

C.S.I.R.O. COMPUTING RESEARCH SECTION

NEWSLETTER NO. 4 - 8/4/65.

1. SYSTEM STATUS

Adelaide - Melbourne - Sydney.

The Control Data 3200 computers at the subsidiary centres are presently undergoing acceptance tests. Program accounting will begin on the 1st May, 1965 and until then all jobs will be run free of charge. Any user whose program fails for reasons which are not understood should contact the local centre manager as this will assist him to pick out faults in the compiler.

Additions to the 3200 Fortran Library

ACOS(X) , arc cosine(x).
CUBERT(X), cube root of x.

N.B. A blank card is necessary before any subroutine deck used with a Fortran program.

Canberra.

Fortran 4.3

It is expected that the present Fortran system will be retained for the next six months.

LOADER ERROR UN EXT

Programs which terminate after compilation due to undefined external may now also list other function names as undefined. In this case the first will be the error.

Algol for the 3600

The ALGO compiler has now been incorporated into the 3600 system tape, and Algol jobs can be submitted on cards, paper tape or sent from subsidiaries on magnetic tape. Unfortunately supplies of the Algol manual (Pub. No. 60083400a) are unobtainable at the moment, but copies are available for brief loan at all C.R.S. centres. Supplies are available however of Manual Supplements No's. 11 and 12 giving the extended character set which may be used for Algol. ALDAP, the more comprehensive Algol compiler allowing various options, is not available at present.

Future System Changes

The present Control Data 3600 system at Canberra will be extended to include time sharing and other facilities by the addition of magnetic drum storage and visual display units. The detailed software to handle the new system is being formulated and programmed. Delivery of the hardware is expected by August when the software should also be usable.

The aim in the first stage will be to accept job stacks in the form currently presented. There will be a few minor changes in the control cards. Besides the simultaneous input, output and job execution there will be on-line keyboard consoles used for writing or editing files on drums and for calling particular files for execution.

Paper Tape FORTRAN Programs

Fortran programs written in TYPETRONICS code on paper tape can now be compiled and executed using the macrogenerator. They should be terminated by a MASTER STOP punching. The following control cards should be used for compilation and execution.

```
7 JOB
9
7 EQUIP, 1 = TR1
9
7 MG,S,T,n
9
7 REWINDT, n
9
7 FTN,X,*,I = n
9
7 LOAD
9
7 RUN
9
DATA
7
8
```

where n refers to a scratch tape 2 $\ll n \ll 59$ N.B. The magrogenerator produces a listing, thus FTN,L is unnecessary.

Gerber Analogue to Digital Data Converter

The above data reduction system is for recording in print and on paper tape the X and Y coordinates of a point beneath the reading head, located by moveable hairlines.

Input

The reading head is a frame with X and Y hairlines, of 20 inches and 16 inches travel, respectively, operated by thumbwheels. The accuracy is 0.01% over the range of travel. The reading head may be moved $7\frac{1}{2}$ inches vertically and rotated approximately 1° . Lateral movement of 36 inches is possible, and spools with variable tension and drive speed are provided to move continuous records beneath the reading head.

Conversion

The analogue console provides for sequential conversion of up to 15 channels. These may be individually calibrated for scaling and zero offset. For example, each line of output might be one X coordinate and four Y coordinates, so in this case, 5 channels would be converted. Optionally, a counter may be stepped and recorded at each line. The output format may be varied.

Operation

The hairlines are set to the required position, and pressing the readout button causes the output of one channel to be punched on the paper tape and printed on the typetronics typewriter. The maximum operating speed is about 8 channels per minute, but it is expected that this will be increased.

Use

This system is now available. Please address enquiries to:

J.A.B. Palmer.
Computing Research Section,
C.S.I.R.O.,
CANBERRA 40455 Ext 507

2. VISITORS CARD PUNCH CANBERRA

An IBM 026 card punch has been installed near the staircase of the Computing Building, Canberra. This punch is reserved for visitors to the section, who need to prepare a small number of control or correction cards. Where whole programs or large amounts of data are to be prepared this must be done by the section staff. Fortran coding forms and data forms are available at the counter.

3. FORTRAN COURSES

BASIC COURSES

Canberra: Tuesday, April 20th - Friday, April 23rd.

Sydney: Tuesday, April 27th - Friday, April 30th.

ADVANCED FORTRAN LECTURE

Canberra: Thursday, April 22nd - 2.00 p.m.

Sydney: Thursday, April 29th - 2.00 p.m.

Topic 3600/3200 word structure, associated I/O routines, magnetic tape, buffering, masking and logical instructions.

4. DISTRIBUTION OF PUBLICATIONS

As indicated in Nesletter No. 3, certain changes are being made to the distribution system. Addressograph plates have been made up for all the known users. If you have not received this newsletter directly will you please complete the reply form enclosed and return it to us as soon as possible.

5. SERIAL PUBLICATIONS IN THE CSIRO COMPUTER LIBRARY

A preliminary list of periodicals held in the Canberra library is available from any of the four centres. There are presently over 70 serial publications held in the library.

6. ACCESSION LIST OF TEXT BOOKS AND PAMPHLETS.

This list, under preparation, will be available at any of the four centres. Suggestions for additions to the library should be sent with full details to Miss G. Watt, Librarian, Computer Library, CSIRO., P.O. Box 109, Canberra. A.C.T.

7. LIST OF CONTROL DATA PUBLICATIONS

A list of Control Data publications held in the Canberra Library will be available later.

8. VISITORS TO CANBERRA CENTRE

Customers visiting the Section at Canberra should leave their names and contact point whilst in Canberra with Miss C. Green at the Enquiry Counter. This will facilitate distribution of mail, telegrams and transfer of telephone calls and other messages.

9. SUBROUTINES

Roots of equation	C2	CSIR	ROOT
Error Function.	C3	CSIR	ERF36

N.B. This routine is considerably faster but is less accurate than the routine C3 CSIR ERF.

Zero order Bessel Functions	C3	CSIR	ZEROBESS
Bessel and Bessel-Neumann Functions	C3	CSIR	BESSOIJY
Integration by Gaussian Quadrature	D1	CSIR	AUGANS

Library Subroutines

Autoplotting Routine		CSIR	AUTO PLOT
Dumping routine incorporates other routines.	VNUM LOC FROMEL	CSIR	PDUMP

Free Format input for numbers	I1	CSIR	VARYREAD
Free format input, incorporates DECODER	A	CSIR	FREEREAD

10. EXPERIMENTS - SELECTION OF GROUPS

A program called OPTGROUP is under preparation which will automatically select the optimum grouping of elements prior to the use of such groups in an experiment. For example, the selection by weight of four groups of six members from 24 cattle such that the standard deviation of the group means is less than some defined maximum. Associated with this program is a subroutine SCRAMBLE which produces a random arrangement of all the items contained in an input list. Anyone interested in receiving the preliminary write-up should contact J.S. Armstrong, Canberra.

11. NEW FEATURE OF THE NEWSLETTER

While the main purpose of the newsletter is to keep the user informed of system changes, new subroutines and publications, programming courses etc. we intend in future issues to include brief details of some of the work being done by CSIRO and other Government departments who are using the network.

12. PUBLICATIONS

The following is a list of Computing Research Section publications to date:-

- Educational Publication No. 1 E.P.1 Lecture Notes for Basic Fortran Course.
J.S. Armstrong - Jan, 65.
- Educational Publication No. 2 E.P.2 Glossary of Computing Terms.
Nov, 64.
- Educational Publication No. A1 E.P.A.1 Notes of the Use of the Plotter. J.S. Armstrong.
- Manual Supplement No. 1 Addenda and Errata to CDC 3600 FORTRAN Reference Manual (Pub. No. 60053700).
D.J. Langridge. 18th June, 1964.
- Manual Supplement No. 2 Structure of Standard CDC 3600 FORTRAN Decks. (Pub. No. 60053700).
J.P. Penny. 30th June, 1964.
- Manual Supplement No. 3 Structure of Standard CDC 3600 COMPASS Decks. (Pub. No. 60052500a).
J.P. Penny. 30th June, 1964.
- Manual Supplement No. 4 Basic FORTRAN II, Reference Manual (Pub. No. 60056900) Preferred Usage.
T.S. Holden. July, 1964.
- Manual Supplement No. 5 FORTRAN-32 As a Compatible overset of Basic FORTRAN II, and a Compatible Subset of CDC 3600 FORTRAN.
(Pub. No. 600537). J.J. Russell.
August, 1964.
- Manual Supplement No. 6 Revision of Line Printer Facilities.
Ref. CDC (Pub. No. 60053700).
D.J. Langridge. October, 1964.
- Manual Supplement No. 7 Additional 3600 FORTRAN Compiler Errors.
Ref: CDC (Pub. No. 60053700)
J.R. Pendleton. October, 1964.
- Manual Supplement No. 8 Additions to FORTRAN Library Functions.
Ref: CDC (Pub. No. 60053700).
J.G. Cleary. July, 1964.

- Manual Supplement No. 9 Additional Entry Points to the Execution Error Routine. Q8QERROR. Ref: CDC (Pub. No. 60053700). D.J. Langridge. November, 1964.
- Manual Supplement No. 10 3200 FORTRAN. Standard Deck Structure. (CDC Pub. No. 60057600). D.C. Knight. November, 1964.
- Manual Supplement No. 11 Algol for the 3600. Ref: CDC (Pub. No. 60083400a). T.S. Holden. February, 1965.
- Manual Supplement No. 12 Paper Tape Input for Algo. Ref: CDC (Pub. No. 60083400a). P.H. Frost. March, 1965.
- Memorandum No. 1)
Memorandum No. 2) - Superseded by Memorandum No. 4
- Memorandum No. 3 Character and code Sets. T. Pearcey June, 1963.
- Memorandum No. 4 Revised Equipment Configurations. T.S. Holden. July, 1964.
- Newsletter No. 1 T.S. Holden. July, 1964.
- Newsletter No. 2 J.S. Armstrong. October, 1964.
- Newsletter No. 3 J.S. Armstrong. January, 1965.
- Newsletter No. 4 J.S. Armstrong. April, 1965.
- Technical Note No. 1 Planned Subroutines for the CSIRO CDC 3200 Subsidiary Computing System. T. Pearcey. May, 1964.
- Technical Note No. 2 Specifications of FORTRAN II/4K Language for the CDC 3200 (as known at 16/4/64). T. Pearcey. May, 1964.
- Technical Note No. 3 Representation of Line Printer Characters on other Media. T.S. Holden. June, 1964.
- Technical Note No. 4 Instructions for Conversion of I.B.M.. 1620 FORTRAN II Programs for use on a CDC 3600. S.R. Albright. June, 1964.

Technical Note No. 5 Use of the 3600 CALCOMP PLOTTERS.
R.H. Hudson. August, 1964.

Technical Note No. 6 The Use of Paper Tape on the CDC 3600.
T.S. Holden. October, 1964.

Addendum

Technical Note No. T.S. Holden, J.W. Marquet. C.D.A.
February, 1965.