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Depreciation Graphics: A Time Saving Tool

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Depreciation Graphics

A Time Saving Tool

By Larry M. Walther

Frequently, accountants, auditors, and others must estimate or verify balances in accumulated depreciation and depreciation expense accounts. The process can be tedious and time consuming, especially when a number of assets are involved.

It seemed useful to attempt to develop a simple tool which would allow an individual to quickly determine the proper amounts of accumulated depreciation and depreciation expense. The result was a practical set of depreciation graphs. In addition to allowing ready determination of accumulated depreciation and depreciation expense, the graphs also provide a tool for determining when a change from a declining balance depreciation method to the straight-line method is most advantageous for tax purposes.[1] This article presents the graphs and explains their use.

Straight-line Method

The vertical axis of the straight-line method graph (figure 1) expresses the balance in accumulated depreciation *as a percentage of the depreciable base* (i.e., original asset cost less salvage value) while the horizontal axis is years which correspond with the current age of an asset. Each line on the graph represents an asset with a different useful life as indicated by the numerals at the top of each line. Thus, one graph can provide for assets that have a wide range of useful lives. For example, the straight-line method graph includes lines for assets with useful lives of 3 to 10,12,15,18,20, 25,30,35, and 40 years.

To determine the proper amount of accumulated depreciation for a particular asset, locate the proper useful life line for the individual asset, locate the point on that line which corresponds to the current age of the individual asset, and move left from that point to the vertical axis. The value on the vertical axis represents the percentage of the depreciable base which should be included in accumulated depreciation.

For instance, assume an asset with an original useful life of four years, a $100 cost, and a $10 salvage value; after two years the balance of accumulated depreciation should be $45. This amount may be determined from the graph by locating the four year useful life line, moving along that line to the point which corresponds to the current age of two years, and moving left from that point to the vertical axis. The value on the vertical axis is .5. Multiplying .5 times the depreciable base of $90 yields the $45 balance of accumulated depreciation.

Sum-of-the-Years'-Digits Method

The sum-of-the-years'-digits graph (figure 2) is applied in the same fashion as the straight-line graph. Again, accumulated depreciation is expressed *as a percentage of depreciable base* (cost less salvage value).

While the useful life lines appear curved, each useful life line is actually composed of a series of short straight lines. This feature enables the graph to be used for assets whose current age is not an exact round number. For instance, assume an asset with an original useful life of four years, a $100 cost, and a $10 salvage value; the balance in accumulated depreciation at the end of two and one-half years should be $72, computed as follows:

Year	Calculation	Depreciation Expense	Accumulated Depreciation
1	4/10 x $90	$36	$36
2	3/10 x $90	27	63
2.5	2/10 x $90 x .5	9	72

The $72 amount may easily be determined from the sum-of-the-years'-digits graph by locating the four year useful life line, moving along that line to the point which corresponds to the current age of two and one-half years, and moving left from that point to the vertical axis. The value on the vertical axis is .8. Multiplying .8 times the depreciable base of $90 yields the $72 balance of accumulated depreciation.

Declining Balance Methods

Separate graphs have been developed for assets which are being depreciated by the double-declining balance method (figure 3), and the 150 percent declining balance method (figure 4), and the 125 percent declining balance method (figure 5). These graphs are applied in the same manner as the straight-line and sum-of-the-years'-digits graphs. The only difference is that, for the three declining balance methods, the vertical axis expresses accumulated depreciation as *a percentage of original asset cost.*

As with the sum-of-the-years'-digits method, each useful life line appears to be curved but is actually composed of a series of short straight-lines. This feature enables the graphs to be used for assets whose current age is not a round number. For instance, assume

FIGURE 1: THE STRAIGHT-LINE METHOD GRAPH

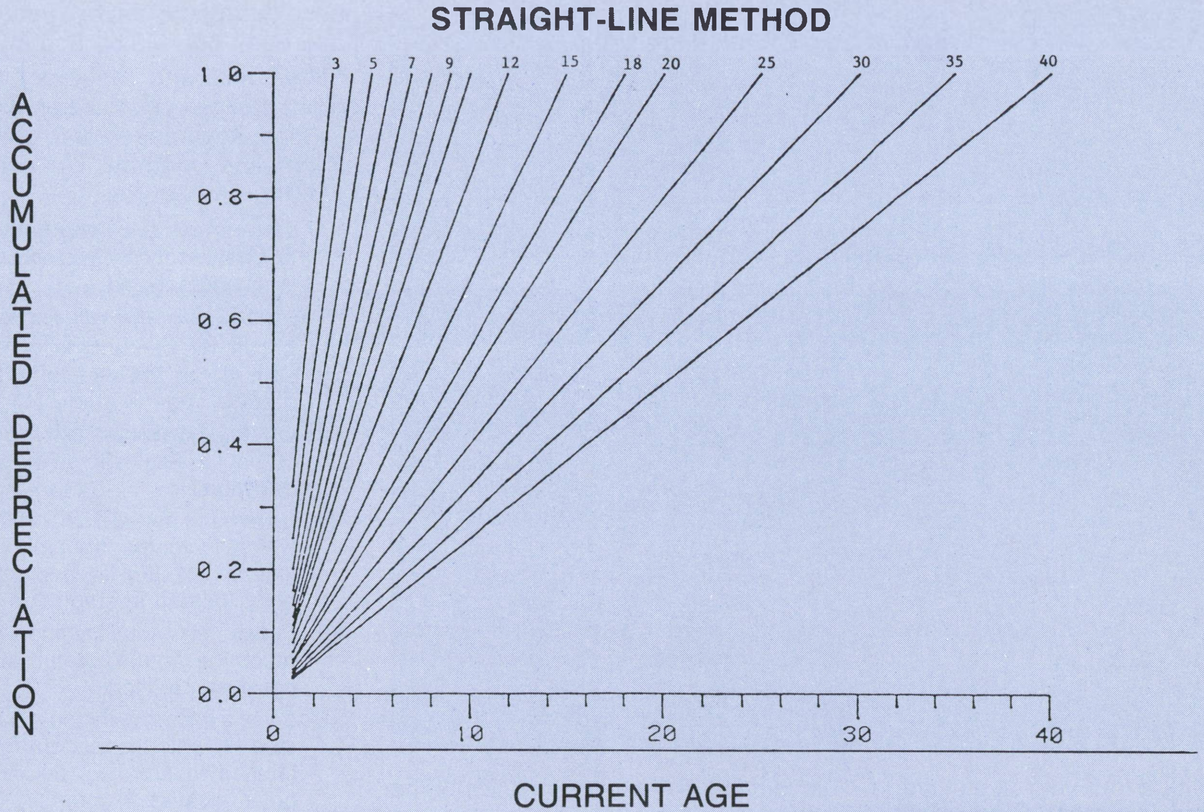

FIGURE 2: THE SUM-OF-THE-YEARS'-DIGITS METHOD GRAPH

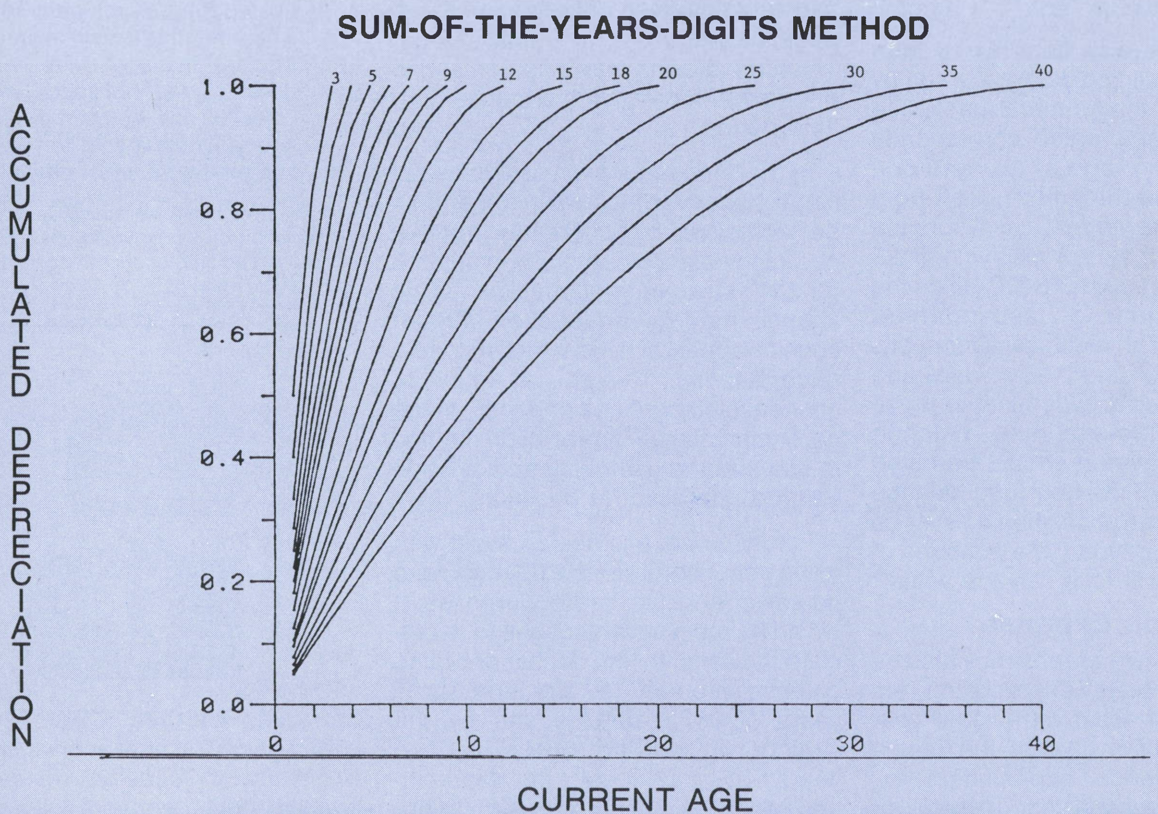

TABLE I

Year	Calculation	Depreciation Expense	Accumulated Depreciation	Net Book Value
1	(100 X .5)	$50	$50	$50
2	(50 X .5)	25	75	25
2.5	(25 X .5 X .5)	6.25	81.25	18.75

OR

Year	Calculation	Depreciation Expense	Accumulated Depreciation	Net Book Value
.5	(100 X .5 X .5)	$25	$25	$75
1.5	(75 X .5)	37.50	62.50	37.50
2.5	(37.5 X .5)	18.75	81.25	18.75

TABLE II

Year	Method	Calculation	Depreciation Expense	Accumulated Expense	Net Book Value
1	DDB	(100 x .4)	$40	$ 40	$60
2	DDB	(60 x .4)	24	64	36
3	DDB	(36 x .4)	14.4	78.4	21.6
4	SL	(21.6/2)	10.8	89.2	10.8
5	SL	(21.6/2)	10.8	100	0

an asset with a four year useful life, a $100 cost, and a $10 salvage value; the balance of accumulated depreciation under the double declining balance method at the end of two and one-half years should be $81.25, computed as shown in Table I.

The $81.25 may be determined from the double-declining balance graph by moving along the four year useful life line to the point which corresponds with the current age of two and one half years, and then moving left from that point to the vertical axis where the value .8125 appears. Multiplying .8125 times the asset *cost* of $100 yields the $81.25 balance of accumulated depreciation. The mechanics for applying the 150% and 125% declining balance graphs are identical to those for the double-declining balance method. However, it should be noted that, for each of the declining balance methods, depreciation should never be accumulated beyond the amount of the original cost less salvage value.

Depreciation Expense

Each of the five graphs may also be used to calculate depreciation expense. For an asset with a four year useful life and a $100 cost, the double declining balance depreciation expense for the second year of useful life is $25. (See preceding example of double declining balance method.) The $25 depreciation expense is simply the change in accumulated depreciation over the second year of useful life ($75-$50). It has already been shown how the graphs may be used to determine accumulated depreciation at the beginning and end of a time period. Thus, the graphs may also be used to determine depreciation expense for a time period.

In the later years of an assets useful life, a tax advantage may sometimes be achieved by changing from a declining balance depreciation method to the straight-line method. This change may be undertaken without special approval of the Internal Revenue Service. The age at which to change to straight-line depends on the declining balance depreciation method in use and the useful life and salvage value of the asset in question.

For instance, assume an asset with a five year useful life, a $100 cost, and no salvage value; for tax purposes, it would be most advantageous to depreciate the asset by the double-declining balance method for the first three years of its useful life and by the straight-line method for the last two years of its useful life. The depreciation schedule for this asset would appear as in Table II.

If the double-declining balance method had been used throughout the entire useful life of the asset, depreciation expense during the last two years would have been only $8.64 and $5.18.

The declining balance method graphs can be used to determine when it is most advantageous to shift to the straight-line method by using the following procedures:

(1) Determine the percentage that original asset cost less salvage value is of original cost:

(cost - salvage value)/cost

(2) Locate the percentage calculated in step (1) on the vertical axis of the graph.

(3) On the horizontal axis, locate the original useful life of the asset in question.

(4) Locate the single point on the graph which is to the right of the point located in step (2) and above the point located in step (3).

(5) Locate the useful life line which corresponds to the useful life of the asset in question.

(6) Draw a line from the point located in step (4) which is tangent to the line located in step (5). (NOTE: If the point located in step (4) is on or below the end of the useful life line located in step (5) then a shift to the straight-line method will never be advantageous.)

(7) From the point of tangency located in step (6) (i.e., the point in step (6) where the line drawn in step (6) just touches the useful life line) move down to the horizontal axis. The value on the horizontal axis is the age at which a shift to the straight-line method is most advantageous.

[1]The discussion pertaining to changes in depreciation methods would not apply to new assets depreciated under the accelerated cost recovery system.

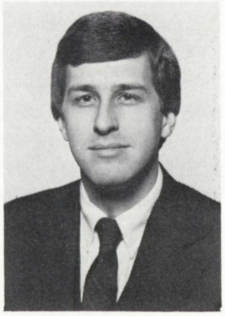

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FIGURE 3: THE DOUBLE-DECLINING BALANCE METHOD GRAPH

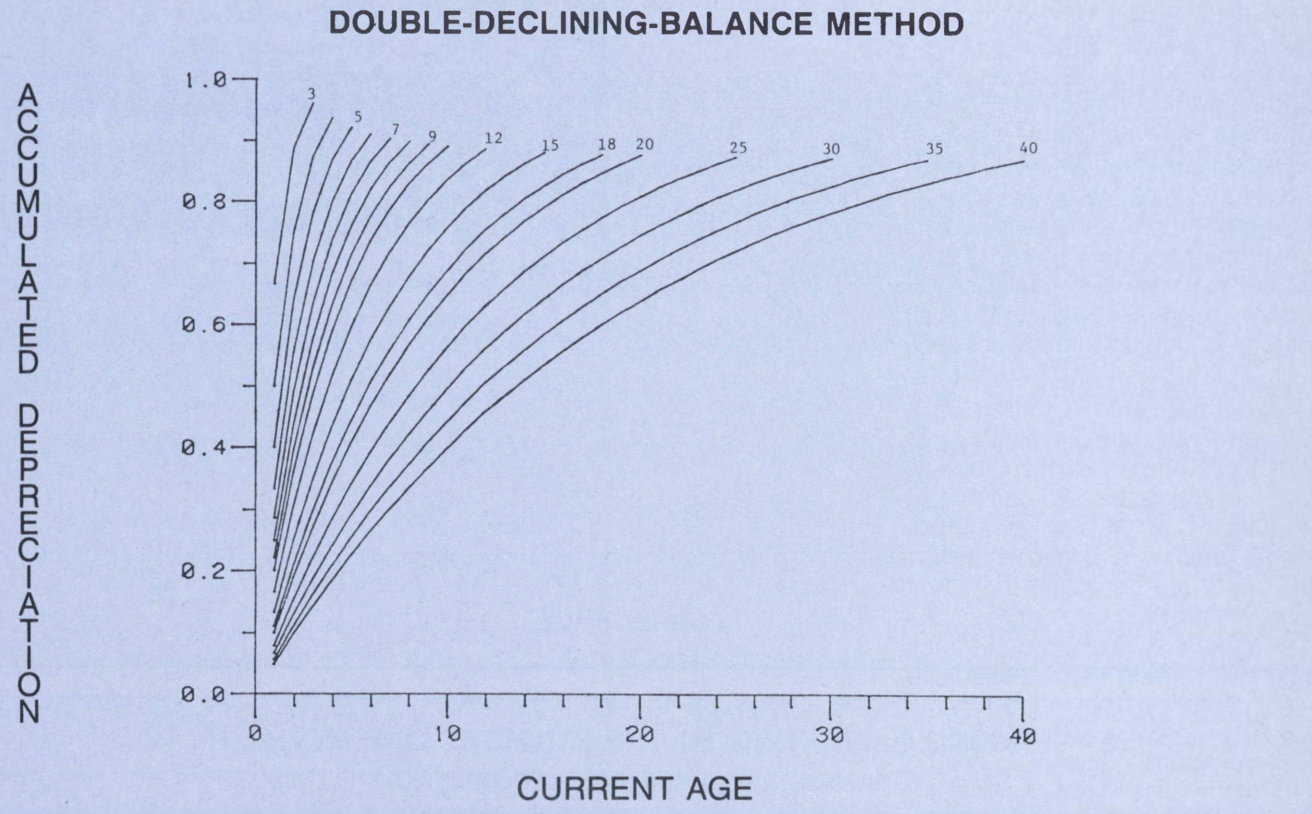

FIGURE 4: THE 150% DECLINING BALANCE METHOD GRAPH

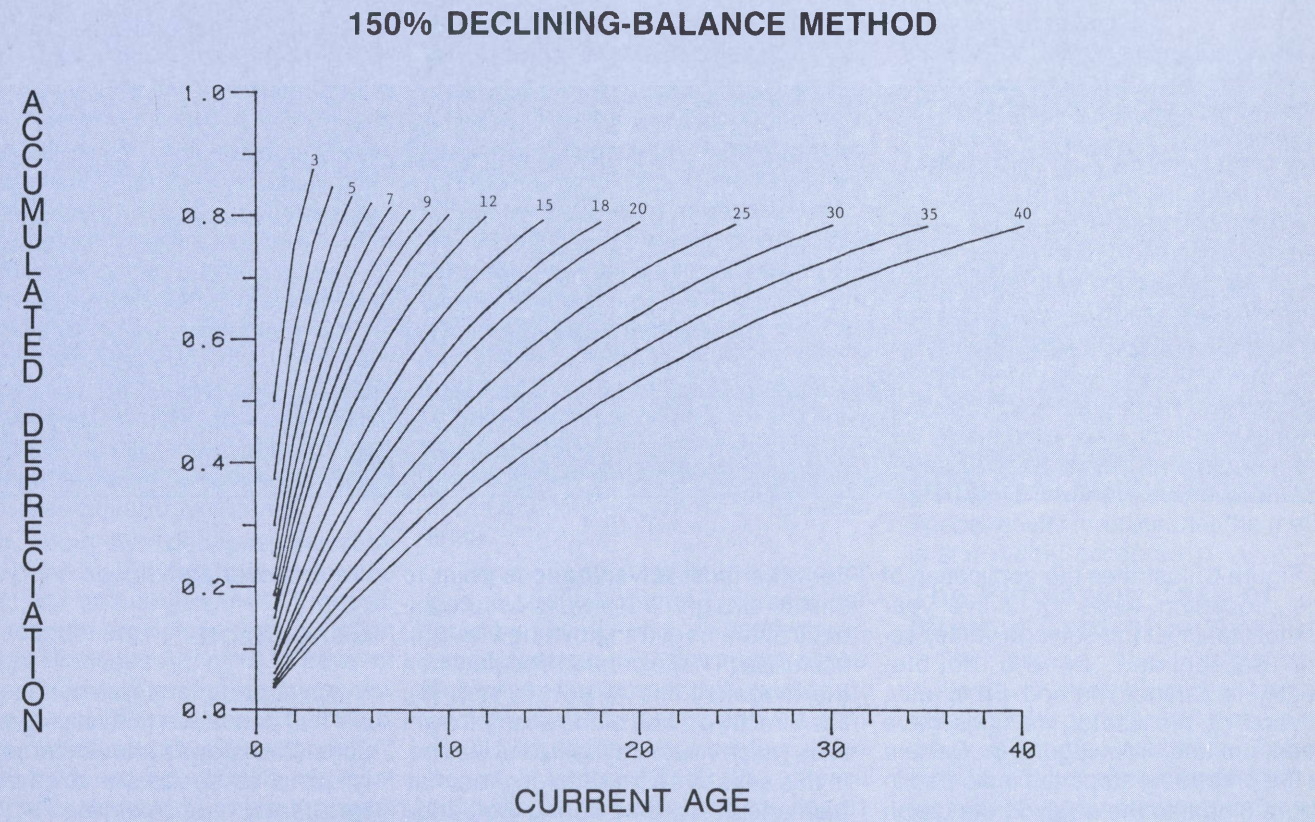

FIGURE 5: THE 125% DECLINING BALANCE METHOD GRAPH

125% DECLINING-BALANCE METHOD

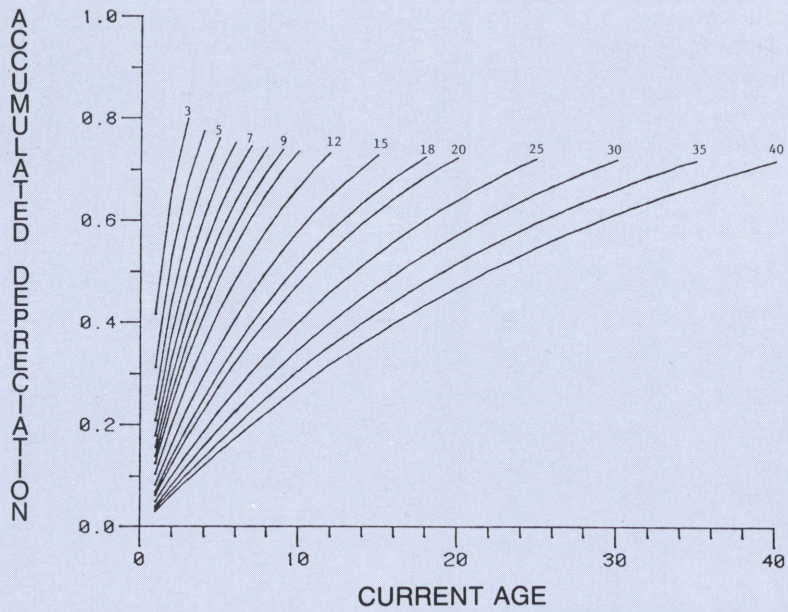

FIGURE 6: SHIFTING TO THE STRAIGHT-LINE METHOD

DOUBLE-DECLINING-BALANCE METHOD

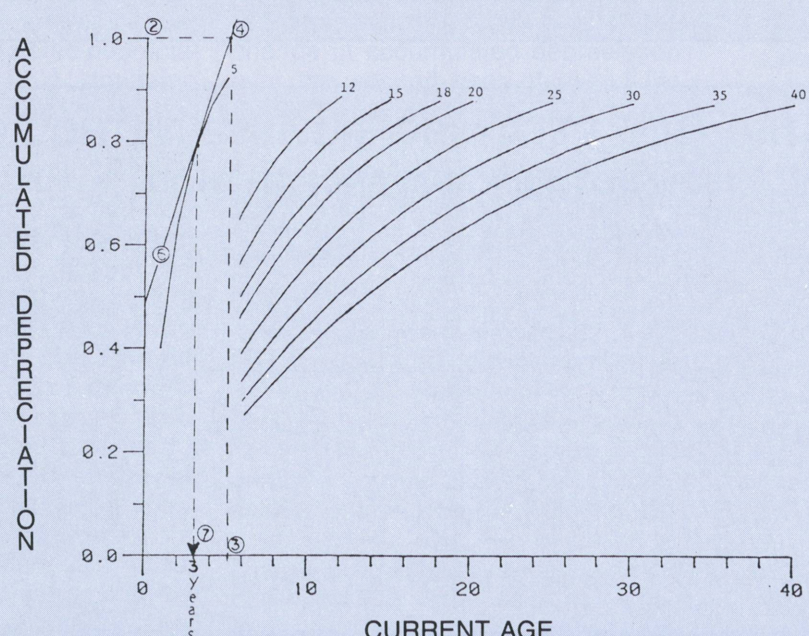

Figure 6 illustrates the application of the preceding steps for a five year useful life asset (no salvage value) being depreciated by the double-declining balance method. For clarity, several of the useful life lines have been omitted from figure 6. Certain of the preceding steps are indicated in figure 6 next to the point on the graph located in that step. With one exception, the most advantageous point to shift to straight-line always occurs exactly at the beginning of a new year *of useful life*. The exception occurs when the tangency line (drawn in step (6)) lies directly on one of the short straight lines which make up the useful life line. In this case, a shift to straight-line may be made at any time during the period in which the tangency line and useful life line overlap.

Conclusion

It is hoped that depreciation graphs will find numerous time saving applications. The graphs should be especially useful to auditors and others who frequently approximate or verify depreciation amounts.