

THE JOSS NEWSLETTER

November 1967 - June 1971

Shirley Marks

PREFACE *

The JOSS Newsletter has been issued monthly since November 1967 to users of JOSS, The RAND Corporation's interactive, time-shared computer system designed for the solution of small numerical problems. JOSS users, both on the RAND staff and at remote Air Force sites, are primarily nonprofessional programmers. The Newsletter has provided a means of communication among these users and JOSS personnel at RAND on topics of mutual interest, and has been issued cumulatively as a Paper each six months.

In June 1971, certain personal services to users were reduced or discontinued, although the system remains in daily use. This final bound edition of the Newsletter contains all issues, and thus replaces previous editions of P-3940.

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THE JOSS NEWSLETTER:
NOVEMBER 1967-JUNE 1968

Pearl Leonhardt
Editor

October 1968

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COMMUNICATION

Telephone Numbers

Extension 233 (Ex 3-0437 night) connects with a daily recording giving the current and expected status of JOSS, including the day's schedule of operation.

Extension 501 (EX 3-0439 night) rings only if the computer is working, and gives a busy signal if JOSS is down or someone else is on the line. The day line also gives a busy signal if it's after hours and the night line is in operation.

Extension 415 (EX 3-0431 night) connects with the PDP-6 room and JOSS maintenance personnel (or an electronic secretary when humans are not available).

JOSS Personnel

For assistance, contact the following:

Art Lucero on maintenance, console supplies, and Dataphone connections;

Shirley Marks on general user questions;

Larry Clark on JOSS software;

Oliver Gross on JOSS exotica;

Terry Wold, who is responsible for the Operations and Support group in CSD;

Pearl Leonhardt, who edits and distributes the JOSS Newsletter and will maintain the JOSS Program Library when it is available.

In addition, each department and remote site has a JOSS Representative who can provide assistance to users. Current assignments are: Lou Rowell in Aero, Shirley Marks in CSD, Hal Boren in Cost, Sid Winter in Econ, Carroll Lindholm in Electronics, Frank Murray in G & A, Bill Way in the Library, John Lu in Logs, Oliver Gross in Math, Art Smith in Physics, Bob Duis in Reports, Bill Stewart in Social Science, Jim Rosen in SyOps, Gene Varble and Norm Brake at Langley AFB, Paul McClenon and Bob Melone at RAND Bethesda, Major Blinn and Capt. Vallerie at SAC, Larry Thompson at McClellan AFB, Major Ray Chapman at the Air Force Academy, Jerry Standig and Howard Berger at OSD, Major Joe Franel at AFCSA, and Robert Taylor at ARPA.

JOSS Mailbox

The JOSS Mailbox is a convenient way to exchange information with JOSS personnel. (Section 1.14 of RM-5367-PR, The JOSS Notebook, describes the JOSS Mailbox.) The Mailbox is located in file 100 (RANDO) -- that's RAND "zero." If you instruct JOSS to "Type item-list," you will learn if there is a message for you or what item numbers are available for your own message. The identification of an item indicates for whom the message is intended; items with no identification are assumed to be for JOSS personnel. After you have read a message to you (by recalling the identified item and instructing JOSS to "Do part 1"), please discard the item.

FILES

JOSS files are assigned about once a week by means of a PDP-6 program that associates a file number with an input user's identification. Users within RAND who desire a file should call extension 415; remote users will find the Mailbox convenient for requesting a file. All users should supply their (1) Name, (2) Usual initials, (3) Department or Site, and (4) Identification (Man Number, or a code of 4 letters and 1 digit) for each file desired. File numbers will be sent within a week. Until a personal file is obtained, temporary use may be made of the public files 101 (RAND1) through 107 (RAND7), and 109 (RAND9). Please remember to discard items after transferring them to a personal file.

Comments made a year ago on file usage are still applicable. Magnetic tape back-up of the files is written twice a week, so that items stored in files between the writing of the back-up tape and the occurrence of a failure may be lost. It is therefore wise to keep a typed copy of important files. Response time of JOSS to file commands varies with the size of the item, the number of simultaneous file requests, and the number of other users in red-state. The response time is likely to be longer during periods of peak JOSS usage, such as mid-afternoon Pacific Time.

JOSS Usage Reports sent to each department and site once a month often show that individuals have filed items under inappropriate RPN's (RAND Project Numbers). To check whether your files contain such items and, if so, to assign a new project number, first log on JOSS with the new RAND Project Number, then initiate your file with a "Use" command, instruct JOSS to "Type item-list" to find the items to be re-filed, and for each item: delete all, recall it, discard it, and file it.

JOSS SCHEDULE

The current JOSS schedule provides for maintenance Monday through Friday from 5 to 7 PM Pacific Time. Changes to this schedule are noted each day on the recording on extension 233.

Prior to a scheduled JOSS maintenance period, a message is inserted in the JOSS page heading warning of the recess time. Once shutdown has been enabled, new users are prevented from logging on and

current users are warned (by a series of five beeps occurring once each minute until shutdown, and by the shutdown message in the page heading). Ample time is allowed for each user to wind up his current activity in an orderly way and to disconnect voluntarily from JOSS. On those rare occasions when an unscheduled shutdown is necessary, the PDP-6 operator makes a particular effort to allow users time to file their programs. At such emergency times, it is most helpful if users sign off promptly.

When you suspect a system failure (red-state persists unreasonably, for example), do not turn off your console unless you wish to terminate the session. In most cases, the system reactivates itself. If the salutation "JOSS at your service" appears, you must log on again. Otherwise, when extension 501 indicates JOSS is on again, press RETURN if JOSS is in green-state or press INTERRUPT or turn the typewriter off and on if JOSS is in red-state to get your program started again.

PUBLICATIONS

Two new publications will be helpful to users with some JOSS experience. The JOSS Notebook, RM-5367-PR, by G. E. Bryan and E. W. Paxson, describes the mechanics of using a console, presents details of the JOSS language and vocabulary and the use of the JOSS functions, and displays sample programs. The Notebook is indexed and is available as a paperback or in a spiral binder for the active JOSS user. JOSS Language, RM-5377-PR, by G. E. Bryan and J. W. Smith, provides brief reference summaries of the JOSS language in three formats: book-size, pocket-size, and poster-size.

JOSS novices may begin with The JOSS Primer, RM-5220-PR, by S. L. Marks and G. W. Armerding, and continue with JOSS: Introduction to a Helpful Assistant, RM-5058-PR, by C. L. Baker, and JOSS: Problem Solving for Engineers, RM-5322-PR, by E. P. Gimble.

CONSOLES

For remote users of JOSS consoles, the special green and black typewriter ribbons are available from Columbia Ribbon & Carbon, Inc. They have offices at 1159 East Duarte Road, Duarte,

California, and in Aurora, Illinois and Glen Cove, New York. Describe your order as: Columbia Typewriter Ribbons for IBM Selectric: No. 40 Medium ink on silk gauze, black and No. 1553 ocean green (hermetically sealed). The net price is about \$20.75 per dozen.

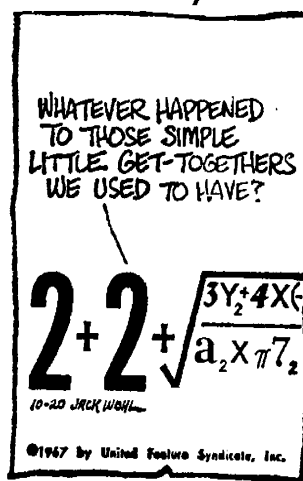
RANDOM NUMBER GENERATION

Back when JOSS was operational on the JOHNNIAC computer, Norm Shapiro suggested the following sequence as a pseudo-random number generator: $x_1 = .111111$, $x_{n+1} = \text{fp}(291 \cdot x_n)$. In December, 1966, Norm wrote a memo to Chuck Baker saying that, although this scheme was adequate for JOHNNIAC JOSS, it was highly inappropriate for JOSS on the PDP-6. Others have since expressed concern that people using this method may not be aware of its limitations.

Norm suggests that there are no more than 50,000 numbers in the cycle, and that good practice dictates using at most 1%, or 500, of these in a single study. He emphasizes the word "study" as differentiated from "run," which is part of a study. If a problem requires an accuracy of 3 to 4 significant digits, then no more than 50 numbers should be used. And under no circumstances should an individual number be considered as a string of random digits to be taken apart and used separately.

As to the future, Larry Clark is looking into the possibility of adding functions to the JOSS language to facilitate random number generation. Difficulties arise because JOSS values are rounded, not truncated, to nine significant digits; many schemes depend on the ability to truncate. Also, some problems require the ability to repeat exactly a previous sequence of random numbers. A guiding rule to any changes in the JOSS language is that they follow the spirit of JOSS as demonstrated below.

PIXies By Wohl





EDITOR • Pearl Leonhardt
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Number 2

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PUBLIC JOSS STATIONS

The "yellow pages" of the RAND telephone directory list the Public JOSS Stations under "J". These nine stations are to be used on a first-come basis by anyone within RAND, unless a notice is displayed to reserve a console for demonstration to visitors. If a priority use is necessary (for personal or demonstration purposes), please contact the JOSS Representative in the corresponding department.

In an effort to simplify the approach to JOSS in the Public Stations, obsolete material has been removed and replaced by the following:

- (1) The JOSS Notebook, on a chain to discourage removal,
- (2) The JOSS Language: Poster Précis, posted on the bulletin board,
- (3) The JOSS Language: Aperçu and Précis, on a cord hanging from the console,
- (4) The current copy of The JOSS Newsletter, posted on the bulletin board,
- (5) A black notebook to hold the previous copies of The JOSS Newsletter.

PUBLIC JOSS FILES

There are two uses of the public JOSS files, file 100 (RAND0) through file 109 (RAND9). Both of these uses are intended for relatively brief periods of time.

One use is as temporary file storage until personal files are assigned. Since all users have access to the public files, items saved there do not have the security of items in a personal file. Personal files are assigned within one week of application; items should then be transferred from the public file to the personal file and discarded from the public file. The current item-lists indicate that most items have been stored far beyond a reasonable length of time. The new year seems appropriate for editing the public files.

The other use of public JOSS files is for communication with other users. File 100 (RAND0), the Mailbox, has been described in "The JOSS Notebook" and in the November issue of the Newsletter. File 108 (RAND8) is mentioned briefly on page xii of the Notebook, as follows:

"About once a week, the user should:

Use file 108 (RAND8)

Recall item 1.

Do part 1.

for late changes, notes, perhaps a program of the week."

Some items that formerly would have been appropriate for file 108 will now find their way into the Newsletter. However, if a JOSS user would like to store an item for a short time to allow other users to comment on it, he should follow the procedure outlined above and then follow the instructions that JOSS types out for the use of file 108.

RUSH TERMINAL AT RAND

JOSS users who would like to experiment with another time-sharing system will find a RUSH terminal available in Room 1351 for two months dating from November 20. RUSH is the acronym of the Allen-Babcock Computing time-sharing system, and stands for Remote Use of Shared Hardware. Please see Bill Myers (Room 1250, Ext. 638) for an account number if you wish to try it.

SETTING TABS

To speed up the typing of output, use the TAB key instead of the SPACE bar to space between data fields in a form description. You should make sure that you have set exactly as many tabs as are required by the forms in your program. Otherwise, the platen pins may damage the type ball.

A JOSS PROGRAM: CONVERSION OF UNITS

Norm Shapiro has a program that will help a person who often needs to convert units of measure. Norm describes his program as a glorified desk calculator, and he will be happy to explain its use in person.

GAMES ON JOSS

Willis Ware is trying to form a catalog of games that have been programmed on JOSS. Listed below are the ones Willis already knows about. Please send him a description of any others you know of.

Submarine Duel: T. A. Brown, C. Clark, D. Kephart
Using two JOSS consoles, opposing commanders maneuver their boats and fire at each other using imprecise range and bearing information. The program can "drive" the players by telling them they have so much real time left for the next decision.

Kriegspiel: J. Gillogly
This program referees double-blind chess with two players at JOSS consoles.

Automated Tactical Air Control System: G. M. Northrop
The various components of a TAC system -- bases, controllers, FACs, air crews are simulated at individual consoles (up to 12?) and interconnected by a JOSS program.

Infiltration: E. P. Durbin, D. M. Kroenke
This is a two-console game with a jungle path, terrain model. The blocker tries to interdict movement on the network using helicopters starting at various nodes. The evader begins at one node and tries to minimize transit time, although he can lay up in the jungle.

Games on JOSS cont.

XRAY: E. W. Paxson

Messages and military actions can be selectively exchanged. "Module" files give costs and effectiveness of entire weapon systems. Order of battle and intelligence files are automatically updated to give new force status. Players input frag orders directing deployment and employment of all forces. An executive file computes minimum time of all those in a suspense file of future actions, thus jumping the game to the "next critical time."

Delphi: T. A. Brown

An anonymous debate can be conducted by a group of experts, each at his own console. On successive rounds, each expert gives his estimate, and if high or low relative to the others defends it with unattributed pro and con reasons.

JOSS LANGUAGE

One use of \$, the current line number, is to control the grouping of lines of typeout. The program below illustrates its use in producing a table of "x, sqrt(x)"; the heading will print at the top of each page, followed by a blank line, then groups consisting of a blank line and four table entries. The JOSS command "Page" ejects to a new page and resets \$ to 1. Care should be taken, when deciding on the number of entries in a group, that $\text{fp}(\$ / n)$ will not be rounded by JOSS in such a way that a specified condition is never satisfied.

- 1.1 Do part 3.
- 1.2 Do part 2 for $x=1(1)100$.
- 2.1 Do step 3.2 if $\$ = 1$.
- 2.2 Do part 3 if $\$ = 53$.
- 2.3 Line if $\text{fp}(\$ / 5) = 3 / 5$.
- 2.4 Type x, sqrt(x) in form 2.
- 3.1 Page.
- 3.2 Type form 1, _.

JOSS Language cont.

Form 1:

x sqrt(x)

Form 2:

— —. —

Do part 1.

Page 1 and page 2 will each begin as follows:

Page 1			Page 2		
x	sqrt(x)		x	sqrt(x)	
		\$=1			
		\$=2			
		\$=3			
1	1.00	\$=4	41	6.40	
2	1.41		42	6.48	
3	1.73		43	6.56	
4	2.00		44	6.63	
		\$=8			
5	2.24		45	6.71	
6	2.45		46	6.78	
7	2.65		47	6.86	
8	2.83		48	6.93	

FA LA LA LA LA

JOSS in red and YOU in green

Make a nice December scene.



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ADDENDUM TO
December, 1967
Number 2

CHANGE IN LOG-ON PROCEDURE

In the present log-on procedure, after a user types his initials, he is requested to type his project number. Currently, if he types 1, 2, 3, or 4 (the four overhead numbers), JOSS considers his log-on complete; log-on is also complete when a remote user types a project number in the range assigned to his site. However, if a user within RAND types a legitimate in-RAND project number, he is then requested to type his department identification.

As of January 1, 1968, the log-on procedure is to be changed so that each user, whether in-RAND or at a remote site, will be requested by JOSS to type his department identification, even when he uses one of the overhead project numbers. In-RAND department codes are standard 3-letter abbreviations for the department names. For remote sites, department numbers are being assigned as follows:

<u>Site</u>	<u>Department Number</u>
Langley AFB, Va.	101
Air Force Cambridge Research Labs.	102
RAND-Bethesda	103
Nellis AFB, Nev.	104
AF Budget, Pentagon	105
Offutt AFB, Neb.	106
McClellan AFB, Cal.	107
AF Academy, Colo.	108
OSD, Pentagon	109
AFCSA, Pentagon	110
ARPA, Pentagon	111

Any 3-digit number will be a permissible project number for a remote user.



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FILES

In July, 1966, Irwin Greenwald reported a suggestion by Oliver Gross for maintaining an index of the items in a personal file. Of the 25 allowable items in a file, it is suggested you reserve item 1 for an index of the remaining items. Part n of item 1 describes item n. You can then obtain an indexed description of the file by recalling item 1 and typing all parts.

- 1.01 *This new use of the asterisk enables you to store
- 1.02 *annotations with your program. When JOSS is instructed
- 1.03 *to "Do part 1", these asterisks cause the annotation
- 1.04 *steps to be ignored; "Type part 1" will produce the
- 1.05 *annotated program. Notice that there is a space
- 1.06 *between the step label and the asterisk.
- 1.07
- 1.08 *You may also store a step that is blank; JOSS will
- 1.09 *treat it as it does an annotation step.
- 1.10
- 1.11 *An asterisk at the end of a line instructs JOSS to
- 1.12 *ignore the entire line (as usual).

To modify an item of a file, it is necessary to recall it, make the required changes, and then refile it. To use the old item number for the new version of the item, you must first discard the old item. Since it is risky to discard the old before testing whether the new is correct, it is suggested that the new item first be filed with a new number. Then it can be verified before discarding and replacing the old version.

JOSS users who leave RAND or a remote site sometimes leave behind a JOSS file, for which charges continue to accumulate. The following procedure is recommended in order to have a dormant file closed:

1. Have items of interest to other users transferred to their personal files.
2. Discard each item of the file.
3. Inform JOSS personnel by calling ext. 415, or by leaving a message in the Mailbox. Please give the name, file number, and code.

If a JOSS Representative has only the name of the former JOSS user, he may obtain the file number and code from Shirley Marks.

DEMONSTRATION PROGRAMS

File 9 (DEM01), a personal file assigned to Larry Clark, contains an assortment of programs suitable for demonstrating JOSS. The code for each item gives a clue to the type of program. After recalling an item, instruct JOSS to "Do part 1" to produce directions for its use. Larry invites all interested users to recall items from the file, but requests that no one file new items in it without first contacting him.

TAB STOPS

An easy way to clear all TAB STOPS on a JOSS console is to move the type ball to the right hand margin and then hold the TAB CLEAR key down while pressing RETURN.

ROUNDING INTERMEDIATE VALUES

Values in JOSS are rounded to 9 decimal digits. In some problems (such as the amortization of a loan), it is necessary to round intermediate values to fewer digits. If "x" is a JOSS value, the following expression represents x rounded to two fractional decimal digits:

$$\text{ip}(100 \cdot x + .5)/100$$

EMPIRICAL CURVES FITTED ON JOSS

Don Kephart of System Operations contributes the following:

JOSS provides a quick and easy way to find an empirical equation to fit your data. Use department file 239 (SYOP9), Recall item 9 (CUFIT), Do part 6. You can try polynomials (Straight Line, Parabola, Cubic, Quartic, etc.), plus a variety of Logarithmic and Exponential equation forms having two or three coefficients. The JOSS program uses the method of least squares to obtain the coefficients for an approximating curve. The print-out for each trial includes a test run to help you judge the fidelity of the empirical fit.

JOSS BEEPS

Like a small foreign car on a crowded freeway, a JOSS console beeps to get your attention. It may be an emergency shutdown or the normal 5 PM recess or an administrative message of immediate interest to users. When you hear a series of beeps, please give JOSS your attention by advancing to the next page heading as soon as possible.



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February, 1968
Number 4

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LOGGING-ON JOSS: Department abbreviations, department number 100.
FILES: The privacy of personal files.
CURVE-FITTING: Art Smith offers two programs.
DEMAND: A space-saver.

LOGGING-ON JOSS

A user logging-on JOSS from an in-RAND console may identify his department by its 2-digit number (if he happens to know it) or by an abbreviation of its name. In some cases, the JOSS system accepts more than one abbreviation for the same department name, actually using only the first three characters of those that are typed. For example, CSD or COM or COMMUNIST will each work for Computer Sciences. Now that Systems Operations has been renamed "System Sciences," one might expect a change in the acceptable abbreviations. Not so. SYS has always been acceptable and will continue to be; SYO will continue to be permitted as a comfort to those averse to change. The only danger lies in a member of System Sciences using the not-unreasonable abbreviation SS, which JOSS interprets as Social Sciences. Such an error will become apparent in the monthly JOSS usage reports sent to each department.

Since January 1, when remote users began logging-on with their new 3-digit department numbers, another error has been noted, one which also will be apparent in the month-end usage summary. Department number 100, having 3 digits, correctly identifies a remote site, but has been reserved for the use of JOSS personnel;

Logging-On JOSS continued

all those numbers assigned to actual sites are greater than 100. There have been several log-on occurrences of Department 100 that can be traced to an incorrect typing of the assigned number (perhaps 109 or 108). Since JOSS cannot provide an error message when a user from one site unintentionally uses a possible number for another site, it will be up to each remote user to hunt and peck with care.

FILES

JOSS design features discourage inadvertent, but not intentional, destruction of a user's program either by himself or by another user, when that program is saved on disc.

- (1) To access a file, an identifying code must accompany the file number.
- (2) To discard an item that is identified with a user-assigned code, the user must supply the code as well as the item number.
- (3) To replace an item by one with the same number, the original item must first be discarded.

Further, the user has control over informing others of his personal file numbers and their codes. Alas, he sometimes does so at his own risk, as Larry Clark has learned since he shared his personal file, file 9 (DEM01), with readers of the January Newsletter. As of January 15, his file contained 12 items of demonstration programs; of these, 6 have mysteriously, and cruelly, disappeared...lost apparently to "intention" rather than to "inadvertence."

CURVE-FITTING

Art Smith of the Physics Department offers two curve-fitting programs that are available in the Physics file 201 (PHYS1). Item 5 (POLY) is a JOSS version of W070, a FORTTRAN IV routine for the 7040/7044 that finds a "Least-squares, Double Precision Polynomial Fit with Optional Weighting." Art warns that the error is overwhelming beyond the eighth degree. Brief instructions for its use can be found by typing part 15; to use the program, do part 150.

Curve-Fitting continued

Item 4 (FIT) of the same file is a JOSS version of the FORTRAN code JENNY. This is the general least-squares code that may be used to fit any function or solve an overdetermined set of simultaneously nonlinear equations. The number of useful adjustable parameters is limited by time and space; the current format provides for a maximum of 5 parameters. "Do part 1" starts you off. Please ask Art if you have any questions about using either of these programs.

DEMAND

The JOSS instruction Demand ... as "..." allows the user to associate the text within quotes with the variable to be assigned a value. JOSS types the text beginning in position one of the line, whereas the simple Demand ... produces the variable in position 12. Try the following if you can't wait for JOSS to space 11 times in response to the simple Demand:

1.1 Demand x as "x".

Do part 1.

x =

- - - - -

Rhoda Carlstedt, sister of CSD's Jim Carlstedt, visited RAND recently while on leave from her teaching position in the Territory of New Guinea. Rhoda was very interested in what for her was an unexplored world, that of the computer and, in particular, that of the personal computing aide, JOSS. Her enthusiasm of discovery will no doubt spread when she returns to show her teen-age students the pages of "Eh?" and "Sorry, say again."



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March, 1968
Number 5

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LINEAR PROGRAMMING: A program by Dick Clasen and Dave McGarvey.
A JOSS QUIZ: Questions and answers by Larry Clark.
RECOMMENDED READING: Technical JOSS for the interested user.

LINEAR PROGRAMMING

A routine to solve linear programming problems, written originally by Dick Clasen and modified by Dave McGarvey, is available in JOSS.

For the operating instructions: Use file 168 (ECON8).
Recall item 1 (INSTR).
Do part 1.

To use the program: Delete all.
Recall item 25 (LINPR).
Do part 100.

A JOSS QUIZ

Users with a spare 20 minutes will enjoy the "20 Questions" devised by Larry Clark. Each question is followed by a set of multiple answers. The "contestant" types the number of his answer and JOSS indicates whether he is right or wrong. In either case, an explanation is given.

Even if you are a newcomer to JOSS and fear that some of the questions will be beyond your present experience, you will find that the answers are illuminating and worth keeping as a reference. For example, Question 1 refers to JOSS' interpretation of text

A JOSS Quiz cont.

within quotes. Question 3 emphasizes the manner in which JOSS interprets a step. Question 5 reminds you about beeps, a point stressed in the January Newsletter. Question 10 covers the interruption of iterated Demands. And so forth.

To retrieve the JOSS QUIZ: Use file 9 (DEM01).

Recall item 1 (JQUIZ).

Do part 1.

RECOMMENDED READING

RM-5270-PR, JOSS: Central Processing Routines, by J. W. Smith, provides answers to mysteries of JOSS behavior in an easy-to-read style. The Memorandum is concerned with those routines that interpret and respond to requests typed by users and that interpret the users' stored programs. (Input-output and supervisory routines are documented elsewhere.)

Beginning on page 63 (a good place for the average user to begin if he is not interested in system design), one learns how lines typed by the user are processed, how commands are interpreted, and how errors are reported. Section III continues by describing the JOSS language as JOSS understands it and as this understanding is conveyed to the user. For example, it is explained how phrases such as "at step ...", "during step ...", and "from step ..." indicate the way a suspended task will be continued.

Section IV, Reprise, reveals the alternatives presented to a system designer and how he selects among them consistent with the philosophy of the system. Joe concludes:

Many carefully considered design points turn out badly, while some hasty, off-the-cuff decisions turn out to be the right ones; errors of commission are matched by errors of omission, and little turns out to be just right.

Obviously the words of a modest man.



EDITOR • Pearl Leonhardt
Ext. 436

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

April, 1968
Number 6

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THE JOSS NOTEBOOK: Blank pages available.
JOSS PUBLICATIONS: A recommendation for visitors.
FILE SPACE: Dormant items.
A JOSS PROGRAM: Plotting among teletype users.
THE JOSS COMPUTER: Illness and recovery.

THE JOSS NOTEBOOK

The RAND stock room has a limited supply of blank pages for the spiral version of The JOSS Notebook by Bryan and Paxson. Individual user programs in the form of brief JOSS output attached to the blank pages can be inserted in Section 5 of the Notebook, Sample Programs. Or users may want to list their file assignments for handy reference, or note the locations of public JOSS consoles (see the RAND telephone directory), or jot down other desired reminders. If you are within RAND, you may order "blank pages for The JOSS Notebook, RM-5367" directly from the stock room; if you are outside RAND, please make your request of Shirley Marks. Ten or fewer pages seems a reasonable number for those who need them.

JOSS PUBLICATIONS

Several of the recent JOSS publications include an extensive bibliography from which to select documents to present to visitors interested in JOSS. The trick, of course, is to select those compatible with the visitors' background and level of curiosity. Ed Bryan's JOSS: Introduction to the System Implementation, P-3486, provides a brief overview, with photographs and diagrams and sample output, to individuals of varied computer experience. It is probably the most appropriate to present when only one document is desired.

JOSS Publications cont.

Other publications assume an interest in the language (RM-5377-PR, JOSS Language) or the computing power (RM-5322-PR, JOSS: Problem Solving for Engineers) or in learning to use JOSS (RM-5220-PR, The JOSS Primer). The JOSS Notebook, RM-5367-PR, is intended for the active JOSS user. If the visitor has an interest in the system software, he should be referred to Shirley Marks in Computer Sciences for help in selecting among the appropriate publications.

FILE SPACE

JOSS file space is being used up at a rapid rate. In the future, it may become necessary for JOSS personnel to review those items that have not been referenced within some reasonable length of time. We would prefer to avoid such functions. You can help by examining the items in your files now and discarding those you no longer need. If you type all before discarding items, you will have a hard copy record in the event that you later discover you need them after all.

A JOSS PROGRAM

Paul McClenon of RAND's Bethesda office offers to teletype users of JOSS a program that draws a sketch of a user-defined function. Oliver Gross is responsible for the JOSS console version. To retrieve the program and instructions for its use:

Use file 345 (BETH5).

Recall item 12 (PLOT).

Do part 1.

THE JOSS COMPUTER

It has been no secret to JOSS users that the PDP-6 computer in RAND's basement has suffered various indispositions in recent days. During the week of March 25th, the disc (the repository of JOSS user files) lost a bearing. It was found to be necessary not only to replace the burned-out bearing but also other significant elements of the disc. The next illness appeared in the memory and was traced to two sources: a parity error in the 16K high memory (where user blocks reside) and a more-difficult-to-find bad soldering connection. Not to be neglected in the epidemic of failures, the processor of the computer contributed a bad shift counter. The DEC maintenance engineers have worked long hours to restore the system to health. Their efforts and the patience of users are appreciated.



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May, 1968
Number 7

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THE JOSS MAILBOX: Through rain and sleet...
LOGGING-ON JOSS: Revisited.
CONSOLES: The care and feeding of...

THE JOSS MAILBOX

Occasionally, when a user wishes to contact JOSS personnel through the Mailbox, file 100 (RAND0), he will mistakenly identify his item with his own name or site, rather than with the name of the person he is addressing. Of course, if he wants to direct his message to the JOSS group generally, no identifying code is necessary. The Mailbox is checked for messages at least once each weekday, and so it is a convenient place to ask for non-emergency service, such as console supplies or file assignments. If you notify Art Lucero of console trouble via the Mailbox, please remember to give your name and the room number where the console is located.

LOGGING-ON JOSS

The February issue of the Newsletter reminded remote JOSS users that if they log on with the legitimate department number of any remote site, their usage will be charged to that particular site. This is desirable for remote users who visit another JOSS site and want their usage charged to their home site. Sometimes such a log-on is unintentional, however, as when department 100 (assigned to RAND Maintenance) is typed instead of 109. Accounting for the first quarter of 1968 shows the following remote (i.e., 3-digit) RPN's associated with department 100:

<u>Month</u>	<u>RPN's</u>
January	234,605,614,646
February	100,605
March	106,605,607
April	100,605,607,610

If remote users wonder where the usage went, they might check through their session output to see whether they have used the appropriate department number.

CONSOLES

As with using JOSS itself, changing paper and ribbon in the console's Selectric typewriter is a do-it-yourself activity. Section 1, Mechanics, in The JOSS Notebook (RM-5367-PR) describes these procedures in easy steps that become even easier with practice. Some reminders may help.

For example, if you pull out the platen clutch release knob (on the left) as part of GETTING A NEW PAGE TO START AT TOP (1.13 of Mechanics), please push the knob in again after you have rolled the paper to the top of a new page. Then be sure to return the paper release lever to its rear position.

And don't be depressed if, contrary to the Notebook's claim, you do have to touch the ribbon slightly when changing cartridges. While you have the typewriter carrier cover raised, you will notice (in addition to the lever on the right of the carrier that raises and lowers the ribbon guide clips) two levers on the left. The proper position for the lower one is in the middle of its three positions. You might try it in the other two to see what happens. When you lower the carrier cover to close it, make sure that the red position pointer is on the outside of the cover.

Each public JOSS room should contain a supply of paper and extra ribbons; please call Art Lucero on extension 415 if the supply runs out. If you require vellum paper for a special job, Art will help you to obtain it.

When you suspect that the typewriter is malfunctioning, please provide Art with as complete information as possible. He needs to see all of the output of your session.



EDITOR • Pearl Leonhardt
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June, 1968
Number 8

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OVERHEAD PROJECT NUMBERS: 1, 2, 3, 4.
CLASSIFIED CALCULATIONS: A no-no on JOSS.
NEW SYSTEM: Improvements, new department codes.
LET AND SET: Let defines, Set assigns.

OVERHEAD PROJECT NUMBERS

Project numbers 1, 2, 3, and 4 are considered "overhead" numbers in the JOSS accounting scheme. Project numbers 1 (for learning) and 2 (for demonstration) are available to all JOSS users. Project numbers 3 (for testing new software) and 4 (for debugging the system) are intended for JOSS personnel only.

Although a JOSS user, by definition, continues to learn, once he has passed the novice stage he should charge his usage to a RAND project number or to a project number assigned by the JOSS Representative at his remote site.

CLASSIFIED CALCULATIONS

Occasionally, a user may feel that, if he disguises his classified data in some ingenious way, he can bypass the security procedures designated for RAND's computing facility and use JOSS for a few quick calculations. However, such a disguise is inadequate, since there is no protection provided for classified data either by the JOSS software or by the PDP-6 hardware or communication devices that access the telephone lines. Thus, users are advised to restrict their JOSS calculations to unclassified material.

NEW SYSTEM

On May 14, a new system was installed to provide certain minor improvements and to bring up-to-date the table of acceptable department identifications.

One improvement has speeded up the access to files. Another has changed the error message JOSS types when encountering a poorly formed command. For example, "To blazes with you" now produces the error message "Eh?" instead of "Don't give this command directly". Some users may have wondered at the removal of the colon in the time printed in each page heading. This surgery was performed to be consistent with the result of the command "Type time". The latter cannot have a colon embedded if the time is to be typed in a form.

With the recent changes in some RAND department names, it has become necessary to revamp the list of acceptable identifications used when logging on to JOSS. The following table gives the code and number corresponding to each RAND department. JOSS will accept either the code or the number as department identification.

<u>DEPARTMENT</u>	<u>CODE</u>	<u>NUMBER</u>
Administration	ADM	23
Computer Sciences	COM, CSD	81
Cost Analysis	COS	11
Engineering Sciences	ENG	33
Economics	ECO	10
Environmental Sciences	ENV	35
Library	LIB	21
Logistics	LOG	12
Mathematics	MAT	80
Personnel	PER	28
Physics	PHY	40
Reports	RD, REP	60
Research Council	RES	30
Social Sciences	SOC	90
System Sciences	SYS	34

NEW SYSTEM cont.

Members of the Washington or New York offices who use JOSS while in Santa Monica should log on with the identification of the department with which they are associated, remembering also to use a 4-digit RPN.

LET AND SET

LET and SET not only are similar in appearance (they rhyme nicely), but sometimes they seem to produce the same results in JOSS and thus may be a source of confusion. The JOSS Notebook, RM-5367-PR, distinguishes between these commands in 3.18 and 3.17.

SET instructs JOSS to evaluate the expression on the right-hand side of the equal sign and then to assign the value to the identifier on the left-hand side. The key word is "assign", the value actually being stored in the named place. If the identifier is an indexed letter, each index may have only integer values between -250 and +250.

LET instructs JOSS to define a formula, that is, a rule for computation that is applied each time JOSS encounters the letter identifying the formula. Here, the key word is "define", and the value computed is used by JOSS but is not stored. A formula may be a function of parameters, that is, dummy letters for which expressions can be substituted to evaluate the formula.

The user who interchanges "Let $a = \sqrt{x} + y$ " with "Set $a = \sqrt{x} + y$ " will get into no difficulty (assuming "x" and "y" have values), and if he types the LET as an indirect command, JOSS may merely define the formula repeatedly.

However, "Let $a(x,y) = \sqrt{x} + y$ " defines a function of the parameters "x" and "y", whereas "Set $a(x,y) = \sqrt{x} + y$ " assigns a value to the letter "a" indexed by "x" and "y". In the first case, "a" identifies a formula; in the second, "a" is the name of an array.

* * * * *

Larry Clark has been responsible for the maintenance and development of the JOSS software since the system attained operational status on the PDP-6 computer. During these many months, he has become not only a friend to the user but a comfort to the system when it ailed and a source of cheer when it performed with brilliance. Now that the current version of JOSS has reached its maturity, Larry is joining a new group of adventure-seekers in the Computer Sciences Department, and we wish him well in the wilds of graphics.

THE JOSS NEWSLETTER:
JULY 1968-DECEMBER 1968

Pearl Leonhardt
Editor

January 1969

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July, 1968
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SUBMITTING LIBRARY ITEMS:	How to..., but <u>not yet</u>

THE PROGRAM LIBRARY

The need to share programs and methods among users has been with us since JOHNNIAC days. This need has increased with the conversion of JOSS to the PDP-6 and the extension of service to remote installations. A program library and catalog system are now in sight. Procedures are being set up for the submittal, review, certification, and distribution of programs and methods of interest to users generally or in special areas of application. The remainder of this issue of the Newsletter will discuss how far we have progressed toward our goal.

THE LIBRARY CATALOG

The JOSS Library Catalog will be distributed by the RAND Reports Department as part of its system of publications, with new editions issued as necessary. The distribution list for the Catalog will be the same as for the JOSS Newsletter; the Newsletter will contain notices of changes to the Library between issues of the Catalog.

The format of the Catalog will be similar to that of others issued by the Reports Department, containing a subject index, an author index, and an index of abstracts. The identification of an item in the Catalog will be either the same as its associated RAND documentation or an assigned number that indicates the absence

The Library Catalog cont.

of RAND documentation. The abstract will describe how to retrieve and use the program, what its limitations are, and, when it is helpful to know, the name of the reviewer. If the item is a method rather than a filed program, the abstract may describe it in full or may refer to RAND documentation for more details.

Documentation referenced in the Catalog may be ordered in one of two ways. Users within RAND may request it through their department document control center. Remote users should mail the order form at the back of the Catalog to the Reports Department.

USING THE LIBRARY

Recent changes to the JOSS software have created the library file, which differs from the personal and public files in this important respect: a user may recall an item from a library file, but when he attempts either to file or to discard an item, JOSS will type an error message.

A new command has been added to the JOSS language:

Use library n.

where "n" is an integer ranging from 1 to 250, and no identifying code follows the "n". Typing this command to access a library file instructs JOSS to inhibit subsequent "file" and "discard" commands, until a "Use file ..." command is typed to access a non-library file. "Type item-list" produces an index of a library file as it does of a non-library file.

Not all of the "protected" library files will be used for storing Catalog programs. For instance, library 1 is the new demonstration file, soon to replace completely "file 9 (DEM01)". You might try "Use library 1" to see what's been tucked away so far. The contents will vary from time to time. Feel free to try discarding an item from "library 1".

SUBMITTING LIBRARY ITEMS

REQUEST TO READERS: Please do not submit items yet for the Library.

As soon as procedures have been established to process items, submittal forms will be sent to JOSS Representatives. A future issue of the Newsletter will invite users to send in programs and methods for consideration.

Before submitting a program, the author must first annotate it so its use is clear. Then he will need to place a copy of his annotated program in a public file. The public files [101 (RAND1) through 107 (RAND7), and 109 (RAND9)] will be used as temporary storage for programs being reviewed, to avoid inadvertently destroying the only copy in a personal or department file. Space in the public files will therefore be at a premium, so users are strongly urged to discard old items now.

Each author of a submitted program or method will be notified whether or not it has been accepted for the Catalog. A rejection will be explained. If a program is accepted, the reviewer may suggest ways to improve the annotation. JOSS personnel will then copy the program from its public file into a library file.



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July 29, 1968

JOSS FLASH

On Monday morning, July 29, the JOSS files were restored to their status on Thursday evening, July 25. All items stored between those times are no longer available.



EDITOR • Pearl Leonhardt
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August, 1968
Number 10

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FILES:	August Cleanup.
ROCKETS AND TRAJECTORIES:	A family of programs sired by Don Kephart.
DO AND TO AND DONE:	A mystery solved.
MORE ON LET:	Substituting a letter for a function.

FILES

Each RAND JOSS user will shortly receive a request to review the items in personal files in order to discard those no longer referred to. If you decide that you do not require all the files assigned to you, please discard all items from the excess files, and then notify Shirley Marks so that these files may be closed. This procedure applies in particular if you are terminating your RAND employ.

Those of you who occasionally use the public files -- file 100 (RAND0) through file 109 (RAND9) -- will notice a more spacious atmosphere, due to the discard of many ancient items. Recall, please, that items are stored temporarily in public files, always at the risk of their being discarded.

One purpose of this general cleanup campaign is to impress on users that file space is not an unlimited resource, especially with the increase in the number of users and requests for multiple files.

ROCKETS AND TRAJECTORIES

Don Kephart has assembled a family of JOSS programs useful for putting together your own conceptual multi-stage rocket designs. The programs will compute rocket burn trajectories and unpowered ballistic trajectories, as well as initial conditions for trajectories and orbits. Please contact Don for do-it-yourself instructions and the file locations of the programs.

DO AND TO AND DONE

Have you ever traced through a portion of a JOSS program and been puzzled why a particular command seemed to be obeyed one more time than you expected? Perhaps the situation was something like this:

```
      :  
      :  
3.5 Do part 7.  
3.6 .....  
      :  
      :  
7.1 .....  
      :  
      :  
7.8 To step 3.6.
```

Here, the DO command of step 3.5 instructs JOSS to perform the steps of part 7, and then continue with step 3.6. However, the final step of part 7 instructs JOSS to perform step 3.6, and thus JOSS will obey step 3.6 twice in this sequence.

The solution to this dilemma lies in a fact stated in the JOSS Notebook (RM-5367-PR) in 3.13: "...each part is provided automatically with an implied DONE command as its last step."

Since a DONE command terminates the current iteration of the current DO command, step 7.8 above is unnecessary to terminate the steps of part 7.

MORE ON LET

The LET command, which defines a formula in JOSS, can be used to substitute a letter for a function, as illustrated by the following two examples:

- (1) Let $s = \cos$.
Type $s(3.14159265)$.
- (2) Let $A(x) = x[i=1(1)100: i*2]$.
Type $A(\text{sum})$.

It may be useful in an actual program to define a letter conditionally to be one of a set of functions.

* * * *

A maximum effort is being made to reduce JOSS down-time and to restore confidence in "the helpful assistant."



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August 29, 1968

JOSS FLASH

During recent weeks, it has been apparent to users and JOSS personnel alike that the system has been experiencing an intolerable number of failures. The word "intolerable" is used in the context of a user-oriented time-sharing system such as JOSS, where confidence in its reliability is a major part of the computing environment.

In trying to discover a pattern to the errors, we have studied the year's statistics, re-examined our procedures for maintenance, and brought in engineers and software specialists familiar with JOSS from its early days on the PDP-6. Although a number of troubles have been isolated and corrected, it has become clear that a new procedure is required to locate the source of the remaining computer errors.

In implementing this new procedure, we must warn users that things may get worse before they get better, in the following sense. Previously, it was often possible for the system to restore itself after a failure. It is true that the current user storage was lost, but at least the friendly "JOSS at your service" might soon reappear. This will not be the case for a while. Switches have been set on the computer to inhibit the self-restoring features of JOSS, so that the engineer can confer with a software expert to locate the trouble while the evidence is still evident. This may work a particular hardship on remote JOSS users if a failure occurs during the night, since night personnel are instructed not to restore JOSS. The weekend will be exempt from this routine, however.

Further restrictions may be added to help the engineer, but always with ample warning to users. For example, we may for a time inhibit access to files, turn off selected stations, or limit size.

FLASH

Until more information is available, users are advised to consider the system marginal. In practice, this means that sessions should be kept shorter, filing should be more frequent, and input-output broken up into smaller units.

We all realize how dependent on JOSS one can become, and how traumatic life is when the "helpful assistant" is "himself" in need of assistance. Your patience and cooperation are necessary and very much appreciated.



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September, 1968
Number 11

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NEW JOSS COMMANDS:	Inter-console communication -- fun and games
NEW DEMONSTRATION FILE:	"Use library 1"
THE JOSS MAILBOX:	A suggestion for remote users

THE JOSS COMPUTER

The "JOSS FLASH" of August 29 described the efforts to restore the PDP-6 computer to its former vigor. Some difficulties have been located and corrected since then, but it is too soon to consider the system fully recovered. It is best, until further notice, to follow the advice of the FLASH, namely, that JOSS is marginal, sessions should be short, filing frequent, and input-output broken up into small units.

SUBMITTING LIBRARY ITEMS

RAND and Air Force JOSS representatives recently received a supply of submittal forms to be filled out by users wishing to offer programs and methods for the JOSS Library and Catalog. If you have a program or method you think might be of interest to other users, please do the following:

1. First reread the July issue of the JOSS Newsletter.
2. If you wish to submit a program for consideration, annotate it so that its use is clear. The January issue of the Newsletter suggests a way to annotate your program by using the asterisk.
3. Then store the annotated program in one of the public files -- 101 (RAND1) through 107 (RAND7), and 109 (RAND9).

Submitting Library Items cont.

4. Fill out a submittal form and send it to Pearl Leonhardt or Joan Groves, Computer Sciences Department. The RAND mail address is in the Newsletter heading.

After your contribution has been reviewed, you will be notified of its acceptance or told why it is considered inappropriate for the Library. Some accepted programs may need improvement in their annotation.

The success of a Library of JOSS programs depends quite strongly on the response of users in submitting items. Modesty here is not a virtue, for if you have found an item to be useful, perhaps others will too.

NEW JOSS COMMANDS

RAND Document 17510-PR, Extended JOSS Language for Inter-console Communication, by R. L. Clark, describes several new JOSS commands that are particularly useful to multi-console game-players. Each RAND and Air Force JOSS Representative has received a copy of the Document, which emphasizes in its Introduction that these new commands are considered experimental, and may not be available in future versions of JOSS.

NEW DEMONSTRATION FILE

The July Newsletter introduced the first of the new "protected" library files, "library 1", which replaces "file 9 (DEM01)" as the demonstration file. Several programs have been moved from the latter to the new file, and others will be added as they are developed. You may send suggestions for demonstration routines to Shirley Marks in Computer Sciences.

THE JOSS MAILBOX

Reference has been made to the Mailbox -- file 100 (RAND0) -- in the Newsletters for November and December, 1967, and May, 1968. Now in September comes a suggestion for remote users.

Messages from remote users to RAND personnel are easily delivered by JOSS "mailmen," who monitor the Mailbox daily. However, to avoid having messages to remote users end up in the dead-message office, it is helpful if someone at each remote site checks the Mailbox once each day that JOSS is used from that site. Then, when a message has been read, the item should be discarded from the file.



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October, 1968
Number 12

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PUBLIC FILES:	The new look of File 108 (RAND8).
CONSOLE TABS:	When more tabs are encoded than are manually set...
LETTERS AND VALUES:	An example of the difference between...

THE JOSS COMPUTER

Operating statistics for the past month show that the PDP-6 computer is responding to treatment. Approximately half the days were considered "green" (or good) computing days. We expect the recuperation to continue, but still advise users to calculate with care.

PUBLIC FILES

File 108 (RAND8) was first mentioned in the JOSS Notebook (RM-5367-PR, page xii) as a public file intended for a special type of communication among users. For two reasons, file 108 is being returned to the pool of public files used for temporary storage of user programs.

1. There no longer seems to be sufficient interest in maintaining it as described in the Notebook.
2. Users have quite naturally assumed that file 108 has the same purpose as files 101 through 107, and 109.

To summarize the present assignment of the public files:

File 100 (RAND0) is the JOSS Mailbox (see the Notebook and Newsletters).

Files 101 (RAND1) through 109 (RAND9) are for the temporary storage of user programs, including programs being reviewed for the JOSS Library.

CONSOLE TABS

When JOSS is instructed to type a line in which more tabs are encoded than are manually set on your particular console, the system will hang in red with the carrier at the right. Such a "hangup" can occur if you use "Type all" to look at a program that includes, say, a form containing encoded tabs. In such a case, you can return to "green" as follows:

Raise the typewriter cover. Push the carrier to the left, near the middle of the line. Press the TAB CLR, and allow the carrier to move to the right, as it types.

When you are again in "green", you may manually set the necessary tabs.

LETTERS AND VALUES

A letter is the name of a value. The following example illustrates that JOSS distinguishes between a value and its name.

Suppose that you want JOSS to assign the value "3" to one of three letters, conditionally.

```
10.1 Set a = 3 if x < 0.  
10.2 Set b = 3 if x = 0.  
10.3 Set c = 3 if x > 0.
```

If you try to substitute for these three steps the single step:

```
20.1 Set (x < 0: a; x = 0: b; c) = 3.
```

JOSS will type:

```
Error at step 20.1: Eh?
```

JOSS expects to find a letter (i.e., the name of a value) following the word "Set". In step 20.1, instead of a letter, there is a conditional expression following the "Set". JOSS expects an expression (conditional or otherwise) to have a value, and thus detects an illegal statement when the left parenthesis is encountered.



Contents

ROUND NUMBERS:	From Carolyn Huber
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ROUND NUMBERS

Carolyn Huber offers a formula, suggested to her by Oliver Gross, to round a number "n" in the "d"th place, where $-9 \leq d \leq 8$ (counting right or left from the decimal point). Note that the formula first inserts a one to cause the appropriate rounding, and then removes the one.

$$\text{Let } R(n,d) = n + 10*(8 + d) - 10*(8 + d).$$

Another method for rounding intermediate values was suggested in the January 1968 issue of the Newsletter.

MODULAR ARITHMETIC

A FORTRAN formula for calculating the remainder M after a number N has been divided by a number D has been rendered unto JOSS by Carolyn Huber.

$$\text{Let } M(N,D) = N - \text{ip}(N/D) \cdot D.$$

M(N,D) (which calculates "N mod D") will reduce an angle to a convenient range for use in trigonometric functions, for example.

LIBRARY FILES

Here is the current index of the items in library 1, the Demonstration File. Item 6 is the newest addition from Larry Clark. The item's code may be misleading in this day of matching humans by machine.

Use library 1.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	QUIZ	4	6/19/68	23
2	GRAPH	4	8/29/68	9
3	PLOT	4	8/29/68	9
4	LOAN	4	8/29/68	5
5	BKTBL	4	8/29/68	9
6	DATES	4	10/30/68	6
8	HANG	4	6/25/68	10
21	BLACK	4	8/19/68	12

Library 10 presently contains two items:

Use library 10.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	SPEED	1407	10/09/68	6
2	ATMOS	1407	10/15/68	5

Item 1 (SPEED), contributed by Howard Talley of Langley AFB, calculates the true air speed, the speed of sound, and the Mach number for each given altitude and calibrated air speed. The program was created on a teletype terminal, which accounts for the user-instructions appearing in lower-case only. Type "Do part 1." to initiate instructions and computation.

Item 2 (ATMOS), written by Gerhard Schilling of Environmental Sciences, is documented in D-17867-PR, Calculation of Standard Atmosphere Values with JOSS, 27 September 1968, obtainable from RAND's Reports Department. For any desired altitude from sea level to 700 km, the program provides values of temperature, pressure, and density of the U.S. Standard Atmosphere. D-17867-PR describes the present program (appropriate for JOSS consoles or teletype terminals), how to modify it for specific applications, and how to incorporate it in other JOSS programs. Type "Do part 1." for instructions and requests for input.

Library 20 now has two items:

Use library 20.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ROOT	1407	10/17/68	3
2	RAND	1407	11/01/68	3

Item 1 (ROOT) presents Newton's method for improving an estimated root of a function. It is an annotated version of the example of "root-finding" in the JOSS Notebook, section 5.19. The formula for the root is recursively defined, and so may result in JOSS running out of space if too many iterations are required. Type "Do part 1." to initiate the program.

Item 2 (RAND) is entitled "A JOSS Simulation of a Procedure for Generating Pseudo-random Numbers." Grace Murray of Computer Sciences has adapted a familiar method for generating pseudo-random numbers to JOSS' habit of rounding products to 9 significant figures. (This method is currently in use on the IBM 7044 at RAND.) Type "Do part 1." for an explanation of the program and a trial run. To see how to incorporate the method in your own program, type parts 1, 2, 3, and 5, and all values.

Library 30 has just one item so far:

Use library 30.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	CORR	1407	10/30/68	2

Item 1 (CORR), by Captain Gary Mills in the Pentagon, calculates a correlation matrix for n variables. Type "Do part 1." to initiate the demand for input: the number of variables, the number of observations, and the data-points.

Several JOSS programs are currently under review as potential additions to the library. Each issue of the Newsletter will report on the newest library programs, including a reference to available RAND documentation. When the size of the library warrants it, a Catalog of programs will be issued through the Reports Department. Contributions to the library are always welcome.

ANNOTATING PROGRAMS

Annotation of JOSS programs serves two purposes: instruction and commentary.

1. Instructions for the user of the program can be provided by commands that type forms or text in quotes, and by the use of the "Demand as" command to identify a request for input.
2. Commentary that identifies the function of a group of program steps can be inserted as steps whose text is preceded by an asterisk. See the January 1968 Newsletter for this use of the asterisk, and the example below.

Instructions on how to use a program should be brief, but not cryptic. Sometimes it is helpful to provide the user with the option of receiving instructions or not:

- 1.1 Demand x as "Do you wish instructions? (true or false)".
- 1.2 Do part 10 if x = true.
.
.
.
- 10.1 *Part 10 produces optional instructions.
.
.
.

Instructions can be produced the first time through only, and avoided on restart, if the instruction-typing steps are deleted, as well as the "Delete" command itself, at the beginning of the program.

Care should be taken to account for the possibility that a user may type an illegal value when input is requested. It is wise to follow a "Demand" command with the typing of an informative error message if the value is unacceptable, followed by a corresponding return to the "Demand". The user should never find himself facing a JOSS error message with no indication of how to proceed.

BACK ISSUES OF THE NEWSLETTER

Newcomers to JOSS whose names are added to the Newsletter distribution list automatically receive all the back issues, beginning with November 1967. These back issues are now available in bound copies, the first running from November 1967 through June 1968. Each succeeding bound copy will cover a six month period.

Current JOSS users who find a bound copy convenient may order the current issue from the Reports Department as P-3940/1. The issue covering the Newsletters from July 1968 through December 1968 will be P-3940/2, and so forth.

- - - - -

A REMINDER

If you need to leave a JOSS console running in a public JOSS room, please place a note on the console so that others who want to use it will know who you are and when you plan to return. If you come upon an operating JOSS console, in a public JOSS room or in an office, please do not interrupt its operation, even if you think it has been abandoned in its "green state."



EDITOR • Pearl Leonhardt
Ext. 436

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

November 26, 1968

JOSS FLASH

Items stored in files since November 7th are lost.

Magnetic-tape backup for items stored previous to November 7th is only partially available, as follows:

- (1) All file assignments exist as of November 7th.
- (2) Some or all items stored in your files may still appear on "Type item-list".
- (3) For those items that do appear, the contents are most likely incomplete.

This JOSS catastrophe is a result of both machine and human error. Considerable forbearance will be necessary on the part of users who must restore their files. Programs will have to be recreated and re-filed; data will need to be re-input and calculations rerun.

Steps have been taken to prevent future catastrophes such as this one. Unfortunately, it is too late now to do more than recover as best we can.

MEMORANDUM

To: All JOSS Users 11-29-68

From: Shirley Marks

Subject: RE-FILING OF JOSS PROGRAMS

Copies: G. W. Armerding, J. P. Haverty, T. E. Wold

The JOSS Flash of November 26 stated that, as a result of the recent files catastrophe, programs which still remain in the files may be incomplete. The following should help in determining whether this condition exists.

Incomplete programs will be missing somewhat predictable portions. The situation is much the same as directing JOSS to "Type all" and then tearing the resulting output at some intermediate point. The top part of the output is what remains in the files; the bottom portion has been lost. JOSS types all in an orderly fashion: steps first, then forms, formulas and values, in that order. Therefore, if your program still contains form 13, you are assured that all steps and all forms numbered less than 13 also exist. If a program still contains a two-dimensional array, the only things which may be missing are other two-dimensional arrays and arrays of higher dimensions.

We hope that this information will aid you in reconstructing your programs.

JOSS users at RAND, Santa Monica, who have lost filed programs but retain manuscript copies are invited to send these manuscripts to me. I will be making arrangements to have these programs typed into your JOSS file. Please note on the manuscript: your name, department, file number and identification, and item number and code. I will notify you when the program has been restored to your file. You will then be responsible for proof-reading it, and correcting typing errors.

Shirley Marks



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December, 1968
Number 14

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INTRODUCTION:	A special issue on the JOSS files.
FILE MAINTENANCE:	How files are stored, assigned, closed, protected, restored. A brief look at old procedures.
NOVEMBER 25:	What went wrong.
NEW PROCEDURES:	For JOSS personnel and JOSS users.
RECOVERY:	A cooperative effort.

INTRODUCTION

On November 25, a major portion of the information stored in JOSS files was lost. This catastrophe, which has hurt all JOSS users, is the subject of this issue of the Newsletter. Following the events of November 25, the most immediate step was to notify users how each might be affected. The subsequent JOSS Flash (November 26) and Memo (November 29) stated that all information filed after November 7 was gone, and described what might be left of items filed prior to that date. Once users had been alerted (although admittedly not yet fully informed), it was possible to proceed with the two steps of greatest priority: recovery from the loss, and prevention of a future one.

The reasons for the loss--both mechanical and human, both accidental and preventable--will be understood better if they are preceded by a description of file maintenance, under normal and emergency conditions.

FILE MAINTENANCE

How JOSS files are stored

JOSS files are located physically on magnetic disc, a device attached to the PDP-6 computer in RAND's basement. Individual items are filed, recalled, or discarded only from a JOSS terminal by means of JOSS

commands. There are "directory records" stored on the disc that associate each assigned file and its identification code with a location on the disc--the location of the beginning of the information stored in the corresponding file. But the information belonging to a single file, or even to a single item of a file, is not, as a rule, stored in a single block of consecutive locations on the disc. Rather, the information is "link-listed". This is computer jargon for a method of dynamically storing data in space obtained as needed from available space, and returned to available space when no longer needed. For example, when you instruct JOSS to recall item 5 of file 101 (RAND1), JOSS may actually have to pull the item together from a "chain" of locations on the disc, although you will not be aware of its piece-meal structure. This "list structure" of the disc files is related to the way the events of November 25 left your files.

How files are assigned and closed

Requests for files to be assigned or closed are telephoned to extension 415. The appropriate identifying facts are written on a form, to be left for the next regular evening session of disc maintenance, when JOSS is off the air. One of the functions of the disc maintenance program that is run at this time is to find an available file number to associate with each input identification code. The program stores the file number, with its code, in a directory record on the disc, and also types out the file number on the on-line teletype so the technician can record it on the file assignment form sent to the user. The program will remove a file number and its code from the disc (i.e., close the file) only if there are no items in the file.

How files are protected and restored

Information stored on magnetic disc remains stored when JOSS is off the air, or even if the power of the PDP-6 computer is turned off. Information can be destroyed on the disc, however, both inadvertantly and intentionally. A computer malfunction can cause wrong data to be stored, or right data to be stored in the wrong place. Many (but not all) such potentially disastrous errors are prevented by good system design, which deliberately inhibits access to files until manual action is taken by a maintenance engineer. Information can be destroyed deliberately when it is replaced by test data during monthly maintenance of the disc by the vendor.

Clearly, then, it is necessary to have a method of writing the information stored on disc onto a temporary medium, for restoring the disc later as necessary. The medium selected is magnetic tape, and is referred to as "magnetic tape backup" for the disc. The same disc maintenance program that assigns and closes files is used to "dump" the disc onto magnetic tape during maintenance sessions, and to verify that the dump was successful.

Before deliberately replacing disc files by test data, the disc is first dumped onto tape, and then restored from the tape immediately following the maintenance period. If a computer malfunction has caused destruction of file data on the disc, files must be restored from the most recent "good" backup tape. Users are immediately notified that files revert to the date the backup tape was written.

Why are not all backup tapes good, if the dump that created each was verified (i.e., compared successfully against the information on disc)? Unfortunately, magnetic tape can deteriorate even under controlled conditions. Dirt and bad spots can develop that make it impossible for tapes to be read, even though correctly written. Occasionally a faulty tape unit can damage a tape. Safety being in numbers, several backup tapes are better insurance against loss of files than only the most recent dump. Of course, the older the backup tape used, the more costly the loss in file information to users who have stored items away since the tape was written.

A brief look at old procedures

During most of the time that files have been available to JOSS users, disc maintenance has occurred in general on Tuesday and Thursday evenings, when files have been assigned and closed, and a new magnetic tape backup dumped from the disc. An original requirement of three sets of backup tapes was extended to four. (Files are now so numerous that two tape reels are required for a single backup, hence the term "set" of backup tapes.) An effort was made to improve the quality of the tapes used, since the tape drives on RAND's PDP-6 are acutely sensitive to dirt. Tapes that could not be written on without difficulty were sent out for special treatment, and other certified tapes replaced them.

NOVEMBER 25

The day of the disaster followed almost two weeks of serious computer failures, with JOSS down much of the time, and maintenance people working long hours. When it was found necessary to restore the disc from tape on that Monday afternoon, it was noticed that there were only two sets of backups, rather than the required four. The first was tried and proved unreadable. One set--two reels--separated JOSS users from either the status of November 7, or nothing. The reels were placed on their units, the program initiated, and in an instant reel number two was ruined--because of an improperly tightened hub.

It should not be necessary to describe the shock of those immediately concerned. The first thought was to see what still could be retrieved. Reel number one, undamaged, contained the directory records and most of the disc information, so that files were still assigned as of November 7, and some of most people's file items were partially on each of the two tape reels. It wasn't likely that anyone came out unhurt.

Once the initial shock has subsided, where does one point a finger of blame? More important to the prevention of future disasters, how does one assign the degree of fault? For instance, if a tense engineer had not been tense, the hub would have been tightened and the disc restored as of November 7. Hearts might have beat a little faster at the danger missed, but users would have slept through the night. Should precautionary steps have been taken before gambling on the last set of tapes? Several come to mind. What of the inescapable fact that procedures specified a pool of tapes sufficient to maintain four backups? Insurance companies are the proof that accidents do happen. Backup procedures assume the same, and prepare as reasonably as possible for their occurrence.

NEW PROCEDURES

In an attempt to strengthen the obvious weak points of the old disc maintenance procedures, some modifications have been introduced.

The normal disc maintenance schedule has been extended from twice to three times per week, and more often when warranted. If restoration of the disc becomes necessary, the loss to users will be less as a rule. During this time of recovery, when much session time is devoted to refiling of lost items, the disc is being dumped as often as five times per week.

The number of sets of backup tapes for the disc will now be kept at five, as a minimum. The record-keeping procedures have been improved with respect to the pool of backups.

If there is trouble writing on a pool tape (always the oldest of them), it will be retired for recertification and immediately replaced by a certified tape from outside the pool. When attempting to restore the disc from tape, the most recent backup tape will be used. If it should prove unreadable, no previous backups will be used without the consensus of JOSS personnel.

The present method of restoring individual JOSS files, as mentioned under FILE MAINTENANCE, is to type and refile during a session at a JOSS terminal. Hard copies of important programs are indispensable backup for users. An alternate user backup was suggested in the days before files, when users typed in their programs at each session. This same alternate has been proposed for consideration recently: a hard-copy of a program in a computer-readable form, such as paper tape or punched cards. The latter is now being worked on and will be discussed more fully at a later date.

RECOVERY

The Memo of November 29 invited JOSS users at RAND Santa Monica to send program manuscripts to Shirley Marks if they needed assistance in refiling lost items. Such assistance is intended to supplement whatever technical typing aid is available in the various departments. Most of the initial batch of programs received have been typed and stored in public files. The authors, when notified, are then responsible for recalling the items (some programs are divided into conveniently-sized items), typing all, proofreading and correcting and filing the programs in personal files. Computer Sciences will continue to offer this service as long as the need exists.

Library files, including the demonstration programs in library 1, are not back to normal yet. JOSS users undoubtedly have already noticed the complete absence of item 21 of the demonstration file, the popular Blackjack program. All these programs will be restored before long. It's all a question of priorities.

1968 has been a strange and unpredictable year. While JOSS troubles may seem minute next to the worries of the world, it will be in the small ways that improvement will come. In 1964, Cliff Shaw ended his Paper, "JOSS: A Designer's View of an Experimental On-line Computing System", with a view that seems appropriate for the end of this JOSS year:

"...the acceptance of an open-shop computing system depends on the little things--hundreds of them!"

May 1969 offer the sum of many happy little things.

THE JOSS NEWSLETTER:
JANUARY 1969-JUNE 1969

Pearl Leonhardt and Joan Groves
Editors

July 1969

P-3940/3

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January, 1969
Number 15

Contents

HARD-COPY BACKUP FOR FILES: A status report.
BACK ISSUES OF THE NEWSLETTER: Bound in June and December.
LIBRARY FILES: As of now.

HARD-COPY BACKUP FOR FILES

The December Newsletter mentioned, under NEW PROCEDURES, the possibility of providing users with the facility for obtaining a hard-copy version of a file item in a computer-readable form. The specific form referred to was punched cards. (Several disadvantages of punched paper tape eliminated this form from consideration.) The purpose of such a hard copy would be to insure against the loss of a difficult-to-recreate item.

Once procedures have been established, and reported to you, you will be able to request that a specific file item be punched on cards to be sent to you, or refiled from cards supplied by you -- much as you now request a file assignment.

BACK ISSUES OF THE NEWSLETTER

The November Newsletter announced the availability of bound copies of the Newsletter, issued by the Reports Department as a convenience to newcomers to JOSS. P-3940/1 covers November 1967 through June 1968. P-3940/2, ending with December 1968, may be ordered shortly from Reports.

LIBRARY FILES

The library files have been reconstructed, added to, and modified for the new year. The November Newsletter presented a first view of library 1, the file of demonstration programs; items 1 and 2 of library 10; items 1 and 2 of library 20; and item 1 of library 30. Please see that issue for a description of these items.

Library 1 has a new GRAPH program in item 2, and item 3 (TGRAF) replaces the former PLOT program. To use GRAPH, recall item 2 and do part 1. JOSS will inquire whether you are a teletype user; if your answer is "true", JOSS will bring in special forms stored in item 3 (TGRAF) to eliminate tabs and shorten the lines.

Use library 1.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	QUIZ	4	12/20/68	23
2	GRAPH	1407	1/14/69	9
3	TGRAF	1407	1/14/69	5
4	LOAN	4	8/29/68	5
5	BKTBL	4	8/29/68	9
6	DATES	4	10/30/68	6
8	HANG	4	12/09/68	9
21	BLACK	4	12/19/68	12

Library 10 has been restored to the state reported in the November Newsletter.

Use library 10.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	SPEED	1407	12/12/68	6
2	ATMOS	1407	12/11/68	5

Library 11 contains one item, submitted by Richard Rhoads of Langley AFB.

Use library 11.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ATOA	1407	1/14/69	12

Item 1 (ATOA) is a two-sided expected value simulation of an air-to-air campaign without ground loss interaction. The daily aircraft losses suffered by the Blue Force are computed from an equation of the form:

$$L_B = S_B \left[1 - (1 - D_R K_R)^{S_R/S_B} \right]$$

where L_B are Blue losses, S_B and S_R are the number of sorties flown by Blue and Red respectively, and $D_R K_R$ is the probability of detection, conversion, and kill of a Blue aircraft by a Red aircraft. A similar equation computes Red losses. The input/output format is structured to demonstrate the interaction of such parameters as force size, sortie rate, reserve commitment, and individual effectiveness in a highly aggregate fashion within the constraints of the central equation. "Do part 1." initiates the program.

Library 20 now has six items:

Use library 20.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ROOT	1407	10/17/68	3
2	RAND	1407	11/01/68	3
3	CUFIT	4	1/07/69	14
4	PROB1	1407	1/14/69	7
5	PROB2	1407	1/03/69	11
6	HXDEC	1407	1/15/69	2

Items 1 and 2 were described in the November Newsletter.

Item 3 (CUFIT) was contributed by Don Kephart of System Sciences. The program allows the user to find an empirical equation to fit his data by trying a variety of polynomials and logarithmic and exponential equation forms having two or three coefficients. The method of least squares obtains the coefficients for an approximating curve; the printout for each trial includes a test run for judging the closeness of the empirical fit. D-16575-ARPA, "Empirical Curves Fitted on JOSS", describes the use of the program.

Item 4 (PROB1) and item 5 (PROB2) are described in D-17821-ISA/ARPA, "Compound Probability Calculations with JOSS," by Gerhard Schilling and Marianne Turner of Environmental Sciences. The Introduction to the Document differentiates between these two programs as follows: "The first program applies when the overall probability of success of a set of events is defined as a selected combination of a desired number of independent events of the set....The second program applies when the overall probability of success of a set of events is defined with restrictions that require that certain specific events must be successful, and that failure is acceptable for the other events."

Item 6 (HXDEC), written by Jim Gillogly of Mathematics, converts hexadecimal numbers to decimal for users of Brand X computers. For example, to convert the hexadecimal number "1AF3C", type "Do part 1 for x = 1,A,F,3,C.". Letters may be upper or lower case, for the benefit of teletype users. Jim warns in the annotation that "size" is used to eliminate the need for terminating characters in the input hexadecimal number, so users should not add or delete values, parts, etc., in the program.

Library 21 has two items, both contributed by Art Smith of Physics:

Use library 21.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INVRT	1407	1/15/69	2
2	SIMUL	1407	1/15/69	4

Item 1 (INVRT) solves N linear simultaneous equations by matrix inversion. Part 120 contains annotation explaining the program's use.

Item 2 (SIMUL) solves N nonlinear simultaneous equations ($1 \leq N \leq 9$) for real values, by iteration from an initial guess. SIMUL uses INVRT. Part 1 annotates the program.

Art invites your comments.

Library 30 is the same (again) as described in the November Newsletter.

Use library 30.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	CORR	1407	12/11/68	2

Library 40 contains a package of four items designed to solve linear programming problems, and is the work of Dick Clasen of Logistics, Dave McGarvey of Economics, and Leola Cutler of Computer Sciences.

Use library 40.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INSTR	1407	1/03/69	4
2	LINPR	1407	1/14/69	6
3	OUTPT	1407	1/03/69	2
4	SAMPL	1407	1/03/69	1

Item 1 (INSTR) describes the use of the three remaining items in response to "Do part 1."

* * * * *

Reviewing the many interesting programs submitted for the library has had to compete with other pressing JOSS activities. The patience of contributors is much appreciated. Several regression programs have been under consideration. It is likely that more than one will be included, so that JOSS users will be able to select the program that best suits their application. In the case of these and other "controversial" programs, it will be helpful to have comments from users after the programs have been available for a while.



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DEMONSTRATIONS: The early days, experimental to operational,
"easy-to-learn-and-easy-to-use."

DEMONSTRATIONS

In olden times -- when "JOSS" had not yet been hyphenated into "JOSS-like," and "Eh?" indicated a hearing difficulty -- missionaries went forth from RAND to spread the word of The Helpful Assistant. JOSS began as an experiment in man-machine communication. It was important in those early research days that the system be seen and used, and that the principles of its design be understood, by as many creative and dynamic and influential computer people as possible.

To further this man-to-man communication, documents were published, blue consoles were installed at selected Air Force sites, and demonstrations...many, many demonstrations...were given. Cliff Shaw, Chuck Baker, Ed Bryan, Irwin Greenwald, and Joe Smith hosted numerous groups from corporations and universities and the government, and spoke at meetings and conferences around the country. Today, the imprint of JOSS can be seen on many of the time-sharing systems in use and under development in the United States and abroad. Much credit is due the hands-on experience provided by personal demonstrations, which have vividly illustrated the interactive nature of JOSS.

With the transformation from an experimental to an operational system, there appeared a change in the audience for demonstrations. System designers were soon outnumbered by the lay public. The latter has included a delegation of Japanese industrialists, a primary school principal, a member of the Israeli parliament, the president of a social science foundation, and children of all ages. For such visitors, a JOSS demonstration presents a friendly glimpse of a powerful ally. Often it is their first opportunity to communicate in a simple way with a highly sophisticated system. For in a few moments, the visitor can experience both the discipline and the delight of problem solving.

The flavor of JOSS is best savored by having each visitor sit at a blue console, even if his typing skill is minimal. A good rule of thumb, if perhaps a half-hour is available, is to reserve one console per three visitors, so that each may have a turn and also be able to observe the others. Generally, to reserve a console in a public JOSS room, simply post a notice on the door or typewriter, stating your name and the scheduled hour. If you think you will require more than one console (certain conference rooms have several JOSS plugs), please contact Art Lucero on extension 415. It is preferable that RAND staff members conduct their own demonstrations, when possible. In special situations, Shirley Marks (extension 507) will arrange the presentation.

When the number of guests is greater than can profit from personal interaction with a blue console, an alternative is to show the JOSS film. Please see Janet Nakamura to reserve a copy.

The background and interest of a guest of course influence the content and style of a demonstration. A program from "library 1" may be an appropriate finale. Children enjoy item 8 (HANG), a non-violent word game; grown-ups are fascinated by item 21 (BLACK). Sometimes it is a nice gesture to distribute one or two user-oriented JOSS publications, either at the end of or prior to the visit. Shirley Marks can offer suggestions here.

One final note, on priorities, lest we forget the JOSS user in our rush to entertain. Please try to schedule a visit by your son's Cub Scout troop for a Saturday.



Contents

NEW AIR FORCE JOSS USERS: Patience rewarded; new channels
FILE BACKUP: Patience rewarded; new procedures

NEW AIR FORCE JOSS USERS

Very shortly, several Air Force sites will be joining the present remote users around the country who connect to JOSS via teletype. To provide access to the system, the Air Force has contracted with Digital Equipment Corporation to add eight additional teletype channels to the multiplexor of the PDP-6 computer in RAND's basement.

In order to inconvenience as few JOSS users as possible while the modifications are being installed on the PDP-6, work will be done on a weekend, very likely the weekend of March 22 and 23. Users will be notified by JOSS FLASH in time to make their plans.

FILE BACKUP

The December and January Newsletters held out the promise of a system for providing hard copy backup for JOSS files, on request. Users who wish to take advantage of the fine system designed by Larry Clark are invited to follow these procedures:

If you wish to have a deck of cards punched from a particular item of a particular file:

Call extension 415 (as you now do to request a file assignment) or write to Shirley Marks (if you are a remote user) with the following information:

1. Your name.
2. Your department or remote site.
3. Your man number (if a RAND employee) or a 5-character identification of your site.

4. The file number and item number you wish punched on cards (no identification of file or item required).
5. An indication of whether or not you wish a listing of your punched cards.

If you wish to have a particular item of a particular file restored from a deck of cards to a specified file location:

Send your deck and the following information to Shirley Marks:

1. Your name.
2. Your department or remote site.
3. The new file number and its identification.
4. The new item number and its identification.
5. The RPN, or project number, under which the item should be filed (RPN's are four digits for RAND users and three digits for Air Force users).

If you wish only a listing of your deck of cards:

Send your deck with the following information to Shirley Marks:

1. Your name.
2. Your department or remote site.
3. Your request for a listing of the deck.

This is what your punched deck will look like:

The first card will be a header card:

* PUNCHED FROM JOSS FILE ... (...), ITEM ... (...) ON date
FOR identification

Following the header card will be the "n" cards of your program. On each of these, there will be 72 columns of unintelligible text, then 5 characters of identification, and a 3-digit sequence number.

The last card is a trailer card:

* END OF OUTPUT FOR FILE ... (...), ITEM ... (...) --number
CARDS--identification

Requests for punched-card backup of files should be limited to those programs of long-term interest, or those that are difficult or tedious to recreate via a JOSS console.



-10-

EDITOR • Pearl Leonhardt
Ext. 436

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

March 24, 1969

JOSS FLASH

JOSS will be off the air on Saturday, March 29 and Sunday, March 30 for the installation of eight new teletype channels to the PDP-6 computer. New Air Force users will be joining the system shortly via these channels from sites across the country.



Contents

HARD-COPY BACKUP OF FILES: Open for business.
LIBRARY FILES: Programs, new and improved.

HARD-COPY BACKUP OF FILES

The March Newsletter outlined the procedures for requesting file items to be punched on cards, a listing of the cards, or a restoration of file items from cards. Requests are processed as part of file maintenance on Monday, Wednesday, and Friday evenings. This service is available to all JOSS users, whether within RAND or at Air Force JOSS sites.

A listing of the cards may show the following idiosyncrasies:

1. Assigned values are printed as "short Set" commands (e.g., $x = 5$).
2. Formulas are printed as "Let" commands.
3. Multiply center-dots are printed as "at-signs".
4. Tabs are indicated by double arrows.

1. and 2. reflect the form in which JOSS files information.
3. and 4. are due to the character set available on the Roman chain of the printer.

LIBRARY FILES

The January Newsletter gave the status of all of the library files as of that date. This issue summarizes the library files as of April, and notes the changes made since the last review.

Library 1 no longer contains the demonstration program DATES, which converted from the Gregorian to the Julian calendar, and vice versa. In its place is CALEN.

Use library 1.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	QUIZ	4	12/20/68	23
2	GRAPH	1407	1/14/69	9
3	TGRAF	1407	1/14/69	5
4	LOAN	4	3/06/69	4
5	BKTBL	4	8/29/68	9
6	CALEN	4	2/07/69	3
8	HANG	4	12/09/68	9
21	BLACK	4	12/19/68	12

Item 6 (CALEN) requests the numbers of a month and of a year (do not abbreviate 1969 as 69) and supplies the calendar for that month. You can verify the day of the week on which you were born, and other important moments in history. For example, Julius Caesar accused Brutus on a Thursday.

Library 10 has a new item contributed by Gerhard Schilling and Marianne Turner of Environmental Sciences.

Use library 10.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	SPEED	1407	12/12/68	6
2	ATMOS	1407	12/11/68	5
3	DRAG	1407	3/19/69	14

Items 1 and 2 were reviewed in the November Newsletter.

Item 3 (DRAG) is described in D-18561-PR, "Satellite Drag Calculations with JOSS". The program calculates atmospheric drag perturbations from satellite orbital elements, and is initiated by "Do part 1.".

Library 11 is unchanged from January.

Use library 11.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ATOA	1407	1/14/69	12

Library 20 contains a modified item and a new item.

Use library 20.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ROOT	1407	10/17/68	3
2	RAND	1407	11/01/68	3
3	CUFIT	1407	4/04/69	16
4	PROB1	1407	1/14/69	7
5	PROB2	1407	1/03/69	11
6	HXDEC	1407	2/28/69	8
7	INTRP	1407	3/19/69	1

Items 1, 2, 3, 4, and 5 were discussed in the November and January Newsletters.

Item 6 (HXDEC) as presented in the January Newsletter converted hexadecimal numbers to decimal. Jim Gillogly has since modified the program to convert decimal numbers to hexadecimal as well. "Type part 10." produces directions for using the program.

Item 7 (INTRP) was written by Art Smith of Physics to perform an n-th degree Lagrange interpolation on an input table of (X,Y) pairs. "Do part 1." displays instructions on the program's use.

Library 21 has not been modified since January.

Use library 21.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INVRT	1407	1/16/69	3
2	SIMUL	1407	1/30/69	5

Library 22 is devoted to a set of regression programs contributed by Dave McGarvey of Economics, Hal Boren of Cost, and Gary Mills of the Air Force. Each program has advantages and disadvantages for particular applications, and users will have to learn by trial which is most appropriate for their needs.

Use library 22.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	OLS1	1407	3/24/69	9
2	OLS2	1407	3/24/69	7
3	OLS3	1407	3/24/69	7
4	OUT	1407	3/24/69	4
5	INSTR	1407	3/24/69	10
6	REG1	1407	3/24/69	16
7	REG2	1407	3/24/69	12

Item 1 (OLS1), item 2 (OLS2), item 3 (OLS3), item 4 (OUT), and item 5 (INSTR) were assembled as a package by Dave McGarvey from an original program by John Koehler. To learn how to manipulate the first four items to solve your specific problem, recall item 5 and "Do part 1."

Item 6 (REG1) is the work of Hal Boren, who has documented his program in D-15997-PR, "A Simple and Multiple Linear Regression Analysis Program for JOSS". The result is a least-squares determination of the parameters of a linear equation with as many as three independent variables. "Do part 1." provides initial information on the program.

Item 7 (REG2), submitted by Gary Mills, fits functions of one or two independent variables to a set of observed points. "Do part 1." initiates the program. The input procedure is self-explanatory, and the output is clearly labeled. When the output is complete, "Do part 99." allows a different type of curve to be fitted without additional input.

Library 30 is as described in the November Newsletter.

Use library 30.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	CORR	1407	12/11/68	2

Library 40 is the same as reviewed in the January Newsletter.

Use library 40.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INSTR	1407	1/03/69	4
2	LINPR	1407	2/05/69	6
3	OUTPT	1407	1/03/69	2
4	SAMPL	1407	1/03/69	1



EDITOR • Pearl Leonhardt
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

May, 1969
Number 19

Contents

JOSS DOWN-TIME: Peripheral ills.
JOSS DATA CONVERSION: Missionary work by Carroll Lindholm.

JOSS DOWN-TIME

In recent weeks, JOSS users have been aware of numerous periods of down-time, which have made some wonder if the PDP-6 has really recuperated from last year's ailments. Actually, the current difficulties have been due primarily to the assortment of JOSS peripheral equipment...the drum, the disk, and the tape drives...rather than to the computer itself.

Problems with the drum led to the drum's vendor flying out from Vermont to change the bearings. While trying to isolate an elusive and stubborn disk failure, it became necessary for the disk's vendor to replace a total of 3 disks during the past month. Then, like a child when company comes, one of the tape drives picked the wrong moment to misbehave...the pre-dawn hours following a night of disk maintenance. During the restoration of the disk files from that night's backup tape dump (the December 1968 Newsletter describes this procedure), a malfunction caused the tape to be creased. Files had to be restored from an earlier backup tape.

JOSS users understandably wonder about the future reliability of the system. The PDP-6 itself has improved, the drum errors have disappeared, the disk failure may still be with us...it is too soon to tell, the tape drives have always been sensitive. Hopefully, down-time will diminish with sustained effort by maintenance personnel. Users can minimize the effect of the occasional file reversion by requesting punched-card backup for file items that are difficult to recreate via a console.

JOSS DATA CONVERSION

Carroll Lindholm of Engineering Sciences has recently needed to convert data produced by a JOSS program into a form acceptable to a FORTRAN program. To do this, he made use of the punched-card backup for the file item containing the data. Carroll invites JOSS users with a similar need to see him.



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Editor: Joan Groves
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June, 1969
Number 20

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NEW EDITOR: Goodbye Pearl, Hello Joan.
BACK ISSUES: Third bound copy.
LOGGING ON: A reminder.
TIME-SAVERS: When time is of the essence.

NEW EDITOR

Pearl Leonhardt, editor of the JOSS Newsletter since its first appearance in November 1967, has moved on to other work at RAND. Joan Groves will now be monitoring news items and welcoming JOSS newcomers to the Newsletter distribution list. Pearl's capable and conscientious efforts have long been appreciated. Joan is a most appropriate replacement.

BACK ISSUES

P-3940/3, *The JOSS Newsletter: January 1969-June 1969*, will be available shortly from the Reports Department. New JOSS users can obtain back issues of the Newsletter or be added to the distribution list by calling Joan Groves on extension 7652.

LOGGING ON

In-RAND JOSS users sometimes log on to the system with obsolete RPN's (RAND Project Numbers). Because a table stored in the system software defines acceptable ranges of RPN's rather than individual RPN's, such obsolete numbers are not necessarily caught at log on. Instead, the Accounting Department accumulates at the end of each month a long list of unacceptable RPN's that are associated with that month's JOSS usage.

To avoid Accounting's monthly trauma of reallocating this usage, RAND JOSSers are requested to make sure of their RPN's, not only when logging on in the future, but also by checking the current item-list of each personal file. If items are filed under obsolete RPN's, they should be refiled under appropriate new ones.

TIME-SAVERS

Normally, the JOSS user doesn't like to think of his Helpful Assistant as just a front man for a computer. Jargon (such as "storage space", "swapping", "compute cycle", "interpretive language") seldom crosses his lips. On occasion, though, a user may wonder whether a program is appropriate for JOSS, whether perhaps another system might not be more efficient in time and therefore in money. In such cases, it helps to understand a bit of how JOSS behaves and why, so as to speed up the execution of the program where possible.

To provide JOSS's interactive character, the language is "interpretive", that is, each step is interpreted from left to right, a character at a time, each time JOSS is instructed to obey the step. Commentary steps, those that begin with an asterisk, are looked at by JOSS even though the asterisk indicates that the step is not to be obeyed. Thus commentary steps that are within a part referred to by a "Do" will be examined repeatedly for the range of the "Do".

The user is rarely aware that he shares the computer's storage with other users during his session. In order to accommodate all concurrent requests for service, the system may send some programs to the drum while processing others in high-speed storage, and then interchange them. Such "swapping" is more likely for an individual program if it is relatively large. In some cases, deleting portions of a program after it is in execution will help this situation, but not always.

Each time a number is interpreted, JOSS converts it to its internal storage form. Each time JOSS interprets "Set x = 1.23456.", the number "1.23456" is converted. On the other hand, if the letter "k" has been assigned the value "1.23456", then each interpretation of the step "Set x = k." requires only a retrieval of this converted value.

RM-5367-PR, *The JOSS Notebook*, discusses computing efficiency in 5.13, 5.14, and 5.15.

THE JOSS NEWSLETTER:
July 1969-December 1969

Jane Saindon
Editor

January 1970

P-3940/4

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"TYPE ITEM-LIST.":	Two new columns describe an item's usage.
ILLEGAL PROJECT NUMBERS:	If you can't lick 'em...



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July, 1969
Number 21

Contents

NEW EDITOR: Play it again, Sam.
JOSS TELETYPES: No tabs, short lines, lower-case letters...
MAILBOX MESSAGE: From the Air Force Avionics Laboratory.
LIBRARY PROGRAMS: Additions. Where is the Catalog?
REMOTE REMINDER: A plea from Art Lucero.

NEW EDITOR

The June Newsletter greeted Joan Groves as our new editor. In July, we welcome Jane Saindon as Joan's replacement. Our best wishes to both in their new positions.

JOSS TELETYPES

"How many teletype users does JOSS have?", asks Paul McClenon from RAND's Washington Office. Paul recently expressed concern that JOSSers creating programs at blue consoles may not consider the potential teletype users of their programs. Here, then, is a reminder of some differences between console-JOSS and teletype-JOSS-as-practiced-at-remote-sites.

First, teletypes do not accommodate tabs in forms.

Second, the console line-length is 78 characters (margins set at 6 and 84); the teletype line-length is 72 characters. A teletype-JOSSer would like to feel confident that any commentary JOSS types as a result of his using a program will not overtype at the end of a line because of too many characters. Of course, portions of a console-created program that are never typed may be as long as the 78-character console limit.

Third, the JOSS language provides both upper- and lower-case letters as variable names, and distinguishes between the upper- and lower-case version of the same letter. Programs created at a JOSS console thus may calculate with a maximum of 52 letter names (plus indexed versions of these letters for additional variables).

A teletype user has two factors to keep in mind:

- (1) Letters he types are stored in JOSS as lower case (the system automatically capitalizes the first letter of an instruction); therefore he has only 26 letters available as variable names in a program he develops.
- (2) He may use a console-created program that contains both upper- and lower-case variables, being assured that JOSS understands the difference. But there is a catch. If the console-created program contains, for example, the two steps "Demand m." and "Demand M.", the teletype user of the program will not be able to read the difference between the "m" and the "M" in order to supply the values. A way around this difficulty for the writer of the program is to substitute, for example:

Demand m as "minimum".

Demand M as "maximum".

MAILBOX MESSAGE

The Air Force Avionics Laboratory at Wright-Patterson AFB is planning a technical forecast to be used to formulate their long-range plan. They invite JOSS users to participate. More information can be obtained by recalling a Mailbox message from H. Mark Grove, as follows:

Use file 100 (RAND0).

Recall item 3 (EVRY1).

Do part 1.

If the message is no longer in the JOSS Mailbox, ask Shirley Marks for a copy.

LIBRARY PROGRAMS

Library 1 has a new program to entertain and amaze you.

Item 7 (3DTT), in the words of author Jim Gillogly of Mathematics, plays a strong (but beatable) game of three-dimensional tic-tac-toe in a 4x4x4 cube.

Other items are as last reported.

Use library 1.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	QUIZ	1407	7/15/69	23
2	GRAPH	1407	1/14/69	9
3	TGRAF	1407	1/14/69	5
4	LOAN	1407	7/15/69	5
5	BKTBL	4	8/29/68	9
6	CALEN	1407	7/15/69	3
7	3DTT	1407	7/15/69	19
8	HANG	4	12/09/68	9
21	BLACK	4	12/19/68	12

Library 10 is unchanged from its April report.

Use library 10.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	SPEED	1407	12/12/68	6
2	ATMOS	1407	12/11/68	5
3	DRAG	1407	3/19/69	14

Library 11 contains a new package of items since last described.

Item 7 (HARD), and items 8-13 are contributed by Gail Burkholz of Engineering Sciences. The group of items is documented in RM-5948-PR, "Aircraft Combat Radius Calculation Procedure for Various Mission Profiles and External-store Configurations", by C. M. Weber, April 1969. Anyone desiring to use this program should please contact G. K. Smith, J. R. Gebman, or Gail Burkholz for additional information.

Use library 11.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ATOA	1407	1/14/69	12
7	HARD	1407	7/15/69	16
8		1407	6/12/69	4
9		1407	6/12/69	4
10		1407	6/12/69	4
11		1407	6/12/69	3
12		1407	6/12/69	3
13		1407	6/12/69	3

Library 12 is a new library file.

Item 22 (TRAJ) is the work of Don Kephart in System Sciences. D-18954-ARPA, "Point-to-point Vacuum Earth Ballistic Trajectories" presents directions on the use of the item, and its variety of options.

Use library 12.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
22	TRAJ	1407	7/16/69	12

Library 20, 21, 22, 30, and 40 remain untouched since last reported.

Use library 20.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	ROOT	1407	10/17/68	3
2	RAND	1407	11/01/68	3
3	CUFIT	1407	4/04/69	16
4	PROB1	1407	1/14/69	7
5	PROB2	1407	1/03/69	11
6	HXDEC	1407	2/28/69	8
7	INTRP	1407	3/19/69	1

Use library 21.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INVRT	1407	1/16/69	3
2	SIMUL	1407	1/30/69	5

Use library 22.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	OLS1	1407	3/24/69	9
2	OLS2	1407	3/24/69	7
3	OLS3	1407	3/24/69	7
4	OUT	1407	3/24/69	4
5	INSTR	1407	3/24/69	10
6	REG1	1407	3/24/69	16
7	REG2	1407	3/24/69	12

Use library 30.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	CORR	1407	12/11/68	2

Use library 40.

Roger.

Type item-list.

ITEM	CODE	RPN	DATE	SPACE
1	INSTR	1407	1/03/69	4
2	LINPR	1407	2/05/69	6
3	OUTPT	1407	1/03/69	2
4	SAMPL	1407	1/03/69	1

And now to the Catalog. Those readers who have tired of thumbing issues of the *Newsletter* in search of a description of a needed program should take heart. The JOSS Program Catalog is nearing reality.

A reminder to JOSS teletype users from Art Lucero:

Once data communications have been established between the teletype and a JOSS teletype channel to the PDP-6 computer, each user must begin his session with Control Q and end it with Control A. Data communications should be disconnected after the last Control A.

Those users who forget to press Control A must be disconnected from JOSS and its inscrutable accounting system by manual means, a tedious business for Art now that the number of teletype users is growing.



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August 1969
Number 22

Contents

REMOTE USERS: Greetings to old friends and new.
NEW DEMONSTRATION PROGRAM: Area of a polygon.
VARIABLE RESPONSE: How many in which queue.

REMOTE USERS

The assignment of our 8 new teletype channels is complete, although all the new users have not yet joined the system. This seems an appropriate time to introduce RAND JOSSers to our newcomers, as well as to renew old acquaintances with our long-time remote friends.

Current blue-console sites are: McClellan Air Force Base, Sacramento, California; Offutt Air Force Base, Omaha, Nebraska; and these three groups in the Pentagon...OASD, ARPA, and AFCSA. Veteran teletype users are: Langley Air Force Base, Virginia; Nellis Air Force Base, Nevada; Air Force Cambridge Research Laboratory, Bedford, Massachusetts; Air Force Budget and Air National Guard in the Pentagon.

New teletype sites connected to JOSS are: Air Force Avionics Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio; AFCRL at the Lunar Laser Observatory in Tucson, Arizona; AFXOWG in the Pentagon; ADC at Ent Air Force Base, Colorado; another group at Offutt in Nebraska; and the first of a pair of sites, Eglin Air Force Base in Florida. Their associates at Kirtland Air Force Base, New Mexico, will be on shortly. Three more teletypes are expected in the Washington area.

Completing the family of remote users are the teletypes in RAND's Washington and New York offices. Remote JOSSers who find themselves at another remote site should log on to the system with their "home" project number and department number (each 3 digits) to charge their usage to their own site.

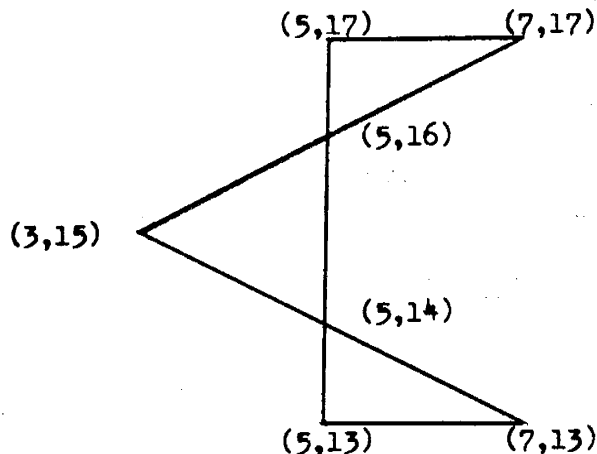
NEW DEMONSTRATION PROGRAM

Terry Linkletter, a summer student in Computer Sciences, has contributed a program to library 1, our file of demonstration programs. To compute the area of a polygon, first:

Use library 1.
Recall item 9 (AREA).
Do part 1.

Instructions then explain that you must input the (x,y) coordinates of the vertices in clock-wise fashion to insure a positive value for the area. If your polygon has an imaginative shape, you may wonder what is meant by "clock-wise". As the example below will show, unless each sub-polygon is traced in a clock-wise manner, it will contribute a negative value to the total area.

Try this polygon, first considering it traced through these 5 vertices... (5,13), (5,17), (7,17), (3,15), (7,13)... and then through these 9 vertices... (5,13), (5,14), (3,15), (5,16), (5,17), (7,17), (5,16), (5,14), (7,13).



VARIABLE RESPONSE

Time-sharing in JOSS means sharing the various facilities with others requesting them. To share such services as computing, access to files, typing commands, and so forth, you wait in patient British style in a corresponding queue. The longer the queue, the more noticeable will be the JOSS response time.

JOSS users, who are accustomed to occasional delays in recalling items from files, have sometimes been puzzled by a difference in the compute time of a familiar program from one session to another. The difference is probably due to the differing lengths of the compute queues during those sessions. Normally, at any instant of prime-time, the JOSS compute queue contains from 2 to 5 users. If you run your program at 1 AM, your compute-oriented program is likely to run faster...unless, of course, other similarly motivated JOSSers join you at that hour.



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August 29, 1969

JOSS FLASH

The April 1968 JOSS Newsletter listed an item that began:
"JOSS file space is being used up at a rapid rate..."

The August 1968 Newsletter described a campaign to discard items no longer used with the comment that "...file space is not an unlimited resource, especially with the increase in the number of users and requests for multiple files."

Today, August 29, 1969, we announce that JOSS files occupy 74.6% of the available disk space, and we predict that at the present rate of growth the disk will be full before the end of this year!

What to do? Simply this:

1. Discard all items no longer needed, including those in the public files.
2. For those items seldom used, but still of value and difficult to recreate, request that cards be punched as backup, and discard the items on receipt of the cards and listings. (See the March 1969 Newsletter for backup procedures.)
3. For files no longer required, discard all items and notify Shirley Marks that you wish to close the files.

Please help us to avoid the alternatives to this voluntary cleanup.



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September 1969
Number 23

Contents

FILE SPACE: Shortage of...
LOGGING ON: A department by any other name...
MATRICES: An RM by Dick Clasen.

FILE SPACE

The August 29th JOSS FLASH warned of the increasing shortage of space on the disk for storing file items. JOSSers were requested to examine both their personal files and the public files, to discard items no longer needed, and to request a punched-card backup for dormant items before discarding them.

It is too soon to see the effect of this appeal. However, a review of the public files--101 (RAND1) through 109 (RAND9)--shows a number of items that are both old and large. The public files are intended for temporary storage...you may want to store items while learning...or while awaiting the assignment of a personal file...or when you discover you have run out of personal file space during a session. After such immediate needs have been satisfied, you should transfer wanted items to your new personal file, and discard all items from the public files.

Not only does overlong storage of large items make the public files less available for emergency or other short-term use, but it also contributes to the overall shortage of disk space.

LOGGING ON

The renaming of RAND departments provides a continuing challenge to Larry Clark's ingenuity. Larry selects the mnemonic version of each department name for the JOSS log on, trying to eliminate ambiguities caused by JOSS' habit of looking only at the first three characters of the department identification a user types. The following table lists the current name, the mnemonic(s), and the 2-digit department number (an acceptable substitute for the mnemonic).

DEPARTMENT NAME	JOSS MNEMONIC	DEPARTMENT NUMBER
Administration	ADM	23
Computer Sciences	COM, CSD	81
Economics	ECO	10
Engineering Sciences	ENG	33
Environmental Sciences	ENV	35
Library	LIB	21
Mathematics	MAT	80
Materials, Facilities, Services	MFS	20
Mail & Records	M+R	26
Management Sciences	MAN, MSD	12
Personnel	PER	28
Physics	PHY	40
Reports	REP, RD	60
Research Council	RC	30
Resource Analysis	RAD	11
Security	SEC	27
Social Sciences	SOC	90
System Sciences	SYS	34

MATRICES

In RM-4952-PR, *Numerical Methods for Inverting Positive Definite Matrices*, Dick Clasen compares the accuracy of several well-known methods. Of particular interest to JOSS users is the program illustrated on page 46, using a method recommended by Dick.



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October 1969
Number 24

Contents

THE JOSS REPRESENTATIVE: A friend indeed.

THE JOSS REPRESENTATIVE

Between JOSS the Helpful Assistant, solver of small numerical problems, and the user stands the JOSS Department Representative, solver of small human problems.

If you are a newcomer to JOSS, ask your JOSS Rep for a brief demonstration at a console. He will probably suggest that you order a few publications for an introduction to the system. If you plan to become an addicted JOSSer, he will send your name to Jane Saindon in Computer Sciences so you will receive the JOSS Newsletter each month, and will explain how to request personal files for storing your programs between sessions.

Whether or not you are a beginner, you are welcome to ask your JOSS Rep for help with a program. On the rare occasion when JOSS is behaving inscrutably, your department Rep may respond with "Eh?" and direct you to JOSS personnel in Computer Sciences. At such times, it is helpful to see the printout of your entire session.

JOSS Reps perform several administrative chores. They referee the access to department consoles, and make arrangements for demonstrations for department visitors. They edit the semi-public department files to keep programs and RPN's up-to-date and worry about the personal files left behind by departed JOSSers.

Following is a list of current assistants to the Helpful Assistant.

DEPARTMENT

Computer Sciences
Economics
Engineering Sciences
Environmental Sciences
Management Sciences

JOSS REPRESENTATIVE

Shirley Marks
John Koehler
Carroll Lindholm, Lou Rowell
Frank Murray
Dick Stanton

<u>DEPARTMENT</u>	<u>JOSS REPRESENTATIVE</u>
Mathematics	Oliver Gross
Physics	Art Smith
Resource Analysis	Hal Boren
Reports	Bob Duis
Social Sciences	Bill Stewart
System Sciences	Jim Rosen
New York Office	Sandy Stevenson
Washington Office	Paul McClenon

JOSS Representatives at locations remote from RAND Santa Monica have additional concerns. They are the principal channel for both data and human communications difficulties, which are more sensitive as distance increases. To all the JOSS Representatives, both with RAND and in the Air Force:

Do part 1.

Thank you from the bottom of my core.

Yours,
JOSS



Jane Saindon
EDITOR.
Ext. 436

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

October 3, 1969

JOSS FLASH

At 5 PM PDT, Friday, October 3, JOSS files reverted to their status as of 5 PM PDT, Wednesday, October 1, because of trouble with the disk file.



EDITOR • Jane Saindon
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

November 1969
Number 25

Contents

THE JOSS PROGRAM LIBRARY CATALOG: At last...

The idea of a Program Library and Catalog was first proposed to JOSSers in the July 1968 issue of the Newsletter. In that issue, library files and a new command to access them were described. In September 1968, readers were invited to send programs for review, and succeeding issues (January, April, and July 1969) kept track of the changing state of the library as JOSSers responded to the call.

However, those who searched with wet thumb through back issues for mention of a regression program or a routine to generate random numbers wondered when the Catalog would appear as promised. Accompanying this November 1969 Newsletter is the long-awaited Catalog, differing in some respects from its portrait as painted in July 1968. One difference is in the way it is to be up-dated.

Following this initial distribution of the Catalog, changes will appear each month as necessary, as a companion to the Newsletter. Sections of the Catalog will be dated rather than pages numbered, and abstracts of programs will appear on separate dated pages to facilitate inserting new ones. The Subject Index, which points to entries in the list of abstracts, will be reissued as a whole when new abstracts are distributed.

The distribution list for the Catalog is the same as for the JOSS Newsletter, and changes can be made to it by contacting Jane Saindon in Computer Sciences.

To encourage JOSS users to contribute a favorite program to the Library, sample submittal forms have been included in the Catalog. If you wish to offer a program for review, please store a well-annotated version in a public file and send a submittal form to Shirley Marks in Computer Sciences.



Jane Saindon
EDITOR •
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

December 1969
Number 26

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NEW JOSS LOG-ON JANUARY 1: A function of RAND-wide accounting changes.
"TYPE ITEM-LIST.": Two new columns describe an item's usage.
ILLEGAL PROJECT NUMBERS: If you can't lick 'em...

NEW JOSS LOG-ON JANUARY 1

Certain changes to RAND's accounting procedures will affect JOSS beginning the first of next year. As of January 1, both RAND and non-RAND JOSSers will log on to the system in this fashion:

1. "Department" and "Project number" will be interchanged in the log-on message as follows:

JOSS at your service.

Initials please:

Department:

Project number:

2. Department numbers for JOSS will be those in the following table, with RAND-ites also allowed to use an appropriate department code. JOSSers who use a terminal other than the one at their "home" location will log on with their home department number or code.

<u>DEPARTMENT OR SITE</u>	<u>JOSS DEPT. NO.</u>	<u>DEPT. CODE</u>
Administration	400	ADM
Communications	700	COM
Computer Sciences	100	CSD
Economics	120	ECO
Engineering Sciences	130	ENG

DEPARTMENT OR SITE	JOSS DEPT. NO.	DEPT. CODE
Environmental Sciences	140	ENV
General Services	420	GS
Information Services (Library, Mail & Records)	450	IS
Management Sciences	150	MSD
Materiel, Facilities	410	MF
Mathematics	160	MAT
New York Office	210	NY
Personnel	430	PER
Physics	170	PHY
Reports	310	REP
Research Council	200	RC
Resource Analysis	110	RAD
Security	440	SEC
Social Science	190	SOC
System Sciences	180	SYS
Washington Office	800	WAS
TAC-Langley	851	
AFCRL-Bedford, Tucson	852	
TAC-Nellis	853	
AF Budget-Pentagon	854	
SAC-Offutt	855	
SMAMA-McClellan	856	
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AFCSA-Pentagon	858	
Air National Guard-Pentagon	859	
AFXOWG-Pentagon	860	
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AFRDQ-ANSER	866	
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Please notice that there no longer will be a distinction between in-RAND and remote JOSS users. For example, a RAND-Santa Monica JOSSer who uses a Pentagon blue console or teletype can log on with his RAND department code.

Also, Air Force users at SAC and AFCSA no longer need to distinguish their console from their teletype usage when logging on to the system.

3. JOSS will allow for a 5-digit project number. Most RAND project numbers will remain the same, with an "imagined" zero added at the left. For these, the user will log on as now with a 4-digit number, the left-most zero being understood by the system. Similarly, non-RAND JOSSers can continue to type a 3-digit project number of their choosing, and JOSS will "imagine" two zeros at the left; or they may select a new set of 5-digit numbers if they like.

Overhead project numbers for users will continue to be "1" for learning, and "2" for demonstrations.

"TYPE ITEM-LIST."

At present, JOSS responds to the command "Type item-list." by typing 5 columns headed as follows:

ITEM	CODE	RPN	DATE	SPACE
------	------	-----	------	-------

referring to the item number (1 to 25), the user-assigned 5-character code, the project number under which the item was filed, the date filed, and the number of records occupied by the item on disk.

To assist users in keeping track of an item's usage, two new columns have been added to the "item-list" of a file, and will appear on command after the first of the new year. The format will then be:

ITM	CODE	RPN	SPACE	FILED	USED	TIMES
-----	------	-----	-------	-------	------	-------

The first three columns contain the same information as before; "SPACE" is now the fourth column; "FILED" is the same as the previous "DATE". "USED" records the date the item was last used, and "TIMES" refers to the number of times the item has been used since its "FILED" date.

These new columns should help users keep track of dormant items, so they may request punched-card backup for seldom-used items before discarding them. In the case of library programs, we

will have a record of their popularity, which is not necessarily a measure of their usefulness of course. Values for these new columns have been accumulating for the past six months for personal and department files, and since Thanksgiving for the library files.

ILLEGAL PROJECT NUMBERS

Past issues of the Newsletter have encouraged users to log on with current and appropriate RPNs. To assist users, a current RPN list will be located near consoles, and replaced each month.

But, no matter how diligent JOSSers may be in accurately logging on to the system, they still face the problem that a correct RPN may in time become changed or obsolete, with items continuing to be charged each month to the illegal RPN. The solution to this quandary is of the "if you can't lick 'em, join 'em" variety. Beginning on January 1, there will no longer be a charge made for the storage of file items. There will continue to be the charge based on compute time and program size for a session.

The monthly JOSS usage summaries sent to each department and site will still record file storage for the month for each RPN and user's initials. Users will still be urged from time to time to edit their files, but to conserve disk space rather than to eliminate illegal RPNs.

* * * * *

Many happy RETURNS of the season.

To all.

From JOSS.

THE JOSS NEWSLETTER:
January 1970-June 1970

Judy Allardice
Editor

June 1970

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THE UNDERSCORE:	The last word.
LIBRARY PROGRAMS:	New identifications, new Catalog.



EDITOR • Jane Saindon
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

January 1970
Number 27

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MAINTENANCE SCHEDULE: Somewhat flexible.
DISK DUMP: Memories; a reading assignment.
RIGHT MARGIN: A slight adjustment for console users.
REPRODUCIBLE JOSS: Printing on vellum.
BACK ISSUES: P-3940/4.

MAINTENANCE SCHEDULE

The normal schedule for preventive maintenance is Monday, Wednesday, and Friday evenings, from 5 PM to about 9:30 PM, Pacific time. Once a month, there is additional maintenance on peripheral devices, generally on a Saturday announced in advance. There are also the occasional periods of unscheduled emergency maintenance, with a warning via console beeps and page heading, and recording on extension 233.

Whenever possible, maintenance times are selected with the interests of users in mind. If you anticipate a special need for JOSS, please let Art Lucero (extension 415) know in advance so that he can consider your requirements in planning downtime.

DISK DUMP

Recently, an administrative message in the JOSS page heading resulted in calls to extension 415, inquiring what was meant by "NO DUMP" as a reason for an early maintenance recess. The message was unduly cryptic because of the small space available for heading commentary. To appreciate this provocative phrase if you joined JOSS after November 1968, or just to recall old memories, please read the December 1968 issue of the Newsletter.

You will find that "DUMP" refers to the copying of JOSS files from their home on magnetic disk to backup magnetic tape. You will also understand why not having been able to obtain such a dump for a week (because of the holidays and a spell of machine trouble) necessitated taking an early recess.

RIGHT MARGIN

A JOSS console line contains a maximum of 78 characters, with margins generally set at 6 and 84. To eliminate a problem involving tabs, a modification was made to each console, resulting in another problem--which can be eliminated by setting the right margin at 85 or beyond.

Before the modification, if a form being typed contained more tab characters than there were physical tabs set, the type ball would stick at the right with the console hung in red. The October 1968 Newsletter described how to extricate oneself from this hangup. Art Lucero helped further by fixing each console to return automatically, avoiding such Mickey Mouse procedures.

However...the sensing device requires one position beyond the last character. If you expect a line to contain a full 78 characters, the margins should allow for 79 characters (as in the case of the GRAPH program in library 1).

REPRODUCIBLE JOSS

Console users who want to include JOSS printout in a publication can obtain carbon-backed vellum by calling Art Lucero on extension 415. Art should be able to direct you to a console that is typing well.

BACK ISSUES

The JOSS Newsletter: July 1969-December 1969 is available from the Reports Department as P-3940/4. Previous bound volumes of the Newsletter can also be requested from Reports, as P-3940/1, 2, and 3. Please call Jane Saindon in Computer Sciences for individual back issues, and to be placed on the distribution list.



EDITOR • Jane Saindon
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February 1970
Number 28

Contents

PUNCHED-CARD FILE BACKUP: New format; extra listings.
TELETYPE USERS: Control Q, Control A; character
equivalences.

PUNCHED-CARD FILE BACKUP

The March 1969 issue of the Newsletter described the format of the punched-card backup for requested file items. In that original format, between the header and trailer cards identifying the item were the "n" cards of the item, with text in the first 72 columns followed by 8 columns of identification and sequence number.

In a very few instances, JOSS characters in the leading columns proved indigestible to IBM System 360. So after the first of this year, the format was changed to place the more acceptable 8 columns of identification and sequence number in the first 8 columns of each text card, with the text in the remaining 72 columns. In addition, the programs that print and reload a file from punched cards were modified to accept both old and new formats.

Incidentally, if you misplace a listing of a backup deck or simply would like another copy, please send the deck to Shirley Marks asking that it be printed.

TELETYPE USERS

Occasionally a JOSS teletype user finds that pressing Control Q after establishing a data connection does not result in the familiar friendly greeting. It may be that the last person to access JOSS during the previous period of connection did not press Control A to terminate his session. If such is the case, then pressing Control A followed by Control Q will place JOSS at your service.

The ancient (1966) list of teletype equivalences for JOSS console characters was retyped to provide copies for the many new remote users. Tom Kirschbaum, Computer Sciences consultant from UCLA, has discovered that the "less than or equal" and "greater than or equal" characters should be interchanged on the new list...that is, Shift L really produces the "less than or equal" character.



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EDITOR • Jane Saindon
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

March 1970
Number 29

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THE JOSS DISK FILE: Gloom and rays of sunshine.
THE UNDERScore: A blank look.

THE JOSS DISK FILE

The week of March 2 began in gloom for the disk file attached to the JOSS PDP-6 computer. This magnetic storage device is the home of personal, public, and library files. Sporadic difficulties in previous months had been remedied as they arose. However, it became obvious this week that merely replacing a bad component was not going to be sufficient to prevent future damage to the disk file. So a major overhaul of the equipment was begun.

Part of the repair work consisted of replacing 11 of the 16 individual disks in the file by ones with an improved oxide coating. The other 5 are already of this type. It is hoped that such replacement will lessen the chance of a "crash", that unpleasant-sounding catastrophe that occurs when a read-write head digs into the surface of a disk.

During a portion of the down time for the disk file, JOSS was up and running without files. Loyal users accessing the system numbered as many as 11 at one time, recalling the early days on the PDP-6 before files were implemented, and the historical file-less days of JOHNNIAC. It is unfortunate that limited space did not permit JOSSers to visit the basement computer room to view the floor-full of disassembled disk, as in the background the on-line teletype merrily chattered each minute's record of JOSS usage without files.

When the system is completely operational again (expected to be sometime Monday, March 9), the files will be restored as of their status on Monday morning, March 2.

THE UNDERScore

An underscore in a "Type" command may produce a blank line, or a blank field within a line. For example, the command

"Type a,_,b."

produces three lines, with the value of "a" on the first, a blank second, and the value of "b" on the third. The command

"Type a,_,b in form 1."

(where "form 1" contains three fields) produces one line, in which the first field contains the value of "a", the second field is blank, and the third field contains the value of "b".

Suppose that the command

"Type f(a),f(b),f(c) in form 1."

produces occasional zeros which you prefer to have appear as blanks, then this conditional formula will do the trick:

Let $f(x) = (x=0:_;x)$.

A class of junior high school students were asked to write a paragraph giving their impressions of a recent visit to JOSS. One young man referred to the Helpful Assistant as "outa site", certainly one of the nicest compliments ever paid to a remote computer system.



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EDITOR • Judy Allardice
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

April 1970
Number 30

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PUBLIC FILES:	Spring cleaning.
THE UNDERSCORE:	Once more.
CONDITIONAL COMMAND:	An iffy proposition.
DELETING A "DO":	Now you see it, now you don't.

NEW EDITOR

Jane Saindon, who has been Newsletter editor since July 1969, will be assuming other responsibilities. Judy Allardice, transferring to Computer Sciences from Administration, becomes our new editor. Please contact Judy about back issues, or changes to the distribution list for the Newsletter and Library Catalog.

PUBLIC FILES

Files 101 (RAND1) through 109 (RAND9) are due for their regular spring once-over. If you suspect that you have items stored on a more than temporary basis, please survey the files now and move these items to your personal file. All items filed prior to 1970 are candidates for the discard heap.

THE UNDERSCORE

Last month's issue attempted to show how to substitute blanks for zeros in a line containing three fields. The example was poorly expressed. Try this instead.

Suppose that the command

Type a, b, c in form 1.

produces occasional zeros which you prefer to have appear as blanks. Then these two commands will do the trick:

Let $f(x) = (x = 0: _ ; x)$.

Type $f(a)$, $f(b)$, $f(c)$ in form 1.

CONDITIONAL COMMAND

In a conditional command, the portion following the "if" must have a truth value (that is, equal "true" or "false"); a numerical value will cause JOSS to respond with "Eh?". This fact may occasionally cause confusion between

1.1 Type "A" if x.

and

2.1 Type "B" if x = y.

In step 1.1, x must have the value "true" or "false". In step 2.1, x and y may have the values "true", "false", or a legitimate JOSS number. In any of these latter cases, "x = y" then has a value of "true" or "false".

DELETING A "DO"

The following steps illustrate how JOSS interprets a "Do" command, obeying it for its complete range despite a rather abrupt dismissal.

1.1 Do part 2 for i = 1,2.

2.1 Delete step 1.1 if i = 1.

2.2 Type all.

"Do part 1." will prove that step 1.1 has indeed disappeared, yet a copy of part 2 (and the value of the only variable, i) will be displayed once for each value of i.



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EDITOR • *Judy Allardice*
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April 20, 1970

JOSS FLASH

The JOSS disk file will be down for routine maintenance on Friday, May 8, from 8 a.m. to 5 p.m. Pacific time. Since the PDP-6 will be required, JOSS will be off the air during these hours.



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EDITOR • Judy Allardice
Ext. 436

May 1970
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The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

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SPARSE ARRAYS: Getting nothing for nothing.
UNATTENDED CONSOLES: A reminder of a reminder.
USE OF PUBLIC JOSS ROOMS: The golden rule revisited.

SPARSE ARRAYS

In RM-5270-PR, "JOSS: Central Processing Routines", Joe Smith describes the command

Let A be sparse.

which allows you to assign the values of only the non-zero elements of the array A. JOSS then "understands" that non-assigned elements have the value zero, without actually storing them. If some elements of A have already been assigned values by the time JOSS executes the sparse command, existing zero elements will continue to be stored as are any assigned non-zero elements.

If the sparse command is obeyed before any element has been assigned a value, JOSS is aware that the array is to be sparse, but he will not indicate this to you until you assign a value to at least one element.

For example, if no element of A has a value yet, the two commands

Let A be sparse.

and

Type A.

produce the response

A = ???

and

Type A(3).

results in

A(3) = ???

However, JOSS responds to

Set A(1)=2.

and

Type A(3), A.

with

A(3) = 0

A(1) = 2

A is sparse

When you file a program in which an array has been defined to be sparse, the "sparseness" is retained when the program is recalled from the file.

UNATTENDED CONSOLES

Console-sharing is a necessary facet of time-sharing. Here is a reprint of a REMINDER in the November 1968 issue of the Newsletter:

If you need to leave a JOSS console running in a public JOSS room, please place a note on the console so that others who want to use it will know who you are and when you plan to return. If you come upon an operating JOSS console, in a public JOSS room or in an office, please do not interrupt its operation, even if you think it has been abandoned in its "green state".

USE OF PUBLIC JOSS ROOMS

The thoughtful use of public JOSS rooms, both during the working day and after hours, is an important part of the friendly JOSS environment. However inviting the blue console and its easy-to-learn-easy-to-use language may be, a user is easily turned off by the discourtesy of previous users of a public room.

Please discard unwanted paper and refreshment remains in the circular file, replace reference documents, and be kind to power cords.



EDITOR • *Judy Allardice*
Ext. 436

June 1970
Number 32

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

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JOSS FILE SPACE:	Middle-age spread.
SPARSE ARRAYS:	More on that subject.
THE UNDERSCORE:	The last word.
LIBRARY PROGRAMS:	New identifications, new Catalog.

JOSS FILE SPACE

More than 80% of the disk attached to the PDP-6 computer is now occupied by file items. Almost each month sees a rise in the percent of capacity used:

January 1970	75.7%
February	75.2
March	77.2
April	78.5
May	80.1

"Type item-list." continues to indicate which file items are seldom used, and thus are candidates for backup and discard. Please call extension 415 whenever you wish help in cleaning out your JOSS attic.

SPARSE ARRAYS

Last month, we discussed the command "Let A be sparse.", in the hope of clearing up an occasional source of confusion among JOSS users. Possibly we added a bit more to the murkiness. Please review the comments in the May 1970 issue before reading further.

The example illustrated a matrix A that was defined to be sparse before any element was assigned a value. The key word to understanding the JOSS response to "Type A." and "Type A(3)." is "dimensionality". Until an element of the matrix A has been assigned a value, JOSS doesn't know the dimensionality of the matrix; therefore the matrix is not yet defined. "Let A be sparse." will apply to A as soon as it has been dimensioned (by "Set A(1)=2." in the example).

Now what happens to A and its sparseness if the dimensionality of A is changed? "Set A(3,5)=9." for example indicates that A is now two-dimensional. Is A still sparse? No, since changing dimensions deletes the previous one-dimensional matrix A, and its sparseness along with it. "Delete A." would also nullify the sparseness of A relative to subsequent assignments of values to elements of a new matrix A.

THE UNDERSCORE

The April 1970 issue described a way to encourage JOSS to print blanks instead of zeros in any field of a line. Here is a variation on that theme, from Don Kephart:

```
1.1 Type a, (b=0:_; b), c in form 1.
a=1
c=3
Form 1:
- - -
Do part 1 for b=0,2.
1 3
1 2 3
```

LIBRARY PROGRAMS

For historical, and perhaps hysterical, reasons, JOSS library programs are identified as RM-xxxx, D-xxxxx, or P-xxx. The first two reflect the Rand documentation that is available for the programs, and the third, well, the third indicates that there is no published documentation. However, because of the confusion between P-for-Programs-without-documentation and P-for-Paper in the milieu of the Reports Department, we have decided to relabel all of the JOSS library programs.

Henceforth, all JOSS library programs will be identified as J-xxx. The entire Catalog is being reissued in June to reflect the new identification.

THE JOSS NEWSLETTER:
July 1970-December 1970

Judy Allardice
Editor

January 1971

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A USER WRITES:	Shades of archie the cockroach.



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EDITOR • Judy Allardice
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July 1970
Number 33

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TELETYPE:	Logging off.
LINE LENGTH:	A guide for blue console users.
HANGMAN:	Behind the scenes.
BACK ISSUES:	P-3940/5.

FILES

The June issue sketched the rise in saturation of the JOSS disk file for the period January through May, 1970. The May figure was 80.1%; June's is 84.3%.

Normally, the message "I've run out of file space." following a "File" command indicates that the total space after filing the new item would exceed 100. One remedy is to discard something from the file in question. Another is to file the item temporarily in a public file, and perhaps request that a new file be assigned.

If, however, the message occurs when there appears to be sufficient space in the file, then know ye that the disk file has finally reached fulfillment. All users--those who have conscientiously been editing their files, as well as those who have ignored past warnings--will be affected. The only choice a user then has during his session is to discard items from any of his files until there is room to file again.

TELETYPE

In February, the Newsletter explained to teletype users why they may occasionally find themselves already in JOSS (that is, why they do not receive the log-on greeting) when they establish their data connection. The reason is that the previous user of the teletype's channel did not press Control A to log off JOSS before disconnecting the terminal from data.

Air Force JOSSers accessing the system via our seven-line rotary need to be especially careful to log off properly. If a particular channel of the rotary remains connected to JOSS after a user has hung up his dataset, that channel is available to the rotary. The user to whom the channel is next assigned (courtesy of General Telephone)

will find strange initials in his page heading. Moreover, his usage will accrue to the previous user of the channel, unless of course he presses Control A to terminate the stranger's session, and Control Q to initiate his own.

LINE LENGTH

Blue console users who create programs for their disadvantaged teletype friends need to make sure that forms do not exceed the 72-character line length available to teletypes. You may find this a convenient measure:

.....|.....|.....|.....|.....|.....|.....|..

HANGMAN

The most reluctant young visitor to JOSS succumbs to the charms of Hangman, item 8 (HANG) in library 1. New users of the system who "Type all." may find rewards in poking around among the parts.

Part 1 assembles the list of words and directs the selection of six for a complete game. Part 2 controls the action for a single word to be guessed. Step 2.3 demonstrates the JOSS function "first". Step 3.5 uses the function "tv" to select an appropriate form. Part 10 divulges the secret of printing letters not yet guessed. Etc.

The program assigns integer values to the lower-case letters:

a = 1, b = 2, ..., z = 26.

A word is stored as the sum of the letter values times an appropriate power of 27. "quartz" is stored as:

$$17(27^5) + 21(27^4) + 1(27^3) + 18(27^2) + 20(27) + 26 = 2.55125051 (10^8)$$

BACK ISSUES

The JOSS Newsletter: January 1970-June 1970 will be available shortly from the Reports Department as P-3940/5. Individual back issues are obtained from Judy Allardice in Computer Sciences; P-3940/1 thorough /4 can be requested from Reports.



EDITOR • Judy Allardice
Ext. 436

August 1970
Number 34

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

Contents

CORE BLOCK	1, 2, 3, or 4.
SIZE:	An object of interest.
SPACE:	A distant relative of "size".
COST:	Small but measurable.

CORE BLOCK

When a JOSS user turns on his console, he is automatically assigned 1024 words of core memory for work area. During his session, as the need for storage increases beyond this initial block of core, the system assigns him a second, third, or fourth block. The limit of four blocks per user is designed to maintain a fast response for a reasonably large number of users.

The number of core blocks JOSS assigns during a session is related to the cost of that session, as you will see in COST below.

SIZE

The JOSS object "size" may appear in an expression, such as:

Type size.
Delete x if size = 1906.
Set G = size - 809.

Its value is the number of cells of work area currently occupied by a user's program.

A JOSS "cell" is equivalent to two words of core memory, and can hold one numerical value (additional cells are required for overhead if the value is an element of an array) or six characters of a program step, or form, or formula. The maximum size a user's program may occupy in his assigned work area is 1906 cells. This is the same as 3812 words of core memory, which is less than the "4 x 1024" maximum described above because the system uses some of the work area for overhead cells.

Joe Smith, in RM-5270-PR, distinguishes between the fairly silent majority of small users, and the few large users who "are always wringing out the last drop of space". The former rarely come

up against the 1906 maximum, and then usually do so in their use of recursive functions. JOSS temporarily stores in the user's work area intermediate results when evaluating a function. If the user fails to specify an initial condition in a recursively-defined formula, as for example:

$$\text{Let } f(x) = x \cdot f(x-1).$$

JOSS will run out of storage in attempting to complete the evaluation for a particular x . Even if the definition is adequate:

$$\text{Let } f(x) = (x=0:1; x \cdot f(x-1)).$$

too many intermediate values may use up the available work area.

Those who need to stretch JOSS to its limits are directed to The JOSS Notebook, RM-5367-PR, sections 3.30 and 5.18. Caveat emptor, however.

SPACE

The JOSS term "space", as it appears in the fourth column of a file's item-list, refers to the number of records a file item occupies on the disk. JOSS types the message "I've run out of file space." if the total number of records after filing an item would exceed 100. Here JOSS specifically mentions "file space".

Other messages, such as:

I've run out of space during above.
I ran out of space at step 2.1.
Revoked. I ran out of space (in formula f).

refer to the size of the user's work area.

The numerical correspondence between "space" and "size" may raise questions without absolute answers. Although program components (steps, forms, formulas, values) appear in a file on disk in the same format as if typed at the console, they may be stored in the work area in a more compact form. The greatest discrepancy occurs with values. For example, a certain item consisting exclusively of values averages 49 cells per record (size = 1579, space = 32). The Blackjack program in library 1 averages 90 cells per record (size = 1085, space = 12).

COST

The cost of JOSS usage is small relative to that of RAND's other systems. However, it does accumulate, and has been known to devour a limited budget. This is how it is calculated.

The number of charge units for a computation period is the product of

1. the number of core blocks required for work area, and
2. the compute time, measured in 60ths of a second (called "tics")

The JOSS accounting program accumulates the charge units from each computation period of a user and produces the total charge units for the session. These totals are available, on request of Shirley Marks in Computer Sciences.

The cost of a thousand charge units is

1. \$.06 for Project RAND jobs
2. \$.20 for non-Project RAND jobs.



EDITOR • Judy Allardice
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Contents

SIZE OF AN ARRAY: A formula for reducing.
QUIT: The end of a "Do".
TRUE OR FALSE: A logical explanation.

SIZE OF AN ARRAY

Fred Blackwell of Computer Sciences contributes a formula for the "size" of an array. (Please see the August 1970 issue for a discussion of size.)

Suppose that the array has n dimensions, where $n \leq 10$, and that each of the n indices has N different values. Then:

$$\text{size} = 1 + \sum_{i=1}^n \prod_{j=1}^i N_j$$

Thus, a three-dimensional array (with first index having N_1 values; second, N_2 values; third N_3 values) would occupy a size of:

$$1 + N_1 + N_1 N_2 + N_1 N_2 N_3$$

In particular, an array $A(x,y,z)$ --where x has values 4,6; y has values 1, 2, 3; and z has values 52, 100--would have a size of

$$1 + 2 + 6 + 12 = 21$$

Notice that if the indices are rearranged from left to right in the order of least number of values to greatest-- x has values 4, 6; y has values 52, 100; z has values 1, 2, 3--then size:

$$1 + 2 + 4 + 12 = 19$$

This rule for minimizing the size of an array becomes apparent from an examination of the formula above.

QUIT

The "Quit" command instructs JOSS to terminate the previous "Do" at the current value of the letter prescribed in its "for" phrase. For example:

1.1 Do part 2 for i=1(1)4.
1.2 Type i.

2.1 Quit if i=2.

Do part 1.

i = 2

Here is how one might use "Quit" to perform a table-lookup. Suppose we have already assigned values to $x(i,j,k)$ and $y(i,j,k)$ for $i=1,2$; $j=1,2,3$; $k=1,2,3,4$. We would like to input an A, find a matching $x(k,j,k)$, and type the corresponding $y(i,j,k)$.

1.01 Demand A.
1.02 Do part 2 for i=1,2.
1.03 Type "A is not in table." if $A \neq x(i,j,k)$.
1.04 To step 1.01 if $A \neq x(i,j,k)$.
1.05 Type $y(i,j,k)$.

2.01 Do part 3 for j=1,2,3.
2.02 Quit if $A=x(i,j,k)$.

3.01 Do part 4 for k=1,2,3,4.
3.02 Quit if $A=x(i,j,k)$.

4.01 Quit if $A=x(i,j,k)$.

"Do part 1." triggers the following actions:

If there is an $x(i,j,k)$ to match A, step 4.01 terminates the range of k in step 3.01; step 3.02 terminates the range of j in step 2.01; step 2.02 terminates the range of i in step 1.02. If A does not match any $x(i,j,k)$, then all ranges run to completion, and steps 1.03 and 1.04 are obeyed. If a match is found, step 1.05 types the corresponding $y(i,j,k)$.

TRUE OR FALSE

The following table points up a useful relation between two JOSS functions: $tv(a)$ and $|a|$.

a	$tv(a)$	$ a $
0	false	0
$\neq 0$	true	absolute value of a
true	1	1
false	0	0

We see that $tv(a) = |a|$ only when "a" has a logical value, true or false.

The Blackjack program illustrates a use of this relation, in protecting against a true/false response to a "Demand" for a numeric value:

8.5 Demand G as "Cut".

8.6 To step 8.5 if $tv(G) \neq |G|$.

The three-dimensional tic-tac-toe game in library 1 discourages a numeric response to a "Demand":

1.05 Demand v as "You want to move first? (true or false)".

1.055 To step 1.05 if $|v| \neq tv(v)$.

Of course, an illegal character or undefined letter will produce a JOSS reprimand at steps 8.5 or 1.05 above.



EDITOR • Judy Allardice
Ext. 436

October 1970
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CURRENT RPN LIST:	A log-on aid.
MSD JOSS ROOM:	New location.
"DOING" A "TO":	A JOSS subtlety.
SEEING STARS:	Asterisks in an item-list.

CURRENT RPN LIST

RAND JOSS Representatives receive a list of current RPNs each month, to post in public JOSS rooms and keep for reference by their department JOSSers. If you are one of the few who occasionally log on with an obsolete or incorrect RAND Project Number, but really would like your compute time charged to a current and correct RPN, please consult the nearest list.

MSD JOSS ROOM

Room 2310 is the new home of Management Sciences' public JOSS console, and the home-away-from-home of their mobile console. If you are curious about the location of all public JOSS stations, please see the yellow pages of the Rand directory.

"DOING" A "TO"

The "To" command is a puzzlement on occasion, as in this sample program:

1.1 To part 2.

2.1 Type "Note the difference between "Do step" and "Do part"".

2.2 Type "when the step or part consists of a "To" command.".

Do step 1.1.

Do part 1.

Note the difference between "Do step" and "Do part"
when the step or part consists of a "To" command.

In obeying a "To" command, JOSS establishes a pointer to the next step in a sequence. The direct command "Do step 1.1." is completed when the pointer is created, and control is returned to the typist. "Do part 1." instructs JOSS to follow the pointer to the end of the sequence (through step 2.2), and then return control to the typist.

For an extra treat, substitute "Do part 2." for step 1.1 above.

SEEING STARS

The last column of an item-list for a JOSS file indicates the number of times each item has been used since it was filed. Item 21 (BLACK) of library 1 shows its popularity by a *** in the "TIMES" column, having overflowed the allotted space since its introduction to fans of the demonstration file.



EDITOR • *Judy Allardice*
Ext. 436

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November 1970
Number 37

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JOSS TYPEWRITERS:	Five years of wear and tear.
COST INCREASE:	Sign of the times.
DECEMBER RECESS:	Extra green-time.

JOSS TYPEWRITERS

The first of the present JOSS typewriters was installed in September 1965. Since then, it is estimated, each has performed 50,000,000 operations per year--faithfully typing characters, spacing, shifting into upper case and back into lower, returning type balls to the left margin. The label "JOSS" on many carrier covers has worn to a memory, perhaps from appreciative pats by users. Others, not so appreciative, have occasionally dropped pencil stubs into the works or caused sprockets to protest the too vigorous removal of paper. Meanwhile, paging mechanisms have adopted an independent attitude.

Sensitive JOSSers may have noticed a change recently in the familiar sound of 15-characters-per-second clacking busily through RAND hallways. Rather than the toll of age, the more sedate 13-output-characters-per-second is part of the effort to lengthen the life of RAND's JOSS typewriters. More than a third of these--ones selected for their history of malfunction--have been rebuilt by IBM.

So, despite occasional twinges, there is still much vigor left in the faded blue Assistant.

COST INCREASE

In line with a general increase in RAND's computing charges, the price of JOSS computing is a penny more per thousand charge units--the Project RAND rate is now \$.07, and non-Project RAND is up to \$.21.

The August 1970 issue of the Newsletter defined a JOSS charge unit, and indicated how to learn more about JOSS accounting.

DECEMBER RECESS

RAND's recent announcement of a company-wide holiday recess will affect JOSS service to some degree. For the period from December 24 through January 3, there will be the regular maintenance on hardware components and files, but most likely at special hours during the day. Emergency maintenance will be at a minimum, corresponding to weekends and holidays throughout the year. If you anticipate a special need for reliable JOSS service during the recess, please inform Shirley Marks as much in advance as possible, so that special arrangements can be considered.

The December Newsletter will describe the service and maintenance schedule more fully.



EDITOR • *Judy Allardice*
Ext. 436

December 1970
Number 38

The RAND Corporation • 1700 Main St. • Santa Monica • California • 90406

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HOLIDAY RECESS:	December 24 - January 3.
FILES:	Going, going, ...
SIZE:	Done in by an undone Do.
A USER WRITES:	Shades of archie the cockroach.

HOLIDAY RECESS

While RAND takes a holiday, JOSS will continue to twinkle merrily in seasonal red and green. Following normal maintenance on Wednesday evening, December 23, there will be a special schedule for the 11-day recess. JOSS will be on the air from December 24 through January 3, except for maintenance periods on Monday, December 28 and Wednesday, December 30--for hardware from 3 pm to 5 pm, and files from 5 pm to 7 pm.

Of the JOSS staff, only Gordon Carlstrom (the resident DEC engineer) will be on hand, and only during the hardware maintenance hours noted above. During other hours, please report JOSS system trouble to the East Lobby Guard's Desk. Art Lucero will be happy to cure console ailments on Monday, January 4.

FILES

Disk file usage marches onward and upward.

November 20:	86.1%
November 24:	86.7
November 30:	87.0

The July Newsletter listed alternatives to tears when "I've run out of file space." greets your attempt to file an item. One is to discard from the file you are using (assuming it's your personal file) to make room for the new item. Another is to file the new item temporarily in a public file until you can be assigned another personal file.

All of which brings us back to the familiar topic of the public files and their use. File 100 (RAND0) is still the Mailbox file, meant for messages only. File 101 (RAND1) through file 109 (RAND9) remain the public files intended for temporary storage of programs. A survey this month of the item-lists of the latter shows them to be 77% full, with many items stored since the early part of the year. (A full non-library file contains 100 spaces, as indicated by summing the entries in the space column of item-list.)

So...if you store items in the public files, and leave them there, and one day wonder where they went...blame the discard of a desperate JOSSer.

SIZE

Size measures not only that portion of the user's work area (core block) occupied by program and generated data, but also the number of cells JOSS is currently using to keep track of suspended and continuing tasks. When tasks are completed, JOSS returns the "borrowed" cells to the user's block. Certain JOSS commands force such a restoration before a task is completed. The following illustrates how "File" does this.

1.1 Do part 2 for i = 1(1)10.

2.1 Type i.

Begin the program with "Do part 1.", then press INTERRUPT after a few lines, and type size. File all as an item, delete all, recall the item, and once more type size. You will find that the second size is smaller than the first, which includes the cells used for JOSS's bookkeeping of the incompleting "Do".

A direct "Do" or a "Cancel" command can be used to regain JOSS work space. For example, a nest of "Do" commands in a large program may require so many borrowed bookkeeping cells that JOSS responds with "I've run out of space.". The direct "Do" would reinitiate computation (if this is desirable) after restoring cells. The "Cancel" command would merely restore the cells.

A USER WRITES

The late writer Don Marquis left some paper in his typewriter one night, and acquired a small friend, archie the cockroach, who typed lower-case wisdom by diving head-first at each key.

archie's persistence is matched in spirit and case by this record found one recent morning in the teletype in the PDP-6 room.

0415 11/24/70 #0

(1)

~USE ITEM LIST.
EH?
~RECALL ITEM(21/
EH?
~RECALL ITEM 21 (BLACK)
EH?
~TYPE ITEM LIST.
EH?
~USE JOSS.
EH?
~START JOSS.
EH?
~USE FILE 1.
I CAN'T FIND THE REQUIRED FILE.
~USE FILE 100
EH?
~USE FILE 100.
I CAN'T FIND THE REQUIRED FILE.
~USE FILE 16
EH?
~USE FILE 16.
I CAN'T FIND THE REQUIRED FILE.
~USE FILE 15
EH?
~USE FILE 2.
I CAN'T FIND THE REQUIRED FILE.
~USE FILE 10.
I CAN'T FIND THE REQUIRED FILE.
~USE ANY DAMN FILE.
EH?

* * * * *
* A HAPPY HO-HO-HO FROM JOLLY JOSS *
* * * * *

THE JOSS NEWSLETTER:
January 1971 - June 1971

Judy Allardice
Editor

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EDITOR • Judy Allardice
Ext. 436

January 1971
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JOSS SCHEDULE: From morning till night.
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LEARNING: The graduate.
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JOSS SCHEDULE

JOSS returns from its holiday schedule to everyday operation with good wishes for 1971. Normal maintenance periods still occur on Monday, Wednesday, and Friday evenings beginning at 5 pm. The first two hours are devoted to hardware. Generally the disk maintenance follows immediately after, unless delayed by the press of work in RAND's main computer facility. Disk maintenance requires some two and one-half hours: to dump the files on a set of three backup tapes, to verify that the tape dump is correct, to assign requested new files, to close returned empty ones, and to perform the first step in punching cards for requested file items, or the last step in reloading punched items.

If you need to use JOSS between 5 pm and 9:30 pm on a Monday, Wednesday, or Friday evening, please see Art Lucero to inquire about special arrangements. If you plan to use JOSS following the scheduled maintenance, also check with Art to see if the disk dump can begin promptly at 7 pm.

Those of you who JOSS it in the Washington or New York Offices should note the hours when data travel via two Santa Monica WATS lines. Calls are placed from datasets in the PDP-6 room to datasets in these offices each Tuesday, Wednesday, Thursday, and Friday morning at 7:30 am Eastern Time. Our Santa Monica switchboard retrieves the lines for voice use at 10:45 am Eastern Time. The WATS call to New York connects to their teletype terminal. The WATS call to the Washington office normally connects to the blue console, but can access a teletype by a requested flip of a switch.

ACCOUNTING

Each month, a summary of JOSS usage is sent to departments and remote JOSS sites. Session time, compute time, and number of file items are listed by project number for each set of user initials. Each time you log on or off, or discard a file item, or spend time computing, JOSS writes information on an accounting

tape. At the end of each month, JOSS automatically writes facts on the tape about items still in files. Each time JOSS goes off the air, the current accounting tape is removed for later processing "upstairs". One result of that processing is the monthly usage summary.

The summary covers the period of time from approximately the 22nd of the previous month to the 22nd of the current month. Because of difficulty with tape drives during December, the processing ended with the 11th instead of the 22nd, making December's usage look slimmer than usual. The unreported portion will inflate the figures for January.

LEARNING

Newcomers to JOSS are invited to use Project Number 1 to indicate they are learning. Since their sessions consist of far more "green" time than compute time, their usage contributes little to overhead costs. However, when a RAND JOSSer graduates from the learning ranks, he should charge his usage to a legitimate RAND Project Number. Your Department Administrative Assistant or JOSS Representative can help you find an appropriate RPN.

BACK ISSUES

Greeting the new year is the latest edition of P-3940, the semi-annual binding of the JOSS Newsletters. If you wish a copy to replace your individual ones for July through December 1970, request P-3940/6 from the Reports Department.



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EDITOR • Judy Allardice
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February 1971
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Contents

FILES: Before the dam bursts.
LETTER NAMES: Value, array, formula.
FUNCTION OF A FUNCTION: Threading parameters.

FILES

The disk file is 91% full!

All JOSS users and representatives are being asked to help in editing personal and public files, to discard unwanted items, and to preserve seldom-used items on cards before discarding them.

JOSSers at RAND will soon receive notices, via their department representatives, of the pending crisis in file space. After you type item-list for each of your personal files, please check the columns headed FILED, USED, and TIMES to locate and remove dusty items. Candidates for a quick dispatch include copies of programs duplicated in the JOSS library. Your representative will be consulting with you about items in department files.

JOSS leaders at remote locations are being mailed item-lists for all files assigned to their groups. They may use the Mailbox file to request punched-card backup for dormant items. Listings will be sent, but cards retained at RAND for convenient reloading when needed.

LETTER NAMES

Of the 52 upper- and lower-case letters available to identify JOSS values, arrays, and formulas, a particular letter may name either a value or an array or a formula, but not more than one at a given time. For example, if "a" is assigned a value, JOSS understands that "a" is a scalar variable. If subsequently in the program's execution, a(3,5) is assigned a value, JOSS redefines (without an error message) "a" to be an array. References thereafter to "a" as a scalar will produce an error message. Similarly "Let a = ..." indicates that "a" is a formula, and removes previous definitions of "a" as a scalar or array.

JOSS users who may convert their programs to or from other JOSS-like languages (e.g., CAL) should be aware that this JOSS rule may not apply in the other language.

FUNCTION OF A FUNCTION

Suppose we define two formulas, f and g :

Let $f(x,y) = g(x) + y$.
Let $g(x) = x + y$.

In formula f , x and y are both parameters, which are evaluated whenever f is referred to in a JOSS step, but whose values are not stored. In formula g , only x is a parameter; y is a variable already assigned a value, or the name of a formula whose components have values.

To show how y differs in the two formulas as given,

Set $y = 10$.
Type $f(2,3)$.
 $f(2,3) = 15$

We see that $g(2) = 2 + 10$, and $f(2,3) = 12 + 3$, or 15.

If we wish the y of formula x to be the same as the y of formula g , it must appear explicitly in both formulas as a parameter.

Let $f(x,y) = g(x,y) + y$.
Let $g(x,y) = x + y$.

Then,

Type $f(2,3)$.
 $f(2,3) = 8$

For, $g(2,3) = 2 + 3$, and $f(2,3) = 5 + 3$, or 8. If we type y , we find it still equals 10.



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EDITOR • Judy Allardice
Ext. 436

March 1971
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Contents

FILES:	Mopping up; the order of things.
MAINTENANCE STAFF:	Trebled.
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FILES

A sincere thank-you to JOSSers who have responded to our call for help in editing personal and department files. We see evidence of waters receding, but it is too soon to stop bailing. Therefore, a sharp nudge to those who have yet to survey their files, discard unwanted items, and request punched-card backup for dormant items.

You may receive a listing for a punched item in which the order of program elements differs from that of the familiar "Type all." printout. This occurs because JOSS assembles the elements differently from the way the disk maintenance program does.

Suppose you create a program at a console from formulas, steps, values, and forms. Whatever the order in which you type these elements, "Type all." produces first all steps, then all forms, followed by all formulas, and finally all values. If instead of typing in the program, you recall it as a file item, "Type all." will still print the program elements in the order of steps, forms, formulas, and values.

However, this may not be the actual order within the file item. If you had stored it away not by "File all as item..." but, for instance, by "File all values, all forms, all steps, all formulas as item...", then the order on disk will be values, forms, steps, and formulas. This will be the order when the item is punched and listed by the disk maintenance procedures. This will also be the order on disk again if you ask us to reload the item from cards.

But trust JOSS to put things back in accustomed sequence when you recall the item and type all.

MAINTENANCE STAFF

RAND extension 415 has been answered over the past JOSS years by the reassuring voice of Art Lucero, and in his absence by Gordon Carlstrom, the resident PDP-6 engineer. When neither has been available to repair or advise, an electronic secretary (after hours number: EX 3-0431) has offered electronic comfort.

In recent months, Art has been dividing his attention between JOSS and the RAND Videographics project. Assisting him in JOSS console maintenance is Norm Johnson and occasionally George Herrick. Art and Norm and George are active in various RAND locations during the day. So extension 415 may now be answered in the basement PDP-6 room or in the Electronics lab in room 1325 or sometimes in both at the same time.

If your need is urgent, and no one answers extension 415, not even electronically, please call Shirley Marks on extension 507.

PROGRAM LIBRARY

Accompanying this March issue of the Newsletter is the first update of the Program Library Catalog since June 1970. Included are a new demonstration program in library 1, and items in library files 12, 51, 60, and 61.

Additional copies of the Catalog may be obtained from Judy Allardice, Program Librarian in Computer Sciences.



EDITOR *Judy Allardice*
Ext. 436

April 1971
Number 42

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JOSS CONSOLES: Limited supply in demand.
NEW JOSS REPRESENTATIVE: For Engineering Sciences.
ILLEGAL PROJECT NUMBERS: An overheadache.
CATALOG UPDATE: A blank look.

JOSS CONSOLES

The 26 blue consoles serving RAND Santa Monica were originally allocated among the various departments according to their anticipated usage. Some were placed in public rooms, available to all users whatever their department. Others were to be used in mobile fashion, to move from office to office as required within the department. Depending on the space at hand, departments have stored all, or some, or none of their assigned consoles in a public room. Their day-to-day management has been the lot of the JOSS Department Representatives, who gracefully walk the line between local and RAND-wide needs. Changes in these needs have affected the balance between public and mobile console access, as well as the original allocation among departments.

This month's Newsletter comments on the public room. The RAND telephone directory lists ten JOSS PUBLIC STATIONS, where a user-in-need hopes to find a free console. He is understandably annoyed when he finds instead an empty room. Has the console been borrowed briefly for office or demonstration, or loaned for a long-term project, and where does one ask about its return? To satisfy both wandering JOSSer and priority user, consider these guidelines. Unless maintenance demands otherwise, every public room should contain at least one console at all times. If two consoles are assigned to a public room, members of the corresponding department may borrow one with permission of their JOSS Representative.

What do you do then if your problem requires a console in your office, but your department's mobile consoles are in use, and its public room has a single (tempting) console? First, negotiate with the mobile users, and then, if necessary, enlist your Representative's help. In urgent situations, the JOSS staff in Computer Sciences will try to locate a loaner to resolve the impasse. In any case, the public console should remain publicly available as advertised. Future Newsletters will discuss plans to accommodate the new pressures for consoles.

NEW JOSS REPRESENTATIVE

Newcomers to Engineering Sciences may wonder why the codes for their department JOSS files include the letters AERO and ELEC. Old-timers will reminisce about the combining of two departments into one, and the retention of two fine JOSS Representatives, Carroll Lindholm and Lou Rowell. With Carroll's departure and Lou's devotion now to other responsibilities, we welcome Gail Burkholz as the new friend to JOSS users in Engineering.

ILLEGAL PROJECT NUMBERS

The JOSS software accepts project numbers which fall within certain stored ranges, even though some of these will later be rejected, after the fact, by the more up-to-date RAND accounting programs. These "illegal" numbers do not show up on the month-end JOSS usage summaries sent to departments, but do appear marked with an asterisk on the JOSS Session Logs kept in Computer Sciences. The cost for such usage is borne by overhead, and thus is spread to all users. To prevent such unfair distribution, please check the monthly RPN list before logging on to JOSS.

CATALOG UPDATE

An overly-thick update to the Program Library Catalog accompanied the March Newsletter at RAND. The printing vendor's error, which inserted blank pages between each abstract, came to late to save a tree. You might save future ones, however, by contributing your blanks to a convenient collection box.



EDITOR • *Judy Allardice*
Ext. 436

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THE MOBILE CONSOLE

In an ideal world, there would be as many blue consoles (and corresponding channels to the JOSS computer) as there are potential users at a moment in time. Lacking such a Utopia, we must allocate our limited resource in a way that satisfies individual needs without alienating the family of users. Last month's Newsletter emphasized the importance of the public JOSS console. This month we look at JOSS on the move.

The wheels of the console bring the computer into your office as a handy tool, along with the telephone, the chalkboard, and the well-stuffed bookcase. This deskside availability encourages a kind of exploration not quite so convenient in a public room. For example, you may be shuffling an abundance of reference material, or wish to confer with colleagues as the computation progresses, or perhaps the subject matter is not for all eyes. You may be on a project requiring extensive use of JOSS, so that you prefer to keep a console in your office even though it sits idle at times.

Please realize, however, that any particular usage is always subject to the demand and supply of consoles. If a JOSS Representative seems to pry into your personal JOSS style, it is only to ensure that all users receive their fair share of JOSS's time.

PARENTHETIC COMPUTATION

Page 3.31 of The JOSS Notebook, RM-5367-PR, presents a way to perform a secondary calculation without disturbing the main one. JOSS provides two commands, a parenthetic "Do" and "Cancel", that permit you to go off on a tangent after an interruption of a program's execution. In doing so, however, there is a possibility of running out of space and of changing values used by the main program.

You might experiment with a program like the following:

1.1 Do part 2 for i = 1(1)5.

2.1 Type i in form 1.

2.2 Do part 3 for j = 100(1)105.

3.1 Type j in form 2.

4.1 Type "This is a JOSS aside..".

4.2 Set j = 200.

Form 1:

i = _

Form 2:

j = ____

"Do part 1." initiates the execution. After a few lines of printing, an INTERRUPT provides an opportunity to

(Do step 4.1.)

JOSS will respond with the message "Done. I'm ready to go at step..." "Go." and a subsequent INTERRUPT allow you to

(Do step 4.2.)

which changes the value of j, as you will see when you continue with "Go.". A third INTERRUPT will enable you to type size before and after

(Cancel.)

JOSS PROGRAMS

If you plan to reference a JOSS program in any publication, consider whether it is located in a file you wish strangers to access. Public files are subject to alteration at any time, and you may not care to have your personal file tampered with. A more appropriate location is a library file, which is protected from user destruction. It is not necessary for items stored in library files to be in the Program Library Catalog. Please see Shirley Marks if this seems to fit your needs.



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EDITOR • Judy Allardice
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Contents

THE JOSS SYSTEM: Whither?
THE JOSS PEOPLE: Hither and yon.

THE JOSS SYSTEM

When Mark Twain cabled the Associated Press from London in 1897 that "the reports of my death are greatly exaggerated", he hardly considered that seventy-four years later his words might describe the rumored demise of a computer. This issue of the Newsletter is concerned with the future of JOSS, which, though aging, is still alive and well in Santa Monica.

In April 1970, Gary Brown looked into the cost of JOSS alternatives at RAND. He concluded that no reasonable substitute would cost as little as the current system, nor be as reliable even if implemented on a new machine. It seemed best then, and now, to maintain the present hardware as long as feasible. "Maintain" and "feasible" require some elaboration.

Since October 1967, the contract with Digital Equipment Corporation has authorized a resident engineer during prime shift, and a two-hour preventive maintenance period three evenings a week. The contract currently being negotiated with DEC specifies a man on call instead of a resident, during hours still to be determined. Hardware service is expected to continue at the accustomed level in spite of this change. Preventive care of the PDP-6 will probably remain on the present schedule. Data Products will as usual furnish disk servicing monthly and on call. IBM will still tend to the RAND and remote Selectric typewriters.

In addition to adjusting equipment to cure and forestall ills, the service engineers occasionally recommend the replacement of components to lengthen the life of a device. For example, the disk has been renewed with read-write arms, main-shaft bearings, and an improved oxide surface to discourage heads from crashing. Also, the most troublesome of the typewriters have received a major overhaul. On the day such renovation is no longer practical, JOSS will old-soldierly fade away.

THE JOSS PEOPLE

As the system has mellowed, users have grown independent, and complaints have become sparse. To reflect the decreasing demand for personal JOSS services, Computer Sciences has reassigned certain of them, and discontinued or curtailed others. In the latter category are the Newsletter and Program Library.

This 44th issue of the Newsletter is the last, the first having appeared in November 1967, and all being blue-bound semi-annually as P-3940/1,2,3,4,5,6, and shortly 7. The reproduction and distribution of the past year's Newsletters have been the fine work of Judy Allardice, with the pleasant assistance of Judy Hoepner.

The Program Library Catalog issued in March 1971 documents the final version of the library. Although no additional JOSS programs can be considered for review and abstracting, it will be possible to submit programs for storage in library files. The purpose of this service is to make available the read-only protection of the library files for those programs offered to other users in RAND documentation or by personal communication. A library location should be requested for such programs before referring to them in a publication.

A directory of the remaining JOSS services follows.

HARDWARE

Call Art Lucero, extension 415:

1. if you have trouble with your console, JOSS connection, or require special service such as WATS to the Washington or New York offices.
2. if you need supplies, such as paper, ribbon, long cord.

FILES

Call Judy Hoepner, extension 7681:

1. to request a new file assignment.
2. to close a file, which is first emptied of items.
3. to request punched-card backup and listing of file items, for which an item-list is then submitted indicating the desired items.
4. to reload previously-punched file items.
5. to change the user's name associated with a file.

JOSS CONSULTANT

Call Bill Allen, extension 7670:

1. on general questions concerning the hardware, software, or language, and for referral on any JOSS problem.
2. to arrange for demonstrations.

ACCOUNTING

Call Bill Myers, extension 638:

1. about the monthly usage summary.
2. to inquire about past costs or estimates of future ones.
3. to refer to the JOSS Session Logs or on-line statistics, both of which contain an abundance of evidence for cost analysts and detectives.

CONSOLE ALLOCATION

Call Bill Myers, extension 638:

1. to request a console for a special need.
2. to discuss a reassignment of department consoles.
3. to inquire about JOSS channel assignments or remote locations.

DOCUMENTATION

Call Judy Hoepner, extension 7681:

1. to recommend JOSS documents for learners, users, and visitors.
2. to order a copy of the March 1971 Program Library Catalog.
3. to refer to the JOSS collection: RAND publications, historical material, correspondence.

PROGRAM LIBRARY

Call Art Lucero, extension 415:

1. to arrange to store a program for safe-keeping in a library file.
2. to inform him of a modification to an existing library program.

1.1 Type i in form 1.

1.2 To part 30 if i = 44.

30 Quit.

Form 1:

The JOSS Newsletter

Number _____

Do part 1 for i = 1(1)1000.

Marks

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