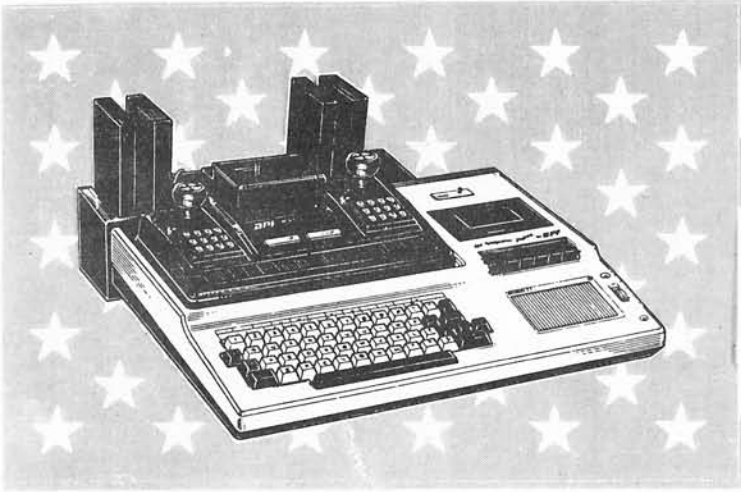

NOVEMBER '84

I-M 1 IN A MILLION CLUB

NATIONAL NEWSLETTER

INSIDE...

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___HANGMAN
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___CASINO
___BASEBALL
___BOXING
___BACKGAMMON
___CATENA
___JUMBLED UP THINGS

Please list 'A' for ALL ALTERNATES
___PAK MAN ___SUPERFROG ___ESCAPE
___MS. PAK ___FOOSEBALL

GENERAL NEWS

A TIP FROM RON STALMA

Ron has come across a "GOOD DEAL" on a GORILLA BANANA printer. He writes, "It seems that the manufacturer is coming out with a new model and is dumping the original GORILLA printer. DAK Industries Inc. 8200 Remmet Ave., Canoga Park, CA. 91304 has 21,000 of these printers for sale at $129.00 each. A GOOD PRICE ISN'T IT! They will send anyone a catalog who writes them."

PROGRAMS FROM RON STALMA

Ron has also generously contributed two programs to the program library. These SPACE games, MOON BASE 16 and XYRON VI are fun to play and should appeal to all age groups. Thank you very much Ron for your contributions to the club.

CLUB HOUSE BULLETIN BOARD

Several items are currently available on our bulletin board. If you are interested in one or more of these items, please write for the name and address of sellers. Remember to include a S.A.S.E. if you want this information. NO INFORMATION WILL BE SENT TO YOU UNLESS A S.A.S.E. ACCOMPANIES YOUR REQUEST!

Item #1. SI-232 for $20.00.
Item #2. Complete MP-1000 (game head) for $25.00.
Item #3. FI-100 for #39.99.

BACK ISSUES AVAILABLE

To those of you who have signed up under our INVITATIONAL FLYER and are new to the club.....WELCOME and THANKS for joining the club for 1985! If you would like to receive 1984 back issues of the newsletter, the cost is $1.25 per issue. Please be sure to indicate what MONTH(s) you would like when ordering.

SUPER 21 and SPACE HUNT DONATED

These 8K programs are now a part of the club program library and come with instruction booklets included. SUPER 21 is very similar to blackjack, except it contains INVESTMENTS, LOANS, KENO, and other surprizes. SPACE HUNT is a simplified STAR TREK type space adventure game that includes tractor beam and many other features.

¶¶¶¶¶¶¶¶¶¶

KA2EWE de KA9FXY 73's

DAVID JAUCH came across an article in QST concerning a program to calculate Maximum Usable Frequency (MUF). David put this information on tape along with a CW Xmit and Rcv program. Both programs were written for a non-APF computer and have not been converted. If anyone would like to try their hand at the conversion, write for the listing. Don't forget the S.A.S.E.

FB OM es TNX!

STOCKING STUFFERS!

With any library order of at least SIX selections we'll send you an APF HANGMAN/TIC TAC TOE/DOODLE cartridge FREE.
These cartridges have been donated by ERIC BECKETT. There are 96 of them still in their original cartons ready to go. The minimum selection as mentioned above should cover our packaging, duplicating, and mailing costs. THANK YOU ERIC FOR THESE CARTRIDGES. We hope that the membership can use them.

ARCADE CORRECTION SEPTEMBER ISSUE

Eric has informed us that the following changes should be made to the ML listing that appeared in the September issue:

A454 should be 20
A477 should be FC
A480 should be A7
A483 should be A4

NO.-BASE CONV/CALC. CORRECTION

Louis Dooley has sent in the following correction to his program that appeared in the AUGUST issue. I cannot produce a LESS THAN SYMBOL with this typewheel, so I will type LESS THAN in place of the symbol. When entering the change, use the proper symbol.

CHANGE LINE 6014 TO READ:
6014IFK=0IFTis less than 10THENZ(K)=T:GOTO 6040

A TIP FROM LOUIS DOOLEY

Louis provides the following information about a color monitor:
"To move my IM-1 from B/W to color, and to have color for my T/S 2068, I've splurged on a SEARS color TV/MONITOR: CAT.NO.57 AX4084 N1 ($336). It accepts antenna inputs, composite monitor inputs, and RGB; the first 2 being acceptable to the IM-1.

SHORT PROGRAM

The following information is the BASIC and MACHINE LANGUAGE data for KEITH PHILLIPS' sound effects program. Enter the BASIC program, then CALL28672 and enter the ML data beginning at A410. Return to BASIC with G8894, CSAVE before typing RUN. After CSAVE is complete, run the program.

THANKS AGAIN KEITH!

```
10REM   type in a total of 40 character A's
20INPUT"DURATION",A:POKE42025,A:CALL42016

ML
A410 B6 01F0 LDAA PITCH
A413 4A      DEC A
A414 26FD    BNE WAIT
A416 BD428B  JSR TOGGLE OSC.
A419 7A01F1  DEC DURATION
A41C 26F2    BNE
A41E 39      RTS
A420 CE 7000 START ADDRESS
A423 A600    LOAD A ACC REL TO INDEX
```

SE-1

```
A425 B7 01F0 STORE EXT
A428 C6 02   LDDB DURATION
A42A F7 01F1 STORE EXT.
A42D BD A410 OSC TOGGLE ROUT.
A430 08      INCREMENT INDEX R.
A431 8C 9FFF CMP END ADDR.
A434 27 02   BRA. IF END REACHED
A436 20 EB   BRA. TO A600
A438 39      BACK TO BASIC
```

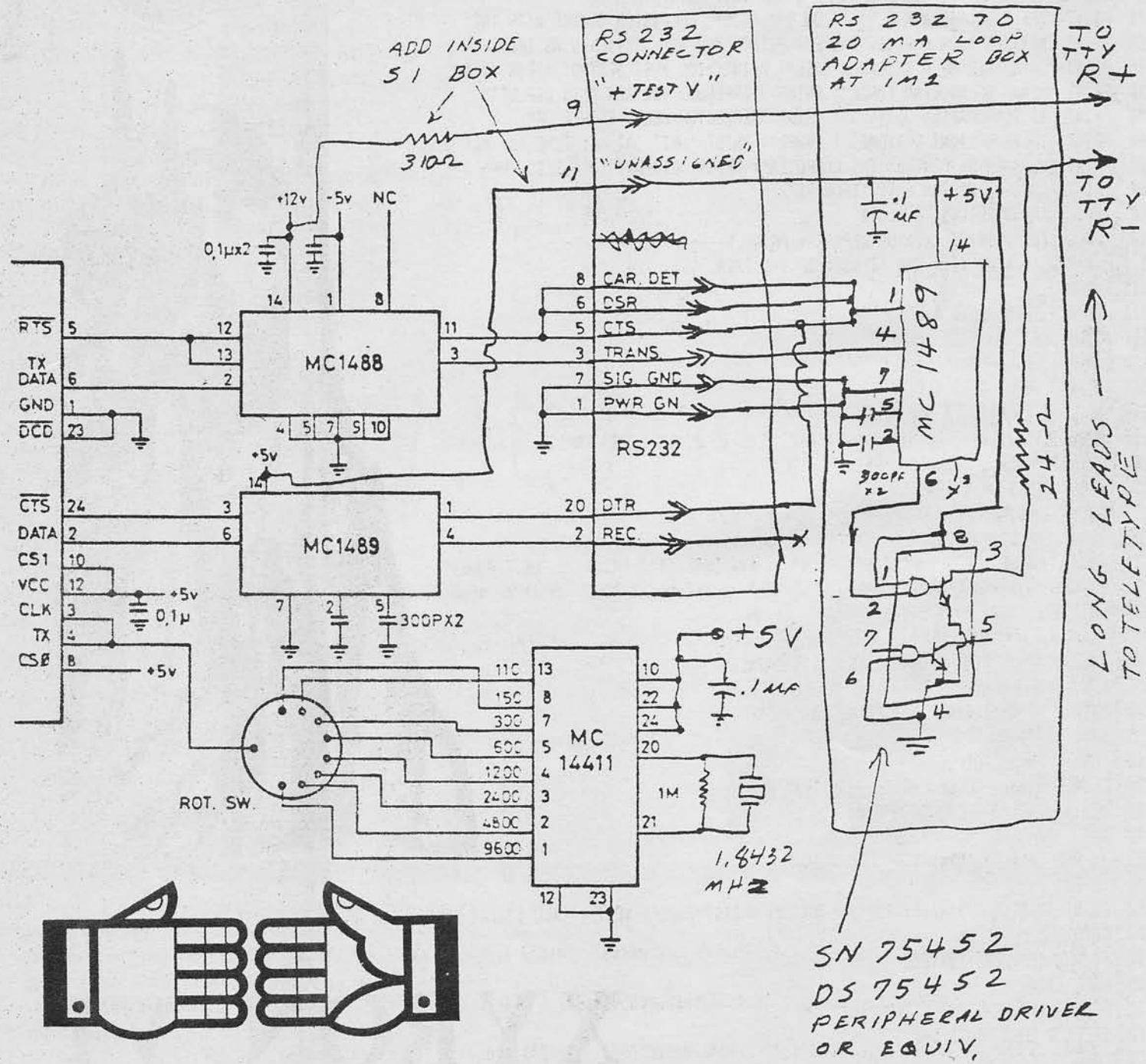

```
10  FOR I=1 TO 2
20  MUSIC "70000000050002000000070006000000+506050+4000000000   60000000+400020000000*1000700000+607060500000000"
30  MUSIC "  "
40  MUSIC "50000000+4000300000005000200000005000700000000000   70000000600050000000300O+400000005000600000000+6000"
50  MUSIC "  "
60  MUSIC "70000000050002000000070006000000+506050+4000000000   60000000+400020000000*1000700000+607060500000000"
70  MUSIC "  "
80  MUSIC "500050000000+4000300000005000200000005000700000000000  60000000300050000000+400050000000000000000"
90  MUSIC "                "
100  NEXT I
```

A FEW MORE OLDES FROM HAL BLOOM

```
10  FOR I=1 TO 2
20  MUSIC "5000*3000000000  *30000000*2000*1000000000000000    *1000 *1000000 *1000700000000600050000000000000000"
30  MUSIC "    "
40  MUSIC "30 30400050006000500000000    300040005000600050000000    70*1060000000000  *30000000*2000 *2000000000000000"
50  MUSIC "    "
60  MUSIC "5000*3000000000  *30000000*2000*1000000000000000    *1000 *1000000 *1000700000000600050000000000000000"
70  MUSIC "    "
80  MUSIC "30 30400050006000500000000    300040005000600050000000    500060007000*1000 *1000*200000*10 *1000000000000000"
90  MUSIC "                "
100  NEXT I
```

HELPFUL HINTS

This circuit was sent in by an anonymous donor and consists of an EIA to CURRENT LOOP CONVERTER. The portion of the print to the left comprises the SI-232 cartridge and the drawn in portion represents additions and modifications to the SI circuit. This circuit, or ones functionally similar to it, are required when interfacing the IM-1 to a current loop device such as a TELETYPE MACHINE.



The adapter is powered from the IM-1 supplies by using two "UNUSED" pins in the RS232 connector. The pins chosen should permit use with more sophisticated printers without UN-modifying. The two resistors used (310 ohm & 24 ohm) are in the circuit so that neither long lead is a "DIRECT" connection in case of shorts or induced current pulses.

SHORT PROGRAMS

```
1  POKE 24578,38
2  REM :CHANGED  TO   APF BASIC BY R. STALMA
4 E=8:A=10000+( RND (0)*2000):C=100
5  CALL 17046: PRINT : PRINT : PRINT "XYRON VI": PRINT
10  PRINT "THE SATELITE XYRON VI IS ON A": PRINT "COLLISION COURSE WITH THE"
20  PRINT "MARTIAN MOON PHOBOS, WHERE": PRINT "YOU ARE STATIONED AS THE"
30  PRINT "COMMANDER OF A RESEARCH BASE": PRINT "YOU MUST DESTROY XYRON VI BY"
40  PRINT "MEANS OF NUCLEAR FORCE": PRINT "TORPEDOS. YOU CAN ALSO DEFLECT"
50  PRINT "IT TEMPORARILY USING A": PRINT "DEFLECTOR BEEM. EITHER OF"
60  PRINT "THESE OPTIONS CONSUMES 1 POWER": PRINT "UNIT. AT ANY TIME YOU MAY ALSO"
70  PRINT "REPOWER OR CONSULT THE COMPUTER": PRINT "LIBRARY TO ASSESS THE"
80  PRINT "CORRECT DISTANCE TO XYRON VI"
90  INPUT "PRESS RETURN TO BEGIN"
100  CALL 17046: PRINT "STATUS REPORT": PRINT "------ ------"
110 P=( RND (0)*200):I=( RND (0)*2): IF I=1 THEN  GOTO 120
115 B=A-P
116  IF A<1 THEN  GOTO 460
117  GOTO 130
120 B=A+P
125  IF A<1 THEN  GOTO 460
130  IF C<=0 THEN  GOTO 510
132  MUSIC "55331111": PRINT "RANGE="A" PLUS OR MINUS "P" KM"
140  PRINT "POWER UNITS REMAINING-----"E
150  PRINT C" % OF XYRON INTACT"
155  PRINT : PRINT
160  PRINT "))))))))))ORDERS((((((((((("
170  PRINT "ENTER 1 FOR TORPEDOS": PRINT "2 FOR DEFLECT": PRINT "3 FOR REPOWER"
171  PRINT "OR 4 FOR LIBRARY COMPUTER": PRINT "(CONSUMES 1 POWER UNIT)": INPUT D
173  ON D GOTO 200,300,175,700
175 E=E+4
180  CALL 17046: PRINT "FOUR POWER UNITS GAINED"
190  GOTO 400
200  PRINT "AT WHAT RANGE (ENTER AS KM)": INPUT K
205  CALL 17046
210  IF K=B THEN  GOTO 250
220  PRINT "MISS---ACTUAL RANGE WAS "B" KM"
230 E=E-1: IF E<=0 THEN  GOTO 500
240  GOTO 400
250 F=( RND (0)*100/15)*10: IF F>C THEN F=C
251 C=C-F
260  PRINT "DIRECT HIT!!!!": FOR I=1 TO 10: MUSIC "/322": NEXT : CALL 17012: PRINT F"% OF XYRON DESTROYED"
270  GOTO 320
300 G=( RND (0)*200)*10+1000
305  CALL 17046
310  PRINT "XYRON VI DEFLECTED "G" KM"
312  IF E<=0 THEN  GOTO 500
315 A=A+G
320  GOTO 230
400  PRINT "XYRON VI DESCENDS": FOR Z=1 TO 1000: NEXT
420 H=( RND (0)*200)*10+1000: PRINT H" KM"
425  FOR I=1 TO 500: NEXT : CALL 17046
```

XYRON VI

By RON STALMA

SHORT PROGRAMS

```
430 A=A-H
450  GOTO 100
460  CALL 17046: FOR T=1 TO 50: MUSIC "*4":U=( RND (0)*131):V=( RND (0)*15): SHAPE =15: COLOR =3: PLOT U,V: NEXT
465  CALL 17046: FOR I=1 TO 10: CALL 17012: NEXT : PRINT "COLLISION!!! PHOBOS DESTROYED IN BLAST"
470  END
500  CALL 17046: PRINT "PHOBOS POWER DEAD!": PRINT "COLLISION IS IMMINENT!"
502  MUSIC "-7-7-6-6-5-5-4-4-3-3-2-2-1-1"
504  FOR Z=1 TO 500: NEXT : GOTO 460
510  PRINT "XYRON IS COMPLETELY DISTROYED!"
511  FOR I=1 TO 5: CALL 17010: NEXT
520  PRINT "YOU WIN HOORAY!"
530  STOP
700  PRINT "LIBRARY COMPUTER READY": MUSIC "737111"
701  MUSIC "222*7*7*7*7": PRINT "XYRON VI IS AT WHAT RANGE ": INPUT Q
702  MUSIC "/5/5/5/5/5/11111/7/7": PRINT "PLUS OR MINUS HOW MANY KM": INPUT O
703  CALL 17046
704  GOTO 705:=Q+O:N=Q-O
705  PRINT :L=Q+O:N=Q-O
706  MUSIC "-2-3-2-3-2-35555": PRINT "XYRON VI IS EITHER AT ";L;" OR ";N;" KM"
707 E=E-1: IF E<0 THEN  GOTO 500
708  MUSIC "111": PRINT "TYPE 1 TO RETURN TO COMMAND STATUS"
709  PRINT "OR TYPE 2 FOR ADDITIONAL INFORMATION": PRINT "(WILL COST AN ADDITIONAL POWER UNIT)"
711  INPUT H
713  CALL 17046
715  IF H=1 GOTO 160
716  IF H=2 GOTO 718
717  CALL 17046: GOTO 708
718 M=( RND (0)*100): IF M<=55 GOTO 718
720  IF A=L GOTO 750
721 Z=( RND (0)*8): IF Z=4 GOTO 730
722  PRINT "COMPUTED PROBABILITY THAT": PRINT "THAT XYRON VI IS AT ";N;" KM--";M;"%"
723  INPUT "PRESS RETURN TO CONTINUE": CALL 17046: GOTO 707
730  PRINT "COMPUTED PROBABILITY THAT": PRINT "XYRON VI IS AT ";L;" KM--";M;"%"
740  GOTO 723
750 Z=( RND (0)*8): IF Z=4 GOTO 775
751  PRINT "COMPUTED PROBABILITY THAT": PRINT "XYRON VI IS AT ";N;" KM--";M;"%"
777  GOTO 723
```

This very short program was submitted by JIM CLATFELTER. "This program works because all leap years happen to be divisible by four. The formula in line 20 is the interesting part. Substitute any number (or variable) in a program to find out if it is divisible by another number. It is useful in programs using a printer if you want to do a form feed after printing a certain number of lines, say 60. Just increment a variable by one each time a line is printed, then GOSUB to this formula, substituting 60 for 4. If the answer is YES then do a form feed. It should have many other uses too."

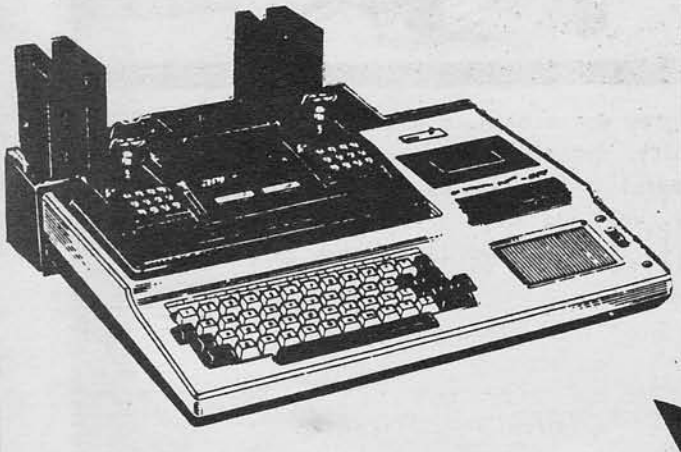
```
 5  DIM E$(1): CALL 17046
 10  INPUT "YEAR",Y: PRINT
 20  IF  INT (Y/4)*4=Y PRINT "YES, ";Y;" IS A LEAP YEAR": GOTO 40
 30  PRINT "NO, ";Y;" IS NOT A LEAP YEAR"
 40  PRINT : PRINT "PRESS RETURN FOR ANOTHER TRY": PRINT
 50 E$= KEY$ (0): IF E$="" THEN 50
 60  RUN
```

IM-1 PROGRAM LIBRARY ADDENDUM

The program library has grown considerably over the past year. Some of the programs that have been sent in have already been printed in previous issues. Others have been filed temporarily in order to review them for the library listing. The initial listing of programs appeared in the MARCH 1984 issue and contained MOST of programs we received.
This addendum to the IM-1 program library contains the programs that were mentioned in the GENERAL NEWS section over the past year. This is provided for reference only and does not include detailed descriptions.

JIM RITTIS--T2LETWRI-LETTER WRITER PROGRAM.
GLENN JONES-24HOUR CLOCK PROGRAM D8CLOCK, KAMEL
TIM DANIELS-INVENTORY PROGRAM
DOUG SMITH-TERM-1 (TERMINAL EMULATOR) and STORDI (APF STORE DISPLAY PROGRAM)
KEITH PHILLIPS-SCNWII(SCREEN PRINTER PROGRAM CALLED SCREENWRITER II)
KEITH PHILLIPS-SE-1 (SOUND EFFECTS PROGRAM)
LOUIS DOOLEY-PAIRED ITEMS, NO. BASE CONVERSION, and IM-1 JUKEBOX
LOUIS DOOLEY-APF IM-1 TYPEWRITER JR (T6TYJR)
DON SCHMIDT-BASERIES CRYPTOSYSTEM
ERIC BECKETT-FROGGIE ON THE FREEWAY
BILL BOWMAN-T6FUELCOMP(FUEL COMPARISON), COM COST, T6FIXWDL(fixed withdrawl), ELECOST
HAL BLOOM-HCDISKMUS (MUSICAL SCORES-hardcopy only)
HARRY BROWN-MY PICASO, RANDOM MUSIC/DISPLAY PROGRAMS--SO MANY! Write for complete list.
RON STALMA-SEE GENERAL NEWS THIS ISSUE

Some of the shorter programs were printed only and were not made a part of the library listings. However ALL programs that have appeared in print ARE also available ON TAPE. If they do not have a library identifier, ask for them by name.
If you have sent in a program and it was not printed or mentioned in the library listing, PLEASE LET US KNOW. We want to insure that full credit is given to everyone who submits material to the library!



HELPFUL HINTS

VIDEO DISPLAY TERMINALS

Video terminals are priority devices in many businesses today, and the trend of replacing older terminals with newer, more efficient ones is a common practice with larger companies. This trend allows the home computer owner/hobbiest a good opportunity to obtain slightly used equipment at very reasonable prices. The video terminal/IM-1 combination lends many advantages to the IM-1 user. We will attempt to give some examples of how a terminal can be used with the IM-1.

Aside from basic communication with a distant host computer or terminal, there are many other advantages in having a video terminal connected directly to the IM-1. For instance, when using the IM-1 to output directly to a printer WITHOUT A TERMINAL, the ability to monitor data as it is flowing out of the IM-1 and into the printer does not exist. There is no display of OUTGOING data on the screen when dumping to a printer. Although the ability to display this data by inserting a terminal between the IM-1 and printer may not seem very important, the ability to CONTROL and EDIT the data BEFORE it is printed can be very important in many applications. Full edit and control is provided by a video terminal. The terminal acts as an intermediary between the IM-1 and periferal device (printer, modem, synthesizer, spooler, etc.), and gives you full control of these devices at all times. The terminal keyboard can functionally take the place of the IM-1 keyboard in this intermediary arrangement.

Most terminals are classified either SMART or DUMB. The SMART terminal contains it's own micro-processor and buffer and can be configured to display it's own graphics, receive and display at one baud rate while it sends the data out at a different baud rate, permits screen fields to be established and recorded, and can be configured to match both serial and parallel protocol. Most smart units contain full editing and cursor control keys, and come equipped with MODE OF TRANSMISSION keys. These mode keys allow the user to talk directly to the computer, send data to the printer a line at a time, or send information to the printer a PAGE (full screen) at a time (line after line). The smart terminal includes features too numerous to mention in this limited space but we do want to convey that smart terminals can be configured to make your work a lot easier.

The DUMB terminal is mainly a DATA IN/DATA OUT display device and does not usually include the features of the smart terminal. These units are generally less expensive because of their limitations, yet many include editing and cursor control.

One very important feature of the smart terminal is the PRINT ON/PRINT OFF key. This key allows or disallows the information from being transmitted to the periferal device. For example, if you would want to make more than one copy of a stored letter that you would happen to have on disk or tape, and relieve the IM-1 from this duplicating task, you could dump the letter to the smart terminal screen. Once the data is displayed on the screen, the IM-1 can go about it's business with something else. The PRINT ON key can then be depressed on the smart terminal (ready to dump to your printer) and then the SEND PAGE key can be depressed that will transmit the data that appears on the screen to the printer. For multiple copies, you would simply depress the SEND KEY again for as many pages needed. This procedure would seem to emulate a SPOOLER or PRINTER BUFFER effect, whereas the data is temporarily held in the terminal screen memory, and re-transmitted to the printer, thus freeing the computer from this task.

Most terminals provide connections for a computer (EIA PORT), a SERIAL DEVICE (SERIAL PORT), and a PARALLEL DEVICE (PARALLEL PORT). Any data coming into the EIA port (IM-1 connection) can be re-transmitted out EITHER the serial or parallel port. Any data coming into the serial or parallel port can be sent to the computer and displayed on the screen of BOTH computer and TERMINAL. With this in mind, consider yet another possibility using a terminal with the IM-1.

For instance, let's assume that you have established contact with another terminal

HELPFUL HINTS

over the phone line, via the modem which is connected to the serial port of your terminal. Your IM-1 is sitting quietly on the side through the EIA port. The person on the other end would like to look at a few BASIC lines in YOUR program that you are experiencing trouble with.
The procedure would be as follows:
You would load the program that contains the lines in question in a normal fashion from tape or disk. When the program is in, you would type PRINT=2 to give control of your IM-1 to the TERMINAL. You would then move to the terminal keyboard. Everything can now be done from this keyboard. You would then depress the CONV (converse) key on the terminal that would let you talk to your IM-1. You would then LIST the line numbers in question (Ex. LIST10,5). Five BASIC lines would then appear on your terminal screen. At this point you can transmit each line to the distant end by using the SEND key on the terminal. The distant end would receive these lines and can modify them and send them back to you. After receiving them back, you can enter the CONV mode again and send each line directly back into your program. The newly modified program can then be SAVED (CSAVE or SAVE) from the terminal.

Another example of EDITING with a terminal WITHOUT using a modem would be to simply LIST the lines as mentioned in the previous example, move your terminal cursor to the line or lines in question, modify them, and send them back into the computer. This editing feature makesit fast and easy to modify ANY type of program, without the need to REWRITE the entire line(s). You can imagine how quick it is to change MUSICAL notes by using the editing features of a terminal.

Used terminals can be purchased through a number of surplus companies, directly from businesses that are changing types or systems, and in some states, directly from the telephone company. Some telephone companies allow outsiders to bid on outdated or surplus equipment.
COMPUTER SHOPPER is good publication for those who are looking for used equipment that can be purchased from businesses and private individuals.

FOR A NEW AWAKENING AND REALIZATION OF THE VERSATILITY OF YOUR IM-1, TRY CONNECTING IT TO A TERMINAL. YOU'LL BE AMAZED AT WHAT YOU CAN DO!

Pictured above (to the right of the IM-1) is our ADDS CONSUL 980 smart terminal. Data coming from the IM-1 goes to the ADDS and then can be switched to any other equipment seen in the picture; model 30 (right of ADDS), CANON AP350 TYPEWRITER, T-103 MODEM, VOTRAX TYPE N TALK, or a model 300 terminet (not shown).

THE ARCADE

Let's continue now from where we left off in SEPTEMBER with Eric's instruction.

Now you can see that by shortening the delay to just the right speed, you can make the square move smoothly. You can even move it in a round circle.

Moving off the screen sides is OK. Because of the way our screen map is laid out, the square just wraps around to the other side. No harm is done. This effect is nice for games like PAK MAN and ESCAPE. It makes it seem like the play field is bigger because you can go to another room. You can also use it like I did in FROGGY to make traffic appear to scroll on and off the screen. However, you run into problems when you go off the top or bottom. When this happens, we are moving the square into our program RAM! The result is usually CRASH! We have to put in our program a routine that checks to see if the square is on the edge of the screen. We compare where we want to move to the highest and lowest screen addresses. If you are about to move off the screen, the program jumps back to the move square routine and loops around until you move to a legal screen address. You could also jump to a sound routine. You could also jump to a routine that puts the square back on the top or bottom to make it appear to wrap around. This is great for space games, where you have an unlimited galaxy to fly in.

Another way is to put a border around the whole screen and check each time we move.

Let's look at one of these ways. We could use the same program we typed previously, with some additions. Here is what we could do to keep the square where we can see it. We want to look before we move to see if we are going off. We need four routines to check the four ways we can go off the top or bottom. We could use only one longer routine but then every--time we move we have to check four ways. This is very time consuming. Using four separate routines might take up a little more RAM, but it will speed up our program.

We are going to do it an easier way. We are going to add our old program so we will need more space for our new ML program. Do this by adding these lines of BASIC.

```
21REMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAA note: total of 51 characters
22CALL17046
23FORI=512TO544:POKEI,159:NEXT
24FORI=575TO991STEP32:POKEI,159:POKEI+1,159:NEXT
25FORI=992TO1023:POKEI,159:NEXT
```

Lines 23 to 25 simply put a yellow border around the screen. Then we add the ML routine that looks before we move to see if the YELLOW is there. We can do this in BASIC because time isn't critical. If you want to start a game by plotting a maze, you would want to draw it in ML for speed.

Now you will learn a trick that will get you out of many ML jams. If we want to put a routine in the middle of our program, we can put in what is called a PATCH. If we want to add a jump to a sub routine at A44D in our program; specifically to check to see if we are going off the edges of the screen. The sub routine that checks to see if we went off the border is at A4AA. So at A448 we put in 7E or jump to A4AA.

What about the codes that were at A44D? In our sub routine that we jumped to, we put in the commands that we covered up at A44D, then we returned (39). Add these ML patches to your expanded program. At A44D put 7E A4 AA, and at A458 put 7E A4 AA. At A468 put 7E A4 AA, and at A478 put 7E A4 AA.

Now lets add the patch routine starting at address A4AA. Enter it in just as follows:

```
A4AA A6
A4AB 00
A4AC 81
A4AD 9F
A4AE 27
A4AF 03
A4B0 7E
A4B1 A4
A4B2 7B
A4B3 FE
A4B4 A4
A4B5 10
A4B6 7E
A4B7 A4
A4B8 18
```

The program should be fairly easy to figure out. We check to see if we move, if OK we move. If not, we re-draw the square which was erased before we came to this point, and then loop to move square. If all was entered right your square won't go off the screen.

Let's take a break for a little while and cover some useful ROM routines, then some sound routines.

If you want to clear the screen to ALL BLACK in ML, jump to sub routine (JSR) 4296.

How about turning the screen all ONE CODE? First load Acc A with the code desired, then JSR 4298.

This routine will load consecutive addresses with the same value. First load the X register with the starting address, then load Acc A with the value to be put in, then load Acc B with the number of bytes to put it in. Now, JSR 477C. When you come back from this routine Acc A is unchanged, Acc B will have 00 in it, and the X register is increased by the value that was in Acc A.

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What if you wanted to add a number to the INDEX register? Just load Acc A with the value, then jump to 771B.

Do you need a random number from an ML program? Jump to sub routine 7155 and when you return, the random value will be in Acc A.

How about converting BCD (Binary coded decimal) to a HEX value. Just store the BCD value at A0A7 and A0A8. Then jump to subroutine at 9060. When you return, the HEX value is in A0A8. To convert from HEX to BCD, store the HEX value at A029 then jump to subroutine 99AD. When you return, the BCD value is in address A0A7 and A0A8.

The next routine will move a block of memory from one location to another. The block must be less than 256 bytes. Load Acc B with the number of bytes to be moved. Store the first address to be moved to at A029 and A02A. Then store the first address to be moved from--at A02B and A02C. Now jump to subroutine at 7700.

This ROM routine will output a code from the Acc A to the screen. Load Acc A with the code to output to the screen. Put screen address where code is to go at A000 and A001, then jump to subroutine at 8473.

Here are some key memory locations that you might be interested in.

At A031 and A032 we find the variable storage pointers for BASIC variables.

At A400 and A401 you will find the next free memory location or the end of your program PLUS 1.

Let's look at some ML sound examples.

The APF BASIC "MUSIC" command is really terrific! One way to pick up some sound speed is using some of APF's ROM sound routines. They are at DEC address 16999 to 17036. You can use a BASIC CALL command, or use the ML jump to subroutine or 7E to any HEX equivilent. Try some of these routines out. Another way, and the way I use mostly, is the ROM routine JSR 526E. Before jumping to this routine, you must load Acc B with any value between 00 and FF. Each one gives you a different sound. It can be very quick depending on the number in Acc B. Here are some of the sounds you will get from the 526E routine.

When you load B with 01 you get a slow high pitch laser sound. When B is loaded with 26, you get the same laser sound only the length is faster. Load B with 55 and get a real fast laser sound.When you get up to 85 you get a very fast high pitched PONG sound. If we put 100 in Acc B, we get almost the same sound as 01 only the pitch is lower and the sound is a lot longer in duration. Use 150 to get the same lower pitch sound, only faster. If we use the value 185 we get an interesting low space sound followed by a beep. 205 sounds the same as 185 but the beep sound is a longer duration. Use 225 and get the same sound as 185 but faster.

A 250 is even faster and sounds real good. Finally, using 253 gives you a low pitched FUZZ sound followed by a laser sound. You can use these examples to get the general idea of what you want, then try all the other numbers between these to get just the sound you want.

The following program will let you check out your sounds (all the different possibilities).

Start with a clear memory and type in the following BASIC program:

```
10REMAAAAAAAAAAAAAAAAAAAAA
20INPUT"SOUND VALUE",X:IFX=" "THENGOTO20
30POKE42003,X
40CALL42002
50INPUT"SAME SOUND AGAIN",A
60IFA=1GOTO40
70GOTO20
```

Now at A412 enter the following ML program:

```
A412 C6
A413 01
A414 BD
A415 52
A416 6E
A417 01
A418 01
A419 01
A41A 39
```

Here is a brief description of what you just entered. In our BASIC program, line 20 asks for a value to put into Acc B. This number can be any number less than 255. Line 30 POKES the number into our ML program just after the load Acc B command at A413. Line 40 jumps to our ML program and makes the sound. Then you are asked if you want to hear the same sound again. Enter 1 for YES, RETURN for NO. If NO it will ask you for a new sound value. Our ML program doesn't require much explanation. It loads B the jumps to the ROM sound routine.