



RCA2610-3P SERIES

MINI 6



P/N: 102-0403-15-17 & 102-0403-15-18

INSTALLATION/OPERATION GUIDE

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REVISION DETAIL

REVISION	DATE	DETAIL
A	06/07/2021	Initial Release
B	08/26/2021	Update Software version (Table 1.1), and Flight Limitations (page 13).
C	10/12/2021	Correction to instrument weight (Table 1.1).
D	11/17/2021	Update Software Version.
E	11/4/2022	Updated Software Version, Data Units (page 5), Menu Styles (pages 6 & 10), and Pre-Flight procedures (page 9).

SECTION 1: INSTRUMENT DESCRIPTION

1.1 GENERAL DESCRIPTION

The **RCA2610-3P Mini6** is a Digital Multi-Function Indicator (MFI) with a built-in battery backup. The display consists of an Attitude, Heading, Altimeter, Airspeed, Rate of Climb, and Turn and Slip indicator. Each function can be added or subtracted to the display and can be individually customized by the user.

Because the **Mini6** has no mechanical gyroscope, it is much more stable than traditional horizons. The unit is designed to work in 360 degrees of pitch and roll and, unlike a mechanical unit, the **Mini6** can tolerate angles in pitch and roll that would cause a mechanical gyroscopic unit to tumble.

1.2 PHYSICAL DESCRIPTION

The **Mini6** is a totally Digital Indicator that fits in the standard 3-inch panel cutout without any special modification to the panel. (See table 1.1 *leading particulars* below).

<u>PART NUMBERS</u>	Standard Configuration: 102-0403-15-17 NVIS configuration: 102-0403-15-18
<u>OPERATING VOLTAGE</u>	9 to 32VDC
<u>RUNNING CURRENT</u>	(14VDC SYSTEM) 0.35 AMP MAX (28VDC SYSTEM) 0.20 AMP MAX
<u>CIRCUIT BREAKER SIZE</u>	1 AMP
<u>SETTLING ERROR</u>	1° MAXIMUM IN ROLL AND PITCH
<u>OPERATING TEMPERATURE RANGE</u>	-20° TO +55° C
<u>MATING CONNECTOR</u>	MS3116E8-4S OR EQUIVALENT
<u>WEIGHT</u>	8.3 oz (235.3 g)
<u>DISPLAY RESOLUTION</u>	320 X 240 Pixels, LED Backlight, Color LCD
<u>MAXIMUM INDICATED AIRSPEED</u>	300 kts
<u>ALTITUDE RANGE</u>	-5,000 to 33,000 feet
<u>BAROMETRIC RANGE</u>	Imperial: 27.49 inHg to 31.51 inHg, Metric: 930.8 mb to 1067.0 mb
<u>VERTICAL SPEED RANGE</u>	± 9,000 feet/minute
<u>PITCH/ROLL RANGE</u>	± 360°
<u>BATTERY BACKUP</u>	Rechargeable LiPO, 3.7V 500mAh (1.85 Wh)
<u>BATTERY LIFE</u>	Up to 3 hours
<u>DIMENSIONS/PANEL CUTOUT</u>	(See Figure 2.1 <i>General Dimensions</i>)
<u>EYE VIEWING ANGLE ENVELOPE</u>	Horizontal Left and Right: 35° Left, 35° Right Vertical Up and Down: 35° Up, 35° Down Minimum distance from display surface: 6 inches Maximum distance from display surface: 48 inches
<u>SOFTWARE VERSION</u>	Version 3.1.14
<u>FAA SPECIFICATION CONFORMANCE</u>	TSO-C4c, TSO-C113a, TSO-C3e TSO-C6e, TSO-C2d Type B, TS-OC10c, TSO-C8e Type B, DO-160G and DO-178B Level C, DO-347
<u>MEETS OR EXCEEDS</u>	AS396B, AS8034B, AS8004, AS8013A, AS8019, AS8009C, AS8016A

TABLE 1.1, LEADING PARTICULARS

SECTION 2, INSTALLATION

2.1 GENERAL INFORMATION

The conditions and tests required for the TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have a separate approval for installation in an aircraft. The article may be installed only if performed under 14CFR Part 43 or the applicable airworthiness requirements.

For certain classes of Part 23 aircraft level C of DO-178B certification may not be sufficient - check with your local regulatory authority prior to installation.

2.2 HANDLING

Although the **Mini6** is totally electronic, improper handling can cause damage. Please observe the following precautions while handling.

1. Do not drop, jar or shake instrument. Store instrument in shipping container until installation.
2. Instruments should be transported in the original shipping container when moved to and from aircraft. If container is not available, carefully carry by hand in upright position.
3. Avoid touching the screen. This is the most vulnerable part of the instrument. Improper handling and cleaning can cause permanent scratching of the screen surface (See *Instrument Care* on Page 15).
4. To prevent further damage, a malfunctioning instrument should be handled as carefully as a new instrument. Most malfunctioning instruments can be repaired and returned to service. Contact Kelly Manufacturing Company for repair and warranty information.

2.3 PRE-INSTALLATION INSPECTION

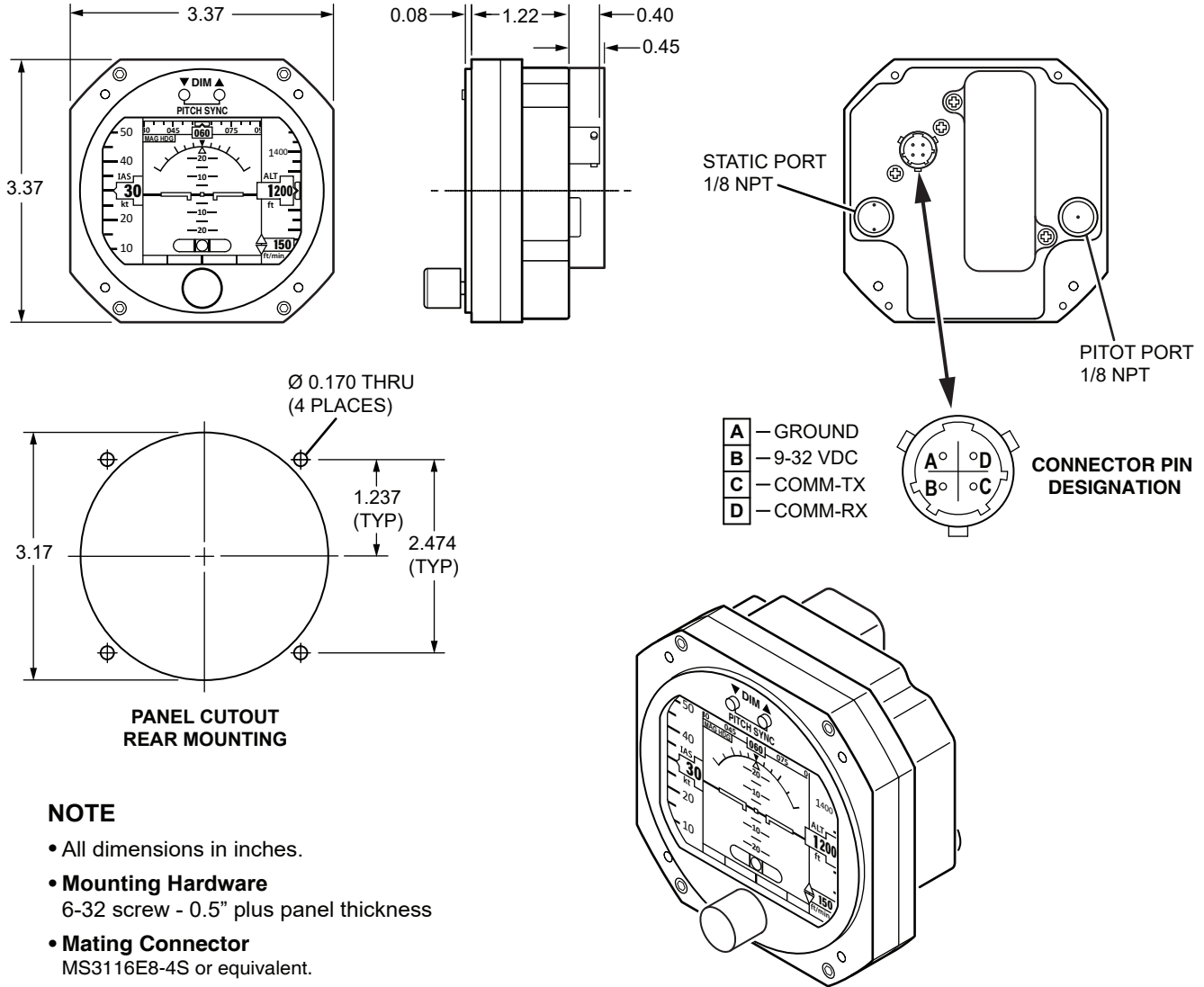
1. When the instrument is first received, inspect container for any shipping damage.
2. Carefully remove the instrument from shipping container and retain container for later storage or shipping.
3. Inspect the instrument for any signs of damage. Contact your Shipper to file any claim due to shipping damage.

2.4 INSTALLATION

Install the instrument on the aircraft by using the aircraft manufacturer's recommendations and by the following steps:

1. The **Mini6** uses standard panel cutouts. (See Figure 2.1 for cutout information).
2. Instrument Pinout:
 A = Ground **D** = RS232 Communication Receive*
 B = Power **C** = RS232 Communication Transmit
 *Connect the RS232 GPS output signal to **PIN D** configured for an aviation application at a baud rate of 9600. (See figure 2.1).
3. Attach pitot-static lines and aircraft electrical connector to the instrument and insert into the instrument panel cutout (See Figure 2.1).
4. Secure instrument with supplied screws. Use 6-32 UNC-2b screws or equivalent. Screw length should not exceed 0.5 inches plus bezel and panel thickness. Do not tighten.
5. With the aircraft on level surface, apply power to the instrument and allow it to warm up for 3 minutes.
6. Adjust roll position of the instrument by visually aligning the roll pointers. The Horizon Line should be level and unbroken. Tighten screws.

Do Not modify the instrument in any way. Any modifications will void the warranty and revoke the FAA certifications.



NOTE

- All dimensions in inches.
- **Mounting Hardware**
6-32 screw - 0.5" plus panel thickness
- **Mating Connector**
MS3116E8-4S or equivalent.

Figure 2.1, General Dimensions

SECTION 3, INITIAL SETUP/CALIBRATION

3.1 SETUP/CONFIGURATION

The **Mini6** indicator comes standard with multiple configurations and customizable options which will require some minor setup before any flights are performed.

To access the configuration menu perform the following procedure:

Apply power to the **Mini6** indicator while holding down the two DIM buttons (located at the top of the unit) until the blue loading screen is displayed. Once the unit finishes loading, the configuration menu will be displayed on the unit as shown in figure 3.1 below. Turn the selection knob to the desired menu setting and push to open the menu.



Figure 3.1 Configuration Menu

OPTIONS MENU

The **Options** menu is used to customize user preferences by turning ON/OFF the various functions offered by the **Mini6**. These functions are as follows: Slip Indicator, Rate of Turn Indicator, Air Data (Airspeed & Altimeter), Vertical Speed Indicator, Heading Indicator and Pitch Sync (refer to section 4.4.2 for pitch sync description).

SETTINGS MENU

The **Settings** menu is used to configure application requirements. These include:

- **Panel Tilt** – If the **Mini6** is being installed into an aircraft/rotorcraft with a tilted panel, then the tilt angle (in degrees) must be entered here prior to flight so the **Mini6** indication can offset the tilted panel.
- **Airspeed Color-coded Marks** – This menu option is used to configure the recommended airspeeds (V-Speeds) and the ranges of the color-coded marks of the Airspeed indicator. Refer to the Pilot's Operating Handbook of the specific aircraft that the **Mini6** is being installed for these important V-Speeds. The 'Flaps Operating Range' (White), 'Normal Operating Range' (Green), the 'Caution Speed Range' (Yellow), the 'Maximum Speed' (Red) as well as the 'Maximum Glide Speed' and the 'Minimum Control Speed' must be entered here prior to flight.

DEFINITION OF TERMS:

- Vs0 – Stall speed or minimum flight speed in landing configuration
- Vfe – Maximum flap extended speed
- Vs1 – Stall speed or minimum steady flight speed for which the aircraft is still controllable in a specific configuration
- Vn0 – Maximum speed for normal operations
- Vne – Never exceed speed
- Vyse – Best rate of climb speed with a single operating engine in a light, two engine aircraft – the speed that provides the most altitude gain per unit of time following an engine failure.
- Vmc – Minimum Control Speed is a V-Speed that specifies the calibrated airspeed below which directional or lateral control of the aircraft can no longer be maintained, after the failure of one or more engines.

- **Data Units** – This menu option is used to select between Metric and Imperial Units for the Airspeed, Altimeter, Barometric Pressure, and Vertical Speed indicators.
- **Reset Battery Health** –Used to reset Battery Health when installing a new battery (See Section 4.8 *Battery Replacement*).

CALIBRATION MENU

The Calibration menu is used to calibrate the Air Data Instruments (Airspeed and Altimeter). (See Section 3.2 *Calibration*).

FLIGHT MENU STYLE

This menu option is used to configure user preferences for the Flight Menu (reference section 4.4.1).

The Flight Menu user preference options are as follows:

Menu Movement Styles

- Knob Rot. (Knob Rotation): navigate Flight Menu by rotating the Selection Knob.
- Knob Click: navigate Flight Menu by push-clicking the Selection Knob.

Selection Knob Rotation Action Styles

Configure the default action of Selection Knob rotation.

- None: no actions when rotated.
- Heading Bug: moves the Heading Bug when rotated.
- Baro Press (Barometric Pressure): moves the barometric pressure setting when rotated.

DIAGNOSTICS

Use for viewing instrument details as shown below.

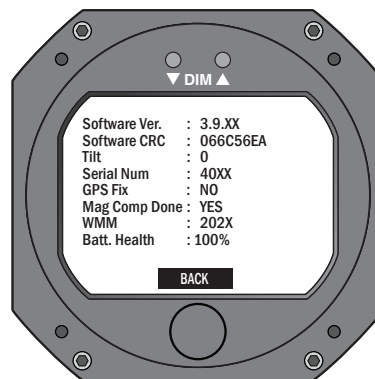


Figure 3.2 Diagnostics Screen

EXIT

Select to Exit the menu.

3.2 CALIBRATION

ALTIMETER CALIBRATION PROCEDURE:

1. Connect unit to a pitot static test machine.
2. Take the readings of the altitude shown on the **Mini6** instrument when the testing machine is set to 0 ft, 4000 ft, 10000 ft, 20000 ft and 30000 ft.
3. Subtract the instrument reading from the reference value, for example 4000 ft – 4030 ft = -30 ft. Do this for the 5 correction points. Write down the correction values.
4. Turn the unit OFF.
5. Access the configuration menu by holding down the two DIM Buttons while applying power and select: Calibration -> Altimeter Calibration (See Section 3.1).
6. In the menu set the correction at each testing point adding the correction obtained in step 3 to the previous correction that the instrument had. Write down the new correction values.
7. After all the values are set select the option SAVE CALIBRATION & BACK and press the knob to save the calibration data.

8. Turn the unit OFF.
9. Access the configuration menu by holding down the two DIM Buttons while applying power and select: Calibration -> Altimeter Calibration.
10. Check that the new correction values were actually saved.
11. Exit the menu. It is not necessary to cycle the power.
12. Test the instrument for accuracy.

If the instrument is set to metric units the calibration points are 0m, 1200m, 3000m, 6000m and 9000m.

AIRSPPEED CALIBRATION PROCEDURE:

1. Connect unit to a pitot static test machine.
2. Take the readings of the airspeed shown on the **Mini6** instrument when the testing machine is set to 40 kt, 80 kt, 140 kt and 250 kt.
3. Subtract the instrument reading from the reference value, for example 140 kt – 145 kt = -5 kt. Do this for the 4 correction points. Write down the correction values.
4. Turn the unit OFF.
5. Access the configuration menu by holding down the two DIM Buttons while applying power and select: Calibration -> Airspeed Calibration.
6. In the menu set the correction at each testing point adding the correction obtained in step 3 to the previous correction that the instrument had. Write down the new correction values.
7. After all the values are set select the option SAVE CALIBRATION & BACK and press the knob to save the calibration data.
8. Turn the unit OFF.
9. Access the configuration menu by holding down the two DIM Buttons while applying power and select: Calibration -> Airspeed Calibration.
10. Check that the new correction values were actually saved.
11. Exit the menu. It is not necessary to cycle the power.
12. Test the instrument for accuracy.

If the instrument is set to metric units the calibration points are 75 km/h, 150 km/h, 260 km/h and 460 km/h

3.3 INITIAL FLIGHT/FLIGHT TEST

To produce accurate information, after the installation or when deviations in the heading are noticed, the instrument needs to be compensated for the aircraft magnetic field. This deviation can also be the result of installing a new instrument close to the heading indicator, or any change in the aircraft than can affect the magnetic field.

The **Magnetic Calibration** procedure has the goal of finding the magnetic field of the aircraft. During the magnetic calibration procedure, the instrument senses what part of the magnetic field rotates together with the instrument, and considers this the magnetic field of the aircraft. This magnetic field is then subtracted from the measured magnetic field, to obtain the earth's magnetic field used to calculate the heading.

Refer to the Magnetic Compensation procedure in Section 4.4.1

ADJUSTMENTS:

After flight testing and evaluation, additional calibration may be required depending on the users application. Communicate flight test data with Kelly Manufacturing Company to determine appropriate adjustments.

SECTION 4, OPERATION GUIDE

4.1 PRIMARY DISPLAY FEATURES

See Figure 4.1 below for Primary Display Features.

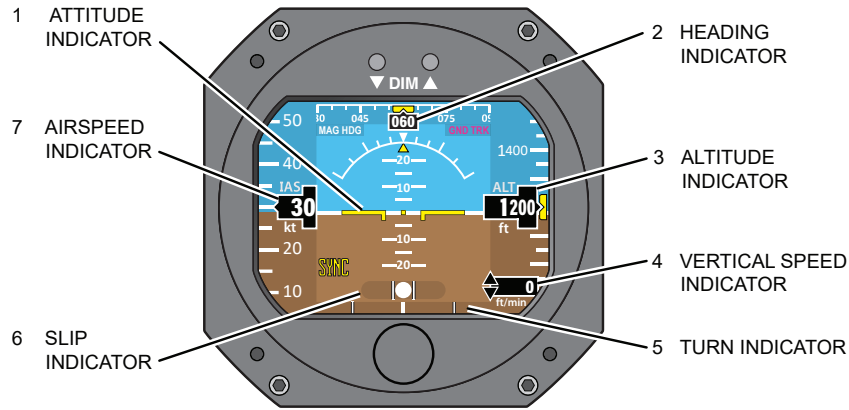


Figure 4.1, Primary Display Features

1 ATTITUDE INDICATOR

Indicates the Pitch and Roll in relation to the Horizon and the Symbolic Airplane.

2 HEADING INDICATOR

Indicates current heading (which consists of a numerical display, a scrolling dial and adjustable Heading Bug).

3 ALTITUDE INDICATOR

Indicates changes in altitude (which consists of a numerical display, a scrolling dial and adjustable Altitude Bug).

4 VERTICAL SPEED INDICATOR

Displays the rate of climb or descent (See Figure 4.2 below).

5 TURN INDICATOR

Displays graduated scale to provide standard Rate of Turn (See Figure 4.2 below).

6 SLIP INDICATOR

Also referred to as an Inclinometer, the Digital Slip Indicator measures the relative strength of the force of gravity and the force of inertia caused by a turn; thus indicating whether the aircraft is slipping or skidding.

7 AIRSPEED INDICATOR

Displays the current airspeed (which consists of a numerical display, and scrolling dial).

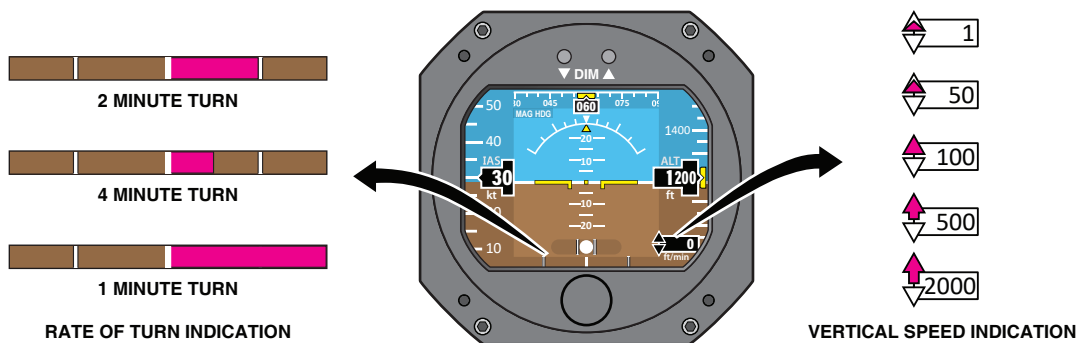


Figure 4.2, Rate of Turn & Vertical Speed Indication

4.2 STATUS DISPLAYS

See Figure 4.3 below for typical Status display features.

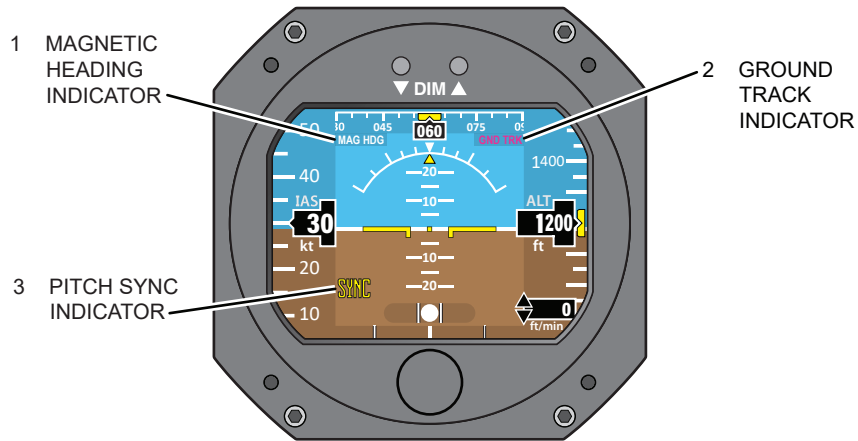


Figure 4.3, Status Displays

1. MAGNETIC HEADING INDICATOR

The Magnetic Heading Indicator (MAG HDG) will be visible when using the Magnetic Heading mode.

2. GROUND TRACK INDICATOR

The Ground Track Indicator (GND TRK) will be visible when using the GPS Ground Track mode.

3. PITCH SYNC INDICATOR

Indicates that the Pitch Synchronization feature is active when visible (See Section 4.4.2 *Pitch Sync Activation*).

4.3 PRE-FLIGHT PROCEDURES

During pre-flight procedures, the instrument must be provided with adequate electrical power under normal vibration conditions (engine running). A red "X" appears across the screen indicating that the instrument is booting up. A red "X" also appears on the Vertical Speed Indicator while it stabilizes. After the red "X" disappears from both the main screen and the VSI, the instrument is fully functional. After 3 minutes, the instrument reaches its optimum performance level.

Check that the Battery Charge Status Indicator displays at least 50% charge to ensure a minimum of 30 minutes of operation in the event of a power failure.

NOTE

On tail-dragger aircraft, the indicator will not show as level until after achieving level flight. No adjustment are necessary when level flight is achieved.

4.4 IN FLIGHT PROCEDURES

4.4.1 FLIGHT MENU

To access the **Flight Menu**, Press the Flight Menu Selection Knob. The Flight Menu will appear on the lower portion of the screen. Rotate the Selection Knob to the desired setting and press the Selection Knob to select the highlighted menu option. Rotate the Selection Knob to the desired number or action and press Selection Knob to set. (See Figure 4.4 below).

NOTE

The Flight Menu can be configured to different optional movement styles. Movement within the Flight Menu can be set by either rotating the Selection Knob (default) or by pressing the Selection Knob (Knob Click). The Selection Knob can also be configured to directly access either the Heading Bug (default) or the Barometric Pressure Setting. (See Section 3.1 for how to configure Menu Styles).

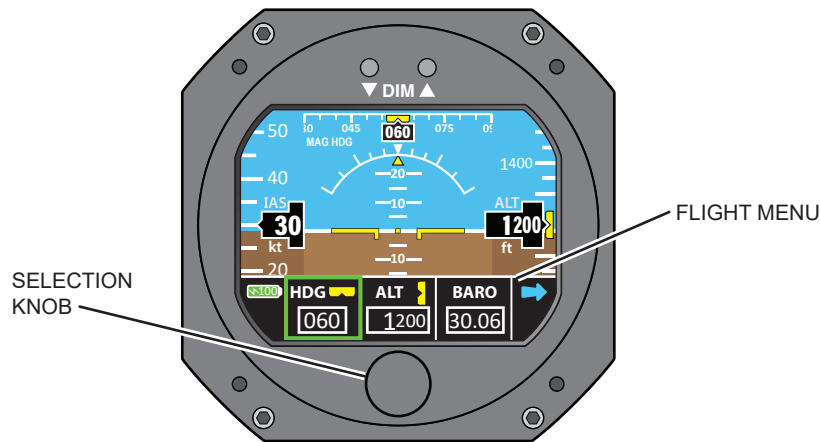
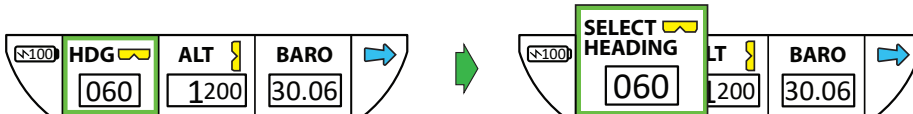


Figure 4.4 Flight Menu

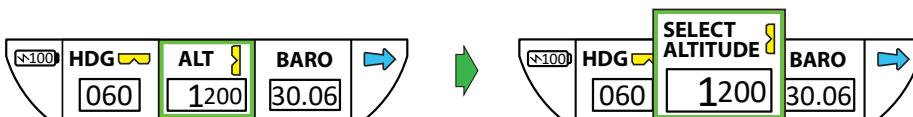
HEADING

This flight menu option is used to input the desired heading. This desired heading number will be represented on the Heading Indicator tape by a yellow heading bug. This feature can also be quick accessed by rotating the Selection Knob.



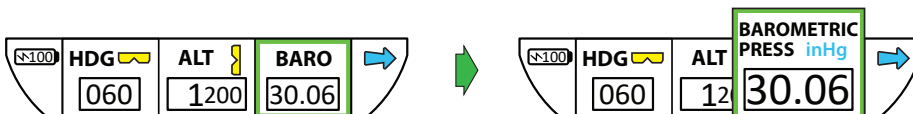
ALTITUDE

This flight menu option is used to input the desired altitude. This desired altitude number will be represented on the Altimeter Indicator tape by a yellow altimeter bug.



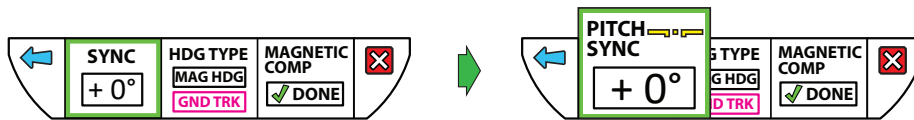
BAROMETRIC PRESSURE

This flight menu option is used to input the Barometric pressure.



PITCH SYNC

This flight menu option is used to input an offset for the symbolic airplane if necessary.



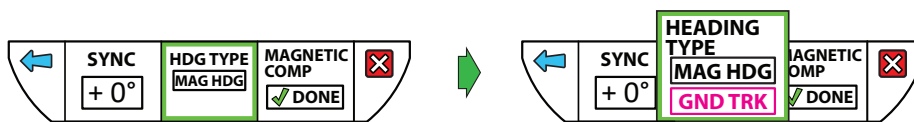
A “Quick Access” **Pitch Sync** is also available by simultaneously pressing both **DIM** buttons (See Section 4.4.2 *Pitch Sync Activation*). If you typically fly in a “nose down” or “nose up” pitch attitude, you can adjust the Airplane Symbol to match the Horizon Line on your instrument. The Pitch Synchronization (Pitch Sync) feature allows you to instantly sync the Airplane Symbol to the Horizon.

NOTE

This feature is not necessary for most aircraft and is to be used only in situations where normal flight pitch is deviated from 0 degrees.

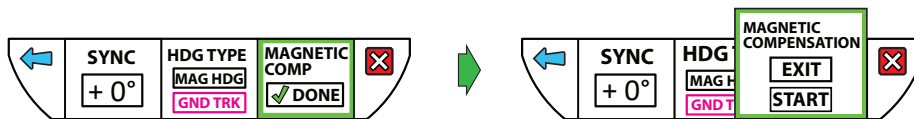
HEADING TYPE

The **Mini6** indicator offers two Heading Indicator types – **Magnetic Heading** and **Ground Track** (using GPS data). The green blinking light next to the “**GND TRK**” Heading Type option indicates that the **Mini6** is receiving GPS data. This Flight Menu option is used to select between the two Heading Types.



MAGNETIC COMPENSATION

This flight menu option is used to perform the **Magnetic Compensation** procedure.



To compensate the instrument to eliminate the magnetic interference from the aircraft do the following:

1. After the **Mini6** has been on for at least 3 minutes and the aircraft is in flight, **Select Magnetic Comp** -> “**Start**” from the flight menu. “**Gathering Mag Data**” is shown on the display. This operation resets any previous compensation and the instrument begins to gather data for 10 minutes to perform the magnetic compensation.
2. During the 10 minutes the instrument is gathering data, perform two 360 degree turns to the right and two 360 deg turns to the left.
3. When the 10 minutes time is over, the instrument will show the message “**Mag Data SAVED**”
4. Turn the instrument off and on. The message will disappear and the instrument is calibrated for the magnetic field of the aircraft (hard iron correction).

NOTE

- **Magnetic Comp** will not be available until after the instrument has been turned on for at least 3 minutes.
- During the calibration procedure, the instrument could behave erratically due to the calibration process.

EXIT MENU

After making selections, rotate the Selection Knob all of the way to the right to the red “**X**” and press Selection Knob to leave the

menu. The menu will also auto-close if no setting is selected.

4.4.2 **PITCH SYNC ACTIVATION**

Pitch Sync is used to offset the symbolic airplane if necessary. Once you have achieved the desired flying pitch, activate the **Pitch Sync** feature by pressing BOTH PUSH BUTTONS simultaneously. This synchronizes the Airplane Symbol to the Horizon Line. The Sync 'On' indicator will display "**SYNC**" when the **Pitch Sync** is activated (see figure 4.5 *Pitch Sync*).

PITCH SYNC DE-ACTIVATION

To return to True Pitch, press BOTH PUSH BUTTONS simultaneously. This moves the Airplane Symbol back to True Pitch Indication and the Sync 'On' indicator will disappear.

EXAMPLE:

In the example shown in Figure 4.5, The aircraft is flying level at a 10 degree nose down pitch with the **Pitch Sync** on. The **Sync "On"** Indicator is being displayed. The Airplane Symbol is shown aligned with the Horizon Line at 0 degrees on the **Pitch Dial**.

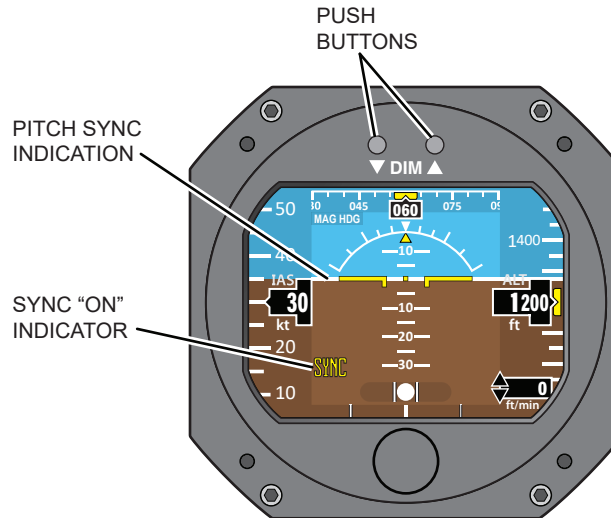


Figure 4.5, Pitch Sync

4.4.3 **DIMMER**

On startup, the **Mini6** defaults at its maximum brightness. You may adjust the screen brightness at any time with the DIMMER PUSH BUTTONS (DIM). The NVIS **Mini6** (P/N 102-0403-15-18) however, will revert to it's last used brightness setting.

Press and hold the DIM (▼) or BRIGHTEN (▲) PUSH BUTTONS until you reach the desired setting and release, or tap each button for incremental steps (See figure 4.6 *Dimmer Controls*).

WARNING

If you press both buttons simultaneously, you will turn the **PITCH SYNC** feature on (as shown by the PITCH SYNC 'ON' INDICATOR). Press both buttons again to turn the PITCH SYNC off if it is not needed. Refer to Section 4.4.2 for more information on the **PITCH SYNC** feature.

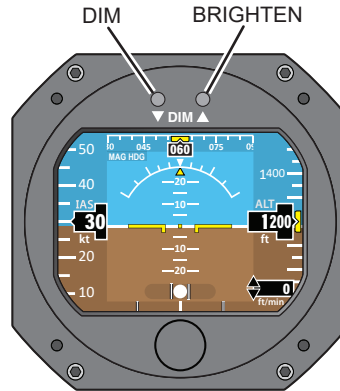


Figure 4.6, Dimmer Controls

4.5 FLIGHT LIMITATIONS

There are no flight limitations to the **Mini6** Series Attitude Indicator. The instrument will operate in a full 360 degrees of turn and may be used in light aerobatic type maneuvers.

Extreme rotation speeds may cause the instrument to display a warning message to indicate to the pilot that the instrument may be operating outside the accuracy limits defined by the TSO. This message is displayed when the full scale of the instrument sensors is being exceeded and should go away within 3 to 10 seconds. Neither the display of the warning message, nor the extreme rotation speeds themselves, negatively affect the instrument so it is not necessary to service the instrument in the rare instance that the warning message is observed.

NOTE

This article meets the minimum performance and quality control standards required by a Technical Standard Order (TSO). Installation of this article requires separate approval.

4.6 EMERGENCY PROCEDURES

In the rare event that your **Mini6** does not reset itself, you will need to pull power to the unit and reset the circuit breaker. This will restart the unit and you can continue on without damage to the unit. You do not need to be flying level while the unit resets.

LOW VOLTAGE:

In a low voltage situation, the **Mini6** will show a “**Low Voltage**” warning notice at the bottom of the screen. This notice will appear when the voltage goes below 11 volts. This notice will also indicate the amount of voltage the instrument is receiving. At 5 volts, a warning will appear across the screen indicating that the instrument is not receiving enough power and will automatically switch to battery backup power.

4.7 BATTERY BACKUP

The **Mini6** is equipped with a lithium battery that will automatically provide an hour of battery power in the event of a power loss. If battery power is required for more than an hour, it is recommended to reduce the screen brightness to 80% once the power loss occurs. This will nearly triple the battery power time.

Associated battery messages:

“**60 Second Countdown**” indicates power loss while stationary (as detected through airspeed) - (normal shutoff).

“**Power Loss Switching to Battery**” indicates a power loss during flight (as detected through airspeed).

“**Batt Pwr**” indicates when the unit is operating in the Battery Mode.
(To shutdown Battery Mode, simultaneously press and hold both “**Dim**” buttons).

“**Chk Batt**” indicates that either the battery failed the capacity test or is inoperable (See Section 4.8 *Battery Replacement*).

4.8 BATTERY REPLACEMENT

When the “**Chk Batt**” warning appears on the screen, it indicates that either the battery failed the capacity test, there was a problem with the capacity test, or the battery is inoperable. Before replacing the battery, perform another capacity test by completing steps 6 through 9 to re-test the battery. If this does not clear the “**Chk Batt**” message, the battery must then be replaced as soon as possible. (See Figure 4.8 below) (replace battery with **P/N 635-0002-01** Battery Assy).

To replace the battery:

1. Remove Battery Cover screws. (QTY: 2)
2. Remove Battery Cover.
3. Disconnect Battery Assembly.
4. Connect new Battery Assembly.
5. Reinstall Battery Cover and screws.
6. Apply power and allow the instrument to run for at least 3 minutes until the Battery Charge Status icon reaches 100%.
7. Adjust DIM buttons so that the screen brightness is at 100%.
8. Once the Battery Charge Status icon reaches 100%, disconnect power to the instrument and allow the instrument to complete the 60 second countdown.
9. Reapply power and check that no battery related messages appear.

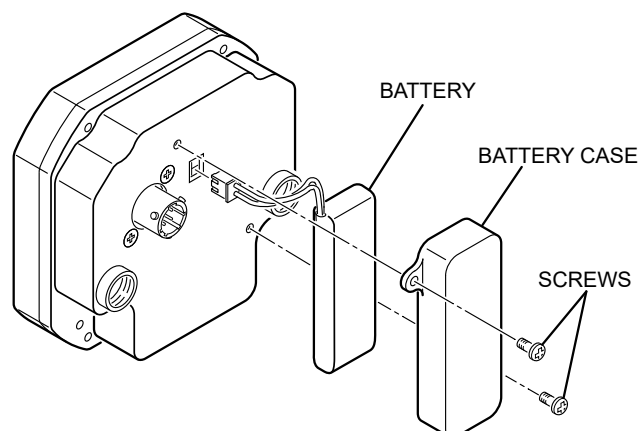


Figure 4.7, Battery Replacement

SECTION 5, GENERAL INFORMATION

5.1 INSTRUMENT CARE

The most easily damaged part of your instrument is the screen. Special care should be taken when cleaning the screen to prevent scratches and other damage. Avoid touching the screen at all times.

To clean light spots and dust, use a soft, lint free cotton cloth slightly moistened with distilled water.

You may also use cleaners approved for LCD TV's and laptop computer screens.

Always apply the cleaner to the cloth and not the screen.

-CAUTION-

- **Do Not** use paper towels, facial tissue or napkins. These products are made from recycled paper and may contain metals and wood chips that will scratch the screen.
- **Do Not** use acetone, alcohol or cleaners containing ammonia.

By avoiding all screen contact and by using proper cleaning methods, the user will be rewarded with many years of service.

5.2 FREQUENTLY ASKED QUESTIONS

How long should my Digital Instrument last?

There isn't a good answer for this question. There are no moving parts in the **Mini6** so there isn't anything to wear out. The **Mini6** should give hundreds of hours of trouble free operation.

At what voltage level will my Digital Instrument become unreliable?

Unlike mechanical horizons, the **Mini6** doesn't have a rotor that is affected by voltage. The **Mini6** will be reliable from 9 to 32VDC. In the event of a power loss, the Battery Backup power will be available.

My instrument is showing a climb/dive, what can I do?

You can check your aircraft owner's manual or contact the aircraft manufacturer to determine if your aircraft's instrument panel is tilted (pitched fore and aft). The tilt angle is any deviation from vertical of your instrument panel in level flight. Your instrument needs to be calibrated to compensate for this angle.

My instrument is showing a turn in level flight, what can I do?

It is very important to have the instrument level (left and right) in your panel. If the instrument is not level, it will show a turn when in level flight. To level the instrument, refer to installation Section 2.4.6.

How do I get my instrument repaired?

For any overhaul or repair questions you can contact Kelly Manufacturing Company. Our Service Center can repair or refurbish any RC Allen instrument. The only thing really required is information. You can send us your instrument with a letter giving us your name, return shipping address, phone number and a brief description of what is wrong with the instrument or download a form from the Support page on our web site at: kellymfg.com/support.html.

Email us for more information: SERVICE@KELLYMFG.COM.

Or, Visit our Web Site: kellymfg.com



APPENDIX A
Environmental Qualification form

Environmental Qualification: DO-160G Environmental Qualification Form

NOMENCLATURE: ELECTRIC DIGITAL HORIZON

MODEL NUMBER: RCA2610-series **TSO NUMBER:** C4c & C113a

MANUFACTURERS SPECIFICATIONS: STP 1501 Rev. A (12/20/2016)

MANUFACTURER: Kelly Manufacturing Company

ADDRESS: 555 S. Topeka, Wichita, KS 67202

REVISION & CHANGE NUMBER OF DO-160: Rev. G **DATES TESTED:** 4/26/16 thru 5/24/16

CONDITIONS	SECTION	DESCRIPTION OF TESTS CONDUCTED
Temperature and Altitude	4.0	Equipment tested to Category D1
Low Temperature	4.5.1	
High Temperature	4.5.2 & 4.5.3	
Altitude	4.6.1	
Temperature Variation	5.0	Equipment tested to Category C
Humidity	6.0	Equipment tested to Category A
Operational Shocks and Crash Safety	7.0	Equipment tested to Category B
Vibration	8.0	Equipment tested to Category U2 curve F & F1
Explosive Atmosphere	9.0	Equipment identified as category X, no test performed
Waterproofness	10.0	Equipment identified as category X, no test performed
Fluids Susceptibility	11.0	Equipment identified as category X, no test performed
Sand and Dust	12.0	Equipment identified as category X, no test performed
Fungus	13.0	Equipment identified as category X, no test performed
Salt Fog Test	14.0	Equipment identified as category X, no test performed
Magnetic Effect	15.0	Equipment tested to Category Z
Power Input	16.0	Equipment tested to Category BRX
Voltage Spike	17.0	Equipment tested to Category A
Audio Frequency Susceptibility	18.0	Equipment tested to Category Z
Induced Signal Susceptibility	19.0	Equipment tested to Category ZC
Radio Frequency Susceptibility (Radiated and Conducted)	20.0	Equipment tested for Conducted Susceptibility to Category W Equipment tested for Radiated Susceptibility to Category F
Emissions of Radio Frequency Energy	21.0	Equipment tested to Category M
Lightning Induced Transient Susceptibility	22.0	Equipment tested to Pin Injection Test: Waveform set B, Level 3 Cable Bundle Test: Waveform set H, Level 3 Multiple Burst: Level 3 [B3H33]
Lightning Direct Effects	23.0	Equipment identified as category X, no test performed
Icing	24.0	Equipment identified as category X, no test performed
Electrostatic Discharge	25.0	Equipment tested to Category A
Fire, Flammability	26.0	Equipment identified as category X, no test performed

REMARKS
<ul style="list-style-type: none"> ▪ In the power input test, equipment was tested to subparagraph 16.5.1.4 b, requirement for equipment with digital circuits ▪ Equipment also tested to (and passed) section 20, SW/CW radiated susceptibility @100V/m from 100MHz to 1GHz

APPENDIX B
Instructions for Continued Airworthiness Page 1

Instructions for Continued Airworthiness



Document Number: ICA21.007

Revision: A

<p>Equipment/Model Number: RCA2610-3P-Mini6 Equipment Description: Multifunctional Indicator</p>					
<p>1. Description</p> <p>This document describes the necessary maintenance requirements and instructions necessary to ensure the continued airworthiness of aircraft/rotorcraft with the RCA2610-3P-Mini6 Multifunctional Indicator installed.</p>					
<p>2. Operation</p> <p>Operating Instructions for the RCA2610-3P-Mini6 are detailed in the following document:</p> <ul style="list-style-type: none"> ▪ Kelly Manufacturing Company Operation/Installation Guide (Publication No. 1401-7) 					
<p>3. Equipment Certifications</p> <table border="1"> <tr> <td> <ul style="list-style-type: none"> ▪ FAA TSO-C4c ▪ FAA TSO-C113a ▪ FAA TSO-C3e ▪ FAA TSO-C6e ▪ FAA TSO-C2d ▪ FAA TSO-C10c ▪ FAA TSO-C8e </td> <td> <ul style="list-style-type: none"> ▪ AS396B ▪ AS8034B ▪ AS8004 ▪ AS8013A ▪ AS8019 ▪ AS8009C ▪ AS8016A </td> <td> <ul style="list-style-type: none"> ▪ RTCA DO-160G ▪ RTCA DO-178B Lv. C ▪ RTCA DO-347 </td> </tr> </table>			<ul style="list-style-type: none"> ▪ FAA TSO-C4c ▪ FAA TSO-C113a ▪ FAA TSO-C3e ▪ FAA TSO-C6e ▪ FAA TSO-C2d ▪ FAA TSO-C10c ▪ FAA TSO-C8e 	<ul style="list-style-type: none"> ▪ AS396B ▪ AS8034B ▪ AS8004 ▪ AS8013A ▪ AS8019 ▪ AS8009C ▪ AS8016A 	<ul style="list-style-type: none"> ▪ RTCA DO-160G ▪ RTCA DO-178B Lv. C ▪ RTCA DO-347
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<p>3. Servicing</p> <p>No scheduled service required</p>					
<p>4. Maintenance Instructions</p> <p>Every 12 months:</p> <p>Check that the Mini6 Indicator is responding properly and operating within the guidelines detailed in Kelly Manufacturing Company Publication No. 1401-7. Also verify the following</p> <ul style="list-style-type: none"> ▪ No warning/error message exists on the display. ▪ No drop off or inconsistency in display brightness. <p>Every 24 months:</p> <p>1) Check functional indication accuracy</p> <p>Indication accuracy of Attitude and Heading can be verified in flight test using the following procedure:</p> <ul style="list-style-type: none"> ▪ After take-off and before IFR situations perform two standard turns in opposite directions. ▪ Return aircraft to level flight/cruising speeds for a minimum of 2 minutes. ▪ Verify the Mini6 indicates level in pitch and roll within two degrees and indicates heading (when applicable) within 2 degrees. <p>Service is required if the Mini6 Indicator does not pass this flight test. Instrument service can be performed at Kelly Manufacturing Company service@kellymfg.com</p> <p>2) Calibrate Air Data</p> <p>Perform calibration procedure for air data functions per section 3.2 of Publication 1401-7.</p>					

APPENDIX B
Instructions for Continued Airworthiness Page 2

Instructions for Continued Airworthiness



Document Number: ICA21.007

Revision: A

<p>3) Confirm World Mag Model Contact Kelly Manufacturing Company with serial number of the unit to determine if update to the World Magnetic Module is required for the GPS of the unit.</p> <p>Every 36 months: Replace Battery Assembly (635-0002-01) on applicable units equipped with a battery backup option. Reference section 4.11 of Publication 1401-7. Contact Kelly Manufacturing Company for availability spareparts@kellymfg.com</p>																							
<p><i>Airworthiness Limitations</i></p> <p>There are no airworthiness limitations for the RCA2610 Reference Kelly Manufacturing Company Publication 1401-7 for operating ranges and indication limitations.</p>																							
<p><i>Notes</i></p>																							
<p><i>Revision History</i></p> <table border="1"> <thead> <tr> <th>Revision</th> <th>Date</th> <th>Detail</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>5/13/2021</td> <td>Initial Release</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			Revision	Date	Detail	A	5/13/2021	Initial Release															
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KMC PUBLICATION NO. 1401-7

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