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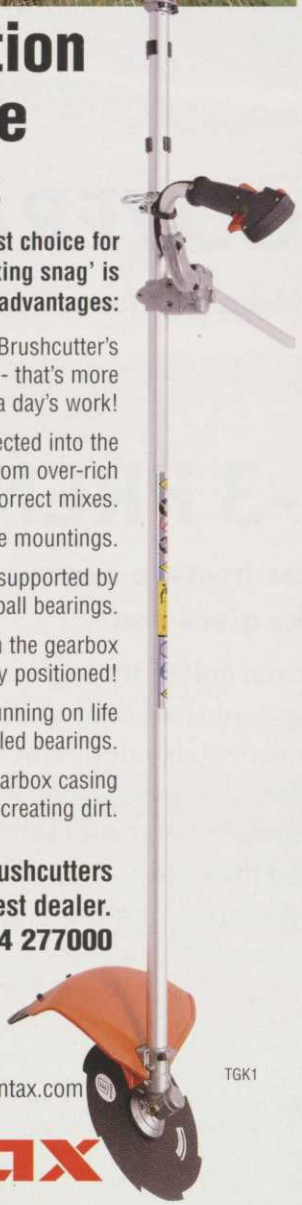

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Bug eyed?

Many, if not all of you, will have heard about or read articles on the Millennium Bug, Year 2000 (Y2k) problem or the Millennium Time Bomb. Opinions vary about what its effect will be from nothing at all to the most cataclysmic event since the advent of automation.

What is the Millennium Bug?

The problem is very simple but what gives it a world wide impact is that almost all organisations and individuals use or are dependent on micro processors (chips). If all chips had been manufactured to today's standards there would, probably, be no problems. Unfortunately, there are many electronically controlled devices containing older chips that could cause problems.

The problem concerns the way that chips store dates. The normal date has three elements ie day, month and year. Most chips, in the past, stored only the third and fourth digits of the year eg. 99 instead of 1999. This was for two reasons. First it saved computer storage space and second, manufacturers did not think ahead and foresee the problems that the year 2000 might bring ie. if the computer adds 1 to 99 the year changes to 00, but is it 1900 or 2000 or even 3000.

Many people feel that the Y2k

Ken Richardson gives some valuable advice aimed at lessening the risks of the dreaded Millennium Bug

problem has been exaggerated by the media, by consultants and by the manufacturers of computers and other systems. There is an element of truth in this, but until you assess the impact that the Y2k bug will have on you there is no way of knowing.

Will I be affected by the Y2k bug?

The answer to the above question is maybe. If you do not use a computer at home or at work, do not have an automated irrigation system, do not use a microwave oven, drive a car, fly off on holiday, use a cash point, rely on traffic lights, use the telephone nor use anything that contains an embedded chip or chips then the answer is no. If however, you use or operate any device that contains a chip or chips the answer, again, is maybe.

How do I find out?

In theory, the answer is simple. Identify all the systems, devices and programs which have date calculations and advance the date and see what happens. This sounds easy but when you start to assess how many chips are used in the home and at work, the problem becomes massive. Some estimates show that between 30 and 40 billion chips have been sold during the last few years with 7 billion chips sold in 1998.

Action 2000 has been set up, by the Government, to help all businesses in the United Kingdom, to deal with the Y2k problem. The Action 2000 seven step plan was designed to help you to apply project management methods to assess if you have problems and how to fix them.

The seven steps are:

1. Understand
2. Prioritise
3. Assess
4. Plan
5. Implement
6. Test
7. Install

Step 1: Understand

If you are reading this article then you have started the process of understanding. Further information can be obtained from Action 2000, PO Box 1999, Stratford on Avon, CV37 9GS, telephone 0845 6012000.

Step 2: Prioritise

Create an inventory of all computer hardware, software and embedded chips in your organisation, which might be affected. This could contain:

A list of software, both applications and operating systems.

A list of computer hardware

A list of devices containing embedded chips eg machinery, irrigation systems, telephones, fire and intruder alarms etc.

A list of all suppliers, sub contractors or agencies whose failure, due to the Y2k problem, could adversly affect your business.

If you are in any doubt whether a device may be affected then add it to your list.

Step 3: Assess

Once you have completed your inventory then you need to assess if the system will have Y2k problems and what impact any failures may have.

Assessing operating systems and general software packages usually means contacting the provider. Information on software packages can be found on the Internet eg Microsoft have a site at www.microsoft.com/year2000.

Assessing computer hardware can be a simple process and more details will be given later.

Assessing embedded systems can be a problem but the manufacturer/dealer who supplied the system should be able to give you the answers. Alternatively, use the Internet eg www.mitre.org/research/cots is an A-Z list of companies and product information.

Step 4: Plan

By this point, you will have decided what equipment and which systems need fixing their priority and the cost implications. However, you may have decided that your systems are compliant and that you do not need to progress any further.

If you do need to take action then you can apply the 5R strategy to the problem. The 5 Rs are:

Repair it
Retire it
Redeploy it
Renew it
Risk it

Some people say that there is a sixth R which is Run Away!

Once you have made the decisions on the way ahead, you need to formulate a plan of action. Remember that 1 January 2000 is just over 200 days away, which does not leave you much time. You may also want to look at contingency plans to be used as a safety back-up in the event of an unforeseen system failure.

Step 5: Implement

If you do have to buy new hardware

Bug eyed?

or software then you should insist on a written guarantee of compliance with each purchase and ensure that the guarantee answers your organisations requirements for compliance.

Step 6: Test

You need to produce a test plan which not only details when testing will take place but what you are testing for and what test data will be used. For embedded chips, the first and easiest test for any piece of equipment is to contact the supplier or person who maintains the equipment and ask them if the equipment is Y2k compliant.

Computer Hardware Problems

First the good news. Macintosh computers are not affected by the millennium bug as their years are held as four digit numbers. The bad news, however, is that most PC type computers could be affected.

PCs hold the date in three distinct places ie. the Real Time Clock, the BIOS Clock and the Operating System Clock and a problem with any or all clocks could cause a problem. Another date problem could be caused by the fact that the year 2000 is a leap year. A leap year is any year that is divisible by four and not by 100 or is also divisible by 400 where the last two digits are zeros eg. 1996/4 = 499 but 1996/100=19.96 therefore it was a leap year but 1900/4 = 475 but 1900/100 = 19 and 1900/400 = 4.75 therefore it was not a leap year. However, 2000/4 = 500 and 2000/100 = 20 and 2000/400 = 5 therefore 2000 is a leap year. This could be a problem if you have a system that needs to calculate days in a year eg. if your computer does not recognise that 2000 is a leap year the number of days in 2000 will be calculated as 365 instead of 366.

Additionally, all dates after 28 February 2000 will be wrong but they can be reset.

If you do not use the date function on your computer you may think that you are safe. However, some software uses the date function to check that your licence or password is still valid if the software sees the wrong date then it may not allow you access. If you use a networked system you have even greater problems as a date problem on one machine can transfer the problem to other machines on the network. If you have software that is licensed to a future date you should not advance your computer held date beyond the licence expiry date as you could be locked out permanently.

Testing BIOS

It is estimated that 50% of all PCs sold in the past four years have a non compliant BIOS. Tracing the BIOS used in a PC is not easy as two 'identical' machines bought on the same day could have different BIOS. There are two ways to test your PC ie. Manual and Software.

Manual Test

The Real Time Clock can be checked by setting the system time and date, through DOS or Windows, to 23 58 on 31 December 1999. After leaving the computer for a few minutes, the date should read 1 January 2000. However, you should also check what happens if you set the date and time as above ie to 23 58 on 31 December 1999 and then turn off the computer, leave for three minutes and turn it on again. If the date is shown as 1 January 2000 then you are one of the lucky few. Remember to check that the time reads 00 01 as some computers roll over to 20 00. Unless your BIOS chip is year 2000 compliant then you may find that the date now reads 1 January 1980 or some other date. As I said above, if you do not need to use the date function within your applications then there may not be a problem. However, if you do use the date some programmes will obtain it from the BIOS clock which will probably return 1 January 1900 and others will obtain it from the Real Time Clock which will return 1 January 1980 ie the date when all computers were 'born'. Check that BIOS recognises that 2000 is a leap year by changing the date and time to 23 58 on 28 February 2000. Shut down your computer, wait for a few minutes and then switch on. The computer should show the date as 29 February 2000.

Software Test

A variety of programmes are available that will test your computer automatically. However, some test packages are of dubious quality. Free downloads are available on the Internet and several sites review test and fix packages. eg. www.solace.co.uk reviews fix software packages, www.span2000.com is a PC fix software site, www.gmt-2000.com contains Check 2000 software plus a host of other information.

Computer Software Problems

Information on Computer Software compliance can be obtained from the manufacture/supplier. Microsoft has massive site on the Internet at www.microsoft.com/year2000. All TRIMS for Windows and TRIMS for DOS Systems (including Tree Inventory) which are at Version level 3.1W or 3.3 are compliant. All TRIMS 97 Systems are compliant as

is their new product TRIMS 2000 (available for release June 15, 1999). More information on TRIMS compatibility can be found on the Internet at www.trims.com

Step 7: Install

This can be the installation of new systems or the installation of fix programmes and/or new chips.

Fixing BIOS

There are several ways to fix the problem caused by BIOS. These are:

- Enter the date manually the first time that the computer is switched on in 2000
- Update your BIOS
- Install a software fix
- Install a new BIOS chip
- Install a new Real Time Clock chip
- Update your operating system
- Buy a new computer

None of the above are guaranteed to fix the problem and detailed knowledge of computer hardware may be needed to remove/insert new chips. Microsoft recommend manually resetting the BIOS the first time that the computer is used in the year 2000 and later versions of Windows NT include an automatic fix. Future 32 bit versions of Windows will also include an automatic fix.

Unfortunately, some computers with non compliant BIOS will need to be reset each time the computer is switched on.

What do I do next?

If you have not considered how the Y2k problem may affect your business then you should take immediate action to Assess all of your electronic equipment to see if the Y2k problem will affect you. If you are certain that none of your electronic systems are date reliant then you need not worry about the Millennium Bug. If, however, you find that you may have a problem then you will need to find out what can be done. Most Training and Enterprise Councils have been running Test and Fix and Assess and Manage Courses for some time so check with your local TEC/LEC.

Search the Internet, it contains a vast amount of information. Talk to others in the same situation. Finally, where necessary, employ a consultant.

Do not panic, as I said above, the Y2k problem may have no effect on your business or home life. However, if you do nothing now, you may have severe problems at the start of and during the Year 2000.

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Don't let it rain on your parade

In irrigation, the programme scheduling including start times, active days etc uses date as one of the essential input factors. With a PC date running out of synchronisation with real dates this can cause some obvious operational problems

Graeme Francis, Marketing Manager for The Hydroscape Group Limited and UK Distributors of Toro Irrigation Products, troubleshoots some potential problems which are facing greenkeepers and their computer-based irrigation systems

There seem to be two things about the year 2000 that everybody hears about, the Millennium Dome and the Millennium Bug.

Both seem to bring out an opinion in most people, and whilst the Dome is of background interest, the Bug will potentially have a greater and more global impact.

We hear many stories about the failure of all kinds of systems and the foretellers of doom are having a great time predicting the chaos that will ensue when the clock rolls over from 31st December 1999 to 1st January 2000.

For us, the question that will arise is what will be the effect of entry into 2000 on the operation of equipment used for golf course management.

The whole scenario is encompassed by the term Year 2000 Compliant sometimes shortened to Y2K (no it doesn't involve changing every Y in the dictionary to a K, or New Year's Eve would become 1st Januark 2000!)

Year 2000 compliance is, however, not really to be seen as a joke, as it is important to greenkeepers. The reason for this is that any piece of equipment you use that has a microchip needs to be compliant. This is particularly relevant to the electronic technology used in irrigation control which probably represents the most sophisticated electronic equipment used in golf course management.

There are two types of irrigation systems that need Year 2000 compliance. The largest group is that of controllers utilising microchips with embedded software and a control panel inputting format. These range from small residential controllers which can operate up to, for example, twelve control valves through to the extensive wall mounted golf course decoder systems which may operate up to four hundred stations.

Some of the decoder controllers may now be fifteen years old and consideration of Year 2000 compliance was not a major issue in the mid 1980's. Well it is now, and you should be checking with the supplier or contractor who installed or services the system as to whether the unit is affected and, if so, what can be done to overcome the matter. In many cases the corrective action will be an upgrade of the chip, however you will need to establish that this is possible and that the appropriate chip is available.

The second system type affected by the Year 2000 issue is that using PC based interfacing. More and more greenkeepers are using a PC as an aid to course management. In some cases the PC is being used for general administrative tasks including word processing, spreadsheet production, report generation etc. In many instances a PC is being used as the central component of the irrigation control system. In the UK today it is probable that as many as 75% of new irrigation systems use PC technology to allow the input, monitoring and adjustment of irrigation operations. The

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Don't let it rain on your parade

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benefits of such control are well founded and make PC control a very serious and viable option when considering the specification for a new system to water the course.

With the increased use of PCs comes the necessity to ensure that all elements of their supply is undertaken correctly and that continuity of technical service support is provided. This support includes the ability to fight off the infamous Millennium Bug.

From a pure irrigation viewpoint the key area of attention is in date comprehension.

In the early days of computer development information storage space was both limited and expensive. As a result it was decided that a six digit date format would be used, i.e. the 1st January 1999 is shown as 01/01/99. This format became the standard, and whilst we are still in the 20th century it serves the purpose perfectly well. What has been created, however, is a situation whereby a computer, or any software embedded in a microchip, has no understanding of a change in century. The machine will read any six digit date ending in 00 to be in 1900, and not in 2000. This problem was most highly demonstrated in the personal banking sphere were computers were voiding transaction made on credit cards with expiry dates ending in 00 because as far as the computer was concerned the card expired in 1900!

This is just one example of why Year 2000 compliance is important in computer systems. In addition, there are a number of crucial transition dates after New Year's Day 2000 which will cause date errors. These include 28th February to 29th February and 29th February to 1st March, which are significant because the first year of the third millennium is also a leap year.

Whilst it is almost certain that you will not be running irrigation on New Years Eve 1999 or indeed for several months before or afterwards it doesn't mean that your equipment can avoid being Year 2000 compliant.

In irrigation, the programme scheduling including start times, active days etc uses date as one of the essential input factors. With a PC date running out of synchronisation with real dates this can cause some obvious operational problems.

Year 2000 compliance applies to both hardware and software. A PC may be compliant, but some of the software programmes it is using may not. The opposite is also true, and this hardware compatibility can extend beyond the PC.

As has already been mentioned it is not just the PC itself, but any other peripherals or specialist hardware components of the system which may be affected. Decoder interface units, field interface modules and radio communication elements could all encounter problems if the manufacturer has not had the foresight to build compliance into them.

In essence you need to have an

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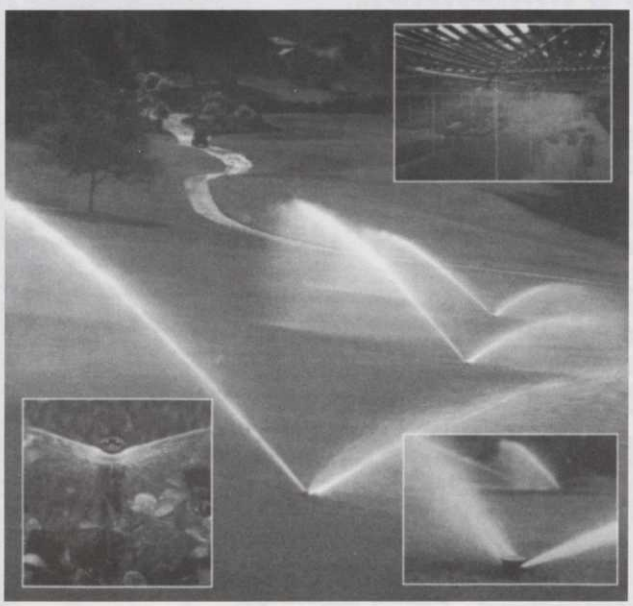

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irrigation system that is fully compliant. Most that have been installed in recent times will be, but it is worth confirming this with the supplier or installer. Any that are not will need to be upgraded to meet the compliance criteria and the sooner this is done the better, as the pressure on manufacturers and installers will increase as the end of 1999 gets nearer.

The best action to take is to first establish exactly what equipment you have on the course. Get the details of the product type, model, serial numbers and installations dates and then contact the system installer or service company. Some companies such as Toro have worked to ensure that their products, such as Toro's SitePro, meet the demands of this once-in-a-thousand-years scenario. With its NSN Service it has an extensive PC irrigation support service in place, which operates at national, regional and global levels using dedicated staff, who will provide all the answers you require. Other major manufacturers have also been aware of Year 2000 compliance requirements and all products recently and currently sold, should be fully compliant.

Don't forget, however, that any software that has been installed on the PC such as word processing, spreadsheet or database packages need to be evaluated as they may require individual fixes, "patches" or upgrades to bring them up to specification.

In summary if you have an electronic controller or a PC based system, gather the equipment information and contact the provider who will be able to confirm you particular status and provide any upgrade or replacement service you need. If the original supplier cannot help, there are several companies who can provide alternative and compatible equipment.

As with all irrigation purchasing decisions the reliability of the equipment, its suppliers, its installers and the long term support they provide are crucial if you are to get the best value for money. Their performance in dealing with Year 2000 compliance will be a measure of how good they really are.

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