

## ELLIOTT 900 SERIES SIMULATOR

### 905 FORTRAN DEMONSTRATION PROGRAMS.

905 FORTRAN demonstration programs are held in the 905FOTRAN directory.

The majority of the demonstration programs are case studies taken from "A Guide to FORTRAN IV Programming", by Daniel D. McCracken, John Wiley & Sons, Second Edition, 1972, a classic student text book from the early 1970's. A few minor changes have been made to accommodate restrictions in 905 FORTRAN and the fact that paper tape rather than punched cards is being used for input-output.

DEMO1.DAT. A simple table of squares program to illustrate the compile / load / run sequence for 905 FORTRAN programs. The program is laid out in the "free format" style.

DEMO2.DAT. McCracken Case Study 1 - Economic Ordering Quantity. Shows basic FORTRAN IV arithmetic and output.

DEMO3.DAT. McCracken Case Study 2 - Current in an A.C. circuit. Shows simple input-output and transfer of control features of FORTRAN IV. Note that formatted input is used, so the input numbers are carefully positioned using spaces.

DEMO4.DAT. McCracken Case Study 3 - Column Design. Illustrates further arithmetic and transfer of control features of FORTRAN IV.

DEMO5.DAT. McCracken Case Study 4 - The Newton-Raphson Method. Shows the calculation of the roots of an equation using an iterative method. Compare to 903FORTRAN DEMO3.DAT that is the same program written in FORTRAN II and 903ALGOL DEMO1.DAT for an ALGOL 60 version..

DEMO6.DAT. McCracken Case Study 5 - Error Analysis in a Double Precision Sine Routine. Shows the use of double precision arithmetic to overcome problems with rounding errors when using Taylor's series to calculate sines of large angles. Both a single and double precision version of the program are given for comparison. The single precision version can also be found in 903FORTRAN DEMO4.DAT as a FORTRAN II program and 903ALGOL DEMO2.DAT for an ALGOL 60 version.

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DEMO7.DAT. McCracken Case Study 6 - A Servomechanism Frequency Response Plot. Illustrates the use of complex numbers in FORTRAN IV. Note the use of free format input.

DEMO8.DAT. McCracken Case Study 7 - Logical Design of a Binary Adder. Illustrates the use of logical values in FORTRAN IV.

DEMO9.DAT. McCracken Case Study 8 - Using Subscripts in Computing Means, Standard Deviations and a Correlation Coefficient. Illustrates the use of arrays in FORTRAN IV. A FORTRAN II version of this program is in 903FORTRAN DEMO9.DAT.

DEMO10.DAT. McCracken Case Study 9 - Damped Oscillation. Explores FORTRAN IV DO loops.

DEMO11.DAT. McCracken Case Study 10 - The Gauss-Seidel Method for Solving Simultaneous Equations. This program further illustrates DO loops and the 905 FORTRAN store map facility. See 903FORTRAN DEMO6.DAT for a FORTRAN II version.

DEMO12.DAT. McCracken Case Study 11A - Graphing / Damped Oscillation. This is an extension of DEMO10 that plots a graph of the damped oscillation to the teleprinter. See 903FORTRAN DEMO7.DAT for a FORTRAN II version of this program.

DEMO13.DAT. McCracken Case Study 11B - Graphing / Temperature Map. This program calculate the temperature distribution in a pipe carrying a hot fluid, immersed in a cold bath. The distribution is plotted graphically to the teleprinter. See 903FORTRAN DEMO8.DAT for a FORTRAN II version of this program.

DEMO14.DAT. McCracken Case Study 13 - Quadratic Equation Solution with Subprograms. This example illustrates the use of subroutines and functions in FORTRAN IV. Note the comments in the routine SOLVE that point to a bug in the FORTRAN IV compiler. DEMO9.DAT in 903FORTRAN is a FORTRAN II version of this program.

DEMO15.DAT. McCracken Case Study 14 - Translating Algebraic Expressions into Polish Notation. This program shows the use of the A format specification to do text processing in FORTRAN IV. Note that every line of data is terminated by a space.

DEMO16.DAT. This program contains embedded SIR code. It is essentially the 905 FORTRAN version of 903 FORTRAN DEMO10.DAT. Note that parameter decoding is easier in 905 FORTRAN, but it is not possible to access an array descriptor to check its

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dimensions, nor can a call be made to QF, so instead all real arithmetic has to be written in FORTRAN.

DEMO17.DAT. This demonstration shows the use of the EXTERNAL statement to allow functions to be passed as arguments. Note that the use of EXTERNAL leads to the 900 Loader reporting \*CLW errors (check words not equivalent) and therefore option bit 9 (400 in octal) is set to ignore these.

### System files

905FORT(ISS6).BIN - "905 FORTRAN COMPILER ISS 6".  
(The tape is labelled "ISSUE 6", but the compiler announces itself as FORT05, suggesting Issue 5?).

905FORTLIB1(ISS4).BIN - "905 FORTRAN LIBRARY VOL 1 ISS 4 RLB"  
(Issue 4)

905FORTLIB2(ISS5).BIN: - "905 FORTRAN LIBRARY VOL 2 ISS 5 RLB"  
(Issue 5).