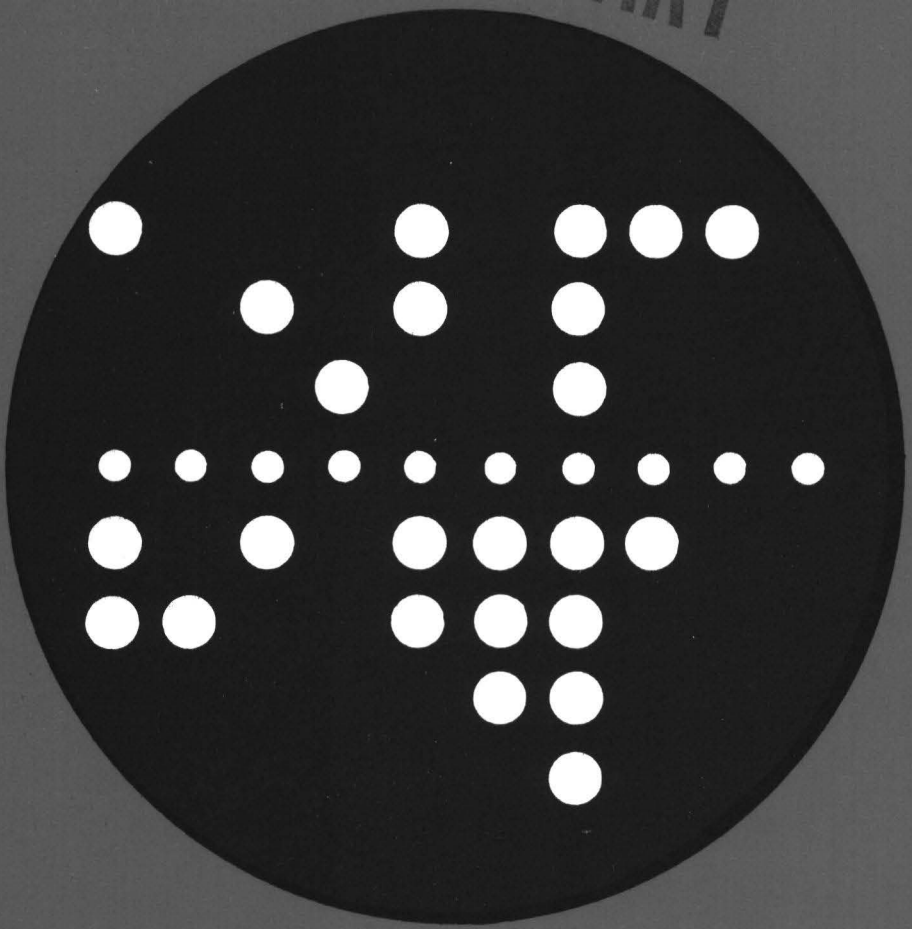
COMPUTING CENTRE NEWSLETTER

MARCH 1978 · No 19



Commission of the European Communities
JOINT RESEARCH CENTRE
Ispra Establishment

Contents

Note of the Editor

The present Newsletter is published monthly except for August and December.

The Newsletter includes:

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

The Editor thanks in advance those who 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 est publié mensuellement excepté durant les mois d'août et décembre.

Le Bulletin traite des:

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

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

Computing Centre References

		Room	Tel.
Manager	J. Pire	1816	732
Adjoined	G. Gaggero	1874	787
Computer Room	P. Tomba	1857	797
Adjoined	A. Binda	1857	797
Peripherals	G. Nocera	1825	767
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o Graphics and Support to Users	H.I. de Wolde	1883	1259
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Application Packages	A. Inzaghi	1887	755

Editor : Jean Pire
Layout : Paul De Hoe
Graphical and Printing Workshop, JRC Ispra

Users' Group

Minutes of the 2nd Meeting Computer Centre – User's Group

February 27, 1978

Participants:

Computer Centre	Messrs. De Wolde, König, Pire
Users' Group present:	Mrs. Airola (for Mr. Biggio) Messrs. Eder, Fangmeyer, Haemers, (for Mr. Jaarsma), Haenen, Halleux Kolar, Lamareille, Powel (for Mr. Town), Riesch (and Caruso), van den Muyzenberg

Availability of the Computer

The frequent breakdowns of the computer during the last weeks were one of the central discussion points of the meeting. Many research groups using the computer for their daily work have found considerable delays. This gave rise to wide dissatisfaction among the users, who start to have very serious fears about the future.

The Computer Centre is perfectly aware of the catastrophic aspects of the last weeks and the reasons for it. Certainly this is one point but unfortunately no tranquillizing arguments could be stated as far as the future is concerned. Mr. Pire said literally:

"Je réussis à colmater les brèches pour maintenir un bateau ingouvernable hors de l'eau. Tout le monde est dans les soutes ..."

which certainly shows the intention of doing something but convinces nobody!
Everybody seems to expect a dramatic issue.

The discussion covered the various aspects of the difficulties. The most important arguments are reproduced here.

- Mr Pire offered the possibility (on request of the users) to let the computer work out of the normal working hours in order to try to recuperate delays due to computer breakdowns.

- Concerning the time which is needed to repair the computer (many users feel that this is too long), Mr. Pire explained, that due to the fact, that hardware components of different manufactures are installed at the Computing Centre the system-analysts have, in case of breakdown, first to locate the probable error source before the outside maintenance services can be called in. This procedure of error location takes some time. Once a service has been asked for the firm has, according to the maintenance

contracts, 2 hours time in order to reach Ispra, which means that in most cases only after this time repair really starts. The users' group asked Mr. Pire to search for solutions both on administrative and technical level in order to reduce the breakdown times of the computer.

- Several severe accidents have happened recently with peripherical units. Magnetic tapes ruptured, data sets on disk were lost, an electrical short circuit put several disk units out of work for some days. For many users it was impossible to continue their work. By chance the data sets were not lost ! What would have happened otherwise?
Mr. Pire answered to these facts that there is a continuous effort to increase the reliability of the different products.

- Concerning the staffing situation at the Computer Centre, the users' group expressed their discontent that the availability of the software system (O.S. and TSO) depends on two persons (one for each system). If one or both, of these people are absent (illness etc.), serious problems on the availability of the system's software may result. The users' group asked the Computer Centre to search for a solution to this problem.

- Mr. Pire summarized that many of the problems are due to the lack of personnel at the Computer Centre. The users' group agrees that this might be one of the reasons, but it is certainly not a justification for the present situation.

Support to Computing

- Presently, there is nobody for direct support to computing: this situation is unacceptable.

- General lectures are given by outside people and organized by the support group in collaboration with Ispra Courses (e.g. GINO-F). It is noted that beside an evident interest for this initiative it will enlarge the number of users with specific needs and increase the above mentioned problem.

- Small lectures held by Computer Centre people on subjects suggested by the users: typical structure of these lectures could be: small bibliography, introduction to the subject and questions by the audience.

- All the lectures can be repetitive.

- As a transient measure, at least, some consulting, limited to half an hour a day, could be offered by experienced persons (e.g. Mr. Daolio for TSO).

- The office of Mrs. Cambon provides for almost all interesting documents classified in an understandable way.

- Users who are informed on subjects of general interest are kindly asked to participate in organizing lectures or support.

TSO

- A description of the present situation can be found in the CC Newsletter of January 1978.
- As far as actual connection to the computer is concerned, no difficulty is foreseen for those users who have terminal, modems and line to CC ready.
- Interactive librarian will be installed for mid-March.
- User are asked to keep some statistics in difficulties encountered when using TSO and to communicate them to Mr. Daolio in order to help debugging and tuning the system.

C C Newsletter

- Despite the good will of the editors there probably will be an increase in publications delays in the future due to lack of manpower and publishing difficulties.
- It should be remembered that if the CC Newsletter is abandoned, the user would have his part of responsibility: it is frustrating for the persons who write these useful booklets to see that only a small percentage of users read it.
- Users' articles are most welcome and will be published.

Daily Problems

A good deal of the time was dedicated to the many daily problems. The main requests of the U.G. were concentrated on:

- Availability of card punch machines
- chairs on the floor for outside users
- light on the card punch machines
- telephone number for enquiry on computer status
- mail box for the U.G., which can serve as a complementary link between the user and the steering committee of the U.G., the normal link still through the representatives.

It seems that the first reaction of Mr. Pire to these problems is that there are no ways of improving the availability of the card punch machines, nor that sufficient chairs will be available, nor will lights be installed. Only the request for the mail box for the users and the improvement of the "telephone number" reluctantly accepted.

GINO-F Course: Results of the Inquiry

The GINO-F course, which was organized by the E.F.I.S., following a proposal by the Unit "support to Computing", was attended by the following numbers of participants, respectively for the mornings and afternoons:

Feb. 21	:	30,28
Feb. 22	:	29,29
Feb. 23	:	30,24

The main items of the inquiry are listed below.

1. Do you feel that you had sufficient preparation ? 14 yes
2. General opinion of the contents:
   4 very satisfactory
   10 satisfactory
3. Balance of the course: 9 balanced
   4 not enough practical examples
4. Duration of the course:
   2 too long
   2 too short
   9 just right
5. Request for more advanced courses: 4 yes
   8 no
6. General opinion on the organization: 11 satisfactory
7. Single additional remarks
   - too much weight given to projection system
   - too much material for three days
   - execution of the examples on Calcomp took too much time and was confusing
   - graphic displays necessary for such course
   - lack of curve routines
   - interest for a course on Computer Aided Design
   - lack of documentation
   - lectures started late
   - more attention to the execution of practical examples
   - "although the organization was more than satisfactory, the problems of harware and software at the Centre should be considered in

greater detail if the Centre wishes to give a better impression to the participants attending such courses at Ispra".

Postscript

The Course Coordinator thanks the participants for the dutiful compilation of the inquiry form and ensures that the stated remarks will be taken into consideration at the organization of consecutive courses.

The Newsletter is available at:	*Des exemplaires du Bulletin sont disponibles chez:*
Mrs. A. Cambon **Support to Computing** **Bldg. 36 - Tel. 730**	**Mme A. Cambon** **Support to Computing** **Bât. 36 - Tel. 730**

The Computing Support Library informes users that the following manuals are available for distribution:

IBM Manuals

SC28-6855	Terminal User's Supplement for Fortran IV (G1) Processor and TSO Fortran Prompter	Lit.	10,200
GC28-6762	TSO Command Language Reference		11,700
GC28-6762	TSO Terminals		1,800
GC28-6763	TSO Terminal User's Guide		3,600
SC33-0029	PL/I Optimizing Compiler TSO User's Guide		3,150
SC28-6852	Fortran IV (H Extended) Compiler Programmer's Guide		12,900
GC28-6515	IBM System/360 and /370 Fortran IV Language		4,800
SC28-6853	Code and GO Fortran and Fortran IV (G1) Programmer's Guide		12,540
GC28-6514	OS Assembler Language		4,800
LIBRARIAN-TSO User Reference Manual			3,000
LIBRARIAN-OS User Routine Abstracts			3,000
ADABAS Introduction			6,500
ADABAS Reference Manual			30,000
ADABAS ADASCRIP Reference Manual			9,000
ADABAS ADACOM Reference Manual			10,000
TUCC (Triangle Univ. Computation Centre) TSO-Editor			5,000

The following manuals will be on limited distribution:

IBM Manuals

SC33-0027	PL/I Optimizing Compiler: Messages	Lit.	12,600
GC33-000	PL/I Checkout and Optimizing Compilers: Language Reference Manual		22,500
SC33-0006	PL/I Optimizing Compiler: Programmer's Guide		15,000
SC26-3759	OS Assembler H Programmer's Guide		4,200
PLOT-10	TEKTRONIX User Manual		13,000
ADABAS Application Programmer Guide			3,500

Order forms for the manuals are available at the office of Mrs. Cambon (building 36 – tel. 730).
Remember that the Computing Support Library only accepts requests with the budget number signed by the programme manager (activity sheet holder), to assure payment.

EQUIVALENT TIME TABLE FOR ALL JOBS OF THE GENERAL SERVICES - Monthly and Cumulative Statistics

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1977	44	74	78	32	26	36	27	25	27	31	40	34
accumulation	44	118	196	228	254	290	317	342	369	400	440	474
Year 1978	51	43										
accumulation	51	94										

EQUIVALENT TIME TABLE FOR THE JOBS OF ALL THE OBJECTIVES AND GENERAL SERVICES - Monthly and Cumulative Statistics

	January	February	March	April	May	June	July	August	September	October	November	December
Year 1977	135	218	312	193	180	269	244	196	277	275	284	179
accumulation	135	353	665	858	1038	1307	1551	1747	2024	2300	2584	2763
Year 1978	211	213										
accumulation	211	424										

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 1977	13	14	18	16	13	22	19	18	27	25	21	20
accumulation	13	27	45	61	74	96	115	133	160	185	206	226
Year 1978	12	10										
accumulation	12	22										

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 1977	158	241	314	242	202	294	266	217	299	299	318	235
accumulation	158	399	713	955	1157	1451	1717	1934	2233	2532	2850	3085
Year 1978	276	261										
accumulation	276	537										

Statistics of computing installation utlization

Report of computing installation exploitation for the month of February

	YEAR 1978	YEAR 1977
Number of working days	20 d	20 d
Work hours from 8.00 to 24.00 for	16 h	16 h
Duration of scheduled maintenance	21.25 h	25.16 h
Duration of unexpected maintenance	32.63 h	6.66 h
Total maintenance time	53.88 h	31.82 h
Total exploitation time	272.12 h	288.18 h
CPU time in problem mode	106.68 h	106.10 h
Conversational Systems:		
CPU time	1.50 h	2.50 h
I/O number	674,000	348,000
Equivalent time	6.20 h	4.94 h
Elapsed time	102.00 h	160.00 h
Batch processing:		
Number of jobs	9,127	9,555
Number of cards read	2,135,000	2,534,000
Number of cards punched	147,000	172,000
Number of lines printed	23,069,000	27,233,000
Number of pages printed	520,000	600,000

BATCH PROCESSING DISTRIBUTION BY REQUESTED CORE MEMORY SIZE

	100	200	300	400	600	800	1000	1400	total
Number of jobs	2401	3131	1936	1006	243	78	34	7	8836
Elapsed time (hrs)	64	167	182	182	34	23	8	7	667
CPU time (hrs)	3	22	26	35	7	5	3	3	104
Equivalent time (hrs)	20	54	69	77	13	11	4	7	255
Turn around time (hrs)	0.8	1.2	1.5	2.5	3,1	3.5	4.6	8.4	1.4

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 1977	37	56	74	87	96	98	99	99	99	100
% year 1978	39	57	72	84	93	97	98	99	99	100

Utilisation of computer center by the objectives and appropriation accounts for the month of February

		IBM 370/165 equivalent time in hours
1.20.2	General Services - Administration - Ispra	41.49
1.20.3	General Services - Technical - Ispra	1.17
1.30.4	L.M.A.	–
1.90.0	ESSOR	21.33
1.92.0	Support to the Commission	12.75
2.10.1	Reactor Safety	79.29
2.10.2	Plutonium Fuel and Actinide Research	2.32
2.10.3	Nuclear Materials	2.05
2.20.1	Solar Energy	0.73
2.20.2.	Hydrogen	–
2.20.4	Design Studies on Thermonuclear Fusion	4.61
2.30.0	Environment and Resources	8.20
2.40.0	METRE	6.50
2.50.1	Informatics	31.02
2.50.3	Safeguards	1.32
	TOTAL	212.80
1.94.0	Services to External Users	10.31
	TOTAL	**223.11**

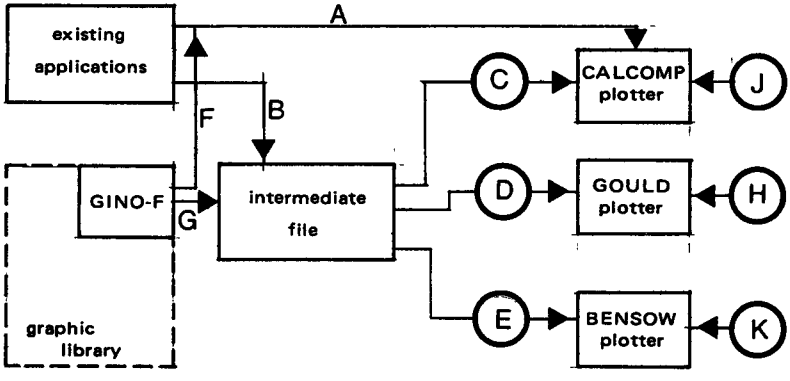
How to Use "GRAPHIT"

H.I. de Wolde, A.A. Pollicini

With the installations of the new plotters, shortly called "Gould" and "Benson", there exists a need for a system which gives easy access to the different graphic devices.
Consequently, the system GRAPHIT has been designed and developed by the Computing Centre. The acronym stands for Graphics by Intermediate Transfers.
This article gives a preliminary description of the use of GRAPHIT. However, the way of application may be changed in future when more experience is gained with this rather complex software tool.

The basic idea of GRAPHIT is to have the drawing commands stored in an intermediate file, which may be temporary or permanent, and to execute the actual plotting in a second jobstep.
The system offers access to the different plotters without the burden of programs modifications.

The next diagram gives the relations of hardware and software. For the time being the three plotters are used off-line.



GRAPHIT SYSTEM

The letters in the diagram point to the related paragraphs in this article:

C, D and F	are device oriented programs which prepare the actual tapes for the chosen device;
J, H and K	are device oriented subroutine libraries.

Hardware Specifications

Calcomp 1136 :	3 pens axial pen movement about 9 cm/sec increment size 0.05 mm plot size in y-direction 83 cm
Benson 1102 :	3 pens axial pen movement 5 cm/sec increment size 0.05 mm plot size in y-direction 32 cm
Gould 5200 :	Electrostatic plotter 200 points/inch, resolution 0.13 mm linear paper speed of 4 cm/sec plot size in y-direction 28 cm

From these specifications it is clear that the Gould plotter best fits for test runs: The device is very quick but the accuracy is not very high.
The Benson plotter may be used to produce accurate drawing of limited size as the plot area is only 32 cm high. This size is sufficient for a large part of the production and it has the advantage that the user need not bother about economic paper use in the y–direction.
The Calcomp plotter is the right device for large accurate drawings.

A. Existing applications directly to Calcomp

The Calcomp plotter may be used as normal, without the services of the intermediate file. The system library SYSI.EURLIB contains the calcomp routines as are described in the manual which may be obtained from the Installation Notes by the job:

```
//.....JOB.....
$    LINES 003
//   EXEC LIHNO,MEMB=PCAL
```

The output file is created on private tape as always. The DD statement for this file is:

```
//GO.FT16F001 DD UNIT=TP9,LABEL=(,,,OUT),DISP=(NEW,PASS),
//    VOLUME=(PRIVATE,SER=EUxxxx),DSNAME=PICT,
//    DCB=(RECFM=VS,BLKSIZE=488,LRECL=484,DEN=2)
```

in which EUxxxx is the tapenumber.

B. Existing applications to Intermediate File

The graphic output of programs which are using the standard Calcomp calling modes may be stored in an intermediate file. This file has to be created by the user, it may be temporary or permanent and may be stored on disk or tape.
If the file is temporary, normally on scratch disk, the preparation of the graphic data, for a specific device, has to be executed in a second jobstep (see par. C). The next example gives the deck composition for the creation of a temporary intermediate file on scratch disk:

```
//     EXEC FTGCLG,PRN=GRAPH,VLB=COPICA,ULB=DISK
//CMP.SYSIN  DD *
           fortran deck
//GO.FT16F001  DD  DSN=&INTERF,SPACE=(CYL,(2,2) ),
//     DISP=(NEW,PASS), UNIT=SYSDA,
//     DCB=(RECFM=VS,LRECL=800,BLKSIZE=804)
//GO.SYSIN  DD  *
           input data
/*
```

The called procedure may also be FTL or FTLG. Programs which exist as load modules have to be re-linkedited. The plot command routines PLOT, FINTRA, FACTOR, FINIM, WHERE, NEWPEN and SYMBL4 are replaced by pseudo routines with the same names out of the library SYS1.LIBGRAPH. These pseudo routines take care that the plot commands are stored, through the routine BUFFER, in the Intermediate File. Normally this job step has to be followed by a second step which creates the device oriented tape file. (See par. C).
The following example gives the DD statement for a permanent file on a private tape, with density 3:

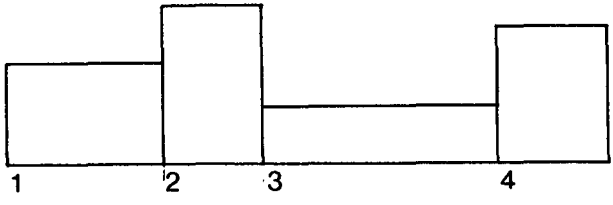
```
//GO.FT16F001  DD  DSN=dsname,DISP=(NEW,PASS), UNIT=TP9,
//     LABEL=(1,SL),VOL=(PRIVATE,SER=EUxxxx),
//     DCB=(RECFM=VS,LRECL=800,BLKSIZE=804)
```

To accommodate the users of a permanent intermediate file, which is normally applied for multiple device use, a new routine is available to segment the drawings. You may, for example, produce a large number of drawings on the quick Gould plotter, then select a few elements from this collection and consequently draw these elements on the large scale Calcomp plotter. The calling statement to this routine is:

```
CALL PICTNO (K)
```

in which j is a consecutive element number.
PICTNO is called before the related segment.

The programmer has to take care that each of the pictures has sufficient drawing space available when previous pictures are omitted.
The easiest way to organize the drawings is in a series of rectangles and to place the pen to the lower left of each segment before calling PICTNO(K).



Picture Number

A more sophisticated version of the routine PICTNO will be developed later.

Problems concerning the scales of the drawings when programming and testing for example, on the Calcomp plotter are solved on the level of the device oriented programs (see D and E). When a system or program failure occurs during the creation of the Intermediate File, the system closes the file with an EOF and the existing part may still be plotted.

C. Intermediate File to Calcomp plotter

If the intermediate file is temporary and will be processed in the same job as it was created, the control cards are:

```
//STEP2 EXEC CALCOMP,TAPE = 'EUxxxx'
//CLP.SYSIN  DD *
          picturenumbers which are read as (1216)
/*
```

in which EUxxxx is the output tape identification.

The data input gives the number of the pictures which are to be processed. These numbers need not be ordered and may contain blank fields. If you want to draw all the images or when the pincturenumbers are not defined, it will be sufficient to insert a blank card here.
If the Intermediate File has been stored on tape, the card configuration becomes:

```
//       EXEC CALCOMP,TAPE='EUxxxx',
//CLP.FT15F001  DD DSN=dsname,DISP=(OLD,PASS),
// UNIT=TP9,LABEL=(1,SL,,IN)VOL=(PRIVATE,SER=EUyyyy)
//CLP.SYSIN DD *
        picturenumbers
/*
```

D. Intermediate File to Gould plotter

If the Intermediate File has been defined as temporary and will be processed in the same job as it was created, the control cards become:

```
//STEP2      EXEC GOULD,TAPE='EUxxxx'
//GLD.SYSIN  DD *
FACTOR,IFORM,NCOPY,INT     (F6.2,3i6)
INP (i)                      (12I6)
/*
```

in which

FACTOR — is the scale factor. If not specified the program takes a default value of 0.32. This is the ratio between the paper height of the Gould plotter and the Calcomp plotter.

IFORM — is the background pattern number
- = 0 blank background
- = 1 squared background
- = -1 black background with erased lines

NCOPY — is the number of copies wanted

INT — is the line intensity
- = -2 triple
- = -1 double
- = 0 normal
- = 1 half
- = 2 one-third

INP (i) — are the desired drawing segments. If omitted all segments will be processed.

If the Intermediate File has been stored on tape, the card configuration becomes:

```
//        EXEC GOULD,TAKE='EUxxxx'
//GLD.FT16001 DD DSN=dsname,DISP=(OLD,PASS),UNIT=TP9,
              LABEL=(1,SL,,IN),VOL=(PRIVATE,SER=EUyyyy)
//GLD.SYSIN   DD *
            data
/*
```

In which

EUyyyy — is the identification of your Intermediate File tape

EUxxxx — is the identification of the output file tape.

E. Intermediate File to Benson plotter

The temporary Intermediate File may be processed in the same job as it was created, with a tape file output for the Benson plotter, by the following jobstep:

```
//STEP2   EXEC BENSON,TAPE='EUxxxx'
//BNS.SYSIN  DD *
FACTOR              (F6.2)
INP(i)              (12I6)
/*
```

in which

FACTOR is the scale factor, if omitted the program multiplies all the input values with 0.37 being the ration between the Benson plotter y-size and the Calcomp plotter y-size

INP (i) are the desired picture segments. If omitted the program processes the complete intermediate file.

If the Intermediate File is permanent and stored on tape, the job becomes:

```
//        EXEC BENSON,TAPE='EUxxxx'
//BNS.FT15F001  DD  DSN=dsname,DISP=(OLD,PASS),UNIT=TP9,
//                  LABEL=(1,SL,,IN),VOL=(PRIVATE,SER=EUyyyy)
//BNS.SYSIN  DD *
            data
/*
```

F. GINO-F to Calcomp Plotter

The subroutine of the GINO-F package are available for direct drawing on the Calcomp plotter by the next job:

```
//     EXEC FTGCLG,PRN=GINOF,VLB=COPICA,ULB=DISK
//CMP.SYSIN  DD *
            fortran deck
/*
//GO.FT16F001  DD  UNIT= TP9,LABEL (,,,OUT),DISP=(NEW,PASS),
//     VOLUME= (PRIVATE,SER=EUxxxx),DSNAME=PICT,
//     DCB=(RECFM=VS,BLKSIZE=488,LRECL=484,DEN=2)
//GO.SYSIN  DD *
          input data
/*
```

G. GINO-F to Intermediate File

The link of the GINO-F package to the Intermediate File is available but

will be discussed in a following article on Computer Graphics.

J. Calcomp Subroutine Library

The Standard Calcomp subroutine library remains available as has been described in paragraph A.

H. Gould Subroutine Library

The use of the Gould Subroutine Library will be limited to its function as a back-end to the Intermediate File. Only in special cases may a user request direct access to this library.
The special functions of the Gould plotter, for example, the surface grey levels will be embedded in the general graphics library.

K. Benson Subroutine Library

Also this library is generally not accessible to the users; the use of the Benson plotter is only possible through the Intermediate File.

Planned Developments

Although the system GRAPHIT has been tested extensively, some bugs might occur in specific applications.
After a trial period of a few months, we plan to continue the development with a more versatile segmenting procedure. Then the special feature of the Gould plotter, with greylevels for surfaces, will be included in the basic graphic library; the pen plotters will ignore this type of task.

After the installation of the Tektronix 4015, the connection of this display with the Intermediate File will be developed, which means that the user may scan his graphic output before asking for the actual plots.
The Tektronix 4015 has also a small digitizer which might be used to build an Intermdiate File. Consequently the Intermediate File must be accessible for computation processes.

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

Mme A. Cambon
Support to Computing
Bât. 36, Tel. 730

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. A. Cambon
Support to Computing
Building 36, Tel. 730

Nom .....

Address .....

.....

Tel. .....