The emerging duel between Amstrad and Cheetah Marketing was the main highlight for Sinclair fans at the Earl's Court PC Show. Spectrum software sold well, but got little publicity on the big stands. HiSoft had its full range of Spectrum compilers at discount prices, while Rambo's cheap Spectrum video digitiser attracted attention. QL suppliers were notable by their absence; Miracle, Digital Precision, Quanta and QL SUB all dropped out this year, though they still attend smaller shows.

The lightgun battle is hotting up, with Cheetah's Defender bundled with the Commodore 64, and the Amstrad/Sinclair/Trojan Magnum thrown in with every new Spectrum. We've followed the resurgence of lightguns for almost a year now, and at last we've got software to compare. Unlike the magazines which printed PR pictures, we have withheld comment on the lightgun software pending a chance to try it on our own Plus Three – with interesting results.

Magnum looks better than it feels, like a space-age raygun with a micro-switched trigger. Defender has a better gunsight, an 'auto-fire' switch (currently unused), and is much heavier, so it feels easier to use. Defender is styled more like a real pistol, but the plastic colouring is unconvincing and it *looks* cheaper.

The real difference is the bundled software. Cheetah lined up with CodeMasters for its lightgun software, while Amstrad/Sinclair chose rival budgeteers Virgin Mastertronic, with technical advice from Trojan, which makes the Magnum.

Trojan's Spectrum lightpen is a cumbersome device which provokes the screen into fits of flickering. Unfortunately, Sinclair's Action Pack has the same problem.

When you pull the trigger, Sinclair's bundled software blanks a large area of the screen and runs a big white rectangle over the blank area. Don't believe the Action Pack brochure – the gun does *not* shoot a red beam, or anything else, from the muzzle.

Sinclair's six games were supplied on cassette; Virgin Mastertronic sent two copies, 'just in case'. We had a lot of trouble loading them into our Plus Three, but managed at last. Each side of the tape holds three games; a menu appears, but whichever option you shoot, the first game tries to load.

Missile Ground Zero resembles

Sinclair Scene

Timothy Green is sheriff in the definitive Spectrum shootout, delves into electronics and dishes up loads of Sinclair fanzine and club news
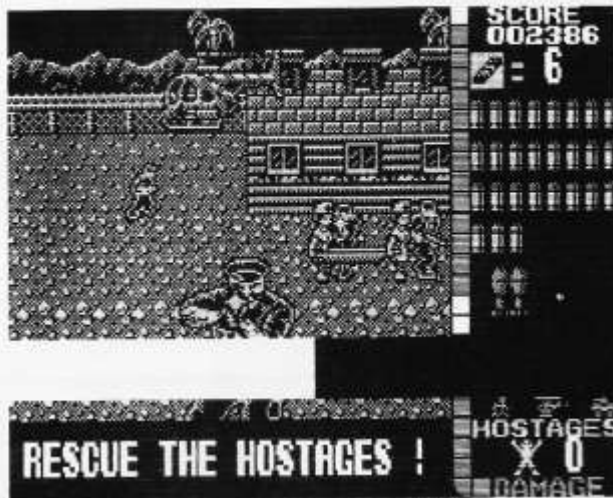
Operation Wolf: the lightgun version with the big black and white stripe that appears whenever you pull the trigger

Missile Command, but the attackers are fast and leave no trail. Turn up the brightness, dim the lights to avoid screen reflections, and blast away at close range, as animated objects drop and whizz down onto your four cities. Targetting is erratic even at close range, and the screen flashes white, with a brighter horizontal bar, whenever you fire.

Solar Invasion has a neat loading screen, which vanishes, worryingly, part-way through the load. Assorted monochrome blobs drift over a big square window. Shoot the biggest ones most, or fire at two arrows to scroll the window through space. The screen flashes white from top to bottom whenever you fire, and it's hard to hit anything at all from a range of more than about a foot.

Operation Wolf was a recent hit under joystick control. *Space Invaders* firm Taito launched it in the arcades, and Ocean handled the Spectrum conversion. The original programmer is reputedly upset at the lightgun version. Loading is slow, with no title screen.

You must shoot troops, helicopters and tanks – but not stretcher-bearers – in a hostage rescue. The 'enemy' fire back, but usually miss, even at point-blank range. The space key launches grenades. Whenever you fire the gun, play stops momentarily, and a broad black and white stripe pulses across the screen. See our picture for the result.

In *Robot Attack*, fifty little robots scuttle around, trying to build

a big robot with a twin laser on one arm and a boxing glove on the other. Again, the screen flashes black then white, but relatively fast. The sprites have big, rectangular black shadows. Gameplay is minimal and it's more fun to stop shooting and wait to see the big robot.

Bullseye is based on the tacky TV series. Shoot wonky darts at the board, then type answers to trivia questions. Central TV is not easily embarrassed, but this time it should be.

In *Rookie*, you pick 'easy' or 'hard' speed, then shoot targets which count down, or shoot arrows to pan between eight exotic screens. This game is quite playable at close range, but very flickery.

Comparisons

The Atari 800 and C64 – like the omni-absent Sam – have internal registers to record the position of the TV scan, but the Spectrum 128 lacks this feature, so some flicker is inevitable. But the Action Pack games seem badly implemented and finished. The flashing screen was obtrusive and accuracy was poor, so we had to get uncomfortably close to the screen to hit anything.

The six CodeMasters games dim the screen momentarily when you press fire, but the blink is much shorter and affects the whole display, so it is less distracting. Cheetah's games open with a 'target practice' screen, so you can get your eye in training before starting play. At first, it's hard to shoot accurately enough to 'qualify' for each game, but after a few tries you find the range, and can hit most of the static targets that appear and disappear.

Hereafter, CodeMasters introduces some much-needed gameplay. Some targets are baddies, who must be shot, though they end up euphemistically 'captured' rather than dead. Others are civilians. You lose loads of points for shooting a granny, so you must identify your target before firing.

The first game, *Bronx Street Cop*, is a shooting gallery with five screens. Terrorists and innocent passers-by pop up in windows and doorways, and it's up to you to slaughter the baddies without running out of time or ammunition.

In *Billy the Kid*, you start by shooting inanimate objects, like tin cans and bottles, which shatter or tumble backwards attractively when hit. To qualify for the main event, a bank raid, you must knock down lots of objects and keep a

spinning tin in the air for as long as possible by shooting it. This is quite fun, although the flicker when you fire is more obvious than in *Bronx*.

Cheetah seems to have made some effort to avoid mindless violence, but the ergonomics of light-gunnery make this difficult. *F16 Fighting Falcon* pits you against 3D air and ground attack – you guide your plane by shooting it! *Jungle Warfare* sets the tank-borne player against various items of

military hardware. In the lightgun variant of *Advanced Pinball Simulator* you shoot the flippers, while in *Supercar Trans-Am* you steer a car by shooting arrows at the edge of the screen!

Lightguns have potential as game input devices, but they do not suit every scenario, and it takes careful design to make best use of a gun. Unless software houses plan some original releases, light-gunnery will be just a passing fad.
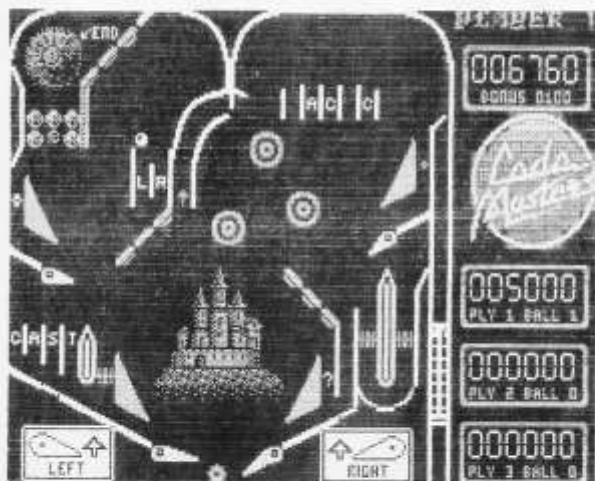
Advanced Pinball Simulator: the lightgun version, (CodeMasters) – shoot (!) the flipper icons to guide the ball

The upshot

If you're thinking about buying a new Spectrum, the Magnum Action Pack should be seen as an attraction; but CodeMasters' software will show off the gun better than Virgin Mastertronic's bundled offerings. If you've already got a 128, the Defender package is £5 cheaper than Magnum and comes with superior games.

48K Spectrum owners will have to wait until Cheetah produces a special version of Defender that works through a joystick interface. This should not be far away, as Cheetah has confirmed plans to release ST and Amiga packs based on the same standard interface – as we suggested, back in August.

Profile

Glensoft's *Profile* is a disk utility for users of MGT's Disciple and Plus D interfaces. It's a menu-driven program, made up of lots of simple, clear screens in three main parts.

The *Disk Manager* is a simple database which can hold details of up to 1,000 files. Once you've found a file in the database, you can put the appropriate disk in the drive, and run, rename or erase a file by pointing to its name in a full disk catalogue.

You must number your disks and type in the name, disk and category of each file. Later you can print, add, delete and edit

entries. Names do not have to be typed in full once they are on the database; later, you only need type the first part of the name, or the record number.

Printed reports use five columns, showing the number, name, type and disk for each title. Users with single-sided drives can specify the side, A or B. Others should enter A every time. You can print an alphabetical range of titles, but output is a continuous scroll, not a series of pages. This utility is simple and it works, but it is tedious to type in all the details. BetterBytes' *Disk Manager* does this for you, given a disk to add to its catalogue. The main advantage of Glensoft's program is that it does not need to create files on each program disk – but it lacks the graphics, bells and whistles of *Disk Manager*.

The *File Transfer* utility copies any type of file from one disk to another – including snapshots and data files, which are not handled by the built-in COPY command (SAVE..TO). Disciple owners can also copy files to other machines via the network. It's now easy to transfer files one at a time, but there's still no way for single-drive users to copy a whole disk in one go.

Part three is a *Disk Editor* which lets you read and change the raw data in each sector on the disk. This is the equivalent

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The guns differ in weight and styling, but are almost identical inside. Defender and Magnum can work with the same software; both plug into the AUX/KEYPAD socket on 128K computers.

This socket was designed for Sinclair's own Spectrum 128 keypad, launched in Spain but never sold in Britain. The details of this port are secret. Amstrad sidekick Trojan demands money from publishers who want to develop lightgun software. Cheetah will give out details, but only to developers who agree to use the Defender logo on their package.

We managed to wring details of the lightgun connectors out of Cheetah, but – despite promises – Cheetah hasn't told us how to read the socket. So we've worked it out for you, for free. It seems the sort of information that should be in the Public Domain.

Lightguns – the inside story

Like the Plus Two serial port, the AUX/KEYPAD socket has two inputs, and two output lines on pins 2 and 4. Pin 1 is ground and pin 6 carries +12 volts. Pin 5 carries the signal from the trigger, while pin 3 reads the light sensor.

Both signals are routed through the 128's sound chip. You can read them from Basic or machine code, with four commands. First you must use OUT 65533,7 to pick the control register and OUT 49149,63 to select input. The port is switched from input to output by the value of bit 6 in register 7; bits 0 to 5 control sound output.

OUT 65533,14 selects the input/output register, then IN 49149 reads both the trigger and light sensor. Bit 4 is set when light hits the gun. Bit 5 is reset when the trigger is pressed. Assuming the

port is not being used for anything else, it reads 239 by default and 255 when lit. If the trigger is pulled you get 207 (no light) or 223 – light and trigger.

The 48K version uses a 9-pin joystick connector, with the trigger and light signals on pins 1 and 6 respectively. Pin 8 is earth, while pin 7 carries +5 volts for the amplifier inside the gun. This version should work with all computers that handle an 'autofire' joystick, like the Atari 800, C64, and almost everything else that takes a standard stick.

We had limited success using Spectrum 128 guns with a QL. The QL SER2 socket accepts the gun plug, and has appropriate input lines, but only one is accessible from the 68008. Bit 5 of PC.IPCRD monitors the serial CTS handshake line, signalling when the port is 'Clear To Send.'

So PRINT PEEK(98336) && 32 gives 32 normally, or zero when the trigger is pressed.

Sadly, the light input is connected to RXD, the data input which goes directly to the 8049 coprocessor. This expects precisely timed serial data, not erratic pulses from the light sensor. You must reprogram the 8049's internal Rom to read RXD directly, and even then there may be timing problems caused by processor haggling.

You *can* link a simple light sensor to the QL; use an ORP-12 photo-conductive cell in place of a switch connected to CTRL 1 or 2. Read the light level with KEYROW; logic 1 indicates bright light. These cells are widely available and interesting to look at – Maplin sells them for around a quid. They are slower in response than a photo-transistor, but need no power. The same trick works with virtually any switched joystick port.

◄178 of *ZipZap* on the Plus Three, or the raw sector editor in Kobrahsoft's *DICE*.

Sectors can be edited and displayed in groups of four 128 pages, with a display of each byte as text or hex or decimal numbers. You can print any sector as a single page of 512 bytes, or print an extended catalogue which tells you the physical location of the start of each file.

A full 780K Disciple or Plus D disk holds 1,600 sectors. The first four tracks on each disk are used for the catalogue, and the rest hold the data inside the files in 512-byte lumps. It's hard work editing a disk directly, with 819,200 characters to keep track of, in 6400 screens – but it is possible to use the editor to hide data, restore recently deleted files, or to recover the remains of a corrupt file.

Glensoft's *Profile* fills some of the gaps in the Disciple and Plus D repertoire, but there's scope for refinement in its presentation and facilities. It costs £9.95 on disk (plus £1.50 if ordering from outside the UK), including a 38-page manual with lots of screendumps.

Next month

Next issue, we plan to take a seasonal look at QL software and test some more Spectrum utilities. Please write in if you wish to pass comments or suggestions. We're pushed for space, so we can't please everyone all the time, but we'd like to hear what you think.

Green's ability to hit a stationary monitor screen from 12 inches away has earned him the nickname 'Deadeye Tim'

CONTACTS

Defender: Cheetah Marketing, Norbury House, Norbury Road, Fairwater, Cardiff CF5 3AS.

Magnum: Virgin Mastertronic, 2-4 Vernon Yard, Portbello Road, London W11 2DX.

ORP-12: Maplin, PO Box 3, Rayleigh, Essex SS6 8LR.
Profile: Glensoft, 8 The Glen, Byncethin, Bridgend, Mid Glamorgan CF32 9LX.

Fanzine update

Two new Sinclair newsletters reached us this month, aimed at QL and Plus Three users. Both come from established names in the world of Sinclair clubs and Public Domain publishers. We also have news of other publications, held over owing to lack of space last month.

QL Technical Review is a much-needed magazine for techie users of the QL and Thor. The first issue has been a year in preparation, but has been worth the wait. It runs to 32 clearly-printed A4 pages, plus four extra yellow pages, a 'colour supplement' which includes six fuzzy pictures of a souped-up QL. Articles discuss *Toolkit 2, Speedscreen, QRAM, Lightning* and Quest's long-lost *CP/M 68K* package – an alternative QL operating system which ended up inside the Atari ST. On the hardware side, *QLTR* explores the availability of spares, overheating, networking, and the quirks of expansion units.

Most of the articles are anecdotal, rather than theoretical, but there's a tutorial for would-be machine code programmers, and stylistic variety in the bizarre form of a Tolkeinesque critique of the dis-assembler *IDIS*.

QL Technical Review costs £5 for a four-issue subscription, from CGH Services, Cwm Gwen Hall, Pencader, Dyfed SA39 9HA.

Daniel Garner has sent the first three issues of *Plus ThreeContact*, newsletter of the Plus Three Users' Group. It runs to between 10 and 14 A4 sheets, with news, reviews, interesting gossip and small programs, including a Basic program compressor and a routine to partition +3 disks into 'user areas' – 127 and 46 bytes of data, respectively.

The first issue was hard to read, owing to the use of blue print in very small letters. Subsequent issues were produced with the excellent *Cardex* Spectrum DTP software, but Garner's thermal printer does not do it justice.

Subscriptions to *Plus Three Contact* cost £10 for 12 issues. Besides the newsletter, subscribers can order PD software at 50p
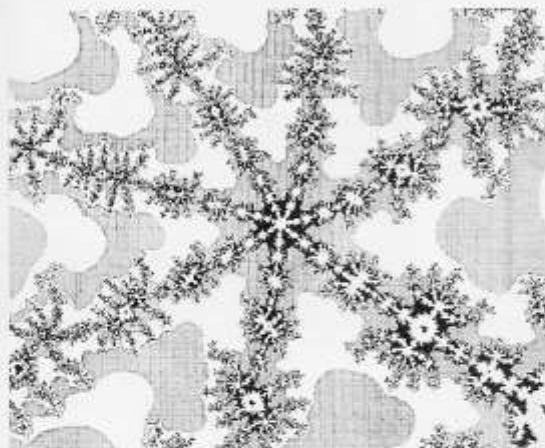
Graphics from Fractal Report – Mandelbrot Set enthusiasts should recognise the characteristic blob at the bottom right-hand corner

per disk, and a bulletin board is planned. Garner Designs also promises *Specfax*, a +3 disk magazine with a base price of £2. The contents sound interesting, but we have not seen a copy.

Garner may be spreading his talents too wide at the moment. *Plus Three Contact* is rather thin compared with other club newsletters, and it is surprising that there is no coverage of Spectrum CP/M. The content is fine, as far as it goes, but the group needs active members if it is to flourish.

Reeves Telecommunications Laboratory has published two issues of *Fractal Report* at once. Issue 3 explains new ways of looking at four-dimensional images derived from the Julia Set, a relation of Mandelbrot's infinitely-detailed mathematical domain.

Short QL and Spectrum Basic programs illustrate a technique that generates views of 'fake planets'; the example parameters give a view similar to a gas giant, but you can dial up your own planet by changing a few parameters – eat your heart out, Slartibartfast! The programs are slow, but quite small – they fit together on a single A4 page.

Another program uses fractal rules to generate 'affine transformations' – detailed images composed of scaled, similar parts, like Christmas trees and ferns. There's discussion of common bugs in fractal code, and ways to assign meaningful colours to fractals. Issue 4 contains 'background' material requested by many readers, including software and book reviews, plus an introduction to the Mandelbrot Set. Three related newsletters are mentioned, along with Basic programs to be typed in. The listings are usually short and well documented, but the *Report* also explains where readers can find custom fractal code for most machines, including the PC, Macintosh, Amiga, PCW, QL and Spectrum.

The QL users' newsletter *Quanta* includes the usual mix of news, advice and appeals for help, with printer problems and Psion software at the forefront. Other topics covered include local meetings, sexism, standards, calendar calculations, modems, bargain hardware and programming in Forth, BCPL and *SuperBasic*.

Issue 7 of *QL Adventurer's Forum* has arrived, and runs to 36 A4 pages of news, reviews, and hints on game-playing. The magazine is well-edited and easy to read, as long as you're interested in the relatively cerebral QL gaming scene.

The Spectrum club magazine *Format* celebrated its second birthday in September with a packed 40-page issue. Sections discuss adventure games, graphics, Basic and assembler programming, along with standard fare about MGT's long-promised Sam micro and Poke commands for games cheats. A new series explores the Disciple interface hardware, alongside reviews of *Hacker's Workbench* and the disappointingly incompatible TTX-2000 teletext interface.