

Happy 2015 Everyone!

- Why RAM-BAT A2U5 can cause WJ 8711A / 8712A / HF1000A start up failures -

A2U5 stores boot time configurations in battery backed RAM. During a power on sequence the radio reads the contents in RAM and configures the active state of the radio. If A2U5 is discharged or missing the radio will display a fault and may fail to boot. Most of the later model radios use this type of system.

WJ 8711A, 8712A, and HF-1000A RAM-BAT Life Expectancy:

There's a lot of misinformation about how long batteries will last in the Watkins Johnson 8711 product families. The early radios have a rechargeable lithium coin cell which should theoretically last for the life of the radio. Later models all use the Dallas DS1643 Time Keeper IC. This discussion pertains only to the later model radios.

Most of the late model WJ 8711A's, 8712A's and HF-1000A's have what is referred to as a RAM-BAT or Time keeper IC loaded at A2U5. This IC contains a lithium cell, real time clock, and RAM. It is a hybrid. The DS1643 is a 28 pin DIP. It is not rechargeable and should be replaced every ten years under the following conditions:

- 1) If it is in a radio that was powered on at least once
- 2) If it was removed from a radio that was powered on at least once

Note: If A2U5 is in a radio that has never been powered on it is inactive and should still be fully charged. A DS1643 that has never been powered on can retain a charge for up to 30 years. There are many factors that determine this such as storage temperature and environment. When in doubt replace it!

So why does the A2U5 / DS1643 IC discharge faster after it has been powered on for the first time?

This is an over simplified explanation. The clock is enabled for the first time but more importantly Vpf is triggered. Vpf is the Vbatt latch threshold that connects the internal battery to the rest of the IC. The DS1643 is shipped from the factory with the internal lithium cell disconnected. This ensures that the internal battery will remain in a storage state until it is actually needed. The first time power is applied (+Vcc = 5V) and exceeds Vpf (4.37V typical) the Vbatt latch is permanently enabled. The internal clock starts and the DS1643 switches to an active state. While the radio is on +Vcc provides power to the DS1643. When power is removed the DS1643 runs off it's internal lithium cell. Even if the DS1643 is removed from an unpowered radio it will continue to discharge because it is still active.

If you have a radio that is more than 10 years old it's probably time to change A2U5.

Best Regards,
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