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Oil Strike

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Acknowledgements

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Educational aims

Oil strike shows in the broadest sense what is involved in searching for and trading in oil. By taking on the role of an oil prospector you will not only become familiar with the geology behind the industry, but also experience something of the risk and huge financial commitment involved. The geology underlying this computer simulation is entirely based on real life geological data so the rock strata you explore are very much as an oil prospecting company might find them.

Running the program

Loading the program

Make sure your ZX Spectrum ⓣⓜ is connected as explained in the Sinclair ZX manual. Check that the tape is at the beginning.
Type **LOAD""ENTER**
Start the tape.
After about 30 seconds a title screen should appear.
The program takes about 5 minutes to load.

The first screen display shows a grid, a service panel to the right of the grid, and a bank statement. The program contains geological data on a huge amount of terrain. Each time you use the program you are given a small part of this terrain to explore. This is generated at random, and will be different every time you play.
You start your first concession with one active well. Further oil is located under some of the squares on the grid. Your task is to find the oil and then maximise your profits by producing it.
All the while you must consider the cost of surveys, drills and fluctuations in the price of oil.
Your position is indicated by the middle (red) of three squares. To move around the grid, press **8** to move left, **Ø** to move right, **9** to go up, **M** to go down.
The service panel confirms the services in use. The truck and driver indicates that you are on the grid, and a seismic survey may be made at any time. The truck is replaced by a boat when the drilling site is underwater.

Surveying

Decide where you want to survey, then move to this chosen square. Press **S** to make a seismic survey.

You will see a profile of the rock strata on your chosen square and the two adjacent squares. On your first and second concessions only you will also be given the probability (0 – 9) of finding oil at that point. This is based on the results of the survey, and in the program as in real life speculation, this probability will not always be reliable.

After your second concession you will be given a picture of the rock strata without the probability, and will have to rely on your own judgement to decide where to drill.

Surveying is very expensive, so you need to choose your survey squares carefully. When you have seen the geology underlying any chosen square you can, with experience, make predictions about the strata of surrounding squares without spending money surveying them.
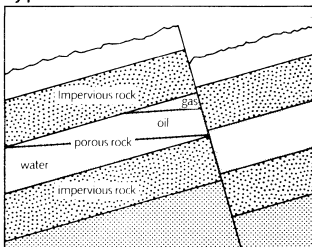
Remember that oil may be found where there are anticlines (uplifted areas of rock) and where there are faults or breaks in the rock.

The anticline when found is a more reliable indicator of oil; fault systems are often misleading.
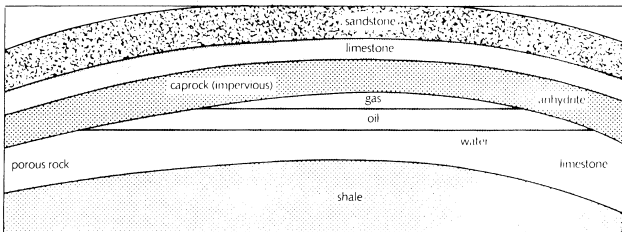
Anticline structure

Typical fault structure

Drilling

When you decide there may be oil, press **D** to carry out a test drill. You will see the drill move through each layer of rock in turn.

Colour	Rock type
black	Tertiary sandstone and shale (30)
blue	Cretaceous chalks (100 – 135)
red	Cretaceous deposits
magenta	Jurassic shale (150)
cyan	Oil *or* water saturated sandstone and shales (170 – 150) (usually contain water; if oil is trapped it will float on top of the water-saturated rock)
yellow	Permo triassic rocks (280 – 190)
white	Paleozoic base rock

(The figure in brackets gives an approximate time ago in millions of years at which these rocks were laid down.)

If oil is present, it will be found in a layer of porous rock, sandwiched between layers of impervious rock. Drilling is even more expensive than surveying. So if the drill reaches the porous rock and has not struck oil, you may be wise to stop drilling right away and save some money.

To stop drilling at any stage, press **C,** when you will be able to renew your searches.

Drilling underwater is even more costly than on land. It is best to seek out oil wells on land before exploring the areas on your grid which are underwater.

The more adventurous may wish to drill without first surveying – to do so simply move to the square and press **D** as before.

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Production

If you strike oil, a well will be set up. The rate of extraction is shown on the service panel. You can increase or decrease it by using the ↑ and ↓ keys.

When you have set the production level, press **C** to continue exploring the grid for more oil.

Economic considerations

While you are using *Oil Strike,* messages will appear across the top of the screen. You should adjust your oil production at active wells accordingly in order to maximise your profits. For example, there may be a sudden drop in the price of oil, in which case you would be wise to lower, or even stop, production at all your wells until the price rises otherwise your cost of production (shown as 'out') will exceed your costs from selling the oil (shown as 'in').

To adjust oil production at an existing well, use **8, Ø, 9, M** keys to move to the correct square on the grid. Press **P** to see the rate of production and ↑ or ↓ to increase or decrease it.

If an oil well runs dry, it will collapse on the screen.

Your monthly income and spending is monitored and your bank balance each month is shown in dollars, the international oil currency. Each time you make a survey or test drill, your spending increases. Your income is derived from the total oil extraction from all your active wells, the price per unit fluctuating as in the real world.

Your score is a measure of your overall performance as the controller of the oil company. It depends on the number of rigs you have created that month in relation to the number which could be found in your territory.

When you succeed in finding most of the oil in your territory – without going bankrupt – you are given a new concession, and can explore a new area of land.

If at any time you wish to start with a new first concession, press **CAPS SHIFT** and **A** together.

To wait, keeping the screen static at any point press **W**.

Press **W** again to continue.

Summary of key presses

8 or **U**	moves cursor left
Ø or **0**	moves cursor right
I or **9**	moves cursor up
N or **M**	moves cursor down
S	gives seismic survey
D	drill
C	returns to 'chart' (Allows movement around the grid without incurring cost.)
P	shows production at a well
↑	increases production
↓	decreases production
W	wait, then start again
CAPS SHIFT and **A**	restarts the program from the beginning
SYMBOL SHIFT and **A**	ends the program
Q	toggles sound off and on

About oil

Oil comes from the remains of marine plants and animals which sank to the sea bed millions of years ago. Sand and mud piled over them, crushing them and squeezing the liquid of their decay outward until it was trapped by hard-rock formations to form oil reservoirs.

Oil-rich sites occur all round the world, below the land and under the sea. Air photography is the key to many of them, the shape of the land telling the prospectors what rocks are likely to be found below.

Rock samples are studied and, if found to be of oil-bearing types, a test drill may be made.

Oil from the ground, known as 'crude', is contaminated with rock fragments, water and chemical impurities and must be cleaned before use. The cleaning process, or refining, was once carried out on site but now takes place in the countries that will use the oil.

Transport is by tanker ship or pipeline. The world's longest pipeline , 4300 kilometres, runs from Alberta in Canada to Buffalo in the USA.

Crude oil is refined by boiling at 400°C. The gases given off cool and condense at various levels inside tall metal towers and the liquid condensates are collected for storage and further treatment.

Oil is so much part of our lives that we are inclined to take it for granted, and are probably unaware that so many familiar objects are formed from oil products – from washing-up liquid to clothes.

Oil products include petrol, diesel fuel, gas (bottled gas), paraffin, lubricating oil and grease, wax for candles and ointments, roadmaking and waterproofing materials, plastic goods, paints, fertilisers and weedkillers, washing powder and fabrics like Nylon and Acrilan.

Does anybody truly believe that supplies of petrol, diesel and central heating fuel will run out? Oil scientists tell us quite plainly that oil is finite – one day we will come to the end of it. But the world's appetite for oil is vast, and the oil industry is engaged in a constant search for new fields, underground and below the sea.

The prospectors and their teams, highly qualified modern adventurers, search the world for oil-bearing rocks. Surveyors using echo-sounding techniques build up pictures of rock strata to depths of thousands of metres. The oil companies then have to decide whether to drill, which is the only way to be sure of the presence of oil. Drilling may take a year and cost millions of pounds. The investors hope for profits, but there is no guarantee – as users of *Oil Strike* will discover.

Oil does not form convenient underground lakes but is trapped in porous rocks. It seeps through soft rock but is trapped when it meets hard, impermeable layers. This can happen where a geological feature known as an anticline (an arch-like structure) occurs: oil under pressure creeps up under the fold and cannot escape. A fault, or break in a rock layer, may form a dam which oil cannot pass.

The presence of porous rock does not in any way guarantee the existence of oil – it is more likely that water will be held instead. Sometimes oil and water are found together in the same rock, in which case the oil will float on the water. *Oil Strike* models the oil prospecting world enabling you to experience some of the details of production for yourself. For example, you will learn that cost of production depends on the hardness of rock, the depth to which drilling takes place,

whether or not the well is underwater; and you will be reminded that the cost of restoring the environment after the well has been used is extremely high. You will experience the uncertainty of interpreting surveys, known even to skilled prospectors, and the excitement of an unexpected find. Finally, you will see the necessity to respond to economic and political factors which are beyond your control.

Copying on to a ZX Microdrive Cartridge

Macmillan and Sinclair authorise buyers of the program to copy it *once only* on to a ZX Microdrive Cartridge.
Any unauthorised copying, hiring, lending or sale and repurchase of the program on cassette or ZX Microdrive is strictly illegal.

Instructions for saving the program on to ZX Microdrive:

1   Make sure your ZX Microdrive is connected correctly with a blank formatted cartridge in place.
2   Load the program from cassette as normal.
3   Press **M** to save on to the Microdrive. Saving will take about 30 seconds, after which the program continues. If any key other than **M** is pressed the program will run without copying.
4   To load the program off ZX Microdrive, make sure the ZX Microdrive and Cartridge are connected correctly. Type **RUN** and **ENTER.** The screen remains blank for 5-10 seconds, then when the program is located it loads and runs automatically.

Sinclair/Macmillan software

Science Horizons:

Oil Strike
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Bodyswop

MacMan Maths:

MacMan and the Caber Eater
Macman in the Treasure Caves
Macman's Magic Mirror
Macman and the Great Escape

Software in the Sinclair/Macmillan range is available from major
retail outlets, or direct from Sinclair Research Ltd, Stanhope Road,
Camberley, Surrey, GU15 3PS. Telephone (0276) 685311.

Teachers can obtain the software either from their normal
educational supplier or direct from Macmillan Education Ltd,
Houndmills, Basingstoke, Hants. RG21 2XS.