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OUR SYSTEMS

by the Sherry Brothers (Bob, Bruce and Gale)

The Sherry Brothers' first home computer system was purchased in late January of 1976. In a week's time an Imsai mainframe, parallel input/output board and two 4-kilobyte ram boards had been assembled along with a "Bay Area Tv Typewriter." Input was by a surplus keyboard and paper tape reader with display on a 17" Conrac monitor purchased for $35. With a week's use two things became apparent: more memory was needed and paper tape was slow! Another 4 kilobytes of memory was purchased along with a Tarbell Cassette Interface and a copy of Palo Alto Tiny Basic with Startrek game. (Startrek was loaded in at 6 p.m. the first day we had it and ran for the next nine hours straight.) At the end of February, 1976, system #1 was a respectable home system with 12 kilobytes of memory, the equivalent of a teletype (without hardcopy) for i/o and was seeing lots of use by two novice programmers.

As we became more familiar with what the system required to start up and as we became proficient in assembly language programming we took up the challenge of writing a simple housekeeping monitor to make startup easier. A 4-kilobyte rom board was purchased and a monitor program was written. This monitor would read and write Tarbell format cassette tapes, read and punch paper tapes in Intel hex format (although we didn't have a punch) and jump to the beginning of a program already loaded in, all on keyboard commands. Startup time went from 15 minutes with paper tape to 5 minutes with Tarbell to 1 minute with the rom monitor and Tarbell.

In March of 1976 we discovered computer clubs and things began to happen. The things we learned and the friends we made really got the Sherry brothers involved in home computers in a big way. At one meeting a member announced a friend of his on the East Coast had 12 CRT terminals for sale at $500 each — was anyone interested? We asked and found out that these were brand new terminals that had been purchased by an equipment manufacturer and had been made obsolete by a design change. Two phone calls and one week later the Sherry brothers had an A.D.D.S. 880 terminal with built-in editor replacing our kluge "glass teletype." At another meeting we were given a copy of 8K BASIC and access to an extensive library of ready to run games. At still another meeting we raised our hands when someone asked if anyone had an Imsai running. That led to the Sherry brothers becoming involved in the development of the Digital Systems S-100 floppy disk interface. (The moral here is if you are interested in home computers and want to learn — join a club and attend meetings.)

After 6 months of running, system #1 had stabilized at 20 kilobytes of ram memory, 4 kilobytes of rom memory, the A.D.D.S. 880 terminal, and a Penneys' cassette recorder. System reliability was excellent with no downtime not due to operator error.

In November of 1976 it became apparent that a second system was needed as one Sherry brother was leaving Livermore (where system #1 was) for Seattle soon. A fortuitous (for us at least) closing of a nearby computer store resulted in the purchase of an Imsai mainframe, with parallel and serial I/O boards for dealer cost. (This sale was announced at another club meeting.) This system was set aside for several months. In January of 1977, Sherry Brothers #1 got a Digital Systems dual floppy disk drive. In February assembly began on Sherry Brothers #2. March saw the purchase of a second A.D.D.S. 880 terminal. In April we took a gamble and bought two printers from the Rondure Co. in Texas; one working and one repairable. The gamble paid off as the working printer has given good service with only minor problems for over a year now. May was memory swap time with system #1 giving up its 20 kilobytes of static memory for 32 kilobytes of dynamic memory. System #2 got the static memory. Both systems were running without problems.

June 1977 saw system #2 moving to Seattle while system #1 moved to Santa Clara. Both systems have grown slowly the past year. System #1 now has 48 kilobytes of dynamic ram, the disk system, 880 terminal, and a Diablo Hytype II printer. System #2 has 60 kilobytes of ram memory (48K dynamic, 12K static), the Tarbell cassette system, 880 terminal, and a Carterfone 1030 printer. The reliability of both systems has been very good with no problems with mainframes, terminals, or I/O cards. One decoder chip went out on a static memory board after two years of use. We have had some initial problems with some of our dynamic memory boards, but once fixed we haven't had any subsequent trouble.

Sherry Brothers #3 is now under construction (see Computer 3 Sherry 0 in this issue). To date it consists of an Imsai mainframe running a Cromemco ZPU board, 24 kilobytes of ram memory, Tarbell cassette interface and a Tally 2100 printer. We're looking for a good buy on a terminal — if you see one, tell us at a club meeting.

ANY INTEREST?

There are many interests in the club that can't all get covered at meeting times. In my case I would like to get together with people interested in Z-80's and computer graphics. If there are a significant number of us out there in either of these subjects we could form a special interest group and have meetings of our own dedicated to these subjects. If you hanker for such a thing give me a call: Ken Berkun, 255-6429, after 5 and before 10:30. I'll keep track of names and available times and see if we can get something going. Those of you with other interests I would recommend doing the same thing. Food for thought: start thinking of programs and topics, such as higher speed operation for Z-80's, disk systems, bug fixing, etc.

I hope I hear from you.

The Sherry Bros. #2 system. This features an Imsai Mainframe, A.D.D.S. terminal, Pennywhistle Modem, Carterfone 1030 hardcopy unit and audio cassette.

MEETINGS

The Northwest Computer Society meets at the Pacific Science Center, in Seattle, on the first and third Thursday of each month at 7:30 PM. The first meeting of the month normally is held in room 200, on the East side of the Science Center Court. This meeting usually features a formal presentation by a speaker or speakers. The second meeting of the month is normally held in the math room, at the Southeast corner of the Science Center Court, two flights down. This meeting is usually more informal with freewheeling discussion and problem solving.

Thursday, July 6 - Room 200
"Optical Character Readers and Computer-Assisted Typesetting"
by Mr. Stark of Compugraphics

Thursday, July 20 - Math Room
Informal meeting with no speaker scheduled.

Thursday, August 3 - Room 200
"Data Structures and Data Management" by Thomas Thackery,
Boeing Computer Services

"7"

Do you receive Northwest Computer News by mail? If you do, check your label. There is one character following your ZIP code. If that character is "7," our records show that you are not a paid member for 1978. We've kept sending the News to you because we're such nice guys.

Naturally, we would like you to send us money, so we can continue sending the News to you. Subscriptions with membership cost only $7 per year. A second copy to the same address costs just half, or $3.50. Foreign subscriptions are invited and there is no extra charge for surface mail.

You say you paid but still have a "7"? Guess what popular machine we will blame? [The computer.] You say you want to keep getting the News but don't have the seven bucks just now? Write. Beg, plead and we'll listen. But if we don't hear from you, we'll assume you don't want the News.

Symbols:
M = Paid Member
H = Paid Ham Member
7 = Unpaid
E = Exchange [other clubs, etc.]
S = Computer Store
C = Complimentary

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Wonder Wizard Video Game		$ 14.95
SOROC-120 Video Terminal (Demo Unit)	$ 995.00	$895.00
Polymorphic VTI Video Board		$149.95
Tarbell-Disk Controller Card Kit	$ 199.00	$149.00
IMSAI-DIC-8 Priority Interrupt		$ 99.95
Stringy Floppy		$199.00
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MCD-Selecterm Terminal (used)	$1750.00	$800.00
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IMS-8K Static RAM (450ns)	$ 249.00	$149.00
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MY COLUMN

by Ken Berkun

This is the second in what I hope to be a long series of informative, amusing, and perhaps even educational columns. This is how I earn my place on the masthead... that is if we have a masthead.

As those of you have been at the recent meetings know, I am very interested in forming a Z-80 user's group. I have been taking names and phone numbers from interested people, and yes, there is enough of an interest to spur me on to form such a group. Within the next two weeks those of you who left me phone numbers will be getting calls to determine where would be the best area to meet, and when. After that initial survey I'll be getting back to everybody on the first meeting data.

Since no one has come running to me begging to present the first program for the user's group, I will take that function myself. The initial part of the meeting will be discussing the user's group's name, function, goals, structure etc. After we've got that under control and are on our way to a charter, I'll give a presentation on assembly language programming for the Z-80. This will be aimed towards whatever level people wish at the meeting.

There will also be a general info exchange time, which I expect to see as a part of every meeting.

Those of you interested who haven't talked to me already, please do so. You can call me at home 255-6429, or at work 655-9945, or call the club number and leave a message. I will make announcements at all meetings and in all newsletter issues. I hope to see you there.

Now it's time for my regular newsletter plug.

The purpose of the newsletter is to provide information to the club members and correspondents. That doesn't do us any good if we don't have any information to present. Most club members have a lot of information of one kind or another, whether that be hardware, software, or just any interesting occurrence. Writing these things down is not hard, regardless of anything you've ever heard (or else we'd never have volunteered for this job). We'll also do anything we can to help you along, such as provide access to terminals, editorial help, proof reading, and even suggestions for topics. Most articles for this paper are input to the Nordata timeshare system, and then output with the RUNOFF program through John Aurelius' Trendata terminal. Leaving files on line on the computer is the best way to get them to us.

Remember, this newsletter is only as good as the club, we have a lot of members, so let's support ourselves.

This brings me to another topic...why is club attendence so low, when the membership is so high? Obviously you're getting something out of the club, because you're paying your dues, but what is it? Come to one of the meetings and let us know... I for one am curious. And they're good meetings too. John Atlas gave one of the most clear and explanative presentations on memory management I have ever seen, at the last program meeting. He covered every major system from single user to virtual memory paging schemes. Having worked with the latter, I very much appreciated his explanation, and would like to thank him for attending the meeting.

At the general meeting on the 16th, the conversation was lively and educational. Seems like there's a lot of interest in modems right now. The man in our club to talk to on that is probably Mike Holley. He's the one who developed the 35 dollar modem, described in the last issue. I love these meetings because I always meet interesting people make new friends and learn something every time. I encourage everyone, member and prospective member, to come.

The remainder of this article is going to concern something quite different than club happenings. Today's topic is Artificial Intelligence (AI) for the microcomputer. AI always seems to attract a lot of attention, whether it be scorn or praise. There may be no nuetral when discussing it, you're either pro AI, or anti, like Joseph Weisenbaum. I happen to be pro, and proud of it. Dr. Weisenbaum's fascinating book, Computer Power and Human Reason, suggests that research into AI be stopped, as nothing but evil can come out of it. He goes on to eloquently support and explain, what I have just paraphrased. He is a persuasive author, and has many fascinating stories and examples.

However, I feel that regardless of whether we should or shouldn't allow research into AI, it's going to get done. And if someone's going to do it, I'd rather it be some good guys, not necessarily the government. Who can do it? Thanks to the microcomputer, we all can. This is one reason why I insist that it will get done. Many AI programs require massive amounts of CPU time. Previously this has been very expensive and available only to those with equally massive funding. Now we can set a program going, and not worry about it if it takes several days to produce results. Sure the CPU is slower, but the cost per cycle is trivial.

This is not to say that AI programs are going to be easy to implement. The traditional language for research in this field is LISP, with some work done in SNOBOL and certain LISP derivatives. None of these languages exist, that I know of, on any micro. If they do exist, someone tell me, because the potentials are staggering.

However, it is possible to do some interesting work in assembly language and even BASIC. For instance I got interested in the work Michie had done at the University of Edinburgh, Scotland. In particular I was delighted with his construction of a simple machine that learned to play tic-tac-toe. Now almost every computer in existence today can play a perfect game of tic-tac-toe. But this is simply because the game has a limited number of possible moves, and a strict algorithm for winning, or drawing a game.

But to program a computer to play a perfect game implies that someone had to learn the algorithm. This someone is the programmer. Taking the attitude, why do what the computer can do, how can we get the computer to figure out how to play a good game of tic-tac-toe without being told anything other than the basic rules?

Michie built his machine out of wooden matchboxes and beads. Shows what passes for intelligence now a days. I decided that anything a matchbox could do, a micro could do just as well, and proceeded to write a program, in BASIC that did the same thing. Here's how a machine learns how to play tic-tac-toe:

To start with Michie collected some 300 odd matchboxes. He then labeled each of these to correspond to one particular configuration of the board. That is with certain X's and O's marked down. He was able to cut the number down by eliminating rotations and reflections. For instance only one matchbox was needed for the four occurances of the starting move, X in a corner.

Then he went back to the tic-tac-toe board, and assigned a color to each of the squares, nine in all. Starting with the first, and finishing with the last (he was very methodical) he went through each matchbox, determined which moves were legal for the computer to make in that configuration, and put a certain number of beads in that matchbox of the color that matched a legal move. Thus if the computer could legally move to the corner square, and that square were blue, he put blue beads in the box. Legal moves mean the other person is not already occupying that square (At first I had trouble with my program, it had a tendency to kick a person out of a square and take it itself.)

The number of beads Michie placed in each square was determined by how many moves into the game that box, or configuration was. He reasoned that early moves mattered more, so for reasons I'll explain in a minute, he put more beads in early moves. Specifically 4 beads in move 1, 3 in move 2, 2 in move 3, and 1 in move 4.

To play the game, Michie would determine which was the correct box, and pull it open. Only one bead would be funneled out of a special cardboard arrangement he had made. The machine's move would then be to that colored square. He put the bead back, but left the box open to indicate which move it was. Now comes that fancy part. At the end of the game the machine would either have won, lost, or drawn. Just like training a rat, Michie trained the machine. He rewarded it with extra beads if it won, did nothing if it drew, and removed beads if it lost. The color would be the one matching the color moved in that turn.

His theory was that bad moves would be eliminated, and good ones increased in odds of choosing. Did it work? You bet. He proceeded to play a round of 200 games, and was eventually being beaten whenever he made a mistake, and drawing the rest. The machine was learning.

He named the machine Menace. It learned several stratages, depending on Michies opening moves, and became proficient at them all.

What, you say that it would have been easier to program that algorithm into the machine? Yes, that's probably true, but I think there was much to be learned by doing it the hard way. So I became interested in this after reading about it, and decided to program it. Sure enough, I blew it by game 80 or so. The program is not particularly long, and presented some interesting problems, not least of which was how to determine what configurations could be eliminated because of rotations and reflections. Tricky.

The program is not reproduced here for two reasons, one is that Interface Age has the copyright on it, and I'm too lazy to find out whether I can legally reproduce it here or not, and two, I'd like to see what other members of the club can produce, if they'll take an interest. How about it? Any takers? We'll print any program here that looks interesting, and this certainly does. Give it a try on your systems, it's a good problem. Naturally I'm available for answering any questions you have. Good luck.

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STAR TREK

This program, by Lichen Wang, illustrates the power of Palo Alto Tiny BASIC. It is as good as any Star Trek I have seen, and it runs with its interpreter in 8K bytes. As you will see in the listing, the program is not commented - it's pure computing power. It gets the most from a small memory. If you'd rather not try to type this into your system, you can get it by sending a cassette with SASE to the Club address. Specify Kansas City, CUTS, or Tarbell. You'll also get the Palo Alto Tiny BASIC interpreter for the 8080. - John Aurelius

The Federation of Planets is being invaded by a band of Klingons. As Captain of the Starship Enterprise, your mission is to find and destroy the invaders within 30 stardates.

The Galaxy is divided into 64 quadrants arranged in an 8 by 8 square. Quadrants are numbered in such a way that Q-35 is at the 3rd row down and 5th column from the left. Each quadrant is further divided into 64 sectors, and the sectors are likewise numbered. Each sector, if not empty, can contain either a Klingon, a star, a Starbase, or the Enterprise.

Your Starship is equipped with a Short Range Sensor and a Long Range Sensor to help you investigate the unmapped Galaxy and to seek the Klingons. There are the Warp Engine and the Impulse Engine under your control — to go where no man has ever gone. You have an arsenal of Phaser banks and deadly Photon Torpedoes to fight the Klingons with, and a protective Shield to defend yourself. The ship's on-board computer keeps good record, and will save your life when you make fatal mistakes in navigation.

Docking at a Starbase is done by occupying an adjacent sector. Your supplies (4000 units of energy and 10 torpedoes) will be replenished and all damages will be repaired at docking.

Here is a list of the commands that you can give, and their consequences:

B — Short Range Sensor

The Short Range Sensor will scan the quadrant you presently occupy and print out a map of 8 by 8 matrix showing the contents of each of the 64 sectors. The Klingons are printed as K, the Starbases as B, the Enterprise herself as E, the stars as *, and empty spaces as periods. The Short Range Sensor hardly uses any energy or time. And the Klingons are unaware of your scanning.

L — Long Range Sensor

The Long Range Sensor will scan the contents of all the nearby quadrants and print out a 3 by 3 matrix showing the number of different objects in these quadrants. Each quadrant is represented as a 3-digit number; the hundreds digit is the number of Klingons in that quadrant, the tens digit is the number of Starbases, and the unit digit is the number of stars. An entry of 305 means 3 Klingons, no Starbases, and 5 stars. Like the Short Range Sensor, the Long Range Sensor hardly uses any energy or time, and the Klingons are unaware of your scanning.

G — Galaxy Map

When you use the Sensors, the on-board computer will keep track of the number of different objects in each quadrant. The G command tells the computer to display this record. It is printed as an 8 by 8 matrix of 3 digits each. The digits have the same meaning as in the Long Range Sensor, except that unchartered quadrants are printed as 0. The computer is very quiet, super fast, and does not use any energy at all.

R — Report

The ship's on-board computer will print out the pertinent information of the state of the Enterprise. Included in the report is the estimated time for in-flight repairs of damaged devices, if any. However, if you dock at a Starbase, those damages will be repaired instantly.

W — Warp Engine

The Warp Engine is used to move the Enterprise. You will be asked to set the distance and the course for the move. Distance is measured in units of sectors. It takes 7 sector distances to move from one side of a quadrant to the other, and 10 (7*1.414 = 10) to move diagonally from corner to corner. Course is given in degrees, 0 is up (North), 90 is to the right (East), etc. If you give a course of <0 or >360, the W command is cancelled. When you move into, or move within a quadrant with Klingons in it, they fire their Phaser at you after your move.

The Warp Engine uses energy in proportion to the square of the distance of the move. It takes 50 units of energy to move 10 sectors. But more important, it costs you one Stardate to start and stop the Engine — no matter how far you are moving. (This phenomenon was first predicted by an ancient scientist in the early 20th century.) As a matter of fact, the W command is the only one that will cost you time. Since you have only 30 Stardates to accomplish your mission, you are advised to use it with discretion.

Other objects (Stars, Starbases, and Klingons) in the present quadrant are navigational hazards. The on-board computer will stop the engine to avoid a collision, but energy and time are wasted. Once you leave the quadrant that you were in, you enter Hyperspace, and will tunnel through objects in other quadrants without any ill effects on either parties.

When you leave a quadrant, the remaining Klingons, if any, will repair their damage and regain strength. The number of objects in the quadrant will not change, but their positions will change. So, don't expect to find them the same way you left them.

I — Impulse Engine

The Impulse Engine works more or less the same way as the Warp Engine, except that you can move only one sector at a time. Impulse Engine does not use up time, but it burns a lot of energy — up to 60% of the ship's remaining energy can be wasted in one burst! When you move into, or move within a quadrant with Klingons in it, they fire their Phaser at you after your move.

P — Fire Phaser

The Phaser banks can fire at all the Klingons in the present quadrant at once. Phaser has no effect on the stars and Starbases. You will be asked for the total amount of energy to fire. (If you enter 0, the command will be cancelled.) This energy will be evenly divided among the remaining Klingons in the quadrant. The amount of energy that hits each Klingon is attenuated by a factor related to the squares of the distance between you and the Klingon. At a distance of 4 sectors, this factor is about 50%.

The strength of the Klingons depends on the current technology. In the period of Stardates 2200-2299 (Novice game), the Klingons can only take 100 units of hit. In 2300-2399 (Expert game), they can take 200 each. And in 2400-2499 (Fanatic game), it will take 300 units to destroy a Klingon. A partial hit will damage it, and the effect is accumulative.

The surviving Klingons will retaliate. The amount they fire is random but related to their remaining strength. Their Phaser is attenuated the same way as yours. Your Shield will normally protect you from damage, but an equal amount of energy will be used to annihilate the hit. If the hit is large, the Shield can get damaged; and consequently, the ship herself can get damaged by further hits.

T — Fire Torpedo

The Torpedo is directional and can hit only one object, a Klingon, a Star, or heaven forbids, a Starbase. You will be asked to set the course, and like the Warp Engine, you can cancel the command by giving a course of <0 or >360. The charge of a Torpedo is quite deadly (and it does not attenuate in distance), even a late model Klingon can seldom survive. Once fired, the on-board computer will track its sector coordinates until it either hits an object or leaves the quadrant (and lost forever). Remaining Klingons will retaliate after you have fired.

That's about it. Captain, be courageous, be bold, and be careful! You are our only hope.

```
  5 N=100,E=200,F=300,Y=999,D=30,C=0
  7 IN."Are You a Novice(N), Expert(E), or Fanatic(F)?"Z
 10 P."Your mission:";IFZ#FY=Y*3;IFZ#EZ=N
 15 K=0,B=0,Q=0;F.I=0TO63;J=R.(99)<5,B=B+J,M=R.(Y)
 20 M=(M<209)+(M<99)+(M<49)+(M<24)+(M<9)+(M<2);IFM*JQ=I+8
 25 K=K+M,@(I)=-100*M-10*J-R.(8);.I;H=K;IFB<2G.15
 30 P."To destroy",#3,K," Klingons in 30 S.D.";GOS.160
 40 U=R.(8),V=R.(8),X=R.(8),Y=R.(8)
 45 F.I=71TO152;@(I)=0;.I;@(8*X+Y+62)=4
 47 M=A.(@(8*U+V-9)),N=M/100,I=1
 50 IFNF.J=1TON;GOS.165;@(J+134)=Z,@(J+140)=S,@(J+146)=T;.J
 55 GOS.175;M=M-100*N,I=2;IFM/10GOS.165
 60 M=M-M/10*10,I=3;IFMF.J=1TOM;GOS.165;.J
 65 GOS.145;GOS.325;IFKG.95
 70 P.;P."Mission accomplished.";IFD<3P."You barely made it.
 75 IFD>5P."Good work!";IFD>9P."Great!";IFD>13P."Fantastic!
 80 D=30-D,I=H*100/D*10;P.#1,H," Klingons in ",D," S.D.: ",I
 85 J=100*(C=0)-5*C;P.#1,C," casualties incurred: ",J
 90 P."Bonus:",#4,Z;P."Total score:",I+J+Z;S.
 95 IFD<0P."Your time ran out";S.
100 IFE<0P."You are dead";S.
120 S=220,G=180,L=200,P=260,R=420,W=465,T=555,I=645
122 IN."Your orders, Captain?"A
125 IF(A=S)+(A=G)+(A=L)+(A=P)+(A=R)+(A=W)+(A=T)+(A=I)G.A
130 P."R=Report       S=S.R. Sensor  L=L.R. Sensor
135 P."G=Galaxy Map   P=Phaser       T=Torpedo
140 P."W=Warp Engine  I=Impulse Engine";G.120
145 F.I=X-(X>1)TOX+(X<8);F.J=Y-(Y>1)TOY+(Y<8)
150 IF@(8*I+J+62)#2N.J;.I;O=0;R.
155 IFO=0P."Sulu: Captain, we are docked.
160 E=4000,F=10,O=1;F.I=64TO70;@(I)=0;.I;R.
165 S=R.(8),T=R.(8),A=8*S+T+62;IF@(A)G.165
170 @(A)=I;R.
175 P."Enterprise in Q-",#1,U,V," S-",X,Y;R.
180 GOS.175;J=2;GOS.375;IFIG.120
185 P." of Galaxy";F.I=0TO7;P.#1,I+1,":",;F.J=0TO7;M=@(8*I+J)
190 P.#4,(M>0)*M,;.J;P.;.I;P."  ",;F.I=0TO7;P."  ..",;.I;P.
195 P."  ",;F.I=1TO8;P.#4,I,;.I;P.;G.120
200 GOS.175;J=3;GOS.375;IFIG.120
205 P.;F.I=U-1TOU+1;F.J=V-1TOV+1;M=8*I+J-9,A=0
210 IFI>0IFI<9IFJ>0IFJ<9A=A.(@(M)),@(M)=A
215 P.#4,A,;.J;P.;.I;G.120
220 GOS.175;J=1;GOS.375;IFIG.120
225 M=8*U+V-9,@(M)=A.(@(M))
230 P.;F.I=1TO8;P.#1,I,;F.J=1TO8;M=@(8*I+J+62);IFM=0P." .",
235 IFM=1P." K",
240 IFM=2P." B",
245 IFM=3P." *",
250 IFM=4P." E",
255 .J;P.;.I;P." ",;F.I=1TO8;P.#2,I,;.I;P.;G.120
260 J=4;GOS.375;IFIG.120
265 IN." energized. ","Units to fire?"A;IFA<1G.120
270 IFA>EP."Spock: We have only ",#1,E," units.";G.120
275 E=E-A;IFN<1P."Fired";G.65
280 A=A/N;F.M=135TO140;IF@(M)=0G.290
285 GOS.295;P.#3,S," units hit ",;GOS.305
290 .M;G.65
295 IFA>1090P."*Overloaded*";J=4,@(67)=1,A=9;GOS.375
300 I=@(M+6)-X,J=@(M+12)-Y,S=A*30/(30+I*I+J*J)+1;R.
305 P."Klingon at S-",#1,@(M+6),@(M+12),;@(M)=@(M)-S
310 IF@(M)>0P." *Damaged*";R.
315 @(M)=0,I=8*U+V-9,J=2*(@(I)>0)-1,@(I)=@(I)-100*J,K=K-1
320 I=8*@(M+6)+@(M+12)+62,@(I)=0,N=N-1;P." *Destroyed*";R.
325 IFN=0R.
330 P."Klingon attack";IFOP."Starbase protects you";R.
335 T=0;F.M=135TO140;IF@(M)=0G.350
340 A=(@(M)+R.(@(M)))/2;GOS.295;T=T+S,I=@(M+6),J=@(M+12)
345 P.#3,S," units hit from Klingon at S-",#1,I,J
```

```
350 .M;E=E-T;IFE<0P."*BANG*";R.
355 P.#1,E," units of energy left.";IFR.(E/4+1)>TR.
360 IF@(70)=0@(70)=R.(T/50+1),J=7;G.375
365 J=R.(6),@(J+63)=R.(T/99+1)+@(J+63),I=R.(8)+1,C=C+I
370 P."Mc Coy: Captain, we suffered",#2,I," casualties.
375 I=@(J+63);IFJ=1P."Short Range Sensor",
380 IFJ=2P."Computer Display",
385 IFJ=3P."Long Range Sensor",
390 IFJ=4P."Phaser",
395 IFJ=5P."Warp Engine",
400 IFJ=6P."Torpedo Tubes",
405 IFJ=7P."Shield",
410 IFI=0R.
415 P." damaged,",#3,I," S.D. estimated for repair";IFQ<1R.
416 A=Q/8;IF(R.(9)>3)+(@(Q-8)>0)+(8*U+V-1=Q)A=0;R.
417 P."Uhura: Captain, SOS call from Q-",#1,A,Q-A*8+1;Q=-Q;R.
420 P."Report:";P."Stardate",#10,2130+Z-D
425 P."Time Left",#9,D;P."Condition   ",;IFOP."Docked";G.445
430 IFNP."   Red";G.445
435 IFE<999P."Yellow";G.445
440 P." Green
445 P."Energy",#12,E;P."Torpedoes",#9,F;P."Klingons",#10,K
450 P."Starbases",#9,B;P."Casualties",#8,C;GOS.175
455 F.J=1TO7;IF@(J+63)GOS.375
460 .J;G.120
465 J=5;GOS.375;IFIG.120
470 IN." Sector Distance?"W;IFW<1G.120
480 IFW>91W=91;P."Spock: Are you sure, Captain?
485 IFE<W*W/2P."Scotty: Captain, not enough energy.";G.120
490 GOS.615;IFR=0G.120
495 IFQ<0Q=-Q;GOS.416;IFAA=R.(Z),C=C+A;P.A," civilians killed
500 E=E-W*W/2,D=D-1;F.M=64TO70;@(M)=(@(M)-1)*(@(M)>0);.M
502 @(8*X+Y+62)=0
505 P=45*X+22,G=45*Y+22,W=45*W;F.M=1TO8;W=W-R;IFW<-22G.525
510 P=P+S,G=G+T,I=P/45,J=G/45;IF(I<1)+(I>8)+(J<1)+(J>8)G.530
515 IF@(8*I+J+62)=0X=I,Y=J;.M
520 P."*Emergency Stop*";P."Spock: To err is human.
525 @(8*X+Y+62)=4;GOS.175;G.65
530 P=U*72+P/5+W/5*S/R-9,U=P/72,G=V*72+G/5+W/5*T/R-9,V=G/72
535 IFR.(9)<2P."*Space Storm*";T=Z/3;GOS.360
540 IFU>0IFU<9IFV>0IFV<9X=(P+9-72*U)/9,Y=(G+9-72*V)/9;G.45
545 P."You goofed, computer intervene...";G.40
555 J=6;GOS.375;IFIG.120
560 IFF=0P." empty";G.120
565 P." loaded";GOS.615;IFR=0G.120
570 P."Torpedo track ",;F=F-1,P=45*X+22,G=45*Y+22;F.M=1TO8
575 P=P+S,G=G+T,I=P/45,J=G/45;IF(I<1)+(I>8)+(J<1)+(J>8)G.585
580 L=8*I+J+62,W=8*U+V-9,R=2*(@(W)>0)-1;P.#1,I,J," ",
582 G.585+5*@(L)
585 .M;P."...missed";G.65
590 S=R.(99)+280;F.M=135TO140;IF@(M+6)=IIF@(M+12)=JGOS.305
592 .M;G.65
595 B=B-1,@(L)=0,@(W)=@(W)-10*R;P."Starbase destroyed
597 P."Spock: I find human behaviour fascinating.";G.65
600 P."Hit a Star";IFR.(9)<3P."Torpedo absorbed";G.65
605 @(L)=0,@(W)=@(W)-R;IFR.(9)<6P."Star destroyed";G.65
610 T=Z;P."It Novas!  *RADIATION*";GOS.360;G.65
615 IN."Course (0-360)?"I;IF(I>360)+(I<0)R=0;R.
620 S=(I+45)/90,I=I-S*90,R=(45+I*I)/110+45;G.625+5*(S<4)*S
625 S=-45,T=I;R.
630 S=I,T=45;R.
635 S=45,T=-I;R.
640 S=-I,T=-45;R.
645 P."Impulse Engine ",;GOS.615;IFR=0G.120
650 I=R.(5)*E/9+1,E=E-I,W=1;P."Used",I," units of energy
655 IF@(68)*(R.(9)>6)@(68)=0;P."Scotty: Warp Engine is fixed!
660 G.502
```

```
 RUN
Are You a Novice(N), Expert(E), or Fanatic(F)?:N
Your mission:
To destroy  7 Klingons in 30 S.D.
Enterprise in Q-23 S-81
Your orders, Captain?:S
Enterprise in Q-23 S-81
Short Range Sensor
1 . . . . . .
2 . * . . . . *
3 . . . . * . *
4 . . . . . .
5 . . . . . .
6 . * * . . . .
7 . . . . . .
8 E . . . . * . .
  1 2 3 4 5 6 7 8
Your orders, Captain?:L
Enterprise in Q-23 S-81
Long Range Sensor
   4   7   2
   8   7   5
   6   8 106
Your orders, Captain?:W
Warp Engine Sector Distance?:12
Course (0-360)?:135
Enterprise in Q-34 S-81
Klingon attack
 21 units hit from Klingon at S-15
3907 units of energy left.
Your orders, Captain?:S
Enterprise in Q-34 S-81
Short Range Sensor
1 . . . . K * . .
2 . . . . . .
3 . . . * . * . *
4 . . . . . .
5 . . . . . .
6 . . * . . . .
7 . . . . . .
8 E . . . . . *
  1 2 3 4 5 6 7 8
Your orders, Captain?:W
Warp Engine Sector Distance?:7
Course (0-360)?:0
Enterprise in Q-34 S-11
Klingon attack
 48 units hit from Klingon at S-15
3835 units of energy left.
Your orders, Captain?:T
Torpedo Tubes loaded
Course (0-360)?:90
Torpedo track 12 13 14 15 Klingon at S-15 *Destroyed*
Your orders, Captain?:L
Enterprise in Q-34 S-11
Long Range Sensor
   7   5   6
   8   6   2
   7   6   6
Your orders, Captain?:
OK
>
```

TIMESHARING TIPS

by Henry Hillbrath

One of the benefits of NWCC membership are the super cut-rates available on NORDATA. The rates are $.50/hour and $.06/month/block for storage. Restrictions are: no use during business hours; no commercial use. A $20 deposit is required. See Roy Gillette for more info.

The system runs on a DEC 11/70 under RSTS/E. Its 'native tongue' is BASIC-PLUS, a very extended dialect. To a large extent the system is self documenting once you get on.

A member mail file is available on the system and this can be used to obtain help among other things. Many powerful system utilities are available and the mail file is a good source of tips on these.

Most of the system programs live in an account called (1,2) which can be abbreviated as '$'. Some others are in (1,4) or '!' You can run those with protection codes of <40>, <104>, or <232>. many of these programs have help files or documents on the system. Look for files like "!RUNOFF.DOC". Account (1,5) abbreviated "&" has over 130 game programs including half a dozen versions of "STAR TREK".

In order to read files that aren't BASIC programs use a "PIP" command. For example "PIP !RUNOFF.DOC <CR> will output an 11 page manual on "$RUNOFF" which is a text preparation program which is used to prepare articles for the news letter among other things. (Typing "RUN $RUNOFF !CR¼" then answering "Input File?" with "$RUNOFF" will give the same manual.) If you want to write an article, you should use any one of the available text editors ($EDIT1,$EDIT2 and a number of others) to build it in the "$RUNOFF" format and leave it on the system. Change its protection code to <40> and leave a mail file for the editor telling where it is!

The protection code can be changed by "PIP". Type "PIP MYFILE.RNO<40>/RE <CR>" and its done! "PIP" is also used to concatenate (merge) files, to move files from one account to another, and to delete files. In many cases "?" and "*" can be used to specify "wild cards" so that groups of files can be operated on. Help on "PIP" itself can be obtained by typing "PIP /HELP <CR>".

'$DIRECT" is the directory program. The directory for the account you are logged in on can be obtained by typing "DIR <CR>". the system directory by "DIR $<CR>", the game directory by "DIR &<CR>" etc. "wild cards" also work. Help can be obtained by "DIR /HELP <CR>".

"$TTYSET" is used to change the characteristics the system assumes for your terminal. Help can be obtained by "RUN $TTYSET <CR>" then answering the prompt by "HELP <CR>".

CALL — APPLE

by Val Golding

Which came first, the Apple or the seed? In this case, we would have to say it was the Apple. Or the Apple II, if one prefers to be technically correct. We were one of the earlier Apple owners in the area, having purchased ours in December 1977, very shortly after they first became available here. After a few weeks of familiarization, it became apparent that our level of learning had become roughly equal to that of the Apple dealer, who had to make a living by selling not just Apples, but a reasonably large line of micros.

And it was here that the "seed" was planted. It came about as the exchange of names and phone numbers between ourselves and a couple of individuals in mid - January, amid small talk which concluded that some type of users group would be both helpful and desirable.

The Apple II is a very powerful microcomputer, based on the popular 6502 chip. It its least expensive form, it comes complete with 4K of dynamic hidden refresh RAM, 5K integer BASIC, monitor and Mini - assembler / disassembler, all on ROM. A 10K extended BASIC is available in either cassette or ROM form at extra cost, as is a Shugart mini - floppy. A printer I/O card is also available, which will interface with most popular printers. Much of the Apple II's power is derived from its capability of direct memory access from BASIC, with PEEK, POKE and CALL commands, and several built in debug routines.

Last, but certainly not least, is Apple II's built in color graphics, 16 colors in low resolution and 6 in high resolution. We believe it to be the first of a new generation of microcomputers, due to its plug in and operate capability, requiring only an RF modulator and a television set. This is in contrast to other popular micros which, like stereo components, are often purchased separately and then assembled into an operating computer system.

It is this "plug in and operate" concept that we feel has led (as Apple claims) Apple II to become the number one seller in the world, and this same concept is what makes it appeal to those who have (like ourselves) no data processing background. This element composes about 70% of the membership of Apple Pugetsound Program Library Exchange (an obvious acronym for Apple). An therein lies one of the secrets of the group's success to date: those 70% need help, which the remaining 30% are in a position to offer. And this makes A.P.P.L.E. essentially a self - help group.

Meetings are held on the third Tuesday of each month, and rotate between the various Apple dealers: Omega Stereo, Computerland and Empire Electronics. They are held on a relatively informal basis, and the majority of the time is spent in discussing problems and exchanging programs. Other benefits include a modest software library which is available to members at low cost, and the monthly newsletter Call -Apple, the June issue of which ran to some ten pages and included program listings, a review of the new Applesoft II Extended BASIC, programming hints and explanatory material.

The first meeting was held in mid - February with just over a dozen members attending. As Apple II's popularity increased, so did the membership of A.P.P.L.E., growing to over 75 members in 15 states by mid - June. The out - of - state membership is attributed almost entirely to mentions in the club sections of three popular computer periodicals. We certainly do not envision ourselves as any kind of threat to the Northwest Computer Society. Rather we feel that we complement them. Now, as some of our members are buying additional computers, we will look to them for assistance. And indeed, the reverse sould also be true when NWCS members add an Apple II to their existing systems.

Membership fees consist of a $2 application fee and $4 annual dues ($5 in 1979). Applications may be requested with SASE to Val J. Golding, 6708 - 39th Avenue SW, Seattle, WA 98136. The A.P.P.L.E. "Hot Line" is 932-6588.

NEWS ITEMS

Compucolor II

Built in 13 inch color video monitor, 8080 CPU, 4K RAM, 16K BASIC in PROM, built in mini disk and a typewriter keyboard with lots of extra function keys are features of the Compucolor II. How much? $4000? $2000? According to Ezra Mintz (not Muntz!) company president the price is $795! From may SGG.

UNCLASSIFIED

WANTED: CRT to be used with 300 baud modem (RS 232). Needed by August 1. Jim Couch, Seattle, 625-4836, days.

FOR SALE: Hardcopy terminal (keyboard, printer, stand). Memorex 1240, band printer, not a dot matrix, high quality, upper and lower case printing. Up to 600 baud. With RS 232 interface, modem, and acoustical coupler. Complete with massive documentation. Has removable tractor feed, takes full width (13 inch) paper, or typewriter size bond. $975. Call Ken Berkun, 655-6429 eves, or 255-9945 days.

GROUP PURCHASE - Trendata 1000 Selectric terminal with RS-232 interface. It's a half duplex, non-ASCII machine. Conversion software is available. For price and details, contact Randyl Britten or leave message to his attention at 284-6109 (Seattle).

FOR SALE - Heath I04530 Scope (10 Mhz, ext. triggered, $335 new as kit) $200. Also Processor Tech. 4KRA RAM board (factory assembled) $85, and IMSAI RAM 4A 4K RAM $75. Scott Treseder, Seattle WA, 632-7536.

COMPUTER STORES

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763-2300

Altair Computer Center
14100 NE 20th St.
Bellevue, WA 98007
641-8800

Byte Shop
2605 Second Avenue
Seattle, WA 98121
622-7196

Byte Shop
14701 NE 20th St.
Bellevue, WA 98007
746-0651

Computerland
14340 NE 20th St.
Bellevue, WA 98007
746-2070

Computerland
1500 S 336th St.
Federal Way, WA 98003
838-9363 Tacoma 927-8585

Computerland
8791 S. Tacoma St.
Tacoma, WA 98499
581-0388

Empire Electronics
616 SW 152nd St.
Seattle, WA 98166
244-5200

Heathkit Electronic Ctr
505 - 8th Ave. N
Seattle, WA 98109
681-2172

Micro Computer Center
11822 NE 8th St.
Bellevue, WA 98005
455-3710

Omega Northwest, Inc.
839 - 106th Ave. NE
Bellevue, WA 98004
455-2126

Radio Shack - many stores in Seattle area

Retail Computer Store
410 NE 72nd St.
Seattle, WA 98115
524-4101

Seawell Marketing, Inc.
315 NW 85th St.
Seattle, WA 98117
782-9480

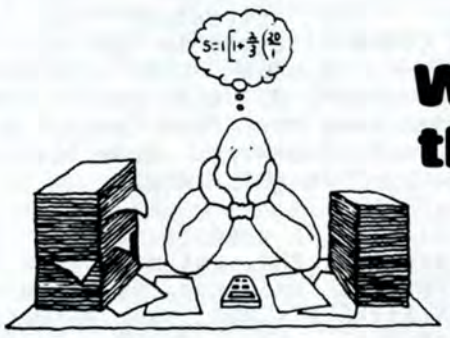
THE RETAIL COMPUTER STORE

The Retail Computer Store is the first and most experienced computer store in the Northwest. At the Retail Computer Store the emphasis is on quality and service from the computer to the program.

The Retail Computer Store staff can answer your questions and provide you with skilled assistance in configuring your system be it for school, hobby, scientific, engineering or business application. Our expertise in software, as well as hardware, has allowed us to develop systems for specific applications requiring custom software design.

The Retail Computer Store's book selection is one of the best in the nation with all the latest publications available. We have books for the novice to the expert. Come in and browse!

Lear Seigler Processor Technology IMSAI Compucolor 8001 North Star Computers, Inc.
TDL Cromenco Digital Group Southwest Technical Products



When you need more than a calculator.

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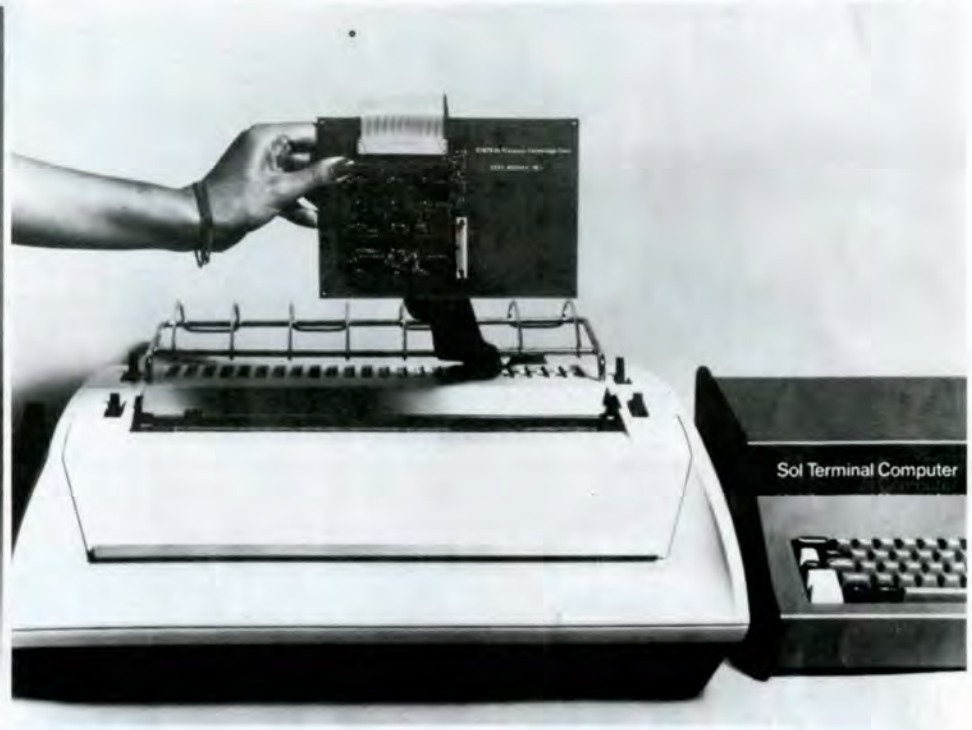
the Retail Computer store



PROCESSOR TECH. NEWS

An integrated small computer system with four full-size floppy disks on-line has been introduced by Processor Technology Corporation.

The new system, Sol System IV, includes the company's Sol-20 mainframe with 50,176 8-bit words of RAM memory, a Helios II Model 4 Disk Memory System, PTDOS Disk Operting System, Extended Disk BASIC, a video monitor and complete documentation. Total mass storage capbility on four formatted disks is 1.5 million bytes.

The PTDOS Disk Operating System offers advanced functions including complex editors, assembler, device-independent files, and random indexed files.

Extended disk BASIC was designed to obtain maximum performance from Sol/Helios hardware. The video display can be addressed randomly to any position on the screen so one can easily wite powerful forms control procedures. Extended BASIC includes string and advanced file functions, timed input, complete matrix algebra, base 10 and rational logarithms, trigonometric functions, exponential numbers and 8-digit precision.

In addition to Extended BASIC, Processor Technology offers Disk FORTRAN and Disk PILOT languages as low cost options.

Suggested domestic price for Sol System IV fully assembled and factory tested is $7995. Delivery from Sol computer dealers throughout the United States, Canada and internationally is stock to 90 days.

Printer Interfaces

Two new printer inferfaces for the Sol computer have also been announced by Processor Technology Co. Both increase the hard copy capabilty of the Sol computer.

Sol Hytype I mounts inside any Diablo Series 1200 Printer connecting it directly to the back of the Sol. Similarly the Sol Hytype II Printer Interface works with the Diablo Series 1300 Printer. The installation package includes the fully assembled, tested and burned-in printed circuit board, software, all cables and mounting hardware. No modification to the Sol is necessary. No holes need be drilled in the printer. The printer can be restored to its original condition if required.

Hytype driver software is included on CUTS cassette along with a source listing. The user may modify the driver software to suit a particular application.

Suggested retail price for both the Hytypte I an Hytype II is $150. Delivery is stock to 30 days. Diablo and Hytype are TMs of the Xerox Corporation.

New Software

Increased power for small computer software allowing programs from one language to communicate with data from another language has been announced by Mr. Steve Dompier, Manager of Systems Operations at Processor Technology Co.

This advance, they claim, is made possible by the use of the Processor Technology Disk Operating System, mentioned above. Extended BASIC, FORTRAN, FOCAL, and PILOT are among the high level languages which can communicate with each other using this standard data format.

"For example," says Dompier, " a program running in FORTRAN can access data created in BASIC and then edit other data written in FOCAL."

"Perhaps more exciting,", he continued, " is that PTDOS permits raw data created under its own text editor or assembler to be accessed by these high level languages. This feature simplifies the programming of complex data manipulation applications such as word processing."

For more information on all the above products and announcements, contact Processor Technology Co. 7100 Johnson Industrial Dr., Pleasanton, Ca. 94566. Their phone is (415) 829-2600.

COMPUTER 3 SHERRY 0

The ad on the back page said, "Grand Opening Celebration.", and right there in the middle was a 22 slot IMSAI for a price I couldn't resist. I went down to Max Cook's store and bought it with a Cromemco Z-80 CPU board instead of the standard 8080, then went home to wait for its arrival.

Two weeks later, the Cromemco board arrived and I rushed down to pick it up. When I got home and opened the box to examine my acquisition, I discovered one PC board, several plastic bags of parts, a bundle of paper tape marked "Z-80 Monitor" (I have no intention of getting a paper tape reader), and nothing else -- no manual, no parts list, no assembly instructions. I'd heard that Cromemco is famous for inadequate documentation, but this is rediculous!

Score one for the computer...

I didn't have time to drive all the way back to Federal Way, so I called Max and he promised to put the missing software in the mail right away. A few days later it came and I set to work. "Yes the parts are all here -- resistor 1 goes here..." After installing the resistors I started installing the IC sockets. The first four went on fine, but on the fifth, sixth, and seventh both pin 1 and pin 8 the solder stuck to everything but the pad. I scraped the pads with my knife-- no results. My brother Bob suggested a mild abrasive, so I gave the whole board a brisk rubdown with Scotchbrite-- nothing. Next, I called Max and he said that Cromemco had recently changed to a new solder mask and that there had been some problems with it. Cromemco's recommendation was to use a solder with two percent silver in it. At $21 a pound, I felt that bite, but tried it-- no change. The next Saturday, I took the board back to Computerland and they tried it with the same results.

Score computer 2

Max had only one other Cromemco ZPU in the shop, and that one was already assembled, but he gave it to me in exchange for the board I had.

The next week the IMSAI came. Now for the real assembly job! I read the manual, and started in. The first day I installed and tested five edge connectors on the mother board. The next day the other seventeen followed. By the time I had finished soldering and testing 1700 connections, I was so tired I couldn't see straight. After a couple of days off, I tackled the power board. Well, I tried to, but when I unpacked the parts, I found that one of the main power capacitors had been smashed to half its original diameter by the transformer. Since I couldn't do that board, I tried the front panel Rats!...It's missing three switches!

Score: computer 3

Max was able to find replacements for the missing switches, but we are still waiting for the power capacitor. I think I've got those four pages of revisions and modifications for the front panel straight now, and tommorrow I start on that.

Current score-- computer 3, Sherry 0.

Gale Sherry

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