In a recent survey made by Kilobaud Microcomputing the Aim 65 had a ranking of 16th with 1% of the total of microcomputers owned.

I understand that the literature for Rockwell's expansion board is available. A new User's Guide & Monitor Listing is available for $5 a piece. The User's Guide includes the major changes that were included in the revised pages and some minor corrections such as typing.

The new Monitor Listing changes only the Symbol Table in the back by adding all references to the symbols. It presently refers only to the location where it resides.

The NCR paper that was listed as an approved paper apparently does not exist. A black print paper would be very desirable but I strongly advise the individual reader NOT to experiment with non-approved papers.

For possible future reference the printer now has a cost of about $50 and a four digit section of the display is about $30. The printer is Olivetti. See the Statistical Analysis article for more printer comments.

I have received some letters about problems with the Enclosures Group. I suggest that you purchase the same enclosure from the suppliers in the Hardware Section of this issue. Note that all the enclosures listed may not be from these same people so if you desire their particular enclosure contact those suppliers to determine if it is one and the same.

The September/October issue will contain a review of the Little Buffered Mother and 16K ram board from Seawell Marketing, among other goodies.

SOFTWARE
SOFTWARE
SOFTWARE
HARDWARE
HARDWARE
A PROGRAM IDEA
PRODUCTS
CASSETTES

STATISTICAL ANALYSIS
ENHANCED DISASSEMBLY REVISITED
BASIC HINTS
AIM DIMENSIONS
HARDWARE PRODUCTS
READER INPUTS
EXCERT, INC.
FOR SALE OR TRADE

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STATISTICAL ANALYSIS

Geo. Sellars
1033 Bishop Walsh Rd.
Cumberland, MD 21502

I talked to the Service Center in El Paso and they estimate 3-5 million lines of printer life with Rockwell paper and greater than 1 million with the other approved papers. The only failures they have seen are with the non-approved papers. (Ed. Note. Do not use TI paper).

I hope to use the Aim for control of a telescope, data collection from a seismograph, statistical analysis and stock-market analysis, etc.

I got my Basic in early May and I am very satisfied with it. Included are a few programs using it for statistical analysis.

Least squares (or regression analysis) is a statistical principle which determines the best fit coefficients (minimum error between actual data and equation) for a set of data. For instance, if data were obtained from some measurements such as the distance (y) that an arm moved for a voltage (x) that is applied to a device such as

\[
\begin{array}{c|c}
 x & y \\
 1 & 2 \\
 2.1 & 2.9 \\
 2.9 & 4.1 \\
 4 & 5 \\
\end{array}
\]

one could expect that \( y = a + bx \) where A and B are constants of a straight line. By using LINR1, \( A = .917, B = 1.03 \) and the error (standard deviation, S) is .19. The value F is a measure of the statistical significance (how confident is one that the correlation is real and not a random occurrence). The value of F is looked up in a table for the number of tests involved. See any basic statistics book for "F" ratios. The example run for LINR1 uses the above data.

The other routines fit other equation forms on similar principles, i.e. LINR2 uses transformations on X and/or Y because many times this will make the basic equation into a linear equation.

All linear regression programs use 999 for each input variable to signal the program to begin calculation of the constants.

A brief description of each program is provided below. MKR1 covers the case of two independent variables X and Z. X, B, and B, are coefficients while A is a constant. All but STOK4 use keyboard input. STOK4 reads data put into the Text Editor. MKR1, LINR3, LINR4 will be presented in the next issue.

LINR1 Least squares of \( y = a + bx \)
LINR2 Least squares of \( y' = a + bx' \)
LINR3 Least squares of \( y = c(1-e^{-bx}) \) (uses uses iterative to find the best B)
LINR4 Least squares of \( y = a + cx^b \) (similar approach as LINR3)
STOK4 Moving average & std. deviation From 2-11 points/avg.
MKR1 Least squares of \( y = a + bx + byz \)

In the Oct. 1977 issue of Kilobaud some timing comparisons were made between the various Basic versions which were available at that time. George has supplied the following results he obtained while running the benchmark tests in that article.

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>TIME</th>
<th>INTERPOLATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.39</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>8.58</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>16.19</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>18.21</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>19.52</td>
<td>3-1/2</td>
</tr>
<tr>
<td>6</td>
<td>29.14</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>45.62</td>
<td>4-1/3</td>
</tr>
</tbody>
</table>

The ranking is out of over 30 different versions of Basic.

GENERAL INFORMATION

Article contributions are always welcome. Program listings may or may not be retyped. Artwork will not be redrawn and will be reduced in size if necessary. Text should accompany programs to explain what the program does, how it does it and how it may be modified.

Please enclose a stamped self addressed envelope for any replies that you desire.

The Target-an AIM 65 newsletter is published bimonthly with an annual subscription rate of $5 in the US and CAN and $12 everywhere. Write to Don Clem RA#2 Spencerville, OH 45687.

JULY/AUGUST 1979
LINE1

10 DIM X(100), Y(100)
100 FOR I = 1 TO 100
101 PRINT "ENTER X, Y" 
102 INPUT X(I), Y(I)
104 IF X(I) = 999 THEN
120 SM(1) = SM(1) + X(I)
120 SM(2) = SM(2) + X(I) * 2
140 SM(3) = SM(3) + Y(I)
150 SM(4) = SM(4) + Y(I) * 2
160 SM(5) = SM(5) + X(I) * Y(I)
170 SM(6) = SM(6) + 1
190 NEXT I
191 PRINT "ENTER OPTION"
20 PRINT "1- LINEAR"
21 PRINT "2- LN(X)"
22 PRINT "3- LN(Y)"
23 PRINT "4- LN(X) * LN(Y)"
24 PRINT "5- EXIT"
25 INPUT IP
26 GOTO 100
30 X(I) = LOG(X(I))
31 RETURN
40 Y(I) = LOG(Y(I))
41 RETURN
100 FOR I = 1 TO 100
101 PRINT "ENTER X, Y"
102 INPUT X(I), Y(I)
104 IF X(I) = 999 THEN
120 SM(1) = SM(1) + X(I)
120 SM(2) = SM(2) + X(I) * 2
140 SM(3) = SM(3) + Y(I)
150 SM(4) = SM(4) + Y(I) * 2
160 SM(5) = SM(5) + X(I) * Y(I)
170 SM(6) = SM(6) + 1
190 NEXT I
191 PRINT "ENTER OPTION"
20 PRINT "1- LINEAR"
21 PRINT "2- LN(X)"
22 PRINT "3- LN(Y)"
23 PRINT "4- LN(X) * LN(Y)"
24 PRINT "5- EXIT"
25 INPUT IP
26 GOTO 100
30 X(I) = LOG(X(I))
31 RETURN
40 Y(I) = LOG(Y(I))
41 RETURN
100 FOR I = 1 TO 100
101 PRINT "ENTER X, Y"
102 INPUT X(I), Y(I)
104 IF X(I) = 999 THEN
120 SM(1) = SM(1) + X(I)
120 SM(2) = SM(2) + X(I) * 2
140 SM(3) = SM(3) + Y(I)
150 SM(4) = SM(4) + Y(I) * 2
160 SM(5) = SM(5) + X(I) * Y(I)
170 SM(6) = SM(6) + 1
190 NEXT I

LINE2

10 DIM X(100), Y(100)
20 PRINT "ENTER OPTION"
21 PRINT "1- LINEAR"
22 PRINT "2- LN(X)"
23 PRINT "3- LN(Y)"
24 PRINT "4- LN(X) * LN(Y)"
25 INPUT IP
26 GOTO 100
30 X(I) = LOG(X(I))
31 RETURN
40 Y(I) = LOG(Y(I))
41 RETURN
100 FOR I = 1 TO 100
101 PRINT "ENTER X, Y"
102 INPUT X(I), Y(I)
104 IF X(I) = 999 THEN
120 SM(1) = SM(1) + X(I)
120 SM(2) = SM(2) + X(I) * 2
140 SM(3) = SM(3) + Y(I)
150 SM(4) = SM(4) + Y(I) * 2
160 SM(5) = SM(5) + X(I) * Y(I)
170 SM(6) = SM(6) + 1
190 NEXT I
LIST

890 PRINT "ENTER N FOR MOVING AVG"
900 AD=PEEK(225)+256*PEEK(226)-21
910 AM=PEEK(227)+256*PEEK(228)
920 SS=0
930 AX=48
940 SX=0
950 DEF FNP(U)=PEEK(U)-AX
960 PRINT "VOL,HIGH,LOW,OR CLOSE?"

RUN

ENTER N FOR MOVING AVG

VOL,HIGH,LOW,OR CLOSE?

AVE CLOSE 16.575
SD CLOSE .14252199
AVE CLOSE 16.775
SD CLOSE .42756798
AVE CLOSE 16.925
SD CLOSE .38119879
AVE CLOSE 17
SD CLOSE .34232698
AVE CLOSE 17.025
SD CLOSE .32355496
AVE CLOSE 17.075
SD CLOSE .25920551
AVE CLOSE 16.9
SD CLOSE .18540494
AVE CLOSE 16.9
SD CLOSE .18540494
AVE CLOSE 16.925
SD CLOSE .20916549
AVE CLOSE 16.95
SD CLOSE .20916549
AVE CLOSE 17.275
SD CLOSE .71479831
BREAK IN 993

HAVE YOU RETURNED YOUR QUESTIONNAIRE??

THE TARGET

JULY/AUGUST 1979
A PROGRAM IDEA

A Program Idea for this month is supplied by the readers. The following list is a cross-section of the needs expressed by readers. Opinions of products, construction details and modification ideas are all needed.

Analog I/O, Kim to Aim software conversion, floppy disk info, review of products, converting other basic programs to Aim, an easy to make box, Kim hardware compatibility, and larger chips are all needed. Kimock on board ram, connection of a TVT 6-5/8 to the Aim, TVT interfaces, receive and transmit CW and RTTY with the Aim, Aim 65 and graphics, educational uses for the Aim, using the Aim as an interval timer to determine charges made by the hour.

AIM DIMENSIONS

Ron Riley

On this page and the following two pages you will find dimensions for the major components on the Aim. The drawings on this page shows the Aim mounted in a CRT enclosure available from B&F Enterprises, Dept. K5 119 Foster ST. Peabody, MA 01960. This enclosure is used and it arrived rather dusty but cleaned up nicely. $28.88
HARDWARE PRODUCTS

The following lists contain suppliers names and addresses who supply hardware for the Aim. Software and individual parts are not included. The first list is of S-44 boards, the second is suppliers of other board configurations as well as power supplies or Aims. The third is a spotlight of motherboards and memory boards. Further description of each list will follow.

I prepared a questionnaire on motherboards and memory boards and sent it to several suppliers. These suppliers are shown below with the response time for their reply. Note that I only contacted a handful. Perhaps one could use the response time for an indicator of what kind of service one could expect. I would like to single out Seawell and Micro Technology Unlimited for their quick responses and Seawell and The Computerist for answering the questions.

RESPONSE TIMES

Seawell Marketing Inc  Johnson Computer  22 days
7 days
Micro Technology Unlimited Kathryn Atwood  25 days
8 days
Excert Jade Computer  30+
9 days
Measurement Systems HDE  70+
9 days
Forethought Products RNB  70+
20 days
The Computerist Wasatch  60+
20 days

All boards use 44 pin edge connectors except the Kim to S-100 motherboards. The similarities begin to end when the signals on these pins are considered. Most differences are subtle but one must be familiar with hardware to determine the modifications needed. Some of the differences to consider are unregulated vs regulated power supplies, ground and +V on the right pins and are all signals that are needed available. Also some boards require placement in certain slots.

There are differences physically between the available boards also. The widths range anywhere from 12" to 4-1/2". The larger boards offer more features/bd and usually have less expansion slots.

The products offered, the costs, board availability and actual signals provided must be determined by contacting the specific supplier involved. Updates to this list are welcome.

The following describes the questions which are answered by the Spotlight List.

1 are Aim expansion signals buffered
2 what is the motherboard size
3 what signals are provided on the exp. bus
4 how many slots are provided
5 what acc. boards are available for your bus
6 are motherboard components socketed
7 is it assembled or a kit
8 price
9 comments

The following describes the questions for the memory boards.

1 board size
2 signals required
3 min.&max. memory on board
4 are components socketed
5 on what boundary may mem. be addressed
6 assembled or kit
7 price
8 comments

S-44

Electrolabs Kathryn Atwood Enterprises
P.O. Box 6721 P.O. Box 5203
Stanford, CA 94305 Orange, CA 92667
Silver Spur Wasatch
13552 Central Ave. 25 South 300 East, Suite 215
Chino, CA 91710 Salt Lake City, Utah 84111
Kim to S-44 adapter proto board
80 digital in board 6502 cpu board
4k ram (2102) serial I/O board
8k ram (2114) 16k ram
16x64 video
8 slot motherboard pc only

8 the target card cage for above
eprom programming board
eprom holding board
40 line LED display board
40 line switch input board
audio tone decoder board
interrupt breakout board
filter for LED board
panel for switch board
32 channel analog in
19" card cage w/power supply and optional fan

THE TARGET

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<table>
<thead>
<tr>
<th>AIM RELATED PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Micro Technology Unlimited</strong></td>
</tr>
<tr>
<td>P.O. Box 4596</td>
</tr>
<tr>
<td>Manchester, NH 03108</td>
</tr>
<tr>
<td><strong>Proto board, unbuffered, motherboard, video board, prom board, 16k dynamic, d/a board</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>RNB</strong></td>
</tr>
<tr>
<td>2967 W. Fairmont Ave.</td>
</tr>
<tr>
<td>Phoenix, AZ 85017</td>
</tr>
<tr>
<td><strong>Proto board, motherboard, video board, prom board</strong></td>
</tr>
<tr>
<td>8 or 16k, 2708 programmer, 16k(2114), floppy disk</td>
</tr>
<tr>
<td><strong>Anconra</strong></td>
</tr>
<tr>
<td>P.O. Box 2208P</td>
</tr>
<tr>
<td>Culver City, CA 90230</td>
</tr>
<tr>
<td><strong>Aim 65, power supplies</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Plainsman Micro Systems</strong></td>
</tr>
<tr>
<td>P.O. Box 1712</td>
</tr>
<tr>
<td>Auburn, AL 36830</td>
</tr>
<tr>
<td><strong>HDE line, Kim-4, Computerist line</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Synertek</strong></td>
</tr>
<tr>
<td>3001 Stenderway MB 33</td>
</tr>
<tr>
<td>Santa Ana, CA 95052</td>
</tr>
<tr>
<td><strong>Video with keyboard</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Quest Electronics</strong></td>
</tr>
<tr>
<td>2322 Walsh Ave.</td>
</tr>
<tr>
<td>Santa Ana, CA 95050</td>
</tr>
<tr>
<td><strong>Aim 65</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Jade Computer Products</strong></td>
</tr>
<tr>
<td>4901 W. Rosecrans</td>
</tr>
<tr>
<td>Hawthorne, CA 90250</td>
</tr>
<tr>
<td><strong>Power supply, Aim 65, 8k ram (2114), Kim to S-100, Computerist line</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
EXPANSION BOARDS

Seawell Marketing
1 yes
2 11 3/4 x 9 1/2
3 address, gnd, sync, rdy, irq, -15, nmi, rst, data, ex clk, +15, dma, +8, q1, q2, r/w, bank select
4 4+1
5 16k (2114)
6 16k cmos
7 96k dynamic eprom burner and board (2758, 2716, 2516)
8 see comments
9 assembled
8 $139 ($189 w/4k)
9 4k of ram on board socketed, the "+1" is intended for separate mother board with 10 sockets, on board hardware for expansion to 128k

Micro Technology Unlimited
1 see comments
2 11-1/4 x 4-3/4
3 n/a
4 4+1
5 visible memory
6 eprom i/o
7 16k dynamic
8 music board
9 kit or assembled
10 up to $95
11 Aim mounting bracket places keyboard on slant, acc brds use LS technology so no buffering needed

Prethought Products
1 yes
2 $100
3 8, 16, 32k static
4 n/a
5 8, 16, 32k dynamic
6 n/a
7 6 n/a
8 7 from $139 to $295
9 dynamic is expandable in 8k blocks

Memory Boards

NBD
1 yes
2 n/a
3 address, data, r/w, sync, rdy, irq, nmi, rdy, decode for Kim
4 5
5 see comments
6 crt board
7 proto board
8 assembled
8 $80
9 a memory board with 8k ram, 8k eprom and a 6522 1/o

Seawell Marketing
1 6-7/8 x 10
2 address, data, q1, r/w, bank select
3 16k
4 memory only
5 8k boundary
6 assembled
7 $325

Prethought Products
1 yes
2 n/a
3 8, 16k
4 5
5 static ram dynamic ram eprom video
6 socketed
7 kit or assembled
8 $125k or 165a
9 ICs must be added to use with Aim

THE TARGET JULY/AUGUST 1979
E.D. REVISITED

The Enhanced Disassembly to the User Via contained a couple of errors and it also deserves some further comments. A last minute change in the listing was not made to the text. References to JMP EOBF should be JMP E182.

There are at least three problems which come to light when trying to use DILINK (A406 and A407). The first two involve the handshake portion starting at 0026. As I have the program coded I do check to see if the external device accepted the data but if the device didn't return an accepted signal the Aim will be executing a continuous loop until the end of time. The second problem arises when an Aim user presses the reset switch and the Via status is changed. This problem too, causes the continuous loop. The solution to these two problems can take two different courses. The first would be to totally ignore the handshake by placing NOP's between 0026 and 0020. This is a simple and quick way around the problem.

The second course provides a delay before checking the appropriate bit. Perhaps after the delay has expired one could try again to write to the Via. If this attempt fails an error message would be generated. (NOTE that the error message might use this routine also so there would be a considerable delay in outputing the message). Whatever course is taken one must always continue on to EP05.

The final problem is the biggest. The STEP/RUN switch causes a non-maskable interrupt when switched to STEP. The interrupt occurs only with addresses below A000. The routines I have provided reside in this area that will be interrupted. The effects of this continuous interrupting can be seen by examining 0100 and up after putting the switch in the STEP position while in the enhanced mode. There will be a definite repeating of data.

The solutions here involve some hardware modifications. The first would be to modify the range of addresses that a NMI is generated. The second would be to decode one of the holes in the Axxx range to provide a section of safe ram.

---

BASIC HINTS

Ron Riley

Some Basic Hints

It is necessary to set the tape gap to $80 prior to using the SAVE in Basic. To do this type,

POKE 41993,128  -then "Return"

To use the User VIA from basic use table 8-1 on page 8-5 of the user's manual and the PEEK and POKE commands and the following conversion table.

A000=40960  A008=40968
A001=40961  A009=40969
A002=40962  A00A=40970
A003=40963  A00B=40971
A004=40964  A00C=40972
A005=40965  A00D=40973
A006=40966  A00E=40974
A007=40967  A00F=40975

Examples,

To program the user ports (A or B) to have all bits in or out.

PORT  DIRECTION  COMMAND  
A   IN       POKE 40963,0
B   IN       POKE 40962,0
A   OUT      POKE 40963,255
B   OUT      POKE 40962,255

To get a value from a port use PEEK.
To put a value in a port use POKE.

Port A=40960  Port B=40961

5 REM STATEMENT 10 SETS UP PORT A&B AS INPUTS
10 POKE40962,0:POKE40963,0
15 REM STATEMENT 20 WAITS UNTIL PIN 14 OF THE APPLICATION
20 REM CONNECTOR IS GROUNDED
25 REM WHEN PIN 14 IS GROUNDED STATEMENT 30&40 ARE EXECUTED
30 PRINT"PORT A BIT 0 IS LOW"
40 END

To turn the printer off in Basic

POKE 42001,128

To turn it on

POKE 42001,0

---

THE TARGET
PRODUCT ANNOUNCEMENT

Excerpt, Inc. of 4434 Thomas Ave.S., Minneapolis, MN 55410 offers several Aim 65 Systems of interest to users. Excerpt configures systems with products from The Computerist and Seawell Marketing and guarantee that their products are compatible. One possible configuration might include an Aim 65 with 4K of ram, Basic, an enclosure, a power supply and 16K of ram. Other combinations might include a video board or an 8K ram, 8K prom board instead of the 16K board.

THE TARGET

FOR SALE OR TRADE

I have 4 Phi-Decks with the motion control electronics boards. These are new units. I would like to sell them all for $400 or $125 each. I will consider trading them for other equipment such as a S.D. Sales memory board, a Kim, Kim 4, etc. I have decided to use a disk system instead and that is why I want to sell them.

Ron Riley
P.O. Box 4310
Flint, MI 48504

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THE TARGET

JULY/AUGUST 1979

c/o DONALD CLEM
R.R. #2, CONANT RD.
SPENCERVILLE, OHIO 45887

Excerpt
4434 Thomas Avenue S
Minneapolis, MN 55410
Attn: David Colglazier