MICRO-8 COMPUTER USER GROUP NEWSLETTER
HAL SINGER & JOHN CRAIG - EDITORS
CABRILLO COMPUTER CENTER
4350 CONSTELLATION ROAD
LOMPOC, CA 93436

JUNE 27, 1975
VOLUME 1, #8

WE RUSHED ANOTHER ISSUE OUT IN A HURRY BECAUSE BOTH JOHN AND I H AVE COMMITTMENTS COMING UP IN JULY. I HAVE TO TRAVEL TO SACRAMENTO FOR A THREE WEEK NATIONAL SCIENCE FOUNDATION INSTITUTE ON TEACHING A PRE-ENGINEERING COURSE IN THE HIGH SCHOOL. JOHN WILL SOON BE STARTING A SERIES OF TRAINING COURSES.

EVERYONE THAT ORDERED BACK ISSUES SHOULD HAVE RECEIVED THEM BY NOW. IF YOU DIDN'T EITHER WE MESSED UP OR THE POST OFFICE DID. PLEASE LET US KNOW IF YOU ORDERED AND GOT MISSED. SORRY ABOUT THE PRINT QUALITY ON 1-4 REPRINTS. THE REDUCED FORMAT MAKES COPY QUALITY VERY CRITICAL AND ALL I HAD TIME TO DO AT THAT TIME WAS TO DUMP PAPER TAPES ON TO OUR FAST PRINTER.

CARL HELMERS OF M.P. PUBLISHING CO., BOX 378, BELMONT, MA 02178 HAD THIS TO SAY IN A RECENT LETTER. "JUST A PAGE, TO INFORM YOU OF THE DEMISE OF ECS MAGAZINE AND - LIKE A PHOENIX FROM IT'S MAILING LIST ARISEN - T HE BEGINNING OF 'BYTE'! I GOT A NOTE IN THE MAIL ABOUT TWO WEEKS AGO FROM WAYNE GREEN, PUBLISHER OF '73 MAGAZINE' ESSENTIALLY SAYING HELLO AND WHY DON'T YOU COME UP AND TALK A BIT. THE NET RESULT OF A FOLLOW UP IS THE DECISION TO CREATE BYTE MAGAZINE USING THE FACILITIES OF GREEN PUBLISHING INC. I WILL END UP WITH THE EDITORIAL FOCUS FOR THE MAGAZINE, WITH THE BUSINESS END BEING MANAGED BY GREEN PUBLISHING.

THE IDEA OF THE MAGAZINE IS TO PROVIDE A FORUM FOR IDEAS AND COMMUNICATIONS ON THE "HOME BREW COMPUTER" THEME AND ITS PRACTICAL AP-PLICATIONS FOR GAMES, AS AN AID TO SMALL BUSINESS AND PROFESSIONAL PEO-PLE'S NEEDS, AND FOR THE NON-PRACTICAL HARDWARE-HACKERS WHO BUILD THINGS AND LET THEM SIT ON THE SHELF. THE FORUM IS THE MAGAZINE, AND ITS SUSTAINANCE COMES FROM A COMBINATION OF SUBSCRIPTIONS AND ADVERTISE-MENTS. THE SUBSCRIPTION PRICE WILL BE $10 FOR A CHARTER SUBSCRIBER PER ANNUM, AND $12 FOLLOWING THE INITIAL "TURN ON" TRANSIENTS. ECS MAGA-ZINE SUBSCRIBERS WILL BE SERVICED ON A TWO FOR ONE BASIS FOR THE REMAIN-D ER OF THEIR PRESENT SUBSCRIPTIONS. INDIVIDUAL COPIES WILL SELL FOR $1.50."

HAL NOVICK CALLED ABOUT A MONTH AGO WITH THE NEWS THAT THEY DID GET THE SELECTRIC TYPEWRITER TERMINALS THEY WERE BIDDING ON. I ORDERED ONE AND F OR $275 DELIVERED PRACTICALLY TO THE DOOR, I GOT A BEAUTIFUL I/O SELECT-RIC TYPEWRITER IN A PRETTY CASE WITH A 8 LEVEL PAPER TAPE READER ON ONE S IDE AND AN 8 LEVEL PAPER TAPE PUNCH ON THE OTHER IN VIRTUALLY PER-FECT OPERATING CONDITION. NOT ALL OF THEM WERE QUITE THAT GOOD BUT I THINK ITS THE BEST BUY WE HAVE SEEN YET IN A HARD COPY PRINTER. ONE STILL HAS TO SOLVE THE ASCII TO SELECTRIC AND VICE VERSA CODE CONVERSION BUT IT SHOULDN'T BE TOO HARD WITH THE NATIONAL $22 ROM AVAILABLE. THEY HAVE SOLD OUT ON THE FIRST BATCH BUT ARE GOING TO GO AFTER MORE. SO THEY W ILL KNOW HOW MUCH MONEY THEY HAVE TO WORK WITH THEY ARE GOING TO ASK FOR REFUNDABLE DEPOSITS IN ADVANCE IF YOU WANT TO RESERVE ONE. WRITE HAL AND ENCLOSE AN SASE IF YOU'D LIKE FULL DETAILS.

HAL NOVICK, 2810 HENDERSON COURT, WHEATON, MD 20902
(301) 933-7453 OR (703) 920-7200 HE SUGGESTS CALLS BE MADE PERSON TO PERSON.

DR. KEN MCGINNIS SENT THE FOLLOWING COPY OF A LETTER TO MINI MICRO MART. UNFORTUNATELY, LETTERS ARE COMING IN RAPIDLY INDICATING SIMILAR PROBLEMS. EVERY INDICATION IS THAT MAURY DOES REALLY CARE ABOUT TRYING TO SERVE THE NEEDS OF THE HOBBYIST BUT APPARENTLY HAS SIMPLY TAKEN ON MORE THAN HE CAN HANDLE.

23 JUNE 1975

KEN A. McGINNIS, M.D.
1289 EAST HILLSDALE BOULEVARD
FOSTER CITY, CALIFORNIA 94404

FAMILY PRACTICE

MAURY GOLDBERG
MINI MICRO MART
1618 JAMES STREET
SYRACUSE, NY 13202

DEAR MAURY,

I HAVE RECEIVED YOUR LETTER DATED 6-21-75

1) SHIP MY KEYBOARD ON OR BEFORE JULY 1, 1975 OR RETURN MY CHECK.
2) SHIP MY OTHER PARTS NOW! OR RETURN MY CHECK NOW! I HAVE WAITED MORE THAN 2 MONTHS AND I CAN'T WAIT ANY LONGER.

I MUST STOP PAYMENT IF I HAVE NOT RECEIVED SHIPMENT ON OR BEFORE JULY 7, 1975. IF YOU AREN'T SURE YOU CAN DELIVER BY THAT DATE, JUST RETURN MY CHECK NOW.

I WOULD VERY MUCH LIKE TO ORDER SEVERAL OTHER THINGS IN YOUR FLYER BUT I CAN'T TRUST YOU. I SUPPOSE I'LL HAVE TO FIND ANOTHER SOURCE. THIS I S TOO BAD SINCE YOU SEEM TO CARE ABOUT THE COMPUTER HOBBIEST MARKET.

I AM SENDING A COPY OF THIS TO HAL SINGER

SINCERELY,

KEN

M. PAUL FARR, 3723 JACKSTADT ST., SAN PEDRO, CA 90731 SAYS THAT ORGANIZATIONAL MEETING FOR THE LOS ANGELES HOBBY COMPUTER GROUP WAS A SMASHING SUCCESS. HE ESTIMATES ABOUT 150 PEOPLE ATTENDED. THE FIRST PEOPLE STARTED ARRIVING AROUND NOON AND THE LST DIDN'T LEAVE UNTIL AFTER SIX. A TREMENDOUS AMOUNT OF TALENT AND INFORMATION WAS BROUGHT TOGETHER BUT HOW CAN WE GET USEFUL WORK AND DIRECTION OUT OF SUCH A MONSTER GROUP? PAUL GOT PHIL MORK'S "CHOMP" RUNNING FOR THE MEETING TO MANY PEOPLE'S DELIGHT. HE APPRECIATED THE DISCUSSION ON I/O HANDLERS IN NL#7 A ND SAYS A LOT OF THIS KIND OF THING IS NEW TO HIM AND INDESPENSIBLE IN H IS CONTINUING EDUCATION".

MY NAME IS BILL LEWIS AND I HAVE HAD MY MARK-8 UP SINCE DECEMBER. I HAVE A SWTP TERMINAL AND KB. THE KB SWITCHES HANG UP LIKE EVERYONE ELSE'S, BUT I HAVE PROGRAMMED AROUND IT. AT THIS TIME, I ONYL HAVE 768 BYTES OF MEMERY, BUT IT IS ENOUGH TO HOLD AN OCTAL ASSEMBLER WITH ONE BLOCK LEFT OVER. A FRIEND OF MINE HAS PURCHASED AN ALTAIR 8800 AND IT RUNS FINE(AND FAST) EXCEPT YOU CANNOT LOAD THE STACK. IT ALWAYS SEEMS TO CONTAIN ONES. (BY THE WAY, THE CHIP DOES NOT HAVE INTEL WRITTEN ON IT) YOUR NEWSLETTER HAS HELPED MY UNCOUNTED TIMES AND I WOULD LIKE TO CONTINUE TO RECIEVE IT. I AM ENCLOSING A CHECK FOR $ 6.00.

My mailing address is: BILL LEWIS
6620 N.E. COTTER
KANSAS CITY, MO 64119

From John Craig.....

Ted Lincoln, 410 Bell Avenue, Santa Ana, Calif. 92707, was recently a student in my Varian V-70 Systems course. He has a Mark-8 up and running but is building a new chassis for the boards to convert it to a bus-oriented system. His goal is to build another processor board with an 8080 and be able to just plug it in in place of the 8008. In the truest sense Ted is a computer interface expert. He's responsible for designing interfaces between an aircraft simulator system and about five different computers (Sigma, PDP-11, V-73, Altair 8800, and more). Hopefully, Ted will come up with some neat inexpensive interfaces for you folks with 8080's.
Ted got together with six other co-workers and set up what we consider a pretty good system for getting info on this hobby. Each member of the group subscribes to one of the various newsletters being put out today and they then make copies and exchange them. When you consider that each one of the NL's being put out cost five or six dollars it would be quite a bundle to get all of them. (Save them bucks wherever ya can, folks. They're gonna be needed for peripherals.)

- -

We're terribly sorry the last newsletter was a little late to inform some of the people in the L.A. area about the meeting at Don Tarbell's place on June 15th. (The NL's were returned to us by the Post Office because they were two or three grams overweight...and that is why one edge was trimmed off.) Anyway, Judge Pierce Young and Don Tarbell did a fantastic job on getting the word out. The meeting was attended by 120 people and there was standing room only in the auditorium. Four or five people brought their computers and set them up. There was also some selling and trading going on. A survey form was filled out by all the participants so that a determination could be made regarding the direction for an L.A. club. George Tate (home ph: 663-2604) was given the organization responsibilities and he reports that it looks like the club will be of unlimited size but will have to be broken up into steering committees and there is also the problem of a large meeting place to be resolved. A tentative August meeting is in the works but firm word on that will be forthcoming. Contact any one of the three gentlemen mentioned if you're interested.

- -

Joe Huffman in Corona, California is currently working on design of a Universal Controller using an 8080 microprocessor. His objective is to come up with a controller which can be used for interfacing an 8008 or 8080 with a TTY or TVT, and tape cassette and also be used as a Block Transfer Controller.

- -

The Amoth Team (father & son) sent us a couple of letters recently totaling 50 pages. One of the sections dealt with Jim Fry's A to D converter and some bugs they discovered. If we could get camera-ready copy of same we'd like to reproduce it in a future newsletter.

- -

If you're planning on starting a Mark-8 soon, you might consider holding off until the next NL. We're going to publish complete plans & wirelists for Tom Boyko's wirewrap version. We can get limited versions of the board for about $10.

ACSNJ NEWS

issue no. 1

June 1975

Amateur Computer Society of New Jersey Newsletter

First ACSNJ Meeting A Success

The first meeting of the ACSNJ was held on Friday night, June 13th at UCTI (Union County Technical Institute) in Scotch Plains NJ. There were 32 people in attendance. The gathering was scheduled for 7-10PM, but people started arriving at 6:30 and some did not leave until the lights were finally turned off at 10:30PM. Here are some of the highlights of the gathering:

Ed LaPlante had his Altair 8800 processor up and running with a demo memory swapping program. Several other Altair owners tried their hands at entering some of their pgms. Several Altair owners complained about slow delivery on extra circuit boards from MITS and non-delivery from mini-micromart.

Bob Silva had his home-built computer terminal on line to the ECN computer located at Rutgers University. They have a fantastic library of pgms (lots of games too) as well as BASIC, FORTRAN, APL and several other languages (all interactive). Bob built his terminal using Don Lancaster's TVT-I for the display and a reworked Univac keyboard with an improved version of Lancaster's ROM encoder circuit. Bob designed the additional circuits for terminal operation (scrolling, CR, LF, UART, etc.) and is using a Bell-103 modem. He plans now to rework the circuit to display 1,024 characters on the screen (64 character/line, 16 lines) to enhance its operation as a terminal(512 characters is just to little for interactive work with a large system)

Bob just graduated from UCTI(electronic technology) and is planning to continue his education for a Bachelor's degree in Florida, so contact him quickly before he leaves the area if you want info on his system.

Norm Compton had his music computer running. It was playing the Beattle's "Yesterday" as well as running through the chromatic scale over 3 octaves. Norm designed and built the system. It uses a 6-bit word stored in a 1024x6 recirculating shift register memory (it was the cheapest way to go at the time this was designed). 4-bits are used to encode the scale and 2-bits for octave and rhythm control. The system is programmed via a switch panel and the memory output. via decoding, controls a VCO. A DAC is used to form harmonic rich musical tones whose harmonic content is controllable via the DAC. The system can play a single-note melody of as much as 1024 notes and elements of rhythm over a range of three full chromatic octaves. The entire unit (incl. power supply) is the size of a music box.

Norm is also a graduate of UCTI and is continuing his education toward a Bachelor's degree at NJIT(formerly NCE).

Between 8 and 9PM we had a business meeting. It was decided to formerly found the ACSNJ and for Sol Libes (that's me) to be the President. It was decided that we should hold monthly meetings (for the present) since things are changing so rapidly. The next meeting is scheduled for Friday July 18th and will be held again at

UCTI. Most attendees found this a convenient meeting point. Rodger Amidon and Marty Nichols volunteered to give a talk on "programming the Altair 8800 versus the Mark-8". Frank Kacerek volunteered to maintain the mailing list on his computer system and run addressing labels as required. It was agreed to start a newsletter (this is the first one) to keep people posted on what is going on in NJ. Information was distributed on other available newsletters, organizations and sources of parts.

31 people completed a 2½pg questionnaire. Here is a compilation of data from them:

CPU's built:	Mark-8	4	
	Altair 8800	5	
	Other	5	
	total	14	(9 are running)
I/O Devices:	TVT-I	4	
	TVT-II	2	
	Suding TVT	2	
	Teletype	3	(2-type 33, 1-Creed)
	Cassette	6	
	Other	1	

Where Do people Live?

NJ counties:	Middlesex	9	NYC	1
	Union	8	Staten Island	1
	Passaic	4		
	Somerset	2		
	Morris	2		
	Essex	2		
	other	3		

Occupations:	Students	9(1-HS, 2-AAS, 4-BS, 2-MS)
	System Pgmmers	4
	Electronic Tech	4
	Self-employed	4
	College teachers	3 (Computer Field Eng. 2
	Electronic Consult.	2
	Mgr in business	2
	other	3

Education:	Tech school	6
	AAS	8
	BSEE	3
	BS(business)	2
	BS(science)	2
	MSEE	2
	MA	1

Free coffee and cookies were provided at the meeting by UCTI. $26 was collected to cover mailing expenses, etc. through the next few months.

A Directory of society members is attached to this newsletter. It should assist members in exchange of info, parts, etc.

I will be out of NJ during JUly and August and Bohdan Lukashewsky has agreed to corrdinate things until I get back. Call him, Marty Nichols, Rodger Amidon or Mike Price for info.

By the way, Mike Price and Fred Holcomb are selling a wide selection of TTL, etc logic. Their price sheet should be in with this mailing.

Remember: Next meeting July 18th. Friday night. 7PM at UCTI
Marty Nichols & Rodger Amidon speakers:"Pgmming Altair Versus Mark-8

See you all in September.....Sol Libes

Page 5

David O. Valliere
Chemical Engineer
1806 E. Lawndale Ave., APT. 3
Victoria, Texas 77901
June 22, 1975

I stated in my first letter I am building a system centered around an Altair which I purchased as a PK (partial kit) in march. My system will have 12K of dynamic Ram initially with hopes of adding an equal amount of core in the future. I/O is both local, through a Southwest Tech. TVT which I built from scratch, and remote through a modem. I added a modem with automatic phone answer because I have access to a TTY with paper tape at work. I hope to get MITS extended BASIC on the unit, but not at the prices they are talking. I cannot understand why MITS wants to jeopardize their market position with poor sales policies. I am sure you have heard from many dissatisfied customers.

As I stated in my previous letter I have an extensive workshop and may be able to provide services to other members. The workshop includes silkscreen and photographic facilities for PC board and dress panel production. I presently have a screen made up to print Altair front dress panels. The screen prints a duplicate of the stock MITS front, less the MITS logo, on any material. I have made several for people here in Texas on 1/8 inch gray Plexiglas. For any members building Altairs from scratch these panels add the final touch for a nice looking system. I will supply them complete with predrilled swt. and Led holes for $20.00. For an additional $5.00 I will print any logo a member wants across the bottom in the same location MITS puts theirs. If any one is interested they can order one immediately or write to me and ask for info and photo. I can also supply main and memory boards for Southwest Tech. TVT for $25.00 a set. I hope to have my plating through unit running within a month, any boards supplied before then will not be plated through. If any of the members want a special PC board or screen printed front panels made have them call or write and I'll be happy to help them. I have toyed with the idea of making screens up for the Altair boards but I don't know how much interest there is. If anyone is interested have them call or write. I'm not interested in making a profit from this service, I'm just trying to pay for my workshop.

I also think that some of the members might be interested to know that the major surplus market centers are not always the best place to get some IC's (memories etc.). Some times it is better to deal with Industrial electronic dealers. For example, I am doing business with an Industrial OEM supplier in Houston who is selling 2102's for $3.50 in lots of ten, he also is selling 8080's for$175.00. Everything he sends out he tests before shipping. I believe that the surplus centers are selling new rather then surplus stock for many of the LSI and MSI devices based on the prices they want. Two very cooperative surplus centers that don't advertise are;

Herbach & Rademan
401 E. Erie Ave.
Philadelphia, Pa. 19134

and,

Surplus Center
1000-1015 West "O" St.
P.O. Box 82209
Lincoln, Nebraska 68501
402/435-4366

RICHARD LERSETH, 8245 MEDITERRANEAN WAY, SACRAMENTO, CA 95826 (916)445-7872 OR (916)381-0335 IS AN ASSOCIATE WATER QUALITY ENGINEER FOR THE STATE OF CALIF. DEPT. OF WATER RESOURCES. AS PART OF HIS WORK HE WROTE A FORTRAN IV PERSPECTIVE PLOTTING PROGRAM WHICH HE WILL MAKE AVAILABLE TO THOSE INTERESTED FOR THE COST OF DUPLICATION. HE PROVIDED THE FOLLOWING CROSS REFERENCE FOR NL'S 1-7 AND SAYS IT WAS A ONE PASS COMPILING AND HE PICKED ITEMS IMPORTANT IN BUILDING A COMPUTER SYSTEM BY NEOPHYTES. HE WILL BE TAKING A MICRO PROCESSOR SYSTEMS COURSE AT LAWRENCE LIVERMORE LABS THIS SUMMER AND WILL TRY TO GET AS MUCH MATERIAL OF INTEREST TO THE COMPUTER HOBBYIST WHILE HE IS THERE.

Page 8

Page 7

Page 10

Page 9

Southwest Technical Products Corporation
219 W. Rhapsody
San Antonio, Texas 78216

May 5, 1975

Dear John and Hal,

Don Lancaster has forwarded me a copy of your April 15 edition. This is a nice newsletter. Should be very helpful to all of the computer freaks who are getting into their own machines. Note that several of your readers didn't appreciate Don's upside down keys on the KBD-2. We were also less than thrilled with this, but it wasn't possible to correct it for the cost we wanted to have in the kit. Also note that some folks had problems with the strobe pulse. This is not due to insufficient debouncing, but is caused by slow rise time. This was noted on prototype TVT-2 units. Correction was easy here. Since strobe pulse went into a 7400 gate, we simply replaced the pack with the new "Schmidt Trigger" gate pack - 74123.. Presto no more problem.

We are now in production on a new keyboard kit, KBD-3. This has a one chip MOS encoder (AY5-2376) which gives you a typewritter style keyboard with all the keys right side up. You also get both upper and lower case, or just upper - selectable. You also get a choice of strobe pulse polarity, jumper selectable. Only problem is that it sells for $49.95. Price reduction should be possible when the encoder chips become less expensive.

Glad to see that most of your readers are happy with the TVT-2. We tried to make this kit as univeral as possible by not forcing anyone to buy features they did not want, or need. I know - it costs too much. Would you be interested in a deal for your subscribers? Since these are the type people that we particularly want to reach, I would be willing to give them a 15% discount on the TVT-2 kit and plug-in units. If you consider this a good deal will be happy to send special order blanks. How many?

We are real interested in just what MITS is up to also. They have a demo truck going around in our part of the country that is due here Friday. Supposed to have an Altair 8800, ASR-33 and diskette system running BASIC. Did you see their ad in the latest Computer Decisions? For only $9, 000 + dollars you can have an Altair with 16K running Super Basic, a printer and a Diskette system. BASIC is "FREE" with the machine. They got to be kidding. Will let you know what the demo looks like.

Daniel Meyer

Dan

TEXAS COMPUTER CLUB TO BE ORGANIZED

Texas Computer Buff's interested in home computer systems are urged to contact L.G. Walker, Rt. 1 Box 272, Aledo, Texas 76008 --Aledo is in the Ft. Worth, Tx. area----

JEAN PIERRE BERNIER, 1005 AVE GRENOBLE, STE FOY QUE10 CANADA 1-418-653-4282 SAYS: "I HAVE FINISHED THE CIRCUIT TO COMMUNICATE WITH A BIG COMPUTER BY PHONE. AT LAVAL UNIVERSITY THERE IS AN IBM 370 WITH A PL. THEY HAVE AN INTERFACE TO USE ASCII AND TTY 38. IT WORKS ALSO WITH TTY 33 AND MY TVT, BUT WITHOUT GREEK ALPHABET AND SPECIAL APL SYMBOLS. I ADDED A MODULATOR AT 2225 AND 2025 HZ TO COMMUNICATE WITH A TTYP HAVING AN ACOUSTIC COUPLER. I USE THE TTY AT MY LABORATORY AND I CAN CONTROL MY MARK-8 WHICH IS AT MY HOME. I AM SENDING YOU:

1) THE SYMBOLIC DUMP OF MY MONITOR WHICH IS MIL EXCEPT FOR INPUT AND OUTPUT AND SOME OTHER ROUTINES.
2) AN OCTAL DUMP OF THE MONITOR
3) A PAPER TAPE OF THE PROGRAM TO PUT IN THE MARK-8 TO LOAD THE MONITOR AND DUMP IT.
4) A PAPER TAPE OF THE MONITOR
4) A CASSETTE WITH A) BOTH PROGRAMS IN THE 2 MODES: 1270-1070 HZ AND 2225-2025 HZ
B) THE OCTAL DUMP OF THE MONITOR IN THE 2225-2025 HZ MODE.

I CHOOSE THE SLOW (BUT SAFER) 9.09 MS PER BIT TO COMMUNICATE WITH A BIG COMPUTER OR A TTY OVER THE PHONE. I CAN COMMUNICATE OVER THE PHONE WITH ANYONE HAVING A TTY AND AN ACOUSTIC COUPLER. I WILL SEND AT 2225-2025 HZ AND RECEIVE AT 1270-1070 HZ. I CAN THEN SEND THE MONITOR (8 BITS) OR THE OTHER PARTNER CAN CONTROL MY MARK-8 THRU THE MONITOR!!!"

WE WILL TRY TO PRINT SOME OF THE LISTINGS IN THE NEXT NEWSLETTER AND HOPEFULLY COME UP WITH A WAY OF PROVIDING DUPLICATE TAPES AND CASSETTES SOON.

HERE IS A COPY OF THE AD THAT WAS SUPPOSE TO APPEAR IN THE NL BEFORE ALL THE DURA MACH 10 SLECTRIC TYPEWRITER TERMINALS GOT SOLD OUT JUST T O MAKE YOU FEEL BAD AND BECAUSE I'VE GOT A LITTLE ROOM I'VE GOT TO FILL AND I'M OUT OF TIME.

4 SALE Government Surplus I/O Selectric Typewriters

We have eight Dura-Mach 10 machines. Each machine includes an IBM I/O Selectric, paper tape reader, paper tape punch, and some have large carriages. Price -- $225 plus $25 packing & handling plus $25 shipping with any excess packing or shipping to be refunded.

All machines should be presumed to have some defect. All Selectric movements appeared to work however all machines are sold "AS IS". No guarantees, no COD, no credit. Full payment required with order. Please expect a two week delay before shippment if payment is by personal check. Machines in best shape will be sold first.

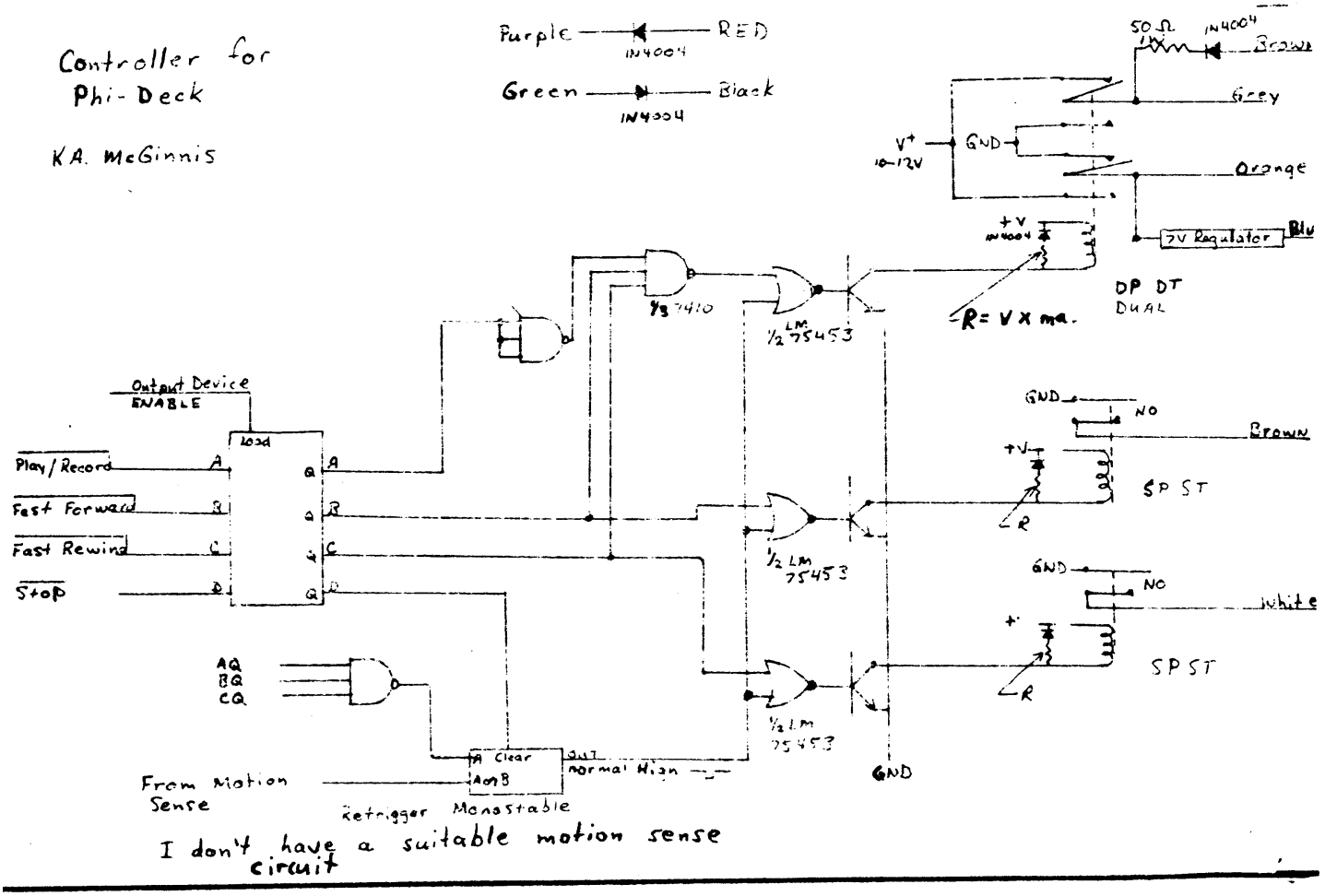
Please note, we are patent attorneys and not in the typewriter business and therefore must impose the above conditions of sale. If there is sufficient interest an attempt will be made to obtain additional units but price will be subject to change.

Shipping will be made by Amtrack or other suitable way. If you have a preferance, please specify. If interested contact:
Hal Novick, 2810 Henderson Court, Wheaton, MD 20902
(301) 933-7453 or (703) 920-7200 (suggest call be made person-to-person)

Due to possible problems, we have scrapped one working machine in order to provide spare parts on a first come, first serve exchange basis. Parts will be provided free to the extent of the supply however please enclose return postage with requests.

Any order received after all typewriters have been sold will be returned immediately.

KEN A. MCGINNIS, MD, PO BOX 2078, SAN MATEO, CA 94401 APPARENTLY HAS BEEN BESIEGED BY REQUESTS FOR INFORMATION ON PHI-DECK CASSETTE TRANSPORTS. HE'D APPRECIATE PEOPLE WRITING DIRECTLY TO: INDIVIDUALIZED INSTRUCTION INC., 1901 N. WALNUT, PO BOX 25308, OKLAHOMA CITY, OK 73105 FOR INFORMATION. HE'S NOT A DEALER AND TO AVOID A TAX MESS, HE'S NOT GOING TO MAKE ANYTHING IF PEOPLE ORDER THRU HIM BUT IF ENOUGH PEOPLE POOL THEIR ORDERS THEY WILL BENEFIT FROM A QUANTITY DISCOUNT. HE WILL ORDER FOR PEOPLE IF THEY SEND $100 PER DECK. HE WILL REFUND ANY UNUSED MONEY PROMPTLY. AFTER HE HAS 50 ORDERS DELIVERED, HE WILL SEND EVERYONE THE QUANITY DISCOUNT. A SIMPLE CIRCUIT FOR CONTROLLING ONE USING THREE CHEAP SURPLUS RELAYS IS INCLUDED. THIS DECK IS SO SIMPLE TO USE, HE THINKS ANYONE COULD MAKE A CONTROLLER BUT HIS ONE BIG PROBLEM IS A WAY TO SENSE END OF TAPE MOTION. HE IS NOW CONSIDERING A CIRCUIT WHICH USES OPTICAL ENCODING TO DETERMINE TAPE POSITION AS WELL AS END OF MOVEMENT.



DAN WINGREN, 2714 1/2 GREENVILLE AVE., DALLAS TX 75206 SAYS THAT HE HAS ONLY RECENTLY LEARNED WHAT "BYOB" MEANS AND I STILL DO NOT KNOW "SASE".

SASE IS "SELF ADDRESSED STAMPED ENVELOPE" DAN AND IS NEARLY A NECESSITY WHEN CORRESPONDING WITH ANY LARGE OUTFIT. THE TIME NECESSARY TO ADDRESS ENVELOPES AND THE COST OF POSTAGE NEARLY GUARANTEES THAT YOUR CORRESPONDENCE WILL BE IGNORED UNLESS YOU DO INCLUDE AN "SASE". YOUR CHANCES ARE GOOD AT LOSING THE DIME YOU SPENT FOR A STAMP STILL BUT YOU MAY GET RESULTS. EVEN RADIO-ELECTRONICS IS REQUIRING THEM NOW IN ORDER TO GET A REPLY TO A LETTER.

M. DOUGLAS CALLIHAN, BERKLEY STREET R.F.D. #1 BERKLEY, MA 02780 MENTION-THAT HE HAD AN ONGOING PHI-DECK CASSETTE TAPE PROJECT AND SENT THESE COMMENTS:

WITH REGARDS TO THE PHI-DECK PROJECT, HERE IS WHERE I AM SO FAR.

1. I AM LETTING THE WISER HEADS DECIDE JUST WHAT FORMAT THE DATA SHOULD BE WRITTEN IN...AT THE PRESENT TIME I AM LEANING TOWARD THE "SUDING-DIGITAL GROUP" CONCEPT...HOWEVER, THE "T.C.H." WOULD BE FINE, EXCEPT I HAVE NOT HEARD FROM THEM. I GAVE THEM MY $6.00 AT THE DAYTON HAMVENTION, AND HAVE WRITTEN TO STEPHEN STALLINGS AND INCLUDED AN SASE AND HAVE YET TO HEAR ANYTHING FROM THEM. I SURE HOPE THEY HAVEN'T FOLDED, AS I WOULD LIKE TO TRY THE CHAMBERLAIN INTERFACE. SO MUCH FOR MY GRIPES!

2. I THINK THAT ANYONE WHO PAYS THE PRICE FOR THE PHI-DECKS SHOULD BE ABLE TO AFFORD A "SEARCH" CAPABILITY. BY USING STEREO RECORD-PLAY BACK HEADS IN THE UNIT, AND RECORDING DATA ON CHANNEL"A" BETWEEN THE BLOCKS ON "A", A PULSE SHOULD BE RECORDED ON CHANNEL "B". IT MAKES NO DIFFERENCE WHAT THE FREQUENCY OF THIS PULSE IS, BUT IT SHOULD BE RECORDED ON THE TAPE BEFORE YOU USE IT FOR DATA. WHAT I AM REALLY SAYING IS THAT THE CASSETTE SHOULD BE FORMATTED ON THE "B" CHANNEL BEFORE DATA IS APPLIED TO IT. TO DO THIS YOU HAVE TO KNOW HOW MANY BITS (OR BYTES OR WORDS) YOU WILL HAVE IN EACH BLOCK. YOU ALSO HAVE TO HAVE A BLOCK NUMBER ON CHANNEL "A" BEFORE YOUR DATA IS ENCODED. I PLAN TO USE A 2.5 INCH INTER-RECORD GAP BETWEEN BLOCKS, FOR START UP AND STOP DOWN. (THIS IS VERY CONSERVATIVE.)

3. AFTER THE "B" CHANNEL IS FORMATTED TO THE USER'S CONFIGURATION, DATA BLOCKS MAY BE WRITTEN ON "A" CHANNEL. SOFTWARE CAN TAKE CARE OF ANY TIMING LOOPS, AND BLOCK NUMBERING ON CHANNEL "A".

4. AS DATA IS READ, FROM CHANNEL "A", THE BLOCK NUMBER IS STORED IN MEMORY. WHEN DATA IS REQUESTED FROM A DIFFERENT BLOCK, A COMPARE IS DONE. IF THE BLOCK NUMBER IS THE SAME, NOTHING HAPPENS BECAUSE THAT BLOCK HAS JUST BEEN READ AND THE CONTENTS SHOULD BE IN MEMORY. IF THE NUMBER IS LESS THAN THE ONE WE NOW HAVE, WE ENABLE THE "TAPE MOVING IN THE REWIND DIRECION, HEAD ENGAGED, SPEED UNREGULATED" (PAGE 31, APPLICATION NOTES FOR PHI-DECK). WE ALSO ENABLE CHANNEL "B" PLAYBACK AMP. WE ARE NOW COUNTING THE CHANNEL "B" PULSES. WHEN WE COUNT THE NUMBER OF B LOCKS + 1, WE STOP THE TAPE. WE ENABLE "TAPE MOVING IN FORWARD DIRECTION, HEAD ENGAGED, SPEED REGULATED" AND WE LOOK AT THE BLOCK NUMBER AND COMPARE TO THE ONE WE WANT. THE "GO TO" NUMBER IS INCREMENTED BY 1 SO THAT WE STOP AT THE CORRECT BLOCK. N+1 IS CORRECT. IF THIS BLOCK NUMBER READ COMPARES WITH OUR N+1 NUMBER, THE THE FOLLOWING BLOCK SHOULD BE THE "N" BLOCK AND OUR SEARCH IS OVER. IF NOT WE COMPARE AND START ALL OVER AGAIN. TO FAST FORWARD SEARCH, OUR COMPARE STEP SHOULD SHOW A BLOCK NUMBER GREATER THAN THE ONE WE ARE AT, AND WE SERACH FOR N BLOCK - 1. THE MICROPROCESSOR DECREMENTS THE BLOCK NUMBER, WE COUNT THE PULSES O N B CHANNEL AND STOP ONE BLOCK BEFORE "N" BLOCK AND READ THE BLOCK NUMB ER ON CHANNEL "A", THEN COMPARE.

MUCH OF THE HARDWARE IS BASED ON 74193'S FOR PRESETING COUNT UP, DOWN AND CONTROLLING THE PHI-DECK TO STOP AFTER CHANNEL "B" COUNTING IS DONE. WITH THIS SYSTEM, I REALIZE 2 INPUT AND 2 OUTPUT PORTS ARE TIED UP--HOWEVER, CONTROLLING UP TO 8 PHIDECKS SHOULD BE POSSIBLE WITH VERY LITTLE MORE TTL. IT SURE IS CHEAPER THAN A DISK SYSTEM AND SHOULD BE GOOD FOR ABOUT ALL THE STORAGE THE AVERAGE HOBBYIST WITH VERY LITTLE MONEY TO SPEND SHOULD NEED. I EXPECT TO USE THIS SYSTEM ON AN 8080 SYSTEM (NOT NECESSARILY THE ALTAIR 8800) BUT IT SHOULD BE APPLICABLE TO 8008 SYSTEMS AS WELL. IT DOES HAVE THE DRAWBACK OF NEEDING 25% OF THE PORTS AVAILABLE TO 8008 USERS. I AM VERY INTERESTED IN ANY AMPLIFICATION ANYONE IN THE MICRO-8 GROUP WOULD CARE TO DO ON THIS SYSTEM.

AS FAR AS NOISE INTERFERANCE IS CONCERNED, IF THE CHANNEL "B" PULSES ARE OF SUFFICIENT DURATION AND LEVEL, THE AMPLIFIER SETTING ON THE CHANNEL "B" INPUT SETTING CAN BE SET LOW ENOUGH THAT ONLY THE ACTUAL PULSES ARE READ, AND POSSIBLY SOME TYPE OF ANTI-NOISE LIMITER COULD BE USE TO FILTER OUT ALL BUT THE ACTUAL PULSES.

I SURE WISH I COULD HEAR FROM THE COMPUTER HOBBYIST PEOPLE!!

IMPROVING THE MARK-8

by Terry F. Ritter
25248 Glen Springs Way
Austin, Texas 78741

Several weeks ago, I mentioned to Hal that I would write up a description of the hardware PUSH/POP stack I had implemented on my Mark-8. At that time the stack itself was fully operational, but I planned further modifications to establish a buss system that would reduce the number of wires between the Mark-8 and and my peripheral breadboard. As it turns out, such a system is not trivial.

It was my intention to extend the Mark-8 data buss (pins 25-18) some ten feet to my breadboard; timing signals would be generated by circuitry added to the Mark-8 CPU board, and be similarly extended to the breadboard. This scheme would appear to allow address data to be latched into the peripheral registers during T1 and T2, as well as making the buss contents availiable during T3 and T4, all on 12 wires (plus power) instead of 26. While I am quite sure that such a system can be implemented, my attempts, using ribbon cable, and standard TTL as line drivers were not successful. Although many timing windows were configured, most giving apparently-suitable waveforms to the distant latches, latched data was rarely correct. It seems probable that transient pulses on the timing lines were latching transitional data, but this is not confirmed. In any case, this simple project quickly got out of hand time-wise, and was terminated prior to success.

For some time, I have been planning some rather complex software systems for my home computer, including a machine-language trace/editing system, and an interpreting language suitable for extensive complex-algebra manipulations. Very soon, however, I became aware of several of the serious deficiencies in the 8008 instruction set. In particular, the 8008 allows no true interrupt service, since it is normally impossible to fully save the processor state at the time of the interrupt and restore it after the interrupt has been answered. There is also no normal access to the program counter or the PC stack. These particular deficiencies are now corrected in some degree with external hardware. In addition, construction of the stack system, as well as other peripherals, implied use of input ports not availiable on the Mark-8. Accordingly, an input-port buss system was developed that made input ports 1-7 availiable on the peripheral breadboard. The presented hardware modifications and additions thus consist of additional input port capability, a PUSH/POP stack designed for interrupt service (including flag latch), and program counter access.

The Input Port System

Since it was desired to place input ports 1-7 on the external breadboard, one approach that seemed reasonable was to place the appropriate data on port 1 input of the Mark-8. This appeared to reduce external complications, since port timing was still accomplished within the Mark-8 itself.

Input data from ports 1-7 is accepted on port 1 of the Mark-8 after modification of the select circuitry associated with IC7, the port-select 7442 on the input board. This modification consists of the addition of seven germanium diodes (which form a seven-input negative-logic OR gate) between the 1-7 outputs of the 7442 and pin 6 of IC6, the 7402 controlling the 8263 input multiplexers.

The input-port structures are configured from six sets of 8-946 quad DTL nand-gates each, with gate outputs in parallel (alternately, 12-7403's could be substituted, with eight pull-up resistors on the common buss). This results in a low-impedence inverted-data buss to the computer, where eight inverters (two more 946's) correct the data into the port 1-7 channel.

On the peripheral board it is necessary to develop signals similar to those to and from our (now modified) 7442 on the input board. This requires all high-address lines (bits 9-15) for development of Den (I/O enable), INPUT, as well as the port-select signals. Six of the 7442 output lines are inverted (complements of one 7404) and used to enable the appropriate input ports (one non-inverted line is used for the POP instruction in the stack, yet to come).

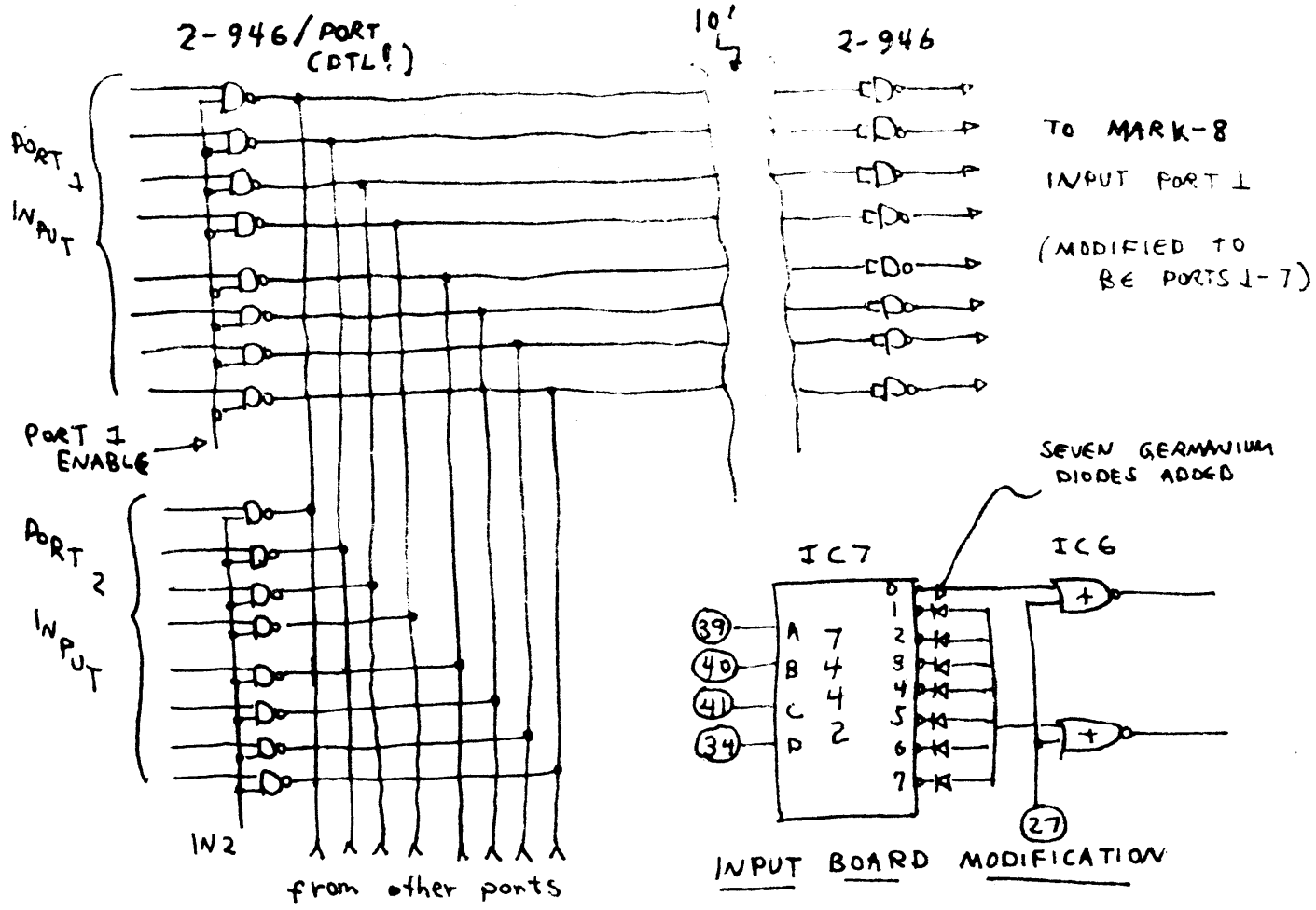
The Hardware PUSH/POP Stack

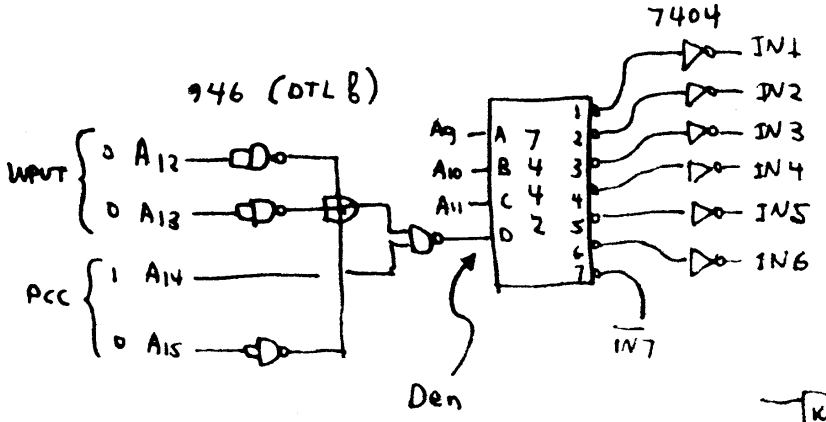
The Push/Pop stack is designed to store the complete status of the CPU prior to execution of an interrupt routine; this includes all registers and flags. Although a software system could be used to identify and store the flags, in this implementation an INPUT 7 instruction causes the flags to be latched externally during what is effectively an OUTPUT-type command (PUSH). These flags are then brought into the accumulator (by another PUSH) and stored on the stack on top of the registers. When status is to be recovered, flag values are easily POPed from the stack and used as an address into a data table in the last sixteen words of a particular page. The appropriate data is then loaded into register A which is added to itself to set the flags to their original values. The registers are then recovered from the stack the accumulator to restore the original CPU status.

The concept for the PUSH/POP stack is taken directly from an article by Tom Pitman writing in Electronic Design for November 22, 1974 (p. 202), although the logic is re-designed for perhaps more-availiable IC's. Two 7489 RAM's are used as a 16-level stack with a 74193 as level-counter. Two 946's (and another diode) provide appropriate timing signals, while a single 7475 latches the flags from the data buss. Timing signals T3 and T4 are required by the stack implementation and are obtained via ribbon-cable from IC17 pin 3 and IC11 pin 10, respectively, on the CPU board. The necessary input commands (IN6 and NOT IN7) are already availiable from the input circuitry. Four data-buss lines are required for the flag latch, however.

The original stack level need not be set to any particular value, since the 74193 is a mod-16 counter and will traverse the stack as a circular list. Hence, the original level-value is meaningless unless it is desired to detect a stack overflow. In the absence of such hardware modifications, of course, it is the responsibility of the programmer not to exceed the stack capacity.

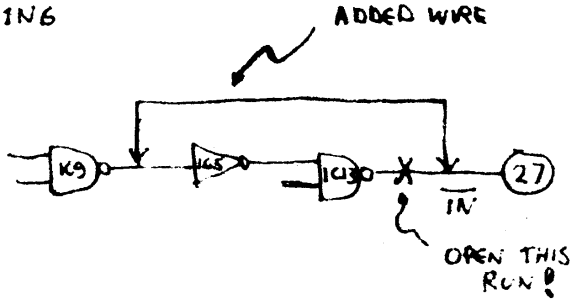
EIGHT INPUT PORTS !!





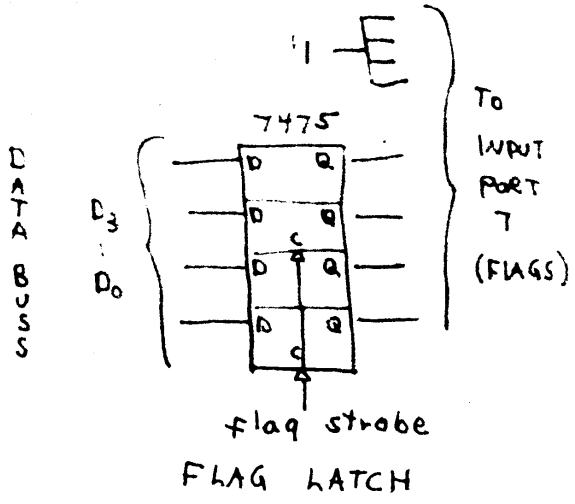
PORT SELECT CIRCUITRY

(on peripheral board)

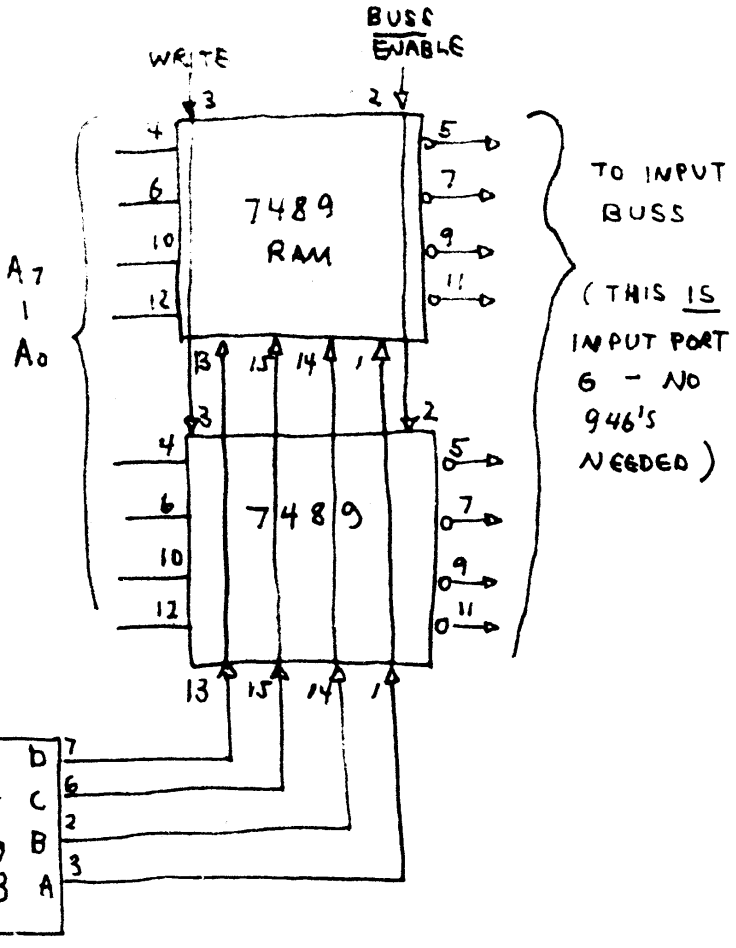


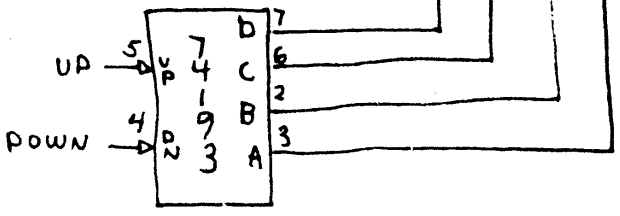
CPU BOARD MODIFICATION

PUSH / POP STACK !



FLAG LATCH





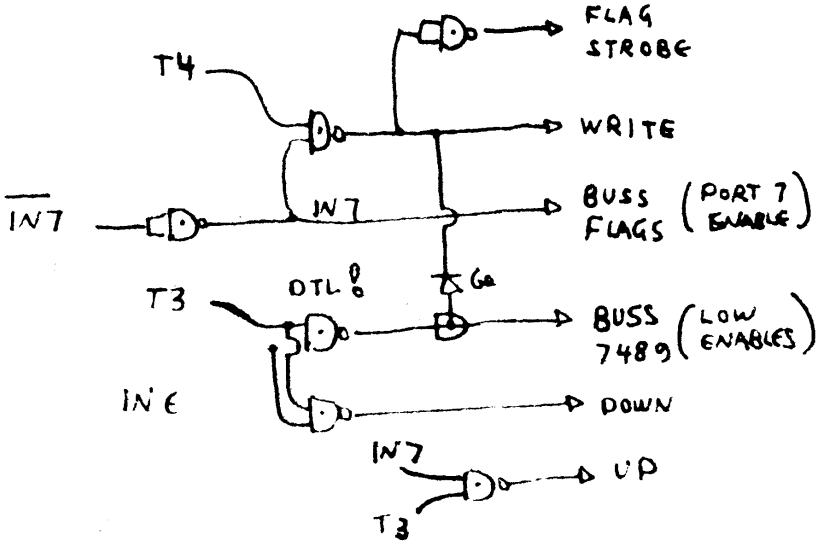
LEVEL COUNTER + STACK

INPUT 7 = 117
PUSH

T1: T1 LATCH ← A
T2: T2 LATCH ← INSTRUCTION
T3: A ← FLAG LATCH
T3→T4: LEVEL ← LEVEL + 1
T4: STACK ← T1 LATCH
T4: FLAG LATCH ← FLAGS

INPUT 6 = 115
POP

T1: T1 LATCH ← A
T2: T2 LATCH ← INSTRUCTION
T3: A ← STACK
T3→T4: LEVEL ← LEVEL - 1



STACK CONTROL LOGIC

Simple Stack Test

```
00 100  301   <-  push
00 101  117       sequential
00 102  010       data
00 103  110
00 104  100   <-
00 105  000
00 106  121   <-
00 107  000       HALT for
00 110  115        display
00 111  104
00 112  106   <-
00 113  000       pop stack loop
```

00 102 can be 011

Simple Flag Recover Test
(needs flag table at 01 360)

change 01 076 for various
flags at 01 104

```
01 075  006
01 076  340   <-  modify at
01 077  200        will
01 100  117
01 101  117
01 102  117
01 103  121
01 104  000   <-  display flags
01 105  250       before save
01 106  117
01 107  117
01 110  121
01 111  000   <-  display
01 112  056       altered
01 113  001       flags
01 114  115
01 115  115
01 116  115
01 117  360
01 120  307
01 121  200
01 122  117
01 123  117
01 124  121
01 125  000       display
                  recovered
                  flags
```

SAVE

RECOVER →

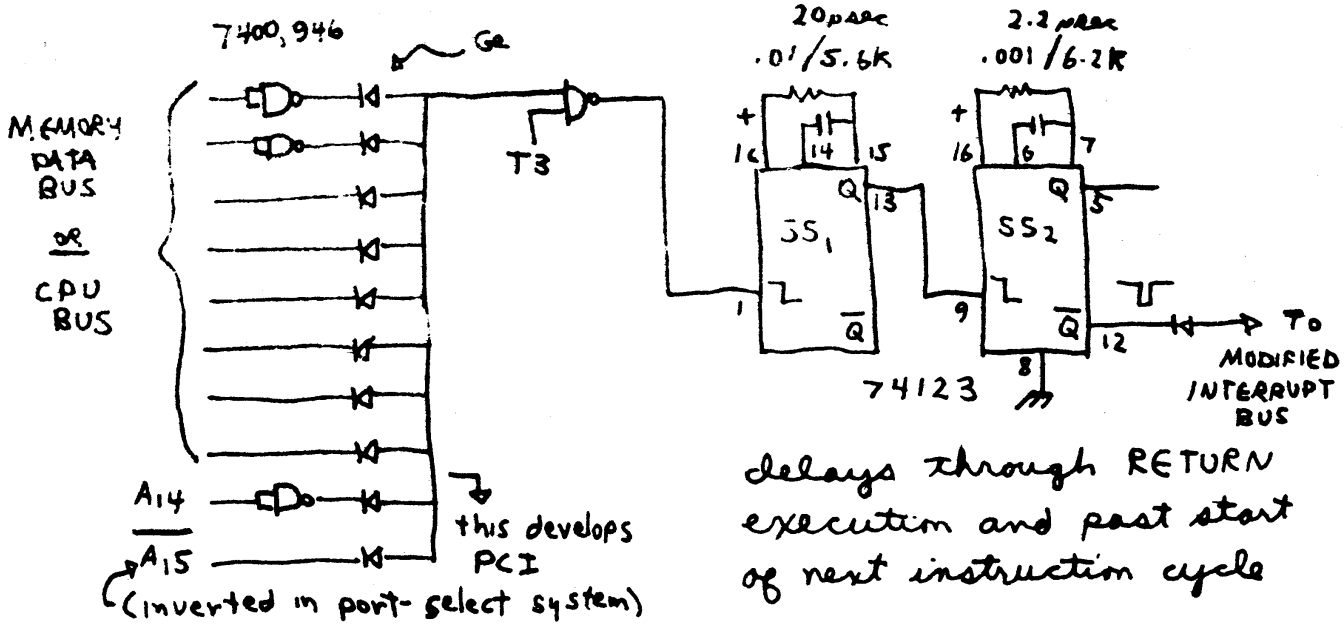
Flag table

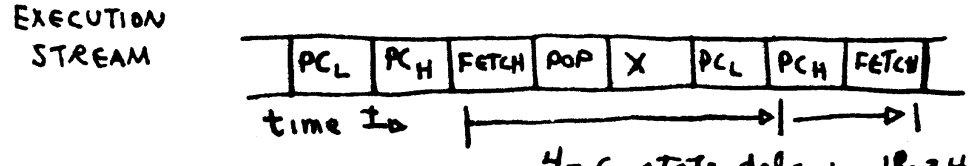
```
01 315  117
01 316  301
01 317  117
01 320  302
01 321  117
01 322  303
01 323  117
01 324  304
01 325  117
01 326  305
01 327  117
01 330  306
01 331  117
01 332  117
01 333  007
01 334  056
01 335  001
01 336  115
01 337  360
01 340  307
01 341  200
01 342  115
01 343  360
01 344  115
01 345  350
01 346  115
01 347  340
01 350  115
01 351  330
01 352  115
01 353  320
01 354  115
01 355  310
01 356  115
01 357  007
01 360  040
01 361  100
01 362  000
01 363  000
01 364  060
01 365  140
01 366  000
01 367  000
01 370  240
01 371  300
01 372  000
01 373  000
01 374  260
01 375  340
01 376  200
01 377  000
```

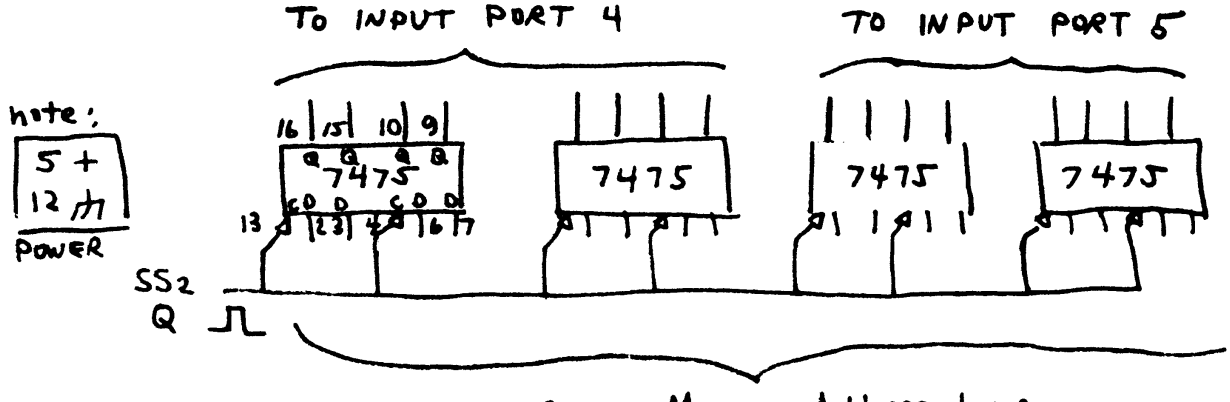
	b_3	b_2	b_1	b_0
'1'	CARRY	EVEN	ZERO	NEG.
'0'	NO-CARRY	ODD	NON-ZERO	POS.

FLAG CONDITIONS

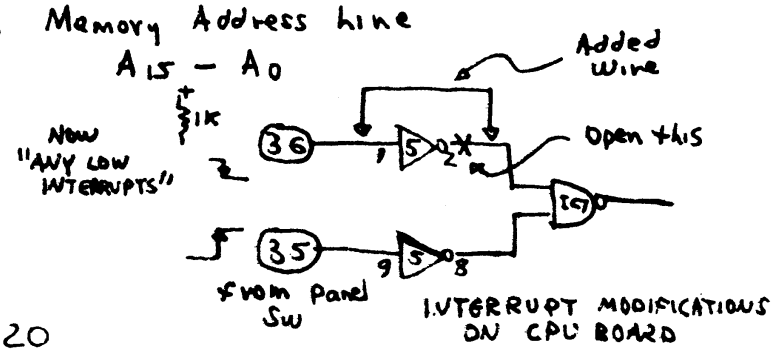
077 = DELAYED AUTO-INTERRUPT AND P.C. ACCESS







THIS HARDWARE SYSTEM SAVES THE PC ADDRESS OF THE LAST EXECUTED STEP OF THE TRACED OPERATION



Program Counter Access

Certain types of programs, in particular TRACE systems, require more than just valid interrupt-handling capabilities; they also may require access to the last value of the program counter before the interrupt. My implementation is to use a special RETURN code to activate a delayed interrupt. As the last instruction of an interrupting system, control passes back to the original program; the delayed interrupt allows one complete instruction to be executed before the interrupting program is again entered. The interrupting program can include octal display of the state of the CPU, or test to determine if display is necessary. Typically, an ASCII SPACE might return processing to the original program until the interrupting program determines that display is again desirable.

Of course, access to a 14-bit address implies that two input ports must be used to regain the data. This paper thus embodies the following input port assignments: 4:PCH; 5:PCL; 6:PUSH; 7:POP.

Back to the Stack

The Stack could alternately have been arranged to store register data without channeling it through the accumulator, by using 3xx ($x \neq 7$) NO-OP instructions. This method would preclude the use of the 3xx NO-OP in a timing loop, although an output instruction could be used instead. But, although register PUSH operations would be quite convenient, POP would still need to come in through the accumulator, and a new software system would be necessary to detect and store the flags in a register, so this method is not as attractive as it first appears.

The POP instruction does not destroy stack data, so repeated POP's may be used to gain access to the stored previous state of the CPU. Of course, 16 POP's are necessary to rotate the stack to its original position. The stack may also be used for temporary storage (for, say, EXCHANGE H,L -type instructions) if care is taken not to overflow the stack and thus destroy stored state-recovery data.

TERRY SAYS THE INCLUDED ARTICLE PLUS HIS OSCILLOSCOPE SYSTEM YET TO COME REPRESENT WELL OVER 2 MONTHS OF SPARE TIME WORK. HE SAYS SARDO IS FAST AT DELIVERING 1702A AND 5314 PROMS AND THEY ARE JUST A LITTLE SLOW (SPEC AT 1.7 MICROSEC) BUT SHOULD WORK OK. MINI MICRO MART IS VERY VERY SLOW AND THEIR BOARD DESIGNER IS JUST PLAIN INCOMPETENT. HE'LL SUPPLY MORE ON THIS LATTER. HE LIKE PARTICIPANT'S ADVICE ON WHETHER THE COMPUTER HOBBYIST AND DIGITAL GROUP NEWSLETTERS ARE WORTHWHILE. HE GETS 20 MAGAZINES PER MONTH NOW BUT WILL SUBSCRIBE IF PARTICIPANTS RECOMMEND THEM HIGHLY ENOUGH.

BILL FULLER, 2377 DALWORTH 157, GRAND PRARIE, TX 75050 AND L. G. WALKER ARE TRYING TO GET A GROUP GOING IN THE NORTH TEXAS AREA AROUND JUNE 30. CONTACT THEM IF YOUR ARE INTERESTED.

TEX'S TOPICS

by Terry F. Ritter
2524B Glen Springs Way
Austin, Tx 78741

On Computer Systems

It is becoming increasingly evident that the usefulness of a computer system is not defined by the CPU chip alone. One system may clearly be superior to another based on the ease of interfacing external systems of various size, control, and power requirements. These external systems may be of such a nature as to logically be considered part of the CPU system, but may necessarily be physically located at some distance from the CPU circuitry. This situation leads to a hodge-podge of wires radiating from the computer chasis proper, a situation that can only get worse, as field developments are not reflected in improved sets of availiable PC boards.

While a powerful bus-structure is clearly important in a useful computer system, there is an obvious trade-off between the number of wires leading to a complex peripheral, and the circuitry needed to transmit the same number of signals on fewer wires. It would seem to me that four uni-directional busses would be worthwhile: a 16-bit address bus, and two busses consisting of 8-bits of data to, and data from the CPU. This would imply a minimum of 32 wires to a moderately-distant peripheral under ideal conditions; systems in a state of flux can get considerably messy.

8008 BASIC?

For some time I have been trying to track down the 8008 BASIC which is rumored to be extant. First, I obtained the IEEE report R75-20 by Weaver, et. al., "A Basic Language Interpreter for the Intel 8008 Microprocessor," which generally discusses the syntactical aspects of the system, but gives no source code, machine code, or other details. Hal probably has the report stuck away somewhere, and perhaps somebody at the University of Illinois in Urbana has some details that we can use.

Then, in the March '75 PCC Newsletter p.21, a letter by Chuck Polisher of Boulder Colorado seemed to indicate that an 8008 BASIC system was availiable from the National Technical Information Service of the US Department of Commerce. But these people replied that the given reference numbers did not correspond to their system, and an enclosed fee schedule indicates that a document search runs $50. So, if you have any firm info on an 8008 BASIC, please get it to me or Hal so we can follow it up and make the system availiable. Thanks.

8008 vs 8080 vs ?

The 8080 chip is far more powerful than the 8008, due to improvement in interrupt handling areas, and instruction microcodes that replace several 8008 instructions with one. It also radically reduces the address multiplexing that makes the 8008 supporting circuitry so complex.

But even the power of the 8008 is just beginning to be felt, and there are several board-sets availiable to support the 8008 -- presently, the 8080 users are generally locked into one system, one supplier. It will be a lot easier to recommend an 8080 system when several appear and their comparitive merits

become apparent. Speed, although highly emphasized as an important factor, is relatively unimportant for experimenters, especially if they are using Dr. Suding's calculator interface design for numerical calculations. (There are several advantages in this, first, all data can be stored in similar formats inside the computer, saving format-conversion systems for I/O to and from people. Second, the many complex functions offered on the interface eliminate not only a floating-point-package, but development of transcendental routines as well, and this is no trivial task.) Although calculations occur inside the calculator chip at P-MOS speed, I/O to and from the calculator chip is quite slow (since the chip was designed for people, blinding speed was not important, and switch de-bouncing and digit-multiplexing was). This means that a slow 8008 may run neck-and-neck with the super 8080 using the calculator interface. The alternative is extensive software systems for the 8080 to allow processing at 8080 speed. But these will probably need to be loaded prior to each session, and may not be availiable anyway.

If the above seems equivocal, it is. There is no best, or even best-value machine right now, things are still in a very early stage for home computer experimenters. But if I had to buy a computer right now, it would not be the Altair, but the MOD-8 system, with its beautiful, beautiful plated-through PC boards.

For the future, there are more and more CPU chips becoming availiable, although they are not cheap enough in onsies to do us much good yet. But the RCA COSMAC may be especially interesting to high-level language designers, due to its unique pointer structure. Further, the same processor may soon be announced in Silicon-on-Saphire technology, increasing its top speed by an order of magnetude. In particular, the COSMAC does not seem to process data internally, but uses sixteen 16-bit internal registers as pointers to data in memory. It is this pointed-to data which is brought in, processed, and retuned to memory; a very fancy system.

Review, Please!

Money and time are things that most experimenters have in short supply, and it does not make a lot of sense for each and every one of us to guess about what we are going to get, or how we will be treated, when dealing with a new device or company. Experimentation is not so competitive that you can't find a couple of hours to type a short review of your transaction. Was delivery prompt? Was the merchandise high-quality? Did the manufacturer respond to your requests for adjustment of faulty or otherwise unacceptable merchandise? Did you deal with a man, or a nameless corporation (I always like to know who I am dealing with)? Do try to be objective. Along these lines, I will shortly present a review of the Mini/Micro Mart calculator interface kit. It will not, unfortunately, be wholly complementary.

PS

I still offer help via SASE to those who need it. Please be specific! And it may take a little while -- things are really piling up around here.

METRICS LABORATORIES
1845 NORTH HOWE STREET CHICAGO, ILLINOIS 60614

1845 N Howe St
Chicago, Ill. 60614
June 19, 1975

Dear Hal Singer...

My husband...not I...is the subscriber to your newsletter. He is the individual in our household who comprehends electronics, logic and that kind of jazz; I don't. Therefore, he finds your newsletter stimulating, valuable & looks forward to receiving each issue--as a substitute for a wife who doesn't understand him when it comes to electronics.

Why am I writing? Because 1) I like him when he's in such a good mood after reading your newsletter...and 2) because I am a professional newsletter (for-profit) editor. We're both scared that comes about the September or October issue, the Micro-8 newsletter may disappear, which we don't want to see happen.

It seems to me that, even for a non-profit venture, the number of pages you are giving per issue, plus the amount of the postage is skinning it pretty damn tight--especially if the renewal money is slow coming in (it always is) at the end of the October term when subscriptions run out. We'd be happy to pay out another $3 to $5 per year to keep Micro-8 coming. You might also consider selling pages of advertising at $10-15 ea. to a few legitimate-but-small businesses interested in this field. This way (or either way), there would be a kitty to pay secretarial costs, etc., any time the burden gets too great...

Our best wishes for the success (continued) of the newsletter & assurances we'll be happy to pay more if you put out a call in the next issue...

Julie Woodman

Julie Woodman

PS Have you run into anyone who is 1) willing to buy programs from MITS in the face of the ferocious contract drawn up by their legal eagles (enclosed) and/or knows anything about copyright law as it relates to programs???

PPS. If you do decide to sell advertising on any basis, please let us know right away; we may have a product of interest to your readers.

You are right, Julie, we do cut it pretty close financially but our effort is to try to provide a service that is unavailable and vital if this hobby computer thing is to get going right, that of trying to get people together. The whole operation is being run as a student body activity thru our high school computer center and although it is probably legal to sell advertising, so far it is just not worth the effort. If is more fun and I think more valuable to be able to pick those items of advertising that seem to be of most interest to the participants. The last few months have seen an enormous increase in the incoming requests for newsletter subscriptions and an enormous decrease in the items submitted for inclusion in the newsletter. We still have our regulars like Terry Ritter, Phil Mork, William Severance Jr., etc. but I can't help think that there are a lot of people out there (with over 800 people that have requested copies of the NL) that have programs and information (especially ALTAIR 8800) that just haven't taken the time to prepare and submit it. A profit making magazine has to generate its own material by paying authors. A newsletter depends on contributions of material from active involved participants. Lack of submitted material would seem more likely to kill the newsletter than financial problems at the present time.

ROGER L. SMITH, 4502 E. NANCY LN., PHOENIX, AZ 85040 (602) 968-0774 WRITES WITH GOOD NEWS FOR BAUDOT TELETYPE OWNERS -- THE ASCII TO BAUDOT CONVERTER BOARDS HAVE BEEN THOROUGHLY DE-BUGGED AND WILL SOON BE AVAILABLE FROM SWTP. WRITE DAN MEYER AT SWTP FOR PRICING. THERE ARE TWO BOARDS, ONE FOR ASCII TO BAUDOT AND THE OTHER FOR BAUDOT TO ASCII. THE BOARDS HAVE PLATED-THRU HOLES AND THE CIRCUITS ARE SUCH THAT THEY WILL FIT EITHER TV TYPEWRITER I, OR TV TYPEWRITER II AND WILL WORK WITH EITHER THE 8008 OR 8080 COMPUTER (WITH OR WITHOUT THE TV TYPEWRITER). HE SAYS, "BELIEVE ME, IT'S REALLY A PLEASURE TO DO AN OCTAL DUMP OF MEMORY TO TTY (IN MY CASE ONE OF BOB COOK'S CREED MACHINES) AND NOT HAVE TO WORRY ABOUT THE ASCII TO BAUDOT CONVERSION! SO, NO ONE SHOULD WORRY ABOUT BUYING A BAUDOT-CODED MACHINE BECAUSE WITH THE ASCII TO BAUDOT CONVERTER BOARD, THE COMPUTER CAN'T TELL THE DIFFERENCE."

ROGER GAVE US PERMISSION TO REPRINT THE SCHEMATICS. ONLY THE ASCII TO BAUDOT ONE IS INCLUDED (THE HARD ONE AND SINCE MOST PEOPLE WILL BE USING A SEPERATE ASCII KEYBOARD, THE IMPORTANT ONE) BECAUSE OF LIMITED SPACE. WE WILL TRY TO GET THE BAUDOT ASCII INTO THE NEXT ISSUE. RE HAS PURCHASED THE DESIGN FOR A FUTURE ARTICLE BUT WHO KNOWS HOW LONG IT WILL TAKE TO GET INTO PRINT.

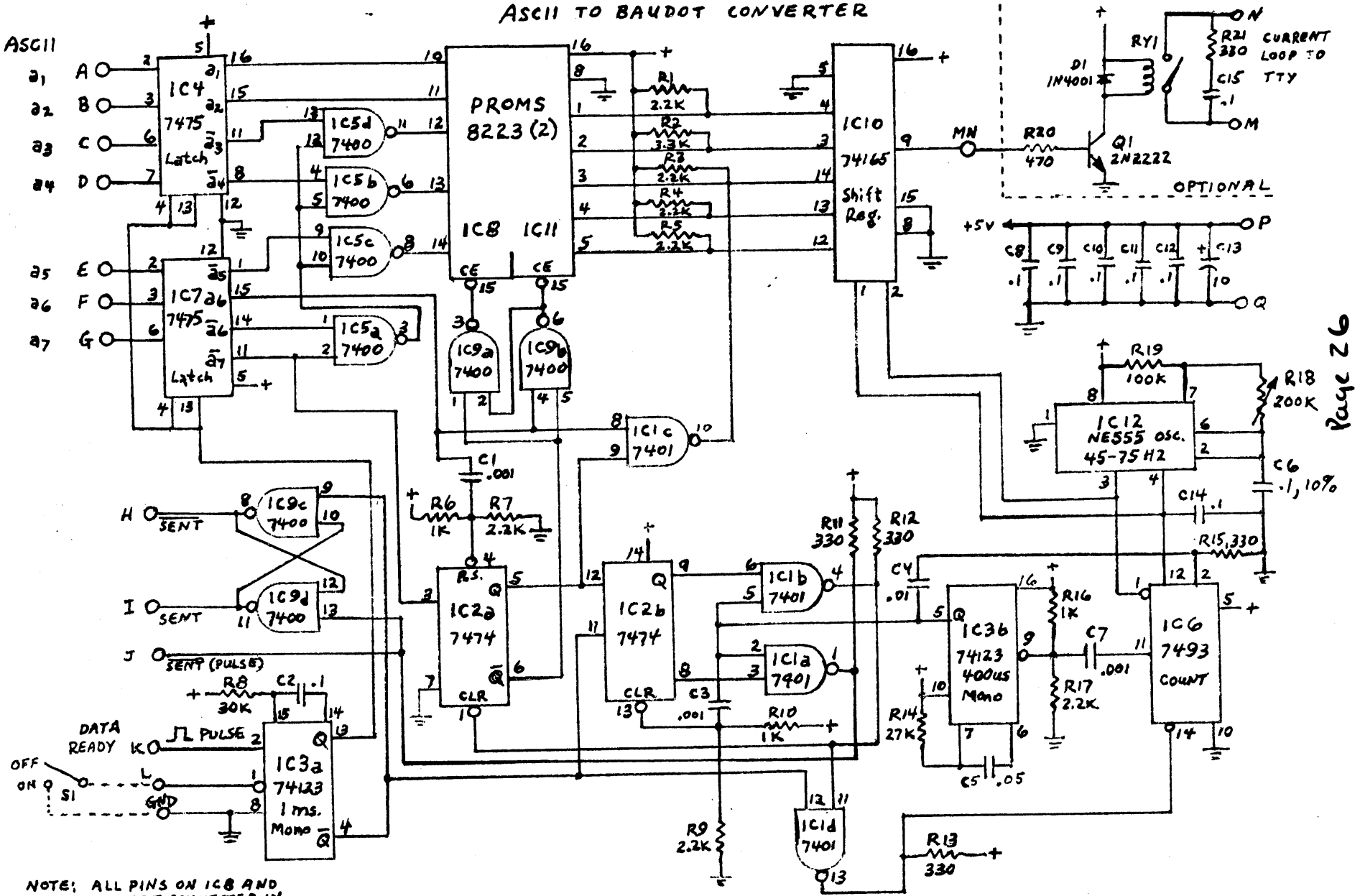
ASCII - BAUDOT CONVERTER 8223 TRUTH TABLES

Word	Input	Output	IC-B Character	IC11 Output	IC11 Character
0_{10}	0_8	00_8		04_8	space
1	1	03	A	15	!
2	2	31	B	21	"
3	3	16	C	24	#
4	4	11	D	11	
5	5	01	E	00	
6	6	15	F	32	&
7	7	32	G	13	'
8	10	24	H	17	(
9	11	06	I	22	)
10	12	13	J	00	
11	13	17	K	00	
12	14	22	L	14	,
13	15	34	M	03	-
14	16	14	N	34	.
15	17	30	O	35	/
16	20	26	P	26	0
17	21	27	Q	27	1
18	22	12	R	23	2
19	23	05	S	01	3
20	24	20	T	12	4
21	25	07	U	20	5
22	26	36	V	25	6
23	27	23	W	07	7
24	30	35	X	06	8
25	31	25	Y	30	9
26	32	21	Z	16	:
27	33	00		36	
28	34	00		00	
29	35	10	CR	00	
30	36	02	LF	00	
31	37	05	BELL	31	?
ALL	XX	37		37	

CAPRILLO SENIOR HIGH SCHOOL

Note: This was transcribed in a hurry, from Roger's old writeup and is subject to errors. Check it and report any bugs. H. Singer

FIGURE 1
ASCII TO BAUDOT CONVERTER



NOTE: ALL PINS ON IC8 AND IC11 ARE CONNECTED IN PARALLEL EXCEPT PINS 15.

SMITH – ASCII/BAUDOT CONVERTERS (Revised)

Micro-8 Computer Group

JAMES G. CALLAS, M. D.
EVELYN R. CALLAS, M. D.
631 NORTH SAN PEDRO ROAD
SAN RAFAEL, CALIF. 94903

Dear Hal & John, 6/15/75

I hope a letter like Bill Fuller's in the #7 NL doesn't discourage you from "bad mouthing" anything that needs it. If he wants to read only rave reviews of the Altair, reading PE will make him feel better.

I bought an Altair too, but only after going over its good and bad points scattered throughout the previous NL's, for which I'm most greatful.

Re your comment that Radio-Electronics may be a joke, there certainly isn't any joke about the thousands of frustrating man-hours that must be wasted because the magazine will never admit a mistake and print a complete correction (corrections, usually incomplete, appear only as letters from the author, implying that it's all the author's fault).

The only joke about it is the money they're missing by not sending out a second book of corrections for $10 to the people who bought the original constructional data for $5. Come to think of it, maybe they would have done just that if you hadn't started the NL.

Regards,
Jim Callas
Jim Callas

P.S.: I didn't like the NL format at first glance, but once in a binder--it's good.

DAVID W. JOHNSTON, PO BOX 3781, WASHINGTON, DC 20007 SAYS THE HEWLETT PACKARD HP-65 PROGRAMMABLE CALCULATOR IS FAIRLY WELL KNOW WITH 11 APPLICATION PACS AND OVER 2000! PROGRAMS ACCORDING TO THEIR LATEST CATALOG. WHAT IS NOT SO WELL KNOWN IS THAT THERE IS AN INTERFACING DEVICE KNOWN AS THE "OPTACON" (TELESENSORY SYSTEMS, 1889 PAGE MILL ROAD, PALO ALTO, CA 94304) THAT PROVIDES AN INTERFACE WITH VIBRATING REEDS SO A BLIND PERSON CAN USE THE HP-65 BY FEELING THE REED'S PATTERN WITH HIS FINGER TIPS. PHOTOTRANSITORS ARE USED TO READ THE CALCULATOR DISPLAY. I WOULD IMAGINE THAT THE OPTACON COULD BE USED WITH OTHER CALCULATORS. IT SEEMS TO ME THAT AN INTERFACE LIKE THIS COULD BE USED TO CONNECT THE HP-65 AND OTHER CALCULATORS TO MICRO AND MINI-COMPUTERS AND SAVE A LOT OF PROGRAMMING AND ALSO MAKE USE OF HP'S OVER 2000 PROGRAMS. REFER TO "HP-65 KEYNOTES", WINTER L975, VOL 1, NO. 3 FOR MORE DETAILS.

Southwest Technical Products Keyboard and Encoder

If you are having trouble locating an ASCII keyboard/encoder and are considering the SWTP kit, execute an immediate interupt and read this first! Having reviewed the specs in their catalog I invested a dollar or so for a phone call to inquire if they had a better keyboard comming up that would include upper and lower case letters. The girl handling my call said no, so I gave my Mastercharge number, and about three weeks later received the kit. (The day after the kit arrived, I received my June issue of Ham Radio magazine and lo and behold the kit I really wanted was prominently featured in the SWTP ad. Strike one.)

Eventhough the construction manual was no more than one sheet and a reprint of the original magazine article, I was not worried as I have had over ten years experience building from construction articles. All the parts plugged nicely on the board until I came to the 52 switches comprising the actual keyboard. Either SWTP got a bargain on misformed switches from the manufacturer or their board driller suffers from depth perception impairments. A ten minute struggle to insert the first switch resulted in a broken switch and a complete recycling of the profanity section of my main core! Each hole required re-drilling, and it still required one hour to insert the first ten switches. (Strike two.) Practise improved the situation, and the remaining fifty-one survivors were installed in another ninety minutes.

SWTP, to eliminate the cost of a double sided board (the Popular Electronics article quoted the board price at $17.50) etched programming jumpers on four strips of pc board. Unfortunately, the board driller must also man the shear for them, since each strip needed about fifteen minutes work with a file to get it to lay flat against the main board.

The next day I decided to inform SWTP of my considered opinion of their kit, and also try and get a replacement switch. After getting my call shunted to four different people (I was paying prime time rates, too!), I was told that I could have a new switch sent to me for $.75. I still haven't gotten the switch, but it has only been a week.

The crowning blow happened tonight when I received my first two issues of the NL. Somebody complained that his SWTP kit puts out a slash when no key is depressed. Having made only a random check of a few characters, I ran down to the basement and set up my keyboard for a test....you guessed it. Has anybody got a cure?

SWTP Keyboard/Encoder: Hope my enclosed comments can prevent others from getting this keyboard. The slash condition is really disturbing since I had planned to use the keyboard inport for my cassette interface inport also . By the time I add a 7475 pair as a latch triggered by the KP pulse and cleared so as to show a '000' octal code output, I will have forked over a lot more money for a lot worse piece of gear than I could have obtained from the surplus market. Also, the mechanical action of the SWTP switches is attrocious. It is virtually impossible to firmly press a key, hold it closed for about $\frac{1}{2}$ second, and then release it without getting another KP strobe and the associated code for a slash up at the output. By the way, my replacement switch finally arrived after the Mastercharge bill had been processed. It took exactly three weeks!! Another local hobbyist was short one switch with his kit. Eventhough he had purchased the TVT at the same time, he was also charged $.75 for the missing switch.

I relay the comments of several friends that are impressed with the no nonsence equipment/supplier reviews. As my company advertises in other magazines, I am well aware that a promise to advertise is usually rewarded with a favorable new product review. Likewise, if no ad is placed, no new product review is published. My partner built the Mark 8 that I am playing with now. I am well on the road to completing my own. He got his up and running, but without any software experience, he got bored and sent it to me. Unfortunately, I made the mistake of telling him about the users group, Digital Group, and TCH. He subscribed to all and now wants his machine back.

Keep up the good work. Your serious efforts will still be needed even after the commercial interests start publishing. (Byte Magazine will debut in August published by Wayne Green of 73Magazine fame)

LEE S. MAIRS, 415 QUINBY ROAD, ROCHESTER, NY 14623 (716)473-6139

HERB NEILINGER, 745 NE 178TH TERRACE, MIAMI, FL 33162 HAS REALLY ENJOYED THE NEWSLETTERS AND IS FINDING A WEALTH OF INFO AND ADDITIONAL SOURCES OF INFO FROM IT. HE HAS AN OPERATING ALTAIR, TVT, AND IS IN THE PROCESS OF FINDING THE BEST CASSETTE INTERFACE BEFORE BUYING IT. HE IS IN THE PROCESS OF DEVELOPING A PROGRAM FOR STOCK AND COMMODITY FUTURE PRICE FORECASTING. HE REALLY CAN'T TEST THE VALIDITY OF THE PROGRAM TIL HE ADDS THE CASSETTE AS HE WILL HAVE TO ENTER DAILY PRICE MOVEMENTS FOR AT LEAST TWO YEARS BACK ON 40 ODD COMMODITIES TO SEE IF THE BUY/SELL SIGNALS ARE REASONABLY VALID BASED ON PAST PRICE PERFORMANCE AND PAST FUNDAMENTAL STATISTICAL INFO. MAYBE IT WILL BE RUNNING IN THREE MONTHS. HE IS SEMI-RETIRED AND MAKES A PRETTY FAIR LIVING NOW FROM STOCK AND COMMODITY TRANDING. HE HAS HAD A HECK OF A PROBLEM WITH MAURY GOLDBERG AT MICRO MINI MART. HIS CHECK TO HIM FOR SOME MEMORIES CLEARED HIS BANK IN APRIL AND AFTER THREE LONG DISTANCE CALLS, ALL HE GETS ARE FLIMSY EXCUSES ABOUT MIX-UPS IN THE HIS ORDER DEPARTMENT, ETC.... SO NO WONDER HE COULDN'T GET MASTER CHARGE TO OK HIM. IN HIS LAST PHONE CALL ON 17 JUNE HE GAVE MAURY TEN DAYS TO DELIVER OR HE'D GO TO THE POST OFFICE DEPT. AND FILE A FORMAL COMPLAINT. HE WOULD LIKE TO KNOW IF ANYONE ELSE HAS HAD THE SAME PROBLEMS. HE SAYS HE BUILT A GREAT CABINET FOR THE TVT AND OCTAL KEYBOARD FROM 1/4" PLEXIGLASS SCRAPS HE PICKED UP AT A LOCAL FABRICATOR. ITS EASY TO WORK WITH (SABRE SAW, DRILLS, SANDPAPER, ETC.). HE USED CORNER BRACKETS INSIDE FOR JOINT REINFORCEMENT AND THE PLASTIC WAS A SMOKEY TYPE WHICH IS SEMI-TRANSPARENT AND VERY SHARP LOOKING. HERB WOULD LIKE TO FIND SOMEONE ELSE TO WORK WITH IN THE MIAMI AREA BUT HAS NOT FOUND A NAME YET IN ANY OF THE NEWSLETTERS.

JOHN D. WITHROW, JR., 233 W. MT. ST., KERNERSVILLE, NC 27184 RESPONDED TO THE POP ELECT. MENTION AND SAYS WE'VE SOLD HIM ON THE MICRO-8 NEWSLETTER. HE IS PARTICULARLY INTERESTED IN THE 8080 AND PLANS A SYSTEM FOR USE IN 1) LARGE-SCALE STORAGE 2) GRAPHICS DISPLAY APPLICATIONS 3) SPEECH SYNTHESIS AND AUDIO RECOGNITION, ETC., ETC., ETC. (HE SAYS HE CAN'T YET SEE THE END OF POSSIBLE APPLICATIONS.) HE PROMISES US SEVERAL NEWSLETTER SUBMISSIONS AND SAYS OUR EFFORTS SEEM TO HAVE EXPANDED SOMETHING LIKE A ROBERT A. HEMLEIN PLOT!! (NOW I HAVE TO FIND OUT WHO ROBERT A. HEMLEIN IS.)

A. J. GREER, 2139 ETHEL PORTER DRIVE, NAPA, CA 94558 RECEIVED A COPY OF NL #6 FROM A FRIEND. HE IS INTERESTED IN MICROPROCESSOR APPLICATIONS TO LABORATORY INSTRUMENTATION, DATA ACQUISTION, AND DATA DISPLAY. AS OF YET HE HAS NOT STARTED CONSTRUCTION OF A COMPUTER AND WOULD BE INTERESTED IN OPINIONS ABOUT WHICH SYSTEM IS BEST. HE HAS MARK-8 INFORMATION AND WANTS TO GET SCELBI-8H INFO. THE ALTAIR IS DEFINITELY OUT OF HIS PRICE RANGE. HE IS INTERESTED IN 2K OR 4K MEMORIES USING 2102'S FOR THE MARK-8. HE IS ALSO INTERESTED IN POSSIBLE MARK-8 INPUT PORT EXPANSION.

ROBERT A. VAN WINKLE, 288 WOODBRIDGE AVENUE, YUBA CITY, CA 95991 (THIS IS AN ADDRESS CHANGE) COMPLIMENTS US ON A FANTASTIC NL #7 AND SAYS HE HAS A THREE PIECE MODEL 28 TTY WHICH HE WOULD LIKE TO GET RID OF. ITS COMPOSED OF THE MODEL 28 PRINTER, THE TAPE PUNCH AND THE TAPE READER AND IF ANYONE IN THE YUBA CITY-SACREMENTO AREA IS INTERESTED, THEY SHOULD CONTACT HIM. PROGRESS ON THE MARK-8 HAS HIT A BRICK WALL IN THE FORM OF CIRCUIT CARDS. HE'S HAVING TROUBLE GETTING THE ARTWORK DONE TO INCLUDE EDGE CONNECTORS. AS SOON AS THEY ARE DONE HE WILL MAKE THEM AVAILABLE. FOR THOSE LOOKING FOR AN ECONOMICAL SOURCE OF EDGE CONNECTORS, ROBERT WOULD LIKE TO RECOMMEND DELTA ELECTRONICS, PO BOX 1, LYNN, MA 01903. THEY OFFER A "RACK OF EDGE CONNECTORS FOR $8.95 PLUS POSTAGE.

ROBERT JONES, 33383 LYNN AVE., ABBOTSFORD, B.C., CANADA, V2S 1E2 HAS THE FOLLOWING TO SAY:

I'D LIKE TO TELL YOU A LITTLE ABOUT MYSELF AND PERHAPS TRY TO CONTACT SOMEONE IN THE GROUP WHO HAS A COMPUCORP CALCULATOR, OR A MONROE (WHICH IS BASICALLY A COMPUCORP "WORK" IN A MONROE CASE).

FIRST, MY MAIN ELECTRONICS INTERESTS WERE DIGITAL LOGIC SYSTEMS DESIGN (THIS IS THE FIELD IN WHICH I SPECIALIZE AND IN WHICH I EARN MY BREAD-AND-BUTTER) AND ELECTRONIC MUSIC, BUT SINCE I BOUGHT A COMPUCORP SCIENTIFIC PROGRAMMABLE CALCULATOR ABOUT 2 1/2 YEARS AGO, MY HOBBY INTERESTS HAVE SWUNG TO MICRO-COMPUTERS. I BEGAN BY TAKING MY COMPUCORP APART, PAINSTAKINGLY TRACING OUT ALL THE PCB BUS-LINES AND DRAWING A CIRCUIT DIAGRAM. UNFORTUNATELY, I FOUND IT EXTREMELY DIFFICULT TO GET ANY TECH INFO FROM COMPUCORP (IN FACT, THEY REFUSED TO RELEASE ANY DATA AT ALL), SO THAT ALTHOUGH I HAD A CIRCUIT DIAGRAM, MOST OF THE IC PINS AND OUT GOING TERMINAL POINTS WERE UNIDENTIFIED. HOWEVER, BY DEVIOUS MEANS, OVER THE YEARS I HAVE MANAGED TO SECURE A COPY OF THE SERVICE-MANUAL AND ALSO OBTAINED ONE FOR THEIR NEWEST MODEL, THE 325 ALPHA. IF YOU HAVE ONE OF THESE MACHINES, YOU MAY WANT TO CONTACT ME. FOR MY OWN PART, I AM STILL ANXIOUS TO TRACK DOWN THE TRUTHTABLES FOR THE VARIOUS IC'S AND ALSO INFO ON COMPUCORP'S LATEST TEST-PROCEDURES SUCH AS HOW TO MANIPULATE INTERRUPTS OR TO JAM DATA DIRECTLY INTO RAM, ETC.

I WAS GOING TO GET AN ALTAIR 8800 AND THEN I READ ABOUT THE NEW MOTOROLA 6800 SERIES AND HAVE ORDERED THE EVALUATION KIT OF 7 CHIPS AND INFO FOR $300. WITH LUCK, I SHOULD GET THESE PIECES WITHIN A WEEK OR SO AND WILL THEN BEGIN TO BUILD MY OWN COMPUTER. MAINLY IT WILL BE A FUN THING, JUST FOR THE JOY OF BUILDING MY OWN COMPUTER TO BEHAVE THE WAY I WANT IT TO (I HOPE!!!), AND THEN EXPERIMENTING WITH PROGRAMMING, ESPECIALLY FOR COMPUTER-GAMES. I AM A NEWCOMER TO COMPUTER TECHNOLOGY AND HAVE A LOT TO LEARN ABOUT VARIOUS ARCHITECTURES, LANGUAGES, AND SO ON, SO FOR SOME TIME TO COME I WILL PROBABLY BE GETTING MORE FROM THE GROUP THEN I WILL BE PUTTING INTO IT.

I HAVE ALREADY BOUGHT THE MARTIN RESEARCH BOOK - WELL, ALMOST BOUGHT IT ANYWAY, AS IT ARRIVED WITH ABOUT 65 PAGES OF TEXT MISSING. I WOULD HAVE THOUGHT THEY'D BE MORE CAREFUL PUTTING TOGETHER A BOOK WHICH COSTS THIS MUCH.

DON'T GIVE UP ON THE NEWSLETTER. AMATEURS LIKE MYSELF NEED SUCH A GROUP OR GROUPS, I SHOULD SAY, AS I'VE TAKEN OUT SUBSCRIPTIONS TO THE COMPUTER HOBBYIST AND THE DIGITAL GROUP'S NL'S AS WELL. I AGREE WITH COMMENTS RE POPULAR ELECTRONICS - - I WOULD MUCH RATHER SEE A CONTINUING SEMINAR ON COMPUTER SYSTEMS, RIGHT FROM THE GROUND UP, THAT THESE THINLY DISGUISED "ADVERTISEMENT" TYPES OF ARTICLES.

WHILE ON THE SUBJECT OF ELECTRONICS MAGAZINES, THE CLOSING ARTICLE OF "RADIO ELECTRONICS" SERIES ON THE TVT II SHOWING HOW TO COUPLE THE UNIT INTO A TV HAS ONE UNLABELLED ARROW ON THE CIRCUIT DIAGRAM. NATURALLY, I WROTE TO ASK THEM WHERE IT WENT. ABOUT 2 WEEKS LATER I GOT A POST-CARD FROM THEM - POSTAGE 13 CENTS - POINTING OUT THAT IN VIEW OF THE HIGH COST OF POSTAGE THEY WERE UNABLE TO REPLY TO MY QUERY REGARDING THE TVT II AS I HAD NOT ENCLOSED A SASE. CAN YOU IMAGINE? IN HALF THE SPACE THIS TOOK UP ON THE POSTCARD, THEY COULD HAVE ANSWERED MY QUERY. IN ANY CASE, IT SHOULD HAVE BEEN OBVIOUS THAT IF ONE READER NEEDED THIS INFO THEN SO WOULD OTHERS, AND THE REPLY SHOULD PROPERLY HAVE BEEN MADE IN A SUBSEQUENT ISSUE OF THE MAGAZINE. SO MUCH FOR COMMON SENSE!!!!!

Suddenly, with about six cheap cassette interface that work known to us, the problem of which one is to become the standard faces us. In a letter to the Digital Group, I asked "What do we do now?" This was their reply. (No information was available on the Computer Hobbyist Magazines unit at that time.)

the digital group

po box 6528
denver, colorado 80206

March 21, 1975

We can understand your concern about setting standards on the cassette interface so as to allow easy program interchanges. Even with Dr. Suding's local influence, several experimenters in Colorado are committed to building their own version of a cassette interface as well as his. A bunch of rugged individualists these experimenters.

The digital group, which, of course, is totally unbiased in its opinions, would like to contribute the following points on the interface situation. (Dr. Suding may contribute his own opinions later.)

Mod-8 - The design looks good but our reservations are the following:

1. The interface software looked good as long as the ROM was going to be available - looks like it will be an orphan at best now and so far we have no information from Mini-Micro Mart that it can be obtained.
2. If you don't have a ROM, then you need 196 bytes of RAM storage for interface software.
3. The level of the volume control of the recorder appears to be a fairly critical adjustment.

Scelbi -

1. Way too many ICs.
2. Too complex and therefore too expensive.

Suding -

1. Costs under $5 in parts (excluding PC board - you can afford a Suding on top of anything else).
2. Requires only 135 bytes of storage - 88 for the write routine and 47 for the read routine. The read routine (Cassette Dumper) can be put in 2 8223's easily.
3. Recorder volume control not critical - if you can hear it playing back (after bypassing speaker cutoff), the computer can understand it. Also very difficult to overload.
4. Tuning the circuit is not critical or particularly sensitive - tuning it using a scope for frequency accuracy is adequate.
5. PC Board and all parts, in various forms are being made available very shortly (see project update) as well as an assembled, tested, and tuned version for those who lack basic test equipment. Prices available soon.
6. Software is currently being distributed on cassette with this interface and, as you know, a great deal more is in the pipeline. About 50 packets have sent out so far.
7. As further verification of the quality of the circuit, we put in a cassette that was binding severly and had a great deal of audible wow - it still loaded!

Dr. Suding's comparison of the three cassette systems written on March 22, 1975 follows. Contact Dr. Suding thru the Digital Group.

Unfortunately, every designer views "his design is best", so there will not be perfect agreement. However, "independent judges" should consider the following when selecting a standard.

1. Minimum Software requirement, especially on "Cassette to Memory" (since you have to "key in" this unless on ROM).

2. Simplest Hardware circuitry - Costwise and Tuning.

3. Most Reliable operation - Noise immunity, dropout resistance, speed fluctuation proof, varying signal levels, tone purity.

4. Possible compatibility with other designs.

5. Number in use.

Perhaps your readers would make the best ultimate judges. Have each designer detail the merits of his system, or have an independent party parallel the qualifications. I have included my views on the following sheet.

Regards,

Dr. Robert Suding

COMPARISON OF MONITOR 8 - SCELBI - SUDING CASSETTE SYSTEMS

1. Software Requirements:

MIL - Estimated at 100 bytes to Read
Maybe 150 bytes to write
(Certain routines are called but not listed.)

SCELBI - 104 bytes to Read
60 bytes to write

SUDING - 47 bytes to read
87 bytes to Write

Comments: MIL and Suding systems are roughly identical except that Mil includes a parity bit. The Scelbi is totally incompatible with anything. The Suding system requires only 1/2 the amount of manual "cold start" entry to run in the tape, and the programming has been placed on 1 1/2 8223 ROMs for "instant startup". MIL has died, and the MIL ROM (16K) has never been correctly built, only a "defective ROM" with a bad bit (from Maury Goldberg of Mini Micro Mart).

2. Hardware Circuitry:

MIL - Simple circuitry with AM detection of the 6Khz tone.
6 ICs, 1 transistor.
Square Wave output.

Scelbi- Complex circuitry with FM detection of the tones 1.3Khz and 2.6 Khz - Many ICs.

Suding- Simple circuitry with FM detection of the tones 2125 and 2975.
4 ICs.

Comment: The FM detection system of the Scelbi and Suding circuit is vastly superior to the AM detection system of the MIL with regard to noise, dropout, and extraneous signals in general. The tuning of any of the systems is not difficult. The software of either the MIL or the Suding system will operate the Suding hardware. The Scelbi circuit uses harmonic related tones of 1300 and 2600, which would impair the signal/noise ratio of the upper tone. The Suding circuit uses standard teletype frequency shift tones which are harmonically unrelated. The 2125 - 2975 tones used by the Suding circuit also allow its use in copying wide shift ham radio teletype signals without modification. The Suding circuit uses a triangular wave, much cleaner than the square wave outputs of the other systems. The Suding circuit is being developed as a PC Board by Signal Systems of Colorado Springs, Colorado.

3. Reliable operation:

MIL - The AM detection system of the MIL is much less problem immune than an FM system. The parity checking circuit does have advantages, but an LRC or CRC system would be even more desirable and could be implemented in any system. However, the parity checking operation requires more "Read Cold Start" storage, meaning more user effort to initially load.

SCELBI- Somewhat higher baud rates are used by the SCELBI system, but the split and combining is wasteful.

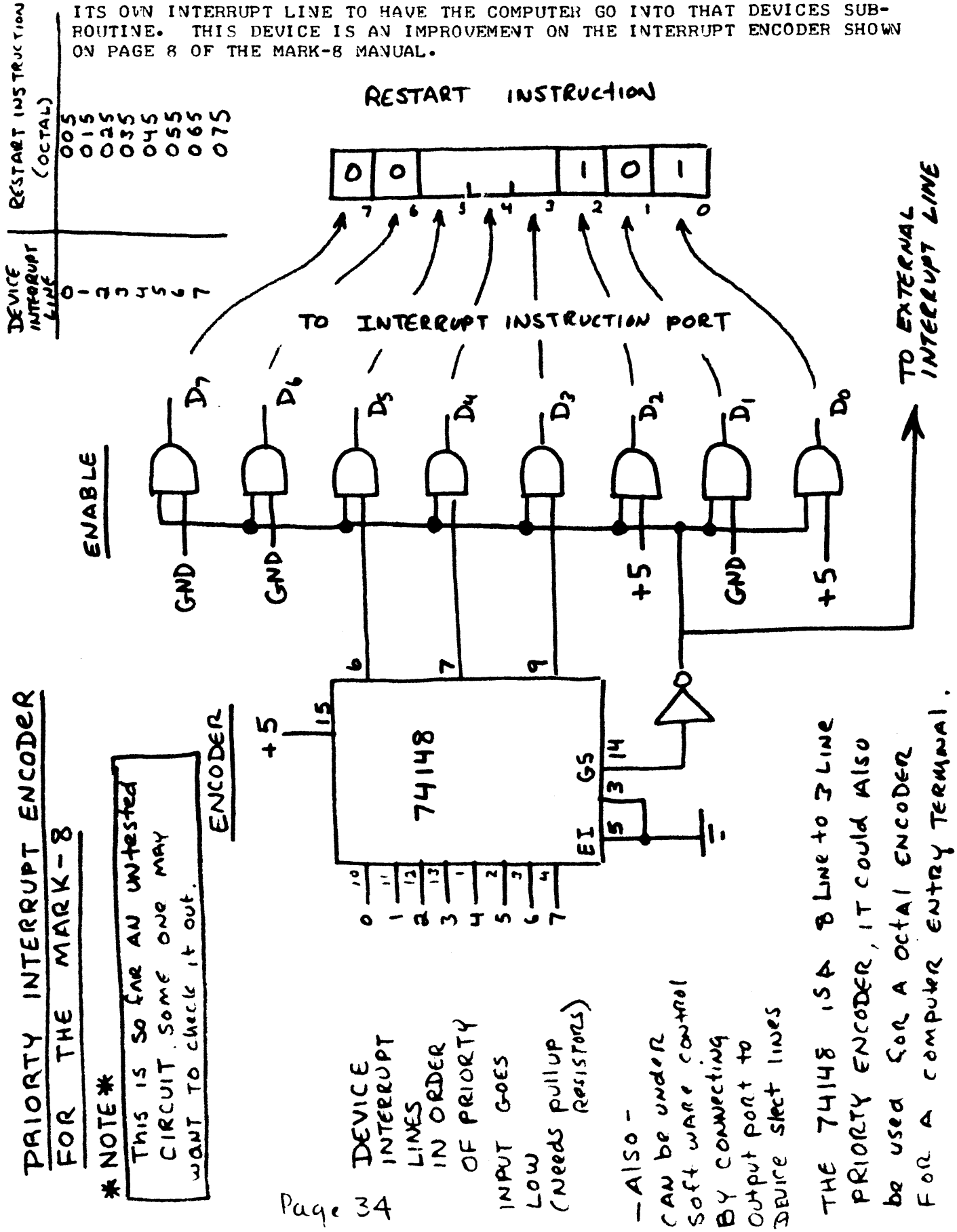
SUDING- Non-standard 400 baud used, but could be increased/decreased under software control. Only load errors that have ever occurred have been due to either very dirty and worn tape head, or very bad tape speed shift due to cassette internal bind or motor slippage.

Comment: It appears all three work, but I feel the Suding system or the Scelbi system have an advantage, at least theoretically, over the MIL.

4. Compatibility - the Suding circuit will work with either MIL software or its own. The MIL hardware requires a strange output logic pulse that could be bypassed to work with the Suding cassette software. Scelbi is not compatible.

5. Number in use - Unknown - 50 people have received a cassette of the Suding software in the 2 weeks since announcement. Feedback included in the requests indicates enthusiasm. All new software developments by Dr. Suding and the digital group will be shipped via cassette.

DEREK DAVIS, PO BOX 628, ANNAPOLIS, MD 21404 SUBMITTED THE FOLLOWING SO FAR UNTESTED PRIORITY INTERRUPT ENCODER CIRCUIT FOR THE MARK-8. AS HE DOESN'T HAVE A MARK-8, HE CAN'T USE IT, BUT MAYBE SOMEONE ELSE WOULD BE INTERESTED. EACH DEVICE WOULD HAVE ITS OWN OPERATING PROGRAM AS A RESTART INSTRUCTION AND ALL THE DEVICE HAS TO DO IS INPUT A LOW TO ITS OWN INTERRUPT LINE TO HAVE THE COMPUTER GO INTO THAT DEVICES SUB-ROUTINE. THIS DEVICE IS AN IMPROVEMENT ON THE INTERRUPT ENCODER SHOWN ON PAGE 8 OF THE MARK-8 MANUAL.



PRIORTY INTERRUPT ENCODER FOR THE MARK-8

NOTE
This is so far an untested circuit. Some one may want to check it out.

ENCODER

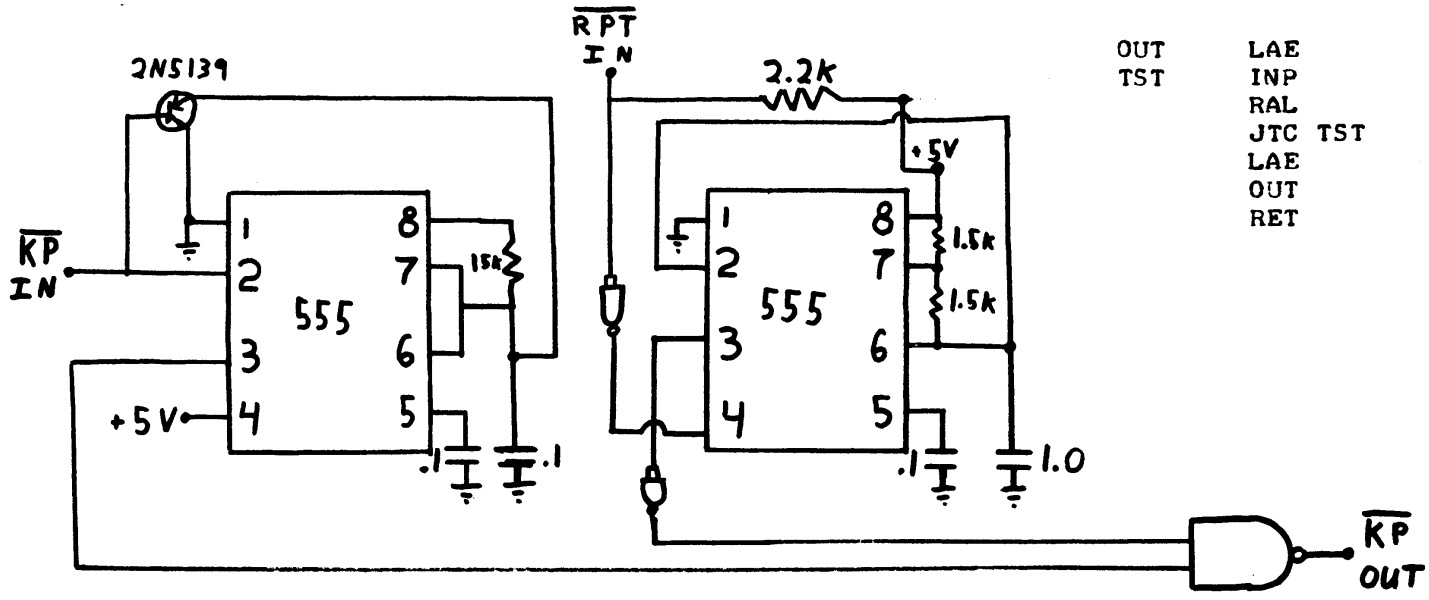
DEVICE INTERRUPT LINES IN ORDER OF PRIORTY

INPUT GOES LOW (Needs pullup Resistors)

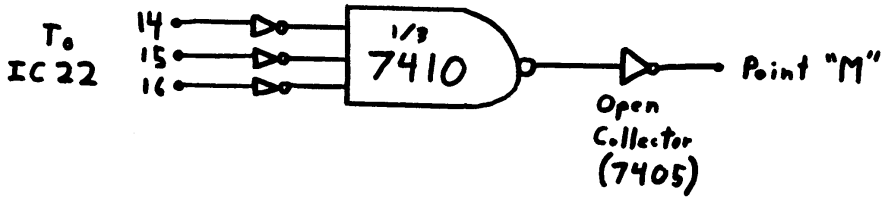
-ALSO-
CAN be under Soft ware control BY connecting output port to Device slect lines

THE 74148 IS A 8 Line to 3 Line PRIORTY ENCODER, IT could ALso be used for a OCTAL ENCODER For a computer entry TERMINAL.

BILL AMES, 3804 MIAMI ROAD, CINCINNATI, OH 45227 SUPPLIED THE FOLLOWING MODS FOR THE SWTP KEYBOARD AND THE TVT-II. ONE OTHER THING ON THE TVT-II: IF OUTPUT IS HANDLED BY TIMING LOOPS, ABOUT 60 CPS OR SO IS THE MAXIMUM RATE. HOWEVER, BY CONNECTING IC-16, PIN 9 OF THE THE TVT-II TO THE UPPER BIT OF AN INPUT PORT (HE USES THE UPPER BIT OF THE KEYBOARD PORT) AND USING THIS SUBROUTINE, THE OUTPUT WILL BE OVER 200 CPS.



Debouncer and repeat key addition to SWTP keyboard.
Connect $\overline{\text{RPT}}$ IN to unused key, other side of key to ground.
The unmodified keyboard is debounced only on leading edge.
With this modification, one clean transition to ground is made, lasting as long as the key is depressed.



Modification to cursor circuitry of SWTP-TVT-II. This curcuit replaces the solid box cursor with single line above the character position, preventing the cursor from hiding a character.

JOHN E. TAYLOR, 2009 NORTH GEYER ROAD, ST. LOUIS, MISSOURI 63131 BELIEVES THAT THE NL'S MAY BE JUST ABOUT THE BEST VALUE IN TERMS OF INFORMATION THAT HE HAS EVER EXPERIENCED. HE IS WAITING FOR THE DUST TO SETTLE BEFORE STARTING CONSTRUCTION BUT WILL PROBABLY START A MIL MOD-8 IF HE CAN GET DELIVERY ON THE MONITOR. AS A PATENT LAWYER, HE WOULD LIKE TO POINT OUT THAT THIS IS A RAPIDLY CHANGING TECHNOLOGY, PATENTS ARE EXPENSIVE TO OBTAIN AND EVEN MORE EXPENSIVE TO ENFORCE AND THAT THE TIMES AND MANY JUDGES DO NOT FAVOR MONOPOLIES OF ANY SORT. THE AVERAGE PERSON MIGHT WELL FIND A BETTER INVESTMENT IN THE STATE LOTTERY. HE IS AGREEABLE TO OFFERING OFFHAND ADVICE AT NOT COST REGARDING PATENTS BY PHONE ONLY AT (314)966-4372 IN THE EVENING.

W. H. BURTNER, RR2, BOX 267, VALPARAISO, IN 46383 SAYS THAT THANKS TO THE NL, HE HAS HAD MANY EHLPFUL REPLIES ON HIS MARK-8 PROBLEMS. HE IS NOW BUSY ADDING DR. SUDINGS ENHANCEMENTS AND CONSEQUENTLY HAS THE MARK-8 STREWN ALL OVER THE HOPE. HE CAN'T WAIT TO TRY THE DIGITAL GROUPS MODS AND SOFTWARE. MARTIN RESEARCH MADE HIM AN OFFER ON THEIR BOOK AT $40 BUT THAT STILL SEEMS HIGH. AFTER A THREE MONTH WAIT, HE FINALLY GOT THE TWO 4K MEMORY BOARDS ORDERED FOR THE ALTAIR. HE SAYS HE CAN'T KICK THOUGH BECAUSE IT TOOK 6 MONTHS TO GET THE PERIPHERALS ON THE RGS KIT. IT SURE IS A DRAG THE WAY THESE SUPPLIERS SHUCK YOU AROUND ONCE THEY HAVE YOUR MONEY. HE COULD SURE USE SOME INFORMATION AND ADVICE ON THE BEST WAY TO PROVIDE I/O FOR HIS ALTAIR. IS ANYONE INTERESTED IN SHARING THE COST ON THE SOFTWARE? HE IS TRYING TO SET UP AN INTERFACE SO HIS CREED TTY CAN BE USED INTERCHANGEABLY BETWEEN THE ALTAIR AND THE MARK-8. APPARENTLY BOB COOK STILL DOES NOT HAVE THE TYPEFACE CHANGES FOR THE CREEDS. MAURY GOLDBERG SEEMS TO ALWAYS BE SO ENTHUSIASTIC ABOUT THE ITEMS HE IS PUSHING AND YET ITS RATHER HARD TO PIN HIM DOWN TO DELIVERY. HE'S GLAD TO SEE SOME IDEAS ARE DEVELOPING WHERE THE MEMORY BOARDS CAN BE SHARED BETWEEN DIFFERENT COMPUTER TYPES AND THE COST IS GETTING INTO A MORE REASONABLE AREA. HE HOPES SOME OF THE BRAINY GUYS CAN COME UP WITH SOME STANDARDIZATION SOON. THERE ARE SO MANY OFFSHOOTS OF, FOR INSTANCE, THE TAPE CASSETTE, THAT ITS BEWILDERING TO SOMEONE NOT IN THE KNOW. P.S. JUST GOT LICENSE AGREEMENTS ON MIT'S SOFTWARE AND APPARENTLY THEY ARE LETTING THE DOLLAR SIGNS SHOW IN THEIR EYEBALLS AND DO NOT INTEND THAT THIS MATERIAL IS TO BE SHARE AROUND. I WONDER HOW MANY FRIENDS THEY THINK THEY WILL MAKE WITH THIS ATTITUDE?

WILLIAM D. THOMAS, 3112 LIS PLACE, HIGHLAND, IN 46322 WOULD LIKE TO INFORM OTHER READERS THAT MINI MICRO MART OF 1618 JAMES STREET MAY NOT BE MAKING THEIR DELIVERIES AS ADVERTISED AND IS ALSO FAILING TO HEED INSTRUCTIONS FOR REFUNDS. HE ORDERED AN ASCII KEYBOARD FROM THEM IN MARCH AND HAS YET TO RECEIVE A REQUESTED DELIVERY OR REFUND WHICH I FINALLY DEMANDED. HE HAS COMPLAINED TO THE POSTAL INSPECTOR IN CHARGE, PITTSBURG, PA 15222 AND YOU MIGHT DO SO ALSO IF EXPERIENCING SIMILAR DIFFICULTIES. HE IS INTERESTED IN 8080 MINIS AND HAS AN ALTAIR THAT HE IS SLOWLY STARTING TO EXPAND. MITS DELIVERY TIMES ARE SO SLOW AS TO BORDER ON THE RIDICULOUS. HE IS LOOKING ELSEWHERE FOR PERIPHERALS.

LAURENCE L. PLATE, 2320 SKYLINE WAY, SANTA BARBARA, CA 93109 FINALLY DECIDED HE HAD TO ABANDON THE MARK-8'S WIRED BUS ARRANGEMENT AND IS NOW INTERESTED IN CONTACTING OTHERS INTERESTED IN WORKING ON A CARD CAGE CONVERSION FOR THE MARK-8 SO WE CAN COMMUNICATE AND EXCHANGE IDEAS. HE IS USING A 26 CARD CAGE SYSTEM WITH 22/22 CONNECTOR CARDS (4 1/2 X 6 1/2) AND HAS ALREADY LAID OUT THE ORIGINAL RE MARK-8 CPU LOGIC ON THE CPU BOARD ON 3 PLUG CARDS. HE WILL SUPPLY FURTHER DETAILS ON THIS WORK AS SOON AS HE GETS ALL OF THE MARK-8 LOGIC WITH THE SUDING MODS LAID OUT. HIS DOCUMENTATION MAY AMOUNT TO ABOUT 100 PAGES OF DETAILED LOGIC DRAWINGS, ETC. HE JUST GOT THE NEW SUDING TVT PRINTED CIRCUIT BOARD WITH THE CHARACTER GENERATOR CHIP AND CRYSTAL. THE BOARD IS REALLY A BEAUTIFUL JOB WITH PLATED THRU HOLES, ETC. HIS ONLY GRIPE IS THAT IT IS NOT THE SAME SIZE AS THE CARDS IN HIS CARD CAGE (IT'S 4 1/2 X 6 1/2) SO HE IS GOING TO INSTALL IT INSIDE HIS NEW TV MONITOR SET SO ONLY THE 8 INTERFACE LINES NEED TO BE BROUGHT OUT. HE INTENDS TO DO EXTENSIVE INPUT MUX REDESIGN AND NEEDS DENSER MEMORY THAN 1101'S OR 2102'S SO IS NOW STUDYING THE AMI S6605BC 4K X 1 CHIP. THEY COST $35 IN UNITS AND $23 IN LOTS OF 100. HENCE ONE CARD IN HIS SYSTEM COULD HOLD 4K MEMORY WITH REFRESH LOGIC, ADDRESSING LOGIC WOULD BE ON ONE CARD SO HE COULD EXPAND TO 16K WITH ONLY 5 CARDS IN HIS SYSTEM. HE WOULD LIKE TO CONTACT OTHERS INTERESTED IN 4K CHIPS.

8008 INSTRUCTIONS

T.A. BOYKO

Function	Accm	B	C	D	E	H	L	MEM
LOAD REGISTER IMMEDIATE	006	016	026	036	046	056	066	076
INCREMENT REGISTER	X	010	020	030	040	050	060	X
DECREMENT REGISTER	X	011	021	031	041	051	061	X
ADD REG to ACC → ACC	200	201	202	203	204	205	206	207
ADD REG to ACC WITH CARRY	210	211	212	213	214	215	216	217
SUB REG from ACC → ACC	220	221	222	223	224	225	226	227
SUB REG from ACC with Borrow	230	231	232	233	234	235	236	237
"AND" REG with ACC → ACC	240	241	242	243	244	245	246	247
"EXCL OR" REG with ACC → ACC	250	251	252	253	254	255	256	257
"OR" REG with ACC → ACC	260	261	262	263	264	265	266	267
"COMPARE" REG with ACC	270	271	272	273	274	275	276	277

LOAD

FROM	Acc.	B	C	D	E	H	L	MEM
ACCUMALATOR	300	310	320	330	340	350	360	370
B Reg	301	311	321	331	341	351	361	371
C Reg	302	312	322	332	342	352	362	372
D Reg	303	313	323	333	343	353	363	373
E Reg	304	314	324	334	344	354	364	374
H Reg	305	315	325	335	345	355	365	375
L Reg	306	316	326	336	346	356	366	376
MEMORY	307	317	327	337	347	357	367	X

STORE

000
001 } HALT
377

LOAD

UNCONDITIONAL		ZERO	$\overline{\text{ZERO}}$	CARRY	$\overline{\text{CARRY}}$	SIGN	$\overline{\text{SIGN}}$	PARITY	$\overline{\text{PARITY}}$
JUMP	104	150	110	140	100	160	120	170	130
CALL	106	152	112	142	102	162	122	172	132
RETURN	007	053	013	043	003	063	023	073	033

Rotate "A" Left - 002
Rotate "A" Right - 012
Left thru Carry - 022
Right thru Carry - 032

PORT	INPUT	OUT 1X	OUT 2X	OUT 3X
0	101	121	141	161
1	103	123	143	163
2	105	125	145	165
3	107	127	147	167
4	111	131	151	171
5	113	133	153	173
6	115	135	155	175
7	117	137	157	177

RESTART (INT.)	
START ADDR.	INSTR.
0X0	0X5

IMMEDIATES WITH ACCUMALATOR

		CARRY
ADD Imm	004	014
SUB Imm	024	034
"AND" Imm	044	BORROW
"EX OR" Imm	054	
"OR" Imm	064	
"COMPARE" Imm	074	

330 Vereda Leyenda
Goleta, CA 93017
June 17, 1975

Dear Hal,

Sorry I missed last meeting in Santa BArbara--this job has too much travel with it. Could you send a copy of the digital graphics oscilloscope display reprint from the MP Publishing paper? Several of us here would like to see it. I'll send it back posthaste.

A new rumor--well, actully its more than a rumor. I talked with Bill Godbout up in Oakland. His company is coming out with a PDP-11 kit in October. It will be a complete 11/10 with cabinet, power supply, front panel, etc. May or may not contain the UNIBUS--they're still negotiating with DEC. Price will be under 1K in kit form, which makes it competitive with the LSI-11. It will come with the basic papertape software--assembler, editor, etc. I don't know any more details except that it will be all TTL, which should make it a llittle easier to fix than the LSI-11. On the other hand the LSI-11 has a better instruction set (11/40), has the front panel simulator, hardwired floating arithmetic, etc. Hard to tell which is best, but if the OEM buy on the LSI-11 falls through this may be a good option. He is reluctant to talk much about it until the thing is on the shelf ready for delivery--says he doesn't want to get the MITS reputation for promising what isn't there. On the other hand it would be nice to let the amateur community know about it. You might give him a call.

The newsletter gets better and better--congradulatons. I will try to get you a copy of the foil pattern for Doug Hogg's scroller before next issue--I'm trying to modify it to scroll on CR, scroll in both directions, allow computer blanking of the screen etc. I've ordered the Edwards Associates "Bugbook" series and will let you know how it looks.

Sincerely,

Jim McCord

Mr. C. Richard Corner
514 So. 9th Street
Moorhead MN 56560

Dear Hal and John:

June 16, 1975

You may have seen the recent advertising campaigns for Intersil's new IM 6100 chip that executes PDP-8 code and the OEM LSI-11 from DEC.

I am interested in getting 100 people to go in on an order for either. The units are expensive, BUT POWERFUL!! We could probably get the IM 6100's for under $200. each, while LSI-11's would be about $650. each. Maybe in 50 lot the LSI-11 could be purchased for $1,000. each.

Maybe people that feel they can afford this (after all, a lot of your readers have spent over $4-500 for lesser systems) would write to me. I will request deposits when I have encugh responses to justify doing so, and will negotiate with the manufacturers. I have already phoned Intersil and talked with the IM 6100 product manager.

You're doing a great job on the Newsletter. The Vol. 1 #7 format is GREAT!

Very truly yours,

C. Richard Corner

WE HAD A PAGE LEFT OVER SO ROGER SMITH'S BAUDOT TO ASCII CIRCUIT IS INCLUDED. SORRY, WE DON'T KNOW WHAT IS IN THE ROMS.

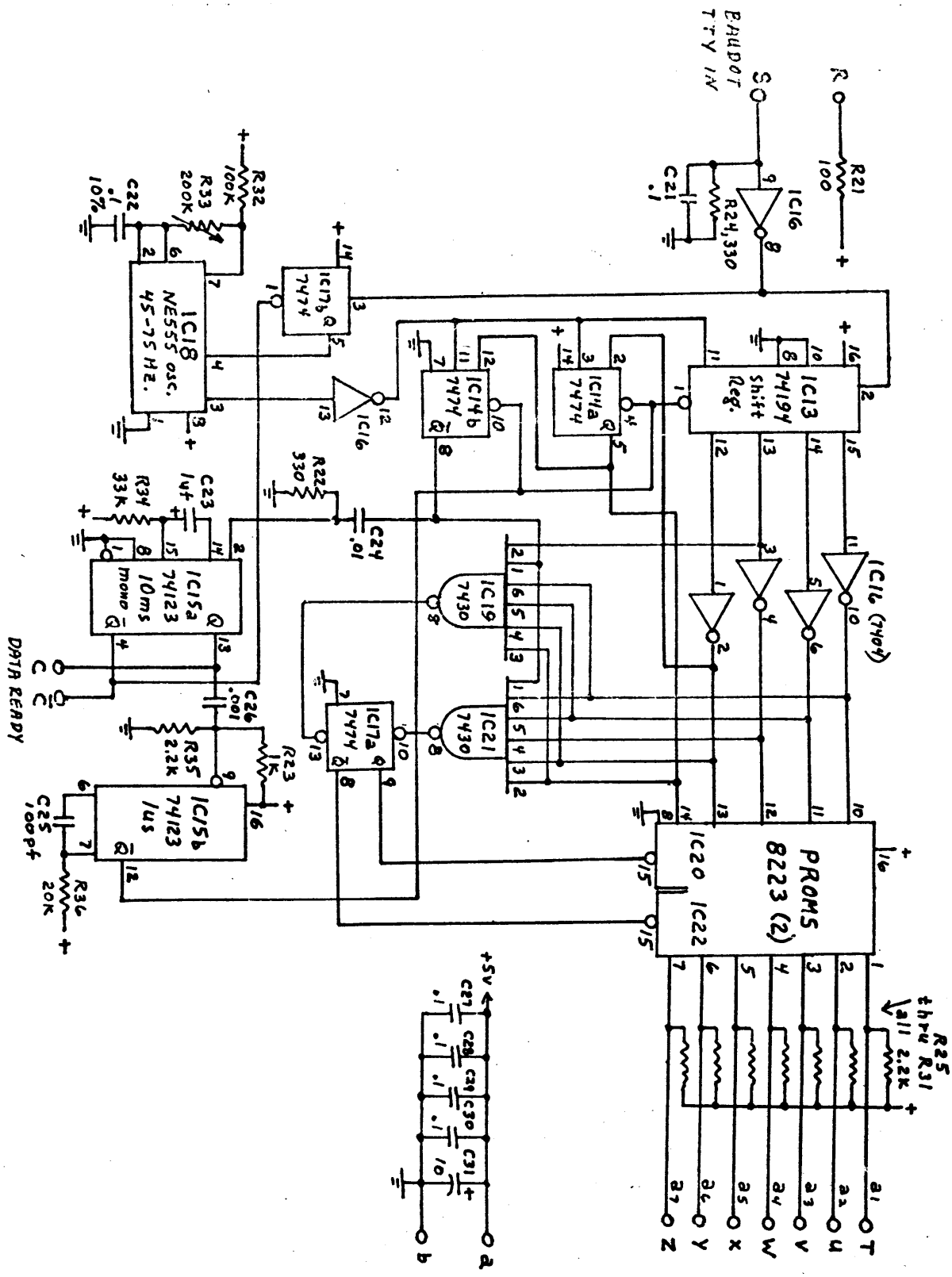


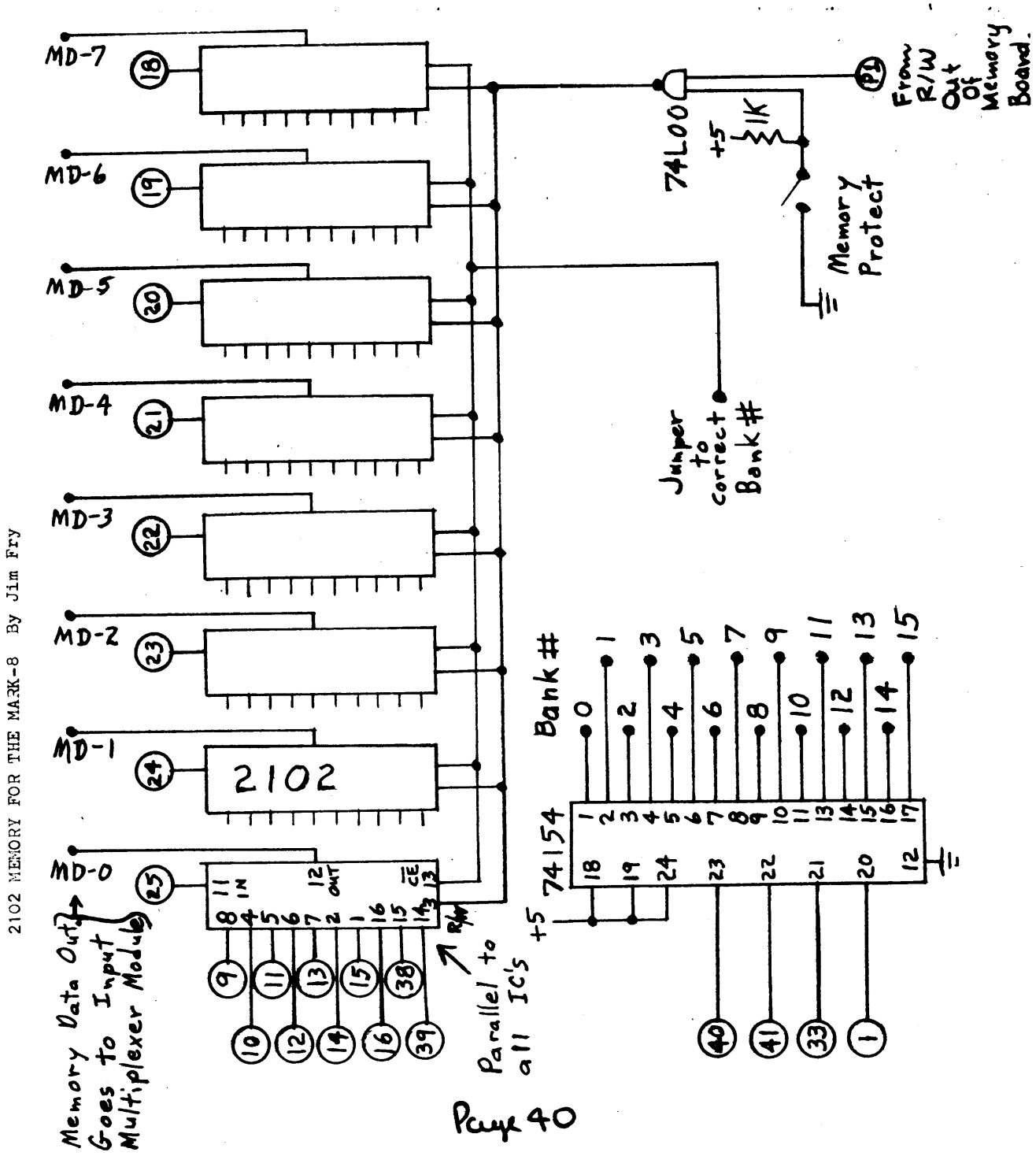
FIGURE 6

BAUDOT TO ASCII CONVERTER

SMITH - ASCII/BAUDOT CONVERTERS Page 15 REVISED

JIM FRY, DIGI-TEL ELECTRONICS, PO BOX 6585, TOLEDO, OH 48316 DESIGNED A CIRCUIT AND LAYED OUT A PC BOARD FOR A 1K 2102 MARK-8 BOARD. HE IS NOW LOOKING FOR A COMPANY THAT CAN ETCH IT FOR HIM.

NUMBERS INSIDE CIRCLES REFER TO MARK-8 BUSS NUMBERS. POWER CONNECTIONS ON THE 2102 ARE +5 TO PIN 10, AND GROUND TO PIN 9. CLOSE MEMORY PROTECT SWITCH FOR ERASE PROTECTION. DISTRIBUTE 8 .1 UFD CAPACITORS AND 2 100 UFD CAPACITORS ON POWER LINES. ONE 74154 CAN PROVIDE HIGH- 4 BIT DECODIN FOR ALL 16 K OF MEMORY. IN PRACTICE THO IT WILL PROBABLY BE EASIER TO USE ONE 74154 FOR EACH BOAARD OF 4K WORDS. WORST CASE POWER CONSUMPTION OF 2K OF 2102 IS 1 AMP. THIS MEMORY DESIGN MUST BE USED IN CONJUNCT ION WITH AN 1101 BOARD. WHEN USING THIS DESIGN IN CONJUNCTION WITH THE ORIGINAL 1101 BOARDS, PROPER DECODING CAN BE OBTAINED ON THE 1101 BOARDS BY CONNECTING A "BANK" SELECT OUTPUT OF THE 74154 TO PINS 9 AND 10 OF IC 34 IN PLACE OF THE #41 BUSS. IN OTHER WORDS BREAK THE FOIL BETWEEN BUSS LINE 41 AND IC 34 AND ATTACH A "BANK" SELECT LINE TO IC34. INSTALL T HE JUMPER IN THE "ONES" POSITION ON ALL 1101 BOARDS. A BANK CONSISTS OF 4 PAGES OF MEMORY.



Computer Glossary

The beginner in this hobby computer thing is hopelessly snowed by all of the technical words and acronyms that people keep throwing around. It's difficult to communicate without using some of them. Motorola published the following microcomputer glossary and I've added some of the terms people have asked me about. Motorola welcomes your suggestions for additional terms and suggested definitions. Send them to Motorola Semiconductor Products, PO Box 20912, Phoenix, AZ. 85036. Your name will be put on a mailing list to receive future editions.

ACCUMULATOR A temporary storage register associated with a processing unit.

ADDRESS A character or group of bits that identifies a particular part of storage, or some other data source or destination.

ALGORITHM A prescribed finite set of well defined rules or processes for the solution of a problem in a finite number of steps: e.g., a full statement of an arithmetic procedure for evaluating sin X.

ALPHANUMERIC Pertaining to a character set that contains letters, digits.

ARITHMETIC AND LOGIC UNIT A part of a microcomputer that performs arithmetic operations, logic operations, and related operations. (An ALU is part of the MPU chip circuitry).

ASCII American Standard Code for Information Interchange. The standard code, using 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, communications systems, and associated equipment.

ASSEMBLER A computer program used to translate a machine language program from a symbolic language program.

ASYNCHRONOUS COMMUNICATIONS INTERFACE ADAPTER (ACIA) A general purpose programmable interface between the MPU and asynchronous I/O.

BAUD A unit of signalling speed equal to the number of discrete conditions or signal events per second. For example, one baud equals one bit per second in a train of binary signals.

BENCHMARK PROBLEM A problem used to evaluate the performance of hardware or software or both. A problem used to evaluate the performance of several microcomputers relative to each other, or a single microcomputer relative to system specifications.

BINARY-CODED DECIMAL NOTATION (BCD) A binary-coded notation in which each of the decimal digits is represented by a binary 4 bit number; e.g., in binary-coded decimal notation that uses the weights 8-4-2-1, the number "twenty three" is represented by 0010 0011 (compare its representation 10111 in the pure binary system.).

BOOTSTRAP An existing version of a program that is used to establish another version of the program. A technique or device designed to bring itself into a desired state by means of its own action, e.g., a machine routine whose first few instructions are sufficient to bring the rest of itself into the microcomputer from an input device.

BRANCH In the execution of a microcomputer program, to select one from a number of alternative sets of instructions. A set of instructions that are executed between two successive decision instructions.

BYTE A binary element string operated upon as a unit (normally 8 bits) and usually shorter than a computer word.

CENTRAL PROCESSING UNIT (CPU) A unit of a computer that includes circuits controlling the interpretation and execution of instructions.

COMPILER A computer program used to translate a program expressed in a problem oriented language into a computer oriented language.

COMPUTER NETWORK A complex consisting of two or more interconnected computers.

CONTROL UNIT Coordinates all units of a computer in a timed, logical sequence.

CYCLIC REDUNDANCY CHECK CHARACTER (CRCC) A character used in a modified cyclic code for error detection and correction.

DATA FLOWCHART A flowchart that represents the path of data in the solving of a problem, and that defines the major phases of the processing as well as the various data media used.

DATA PROCESSING The execution of a systematic sequence of operations performed upon data, e.g., handling, merging, sorting, computing.

DATA PROCESSOR A device capable of performing data processing, such as a desk calculator, a punch card machine, or a computer.

DATA SIGNALLING RATE In communications, the data transmission capacity of a set; the data signalling rate is expressed in bits per second.

DEBUG To detect, to trace, and to eliminate mistakes in microcomputer programs or in other software.

DIRECT MEMORY ACCESS (DMA) The process of obtaining data from storage, or of placing data into storage, directly and not depending on the usual flow of data through the processor.

DUMP To write the contents of a storage, usually from an internal storage to an external medium, for a specific purpose such as to allow other use of the storage, as a safeguard against faults or errors, or in connection with debugging.

DUPLEX In communications, pertaining to a simultaneous independent transmission in both directions.

DYNAMIC Refers to the finite storage time of charge within certain MOS circuits that depend on device capcitance to store information, and the need to constantly refresh or recharge these data locations. Contrast with static.

EMULATE To imitate one system with another, primarily by hardware, so that the imitating system accepts the same data, executes the same prorams, and achieves the same results as the imitated system. Contrast with simulate.

EXbug™ Motorola tradename for EXORciser's firmware which minimizes the time required to develop users' programs.

EXORciser™ Motorola tradename for a systems development tool for evaluation of M6800 prototype hardware and software in its actual working environment. As the name suggests, the EXORciser "casts out" problems within the prototype system.

EVALUATION MODULE An evaluation system to check the operating characteristics of Motorola's M6800 microcomputer family of parts.

FIFO First in, first out. A queuing technique in which the next item to be retrieved is the item that has been in storage for the longest time.

FIRMWARE Software in hardware form. Example: Computer program in read only memory.

FLOWCHART A graphical representation of the definition, analysis or method of solution of a problem, in which symbols are used to represent operations, data, flow, equipment, etc.

FORTRAN (Formula translation). A programming language primarily used to express computer programs by arithmetic formulas.

GENERAL PURPOSE COMPUTER A computer that is designed to operate upon a wide variety of problems.

HARDWARE Physical equipment used in data processing, as opposed to computer programs, procedures, rules, and associated documentation. Contrast with software.

HYBRID COMPUTER A computer using both analog representation and discrete, or digital, representation of data.

INDEX REGISTER A feature to provide programming flexibility by providing additional addressing modes.

INSTRUCTION In a programming language, expression that specifies one operation and identifies its operands, if any.

INTERRUPT An external event that causes the computer to shift its attention to another problem.

I/O Input-output

JUMP A departure from the normal sequence of executing instructions in a microcomputer.

MACHINE LANGUAGE A language, that is, a set of characters, conventions and rules used for conveying information, used directly by a machine.

MACRO-INSTRUCTION An instruction in a source language that is to be replaced by a defined sequence of instructions in the same source language. The macroinstruction may also specify values for parameters in the instructions that are to replace it.

MAIN STORAGE Program addressable storage from which instructions and data can be loaded directly into registers from which the instructions can be executed or the data can be operated upon. Usually an internal storage.

MASS STORAGE An auxiliary storage or very large storage capacity used for storage of data to which infrequent reference need be made.

MICROCOMPUTER INSTRUCTION An instruction that can be recognized by the microprocessing unit of the microcomputer for which it is designed. Synonymous with machine instruction.

MICROCOMPUTER PROGRAM A series of instructions or statements in a form acceptable to a microcomputer.

MICROCOMPUTER WORD A sequence of bits or characters treated as a unit and capable of being stored in one microcomputer location.

MICROPROCESSING UNIT (MPU) A unit of a microcomputer that includes circuits controlling the interpretation and execution of instructions.

MICROPROCESSOR Term applied to a semiconductor device for performance of arithmetic, logic and decision-making operations which are directed by a set of instructions stored in a memory device.

MIKBUG™ Motorola tradename for a program which permits communication between the evaluation module and user's terminal.

MNEMONIC SYMBOL A symbol chosen to assist the human memory, e.g., an abbreviation such as "STAA" for "store accumulator A".

MODEM (Modulator-demodulator). A device that modulates and demodulates signals transmitted over communication facilities.

MULTIPLEX To interleave or simultaneously transmit two or more messages on a single channel.

OBJECT CODE Output from a compiler or assembler which is itself executable machine code or is suitable for processing to produce executable machine code.

OFFLINE Pertaining to a device that is not online to the computer but is associated with its operation, i.e., an offline printing station. Pertaining to equipment or devices not under control of a central processing unit.

ONLINE Pertaining to a device under the direct control of a central processing unit, or to a user's ability to interact with a computer via a communication link or terminal.

OPERATING SYSTEM Software that controls the execution of computer programs and that may provide scheduling, debugging, input output control, accounting, compilation, storage assignment, data management.

PERIPHERAL INTERFACE ADAPTER (PIA) Provides a means of interfacing peripheral equipment to the microprocessing unit (MPU).

PROGRAM A series of actions designed to achieve a certain result. Loosely, a routine.

PROGRAMMING LANGUAGE An artificial language established for expressing computer programs.

READ To acquire or to interpret data from a storage device, from a data medium, or from another source.

REAL TIME Pertaining to the performance of a computation during the actual time that the related physical process transpires, in order that results of the computation can be used in guiding the physical process.

REMOTE ACCESS Pertaining to communication with a data processing facility by one or more stations that are distant from that facility.

SIMULATE To imitate one system with another, primarily by software, so that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated system. Contrast with emulate.

SOFTWARE Computer programs, procedures, rules, concerned with the operation of a data processing system. Contrast with hardware.

SPECIAL PURPOSE COMPUTER A computer that is designed to operate upon a restricted class of problems.

STATIC Refers to the storage of data within a MOS circuit without the need for recharging the state of the information. Synonymous with DC. Contrast with dynamic.

SYMBOLIC LANGUAGE A programming language which expresses addresses and operation codes of instructions in symbols convenient to humans rather than in machine language.

TIME SHARING The interleaving in time of two or more independent processes on one functional unit. Pertaining to the interleaved use of time on a computing systm that enables two or more users to execute computer programs concurrently.

USER TERMINAL An input-output unit by which a user communicates with an automatic data processing system.

VOLATILE STORAGE A storage whose content is lost when the power is removed.

WRITE To make a permanent or transient recording of data in a storage device or on a data medium.

ALTAIR 8800 - MITS'S CRAFTILY PROMOTED 8080 BASED COMPUTER SYSTEM.
ASR-33 - THE MOST POPULAR TELETYPE TERMINAL WITH PAPER TAPE I/O INCLUDED.
B URN-IN - PROCESS OF INITIALLY RUNNING COMPONENTS OR SYSTEMS AT EXTREME CONDITIONS TO ELIMINATE THE ONES THAT FAIL QUICKLY.
BYOB - BRING YOUR OWN BOOZE
DEC - DIGITAL EQUIPMENT CORPORATION.
EROM - ERASEABLE READ ONLY MEMORY
FSK - FREQUENCY SHIFT KEYING, A MODULATION TECHNIQUE.
I/O - INPUT/OUTPUT.
IMP-16 - NATIONAL'S 16 BIT MICROPROCESSOR CHIP SET.
KSR-33 - AN ASR-33 WITHOUT PAPER TAPE.
LSI-11 - DIGITAL EQUIPMENT CORP.'S NEW PDP-11 MACHINE BUILT AROUND A CHIP SET JOINTLY DEVELOPED BY WESTERN DIGITAL AND DEC. 16 BIT, 4K MEMORY, KEYBOARD MONITOR BUILT IN, $654-50 OR MORE, $990 EACH.
MARK-8 8008 MICROCOMPUTER DESIGN BY JON TITUS THAT APPEARED AS A CONSTRUCTION ARTICLE IN THE JUNE L974 RADIO-ELECTRONICS MAGAZINE.
MICRO-8 - USER GROUP AND NEWSLETTER NAME.
MIL - MICROSYSTEMS INTERNATIONAL LIMITED, COMPANY NOW OUT OF BUSINESS.
MIKE-2 - 8008 MICROCOMPUTER SYSTEM AVAILABLE FROM MARTIN RESEARCH CO.
MITS - NEW MEXICO BASED COMPANY PRODUCING THE ALTAIR 8800 SYSTEM.
MOD-8 - 8008 SYSTEM DESIGNED BY MICROSYSTEM INTERNATIONAL, BOARDS AVAILABLE FROM SPACE CIRCUITS, 156 ROGER ST, WATERLOO, ONTARIO CANADA.
MOD-80 - THE MOD-8 WITH A COUPLE OF BOARD CHANGES THAT ALLOW IT TO USE THE 8080 PROCESSOR.
MONITOR-8 - THE SUPER KEYBOARD MONITOR AVAILABLE FOR USE WITH THE MOD-8 SYSTEM AND THAT CAN BE MODIFIED FOR USE ON ANY 8008 BASED SYSTEM.
MONITOR-80 - MONITOR-8 MODIFIED FOR USE WITH 8080 PROCESSORS.
MPS - MICRO PROCESSOR SYSTEM, A SET OF BOARDS BY DIGITAL EQUIPMENT CORP. BASED ON THE 8008 MICROPROCESSOR.
NL - ABBREVIATION FOR NEWSLETTER.
PACE - NATIONAL'S SINGLE CHIP 16 BIT PROCESSOR. BASICALLY A ONE PACKAGE IMP-16.
PCC - PEOPLE'S COMPUTER COMPANY.

PDP-8 - THE FIRST AND PROBABLY MOST USED MINICOMPUTER, BUILT BY DEC IN VARIOUS FORMS STARTING IN ABOUT 1961. STILL A VERY POPULAR 12 BIT MACHINE BECAUSE MORE SOFTWARE IS AVAILABLE THAN FOR ANY SYSTEM.

PDP-11 - A 16 BIT MINCOMPGUTER SERIES BUILT BY DIGITAL EQUIPMENT CORP. FEATURING AN EXTREMELY VERSATILE INSTRUCTION SET.

PE - POPULAR ELECTRONICS MAGAZINE.

PROM - PROGRAMMABLE READ ONLY MEMORY

RAM - RANDOM ACCESS MEMORY

RE - RADIO-ELECTRONICS MAGAZINE

RGS-008A - 8008 BASED MICROCOMPUTER SYSTEM PRODUCED BY RGS ELECTRONICS.

ROM - READ ONLY MEMORY

SASE - SELF ADDRESSED, STAMPED ENVELOPE.

SCELBI 8H - 8008 MICROPROCESSOR SYSTEM PRODUCED BY SCELBI.

SCROLLING - ON VIDEO TERMINALS, ALL LINES MOVE UP ONE, TOP LINE IS LOST, BOTTOM LINE CLEARS FOR NEW ENTRY.

SWTP - SOUTHWEST TECHNICAL PRODUCTS CORP.

TGIF - THANK GOODNESS ITS FRIDAY.

TTY - ABBREVIATION FOR TELETYPE WHICH IS A REGISTERED TRADENAME BUT IN SUCH GENERAL USE AS TO MAKE MENTIONING IT SOMEWHAT RIDICULOUS.

TVT - TV TYPEWRITER

TVT-1 - TV TYPEWRITER DESIGNED BY DON LANCASTER USING MOS SHIFT REGISTER MEMORY. ORIGINALLY APPEARED IN RE A COUPLE OF YEARS AGO. VERY POPULAR, THOUSANDS WORKING, A SOMEWHAT OBSOLETE DESIGN TO START NOW.

TVT-2 - TV TYPEWRITER DESIGNED BY A FELLOW IN TEXAS AND BEING SUPPLIED BY SOUTHWEST TECHNICAL PRODUCTS. INTRODUCTORY ARTICLE IN RE, FEB 75 USES TTL LOGIC, 2102 MEMORIES.

TVT-3 - NEW TVT DESIGN BY DON LANCASTER USING ABOUT 18 CMOS IC'S. INFO AND DOCUMENTATION PACKET TO BE AVAILABLE THRU PCC, PROBABLY IN THEIR SEPTEMBER 75 ISSUE.

TVT-4 - NEWEST TVT DESIGN BY DON LANCASTER USING ABOUT 14 CMOS IC'S. MERCHANDISING METHOD NOW BEING WORKED OUT.

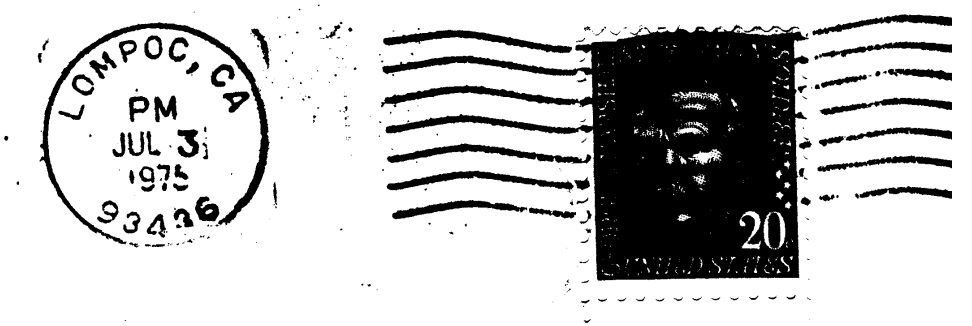
UART - UNIVERSAL ASYNCHRONOUS RECEIVER TRANSMITTER, AN LSI CHIP NOW AVAILABLE FOR ABOUT $7 THAT COMPLETELY TAKES CARE OF SERIAL-PARALLEL AND PARALLEL-SERIAL CONVERSIONS.

8008 - THE FIRST POPULAR 8 BIT MICROPROCESSOR CHIP AVAILABLE FROM INTEL. SMALL PACKAGE SIZE REQUIRES DATA MULTIPLEXING WHICH NECESSITATES A LARGE NUMBER OF SUPPORT IC'S. NEW LSI CHIP TO BE AVAILABLE SOON WILL INCLUDE ALL OF THE MULTIPLEXING LOGIC.

8080 - PRESENTLY THE MOST POPULAR 8-BIT MICROPROCESSOR CHIP. PRESENTLY BEING SECOND SOURCED BY AT LEAST 6 COMPANIES AND DESTINED TO BECOME THE PDP-8 OF THE MICROPROCESSORS.

8080-A - INTEL'S NEW 8080 FEATURING FULL TTL DRIVE, JAMMING OF MULTIBYTE INT. INSTRUCTIONS, ETC. UNDOUBTEDLY PRODUCED TO MAKE LIVES OF SECOND SOURCES MORE COMPLICATED. WILL OPERATE IN REGULAR 8080 SOCKET.

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



FIRST CLASS MAIL