MICRO-8 NEWSLETTER

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A newsletter dedicated to the interaction and dissimination of information to computer enthusiasts involved in the construction, programming, and applications of MICROCOMPUTER SYSTEMS.

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MICRO-8 COMPUTER USER GROUP NEWSLETTER FEB. 8, 1975
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DO WE HAVE SOME EXCITING NEWS FOR YOU THIS TIME! EVERYONE'S DREAM WILL NEARLY COME TRUE WHEN THEY SEE BOB COOK'S CREED TELETYPE OFFER. JIM FRY HAS GOT 2102'S DOWN TO $5.45. 8008 PRICES CONTINUE TO DROP. (COOK HAS THEM FOR $45.) THE MIL MONITOR-8 ROM & CASSETTE UNIT ARE MAJOR BREAKTHRUS FOR THE HOBBYIST, AND THE DIGITAL GROUP HAS AN EXCITING DOCUMENTATION PACKAGE THEY ARE OFFERING THAT INCLUDES A CASSETTE TAPE UNIT THAT WORKS AND A $80 TV TYPEWRITER UNIT. ITS AN EXCITING TIME TO BE WORKING IN HOBBY ELECTRONICS BUT FRUSTRATING TOO SINCE THINGS CHANGE SO DARN FAST. WE NOW HAVE 400 PARTICIPANTS & SEVERAL NEW LETTERS ARRIVE EVERY DAY.

SINCE MANY PEOPLE WILL SOON BE EXPERIMENTING WITH CONFIGURATIONS OTHER THAN THE MARK-8, WE ARE SWITCHING BACK TO THE NAME "MICRO-8 COMPUTER USER GROUP." JOHN CRAIG, PRESENTLY WITH VARIAN, WILL BE HELPING ME AS A CO-EDITOR. HE PREPARED PART OF THIS NEWSLETTER.

IT'S TIME TO MAKE A DECISION ON WHAT TO DO WITH THE NEWSLETTER FOR THE FUTURE. SEVERAL POSSIBILITIES HAVE COME UP BUT NOTHING THAT WE CAN REALLY COUNT ON. BOB ALBRECHT, THRU PCC, WOULD LIKE TO START A HOBBY COMPUTER NEWSPAPER IN THE FALL. WE HAVE SEVERAL REGIONAL GROUPS THAT COULD PROBABLY BE PERSUADED TO PUBLISH AT LEAST A FEW NEWSLETTER ISSUES.

NOTHING HOWEVER HAS COME UP THAT I AM WILLING TO GAMBLE THE INTERESTS OF THE PARTICIPANTS ON. ALMOST UNANIMOUSLY, PARTICIPANTS AGREE THAT A SUBSCRIPTION NEWSLETTER IS NECESSARY. JUDGING FROM THE VERY GENEROUS DONATIONS THAT KEEP ARRIVING DAILY, WE MUST BE DOING SOMETHING RIGHT. THEREFORE THE FOLLOWING DECISION HAS BEEN MADE.

WE WILL CONTINUE TO PUBLISH 6 MORE NEWSLETTERS IN THE NEXT 6 TO 12 MONTHS FOR A FEE OF $6.00. A SERIOUS ATTEMPT WILL BE MADE TO HAVE THEM OFFSET PRINTED AND WE WILL INVESTIGATE A NON-PROFIT BULK MAILING PERMIT. I RELUCTANTLY PROPOSE THE $6.00 FEE BUT WITH PAPER AND PRINTING COSTS AS HIGH AS THEY ARE, IT WILL PROBABLY COST NEARLY THAT TO PUBLISH THE NEXT 6 ISSUES. I WOULD LIKE TO HAVE A FEW DOLLARS LEFT OVER TO HELP CONSTRUCT PERIPHERALS FOR THE CABRILLO COMPUTER CENTER'S 8008 SYSTEM TO HELP COMPENSATE THE ADVANCED STUDENTS THAT HAVE HELPED MAKE THE NEWSLETTER POSSIBLE.

MANY THANKS TO THOSE THAT HAVE SENT IN GENEROUS DONATIONS. WE HAVE KEPT CAREFULL RECORDS OF DONATIONS AND PUBLISHING COSTS AND WE WILL ONLY BE ABOUT $50 OR $60 IN THE HOLE AFTER THIS ISSUE. IF YOU HAVE ALREADY DONATED $6.00 OR MORE, PLEASE NOTE IT ON THE RENEWAL FORM. YOUR SUBSCRIPTION IS ALREADY PAID AND MANY THANKS FOR HELPING PAY FOR POSTAGE AND PAPER FOR THE PAST ISSUES.

PLEASE REMEMBER THAT THIS IS A NEWSLETTER. THAT MEANS WE DEPEND ON YOU!!! TO SEND INFORMATION THAT MIGHT INTEREST OTHERS. IF EVERYONE TAKES JUST A LITTLE EXTRA TIME TO WRITE UP WHAT THEY ARE DOING, THE NEWSLETTER WILL CONTINUE TO BE INTERESTING AND VALUABLE. IF YOU CAN SEND CAMERA READY WRITEUPS, PROGRAM LISTINGS, AND SCHEMATICS, WE WILL BE ABLE TO PUBLISH MUCH MORE MATERIAL THAN IF WE HAVE TO RETYPE AND REDRAW EVERYTHING. PARTICIPANTS MUST BE COMPLIMENTED ON THEIR WILLINGNESS TO SUPPLY MATERIAL SO FAR. YOU HAVE KEPT OUR MAILBOX FULL AND HAVE HELPED MAKE THE NEWSLETTER VALUABLE AND INTERESTING.

WE COULD EASILY DO 80 PAGES THIS TIME WITH THE MATERIAL WE HAVE IF WE COULD JUST FIGURE OUT HOW TO PRINT IT AND PAY POSTAGE. PLEASE DON'T BE UPSET IF SOME GOOD STUFF YOU SENT IN DOESN'T MAKE IT INTO THIS ISSUE. WE'LL GET IT INTO THE NEXT ONE FOR SURE. A LOT OF ITEMS TO BE MENTIONED ARE TOO BIG TO PUBLISH IN THE NL SO WE ARE PROPOSING A SUBTLE BRIBE. SEND US A NEWSLETTER ARTICLE AND A SASE, AND WE'LL SUPPLY THE REPRINT YOU REQUEST.

WILCOX ENTERPRISES
28 W 178 39TH ST.
NAPERVILLE, ILL. 60540

312-357-3021

CREED model 75 teletype with interface kit, includes crate
FOB Naperville, Ill. See over for description. $125.00
Carriage return and run out(repeat) key option on above,add 5.00
Set of original maintenance manuals on microfiche available soon
(For loan of originals write for information)
New type characters for Creed available soon
Lamp and photocell with mounting bracket for counting the number of Creed punch operations 1.00
Paper tape winder(wind up) and 2 plastic reels 5.00
Paper tape per reel .30
per box of 10 2.50
Power distribution box - includes 3 wire cord, six outlets and switch in metal box. Wonderful for work bench. 5.00
Creed Manual (may be credited to later purchase of Creed). 1.00

Optical Scanner for use with bar codes. Originally used with Creed in Spiegel system to generate teletype code. Has a variety of switches, motors, lens, photocell, power cord, etc.
Includes some descriptive material. good condition $10.00
damaged 5.00

Integrated Circuits (all prime, obtained from Intel or MIL distributors unless noted otherwise)
8008 - 8 bit Microcomputer chip $45.00
with Creed 40.00
1702 - 256 x 8 Programmable and erasable Read Only Memory 35.00
with Creed 30.00
(programmed with Creed monitor for free)
2102 - 1K x 1 RAM - Static 6.00
8 with Creed 45.00
1101 - Manufactured for United. Fully tested. 1.50

Radio Electronics 1101 memory board with 32 - United 1101's 55.00

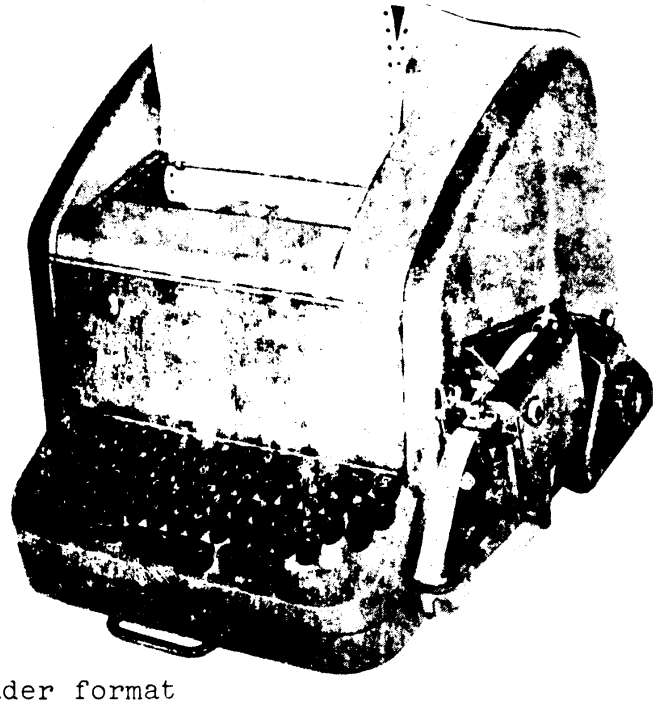
Wire wrap boards - Wrapped, used, bypass capacitors included.
14 - 16 pin sockets and 21 - 14 pin sockets 10.00

Transformers , two secondaries 27 v and 7 v, appear to be high current 4.00

Lamda power supplies - 20 v 20 a- variable from 0 to 25 v. includes current and voltage meters(rack mountable) 60.00
20v 12 a - variable from 0 to 25 v. no meters 40.00
Rixon multiplexer circuit packs and mounting hardware. Write for full information. Circuit packs include teletype speed converters, clocks, small power supplies, modems, etc.

RWC 1-26-75

ITT CREED MODEL 75 TELETYPE



COMPLETE WITH INTERFACE KIT AND PROGRAMS FOR 8008

Table model with shock mounted rubber feet. Weighs 55 lb.

Uses 5 bit Baudot code, fractions set.

Manufactured for Spiegel about 1964.

Programs included(available on 1702):

1. Convert to and from 6 bit code or ASCII
2. Monitor program to load (octal keyboard) or display memory.
3. Loader from 5 bit serial device (paper tape reader or cassette)
4. Paper tape or cassette dump in loader format

KEYBOARD - Includes 29 keys in 3 rows (not as shown above), some available with repeat key and carriage return. The keyboard is mechanically linked to the printer so that it can be used locally without a loop supply

PRINTER - A cylindrical type head gives high quality printing and allows individual characters to be replaced. Both single or multiple copy and pin or friction feed are selectable by levers. There are 71 characters per line and standard 8 1/2 inch wide paper is used.

PAPER TAPE PUNCH - A reel of tape is held in a disappearing drawer below the keyboard and there is a low tape warning light. Punching is suppressed on 5 control characters, but instructions are included to remove the suppression. A full reel of 11/16 inch tape is included.

NO TAPE READER

MISCELLANEOUS FEATURES

1. Message sender drum is activated by a solenoid and sends 20 characters as determined by bars in the drum.
2. Fast form feed solenoid (kit does not include driver for this solenoid as it is unnecessary in most applications).
3. Digital operations counter for maintenance logging.
4. Manual carriage return key above keyboard.
5. Start key above keyboard (not shown above) brought out to contacts.
6. Blank tape key above keyboard.

ELECTRICAL INTERFACE - Serial to printer (polar 24 v solenoids) and parallel from keyboard (instructions included for rewiring for serial from keyboard for other applications). Punch suppress, print suppress, and message sender solenoids. 10 characters per sec., 7 1/2 bit code, and 13 1/3 millisecond bit time.

INTERFACE KIT - Includes manual, program listings, power supply for solenoids, drivers for solenoids and input interface. Requires 5 v. from processor for 7406 driver, 1 input port (port 0) and 1 or 2 out ports (11 and 12).

Warranty : To arrive in working order. Free parts for 1 year as necessary.

RWC 1-26-75

HOW TO GET RELIABLE HARD COPY PRINTOUT FOR $125

BOB COOK, WILCOX ENTERPRISES, 25 W 178 39TH ST., NAPERVILLE, IL 60540, PROVIDED US WITH WHAT I THINK IS THE MOST EXCITING INFORMATION TO HIT THE HOBBY COMPUTER GROUP YET. ENCLOSED IS A FLYER OFFERING CREED TTY'S MANUFACTURED IN ENGLAND BY A SUBSIDARY OF IT&T IN 1964 FOR A SPECIALIZED ORDER PROCESSING SYSTEM USED BY SPIEGAL.

BOB HAS DONE A BEAUTIFUL JOB OF PREPARING HIS FLYER AND IT WILL TAKE MANY RE-READINGS BEFORE YOU APPRECIATE ALL OF THE FEATURES THESE OFFER. HE ALSO PROVIDES A MARK-8 INTERFACE KIT WITH THE UNIT SO THAT THE BUYER WILL KNOW EXACTLY HOW TO GET THE UNIT RUNNING, HAS PROM'S AVAILABLE WITH A KEYBOARD MONITOR DESCRIBED BELOW, AND WILL SUPPLY FREE PARTS FOR 1 YEAR SO THAT YOU CAN KEEP THEM RUNNING. HE ALSO HAS SERVICE DOCUMENTATION AVAILABLE AND SELLS EACH UNIT WITH A DETAILED MANUAL.

A REASONABLY QUIET AND MODERN, 10 CPS, HARD COPY DEVICE AND KEYBOARD WITH A PAPER TAPE PUNCH AS A BONUS FOR $125. THAT HAS TO BE A DREAM COME TRUE FOR THE MARK-8 PARTICIPANT. TO MAKE THE OFFER SEEM EVEN BETTER, CIRCUITS AND PROMS WILL SOON BE AVAILABLE FOR USING THE CREEDS WITH THE MIL MONITOR-8 DESCRIBED IN THE NEXT SECTION.

IT LOOKS LIKE I WILL HAVE TO MAKE GOOD ON MY PROMISE FOR A CONSTRUCTION ARTICLE ON A $35 PAPER TAPE READER. MR. TITUS SAYS HE BUILT ONE USING A LEDEX STEPPING SWITCH DRIVE. MAYBE WE CAN GET HIM TO SUPPLY MORE DETAILS.

BOB HAS SEVERAL HUNDRED OF THESE UNITS AVAILABLE SO IT WILL UNDOUBTEDLY BECOME THE STANDARD MARK-8 USER'S HARD COPY DEVICE. HE WOULD LIKE TO SEE THE MIL MONITOR BECOME THE STANDARD ALSO.

THE CREED I/O FORMAT IS AS FOLLOWS:

```
  IN0                                OUT11
BIT 0  UNUSED                     BIT 0  SERIAL OUT TO PRINTER, PUNCH,
    1  D0     CREED                      CASSETTE, ETC.
    2  D1     PARALLEL                 1-7 UNUSED
    3  D2     KEYBOARD OUT
    4  D3
    5  D4                          OUT13
    6  STROBE KEYBOARD           BIT 0  UNUSED
    7  SERIAL IN PAPERTAPE           1  PUNCH INHIBIT
                                     2  PRINT INHIBIT
                                     3  MESSAGE SENDER
                                    4-7 UNUSED
```

THE CREED BAUDOT LOADER TAPE FORMAT -- 5 BIT TAPE

```
    B------BBL L H H D D ----------D D BBBBBBBBBBB
HEADER        L H L H L H             L H      TRAILER
    B MEANS BLANK TAPE
```

L_L - LOW 4 BITS OF LOW 8 BITS OF LOAD ADDRESS

L_H - HI

H_L - LOW 4 BITS OF HI 8 BITS OF LOAD ADDRESS

H_H - HI

D_L - LOW 4 BIT OF DATA WORD

D_H - HI

THE HIGH ORDER BIT OF EACH 5 BIT WORD IS IGNORED, EXCEPT IN LOOKING FOR BLANK HEADER AND BLANK TRAILER, I.E. THE 5TH BIT MAY BE 1 OR 0 EXCEPT THAT 0000 MUST BE 10000 RATHER THAN 00000.

THE CREED MONITOR--FUNCTIONS AND CONTROL CHARACTERS

B REPRESENTS THE LAST THREE DIGITS TYPED.

- H - PUT B IN H
- L - PUT B IN L
- Z - PUT B IN MEMORY
- S - PUT H:L IN 'START ADDRESS'
- N - PUT H:L IN 'END ADDRESS'
- X - CALL 'START ADDRESS'
- 0 - LOAD MEMORY FROM TAPE, PUT FIRST ADDRESS IN START ADDRESS

I - INCREMENT H:L
D - DECREMENT H:L
M - DUMP MEMORY FROM 'START ADDRESS TO END ADDRESS AS A LOADER TAPE
A - L TO LIGHTS
B - H TO LIGHTS
C - MEMORY AT H:L TO LIGHTS
Ø - 7 - SHIFT B LEFT 3 BITS AND INSERT IN LOW 3 BITS
COMING - PRINT H:L:MEMORY IN OCTAL

THE MIL MOD-8, MONITOR-8, CHEAP MEMORY, AND A CASSETTE TAPE THAT WORKS!

EVER SINCE PEOPLE FIRST DISCOVERED THE MICROSYSTEMS INTERNATIONAL (MIL) MOD-8 CONFIGURATION, IT HAS STARTED TO LOOK BETTER AND BETTER. (SEND THE MIL CARD IN AND YOU WILL RECEIVE AN MF8ØØ8 BOOK WITH CIRCUITS AND PC BOARD LAYOUTS FOR THE MOD-8 AND A DESCRIPTION AND LISTING OF MONITOR-8.) THE MOD-8 BOARDS ARE AVAILABLE PRESENTLY FROM CANADA FOR ABOUT $12Ø AND WE HAVE PERMISSION TO HAVE THEM CUSTOM ETCHED FOR US. ROBERT SWARTZ, 195 IVY LANE, HIGHLAND PARK, IL 6ØØ35, HAS HIS MOD-8 RUNNING AND IS VERY IMPRESSED WITH THE DESIGN AND QUALITY OF THE BOARDS AND THE TOTAL SYSTEM. IT CAN ALSO BE EXPANDED TO AN 8Ø8Ø SYSTEM BY CHANGING A COUPLE OF BOARDS WHICH WILL BE MADE AVAILABLE.

WITH THE ANNOUNCEMENT THAT MONITOR-8 WOULD SOON BE AVAILABLE IN A MASK PROGRAMMED ROM, THINGS REALLY GOT EXCITING. NOW WE HAVE A COPY OF MIL'S CASSETTE LOAD AND DUMP CIRCUIT AND ARE TOLD THAT THE ROM MONITOR-8 WILL INCLUDE CASSETTE LOAD AND DUMP ROUTINES. I'M ESTACTIC!

MANY PARTICIPANTS MAY NOT HAVE RECEIVED THE MF8ØØ8 MANUAL SO WE HAD BETTER FIRST EXPLAIN WHAT MONITOR-8 IS. IT'S A 2K BYTE PROGRAM THAT ALLOWS YOU TO: 1) INTERRUPT RESTART DIRECTLY TO TTY CONTROL. (WHO NEEDS A FRONT PANEL?) 2) SET THE CURRENT LOCATION POINTER FROM THE TTY. (ALL DATA ENTRY AND MANIPULATION IS DONE AT THIS ADDRESS AND IT IS UPDATED TO POINT AT THE NEXT MEMORY ADDRESS AFTER EACH OPERATION.) 3) DISPLAY THE CURRENT LOCATION POINTER ON THE TTY. 4) DUMP SYMBOLIC (TYPES OUT THE MNEUMONIC CONTENTS OF MEMORY LOCATIONS BETWEEN TWO MEMORY LIMITS.) 5) LOAD A SECTION OF MEMORY FROM TTY IN OCTAL. 6) DUMP A SECTION OF MEMORY ON TTY IN OCTAL. 7) LOAD A SECTION OF MEMORY FROM TTY IN BNPF FORMAT. 8) DUMP A SECTION OF MEMORY IN BNPF FORMAT. (USEFUL FOR ROM PROGRAMMING.) 9) LOAD A SECTION OF MEMORY WITH INSTRUCTIONS TYPED IN MNEUMONIC FORM. 1Ø) START A PROGRAM AT A TYPED STARTING LOCATION. 11) COPY A PROGRAM FROM ONE SECTION OF MEMORY TO ANOTHER. 12) TRANSLATE A PROGRAM SO THAT MEMORY REFERENCES ARE ADJUSTED SO THAT IT WOULD RUN AT A NEW LOCATION IF COPIED. 13) SET A BREAKPOINT. (WHEN A RUNNING PROGRAM REACHES THIS LOCATION, IT TYPES OUT THE CONTENTS OF THE CARRY FLAG, THE A, B, C, L, & H REGISTERS AND THE CONTENT OF MEMORY POINTED TO BY L & H, AND RETURNS CONTROL TO MONITOR-8. 14) CLEAR THE BREAK POINT. 15) PROGRAM 17Ø2 PROM'S. 16) DUMP A SECTION OF MEMORY ONTO A CASSETTE. 17) LOAD A SECTION OF MEMORY FROM CASSETTE. 18) VERIFY THE CONTENTS OF A CASSETTE AGAINST MEMORY.

NOW THE GREAT NEWS! MAURY GOLDBURG, CELITRON COMMUNICATIONS CORP., 1618 JAMES ST., SYRACUSE, NY 13203 315-422-4467, (ALSO M&R ENTERPRISES, PO BOX 1Ø11, SUNNYVALE, CA 94Ø88.) IS GOING TO BE ABLE TO SUPPLY THIS MONITOR-8 ROM AND ALTHOUGH THE PRICE IS NOT FIRM, HE THINKS HE CAN SUPPLY IT FOR ABOUT $5Ø AND HE SHOULD BE ABLE TO SUPPLY A PC BOARD FOR THE INTERFACE SOON ALSO. TWO K OF MEMORY FOR $5Ø IN ONE EASY TO WIRE IN PACKAGE WITH ALL OF THAT CAPABILITY, AND AS A BONUS, 35 OR SO INTERNAL SUBROUTINES THAT YOU CAN USE FOR YOUR OWN PROGRAMMING! WOW!!!! THE GOOD NEWS ISN'T OVER YET. THE CHICAGO GROUP IS WORKING ON A HARDWARE MODIFICATION THAT ALLOWS THE CREED TTY'S THAT BOB COOK CAN SUPPLY (OR ANY 5 LEVEL BAUDOT TTY) TO OPERATE WITH THIS MONITOR.

NOW SOME DETAILS ON THE CASSETTE INTERFACE. AN EXTREME CONDENSATION OF MIL'S WRITEUP FOLLOWS:

PAUL MORK'S MUSIC PROGRAM (YOU'LL JUST HAVE TO TRY THIS ONE!)

INSTRUCTIONS: LOAD PROGRAM AT MEMORY LOCATIONS 00000 TO 00050.
LOAD DATA STARTING AT MEMORY LOCATION 00060.
CONNECT AMPLIFIER AUXILLARY INPUT THRU A 1 MFD CAPACITOR TO ANY LINE ON OUTPUT B. CONNECT COMPUTER AND AMP. GROUNDS TOGETHER.
START PROGRAM WITH RESTART 005.
PROGRAM STOPS AT END OF TUNE.
(IF YOU WANT TO KNOW WHAT TUNE IS PROGRAMMED HERE, YOU'LL JUST HAVE TO TRY IT FOR YOURSELF.)

```
00000/  LLI (066)
        060
        LHI (056)
        000
        LDI (036)
        012
        DCB (011)
        CTZ (152)
00010/  021
        000
        DCC (021)
        JFZ (110)
        006
        000
        JMP (104)
        026
00020/  000
        XRI (054)
        377
        OUT B (125)
        LBM (317)
        RET (007)
        DCD 8031)
        JFZ (110)
00030/  006
        000
        INL (060)
        LDA (330)
        LAM (307)
        CPI (034)
        377
        LAD (303)
00040/  JTZ (150)
        050
        000
        LDI (036)
        012
        JMP (104)
        006
        000
00050/  HLT (000)

00060/  037
        037
        037
        045
        045
        045
        057
        057
00070/  057
        077
        077
        077
        070
        061
        057
        070
00100/  070
        057
        077
        077
        077
        077
        077
        077
00110/  051
        051
        051
        037
        037
        037
        045
        045
00120/  045
        057
        057
        057
        070
        061
        057
        051
00130/  051
        045
        051
        051
        051
        051
        051
        045

00140/  043
        045
        051
        037
        037
        045
        051
        057
00150/  057
        057
        057
        051
        045
        045
        057
        070
00160/  070
        057
        070
        077
        077
        077
        077
        077
00170/  077//57
        057
        045
        051
        051
        077
        057
        057
00200/  045
        051
        045
        043
        037
        045
        057
        051
00210/  051
        077
        057
        057
        057
        057
        377
```

WRITE YOUR OWN MUSIC. DATA IS AT LOCATIONS 00044 AND 00005 CONTROLS TEMPO. DATA STARTING AT 00060 IS MUSIC, 1 BEAT PER WORD. LOAD NOTES AS FOLLOWS. 377 STOPS PROGRAM. C=027, B=030, A=033, G=037, F=043 E=045, D=051, C=057, B=061, A=070, G=077.

Appendix B

Memory Diagnostic Program
by
James E. Maddie

Program loads memory address into memory location then checks for error. For a random test pattern: 1.) Put pattern in loc. 5 2.) Change loc. 6 to 373 3.) Change loc. 14 to 271.

Location	Instruction		Comment
0	056	LHI	
1	PPP	PPP	Page under test (not same page that prog is loaded)
2	066	LLI	
3	000	000	
4	016	LBI	
5	TTT	TTT	Test Pattern
6	376	LML	Write into memory
7	060	INL	
10	110	JFC	Continue if page not filled
11	006	006	
12	000	000	
13	307	LAM	Read from memory
14	276	CML	Compare with pattern
15	110	JFC	Jump if different
16	027	027	
17	000	000	
20	060	INL	
21	110	JFC	Continue if page not completely checked
22	013	013	
23	000	000	
24	104	JMP	Do it again
25	000	000	
26	000	000	
27	121	OUTO	Output wrong pattern read from mem
30	000	HLT	
31	306	LAL	
32	121	OUTO	Output address of error
33	000	HLT	
34	104	JMP	Continue
35	020	020	
36	000	000	

JOHN HOPKIN'S RANDOM NUMBER GENERATION ALGORITHM (LEHMER METHOD)

TAKE AN EIGHT DIGIT NUMBER (SAY 12345678), MULTIPLY BY 23 WHICH GIVES 028395094. THE NINTH AND TENTH DIGITS FROM THE RIGHT ARE TAKEN OFF AND TREATED AS ONE 2 DIGIT NUMBER WHICH IS SUBTRACTED FROM THE REMAINING EIGHT DIGIT NUMBER. (12345678 X 23 = 0283950594 83950594 - 02 = 83950592) THIS GIVES YOU EIGHT RANDOM DIGITS BETWEEN 0 AND 9. THE SERIES REPEATS ITSELF AFTER 5,882,352 ITERATIONS LEAVING YOU WITH ABOUT 47 MILLION RANDOM DIGITS. ONLY THE LAST EIGHT COMPUTED RANDOM DIGITS NEED BE STORED IN MEMORY AND RECOMPUTATION WILL GIVE A NEW SET WHICH CAN BE STORED BACK IN MEMORY. HERE ARE A FEW ITERATIONS: (1234 5678 0592 3086 3597 0986 2724 2684 2650, ETC.) THIS SHOULD WORK NICELY WITH ONE OF THE CALCULATOR INTERFACES THAT SEVERAL PEOPLE ARE WORKING ON.

WITH THE INCREASING USE OF MICROPROCESSORS, THERE IS A GROWING NEED FOR LOW COST MEMORY DEVICES. THIS NEED CAN BE MET BY USING A LOW COST AUDIO CASSETTE UNIT TO STORE DATA. OFFERING 330 BAUD (BITS PER SECOND) WITH 1 BIT PER 1 MILLION ERROR RATE USING A LOW COST REUSABLE AUDIO CASSETTE AND A MEDIUM QUALITY RECORDER AS THE STORAGE MEDIUM, THE COMPLETE SYSTEM IS AN ATTRACTIVE ALTERNATIVE TO THE TELETYPE PAPER TAPE APPROACH.

THE TWO POPULAR CASSETTE RECORDING METHODS ARE FSK (FREQUENCY SHIFT KEYING) AND TONE BURST RECORDING. WITH THE FSK SYSTEM, TEMPORARY LOSS OF SIGNAL DUE TO TAPE IMPERFECTIONS AND THE TAPE "BUMPING AGAINST THE HEAD WILL CASE THE PLL TO LOSE TRACK OF INPUT FREQUENCIES AND THE REQUIRED RELOCKING OF THE PLL MAY REQUIRE SEVERAL BIT TIMES. FURTHERMORE, WOW AND TAPE FLUTTER WILL CAUSE FREQUENCY SHIFTS WHICH COULD BE INTERPRETED AS DATA BIT TRANSITIONS. THE TONE BURST TECHNIQUE BEGINS TO FAIL ABOVE THE 200 BAUD LEVELS AND WITH AUTOMATIC LEVEL CONTROLS (ALC) USE IN MOST CASSETTE UNITS WHICH ADJUST THE RECORDING AMPLIFIERS TO COMPENSATE FOR SIGNAL LEVEL VARIATIONS, THE NO-TONE STATE WILL CAUSE THE GAIN TO BE MAXIMUM WHICH RESULTS IN UNBEARABLE BACKGROUND NOISE BEING RECORDED.

A HYBRID APPROACH HAS BEEN TAKEN WHICH TAKES ADVANTAGE OF THE LESS THAT 8 KHZ FREQUENCY RESPONSE OF A CASSETTE RECORDER. "1"S ARE RECORDED AS 6 KHZ AND "0'S" AS 12 KHZ (WAY ABOVE THE RESPONSE OF THE CASSETTE BUT IT ENSURES THAT THE ALC WILL NOT BOOST THE GAIN). DURING PLAYBACK, A SIMPLE CAPACITOR FILTERS OUT ANY HIGH FREQUENCY AND THE 6KHZ SIGNAL IS DIGITALLY INTEGRATED TO PROVIDE A LOGIC 1 LEVEL. THE DIGITAL INTEGRATOR WILL TRAP AFTER 1 CYCLE AND HOLD UP TO 1 CYCLE TIME THUS REDUCING PROBLEMS DUE TO DROPOUTS AND TAPE NOISE. SOFTWARE USED TO GENERATE AND RECEIVE SERIAL DATA ALSO INCLUDES PARITY CHECKING ROUTINES. FURTHERMORE, EACH BIT TIME IS DIVIDED INTO 12 EQUAL SAMPLE TIMES AND THE DATA READ ROUTINE AVERAGES THE SAMPLES DURING EACH BIT TIME (LESS THAN 6 IS A "0", MORE THAN 6 IS A "1"). THIS FURTHER REDUCES THE NUMBER OF ERRORS DUE TO TAPE NOISE AND DROPOUTS. THE RESULTING SYSTEM OPERATES VERY SATISFACTORILY AT A 330 BAUD RATE WITH AN ERROR RATE BETTER THAN 1 BIT/10^6 BITS USING A MEDIUM QUALITY AUDIO CASSETTE CARTRIDGE.

THE HARDWARE INTERFACE IS SHOWN IN APPENDIX A-1. IT USES SOME FUNNY IC'S BUT THEY ARE AVAILABLE AND A CLEVER GUY COULD EASILY CHANGE IT TO EASILY AVAILABLE IC'S. ALSO ITS 'DIGITAL' NOT 'ANALOG' WHICH IS A VERY NICE FEATURE.

THE MONITOR ROUTINE OFFERS 3 OPTIONS: 1) DUMP TO CASSETTE 2) LOAD FROM CASSETTE 3) VERIFY THAT CASSETTE DATA IS THE SAME AS MEMORY. TO UTILIZE IT, THE USER TYPES XQT 007000 AND MONITOR ACCEPTS A LOW AND HIGH MEMORY ADDRESS AND REQUESTS OPTION D/L/V. FOLLOWING THE PRINTING OF THE OPTION LIST, THE USER SHOULD START THE CASSETTE UNIT, EITHER IN PLAY OR RECORD MODE ACCORDING TO THE DESIRED FUNCTION, AND TYPE THE OPTION LETTER.

IF THE WRITE OPTION IS CHOSEN, IT WILL WAIT FOR 5 SECONDS TO ENSURE THAT THE TAPE LEADER IS PAST THE HEAD, WRITE A PREAMBLE OF 8 377 WORDS AND A SYNCH WORD OF 000. IMMEDIATELY AFTER THE 000 SYNCH WORD, MEMORY DATA IS RECORDED AS CONTINUOUS DATA WORDS. UPON COMPLETION, CONTROL IS RETURNED TO MONITOR.

THE PLAYBACK ROUTINE READS CHARACTERS UNTIL IT RECEIVES A 377 WORD AND THEN WAITS UNTIL IT RECEIVES A 000 SYNCH WORD AND THEN LOADS SUBSEQUENT DATA ITEMS. A PARITY ERROR OR A VERIFY ERROR WILL PRINT THE CARRY FLAG, CONTENTS OF A,B,C,L & H REGISTERS AND CONTENTS OF MEMORY POINTED TO BY H & L AND RETURN CONTROL TO MONITOR. THE A & B REGISTERS CONTAIN THE CASSETTE DATA AND H & L POINT TO THE CURRENT LOCATION POINTER.

THE FULL DOCUMENT IS 11 PAGES LONG AND INCLUDES THE SOFTWARE LISTING AND COPIES WILL BE SENT TO ANYONE SUPPLYING A 20 CENT SASE AND A SHORT CAMERA READY WRITEUP ON YOUR MICRO-COMPUTER PROJECT USEABLE IN THE NEXT NEWSLETTER.

MARK-8 MODS, A $80 VIDEO TERMINAL, & ANOTHER CASSETTE UNIT THAT WORKS!

THE DIGITAL GROUP, PO BOX 6528, DENVER, CO 80206 HAS AN EXCITING PACKAGE OF INFORMATION THAT WILL SOON BE AVAILABLE. THE BEST WAY TO DESCRIBE IT IS TO EXTRACT PARAGRAPHS FROM LETTERS THEY HAVE SENT:

"A GUY NAMED DR. ROBERT SUDING CALLED US ABOUT SHOWING HIS COMPLETE MARK-8 TO THOSE IN THE DENVER AREA AND ABOUT 15 SHOWED UP. DR. SUDING HAS A DOCTORATE IN SYSTEMS ANALYSIS, WORKS FOR IBM AND HIS LATEST DEVELOPMENT PROJECT IS IN GRAPHICS. HE IS ALSO ONE OF THE NATION'S LEADING DEVELOPERS OF SLOW-SCAN TV. HE HAS MADE EXTENSIVE MODS TO HIS MARK-8 INCLUDING PLUGGABLE BOARDS, OCTAL READOUT, LARGE POWER SUPPLY, & KEYBOARD DATA ENTRY. HE SPENT A 1/2 DAY DESIGNING AN FSK CASSETTE INTERFACE AFTER REJECTING OTHER CIRCUITS DUE TO DRIFT. RESUULT-- NOT ONE BIT ERROR IN OVER 2 MONTHS USING A K-MART $30 EL-CHEAPO. HIS CROWNING ACHIEVEMENT IS A TV CHARACTER GENERATOR THAT USES 1101 RAM (ALMOST INSTANTANEOUS UPDATE) AND DISPLAYS UPPER AND LOWER CASE, #'S & SYMBOLS AND THE GREEK ALPHABET AND THAT CAN BE BUILT FOR UNDER $80."

DR. SUDING SAYS, "THE 'DIGITAL GROUP' IS ASSISTING ME TO DISTRIBUTE MY IDEAS AS EASILY AND EFFICIENTLY AS POSSIBLE. IT IS AN OUTFIT WHOSE DESIRE IS MUTUAL HELP ON A BREAK-EVEN BASIS. I AM VERY ACTIVELY INVOLVED IN AMATEUR RADIO SLOW SCAN TV DESIGN AS A HOBBY AND OFTEN AVERAGE TWO LETTERS A DAY, SO THIS WAY HELP GETS OUT FAST FOR THE MARK-8. THE COST OF $7.50 IS SOLELY REIMBURSEMENT FOR EXPENSES OF REPRODUCTION, THE CASSETTE, & MAILING." INCIDENTLY, DR. SUDING ASKS THAT ALL QUESTIONS BE DIRECTED THRU THE DIGITAL GROUP TO HIM.

"A COPY OF THE CASSETTE INTERFACE CIRCUIT IS INCLUDED SO THAT THOSE INTERESTED CAN GET TO WORK ON THE CIRCUIT AND TO SERVE AS AN EXAMPLE OF WHAT THEY EXPECT THEIR ENTIRE $7.50 DOCUMENTATION PACKAGE TO LOOK LIKE. THE LATEST LIST OF SCHEMATICS AND SOFTWARE TO BE INCLUDED IN THE PACKAGE IS:

I. MARK-8 HARDWARE MODIFICATIONS
   1. FRONT PANEL OCTAL KEYBOARD AND 7 SEGEMENT READOUTS.
   2. INPUT PORT EXPANSIONS (TO 7 PORTS)
   3. OUTPUT PORT EXPANSIONS.
   4. A LARGE INEXPENSIVE POWER SUPPLY.
   5. A 4-IC CASSETTE RECORDER INTERFACE THAT WORKS! (NOT ONE BIT ERROR IN OVER 2 MONTHS ON A K-MART EL-CHEAPO.)
   6. 128 CHARACTER-SET INEXPENSIVE TV TYPEWRITER CAPABLE OF DISPLAYING 256 CHARACTERS UTILIZING 1101 RAM AND WHICH CAN BE BUILT FOR UNDER $80.
   7. A BACKPLANE WIRING CHART TO ASSIST CONVERTING THE MARK-8 TO PLUGGABLE BOARDS.
   8. A 128-CHARACTER KEYBOARD ENCODER.
   9. A PARTS LIST FOR ALL OF THE ABOVE.

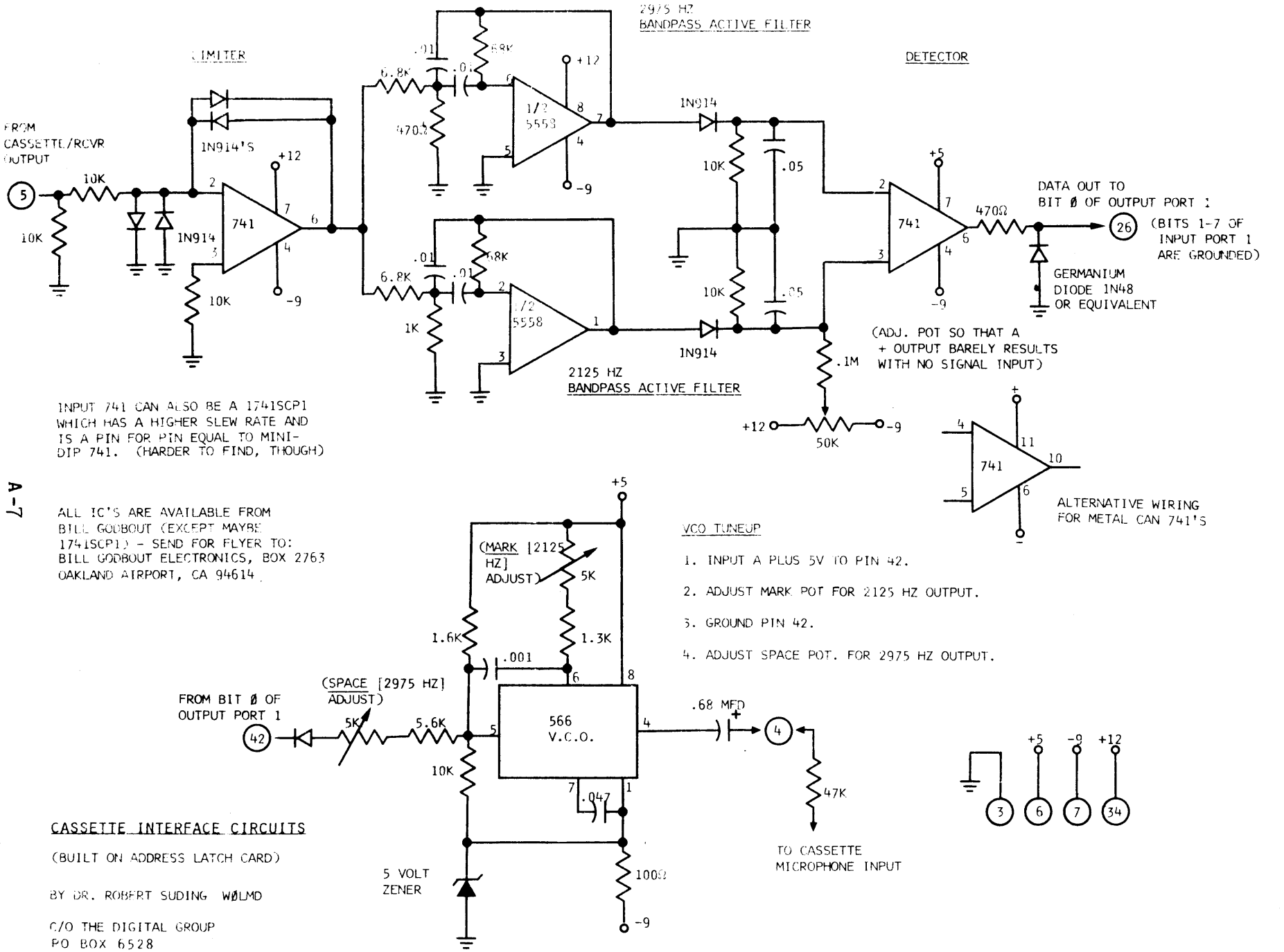
II. SUPPORTING PROGRAMS WITH DOCUMENTATION (25 PAGES).
   1. CASSETTE DUMPER (BOOTSTRAP LOADER). 2. CASSETTE LOADER
   3. MEMORY CLEAR SUBROUTINE
   4. MEMORY CHECKER (TESTS CHIPS AND IDENTIFIES BAD ONES)
   5. KEYBOARD TO MEMORY. 6. BIT REVERSE SUBROUTINE
   7. KEYBOARD PROGRAM LOADER 8. RESTART TO PROGRAMS
   9. KEYBOARD TO TV 10. TV CHARACTER GENERATOR TEST.
   11. TV CHARACTER GENERATOR DEMONSTRATION.
   12. RUNNING (RIGHT TO LEFT) TV DISPLAY.
   13. TV STORAGE DUMP 14. TV HOME ERASE SUBROUTINE
   15. TV SPACING SUBROUTINE. 16. TV CHARACTER ENTRY SUBROUTINE.

III. A CASSETTE CONTAINING ALL THE ABOVE SOFTWARE.

IV. SUPPORTING NARRATIVES AND COMMENTS THRUOUT.

THE PRICE FOR THE PACKAGE IS $7.50, DELIVERY - FIRST CLASS, DELIVERY DATE - AFTER ARRIVAL OF NEWSLETTER #5.

THERE ARE 2 MINOR CORRECTIONS TO THE CASSETTE INTEFACE SCHEMATIC ENCLOSED. 1) THE UNMARKED DIODE IN THE LOWER CIRCUIT IS A 1N914, & 2) THE ALTERNATE WIRING FOR 741'S IS FOR 14-PIN DIP 741'S.



A-7

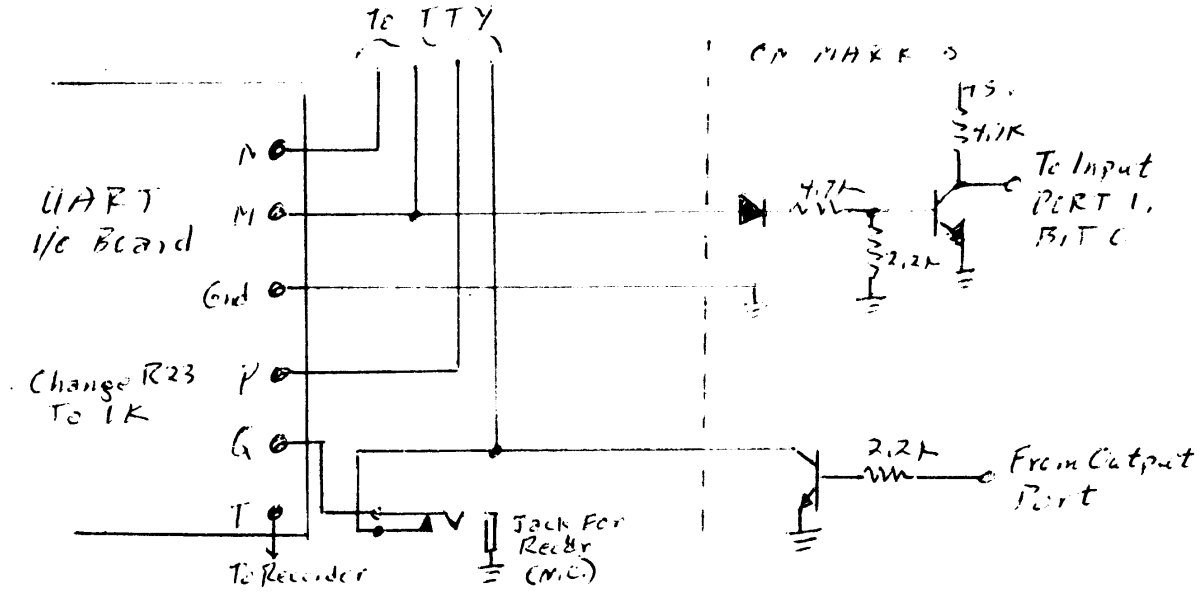
CASSETTE INTERFACE CIRCUITS

(BUILT ON ADDRESS LATCH CARD)

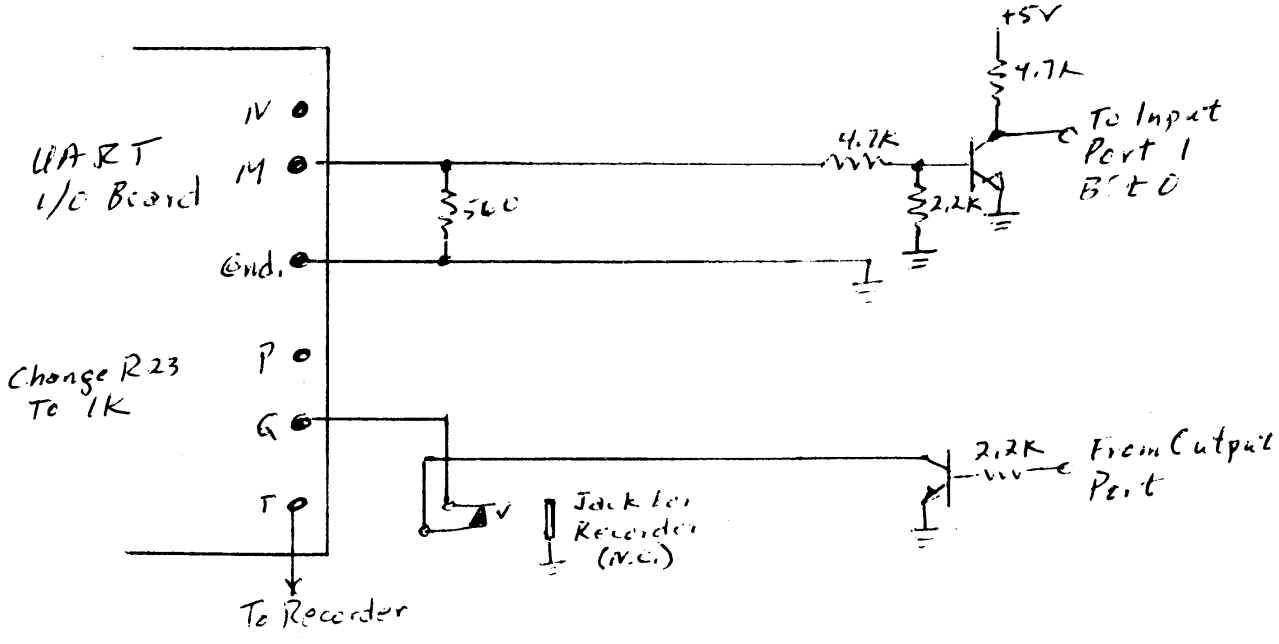
BY DR. ROBERT SUDING WØLMD

C/O THE DIGITAL GROUP
PO BOX 6528
DENVER, COLORADO 80206

Interconnection schematic to connect UART I/O board on R-2 TV Typewriter to the Mark-8 computer. By Roger Smith



Above circuit if you have TTY connected.



Above circuit if you don't have TTY

RLS 1-11-75

"WE HAVE DECIDED TO DO A DOUBLE-SIDED PC BOARD FOR THE TV CHARACTER GEN. AND SHOULD HAVE QUOTES BACK SOON. A "KIT" AND THE PC BOARD MIGHT BE AVAILABLE BY THE END OF FEBRUARY. DR. SUDING IS ALSO EXPANDING HIS CHARACTER GENERATOR TO 1000 CHARACTERS ON THE SCREEN AT A TIME. BANDWIDTH IS THE MAJOR LIMITATION, BUT HE FEELS IT WILL WORK REASONABLY WELL. (REMEMBER, TV DESIGN AND GRAPHICS ARE HIS FORTE.) IT WILL USE 2102'S AND TAKE 5 MSEC TO UPDATE THE SCREEN SO WE WILL PROBABLY HAVE TWO VERSIONS."

"DR. SUDING HAS COMPLETED AND IS OPERATING HIS HARDWARE INTERFACE FOR THE RADIO SHACK 5012 12-DIGIT CALCULATOR CHIP. IT REQUIRES LESS THAN $20 IN PARTS INCLUDING THE CHIP (ABOUT $8). HE IS NOW DEVELOPING THE SOFTWARE DRIVER ROUTINES. IT USES +5V AND +12V, 17 ICS, PORT 6 AND LOWER HALF OF PORT 7 FOR INPUT AND PORT 7 FOR OUTPUT. HIS FIRST APPLICATION WILL BE A CHECKBOOK BALANCER (WITH RECALL LOOK-UP) FOR HIS WIFE. DR. SUDING ALSO MENTIONED USING A MOSTEK IC THAT COSTS $27.50 AND ROUGHLY DUPLICATES FUNCTIONS OF THE SR-50. PERHAPS HE CAN BE PERSUADED TO COMPLETE THAT DESIGN. OTHER ITEMS HE IS WORKING ON ARE 4K DYNAMIC RAM MEMORY, 16K SHIFT REGISTER MEMORY, AND A SCAN CONVERTER, 16K BITS OF SR MEMORY ORGANIZED AS 128 X 128 DOT POSITIONS ON A BLACK AND WHITE TV SET. THIS UNIT COULD BE USED FOR LINE GRAPHING, STATISTICAL ANALYSIS, AND VIDEO GAMES. A FOLLOW-ON PROJECT WOULD INTERFACE TO A COLOR TV."

DR. SUDING HAS BEEN SELECTED AS A KEYNOTE SPEAKER AT THE DAYTON HAMVENTION, DAYTON, OHIO, SUNDAY, APRIL 27, 1975, 2:00 PM, THE LARGEST HAM CONVENTION IN THE WORLD. HIS TOPIC IS "THE MICROCOMPUTER IN DESIGN AND APPLICATION WITH HAM RADIO". HIS MARK-8 WILL BE ON DISPLAY AND OPERATING AS A CW STATION, RTTY STATION, SLOW-SCAN TV STATION, AND USING NAME RETRIEVAL BY CALL. ALL OF THESE APPLICATIONS ARE UP AND RUNNING ON HIS MARK-8 AND WILL BE MADE AVAILABLE LATER THRU THE DIGITAL GROUP. ANYONE IN THE MARK-8 GROUP SHOULD ATTEMPT TO ATTEND IF THEY ARE IN THE AREA.

THE ALTAIR 8800 -- THE DREAM MACHINE! OR A NIGHTMARE?

MORE AND MORE PEOPLE KEEP WONDERING ABOUT THE ALTAIR 8800 AND HOW THEY CAN MAKE THE KIT PRICES SO LOW. A LOT OF PEOPLE HAVE GAMBLED ON IT. (SEVERAL THOUSAND BACK ORDERS ACCORDING TO ONE REPORT.) I SUSPECT THAT ITS A LOSS LEADER TO TRY TO LOCK PEOPLE INTO BUYING THEIR ADD-ONS. AT LEAST ONE RUMOR IS FLOATING AROUND ABOUT THEM USING FACTORY FALLOUT 8080'S. (INTEL SAYS YOU CAN ALWAYS TELL A FALLOUT. IF IT DOSEN'T HAVE THE FULL FACTORY MARKINGS, THEN IT IS NOT A PRIME COMPONENT AND IS SOME FORM OF FALLOUT. THAT MAY NOT KEEP IT FROM WORKING BUT IT DOES MAKE A GUY NERVOUS.) WITH THE KIND OF BACKLOG THEY ARE SUPPOSE TO HAVE, YOU MAY HAVE TO WAIT MANY MONTHS FOR DELIVERY AND THEN YOU'LL STILL BE STUCK WITH THE PROBLEM OF MEMORY AND PERIPHERALS.

IF THE FUTURE ARTICLES ON PERIPHERALS IN POPULAR ELECTRONICS ARE GLORIFIED ADVERTISEMENTS AS THE LAST TWO HAVE BEEN, THEN WHAT? I SUGGEST THAT EACH NEWSLETTER PARTICIPANT TAKE A FEW MINUTES OF TIME TO WRITE PE AND TELL THEM WHAT YOU THINK OF THE TWO ALTAIR 8800 ARTICLES. MINE WON'T BE COMPLIMENTARY! EVEN THE INFORMATION PACK DIDN'T CONTAIN ANY REAL CONSTRUCTION INFORMATION.

I ASKED MITS TO RESPOND TO OUR PRELIMINARY STANDARDIZATION PROPOSAL AND SUPPLY US WITH THEIR PLANNED PERIPHERAL I/O FUNCTIONS AND CODES SO WE COULD ATTEMPT TO DESIGN STANDARD INTERFACES THAT COULD BE USED WITH EITHER THE MARK-8 OR ALTAIR 8800. THEIR REPLY WAS: "NO, IT IS NOT POSSIBLE FOR YOU TO RECEIVE 'A DESCRIPTION OF I/O CODES AND THEIR ACTIONS FOR 8800 PERIPHERALS'. MITS IS A BUSINESS AND AS SUCH, WE DON'T GIVE OUT THIS TYPE OF INFORMATION." THIS IS A FIRST! THEY MAY BE THE ONLY MINICOMPUTER MAINFRAME MANUFACUTER IN THE WORLD THAT REFUSES TO HELP YOU INTERFACE TO THEIR COMPUTER. GOOD LUCK, IF YOU ORDERED AN 8800.

THE STUDENTS AND STAFF OF THE CABRILLO COMPUTER CENTER WERE PARTICULARLY EXCITED TUESDAY, 11 FEB. WE RECEIVED A PDP-8/E CENTRONICS LINE PRINTER INTERFACE. WE FIGURE THAT IF THEY SENT AN INTERFACE, OUR 6 MONTH OVERDO LINE PRINTER CAN'T BE VERY FAR BEHIND. WE WERE COUNTING ON USING IT FOR PREPARATION OF THE NEWSLETTER AND MAILING LABELS.

THE AUDIO CASSETTE TAPE DATA STORAGE UNIT - DON LANCASTER'S IDEAS

(THE FOLLOWING WAS ROBBED FROM PAGE 12 OF THE LASTEST PEOPLE'S COMPUTER COMPANY NEWSPAPER AND IS AN EXPERIMENT IN PARTICIPATORY DESIGN ORGANIZED BY LEE FELSENSTEIN. LET US KNOW IF YOU MAKE ANY PROGRESS IN THIS DIRECTION AND THEN NOTIFY PCC.)

ENTER DON LANCASTER, CARRYING A 40-LEGGED BUG CALLED A UART. "AHA!" SAYS DON, "I'VE NOTICED SOMETHING ABOUT THE UART THAT MAY HAVE ESCAPED YOU. YOU KNOW THAT IT REQUIRES A CLOCK SIGNAL AT EXACTLY 16 TIMES THE BIT RATE, RIGHT?" RIGHT. SO?

"WHAT THAT REALLY MEANS IS THAT NO MATTER WHAT THE SPEED, 16 CLOCK CYCLES INTO THE RECEIVER CLOCK MARKS OFF ONE BIT OF DATA. IF YOU HAD A CLOCK FREQUENCY OF 16 TIMES THAT BAUD RATE RECORDED ON THE SAME TAPE AS THE DATA, AND YOU USED THAT CLOCK TO RUN A UART TO RECEIVE THE DATA, THE CLOCK WOULD ALWAYS BE AT THE RIGHT SPEED FOR THE DATA, NO MATTER HOW SLOPPILY THE TAPE RAN!" BUT WE DON'T HAVE A STEREO TAPE--

"NO NEED FOR TWO CHANNELS. JUST RECORD THE DATA AS AN AMPLITUDE MODULATED SIGNAL ON A CARRIER FREQUENCY OF 16 TIMES THE BAUD RATE. FROM ONE TAPE CHANNEL YOU HAVE 16 CYCLES PER BIT, LOUD OR SOFT DEPENDING ON WHETHER THE DATA IS 1 OR 0, BUT ALWAYS THERE. JUST AMPLIFY AND LIMIT THE CARRIER AND FEED IT TO THE CLOCK INPUT OF THE UART. DEMODULATE THE DATA WITH AN AM DETECTOR AND FEED IT TO THE SERIAL INPUT OF THE UART. OUT COMES 8 BITS ALL LINED UP PROPERLY ON THE PARALLEL OUTPUT PINS!"

WOW! WHAT AN IDEA! NOW ALL WE HAVE TO DO IS SOLVE THE LITTLE PROBLEMS.

LITTLE PROBLEM #1. THE UART RECEIVER PRESENTS ITS DATA TO THE WORLD AS UP TO EIGHT PARALLEL BITS. BUT IF WE WANT TO USE IT AS A PAPER TAPE REPLACEMENT AT A TERMINAL, WE HAVE TO COME OUT WITH SERIAL DATA. (NOT A PROBLEM FOR MOST MARK-8 USERS.) SOLUTION: USE THE OTHER HALF OF THE UART, THE TRANSMITTER. FEED IT A NICE, CONSTANT CLOCK FROM AN OSCILLATOR AND TIE ITS DATA AND CONTROL INPUTS TO THE RECEIVER'S OUTPUTS. THEN WHEN A WORD OF DATA COMES IN FROM THE RECEIVER, IT GETS SQUIRTED OUT TO THE COMPUTER AT JUST THE RIGHT SPEED. TO AVOID TAPE OVERRUNNING THE TRANSMITTER, THE RECEIVER SHOULD BE SET FOR ONE STOP BIT AND THE TAPE RECORDED WITH TWO STOP BITS. THAT ALLOWS FOR UP TO A TEN PERCENT SPEED DIFFERENCE WITHOUT STUMBLING.

LITTLE PROBLEM #2. RECORDING THE DATA ON THE TAPE. DON SUGGESTS A 15 DB DIFFERENCE FROM A "1" TO "0". THIS WORKS OUT TO "0" BEING 17% OF THE "1" CARRIER AMPLITUDE.

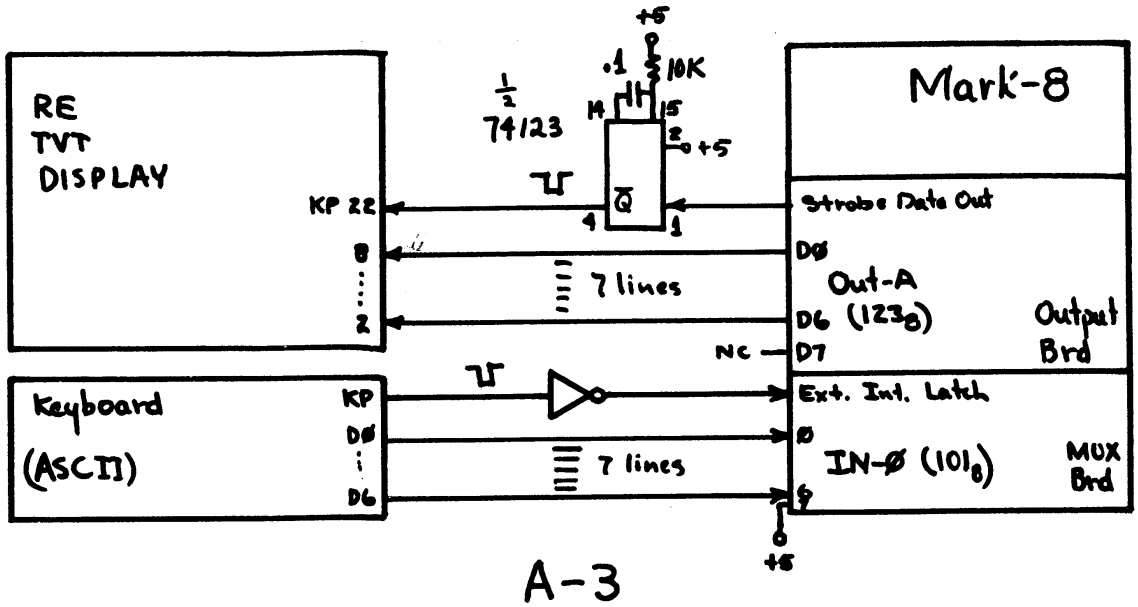
LITTLE PROBLEM #3. CONTROLLING THE AMPLIFICATION OF THE SIGNAL RECEIVED FROM THE TAPE. POSSIBLE APPROACHES INCLUDE: A) AUTOMATIC GAIN CONTROL CIRCUIT. B) A LEVEL INDICATOR SO YOU CAN ADJUST THE PLAY LEVEL PROPERLY AND SEE IF IT FALLS BELOW THE MINIMUM DURING PLAYBACK. C) RECEIVER CIRCUITRY WITH ENOUGH "DYNAMIC RANGE" TO ALLOW FOR A WIDE RANGE OF INPUT SIGNAL LEVELS.

LITTLE PROBLEM #4. THE AMPLITUDE DEMODULATION - MINIMIZING THE EFFECT OF NOISE SPIKES.

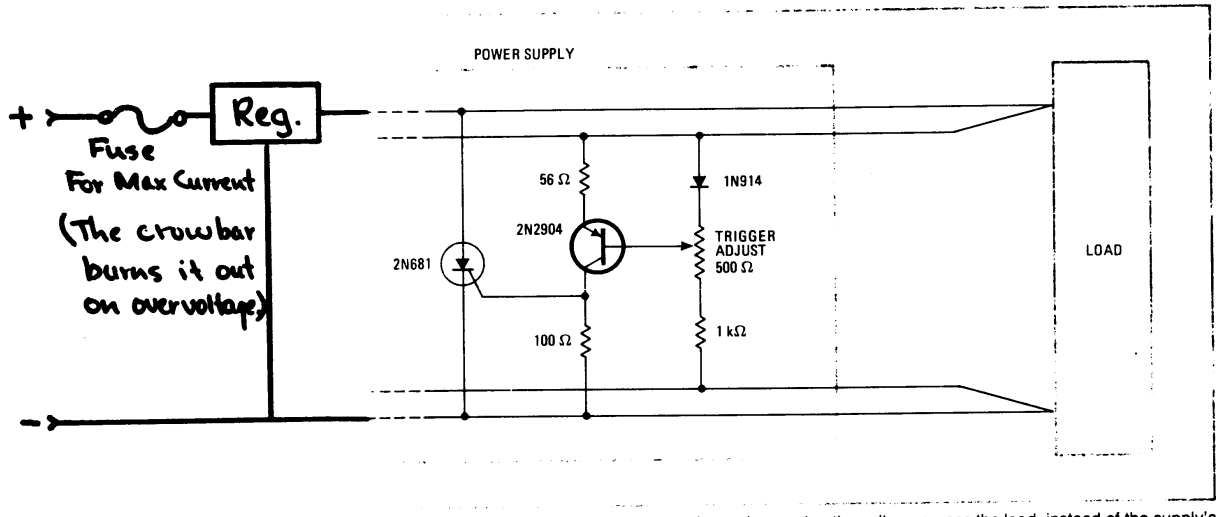
LITTLE PROBLEM #5. EXTRACTING THE CLOCK SIGNAL WITHOUT INTERFERENCE FROM NOISE OR LOW SIGNAL LEVELS. A BIG AMPLIFIER WITH A LIMITER WOULD AMPLIFY NOISE UP TO SIGNAL LEVELS. A PHASE-LOCKED LOOP WOULD BE NICE BUT A LITTLE EXPENSIVE, THOUGH IT WOULD ELIMINATE NOISE PROBLEMS. MAYBE A SERIES OF SMALL AMPLIFIERS AND LIMITERS, WITH TRIGGER THRESHOLDS FOR NOISE REJECTION?

LITTLE PROBLEM #6. CONTROLLING TAPE MOTION. MOST CASSETTE RECORDERS HAVE A REMOTE ON/OFF SWITCH WHICH STOPS THE MOTOR. THIS COULD BE REPLACED BY A PAIR OF RELAY CONTACTS WHICH PLUG INTO THE SAME JACK. WILL CONTROL BE MANUAL? MANUAL START AND AUTOMATICALLY MAINTAINED UNTIL THE SIGNAL STOPS? WHAT KIND OF RELAY TO USE? CAN SOMETHING OTHER THAN A RELAY BE USED?

Paul Farr's TVT - MARK-8 Interface



A-3

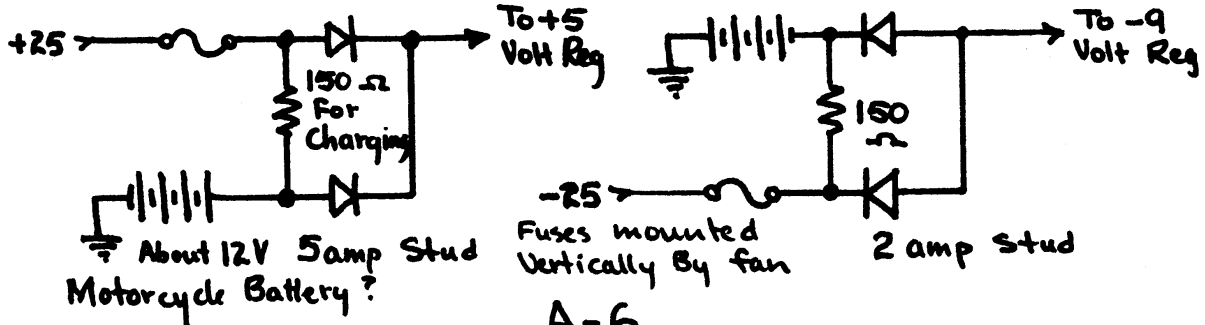


Better protection. Crowbar circuit protects a power supply from overvoltages by sensing the voltage across the load, instead of the supply's output voltage, which is the usual approach. This means that overvoltage sensing will not be affected by wiring voltage drops, nor will there be an increased sensitivity to voltage transients. The components shown here are for a power supply of 4 to 10 volts at up to 20 amperes.

(Turn crowbar upside down for use with −9 Volts.)

Another Crowbar Circuit A-5

Jay Bowden's Circuit For Making Precision Systems Power Supply Uninterruptable.



A-6

ANALOG-TO-DIGITAL CONVERTER

Theory of Operation

As the computer addresses output port B with an output command the latch output goes high. This initializes the 74193 counters to zero. As long as the latch is high the counters are held at zero. This holding period can be used to select one of up to 255 different analog signals (vial an analog multiplexer). When the latch goes low the 74193's begin to count (assuming a voltage greater than zero is being measured). Clock pulses for the counting circuit are obtained from the 8008 "Sync" clock. As the 74193's count through their binary progression they cause the 8-bit DAC to generate a staircase output on pin 4. This output is compared with the buffered input voltage. When the two signals are equal the output of the comparator goes low and stops the counting of the 74193's. The binary output of the 74193's at this point is directly proportional to the input voltage. The computer can sense this binary output at any time (with an input command) and act on it as directed.

Adjustments: "Vref" to the MC1408 (pin 14) is adjusted for a 2mA current at pin 4 when all TTL inputs are high (≈2v). The following program provides the proper delay and in/out instructions:

Location	Instruction		Comment
x	LAI		Load A Register with analog device #
x+1	OUT B		Select analog device & initialize cntr
x+2	LAI	⎫	
x+3	240_{10}		
x+4	INA	⎬	1.05 millisecond delay
x+5	JFZ		
x+6	x+4		
x+7		⎭	
x+8	INP Y		Y = analog converter port #

REPORT ON MY VISIT TO INTEL

I MADE AN APPOINTMENT AND DROPPED BY INTEL ON DEC. 27. THEY WERE INTERESTED IN OUR GROUP, HELPFUL TO THE EXTEND THAT I RECEIVED COPIES OF ALL OF THEIR PUBLICATIONS, UNINTERESTED IN HELPING OUT THE GROUP IN ANY SIGNIFICANT WAY, UNWILLING TO PART WITH DIAGNOSTIC SOFTWARE OR GIVE US ACCESS TO THEIR PROGRAM LIBRARY, AND TOTALLY UNWILLING TO TALK ABOUT QUANTITY PURCHASES ALTHOUGH I WAS TOLD THAT WE SHOULD PUT TOGETHER A PACKAGE OF ITEMS WE WANTED IN QUANTITY AND THEN TALK TO THE DISTRICT DISTRIBUTORS. I RECEIVED A VERY NICE TOUR OF THEIR DESIGN AND MANUFACTURING FACILITY. SINCE A VERY HIGH PRIORITY NEED IS SYSTEM CHECK-OUT DIAGNOSTIC PROGRAMS, I ESPECIALLY TRIED TO OBTAIN THEM AND WOULD YOU BELIEVE THEY SAID THEY DON'T HAVE ANY!! HOW DO ALL OF THOSE CHIPS GET TESTED AND THEIR INTELLEC 8'S AND 8-80'S??

HERE IS WHAT WILL INTEREST YOU:

1) INTEL USER GROUP PROGRAM LIBRARY - IT COSTS $100 TO JOIN (RIDICULOUS) BUT THEY WOULD PREFER TO HAVE YOU JOIN BY SUBMITTING A PROGRAM FOR AN 8008 OR 8080 WHICH WOULD GET YOU A YEARS MEMBERSHIP. FORMS FOR SUBMITTING THE PROGRAM CAN BE OBTAINED BY WRITING USER'S LIBRARY, INTEL, 3065 BOWERS AVE., SANTA CLARA, CA 95051. THE 8008 SECTION HAS 18 PROGRAMS LISTED INCLUDING A FLOATING POINT PACKAGE, RAM TEST PROGRAM, TTY LOAD AND DUMP, AND A PROGRAM THAT SENDS MORSE CODE FOR TEXT TYPED ON THE TTY.

2) BOOKS OF INTEREST

- B) MCS-8 (8008) ASSEMBLY LANGUAGE PROGRAMMING MANUAL-200 PAGES $5.00 (THIS ONE TAKES UP WHERE THE SCELBI MANUAL LEAVES OFF. EXCELLENT - WELL WORTH $5.00)
- C) 8080 ASSEMBLY LANGUAGE PROGRAMMING MANUAL - 80 PAGES $5.00 (IF YOU ARE INTERESTED IN 8080'S YOU NEED THIS.)
- D) INTELLEC 8/MOD 8 1) REFERENCE MANUAL (CONTAINS INTELLEC 8 SCHEMATICS) $5.00 2) OPERATORS MANUAL $5.00
- E) INTELLEC 8/MOD 80 (8080) 1) REFERENCE MANUAL (CONTAINS INTELLEC 80 SCHEMATICS) $5.00 2) OPERATORS MANUAL $5.00 (I DIDN'T GET THIS ONE BUT IT PROBABLY EXISTS.)

I STOPPED BY THE MICROSYSTEM INTERNATIONAL SALES OFFICE IN PALO ALTO. IF YOU FILL OUT THE CARD IN THE FLYER ATTACHED, YOU'LL RECEIVE A PACKAGE OF INFO INCLUDING THE MF8008 APPLICATION BULLETIN 80007 WHICH INCLUDES THE MOD 8 DESIGN AND THE MONITOR 8 USERS GUIDE AND PROGRAM LISTING. YOU MIGHT ALSO ASK FOR BULLETINS 80001C (SHORTFORM CATALOG), 80004A (LINEAR IC'S), AND 80005 (MOS MEMORIES).

STANDARDIZATION PROPOSAL

EVERYONE SAYS LETS STANDARDIZE BUT NO ONE WILL SAY WHAT TO! ABOUT JAN 10, I DECIDED TO FACE THE PROBLEM, AND PROPOSED A PARTIALLY THOUGHT OUT LIST OF POSSIBLE PERIPHERALS AND WHAT THEY SHOULD COST AND A LIST OF I/O ASSIGNMENTS. THIS WAS INTENDED AS SOMETHING THAT PARTICIPANTS COULD "THROW ROCKS" AT IN AN ATTEMPT TO GET SOME DIALOGUE GOING IN THE DIRECTION OF STANDARDIZATION. THIS WAS SENT OUT TO ABOUT 50 OF OUR MOST ACTIVE PARTICPANTS AND OTHER INTERESTED PARTIES. INFORMATION RECEIVED IN RESPONSE TO IT WAS TO BE INCLUDED IN THIS NEWSLETTER BUT THE IMPORTANT ITEMS ALREADY INCLUDED SQUEEZED IT OUT AND IT WILL HAVE TO BE INCLUDED IN ISSUE #6. IF YOU WOULD LIKE TO RECEIVE THE POPOSAL AND THE COMMENTS RECEIVED SO FAR AND THEN REPLY TO IT, PLEASE SEND A 20 CENT SASE AND A CAMERA READY DESCRIPTION OF SOMETHING OF INTEREST FOR THE NEXT NEWSLETTER.

LITERATURE OF INTEREST

DON LANCASTER IS ONE OF THE MOST CLEVER DESIGNERS AROUND. HIS RTL COOKBOOK WAS INCREDIBLY GOOD BUT WHO USES RTL LOGIC? HIS TTL COOKBOOK IS ALMOST AS GOOD AND WELL WORTH $7.95. ORDER FROM PCC BOOKSTORE, PO BOX 310, MENLO PARK, CA 94025.

WHETHER YOU LIKE IT OR NOT, SOME DUMMY IS GOING TO SUGGEST USING HEXADECIMAL NOTATION FOR THE 8008 OR 8080. YOUR ONLY DEFENSES ARE:
1) HAVE LOTS OF NASTY WORDS STORED UP TO USE ON HIM.
2) ORDER THE 16 PAGE PROGRAMMED INSTRUCTION MANUAL "UNDERSTANDING HEXADECIMAL NOTATION", AVAILABLE FREE FROM EDUCATION CENTER, FISHER CONTROLS CO., MARSHALLTOWN, 50158 (I GOT IT WITH THAT ADDRESS. YOU PROBABLY WILL TO.)

A 176 PAGE DATA CONVERSION HANDBOOK WITH EVERYTHING YOU EVER WANTED TO KNOW AND MORE ABOUT A/D AND D/A CONVERTERS IS AVAILABLE FOR $1.50 FROM HYBRID SYSTEMS, 87 2ND AVE., BURLINGTON, MASS 01803.

THE DESIGNERS GUIDE TO PROGRAMMED LOGIC BY PRO-LOG CORP., 852 AIRPORT RD., MONTERY, CA IS A VALUABLE REFERENCE FOR 8008 USERS. (WHETHER ITS WORTH $10.--, I HAVEN'T DECIDED YET.)

WRITE MOTOROLA SEMICONDUCTOR PRODUCTS, 5005 E. MCDOWELL RD., PHOENIX, AZ 85008 FOR BROCHURES ON THEIR M6800 MICROPROCESSOR SERIES. IT'S SUPPOSE TO BE MUCH BETTER THAN THE 8080 AND AVAILABLE SOON.

A COMPLIMENTARY ISSUE OF THE "NEW LOGIC NOTEBOOK" IS AVAILABLE FREE FROM MICROCOMPUTER TECHNIQUES, INC., 11227 HANDLEBAR ROAD, RESTON, VIRGINIA 22091. IT CONTAINS A COMPLETE DESCRIPTION AND BLOCK DIAGRAM FOR ALL OF THE MICROPROCESSORS THAT HAVE BEEN BUILT OR PROPOSED.

WRITE THE DIGITAL EQUIP. CORP. COMPONENT GROUP, ONE IRON WAY, MARLBOROUGH, MASS 01752 AND ASK FOR M7341, M7344, M7345, M7346 8008 MODULE DATA SHEETS AND THE APPLICATION NOTES, "GENERAL INTERFACING TECHNIQUES FOR M7341 MICROPROCESSOR MODULES" (CONTAINS I/O EXPANSION INFO), AND "INTERFACING THE TU60 CASSETTE UNIT TO THE M7341 MICROPROCESSOR". FOR YOU INTERRUPT NUTS, THE M7346 MODULE HAS THE CUTEST 8008 PRIORITY INTERRUPT SCHEME YOU HAVE EVER SEEN. (THANKS TO MAURY GOLDBERG FOR SENDING THESE.)

THANKS TO ROBERT KELLEY, 5806 MT TERMINAL DR., WACO, TX 76710, I'VE HAD A CHANCE TO LOOK AT THE MARTIN RESEARCH BOOKS. I'M SLIGHTLY COLORBLIND ON THE RED END OF THE SPECTRUM AND THE RED PLASTIC PAGES TO DISCOURAGE COPYING DON'T BOTHER ME AT ALL AND THE CONTENT IS GREAT. OH, IT WOULD HURT TO PAY $100 FOR IT. YOU'D BETTER HUNT DOWN SOMEONE THAT CAN LOAN YOU THEIR COPY FOR A FEW DAYS.

WE MAY BE THE ONLY HOBBY COMPUTER GROUP IN THE WORLD WITH THEIR OWN POET LAUREATE. ADD MRS. GENEVIEVE ALLWEN, 1328 N. BALDWIN, PORTLAND OR TO THE ROSTER. (MY MOM WANTS TO RECEIVE THE NEWSLETTER AND HER POETRY IS INTERESTING! SAMPLES WILL APPEAR AS SOON AS SHE IS INSPIRED.)

COMMENTS FROM CURRENT PARTICIPANTS

ADAM TRENT, BENDIX BOX A ASCENSION, PATRICK AFB, FL 32925 SAYS HE FEELS LIKE HE IS BEING LEFT BEHIND BY THE SPEED WITH WHICH THINGS ARE HAPPENING (WHO DOSEN'T?). HIS MARK-8 & TVT PROJECTS WERE INTENDED TO BE LEARNING EXPERIENCES WHICH HE SAYS THEY CERTAINLY HAVE BEEN. HE WORKS WITH A UNIVAC 1218 WHICH IS USED TO HANDLE TRACKING DATA AND TO PROVIDE ANGLE POINTING DATA FOR THEIR S-BAND DISH ANTENNA. HE SUBMITTED A BEAUTIFUL HANDBOOK TYPE FORMAT IN WHICH HE HAS ARRANGED THE MARK-8 INSTRUCTIONS WHICH LISTS THE MNEUMONIC, OCTAL, BIN, HEX AND INSTRUCTION DESCRIPTIONS. ITS 7 PAGES LONG, MUCH TOO BIG TO INCLUDE, BUT WE CAN SUPPLY COPIES FOR A NEWSLETTER ARTICLE AND A 20 CENT SASE.

ROBERT SWARTZ, 195 IVY LANE, HIGHLAND PARK, IL 60035, PURCHASED THE MICROSYSTEMS INTERNATIONAL BOARD SET FOR THE MOD-8 SYSTEM AND SAYS THE BOARDS AND THE SYSTEM ARE GREAT. (MARTY SPERGLE OF M&R ENTERPRISES CONTACTED MIL AND OBTAINED A RELEASE TO ENABLE US TO HAVE THE BOARDS ETCHED FOR US BY ANYONE. THE MOD-8 BACKPLANE CONTAINS A PROM PROGRAMMER THAT USES ABOUT $40 WORTH OF PARTS. THE MIL MONITOR IS FABULOUS. HE HAS A SAMPLE ROM WITH A BAD BIT AND IS PRESENTLY USING IT.

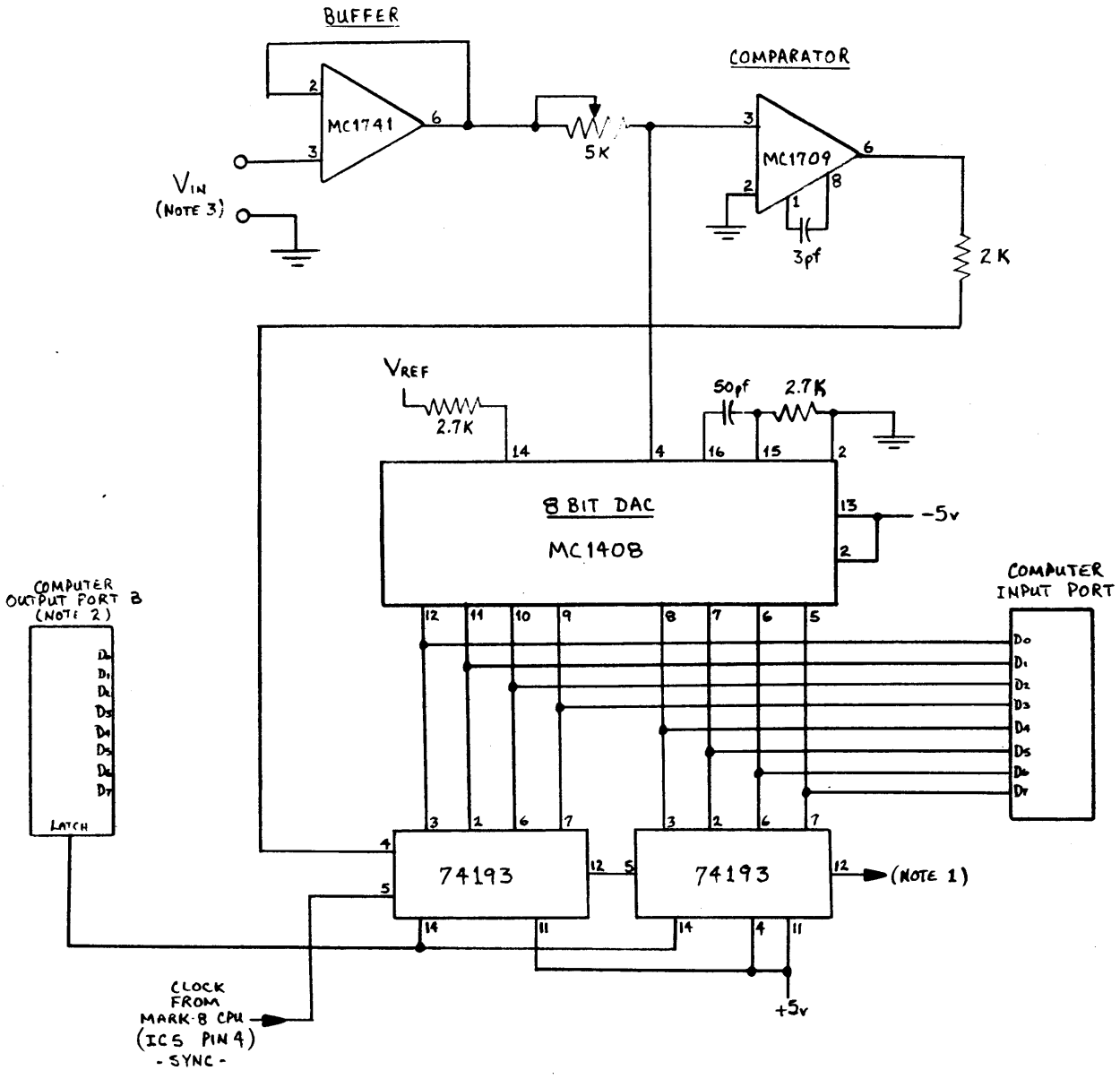
ROBERT IS WORKING CLOSLY WITH BOB COOK, MARK CONDIC, AND DON MARTIN OF MARTIN RESEARCH AND THEY ARE SETTING UP A CHICAGO AREA USER GROUP. ALL PEOPLE IN THE CHICAGO AREA SHOULD CONTACT ROBERT AT 472-6660 DAYTIME, AND 432-6423 AT NIGHT. DON MARTIN WILL SOON SUPPLY AN 8008 KIT PRICED SOMEWHERE AROUND $250.

BOB SAYS THE 74L138 IS PARTICULARLY HANDY FOR USE WITH AN 8008 SYSTEM. HE RECOMMENDS GERBER FOR PARTS, ALL PRIME. CALL TOLL FREE 800-225-8290 TO ORDER OR TO OBTAIN A CATALOG.

A SIMPLE ANALOG-TO-DIGITAL CONVERTER

by

Jim Fry



Note 1: This output could go to some type of overflow latch and/or indicator if desired.

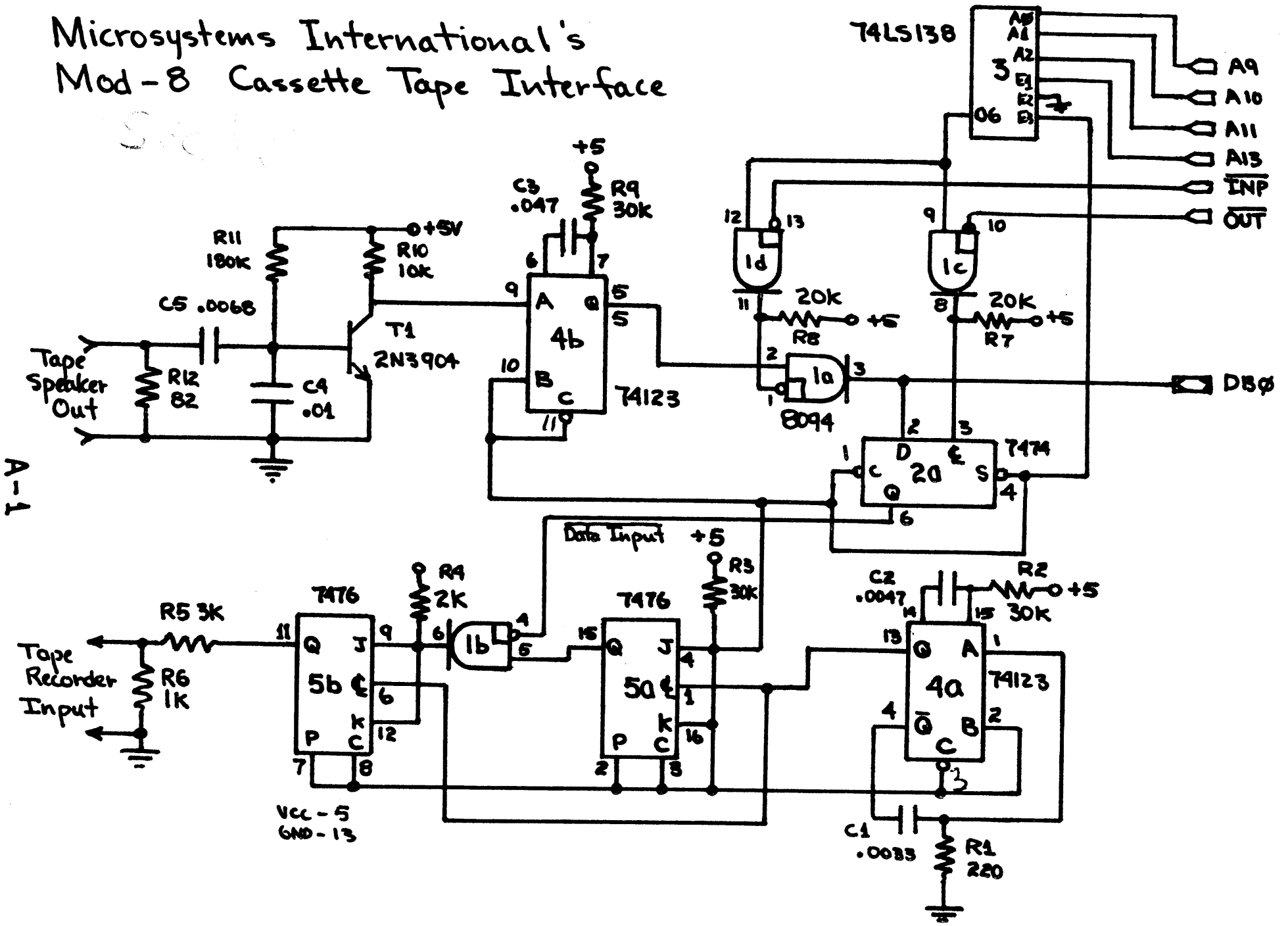
Note 2: D0 thru D7 could be connected to an analog multiplexer circuit.

Note 3: Maximum Vin = 2.55 volts. Accuracy to ±5mv in 10 mv steps.

Note 4: All analog IC's are Motorola.

Note 5: MC 1741 can be replaced by a LM741 & MC1709 can be replaced by a LM709 thereby bringing the total cost from $12.00 to $7.00.

Microsystems International's Mod-8 Cassette Tape Interface



M. PAUL FARR, 3723 JACKSTADT, SAN PEDRO, CA 90731 MADE NUMERIOUS COMMENTS ON OUR STANDARDIZATION PROPOSAL. HE PROVIDED US WITH A SCHEMATIC OF HIS TVT INTERFACE (APPENDIX A-3), AND A VERY COMPREHENSIVE RAM MEMORY TEST PROGRAM, AND HE HAS MADE MODIFICATIONS TO A STANDARD KEYBOARD MONITOR PROGRAM TO HANDLE THE TVT. SEND A SHORT ARTICLE FOR THE NEXT NEWSLETTER AND A 20 CENT SASE FOR A COPY OF EACH. HE REGRETS THAT HE MUST WITHDRAW HIS OFFER TO SUPPLY REVERSED MARK-8 MEMORY BOARDS. THE ARTWORK IN THE RE PACKET WAS NOT GOOD ENOUGH TO PRODUCE QUALITY BOARDS AND HE'D RATHER NOT SEND OUT SHABBY GOODS. HE SAYS THE GENERAL INSTRUMENTS AY-5-1013 UART IS AVAILABLE EVERYWHERE FOR $6.75 IN SINGLE QUANTITY.

RGS ELECTRONICS, 3650 CHARLES ST. SUITE K, SANTA CLARA, CA 95050 HAS UPGRADED THEIR KITS AND MANUALS TO PCC BOARDS SO COMMENTS IN THE LAST NL DON'T APPLY ANYMORE. $25 IS STILL AN AWFUL LOT TO PAY FOR THAT MANUAL. BORROW ONE FROM SOMEONE IF YOU'RE REALLY INTERESTED. THEIR BUS I/O IS REALLY CUTE BUT SUFFERS FROM THE FACT THAT NO ONE ELSE USES IT PRESENTLY.

ROGER SMITH, SMITH ENTERPRISES, 4502 E. NANCY LN., PHOENIX, AZ 85040 INCLUDED THE SCHEMATICS IN APPENDIX A-4 SHOWING HOW TO INTERFACE HIS TVT TAPE RECORDER UART BOARD TO THE MARK-8. HE SAYS HE TRIED ALL KINDS OF CASSETTE TAPE RECORDING TECHNIQUES AND SETTLED ON TONE BURST BECAUSE IT WORKS WELL AND NO CRITICAL TUNING IS REQUIRED.

LARRY PLESKAC, 938 PAULA ST., ESCONDIDO, CA 92027 REPLIED IN DETAIL TO THE STANDARDIZATION PROPOSAL. HE SUGGESTS TWO CASSETTE UNITS, ONE FOR READING, AND THE OTHER FOR WRITING, AND WANTS TO STANDARDIZE THE CASSETTE FORMAT. (I SUSPECT THAT EITHER THE SUDING OR MIL FORMAT WILL BE FORCED AS A STANDARD BECAUSE THEY WORK AND PEOPLE WILL START USING THEM IMMEDIATELY.) EVERYONE IT SEEMS, WANTS MONEY FOR THEIR DOCUMENTATION AND LARRY WONDERS IF WE AREN'T GOING TO BE REDUCED TO A BUNCH OF SMALL BUSINESSMEN DEALING WITH EACH OTHER INSTEAD OF HOBBYISTS.

WILLIAM E. SEVERANCE, CENTER LOVELL, MAINE 04016, 207-925-2271 SAYS HIS MARK-8 HAS BEEN UP AND RUNNING SINCE EARLY DEC. HIS STRANGEST DEBUGGING PROBLEM WAS THE CLOCK WHICH WOULDN'T START ON FREQUENCY. MULTICYCLE INSTRUCTIONS WOULDN'T RUN. HE SOLVED IT BY PARALLELING A 27 PF CAPACITOR ACROSS R3 ON THE CPU BOARD. HE HAS MADE EXTENSIVE MODIFICATIONS TO THE MARK-8, ESPECIALLY TO THE INPUT BUS. HE ALSO MADE EXTENSIVE COMMENTS ABOUT THE STANDARDIZATION PROPOSAL.

JERRY WALKER, 761 CLAYTON, SAN FRANCISCO, CA 94117 SAYS HE HAS THE MARTIN RESEARCH BOOK AND AN 8008 CHIP AND WOULD LIKE TO GET TOGETHER WITH SOMEONE IN THE BAY AREA AND BUILD A COMPUTER. HE HAS 10 YEARS EXPERIENCE AS AN ELECTRONIC TECHNICIAN.

PHIL MORK, 12 WOODLAND RD., WESTON, MA 02193 GOT HIS MARK-8 RUNNING DEC. 22. HE CHANGED HIS MIND AND IS NOW USING SOFTWARE FOR PARALLEL TO SERIAL CONVERSION AND VICE VERSA. HE'S WRITTEN A CONTROL PROGRAM THAT TIES THE TVT, KEYBOARD, AND MODEM TO THE COMPUTER AND ALLOWS OCTAL LOADING AND DUMPING, EXECUTION OF PROGRAMS, AND I/O TO THE MODEM. HE HOPES TO ADD A CHECKING PROGRAM WHICH WILL VERIFY CASSETTE DATA. HIS LOADER PROGRAM SHOULD FIT IN TWO 8223'S WHICH WILL LOAD THE CASSETTE DATA INTO MEMORY, STARTING AT THE ADDRESS WHICH FORMS THE FIRST 2 WORDS AND CONTINUING UNTIL A 377 IS ENCOUNTERED IN CASSETTE DATA. THIS COULD BOOTSTRAP THE REST OF THE CONTROL PROGRAMS INTO THE COMPUTER. HE PROPOSES THE FOLLOWING TAPE FORMAT: 1 7/8 IPS CASSETTE, 300 BAUD, 1 START, 8 DATA, AND 2 STOP BITS, START BIT LOGIC 1, STOP BITS LOGIC 0, DATA TRANSMITTED LEAST SIGNIFICANT BIT FIRST, LOGIC 1=1270 HZ, & LOGIC 0=1070 HZ. UPON FIRING UP HIS SYSTEM (WITHOUT THE 8008), HIS REGULATOR BROKE DOWN PRODUCING SMOKE AND A MINOR EXPLOSION FROM A 7476. HE REBUILT THE PS, ADDED A CROWBAR, AND FOUND DAMAGE TO BE MINIMAL: 2 7475 AND A COUPLE OF 1101'S. MORAL: YOU REALLY DO NEED A CROWBAR! ANOTHER CIRCUIT IS SHOWN IN APPENDIX A-5. HE SUPPLIED THE CUTE MUSIC PROGRAM THAT YOU MUST TRY WHICH APPEARS IN APPENDIX B-2. NOW THAT HE HAS A RUNNING 8008, HE IS FAR MORE INTERESTED IN SOFTWARE THAN HARDWARE. HE THINKS A COMMERCIAL COMPUTER HOBBYIST MAGAZINE WOULD BE FEASIBLE.

MR. TITUS, TYCHRON, INC. (THE NEW NAME FOR HIS COMPANY), PO BOX 242, BLACKSBURG, VA 24060, 703-951-9030 SAYS HIS CALCULATOR INTERFACE WILL APPEAR IN RE SOON. IT WILL USE THE TI MS-0117 BCD MATH CHIP AND KA ELECTRONICS SALES, 1220 MAJESTY DR., DALLAS, TX 75247 WILL BE SELLING IT AND PERHAPS A KIT OF PARTS ALSO. TECHNIQUES, INC. WILL HAVE THE PC BOARD.

SSG. JACKIE W. PIERCE, 460-84-4884, 178TH SIG. CO., APO NY 09102 WANTS TO KNOW WHETHER WE HAVE SET UP COMMITTEE OPERATION FOR THE GROUP. (ITS HARD ENOUGH TO JUST COMMUNICATE! PERHAPS LOCAL GROUPS CAN ORGANIZE THAT WAY BUT IT SURE DOESN'T SEEM FEASIBLE NATIONALLY IN THE NEAR FUTURE.) HE SUGGESTS THE FOLLOWING STANDARD FORMAT FOR TAPE RECORDING: A TAPE SHOUDLD BE SEPARATED INTO BLOCKS. EACH BLOCK SHOULD BE NUMBERED SEQUENTIALLY AND BE BIG ENOUGH TO STORE 1K BYTES. THERE SHOULD BE APPROXIMATELY 5 SECONDS BETWEEN BLOCKS WITH ABOUT 3 SECONDS BETWEEN THE NUMBER OF THE BLOCK AND THE DATA IN THE BLOCK (TO PERMIT EDITING INFORMATION IN A BLOCK.) THERE SHOULD BE A START AND STOP CHARACTER AROUND THE BLOCK NUMBER AND AROUND THE DATA. IF YOU WANT TO CORRECT OR CHANGE INFORMATION IN BLOCK 001, YOU READ THE TAPE UNTIL 001, THEN STOP (DURING THE 3 SEC INTERVAL), GO TO RECORD MODE, AND WRITE IN A WHOLE NEW DATA GROUP. THE START AND STOP CHARACTERS WILL PREVENT MOST ERRORS DUE TO TAPE RECORDER START UP AND STOP TIMES. HE IS ALSO LOOKING FOR AN A/D CONVERTER THAT CAN SAMPLE AROUND 50 KHZ.

R. S. FORMAN, 2421 NW JOHNSON, PORTLAND, OR 97210 IS CONFUSED AS TO WHETHER TO CONTINUE OBTAINING 8008 PARTS OR TO SWITCH TO AN 8080. HE WANTS HARDCOPY PRINTOUT (TRY BOB COOK'S CREEDS). NOTE HIS NEW ADDRESS.

BOB ALBRECHT, PEOPLE'S COMPUTER COMPANY, PO BOX 310, MENLO PARK, CA 94025 SAYS HIS $3.00 YEARLY SUBSCRIPTION OFFER TO THE PCC NEWSPAPER IS EXTENDED INDEFINITELY TO MARK-8 PARTICIPANTS. HE IS STARTING TO EMPHASIZE MICROCOMPUTERS AND HOME COMPUTERS HEAVILY IN THE NEWSPAPER. SEVERAL PARTICIPANTS HAVE ALREADY MENTIONED HOW EXCITED THEY ARE ABOUT THE NEWSPAPER'S CONTENT. THE 9 BACK ISSUES FOR $6.00 IS STILL A GOOD BUY. BOB SAYS HE WOULD LIKE TO START A HOBBYCOMPUTER NEWSPAPER IN SEPTEMBER 1975. IT WOULD BE 8 1/2 BY 11, ABOUT 20 PAGES PRINTED ON NEWSPRINT, 6 ISSUES A YEAR, $3.00/YEAR FOR CHARTER SUBSCRIPTIONS, $5.00 THEREAFTER. WRITE BOB AT PCC IF YOU ARE INTERESTED IN SUPPORTING THIS EFFORT AND SEEING WHAT HE CAN DO.

MARK CONDIC, 410 WOODS LANE, #6A, DOWNERS GROVE, IL 60515 HAS A CLASS HE IS TEACHING IN WHICH THEY ARE BUILDING UP SOME OF DON MARTIN'S (MARTIN RESEARCH) NEW 8008 CHEAP 8008 SYSTEM. (I DON'T HAVE ANY OTHER INFO ON IT NOW BUT IT IS SUPPOSE TO BE GOOD.) BOB SWARTZ SAYS MARK IS WILLING TO WRITE A BASIC BUT ISN'T WILLING TO WRITE THE FLOATING POINT PACKAGE. WE GOTCHA, MARK!!!! JOE CIMMINO, 19304 RICHWOOD COURT, BROOKEVILLE, MARYLAND 20729 WILL HAVE A SUPER FLOATING POINT PACKAGE AVAILABLE SOON. CAN WE PLACE OUR ORDER?? A BASIC LIKE DEC'S PDP-8 EDU10 THAT WILL RUN IN 6K BUT WILL ALLOW YOU TO DEFINE LARGER MEMORY SIZE FOR TEXT AND DEFINE MACHINE LANGUAGE FUNCTIONS. DEC PUTS EDU10 IN 4K OF 12 BIT WORDS SO AN 8008 BASIC IN 6K SHOULDN'T BE UNREALISTIC. MARK SAYS HE HAS A CROSS ASSEMBLER THAT RUNS ON A UNIVAC/1108. HE SUGGESTS REGIONAL NEWSLETTER DISTRIBUTION POINTS. HE AND BOB SWARTZ ARE ACTIVELY FORMING A CHICAGO AREA USER GROUP.

DAVID HIGGIN, KHIG/STEREO 105, PO BOX 1106, PARAGOULD, AR 72450 WOULD LIKE TO HAVE AN ASSEMBLER AVAILABLE IN PROM. HE IS GOING TO BUY A MITS 8080 WITH HIS IRS '74 RETURNS.

JOHN B. HOPKINS, 29 GRANDVIEW AVE., PITMAN, NJ 08071 SAYS THE COMPUTER HOBBYIST GUYS ARE GREAT AND HE IS ALSO IMPRESSED WITH THE PCC NEWSPAPER. HE WOULD LIKE TO SEE SEPERATE EDITORS FOR VARIOUS SPECIAL INTEREST AREAS, A SOFTWARE LIBRARY, AND WOULD LIKE THE GROUP TO INVOLVE ONLY 8008 SYSTEMS. HE HAS A RUNNING MARK-8 WITH 1.5K OF 1101'S WITH OCTAL LOADING VIA 8 PUSHBUTTON SWITCHES DECODED BY SOFTWARE. (I'D LIKE TO SEE THAT SOFTWARE SINCE MY MARK-8 CONFIGURATION COULD EASILY BE SET UP THIS WAY ALSO.) HE CONTRIBUTED THE RANDOM NUMBER GENERATION ALGORITHM IN APPENDIX B-3. HE HAS ACCESS TO SEVERAL LARGE LIBRARIES SO IF YOU CAN'T FIND A PARTICULAR REFERENCE LOCALLY HE'S WILLING TO HELP. HE WOULD LIKE TO SEE US GET TOGETHER ON A STANDARD TTY I/O.

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We have received a large number of copies of magazine articles which would be of interest to all of us. Hal and I have decided the best approach would be the legal one and therefore we are going to get permission to reprint from the publishers and then include them in future newsletters. In the meantime those of you having access to Electronic Design News magazine will find the list on page A-3 of interest.

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Phillip C. Bold, 963 South Iowa St., Addison ILL 60104, plans on getting started on his Mark-8 toward the end of January.

Harry G. Derks, 658 Goldenrod Ave., Holland MICH 49423, is currently building his Mark-8.

Edward C. Epp, Science Dept. Swan Lake Christian Camp, Viborg S.D. 57070, is planning to build a Mark-8.

Frederick H. Faulkner (Hal) Lt. Col. USAF, 58 Offutt Rd., Bedford MA 01730, is hard at putting together his TVT and Mark-8. He has plans for cassette tape, possibly 4K of 1101's or interfacing 20K bytes of core, hard copy (printer), and a modem & acoustic coupler for telephone interface. He wants to acquaint his daughter (11) and son (17) with computer programming and applications. (which is one of my big goals.)

LGC Engineering, 1807 Delaware St., Berkeley CA 94703, are builders of the "Tom Swift Terminal" (or "A Convivial Cybernetic Device") which is an inexpensive computer terminal for public-access information systems. Their goal is to dispel the theory that the more complex a technology becomes the less useful to society it becomes.

SSgt Jackie W. Pierce, 460-84-4884, 178th Signal Co., APO New York 09102, has built, and is testing, a cassette recorder modem which operates at 3800 bps. It requires a frequency cntr & dual-trace scope for calibration.

Phil Lohr, 3917 Flowerfield Rd., Charlotte N.C. 28210, has his Mark-8 about 85% finished & the TVT about 30%. And, what a system he's going to have! He's got a floppy disc, card reader, card punch, and plans on a 16K memory. It's going to be used for research work, developing a Computer Design Simulator language, and probably be retired eventually to a GP household computer.

Gerald McKee, W6ZQT, Six S Company, P.O. Box 4667, San Jose CA 95126, plans on using his Mark-8 for learning programming and updating his electronics background (which goes back to 1940).

Bro. Felix N. Neussendorfer, Colegio San Antonio Abad, Box 729, Humacao, Puerto Rico 00661, will be using his Mark-8 as a tool for teaching programming. He is currently building the TVT and plans to build a cassette interface & controller. He expressed a concern over availability of software for the 8008. (That's what this User's Group is all about, Felix. After we all get the little beasts running the interchange of software will become the big thing.)

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Hal has some additional goodies to contribute to this issue so I'm now going to drop it off at his house for the finishing touches. Incidentally, he and I have reached a decision regarding the future of the Newsletter. We will be working together on it in the future as a joint project (and I'm sure you can appreciate the fact that it is too much for one man).

It's been a pleasure.

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Gordon French, 614 18th Ave., Menlo Park CA 94025, AND Jerry Filek, 774 Miller Ave., San Jose CA 95129, have been working for several months on an intelligent terminal controller which uses an 8008 for control. They have written an interpretive processor language and math routines which use ASCII number strings.

Gary E. Friedrich, 2618-C Capitales Dr., Rancho Cordova CA 95670, has joined the growing list of Mark-8 builders.

Several of you Canadians have mentioned the difficulty of getting parts up there in Canada. Recv'd a note from K.M. Hamilton, 116 Joffre St., Dartmouth Nova Scotia. He runs an electronic mail order house and may be of assistance.

Fred Hatfield, Computer Data Systems, Inc., 1372 Grandview Ave., Columbus OHIO 43212, is currently writing a system for an 8080 w/a disc. He is a good man to know if you have a Teletype (manuals, parts, misc. info, etc.). He has a home PDP/8.

Robert A. Helber, 2417 E. Yucca St., Phoenix AZ 85028.....another newcomer.

J. Horner, 3289 NE Duncilley, Portland OR 97212.....also.

A.J. Kleinschnitz, Ch. Eng., AKI Industries, Inc., 23 Abbeyview Ave., Willow Grove PA 19090

John LaTocha, 2130 University Ave. #89, Madison WI 53705

Emerson Lawson, Jefferson Productions, One Julian Price Place, Charlotte NC 28208

Jeff Mendenall, P.O. Box 782, Ridgecrest CA 93555

Larry Moss, 9347 O'Day Drive, Highland IND 46322

Jim Rawlings WB6QGY, 211 Milo Place, San Ramon CA 94583

Michael Semanczuk, 40 Willow St., Elmwood Park N.J. 07407

Lloyd L. Smith, 530 Pierce Ave., Dyer IND 46311, has recv'd his circuit boards.

Larry Stein, 151 Kline Blvd., Colonia N.J. 07067

John Szilock, 3395 Cliff Road N Unit 30, Mississauga ONT Canada C5A-3M7

Dave Turner, Box 24/1647, FPO New York 09540 (an electronic tech stationed in Spain)

David Walters, Route 4 Box 386, Andalusia ALA 36420

David R. Jewell, 2495 Oro Ave., Oroville CA 95965, hasn't started yet but anticipates using his micro-computer for scientific calculations & plotting math functions.

Sgt. Lee C. Hanson, PSC Box 648, APO San Francisco 96366, has his Mark-8 up and running & would like to get some basics on programming (Once again, I would recommend the Scelbi manual). He made a remark about convincing his wife the cost of the TVT would be worthwhile. It's for sure you're not alone in that department, Lee.

Hey....one of you Ham radio operators should compile a list of all the Hams who are into this thing so you guys can get together on the air. It seems that several of you are interested in code conversion, radio teletype (w/a TVT), etc.

S Lieberman, 1489 Durango Ave., Los Angeles CA 90035, has put together the Southwest Tech Prod Corp Keyboard & Encoder Kit KBD-2 and finds that some of the switches on his unit are hanging up. Does anyone have a cure for the problem?

Jim Fry has come up with a significant contribution in the way of a low-cost analog-to-digital converter. He has included, along with the schematic, a theory of operation and a test program for making adjustments. The entire package may be found on page A-3.

RICK BRENNAN, 601 S. KNIGHT, PARK RIDGE, IL 60068 BOUGHT THE ALTAIR 8800 KIT AFTER EVALUATING THE RGS AND IEU KITS. THE IEU INFORMATION PACKAGE IS A COMBINATION OF NATIONAL IMP-16 LITERATURE REPRINTS AND A FEW DESCRIPTIONS OF THE KIT, SCHEMATICS, PC BOARDS, AND PARTS LAYOUTS. IT IS DEFINITELY NOT FOR THE BEGINNER. HE ORDERED A SET OF REPRINTS FROM EDN FOR $6.95 ON MICROPROCESSORS AND WILL LET US KNOW WHETHER THEY WERE WORTH THE MONEY.

THANKS TO LEE C. HANSON, 51 CES, BOX 648, APO SAN FRANCISCO 96366, WE NOW HAVE A COPY OF THE SCHEMATIC FOR THE PRECISION SYSTEMS POWER SUPPLY. IT WILL HAVE TO BE REDRAWN BEFORE IT CAN BE DISTRIBUTED. LET US KNOW IF YOU NEED A COPY. LEE IS VERY IMPRESSED WITH THE COMPUTER HOBBYIST. HE WONDERS IF HE DID THE RIGHT THING BY GOING THE MARK-8 INSTEAD OF WAITING FOR THE 8080 SYSTEM. (I MAYBE OVERLY PESSIMISTIC BUT I SUSPECT THAT YOU'LL BE VERY GLAD YOU DIDN'T DEAL WITH MITS.) HE WOULD ALSO LIKE SOME ARTICLES ON ELEMENTARY COMPUTER THEORY SO HE CAN SORT OUT THE STRANGE VOCABULARY PEOPLE KEEP USING.

DAVE CHAPMAN, 3420 S. PERKINS RD., MEMPHIS TN 38118 HAS AGREED TO SERVE AS "ART EDITOR" FOR THE NL. WE'LL CHALLENGE HIM BY ASKING HIM TO RE-DRAW THE PRECISION SYSTEMS POWER SUPPLY SCHEMATICS.

STEVE CIARCIA, 41 HILLTOP DRIVE, WEST HARTFORD, CN 06107 HAS HIS SCELBI COMPUTER RUNNING AND IS EVEN MORE ENTHUSIASTIC THAN BEFORE REGARDING THE QUALITY OF THE BOARDS AND THE DESIGN OF THE SYSTEM. (I'VE HEARD RUMORS THAT THE PRICE OF THEIR BOARD SETS HAS BEEN REDUCED. THAT MAY NOW BE THE BEST WAY TO GO. (THEY DO PUBLISH A USER NEWSLETTER. PERHAPS THEY OFFER THAT ON A SUBSCRIPTION BASIS.)

BILL MILLER, 2813 WAGNER DR., BURLINGTON, NC 27215 SUGGESTS NL SUBSCRIPTIONS AND RECOMMENDS THAT PARTICIPANTS SUBMIT SCHEMATICS AND PROGRAMS IN CAMERA READY FORM (OH!!! PLEASE DO! YOU WOULDN'T BELIEVE THE AWFUL COPIES AND SCHEMATICS WE RECEIVE AND THERE JUST ISN'T TIME TO REWRITE AND REDRAW EVERYTHING.) HE HAS AN RGS-8A AND ASR33. HE RECEIVED DON TARBELL'S CASSETTE TAPE INFO AND WILL BUILD IT AND LET US KNOW HOW IT WORKS.

LARRY MOSS, 9347 O'DAY DR., HIGHLAND, IN 46322 WONDERS IF PERIPHERALS CAN REALLY BE BUILT AT PRICES MENTIONED IN THE STANDARDIZATION PROPOSAL. HE PLANS TO BUILD A SMALL DIGITAL DATA ACQUISITION SYSTEM AND AN AUTOMATIC FIST FOLLOWER (MORSE CODE TO TTY CONVERTER). THE SENDING PROGRAM IS AVAILABLE IN THE INTEL USER LIBRARY. ALSO CONTACT DR. SUDING, C/O DIGITAL GROUP, BOX 6528, DENVER CO 80206 FOR SOME REALLY FANCY INFORMATION ON HAM STUFF.

JAY C. BOWDEN, 1613 ENCINO DR., ESCONDIDO, CA 92025 HAS HIS MARK-8 RUNNING WITH A KEYBOARD AND LED DIGIT READOUTS. NOW HE WANTS SOME SOFTWARE TO MAKE IT DO SOMETHING USEFUL. HE USED A PRECISIONS SYSTEMS POWER SUPPLY AND HAD 5 OUT OF 35 BAD 1101'S FROM IEU. HE SUPPLIED THE CLEVER CIRCUITS IN APPENDIX A-6 TO MAKE THE PS UNINTERRUPTABLE. HE IS INTERESTED IN A 4K DYNAMIC RAM MEMORY. (WITH 2102'S HEADING BELOW $5 EACH, IT DOSEN'T APPEAR PRACTICAL ANYMORE!) HE MENTIONED MICRAL A FRENCH COMPANY THAT MAKES AN ELABORATE 8008 SYSTEM WITH AN AVAILABLE BASIC. HE WOULD ALSO LIKE TO KNOW MORE ABOUT PL/M. (IT COSTS SOMETHING LIKE $1250 TO BUY FROM INTEL AND REQUIRES A BIG FORT IV MACHINE TO RUN.) HE WOULD ALSO LIKE TO KNOW IF ANYONE ELSE WOULD LIKE TO SPLIT THE COST OF THE SCELBI CALCULATOR PROGRAM.

MICHAEL G. SCOTT, ROUTE 1, BOX 105, KIRON, IOWA 51448 HAS STARTED ON A TVT AND NOTES THAT SWTP NO LONGER SUPPLIES TVT BOARDS. (SEMTRONICS, RT 3 BOX 1, BELLAIRE, OH 43906 DOES BUT YOU MAY WANT TO CONSIDER THE NEW SWTP TVT OR THE DIGITAL GROUPS TVT INSTEAD.) HE WOULD LIKE TO KNOW HOW MANY 2524'S CAN BE DRIVEN BY THE TVT CLOCK DRIVER?? HE SUGGESTS WRITING TO SIGNETICS, 811 EAST ARQUES AVE., SUNNYVALE, CA 94086 FOR THE BIG WHITE DATA BOOK WHICH HAS DATA ON EVERYTHING.

JOSEPH A. CIMMINO, 19304 RICHWOOD COURT, BROOKEVILLE, MARYLAND 20729 IS PROMOTING A WASHINGTON DC USER'S GROUP AND INTENDS TO SET UP AN 8008 AND 8080 SOFTWARE DISTRIBUTION HOUSE. THE GROUP'S RESOURCES INCLUDE MARK-8'S, INTELLEC 8'S, MIL MOD-8'S, BIG COMPUTERS, ETC, AND THEY ARE CONTEMPLATING BIG THINGS FOR THE FUTURE. THEY INTEND TO HAVE ONE EACH OF THE SEMISTANDARD DEVICES THE USER GROUP ESTABLISHES SO THEY CAN DO SOFTWARE MODIFICATION FROM ONE FORMAT TO ANOTHER. THEY HAVE PURCHASED THE INTEL USER LIBRARY. THEY WILL SOON SET UP A TELEPHONE COMMUNICATIONS NETWORK USING MIKE HAYES' (MNH ELECTRONICS) MODEMS AND JOE IS EVEN SUGGESTING USE OF THE HAM RTTY SATELLITE NETWORK FOR NATIONAL DISTRIBUTION OF SOFTWARE. MAYBE WE CAN GET THEM TO WRITE UP WHAT THEY HAVE GOING FOR THE NEXT NEWSLETTER. JOE IS DOING THE GROUP A SERVICE BY PUTING THE ROSTER INTO MACHINE READABLE FORMAT. CONTACT HIM IF YOU WANT TO BUY A COMPLETE SET OF STICK-ON MAILING LABELS. HE WILL SOON MAIL OUT AN ELABORATE SURVEY FORM ASKING PARTICIPANTS DOZENS OF QUESTIONS REGARDING WHAT THEY ARE DOING AND WHAT THEY WANT TO DO IN THE FUTURE. HE WILL COMPILE THIS INFO AND MAKE IT AVAILABLE TO ALL OF US SO PLEASE TAKE FILLING IT OUT SERIOUSLY. HE IS ALSO WORKING ON A SUPER 8008 FLOATING POINT PACKAGE.

JIM FRY, DIGI-TEL ELECTRONICS, POBOX 6585, TOLEDO OH 43012 SENT A LETTER TO PARTICIPANTS OFFERING 2102'S AT less than $5.45 EA. IF HE COULD COLLECT ORDERS FOR 1000. SOME PEOPLE WERE SUSPICIOUS SO HE ASKED THAT THIS LETTER BE REPRINTED IN THE NEWSLETTER:

DEAR INQUIRER:

THANK YOU FOR YOUR INTEREST IN THIS PROJECT. I DON'T MIND YOUR BEING A BIT SKEPTICAL. I AM A MEMBER ALSO OF THE CABRILLO GROUP AND YOU WILL FIND MY NAME ON THEIR ROSTER. I HAVE UNDERTAKEN THIS PROJECT SO THAT WE COULD OBTAIN THIS NECESSARY & EXPENSIVE PART AT THE BEST POSSIBLE PRICE.

AT THE TIME I FIRST WROTE TO HAL ABOUT HANDLING THE PAPERWORK & ORDERING FOR THE GROUP, THE PRICE WAS $7.00 EACH IN QUANTITIES OF 1000. SINCE THAT TIME I HAVE FOUND A SOURCE FOR 2102'S FOR $4.95. THAT IN ITSELF IS A SIGNIFICANT SAVINGS; SO I DECIDED NOT TO WAIT FOR THE NEWSLETTER TO COME OUT, BUT TO WRITE TO THE MEMBERS DIRECTLY. I BORROWED COMPANY STATIONARY, HAD LETTERS PRINTED, AND CONNED MY WIFE INTO DOING THE TYPING. I AM NOT DOING THIS AS A MONEY MAKING PROJECT, AND DON'T INTEND TO BECOME A SURPLUS DEALER. I AM ASKING ONLY 10% OVER OUR COST TO COVER MAILING EXPENSES. THIS IS NOT MY BUSINESS BUT MY HOBBY.

THIS WILL BE A ONE TIME ONLY ORDER, THEREFORE I HAVE ASKED FOR A 10% DEPOSIT SO I KNOW EXACTLY HOW MANY WE WILL NEED. I DEFINITELY DO NOT WANT ANY SURPLUS. THESE DEPOSIT CHECKS WILL NOT BE CASHED UNTIL THE ORDER IS ACTUALLY PLACED AND WILL BE RETURNED TO YOU IF WE DON'T GET OUR MINIMUM QUANTITY. ORDERS ARE COMING IN AND I HOPE WE MAKE IT. THE OFFER DEADLINE HAS BEEN EXTENDED TO MARCH 14.

I FAILED TO MENTION IN MY INITIAL LETTER THAT THESE UNITS WILL HAVE MIL-SPC-883 PROCESSING. THEY ARE GUARANTEED BY THE MANUFACUTRER; AND ALTHOUGH I DO NOT EXPECT ANY RETURNS, I WILL HANDLE ANY COMPLAINTS WITH THE MANUFACTURER. I WOULD SUGGEST USING SOCKETS OR MOLEX PINS WITH THIS DEVICE TO OVERCOME OVERHEATING AND STATIC VOLTAGE PROBLEMS.

I HOPE THIS LETTER EXPLAINS MY POSITION. WE DO NEED YOUR SUPPORT IN GETTING THIS QUANTITY PRICE. HOPE TO HEAR FROM YOU SOON.

SINCERELY, JIM FRY

JIM SAYS HE TRIED PHIL MORK'S FRONT PANEL SWITCH MODS (NL #4) AND FOUND THAT WHEN IN SINGLE STEP AND INTERRUPT MODES, HE COULD NOT SINGLE STEP. HE MOVED SS COMMON TO THE B TAP TO CORRECT IT.

TERRY RITTER, DANTCO, 2524B GLEN SPRINGS WAY, AUSTIN TX 78741, 512-441-0036 HAS COMPLETED HIS EXECUTIVE MONITOR SYSTEM WHICH INCLUDES KEYBOARD ENTRY, MODIFICATION, & PROGRAM INITIATION, TTY OCTAL DUMP IN WHICH ALL MASKING, BAUDOT TRANSLATION, BIT TIMING, AND SERIAL OUTPUT IS DONE IN SOFTWARE. HE SAYS THAT AFTER TWO WEEKS OF USE HE IS WELL SATISFIED AND WOULD MAKE ONLY MINOR CHANGES IF HE WERE TO RECONSTRUCT IT. HE SUPPLIED A COPY AND A CIRCUIT OF HIS BAUDOT SERIAL ISOLATED TTY DRIVER, AND AN OCTAL LISTING IN WHICH HE HAS PARTITIONED THE 8008 OP CODES INTO LOGICAL GROUPS TO EASE PROGRAMMING, AND AN OCTAL LISTING WITH COMMENTS OF HIS EXECUTIVE. ITS LONG! SEND A NL ARTICLE AND A 20 CENT SASE FOR A COPY OF THE ABOVE. HE MADE HIS OWN ROM BY

Dale Berggren, 9207 S.W. 43rd Ave., Portland ORE 97219, has a unique and interesting suggestion: A SWAP SHOP section to the NL. To quote him....."Not a big-deal, make-a-profit thing but just a place to get rid of unwanted or unneeded things in hopes of getting needed items. No money involved. No commercial interests, etc."
He also asks if anyone has compiled a name & address list (with their Mark-8) of the User Group members? Might be a worthy project. He is currently building a "Day Clock' with variable length interrupts (more info on that after he's tested it).

::
PEOPLE's COMPUTER COMPANY ----P.O. Box 310, Menlo Park, CA 94025
Fantastic publication - I thoroughly enjoy it. Bob Albrecht, the editor, writes that he had such a good response to the offer made in NL #4 that he will extend it to the user's group for an additional period of time (til Feb 28, '75). See NL #4 for details.
::

Dr. George L. Haller, 1500 Galleon Dr., Naples Fla. 33940, has a Scelbi w/2K of memory, Tape interface, & model 32 RO. He's programming it for golf handicaps (which consists of accepting 20 scores; sorting; adding the lowest ten in double precision; subtracting the course rating; dividing by ten; multiply by 0.85 (whew!), and then output the result.

Dr. James G. Callas, 631 No. San Pedro Rd., San Rafrael CA 94903, would like to see a recommended list of books (software & hardware) which would be applicable and helpful to the Mark-8 users. (digital group??) He also commented on a NL comment regarding doctors in "hobby" computers:...."That's hardly the right word for some of the very serious computer applications involved."

Here's a good one..... a note from a gentleman in Pearl City, Hawaii which says: "Aloha: Please kindly send me copy of your latest Catalogue." AND IT'S TYPED ON THE BACK OF A LABEL FROM A CAN OF DOLE PINEAPPLES!! Now, there must be a really interesting story behind that one!

- -
Due to circumstances beyond our control, we will now do a "BRANCH & PECK" to a different typewriter. (or is that a "BRANCH & BOMB"?)
- -

Adam Trent, Bendix Box A Ascension, Patrick AFB FLA 32925, is stuck down there on Ascension Island (working for NASA) and is about to fire up his Mark-8. He speaks very highly of MNH-AE Applied Electronics. They provide extensive documentation on their surplus electronics & top quality. He is planning to interface his 8 with a UNIVAC 1218. Should be interesting.

James R. Boddie, Apt. 216, 420 No. Dean Road, Auburn ALA 36830, has a running Mark-8. And, he gives a lot of credit to the NL bug reports (which a lot of other people have also). You will find his Memory Diagnostic program on page B-1.

(After 3½ pages I've decided on the appendices! Appendix A will contain HARDWARE information (schematics, etc.); Appendix B will be devoted to SOFTWARE; and Appendix C will be reserved for flyers and announcements from COMMERCIAL SUPPLIERS.)

Laurence Platt, 2220 Skyline Way, Santa Barbara CA , is hard at it (fighting the solder bridges) and should have his Mark-8 up soon.

Doug Arnold, #9 Colonial Village, Brookings S.D. 57006, is a senior at SDSU and is working on a core memory interface design for the 8008.

Peter Wolfe, Box 139, Yarrow B.C. Canada V0X 2A0, is getting started on his Mark-8 and is getting the 8008 from Martin Research along with their book Microcomputer Design.

Stephen Gilmore, 2014 Perkins Ln., Redondo Beach CA 90278, is currently working on a TTY to Mark-8 interface while waiting for the processor parts to arrive.

J.N. Noren, 111-11033-127 St., Edmonton, Alberta Canada, is still struggling along trying to get parts for his Mark-8 and indicates his interests will be in the software development areas. He's building a dual Mark-8 system.

John G. Raiche, 10406 55th Ave. So., Seattle WA 98178, almost has his Mark-8 flying. Send for that Scelbi manual, John, if you're looking for a good basics manual.

.....

Just received the letter from Jim Fry concerning the 1k static RAM's----cancel my previous comment about designing a refresh for the 4K dynamic memories---- I didn't realize the prices were getting so far down on the static (he's trying for a quantity order at $5.45 each).

.....

Gregory W. Hart, 8948 Ramstad Ave., Fair Oaks CA 95628, is presently constructing his Mark-8 and in comparing the construction booklet and the Intel Users Manual he has noted several items which seem to be in error with regard to the output ports. (I haven't checked this out, so I'll just give it to you verbatim.)
--"An output instr is 01 RRM MMM where the RR≠00 and the MMM= the output port location from port 0-7. In the Mark-8 only the RR=01 is used thereby limiting us to 8 output ports. The Mark-8 as constructed using the booklet only allows 7 output ports to be used, ports 1-7. In many cases in the booklet reference is made to output port 0 being addressed by a 121 instr. However, in tracing the circuit I note that the 7442 decoder on the output port board has no connection made to the 0000 input which corresponds to a 121 instr. Pin 1 of the 7442 (IC 12) is the 0 output which corresponds to the 121 instr and should be utilized. As it is I don't understand how the Mark-8 can use port 0 since it is never decoded. On the LED Reg board the 7442 decoder is wired correctly so that when a 121 instr is given the 0 bit of the 7442 (pin 1) is used to enable the LED display. Perhaps because most users only use the display rather than the actual port 0 they aren't aware of the error. Same errors noted in the sample programs:(a 121 = port 0, 123 = port 1, 125 = port 2, & 127 = port 3) Yet on page 9 the sequencing program lists a 123 as port 2 (& same mistake on page 10 in the counter input program)"--

Vincent Buscemi, Newfield High School, Marshall Dr., Shelden N.Y. 11784, is trying to get the school to finance an 8080 system. He was asking about a good computer basics manual and also stated that he was sending for a Scelbi manual. That is an excellent manual for basics and more.

Capt. Mack Ward, 17 Nijmegen St., Ft. Bragg, N.C. 28307 states that the bug reports and other info has helped him in getting along with the construction of his Mark-8.

Mark Peterson, Teaching Specialist, Dept. of Industrial Education, University of Minn., Duluth Minn., says the use of small brass rivets for plated thru holes works quite well (see your local auto brake relining shop for rivets)-- no soldering neccessary. He also sent the interesting ad from Delta Electronics Co. (no address) for card reader assemblies on page .

J. Scott Williams, P.O. Box 932, Bellingham WA 98225, (computer programmer) has decided to go with the ALTAIR 8800 (Jan 75 PE) because of the stronger interrupt capability (compared to the 8008). I know how he feels....everything I encounter which increases the 8008's capability I latch onto.

Doug Drye, 3202 Winchester Dr., Greensboro N.C. 27406, writes that the Computer Hobbyist Group in North Carolina has decided to publish their newsletter on a regular basis ($6.00 per yr.).

Bob Thomas, 910 Sonman Ave., Portage PA 15946, would like to see a memory system based upon the new 4K dynamic chips (so would a lot of us....how about somebody getting an in with one of the supuliers, and then design a nice simple refresh circuit? ---it's so simple to just sit back and suggest these things, isn't it?----). Bob has an order in for the ALTAIR 8800.

HAND THREADING WIRES THRU TORROIDAL CORES! HE WOULD LIKE INFO ON A CHEAP 5203 PROM PROGRAMMER AND IS WORKING ON AN OSCILLOSCOPE OCTAL DISPLAY AND CASSETTE TAPE CIRCUITS. HE STILL OFFERS HARDWARE AND SOFTWARE HELP VIA SASE, AND IS BOTHERED ABOUT HAVING TO PAY FOR EVERYTHING AND IS SURE THERE IS AN ALTERNATE DISTRIBUTION METHOD SUCH AS DAISY CHAINS THRU THE MAIL.

ADDITIONS TO POSTER AS OF FEBRUARY 8, 1975

(NOTE ALSO THE ADDITIONS IN JOHN CRAIG'S SECTION AS WELL. A COMPLETE UP-TO-DATE POSTER WILL BE INCLUDED IN NL #6.)

DONALD K. ABELES, THUNDERBIRD PRINTER, 7054 25TH NE, SEATTLE, WA 98115 IS INTERESTED IN 8008 INTERFACES AND I/O DEVICES AND IN 8008 PROGRAMS.

DON ALLISON, BOX 1685, CRAIG AFB, ALABAMA 36701 IS PLANNING ON BUILDING AN ALTAIR 8800 IN THE SPRING.

MIKE ANASTASION, 6211 QUINCEWOOD CIRCLE, CITRUS HEIGHTS, CA 95610

RICHARD D. APPLING, 1009 G NO. 6, LINCOLN, NEBR 68508

MICHAEL J. BATCHELDER, DEPT. OF EE, SOUTH DAKOTA SCHOOL OF MINES, RAPID 57701

JERRY BILEK, 774 MILLER AVE., SAN JOSE, CA 95129

LEO D. BORES, M.D., OPHTHALMOLOGY, 1055 FISHER BUILDING, DETROIT, MI 48202

JEB BOSWELL, M.D., 29 KENILWORTH ST., NEWTON, MASS 02158

SP/6 JOHN R. BRONSON, 208-26-5689, USACSC SUPPORT GROUP, PO BOX 5307. FT. LEE, VA 23801

WILLIAM BROOKS, BROOKS OPTRONICS, 2971 COPPER RD., SANTA CLARA, CA 95051

BRUCE BROWN, 4801 KENMORE AVE., APT. 1022, ALEXANDRIA, VA 22304

DR. J. N. BURNETT, DEPT. OF CHEM., DAVIDSON COLLEGE, DAVIDSON NC 28036

TOM CARY, 4370 VALENTINE ST., FORT WORTH, TX 76107

JOHN CHOCHRAN, ELECTRONIC AUTOMATION SYSTEMS, INC., PO BOX 966, JESSUP, GEORGIA 31545

PERRY COLSTROM, 5720 MADISON ST. NE, MINNEAPOLIS, MN 55432

WILLIAM CONRAD, 7818 BANCROFT, TOLEDO, OH 43617

CHARLES F. DOUDS, 381 POPLAT ST., WINNETKA, IL 60093 IS DEEPLY INVOLVED IN ELECTRONICS IN MODEL RAILROADING. HE IS CONNECTED WITH THE GARFIELD-CLARENDON MODEL RAILROAD CLUB AND ANYONE WITH SIMILAR INTERESTS SHOULD CONTACT CHARLES AND FIND OUT WHAT THEY ARE UP TO. HE IS ALSO INTERESTED IN COMPUTER TEXT PROCESSING SYSTEMS. HE KNOWS OF A SOURCE OF 1/4 WATT RESISTORS AT $.02 EA IN QUANTITIES OF 100-499. IF YOUR INTERESTED, CONTACT HIM.

ELLIS, JACK. (I LOST HIS ADDRESS. IF YOU KNOW IT, LET US KNOW PLEASE.)

MIKE HAYES, MNH APPLIED ELECTRONICS, PO BOX 1208, LANDOVER, MD 20785 HAD A FLYER IN NL #4 ADVERTISING MODEMS AND POWER SUPPLIES AMONG OTHER THINGS. ADAM TRENT SAYS WE MISQUOTED HIM. HE ORDERED A POWER SUPPLY AND IT IS FABULOUS. THE TTL LOGIC WHICH HE SAID CONTAINED NO GOOD ITEMS WAS ONLY A SAMPLE THROWN IN WITH ANOTHER ORDER FOR FREE. HE SAYS THAT MIKE SUPPLIES QUALITY MERCHANDISE AND MAY BE THE ONLY SUPPLIER THAT FURNISHES COMPLETE DOCUMENTATION WITH SURPLUS EQUIPMENT. I CAN VOUCH FOR THAT. I PURCHASED 3 PAPER TAPE READERS AND RECEIVED 1/2 INCH THICK MANUALS. MIKE SENT ME ONE OF THE MODEMS AND IT COMES WITH A

1/2 INCH THICK DOCUMENTATION PACKAGE. JOE CIMMINO HAS USED ONE OF THE MODEMS TO IMPLEMENT A CASSETTE TAPE UNIT AND SAYS IT WORKS GREAT. THE WASHINGTON DC GROUP IS PLANNING ON SETTING UP A TELEPHONE SYSTEM FOR TRADING SOFTWARE THAT WILL USE THESE MODEMS. THE FSK UNIT INCLUDES ELABORATE NOISE DISCRIMINATION CIRCUITRY AND IS USEABLE UP TO 1900 BITS PER SEC. JOE IS EVEN TALKING ABOUT JOINING UP WITH THE HAM SATELLITE RTTY NETWORK FOR NATIONAL SOFTWARE TRADING. IT MAY BE WORTHWHILE TO TAKE ANOTHER LOOK A TE FLYER IN THE LAST NEWSLETTER AND ORDER CATALOG NO. 8 WHICH INCLUDES AN ELABORATE DESCRIPTION OF THE MODEMS, THE POWER SUPPLIES, AND SOME REALLY WILD ELECTROACOUSTICAL SERIAL MEMORY UNITS.

JOSEPH R. HOKE, 2523 SAINT CLAIR DR., HILLCREST HEIGHTS, MD 20031

ROBERT LEONARD, 3003 DRISCOLL DR., SAN DIEGO, CA 92117

ROBERT LONG, 1815 SWEETWATER RD., SP. 165, SPRING VALLEY, CA 92077

SIDNEY R. MAXWELL II, PO BOX 217, QUENCHEE, VT 05059

MITS, 6328 LINN, NE, ALBUQUERQUE, NM 87108

JOHN C. NEVES, 930 PALO ALTO AVE., PALO ALTO, CA 94301 IS INTERESTED IN MORSE CODE TRANSLATION AND WANTS TO TRY DIGITAL FILTERING ALGORITHMS.

WILLIAM C. PARRISH, PARRISH SOLID STATE POWER SYSTEMS, 127 WINFIELD AVE, JERSEY CITY, NJ 07305

TIM RAND, 59 WILLINGTON OAKS, STORRS, CT 06268

ERIC SCHOTT, 208 14TH AVE., JANIATA, ALTOONA, PA 16601

RALPH E. SKOOG, 6217 KENNEDY AVE., HAMMOND, IN 46323

GARY H. SMITH, 1121 SPARKMAN AVE., MELBOURNE, FL HAS A RUNNING MARK-8.

DR. LEO H. SODERHOLM, RM 213, AG. ENGR., IOWA STATE UNIV., AMES, IOWA 50010

C. SOLOMONS, FRIENDS' CENTRAL SCHOOL, 68TH ST. AND CITY LINE, PHILADELPHIA, PA 19151

STEPHEN C. STALLINGS, THE COMPUTER HOBBYIST, BOX 295, CARY, NC 27511

DAVID F. STOUT, 717 SARANAC DR., SUNNYVALE, CA 94087

ED SZCZEPANSKI, MOOG INC., PRONER AIRPORT, EAST AURORA, NY 14052

O. C. TASKER, PO BOX 168, ROMNEY, WV 26757

GEORGE TATE, 3544 DAHLIA AVE., LA, CA 90026

LESTER C. WARD, BOX 35L, MANTEO, NC 27954

ROBERT E. WHITMOYER, J.D., OLD DOLLAR RD., BOX 13, ROUTE #1, HEUVELTON, NY 13654

RUSTY WHITNEY, OREGON MUSEUM OF SCIENCE AND INDUSTRY, 4015 SW CANYON RD, PORTLAND, OR 97221

DAVID WILLIAMS, STERLING ELECTRONICS, 1061 INDUSTRIAL RD., SAN CARLOS, CA 94070 IS AN MIL DISTRIBUTOR AND SHOULD BE CONTACTED IF ANYONE WANTS PRICES ON QUANTITY PURCHASES.

DAVID YULKE, 121 LIBERTY AVE., SELDEN, NY 11784 WILL SOON OFFER 5203 PROM PROGRAMMING SERVICE. (NOW ALL OF YOU GUYS THAT BOUGHT 5203 PROMS WITHOUT KNOWING HOW TO GET THEM PROGRAMMED HAVE AN OUT.)

MARK-8 NEWSLETTER

31 January 1975 Vol. 1, No. 5

Current Editor:
John T. Craig

"....as happened with television and then color television, the enthusiasts and the well-to-do will be the first to install computer consoles in their homes. Eventually, however, everyone will consider them to be essential household equipment. People will soon become discontented with the "canned" programs available; they will want to write their own. The ability to write a computer program will become as widespread as the ability to drive a car."

Scientific American
September 1966

I recently told Hal Singer that I would be happy to lighten his load somewhat and do the next newsletter. The result is that he stopped by my house a few days ago and dropped off a BOX of correspondence! You just can't imagine the bulk of mail he's been getting. (Or perhaps you can if you notice that the last newsletter was 28 pages in length!)

He mentioned that most of the material was new correspondence but that there were a lot of older letters that he felt he hadn't been able to do justice. I'm going to make every effort to get as much of it all as I can.

As an introduction let me just slip in a few words about myself here and then I'd like to tell you a few things about Hal. I'm a Computer Systems Instructor with Varian Data Machines in Irvine, California. When I tell people that my hobby is building a micro-computer they look at me like I'm some kind of nut. (And, sometimes after teaching, troubleshooting, or studying computer hardware all day I think I know what they mean!) I've been building my Mark-8 in a wire-wrap version and I can assure you that that approach is nothing to write home to Mother about! Unfortunately (and fortunately) I recently acquired a Varian 620-L computer (a basket case) and I've decided to put the 8008 aside for the time being and devote my energies to getting it up and going. (I'm building it (THIS) a board which will plug right into the 620-L, so no telling what kind of interesting application I'll come up with now.)

Now, about this guy Hal Singer that everybody keeps writing to...

I first met Hal about 4½ years ago when he attended an Adult Education class I was teaching in digital electronics. That was about the time that Hal was getting the ball rolling on acquiring a computer for Cabrillo High School (where he teaches math and algebra). His efforts were finally realized and he and a couple of other math teachers have succeeded in building a fine educational tool called the Cabrillo Computer Center. Hal is an "EE", and when he's not building something like the Mark-8 in his home laboratory (workshop) he's busy putting that good electronic know-how to good use building peripherals for the school computer center. (And, he's built some beauts!)

Hal has been throwing real strong hints in the last few newsletters for someone to come up with a standardization scheme for the I/O -- so that the software we develope in the future can be exchanged among ourselves with no problems. He didn't get any response so he generated a version of his own (which looks good), and sent it to about 31 bodies and asked them to evaluate it. He sent it out to people who have their Mark-8's running, Mr. Titus, Intel, Scelbi, Dr. Robert Suding (to whom he would like to apologize - I'm sure - for misspelling his name three different ways), Radio Electronics, MP Publishing, just to name a few. And, you can be sure that NL #6 will be one of the most important because of this effort.

FROM: MICRO-8 COMPUTER USER GROUP
CABRILLO COMPUTER CENTER
4350 CONSTELLATION ROAD
LOMPOC, CA 93436

TO: