

# Pascal News

(FORMERLY PASCAL NEWSLETTER)

NUMBER 11

COMMUNICATIONS ABOUT THE PROGRAMMING LANGUAGE PASCAL BY PASCALERS

FEBRUARY, 1978

## TABLE OF CONTENTS

COVER: Paper Fasteners from the mail of international Pascalers

0 POLICY: Pascal News

1 ALL PURPOSE COUPON

3 EDITOR'S CONTRIBUTION

4 HERE AND THERE WITH PASCAL

4 News (Jobs, Help Wanted!, Tidbits from Pascalers)

8 Pascal in the News

10 Conferences

10 Books and Articles

13 Errata to Pascal User Manual and Report, Second Edition

16 Review of Pascal Newsletters 5 - 8

19 Roster Increment

33 ARTICLES

33 "Type Compatibility Checking in Pascal Compilers" Pierre Desjardins

34 "A Novel Approach to Compiler Design" James Q. Arnold

36 "Status of UCSD Pascal Project" Kenneth L. Bowles

40 "Suggestions for Pascal Implementations" Willett Kempton

41 "Suggested Extensions to Pascal" Robert A. Fraley

48 "What to do After a While" David W. Barron and Judy M. Mullins

51 "Adapting Pascal for the PDP 11/45" David D. Miller

54 "Pascal: Standards and Extensions" Chris Bishop

57 OPEN FORUM FOR MEMBERS

64 Special Topic: Pascal Standards

70 IMPLEMENTATION NOTES

70 General Information

70 Applications

70 Portable Pascals

72 Pascal Variants

75 Feature Implementation Notes

80 Machine Dependent Implementations

104 Index to Implementation Notes

105 POLICY: Pascal User's Group

EX LIBRIS: David T. Craig  
736 Edgewater  
[# ] Wichita, Kansas 67230 (USA)

# POLICY: PASCAL NEWS (77/12/30)

- \* Pascal News is the official but informal publication of the User's Group.

Pascal News contains all we (the editors) know about Pascal; we use it as the vehicle to answer all inquiries because our physical energy and resources for answering individual requests are finite. As PUG grows, we unfortunately succumb to the reality of (1) having to insist that people who need to know "about Pascal" join PUG and read Pascal News - that is why we spend time to produce it! and (2) refusing to return phone calls or answer letters full of questions - we will pass the questions on to the readership of Pascal News. Please understand what the collective effect of individual inquiries has at the "concentrators" (our phones and mailboxes). We are trying honestly to say: "we cannot promise more than we can do."

- \* An attempt is made to produce Pascal News 4 times during an academic year from July 1 to June 30; usually September, November, February, and May.
- \* ALL THE NEWS THAT FITS, WE PRINT. Please send written material for Pascal News single spaced and in camera-ready form. Use lines 18.5 cm wide!
- \* Remember: ALL LETTERS TO US WILL BE PRINTED UNLESS THEY CONTAIN A REQUEST TO THE CONTRARY.
- \* Pascal News is divided into flexible sections:

POLICY - tries to explain the way we do things (ALL PURPOSE COUPON, etc.).

EDITOR'S CONTRIBUTION - passes along the opinion and point of view of the editor together with changes in the mechanics of PUG operation, etc.

HERE AND THERE WITH PASCAL - presents news from people, conference announcements and reports, new books and articles (including reviews), notices of Pascal applications, history, membership rosters, etc.

ARTICLES - contains formal, submitted contributions (such as Pascal philosophy, use of Pascal as a teaching tool, use of Pascal at different computer installations, how to promote Pascal, etc.)

OPEN FORUM FOR MEMBERS - contains short, informal correspondence among members which is of interest to the readership of Pascal News.

IMPLEMENTATION NOTES - reports news of Pascal implementations: contacts for maintainers, implementors, distributors, and documentors of various implementations as well as where to send bug reports. Qualitative and quantitative descriptions and comparisons of various implementations are publicized. Sections contain information about Software Writing Tools for a Pascal environment, Portable Pascals, Pascal Variants, Feature Implementation Notes, Machine Dependent Implementations, etc.

- \* Volunteer editors are:

Andy Mickel - editor  
Tim Bonham and Jim Miner - Implementation Notes editors  
Sara Graffunder - Here and There editor  
John Strait and John Easton - Tasks editors  
Rich Stevens - Books and Articles editor  
Rich Cichelli - Software Tools and Applications editor  
George Richmond - past editor (issues 1 through 4)

RECEIVED

FEB 16 1978

CYTROL INC.

Policy

PASCAL USER'S GROUP

USER'S  
GROUP

ALL PURPOSE COUPON

\*\*\*\*\*

(77/12/30)

Pascal User's Group, c/o Andy Mickel  
University Computer Center: 227 EX  
208 SE Union Street  
University of Minnesota  
Minneapolis, MN 55455 USA

+ Clip, photocopy, or  
+  
+ reproduce, etc. and  
+  
+ mail to this address.

// Please enter me as a new member of the PASCAL USER'S GROUP for \_\_\_ Academic year(s) ending June 30 \_\_\_\_\_. I shall receive all 4 issues of Pascal News for each year. Enclosed please find \_\_\_\_\_ (\$4.00 for each year). (\* When joining from overseas, check the Pascal News POLICY section on the reverse side for a PUG "regional representative." \*)

// Please renew my membership in PASCAL USER'S GROUP for \_\_\_ Academic year(s) ending June 30 \_\_\_\_\_. Enclosed please find \_\_\_\_\_ (\$4.00 for each year).

// Please send a copy of Pascal News Number(s) \_\_\_\_\_. (\* See the Pascal News POLICY section on the reverse side for prices and issues available. \*)

// My new <sup>address</sup> <sub>phone</sub> is printed below. Please use it from now on. I'll enclose an old mailing label if I can find one.

// You messed up my <sup>address</sup> <sub>phone</sub>. See below.

// Enclosed please find a contribution (such as what we are doing with Pascal at our computer installation), idea, article, or opinion which I wish to submit for publication in the next issue of Pascal News. (\* Please send bug reports to the maintainer of the appropriate implementation listed in the Pascal News IMPLEMENTATION NOTES section. \*)

// None of the above. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other comments: \_\_\_\_\_  
From: name \_\_\_\_\_  
mailing address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
phone \_\_\_\_\_  
computer system(s) \_\_\_\_\_  
date \_\_\_\_\_

(\* Your phone number aids communication with other PUG members. \*)

JOINING PASCAL USER'S GROUP?

- membership is open to anyone: particularly the Pascal user, teacher, maintainer, implementor, distributor, or just plain fan. Memberships from libraries are also encouraged.
- please enclose the proper prepayment - we will not bill you.
- please do not send us purchase orders - we cannot endure the paper work! (if you are trying to get your organization to pay for your membership, think of the cost of paperwork involved for such a small sum as a PUG membership).
- when you join PUG anytime within an academic year: July 1 to June 30, you will receive all issues of Pascal News for that year unless you request otherwise. You will receive a membership receipt.
- please remember that PUG is run by volunteers who don't consider themselves in the "publishing business." We consider production of Pascal News as simply a means toward the end of promoting Pascal and communicating news of events surrounding Pascal to persons interested in Pascal. We are simply interested in the news ourselves and prefer to share it through Pascal News (rather than having to answer individually every letter and phone call). We desire to keep paperwork to a minimum because we have other work to do.

JOINING THROUGH "REGIONAL REPRESENTATIVES" ?

- To join through PUG(USA), see address on reverse side. International telephone: 1-612-376-7290. PUG(USA) produces Pascal News and keeps all mailing addresses on a common list. Regional representatives collect memberships from their regions as a service and reprint and distribute Pascal News using mailing labels sent from PUG(USA). Persons in the Australasian Region must join through PUG(AUS).

European Region (Europe, North Africa, Middle and Near East):  
 send £2.50 to: Pascal Users' Group (UK)  
 c/o Computer Studies Group  
 Mathematics Department  
 The University  
 Southampton SO9 5NH  
 United Kingdom  
 telephone: 44-703-559122 x700

Australasian Region (Australia, New Zealand, Indonesia, Malaysia):  
 send \$A10 to: Pascal Users Group (AUS)  
 c/o Arthur Sale  
 Dept. of Information Sci.  
 University of Tasmania  
 GPO Box 252C  
 Hobart, Tasmania 7001  
 Australia  
 telephone: (002) 23 0561

RENEWING?

- please renew early (before August) and please write us a line or two to tell us what you are doing with Pascal, and tell us what you think of PUG and Pascal News to help keep us honest. To save PUG postage, we do not send receipts when you renew.

ORDERING BACKISSUES OR EXTRA ISSUES?

Our unusual policy of automatically sending all issues of Pascal News to anyone who joins within an academic year (July 1 to June 30) means that we eliminate many requests for backissues ahead of time, and we don't have to reprint important information in every issue - especially about Pascal implementations!

- Issues 1, 2, 3, and 4 (January, 1974 - August, 1976) are out of print.
- Issues 5, 6, 7, and 8 (September, 1976 - May, 1977) are out of print.  
 (A few copies of issue 8 remain at PUG(UK) available for £1 each.)
- Extra single copies of new issues (current academic year) are:  
 \$2 each - PUG(USA); £1 each - PUG(UK); and \$A3 each - PUG(AUS).

SENDING MATERIAL FOR PUBLICATION?

(such as ideas, queries, articles, letters, opinions, notices, news, implementation information, conference announcements and reports, etc.) "ALL THE NEWS THAT FITS, WE PRINT." Please send written material for Pascal News single spaced and in camera-ready form. Use lines 18.5 cm wide! Remember: ALL LETTERS TO US WILL BE PRINTED UNLESS THEY CONTAIN A REQUEST TO THE CONTRARY.

MISCELLANEOUS INQUIRIES? Please remember we will use Pascal News as the vehicle to answer all inquiries and regret to be unable to answer individual requests.



UNIVERSITY OF MINNESOTA  
TWIN CITIES

University Computer Center  
227 Experimental Engineering Building  
Minneapolis, Minnesota 55455  
(612) 376-7290

The DEADLINE for written contributions to Pascal News #12 is March 20. Please send DARK copy! New companies committed to Pascal (add to the list in PUGN#9): Ericsson Telephone and ICL in Europe, Interdata and Tektronix in the US. TI continues to be very mysterious about their heavy use of Pascal - they haven't told us a word in a year now! DEC may be finally waking up because of DOD-1 (see Here and There). Thanks to everyone who sent material for this issue. We sent renewal notices to 315 holdouts in November. We may have to stop sending receipts for membership - it is getting too time consuming. We will probably have to combine issues 13&14 next autumn.

Judy sent the letter below to "The Editor, Pascal News":

*- Andy*



UNIVERSITY OF SOUTHAMPTON  
Faculty of Mathematical Studies

Southampton, SO9 5NH. Telex 47661. Tel 0703 559122 Ext 2387

5th December, 1977.

Dear Andy,

PUG (UK) PRINTING and POSTAGE

Now that PUGN 9/10 is out of the way, I thought I would share some statistics on printing costs.

PUGN		USA		UK	
number	pages	per copy	per page	per copy	per page
5	64	\$0.70	1.09c	?	?
6	96	\$1.18	1.23c	\$0.50	.52c
7	48	\$0.69	1.44c	\$0.14	.29c
8	64	\$1.07	1.67c	\$0.40	.62c
9/10	112	?	?	\$0.56	.51c

As you can see, we have managed to keep our costs at well below half yours. After No. 8, we outgrew the Departmental printing service and took 9/10 to the University Printing Unit. They were able to do the job at the same price - in fact slightly cheaper because I did much of the collating myself to hurry it along. However, indications are that there could be a steep rise in costs in the New Year. It may be possible to avoid it, and in order to do so we need to know, accurately,

No. of pages in No. 11  
Date of arrival of Masters.

However, should it not be possible to get preferential rates, we shall have to face a cost of about 90c for a 64 page issue (compared to \$1.07 in the U.S.A. and 40c previously). Are you still relying on our ultra cheap rates or can PUG afford to pay the going rate?

**Editor's Contribution**

Postage for 9/10 was

Country - group	Unit Cost	Previous group	Unit Cost
U.K. 350g	45c	300g	39c
Europe 500g	48c	250g	26c

and came to a total of \$115 (approx.). The mailing included close on 50 renewals received after you ran the labels off. As you can see, it is unlikely that any future issue will hit the lower group for European postage, so that we might have to face 90c + 48c = \$1.38 for getting a copy to a European member. However, with luck we can still do it at under a dollar.

That seems to be all. I have today handed over the files in good order to David who will handle everything after my departure. Following his article in Computing we have had an influx of queries, especially from Industry. Pascal lives!

Thank you very much for all the numerous snippets of information over the past year, and for the most recent ones on South Africa. The personal touch is sincerely appreciated. You will be glad to know that Wits are seriously contemplating switching from Fortran to Pascal for first years (including engineers) in January. It all depends on whether a decent 370 compiler is ready.

I'll keep in touch, of course, and won't forget to send a photo of the wedding.

All the best,

*Judy Mullins*  
Judy Mullins

Professors: H.B. Griffiths, S.A. Robertson (Pure Mathematics); P.T. Landsberg (Applied Mathematics); J.W. Craggs (Engineering Mathematics); D.W. Barron (Computer Studies); T.M.F. Smith (Statistics).

(\* It might help explain to new PUG members a few related facts. Judy Mullins last year (76-77) proposed and implemented a reprinting and distribution service of PUGN for PUG members in Europe. Not only was delivery speeded, but also the rates were kept low. Last March, the University of Southampton Computer Studies Group headed by Prof. David Barron held their third annual computing symposium on "Pascal - the Language and Implementation." Both Judy and David have done PUG many great services. Judy graduated this month and is going home to South Africa where she will marry her fiance. David (who by the way edits the ever-popular journal: SOFTWARE - Practice and Experience) recently wrote an outstanding article for the 77/10/24 issue of Computing Europe (a kind of Computerworld for Europe); please see Here and There.

David continues to man the PUG European region and as a result had to quit as a Books and Articles editor for PUGN.

Regarding the question marks under "USA" for PUGN 9/10 in Judy's letter, the costs were \$1.10 and \$0.96. Ken Robinson (see Open Forum) asks for a public explanation of the high (\$A10) cost of PUGN for Australasian members for the new distribution service provided this year by Arthur Sale. Arthur on 77/09/07 sent this information about his estimated costs: \$2.80 for printing per issue (based on the size of #8); postage within Australia = \$0.70. Arthur says that he thinks the cost is "dubiously low" and that \$10 might leave his operation "out of pocket, and to understand the costing, you have to realize that Australia has a high postal charge, and I also am taking on New Zealand." I think it is unfortunate that Arthur's costs are so high, because it is not in the cheap spirit of PUG. Until Ken wrote I didn't know the \$A10 price was relatively "high". Remember though that last year we had severe distribution problems to Australia. I'm grateful to Arthur for volunteering to do the work, and I'm sure he's watching costs. - Andy \*)

# Here and There With Pascal

## NEWS

### PASCAL JOBS...

People keep calling us at PUG central asking for people to employ who know Pascal. (\*If that isn't evidence of Pascal's viability, I don't know what is!\*) With the interest of Pascalers in mind we list here as a service contacts who desire people with compiler experience and knowledge of Pascal:

David Shaw, Structured Systems Corp., Suite 605, 2600 El Camino Real, Palo Alto, CA 94306. (415) 321-8111

Charles Moore, ADP Network Services, 175 Jackson Plaza, Ann Arbor, MI 48106. (313) 769-6800 (also Neil Barta, same address and phone)

Gregory Hopwood, Sperry Univac Mini Computer Division (formerly Varian), 2722 Michelson Drive, Irvine, CA 92713. (714) 833-2400

### HELP WANTED!

If Pascal is to make any inroads into serious scientific computing (currently the almost exclusive preserve of FORTRAN) it must have a decent library of scientific subroutines - which means, as far as the U.K. is concerned, that there must be a Pascal version of the NAG (Numerical Algorithms Group) library. (\*...and as far as the U.S. is concerned, that there must be a Pascal version of the IMSL (International Mathematics and Statistics Library) library...\*)

It should be possible to make a Pascal NAG library largely machine-independent, with all machine-dependent features begin collected into the "X" routines. Probably the easiest method of production of the library would be straight transcription of the existing ALGOL-60 versions, together with the writing of the set of "X" routines for each different range of machines.

Please send your views on this matter, and offers of help, to:

Professor D. W. Barron,  
Computer Studies Group,  
Department of Mathematics,  
The University,  
Southampton, Hants, SO9 5NH (United Kingdom)

who is coordinating this project and negotiating with NAG.

### TIDBITS

D. B. Anderson, 280 Bella Vista Drive, Hillsborough, CA 94010: "I am particularly interested in implementations usable on my company's Interdata 7-32." (\* 77/12/12 \*)

David B. Anderson, Dept. of Math., Lehigh University, Bethlehem, PA 18015: "By the way, the section in the newsletter called 'Here and There with Pascal' has been very helpful in stimulating the interest of non-believers." (\* 77/12/17 \*)

Peter A. Armstrong, Digital Data Systems, 1113 Dexter Ave. N., Seattle, WA 98109: "We are immediately interested in information on PASCAL compilers for PDP-11 processors running DEC's RSTS/E monitor. However, we are also interested in any mini- and or

microcomputer PASCAL capabilities." (\* 77/12/13 \*)

Paul Barr, Raytheon Co., Equipment Div., Boston Post Road, Wayland, MA 01778: "Am attempting to use PASCAL for a Signal Processing application (FFT). Am designing hardware to fit the compiler." (\* 77/11/21 \*)

Michael Behar, 428 Windy Hill Rd., Orange, CT 06477: "Do you know if there is a version of PASCAL for a MICRO-MIND-II computer (manufactured by ECD of Cambridge, MA)?" (\* 77/9/22 \*)

Roy E. Bollinger, Dept. 1965, BLD 529, Lockheed, P. O. Box 504, Sunnyvale, CA 94088: "Are there any plans to have any Pascal seminars?" (\* 77/11/8 \*)

Steven L. Brecher, 5221 Marina Pacifica Dr., N. Key 19, Long Beach, CA 90803: "More generally, I am interested in information on any implementation which can be run on/adapted to a Digital Equipment LSI-11 based system." (\* 77/12/19 \*)

A. Charles Buckley, Data/Information Systems, Urban Studies Center, Gardencourt/Alta Vista Road, Louisville, KY 40205: "We are currently interested in any work being done to implement Hansen's CONCURRENT PASCAL on a DEC-10 and/or an IBM 370." (\* 77/11/28 \*)

David Burnett-Hall, Univ. of York, Heslington, York, YO1 5DD, England: "In the discussions on whether array parameters could be dynamic in size, there have been some suggestions that only numerical analysts handling matrices need these facilities. A much more important use, to my mind, is to be able to pass strings of varying lengths. E. g., the DEC-10 compiler has to have 9 almost identical error routines, to handle errors of lengths 15, 20, 25, . . . 55 characters: Stupid." (\* 77/8/10 \*)

Joe Celko, Box # 11023, Atlanta, GA 30310: "Is there a Nova Pascal sitting around?" (\* 77/12/6 \*)

Grant M. Colvin, Management Shares, 2121 W. Airport Frwy., Suite 660, Irving, TX 75062: "Do you know of PASCAL implementations for the Hewlett-Packard 3000 series?" (\* 77/12/5 \*)

C. R. Corner, 514 S. 9th St., Moorhead, MN 56560: "I have a PDP 11/05 and am interested in Pascal activity on the 11 and on micro-based systems." (\* 77/09/29 \*)

Lawrence S. Cram, 64 Bowen Street, Newton, MA 02159: "Although I am not now a user of PASCAL, I certainly would like to be, and I would like to be on your mailing list. I program commercial applications on a DECsystem-10 in COBOL and am fed up with the limitations inherent in COBOL. I was introduced to PASCAL in Wirth's book, Data Structures + Algorithms = Programs and have followed up with Hansen's Principles of Operating Systems and the PASCAL Users' Guide. I currently have a second-hand bootleg PASCAL compiler and I dabble with it occasionally." (\* 77/11/8 \*)

Pierre Desjardins, Departement d'informatique, Universite de Montreal, Immeuble principal V-240, Montreal 101 Quebec H3C 3J7, Canada: "My implementation of the Concurrent Pascal machine on Sigma 6 is presently being used to implement (using Concurrent Pascal, of course) the "line access protocol" necessary for communicating with a packet switching service of Bell Canada called DATAPAC. "I am currently involved in the organisation and realization of a primitive distributed microprocessor system. System programs will be written in CP and executed by a CP machine contained in every MP." (\* 77/10/13 \*)

Robert I. Demrow, 11 Linda Rd., Andover, MA 01810: "I am interested in finding a copy of Pascal that will run on my 8080 computer--presently have 32K and am planning an expansion." (\* 77/11/26 \*)

John DeRosa, The Boston Systems Office, 400-1 Totten Pond Road, Waltham, MA 02154: "We're presently beginning development of PASCAL systems for micro's as well as resident compilers with the intent of creating a PASCAL well-suited for writing system software. Any news from people working in this direction would be appreciated." (\* 77/9/21 \*)

George B. Diamond, Diamond Aerosol Corp., RD # 1, Glen Gardner, NJ 08826: "Any other information on PASCAL would be appreciated especially compilers or assemblers for the Z80 CPU." (\* 77/12/14 \*)

Roberto Dias, 134 Colin Ave., Toronto, Ont M5P 2C3, Canada: "I am a humble owner of a digital group Z-80 minicomputer and as such very interested in learning new languages. I understand that you are publishing four times a year a paper on Pascal. I would very much like to subscribe to it but instead of sending US\$4 right now, I would like to know if the price would be the same for a subscriber in Brazil, as I will be moving to that country in February 78, with my computer." (\* 77/11/30 \*)

Richard Dievendorff, Dept. 84F, IBM, 620 North Brand Blvd., Glendale, CA 91203: "Although I am having this sent to my business address, this is a personal, hobby venture." (\* 77/12/3 \*)

Felix F. Dreher, Computer Science, Pittsburg State Univ., Pittsburg, KS 66762: "I am interested in obtaining information about the possible implementation of PASCAL on a small IBM 370/125 machine. Do you have any data suggesting that this has been done? Is there a bootstrap interpreter/compiler available that might be modified for this system? If so, from whom can it be obtained?" (\* 77/10/13 \*)

William E. Drobish, Silicon Systems, 16692 Hale Ave., Irvine, CA 92714: "Additionally, I would appreciate any information on PASCAL compilers and the availability of one for the Interdata 7/32." (\* 77/11/14 \*)

C. E. Duncan, 865 Thornwood Dr., Palo Alto, CA 94303: "I am not at present a user, but would like to be one. We have available a number of computing systems, and I would be particularly interested to obtain a running system for IBM 360/370, Univac 1110, Data General NOVA and Intel 8080A. Perhaps not altogether at once; these systems happen to be conveniently available." (\* 77/10/24 \*)

Randall B. Enger, 28 Briar Patch Lane, Sudbury, MA 01776: "I'm planning to try an implementation on a small machine, mostly because I'm tired of assembly language, but also because I've been away from programming languages stuff for too long. "I like to believe I'm relatively free from 'N.I.H.' disease--'not invented here,' and consequently will eagerly build upon the work of others (borrow from, steal from. . .). Whatever will help me get an implementation going--listings/source on tape/whatever - I'd be willing to spend a few \$ happily (especially if it were to cover copying charges. . .)" (\* 77/11/10 \*)

Robert B. Finch, 910 N. Lk. Samish Dr. # 30, Bellingham, WA 98225, "My interest is personal/hobbyist computing, and I am currently in the process of implementing Per Brinch Hansen's Sequential Pascal on an Alpha-Microsystems AM-100."

Read T. Fleming, Program in Computer Science, Box F, Brown Univ., Providence, RI 02912: "Brown has an IBM 360/67 running CP-CMS for interactive work, an IBM 370/138 for batch, running VS 1. We have on order a Pascal compiler from the Australian Atomic Energy Commission. When it arrives, we hope to put it up on the batch machine immediately, and at some later date add it to the interactive (CP/CMS) system. "Everybody here is looking forward to Pascal; we hope to use it in a course on compile design next semester, and we're anxious to see how it works in an instructional environment." (\* 77/12/18 \*)

Jim Fontana, 3519 W. Warner Ave., Santa Ana, CA 92704: "The implementor/maintainer of the 2550/Cyber 18 Pascal compiler is Gordon Wood at CDC LaJolla operation. The compiler is distributed from PSD in Sunnyvale." (\* 77/11/2 \*)

Ed F. Gehringer, Dept. of Computer Science, Math Sciences Bldg., Purdue Univ., West Lafayette, IN 47907: "You guys sure are lax about sending out renewal notices. Most periodicals bombard you with notices for months before your subscription expires. With PUG, you don't get a single notification until 5 months after your subscription expires." (\* 77/12/16 \*)

## Here and There With Pascal

Thomas Giventer, 1250 Post Road, Scarsdale, NY 10583, "I am currently working on a PASCAL compiler for the TMS 9900 and would like to find out what other work is being done in this area."

Steven B. Hall and Arthur Dartt, 1599 Orchard Grove, Lakewood, OH 44107 (\* address for Hall \*): "The installation with which we are professionally affiliated and are students (Cleveland State University) currently is running VSI on a 370/158. . . . Any help you can give us in differentiating between the various PASCALS will be appreciated (as we do not wish to waste valuable man-hours at vain attempts). We will look forward to hearing from you, as several people are anxious to implement and use PASCAL." (\* 77/12/6 \*)

Michael E. Harris, 309 W. Edwards # 4, Springfield, IL 62704: "Does anyone have a 'full' PASCAL that will work with minor modification on an HP3000 or on an IBM 370/MVS system? Micros? Any computer graphics activity in PASCAL?" (\* 77/10/26 \*)

Charles Hedrick, Computer Science Dept., Rutgers Univ., Hill Center, New Brunswick, NJ 08923: "Implementors should give some thought to implementing machine-independent representations of data so that data is transportable as well as programs. This involves the generating of files which are not textfiles. What may be the only way out is to use ASCII text representations (using blanks as separators where appropriate)." (\* 77/09/20 \*)

H. F. Hession, Adv. Record Systems Eng., Gov't. Systems Div., Western Union, 7916 Westpark Drive, McLean, VA 22101: "We are programming Zilog Z-80 microprocessors in assembly language for communications controller applications, and noted an article in the December 1977 issue of BYTE magazine referring to your user group on PASCAL. "None of us has had training in PASCAL, but given the proper documentation, we are confident we can master it." (\* 77/12/5 \*)

Charles Hethcoat, 2416 Yorktown # 371, Houston, TX 77056: "I obtained a copy of the Pascal PCODE assembler-interpretor with a view to study how it works. I suggest that a worthwhile project would be collect copies of this program as written for a variety of machines and languages, or to write them up for those machines not having a version yet. (This would be especially appealing as a way to implement Pascal on the 8 bit micros). A project like this would go a long way toward assuring that a common language is widely distributed, and at the same time it would simplify life for those wishing to try out language extensions. Also, the PCODE language can be extended to include interruption handling, queues and other real-time techniques for operating system development, as Brinch-Hansen has done with Concurrent Pascal." (\* 77/10/10 \*)

Robert B. (Buzz) Hill, Eyedentify, Inc., P.O. Box 2006, Longview, WA 98632: "We are a new company in the business of developing and manufacturing custom dedicated microprocessor devices. Our main product, the Eyedentifier, is a microprocessor based image recognition system that utilizes the retinal image as a means of identification (as opposed to a finger print). "Although the Eyedentifier is a simple machine whose software was written in Motorola 6800 assembly language, we anticipate the support products we intend to build for it will require development with a high level structured language. "Recently, a group from my company attended a talk at Lewis and Clark college near here, by Kenneth L. Bowles, UCSD on the PASCAL language. As a result, we are very interested in implementing it on a 6800."

Philip T. Hodge, Habco, P.O. Box 305, Schererville, IN 46375: "As a Z-80 based microprocessor user anxiously awaiting the UCSD version of Pascal, it is heartening to find others who share my opinion of both Basic and Pascal." (\* 77/12/6 \*)

Ross F. Householder, 1725 Brooks Drive, Arlington, TX 76012: "I am a Pascal user working at Texas Instruments and would like to see what is going on with Pascal in other parts of the country." (\* 77/09/11 \*)

R. Warren Johnson, Dept. of Math. and Comp. Sci., St. Cloud State U., St. Cloud, MN 56301: "I am seeing more and more hobbyists in beginning courses who need some convincing that PASCAL is real." (\* 77/09/15 \*)

Ernest W. Jones, 59 Billou St., San Rafael, CA 94901: "I am interested in certain languages for use on 16-bit micro's and have investigated the MUMPS language. Pascal would no doubt provide more suitable capabilities, but may not be suitable for so small a machine. I would like to learn more about it nevertheless." (\* 77/12/81 \*)

Mark Jungworth, 13318 Newland St., Garden Grove, CA 92644: "We have recently implemented Pascal on our CDC 7000 machines at McDonnell Douglas in Huntington Beach. I am a complete novice at Pascal usage, but can't wait to BEGIN." (\* 77/09/12 \*)

Milan Karspeck, 1149 North Michigan, Pasadena, CA 91104: "I am dying to get my hands on a PDP-11 PASCAL implementation. According to the December editorial in Byte Magazine, you ran a list of PASCAL implementations in your issue # 8. I would appreciate it if you could begin my subscription with that issue." (\* 77/12/11 \*)

Neil T. Keane, Stansaab Elektronik AB, System Development, Veddestavagen 13, Jaarfaalla, Sweden S-175 62: "As a manufacturer of Turn Key Computer Systems we are currently engaged in the assessment of a suitable high level programming language to which we can standardize our in-house programming. Since we are mainly engaged in real time applications we are particularly interested in Concurrent Pascal. To this end, we would like to know the extent to which it has been implemented in the US (apart from the Solo System), and the status of such implementations." (\* 77/11/17 \*)

Paul Kelly, Educational Data Systems, 1682 Langley Ave., Irvine, CA 92714: "If you are aware of any FORTRAN compilers written in PASCAL which are available at a reasonable cost, I would be quite interested to hear about it." (\* 77/10/26 \*)

Thomas J. Kelly, Jr., 58-B Meadowlake Drive, Downingtown, PA 19335: "Here at Burroughs I have been using the UCSD implementation of PASCAL for the B6700. It is fairly reliable, although a number of problems have been noted. I have been sending bug reports (most with fixes) directly to UCSD. If anyone is interested in the bugs and/or the fixes, drop me a line. I'll be glad to send listings (most fixes are less than 1 page). "You may also be interested in the fact that a colleague and I have brought up the CDC 6000 compiler at Burroughs (although the code generation has been disabled). This is to allow us to run checks on what constructs were implemented there. We think we have found a bug in it. If so, we'll pass along a bug report." (\* 77/11/29 \*)

William Kempton, Language Behavior Research Lab, 2220 Piedmont Ave., University of California, Berkeley, Berkeley, CA 94720: "As a linguistic anthropologist, I find the reasons for using Pascal versus other languages fascinating. You find a lot of the same factors operating that operate in any other multilingual speech community. Clearly the merit of the language and the utility of the compiler are only two of many factors affecting language choice, they may not be the most important for most users. The best strategy for a long large change is to have computation center staff at least very familiar with Pascal, and to have it taught in the introductory course in computer science." (\* 77/09/22 \*)

John Kenyon, Technical Staff, International Computing, 4330 East-West Highway, Bethesda, MD 20014: "We are currently involved in the planning and concept development for the USAF Foreign Technology Division data processing for FY78-82. One of the primary subjects of our study will be the use of standard higher-order systems programming languages within the Department of Defense. I understand that Pascal has been chosen as the candidate language for all DOD and I would appreciate any information you could send me on this subject."

Stephen Klein, 188 Judy Farm Rd., Carlisle, MA 01741: "Computer programming has been a hobby of mine for a few years, mostly in FORTRAN and BASIC, but now I'm sure there are better languages around so I'm also looking into APL and LISP (\* besides Pascal \*) to get an idea what type of work each language is best suited for." (\* 77/12/27 \*)

John C. Knight, MS 125A, NASA Langley Research Center, Hampton, VA 23665: "Any interest withing PUG in actively pursuing a PASCAL standard with the National Bureau of Standards?" (\* 77/10/20 \*)

Henry Ledgard, Comp. and Info. Sci., U. of Mass., Amherst, MA 01002: "We've been inundated with over 50 requests for our prettyprinter and losing money distributing it in the process, too." (\* 77/9/15 \*)

K. P. Lee, Dept. of Computer Science, 102 Nicholson, Louisiana State Univ., Baton Rouge, LA 70803: "You may be interested to know that we are in the process of getting the Australian compiler. We will be happy to share with PUG any experience we may have with it." (\* 77/10/6 \*)

Maria Lindsay, Microcomputer Library ! Resource Center, 5150 Anton Dr., Room 212, Madison, WI 53719: "Thank you so much for sending us your brochures and issues. Your newsletter is very impressive. I, for one, now view Pascal as a favorable language. Hopefully it will be available for microcomputers through the manufacturer soon. You can be sure that when we are asked about computer languages, Pascal is mentioned in a very favorable light." (\* 77/9/21 \*)

Peter Linhardt, 1890 Arch St. Berkeley, CA 94709: "I'm interested in PASCAL for use on a personal system. I understand there is a system that will run on my machine (\* TDL Z80 system \*)." (\* 77/12/9 \*)

Ron Mahon, Video Link, 201 N. Main St., P. O. Box 688, Masontown, PA 15461: "Be very interested in any compilers for direct use on a micro, preferably Motorola 6800." (\* 77/12/06 \*)

John P. McGinitie, P.O. Box 655, Berkeley, CA 94701: "During my education at U.C. Berkeley, I had the honor of learning Pascal as well as Basic, Fortran, Lisp, C, Snobol, . . . Having experienced many languages Pascal has impressed me the most." (\* 77/12/17 \*)

Michael McKenna, Time Share Corp., Box 683, Hanover, NH 03755: "We are currently using ESI/OMSI Pascal for the PDP 11. We are planning a distributed network using LSI 11's in stand alone mode and with RT 11; the host computer is an 11/60 under RSTS/E - all will be programmed in Pascal." (\* 77/12/27 \*)

James S. Miller, Intermetrics Inc., 701 Concord Ave., Cambridge, MA 02138: "Today my interest is in finding a solid Pascal compiler for Data General equipment, Novas and/or Eclipses." (\* 77/11/10 \*)

Roderick Montgomery, Statistical Associate, Health Products Research, 3520 U.S. Route 22, Somerville, NJ 08876: "I would also appreciate receiving information on the availability of back issues for the Newsletter and on PASCAL implementations that produce object code for the Intel 8080 microprocessor. (Either "resident" or "cross" compilers would be acceptable implementations for my purposes, although a "resident" implementation would be preferable.)" (\* 77/12/4 \*)

Herbert E. Morrison, 1257 2nd St., Manhattan Beach, CA : "I am interested in implementing PASCAL on my Poly 88 (8080) computer. Is there someone you know of who has done this in the Los Angeles area?" (\* 77/12/7 \*)

G. o'Schenectady, 144 Lancaster St., Albany, NY 12210: "Most pleased that the most rational language ive seen has found 1087 adherants. Read of you-all in Microcomputer SCCS Interface, I id like to be one of you. "My own activity is presently restricted to hardware selection, and i doubt my 8K S-100 system-to-be will support too much of Pascal without additions, but even so it will be good to be in touch with whats happening." (\* 77/9/17 \*)

David Peercy, BDM Corp., 2600 Yale Blvd. S.E., Albuquerque, MN 87106: "I was previously with Texas Instruments, where Pascal is beginning to flourish." (\* 77/12/15 \*)

Darrell Preble, Computer Center, Georgia State Univ., University Plaza, Atlanta, GA 30303: "Georgia State University would like to implement Pascal on our Univac 70/7 or barring that, our Interdata 8/32. If you have a working version of Pascal on either of these machines please contact me at the above address. We would like to obtain a working source copy of Pascal for either of these machines." (\* 77/11/28 \*)

Jerry Pournelle, 12051 Laurel Terrace, Studio City, CA 91604: "A consulting engineering firm is at the moment putting together my Cromemco Z-80, with which I hope to put together some word-processing and small-business bookkeeping--as well as play about. I can see some limits to BASIC, and from years ago when I had my only previous experience with computers I know there are limits to FORTRAN. . . ." (\* 77/12/3 \*)



Edward K. Ream, 508 Farley Avenue, Apt. 5, Madison, WI 53705: "I am particularly interested in implementations for the 8080 or Z80." (\* 77/11/30 \*)

Peter Richetta, Computer Science, Slippery Rock State College, Slippery Rock, PA 16057: "I have been trying to get Brinch Hansen's Concurrent PASCAL compiler. After distributing hundreds of systems he stopped distribution. Dr. Hartmann, who wrote much of the compiler, gave me a list of sources to try. Can you help? Any suggestions? "Our computers are NOVA 3 (soft discs) and 370/135 using DOS/VS. Educational use is all we want." (\* 77/10/26 \*)

Mark Riordan, User Services, Computer Laboratory, Michigan State University, East Lansing, MI 48824: "Here at MSU we are developing (in PASCAL, of course) a word processing system we call Redact. Our CDC 6500 is becoming badly overloaded, so we are considering moving Redact to an Ontel Op-1 intelligent terminal, based partly on the availability of a PASCAL compiler or cross-compiler for an 8080 chip. (We have even considered modifying the venerable CDC 6000 PASCAL compiler to do the trick.) Any input from other microprocessor PASCALers would be appreciated." (\* 77/10/24 \*)

T. P. Roberts, Kern Instruments, 111 Bowman Ave., Port Chester, NY 10573: "We will soon be accepting delivery of a Nova 3/12 computer with floppy disk and 32K words of memory. I wonder if your PASCAL Users Group has a compiler/interpreter suitable for this machine? An interpreter alone is not of interest to me, but a compiler would be of interest. "If you have such programs, please inform me of the price, core required, and rough comparison of compile times with Data General Fortran." (\* 77/09/08 \*)

Robert Rogers, 18625 Azalea Drive, Derwood, MD 20855: ". . . being in Minneapolis, do you know of any implementations of PASCAL for a Control Data Corp. 3500? I am aware of the CYBER implementation, but I have a CDC 3500 available for my use." (\* 77/12/01 \*)

Herb Rubenstein, 1036 6th St., Golden, CO 80401: "I would like any information on Varian V75 Pascal--even a Pascal to Fortran preprocessor (translator)." (\* 77/12/19 \*)

Janne Sahady, Systems Programmer, LAMBDA, Div. of Biol. and Med., Brown Univ., Providence, RI 02912: "We have recently implemented a Pascal compiler on a V77-600 Univac minicomputer (formerly Varian Data Machines). This compiler is the sequential version of P. Brinch Hansen's Concurrent Pascal compiler. Our current emphasis is on upgrading the I/O interface and we hope to be writing major system utilities (a mag tape utility to start with) in Pascal in the near future. "Herb Rubenstein, currently working at Autotrol, has referred us to your newsletter and mentioned that you are maintaining a Pascal software library. . . we would definitely be interested in contributing to it as we develop useful routines--most likely in the areas of graphics, signal processing and I/O utilities." (\* 77/09/16 \*)

Stephen C. Schwarm, duPont Co., 101 Beech St., Wilmington, DE 19898: "Should have Sweden PDP-11 compiler self-compiling soon." (\* 77/12/6 \*)

Ted Shapin, 5110 E. Elsinore Ave., Orange, CA 92669: "I have access to an IBM 370 and Stanford's version." (\* 77/12/15 \*)

Thomas E. Shields, Software Resources, 2715 Bissonnet, Suite 212, Houston, TX 77005: "We have UCSD Pascal compiler for B6700 - currently a 1 x 1 (1 cpu, 1 I/O processor); soon to become a 2 x 2)." (\* 77/11/04 \*)

John Signe, Computing and Information Sciences, Trinity Univ., 715 Stadium Drive, San Antonio, TX 78284: "We have two Digital Group systems, a Motorola 6800 and a Z-80, and I am interested in developing PASCAL compilers and/or interpreters for them." (\* 77/12/7 \*)

Jon Singer, 1540 W. Rosemont CE, Chicago, IL 60660: "Do you know of anyone around here who has a micro running PASCAL? I would like to see such a system." (\* 77/12/14 \*)

Dave Skinner, Communication Mfg. Co., 3300 E. Spring St., P. O. Box 2708, Long Beach, CA 90801: "I just finished reading the article 'Is PASCAL the next BASIC?' in the December issue of BYTE magazine, where they mention the Pascal User's Group. As a former PASCAL user (on the Univ. of Colorado CDC 6400's), I am interested in following the

developments of the language as well as perhaps finding a compiler for one of our machines (NOVA, PDP-11, or any microprocessor)." (\* 77/12/06 \*)

Eric Small, 680 Beach St., San Francisco, CA 94109: "Am using ESI Pascal in process control type application in broadcasting." (\* 77/11/30 \*)

Jon A. Solworth, 7 W. 14th St., Apt. 15A, New York, NY 10011: "Please send info on implementations on any minicomputer and addresses if possible (especially Interdata)." (\* 77/09/08 \*)

Turney C. Steward, 201 Drake St., San Francisco, CA 94112: "I am at present using a Pascal compiler running on a CDC 6600 at Berkeley, Cal., but would be most appreciative to obtain info on versions for microcomputers, especially 8080 or Z80 systems, either resident or cross-compilers." (\* 77/12/14 \*)

Jim Stewart, 194B Pleasantview Rd., Piscataway, NJ 08854: "I am interested in the implementation of a subset of PASCAL on a Z-80 based micro-computer system." (\* 77/11/20 \*)

Jyrki Tuomi and Matti Karinen, Room 2113, Computing Center, Tampere University of Technology, Box 527, 3310 Tampere 10, Finland: "When you wrote to us with info about PUG, you said that there are 4 members in Finland already. "Well, now we are doubling that, and more. The coupons are enclosed and here's the money, too. "We have a PDP 11/70 at our disposal and have sent for a couple Pascal implementations. What comes out of this, we shall see. . . ." (\* 77/10/7 \*)

Steven Vere, Asst. Prof., Dept. of Information Eng., Univ. of Illinois at Chicago Circle, Box 4348, Chicago, IL 60680: "In the December 1977 issue of Byte Magazine Carl Helmers mentioned that a PASCAL compiler exists for the Z80 microprocessor. Do you have any direct information on this compiler, or know where information can be obtained? I would like to know

1. the core requirements
2. cost of obtaining the compiler
3. if it runs on the Z-80 or is a cross-compiler
4. where and how it can be obtained." (\* 77/12/12 \*)

Wayne Vyrostek, Tektronix, Inc., MS 74-329, P.O. Box 500, Beaverton, OR 97077: "I am a Technical Instructor on Microprocessor Development aids for Tektronix, Inc. I would like to enroll our training department in the Pascal users group and receive back issues that are available. I would also appreciate information you have about training programmers in the use of PASCAL; particularly for Microprocessor software development." (\* 77/09/06 \*)

Donald Warren, 130 W. 81st St., Apt. 7, New York, NY 10024: "I heard about the group in Creative Computing. I've been programming in Pascal for the past four years, first at the State Univ. of N.Y. at Buffalo, and currently at N.Y. University, and I'm pleased to see its use has spread enough to merit this organization." (\* 77/09/12 \*)

Hellmut Weber, Leibniz-Rechenzentrum, Der Bayerischen Akademie der Wissenschaften, Barer Strasse 21, D-8000 Munchen 2, West Germany: "I am collecting from colleagues some more user-oriented points of view. (I feel that simple users who want to write production programs haven't found enough attention in the PASCAL community)." (\* 77/09/12 \*)

Terry Weymouth, 4702 Beau Bien Lane East, Lisle, IL 60532: "I'm interested in any news on micros with PASCAL (or should that be PASCAL with micros?)" (\* 77/12/7 \*)

Fulton Wright, Jr., Yavapai College, 1100 East Sheldon Street, Prescott, Arizona 86301: "I'm the educational coordinator for Computer Services at Yavapai College. I've just read an editorial in BYTE magazine about PASCAL. I know almost nothing about it, but the editorial makes it sound like the language of my dreams. The editorial suggested you as a source of further information. What should I and my DEC 10 do next?" (\* 77/12/7 \*)

Mark Zimmer, #10 2750 Dwight Ave., Berkeley, CA 94704: "PASCAL is supported in U.C. Berkeley (in which I am a student) for the use of teaching data-structures (and now) compilers courses. I learned it in our style course - CS 40. I am interested in implementing PASCAL on the DG ECLIPSE machine. The specification is done (PASCAL has been modified slightly so that ALGOL code from DG can be a subset) and the code is pouring forth for the compiler. Since PASCAL is a "one-pass language," some readers may be interested in my three-pass approach with special emphasis on the reversability of the parse-tree into "source" form." (\* 77/09/23 \*)

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Dear Editor,

Just so this newsletter isn't quite so serious, can I draw your attention to the evolution of the pug dog that is the heraldic emblem of the Pascal Users Group? The York Herald of Arms, in visiting Tasmania recently, was at pains to emphasize that artists were free to re-interpret heraldic emblems and that this was a medieval norm. He said it was regrettable that in this machine age a sad uniformity had crept in. As you can see from the samples reproduced here, Pascallers are free from this mechanistic taint, and the guardian of rational programming has changed significantly over the months, even at one stage being rather pig-like (possibly an unintended pun).



1976, U.S.A.



1977, Europe



1977, Australia

*Arthur*

## PASCAL IN THE NEWS

(\* This new section will list articles which take note of Pascal, sometimes just in passing. Most of the entries here don't really belong in a bibliographical section like "Books and Articles," but they do give some indication of the currency of Pascal. The references have now become so frequent that they merit being set off in a separate section of "News." Several PUG members have mentioned that "Here and There" is visible proof of interest in Pascal. We hope that this section is useful in the same way. The three most important articles listed here are Carl Helmers' editorial in *Byte* and David Barron's article in *Computing Europe*, and the press release (with editorial comment by Andy) from the US Dept. of Defense. PUG member David Mundie is doing heroic work, writing letters to the editor in praise (and defense) of Pascal. Three of his letters are listed here, as are one each by PUG members George Cohn and Stephen Alpert. More PUG members should do the same. In addition, we'd appreciate copies of references made to Pascal in publications you read so that we can make this list more complete. \*)

*BYTE*, 77/09, p. 174, two letters to the editor, one from PUG member George Cohn. Both suggest Pascal as a high-level language for micro-processors.

*BYTE*, 77/10, "C: A Language for Microprocessors?" J. Gregory Madden. Mentions Pascal as "a reasonable candidate" for a high level, machine-independent language for microprocessors, but goes on to tout Bell Labs' language C as the candidate of choice.

*BYTE*, 77/11, "Language Development. A Proposal," Glen A. Taylor. Mentions Pascal as a "good structured programming language," but rejects any "large" language "as the best choice for a standard home computing language."

*BYTE*, 77/11, Two letters to the editor suggesting that Pascal be considered as a standard language for programs and as an excellent high-level language for microcomputers. The writers are PUG members Stephen Alpert and David Mundie.

*BYTE*, 77/12, "Is Pascal the next B ASIC?" editorial by Carl Helmers. "We at *BYTE* are interested in giving Pascal a boost," best sums up the author's attitude. The editorial demolishes, point-by-point, several arguments frequently made in favor of BASIC, and argues the superiority of Pascal in several areas. Well worth reading, if you are interested in personal computers.

*Computer Weekly*, 77/10/20, "ICL Pascal users expect boost." Report of a Pascal users' group for exchange of software among ICL users: organizer, David Joslin, Univ. of Sussex, Brighton, England. Pascal users in Britain are dicker with the Numerical Algorithms Group, which produces scientific routines in other languages, to get a scientific library translated into Pascal. See David Barron's Help Wanted ad in another part of "Here and There" for details.

*Computer Weekly*, 77/10/20, "More support for Pascal." Reports that "the Swedish defence procurement agency, EMV, has specified a Pascal-based language as its standard for real time software development."

*Computing*, 77/10/20. "Two pleas to Pascal users." Similar to the first article from *Computer Weekly*.

*Computerworld*, 77/11/14, "'Sounds of Computing' a Record for History," Miles Benson. A tongue-in-cheek description of a new record entitled "Sounds of Computing," the second movement of which is called "Pascal Time-Sharing Terminal."

*Computing Europe*, 77/10/24, pp. 18-19, "Letting the dinosaur know that it's dead," David Barron. An argument for burying FORTRAN, however great its effect on computing might once have been. Barron argues the need for using compact, conceptually clear languages that make writing correct programs and specifying data structures easy. Pascal is the language of choice.

*Creative Computing*, Sept/Oct 1977, p. 11. "A Plug for Pascal" letter to the editor from PUG member David Mundie. He counters an argument for creating a structured COBOL/BASIC by showing how clearly a main program can be in Pascal. His example program (5 lines long) is a Pascal version of the one used in the article he criticizes.

*Dataline*, 77/10/31, "Blazing the trail for Pascal." More reports from the UK about the ICL user's group, the Swedish defense language contract, and David Barron's commission to write a Pascal compiler for the ICL 2900 series.

*First Computer Faire Proceedings*, pp. 245-247, "Computer Languages: the Key to Processor Power," by Tom Pittman. Discusses the virtues of various high level languages for personal computers. Mentions Sequential Pascal, and says that Pascal is in many ways better than FORTRAN or BASIC.

*Kilobaud*, October 1977, p. 11. Another letter to the editor by PUG member David Mundie. He says that Pascal is a better language than a structured BASIC discussed in an earlier article, and gives a sample main program in Pascal which duplicates the program suggested by the author of the earlier article.

MACC Computing News (University of Wisconsin Academic Computing Center), 77/11/28. Mentions plans to distribute a Pascal compiler under a license agreement. Reference comes in an article about proprietary software.

SCCS Microcomputer Interface, Aug. 1977, p. 52. An announcement about the existence of PUG and Pascal News.

Stanford Campus Computing Bulletin, Nov. 1977, p. 24. A user wrote in to ask that Stanford acquire a good Pascal compiler. The editor's response was that Stanford is looking into what compiler to acquire.

Twin Cities Technical Hobbyist, (77:9), pp. 01111-10000, "Pascal in Micros," Geoff Wattles. An article describing Pascal, with a discussion of the syntax of the language and Pascal's usefulness for hobbyists.

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The U. S. Department of Defense High Order Language Effort (or "IRONMAN" or "DOD-1")

(\* In PUGN8, May, 1977, on page 3, we passed along the summary of a press release by the U. S. Department of Defense which was distributed by the British Computer Society on March 3, 1977.

William A. Whitaker, Lt. Col. USAF, Defense Advanced Research Projects Agency (DARPA) described in the full version of that press release a three year effort by the U.S. Defense Department (DoD) to develop specifications for a real-time language called DOD1--a single common military computer programming language for "embedded systems," computer systems on board tanks and ships, on rifles, etc.).

The language would replace FORTRAN, COBOL, JOVIAL, and all the others. A working group at DARPA was formed in January, 1975. A rigorous language definition was sought, but as it turned out, 4 different stages of development/evolution have transpired: first STRAWMAN, a set of relatively complete, although tentative requirements. WOODENMAN and TINMAN followed. With each step, the proposals were widely distributed for comment. Existing languages were evaluated, and, as we reported in PUGN8, only Pascal, Algol-68, and PL/1 survived.

At the IRONMAN (4th step), specifications gave way to a language definition. In July, 1977, IRONMAN was released to vendors for competitive bidding. The report below, sent to us by William Whitaker, tells the results. The four successful contractors will be narrowed to two in February, 1978. What is at stake is \$3 billion spent on defense-related software per year.

It is truly amazing how a giant operation such as the HOLWG (Higher Order Language Working Group) came up with 95% Pascal almost independently in three years working with committees.

There has been sporadic news coverage of these events in the computer trade journals. One, in October 1977 Datamation, reported on how a French software organization's bid got lost in the mail in the original competition. In the December, 1977, SIGPLAN Notices, it is amusing to see the confusion resulting from their just having learned about IRONMAN and still not realizing that it's going to be based on Pascal.

- Andy Mickel \*)

The Defense Supply Service Washington has announced the award of four contracts to produce competitive prototypes of a common high order computer programming language for Department of Defense embedded computer systems. These awards came as a result of a request for proposal and offers received from fourteen firms, both U.S. and foreign. The successful contractors were Honeywell (CII-Honeywell Bull), Intermetrics, Softech, and SRI-International.

While different approaches were offered, all four winning contractors proposed to start from the computer language PASCAL as a base. They will provide modifications to construct a resulting language to satisfy military needs as expressed in the "DoD Requirements for High Order Computer Programming Languages (Revised IRONMAN, July 1977)".

The contracts provide for three phases at the discretion of the government. The first phase is to be six-months and will produce a preliminary language design. At the end of the first phase, an evaluation of the products will result in some of the contractors being continued through full formal design, rigorous definition, and prototype implementation. The one contractor whose language is selected by the government will be continued for refinement and initial maintenance. The language will be ready for initial use in 1979.

This language design is the next step in a Department of Defense effort to reduce software costs of embedded computer systems. Earlier actions included issuing DoD Directive 5000.29, "Management of Computer Resources in Major Defense Systems," which, as one of several management actions, required the uses of approved high order languages in future Defense systems software. DoD Instruction 5000.31, "Interim List of DoD Approved High Order Programming Languages," stopped proliferation by approving only seven existing languages.

The technical effort in high order languages has, over the last three years, brought increasingly refined sets of requirements, produced an evaluation of existing languages, and has established the technical feasibility of a single language for these applications. The successful design of such a language will be followed by testing and evaluation, compiler and tool generation, and the necessary long-term language control. This program is presently being directed by the DoD High Order Language Working Group, chaired by Lt Col William A. Whitaker, Defense Advanced Research Projects Agency, 1400 Wilson Blvd., Arlington, Va., 22209.

