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Games systems selling well

SALES of Atari's VCS 2600 and XE games/computer systems have been high despite a TV advertising campaign setback.

The problem arose when the Independent Broadcasting Authority objected to an advert scheduled to be shown during prime children's watching time.

One reason given by an IBA spokesman is that the advert put forward by Atari did not comply with its code of practice. The statute that

Atari seems to have been in breach of states: "Children's ability to distinguish between fact and fantasy will vary according to their age and individual personality.

"With this in mind no unreasonable expectations of performance of toys and games must be stimulated by the excess use of imaginative backgrounds or special effects".

By the time Atari had produced another advert to

promote its machines for the Christmas market all remaining slots had been sold, leaving the campaign well and truly out in the cold.

Atari spokesman Peter Walker refused to comment about the ad content or problems with the TV campaign. But he did say that "sales of the games/computer systems are high and do not appear to have been affected by the lack of advertising".

Record turnover

ATARI has achieved record results in the third quarter of its financial year.

Sales were \$80.4 million — a 34 per cent increase over last year's third quarter when sales totalled \$59.8 million.

Income was \$8.3 million compared to \$4.6 million, a rise of almost 80 per cent over last year.

Sales for the first nine months stand at \$275 million, 30 per cent up on last year's \$215 million. Income has risen 76 per cent from \$25.8 million to \$45.4 million.

The very devil to pay over games

HUBBLE bubble tail and trouble for Red Rat Software games Little Devil and Nightmares.

They have been banned in France and Italy because they are considered to have sexual connotations. A major UK distributor refused to handle the games in this country for similar reasons.

Red Rat director Harry Nadler told Atari: "I can't understand it. Little Devil is nothing more than a harmless Jewish game with no evil intent at all.

"Nightmares contains all the ingredients of a classic fairy tale with no harmful additives or colouring for people to worry about.

"If the games were sending children to start dabbling with witch beans or something like that then there could be a justified



complaint". Both titles were reviewed in the December issue of Atari User.

Mike Reynolds, who reviewed Little Devil, said: "I see no nothing evil in the game at all.

"In fact the opposite situation exists, with the little devil doing good by trying to free lost souls and break out of hell himself".

Silca Distribution had originally banned both games, but has relented in the case of Nightmares.

Their spokesman John

Hartley told Atari User: "We are now handling Nightmares — but Little Devil remains on our banned list.

"We consider the title unsuitable for general distribution and refuse to stock it for the same reasons as we do not stock Lantier's Bustin, Leather Goddesses of Phobos or Strip Poker".

Says Nadler: "The French and Italian and Silca Distribution are all judging the book by its cover — I doubt if any of them have played the games at all".

Weather outlook brighter

The service which offers Atari users an opportunity to become weather forecasters is being upgraded to a professional standard.

Thanks to WeatherLink, all Atari owners will soon be able to pick up the same satellite pictures as the Met Office experts.

To achieve this, WeatherLink — which operates on the MicroLink system — has switched satellites from the older NOAA 5 to the more advanced Meteosat.

This means that the weather maps transmitted from outer space have been dramatically improved in quality — offering perfect clarity and true colour.

"The problem with NOAA 5 was that it relied on infra red images", said Derek Maslin, head of MicroLink, "and this, at times, resulted in weather maps that lacked clarity and true colour.

"The far more sophisticated Meteosat satellite totally eliminates the problem, enabling Atari owners to download pictures of a completely professional standard".

Show bargains a big draw

AN in-depth survey of visitors attending the Atari Christmas Show has revealed it was a smash hit with the public.

One hundred per cent indicated not only they felt their attendance had been well worthwhile, but also that they plan to attend the next in the series.

The reason for the mass endorsement stemmed in the main from the vast number of special offers to be found, with a conservative estimate of total discounts available being placed in excess of £180,000.

And such was the competition between exhibitors at the show that some prices fell dramatically during the course of the event.

When the doors opened on the Friday, boxes of 2in discs were selling for £14.95.

By the end of the first day,

this had been slashed to £9.95.

"The visitors have had a bonanza", said one major disc supplier.

That's why more than 40 per cent of visitors questioned reported that bargains were the highlight of the show.

Other major reasons given for describing the event as a success were the mix of exhibitors, the range of products, the venue and the overall presentation.

The survey also revealed the spending pattern of visitors to the show. Some 40 per cent spent up to £20, 25 per cent up to £30, a further 12 per cent up to a £100, with 22 per cent paying out more than £100.

"It was fantastic", said Atari user Donald Peterson. "I've travelled down from Bedford for the day and I reckon I've saved not only my fare but also more than £150 in special offers".

Olympic competition

WITH the winter Olympics poised to grace our television screens, Tynesoft has released Winter Olympics 88 for the Atari XL and XE.

As well as being able to take part in the simulated sporting action which includes downhill racing, bobsleigh, slalom, ski jump and biathlon, Tynesoft (081-414 4011) is running a competition with a trip for two to the winter Olympics in Calgary as the star prize.

The competition, which closes on January 20, is open to all purchasers of Winter Olympics 88 and requires you to place in order the eight most important qualities which are needed by a top alpine skiing star.

Leading TV winter sports commentator David Vine contributed to a free booklet which is included with the game. Price £9.95 as cassette and £14.95 as disc.

Schematics software

A PACKAGE designed to complement word processing software has been announced by Agamemnon (0203 417500).

Print Marshal - which requires 64k ram, disc drive and a dot matrix printer - allows the user to produce flow charts, circuit dia-

grams, club magazines, sheet music and anything of a schematic nature.

The program also mixes graphics with text and turns the computer into a 48 column by 20 row window of an 80 column by 90 row document page which can be scrolled around.

THE GALLIP CHART

TOP 20

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	▲	DEATHLON Firebird	1.99
2	▲	FEUD Mastertronic	1.99
3	●	HENRY'S HOUSE Mastertronic	1.99
4	▼	180 Mastertronic	2.99
5	●	PANTHER Mastertronic	1.99
6	▲	ON CUE Mastertronic	2.99
7	●	SOCCER Alternative	1.99
8	▲	SILENT SERVICE Microzone	9.95
9	▲	FOUR GREAT GAMES Micro Value	3.99
10	●	TALLADEGA Top Ten	2.99
11	▼	MILK RACE Mastertronic	2.99
12	▼	STORM Mastertronic	1.99
13	▼	LEADERBOARD Access/US Gold	9.95
14	●	BMX SIMULATOR Code Masters	1.99
15	▼	GAUNTLET US Gold	9.95
16	▼	DIZZY DICE Players	1.99
17	▲	FOUR GREAT GAMES 2 Micro Value	3.99
18	▼	BOULDER DASH II First Star/Prism	2.99
19	●	KNOCKOUT Atlix	2.99
20	●	GUN LAW Mastertronic	1.99

Compiled by Gallip/Microzone

There are four new entries this month, all in the Top Ten. While three games re-enter lower down the chart, Mastertronic's budget range is well represented with four in the Top Five - the first place still eluding them, as Deathlon from Firebird seems unmovable.

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Ravings from a year of plenty

By
Kouloc



EVERY month I wonder if I'm going to have enough time to write this column. What with being kingdoms held in tyranny's thrall by power-crazed sorcerers, rescuing damsels trapped in high towers and hacking my way through deep jungles to bring back the last blue pearl of the Pimpope tribe, I reckon I have my work cut out. And that was only yesterday!

Still, I've managed to make it in one place yet again. Looking back over the year, it seems that not a day passed when I wasn't being baffled, bamboozled or landing myself in a pretty pickle or dire dilemma. And the same most apply to you if you've played all the adventures that have been spaced in these pages during that time. This month I'm taking the opportunity to cast my mind back over some of the adventures that stood out in 1987.

Remember Rick Hanson from *Robico Software*? — a meaty text adventure if ever there was one. Special Agent Rick, a tough guy who feared nothing but spiders, was set the task of stopping some kooky general from wiping out the world. Did Rick succeed? Well, only you can answer that if you've played the adventure. If you've not tried it, I strongly recommend it to you — it's a good 'un.

Then along came *Hollywood Hijinx* from Infocom. In this you were forced to track down a number of bizarre artifacts from your late Uncle Buddy's Hollywood menagerie. There were some really wry-out scenes in *Hijinx*, as I recall.

Did you manage to solve the multi-step puzzle of the *Moriah* *thrush*? Were you successful in finding the buried loot in what must have been the biggest maze ever in an adven-

ture? And incidentally, don't you think mazes are a bit of a pain? It's about time they were dropped from adventures — to see they are just time wasters.

And what about that beginning in *Hollywood Hijinx*? What a stinker! I can't think of too many adventures where even getting started had the old grey matter going into overdrive. But how satisfying when at last the penny dropped and you found the way to get into the mansion.



Next up was *Brimstone*, an unusual text adventure in the *Electronic Novel* series from Broderbund, courtesy of US Gold. Although the screen layout on this adventure was a shade unattractive, the contents more than made up for it.

These *Electronic Novels* have perhaps been a bit neglected by most adventures and they certainly have not been given the publicity by their distributors that the products deserve.

That is a pity, because these games are very good. The genre is impressively sophisticated, on a par with Infocom's and Magwerks' efforts, and there are many innovations in the adventures. The text is lush and the prose gripping and atmospheric.

If you've never tried an *Electronic Novel*, I should waste no time in getting your hands on one. They are not cheap — around £25 — but they are worth every penny. Others in the series are *Isaac*, *Breakers* and *Mindwheel* — they are all a joy to play.

The best adventure of the year had to be *Satanical* from Infocom. This

4 From Page 8

featured the return of Hoyt, that lovable little robot you first encountered in Planetfall. Stationfall contained superb puzzles, many very funny incidents — the windy Aquarian balloon creature immediately springs to mind — a teasing plot and quite the best ending I've come across.

Talk about bringing tears to the eyes — why, there wasn't a handkerchief in our house that wasn't sopping! Stationfall wins my vote as one of the best adventures ever written.

Running a close second was the elegantly styled Magnetic Scrolls' *Castle of Thieves* from Pandion, the dashing follow-up to *The Pawn*. In



several ways, *Castle of Thieves* is the better of the pair. It has the same excellent parser, good textual descriptions and high-quality graphics that *The Pawn* has, but the story is much more tightly plotted and consistent.

The puzzles are more logical and there is the added touch of the Master Thief's humorous appearances at different points in the game. *Castle of*

RUCOLC'S RAVES	
1	Stationfall (Infocom)
2	Castle of Thieves (Pandion)
3	High Alton's Guide to the Galaxy (Infocom)
4	Jewels of Darkness Trilogy (Infocom/Level 9)
5	Pirate Adventure (Scott Adams Adventure International)
6	Suspect (Infocom)
7	Zork I (Infocom)
8	The Pawn (Pandion)
9	Circus (Mysterious Adventures)
10	Leads of Khavara (Austin Hill)
11	Adventureland (Scott Adams)
12	Rick Hansen (Robot)
13	Billybad (Infocom)
14	Scorner (Infocom)
15	The Worm in Paradise (Level 9)
16	Monter's Quest (Melbourne House)
17	Zork II (Infocom)
18	Zork III (Infocom)
19	Silverox of Claymorgue Castle (Scott Adams)
20	Spellbreaker (Infocom)

Thieves has won several awards already including PCW Adventure Of The Year and looks like remaining a steady seller for a long time to come.

To conclude my review of some of the highlights of '87, there was *Lurking Horror* (Infocom) and *Knight Of Mind* (Level 9). Both started off promisingly but turned out to be a little disappointing.

Lurking Horror had one or two irregularities and was somewhat overrated as a horror story — it turned out to be rather tame. *Knight Of* was a major step forward for Level 9 but the

final part — there are three sections in the game — was sprawling, over-populated and somewhat unimproving. Even so, both adventures fully earned their place in any dedicated adventurer's collection.

You'll note that many adventures these days are for disc owners only. That's hard balls on those who only have cassette decks but I'm afraid that's the trend with adventures. Soing and save every penny to get a disc drive is my advice — you're missing out on a lot of pleasure without one.

For a bit of fun, I am giving you my list of the best Atari adventures. I hope you will find some there that you see agree with but if not, why not write to me and tell me what your own favorites are? I'll publish such lists from time to time — there's nothing like giving your own views for getting a good argument going!



Hints & tips

And so lastly to a few of the letters received. My belated thanks to Simon Casrell (aged 13) of Stourport for his superb map of Mercenary. The Second City. Not in the traditional mould of adventures, I know, but a splendid game for all that.

Martin Toy would like some help with *Golden Bazon*. He can't find a lamp and cannot defeat the knight on the battlements. It's a long time since I played this one and I've lost my solution documents.

I think the lamp is inside the cards somewhere — perhaps you can find it after overcoming the knight? I seem to remember that you also have to make yourself invisible — maybe that's how you get past the knight. Can anyone say for certain?

For Andrew Tonge of Leeds and other readers still troubled by *The*

Paveff, let me advise you to beg, buy or borrow the April 1987 issue of *April User*, where a complete solution appeared.

Andrew would also like some assistance with *Earthquake*. He has got to the fire blocking the path and has been down the drain but can't make any further progress. Who can help this adventurer in distress?

From Cambridge, A.M. Morris and party have reached level 8 in *Ultima IV* but can't find the reanimator. Another problem is in entering the codes (after the abyss encounter) — they are unable to get the symbols of the word of passage in order. Advice is required from other *Ultima IV* players, please.

And so until next month, I bid you all a fond farewell. Have a happy new year and may all your treasures be non-rusting!

You win some ...

Producer: *4 Star Compilations*,
 Wichita, KS
 Price: \$7.95 (cover) \$3.95
 (disk)
 Supplier: *Real Star Software*,
 11 Federal Street, Win-
 chester, MA 01890
 Tel: 087-638 1988

WHENEVER I see a compilation I am always a little dubious about the quality of the software but with this package one of the four are good. Let's look at them individually.

If you ever play arcade games you will recognize *Sansaring Wings* as a clone of 1942. Basically you take on the role of a lone pilot and single handily take on an entire Japanese airforce.

Your aircraft is a Lockheed Lightning and you take off from the carrier where you are based at the beginning of each level. If you survive you must return there to land.

By shooting certain aircraft you can gain extra

firepower or a destructor smart bomb which is operated by the speaker.

Some of the enemy aircraft take a bit of killing and the large bomber simply refuses to evade. If you get into trouble then simply leave the loop and escape the danger.

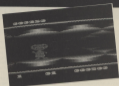
The graphics are acceptable - except for the aircraft which are rather uninspiringly designed.

Play is quite addictive despite the niggles and the one feature that really saves the day is the smooth and efficient screen scrolling. *Sansaring Wings* is the best on the compilation and should give you hours of fun.

In *Crumble's Crisis* you are Crumble, and work in the intergalactic zoo.

Last night when you were looking up you didn't see the time ticks as the Fuzzies' cages properly and they have now escaped - all 30 of them.

So away you go with your



jet-pack to bring them all back. There are six Fuzzies on each of the five levels and all you have to do is go up to them and pop them into the cage.

Lucky for you they are all relatively harmless. However there are other nasties: Ghosts, goblins and evil weevils.

If you start to get low on energy, just look for the knives and forks that will replace it but be careful not to touch the walls as they are made of antimatter and make a bit of a mess if touched.

The graphics are well done and the game is fun to play, so if you fancy going Fuzzie hunting this is for you.

I have read some strange introductions for games in the past, but the one for *Disc Wapper* is superb: "Zietri has been awarded the membership on a strange alien world 80,000 per sec away from his home planetary system of Bright Arness. His only hope of survival is to Disc Wap home. This involves riding the sub-ethereal spatial interactor." Did you get all that?

Your object is to advance through as many screens as you can collecting points avoiding the mines and the waterloo disintegrator as you go.

You can be killed in any number of ways, but in the process of playing the game I couldn't keep track of what killed me or when or how it happened. Extra lives are

obtained by hopping on to a diamond stage - but only on certain screens - and then hopping off quickly.

The game has a few curious features which include chest pods - diamonds with a circle around them. If you stand on one of these and press fire you will go to the next level.

Though original, this game did not have much else going for it.

The concept of *The Search* is to retrieve a magic ring hidden somewhere in the frozen wastes. You have to return it to the blue castle from where you set out.

Control is by joystick and in the process of playing you will encounter different characters. When this occurs you are offered four courses of action: Fly, attack, grab or bribe.

There are various objects that you can find to help you in your quest. The game also has a save feature that will allow you to store your progress on tape or disc.

Yet as far as graphic adventures go this one suffers from both poor graphics and sound.

Few compilations contain games of equal value and this is no exception. However, for the price this Four Star Compilation does give you your money's worth.

Neil Fawcett



Sound	4
Graphics	7
Playability	6
Value for money	8
Overall	7

What a great battle it was ...

Program: *Shiloh* - *Grant's Trial in the West*
Price: \$19.95
Supplier: *SSI/SD Gold Units*
231 Colford Way, Colford
Bournemouth BH3 3AA
Tel: 021-857 0369

UNTE, April 1862, General Grant's ascendancy in the American Union army had been relatively uneventful. But then came that fateful dawn when he and his 45,000-strong force was caught in a surprise attack by Confederate General Johnston and his army of the Mississippi.

So began the Battle of Shiloh - two days that were to prove Grant's first real trial by fire.

In this latest wargame from experts Strategic Simulations, you have the chance to determine the outcome of this historic

battle in the American Civil War.

Taking command of either army against the computer or a human opponent, you have the choice of playing at any of three levels: introductory, intermediate or advanced.

There are 15 turns in each game, each representing 90 minutes of real time. A turn is made up of a number of phases which are played out over a two-level, 32 x 32 square-gridded, scrolling map of the battleground.

The terrain includes light and heavy woods, clearings, roads, ridges, meads, swamps, swamps, orchards, streams, a ford, river, a sunken road and Shiloh Church.

The map can be viewed from long range - giving a strategic view of the whole battlefield - or you can zoom in to have a tactical

look at an enlarged smaller area.

There are four types of unit used: infantry, cavalry, gun boats and artillery. Each of these is rated for manoeuvre - including game fit artillery - efficiency, morale, fatigue, weapon type, ammunition, and other factors. The units are distinguished on screen by specific shapes and colours.

At the intermediate and advanced levels, the phases, in order of play, consist of command control, recovery or rally, reinforcement, followed by two sets of Confederate and Union operations and combat phases, with a mid-point recovery phase intervening and culminating in a victory determination phase.

On the eighth turn only, an end-of-day phase also comes into play.

Each phase offers a wide variety of options and the game is extremely flexible in play. It is possible in a short review to do justice to the range of options, parameters and commands available and to the depth and complexity - and hence realism - of *Shiloh*.

But just to give you a flavour of the intricacies, let me list a few of the options open to you: You can elect to have certain units hidden from view, only becoming visible when moved adjacent to during an operation phase. This is particularly recommended if you want to realistically portray the fog of war.

Within one of the three overall complexity levels, you may pick from any of five difficulty levels. Level three is historical and makes no modification to either side.

The other levels affect the casualties inflicted in combat - one and two favour the Confederate player, four and five the Union.

Ammunition supply, the efficiency of the units and

the arrival of Union reinforcements may be varied and you can choose between a one or the full two-day campaign.

In addition, a comprehensive range of commands allows the player to, among other things, display help menus, save and load games, toggle between tactical and strategic maps, remove units to view the underlying terrain, centre the map around a unit, build a level of fortification, and view all squares that the designated unit can fire into - the list goes on and on.

The game's algorithms are many and complex too. For example, each leader has a bonus rating that is modified randomly each turn. The effect this has is to make that command confident, indecisive, cautious or confident and this in turn affects the units.

Fortunately, the accompanying documentation, in the form of a glossy 68-plus page booklet, clearly sets out the instructions, background, complexities and refinements.

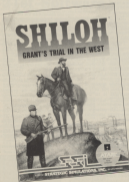
The game is supplied in an attractively illustrated box and comes complete with a stiff map of the battlefield on the reverse of which is a handy reference guide.

Shiloh is sure to be greeted with delight by all wargaming fans. It is flexible enough for beginners to play at a fairly basic level but true sophistication and challenge really becomes apparent at the higher levels.

This is one that you can turn to again and again and represents excellent value for money. A must for all aficionados.

Rob Chappell

Documentation	5
Graphics	7
Playability	5
Value for money	5
Overall	5



Star rating

Product: *Star Force*
Price: £7.99 (suggested) £9.99 (real)

Supplier: Terebuch Software
Industrial Estate, Bishops
Cleeve, West Wick, W21 4JF
Tel: 091-434-6071

"ALERT...Alert...Delta Base to Star Quest - Priority Dispatch - Code Red...Code Red...". Thus begins *Star Force* - one of the best games to appear for a long time.

Your mission is to fly *Star Quest*, your super star fighter, over the gigantic alien mother ship, destroying as much of the main superstructure as possible.

Your goal is to annihilate the ship's main reactor. This sounds straightforward, but isn't and it isn't me.

As you attempt to destroy the mother ship you are constantly harassed by the defence fighters. These small craft attempt to eliminate you with relentless

determination - even if their missiles miss the enemy will run you.

As well as avoiding the fighters you must negotiate tall pylons, buildings and shadowed objects. This addition makes the game extremely taxing.

The inlay card outlines one of the features as very smooth bidirectional scrolling, but to the common mortal this means that the screen scrolls from left to right in a fashion very similar to *Defenders*.

The graphics are superb, the colours expertly used and together they make a stunning display. Intricate design work adds to the overall quality and style and a nice feature is that over time you lose a life the colours change.

The sound effects are adequate but are lifted above the average by the digitised speech. On loading you are greeted with the message, "The battle begins".



The credit for the quality of sound goes to 2-bit Systems' Playlog add-on which was reviewed in the June 1990 issue of *Amiga User*.

More speech can be heard as you play, and it is always as crisp and clear as the opening message.

The game has a one-player mode and uses a joystick plugged into port one. It's response is very sharp, and this is necessary because at times you have to turn sharply to avoid the buildings or defence craft.

Because of the much acceleration an eagle soon find yourself in deep trouble.

Star Force is well packaged and the inlay card carries some very nice

artwork. The sound, graphics and superb scrolling complement each other superbly. My only reservation is that, at times, movement was so fast I had difficulty in telling what killed me.

Even though the gameplay is difficult it is addictive. Billed as the ultimate shoot-'em-up, with numerous levels featuring the very best of the Amiga's graphic capabilities - I can only agree.

Nell Fawcett

Sound	5
Graphics	10
Playability	10
Value for money	5
Overall	8

Blasting can be boring

Program: *Mining One*
Price: £2.99

Supplier: Big Blue Victory
House, Leighton Place,
London WC2H 9JH
Tel: 071-639 0980

RUSTY is a rather young droid, whose manufacturers state wasn't that long ago, and he is more than a bit impetuous. You see, *Rusty* likes to explore.

But one day, he got separated from his companions, so he went for a look around. When he stuck his hands into a top-dimensional converter and promptly disappeared, the main computer wasn't all that surprised.

"Oh, well, another day, another droid," it muttered,

and logged *Rusty* down in his memory banks as, "Fuzzy droid terminated". Well, it saved a lot of time, and was far easier than filing a report detailing *Rusty's* sudden disappearance.

But *Rusty* wasn't dead in fact he was very much alive, but in a void, alone, except for surreal enemies whose only intent was his utter annihilation. His only chance was to run.

What little he knew about dimensional converters - which certainly wasn't much - told him that in a compact universe such as this, if he kept fighting and moving, it should stress the fabric of the universe.

In theory this should ensure that he would be thrown back into the real

world. But how long will that take? Only you can decide...

That initial story covers up for what basically is a strange kind of shoot-'em-up. You control a small droid in the centre of the screen, and have to shoot anything that moves.

The enemies float around you in an attempt to collide with you, thereby draining your power.

To increase your life energy you have to make contact with the floating bear legs. These help, but not much and you have to collect a lot to make any gain at all.

The evil spirits you encounter come in various forms and colours - you need to destroy them all in progress to the next level.

You may recognise a couple of the spiritus loci.

This is a weird kind of game, and it does get a little boring after a while. Though original, it soon becomes annoying rather than amusing.

Overall, there's not really much here. It's basic blast-everything-in-sight and this is made simple by holding down the fire button and wiggling the joystick in slow circles.

The sound and gameplay are both very basic.

Robert Owen

Sound	4
Graphics	4
Playability	4
Value for money	4
Overall	4

Good, but not great

Program: Four Great Games II
Price: £3.99 (includes)
 Sussman, Tynemouth, Action
 Industrial Group, (London)
 info: Tyn, Tyn and
 Moor, 0274 474747.
 Telephone: 081-203 0811

FOUR Great Games II is the latest budget compilation from Tynemouth. I wouldn't necessarily agree that the collection qualifies for the accolade Great.

The four included are a pretty mixed bunch - but there should be something on offer here to entertain or amuse a good many.

Mousetrap is a traditional platform game. You must guide Marvin the nervous mouse through 22 screens to sniff out his favourite nibble, cheese.

Naturally, it isn't going to be made easy for you and all sorts of hazards and obstacles must be overcome including dragons, flying fried eggs, toilet rolls and Christmas puddings.

In each screen you must collect what appear to be flecks in order to gain access to the next one. The final one holds the giant wedge of golden cheese.

Mouse and cheese are a slight departure from the more usual explorers and gems, but *Mousetrap* is hardly original.

Despite being described in the packaging blurb as incredible graphics animation, the graphics are only average and the sound - a continuous wailing discordant tune - is poor. It is nonetheless playable and quite tricky too.

Space Hawk is a well put together vertically scrolling space-shoot-'em-up. There's not much plot, just pure unadorned mass murder.

Flying the gunship Zebo you have to earn your wings by exploring the planets in the neighbouring Solar System.

The Star Council has given you licence to kill any hostile aliens, should you

encounter them, and destroy their defences.

Naturally you come across millions of the little devils and of course they are all hostile - well I certainly never met a friendly one.

You have the ability to fly both up and down, and can also adjust your speed - which can make for some pretty tricky manoeuvring. Despite the ostensibly powerful nature of your Solar System exploration, the reality means that you must shoot anything that doesn't move and just about anything that doesn't. Captain Kirk would not have approved I'm sure.

You start with a shield strength of 25 points which is gradually eroded by collisions with the kamikaze enemy space ships, each hit knocking off one point. To get to the next level the grounded space fleet must be destroyed, together with a substantial proportion of ground installations. The graphics are up to standard and the sound adequate, if not exactly stunning, making *Space Hawk* a good and pleasing game.

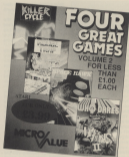
I played **Who Dares Wins II** last May and playing it again now, my opinion of it hasn't improved. Armed with a rifle and a dozen hand grenades you have to single-handedly defeat the enemy.

Working your way through a rather dismal landscape you must dodge falling trees, pencils and bullets on your way to the first enemy garrison.

If you lose off its defences you will gain access to the next level for a bit more of the same.

An extra life is awarded for each 10,000 points scored, but *Who Dares* didn't hold my interest long enough to get that far. The pace is rather too slow, graphics poor and sound irritating in the extreme.

Kills Cycle is altogether different. The visual presentation is simplistic to say the least and the plot absolutely



minimal - just stay alive. It's for one or two players, with optional computer-controlled opposition making the numbers up to four.

Pressing Start clears the screen and four coloured lines appear, each moving at a steady pace. The computer-controlled lines move by their own volition and you control the direction and speed of your own, leaving a solid coloured trail in your wake.

Whether you eat your opponents can move across any trail and the objective is to keep moving without crashing - hitting a trail means instant oblivion.

With four players this score becomes pretty tricky and careful coordination is necessary to keep going in the tightest corners.

Players who crash disappear from the screen, together with their trail making more space available to the survivors. The

last survivor is awarded maximum points and the others get points on a decreasing scale.

This game continues until a preset total is reached.

There are seven different screen layouts, related in turn with all but the first having blocks or small zones to make life even more difficult.

Although it's a simple game in concept and presentation, I found it surprisingly enjoyable, competitive and addictive - although quite where points came into it I don't know.

At the price, *Four Great Games II* has to be good value for money.

Mark Reynolds

Sound	6
Graphics	7
Playability	7
Value for money	8
Overall	6



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Back to the future

I BOUGHT my first cartridge game system a long time ago – an Atari VCS. At this time the company was relatively unknown in Britain, but the VCS was nonetheless a huge success. Soon after came the Atari home computers and this was when the games age really arrived.

Atari produced some superb software to complement its new computers. Most numbers of games appeared in the form of ram cartridges and their popularity was second to none despite their cost, a hefty £30 or so. Then suddenly the cartridge-based games lost their appeal, mainly because of the advent of discs which were cheaper and easier to produce.

As the computers changed in quality and size of memory, so the software had to change too. Why settle for a good 128 cartridge game when you could write a superb 512 game disc and produce it more cheaply?

Atari's first major success was in the field of arcade games, which

NEIL FAWCETT looks at software that has stood the test of time

meant that many of the early cartridge-based packs were Atari Coin-op conversions.

The best of these have become legendary and entertained millions of Atari users world-wide. Not all the conversions met with acclaim, but the success stories far outnumber the failures.

Now, with the release of the new 88 Games Console, Atari is attempting to bring the cartridges back into the limelight – at an attractive price.

This means that people now to the world of Atari will get a chance to play the classics that made these computers popular in the old days – and kept me up until late in the evening. So let's take a look at some of the old favourites that may again become blockbusters.

DEFENDER

Aliens have invaded your home planet and you have to fly around destroying them and rescuing the stranded humans before the aliens mutate them...

The object of the game is simple: fly around in your super sleek space fighter blasting the aliens with your laser cannon or obliterating the entire screen with your smart bombs. The screen scrolls from left to right very

smoothly. Most home micros offer versions of this game, but none is as spectacular as the Atari one.

Stunning graphics, fabulous sound effects and its awesome speed make this one a winner.

GALAXIAN

The ultimate sequel to the early Space Invaders, shoot-'em-up, Galaxian first appeared in arcades in 1979 and met with overwhelming success.

The Atari conversion retained all the characteristic qualities and charm of the original, and superb graphics and animation enhanced the playability.

Even after years of playing the game it's still a pleasure to watch waves of alien spaces respectively glowing down the screen in an attempt to destroy you. Even if you don't rate shoot-'em-ups it's impossible not to like this one.

CENTIPEDE

In 1980 Atari Coin-Op introduced this original game in arcades. It was later converted for the Atari 512k range and was very popular indeed.

You are in a garden with a bug sprayer, and you have to kill the centipedes as they come down the screen, but you are hindered by the



PACMAN

If you haven't played Pacman you haven't lived – it's the ultimate in maze games and the inspiration of countless clones.

When released in the arcades it caused total pandemonium as adults flocked to play it. I had many a late night scurrying round the maze eating the pellets and attempting to avoid the hungry ghosts. But when I ate the power pill it was my turn to do the eating!

JOUST

In this novel arcade conversion you are mounted on a giant bird. You have a jousting lance – hence the title – and you must do battle with other jousters who are similarly mounted.

You are treated to stunning graphics and sound. The rise and animation of the birds are beautifully done and the playing field constantly changes.

Playing the computer is fun, but the game comes into its own when you have a live opponent.



DIG-DUG

This is one of the most popular games I ever played on the Atari – not the most exciting, but certainly the most enjoyable. Originally written as an arcade funny, the conversion has kept all the humour.

The game play is simple – you have to earn points by tunnelling your way through the earth. Appearing on screen are bones, vegetables, and if you eat them before they disappear you can

score up to 8,000 points. Living in small caves and monsters like Fooka the intelligent torse that can kill you with a single touch.

You can kill the monsters by dropping boulders on their heads or by pumping the fire button quickly to inflate them until they explode – a little bit gruesome perhaps – but different.

All in all this is a very amusing game and great for the kids.



eat that part of the time they are obscured by mushrooms. You can also move your bag spray up and down the screen as well as left to right – this was a new concept in shoot 'em-ups when the game was released.

This version hasn't quite got the style of the arcade original but it is certainly entertaining and challenging.

OIX

There is one of the simplest games you could ever play and one of the most addictive. All you have to do is colour in 75 per cent of the screen – simple.

However, you are hindered as you do this by a Oix that bounces around the screen in a haphazard fashion, and by the two Spaxs that travel along the lines you draw. If these or the Oix beat you you lose a life.

STAR RAIDERS

When I first bought a 16k Atari 400 I got a joystick and this game. There has never been a challenge quite like it and never one that fits quite as snugly into an 8k slot.

You take the role of a starship commander who has the simple task



of saving the universe from total destruction – and all before breakfast.

The game is joystick controlled, but you also have a range of single-key commands.

Several years and numerous joysticks have not even dented my passion for this one. Many games have attempted to match it but none have succeeded.

MISSILE COMMAND

In this game – one of the most challenging I have ever played – you need lightning reactions as you attempt to save six cities from destruction by incoming nuclear missiles.

As yet another arcade conversion this only differs from the original in that you control one missile base instead of three and use a joystick instead of a trackball. Later versions allow you to use Atari Trackball by pressing Control-T to put you into the right mode.

It's a game that every Atari owner should have and the new XL systems come with it built in.

It has been said that the early success of Atari computers can be attributed to this game – after all, a computer is only as good as the software written for it.

DONKEY KONG

This is one of the first and, for me, one of the best platform games ever to be converted to a home video.

You play the part of Mario, the maintenance man, and you have to rescue your girlfriend from the gigantic gorilla Donkey Kong. This is made difficult because he is constantly throwing barrels at you as you stand up each screen. You can jump over them or split them using

one of the sledgehammers positioned around the levels.

Due to the tremendous success of this game a follow-up – Donkey Kong Jr – was released and this also appeared on cartridge. In this version you play the son of Donkey Kong and you are out to rescue your dad who has been locked in a cage by Mario. The game play is similar and as much fun as the first. These are two very classy games.



ONLINE COMPUTERS ARE HELPING UK FARMERS

A NEW users group has been set up on MicroLink to help UK farmers make better use of their computers. The British Farm Computer Users' Group is being organised by Andrew Cooley, who is project coordinator for on-farm systems with the Milk Marketing Board.

"My experience is that many farmers are already exploring the potential of micros beyond their use in day-to-day management", he said, "but they suffer, perhaps more than managers in any other business, from the isolation inherent in farming itself. The pri-

mary aim of BFCUG is to overcome this isolation.

We want farm computer users to be able to share their ideas and experiences and get the maximum value from these immensely powerful management tools".

At first, MicroLink is providing a mailing section on its bulletin board, but eventually BFCUG will become a closed user group on the system.

Support for the new

organisation has come from Dr John Coates, head of the Milk Marketing Board's farm management services, and from leading farm software suppliers Farmplan and Sum-8.

Special terms are being arranged for farmers subscribing to MicroLink and BFCUG - and a reduced subscription will also apply for existing MicroLink users who join BFCUG before the end of this year.

Moving with the times

ONE of Britain's largest remote specialists has joined MicroLink in order to improve communications between its widespread offices.

Scopac - a subsidiary of RSD International Removite - ships by land, sea and air to just about anywhere in the world you can think of, everything from a single item to a haulerful of furnishings.

The company has 18 depots in the British Isles plus five branches in Australia, New Zealand, Canada, South Africa and the Middle East.

All are now able to send messages to each other via MicroLink text and electronic mail services.

Scopac has installed at least one micro and modem at each of its depots, and has eight micro-systems in its Glasgow headquarters.

If all adds up to some very busy MicroLink mailboxes - last year Scopac handled more than 25,000 individual shipments weighing a total of 21 million lb.

Comms boom in the heavens

AMATEUR astronomers are joining MicroLink at the rate of ten a month.

The reason is that nothing beats electronic mail as a means of getting to know about the latest happenings in the heavens.

Initiative behind the booming interest in MicroLink comes from Guy Hunt, editor of The Astronomer, a monthly magazine with an international readership.

A constant stream of aural activity means he also needs to produce twice-weekly newsletters detailing all the fresh sightings reported by the Smithsonian Institute in America.

"When it is processed and distributed by conventional means, this information is often quite dated by the time it reaches our readers", said Guy Hunt.

"MicroLink has, however,

spread up the transmission of news from America. A paging device alerts me each time a telex message arrives from the Smithsonian and I don't waste a moment relaying it via Ensat.

"Those of my members with MicroLink facilities can often access information the same day it reaches me - but others have to wait until one of my newsletters arrives by post. That's why so many astronomers are keen to join MicroLink.

"People in places as far away as Sweden, West Germany, Australia and New Zealand are now receiving the Ensat version of my newsletters. This means they are often able to study new phenomena within hours of a first sighting - something not possible before we joined MicroLink".

The fax in a flash

SHROPSHIRE entrepreneur Duncan Baker has come up with a novel idea for getting more mileage out of his MicroLink subscription.

He is using the system to help him operate a freelance service from his office in Lydbury.

"Basically we need the fax machine for our own purposes", said Duncan, proprietor of the Lydbury English Centre, "but we have a fair amount of spare capacity.

"Seeking to help cover our costs we've started a fax service priced at roughly half that of other local agencies".

The service Duncan offers includes receiving text via MicroLink electronic mail or telex, printing it out on plain paper or letterhead and distributing it by fax. And of course this procedure also operates in reverse when required.

DICER



ANYONE who has played Yahtzee will know just how addictive it is. In this computerized version of the original dice game, points are gained by rolling five dice and holding those that seem the most useful.

After a total of three full throws — irrespective of the number of dice held — you choose the category into which you want to enter the dice combination. The available categories are shown in Figure 1 and your final score is displayed once all three are filled.

If the dice fall well after the first or second throw of a turn, just hold them all and select *Three again*. After each set of three throws your score must be entered into a category — even if it means you get no points.

This program has been written with brevity in mind, and is fully controlled by the joystick using fire to select or de-select dice held or to choose the category. Various prompts indicate what to do, and the program scores itself.

Even if you have never played the game before you will soon get the idea — and then have problems tearing yourself away from it. The challenge is simple: Score the maximum 348. With skill and luck it is possible.

STEVE KNIGHT introduces an intriguing and sometimes infuriating game

VARIABLES

DICE	Holds the status of the five dice used. The sixth position corresponds to the roll option.
CATS	Corresponds to the screen position of the various categories.
OPTION	Used initially to decide whether a die has been held. Used again to check the frequency of the occurrence of each number on the die.
HISC	High score
SC	Current score
ROLLDICE	Line numbers
TOTUP	



PROGRAM BREAKDOWN

50-400	Initialize variables and draw the screen
500-750	Main loop
750-1100	Die rolling and selection routine
1200-1370	Further routine to roll and display dice
1400-1900	Decide which character to print
2000-2090	Validate selected category and total score

Combination	Description	Score	Max
One	Any number of ones	Total of ones	5
Two	Any number of twos	Total of twos	10
Three	Any number of threes	Total of threes	15
Four	Any number of fours	Total of fours	20
Five	Any number of fives	Total of fives	25
Six	Any number of sixes	Total of sixes	30
High score	Any five dice	Total of all dice	36
Full house	Two dice the same, other three the same	55	60
Pair	Two dice the same	Highest pair	12
3 of a kind	Three dice the same	Best three	18
4 of a kind	Four dice the same	Best four	24
5 of a kind	Five dice the same	Best five	30
2 Pairs	Two dice the same and two others the same	Total of two pairs	24
Run of three	Three consecutive dice	Total of dice in run	18
Run of four	Four consecutive dice	Total of dice in run	18
Run of five	Five consecutive dice	Total of dice in run	20
		Total	348

Figure 1. Available categories

4 From Page 21

44 NEW BILLS
 45 NEW BY 100% BILLS
 46 NEW SCHEDULE BOOKS
 48 NEW WOODS, POOL TABLES, BATHS, JACUZZI, HOT TUBS, SHOWERS, BATHS

49 10' x 12' 1 PAIR.....
 50 12' x 12' 1 PAIR.....
 51 12' x 14' 1 PAIR.....

52 12' x 14' 1 PAIR.....
 53 12' x 16' 1 PAIR.....
 54 12' x 18' 1 PAIR.....
 55 12' x 20' 1 PAIR.....

56 12' x 22' 1 PAIR.....
 57 12' x 24' 1 PAIR.....
 58 12' x 26' 1 PAIR.....
 59 12' x 28' 1 PAIR.....

60 12' x 30' 1 PAIR.....
 61 12' x 32' 1 PAIR.....
 62 12' x 34' 1 PAIR.....
 63 12' x 36' 1 PAIR.....

64 12' x 38' 1 PAIR.....
 65 12' x 40' 1 PAIR.....
 66 12' x 42' 1 PAIR.....
 67 12' x 44' 1 PAIR.....

68 12' x 46' 1 PAIR.....
 69 12' x 48' 1 PAIR.....
 70 12' x 50' 1 PAIR.....
 71 12' x 52' 1 PAIR.....

72 12' x 54' 1 PAIR.....
 73 12' x 56' 1 PAIR.....
 74 12' x 58' 1 PAIR.....
 75 12' x 60' 1 PAIR.....

76 12' x 62' 1 PAIR.....
 77 12' x 64' 1 PAIR.....
 78 12' x 66' 1 PAIR.....
 79 12' x 68' 1 PAIR.....

80 12' x 70' 1 PAIR.....
 81 12' x 72' 1 PAIR.....
 82 12' x 74' 1 PAIR.....
 83 12' x 76' 1 PAIR.....

84 12' x 78' 1 PAIR.....
 85 12' x 80' 1 PAIR.....
 86 12' x 82' 1 PAIR.....
 87 12' x 84' 1 PAIR.....

88 12' x 86' 1 PAIR.....
 89 12' x 88' 1 PAIR.....
 90 12' x 90' 1 PAIR.....
 91 12' x 92' 1 PAIR.....

92 12' x 94' 1 PAIR.....
 93 12' x 96' 1 PAIR.....
 94 12' x 98' 1 PAIR.....
 95 12' x 100' 1 PAIR.....



96 12' x 102' 1 PAIR.....
 97 12' x 104' 1 PAIR.....
 98 12' x 106' 1 PAIR.....
 99 12' x 108' 1 PAIR.....
 100 12' x 110' 1 PAIR.....



101 12' x 112' 1 PAIR.....
 102 12' x 114' 1 PAIR.....
 103 12' x 116' 1 PAIR.....
 104 12' x 118' 1 PAIR.....
 105 12' x 120' 1 PAIR.....

106 12' x 122' 1 PAIR.....
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 109 12' x 128' 1 PAIR.....
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111 12' x 132' 1 PAIR.....
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136 12' x 182' 1 PAIR.....
 137 12' x 184' 1 PAIR.....
 138 12' x 186' 1 PAIR.....
 139 12' x 188' 1 PAIR.....
 140 12' x 190' 1 PAIR.....

Turn to Page 24

101 12' x 112'	141 12' x 172'	179 12' x 238'	217 12' x 282'	255 12' x 318'
102 12' x 114'	142 12' x 174'	180 12' x 240'	218 12' x 284'	256 12' x 320'
103 12' x 116'	143 12' x 176'	181 12' x 242'	219 12' x 286'	257 12' x 322'
104 12' x 118'	144 12' x 178'	182 12' x 244'	220 12' x 288'	258 12' x 324'
105 12' x 120'	145 12' x 180'	183 12' x 246'	221 12' x 290'	259 12' x 326'
106 12' x 122'	146 12' x 182'	184 12' x 248'	222 12' x 292'	260 12' x 328'
107 12' x 124'	147 12' x 184'	185 12' x 250'	223 12' x 294'	261 12' x 330'
108 12' x 126'	148 12' x 186'	186 12' x 252'	224 12' x 296'	262 12' x 332'
109 12' x 128'	149 12' x 188'	187 12' x 254'	225 12' x 298'	263 12' x 334'
110 12' x 130'	150 12' x 190'	188 12' x 256'	226 12' x 300'	264 12' x 336'
111 12' x 132'	151 12' x 192'	189 12' x 258'	227 12' x 302'	265 12' x 338'
112 12' x 134'	152 12' x 194'	190 12' x 260'	228 12' x 304'	266 12' x 340'
113 12' x 136'	153 12' x 196'	191 12' x 262'	229 12' x 306'	267 12' x 342'
114 12' x 138'	154 12' x 198'	192 12' x 264'	230 12' x 308'	268 12' x 344'
115 12' x 140'	155 12' x 200'	193 12' x 266'	231 12' x 310'	269 12' x 346'
116 12' x 142'	156 12' x 202'	194 12' x 268'	232 12' x 312'	270 12' x 348'
117 12' x 144'	157 12' x 204'	195 12' x 270'	233 12' x 314'	271 12' x 350'
118 12' x 146'	158 12' x 206'	196 12' x 272'	234 12' x 316'	272 12' x 352'
119 12' x 148'	159 12' x 208'	197 12' x 274'	235 12' x 318'	273 12' x 354'
120 12' x 150'	160 12' x 210'	198 12' x 276'	236 12' x 320'	274 12' x 356'
121 12' x 152'	161 12' x 212'	199 12' x 278'	237 12' x 322'	275 12' x 358'
122 12' x 154'	162 12' x 214'	200 12' x 280'	238 12' x 324'	276 12' x 360'
123 12' x 156'	163 12' x 216'	201 12' x 282'	239 12' x 326'	277 12' x 362'
124 12' x 158'	164 12' x 218'	202 12' x 284'	240 12' x 328'	278 12' x 364'
125 12' x 160'	165 12' x 220'	203 12' x 286'	241 12' x 330'	279 12' x 366'
126 12' x 162'	166 12' x 222'	204 12' x 288'	242 12' x 332'	280 12' x 368'
127 12' x 164'	167 12' x 224'	205 12' x 290'	243 12' x 334'	281 12' x 370'
128 12' x 166'	168 12' x 226'	206 12' x 292'	244 12' x 336'	282 12' x 372'
129 12' x 168'	169 12' x 228'	207 12' x 294'	245 12' x 338'	283 12' x 374'
130 12' x 170'	170 12' x 230'	208 12' x 296'	246 12' x 340'	284 12' x 376'
131 12' x 172'	171 12' x 232'	209 12' x 298'	247 12' x 342'	285 12' x 378'
132 12' x 174'	172 12' x 234'	210 12' x 300'	248 12' x 344'	286 12' x 380'
133 12' x 176'	173 12' x 236'	211 12' x 302'	249 12' x 346'	287 12' x 382'
134 12' x 178'	174 12' x 238'	212 12' x 304'	250 12' x 348'	288 12' x 384'
135 12' x 180'	175 12' x 240'	213 12' x 306'	251 12' x 350'	289 12' x 386'
136 12' x 182'	176 12' x 242'	214 12' x 308'	252 12' x 352'	290 12' x 388'
137 12' x 184'	177 12' x 244'	215 12' x 310'	253 12' x 354'	291 12' x 390'
138 12' x 186'	178 12' x 246'	216 12' x 312'	254 12' x 356'	292 12' x 392'
139 12' x 188'	179 12' x 248'	217 12' x 314'	255 12' x 358'	293 12' x 394'
140 12' x 190'	180 12' x 250'	218 12' x 316'	256 12' x 360'	294 12' x 396'

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Getting inside the console

ANDRE WILLEY takes an in-depth look at the Atari XE systems

FOLLOWING last month's overview of the new Atari XE games console and keyboard, let's take a more detailed look at how it performs and what you can expect if you decide to buy one.

As you probably know by now the XE system is supplied in two versions. The first is the straightforward games console with joystick and built-in Missile Command. In this configuration you could, in fact, add both a tape deck and a disc drive, but you'd only be able to use them to load pre-recorded games.

That said, the difference in cost between cassette and cartridge based software would hardly offset the price of an XE10 tape deck.

The second package comes with joystick, light gun, plug-in keyboard and the Bug Hunt cartridge game making a 64K bit computer which, in practical terms, is almost identical to the old 800K. In addition, you also get the cartridge version of Flight Simulator II - a very well regarded aircraft emulator game which uses both joystick and keyboard.

Those interested in the games angle might like to note that Missile Command will run very effectively with a Track-Ball.

What you don't get, however, is a tape deck, which I find a little surprising as this pack is being sold as a programmer-oriented item. But you do now have the basis of a complete computer system and you can add

most of the peripherals available for the 8 bit range - but more of that later.

Let's start by looking at the console from the outside. Most of the standard I/O connections are present, including the now obligatory two, rather than four, joystick sockets, the 13-pin serial I/O port and the 7-pin Din power socket which, incidentally, uses the same power supply module as the rest of the XL and XE range.

Also present are the TV output - phono socket with detachable RF cable - and two new sockets, composite video and audio out. These always used to be part of a 5-pin Din socket which also included chrominance and luminance (colour and brightness) signals but neither are all that likely to be missed.

Convenient

The cartridge socket is on the top of the machine as with the XL series, and is much more convenient than the awkward rear-mounted system used on the 800K. It should take all XL/XE cartridges, including the sophisticated bank selecting ones such as Action!, Mac/MS and Basic/MS.

The final socket, which has never been featured on an Atari 8 bit machine before, is a 16-way D socket to allow connection of the removable keyboard.

Unfortunately for any serious com-

puter users Atari has not allowed any expansion of the machine by rather short-sightedly omitting the parallel bus which has been present on all Atari 8 bit for the last six years. This means you can't add any of the now very common memory boards, fast I/O modifications or even such mainstream computer products as hard disks.

I find this to be an unacceptable cost-cutting exercise. After all, how much would it have cost to leave a simple edge connector - or even the edge of the PCB itself - protruding from the rear of the casing? In order to save a few pence Atari has eliminated the possibility of using the XE console as a serious computer system.

Other than this one little niggle I found the new unit, with its elegant detachable keyboard, to be a marked improvement over the older machines. Certainly the quality of both the television and composite video outputs show a marked improvement over the rather faint and slightly blurred 800K display.

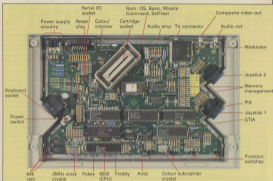
The sculptured keyboard has an excellent feel with a light but very positive action. The layout is the same as that of the 1300K, with the exception of the function keys which are now round, pastel-keyed buttons along the top of the unit. It would, however, have been nice if Atari had marked the keys with both the control key graphics and the international character set rather than just the graphics set.

Now let's see what's new under the bonnet - surprisingly little in fact. In essence the only difference you're likely to notice at first is the fact that Missile Command is now built into the machine. This, together with Basic, the operating system and the self-test routines are all packed into a single 32K rom chip banked into the console locations by the Freddy chip and a couple of memory management support chips.

The power-up sequence now checks for the presence of the keyboard before deciding what portions of the rom to enable. If there is no keyboard

Current Atari Computers/Console Packages

Model	Includes	Price
XE5 800K	Console and joystick only	£79.99
XE5 400K	Console, keyboard, joystick, Flight Simulator II cartridge, Light gun and Bug Hunt cartridge	£119.99
XE5 200K	Keyboard, XE10 data recorder, 10 games on two tapes	£59.99
XE5 200K	Light gun and Bug Hunt cartridge	£29.99
1300K Pack	1300K 128K computer, XE10 data recorder, joystick and 10 games on two tapes	£129.99
850K Pack	850K 64K computer, XE10 data recorder, joystick and 10 games on two tapes (DiamondCurry special offer)	£99.99*



Atari games console internal layout

the default is to run Missile Command. Hold down Option and you'll get the self-test mode. Select gives you Basic (for all the good it will do you without a keyboard) and Start gives a cassette boot.

The operating system

If the OS detects the presence of a keyboard the default power-up is Basic and Option gives you self-test mode. Select gives Missile Command, Start requests a tape load and, as with previous Atari machines, the buttons may be used in combination – such as Start and Option to override Basic when you load a machine code game.

The first thing I did when I received my console was to check which revision of the operating system was being used. Dated May 7, 1987 it has the same internal code as the 13003 (88001), but is entitled Revision 4.0 – I don't know what happened to Revision 3. The differences between Revision 4.0 and the XL/XE OS are purely cosmetic – most of them being in the self-test routine.

The latter's initialise locations at \$5080 and \$5090 have been moved to \$5080 and \$5096 respectively, and the keyboard template has been altered to

show the correct XE layout, rather than that of the old 1300XL. This probably explains the major modifications to the OS which exist at \$C40d to \$C455. However, the break key still doesn't show up correctly on the test.

The power-up and system reset routines have some extra code patched in at \$C860 to take note of the possible new configurations – such as booting with Missile Command. I'm not sure why Atari bothered, since the modified handler doesn't seem to be able to cope correctly with the game's title case.

For example, if you load the system with Missile Command and then press Reset you will be dropped back into self-test, and the next time you try you'll be returned to either Missile Command or Basic depending upon whether you have a keyboard attached. Fortunately, when you're working in Basic the Reset handler seems pretty reliable.

The only thing worth mentioning is the patch at \$C180 which enables the cassette handler to look for the Start key as well as Return to start cassette VQ. This was added at the last moment after a frantic plea from Atari UK saying that users without the keyboard add-on wouldn't be able to boot commercial games tapes.

Strangely enough, most of the parallel device driver code designed to interface with the XL/XE parallel bus is still present. All that seems to have been altered are some vectors at \$549E – in other words, there's a large chunk of totally wasted rom inside the XE console – besides the self-test, that is.

The light gun

The only new item in the package is the light gun and this comes with its own Bag Bunch game cartridge – the only game currently available. The firing range will depend on your TV set, but I managed to get a comfortable 10 feet away from my 27in screen with no problems.

If we're to believe Atari's adverts, it would appear that the gun fires an invisible beam of light at the television screen. This is not strictly true – what actually happens is that the TV set fires a completely visible beam of light at the gun.

As you will know if you've followed some of the more technical articles in Atari User, a TV set works by scanning a pinpoint of light across the screen,

Picture processor

MOST screen dump utilities work with 80-sector uncompressed files, and this program converts other types of picture files into this form. It's an ideal companion to the poster printer in this issue. Once converted, files will also load into the AtariLetter art package.

Type in the program and see Get it Right! to correct any typing errors. When it is first run you will be presented with a menu of the different picture formats the program can use — see Figure 1. You select option four if you want to see the disk directory.

Once you have chosen a suitable format for your picture, you will be asked to enter the source filename — the one you want to convert — and the destination filename — the one you're creating — of the picture. It is important to note that if they are both the same, the original will be overwritten.

After the filename has been given, the picture will be loaded and you press Q to save it as a 82-sector file.

GRANVILLE DANBY provides a routine to convert picture files into 82-sector uncompressed form

PROGRAM BREAKDOWN

10-110 Print text
120-270 Get source picture format
280-350 Get source and destination filenames
360-450 Read in and display the picture
470-510 Save the picture out as a 82-sector file
520-600 Disc directory routine
610-650 Loop to wait for a key input
660 Machine code stub for the save routine

Graphic Art Department
Paint
Graphic T screen

VARIABLE
DATA Dumping bytes to read in before picture is loaded
PNO Source filename
SDN Start of screen memory
PND Destination filename

Figure 1. Picture format that the utility can convert

```

10 GOTO *****
20 GOTO PICTURE CONVERTER *
30 GOTO BY GRAPHIC T SCREEN *
40 GOTO BY OTHER USER *
50 GOTO *****
60 GOTO PNO,SDN,PND
70 GOTO 10 TO 100:GOTO PICTURE
      GOTO 1
80 GRAPHIC SUBROUTINE L,P,DESTFILE
  L,P,SDN PNO,1
90 PNO 82,0
100 POSITION 11,11 PICTURE CONVERTER
*****
110 1 1 1. GRAPHIC ART DEPARTMENT.
*****
120 1 2. PAINT.
130 1 3. GRAPHIC T SCREEN.
140 1 4. OTHER DIRECTORY.
150 TRAP STOP 17
160 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
170 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
180 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
190 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
200 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
210 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
220 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
230 TRAP 180
240 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
250 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
260 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
270 TRAP 180
280 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
290 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
300 PICTURE G.P. GRAPHIC.PIC
310 TRAP 180
320 TRAP 180
330 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
340 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
350 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
360 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
370 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
380 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
390 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
400 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
410 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

```

```

120 11000 P=OPEN P1,P2,P3
130 GOTO P1,0
140 11000 P1
150 11000 P2
160 11000 P3
170 11000 P4
180 11000 P5
190 11000 P6
200 11000 P7
210 11000 P8
220 11000 P9
230 11000 P10
240 11000 P11
250 11000 P12
260 11000 P13
270 11000 P14
280 11000 P15
290 11000 P16
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1040 11000 P91
1050 11000 P92
1060 11000 P93
1070 11000 P94
1080 11000 P95
1090 11000 P96
1100 11000 P97
1110 11000 P98
1120 11000 P99
1130 11000 P100

```

Get it right!

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10 100 100 100 100 100 100 100 100 100
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Atari Home LXXX	11.99	Atariware LXXXIII	136.99	Atariware
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Atari Home LXXXIV	11.99	Atariware LXXXVII	140.99	Atariware
Atari Home LXXXV	11.99	Atariware LXXXVIII	141.99	Atariware
Atari Home LXXXVI	11.99	Atariware LXXXIX	142.99	Atariware
Atari Home LXXXVII	11.99	Atariware LXXX	143.99	Atariware
Atari Home LXXXVIII	11.99	Atariware LXXXI	144.99	Atariware
Atari Home LXXXIX	11.99	Atariware LXXXII	145.99	Atariware
Atari Home LXXX	11.99	Atariware LXXXIII	146.99	Atariware
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Atari Home LXXXII	11.99	Atariware LXXXV	148.99	Atariware
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Atari Home LXXXIV	11.99	Atariware LXXXVII	150.99	Atariware
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Atari Home LXXXVI	11.99	Atariware LXXXIX	152.99	Atariware
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Spoiled for choice?

Steve Gold explains what to look for when buying your first quality modem

WHEN I bought my first modem — was back in 1982 — my choice was fairly limited, mostly in terms of price. In 1982 the modem market for Atari computers was split into the sub-£100 bracket for acoustic 300/300 and 1200/1200 baud modems, while you had to look at spending £200 or more even for a simple direct-connect or full-rate model.

Today the situation is very different. Modems are even being given away by some online services in a bid to get subscribers to sign on the dotted line for a year or more.

So what criteria should the beginner apply when he sets out to choose a modem?

To my mind (and I would stress this is a personal opinion only — based on several years' usage), the key factors to be borne in mind when choosing a modem are — in no particular order — price, Hayes compatibility, ease-of-use, and reliability of construction.

As with most things, price is a major factor in the modem market. Ignoring the flexible modems (which are generally coated in with your first year's subscription to the service offering it), the cheapest modems on the market today start at around the £20 mark.

For your money you usually get a direct-connect unit: a modem that plugs straight into a telephone socket that has a simple switch taking it on or

off line as required. Most of the modems in this price bracket work at 1200TTL.

For the beginner, such modems are ideal for the first few months, but automated logons — so necessary for the smooth operation of communications programs — save a lot of time and effort for the ex- novice. The route to automated logons is good communications software and Hayes compatibility.

The Hayes standard — sometimes called the Hayes protocol — is a simple modem control language first used by the Hayes modem corporation in the US. Developed by Dennis Hayes, the modem company's owner, it first appeared in Hayes modems in the early part of this decade.

As with all good ideas, the Hayes command language is fairly simple by design. All commands to the modem (with the exception of those prefixed by the command AT (short for ATten-

tion) and subsequent commands are mnemonic. A list of the basic commands in the Hayes command language set is given in Figure 1.

Unlike several other proprietary modem control systems of its genre, the Hayes command set was placed into the public domain by Hayes, so that other modem manufacturers might adopt the standard — thereby making it universal.

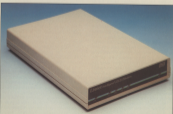
The idea caught on and by 1983 the majority of modems to high priced modems on sale in the US had some form of Hayes command language built into them.

At that time modems were only just beginning to penetrate the home and small business user market in the UK. As with most American originated ideas (good or bad) it took a few years for the idea of Hayes compatibility to

Turn to Page 28 in

A	Answer call
C	Carrier control CR=OFF , CT=ON
D	Modem dialing prefix
E	Echo commands ER=OFF , ET=ON
F	Echo data FD=ON , FI=OFF
M	Take modem off line (hang up) — used in conjunction with + to a command prefix — see below
AT	Display identity (n=0,1,2)
ATL	Speaker loudness (n=1,2,3)
ATM	Monitor status (n=0,1,2)
W	Display/number store
GO	Go online
P	Pause dialing prefix
R	Reverse to answer after dialing
T	Test dialing prefix
W	Wait for secondary dial tone
Z	Modem reset

+++ Instructs modem to interpret next command using parity and not transmit the string. Usually used to take modem off line using the H command above. For example +++ATH. This command set may vary from modem to modem.



The Paper Loader

Figure 1: The basic Hayes command set

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percolate through to the UK modem market.

By 1985, the Hayes command language was beginning to appear in several high-end (£200 plus) modems and – at last – people were beginning to realise what a useful facility the Hayes command set is.

Today, most modems priced above the budget market (£20 to £50) are Hayes-compatible, or have a low-cost option for the facility to be fitted by the modem manufacturer.

Ease of use is another important criteria that is often overlooked by many modem buyers and, amazingly, modem designers themselves.

Hayes compatibility is a major step towards ease of use, but some modems (which shall remain unnamed) have a front-panel control system that defies all logical explanation.

Because the Hayes command language is so comprehensive, most of the modems on sale today only need one control switch on the unit itself – the on/off switch – the remainder of the modem controls can easily be handled by a series of Hayes commands piped down the modem's serial port.

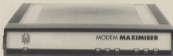
Like a good car, the quality of a modem's construction – its pedigree if you like – can usually be spotted by careful examination of the case.

Telltale signs such as slippage marks at the point where screws or retaining clips are fitted, along with a bad finish generally, tend to indicate a modem is not professionally produced. If it is relatively new on the market, the casing's lack of finish may be due to the modem being hand-built, but you should question your dealer thoroughly as to the number sold and the number of satisfied customers.

If the modem looks badly finished and has been on the market for some time, it is best to reject the unit in favour of a better one. The BSBT modem approval regulations – as well as your guarantee rights – forbid you to open up the modem box, so the internal construction can only be easily assessed by its outward appearance.

For illustrative purposes only I've chosen the Pace Linnet Hayes-compatible modem to look at and explain how the factory behind this article comes into practice.

The Linnet comes in a small beige box about half the height of a regular Atari disc drive, and with about the same footprint. On the front of the unit is a grey-green display panel along



The Modem Maximiser

with six red status lights, which indicate the current state of the modem.

As well as using the Hayes command set, the Linnet is capable of pulse and tone dialing – useful for speed-dialing on most modems telephone exchanges and office PBXs.

Limited speed-buffering is available so that, if you wish to communicate at 1200 baud full duplex constantly

with a modem, the Pace Linnet is entirely software controlled. Commands sent via its serial port are interpreted by an onboard micro and translated into specific modem commands.

The software – which occupies a single 16K option on the modem's PCB – functions in a similar fashion to your Atari's Basic interpreter, translating the Hayes commands into direct instructions to the modem components.

Modems are changing all the time and recently another manufacturer – Minicore Technology – invented an add-on, the Modem Maximiser.

Designed to complement any Hayes-compatible modem, the Maximiser costs £225-00 (£30-00 extra for the data encryption option), and adds a range of features to even the most basic of Hayes-compatible modems.

Features of the Maximiser include: error-correction to Mpoad, Eppad and Xmodem protocols, data-compression and encryption, data storage – a 16K serial buffer comes as standard, 9600 baud speed buffering, and a centronics printer port for connection to a printer in the absence of your computer being switched on.

Although the Maximiser is a rather pricey add-on for many modem owners, it does indicate the way that the modem market is going. It seems more than likely that at least some of the facilities found on the Maximiser will be incorporated in future generations of modems, in much the same way that the Hayes command set is almost universal in today's quality modems.

“The internal construction can only be assessed by its outward appearance”

(possibly due to a software limitation), the modem will buffer data down to its three speeds – 300 baud full duplex, 1200/75 baud and 75/1200 baud.

The Linnet also features call monitoring. Via an internal loudspeaker and semi-intelligent line sensing, the modem can recognise dial, engaged and number unobtainable tones found on the telephone network. By returning special result codes via its serial port, the modem can signal to your Atari where the current state of the call. This option is used on some communications software packages for extended auto-dialing.

As with many modems in the £120 to £195 price bracket, the Linnet is auto-answer and can thus be used in a computer-based bulletin board system.

Also like several of the latest gener-

Further details are available from:
Pace Linnet: Pace Micro Technology,
Albion Road, Buxford, 8015 3A5.
Tel: 0274-686077.
Modem Maximiser: Minicore Techno-
logy, 25 Peter Street, Ipswich, IP1
1AS.
Tel: 0473-708140.

Programming the easy way!

LEN GOLDING takes you on a journey
into the wonderful world of Atari Basic

In this new series we'll be exploring the wonders of Atari Basic from square one, and showing how even square absolute beginners can quickly learn to produce interesting and worthwhile programs. We'll start by explaining some of the fundamental things they don't bother to tell you in the manuals, then progress to sound, colour, graphics and some advanced programming techniques.

First let's assume that all you've read are the booklets which come with your computer - as you know how to plug all the various bits and pieces together, can find your way around the keyboard and maybe you've tried typing in one or two of the sample programs. So now what? Where do you go from here?

The Basic reference book gives you a list of words that the computer can understand, but it doesn't try very hard to make these comprehensible to humans. Terms like variable, string, function, register, channel and I/O are liberally sprinkled around, and there's little attempt to explain what they are, let alone how to use them.

As an example, try reading the sections on **COLOR** and **SETCOLOR** - you'll soon see what I mean.

Fortunately, programming isn't nearly as difficult as it looks. Basically - ignore the pain - it's all about following strict rules. Once you've learned the rules and can apply them correctly, your computer will turn into an obedient servant, instead of an uncooperative little monster.

So let's start at the very beginning, by defining a few terms. A program is nothing more than a set of instructions, phrased in a way that the computer can understand, and arranged in a carefully worked-out order.

Every program consists of at least one program line, which may contain

as many as 100 characters - letters, numbers or symbols - as it could easily occupy up to three lines on your TV screen.

Every program line must start with a line number, and the computer automatically shuffles the lines around in its memory so that they are always arranged in numerical order, with the lowest first. This will happen regardless of the order in which you typed the lines.

Every line number must be followed by at least one command, which might be a single word such as **PRINT**, **LIST**, **REM** or **END**, but will usually have extra letters or numbers tacked on to it. Some examples are:

```
PRINT "So far so good"
REM Program 1
DEF FN C(A,B,C)
  IF C=0 THEN
```

Don't worry if this still looks like a foreign language - we'll explain it all shortly.

Every command has its own rules which tell you what extra bits and pieces have to be tacked on, and the order in which they must appear. These are known collectively as the rules of **Syntax**, and if you get them wrong the computer will not accept your program line when you hit the Return key. Let's pause for breath and look at an example:

```
10 PRINT "HELLO"
```

This is a valid program line which your computer will understand and obey. It starts with a line number - 10 - then it has a command **PRINT** followed by an extra group of characters - **"HELLO"**.

The rules of syntax for the **PRINT**

Turn to Page 21

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command says that if you want it to print a group of characters exactly as they appear on the program line, you must enclose those characters in inverted commas. If you leave the commas out, the computer will misunderstand your intention and print the number 0. Why does it do that? Read on.

There are two other items you need to understand before you can write any worthwhile programs. Numbers and strings. Let's look at numeric variables first.

Every numeric variable has a "name", such as *X* or *LIFE* or *LEVEL*, and a corresponding numeric value such as 5, 0.003, -204 or 50000000. Remember how in algebra you can write $Let\ X = 501$. Well, to your computer the letter *X* would be a variable name, and the number 50 would be its value.

The name remains constant throughout your programs, but its value can change as many times as you like. So whenever you tell the computer to print the value of *X*, it will give you the number that *X* represents at that particular moment.

A variable name need not be a single letter, but it must begin with a capital letter, and can contain only capital letters or numbers - symbols such as % or @ are not allowed.

If we go back to our previous example `PRINT "HELLO"`, you will recall we said that leaving out the inverted commas would make the computer give you the number zero. Now can you see why?

It's because the computer will assume that `HELLO` - without inverted commas - is a variable name, so it promptly starts to search for the numeric value which `HELLO` represents. It can't find one, so it assumes that the answer must be zero. You therefore get 0 printed on the screen, much to your annoyance. See how a small change can produce major differences in the computer's behaviour?

We'll return to variables next time, but now let's turn to the related subject of strings. A string is a sequence of characters grouped together in any way you fancy. This month we'll look at the two main types, literal strings and string variables.

A literal string is a group of characters enclosed by inverted commas - like `"HELLO"`, or `"So far so good"`, or `"Useless"`. When told to print a literal string, the computer will print

everything inside the inverted commas, exactly as it appears in the program line. You can put almost anything in a literal string, apart from the double-quote character (") itself. Experiment with a few and see.

String variables are a bit trickier to understand, but like numeric variables they have names made up from capital letters and numbers, but all string names must end with a dollar sign \$. For example:

```

11
12  NAME
13  MESSAGES

```

Each name can represent a group of characters. Let's say, for example, that you have a variable called `AS` which contains the characters: `"READY FOR ACTION"`. If you now tell the computer to `PRINT AS`, it will respond by printing `READY FOR ACTION`, just as though you'd told it to print the characters themselves. The variable name and its contents are interchangeable, so as far as the computer is concerned.

Suppose, though, you had told it to `PRINT "AS"`. What do you think you'd get, and why?

As with numeric variables, the name which identifies a particular string will remain constant, though its value - the characters in the string - can change. So at the beginning of your program, a string variable called `LIVES` could contain the words `"ALL LIVES INTACT"`, while at the end of the program it would contain `"NO LIVES LEFT"`.

The awkward thing about string variables is that you can't just write them straight into a program. This is because your computer needs to know how much memory it must set aside to hold the string's characters. If you had a program line like this:

```
10 PRINT "A B C D E F G H I J K L M N O P Q R S T U V W X Y Z"
```

You would need to reserve space for at least 14 characters - 11 letters and three spaces.

This process of reserving memory is called dimensioning - for obvious reasons - and there is a special command - `DIM` - for doing it. To reserve space for up to 20 characters in a variable called `AS`, you would type:

```
10 DIM AS(19)
```

For up to 50 characters in a variable

Go on to Page 42 >

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called MESSAGES you would type:

```
10 GO MESSAGE
```

The number in brackets is the number of character count. You don't need to use all the reserved space, but you mustn't exceed it or you will lose the excess characters.

Once a string variable has been dimensioned, you can specify its contents in a number of ways. Here are two simple examples:

```
10 GO NAME  
20 PRINT "Please tell me your name"  
30 INPUT N  
40 PRINT N
```

or

```
10 GO NAME  
20 PRINT "Please tell me your name"  
30 INPUT N  
40 PRINT "HELLO"  
50 PRINT NAME
```

The second of these programs uses

two literal strings and one string variable. Can you identify them? Line 30 contains a new command - INPUT. This tells the computer to wait until you've typed something and pressed Return, then it proceeds with the program.

It acts a direct link between you and the computer, and whatever you have typed will be called NAMES for the duration of the program - so don't type Names unless you're happy to be stuck with it!

Numeric and string variables are among the most difficult things to master when you're starting out at first, but you must understand them before you can progress very far. So why not read through this article again, and have a go at writing a few programs of your own?

- Next month we'll look at a few more interesting commands, including the SOUND statements, and show how your knowledge of variables can be put to an entertaining use.

The truth about TELEX

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,500 (the 14000, the best) £2,000 (the Chatski). You will also need a dedicated telephone line, costing £100 to install, plus £400 a year rental. That's a total outlay over the first year of a minimum of £2,000. (All prices include VAT.)

Or you could do what more and more Alas users are doing - use your main or double-dial Telex machine. And just use your ordinary telephone!

How do I turn my Atari into a Telex machine?

All you need is a modem and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to Mincosink. Telex is just one of a growing number of services available to Atari users via Mincosink. With Mincosink you can also read the news as it happens, go shopping, television, with Mincosink you can also read the news as it happens, go shopping, create your own closed user groups, send telemessages and electronic mail right round the world, download free Mincosink programs directly into your main... and much more.

But why use Telex?

Because it's a standard means of instant communication between business. Today there are 150,000 Telex machines in use in Britain - and more than 2 million worldwide. It's used to dramatically speed up business communications - just as quick as using the phone but far more efficient, because you have a hard copy of every "conversation" for your records.

But there's a big bonus you get when you use Mincosink for Telex that the conventional way doesn't offer.

With Mincosink you don't need to be in your office to send or receive Telex messages. You can just as easily use your computer at home (or even a portable), so now you can check, send or receive any Telex messages waiting for you - anywhere, anytime. How's that for your business efficiency?

5

LINERS

GRAPHICS DUMP from I. Sutcliffe

UNFORTUNATELY Mini Office II can't dump screens from the Graphics module directly to a 1024 printer/ploter. However, you can save a screen by selecting the Dial save icon from the Screen options menu. The screen can then be printed using this free-line program.

Load it and change the reference to GRAPH in the first line to the name of the file you wish to print. Make sure the plotter is switched on and that you have fitted a pen then run the program.

The file will load and the plotter will begin to work taking about an hour to complete a dump. The exact time depends on the complexity of the screen, because it reproduces each pixel.

PROGRAM BREAKDOWN

1 - Sets the graphics mode and takes the file name directly on to the screen from disc.

2 - Initializes the plotter.
3 - Using the values obtained from the loops X and Y it locates a pixel on the screen. It then works out if it is a solid block - 1 - or if the pixel is a blank - 0.
4 - Sends the correct printer codes to the 1024 and plots them.
5 - Moves to the next position on the paper. At the end of a screen column it moves the paper up to the start of the next column.

```

10 GRAPH SCREEN 0 SCREEN 00000000
20 SCREEN 00,0000 0000,0000 000
30 SCREEN 00,0000 0000,0000 000
40 SCREEN 00,0000 0000,0000 000
50 SCREEN 00,0000 0000,0000 000
60 SCREEN 00,0000 0000,0000 000
70 SCREEN 00,0000 0000,0000 000
80 SCREEN 00,0000 0000,0000 000
90 SCREEN 00,0000 0000,0000 000
100 SCREEN 00,0000 0000,0000 000
110 SCREEN 00,0000 0000,0000 000
120 SCREEN 00,0000 0000,0000 000
130 SCREEN 00,0000 0000,0000 000
140 SCREEN 00,0000 0000,0000 000
150 SCREEN 00,0000 0000,0000 000
160 SCREEN 00,0000 0000,0000 000
170 SCREEN 00,0000 0000,0000 000
180 SCREEN 00,0000 0000,0000 000
190 SCREEN 00,0000 0000,0000 000
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990 SCREEN 00,0000 0000,0000 000
1000 SCREEN 00,0000 0000,0000 000

```



10 000 100
20 100 100
30 200 100
40 300 100
50 400 100

DAY-FINDER from S. O'Harehan

HAVE you ever wondered what day a particular date fell on? This useful little program will tell you the answer. It prompts you for a specific date, which you must enter in the form of day, month, and year with each separated either by a comma or Return.

Note that the day should be a number from 0 to 31, the month from 1 to 12 and the year should be four digits such as 1988. The day corresponding to that date will then be output.

PROGRAM BREAKDOWN

10 - Sets up DAY - the string that holds the answer.
20 - Gets the variables D, M and Y from the user. These correspond to day, month and year. It also places the value of Y into Y1.
30 - Calculates the value of A which is a number from one to seven.

40 - Reads the date statements and chooses day X. Prints the original date you entered followed by the day.
50 - Clears the screen, prints the day and holds the date statements.

```

10 DIM DAY$(100)
20 DIM D$(100)
30 DIM M$(100)
40 DIM Y$(100)
50 DIM Y1$(100)
60 DIM A$(100)
70 DIM X$(100)
80 DIM Z$(100)
90 DIM W$(100)
100 DIM V$(100)
110 DIM U$(100)
120 DIM T$(100)
130 DIM S$(100)
140 DIM R$(100)
150 DIM Q$(100)
160 DIM P$(100)
170 DIM O$(100)
180 DIM N$(100)
190 DIM M$(100)
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210 DIM K$(100)
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260 DIM F$(100)
270 DIM E$(100)
280 DIM D$(100)
290 DIM C$(100)
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770 DIM G$(100)
780 DIM F$(100)
790 DIM E$(100)
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Your HINTS & TIPS

The Price of Magik

WHEN you die enter RESTORE, then when the Lancelot screen appears get it wrong three times. The game will restart at the point where you died and you will have 261 starting points and all your equipment.

You can do this every time you die, giving you infinite lives to allow you to complete most of the game skills. — David Welch, Rowley Regis, West Midlands.

Bounty Bob

Strikes Back

When you have collected the flower-pot on the first level, press number one on the keyboard. Nine press three and you will move to level five.

On level five if you collect the coffee pot and press eight followed by three you will jump to level eight. — William Donald, Tamworth, Worcestershire.

Encounter

AS soon as you hear or see a missile flying towards you put your tank into full reverse and start firing. This is the best manoeuvre when trying to dodge it.

After completing a screen you have to go through the black hole. Look between the lights and, when you see an asteroid appear, move the joystick

Mercenary

AFTER getting the cheese — the fastest ship on Targ — go to the colony craft, then enter the kitchen and take the suit. It will allow you to pick up almost any object you find.

You can now pick up the spider's web which will act as a skeleton key and you will be able to open any door. Because of this you can drop the rest of your keys as you don't need them.

On the edge of the city you should see another ship flying around — go up to it and take it to get a lot more speed. If you wish to fly it you must go to a hanger, drop it, and boost it. If you drop it anywhere else it will just fly away.

To be able to tell what you are near

to one side and you should be able to avoid it without having to move around too much. — Dorothy Beer, Middlesbrough, Cleveland.

Pole Position

SELECT track one, the right-hand race and at the beginning of the game position your car in the centre of the track. This way no cars can hit you and you can sit back with the minimum of effort and watch the points accumulate until all the legs have been completed. — Michael How, Cusburn, Wilt.

Quasimodo

HERE'S a cheat that will allow you to mist all the archers climbing the ladders.

After getting the first jewel on the second level run to the opposite end of the screen where the jewel takes

a makeshift installation you must collect the metal detector at location 08-08. This will cause Benson's screen to change to blue when you are near an installation.

The metal detector will also let you know when you are over a Palyar building by glowing green — if it glows red, the building is not owned by anybody.

To avoid having your craft blown up when you are attacked on the ground, press L to leave it. You are shot but your craft is left intact. Finally, your escape craft is at location 3-15 and you have to use the elevators at location 8-05 to get to it. — Ruth James, Heston Moor, Stockport.

ans. Jump in the air and the jewel will automatically be placed in the first slot for you.

What appears to be a ghost door will appear nearby — go through it and you will be transported to the next level. — Michael Cain, Beeston, Nottingham.

Ghostbusters

WHEN you are just starting and the computer asks you if you have a bank account enter the following code without a name: 312526646. This will give you 2000,000 in your account and you will be able to fit yourself out with all the best equipment. — J Speed, Beeston Nylands, Nottingham.

Beer Belly Burt's

Brew Biz

ON certain screens look for walls next to the platforms. You can jump over them and out of the exits skipping several screens. — Daniel Welsh, Rowley Regis, West Midlands.

The Pay-off

HERE is a cheat for the adventure game that comes free with most Atari disc systems.

Once the main program has loaded remove the disc from the drive, if you are killed during play you will be asked if you want to try again.

Entering Y will make the computer attempt to access the disc without success. Half the disc screen will appear with the prompt What Now? and you have been returned to Luigi's betting shop.

To refresh the screen and remove the title, type E to throw east. All the other game elements will remain unchanged. Objects will be in the same locations and condition they were left in from the previous game. — R. Clarke, Solihull, West Midlands.

One on One

ON the inlay card for the tape version there is a mistake. It says that you should press 1 or 0 for a time-out. It should read: Press 0 for 0 or 1 for 0.1, to obtain the time-out. — Christopher Smith, Welling, Kent.

LEN GOLDING gives you the lazy approach to computing

EVER since man first poked his enemy with a stick, the subject of remote control has fascinated the human mind. You can switch on your television or video, open your garage doors, lock your car, pilot model aircraft and do a host of other clever things without leaving the spot.

But this amazing revolution seems to have bypassed the computer world. So here's a gadget to start you on the right road - it's a simple remote control device which lets you send messages to your computer from a distance of up to six metres.

It can add an extra dimension to audio-visual displays in schools or staff-training centres, by allowing you to step through a preset sequence of stills or computer-generated drawings at the touch of a button, without any trailing wires.

It can also be used to trigger any of the power-control gadgets described in previous issues, so you could switch mains or battery-powered appliances on or off without going near them. It can even be made to operate as a stand-alone unit, to



The sound way to take things easy

switch appliances on or off without the help of your computer.

We've chosen an ultrasonic system, for various reasons: it's cheaper and simpler than radio control, and beats infrared on range, cost of operation and susceptibility to extraneous fac-

tors from the outside world.

There's also no risk that it will accidentally change channels on your TV-controlled television or interfere your video. It uses a single on/off channel, but this is adequate for many purposes, as we'll explain later.

Figure 1 shows the transmitter, it's a simple oscillator which can be adjusted by VR1 to generate any frequency from around 20KHz to 40KHz, so it can be tuned precisely to the ultrasonic emitter's optimum frequency. Figure 2 shows the receiver, which is a little more complex in design.

TR1 and TR2 form a simple but powerful amplifier, which converts the low output from the ultrasonic transducer into a respectable voltage swing at the input of IC1. This IC is a phase-locked loop device, whose output goes low whenever a signal of the correct frequency is received.

It serves three purposes: first as an audio-to-digital converter, second as a current amplifier and third as a filter which rejects any spurious incoming frequencies.

Construction of both boards is easy, especially if you use the ready-made PCBs available from PH Design. Alternatively you may prefer to etch your own from the patterns at Figures 3(a) and 3(b).

The transmitter board layout is

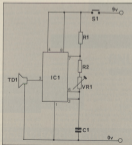


Figure 1: Circuit for transmitter

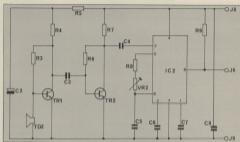


Figure 4: Circuit for receiver

given in Figure 4. It's designed to fit into a small case supplied by Mastek Electronics, but could easily be adapted to suit other boxes if necessary.

The switch is a high-quality push-button type, which is sturdy enough to hold the entire board firmly in place, but we've included four retaining holes in case you want to use a different switch or box.

Make sure that IC1 is inserted with pin 1 in the correct position, but all the other transmitter components can go either way round. TR1 is the ultrasonic transmitter, and is marked with a T. You can attach it directly to a 2-way PCB terminal block as shown in Figure 4, by bending its leads slightly.

Alternatively, solder on longer leads allowing enough space to allow for adjustment of its position in the hand-held box. The battery leads must be soldered to veripins, or directly to their pads.

The receiver board layout is shown in Figure 5. The only polarized components are TR1, TR2, IC2 and C2. The transistors will only fit one way round: IC2 has a small notch in one end, as shown in Figure 1, and C2 has black chevrons to mark the 0v side. All other components can go either way round.

As with the transmitter board, the ultrasonic transducer TR2 can be wired to a two-way terminal block, or

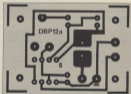


Figure 5a: The PCB transmitter pattern

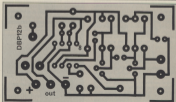


Figure 5b: The PCB receiver pattern

4 From Page 88

directly to the PCB pads via extension leads.

When everything has been correctly soldered, the two units must be tuned to work together. This can be a bit fiddly if you don't possess an oscilloscope, but it's worth the effort to achieve maximum reliability and range.

Start by plugging the receiver into port 1, and then run Program 1. You should see the number 1 at centre screen. If you get 0, adjust VR2 until the number changes and holds there reliably. If you can't get a 1 to appear, there's a mistake in assembly somewhere.

Attach a 9v battery to the transmitter board and adjust VR1 to somewhere near its centre point. Hold it pointing at the receiver about half a metre away, press the button and adjust VR2 on the receiver board until the number on screen changes from 1 to 0, and the test window disappears. This adjustment is fairly critical.

Now stand about two metres away and press the transmit button again. If the number on screen does not change, adjust VR1 on the transmitter until it does. Repeat this dual-adjustment procedure at about six metres distance, to get the best possible response.

Programming could hardly be simpler. Your computer thinks the switch is a joystick trigger button, so the number in address 884 changes from 1 to 0 whenever the unit is activated.

You can use this to initiate a single action, or build a step counter into your program which selects options in sequence when the button is pressed. In this case it's a good idea to build in some kind of delay as well, to avoid triggering unwanted options on the way through the sequence.

Program 11 gives you a demonstration of how different options can be chosen quickly and easily. Hold down the Transmit button to step through the various options without triggering any of them, and release it when you get to the one you want. As it stands, it simply verifies you that a particular option has been triggered, but you can insert extra code at line 118 to make it do something useful.

For example, it could trigger one of the power-control devices we've described in earlier issues, to control models at remote appliances. The power controller could plug into port 1, leaving part 2 for the ultrasonic switch. In this case the address controlled by the switch will be 845.

Software to drive the power controllers themselves is described in the



Figure 10: Component layout for transmitter



Figure 11: Component layout for receiver

constructional articles for each device.

If you would prefer to use the remote switch as a standalone module, independent of your computer, attach a 9v or 6v battery in place of joystick leads 7 and 8 – positive to the pin 7 point – and replace R6 with a 1M Ω signal diode, wired with its cathode – coloured band – towards IC1.

Choose a 9v relay whose coil is 80 ohms or more, such as Magline types FR80, FM077, FM808 or FC31A, and connect it between the pin 7 and pin 8 terminals. The relay contacts will close when the transmit button is pressed and open again when it is released.

Program 11: Demonstration of switch selecting different options

```

5 REM Program 11: using the switch to
  select from a range of options
10 DIM ADDR(884)
15 PRINT "READY TO GO"
20 PRINT "PRESS THE TRANSMIT BUTT
  ON"
30 PRINT "PRESS THE TRANSMIT BUTT
  ON TO CHANGE THE ONE YOU WANT"
40 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
50 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
60 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
70 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
80 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
90 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
100 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
110 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
120 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
130 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
140 PRINT "PRESS TRANSMIT TO GET
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150 PRINT "PRESS TRANSMIT TO GET
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160 PRINT "PRESS TRANSMIT TO GET
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170 PRINT "PRESS TRANSMIT TO GET
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180 PRINT "PRESS TRANSMIT TO GET
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190 PRINT "PRESS TRANSMIT TO GET
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400 PRINT "PRESS TRANSMIT TO GET
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420 PRINT "PRESS TRANSMIT TO GET
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430 PRINT "PRESS TRANSMIT TO GET
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460 PRINT "PRESS TRANSMIT TO GET
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470 PRINT "PRESS TRANSMIT TO GET
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480 PRINT "PRESS TRANSMIT TO GET
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490 PRINT "PRESS TRANSMIT TO GET
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500 PRINT "PRESS TRANSMIT TO GET
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990 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
1000 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"

```

Program 1: Program to hold set up the switch

```

1 REM Program 1: Settings for the ultra
  sonic switch
10 PRINT "READY TO GO"
15 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
16 PRINT "PRESS TRANSMIT TO GET
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17 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
18 PRINT "PRESS TRANSMIT TO GET
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99 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"
1000 PRINT "PRESS TRANSMIT TO GET
  REMOTE SIGNAL"

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PARTS REQUIRED FOR ULTRASONIC SWITCH

TRANSMITTER

		Maplin Code
R1	5k (brown/black/red)	M100
R2	17k (brown/black/orange)	M120
VH1	4C7 horizontal preset	UH02C
C1	0.01 mfd Mylar (marked 102)	WH15B
S1	Push-to-make switch	YH07X
IC1	TLC090C	KA18H
TD1	Ultrasonic transmitter *	
	PP3 battery lead	HF20F
	PP3 battery	FD02B
	8-pin DIL socket	RL17T
	Small narrow base (optional)	FT31J

RECEIVER

FD, R4	1M (brown/black/green)	R184
R4	47k (yellow/black/orange)	MA70
R5	5k (brown/black/red)	M100
R7	50k (brown/black/orange)	M100
R8	10k (brown/black/orange)	M100
R9	4C7 (yellow/violet/red)	MA82
VH2	10k horizontal preset	UH02D
C2	100mfd 10v single-sided	FF10L
C3	2n2 ceramic	WC104
C4	22n ceramic	WC18C
C5	1n2 ceramic	WC08Y
C6	0.1mfd disc ceramic	YR75G

C7	0.22mfd Mylar (marked 224)	WH02B
C8	0.01mfd Mylar (marked 102)	WH15B
TR1, TR2	BC108C	GR33
IC2	NE567 tone decoder	QH85A
TD2	Ultrasonic receiver *	
	3-way PCB terminal	PK23P
	2-way PCB terminal (optional)	FT28P

* Note: The ultrasonic transducers are sold as a pair, under code HY12W.

All components are available from:
Maplin Electronic Supplies,
P.O. Box 3, Rayleigh,
Essex SS6 6LR.
Tel: 0700 502911

Printed circuit boards (under code DBP12a and DBP12b) Price £2.35 per pair. Javelot extension lead (under code AT111) Price £2.99 Available from:

R.H. Design,
27 Beornfall Avenue, Harrogate,
North Yorkshire, HG2 7NS.
Tel: 0432 508000

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LD88 Streamliner	£199.00
LD888 8-pin DTM	£205.00

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- Ads can only be accepted on this form (or a photocopy of it).
- There is no maximum to the number of words you include in your ad. If there is insufficient room on the form, continue on a separate sheet of paper.
- The cost is 20p per word, with a minimum of 10 words.
- We **GUARANTEE** your ad will appear in the February issue (on sale January 27) providing it is received by December 20.

● 1300e disc drive, data recorder, joystick, software, books £225. Tel: 0266 773898.

● Atari 800xl 1050 disc drive, cassette player, joystick, £1300+ worth of games all latest titles £250. Tel: 01 308 23446.

● Atari 808xl, 1050 disc drive with hyperdrive enhancement and 30+ software titles £200. Tel: Beaconsfield 04848 8641.

● Cassette software for sale, s.p.a. for list to Dean Hillings, 80 Peterhouse Close, Middlesbrough, Saffron.

● Atari 1300e 1304 computer, disc drive, joystick, KC3 cassette deck, over £250 worth of software, books, mags, very good condition, all the lot for £200 o.n.o. Tel: Daniel 0824 820166.

● Atari 800 104 car, 104 rom, 48K rom expansion boards also keyboard and connector strap for Atari 800 £35. Tel: 0272 881842 after 5pm.

● Clavin 1200 RLD Epson compatible printer £130. Atari assembler £12. Epson compatible dot matrix printer £168. Cassette, Babybus, Mini Office £10 each. Tel: Bristol 0272 623820.

● For sale Atari 1300e, 1010 recorder, 1080 disc drive, 1027 printer, joysticks all boxed, image-discs and start-writer, Mini Office II + software £208. Tel: Floss 01 842 1352.

● Atari 1300e, 1050 disc drive with 'learn' enhancement. Super software £120. Super collecta. Tel: Brentwood 267112.

atari artix touch tablet, manuals, discs £248. Tel: Southend-on-Sea 02996.

● 1050 drive £100, 1027 printer £80, 1020 ploner + T-tablet + extra pens, paper, software £100. Atari XMM501 Epson + compatible dot matrix printer £168. Cassette, Babybus, Mini Office £10 each. Tel: Bristol 0272 623820.

● For sale Atari 1300e, 1010 recorder, 1080 disc drive, 1027 printer, joysticks all boxed, image-discs and start-writer, Mini Office II + software £208. Tel: Floss 01 842 1352.

● Atari 1300e, 1050 disc drive with 'learn' enhancement. Super software £120. Super collecta. Tel: Brentwood 267112.

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● Atari touch tablet and software £20. Plus original disc and cassette software from Rip to £250. Tel: 0200 815460.

● Atari 1027 printer £80. Tel: 1780888 671 evenings.

● 800xl, 1080 disc drive, original software, boxed £100 s.p.a. Tel: Max on 0243 864958 after 3.30pm.

● Atari 5285TM, 5F354 disc drive, mouse and usual free software. As new £220. Tel: 0210 262760.

● Atari 1027 printer £70, Atari 800 computer £40, Atari 1010 data recorder

£75. Excellent condition. Tel: 04032 26472.

● Wanted 1080 disc drive. Tel: Portonway 07050 612536.

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LET'S start with an easy query from Mr. K.L. Edwards from Wenden Hill, Cheltenham, who writes:

“I'm in the middle of designing a large database program on my 1300C, but I've found a problem:

When someone runs the program he can enter almost unlimited information because the text is stored in a very long string. This is initiated by the following code:

```
100 DIM A$(10000)
110 FOR I=1 TO 10000: A(I),
120 " " NEXT I
```

But line 110 takes about two minutes to execute, so please could you give me an alternative method – possibly by programming it in machine code for me. ☺

Typing machine code in this case would be rather like using a spreadsheet to crack a nut. In fact, Basic's own string handling functions have a rather convenient little side effect which will solve your problem much more easily. We have touched briefly on this technique before, but it's so useful that it could do with more explanation.

When copying between two strings using a statement like LET A\$(4)=B\$, Basic simply takes the first character from B\$ and places it in the first position of A\$, and then repeats the process for the second, third, fourth and so on until the whole string is copied.

Alternatively, it is quite possible to copy the new string anywhere inside the original using the normal subscript notation. For example, to copy B\$ in at position two of A\$ you would use A\$(2)=B\$.

If you pause to think what's happening here you will see the answer to your query is just around the corner. Character one from B\$ is copied in to position two of A\$, then B\$(2) is copied to A\$(3), B\$(3) to A\$(4) and so on until all B\$ has been copied.

The sneaky trick comes when you try copying a string into itself in this manner – using A\$(2)=A\$. Firstly character one from A\$ is copied to position two. Next character two – which we have just transferred from position one – is copied to position three. This new character at position three is copied to four, and so on until the end of the string.

The final effect is that character one is copied to position two, then three, then four and so on until the whole

SOFTWARE Solutions

Your programming problems solved by ANDRÉ WILLEY

string is filled with the first character – rather like tapping a line of dominoes.

So, in your example, try the following:

```
100 DIM A$(10000)
110 A$(1)=
120 " " NEXT I
130 A$(1)=A$
```

Don't forget to set up the length of the string by writing to the very last character as shown in line 130, otherwise the string copy will stop as soon as it thinks there's no more text giving only a copy of a single character.

So there you have it – a very simple and rather elegant method of filling a string with anything you want instantly.

Type-in trouble

Here a letter from **Steven Taylor** from Essex who seems to be having some difficulty with one of our larger programs:

“I have an 800XL with a DOS disk drive, and have been buying Atari User from the very first issue. I quite often key in the dialog, but I've been having a little difficulty with *Chopper Finance* from the September 1987 issue.

I had been typing for some time and had almost finished when I got an error as I tried to enter the 0200. My book says that this means 'Too many variables (greater than 126), but I've reviewed and there seem to be far less. Is this due to a fault in my machine, or does the game code make this 048 to run? I assume that it does work correctly with the 800XL. ☺

Although the solution to your problem is straightforward, the cause is rather more complex. First of all let's discount some of the possibilities.

There is no fault in the game, and it should run quite happily on a 64K 800XL. Also, there are not more than 126 variables in the program – so why does the error occur?

The answer lies in the way in which Atari Basic functions, using a system known as tokenisation. At this means is that after you've typed in each line, Basic converts all the long-winded text into a much shorter set of symbols.

For example, when you type REM, Basic will store it as a single ASCII byte zero. Similarly, DATA would give a value of one, INPUT two, COLOR three, and so on.

Another way in which it packs your program in into a smaller space is by using a similar technique with variable names. You may find variables with names such as MYDISPLAYLIST and CUSTOMERSTOCKCODE useful, but they waste an enormous amount of memory. Just think, if you used them each 20 times in your program you'd have just wasted half a kilobyte of memory. It is obviously far more convenient and compact for Basic to store the name just once, and use another one-byte token whenever it needs to refer to it.

Each time you type in a new variable name as you key a program in, the computer will set up an entry in a special table – called the variable name table – and the tokenised line will just contain a reference number. This whole table is always stored with the program when you save it and, in fact, there are only two ways to remove it –

From Page 63

load a new program of type NEW.

I assume you must have been working on another listing before you started typing in Chapter Rescue, so leaving all the variable references from that previous program were left in memory. When you started working on Chapter Rescue you simply added your new variables to the end of the table, and eventually filled it up to the maximum of 128 entries.

The solution is simple: First you should list the program to disk using:

```
LIST 0:1000111
```

Then type NEW to erase both the program and the variable name table from memory, leaving a clean slate ready to accept the correct table. Now all you need do is use:

```
LIST 0:1000100
```

The program will be read back in, line by line, and a new table created just as though you were typing the lines in from the keyboard. This tokenizing process is usually very fast — you certainly wouldn't notice it when typing in a single line from the keyboard — but you will find that ENTER is very much slower than LOAD due to the extra time taken by this routine.

You might like to take a look at the token table for yourself so I've written a small program which will display the current contents of the variable name table, plus the ram-based statement and function tables. In case you want to delve further, the ram-based tables start straight after Dos and there are a set of zero page pointers to keep track of them.

The variable name table we have been discussing is pointed to by locations 130 and 131 (in normal 8203 low-high format). The end is indicated by locations 132 and 133 (but, since there is normally a null byte (zero) at the end, the program doesn't test for the end address).

Locations 134 and 135 point to the variable value table. This contains eight-byte values for each variable defined in the same table, and it is these entries which determine the type of variable (numeric, string or array).

Locations 136 and 137 point to the statement table — the tokenized version of the program itself. Locations

SOFTWARE Solutions

136 and 139 indicate the last entry in this table, and it is here that your immediate mode commands are stored until Basic has finished processing them.

After the program space comes an area reserved for the contents of strings and arrays (pointed to by 140 and 141), and finally locations 142 and 143 point to Basic's internal stack which keeps track of GOSUBs and FOR ... NEXT loops.

```

00 0000000000000000
01 01 000101 000 010100000100000000
02 02 000100 00 0001
03 03 000100 00 000100 000 000 000 000 000
04 04 000100 000 000000 000 000 000 000
05 05 000100 000 000000 000 000000 000 000000
06 06 000100 000 000000 000 000000 000 000000
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Speedier sort

Finally this month a letter from G. Fearwood of Lincoln who writes:

“Having had my Atari 1300E for a few months, I have progressed to the stage where I'm trying to write programs of my own.

I have written a database program of names and address of just about everyone I know and it seems to me that the speed I have seen using Any amend-

ments or additions to the information will initiate a sorting of the names, and here lies the problem — it takes ages!

Is there a machine code routine for string sorting that I could use to speed things up?”

This is another problem where machine code is not the best solution, and a little bit of lateral thinking will let you do the job much more elegantly in Basic. What you really need to do is redefine the problem.

You have a sorted list of names and addresses, in surname order. When adding a new entry to this you are at present adding it to the end of the list and then re-sorting the whole thing to get it back into order. But wait a moment — there's only one entry out of sequence here, so isn't it rather a waste of time re-sorting the whole lot?

Instead, why not simply put the new entry in the correct position in the first place? If you do this every time a new record is added, the list will always remain in sequence and you'll never have to do a sort again.

Each time you want to add a new item to your list, search through until you find the entry just after the position you want to place your new entry. Then move the rest of the list up in memory to make room for it and just drop it in its place.

For example, if you wanted to add the name Smith to a list such as Davidson, Jones, Morgan, Taylor and Wiley you would select the next entry (Taylor) and move it up one place together with all the following entries. Then you just fill the gap with Smith.

You will already be familiar with the commands used to modify portions of strings and to compare them, so all you need to know is how to make that extra space. Once again, Basic's string handler comes to the rescue.

Take as an example PAYS, which contains a number of 50 character sub-strings which make up your entries. If you want to make space for an extra one at position 204 you would use:

```
PRINT PAYS(100) TO 111(100)
```

That's it for this month, but don't forget that solving problems with a computer is often a lot easier if you can step back a couple of pages and think of an alternative way of asking the question. You might find that the answer is a lot simpler than it first looked.

£10

WHILE playing around with Dos 2.0 the other day I got the directory of my Mini Office II also on screen. I found that any of the readers can be loaded using the binary load feature of Dos - that is option L, followed by the filename of the module you wish to load.

Also when using the word processor, if you type Return - but not a marked Return, which would show up as a bent arrow character - then backspace with the cursor and type Control+reverse video key, the Escape (ESC) character will appear. This is very useful for printer codes, especially if you have run out of macros. This enables you to switch between fonts, pitches or new character sets without having to resort to using macros, which is very useful for anybody who wants to emulate the printer set, but doesn't have enough room to do so in the macro menu.

On a different topic, when using Dos 2.0 and you wish to view a text file without having to go into the word processor, select option C from Dos and type: FILENAME.EXT to display the file on screen, or: FILENAME.EXT.P to print the file out.

If the text is scrolling too fast use Control+T to stop or start it. When printed out the file is of a poor format, so its only use is if you want to quickly check a document before creating a final copy. — Jonathan Burg, London.

WP with a recorder

COULD you please inform me if there are any record processors available for use with a data recorder? — Marcus McCollum, Ballymore, Co. Antrim, N.Ireland.

■ The Applewriter cartridge

Making the most of Mini Office II

will work with a cassette deck, then a file is saved long inter-record gaps are used and this unfortunately slows the proceedings down - but it does work perfectly well.

Software compatibility

I HAVE been reading Atari User for five months and I find it excellent, but I have some questions: Is it 8-bit software compatible with the 16 bit ST? And how can you get the Atari to take in a letter or number without you having to press Return? — Simon Lewis, Lee, London.

■ No, the software written for the 8-bit Atari models is not compatible with the ST. The latter uses a Motorola 68000 CPU while the 8-bit Atari uses a 6502C micro-processor.

The way to get the Atari to take a number from the keyboard without having to press Return is to use the OPEN and GET commands.

The simplest way to explain this is to give you a simple program:

```

10 OPEN "A,B,C"
10 GET V1,00
10 IF V1=10 THEN 10
40 GOTO 10
10 *****

```

Line 10 tells the computer to look for an input from the keyboard. The GET in the OPEN command tells the computer to look at the keyboard, and the 40 indicates an INPUT operation.

The GET+V1,KEY com-

mand on line 20 takes the input and assigns the Atari value to KEY which is just a variable name and can be anything you want.

Line 30 checks to see if the key pressed is the spacebar and if it is goes to line 50. Line 40 simply puts the computer into a loop waiting for the spacebar to be pressed. Line 50 simply prints a message indicating you hit the spacebar.

Waiting for new drive

I RECENTLY ordered a 1050 disc drive from Computer 1, but I received a letter saying that Atari User withdrew it. They also said that a new disc drive made by Atari will be released around September.

Could you please tell me the differences between it and the old 1050 and will software be compatible? Also, when exactly will it appear? — A Pyralis, Slough, Berks.

■ The Atari 1050 disc drive has been withdrawn so it can be replaced with the XP-551 drive. This was expected to be released before Christmas, but Atari is experiencing difficulties so the release date will probably be around January.

The main difference between the two drives is that where the 1050 required a modification to give double density and faster loading speed, the XT-551 has true double density and high-speed load built in. Atari guarantees the

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drive will retain full compatibility with all existing software.

Help in business

THREE years ago I bought an Atari 800XL with Atari 1050 disc drive but never used them. Last year, after being made redundant, I started my own firm and purchased Atari business which has proved successful.

I now wonder if it is possible for me to use the computer in my business with

Turn to Page 88 ▶

regard to my personal taxation, business accounts and business writing using a word processor.

I realise that if such programs are available I would also require a printer and your suggestions would be appreciated - G. Hallas, Blackpool, Lancs.

■ An ideal product for you to buy to help you with your business is Mini Office II. It is disc based and gives you a word processor, spreadsheet, database, label printer, graphics package and communications program for only £19.99.

It is designed to work with an Atari 1020 or Epson-compatible printer. The 1020 will plug straight into the serial port on your 800XL, but other printers need an Atari 850 interface box or some other suitable printer interface before you can use them.

There is a review of the Panasonic KX-PT1001 - an Epson-compatible printer - in the October 1987 issue of Atari User.

ATARI USER Mailbag

We welcome letters from readers - about your experiences using the Atari micros, about tips you would like to pass on to other users... and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Empire House
Arlington Park
Arlington
Middlesex SK16 5NP

Booting with Basic

I OWN an Atari 800XL and have an annual subscription for Atari User. I typed in Get it Right II from the November issue, checked it with the old Get it Right! and saved it in cassette as instructed in the magazine. When loaded into memory I got on screen the message Get it Right II in a box and loaded OR (not in a box) but I do not get the

message Ready. Instead it goes straight to the Self Test routine.

Can you explain why the Ready message is not coming up on my screen. - **Maureen Seymour, Ayrshire, Scotland.**

■ You will find your problem lies with the procedure you are using to load the new autoboot file into memory. If you hold the Option and the Start keys when booting the program, you will switch off Basic.

When the GRP program attempts to go to Basic after

loading it won't be able to, so it will go into self test. You only have to hold the Start key down to boot with Basic.

Switching Dos formats

Is there a utility available that will allow me to convert Dos 2 files to a Dos 3.9 format? - **James Harvey, Warrimaroo, London.**

■ The Dos 2.8 master disk contains a file called COPY2.COM which will allow you to do this. You'll also have the enhanced density available and retain full compatibility with Dos 1.

Auto line numbering

I RECALL recently bought an 800XL and I am still learning how to use it. It seems to lack the facility of automatic line numbering and renumbering.

Have these subjects ever been featured in Atari User? - **D.M. Hill, Stranraer.**

■ In the August 1987 issue we published a utility to renumber Basic programs. It creates an autoboot disc or cassette file that loads into memory and remains resident until the power is turned off. We hope to cover auto line numbering in a future issue.

Basic facts in Basics

I AM a new Atari owner and I bought a book on Basic from a friend who owns another colour computer. When I type in some of the programs I get error messages, though I'm certain I have made no mistakes when typing them in.

Could you please explain to me what is going on? Is there some secret to typing

Getting it quite right

I'VE just typed in your excellent new Get-it-Right II checksum program, and I think it's really good - especially like being able to call it up instantly rather than having to LIST and ENTER everything.

However, I can't seem to make it checksum itself correctly - either with the old or new versions. Could you let me the same error lines - 130 and 3070. On GR II it also got the wrong cumulative check digit from line 130 onwards.

Since these are only BASIC lines and the program seems to work fine, I wasn't too worried - but I have checked the spacing of each line very carefully and I

still can't get it to give the right checksum.

I'm wondering - is it me, or are the checksums printed correct or not? - **Michael Hayston, Aston, Birmingham.**

■ **Andre Wilkey** replies: Some of you have noticed that the two checksums printed alongside the Basic version of my Get it Right II program didn't quite match the listing.

This was rather embarrassing and caused by a printing error which meant that two lines of the program containing inverse video text were inadvertently printed as normal characters.

On line 130 the text inside

the quotes should have been shown as inverse video, including one extra inverse space on either side of the wording. Similarly line 3070 should also have had the whole of its PRINT text using in inverse video.

The program will still work quite correctly without either of these changes, of course, but it did mean that the checksum values for these lines didn't match.

Both checksums were printed out from my original program listing before the printers printed the inverse text.

So it had the checksums as back correct if the listing that's wrong. I'm sorry for any confusion caused.

in programs out of books? — Richard Lawson, Heston Merry, Stockport.

■ All Basics are different, although most are based on a dialect of the language developed by the Microsoft Corporation. Nearly all publications outside those dedicated purely for your computer feature programs written in the most common style of Basic available.

Unfortunately, Atari Basic differs from most of these, so you will have to modify the program listings to a style that Atari Basic will accept.

Computer comparison

Can you please explain the difference between the 800XL and the new 800E computer? Is the 800E as reliable and can it do all the things the 800XL can do?

At 800 I would a very good buy and if it can do all the things the 800XL can do it will be a good starter pack. — J. L. White, Hauxton, Chesh.

■ The 800E computer and the 800XL are very similar to each other. The major differences occur in the physical design and layout of the micro. On the 800XL the cartridge socket is on the top, but on the 800E it is positioned at the rear.

The parallel bus that featured on the 800XL is not on the 800E, nor does it have the expansion bus that appeared on the 130XE.

Serious searches

I RECENTLY started writing a database program to store my friends' names and addresses on my Atari 800XL.

The main program proved no problems, but when it came to writing a routine to search through the names for first and individual

Differing TV systems

That other day I was reading an American magazine for the Atari 8 bit computers and was interested when it started making comments about the PAL and NTSC television systems.

Could you please explain the differences between the two and why would this affect the Atari computers? — Pamela Benjamin, Warrington, Cheshire.

■ The PAL system is one of the European television standards that we use. It has a 50Hz frame rate and uses 312 lines per frame to build a picture on the screen.

The NTSC system is the American equivalent to PAL.

However, it only uses 262 lines per frame to build a picture and uses a faster frame rate of 60Hz.

This means that although the screen is up-dated faster on the American television, the picture quality is not as good as that achieved by PAL.

Atari computers were initially designed around the NTSC system, but when they were sold in Europe a hardware modification was made so they would be compatible with the PAL system. So, the difference in the way the two systems work will not directly affect your own micro.

SURROUSE, the program did not always do almost exactly as you. Could you give me any help on this matter? — Alexander Brock, Cheshire Helms, Cheshire.

■ When searching through the surrouses there is, as usual, a slow way and a quick way. The slow way is the most obvious — you start at the first entry number and continue until you find the one you're looking for.

This is an obvious way, but rather tedious. You certainly wouldn't work that way if you were looking up a phone number in the directory, would you?

A much faster method is to open the book in the middle and decide whether you've got to go forward or back. By looking at just one name you've already eliminated half the directory.

If you then turn to the middle of the section you now know the entry's in, and again decide whether it's above or below the one you've selected, you will have quartered the book — and so on until you find the name you're after.

Using this method the

computer could find any one item in an ordered list of 1000 by looking at just 10 entries.

This system is known as a binary chop, because each successive test chops the remainder of the list in half.

Following this method you should have no problem in speeding up the search routine, and the coding for it is relatively simple.

Right lines for fault

THANK you for a great magazine, and thanks also for my copy of *Speedy Debug* that is because that I was in your birthday competition. I was very pleased with it.

In the November 1987 issue of Atari User you published the listing for *Grandy Gunther*.

After I had completed the first screen the program was in the process of drawing the second when it came up with an ERROR 8 at line

3010. After checking the 3010 I found it to be correct. Could you please help me? — Michael Davies, Braintree, Essex.

■ The error that the program is encountering is not actually at line 3010, but is in fact located between lines 3000 to 3005. You will probably find that you have entered one or more of the data statements incorrectly. Check these lines very carefully and you should find your error.

Pin-outs in the 800XL

FOR a while now I have had an interest in the field of electronics and computers. I have built many of the projects that have appeared in Atari User, but I now wish to design and build my own hardware modifications for my 800XL.

Most pin-outs for the connections on my Atari have been readily available, but I have found it impossible to get the any details for the serial HD connector as the rest.

I would appreciate it very much if you could help me. — Philip Marsh, Hammer Smith, London.

■ Here is a diagram of the pin-outs for the serial HD connector:



Serial HD jack

1. Clock input
2. Clock output
3. Data input
4. Ground
5. Data output
6. Ground
7. Command
8. Motor control
9. Power
10. +5Vdc
11. Audio input
12. +12 volts
13. Interrupt

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