GPS Date Rollover: Updating Ag Electronics is Even More Important in 2019!

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Modern agricultural equipment utilize electronic components to operate properly. They interact with and control virtually every aspect of the machine including the engine, drive train, and machine/crop interface components. If a machine is equipped with precision agriculture systems, there are even more aspects that interface and deal with electronic components. Electronic system agricultural machinery operators rely on the Global Satellite Navigation System (GSNS), better known as the Global Positioning System (GPS), to provide accurate spatial information to machines as feedback information for guidance systems and machine control components such as variable-rate technology (VRT).

On April 6, 2019, the GPS system experienced an artifact of its design called a "Date Rollover" that may impact performance of these systems. Special attention should be paid to device updates this spring in order to avoid any negative effects.

The ones and zeros language our electronic devices speak is usually of little concern as long as devices are working properly, but in this instance a shortcoming of that language could affect GPS performance. The output of GPS receivers is a comma separated ASCII string with fields for each piece of data contained within the string. Data fields, like date, are represented by binary numbers corresponding to the year, month, and date. In this case, the field is a 10-bit binary number, meaning it can only count up to 1,024 values before resetting back to zero, hence the "Date Rollover" issue. When the date rollover happened, the GPS date field went from April 5, 2019 (1111111111) to (0000000000) representing August 1, 1999, on receivers not updated. Receivers made after 2011 can accommodate this without incident other than data appearing incorrect. Older receivers may not function at all without an update.

Updating GPS receivers, guidance systems, and field displays/monitors is usually a simple process. Manufacturers supply firmware updates on their websites that can be downloaded to a thumb-drive (Figure 1). Some systems may even use the telematics system (wireless connectivity) to push updates out on machine startup. There are several online tutorials showing step-by-step instructions on performing updates or you can consult your owner's manual for detailed instructions. Service providers and dealerships will be able to help with the updates as well. One recommendation is to ensure all data contained within the device is safely backed up before performing updates. The time required to complete the update is less than 20 minutes from download to install. Once the update has been completed, it is wise to perform a function check of the system to ensure no surprises arise during critical times (e.g., planting, early harvest). A quick A-B line near the shop to test the guidance system and running the machine are cheap insurance.

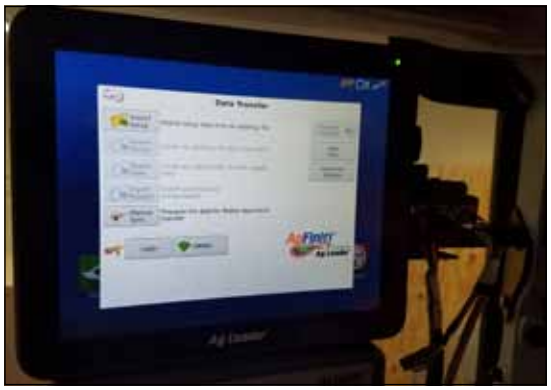

Figure 1. AgLeader InCommand™ 1200 display data transfer screen. In the upper right corner the Update Firmware button allows you to select update files on a thumb-drive that were downloaded from the manufacturer's website. The update process is automated once the files are selected.

Events like the GPS "Date Rollover" are once-in-a-decade occurrences but can impact functionality. Similar to changing engine oil or checking tire pressure, regular maintenance of your electronic systems will ensure they are performing at their highest level and can reduce down-time. For more update information, visit your manufacturer's website or contact your dealer.