Commodore International

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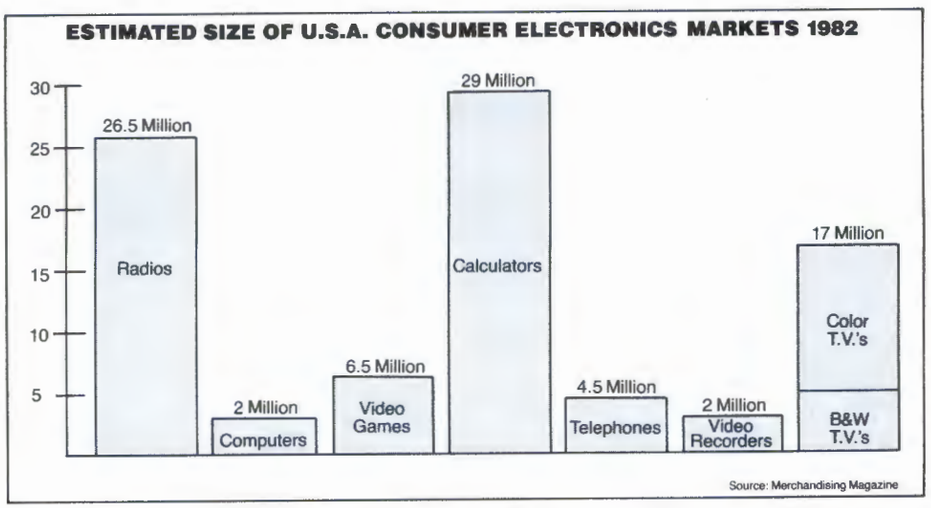
Personal Computers And The Consumer Electronics Markets

While the personal computer market has been growing rapidly over recent years it is an interesting exercise to see how the apparent massive size of today's market really does compare with some of the more mature markets for products that have something in common with personal computers. For the purpose of this exercise some figures have been taken from a recent analysis of the U.S.A. market for "consumer electronics" done by "Merchandising" magazine. Another valid exercise would have been to compare the markets for office equipment such as typewriters and word processors. The estimates given by "Merchandising" are precisely that—"estimates" and while one might take argument with some of the particular numbers given such as that for Personal Computers, which depends a lot on definition, this is not really the main point which is the *relative* sizes of each market.



As can be seen the size of the markets for the two fastest growing products listed, computers and video cassette recorders, is much the same at around 2 million units in 1982. But both are still in a relative infancy if they were to gain a similar size to either the total T.V. market of 17 million units or 29 million units if they were ever to gain the same market size as the calculator—a product that was once considered the prerogative of the office more than the home.

It is interesting to note that three of the growing products; computers, video games and video recorders are all forms of interactive products where the initial purchase is in many ways only the beginning.

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The owner can expand his purchase with peripherals such as cameras, joysticks and printers as well as building up a library of software titles. In this area "Merchandising" reports that the hardware markets for videorecorders and videogames generated sales for 6.5 million prerecorded videocassettes and 61 million videogames respectively.

While we are not making any predictions for just how large the personal computer market will grow, our President and Founder has been heard to talk potential figures that would put computers on a similar level to some of the more mature markets shown here within five years—the two computer family is already common news and the younger generation are growing up with them at home, school and in work so who are we to argue!

Who Really Buys A Home Computer And Why?

Over recent months extraordinary numbers of "home" computers have been sold by our company. As yet another VIC 20 goes past you on the production line or you see another ever increasing order come across your desk have you ever stopped and asked yourself the question—who is buying all our computers and why? Well, if you have, you might be interested to compare your own theories with an analysis done recently on some of the warranty card returns to us. While such surveys should never be taken literally and we don't want to tell our competitors everything the following are some selected highlights.

Well first to the reasons why people chose a VIC 20. The most commonly cited reason was its low price and outstanding value. However most users had obviously looked a little deeper than this as the second most common reason given was the expandability of the VIC system—unlike many of our competitors who may also have a low entry price the VIC has two major advantages. First it can, unlike some, be expanded into a full system complete with disc drives, expanded memory, a modem and printers. And second the cost of doing this with a VIC 20 can be almost half that of many competitors. It's nice to know that many of our users appreciate this. The third most commonly cited reason was its "user friendliness". The VIC 20 has a friendly basic computer language built in, the best keyboard of any low cost computer, expansion peripherals that need no interfaces and plug directly into the computer itself; and VIC documentation is exceptionally user friendly from the beginners manual included to the Programmers Reference Guide and the Introduction To Basic computer language courses.

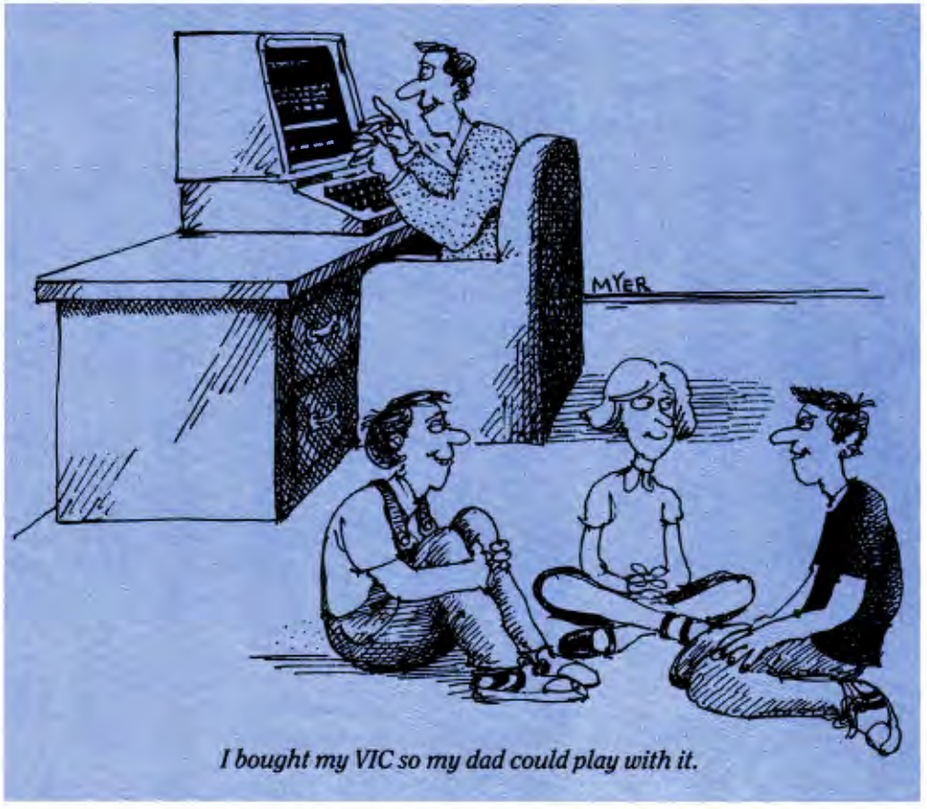
As to the age of most owners the majority were over 30 years old but a further clue to the attraction of VIC to the young was given when half the respondents replied that 3 to 9 people would use their VIC—presumably an indication that the computer was often considered a family present.

As to their area of computing interest the most commonly cited reason was "self teaching" followed by "recreation and hobby" with "education" following in third place.

When the respondents were asked to try and recall where they had first heard about their Commodore computer the most commonly cited source was from "friends" an endorsement for the importance of word of mouth in our industry and the good reputation the VIC 20 enjoys among users. With over a million users out there this also bodes well for the future. The second most commonly cited source was "newspaper/magazine stories" although when "T.V. commercials" and "newspaper/magazine adverts" were combined they did manage to edge the journalists' stories into third place.

For the chauvinists and social analysts among us it was noted that the vast majority of owners were male and two thirds of them were married.

And a final answer to find out whether our respondents really just wanted to play video games or would admit to it if they did. Well almost half said they bought their VIC 20 "to use as a real computer" and half said they bought it "as a computer and to play games with"—fortunately we don't really have to make a judgement on that one as VIC is a real computer and it does play excellent video games!



I bought my VIC so my dad could play with it.

The German Hanover Show—

A Great Success

Our German factory at Braunschweig near Hanover.

When first visiting the Hanover Show ten years ago the Commodore floor space was less than a tenth of that now occupied by us and it was a single story exhibit. Now our impressive stand occupies two levels complete with offices and a refreshment area for customers. Even then our exhibit was busy, although despite the growth in floor area the crowds visiting us seem to have grown at an even greater rate. Indeed we were reported by many people to be the busiest stand at this massive international show. While such statements can never be proved, or disproved(!), it certainly must have felt that way to the hard working and efficient staff from Commodore Buromaschinen, Germany who were manning the stand and organizing the associated logistics.

A crowded press conference.

A Crowded Press Conference

Even the press conference, supposedly held in peace and comfort over lunch, found there was standing room only for many journalists. For in addition to the large turnout of German press there were numerous overseas journalists who appeared from many countries including one group flown over from the U.K. in the Commodore jet.

In addition to the presentation by our German general manager, Harold Speyer, who has presided over our affairs there for the last six years, our President and founder, Jack Tramiel, added his usual bold and illuminating outlook on the future of Commodore and the personal computer industry which he has done so much to create.

Our booth at the Hanover show.

Among the messages Jack Tramiel gave was the hint of a "Lisa and Star" type of workstation product but at a "Commodore" price within the year, a forecast of 50 million computers to be sold annually on a worldwide basis by 1985, Commodore's turnover to double again and a major emphasis to come on software with it accounting for as much as a third of our sales within the next couple of years.

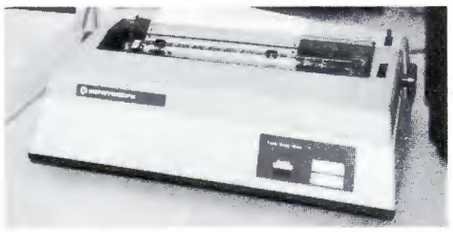
A Busy Exhibition Stand

The Commodore exhibit was broken down into several main areas—a business area, a home and personal computer area and a new products section.

In the business area the main emphasis was on complete systems including software and peripherals. The B700 business computer featured strongly along with the additional add in boards for second co-processors for CP/M and MS-DOS running on the Z80 and 8088 microprocessors. A popular product being demonstrated was the leading CP/M wordprocessor package —Wordstar. A positive reaction was received from many dealers and users to the fact that these new computers can utilize all the existing range of CBM peripherals such as discs and printers. This apparently will help dealers in their stockholding requirements and in continuing to address our strength in a large existing user base. A good reaction was also obtained to the relaunched CBM 8000 series in the stylish new cabinets of the B700 series where the emphasis was on the great wealth of software available in many different languages. One particularly popular product was the new spreadsheet product Calcresult that at the press of a key turns data into graphs. This product is also to be shortly available for the B700 series complete with an integrated database and communications link.

In the home and personal computer area the million selling VIC and the Commodore 64 were well displayed along with a host of software and some of the new peripherals first shown at the January C.E.S. show. Once again the color monitor and the low cost printer plotter received a good reaction although many of the public often seemed to be more interested in the host of games being played on them and a new record may well have been created for the arcade classic—Omega Race!

The portable Executive 64-A show winner.



A low cost daisy wheel printer.

High speed dot matrix printer prototype at Hanover.

A color printer prototype on display.

A digitizer system on display at Hanover.

The I/O Controller on show.

New Products On Show

In the "NEU" products section a number of forthcoming and potential products were being demonstrated and reactions gauged. The "Executive 64" version of the popular Commodore 64 complete with built in disc drives and 5 inch color monitor in a briefcase size portable case weighing only 20 lbs was once again the hit of this area. Because of the potential home and office business use of this product an electronic spreadsheet cartridge was being demonstrated, although because of the crowds around this product the additional output into a large screen monitor/T.V. was utilized in addition to the built in screen which was designed for more personal use than seemed appropriate for the show crowds! The "NEU" products section also featured a large number of printer products and prototypes. These included a low cost daisywheel letter quality printer for the VIC and 64 series of computers. Also for this series was a 7 color printer with a bit image mode capable of producing some extraordinary pictures on paper in addition to the normal letters and graphic character set reproduction. Other printer prototypes being demonstrated for the CBM peripheral range included letter

Calcresult "spreadsheet and graphics" package.

quality printers and a high-speed 420 cps, 136 column printer with a large variety of print modes including a three pass pseudo letter quality mode. Another product area was the model 4270 I/O controller demonstrating the large German market for us in laboratory and industrial control. Also being shown in this same general area of interest was the 8072 digitizer which was demonstrating some CAD—computer aided design.

Awards For Commodore

At the show Commodore was given an industrial design award by the organizers for the new B700 series styling. This was in addition to the recent award given to Commodore Germany by their leading microcomputer magazine CHIP for the outstanding microcomputer product of 1982 —the Commodore VIC 20, or VC 20 as it is known in Germany due to an unfortunate association of the sound of VIC in their language with a well known four letter word!

Harald Speyer and our designer Ira Vilinsky with the design award and the computer that won it.

Harald Speyer receiving an award from Chip Magazine.

Editorial

COMMODORE INTERNATIONAL NEWS, as well as providing an opportunity to focus on the achievements of yesterday and today, shows a window into the products of tomorrow. While the management philosophy of Commodore has changed little through the years, (and why should it with such successful results?), there have been many changes in the size of the company and in the markets in which we operate. In terms of the products we offer the public and our trade customers there is perhaps less change than generally perceived—the price, technology and component make-up of a computer or printer today is not so different from some of the calculators and typewriters of yesterday—as is the "value for money" we offer. However it is in our ability to recognize and adapt to these changes that the greatest opportunities occur. Unfortunately it is in the way of "human nature" to resist change and the unknown. But happily this has not been the case with the management of Commodore and we have generally been successful at recruiting and motivating people to follow this lead. These changes will doubtless continue to occur and while we should retain the best of the past and learn lessons from our experience it is up to all of us to think and react positively to these changes in order to best exploit the opportunities in the marketplace—for if we don't our competitors surely will. Anticipation, entrepreneurialism, and speed of reaction are some of Commodore's greatest weapons so we should maintain these while adapting the new skills required to be one of the largest electronics companies around. Our goal is to be THE NUMBER ONE PERSONAL COMPUTER company—we are already well on the way.

If we look at some of the goals, directions and opportunities our founder Jack Tramiel has focused on recently, it is not hard to see some of the new ways ahead—we will soon be past the first billion dollar mark. As Jack Tramiel has said recently, we are a TOTAL personal computer company with a full range of home, business and educational computers backed up by a complete range of peripherals that have international distribution. Perhaps it is not surprising that we are selling more computers worldwide than any other company. In this issue we can see that some of the emphasis is currently being given to the software side of our business which is both essential to our continuing growth in computer sales and to a massive business opportunity in its own right—WE WELCOME THE OPPORTUNITY OF CHANGE.

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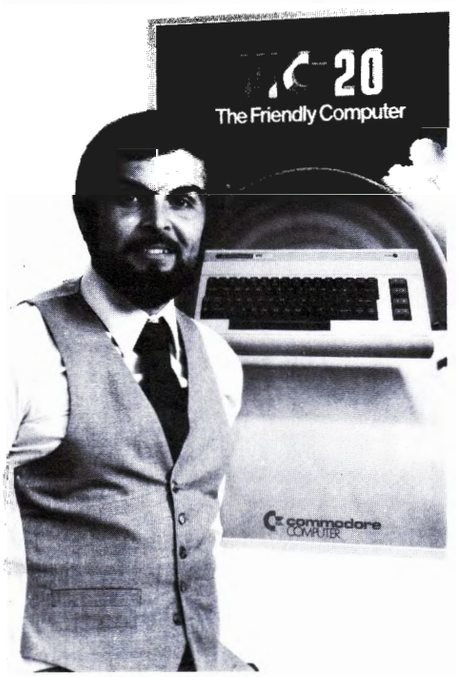
The Story Of The VIC

In this section Commodore's Michael Tomczyk, the original product manager for the VIC 20, tells the story of the world's first million unit selling color computer. Thanks to Compute magazine and their top selling book "Compute's First Book of VIC" from which this extract has been adapted.



The VIC-20 was first announced by Jack Tramiel—Commodore's founder and President—at an international manager's meeting in London in April 1980. There, at a quaint inn on the outskirts of the city, the representatives of half a dozen "Commodore countries" gathered to discuss problems and exchange ideas.

We Will Become The Japanese

On the second day of the meeting, Tramiel surprised everyone by announcing his intention to develop and market a "$300 personal computer." He reminded his management group that Commodore was a pioneer in low-priced pocket calculators and had introduced the first self-contained personal computer—the PET—in 1976. Now it was time to introduce a low-priced color computer.

A debate ensued, with several groups talking simultaneously. Some felt it wasn't time for a computer priced that low. Others felt the new computer might undercut sales of the PET, and still others questioned whether it was economically and technologically feasible.

Finally, about twenty minutes later, Tramiel stood up, pounded his fist once on the table, and said in his deep booming voice, "The Japanese are coming, so we will become the Japanese!" The room fell silent as he explained that several Japanese computer companies (known collectively as "Japan, Inc.") were already poised to enter the U.S. market. Japanese companies had already captured the television, radio, and small car markets, and personal computers were next on their list.

He said we have to compete with ourselves by making computers that do more and cost less, and that meant breaking the $300 price barrier.

The First $300 Color Computer

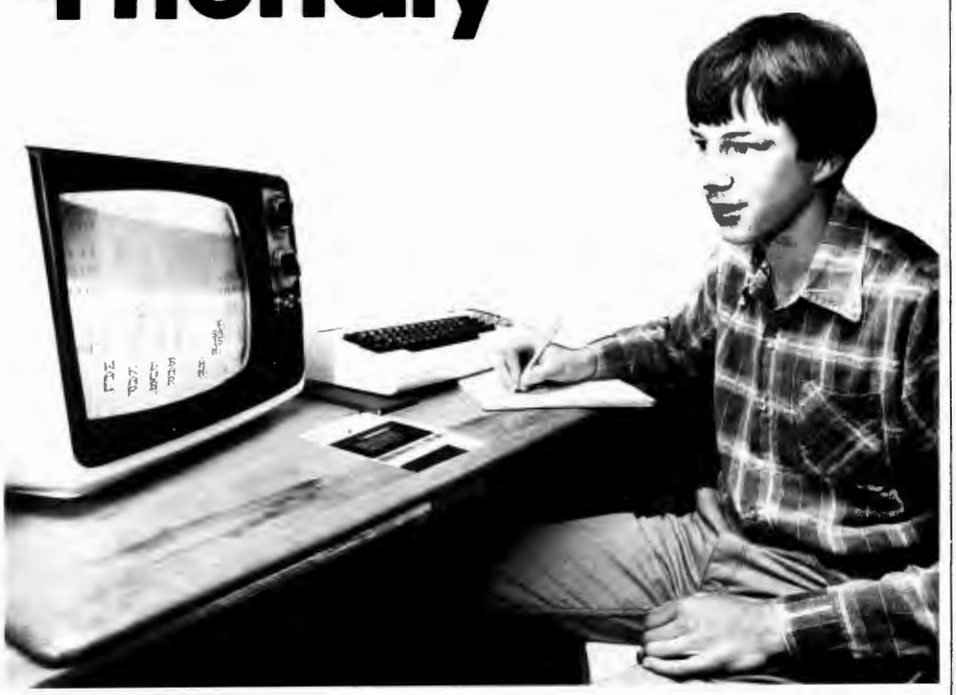
We knew there was price resistance at the $300 price point: but how could Commodore make a $300 color computer profitably? Commodore has one terrific advantage—vertical integration, which means we design and manufacture our entire product. Most important, it means we design and make our own computer chips, and computer chips are the heart of any computer.

Many people still don't know that MOS Technology (a Commodore subsidiary) developed the 6502 Microprocessor, the key computer chip used in Apple, Atari, and several other popular computers, in addition to Commodore. MOS also designed the Video Interface Chip, one of the key chips used in the VIC-20 computer.

When it was suggested that we create a computer based on the VIC chip, some of the engineers resisted the idea, claiming the chip was too "limited." They scoffed at the idea of a VIC chip computer and complained that the VIC chip allowed only 22 columns on the screen compared to PET's 40 columns.

Finally, two groups of engineers, on the East and West coasts, wound up in a race to build a prototype computer using the VIC chip. At MOS in Pennsylvania, the designer of the VIC chip spent several sleepless nights building his prototype. He put the computer in an old Commodore desktop calculator housing and used a keyboard from one of the original PET computers. The original keyboard was a calculator-style keyboard with red metallic keys. In a few days, the prototype was done.

Introducing The User-Friendly VIC



The first prototypes were taken to the National Computer Convention in Chicago in June 1980, but the new computers weren't put on display. They were set up at our booth in a room enclosed by tinted Plexiglas walls. Only a few people were allowed inside to see the new computer, but lots of noses pressed against the windows as passers-by peered in to get a glimpse of our new "secret" computer.

The next job was to put together the marketing program to launch the product in the United States. We began with a very simple premise: computers are not perceived as being "friendly," so we have to make the VIC-20 as "user friendly" as possible. A lot of people chuckled because we waved the "user friendly" banner so forcefully. Some people even resisted the idea when we dubbed the VIC "The Friendly Computer" and trademarked the phrase. But in the end, "user friendliness" turned out to be one of the VIC's most important features.

Commodore engineers all picked up on the phrase and built some *very* friendly computing features into the VIC-20, like two graphic symbols on each key, color abbreviations on the color control keys, and included an L-shaped pound sign for our English friends. In Autumn 1980, we took the "user friendly" banner to Japan, where we held engineering consultations and finalized the product.

VIC... Vickie... Vixen...

One of the hardest challenges was giving the VIC-20 its name. In the early days, the VIC-20 really didn't have a name.

Most of the engineers liked the name Vixen. The name Vickie was mentioned, too, but never seriously considered. Over the next few months we considered quite a long list of names which might be acceptable internationally. We all spent long hours thumbing through our thesauri searching for an obscure but clever name like Atari or a cute name like Apple.

Finally, we decided to name the computer after the Video Interface Chip—VIC—which became Video Interface Computer. VIC sounded naked by itself, however, so we decided to add a number. But the only meaningful number was VIC-22 (based on its 22 columns). For some reason, the number 22 didn't seem very friendly, so we settled on the name VIC-20 because the number 20 sounded "friendlier."

Ironically, as a sidenote, we originally vetoed the name Vixen because it had undesirable connotations in German, but VIC later turned out to mean something even worse. As a result, the German model was called VC-20 and translated as "Volks Computer" (the "People's Computer"). For awhile, the name "Volks Computer" was so well-liked that we considered using it worldwide, but the only U.S. tie-in was Volkswagen, and Volkswagens were no longer being made. Except for Germany (VC-20) and Japan (VIC-1001), we stuck with VIC-20. In the end, the short, snappy name turned out to be easy to remember, convenient for magazine headlines, and very "user friendly."

The Japanese Didn't Come

We first introduced the VIC not in the United States but in Japan, where the VIC's potential competition was already brewing. It was sort of like carrying coals to Newcastle, but we knew if the VIC succeeded in the Japanese market, it would succeed in the rest of the world.

Our Japanese VIC, called the VIC-1001, included uppercase English letters, PET graphics, and Japanese characters. It was introduced in September 1980 at a major computer exhibit at Seibu Department Store in downtown Tokyo. Over 100 orders were taken the first day.

When we introduced the VIC-20 in the U.S., in the spring of 1981, we still expected some low-priced Japanese computers to hit our market by Christmas. Incredibly, that didn't happen. The Japanese didn't come!

Instead, most Japanese companies ignored the low end of the market and entered the U.S. with higher priced computers in the $2000-6000 price range. As a result, throughout 1981 and much of 1982, the Commodore VIC-20 was the first and *only* full-featured color computer priced under $300.

Commodore History

A Computer Priced Like A Video Game

Personal computers had been available since the mid-1970s, but by 1980 they still hadn't become a mass market item. Three major obstacles stood in the way: 1) computers were too expensive, 2) computers weren't very "friendly", and 3) nobody knew what to *do* with them!

The long-awaited "Home Computer Revolution" had not caught fire, and the popular use of computers was limited to hobbyists, engineers, and classrooms.

Our U.S.A. advertising started out comparing the VIC-20 to our closest competition, but we soon realized that there *wasn't* any competition at our price point. And those higher priced computers weren't selling very well anyway, so why compare the VIC-20 to them? Why not compare the VIC-20 to a product that *was* selling well, like video game machines?

After all, the VIC-20 was selling for the same price as a video game machine, and VIC software includes cartridge games as well as practical programs. In other words, why buy a video game when you can buy a full-fledged computer for the same price? That message became our advertising slogan.

Actor William Shatner of "Star Trek" was chosen as our spokesperson, and in the first months of 1982 we kicked off the largest advertising campaign in Commodore's history. Shatner introduced the VIC as the "Wonder Computer of the 80s," adding, "It plays great space games, too!"

Commodore also negotiated a long-term arrangement for conversion of Bally Midway coin-operated games to cartridge —including best-sellers like *Gorf* and *Omega Race*. *Sargon II Chess* gave us one of the best chess games in personal computing, and five Scott Adams Adventure games gave us possibly the best assortment of adventure games available from a computer manufacturer. We also introduced a low-priced six-pack of games on cassette tape, with names like *Blue Meanies From Outer Space*. These games helped persuade a lot of people to buy the VIC-20. The next step was to take those VIC-owners from video games to other computing. To do that, we had to cross the second obstacle to mass market computing and make computing "friendly."

Friendly Computing In Action

Owning a personal computer used to mean you had to know how to program in BASIC.

But user friendliness in marketing means *giving the customer an item that requires little or no special expertise to use, apply, or enjoy.* One way to do this is to include a really nice instruction book that lets you have fun and do interesting things without expensive peripherals or packaged software.

You don't have to be an auto mechanic to drive a car. So why should you have to be a programmer to use a computer?

The user friendly manual we wrote for the VIC-20 doesn't even *mention* the word "programming" until the last chapter. Our manual teaches you how to "compute," which we interpret as meaning "to have fun." So we talk about cartoon animation, sound and music, color graphics, and other topics. We also wrote the book so you can turn to any chapter and start computing from that point, with little or no experience. If you want to write computer music, you turn to the music chapter and start there. If you want to work with color and graphics, you start with that chapter.

What we didn't say is that if you work through the book, you'll learn how to program in BASIC, by osmosis, since most of our examples included a very subtle introduction to programming. It was a sneaky

—but helpful—way to ease new computer owners into the fundamentals of computer programming, and it meant new VIC owners had an excellent head start if they decided they wanted to learn computer programming. We also wrote a technical manual for programmers, called the *VIC-20 Programmer's Reference Guide.* This manual set the standard for future Commodore programmer's reference guides.

What Do You Do With A Computer?

The last obstacle to selling personal computers was that nobody knew what to do with them. This was the toughest challenge of all.

The key point in using a computer is that if you can find one useful, interesting, or which has practical application, you've justified its use. However, everyone has his/her own special need for a computer, and that's what makes this challenge so difficult.

One of the answers is to provide a useful selection of software. So, in addition to games, we introduced a *Home Calculation Six-Pack* and a *Personal Finance* program, and we developed some unique educational programs like the *Home Babysitter* cartridge, which contains three separate skill building programs for pre-schoolers. We've also found that VIC owners are coming up with their own unique applications. A ninth grader wrote a program that keeps track of his paper route. A computer artist found a way to create new designs. A container executive uses the VIC to calculate complicated paper trim percentages.

After owning his VIC for two months, one VIC owner wrote a program and sold it to Commodore. And he'd never used a computer before.

Story Of The VIC Modem

The device which lets you connect your computer to the telephone is called a *modem,* but modems cost as much as $400. In 1981 we wanted to develop a "VIC-modem" which could retail for about $100, but no one wanted to build a modem we could sell for that price. Everyone wanted to "protect" their price levels, or felt it wasn't "time" for a hundred dollar modem, or that it was technically impossible.

Finally, a small company that made industrial modems for food processing plants offered to help design our modem. After several tough sessions we came up with a modem on a cartridge which plugs directly into the VIC-20 and connects to any modular telephone handset. A non-modular telephone adapter for connecting the modem into the wall phone socket was also designed for those who didn't own modular telephones, and for users in Canada.

The final VICmodem includes a free subscription to and complimentary hour on CompuServe's information service (including "Commodore Information Network," a VICterm terminal program on tape) and several other special offers, all for only $109.95. VICmodem went on sale only six months from the day the original idea popped into our heads.

VIC-20 As Home Appliance

Computers had a hard time being accepted as retail home appliances because of the chicken and the egg phenomenon. For example, the VIC-20 couldn't be accepted as a home appliance until a housewife or student could walk into a department store and buy the VIC-20 off the shelf, like a radio or an alarm clock. On the other hand, department stores weren't ready to put computers on their shelves until the general public was ready to come into their stores to buy computers off the shelf.

Commodore put together a consumer products team which went after the retail market and persuaded large department stores, toy stores, audio-video stores, and even discount chains to carry the VIC in large quantities.

We provided regional training for store personnel, designed an in-store display fixture containing a full selection of VIC products, and put together co-operative advertising and other merchandising programs which appealed to mass merchandising chains. The result is that the VIC-20 is now being sold in places like Macy's, Toys R Us, and even K mart, and is included on the back cover and inside Montgomery Ward's catalog.

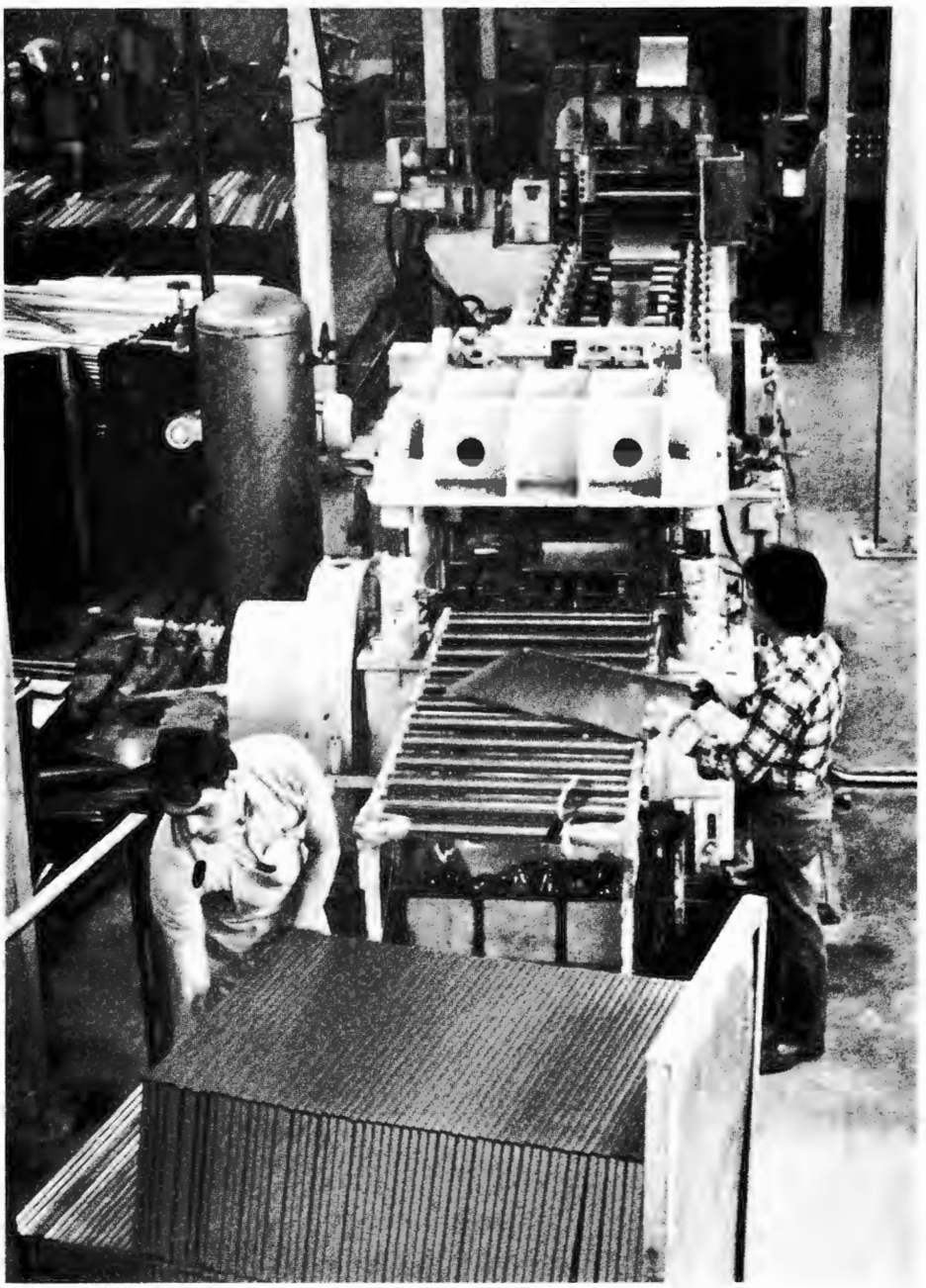
What's next? There are some exciting surprises in VIC's future. And we will continue to produce new and better software for the VIC-20, including more "practical" software which most serious computerists will appreciate.

The "story of the VIC" goes on.

An Outlook On Commodore In Canada

As most of us know, Commodore's exciting history began in Toronto, Canada with a typewriter repair shop Jack Tramiel opened in 1958. What may not be as obvious is that Commodore Canada has maintained tremendous growth, along with her sister companies in the Commodore family.

A steel furniture line.



A Steel Furniture Manufacturer

One area which has helped fuel our growth in Canada and which makes Commodore Canada a little bit different from other Commodore companies, is that we operate a steel plant for office furniture production. In 1965 Commodore purchased an office furniture manufacturing company for which it had previously distributed and expanded its operations to a plant located in Scarborough, Ontario. This plant is still producing commercial furniture and accessories. When Commodore broke into the microcomputer field in 1977, the furniture plant became a separate division in the company, and added the manufacture of PET Computer housings and related parts to the product list.

Ed Kellow, President of Commodore Business Machines Limited, is very proud of the growth Commodore Canada has achieved in the eleven years he has been there. "In 1972, when I came on board, we had 21 production employees. Today, there are over 450 production employees in two plants producing filing cabinets, office desks, lateral filing cabinets, computer desks, and VIC-20s and 64s," Ed said.

Canadian steel furniture plant.

Largest Maker Of Filing Cabinets

Commodore Canada is a major player in the Canadian scene as far as office furniture is concerned (not to mention as far as our microcomputers are concerned, but more about that later). In fact, Ed noted that commodore manufactures more vertical filing cabinets than all other filing cabinet manufacturers in Canada put together.

Commodore furniture products are sold from coast to coast in Canada. We have over 80 dealers as well as major department stores and catalogue houses to handle these sales.

"Our steel plant is still growing—both in terms of products and revenue," said Ed. "In February, we began to manufacture computer desks for the VIC-20 and the 64, and the market for these products is booming. At certain times we're selling almost one desk per machine, and of course the VIC-20 and 64 are selling like hotcakes."

The furniture plant itself is being updated and modernized. Two years ago Commodore Canada purchased $3 million worth of automated equipment which has helped increase efficiency and productivity. And staff hasn't been decreased, so we're a first-hand example of the fact that automation doesn't have to mean fewer jobs for people.

From January to June every year in the steel plant we also manufacture gas barbecues for sale in Canada. There are a couple of barbecues in the courtyard at the Scarborough head office for the employees to use at lunchtime in the summer months.

In July, 1982 we began assembling VIC-20s and 64s at another plant in Scarborough. With this important step Commodore became the first international microcomputer company to manufacture in Canada. Commodore Canada has a mandate to produce VICs and 64s to be exported to 25 countries, and we have increased staff to meet the demand. Of course, the company also exports the PET housings and some steel products as well. "International" really is the name of the game.

A Leader In The Education Field

In Canada, as around the world, Commodore is a leader. In the field of education, Commodore is known as the "Teacher's Choice." As a result we now have more computers installed in Canadian schools than any other computer manufacturer, representing a marketshare of about 65% nationwide. And, we have developed 656 courseware programs now available for the public domain in English and French. We expect to update and enlarge this courseware continually.

With the help of schools across the country, we have established 48 VIC-20 Education Training Centres in nine of Canada's 10 provinces. The courses at these education centres are serving the needs of many consumers for some introductory exposure to a computer, and focus primarily on BASIC programming for the VIC. The courses are very popular, and we are the only manufacturer to provide such a national training network.

Jack Tramiel with a student demonstrating the educational software.

Ed Kellow with education manager Frank Winter and the public domain software.

A Strong Business Dealer Network

In the business market, Commodore is again in the top three manufacturers. Systems are sold from coast to coast through a strong 82-dealer national network. In Canada, Commodore systems are being used by small, medium and large organizations. Of the 56,000 firms in Canada with sales of under $10 million, by the end of 1982 some 25% had microcomputers—and the percentage of large businesses using micros is much the same—a fairly healthy percentage, but it still means Commodore has lots of room to grow in the near future in the business market.

Home Market Shows Great Potential

The home market for personal computers may be the most exciting of all for Commodore Canada in the near future, because of the VIC and the 64. In Canada, in 1982, we manufactured and sold more home computers than our five major competitors combined. And the distance between us should increase in 1983.

With our showing in the personal computer division added to that of our unique steel plant, we can see Commodore's Canadian roots are strong and growing deeper with every product we produce and sell.

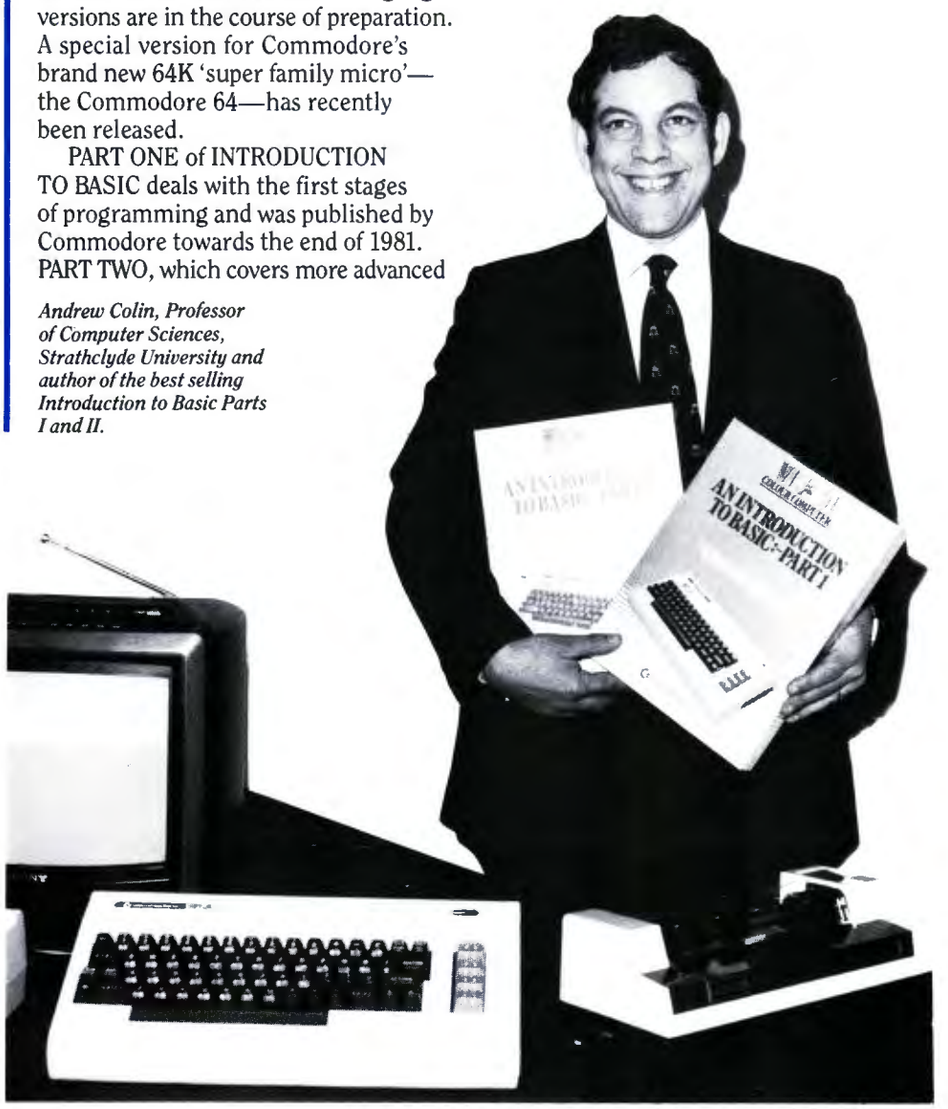
Commodore's "Intro To Basic" Program Sells 100,000 Copies

Commodore's teach-yourself program—INTRODUCTION TO BASIC (PART ONE)—has already sold well over 100,000 copies—making it Commodore U.K.'s best-selling program for the Commodore VIC and also the most popular 'family' microcomputer learning program in the world.

The Commodore VIC computer, together with INTRODUCTION TO BASIC—which makes full use of the VIC's sound and colour graphics facilities—are together one of the most effective, and most popular, ways of learning the methods and disciplines of computer programming. The course has been translated into French, Spanish, Italian, Swedish and Dutch and other language versions are in the course of preparation. A special version for Commodore's brand new 64K 'super family micro'—the Commodore 64—has recently been released.

PART ONE of INTRODUCTION TO BASIC deals with the first stages of programming and was published by Commodore towards the end of 1981. PART TWO, which covers more advanced programming techniques, followed some 6 months later. Each part consists of a workbook which contains both printed course material and space for writing down results, two cassettes containing demonstration and self-assessment programs and, finally, a plastic stencil with the most frequently used program flowchart symbols.

The course is split into 15 units. Each unit takes typically one or two evenings of solid work. Most units include some reading, some practical work on the VIC, some programming, and a self-test questionnaire to measure how well the unit has been understood.



Andrew Colin, Professor of Computer Sciences, Strathclyde University and author of the best selling Introduction to Basic Parts I and II.

A Course At Strathclyde University

The author of the course is Professor Andrew Colin, one of the world's pioneering figures in the use of microcomputers to teach computer literacy. Back in 1978—at a time when most of his academic colleagues were running such courses with 'mainframe' computers—he set up a microcomputer laboratory at Strathclyde University, in Glasgow, Scotland equipped with 50 Commodore 'PET' microcomputers, to run a special course devised by himself to teach students how to program in the BASIC computer language. A research study by a second British University—the University of Leeds—showed that Professor Colin's course was one of the most effective methods of teaching BASIC that was available. Commodore was so impressed by the success of the Professor's methods that they packaged the course and sold it commercially under the name "Strathclyde Basic" for the PET computer.

When in 1981 Commodore launched the VIC computer and aimed it firmly at the 'family micro' market, Professor Colin agreed to produce a brand new course around the new machine. The new course, unlike Strathclyde Basic, was to assume that the people using the material had little or no scientific or mathematical background, but at the same time it was to use the interactive 'learning by doing' methods that had made Stratchclyde Basic so effective. The new course was called INTRODUCTION TO BASIC.

Outselling The Arcade Games

Today INTRODUCTION TO BASIC (PART ONE) is Commodore's top selling educational program, and in the U.K. outsells AVENGERS, ADVENTURE and many other games commonly associated with 'family micros'—and what is Commodore's No. 2 best seller? INTRODUCTION TO BASIC (PART TWO)!

Commodore And The Bally/MIDWAY T.M. Agreement

Back in 1981 and the very early days of the VIC 20 computer most people were wondering whether there really was a "HOME" computer market outside of the dedicated computer hobbyist who had given much of the early impetus to the microcomputer revolution. However planet Earth had already been overrun by an invasion of "SPACE INVADERS" in the form of large amusement arcade machines. These had rapidly evolved after their first landings into a much larger population of "VIDEO GAME" machines. These video games sported in their wake an even greater myriad of other alien forms to be shot down, chased, jumped over and almost anything done to in the name of entertainment. This multitude of aliens were incorporated in a host of amusement arcade machines and the most popular converted into software game cartridges. Fortunately the potential for game playing had been realized in the original development of the VIC 20 computer which included a joystick port and a plug in software cartridge slot as well as the necessary color and sound effects. On the other hand, the then popular video games had not been designed with computing in mind and did not realize that their greatest threat lay not in the alien space invaders but in the ever increasing price/performance ratio of computers and their expanding software libraries.

It was with this in mind that Commodore International entered into an alliance in late 1981 with the leading supplier of these alien life forms. The alliance took the form of a license agreement to the marketing rights for game cartridge versions on Commodore computers of any games developed by Bally-Midway for their amusement arcade machines.

Now that Commodore has become the number one world supplier of home and personal computers over the last 12 months and the necessary conversion time has elapsed to produce the computer versions of these games, it is interesting to review the current status—particularly in view of all the software currently being released for the Commodore 64.

The Bally-Midway Amusement Arcade Presents

GORF

This is the ever popular arcade classic that now tops the home charts. In the game you fight your way through 4 completely different screens shooting down invaders, gorfies, laser rockets, death ships, flying saucers and a host of aliens in a superb display of sound and graphics. (Currently available on the VIC and soon to be released on the Commodore 64).

KICKMAN

KICKMAN is another extremely colorful game from the amusement arcades that uses a clown theme and in which there is no shooting. You are a clown steering a unicycle through a three dimensional city popping and balancing falling balloons on your head. Should you fail at this you can always get a second chance by "KICKING" them. Although, as you would expect, there is a penalty for this in the form of an increasing difficulty. (Just released for the Commodore 64).

OMEGA RACE

Another classic arcade game which while extremely popular in the arcades never made the number one slot. However among "game aficionados" many consider this the most enjoyable and sophisticated from a game playing point of view. An especially important point for home playing where quick appeal and the need to put in another coin are relegated in importance to a prolonged challenge. In this "ultimate" space game one Omegan fighter maneuvers against droid ships, death ships, photon mines and vapor mines. Fantastic "rubber band" boundaries and multiple levels of difficulty give this game its own unique appeal. (Versions for both VIC 20 and just released for COMMODORE 64).

SEA WOLF

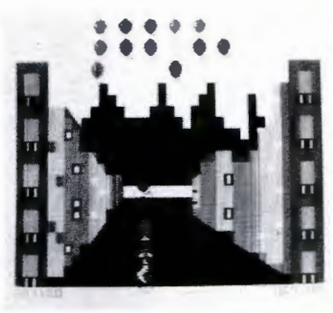
SEA WOLF is another early arcade classic with perennial appeal. In a variation on outer space Sea Wolf takes you underwater for its challenge. As a submarine commander you are in charge of sinking and destroying all enemy ships... destroyers, freighters and P.T. boats... but watch out, for like all enemies, they will fight back at you. (Available for both VIC 20 and Commodore 64).

CLOWNS

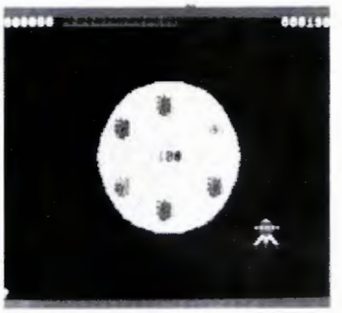
In a respite from the alien shooting games this is a very popular game among the younger members of the family with the ageless appeal of the circus. Two acrobatic clowns bounce up and down while piercing balloons in the sky—a simple game to understand but like any arcade classic difficult to master. Clowns is operated with paddles and has the additional benefit of being a one or two player game. (Available for both VIC 20 and Commodore 64).

WIZARD OF WOR

Yes "WOR" is spelled correctly. WIZARD OF WOR is another of the all time arcade classic greats that is enjoying renewed popularity with the release of home versions. This game was a turning point in the evolution of the arcade game for it combines the ever popular shooting feature with a maze in which you seek out, track and destroy enemy monsters, worlucks and wizards which you kill for bonus points while advancing to increasing levels of difficulty until you yourself ultimately fail... but hopefully with a new high score. (Just released for the Commodore 64).

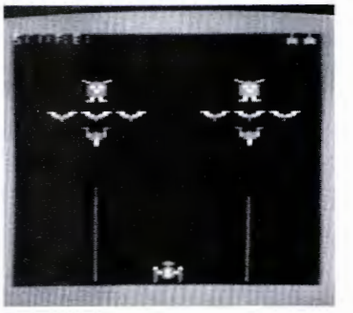


Kickman



Lazarian

Clowns



Gorf

New Arcade Hits

Commodore's agreement with Bally-Midway should ensure an ever continuing supply of new hits from the amusement arcades as we increasingly gear up our software development and marketing operations from that early start in "home entertainment" when we launched the VIC 20 into the mass consumer market in 1982. Indeed two further new Bally-Midway titles are to be released at the June Consumer Electronics Show in the U.S.A. These will be for the Commodore 64 and are:

BLUEPRINT

BLUEPRINT is a game with a difference in which an ogre is chasing J.J.'s girlfriend, Loni, across the top of the screen, and he's catching up to her! J.J.'s only hope for saving Loni is the AMMO MACHINE, but first he has to build it. J.J. must go to all the houses in the maze so he can collect all the parts he needs. Then he has to put the parts in their proper location on the BLUEPRINT at the bottom center of the screen. J.J. has a number of obstacles to overcome, including a time limit, bomb pits, killer flower pots, Weird Willie and a time limit before he can get the Ammo Machine built.

LAZARIAN

This is another classic space game in the mold of Gorf. There are three separate phases and five different screens to be completed in a quest as the pilot of a space fighter stationed in a remote sector of our galaxy. The mission is to rescue stranded starships and to defend a sector of space against all types of hazards. In phase 1 a sister ship has to be rescued from a field of meteors. In phase 2 the pilot must work his way through four levels of a space tunnel to rescue another ship in distress. And finally in phase 3 the pilot battles the one eyed space leviathan, LAZARIAN. Lazarian can only be destroyed by shooting its eye and the ship's lasers are needed to cut away the monster and get to this.

Other Arcade Games

Another new arcade game release for the Commodore 64 is "LE MANS". Although "LE MANS" is not part of the Bally-Midway series it borrows much of its exciting play from the many arcade car racing games. It's race day at Le Mans, and your car is in the pole position. The countdown lights signal the start of the race. Hold down the FIRE BUTTON, which is your gas pedal, and you're off and running on a tricky, sometimes hazardous Grand Prix track. Your goal is to pass as many cars as you can. The more cars you pass the more points you make. Every 10 cars passed gives you 1000 bonus points. If you score more than 20,000 points before time runs out, you're still in the lead and can continue the race. Passing the other drivers is not easy; they will try to block you whenever they can. And, since this is Grand Prix racing at its best, you must maneuver your car over a variety of terrains, including icy roads, divided highways, night driving, and the famous "Le Mans Esses".

In the next issue we will describe "TOOTH INVADERS"—a unique game exclusive to Commodore that we believe could become one of the hottest hits of 1983.

HIGH SCORES ON VIC GAMES

For those of our employees who are game lovers we are including the highest reported scores as recorded in our North American Users Magazine—"Powerplay" which incidentally now has a circulation of over 100,000 copies and is starting to be distributed on bookshelves along with famous magazines such as Time and Newsweek—it's not only software we are publishing!

BLUE MEANIES
1,260
Alan S. Newman, Fairfield, CT

CAR CHASE
75,865
Zach Coleman, Charlotte, NC

COSMIC CRUNCHER
215,000
Barbara Schrieber, New York, NY

DRAW POKER
17,410
R. Callia, Torrance, CA

JUPITER LANDER
207,400
Christopher Champlain, St. Petersburg, FL

GORF
60,410
Andy Ralston, Fairfax, VA

MIDNIGHT DRIVE
14.11 km
Nathan Mehl, Newark, DE

MOLE ATTACK
331
Heda Takaya, Saskatoon, Saskatchewan

OMEGA RACE
260,050—5 ships
Ben Piper, Chico, CA

PINBALL
1,500,000
Joe Ferrari, Commodore, Toronto

RADAR RAT RACE
122,240
John Higginson, South Holland, IL

SEA WOLF
10,080
Jimmy Kuhn, Norfolk, VA

SKY IS FALLING
13,810
Rachel Koons, Drexel Hill, PA

SLITHER
261
Amy Miles, Mt. Pleasant, MI

SUPER ALIEN
45,700
Robert Schaeffer, Brookline, MA

SUPER SLITHER
167
David Goldberg, Richardson, TX

SUPER SLOT
7,306 coins
Jerry Krueger, Cary, IL

VIC AVENGER
10,190
Chad McCubbins, Coatesville, IN

Financial News

Commodore International Reports

Record Third Quarter and Nine Month Results.

THIRD QUARTER SALES RISE 130% NET INCOME UP 128% PER SHARE NET UP 128%

Mr. Irving Gould, Chairman of the Board of Commodore International Limited announced that Commodore had achieved record sales, net income and earnings per share for the third quarter and nine month period ended March 31, 1983, the results of which are summarized here.

In commenting upon these results, Mr. Gould stated that "the primary contributor to Commodore's record results in the third quarter and nine month period were continuing and accelerating extremely strong sales of Commodore's microcomputer systems to the business, educational and home markets."

Mr. Gould continued by noting that "during the most recent quarter ended March 31, 1983, Commodore recorded excellent microcomputer systems sales gains, especially of its now under $400 COMMODORE 64 personal computer, as well as its VIC 20 home computer."

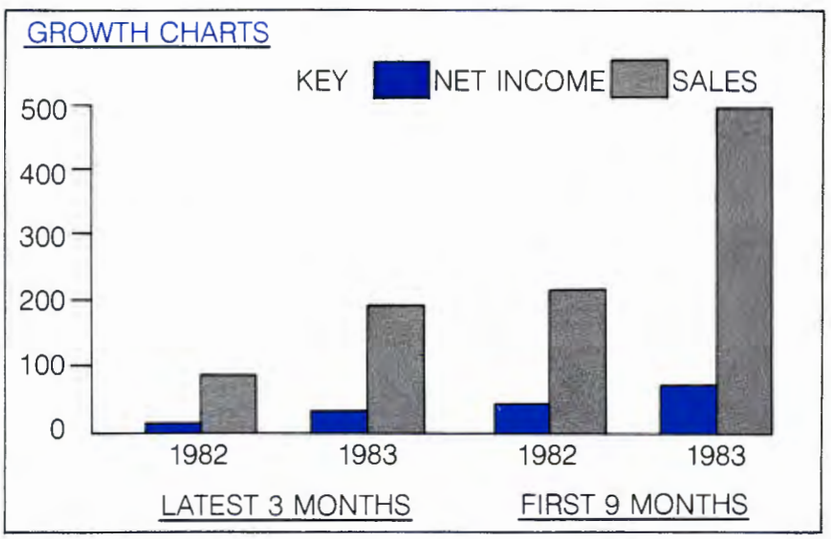
Mr. Gould went on to say that "the current final quarter's results are expected to benefit from both continuing strong demand for the COMMODORE 64 and VIC 20, as well as from new orders recently received from several very large mass merchandisers and chain stores, including two of the largest in the world, that have decided to carry Commodore computers for the very first time."

Mr. Gould concluded by noting that "the positive sales and earnings trends witnessed over the first nine months of the current fiscal year are expected to continue through the current final quarter of fiscal 1983 and into our new fiscal year beginning July 1st. We fully expect further significant sales and earnings gains in both the fourth quarter of fiscal 1983 and into fiscal 1984."

COMMODORE INTERNATIONAL LIMITED AND SUBSIDIARIES
CONDENSED STATEMENT OF OPERATIONS
$(000)
(unaudited)

	Three Months Ended March 31,		Nine Months Ended March 31,	
	1983	1982	**1983**	1982
*Net Sales	**$189,575**	$82,130	**$469,146**	$206,336
Income before Income Taxes	**31,794**	13,719	**77,938**	34,394
Provision for Income Taxes	**6,775**	2,762	**16,600**	6,852
Net Income before Tax Credit	**25,019**	10,957	**61,338**	27,542
Extraordinary Item[1]	**—**	209	**3,680**	509
*Net Income	**$ 25,019**	$11,166	**$ 65,018**	$ 28,051
Earnings Per Share				
Before Extraordinary Item	**$ 1.62**	$ .71	**$ 3.98**	$ 1.79
Extraordinary Item[1]	**—**	.01	**.24**	.03
Net Income Per Share	**$ 1.62**	$ .72	**$ 4.22**	$ 1.82
Average common shares and common share equivalents	**15,422,000**	15,433,000	**15,397,000**	15,420,000

[1]Extraordinary item relates to net tax loss carryforward benefit.



A Breakthrough In Sound Technology

Over recent months we have seen the incorporation of an unique device from Commodore's technical development groups into a number of Commodore end products with more to come. This device is the SID chip (sound interface device)—the first complete music synthesizer on a chip. Here Paul Higginbottom, from our Canadian operation, takes a general look at our involvement with "the remarkable SID chip".

The Remarkable SID Chip

When Commodore introduced the first PET computer in 1977, we really were not sure where we were headed with it. We knew it could do many things, but no one could have predicted then, some of the things that are being done with Commodore computers today.

One aspect of our computers that has developed tremendously, is the area of sound creation. When the first PETS made a few beeps in an early game, I was intrigued that a computer could actually make sounds, and when they began to play classical music, I began to see an enormous potential in sound creation.

Commodore's research and development company, MOS Technology saw that great things could be done with computer generated sound, and embarked upon the development of a truly innovative chip known as "SID." SID is an acronym for *S*ound *I*nterface *D*evice.

This chip boldly goes where no sound chip has gone before!

Its features surpass any sound chip and many commercially available music synthesizers costing many thousands of dollars. It can produce an enormous variety of sounds from the ones you're used to computers making, such as those in games, to many far more esthetically pleasing sounds like real instruments ranging from stringed, brass, and even percussive ones.

This little 28 pin chip opened up a lot of possibilities for new products for Commodore. When I was first learning about the Commodore-64 which has a SID chip built right in, I spent a large amount of time experimenting with the sound capabilities, because of my interest in electronic music. After having written numerous programs, I became really interested in looking into the possibility of interfacing an organ keyboard to the Commodore-64, so that the SID could be played to its fullest potential. Much to my delight, another development facility located at Commodore's office in Dallas, Texas, developed this, and with the firmware I have been developing, Commodore is now set to enter the musical instrument market. The add-on keyboard also has MORE SID chips in it, so that a whole orchestra of sound can be created by anyone! Commodore is also introducing a drum pad unit, which allows the user to explore the SID's capability as a sophisticated percussion machine.

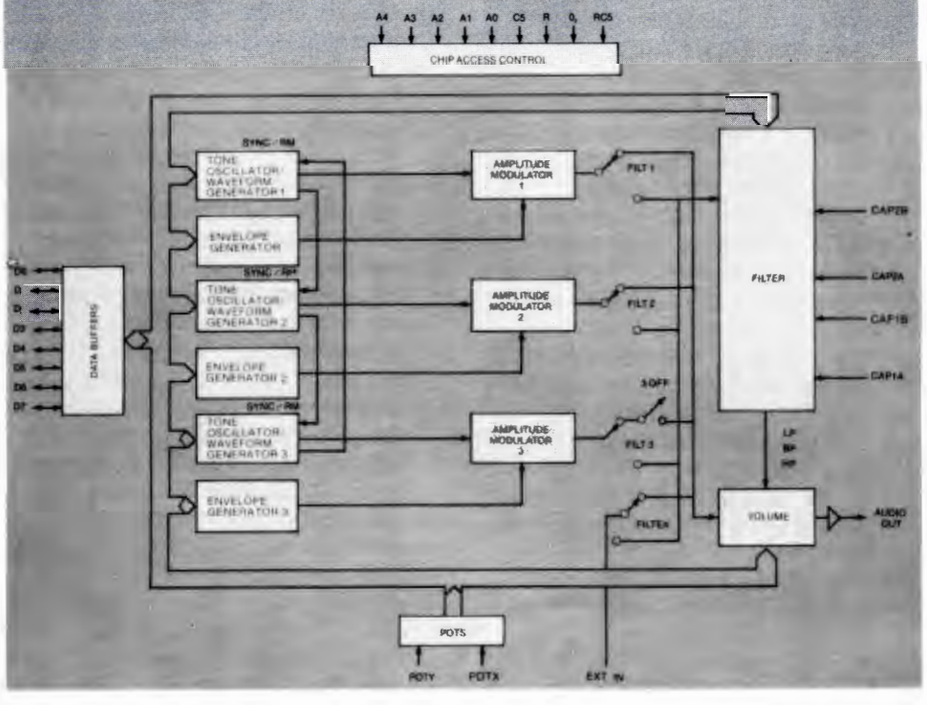
In the future, it is certain that Commodore computers will be making whole orchestras of sound, including ALL the stringed, brass, reed, wind, and percussive instruments. I look forward to seeing the first "Commodore computer performing live, without humans." We needn't fear that this eliminates our musical creativity; quite the reverse is true: it will bring all of the "bathroom musicians" out of the closet, and let them express their musical desires.

This, however, is only the beginning. I think many people believed that electronic synthesizers were only a passing craze. They are now used by ALL musical fields. The flexibility and capability of music synthesizers would have brought a tear of happiness to Bach's eyes.

A Technical Overview

The Commodore SID—6581 sound interface device is a single chip, 3 voice electronic music synthesizer/sound effect generator compatible with the 6500 and similar microprocessor families. SID produces three independent voices, each with a nine octave range. Four waveforms are available: sawtooth, triangle, variable pulse and noise. The chip includes a programmable ADSR (attack, decay, sustain, release) generator. A programmable filter can be selected for each voice which provides low-pass, high-pass, band-pass or notch outputs. Also included is variable resonance and master volume control. The block diagram gives an overview of the SID chip layout.

Figure 1 *Block diagram of the Commodore 6581 Sound Interface Device (SID).*

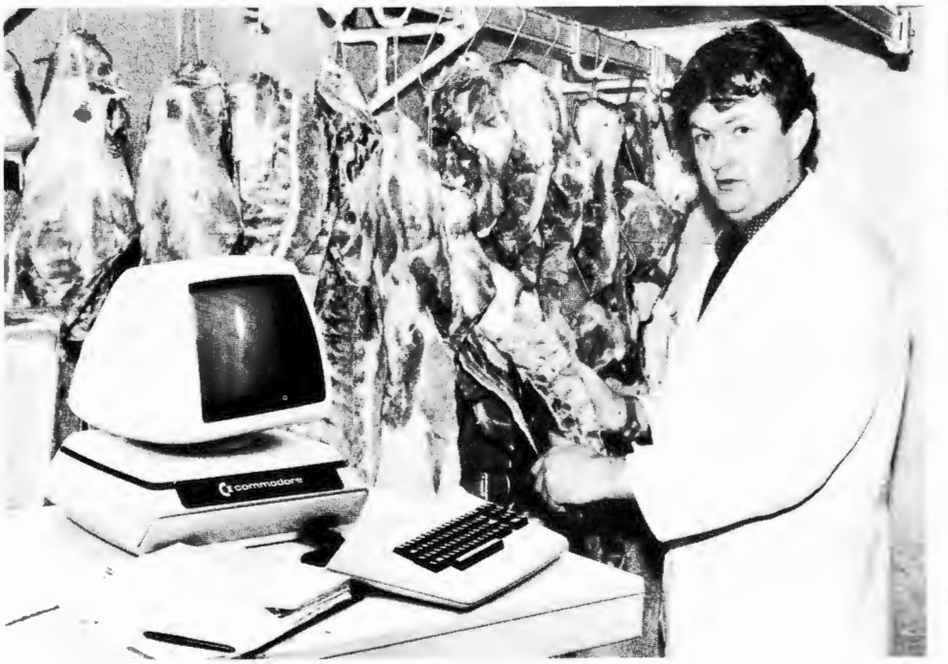


Application News

Commodore Computer Helps German Butcher

For more than a year and a half Achim Schmalhorst from Opel, West Germany has been using a Commodore computer to help calculate the gains and losses of his butcher's meat business. He starts with a calculation on the economics of different meat cuts and stores the target prices for various types of meat such as pork, beef and veal. For instance a pig of a particular trade class should yield certain components of cutlets, ham, and bacon. The computer compares these expected yields with the actuals and while the actuals exceed the expected everything is in order. However when the reverse appears then the supplier may well have delivered an inferior class of merchandise. This used to be a very time consuming part of the business and essential in calculating and achieving the maximum profitability of the operation and tying this back to specific cuts of meat and suppliers. In this way likely profitability of purchasing various cuts and types of meat from different suppliers can be made. Another option open to Achim Schmalhorst is to butcher the meat himself or to buy it from a main distributor already butchered into individual cuts. Once again his computer program can give him an instantaneous read out on the more profitable of these options.

Over a period of time Achim Schmalhorst has built up a database on alternative suppliers to check on the yields, discounts and quality etc. In this way he is able to make rational buying decisions on actual facts, rather than the claims of competing suppliers with regard to their quality and yields. Achim Schmalhorst has been working with his Commodore computer for a year and a half now and says that the Commodore is an ideal computer for his type of small business operation. The reasons he gives for this are not only the competitive price and ease of programming but Achim says that the robustness and reliability of Commodore equipment is a necessity for his type of operation where there is no separate computer office and the equipment must be close at hand for him as he carries out his day to day operations. In the photograph Achim can be seen at work in his "day to day" operations!



Achim Schmalhorst at work with his computer!

Commodore Computers Used To Teach Preschoolers

In the U.S.A. preschoolers are stepping into the future as they use the Commodore PET and the Commodore 64 to develop their basic skills. The children, ages three to six, attend Kindercare Learning Centers in three cities, Minneapolis, Minnesota; Houston, Texas; and Montgomery, Alabama, where an innovative computer learning program is available.

Since the preschoolers do not yet read, they are given directions by a natural voice recording played on a tape recorder connected to the computer. The children who use a light pen to answer questions, are being taught pre-math and pre-reading concepts, memory skills, colors, shapes, and concepts such as over/under.

Working with Fisher Scientific, Inc., a Commodore Dealer specializing in educational sales, Kindercare, the largest nationwide childcare facility, started using the Commodore PET to teach preschoolers in June of 1982 at eight centers in Minneapolis. As this advanced educational technique proved to be successful, the program was expanded to 35 centers in Houston.

The program has been accepted with enthusiasm by both parents and students. The Commodore computers have proved to be so reliable and successful as a teaching tool that in January of 1983, the program was expanded once more and the Commodore 64 was installed in 11 centers in the Montgomery, Alabama area. We look forward to the day when Commodore computer may be incorporated into all 759 Kindercare Learning Centers.

Children at work in a kindercare center.

Commodore and Friends

We recently received the following letter from 9th grader David Cummins in Dayton, Ohio, to Jack Tramiel. David thought it might help in "advertising our products"—we're very pleased to include it here and the photograph of the "friends" that his sisters attracted around his VIC 20. Thank you very much David and happy computing.

2011 Tiara Court
Dayton, Ohio 45459
U.S.A.

Dear Mr. Jack Tramiel,

I thought this picture might give you some enjoyment and a break from your busy day.

It is of my two sisters playing with our VIC-20.

I also thought it might help in advertising your products.

"Commodore, the friendly computer that draws a crowd."

Sincerely,

David Cummins

David Cummins
9th Grade Student

U.S.A. Leases New Facility

Commodore Business Machines, Inc., U.S.A. has announced the completion of the negotiations for a 17 year lease on the Norcross Rustcraft facility. This half million square foot facility is located at Wilson Drive, Brandywine Industrial Park in West Goshen Township, adjacent to the West Chester County Airport.

The move to the Chester County location will consolidate activities currently located at various points in the Wayne and King of Prussia area and add additional production capability for our rapidly expanding needs. The building will become the headquarters for CBM's U.S. manufacturing, distribution, warehousing, marketing, and sales activities.

British Factory

For a long time Britain has been one of Commodore's top markets for computers. Recently only software for our computers has been produced by our U.K. company. But now plans are being finalized to open a new 150,000 square foot factory in Corby, England, about 100 miles north of London. There will be production lines for both the VIC and Commodore 64. This will be Commodore's second European factory to complement the existing facility in Braunschweig, Germany which will continue to produce the larger machines for all Europe. In addition to the extra capacity needed for our rapid expansion the "made in Britain" label will help us in the important domestic market—particularly in the school sector where government preference is given to domestic products.

Commodore Computer Shows

So successful have our computers become that they now boast their own exclusive shows. The first began 4 years ago at the Cafe Royale Ballroom next to Picadilly Circus in London, Britain. The original show attracted exhibitors from user clubs and some 60 software and peripherals suppliers in addition to around 4000 entrants. This year the number of exhibitors and visitors should be well over double that. These unique occasions enable users, suppliers, Commodore and press from around the world to meet in an unique atmosphere. There are two of these shows scheduled in the forthcoming months. The first is "The 4th International Commodore Computer Show" at the Cunard Hotel in London from the 9th-11th June which is followed later in the year from the 6th-8th October at the Frankfurter Messegelande, Germany, by the "3rd International Commodore Fachausstellung". To anyone interested in Commodore computers these are fascinating places to visit.

A Computer Camp For Experts

While there are many computer courses going on around the world, including several run by Commodore companies, the ultimate perhaps for the really dedicated Commodore computer lover is at Lincoln College in Illinois, U.S.A. This June up to 200 students will take part in a week long residential course that can earn college credit for those with at least High School Junior standing. The course has an incredible coverage of all aspects and models of Commodore computers including such subjects as networking on Compuserve and the many different computer languages available on Commodore computers. However the most interesting aspect is the impressive array of lecturers lined up for the course. The list contains many of the most famous "gurus" known throughout the hundreds of Commodore user clubs around the world. The "guru" of "gurus"—Jim Butterfield from Canada will be there along with Len Lindsay—founder of the PET Gazette (now alias Compute), Ellen and Jim Strasma—producers of the Midnight Paper (a magazine on Commodore computers and software), Karl Hildon—editor of The Transactor (Canada's magazine on Commodore computers), and a host of other experts on Commodore computers—thanks to all of them for the excellent support they have given to Commodore users through the years.

Commodore Forms Software Division; Appoints Sig Hartmann President

Sig Hartmann

Mr. Jack Tramiel, President of Commodore International Limited has announced the formation of a Commodore Software Division and named Mr. Sigmund Hartmann as president.

Mr. Hartmann, who reports to Mr. Tramiel, has over 25 years of management experience in the computer hardware, software and data processing fields—most recently at TRW, Inc. in Los Angeles where he held a variety of senior positions over an 18 year period.

According to Mr. Tramiel, "Sig Hartmann's immediate responsibilities include establishing a broader nucleus of small business, educational, home and recreational software for Commodore microcomputers, including several new models planned for introduction later this year."

"This represents a major commitment by Commodore to the development and marketing of software," Mr. Tramiel said.

"In the past, our emphasis was in computer hardware. Today our philosophy has broadened. We design and manufacture computer *systems*—and that includes software as well as hardware and peripherals. We intend to be a major factor in the software business."

Mr. Tramiel also noted that "Commodore sold more computers in 1982 than any other company in the world, creating a huge aftermarket for software sales which, as a goal, are expected to reach 20 percent of the company's hardware sales over the next 18 to 24 months."

"One of the things we've learned in the past year," he said, "is that major retail chains and computer dealers prefer 'one stop' shopping for software. Mass merchants, especially, want us to provide a complete hardware/software package. That's what we're doing now... and will do even better in the future."

"In the small business market, the software *is* the computer. The manufacturer has to provide top quality wordprocessing, electronic spreadsheet, accounting, database and management software—and we're doing that. Our new "B" series small business microcomputers will be introduced this summer with some of the most powerful, best-selling software packages in the industry."

Mr. Tramiel emphasized that "the company will continue to work closely with third party software developers, by inviting them to become partners with Commodore. The company has already launched a major software acquisition effort to contract existing quality software and to develop innovative new programs.

Commodore is also exploring new techniques for marketing software.

Hartmann's Background

Sig Hartmann's responsibilities at TRW included Manager, Communication and Digital Development Laboratory and Computer Development Laboratory, which designed data processing and digital communication systems.

In the 1970's, as vice president of TRW's Data Systems Inc., he was responsible for development of the first computerized credit verification system used widely by retail stores, airlines and other commercial organizations.

He was also president of Comtec Data Systems, Inc., a data communications company in Santa Clara, California which developed sophisticated front-end processors for computer systems used by major government agencies and financial institutions.

Mr. Hartmann has lectured widely in computer technology at various colleges and universities.

Sig previously worked at Commodore in the early 1970's as general manager of U.S. operations and so is well acquainted with the philosophy and style of Commodore—a company which he has followed closely and admired since that time. He is pleased to be back with such an exciting company and opportunity.