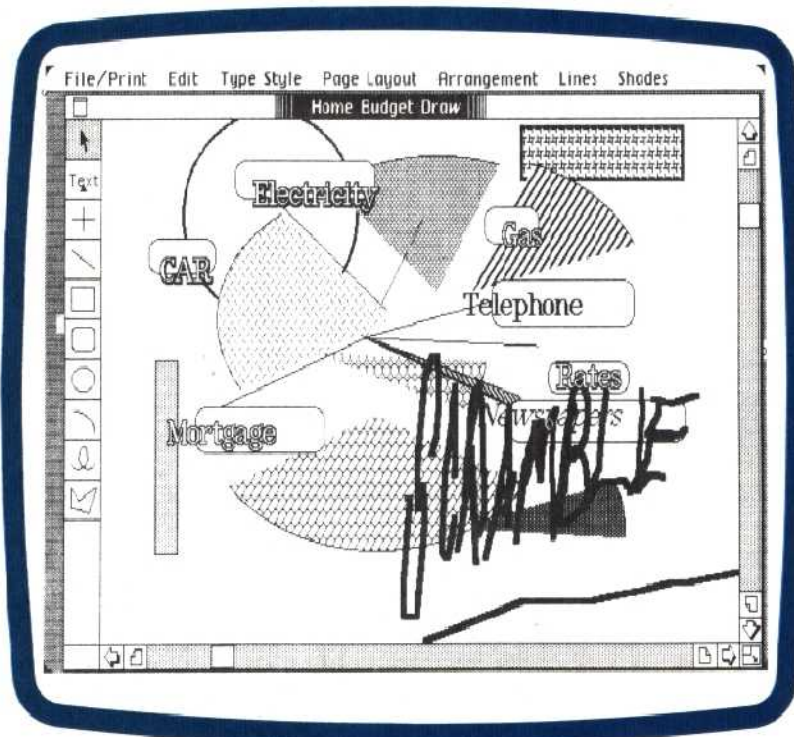
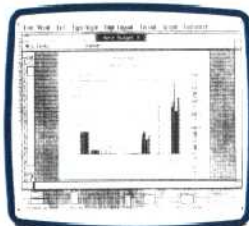
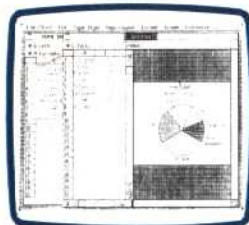


### Passing It On

One of the Lisa's distinctive features allows for information to be passed from one application to another, using the COPY option. This stores information temporarily on the clipboard icon, ready to be 'pasted' into another window. For example, we might start off by analysing some figures using LisaCalc (the spreadsheet application). The resulting figures could then be copied onto LisaGraph, which would produce a pie chart or bar graph of the figures automatically. Finally, the entire image could be transferred to LisaDraw, which would allow us to embellish it with additional labels, arrows, diagrams or other details. The finished result can then be printed out



graph drawing system; LisaList, a database/list manager; LisaProject, a project planning aid; and LisaDraw, a sophisticated tool for creating all kinds of graphical images. The icons for these applications are simply pads of paper. To perform a spreadsheet calculation, for example, the cursor is positioned over the pad of paper ruled into rows and columns called LisaCalc. Pressing the SELECT button will then effectively 'tear off' a sheet of this paper, which is then placed elsewhere on the desktop and can be given a label such as 'sales projections'.

In fact, the user may choose to have several spreadsheet applications on his desk at a time, by re-selecting the same icon. In a normal computer system, you would have to go through the process of loading the spreadsheet program, and then specifying the data file that you wish to work on. On the Lisa, however, program and data are inseparable. This is another example of object-oriented programming, which we introduced when discussing the Pinball Construction Set (see page 241).

Another important feature of the Lisa 'operating environment' (as it is called) is its ability to 'window'. When an application is selected, it appears like a large sheet of paper on the desk. The size of this piece of paper can be specified, again by using the mouse. If there is more than one such application 'open' at once, the sheets will overlap each other, with the one you are currently working on displayed at the top of the pile — just as they would be on a desk. It may be that the application you are working on, for example the word processor, requires more space than the size of the sheet you've specified. In that case, the sheet merely acts as a window onto the application, and can be moved around to display any part of the whole document. The principle of windowing was fully explained when we first examined

spreadsheets (see page 158).

It is quite possible to move information from one application to another, again by using the icons, and this is another major strength of the Lisa. Let's say you were doing an analysis of your monthly sales figures using LisaCalc. By using the COPY function, which is selected from a menu of special functions listed across the top of the screen, you could make a temporary copy of the results from the spreadsheet, which would be stored in the clipboard icon. Then, by selecting a piece of LisaGraph paper, those results could be entered into the INPUT DATA section of the graphing application, simply by selecting the PASTE option from the menu. If requested, LisaGraph will then produce a neat pie chart (or bar graph or line chart), fully labelled and shaded. Now, again using the COPY and PASTE options from the top of the screen, it is possible to copy this image onto a piece of LisaDraw paper. This last application would then allow you to embellish the pie chart with some arrows or diagrams, or change the labels and headings into a variety of type styles. The finished result could then be printed out and copied onto an overhead projector slide, or used as final artwork for a report or magazine article.

As we have said, the principles both of object oriented programming and Lisa-style operating environments will soon be filtering down even to the cheapest machines, particularly as they become more sophisticated in terms of processor speeds and RAM memory size. Imagine having multiple windows on your home computer's screen — you could write a program in one of them, and observe its output on another. Then you could call up programming aids simply by pointing to an icon shaped like a toolbox, and move subroutines around your listing simply by moving the mouse. Let's hope that such software capabilities aren't all that far away.