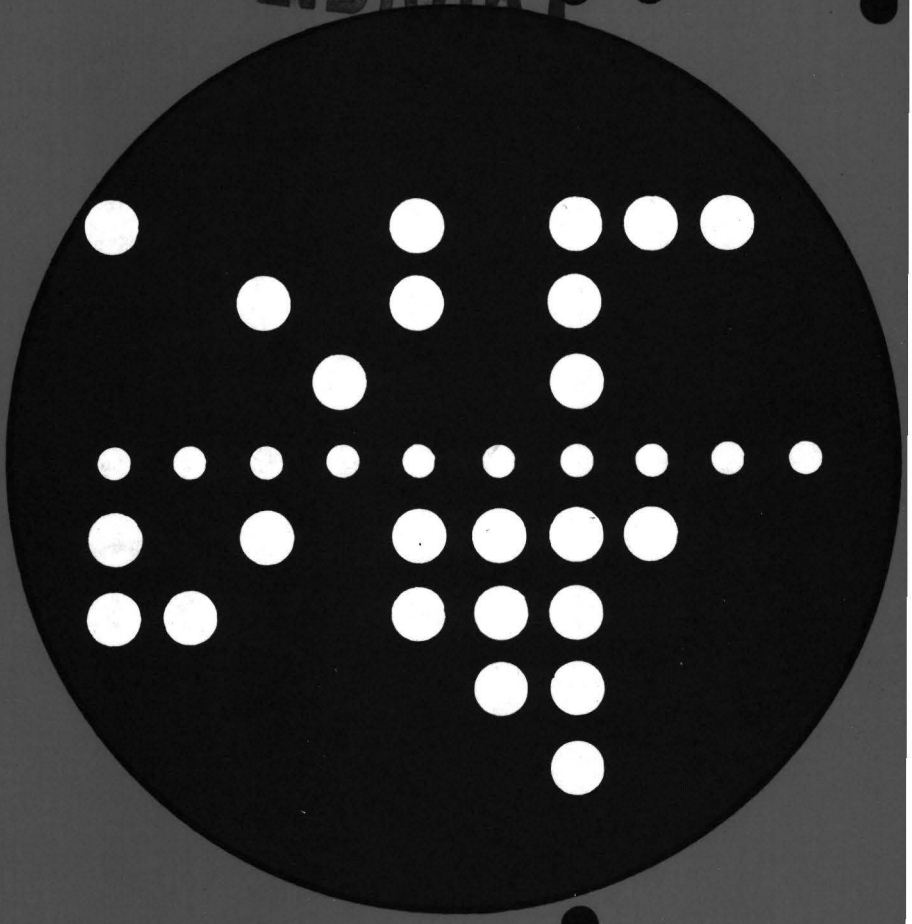
Commission of the European Communities

Joint Research Centre - Ispra

Computing Centre Newsletter



June 1976 No 2

Contents

Note of the Editor

The present Newsletter will be published monthly except for August and December.

The Newsletter will include:

- Developments, changes, uses of installations
- Announcements, news and abstracts on initiatives and accomplishments.

The Editor thanks in advance those who will want to contribute to the Newsletter by sending articles in English or French to one of the following persons of the Editorial Board.

Note de la Rédaction

Le présent Bulletin sera publié mensuellement excepté durant les mois d'août et décembre.

Le Bulletin traitera des:

- Développements, changements et emploi des installations
- Avis, nouvelles et résumés concernant les initiatives et les réalisations.

La Rédaction remercie d'avance ceux qui voudront bien contribuer au Bulletin en envoyant des articles en anglais ou français à l'un des membres du Comité de Rédaction.

Editor : Sylvia R. Gabbai
Layout : Paul De Hoe
Graphical and Printing Workshop, JRC Ispra

Acknowledgement should be given for their technical support to Mr. E. Eiselt, Mrs. M.G. Giaretta, Mrs. M. Van Andel, Mr. G. Clivio and Mr. G. Zurlo.

EUROCOPI

European Computer Program Institute

G. Gaggero

In Europe, as in the rest of the world, the use of computers has grown rapidly during the past decade. Computer applications have advanced, many programs being written by software companies, computer manufacturers, universities, industries, and governmental bodies. Nevertheless, the development of new programs involves increasing costs and the promotion of software sharing is considered necessary.

For an efficient software exchange, the first need is for complete information on the software available on the market; secondly, suitable ways to access programs must be available.

For these reasons, an activity was initiated in 1971 at the Joint Research Centre of the Commission of the European Communities with the long-term scope of:

- promoting cooperation on a full European basis for a complete information service on scientific/technical software;
- improving programs exchange especially in those fields in which European program libraries do not exist.

The short-term objectives of this action, know as EUROCOPI, were:

- the setting up of an experimental computerized data base on program information and the development of the necessary informatics tools;
- the organization of a program distribution and program information dissemination service on an experimental but operational basis;
- the development of research and educational activities aimed at providing an efficient support to the users of programs.

The activity of EUROCOPI has been directed along the following lines:

Program Information Service

- Design and development of a conversational information storage and retrieval system (SIMAS) for the management of the program-information data base.
- Development and maintenance of a comprehensive computerized data base on program information. Collection of program information is mainly based on the submission of abstracts by Program Libraries/Information Centre and by program authors/owners.
- Diffusion of information by issuing Program Indexes and by answering queries on specific subjects.

- Promotion of the cooperation among European Program Libraries/Program Information Centres/Users Groups operating in the field of scientific/technical software in order to improve the exchange of information and finally the sharing of software within the European Community.

The actions undertaken include:

a) the organization of meetings in which the European Program Libraries/ Information Centres can confront their experience and define common actions;

b) the promotion of and the participation in joint working groups for the development of standards for a program documentation system (abstracts, thesaurus, etc.).

Program Distribution Service

- Operation of the JRC Program Library and of the European Distribution Agencies of SEAS (Share European Association) and I.U.G. (ICES Users Group). Setting up of other European Agencies of non-European Libraries to make easier and less expensive the acquisition of programs developed outside Europe.
- Promotion of actions aimed at improving application software portability.

These actions include:

a) the definition of suitable recommendations and guidelines for scientific programmers and their diffusion through courses;

b) the development of tools which can help in the adaptation of existing programs to new computers.

EUROCOPI has at present collected information on more than 10.000 programs for scientific/technical applications. Of this total, a subset of information on about 2000 programs has been computerized and introduced in the present Index.

The Computer Program Index contains abstracts of the computerized information on programs; it is issued once a year. More complete information can be obtained on request.

How to benefit from EUROCOPI services

In 1975, EUROCOPI served a user community of more than 500 organizations, institutes or departments, mainly within the European Community, (see Table 1).

This resulted in the distribution of 2000 EUROCOPI publications and of 700 programs.

After some years of activity, one can say that EUROCOPI service is well established and the users interest proved the feasibility and the usefulness of such an activity.

Time is mature for moving from a funded activity to a partly selfsupporting service.

As in the past, any scientist or engineer, any industrial or academic organization, may ask to be put on EUROCOPI mailing list in order to be informed, free of charge, about existing and new services.

However a charge has been introduced for both the dissemination of information and the distribution of programs and related documentation. The income of this sale will help EUROCOPI to meet the expenses and to provide a better service.

Detailed information on costs and the order forms to be used for ordering EUROCOPI publications and available programs are provided on request.

How to submit information on programs

Persons or organizations who have developed programs which might be interesting and valuable for general use may submit a program description to be included in our files.

These programs will be listed in the EUROCOPI Program Index and the attention of managers, engineers and scientists in the European Community will be drawn to them. Furthermore, the name of the author organization would appear in the "Roster of Information Sources" which we plan to include in the next issue of the Index.

Program descriptions should be prepared in accordance with a standard list of items and, possibly, in English.

Institutions using EUROCOPI Services (1975)

Belgium	17	The Netherlands	34
Denmark	18	United Kingdom	101
France	49	Ireland	14
Germany	86	Other European Countries	64
Italy	123	International Organizations	31
	Institutions of the EEC	442	
	Institutions outside EEC	134	
	Total	**576**	

ACCESS TO EUROCOPI SERVICES BY INTERNAL USERS

The users from the JRC can interrogate the data base on computer program information through a teletypewriter (IBM 2741) and a CRT terminal (IBM 3270). Interested users are asked to contact the EUROCOPI secretariat to arrange for an introductory demonstration.

Private Program Libraries

P.A. Moinil, H.I. de Wolde

The Linkage Editor is a rather neglected tool in the daily life of the application programmer although it may serve the user in a very practical way, next to its automatic functions. Here we will explain two particular applications without a detailed discussion of all the aspects of the Linkage Editor: private program libraries and private subroutine libraries.

A well known function of the Linkage Editor is the preparation of a list of external references in a given program. Sequentially these references are solved by scanning the system libraries for entry names. External references are names of functions and subroutines which are not a part of the input deck. The output of the Linkage Editor is called a "load module".

This automatic function of the Linkage Editor may also be used for two practical applications:

- You may store your entire program as a load module on disks, asking at running time directly for the execution of your program without going through the phases of compiling and link-editing. This system will give you a considerable time-saving and might render a reduction in class.
- You may store individual subroutines in a private library which will be concatenated to the system libraries at execution time. This private library is also searched to solve the external references from your program. This application is especially useful for people who are working with program "families", i.e. series of strongly related programs which have a number of subroutines in common. This feature is also of interest at developing large software projects.

To obtain diskspace, the user can dispose of volume USERO1, which is available for private libraries. However, for the time being only very urgent requests can be satisfied as the available space is almost exhausted. In the near future (July), other diskpacks, USERO2, USERO3, ..., will be provided.

The space allocation has to be registrated through the program EURUDR. Datasets found on the user disks, which have been created without using the first procedure, as described hereafter, will be canceled.

The controlcards configurations as required for the creation and use of private libraries, are given as a series of procedures.

1. Creation and registration of a partitioned dataset

```
//STEP1          EXEC  PGM=IEFBR14
//SYSPRINT       DD    SYSOUT=A
//DD1            DD    DSN=SYS1.LIBxxxxx,UNIT=3330,
//                     VOL=SER=USERnn,
//                     DISP=(NEW,KEEP,DELETE),
//                     SPACE=(CYL,(i,j,k,))
//STEP2          EXEC  EURUDR,U=3330,V=USERn
//GO.SYSIN       DD *
                 reservation cards, see Installation Notes.
/*
```

in which:

xxxxx	is a group of characters which complete the dsname of your private library
nn	is a number indicating the diskpack
i	is the number of primary cylinders
j	is the number of secondary cylinders
k	is the number of directory blocks; each block may contain up to 5 membernames with entry addresses.

2. To load a program

```
//STEP1          EXEC  FTGC
//CMP.SYSIN      DD *
                 Fortran deck
/*
//STEP2          EXEC  FTL
//LKED.SYSLMOD   DD    DSN=SYS1.LIBxxxxx,UNIT=3330,
//                     VOL=SER=USERnn,
//                     DISP=(OLD,KEEP)
//LKED.SYSLIN    DD    DSN=&LOADSET,DISP=(OLD,DELETE)
//                 DD *
  NAME yyyy
/*
```

in which yyyy is the membername of your program

For replacing an existing program write: NAME yyyy(R)

3. Execute the program.

```
//JOBLIB          DD   DSN=SYS1.LIBxxxxx,
//                     DISP=(OLD,KEEP),UNIT=3330,
//                     VOL=SER=USERnn
//STEP1           EXEC   PGM=yyyy
//FT05F001        DD   DDNAME=SYSIN
//FT06F001        DD   SYSOUT=A
//FT07F001        DD   SYSOUT=B
                  other DD-cards eventually
//SYSIN           DD   *
                  input data
/*
```

4. Load a subroutine in the private library.

```
//STEP1           EXEC   FTGC
//CMP.SYSIN       DD   *
                  Fortran subroutine
/*
//STEP2           EXEC   FTL
//LKED.SYSLMOD    DD   DSN=SYS1.LIBxxxxx,UNIT=3330,
//                     VOL=SER=USERnn,
//                     DISP=(OLD,KEEP)
//LKED.SYSLIN     DD   DSN=&LOADSET,
//                     DISP=(OLD,DELETE)
//                DD   *
  NAME zzz
/*
```

in which zzz is the name of your subroutine.

For replacing an existing subroutine write: NAME zzz(R)

5. Private subroutine library.

Once you have organized your private subroutine library through the previous procedure, you may compile your source deck and sequentially the

Linkage Editor will resolve the external references by also scanning the private library:

```
//STEP1          EXEC FTGCLG,PRN=xxxxx,VLB=nnn
                 follows normal deck composition
```

6. LISTPDS

The next procedure will supply you with a specified list of all the members of the partitioned data set SYS1.LIBxxxxx.

```
//STEP1          EXEC   PGM=IEHLIST
//SYSPRINT       DD   SYSOUT=A
//DD1            DD   VOL=SER=USERnn,UNIT=3330,
//                    DISP=(OLD,KEEP)
//SYSIN          DD   *
  LISTPDS  DSNAME=SYS1.LIBxxxxx,FORMAT,VOL=3330=USERnn
/*
```

7. Delete a member.

To delete an obsolete member of the private library apply the next procedure:

```
//STEP1          EXEC   PGM=IEHPROGM
//SYSPRINT       DD   SYSOUT=A
//DD1            DD   UNIT=3330,VOL=SER=USERn,
//                    DISP=(OLD,KEEP)
//SYSIN          DD   *
    SCRATCH DSNAME=SYS1.LIBxxxxx,VOL=3330=USERnn,        C
                MEMBER=zzz
/*
```

The IBM manual "Fortran IV Programmer's Guide", No. C28-6817, supplies enough information to understand the details of the specified procedures. Detailed information is supplied by the Installation Note: "Note operative sulle procedure O.S."

Statistics of computing installation utilization

Report of computing installation exploitation for the month of April

	YEAR 1976	YEAR 1975
Number of working days	20 d	21 d
Work hours from 8.30 to 1.30 for	14.00 h	12.00 h
Duration of scheduled maintenance	23.69 h	21.17 h
Duration of unexpected maintenance	36.75 h	11.08 h
Total maintenance time	60.44 h	32.25 h
Total exploitation time	280.778 h	214.66 h
CPU time in problem mode	118.582 h	72.38 h
Teleprocessing:		
CPU time	1.33 h	0.90 h
I/O number	585.675	476.000
Equivalent time	5.40 h	4.30 h
Elapsed time	139.90 h	89.80 h
Batch processing:		
Number of jobs	9,000	7,610
Number of cards read	2,748,000	2,485,000
Number of cards punched	212,000	222,000
Number of lines printed	25,613,000	25,051,000
Number of pages printed	579,000	548,000

BATCH PROCESSING DISTRIBUTION BY CLASS

	A	1	2	3	4	5	D	TOTAL
Number of jobs	1351	3133	1221	1731	364	169	520	8489
Elapsed time (hrs)	28	127	97	186	89	43	103	673
CPU time (hrs)	0.7	9.4	14.0	33.7	27.2	11.3	14.3	111
Equivalent time (hrs)	8.2	327	35.6	75.7	38.5	20.5	54.0	272
Turn around time (hrs)	0.4	1.1	2.5	1.8	2.8	5.4	3.6	1.6

PERCENTAGE OF JOBS FINISHED IN LESS THAN

TIME	15'	30'	1^h	2^h	4^h	8^h	1^D	2^D	3^D	6^D
% year 1975	23.4	38.8	58.2	75.8	87.0	91.4	98.7	99.4	99.4	100
% year 1976	39.6	57.0	72.7	85.1	94.5	97.5	98.9	99.0	99.1	100

Utilization of the computer center by the objectives and appropriation accounts for the month of April

IBM 370/165
equivalent time in hours

120	General Infrastructure	81.35
130	Scientific and Technical Support	2.51
143	ESSOR Reactor	2.29
145	Medium Activity Laboratory	0.16
146	Central Bureau for Nuclear Measurements (CBNM)	–
191	Technical Support to Commission Activities	1.27
193	Technical Support to Power Stations	0.22
211	Waste Disposal	0.42
213	Materials Science and Basic Research on Materials	1.78
214	Hydrogen	0.56
221	Reactor Safety	56.14
222	Applied Informatics	34.37
223	Information Analysis Services	39.27
230	European Informatics Network	2.68
251	Standards and Reference Materials	2.09
252	Protection of the Environment	14.11
253	Remote Sensing of Earth's Resources	9.63
254	New Technologies	0.06
412	Fissile Materials Control	0.64
	TOTAL	249.55
190	Services to external Users	17.83
	TOTAL	267.38

EQUIVALENT TIME TABLE FOR ALL JOBS OF THE ADMINISTRATION – MONTHLY AND CUMULATIVE STATISTICS

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1975	64	55	62	73	62	61	94	52	51	59	74	70
accumulation	64	119	181	254	316	377	471	523	574	633	707	777
Year 1976	84	82	101	77								
accumulation	84	166	267	344								

EQUIVALENT TIME TABLE FOR THE JOBS OF ALL THE OBJECTIVES – MONTHLY AND CUMULATIVE STATISTICS

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1975	178	171	168	166	142	166	228	137	152	170	190	176
accumulation	178	349	517	683	825	991	1219	1356	1508	1678	1868	2044
Year 1976	206	237	270	241								
accumulation	206	443	713	954								

EQUIVALENT TIME TABLE FOR THE JOBS OF THE EXTERNAL USERS -- MONTHLY AND CUMULATIVE STATISTICS

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1975	16	28	24	28	32	31	26	15	18	19	12	18
accumulation	16	44	68	96	128	159	185	200	218	237	249	267
Year 1976	18	19	28	16								
accumulation	18	37	65	81								

EQUIVALENT TIME TABLE FOR ALL JOBS OF ALL USERS – MONTHLY AND CUMULATIVE STATISTICS

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1975	214	216	208	215	190	222	266	166	181	202	219	208
accumulation	214	430	638	853	1043	1265	1531	1697	1878	2080	2299	2507
Year 1976	233	271	313	280								
accumulation	233	504	817	1097								

PRESENTATION DES TRAVAUX A EXECUTER ET EFFICIENCE DU SERVICE RENDU

J. Pire

L'ordinateur est actuellement en service de 08h00 à 24h00 et le turn around time a été notablement amélioré. Il pourrait être meilleur encore si les utilisateurs consentaient *à déposer leurs travaux dès le moment où ils sont prêts.*

Nous sommes cependant obligés de constater qu'au cours du mois de mars 1976

1) 28,9% des travaux ont été déposés entre 10h30 et 12h30,

2) 51,2% des travaux ont été déposés après 15h30,

soit 80,1% en une période de 4h00 d'affluence.

Jusqu'à environ 10h30, l'ordinateur – et les opérateurs – attendent patiemment le coup de feu qu'ils devront amortir pendant la pause de midi.

Il est clair, dans ces conditions, que 50% des utilisateurs ont l'impression de devoir attendre une journée avant de recevoir leurs résultats; il serait plus juste de dire une nuit.

Il doit exister une solution à ce problème.

En tout état de cause, qui désire améliorer le service qui lui est rendu par le Centre de Calcul peut utilement profiter des heures creuses. Même les problèmes de longue durée peuvent bénéficier de deux passages journaliers s'ils sont présentés aux heures convenables (vers 08h30 et 14h00).

The Newsletter is available at:	*Des exemplaires du Bulletin sont disponibles chez:*
Mrs R. Porta Program's Library Bldg. 36 - Tel. 760	Mme R. Porta Bibliothèque des Programmes Bât. 36 - Tel. 760

Deuxième Colloque International concernant les Modèles et l'Evaluation des Performances des Systèmes Informatiques

H. Fangmeyer, R.F. Gloden, J.G. Larisse

Le deuxième Colloque International concernant les modèles et l'évaluation des performances des systèmes informatiques aura lieu à Stresa (Lac Majeur, Italie) du 4 au 6 octobre 1976. Il sera organisé par l'I.R.I.A. Rocquencourt (France), le CCR et très probablement l'I.F.I.P. WG 7.3 (Création de modèles pour les systèmes informatiques). Ce colloque est une continuation du premier Symposium International de Calcul, organisé par la section française de l'A.C.M. et par l'A.F.C.E.T., qui s'est déroulé à Antibes (France) du 2 au 4 juin 1975 sous le parrainage des sections européennes de l'A.C.M. et de l'E.C.I. Il doit avoir lieu tous les deux ans.

Le présent colloque est présidé par M. H.J. HELMS, Directeur du Département A du CCR Ispra; les organisateurs sont MM H. FANGMEYER et J. LARISSE.

Un comité pour l'étude du programme scientifique a été créé. La présidence de ce comité est assurée par M. E. GELENBE (Université de Liège et I.R.I.A. – Laboria Rocquencourt, France), un des meilleurs spécialistes mondiaux pour les solutions exactes ou approchées de modèles probabilistes ainsi que pour les recherches concernant la mémoire virtuelle.

Voici la liste des membres du Comité du programme scientifique avec les attributions respectives:

H. Beilner	Université de Stuttgart, A.F.A. Mesures concernant les systèmes
P.J. Courtois	Laboratoires M.B.L.E. Bruxelles Modèles de systèmes à mémoire virtuelle, mesure du comportement d'un programme dans l'espace des adresses
H. Fangmeyer **J. Larisse**	Modèles de la fiabilité des systèmes informatiques
D.P. Bovet	Université de Pise, Italie Théorie de l'organisation, multitraitement
G. Iazzeola	Université de Pise, Italie Simulation de systèmes
M.M. Lehman	Imperial College, London, United Kingdom Evaluation du rendement d'un système, divers
E. Gelenbe	Théorie des réseaux de queues, réseaux d'ordinateurs

Les thèmes du colloque sont les suivants:

a) Théorie des modèles

b) Modèles et évaluations de systèmes existants, Operating System, réseaux de calcul, architecture et banques de données

c) Méthodes et instruments d'évaluation

d) Scheduling

e) Modèles probabilistes de la fiabilité des systèmes informatiques

ad a) : Ce titre comprend la théorie des modèles de systèmes complexes, en particulier des systèmes informatiques. Dans ce contexte une grande importance est attribuée aux modèles de simulation ainsi qu'aux modèles tirés de la théorie des queues. On demande des méthodes de résolution conduisant à des solutions exactes ou approchées.
A cet effet il faut prendre en considération les modèles statistiques en vue de l'analyse d'une charge de programmes et l'optimisation des installations de calcul (par exemple: réseaux d'ordinateurs, banques de données, etc.). En effet la statistique se prête particulièrement bien pour réduire un grand nombre de données à quelques paramètres caractéristiques.
Le groupe mathématique et statistique fournira une contribution dans ce domaine.

ad b) : Sous ce thème on regroupe des applications particulières. Le groupe "Etudes et Développements de Systèmes" se propose de présenter au colloque une communication ayant trait au problème des réseaux d'ordinateurs et à leurs architectures.
D'autre part, nous nous proposons d'attirer l'attention de nos collègues intéressés sur le vaste domaine de l'évaluation des banques de données où l'on constate l'absence de techniques appropriées destinées à donner une estimation du rendement des systèmes actuels et une évaluation des possibilités d'application.

ad c) : Il s'agit de prendre en considération des méthodes et des instruments pour l'évaluation de systèmes informatiques. Le chapitre revêt toute son importance par suite de l'absence de méthodes et d'instruments universellement reconnus, dont l'application est possible sans l'intervention de spécialistes.

ad d) : Ce chapitre comprend toute la méthodologie en rapport avec le problème de scheduling intervenant dans des systèmes de traitement de données. Ces problèmes se posent lors de l'interruption de programmes en multiprogrammation (par exemple en mémoire virtuelle), processus en temps réel. Il s'agit principalement de l'analyse statistique de scheduling d'algorithmes dans le but d'optimiser le système.

ad e) : Le thème, que nous présentons est proposé dans le prochain programme pluriennal du CCR. A l'occasion de ce colloque nous ferons le point sur les recherches dans ce domaine; en particulier sur la fiabilité des programmes d'application qui fait déjà l'objet d'un contrat de recherches avec l'Imperial College (Londres).

Détails de l'organisation du Colloque

Jusqu'à présent 63 articles ont été reçus et environ 120 scientifiques ont confirmé leur participation au colloque. Les articles sur les différents domaines se répartissent comme suit:

a) 26 articles
b) 12 articles
c) 14 articles
d) 10 articles
e) 1 article

Visitors / Visiteurs

• Nous avons reçu, le 20 mai dernier, la visite du professeur Jean ABADIE de l'Université de Paris (Dauphiné). Conseiller scientifique à la Direction des Etudes de l'Electricité de France, M. ABADIE a donné une conférence: "Optimisation en problèmes non-linéaires", durant laquelle il a décrit de nombreux exemples pratiques et les méthodologies mathématiques utilisées pour en donner certaines solutions.

• Mr. DANZIN, Director of IRIA, France, Chairman of CERD and of the CREST Sub-Committee of Informatics visited the Establishment on May 28. In connection with his visit Mr. DANZIN also visited the Department A where he saw the Computing Centre and the connection to the European Informatics Network (COST 11).
Mr. DANZIN was informed on the work programmes and the activities of the Department.

Courses and Seminars

Course on the APL Language

June 16 - 21, 1976
EURATOM JRC - Ispra

Lecturers	Dr. Leo Cardetta of the CSATA, Bari Dr. Onofrio Murro of the CSATA, Bari
Students	The course is directed to persons interested in using the APL language and system for the interactive solution of problems and the existing library.
Qualification	No particular knowledge of programming is required.
Objective	To supply a knowledge of the essential characteristics of the APL language immediately applicable even to rather complex problems.
Organization	The presentation of the various subjects will constantly refer to simple basic problems for practical exercises on terminals.
Implementation	The system will be installed at Ispra before the start of the seminar and will be available for use afterwards.

A P L (A Programming Language) is a conversational language based on a concise mathematical notation.

A P L provides an extended set of simple operators and powerful functions, which can operate on scalar data as well as sets of data (vectors and matrices).

A P L was designed to allow the problem definition in a way near the natural form, rather than computer oriented.

The implementation of A P L allows the interactive use of terminals (like teletypewriter) connected to a central computer, thus the user can regard his terminal as a powerful desk-calculator.

The system A P L – 360 is provided with a basic library of functions. It can easily be extended by user-defined functions, which increase the power of the language.

Course Programme

Fundamental characteristics of APL

- work environment,
- use of a terminal as a desk-calculator,
- primitive functions,
- execution order of the expressions,
- workspaces and libraries

Data structures

- types of data,
- creation of data structures,
- elements and substructures extraction,
- data reorganization

Operative functions and operators

- scaled functions,
- logical and relational functions,
- reduction operators,
- scan and axis,
- internal and external products,
- numerical functions

Functions defined by the user

- definition, modification and list of functions,
- types of functions,
- labels and branch,
- control of the execution of functions,
- trace and stop,
- variables and system functions

Control of the system

- management of workspace and libraries,
- communication between the terminals,
- error messages

Extension of the language

- auxiliary processors and shared variables,
- construction of private files (APL/TSLO),
- support for graphic applications (GRAPH-2/TEKTRONIX)

General information

- associations for APL and users groups,
- oriented program libraries,
- basic bibliography.

Les personnes intéressées et désireuses de recevoir régulièrement "Computing Centre Newsletter" sont priées de remplir le bulletin suivant et de l'envoyer à:

Mme R. Porta
Bibliothèque des Programmes
Bât. 36, Tel. 760

Nom .....

Adresse .....

.....

Tel. .....

The Persons interested in receiving regularly the "Computing Centre Newsletter" are requested to fill out the following form and to send it to:

Mrs R. Porta
Program Library
Building 36, Tel. 760

Name .....

Address .....

.....

Tel. .....