| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV. | ECO | DESCRIPTION | VERSION | APPROVAL | DATE |
| B | 34662 | REVISED PER ECO | 1.5.1.3 | N SPRONK | 02/17/20 |
| C | 35043 | REVISED PER ECO | 1.5.2.1 | N SPRONK | 03/24/20 |
| D | 35520 | REVISED PER ECO | 20.3.2.32 | N SPRONK | 10/08/20 |
| E | 36771 | REVISED PER ECO | 21.1.0.3 | N SPRONK | 03/23/21 |

## RELEASE NOTES:

**VERSION: 21.1.0.3**

FILE NAME: P514V21_1_0_3_A0009C19.hex
SIZE: 5,580,503 BYTES

GIT Commit Hash: 24f257cafe31ef16439626232f0d687fe234077e

MD5 checksum: b360fd1f2b80e42cd3f97f07dcd623ba

Release Notes:

1. Controls updated to prevent height sensors getting stuck in an invalid state after being pointed at the sky.
2. Using preset to engage automatic boom control now correctly sets previously selected Ground/Canopy target type.
3. ISOBUS source address fixed to address 0x90 to maintain compatibility with New Holland vehicle electronics when a third-party device is introduced.
4. Remove boom height movement from main run screen.
5. Removed all horizon images of varying height from the object pool.
6. Only fold animations will take place on the main run screen.
7. Corrected speed source type when paired with RS1 for GPS speed.
8. Updated what image is show for the various fold states.
9. Remedied center rack to allow movement prior to calibration/UT interaction.

Software URL
ftp://embedded.ravenind.com/images/ecu/077-0171-514/archive/

**NOTES:**

RAVEN

RAVEN INDUSTRIES, INC.
SIOUX FALLS, SD 57104

| | NAME | DATE |
|---|---|---|
| DRAWN | RRS | 08/29/19 |
| APPROVED | KKJ | 09/16/19 |

TITLE:

**SOFTWARE SPECIFICATION, PROGRAM, CASE, AUTOBOOM XRT, ABM**

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| A | 077-0171-514 | E |

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| CODE | SCALE | SHEET |
|---|---|---|
| **14979** | N/A | 1 OF 5 |

# RELEASE NOTES:

| VERSION: | 20.3.2.32 | FILE NAME: | P514V20_3_2_32_944E214A.hex |
|---|---|---|---|
| | | SIZE: | 5,831,782 BYTES |

GIT Commit Hash: 4973c533f94fc8aac822750d6c87dd1d856a9f0b

MD5 checksum: dd5cfa45091f315ec69b3f78c441c152

Release Notes

1. Split Case IH 132/135 ft boom configuration into separate 132 ft and 135 ft boom configurations.
2. ABNG-2726 - Right AutoFold Spray Position Calibration value now saved correctly
3. ABNG-2718 - Disabled Technician Mode for Trident/Patriot 120' configurations
4. ABNG-2724 - Breakpoint values for fold 3 joint corrected.
5. ABNG-2669 - Right Fold3 Extend Max and Min values fixed.
6. ABNG-2644 - Case Unlocked assembly list fixed.
7. ABNG-2625 - Minimum voltage change of 0.25 volts needed to complete calibration of all AutoFold Joints. (0.25 mV was being used for some joints).
8. ABNG-2617 - AutoFold left/right boom state within PGN 0xFF04 fixed to report correct boom state.
9. ABNG-2566 - Added Canopy Tuning page. AutoBoom Engineering Settings -> Canopy Tuning
10. Controls update: Worked on Patriot 120’ AutoFold specific controls features. Not releasing in this version.
11. Controls update: Pulled in changes requested by CIH for Patriot 135’ AutoFold after initial 1.5 release
12. Controls update: AB used to control off of the height sensor causing the highest target angle. Changed to control off of the sensor giving highest target velocity. These are usually the same, but this change better handles the boom dropping quickly when outer sensor is over a ditch.
13. Controls update: Limiting AutoBoom down speed based on height sensor to -5°/second. Chassis roll rate can still result in a total target velocity being higher.
14. Controls update: Created a bunch of more target types for engineering development. None of these are accessible from standard screens. They can be viewed in engineering settings/AutoBoom/User Settings.
15. Controls update: Various filter parameters that were previously hard coded are now settable in engineering screens/AutoBoom/Filter Settings.
16. Improved height sensor reprogramming reliability
17. ABNG-2738 - VT help page updated to only show operation zone info when input field is present
    1. Removed redundant Center Rack Control in help menu.
    2. Fixed object pool typos
    3. Case builds show booms as always level

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| A | 077-0171-514 | E |

| CODE | SCALE | SHEET |
|---|---|---|
| 14979 | N/A | 2 OF 5 |

## RELEASE NOTES:

| VERSION: | 20.3.2.32 | FILE NAME: | P514V20_3_2_32_944E214A.hex |
|---|---|---|---|
| | | SIZE: | 5,831,782 BYTES |

18. ABNG-2737/2888 - allow joystick switches to be pressed prior to machine type selection (similar to 135 foot machine type)
19. ABNG-2901 - Corrected ET Apache machine configuration list off by one issue.
20. ABNG-2738 - Updated Settings Fold Tuning button visibility so it is tied to valve type only.
21. ABNG-2944 - Updated config wizard to run Baumer can interface right away so that PGN data request message is sent out before machine configuration is created.
22. ABNG-2942 - Updated object pool, machine database and code to support new machines
23. ABNG-2942 - Updated machine database to set RoGator A/B to visible for Raven builds
24. ABNG-2776 - Added MATLAB filtered canopy and ground height functionality and associated cyclic PGNs
25. ABNG-2955 - Set frequency for all 4 driver pins that share a timer to hardcoded value of either 200 or 60 depending on height control enabled state.
26. Controls updated - Changes to height sensor target decision. If user selected ground, and ground confidence is above threshold, we will use ground even if canopy confidence is very high. Based on more field time with new radar software.
27. ABNG-2978 - Autofold version check fixed.
28. ABNG-2776 - Fixed scaling for SPN 524866 (Center Boom Ground Height) and VSN partner registration.
29. Added PWM Valve Frequency fields to machine database, and initialization functionality for existing configurations.
30. Machine database update - MY20+ Patriot4440 132 135 changing Fold1/Fold2 back to Proportional/Directional. These were inadvertently set to Directional as part of the May20 commit to support CT56 testing.
31. ABNG-2910 - Updated so Autofold state message from 2 different PGNs are filtered so the first source to send a fold in or fold out message becomes the master.
32. ABNG-2990 - Disabled IMU updated needed alarm.
33. ABNG-2914 - Fixed alert for master switch disabled because booms are folded. This should only trigger when the user tries to turn the master switch on, not happen if the master switch already was on.
34. Changed the left and right wing base control effort to 35 for all Case120ft booms.
35. ABNG-3028 - Increased CAN RX buffer from 10 to 50 to prevent dropped messages.
36. MATLAB control update to prevent canopy strike occurrences.
37. MATLAB control voltage input fix to improve boom response consistency over a variety of system voltages.
38. ABM calibration request response messages throttled.
39. Updated machine database defaults for AutoFold Min/Max values on NH/Miller Truss Boom systems.
40. Updated Preset 2 behavior to drive center rack up 10 seconds and then turn off AutoBoom master switch when complete.
41. Terrain always appears level on object pool main page for Case machines
42. Updated machine database defaults for Patriot 120' primary radar offset.
43. Updated CAN stack address arbitration list to exclude address 0x91, and to add addresses 0x81 – 0x8F.

Software URL

1. ftp://embedded.ravenind.com/images/ecu/077-0171-514/archive/

| SIZE | DRAWING NUMBER | REV |
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| A | 077-0171-514 | E |

| CODE | SCALE | SHEET |
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| **14979** | N/A | 3 OF 5 |

# RELEASE NOTES:

| VERSION: | 1.5.2.1 | FILE NAME: | P514V1_5_2_1_DA6EA88D.hex |
|---|---|---|---|
| | | SIZE: | 5,238,121 BYTES |

GIT Commit Hash 522f12fdbe3fccd77098248792d70f68

Release notes:

1.AutoFold Out requires higher tilt position prior to driving Fold1 out, to avoid scraping cradle. This does result in the boom coming closer to the mirror. (Patriot only)

2.AutoFold In, Fold1 will come all the way in if tilt and center are at proper locations, will not wait for Fold2. (Patriot only)

3.AutoFold In, will wait for opposite boom to be at the cradle before lowering into cradle. (Patriot only)

4.Reduced delay for audible feedback when AutoFold is complete in both directions.

5.Fixed issue with Percent Spray positions not being saved properly from calibrated positions.

6.Reduced delay between booms settling into cradle and the audible beep at the end of an AutoFold IN sequence.

a.Previous versions required the tilt joints to be stationary. That is, nearly all of the pressure relieved from the lift cylinder. This version will provide the audible beep when the tilt joints are 2% lower than the calibrated position. If the user continues to hold the button after the beep, the load will continue to transfer from tilt cylinder to cradle. This reduces the delay for beep by about 1.5 seconds.

Software URL

1.ftp://embedded.ravenind.com/images/ecu/077-0171-514/archive/

| SIZE | DRAWING NUMBER | REV |
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| A | 077-0171-514 | E |

| CODE | SCALE | SHEET |
|---|---|---|
| **14979** | N/A | 4 OF 5 |

## RELEASE NOTES:

| VERSION: | 1.5.1.3 | FILE NAME: | P514V1_5_1_3_9C9A4CE9.hex |
|---|---|---|---|
| | | SIZE: | 5,237,416 BYTES |

GIT Commit Hash c84e39266782aaf60121c9b43732f290d6cf5347

Release notes:

1.Correctly initializing PWM pin frequencies when updating from previous version

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| A | 077-0171-514 | E |

| CODE | SCALE | SHEET |
|---|---|---|
| 14979 | N/A | 5 OF 5 |