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INTRODUCTION

Welcome to DGCALC.

DGCALC is the culmination of careful examination and research into the world of spreadsheet applications. From industrialists and business users to hobbyists, educationalists and home users.

DGCALC performs all of the essential functions required in the majority of spreadsheet applications. DGCALC is therefore simple to use, fast and efficient since it is not complicated by gimmicks or unnecessary features.

Also, DGCALC works with other computer programs.

This manual will cater for experienced computer users as well as those who are embarking on a computerised spreadsheet for the first time.

However, from whatever point you wish to start, we do suggest that you read the first sections very carefully. You'll probably save a lot of time by working through the tutorial section. This doesn't take long and it will enable you to become familiar with most of the features of the program.

If you are reasonably experienced, and patience is not one of your virtues, then it is possible to get going quickly by reading the Reference Section. This will quickly point you in the right direction, and avoid unnecessary detail.

GENERAL SYSTEM OVERVIEW

This program requires the following computer:-

IBM PC (or compatible)
Amstrad PC1512/1640
Commodore Amiga
Torch Triple X
Atari ST

System Design and Features

The main features are as follows:

1. 512 rows, 52 columns, 26624 cells.
2. Fully menu and command driven.
3. Individually adjustable column widths with text overflow.
4. Instant recalculation — no waiting.
5. Integration with other programs (using ASCII files).
6. Windowing, allowing any row(s) and/or column(s) to be held on the screen as the spreadsheet scrolls underneath.
7. 52 user defined formulae.
8. 9 Programmable Function Keys (saving repetitive entry of text data and menu options).
9. Insert and delete row and columns
10. GOTO cell feature.
11. Password facility.
12. Cell locking/unlocking.
13. Cell justification, left/right/centre.
14. Optional suppression of zeros.
15. Up to 70 characters per cell.
16. Numeric accuracy to 7 decimal places, max value $1 \times 10^{(8)}$.
17. Full relative and absolute replication facilities.
18. Print facilities include:
 - all/part of spreadsheet
 - cell formulae only
 - automatic titling and paging
 - split wide spreadsheets (suitable for cut and pasting).
19. Functions include:
 - ABS, AVERAGE, COS, COUNT, EXP, LOG, LOGTEN,
 - MAX, MIN, ROUND, SIN, SQRT, SUM, TAN, TRUNC.
20. Powerful line editor.
21. UNDO feature.

Computer Terminology

Absolute copying — When copying information from one part of spreadsheet to another, you may copy **ABSOLUTELY** or **RELATIVELY**. The different implications of each type of copying is best explained with the following example:

Imagine the simple formula **SUM(A1:C1)** in cell D1. This means total all of the values in cells A1, B1 and C1. If I copied D1 **RELATIVELY** to another part of the spreadsheet, say D7, the formula would be changed to **SUM(A7:C7)**. In other words, the program works out that you now wish to total the same columns but on a different row, in this case row 7. If I had copied the cell **ABSOLUTELY**, the formula would remain completely unchanged, i.e., **SUM(A1:C1)**.

In conclusion, **RELATIVE** copying copies the formula but replaces cell reference within the formula where appropriate for the new location. **ABSOLUTE** copying simply copies the formula from one cell to another without changing anything.

- ASCII** — American Standard Code for Information Interchange. This character coding technique enables computer programs made by different manufacturers to communicate information with each other.
- Cell** — Each intersection of a column and row is known as a cell (a bit like a map grid reference).
- Cell Reference** — Each cell has a reference given by the column letter followed by the row number (e.g., a10 or az511).
- Character** — Single letter, number, symbol or punctuation mark.
- Column** — A linear, vertical arrangement of locations where data can be placed.
- Command driven** — Commands may be entered directly to select options, rather than selecting from a menu.

- Control key** — Computers have one key that you won't find on a typewriter, the CONTROL key (sometimes labelled CTRL, CODE). You will be using this in conjunction with another key (like SHIFT for upper case on a typewriter) for special facilities in the Editor. For example, CTRL I — to insert a space.
- Cursor** — A small rectangle or line of light (usually flashing) on the screen marking your place in text. It's like the moving ball of a typewriter in that it moves when you type, leaving the letter behind it.
- Cursor Keys** — These keys, situated on the right hand side of the keyboard, allow movement of the cursor in the following directions: — up, down, left and right — this corresponds to the direction of the arrows on them.
- Data** — Information, as opposed to instructions. For example, your DATA DISC is the disc containing your spreadsheet, whereas the PROGRAM DISC contains the instructions for your computer to manipulate that information
- Default Data** — This represents the action that DGCALC will take unless directed otherwise. A preset value or condition in a program which can however, be changed or deleted, as described under 'Operating Notes'.
- Directory** — Onscreen list of filenames on your disc.
- File** — A storage unit for information (a spreadsheet in this case). A file is stored on a disc and identified by a unique filename.
- Formula** — A formula may be entered into any numeric cell, and into the User Definable Formulae. It is an expression to be calculated by the program, and may contain any cell/User Definable Formulae references. For example, C11/100 * 1.15, (A2+15)/100.
- Function Keys** — Situated on your key board, these keys may be programmed by the operator to contain menu commands, text, formulae or numbers. This can often save repetitive entry of identical data.

Justification —	Data within each cell may be justified, either left, right or centred.
Load —	Transfer data or programs into the computer's memory.
Menu —	When a computer program such as this, displays a series of options on the screen for you to select, it is called a 'menu'.
Numeric —	Data consisting of digits or numbers only.
Operating System (OS) —	A collection of programs that 'runs' the computer.
Password —	To protect confidential spreadsheets that you may create with DGCALC, the facility to setup a password for each spreadsheet is provided (see Reference Section). If a password has been setup on a spreadsheet, it is not possible to load the spreadsheet into DGCALC without entering the password.
Range —	All the values between a lower and upper limit. E.g., B1:D1 (i.e., B1, C1, D1), B1:B3 (i.e., B1, B2, B3), B1:D3 (i.e., B1, B2, B3, C1, C2, C3, D1, D2, D3).
Relative Copying —	See Absolute Copying.
Replication —	To copy. Use this facility to copy the contents of a cell/range of cells to a cell/range of cells.
Row —	A linear, horizontal arrangement of locations where data can be placed.
Save —	Transfer data/programs from the computer's memory to disc.
Scroll —	Moving the spreadsheet on the screen. Using the cursor keys, the spreadsheet may be scrolled left, right, down or up.
String —	A sequence of letters or numbers. For example: a word, number or sentence.
Text Overflow —	Facility to allow text to continue horizontally regardless of column width. In many instances, having setup a spreadsheet, you may wish to title it. If the title exceeds the length of the first column, it might be necessary to resort to placing one word into each column. This facility allows titles to run across columns irrespective of the column width.

Undo —	This will ‘undo’ or reverse the last edit made.
User Definable Formulae (UDF) —	These are a way of entering commonly used or complex formulae into numeric cells. Each formula can be assigned a UDF (52 in total), which is referenced by AO:AZO.
Windowing —	Holding part of the spreadsheet on the screen, whilst scrolling the spreadsheet underneath.
Zap —	Erase all of the current spreadsheet.

Function/Statistical Terminology

+ , - , / , * , ^ —	Add, subtract, divide, multiply, to the power (executed in conventional priority).
ABS —	Absolute value of a number: all negative numbers become positive.
AVERAGE —	A single number which is representative of the size of numbers in a group. Its main use is to describe a characteristic of the group. It is calculated by adding up all the numbers and dividing the total by however many numbers there are.
COS —	Cosine: a trigonometric function (calculated in radians).
COUNT —	This gives the number of figures in a group and is particularly useful for statistical calculations.
EXP —	Exponential: use to calculate the natural logarithm base E to a power.
LOGTEN —	Logarithm: to the base 10.
LOG —	Logarithm: to the base E (natural logarithm).
MAX —	Maximum: used to determine the highest number in a group.
MIN —	Minimum — used to determine the lowest number in a group.

ROUND —	Rounding a number simply means reducing it's accuracy. For example, £12.83 rounded to the nearest pound is £13, while £12.33 rounded to the nearest pound is £12.
SIN —	Sine: a trigonometric function (calculated in radians).
SQRT —	Square root: a number, which when multiplied by itself, gives a given number. For example, the square root of 9 is 3, since $3 \times 3 = 9$.
SUM —	To total a range of figures by means of addition.
TAN —	Tangent: a trigonometric function (calculated in radians).
TRUNC —	Truncate: removes all digits after the decimal point. (Similar to ROUND, but always rounds down.)

Backup Your Program Disc

Making backups of the discs you use on your computer is a habit you must try to develop. You'll be glad you did the first time a disc is destroyed by a power surge or a spilt cup of coffee.

Refer to your computer manual and make a backup copy of DGCALC, then put it in a safe place.

OPERATING NOTES

The program works in two different modes:

Menu — (Press /) for selecting Main Menu Options
Browse — (press ESCAPE) for scrolling/editing the spreadsheet

DGCALC is completely menu driven. This means that every option is selectable from menus. When you first load the program, the Main Menu appears at the top of the screen.

Before selecting a Main Menu option make sure that you are in Menu mode. You may do this by pressing /, a highlighted bar will then appear over the first Main Menu option. To return to Browse mode, press ESCAPE.

Selecting from the Main Menu:

You may do this in three ways:

1. Using the left and right cursor keys to position the highlighted bar over the option required and then press RETURN. The advantage of using this option is that a description of the option is displayed directly underneath the Main Menu.
2. Press the letter on the keyboard corresponding to the first letter of the option that you have selected (e.g., press A if you require the 'Attr' option).
3. Using the mouse (if supplied with your computer) to position the highlighted bar over the option required and then 'click'.

Selecting from Sub Menus:

Follow the same procedure as previously. However, many options will have defaults already inserted, to accept these simply press RETURN (or 'click' the mouse).

Important Note:

If you wish to leave any menu option and return to Browse Mode, press ESCAPE.

However, if you wish to leave DGCALC, always use the QUIT option from the Main Menu.

Browse mode:

When in Browse mode, the current cell contents (i.e., where the highlighted bar is positioned on the spreadsheet) are displayed in the top lefthand corner of the screen. There are various commands available when you are in Browse mode:

Key:	Action:
LEFT ARROW:	move 1 cell left
RIGHT ARROW:	move 1 cell right
UP ARROW:	move 1 cell up
DOWN ARROW:	move 1 cell down
CTRL L:	move 1 page left
CTRL R:	move 1 page right
CTRL U:	move 1 page up
CTRL D:	move 1 page down
CTRL C:	centre highlighted bar (within spreadsheet)
CTRL E:	edit current cell contents

Important Note:

CTRL E allows you to edit the current cell contents (mouse users may 'click' on the top line of the screen). If, however, you simply start typing, the current cell contents will be replaced.

The Line Editor

At all times when entering information into the DGCALC, the built-in line editor may be used to correct/edit what is being typed in. Very often a 'default' value will appear, in which case just pressing RETURN will enter that value.

Key:	Action:
LEFT ARROW:	move 1 character left
RIGHT ARROW:	move 1 character right
DELETE:	delete 1 character left
CTRL X:	delete 1 character right
CTRL I:	insert 1 character
CTRL W:	delete (wipe) line from cursor position
RETURN:	complete entry/accept default
ESCAPE:	may be used at any time to exit and return to Browse mode.

See Appendix 3 for machine variations.

Important Note:

Whilst editing a cell, if you wish to restore the previous contents, press ESCAPE (or CTRL A). Having completed an edit (i.e., you have pressed RETURN), the previous contents may be restored by using the Main Menu option UNDO.

Important Note:

To clear the contents of the current cell, press SPACE BAR.

Capacity

DGCALC is a memory based program. This means that whilst you are using the program, both DGCALC and your spreadsheet will be in the computer's memory.

As a result, DGCALC is very fast. However, the total number of cells you may enter in one file will be limited by the memory of your computer.

If your computer's memory becomes full, DGCALC will display the message 'no more room'. AT THIS POINT WE STRONGLY RECOMMEND THAT USERS REDUCE THE SIZE OF THEIR SPREADSHEET.

Data Files and their Security

These data discs will contain all the information that you will be typing into the system in the future. It is therefore very important to keep back up copies of these discs, on a regular basis, in case a fault develops.

Although time consuming, imagine how much time it will take you to re-type, say 100 rows of information. Faults can develop on discs and it can be very difficult or impossible to recover your lost data.

Take care to keep one set of back up data discs in a separate location. It is a good idea for the operator to be responsible for taking home a copy of the data discs at night.

The standard method of securely backing up your data discs is as follows:

1. For each current data disc you use when running the program keep 3 copies.
2. Label the 3 copies:

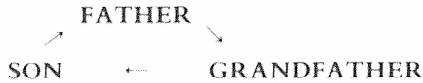
Grandfather, Father and Son

For example:-

Customer Data Grandfather
Customer Data Father
Customer Data Son

3. After each day of processing, copy the contents of the data discs you have been using onto the next logical relative.

For example, if you have been using Grandfather copy the contents onto Father. If you use Father copy it onto Son. If you use Son copy it onto Grandfather. Be sure to check that you are copying the discs the right way and not copying over today's data with yesterday's! This is illustrated below:



4. At the next session use the next version of your data disc (i.e., Father, if you had been using Grandfather previously).

By rotating the use of each disc day by day you will extend their life and reliability. Also you will be automatically maintaining the previous day's data (since you only copy the current data onto one generation). Thus providing an extra security of maintaining the previous day's information as well as the current day.

You may find it helpful to keep a simple log, showing the date each disc was used. By using this method you will know exactly which version to use each day.

Refer to your computer manual for instructions on formatting and copying discs.

TUTORIAL SECTION

You should have backed up DGCALC and have some idea of the facilities available. The purpose of this section is to work through step by step the setting up of a simple spreadsheet. This will help demonstrate the concept behind DGCALC.

Recent Amendments

Any amendments to DGCALC not covered in this manual will be included on the program disc in a file called 'READ.ME'. By cataloguing the disc, check to see if this file exists and if so, see Appendix 2. Be sure to print and read the file BEFORE continuing.

Load the program as instructed in Appendix 1.

Firstly the title screen will appear.

First Concepts

A spreadsheet is a computer program designed primarily to handle 'number crunching'. This is a term applied to handling large amounts of numeric calculations.

As we discovered earlier in the Operating Notes section, DGCALC works in two different modes:

Menu mode — for selecting functions, options, etc.

Browse mode — for entering/editing text, numbers, formulae, etc.

Firstly, we must setup a spreadsheet. A typical application might be a price list.

Important Note:

When using DGCALC, you may use either upper or lower case letters.

Consider a number of consumer products, each having a unique price, and we wish to generate a price list. We will require the price of each product with various discount percentages.

Initially we would make a sketch of the layout. It should look something like this:

Product	PRICE	20%	30%	40%	50%	60%
Gloves	15.00					
Hat	25.00					
Coat	64.00					
Socks	5.99					
Tie	12.95					

We already know the price of the products, but we want the program to calculate the discounts.

Now that we have a rough idea of what the spreadsheet is going to look like, we can configure DGCALC. When you first load the program, the spreadsheet is blank.

Cell References

Each column is lettered from A to AZ (A—Z and AA—AZ), and each row is numbered from 1 to 511. Therefore the reference of the cell at the intersection of column C with row 8 is C8.

When entering a range of cell references, two formats may be used:

A1, C1, AF23 to select just a single cell.
A1:F1, A1:F6 to select a column, row or range of cells.

All of the cell attributes (e.g., justification, number of decimal places, etc.) are already setup. If you wish to change these, you may do so at any stage. The only important option to check now is the column width. The program is currently setup for 9 characters width for each column.

Clearly, for our example, it is unnecessary to assign 9 characters per column, we will therefore set the first column (Product Descriptions) to 11 characters, the second (Price) to 8 and the rest to 6.

Important Note:

Notice that the above column widths allow an extra character for spacing between each column.

From the Main Menu, position the highlighted bar over the WIDTH option (by pressing / and then using the right arrow key). Notice that directly under the Main Menu, the program offers a description of each option when highlighted. Move the highlighted bar, using the right and left cursor keys to examine the description of each Main Menu option.

Now reposition the highlighted bar over the WIDTH option and press RETURN.

DGCALC will prompt you to enter the range. Notice the default of the current column (which is indicated by the highlighted bar within the spreadsheet), in this case A. Since we only wish to set column A to a width of 11 characters, press RETURN to accept the default. Now enter the new column width. Notice that the current size (i.e., 9) is the default.

After pressing RETURN, you will see column A increase in width from 9 to 11 characters. Now select WIDTH again. Since we have already set the required width for column A, we now want to over-type the default to the next column in our spreadsheet, in this case B. Set the width to 8 and press RETURN.

In our example we require 7 columns. We must therefore now set the column width for the next 5 columns, since we have already setup column 1 (or A) and column 2 (B). We therefore want to set the column width for columns C to G. When entering a range, as opposed to one column/row/cell reference, it is necessary to separate the references with a colon. Therefore enter C:G to indicate that you wish to set the column widths for columns C to G.

Now enter the column width, again DGCALC will offer a default (11, since this is the size that you set column A), so over-type this with 6 and press RETURN.

Now that the column widths have been setup, we can proceed with entering the information.

Firstly, we will enter the column titles. Select TITLE from the Main Menu. Type:

PRODUCT

and press RETURN.

(Be sure the highlighted bar is positioned over cell A1.) Now move the highlighted bar to the next column by using the right cursor key. Set the title to column B as PRICE, column C as 20%, column D as 30%, column E as 40%, column F as 50% and column G as 60%.

Using the left arrow key, move the highlighted bar back to column A. We can now enter information into the cells.

There are two methods of entering information into a cell:

1. Number/formulae.

Simply type the numbers/formulae and press RETURN.

2. Text, comments, etc.

As above, except precede the entry with ' (single quote) or "" (double quote).

Important Note:

DGCALC will not calculate cells preceded with ‘ or ‘‘, since these should only contain supporting text. If however, you enter text not preceded by ‘ or ‘‘, the program will prompt:

Bad cell contents

Important Note:

If at any stage you wish to return to the Main Menu and leave the current option, press ESCAPE.

Important Note:

From now onwards we will only refer to the ‘‘ symbol to precede any text entry. You may, of course, use either the ‘‘ or ‘.

Important Note:

Refer to the Editor facilities in the Operating notes section or Quick Reference Card.

Since we wish to enter the product name, type ‘‘. Notice the flashing cursor at the very top of the screen, the current cell position is also indicated (i.e., A1) to the left of the cursor. Therefore, any information entered at this point, will be put into cell A1. Type:

Gloves

and press RETURN.

The word ‘Gloves’ has now been entered into cell A1 and the highlighted bar has moved rightwards to the next cell automatically. (As we will discover later, it is possible to set the direction of the highlighted bar.)

We now wish to enter a figure (15.00) rather than text and so it is not necessary to precede the entry with ‘‘. Simply type:

15

and press RETURN.

Important Note:

The reason the figure is displayed as 15.00, although you entered 15, is because each cell has been set to display figures to 2 decimal places. (You may define the number of decimal places (0-7) as we will see later.)

Now move the highlighted bar to the beginning of the next row and fill in the other products and prices.

The highlighted bar should now be on cell C5.

Important Note:

You can immediately tell which cell you are on by looking at the top left corner. Notice also, in the top right corner, the last cell of the spreadsheet is indicated (when in Menu Mode).

Now that all of the necessary information has been entered, we can start calculating the figures for the empty cells.

Move the highlighted bar to cell C1. This cell should represent the total price less 20% discount. We can calculate this by using the formula $15 * 0.8$ (where $*$ represents multiply). Rather than type the number 15, we can just enter the cell reference B1 (since it contains the price of 15). Therefore type:

$B1 * 0.8$

into cell C1 and press RETURN.

Important Note:

All decimal points (e.g., 0.5, 0.2) must be preceded by 0.

Notice that DGCALC immediately calculates the value (12.00).

Now the formula $B1 * 0.8$ may be copied throughout the C column because when the contents of C1 (the formula $B1 * 0.8$) are copied, DGCALC will automatically replace B1 with B2, B3, B4 and B5 as appropriate. Therefore every price will automatically be substituted into the formula. This is one of the major advantages of computerised spreadsheets in that the program is intelligent enough to substitute values where appropriate. This is called RELATIVE COPYING.

If, at this stage we had entered $15 * 0.8$ for the formula, the program will copy that formula into each column and that clearly would be incorrect (the same result would be achieved by performing ABSOLUTE COPYING on the formula $B1 * 0.8$).

To copy a formula into a cell or range of cells proceed as follows:

Select copy from the Main Menu and enter the source range/cell, in this case C1 and press RETURN. Now enter the destination range/cell, in this case C2:C5 and press RETURN (since you wish to copy the formula calculating 20% discount for each product). Now select to copy RELATIVE (see Glossary).

DGCALC will now calculate 20% discount for each product. Move the highlighted bar up and down column C and notice how DGCALC has copied the same formula throughout the column substituting the appropriate price (cell reference).

We have just copied a basic formula from one cell to a range of cells within one column. It is also possible to copy a range of cells to another range of cells.

To demonstrate this, let us enter all of the formulae for row 1 and copy those formulae to the rest of the spreadsheet.
Move the highlighted bar to cell D1, type:

$B1 \times 0.7$

and press RETURN

The highlighted bar will move to cell E1, type:

$B1 \times 0.6$

and press RETURN

The highlighted bar will move to cell F1, type:

$B1 \times 0.5$

and press RETURN

The highlighted bar will move to cell G1, type:

$B1 \times 0.4$

and press RETURN

You should now have all of the different discounts for 'Gloves' displayed. Now let us copy those formulae to the other rows.
Select COPY from the Main Menu. Enter the source range/cell as:

D1:G1

(i.e., D1, E1, F1, G1) and press RETURN.

We now wish to copy the formulae into an area starting from D2 to the bottom at G5. By specifying the top left-hand corner and bottom right-hand corner, this will include D2, E2, F2, G2, D3, E3, F3, G3, D4, E4, F4, G4, D5, E5, F5, G5. In other words, the contents of the box specified by the corner cell references.
Therefore enter the destination range/cell as:

D2:G5

Select to copy RELATIVE as previously.

Your spreadsheet is now complete. By using formulae, values have been calculated for the percentage discounts based on the price. By copying cells, large spreadsheets can be developed and the program will automatically substitute the correct cell reference or range as appropriate.

Computerised spreadsheets are particularly useful for performing quick recalculations or 'what-if' calculations.

For example, we could experiment by increasing one of the prices of our products and instantly see how this will affect the price after discount.

Experiment by moving the highlighted bar over B1, the price of the gloves, and change the contents which are displayed at the top of the screen (either press CTRL E to edit contents or simply over-type). Change 15 to 20. Notice how the figures on the spreadsheet have been instantly recalculated.

Statistics may also be applied to a cell or range (see Function/Statistic terminology). For example, if we want to total the contents of column B (prices) we would enter the following formula into cell B7:

SUM(B1:B5)

Naturally, the above formula could be entered into any cell, but the spreadsheet looks more conventional to place the total under the column.

But leaving a gap between the last entry and the total, there is room to place a few dots to create a clear separation. Move to cell B6 and type:

“ - - - - -

Using the sample spreadsheet we have just created, work through the Reference Section and experiment with each option.

Now that we have completed our first spreadsheet, let us briefly run through each Main Menu option. Notice that each option has an accompanying description. Use the left and right cursor keys to move the highlighted bar over each option displayed.

Select ATTR from the Main Menu, this is used to set the attributes of each cell. Select B1 for the range (so that we will only set the attributes for cell B1). Each subsequent option will default as SAME, in other words, the particular attribute will remain unchanged. The first is Lock/Unlock. Sometimes you might want to 'lock' a cell, thereby preventing accidental editing.

The second is justification and the third zero suppression. The fourth is the number of decimal places (currently set to 2).

We have already experimented with COPY, and so move onto DEL. You firstly select to delete a row or column, and then the quantity.

FILE is for saving, loading and printing your spreadsheet. Select SAVE, and type the filename for your spreadsheet and press RETURN. Your spreadsheet should now be stored on disc. An identical spreadsheet to the one you have just setup is supplied on your program disc. If you wish to load the file, select LOAD and type DEMO for the filename.

GOTO — jump to a cell in your spreadsheet. Simply enter the cell reference.

HOLD — hold row/column(s) on the screen allowing the scrolling of the spreadsheet underneath.

INS — insert a row or column. This works in the same way as DEL.

MISC — miscellaneous functions. including:

DIRECTION: For setting the direction of the highlighted bar (it currently moves rightwards after data entry).

FUNCTION KEYS: The function keys of your computer may be programmed with formulae or text, saving repetitive entry of common information.

PASSWORD: Any spreadsheet created with DGCALC may be given a password, restricting access to any confidential information.

OS — enter operating system command, such as DIR for a directory listing.

TITLE — set the title of each column as we used previously.

UNDO — ‘undoing’ the previous edit. If, for example, you deleted a formula by mistake, this feature will retrieve the old contents.

WIDTH — set the column widths as we used previously.

QUIT — leave DGCALC.

REFERENCE SECTION

Important Note:

Floppy disc users, format a blank disc before adding/creating any spreadsheets. You will need it later to store your spreadsheet files.

Important Note:

Many of the following options require the RANGE to be specified. Usually the current cell is given as a default. You may, of course enter any cell reference or any range of cells (e.g., A4, A1:AE1, A1:H7). Use the range A1:AZ511 to affect the whole spreadsheet.

Important Note:

When referring to the CURRENT Position in the spreadsheet, we are referring to the position of the highlighted bar.

Important Note:

All decimal points must be preceded by 0 (e.g., 0.5).

General Notes:

Cell Contents

Any cell may contain up to 70 characters. However, the top line of the screen normally only shows the first 36 characters, except when editing.

Overflow

Numbers (including decimal places) exceeding the width of a column will be represented by asterisks. If this occurs, increase the width of the column.

Text Overflow

Text entered into a cell, where the column width is less than the length of text, will overflow into the following columns provided they are blank. This applies to TEXT entries only (i.e., any entry preceded by “ or ’). Text overflow is particularly useful for titles and commentary, etc.

Important Note:

If the first cell containing text overflow is not on the screen, the entire text will not be displayed.

Entering formulae

When using mathematical functions (see Function/Statistical Terminology), the range/cell reference must be enclosed in brackets. For example. SUM(A1:A6), SQRT(B3), SQRT(ABS(A1)). You may use up to any level of parentheses.

User Definable Formulae

User Definable Formulae (UDF) are a way of storing commonly used or complex formulae normally entered into numeric cells. Row 0 is designated for UDF. It is not possible to browse this row, since it is not part of the spreadsheet and is unaffected by copying/inserting/deleting rows or columns.

To edit UDF, use the GOTO option (e.g., GOTO A0). Having entered your formulae into Row 0, access them by referring to the cell reference, so formula 1 would be reference as A0.

There are 52 in total (A0 to AZ0).

Zap Command

The Zap facility is designed to completely remove the contents of the current spreadsheet (see Copy).

ATTR — Change Cell/Range attributes

Each cell has the following default cell attributes (characteristics):

Option:	Default:
LOCK/UNLOCK	UNLOCK
JUSTIFICATION	Text: LEFT, numeric: RIGHT
ZERO SUPPRESSION	NO
NO. OF DECIMAL PLACES	2

LOCKING — Use the facility to 'lock' a cell if you do not wish the contents to be edited or altered (this can easily be done by accident and is particularly undesirable if cells are linked by formulae). A cell once LOCKED can be UNLOCKED, if necessary.

JUSTIFICATION — The contents of a cell may be justified left, right or centre.

ZERO SUPPRESSION — If a cell's formula, after calculation, results in zero, you may wish to suppress the display of '0' and simply leave a blank space.

NUMBER OF DECIMAL PLACES — Figures may be displayed to 7 decimal places. Although you may wish to display only a few decimal places, DGCALC will still maintain the figure to an accuracy of 7 decimal places.

Important Note:

All attributes will be saved with your spreadsheet file.

COPY — Copy Cell/Range

If you wish to copy a cell or range of cells (including formulae) to another location, simply enter the source (FROM) and then the destination (TO).

If copying from a range, then having entered the source range, DGCALC will ask for the destination. However, usually it is not necessary to specify the destination range as a range, you can simply type just the co-ordinate of the top left corner of the destination range and DGCALC will then fill from this corner.

You can use this option to delete sections, or the entire spreadsheet by specifying a blank cell as the source.

Normally, copying is done RELATIVELY and this is the default. For an explanation of the difference of RELATIVE and ABSOLUTE copying, see Glossary.

To completely remove the contents of the current spreadsheet, copy cell reference AZ511 to the range A0:AZ511 (this facility has already been configured for function key 4, see Function Keys). This over-rides all locked cells and resets the attributes. To remove the current spreadsheet and maintain function keys, UDFs, column widths and titles, use the same procedure but set the destination to A1:AZ511.

Important Note:

The attributes of the blank cell will be copied into the new location:

Previously used blank cell:
Attributes will be as set at the time of use.

Previously unused blank cell:
Default attributes (i.e., text — left justified, numeric — right justified, 2 decimal places).

DEL — Delete Row/Column

Use this option to delete complete rows or columns at the position of the highlighted bar (the default is 1, although you may delete any number).

DGCALC scans the spreadsheet to check whether a cell reference has been moved and if so, the cell is adjusted.

FILE — Load/Save/Export/Print File

These options control the manipulation of the spreadsheet. Either load, save, export (to a file in ASCII format or to a printer) or print (to a printer).

When saving spreadsheets, DGCALC will append the following suffixes (file extensions):

- .SPR — spreadsheet file (from SAVE Option)
- .TXT — ASCII (text) file (from EXPORT option)

LOAD — Specify filename and load in a new spreadsheet

If a spreadsheet already exists which has been edited or altered in some way, DGCALC will query:

UNSAVED CHANGES — Discard changes NO YES

If you select YES, the program will proceed with loading the new file in place of the existing spreadsheet in memory. If you select NO, DGCALC will return to the Main Menu.

If a spreadsheet already exists which has not been edited, DGCALC will proceed with loading the new file in place of the existing spreadsheet in memory.

Save — Specify filename and save the current spreadsheet

If a file of the same name already exists, DGCALC will query

FILE EXISTS — Replace Yes No

If you select YES, the program will proceed with saving the spreadsheet in memory in place of the existing file. If you select NO, DGCALC will return to the Main Menu.

Export — Specify filename and save (print) the current spreadsheet in ASCII format.

Select to save the spreadsheet itself or just the formulae, with/without row numbers/column letters, the range, page length, page width. The range default is the entire spreadsheet. Remember to specify row 0 if you wish to include the UDF's.

If the spreadsheet's width exceeds the page width you specified previously, DGCALC will print as many columns as possible to fit on the page and print the remaining columns after the last row. Column titles will automatically be printed at the top of each new page. 2 blank lines are inserted at top and bottom of each page. Setting the page length/width to a large number will prevent page breaks.

Print — Print current spreadsheet to the printer

Use this option to print the actual spreadsheet or just the formulae direct to the printer.

The options are the same as EXPORT. In addition, you may specify printer initialisation codes to configure your printer. This takes the form of numbers, separated by commas.

For example, (for an Epson compatible printer) 27, 69 will give bold print. Refer to your printer manual for the appropriate codes.

GOTO — Goto a Cell

Enter cell reference and the program will jump to the specified cell. Mouse users may simply 'click' on the appropriate cell.

HOLD — Hold/release current Row/Column

Use this option to switch between holding and releasing the current row or column on the screen. If, for example you hold row 1, and scrolled downwards, although row 2, 3, etc., would scroll off the top of the screen, row 1 will remain. The same principle applies for columns. You may hold up to 3 rows and 3 columns simultaneously. However, the total width of the columns may exceed 36 characters.

To release a row or column, move the highlighted bar to the row/column and select the HOLD option again.

Important Note:

When you select to HOLD a row/column, DGCALC will place a copy of the row/column in the top/left side of the spreadsheet. The complete spreadsheet will then scroll underneath.

INS — Insert Row/Column

Use this option to insert a row or column (the default is 1, although you may insert any number). You may specify whether you wish to insert the row/column(s) before or after the current position.

DGCALC scans the spreadsheet to check whether a cell reference has been moved and if so, the cell is adjusted.

In most cases, you will be inserting before the current cursor position, and this is the default.

However, in some cases it is beneficial to insert after the current cursor position so that DGCALC changes any totals correctly. For example, suppose we consider the following spreadsheet:

A1: 10.00
A2: 15.00
A3: 12.00
A4: SUM (A1:A3)

If we wanted to insert a row between A3 and A4 AND update the formula to include the new row (i.e., SUM (A1:A4)), you should insert the row AFTER A3. The result of inserting a row AFTER A3 would be:

A1: 10.00
A2: 15.00
A3: 12.00
A4:
A5: SUM (A1:A4)

If you had inserted the row BEFORE A4, the blank row would be inserted, but the formula would still remain SUM (A1:A3).

MISC — (Direction/Function keys/Password)

This is divided into 3 separate options:

Direction — Cursor Direction

This option determines the direction in which the highlighted bar moves on the spreadsheet after completing a cell entry. For example, if you were entering a list of vertical titles in a column, you would require the DOWN cursor direction, so that after each entry the highlighted bar moved downwards to the next row. The program is setup to move to the right.

Function keys — Edit function keys

You may program up to 9 function keys with text, numbers, formula or menu options. This saves repetitive entry of data. The ability to program menu options is particularly useful. For example, you could program function key 1 with the GOTO option and cell reference. Whenever you pressed function key 1, the highlighted bar would jump straight to the specified position on the spreadsheet.

The function key menu shows each function numbered 1 to 9. Use the cursor keys to move from left to right. As each number is highlighted, the contents of the function key will be displayed underneath.

Position the cursor over a function key and press RETURN. You may now enter your information (up to 36 characters). Press RETURN when your entry is complete. The value in each function key may be edited at any time and is automatically saved with your spreadsheet.

The following function keys have already been configured:

Key No.	Contents	Action
F1	/G@wA1@e	Go to cell A1
F2	/O@wDIR@e	List files in current directory
F3	/FP6@e@e@e@e@e@e	Print current spreadsheet with all defaults
F4	/CAZ511@eA0:AZ511@e	Zap entire spreadsheet

How to program the function keys with text/numbers/formulae:

Simply type your information, but remember to precede any text with “”. (If you wish to instruct the computer to issue RETURN after the information see the next section.)

How to program the function keys with menu options/commands:

Simply enter / and then the first letter of a Main Menu option. For example, if you wanted to use GOTO, simply enter /G.

If you wish to enter a command, precede all references by @:

Command	Action
@e	RETURN (or ENTER)
@u	cursor up 1 character
@d	cursor down 1 character
@l	cursor left 1 character
@r	cursor right 1 character
@U	page up
@D	page down
@L	page left
@R	page right
@?	delete 1 character left
@w	delete (wipe) from cursor position to end of line

PASSWORD — Create/Change password

Each of your spreadsheet files may be given a unique (or identical) password to prevent unauthorized access through DGCALC. You can change the password at any time.

Important Note:

Digitia International cannot be held responsible to retrieve any information protected by a password. **DO NOT FORGET YOUR PASSWORD.**

If you are creating a password for the first time, you will be asked to enter the new password (up to 8 characters). Now save your spreadsheet file. In future, DGCALC will prompt for a password before loading the file.

Important Note:

The password routine is the only part of DGCALC which discriminates between upper and lower case letters. If, for example, you entered 'Paul' as your password, DGCALC will not accept 'paul' or 'PAUL'.

To change the password, select the same option as previously. However, this time DGCALC will ask for the existing password before prompting you to enter the new version. If you wish to remove the password altogether simply press RETURN when prompted for the new password.

OS — Enter operating system command

Select this option to make direct operating system commands. This is particularly useful for screening a directory listing, printer commands, etc.

TITLE — Change Column Titles

This option may be used to change the current column titles at the top of the screen. Position the highlighted bar in the appropriate column before selecting this option. The titles appear on the screen with the column letter followed by the title (e.g., B:PRICE).

When printing your spreadsheet, the titles will be printed at the top of each new page.

UNDO — Undo last edit of Cell

If you have accidentally edited a cell, use the undo option to reverse the process.

WIDTH — Change Column width

The display width of each column is individually adjustable. You will be prompted for the range, which may be a single column (the default is the current column) or a range of columns. Enter the required width (the default is the current width) and press RETURN.

QUIT — Quit DGCALC

Use this option to leave DGCALC. If you have not saved any new or amended data, DGCALC will query whether you still wish to leave the program:

UNSAVED CHANGES — Sure you want to quit: NO
YES

If you select NO, the program will return to the Main Menu.

If, however, you have saved your data or, if you have loaded a spreadsheet and not performed any editing, etc., DGCALC will simply query:

Sure you want to quit: YES NO

If you select NO, the program will return to the Main Menu.

TROUBLE SHOOTING

Error Message	Reason
Bad cell	Reference incorrect cell reference, or cell does not exist.
Bad cell range	Incorrect range, or range not valid (e.g., A10:A9)
Cell is locked	Attempted edit on locked cell
Bad cell contents	Information entered in wrong format (e.g., entering text not preceded with “ or ‘, mismatched bracket)
Max rows/cols already held	Attempt to exceed maximum hold of 3 rows and 3 columns, or total column width exceeds 36 characters.
Bad Number	Number unrecognised, or number too big or too small. Also, attempt to delete/insert too many rows/columns.
Locked cell exists	Attempt to delete or copy over locked cell(s)
Password incorrect	Incorrect password entered, check for upper and lower case letters.
Out of room	Your spreadsheet has filled your computer’s memory

Calculation errors:

Recursion too deep	Exceeded the maximum of 9 references between formulae, or incorrect reference (e.g., referring to cell A1 from cell A1)
DIV0 (in actual cell)	Number divided by zero
Mathematical function error	Error in maths function (e.g., square root of -1)
Number too big	Number, possibly as a result of a calculation, exceeds system maximum (999,999,999).∞

For other ‘system’ errors, please refer to your computer manual.

HOW TO PROTECT YOUR DATA DISCS

To ensure the efficient operation of DGCALC:

1. Users **MUST** make daily backups of their data discs using the grandfather routine illustrated in the manual.
2. Under no circumstances remove discs from the disc drive when the indicator light is on or directly after an option from the FILE menu has been selected.
3. Keep discs away from magnetic and heat sources such as televisions/monitors, telephones, electric fires, etc.
4. Handle the discs carefully, they are very fragile, always return them to their wallet after use.
6. Locate the discs and computer in a clean environment.
7. Only move the computer when absolutely necessary, keep clear from vibration. Take extra care with hard disc systems.
8. Store all discs in dust-proof boxes.
9. Keep discs out of direct sunlight and away from dust and dirt.
10. Do not handle discs with dirty or greasy hands.

SOFTWARE SUPPORT SERVICE

Program discs supplied by Digita are guaranteed against faulty manufacture or materials for a period of 60 days from the date of purchase. For this period also, users who return their software registration cards will be provided with free written and telephone support by Digita.

Important Note:

At the end of the warranty period, customers have the option to join the Software Maintenance Scheme. For DGCALC the cost is £20 per annum. This offers continuing direct support and entitlement to the issue of free program updates.

APPENDICES — IBM PC Version

APPENDIX 1 — Loading DGCALC

Switch on your computer (or reset) and insert your DGCALC program disc into drive A.

Non-mouse users, from MS-DOS type:

DCN

Mouse users, from MS-DOS type:

DCM

Alternatively, you may wish to rename the version you intend to use DC.EXE. Ensure that the command is on your PATH or in the current directory. The program will then load.

Important Note:

When loading DGCALC, you may also load a spreadsheet file simultaneously by typing, for example, the following:

DC DEMO

Note: do not type the .SPR suffix.

APPENDIX 2 — Printing the READ.ME file

If this file exists (i.e., there are manual amendments), from MS-DOS type:

MORE <READ.ME

If the 'MORE' prompt appears, this means that there is more than one page of instructions. Press SPACE BAR to reveal the next page.

APPENDIX 3 — Machine Variations

Single disc drive users:

Having loaded DGCALC, replace the program disc with a formatted blank disc. This is for your data.

Double disc drive users:

Follow the single disc drive procedure. Alternatively, put the blank disc in drive B and when loading/saving files, be sure to enter the following before the filename:

B:\

Keyboard Variations:

← Del	deletes leftwards
Del	deletes rightwards
Tab or Ins	inserts a space
Home	page left
End	page right
PgUp	page up
PgDn	page down

APPENDICES — Atari ST Version

APPENDIX 1 — Copying/Formatting

Follow instructions detailed in the Atari manual for copying/formatting discs.

APPENDIX 2 — Loading

Switch on your ST (or press the reset button) and insert your DGCALC program disc into drive A. When the Desktop appears, double click on floppy drive A icon and then double click on the DGCALC icon. The program will then load.

APPENDIX 3 — READ.ME file

If this file exists (i.e., there are manual amendments), double click and select to 'Show'. If a 'More' prompt appears, this means that there is more than one page of instructions, press the SPACE BAR to reveal the next page.

APPENDIX 4 — Machine variations

Colour monitor/TV users

DGCALC will work with all Atari ST compatible monitors/TVs in medium resolution mode. With your backup copy of DGCALC in drive A, change to medium resolution and refer to your user manual to save Desktop preferences.

Single disc drive users

Having loaded DGCALC, replace the program disc with a formatted blank disc. This is for your data.

Double disc drive users

Follow the single disc drive procedure. Alternatively, put the blank disc in drive B and, when loading/saving files, be sure to enter the following before the filename:

B:\

This will instruct the computer to load/save all data to the B drive.

Keyboard Variations:

Backspace	deletes leftwards
CTRL X or Delete	deletes rightwards
CTRL I, Tab or Insert	inserts a space
CTRL Z	centre spreadsheet

Please note: The editor cursor is represented by a flashing block.

Operating System Commands (OS option)

Currently, an Atari ST will only recognise the following command:

dir

This gives directory of the current disc (dir B:\ gives directory of B drive).

APPENDICES — Commodore Amiga Version

APPENDIX 1 — Copying/Formatting

Follow the instructions detailed in the Amiga manual for copying/formatting discs.

APPENDIX 2 — Loading

Load the Workbench and insert your DGCALC program disc into the drive. Double click on the floppy drive icon and then double click on the DGCALC icon. The program will then load.

APPENDIX 3 — READ.ME file

If this file exists (i.e., there are manual amendments), double click on the READ.ME icon.

APPENDIX 4 — Machine variations

Colour monitor/TV users

DGCALC will work with all Amiga compatible monitors/TVs.

Single disc drive users

Having loaded DGCALC, replace the program disc with a formatted blank disc. This is for your data. It is important to specify the drive name (i.e., df0:) within the filename when loading and saving (e.g., df0:myfile).

Double disc drive users

Follow the single disc drive procedure. Alternatively, put the blank disc in the second drive and, when loading/saving files, be sure to enter the following before the filename:

df1:

This will instruct the computer to load/save all data to the second drive.

Keyboard Variations:

Backspace	deletes left
CTRL X or Del	deletes right
CTRL I, or Tab	inserts a space

Please note: The editor cursor is represented by a steady block.

Operating System Commands (OS option)

To invoke a new CLI, type:

newcli

To terminate this, type:

endcli

You will find that, when issuing an OS command, your current directory is df0:. If, for example, you required a directory of df1:, enter df1: as your OS command.

DGCALC is a memory based program. Therefore, more memory will be available for storing labels if the Workbench Accessories are not present.

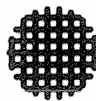
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