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EQUITY

Compucolor II

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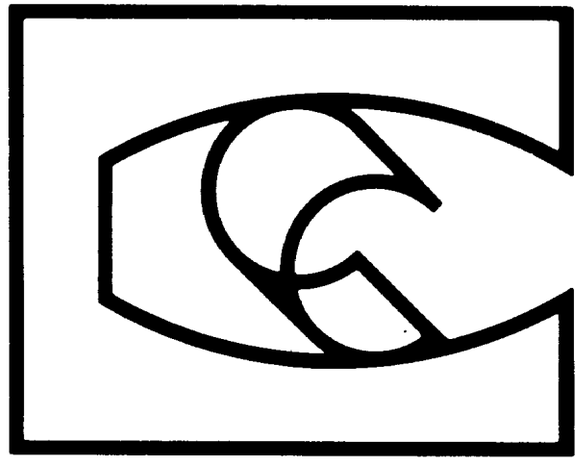

A set of two specialized programs that: (1) Calculate depreciation by any of five popular methods, and (2) calculate the capitalized cost and periodic changes of up to three assets simultaneously.

Library Album No. 990013

Requires 16K user RAM

EQUITY

EQUITY consists of two BASIC language programs which will calculate depreciation and capitalized cost of assets. EQUITY will make any of the following calculations:

1. Depreciation
   a. Straight-Line Method
   b. Double-Declining Balance Method
   c. Constant Percentage Method
   d. Sum of the Digits Method
   e. Sinking Fund Method

2. Capitalization Cost
   a. Periodic changes of an asset
   b. Capitalized cost of an asset
   c. Given Periodic changes or capitalized cost, solve for an unknown value
   d. Comparison of up to three alternative assets

Limitations

Compucolor Corporation assumes no responsibility for accurancy or losses incurred from decisions based on the results of these programs. Calculations are made to eight significant digits; however, small errors can occur in the seventh and eighth digits due to binary to decimal conversions and rounding errors. Values of $1,000,000 or greater will not be displayed properly in either program. Large amounts can still be used by dropping the least significant digits when entering data and adding the approximate number of zeros to the results. Some calculations use an iteration process and will have small errors.

The capitalization program cannot solve for a number of periods greater than 99. Large values of N can result in significant errors during some calculations.

Loading **EQUITY**

Insert the EQUITY disk into the Compucolor and hit the "AUTO" key (BASIC must have been initialized). This will automatically load and display the EQUITY Menu. Select the desired program from the menu by entering its corresponding number and hitting return.

DEPRECIATION

This program will calculate the depreciation of an asset by any one of five methods. Although other methods exist, this program will solve most depreciation problems encountered. The selection of the particular method to be used will depend on the type of asset and use of the depreciation expense. IRS and other tax regulations should be consulted when depreciating for tax purposes since only certain methods may be permitted. It is also possible that you may be eligible for special depreciations not covered by this program.

The results of the depreciation calculations are displayed in three columns entitled: Years, Depreciation Expense and Book Value. Book Value is the initial value of the asset less the accumulated depreciation.

The following variables are used by the depreciation program:

VARIABLE	REMARKS
1. Value of Asset	
a. Start of Period	Initial value of asset
b. End of Period	Salvage value of asset
2. Depreciation Rate	Annual depreciation rate (%). Used only by constant percentage method when a salvage value of zero is entered
3. Number of Years Depreciated Over:	None
4. Interest Rate on Sinking Fund (%):	See sinking fund method

The following paragraphs give a brief description of each method:

1. Straight-Line Method

This is the simplest depreciation method. It spreads the depreciation expense evenly over the estimated life of the asset. It is calculated by dividing the depreciation expense (cost - salvage value) by the number of depreciation periods.

2. Double Declining Balance Method

Under this method the depreciation rate for each year is double the straight-line rate. For example, if an asset was to be depreciated over 5 years, the straight-line rate would be 20% per year. With the double declining balance method 40% would be used. In this example then the annual depreciation for an asset with an initial value of $1000 would be:

YEAR	DEPRECIATION EXPENSE		BOOK VALUE
			$1000.00
1	(40% of 1000)	$400	$600.00
2	(40% of 600)	$240	$360.00
3	(40% of 360)	$144	$216.00
4	(40% of 216)	$86.40	$129.60
5	(40% of 129.60)	$51.84	$77.76

Using this method the complete cost of an asset will never be charged off as depreciation. The undepreciated amount at the end of the useful life of the asset is considered salvage value. This method is a special case of the constant percentage method. It

produces depreciation changes which decrease throughout the life of the asset.

3. Constant Percentage Method

Also known as the declining-balance method, this method yields a depreciation change which is a constant percentage of the book value at the end of the last period. It breaks down if the salvage value is zero. If zero is entered, the program will ask the user to enter the annual depreciation rate to be used, as a percentage. The example under the double declining balance method could be duplicated here by entering zero for the salvage value and 40% for the annual depreciation rate. If a salvage value is entered, the program will calculate the annual percentage necessary to reach that salvage in the desired number of years. For example, if an item has an initial value of $1000 and a salvage value of $200, the annual percentage rate necessary to depreciate the $1000 to $300 is 21.39% (from the program).

YEAR	DEPRECIATION EXPENSE	BOOK VALUE
		$1000.00
1	213.00	$786.00
2	168.20	$617.80
3	132.21	$485.59
4	103.92	$381.68
5	81.68	$300.00

A frequently encountered depreciation method is to depreciate at 1.5 times the straight-line rate. This can be done with the constant percentage method by computing the straight-line rate and multiplying it by 1.5. For example, to depreciate an asset over 4

years at 1.5 times straight-line, enter zero for the salvage value and 30% (100%/4 Years = 20%/Year: 20% x 1.5 = 30%) for the annual depreciation rate.

This method produces depreciation changes which decrease throughout the life of the asset. Note that this method will never depreciate an asset to zero. Zero is entered only to inform the program that the user wishes to enter the annual depreciation rate.

4. Sum of the Digits Method

Under this method the depreciation rate for any year is a fraction whose numerator is the remaining years of the life of the asset and whose denominator is the sum of the years digits. For an asset with a 4 year life, for example, the first year depreciation would be:

$$\frac{4}{4+3+2+1} = \frac{4}{10} \text{ or } 40\%$$

The second year depreciation would be:

$$\frac{3}{4+3+2+1} = \frac{3}{10} \text{ or } 30\%$$

This method produces depreciation changes which decrease throughout the life of the asset.

5. Sinking Fund Method

This method sets up a compound interest sinking fund which accumulates over the life of the asset. The book value is the initial value of the asset less the amount in the sinking fund. The interest rate on the sinking fund is the yield rate desired on the investment after expenses. The sinking fund may or may not actually exist. This is the only method where the depreciation increases throughout the life of the asset.

How to Use DEPRECIATION

From the list of depreciation methods select the desired method by entering its corresponding number and hitting RETURN. If a six (6) is entered the program will return to the EQUITY MENU.

The program will prompt the user to enter the required information. Only information applicable to the method being used will be requested. After the data has been entered, the program will display the depreciation schedule. If the depreciation exceeds 12 years, only the first 12 will be displayed. Subsequent years are displayed in groups of 12 by hitting the RETURN key. A long listing can be terminated by typing "END" prior to hitting RETURN. When the depreciation listing is complete, the program will halt. Hitting RETURN will cause the program to return to the depreciation menu.

CAPITALIZATION

This program will enable you to compare up to three assets so that the best alternative can be selected. In addition to calculating the periodic charges and capitalization costs of an asset the program can calculate the value of any variable, given sufficient information. In the Capitalization program, the following variables are used:

VARIABLE	REMARKS	
1. Initial value of Asset	**A**	Original Cost of Asset
2. Value of Asset at END	**S**	Salvage value at end of N periods
3. Number of Periods	**N**	
4. Interest Rate per Period	**R**	This is the interest which could have been received if the money were invested elsewhere.
5. Maintenance Cost/Period	**M**	The cost of maintaining the asset for each period
6. Periodic changes	**H**	The cost per period of owning the asset
7. Production Units/Period	**U**	This variable is used so that assets with different production rates can be compared.
8. Periodic Change/Unit	**P**	The cost per period of each production unit (P = H/U). This would be compared with the same value for other assets to determine the best buy

9. Capitalized Cost	**C**	The present value of periodic changes forever (C = H/R)

How to Use **CAPITALIZATION**

When Capitalization is run, the program will display nine (9) variables with columns for three (3) assets. The following commands are recognized by the program and may be entered anytime the cursor follows the bottom line:

COMMAND	PURPOSE
A#,B#,C#	Moves cursor to item number # of asset A,B,or C. Range of # is from 1 to 9
A,B, or **C**	Allows user to enter data for each variable of asset A,B or C
ALL	Allows user to enter data for each variable of all assets
CALC	Initiates calculations
END	Exits program and returns to EQUITY Menu

These commands must be followed by a RETURN. If entries other than the above commands are entered, the phrase "ENTRY NOT RECOGNIZED" will be displayed for two seconds.

To enter data the cursor must be positioned at the variables location. This is accomplished by using one of the first three commands above. An asset letter follwoed by an item number will move the cursor to the desired item and asset. For example "A3" will position the cursor at item 3 of asset A. If "A" is entered without an item number, the cursor will move to A1 and advance to the next item after data is entered. When data has been entered for A9, the cursor will return to the bottom line. The "ALL" command operates the same except the cursor will move through all items of each asset (A1 to B9).

Data is entered by typing the desired value and hitting return. If RETURN is hit without entering data or a single "0" is entered, the previous value will remain unchanged. If a zero value is required, two zero's "00" must be entered. This is necessary since BASIC returns a "0" if only RETURN is hit in response to an input. An "X" is entered for unknown variables. No calculations will take place for an asset unless an "X" is entered for one of the variables. In certain cases it is possible to solve for more than one "X". If insufficient information is available to obtain a solution, an error message will be displayed.

Interest rates must be entered as a percentage. If production units/period is set to zero, the program will set it to one (1).

Calculations are initialized by entering the "CALC" command. The calculations for the three assets are independent of each other. By comparing the periodic change per unit the user can determine the best asset to purchase. Since any value can be solved for, it is possible to work backwards to determine various values required to get a particular periodic change or capitalized cost.

Three errors are displayed by the program under the following conditions:

ENTRY NOT RECOGNIZED The asset and/or line number entered is illegal.

TOO MANY UNKNOWNS, PROBLEM NOT SOLVABLE The program has insufficient data to solve the problem.

N IS TO LARGE TO SOLVE This will occur only when "N" is the unknown and the value is calculated to be greater than 99 periods.

The capitalization program is exited by entering "END". This will result in a return to the EQUITY MENU.

The following example is included to familiarize the user with the program.

Problem: Machine A sells for $243000, has an annual maintenance expense of $1900 and has a life of 15 years with a salvage value of $3000. Machine B has an annual maintenance expense of $5500 and a life of 10 years with no salvage value. Assuming an effective interest rate of 7%, find the price of machine B so that a buyer is indifferent between the two machines if Machine B produces output twice as fast as Machine A.

Solution: To solve the problem, first enter the data for Machine A (See Below) and solve for periodic changes, Periodic Change/Unit and Capitalized Cost. The data for machine B is then entered. If the buyer is to be indifferent between the two machines, the periodic change/unit must be equal. Therefore, the periodic change/unit of "A" must be transfered to B. The values calculated by the computer are shown in parenthesis above the unknowns. The answer to the problem is $361162.59.

	ASSET A		ASSET B
			($361162.59)
1. Initial value of Asset	$243000		X
2. Value of Asset at End	$3000		$0
3. Number of Periods	15		10
4. Interest Rate per Period	7%		7%
5. Maintenance Cost/Period	$1900		$5500
	($28460.71)		($56921.42)
6. Periodic Changes	X		X
7. Production Units/Period	1		2
	($28460.71)		
8. Periodic Change/Unit	X	-->	28460.71
	($406581.50)		($813163.12)
9. Capitalized Cost	X		X

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1. Depreciation
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3. Capitalized Cost

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