Needed LOW ALTITUDE DJI Pilot app software enhancements:

Consider these relatively easy DJI Pilot software feature enhancements, most of which are already common on military drones and on manned commercial, military and some civilian aircraft. These needed software enhancements, which would prevent about 95% of such low altitude-related Inspire (and Phantom 3) crashes/accidents or damage to others and to property (and would help to reduce your critical repair backlog of Inspires to repair). Please seriously consider these additions (or at least some of them). Please help us lobby for these needed software enhancements. This is particularly important in photo/video work, land surveys, and search and rescue operations, where "Map View" is utilized significantly during flight by the actual pilot, and in situation where the camera is not in FPV use or used (taken over) by the second controller (camera) operator, or is down-facing. These are high-risk situations for Inspire (or Phantom 3) survival, especially at distant operation where direct visualization is difficult or obstructed for the pilot of the aircraft or when the camera is in non-FPV flight direction, or being used by another video camera operator.

Please consider some or all of these:

1. **"Set Minimal Altitude"**: Similar to "Maximum Distance" and "Maximum Altitude" and "Failsafe Altitude (return home)" presets, have a preset for "Set Minimal Altitude", with these sub-options (the pilot can easily change these (or temporarily suspend these) during a flight):
    a. Enter **"Minimal Altitude Value"**: _____ (in feet (imperial) or meters (metric)). *… example: 160 feet above home altitude*
        i. Software button to click which would set to <u>current</u> altitude (if performed while in flight)

    b. **"Minimal altitude feature on/off (MASTER)"**: toggle OFF( ) - ON(X) … this and other sub-settings can provide:
        i. **Audio voice warning**: toggle OFF( ) - ON(X) … "Descending below minimal altitude set [of XX feet]/[of XX meters]"
        ii. **Audio coded beep warning from controller**: toggle OFF( ) - ON(X) … <coded beep sound>
        iii. **Visual warning**: toggle OFF( ) - ON(X)
            1. Visual alert appears "Descending Below Preset Minimum Altitude [of XX feet]"
            2. Clicking goes to pop-up to allow in-flight changes in toggles and altitude value and temporary bypass.
        iv. **Prohibit flying at altitude lower than preset altitude**: toggle OFF( ) - ON(X) … (activates once ascends above minimal altitude value set) **<u>except for</u>**:
            1. Software-ordered or failsafe: "Go home".
            2. Software-ordered or failsafe: "Auto-land"
            3. Manual land at (or near) "Home" location (as was set elsewhere in DJI Pilot app as either aircraft takeoff "Home" or controller "Home").
            4. Lowering landing gear.
                a. This would be important in the case of emergency land situations (a way to quickly bypass this minimal altitude prohibition).
                b. This could even be done if iPad/software loses power or connection (by using the controller to lower the landing gear).
        v. **Temporarily bypass of altitude prohibition (as set) to allow lower flight operation**: a simple [BYPASS] button.
            1. Minimal altitude limit remains nonfunctional until again ascends above minimal altitude value set.
            2. To reiterate, automatically reactivates minimal altitude prohibition once again ascends above the pre-set minimal altitude value.
            3. Other possible conditions?
        vi. **Show "Minimal Altitude feature set" on main screen of DJI Pilot app**: toggle OFF( ) - ON(X)
                a. On "Camera" main page: toggle OFF( ) - ON(X)
                b. On "Map" main page: toggle OFF( ) - ON(X)

c. When in use, clicking on this main-screen indicator will bring up a window to:
i. Option button to temporarily [BYPASS] of minimal altitude prohibition, allowing lower flight operation: (minimum altitude system automatically reactivated once again above the pre-set minimal altitude value)
ii. Allow inflight changes in toggles (at least master toggle)and minimal altitude value.

vii. **Indicate when ascends above minimal flight altitude**: toggle OFF( ) - ON(X)
1. Voice announcement "ascending above the minimal altitude value set of [of XX feet]" : toggle OFF( ) - ON(X)
2. Visual alert appears "Ascending above Preset Minimum Altitude of [XX feet]" : toggle OFF( ) - ON(X)
a. Clicking goes to pop-up to allow inflight changes in toggles and altitude value.
i. Option button to temporarily [BYPASS] of minimal altitude prohibition, allowing lower flight operation: (minimum altitude system automatically reactivated once again above the pre-set minimal altitude value)
ii. Allow inflight changes in toggles (at least master toggle) and minimal altitude value.

c. **On takeoff, report "Minimal altitude feature is on/off" (master):** toggle OFF( ) - ON(X)
i. Audio voice announcement via "DJI Pilot" app iPad: "Minimum Altitude feature set for XX feet altitude" or "Minimum Altitude feature has not yet been set".
ii. Visually seen on "DJI Pilot" app iPad screen "Minimum Altitude Feature Set for XX feet Altitude".
1. Clicking goes to pop-up to allow changes in altitude value and toggle settings.
a. Delay this voice and visual screen announcement for 10-20 seconds until the other takeoff voice and visual screen announcements have been completed (such as " Landing gear raiding", etc.)
b. Option button to temporarily [BYPASS] of minimal altitude prohibition, allowing lower flight operation: (minimum altitude system automatically reactivated once again above the pre-set minimal altitude value)

d. **On takeoff, report "Failsafe Return Home Altitude":** toggle OFF( ) - ON(X)
i. Audio voice announcement via "DJI Pilot" app iPad: "Failsafe return Home altitude set for [XX feet]/[XX meters]".
ii. Visually seen on "DJI Pilot" app iPad screen "Failsafe return Home altitude set for [XX feet] Altitude".
1. Clicking goes to pop-up to allow changes in Failsafe return Home altitude value.
iii. Delay this voice and visual screen announcement for 30 seconds until the other takeoff voice and visual screen announcements have been completed (such as " Landing gear raiding", "Minimal altitude setting", etc.).

2. **Ground Proximity Warning, and Near-ground Vertical Descent Speed**: In this case, instead of ground proximity radar that might be used in military drones, and in manned military, commercial, and some civilian aircraft, we are limited primarily to the use of the Inspire's (and Phantom 3's) "sonar"/ultrasonic sensor system. Consider the following options, and some of these might not be possible because of the possible latency considerations of these sensor systems. I am also not sure how these would operation over water:
a. **Vertical descent speed limitation once ultrasonic speed sensor system has activated**:
i. **Override ultrasonic sensor vertical auto-descent speed on DJI auto-land, auto-home, etc. (except in critical low battery situation).**
1. Activate this override: **:** toggle OFF( ) - ON(X)
2. V.S. Value: _____ F/S (or M/S). *… example: 0.3 F/S or 0.3 F/S*
3. Sometimes, where there are condition of grass or brush in the area, rocks and irregular surface, near ditches, vertical stalks, or with poor GPS coverage, or with low light levels, or when moving controller home, coming at default speeds can be hazardous to the

inspire (or Phantom 3), to others, and to property. This bypass of the forces a slowdown to look carefully for such hard-to-see problems as vertical sticks, tree or weed spouts or stalks, fishing line, wire, ditched, etc, that might result in a crash.

b. **Override low-altitude pilot manual vertical descent speed:** In this case, the pilot may be manually trying to force a more rapid (high-speed) descent of the Inspire from a high altitude of say 300-500 feet, even in an auto-Go-Home situation or auto-Land-Now situation. It is easy not to stop in time, and descend the Inspire right into the ground at high speed. This feature would make this much less likely to occur.
    i. **Override pilot NEAR-GROUND manual vertical descent speed (except in critical low battery situation) if descending to aircraft takeoff "Home" location or controller "Home" location (depending on how set).**
        1. Activate this override: toggle OFF( ) - ON(X)
        2. V.S. Value: _____ F/S (or M/S*). … example: 3 F/S*
        3. Activate at altitude of: _____ feet above "Home" point (aircraft takeoff or controller position, depending on how set). *… example: 40 feet altitude*
        4. **Alternative** (or additional) **"Ground Proximity Warning" :** toggle OFF( ) - ON(X)
            a. Voice announcement "Ground Proximity Warning at [of XX feet]"
        5. This reduces that chance of accidentally flying the Inspire into the ground.

c. **Voice Report Ultrasonic Altitude above ground**:
    i. **Audio voice warning**: toggle OFF( ) - ON(X) … "Ultrasonic altitude of [of XX feet]/[of XX meters] above ground"
        1. Reports at each one foot interval while descending, once the ultrasonic system picks it up.
        2. *… example: 8 feet above ground … 7 feet … 6 feet … 5 feet … 4 feet … 3 feet above ground… 2 feet … 1 feet … 0.3) on ground … props stopped*
        3. Allows for more controlled landing when landing in poorly visualized landing, especially when FPV and difficult to judge precise altitude above ground, or if difficult to see DJI Pilot app screen at to left bottom (where the the ultrasonic altitude above ground is shown.

d. **(THIS IS A LITTLE QUESTIONABLE) Prohibit flying at ULTRASONIC altitude lower than preset ultrasonic altitude above ground**: toggle OFF( ) - ON(X) … (activates once ascends above minimal altitude value set) **<u>except for</u>**:
    i. Would probably not work above a certain horizontal speed (because of latency or behavior of ultrasonic systems).
    ii. May not work over water?
    iii. May not work at all?
    iv. Software-ordered or failsafe: "Go home".
    v. Software-ordered or failsafe: "Auto-land"
    vi. Manual land at (or near) "Home" location (as was set elsewhere in DJI Pilot app as either aircraft takeoff "Home" or controller "Home").
    vii. Lowering landing gear.
        1. This would be important in the case of emergency land situations (a way to quickly bypass this minimal altitude prohibition).
        2. This could even be done if iPad/software loses power or connection (by using the controller to lower the landing gear).
    viii. **Temporarily bypass of minimal ULTRASONIC altitude prohibition (as set) to allow lower flight operation**: a simple [BYPASS] button.
        1. Minimal altitude limit remains nonfunctional until again ascends above minimal altitude value set.
        2. To reiterate, automatically reactivates minimal ULTRASONIC altitude prohibition once again ascends above the pre-set minimal ULTRASONIC altitude value.
        3. Other possible conditions?

ix. **Show "Minimal ULTRASONIC Altitude prohibition feature set" on main screen of DJI Pilot app**: toggle OFF( ) - ON(X)

a. On "Camera" main page: toggle OFF( ) - ON(X)
b. On "Map" main page: toggle OFF( ) - ON(X)
c. When in use, clicking on this main-screen indicator will bring up a window to:
    i. Option button to temporarily [BYPASS] of minimal ULTRASONIC altitude prohibition, allowing lower flight operation: (minimum ULTRASONIC altitude system automatically reactivated once again above the pre-set minimal altitude value)
    ii. Allow inflight changes in toggles (at least master toggle) and minimal altitude value.

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