

D3 POCKET PANEL

PORTABLE TOUCHSCREEN EFIS WITH SYNTHETIC VISION



PILOT'S GUIDE



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- newsletter.dynonavionics.com: Dynon Avionics' email newsletter.
- blog.dynonavionics.com: The Dynon Avionics blog, where you can find new and interesting Dynon-related content.

Registering Your D3

Please take a moment to register your D3 Pocket Panel at register.dynonavionics.com. Registering your product with Dynon ensures that your contact information is up-to-date. This helps verify product ownership, can expedite warranty claims, and allows us to notify you in the event a service bulletin is published for your product. You can also optionally sign up to receive other Dynon news and product announcements. Dynon will not share your contact information with third parties or send you announcements without your explicit consent.

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Dynon Avionics' products incorporate a variety of precise, calibrated electronics. Except for external accessories, this device does not contain any field/user-serviceable parts.

Units that have been found to have been taken apart may not be eligible for repair under warranty.

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1. SAFETY INFORMATION

Important Safety Information



Your Dynon Avionics D3 Pocket Panel contains a Li-Ion battery. Li-Ion batteries are safe when used as directed, but can also be hazardous if they are not used in accordance with their instructions.



Do not expose the D3's Li-Ion battery to fire or otherwise expose them to excessive heat.



Please dispose of non-functional batteries in a responsible manner. The battery for your D3 is very similar to mobile phone batteries and can likely be recycled wherever mobile phone battery recycling is available. For a list of recycling locations in your area (USA only), call 1-800-8-BATTERY or see the Call 2 Recycle website at www.rbr.org.



This device is designed to charge via included USB-C chargers. Some third-party USB-C chargers may not charge the D3.



This device is not waterproof. It is not designed to be used in wet conditions.



Do not operate this device below -20°C (-4°F) or above 60°C (140°F). Prolonged sunlight exposure may result in excessively high temperatures.



Do not drop this device, especially onto hard surfaces or from great height.



Do not attempt to modify or repair this device. There are no user-serviceable parts inside. Doing so will void the warranty.

2. INTRODUCTION

Welcome to your new Dynon portable EFIS - the D3 Pocket Panel. Featuring improved brightness, an intuitive touchscreen interface, and a new synthetic vision display, the D3 is the most advanced portable safety device Dynon has ever made.

D3 lets you supplement your unreliable legacy instrumentation with an affordable, portable electronic attitude indicator that works. The D3 features the same reliable, proven AHRS engine from Dynon's best-selling panel-mounted products for experimental, light sport, and type certificated aircraft

Features

- Synthetic Vision
- Intuitive Touchscreen Interface
- Improved Brightness for Superior Sunlight Readability
- 6+ hours of battery life at full brightness
- Auto-adjusting brightness and manual dimming capabilities
- Accurate pitch and roll: A true artificial horizon
- Internal high capacity Li-Ion battery and GPS for hours of portable use
- Versatile portable mounts: RAM suction mount and 3 1/8" panel hole "pinch" mounts included
- GPS ground speed
- GPS ground track (direction)
- GPS altitude and vertical speed
- Turn rate
- Slip/skid ball
- Truly pocket sized - approximately 3 1/2" Width x 3 1/4" Height x 1" Depth

3. PRODUCT LIMITATIONS

The D3 Pocket Panel is a portable device that aids situational awareness. As the D3 does not have TSO authorization from the FAA or other regulatory body, it can not be used to replace any required flight instruments in type certificated aircraft.

The D3's Ground Speed, Altitude, Vertical Speed, and Ground Track (direction) instruments are GPS-derived. Their indications WILL BE DIFFERENT from the airspeed, altimeter, VSI, and heading instruments in your aircraft panel. The D3's GPS-based indications should not be considered replacements for any of these primary aircraft instruments. Details about each of these differences are described in the Product Tour section of this guide.

4. PRODUCT TOUR

Left Side

GPS: Connection port for optional external GPS antenna.

USB-C Port: Can be used to charge unit from any USB-C power source.



Figure 1 - D3 Left Side (left to right): GPS, USB-C

Front

Power Button: Hold to power on and off.

Touchscreen: The D3 is controlled through a touchscreen interface. Touch the menu icon on the upper left corner of the screen to access most controls and settings. Swipe left and right on the main display to choose between various displays.



Figure 2 - D3 Front: Power Button (lower right)



On-Screen Elements

The D3 is primarily a portable backup attitude indicator but also has a variety of other useful information to improve situational awareness.

Aircraft Attitude is determined by combining information from internal solid-state rotation rate sensors (gyros) and accelerometers. GPS-based ground speed is additionally used to ensure the quality of the displayed attitude indication. Like a mechanical attitude indicator, the artificial horizon depicted on the D3 screen displays both the pitch and roll of the aircraft. The D3's attitude depiction is not GPS-based, but a GPS fix is required for the attitude to work properly.



Figure 3 - Full D3 Display with Attitude

Pitch angle is read by noting the position of the indexed pitch ladder against the centered white-outlined black square. There are extended pitch cues, also in white-outlined black to the left and right of the primary aircraft pitch indication. In the example below, the aircraft is level in pitch.



Figure 4 - Pitch

Roll angle is indicated by the position of the yellow triangular roll pointer with respect to the arc above it. There are tick marks on the roll arc at 10, 20, and 30, 45, and 60 degrees of bank. The triangle pointers are a dynamic estimate of the roll angle that would be required to achieve a standard rate turn at the current speed. In the example below, the aircraft is banked approximately 1 degree to the left. It would take approximately 22 degrees of bank to achieve a standard rate turn.



Figure 5 - Roll



GPS Ground Speed is the aircraft's speed over the ground in knots, miles per hour, or kilometers per hour as determined by the D3's GPS. GPS ground speed will not match your pitot/static airspeed instruments due to wind. Since GPS ground speed does not take into account the dynamic pressure of the air acting on the aircraft, it does not provide the information necessary to determine if the aircraft is close to stalling. It should not be used as a reference when landing the aircraft.



Figure 6 - GPS Ground Speed

GPS Altitude is the aircraft's altitude in either feet or meters as determined by the D3's GPS. GPS altitude will not always match your aircraft's static system-based barometric altimeter, and should not be used as a replacement for one.



Figure 7 - GPS Altitude



GPS Ground Track is the direction that the aircraft is moving over the ground as determined by the D3's GPS. It is displayed both numerically and as a graphical arc when using the Classic style. In TRK Overlaid mode, it is depicted as a circular compass-style indicator overlaid on the attitude indicator, with the numerical track above the roll scale. GPS ground track is oriented to magnetic north - not true north - similar to your magnetic compass. However, due to winds, GPS ground track will usually not match the heading provided by your aircraft's magnetic heading compass/instrument. Therefore, the GPS Ground Track indication should not be used as a replacement for a magnetic heading instrument.

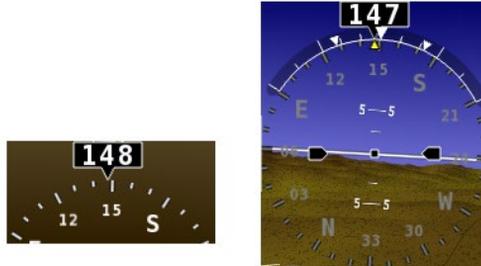


Figure 8 - GPS Ground Track Arc Classic (left) / Track Overlaid (right)



GPS Vertical Speed depicts the rate of climb or descent of the aircraft in thousands of feet per minute or meters per second as determined by the D3's GPS. GPS vertical speed will not always match the indication provided by your aircraft's static-based vertical speed indicator, and should not be used as a replacement for one. In the example above, the GPS Vertical Speed is indicating no climb or descent.



Figure 9 - GPS Vertical Speed

The **Slip/Skid Ball** provides a visual representation of lateral acceleration. When the ball is within the two vertical lines, the aircraft is in coordinated flight. The slip/skid ball operates independently of GPS reception.



Figure 10 - Slip / Skid Ball

Turn Rate is displayed as a curved magenta bar just within the roll scale when the Turn Rate display setting is set to “Magenta Bar”. The bar grows in the direction that the aircraft is currently turning. The inner white markings on the turn rate indicator indicate a half standard-rate turn of 1.5 degree per second. The outer white markings indicate a standard rate turn of 3 degrees per second. The turn rate arc example below depicts a half-standard rate turn to the left.

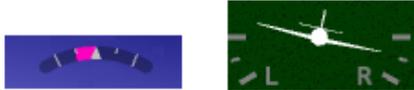


Figure 11 - Turn Rate Arc (left) / Airplane (right)

When the Turn Rate display setting is set to “Airplane”, turn rate is depicted as a more conventional-style miniature airplane icon that behaves like the airplane in a classic turn coordinator instrument. There are half-rate and standard rate markings. Like a conventional turn coordinator, this depiction indicates turn rate, not bank angle. The airplane style depiction above shows a half-standard turn to the right.

GPS Signal Strength is depicted in the upper left corner of the display. “Ext” is displayed alongside the GPS Signal Strength indication when the external GPS antenna is connected.



Figure 12 - GPS Signal Strength



Battery Charge Level is depicted in the upper right corner of the display. The red exclamation point that signals that the device is not charging may appear if the D3 is operated at extreme temperature or if there is some other problem with the battery or charging circuit.



Figure 13 - Battery Charge Level / Charging External Power Source / Not Charging Icons

Load Factor (G Meter) can be depicted instead of attitude by swiping left or right across the screen. Gs are determined by internal accelerometer sensors and are displayed as an analog-style gauge. Configurable settings (under Menu > Settings > G Meter) are provided for the color coded (red/yellow) ranges for both positive and negative G loads.



Figure 14 - G Meter



The D3 Load Factor (G meter) display has two selectable ranges to meet the needs of Normal Category aircraft and Aerobatic Category aircraft.

Minimum and maximum Gs can be reset under Menu > Display > Reset Gmeter.

The caution (yellow) and warning (red) ranges are selectable from the settings menu in 0.1 G steps.

The yellow range will always end at the start of the red range.

5. GETTING STARTED

Unpacking

Carefully unpack the box and confirm the following parts are included:

- D3 Device
 - Main button: Powers the D3 on and off.
 - USB-C port: Powers the D3, charges the battery, and enables software updates.
- USB-C Charging cable
- AC Wall Charger
- DC 14/28V DC Vehicle Charger
- USB-C adapter: Enables connection to thumb drive for software updates.
- Mounting options
 - Pinch mount
 - RAM suction cup mount
- External GPS antenna
- Matte finish screen protector



Before First Use

Before you use your D3 for the first time, please complete the following initial setup and configuration steps:

- Fully charge the battery (see following section).
- Check for D3 software updates at www.dynonavionics.com.
- Choose settings (see following section).

Turn the D3 On and Off

Turn the D3 on and off by holding the power button on the top of the device for about two seconds. The D3 will also automatically power on any time an external power source is connected.

Turn the D3 off by pressing and holding the power button for three seconds.

Charging the Battery

BATTERY INFORMATION

The D3 is powered by an internal Li-Ion battery that provides at least 5.5 hours of use from full charge when not connected to an external power source. The amount of time that the battery will operate the D3 from a full charge will vary with temperature, GPS visibility, use of the external GPS antenna, and the brightness setting. You can decrease the brightness and disable synthetic vision to maximize battery life.



CHARGE USING THE AC POWER ADAPTER OR VEHICLE POWER ADAPTER

- Plug the AC Power Adapter into a standard wall plug, or the Vehicle Power Adapter into a vehicle DC socket. The Vehicle Power Adapter is designed to work in cars, 14V aircraft, and 28V aircraft.
- Connect the Power Adapter to the USB-C port on the left side of the D3.
- Leave connected for approximately 6 hours to completely charge from empty (with a USB-C power source that can supply 1.5 amps or more). Less time will be needed if the battery is partially charged.
- When powered on, a full charge is indicated by a full battery gauge on the display.
- To charge the D3 faster, turn the unit off after power is connected. A red indicator light on the power button illuminates to indicate charging is in progress. The light turns green when the D3 is fully charged.
-

ADJUSTING SETTINGS AND PREFERENCES

You can adjust settings such as ground speed units (KTS / MPH / KPH), altitude units (feet / meters), whether the D3 automatically shuts down after a period of inactivity, and other display settings. To adjust settings on your D3:

- Touch the Menu icon in the upper left corner of the display.
- Touch “Settings” to enter the settings menu.
- When you are finished, touch anywhere outside the settings menu to completely exit the menu system. You may also use the “back” arrow to navigate back to other settings.
- Other preferences, such as brightness control and a toggle for synthetic vision, can be found in the Main Menu.



Mounting Your D3

Mount in the aircraft using one of the provided removable, portable mounts. When mounting the D3, the following alignment constraints must be met:

- A small amount of roll install error (+/- 6 degrees) can be corrected during the software-based alignment process.
- A larger amount of pitch (+/- 30 degrees) can be accommodated via software alignment.
- For proper yaw alignment, the unit must be aligned so that the surface of the display is parallel with the lateral axis (wingtip to wingtip) of the aircraft. In other words, the D3 must not be pointed left or right to face you if it is not directly in front of you. Pointing the D3 left or right will cause the attitude, turn rate, and slip/skid ball indications to be degraded.

RAM Suction Cup Mount

- Attach the square RAM mount plate to the plastic D3 cradle using the included hardware.
- Connect the above assembly to the suction base via the included short connecting arm.
- Mount the suction cup to a surface that is capable of supporting the weight of the assembly. A canopy or windscreen that has a minimal amount of curvature is ideal.
- Loosen the knob on the arm to align the cradle so that it meets the roll, pitch and yaw mounting criteria above.
- Tighten the knob to set the orientation of the cradle. Check that the mount and cradle are secure.
- Clip the D3 into the cradle. Start with the bottom of the D3. The D3 will positively snap into the cradle as you press the top side in. The cradle's wings will sit flush along the top and bottom faces of the D3 when it is fully clipped in.
- Check that the D3 is secure.



- If you are using the Vehicle Power Adapter to provide continuous power to the D3, route the wire through the channel along the bottom right of the cradle.

Pinch Mount

- The pinch mount is designed to allow portable use of the D3 in an empty standard 3 1/8" aircraft instrument hole.
- Retract the mount's retention arms by pinching together the finger holes on the front of the mount.
- With the retention arms pinched together, place the pinch mount flush against the panel over the instrument hole.
- Let go to wedge the arms in the instrument hole.
- Ensure that the mount meets the roll, pitch and yaw mounting criteria above.
- Check that the mount and cradle are secure.
- Clip the D3 into the cradle. Start with the bottom of the D3. The D3 will positively snap into the cradle as you press the top side in. The cradle's wings will sit flush along the top and bottom faces of the D3 when it is fully clipped in.
- Check that the D3 is secure.
- If you are using the Vehicle Power Adapter to provide continuous power to the D3, route the wire through the channel along the bottom right of the cradle.
- When using the pinch mount, Dynon highly recommends using the optional external GPS antenna as the D3's view of the sky is likely to be obscured by aircraft structure.

General Usage



- Swipe across the face of the device to switch between attitude and G-meter display modes.
- Press the Menu button on the top left of the display to access settings, preferences, and all other features.
- When you are in a menu, you can “back up” through the menu to adjust other settings or features by pressing the arrow in the upper left hand corner.
- To completely close the menu, touch anywhere on the right half of the screen.



Align the D3 for Flight



Figure 15 - Pitch / Roll Adjust

- With the D3 powered on, Press the Menu button, and then go to “Pitch/Roll Adjust”.
- Press the up/down arrows until the displayed pitch matches the current pitch of the aircraft. Note that this won’t necessarily be “level”, particularly for taildraggers that are being aligned on the ground.
- Press the roll left and roll right arrows until the displayed roll angle indication matches the actual roll angle of the aircraft. If your aircraft is perfectly level, this means that the horizon should level and the ball centered.



- Touch “Accept” to complete the alignment.
- Wait for a GPS fix. When a GPS fix is attained, the upper left corner of the display will show GPS signal strength, and the main display will display flight instruments.
- If GPS lock takes too long to achieve, or you have the D3 installed in a place where its internal GPS antenna is unlikely to get a lock (such as in the panel), plug in the external GPS antenna and ensure it has a clear view of the sky. The top of the panel glare shield is usually a good choice for GPS antenna placement.
- Go Fly!™
- You may find that you need to re-adjust the roll and pitch a bit more in flight.

Adjusting Brightness for Night Flight

Enter the Menu to adjust the brightness settings. When “Auto” is enabled, brightness will adjust automatically to match the ambient light.

You can also move the brightness slider to manually adjust brightness. When you adjust the brightness manually via the slider, auto-dimming is turned off.

Other Display Options

Other display options can be changed by going to the Display menu. These include:

- **Synth Vision:** Toggles the display of synthetic vision on and off.
- **Turn Rate:** Choose between the modern “EFIS” style magenta bar below the roll scale, or a more conventional-style miniature airplane icon that behaves like the airplane in a classic turn coordinator instrument.



- **Style:** “Classic” style depicts GPS ground track information as an arc along the bottom of the screen. “TRK Overlaid” mode depicts GPS ground track information as a full circular compass that is inset within the attitude indicator.
- **Reset Gmeter** resets the G-meter minimums and maximums.

Settings

To adjust unit settings, go to Main Menu > Settings. Settings that can be adjusted include:

- **Units:** Changes speed and altitude units
- **G Meter:** Change between normal and aerobic display ranges, as well as set your own customer yellow and red lines for G gauge markings.
- **Inactivity:** The D3 can be configured to automatically power down after a period of inactivity / nonmovement.
- **Version:** Displays the current software version of the D3. Compare with the version available on the Dynon website to determine if newer software is available.

6. PERFORMANCE NOTES

Attitude Performance

Optimal attitude performance depends on a number of environmental factors:

GPS REQUIRED

The attitude indication provided by the D3 is primarily created by combining information from solid state MEMS-type accelerometers and rotation rate sensors, and supplemented by GPS ground speed. In order to display as reliable an indication as possible, a GPS fix is required. The D3 will not display attitude until it has obtained a GPS fix. Once a GPS fix is obtained, it is important that the GPS fix be maintained by either mounting the D3 in a position that affords it a good view of the sky, or, if that is not possible (such as when using the pinch mount to panel-mount the D3), using the included external GPS antenna.

LOSS OF GPS

The D3 requires a GPS fix to display attitude, speed, altitude, vertical speed, ground track, and vertical speed. The D3 can cope with momentary degradations in GPS signal quality. After approximately 2 after the loss of GPS signal, the above flight instruments will become inoperative and removed from view.

ROTATION RATE LIMIT

The D3 will operate normally with rotational rates of up to 150 degree per second around any axis. If a rate of 150 degrees per second is exceeded, HORIZON RECOVERING will be displayed along the bottom of the display. The D3 will continue to display attitude information, but it should be cross-checked against other instruments while in this recovery mode. After a few seconds of

straight and level flight, the HORIZON RECOVERING message will automatically disappear when the D3 is confident that it is showing the correct attitude.



Figure 16 - Horizon Recovering After Rate Limit Exceeded

AEROBATICS AND NON-STANDARD MANEUVERS

The D3's attitude sensing algorithm is based on fixed wing aircraft flight dynamics. Using the D3 during aerobatics or other maneuvers that are not encountered during normal fixed wing aircraft flight may cause the D3's attitude indicator to lag the actual horizon or be otherwise incorrect. This will especially be true if the maneuvers being performed exceed 150 degrees per second as described above. However, once straight and level flight is resumed for a short period, the D3 will automatically recover and display the correct attitude. Additionally, no aerobatic flight maneuver will cause any permanent damage to the D3's attitude sensing ability.

7. SOFTWARE UPDATES

You should periodically check our website for software updates.

- Verify the battery is charged before updating.
- Check the version of your current software, go the Menu > Settings > Version.
- Check <http://www.dynonavionics.com> for the latest software version.
- If the version number on the Dynon website is higher than the one your D3 currently has, download the current version from the Dynon website.
- Copy the downloaded file to a USB drive (not included). The drive may be formatted in the FAT, FAT32, or exFAT (most drives come preformatted in one of these formats).
- While the D3 is powered off, use the USB-C adapter (included) to connect the USB drive to the D3.
- Power on the D3.
- The D3 will automatically update and display further instructions and status.
- Remove the USB drive and adapter once the update is complete and restart the D3.
- Confirm that the software is up to date by confirming that the version number under Menu > Settings > Version matches the version you downloaded from the Dynon website.

8. ADDITIONAL MOUNTING OPTIONS

Other RAM® Mounts

The RAM® suction cup mounting system that is included with your D3 can be adapted and customized with the use of other components. These can be purchased directly from www.rammount.com or from any of RAM's authorized dealers. The RAM® components that come with the D3 use the B size (1" diameter) ball. Some specific RAM® components that may be useful in aircraft include:

RAM-B-259U: 1" x 1" glare shield clamp base with 1" ball (finger screws)

RAM-B-247U-15/17/2/25/3/4: Square rail clamp base with 1" ball, available in various widths (designated by numerical suffix)



Note that the FAA and other regulatory agencies do not permit permanent mounting of portable products in type certificated aircraft. All of the mounts included with the D3 can be fixed and removed without the use of tools.

Included RAM® Mount Components

Replacements for the included RAM® mounting system can be purchased directly from RAM® Mount and their authorized dealers. The RAM® components that come included with the D3 are:

RAP-224-1U: Suction cup base (3.3" diameter) with twist lock

RAM-B-201U-A: Short double socket arm for 1" ball bases

RAM-B-347U: AMPS square base with 1" ball

9. TROUBLESHOOTING

Problem Description	Possible Cause	Solution
The D3 does not power on	Battery is completely discharged	Charge the battery; Additionally, the D3 will automatically power on when external power is applied via the power port on the right side of the unit
	The brightness is turned all the way down	Navigate to the display menu via the menu button in the upper left of the screen and adjust the brightness.
The D3 does not power on, even when power is applied to the charging port on the right side of the unit	D3 may be damaged	Contact Dynon Avionics technical support staff
Battery life is too short	Battery is either not being fully charged, or is worn out	Confirm that you are fully charging the D3 before use. If this does not solve the issue, contact Dynon Avionics technical support staff
Battery display does not change to the plug icon when plugged in to the wall	No power at wall outlet	Check that power source is supplying power



Problem Description	Possible Cause	Solution
<p>Battery display does not change to the plug icon when plugged in to a vehicle</p>	<p>No power coming from vehicle</p>	<p>Check that vehicle is supplying power</p>
<p>The D3's attitude indication is incorrect</p>	<p>Improper alignment</p>	<p>Ensure that the D3 is correctly oriented in the yaw axis and is NOT pointed left or right towards the pilot</p> <p>Redo the alignment process to ensure that the displayed attitude is correct</p>
<p>The ball is not centered, but the D3/aircraft is definitely level</p>	<p>Roll adjust is not correct for the current mounting position</p>	<p>Go to Menu > Pitch/Roll Adjust to align.</p>
<p>The horizon zero pitch line is not centered on the zero pitch indication, but the D3/aircraft is definitely level</p>	<p>Pitch adjust is not correct for the current mounting position</p>	<p>Go to Menu > Pitch/Roll Adjust to align. Adjust until the displayed pitch matches the aircraft pitch attitude</p>



Problem Description	Possible Cause	Solution
The D3's speed, altitude, and/or track indication does not match my other aircraft instruments	This is expected behavior	The D3's instruments are GPS based and will not match the other permanently-mounted pneumatic and magnetic instruments in your aircraft
The D3's screen is too dim	Display brightness has been turned down	Adjust the brightness under the main menu.

10. SPECIFICATIONS

All specifications are subject to change without notice or obligation.

PHYSICAL

Dimensions (exclusive of projections/buttons/switches)

3.63 inches (92mm) W

3.26 inches (83mm) H

1.16 inches (29mm) D

Weight

8 oz (227g)

Temperature Range

Operating/Charging (allowable): -20°C (-4°F) to 60°C (140°F)

Operating/Charging (for best battery lifespan): -15°C (5°F) to 45°C (113°F)

Short Term Storage (<3 months): -10°C (14°F) to 45°C (113°F)

Long Term Storage (>3 months): 18°C (64°F) to 28°C (82°F)

POWER

Internal Li-Ion Battery

5.5+ Hours Run Time (worst case from full charge, full brightness). 7+ hours without synthetic vision at 60% brightness.



Charging

USB-C. Use included chargers for best performance. Some third-party chargers may not charge the D3.

11.SCREEN CARE

The D3 features a display which with normal care will provide years of problem free use.

Use a dry, clean, soft cloth to clean the screen. Do not use soap, chemicals, or abrasives to avoid damaging the screen. You may also use commercially available wipes that are designed specifically for LCD screen cleaning. soft cloth. Never use water or solvents when attempting to clean the display.

Avoid excessive pressure to the display to prevent damage to the LCD (Liquid Crystal Display). Take care to prevent impacts to the screen to prevent cracking the display.

The D3 also comes with an optional screen protector. In addition to protecting against scratches, it affords a matte finish that some pilots prefer.

12.REQUESTING SUPPORT / REPAIR

Before contacting Dynon Avionics Technical Support, please consult the Troubleshooting section of this guide for solutions to common issues.

When contacting Dynon Technical Support, have your D3 at hand. If possible, have the AC Adapter (charger) also at hand to provide power if there is a battery issue.

DYNON AVIONICS TECHNICAL SUPPORT CONTACT INFORMATION

Phone: (425) 402-0433 7:00 AM - 5:00 PM (Pacific), Monday - Friday

Email: support@dynonavionics.com

Web: www.dynonavionics.com

13.NOTES

