

NATIONAL MFE COMPUTER CENTER



THE MFECC BUFFER

The National Magnetic Fusion Energy Computer Center Newsletter
Lawrence Livermore Laboratory, Livermore Ca. 94550

Volume 1, Number 1 April 1977

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EDITORIAL

Once upon a time...a study sponsored by the AEC Division of CTR concluded that if the milestones towards the goals of fusion power are to be met, the computation capability of the CTR community must be greatly expanded. That was in April, 1973. By the summer of 1975, computer equipment began to be installed at the Lawrence Livermore Laboratory, the site chosen to provide this greatly expanded computational capability, and by 1976 the newly established CTR Computer Center actually provided computational services to many CTR laboratories. Today, although all the names have been changed to protect the innocent, we are back at "Once upon a time..."

Since the need for machine time seems to greatly exceed the availability, we of the MFE Computer Center would like to open up additional avenues of information exchange in order to encourage the efficient use of the existing MFECC facilities and resources. In future issues, we intend to address such subjects as charging algorithms, FILEM expansion, Class VI computer acquisition, as well as current and planned projects. We believe that a newsletter such as this might significantly add to the understanding of hardware/software projects in areas where DOCUMENT, NEWS, LIBRIS, etc., are inappropriate; we are confident that what you read in "The Buff" will be stimulating.

This is our first issue and we encourage all of you to comment, contribute or request information concerning the National MFE Computer Center so that future issues will be most informative. Art Scott (X-5272) has graciously taken on the responsibility for organizing this newsletter and should be your contact for questions and/or submissions.

-D. Fuss

OPERATIONS INFORMATION

CDC 7600 Schedule

Available 24 hours per day except for emergency maintenance and the following scheduled interruptions:

Preventive Maintenance 1715-2230 PST Friday
Software Development 1600-1700 PST Tuesday and Thursday

Bank Account Schedule

Daytime 0600-1800 PST Mon-Fri
Nighttime 1800-0600 PST Mon-Thu
Weekend 1800 PST Fri to 0600 PST Mon.
Holiday 1800 PST holiday eve to 0600 PST holiday +1

Batch Schedule

1800-0600 PST Mon-Thu
1800 PST Fri. to 0600 PST Mon.

Berkeley Batch Schedule

Tues/Wed 2200-0800 PST
Sun/Mon 1700-0500 PST

MFECC Holiday Schedule

May 30
July 4
September 5
November 24-25
December 23, 26, 30

SYSTEM AND NETWORK INFORMATION

CDC 7600 Systems Information

A new NATES was released on March 7 along with system changes to support NATES. NATES allows administrators to manipulate time allocations and user numbers in a specific set of repositories. The new version allows a maximum priority limit to be set on an individual user, time may be donated to any repository rather than a subset, and there is an improved HELP package and clearer error comments.

A FREE utility capability has been implemented to allow users to save files and give away output files after their time allocation has been used up. A FREE utility is a public file that is allowed to run at normal priorities when there is no time left for the user. Output routines which use a significant amount of CPU time are not included. The following public files are treated as FREE utilities:

- ALLOUT DESTROY
- FILEM FILES
- GIVE NATES
- NETOUT SWITCH

New 819 disk drivers and scheduling algorithms were released on March 7. The new drivers allow any of the four 819 disks to be accessed from either of the two disk channels and make it possible to give an ailing 819 disk to the engineers while the system continues to use the other three disks. The new system also allows the engineers to insert soft flaws detected on the 819 and 844 disks into the disk maps thereby preventing the flawed areas from being allocated for file space.

A shortage of space in the active file index has been a frequent problem on the MFECC 7600. A system which was released on April 12 has space allocated in the active file index for 3001 files. Previous systems allowed for 2503 active files. The active file index is an LCM resident table containing six word entries for all public files and for all private files owned by users currently active in the machine. With 50 or more users active in the 7600, it doesn't take very many users with a hundred private files to fill up the file index. The increased size of the active file index will alleviate the problem for a while but all users are encouraged to store files in FILEM that are not currently being used, or to make use of LIX libraries if you must handle large numbers of files. When the file index is completely full, nothing will run because drop files cannot be created. Remedial measures include logging everybody out to get

rid of file index entries belonging to users who are logged in but not running anything, doing a DSU to kill running programs forgetting about files created in the previous two minutes, or deadstarting without private files.

The new disk drivers mentioned above have resulted in more efficient disk usage and in better CPU utilization. Both of these factors have caused an increase in total time charges for a given period of time. On April 1, the 7600 charging algorithm was changed to effect a net reduction in time charges. A future newsletter will try to explain the charging algorithm in some detail.

-D. Storch

MFECC DEC-10 Information

New versions of several of the network access programs were released concurrently in March. The releases included NETMGR, NETTY, NSP6, IPBSER, NETOUT, NETRJO, LPTSPL and ECHOR. Listed below are some of the changes made to this software:

NETMGR Version 3(22)

- 1) NSP messages were modified to comply with the new implementation being debugged in the A machine.
- 2) The terminal line security and NETMGR-NETTY protocol were improved. A new initial connection procedure prevents a new NETTY from receiving a previous user's messages. NETMGR informs NETTY more quickly and with more precise messages and error codes when transmission (output) to the local CCP is failing.
- 3) The output (to CCP) failure recovery procedures were improved.
- 4) CPU time required when multiple NETTY jobs are active has been reduced.
- 5) A new command, RESET, was added for operational convenience.

NETTY Version 4

- 1) A user may default his entire ID line, except the combo, by using a SWITCH.INI file to specify his A-machine account. To use the default system, a user must:
 - a) Create or add to SWITCH.INI (in his DEC-10 disc area) the line,

NETTY /430pdp/

where the user's account is enclosed by the slashes.
 - b) Respond to NETTY's solicitation for LOG IN with <CTRL>Z followed by the user's combo.

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- 2) NETTY saves the user's ID line. If the connection with the A machine is broken, the user will be asked to retype his combo. NETTY will attempt to reestablish connection.
- 3) The message "@SORRY" is typed when a user's input line to the A machine is discarded. NETTY's response to <CTRL>ES indicates whether the message was discarded by NETMGR or the network.
- 4) Terminals are set automatically for graphics.
- 5) NETMGR status checks are made more frequently.
- 6) The error messages, "NETWORK TRAFFIC PAUSING" or "NETTY'S OUTPUT QUEUES FULL", indicate that NETMGR is still running but has slowed down in retrieving NETTY messages.

NETOUT Version 2(54)

- 1) Support was added for the new remote FILEM program being tested.
- 2) The error exit taken when a binary file is sent as an ASCII file was made more dignified.
- 3) Assembly parameters were added to allow selection of file queueing and staging areas according to the needs and requirements of individual installations.

NETRJO Version 2(17)

- 1) A test was added in NETRJO for "last message" to prevent the occasional duplication of the last file packet.
- 2) Also, NETRJO now places files in the printer queue under the user's PPN, if provided; this enables the user to delete his job from that queue.

LPTSPL 6(34413)

A "sideways printing" capability (previously provided by program EPLPRT) has been incorporated into LPTSPL. This feature is selected by placing an ASCII file with the extension ".SWP" into the print queue. A drawback is very slow printer output.

Under Development

A new program that will allow DEC-10 users to access FILEM without running NETTY is being tested. The routine, RFILEM, will generate FILEM commands from user requests and forward them to the A machine.

-B. Howard

Network Information

Debugging of the PDP11/50 "NSP" system is continuing. "NSP" is the Network Service Protocol that has been designed and developed for use throughout the network. In the 7600, the "OCTOPUS" protocol developed by LLLCC was used to allow the MFECC to concentrate on the network. Now we are bringing the 7600 protocols in line with NSP. Progress has been good considering the amount of new coding involved. In addition to the line unit drivers, the loader, the dump routine, and the reload process routines in the PDP11/50, there is a new PPU13, new overlays and new network service routines (RP#66 and RC#66) on the 7600. Interactive messages can be sent in both directions and the PDP11/50 can be dumped successfully. Loading the PDP11/50 is now being debugged.

The first phase of a routine to test the wide-band telephone lines is in the final stages of debugging.

Changes are continually being made to the PDP11/40 system to make it more efficient.

The network group has grown with the addition of Don Hall on April 4th.

-P. Lund

File Storage Information

The main effort during the last few months has been to move some of the 7600 FILEM operations onto the CDC 6400 as the first step in preparation for the mass storage device.

The three major changes to FILEM will be:

- 1) Dynamic allocation of staging disk space.
- 2) Saving of files to tape on the 6400.
- 3) File retrieval from tape on the 6400 and transported to the user on the 7600 (through the shared packs).

When the retrieval of files from tape is transferred to the 6400, the user will no longer see large tape I/O charges--but a charge in proportion to file size.

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The FILEM switch to the G400 has encountered many problems. As can be surmized from viewing the graphs appended to this report, just maintaining FILEM and the associated tape operation (fixing bad tapes, reclaiming tapes, etc.) is taking more and more time.

-J. Shuler

Utility Program Information

TV80LIB ON SLOPE:

A version of TV80LIB that runs with SLOPE is now in public. This version supports DD80 files only. You may use the LTSS utility FROG to convert to other forms (fiche, film, etc.). If you want the plots on the Versatec or Tektronix terminal you must use NETPLOT or TEKPLOT.

Temporary documentation may be obtained as follows:

FILEM / t v
.RDS 740 TVDOC

Then list the file with QED using the ULC option.

-R. Johnson

SLOPE II:

This all new version of SLOPE is completed and will be installed on April 18. This version corrects all known problems of SLOPE I, while providing more SSM space (>150K), increased I/O capabilities (random access, tape I/O), additional debugging features, and an improved loader.

This version of SLOPE contains standard versions of CDC products. The user should obtain the following documents:

FORTTRAN EXTENDED REF. Manual	60497800
LOADER VERSION 1 Ref. Manual	60429800
CYBER RECORD MANAGER Version 1	60307300
UPDATE Reference Manual	60342500
NOS VERSION 1 Ref. Manual Vol. 1	60435400

Initially, SLOPE I will remain on the system for about 3 months, or until we are satisfied that no problems exist on SLOPE II. A NEWS item will explain how to obtain temporary documentation of SLOPE II.

-R. Johnson

REDUCE:

REDUCE is an algebraic manipulation language developed by Dr. T. Hearn and Dr. M. Griss at the University of Utah. The REDUCE language is designed to handle such things as expansion and ordering of polynomials and rational functions, a variety of pattern matching, symbolic matrix calculation, and high-energy physics calculations. Recently, Dr. Griss has made REDUCE available for use on User Service Center PDP-10's. In addition, MFECC has placed the REDUCE Users Manual on the A-machine as an on-line document. This document gives full details on how to run REDUCE on the PDP-10, and describes the language and it's full uses.

-B. Kelly

USER SERVICE INFORMATION

CDC 7600 Statistics

For the months January, February, and March:

Availability - 92 Percent

Mean Time Between Failure - 10 hours 37 minutes

Mean Time To Repair - 28 minutes

Service Interruptions:

159 hardware

31 software

37 system development

12 preventive maintainance

total - 239

-A. M. Scott

Output Distribution Statistics

For the months of January, February and March:

705 thousand pages of high speed printer output, 11659 microfiche and 12458 feet of film were distributed.

We have 588 assigned users, up from 546 in December 76. (Last March we had 404 assigned users). There were also 383 requests for bank account, Alphatable and Effortable changes and/or additions.

-A. M. Scott

Documentation Additions and Changes

So far in 1977 we've added 21 writeups to our online documentation. Of them, 16 are class notes from the advanced-users class taught here in January (LECTLADV through LECT16ADV) and one is the index to those writeups (INDEXADV).

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The other new writeups are HIDDEN, which describes an algorithm for displaying complex three-dimensional objects; MASS11, which describes an assembler on the CDC 7600 for the PDP11; NETHER, which tells how to use the network spooler/NSP manager; and REDUCE, which describes a symbolic language for algebraic computations.

We're working on some big projects--ORDERLIB, URLIB, the Summary Sheets--and we hope to have them online in the next quarter. Prediction being a risky business, we decline to say anything stronger.

-J. Barnett

LIBRIS - A Physics Code Library

LIBRIS is a physics code documentation and interrogation routine. The documentation for LIBRIS can be found via the "DOCUMENT" routine. LIBRIS is intended to be an on-line physics code library for the KFE community. LIBRIS should make it easier for you to document your codes and/or find out what codes are available to you. We encourage you to contribute and to make use of this code library.

If you have suggestions, please contact Arthur Scott (415) 447-1100 Ext. 5271.

The latest physics codes entered in LIBRIS are:

Number 14 FLUPAR Bill Hobbs, NRL
HYBRID CODE TO INCLUDE PARTICLE EFFECTS IN A FLUID CODE

Number 15 RINGA Alex Friedman, Cornell University
MAGNETIC AXISYMMETRIC (2.5-DIMENSIONAL) PARTICLE CODE

Questions, Comments and Answers

This section is used to discuss topics of interest for users of the MFECC Network. If you have a question or comment that you wish to present in this Newsletter, please write us and we will attempt to publish the question or comment with an appropriate reply.

-A. B. Scott

THE MFEECC SUMMER

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QUESTION: DEBUG dies with an ERROR 00317 at 13717 if you use a variable instead of a constant as a subscript, e.g., "A(J)". Even if this is an illegal command, DEBUG should still not commit suicide. -A. McKenney/PPPL

ANSWER: Yes, you are correct, DEBUG shouldn't just give up and die. The MFEECC will decide, which debugging routine it will support to prevent errors like this from lingering in a utility. -A. B. Scott

QUESTION: I recommend that a new command be added to document, called Docdate (or some such), it would give a list of the write-ups available a long with the date of the last revision for each. This would make it easier for a user to find out whether he has the current write-up on a given subject.

ANSWER: There are two ways to find out what have been revised since a particular date:

1. "Print since date" will give a list of write-ups that have been revised on or after the given date, or
2. "View Directory List" will give a list of write-ups along with the date of the last revision for each, and a very brief description for each write-up.

Your proposed option will be available as one of the abstracting functions of a future version of document. -C. Luk

QUESTION: FILEM has a nasty habit of changing files from "L." to "A." I will write my files with "WRS L." or "RLS L.", but later on I find that they have become archival. What is worse, it does not do it consistently enough to tell exactly what might have caused it. In one case, today, I wrote a file, and the next time I did a LST#, I (15 minutes later), found it was archival. What is going on? -A. McKenney/PPPL

ANSWER: When there is no more disk space available FILEM will automatically default the lifetime of the file to archival (A.). So if you use M. or L. and there is no disk space left, the file is switched to archival (A.) -J. Choy

QUESTION: How can I use the new FILEM command to destroy a bunch of FILEM directories (and the contents) which start with the same letters? I have tried "DST ALWITH. DIRNAME" and "DST ALWITH. .DIRNAME" both to no avail. -H. R. Hicks/ORNL

ANSWER: You can't. Perhaps in the future. -J. Choy

QUESTION: Please tell me which of the following constructions is the fastest:

```
DO 10 K=1, MK
  KP=K+1
  IF (K.EQ. MK) KP=1
```

or

```
DO 10 K=1, MK
  KP=MOD(K+1, MK)
```

or perhaps some other (standard FORTRAN) construction. -H. R. Hicks/ORNL

ANSWER: MOD (K+1, MK) is "equivalent" to:

```
INT(FLOAT(K+1)-FLOAT(MK+INT(FLOAT(K+1)/FLOAT(MK))))
```

Your first example is more efficient. -C. Luk

POINTS OF INTEREST

NEW TEKPLOT FEATURE:

There is a new command in TEKPLOT that allows a user to send selected frames of the DD80 file being viewed to a USC Versatec printer. By typing USC after a DD80 frame has been displayed, the frame will be placed in a temporary file that will be processed by NETPLOT when a user is done using TEKPLOT. The first time the USC command is used, TEKPLOT will prompt the user for various information, including destination, size, box and ID. This command may be useful to users who wish to send only selected frames to the printer instead of the entire file.

-S. Louis

FILES REMOVED FROM PUBLIC FILES:

The following files have been preserved in FILEM under a special user number (76) created for this purpose:

ALA76	COBOL	DD80GST	FTN76	NETCHOR	TIDY
APL	COLIB	DDIBIN	HSPLST	PPU76	TPVAULT
APLCON	CPU76	DKSTAR	LIB	PROXY	UPDATE
APLFUN	CRASH	FLOWCHART	LIBTST	SIM11	
ATE	CURVE	FR80LST	LISP	TAPEREC	
BINED	DAYHIST	FRADLST	MEMSTUFF	TESTAT	

In order to read one of these from FILEM type:

FILEM RDS 76 .PUBFILES filename / t v

If you have any comments or problems, please contact Kirby Fong at extension 3251, MFECC.

-K. Fong

CHANGES TO TRIX AC:

TRIX AC was changed to wrap around after column 80 for all terminals. See NEWS 03/31/77 "Change to TRIX AC".

-K. Fong

Puzzles

This is a problem sent by H. Nelson.

"Among all cubic polynomials whose coefficients are integers between -10 and +10, which one has a root nearest to pi."

(Solution next month.) -

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MFECC Telephone Numbers

(415) 447-1100

Director	John Killeen	3278
Deputy Director	Hans Bruijnes	3094
Program Manager	John M. Fitzgerald	3961
Programming Supervisor	Dieter Fuss	3142
Engineering Supervisor	James F. Leighton	3959
Department Secretary	Donna Lee	3108
Large System Group	Dave Storch	3087
User Service Center Grp	Barry Howard	3242
Data Communication	Paul Lund	3100
Consulting	Clement Luk/Arthur Scott	5271/5272
Math Libraries	Kirby Fong	3251
User Number/Accounting Output/etc	Anita Scott	8997
File Storage	Joe Choy/Jean Shuler	3369/3286
Physics Group	Art Mirin	8860
CHATR Compiler	Larry Berdahl	3263
Order/Batch/Graphics	Steve Louis	3398
CDC 7600 Machine Rm.		3338

For additional contacts please see the document PERSONNEL.

Appendices

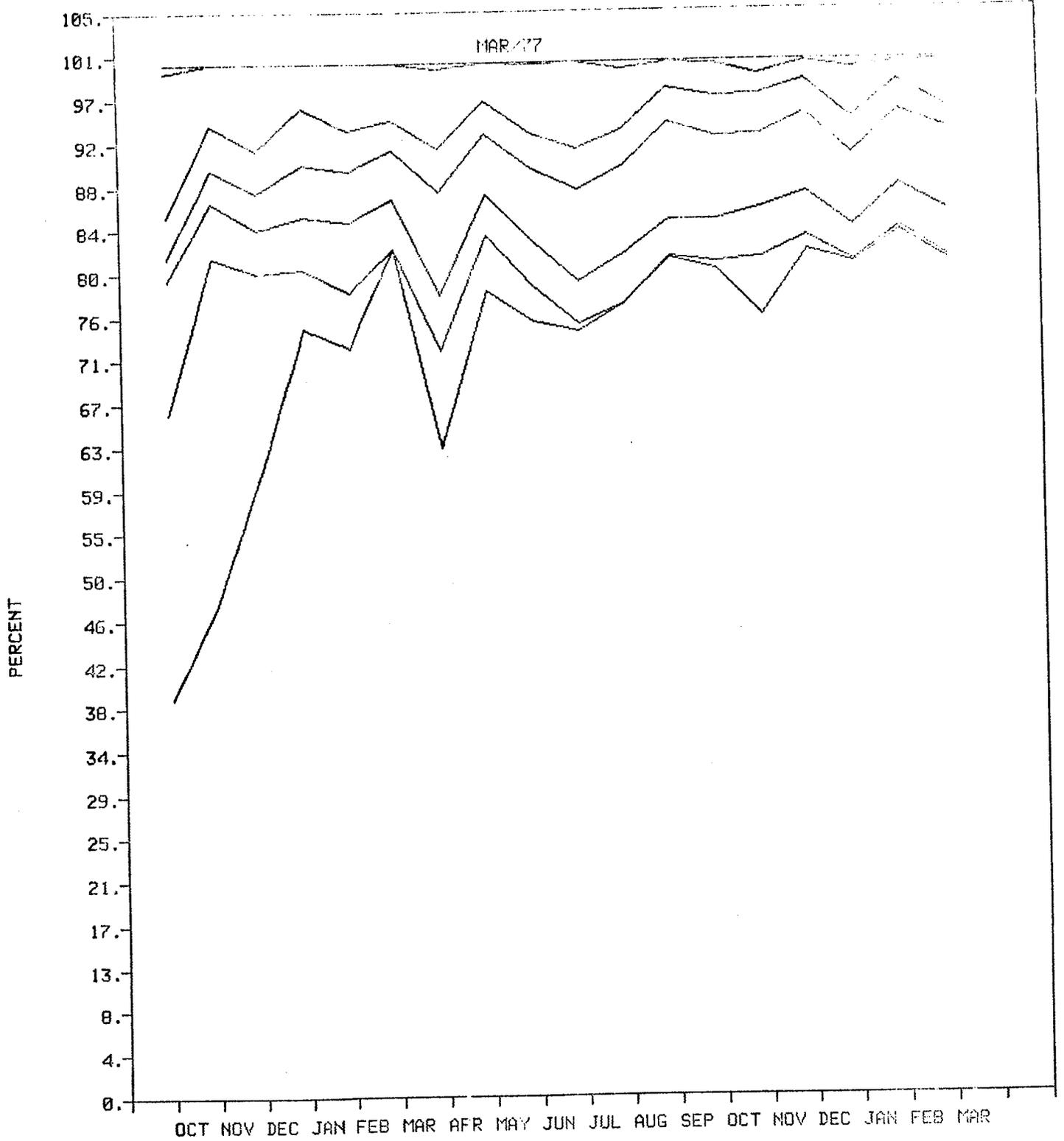
The 1st plot graphs the utilization percentage of the 7600, the percentage of production time is the first graph drawn and subsequent percentages (idle, system development, etc.) are added to each other for a total of 100 percent. The values printed at the bottom of the page are the current month's percentages.

The 2nd plot shows the number of files added monthly to FILEM.

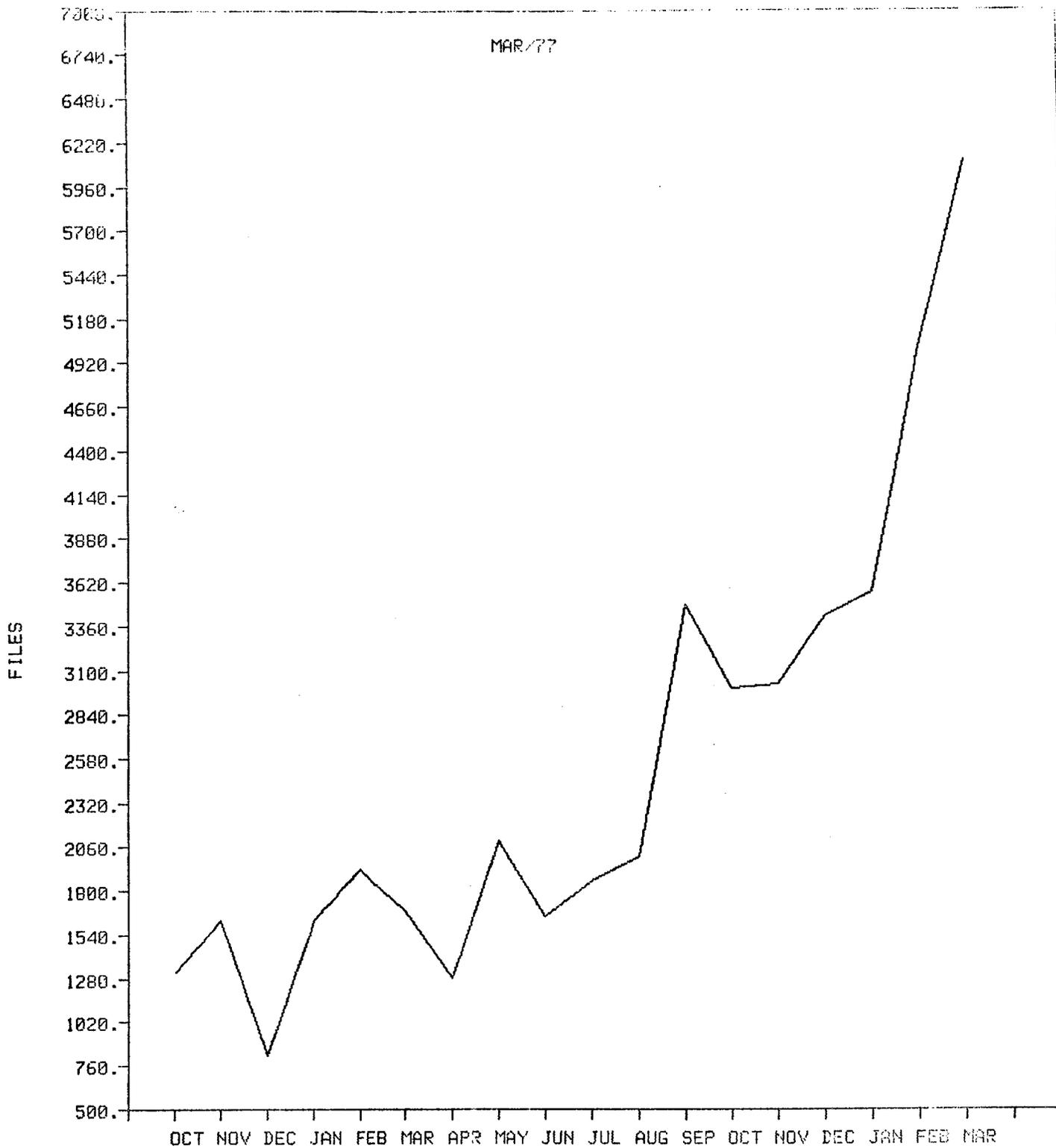
The 3rd plot shows the total number of files stored in FILEM.

The 4th plot is the number of physics code abstracts available to other physicists and programmers in the network thru LIBRIS.

The last plot graphs the number of network packets transmitted over the network. A packet is a maximum of 720 8-bit bytes. As files are transmitted to and from the 7600, they are broken into packets and the number of packets transmitted per day is tallied for statistical purposes. The graph shows the number of packets sent IN and OUT of the 7600. The values indicate the number of packets transmitted during the current month.

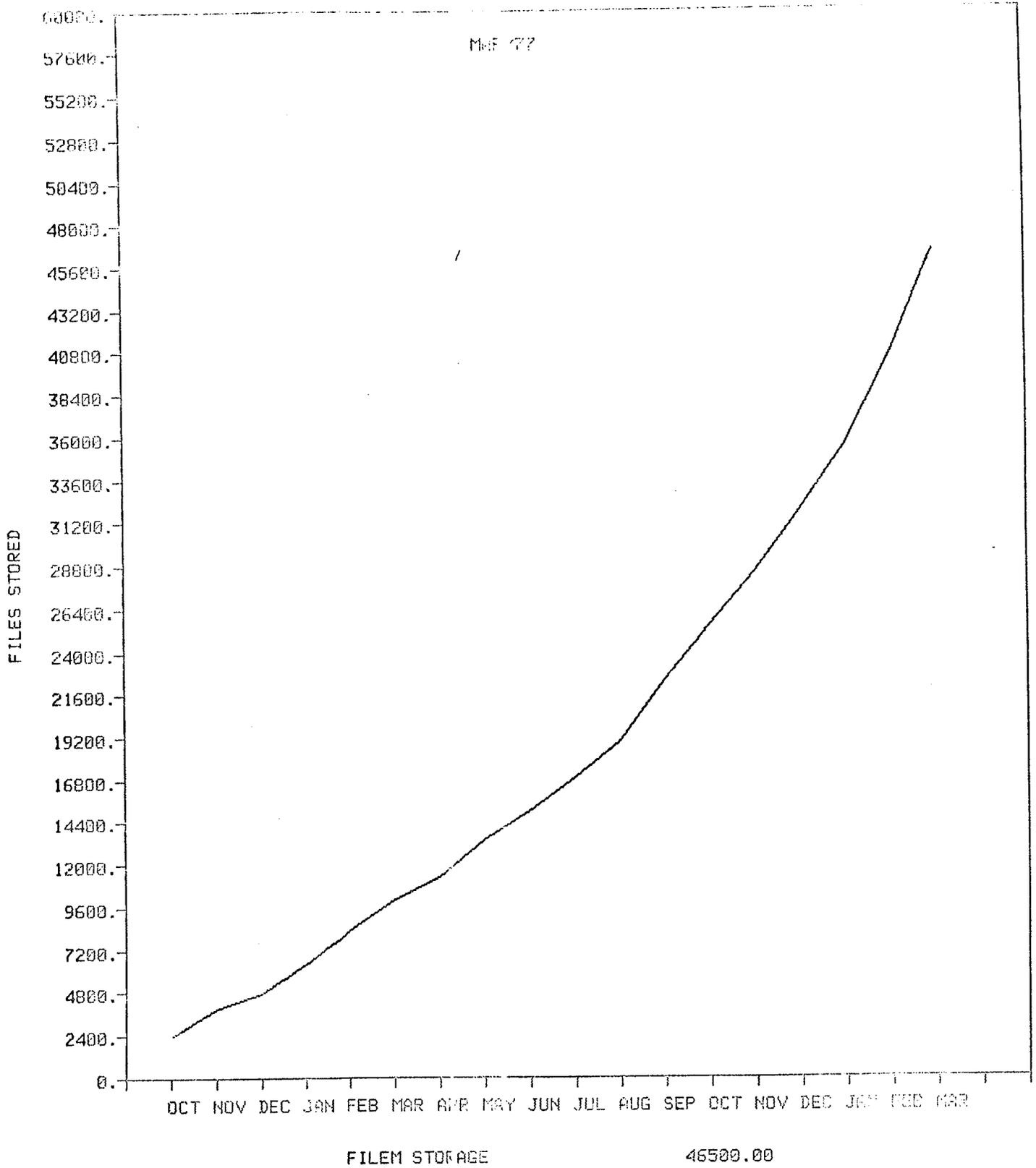


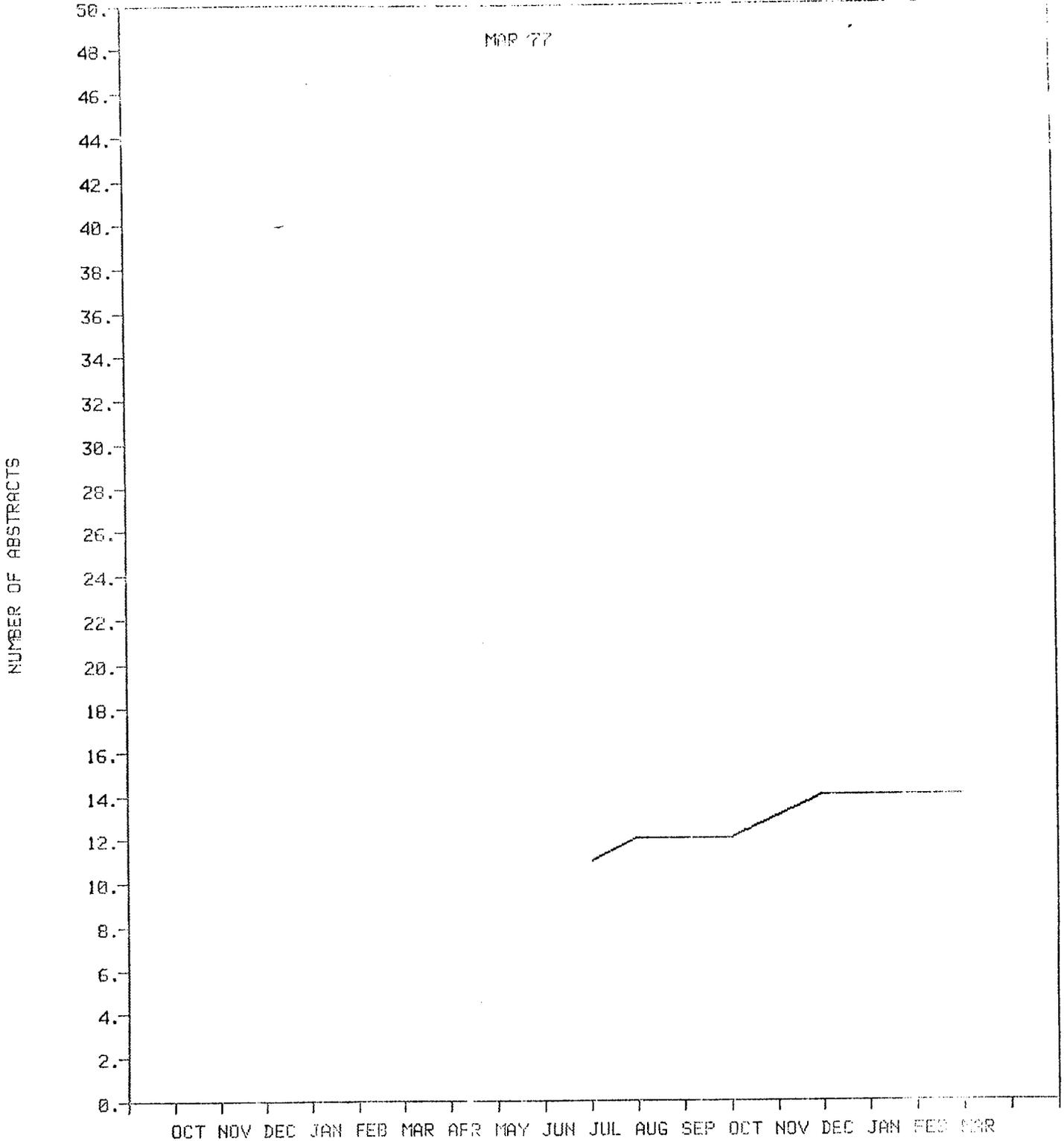
MISCELLANEOUS DOWN	0.07
EMERGENCY MAINTENANCE	4.47
PREVENTATIVE MAINTENANCE	1.97
OPERATION	7.89
SYSTEM DEVELOPMENT	4.52
IDLE	0.26
PRODUCTION	80.72



FILEM FILES ADDED/MO.

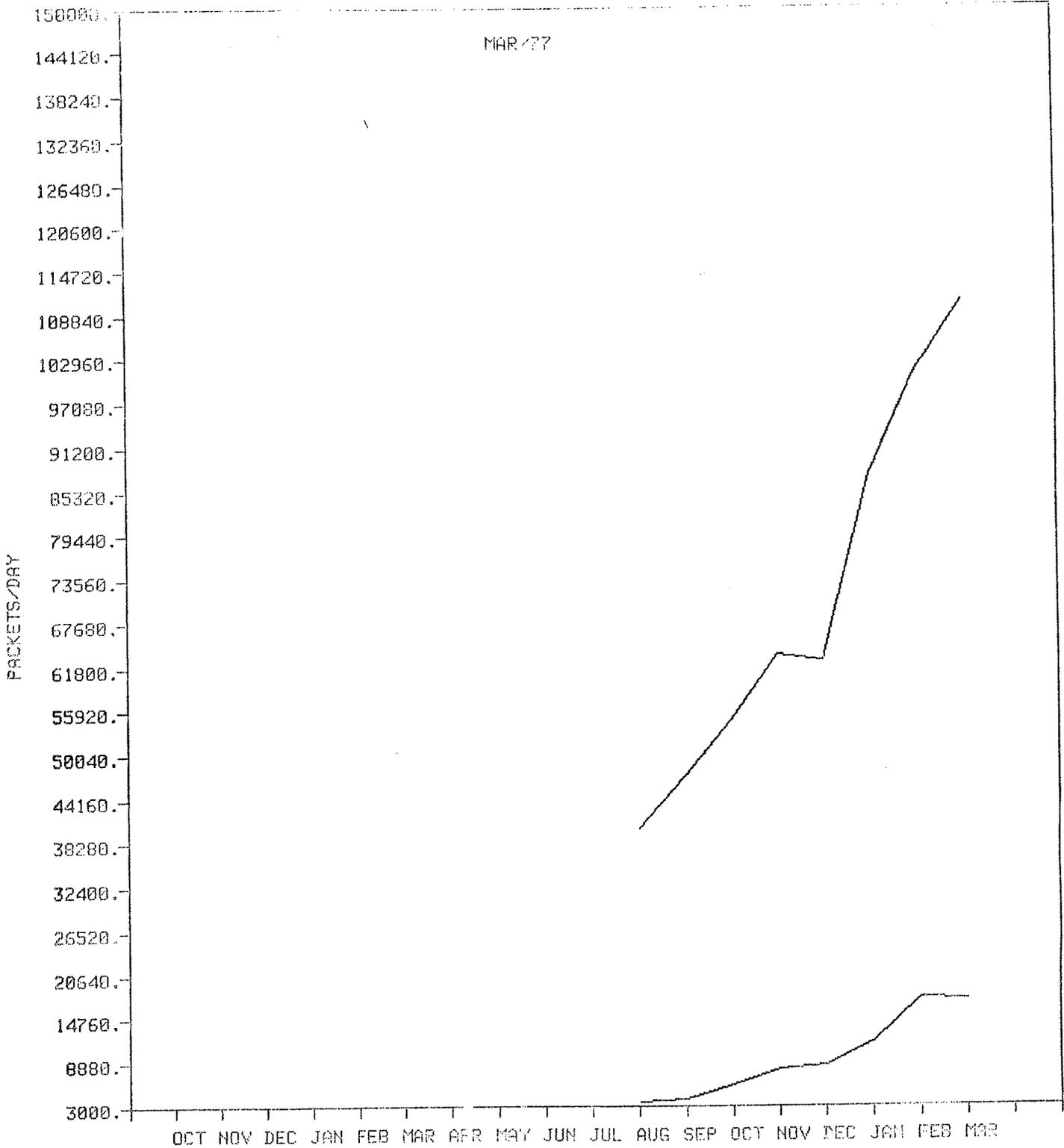
6118.00





PHYSICS ABSTRACTS ON FILE

14.00



PACKETS-OUT 93239.00
PACKETS-IN 17266.00