

Dear User,

A brief Newsletter this issue whose main purpose is to announce the proposed formation of a National User Group. Please see the enclosed information and we should be glad to receive the reply forms as soon as possible.

We are also enclosing with this issue the new July Price List and a 380Z User List. The names appearing on this list do so by written request only.

We have had complaints from our users to say that they have not been receiving a copy of the Newsletter. Following the return of the Newsletter Registration Forms, we have made a comprehensive check of the mailing list and hope now that all users will receive a copy and that our entries are correct. If there is an incorrect entry or omission please let us know by writing to 'Newsletter Registration'.

The Chelsea Simulations and Schools' Council packages are not ready yet. We hope to announce their availability shortly in a future issue of the Newsletter.

380Z USERS' SECTION

The following is included in the Newsletter by request from our users.

Item 1 All 380Z Users in the West Midlands are invited to contact Peter Smith, Birmingham Education Computer Centre, Mathew Bolton College, Hope Street, BIRMINGHAM, B5 7EA, in order to form a user group.

A user group is already under way on Merseyside and those interested should contact Mr. A.R. Pope, Paal Enterprise, 37 Stuart Road, Crosby, LIVERPOOL, L23 0QE.

Item 2 'SARGON' 380Z Micro Chess. SARGON is a machine code chess playing program of outstanding calibre. It will easily 'thrash' the PET's micro chess at all levels. It has fabulous graphics; adjustable IQ; the ability to play black or white; it can play itself; you can set up any board position; change position in mid game; remove pieces during any game; castling and en passant are included; change IQ mid game.

SARGON needs to be seen to be believed. It is hoped that it will do well in the Personal Computer World Micro Chess World Championships later this year.

Available for £20.00 from Sheridan Williams, 114 Beech Road, ST. ALBANS, Hertfordshire, AL3 5AU.

(Ed. - not our sales talk!)

CHOOSING A LANGUAGE

There are literally hundreds of computer programming languages available. This section describes some of the features of programming languages used in scientific work and available on small computers. The next Newsletter will contain a similar discussion of 'business' languages.

By far the most common microcomputer language is BASIC. Originally developed as a teaching language, it possesses a number of big advantages, especially where the mass storage of the computer is limited to cassette. Because the program is normally 'interpreted', only one version of the program is needed - the computer in effect executes the same text as the programmer sees. This means that it is possible to load the program into memory, run it, change it if necessary, and save it only at the end of the session. Program development is very rapid because it takes only seconds to make a small change, error messages can be very helpful and the programmer can list the values of the variables. Of course, there is a drawback to this, and that is that the run speed is relatively low.

RML provide many different BASIC interpreters to suit varying needs. These range in size from about 3K bytes (Tiny BASIC) to 18K bytes (Extended Disc BASIC). In general, the bigger the interpreter, the more facilities are offered.

For users with discs, the choice of language is much wider. Fortran and Algol are available and are realistic alternatives. In each case, an intermediate stage of processing called compilation is necessary between typing in the program and running it. The advantage of any compiled system is that run speed is greatly increased over interpreted BASIC, by a factor of ten or more. The disadvantage is that error diagnostics are much less helpful, and that it takes longer to modify a program. These two languages will be discussed in turn.

Fortran is probably the most widely used language in scientific work. Its main advantage is precisely that - 'everybody' understands Fortran, compilers are readily available, and there are many programs written in Fortran which can be used universally, saving a great deal of programming effort. Linking libraries of useful routines is usually very easy in Fortran. The main disadvantage of Fortran is the lack of good control structures; 'structured programming' is virtually impossible in standard Fortran.

RML provide a Fortran compiler which generates in-line code. For more details, see the section on new products elsewhere in this Newsletter.

Algol 60 is the other main scientific programming language, in Europe at least. Its main advantage is that it is possible to write 'structured programs' in Algol. This alone speeds program development, as it is much easier to keep track of the various bits of a large program when written in this manner. The other main advantage is that the language was rigorously specified, reducing misunderstandings as to the meaning of the defining Report. This greatly aids program portability. Library routines are commonly available, and easily linked with the main program.

RML provide an Algol system. This is a compiler-interpretor, which means that the compiler produces an intermediate code which is then interpreted by a runtime system. For more details, see the New Products section elsewhere in this Newsletter.

Pascal is another scientific programming language which has caught on in recent years, mainly in the US but also in Europe. It is a development of Algol 60, better in some respects, worse in others. Its main advantage is that it allows good program structure. Unfortunately, while Pascal systems are available for the Z80 processor, none of them are at present particularly suitable for the 380Z. This situation will change in due course.

There are of course many other languages used in scientific work. However, none of the more common ones have as yet been implemented on microcomputers.

NEW PRODUCTS

Several new products have been completed since the last Newsletter. Prices are available in the latest price list.

1. Fortran. Fortran-80 is a complete Fortran programming system, including a compiler, linker, librarian, and Z80 macro-assembler and cross-referencer. The compiler supports near ANSI Fortran IV, the only significant exclusion being the COMPLEX data type. It generates in-line code for all operations possible on the Z80 (such as integer addition), and calls subroutines for those that are not (e.g. integer multiply, floating point). The subroutines are contained in a library and only included in the final program if referenced. All modules are fully relocatable. The assembler supports both Zilog Z80 and Intel 8080 mnemonics, producing relocatable or absolute code, and includes macro facilities.

The compiler will operate adequately on a 32K 380Z system with either mini or full-sized discs. A typical short program, including formatted I/O and REAL*4 arithmetic, occupies about 11K bytes, and programs of up to 500-1000 lines can be run in 32K. Fortran-80 run speed compares well with any other high-level language available for the Z80 microcomputer, being 5-15 times as fast as BASIC for typical operations. The Whetstone mix is about 5.9.

2. Algol 60. The RML Algol 60 system consists of a one-pass compiler and a runtime program. Almost all the features of Algol 60 are implemented, the main restrictions being the lack of multiple assignments and OWN variables. In addition, a significant number of extensions are provided, including BYTE arrays to simplify string handling, and extra operators. Built-in procedures include graphics, peek and poke, location, (giving the address of a variable), and many more. The I/O is extremely powerful, with serial and random access to multiple files, free format input, and either formatted or unformatted output. Data areas may be used as input/output buffers in conjunction with the string handling routines built in.

The compiler can operate adequately on a system with as little as

21K bytes of memory. The runtime system occupies about 9K bytes, which with the program, data, and CP/M requirements allows sizable programs to run in as little as 16K bytes, and programs of 1500-2000 lines can be run in 32K. The availability of virtually the same compiler for Z80, PDP8, and PDP11 computers makes it possible to develop programs on larger computers and run them on microcomputers which do not have the I/O or memory to run either the compiler or CP/M.

The run speed of RML Algol 60 compares favourably with other high level languages available on microcomputers, being 5-15 times as fast as BASIC. As with the Fortran, the Whetstone mix is about 5.9.

3. TEX. TEX is a formatter. This is a program which takes text, prepared with a text editor, and fills and justifies it so that the right-hand margins line up. This document was prepared with the aid of a formatter. TEX also takes care of starting a new page when necessary, and other such details. For example, this paragraph started life like this.

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4. A new version of the PIO/RTC development board software support package is now available. This version can be merged with C100 and disc-based BASIC interpreters, BASG, BASGF, DBAS9, DBAS12, and XDB.

5. A new version of the BASIC reader extension has been developed. This is a patch to BASIC which will allow users with a paper tape or card reader with a serial interface to input programs to BASIC. This version will cope with any RML standard serial interface and can be merged with any cassette-based BASIC (BASG, BASGF, B12GF), on either C100 or C4100 systems. It will replace BASGP, and is free on request for those users with BASIC and a serial interface.

6. 12K Cassette BASIC with Graphics and Files is ready. This is an upgrade to the BAS12 interpreter already available, and includes low-resolution graphics and cassette files. It is available in both C100 and C4100 versions.