CORAL

CORAL-66 is a real-time programming language developed by the UK Ministry of Defence. It was loosely based on Algol60 but with a wider range of data types suited to real-time embedded systems.

There were at least two CORAL systems for the 920 series. The one described here was developed by CAP – Computer Analysts and Programmers – a UK software house, as a cross-compiler to be run on an Elliott 920C/905 computer producing binary object code suitable for loading on a 920B/903, 920M or 920C/905 system. Note that this CORAL does not support floating-point arithmetic.

The system operates in multiple passes. The initial pass performs macro-generation, taking a 900 telecode CORAL program with embedded macros as input and producing a 900 telecode output version with the macros expanded. This tape is then input to the compiler that comprises passes 1A, 1B and 2. Pass 1A reads the expanded source code and emits an intermediate binary tape. This is then processed by Pass 1B to produce a second intermediate tape. (Note Pass 1B must be loaded on top of Pass 1A as they share data structures in store.) Pass 2 takes the output from Pass 1B and generate a relocatable binary tape.

This relocatable binary tape is then input reversed to the CORAL loader which produces a mode 3 binary tape suitable for loading by initial instructions. The loader takes commands from the teleprinter as follows:

AUT=YES	Produce a binary tape which autostarts when loaded.
AUT=NO	Produce a binary tape which halts after loading (default).
COR=1|2|3|4	Number of 8K store modules in target machine. If COR is greater than 1, CORAL generates code to run in 920C absolute mode. If COR=1, the code produced runs in relative mode and is suitable for 920B and 930M models as well as 920C. The default is COR=4.
END=YES	Finish loading and finalise output binary tape.
GO	Read in next relocatable binary tape.

LEV=0|1|2|3|4	Set the level at which the next segment to be loaded will run. The default is LEV=0, for a single level program to run at level 1.
UND	Print list of undeclared names in tapes loaded up until this point.

DEMONSTRATION PROGRAMS

DEMO1.DAT: This script shows how to compile a program (QUEENS.900) that computes all possible layouts of eight queens on a chessboard.

DEMO2.DAT: This script shows how to build a program that runs on multiple interrupt levels. There is a separate program for each level (LEVEL1, LEVEL2, LEVEL3, LEVEL4). Note that each level program contains its own copy of the procedure PUNCH since 900 series code is not re-entrant.

DEMO3.DAT: This script illustrates the mechanisms available for separate compilation. It shows how to create a procedure library for program re-use, and the use of COMMON data types to enable communication between separately compiled segments.

DEMO4.DAT: This script demonstrates the use of the FLOATING type which requires a customized version of the QF floating point package to be loaded as a library. Note the use of the UND command in the Loader to list the missing library after loading the program segment.

PROGRAM FILES

QUEENS.900: Eight Queens program.

LEVEL1.900, LEVEL2.900, LEVEL3.900, LEVEL4.900: Programs to run on each interrupt level.

UNIT1.900: A program comprising two segments and defining a set of COMMON data. The program also calls library procedures.
UNIT2.900: A program that accesses data from COMMON and library procedures.
UNIT3.900: The procedure library used by UNIT1.900 and UNIT2.900. Note the syntax of the procedure specification -

the formal parameters are separated by semicolons, rather than, as might be expected, commas.

REAL.900: Simple program using the FLOATING type.

SYSTEM FILES

MACRO.BIN: "920C CORAL MACRO PASS, CAP BOREHAMWOOD VERSION 3B" MASD – Coral macro-processor.

PASS1A.BIN: "920C CORAL PASS 1A, CAP BOREHAMWOOD VERSION 3B" MASD – Coral compiler pass 1A.

PASS1B.BIN: "920C CORAL PASS 1B, CAP BOREHAMWOOD VERSION 3B" MASD – Coral compiler pass 1B.

PASS2.BIN: "920C CORAL PASS 2, CAP BOREHAMWOOD VERSION 3B" MASD - CORAL compiler PASS 2.

BIN_16K.BIN: "CORAL 16K EXTENDED LOADER, Binary Mode 3" MASD - The CORAL loader (for a 16K configuration).

CAPCORALQF.RLB: "CAPQF TJF VERSION 16/2/76, RLB Mode 3" MASD – a version of QF for use with 920 CAP Coral.