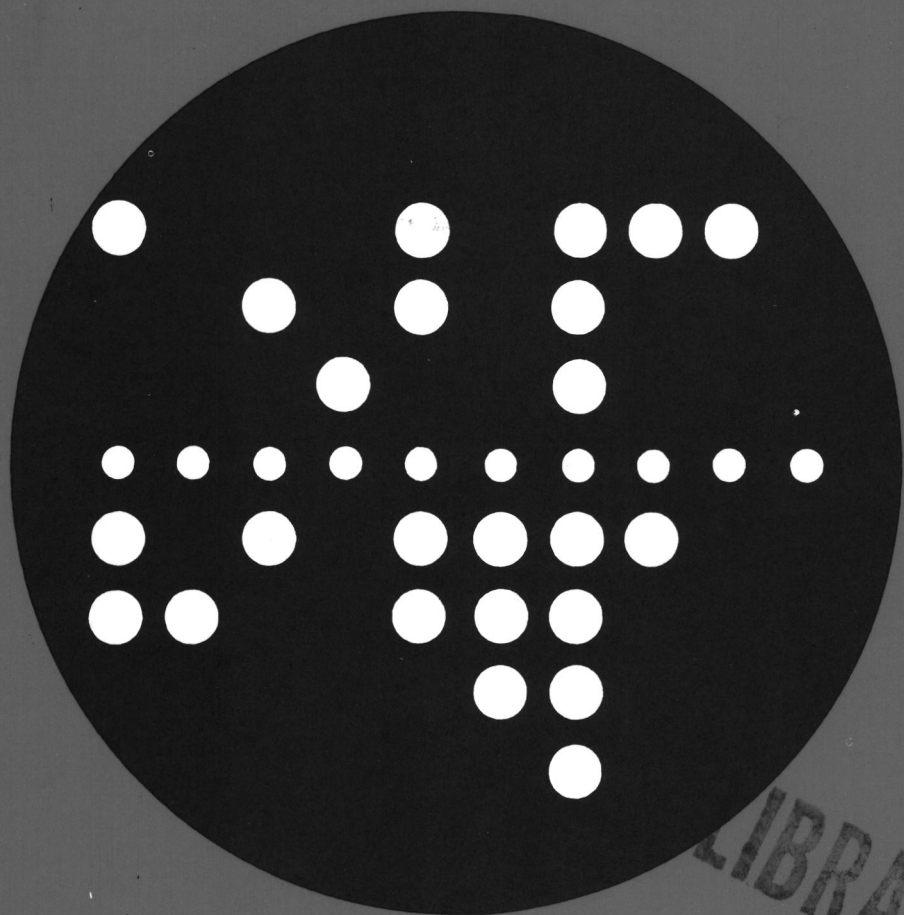


COMPUTING CENTRE NEWSLETTER

September 1981 - N. 54



LIBRARY

Commission of the European Communities



**JOINT
RESEARCH
CENTRE**

Ispra Establishment

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EDITORIAL NOTE

The Computing Centre Newsletter is published monthly except for August and December.

It describes developments, modifications and specific topics in relation to the use of the computing installations of the Joint Research Centre, Ispra Establishment.

The aim of the Newsletter is to provide information of importance to the users of the computing installations, in a form which is both interesting and readable.

The Newsletter also includes articles which are of intellectual and educational value in order to keep the users informed of new advances in computer science topics.

The Editorial Board is composed as follows:

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Neither the Commission of the European Communities nor any person acting on behalf of the Commission is responsible for the use which might be made of the information in this Newsletter.

IMSL EDITION 8A

M. Dowell

Edition 8A of the IMSL mathematical library has been received and is now available using the existing data sets. This is a maintenance release of the library which corrects errors in the routines and the documentation. This version does not, however, contain any new routines. An updated version of the IMSL manual is available for reference from the Computing Support Library (room 1871 building A36).

At the beginning of the manual there is a copy of the Library Maintenance Letter which gives details of all the changes made. In this article details are given of some of the more important corrections.

IMSL Edition 8A Corrections

<u>NAME</u>	<u>DESCRIPTION OF CHANGE</u>
GGAMR	modified code so as to ensure correct branch is taken for all values of 'A' and reinitialized local variables for use in subsequent calls to routine
GGBTR	modified code so as to ensure correct branch is taken for all values of 'P' and 'Q'
GGCAY	modified source code to improve efficiency and protect against division by zero
GGDA	code changed for greater efficiency. Input vector 'P' is no longer destroyed on output
GGUW	zeroed out 'WK' vector in a data statement in order to assure its integrity from call to call
LGING	corrected to handle rows of all zeros
MDFD	argument checking procedure changed to guard against user input errors
MDNRIS	revised routine to accommodate arguments less than machine EPS

<u>NAME</u>	<u>DESCRIPTION OF CHANGE</u>
MDTD	corrected code for nonintegral DF
MERFCI	revised routine to accomodate arguments less than machine EPS
MMPSI	code changed to eliminate overflow
MHEXT	modified code for computation of 'P(1)' and 'P(2)'
RLEAP	modified code to prevent division by zero when the problem is too ill-conditioned extended the definition of 'IJOB(2)' to allow for early termination and modified code accordingly
RLFOTH	modified code to avoid division by zero when perfect fit is obtained and added warning error when perfect fit is obtained with a model of lower degree than expected when 'RSQ' = 100
RLFOTW	modified code to avoid division by zero when perfect fit is obtained and added warning error when perfect fit is obtained with a model of lower degree than expected when 'RSQ' = 100 corrected code so that constant response variable will not result in a terminal error
RLONE	code changed to avoid division by zero when dependent variable is constant. Changed documentation of 'IER'=129
USBOX1	replaced 'DASH' with 'PLUS' for two adjacent hinges
ZXMIN	corrected handling of case where 'N' is one and 'IOPT' is zero, and improved accuracy of initial Hessian when 'IOPT' = 2 or 3
ZX4LR	corrected inadequate handling of artificial vector

INSTALLATION NOTES

M. Dowell

There have been many changes in the "installation notes" in the last few months to give details of the new disks, changes due to the introduction of DMS, etc. This short article gives details of how to obtain the installation notes and describes the new system for obtaining the recent update to the notes.

A line printer listing of selected items from the set of installation notes may be obtained by executing a batch job. The appropriate format for the job is given below:

```
//.....JOB(your job card).....  
$   LINES 111  
//   EXEC LIHNO,MEMB=nnnn
```

where 111 and nnnn should be replaced by the appropriate items from the following table.

Description of the contents	nnnn	111
General information on AMDAHL, O.S. and HASP utilization	INFO	002
Job Execution Requirements (\$OC)	JER	002
Information about the job control procedures available for use with Algol, Assembler and FORTRAN (G1 and HE)	PROC	003
Information about the job control procedures available for use with PL1 and COBOL compilers and also SORT/MERGE. There is also extended information for Algol and FORTRAN (G1 and HE)	PPGL	002
Programs and utility routines	UTIL	003

It is envisaged that users will produce copies of various sections of the installation notes for subsequent reference. It is, of course, possible to obtain lists of several of the sections of the installation notes in one job. This may be accomplished by having a 'LINES' card which contains the total accumulated 'lll' values. This is followed by the appropriate EXEC cards to produce the listings required.

Note. The specification of the job format does not include a 'TIME' card. It is not envisaged that the production of listings of one (or even all) of the sections of the installation notes will require more than the default time allocation.

From time to time sections of the installation notes may be modified to perform additions, deletions or corrections. The following facility has been made available to enable users to ensure that their copies of the sections of the installation notes are always up to date. This system has recently been modified to provide this update feature in a more flexible manner.

Every page of the installation notes contains the date on which that a page was last modified. It is possible to obtain all of the modifications (since the date "ddmmyy") to a particular set of notes by adding a DATE=ddmmyy parameter to the EXEC statement in the job.

i.e.

```
//      JOB(your job card)
$      LINES lll
//      EXEC LIHNO,MEMB=nnnn,DATE=ddmmyy
```

will give all pages of installation notes "nnnn" which have been modified since date "ddmmyy".

Examples

1. To obtain a copy of the two sections of installation notes named INFO and JER.

```
//      JOB(your job card)
$      LINES 004
//      EXEC LIHNO,MEMB=INFO
//      EXEC LIHNO,MEMB=JER
```

2. To obtain a copy of all pages of the JER installation notes which have been changed since 1st June 1981.

```
//      JOB(your job card)
$      LINES 002
//      EXEC LIHNO,MEMB=JER,DATE=010681
```

TSO COMMAND PROCEDURE CHANGES

M. Dowell

Changes have been made to the COBCLG, FG1CLG and PL1CLG TSO command procedures. These changes have been performed in order to provide new facilities for those TSO command procedures which are equivalent to the changes for the major language batch procedures already described in Newsletter N. 51 - May 1981, page 8.

The changes concern the use of a private or special system library at the consolidation phase of the procedure.

These libraries historically were named SYS1.LIB---. However, following the DMS changes and other related changes in July 1981 all such user libraries have been renamed USER.LIB--- or TSOabcd.LIB--- and have been cataloged.

The modifications made to the procedures to accomodate these changes are:

1. The use of the PRN(---) parameter is unchanged.
2. The UID(---) parameter is introduced to enable the specification of a new leading string to replace the default value of "SYS1" (Thus for a library named TSOTEST.LIBXYZ, a parameter UID(TSOTEST) must be given).
3. The VLB(---) parameter, which was previously used to specify the volume on which the library resides, is no longer available. This parameter is no longer needed for system libraries or libraries on the user disks (which are always cataloged). For libraries on private disks, the user must allocate the data set (with the ALLOC command), specifying the volume, before the call to the relevant command procedure.
4. The NM(---) parameter is introduced to enable the "LIB" part of the library name to be changed. This also means that if the NM parameter is used in conjunction with the UID parameter (and without the PRN parameter), a general name can be specified (see example 4).

Examples

1. When logged-on under TSO user TSOABC, compile-link and run a FORTRAN program PROG1.FORT (i.e. full name of data set TSOABC.PROG1.FORT).
The program uses routines from the NAG-single precision mathematical library (SYS1.LIBNAGS).

The following TSO command procedure may be reused:

```
FG1CLG PROG1 PRN(NAGS)
```

2. When logged-on under TSO user TSOABC, compile-link and run a FORTRAN program PROG2.FORT (i.e. full name of data set TSOABC.PROG2.FORT).
The program uses routines from the user's library LIBMX22 (i.e. full name TSOABC.LIBMX22).

The following TSO command procedure may be used:

```
FG1CLG PROG2 PRN(MX22) UID(TSOABC)
```

3. When logged-on under TSO user TSOABC, compile-link and run a FORTRAN program PROG3.FORT (i.e. full name of data set TSOABC.PROG3.FORT).
The program uses routines from the user's library USER.LIBXAB (this is the full name).

The following TSO command procedure may be used:

```
FG1CLG PROG3 PRN(XAB) UID(USER)
```

4. When logged-on under TSO user TSOABC, compile-link and run a FORTRAN program PROG4.FORT (i.e. full name of data set TSOABC.PROG4.FORT).
The program uses routines from the user's library XYZ.LOAD (i.e. full name TSOABC.XYZ.LOAD).

The following TSO command procedure may be used:

```
FG1CLG PROG4 UID(TSOABC) NM(XYZ.LOAD)
```

Note

Full details of these new facilities are included in the HELP information for COBCLG, FG1CLG & PL1CLG.

LINEPRINTER CHARACTER SET

M. Dowell

It is now possible to produce printed output on one of the new lineprinters with a much fuller character set than has been previously available.

To obtain output on the printer, using a special "T-chain", a DD card must be given which specifies that the output should be sent to the system output queue (SYSOUT) and then should be output with special properties.

The general form of the DD statement is

```
//outname DD SYSOUT=(A,,2001)
```

where outname should be replaced by the relevant ddname.

This will produce the output using the new special "T-chain" on the standard lineprinter paper (9 inches x 8 lines per inch). In this case it is not necessary to specify a "\$OC" control card for the lineprinter output. However, it is possible to use the "T-chain" with other non-standard lineprinter paper. In such cases a "\$OC" card to specify the type of output paper is necessary. Full details of these various options may be found in the Installation Notes: section "INFO", page C.2-1.

Example of the Use of the "T-chain"

```
//          JOB(your job card)
//          EXEC FTG1CG
//CMP.SYSIN DD *
.
.          FORTRAN program which writes
.          output needing to be interpreted
.          by the "T-chain"
.
/*
//GO.FT06F001 DD SYSOUT=(A,,2001)
```

"T-chain" Characters

The following is a list of "T-chain" characters with their relevant internal EBCDIC code (given both in decimal and hexadecimal form). Codes for which no character is shown are "non-printable" and will give a space in the relevant position on the lineprinter output. (Note codes 00-3F i.e. 0-63 are not listed because they are all non-printable).

40 (64) =	00 (96) = -	80 (128) =	A0 (160) = -	C0 (192) =	E0 (224) =
41 (65) =	01 (97) = /	81 (129) = a	A1 (161) = 0	C1 (193) = A	E1 (225) =
42 (66) =	02 (98) =	82 (130) = b	A2 (162) = s	C2 (194) = B	E2 (226) = S
43 (67) =	03 (99) =	83 (131) = c	A3 (163) = t	C3 (195) = C	E3 (227) = T
44 (68) =	04 (100) =	84 (132) = d	A4 (164) = u	C4 (196) = D	E4 (228) = U
45 (69) =	05 (101) =	85 (133) = e	A5 (165) = v	C5 (197) = E	E5 (229) = V
46 (70) =	06 (102) =	86 (134) = f	A6 (166) = w	C6 (198) = F	E6 (230) = W
47 (71) =	07 (103) =	87 (135) = g	A7 (167) = x	C7 (199) = G	E7 (231) = X
48 (72) =	08 (104) =	88 (136) = h	A8 (168) = y	C8 (200) = H	E8 (232) = Y
49 (73) =	09 (105) =	89 (137) = i	A9 (169) = z	C9 (201) = I	E9 (233) = Z
4A (74) = €	0A (106) =	8A (138) =	AA (170) =	CA (202) =	EA (234) =
4B (75) = .	0B (107) = ,	8B (139) = {	AB (171) = L	CB (203) =	EB (235) =
4C (76) = <	0C (108) = %	8C (140) = ≤	AC (172) = r	CC (204) =	EC (236) =
4D (77) = (0D (109) = _	8D (141) = ‘	AD (173) = [CD (205) =	ED (237) =
4E (78) = +	0E (110) = >	8E (142) = †	AE (174) = ≥	CE (206) =	EE (238) =
4F (79) =	0F (111) = ?	8F (143) = †	AF (175) = °	CF (207) =	EF (239) =
50 (80) = &	70 (112) =	90 (144) =	B0 (176) = 0	D0 (208) =	F0 (240) = 0
51 (81) =	71 (113) =	91 (145) = j	B1 (177) = 1	D1 (209) = J	F1 (241) = 1
52 (82) =	72 (114) =	92 (146) = k	B2 (178) = 2	D2 (210) = K	F2 (242) = 2
53 (83) =	73 (115) =	93 (147) = l	B3 (179) = 3	D3 (211) = L	F3 (243) = 3
54 (84) =	74 (116) =	94 (148) = m	B4 (180) = 4	D4 (212) = M	F4 (244) = 4
55 (85) =	75 (117) =	95 (149) = n	B5 (181) = 5	D5 (213) = N	F5 (245) = 5
56 (86) =	76 (118) =	96 (150) = o	B6 (182) = 6	D6 (214) = O	F6 (246) = 6
57 (87) =	77 (119) =	97 (151) = p	B7 (183) = 7	D7 (215) = P	F7 (247) = 7
58 (88) =	78 (120) =	98 (152) = q	B8 (184) = 8	D8 (216) = Q	F8 (248) = 8
59 (89) =	79 (121) =	99 (153) = r	B9 (185) = 9	D9 (217) = R	F9 (249) = 9
5A (90) = !	7A (122) = :	9A (154) =	BA (186) =	DA (218) =	FA (250) =
5B (91) = \$	7B (123) = #	9B (155) = }	BB (187) = J	DB (219) =	FB (251) =
5C (92) = *	7C (124) = @	9C (156) = □	BC (188) = 1	DC (220) =	FC (252) =
5D (93) =)	7D (125) = ‘	9D (157) = ’	BD (189) =]	DD (221) =	FD (253) =
5E (94) = ;	7E (126) = =	9E (158) = ±	BE (190) = †	DE (222) =	FE (254) =
5F (95) = ~	7F (127) = "	9F (159) = =	BF (191) = -	DF (223) =	FF (255) =

TELEPHONE NUMBER CHANGES

Recently there has been a complete change in the numbering system of the internal telephone exchange of the centre. The new telephone numbers for the members of the informatics support sector are shown in the back of the newsletter.

Information regarding the current state of the main computer system can be obtained by using the telephone. By dialling the new extension 5463 it is possible to listen to a recorded message which gives details of the situation in the event of a computer breakdown. The information is short and concise and will usually contain an indication of the expected length of time of the delay.

ERRATA CORRIGE

There are two errors on page 15 of the Newsletter N° 53, July 1981.

- 1) In the description of parameter Y of the subroutine XPRE, the text should read:

"On exit Y contains the number....."

- 2) Under the heading "error messages" the text should read:

"Due to erroneous use of the described routines a NAG error message could appear followed by the name of a NAG routine and the number of the error."

**STATISTICS OF COMPUTING INSTALLATION UTILIZATION.
 REPORT OF COMPUTING INSTALLATION EXPLOITATION
 FOR THE MONTH OF JULY 1981.**

<u>General</u>	YEAR 1980	YEAR 1981
Number of working days	23 d	23 d
Work hours from 8.00 to 24.00 for	16.00h	16.00h
Duration of scheduled maintenance	15.84h	17.83h
Duration of unexpected maintenance	39.52h	8.17h**
Total maintenance time	55.36h	26.00h
Total exploitation time	312.64h	342.00h
CPU time in problem mode	183.64h	275.88h*

Batch Processing

Number of jobs	7637	6892
Number of cards input	1565000	323278
Number of lines printed	25710000	22492000
Number of cards punched	377000	24400
CPU Time	161.35h	239.69h*
Number of I/O (Disks)	19563000	21258700
Number of I/O (Magnetic tape)	4024000	4724300

T.S.O.

Number of LOGON's	3700	4291
Number of messages sent by terminals	267000	268363
Number of messages received by terminals	1684000	1990585
CPU time	20.91h	31.08h*
Number of I/O (Disk)	3118000	2107600
Connect time	2785.84h	2534.51h

ADABAS

Total time service is available	-	154.42h
CPU time	-	2.21h*
Number of I/O (Disk)	-	557800

IMS

Total time service is available	91.66h	118.62h
CPU time	1.38h	2.90h*
Number of I/O (Disk)	283000	389800

* Real CPU has been multiplied by a factor of 2 to indicate the increased throughput of the AMDAHL.

** Covering all the configuration.

**UTILIZATION OF COMPUTING CENTRE BY OBJECTIVES & APPROPRIATION
ACCOUNTS FOR THE MONTH OF JULY 1981.**

AMDAHL 470/V7A
work units in hours

33001	Reactor Safety	234.15
33002	Plutonium Fuel and Actinide Research	-
33003	Safety of Nuclear Materials	3.20
33004	Fissile Materials Control and Management	14.25
33005	Super-SARA Test Programme SSTP	101.80
33011	Solar Energy	0.07
33012	Hydrogen Production, Energy Storage and Transport	0.46
33013	Thermonuclear Fusion Technology	14.15
33014	High Temperature Materials	5.13
33021	Protection of the Environment	9.89
33022	Remote Sensing from Space	1.47
33041	Informatics	54.97
33043	Support to the Community - Bureau of References	-
33044	Training and Education	-
33046	Provision of Scientific and Technical Services	7.54
1.20.1	General Administration - JRC	57.03
1.20.2	General Services - Administration - Ispra	
1.20.3	General Services - Technical - Ispra	0.55
1.30.0	Central Workshop Ispra	3.22
1.40.2	ESSOR	0.01
	TOTAL	507.98
1.94.0	Services to External Users	15.76
	TOTAL	523.74

BATCH PROCESSING DISTRIBUTED BY REQUESTED CORE MEMORY SIZE

	100 k	200 k	300 k	400 k	600 k	800 k	1000 k	1200 k	1400 k	1400 > k
No. of jobs	2028	1449	895	962	545	129	141	19	28	80
Elapsed time	59	88	99	163	166	45	39	20	8	33
CPU time	6.3	17.1	22.9	35.1	77.2	15.2	20.9	11.7	4.9	23.3
"Equip" time	26	35	48	76	100	23	23	13	6	26
"Turn" time	0.4	0.5	1.4	3.0	2.2	2.4	1.2	3.4	2.2	11.5
I/O (disk)	2108	2331	3372	5595	3207	1061	256	196	95	431
I/O tape	1621	592	332	451	205	1	23	0.5	-	0.5

NOTE.

All times are in hours.

"Equip" means equivalent.

"Turn" means turn around.

All I/O transfers are measured in 1000's.

PERCENTAGE OF JOBS FINISHED IN LESS THAN:

TIME	15mn	30mn	1hr	2hrs	4hrs	8hrs	1day	2dav	3day	6dav
%year 1980	25	38	51	64	78	92	98	100	100	100
%year 1981	43	59	73	82	94	98	100	100	100	100

For histogram of equivalent time

please see page 17.

**STATISTICS OF COMPUTING INSTALLATION UTILIZATION.
 REPORT OF COMPUTING INSTALLATION EXPLOITATION
 FOR THE MONTH OF AUGUST 1981.**

	YEAR 1980	YEAR 1981
<u>General</u>		
Number of working days	8 d+	21 d
Work hours from 8.00 to 24.00 for	16.00h	16.00h
Duration of scheduled maintenance	10.34h	16.34h
Duration of unexpected maintenance	9.84h	12.66h**
Total maintenance time	20.18h	29.00h
Total exploitation time	107.82h	307.00h
CPU time in problem mode	34.40h	262.02h*

<u>Batch Processing</u>		
Number of jobs	2491	7040
Number of cards input	371300	164700
Number of lines printed	7201000	19005000
Number of cards punched	104000	7000
CPU Time	30.03h	222.99h*
Number of I/O (Disks)	5997000	25032500
Number of I/O (Magnetic tape)	1615000	7623000

<u>T.S.O.</u>		
Number of LOGON's	1189	4243
Number of messages sent by terminals	81800	277960
Number of messages received by terminals	570300	2056700
CPU time	4.21h	34.60h*
Number of I/O (Disk)	954000	3120150
Connect time	699.90h	2836.25h

<u>ADABAS</u>		
Total time service is available	-	125.08h
CPU time	-	2.40h*
Number of I/O (Disk)	-	518300

<u>IMS</u>		
Total time service is available	30.09h	107.08h
CPU time	0.16h	2.03h*
Number of I/O (Disk)	88400	345000

* Real CPU has been multiplied by a factor of 2 to indicate the increased throughput of the AMDAHL.

** Covering all the configuration.

+ In August 1980 the central service functioned for only 8 days (due to air conditioning maintenance).

**UTILIZATION OF COMPUTING CENTRE BY OBJECTIVES & APPROPRIATION
ACCOUNTS FOR THE MONTH OF AUGUST 1981.**

AMDAHL 470/V7A
work units in hours

33001	Reactor Safety	273.11
33002	Plutonium Fuel and Actinide Research	-
33003	Safety of Nuclear Materials	5.62
33004	Fissile Materials Control and Management	7.92
33005	Super-SARA Test Programme SSTP	44.50
33011	Solar Energy	0.06
33012	Hydrogen Production, Energy Storage and Transport	1.00
33013	Thermonuclear Fusion Technology	19.46
33014	High Temperature Materials	15.88
33021	Protection of the Environment	24.65
33022	Remote Sensing from Space	2.33
33041	Informatics	35.47
33043	Support to the Community - Bureau of References	-
33044	Training and Education	-
33046	Provision of Scientific and Technical Services	21.50
1.20.1	General Administration - JRC	47.64
1.20.2	General Services - Administration - Ispra	
1.20.3	General Services - Technical - Ispra	0.23
1.30.0	Central Workshop Ispra	2.94
1.40.2	ESSOR	1.22
	TOTAL	503.53
1.94.0	Services to External Users	6.66
	TOTAL	510.19

BATCH PROCESSING DISTRIBUTED BY REQUESTED CORE MEMORY SIZE

	100 k	200 k	300 k	400 k	600 k	800 k	1000 k	1200 k	1400 k	1400 > k
No. of jobs	1929	1830	995	968	633	46	118	37	9	48
Elapsed time	63	157	175	238	160	8	70	18	3	18
CPU time	7.6	22.0	41.1	62.2	38.0	1.4	39.3	3.1	0.5	5.8
"Equiv" time	21	48	85	103	65	2	42	6	1	9
"Turn" time	0.4	1.4	2.1	2.1	2.0	1.5	2.0	2.1	1.3	3.0
I/O (disk)	1246	5389	5617	5664	3443	119	433	462	48	402
I/O tape	1682	2668	1468	525	816	0.1	27	-	-	-

NOTE.

All times are in hours.

"Equiv" means equivalent.

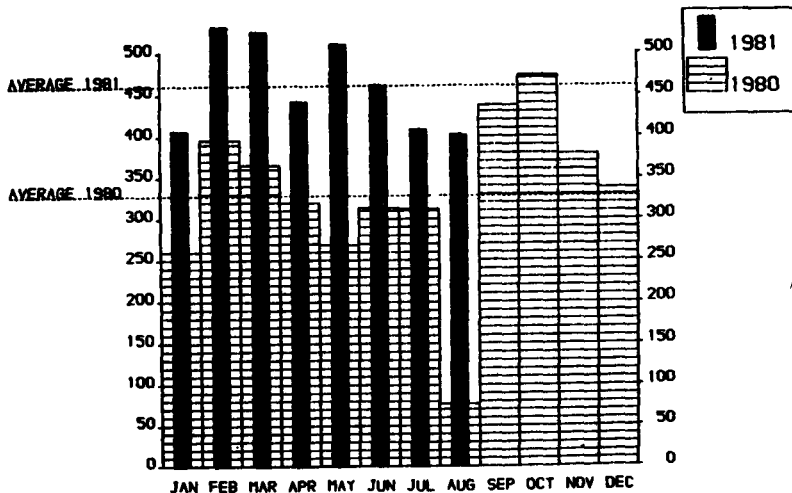
"Turn" means turn around.

All I/O transfers are measured in 1000's.

PERCENTAGE OF JOBS FINISHED IN LESS THAN:

TIME	15mn	30mn	1hr	2hrs	4hrs	8hrs	1day	2day	3day	6day
%year 1980	44	59	72	82	91	95	98	100	100	100
%year 1981	35	49	63	77	89	96	98	100	100	100

HISTOGRAM OF TOTAL EQUIVALENT TIME(HRS)



Projected total for 1981 = 5525 hours(using average)

Total for 1980 was = 3936 hours

REFERENCES TO THE PERSONNEL/FUNCTIONS OF THE COMPUTING CENTRE

<u>Manager of the Computing Centre</u>	J. Fire	
Responsible for User Registration	Ms. G. Ramsb	
 <u>Operations Sector</u>		
Responsible for the Computer Room	A. Binda-Rossetti	
Substituted in case of absence by:		
Responsible for Peripherals	G. Nocera	
 <u>Systems Software Sector</u>		
Responsible for the sector	D. König	
Substituted in case of absence by:	P.A. Moinil	
Responsible for TSO Registration	C. Daolio	
		Room Tel.
<u>Informatics Support Sector</u>		
Responsible for the Sector	(f.f.) H. de Wolde	1883 5787
Secretary	Ms. G. Hudry	1873 5787
Responsible for User Support	M. Dowell	1886 5419
General Inf./Support Library	Ms. A. Cambon	1871 5446
<u>Advisory Service /List of Consultants(See Note 1)</u>		1870 5446
A. Inzaghi	H. I. de Wolde	
A. A. Pollicini		
R. Meelhuysen	M. Dowell	

Note 1. The advisory service is available in the same room as the Computing Support Library (room 1870). Exact details of the advisory service times for a specific week can be found at the head of any output listing (for that week).

Any informatics problem may be raised. However, the service is not designed to help users with problems which are their sole responsibility. For example, debugging of the logic of programs and requests for information which can easily be retrieved from available documentation.

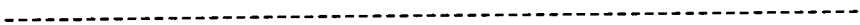
If necessary, other competent personnel from the informatics division may be contacted by the consultant but not directly by the users.

The users should only contact the person who is the consultant for that specific day and only during the specific hours. Outside the specific hours general information may be requested from Ms. A. Cambon in the Computing Support Library.

HOW TO OBTAIN COMPUTING CENTRE DOCUMENTATION

Person interested in receiving copies of the Computing Centre "green books" or in receiving regularly the "Computing Centre Newsletter" are requested to complete the appropriate part of the following form and send it to:

Ms. A. Cambon
Support to Computing
Building 36
Tel. 5446.



Indicate with a (✓) which option are required.

Please add my name to Newsletter mailing list ()

Please send me copies of the following "green books":

JRC-TSO Primer ()

JRC Computer Graphics (new version) ()

Towards a New Programming Style ()

LIBRARIAN ()

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TELEPHONE

