POWER ·PLAN 64

Super Spreadsheet with Built-in Graphics

212723

A DATA BECKER PRODUCT

Published by:

Abacus ▓▓▓▓▓ **Software**

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PART 1. POWER PLAN TRAINING MANUAL

1.1. WHAT IS POWER PLAN?

As you probably know, POWER PLAN is a "spreadsheet". All types of calculations may be carried out with the aid of POWER PLAN. As an example of a calculation, let's calculate the selling price for an item based on the specified cost price. This is a calculation which a retailer has to make every day.

The cost price of an article is a combination of various factors. The most significant ones are the actual cost price, the additional costs (rent, etc.) and the retailer's profit margin. To calculate the selling price, the retailer needs various implements. For example, a sheet of paper, a pencil and in most cases, a pocket calculator. In this case you can already see that it is very sensible to use a computer for these calculations, as it offers advantages in a number of ways.

With suitable software, the computer is able to replace the above-mentioned implements. And you have this software right in your hands.

POWER PLAN not only replaces these implements, but offers you many other advantages.

You can carry out simulations with POWER PLAN. A simulation is based on the fact that a final value is produced in relation to various input values. If one of the input values is varied, the final value changes automatically.

To continue with the example of the retailer, this means that by altering the cost price, the retailer immediately sees how the selling price of the respective product changes as a result.

A further advantage of POWER PLAN is that such a calculation can be stored on a floppy disk and can be recalled at any time.

Naturally, each calculation can also be printed out on a printer. But that is by no means all.......

On your distribution disk is not only POWER PLAN, but also POWER GRAPH, a program which converts your results - obtained by POWER PLAN - into charts.

Charts of every kind can be generated in this way and may be displayed on the screen or printed out on a printer.

1.2. LOADING AND STARTING POWER PLAN

In the following chapters we shall frequently follow the
theoretical explanations with practical examples. You should
now start POWER PLAN so that you can understand these
examples with the aid of your POWER PLAN program.

To do this, turn on your Commodore 64, your disk drive, your
monitor and if you have a printer turn it on too.

Now place the distribution diskette into the disk drive and
close the drive door. Enter the following text:

LOAD "O:*",8,1 and press the <RETURN> key.

The main program is first loaded into the memory of your
computer and started automatically.

At the end of this process (it takes about 2 minutes), the
screen should appear as shown below.

```
---------------------------------------------------------
:Coordinate:A/1         EMPTY              Memory 99%:
---------------------------------------------------------
{INPUT/CONTENTS ZONE}                                  C
1:1    A         B         C               D           E
  1
  2
  3
  4
  5
  6
  7
  8
  9              {WORKSHEET ZONE}
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
  Format Global Edit dIsk Printer Quit        {MENU ZONE}
  New Blank gRafics Options Status ?
```

Comments are in { }'s and do not appear on the screen.

1.3. THE BASIC PRINCIPLE OF POWER PLAN

You have already learned in the previous chapter that POWER
PLAN is an electronic spreadsheet. POWER PLAN is similar to
spreadsheets used by bookkeepers- it has rows and columns.

This worksheet can be represented as a large set of wall
shelves consisting of many compartments. Data may be placed
in each compartment (also referred to as a cell. Each
compartment may be used in relation to another one. For
instance, we can specify that a cell (we will call it B)
should have twice the content of another cell. If, for
example, the content of cell A is 1, then that of cell B is
2.

If the content of cell A changes to 3, the content of cell B
automatically changes to 6. This process, however, is not
reversible. This means that the content of A does not alter
if the content of B changes.

We say: B is dependent on A — but A is not dependent on B

Obviously this experimental idea could be expanded by a cell
C, which would then be directly dependent on B and
indirectly on A. Let us therefore assume that the content
of cell C should always be double that of cell B.

Since the content of cell B is already double that of cell
A, this means that the content of cell C is four-times
larger than that of cell A. If the content of cell A is 3,
the content of cell B is 6 and that of cell C is 12. If the
content of cell B is changed, only the content of cell C
changes, not that of cell A.

INPUT/CONTENT ZONE←

(WORKSHEET ZONE)

Format Global Edit dIsk Printer Quit
New Blank gRafics Options Status ?
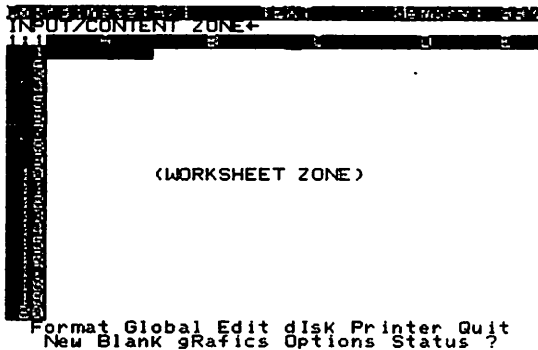
1.4. SCREEN LAYOUT

When working with POWER PLAN it is very important to
understand the screen layout since all inputs and outputs
are made on the screen.

Starting with the diagram of the screen layout on page 4, we
shall explain the points shown there, one by one.

As you have already seen, the screen is divided into three
important zones, each one having its own special function.

1.4.1. THE INPUT OR CONTENTS ZONE

{Coordinate:} represents the actual coordinate of the screen
cursor in the worksheet. At the moment is says "A/1". This
tells you that the cursor is located at the top left corner
of the worksheet. If the screen cursor was in the bottom
right corner of the worksheet, it would read "BK/255".

{EMPTY} indicates the status or content of the cell at which
the screen cursor is positioned. The three states of a cell
are: "VALUE", "TEXT" or "EMPTY".

When information is typed into a cell, this field indicates
the type of input.

On the screen you can see the word "EMPTY". It tells you
that cell A1 is empty, that it is not occupied. If cell A1
contained the text "Power Plan", you would read the word
"TEXT" instead of "EMPTY".

{Memory:} indicates the percentage of the total memory still
available for inputs. At the moment "99%" of memory is free.
The 99% means that the complete 25 kilobytes of memory are
available to you. The remaining storage for the worksheet is
sufficient to fill approximately 2500 cells with text.

{INPUT/CONTENTS ZONE}, the blank line directly under
{Coordinate:}, represents the actual input to the cell. Let
us assume that cell A1 contains the formula "5 + 1". You can
see the result of this formula (6) in cell A1 itself, "5 +
1", that is the actual content of the cell can be read in
the contents line. If you wish to use a cell for an entry,
the content of this cell is first entered in this line
before being accepted into the cell.

The last set of information on this line (the letter)
indicates the type of check, i.e. the way in which POWER
PLAN recalculates the content of the cell. "R" stands for
row-by-row, "C" for column-by-column and "O" for off.

1.4.2. The WORKSHEET ZONE

In this zone you can see a part of the worksheet. The
position of this section is defined by the position of the
cursor in the worksheet.

The numbers (1-20) represents the row scale, the letters (A-
E) the column scale of the worksheet.

The number of the worksheet page (1 or 2) and the number of
the window displayed (1 or 2) can be read below the input
line, (1:1).

The small box marked in reverse on the screen is the screen
cursor. Note that the characters in the cell where it is
located, are not displayed normally, but are reversed.
(Reversed display in this case means that a character is
displayed dark on a light background, not light on a dark
background).

1.4.3. THE MENU ZONE

The current menu is always displayed in this part of the
screen. For many menus, inputs are also activated in this
zone. (Duplicate, header cell, etc). At the moment you can
see the main menu in this zone.

The main menu:

                Format Global Edit dIsk Printer Quit
                New Blank gRaphics Options Status ?

1.5. THE WORKSHEET

The worksheet is the most important part of POWER PLAN as all calculations are carried out in it.

How is the worksheet organized? To answer this question, we would like to use the example which we referred to in a previous chapter.

The worksheet is organized as a large set of shelves with many compartments. The size of course can be specified. In the case of POWER PLAN, this set of shelves has exactly 255 compartments one above the other (rows) and 63 compartments side by side (columns). The number of compartments is obtained by multiplying the two values together.

255 x 63 = 16065 compartments

The size of the worksheet is an advantage in that particularly large calculations can be easily handled, but is has the drawback that the whole of the worksheet cannot be displayed on the screen at the same time.

It is therefore important that you always bear in mind that you are looking at only a very small section of the worksheet on the screen.

As you already know, a calculation is based on linking the contents of different cells together. To be able to refer to individual cells, we have to give each cell a name.

This name is derived from the cell's position the worksheet. It is composed of a row and column coordinate. Thus each cell has allocated to it a coordinate (a name), which occurs only once.

As you view the worksheet a scale is displayed that indicates the names of the cells.

On the left hand side the scale shows the figures 1 thru 20. These are the numbers of the displayed rows.

Across the top, the scale shows letters A to E. These are the columns shown on the screen.

The rows are marked with consecutive numbers from 1 to 255. Rows 21 to 255 cannot be seen at the moment.

The columns are marked with the consecutive letters of the alphabet. This causes a problem since we have to name 63 columns and only 26 letters are available. So we use a little trick. The initial 26 columns are given the letters A to Z. The same procedure is used for the next 26 columns, but the "A" is used as a prefix. Using this system, column Z is followed by columns AA, AB, AC.....AZ. After column AZ,

the prefix letter is no longer A, but B. Thus columns BA, BB, BC......BK follow column AZ.

Column BK then represents the 63rd column, which is the last column of the worksheet.

Now returning to the names of the cells - in order to identify a cell, the column in which the cell is located is named first, and then the row.

In the example demonstrated, this means that the cell in the top left hand corner of the worksheet is designated Al, as it is in the first row and the first column of the worksheet.

Similarly, the cell in the bottom right hand corner of the worksheet is marked BK255. Our aim is to display the cell just named, BK255, on the screen. To do this, the screen cursor must be set at this cell.

The screen cursor is moved in the same way as it is moved in the BASIC mode - that is with the cursor key. Press the "CURSOR RIGHT" key once. You can see how the screen cursor immediately moves to cell A2. The coordinate data in the first line of the screen varies at the same time. It no longer shows Al, but A2; the new position of the cursor. Press the "CURSOR LEFT" key once. The cursor immediately moves back to cell Al. Now move the cursor to cell B1 and then back again to cell Al. (In this case using the "CURSOR UP" and "CURSOR DOWN" keys).

Now press and hold down the "CURSOR RIGHT" key. The cursor reaches the right hand edge of the screen in a short time. From this moment on its position on the screen does not change. To achieve this, the entire scale at the top of the screen is moved. Hold down the "CURSOR RIGHT" key again until the scale stops moving. The cursor has then reached the last column of the worksheet, column BK.

Now hold down the "CURSOR DOWN" key until you can see the coordinate BK255 in the first line of the screen. As you travel through the worksheet, please notice the changes on the screen.

Using the "CURSOR UP" and "CURSOR LEFT" keys would seem a simple way of moving the cursor back to cell Al, but POWER PLAN has a very convenient function which spares you this lengthy procedure.

To use this, operate the "CLR/HOME" key ONCE. The cursor jumps immediately to the top left hand·cell of the current worksheet section. Press the "CLR/HOME" key a second time and the cursor returns to cell Al. Remember: By pressing the "CLR/HOME" key twice we can return to cell Al from any cell in the worksheet.

You   have now learned a simple way to move the   cursor   over
the worksheet.
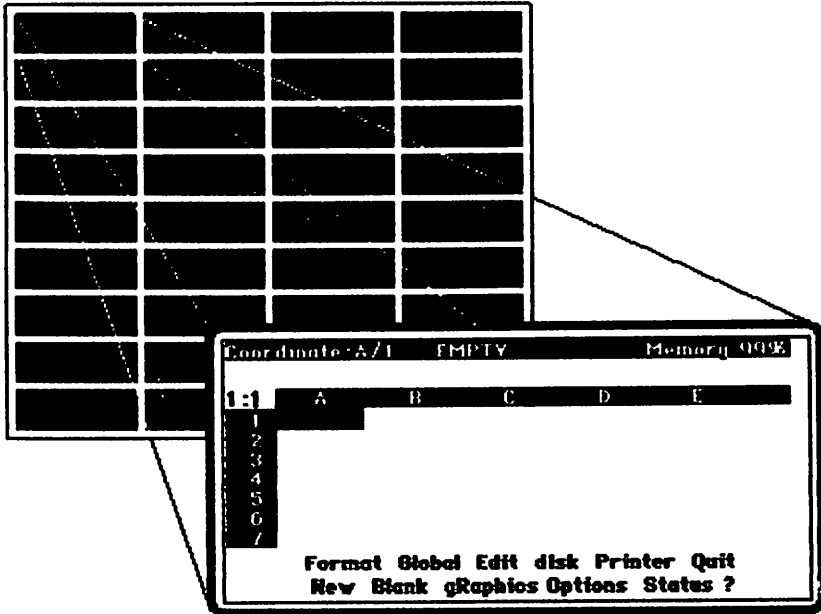
**Diagram of the screen's picture
in relationship to the actual spreadsheet.**

1.6. INPUT

The goal of this chapter is to enable you to perform small calculations on your own.

Let's talk a few minutes about the various states of a cell. As you already know, all the cells of our worksheet are empty when POWER PLAN is started. By empty we mean that they do not contain any information. If a cell is not "EMPTY" then it may contain either TEXT or VALUE.

First of all, a cell may contain TEXT. TEXT is any string of alphanumeric characters.

Examples of such character strings are "Hello" or "POWER PLAN" or "SALES 1984". One characteristic of TEXT, is that these cells may not be used for calculations. This means, for instance, that two such cells may not be multiplied together or divided by each other, since this would give an absurd result. ("William"/"Hubert" = ...?).

Although Text cells may not be used for calculations, they have a very important and indispensable function. They are used to identify or label the contents of adjacent cells.

For example, if our retailer wanted to look at his calculation after a six week break. Would he still know which product it referred to and would he really know what the cost price and the selling price were?

You can see from this example that it is always advisable to label parts of a worksheet with TEXT information.

In the case of our retailer it would be sufficient if he identified the product and the cells which represent the cost price and the selling price.

1.6.1. TEXT INPUT

Now you will learn how TEXT is entered. First, move the screen cursor to cell B2 which we want to use for a text entry.

This text should say "Total" - because it will indicate that the contents of the adjoining cell A2 is a total.

If you enter the word "Total" POWER PLAN would interpret it as a VALUE and not as a TEXT. This would result in an error message when the "RETURN" key was pressed.

The error message will ask you to press a key. After you have done this, POWER PLAN goes into the "EDIT" mode, which enables you to correct the wrong input. You can exit from the EDIT mode by pressing the "RUN/STOP" key, do so now.

To enter TEXT, and not a VALUE, into a cell you must press
the "SPACE BAR" before entering your TEXT.

If you now press the "SPACE BAR" you will see the EMPTY
change to TEXT.   This indicates that POWER PLAN is ready to
accept TEXT from the keyboard.

Now· type in the TEXT "Total" (without the quotation marks)
and then press the "RETURN" key.

1.6.2. VALUE INPUT

A cell may also contain a VALUE. By VALUE, POWER PLAN means
a numerical value or a formula.

1.6.2.1 NUMERICAL VALUE

A numerical value is nothing more than a number (e.g.
37.64). Another peculiarity is "exponential notation", which
you·will frequently meet. This notation is used to simplify
very long numbers. In exponential notation the number
1000000 is written 1E06. An "E" is a characteristic of this
notation, and it is followed by a number consisting of two
digits. The exponent may range between -39 and +39. It
indicates by how many places the decimal point has to be
displaced to the left or right of the number preceding the
"E". Notice how 1E+06 becomes 1000000. E+06 tells us that
the decimal point must be moved six places to the right.
First, it is advisable to rewrite the number 1. Instead of
1, we then write 1.000000

The decimal point now moves six places to the right.

                    1st move 10.00000
                    2nd move 100.0000
                    3rd move 1000.000
                    4th move 10000.00
                    5th move 100000.0
                    6th move 1000000.

                      1000000=1E+06

1.6.2.2 FORMULA VALUE

A formula is the basis of any calculation, since it enables various cells to be linked together. To understand this point, you must be clear as to what a formula is.

Any formula is based on the combining of different numbers by mathematical operators. (Mathematical operators are for instance "+", "-", "*" and "/").

For example, two simple formulas are "5+3" or "16*4". These formulas become more complex if variables are included. Variables are used in formula that require values that change.

For example a formula which includes a variable is, the term 5+a, where a is the variable. By using this variable, the result of this term is dependent on a. If a = 1, the result is 6. For a = 2, it is 7, etc.

How does this relate to POWER PLAN? To explain this, first we move the screen cursor to cell A2 and enter the VALUE (formula) 5+a1 in this cell. To do this it is imperative that the VALUE input mode is operative.

Here is a step-by-step description of entering this VALUE into cell A2. If, as in this case, you wish to type in a VALUE, this is particularly easy. While keying in 5, notice the changes in the first lines of the screen.

Instead of the work "EMPTY" appearing in the first line, the word "VALUE" now appears, which indicates that you have just entered a VALUE.

In the second line of the screen appears the "5", followed by a small, flashing box; the INPUT CURSOR. The input cursor and the arrow at the end of the line tells you that POWER PLAN is ready to accept an input.

As you have already learned, the second line of the screen has changed from a contents line to an input line. The characters entered from the keyboard are displayed on this line.

Now type in a "+" character. The input cursor moves one place to the right indicating the input position of the next character.

If you make a mistake when making an entry, you can easily correct the error. You'll be able to use the "INST/DEL" key to delete the wrong characters. Naturally, characters under the input cursor are deleted at the same time.

Now back to our input. At this point, "5+" is visible on the input line. To complete this formula, we need only to

11

enter the variable. The variable, that is the number which
has to be added to 5, appears in cell A1. The variable is
thus the contents of cell A1. To tell POWER PLAN this, you
only have to add "al" to the "5+" already entered. The input
line should now look like this:

                        5+al

If this is so, press the "RETURN" key to complete the input.
The formula entered is accepted as the contents of cell A2.
If the input line does not appear as described above, first
correct your error by means of the "INST/DEL" key.

On completion of the input, the input line again becomes the
contents line. The arrow and the input cursor disappear to
indicate this.

A word now about coordinate notation:

In contrast to other inputs, in the VALUE input mode it is
very important that coordinate inputs use lower case
letters. The only letter that may be written in upper case
is the letter "E", which stands for "exponent".

In the contents line you can now read the contents of cell
A2, that is the formula just entered. The figure 5 is
displayed in cell A2 itself. The reason for this is that the
cell to which the formula refers is still blank and its
contents are seen as 0.

If you want to use cell A1 for a VALUE, move the screen
cursor to cell A1. Then key in a "1" and complete the input
by pressing the "RETURN" key.

The contents of cell A2 immediately changed to 6, the sum of
5 + 1. Now change the contents of cell A1 and observe the
resulting change in cell A2.

You can enter both negative numbers and fractions in cell
A1.

1.7. COLUMN WIDTH

The width of a column determines the format of a cell as it
appears on the screen and printer. You may specify the
width of a column. For example, a column width of 10 means
that all cells in this column are exactly 10 characters wide
on the screen.

The column width may vary from a minimum of 5 to a maximum
of 18 characters.

This limitation has far-reaching consequences which affect
the TEXT and VALUE cells differently.

We shall now look at the effects on the TEXT cells. We
shall deal with the effects on the VALUE cells in a later
chapter.

Press the "f7" key to get into the main menu, then the "n"
key to select the NEW instruction, and lastly the "y" key to
confirm this choice.

These inputs clear the worksheet and set the screen cursor
to cell A1. The width of all columns of the worksheet is now
8 characters.

Enter the 18 character-long text "POWER PLAN is fun!"
(without the quotation marks) into cell A1. (If unsure about
entering TEXT cells, read the corresponding sections in the
previous chapter again).

Now compare the contents of cell A1 with what you can see in
the contents line, and you can see there is a difference.
From the contents line you can see that POWER PLAN has
indeed noted all the 18 characters entered, but only the
first 8 of these are shown in cell A1. It does this because
column width tells it that column A may take up only 8
characters on the screen.

If you increase the width of column A to 18 characters, then
the complete text "POWER PLAN is fun" would be displayed in
cell A1.

POWER PLAN remembers all the characters of the text which is
entered, but only shows the number of characters (i.e.
exactly the amount of the column width), as determined by
the column width.

In view of this, the function of the white bar, which
appears on the screen when a TEXT cell is being entered, is
easy to understand. Taking the column width into account,
the white bar specifies the length of that part of the
entered text which you can seen in the cell after making the
input.

In the case of column A, the bar appears in the input line
at the beginning of the 9th character, this indicate that
all characters entered up to this point are displayed in the
cell.

If you now move the screen cursor to cell D1 and then to
cell E1, you will discover that it is wider in column D than
in column E. How do you explain that if all columns should
have the same width ?

We'll investigate this question with the aid of the actual
screen layout.

After POWER PLAN has displayed columns A to D on the screen,
there is still room for 5 characters in the line. Since the
following column E has a column width of 8 characters, the
remaining space had to remain empty.

Instead of leaving this space unused, POWER PLAN shortens
the width of column E to 5 characters and displays them on
the screen.   POWER PLAN only shortens the width of a column
if the remaining free space is more than 4 characters. This
reduction is only maintained until the column disappears
from the edge of the screen.

Move the screen cursor to the right into column F, and note
that column E returns from the edge of the screen and is
again displayed with its full width.

<div align="center">Important!</div>

The columns are of course displayed with their full width
when the worksheet is printed out on a printer.

1.8. THE FIRST WORKSHEET

In the previous chapter you have been given the necessary instructions to set up a worksheet.

This worksheet will be based on the following problem:

A painter and decorator employs three house painters. At the end of each week he adds up the hours which each of his painters has worked. He multiplies the number of hours of each one by his wage, and thus calculates the weekly earnings for each one of them. By adding the individual weekly wages, he obtains his weekly wage costs.

The construction of this worksheet should help you when working out future worksheets of your own. It is also our aim to construct this worksheet by using as many of the POWER PLAN functions as possible.

The first step when setting up a worksheet is the question as to what has to be entered in it. Let us recall the problem.

As it involves the recording of the weekly hours of work for each one of the painters, our worksheet must naturally first include the names of the 3 painters. The worksheet must also contain the hourly rate of each painter, and the days from Monday to Friday. Finally, the worksheet must include the total weekly hours worked by each, and the resulting weekly wage.

The next question is how the above-mentioned data can be built into the worksheet. In this case it is best to allocate a column of the worksheet for each entry. Here the first column should contain the name, the second column the hourly wage rate and the next columns the days of the week.

We have already agreed to type in the name of the painter in the first column, that is column A, of the worksheet. But that does not mean that we should type it in the first line. It is far more sensible to leave the first line of the worksheet free for headings or comments to be inserted later.

Press the "CLR/HOME" key twice to set the screen cursor in cell A1. Now press the "CURSOR DOWN" key three times, which causes the screen cursor to "move" to cell A4.

The TEXT "Names" should be entered in this cell. To do this, first press the "SPACE BAR". The TEXT "Names" can then be entered. The quotation marks must be omitted as with every other TEXT input. To complete the input, press the "RETURN" key.

Move the screen cursor to cell B4 by means of the "CURSOR
RIGHT" key. Like with cell A4, type in the TEXT "Hourly
wage" into the cell. After you have filled cells A4 and B4
with text, try using the same method to fill cells C4 to G4
with the names of the days of the week from Monday to
Friday.

At the moment the screen cursor is in cell B4, but it is set
in cell C4 by operating the "CURSOR RIGHT" key. Now press
the "SPACE BAR" to tell POWER PLAN that you wish to type in
a TEXT. After that, type in the TEXT "Monday". Your input is
completed by pressing the "RETURN" key.

You should now be in a position to type in the remaining
days of the week into cells D4 to G4.   Following this, the
screen cursor should be at cell G4.

1.8.1 COLUMN WIDTH

At this point the width of all columns is 8 characters. This
width, however, is not very practical for our worksheet,
since several days of the week are longer than 8 letters. A
width of 12 characters would be adequate because none of the
present texts is longer than 12 letters.

We can change the width of all the columns with the aid of
the GLOBAL instruction. This is the second instruction in
the menu line.

How   can this instruction be called up?   Since this
instruction is part of the "main menu", we must first get
into this main menu. So press the "f7" key.   The "menu
cursor" appears in the main menu. It helps you select the
required menu. You can move this menu cursor within the main
menu by using the "CURSOR LEFT", "CURSOR RIGHT" and the
"SPACE BAR". Try this out and then set the menu cursor to
the "GLOBAL" instruction.

Select this menu by pressing the "RETURN" key. A new menu,
the GLOBAL menu, appears in the menu zone.   As with the
main menu, the cursor can be moved with the aid of the
cursor keys.

We select from the menu "cOlumns" with the menu cursor and
press the "RETURN" key. The menu zone changes again.

You will see the flashing cursor behind the text "global
column width for window:". Now type in a "1" and then press
the "RETURN" key. The input cursor appears again. You can
now type in the required width (12 characters). The input is
completed by pressing the "RETURN" key. The screen changes
immediately as a result of the columns being widened.

A width of 12 characters is certainly sufficient for the
columns in which the hours worked per weekday are entered,
but is it adequate for the column in which the names of the
painters are entered? Obviously not, since these are family
names, some of which may be longer than 12 letters.

18 characters, on the other hand, would be sufficient. For
this reason we want to increase the width of column A to 18
characters. Don't worry, the width of columns B to F can
remain the same.

Here POWER PLAN shows one of its great strengths. It can
allocate different widths to different columns, so that it
is certainly possible, as in our example, for column A to be
18 characters wide and the remaining columns to be only 12
characters wide.

We cannot use the GLOBAL instruction to vary the width of
column A, since we change the width of all columns with this
command. In this case the FORMAT instruction comes to our
aid.   Before you use it, move the screen cursor into any
cell of column A.

Since the FORMAT instruction is one of the main menu options
press the "f7" key first. As the menu cursor is located at
this instruction, you can press the "RETURN" immediately.

The same options as in the GLOBAL menu in fact now appear in
the menu zone, but there is an important difference between
these similarly-named options. The GLOBAL menu options refer
to all cells of the worksheet or to all columns. The FORMAT
menu options only affect a certain cell or column.

This is why we asked you move the screen cursor into column
A before selecting the main menu, since the width of column
A will be varied by means of the FORMAT menus.

Select the "cOlumns" instruction again.   In the menu zone
appears the text:

                Column width for A in window 1: 12

Again, an input cursor follows the text and stops at the
number "12". This number represents the actual width of
column A.

Enter the number 18 and then press the "RETURN" key. The
width of column A automatically changes to 18 characters.

Now is the time to type in the names of the 3 painters.
First move the screen cursor to cell A5 and type in the name
"Meyers". Enter the names "Painton" and "Brushman" in the
next two cells (A6, A7).

1.8.2 FORMULA INPUT

We now want to type in the hourly rates of the three men.
Move the screen cursor to cell B5. Enter the VALUE "15" in
this cell. This represents the hourly rate of painter
Meyers.

In cell B6 is entered the hourly rate for painter Painton.
Since he works harder than Meyers, he should earn $3 more
per hour. The formula for calculating his hourly rate is
thus 3+ (hourly rate Meyers). Of course POWER PLAN does not
know in which cell the hourly rate for painter Meyers is
located, but you do!

Since his rate is in cell B5, the formula must read 3+b5.

Before you type in the formula, move the screen cursor to
cell B6. Then type in "3+". You could still add "b5" to
complete the formula, but that is quite unnecessary.
Instead, operate the "CURSOR UP" key once.

You will see that the screen cursor is now at cell B5. The
coordinate "b5" has also been added to the end of the
formula just entered.

Since this is the desired formula, you can now complete the
input by pressing the "RETURN" key.

This returns the cursor to its original cell, cell B6, and
the formula is filed in this cell.

Let us repeat this very convenient POWER PLAN function once
more. When entering a formula, it is possible to move the
screen cursor over the worksheet with the help of the cursor
key. The new screen cursor coordinate is added to the end of
the formula at the same time. When a "non cursor key" is
operated, the screen cursor then returns to its source cell.
Now the hourly rate of painter Brushman should be entered in
cell B7. Since he is rather "idle", he receives $0.5 less
than Meyers. Try to generate the formula yourself and type
in it in cell B7. (It reads -.5+b5).

After you have entered all 3 formulas, you should change the
contents of cell B5 (hourly rate of Mr. Meyers) several
times and note the corresponding changes in cells B6 and B7.

Now move the screen cursor to cell H4. Enter in this cell
the TEXT "Total hours".

1.8.3 SUM FUNCTION

Using the "CURSOR DOWN" key, move the screen cursor into cell H5. The number of hours that Meyers has worked on the five working days should be totaled here. These hours appear in cells C5 to G5. The formula for adding up these cells must therefore read c5+d5+e5+f5+g5.

POWER PLAN also has a function which saves you a lot of work: the SUM function. The SUM function is one of the many block orientated POWER PLAN functions.

By "block" POWER PLAN means a group of cells. Block really means that this group of cells extends over several columns and rows. In this case it is very important that there is the same number of rows in each column of the block, and there must be the same number of columns in each line of the block. In short, a block is always a rectangle made of cells. The width and the length of a rectangle is specified exactly.

Since the width or the length of a rectangle may be 1, a block can also consist of only one column or one row. If both width and length are equal to 1, the block consists of only one cell.

In the case of the SUM function, the value of one block is added. The syntax of the SUM function is:

sum (top left corner of block: bottom right corner of block)

So sum(a1:b2) means, for example, that the contents of cells a1, a2, b1 and b2 should be added.

Let's apply this block scheme to our example. The top left corner of our block is cell C5. The bottom right corner is cell G5. This is an example showing that a block can consist of only one row. Now back to our input.

Enter the VALUE sum(.

Now move the screen cursor to the top left corner of the block, cell C5. Then type in a colon. This causes the screen cursor to return to cell H5. Now move the screen cursor to cell G5, which represents the bottom right corner of the block. Press the ")" key - followed by the "RETURN" key.

The formula: sum(c5:g5) now appears in cell H5.

In the worksheet you can see the number 0 in cell H5. The 0 appears because we have still not entered any hours of work, which we want to do now. But before that, another word about block orientated functions. These functions all refer to a block of values. If the block contains empty cells or TEXT cells, these are not taken into account, but ignored.

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Up to now we have only calculated the weekly hours of work
of painter Meyers, but we also want to calculate those of
his two colleagues.

The formulas are sum(c6:g6) or sum(c7:g7).

If you compare the two formulae with those already entered,
you will discover that only the row coordinates (row
ordinates) differ.

1.8.4 REPLICATE

We could now continue so that we type in the above formulas
in cells H6 or H7, but POWER PLAN provides a very useful
function for this, which makes the work much easier for you.

The instruction involved here is located in the EDIT menu.
It is the REPLICATE function.

Replication is basically intelligent copying. Copying means
nothing more than reproducing the contents of one cell in
another cell.

If we were to copy the formula sum(c5:g5) into cells H6 and
H7, the same formula would appear in cells H6 and H7 as in
the source cell H5. This would result, however, in the
weekly hours of work of painter Painton and his colleague
Brushman being the same as those of painter Meyers.

We wish to replicate the formula from H5 in cells H6 and H7,
and then during replication, change the coordinates in the
formula to be replicated.

We will demonstrate the change in coordinates using the
REPLICATE instruction, using the first coordinate in the
formula to be replicated. It is coordinate C5.

If a formula is being replicated, then POWER PLAN first
displays the spacing between the columns in which the source
cell is found (the cell containing the formula), and the
column information in the coordinate in the formula. In our
case it decides that there are 5 columns between column H
(source cell) and column C (formula). POWER PLAN makes the
same decisions about the rows. In this case it specifies
that both the source cell and the coordinate in the formula
are located in row 5. The difference is thus 0 rows.

This relationship between the coordinates must also be
maintained in the replicated formula.   The first cell in
which the formula is to be replicated is cell H6. Since the
line difference is 0, the coordinate in the formula must
also lie in line 6.   Since the column difference is 5, the
coordinate in the formula must appear in column C. So
instead of C5, the replicated coordinate is now C6. POWER

PLAN applies the same principles to the second coordinate as
we have used for the first coordinate in our formula. The
coordinate is then G6 instead of G5. But enough of
theoretical considerations.

We will try out the REPLICATE instruction.

First make sure that the screen cursor is at cell H5.
Select the main menu by pressing the "f7" key. Then select
the EDIT menu and the REPLICATE instruction (don't forget to
press the "RETURN" key after you have set the menu cursor to
"Replicate").

You should now see the following text in the menu zone:

               Source range from H5   to
               Target range from   to

Perhaps you now understand why we asked you to move the
screen cursor to cell H5 before selecting the REPLICATE
instruction.

When entering a coordinate during REPLICATE, as with other
options, POWER PLAN automatically writes the coordinate of
the screen cursor in the input cell.

First of all let us analyze the text shown in the menu zone.
You can see that two coordinates must be entered each time
for both the source and the target range. This is based on
the fact that you can replicate not only a cell, but also a
row and a column.

Of course it is not possible to replicate several columns or
rows simultaneously.

At the moment the input cursor is directly behind the
coordinate H5. Since this coordinate represents the
coordinate of the source cell, you may press the "RETURN"
key.

The input cursor moves to the next input cell which follows
the text "to". Again, the coordinate of the screen cursor is
automatically written into the input cell.

Since we wish to replicate only one cell, the "from"
coordinate is identical to the "to" coordinate, so you can
again press the "RETURN" key.

The top left coordinate of the destination area must now be
entered. Since it does not coincide with the coordinate
already displayed in the input cell, we want to show you in
this example the coordinate input facilities.

The aim here is to enter in coordinate H6 in the input cell.
There are various ways of doing this. First, you could

delete the input cell by means of the "INST/DEL" or
"CLR/HOME" key. Then it would be easy for you to type in the
coordinate by means of the "h" key and the "6" key,
completing your input by means of the "RETURN" key.

But there is also a simpler way.   To type in a coordinate
you can simply use the cursor keys.   If you press the
"CURSOR DOWN" key, the screen cursor is automatically moved
to cell H6. The coordinate of the "new" cell is displayed in
the input cell at the same time.

As coordinate H6 represents the top left corner of the
destination area, you can simply press "RETURN".

This moves the screen cursor back to the source cell again.
POWER PLAN is now ready to accept the coordinate of the
bottom right corner of the destination area.

Type in coordinate H7.   After completing the input by means
of the "RETURN" key, POWER PLAN asks you to make two more
inputs. Although these shall only be explained in the system
manual, we must respond here.   This is done by pressing the
"RETURN" key twice.

POWER PLAN now replicates the formula from cell H5 in cell
H6 and H7, respectively.

This process is completed so rapidly that it seems as if the
main menu momentarily appears again in the menu zone.

Should you have made a mistake when entering a coordinate,
and have already pressed the "RETURN" key, you can return to
the previous input cell by operating the "SHIFT" and
"RETURN" keys together; a further demonstration of POWER
PLAN's "user-friendliness".

The number of weekly hours for each worker is 0 since up to
now hours has been entered.   Now type in a certain number of
hours in several cells and note how this effects the input
for the weekly hours worked.

However, we want to know not only the weekly hours worked,
but also the resulting weekly wages of the 3 painters.   So
type in in cell I4 the TEXT "Total wages".   The total wages
which have to be entered in the 3 following cells is the
product of the hourly rate and the weekly hours worked.

It is necessary to first type in a formula for calculating
the total wages of painter Meyers.   Here we come up against
a small problem since we:

A) no longer know in which cell his rate is entered and

B) we cannot look at the input of this cell as we are not in
the VALUE input mode.

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1.8.5 SHIFT-RETURN

There are two ways of solving this problem. The first is to
find the cell in which the hourly rate is recorded, in order
to type in its coordinate (it is cell B5). We could reach
the cell, which contains his weekly hours of work, by means
of the cursor key since we are now in the VALUE input mode.

The second possibility is to type in a "+". This has the
advantage in that a "+" character initiates the VALUE input
mode, but has no influence on the mathematical result of the
formula. Type in the following formula:

                        +h5*b5

Set   the two coordinates by displaying them   at   the
appropriate cell.

Of course we have now made a small error. If you were now to
operate the "RETURN" key, the formula would be stored in the
cell in which the cursor is located. This is the wrong cell
since the formula should be stored in cell I5, not cell I4.
With other programs you would have had to leave the input
mode, move the screen cursor to cell I5 and type in the
formula again. Not so with POWER PLAN.

Operate the "SHIFT" and the "RETURN" keys together.   This
gives you the facility to position the screen cursor with
the cursor keys to the cell in which you wish to store the
formula. Now move the screen cursor to cell I5. Now simply
press the "RETURN" key and the formula is stored in cell I5
instead of I4.

The formula from cell I5 should now be replicated in cells
I6 and I7. Since the procedure is similar to that already
used, you should be able to carry out the replication
yourself.

1.8.6 RND FUNCTION

We are now going to type in the daily hours of the
individual painters in the table.

First move the screen cursor into cell C5. Had we wanted to
type in the hours of work of each of the workers for each
day of the week, we would have had to type in 15 values. We
can spare ourselves the work in this example by letting
POWER PLAN make up the hours worked. They will be random
numbers.

In order to generate random numbers, we will use a function
in POWER PLAN which many of you may know from BASIC.

Here are a few comments for those of you who do not know
this function.   The RND function generates a random number
between 1 and 0.

The RND instruction (like all other options, it is written
in small letters) must be followed by a number between 0 and
1 in brackets.

Since the hours worked are not between 0 and 1, but should
be between 4 and 8, the RND function cannot be the only
component of the formula for calculating the hours of work.

The formula is : 4+int(rnd(1)*4)

A second function, taken from the Basic instruction set
is used in this formula. It is the INT function. It causes
the expression in brackets which follows it to be rounded to
a whole number. Thus 3.14, or 3.9999, becomes the whole
number 3.

Enter the above formula in cell C5.   We also want to
replicate this in all other cells in which the hours of work
are specified. This is not done this time via the REPLICATE
instruction, but with the COPY instruction since this
formula does not contain any variable coordinates.

The COPY instruction can be found in the EDIT menu, which
you should now select. After you have selected the COPY
instruction, you will see that its input mask does not
differ from that of the REPLICATE instruction. It is also
used in exactly the same way.

Whether you use the cursor keys or not, specify cell C5
twice as the source coordinates. The destination coordinates
are cell C5 and G7.

As you see, it is possible to select a whole block of cells
as destination coordinates, which is not possible when
entering source coordinates.

After completion of the coordinate input, the question is
asked whether occupied cells should be deleted. In this case
you must answer this question by pressing the "y" key, since
you may still have filled a few cells with VALUEs and these
should be overwritten by the new formula.

To the question, "Copy format only?", you can reply with
"n".

The formula is then copied in cells C5 to G7. As a result,
the contents of the cells which specify the total number of
hours or the total wages, are now filled.

1.8.7 CENTER FUNCTION

Move the screen cursor to cell B4. In this cell is the TEXT
"Hourly wage" and in the cell under this, the hourly rate of
painter Meyers. The fact that the number which represents
the hourly rate is much nearer to the word "Monday" than the
word "Hourly wage", is slightly confusing. But it is
possible to tell POWER PLAN that the number should be
located directly under the word "hourly rate".

With the exception of the cells in column A, we want to
display all other cells so that their contents are centered
exactly in the respective cell. To do this, select the
FORMAT instruction. Three options in this menu determine how
the contents of a cell are positioned in the cell itself.

These options are the LEFT, RIGHT and CENTER options.   The
LEFT and the RIGHT options cause the contents of a cell to
be right or left justified. CENTER means that the contents
are centered according to the column width. If the column
width alters, the contents remain centered. It should be
noted that in the case of TEXTs preceded by spaces, these
are included in the contents of the TEXT. It can therefore
happen that a TEXT appears to be incorrectly centered.

You have already seen one way of selecting an instruction in
a menu. This involves moving the menu cursor by means of the
cursor keys to the required instruction and then pressing
the "RETURN" key.

There is, however, a second, simpler method which also saves
even more time.   If you look at the options in the FORMAT
menu, you will see that there is a capital letter written in
each instruction. Each instruction can be selected by
entering this letter. You can type in the letters themselves
without using the "SHIFT" key – that is lower case letters.
This way of selecting options spares you from the time-
consuming movements with the menu cursor, and you do not
have to operate the "RETURN" key.

To select the CENTER instruction, operate the "e" key.

This causes the contents of cell B4 to be centered on the
screen.   However, we wanted to center not only cell B4, but
also a few other cells of our worksheet. To achieve this
with other spreadsheet programs you would have to center
each cell individually. Not so with POWER PLAN !

Simply select the COPY instruction in the EDIT menu and
specify cell B4 twice as the source coordinate. Cells B4 and
H7 represent the destination coordinates. After you have
entered the coordinates, POWER PLAN asks whether cells
already occupied should be deleted. We answer this by
pressing the "n" key.

POWER   PLAN   now asks   a question   which is   of   great
significance. It is:

                  copy format only ?   (y/n)

We must certainly answer with a yes, since only the format
and not the contents of cell B4 have to be copied.   So type
in "y".

As you see, our worksheet is looking much better !

```
Names                    Hourly wage Monday
Meyers                        15
Painton                       18        6
Brushman                    14.5        7
```

```
Format Global Edit dIsK Printer Quit
 New Blank gRafics Options Status ?
```

```
Friday     Total hours Total wages
  5            33           495
  7            33         478.5
```

```
Format Global Edit dIsK Printer Quit
 New Blank gRafics Options Status ?
```

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1.9 THE HELP TEXT

In the previous chapter you have been introduced to a few of
the POWER PLAN options which are available to you. During
the course of the manual you will meet so many options so
that it will become almost impossible for you to remember
the meaning of every individual instruction.

For this reason, this manual has a "System Manual", in which
the meaning of each one of the options is described in great
detail. Of course, if you want only brief information on an
instruction, it is not necessary to refer directly to the
system manual.

Your distribution diskette contains approximately 100 "HELP"
texts. The majority of these texts involve the meaning of
individual POWER PLAN options, but items such as "Commands"
or "General" are also dealt with.

If you want to select the HELP text for a   certain
instruction, you are only required to move the menu cursor
to the required instruction inside the respective menu.

Then press the "?" key. This causes the message "please
insert system disk" to appear in the menu zone, whereupon
the HELP text is loaded.   If the above message does not
appear,   then   there is no HELP text for the chosen
instruction.

After the HELP text has been loaded, it will be displayed
inside a frame on the screen. POWER PLAN is now in the HELP
mode.

This menu contains the following options.

<p style="text-align:center">Back Next-page Last-page Keyboard
Commands General</p>

Below is a description of the most important options
contained in this menu.

Back

When this is selected, POWER PLAN returns to the input mode.

Next-page

When this instruction is selected, the next page of the HELP
text is loaded and displayed on the screen.

Last-page

After this instruction has been selected, the text prior to
the last HELP text shown on the screen is loaded and
displayed on the screen.

1.10. DISK INSTRUCTIONS

Save your worksheet at regular intervals (about every half-hour) on the floppy disk. That way you can prevent a power failure from ruining hours of work.

Even if this seems like a waste of time, you will later wish you had followed this advice after you have lost your first worksheet. Since we have spent a long time creating our worksheet, we should now store it.

Before we store our worksheet, we should first prepare a data disk to store POWER PLAN worksheets. Select the DISK instruction from the main menu. The disk menu options then appear in the menu zone:

<p align="center">Save Load Directory sYstem commands</p>

Select "system commands" with the cursor keys or a "y". The options Format, Scratch, Rename and Validate are available to you. Select the first of these four, the FORMAT instruction. You are now asked to type in the name of the disk to be formatted. After you have entered a name, before pressing the "RETURN" key, you should ensure that the disk drive is switched on and the disk to be formatted is properly inserted into the drive. If this is so, then press the "RETURN" key.

If you change your mind and do not wish your disk to be formatted, you can return to the input mode by pressing the "RUN/STOP" or the "f7" key. This is only possible before you complete your input with the "RETURN" key.

After your disk is formatted, it will take about 2 minutes, POWER PLAN returns to the input mode.

Now select the SAVE instruction, which is also in the DISK menu.

POWER PLAN now asks you to type in a name under which it should file the worksheet on the disk. Enter "painter" (without the quotation marks). After POWER PLAN has stored the worksheet on the disk, it returns to the input mode.

Store the same worksheet on the disk again under any other name, such as "test".

At this point we would like to explain a few other things concerning disk management with POWER PLAN.

Let's look at the disk directory. The associated instruction is also in the DISK menu and is named after its function:

After this instruction is selected, POWER PLAN asks you to insert the disk, whose directory you wish to see, into the

disk drive and then press the "SPACE BAR". After you have
done this , POWER PLAN loads the directory and displays it
on the screen.

Two things have to said about the directory. First of all
it is very important to know that only the stored
worksheets, no other programs are displayed. Up to 57
worksheets may be listed in the directory. But as many
worksheets as this can never be stored on one disk, because
of the limited disk capacity.

We had just asked you to store the worksheet under the name
"painter" and under the name "test". This second stored
worksheet should now be deleted from the disk. The
instruction is in the DISK menu under SYSTEM INSTRUCTIONS
and is called SCRATCH.

When you have selected this instruction, POWER PLAN asks you
to type in the name of the worksheet to be deleted. Let us
assume that you know which program you want to delete, but
don't know exactly how its name is written.

Instead of entering a name, press the "RETURN" key once.
You are immediately asked to insert a disk in the disk drive
and then to press the "SPACE BAR". When you have complied
with these requests, the disk directory is loaded and
displayed on the screen.

The screen layout differs in two ways from the normal
directory display. In the top line of the screen appears
"Select a worksheet" and not "please press space key".
Furthermore, you can see the word "SCRATCH" in the top right
corner of the screen, instead of the word "DIRECTORY".
Thirdly, the first program name in the directory is
displayed reversed. The usual procedure now would be to
remember the name (its notation) of the worksheet to be
deleted in order to then select the SCRATCH instruction a
second time.

With POWER PLAN, however, this is much simpler.

Using the cursor key, you can now move the cursor to each
program in the directory in turn.

After setting the cursor at the name of the program to be
deleted, press the "RETURN" key and the program will be
automatically deleted from the disk. In this way, delete the
second worksheet stored on the disk.

Incidentally, it is also possible to return to the input
mode by pressing the "RUN/STOP" or the "f7" key. After the
worksheet on the disk has been deleted, we now want to
completely delete our worksheet in the memory of our
computer so we may then load it again from the disk.

1.11. FINISHING OUR WORKSHEET

Select the NEW instruction in the main menu. For safety, POWER PLAN asks if you really wish to delete your worksheet. Answer this question by pressing the "y" key.

As you see, the worksheet is again completely blank. The width of all columns has been set to the initial value 8.

Now load the worksheet which was stored under the name "painter". To do this, use the LOAD instruction contained in the DISK menu. Again, you are asked to type in the name of the program to be loaded. If you wish you can select the program from the directory again by pressing the "RETURN" key.

After the worksheet has been loaded into the memory of your C-64, POWER PLAN is again in the input mode. As you see, your worksheet is in exactly the same condition as it was when it was stored.

Perhaps you are now asking how the clarity of the worksheet can be improved. One way this may be done is by placing an explanatory text at the head of the worksheet. Another method is to divide the worksheet by vertical and horizontal lines, as you would certainly do in the case of a handwritten calculation.

The worksheet is easier to read if each column is not separated from the other. Such a subdivision should always mark the start or the end of a logical block of columns or lines.

In our special case, a division should be made between column A and column B since they do not form a coherent unit.

How can such a dividing line be "built into" the worksheet ? In the case of a vertical dividing line, column A, which is an original column all of whose cells are occupied by a permanent TEXT entry. With the vertical dividing line, this TEXT entry is a vertical line which is entered by operating the "SHIFT" key and the "-" key together.

If we wish to draw a separating line between column A and column B of our worksheet, this is something of a problem because there is no column between these columns which could accept the TEXT entry.

POWER PLAN, however, makes it possible to shift the contents of the cells following column A by one column to the right, so that column B is blank again. A cell, which was in column B before the shift, will appear in column C after the shift.

The instruction which enables us to insert a column is called INSERT and can be found in the EDIT menu. After this instruction has been selected, POWER PLAN asks you if a column or a row is to be inserted. Enter "c" for column.

The next question asks in which column you wish to insert a column. The simplest method in this case is to move the screen cursor into any cell of column B. This will cause Column B and the row in which the screen cursor is resting to be entered in the input cell. Your entry can again be completed by pressing the "RETURN" key.

The next question which POWER PLAN asks you, you have a choice between "absolute" and "relative". The choice of instruction which you make at this point must be well thought out, as it is of great significance.

We would like to explain what this question is about, with an example. In cell B6 the formula b5+3. This is used to calculate the hourly rate of painter Brushman, which should be $3 higher than that of his colleague Meyers. Were POWER PLAN to shift the cells absolutely, this would mean that after shifting cell B6, the formula in this cell would still read b5+3.

This formula is no longer correct, since not only the formula but also the cell, to which the formula refers, has moved one column to the right. To be correct the formula must now read c5+3, instead of b5+3. To avoid this "shift error", "relative" should be entered instead of "absolute". This instruction operates so that the coordinates, which relate to shifted cells, are matched to the new position of the corresponding reference cell.

Now select the RELATIVE instruction.

The final question determines whether the contents of the cells plus their width, i.e. the width of the column in which the relevant cell is located, should be shifted. This is very important if columns to be shifted have differing widths.

In our case, all columns following column A have a width of 12. We can answer the question by pressing the "n" key. After a brief interval we see that column B is now blank.

At the moment, the width of column B is still 12 characters, which is far too wide for a separating column. Reduce the width of column B to the minimum, 5 characters. If you are unable to do this, read through the first pages of the chapter entitled "The first worksheet" again.

Move the screen cursor to cell B4 and then press the "SPACE BAR" to enter the TEXT input mode. To type in a vertical line, press the "SHIFT" key and the "-" at the same time.

The input can now be completed by pressing the "RETURN" key.
The line you have entered is now visible in cell B4; it is
placed not at the center as required, but at the left hand
edge of the cell.

To change this, select the FORMAT and then the CENTER
instruction. The line is now at the center of the column.

Now copy the contents of this cell into the three cells
below, i.e. fields B5 to B7. Enter the coordinate B4 twice
as the source cell. Cells B5 and B7 then form the
destination cell.

If you have not fully understood the above explanation, read
through it once again.

Finally, we have a task for you which is not entirely
simple. This is to use the operations just carried out on
column D and column J. In plain English, this means that
you should first insert a column into column D, then reduce
the column width to 5 characters, and lastly, type in a
vertical line in this column. Then follow the same procedure
with column J. Our worksheet is now subdivided by three
vertical dividing lines.

We want to make our last dividing line a horizontal one,
which will separate the headings in the individual columns
from the data below.

We enter this dividing line in row 5. But before this, row 5
must be made blank by inserting a row. Up to now we have
used the INSERT instruction only for inserting columns, but
now want to use it for inserting rows.

Select the INSERT instruction for a fourth time. When asked
whether you wish to insert a column or a row, move the menu
cursor to the word "row" and then press the "RETURN" key.
Move the screen cursor into line 5 and press the "RETURN"
key.

To the question in which POWER PLAN lets you choose between
"absolute" and "relative", reply by pressing the "r" key.

After row 5 has been cleared, move the screen cursor into
cell A5. This cell should be occupied with a TEXT entry
comprising a number of horizontal dashes.

First open the TEXT input mode by pressing the "SPACE" key.
Now type in the horizontal character 18 times by pressing
the "SHIFT" and "*" keys simultaneously. You do not need to
press both keys 18 times in succession. You need only press
down and hold them until you have entered 18 characters.

To obtain a continuous horizontal line, this dash should be
copied into all columns between column A and column L. Try

to manage this yourself; you are already acquainted with the
COPY instruction.

Apart from one small flaw, the subdivision of our worksheet
is now complete. If you examine cells B4 to B6, you will
understand what we mean by "flaw".

By inserting a line and then filling this line with
horizontal dashes we have indeed obtained a continuous
horizontal dividing line, but not a continuous vertical
dividing line.

To complete both dividing lines, a cross, i.e. a vertical
and a horizontal stroke must be inserted at the intersection
of the two lines. This cross is included in the POWER PLAN
character set and may be entered by operating the "SHIFT"
and the "↑" (up-arrow) keys together. Our aim is therefore
to insert a cross in the horizontal dash in cell B5.

Move the screen cursor to cell B5.   Then operate the "f1"
key. This puts us into the "EDIT" mode, which is also
indicated by the word "EDIT" at the end of the first line on
the screen.

This mode enables you to move the input cursor in the input
line and to replace characters at any point. Column B, in
which the TEXT to be edited is located, is five characters
wide.   The third character from the left thus represents the
center of cell B5 on the screen. So move the input cursor to
this character by means of the "CURSOR RIGHT" key. Having
reached this point, type in a cross by pressing the "SHIFT"
key and the "↑" (up-arrow) key. The editing is now done and
can be completed by pressing the "RETURN" key.

We must now do the same with cells D5 and J5. There is a
way, however, to avoid this work. Press the "f1" key again
to type in the EDIT mode. Press the "SHIFT" and "RETURN"
keys together. Exactly as with a "normal" input, you can now
specify in which cell you wish to enter the contents of the
input line. Move the screen cursor to cell D5. Then press
the "RETURN" key and the contents of the input line are
immediately filed in this cell. Now transfer the contents of
cell D5 into cell J5 in the same way.

The subdivision of our worksheet is complete and we have a
much clearer picture of our solution!

1.11.1 WORKSHEET TITLE

Finally, we want to give our worksheet a title. This should
read "Weekly accounts 02-05-85". Because of its length, this
text does not fit into one cell and we have to distribute it
over adjacent cells, which would be very involved. POWER
PLAN, however, can relieve you of this work.

To achieve this, first select the OPTIONS instruction in the
main menu. Then, in the OPTIONS menu select the TITLE FIELD
instruction. Now you can type in the cell in which the text
should start. Since our heading should start in cell A1,
move the screen cursor to cell A1 and then press the
"RETURN" key. The menu zone then changes to the input zone.

In this zone you can see 80 small dots. They appear in many
inputs and indicate that you have special facilities for
editing your input. In contrast to the input facilities in
the TEXT or VALUE input modes, in this case you can move the
input cursor within the input zone and replace characters
just as you like. You can also insert or delete characters
with the "INST/DEL" key. You can delete the whole input cell
by pressing the "CLR/HOME" key. If, however, you do not wish
to make an entry, then you can return to the normal input
mode at any time by operating the "RUN/STOP" or the "f7"
key.

Now type in the title "Weekly Accounts 02-05-85" and
complete your input by pressing the "RETURN" key.

Our worksheet is finished, please save the worksheet on your
data disk.

1.12. MORE ABOUT (GLOBAL) FORMATS

You may already have asked yourself why numbers appear at
the right edge of a cell and text at the left? We shall be
answering these and similar questions in this chapter.

But before we go into this question more closely, we want to
reset our worksheet to the initial condition. Select the
NEW instruction in the main menu. When asked if you are
sure, answer by pressing the "y" key.

Now type in the VALUE (in this case the number) 1 in cell
A1. You can see that it appears at the right hand edge of
cell A1. It is displayed right justified. This applies to
not only this VALUE cell, but to all other VALUE cells too.
Why?

Because, due to the NEW instruction, POWER PLAN has defined
the global format for VALUE cells as right justified. The
GLOBAL format always determines how cells are displayed on
the screen after they have been entered. The appearance of
individual cells can of course be changed later by means of
the FORMAT instruction.

Select the GLOBAL instruction in the main menu. The
following options appear in the menu zone:

> Maximum Integer Decimal cEnter Left
> Right Color cOlumns Protect

Three of these options specify how the contents of a cell
will be displayed in the cell itself.

These are the CENTER, LEFT and RIGHT options.

At the moment the RIGHT instruction is activated, i.e. all
VALUE cells are shown right justified. Since we wish to
display our VALUE cells left justified and not right
justified, type in an "l" for left justified.

Now you can decide whether this global format is to apply
only to VALUE cells, only to TEXT cells or to both types of
cells. In this case, select VALUE.

POWER PLAN now returns to the input mode and you will see
that the number 1 is now shown left justified. The fact
that it is not at the left hand edge of the cell, but
displaced by one character to the right, is because its sign
is displayed too. Since this is positive of course, the "+"
sign is not shown in this case.

You will realize from the fact that you were able to decide
whether the format should apply to VALUE or TEXT cells, that
VALUE and TEXT cells have independent global formats. It is
therefore possible for all VALUE cells to be displayed right

justified and all TEXT cells to be displayed left justified.
Incidentally, with the NEW instruction POWER PLAN sets the
global format of TEXT cells as left justified.

In the GLOBAL menu there are still three more important
options for VALUE cells only.

These are the MAXIMUM, INTEGER and DECIMAL options.

They refer to the way in which the mathematical result of a
VALUE is displayed. At the moment, the MAXIMUM instruction
is activated, which means that this mathematical result is
displayed as accurately as possible.

The INTEGER instruction causes the mathematical result of a
cell to be rounded down to a whole number.

Now select the last of the three options, the DECIMAL
instruction in the GLOBAL menu. Within the DECIMAL
instruction, you can chose between DECIMAL PLACES and SET
FORMAT. Select DECIMAL PLACES.

You can now select the number of decimal places. This can be
between 1 and 9. We shall chose 4 places. After you have
entered a "4" and pressed the "RETURN" key, POWER PLAN
returns to the input mode. Select the DECIMAL instruction
again in the GLOBAL menu. This time, within this
instruction, select SET FORMAT instead of DECIMAL PLACES.
This causes the number in cell A1 to be displayed with 4
decimal places.

The DECIMAL instruction is very important since it makes it
possible to display numbers with two decimal places as in
100.00 or dollar format. The number is always rounded to the
desired number of decimal places.

An example:

Let's assume that you want to display a number with two
decimal places. If the number was 3.142, it will be rounded
to 3.14. If it was 3.145, it would be rounded to 3.15.

                            Important

One of the first operations which you should carry out when
setting up a worksheet, is to set the global format. If,
subsequently you have altered the format of various cells,
by means of the FORMAT instruction and then alter the global
format, all cells, including those whose format was defined
by the FORMAT instruction, will be set to the new global
format.

You now know about the most important options in the GLOBAL
menu. Now is the time to mention the effect of the column
width on VALUE cells.

Delete the worksheet with the aid of the NEW instruction.
Then set the global format to DECIMAL with 5 decimal places.

Now type in the VALUE 3 in cell A1. The following can now be
seen in the cell.

<div align="center">3.00000</div>

Now type in the VALUE 33 in cell A2.

But ">>>>>>>" now appears in cell A2 instead of 33.00000.
Why? The answer to this puzzle is quite simple if we
consider how many characters we need to display the number
33 to 5 decimal places.

First, we require 2 characters for the number 33. And
another 5 for the decimal places: this would make 7
characters. Add to this one character for the decimal point
and the sign. So we need 9 characters in order to display
the number 33 to 5 places of decimals. Since column A is
only 8 characters wide, the number 33 cannot be represented
in cell A2. To tell you this, POWER PLAN fills the whole of
cell A2 with ">" characters. If you increased the width of
column A to 10 characters, for example, the number could be
displayed.

Now set the global format for VALUE cells to MAXIMUM. Then
type in the number one billion (one thousand million - a one
and 9 zeros).

This cannot be displayed with the 8 characters available.
Unlike the fixed point format, cell A3 is not filled with
">" characters. Here the number one billion is shown by
means of the well-known exponential notation. 1000000000
thus becomes 1E+09.

In this chapter you have not only learned the significance
of the global format, but also about the different effects
on the VALUE cells of columns which are too narrow.
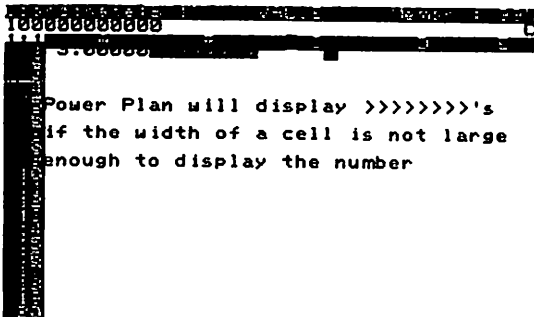
1.13. TEXT CONSTANTS

Another marvelous POWER PLAN feature is the ability to
define "text constants". They can be very useful, for
example, if the name of a product occurs several times in
one worksheet. Instead of writing in the names in each
individual cell, you type in the code for a text constant in
the corresponding cell.

This has the advantage that you save storage space and that
you do not need to alter all entries when changing the
product name. Let's try this out in practice.

In the main menu, select EDIT and then the TEXT instruction
from the edit menu. Answer the question "Text constants:"
by pressing the "i" key.

A box now appears in the center of the screen, which
contains the 12 text constants which are available. You can
see that they are identified by the letters a to l. When you
wish to type in or alter a text constant, you can move the
cursor to the relevant text constant with the aid of the
"CURSOR UP" or "CURSOR DOWN" key.

Now move the cursor to text constant 1 and press the
"RETURN" key. Just below the large box appears a second,
slightly smaller box and the request that you should type in
the text constant.

POWER PLAN shows the text constant 1 in this small box which
you can now edit. Since we have not yet defined text
constant 1, the small box is blank.

To be precise, it it not blank but filled with 17 small dots
which indicate to you that text constant 1 is "blank". If
you recall the previous chapter, you will remember that you
have seen these small dots before: when entering the heading
for our worksheet. The same facilities which you had there
for modifying your input, are available here.

As an example, type in your name and press the "RETURN" key.
The small box now disappears and you can now select a new
text constant.

We return to the input mode by pressing the "f7" key.

We have now defined a text constant, but how do we get it
into a cell?.

To write text constant 1 into cell A1, move the screen
cursor to cell A1. Open the TEXT input mode by pressing the
"SPACE BAR" and then press the "←-" (left-arrow) key.

This arrow tells POWER PLAN that it has to display a text
constant. To tell it which of the 12 text constants it has

to display, add to the arrow the letter of our text
constant, the letter l. Our input is now ready and you can
complete it by pressing the "RETURN" key.

The text which was defined under text constant 1 now appears
in cell A1. If it is not displayed fully, but only
partially, this is not due to a program error in POWER PLAN,
but due to the width of column A being less than the length
of the text constant. You can change this by widening
column A with the aid of the FORMAT instruction.

Repeat the above procedure for defining a text constant a
second time. To do this, press the following keys:

                    "f7" (for the main menu)
                    "e" (for the EDIT menu)
                    "t" (for the TEXT menu)
                    "i" (to input the text)

Move the cursor to text constant 1 and operate the "RETURN"
key. Instead of your own name, now type in the text "POWER
PLAN is fun" and then press the "RETURN" key.

You then return to the input mode by pressing the "f7" key.
As you can see, the contents of cell A1 has changed on the
screen. You can now read in cell A1, not your name but
"POWER PLAN is fun".

Again, cell A1 contains text constant 1, but since this has
been changed, the appearance of cell A1 has also changed.

In cell A1 now appears: POWER PLAN is fun; which is quite
correct.

```
████████████ TEXTCONSTANTS ████████████

┌─────────────────────────────────────────┐
│ Number of textconstant ? h               │
└─────────────────────────────────────────┘

        ┌──────────────────────────┐
        │ a - POWER PLAN is fun     │
        │ b -                       │
        │ c - TEXT Constants        │
        │ d - save memory and       │
        │ e - allows quick          │
        │ f - changes in the        │
        │ g - entire worksheet      │
        │ h -                       │
        │ i - The left-arrow        │
        │ j - key is used to        │
        │ k - display the           │
        │ l - Text constants        │
        └──────────────────────────┘

      Please enter textconstant :
        ┌──────────────────────┐
        │ REM 17 characters     │
        └──────────────────────┘
```

1.14 MENU STRUCTURE

At this point, we would like to explain the structure of the
menu and how the options of the individual menus can be
activated.

In the "normal" input mode, i.e. the mode in which you can
open the VALUE and TEXT input modes, the main menu is
displayed in the menu zone (to reiterate: the menu zone is
located in the last two lines of the screen). The main menu
contains the most important options available to you.

To select these options, the "f7" key must be operated
first. If you now press this key, you will see that this
causes the menu cursor to appear in the menu zone. It is
positioned at the first main menu instruction, the FORMAT
instruction.

In this menu mode it is not possible to type in TEXT or
VALUE cells, or move the screen cursor over the worksheet.

The first line of the screen displays which menu you are in
at any time. At the moment, the MAIN MENU is selected.

There are two ways of selecting an instruction within a
menu. The first is to move the menu cursor to the desired
instruction. This can be done by means of the "CURSOR
RIGHT", "CURSOR LEFT" or "SPACE BAR". When the menu cursor
is positioned at the corresponding instruction, you can
select it by pressing the "RETURN" key.

The second possibility is based on the fact that only one
letter, in capitals, is written into each menu instruction.
This letter is usually the initial letter of the
instruction, but can be the second or third letter in
exceptional cases. An instruction can be selected directly
by entering this letter, that is, without operating the
"RETURN" key.

Using either method, select the OPTIONS instruction.

A new menu immediately appears in the menu zone. As you can
see from the first line of the screen, this is the "OPTIONS
MENU".

Perhaps you are now asking why these options, now appearing
on the screen, are not listed directly in the main menu.
Since POWER PLAN offers you over 50 options, this is
unfortunately not possible as the names of these 50 options
cannot be written into two lines of the screen.

This gives rise to a tree structure. Here the main menu
represents the trunk, from which several branches project.
These branches are the main menu options.

Further branches emerge from these branches, which represent the individual sub-menus. The branch then ends after a few menu levels.

This is the case, for example, when you select the TITLE FIELD instruction from the OPTIONS menu. It is true that you still have to type in a few parameters to this instruction, but no further menu levels follow this instruction.

After you have entered the necessary parameters, POWER PLAN executes the instruction and returns to the input mode.

If you then want to select the TITLE FIELD instruction a second time, it is not necessary to carry out the operations again which occurred when first selecting the instruction (pressing the "f7" key, etc.). POWER PLAN always remembers the last menu instruction, it is only necessary to press the "←-" (back-arrow) key. This immediately activates the TITLE FIELD instruction.

This method is not possible of course with a few, minor options (such as DELETE). Instead of jumping to this instruction, POWER PLAN branches into the main menu.

Once into a menu level, it is no longer possible to go back into the previous level. Should it happen that you have "landed" at a menu level which you do not want, you can return to the input mode by touching the "f7" or the "RUN/STOP" key.

When the menu is interrupted in the above way, POWER PLAN does not remember the last-mentioned instruction.

See APPENDIX B for the MENU STRUCTURE diagrams.

1.15 THE GOTO INSTRUCTION

The GOTO instruction is the second method by which the
screen cursor may be moved over the worksheet. We would like
to demonstrate the use of this helpful instruction with an
example.

This instruction is called up by operating the "f5" key in
the input mode. After you have pressed this key, the main
menu disappears and another text appears at this position:

Move cursor to field:

After this message you can see a flashing cursor, which
tells you that POWER PLAN is ready to accept the coordinates
of the cell to be jumped to. Enter the following text:

bk255

This represents the coordinate of the cell to be jumped to.
After entering this text, press the "RETURN" key. The
section of the worksheet displayed on the screen immediately
changes. The screen cursor is now at cell BK255 in the
bottom right corner of the worksheet. The main menu is again
displayed in the menu zone.

We will now examine in more detail the coordinate
arrangements in relation to permissible and non-permissible
keys. Press the "f5" key a second time.

The above-mentioned message again appears on the screen.
For coordinate inputs, POWER PLAN accepts capital letters
and lower case letters, and the numbers from 0 to 9.

In the case of letters, note that POWER PLAN displays all
letters as capitals on the screen, whether or not they were
entered by using the "SHIFT" key.

Input errors can be corrected by using the "INST/DEL" key.
If you want to delete all of your input, you can do this
with the aid of the "CLR/HOME" key. If you change your mind
and do not want to jump to any cell, you can leave this menu
by pressing the "f7"key. The "RETURN" key completes your
coordinate input.

A word about incorrect coordinates.

If you type in a wrong coordinate by mistake (A00 , XA40 or
similar), this does not matter at all to POWER PLAN. It will
recognize the error and tell you this via an error message.

1.16 RECALCULATING THE WORKSHEET

You have already learned in the first chapter of our manual that a calculation is based on two important principles

The first principle is the ability to set different cells in relation to each other.

The second principle is that when changing an input value, all values relating to this value also change.

An example:

In cell Al we write the VALUE 1. We fill cell A2 with the VALUE 1+al. The mathematical result of cell A2 is thus 2. If we change the VALUE in cell Al to 3.5, the result of cell A2 immediately changes to 4.5.

Let us examine how this problem was solved by programming. If you alter the contents of a cell, and here we include the specification of a blank cell, the entire worksheet is recalculated. How does this recalculation occur ?

In principle this process operates in that POWER PLAN runs through all cells. starting with cell Al, and calculates its result. In this case there are two types of results. The result of TEXT cells is of course the TEXT itself. The result of a VALUE cell is the mathematical result of a cell.

Let's follow up the idea of this process. We begin our experiment at the moment where we type in the VALUE 3.5 in cell Al and POWER PLAN recalculates the worksheet.

Since the cells are checked from top left to bottom right, POWER PLAN starts its calculations in cell Al. Its mathematical result is now no longer 1, but 3.5. This number is shown immediately in cell next cell Al. The next cell to be calculated is cell A2. The VALUE 1+al appears in it.

As the contents of cell Al are no longer 1, but 3.5, the result of the formula 1+al is also no longer 2, but 4.5. The contents of cell A2 also immediately change on the screen. Since this is the last occupied cell on our worksheet, the recalculation process ends here.

One of the processes described above is particularly important. This is the fact that the worksheet is rechecked from top left to bottom right. Because of this, it is not possible for a cell to refer to another one which is located below it or to the right of it. This should be avoided anyway, because the worksheet otherwise becomes confused.

In normal circumstances this contradiction of the principles of a spreadsheet program is foreseen by classifying the cell as non-calculable. But more of this in the system manual.

1.17. A CLOSER LOOK AT THE INPUT MODE

As the title of this chapter already suggests, we now want
to deal with the input of VALUES and TEXT in more detail.

1.17.1 TEXT INPUT

Let us first deal with a TEXT entry.

To tell POWER PLAN that you want to type in a TEXT, you must
first press the "SPACE BAR". POWER PLAN now recognizes that
you wish to type in a TEXT and goes into the TEXT input
mode. The type of input mode always appears in the center of
the first line on the screen. The word "TEXT" appears there
after the "SPACE BAR" is pressed.

The second line of the screen, which is no longer used to
display the contents of a cell, but a cell input, becomes
blank. The "SPACE" character is only used to open the TEXT
input mode, POWER PLAN does not consider it part of the TEXT
and does not write it in the input zone.

Another case is when you are already in the TEXT input mode
and type in a "SPACE" character. The character is then
accepted into the input line as part of your TEXT input.

The flashing input cursor, which indicates the position of
the next character to be entered, appears at the start of
the input line. To limit the input zone, an arrow pointing
to the left is situated 19 characters from the left hand
edge of the input zone. Because of this limitation, it is
not possible to type in a TEXT which is more than 18
characters long. Longer TEXTs could not be displayed by
changing the column width to 18 characters.

The horizontal bar in the input zone shows that part of the
TEXT which is visible in the relevant cell after the input
is completed. The distance of the bar from the left hand
edge of the input zone depends on the width of the column
occupied by the screen cursor. The bar itself does not
appear in the cell after the entry is completed.

You can type in capitals and lower case letters, numbers and
special characters (!, &...) within the TEXT input. Three
characters which help to subdivide the worksheet are also
available to you. These are a vertical stroke ("SHIFT" + "-
"), a horizontal stroke ("SHIFT" + "*") and a cross ("SHIFT"
+ " ↑ " up-arrow).

The ←- (left-arrow) is used if a text constant has to be
displayed instead of normal TEXT. A letter between "a" and
"l" must always follow it.

To edit your input, you can use the "INST/DEL" key. This
deletes the character below the input cursor and moves the
input cursor one position to the left.

You can end you input at any time by operating the
"RUN/STOP" key. POWER PLAN then returns to the input mode
without storing your input.

You can complete your input by pressing the "RETURN" key or
"SHIFT" and "RETURN" keys together. When the "RETURN" key
is pressed, your input is stored in the cell at which the
screen cursor is positioned. When both the "SHIFT" and the
"RETURN" keys are pressed, you can move the screen cursor to
the desired cell by using the CURSOR keys. When the screen
cursor is at the desired cell press the "RETURN" key to
store your input in that cell.

If your input is stored in a cell that was blank up to this
point, the format of the cell is determined by the global
TEXT format. If the relevant cell was already occupied, the
old contents will be overwritten by the new ones, but the
format of the old cell is kept.

During TEXT entry, the CURSOR keys have no effect on the
position of the input cursor inside the input zone. This
makes editing rather difficult. There is a way which
enables us to edit our input very conveniently. We open the
"EDIT" mode by operating the "fl" key. It provides a very
convenient editing facility, that enables us to move the
input cursor inside the input zone with the "CURSOR LEFT" or
"CURSOR RIGHT" keys.

This mode also makes it possible to delete or insert
characters with the aid of the "INST/DEL" key. By using the
"CLR/HOME" key you can move the input cursor to the end or
the start of the input zone.

Naturally, in this mode you can also complete your input by
operating the "RETURN" key or the "SHIFT" and the"RETURN"
keys together.

Press the "fl" key a second time to return POWER PLAN to the
TEXT input mode.

1.17.2. VALUE INPUT

In contrast to a TEXT entry, when entering a VALUE, no
specific characters have to be entered to open the VALUE
input mode. The VALUE input mode is opened by all
characters which can otherwise be entered in the VALUE input
mode. These characters are:

45

lower case letters: "a" - "z"
the numbers: "0" - "9"
special characters: "(" ")" "+" "-" "*" "E"

Using one of these characters not only opens the VALUE input
mode, but brings the character into the input zone. As when
entering a TEXT, the flashing input cursor appears in the
input zone. But there are two differences if the structure
of the input line in the VALUE input mode is compared with
that of the TEXT input mode.

On the one hand, with a VALUE input, the vertical bar in the
input zone is missing. Within an input mode this is not
necessary, since it is not the entered VALUE, but its
mathematical result which is displayed in the respective
cell.

Secondly, the arrow pointing to the left is not in the same
position as it is for a TEXT entry, as its function is not
the same in the VALUE input mode as in the TEXT input mode.

The maximum length of a TEXT is 18 characters, but the
maximum length of a VALUE (a formula) can be considerably
longer. The length of the VALUE input zone displayed is
therefore increased to 35 characters.

Since it seemed to the authors that a length of 35
characters for a VALUE (a formula) was still too short, they
have thought of something special for the VALUE input mode.
To demonstrate this to you, please type in the following
VALUE:

$$12*sum(a1:b5)-max(c5:h25)*(5-a12)+1$$

The input cursor is now directly in front of arrow pointing
you press the "+" key a second time. You will see that the
contents of the input zone are displaced one character to
the left. The "+" character entered is at the end of the
input zone, still in front of the input cursor, The
character that has been displaced out of the input zone is
still in your input, but is not visible at the moment. Keep
the "0" key pressed and see how many characters are
displaced out of the input zone. This displacement ceases
after some time.

This means that you have entered 53 characters, the maximum
length of a VALUE. If you now press the "INST/DEL" key, the
character at which the input cursor is positioned, is
deleted. Furthermore, the character which was displaced out
of the input zone last, is moved back again into the input
zone. Operate the "INST/DEL" key until all "0" characters
have been deleted.

Now operate the "RUN/STOP" key. This returns POWER PLAN to
the input mode without storing the entered TEXT.

1.18 THE MATHEMATICAL RESULT

As you know, it is not the actual VALUE, but its
mathematical result which is shown in VALUE cells. In this
chapter we will examine what this mathematical result is,
and how it is calculated.

A VALUE can consist of three components, which we shall now
explain.

The first and certainly the most often used component of a
VALUE is a number (such as 34).

An equally often-used component is a coordinate. This must
be between a1 and bk255. Invalid coordinates are indicated
by the following error message:

Invalid coordinate in cell XXX

The third and last component is the function. You already
know several functions. These are the SUM, RND and INT
functions. POWER PLAN has many other functions, which we
shall deal with in the next chapter. An arbitrary
expression (in brackets) must always follow the function
name. If this does not happen, this causes a "syntax error".

Each one of these three components of a VALUE must be
separated from each other by an operator (+, -, *, /, ↑).

We will demonstrate the calculation of a mathematical result
with the aid of this example: the VALUE reads:

al+al ^ (-2+2*sqr(4))

The cell addressed in this VALUE will have the VALUE 4.

When calculating the mathematical result of this VALUE,
POWER PLAN follows fixed rules, which we will explain.

First, POWER PLAN looks for the innermost brackets "( )"
and, if they exist, works out the expression inside these
brackets. In our case this expression is:

-2+2*sqr(4)

Inside this expression POWER PLAN looks for the highest
ranking operator. You should know at this point that POWER
PLAN allocates to each operator a rank within a hierarchical
structure. This structure is formed as follows:

        1st rank ↑ (exponentiation)
        2nd rank */ (multiplication and division)
        3rd rank +- (addition and subtraction)

If operators inside an expression are of equal rank, the calculation is carried out from left to right. In our case the expression 2*sqr(4) is worked out first, since multiplication has a higher rank than addition. The expression to be calculated then reads:

$$2*sqr(4)$$

Within this expression POWER PLAN then works out the function reference sqr(4). The function sqr(x) always gives the root of the argument which follows in brackets. The root of 4 is 2. Thus sqr(4) = 2. POWER PLAN then places the number 2 in the expression. This then reads:

$$2*2$$

The result 4 is again placed in the expression by POWER PLAN, leaving a remainder:

$$-2+4$$

The result of this expression, 2, is then placed into the (remaining) expression. It then reads:

$$a1+a1 \char94 (2)$$

Since exponentiation has a higher rank than addition, the expression a1 ^ (2) is calculated first. For the coordinate a1 POWER PLAN uses the contents of cell a1, which is 4 you will recall. POWER PLAN again places the result of this calculation (4 ^ 2 = 16) in the remainder of the expression. This then reads:

$$a1+16$$

After POWER PLAN has again used the number 4 for cell a1, we get the end result of the expression. This is 20.

Let us briefly summarize the rules which we have just worked through:

The basic principle of the calculation of a VALUE is that POWER PLAN allocates a specific priority to individual operators within a formula (of a VALUE). This makes it possible to split up the formula into smaller expressions, until the highest- ranking expression has been found. The expression thus obtained is worked out and its result is inserted into the formula. After this, the search for the highest-ranking expression starts again. This process is continued until the formula contains no more operators. The number then remaining is the final result of the VALUE.

If you are not sure whether you have understood every detail, you should read through this chapter a second time, since it is very important that you understand this chapter.

1.19. FUNCTIONS

In the previous chapters you have worked with functions, for
example, the SUM function in the chapter "1.8. THE FIRST
WORKSHEET". In this chapter we will be dealing with these
functions and the way they work in more detail.

1.19.1 BASIC FUNCTIONS

The group of functions built into POWER PLAN can be divided
into two sub-groups. The first represents all functions from
the BASIC vocabulary. The SQR function, for example. These
functions may be inserted into a VALUE at any position.
Their syntax is as follows:

            Function name (any expression)

An example: If we wish to calculate the absolute value of
the expression 2*a1, then we must use the ABS (for absolute)
function. We first write the name of the function:

                        abs

Followed by the expression to be calculated in brackets:
                        (2*a1)

Combined together, this gives:

                      abs(2*a1)

This "function expression" can have another function
reference. For example, the following VALUE is possible:

            abs(2*sin(a1 ^ 3-(5*b4)+5))

As you can see, there are no limits to its complexity.

So much for the syntax of these functions. You can find a
detailed description of the operation of these functions in
the system manual.

1.19.2 SPREADSHEET FUNCTIONS

Now we will explain the "other" group of the functions.
These are functions which have been specially developed for
a spreadsheet calculation program:

The syntax of these frequently-used functions reads:

        Function name(1st coordinate : 2nd coordinate)

Since these functions always refer to a block of cells. the
1st coordinate specifies the top left corner of the block
and the 2nd coordinate the bottom right.

It is very important that you place the actual coordinates
in brackets, and not the expressions.

It is also very important that you always write the function
name in a VALUE with lower case letters. It is common to
all block orientated functions that they do not take into
account blank or TEXT cells within the given block.

Here is a list of the individual block orientated functions,
with an explanation:

SUM : totals the mathematical result of the cells

AVG : calculates the average value

CNT : calculates the number of VALUE cells in the block

MAX : gives the largest mathematical value of the cells

MIN : gives the smallest mathematical value of the cells

Another function is the IF-THEN-ELSE function, which may be
familiar to some of you. With its help it is possible to
make the contents of a VALUE cell dependent on a condition.
Let's make this clear by using this instruction in an
example:

                if al < a2 then 1 else 2

When calculating this VALUE, POWER PLAN first looks to see
if the statement following IF applies. If it does, POWER
PLAN then calculates the result of the VALUE which follows
THEN. If this statement does not apply, POWER PLAN
calculates the result of the VALUE which follows ELSE and
shows it in the corresponding cell.

There must always be an expression between IF and THEN,
which can be either true or false. This expression must
therefore be further split into other expressions separated
by a relational operator <=, <, >=, (=, >, <>.

If the statement applies, the expression being calculated
always follows THEN. The expression being calculated thus
follows ELSE if the statement does not apply.
A further example:

    if sin(al*-5)+5=max(d4:g6)*cl4 then 45 else 5*a2+a34

Please practice the use of the functions explained above.
Try the SUM and AVG functions, then alter the numbers to see
how the totals will vary.

1.20. USER DATA

Now select the OPTIONS instruction from the main menu, you
will see the USER DATA instruction inside the OPTIONS menu.

What is USER DATA?   As the name of this instruction already
suggests, it involves certain parameters which can be
specified by the user himself, that is by you.   These
parameters include border, background, character color and
many others.

Now select the USER DATA instruction.   POWER PLAN asks you
if you want to load the user data from the floppy disk.
Section 2 goes into the significance of this question in
more detail.   Answer this question by pressing the "n" key.

On the left hand side of the screen are the variable
parameters.   On the right hand side the actual contents as
preset by POWER PLAN.   We will explain the meaning of the
individual parameters from top to bottom and vary them if
necessary.

The first parameter is the border color.   We will now alter
it so that the border will be light blue.

To alter a parameter, the frame enclosing the parameter must
first be moved.   This frame can be moved with the aid of the
"CURSOR UP" and "CURSOR DOWN" keys.   Try this out and then
move the frame to the "border color" parameter.

The second step in altering a parameter is to press the
"RETURN" key when the frame is at the respective parameter.

Press the "RETURN" key.   A second frame, which contains the
possible colors, now appears at the bottom edge of the
screen.   To select the required color, as with all other
menus, you can move the menu cursor by means of the "CURSOR
RIGHT", "CURSOR LEFT" and "SPACE" keys.

When you have moved the menu cursor to the color "light
blue", press the "RETURN" key. This completes your input. At
the same time, the border color is changed to the desired
color, light blue.

If you wish, you can now change the background, character
and contrast color in the same way as you have just altered
the border color.   The contrast color determines the color
in which important messages, such as error messages, are
displayed on the screen.

With the character color, POWER PLAN prevents the characters
from becoming the color of the background.

Important: If when returning from the USER DATA
instruction, you should find that your worksheet is "blank",

this does not mean that POWER PLAN has deleted your
worksheet, but that your worksheet has the same color as the
background since its color is not defined by the character
color.   You can easily change this, however, with the help
of the COLOR instruction in the GLOBAL menu.

After you have changed the color parameter, move the frame
to the "printer address" parameter and press the "RETURN"
key. You may now set the device address of your printer. If
you do not have a printer, you can type in any number here.

Setting of the parameters is now complete.   Press the "f7"
key to return to the input mode.

Before POWERPLAN returns to the input mode, however, it
wants to know if you wish to store the user data (all
parameters) on disk. This question is similar to the
question POWER PLAN asked you at the start of the USER DATA
instruction.   Since the USER DATA can be stored, they can of
course also be loaded again.

If you wish to, you can now store your parameters on floppy
disk by pressing the "y" key. POWER PLAN then returns to the
input mode.   If you don't want to store the user data, you
can return to the input mode by pressing the "n" key.

1.21. THE SORT INSTRUCTION

POWER PLAN lets you sort the cells of your worksheet
according to specific criteria. In this chapter, we shall
deal with the method by which it does this and how this is
arranged.

First of all, delete your worksheet by means of the NEW
instruction.

Then type in the following VALUES in cells A1 to A5:

                        Cell : VALUE
                         A1 : 5
                         A2 : 1
                         A3 : 6
                         A4 : 4
                         A5 : 3.5

Now press the "f7" key to enter the MAIN MENU and then
select the EDIT instruction. From this instruction, select
the SORT instruction.

First POWER PLAN asks you to state which area of your
worksheet you wish to sort. Before you answer this
question, here are a few comments.

POWER PLAN allows you to sort the entire contents or part of
a column. But it is not possible to sort a row or block of
cells.

After the cells have been sorted, they are "written" into
the area from which they were "extracted".

Now back to the sort area input. In the menu zone you can
see the following text:

                    Sort area from   to

After the word "from", POWER PLAN has already entered the
actual screen cursor coordinate.

We noticed this before when typing in the coordinates for
the REPLICATE instruction. This suggests that you can type
in coordinates within the SORT instruction in the same way
as the REPLICATE instruction.

In this case, POWER PLAN also provides you with two ways of
typing in the "from" coordinate al. The first involves
deleting the input zone by operating the "SHIFT" and
"CLR/HOME" keys together, then typing in the coordinate by
pressing the "a", followed by the "1" key. Finally, your
input is completed as usual by operating the "RETURN" key.

The second way involves moving the screen cursor with the cursor keys to the respective cell (here it would be cell A1), then completing your input by pressing the "RETURN" key.

Now specify the coordinate A1 as the "from" coordinate. How you do this is left to you.

Specify cell A5 as the "to" coordinate. After the sort area input is completed, POWER PLAN wants to know if it is to sort texts (TEXT) or formulas (VALUE). Since in our case VALUE cells are involved, select "formulas".

The next inquiry decides the sequence in which the cells are to be sorted. "Increasing" means that the smallest number is written into the highest cell of the area to be sorted and the largest number into the lowest cell. In contrast to this, "decreasing" means that the largest number is written into the highest cell, and the smallest number in the lowest cell of the area to be sorted.

In our case this means that after sorting in decreasing order, the number 6 would be located in cell A1 and the number 1 in cell A5.

Select "decreasing".

A final question now appears in the menu zone, the significance of which we shall deal with in detail in an example.

Answer this question by pressing the "n" key.

All questions are now answered and POWER PLAN now carries out the SORT instruction. After a few moments the sorted cells appear in the correct sequence on the screen.

Before we work through our second example of the use of the SORT instruction, delete the entire worksheet once again. Our second example, although in simplified form, is based on a real situation.

An employer pays his 5 staff, whose names are entered in column A, a certain monthly salary, which is in column B. First of all, type in the specified TEXT (the names) in the corresponding cells:

CELL	:	TEXT
A1	:	Lewis
A2	:	Meyers
A3	:	Smith
A4	:	Walters
A5	:	Abel

Then type in the corresponding VALUES (the monthly salaries)
in the specified cells:

                      Cell : VALUE
                        B1 : 1800
                        B2 : 1850
                        B3 : 1785
                        B4 : 1640
                        B5 : 1100

If the employer only wants the names of his employees to be
sorted   alphabetically,   this   will   lead   to   serious
complications, since after sorting, the positions of the
individual names will have changed, but not those of the
corresponding salaries.   The name of employee Abel would
then be in cell A1, but his salary would be in cell B5.

To avoid this "sorting" error, POWER PLAN has a function
which we will now demonstrate.   First select the SORT
instruction in the EDIT menu. Specify cell A1 as the "from"
coordinate and cell A5 as the "to" coordinate.

To the next inquiry select "text", as we wish to sort
alphabetically. At the next inquiry, select "increasing".

In our case POWER PLAN now asks a very important question.
This is:

                    Reference column (y/n)

To answer "yes", press the "y" key.

You are now able to define reference columns.   But what are
reference columns? Let us assume that we define column B as
the reference column,   while we sort column A or a part of
it.

If POWER PLAN now displaces a cell within column A, the cell
in column B which lies in the same row as the cell to be
displaced, is also moved. In practice, this means that when
the name Abel in column A is shifted from line 5 to line 1,
his salary in column B is also shifted from line 5 to line
1.

POWER PLAN now requests you to specify a reference column.
The easiest way to define a column is to move the screen
cursor to any within this column and then operate the
"RETURN" key. Move the screen cursor into column B and then
press the "RETURN" key.

POWER PLAN then asks you to type in a further reference
column,   since it is possible to define up to 62 reference
columns.   We have of course defined all reference columns,
we now have to tell POWER PLAN this. This is done by
specifying the column to be sorted as the reference column.

Move the screen cursor into column A and press the "RETURN"
key.   The sorting process now starts and is completed after
only a few moments.

In this chapter you have learned about another important
strength of POWER PLAN, which you should not neglect.   Try
out the SORT instruction on your own.

If you sort a large number of cells, the sorting process can
take several minutes. But don't worry, POWER PLAN has not
"locked up"!

```
┌───────────────────────────────────────────────┐
│1:1    A        B        C        D        E     │
│   Lewis      1800                               │
│   Abel       1100                               │
│   Smith       785                               │
│   Meyers      850                               │
│   Walters    1640                               │
│                                                 │
│                                                 │
│                                                 │
│ Example of the SORT command                     │
│                                                 │
│ Format Global Edit dIsk Printer Quit            │
│  New Blank gRafics Options Status ?             │
└─────────────────────────────────────────────────┘
```

```
┌───────────────────────────────────────────────┐
│1:1    A        B        C        D        E     │
│   Abel       1100                               │
│   Lewis      1800                               │
│   Meyers      850                               │
│   Smith       785                               │
│   Walters    1640                               │
│                                                 │
│                                                 │
│                                                 │
│ Example of the SORT command                     │
│                                                 │
│ Format Global Edit dIsk Printer Quit            │
│  New Blank gRafics Options Status ?             │
└─────────────────────────────────────────────────┘
```

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1.22. THE PRINTOUT

We have now arrived at the point where we want to print out
a worksheet for the first time on the printer.   But before
we can print out a worksheet, we have to make a few
preparations.   First of all, we need a worksheet which is
worth printing out on the printer.

We have already prepared such a worksheet for you and stored
it on the system disk under the name "demo".   To load this
worksheet, first press the "f7" key to get into the main
menu and then select the DISK instruction in the main menu.
Within the DISK instruction, select the LOAD instruction.
POWER PLAN now asks you to type in the name of the worksheet
to be loaded. After you have typed in "demo" (without the
quotation marks), make sure that the system disk is in the
drive and that both disk drive and printer are switched on.
Complete the input by pressing the "RETURN" key.

The worksheet is now loaded and appears on the screen when
the loading process has stopped.   This worksheet will
certainly seem familiar to you, for we have already worked
out a similar one in this manual.

The worksheet that you now see, however, differs from the
first one in that it "deals with" 10 painters, not 3.
Another difference is that for each working day the maximum
and minimum or average number of hours has been worked out.

So the first step in printing out a worksheet, the setting-
up of the worksheet, is completed.

The second step is to match POWER PLAN to your printer.
To do this, select the OPTIONS instruction in the main menu.
Inside the OPTIONS instruction, select the first instruction
in the menu zone, the USER DATA instruction.

After this option has been chosen, POWER PLAN asks if the
user data has to be loaded from the floppy disk. Answer this
by pressing the "n", since your system disk contains no user
data.

On the left side of the screen are displayed the individual
parameters and their actual status on the right hand side.
Move the frame surrounding the first parameter to the lowest
parameter by pressing the "CURSOR DOWN" key several times.

This printer parameter shows which printer POWER PLAN is
matched to at the moment. After POWER PLAN was started, this
parameter was preset to "EPSON".

Generally speaking, POWER PLAN will work with all popular
printers, which it divides into three groups, each group
representing at least two printers.

Here are the three groups:

> 1st group: MPS 801
>   Commodore 1525
>   Seikosha GP 100 VC
>   Seikosha GP 700 VC
>   and equivalents
>
> 2nd group: MPS 802
>   Commodore 1526 (with H-Eprom)
>   and equivalents
>
> 3rd group: EPSON FX-80 (with proper interface)
>   EPSON RX-80 (with proper interface)
>   and equivalents

Now press the "RETURN" key. A frame representing one of the above-mentioned 3 groups appears in one of the bottom lines of the screen.

Move the menu cursor with the "CURSOR RIGHT" key to one of the printer groups which includes your printer. Then press the "RETURN" key.

POWER PLAN is now completely matched to your printer and we can leave the OPTIONS instruction by pressing the "f7" key. But before POWER PLAN returns to the input mode, it wants to know if the user data should be stored on the floppy disk. Answer this question by operating the "n" key, as we are only concerned at the moment with matching your printer to POWER PLAN.

POWER PLAN is once again in the input mode and we can go ahead with printing out our worksheet on the printer.

Before you select the PRINTER instruction to print out the worksheet, make sure that the screen cursor is at cell A2, (this is very useful for the following inputs) and that your printer is switched on.

Now select the PRINTER instruction in the main menu. When this instruction is selected, the following text appears in the menu zone:

Print-part Output-formula

Since we want to print out a part of the worksheet on the printer, select "Print-part".

The following text appears in the menu zone when PARTIAL PRINTOUT is selected:

Print from xx

Here the actual screen cursor coordinate is inserted for xx.
With this message POWER PLAN asks you to state the
coordinate of the cell which is located at the top left
corner of the section of the worksheet to be printed out.
Since we only want to print out cells A2 to C16, type in the
coordinate A2.

The simplest way to type in this coordinate is to move the
screen cursor to this cell. The chapter on "The coordinate
input" tells you about other ways of entering the
coordinate. So after you have moved the screen cursor to
cell A2, press the "RETURN" key to complete the input.

You are now asked to type in the coordinate of the cell in
the bottom right corner of the section of the worksheet to
be printed. Enter coordinate C16 in the same way as just
described.

The next inquiry now appears in the menu zone:

Title (y/n)

Since we want the printed worksheet to have a title, press
the "y" key. A title of up to 80 characters long can now be
typed in the menu zone. Take no notice of the small dots,
as they are regarded as blank characters during printout.
Enter the text "demo printout" and then press the "RETURN"
key.

The specified title is now printed out on the printer. At
the end of the output, a new question appears in the menu
zone:

Border (y/n)

Answer this question by pressing the "y" key, and this will
print out the specified part of the worksheet, including the
scale at the top and the left hand edge of the worksheet.
If the "n" key is pressed, the scale is not in the printout.

In this case, the worksheet should be printed out with the
border. So press the "y" key.

The next and final question says:

Center (y/n)

This question is only asked if the part of the worksheet to
be printed out is less than 80 characters wide. If not, this
question is avoided and printing starts immediately after
the last question has been answered. Since in this case,
however, we are able to center the worksheet section, we
should also use this facility. So press the "y" key. The
printing process now starts, at the end of which POWER PLAN
returns to the input mode.

If during printing your printer makes a strange rattling
noise, this is no cause for alarm. This rattling is due to
the fact that the subdividing characters in the worksheet
have not been defined in the printer's standard character
set and have to be printed out as a series of separate dots.

A few more words to complete this chapter.

Try to print out the entire worksheet yourself. To do this,
first look at your worksheet to see which cells it covers.
Then print out the worksheet using the method described
above.

2. POWER PLAN SYSTEM MANUAL

In this part of the manual we are going to deal with all the important points concerning the operation of POWER PLAN.

Since the system manual contains a great deal of important information on POWER PLAN, it will be very useful to you later as a reference book.

Before we go into detail about all the options which POWER PLAN offers you, we shall deal first with the significance of the various input modes.

Input Mode

Cursor movement keys

⋀ Row up

⋁ Row down

« Column right

» Column left

[clr home] home position
second press
goes to cell A1
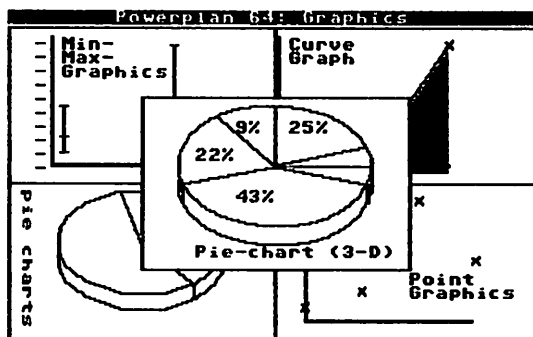
f1 Enter
Edit mode

f2 Move
between
2 pages

f3 Move cursor
to other
window

f4 switch
parallel
scrolling

f5 GOTO cell

f6 Recalculate
entire
worksheet

f7 enter the
Main menu

f8 Hardcopy
of screen
to printer

Space Bar

Enters the TEXT Input
mode

+ , a – z , 0 – 9 , E

Enters the value input
mode

← return to last menu

2.1. THE INPUT MODE

The screen cursor can be moved within the active window in the worksheet with the aid of the CURSOR key.

In this case: the "CURSOR UP" key moves the screen cursor one line upwards.

The "CURSOR DOWN" key moves the screen cursor one line down.

The "CURSOR LEFT" key moves the screen cursor one column to the left.

The "CURSOR RIGHT" key moves the screen cursor one column to the right.

The "CLR/HOME" key moves the screen cursor to the top left corner of the actual section of the screen being displayed. If it is already in this cell, it will be set in the top left corner of the worksheet, in cell A1. This enables the screen cursor to be moved from any position in the worksheet to cell A1 by pressing the "CLR/HOME" key twice.

2.1.1. FUNCTION KEYS

In the input mode, the function keys are very important and we will now deal with them.

f1 : The function of the "f1" key depends on the status of the cell at which the screen cursor is located.

If the corresponding cell is blank, the "f1" key carries out no function. If, on the other hand, the relevant cell is occupied by a TEXT or a VALUE, the "f1" key opens the EDIT mode. (See chapter on EDIT mode).

f2 : Using the "f2" key, it is possible to move backwards and forwards between the two pages of the worksheet. This assumes of course that you have first loaded a second worksheet page by means of the LINK option.

If the first page of the worksheet is displayed on the screen, the second page appears on the screen after the "f2" key is pressed. If the "f2" is pressed a second time, the first page appears on the screen again.

f3 : This key is only used if you have divided the screen into two windows. If so, when the "f3" key is operated, the screen cursor moves from the "active" to the "non active" window. This process is reversed if the "f3" key is pressed again.

f4 : Again this key is only operative if the screen has been
divided into two windows before "f4" is pressed. If this is
the case, operating the "f4" key switches the "parallel
scrolling" on or off. When parallel scrolling is selected,
both windows are "active". This causes the screen cursor to
appear in both windows at the same time and it is also moved
inside both windows simultaneously.

f5 : The GOTO option is obtained by pressing the "f5" key.

f6 : Operating the "f6" key causes the entire worksheet to
be recalculated. This process is only carried out if the
worksheet recalculation has been switched off.

f7 : By operating the "f7" key, you can get into the MENU
mode to select the required option.

f8 : After the "f8" key has been pressed, a hard copy of the
information on the screen is provided by the printer. POWER
PLAN then reverts to the input mode.

The ←- (left-arrow key) is also very important. If this key
is pressed, POWER PLAN jumps to the option which was used
last.

If the "SPACE BAR" is used in the input mode, this opens the
TEXT input mode. This allows you to fill a cell with a TEXT
entry.

The "a" – "z" and "0" – "9" keys and simulataneous operation
of the "SHIFT" and "E" keys open the VALUE input mode, which
enables you to occupy a cell with a VALUE input.

2.2 THE TEXT INPUT MODE

The TEXT input mode is opened by pressing the "SPACE BAR".
This converts the second line of the screen to the input
line, the first "SPACE" is not put into the input line.
The flashing input cursor indicates the position at which
the next character to be entered is written.

The <- (left-arrow) on the screen limits the input line to
18 characters. All 18 characters are accepted into your
worksheet when the TEXT input is completed. Of course you
see only a part of the TEXT typed in, because the width of
the column in which the TEXT is entered, can be less than 18
characters. You can determine the length of this part during
input, since the vertical bar in the input line limits the
part of the TEXT which you will see in the worksheet on
completion of the input.

The part which cannot be seen can be made visible at any
time by increasing the column width.   Likewise, part of the
TEXT disappears from view when the column width is reduced.

A TEXT must not be enclosed by quotation marks!!

POWER PLAN does not accept every character when a text is
being typed in, only a specific group of characters. These
are:

1.) all capital letters ("A" - "Z")
2.) all small letters ("a" - "z")
3.) all numbers ("0" - "9")
4.) all special small character ("!", "(" etc.)
5.) three characters for subdividing the worksheet *, -, +.
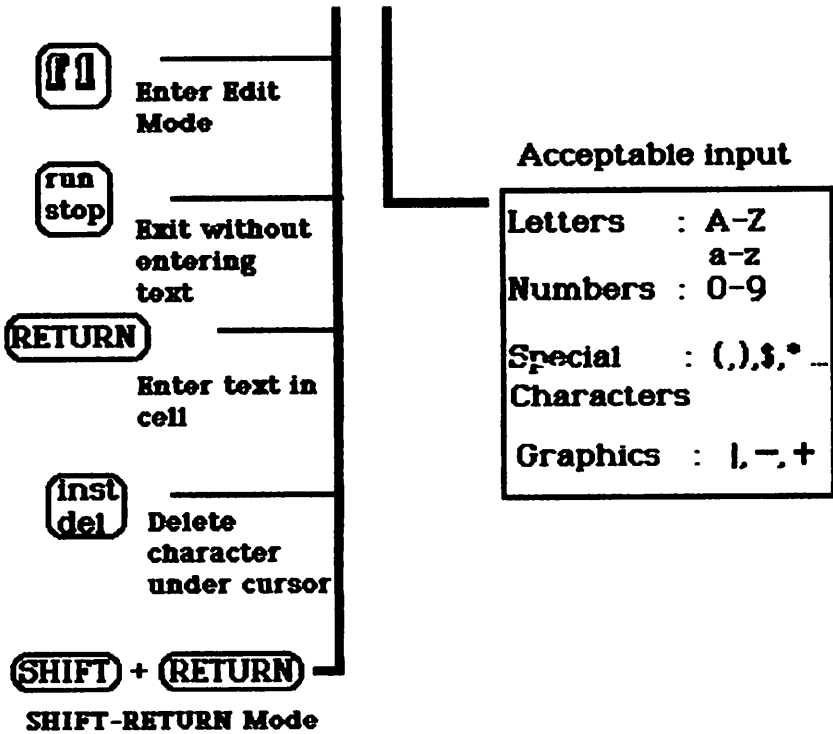
The input is ended and the TEXT stored in the worksheet when
the "RETURN" key or the "SHIFT" and "RETURN" keys are
operated together. When the "RETURN" key is operated, the
TEXT is filed in the cell at which the screen cursor is
positioned. When the "SHIFT" and the "RETURN" keys are
operated at the same time, the cell in which the TEXT is to
be filed may still be defined with the help of the cursor
keys.

If the TEXT is stored in a cell, which was blank up to this
point, the format of the TEXT is determined by the global
TEXT format. (Normally, this is set left justified). If, on
the other hand, the cell was already occupied,   the
previously set cell format is retained.

You can correct your input by means of the "INST/DEL" key.
Operating this key deletes the character under the input
cursor and the input cursor is moved one place to the right.
You can interrupt your input at any time by pressing the
"f7" or the "RUN STOP" keys. This returns POWER PLAN to the
input mode without storing the TEXT typed in.

(SPACE BAR)
↓
TEXT INPUT

A maxium of 18 characters may be entered in the TEXT INPUT mode.

f1 Enter Edit Mode

run stop Exit without entering text

RETURN Enter text in cell

inst del Delete character under cursor

SHIFT + RETURN
SHIFT-RETURN Mode

Acceptable input

Letters	: A-Z a-z
Numbers	: 0-9
Special Characters	: (,),$,* ...
Graphics	: I, -, +

2.3. THE VALUE INPUT MODE

The VALUE input mode is opened by means of the following keys:

1.) Letters: "a" - "z"
2.) Numbers : "0" - "9"
3.) Special characters : "(", ")", "+", "-", "*"

The VALUE input mode is opened by pressing one of these keys in the input mode, and the character typed in is accepted into the input line.

These characters not only open the VALUE input mode, but can also be typed in after opening the VALUE input mode.

A VALUE may have a maximum length of 53 characters. Because of this, the VALUE can never be fully displayed in the input zone, only a part of it. As required, POWER PLAN automatically shifts that part of the input within the input zone.

A cell, whose result is then used in the VALUE instead of the coordinate, may be indicated in a VALUE. This can be done by typing in the individual components (the letters and numbers) of this coordinate, or the coordinate may be entered by indicating the corresponding cell.
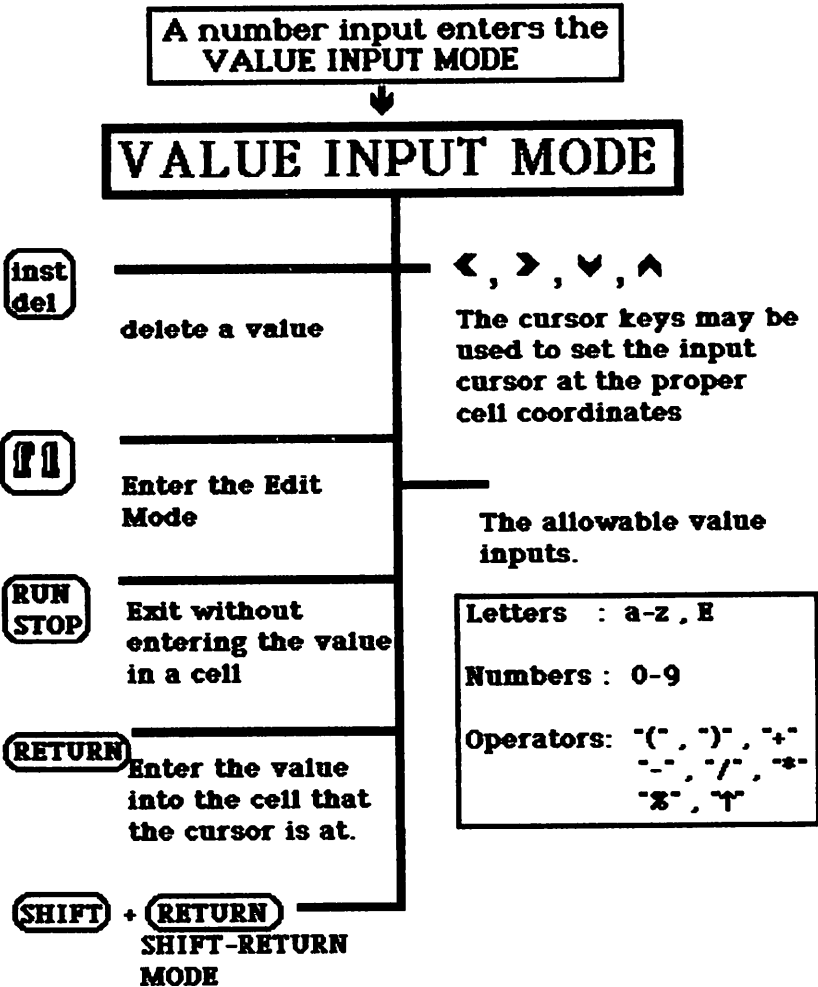
The screen cursor may also be moved in the worksheet in the VALUE input mode by means of the cursor keys. Depending on which cursor key is operated, the screen cursor is moved to a new cell. At the same time, its coordinate is added onto the end of the previous input. After the desired cell has been indicated, the screen cursor is returned again to its source cell when a "non cursor key" is operated. At the same time, provided 53 characters have still not been entered, the character which was typed in is added after the coordinate.

If a cell has been indicated and the "RETURN" key is then pressed, the coordinate of the cell which was indicated, is added to the end of the input, and the input is stored in the source cell.

If the "INST/DEL" key is operated when a cell is being indicated, the screen cursor is again returned to the source cell and the added coordinate is deleted again.

To edit the input, you can also jump from the VALUE input mode to the EDIT mode by pressing the "f1" key.

You leave the VALUE input mode by pressing the "RUN/STOP" key, without storing the input.

**A number input enters the
VALUE INPUT MODE**

⬇

VALUE INPUT MODE

**inst
del**

delete a value

❮ , ❯ , � , ^

The cursor keys may be
used to set the input
cursor at the proper
cell coordinates

⌷⌷

Enter the Edit
Mode

The allowable value
inputs.

**RUN
STOP**

Exit without
entering the value
in a cell

| Letters : a-z , E |
| Numbers : 0-9 |
| Operators: "(" , ")" , "+" |
| "-" , "/" , "*" |
| "z" , "Y" |

RETURN
Enter the value
into the cell that
the cursor is at.

SHIFT + RETURN
SHIFT-RETURN
MODE

If the "RETURN" key is operated, the input is stored in the
cell at which the screen cursor was located before the VALUE
input was opened.

Operating the "SHIFT" and "RETURN" keys together selects the
cell in which the input is to be stored.

If the input is stored in a blank cell, the format of the
cell is determined by the global VALUE format. If, on the
other hand, the relevant cell is already occupied, the old
cell format is retained.

In contrast to a TEXT, it is not the VALUE typed in which is
displayed in the worksheet, but its mathematical result.
For this, POWER PLAN separates the VALUE into individual
expressions, to which it allocates a certain order of
priority within a hierarchy. The expressions allocated the
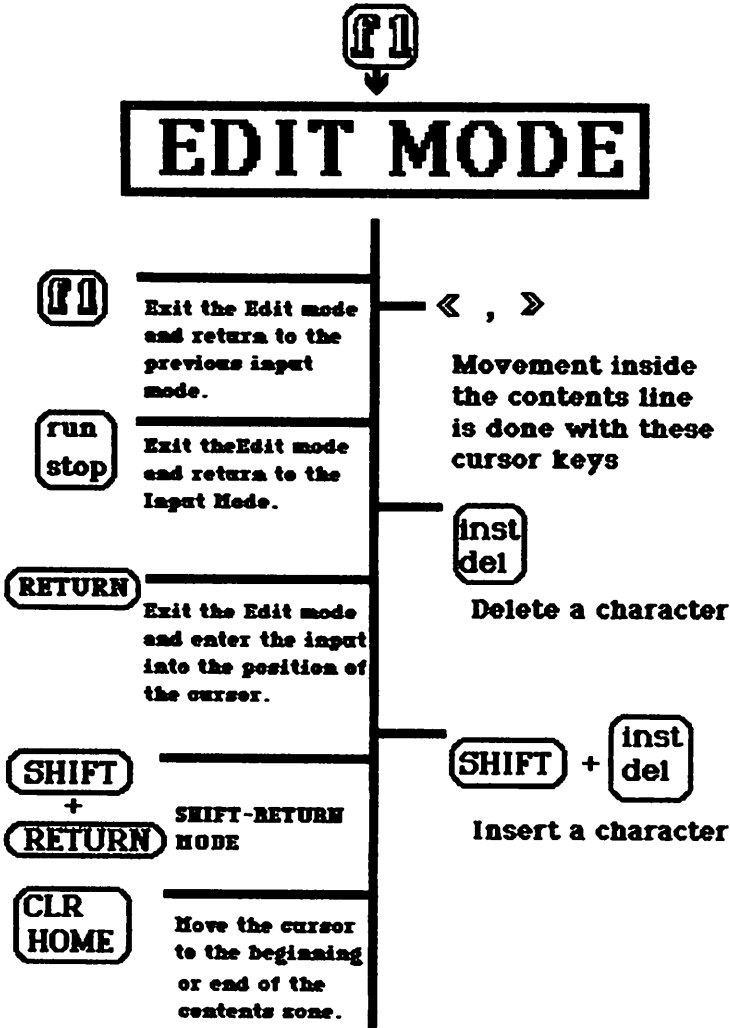highest rank are calculated first.

The rank of the individual expressions is determined by the
mathematical operators (operational signs) contained within
them. Exponentiation has the highest rank, addition and
subtraction the lowest.

1st rank exponentiation
2nd rank multiplication *, division /
3rd rank addition +, subtraction -

In the majority of practical cases, you will be OK if you
stick to the following rules:

Point-by-point calculation preceeds batch calculation.

Expressions inside brackets are ALWAYS calculated first,
without reference to their rank. In this case, the lowest
embedded expression is calculated first. The expression
which POWER PLAN regards as the lowest embedded is the
expression which is enclosed in the most brackets.

EDIT MODE

f1

Exit the Edit mode and return to the previous input mode.

run stop

Exit theEdit mode and return to the Input Mode.

RETURN

Exit the Edit mode and enter the input into the position of the cursor.

SHIFT + RETURN

SHIFT-RETURN MODE

CLR HOME

Move the cursor to the beginning or end of the contents zone.

《 , 》

Movement inside the contents line is done with these cursor keys

inst del

Delete a character

SHIFT + inst del

Insert a character

2.4. THE EDIT MODE

The EDIT mode makes it very convenient to edit an input or
the contents of a cell.   You can jump to the EDIT mode from
the VALUE input mode and the TEXT input mode.

Provided that the cell at which the screen cursor is
positioned is not blank, the EDIT mode can also be reached
from the input mode. POWER PLAN acts as if you had just
typed in the contents of the appropriate cell and then
selected the EDIT mode.

In the EDIT mode, the input cursor may be moved inside the
input zone by means of the "CURSOR LEFT" and "CURSOR RIGHT"
keys.   This enables a character to be replaced by another
one at any position in the input zone. Only those characters
can be typed in which are also able to be entered in the
corresponding input mode. If the EDIT mode is reached from
the VALUE input mode, no capitals may be typed in either.

The input may also be edited by using the "INST/DEL" and the
"SHIFT" + "INST/DEL" key.

Pressing the "INST/DEL" key deletes the character to the
left of the input cursor and the input cursor is moved one
place to the left.

Pressing the "SHIFT" and the "INST/DEL" keys together
inserts a blank character at the input cursor position.   A
character can only be inserted, of course, if the input line
is not full.

When the "CLR/HOME" key is pressed, the input cursor jumps
to the start of the input zone. If it is already there, it
is moved to the end of the input zone when the "CLR/HOME"
key is pressed.

To leave the EDIT mode again, press the "f1" key once more.
POWER PLAN now jumps back to the original input mode. The
input cursor is then positioned at the last character of the
input zone.

The input may also be completed in the EDIT mode, by
pressing the "RETURN" key to store the entry located in the
cell at which the screen cursor is positioned.

If both the "SHIFT" key and the "RETURN" key are operated at
the same time, you jump to the SHIFT RETURN mode. (See next
section).

When the "RUN/STOP" key is pressed, POWER PLAN leaves the
EDIT mode and goes into the input mode without storing the
input.

2.5. THE SHIFT RETURN MODE

This mode may be called up from the TEXT input, VALUE input
and EDIT modes.

In this mode the screen cursor may be moved over the
worksheet by means of the cursor keys and the "CLR/HOME"
key.

Pressing the "RETURN" key stores the previously typed input
in the cell at which the screen cursor is located.

You can also leave this mode by pressing the "RUN/STOP" key,
without filing the input in a cell.

You should always select this mode if you decide, after
typing in a VALUE or a TEXT, that the screen cursor is not
at the cell in which you wish to file the input.

2.6. THE WORKSHEET

All calculations within POWER PLAN take place in the
"worksheet".   This worksheet is divided into 255 lines and
63 columns. This gives approximately 16000 cells.

Each cell can be clearly identified by quoting its position
within the worksheet.   To identify a cell, the row and the
column in which it lies are combined together in   a
coordinate.   In this case, the column is named first, and
then the row.

The simplest way to specify the coordinate of a cell is to
quote the number of the relevant column or row.   POWER PLAN
uses a number to identify a row.   The column is defined by
one or two letters.   The first column is identified by the
letter A,   the second by the letter B.   Column Z is followed
by column AA,   and this is followed by column AB. The column
which follows column AZ is named BA.   The 63rd, that is the
last column of the worksheet, gets the name BK.

Naming of the rows, on the other hand, is very simple, since
they are consecutively numbered 1 to 255.

If the column and row references are put together, the
column always being named first, the cell in the top left
corner of the worksheet is designated A1.

In the same way, the cell in the bottom right corner of the
worksheet has the designation BK255.

2.7 THE FUNCTIONS

Apart from numbers and coordinates, functions can also be part of a VALUE (formula).

POWER PLAN offers you a large number of functions. The operation of which, we will now deal with.

Although the functions differ in the way they are called up, all function names in the VALUE must be specified as a combination of several small letters.

To address the SIN function, for example, you must press the "s", "i" and "n" keys one after the other.

2.7.1 BASIC FUNCTIONS

The first group includes many functions which are also used in a BASIC program. The syntax of these functions reads:

Function name (expression)

POWER PLAN considers an expression to be not just a number, but any combination of numbers, coordinates and function names. It is also quite possible that the expression, which follows a function name, contains a function reference as well.

E.g.: sin(3*a1+int(a2))

We shall now describe the individual functions, starting with the name of the function, followed by the "(expression)" and then the operation of the function itself.

abs (expression): This function gives the (ABSolute) value of the expression, which is always positive.

abs(-3) = 3 = abs(3)

int (expression): This function rounds the expression down to the next smallest number. So it always gives a result which is a whole number.

int(12.56) = 12 ; int(-5.2) = -6 (-6 is smaller than -5 !!).

exp (expression): Exponentiates the mathematical constant e (2.71828) with the expression.

exp(1) = 2.71828 ; exp(2) = 7.38905

log (expression): This function calculates the natural logarithm of the expression. It is the inverse function of the exp function. The number e (2.71828) is used as the base. The expression must always be greater than zero.

$$\log (2.71828) = 1 \; ; \; \log (7.38905) = 2$$

rnd (expression): This function gives a random result, which is between 0 and 1 and has no obvious relationship with the value of the expression.

$$\text{rnd } (0) = \text{random number between 0 and 1}$$

sgn (expression): The result of this function depends on the sign of the result of the expression.

Expression less than zero : sgn (-5) = -1
Expression greater than zero: sgn (+5) = + 1
Expression equal to zero: sgn(0) = 0

sqr (expression): This function calculates the root of the expression, which must be greater than or equal to zero.

$$\text{sqr } (0) = 0 \; ; \; \text{sqr } (81) = 9$$

2.7.2 THE TRIGONOMETRIC FUNCTIONS:

As you probably know, trigonometric functions normally refer to angular data. Since POWER PLAN cannot process angular data, these must first be converted into circular measure. The following formulae apply:

Angle in circular measure = angle in degrees * 0.174532925

cos (expression): Calculates the COSine of the expression.

$$\cos (3.14159265) = -1$$

sin (expression): Calculates the SINe of the expression.

$$\sin (3.14159265) = 0$$

tan (expression): Calculates the TANgent of the expression.

$$\tan (3.14159265) = 0$$

2.7.3 SPREADSHEET FUNCTIONS

This group contains all functions which may be used exclusively when working with POWER PLAN. Apart from two exceptions, all functions in this group are "block orientated".

Block orientated means that these functions always refer to a block of cells. The block can extend over several lines and columns.

To address a block orientated function, the function name must be typed in first, followed by the top left and bottom right corners of the block. The exact syntax is:

    Function name (top left corner: bottom right corner)

It is very important that two coordinates, separated by a colon, and not two expressions are written inside the brackets.

In the command sum(al:c4), the coordinate A1 represents the top left corner of the block, and the coordinate C4 the bottom right corner of the block. These two coordinates mean that this expression refers exclusively to the following cells:

    A1, A2, A3, A4, B1, B2, B3, B4, C1, C2, C3, C4

As usual, coordinates are only written in small letters in the block orientated commands. Block orientated functions mainly refer to VALUE fields. This is why blank or TEXT cells inside the given block are ignored.

Now, the functions and their method of operation in detail. (k1 represents the coordinate of the top left, k2 the coordinate of the bottom right corner of the block).

sum (k1:k2) : SUMs the contents of the cells in the block.

avg (k1:k2) : Calculates the average value of the cells of the block.

cnt (k1:k2) : Gives the number of VALUE cells in the block.

max (k1:k2) : Gives the largest (MAXimum) value in the block

min (k1:k2) : Gives the smallest (MINimum) value in the block.

Another function is the IF THEN ELSE function, which makes the worksheet become "intelligent". The IF must be followed by two expressions, which are separated by the greater than, less than, greater than or equal to, less than or equal to, equal to, or not equal signs. (<,>,<=,>=,=,<>).

It is thus possible to determine if the expression due to linking the two is true or false. Thus the expression 1 = 1 is true. But, the expression 1 = 2 is false.

If the expression is true, POWER PLAN calculates the expression which follows THEN. If the expression is false, POWER PLAN calculates the expression which follows ELSE.
An example: Let us assume that the number 1 is in cell A1, the number 4 is in cell A2 and the number 1 is in cell A3.

            if al=a2 then 4*3 else 25+int(5.5)

Since the expression al=a2 does not apply, POWER PLAN gives the result of the expression 25+int(5.5) ; 30

On the other hand, let us write:

            if al=a3 then 3*al else sum(al:a4)

In this case, POWER PLAN gives the result of the expression 3*al, since the contents of cell Al equal that of cell A3.

The percentage function

The syntax of the percentage function reads:

            %(expression 1 < expression 2)

Here expression 1 represents the percentage value and expression 2 represents the base value.

            %(9+1 < 100) = 10

2.8 THE MENU

All your POWER PLAN options are contained in the various
menus. To select one of these options, you must press the
"f7" key in the input mode. This moves POWER PLAN into the
menu mode. The main menu, where the menu cursor is also
located, appears at the bottom edge of the screen.

There are two main methods of selecting an option in a menu.

The first is to move the menu cursor to the appropriate
option by means of the "CURSOR RIGHT", "CURSOR LEFT", or
"SPACE BAR", and then press the "RETURN" key.

The second way to select the option is to type in, in small
letters, the letters written in capitals in the option. For
example, to select the EDIT option in the main menu, just
press the "e" key.

Important!

If the menu cursor is positioned at an option in any menu, a
HELP text for this option may be called up by pressing the
"?" key.

The system disk should be inserted in the drive unit of
course before the "?" key is pressed, as the HELP text has
to be loaded from the system disk.

If the message "please insert system disk" appears after the
"?" key has been pressed, this means that there is no HELP
text for this option.

In most cases, after the option has been selected, a new
menu appears in the menu zone, as the previously selected
option just represents a group of options.

This gives rise to a tree structure, the main menu
representing the trunk. The individual sub-menus are the
branches, which are further divided into smaller branches.
The end of a branch then stands for the option which is
carried out at the end.

POWER PLAN notes this option at the end of a branch. After
the option has been carried out and POWER PLAN has returned
to the input mode, the option can be selected again by
pressing the "←-" key, without having to go the roundabout
way through the individual sub-menus. The use of the "←-"
key in conjunction with the TITLE FIELD, for example, is
very useful.

2.9. THE COORDINATE INPUT

When using a few options you will again be asked to type in coordinates. The coordinate is always typed in inside an input zone which is 5 character wide.

After you have selected the appropriate option, POWER PLAN first enters the actual screen cursor coordinate in the input zone. Because of this, it is advisable in most cases to move the screen cursor to the cell which you wish to nominate as the coordinate before selecting the relevant option.

If, after selecting the appropriate option, the desired coordinate is already in the input zone, the "RETURN" key may be pressed to complete the coordinate input. Of course, if you wish to type in another coordinate, rather than the one already displayed, there are 2 ways of doing this.

Method one

First clear the input zone by operating the "SHIFT" and "CLR/HOME" keys together. Then type the desired coordinate as a combination of letters and numbers in the input zone. If you enter a wrong letter, you can delete the last letter in the input zone by pressing the "INST/DEL" key.

If the correct coordinate is now in the input zone, you can complete the coordinate input by pressing the "RETURN" key.

Method two

The second method involves moving the screen cursor in the coordinate input to the desired cell by means of the cursor keys. If a cursor key is pressed in the coordinate input mode, this not only moves the screen cursor in the corresponding direction, but also automatically enters the new screen cursor coordinate in the input cell.

If the screen cursor is positioned at the desired cell, the coordinate input is completed by pressing the "RETURN" key and at the same time, the screen cursor is moved to the cell where it was located before the relevant option was selected.

Pressing the "SHIFT" and the "RETURN" keys together in conjunction with various options, has a special significance which applies to both types of inputs.

Both keys have this special function, for example with the REPLICATE option, when not one, but several coordinates are typed in.

The following text is displayed in the menu zone after the REPLICATE option has been selected:

                    Source range from   to
                    Target range from   to

Here, not one but four coordinates have to be entered. The
first input zone is next to the word "from" in the first
line of the menu zone.   The first coordinate is typed into
this input zone.

The coordinate input continues in the next input zone after
this coordinate has been completed by pressing the "RETURN"
key.

If, in this input, the "RETURN" and the "SHIFT" keys are
pressed at the same time, the next coordinate is entered in
the previously used input cell and not in the next one.

In this way it is possible to correct incorrectly entered
coordinates, even after completing the coordinate input.

2.10. THE OPTIONS

In the following pages we shall be discussing in detail the options provided by POWER PLAN.

Each option is dealt with from three different points of view.

The first is the way in which the option is selected. We shall always assume that POWER PLAN is in the input mode and that we can get into the menu mode.

Secondly, we will be looking at the operation of the option and its effect on the worksheet or individual cells.

The third and last aspect of each option which we shall consider, concerns the way in which the particular option is handled. This involves the information to be given about the relevant option.

2.11 GLOBAL

To call it up from the input mode, press the following keys:

                    f7 (in the menu mode)
                    g (for global)

The GLOBAL option is contained in the main menu. It represents a group of options held in the GLOBAL menu. After the GLOBAL option has been called up, the system branches into the GLOBAL menu.

The GLOBAL menus contains the following options:

                    Maximum Integer Fixed point Center
                    Left Right Colour Columns Protect

The GLOBAL menu options determine the way in which all cells are displayed on the screen and on the printer. This applies to both VALUE and TEXT cells.

In addition, the width of all columns in the window may be defined with the aid of the options in this menu.

Now, details of the options.

2.11.1 MAXIMUM (GLOBAL)

To call it up from the input mode, press the following keys:

>   f7 (in the menu mode)
>   g (in the GLOBAL menu)
>   m (for maximum)

The MAXIMUM option is contained in the GLOBAL menu. Since this option requires no further inputs, it is carried out immediately. When this has been completed, POWER PLAN returns to the input mode.

The MAXIMUM option means that all VALUE cells are displayed in the worksheet with maximum accuracy. When it is called up, all VALUE cells, even those whose appearance has been defined by means of the FORMAT option, are immediately displayed with maximum accuracy.

The MAXIMUM option only relates to numbers displayed externally (on the screen and the printer). Internally, numbers are always represented as accurately as possible.

The "maximum" accuracy of a cell mainly depends on two factors. The first is the number of bytes with which a number is represented in the computer's memory. The more bytes used to represent a number, the more accurate it becomes, but the storage space for other cells is reduced. We therefore have to try to combine the desire for high accuracy with the requirement to store a large number of cells.

The second factor, which limits the accuracy of a number, is the column width. Although a number is stored in the computer's memory with 12 decimal places, only a few of the decimal places may be displayed on the screen, because the column width is too narrow. You should therefore try to display numbers which have to be very accurate, in columns which are as wide as possible.

If a column, which is to display a number with maximum accuracy, is too narrow, the last decimal places are left out, rounded up, or the number is represented by exponential notation.

When POWER PLAN is started up, the appearance of the VALUE cells is preset to maximum accuracy, so all newly typed VALUE cells are displayed on the screen with maximum accuracy.

2.11.2 INTEGER (GLOBAL)

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    g (in the GLOBAL menu)
                    i (for integer)

The INTEGER option is contained in the GLOBAL menu and is executed immediately as it does not need any further input. After it has been carried out, POWER PLAN returns to the input mode.

The INTEGER option refers only to VALUE cells and means that all VALUE cells are displayed in the worksheet as whole numbers. Even VALUE cells, whose appearance was defined by means of the FORMAT option, are displayed as integers after the option has been called up.

Not only those just entered, but all VALUE cells typed in later are displayed as whole numbers until their appearance is redefined.

After the INTEGER option has been called up, the cells are also stored internally as accurately as possible. They are only represented as whole numbers when displayed on the screen or printed out on the printer.

Positive numbers are displayed by rounding down to the next whole number. The number 12.67 thus becomes 12 in the integer format.

POWER PLAN treats negative numbers in exactly the same way, but the rounded result is often rather confusing. For example, the number -5.1 becomes -6.

This apparently strange process is due to the fact that the number -6 is smaller than the number -5.

2.11.3 DECIMAL (GLOBAL)

To call it up from the input mode, press the following keys:

> f7 (in the menu mode)
> g (in the GLOBAL menu)
> d (for decimal)

The DECIMAL option is contained in the GLOBAL menu and represents two other options. After the DECIMAL option has been called up, POWER PLAN branches into the DECIMAL menu.

The DECIMAL menu contains the following options:

Set format Decimal places

The idea of the DECIMAL option is to display numbers with a specific number of decimal places. This can be very useful in business calculations, for example.

Using the DECIMAL option it is possible to represent dollars with two decimal places, to obtain the exact dollar and penny amounts.

Now details of the two options:

2.11.3.1 SET FORMAT

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> d (in the DECIMAL menu)
> f (for SET FORMAT)

The SET FORMAT option is contained in the DECIMAL menu. It is executed immediately when called up as it requires no further inputs. After it has been carried out, POWER PLAN branches into the input mode.

By selecting the SET FORMAT option, all VALUE cells are displayed on the screen and the printer with a definite number of decimal places. This also applies to cells, whose appearance has been defined by the FORMAT option and to cells to be typed in later.

The number of decimal places can be defined by means of the DECIMAL PLACES option. When POWER PLAN starts up, this is preset to two places.

Displaying the number with two decimal places is particularly useful if the number concerned represents an amount of currency.

Even when a number is displayed on the screen with a fixed
number of decimal places, it is processed in the memory with
higher accuracy.

If the number has more than the specified number of decimal
places, these are rounded up to the required number of
places.

If the column width is too narrow to allow a number to be
displayed with the required number of decimal places, these
are not suppressed, but several " > " characters appear on
the screen instead of the number.

2.11.3.2 DECIMAL PLACES

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    g (in the GLOBAL menu)
                    d (in the DECIMAL menu)
                    d (for DECIMAL PLACES)

The DECIMAL PLACES option is contained in the DECIMAL menu,
but is not carried out immediately as it requires a further
input.

You can type into the menu zone how many decimal places a
number should have when displayed. The number typed in here
applies to all VALUES displayed in the worksheet as fixed
point numbers.

The previous number of decimal places is shown in the input
zone and may be overwritten by a new number.

A number may be displayed with a minimum of 1 or a maximum
of 9 decimal places.

After POWER PLAN has started up, the number of decimal
places is preset to 2.

2.11.4. CENTER (GLOBAL)

To call it up from the input mode, press the following keys:

> f (in the main menu)
> g (in the GLOBAL menu)
> e (for cEnter)

The CENTER option is contained in the GLOBAL menu and is not executed immediately as it requires further inputs.

The CENTER option can refer to both VALUE and TEXT cells. Selecting this option centers all VALUE or TEXT cells in the relevant cell of the worksheet. This also applies to cells whose appearance was defined by means of the FORMAT option.

The cells within a column remain centered, even if the width of this column is changed.

After the CENTER option has been selected, the following text appears in the menu zone:

Values Texts Both

Using the menu cursor, you can now select the group of cells to be centered.

VALUES means that only VALUE cells ; TEXTS means only TEXT cells and BOTH means that both types of cells are shown centered.

After the group has been specified, the CENTER option is carried out and POWER PLAN returns to the input mode.

2.11.5 LEFT (GLOBAL)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> l (for left)

The LEFT option is contained in the GLOBAL menu and is not
carried out immediately as it requires further inputs.

Using the LEFT option, you can specify that all VALUE or
TEXT cells are displayed left justified in the worksheet.
This applies to all cells whose appearance was defined by
means of the FORMAT option.

After POWER PLAN is started, it sets the display for all
TEXT cells to left justified.

When the LEFT option has been selected, the following text
appears in the menu zone:

                    Values Texts Both

Using the menu cursor, you can now decide whether only VALUE
cells, only TEXT cells or both types of cells are to be
displayed left justified.

When this group is selected, POWER PLAN carries out the LEFT
option and then returns to the input mode.

2.11.6 RIGHT (GLOBAL)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> r (for right)

The RIGHT option is contained in the GLOBAL menu and is not
carried out immediately as it requires further inputs.

The RIGHT option specifies that all VALUE or TEXT cells are
displayed in worksheet right justified.

After the option has been selected, those cells whose format
was defined by means of the FORMAT option are displayed
right justified.

When POWER PLAN is started it presets the display to right
justified for all VALUE cells.

When the RIGHT option has been selected, the following text
appears in the menu zone:

<p align="center">Values Texts Both</p>

Using the menu cursor, you can now decide whether only VALUE
cells, only TEXT cells or both types of cells are to be
shown right justified.

After this group has been selected, the RIGHT option is
carried out and the system then goes into the input mode.

2.11.7 COLOR (GLOBAL)

The COLOR option is contained in the GLOBAL menu and is not
carried out immediately after being selected as it requires
further inputs.

The color of all TEXT cells on the screen may be defined by
means of the COLOR option. When this option is called up,
the color of all cells whose color has been defined by the
FORMAT option is set to the new color.

When POWER PLAN is started up, the color of all VALUE and
TEXT cells is set to white.

After the COLOR option has been called up, the following
text appears in the menu zone:

<div align="center">Color :   0-black</div>

A name of a color is now shown in the menu zone. To display
another color, just press the "SPACE BAR". When you have
located the desired color, complete your selection by
pressing the "RETURN" key.

The following text now appears in the menu zone:

<div align="center">Values Texts Both</div>

You can now chose to display only VALUE cells, only TEXT
cells or both types of cells in the preselected color.   On
completion of the input, the COLOR option is carried out and
then returns to the input mode.

2.11.8. COLUMNS (GLOBAL)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> o (for cOlumns)

The COLUMNS option is contained in the GLOBAL menu and is not executed immediately as further inputs to this option are required.

Using the COLUMNS option you can define the width of all columns in a window. When the option is carried out, the width of the columns, whose width was specified by the FORMAT option, are set to the new width.

After the option has been called up, the following text appears in the menu zone:

> Global Column width for window:

You now decide which window is to be defined by the global column width. Since POWER PLAN can display two windows, only the numbers 1 and 2 are accepted.

When the window input is completed, the desired width is typed in. Widths of less than 5 or more than 18 characters cause an error message to be displayed.

If an acceptable width has been typed in, the COLUMN option is carried out and the system reverts to the input mode.

2.11.9. PROTECT (GLOBAL)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> p (for protect)

The PROTECT option is contained in the GLOBAL menu and represents three more options, which are displayed in the menu zone when the option is called up.

The three options are:

> Codeword: Input / Clear
>   Fill character

This option allows you to define a code word to protect certain cells in the worksheet from overwriting or "listing".

We'll now deal with the three options in detail:

2.11.9.1 CODEWORD: INPUT (PROTECT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> p (in the PROTECT menu)
> i (for input)

The CODEWORD INPUT option is contained in the PROTECT menu and is not carried out immediately as it requires further inputs.

After the CODEWORD INPUT option has been called up, the following appears in the menu zone:

> Define Code-word :   .....

If you are calling up this option for the first time, you can then type in any code word of 5 characters, which you must remember since it can be very important later on.

If, however, you have already protected a few cells by using the CODEWORD INPUT and CODEWORD CLEAR options, you must now type in the code word again which has already been defined.

To provide a certain amount of protection, the characters typed in are not displayed on the screen.

If the correct codeword has been typed in, POWER PLAN acknowledges this with an appropriate message and then goes

into the input mode. Previously protected cells are then
displayed unprotected.

This does not mean of course that the corresponding cells
are no longer protected. When the code word is cleared
again, they are again displayed protected.

2.11.9.2 CODEWORD CLEAR (PROTECT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> g (in the GLOBAL menu)
> p (in the PROTECT menu)
> c (for clear)

The CODEWORD CLEAR option is contained in the PROTECT menu
and is executed immediately.

The CODEWORD CLEAR option is only important if a code word
has already been defined. If not, an error message appears.

On the other hand, if a code word was defined by means of
the CODEWORD INPUT option, all cells in the worksheet which
are labelled as protected, are identified when the CODEWORD
CLEAR option is called up.

2.11.9.3 FILL CHARACTERS

The FILL CHARACTERS option is contained in the PROTECT menu
and is not carried out immediately as it requires further
input.

After the FILL CHARACTERS option has been called up, the
following appears in the menu zone:

> Please enter fillcharacter :

The character typed in will be displayed when you PROTECT a
cell.

2.12. FORMAT

To call it up from the input mode, press the following keys:

                    f7 (in the menu mode)
                    f (for format)

The FORMAT option is contained in the main menu. It
represents a group of options, which are held in the FORMAT
menu. After the FORMAT option has been called up, it
branches into the FORMAT menu.

The FORMAT menu contains the following options:

            Maximum Integer Decimal cEnter Left
            Right Color cOlumns Protect

The FORMAT menu options determine the appearance of the cell
at which the screen cursor is located when the FORMAT option
is selected. This applies to both VALUE and TEXT cells.

The width of the column at which the screen is positioned,
may also be defined with this option.

                      IMPORTANT!

The FORMAT menu options can only define the appearance of
occupied cells. If you try to define the appearance of a
blank cell, this brings up an error message.

And now the options in detail.

2.12.1. MAXIMUM (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the menu mode)
> f (in the FORMAT menu)
> m (for maximum)

The MAXIMUM option is contained in the FORMAT menu. Since this option needs no further inputs, it is executed immediately. After it has done this, POWER PLAN returns to the input mode.

The MAXIMUM option means that the cell at which the screen cursor is located is displayed with maximum accuracy in the worksheet. This only happens of course if the screen cursor is positioned at a VALUE cell. If it is at a blank or a TEXT cell, an error message appears.

2.12.2. INTEGER (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> f (in the FORMAT menu)
> i (for integer)

The INTEGER option is contained in the FORMAT menu and is carried out immediately since it does not require any other inputs. After it has been carried out, POWER PLAN returns to the input mode.

The INTEGER option only refers to the cell at which the screen cursor is positioned. It means that the cell at which the screen cursor is positioned in the worksheet, is displayed as a whole number. This only happens if the corresponding cell is a VALUE cell. Otherwise, an error message appears.

After the INTEGER option has been called up, the cell is stored internally as accurately as possible. It is only displayed as a whole number when it appears on the screen or the printer.

Positive numbers are rounded down to the next whole number. Thus the number 12.7 becomes 12 in the whole number format.

POWER PLAN treats negative numbers in exactly the same way, but the rounded result is often rather confusing. For instance, the number -5.1 becomes -6. This apparently strange process is due to the fact that the number -6 is smaller than the number -5.

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2.12.3. DECIMAL (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the menu mode)
> f (in the FORMAT menu)
> d (for decimal)

The DECIMAL option is contained in the FORMAT menu and is carried out immediately if the screen cursor is at a VALUE cell.

If the screen cursor is at a blank or TEXT cell, this generates an error message.

The DECIMAL option means that the number is displayed in the appropriate cell with a fixed number of decimal places.

The number of decimal places can be defined by means of the DECIMAL PLACES option in the GLOBAL menu.

2.12.4 CENTER (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> f (in the FORMAT menu)
> e (for cEnter)

The CENTER option is contained in the FORMAT menu and is carried out immediately as it needs no further inputs.

The CENTER option only refers to the cell where the screen cursor is positioned. If the corresponding cell is blank, an error message appears.

When this option is selected, the cell at which the screen cursor is located, is centered in the worksheet. The cell remains centered in the column, even if the width of this column is changed.

After this option has been carried out, the system returns to the input mode.

2.12.5 LEFT (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> f (in the FORMAT menu)
> l (for left)

The LEFT option is contained in the FORMAT menu and is carried out immediately as it needs no further inputs.

Using the LEFT option, you can specify that the cell at which the screen cursor is positioned, is displayed left justified in the worksheet.

If the screen cursor is at a blank cell, this generates an error message.

When this option has been executed, the system returns to the input mode.

2.12.6. RIGHT (FORMAT)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> f (in the FORMAT menu)
> r (for right)

The RIGHT option is contained in the FORMAT menu and is carried out as soon as it is selected, as it needs no further inputs.

With the help of the RIGHT option, you can specify that the cell at which the screen cursor is positioned is displayed right justified in the worksheet.

If the screen cursor is at a blank cell, an error message appears.

After this option has been carried out, the system returns to the input mode.

2.12.7. COLOR (FORMAT)

The COLOR option is contained in the FORMAT menu and is carried out when selected, as it needs no further inputs.

Using the COLOR option, you can define the color of the cell at which the screen cursor is located.

If the screen cursor is at a blank cell, an error message appears, because it is not possible to allocate a color to a blank cell.

After the COLOR option has been called up, the following text appears in the menu zone:

                    Color :   0-black

A name of a color is now shown in the menu zone. To display another color, just press the "SPACE BAR". When you have located the desired color, complete your selection by pressing the "RETURN" key.

The option is now carried out and then returns to the input mode.

2.12.8. COLUMNS (FORMAT)

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    f (in the FORMAT menu)
                    o (for cOlumns)

The COLUMNS option is contained in the FORMAT menu and is not executed when selected, as further inputs to this option are required.

Using the COLUMNS option, you can define the width of the column in the corresponding window in which the screen cursor is located.

After the option has been called up, the following text appears in the menu zone:

                Column width for x in window y :

Here x stands for the column at which the screen cursor is positioned, and y stands for the window in which the screen cursor is located.

You can now type in the desired column width. Widths of less than 5 or more than 18 characters cause an error. If an acceptable width has been typed in, the COLUMN option is preformed and the system reverts to the input mode.

2.12.9. PROTECT (FORMAT)

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    f (in the FORMAT menu)
                    p (for protect)

The PROTECT option is contained in the FORMAT menu and
represents four more options, which are displayed in the
menu zone when the option is called up.

The four options are:

                    Protect value   Set / Clear
                    Protect formula sEt / cLear

It is possible to protect occupied cells against overwriting
and "listing", with the help of this option.

A code word should be defined first by means of the CODEWORD
INPUT (GLOBAL PROTECT) option before cells are protected by
means of the above option.

When cells are protected they are not immediately identified
as such in the worksheet. This only happens when the
protection is activated by the DELETE (GLOBAL PROTECT)
option.

Now, details of the options..

2.12.9.1. PROTECT VALUE SET

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    f (in the FORMAT menu)
                    s (for set)

The PROTECT VALUE SET option is contained in the FORMAT menu
and is executed immediately on selection, as it needs no
further inputs.

A code word must be defined via the CODEWORD INPUT (GLOBAL
PROTECT) option before the PROTECT VALUE SET option is
selected.

After the PROTECT VALUE SET option has been selected, the
cell where the screen cursor is positioned is protected,
provided this cell is occupied by a VALUE or a TEXT.

The cell is only shown as protected in the worksheet if the
code word is deleted by means of the CLEAR (GLOBAL PROTECT)
option.

If the cell in the worksheet has VALUE protection, the VALUE
is displayed in the contents line, since the cell is filled
in the worksheet with characters typed in in the form of
fill characters (GLOBAL PROTECT FILL CHARACTERS).

Of course the relevant cell may be overwritten by a new
cell.

2.12.9.2. PROTECT VALUE CLEAR

To call it up from the input mode, press the following keys:

> f7 (in the main format)
> f (in the FORMAT menu)
> c (for clear)

The PROTECT VALUE CLEAR option is contained in the FORMAT
menu and is carried out immediately it is selected, since it
needs no further inputs.

Before selecting the PROTECT VALUE CLEAR option, you must
type in a code word with the CODEWORD INPUT (GLOBAL PROTECT)
option, to de-activate the cell protection in the worksheet.

After the PROTECT VALUE CLEAR option has been called up, the
cell where the cursor is located no longer has value
protection.

2.12.9.3. PROTECT FORMULA SET

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> f (in the FORMAT menu)
> e (for sEt)

The PROTECT FORMULA SET option is contained in the FORMAT
option and is carried out immediately, since it needs no
further inputs.

A code word must be defined with the aid of the CODEWORD
INPUT (GLOBAL PROTECT) option before the (protect formula)
SET option is selected.

After the PROTECT FORMULA SET option has been selected, the
cell where the screen cursor is located is protected,
provided this cell is occupied by a VALUE or a TEXT.

The cell is only shown in the worksheet as protected if the
code word typed in has been deleted by means of the CLEAR
(GLOBAL PROTECT) option.

If the cell in the worksheet has formula protection, the
mathematical result of the cell is shown in the cell. The
word "protected" now appears in the contents line, instead
of the VALUE.

The relevant cell is also protected against overwriting or
deletion when the PROTECT FORMULA SET option is selected.

2.12.9.4 PROTECT FORMULA CLEAR

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    f (in the FORMAT menu)
                    l (for cLear)

The PROTECT FORMULA CLEAR option is contained in the FORMAT
menu and is carried out immediately when selected, as it
needs no further inputs.

Before selecting the PROTECT FORMULA CLEAR option, you must
first de-activate the cell protection by using the CODEWORD
INPUT (GLOBAL PROTECT) option.

After the PROTECT FORMULA CLEAR option has been carried out,
the corresponding cell is no longer protected and may be
overwritten or deleted.

2.13. EDIT

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    e (for edit)

The EDIT option is contained in the main menu. It has no
function itself but represents a group of options which are
held in the EDIT menu.

When this option is selected, the EDIT menu appears in the
menu zone. This contains the following options:

            Replicate Sort Copy Window rEcalculate
                 Delete Insert Text Move

Using these options, you can manipulate cells in the
worksheet in different ways.

When selecting one of these options you will frequently be
asked to type in coordinates. You can read how to do this in
the chapter headed "2.9. Coordinate input" in the system
manual.

2.13.1. REPLICATE

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> r (for replicate)

The REPLICATE option is contained in the EDIT menu and is not carried out immediately as this option needs further inputs.

Important!

The REPLICATE option is designed exclusively for the duplication of VALUE cells in the worksheet. Of course you can also duplicate TEXT cells, but you should use the COPY option for duplicating TEXT cells because it is quicker.

The REPLICATE option duplicates VALUE cells is a special way, as it also shifts the coordinate inputs inside the formula to be duplicated.

An example:

Let us assume that cells A1 to A10 are occupied with the numbers 1 to 10. The total of 1 and the contents of corresponding cell in column A should appear in cells B1 to B10.

The formula for cell B1 would be: 1+a1, and that for cell B2: 1+a2, etc.

Using the REPLICATE option, you don't have write in the respective formula in cells B1 to B10; all you do is write the formula in cell B1 and then duplicate it.

Let's assume that the formula 1+a1 is now in cell B1 and you tell POWER PLAN to duplicate this formula in cells B2 to B10, then the following happens.

POWER PLAN moves the source formula in cell B1 into the cells below in succession, and for each line where it moves a cell, it moves the line information in the coordinate input inside the formula.

Thus if it moves the formula from cell B1 to cell B2, it also moves the coordinate information in the formula down by one line at the same time.

The formula 1+a1 would then become 1+a2.

The same process is repeated when the formula is moved into cells B3 to B10.

If the source formula is not moved into another row but into another column, the column information in the coordinate data is also moved in the same way.

Obviously with longer formulae, not just the first, but all coordinate inputs are moved.

Now back to the REPLICATE option.

After the replicate option has been called up, the following text appears in the menu zone:

                    Source range from   to
                    Target range from   to

You can now specify which cells you wish to duplicate in other cells.

First, type in which cells have to be duplicated. If you want to duplicate only one cell, you must type in the coordinate of the corresponding cell twice as the source coordinates. (We suggest you move the screen cursor to the cell to be duplicated, before selecting the REPLICATE option).

It is not only possible to duplicate one cell, but you can also duplicate a column or a row of cells. In this case you must type in the highest cell or the one furthest to the left, as the "from" coordinate. The two destination area coordinates give the area in which the formula or formulae have to be duplicated.

Here, one cell, one row, one column or a whole block of cells may be entered as the destination area.

When the coordinates for the destination and source areas have been typed in, a new question appears in the menu zone:

                    Delete occupied cells y/n

If you answer this question with "y" for yes, all occupied cells in the destination area are overwritten by the new formula.

If you answer "n" for no, the formula is only duplicated in those cells which were not occupied up to this point. After this question is answered, a second one appears in the menu zone.

                    Preserve pattern (y/n)

If you want all coordinate inputs contained in the formula being duplicated to be moved, answer this question with "n" for no. Consequently, all important data are entered and the REPLICATE option is carried out.

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If don't want one or more coordinate inputs inside the
formula being duplicated to be moved, then answer the above
question by pressing the "y" key.

The formula to be duplicated now appears in the menu zone,
with all coordinate data being displayed initially in the
contrast color.

To tell POWER PLAN that a coordinate input should not be
moved, move the cursor with the "CURSOR LEFT" or the "CURSOR
RIGHT" key to the cooresponding coordinate information.

If the "RETURN" key is now pressed, the corresponding
coordinate information is now displayed in the type color,
not the contrast color. This indicates that this coordinate
data is not to be moved during duplication. This process
can be reversed if the "RETURN" key is pressed again.

If you have labelled all the coordinates which are not to be
moved, you can start the duplication process by pressing the
"SHIFT" and the "RETURN" keys together.

2.13.2 SORT

To call this up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> s (for sort)

The SORT option is contained in the EDIT menu and is not carried out immediately after selection as further inputs are needed.

Both VALUE and TEXT cells may be sorted with the aid of the SORT option.

The following text appears in the menu zone when the SORT option is called up:

> Sort   from   to

You can now type in the two coordinates which specify the area to be sorted. It is important that both coordinates are in the same column, since only one column or part of it can be sorted.

Type in the first coordinate of the highest cell to be sorted.

The next question relates to the type of cell which has to be sorted. You can select either TEXTS or FORMULAS.

Your answer to the next question, where you select either "increasing" or "decreasing", determines how the sorting is done.

Before we go into the significance of the next question, we'll first explain the two questions just mentioned.

As you already know, POWER PLAN can sort TEXT cells and VALUE cells, and the way it does it is different in each case. When it is sorting TEXT cells, these are sorted according to the priority of the individual letters of the alphabet contained in it. This makes it possible, for instance, to sort lists of names.

VALUE cells, on the other hand, are sorted according to their value.

If TEXTs are sorted in increasing order, the name "Abel" is placed before the name "Zagolla". Conversely, if these TEXTs are sorted in decreasing order, the name "Zagolla" is placed before the name "Abel".

VALUEs are sorted in a similar way. If VALUEs are sorted in
increasing order, the number 1 is placed before the number
99.   If VALUEs are sorted in decreasing order, the number 99
is placed before the number 1.

The last question reads:

<div align="center">Reference columns (y/n)</div>

If you answer with "n" for no, the sorting process starts,
and only the positions of the cells in the block being
sorted are changed.   At the end of the sorting process,
POWER PLAN returns to the input mode.

If, however, you answer the above question by pressing the
"y" key, you are able to define up to 62 reference columns.

What is a reference column?

Let's assume that cells A1 to A10 are being sorted and
column B is defined as the reference column.   During the
sorting process if the contents of cell A5 are moved to cell
A2, the contents of cell B5 are moved into cell B2 at the
same time.

In order to define a reference column, you only have to move
the screen cursor to the relevant column and then press the
"RETURN" key.

To end the reference column input, move the screen cursor to
any cell in the column being sorted and then press the
"RETURN" key.   The sorting process then starts and when it
has finished, the system returns to the input mode.

2.13.3. COPY

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> c (for copy)

The COPY option is contained in the EDIT menu and is not carried out immediately when it is called up, as it requires further inputs.
Blank cells, TEXT cells and VALUE cells can be copied by means of the COPY option.

If blank cells are copied, this causes the cells in the destination area to be deleted.

The following text appears in the menu zone when this option is called up:

> Source-range from   to
> Target-range from   to

The coordinates for the source area decide which cells are to be copied. In this case, one cell, one column or a line of cells may be typed in. It is important that the coordinate of the highest cell or the one furthest to the left is typed in.

The two coordinates which enclose the destination area are then typed in. The destination area can be a cell, a column, a row or a block of cells.

As when typing in the source area, the top left and then the bottom right corner of the block must be typed in here.

<p align="center">Important!</p>

1.) The destination area and the source area must not overlap.

2.) The destination area must have as many rows or columns as the source area. So, for example, it is not possible to copy cells A1, B1, C1 and D1 into cells A3, B3, A4 and C4.

The next question decides whether cells already occupied should be overwritten in the destination area.

<p align="center">Delete occupied cells (y/n)</p>

If you answer this question with "y" for yes, the source cell is written into all cells, including those in the destination area already occupied.

But if your answer this question by pressing the "n" key, the source cell is only written into cells in the destination area which are not yet occupied.

If several cells were specified as the source area, the copy process is started when the above question is answered, and when completed, the system reverts to the input mode.

If, on the other hand, only one cell was specified as the source area, this final question appears in the menu zone.

<center>Copy format only (y/n)</center>

This question means that not only cells but also their format may be copied by means of the COPY option.

An example:

Let's assume that the VALUE global format has been set to left justified, but you want to display cells Al to Al0 right justified. To do this with POWER PLAN, you don't have to set each one of these 10 cells to right justified by means of the FORMAT option, as there is a much simpler way.

First make cell Al right justified with the help of the FORMAT option. You then copy cell Al, cell Al being typed in twice as the source area. Cell A2 and cell Al0 are specified as the destination area. When asked if occupied cells have to be deleted, answer by pressing the "n" key. When asked if only the format of cell Al is to be copied, answer by pressing the "y" key. As a result, only the format of cell Al is copied into cells A2 to Al0.

2.13.4. WINDOW

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> w (for window)

The WINDOW option is contained in the EDIT menu. It carries out no function itself, as it merely represents two other options, which appear in the menu zone when it is called up.

Window: Set up / Clear

Before we deal with the significance of these two options, we'll say a word about windows.

POWER PLAN is able to divide the screen into two windows, and you can chose whether it divides the screen horizontally or vertically.

When POWER PLAN is started up, there is only one window, which practically fills the entire screen.

If two windows are displayed on the screen, the contents of both are taken from the same worksheet.

If for example, you write the VALUE 1 in cell A1 in the first window, cell A1 displayed in the second window also contains the VALUE 1.

Now details of the options.

2.13.4.1 WINDOW: SET UP

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> w (in the WINDOW menu)
> s (for set up)

The SET UP option is contained in the WINDOW menu and is not carried out immediately, since further inputs are needed.

If the screen is already divided into two windows, an error message appears if this option is selected.

After the SET UP option has been selected, the following text appears in the menu zone:

Splitting Horizontal / Vertical

You can chose with the cursor whether the screen is divided horizontally or vertically.

Let's first deal with the horizontal division. After you have selected HORIZONTAL, a long, horizontal cursor appears in the rows of the worksheet section displayed on the screen. You can now move this cursor by using the "CURSOR UP" and "CURSOR DOWN" keys, but you must ensure that at least one row is left for each window.

If the long horizontal cursor is in the row that you want, the screen is divided at this point when you press the "RETURN" key. POWER PLAN then returns to the input mode.

If, on the other hand, you chose VERTICAL, a vertical cursor appears on the screen, and this can be moved over the screen by means of the "CURSOR LEFT" and "CURSOR RIGHT" keys.

In this case you must make sure that each window is at least 7 characters wide.

Having selected the column at which the screen is to be divided, you complete this operation by pressing the "RETURN" key.

2.13.4.2 WINDOW: CLEAR

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   w (in the WINDOW menu)
>   c (for delete)

The CLEAR option is contained in the WINDOW menu and is executed immediately, since it needs no further inputs.

When the CLEAR option is carried out, the operation dividing the screen into 2 windows is reversed.

After this option is called up, the screen consists of only one window (with the number 1) which practically fills the entire screen.

After POWER PLAN returns to the input mode, the screen cursor is positioned at cell A1.

2.13.5 RECALCULATE

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> e (for rEcalculate)

The RECALCULATE option is contained in the EDIT menu and fulfills no function itself, as it just represents a group of options.

These options are contained in the RECALCULATE menu, which appears in the menu zone when the RECALCULATE option is selected:

> Recalculate : Columns Rows Off
> Screen   : oFf oN

Before going into the meaning of the individual options, we'll briefly explain how the worksheet is recalculated. As you know, you can carry out calculations with POWER PLAN, so that when an input value is changed, the final value of the calculation is changed automatically. This ability is based on the fact that worksheet is recalculated each time a cell is typed in.

In the training manual we explained that this recalculation is carried out from cell Al to cell BK255. For this reason, a cell can only relate to another cell which is above it or to the left of it. This explanation, however, was simplified and we shall modify it a little when looking at the options contained in the RECALCULATE menu.

2.13.5.1 RECALCULATE : COLUMNS

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> e (in the RECALCULATE menu)
> c (for columns)

The COLUMNS option is contained in the RECALCULATE menu and
is carried out immediately.

When the system has returned to the input mode, a "C"
appears at the end of the second line of the screen, to
indicated that the screen is being checked column by column.

If the screen is recalculated column by column, this means
that cells A1, A2, A3 to A255 are recalculated first, then
cells B1 to B255.

This form of recalculation is preset when POWER PLAN is
started.

By using this type of recalculation, it is possible for cell
B1 to relate to cell A5, for example, since cell A5 is
recalculated before cell B1.   But it is not possible for
cell A1 to relate to cell B1 or even cell B2.

2.13.5.2 RECALCULATE : ROWS

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> e (in the RECALCULATE menu)
> r (for rows)

The ROWS option is contained in the RECALCULATE menu and is
carried out immediately, as it needs no further inputs.

The ROWS option specifies how the worksheet is recalculated
when a new cell is typed in.

When the system has returned to the input mode, a "R"
appears at the end of the second line of the screen, to
indicate that the screen is being checked through row by
row.

When the screen is checked row by row, cells A1, B1, C1 to
BK1 are checked first. If the worksheet is recalculated row
by row, it is possible, for example, for cell A2 to relate
to cell B1, since cell B1 is checked before cell A2.
However, it is not possible for cell A2 to relate to cell B2
or cell B3.

2.13.5.3 RECALCULATE : OFF

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   e (in the RECALCULATE menu)
>   o (for off)

The OFF option is contained in the RECALCULATE menu and is carried out immediately.

The OFF option prevents the worksheet being recalculated. This is shown by an "O" at the end of the second line of the screen.

Switching off the recalculation is most useful in a large worksheet with many explanatory TEXTs. Entering a TEXT cell does not alter the input value or the final value of the calculation. It is for this reason that the recalculation can be switched off when TEXT is being typed in. Otherwise, the worksheet is recalculated every time a TEXT is entered, which can take up to a minute in the case of a large spreadsheet.

After all TEXT cells have been typed in, recalculation can be made operative again via the ROWS or COLUMNS options.

2.13.5.4. SCREEN OFF

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   e (in the RECALCULATE menu)
>   f (for screen off)

The SCREEN OFF option is contained in the RECALCULATE menu and is carried out immediately, as it need no further inputs.

After the SCREEN OFF option has been selected, the screen is switched off each time the worksheet is recalculated. This speeds up the calculation process by about 5%.

The SCREEN OFF option can be reversed by the SCREEN ON option.

2.13.5.5. SCREEN ON

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> e (in the RECALCULATE menu)
> n (for switch on)

The SCREEN ON option is contained in the RECALCULATE menu
and is carried out immediately, as it needs no further
inputs.

After the SCREEN ON option has been selected, the screen
stays switched on during the recalculation process.

This slows down the recalculation process by about 5 %,
which is acceptable in most cases.

The SCREEN ON option is preset when POWER PLAN is started.

2.13.6. DELETE

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> d (for delete)

The DELETE option is contained in the EDIT menu and is not executed immediately after being called up, since it represents two other options, which are shown in the menu zone after it has been selected:

Column / Row

Using these two options, it is very easy to delete rows or columns in the worksheet, the rest of the worksheet being scrolled to fill the space.

We'll now deal with the meaning of individual options:

2.13.6.1. DELETE COLUMNS

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> d (in the DELETE menu)
> c (for columns)

The COLUMN option is contained in the DELETE menu and is not carried out immediately as it needs further inputs.

The following message appears in the menu zone when the option is selected:

Delete column at : xx

Here xx represents the actual position of the screen cursor. To identify the column being deleted, move the screen cursor with the cursor keys into any cell of the corresponding column.

When the screen cursor is in the desired column, the input is completed by pressing the "RETURN" key. A new question now appears in the menu zone. It says:

Absolute / Relative

This question is based on the fact that all columns to the right of the column to be deleted are shifted one column to the left in the worksheet. This can mean that your worksheet no longer produces the desired result.

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An example:

Let's assume that the VALUE 1+b1 is in cell C1 and the VALUE
5 is in cell B1.   If column A is now deleted, cell B1 is
automatically shifted into cell A1 and C1 into B1.   This
means that the VALUE in cell B1 relates to cell B1 itself,
and not to cell A1 as it should.

If you select RELATIVE in answer to the above question, this
error will not occur, since POWER PLAN automatically matches
the coordinate data inside VALUEs, which relate to cells
which have been moved.

If, on the other hand you select ABSOLUTE, the coordinate
information is not matched.

When you have answered the above question, a final question
appears in the menu zone:

                    Columns adjustment (y/n)

Answer this question with "y" for yes, and not only the
contents of the individual cells, but also the widths of the
corresponding columns are moved one column to the left. This
can be very important if different columns have different
widths.

If you answer with "n", the column widths are not matched.

After this last question has been answered, the DELETE
option is carried out and the system then returns to the
input mode.

2.13.6.2. DELETE ROW

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> d (in the DELETE menu)
> r (for row)

The ROW option is contained in the DELETE menu and is not
carried out immediately, since it needs further inputs.

The following message appears in the menu zone after the
option has been selected:

<p align="center">Delete row at : xx</p>

Here xx is used for the actual screen cursor position.

To specify the required row, the screen cursor is moved with
the cursor keys into any cell of the corresponding line.
When the screen cursor is at the desired line, the input is
completed by pressing the "RETURN" key.

A second question now appears in the menu zone. It says:

<p align="center">Absolute / Relative</p>

To answer this question, you ought to know that when a line
is deleted, the line below it is automatically moved upwards
by one line, in order to fill up the gap left in the
worksheet by the deletion.

Due to this process, your calculations may be incorrect, as
VALUEs relate to cells that have been moved. This means that
VALUEs relate to cells which are no longer located at the
correct coordinate concerned after the move.

To avoid this error, you have to answer the above question
with "r" for relative.   The coordinate information which
relates to cells that have been moved, are matched to the
new position of the respective cell during the move.

If there are only TEXT cells in the lines to be moved, you
can answer the above question with "a", as there are no
cells which relate to TEXT cells.

When you have replied to this question, the DELETE option is
carried out and the system then returns to the input mode.

2.13.7. INSERT

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   i (for insert)

The INSERT option is contained in the EDIT menu and is not
carried out immediately, as it represents two further
options which appear in the menu zone when it has been
called up:

<p align="center">Column / Row</p>

Using these two options, it is very easy to insert rows or
columns into the worksheet.

Now the functions of the two options in detail:

2.13.7.1 INSERT COLUMNS

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   i (in the INSERT menu)
>   c (for columns)

The COLUMNS option is contained in the INSERT menu and is
not carried out immediately, since it needs further inputs.

The following message appears in the menu zone:

<p align="center">Insert column at : xx</p>

Here xx represents the actual screen cursor position.   To
identify the column to be inserted, move the screen cursor
into any cell of the relevant column by means of the cursor
keys.   When the screen cursor is in the desired position,
the column input is completed by pressing the "RETURN" key.

A blank column is then inserted into the column in which the
screen cursor is located. If, for instance, the screen
cursor is in column B when the "RETURN" key is pressed, the
contents of columns B to BK are shifted one column to the
right and a blank column is then inserted into column B.

When the column has been specified, another question appears
in the menu zone:

<p align="center">Absolute / Relative</p>

The reason for this question is that all columns to the
right of the column to be inserted are moved one column to
the right in the worksheet. This means that your worksheet
may no longer give the result you wanted.

An example:

Let's assume that the VALUE 1+a1 is in cell B1 and the VALUE
5 is in cell A1. If a column is now inserted into column A,
cell A1 is automatically shifted into cell B1 and B1 is
moved into cell C1. This means that the VALUE in cell C1
relates to cell A1 (now blank), and not to cell B1 as it
should do.

If you answer the above question by selecting RELATIVE, this
error will not occur, as POWER PLAN automatically matches
the coordinate information in VALUES which relates to cells
which are moved.

But if you select ABSOLUTE, matching of the coordinate data
is not carried out.

When you have replied to the above question, a final one
appears in the menu zone:

<center>Columns adjustment (y/n)</center>

If you answer this question with "y" for yes, not only the
contents of the individual cells are moved one column to the
right, but the widths of the corresponding columns are
altered as well. This can be very important if different
columns have different widths.

If, on the other hand, you answer "n" for no, the column
widths are not matched.

The INSERT option is carried out when this last question has
been answered, and then retruns to the input mode.

2.13.7.2 INSERT ROWS

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   i (in the INSERT menu)
>   r (for rows)

The LINES option is contained in the INSERT menu and is not
carried out immediately, as it needs further inputs.

The following message appears in the menu zone after the
option has been selected:

<div align="center">Insert row at : xx</div>

Here xx is used for the actual position of the screen
cursor.

To specify the row you want, move the screen cursor to any
cell of the relevant row by means of the cursor keys.   When
the screen cursor is at the desired row, the input is
completed byv pressing the "RETURN" key.   If, for example,
the screen cursor is at row 3 when the "RETURN" key is
pressed, the contents of rows 3 to 255 are first moved one
row down and a blank row is then inserted into row 3.

When the row has been specified, a second question appears
in the menu zone. It says:

<div align="center">Absolute / Relative</div>

To answer this question, you ought to know that when a line
is inserted, the row below it is automatically moved
downwards by one row.

Due to this process, your calculation may become wrong, as
VALUES relate to cells that have been moved.   This means
that VALUEs relate to cells which are no longer located at
the correct coordinate concerned after the move.

To avoid this error, you have to answer the above question
with "r" for relative.   The coordinate information relating
to cells that have been moved is then matched to the new
position of the respective cell during the move.

If there are only TEXT cells in the lines to be moved, you
can answer the above question with "a", as there are no
cells which relate to TEXT cells.

When you have replied to this question, the INSERT option is
carried out and the system then returns to the input mode.

2.13.8. TEXT

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> e (in the EDIT menu)
> t (for text)

The TEXT option is contained in the EDIT menu and has no function of its own as it represents two other options, which are shown in the menu zone when it is called up:

> Text constants: Input / List

You can choose between Input and List by using the menu cursor. If various texts appear a number of times in a worksheet, it is an advantage to define these texts as "text constants", instead of typing in each text individually in a cell.

With POWER PLAN you can define a maximum of 12 such text constants, with the advantage that when one text constant is changed, the text is changed automatically in all cells which represent text constants.

To address a text constant, a left-arrow, (←-), followed by an identification letter, must be typed into a TEXT cell. The identification letter (any letter between "a" and "l") indicates which text constant is to be shown in the respective cell.

2.13.8.1 TEXT CONSTANT LIST

If you select the LIST option in the TEXT CONSTANT menu, all twelve repetitive texts appear on the screen.

```
                 TEXT CONSTANTS
```

```
 a - These are the
 b - text constants
 c - of POWER PLAN,
 d - they are entered
 e - from the EDIT
 f - MENU and then
 g - the text menu.
 h -
 i - They save memory
 j - and provide quick
 k - replacement of
 l - worksheet texts.
```

- press a key -

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2.13.8.2. TEXT CONSTANT INPUT

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   e (in the EDIT menu)
>   t (in the TEXT menu)
>   i (for input)

The INPUT option is contained in the TEXT CONSTANT menu and is carried out immediately as it is called up.

All 12 text constants then appear inside a frame on the screen. The cursor can be moved inside the frame to the appropriate text constant by means of the "CURSOR UP" and "CURSOR DOWN" keys.

If the "RETURN" key is pressed, the text constant at which the cursor is positioned, appears below the frame. Dots are shown inside the text constant, instead of blank characters, but these have the same meaning as blank characters.

You have the same facilities for modifying or editing the text constant as when editing a formula in the EDIT mode. After you have edited the text constant, you can complete your editing operation by pressing the "RETURN" key.

You can select another repetitive text for editing by means of the cursor.

To return to the input mode, just press the "f7" key.

```
 ████████████████████████████████████████
┌──────────────────────────────────────┐
│ Number of textconstant ? h            │
└──────────────────────────────────────┘

       ┌──────────────────────────┐
       │ a - These are the        │
       │ b - text constants       │
       │ c - of POWER PLAN,       │
       │ d - they are entered     │
       │ e - from the EDIT        │
       │ f - MENU and then        │
       │ g - the text menu.       │
       │ h - ███████████████████  │
       │ i - They save memory     │
       │ j - and provide quick    │
       │ k - replacement of       │
       │ l - worksheet texts.     │
       └──────────────────────────┘

       Please enter textconstant :
       ┌──────────────────────────┐
       │ TEXT CONSTANTS···        │
       └──────────────────────────┘
```

2.13.9. MOVE

To call it up from the input mode, press the following keys:

                        f7 (in the main menu)
                        e (in the edit menu)
                        m (in the move menu)

The following text appears in the menu zone when this option
is selected:

                        Source-range from   to
                        Target-range from   to

The coordinates for the source range decide which cells are
to be moved, either a cell, column, row, or block may be
moved.

The next question decides whether cells already occupied
should be overwritten the destination area.

                        Delete occupied cells (y/n)

If you answer this question with "y" for yes, the source
area is written into all cells, including those in the
destination area already occupied.

If you answer this question with "n", then the source cells
are only written into cells in the destination area which
are not yet occupied.

The MOVE is started when the above question is answered, and
when completed, the system returns to the input mode.

2.14. DISK

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    i (for disk)

The DISK option is contained in the main menu and has no
function itself, as it just stands for a group of options
which appear in the menu zone when it is called up :

                Save Load Directory sYstemcommands

These options make it very easy for you to work with the
disk drive. You can not only load or save worksheets on the
disk, but you can also get POWER PLAN to format your disks.

If an error occurs during a disk operation, POWER PLAN
indicates this error with an error message and number, the
meaning of which is given in the appendix.

Now, the meanings of the individual options:

2.14.1 LOAD

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    i (in the DISK menu)
                    l (for load)

The LOAD option is contained in the DISK menu and is not
carried out immediately as it needs further inputs.

First, you are asked to type in the name of a document (the
name under which you have stored your worksheet on the
disk). After you have typed in the name, press the "RETURN"
key, and the worksheet is reloaded from the disk.

If you are not sure how the name was written, or cannot type
in the name for some other reason, press the "RETURN" key
without typing in a name. You are then requested to place a
disk in the disk drive and to press the "space" key. When
you have done this, the disk directory is loaded and appears
on the screen.

If the required worksheet is not in the directory, that is
not on the disk, you can return to the input mode by
pressing the "f7" key or the "RUN/STOP" key.

If the worksheet you want is in the directory, then you can
move the cursor, now at the name of the first worksheet, to
the desired document by means of the cursor keys.

If you then press the "RETURN" key, the worksheet at which
the cursor is positioned is loaded.

This not only loads the actual worksheet, but also the
repetitive texts stored with it.

Of course, when a new worksheet is loaded, the worksheet
already in the memory is removed. When the appropriate
worksheet has been loaded, POWER PLAN returns to the input
mode.

2.14.2. SAVE

To call it up from the input mode, press the following keys:

> f (in the main menu)
> i (in the DISK menu)
> s (for save)

The SAVE option is contained in the DISK menu and is not carried out immediately when selected, as it needs further inputs.

When you have selected the SAVE option, you are asked to state the name under which you want the worksheet to be stored. After you have typed in the name, press the "RETURN" key, and the worksheet is stored on the disk under the name you have indicated.

Also with the SAVE option you can select a name from the disk directory. To do this, instead of typing in a name, just press the "RETURN" key. The message on the screen then asks you to place the relevant disk in the disk drive and then to press the "SPACE BAR". When you have done this, the disk directory is loaded and is displayed on the screen.

If the name you want is not in the directory, you can return to the input mode by pressing the "f7" key or the "RUN/STOP" key.

If the required worksheet is in the directory, you can move the cursor with the cursor keys to the name of the worksheet you want. Then press the "RETURN" key to complete the selection. The worksheet is then stored on the disk.
If there is already a worksheet on the disk under that name, POWER PLAN asks you whether this should replace the old worksheet.

The code word and the 12 text constants are stored along with the worksheet.

At the end of the storage operation, POWER PLAN again returns to the input mode.

2.14.3. DIRECTORY

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> i (in the DISK menu)
> d (in the directory)

The DIRECTORY option is contained in the DISK menu and is carried out immediately as it is called up.

After the DIRECTORY option has been called up, POWER PLAN asks you to insert a disk in the disk drive and then press the "SPACE BAR".

After you have done this, the directory of the disk in the drive is loaded and displayed on the screen. Worksheets stored on the disk with the aid of POWER PLAN and diagrams or pictures generated by POWER GRAPH are now displayed in the directory.

When the "SPACE BAR" is pressed, POWER PLAN returns to the input mode.

2.14.5. SYSTEM COMMANDS

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> i (in the DISK menu)
> y (for system instructions)

The SYSTEM COMMANDS option is contained in the DISK menu and has no function itself, as it just stands for a group of options held in the SYSTEM INSTRUCTIONS menu.

After the SYSTEM COMMANDS option has been called up, these options are displayed in the menu zone:

> **Format Scratch Rename Validate**

The functions of the individual options are as follows:

2.14.5.1. FORMAT

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> i (in the DISK menu)
> y (in the SYSTEM COMMANDS menu)
> f (for format)

The FORMAT option is contained in the SYSTEM INSTRUCTIONS menu and is not carried out immediately, as it needs further inputs.

Any disk can be prepared for recording POWER PLAN worksheets with the aid of the FORMAT option. As is usual, the disk has a 15-character long name which you can specify yourself.

After you have called up the option, you are asked to type in the name of the disk. To complete the input, press the "RETURN" key as usual. But before pressing the "RETURN" key, you should insert the appropriate disk into the disk drive, as POWER PLAN starts formatting the disk as soon as the input has been completed.

If you are familiar with the disk options of your COMMODORE 64, you may know that each disk has a two-digit identification label (ID) as well as the disk name. You cannot specify this identification number yourself – this is done by POWER PLAN.

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2.14.5.2 SCRATCH (SYSTEM COMMANDS)

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    i (in the DISK menu)
                    y (in the SYSTEM COMMANDS menu)
                    s (for scratch)

The SCRATCH option is contained in the SYSTEM COMMANDS menu and is not carried out immediately as it is called up, as it needs further inputs.

Using the SCRATCH option, you can delete a worksheet stored on the disk. To do this, POWER PLAN asks you to type in the name of the worksheet to be deleted.

If you press the "RETURN" key before typing in a name, the disk directory is loaded and appears on the screen. You can then select from this directory the name of the worksheet to be deleted, by moving the cursor to the name of the desired worksheet and then pressing the "RETURN" key.

2.14.5.3. RENAME

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    i (in the DISK menu)
                    y (in the SYSTEM COMMANDS menu)
                    r (for rename)

The RENAME option is contained in the SYSTEM COMMANDS menu and is not carried out immediately it is called up, as it needs further inputs.

Using the RENAME option, you can alter the name of a worksheet stored on the disk. After selecting the option, you are first asked to type in the old name under which the worksheet was stored on the disk.

If you press the "RETURN" key before typing in a name, the disk directory is displayed on the screen and you can then locate the name of the document.

POWER PLAN then asks you to state the new name of the worksheet. The worksheet on the disk is renamed when the input is completed by pressing the "RETURN" key.

2.14.5.4. VALIDATE

To call it up from the input mode, press the following keys:

        f7 (in the main menu)
        i (in the DISK menu)
        y (in the SYSTEM COMMANDS menu)
        v (for validate)

The VALIDATE option is contained in the SYSTEM COMMAND menu
and is carried out immediately it is selected, as no further
inputs are required.

The VALIDATE option operates in the same way as the VALIDATE
option used in the BASIC mode.

When this option is carried out, the disk is cleaned up so
that parts of the disk which are occupied, but are no longer
required, are freed for rewriting.

When the VALIDATE option has been carried out, the disk may
have more free storage space than it had before.

2.15 QUIT

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    q (for quit)

The QUIT option is contained in the main menu and is not carried out immediately, as it needs further inputs.

The QUIT option ends your work with POWER PLAN. After it has been called up, POWER PLAN asks if you really have finished your work with POWER PLAN.

If you have moved into this menu without wanting to, you can return to the input mode by pressing the "n" key.

On the other hand, if you really want to finish your work, you can get back into the BASIC mode by pressing the "y" key. The picture which appeared when you started up your COMMODORE 64, is displayed on the screen again.

2.16. NEW

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    n (for new)

The NEW option is contained in the main menu and is not carried out immediately, as it needs further inputs.

After this option is selected, POWER PLAN asks you if you really want to delete the worksheet.

If you answer this question by pressing the "n" key, POWER PLAN immediately returns to the input mode, without deleting the worksheet.

But if you press the "y" key, the entire worksheet becomes blank and the width of all columns in windows 1 and 2 is reset to 8 characters. In general terms, selecting the NEW option is the same as restarting POWER PLAN.

After the NEW option has been selected, all values which affect the appearance of the worksheet or of the individual cells, return to their original state.

2.17. BLANK

To call it up from the input mode, press the following keys:

f7 (in the main menu)
b (for blank)

The BLANK option is contained in the main menu and is not carried out immediately, as it needs further inputs.

The BLANK option allows you to blank the cell at which the screen cursor is positioned. If of course the screen cursor is at a protected cell, an error message appears, since the old code word must first be typed in again with the help of the INPUT (GLOBAL PROTECT) option.

But if the relevant cell is not protected, POWER PLAN first asks you if you are sure that you want to delete that cell.

If you answer by pressing the "n" key, POWER PLAN reverts to the input mode without deleting the cell.

On the other hand, if you press the "y" key, the cell at which the screen cursor is positioned is deleted immediately and POWER PLAN returns to the input mode.

2.18. GRAPHICS

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> r (for gRaphics)

The GRAPHICS option is contained in the main menu and is carried out immediately.

The GRAPHICS option hands over control of the program to POWER GRAPH.

When the GRAPHICS option is selected, POWER PLAN asks you to place the system disk in the disk drive and then to press the "RETURN" key. When you have done this, POWER GRAPH is loaded from the system disk into the memory.

Please refer to the POWER GRAPH manual for further details.
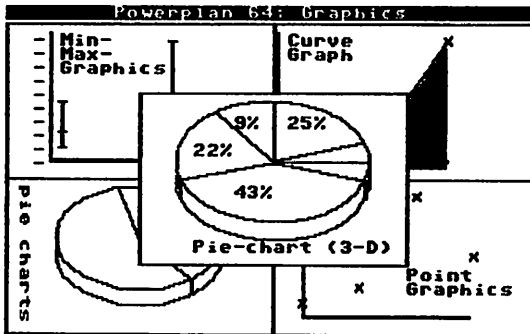
2.19. OPTIONS

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    o (for options)

The OPTIONS option is contained in the main menu and has no
function itself, as it just represents a group of options,
which are contained in the OPTIONS menu. These are as
follows:

                User-data Formula-output Chain
                     Titlefield Border

The   functions   of the individual options   cannot   be
summarized, so we shall describe each one in detail:

2.19.1. USER DATA

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    o (in the OPTIONS menu)
                    u (for user data)

The USER DATA option is contained in the OPTIONS menu.

After this option is called up, POWER PLAN wants to know if
the user data has to be reloaded from the disk. If the "y"
key is pressed, the user data is then loaded from the disk
located in the disk drive.

The individual parameters and their actual contents are then
displayed on the screen.

If you answer no to the above question by pressing the "n"
key,   POWER   PLAN   immediately displays the   individual
parameters and their actual status on the screen.

Here the name of the parameter is shown on the left hand
side of the screen, and its actual status appears on the
right hand side of the screen.

To   alter   a parameter, first move the frame shown on the
screen to the parameter to be changed. You do this by
pressing the "CURSOR UP" or "CURSOR DOWN" key.

When you have moved the frame to the parameter being
changed, if the "RETURN" key is pressed, the status of this
parameter appears at the lower edge of the screen.
If you press the "f7" key instead of the "RETURN" key, POWER
PLAN   returns to the input mode.   Before this happens,
however, the message on the screen asks if the user data has
to be stored on the disk.

If you answer yes by pressing the "y" key, the user data is
stored on the disk located in the disk drive.

Important!

1.) POWER PLAN itself determines the name under which the
user data is located on the disk.

2.) Only one set of user data may be located on each floppy
disk. If user data is stored on a disk already carrying user
data, the old user data is replaced by the new data.

Here are the meanings of the individual parameters:

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2.19.1.1. BORDER COLOR

By selecting this parameter, you can choose the color of the border from a range of 16 colors.

2.19.1.2. BACKGROUND COLOR

If you select this parameter, you can specify one of 16 available colors for the screen background. Note that the background cannot have the same color as the type.

If, after you have changed this parameter, you find that your worksheet is blank, this means that the background has taken on the same color as some of the cells of the worksheet.

2.19.1.3. CHARACTER COLOR

The character color represents the color in which the worksheet frame, for example, is shown on the screen. This has nothing to do with the color of the cells.

The character color can be chosen from a range of 16, but may not be the same as the background color.

2.19.1.4. CONTRAST COLOR

The contrast color represents the color in which POWER PLAN's important messages (such as error messages) are shown on the screen.

Again, this can be selected from a range of 16 colors. POWER PLAN does not let you choose the same color as the background, of course.

2.19.1.5. N.A. STATUS

This parameter determines how VALUE cells, which relate to blank cells, are to be handled. N.A. means that the corresponding cells in the worksheet are identified as non calculable.

"0/" means that a blank cell, which is addressed inside a VALUE, is treated as if its contents were "0/".

2.19.1.6. PRINTER ADDRESS

Selecting this parameter allows you to specify the device address of your printer. Normally this is between 2 and 7.

2.19.1.7 TYPE OF PRINTER

This parameter makes it very easy for you to match your
printer to POWER PLAN. When this parameter is selected, you
can choose between three types of printers which represent a
group of printers. Generally speaking, POWER PLAN works with
all popular printers, which it divides into three
categories:

        1.) MPS 801
           Commodore 1525
           Seikosha GP 100
           Seikosha GP 700
           and equivalents

        2.) MPS 802
           Commodore 1526 (with H Eprom)
           and equivalents

        3.) Epson FX-80 with proper interface
           Epson RX-80 with proper interface
           and equivalents

If you select these parameters according to the type of
printer, POWER PLAN is then completely set up, so that you
don't have to worry any more about matching up the printer.

```
████████████ Input of user data ████████████

     Border color...................black
     Backgr. color:.................black
     Character color:............lt-blue
     Contrast color:...............white
     N.A status.........................0
     Printer address:...............-4-
    ┌──────────────────────────────────────┐
    │ Printer type:........CommOdore 1526   │
    └──────────────────────────────────────┘


    ┌──────────────────────────────────────┐
    │ ██████  Seikosha/MPS Commodore 1526   │
    └──────────────────────────────────────┘
```

2.19.2. FORMULA OUTPUT

To call it up from the input mode, press the following keys:

                        f7 (in the main menu)
                        o (in the OPTIONS menu)
                        f (for formula output)

The FORMULA OUTPUT option is contained in the OPTIONS menu and is carried out immediately, as it needs no further inputs.

When this option is selected, it is not the mathematical result of a cell which is shown in the worksheet, but the formula on which this result is based.

In cells which contain repetitive texts, it is not the repetitive texts, but their reference which is displayed.

Protected cells are identified in the worksheet by the word "protected".

If, due to their length, formulae cannot be fitted inside one column, the last part of the formula is "chopped off". The specified formulae are shown in each cell left justified and in the color of the worksheet frame.

Selecting the FORMULA OUTPUT option gives you a simple way of obtaining an overall view of the structure of a worksheet. All POWER PLAN options can be selected when in the formula output mode. The formula output mode is turned off by selecting the SCREEN OFF or SCREEN ON from the EDIT RECALCULATE menus.
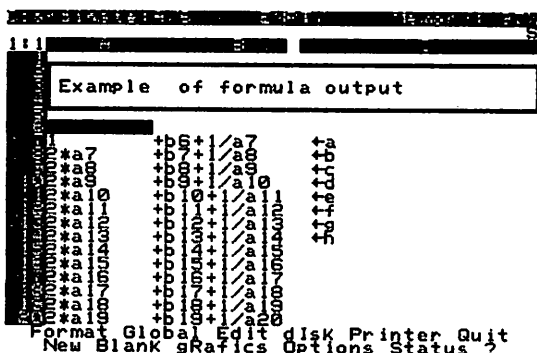
2.19.3. TITLE FIELD

To call it up from the input mode, press the following keys:

f7 (in the main menu)
o (in the OPTIONS menu)
t (for title field)

The TITLE FIELD option is contained in the OPTIONS menu and
is not carried out immediately, as it needs further inputs.

Using the TITLE FIELD option is a very convenient way of
typing in long texts into the worksheet.

When this option is selected, POWER PLAN asks you to state
the start cell of the text.   To type in the appropriate
coordinates, refer to the facilities described in the
chapter "2.9. COORDINATE INPUT".

Having typed in the start cell, you can now type a text of
up to 80 characters long into the menu zone. Ignore the dots
shown in the menu zone as they are regarded as blank
characters when the TITLE FIELD option is carried out.

After you have typed in the text, complete the input by
pressing the "RETURN" key.

The text which has been entered is now distributed in the
start cell and those following it, so that a continuous line
is visible in the worksheet.

This is done by writing into each cell only as many
characters of the whole text as the respective column width
allows.

Important!

If the width of the columns at the edge of the screen is
shortened, it appears as if some letters in the text are
missing.   If the appropriate columns, however, are shifted
to the center of the screen (the columns again being
displayed at full width), the missing letters re-appear.

2.19.4. BORDER

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    o (in the options menu)
                    b (for border)

The BORDER option is contained in the OPTIONS menu and is not carried out immediately, as it needs further inputs.

The BORDER option puts a frame around various cells, specified by the user, to highlight certain sections of the worksheet.

After selecting the BORDER option, you are first asked to specify the top left and then the bottom right corner of the frame.

The methods for typing in the coordinates are described in the chapter on "2.9. COORDINATE INPUT".

Important!

The frame must be at least three cells wide and three cells long. If not, the two corner coordinates of the frame will have to be typed in again.

An example

To place a frame around cells B4 to D6, cell A3 must be specified as the top left corner of the frame and cell E7 as the bottom right corner.

The BORDER option is carried out when the coordinate input is complete, and POWER PLAN then returns to the input mode.

Important!

The frame consists of individual TEXT cells, and when entered into the worksheet, the old contents of the respective cells will be overwritten.

2.19.5. CHAIN

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> o (in the OPTIONS menu)
> c (for chain)

The CHAIN option is contained in the OPTIONS menu and has no function of its own, as it just stands for a group of options, which appear in the menu zone when it is called up:

> Load   Erase   Add
> Transfer : Formulas   Values

Before we deal with the meanings of the individual options contained in the CHAIN menu, let's first have a look at the "page concept".

Up to this point we have always worked with one page of the worksheet. But POWER PLAN allows you to work with two independent worksheet pages at the same time. The idea for this page concept came from the following problem:

A retailer who calculates his weekly costs (rents, wages, etc.) wants to add up at the end of the month the costs incurred during the four previous weeks, and find a total.

But here he comes up against a problem, he has to add up figures from four different worksheets. So one worksheet page is not enough.

If, however, he has two pages of worksheet at the same time, it is possible to load the four weekly calculations one after the other into the second worksheet, and then add up the figures needed from these four worksheets in the first worksheet.

POWER PLAN's worksheet concept is therefore based on the principles explained above.

Now, the meanings of the options contained in the CHAIN menu.

2.19.5.1 LOAD (CHAIN)

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   o (in the OPTIONS menu)
>   c (in the CHAIN menu)
>   l (for load)

The LOAD option is contained in the CHAIN menu and is not carried out immediately as it is called up, as it needs further inputs. After the LOAD option has been selected, POWER PLAN asks you to specify the name of the worksheet to be loaded.

If you press "RETURN", the disk directory is loaded, and the worksheet to be loaded can then be selected from this.

At the end of the load cycle, the worksheet which was loaded now appears in the memory as the second worksheet. You can switch between the two worksheets by pressing the "f2" key.

Which worksheet is active can be seen by the text (1:1) at the intersection of the two scales surrounding the worksheet. The first number shown there indicates the active worksheet.

The second worksheet takes its column width and the position of the windows dividing the screen, from the first worksheet.

Important!

All operations and options which can be carried out in the first worksheet, can also be used in the second worksheet. The graphics options in POWER GRAPH always refer to the first page of the worksheet only.

2.19.5.2. ERASE (LINK)

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   o (in the OPTIONS menu)
>   c (in the CHAIN menu)
>   e (for erase)

The ERASE option is contained in the CHAIN menu and is carried out immediately, since it needs no further inputs.

The second worksheet is deleted when the ERASE option is selected. This means that only the first page of the worksheet remains in the memory, and the second page can no longer be activated by means of the "f2" key.

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2.19.5.3 ADD

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    o (in the OPTIONS menu)
                    c (in the CHAIN menu)
                    a (for add)

The ADD option is contained in the CHAIN menu and is not
carried out immediately, since it needs further inputs.

The ADD option is used to add VALUES from one page of the
worksheet into the other.

The following text appears in the menu zone when the option
is selected:

                Source range: Page 1 pAge 2

You can then choose from which page of the worksheet the
VALUES to be added have to be taken, and into which page
they have to be added.

If, for example, you select "Page 2", the VALUEs from
worksheet page 2 are added into page 1. When you have
answered this question, a new one appears in the menu zone:

                    Block page x from to
                      to page y from

Here POWER PLAN uses x for the page which you have specified
as the source page, and y for the other, that is, the
destination page.

The methods for entering the three coordinates are given in
the chapter on "2.9. COORDINATE INPUT".

Type into the source page the top left corner as the first
coordinate and then the bottom right corner as the second
coordinate of the block to be added.

The third and final coordinate determines the top left
corner of the block in the destination page to which the
cells from the source page are to be added.

You don't have to type in the coordinate of the bottom left
corner of the destination area, as POWER PLAN derives this
itself from the size of the source area. (The source area
must have the same number of cells as the destination area).

The ADD option is carried out on completion of the
coordinate input. POWER PLAN is then once again in the input
mode.

An example of the ADD option

The VALUE 5 has to be located in cell Al of the second page
of the worksheet. The VALUE 10 has to be located in cell C5
of the first page.

Now select the ADD option and specify the second page of the
worksheet as the source page. Type in the coordinate Al
twice as the source area and specify cell C5 as the
destination area.   If the ADD option is then carried out,
the VALUE 5 from cell Al in the second page of the worksheet
is added to the VALUE in cell C5 of the first page of the
worksheet. The VALUE 15, the sum of 5 and 10, then appears
in cell C5 of the first page of the worksheet.

2.19.5.4. FORMULAS

To call it up from the input mode, press the following keys:

>   f7 (in the main menu)
>   o (in the OPTIONS menu)
>   c (in the CHAIN menu)
>   f (for formulas)

The FORMULAS option is contained in the CHAIN menu and is not carried out immediately it is called up, as it needs further inputs.

VALUEs are transferred from one page of the worksheet to the other by means of the FORMULAS option.

The following text appears in the menu zone when the option is called up:

>   Source range: Page 1 pAge 2

You can then choose from which page of the worksheet to take the VALUE cells and to which page to transfer them. If, for example, you select "page 2", the VALUEs are transferred from worksheet page 2 to page 1.

When you have replied to this question, a new one appears in the menu zone:

>   Block page x from to
>   to page y from

Here POWER PLAN uses x for the page which you specified as the source area. Y is used for the other page, that is the destination page.

The chapter entitled "2.9. COORDINATE INPUT" tells you how to type in the three coordinates.

The top left corner is typed into the source page as the first coordinate, then the bottom right corner of the block to be transferred.

The third and final coordinate determines the top left corner of the block in the destination page into which the cells from the source page have to be transferred.

You do not have to type in the coordinates of the bottom left corner of the destination area, since POWER PLAN derives this automatically from the size of the source area. (The source area must be the same size as the destination area).

Important!

Always remember that the corresponding cells are only transferred and not added when you use the FORMULAS option.

When the coordinate input is complete, the FORMULAS option is carried out and the relevant cells are transferred.

When the transfer is complete, POWER PLAN returns to the input mode again.

An example of the FORMULAS option

VALUES 1+a1 and 1+a2 are to be located in cells A2 and A3 respectively.

The FORMULAS option is now selected and you specify the first page of the worksheet as the source page.

Cells A2 and A3 are typed in as the source area and cell A3 is the top left corner of the destination area. The FORMULAS option is then carried out.

As a result, VALUES 1+a1 and 1+a2 are located in cells A3 and A4 of the second page of the worksheet.

2.19.5.5. VALUES

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> o (in the OPTIONS menu)
> c (in the CHAIN menu)
> v (for values)

The VALUES option is contained in the CHAIN menu and is not
carried out immediately, it is called up, as it needs
further inputs.

Using the VALUE option, the mathematical result of VALUE
cells is transferred from one page of the worksheet to the
other.

After the option has been selected, the following text
appears in the menu zone:

> ### Source range: Page 1 pAge 2

You can now choose from which page of the worksheet the
VALUE cells to be transferred are to be taken and into which
page of the worksheet they are to be transferred.

If, for example, you select "page 2", the mathematical
results of page 2 of the worksheet are transferred into page
1.

When you have replied to the first question, a new one
appears in the menu zone:

> ### Block page x from   to
> ### to page y from

POWER PLAN uses x for the page which you have specified as
the source area, and y for the other (destination) page.

The chapter on "2.9. COORDINATE INPUT" explains how to type
in the three coordinates.

First of all, for the two coordinates, type into the source
page the top left corner and then the bottom right corner of
the block to be transferred.

The third and final coordinate determines the top left
corner of the block in the destination page into which the
cells from the source page have to be transferred.

You do not have to type in the coordinate of the bottom left
corner of the destination area, as POWER PLAN derives this
itself from the size of the source area. (The source area
must be the same size as the destination area).

The VALUE option is carried out and the relevant cells are transferred when the coordinate input is completed. After the transfer, POWER PLAN returns to the input mode.

An example of the VALUE option

The VALUES 1+al and 1+a2 are to be located in cells A2 and A3 respectively of the first page of the worksheet.

Since the VALUE 3 is in cell A1, the mathematical result of cell A2 is 4 and that of cell A3 is 5.

Now select the VALUE option and specify the first page of the worksheet as the source page.

Type in cells A2 and A3 as the source area and cell A3 as the top left corner of the destination area. The VALUE option is then carried out.

Following this, VALUEs 4 and 5 are located in cells A3 and A4 of the second page of the worksheet.

2.20. HELP

The HELP option is contained in the main menu and is called
up by first pressing the "f7" key in the input mode to get
into the menu mode. The menu cursor is then moved with the
"CURSOR LEFT" key to the question mark (?) which represents
the HELP option.

Before the "RETURN" key is pressed to complete the selection
of the HELP option, however, the system disk should be
placed in the disk drive, as POWER PLAN loads the first HELP
text from the disk immediately after the HELP option has
been selected.

This HELP text has been specially introduced with POWER
PLAN.

After it has been displayed on the screen, the individual
options contained in the HELP menu appear in the menu zone:

<div align="center">

Back Next-page Last-page Keyboard
Commands General

</div>

Approximately 100 HELP texts, which deal mainly with the
meaning of POWER PLAN options, are stored on your system
disk.

Now, the significance of the options in detail.

2.20.1. BACK

The BACK option is contained in the HELP menu and cannot be
called up directly from the input mode, as the HELP option
has to be called up first in the main menu.

When this is done, a HELP text is loaded from the system
disk and displayed on the screen. POWER PLAN is then in the
HELP menu and the BACK option can be selected.

In the HELP menu, the BACK option can be selected by
pressing the "b" key.

After the BACK option has been selected, POWER PLAN
immediately returns from the HELP menu to the input mode.

2.20.2. NEXT-PAGE

The NEXT-PAGE option is contained in the HELP menu and cannot be called up directly from the input mode, as the HELP option has to be called up first in the main menu.

After this, a HELP text is loaded from the system disk and displayed on the screen.
POWER PLAN is then in the HELP menu and NEXT PAGE option can be called up.

In the HELP menu, the NEXT PAGE option can be called up by pressing the "n" key.

There are approximately 100 HELP texts on your system disk. When you call up the NEXT PAGE option, the text following the HELP text shown on the screen is loaded from the system disk and displayed on the screen. POWER PLAN then returns to the HELP menu.

2.20.3. LAST-PAGE

The LAST-PAGE option is contained in the HELP menu and cannot be called up directly from the input mode, as the HELP option has to be called up first in the main menu.

A HELP text is then loaded from the system disk and displayed on the screen.

POWER PLAN is then in the HELP menu and the LAST PAGE option can be called up by pressing the "l" key.

There are approximately 100 HELP texts on your system disk. When you call up the LAST PAGE option, the text preceeding the HELP text shown on the screen is loaded from the system disk and displayed on the screen. POWER PLAN then returns to the HELP menu.

2.20.4. KEYBOARD

The KEYBOARD option is contained in the HELP menu and cannot be called up directly from the input mode, as the HELP option has to be called up first in the main menu.

A HELP text is then loaded from the system disk and displayed on the screen.

POWER PLAN is then in the HELP menu and the KEYBOARD option can be selected by pressing the "k" key.

When the KEYBOARD option is selected, a HELP text, which deals with the POWER PLAN keyboard layout, is loaded from the system disk.

2.20.5. COMMANDS

The COMMANDS option is contained in the HELP menu and cannot be called up directly from the input mode, as the HELP option has to be called up first in the main menu.

A HELP text is then loaded from the system disk and displayed on the screen.

POWER PLAN is then in the HELP menu and the INSTRUCTIONS option can be selected by pressing the "c" key.

After you have selected the COMMANDS option, a HELP text, which gives you a summary of the options contained in POWER PLAN, is loaded from the system disk.

When the HELP text has been displayed on the screen, POWER PLAN returns to the HELP menu.

2.20.6. GENERAL

The GENERAL option is contained in the HELP menu and cannot be called up directly from the input mode, as the HELP option has to be called up first in the main menu.

A HELP text is then loaded from the system disk and displayed on the screen.

POWER PLAN is then in the HELP menu and the GENERAL option can be selected by pressing the "g" key.

When you have selected the GENERAL option, a HELP text, which deals with general points about POWER PLAN, is loaded from the system disk.

When the HELP text has been displayed on the screen, POWER PLAN returns to the HELP menu.

2.21. PRINTER

To call it up from the input mode, press the following keys:

                    f7 (in the main menu)
                    p (for printer)

The PRINTER option is contained in the main menu and has no
function of its own, as it just represents two other
options.

These two options are displayed in the menu zone when the
PRINTER option is called up:

                    Print-part Output-formula

Before you select one of these options, you should match
POWER PLAN to your printer.

The associated option is contained in the OPTIONS menu under
USER DATA.

Apart from the above two options, there is another one which
lets you print out just a part of your worksheet on the
printer.

Using the HARDCOPY option, you can produce a hardcopy of the
entire screen on the printer. But you must have matched your
printer to POWER PLAN before you select this option.

The HARDCOPY option can be selected at any point where an
input is required, by pressing the "f8" key.

When the hardcopy has been printed out, POWER PLAN returns
to the input mode.

This method enables you to print out the disk directory, for
example, on the printer.

If the directory is loaded and has been displayed on the
screen, POWER PLAN asks you to press the "SPACE BAR" in
order to get into the input mode.   If, however, you press
the "f8" key instead of the "SPACE" key, the disk directory
is printed out on the printer.

An now the functions of the two options contained in the
PRINTER menu:

2.21.1. PRINT-PART

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> p (in the PRINTER menu)
> p (for partial printout)

The PRINT-PART option is contained in the PRINTER menu and is not carried out immediately, as it needs further inputs.

Using the PRINT-PART option, you can print out the whole or part of the worksheet on the printer.

Before selecting the option, POWER PLAN should be matched to your printer by means of the USER DATA option in the OPTIONS menu.

The following text appears in the menu zone when the PART-PRINT option is called up:

> **Print from xx**

Here POWER PLAN uses xx for the actual screen cursor coordinate. The coordinate typed in here specifies the top left corner of the section of the worksheet to be printed out.

After you have completed the input by pressing the "RETURN" key, the word "to" appears after the coordinate you typed in, followed by the coordinate of the screen cursor. The coordinate to be entered now, specifies the bottom right corner of that part of the worksheet to be printed out.
A new question appears in the menu zone when the coordinate input is completed:

> **Title (y/n)**

If you answer this with "n", POWER PLAN immediately goes to the next question.

If, on the other hand, you answered "y" for yes, you can now type into the menu zone a heading of up to 80 characters long.

When you complete the input by pressing the "RETURN" key, the title you typed in is printed out on the printer.

A new question then appears in the menu zone:

> **Border (y/n)**

If you answer by pressing the "y" key, the section of the worksheet to be printed out, including the scale surrounding the worksheet, is printed out.

If you answer "no" by pressing the "n" key, the worksheet scale is not printed out.

If the section of the worksheet to be printed is wider than 80 characters, the printing process starts, and when it has ended, POWER PLAN returns to the input mode.

If, however, the width of the worksheet to be printed is less than 80 characters, a final query appears in the menu zone:

                          Center (y/n)

If yow answer by pressing the "y" key the section of the worksheet is printed out centered on the printer. But if you press the "n" key, the worksheet is printed out left justified.

2.21.2. OUTPUT-FORMULA (PRINTER)

To call it up from the input mode, press the following keys:

> f7 (in the main menu)
> p (in the PRINTER menu)
> o (for output-formula)

The OUTPUT-FORMULA option is contained in the PRINTER menu and is carried out immediately, as it needs no further inputs.

After the OUTPUT-FORMULA option has been selected, the contents of all cells in the worksheet which are not blank are printed out on the printer.

In this case, cells A1 to A255 are printed out first, then cells B2 to B255, etc.

The contents of a cell are printed out exactly as they were typed in. With VALUE cells, it is not the mathematical result of the cell, but the formula on which it is based, which is printed out.

When TEXT cells are printed out, the contents of the corresponding cells are identified by the prefix "$".

Protected cells are also shown as protected when printed out.

When the printout has ended, POWER PLAN returns again to the input mode.

3. POWER GRAPH TRAINING MANUAL

The following pages deal with POWER GRAPH, the valuable analytical tool for POWER PLAN. With POWER GRAPH you can generate various graphs to better understand trends and relationships. You should use POWER GRAPH as often as possible because the graphs say so much more than bare sequences of numbers !

Now, let's have some fun with POWER GRAPH !
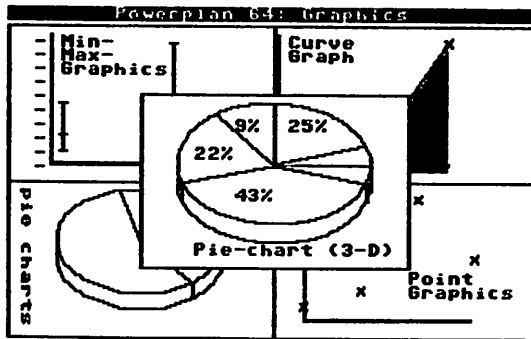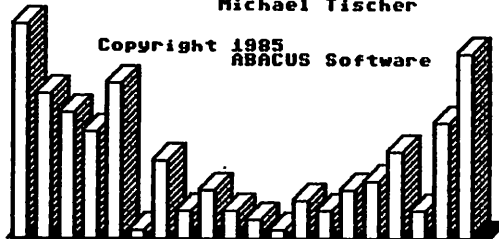
3.1. STARTING POWER GRAPH

First of all, to work with POWER GRAPH we must have a
worksheet with at least one occupied value cell. For our
example load the "demo" worksheet from the system disk via
POWER PLAN by pressing the "F7" key to get into the main
menu and then select DISK in the menu. When the disk menu
appears, select the LOAD function. Specify "demo" as the
name of the worksheet and complete with "RETURN". A
possible key sequence is shown below:

> f7 (to select the main menu)
> i (to select the disk menu)
> l (to select the load function)
> demo (name of worksheet)
> RETURN (to complete the input)

You will see that it is practically identical to the
worksheet already produced in the POWER PLAN teaching
manual. Your business has grown to 10 employees and the
minimum, maximum and average work done is shown under each
working day. This enlarged worksheet is fully explained in
the POWER PLAN manual.

Now get into the main menu via F7 and type either an "r" for
graphics or move the cursor to this field, ending with a
RETURN. Below is an example key sequence:

> f7 (to call up main menu)
> r (to start the graphics)

You will now be asked to insert the system disk and to press
any key. POWER PLAN now loads POWER GRAPH – which takes
about 2 minutes.

When working with POWER GRAPH the entire worksheet remains
in the memory, so that you can return to POWER PLAN at any
time to continue working with the same data. Likewise, your
individual data, such as global formats, repetitive texts or
the code word are also in memory.

When the loading process is completed, the main graphics
menu appears in the lower portion of the screen. Reaching
and selecting the menu points is done in the same way as
with POWER PLAN, that is either by typing in the capital
letter or by moving the cursor to the option or instruction,
and then pressing the RETURN key.

You can get back to the main graphics menu any time via the
F7 or RUN/STOP keys.

3.2. BAR CHART

First of all we are going to generate a bar chart, which
will represent the total wages of the individual workers.

To do this, select the item GENERATE in the main menu:

Press either
                        "g" or
                        "RETURN"

In the center of the screen you can now see a table of
screen windows and a request to type in a window number.
The significance of this table is fully explained in the
chapter on screen windows. The number is unimportant for
this and the following examples, since we shall be working
with one window only.

Type in a number between 1 and 8 (you can chose from 8
different windows), and complete the input with RETURN:

For example, type in
                        1
                        "RETURN"

The question which appears next relates to the framing of
the diagram. If you type in a "y", a frame is drawn around
the entire screen. If you answer with "n", you see only the
diagram.

Following this input, which is identical in all examples,
the GENERATION MENU appears in the menu zone:

            Bar chart Curve graph Point graph
                Min-Max graph Pie chart

Here you select the type of graph you want. As we want to
generate a bar chart, type in a "b" or simply press RETURN,
as the cursor is positioned at the first item - BAR CHART.

3.3. THE INPUT MASK

This is the most important part of generating a graph. At this point you can type in the various parameters and data in particular. The chosen type of graph appears in the first line in each case.

Below it, in the case of the bar chart, you are asked if the graph is to be 2-dimensional or 3-dimensional.

The selection is made as with any other menu. That is, either via the cursor or by typing in the capital letter.

This input is unimportant in this example, as it only determines the form in which the individual bars are displayed.

Now you can specify the left margin. This input determines how far the graph is to be drawn from the left hand edge of the screen, to be able to label the vertical axis, for example. The input permits values from 0 to 7. Select a number and complete the input with RETURN.

The question which now follows relates to the number of positions. This is merely the number of bars which you want to show in your chart. Since we want to display the total wages of 10 workers on the screen, type in 10 and press RETURN.

Now comes the central part of generating graphs:

The allocation of cells.

On the left hand side you can see a column with the numbers 1 to 10. These numbers represent the numbers of the bars, the left hand bar having the number 1. As you already know from the coordinate input in POWER PLAN, an input cell is allocated to each number. Here you have the same convenient ways of making corrections, such as CLR/HOME, INST, DEL or the cursor keys.

You can write a coordinate of a VALUE cell of the worksheet into each input cell. If you are unsure, you can get back to the worksheet by means of the following key sequence:

        SHIFT/HOME (to delete the input cell)
        RETURN (completes the input)

You can now see the worksheet – with a few external differences. The column widths are no longer different, but are set to 9. Repetitive texts are not displayed.

NO alterations OF ANY KIND may be made to the worksheet.

As in POWER PLAN, you can move the cursor as you like or use
the GOTO option (F5).   Now move with the cursor to cell 05,
either with the GOTO option

                    f5 (GOTO option)
                    o5 (coordinate)
                    RETURN (end)

or via the appropriate cursor keys.

When you press RETURN, you complete the input and return to
the previous input mask, and the cell at which the cursor
was positioned last, is located at the corresponding input
cell of the input mask.

You can see the coordinate 05 in the first input cell.   If
you have selected a text or blank cell by mistake, an
appropriate error message appears in the corresponding input
cell. You can re-specify the cell by pressing any key.

You already know 2 ways of entering coordinate inputs:

                    typing in the coordinate
                    selection via the worksheet

A third possibility is coordinate copying.

The next coordinates would be 06, then 07, 08 etc. Instead
of typing in these individually, type

                          #
                          r
                          RETURN

You can now see that all the input cells have been filled,
with the coordinates which we want.

But what have you actually done?   By typing in #r, you have
told POWER GRAPH to copy the previous coordinate, in this
case 05, into all the following input cells. Here the line
number is always increased by 1, but the column is kept the
same.

If there is a blank, text or N.A. field under the cells
generated by POWER GRAPH, no error message is generated for
the moment, and the coordinate remains in the input cell.
But as soon as you reach the relevant input cell with the
cursor, the usual error message appears.

It is obvious that there cannot be any coordinate copy
instruction in the first input cell, as no start value has
been specified which POWER GRAPH can refer to.

It is also possible to type in #c.

In this case, the column is increased by one and the row is kept the same.

After all input cells have been correctly filled, the coordinate input is completed and we can leave the input mask by pressing SHIFT+RETURN.

So press **Shift+RETURN** (exit from input mask).

If you have made a mistake in the input, the input mask appears again and you can correct the cell concerned and again end with SHIFT+RETURN.

If the input is correct, the menu zone asks you if the input mask has to be stored. The significance of this is explained in detail in the chapter on masks.

Answer this question with "no", since it is not necessary to store the mask at the moment.

Press

                            n

This completes all inputs and the graph is built.

To do this, first of all the screen must be erased, which takes about 10 seconds.

If you have answered "yes" to the question about the framing, the frame is then drawn and the actual graph is generated.

When the graph is finished, you will again find yourself in POWER GRAPH's main menu.
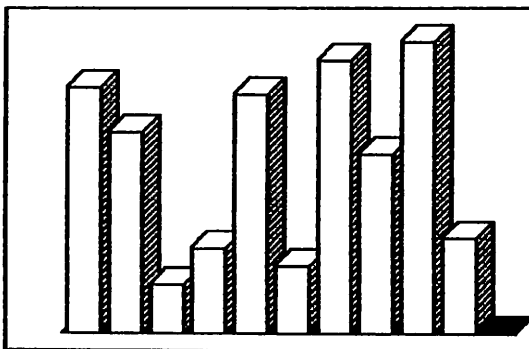
3.4. THE VIEW OPTION

As you are now in the main menu, you can see that the lower
part of the graph is covered by just these two menu lines.

The VIEW option helps you get rid of this problem.   This is
in the main menu and, as usual, can be operated either by
typing in the capital letter, namely "b", or moving the
cursor to the option and ending this selection with a
RETURN.

<div align="center">Press v</div>

You can now see that the graph takes up the   entire   screen
again and the menu lines are no longer present.   This
condition remains until you press any one of the keys.   Then
POWER GRAPH returns to the main menu.

This option is mainly used to let you see the whole graph
once again before you print it out or store it on disk.

Week from 1/1 - 1/6
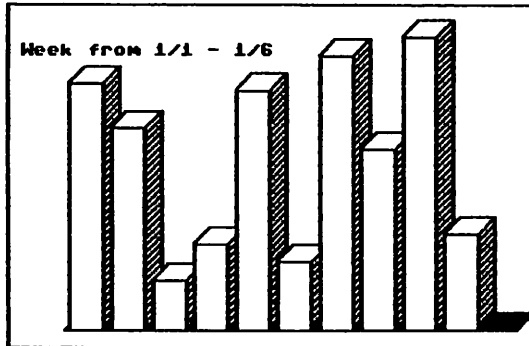
3.5. THE TEXT EDITOR

Something very important is missing from the graph as it
stands at the moment, namely clear, practical labelling.

Here POWER GRAPH provides you with a TEXT EDITOR with which
you can label all parts of the diagram with 5 different type
styles.

You select these via the TEXT menu item in the main menu,
either by pressing "t" or the cursor keys.

                           Press t

The two menu lines disappear again and the graph appears on
its own on the screen. However, you can see a cursor in the
top left corner, which stands out due to its reversed
display. This can be positioned anywhere in the graph by
means of the four cursor keys. Move around the graph for a
bit to get a feel of the graph cursor.

Another way to move the cursor is to use the RETURN key. By
pressing this key you reach the start of the next line. If
the cursor is at the bottom end of the screen, it jumps to
the top left corner.

You can also use the CLR/HOME key, which also brings the
cursor to the top left corner.

So, once again these are the keys which can be used to
control the graph cursor:

     Cursor keys = move the cursor in the desired direction
     RETURN   = jump to the start of the next line
     CLR/HOME   = jump to the top left corner.

Texts can always be written in at the respective cursor
position, even if there are parts of the graph at that
point.

For practice, type "Week from 1/1 - 1/6" into the third
line.

3.5.1. TEXT EDITOR TYPE FONT

Using the function keys you can select various type styles,
which may also be mixed.   A total of 15 type modes is
available to you.

3.5.1.1. LARGE TYPE

The LARGE TYPE mode is selected via the F1 key. At first you
can see no change, but as soon as you have typed in a
letter, you will notice that the character is shown double
height.   This mode is used especially for headings, which
must stand out immediately.

Write the following heading in your graph : "Total wages :"

To exit from this mode, press the F1 key once.

3.5.1.2. VERTICAL TYPE

You select this type mode via the F3 key.   When you write
something, you will see that the letters no longer appear
next to each other, but one above the other. The type has
been moved by 90 degrees, so to speak. This makes it
particulary suitable for labelling bars or vertical axes.

Move the cursor with the cursor control keys to the first
bar and type in "worker 1", for example. You can do exactly
the same with the other bars, so that each one has a legend.

You leave this mode by pressing the F3 key again.

3.5.1.3. REVERSED TYPE

To obtain reversed type, press the F6 key.   All letters
typed in are now shown reversed. You use this type, together
with the vertical type, to label the 2-dimensional bar
chart, for instance, as the front faces are filled in.

Press the F6 key again to exit.

3.5.1.4 OVERLAY TYPE

This type style is selected by means of the F5 key.   This
comes to your rescue when you cannot avoid typing a text
into the actual graph, which would otherwise be overwritten.

In the overlay mode, the old graph and the new letters are
combined and both can be seen together. Sometimes these
overlaps are so large, however, that it is not worth
writing in this mode. In this case it helps to either use

the next line or to displace the graph, which is explained
in the chapter on WINDOWS.

You can leave this mode by pressing F5 again.

Finally, all the type styles, with all the possible
combinations, are shown in the table below.

Type style	Normal	Large	Reversed	Vertical	Overlay
Normal	---	yes	yes	yes	yes
Large (F1)	yes	---	yes	no	yes
Reversed (F6)	yes	yes	---	yes	yes
Vertical (F3)	yes	no	yes	---	yes
Overlay (F5)	yes	yes	yes	yes	---

It would be a good idea to get plenty of practice with the
text editor, because good labelling is just as important as
data selection.
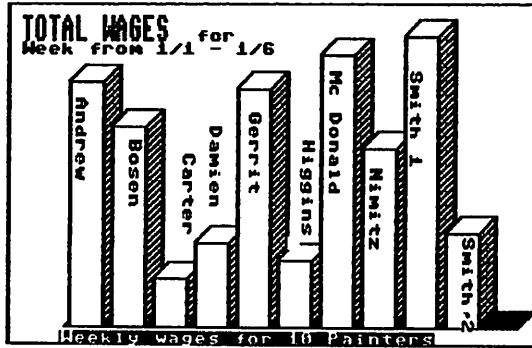
3.6. STORING THE GRAPHS

After you have taken so much time to generate the graph, it would be a pity if it was lost in order to produce another one. POWER GRAPH makes it possible for you to store graphs.

Select the SAVE menu item in the main graphics menu, either by moving the cursor to the option or typing in the letter "s".

Press s

POWER GRAPH now asks you what name you will give to your picture. As with POWER PLAN, you can use all the editing facilities for the input, but cannot specify the name by loading the disk directory like POWER PLAN does when loading and storing programs. Type in a name and end the input with RETURN.

You are now asked to insert a data disk. Any formatted disk may be used as the data disk, provided it still has sufficient storage space.

When you have done this, press any one of the keys and POWER GRAPH stores the graph.

In this way you can hold the results of each month's work on a disk and call them up individual at the end of the year to compare them or print them out to provide a complete record.

3.7. LOADING THE GRAPHS

Loading the graphs is similar to storing them. You select the LOAD item in the main menu and type in a name.

POWER GRAPH can only load graphs which have also been previously stored by POWER GRAPH.

Since it is not very interesting to load the same graph, you don't need to carry out this option. So press the F7 key or RUN/STOP key and you are again in the main menu.

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3.8. PRINTING THE GRAPHS

POWER GRAPH can print out any graph on the printer. This
assumes that you have entered your printer type when typing
the user data in POWER PLAN. This is accepted by POWER GRAPH
just like the device address.

To start printing, select the PRINT item in the main menu,
either by typing in "p" or moving the cursor to the item.

You are then asked if the graph is to be inverted.   This
means that the graph will be printed out in negative form.
If you answer with a "y for yes, only the background is
printed, not the actual diagram. The diagram appears as
white "flecks".   You should not use this option too often,
as you will soon wear out the ink ribbon of your printer.

At the end of the printout, you are again in POWER GRAPH's
main menu.

The picture below shows the bar chart with labels, using the
reversed video effect.
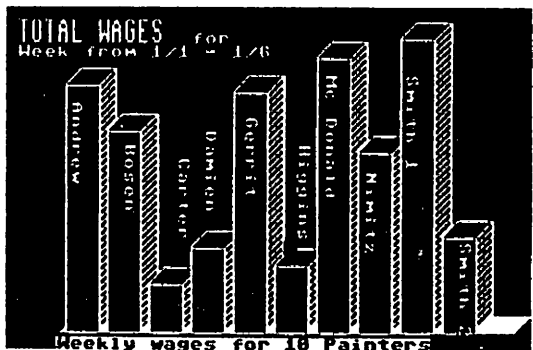
3.9. THE CLEAR OPTION

Using this option, which is also in the main menu, you can
clear all the graphics, including all labelling.

Once a graph has been cleared, it cannot be recovered. The
only way you can get it back is to type in the data again,
together with the legends.

3.10 CHOICE OF COLORS

If you are in the main menu, you can vary the color of the
screen or type at any time.

The background color is changed via the F1 key, and the
color of the type via the F3 key.

The type color is identical to that used to generate the
diagram itself.

3.11
THE CURVE GRAPH

Up to now we have only dealt with the text editor and the
bar chart, so we will now look at the curve graph.

Since the curve graph is particular good for showing trends
and variations, we will show the daily work done by worker
number 1 in a week, by means of a diagram.

To generate the curve, we first have to select the
GENERATION MENU. You do this by pressing the following keys:

                    g (select generation menu)
                    1 (type in window number)
                    RETURN (end the input)
                    n or y (question about the frame)

With these inputs you have defined the screen window, in
this case window 1, any other window may be used, and
decided whether or not the window is to have a frame.

The generation menu appears again.   Select the CURVE GRAPH
item by typing in

                              c

You now see the input mask again, with the difference that
curve graph appears in the first line as the type of
graphics required.

The next question refers to the number of curves which have
to be shown in the diagram. You can have a maximum of 3
curves, but for this example we need only one. So   press

                              1
                            RETURN

The familiar question about the width of the left margin now
appears.   You can type in values from 0 to 7 and end the
input with RETURN.

The next question again refers to the number of positions,
that is the number of points on each curve.

Since we wish to show the work done on each day of the week,
type in a 5 and end with RETURN.   Now type in

                              5
                            RETURN

The allocation of cells which follows is practically
identical to that of the bar chart.   At the left margin you
see the numbers, here only 1 to 5, as you have typed in 5
points. So only 5 input cells are present.

Into the first you type the coordinate G5 in which appears the day's work of worker 1 for the month.

If you want to make sure, you can always get back into the worksheet by pressing the SHIFT+CLR/HOME keys.

<div align="center">

Press g

5

RETURN
</div>

or move in the worksheet to cell G5 and press RETURN.

If the cursor is now positioned at the second input cell, you can either type in the following coordinates individually or use the coordinate copy option.

To use the latter, press the following keys to copy columns:

<div align="center">

#

c

RETURN
</div>

Unlike the bar chart, where we typed in #r, you can see that we used "c". If you remember, this instruction changes the column, the row number remaining the same.

The following input cells have the coordinates H5 to K5, that is the cells which contain the hours of work.

This completes the input and we can leave the input mask via the SHIFT+RETURN. Press:

<div align="center">

SHIFT+RETURN
</div>

Assuming you have not made any mistakes in the input, you are asked if the mask has to be stored. Since it is not necessary to store the mask at the moment, answer "no".

<div align="center">

Press n
</div>

After the window has been deleted, which takes about 10 seconds, POWER GRAPH starts to generate the graph. Since the graph still looks rather bare, you can insert any legends and explanations via the text editor.

3.12. THE MULTIPLE CURVE GRAPH

Now that we have produced a single curve, we will now
generate a diagram having several curves. In this way you
can for example, make a direct comparison between the daily
work of two or three workers.

First of all, select the generation menu again and enter the
window number and decide on the worksheet frame. To do
this, press:

                    g (generation menu)
                    1 (window number)
                    n or y (question about frame)

In the generation menu, select the curve graph item by
typing in "c".

The first input refers to the number of curves per diagram.
As we wish to display the hours worked by two workers, enter
a 2. Type in:

                    2
                    RETURN

You can answer the next question, the width of the left
margin, in exactly the same way as you did with the single
curve graph.

The number of points does not alter, although you now want
to produce a graph with two curves. This can be explained
as follows:

The number of positions is the same as the number of points
in each curve. So, with the double curve graph, each curve
has 5 points. The same applies to the graph with 3 curves.
In this case, 3 curves, each with 5 points, would be drawn.
So press:

                    5
                    RETURN

You now see the input cells again, but with an important
difference from the single curve graph. For each number, or
point, there are TWO input cells. So for each point on the
horizontal axis, you can type in two coordinates which,
depending on the contents of the cell, are shown one on top
of the other.

For our example, type in the coordinates G5 to K5 for curve
1 and G6 to K6 for the curve 2. By doing this, you have
allocated the daily work of the first worker to the first
curve and that of the second worker to the second curve.

In this case it is not possible to use the coordinate copy option, since the coordinates which we now need are not arranged in one line or column. You therefore have to use the rather more involved alternative, that is, typing in the coordinates by hand.

When you have completed the input, leave via the SHIFT+RETURN. After the screen clears, the graph is built and you return to the main graphics menu.

The following graph gives an idea of the labelling and demonstrates a few of POWER GRAPH's structural capabilites.

Multiple curve graph
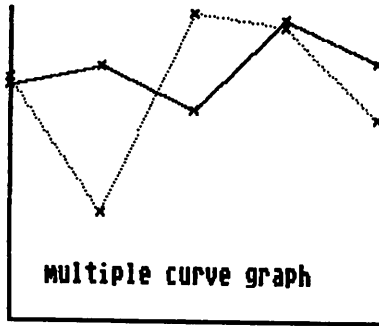
3.13. THE POINT GRAPH

The point graph is actually only a simplified form of the
curve graph. Because of this, the inputs and examples are
practically identical.

It is not possible to show several point graphs in one
window   as you cannot distinguish between the   points
themselves, so the object of a multiple point graph would be
lost.

For practice, you can use the example from the curve graph,
ignoring the input for the number of curves and selecting
the point-to-point item in the generation menu.   To do this
press:

<p style="text-align:center">P</p>

and proceed as you did with the curve graph.

Week One Point graph model   ×

×

×

Daily Wages for Employee Andrew

×

Mon.   Tue.   Wed.   Thu.   Fr.
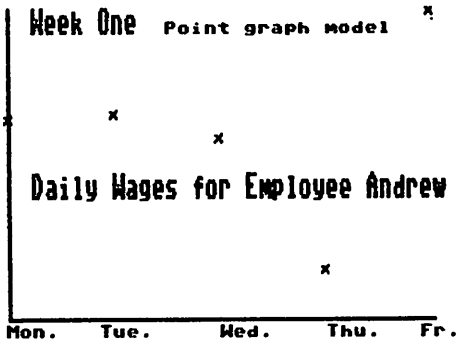
3.14. THE MIN-MAX GRAPH

The min-max graph clearly shows differences, for instance
when illustrating share prices, where the highest, lowest
and final figures can be clearly shown. In lines 18-20 of
our worksheet are cells which contain a MIN, MAX or AVG
option. These represent the minimum, maximum and average
hours of works in a day. Our graph is to be based on these
figures.

Select the generation menu in the usual way. Press

> g (generation menu)
> l (window number)
> RETURN (end the input)
> y or n (question about frame)

In the generation menu, type an "m" for min-max graph, or
move the cursor to the appropriate point.

> Press m

The input mask and the question about the left margin appear
again. Type in a value of between 0 and 7 letters and
complete the input with RETURN.

> E.g. press 3
> RETURN

The next input refers to the number of positions. For this
you need to know the following:

A point on the horizontal axis consists of THREE
coordinates, the minimum, the maximum and the average value.
Since our data cover a working week, type in a 5.

> Type in 5
> RETURN

You will notice that the cells are arranged so that 3 input
cells are allocated to each number. The first one is the
maximum value, the middle one is the average value, and the
one on the right is the minimum value.

Type in cell G18 for maximum, then G19 and finally G20 for
minimum. At first the input is rather complicated and time-
consuming as the coordinate copy option cannot be used, but
the effort is rewarded by a very functional diagram.

The input mask is shown below, section by section:

No.	Maximum	Average	Minimum
1	g18	g19	g20
2	h18	h19	h20
3	i18	i19	i20
4	etc.		

When you have completed the input, leave the input mask via the SHIFT+RETURN and answer the question about storing the mask with "n" - for the reasons already stated.

Here is a completed min-max graph with suitable labelling:

Min-Max Graph

Minimum and Maximum pay each day

Mon.   Tue.   Wed.   Thur.   Fri.
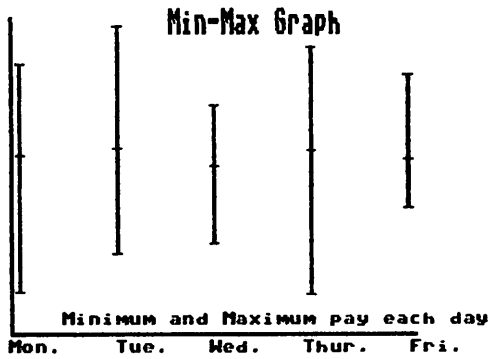
3.15 THE PIE GRAPH

The pie chart is a frequently-used form of graphic representation. It clearly illustrates the relationships between the data, rather than the absolute proportions.

It is therefore often used to show proportions when it is not absolutely necessary to show the actual value of each slice of the cake.

In our example we shall use exactly the same data as we used in the bar chart.

You can now see that the types of graph can be interchanged, perhaps to highlight other aspects. So basically, bar charts and pie charts are interchangeable as far as the data is concerned, but not with regard to the purpose of the graph.

You can, for example, produce a pie chart which has to express actual, substantial, absolute values, which is difficult with a diagram, but certainly technically possible. You can also replace a simple curve graph with a bar chart, but the shape of the curve is lost. You should think carefully about which type you will choose later for your own diagrams, particularly with regard to function and clarity.

But enough of the introduction. Let's get on with producing a pie chart.

You select the generation menu by the well-known sequence:

> g (generation menu)
> l (window number)
> RETURN
> y or n (question about frame)

In the generation menu, select the pie chart item.

<p align="center">Type in I</p>

To the first question, you can choose between the 2-dimensional or the 3-dimensional representation. For the purposes of this example this choice is unimportant, since you are only concerned with the external representation, as with the bar chart.

You do not type in a left margin this time, because there is no labelling of the vertical axis.

You now type in the number of positions, which in this case is the number of slices of the cake.

<p align="center">177</p>

Since we are using the same data as we had for the bar chart, type in a 10 here:

<div style="text-align:center">

Press 1
0
RETURN

</div>

You fill the ten input cells which now appear, like you did with the bar chart. That is, coordinates 05 to 015.

Type in the first coordinate direct or via the worksheet, by pressing the following keys:

<div style="text-align:center">

0
5
RETURN

</div>

When the cursor is in the second input cell, use the coordinate copy option. Type in:

<div style="text-align:center">

(copy coordinate)
r
RETURN

</div>

All the input cells are now defined and you can leave the input mask via the SHIFT+RETURN.

It is rather difficult to allocate the correct coordinate to each pie slice. You should know that the first coordinate is the same as the slice of the pie whose upper boundary is the straight line running horizontally to the right from the center. The next coordinates are the slices of the pie which run clockwise from the first slice.

The following example graph should encourage you to carry out further work with POWER GRAPH.
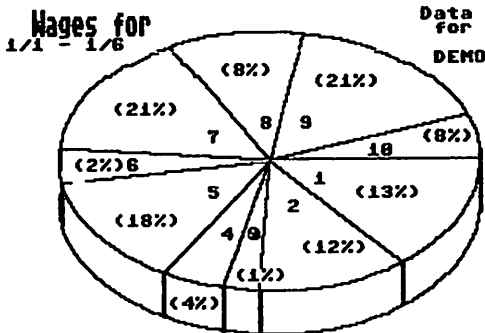
3.16. SCREEN WINDOWS

POWER GRAPH enables you to display eight different graphs in
eight windows on the screen.

To set the size of the windows, select the WINDOW item in
the main graphics menu.

<p align="center">Press w</p>

You now see the same table that appeared when selecting
GENERATE. The difference is as follows:

There is an arrow at the left margin next to the first line
of the table. You can move this down or up by means of the
cursor down and cursor up keys.

The cursor is used to select the window which you now want
to alter.

Move the arrow to any line, as at the moment all the windows
are the same size, and press the RETURN.

For window 1, you would just press RETURN.

The table now disappears and the graphics take over the
entire screen. You will notice a cross in the top left
corner, which can also be moved by means of the cursor keys.

The cross is used to set the top left point of your window.
Move the cross to any position and press RETURN.

The first cross now remains at the point where you pressed
the RETURN key. A second cross appears diagonally below it.

You can then specify the bottom right corner with this, and
then the window is defined.

A note about this: The second cross cannot be moved
everywhere. The reason for this is that the window has to
have a minimum size so that it remains visible in your
graphics. For the user who is familiar with the graphics
resolution of the C64, the minimum size is an 80x80 matrix.

When you have completed the coordinate input by a RETURN,
the table appears again.

You can now see that other coordinates appear in the line
where the arrow was previously. These coordinates merely
represent the positions of the two crosses. The first figure
is the X-coordinate, the second the Y-coordinate or the top
left point. Similarly, the last two figures stand for the
position of the bottom right corner of your window.

At first sight, these numbers may seem rather complicated, but are not that important to you. They should just be a guide as to the position and size of the window when you are generating graphics.

For practice you can define several, different sized windows and get familiar with the coordinate inputs.

When you are ready, leave the table via F7.

Run through the example of the pie chart in a small window. To do this, select the generation menu and then type in the number of the window which you have previously made smaller.

End the input with RETURN.

The next question asks if the frame should be drawn. You now know the real point of this input, that is to separate the individual windows from each other.

<div align="center">Press y</div>

In the generation menu itself, select the pie chart in the usual way.

> Type i
> RETURN (dimensions)
> l (positions)
> 0
> RETURN
> o (1st coordinate)
> 5
> RETURN
> #r (copy coordinate)
> RETURN
> SHIFT+RETURN (exit from input mask)
> n (store the mask)

When you have completed the data input, you see that only the window defined by you is erased, not the whole screen. The frame is then drawn round this window and the graph is generated.

The result of this is that inside the large pie you have now displayed a smaller one which is clearly separated by the frame.

Of course you can produce any other type of diagram there, instead of the pie chart.

There is one point to watch with other graphs: The number of maximum positions depends on the size of the window. This is obvious, since fewer bars can be shown in a width of 80 pixels than with a width of 320 pixels.

<div align="center">180</div>

Always ensure that at least the required amount of data can
be entered.

Should this not be the case, you can still increase the room
for the actual graph by reducing the left margin.

To become familiar with this very convenient facility, set
up a few graphs in different screen windows. For example,
you can place the graph of the daily work of each worker in
a window and compare the curves.

This has been done in the diagram below:
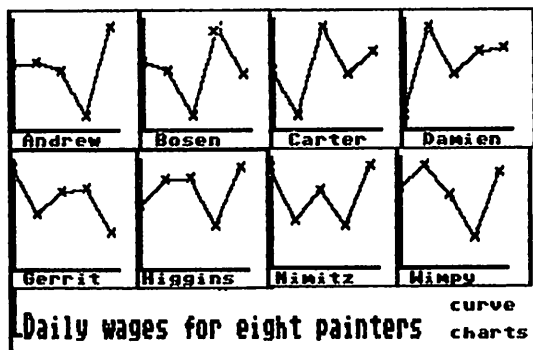
3.17 STORING THE INPUT MASK

You can store any of the input masks which you have prepared
and reload them when required.

To demonstrate this, we will use the example of the bar
chart once again.

First, select the generation menu again. Press:

> g
> 2
> RETURN
> y

We now select the bar chart by pressing RETURN.

Now go through the example from the beginning of the POWER
GRAPH teaching manual. Here is the key sequence again:

> RETURN (dimensions)
> 5 (left margin)
> RETURN
> 1 (positions)
> 0
> RETURN
> o (1st coordinate)
> 5
> RETURN
> # (copy coordinate)
> r
> RETURN
> SHIFT+RETURN (exit from input mask)

You now see at the bottom edge of the screen the question
about storing the mask. Answer this with "yes".

> Press y

You are now asked to type in a name. You can type in a text
of up to 6 letters long, then complete the input with
RETURN.

You are now requested to insert a data disk. Here you use
any disk which has been formatted and has sufficient free
storage space.

When you press any key, POWER GRAPH starts to store the
input mask and the graph is generated in the normal way.

But what's the point of all this?

This function seems pointless at first sight, but it saves
you a lot of work making notes.

Let's assume you that for each month you have prepared a worksheet with the total wages of all workers, and wish to display all the monthly data graphically at the end of the year.

You have to carry out the same operations for each month. Select the generation menu, type in the dimensions, left margin, etc. Here is where it helps to store the input mask. You have stored all data, particulary the coordinates, on disk.

Since the coordinates are always repeated each month, the input mask does not change and you use the same one that you stored.

Loading the mask is done via the MASK item in the main graphics menu.

<p align="center">Press m</p>

You are again asked to type in a name. Enter the same name that you used when storing the mask on leaving the input mask mode. End the input with RETURN.

Now insert the same disk on which you have stored the mask, and press any key.

POWER GRAPH now loads the mask, skips filling the input mask, and starts to construct the graph.

You can see that it is exactly the same graph as before. If, via POWER PLAN, you now alter the total wages in the worksheet, or load the next month, and then return to POWER GRAPH and load the mask, the same graph would be generated, but with different values for the individual coordinates. This would then give you a good comparison, since you have used the same assumptions. If you have defined different windows, these are also stored at the same time, and this does not have to be done again.

If the worksheet does not agree with the stored input mask, POWER GRAPH generates an error message.

3.18. RETURN TO POWER PLAN

We have now reached the end of the POWER GRAPH training manual and you are able to generate and label graphs in different windows.

If you think that you are completely familiar with POWER GRAPH, we will go back to POWER PLAN again.

This is done via the RETURN item in the main graphics menu.

Press b

POWER GRAPH now asks you to insert the system disk and press any key. When you have done this, POWER PLAN is loaded, and after about 2 minutes you are again in the familiar worksheet.

All cells, as well as repetitive texts, code word, global formats, printer matching, etc. are retained and you can carry on from the point where you started the graphics.

4. POWER GRAPH SYSTEM MANUAL

The part of the POWER GRAPH manual which now follows, summarizes the important options in the graphics menu and the sequences for generating the individual graphs. This section should be used as a reference book, in which you will find brief, precise explanations, which will help you - the keen reader of the training manual - to recall the necessary details.
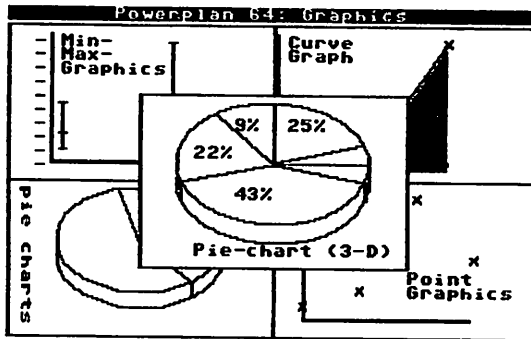
4.1. GENERATE (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the following key:

g (select the Generate item)

The GENERATE option is contained in the main graphics menu and is not carried out immediately, but initiates the parameter and coordinate inputs, which are required to generate a graph.

You must always select this item when you want to generate a graph. First of all you call up the screen window table, into which you can then type your window number. You also decide if the window is to have a frame. The generate menu then appears.

Further details are given in the summaries of the generation sequences for the individual graphs.

4.2 PRINT (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the following key:

p (select the Print item)

You can print out the graph at any time by using this menu item. You can choose between the reversed or normal printout. The difference is as follows:

In the normal printout only the graph and any legends are printed out, that is the foreground.

If you have decided on the inverted or reversed printout, POWER GRAPH prints only the background, leaving the actual graph as white "spots". This certainly gives a very attractive effect, but wears out the ink ribbon of your printer.

If the printer is not connected or not turned on, POWER GRAPH provides an appropriate error message.

POWER GRAPH matches up the printer which you have defined in POWER PLAN by entering the user data.

The printout can be interrupted at any time via the F7 key. POWER GRAPH then returns to the main graphics menu.

4.3. SAVE (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the following key:

                    s (select Store item)

This option lets you store a completed graph on disk. To do this, the floppy disk must be formatted and have sufficent free storage space (at least 33 blocks).

When you have selected this item, you are asked to type in a name, which may be a maximum of 6 letters long.

Having completed the input with the RETURN key, you are asked to insert the data disk mentioned above. When any key is pressed, POWER GRAPH starts to store the graph.

POWER GRAPH then returns to the main graphics menu.

4.4 LOAD (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the following key:

                    l (select the Load item)

The LOAD option is similar to storing the graph. After this item has been selected, you are again asked to type in a name of up to 6 letters long.

When you have completed the input with the RETURN key, you are asked to insert the data disk and press any key.

POWER GRAPH can only load graphics which have previously been stored by POWER GRAPH. Otherwise, an error message appears.

4.5. MASK (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

                    m (select the Mask item)

When you select this item you load a previously stored input
mask. Thus all parameters, and above all the coordinates,
are loaded and POWER GRAPH can begin to generate the graph,
provided the stored coordinates match the present worksheet.

This option is mainly used when you want to produce several
graphs which are identical but have different data, i.e.
worksheets. This spares you from entering the entire input
again and the graphs are absolutely identical in their
external apperance. This option can only be used, of course,
if there is one VALUE cell in the worksheet for each
coordinate in the input mask. If not, an error message says
"data record not correct".

4.6 WINDOW (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

                    w (select the Window item)

This option allows you to vary the size and position of the
8 screen windows.

After this menu item has been called up, the screen window
table appears. At the left hand margin of the first line you
can see an arrow which can be moved by means of the cursor
keys. The window in whose line the arrow is located, is then
defined when you press the RETURN key.

Having pressed the RETURN key, you will again see the graph
on the screen, but with the difference that there is a cross
in the top left corner. You can move this with the cursor
keys and position it almost anywhere on the screen. A zone
remains at the right hand and bottom margins, into which you
cannot move the cross, as then the window would become too
small.

By pressing the RETURN you specify the coordinate at which
the cross is located, as the top left point of the window
margin. A second cross appears, which you can also move.
Pressing the RETURN sets the bottom right coordinate. Your
window has now been defined with these two coordinates and
the screen window table appears again. The coordinates of
the two crosses appear in the line of the window which you
have just defined. You exit from the input by pressing the
F7 key.

4.7. VIEW (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

                    v (select the Picture item)

This option brings the whole of the graphics onto the
screen, as otherwise the bottom two lines are covered by the
main graphics menu.

If you press any key you leave this mode and the main
graphics menu appears once again in the menu zone.

4.8. TEXT (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

                    t (select the Text editor)

By pressing "t" you get into the text editor mode, with
enables you to label your graphs.

The graphics cursor, which initially is at the top left
corner, can be moved around the picture by means of the
cursor keys. You can insert text at any cursor position,
writing over the graph as well.

It is possible to get to the start of the next line by
pressing the RETURN key, and to reach the top left corner
via the CLR/HOME key.

Using the function keys, you can also call up the various
type styles. The function keys acts like switches, i.e.
press once to call up the mode; press again to switch it
off.

F1 : Large type

In this mode the letters are twice as high as normal. They
are particular suitable for headings.

F3 : Vertical type

The vertical type is displaced by 90 degrees, so to speak,
and the direction of writing is from top to bottom, instead
of from left to right. This type style is very good for
labelling vertical axes or bars.

F5 : Overlay type

In this type mode, POWER GRAPH enables all letters, which
you now type in, to be mixed with the previous contents of

the cell. You can write into the graph without upsetting it.
If the overlaps are too large, you cannot make out the graph
or the type clearly, and the only way out of this is to
continue writing in the next line, or shift the graph by
making the window smaller.

F6 : Reversed type

When this mode is selected, the letter are displayed
reversed, which emphasizes the type even more.

You can mix all type modes, with the exception of vertical
plus capitals.

4.9 RETURN (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

> b (select the Back item)

Selecting this item returns you to POWER PLAN, where of
course the worksheet and all the individual inputs are
retained.

You are asked to insert the system disk and press any key.
POWER PLAN is then reloaded. This takes about 2 minutes.

4.10 CLEAR (MAIN GRAPHICS MENU)

To call it up from the main graphics menu, press the
following key:

> c (select the Clear item)

When this menu item is selected, POWER GRAPH causes all the
graphics, plus all legends to be deleted. They are now
irrevocably lost and can only be restored by regenerating
and writing them again.

4.11. GENERATION SEQUENCES

The following pages briefly list the necessary inputs which
are required to generate the various types of graph.

Getting into the generation menu initially is the same for
all types, exactly like the coordinate inputs. So follow the
route to the generation menu, which is the starting point
for all the following pages.

4.11.1 GENERATION MENU

To call it up from the main graphics menu, press the
following keys

> g (select the Generation item)
> 1 to 8 (window number)
> n or y (question about frame)

You are now in the generation menu from which you can select
the type of graph you require.

You can choose from the following:

> - bar chart
> - curve graph
> - point graph
> - pie chartgraph
> - min-max graph

4.11.2 BAR CHART (GENERATION MENU)

To call it up from the generation menu, press the following key:

                    b (for bar chart)

After the bar chart menu item has been selected, the input mask appears on the screen. The first input refers to the type of bar chart display. You can choose between a 2-dimensional or a 3-dimensional representation.

                    Press t or h

You now specify the left margin. Values between 0 and 7 are allowed. The input is completed with "RETURN".

                    Type in 0 to 7
                    RETURN

You now enter the number of positions, that is the number of bars to be displayed in your diagram. The question is followed by the maximum number in brackets, which depends on the size of the window. The input is completed by RETURN.
The coordinate inputs and allocation of cells which follows, is discussed in the system manual under the chapter "4.12. Allocation of cells". This applies to all types of graphs.

4.11.3. CURVE GRAPH (GENERATION MENU)

To call it up from the generation menu, press the following
key:

                c (for curve graph)

As with the bar chart, the input mask now appears. The first
input refers to the number of curves which is to be
displayed in one diagram.   Up to 3 curves per diagram are
allowed.

So type in values from 1 to 3 and end the input with RETURN

Now specify the left margin.

                Press 0 to 7
                RETURN

The question which now follows concerns the number of
positions, in this case the number of points in EACH curve.
The maximum number is again set by the size of the window.

Complete the input with RETURN.

The coordinate inputs and allocation of cells which follows
is discussed in the system manual under "4.12. Allocation of
cells". This applies to all types of graphs.

4.11.4 POINT GRAPH (GENERATION MENU)

To call it up from the generation menu, press the following
key:

                    p (for point-to-point graph)

As with all other graphs, the input mask appears when you
call up the point-to- point graph. In this case you only
need to specify the left margin.

Values from 0 to 7 are allowed.

The input is ended with RETURN.

The following question relates to the number of positions,
that is the number of points.   The maximum number is again
determined by the size of the window and appears in brackets
after the question. The input is completed with RETURN.

4.11.5. MIN-MAX GRAPH (GENERATION MENU)

To call it up from the generation menu, press the following
key:

                    m (for min-max graph)

By pressing the "m" key, you call up the input mask for the
min-max graph.

The first input refers to the width of the left margin.

                    Press 0 to 7
                    RETURN
The next question refers to the number of positions,   each
comprising three coordinates, namely the maximum, minimum
and average values.

The maximum number is set by the size of the window and you
must complete the input with RETURN.

The coordinate inputs and allocation of cells which follows
is discussed in the system manual under "4.12. Allocation of
cells". This applies to all types of graphs.

4.11.6. PIE CHART (GENERATION MENU)

To call it up from the generation menu, press the following
key:

                i (for pIe chart)

The input causes the input mask for the pie chart to appear.

First, you have to specify the way the whole pie chart is to
be displayed. You can choose between a 2-dimensional and a
3-dimensional display.

                Press t or h

The next input refers to the number of positions, that is
the number of slices of the pie.

        Press 2 to 15
        RETURN

The top of the first slice is marked by the straight line
running horizontally from the mid-point to the right.   The
rest of the slices follow on clockwise from this one.   The
coordinate inputs and allocation of cells which follows is
discussed in the system manual under "4.12. Allocation of
cells". This applies to all types of graphs.

4.12. ALLOCATION OF CELLS

Allocation of cells is carried out when the parameters for
the individual types of diagrams have been entered.

In the bottom half of the screen, on the left hand side, you
can see a column with the numbers from 1 to a value which
you typed in for the number of positions. If you have
defined more positions than lines on the screen, the bottom
part of the screen "scrolls" upward until you arrive at the
last position. The cursor then jumps back to the first input
cell. In addition to each number, there is one or more input
cells. In the first input cell you can see a cursor, which
may be controlled via the cursor keys, SHIFT+CLR/HOME or
INST/DEL keys. Further information on these is given in the
POWER PLAN manual.

In general, three types of input cells have to be filled:

                - coordinate input via the keyboard
                - coordinate input via the worksheet
                - copy coordinate

Input via the worksheet

You select the coordinate via the worksheet by typing in a
blank cell.

To do this, press **SHIFT+CLR/HOME** then **RETURN**

You can see that the worksheet is now on the screen, and you
can't make changes to the worksheet fro POWER GRAPH.

You can move the cursor with the four cursor keys or the
GOTO option. This is done via the F5 key, just as you do
with POWER PLAN.

After pressing F5, you are asked to type in a coordinate at
which POWER GRAPH positions the cursor after you have
completed the input with RETURN. When RETURN is pressed, the
coordinate of the cell at which the cursor is now located,
is accepted into the relevant input cell of the input mask.

Copy coordinates

By typing in #r or #c, you can copy the coordinate located
in the preceeding input cell into the next input cell. With
#r the row number is increased by one and the column remains
the same, whereas with #c, the column is increased by one
and the line remains the same.

If there is text or blank cells under the cells generated by
the copy, no error message appears at first. This is only
displayed when the cursor is moved to the input cell.   Exit
from the input mask by pressing "SHIFT+RETURN"

APPENDIX A

ERROR MESSAGES

The error messages are described in the following manner.
1) Indicates the cause of the fault
2) Gives hints for clearing it
3) Any special cases

1 - Wrong coordinate

1) POWER PLAN has detected in the cell concerned a
coordinate whose line number exceeds 255 or whose column is
greater than BK.

2) Correct the coordinate.

3) This error message can also appear if you want to type in
a TEXT field and have forgotten to press the blank key.
POWER PLAN then interprets your text as a coordinate or
instruction word, and if neither apply, generates this error
message. Incorrectly written instruction words can also
cause this.

2 - "(" left out

1) You have forgotten to complete all brackets. Either the
"(" or the ")" character is missing.

2) Check the formula.

3 - 2nd page present

1) You wanted to reload a 2nd page, without deleting the
previous one.

2) Delete the 2nd page at present located in the memory.

4 - Value not allowed

1) You have used an impermissible mathematical function,
e.g. sqr(-1).

2) Check the relationship, possibly use "if.then.else"
instruction and thus allow impermissible values only after
conversion.

Example: If al <0 then sqr(abs(al)) else sqr(al).

If al is negative, the absolute value is generated for which
the sqr function is allowed.

5 - No status possible

1) You have tried to interrogate the status of a blank cell.

2) Move the cursor to an occupied cell.

6 - Reference to text cell

1) A coordinate of a VALUE cell refers to a TEXT cell and cannot therefore be calculated.

2) Check the coordinate. You may have inserted or deleted a column or line without matching the coordinates.

7 - Variables missing

1) The variables which limit the block are missing from a block function, such as SUM, AVG or MIN.

2) Insert the coordinate.

8 - Colon left out

1) In a block function you have forgotten the colon between the two coordinates, which limits the block.

2) Insert the colon.

9 - Area error 1

1) This error occurs if you have tried to define a block which includes the cell in which the instruction is located.

2) Alter the block.

10 - No function brackets

1) You have forgotten the brackets around the corner coordinates.

2) Insert the brackets

11 - Area error 2

1) This error occurs when you have mixed up the corner coordinates in a block instruction and the 2nd coordinate is larger than the first.

2) Change the coordinates around.

12 - "if" is wrongly used

1) You have not put the "if" at the first position.

2) "if" instructions must not be embedded, and the "if" must appear at the beginning of the formula.

13 - "then"/"else" mixed up

1) You have used the two expressions "then" and "else" in the wrong order. The "then" must always come before the "else".

2) Change the expressions.

14 - Relational characters

1) POWER PLAN cannot find any relational operators between the "if" and the "then", so that it cannot decide if the "then" or "else" instruction should be carried out.

2) Insert a relational character such as "(", ")" or "( )".

15 - " " left out

1) This error occurs if you have forgotten to insert the " " (SPACE) character between the two arguments of the % function.

2) Insert " ".

16 - Memory overflow

1) The memory for the worksheet is full. POWER PLAN cannot store any more cells.

2) Reduce the worksheet, saving on frames or TEXT cells, or delete the 2nd page, if present.

17 - No 2nd page present

1) You have tried to use options in the link menu, although there is no 2nd page.

2) Link the worksheets.

18 - Format error

1) You have tried to enter a value format, such as maximum
or integer, into a TEXT cell.

2) Select the correct format or position the cursor at a
VALUE cell.

19 - Unoccupied cell

1) You have tried to allocate a format to an unoccupied cell
or to interrogate its status.

2) Move the cursor to an occupied cell.

20 - % function without brackets

1) The % function has been completed without brackets.

2) Insert the brackets.

21 - Wrong column width

1) You have tried to define a column wider than 18
characters.

2) Type in the column width again. Only values of between 5
and 18 are allowed.

22 - Wrong decimal point format

1) You have tried to define more than 8 decimal places.

2) Type in the decimal places again.

23 - Screen already split

1) This error occurs when you try to divide up the screen
when this has already been done.

2) Cancel the old division and split up the screen again.

24 - Printer not connected

1) You have tried to activate the printer, without switching
it on or connecting it up.

2) Switch on or connect up the printer. Check the serial bus
cable or interface in the case of Epson printers.

25 - Syntax error

1) You have made a mistake in a mathematical function or have used the wrong brackets.

2) The formula and brackets.

26 - Numeric Overflow

1) A VALUE cell has a result which is greater than 10E+39 or is less than -10E-39.

2) Check the formula, there may be an incorrect arithmetic character.

27 - Division by "0"

1) You have tried to divide by 0, which is not mathematically permissible.

2) Check the formula or the coordinates used.

28 - Disk drive switched off

1) You have tried to access the floppy disk, without this being switched on.

2) Insert the disk or switch on the drive. Check for damaged hardware.

29 - No disk present

1) This error message appears if the drive is activated without a disk in place.

2) Insert a disk.

30 - Disk full

1) The disk in the disk drive has insufficient storage space to take your worksheet.

2) Replace or validate the disk.

31 - Program not present

1) The program or worksheet you want is not on the disk in the disk drive.

2) Change the disk or check the name of the worksheet.

32 - Write protection present

1) The disk in the drive has write protection. No further programs can be stored.

2) Remove the write protection tab or change the disk.

33 - Faulty disk

1) POWER PLAN cannot read the disk because the disk is probably defective.

2) Change the disk or try to load the worksheet once again.

3) Very often a disk with this fault cannot be saved, since it was probably badly stored and the data on it has been mutilated.

APPENDIX B

MENU STRUCTURE

POWER PLAN's menu structure is shown on the next two pages.

You can see from this chart which command you use to get to
any option.

An example:

Let's assume that your want to select the FILL CHARACTER
option.

To find out how to select this option, first locate its
position on the chart.

When you have found it, go back along the line until you
reach an option contained in the main menu.

Following this method, you can see from the chart that to
select a FILL CHARACTER, you must first select the GLOBAL
and then the PROTECT option.

POWER PLAN

| PRINTER | STATUS | OPTIONS | GRAPHICS | GLOBAL |

| PRINT PART | OUTPUT FORMULA | SHOWS CELL STATUS |

LOAD POWER GRAPH

USER DATA

FORMULA OUTPUT

BORDER

TITLE FIELD

LOAD

ERASE

CHAIN

TRANSFER

DEFINE CELL FORMAT

MAXIMUM

INTEGER

CENTER

LEFT

RIGHT

DECIMAL DEFINE NUMBER OF PLACES

INPUT CODEWORD

CLEAR CODEWORD

FILL CHARACTER

TEXT COLOR

VALUE COLOR

COLUMNS DEFINE WIDTH

PROTECT

COLOR

MENU STRUCTURE

QUIT	EDIT	BLANK	FORMAT	DISK	NEW	?

EXIT TO BASIC

BLANK A CELL

ERASE WORKSHEET

HELP TEXT

WINDOW SPLIT SCREEN

DEFINE SINGLE FORMAT
- **MAXIMUM**
- **INTEGER**
- **CENTER**
- **LEFT**
- **RIGHT**
- **DECIMAL**

LOAD FROM DISK

SAVE TO DISK

DIRECTORY OF DISK

DELETE COLUMN OR ROW

MOVE BLOCKS OF CELLS

REPLICATE

COPY

SORT

COLUMNS SET SINGLE WIDTH

SYSTEM COMMANDS
- **FORMAT**
- **SCRATCH**
- **RENAME**
- **VALIDATE**

COLOR DEFINE FIELD COLOR

INSERT COLUMN OR ROW

TEXT CONSTANT

PROTECT SET/CLEAR VALUE OR FORMULA

RECALCULATE WORKSHEET