Time
by Gerald Fitton

Time is
Too Slow for those who Wait,
Too Swift for those who Fear,
Too Long for those who Grieve,
Too Short for those who Rejoice;
But for those who Love,
Time is Now.

Henry van Dyke Jr. (1852 - 1933)

This is one of van Dyke's best known poems. It was originally called, "For Katrina's Sundial" because it was intended as a sundial inscription for his friend Katrina Trask. It was read at the funeral of Diana, Princess of Wales. Also it can be found on a memorial in Grosvenor Square, London, dedicated to British victims of the 9/11 twin towers attack. In some later versions of the poem the final word, "Now", is replaced by "Eternity".

Divisions of Time

60 seconds make a minute; 60 minutes make an hour; 24 hours make a day. At this point the regularity ceases because our months sometimes have 28, 29, 30 or 31 days. This irregularity can make some graphs misleading. For example, plotting data against 12 equally spaced months distorts graphs of sales turnover, fuel used, miles travelled and many more applications such as sugar intake or beers drunk! In this article I will show one way of overcoming this difficulty. I shall use PipeDream although many other spreadsheets can be used in a similar way.

Why Use PipeDream?

The three spreadsheets with which I am most familiar are: Libra Office Calc, Fireworkz and PipeDream. Calc is a Microsoft Office clone which runs in Windows and MacOS. Fireworkz runs in RISC OS and Windows. PipeDream runs only in RISC OS. Although there is a charting package in Fireworkz, the PipeDream package is far more versatile; it is harder to use than Fireworkz but this is because it is considerably more versatile.

The Chart

I keep a record of the mileage (taken from the odometer) each time I fill up with petrol. I bought my nearly new Seat Mii car at the end of February 2017. I have plotted the mileage (which I write on the receipt) for the 12 month period, February 2017 to February 2018, against the number of days since 1st January 2017.

Have a look at the graph below. This is the graph we are going to reproduce. It is not possible to create a graph like this using Fireworkz.

It is a graph of 'Miles' (the mileage which I have written on my petrol receipt) against 'Days since 1st January 2017'; these appear as a set of circular red dots. The first of each month is marked with a blue triangle at the bottom and top of the chart; the abbreviated months are shown as added text between the blue triangles at the top of the chart.
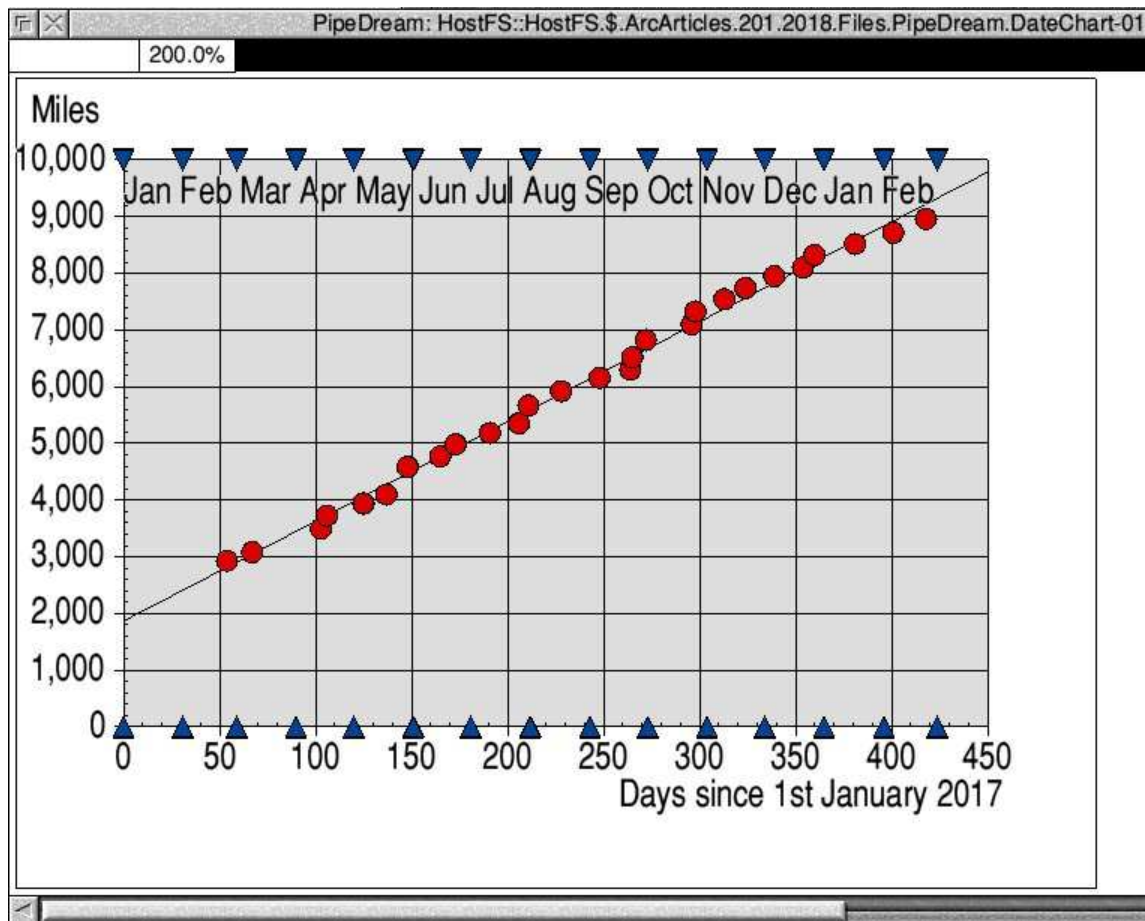
A feature of PipeDream scatter graphs is that a 'Line of Best Fit' can be added easily with one click. If you look at the graph carefully (compare the data with the 'Line of Best Fit') you will see that at six times during the year (between fill-ups) I have done more miles than usual. These are the times that we have been on holiday; on holiday I travel more miles than usual. For example, in 2017 we went on holiday in May, July and September. Also, in April, October and at Christmas of 2017 I went to see relatives. Apart from these six occasions, the number of miles per week has been fairly consistent.

The Data

Each time I fill up with petrol I receive a dated receipt.

To create the graph I have entered these dates in column A (of a PipeDream spreadsheet) in the format 1.1.2017. Although entered as 1.1.2017, when using PipeDream, you can choose to display the date in many formats; I have chosen the format 1 Jan 2017.

On the receipt I have written the mileage as shown by the odometer; these mileages are in column C. After entering the 'raw data' into columns A (date) and C (mileage), I enter the formula A4-A$3 into B4 and then replicate down from B4 to B30. To do this you must mark (highlight) the block B4B30 (select B4 and then right click B30) and then tap the down arrow (the left-most icon) at the top left of the spreadsheet.

You will find that in column B, PipeDream will have calculated the number of days since 1st January 2017. These are the 'X-values' of the graph.

A4-A$3

	Date	Days since	Value
1			
2	Date	Days since	Value
3	1 Jan 2017	1 Jan 2017	
4	24 Feb 2017	54	2934
5	9 Mar 2017	67	3083
6	14 Apr 2017	103	3500
7	17 Apr 2017	106	3730
8	6 May 2017	125	3942
9	18 May 2017	137	4101
10	29 May 2017	148	4588
11	15 Jun 2017	165	4775
12	23 Jun 2017	173	4984
13	11 Jul 2017	191	5187
14	26 Jul 2017	206	5356
15	31 Jul 2017	211	5668
16	17 Aug 2017	228	5924
17	6 Sep 2017	248	6159
18	22 Sep 2017	264	6305
19	23 Sep 2017	265	6521
20	30 Sep 2017	272	6828
21	24 Oct 2017	296	7103
22	26 Oct 2017	298	7330
23	10 Nov 2017	313	7543
24	21 Nov 2017	324	7742
25	6 Dec 2017	339	7950
26	21 Dec 2017	354	8106
27	27 Dec 2017	360	8327
28	17 Jan 2018	381	8519
29	6 Feb 2018	401	8719
30	23 Feb 2018	418	8959

The Scattergraph
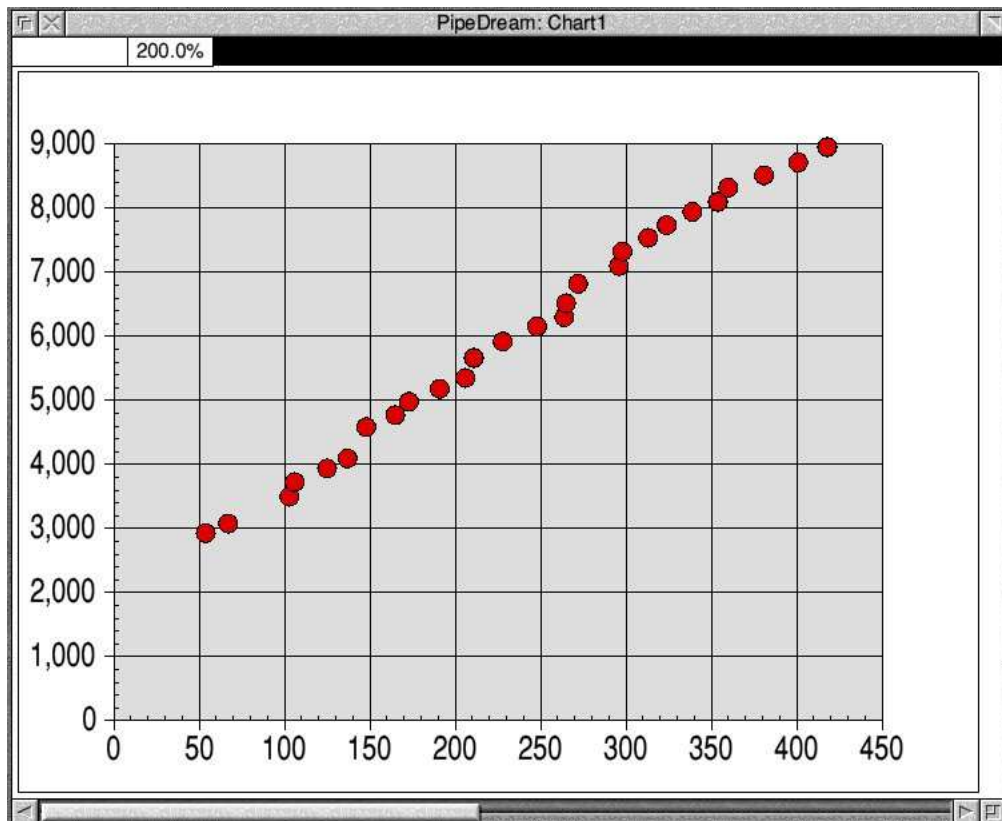
Select the block B4C30 (select B4 and right click on C30) then click on the chart icon. This icon is the fifth from the left; it looks rather like a histogram. Within the window showing the histogram click the <menu> (middle) button of the mouse and run the pointer through Gallery. Select 'Scatter ...' from the Gallery menu. Nine Scatter (X-Y) charts will appear. Select the chart 2nd down in the left hand column. This chart shows dots with no lines. Click on OK. With the pointer over the chart, tap the <menu> button and untick Legend. This action will remove the S1 (Series 1) icon to the right of the chart.

At this stage the chart will look like the screenshot above.

Months

Generating the blue triangles at the top and bottom of the chart is a little more tricky. Enter into Column A of a second spreadsheet (the spreadsheet shown below), the first of every month in the format 1.1.2017 to 1.3.2018. In cell B4 enter the formula A4-A$4. In cell C4 enter the number '0'; in D4 enter '1000'.

Mark the block B4D18 (select B4, right click in D18); then replicate down using the down arrow (top left icon). You will create a spreadsheet which looks like the one below.

	HostFS::HostFS.$.ArcArticles.201.2018.Files.PipeDream.DateData-01		
	A4-A$4		
	F B I u 2 £% .00		
	A	B	C	D
1				
2		Days since	Month	Month
3		1st Jan 2017	Divider	Divider
4	1 Jan 2017	0	0	10000
5	1 Feb 2017	31	0	10000
6	1 Mar 2017	59	0	10000
7	1 Apr 2017	90	0	10000
8	1 May 2017	120	0	10000
9	1 Jun 2017	151	0	10000
10	1 Jul 2017	181	0	10000
11	1 Aug 2017	212	0	10000
12	1 Sep 2017	243	0	10000
13	1 Oct 2017	273	0	10000
14	1 Nov 2017	304	0	10000
15	1 Dec 2017	334	0	10000
16	1 Jan 2018	365	0	10000
17	1 Feb 2018	396	0	10000
18	1 Mar 2018	424	0	10000

.

Those of you who have not created a PipeDream spreadsheet having two sets of Y data with the same X data may like to know the way in which I do this. It is a process which can be used for any PipeDream scattergraph which has more than two sets of data which have the same X values.

First the 'easy' bit. To generate the triangles for the months at the bottom of the graph select the block B4C18; click on the chart (histogram) icon. Within the window showing the histogram click the <menu> (middle) button and select 'Add to chart ...'.

At this stage you will have the points for the mileage data and, at the bottom of the chart, another set of points which might be circular red dots or blue triangles or something else. We'll get around to changing these dots to upward facing, blue triangles later.
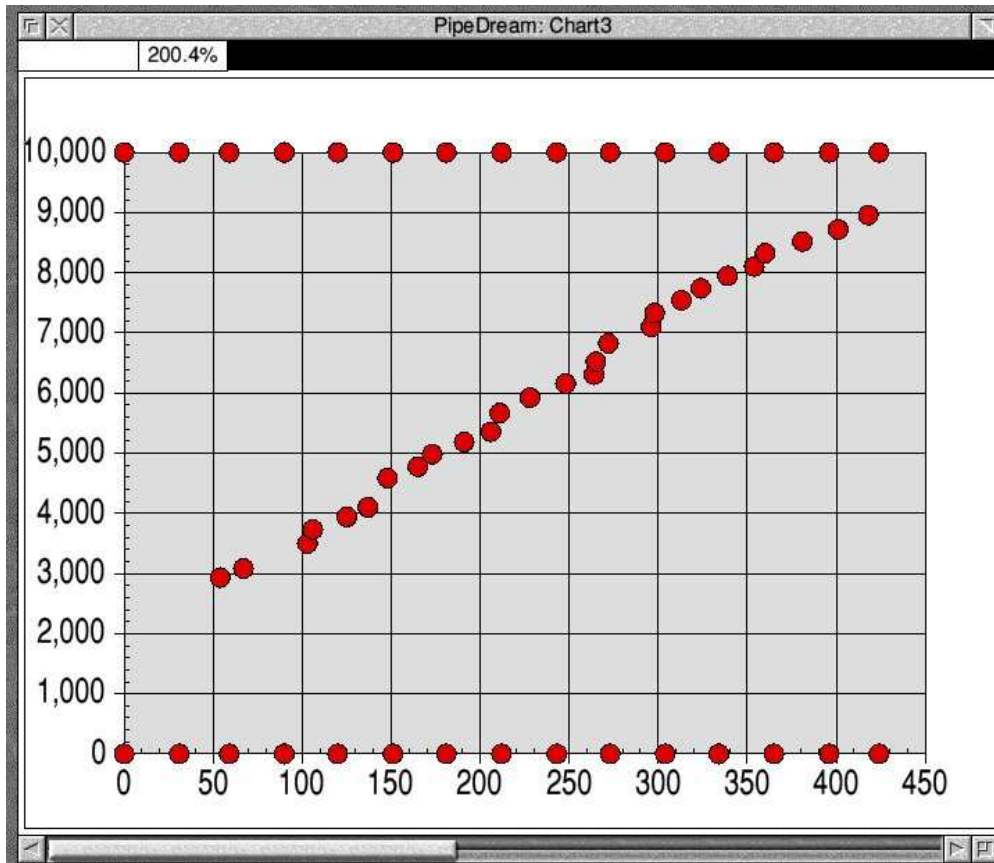
Now to add the set of markers which will appear at the top of the graph (mileage 1000).

First mark the block B4B18. Then using the <menu> (middle) button of your mouse, click on the histogram chart icon again. Select 'Add to chart'. Nothing much will happen to the chart but be patient! Now mark the block D4D18 (containing the 1000 mile values) and, in a similar way use the 'Add to chart ...' operation to include this set of data in the chart. When you do this two part operation, the data in B is treated as being the abscissa (along the X axis) and the data in D is treated as the corresponding ordinate (the Y axis).

At this point your chart will expand upwards so that the largest mileage is 10000 instead of 9000. Your chart will look like the screenshot above.

Blue Triangles

Click on the row of dots at the bottom of the chart. At the top left of the chart you will see 'Series 2'. The row of dots at the bottom of the chart were the second set of data we used (we added it to the chart) that's why it is called 'Series 2' (by PipeDream).

Tap the <menu> button and the 'Chart' pop up menu will appear. Run the pointer through 'Selection' to bring up the 'Series 2' menu. Run the pointer through 'Fill Style' to bring up the 'Series 2 fill style' menu.
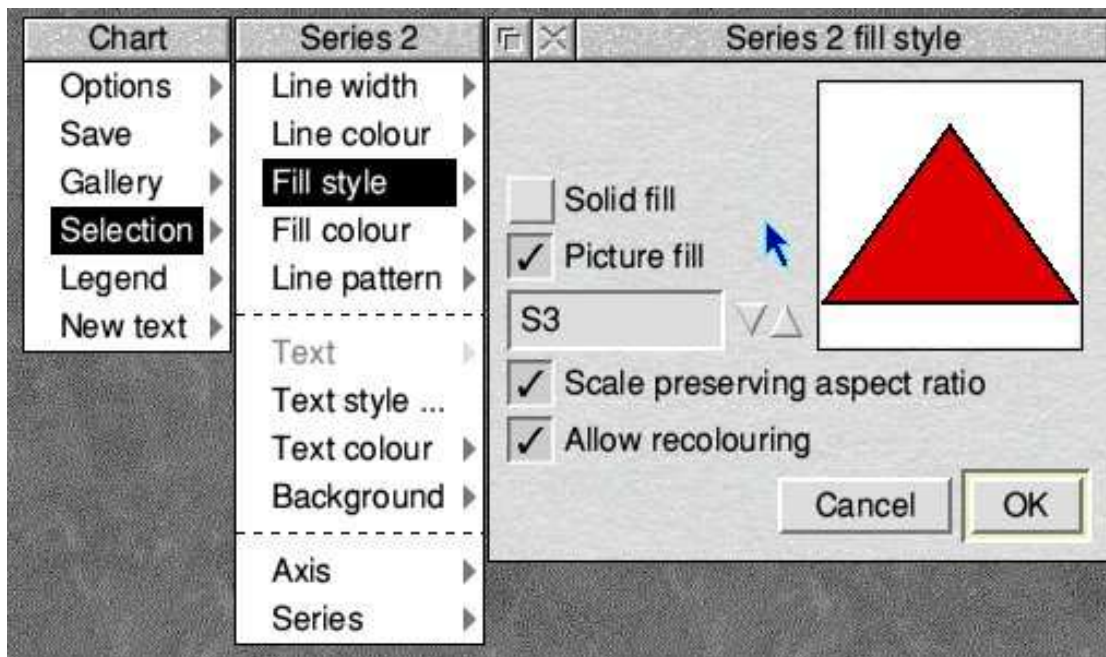

In my version of PipeDream it is the S3 icon which is an upward pointing triangle. Your copy of PipeDream may not have 'S3' as the upward pointing triangle but something else. You can click on the up and down arrows (to the right of 'S3') to change the icon. I have 5 different shapes which are named as S1 to S5.

Having changed the shape of the markers from circular to upward pointing triangles, the next step is to change the colour of these triangles from the default colour red, to blue.

Use the operation Chart - Selection - Fill colour to bring up the 'Series 2 fill colour' sub-menu. Select blue and click 'OK'. Have a look at the screenshot below. This shows how to get to the menu which allows you to change the colour of the markers.
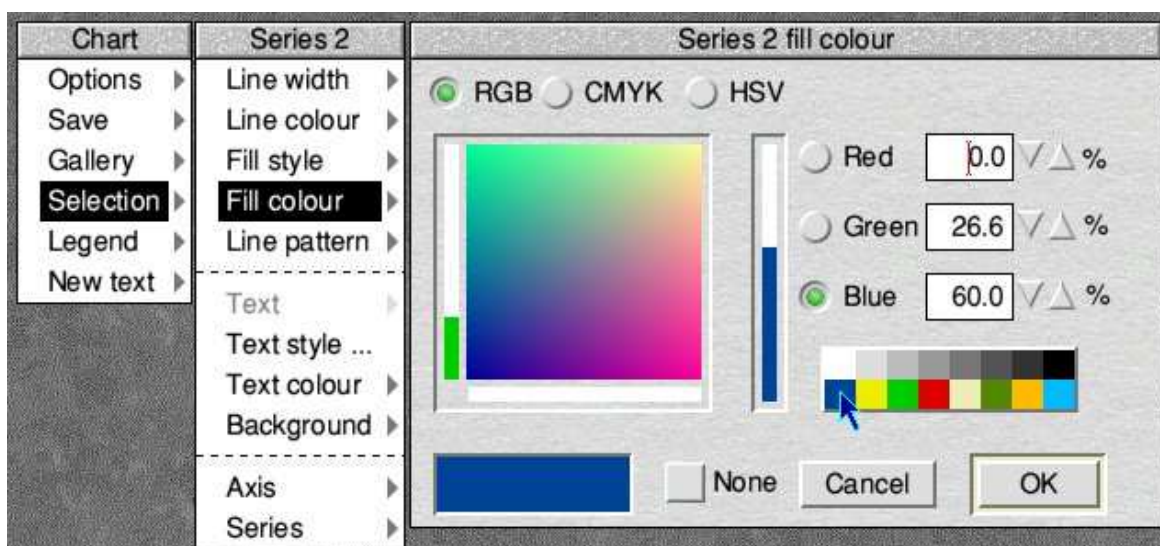
When you click on 'OK' then your chart will change so that the red triangles (at the bottom of the graph) become blue triangles as shown in the screenshot below.
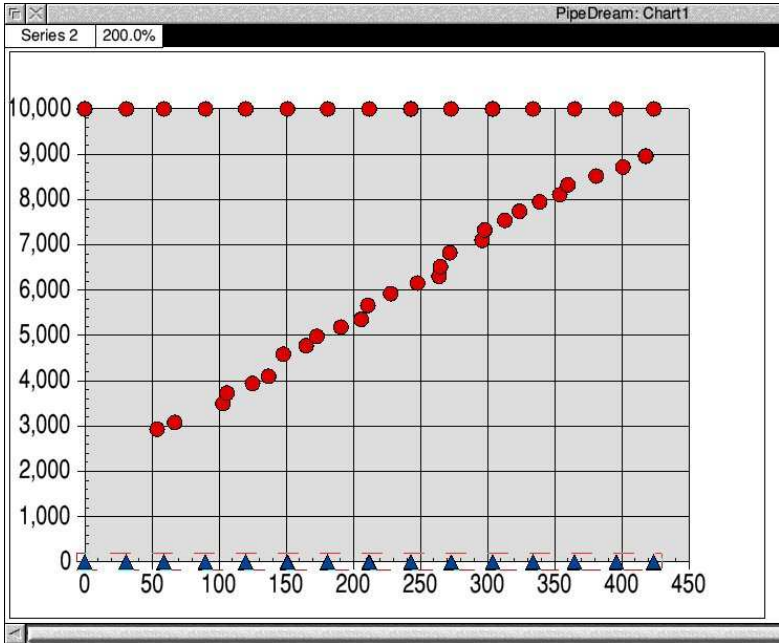

In a similar way, click on the 'Series 3' points which are along the top of the chart. These are the points at Miles = 10,000; turn them into downward pointing blue triangles (S5).

Making Space

There is not enough space below the X-axis to write the label, "Days since 1st January 2017". This space can be increased using the Options menu.

Use the <menu> button to click on the chart and a menu called, 'Chart' will pop up.

Run the pointer through 'Options' and increase the Bottom Margin from its default of 10% to 15% as shown in the screenshot below.
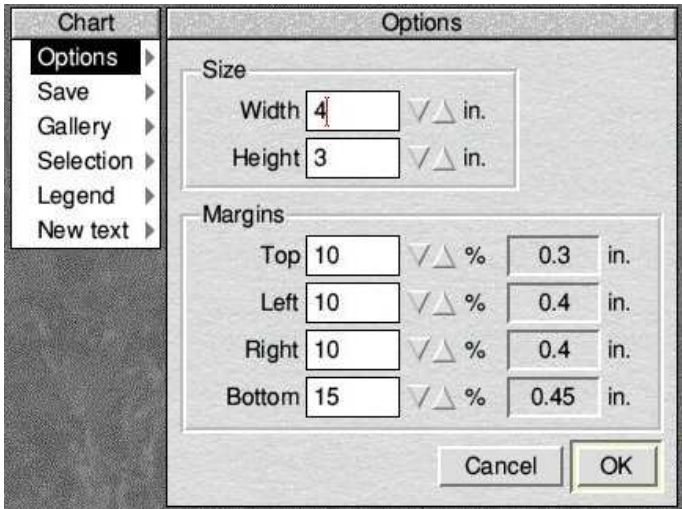
Adding Text

One of the Chart menu items is 'New Text'. You need three separate items of text, these are: "Miles" (at the top left), "Days since 1st January 2017" (under the X-axis) and the abbreviated name for the 14 months, Jan 2017 to Feb 2018 which are shown under the downward pointing blue triangles. By trial and error I have found that a spacing which works is one space between each of the three letter month names.The screenshot below shows that, as 'Text 2', the three letter month names have been entered. Now click on the green tick of the 'Text 2' box. The block of text will appear on the chart but it probably will be at the wrong place. You can drag it into the position where you want it to be.
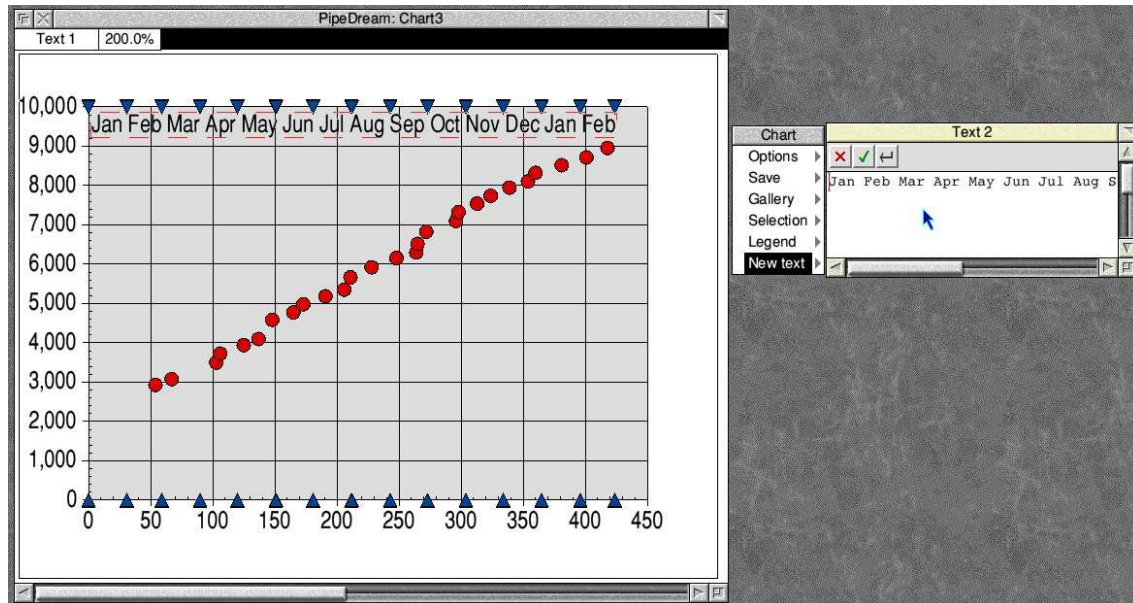
In a similar manner, add the two text objects, "Miles" and, "Days since 1st January 2017".

The Line of Best Fit

Finally we shall add the 'Line of best fit'. Click anywhere on the sloping line of circular, red dots. In the top left of the window you will see, 'Series 1'. It is 'Series 1' because this sloping line was generated from the first set of data that we entered into the X - Y chart. The screenshot below shows the menu for drawing the 'Line of best fit' through the data. Simply click on the '?' to the left of the 'Line of best fit'; the '?' will become a tick.
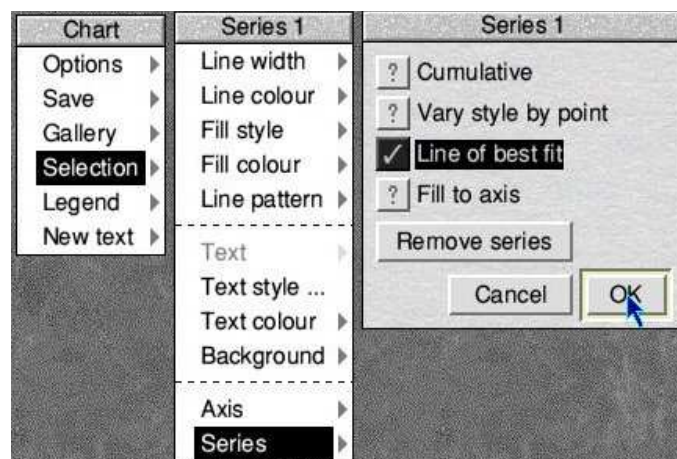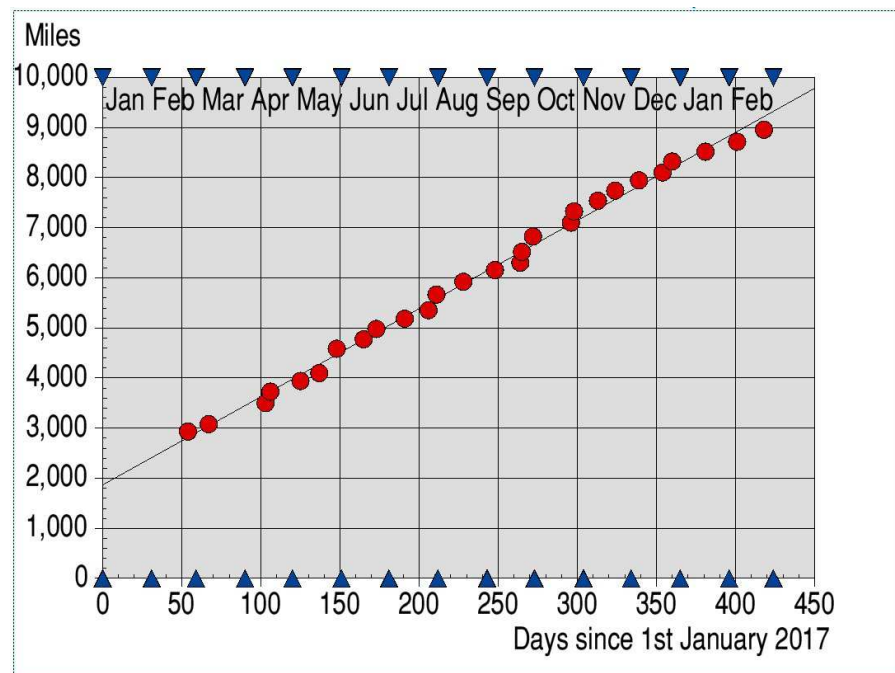
Chart Title

This completes the exercise. You have created a spreadsheet which looks like the one below.

I haven't added a title but,if you want to add one then you can do this through the 'New text' menu in the same way that you created the other three text objects. Well Done!

Time

Of all the four dimensions in which we eke out our existence, time is the most enigmatic. We can revisit Space but we cannot relive Time; it flows past us as does the "ever rolling stream" and, once gone, it is gone forever. As Hiraclitus famously said, "No man ever steps into the same river twice".

Objective time is not only studied in depth by brilliant scientists but also it is well documented. Time began when Energy (was it Dark or Light Energy - or a bit of both?) was converted spontaneously into Mass at the time of the Big Bang. We measure objective time in many ways; some, such as Plank time, approximately $5.39 * 10^{-44}$ seconds, are too minute to understand, whilst others, such as the age of The Universe, approximately 13.8 billion years old, are incomprehensively large,. In between we have some regular divisions of time such as hours and nanoseconds; also we have other, irregular divisions such as the length of our year and, the subject of this article, the months of the year.

We have no control over objective time, but the poem by Henry van Dyke captures the subjectivity of our personal experiences of time in five different ways. Most of us will have experienced the first two: "The watched pot, never boils" and, "Time flies when you're having fun" (or are scared). However, what about those who Grieve? Those who have experienced Grief see time, stretching out into an interminably long and hopeless future; there is no daylight to be seen at the end of the tunnel. When we Rejoice we loose ourselves in the passion of the moment - and that moment has no time dimension.

The poem concludes, "But for those who Love, Time is Now". "There is no time like the present". The past is gone, the future is unknown, all that we have, like lovers, is now.

A John Denver song starts with, "Today is the first day of the rest of my life". The song continues, "to grow is to change, to change is to be new, to be new is to be young again".

As sentient beings the time we experience is totally subjective. The past is gone and cannot be changed; the future is unknown; all we have is 'now'.

Bio-Bit

Last year, on holiday in Pembrokeshire, the Sun was blazing so, like any other Englishman on holiday, Gerald tied knots in his handkerchief and used it to protect his bald patch.