IBM PC Hardware: A Closer Look

Time and Date Functions in an IBM Personal System

A device called a Real Time Clock (RTC) resides within an IBM personal computer's hardware. This clock has battery backup and maintains the time and date, as long as the battery remains charged, including when the system is powered "off," or when it is powered "on" and the operating system is initialized or running. The RTC works in much the same way as a digital watch that has both time and date features. There is one exception to this analogy, though, on some IBM personal computer systems. The first two digits of the year, called the "Century Indicator", do not update the century (e.g., from "19" to "20") using an automated hardware function. Instead, in current IBM PC models the PC system's BIOS firmware uses software to update these two digits. Some older models rely on the user to manually reset the date.

IBM Year 2000 Ready Personal Systems

IBM Personal Computer models with BIOS designed to update the RTC Century Indicator to the 21st century is designated "Year 2000 Ready." Models that rely on the user to manual update the RTC Century Indicator to the 21st century are designated "Not Year 2000 Ready."

All 1996 and newer IBM PC models have BIOS designed to update the RTC Century Indicator to the 21st century and are coded *Ready* in the database. Some IBM PC's require a BIOS update to be considered Year 2000 Ready and are coded *Ready** in the database. The BIOS level and the access method is indicated in the database. The information below provides further detail about this update mechanism.

Updating the Real Time Clock Century Indicator

If the PC System is powered "off" during the date transition to the year 2000, the RTC Century Indicator is updated to "20" the next time the system is powered on. This software in the BIOS recognizes the change in the century and increments the RTC Century Indicator accordingly.

If the PC is powered "on" during the year 2000 transition, it is possible that the RTC Century Indicator will not be immediately updated to "20", but instead will remain at "19". Even if this situation occurs, the BIOS will update the RTC Century Indicator to "20" the next time the system is rebooted.

In most cases, this potential for delay in updating the RTC Century Indicator should not affect normal system operations. Well behaved, Year 2000 Ready application programs and device drivers should execute by referencing the century timer maintained by the BIOS or the operating system, not the RTC Century Indicator. The century timer maintained by the BIOS of all IBM

Year 2000 Ready PCs will correctly update the century to "20," whether the system is powered "on" or "off" during the year 2000 transition. Year 2000 Ready operating systems should update their own century timers in the same way.

Applications and Operating Systems

If an application program bypasses both the operating system and the BIOS, and queries the date directly from the RTC Century Indicator, the application could potentially receive incorrect century information. We believe that very few modern commercial application programs access the RTC Century Indicator directly. On the other hand, there are Year 2000 hardware test tools which may report that the RTC Century Indicator has not been updated. As described above, incorrect century information can be avoided by simply rebooting the system manually once when the year 2000 has occurred. An alternate approach would be to manually update the RTC Century Indicator when the year 2000 occurs.

In addition, the choice of operating system and release can affect the manner in which any PC's RTC Century Indicator is updated. Please contact the operating system developer directly for information about their products.

IBM PC Models which are Not Year 2000 Ready

All IBM PC's since the AT have an RTC Century Indicator byte in hardware. For models introduced before 1996, the user of the machine will need to reset the date manually when the year 2000 occurs, or choose another option available.

For more information on options for the IBM Personal System Users, reference the IBM PSG Year 2000 Web Page at   **www.ibm.com/pc/year2000/**