

C.S.I.R.O.

DIVISION OF COMPUTING RESEARCH

NEWSLETTER NO. 28 - 1ST OCTOBER, 1967

I. GENERAL

Publications Issued this Month

NL - Newsletter No. 28

Other Publications Available

F4 - C.S.I.R. EIGEN Eigenvalues and eigenvectors of a real matrix. 3200/3600 Fortran.

Author: J. Boothroyd, University of Tasmania. September, 1967.

EP - A SImscript Primer (EP5), revised edition.

Authors: J.S. Armstrong, D.C.R. and K.P. Tognetti, Navy, Canberra.

Seminars - Canberra

The following Seminars will be held at 2 p.m. in the lecture room of the Division of Computing Research, Clunies-Ross Street, Black Mountain, A.C.T.

October 26	Compilers, Assemblers and Loaders	R.H. Hudson (D.C.R.)
November 9	Impressions of a U.S. Visit	B.J. Austin (D.C.R.)
November 30	Interactive Computing	D.G. Moore (Director, Comp. Centre, Univ. of W.A.)
December 7	Document Management in the DAD System	T.S. Holden (D.C.R.)

Advanced Lecture

A lecture on the use of the Calcomp plotter will be given at D.C.R., Canberra on October 19 at 2.00 p.m. All who would like to learn how to use the plotter are welcome to attend.

Basic Fortran Course

A Basic Fortran Course will be given at D.C.R., Canberra during the week commencing October 9th. All places on this course are taken, but readers are reminded that application to attend future courses can be made using the form available from the Division.

Division of Computing Research

The Executive of C.S.I.R.O. has decided that in future the Computing Research Section shall be known as the Division of Computing Research.

Consultation on Data Acquisition

Mr. C.D. Gilbert will be visiting the Sydney area towards the end of October to meet users with interests or problems associated with the measurement and recording of data.

Users interested in meeting him should leave a note with the Officer-in-Charge at Sydney or write to Mr. C.D. Gilbert, Division of Computing Research, Canberra as soon as possible.

Puzzle Corner

Only Mr. G. Petru submitted a correct answer last month. While quite lengthy analyses of the puzzle are possible, probably the simplest is that given below.

The rapidly rotating 'hour hand' of the clock in the puzzle will catch the 'minute hand' at one possible time on each rotation. Thus 12 possible times are achieved during each hour, and in the course of twelve hours, 144 possible times. But the position in which both hands are pointing upward has been counted twice, so the answer is 143.

Two puzzles this month, both to do with primes:

- (i) Find three integers in arithmetic progression whose product is prime.
- (ii) Find 1000 consecutive non-prime numbers

Use of the Keyboard Display Consoles

Many lecture-demonstrations of the use of the consoles which form part of the 3600 computer system have been given in Canberra. The Education Officer would like to hear from any users away from Canberra who would be interested in a lecture at their own centre describing how they may make the best use of the consoles on their visits to Canberra.

II. 3600KWIKTRAN

KWIKTRAN is a modified version of the Control Data 3600 Fortran compiler system. It is implemented and available under DAD and this note is intended to introduce it to users. Full documentation will be available shortly as a Manual Supplement to the Fortran Manual and it will also be described at the Seminar on October 26th.

Programs written in KWIKTRAN are compiled and loaded two to eight times faster than corresponding Fortran programs. This is faster than the loader can load relocatable binary decks. Users of the 3600 via the Jobstack are reminded that once in Canberra their jobs are indistinguishable from those originating in Canberra so that KWIKTRAN and all other 3600 facilities are available to them.

The language of KWIKTRAN is the same as Fortran with some differences in implementation and with some restrictions on the size of programs and the availability of system library routines.

The KWIKTRAN system is loaded by a *KTN or *KWIKTRAN control statement. The options I,X and L have the same effect as on a *FTN card, but the options B,A,R,C,P are ignored. All the user subroutines and main program must be between one *KTN card and one SCOPE card, that is, control card options cannot be changed between subroutines and binary object programs cannot be loaded.

If execution is desired, the SCOPE card must be followed by *LOAD and *RUN control cards in the usual way. No logical unit is required for the *LOAD card since the absolute code is simply loaded from the random access logical unit. If a program dump is specified on the *RUN card, the program plus the entire library will be dumped.

Less storage is available to the programmer as the entire KWIKTRAN library is loaded as one 9000 word absolute record. Approximately 15000 words remain for the main program, user subroutines and arrays. The following system library routines are not available to KWIKTRAN programs:

DECREAL, DUMMYLINK, EXAMINER, FORMEL, FRDMASK, FRDSET, JACK, LOVER, MATINV, MTRXPack, NEXTITEM, OVERSEG, PDUMP, QUIKPLOT, SIDADD, SNAP, SRLIST, TRNSLATE, VISIWRT, VNUM, VRDREAL.

If a COMMON block is defined with different lengths in two or more subroutines, the subroutine with the largest block length must appear first in the source deck or a fatal diagnostic will be given.

If a user subroutine has the same name as an entry point in the system library routines, it must appear before the calling subprogram. Otherwise, the address of the library routine entry point will be substituted.

Before program execution, numbered and labelled COMMON and all local arrays are cleared to positive zero unless predefined by DATA statements.

There are some restrictions imposed by the size of various assembler tables. These tables have dimensions which have so far proved satisfactory but which can readily be altered in the light of experience. At present, these tables give the following maxima:

symbols per subroutine	1536
literals per subroutine	512
code per subroutine (excluding arrays)	6580 words
number of common blocks	126
number of user-defined entry points	35
number of user-defined subroutines	40

A maximum of 600-700 KWIKTRAN statements per subroutine can be processed.

BREAKIN

The time limit allowed for a job whose execution is initiated from the displays by means of a BREAKIN request is determined by the following rule. The time in minutes is the larger of 2 and $1 + r/8$ where r is the number of minutes remaining for the current main job.

Jobstack Ordering

The batch of jobs originating from a Jobstack tape are re-ordered to give short jobs priority over long jobs. Users who have several jobs which should be run in sequence can assist by allotting their series of jobs an ascending series of time limits.

Document Saving

It is always possible when drum space is short that documents will be removed by the FLUSH routine described in the last Newsletter. Users

can help avoid this by not saving documents unnecessarily and by deleting documents no longer required. If a document produced by one job is required by a second job, the Equip statement of the second job should not include a save request. The document will then be deleted after the execution of the second job.

