A CHOICE OF PROGRAMMING LANGUAGES
FOR THE BRITISH BROADCASTING CORPORATION
MICROCOMPUTER SYSTEM
ISO-Pascal is the natural language for large-scale programming, compiling to a compact intermediate code, which is then interpreted to give a performance superior to interpreted BASIC, without the complexities of machine code. The philosophy behind the design of Pascal was to provide a language in which the programmer's intentions are explicitly stated in the program. Thus all variables must be declared with their precise type, with array bounds stated, and the enumerated types allow the programmer to define the set of values that a variable can take. The result is faster debugging and comprehensive error-checking both at compile time and run time. These features also make it ideal for educational use at all levels.

Sample applications: writing business packages, compilers, learning programming.

Acornsoft ISO-Pascal is a full implementation of Pascal to the BSI/ISO standard, with sound and graphics extensions. Two versions are available: in two language ROMs for the BBC Microcomputer models B, B+, or B+ 128K; and on Cartridge ROM for the Master 128. Each version is ISO-Standard Level 0, and comprises the compiler, intermediate code interpreter, and full screen editor. On the Master 128 the resident editor EDIT will be called from ISO-Pascal automatically.

With the language in ROM or Cartridge ROM programs may be edited, compiled, and run while retaining the source text in memory, and without requiring disc access. Program development can thus be very rapid, making the system ideal for education. Where programs are too large to fit into memory they may alternatively be compiled to or from disc. For speed-critical programming machine code can be incorporated into Pascal programs and called from Pascal routines. The compilers feature comprehensive error checking which can be disabled for maximum speed of debugged programs, and can optionally generate full textual error messages when used with a disc system.

ISO-Pascal is supplied with a comprehensive user guide including a copy of the BSI ISO-Pascal specification, an introductory tutorial manual, a function key strip and a reference card of editor commands and error messages. Each version includes an extended version to ISO-Standard Level 1 supplied on disc to take full advantage of a Master Turbo, or a 6502 Second Processor if fitted. The disc also includes several demonstration programs.

Types Supported

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Character</td>
<td>'A'</td>
<td>A single character</td>
</tr>
<tr>
<td>Integer</td>
<td>123</td>
<td>A whole number</td>
</tr>
<tr>
<td>Real</td>
<td>3.14157</td>
<td>A floating point number</td>
</tr>
<tr>
<td>Boolean</td>
<td>True</td>
<td>A logical value</td>
</tr>
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</table>

Logo is designed to introduce children and students to elementary programming techniques using a 'tortoise/hare turtle' to create graphics displays. It uses a set of simple commands centred on the turtle, rather than the more usual cartesian coordinate system, and this has since become widely known as 'turtle graphics.' In addition, Logo includes many list-processing facilities, making it both a powerful introduction to programming and a problem-solving tool.

Sample applications: home and school education in graphics, mathematics, databases and problem solving at primary level and above. Acornsoft Logo is a full implementation of Logo, containing all the standard turtle graphics and list-processing functions. It is available in two versions: on two language ROMs for the BBC Microcomputer Model B, B+ or 128K B+; and on a ROM Cartridge for the Master 128. Additional graphics features include changeable screen mode allowing multi-colour graphics, split and variable sized graphics and text windows, and a NIB feature which allows the turtle to make use of the BBC Microcomputer graphics system; for example, it allows the drawing of dotted lines or filled triangles under turtle control, and the SPIRE facilities of the Acornsoft Graphics Extension ROM. Multiple screen turtles can be 'hatched' and controlled independently using simple list-processing instructions, and providing a convenient link between Logo's graphics and list-processing facilities. A variety of floor turtles may also be driven.

Acornsoft Logo includes a full implementation of all the list-processing and text-manipulation features of the language. It includes property lists, allowing the language to be used to build a simple filing system. Two versions of the Acornsoft Logo are available: one is compatible with the BBC Microcomputer Models B, B+ or 128K B+; and on a ROM Cartridge for the Master 128. Additional graphics features include changeable screen mode allowing multi-colour graphics, split and variable sized graphics and text windows, and a NIB feature which allows the turtle to make use of the BBC Microcomputer graphics system; for example, it allows the drawing of dotted lines or filled triangles under turtle control, and the SPIRE facilities of the Acornsoft Graphics Extension ROM. Multiple screen turtles can be 'hatched' and controlled independently using simple list-processing instructions, and providing a convenient link between Logo's graphics and list-processing facilities. A variety of floor turtles may also be driven.

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The Acomsoft BCPL package and it will automatically claim code. A comprehensive 450 and some examples of BCPL program development aids, software, compilers.

**BCPL Calculations Package**

BCPL is an untyped language, but routines can be added to provide floating-point and fixed-point arithmetic, and these are available in the BCPL Calculations Package.

**Types Supported**

- Integer (2 byte)
- Floating point (5 byte) -1.7E38 to 1.7E38
- Fixed point (6 byte)
- Integer (2 byte) (BCPL word)/10000

**BCPL Stand Alone Generator**

This package converts programs developed in BCPL into stand alone programs which can be run on any BBC Microcomputer, without the BCPL ROM fitted. Stand Alone programs can be produced either as files stored on any suitable medium or as language ROMs. This package consists of a disc of utility programs, a user guide and a licence permitting the distribution of up to 100 copies of a program developed using the system. A separate licence permitting unlimited distribution is also available.

**ACOMSOFT LANGUAGES**

**BCPL**

BCPL is one of the most flexible of modern structured languages and it is easy to learn. BCPL allows the programmer to implement arrays, records, and other datatypes by providing direct access to machine addresses, and operators for their manipulation. This gives BCPL the flexibility of machine code, making it especially suitable for low-level and system programming, but does place a greater onus on the programmer due to the limited error checking. It is particularly good at handling input and output, and hence it is often used to write utility programs.

Sample applications: writing business program, system software, compilers. The Acomsoft BCPL package consists of a 16K ROM, 40/80 disc containing the compiler, a screen editor, a 6502 assembler, other utilities and program development aids, and some examples of BCPL code. A comprehensive 450 page user guide is also included in the package. The BCPL language can be used with any Acorn filing system, and it will automatically claim all available memory from a Master Turbo or a 6502 Second Processor if fitted.

**A recent increase in interest in LISP followed the selection of PROLOG by the Japanese as the foundation for their Fifth Generation Computer Systems. Sample applications: relational databases, expert systems, and problem solving; educational use in manipulating project data. Acornsoft micro-PROLOG is compatible with versions of the language available on several other computers and in addition includes commands to take advantage of the BBC Microcomputer's sound and graphics facilities. The package consists of a language ROM, a comprehensive reference manual and a disc containing extension modules including the commonly used "SIMPLE" and the more recently developed "MRTS" modules. Also included is a version of the interpreter to take full advantage of a Master Turbo or a 6502 Second Processor if fitted.

**Types Supported**

- Integer (2 byte) -32768 to 32767
- Floating point (5 byte) -1.7E10 to 1.7E10
- Fixed point (6 byte)

**Micro-PROLOG**

PROLOG is fundamentally different from other programming languages in the way that problems are expressed. Rather than being encoded as a sequence of steps to be followed to solve the problem, in PROLOG they are expressed as a set of facts about the problem, and rules which relate these facts to one another. This makes PROLOG especially suitable for solving problems in which the route to the solution is not clear.

**Types Supported**

- Integer (4 byte) -2^31 to 2^31
- Floating point (5 byte)
- List

**ACOMSOFT LANGUAGES**

**COMAL**

Acomsoft COMAL adheres closely to the original specification of the language by B. Christensen, and supports reals, integers, booleans, and strings, as well as multi-dimensional arrays and extensive file handling facilities.

**Types Supported**

- Integer (2 byte)
- Float 1.7E-10 to 1.7E10
- 9-digit accuracy

**LISP**

LISP is the fundamental list-processing language of artificial intelligence research, and the fact that it is still widely used more than twenty years after its original design is credit to the power of the language. Due to its simple overall structure LISP offers more flexibility in data and control structures than other languages, while giving fast enough execution for language design applications. Sample applications: natural language manipulation, compiler design, experimentation with artificial intelligence problems.

**Types Supported**

- Integer (16 bit) -32768 to 32767
- Floating point 5 byte
- 9-digit accuracy
- Strings up to 127 characters
- Lists

**ACOMSOFT LANGUAGES**

**LISP**

Acomsoft LISP is a fast interactive implementation of LISP containing a number of useful extensions to LISP including LOOP, WHILE, AND UNTIL control functions. It can be used in any graphics mode, and several extensions to the language are provided to take advantage of the BBC Microcomputer's graphics and sound facilities including VDU, CALL, MODE, TIME, INKEY and ADVA. The system includes a LISP editor and a printer written in LISP so that it can be extended by the user.

It is available either as a language ROM for the BBC Microcomputer Models B, B+ and 128K B+ or on ROM Card for the Master 128. Each version will automatically relocate itself to give additional memory on a Master Turbo, or if a 6502 Second Processor is fitted. A comprehensive guide to Acomsoft LISP, 'LISP on the BBC Microcomputer,' is supplied with the ROM Card and version, or is available separately for use with the other versions. As well as an introduction to programming in LISP, it includes a complete glossary of all predefined functions, and several example programs illustrating typical applications of the language.
FORTH began life in a public domain version, which contributed to its popularity as one of the first languages available on microcomputers. It is a compiled language using a concise stack-oriented syntax, and programs run very fast (typically five times faster than BASIC). One of the key features of FORTH is the ability to define new keywords, allowing the user to create new FORTH-based languages.

Sample applications: machine control, games development. Acomsoft FORTH adheres to the 1979 Standard. It is supplied on a language ROM which permits the use of any graphics mode, and includes a resident FORTH screen editor, graphics mode, and includes a resident FORTH screen editor, a full glossary defining the actions of all the standard words.

A general introduction to Acomsoft FORTH, 'FORTH on the BBC Microcomputer', is available separately and is recommended for use with the language. It includes a full description of Acomsoft FORTH accompanied by many practical examples, and a glossary defining the actions of all the standard words.

**Types Supported**
- Integer (16 bit)
- Floating point (32 bit)
- 0 to 255

**ISO-Pascal**
*Sample Program*
program days of week (input, output),
type days = (monday, tuesday, wednesday, thursday,friday, saturday, sunday),
var today: days,
begin
for today = monday to sunday do
if today in (monday, friday) then writeln ('Get up to work today!')
else writeln ('Anh a lie in...')
end.

**BCPL**
*Sample Program – Print Octal Number*
LET WRITEOCT (N,D) BE
$/ IF D > 1 DO WRITEOCT (N> >3,D-1)
10 WHILE NOT EOD
20 READ text$
30 PRINT 'that's all.'
40 END WHILE
50 PRINT text$
60 END

**Logo**
*Sample Program – 4 Turtles Linked Together*
TO CROSS
DRAW
HATCH { 2 3}
START 0 START 1 START 2 START 3
TELL { 0 1 2 3}
END
TO START: NUMBER
TELL: NUMBER
RIGHT: NUMBER
END

**Micro-PROLOG**
*Sample Program – Drug-use Expert System*
add (x recommended for y if y complains of z and not x may harm y)
add (x may harm y if x aggravates z and y suffers from z)
add (aspirin suppresses headache)
add (valium suppresses anxiety)
add (aspirin aggravates peptic ulcer)
add (Alise complaints of headaches)
add (Alise suffers from ingrowing toenails)

A fact (valium recommended for Alise)
NO
which (x recommended for Alise)
ask

**LISP**
*Sample Program – Finds a Value in a List*
(DEFUN FIND (LIST VALUE) (COND ((NULL LIST) NIL) (EQ VALUE (CAR LIST)) LIST) ((NULL LIST) NIL)

**FORTH**
*Sample Program – Factorial Function*
FACT 0 SWAP ?DUP IF 1+ 1 D* 1 D- 1 D- END

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