OTHER DEMONSTRATION PROGRAMS

The folder HERBERT contains other programs written by me as larger programming projects.

The folder HEXTRA contains additional programs written by Don Hunter, taken from his personal web site.

The folder MISC contains additional example programs written by others.

HERBERT

INTCODE.DAT. This script assembles and runs a BCPL INTCODE interpreter in the file INTCODE.900. This is a first step in towards bootstrapping BCPL for the Elliot 903. INTCODE is described in the book "BCPL The Language and its Compiler" by M.Richards and C. Whitby-Strevens, Cambridge University Press, 1980. Martin Richards now regards INTCODE as obsolete – see his BCPL web site at http://www.cl.cam.ac.uk/~mr10/BCPL.html for his current BCPL system.

RAGETPUT.DAT: This script assembles the file RAPUTGET.RLB which implements the raget and raput code procedures described in the Elliott Technical Manual section on magnetic tapes routines for ALGOL. (An Elliott issued version of these has not been found).

RLBTEST.DAT: This script assembles a program that explores the RLB output resulting from referencing different kinds of variables, local versus global, located versus unlocated and forward versus backward references. It is instructional to relate the output RLB to the SIR input.

TRACKER.DAT: This script assembles and runs TRACKER.903 a program that use the 903 trace interrupt facility to punch out an execution trace of a program. A suitable decoding program for the output has yet to be written.

HEXTRA

There are a large number of example programs in this folder. Of particular interest is the use of a library of multi-length arithmetic routines to calculate primes and factors. This library is contained in the file BIGLIBRARY.BIN. The file MPQS.DAT contains a specification of the additional routines.

MISC

BGIRAH.DAT. This runs an ALGOL program apparently distributed by Elliotts as an example numerical application, although no associated documentation has been found. The program is in BGIRAH_P.900 "BGIRAH PROGRAM ISS1" and the data is in BGIRAH_D.900 "BGIRAH DATA ISS1". The program title and output suggests the program is modelling heat transfer from a mould containing layers of glass. It is run using the 16K Load and Go ALGOL system.

PARACH.DAT. This runs an ALGOL program apparently distributed by Elliotts as an example numerical application, although no associated documentation has been found. The program is in PARACH_P.900 "PARACH PROGRAM 21767" and the data is in PARACH_D.900 "PARACH DATA 21767". The program title and output suggests the program is modelling the opening of a parachute. It is run using the 16K Load and Go ALGOL system.

RINTRN.DAT. This runs a demonstration program apparently distributed by Elliotts to show how to achieve something similar to the FORTRAN IV EXTERNAL statement when using 903 FORTRAN II. Confusingly the original tape is labelled "905 RINTRN FORTRAN", and 905 FORTRAN is FORTRAN IV: the program code is however clearly FORTRAN II. The program is run using the 16K Load and Go FORTRAN system.

WHET.DAT. The Whetstone benchmark due to Brian Wichmann was a popular early benchmark for comparing the performance of computers in the 1960s. The basic principle of the Whetstone benchmark was to execute a mix of machine functions corresponding to the codes interpreted by the Whetstone ALGOL system that matched aggregated statistics across a wide range of typical scientific computations at that time. It fell out

of favour later on as improvements in code generation technologies meant some of the paths through the benchmark were effectively optimized out of the executable. The example shows the original ALGOL version of the benchmark, modified by Don Hunter to use Elliott I/O, and a version for Elliott FORTRAN translated from ALGOL by the author and compared to the FORTRAN IV version that can be found online.

Elliott FORTRAN is about 20% faster than Elliott ALGOL. Most of this is explained by the fact that Elliott FORTRAN is essentially an autocode that produces machine code for direct execution, whereas ALGOL is interpreted. However the advantage to FORTRAN is only the case for control functions and integer arithmetic, since it relies on the QF interpreter for floating point operations. Given the additional protection in ALGOL given by overflow checks and array bounds checks, 20% is actually a remarkably small penalty to pay.

Don Hunter converted the Elliott ALGOL version of the Whetstone benchmark from the original KDF9 ALGOL version.

XFIND.DAT. This runs a SIR program apparently distributed by Elliotts as an example application, although no associated documentation has been found. It searches for an amount of money in British pounds, shillings and pence, such that the value in farthings equals:

```
     If pence >= 10 and shillings >= 10
          Pounds * 1000 + shillings * 100 + pence
     If pence >= 10 and shillings < 10
          Pounds * 1000 + shillings + 100 + pence
     If pence < 10 and shillings >= 10
          Pounds * 1000 + shillings * 10 + pence
     If pence < 10 and shillings < 10
          Pounds * 100 + shillings * 10.
```

If such a value is found (i.e., £12/12/8) a legible message is output.