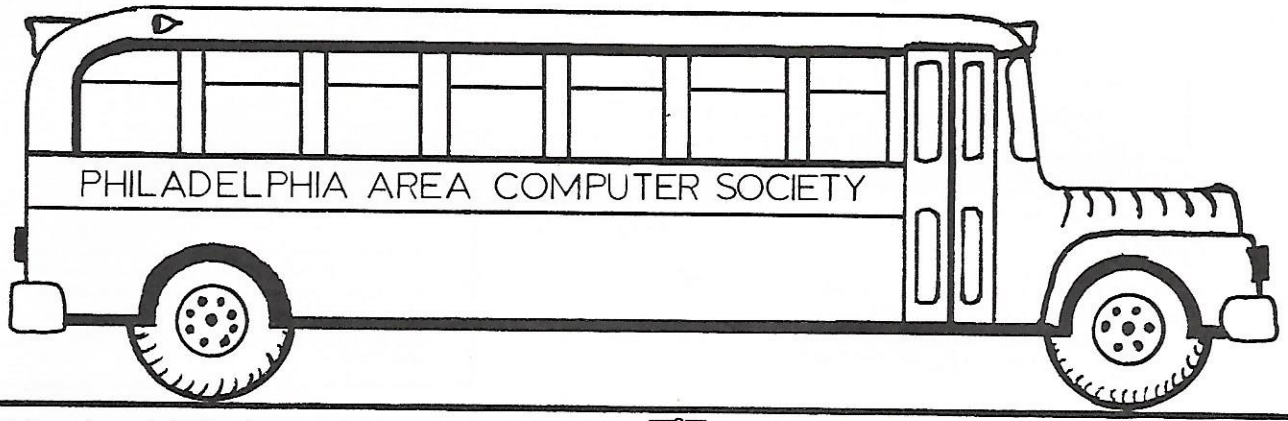
THE DATA BUS



VOL.1 NO.1 BICENTENNIAL EDITION JULY 1976

AT LAST

the Philadelphia area has its own computer group. Its called the Philadelphia Area Computer Society (PACS). As you can tell by the name, its not only a microcomputer users club but a group that welcomes all people interested in any phase of computer technology. Also, its not only an amateur group, for our membership encompasses beginners as well as computer professionals.

The group started on June 5th when approximately 85 people gathered at the Frazer Mall, and, amidst much confusion, officers were appointed and the group was officially organized (?). At the next meeting, June 27th, Dave Hilton, of Personal Computer Corp., demonstrated the Digital Group line of microcomputers and accessories. Future meetings will be held monthly and will be announced in this newsletter.

It is hoped that PACS will serve its members by providing a means of intercommunication among computer users and also by offering tutorial materials and resources for those wishing to upgrade their understanding of computer arts and sciences.

Of course, as with any new group, we need your support. We hope you will join us, share with us what you know, and maybe learn from us something you don't know. But, in any case, ...

HAPPY COMPUTING

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The Data Bus is published monthly by
THE PHILADELPHIA AREA COMPUTER SOCIETY

President: Dick Moberg
Vice-President: Cyril Solomons
Secretary: Frank Contini
Treasurer: Jon Avery

Items for inclusion in The Data Bus must be received by the first of the month to appear in that month's issue. Send all items to: Dick Moberg, 404 South Quince Street, Philadelphia, PA 19147.

DUES

Dues for membership in PACS are as follows:

$10/yr Regular Membership
$5/yr Student Membership

Membership applications will be provided at the meeting. Please bring your dues at this time! Make checks payable to Philadelphia Area Computer Society.

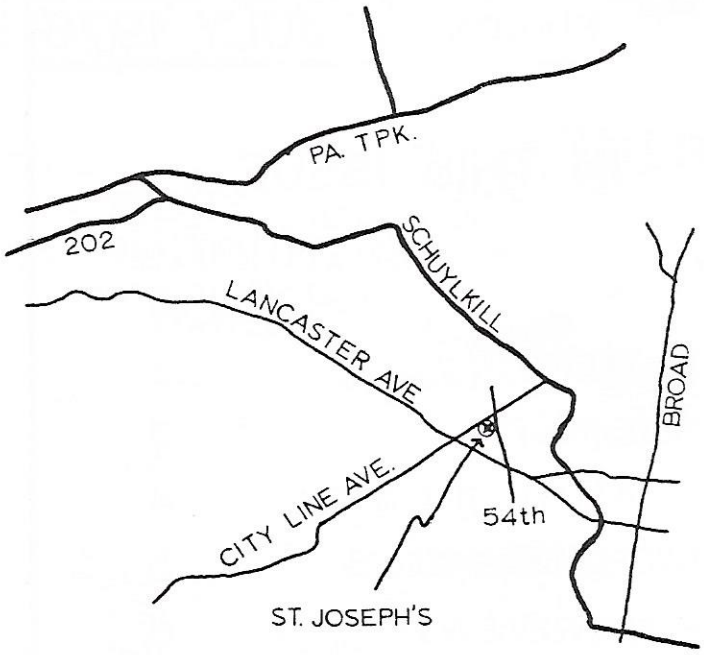
JULY MEETING

Saturday July 31st
2:00 PM
St. Joseph's College, Science Center

AGENDA:

Demonstration of Sphere System

Flea Market: bring items you wish to sell or trade (to be held after demonstration)



Directions to Science Center:

Enter grounds of St. Joseph's at 2nd gate from Lancaster Ave. end of campus (gray stone wall). Science Center is at the end of the driveway. Follow PACS signs to auditorium.

COMMITTEES

Program Committee	Ed Chein
Membership Committee	Bill Magill
Public Relations Committee	Everett Holland
Logo Committee	Jim Butterly

WRITE FOR THE DATA BUS

Please send us material for The Data Bus which would be of interest to our members. Applications, letters, book reviews, reports on kits, suppliers, etc. are all welcome.

LOGO CONTEST

OBJECTIVE

To select a symbol (logo) for use by the Philadelphia Area Computer Society for stationary, promotions, public relations and other Society activities.

RULES

The symbol shall be capable of being reproduced for printing.

The symbol shall represent the general theme of computers in the context of an interest group such as PACS.

The symbol shall be submitted on plain white paper to the chairperson of the PACS Symbol Committee prior to August 1st, 1976.

The symbol and all rights to its use shall become the property of PACS.

ELIGIBILITY

Anyone may submit any number of entries.

JUDGING

Judging and selection will be performed by the Symbol Committee which will consist of the Chairperson, a PACS officer, and an outside consultant, the latter two being selected by the Chariperson. Decision of the Symbol Committee is final.

PRIZE

The prize will be a MOS Technology MCS6502 microprocessor.

Symbol Chairman: Jim Butterly
610 W. Olney Ave.
Phila., PA 19120
CA 4-9926

LETTERS

Anyone interested in joining a project oriented 6800 users subgroup please contact Mitch Fujita at the next meeting. I propose the following activities for the groups consideration:

1) Aid and abet newcomers to the 6800
2) Group purchase of software.
3) Develop software: cassette operating system, math packages, editors, assemblers, etc.
4) Develop firmware: cassette loaders, library of subroutines, code translators, hardware drivers, etc.
5) Develop hardware: mother boards, cassette interfaces, printer interfaces, A/D converters (for joy sticks naturally), D/A converters (X,Y,Z outputs for X,Y scope ?), shared memory video interface (like Processor Tech's VDM-1), etc.

Mitch Fujita
University of Pennsylvania
Room 11, Leidy Labs
Phila., PA 19104
243-7138, -7936

SUBGROUPS

If you would like to start a subgroup in your specialty, send your name and address to The Data Bus.

6800 USERS SUBGROUP

Contact Mitch Fujita (see letter section)

MEDICAL APPLICATIONS

Contact Dick Moberg

Telephone Answering Machine Project

There is a great need for PACS members to be able to get information about upcoming activities: where and when the next meeting is to be held, for example. Your officers are willing to provide a telephone-answer capability, but cannot, of course, do so on an on-demand basis without mechanical aid. We would therefore like to have message machines installed at each of our homes to provide service in our absence.

To make this project cheap enough for such a service it would seem best to build our own. If we could get enough orders in advance, we could even produce our own PC boards and buy components in quantity to get the advantages of bulk purchase.

The first question is, therefore, how many members would be interested in owning and/or building their own telephone-answering machines? The second is whether anyone has a good circuit (preferably "tried & tested") for a machine that can be built cheaply to answer the phone and play a message from a tape recorder (reel-to-reel, continuous loop, or cassette). One modifiable to receive incoming messages from the caller, on a second recorder, would be a plus. We might even be able to do as the Denver group is doing, if the circuit is non-proprietory, and sell PC boards and complete kits, even assembled units, as a fund-raising project.

Please send your answers to these questions to me:

Dr. Cyril Solomons
V.P., PACS
240 E. Montgomery Ave.
Ardmore, Pa. 19003

ANSWERS FROM (print name) _____

Address _____

_____

I would be interested in a telephone-answering device

◯ one-recorder, message out only
◯ two-recorder, providing for caller's incoming messages

I would prefer

◯ PC board only (willing to pay up to $)
◯ PC board & component kit (up to $)
◯ assembled (up to $)

The following information may be useful

◯ A good circuit is published in (magazine) _____

(date of issue) _____

◯ PC boards/kits are available already, from

_____

◯ I have attached a circuit diagram of my own design and would be willing to discuss production of it with PACS

◯ I have PC board facilities available for production in reasonable quantities and would be willing to arrange with PACS for their use.

◯ Custom PC boards can be made up for you at low cost by _____

_____

◯ Other helpful material is attached.

DIRECT MEMORY ACCESS WITH

by BILL GOBLE
from CGRS MICROTECH

A typical microcomputer system consists of a microprocessor, some program storage - "ROM", random access memory - "RAM", and input/output - "I/O". The parallel connected lines that run from device to device are divided into three sections called 1) the address bus, 2) the data bus, and 3) the control bus. In normal operation, the microprocessor controls these buses and moves through its program doing its job. Memory is loaded by microprocessor control through its I/O devices, typically a terminal of some sort (Fig. 1).

However, sometimes the microcomputer user finds it very desirable to directly control memory. This feature can be invaluable when trying to troubleshoot a microcomputer system or when loading memory from a "front panel" when no terminal type device is available.

Direct Memory Access,(DMA) implies that the user has direct access to the memory for reading or writing. This can be done by a technique called "cycle stealing" in which the memory is accessed during the ϕ_1 cycle of the miroprocessor. But this technique cannot be used with slow mwmories and generally it is much simpler to stop the microprocessor and disconnect it from the bus.

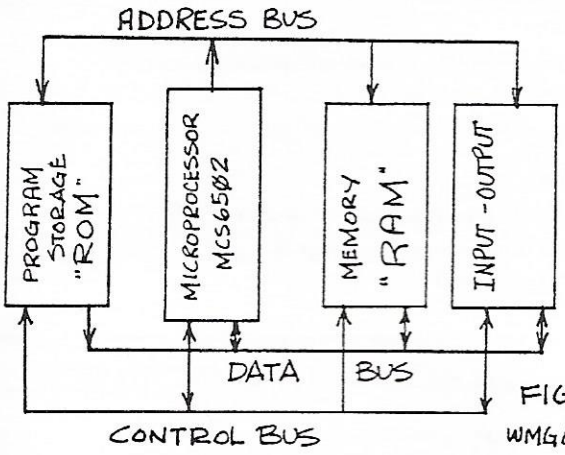


FIG. 1
WMG 070176

The Data Bus is looking for hardware articles so we can make this a regular section. Article should be specific (ie. give device numbers) but should also include a little background material for tutorial purposes.

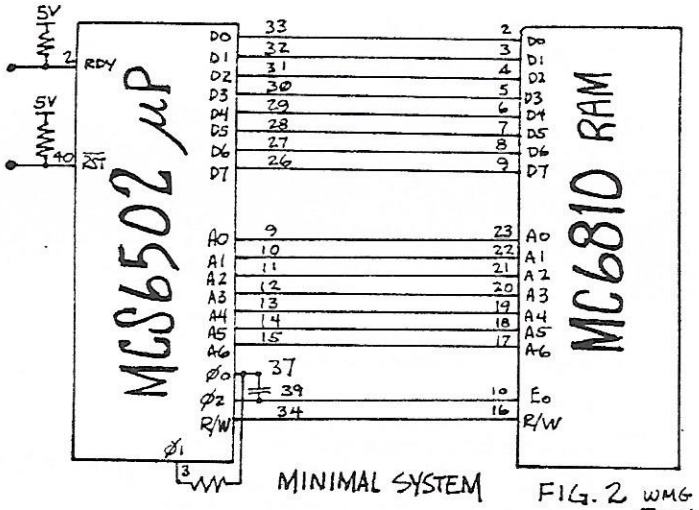


FIG. 2 WMG 070176

Take, for example, a minimum system consisting of the MCS6502 microprocessor hook to a MC6810, 128 X 8, ransom access memory such as in Fig. 2. In order to directly control the MC6810 memory, it is necessary to add some external circuitry including tri-state buffers to disconnect the address lines from the microprocessor. This allows an external device to control the bus without fighting the microprocessor. Fig. 3 shows the minimal system with all additional circuitry required for direct memory control.

The "DMA CONTROL" switch grounds the "READY" line requesting the microprocessor to halt and this happens during the next read cycle. The discrete logic and D-type flip-flop provide a signal that detects this next microprocessor read cycle and the output of the flip-flop indicates "BUS AVAILABLE". When the bus becomes available, the buffers are put into a high impedance mode allowing an external device to control and load memory. The external device then sets the address lines and the read/write line as desired to read or write from any location in memory.

Both fromt panel controls and "smart terminals such as the TV Dazzler (1) use the DMA technique to read and write with the microcomputer memory. The technique is very simple with the MCS6502 and can be very useful. DMA capability is a valuable asset in any microcomputer system and eventually your system will have need for it!

1. "Build the TV Dazzler" by Terry Walker, Roger Melen, Harry Garland, and Ed Hall. Popular Electronics, February, 1976.

Reference: "MCS6500 Microcomputer Family Hardware Manual", August 1975, 1st Edition, MOS Technology, Inc. 950 Rittenhouse Rd.,Norristown, Pa. 19401.

THE MCS6502 MICROPROCESSOR

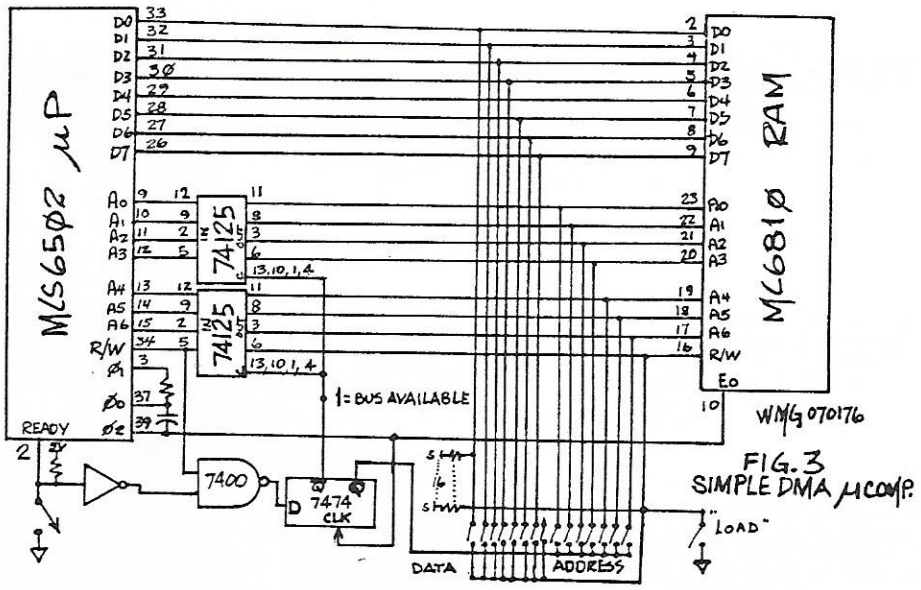


FIG. 3
SIMPLE DMA μCOMP.

A GUIDE TO MICROCOMPUTER MAGAZINES

BYTE
70 Main St.
Peterborough, NH 03458

$12/yr. (monthly)

A must for the microcomputer hobbyist. Hardware and software articles written at all levels.

Creative Computing
P.O. Box 789-M
Morristown, NJ 07960

$10/yr (bimonthly)
$6/yr for students

If you get your system up and then don't know what to do with it subscribe to Creative Computing. Everything from Artificial Intelligence to Computer Art.

Micro-8 Computer User Group
Cabrillo Computer Center
4350 Constellation Rd.
Lompoc, CA 93436

$6/yr (bimonthly)

Originally started as a user group newsletter for the people who built the Mark-8 (July 1974, Radio Electronics) and now is a collection of letters and information submitted by hobbyists across the country. Lots of useful tidbits.

The Digital Group Clearinghouse
P.O. Box 6528
Denver, Colorado 80206

$6/yr (monthly)

Started out slow but apparently they are shaping up. Some good comparisons of microcomputers in the last issue for those who are trying to decide on one.

Interface
Southern California
Computer Society
P.O. Box 3123
Los Angeles, CA 90051

$10/yr (monthly)

Official publication of the Southern California Computer Society. They have a group purchasing plan, articles on teletype repair, and complete software listings.

The Computer Hobbyist
Box 295
Cary, NC 27511

$6/yr (monthly)

Good articles on hardware. Interfaces for cassette, graphics, and floppy disk in past issues.

People's Computer Company
P.O. Box 310
Menlo Park, CA 94025

$6/yr. (7 issues)

THE source for games and educational articles on computing. A good guide to computer recources.

Dr. Dobb's Journal of
Tiny BASIC, Computer
Calesthenics and Orthodontia: Running Light
Without Overbyte
(whew!)

$10/yr. (monthly)

THE software source for microcomputers. Highly recommended. Same address as PCC.

NEW ONES (Jumping on the Byte Bandwagon ?)

Personal Computing
Benwill Publishing Co.
167 Corey Rd.
Brookline, MA 02146

$6/yr (bimonthly)

First issue scheduled for Oct.-Nov. 1976.

Microtrek
Schneider Publications, Inc.
Dows Building
Cedar Rapids, Iowa 52401

$10/yr (monthly)

All I got for my $10 was a letter saying they need articles. We will have to see how this one turns out.

Personal Computing

76 Consumer Trade Fair • Atlantic City, N. J. • August 28th 29th, 1976

503 WEST NEW JERSEY AVENUE SOMERS POINT NEW JERSEY 08244 (609) 927-6950

Inexpensive computers for the home? For the small businessman? For industrial machine control? For educational purposes? The ultimate toy? The answer to all the above is YES-YES-YES-YES! Read on----

One of the latest advances in the ever growing field of electronics is the micro or personal computer. Unlike their country cousins, the pocket caculator, these relatively small and inexpensive units can perform many of the functions that a few years ago took a room full of components, costing hundreds of thousands of dollars.

The rapid development of these devises and the quick entry into the market by a number of new firms, has brought the price down to the point where a complete personal computer can be purchased and placed in operation for as little as $245., of course one can add on a few extras to make his system more versatile and the cost will rise accordingly, perhaps to a few thousand dollars.

Those already owning personal computers have employed them in a variety of ways, from making up mailing lists to handling the bookkeeping and inventory control for small businesses in their area. Schools are purchasing personal computers for teaching and learning aids for their students. Hobbyists are using them to control their Ham Radio stations and for playing exotic games such as Startrek (a three dimensional space war game) and chess. Checkers and tic-tac-toe can also be played.

Personal computers can be designed by the owner with specific functions in mind. Plug-in modulues make changing functions easy, thereby making an individual computer as simple or complex as necessary. One other factor that contributes to the low cost of personal computers is the availability of kits. Many owners actually build their own units from manufacturer supplied kits.

PERSONAL COMPUTING '76 will be a national gathering of manufacturers and users to discuss and exhibit microcomputers, and is open to the public. The weekend show is sponsored by the Southern Counties Amateur Radio Association of New Jersey, K2BR. and is being held in the AIRCONDITIONED convention facilities of the Shelburne Hotel/ Motel, Michigan Ave. on the famous Atlantic City Boardwalk. Experts in their fields will conduct many varied seminars and demonstrations on all aspects of personal computing. For the beginner, for the student, for the businessman, and even for the advanced computer experts.

Bring your family because Atlantic City is a family resort, with many interesting things to do. There is the famous Beach and Boardwalk, shopping, Night Clubs, Bowling, fishing, amusments, and many other exciting places to visit nearby. Those of you coming from the Midwest or West Coast should plan to visit Bicentennial Philadelphia and see the exhibits in our nations first capital, only an hour away by car or bus.

To order your tickets please complete the form below, and indicate if you want reservation information from the hotel. MAIL FORM AND MAKE CHECK PAYABLE TO: PERSONAL COMPUTING '76, 503 West New Jersey Ave., Somers Point, New Jersey, 08244.

See you August 28-29th.

****

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I want the reduced hotel rate reservation information. _____

PACS

****

NUMBER OF TICKETS _____ ENCLOSED $ _____ Tickets are $7.50 at the door and are $5.00 each if ordered in advance. Tickets are for the entire weekend including all seminars and the greatest door prizes you ever saw. (several personal computers will be awarded to some lucky individuals)

HIT THE BEACH ...

Personal
Computing
76 Consumer Trade Fair

Atlantic City, N.J.
August 28th-29th

What its all about!

Software Development
Micro Computers
Hardware Development
Disc Memories
Computer Comparisons
Interfacing
Program Implementation
AMSAT
Computerized Music
Video Terminals
Kit Construction
Printers
Computer Games
Digital Tapes

- Seminars and Technical talks by leading electronic equipment manufacturers
- Major Exhibits from all over the country
- Demonstrations in many areas including Home and Personal Computing
- Door Prizes, Free Literature and Free Mementos
- All this plus Sun and Surf - Fun and Excitement - Relaxation and Leisure

Weekend Fair admission $5.00 advanced. $7.50 at door
Admission includes Exhibits, Seminars

Write for FREE TRIP-KIT to Personal Computing 76 Fair Headquarters Shelburne Hotel-Motel
Box 1138 Boardwalk and Michigan Ave. Atlantic City, New Jersey 08404
EXHIBITION BOOTHS STILL AVAILABLE - CALL (609) 927-6950

BOOK REVIEWS

by Cyril Solomons

Two Good Books on BASIC

BASIC is Beginners All-Purpose Symbolic Instructive Code language (sometimes confused with Basic FORTRAN, which is merely a simple version of FORTRAN language). Designed at Dartmouth College by a group of professors and students as an easy way to get novices to use the computer, it proved so successful that many users never desire to progress beyond one of its many powerful, extended versions (Super BASIC, Extended BASIC, etc.) or even need to do so. Those who do need or want to extend their programming skills find that BASIC serves as an excellent introduction to programming principles and to other languages such as FORTRAN,APL,PL/1, or ALGOL, even to COBOL and assembly languages. The recent advent of a cut-down version, Tiny BASIC, brings this useful language within the range of a microcomputer equipped with as little as 2K 8-bit bytes of memory.

It should not be unexpected, therefore, to find numerous manuals, texts, guides, and primers on BASIC in the bookshop. Unfortunately, the only thing that can be said in favor of many such works is that BASIC is fundamentally so simple, it is difficult not to learn a great deal about it from almost any book or article.

Two books, however, can be recommended: Programming Time-Shared Computers in BASIC by Eugene H. Barnett (Wiley-Interscience, 1972) and Computer Programming in BASIC by J.P. Pavlovich and T.E. Tahan (Holden-Day, 1971). These are both clearly written, with lots of explanatory material especially helpful to the lone student. Both are available in paperback.

In scope they both progress from a base of programming ignorance to the solution of problems requiring a fair degree of mathematical sophistication. Pavlovich/Tahan includes some integral calculus, matrix algebra, descriptive statistics, and numerical analysis, for example, and is the better book for those who wish to continue to an advanced level of skill in mathematics programming. Barnett, however, is the easier to read, being printed in clearer type on a better quality paper, and uses more gimmicks (like cartoon drawings and shaded areas on program listings for highlighting) to assist the student. I have used both successfully with high school students and even some younger pupils, as well as with college students, graduates, and mathematics teachers.

BASIC is primarily algebraic in orientation, with rather limited word and character handling capabilities in some versions, hence both books emphasize mathematical applications. Perhaps because some implementations of BASIC lack adequate file-handling capabilities, Barnett provides few examples of business applications, which generally make heavy demands on files, and Pavlovich/Tahan ignores files completely.

Both books have one major shortcoming, in that insufficient attention is paid to program design, however, very few books cover this topic adequately. They assume that the "programmer"has solved the problem of what to do ("analysis"), and merely needs to write ("code") appropriate instructions for the computer to follow. Since analysis is often nearly half the total job, with error detection and removal ("debugging") taking up most of the rest of the effort, these books (like most programming books) deal mainly with a relatively minor 10-20% of a complete large project (small programs may need little analysis and debugging). If this is borne in mind, however, either book can be highly recommended for that portion of a programming project which involves coding in BASIC, or as an introduction to coding in general.

PERSONAL COMPUTING TRADE FAIR

Personal Computing is planning the largest microcomputer show ever. It will be held in Atlantic City, August 28th & 29th. Over 10 computers will be given away as door prizes including an Altair 680, SWTP 6800, and KIM-1. Computer stores and manufacturers will be there including the old grandaddy IBM. Several new products will be announced at the fair.

Please use the form enclosed to order your tickets. The Society gets $1.00 back from each ticket bought by our members so you'll be helping us as well as attending a great computer fair. (If the form is missing contact Dick Moberg).

RATES FOR HOTEL SHELBURNE:

Single	economy	city view	ocean/pool view	deluxe
3 nights	$54	66	78	90
2 nights	40	48	56	64
Double				
per person				
3 nights	36	42	48	54
2 nights	26	30	34	38

Add $5.00 for third or fourth person. Children under 12 free. Free parking. 5% state tax.

Food Plan A: Friday buffet dinner
Breakfast Sat. & Sun.
Sat. dinner banquet
$30.00

Food Plan B: Sat. dinner banquet
Sun. buffet breakfast
$20.00

People

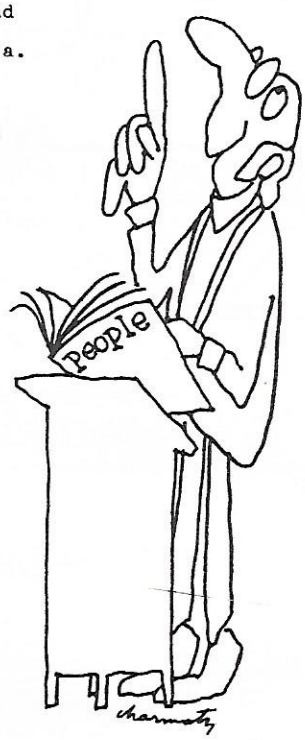
Each month in this section the Data Bus will feature one or several of our members; their backgrounds and interests. To start with, we present the officers of PACS.

DICK MOBERG
PRESIDENT

Dick was born in Ft. Lauderdale, Florida and lived and attended schools in nearby Hollywood. For educational reasons he left the beach and went to a New England school, Choate, for two years before attending the University of Pennsylvania. At Penn he majored in electrical engineering and pre-med and graduated in 1973 with a BSEE. He is now working on a PhD in biomedical engineering from Penn and will be a medical student at Jefferson Medical College this fall.

He has worked 4 years for the chairman of the Dept. of Neurosurgery at Jefferson on his spinal cord injury project and during this time he "found some very interesting places where microprocessors might be placed." He is now doing his thesis on microcomputer replacements for various brain functions (either as an aid to or extension of its function).

Working on two degrees and with a job on the side leaves very little time for a normal social life. Thus, he is designing a programmable "bionic woman" for future companionship and maid service.



FRANK CONTINI
SECRETARY

Gianfranco Contini was born in Milan, Italy, and while there he received a PhD from the University of Rome in organic chemistry. He moved to Vene uela in December, 1947, and was Director of the Chemical Laboratory of the Health Ministry in Maracaibo.

He then moved to the United States in 1952 and worked as a research chemist in the R & D Dapartment of the Atlantic Refining Company. After attending the University of Pennsylvania he became Development Engineer involved in the sales and development of Atlantic's patented processes, mainly catalytic reforming.

He became a travel agent in 1958 and has owned and operated the Central Travel Bureau, Inc. since that time. He is married to Marie and they have one daughter who is a junior at the University of Delaware.

He became interested in computers in 1975 and now owns an Altair 8800 with 21K of memory, dual floppies, and TTY (up but not running yet). His main interests are software and scientific and business applications.

CYRIL SOLOMONS
VICE-PRESIDENT

Born in London, England, studied and then taught at the University of London. Spent two years on a post doctoral fellowship at Rensselaer Polytechnical Institute, Troy, New York. "Learned to program in 1s and 0s." In 1960, he was invited back to the the U.S. by the Honeywell Corporate Research Center in Minnesota. A major part of his research there was related to a computer-based network for water pollution instrumentation. By the time he moved to the University of Pennsylvania in 1965 as Assistant Director of the Electrochemistry Laboratory he had been bitten by the computer bug. One of his projects at the University was a computer simulation of ionic diffusion in crystal lattices that was "quite simple in concept but took 14 minutes a run on the IBM 360."

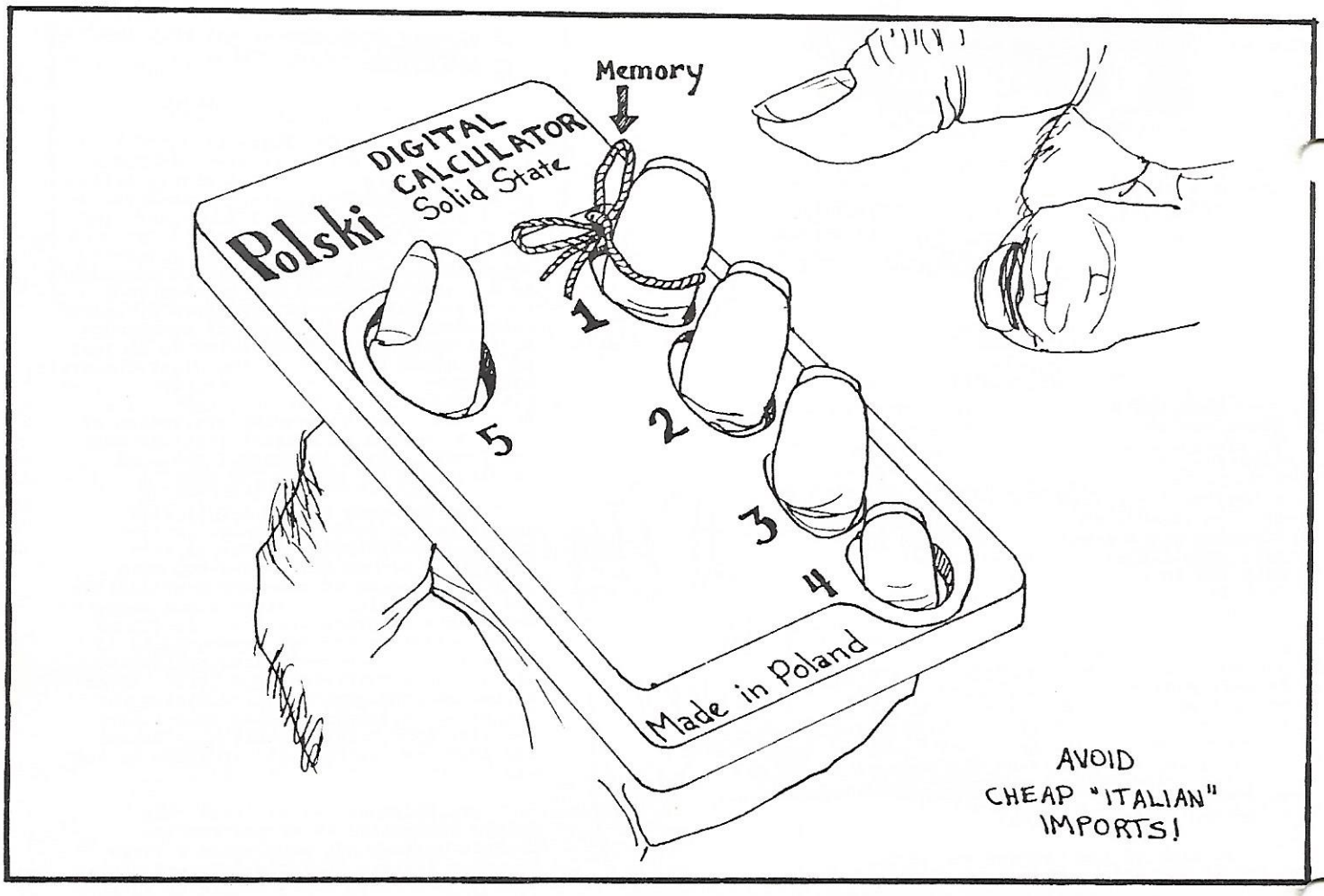
Dr. Solomons became a full-time consultant in 1970. Although part of his practice is still concerned with chemistry, he has moved more and more in the direction of computer applications and the education of people about computers. One of his projects was a simulation of river pollution for the Commonwealth of Pennsylvania, another was an evaluation of the food, nutrition, and health information network of the United States for Congress. A third involved selecting a computer system for a local high school and trianing teachers and students in its use.

Dr. Solomons was at first only mildly interested in microcomputers because most of his work needs a large computer system. But his interest soared when he got ideas for a couple of inventions (he already holds 5 patents) and realized they would be "absolutely fantastic" if computerized. His enthusiasm has infected his son, Daniel, age 15, who is currently preparing to build a microcomputer and use it in teaching a course at Alternative West High School next September as an independent project.

JON AVERY
TREASURER

Jon started his interest in personal computing when he purchased a General Precision LGP-21 computer at a sealed bid auction. That system is an old commercial computer with a 32-bit word and a magnetic drum memory - even the registers are on the drum! A hardware multiply and divide was included that whizzed along at 1/10 second. Since that time, however, Jon has put up an OSI-400 (MCS-6502/TIM) system and is in the process of putting up a home brew 8080A with a home-brew IMP-16 in the planning stage. Jon built his own own TV display before the kits were available and enjoys "rolling his own" whether it's hardware or software.

Jon works at General Electric Space Division in Valley Forge where he is Manager of Computer Systems Engineering. In this capacity he works with several micro, mini, midi, and maxi computer systems and uses several programming languages including assembly, FORTRAN, COBOL, and simulation languages such as GPSS and SIMSCRIPT.



PHILADELPHIA AREA COMPUTER SOCIETY
404 South Quince St.
Philadelphia, PA 19147