

[1.12] Processor clock speed and battery voltage

The TI89/92+ use an RC (resistor-capacitor) network to set the speed of the processor clock. This means that the processor clock frequency is not set as precisely as it would be if a crystal was used. Some people have claimed that this results in clock frequency variations as the batteries discharge during use.

I tested the variation in clock frequency as a function of battery supply voltage by timing a short test program at various voltages from 6V down to the second low "BATT" indication. I found much less than 1% variation in clock speed for both a HW1 TI-89 and a HW2 TI-92+.

GraphLink transfers, particularly AMS upgrades, are known to fail at low battery voltages. One theory has been that these failures are caused by clock speed variations that result in synchronization failure. My test results do not support this theory. However, during my testing I did notice that, at very low battery voltages, the calculator will turn itself off while the program is running. This effect may cause the GraphLink transfer failures. Another possible cause is that low battery voltages reduce the voltage levels of the GraphLink signals such that they no longer meet the minimum requirements for successful transmission.