

graphics (see page 132). It was hardly innovatory in terms of either hardware or software, but when it first appeared it was the cause of a social revolution the like of which had not been seen since the birth of the cinema. The hardware that supported Space Invaders and all its near relatives differed very little from the home micros of the day. The manufacturers of those home micros were quick to realise that there existed a huge untapped market in the affluent homes of the West. The marketing focus changed rapidly away from learning to write computer programs, towards the use of the computer as an entertainment medium, and machine design followed suit.

Six years later, machines are still being sold on their games-playing power, though by this time the latest generation of arcade games has gone far beyond the abilities of all but the most advanced home computers. It is not uncommon to find up to one million bytes of memory in an arcade game, together with the sort of graphics capabilities seldom encountered outside purpose-built

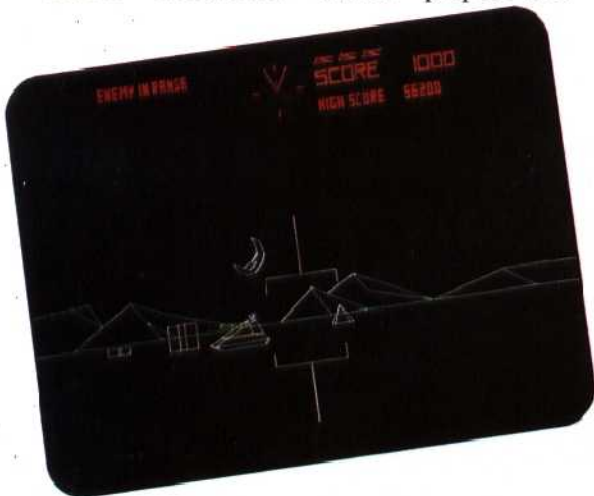
Atari, whose fortunes are founded on Nolan Bushnell's original game, is a particularly appropriate example of the trade-off between arcade games and home computers. Atari has long seen the home computer as an entertainment medium before all else (a reflection, perhaps, of its parent's chief interest as Atari is owned by Warner Bros), and in addition to its range of micros, also offers a dedicated games computer known as VCS (Video Cartridge System), which brings many of the games available on arcade machines into the home virtually unchanged. Atari has a great advantage here, of course, being a prime producer of arcade machines itself. However, other leisure- and entertainment-based companies, notably the Columbia Broadcasting System and toy makers Mattel, are also very heavily involved in the same business. They are buying up the rights to produce many arcade games for the home market, under licence, for use on their Colecovision and Intellivision games consoles, respectively.

The entire games market, whether for stand-alone arcade games, or for games software for home micros, is fast becoming an industry all on its own. In terms of marketing strategy it closely resembles the record industry, with Top 20 best-selling games listings being produced regularly. The two phenomena are similar in other ways, too. Games software seems to be the thing that schoolchildren swop these days, and there is a thriving software piracy business (see page 192).

We mentioned earlier that the degree of hardware development to be found in arcade games takes them into a different class from home

## Playing Fields

Arcade games like Space Invaders, where the player can move his 'token' only along a fixed line, have been overtaken in popularity by 'maze chase' games like PacMan. They both use sprite graphics, and as a result were of poor visual quality. Recently, games designers have been producing much more abstract representations, such as Battlezone, a futuristic player versus tank and missile game, or Tempest, which uses stunning graphic design to produce an outstanding illusion of depth



graphics terminals used with mainframe computers by designers, architects and the like.

Many of the advances made in the field of home computing can be traced back to arcade games. The move towards 16- and even 32-bit processors, for example, occurred as a result of users' requirements to address more than 64 Kbytes, and their need for faster processing speeds. The manufacturers of arcade games were in the forefront of this movement, and were amongst the first customers for 16-bit microprocessors like Motorola's 68000 and Intel's 8086. Their requirement for faster processing and larger memories predated those of even the users of office microcomputers.

There have been derived benefits for the home user even at the lower end of the scale. Sprite graphics, for example, were developed for arcade games, and later became available for home computers. Dedicated chips for graphics and sound generation, like Commodore's Video Interface Chip and Sound Interface Device, all sprang from that same source, as did the three chips used by Atari for the same purpose in its 400 and 800 series home computers.



micros. The most recent of these developments involve the use of video discs to provide a backdrop on the television monitor, against which the games are played. Whether refinements such as this will ever reach the domestic market is a matter for speculation. The technology certainly exists within reasonably priced consumer electronics, though the games software produced for the home market, whether for dedicated games consoles or for home micros, has never really come up to the standard of arcade games in

