


TR 98/D5 - Income tax: deductibility of year 2000 (millennium bug) expenses

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Draft Taxation Ruling

Income tax: deductibility of year 2000 (millennium bug) expenses

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TR 97/23

contents	para
What this Ruling is about	1
Class of person/arrangement	1
Cross references of provisions	3
Ruling	4
Y2K expenditure on computer software	4
Y2K expenditure on computer chips, firmware, and other hardware and equipment	8
Y2K expenditure on trading stock, etc	9
Apportionment	10
Date of effect	12
Explanations	14
Nature of Y2K expenditure	14
Key legal principles and analysis	19
<i>Y2K expenditure on computer software</i>	20
<i>Relevance of repair/improvement dichotomy</i>	25
<i>Relevance of Sun Newspapers' principles</i>	33
<i>Y2K expenditure on computer chips, firmware and other hardware and equipment</i>	37
<i>Apportionment</i>	42
Examples	44
Your comments	50

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What this Ruling is about

Class of person/arrangement

1. This Ruling applies to expenditure incurred in making computer systems year 2000 (Y2K) compliant. The Ruling explains the circumstances in which such expenditure is on revenue or capital account for the purpose of determining the extent to which it may be deductible under sections 8-1 or 25-10 of the *Income Tax Assessment Act 1997* (the 1997 Act).

2. This Ruling does not cover issues relevant to insurance, transfer pricing, legal expenses or the payment or receipt of damages. Nor does it apply to expenditure on software acquired or developed other than in relation to Y2K compliance.

Cross references of provisions

3. This Ruling refers to sections 8-1 and 25-10 of the 1997 Act which express the same ideas as sections 51 and 53, respectively, of the *Income Tax Assessment Act 1936* (the 1936 Act).

Ruling

Y2K expenditure on computer software

4. The deductibility or otherwise of expenditure incurred in making computer software Y2K compliant is governed by section 8-1 (the general deduction provision) and not by section 25-10 (the specific deduction provision relating to repairs). The extent to which the

TR 98/D5

expenditure is capital or of a capital nature, and specifically excluded from deductibility under section 8-1, depends on the type of work undertaken.

5. Expenditure incurred in undertaking initial diagnostic work on computer software to determine the extent it is Y2K compliant is a revenue expense and not of a capital nature. This is the case even if the computer system is found to be fully Y2K compliant.

6. Expenditure incurred in modifying computer software to make it Y2K compliant, and in testing the modifications, is also accepted as being of a revenue rather than a capital nature provided the work does not result in what is, in essence, a complete replacement of the computer software.

7. Expenditure incurred in respect to what is, in essence, the complete replacement of computer software (e.g., substantially rebuilding software or acquiring new software) to achieve Y2K compliance, and testing the replacement, is of a capital nature and is treated as an acquisition of new software. The written-down value of the replaced software can be written off in the year it is replaced. Rewriting of source or assembler code does not, by itself, constitute a replacement of computer software.

Y2K expenditure on computer chips, firmware, and other hardware and equipment

8. Expenditure incurred in modifying or completely replacing a computer chip or firmware to make computer hardware or computer operated equipment Y2K compliant is on revenue account. This includes the modification or complete replacement of software embedded in firmware. However, Y2K compliance expenditure that involves replacement of the whole or substantially the whole of the unit of hardware or equipment containing the computer chip or firmware is of a capital nature.

Y2K expenditure on trading stock, etc

9. Where the acquisition cost of computer software or hardware is of a revenue nature (e.g., because it is trading stock) all expenditure incurred in making the software or hardware Y2K compliant is of a revenue nature (unless the work done changes the nature of the software so that it becomes a capital item).

Apportionment

10. Where there is a combination of Y2K compliance work that is capital (e.g., the replacement of some software) and Y2K compliance work that is revenue (e.g., modifications to some software) the costs should be accounted for in accordance with the nature of the work done (i.e., either on capital or revenue account). Where the expenditure is directed at Y2K compliance work that is both revenue and capital (e.g., final testing of a system that has both replaced and modified software) it is necessary to apportion the expenditure on a reasonable basis to determine the respective amounts that are on revenue or capital account.

11. Where expenditure is directed at both Y2K compliance work of a revenue nature and other work of a capital nature (e.g., new or enhanced features) it is also necessary to apportion the expenditure on a reasonable basis to determine the respective amounts that are on revenue or capital account. Apportionment is not necessary where the work of a capital nature is minor and incidental to the Y2K compliance work of a revenue nature.

Date of effect

12. Income Tax Ruling IT 26 is withdrawn from 10:00 am (Eastern Standard Time) on 11 May 1998. To the extent that it is inconsistent with this Ruling, IT 26 continues to apply in respect to expenditure to make computer software Y2K compliant incurred prior to 10:00 am on 11 May 1998. This means that all expenditure incurred prior to 10:00 am on 11 May 1998 in making application software Y2K compliant is deductible as a revenue expense.

13. Otherwise, this Ruling applies to all expenditure on making computer software Y2K compliant incurred before and after the date of issue of the draft Ruling. However, the Ruling does not apply to taxpayers to the extent that it conflicts with the terms of a settlement of a dispute agreed before the date of issue of this Ruling (see paragraphs 21 and 22 of Taxation Ruling TR 92/20).

Explanations**Nature of Y2K expenditure**

14. The millennium bug refers to problems in computer systems, identifying a year by two digits, that will arise when the year rolls over from '99' to '00' at the end of 1999. This problem restricts the ability

TR 98/D5

of computer systems to process accurately date-related information for the year 2000 and beyond. The problem could result in:

- complete failures in computer systems;
- failures in arithmetic, comparisons, sorting and input/output;
- failure to recognise that the year 2000 is a leap year;
- use of '99' or '00' as reserve values, e.g., that a record should never be deleted or is a dummy transaction or account;
- platform limitations such as register storage sizes; and
- licenses for software expiring when the '00' date is reached.

15. Compliance is required for all types of computer systems including personal computers, networks, mainframe systems and embedded systems.

16. Making computer systems Y2K compliant involves some or all of the following types of work:

- (a) testing of computer systems and firmware, to determine compliance or otherwise (in some cases an entire system may be discovered to be fully Y2K compliant only after an extensive investigation process);
- (b) modification of existing software, for example:
 - (i) complete substitution of a 4 digit year format;
 - (ii) 'windowing' whereby computer date functions are 'wound back' for a period of, say, 50 years;
 - (iii) diverting date functions to the date fields of other software which is Y2K compliant;
 - (iv) rewriting of source or assembler code; or
 - (v) rewriting or modifying interfaces with other computer systems that may not be Y2K compliant;
- (c) replacement of software, by completely rebuilding it or substituting a Y2K compliant program;
- (d) replacement of computer chips, firmware, or in some cases, the whole hardware where the embedded software or the chip cannot be changed; and
- (e) testing of modified or new system or firmware.

17. For many organisations salaries represents a major component of the cost, although other components include contractor expenses and the acquisition of software and hardware.

18. The character of expenditure incurred in rectifying the millennium bug is not determined by the nature of the rights by which the computer system is held, i.e., it makes no difference whether the software is owned outright or used under licence.

Key legal principles and analysis

19. The key legal issue is whether expenditure incurred in making computer systems Y2K compliant is an allowable deduction under the specific deduction provision for repairs (section 25-10) or the general deduction provision (section 8-1). Expenditure that falls outside these provisions would generally not be deductible, although if it has a capital nature it may qualify for depreciation.

Y2K expenditure on computer software

20. Section 25-10 provides for the deductibility of expenditure, other than capital expenditure, for repairs to premises (or part of premises), plant, machinery, tools or articles held or used for the purpose of producing assessable income. While the things specified in the section cover a wide range of property, they do not extend to all classes of property, e.g., intangible property such as computer software. However, it is considered that section 25-10 does apply to repairs to computer hardware.

21. Expenditure on rectification work on computer software may qualify for deduction under section 8-1 to the extent that it is incurred in gaining or producing assessable income or necessarily incurred in carrying on a business for the purpose of gaining or producing assessable income. The expenditure must not be of a capital, private or domestic nature, or incurred in gaining or producing exempt income.

22. Where expenditure incurred in acquiring the computer software itself is on revenue account, expenditure incurred in making that software Y2K compliant is also of a revenue nature. For example, a trader in computer software may replace the software with Y2K compliant software, or a taxpayer may be obliged under a warranty to replace computer software to achieve Y2K compliance in equipment that the taxpayer has sold. An exception would be where the work done is such that it changes the nature of the software so that it is on capital account.

TR 98/D5

23. Where the computer software itself is on capital account, general capital/income principles and tests apply in determining whether the expenditure in modifying that software is on capital or revenue account.

24. In determining whether such expenditure is of a revenue or capital nature, the principles provided in *Sun Newspapers Ltd and Associated Newspapers Ltd v. FCT* (1938) 61 CLR 337; 1 AITR 403 (Sun Newspapers) are particularly relevant. Dixon J stated the key principles at CLR 359-363; AITR 410-413:

'The distinction between expenditure and outgoings on revenue account and on capital account corresponds with the distinction between the ***business entity, structure, or organisation set up or established for the earning of profit and the process by which such an organisation operates to obtain regular returns by means of regular outlay***, the difference between the outlay and returns representing profit or loss. ... As general conceptions it may not be difficult to distinguish between the profit-yielding subject and the process of operating it. In the same way expenditure and outlay upon establishing, replacing and enlarging the profit-yielding subject may in a general way appear to be of a nature entirely different from the continual flow of working expenses which are or ought to be supplied continually out of the returns or revenue. The latter can be considered, estimated and determined only in relation to a period or interval of time, the former as at a point of time. For the one concerns the instrument for earning profits and the other the continuous process of its use or employment for that purpose. But the practical application of such general notions is another matter. The basal difficulty in applying them lies in the fact that the extent, condition and efficiency of the profit-yielding subject is often as much the product of the course of operations as it is of a clear and definable outlay of work or money by way of establishment, replacement or enlargement. In the case of machinery, plant and other material objects, this is illustrated by the commonplace difficulty of saying what is maintenance and what are renewals to be referred to capital.'

'In the attempt, by no means successful, to find some test or standard by the application of which expenditure or outgoings may be referred to capital account or to revenue account the courts have relied to some extent upon the difference between an outlay which is recurrent, repeated or continual and that which is final or made "once for all", and to a still greater extent upon a distinction to be discovered in the nature of the asset or advantage obtained by the outlay. If what is commonly understood as a fixed capital asset is acquired the question

answers itself. But the distinction goes further. The result or purpose of the expenditure may be to bring into existence or procure some asset or advantage of a lasting character which will enure for the benefit of the organisation or system or "profit-earning subject". It will thus be distinguished from the expenditure which should be recouped by circulating capital or by working capital.' (emphasis added)

Relevance of repair/improvement dichotomy

25. When determining whether expenditure incurred in modifying a capital asset (as opposed to the cost of acquiring the asset) is on capital or revenue account, the courts have generally relied on the distinction between repairs and improvements. Comments by Kitto J in *FC of T v. Western Suburbs Cinemas Ltd* (1952) 86 CLR 102; (1952) 9 ATD 452 at CLR 105; ATD 454 indicate that this distinction is not limited to section 25-10 and may also apply to section 8-1.

26. This raises the question of whether work done to make computer software Y2K compliant can be considered to be a 'repair'. The ordinary meaning of the word 'repair' is the making good of defects in a property which has deteriorated from its original state and may involve curing defects arising from the defective design or construction of the building: **Osborn's Concise Law Dictionary, 8th ed.** Many judicial decisions make it plain that 'repair' involves the making good of defects, damage or deterioration including the renewal of parts and that the word does not imply a total reconstruction: **Stroud's Judicial Dictionary, 5th ed.**

27. It is generally accepted that such work involves removing a defect in the software which arises from a combination of the use of two digits to represent the year and the year rolling over from '99' to '00'. However, while the removal of such defects in software may fall within the general notion of repair, this has limitations that could be misleading, particularly when applying case law that has developed around the repair/improvement dichotomy. This arises because 'repairs' generally implies a notion of remedying the effects of 'wear and tear' or 'deterioration arising from the use of the property'. This applies even when reference is made to defects in design, which still seems to assume that the defects arise from the use of the property as part of the process of deterioration.

28. Tangible concepts such as 'wear and tear', 'deterioration' and 'defects arising from the use of the property' have no real meaning for computer software, except perhaps in situations where external events such as computer viruses or power surges affect the operation of a

TR 98/D5

program. The millennium bug does not arise so much **'from** the use of the computer software, but arises **during** the use of the software.

29. The limitations of treating modifications to software as a repair can be seen when attempting to apply the 'initial repairs' principle. The principle, in distinguishing between defects that are part of the acquisition cost and defects that arise from the operations of the acquirer, is dealing with defects that arise from 'wear and tear' of the property (see Windeyer J in *W Thomas & Co Pty Ltd v. COT* (1965) 115 CLR 58 at 72; (1965) 14 ATD 78 at 87 (Thomas)). While the principle may still apply in respect to defects that do not arise from 'wear and tear', it does not recognise that the existence of defects arises from the particular nature of software programs and the removing of these defects is a regular function of the maintenance of computer software.

30. The limitations of treating modifications to software as a repair are also apparent when attempting to apply the delineation between repair and improvement. A repair is generally considered to involve a restoration of a thing to a condition it formerly had without changing its character (see Windeyer J in the Thomas case at CLR 72; ATD 87. The focus on restoration seems more appropriate in the context of wear and tear than in the removal of a design defect.

31. It may be possible to accommodate Y2K expenditure within Justice Windeyer's understanding of the repair/improvement dichotomy; however, it is an awkward fit. The principles relating to repairs do not fully recognise the intangible nature of software as a programmed language that, by its nature, generally does not become defective due to the passage of time or use of the software, but still may contain design defects. These defects generally exist in the program at the time it is acquired and many may only arise as problems during the course of its use.

32. Because computer software does not fit neatly into the repair/improvement dichotomy a more accurate application of the case law may be found outside this terminology.

Relevance of Sun Newspapers' principles

33. Although the repair/improvement terminology is limited in its application to computer software, it does indicate the approach taken by the courts in applying the Sun Newspapers' test to work done on a capital asset. The test is not so much whether the expenditure itself provides an enduring benefit, but whether the expenditure enhances the asset itself so as to add to the structure of the business, or whether the expenditure is part of day to day processes of the business in operating its assets. This is an important qualification, because it is

inappropriate to apply an enduring benefit test to work done on computer software of a capital nature, which by its nature does not suffer from wear and tear such that the work done would (subject to obsolescence) always provide an enduring benefit.

34. It is the character of the expenditure at the time it is incurred that is relevant. Thus, even if the defect derives from the programming when it is developed, the issue is what is the nature of expenditure to make software Y2K compliant at the time it is incurred. The expenditure is being incurred to remove a problem in the software to allow the existing system to continue functioning in the same way after the year 2000 as before the year 2000. Provided the expenditure merely modifies the software to achieve this outcome it would result in only minor enhancements and would not produce a different software system. The expenditure is not incurred to enhance the software so as to add to the structure of the business itself, but is part of the day to day processes of the business to keep its software operational. Such expenditure would be of a revenue nature.

35. It is also generally recognised that when a computer system is installed there is repetitive and frequent day to day work done to maintain the software program, including minor enhancements to the system, to meet ongoing operational needs. This expenditure would have a revenue nature. It is considered that expenditure incurred in making computer software Y2K compliant is generally no different from this type of expenditure.

36. However, where the work done to make software Y2K compliant results in what is, in essence, the original software being substantially rebuilt, it produces a different software system and the expenditure is treated as being incurred in acquiring a new software program. The cost of acquiring a new software program is on capital account. The written-down value of the replaced software can be written off at the time of replacement.

Y2K expenditure on computer chips, firmware and other hardware and equipment

37. Expenditure incurred on computer chips or firmware to make computer systems or computer operated equipment Y2K compliant may be deductible under either section 8-1 or section 25-10. The distinction between software and hardware becomes less clear when we talk about 'firmware'. Firmware is regarded as hardware although it usually also contains embedded software. Y2K compliance expenditure incurred in respect to firmware could involve modifications or replacement of embedded software or replacement of the whole firmware.

TR 98/D5

38. Expenditure incurred on computer chips or firmware to make computer hardware or computer operated equipment Y2K compliant is also recognised as part of the repetitive and frequent day to day work done to maintain that computer hardware or computer operated equipment.

39. However, a key consideration is whether expenditure on the replacement of embedded software, a computer chip or firmware is a repair of a revenue nature, or the renewal, replacement or reconstruction of the entirety (i.e., the whole or substantially the whole) of a thing or structure that is an improvement of a capital nature (see Buckley LJ in *Lurcott v. Wakely & Wheeler* [1911] 1 KB 905 at 924).

40. Computer chips or firmware cannot provide useful functions without regard to the computer hardware or computer operated equipment of which they are a part. Nor are they separate and distinct items, standing alone physically and commercially from the hardware or equipment. It is therefore considered that they are not entireties, but subsidiary parts of computer hardware or computer operated equipment. Thus, expenditure incurred in replacing a computer chip or firmware to make computer hardware or computer operated equipment Y2K compliant has a revenue nature. Similarly, Y2K compliance expenditure incurred in modifying firmware by modifying or replacing the embedded software also has a revenue nature.

41. In some cases where a computer chip or firmware cannot be altered or replaced, it may be necessary to replace some or all of the units of the computer hardware or computer operated equipment. Y2K compliance expenditure that involves replacement of the whole or substantially the whole of the unit of hardware or equipment containing the computer chip or firmware is of a capital nature.

Apportionment

42. In some instances, work to make a computer system Y2K compliant will involve the complete replacement of some software and modifications to other software. In these circumstances, the expenditure on the project should be accounted for in accordance with the nature of the specific work (i.e., some is on capital account and some is on revenue account). Where the expenditure is directed at Y2K compliance work that is both revenue and capital (e.g., final testing of a system that has both replaced and modified software) it is necessary to apportion the expenditure on a reasonable basis to determine the respective amounts that are on revenue or capital account.

43. Expenditure may be directed at both Y2K compliance work of a revenue nature and other work of a capital nature, such as adding new or enhanced features to the software that are unrelated to Y2K compliance. In these circumstances, it will also be necessary to apportion the expenditure on a reasonable basis to determine the amount that is of a revenue nature and deductible. Apportionment will not be necessary where the work of a capital nature is minor and incidental to the Y2K compliance work of a revenue nature.

Examples

Example 1

44. Bankcom is a large banking and financial corporation, with multiple branches. It has a centralised mainframe connected via a wide area network (WAN) to each of its branches, as well as a network of Automatic Teller Machines (ATMs). The desktop computers which compose its WAN are also used for a variety of business applications, such as word processing and spreadsheets.

45. In order to become Y2K compliant, Bankcom engages Bug Compliance Inc (BCI) to undertake a Y2K compliance assessment of all its computer systems. The costs of this assessment are revenue in nature.

46. BCI identifies various problems which need rectification in order to achieve Y2K compliance. Bankcom decides upon the following strategies to deal with them, with corresponding tax consequences:

- (a) The mainframe hardware contains two digit date fields on its processing chips which need to be replaced before they cause a failure. Because of their need to continue operations and to allow testing of other rectification to take place, Bankcom decides to purchase a new Y2K compliant mainframe, which will also provide additional processing efficiency. This hardware is installed in parallel to the current system and testing is conducted. The costs of the replacement mainframe are capital, and are subject to depreciation.
- (b) The purpose written COBOL accounting software running on the mainframe contains numerous two digit data fields which will cause a failure if not corrected. Unfortunately, the source code for this software is no longer available and will need to be decompiled or re-engineered before the software can be made Y2K compliant. Bankcom re-engineers the source code and then makes the necessary

TR 98/D5

modifications to the date fields. The modified software is tested with copies of both the current data from business transactions and test data containing 21st century dates. The costs of both the modification and the testing are of a revenue nature.

- (c) The ATM network hardware uses programmable chips which currently contain a two digit date field likely to cause a failure. Using special equipment, the contents of these chips are erased and re-written to replace the two digit date field with a four digit date field. Each ATM is tested onsite as this work is carried out and the entire network is tested periodically during the course of the rectification work. The costs of both the replacement and the testing are revenue in nature.
- (d) In addition, the ATM communications software needs to be tested with both the new mainframe and the replacement accounting software. Because the testing takes place at the same time, it is difficult to dissect which components of the testing relate to each. Consequently, Bankcom decides to apportion the testing expenditure between the new mainframe (capital) and the replacement accounting software (revenue).
- (e) The recently acquired PCs running the WAN are fully Y2K compliant, but the software running them contains two digit date fields likely to cause a failure. An alternative software program that is Y2K compliant is available and Bankcom decides to acquire it as a cheaper option than attempting to fix the current version. The costs of the acquisition of the improved version are capital in nature.
- (f) The word processing software used on the PCs is also Y2K compliant, but the spreadsheet software defaults to two digits for the year. This means that almost all current spreadsheets containing dates need to be corrected if they are to be used to calculate durations extending beyond 31 December 1999. Bankcom decides to implement a conversion macro for all spreadsheets, but decides against testing because it regards the risk as low. The cost of the conversion macro is of a revenue nature.

Example 2

47. MachineCo uses computer controlled automated machinery in assembling its product. To become Y2K compliant, it directs its IT

staff to conduct an assessment of its computer systems. Based upon the results of this assessment, MachineCo decides upon the following rectification work to deal with identified problems, with corresponding tax consequences:

- (a) Its original automated assembly units contain chips with two digit dates. These units are old and have experienced increasing maintenance costs over the last few years. MachineCo decides to replace them with newer, more efficient units which are also Y2K compliant. The cost of these new units is capital in nature, although subject to depreciation. The costs of testing these units in the course of installation are also capital, but are included in the cost of making the units ready for use for depreciation purposes.
- (b) The computer controlled hardware which directs the operations of the plant contains circuitry with hardwired two digit date fields (similar to computer chips) which requires replacement. This work is carried out and the costs are revenue in nature, as they only involve the replacement of computer chips. Testing done on the rectified circuitry is also revenue in nature.
- (c) The software which runs on the computer controlled hardware and directs the operations of the plant also contains two digit date fields which are likely to cause failures. The original source code for this software has been lost, but large blocks have been edited over the years and the source code for some modules of the current system is available.

For those modules with source code available, programmers simply edit the lines of the existing code and then compile it into executable binary.

Where the source code is not available, the company's programmers attempt to reconstruct the source code by either decompiling or disassembling the executable binary. Once the missing source code has been reconstructed, the programmers simply edit the offending lines and recompile it into executable binary once more.

In both cases, the cost of rectifying the Y2K problem in the modules is revenue in nature. Consequently, the expenses of testing the various applications will also be revenue in nature.

TR 98/D5

Example 3

48. Small Business Specialists (SBS) are a management consulting firm providing a variety of advisory services to industry. They have an older EyrieNet server running a six workstation Local Area Network (LAN). This system allows the consultants to use word processing, spreadsheets, database management, desktop publishing and slide show presentations in performing their work for their clients. SBS undertakes the following activities to ensure its computer system is Y2K compliant:

- (a) SBS's inhouse part-time systems manager (Tom) conducts a survey of their system which concludes that SBS's various software packages can not be guaranteed to be Y2K compliant. The cost of the survey is revenue in nature.
- (b) From his discussions with suppliers, Tom has learned that the Y2K upgrades of some of their software packages have just been released with automatic date filters to translate two digit year fields to four digits upon first opening data files. After acquisition of these upgrades, data files need to be uploaded to the new system after it is installed. The cost of the upgrade and upload of files is revenue in nature, as it is incurred in modifying the software to make it Y2K compliant.
- (c) However, the database management software is no longer commercially available, so SBS decides to replace it with software from a new provider. The cost of this replacement is capital in nature, as it results in the complete replacement of the software.

Example 4

49. Opstra Ltd is a telecommunications company with operations involving telephone exchanges, landlines, cellular phone towers and overseas cable and satellite services. In order to become Y2K compliant, Opstra conducts a review of all its systems. Their IT, landline, exchange maintenance and property divisions all find problems requiring rectification:

- (a) Their main IT exposure relates to their internal accounting systems, which are due for complete replacement in 2003 when the lease on the hardware platform expires. Opstra decides to implement a 'fixed window' solution for this system, inserting a line of code into every date manipulation routine which conducts a comparison of two digit years with '08' (by which time the contemplated

renovation should have taken place). The costs of implementing and testing this short-term solution are revenue in nature.

- (b) Opstra also has management information systems software which contains two digit date fields likely to cause a failure. A Y2K compliant version of this software is now available and Opstra decides to acquire an upgrade as a cheaper option than attempting to fix the current version. The upgrade mainly provides Y2K benefits, but also provides a new entry field and two additional report selections. The cost of acquisition of the upgrade is revenue in nature as the enhancements are minor and incidental to the Y2K benefits.
- (c) The air conditioning system for climate control contains a 286 processing chip with two digit year fields. These chips cannot be substituted or repaired, so the entire control system will need to be replaced. As this is a replacement of an entirety, the cost of this work and any testing is capital in nature.
- (d) The property division has found that their lift control systems also contain chips with two digit year fields which are likely to fail on 1 January 2000 resulting in stoppage of lifts. These chips can be replaced with chips which have a four digit year field. The cost of this rectification is revenue in nature, as is the testing of the new chips *in situ*.

Your comments

50. If you wish to comment on this Ruling, please send your comments by: 20 June 1998
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TR 98/D5

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- capital nature
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- Y2K compliant
- year 2000 bug
- year 2000 compliant

legislative references

- ITAA97 8-1
- ITAA97 25-10

- ITAA36 51
- ITAA36 53

case references

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Cinemas Ltd 86 CLR 102; (1952) 9
ATD 452
- Lurcott v. Wakely & Wheeler
[1911] 1 KB 905
- Sun Newspapers Ltd and Associated
Newspapers Ltd v. FCT (1938) 61
CLR 337; 1 AITR 403