UNIVERSITY OF QUEENSLAND

Computer Centre

NEWSLETTER

authorization: Director of the Computer Centre

1   SYSTEM PERFORMANCE

PERIOD FOR MARCH 1974

USEFUL TIME	310	75.24%
GOOD TIME	315	76.46%
ON TIME	412	100%
NO OF CRASHES	43	
TIME BETWEEN CRASHES	7.34 HRS	

During March we suffered from the same intermittent fault that developed towards the end of February.   Fortunately, users work was able to be cleared without too much inconvenience. We are happy to report that we eventually isolated the fault to a component failure.

2   MAY VACATION COURSES

(a)   Introductory Fortran Course

The Computer Centre will be conducting an introductory FORTRAN course over five half-day lecture/tutorial sessions during the week 13 - 17 May, 1974.

The course is intended specifically for members of the University staff and postgraduate students and will be free to people from this category, Others may attend the course, but will be charged the usual rate.

Send applications to the Operations Supervisor, Computer Centre, to arrive no later than 22nd April, 1974.

(b)   "The Computer as a Research Tool"

To introduce you to computers, computer problem solving and the
currently available statistical programs, the Computer Centre is
holding a course from 2p.m. - 4p.m. on <u>MAY 7 - 10</u> in Room B18 of
the Hawken Building.

The course is free to University staff members and an outline is
set out below.   The course is designed to introduce researchers
to computer problem solving generally and the SPSS and BMD statistical
packages in particular.   Please feel free to come to whatever parts
of the course you think are appropriate to your situation.   However,
everyone not currently involved with computers is urged to attend
the initial session to gain some appreciation of the way in which
computers can be applied to university research.

Enquiries about this course should be directed to Mr. Robert Crago
at the Centre - telephone extension 6288.

<u>COURSE OUTLINE</u>

1   PROBLEM SOLVING BY COMPUTER   (Tuesday, 7th May)

       1.1 Introduction to Computers
       1.2 Computer-Applicable Problems
       1.3 Collection, Coding and Preparation of Data
       1.4 Introduction to Packages

2   USING THE U.Q. COMPUTER   (Wednesday, 8th May)
       (FOR NON-PROGRAMMERS)

       2.1 Computer Centre Facilities
       2.2 Timesharing (terminal) Usage
       2.3 Batch (card) Usage
       2.4 Files (storage of data)

3   STATISTICAL PACKAGES   (Thursday & Friday, 9th & 10th May)

       3.1 Using the 'Statistical Package for the Social Sciences'(SPSS)
       3.2 Using the 'Biomedical Computer Programs' (BMD)
       3.3 Programs in SPSS and BMD

3   <u>NEW EDITOR MANUALS</u>

A new edition of the EDITOR manual is now available from the
Computer Centre, price 80 cents.

4   FORTRAN ON THE PDP-10

The implementation of FORTRAN IV on the PDP-10 is currently under-
going a 'face lift' and, whilst the actual implications of change
to the user will be minimal, they are significant in that they
will generally provide faster compilation and execution times and
better error reporting and handling facilities.

This article is intended as an outline of the FORTRAN system on
the PDP-10, the intended developments and their affects on the
user.

The FORTRAN compiler which is currently used (unless another is
specifically requested) is F40 version 23.   This compiler has
been operating on the system for some time now and is by far the
most commonly used. Programs written in FORTRAN also require an
execution system to handle the various run time requirements of
I/O operations etc.   This system is called the "FORTRAN OPERATING
SYSTEM".   The current standard FORTRAN operating system on the
PDP-10 is called FORSE, and associated with it is a library of
FORTRAN routines such as COS, SQRT, etc known as LIB40.

VERSION 23 has since been updated and a new F40 VERSION 26 is
available.   Version 26 has corrected a number of problems exist-
ing in VERSION 23, and as far as testing has shown, has not
introduced any new ones.   As well, VERSION 26 prints the relative
location of the start of the FORTRAN statement to be printed on
the listing.   This will assist in the debugging of programs which
have error referring to the user PC location.

As well as a new version of the F40 compiler, DEC have also
developed an entirely new compiler called F10.   This compiler is
referred to as FORTRAN 10 and provides the user with many extra
features which do not appear in FORTRAN IV.   These features
include:-

    (1)   Comprehensive file handling facilities, such as the
           ability to operate on image mode binary files.

    (2)   Multiple entry points into routines.

    (3)   Namelist facility.

    (4)   Multiple statement lines.

As well as providing these, and many more features, FORTRAN 10 still
allows for the compilation of programs written in standard FORTRAN IV.
Whilst taking slightly longer to compile, FORTRAN 10 generates better
machine code and so is more efficient at run time.

Although FORTRAN 10 is still undergoing extensive testing at the
Computer Centre, experienced users are encourages to consider
using it for the writing of complex programs.

With the introduction of F40 VERSION 26 and FORTRAN 10, the need
arose for a new FORTRAN operating system and so a new system
known as FOROTS was introduced.   Along with FOROTS comes a new
library known as FORLIB to replace the old LIB40, and as well as
providing a number of new routines, FORLIB provides all of the
routines available in LIB40, except for a couple which have
become redundant.

The use of FOROTS is mandatory for all FORTRAN 10 programs, but
is optional with F40 VERSION 26, which may still use FORSE (and
its associated LIB40).   However as FOROTS provides much better
run time management of both F40 and FORTRAN 10 programs,
particularly as far as error handling is concerned, it is intended
that for the present FOROTS (and its associated FORLIB) will
become the standard default FORTRAN operating system.   F40
VERSION 26 will be the standard default FORTRAN compiler.
FORTRAN 10 will be made available on the "NEW" directory, while
F40 VERSION 23 and FORSE will still be available, but on the
"OLD" directory.

F40 V26, FORTRAN 10 and FOROTS have been placed on the NEW
directory;

        example:

                .COMPILE/NEW/LIST MYPROG.F4
                .EXECUTE/NEW/FOROTS   MYPROG.REL

Users are requested to familiarise themselves with this system
and the particular error messages it produces, together with any
compatibility problems (see section on Compatibility).

The following adjustments will be made from April 22nd:

        F40 V26 and FOROTS will be placed on the system as the
        default FORTRAN compiler and operating system.

        F40 V23 and FORSE will be placed on the "OLD" Directory.

        F10 (FORTRAN 10) will be placed onto the NEW: directory.

NOTE:- (1) Users with assembly language routines which require
            linkage to both F40 V26 and F10 programs should
            consult the FORTRAN 10 LANGUAGE HANDBOOK (at Centre).

4

(2) FOROTS will not accept, in the same way as FORSE did, the mixing of 026 and 029 punched data decks. Means exist to handle entirely 026 or entirely 029, but not both. Users are requested to resolve this problem where possible. However, users with serious difficulties should contact the Computer Centre.

Any queries with regard to this changeover or the use of FORTRAN 10, should contact Bob Christiansen - telephone extension 6288.

4.1 Compatibility

4.1.1 FOROTS/FORSE Compatibility

The information presented in paragraphs 4.1.2 and 4.1.3 is intended only for those users who have programs and data files which were developed using the F40 FORTRAN compiler and the FORSE object time system. The manner in which both upward and downward compatibility between the FORTRAN 10, FOROTS and F40, FORSE FORTRAN systems may be achieved is described in the following sections.

4.1.2 FORTRAN 10/F40 Data File Compatibility

Upward compatibility of data files (FORSE TO FOROTS) is described in Table B-3. Downward compatibility of data files (FOROTS TO FORSE) is described in Table B-4.

4.1.3 Conversion of FOROTS-Developed Data Files Into a Form Acceptable to FORSE

The following paragraphs describe procedures which may be used to convert FOROTS sequential mixed, random access ASCII and random access binary data files into a form which can be read by FORSE.

4.1.4 Conversion of FOROTS Sequential Mixed Files

The following steps are suggested as a method of converting a FOROTS sequential mixed file into either a sequential ASCII or sequential binary file which is acceptable to FORSE:

(i) Prepare and run a FORTRAN 10 I/O program which will produce either a sequential ASCII or a sequential binary output file.

(ii) If a sequential ASCII file is produced, it must be line-blocked before it can be read by FORSE. Line-blocking is accomplished by copying the file using either the system COPY command (with an A switch) or PIP. The copy will be

line-blocked and will be acceptable to FORSE. The following
is an example of the command sequence needed to line-block
the data file FOROT.DAT:

     .COPY FOROT.DAT=FOROT.DAT/A

(iii) If a sequential binary file is produced it must be record-
blocked before it can be read by FORSE. Record-blocking is
accomplished using the /K feature of the program BAKWDS.
The following is an example of the command sequence needed
to record-block the data file FOROT.DAT:

     .R BAKWDS

     *FOROT.DAT=FOROT.DAT/K

Table B-3

Upward Compatibility (FORSE TO FOROTS)

FORSE File Type	May Be Read by FOROTS	In the Following Manner
1. Sequential ASCII	Yes	May be read directly; record positioning operations (e.g. BACKSPACE, SKIP RECORD) may be used.
2. Sequential Binary	Yes	May be read directly in a forward fashion only, record positioning operations are not permitted.
3. Sequential Mixed Files	Yes	May be read directly in a forward fashion only, record positioning operations not permitted.
4. Random Access ASCII Files	No	NOTE: It is suggested that the random access file be read (using FORSE) and be rewritten as a sequential file which can be accepted by FOROTS.
5. Random Access Binary Files	No	(The conversion suggested in the above note also applies in this case).

Table B-4

Downward Compatibility (FOROTS TO FORSE)

FOROTS File Type	May Be Read by FORSE	In the Following Manner:
1. Sequential ASCII File	Yes	This operation is permitted if the file is line-blocked. This may be accomplished by making a copy of the file using either the system copy command (with an A switch) or the PIP program. The resulting copy will be line-blocked. An example of the command sequence needed to line block a FOROTS file, using PIP, follows: .R PIP *FORSE.DAT=FOROTS.DAT/A
2. Sequential Binary File	Yes	This operation is permitted if the file is record-blocked. This type of blocking is accomplished by using the /K option of the program BAKWDS. The following is an example of a command sequence which record-blocks a file: .R BAKWDS *FORSE.DAT=FOROTS.DAT/K
3. Sequential Mixed File	No	(See Paragraph 4.1.4 for suggested conversion procedure).
4. Random Access ASCII File	No	(See Paragraph 4.1.4 for suggested conversion procedure).
5. Random Access Binary File	No	(See Paragraph 4.1.4 for suggested conversion procedure).

4.1.5   Conversion of FOROTS Random Access ASCII Files

The following procedure is suggested as a method of converting a FOROTS random access ASCII file into a form acceptable to FORSE:

(i)   Prepare and run a FORTRAN 10 I/O program which will create a sequential ASCII file comprised of the records of the random access file.

(ii)   Line-block the sequential ASCII file using either the system COPY command (with an A switch) or the PIP program. The following is an example of the COPY command:

    .COPY LNBLK.DAT=SEQFL.DAT/A

    The foregoing command would produce a line-blocked copy (LNBLK.DAT) of the sequential file SEQFL.DAT.

(iii)   Prepare and run an F40 I/O program which will read the file produced in step (ii) and will rewrite the file as a FORSE-generated random access file.

4.1.6   Conversion of FOROTS Random Access Binary Files

The following procedure is suggested as a method of converting a FOROTS random access binary file into a form acceptable to FORSE:

(i)   Prepare and run a FORTRAN 10 I/O program which will create a sequential binary file comprised of the records of the random access file.

(ii)   Record-block the sequential file. This is accomplished by using the /K feature of the program BAKWDS. The following example illustrates the command sequence required to convert the file FOROTS.DAT into the record-blocked file FORBLK.DAT.

    .R BAKWDS
    *FORBLK.DAT=FOROTS.DAT/K

(iii)   An F40 I/O program may then be written to convert the sequential record-blocked file into a FORSE generated random access file.

5   FILE STORAGE LIMITS INCREASED

As was foreshadowed at the time of introduction of the File Migration System, file storage limits will be revised to give user's additional online storage. As from WEDNESDAY, 10TH APRIL, all user's will be allowed a logged out quota of 400 blocks and a 'first-come-first-served' (logged in) quota of 1500 blocks. Extension above this limit is dependant on the operational availability of an additional disk pack drive, though it must be emphasized that substantial increase in limits is also dependant on the effective use of the File Migration System for the disposal of inactive files.