

## **Real-Time Clock (RTC) FAQ**

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Please read the following information BEFORE ordering or replacing a Real-Time Clock (RTC).

### **If my computer uses a standard battery, can it also have a Dallas Semiconductor Clock/CMOS RAM chip?**

No. Clock/CMOS RAM devices (Dallas Semiconductor, Odin, Benchmarq, Twinhead, et al) use tiny Lithium batteries that are encased in the device. If your system uses a Nickel Cadmium (NiCd) battery soldered to the board, a coin cell (soldered or in a cup socket) or a wire harness battery it won't use one of these devices.

Clock/CMOS RAM devices with onboard power CANNOT be added to systems with board mounted clock and CMOS powered by one of the above types of batteries. If you are unable to find anything that looks like a battery on your system board, see the next question in this FAQ.

### **How do I recognize Dallas Semiconductor modules on my system board?**

Dallas Semiconductor "Smart Batteries" and computer clock Modules with on-board batteries are easy to identify. The most commonly used types are:

DS1260  
DS1287  
DS12887  
DS12887A

Service life on these devices is typically in excess of 5 years. The manufacturer rates them at 10 years. Heat can play a role in early failure, so 5 years is the recommended replacement period.

These devices are typically mounted in sockets on the computer's system board (see CAUTION below). Disconnect the power cord and observe the Electrostatic Discharge (ESD) safety rules before touching any part of the computer.

CAUTION - We have encountered some systems where the module has been soldered directly to the systemboard instead of using a socket. Don't attempt to remove the old unit and resolder a new unit in place unless you are an experienced, board-level repair technician!

DS1260 "Smart Batteries" are available in 250, 500 and 1,000 mAH (milli Ampere Hours) rated packages. These devices sense when the AC power to the system is on and switch themselves out of the circuit to conserve battery resources. The DS1287 and 12887 are completely self-contained CMOS RAM modules with their own on-board power and a real-time computer clock. According to the Dallas Semiconductor data book, the DS1287 can be replaced by the DS12887. The service life on these devices is in excess of 5 years. The manufacturer rates them at 10 years.

\* other manufacturers (like Odin and Benchmark) that make competitive modules typically use the same number as Dallas Semiconductor models. They are usually pin compatible. For more information, see the cross-reference information in the section entitled Dallas Semiconductor Devices.

## Real-Time Clock (RTC) FAQ

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Someone put a password in my Dallas Semiconductor DS12887 chip. Is there any way to remove it?

Unfortunately, no. Dallas Semiconductor products without an "A" at the end of the model number can only be reset using a password. Our recommendation is to password protect all systems using this type of device with the same password and keep the password under lock and key in one or more places.

Dallas Semiconductor devices that do have an "A" at the end of their model number can be completely erased even if they are password protected. This is usually accomplished with a jumper on the system board. It is also possible to use a device with an "A" at the end of the model number in systems that don't have this feature.

To eliminate tampering on those systems that do not have a RAM clear jumper, we recommend that users password protect the device and tape a copy of the password INSIDE the computer case.

### **My system won't boot after I replaced my DS1287. What's wrong?**

We have encountered some systems that simply will not recognize the system clock or the CMOS settings after the clock/CMOS RAM device has been replaced. It appears that the only way to get the system to recognize the clock is to use the manufacturer's set up disk. This allows the system BIOS to recognize the clock/CMOS RAM chip so the user can enter the setup information.

### **My Dallas Semiconductor DS12887 chip failed almost immediately after I installed 32 MB of RAM? What's wrong?**

The answer (as of 3/13/97) is: we don't know. The following e-mail was graciously provided by Mr. Ken Price, director of research and development, of Simulator Labbs. Mr. Price has extensive knowledge of computer system boards and took the time to reply to our query regarding the recent rash of computer clock devices (Odin, Benchmark and Dallas Semiconductor) with on-board power. The information is provided by Resource 800 with Mr. Price's permission.

Date: Tue, 11 Mar 1997 23:54:44 -0800

Organization: Simulator Labbs

To: rescueme@onramp.net

Subject: Battery & Clock failure X-URL: <http://www.dallas.net/~r800/r800.htm>

There has been a rash of failures recently in Dallas Semiconductor components. From what I can gather given the facts I have available.

- 1.) Most failures occur after an upgrade in memory (Most 16 upto 32 or 32 upto 64 Meg.)
- 2.) Most failures are in large cases acting as servers w/2+ drives active at all times.
- 3.) Random number lots and ages of the failed parts.

I would surmise that failure has to do with the memory subsystem in some way. The most likely cause of this failure would in my opinion be caused by a slight overload in the bank, Ras and Cas switching logic. This can in my opinion be because of:

- 1.) improperly set resistor packs on motherboard indicating for instance a single sided 72-Pin bank when it is really a two sided.

## Real-Time Clock (RTC) FAQ

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- 2.) Barely spec, or improperly rated memory.
- 3.) Mixed banks of single and double sided memory on motherboards using interleaved placement of SIMMs. 1-2-1-2 instead of 1-1-2-2, etc.
- 4.) Power supply being run too close to its rated output.

The end result of this is both overshoot and undershoot of the power supply. The way this happens is that the power coming into the MB is split up according to IBM's original specs which call for specific pins on CN8 and CN9 to do specific jobs. This means that instead of having single ground and power planes for 5-Volts you have multiple planes and end up with what is called switching noise on the power lines. This is a byproduct of the over and under shoot found on the logic lines. What happens here though is that during power up there is twice as many or four times as many capacitors being charged in the DRAM and it puts a greater load on the lines going to both the memory and memory controller. If the power supply senses this extra load (Seen as lower voltage) it will increase the amperage available (Raise voltage) to compensate.

So while the CPU with its own line (Pin Not found on XT's) will see only a slight drop or raise in voltage because of local filters. The memory subsystem will feel it a great deal more. When the memory is charged the load goes away the discharging inductors in the power supply will see a lesser load and raise voltage due to the lesser load. This causes a normally small spike in the 5-Volt line to the memory. If this spike is large enough (>0.7V) then it could in theory overload the input diodes in the Dallas Semi. Devices causing failures with no reason for the failures detectable at a later time because the remainder of the machine is unaffected.

If this should be found to at fault then possible solutions are:

Use a larger U.L. Rated supply (Add 100 Watts Min.).

Use a higher frequency switching supply (Most are 30Khz., Use min 50Khz.) as this will reduce the amount of compensation necessary during bootup and power on.

Use a double filtered power supply so that spikes are absorbed by a second inductive/capacitive filter (More expensive).

Sequence the power on of H.D.'s to lower the power on draw. (Most SCSI and some IDE drives have this feature.)

Use a UPS so as to give a much more steady voltage to the power supply. Another great source of spike is power fluctuations.

Use larger single drives with larger partitions so there are fewer drives powering on at once.

Is there a way to trouble-shoot my system if it has a Clock/CMOS RAM chip installed?

If your system is 3-4 years old and you haven't made any significant changes like adding drives, newer modem or more RAM, replace the chip.

If you've made hardware changes to the system and begin experiencing problems, then you need to see what's causing them. It might be a disk drive, modem, network interface card (NIC) or even a floppy drive.

The following e-mail may be of interest to those persons experiencing difficulty with these devices. It tends to support our contention that, in many cases, the problems users are experiencing are with the system board or the power supply and not with the Dallas Semiconductor device itself.

## Real-Time Clock (RTC) FAQ

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To Resource 800 Technical Support:

Since our conversation about Dallas Real-Time CMOS battery failure I disconnected all peripherals and started reconnecting them one at a time.

When I got to the 5 1/4 floppy, it caused the CMOS to lose all prior settings. I reset the CMOS date, time and configuration information and left the drive disconnected. It has functioned for almost three weeks without incident

The problem seems to be a weak power supply or some kind of high resistance short to ground. If anything else develops in the near future, I will let you know

Thanks for your help,

Bob Leeling

P.S. It was one of your suggestions to do this

The best way to trouble-shoot any system is to disconnect all of the peripherals EXCEPT for the video card and boot hard drive. Remove all but 8 Megabytes (up to a maximum of 16 Megabytes) of RAM. Perform a cold start (using the power switch, NOT Ctrl-Alt-Delete (warm boot)).

If the system starts, then you have either a peripheral malfunction or the power supply Wattage is inadequate. Please note that you should have AT LEAST a 250 Watt power supply for a system using 32 Megabytes of RAM with a full load of peripherals (fast video card, floppy disk, modem, CD-ROM, large (or multiple hard drives, tape drive, etc.). Systems with 64 Megabytes of RAM should use a 300 Watt power supply.

In either case, a UPS is recommended to stabilize Voltage in the system. It is our experience that systems with weak or under-rated power supplies will surge and DESTROY the Lithium wafer batteries in clock/CMOS RAM devices like the DS12C887. This can happen in as little as 24 hours! Surges also tend to damage other devices that oscillate at high frequency including the video card, modem, network interface card (NIC), CD-ROM and processor (CPU).

Begin connecting after each peripheral is reconnected to the system. Note: if you're using Windows 95, press F8 and go straight to the command prompt! Then power down, reconnect another peripheral and restart. If you don't this, the Windows 95 will try to reconfigure itself for those items that are disconnected. If you connect a peripheral (or add more RAM to the system) and it exhibits problems or fails to boot, then you will know that either the peripheral is malfunctioning OR the power supply is failing or too small for the peripheral load. If you need a replacement power supply, you can link directly to <http://www.pcpowercooling.com/>.

In the case of excess RAM memory, reduce the amount of RAM memory to the amount installed before the upgrade. Most users report this as the last significant change to the system before the problems started.

## **Real-Time Clock (RTC) FAQ**

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### **When will Year 2000 compliant parts be available for DS12887 and DS12887A?**

DS12C887 Year 2000 compliant devices are available for world-wide shipment. For complete information about the DS12C887 and the devices it will replace, see Dallas Semiconductor Devices.

### **Can I substitute a DS12887 for DS12B887 or DS12887A?**

Yes. The DS12887 or the Year 2000 compliant DS12C887 will replace either device. However, the use of the RAM clear feature found on these devices will not be accessible. In this case, we recommend that the device be password protected to defend against possible tampering. Make sure that a copy of the password is taped inside the computer case in the event of an emergency.

### **Is the DS12C887 compatible with ANY of the Award 4.5X BIOS series?**

Dallas Semiconductor says that a small segment of devices in the Award 4.5X (i.e. the 4.50G and 4.51PG) series are incompatible with the DS12C887. It is best to test your system with one of the Y2K compliance analysis programs PRIOR to ordering a replacement.

Year2000.Com is a small resident program for DOS, OS/2 and Windows published by The RightTime Company that fixes the year 1999 to 2000 date change flaw of the CMOS RTC in AT-class PCs and PS/2s, 286 through Pentium and its clones. It works, and it's free for personal, non-business use (a licensed business version is available; see below). You can get a copy of the program from: [www.RightTime.com](http://www.RightTime.com) or via their BBS at (305)644-6185.

The program will determine quickly and safely whether or not your system is:

- Year 2000 compliant
- Year 2000 compliant with intervention (date must be manually set at 2000)
- Not compliant and requires BIOS replacement, BIOS "flash" or clock/CMOS RAM chip replacement.

Contact information for the company is:

Tom Becker  
The RightTime Company  
Miami, USA  
Phone: (305)644-6500  
Email: [GTBecker@RightTime.com](mailto:GTBecker@RightTime.com)

### **Are the DS1397 and DS1497 being discontinued?**

Yes. According to Dallas Semiconductor, these devices will no longer be made past May 1999. Users needing replacements will have to rely on existing stocks as these devices fail. Compaq and other manufacturers used these devices in file servers. Resource 800 will continue to provide these parts to users as long as supplies last.

## **Real-Time Clock (RTC) FAQ**

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### **I'm confused! What's the difference between Y2K compliant and Y2K capable?**

This is a confusing issue. The simplest explanation is that Y2K compliant means that the system will AUTOMATICALLY roll over to the year 2000 after 12/31/99 at 11:59:59.

Systems that are Y2K capable can be RESET to function in the new century after 12/31/99 at 11:59:59. In other words, these systems require manual intervention and/or operating system patches or special application software to provide the correct date.

### **My new system board uses a DS17887. Is it Y2K compliant?**

The DS17887 along with the DS1687, DS17287 and DS17487 are Y2K compliant, however the location of the century counter does not conform to the PC-AT or PS2 specifications. The century counter is located in bank one location 48h.

### **My PS/2 with Micro-Channel architecture uses a DS12887. Can I make my system Y2K compliant with the DS12C887?**

Not according to knowledgeable sources at Dallas Semiconductor and IBM. The reason is that the Micro-Channel architecture (MCA) used by IBM in the PS/2 series maintains the century bit information at 37HEX. AT-type systems maintain century bit information at 32HEX. The DS12C887 WILL NOT work in systems that use Micro-Channel architecture (MCA). Users who need more information on this subject should contact IBM directly via <http://www.ibm.com/>.

### **Can I use a software program to correct my operating system clock so I can be Y2K compliant?**

Yes and no. Yes, some software programs that run at boot time can correct the operating system clock and allow you to provide the correct date and time to application programs. However, if ANY application programs makes a call DIRECTLY to the hardware clock, it will get the wrong date.

NOTE - most applications use the software clock. Others, especially engineering, scientific, machine control, CAD and accounting programs use the hardware clock for date information (See the next question for additional information about ISA and PCI cards that attempt to correct hardware clock dates).

### **I've seen ISA and PCI boards that seem to take care of the Y2K issue. Do they work?**

It depends on the board. You should also be aware that, when pressed on this issue, the board manufacturers will tell you that there is always a latency issue when using this type of retrofit solution.

These devices implant the century information in the system in place of the BIOS and the associated hardware clock information. Application programs that make all their calls to the operating system clock (or DOS clock) won't have any problems. However, ANY application that makes a call to the hardware clock MAY encounter the latency between the time the Y2K board intercepts the hardware clock information and relays it to the operating system clock. In this case, the application

## Real-Time Clock (RTC) FAQ

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gets the wrong date and spawns passes the incorrect information to corresponding data files.

### **I need a new power supply. Where can I get one?**

You may be able to find one locally. Be sure to look for a at least a 250 Watt, double-filtered, UL-rated supply. If you have more than 32 Megabytes of RAM memory and/or a full load of peripherals, purchase a 300 Watt, double-filtered, UL-rated supply.

We also recommend using a UPS on the system. These devices help stabilize Voltages in the system and help protect from brown-out conditions and power surges. Be sure to purchase one with a phone-line surge suppression socket as most power surges (especially from lightning!) enter your system via this route.

If you can't find a power supply locally, visit <http://www.pcpowercooling.com/>. They provide a complete line of well-built power supplies and accessories. You can easily match the power supply in your system to the detailed drawings at their web site.

### **I took my old chip out and plugged it in the wrong way when I put it back. Is it fried?**

Probably. These devices are made to be plugged in ONLY ONE WAY! Please be sure to note the position of the dot (lower left-hand corner) of the chip. We recommend putting a small dot of ink (or Liquid Paper) on the system board to note the proper placement.

### **Will the DS12C887 correct an older BIOS that cannot generate dates past 12/31/99?**

Yes. According to Dallas Semiconductor, the DS12C887 CAN correct older BIOS versions by providing four century digits at the 32H address. In this case, the system performs correctly (i.e. falls in the Y2K capable category) once the correct date is set.

### **I'm REALLY confused! Is there a check-list or a single document that I can use to see if the DS12C887 will work in my system?**

This question is a compilation of many of the questions in this FAQ.

This is what you need to do or know, arranged in priority, BEFORE ordering a DS12C887 Y2K compliant device for your system. Resource 800 provides this information as a consumer service. Please note that we cannot provide technical assistance via our toll-free sales number. We will gladly provide copies of the following information, our price list and the relevant Frequently Asked Questions (FAQ) document via e-mail.

At a minimum, you MUST know ALL of the following:

- Who manufactured the device in the system? This could be: Dallas Semiconductor, BenchMarq, Twinhead, Odin or Houston Tech (ONLY if DS12885 DIP is used in device!).
- How long the original device lasted, especially if it failed in less than five (5) years.
- Is the device socketed or soldered?
- The total amount of RAM memory is in the system.

## Real-Time Clock (RTC) FAQ

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- Whether or not you or someone else made significant changes to the system, including adding peripherals and RAM memory up to or in excess of 32 Megabytes.
- Whether or not there are peripherals that are plugged into the serial or parallel port that remain on AFTER the system is powered off.
- The BIOS manufacturer and FULL version number.
- The power supply Wattage.
- Whether or not the system has been tested for Y2K compliance using one of the programs available via this site or a commercial software offering.

If you can't answer the above questions, you must read and implement the following BEFORE ordering or inserting the DS12C887 Y2K-compliant clock/CMOS RAM device.

### STEP ONE -

Open your system case and determine which (if any) device is used in your particular system. If you are not familiar with the various types of computer clock/CMOS batteries and semiconductor hybrid devices used read Computer Clock (CMOS) Battery Types BEFORE continuing. Please note that you cannot determine whether or not a clock/CMOS RAM chip has been used in your system without visually inspecting the system. Please do not rely on manufacturer schematic diagrams as they are notoriously inaccurate.

If your system uses a board-mounted battery like a soldered-on NiCd, a coin-cell or Lithium barrel or wire-harness (i.e. external) battery, STOP AT THIS STEP!. You CANNOT use the DS12C887 in your system. The system contains a chip set clock and you will have to replace the BIOS in order to effect Y2K compliance.

For your convenience, here is a list of the major BIOS manufacturers along with their contact information and URLs:

AMI (American Megatrends, Inc.)

According to AMI, "All current versions of AMIBIOS 95, core date 7-15-95, and future versions of AMIBIOS are year 2000 compliant. All previous OEM versions of AMIBIOS can be changed only by the system OEM to support the year 2000 feature. This change can be given directly to the system OEM from American Megatrends."

Specific information on Year 2000 (Y2K) compliance is available via:  
<http://www.amibios.com/y2k/>.

The contact information for American Megatrends, Inc. is:

American Megatrends, Inc.  
6146-F Northbelt Parkway  
Norcross, GA 30071-2976 USA  
Phone: 770-246-8600  
Technical Support: 770-246-8645

The URL for the AMI website is: <http://www.megatrends.com/> or  
<http://www.amibios.com/>.



## Real-Time Clock (RTC) FAQ

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Award Software International -

The following information characterizes the v4.50G and v4.51PG BIOS series:

Systems using the Award v4.50 series BIOS (most commonly v4.50G) may not accept any dates after 1999 nor prior to 1994. In some cases, the Award v4.51PG BIOS yields the year 2096. Award recommends that end-users "get a BIOS upgrade from the OEM (the machine or motherboard's supplier or manufacturer)." Users that are unable to determine the Original Equipment Manufacturer (OEM) or who cannot contact them, should determine the BIOS part number from the top of the CMOS Setup screen and contact Award directly.

The contact information for Award Software International is:

Award Software International Inc.  
777 East Middlefield Road  
Mountain View, CA 94043-4023 USA  
Phone: 415-968-4433  
FAX: 415-968-0274  
E-mail: support@award.com

The URL for the Award web site is: <http://www.award.com/>.

Phoenix Technologies -

Phoenix Technologies does not provide BIOS upgrades directly to end-users. BIOS upgrades must be obtained either from the Original Equipment Manufacturer (OEM) or from Micro Firmware, a company specializing in Phoenix BIOS upgrades.

We recommend that you read the information found in this document found at the Micro Firmware website: <http://www.firmware.com/pb4ts/year2000.htm>.

The contact information for Microfirmware is:

Micro Firmware, Inc.  
330 West Gray Street, Suite 120  
Norman, OK 73069-7111  
Toll-free: 800-767-5465 Phone: 405-321-8333  
E-mail: support@firmware.com/

The URL for the Micro Firmware web site is: <http://www.microfirmware.com>.

STEP TWO -

If you determine that your system uses a clock/CMOS RAM device, you should next check the BIOS manufacturer and series for compatibility. You MUST do this by booting the system, noting the information presented by the system. Reading the information on the BIOS chip itself is inadequate and will almost never provide the provide the actual series number.

## Real-Time Clock (RTC) FAQ

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A. If the system will not boot, read the following:

The best way to trouble-shoot any system is to disconnect all of the peripherals EXCEPT for the video card and boot hard drive. Remove all but 8 Megabytes (up to a maximum of 16 Megabytes) of RAM. Perform a cold start (using the power switch, NOT Ctrl-Alt-Delete (warm boot)). VERY IMPORTANT: if you are using Windows 95 or Windows 98, press shift-F5 during the boot process and go straight to the DOS command prompt! If you don't this, the Windows 95 will try to reconfigure itself for those items that are disconnected. If the system boots properly, power down, reconnect another peripheral and restart using the power switch.

If the system misbehaves or won't boot at all during this process, then either a peripheral malfunction exists or the power supply Wattage is less than adequate for the configuration. Systems that will not hold configuration information in CMOS RAM during a warm-boot or those that stall and/or lock up at boot time are indicating malfunctions in some sub-system OTHER THAN the clock/CMOS RAM device!

SPECIAL NOTE - systems equipped with a device that ends with or contains an "A" (i.e. DS12887A, BQ3287A, etc.) may have the RAM clear jumper set in the wrong position. READ THE SYSTEM BOARD DOCUMENTATION to determine which position the device must be in TO RETAIN the CMOS settings. In some cases, the RAM clear jumper must be engaged to clear the machine BEFORE a new clock/CMOS RAM device can be inserted.

Please note that you should have AT LEAST a 250 Watt power supply for a system using 32 Megabytes of RAM with a full load of peripherals (fast video card, floppy disk, modem, CD-ROM, large (or multiple hard drives, tape drive, etc.). Systems with 64 Megabytes of RAM should use a 300 Watt power supply.

In any case, a UPS is recommended to stabilize Voltage in the system. It is our experience that systems with weak or under-rated power supplies will surge and DESTROY the Lithium wafer batteries in clock/CMOS RAM devices like the DS12C887. This can happen in as little as 24 hours! Surges also tend to damage other devices that oscillate at high frequency including the video card, modem, network interface card (NIC), CD-ROM and processor (CPU).

If you connect a peripheral (or add more RAM to the system) and it exhibits problems or the system fails to boot, then you will know that either the last peripheral installed is malfunctioning OR the power supply is failing or is too small for the configuration. If you determine that you need a replacement power supply, you should consider linking directly to <http://www.pcpowercooling.com/>.

In the case of excess RAM memory, reduce the amount of RAM memory to the amount installed before the upgrade.

Most users report this as the last significant change to the system before the problems started.

NOTE: These devices are rated by the manufacturer for a ten (10) year life. We rate them at five (5) years, nominally. If the device in your system failed in less than five (5) years (typically about two (2) years) and/or you have made major changes to the system peripherals including adding hard drives (especially SCSI devices), other

## Real-Time Clock (RTC) FAQ

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high-drain peripherals like storage devices or RAM memory you have a system-based problem.

Typically, this is due to a weak or inadequate power supply. In this case, you may have to spend \$100.00 US, or more, plus the cost of a BIOS (flash program or new EPROM chip at a cost of \$49.95 US) from a BIOS manufacturer, plus the cost of the clock/CMOS RAM chip (\$29.95 US). In some cases, it may be less expensive to purchase a new system board. Resource 800 makes a business out of trying to solve more problems than it creates. Therefore, this option may be better for you in the long-run.

B. If the system starts, determine whether or not the clock/CMOS RAM device is socketed or soldered to the system board.

If the device is soldered, you will have to remove the system board from the case, de-solder the old device, solder in a 24 pin DIP socket (available from Resource 800), re-install the system board and peripherals and insert the new device into the socket. Caution: You MUST remember to mark pin one on the system board BEFORE de-soldering the old device! The 24 pin socket can be inserted backwards but the DS12C887 CANNOT!.

C. Verify the manufacturer and device model for the clock/CMOS RAM device.

The DS12C887 CANNOT replace the following: DS1387, DS1488, DS1397, DS1497 and DS14287. These devices ARE NOT Y2K compliant and there are no replacements planned for this series. For more information, please read the appropriate entry in the Dallas Semiconductor (Clock/CMOS RAM Chips) Frequently Asked Questions (FAQ).

The current list of pin-compatible items for the DS12C887 includes the following:

BenchMarq

BQ3287MT  
BQ3287AMT  
BQ3785P DIP

Dallas Semiconductor

DS12885 DIP  
DS1285 DIP  
DS12B887  
DS1287 \*  
DS1287A  
DS12887  
DS12887A

Houston Tech HT12888A \*\*

\* January 1999 -- According to the engineers at Dallas Semiconductor, there are instances where the DS12887 CANNOT replace the DS1287. This apparently occurs

## Real-Time Clock (RTC) FAQ

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when the BIOS accesses the wrong memory segment in the DS12887 and the device then fails to communicate with the timekeeping registers.

\*\* ONLY if DS12885 DIP used in base assembly. According to sources at Dallas Semiconductor, the VIA VT82885N was meant to be a functional replacement for the DS12885 DIP but did not meet the correct specifications. One or more system board manufacturers changed their design to match the specifications of this device. Therefore, you cannot replace it with a DS12885 DIP or DS12887. For many users, this will mean REPLACING the system board because the HT12888A is not commercially available.

Here are the symptoms:

- The system fails the Post Test.
- The boot sequence reports a real-time clock (RTC) malfunction.
- The system time will not advance because it is accessing memory instead of the timekeeping registers.

At this time, users should assume that if the DS1287 cannot be replaced with the DS12887, it also cannot be replaced with the DS12C887 Y2K compliant Clock/CMOS RAM device.

Odin -

- OEC12C887
- OEC12C887A

Thomsen-Mostek

- M48T86
- MK48T87

D. Verify the BIOS manufacturer and series:

If the BIOS is an Award 4.50G or 4.51PG, contact the BIOS manufacturer (see contact list above) for an upgrade if you want to purchase the DS12C887 Y2K compliant device. The DS12C887 WILL NOT work with these BIOS versions! In many cases, the system will not even boot! You can, however, purchase one of the non-compliant device (i.e. DS12887, DS12887A) but your system will most likely not calculate dates beyond 12/31/99.

If the BIOS is an AMI or Phoenix BIOS, you should test the system with one of the Y2K compliance analysis programs. We currently recommend the program provided by The RightTime Company. The free download contains a test program and a terminate-and-stay-resident (TSR) program that can correct some time-related defects in older systems.

DO NOT INSTALL the program without reading the documentation! Un-ZIP the program, read the documentation and run the test FIRST!.

## Real-Time Clock (RTC) FAQ

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The program will tell you quickly and safely whether or not your system is:

- Year 2000 compliant
- Year 2000 compliant with intervention (date must be manually set at 2000)
- Not compliant and requires BIOS replacement, BIOS "flash" or clock/CMOS RAM chip replacement.

Year2000.Com is a small resident program for DOS, OS/2 and Windows published by The RightTime Company that fixes the year 1999 to 2000 date change flaw of the CMOS RTC in AT-class PCs and PS/2s, 286 through Pentium and its clones. It works, and it's free for personal, non-business use (a licensed business version is available; see below). You can get a copy of the program from: [www.RightTime.com](http://www.RightTime.com) or via their BBS at (305)644-6185.

Contact information for the company is:

Tom Becker  
The RightTime Company  
Miami, USA  
Phone: (305)644-6500  
Email: [GTBecker@RightTime.com](mailto:GTBecker@RightTime.com)

Note: Resource 800 CANNOT provide technical support for this program. You should read the documentation in its entirety and then contact The RightTime Company for assistance.

### STEP THREE -

If you have determined that your system is operating properly, has a power supply with enough Wattage to cover the system's needs, has a compliant (or capable; see definition above) BIOS that is compatible with the DS12C887, call 1-800-430-7030 to order or use the secure form at <http://www.resource800.com/ho13008.html>.

Remember that there are ALWAYS exceptions and we have found some situations where the DS12C887 will not run with older BIOS versions. In these cases, you must upgrade the BIOS via the manufacturer (see BIOS manufacturer contact information above)

### SPECIAL NOTE REGARDING PASSWORD SECURITY FOR DS12C887

If you are replacing a DS1287A, DS12887A, OEC12C887A or BQ3287AMT, you will no longer have the ability to clear the CMOS RAM using the jumper on your system board. Therefore, we STRONGLY recommend that you enter a password in the BIOS setup to prevent tampering by unauthorized persons. Tape a copy of the password INSIDE the computer case or make certain that the password is documented and stored in a secure manner per your organization's security guidelines. If the password is forgotten or otherwise unavailable, you will have to replace the DS12C887 before you can use the computer or access the setup information stored in CMOS RAM. No one at Resource 800 or Dallas Semiconductor can help you if this occurs!

## **Real-Time Clock (RTC) FAQ**

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Thank you very much for taking the time to read this information. We hope that it was informative and provided you with the data needed to make a decision about upgrading your system to Y2K compliance.

### **I tried replacing my DS1287 with a DS12887 and it didn't work! What's wrong?**

January 1999 -- According to the engineers at Dallas Semiconductor, there are instances where the DS12887 CANNOT replace the DS1287. This apparently occurs when the BIOS accesses the wrong memory segment in the DS12887 and the device then fails to communicate with the timekeeping registers.

Here are the symptoms:

- The system fails the Post Test.
- The boot sequence reports a real-time clock (RTC) malfunction.
- The system time will not advance because it is accessing memory instead of the timekeeping registers.

### **I installed a new clock/CMOS RAM chip and my computer is STILL losing time! What's wrong?**

Here is the answer provided by Dallas Semiconductor engineers:

First determine if the time loss is in the real-time clock (RTC) or the operating system clock. The real-time clock (RTC) is a hardware clock and is unaffected by system-level changes. The operating system clock runs in memory and can be affected by other system processes and BIOS settings.

Is the time wrong when the system is turned on?

Is the system on 24 hours a day?

If the system is on 24 hours a day, then let:

1. Let the error accumulate.
2. Do not correct the time error and turn the system off.
3. Turn the system back on.
4. Check the time.
5. If the time is correct, then the problem IS NOT the real-time clock (RTC).

If the RTC is not the problem, then the most likely suspect would be BIOS-level power management functions. Many times these power management functions will cause the system clock to lose time. Disable the power management functions and test again for time loss.

Many computer users change their power management functions from the original factory settings and these system management interrupts (SMIs) take priority over all other functions, including the system time tick. This causes the system time to run slow because more and more interrupts are missed. Disabling the power management functions or setting them back to the original factory settings normally eliminates the problem.

## **Real-Time Clock (RTC) FAQ**

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### **I read the DS12887A specification sheet and it calculates dates to 2100. Is it Y2K compliant?**

No. The device can calculate but won't be able to roll over and store a binary date that will support year 2000 and beyond. See the next question for a quick link to Dallas Semiconductor if you need to find out which devices are Y2K compliant.

### **Is there an EASY way to determine which Dallas Semiconductor parts are Y2K compliant?**

Yes! All you have to do is link to <http://www.dalsemi.com/info/y2k/>. All of the Dallas Semiconductor products have been inventoried and categorized. For Clock/CMOS RAM devices, select the "Timekeeping" link. You must have installed Adobe Acrobat to be able to read and/or print the file.

### **I used an MR BIOS flash upgrade and installed a DS12C887. The year reads 2001. What happened?**

To date, we have had no response from MR BIOS about this problem. The engineering staffs at Dallas Semiconductor and RightTime suspect that the BIOS and the DS12C887 are each incrementing the century address at roll-over. In this case, users can either upgrade their BIOS or replace the Clock/CMOS RAM device, BUT NOT BOTH!

### **My system has an HT12888A made by Houston Technologies. Can I replace this device?**

It depends on which manufacturer's part was actually used underneath the plastic "turtle shell" that covers the battery and DIP device. DO NOT REMOVE THE DEVICE FROM THE SYSTEM BOARD SOCKET! CAREFULLY remove the plastic shell labeled "HT12888A - Houston Technologies" without damaging ANY of the pins that point downward to the system board or upward to make the battery connection. Usually, a finger-nail inserted under the shell on one of the long sides does the trick. If you break one of the pins and the underlying device is a VT82885N, you will have to replace the system board!

NEW INFORMATION (January 2002) - Several repair facilities successfully replaced VT82885N devices with the DS12887A. The DS devices apparently do work but care must be taken to identify pin 1 on the VT82885N BEFORE inserting the DS12887A. If the device is inserted backwards, it and/or the system board can be damaged. Once again, the safest repair option is the battery replacement described above as long as there are no broken pins on the VT82885N.

If the semiconductor device under the plastic shell was made by Dallas Semiconductor or Odin (i.e. a DS12885 DIP or Odin OEC12885), then the DS12C887 can be used for replacement. If your system uses an Award 4.50G or 4.51PG BIOS, you MUST UPGRADE the BIOS BEFORE ordering/replacing the clock CMOS RAM device. BIOS upgrades, unless provided by the system board manufacturer free-of-charge, typically cost \$49.95 US. If you have a Dallas Semiconductor or Odin device and choose to replace using the DS12887A DS12C887, make certain that the system has an adequate power supply to support the RAM and peripherals. For more information, read: "I'm REALLY confused! Is there a check-list or a single document that I can use to see if the DS12C887 will work in my system?" BEFORE ordering or replacing one of these devices.

## **Real-Time Clock (RTC) FAQ**

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If your system uses a VIA VT82885N device, you can only replace the battery. According to Dallas Semiconductor, the VT82885N is a close, but not exact, emulation of the DS12885 DIP. Therefore, The only sure repair option requires CAREFUL removal of the battery and soldering. We can provide a replacement cup socket with wire leads (CR2032-CSR; \$19.95 US, plus shipping) that makes the job simple.

Some users have reported that they have used a DS12887A (\$19.95 US, plus shipping) to make the replacement. However, the DS12887A DOES NOT WORK in all cases. In one case, with two identical machines side-by-side, the DS12887A worked in one system, but not in the other. Since ESD devices like the DS12887A are NOT RETURNABLE for credit or exchange, we highly recommend replacement of the battery using the CR2032-CSR kit.

NOTE - If the device in your system uses the VT82885N and you break one of the pins, your only repair option is to purchase another system board. At the time this FAQ item was written, Socket 7 system boards were available in limited supply.

### **I have an NEC Ready laptop. Can I use a DS12C887A to replace the BQ3287AMT that is in the system?**

Based on the reports that we're getting from customers, the answer is "No." Apparently, NEC made some changes to the microcode in the Phoenix BIOS so you will have to stick with the BQ3287AMT or the DS12887A (non-Y2K compliant).

Additionally, users that have attempted to "flash" the Phoenix BIOS in the NEC Ready laptops with an MR BIOS are also reporting difficulties.