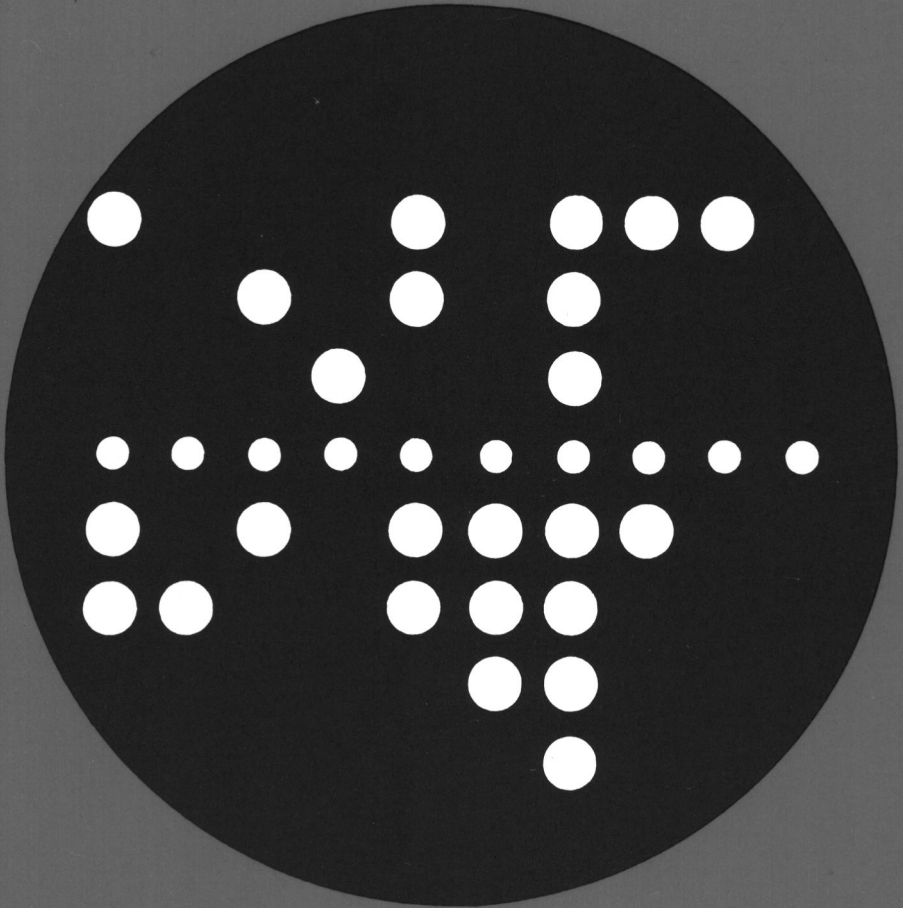


# COMPUTING CENTRE NEWSLETTER

July 1980 - N° 43



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CEE, XV/6

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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:

J. Pire.	Responsible Editor.
M. Dowell.	Technical Editor.
C. Pigni.	Editors.
H. de Wolde.	

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## THE NEW COMPUTER

Hans Jørgen Helms

The present main computer in the Computing Centre is no longer adequate for its purposes. The mainframe was installed in 1972, and in spite of later extensions it is technically obsolete, difficult to maintain, and used to capacity.

A careful survey, and extensive discussions lead to the conclusion of replacing the present computer by a modern powerful mainframe to satisfy the estimated needs over the next four years. This strategy is parallel with similar strategies in many national establishments with activities similar to our JRC Programme. The strategy is also fitted into an overall strategy where we have the emerging internal network, the many terminals, and a number of computers for more specialized purposes.

As Mr. Pire describes in the following article, the computer selection has been a lengthy process with many steps. In all of these steps, both locally and in the Commission, the Ispra need at this time for a large scale, powerful and modern computer was clearly acknowledged.

The final choice was an AMDAHL 470/V7A mainframe to be installed later this year. This computer satisfies amply our expectations in many computer user environments in Europe and elsewhere in the world. It is already installed in several environments similar to ours also here in Italy.

As Mr. Pire describes in his article below, we shall take advantage of the new computer and its capabilities in a phasewise fashion. This may be felt to be inconvenient, but it does imply for the users, that in the beginning they will only be faced with a more powerful computer - everything else will be unchanged. Later when we have all learned more about the new machine and more modern operating systems, we will go ahead with new capabilities, backed by a new set of peripheral units to be selected later, and installed next year.

An important element of the strategy was to preserve a continuous service to the users of the Computing Centre in recognition of the important role this facility plays for many activities in the Establishment and the execution of the JRC Programme 1980-1983.

In connection with the preparation and installation of the new machine inevitably there may occur some inconveniences. One is that the technical support facilities need an overhaul which will take place during a period in August.

We can, however, be assured that everybody concerned - within the resources available - will do their utmost to ensure users satisfaction with the new machine.

## UN NOUVEL ORDINATEUR A ISPRA

J. Pire

### Introduction

Après plusieurs années de lamentations concernant l'obsolescence du matériel en usage au Centre de Calcul une bonne nouvelle peut enfin être annoncée.

L'unité centrale sera très prochainement remplacée par une unité plus moderne et a performance largement supérieure à l'unité actuelle.

En ce qui concerne les unités périphériques, nous devons prendre patience environ un an par suite d'une décision de la Commission qui nous oblige à lancer un nouvel appel d'offres pour ces unités.

### Historique

Un changement d'ordinateurs ne s'improvise pas du jour au lendemain et une longue suite d'étapes soigneusement planifiées sont nécessaires.

Nous pouvons les identifier de la façon suivante:

- 1) Identification des besoins à moyen terme des utilisateurs pour leur permettre de faire face aux développements prévus par les programmes du C.C.R.
- 2) Conversion de ces besoins en spécifications détaillées du matériel et du logiciel apte à y satisfaire.
- 3) Approbation des spécifications ainsi que de la procédure à suivre pour l'appel d'offre.
- 4) Dépouillement des offres, évaluation technique et choix du fournisseur.
- 5) Ratification du choix par l'autorité compétente.

Lors d'une enquête menée en 1978, il était demandé aux utilisateurs d'exprimer leurs besoins pour une période s'étendant jusqu'au 1983.

Après dépouillement, les résultats de cette enquête ont été soumis à un groupe de travail composé des directeurs de l'établissement et des conseillers qui'ils s'étaient choisis.

Après approbation par le groupe de travail des conclusions tirées de l'enquête, des spécifications techniques et un cahier des charges ont été rédigés et soumis à nouveau au même groupe de travail qui a pu vérifier qu'il correspondait aux conclusions du rapport précédent.

Ce document a également été présenté pour avis à diverses autres directions générales de la Commission et nous avons obtenu leur accord.

La C.C.A.M. a été consultée concernant la procédure à suivre et un appel d'offres a finalement pu être lancé en août 1979. Il fut adressé à 8 sociétés susceptibles de fournir du matériel correspondant aux spécifications: AMDAHL, C.D.C., CII-Honeywell-Bull, I.B.M., I.C.L., ITEL, SIEMENS, UNIVAC.

La date limite d'expédition des offres était fixée au 20 décembre 1979.

Après avoir attendu un temps suffisant (1 mois) pour garantir l'arrivée de toutes les réponses, l'ouverture des offres a pu être effectuée.

Les sociétés AMDAHL, CCI-Honeywell-Bull, I.B.M., et SIEMENS ont répondu positivement à l'appel d'offres tandis que les quatre autres sociétés, pour des raisons variées, se sont désistées.

Des représentants d'autres directions générales (DG III, DG IX, DG XIII), des représentants des utilisateurs et le personnel spécialisé de la division Informatique se sont alors partagés l'examen des dizaines de kilos de documentation jointes aux 4 offres.

Un travail méticuleux de comparaison des offres a porté sur les particularités et les facilités offertes par le matériel et le logiciel, l'estimation des difficultés de conversion des applications existantes, les difficultés d'installation, les coûts d'exploitation, les délais de livraison.

Ce travail a conduit à la sélection de l'unité centrale 470/V7A de la société AMDAHL.

La procédure suivie pour la sélection du fournisseur a été approuvée par la C.C.A.M. du C.C.R. le 19 Mai et la Commission a approuvé le choix le 12 Juin après consultation du Noyau permanent pour la Télématique.

En ce qui concerne le remplacement des unités périphériques, la Commission a décidé de lancer un nouvel appel d'offres dont les spécifications devront au préalable recevoir son accord. Ceci introduit un délai supplémentaire d'au moins six mois pour le renouvellement total de l'installation, mais la partie la plus importante, c'est-à-dire l'unité centrale, sera installée fin août prochain et entrera en service début septembre.

Plus de 2 ans se seront écoulés entre l'envoi des formulaires de l'enquête préliminaire et le premier résultat tangible. Une étape importante aura ainsi été réalisée dans le renouvellement de nos installations. Je saisis cette occasion pour remercier tous ceux qui ont collaboré à ce travail, qui ont eu la patience d'écrire, lire, relire et discuter le fatras des documents qui ont été nécessaires pour arriver à ce résultat.

#### L'Unité Centrale AMDAHL 470/V7A

Il nous paraît utile d'informer les utilisateurs de quelques caractéristiques de l'unité centrale choisie et de les confronter avec les caractéristiques correspondantes du système qui sera remplacé.

Caractéristiques	Nouveau Système	Ancien système
Mémoire centrale	8 Mégabytes	4 Mégabytes
Buffer cache	32 Kbytes	8 Kbytes
Canaux	12	4

Un bench-mark exécuté par nos soins sur l'ordinateur ancien et par les constructeurs sur leur matériel nous laisse espérer que, du point de vue de la vitesse de calcul, l'unité centrale choisie présentera un facteur d'amélioration supérieur à 4. Ceci est dû tant à la rapidité des registres de calcul qu'à l'élargissement des dimensions de la mémoire ultra-rapide (cache) qui sur l'unité ancienne n'était pas proportionnée à la taille de la mémoire centrale et ralentissait notablement l'exécution des opérations. Par ailleurs le nombre de canaux disponibles permettra d'éliminer l'étranglement dû à la limitation des voies d'accès aux unités périphériques. La dimension de la mémoire centrale permettra également d'exécuter, pendant les heures normales d'ouverture du C.C.R., les programmes exigeant de grandes partitions de mémoire (jusqu'à 1,4 Mégabytes et même plus) et d'augmenter les régions TSO réduisant ainsi les temps de réponse, qui pendant les heures de pointe, étaient intolérables.

#### Conversion

Pendant l'année 1980, la nouvelle unité centrale sera connectée aux unités périphériques anciennes, le système de gestion ne changera pas et aucune conversion de logiciel n'est actuellement nécessaire.

Il n'est pas possible en effet, avec les unités périphériques actuelles d'implanter un système plus moderne sans encourir de graves problèmes de dégradation des performances et créer de sérieux problèmes de conversion.

Comme déjà dit précédemment, un nouvel appel d'offres sera lancé prochainement pour le remplacement des unités périphériques actuelles.

Selon nos estimations ces unités seront disponibles vers le mois de juin 1981. Le nouveau système d'exploitation (MVS) sera alors mis en oeuvre et travaillera en parallèle avec le système actuel (MVT) pendant une période de trois à quatre mois de façon à permettre aux utilisateurs de convertir leurs applications en toute commodité.

Entre-temps des cours et séminaires seront organisés et la documentation nécessaire acquise de façon à faciliter au maximum cette conversion.

#### Conclusion

Quelque chose a changé dans le bon sens; prenons patience en attendant que le reste suive.



## PRINTER PLOTS

Herman I. de Wolde

Although the present facilities to produce graphic output are easy to use and the turn around time is small if a Tektronix terminal is available, there have been requests from some users for subroutines to perform lineprinter plots. Plotting functions on the lineprinter is, of course, a rather crude way of obtaining graphics but for a first scanning of the results it may be useful.

The IMSL library offers some interesting options to produce printer plots, these include:

- probability distribution functions  
(IMSL routine USPDF)
- histograms  
(IMSL routines USHIST, USHIUT, USHV1)
- 2D graphs  
(IMSL routines USPLT, USHV1)
- binary trees  
(IMSL routine USTREE)

The routines are all members of the U chapter of the IMSL library. Complete details of how to use these routines may be found in the IMSL Library Manual (Edition 7) which is available for reference from the Computing Support Library. Also details of the use of the IMSL Library on the JRC-Computing Centre system may be found in Newsletter N. 42, June 1980.

For convenience sake a special, very simplified, subroutine has been added to the X-collection for easy graphics, in the SYS1.LIBERTY library. With this subroutine one may plot up to 10 curves in a single diagram. (This routine is based on the IMSL routine USPLT). The output is produced on one lineprinter page with abscissa values horizontally across the page.

The routine of this library are accessible by putting the following parameters in the EXEC statement:

```
// EXEC FTG1CG,PRN=ERTY,ULB=COPICB,VLB=DISK
```

Full details of the use of this library may be found in Newsletter N. 41, May 1980.

#### Use of the Line Printer Graph Plotting Routine

The calling sequence is as follows:

```
CALL XPRPLT (X,Y,N,M,NY)
```

in which:

X is a vector containing N abscis values

Y a matrix with dimensions (NY,MA). Each column may contain N ordinate values

N is the number of coordinate pairs for each curve ( $N \leq NY$ )

M is the number of curves to be plotted, with the limitations:  
 $M \leq 10$  &  $M \leq MA$

NY is dimensional column length of matrix Y

The results are printed over 80 columns and may consequently also be used for a print plot on the 2741 terminal (see following TSO example). The print symbols for the different curves in the diagram are 1,2,..etc. For the cross points of the curves the symbol 'M' is printed. A subscript may be added beneath the diagram by a simple WRITE statement as is shown in the example.

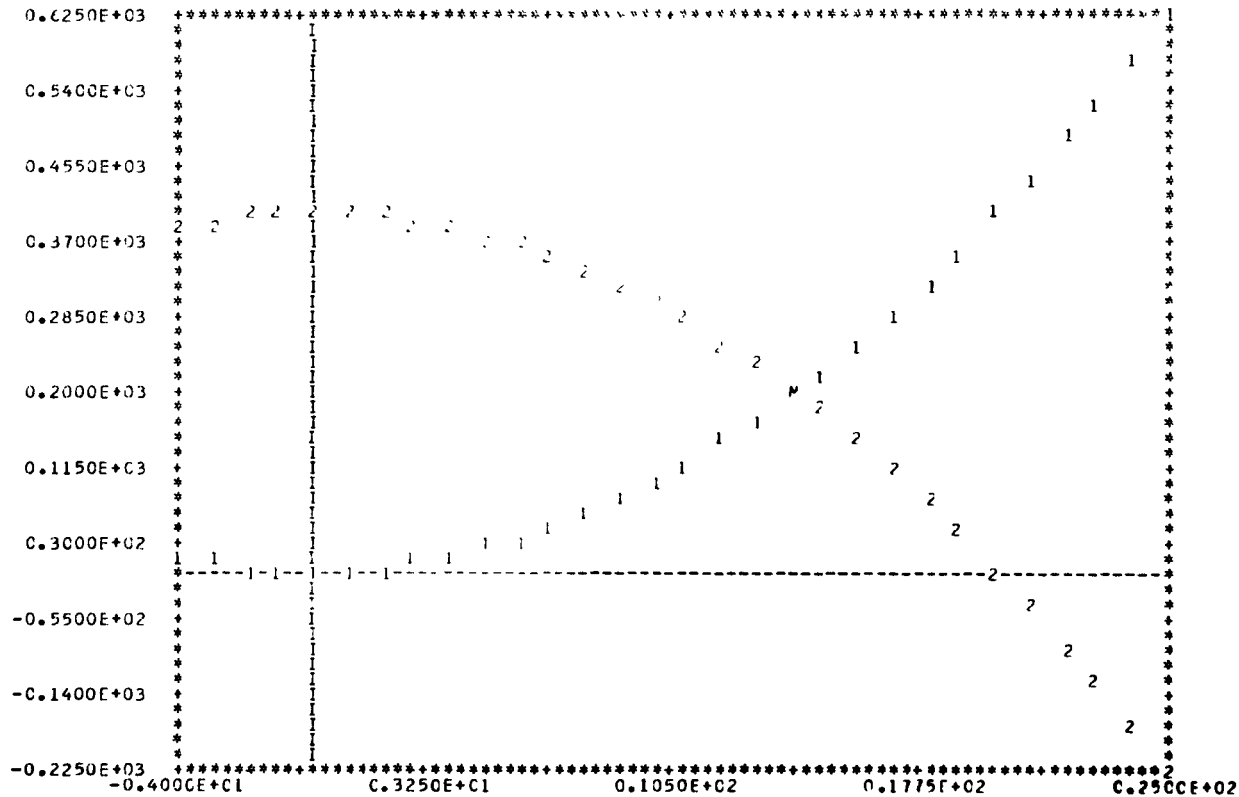
Example of Use in batch

```
//          JOB(YOUR JOB CARD)
$          CLASS 2
// EXEC FTG1CG,PRN=ERTY,ULB=DISK,ULB=COPICB
//CMP.SYSIN DD *
C          MAIN PROGRAM TO DEMONSTRATE XPRPLT SUBROUTINE
          DIMENSION X(1000),Y(500,20)
          DO 100 I=1,30
          X(I)=FLOAT(I)-5.0
          Y(I,1)=X(I)**2
          Y(I,2)=400.0-Y(I,1)
100        CONTINUE
          CALL XPRPLT(X,Y,30,2,500)
          WRITE(6,110)
110        FORMAT(' EXAMPLE OF OUTPUT BY XPRPLT ROUTINE')
          STOP
          END
/*
```

Example of TSO Usage (lines typed by user are shown in lower case)

```
list lpgraph.fort
LPGRAPH.FORT
00050 C          MAIN PROGRAM TO DEMONSTRATE XPRPLT SUBROUTINE
00060          DIMENSION X(1000),Y(500,20)
00070          DO 100 I=1,30
00080          X(I)=FLOAT(I)-5.0
00090          Y(I,1)=X(I)**2
00100          Y(I,2)=400.0-Y(I,1)
00110          100 CONTINUE
00120          CALL XPRPLT(X,Y,30,2,500)
00130          WRITE(6,110)
00140          110 FORMAT(' EXAMPLE OF OUTPUT BY XPRPLT ROUTINE')
00150          STOP
00160          END
READY
fort lpgraph
G1 COMPILER ENTERED
SOURCE ANALYZED
PROGRAM NAME = MAIN
* NO DIAGNOSTICS GENERATED
READY
loadgo lpgraph fortlib lib('sys1.liberty')
```

Output (see example on next page) will be produced on terminal.



XAMPLE CF OUTPUT BY XPPPLT FCUTINE

ERRATA CORRIGE

1. There is an error in Newsletter N. 40 - April 1980. In the article 'Internal Network - Solar "Self-Service System"' on page 8. For the two examples there should be a record:

```
//CMP.SYSIN DD *
```

following the "\$ CLASS 2" record.  
Also, the examples suffer from some mis-alignment of the \$ HASP control cards.  
Thus, the example of a normal job should be:

```
//          JOB(YOUR JOB CARD)
$          TIME 002
$          LINES 002
$          CLASS 2
//          EXEC FTG1CLG
//CMP.SYSIN DD *
C          VERY SMALL FORTRAN PROGRAM
          A=2
          STOP
          END
/*
```

And similarly for the other example.

2. There is an error in Newsletter N. 41 - May 1980. In the article "Use of Partitioned Data Sets" on page 14 there is an error in the job which is to be used for COMPRESS in batch. For data sets on 3330-1 disks (such as USER0A,.....USER0F) an extra parameter UNI=DISK is required. Therefore, the example should read:

```
//          JOB(YOUR JOB CARD)
$          TIME 002
//STEP1 EXEC COMPRESS,DSN='dsname',UOL=user0x,UNI=DISK
```

**ERRATA CORRIGE** (continued)

3. There is an error in Newsletter N. 41 - May 1980. In the article "TSO Changes" on page 10 the example for the SUBMIT command is incorrect. The 'SFX' and 'ACCT' parameters are positional parameters and not keyword parameters as shown. Also the section on SUBMIT should have explained that the previously available JCL keyword parameter has been changed to a positional parameter. To explain more fully the full specification of the new SUBMIT command (with an example) is given here:

**SUBMIT**

The SUBMIT command is used to enter a job into the background from a terminal.

The user will receive a message when his job has completed running in the background. If, at this time, the user isn't logged on, the message will be placed in the broadcast data set.

If the job card is on the data set being submitted, no parameters will be asked by the system, if the user accepts the default values of 'sfx' 'acct' and 'jcl'.

If the job card is not on the data set being submitted, the box number and programmer name will be asked by the system.

If the TSO system is not available see the 'TSOHASP' program in the 'UTIL' notes, to supply the TSO SUBMIT function in batch.

If the job queue is completely full of jobs, the user receives the following msg 'HASP INPUT SERVICE IS MOMENTARILY STOPPED'. In this case the user can try to SUBMIT some time later.

If the 'dsn' data set is allocated as OLD, the background job execution will be impossible until a FREE command has been given.

**SYNTAX**

SUBMIT 'dsn' 'sfx' 'acct' 'jcl'

REQUIRED - 'dsn'

DEFAULT - if the parameters 'sfx' 'acct' and 'jcl' are not given, the following default are considered:  
'z' 'userid acctn' 'A'

ALIAS - SUB

NOTE - the parameters must be given on the sequence specified

OPERANDS -

- 'dsn' - specifies the name of the data set on which the job resides (with or without job card). It can be the name of a sequential or partitioned data set with a member.
- 'sfx' - specifies the suffix character that will be appended to userid identification to form the job-name. This job-name will be in effect in any case, even if the job card is present on the data set. Default 'Z'
- 'acct' - specifies the accounting number. (Eight numeric char.) If the job card is not present the valid acctn number given by the user or the default value (userid acctn) will be considered.
- 'jcl' - specifies the msgclass (JCL output class). The user can give 'Q' or 'M'. Default is 'A' (local printer). See the PRT commands procedure for more details on output classes.

Example

```
SUBMIT JOB.CNTL / 99998888 M
```

This specifies that the job residing of data set JOB.CNTL should be submitted to the background queue. The job should have suffix X appended to the TSO identifier, is submitted for user accounting number 99998888 and the JCL output class is specified as M.

Statistics of computing installation utilization.  
 Report of computing installation exploitation  
 for the month of July 1980.

	YEAR 1979	YEAR 1980
<u>General</u>		
Number of working days	20 d	21 d
Work hours from 8.00 to 24.00 for	16.00h	16.00h
Duration of scheduled maintenance	16.50h	21.00h
Duration of unexpected maintenance	16.87h	26.34h
Total maintenance time	33.37h	47.34h
Total exploitation time	286.63h	311.16h
CPU time in problem mode	153.24h	192.33h

Batch Processing

Number of jobs	7393	7526
Number of cards input	1453100	1155000
Number of lines printed	24687000	23516000
Number of cards punched	200100	324500
CPU time	133.65h	168.01h
Number of I/O (Disk)	15859000	19170000
Number of I/O (Magnetic tape)	4058000	3096000

T.S.O.

Number of LOGON's	3270	3760
Number of messages sent by terminals	193457	272346
Number of messages received by terminals	1133375	1702260
CPU time	17.91h	22.30h
Number of I/O (Disk)	2490000	3174700
Connect time	2125.00h	2941.38h

IMS

Total time service is available	122.59h	95.70h
CPU time	1.68h	2.07h
Number of I/O (Disk)	442000	459000



Utilisation of computer centre by objectives and appropriation  
accounts for the month of July 1980.

	IBM 370/165 equivalent time in hours
1.20.2 General Services - Administration - Ispra	39.36
1.20.3 General Services - Technical - Ispra	0.24
1.30.3 Central Workshop	2.45
1.30.4 L.M.A.	-
33001 Reactor Safety	207.34
33002 Plutonium Fuel and Actinide Research	3.37
33003 Nuclear Materials	4.91
33004 Safeguards	8.12
33011 Solar Energy	0.02
33012 Hydrogen	0.01
33013 Design Studies on Thermonuclear Fusion	10.77
33021 Environment and Resources	14.96
33030 METRE	2.41
33041 Informatics	38.16
33044 Training	-
33046 Support to the Commission	0.37
33300 ESSOR	58.01
	TOTAL
	400.10
1.94.0 Services to External Users	6.07
	TOTAL
	406.17

BATCH PROCESSING DISTRIBUTED BY REQUESTED CORE MEMORY SIZE

	100	200	300	400	600	800	1000	1200	1400	>1400
No. of jobs	2340	1594	1419	1187	379	49	15	124	17	-
Elapsed time	74	135	208	306	122	15	16	24	19	-
CPU time	3.0	15.9	32.7	58.7	30.0	4.2	8.6	6.7	6.0	-
"Equiv" time	21	37	65	99	43	6	9	8	9	-
"Turn" time	1.0	2.1	4.4	4.3	5.5	6.1	10.2	4.4	6.4	-
I/O (disk)	1903	2818	4507	5301	1857	254	53	174	483	-
I/O (tape)	1579	313	128	995	31	9	1	0.2	4	-

NOTE.

All times are in hours.

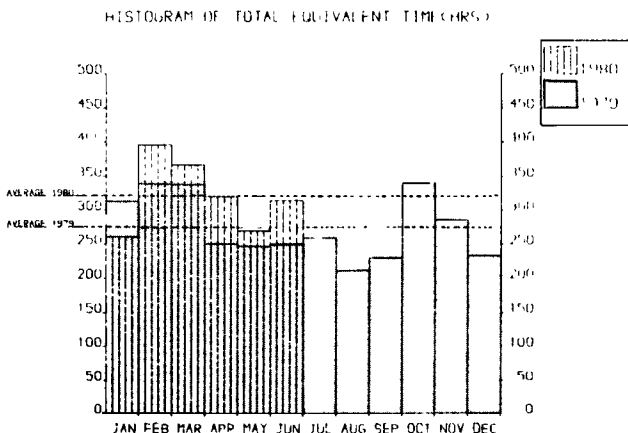
"Equiv" means equivalent.

"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 1979	29	46	63	78	93	99	100	100	100	100
%year 1980	26	39	53	65	78	90	98	100	100	100



Projected total for 1980 = 3843 Hours (using average)

Total for 1979 was = 3292 Hours

REFERENCES TO THE PERSONNEL/FUNCTIONS OF THE COMPUTING CENTRE.

<u>Manager of The Computing Centre</u>		J.Pire	
Responsible for User Registration	Ms. G.Rambs		
<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 Group</u>			
Responsible for the group	D.König		
Substituted in case of absence by:	P.A.Moinil		
Responsible for TSO Registration	C.Daolio		
		Room	Tele.
<u>Informatics Support Sector</u>			
Responsible for the Sector	(f.f.) H.de Wolde	1883	1259
Secretary	Mrs. G.Hudry	1873	787
Responsible for User Support	H.de Wolde	1883	1259
General Inf./Support Library	Mrs. A.Cambon	1871	730
<u>Advisory Service/List of Consultants</u> (See Note 1)		1870	730
A.Inzaghi	A.A.Pollicini		
R.Meelhuysen	H.I. de Wolde		
	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 specified hours. Outside the specified hours general information may be requested from Mrs. A. Cambon in the Computing Support Library.

HOW TO OBTAIN COMPUTING CENTRE DOCUMENTATION.

Persons 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 35  
Tel. 730.

---

Indicate with a (✓) which options are required.

Please add my name to Newsletter mailing list ( )

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

JRC-TSO Primer ( )

GRAPHIT ( )

Towards a New Programming Style ( )

LIBRARIAN ( )

NAME .....

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.....

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