Home Computing WEEKLY
An Argus Specialist Publication
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SPECIAL SUPPLEMENT
No. 72
July 24-31, 1984
45p

More MSX

Computing
Read the latest news and start learning MSX BASIC

WIN
a weekend for two in Paris courtesy of OPTIONS

Software reviews for:
Spectrum, CBM 64, BBC/Electron, Dragon, Oric/Atmos, TI-99/4A

Spectrum program
Bowl googlies – and hit them for six

TI-99/4A program
See how you grow as you eat



Copied tapes seized — judge told

Cassette copying equipment was seized in a raid on a doctor's home, a High Court judge was told.

Microdeal, the Cornish-based software company, had been granted a "search and seize" order at a private hearing.

It enabled the company to search the premises of Dr T. Mohamed in Blackburn and take away any offending copyright material.

Microdeal alleges that Dr Mohamed and Mr T. Mohsan — believed to be Dr Mohamed's 14-year-old brother — have been copying Dragon games such as Eight Ball, Katerpillar Attack, Scarfman and Space War.

Miss Mary Victoria, for Microdeal, told Mr Justice Mervyn Davies that the company had obtained "quite a lot of interesting material" when the order was executed.

She read a sworn statement

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School's over for Chris

A schoolboy is dropping his 'A' level course to invent computer games. Christopher Kerry, 17, of Batemoor, Sheffield, wrote the game Jack and the Beanstalk, currently high in the charts.

The game achieved top status and popularity even without advertising. And the company marketing the game, Liverpool's House of Thor, is now planning a massive promotion for it.

Now Christopher, who feared he would be joining the dole queue, may earn tens of thousands of pounds in royalties.

Christopher was studying physics, chemistry and computer studies at Jordanthorpe school. He left before the end of the summer term of his first year in the sixth form. Assistant head, Mr Heath said: "Christopher is a very capable young man with plenty of initiative. We wish him well!"

Christopher is now signed up

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MSX COMPUTING

Here's the third issue of MSX Computing, presented to you free with Home Computing Weekly. This is what's in store for you:

- Insight into who's planning what when
- Start learning how to program MSX BASIC

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"With practice, certainly."
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"You do, of course, control the batsman with the joystick."
"Of course."
"Come on - there must be a limit."
"Ask away."
"All right - can I pick my own teams, decide how skilful each batsman and bowler is, can I practise bowling, be out LBW, run out or bowled, can I hit my wicket or be caught, are there byes, no-balls and wides, does a damp wicket help the spinners, if I need a break, can I save the game..."
"Hang on, let's catch up. Yes, yes, yes, yes, yes, yes, yes, yes, yes, yes, yes, yes and yes."
"And what happens if I've no-one to play against?"
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Tapes

From front page

by the solicitor who carried out the order in which he said that Dr Mohamed had "readily admitted" copying Microdeal's tapes and that he had found recording equipment, blank tapes and tapes which had been copied.

Nothing, however, had been found at the boy's home.

Neither Dr Mohamed or Mr Mohsan were present or represented in court.

But Miss Vitoria said Microdeal's solicitors had received a phone call from Dr Mohamed denying all knowledge of the matter.

The judge agreed to continue an order banning Dr Mohamed from infringing Microdeal's copyrights until a further hearing last Friday. He refused to make any order against Mr Mohsan.

Chris

From front page

as a freelance for Thor and he will receive royalties for Jack and the Beanstalk. His brother, Steven, helped with the graphics, an outstanding feature of the game.

Christopher came up with the idea of Jack and the Beanstalk because he thought people were getting fed up with space games and shoot-outs. Now he is going to think up some more new games.

Jack and the Beanstalk received a five-star rating when reviewed in Home Computing Weekly. "Frustrating but challenging; if you want a difficult action game this can certainly be recommended", our reviewer wrote.

Headmaster Ken Cook says he is not worried about Christopher dropping 'A' levels and he is sure he will be a big success in computers.

No longer in the dark

Broadway Electronics chose to herald its mushrooming expansion plans by sending mushrooms to numerous computer personalities. Half-pound punnets of fresh mushrooms were delivered to their desks following the opening of new high tech headquarters in Bedford in March. Plans have been kept in the dark while new marketing strategies were formed.

Mushroom Computers becomes the parent company, responsible for marketing and manufacturing BBC/Electron add-ons. Broadway Electronics becomes a subsidiary and continues as Mushroom's retail arm. Mushroom Software and Mushroom Electronics are two other subsidiaries.

Paul Vaughan, managing director, said: "While continuing to manufacture peripherals for Acorn, we will develop independent products to an increasing degree."

Broadway Electronics, Aston Rd, Bedford, Beds MK42 0LJ

PSS track success

Kevin Bowes, the motorcyclist sponsored by PSS, is having a successful season. He is currently lying fifth in the Marlboro Clubman's Championship. This is only his second season, yet he has completed over 30 races.

Kevin is a 23-year-old Coventry printer, who took up racing motor bikes as a hobby. His progress against local rivals was quick, and PSS decided to back him in is career on the track.

Kevin has qualified for the Marlboro Clubman's Championships at Silverstone on September 22 and 23.

PSS, 452 Stoney Stanton Rd, Coventry CV6 5DG

Run for fun

The third annual Cambridge festival half-marathon, sponsored by Sinclair Research, has attracted a record 2,599 entries, including British Olympic marathan hope, Joyce Smith.

The half-marathon will take place on Sunday 15 July. Leading Sinclair staff have been persuaded to take part and Sir Clive and managing director Nigel Searle plan to jog along with the rest.

The fun run starts at 8.30 a.m. and the course is from Parkers Piece, Cambridge, through Fen Causeway, Grantchester and Trumpington. If you would like to participate, call Eddie Sharp at Cambridge City Council on 0223 358977.

Stop those headaches

Do you see spots before your eyes or feel a pounding in your ears after spending hours in front of your trusty micro? If so, you could be suffering from vision disorders or headaches, known to be problems faced by TV computer users.

You may find relief from your ailments if you invest in an anti-glare filter, available from Romag. CEAF is a laminated filter combined with a diffused etched face which dissipates unwanted reflections. CEAF fits the curvature of the screen and is fixed on by velcro.

CEAF will retail for under £20 and should be in stock at your major high street computer dealer.

Romag, Patterson St, Blaydon on Tyne, Tyne and Wear NE21 5SG

Scary monsters

Just out on the Commodore 64: Bonzo, from Audiogenic. Audiogenic says that Bonzo features brilliant full-screen graphics and "some of the most devious and vicious monsters ever devised."

You're a workman who must collect boxes from different levels of the screen. You must climb up and down ladders, avoiding monsters who are guarding the boxes. The monsters react intelligently and try to trap you on a particular level. Price: £5.95.

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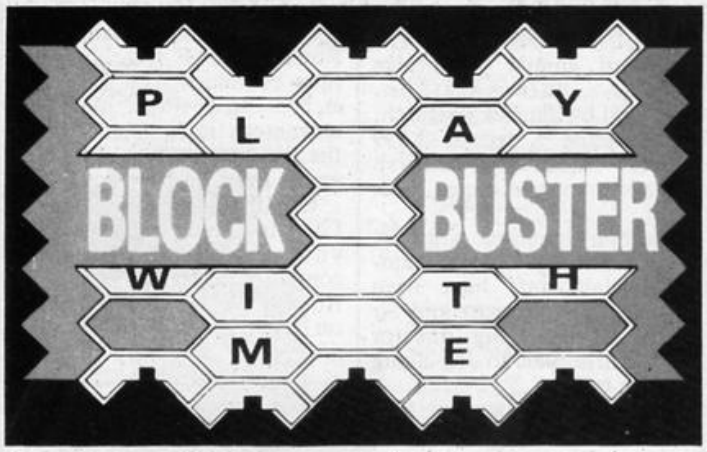
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Win a weekend for two in PARIS from OPTIONS



Our top prize in this week's competition is a weekend for two in Paris. Paris is an exciting city; the Parisians are stylish and elegant and enjoy the French tradition of drinking at roadside cafes and watching the world go by. You'll soon get into the swing of it.

Stroll along the Champs Elysées, climb the Eiffel Tower and take a boat ride down the Seine. Wander round the Galeries Lafayettes and spend an hour or so in the Louvre. While Paris is rich in cultural heritage, it's also up to the minute in fashion and design.

There's so much to do in Paris that a weekend can only give you the taste of this city at the heart of France. The cuisine is justly world famous and wine is cheap. And now you have the chance of visiting Paris — at Option's expense.

The top prizewinner of this week's competition will be flown out to Paris, courtesy of Options, and will stay in a hotel at Option's expense together with his or her companion. This is an ideal opportunity to enjoy an off-season weekend break in the French capital.

Fifty additional prizewinners will receive one of Option's range of educational software, which runs on the BBC and Commodore 64. In the shops each tape costs £8.95 (£9.95 for disc) so the prizes are worth £500.

All you have to do is suggest three applications for adult software. Options is planning to release non-technical software for Mums and Dads and wants you to send in your brainwaves on what would keep them fascinated.

Options is currently preparing a birthday book package, in which the user can retain all necessary dates, as well as a gardening program. What can you think of?

Options' educational software also involves parents. Each program has the facility for addition of data and questions. For example, after the demo program has been run, an adult could type in questions which are relevant to the child's school syllabus. That's one way of involving both parents and children.

Options is a new company formed in June 1984. Options wants to encourage adults to use home computers. David Collins, manager, said: "In 99 out of 100 cases Mum and Dad bought a computer for their child and hoped it would provide help with homework. Our educational packages are ideal for that!"

He continued: "What we want now is to provide software for their own use. There's really nothing on the market at the moment for adult leisure. There's only games and technical packages like spreadsheets!"

So put on your thinking caps and send us three original ideas — and you could find yourself on that plane winging its way to Paris!

How to enter

Write on the coupon, in order of importance, three original ideas for adult software. Explain clearly and concisely your reasons why each program would interest adults. Your ideas should be non-technical programs for adults with little or no knowledge of computing. Please do not include the names of any arcade or non-arcade games.

Complete the sentence "I'd like to go to Paris because..." in not more than 20 words. This will be used as a tie-breaker, in the event of more than one person being eligible for the top prize.

Write in your name and address and computer (Commodore or BBC). Complete the coupon clearly and fully — it will be used as a label if you are a prizewinner. Please include your age: if you are a top prizewinner and are under 18 you will need to be accompanied by an adult companion.

Send the coupon to Options Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Entries close at first post on Friday August 10, 1984.

Take off for a weekend in Paris courtesy of Options. And we're also giving away 50 tapes from Options

You may enter as many times as you wish, but each entry must be on an official coupon — not a copy — and sealed in a separate envelope. **Important:** please follow carefully the guidelines on entering — incomplete coupons cannot be considered.

The rules

Entries will not be accepted from employees of Argus Specialist Publications, Options and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies. The How to Enter section forms part of the rules.

Options Competition

Entry Coupon

1 _____

_____

2 _____

_____

3 _____

_____

I'd like to go to Paris because _____

_____

_____

Name _____

Address _____

_____

_____ **post code** _____

Computer (BBC or Commodore 64) _____

Age (if under 18) _____

Complete clearly and fully — if you are a winner this will act as a label for your prize. Post to Options Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Closing date: first post, Friday August 10, 1984.

```
  10 PAPER 4: BORDER 4: RANDOMIZE 0
  20 GO SUB 1409: GO SUB 1040
  22 GO TO 30
  29 CLS : BORDER 4: GO SUB 1390
  30 PAPER 7: GO SUB 1580
  31 GO SUB 2000
  40 DIM v(11): LET l=0
  45 LET bw=INT (RND*5)+1
  50 LET lw=0
  60 LET wkt=0: LET tot=0: LET ov=0: LET pl=0: LET no=1
  70 LET bal=0: PRINT AT 10,15;ov: PRINT  INVERSE 1;AT bw+5,27;"Q": PRINT AT 18
,
5;hi
  80 LET v=0
  90 LET v=INT (RND*270)+1+(pl/30)+(bw-3)+(2-INT (no/2))
  91 IF v<1 THEN  LET v=1
  92 IF v>270 THEN  LET v=270
 100 PAUSE 0
 110 IF INKEY$<>"1" AND INKEY$<>"2" AND INKEY$<>"3" AND INKEY$<>"r" AND INKEY$<>
"R" THEN  GO TO 100
 120 IF INKEY$="1" THEN  GO TO 160
 130 IF INKEY$="2" THEN  GO TO 220
 140 IF INKEY$="3" THEN  GO TO 290
 150 IF INKEY$="r" OR INKEY$="R" THEN  GO TO 350
 160 IF v>=1 AND v<=5 THEN  GO TO 510
 170 IF v>=6 AND v<=132 THEN  GO TO 500
 180 IF v>=133 AND v<=232 THEN  GO TO 520
 190 IF v>=233 AND v<=266 THEN  GO TO 530
 200 IF v>=267 AND v<=268 THEN  GO TO 540
 210 IF v>=269 AND v<=270 THEN  GO TO 550
```

Will you be a cricketing star?

You stand nervously at the crease as an expectant hush falls over the crowd...

That's how One Day Cricket, for the 48K Spectrum, begins. Your challenge is to get the best high score or beat a random high score.

The program holds Essex and England teams and choice is made depending on whether you select 40 or 50 overs.

These may be changed by altering the following lines (where x$ is Essex/England and f$ is the opposition):

802 & **812** venue (county/international)
809 & **819** data (county/international)
2002 & **2501** data (county/international)
2004 & **2503** x$ Essex/England

The opposition is randomly chosen for cosmetic purposes and does not affect the outcome of the game.

At the end of the innings the scoreboard and score card may be copied on the ZX Printer.

Spectators on each side of the scoreboard raise their arms if a six is hit or a wicket falls.

At the end of each over you are given the option of obtaining the run rate and the required run rate. The scoreboard keeps track of total runs scored, batsman's runs, total when wicket fell, overs bowled, wickets fallen and bowler number bowling.

You play the game using three keys: **1** defensive stroke, **2** attacking/solid stroke, **3** aggressive stroke. Full details are in the program.

Capitals which are underlined are UDGs and should be entered in GRAPHICS mode. They are: **A-M** wicket, **N** spectators, **O** arms aloft, **P** spectators with arms aloft, **Q** indicator for bowlers.



```
220 IF v>=1 AND v<=15 THEN  GO TO 510
230 IF v>=16 AND v<=146 THEN  GO TO 500
240 IF v>=147 AND v<=201 THEN  GO TO 520
250 IF v>=202 AND v<=231 THEN  GO TO 530
260 IF v>=232 AND v<=234 THEN  GO TO 540
270 IF v>=235 AND v<=269 THEN  GO TO 550
280 IF v=270 THEN  GO TO 560
290 IF v>=1 AND v<=45 THEN  GO TO 510
300 IF v>=46 AND v<=123 THEN  GO TO 500
310 IF v>=124 AND v<=181 THEN  GO TO 520
320 IF v>=182 AND v<=201 THEN  GO TO 530
325 IF v>=202 AND v<=205 THEN  GO TO 540
330 IF v>=206 AND v<=230 THEN  GO TO 550
340 IF v>=231 AND v<=270 THEN  GO TO 560
350 IF ov=0 THEN  GO TO 100
360 IF bal>0 THEN  GO TO 100
370 LET r=tot/ov: LET r$=STR$ r: PRINT AT 21,1;"Run Rate "
380 IF LEN r$<3 THEN  PRINT AT 21,11;r$+".0": GO TO 410
390 IF LEN r$=3 THEN  PRINT AT 21,11;r$: GO TO 410
400 IF LEN r$>3 THEN  PRINT AT 21,11;r$( TO 4): GO TO 410
410 IF tot>=hi THEN  GO TO 490
420 LET q=hi-tot+1
425 IF ovs=50 THEN  GO TO 435
430 LET p=40-ov: LET t=q/p: GO TO 440
435 LET p=50-ov: LET t=q/p
440 LET t$=STR$ t: PRINT AT 21,17;"Reqd.R/R "
450 IF LEN t$<3 THEN  PRINT AT 21,27;t$+".0": GO TO 480
460 IF LEN t$=3 THEN  PRINT AT 21,27;t$: GO TO 480
470 IF LEN t$>3 THEN  PRINT AT 21,27;t$( TO 4): GO TO 480
480 PAUSE 0
481 IF INKEY$<>"r" AND INKEY$<>"R" THEN  GO TO 480
482 PRINT  INK 4;AT 21,0;"                                                ": GO TO 1
00
```



Variables

V(1) scores for player on scoreboard
1 variable for player, no score
bw current bowler's number
lw score at which last wicket fell
wkt number of wickets fallen
tot total runs at current time
ov overs elapsed
pl current player's score
no current batman's number
bal ball number of current over
V random number plus formula
r run rate (total ÷ over)
q high total (for required run rate)
ovs number of overs chosen (40 or 50)
p 40-over (for required run rate)
t 9 ÷ p (for require run rate)
z (bal*4 + 1) position for display
hi initial total to aim for (updated if chosen)
rr tot-hi, rs hi tot. For "won by runs" on scoreboard
sk skill factor chosen

**r$** STRS$ r
**t$** STR$ t
c$ keyboard response (copy board)
e$ date
w$ players' names
x$ home team
f$ away team
keyboard responses:
s$ another innings
g$ copy card
y$ same match details
q$ instructions
b$ instructions again
i$ details correct

Choose a county match or face some of the best international teams in One Day Cricket, a Spectrum game by R. Butcher

How it works

40-92 set variables
110-150 check keyboard for input
160-340 result for that particular ball
350-360 stops run rate/required run rate midway through over
370-400 works out/prints run rate
410 checks total behind so run rate may be printed
420-470 work out/print required run rate
480-493 reprints over required run rate and run rate, returns to game
500-560 add wickets/runs to total/player's score
570-630 print result of ball at appropriate position
640-670 increment variables
690-720 print new data, updated if necessary after each ball
730 checks if wickets equal 10 for end of game
740 checks if more balls to over, if so returns to game
750-751 check if BAL = 1, if so "end of over," deletes displays
752-760 check if end of over has been reached, if not return to game
770 "end of innings" printed. Asks if copy wanted
800-921 prints out scorecard
930-958 card copy option, match details option
970 end screen
1000-1030 if wicket falls spectators raise arms
1040-1260 title screen
1290-1370 instructions
1390-1408 input details
1409-1565 UDGs
1580-1720 set up screen display
2000-2002 if overs equal 40 picks county team
2500 if overs equal 50 picks national team
2502-2552 screen displays

```
 490 PRINT  INK 4;AT 21,17;"                    "
 491 PAUSE 0
 492 IF INKEY$<>"r" AND INKEY$<>"R" THEN  GO TO 491
 493 PRINT  INK 4;AT 21,1;"                      ": GO TO 100
 500 LET tot=tot+0: GO SUB 980: GO TO 570
 510 LET wkt=wkt+1: GO SUB 660: GO SUB 1000: LET pl=0: LET no=no+1: GO SUB 980:
GO TO 580
 520 LET tot=tot+1: LET pl=pl+1: GO SUB 980: GO TO 590
 530 LET tot=tot+2: LET pl=pl+2: GO SUB 980: GO TO 600
 540 LET tot=tot+3: LET pl=pl+3: GO SUB 980: GO TO 610
 550 LET tot=tot+4: LET pl=pl+4: GO SUB 980: GO TO 620
 560 LET tot=tot+6: LET pl=pl+6: GO SUB 980: GO TO 630
 570 GO SUB 640: PRINT  BRIGHT 1; INK 2;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO TO 690
 580 GO SUB 640: PRINT  BRIGHT 1;AT 12,z;"BD ";AT 13,z;"BC ";AT 14,z;"BC ";AT
15
,z;"BC ": PAUSE 15: BEEP .01,0: PRINT  BRIGHT 1;AT 12,z;"EFM";AT 13,z;"BGK";A
T 1
4,z;"BLJ";AT 15,z;"BHI": GO SUB 1030: GO TO 690
 590 GO SUB 640: PRINT  BRIGHT 1; INK 4;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO TO 690
 600 GO SUB 640: PRINT  BRIGHT 1; INK 3;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO TO 690
 610 GO SUB 640: PRINT  BRIGHT 1; INK 5;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO TO 690
 620 GO SUB 640: PRINT  BRIGHT 1; INK 6;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO TO 690
 630 GO SUB 640: PRINT  BRIGHT 1; INK 1;AT 12,z;"  ";AT 13,z;"  ";AT 14,z;"
 "
;AT 15,z;"  ": GO SUB 1020: GO TO 690
 640 LET z=(bal*4+1)
 650 RETURN
 660 LET l=l+1
 670 LET v(l)=pl
 680 RETURN
 690 PRINT AT 6,14;tot
 700 PRINT AT 8,15;;wkt
 710 PRINT AT 5,22;no
 720 PRINT AT 7,21;pl
 730 IF wkt=10 THEN  GO TO 770
 740 IF bal<6 THEN  GO TO 80
 750 IF bal=6 THEN  PRINT  FLASH 1;AT 21,0;"END OF OVER": PAUSE 50: PRINT  INK 4
;AT 21,0;"                    ": FOR a=5 TO 25 STEP 4: FOR b=12 TO 15: PRINT AT b,a;"
   "
: NEXT b: NEXT a: LET bal=0: LET ov=ov+1
 751 LET bw=bw+1: PRINT  INVERSE 1;AT bw+4,27;" ": IF bw=6 THEN  LET bw=1
 752 IF ov<40 THEN  GO TO 70
 760 IF ov=40 AND ovs=40 THEN  PRINT AT 10,15;"40": LET l=l+1: LET v(l)=pl: GO T
O 770
 761 IF ov<50 AND ovs=50 THEN  GO TO 70
 762 IF ov=50 AND ovs=50 THEN  PRINT AT 10,15;"50": LET l=l+1: LET v(l)=pl
 770 PRINT  FLASH 1;AT 21,18;"END OF INNINGS": PAUSE 200: PRINT  INK 4;AT 21,18;
"                    "
 780 INPUT "ZX printer copy (y/n)?";c$
 790 IF c$="y" OR c$="Y" THEN  GO SUB 2550: COPY : GO TO 780
 791 IF c$<>"n" AND c$<>"N" THEN  GO TO 780
 800 IF ovs=50 THEN  GO TO 811
 801 CLS : PRINT '''''''': FOR l=1 TO 11: PRINT TAB (20);v(l): NEXT l
 802 PRINT AT 1,3;"Chelmsford";AT 1,18;e$
 803 PRINT AT 2,14-LEN x$;x$;AT 2,15;"v";AT 2,17;f$: PRINT AT 5,INT 15-(LEN x$-1
)/2;x$
 804 PRINT '
```

```
 805 RESTORE 805: FOR a=1 TO 11
 806 READ w$
 807 PRINT TAB (6);w$
 808 NEXT a
 809 DATA "G.Gooch","B.Hardie","K.McEwan","K.Fletcher","K.Pont","S.Turner","D.Pr
ingle","D.East","N.Phillip","N.Foster","J.Lever"
 810 GO TO 890
 811 CLS : PRINT '''''''': FOR l=1 TO 11: PRINT TAB (20);v(l): NEXT l
 812 PRINT AT 1,3;"Lords";AT 1,18;e$
 813 PRINT AT 2,14-LEN x$;x$;AT 2,15;"v";AT 2,17;f$: PRINT AT 5,INT 15-(LEN x$-1
)/2;x$
 814 PRINT '
 815 RESTORE 815: FOR a=1 TO 11
 816 READ w$
 817 PRINT TAB (6);w$
 818 NEXT a
 819 DATA "G.Fowler","C.Tavare","D.Gower","A.Lamb","D.Randall","I.Botham","B.Tay
lor","G.Dilley","N.Cowans","N.Foster","R.Willis"
 890 PRINT AT 19,6;"TOTAL(";wkt;AT 19,14;"wkts)";AT 19,20;tot
 900 PRINT AT 20,8;ov;AT 20,10;".";AT 20,11;bal;AT 20,13;"overs"
 901 LET rr=tot-hi: LET rs=hi-tot
 902 IF tot=hi THEN  GO TO 910
 903 IF tot>hi THEN  GO TO 911
 904 IF hi>tot THEN  GO TO 912
 910 PRINT AT 4,10-LEN x$;x$;AT 4,11;"drew with ";AT 4,21;f$: GO TO 919
 911 PRINT AT 4,11-LEN x$;x$;AT 4,12;"won by ";rr;AT 4,23;"runs": GO TO 919
 912 PRINT AT 4,11-LEN f$;f$;AT 4,12;"won by ";rs;AT 4,23;"runs"
 919 PLOT 12,172: DRAW 230,0: DRAW 0,-169: DRAW -230,0: DRAW 0,169
 920 PLOT 159,31: DRAW 25,0
 921 IF tot>hi THEN  LET hi=tot
 930 INPUT "ZX printer copy ?(y/n)";g$
 940 IF g$="y" OR g$="Y" THEN  COPY : GO TO 930
 941 IF g$<>"n" AND g$<>"N" THEN  GO TO 930
 950 INPUT "Do you want another innings?";s$
 951 IF s$="y" OR s$="Y" THEN  GO TO 955
 952 IF s$<>"n" AND s$<>"N" THEN  GO TO 950
 953 GO TO 970
 955 INPUT "Same match details ?";y$
 956 IF y$="y" OR y$="Y" THEN  BORDER 4: GO TO 30
 957 IF y$<>"n" AND y$<>"N" THEN  GO TO 955
 958 GO TO 29
 970 CLS : BORDER 4: PRINT "       ...CLOSE OF PLAY...": PRINT '"As the sun slowl
y sets over the wicket,we must bid farewell to  another day's exciting cricket.
The teams,players and spectators will be here the same time     tomorrow - will
you set a new   record runs total,or be bowled  out for a record low ?.Will one
of your batsmen score an all    time record over 40 or 50 overs?Who knows what m
ay happen in    another game of..."
 971 PRINT AT 15,8;"ONE DAY CRICKET"
 972 PAUSE 0
 980 LET bal=bal+1
 990 RETURN
1000 PRINT AT 18,22;tot: PRINT  INVERSE 1;AT 7,21;"   "
1010 RETURN
1020 PRINT AT 16,0;"PPPP";AT 15,0;"QQQQ": PAUSE 35: PRINT AT 15,0;"    ";AT 1
6,0
;"NNNN": RETURN
1030 PRINT AT 16,29;"PPP";AT 15,29;"QQQ": PAUSE 35: PRINT AT 15,29;"   ";AT 16
,2
9;"NNN": RETURN
1040 CLS : PAPER 4: BORDER 4
1050 PLOT 15,159: DRAW 15,0: DRAW 0,-22: DRAW -15,0: DRAW 0,22
1060 PLOT 38,137: DRAW 0,22: DRAW 15,-22: DRAW 0,22
1070 PLOT 76,137: DRAW -15,0: DRAW 0,22: DRAW 15,0: PLOT 61,148: DRAW 15,0
1080 PLOT 96,137: DRAW 0,22: DRAW 8,0: DRAW 8,-11: DRAW -8,-11: DRAW -8,0
1090 PLOT 120,137: DRAW 8,22: DRAW 8,-22: PLOT 124,147: DRAW 8,0
1100 PLOT 151,137: DRAW 0,14: DRAW -8,8: PLOT 151,151: DRAW 8,8
1110 PLOT 31,88: DRAW -15,0: DRAW 0,22: DRAW 15,0
```

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1120 PLOT 39,88: DRAW 0,22: DRAW 15,0: DRAW 0,-11: DRAW -15,0: DRAW 15,-11
1130 PLOT 67,88: DRAW 0,22
1140 PLOT 95,88: DRAW -15,0: DRAW 0,22: DRAW 15,0
1150 PLOT 103,88: DRAW 0,22: PLOT 119,88: DRAW -15,11: DRAW 15,11
1160 PLOT 143,88: DRAW -15,0: DRAW 0,22: DRAW 15,0: PLOT 143,99: DRAW -15,0
1170 PLOT 159,88: DRAW 0,22: PLOT 151,110: DRAW 15,0
1180 PLOT 223,144: DRAW 6,0: DRAW 0,-40: DRAW 7,0: DRAW ,-93: PLOT 216,11: DRAW
0,93: DRAW 7,0: DRAW 0,40: PLOT 216,11: DRAW 20,0,PI/2
1190 PLOT 224,144: DRAW 0,-40: PLOT 228,144: DRAW 0,-40: PLOT 226,87: DRAW 0,-62
: PLOT 220,95: DRAW 6,-8: PLOT 232,95: DRAW -6,-8
1200 PLOT 199,8: DRAW 0,80: DRAW -32,0: DRAW 0,-80: PLOT 183,8: DRAW 0,80
1210 CIRCLE 127,40,20: PLOT 127,20: DRAW 0,40: LET a=123: FOR b=20 TO 60 STEP 3:
 PLOT a,b: NEXT b: LET a=131: FOR b=20 TO 60 STEP 3: PLOT a,b: NEXT b
1220 PRINT AT 16,2;"by";AT 18,2;"R.Butcher"
1230 PRINT AT 19,3; 1984"
1260 INPUT "Instructions ? (y/n)";a$
1270 IF a$="y" OR a$="Y" THEN  GO TO 1290
1271 IF a$<>"n" AND a$<>"N" THEN  GO TO 1260
1280 GO TO 1390
1290 INK 7: CLS : PRINT "INSTRUCTIONS FOR ONE DAY CRICKET": PRINT "_____________
_____________________"
1300 PRINT "In this game you act for the    side batting.One Day Cricket    cons
ists of 40 overs(County) or 50 overs(International); ending either at the end of
 the        allotted overs or the loss of 10wickets,whichever the sooner.": PRIN
T "The scoreboard keeps you        informed of what is happening   after every d
elivery.": PRINT "For a ball to be bowled press   either the keys 1 2 OR 3.": PR
INT  INVERSE 1;AT 19,10;"PRESS ANY KEY"
1310 PAUSE 0: CLS : PRINT "These keys also simulate the    batsmans stroke to th
at         particular delivery.The keys    represent as follows..."
1320 PRINT '"1  DEFENSIVE STROKE"
1330 PRINT "2  ATTACKING/SOLID STROKE"
1340 PRINT "3  AGGRESSIVE STROKE"
1350 PRINT '"By tactical use of these keys   for each ball,you determine the out
come (NO-SCORE,RUNS SCORED,  OUT).": PRINT "(e.g)Using the 1 key will not   prod
uce as many runs as 2 OR 3  but there is less chance of     being out.": PRINT
INVERSE 1;AT 19,10;"PRESS ANY KEY": PAUSE 0: CLS : PRINT "The following statisti
cs are    also determined  by the key     chosen.  (RUNS/OVER:RUNS/WICKET OVERS/
WICKET)."
1360 PRINT "Apart from these set ratios,alsotaken into account are...       (a)B
atsmans No [1-10]          (b)Bowlers No [1-5]            (c)Players current s
core        For both (a)&(b)the best playershave the lowest No.             At t
he bottom left corner of theScoreboard will be a team      displayed at random,
along with  their score that you are trying to beat.Before the first inningsthis
 score is determined by     choosing a SKILL FACTOR(1-5).": PRINT  INVERSE 1;AT
19,10;"PRESS ANY KEY": PAUSE 0: CLS
1361 PRINT "1 being the easiest.This score  is then treated as a -hi score- bein
g updated with your hi totalif that is the case after every innings.After each i
nnings you  have the option of changing the MATCH DATA which will result in a ne
w randomly chosen target    independent of your hi-score."
1362 PRINT "By pressing the R  key you are  given your RUN RATE and the     REQU
IRED RUN RATE to beat the   opponents total.This key will   only operate at the
end of an   over.Pressing R again will      return you to the game.At the   end
of the innings  you  are    offered the option of a COPY of both the SCOREBOARD
and        SCORECARD ON THE ZX printer."
1370 INPUT "Instructions again ? (y/n)";b$
1380 IF b$="y"OR b$="Y" THEN  GO TO 1290
1381 IF b$<>"n" AND b$<>"N" THEN  GO TO 1370
1390 INK 0: PAPER 7: CLS : PAPER 7: PRINT AT 0,10;"MATCH DATA": PLOT 75,175: DRA
W 0,-11: DRAW 89,0: DRAW 0,11
1391 INPUT "Date";e$
1392 IF LEN e$>12 THEN  GO TO 1391
1393 PRINT  INVERSE 1;AT 3,3;"Date          - ";e$
1394 INPUT "No of overs ";ovs
1395 IF ovs<>40 AND ovs<>50 THEN  GO TO 1394
1396 PRINT  INVERSE 1;AT 5,3;"Overs         - ";ovs
1401 INPUT "Skill factor (1-5) ";sk
1402 IF sk<>1 AND sk<>2 AND sk<>3 AND sk<>4 AND sk<>5 THEN  GO TO 1401
```

```
1403 PRINT  INVERSE 1;AT 7,3;"Skill factor  - ";sk
1404 LET hi=(4*ovs)+(sk*25)-INT (RND*20)+1
1405 INPUT "Are the above correct";i$
1406 IF i$="y" OR i$="Y" THEN  RETURN
1407 IF i$<>"n" AND i$<>"N" THEN  GO TO 1405
1408 GO TO 1390
1409 RESTORE 1409: FOR f=USR "a" TO USR "q"+7: READ x: POKE f,x: NEXT f
1410 DATA 24,24,24,24,24,24,24,24
1420  DATA 0,0,0,0,31,31,24,24
1430 DATA 198,198,198,198,198,198,198,198
1440 DATA 0,0,0,0,254,254,198,198
1450 DATA 0,24,56,112,96,0,24,24
1460 DATA 0,0,0,0,0,0,192,192
1470 DATA 192,206,223,223,223,206,192,192
1480 DATA 192,192,193,193,195,195,199,199
1490 DATA 192,192,128,128,0,0,0,0
1500 DATA 12,12,24,24,48,48,96,96
1510 DATA 0,0,0,0,3,3,7,6
1520 DATA 192,192,192,192,192,192,192,192
1530 DATA 0,0,192,224,112,48,0,0
1540 DATA 24,36,36,60,66,129,129,129
1550 DATA 0,0,36,36,66,66,66,66
1560 DATA 153,165,165,60,66,129,129,129
1565 DATA 0,56,124,124,124,56,0,0
1570 RETURN
1580 CLS : PAPER 7: BORDER 0
1590 FOR a=3 TO 14: PRINT  INK 5;AT a,0;"▒▒▒▒▒▒": NEXT a
1600 FOR a=3 TO 14: PRINT  INK 5;AT a,29;"▒▒▒▒": NEXT a
1610 FOR b=0 TO 2: FOR a=0 TO 31: PRINT  INK 5;AT b,a;"▒": NEXT a: NEXT b
1620 FOR b=21 TO 20 STEP -1: FOR a=0 TO 31: PRINT  INK 4;AT b,a;"▒": NEXT a: NE
X
T b
1630 FOR a=4 TO 28: FOR b=3 TO 19: PRINT AT b,a;"▒": NEXT b: NEXT a
1640 PRINT  INVERSE 1;AT 4,13;"TOTAL";AT 5,20;"No  "
1641 PRINT  INVERSE 1;AT 5,25;"Bwl"
1642 PRINT  INVERSE 1;AT 6,26;"1";AT 7,26;"2";AT 8,26;"3";AT 9,26;"4";AT 10,26;"
5"
1650 PRINT  INVERSE 1;AT 6,14;"   "
1660 PRINT   INVERSE 1;AT 8,10;"WKTS";AT 8,15;"  "
1670 PRINT  INVERSE 1;AT 10,9;"OVERS";AT 10,15;"  "
1680 FOR A=5 TO 25 STEP 4: FOR B=12 TO 15: PRINT AT B,A;"   ": NEXT b: NEXT a
1690 PRINT  INVERSE 1;AT 17,18;"LAST"
1700 PRINT  INVERSE 1;AT 18,18;"WKT";AT 18,22;"   "
1710 FOR a=16 TO 19: PRINT AT a,0;"NNNNN": NEXT a
1720 FOR a=16 TO 19: PRINT AT a,29;"NNN": NEXT a
1730 RETURN
2000 IF ovs=50 THEN  GO TO 2500
2001 RESTORE 2001: FOR a=1 TO INT (RND*16)+1: READ f$: NEXT a
2002 DATA "Notts","Sussex","Somerset","Middlesex","Surrey","Hampshire","Leics","
Kent","Yorks","Derbys","Gloucs","Glamorgan","Northants","Lancs","Warwicks","Worc
s"
2003 PRINT  INVERSE 1;AT 17,5;f$
2004 LET x$="ESSEX": PRINT  INVERSE 1;AT 6,5;x$
2005 RETURN
2500 RESTORE 2500: FOR a=1 TO INT (RND*6)+1: READ f$: NEXT a
2501 DATA "Australia","India","Pakistan","Sri Lanka","W.Indies","N.Zealand"
2502 PRINT  INVERSE 1;AT 17,5;f$
2503 LET x$="ENGLAND": PRINT  INVERSE 1;AT 6,5;x$
2504 RETURN
2550 FOR a=3 TO 14: PRINT AT a,0;"    ": NEXT a
2551 FOR a=3 TO 14: PRINT AT a,29;"   ": NEXT a
2552 FOR b=0 TO 2: FOR a=0 TO 31: PRINT AT b,a;" ": NEXT a: NEXT b
2553 RETURN
9999 SAVE "oneday" LINE 1
```

CHARTBUSTERS

BRITAIN'S SOFTWARE CHARTS

by the ASP Market Research Group

ARCADE

1	Sabre Wulf	Ultimate	Spectrum (-)
2	Beach Head	US Gold	CBM (2)
3	Loco	Alligata	CBM 64 (3)
4	Psytron	Beyond	Spectrum (5)
5	Omega Race	Commodore	CBM 64 (4)
6	Trashman	Quicksilva	CBM 64 (7)
7	Oblivion	Bug-Byte	Spectrum (6)
8	Son of Blagger	Alligata	CBM 64 (9)
9	Trashman	New Generation	Spectrum (10)
10	Munch Mania	Mastertronic	CBM 64 (-)

NON-ARCADE

1	Mugsy	Melbourne House	Spectrum (1)
3	Flight Path 737	Anirog	CBM 64 (2)
3	Lords of Midnight	Beyond	Spectrum (4)
4	Sphinx Adventure	Acornsoft	BBC (3)
5	The Inferno	R. Shepherd	Spectrum (6)
6	Mastermind	Commodore	CBM 64 (5)
7	Valhalla	Legend	CBM 64 (7)
8	The Fall of Rome	APS	Spectrum (9)
9	Quizmaster	Commodore	CBM 64 (10)
10	Solo Flight	US Gold	CBM 64 (8)

Compiled with the assistance of Britain's leading software distributors, including: Pinnacle, SDL, PCE, Websters, PCS and Software Centre.

SPECTRUM

1	Sabre Wulf	Ultimate (1)
2	Jet Set Willy	Software Projs (-)
3	Stop the Express	Sinclair (9)
4	Match Point	Sinclair (-)
5	Mugsy	Melbourne Hse (-)
6	Atic Atac	Ultimate (-)
7	Scuba Dive	Martech (-)
8	Fighter Pilot	Digital Integratn (-)
9	Night Gunner	Digital Integratn (-)
10	Manic Miner	Software Projs (-)

COMMODORE 64

1	Manic Miner	Software Projs (-)
2	Beachhead	Centresoft (-)
3	Solo Flight	Centresoft (-)
4	Colossus Chess	CDS (-)
5	Chuckie Egg	A & F (-)
6	Snooker	Visions (-)
7	Superpipeline	Tasket (-)
8	Megawarz	Paramount (-)
9	Chinese Juggler	Microsoft (-)
10	Revelation	Softek (-)

DRAGON 32

1	Buzzard Bait	Microdeal (-)
2	Cuthbert in Space	Microdeal (-)
3	Hungry Horace	Melbourne Hse (-)
4	Bug Diver	Mastertronic (-)
5	Dragon Chess	Oasis Software (-)
6	Mr Dig	Microdeal (-)
7	Sprite Magic	Knight (-)
8	Chuckie Egg	A & F (-)
9	Transylvanian Twr	R. Shepherd (-)
10	Hunchback	Ocean (-)

Compiled by W. H. Smith and Websters. Figures in brackets are last week's positions.

VIC-20

1	Computer War	Creative Sparks (-)
2	Tank Commander	Creative Sparks (-)
3	Chariot Race	Microantics (-)
4	Snooker	Visions (-)
5	Flight 015	Ferranti/Craig (-)
6	Games Designer	Galactic (-)
7	Wizard and the Princess	Melbourne House (-)
8	Grandmaster Chess	Audiogenic (-)
9	Duck Shoot	Mastertronic (-)
10	Tower of Evil	Creative Sparks (-)

BBC

1	Aviator	Acornsoft (-)
2	JCB Digger	Acornsoft (-)
3	Linkwood French	Acornsoft (-)
4	Linkwood German	Acornsoft (-)
5	Ghouls	Micropower (-)
6	Fortress	Pace (-)
7	Snooker	Acornsoft (-)
8	Snooker	Visions (-)
9	Twin Kingdom Valley	Bug-Byte (-)
10	Tree of Knowledge	Acornsoft (-)

ZX81

1	Krypton Ordeal	Novus (4)
2	Black Crystal	Carnell (9)
3	Planet Raider	Novus (8)
4	Walk the Plank	Novus (5)
5	Sabotage	Sinclair (10)
6	Space Raiders	Sinclair (-)
7	Flight Simulation	Sinclair (-)
8	Chess 1K	Sinclair (-)
9	Reversi	Sinclair (-)
10	City Patrol	Sinclair (-)

MSX computers are big news. Backed by some of the biggest names in electronics, the stylish new computers are due in the UK from Japan in September.

In this issue of MSX Computing we question the companies about their MSX plans. And, in an exclusive article, Graham Knight, of Knights TV and Computers, gives you a head start in programming the MSX micros.

Number 3

MSX COMPUTING

July 24, 1984

We give you the rundown on who's planning what for MSX

Yamaha's MSX micro, due here in November, will also be a musical instrument, with its own remote piano-style keyboard.

The system will cost about £600 and will comprise Yamaha's CX5 computer with a built-in sound module and added keyboard.

Jerry Uwins, marketing manager for the company's UK arm, Kemble-Yamaha, said "With 48 preset sounds it can sound like a piano, trumpet, violin... any instrument you care to name.

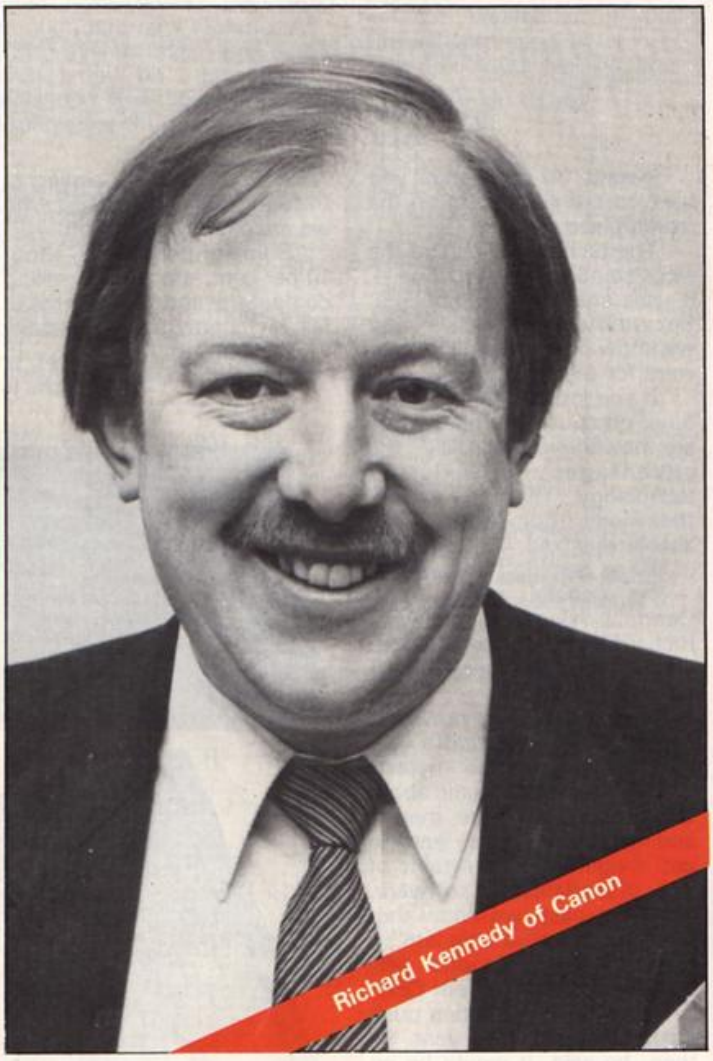
"Composing is going to be one particular feature.

"One of the important points to stress is that the various squeaks and squawks that you get out of Commodore and Sinclair are not in the same league.

"The sound is very similar to our DX9 synthesiser, which is a proper, pedigree musical instrument using proper classical notation."

The MSX computer from Sony will probably be called the Hit Bit.

Sony's new business manager, Mike Margolis, explained: "Until a week before we launched the Walkman we were in two minds about whether to use the name.



Richard Kennedy of Canon

"We thought: 'Why call it a silly name like Walkman... it's ridiculous'. We thought long and hard about it. But it's now part of the language. It has a personality and it's part of a lifestyle.

"A lot of the thinking behind the computer was done by the same people who are behind the Walkman, so we would expect the same unique approach. The uniqueness of the name has been an advantage to the Walkman and it would be the same for the computer."

Sony's present range of products in the UK include hi-fi, audio, video, TV and broadcasting equipment for both TV and radio.

And Mr Margolis said the computer would be sold through dealers who are currently selling Sony products.

Answering criticisms that the MSX standard could delay computer development, he said: "The way we see home computers is that they have traditionally been developed by boffins, reviewed by boffins and bought by boffins.

"They are people who are interested in computers for their own sakes. We believe there are a lot of people who are interested in home entertainment, not only to do their own programming.

"There is a large number of people who are afraid of buying home computers. They are not sure what to buy and they have a whole list of fears."

The only reason for innovation was to bring benefits to the consumer — which would continue to be done with MSX — but there was no point in putting the latest chip into a home computer to sort 10 megabytes of information more quickly.

Speed of games was important, though. And the format allowed considerable sophistication, not only with discs and the CP/M business operating system to come, but also the possibility of a second processor — increasing speed by two to three times — within about three years.

He stressed, however, that the computers would always be upward-compatible. The companies making them were highly competitive and their only common ground was compatibility.

Mr Margolis said Sony would be bringing out its own

Continued on page 3.

What MSX will mean

MSX will cure the major headache for home computer users and dealers: software for one micro won't generally work on another maker's range.

Several Japanese companies have got together to bring out computers which all use the same BASIC and operating system. And European and American computer makers are thinking of doing the same.

It means that all software and peripherals will run on any computer using the same standard, designed by the U.S. company Microsoft. MSX stands for Microsoft Extended.

MSX computers are due in the shops in September from, among other companies, Hitachi, Teleton, Sanyo, Mitsubishi, Sony, Toshiba, Canon and Yamaha.

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Continued from page 1.

peripherals, like disc drive and joystick, but probably not a standard joystick.

He said: "We pride ourselves on being innovative."

Toshiba expects to have its computer in the shops in September/October. Product manager Chris Greet said: "We're been ahead of the field in Japan, so we will possibly be one of the first in the UK."

UK buyers had the advantage that they would be getting the second generation of MSX computers, advanced on what first went on sale in Japan.

Talking of computer development, he said that the problem with boffins and research staff was that they always wanted to wait for the next advance before bringing out a computer.

He said: "At some stage you have to put something on the marketplace.

"The technology behind the MSX standard is not unique — it uses standard components. But we know the reliability and we know how to develop software for the computers.

"If you look at the problems other computer manufacturers are having you can see the advantages of existing technology, That isn't to say that our computers are absolutely fixed. There's a lot of things coming from Japan."

The general manager of Canon's systems division, Richard Kennedy, expected his company's computer to start arriving in October.

He was cautious, however, saying: "We are taking a very advised view of the market. We are very enthusiastic about the product and the market and we are trying very hard to get it right from the point of view of availability of software. From the past, we know that software can be a little late."

He expected Canon's 64K computer, costing about £250, to get a major marketing push in the spring of next year. By then, he said, it would be on sale in every major high street retailer.

He expected tremendous competition between the makers of MSX computers.

The objects of the MSX working party had been superb but "certain people" would now adopt the standard after the hard work had been done by the founders.

He felt that in the beginning there may be some confusion in the minds of buyers about which MSX computer to choose. But this would be cleared up as each manufacturer advertised and promoted its additional features.

He said: "At the end of the day the machines are completely different. Some have cassettes built in, some have got built-in joysticks."

JVC's computer, made in the town of Ewai, 50 miles north of Tokyo, will also have 64K of RAM and cost will be about £250. The company also plans to offer a monitor, 3½in disc drive and a data recorder.

JVC's assistant marketing manager, Stephen Michaelis, said his company was also thinking of introducing a 5¼in drive because that format was quite popular.

He said: "We are aiming at the audio and video dealer who we are already supplying.

"Some of the dealers, about 10 per cent, are already selling computers and they know a fair bit about them. We have two training centres, in London and in Leeds, and we'll be running training courses for dealers before the launch."

There would also be training for service engineers at the same centres, as well as in Scotland and Ireland.

Mr Michaelis said: "I don't see many problems on that side — video recorders are far more complex and our dealer network can service them already. Computers are a piece of cake."

JVC, short for the Japan Victor Company, is the inventor of the VHS video recorder format — which now had a claimed 80 per cent of the market — and makes video recorders, TVs, hi-fi, including compact disc players, as well as other products. It employs 1,200 people worldwide.

Mr Michaelis expected JVC to export its computer to most of Europe, starting with France and Germany next year.

But supplies for the UK would at first be limited. He said: "It's very critical coming into the market in October. This year I don't think we will be able to meet demand because it's coming too late."

The big names behind MSX reveal their plans for their own machines. What sets them apart from each other? Paul Liptrot investigates



New Series

HOW TO USE YOUR MSX MICRO

MSX computers have been on sale in Japan since October 1983 and we have been fortunate enough to have had MSX models at Aberdeen since that time. The purpose of this series of How to MSX articles is to assist readers in understanding all the features and complexities of the MSX range.

The MSX concept is a simple one — MSX seeks to set a standard for home computers. Manufacturers joining the MSX Group agree to make computers to the same technical and software specification.

As all MSX computers have the same cassette, joystick, cartridge and printer interfaces, software and peripherals made by, say, Tobisha, will run on a Sanyo or any other MSX micro.

The MSX concept has had the backing of at least 20 of the largest Japanese electronic corporations since 1983 and they have been joined this by European giants G.E.C. and Philips.

MSX has already taken a large slice of the Japanese home computer market. With the might of companies like Canon, Hitachi, JVC, Mitsubishi, Sanyo, Sony, and Toshiba combining to make computers to a single standard, there is no doubt that MSX will also take a substantial share of the European market.

The manufacturers aim to sell their micros as "family computers".

As each MSX Group member also manufacturers home entertainment products it is no surprise that MSX micros can be interfaced with radio, TV, hi-fi and video equipment. JVC, the manufacturer which invented the VHS video system, has already shown its micro linked interactively with a video disc player. JVC and the other manufacturers see MSX as setting the standard for home computers, just as VHS sets the standard for video recorders.

Each MSX micro has an extended version of Microsoft Basic in ROM. Switching on a typical MSX micro boots the BASIC which is in a 32K ROM which occupies an area of memory from 0000H to 7FFFH.

The computer then finds the largest continuous block of memory from FFFFH down to 8000H and uses this for program and data storage. All MSX micros start up with white letters on a blue background. The following is displayed at the top left:

MSX BASIC version 1.0
Copyright by Microsoft
28815 Bytes free.
Ok

The start up mode is SCREEN 0 (detailed later) and line 24 of the screen displays the words:

color auto goto list run

to remind users of the initial definitions of the five function keys. This line changes to show:

colour cload" cont list. run

● **Program 1 — displays bars of all 16 colours**

```
100 COLOR 15,1,1:SCREEN 2
110 OPEN "GRP:"AS#1
120 PRESET (35,5)
130 PRINT #1,"A CORRECTLY ADJUSTED SE
T"
140 PRESET (35,15)
150 PRINT #1,"SHOWS 15 COLOURS & BLAC
K"
160 CLOSE #1
170 FOR G%=2 TO 15
180 COLOR G%
190 LINE (G%*16-15,30)-(G%*16,184),,B
F
200 NEXT G%
210 FOR D%=1 TO 12000:NEXT D%
```

● **Program 2 — shows all 256 characters**

```
100 COLOR 15,4,4:SCREEN 1
110 FOR F%=0 TO 19
120 FOR J%=0 TO 13
130 IF F%*14+J%<256 THEN VPOKE &H1842
+F%*32+J%*2,F%*14+J%
140 NEXT J%,F%
```

when the shift key is pressed. Function keys 1 to 5 become F6 to F10 when pressed with the shift. This visual reminder of the key definitions can be switched off and on with the KEYOFF and KEYON commands.

All MSX micros have 16K of built-in video RAM which is separate from the main memory. There is no reduction in the amount of memory free when you are in high-resolution or multi-colour modes. There are four screen modes which are specified by the first parameter of the SCREEN command.

The 16 colours available are:

0 transparent
1 black
2 medium green
3 light green
4 dark blue
5 light blue
6 dark red
7 cyan
8 medium red
9 light red
10 dark yellow
11 light yellow
12 dark green
13 magenta
14 grey
15 white

Program 1 displays bars of all the 16 colours on the high-resolution screen. After a short delay, the computer returns to the text mode.

Microsoft has obviously given a great deal of thought to the character set as it contains all the usual letters and figures plus many language, scientific, game and graphic shapes. The German umlauts, the French accents, circumflexes a the mathematical symbols will be especially popular with schools.

Program 2 displays all the 256 charactes on the screen.

SCREEN 0 is the first of the two text modes and gives a format of 24 lines each with up to 40 characters. All UK MSX micros default to 37 characters per line when switched on.

The WIDTH command selects the number of characters per line. It is possible to get the full 40 characters by entering WIDTH 40.

All Japanese MSX micros default to 40 characters. Perhaps our Far East friends know that very few UK TV sets have a picture width control which can be adjusted by the customer and that many sets therefore "overscan".

Each character displayed in this mode is made up of 6 x 8 pixels. The built-in character set stores 8 x 8 pixels, but in this mode the right-most two columns of pixels are not displayed.

When the screen mode is changed to 0 or 1, the character set is copied from ROM (Read Only Memory) to RAM (Random Access Memory) so this makes it possible to re-define any of the 256 characters. This feature allows special characters to be displayed without going into high-resolution mode. Two of the sixteen colours can be used in this screen 0 mode — one for foreground and one for background.

SCREEN 1 is the second of the text modes and gives a format of 24 lines each of up to 32 characters. Again the switch-on default width is less than the maximum possible — the default for screen 1 is 29 characters per line. To get the full number of characters per line enter WIDTH 32, but on nearly all UK TVs the left-most character would be off the edge of the screen.

The MSX specification defines the use of two colours in SCREEN 1 mode. In later

New Series
HOW TO USE YOUR MSX MICRO

issues of MSX COMPUTING, we will describe a programming method which allows all 16 colours to be displayed.

At present the character set is split up into 32 groups of eight characters and the foreground and background colours of each group are the same effectively giving a two colour display. Our method will show how to alter the foreground and background colour of all these 32 groups.

Remember it is also possible to redefine the shape of each character in screen 1 mode.

SCREEN 2 is the high-resolution mode which has 256 x 192 pixels definition. All 16 colours can be displayed at the same time.

The horizontal colour resolution is eight dots which means that in every group of eight adjacent horizontal dots, there can only be one foreground colour and one background colour. Any two of the 16 colours can be used for each group of 8 dots. The vertical colour resolution is one pixel, therefore any of the 16 colours can be placed next to each other vertically. There are many commands for creating hi-resolution patterns and they are all very flexible.

Program 3 demonstrates the speed of the computer and also shows all the colours. First hte computer is put into SCREEN 2 (hi-res mode) and then 100 boxes of random sizes and colours are displayed.

There is a command which allows printing of normal text on the hi-res screen. As the text can be placed anywhere on the 256 x 192 grid, this allows much greater control over where it is printed than in either of the text modes.

SCREEN 3 is the multi-colour mode and has 64 x 48 resolution. Each of the 3072 pixels on the screen can be in any of the 16 colours.

When text is printed to this screen, all the pixels that make up the characters turn on one of the SCREEN 3 pixels which are equivalent to a square of sixteen SCREEN 2 mode pixels. Since the letters are made up of 8 x 8 dots, and the screen has 64 x 48 pixels, you can get 6 rows of eight characters in this mode. This is useful for title pages etc.

Program 4 draws 200 lines at random positions on the screen and shows the size of the pixels in the SCREEN 3 mode.

MSX computers can display up to 32 sprites at the same time and can remember up to 256 'sprite patterns'. Sprites are characters whose shape, colour and position can easily be defined. They can be placed much more exactly than characters can and there are built-in collision detection routines. There are four sprite modes, these are specified by the second parameter of the SCREEN command.

The four sprite modes are combinations of large or small sprites and magnified or unmagnified sprites. The modes are as follows:

0 8 x 8 unmagnified
1 8 x 8 magnified
2 16 x 16 unmagnified
3 16 x 16 magnified

The numbers refer to the number pixels make up the sprites e.g. a mode 2 sprite has 16 x 16 = 256 pixels. Magnified means that every pixel is the size of a square of four pixels, so the sprites become four times their normal size.

When using a 8 x 8 size, the computer can store up to 256 sprite patterns. When using a 16 x 16 size, the computer can store up to 64 sprite patterns. Remember — only 32 sprites can be displayed at the one time.

Program 5 shows a sprite in the shape of a knight bouncing off the edges of the screen. To stop the program press the CTRL and STOP keys at the same time.

Try changing both the occurances of the number 1 in line 160 to 2 and note that the sprite moves faster.

• Program 3 — demonstrates the speed of MSX computers

```
100 COLOR 15,1,1:SCREEN 2
110 FOR F%=1 TO 100
120 LINE (RND(1)*250,RND(1)*190)-(RND
(1)*250,RND(1)*190),RND(1)*14+2,BF
130 NEXT F%
```

• Program 4 — draws 200 lines and shows SCREEN 3 pixel sizes

```
100 COLOR 15,1,1:SCREEN 3
110 FOR F%=1 to 200
120 LINE (RND(1)*256,RND(1)*192)-(RND
(1)*256,RND(1)*192),RND(1)*15+1
130 NEXT F%
```

• Program 5 — a knight-shaped sprite bounces off the screen edges

```
100 COLOR 15,1,1:SCREEN 2,3
110 S$="":FOR F%=0 TO 31:READ A$
120 S$=S$+CHR$(VAL("&H"+A$)):NEXT F%
130 SPRITE$(0)=S$
140 DATA 0,1,6,1D,2A,2A,2A,1F,4C,F7,F
0,18,7,2,3E,FE,18,8F,65,11,C9,A9,81,F
3,7F,9F,31,41,81,81,F9,FD
150 X%=128:Y%=96
160 XS%=1:YS%=1
170 PUT SPRITE 0,(X%,Y%),13
180 X%=X%+XS%:Y%=Y%+YS%
190 IF X%<0 OR X%>210 THEN XS%=-XS%
200 IF Y%<0 OR Y%>156 THEN YS%=-YS%
210 GOTO 170
```






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Puzzles and adventures

Now get out of that! Our reviewers have tackled this software before, and this is what they think

Velnor's Lair 48K Oric/ 48K Atmos £6.95

Quicksilva, 13 Palmerston Rd, Southampton, Hants SO1 1LL

Quicksilva's first adventure game for the Oric is a classic all-text version, similar in layout to most others of its type. You choose the role of a warrior, priest or wizard in a quest to destroy the evil Velnor. Your journey will take you through dark caverns and passages where untold dangers lurk but vast treasures may also be found.

If you like adventures then Velnor offers a good challenge, with logical thought and inspiration both playing their part. An option to save the game at any stage is provided which worked satisfactorily and is probably essential if you do not have the patience to solve the puzzle in one go.

There is little assistance given and, by the nature of the game, this is correct. But perhaps some fundamental explanations of the very simplest moves and commands should have been supplied for the novice. The descriptions of your surroundings are quite realistic. If you are with children make sure they are not frightened by goblins, trolls or much worse nasties.

All in all, a fairly standard adventure without too many frills. **P.S.W.**

instructions	75%
playability	75%
graphics	N/A
value for money	80%

★ ★ ★ ★

Star Force Seven 32K BBC £9.99

Argus Press Software, No. 1 Golden Sq, London W1R 3AB

Another in the Mind Games series. My major criticism of this program is that the information screens, while clear and unambiguous, are most uninspiring. Even the major planet display is not very exciting.

The game is, however, a fully implemented, war based, strategy game and will appeal to those who enjoy a good long thoughtful battle amongst the stars. The aim is to destroy the home planet of the Zurgs or to capture, and keep, 25 of the other planets in the galaxy.

You start by choosing the proportions of each type of fighting ship to commission for the battle. Then you progress by three major stages, expressed as screens. The computer screen can give intelligence, energy status and fleet details whilst the navigational one allows star jumping, orbiting and attacking. If you are in orbit you may bombard, asault or retire. Notice that there is no chance of a friendly approach! In battle the screen is graphically much better as you watch the various ships being destroyed before your eyes. An interesting, yet not too long-winded, game to be sure. **D.C.**

instructions	55%
playability	80%
graphics	60%
value for money	70%

★ ★ ★ ★

Firelady plus Snakes and Ladders TI-99/4A £5

The first is quite long and takes some time to load. Judging by the awkwardness of the instructions it was written by a couple of youngsters and viewed in that light it is a very creditable effort. I don't know why the main character is a "fire-lady", but due credit for including the girls in the heroism charts.

A block of flats is ablaze and you must climb 10 floors to save an old man. You can play against the computer or another player and your movements are determined by dice. In fact, it's actually a revamped Snakes and Ladders — intelligently done, despite odd macabre moments. If you land on a smaller fire you must guess how many gallons of water are needed to extinguisher, and you've saved someone's life so you gain another throw; a skull and crossbones, and you'll need a '6'; and of course there are ladders.

By the same authors, the second program, also long, is a bog-standard Snakes and Ladders.

Both games make good, colourful use of graphics, and are aimed squarely at the younger users. **P.B.**

instructions	50%
playability	75%
graphics	85%
value for money	85%

★ ★ ★ ★

Gatecrasher 32K BBC £6.95

Quicksilva, 13 Palmerston Rd, Southampton, Hants SO1 1LL

With a chance of winning £200 on completion of this game, enthusiasm overwhelmed me.

On loading you are presented with a screen full of complex passages and angled gates. You are at the top clutching a barrel which you can roll left and right or drop down. If you drop it, it falls down passages bouncing off the gates at right angles, falling into one of eight holes at the bottom. When the barrel drops on any gate it swivels to slant in the opposite direction.

The object is to fill all nine holes with 20 barrels, which is not as easy as it sounds. If a barrel is accidentally dropped in a full hole all the barrels in that hole are wiped out. At first the game seems easy, but when you have only one hole left to fill you realise it isn't. If you're desperate the earthquake function can be used to swivel the gates at random.

After seeing the difficulty of the later stages I can safely say the £200 will be well earned. **M.B.**

instructions	80%
playability	60%
graphics	60%
value for money	80%

★ ★ ★ ★

The Mystery of the Java Star 32K BBC/ Electron £7.95

Shards, 189 Eton Rd, Ilford, Essex IG1 2UQ

If you like puzzles then this multi-faceted program may be just your cup of tea. To describe this as a program is far too mean, for the package comprises four individual, yet linked, games of different types and styles.

The first is called Bristol and involves the jigsaw type skills of piecing together a message. In London you must wander around researching your information ready to go exploring, the aim here being to get just the information you need at minimum cost in time and money. In Jamaica you go looking for an island to match your research and can survey those you find before landing to charter a boat.

Finally, you dive in your chosen location on the Seawitch in the hope that you find the ultimate goal — the beautiful Java Star ruby and all the gold that the wrecked ship carried. When you consider the cost of individual programs like this you can only conclude that this is exceptional value for money and, unlike short action games, the work involved is likely to take a number of days if not weeks. Its claim to be educational is reasonably fair too. Well done Shards! **D.C.**

instructions	75%
playability	90%
graphics	90%
value for money	100%

★ ★ ★ ★ ★

THOUGHTS & CROSSES

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All-action arcade aces

These fun games are hot news. Test your arcade skill and experience against them

Mined-Out 48K Oric/ Atmos £6.95

Quicksilva, PO Box 6, Wimbourne, Dorset BH21 7PY

A welcome change from space wars, Mined-Out requires more brain than brawn and one false move can lead to disaster. You are situated at the start of a minefield over which you must carefully pick your way to reach the next level. The snag is that you cannot see the mines and you only have one chance. All is not lost, however, since you know if one, two or three mines lie next to you and by getting the old grey matter working, it is possible to find a safe path.

As you progress, various complications arise but ultimate success is achieved when you reach level 8 and are permitted to rescue the famous star Bill the Worm. A neat reply facility is included for all us failures.

A clever game, simple to pick up, but requiring skill to master. For more thoughtful players it should provide some hours of diversion.

My only quibbles are that only a fast load version is available and the inlay card, although amusing, did not describe the game very accurately. **P.S.W.**

instructions	80%
playability	85%
graphics	80%
value for money	90%

★★★★

Gatecrasher 48K Spectrum £6.95

Quicksilva, PO Box 6, Wimbourne, Dorset BH21 7PY

No, it's not party time! You must drop barrels into a maze of tunnels, trying to get one barrel into each of the nine boxes at the base of the maze. However, the barrels look and sound like ball bearings!

If a barrel drops on to a gate it moves in the direction the gate is facing and flips it over.

A box will empty if a second barrel falls into it — and you're limited to only 20 barrels per level, so study the maze carefully! You are able to rotate the maze up or down and there's an earthquake feature which randomly alters some of the gates.

Levels five and six add a difficult twist. You must sort the barrels into numerical order. If a barrel drops into a box it swops places with its neighbour on the right.

The keys are user-definable making the barrel-dropping machine easy to control. It's interesting that the screen shot on the inlay is from a different version of the game.

Enjoyable, simple at first but becoming much more difficult. **S.E.**

instructions	70%
playability	90%
graphics	70%
value for money	70%

★★★★

Ugh! 48K Spectrum £5.95

Softek, 12/13 Henrietta St, London WC2

The Ice Age is coming so Ugh's got to stock up with food by stealing Ptery the Pterodactyl's eggs! Pterry, Rex the tyranosaurus and Alison the aliosaurus drop tones on Ugh.

As Ugh you must climb the hill to get the eggs. You have an unlimited amount of spears in your cave — but you can only carry one at a time. When you pick up an egg you leave yourself defenceless. Your pursuers are stupid and would be easy to avoid if it wasn't so difficult to move — to get on to a different path you must press up or down with left or right and be in exactly the right position. The rocks are accurate so they're difficult to avoid.

Graphics are excellent. Score and lives left are displayed on a tablet of stone, in keeping with the prehistoric scenario. The game starts with an excellent title screen and unbelievable sound. The keys can be redefined, or you can use a wide variety of joysticks.

Unfortunately, Ugh!'s lasting appeal is questionable because the 'maze' is tiny and there only appears to be one screen display. **S.E.**

instructions	80%
playability	65%
graphics	100%
value for money	75%

★★★★

Encounter CBM 64 £9.95

Novagen

This must be about the best arcade-style game I have seen on the CBM 64. It seems to be based on an arcade game which involves shooting line drawn tanks.

Encounter is a full colour game in which you must locate and destroy flying saucers. The display is a 3D picture with radar and scanners below. Cyclinders on the battlefield deflect shots from both yourself and the enemy craft. Sometimes missiles home in on you. If you don't destroy them immediately they smash into your shields.

Once you have killed all your enemies on one level you may go through a gate to the next one. You are propelled through a hailstorm. If you are hit by one of the spheres you are returned to the last level. If you get through you are awarded an extra shield and sent on to the next level.

The sound is excellent and realy makes the game interesting.

Graphics are quite outstanding. The 3D display is fast, smooth and flicker-free in its movement. The explosions are spectacular as debris flies all over before twinkling away. **K.I.**

instructions	60%
playability	95%
graphics	90%
value for money	90%

★★★★★

Horace Goes Skiing Dragon 32 £5.95

Melbourne House, Church Yard, Tring, Herts HP23 5LU

Horace wants to go skiing — but the ski hut is on the other side of a busy road. He must cross the road to get some skis then cross back to tackle the slalom course.

The first part, crossing the road, is rather like Frogger, and the second part bears some resemblance to a car race game. The traffic is fast and furious, and you need a lot of patience and skill to reach the ski slope.

The graphics are excellent, among the best I've seen on the Dragon. The traffic is very convincing, with slow-moving lorries and speedy little motorbikes as well as cars and tractors. The flags and fir trees in the second stage are simpler but still very effective. The sound is also good, and not over-done for once.

The game can be played using the keyboard, or, preferably, a joystick. There are a few minor faults — the demonstration mode described on the cassette inlay didn't appear to exist, and there is a fairly long delay before the game re-starts after you lose a life on the road. Overall, though, it's a good, entertaining game. **M.N**

instructions	75%
playability	80%
graphics	95%
value for money	80%

★★★★★

The more more you

Now that summer's finally here, all the insects are out and about and making the most of the warmer weather. So are you in this game.

You are a caterpillar and you spend most of the lazy hazy days of summer eating leaves. Your particularly favourite patch is the mushroom patch.

Eating leaves makes you grow at a miraculous rate. You can almost see yourself expand — it's a good thing that doesn't happen in real life! You must avoid bumping into your own body or colliding with mushrooms, or you'll lose one of your three lives. Once all your lives have been used up, the game ends.

Another obstacle to beware is the hedge bordering the mushroom patch. If you touch it the game ends.

Your first patch has 20 mushrooms and 10 leaves. Once you finish a patch, you move on to a new one with five more mushrooms and one more leaf. This makes each patch harder than the one before.

Control the caterpillar with the four cursor keys, keeping the alpha-lock button down. If you find the game too fast, stop the caterpillar moving by holding down any other key apart from the cursor keys.

Your score, patch number and number of lives are constantly displayed at the top of the screen. You score 10 points for each leaf you eat, and whenever you complete a patch you get a bonus score. The bonus depends on which patch you've completed and how many of your lives are left.

At the beginning of the game simple instructions are displayed, but if you decide to play again at the end of a game, the instructions won't be repeated.

How it works

10 go ahead to print instructions
15-60 first set of variables set-up
70 clear screen
80 set screen colour to black
90-110 set text to white
120-150 define colours
160-240 define characters
250-320 second set of variables set-up
330-360 hedge displayed
370-400 score printed
410-440 patch number printed
450-480 number of lives printed
490-610 mushrooms displayed
620-710 leaves displayed
720-730 display caterpillar
740 check caterpillar position
750 check keyboard
760-800 check for movement
810-1120 define new screen positions
1150-1160 check new screen positions
1170-1180 display caterpillar in new positions
1190-1220 check new screen positions
1230-1300 you've eaten a leaf
1310-1580 a patch is completed
1590-1650 you bumped into your own body
1660-1700 you hit a mushroom
1710-1800 you went into the hedge
1810-1840 display number of remaining lives
1850-1930 have you run out of lives?
1940-2200 end of game
2210-2240 display score and screen messages
2250-2370 display instructions

Variables

NOM number of mushrooms
NOL number of leaves
PAT patch number
LI number of lives
SC score
Q detect position of caterpillar
COT change text to white
J,F,A,B,O,P used to move caterpillar
LEAF number of leaves eaten
CHAR shape of caterpillars head
M$ hold screen messages and score
MD/MA positions of M$
MUSH display required number of mushrooms
Y/X positions of leaves and mushrooms
WM1 check positions of mushrooms tops
WM2 check positions of mushrooms stalks
LEA display required number of leaves
WAL check positions of leaves
NOCD clear screen
DELAY produce short delay
NU change colour of caterpillar's body
V change volume of sound
NUCD clear screen
SO change musical notes
I display screen messages

```
1 REM  ********************
2 REM  *CATERPILLAR CRAWL*
3 REM  *       BY         *
4 REM  *  STUART LENKER   *
5 REM  * 25TH APRIL 1984 *
6 REM  *                  *
7 REM  * HIGH-SCORE 2870 *
8 REM  *    BY JULIETTE   *
9 REM  ********************
10 GOSUB 2250
15 NOM=20
20 NOL=10
30 PAT=1
40 LI=3
50 SC=0
60 Q=32
70 CALL CLEAR
80 CALL SCREEN(2)
90 FOR COT=1 TO 8
100 CALL COLOR(COT,16,1)
110 NEXT COT
120 CALL COLOR(13,13,1)
130 CALL COLOR(14,16,1)
140 CALL COLOR(15,7,1)
150 CALL COLOR(16,11,1)
160 CALL CHAR(128,"AA55AA55AA55A
A55")
170 CALL CHAR(129,"081C3E7F7F3E0
808")
180 CALL CHAR(136,"18183C3C7E")
190 CALL CHAR(144,"000000183C7EF
FFF")
200 CALL CHAR(152,"3C7EFFFFFFFF7
E3C")
210 CALL CHAR(153,"814224183C7E7
E3C")
220 CALL CHAR(154,"3C7E7E3C18244
281")
230 CALL CHAR(155,"0162F4F8F8F46
201")
240 CALL CHAR(156,"80462F1F1F2F4
680")
250 J=0
260 F=1
270 A=4
280 B=2
290 O=1
```

Watch yourself expand as you gobble up more and more in this caterpillar game by Stuart Lenker

e you eat, the grow

```
300 P=0
310 LEAF=1
320 CHAR=154
330 CALL HCHAR(2,1,128,32)
340 CALL HCHAR(24,1,128,32)
350 CALL VCHAR(2,1,128,23)
360 CALL VCHAR(2,32,128,23)
370 M$="SCORE-"&STR$(SC)
380 MD=1
390 MA=1
400 GOSUB 2210
410 M$="PATCH-"&STR$(PAT)
420 MD=1
430 MA=13
440 GOSUB 2210
450 M$="LIVES-"&STR$(LI)
460 MD=1
470 MA=23
480 GOSUB 2210
490 FOR MUSH=1 TO NOM
500 RANDOMIZE
510 X=INT(31*RND)+1
520 IF X<3 THEN 510
530 Y=INT(22*RND)+1
540 IF Y=1 THEN 530
550 CALL GCHAR(Y,X,WM1)
560 IF WM1<>32 THEN 500
570 CALL GCHAR(Y+1,X,WM2)
580 IF WM2<>32 THEN 500
590 CALL HCHAR(Y,X,144)
600 CALL HCHAR(Y+1,X,136)
610 NEXT MUSH
620 FOR LEA=1 TO NOL
630 RANDOMIZE
640 X=INT(31*RND)+1
650 IF X<3 THEN 640
660 Y=INT(23*RND)+1
670 IF Y=1 THEN 660
680 CALL GCHAR(Y,X,WAL)
690 IF WAL<>32 THEN 630
700 CALL HCHAR(Y,X,129)
710 NEXT LEA
720 CALL HCHAR(A,B,CHAR)
730 CALL HCHAR(A-F,B-J,152)
740 IF Q<>32 THEN 1190
750 CALL KEY(0,X,Y)
760 IF Y=0 THEN 1130
770 IF X=83 THEN 810
780 IF X=68 THEN 890
790 IF X=69 THEN 970
800 IF X=88 THEN 1050 ELSE 720
810 B=B-1
820 F=0
830 J=-1
840 P=-1
850 O=0
860 CHAR=156
870 CALL GCHAR(A,B,Q)
880 GOTO 720
890 B=B+1
900 F=0
910 J=1
920 P=1
930 O=0
```

Hints on conversion

If you are going to try and convert this program to another machine, then remember the following points:

1 The Texas has a 24 by 32 graphic screen.
2 It has a 24 by 28 text screen.
3 It uses user-defined graphics.

A good amount of space can be saved by using multiple line statements. Below are the more unusual commands:

CALL CHAR (ASCII code number, hexadecimal string) Defines characters used in the program. The hexadecimal string describes the pattern to be given to the character with ASCII code stated.

CALL HCHAR (row number, column number, ASCII code, number of repetitions) Places character on screen at row and column specified, and repeats it horizontally the number of times stated. If this fourth value is omitted then the character is displayed only once. The character used is the one whose ASCII code appears in the command.

CALL VCHAR (row number, column number, ASCII code, number of repetitions) Works the same way as CALL HCHAR only repeats vertically instead of horizontally.

CALL GCHAR (row number, column number, numerical variable) Equivalent of PEEK; assigns ASCII code of character at row and column stated to numerical variable.

CALL CLEAR Clears the screen. Equivalent to CLS.

CALL SCREEN (colour code) Specifies screen colour, using colour code.

CALL COLOUR (character set number, foreground colour code, background colour code) Specifies foreground and background colours for all characters in set stated.

CALL SOUND (duration, frequency, volume) Produces sound with duration, frequency, and volume specified. Duration is in milliseconds, frequency in Hertz and volume in scale from 0 (loudest) to 30 (quietest).

CALL KEY (key unit, k,s) Equivalent of INKEY$ or GET. Returns code if key pressed in variable k.

These are the 16 colours:

1 transparent
2 black
3 medium green
4 light green
5 dark blue
6 light blue
7 dark red
8 Cyan
9 medium red
10 light red
11 dark yellow
12 light yellow
13 dark green
14 magenta
15 grey
16 white

```
940 CHAR=155
950 CALL GCHAR(A,B,Q)
960 GOTO 720
970 A=A-1
980 F=-1
990 J=0
1000 P=0
1010 D=-1
1020 CHAR=153
1030 CALL GCHAR(A,B,Q)
1040 GOTO 720
1050 A=A+1
1060 F=1
1070 J=0
1080 P=0
1090 D=1
1100 CHAR=154
1110 CALL GCHAR(A,B,Q)
1120 GOTO 720
1130 B=B+P
1140 A=A+D
1150 CALL GCHAR(A,B,Q)
1160 IF Q<>32 THEN 1170 ELSE 720
1170 CALL HCHAR(A,B,CHAR)
1180 CALL HCHAR(A-F,B-J,152)
1190 IF Q=129 THEN 1230
1200 IF Q=128 THEN 1710
1210 IF Q=152 THEN 1590
1220 IF (Q=136)+(Q=144)THEN 1660
1230 CALL SOUND(99,-1,2,320,0,55
0,3)
1240 SC=SC+10
1250 LEAF=LEAF+1
1260 Q=32
1270 M$=STR$(SC)
1280 MD=1
1290 MA=7
1300 GOSUB 2210
1310 IF LEAF=NOL+1 THEN 1320 ELS
E 720
1320 CALL SOUND(100,440,0,540,2)
1330 CALL SOUND(100,550,0,650,2)
1340 CALL SOUND(100,440,0,540,2)
1350 CALL SOUND(100,660,0,760,2)
1360 CALL SOUND(100,880,0,980,2)
1370 FOR NOCD=3 TO 23
1380 CALL HCHAR(NOCD,2,32,30)
1390 NEXT NOCD
1400 M$="WELL DONE-PATCH "&STR$(
PAT)&" COMPLETED"
1410 MD=5
1420 MA=2
1430 GOSUB 2210
1440 M$="BONUS OF "&STR$(PAT*LI*
10)
1450 MD=7
1460 MA=10
1470 GOSUB 2210
1480 SC=SC+(PAT*LI*10)
1490 M$=STR$(SC)
1500 MD=1
1510 MA=7
1520 GOSUB 2210
1530 PAT=PAT+1
1540 NOL=9+PAT
1550 NOM=NOM+5
1560 FOR DELAY=1 TO 500
1570 NEXT DELAY
1580 GOTO 70
1590 CALL SOUND(600,110,30,110,3
0,500,30,-8,0)
1600 FOR NU=1 TO 6
1610 CALL COLOR(16,7,1)
1620 CALL COLOR(16,11,1)
1630 NEXT NU
1640 LI=LI-1
1650 GOTO 1810
1660 FOR V=0 TO 30 STEP 2
1670 CALL SOUND(-99,-6,V)
1680 NEXT V
1690 LI=LI-1
1700 GOTO 1810
1710 FOR V=30 TO 0 STEP -1
1720 CALL SOUND(-250,-2,V)
1730 NEXT V
1740 FOR V=0 TO 30
1750 CALL SOUND(-500,-2,V)
1760 NEXT V
1770 FOR NUCD=3 TO 23
1780 CALL HCHAR(NUCD,2,32,30)
1790 NEXT NUCD
1800 GOTO 2050
1810 M$=STR$(LI)
1820 MD=1
1830 MA=29
1840 GOSUB 2210
1850 IF LI<1 THEN 1940
1860 D=0
1870 P=0
1880 Q=32
1890 CALL HCHAR(A,B,CHAR)
1900 CALL HCHAR(A-F,B-J,152)
1910 CALL KEY(0,K,S)
1920 IF S=0 THEN 1910
1930 GOTO 720
1940 FOR SD=150 TO 110 STEP -1
1950 CALL SOUND(-100,SD,0)
1960 NEXT SD
1970 FOR NUCD=3 TO 23
1980 CALL HCHAR(NUCD,2,32,30)
1990 NEXT NUCD
2050 M$="GAME OVER"
2060 MD=9
```

PROGRAM

```
2070 MA=11
2080 GOSUB 2210
2090 M$="YOUR FINAL SCORE IS "&S
TR$(SC)
2100 MD=11
2110 MA=5
2120 GOSUB 2210
2130 M$="PRESS Y TO PLAY AGAIN"
2140 MD=16
2150 MA=5
2160 GOSUB 2210
2170 CALL KEY(0,K,S)
2180 IF S=0 THEN 2170
2190 IF K=89 THEN 15 ELSE 2200
2200 END
2210 FOR I=1 TO LEN(M$)
2220 CALL HCHAR(MD,MA+I,ASC(SEG$
(M$,I,1)))
2230 NEXT I
2240 RETURN
2250 CALL CLEAR
2260 CALL SCREEN(2)
2270 FOR COT=1 TO 8
2280 CALL COLOR(COT,16,1)
2290 NEXT COT
2300 PRINT TAB(5);"CATERPILLAR C
RAWL";TAB(5);"****************"
::::
2310 PRINT "MOVE THE CATERPILLAR
 AROUND"::"THE MUSHROOM PATCH,WH
ILE"::
2320 PRINT "EATING THE LEAVES AN
D"::"DODGING THE MUSHROOMS.":::
2330 PRINT "AVOID THE SURROUNDIN
G HEDGE,"::"AND YOUR OWN BODY.":
::
2340 PRINT "PRESS ANY KEY TO CON
TINUE"
2350 CALL KEY(0,K,S)
2360 IF S=0 THEN 2350
2370 RETURN
```



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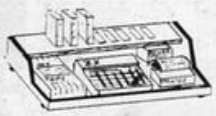
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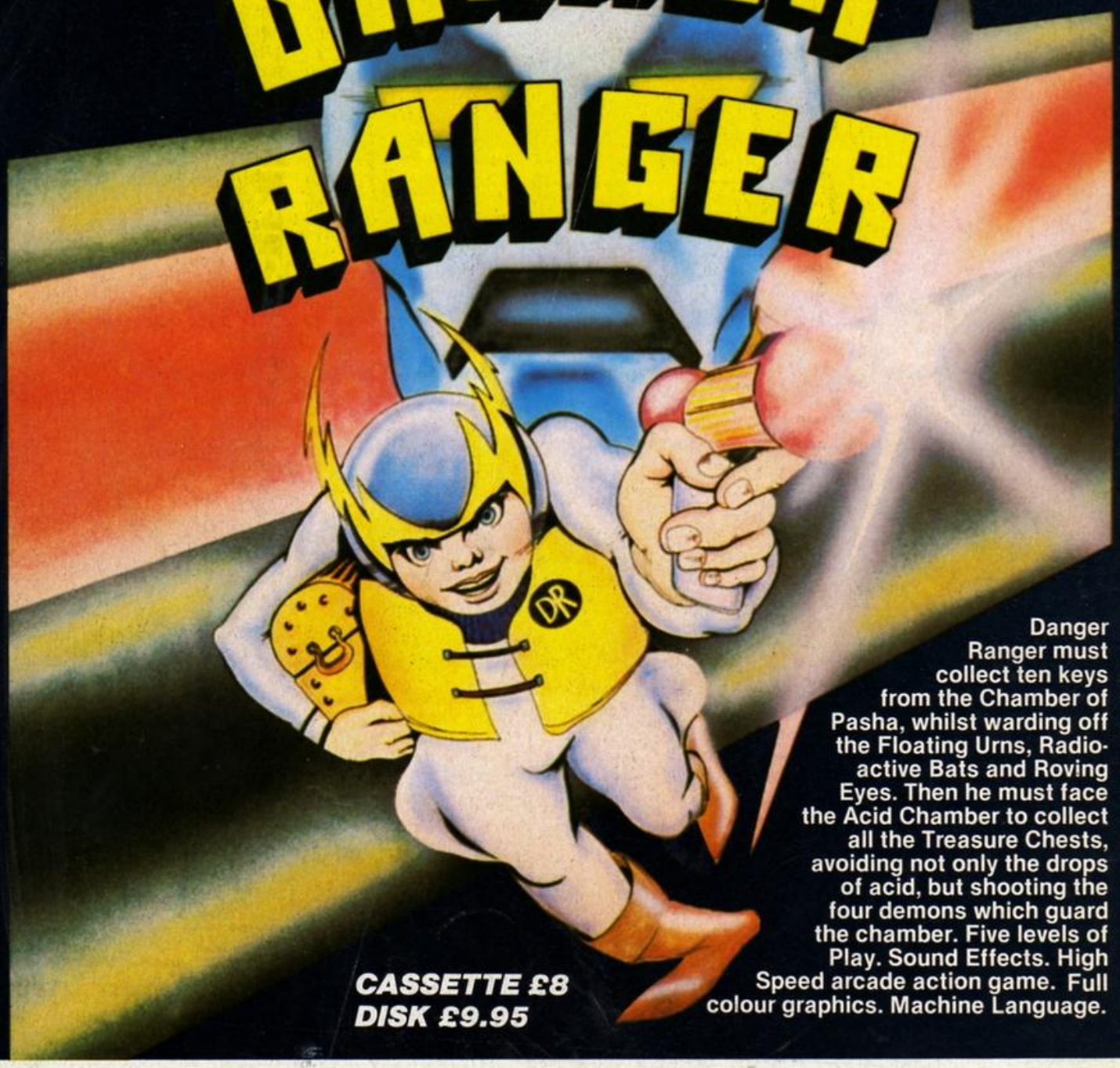
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