat.	Test Notes
4.0	Temperature and Altitude	F2	Operating Low: -55°C Operating High: +70°C Ground Survival Low: -55°C Ground Survival High: +85°C Altitude: +55,000 feet
4.5.5	In-Flight Loss of Cooling	X	Not Applicable
4.6.2	Decompression	X	Not Applicable
4.6.3	Over Pressure	X	Not Applicable
5.0	Temperature Variation	B	-55 to +70C @ 5 °C/Min.
6.0	Humidity	B	
7.0	Operational Shock / Crash Safety	B	Aircraft Type 5, Test Type R for Crash Safety Sustained Test
8.0	Vibration	H, R, U	Category H (Curve R) Category R (Curve B & B1) Category U (Curve G)
9.0	Explosion Atmosphere	X	Not Applicable
10.0	Waterproofness	W	
11.0	Fluids Susceptibility	X	Not Applicable
12.0	Sand and Dust	S	
13.0	Fungus Resistance	F	By Analysis
14.0	Salt Fog	S	
15.0	Magnetic Effect	Z	
16.0	Power Input	Z	200 ms Power Interruption Capacity
17.0	Voltage Spike	A	
18.0	Audio Frequency Conducted Susceptibility	Z	
19.0	Induced Signal Susceptibility	ZC	
20.0	Radio Frequency Susceptibility	W/WR	Conducted: W Radiated: WR
21.0	Emission of Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	A3J3L3	
23.0	Lightning Direct Effects	X	Not Applicable
24.0	Icing	X	Not Applicable
25.0	Electrostatic Discharge (ESD)	A	
26.0	Fire Flammability	C	By analysis

## Section 14 Reliability

MIL-STD 217, Airborne Inhabited Cargo (AIC) and Airborne Rotary Wing (ARW) at 30°C.

<b>Table 14-1: Mean Time Between Failures</b>		
<b>Component</b>	<b>AIC MTBF</b>	<b>ARW MTBF</b>
GCP	45377 Hours	12103 Hours

## Section 15 Software and Hardware Certification

All Software is compliant with RTCA/DO-178C, Level-B.

The GCP contains no complex electronic hardware; therefore, RTCA/DO-254 is not applicable.

## Section 16 Built-In Test

The GCP performs an initialization test on startup and continuous watchdog test during operation.

## Section 17 Export

Commodity jurisdiction from the U.S. State Department is listed as NON-ITAR Controlled. Exporting is available under U.S. Commerce Department General License 7A994.