NASA TECHNICAL MEMORANDUM

NASA TM X-64585

SKYLAB FILM USAGE ANALYSIS PROGRAM

By Ronald A. Schlagheck Astronautics Laboratory

April 21, 1971

CASE FILE COPY

NASA

George C. Marshall Space Flight Center Marshall Space Flight Center, Alabama

MSFC - Form 3190 (September 1968)

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1. REPORT NO. NASA TM X-64585	2. GOVERNMENT ACC	ESSION NO.	3. RECIPIENT'S CAT.	ALOG NO.
4. TITLE AND SUBTITLE			5. REPORT DATE	
			April 21, 1971	
SKYLAB FILM USAGE ANALY	SIS PROGRAM		6. PERFORMING ORG 5/28	ANIZATION CODE
7. AUTHOR (S) Ronald A. Schlagheck		1	8. PERFORMING ORGA	NIZATION REPORT #
9. PERFORMING ORGANIZATION NAME AND	ADDRESS	1	10. WORK UNIT NO. 964-50-10-00-00)
George C. Marshall Space Flight C Marshall Space Flight Center, Ala			11. CONTRACT OR GR	ANT NO.
		ī	3. TYPE OF REPORT	& PERIOD COVERED
12. SPONSORING AGENCY NAME AND ADDRE	:55			
National Aeronautics and Space	Administration		Technical Memo	orandum
Washington, D. C. 20546			14. SPONSORING AG	ENCY CODE
15. SUPPLEMENTARY NOTES		I		
Prepared by Astronautics Labora	tory, Science and En	gineering		
16. ABSTRACT				
A computer model for a film usage analysis of the Skylab missions is described. The major objectives of the program are to predict the total time that each film canister will be out of the radiation vault and to verify the compatibility between the principal investigators' film requirements and the amount of time allocated for filming during the mission. The program is written in GASP IIA simulation language. The description and format for the input data are given. An example problem, as well as a sample output, is explained. The program description includes an execution flow chart, subprogram definitions, variable definitions, array limitations, and a FORTRAN listing of both the user written routines and the GASP routines.				
	EDITOR	'S NOTE		
Use of trade names or names of manufacturers in this report does not constitute an official endorsement of such products or manufacturers, either expressed or implied, by the National Aeronautics and Space Administration or any other agency of the United States Government.				
17. KEY WORDS		18. DISTRIBUTION STAT		
Simulation Radiation				
Skylab Film storage		Unclassified -		
GASP		Ronald a	Schlas.	ich
Math-model			a che and	
Film usage Film				
19. SECURITY CLASSIF. (of this report)	20. SECURITY CLA	SIE (of this page)	21. NO. OF PAGES	22. PRICE
Unclassified	Uncl	assified	78	\$3.00

MSFC - Form 3292 (May 1969)

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TECHNICAL MEMORANDUM X-64585

SKYLAB FILM USAGE ANALYSIS PROGRAM

SUMMARY

A computer model for a film usage analysis (FUA) of the Skylab (SL) mission has been developed, and its operation and use are described in this report. The program traces the use of the film cassettes throughout the complete mission and tabulates the total amount of time that each canister is out of the radiation vault, along with a summary of unused film.

This program is written in General Activity Simulation Program (GASP)-IIA language. The use of GASP was best suited for this program because of its adaptability to the accounting processes and event logic that were considered. The input to the program consists of the film requirements data and the filming activity timeline. A complete description of the user-written routines is given so that the changes to the existing model may be made when needed.

INTRODUCTION

Many of the activities to be performed on the SL missions require various amounts of filming, with some activities using different types of film. For example, the amount of filming planned for the SL-1/2 mission consumes 60 to 70 canisters for 30 different experiments and activities. A model was developed to provide the mission planner with an easy method of keeping track of the 150 filming events that will take place during the 28-day mission. The prime objectives of the SL FUA model are to predict the time that each canister will be out of the protective film vault and to verify compatibility between the film requirements and the mission timeline. The calculated out-of-vault time is used to predict the approximate amount of radiation dosage that each film canister will receive. A canister usage timeline tape can be generated by this program and serves as input to a detailed radiation analysis model.

The program is written in GASP IIA simulation language. This is a Fortran-based, next-event simulation language consisting of a set of Fortran routines that can be used by the analyst subprograms. No attempt will be made to explain the fundamental operations

of GASP since adequate references¹ are available, and an understanding of it is not needed for those who want to use the program as it is. However, modifications can easily be made to the existing program if the analyst wants to change the model to fit his particular needs.

This report is divided into three major sections. The first section contains all the instructions required by the user to operate and execute the program. A description of the UNIVAC 1108 control cards and of the input data format is presented. The second section illustrates an example project. A variety of different program options is shown, along with a listing of the input data and output results. The third section is a program description and should be referred to if modifications to the existing program are necessary. It includes a description of program execution, subprograms, variables, and GASP file definitions; project limitations, and a Fortran listing of all routines.

PROGRAM OPERATING INSTRUCTIONS

Control Card Description

Execution of the FUA program may be accomplished by means of the following control deck designed for operation on the Marshall Space Flight Center's (MSFC) UNIVAC 1108 EXEC VIII system. This method uses two tapes that are stored in the central site tape library. The first is the program tape that contains a compiled set of subroutines ready for execution. The second tape is the activity timeline data that is used as dynamic input to the program.

An additional tape may be needed when the user wishes to produce an output data tape that contains a canister usage timeline trace. All control cards containing the word OPTIONAL should be deleted from the following list if the output tape is not required.

^{1.} A. A. Pritsker and P. J. Kiviat: Simulation with GASP II. Prentice Hall, Inc., Englewood Cliffs, N. J., 1969.

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AASSOT TAPE2.T.23401	
AASG T TAPES T	.OPTIONAL
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PASG . T 4 . F2	.OPTIONAL
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BREWIND TAPE2 .	
AREWIND TAPES.	. OPTIONAL
ACOPTN TAPET. TPFS.	
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DATA CARD TYPE 1	
DATA CARD TYPE 2	
DATA CARD TYPE 3	
-	
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BLANK CARD	
acopy GM 4 + TAPE3	. OPTIONAL
RFIN	

Similar control card deck setups may be generated for other computers or remote site operation.

Input Data Description

The input data required for the FUA program consist of three different types of data cards and one data tape. The format and description of the cards and tape are as follows.

1. Data Card Type 1	(2A6, 2A4, 5F10.0, I5)
Fields 1 and 2 (T1, T2)	A 12-letter alphanumeric title that describes the mission being analyzed. (Example, Skylab $1/2$).
Fields 3 and 4 (D1, D2)	The reference date assigned by the analyst.
Field 5 (PRTIME)	The time the film canisters have been in the vault up to the start of the current mission (minutes).
Field 6 (VATIME)	The maximum time the film canisters have been in the vault during the current mission (minutes).

Field 7 (OTTIME)	The amount of time that the film canisters were out of the vault other than for filming operations (minutes).
Field 8 (XDAY)	The number of minutes per orbital day.
Field 9 (XTIME)	The initial starting time for the first orbital day (MISSION TIME = GROUND ELAPSED TIME + X TIME).
Field 10 (JTEST)	If a canister usage timeline output tape is required, a (1) should be placed in this field; otherwise, it can be left blank.
2. Data Card Type 2	(4F5.1)
Fields 1 through 4 (TRANS(I),I=1, 4)	The transfer time for moving the canister between the film vault and the area of filming. The four defined areas are the CM, MDA, AM, and OWS, respectively. Time is in minutes.
3. Data Card Type 3	(I3, 5X, 2A6, 6I5, 3F10.1)

a. This data card contains all the attributes associated with the experiment/ film requirements. The user must define one card per individual filming requirement.

b. For activities requiring multiple film types, one card entry per type should be assigned.

Field 1 (JQ)	Activity identification code. This variable matches those codes contained on the activity timeline tape. (The code value of 1 is not permitted.)
Fields 2 and 3 (NAME 1, NAME 2)	A 12-letter alphanumeric descriptor used for identification of the event being filmed.
Field 4 (JTRIB(1))	Numeric representation of the film type assigned to the activity.
Field 5 (JTRIB(2))	Numeric code for the type of camera to be used. Present program designates camera 1 as a Maurer, 2 as a Hasselblad, 3 as undefined, and 4 as TBD.

Field 6 (JTRIB(4))	The footage or number of exposures per canister for the particular film type being used.
Field 7 (JTRIB(3))	Special canister code used by activities that share film off the same canister. Any integer may be assigned to this field; however, the same value must be assigned for all filming events that use a common canister. This field may be left blank.
Field 8 (JTRIB(5))	Code to indicate that the film is to be returned to the vault immediately after filming occurs versus waiting until the completion of activity perform- ance. A 1 in this field represents immediate return; otherwise, it can be left blank.
Field 9 (JTRIB(7))	Integer code representing the location of filming. This field may be left blank if the location code is specified on the activity timeline tape.
Field 10 (ATRIB(1))	Total footage or exposures to be shot.
Field 11 (ATRIB(2))	Film time per activity performance in minutes.
Field 12 (ATRIB(3))	Camera shooting rate. For movie cameras it is in feet per minute and for single exposure cameras, shots per minute.

c. A blank card must be inserted as the last card in the data deck.

d. In cases where the filming requirements dictate variable shooting times and camera rates, this information can be read from the activity tape, thus overriding any constant input values defined on this card type.

4. Activity Timeline Tape Description

a. Present program operation requires the mission timeline of filming activities to be read from a magnetic tape. This tape is a condensed version of a generalized flight plan timeline tape containing only those events that require film. Input to the program is accomplished by a binary tape read statement containing the following variables.

Variables	Function
ICODE	This integer variable represents the code for an event requiring film. These codes must be compatible with the identification used in Field 1 of data card type 3.

Variables	Function
ASTART	The starting time at the beginning of the activity (hours).
ASTOP	The ending time at the completion of the activity (hours).
LOC	An integer variable indicating the location of filming. Used for determining the cumulative transfer time per canister. Present timeline includes the four major locations in the Skylab workshop (1-CM, 2-MDA, 3-AM, and 4-OWS).

b. Other formats for the activity timeline tape can be used by the program; however, subroutine EPICK must be changed accordingly.

EXAMPLE PROJECT

The example project chosen is based on preliminary film requirements and other information selected from the SL-3 mission. These data illustrate typical results produced by the FUA model. As explained in the preceding section of this report, the input film requirements consist of nine different attributes associated with each requirement entry. A listing of the punched input data is shown in Table 1, and the program printout of this information is shown in Table 2. Notice should be taken of the canister assignment for experiments M074, M092, and M093. These experiments permit the sharing of film among canisters assigned to the three activities. An identical canister code (10) was assigned to field 7 for each card entry. Experiments M171B and M171C also share common canisters.

A special requirement was placed on all film for experiment S190. This type of film is very sensitive to the radiation environment; therefore, the analyst specified that these canisters are to be returned to the vault immediately after filming takes place. A "1" placed in field 8 permitted this option to be executed.

The activity timeline used represents a reference flight plan that was defined during the planning stages of the Skylab program. An example listing of the first 50 records contained on the timeline tape is shown in Table 3.

The output of the program generates four tables and one optional canister usage trace tape. Table 4 is an hour-by-hour timeline of the status of each canister. Identification of each canister is made by a number code assigned internally within the program and

TABLE 1. LISTING OF INPUT DATA FOR EXAMPLE PROJECT

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TABLE 2. INITIAL FILM REQUIREMENTS DATA FOR SKYLAB MISSION

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- AN OUTPUT TAPE HAS BEEN SEVERATED OURING THIS RUM-

CODE	EXPERIMENT	TYPE	LANE RA	SPECTAL CAN.	FOOT/CAN.	FOOTAGE	SHOOT-TIME	CAMERA-RATE	IMMENIATE RETURN
i u				1 1 1 1 1 1 1 1 1 1	400	400 °	15 .0	10 10 8	NO
· u	M487 FFMA-			U	FUN	* 50°	5.0	4°00	NO N
-	M0748M151	-	C	10	4 LI D	81N.	15 ° U	3 * 6 6	ON
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~	MITIARMISI	-	~	C	400	945 。	15.U	8 . 66	NO
~	M17188M151	•	~	12	400	945 -	15.0	3 ° 6 6	ON
7	MI71C8MI51	-	~	12	4 0 U	945 。	15.0	8 .66	NO
	M509 SUITED	-	0	e	4 0 U	1000.	45 .0	8 .E6	ON
' u	M5LBUNSUITED	-	2	U	4 0 0	1000.	45.0	8 .66	NO
U	5190	m	2	Ú	500	* 15nn.	8.1	7.50	YES
u	061S	(*1	M.	4	500	* 15NO.	8 . []	7.50	YES
U	0615	ŋ	M	ŋ	50n	* 1500.	8 °D	7.50	YES
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ſ	5190	8	۲	0	500	*] < OD •	8.0	7.50	YES
77	1020	•	r	n	4 UU	1600.	69 °D	9 a 6 6	NO
~	1020		-	9	500	* 10.	2 • 5	4 - 00	NO.

*-INDICATES NUMBER OF EXPOSURES RATHER THAN FOOTAGE

TABLE 3. LISTING FROM ACTIVITY TIMELINE TAPE

6	24.50	25.50	1
6	29.75	30.75	4
23	33.23	34 . 7 3	4
25	34.23	35.50	4
6	35.50	3F + 5D	4
7	36.50	35.75	4
7	39.75	40.00	4
29	51.92	52.47	4
29	52.35	53.00	4
E	53.00	54.00	4
۴	EB.50	61.50	4
		61.75	
7			4
7	63.25	€3.5D	4
2.5	75.48	75.75	4
6	76.75	77.75	4
35	79.00	80.55	2
29	80.70	81.35	4
25	81.23	82.5U	. 4
6	82.5U	83.50	4
7	83.50	83.75	4
7	8F.75	87.00	4
32	95.08	99.50	4
23	98.75	100.25	4
6	100.25	101.25	4
35	112.25	103.80	2
23	104.50	106.00	4
ĥ	106.00	107.00	4
7	107.00	107.25	4
7	110.25	110.51	4
37	121.07	123.117	4
25	122.48	123.75	4
F	123.75	124.75	4
32	125.25	126.67	ц
32	126.42	127.94	4
29	128.32	128.97	4
29	123.85	129.50	4
6	129.50	134.54	4
7		130.75	4
7	133.75	134.00	4
25	145.98	147.25	4
6	147.25	148.25	4
35	148.88	150.43	2
29	151.20	151.85	4
25	151.73	153.00	4
6	153.00	154.00	4
7	154.00	154.25	4
7	157.25	157.50	4
6	170.75	171.75	4
37	172.75	174.75	4
37	174.50	176.50	4
F	176.50	177.50	4
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GE RESULTS	
USAGE	
E FILM	
INTERMEDIATE	
TABLE 4.	

CUMULATIVE TIME OUT OF REPOS	יואיפט	റ്റ്		180,00		,	10°61		38 ° DD	m	240*30			57-00		76 ° 00	σ	152.40	14.00	14.00	14.00	14°00	14.00	14.00	2	228 ° 50	76.20		38°D <i>0</i>		7°0	5 • 2	180-01	ຕຸ ຄ	с 8
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CURRENT Remain. Film	270.10 580.00 140.20	560-00. 270-10	0	550.00	5	EXCE		TY EXCEEDS T	0 h		10.		ITY EXCEEDS J	•	ITY EXCEEDS T	.00°		53.60	440.00	4 4 D a D U	440°00	5	00.044	5		۰	280.40	ITY EXCEEDS T	0°2	ITY EXCEEDS T	20 . 60	270.10	4 U • 2	ំបំដ	380.00
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Н	600	9 D 1	10	22	*		12		15	4		*		13		15	1.5	ភ	2	~	-	2	-	~	σ	2	10		12		51	3	ហ	٢	7
DAY	~ ~ ~	~ ~	~	~ ~	N		~		~	m 1	m			m		m	m	J	4	3	J	a	3	3	đ	5	3		5		a	r.	Ľ	ſ	r.

serves as a means of tracing canister handling. Associated attributes are given for each filming performance, including experiment title, film type, camera type, and location. Statistics on the remaining unexposed film and the cumulative out-of-repository time are shown. Logic within the program generates a message when all requirements for a particular experiment have been completed. Incompatibilities between the activity performance time and the assigned shoot time are also noted in this output.

Table 5 gives the final summary per film type for each canister. These results permit the mission planner to reassign unused film to other experiments that require the same film type, thus optimizing the number of canisters.

A histogram of cumulative out-of-vault times for each film type is given in Table 6. The average, minimum, and maximum, times out permit a rough estimate that any film type will receive a given amount of radiation damage. A large distribution of canisters per film type represents a typical variety for out-of-vault times and gives a good indication of what the final mission statistics will probably be like.

Table 7 includes the percentage of filming requirements that are completed during the mission. Incomplete requirements indicate that not enough performances of the activity are scheduled or that an excessive amount of film is assigned. This information permits the analyst to recommend that the Principal Investigator reduce his desired footage or use longer shoot times. In some cases the longer shoot times will not give any more photographic information. One additional solution to this problem is to schedule more performances of the desired filming event.

Table 8 includes a portion of the printout from canister usage trace tapes. Each record contains four words of information. The first word is the canister code (XXYY - XX is the film type, YY is the canister number) and is used for identification purposes. The second and third words are floating point variables giving the absolute mission times (hours) that each canister is removed and returned to the film vault. The fourth word is an integer code reflecting the location of the canister during filming operations. The tape is generated by a formatted write statement, and therefore must be read according to the following format (I4, 2F10.3, I4). The data contained on this tape serve as input to a radiation analysis program that determines the probable dosages received by each canister during the duration of the mission.

PROGRAM DESCRIPTION

Program Execution

A flow chart showing the major events for normal operation of the program is given in Figure 1. Execution begins by reading in all user-defined variables. The mission

E SUMMARY	
FILM USAGE	
TABLE 5.]	

F00TAGE/ Canister	400 400 400 400			0074747 00074747 00074747	500 500 500 500 500	500 500 500 500 500
RE MAIN Film	-	95,0 55,0 25,0 20,0 20,0 20,0 20,0 20,0 2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	د ت د ت 200 م 200 م 200 م 200 م 200 م 200 م	*0 420*0 *0 *0 *0	0° 0° 0° 0° 0° 0°
TOTAL TIME IN Repos	77720°0 77784°0 77884°0 77888°0	77751.8 77600.0 77600.0 77780.0 77731.4 77731.4	7765552 778040 77619.2 77619.2 77549.6	77480.0 77630.0 77795.0 77570.0 77570.0 77570.0	77834.0 77834.0 77932.0 77834.0 77634.0 77932.0	77834 . 0 77834 . 0 77932 . 0 77834 . 0 77834 . 0
T01AL TIME OUT OF REPOS	240.0 180.0 76.0 72.0	203,2 360,0 360,0 360,0 228,6 228,6 228,6 228,6	340 44 340 340 340 80 80 80 90 90 90 90 90 90 90 90 90 90 90 90 90	480.0 330.0 165.0 390.0 390.1 195.0	126.0 126.0 28.0 126.0 126.0 28.0 28.0	126.0 126.0 28.0 126.0 126.0
OTHER TIME OUT Of Rfpos				.	00000	
TOTAL Wait Time	183,8 157,6 121,8 33,8 33,8 33,8	153.0 297.8 297.8 301.8 155.7 170.4	2466 946 946 946 778 778 8 718 8 3 11 8 8	471.8 275.8 275.8 375.8 335.8 335.8 335.8 167.9	ក្តាក ស្តេតស្រួស ខេត្តទេខ ស្តេសស្ត្រស្តេ ស្តេសស្ត្រស្តេ	เหาง เริ่ง เหาง เริ่ง เหเนินน
TOTAL Shoot TIME	ເບັບ		ວພຜຍຜທເຜ		66.7 66.7 10.7 66.7 10.7 10.7	66.7 66.7 10.7 56.7 66.7
TOTAL TRANS TIME	ລື່ມ ດ ໍ່ ເ	20 20 22 22 22 22 22 22 22 22 22 22 22 2		00050005 00050005	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
L N N O N O N O	- N M 2	E. E. C.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	89 0 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -		
FILM TYPE	-				የጣ በጣ በጣ በጣ በጣ	טניט דד

TABLE 6. FREQUENCY RESULTS FOR TIME OUT OF VAULT

TIME	007				NUMBER	CANISTERS	OF FILM	TYPE
			1	3	5	7	8	
۱] م	TO	50.	0	2	1	2	1	
۶Ŋ.	T O	100.	2	p	0	Ð	n	
100.	τo	150.	Ð	4	2	4	2	
150.	то	200.	5	11	0	б	n	
200.	TO	2511.	5	n	U	n	п	
250.	TO	300.	Ð	Û	t)	n.	n	
300.	ТЭ	3511.	5	Ð	U	ŋ	n	
350.	10	400.	5	Ū.	ũ	0	0	
400.	TO	450.	1	0	L1	n	n	
450.	TO	500.]	Ð	υ	ñ	n	
NUMBER C	AN.	USED	24 .	6.	P	Ē	3.	
AVERAGE	TIME	NUT	273,	93.	93.	93.	<u>ح</u> ۾	
MINTMUM	TIME	OUT	72 .	28.	28.	28.	29.	
MAXIMUM	TIME	OUT	480.	126.	125.	126.	126.	

TABLE 7. SUMMARY RESULTS FOR COMPLETEDFILM REQUIREMENTS

ΑCTIVITY	FILM TYPE	FOOTAGE REQUIRED	FOCTAGE SHOT	PERCENT OF REQUIREMENTS COMPLETED
M487 - FMA-	1	4110 .	400.	100.
M487 - FMA-	1 *	50.	50.	100.
M0748M151	1	810.	<u>٥١٥.</u>	100.
MD928M151	3	1620.	1520.	100.
M0938M151	1	ε 75 .	675.	100.
M171A8M151	1	945.	945 .	100.
M17188M151	1	945.	945 .	100 •
M171C8M151	1	945.	945.	100.
M508 SUITED	1	1000.	1000.	100.
M508UNSUITED	1	1000.	1000.	100.
5190	3 *	1500.	1080.	72.
5190	3 *	1500.	1080.	72 .
S1 90	5 *	1500.	1090.	72.
5190	7 *	1500.	1080.	72.
S1 90	7 *	1500.	1080.	72 .
5190	8 *	1500.	1080.	72 .
T020	1	1600.	0.	0.
T (12 ()] *	10.	Ω.	0.

 $(\mathcal{T}^{*})^{*}$

101	24.500	25.500	1
102	24.500	25°500	1
101	29.750	30.750	4
102	29.750	311.750	4
105	33,230	34.730	4
109	34.230	35.500	4
101	35.500	36.500	4
102	35.500	36.500	ų
103	36.500	36.817	4
		40.067	4
103	39.750		
113	51.820	52.470	4
101	53.000	54°0Ωព	4
103	61.500	61.817	4
103	63°550	63.567	4
104	53.250	63.567	4
109	75.480	76.750	4
301	79.000	79.233	2
304	79.00 0	79.233	2
501	73.00 0	79.233	2
701	79.000	79 . 233	2
7114	79.0AU	79.233	2
801	79.000	79.233	2
113	80.700	81.350	4
1/19	81.230	82.500	4
110	91 . 230	82.500	4
104	83.500	83.817	4
104	86.750	87.067	4
114	98.080	99.500	4
106	98 .7 50	100.250	u
301	102.250	102.483	2
304	102.250	102.483	2
501	102.250	102.483	2
701	102.250	102.483	2
704	102.250	1112.483	2
8 11 1	102.250	102.483	2
106	104.500	106.800	4
1 11 4	107.000	107.250	4
105	107.000	107.250	Ц
117	121-070	123.1170	u
110	122.480	123.750	4
114	125.250	126.670	4
113	128.321	128 . 971	4
110	145.980	147.250	4
111	145.980	147.250	Ц
301	143.880	149.113	2
304	148.880	149.113	2
501	143.990	149.113	2
701	148.880	149.113	2
7114	142.890	149.113	2
801	148.880	149.113	2
113	151.200	151,950	4

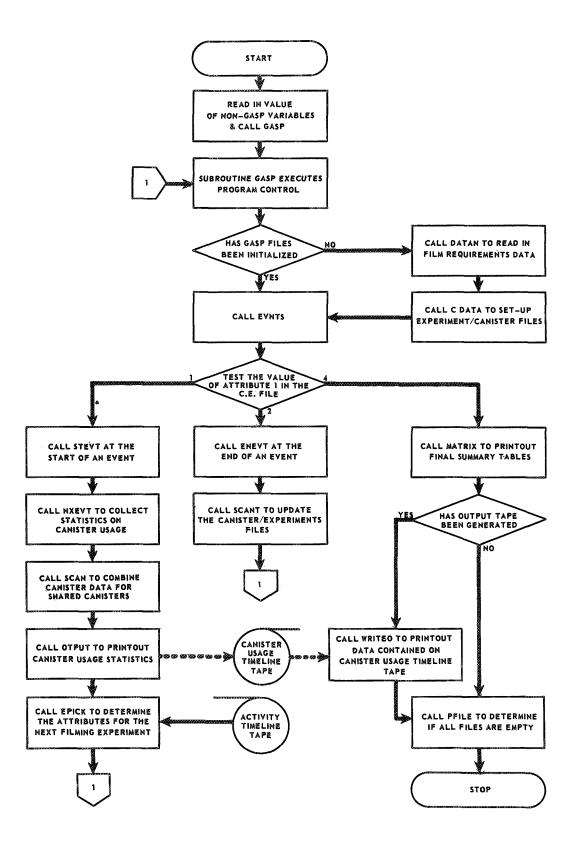


Figure 1. Film usage analysis program flow chart.

title and reference date are then printed out. If an output tape is to be generated, a message to this effect is noted on the title page. Subroutine GASP is then called to handle program control. The initialization of the GASP files are established by subroutines DATAN and CDATA. Subroutine CDATA allocates and assigns the number of canisters needed to complete each filming requirement. The EVNTS routine determines the state of the next event simulation by testing the value of attribute 1 in the current events file. The program is then transferred to one of three different legs. Leg one is executed at the start of each filming event. Cumulative statistics on canister usage and time out of the vault are collected and stored in the canister/experiment files. The intermediate film usage results are printed out. Generation of a canister usage timeline trace is recorded on tape. The last operation in this leg is accomplished by EPICK. This includes the updating of the current events file with the requirements for the next filming activity. The activity timeline tape is required as input to this routine. Execution sends control back to routine GASP.

Leg two is executed at the end of each filming event. The status of the canister usage is recorded and stored in the canister/experiment files. Program operation is then returned to GASP.

The last major leg is called only at the end of the mission. Subroutine MATRIX prints out the summary Tables 5 through 7. If an output tape has been generated, sub-program WRITEO is called. Subprogram WRITEO rewinds the output tape and prints the data contained on this file. Routine PFILE checks the status of the GASP files to determine if all information has been retrieved. Variable MSTOP is set to the value of (-1); thus, program execution is completed.

User-Written Routines

<u>User Subprogram Descriptions.</u> Table A-1, Appendix A, gives a description of the user-written subroutines that are contained in the FUA program. Each routine has been well explained; therefore, only a brief statement of its purpose was given.

<u>User Variables and Arrays</u>. An alphabetical list of the variables contained in the user-written program is given in Table A-2 of Appendix A. All variables are defined in COMMON. All dimensioned variables that limit the size of the problem are discussed in the following subsection.

<u>Program Limitations</u>. The size of the analysis is limited by the dimensions of the user-defined arrays. Current program limitations are shown in the following table.

Arrays Affected	Limitation	Characteristics
NAME 1 (200) NAME 2 (200)	200	Number of different filming activities.
ICAN (40)	40	Number of canisters per activity for each film type.
KFILM (25)	25	Number of different film types.
TRANS (4)	4	Number of different areas in which filming occurs.
CAMERA (4)	4	Number of camera types.

The complete compiled program uses 20 500 words of core storage.

Error Messages. Normal operation of the program will not terminate execution because of changes in input data. However, the development of the program included various tests within the user-written and GASP subroutines that determine if the program is operating in a nominal manner. These tests will terminate execution by calling subroutine ERROR upon the generation of any irregular conditions. At this time a complete dump of the status of all GASP files will be made. The following list of error codes and the corresponding routines is included as a troubleshooting tool for those wishing to modify the program.

Error Code	Routine
11	EPICK
12	NXEVT
87	FILEM
88	SET
89	FIND
93	GASP
97	RMOVE
90	COLCT

Fortran Listing. A Fortran listing of the user-written subprograms is contained in Tables A-3 through A-15 of Appendix A.

GASP Routines

GASP File Definitions. The GASP written program requires the manipulation of three user-defined files. The information contained in each file is retrieved and filed through the use of the GASP-IIA routines that are called within the analyst-written subroutines.

File 1 is always the current events file, and the user's event subprograms must be written so that the attributes of the next event to occur are stored in file 1. Two additional sets of files are defined.

The first set, referred to as the experiment/film requirements files, consists of a file for each experiment that requires film. Each entry in a file corresponds to a different filming requirement. The file number corresponds to a code assigned to each experiment and varied from 3 to 200. The second set of files, referred to as the experiment/canister files, is generated within a user subroutine using the film requirements specified in the first set. As for the first set, a file was defined for each experiment that required film with the file number corresponding to 200 plus the experiment code. An entry was made for each film canister that was allocated to each film requirement. The fixed- and floating-point attributes associated with each of the files are given in Tables B-1, B-2, and B-3 of Appendix B.

GASP Subprogram Descriptions. The GASP routines used in the FUA program consist of the set of standard subprograms that make up the simulation language. However, the operation of the program utilizes only 10 out of the 22 available subroutines. Subroutines GASP and DATAN were modified to reduce unnecessary logic and input to the program. The other eight routines are used for information storage and retrieval, error reporting, and data collection. The function of each subprogram is described in Table B-4 of Appendix B.

<u>Variables and Arrays</u>. The variables contained in the FUA program that are peculiar to the GASP subroutines are included in Table B-5 of Appendix B. It should be noted that not all of these variables are used by the program but are listed in the COMMON statements of the standard GASP routines.

<u>GASP Listing</u>. A Fortran listing of the GASP subprograms is contained in Tables B-6 through B-16 of Appendix B.

APPENDIX A USER-WRITTEN PROGRAM INFORMATION

Subprogram	Function
MAIN	Serves as master control FUA program. All initialization of user variables is read in from this routine. (Subroutine called GASP.)
CDATA	Initializes the experiment/canister files from the data available in the experiment/film requirements files. (User-written sub- routine called NONE.)
ENEVT	Stores the attributes of ending an event in the experiment/ canister files. (User-written subroutine called SCANT.)
EPICK	Sets up data for the current events file. Film activity timeline tape provides input to this routine. (User-written subroutine called NONE.)
EVNTS	Controls the sequencing of starting or ending an event and end of mission. (User-written subroutines called STEVT, ENEVT, and MATRIX.)
MATRIX	Generates the summary tables for the FUA program. Output includes Tables 5 through 7. (User-written subroutines called PFILE and WRITEO.)
NXEVT	Collects statistics and determines the time usage data on each canister of film. Generates the attributes for the next experi- ment requiring film. Prints out message indicating that an activity has completed all filming requirements. (User-written subroutines called SCANT, SCAN, OTPUT, and EPICK.)
PFILE	Prints out the current values of the attributes stored in the GASP files. This routine is called when abnormal operation of the program occurs.

TABLE A-1. USER-WRITTEN SUBPROGRAM DESCRIPTION

Subprogram	Function
ΟΤΡUΤ	Prints out the film canister usage timeline (Table 4) and gener- ates an output tape if required. (User-written subroutine called NONE.)
SCAN	Updates the attributes of the experiment/canister files for those activities that share film off a common canister. (User-written subroutine called NONE.)
SCANT	Determines the status of the canister usage such as canister on standby or in vault and partially used or new canister. (User- written subroutine called NONE.)
STEVT	Checks to see if the event is the first event. Computes the time for ending an event and determines the total footage used during the filming activity. (User-written subroutines called EPICK and NXEVT.)
WRITEO	Produces a printout of the data contained on the canister usage timeline tape. This routine is executed after the output tape has been generated and serves as a check on parity errors. (User- written subroutine called NONE)

TABLE A-1. (Concluded)

TABLE A-2. USER-DEFINED VARIABLES AND ARRAYS

Variable	Definition
A(I)	A buffer array used to store the floating-point attributes of the current events file.
BTIME	The beginning time for the start of filming events.
ETIME	The time in which a canister is returned to the vault.
IA(I)	A buffer array used to store the fixed-point attributes of the current events file.
ICAN(I)	The number of canisters per film type per activity.
JCOUNT	Counter used to keep track of the number of printed lines per page of output.
JTEST	Indicator value that permits an output tape to be generated. (Value = 1 if output tape is required.)
KFILE	Unit number for the input tape (flight plan data tape).
KOUT	Unit number for the output tape (canister usage timeline trace).
KFILM(I)	Stores the different types of film to be used during the mission.
NAME 1 (I), NAME 2 (I)	Used to store the alphanumeric identification name of the ith filming activity (12-letter description).
NCODE(I)	The array used to store the values of the filming activity codes.
NFILM	The number of different film types used during the mission.
NOEXP	The number of activities or experiments requiring film.
NRECYC	Test variable used to determine if additional filming is to be completed during present filming activity.
NWRITE	Indicator value used to print out a message when all film require- ments of an activity have been completed.

TABLE A-2. (Concluded)

10.0

Variable	Definition
OTIME	The amount of time the film canisters were out of the vault other than for filming operations (minutes).
PFOOT	The tolerance on the amount of film shot per performance (feet or exposures).
PRTIME	The amount of time the canisters have spent in the vault other than during the current mission (minutes).
RFOOT	The minimum amount of film remaining on a canister in order that the canister can be used again (feet or exposures).
TRANS(I)	The translation times for moving the canisters between the vault and the area in which filming occurs.
VATIME	The maximum time that the film canister has been in the vault during the current mission (minutes).
XDAY	The number of minutes in an orbital day.
XTIME	The initial time for the start of the first mission day (minutes).

TABLE A-3. FORTRAN LISTING OF USER-WRITTEN PROGRAM MAIN

4 00550*7PF\$. MAIN

0550+TPF5.MAIN			
	JIMENSION NSET(6000)+0SET(3333)	MAIN	
~	COMMON ID. IM. IMIT. JEVNI, JMNIT. MFA. MSTOP. MX. MXC. NCLCT. NHIST.	NITW	20
- 107	1 NOG, NORPT, NOT, NPRMS, NRUN, NRUNS, NSTAT, OUT, SCALE, ISEEO, TNOW,	MAIN	30
9	218E6°1FIN°MXX*NPRNT*NCRDR*NEP*VNQ(400)%IMM•MÅXOS*MÅXNS	MAIN	4
· u	COMMON ATRI3(15)° CNO(400)° LNN(400)° JCELS(20°22)° AZANK(403)°	MAIN	50
, .		MA T M	9
0 •	JARANNO 4100 VOT (1400 VOT	MATN	3 6
-			
æ	DAY.NYR.JCLR.JTHIB(17)	NITEM	ŝ
F	(]])。BTIME*ETIME.[A(]], ICAN(40)。JCOUNT.JTEST. *FILE.K	NTV	06
0	KF ILM (251 °NAME1 (200) «NAME2 (200) «NCODE (40) «NF ILM» NOEXP	NIVW	100
5	Z NWRITEODITIME.PFODIFPRIMEOR OOTOTANS(4) & VATIMEOXDAY & XIIME	NIVH	
25		MAIN	
5	C*****NJR IS IIF UNIT NUMBER OF THE CARO READER	MAIN	130
14		NITW	
15	NCRJR I 5	MAIN	
2		MAIN	
7	C*****NRANT IS 145 UNIT NUMBER OF 145 PRINTER	MAIN	
9		MIAM	
5	NPRNT = 6	MAIN	
		MIDH	
	C*************************************	MAIN	
		MAIN	
		N E I N	
	C	MATN	
, L 1	A CALL AND A LOCAL AND AND AN AN AND AN AND AND AN AND AND	N I U M	
	21737	MATN	
4 1	AT LEC -		
27			
80 1	C*****KDU IS THE UNIT NUMBER FOR THE GUIPUL FILE	11111	
5			
30	K D I I I I I I I I I I I I I I I I I I		
15			
32			
33	THE VEJLT OTHER THAN FOR FILMING OPERATION		
# M	**************************************	NI SH	
35	©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©©	NICH	
36	*	NT a M	
37	THE LAST MISSION	MAIN	
38	IS THE MAXIMUM TIME THE FILM HAS BEEN IN THE VAUL	FM & IN	
66	JURING THE CURRENT MISSION	NIAN	
03	DAY	MAIN	
1.4	*****VARIA3LE JIEST = 1 IF OUTPJT TAPE IS RÊÖUIRED	MAIN	
4 2	, ,	MAIN	
1	C*****REAJ IN THE MISSION TITLE. REFERCE DATE. AND OTHER DATA	MAIN	
44		MAIN	
ы а	qEAJ(NCRDR.103)11.5	MAIN	450
46	F)0.015)	NI VH	460
47	3 I INCLATING	NIVW	470
8	• 02	MAIN	
त स	e 1 H*c/	MAIN	
05	3 /45%,28H*FILM USAGE ANALYSIS FOR THE.IX.2A6.9H MISSION*+	MAIN	500
د. د	2 / 45% ° 1 4 * ° 4 8 X * 1 H * ° / 45 X * 1 H * ° 4 8 X * 1 H * °	MAIN	510
52	11X.JGHREFERENCE	MAIN	520
53	/45XelH*e48XelH*e/45Xe	MAIN	530
54	FLATEST .EQ. THARTES	MA IN	540
55	IF(JTEST.EQ.I)REWIND MOUT	<л.	550
56	JOS FORMAT(30(/)20%,51H-AN OUTPUT TAPE HAS BEEN GENERATED DURING THIS	MAIN	560

TABLE A-3. (Concluded)

JRUN-) **READ IN THE TRANSLATION TIMES FOR TRANSFER BETWEEN VAULT AND CM' MAIN 590 *Da.AM.ANJ DWS *AIN 590 MAIN 500 MAIN
W THE TRANSLATION TIMES FOR TRANSFER BETWEEN VAULT AND CM. AND DWS CRDR.1001 (TRANS(I).I=1.4) (4F5.1) 15P(NSET.05ET) XIT
W THE TRANSLATION TIMES FOR TRANSFER BETWEEN VAULT AND AND DWS Crdr.1gd) (Trans(1).1=1.4) (4F5.1) 15p(NSET.05ET) XIT
W THE TRANSLATION TIMES FOR TRANSFER BETWEEN VAULT AND DWS Crdr.1001 (Trans(I).I=1.4) (4F5.1) Asp(nSet.0set)
W THE TRANSLATION TIMES FOR TRANSFER BETWEEN AND DWS CRDR.1001 (TRANS(I).1=1.4) (45.1) 15P(NSET.05ET) XI
W THE TRANSLATION TIMES FOR TRANSFER AND DWS Crdr.1001 (Trans(1).1=1.4) Crdr.101 (Trans(1).1=1.4) Crds.11 Sp(nSet.05et)
W THE TRANSLATION TIMES FOR T AND DWS CRDR.1001 (TRANS(I).I=J. (4F5.1) Sep(NSET.05ET)
W THE TRANSLATION TIMES F Anj dws Crdr.100) (trans(1) Crdr.31) Crdr.31) Sp(nset.05et)
V THE TRANS ANJ DWS CRDR.100) CRDR.100) (4F5.1) SP(NSET.00
3 RUN-) C C**** READ IN C **** READ IN MDA.AM C ACANAT C ALL 54 C ALL 54 C ALL 54 C ALL 54 C ALL 54

TABLE A-4. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM CDATA

520 530 540 550 CDAT CDAT 3NDAY.NYR.JCLR.JTRIR(17) COMMON 4.113);471ME.CTM2.14(13),1CAN(40),JCOUNT.JTE51,4FILE,KOUT. 1 Kfika25),NMME1(200),NAME2(200),NCODE(40).NFILM.NOEXP.NRECYC. 2 NMRT12.011HPFPG01,FPG14,PF01H5.R7001,TRANS(4),VAT142.KDAY.KTINE EACH CANISTER IN THE EXPERIMENT/CANISTER FILE. C C00000 BEEN AS CANISTER HAS ALREADY BEEN ASSIGNED WITH THIS CODE. ****SETS UP CANISTER/EXPERIMENT "ILES FROM DATA AVAILABLE IN THE N 2. SET UP THE CANIS-TER FILE C C******REMOVE ALL ENTRIES FROM THE FILE AND STORE THEM IV FILE C ***CHECK IF CANISTER HAS A SPECIAL CANISTER CODE EXPERIMENT/FILM REQUIREMENTS FILES IF (ABS (FL 0 AT (T)) - X) - 1 .E - 4) 5 . 5 .6 C↔↔↔∗RMOVE THE ENTRIES FROM FILE 7. C↔↔↔↓AND RESTORE THE ENTRY IN FILE 1 C DO 4 J=1.KK Call Rmovf(Mfe(2).2.NSFT.0SET) CALL RMOVE(MFE(I) . I . NSET . 05ET) X=ATRIB(])/FLOAT (JTRIB(4)) CALL FILEM(2.NSET.QSET) IF(JA(3).F0.0)60 T0 40 ISP=14(3) IF(12.NF_11)60 TO 40 30 11 [4=1.[M IA(14)=JTRIB(14) C C*****SIORE ENIRY FOR A(]4)=ATRIB(]4) 00 12 I4=1.IMM 00 I I:201.N00 IF (NO(1)11.01.2 11,1=51 01 0C C#+I=1 02 0C J=] • KK I 3=J1RTB(1) 20 ICAN(I)=D KK=NO(I) **CONTINUE** CONTINUE 1 11=11 5 ISP=D m X = [] 60 11 12 m N m 40355A*IPFS.COAT8 ບບໍ່ບ ວ ພຶບ U U

TABLE A-4. (Concluded)

	CDAT 580					CD&T 63D									CDAT 720																									CDAT 990	CDAT1000	C0411010	CDA71020
υ	DO 41 1423,199	IF(Na(I4).50.0)60 TO 41	CALL FINDN (IA (3) +5+ I4+ 5+ KCOL+NSET+ OSET)	IF4KC0L。E0.3)60 TO 41	CALL RMOVE (KCOL, 14, NSET, QSET)	I51777519(1)	CALL FILEM (14, NSF1, 0SE1)	JTR18(1):15	60 T0 42	al CONTINUE	40 ICAN(IS)=ICAN(IS)+I	JTRI6(1)=TCAN(13)	42 JTRIR(2)=1	JTTTS(3)=I2(4)	JTRTB(4)=I&(]) 1012461-150	 JTR18(7)=3	JTTTF (8) = 0	ATRI8(1)=3.	ATRIR (2) = 0.	AIRTE(3)=3°	ATRIB(4) = FLOAT(IA(4))		3D CONTINUE		25 JTRIB(14)=1A(14)	00 26 I4:1.1MM	26 ATRIB(14)=A(14)	CALL FILEM(I.»NSEI0OSEI)	a CONTINUE		WRITE (WPRNT . 300)		WR ITF (URITE (332 FORMAT (3X*3HDAY3X*2HHR.2X*3HMLN.2X*3OHEXPERIMEN*4X8HL0CATION.	IZX °6HCAMEKA ° ZX °4HIYPE 5X ° 3HNO ° 44X ° 7HREMAIN ° ° 5X °5HIKANS ° / X°	25454001.8%**4M&AIT.5%*#HIM= DUT)	WRITF (NPRNT # 303)	333 70RMAT [55%.44FILM.349%.44HT14E).55%.8H0F REPOS/)	JC 00N1 = 0	201 U 2 V	END
57	85	5	ų م	51	62	63	54	in G	99	57	58	63	70	22	72	52	76	77	78	5	80	61	82	Э Э	94	85	85	87	88	۵ ۵	90	16	6	£6	a 6	5	36	26	98	99	100	101	102

TABLE A-5. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM ENEVT

	SUBROUTINE ENFLICEST, OSET)
- (- 3
N	DIMENSION NSET 114656-111
•	SIGNADY ID SIN IN IN THE SEARCH STAR STAR STAR STAR STAR STAR STAR STAR
4	1000,00771,001,0778,0780,0700,0700,0701,0011,5041E+ISEE0+1004
un	ZTBE3«T"IN»MXX«NPRNT«NCROR«NEP«VOG 400) «IMM«MAXOS»4ÅXNS
u	COMMON ATRIB(15) "EN0(400) "INN(400)" JCELS(20,22) "KRANK(400)"
P	1 M # Y NOV # 10 . M F (400) . M - (600) . M - F (400) . NCF . S (200) . NO (200) .
. a	72 AD AM (40,4), 01 THE (400), 55 (194 20,4) (21,5), 10 (21,5), 10 AB (6), 10 PROJ, MON.
•	
7	A CONTRACTOR AND A CONTRACT A CONTRACTOR AND A CONTRACTOR A
04	CUMPUN ALLUS SHITMESELIMES IN 13014 ICAN1401 SOCOONS STERLERS
-	
32	2 NWRITE.OTTIMF.PF00T.PRTIME.RF00T.TRANS(4).VÅTIME.XJÅY.XTIMF
5	
14	*****UARTARLF
	***IN DRJER FOR THE CANISTER TO BE USED AGAIN.
c 6	L. C. STATTOR ATTRIBUTES OF ENDING SVOFDIMENT IN IA AND A ADDAYS.
n	
20	υ
21	30 13 III 8
22	ID IA(I)=JTRIB(I)
2	DO 1 III KWW
90	1 A (T) = A T (T) = A (T) =
	-
22	****TEPOR MI AN MATERIAN IN THE NEX CAUSE FILE ADJULATE FILE
8. I	
6° N	
30	CALL SCANT (102*LA(2) 0) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
31	I=KCOL
32	
33	
10	USED CANISTER FIL
5	Ш
	CALL SCANT JIAJDI. 2.4.6.14401.04.18141.WEDI. NSET.
882	5 CALL NOUVE (ACUL #IATZ) #NSE # VOID
6 7	
0.4	31 IF(I)20*20*21
1	23 JIRIR(2)=2
0.4	60 IO 23
1 44	21 JIRER(2)17
1	
5	33 JIRIR(2)=5
24	23 CONTINUE
	0.
7	
0	RETORN
;	

TABLE A-6. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM EPICK

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Actor stratector		EPIK	10
n : -	JIMENSION NSET(1) . 0SET(1)	HId3	20
mi	COMMON ID. IN. IN. I.I. (EVIT. JMNIT. MARTARD P. MX. MX C.NCL CT. NHIST.		D
a			
ur: i	ZIGE G.T FIN.MXX.NPRNT.N.NCRDN.NEP.VN09(400); IMM.MZXOS/MAXNS 2000000000000000000000000000000000000		26
~ ~	ΓΕΡΧΝΘΕΊΝΟΙ ΦΕΓΕΊΟΟΙ ΤΟ ΓΟΥΓΙΑΓΕΊΟΙ ΤΟ	A L L L	
c		ED TK	
	JUNEAR AND AN JULE AND	EPIK	100
11	I KFILM(25) NAMEI(200) NAMEZ(200) NCODE(401) NFILM, NOEXP NRECYC	EPIK	110
12	Z NWRITE.OTTIME.PFODT.PRIIME.R. OOT.TTANS(4) . VATIME.X DAY.XTIME	EPIK	120
13	C*****CHECK TO SEE IF TNOW = BIIME	EP IK	150
14	I F(ABS(INOW-BTIME)-1.E(-04)2°2°1	EPIK	160
ы Ч		EP IK	170
			180
~ 0	Z I FINT (LE 15,5) C	н Т.К. И Т.К.	190
	3 READ(MEILE)ICODE.ASTARI, ASTOP, LOC		210
20	IF(ICO)E.50.0)60 TO 99		220
21	JD CONTINUE		230
22	STTEME=ASTART+60.+XTIME		240
23	1 ART 0		2 50
24	STIME = STITME		260
25	G0 T0 2	EΡΙΚ	270
55			280
27	C*****END OF FILE COMMAND SETS JIRIB(1)=4 IN THE CURRENT EVENTS FILE		2 9Ü
28	91414(1)144 1	EPIK	300
79			310
30	CALL "ILEM().NSET.OSET)		320
.	,		330
25	25 CONTINUE	EPIK	340
147. g			500
5 I	21121212		
ກ M	SIG FORME TOTAL FROM IN SUBSCOLING CFICM	ALC J	380
- - -			390
	2 %		
- -	CALL FINDNETCODE	EPIK	
1			420
	3D CONTINUE		1 30
42	CALL RMOVE(KCOL+1+NSET+0SET)		440
M A			450
t t			100
10 at		EPIK	0/8
u 2			0.00
x (C****** OF UP OF USA CEARDING AND A CONTROL OF CONTROL		
	57 × 1		
	UC IN THE NUMBER OF THE EXTRACTED AND AND AND AND AND AND AND AND AND AN	5 H K	
. u	JASEKCONST & TCORE		
	C*****IS ANY FUTHER FILMING OF THIS EXP. PEOULRED?	PIK	550
i ar	NAORED	~	560
an M	NDN (NMORE +5	РIК	570
55	IF{KCOL.NE.J)60 TO 4D	£ PIK	580

TABLE A-6. (Continued)

57	CALL "INDN(NHORE+2.40.6+KC)L+VSET+GSET)		
80			
6 6		EPIK 610	00
60	1 CONTINUE	1 T T T T	
6] 6 2	T I DIACK TET (TPES AND TO BE SHOT JUNING FILE) . DE 11NCYCEE1	EPIK 650	0
100			0
54			0
65	Co****UPDATE 700TAGE USED.		0
9		EPIK 780	
67	ZZATRI3(7)*ATRI8(3)		э с
85 (J 19 19	IF(#TRIB(5)+X7.4E.ATRIB(1))60 TO 8U	EPIK 750	
50	TRTR (21-Y 2/ATRTR(¥ M	0
11	8] aTRI8(5)=aTRI8(5)+X2		0
72			0
73	-		0
74	PCNUM		•
75	NTTPC - JTR18(4)	EPIK 820	0 0
76		EP 1K 850	
	NMORE 1 JIRIB(6)		
E 0 4	LUCEUTRIELT Stipft : Stotrafyi	EPIK 850	. 0
	CAMPAT = ATRIB(3)		•
81	SHIIME = BIRIB(4)		0
82	EST=ATRIB(5)-A		0
83	If(TEST)71.72.72		0 1
84	71 CALL FILEM (JO.NSET.OSFT)	EPIK 900	⊐ c
8 7 9			
τ. τ. τ.			2
- a			0
. . .	CALL FILEMC2010NSET00SET)		0
06	B(1) = 1		6
16		EPIK 970	0
42	Ð		
5	JTRT8(4) : NMORE	EPIK 990	5 0
3 L		FPTK1010	
5.0	1	EPIK1020	, 0
6 F	1 11	EPIK1030	0
96	11	EP IK 1040	0
99	TRIB(3) = CAMRAT	EPIK1050	00
100		CPTK1/20) c
101	alkin(a) = signature	FP TK 1080	50
201	C. C*****TEST TO SEE IF ACTIVITY PERTORMANCE TIME IS S4031ER T4AN SHOOTING		0
104	PLUS TRANSFER TIME	EP IK 1 1 00	0
105		EPIK111	00
106	IF(TTTME_6T_ATTTB(4))WKTTE(NPKNI*1U3) 132 soduktriser.974*****MATF: TJ: FTIMING TTME FOR THE NFYT ACTIVITY	E XE PI K1131	0 0
	TOPEON THE ALLOCATED FLIGHT PLAN TIME	EPIKII4	0
501	•	EPIK1150	0
110	IF (NRFTUN_EQ_1_OR_TTIME_6T _aTRIB(4))ATRIB(4)=TTIME	EPIKIIEI	o :
111	btRT8(5) = STTIME TT-MT-ATORDAN	PTK118	
211	EITME FATABORY Call FileMia NSETOSET)	16 I LAIG3	0
	1		

ងផ្លូន	59 RETJRN	EPIK1200
5	C*****FILE OTHER FILM DATA FOR THIS PERFORMANCE	EPIK1210
۲. ۱۳	30 JQ 1 K20N51 + ICODE	EPIK%220
2 2 8	CARL FINDN (NMORE, 2, JQ, 6, K COL, NSET, OSET)	EPIK1230
- C	# F & K C O L ~ F O ~ C O 7 O 3	EPIK1240
6 800	74 CALL RMOVE(KCOL .JG.NSF1.0SE1)	EPIK1250
200	GO 10 41	EPIK1260
500 600	END	EPIK1270

54.)

TABLE A-7. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM EVNTS

400550*1PF\$.EVNTS

с ,			30	40	50	09	70		30	1 UO			4 -4	140	150			180	05 F	200	210	220	0 ¥ C	נ
* 7 7 1			EVNI	EVNT	EVNY	EVNT	EVNT	EVNT	EVNT		EVNT	EVNT	EVNT	EVNT	EVNT	EVNT	EVNT	EVNT	EVNY	EVNT	EVNT	EVNT	FUNT	-
B . L VRIS			COMMON ID, IM, INIT, JEVNI, JMNII, MFA, MSIOP, MX, MX C, NCL CI, NHISI,	Z		C) T	چ ۵	ZNDAY NAD. IT D. ITATA (17)	ຼີ	3 KFILM 253. NAME1(200) .NAME2(200) .NCODE(43) .NFILM. V0EXP.NRECYC.	-		2 CARTERS STEVIES (NSE1)		J PART INCET.DOFT) C	່	> ⊌			: 1	END
0055U* [Pr	çar ı	N	1 1991	4	ſ	i u		- 0	° 0	ŗç) 	- + - (\ ₽ ≈ œ	ា ឆ្	t U ~~~	7 L	L P •• •	- C	C 0	r ((2.6		22	20 20 20

TABLE A-8. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM MATRIX

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-	SURROUTINS MATRIX(NSET, QSET)		20
~	DIMENSION NSEI(1)+85EY(1)		20
•	COMMON ID'SIM'SINIL' TEVNI'STWALL' MED'MZIOD' WX C'NOCCI'S NHISI'S		30
a	100.NORP1.NOT.NPRMS.NRUN.NRUNS.NSTAT.OUT.SCALE.ISEED.TNOW.		0
· ur	21353.171N.MXX.HPRN1.NCRD8.V2P.VN014001.1MM.MXX52.44XNS		50
۰ ر	COMMEN AT DID (1) - CNO (1) (1) (1) - TNM (1) (1) - 1) - 10 - 20 - 20 - 20 - 20 - 20 - 20 - 20		
	CONTROL TO ALL ALL ALL ALL VOING ALL ALL ALL ALL ALL ALL ALL ALL ALL AL		5
- 6			2 3
ε σ	T FRANK AND A TOTAL TOTAL TOTAL ADDRESS OF A SOUTH AND	Warx.	
	TUCN, 1 (1), (1)] . [] [] [] [] []] . [] []] . []]] . []]]]		
2:	LOTION PAILENSIAN LATAR LATAR LATAR LATAR CONTRACTOR CONTRACTOR AND LATAR LATAR LATAR LATAR LATAR LATAR LATAR L		3
- ;	A THER CONVERSION AND A CONTRET AND A CONTRET AND A CONTRET AND A CONTRE A CONTRET AND A CONTRET		2 6
	/ NETISKING DILITE (TEU) ATAI INE AN OUT A TARNALA AN AN INE AND ANAN' AN	MATK 1	1 2 1
	DIMENSION MEYED 2		
			150
4	XI = FL DAT(TNT(CTTTME/JUL)) * 3100.		191
11	ARTY (NPART: 165)		170
18	JOS FORMAI (1H]./48X.22H**FILM USAGE SUMMARY**)		180
61	ARTIF (NPRNT 01)		190
20	1D] FORMAT (//7X °44F1LM.6X.*34CAN.3(8X.5HT0TAL).8X.5H0THER.8X.		200
21	1 5HT0T8L。7X+5HT0TAL)		210
22	WRITF (NPRNI.)U2)		220
52			30
74	J246X+BHTIME OUT1*5X+7HTIME IN+7X+6HREMAIN+3X,8BFEQ0TAGE/)		240
25			25 U
26	1D3 FORMAT (2UX.3(9X.44HIME).2(6X.8HOF REPOS).6X.5HREPCS. 9X.44HILM.		26U
27			2.0
م ۲			2.80
29	MILLOC I NICONTRACTION		90
U M	WRITE		300
11	111 = OKMAT 4.1		310
32			320
33	J=K = I F 4 (N)		330
8 M		MATX 31	340
5	C+++++REMONE CONTRIANS OF TYPE J AND PUT IN FILE 2		350
35		MATX 3	360
37	00 11 1 23°1 44		370
8	IF (NG(T))10+10+2	MATX 30	380
65	Z CALL TINDM (J=5*1+4*KCOL/NST+GSET)		3.90
	IF (KCOL)] D+] 0+ 3	MATX 4	
۲ ۲ 5 5	COLL FILTER [20MACT 9037]]	MATK L	2 4 4 5
1			100
1	,	MATX 45	450
1	C*****INTTALIZF JCELS AND SUMA ARRAYS.		460
47			470
6 J			480
49	343 JCELS(N°C1=3		4 9 0
۲, D			500
51	17 SUMB(Noff)=3.		510
52	±1.E2		520
53	SUMA(N•5)z-1.F23	ATX	530
ង		ΔTX	540
5.7	C*****PRINT RESULTS FOR EACH CANISTER	TX S	0
56	υ	MATX 50	60

TABLE A-8. (Continued)

MSFT.BCET) MSFT.BCET) C 11 C 11 C 203 F 112 F 112 F 111-) F 11-) F 11-) F 11-) F 11-) F 11-) F 11-) F 11-) F 11-)	T METERS/JANSTLACT) METERS/JANSTLACT) METERS/JANSTLACT) METERS/JANSTLACT) METERS/JANSTLACT) METERS/JANSTLACT) METERS/JANSTJACSTJACST METERS/JANSTJACST METER	Matx 570 Matx 570 Matx 590 Matx 610 Matx 620 Matx 620 Matx 620	MBTX 550 MBTX 650 MBTX 670 MBTX 690 MBTX 690	MATX 700 MATX 710 MATX 710 MATX 720 MATX 730 MATX 740		 011IME * Y * X * ATRIB(4) MATX 850 Matx 860 Matx 890 Matx 910 Matx 920 Matx 920 Matx 950 Matx 950 Matx 950 	МАТХ 970 МАТХ 980 ТТЧЕ ЭЦГ ОГ VAULT**//МАТХ1010 МАТХ1010 ОГ FILY Түэс, МАТХ1020 МАТХ1020 МАТХ1020 МАТХ1020 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100 МАТХ1100
	102 102 102 102 102 102 102 102 102 102] NSET.0557 C 11 0 203	.+×COL+¥5£7≠05Ê .51+05£7)	(2)+ÅTRIB(3)+0TTI SET+0SET) 50-•N) Y	60 T0 112 -TABLE III-) 1 1	(NPRNT.10U) J.JTRIB(1).(ATRIR(K ⁹ .K=1.3) 133) 1 (2110.7F33.1+1 ⁹) ¹ (2110.7F33.1+1 ⁹) ¹ Aalw.31.LE.D.D160 T0 15D 1 NUE NUE NUE NUE NUE NUE NUE NUE NUE NUE	ISTICAL RESULTS FOR FILM TYPE J. WT-120) II.//35X.43H.*FREQUENCY RESULTS FOR II.//35X.43H.*FREQUENCY RESULTS FOR WT.122) (KFILM(N).NETLM) 0411M2 OUT.20X.294WU98ER CANTSTERS WT.111) II.21 MT.111) II.21 MTLM II.21 II.

TABLE A-8. (Continued)

		• • • • • •	041171W
4 []			
116	= [X	IXI-50. 263 III - WILW	MATX1150 MATX1120
			UBLIXIAN
x		X Z X Y S H S X 2 ± X 1 + 5] _	Delly an
	1 3 1		MATX1200
121		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	MATX1210
122	175 FOR	2X * 2HT 0 + 1X + F6 «U + 1617)	MA TX1220
123		0 250	N.
124	30	WPITF (NPRNT.126) X2.(JCFLS(N.22).NEJ.NFILM)	MATX1240
125	tri -	MAT (1X*124GREATER THAN,=E.D.(LE.1517)	UC2 (X) BM
125		CONTINUE Dite : woont (13), (Sumble) - 2), (-), Net My	MATX1250
			USCIVITY W
			062 IXIVW
130	145 F 0F	FORMAT (1X°16HAVERAGE TIME OUT.1X°16F7.01	MATX1300
131	195		WATXI 31U
132	146 F 0P	01	MA TX1320
133			U22[X+am
134	147 FCR	FCPMAT (]X*16HMAXIMUM TIME OUI\$]X*16F7&01	Ma T X] 54 U
	107 501	2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	MATY1360
135	~		MATX1370
851			MATX1380
951	INISC****2	NF SUMMARY RESULT FOR COMPLETED FILM REGUIRENES	MATX1 390
140	U U		MATX14.00
141	1.9 k	8991	MATXI410
142	803 F08	1. 30X. 53HA**SUMMARY RESULTS FOR COMPLETED FILM PE	QUIREMATX142U
143	2.57		MaTX1430
144	:	WRTIE (NPRNIsgns) sector	MATX1440
	4]5 °0R		1000 [X 1 4 M
145	1 ~ 1 ~ 1 ~ 1 ~ 1 ~ 1 ~ 1 ~ 1 ~ 1 ~ 1 ~	10/HFUU146F 04401UHFEKUEN: UF 010/00/004501KEU144444400 HU 4040	MATX1470
14.9	nro		MATX1480
	20	[1] • NOFXP	MATX1490
150	K K I	Ξ	MATX1500
151	575	× Y + C 们 ご = C ?	MATX1510
152	JF (JCPUNT_LF_40160 TO 163	D25IX19W
153		1	025[X14M
150	1018 FUR	FURMET(//STX+TUH-TABLF V-J	0401X140
		JCUUNIEJ MDTTE (NDPN1.907)	MATX J560
157	901 718		MATX1570
15,8		*905)	MATX1580
159			MATX1590
160	C****CHE	CK IF EXPERIMENT HAS REQUIREMENTS WHICH HAVE BEEN COMPLETED.	MATX1610
161	-		MATVIC20
167	JFS CALL	FINDWANDYZUISSEKCULENSEISU Po. Ed. 1930 to 163	MATX1630
101		I RMOVE (Krol. 2011, NSFT, 05FT)	MATXJE4U
1951	2 00 1 11 2 n.		MATX1650
166	MFX	MF X D = 1	M&TX166U
167) - I	IF(JTRIA(2).EQ.21MFXP=2	، دى
168	I HW	WR TIF (NPRNT, 9DE) NAMEJ(KK), NAMEZ(KK), JTRIB(I), NEXP(MEXP), ATRIB(I)	wι
169	_		
170	чрғ ғин	URMAL 1588+5200+524155444+441+1448444444444444444444444444	

TABLE A-8. (Concluded)

	. IC 011NT = . IC 011NT + 1	MATX1710
		JZL IXIVW
	ົ	MATX1730
		MATXITU
	CBEEN COMPLETEDMAIX JAS REQUIREMENTS WHICH HAVE NOT BEEN COMPLETEDMAIX17	101 BEEN COMPLETEDMATX1750
		Matx1761
	164 70	ILLIXIVI WATXIJI
	L 951 4 E 1 6	MATXI 780
		NATX179
		MATX18DD
) L	MATX1810
	uptif (NDRNY, 905) NAMEI(KK), NAME2(KK), JTRIB(), NEXP(MEXP), ATRIB() MATX1820	XP(MEXP) & TRIBII MATX] 821
	- 4	MATX1831
		MATX184
	, C	MATX1850
	STS FONTYNIF	MATX1861
	4 7	MATX1870
	999 FORWATK//53%,10H+TAB) E V-1	MATX] BBI
		MATX189
500		DU9 I X I A M
		MATX191
	រ	MATX1920
	: :	MATY 10211

TABLE A-9. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM NXEVT

4.3.7557*TPF 5. NX 241

с ,		11.714	Ş
	SURPOUTINE NYEVI(XZ+NYET+0SET)	N X - V	202
. M	C*****COLLFCTS STATISTICS AND DETERMINE THE NEXT EXPERIMENT REQUIPING	NXEV	30
3	e * * * * * * * * * * * * * * * * * * *	VEXN	40
Ŀ	DIMENCION NCEI(1).OCET(1)	NXEV	20
ĸ	TFILM(2)		
r (COMMON ID.IM. HNII. LEVIL. CHANIT. HE BASIOP. WAS ACCULED FULLY.	N 7 7 V	
r 0	NACON NACIONAL NO PARTANANANANANANANANANANANANANANANANANANA	NXEV	30
-	COMMON ATRICAL SOCIADOR NO FORMA CONTRACTOR SOCIADOR SOCI		001
1			10
12	2388844434940143464440)*52948620451,51,51,51,421,51,4246661,4244444		20
13			130
7 (
r u 	J RF LEM (2019) MAME I COULY WART ZIZUULENCOUS (401) FOR ILMENUZAFENKEGICE 2 Nuberts ontilme. Pfondt pritke Rinning (41) vatike Sokoaye x EME		
17	DATA TETLMJEH S.F FH MOVIEJ		170
8			80
5 5 5	Coo≭***V⊅PIABLE PFOOT IS THE TOLFRANCE ON THE FROTAGE SHOT PER Coox**Strendanct.	NXEV	190
10			010
22	- 1 - 1 O O J C - 1 - 1	VEXN	220
53	c		230
a 1	A CIT IN A C	N I X N	0 4 0
с і Л т	**************************************		
~ 0		NX-XN	
0	11 11		062
۲۶			300
15			310
32	****CDLL 5CD		320
÷.	C*****STAND-RY。		
1			
16 L	Jese Serejeteteteteteteten CULENSE Fedst		
1 2 2	I TATI REPORT I	NX EV	270
ar			380
đ Mi	C****¤CHECK IF PIL OF THE CANISTER CAN BE USED		390
47			001
41	IF (X2-41R18(4))3.4.4		55
5 U U	Control The Cantsied Can be lised	NXFV	1 20
) a 1 a			U R
4.5	4 X2=X2-DTRIP(4)	NXEV	150
45	31R13(2)=5		0.9
5			01.5
7 (7 4		N L XN	100
105	C*****COMPULT SHOT TIME. TRANSIER TIME. AND WALT		500
5			510
5,7	T = (T 2 3 + + A 7 8 1 8 4 9 + + + + + + + + + + + + + + + + + +	>	520
ц Г	3IB(3)+(2)8IS	NXEV	530
3 L 7 L	50 10 47 41 ATOTOK21-ATOTOK21-ATOTOK401/AK31) ⊂ 7 47
ւ ս ւ տ	10-1: 1c 1c 1 x 1c		5611
:			

TABLE A-9. (Continued)

13	816[a/] - 61010 (1)	NXEN	5 7 Ú
	PTB(2)=A(ы. Х	. α
. U		A EXN	0
5	ATRTP (4) = () -	NXFV	μIJβ
1.9		NXEV	610
5	CALL FTIEM (TA(2),NSET.)	NXFV	F 20
. re		NXEV	630
5	0 TPUT	NXEV	640
u u	30 10 2	NYEV	650
л 7	3 CONTINUE	NXEV	660
F 7		NXIN	F70
8	C*****ALL THE CANISTEP CANNOT 9F USED. COLLECT STATISTICS AND STORE	NXEV	f 811
5	****COMISTER AS AN IN USE CANISTER.	N = X N	164
10	.ITRTR(2)=4	NXFV	100
12		N X - N	111
		NYFV	721
	TIAN ONG "BMIT WINSTEAD IN TOOLS EINGRACHASSA	N	730
74		NXEV	7 4 ()
70	I = { TNOW - ATRIBU	VEXN	750
76	43 ATPI8(3)=ATRI9(3)+(0(4)-4(5))-X2/0(3)	NXFV	761
77		VEV	77N
78	4	NXEV	7811
79	in	NXEV	790
ы	4TRTR(1)=4TRTR(1)	NXEV	8 U D
۲,	ATRI4(2)=ATRI4(2)+X2/6(3)	VIXI	814
58	ΔTRTR18(4)=ΔTRTR(4)=X 2	NXEV	820
83	4 T R I R (5) : D (4)	NXEV	830
84	CALL FILEM (IA(2),NSFT,0SET)	NXEV	840
u e		∧ ∃ x n	850
Яĥ	۲. ۲۲	NXEV	8 E U
٩7		N Z N	015
88	2 CONTINUE	NX E V	182
5			
16	C*****CHECK IF THERE IN & PARIJALLY UNED CANTAICK IN IN THE VAULT.	N X F V	005
- 0	211 JE (ARS(X2)-PEDUT 125.25.2	NXEV	920
. M	SCANT(TA(2)+2-2	N I X I	930
40	IF(KCOL)6.6.7	NXEV	940
5		NXFV	950
9£	C*****REMOVE THE PARIJALLY USED CANISTER.	NXEV	960
97	L	NXEV	97.0
9.8	7 CALL RMOVE (KCOL+IA(2)+NSET+0SET)	NXEV	980
99		NX-V 901	ll o b
100	C*****CHECK IF ALL THE CANISTER CAN BE USED.	NXEV]	000
101			010
201 201	IF(X2-ATRIR(4))8.9.9	NXEV1020 NYEV1020	020
	A STATE THE CAN BE HEED		
	*** ALL THE CONTOLES CAN BE	NX=V1050	020
	đ	NXEVICED	06 U
107	JTRIB(21=5	N X 5 V 1 0 7 0	010
108	UTR JR (8) = 0	NXEVIDED	0.8.0
601	[] =] A (7	060 LA 2XN	060
110	TAL CUA DATE CUDITACE DISEE FOCUL TELEVICE	NXEVI	EVIIUU
			120
117	C T C I T NOW - & T 2 T R (5 1) 4 7 ° 4 6 ° 4 6	NXEV1130	130
			1

TABLE A-9. (Continued)

45 ATR19(31=5TR19(3)+(A(4)-A(
FO TO 48		NXEVII50
47 ATRI9(3)=ATRI9(3)-AT	RT3[4]/4[3]	N X N V I I C
117 4R CONTINUE		NX EVII70
atrial starge (1)+2.*fgans(1)	(1)SN&2;	NXE VI 18
	8(41/0(3)	NXEVII
		NXEVIZ
	*0SET1	VX EVIZ.
		NXE V1 Z1
	ET)	NX EV 12
		NXE VI ZI
R CONT		NX EV 12
L		NX= V 1 2 8 0
C*****ALL THE CANTSTER EANNOT	T RE USED.	NXEVIZ
		NXEVI 3
118TR(2)=		NX EV 13
ITRTR(9)		NXEVI 320
T-70[7]		NXFV13
۲ د.		NXEVI 34U
	IANSFFE TIME, AND WAIT	NX EV 13
		NXEV1360
TF (TNOW-ATRIR(5))ED	5 th G	NX EV 13
49 ATRI3(3)=ATPI8(3)+(A(4)	•	NXE V1 3 8U
GO TO 51		NXEVI39U
51 aleret	(3)	NXEVI400
		NVEVIBIO
	(D A M C (T)	lica LASAN
	•	NVFUL
		TA IA IX
ATRIB		NXEVIU
45 CaLL FILFM (IA(2),NSET,0SET	• 02EI)	NXEVI460
CALL		NX EV 14
	5ET J	U 8 4 1 A 3 A 4 8 D
		NX EV 14
		NXEVI500
-		
C*****REMOVE CANJSIFRS THAT	HAVE NOT BEEN USED.	NXEVIS
72 IF (DHS(X2)-PFUUI)/25:25:2	5 • • • • • • • • • • • • • • • • • • •	
æ	1256 125N 1701 2 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	
11 11 11 1 		
ALL RRUPELSON	, , ,	
31 CALL R	• N S E 1 ¢ 6 S E 1 1	NY EVIEDD
C*****CHECK IF ALL THE CANISTE	TER CAN BE USED.	NXEVIEIO NY=V1E20
Tr / VI- «TOID / / / / 20-	a	NVFV16
AIR 10 4 1 1 7 7 1 8 7 0 8		NXEVI6
7 1100000	110 50	NVFUIE
איידר אזוכן אפר א		
C 2R X2=X2-ATRTR(4)		NXEVIE
		NXEVIG
CASASSONDIILS SUDDI TIME. TRANSFER TIMES AND	ANCEED TIME, AND MATT	
		NYFVIE

TABLE A-9. (Concluded)

171	JTRIR(2)=5	N XE V1 71 0
172	JTRJR(8)=0	NX EVI720
173	I = I a (7)	DEL LA EXN
174	ATRTB(1)=ATRTP(1)+2.**TR&NS(1)	NXEV1740
175		N XE VI 750
176	aTFTB(3)=bTFTB(3)+(A(4)-A(5))-ATFTB(4)/A(3)-2**FANS(I)	NXEVI760
177	XITATRS(4)	0 4 2 T N E X N
178	AIRI8(4):0.0	NX E V 1 7 8 0
179	ATRTR(5)=8(4)	NXEV1790
180		NX E V 1 8 00
181	CALL SCAN(NSET+05ET)	NX 2 V1 810
182	CALL OTPUT (X1*NSFT+GSET)	NX EV1820
183	50 TO 22	NXE V1 830
184	::	NXEV1840
185	C*****ALL THE CANISTER CANNOT RE USED.	NXEV1 A50
186		NX EV 1860
187	E CONTINUE 7	NXEV1870
188	JTRTF(2)=4	NX EV 1880
189	17713(9)212) ()	NXEV1890
190	I=TA(7)	NX EV 1900
191		NXEV1910
192	C*****COMPUTE SHOOT TIMF. TRANSFER TIME. BND WAIT	NX E V 1920
193	υ	NX5V1930
194	ATRJB(1)=ATRIR(1)+2。*TRANS(T)	NX EV 1940
195	ATRIR(2)=ATRI9(2)+X2/A(3)	NXEV1950
196	ATRJF(3)=ATRJF(3)+(4(4)-A(5))-X2/8(3)-2.*TRANS(1)	NXEV1960
197	atrir(4)=atrir(4)-X2	NXEV1970
198	(5)=0(4)	NX EV 1980
1 99		066 I A E X N
200	SCAN (NSET . QSET)	NXEVZDOD
201	CALE OTPUT (X2+NSET+OSET)	NXEV2010
202		NXEVZUZO
203	2 CONTINUS 25	NX2 V2030
204		N X E V Z U 4 U N V E V 2 D E D
205	CAPERITENI/ LLA 11.	
101	C L DJCD ID 312	NYEVZUEU
		NYFV2080
		NXEV2D90
	TE(TA(E), EG. 21NT=2	NX EV2100
110		NXEVZIIO
	RIF(NPRNT 222) IA(NXEV2320
212	TYPE . 12. AS, 21H FILM ASSIGNED TO : .	I
214	TAS BEFN USED (1P*)	
512		NXEV2150
2]F		NX EV2160
217	C*****CALL PICK TO DETERMINE THE VEXT EXPERIMENT REQUIRING FILM.	N XE V2170
218		NXEVZIBU
510		
720		NYFV2710
223		1224

TABLE A-10. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM OTPUT

4.33559*TPF \$.01PUT

1	SUPPOUTINE OTPUT (X2, N° ET , 0SET)	1410	0
r.		1 1 1 1	202
m =	COMPON ID / Me INIT, JEVNT, JMNIT, MA AN STOP, MX (* NCE CT & NHIST) 1 400-40351-401-40545.40144-40145.40144-40145.5150-41451	1410	2 C
7 6	2	0101	5
r le	fow atriation stored and a store stored and a stored an	1 d L O	09
~	(NO (400) * MFE (400) * ML C (400) * ML E (400) * N CE LS (20) * NO (400) *	OTPT	70
æ	228884443949,01185(400)。SSU48(2045)。SU48(2045)。NB486(5)。NP407, MON.	1 < 1 0	06
٥.	arsNrRoJCLR.JTRIR(]7)	DIPI	90
10	a()),ICAN(40),JCOUNT,JTEST,KFILE,K	1 = 1 0	100
4 11 4 11	J K TLM (25) VAME (200) VAME (200) VAME (200) VCODE (40) VE LW VOE XVVECYC V	1410	110
12	2		121
1	している ひろうかん しいう しんごうしんひ うせいしゅん こうしゅう	1410	130
14	CARRERT DETINE OFFICE OFFICE OFFICE		
	C DINSKIDN FANTOARS	Lelo	
. r		TPT	120
	111 - CORMAR (315,32,0266,22,414,311,211,22,415,22)	1 c 1 0	180
5	XHR=X04Y/50.	0101	190
U 2	× • • • • • • • • • • • • • • • • • • •	OTPT	200
51	X]={a(4)/XDaY-FLOAT(IDAY-1))*XHR	0TPT	210
<i>د</i> خ		Ldi O	220
23	MIN= (X]-FLOAT (JHR))*60.	0101	2 30
24	Y = A T R I + A T R I + A T R I B (2) + A T R I B (3)	1 4 1 0	240
52	ICODFIIA(2)	1410	250
75	I) = I 4 (5)	1610	260
27		1410	270
2.8	If(JCOJNI.LT.40360 TO 110	1 1 0	280
56	WRTIF(NPRN1+101)	TPTO	2 90
12]] FURMI(//51×*/UH-/ARLE II-) 1.000000000000000000000000000000000000		200
~ ~	JC(2)20	0TPT	1010
- F	OPMAT (141)	OTPT	330
i ar		1e10	340
5	(NPRNT .	TTPT	350
5	~	1010	360
37	I FORMAT	1410	370
38	332 "ORMAT (3X°3H)DY°3X°2HHR。2X°3HMIN。2X°10HEXPERIMENT*9X°8H.OCATION.	1010	381
6 E	X ° 7HREM & I N ° • 5 X • 5	1410	390
	Ν,		100
	TURME (SUMATHE LEASSONAHE MERADANAHE MERADAU KUNUN) - Meradahe Sumatan Tur tet sekeriti Meradahe Angori Tela	Tero	
	J WRITELNPRNESIJUIIUPTEINELTENSNAMEJELEUUEISNAMEZELEUUEI Soemedeltii testi.	1010	
r =	ILENERSALIS VIENTALIS STRETALIS GATARIAS ATOTRIS STRETALIS ATOTRIS STRETAS STRETAS STRETAS STRETAS STRETAS STRE	1 c 1 O	4 4 0
, n		1910	450
r 4	1.5	1 c L O	460
		0101	470
- 67	C*****5ENERATE CANISTER USAGE TIMELINE TRACE TAPE IF REBUIRED	1 = 10	4 8 D
49	-	07P7	4 9D
50	°1331°°	1=10	200
5	104 FORMAT(212*2F10_3\$14)	1410	210
57	RETURN	1610	520
۲. ۲	FND	1410	530

TABLE A-11. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM PFILE

dlige"sights.prile

-	SUBROUTINE PFILE (NSET+OSET)	PF IL	10
n			2 0
en 4	COPPON ID: 10: 14: LEVNI: JANII: FESCOP: MX: MXCONCLCISNHIST: 1 MOD: MODDI.VOI: NOPMS.MDHM.WDHMA.NOIAS.OHI. COHE.ISED.YNDM.	PFTL	4 D C
r un	ZTREG.TEIN, MXX, NPRNT, NCRDR, NEP, VN0(400), IMM, MXX05, MXXN5	PFIL	205
u:	COMMON ATRIS(IS)*ENG(400)*INN(403)*JCELS(20*22)**74NK(403)*	PF1C	9
r «	JM AXNG (400) *MFF(400) *ML (400) *MLE (400) *NCELS (20) *NG (400) * 22 ARAM & 1 * 01 * 01 TME (400) * 55 UMA (20 * 51 * 51 MA (20 * 51 * NA YE (61 * NPRO) * MON*	PF IL PF IL	70 80
e o	TABAY AND A SURVICE AND A S	PFIL	06
10	JRITE (NPRNI-240) INOW	PFIL	100
11	240 FORMAT (1H1.//10X.22HPRINT OF FILES AT TIME.F10.2//)	PFIL	110
25	900+1=1 E12 DE	DFIL	120
13	IF (NG(I))210.2210.221	PFIL	130
14		PFIL	0
<u> </u>	C****PRINT THE NSET ARRAY	PFIL	150
c r	ر 221 12-0		
	-	0110	
	91 FORMAT (//UX:44FILE:17.2X.8HCONTENTS//.25X.4HNSET/)	PFIL	061
5	[] = MF = ([]		200
21	223 IL={I]-]}#MXX+]		2 3 0
22	I N = I L + M X X - 1		220
23	WRITE (NPRNT,990) II.(NSET(IJ).IJ=IL.IV) Write (NPRNT,990) II.		2 30
24	9] FORMAI (3X*15*5X*13T8*/13X*13T8)		240
2	I = A Z E I (I A - I)		250
75	I = (I] - 7 7 7 7 3 2 2 3 ° 2 2 4 ≈ 2 2 4		260
27	υ		270
2 8	C******PINI FIE OVET ARAAV		280
500	υ	PFIL	290
30	0=23 H ZZ	PFIL	300
33		PF IL	310
۳ ۵	92 FORMAT(/75X.4440SET/)		320
33		PFIÚ	330
34	225 I 3=(I]+I) #MXX+1	PFIL	340
ы М	I 4 = I 3 + MXX - I		350
35	<pre>IL=(I]-I)*IM+1</pre>		360
37	IV=It+IMM-1		370
5 M	WRITE (NPRNI,95) I].(ASEI(IJ).LJ=IL.IV)		380
50	95 FORMAT (3X+15+4X+84E12+6+2X)+/12X+84E12+6+2X))		390
5			400
47	IF(I]-7777)225*210*210		410
2, 11	21 3 CONTINUE		420
m a	RETURN		4 30
7 1	C Z E	PFIL	0 11 1

TABLE A-12. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM SCAN

433559*1PF5.SCAN

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ENSION NSET(])#OSET(]) Mon to twitt.ethit.meanweathd.wy.wyf.anchfitt.
MON LUST ALVELS ALVES AND AUNTION FRANCION ANALAN AVALATINAN AVA
G.IFIN.MXX.NPRNT.NCRDR.NEP.VNQ(400).IMM.MAXOS.MAXNS
YON ATRIBUTSI ENG(430) . INN(400) . JCELS(20.22) . KRANKI
NO(400) *MEE(400) *MCC(400) *MEE(400) *NCETS(20) *NO(40
AM(4].41.GTINE(4001.SSU4A(20.5).SUMA(20.5).NA4E(6).N
Y * N YR * JCL R • JT R IB ( ]
ON A413).3TIME.ETIME.LA(13).ICAN(40).JCOUNT.JTEST.AFILE.K
JLM(25) NAME1(200) NAME2(200) NCODE(40) NFILM.NOFXP.NRECY
2115 OTTIME PF001 PRTIME R = 00T . TRANSIG N VATIME X DAY & XING
VFNT
(JTRJB(5
=ATRT3(1)
= A T R I B (
TATATAL 343
= & TRIB(4
311 11-3°29
J1.FQ.IA(2)160 TO 11
(NO(1)).50.0160 TO 3
LL FINDN(JTRIB(5) \$5.I
(KCOL . F0. 7160 T0 11
LL RMOVF (KCOL .
RTS(])=
RTB(2) = Y
RIG(3)
RTB(4) = Y
LL FIL
NTINU
å

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TABLE A-13. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM SCANT

403557*TPF5°SCANT

7 10 20	30						- <mark></mark>	• •				140										240					r 290	300	310						370
SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	SCAT	U	SCAT
SURROUTINE SCANT (11,12,13,14,15,16,17,KCOL,NSET,0SET) DIMENSION AGET(1),0SET(1)	COMMON ID'IM'INII', JEVNI', JMNII', ME A, MSIOP, MX, MX C'NCLCI, NHISI'	1 NOO & NO 2 P T & NO T & NPRM S & NR UN & N R UN S NS T A T & OUT & S C A L E • I S E E D • T NOW &	21866.1111N.#XX.NPRN1.NCRDR.NEP.VN01400).1MM.MAX05.MAXNS	COMMON ATRISISENO(400).INN(400).JCELS(20.22).43ANX(403).	JMAXNG(400)。MFE(400)。MLC(400), MLE(400), NCELS(20), NC(400),	2PARAM(4]*4)*01IME(400)*5504A(20,2)*50MA(20,5)% VA4E(6)*NP400%	3NDAY «NYR » JCLR «JTRIB (17)	COMMON A(1);3TIME.ETIME.IA(1),ICAN(40).JCOUNT.JTEST.KFILE.KOUT.	3 KFTLM(25),NAME3(200),NAME2(200) «NCODF(40) «NFTLM«NOFXP«NRECYC»	> NWRITE OTTIME oF 001 "PRTIME "R" 001 "TRANS(4) "VATIME "X DAY "XTIME	, c	C*****I IS FILE NUMBER. IZ IS COLUMN AND IS IS NVAL, EIC.	ن ن	C = 10 2 X	K = N Ø ( I ] )		IF (K. EQ.D) RFTURN		INDX={K]-]}*MXX	L 1 = T N J X + T Z	J=N5F7(L])	I:(1).NE.I3)60 TO 102		J]=NSE1{[]}	IF(J].NF.I5160 T0 JD2	L 1 = 1 N 3 K + 1 5	J=NSE1(L])	IF(J].NE.I7160 10 102	KC0F=K3	50 LO 105	102 L]=INDX+IM+]		3 DD CONTINUE	I J RETURN	END
- ^	M	्य	цС.	uc	~	æ	o		**	2	600 100	47 197	۲C) روم	21 •••	-	90 570	0 	20	~	23	23	8 C	ר ע	35	27	с: С	29	3 U	31	<u>г</u> м	3	34	s. M	ŝ	23

TABLE A-14. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM STEVT

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3

1       STEV 10         2       STEV 10         3	3550*YPF	SoSTEVT		1
01WEASION NETITI: 05F111       01WEASION NETITI: 05F111       57EV         01WEASION NETIT: 2EWI: JMMIT: MFA.MSTOP: MX.MXC.CTAHTST:       57EV         1000: A00PT: 400T: MRIANCAURUNARUNS: MSTD: 001: 5CALE: 15E0: TNOM:       57EV         1000: A00PT: 400T: MREAURUNARUNS: MSTD: 001: 5CALE: 15E0: TNOM:       57EV         1000: A00PT: 400T: MREAURUNARUNS: MSTD: 001: 5CALE: 15E0: TNOM:       57EV         1000: A00PT: 400T: MREAURUNARUNS: MSTD: 001: 5CALE: 15E0: TNOM:       57EV         1000: MREAURUNARUNCER.MERAURUNARUNS: MSTD: 204000:       57EV         1000: MREAURUNARUNCER.MERAURUNARUNS: MSTD: 200400:       57EV         1000: MREAURUNARUNCER.MERAURUNARUNCERSENCER.MAKEAURUNARUNCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSENCERSE	مەر	URROUTINE STEVI (NSET, OSE	ш.	2
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<pre>7 NWRTTE.OTTIME.PF00T.PRING.AF00T.FRANS(4).VATIME.STORY.TIME STEV 3 C C</pre>		KFTLM (25) *NAWE1 (200) *NA ME2 (200) * NCODF(40) *NFTLM*NOFXP*NRECYC	1.1	110
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TABLE A-15. FORTRAN LISTING OF USER-WRITTEN SUBPROGRAM WRITEO

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## APPENDIX B GASP FILE AND PROGRAM INFORMATION

Attributes	Description
Fixed-Point 1	Event code: 1 – start filming, 2 – end filming, and 4 – end of mission.
2	Experiment code. Used in communicating with the experiment/ canister files.
3	File type. Used for output purposes.
4	Entry number in experiment/film requirements file. This attribute is used to communicate between the files for file updating.
5	Camera type. Used for output purposes.
6	Footage per canister. Used for output purposes.
7	Code for location in which experiment is performed. Used for output purposes.
8	Indicator used to determine if all assigned film is depleted.
Floating-Point	
1	Time the event occurs. Required by GASP to perform next event simulation.
2	Filming time per experiment performance. This attribute is used in conjunction with the camera rate to determine the footage.
3	Camera rate.
4	Time the performance of experiment ends. This attribute is used in conjunction with the time that filming starts to compute statistics for the canister.
5	Time in which the filming event begins.

## TABLE B-1. ATTRIBUTES FOR EVENT FILE

## TABLE B-2. ATTRIBUTES FOR EXPERIMENT/FILMREQUIREMENT FILES

<b>r</b> *	REQUIREMENT FILES
Attribute	Description
Fixed Point	
1	Film type. Used by event file and experiment/canister files for information purposes.
2	Camera type. Used by event file.
3	Common canister code. All experiment requirements with the same code use the same canister.
4	Footage per canister. Used by event and experiment canister file.
5	Code to indicate that the film is to be returned to the vault immediately after filming versus waiting until the experiment is complete.
6	Entry number in file. Each entry in a file is numbered in ascending order. This is used to communicate between the experiment/film requirements files and the experiment/canister files.
7	Code for the location where filming occurs. Used for determin- ing the amount of transfer time between the film vault and shoot area.
Floating Point	
1	Total footage or exposures of film required for the experiment. Used to determine the number of canisters to assign to the experiment. Also used in conjunction with the cumulative footage or exposures during the simulation to determine when all of the filming requirement has been met.
2	Filming time per experiment performance. This is used by the event file.
3	Camera rate. This is used by the event file.
4	Not used.
5	Cumulative footage or exposures used.

Attributes	Description
Fixed Point	
1	Canister numbers. The canisters are numbered in ascending order by film type. Used for output purposes.
2	Canister status code: $1 - has$ not been used, $2 - partially$ used and in the vault, $3 - partially$ used and out of the vault, $4 - in$ use, $5 - no$ film remaining.
3	Footage per canister. Used to initially define the remaining footage or exposures. Also used for output purposes.
4	Film type. Used for output purposes.
5	Common canister code. Used to determine if the canister is used by more than one experiment.
6	Entry number in experiment/film requirements file which the canister is allocated to.
Floating Point	
1	Cumulative transfer time. This is the time that the canister is in transit between the vault and the filming location.
2	Cumulative filming time. This is the time that the canister is being used for filming.
3	Cumulative wait time. This is the time that the canister is out of the vault but not being transferred or filmed. The sum of the transfer time, filming time, and wait time gives the total time out of the protective vault.
4	Remaining footage or exposures. Used to determine when all of the canister has been used.

## TABLE B-3. ATTRIBUTES FOR EXPERIMENT/CANISTER FILES

Subprogram	Function
COLCT	Used in computing the mean, standard deviation, the number of observations, and the minimum and maximum values of a variable.
DATAN	Initializes GASP variables and sets up to experiment/film requirements from the input data.
ERROR	Called when an error is detected in any GASP subroutine except PRNTQ, SUMRY, and MONTR, all of which print their own error messages.
FILEM	Called to file an entry in file JQ of the arrays NSET and QSET.
FINDN	Used to locate a row called KCOL in file JQ of the array NSET.
FINDQ	Used to locate a row called KCOL in file JQ of the array QSET. The only difference in FINDN and FINDQ is that the first argu- ment of FINDQ is a floating-point variable, and additional argu- ment TOL is added. TOL is the tolerance used in the search for the specified condition.
GASP	Executive control for GASP written programs.
HISTO	Used to obtain the histogram of observed observations.
RMOVE	Called to remove an entry from file JQ of the arrays NSET and QSET. KCOL is the row to be removed.
SET	This subroutine maintains and updates the filing arrays NSET and QSET.

## TABLE B-4. GASP SUBPROGRAM DESCRIPTION

## TABLE B-5. GASP VARIABLES AND ARRAYS

Variable	Definition
ATRIB(IMM)	Buffer for floating-point attribute values stored in or retrieved from QSET array.
ENQ(NOQ)	Time-integrated number of entries in a file.
ID	Number of rows of NSET and QSET, limited only by available storage.
IM	Number of attribute columns in NSET.
IMM	Number of attribute columns in QSET.
INN(NOQ)	If $INN(J) = 1$ , entries in file J are ordered with lowest value first (LVF). If $INN(J) = 2$ , entries in file J are ordered with highest value first (HVF).
INIT	Indicator. The statements INIT = 1, CALL SET (1, NSET, QSET) initializes NSET and QSET.
ISEED	Initial random number.
JCELS(NHIST, MXC)	Storage array for histograms.
JCLR	If JCLR $\leq 0$ , the statistical storage areas are not initialized. If JCLR > 0, the statistical storage areas are initialized.
JEVNT	Code of event being processed. Also used as a control in sub- routine MONTR.
JMNIT	If JMNIT = 1, each event is monitored. If JMNIT = 0, no monitoring occurs.
JSEED	Local variable used in subroutine DATAN to read the initial random number seed value. JSEED must be positive for TNOW to be set to TBEG.
JTRIB(IM)	Buffer for fixed-point attribute values being stored in or retrieved from NSET.

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TABLE B-5. (Continued)

Variable	Definition
KRANK(NOQ)	KRANK(J) is the attribute column on which File J is ranked.
MAXNQ(NOQ)	MAXNQ(J) is the maximum number of entries in File J.
MFA	Identifier of first row in NSET that is available for storing an event or entity.
MFE(NOQ)	MFE(J) is the first entry in File J.
MLC(NOQ)	MLC(J) is the next entry in File J to be removed. If not specified, MLC(J) is set equal to MFE(J).
MLE(NOQ)	MLE(J) is the last entry in File J.
MSTOP	Indicator for specifying method of ending the simulation.
MX	Successor column in NSET array. $(MX = IM + 1.)$
МХС	Largest number of cells to be used in any histogram.
MXX	Predecessor column in array NSET. (MXX = IM + 2.)
NCELS(NHIST)	NCELS(J) is the number of cells in histogram J, not including end cells.
NCLCT	Number of sets of statistics that can be collected in COLCT.
NEP	Indicator used in DATAN for initialization. NEP specifies the data card type at which reading of initialization cards is to begin for the next simulation run.
NHIST	Number of histograms that can be generated by HISTO.
NOQ	Number of files in NSET and QSET.
NORPT	If NORPT > 0, SUMRY and OTPUT are bypassed. If NORPT = 0, SUMRY and OTPUT are used.
NOT	If NOT = 0, simulation starts from beginning. If NOT > 0, a check on NEP is made.

Variable	Definition
NPRMS	Number of sets of parameters.
NQ(NOQ)	NQ(J) is the current number of entries in File J.
NRUN	Number of the current simulation run.
NRUNS	Number of runs remaining, including the one remaining.
NSET(ID*MXX)	Integer part of the filing array.
QSET(ID*IMM)	Real valued part of the filing array.
QTIME(NOQ)	QTIME(J) is the time of the last use of File J.
SSUMA(NSTAT,J)	Array for storing time statistics generated by TMST.
SUMA(NCLCT,J)	Array for storing statistics generated by COLCT.
TBEG	Initial value of TNOW.
TFIN	Time to end the simulation if $MSTOP > 0$ .
TNOW	Current time of a simulation.
VNQ(NOQ)	Time-integrated square of the number of entries in a file.
OUT	If OUT = 1, an entry is to be removed from NSET and QSET. If OUT = 0, an entry is to be stored in NSET and QSET.

TABLE B-5. (Concluded)

TABLE B-6. FORTRAN LISTING OF GASP SUBPROGRAM COLCT

403550*%PF5.COLCT

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3NDAY,NYR,JCLR.JTRIB(17)       If (N) 2,201         If (N) 2,201       COLC         2 Call ERROR(90,NSFT.0SET)       COLC         1 If (N- NCLCT) 3,32.2       COLC         3 SUMA(N,1) = SUMA(N,1)+X       COLC         5 UMA(N,1) = SUMA(N,1)+X       COLC         5 UMA(N,1) = SUMA(N,1)+X       COLC         5 UMA(N,2) = SUMA(N,2)+X*X       COLC         5 UMA(N,4) = AMINI(SUMA(N,5)+X)       COLC         5 UMA(N,4) = AMINI(SUMA(N,5)+X)       COLC         5 UMA(N,4) = AMINI(SUMA(N,5)+X)       COLC         7 UNA(N,4) = AMINI(SUMA(N,5)+X)       COLC         7 UMA(N,4) = AMINI(SUMA	- α	1	COLC	80
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SUMA(N,3)       SUMA(N,3)+1.01         SUMA(N,4)       SUMA(N,4)         SUMA(N,4)       AMINI(SUMA(N,4).x)         SUMA(N,5)       AMAXI(SUMA(N,5).x)	۲. ۵۲ ۲. ۲. ۲.	SUMALN 2)		140
SUMA(N.4) = AMINI(SUMA(N.4).X) SUMA(N.5) = AMAXI(SUMA(N.5).X) SUMA(N.5) = AMAXI(SUMA(N.5).X) SUMA(N.5) = COLC COLC FAD		MA(N. Z)	COLC	150
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## TABLE B-7. FORTRAN LISTING OF GASP SUBPROGRAM DATAN

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<pre>31? NCCLS(II)=?? MEXP=1 SET TO SET IF SINGLE EXPOSURE FILM 0? MOVIE FILW IS USTO A MEXP=1 SET TO SET IF SINGLE EXPOSURE FILM 0? MOVIE FILW'IS USTO A DIFLUTRIB(7).E0.2)WEXP=2 DIFLO A DIFLUTRIB(7).E0.2)WEXP=2 DIFLO A DIFLUTRIB(7).E0.2)WEXP=2 DIFLO A DIFLUTRIB(7).E0.2)WEXP=2 DIFLO A DIFLUTRIB(7).E0.2)WEXP=2 DIFLO A DIFLUTRIB(7).E0.2)WEXPECT BACK INTO THE VAULT IMMEDIATELO A DIFLUTRIFT(1).E0.2) A DIFLUTRIFT(1).E0.</pre>	212 OÚ	SIHNII	2
MERV=1       Date: 10 State Stuge Erlem 03 Movie Film' IS USFO       Date: 10 State Stuge Erlem 03 Movie Film' IS USFO         If Lutribio.state Stuge Erlem 03 Movie Film' IS USFO       Date State S	2 NCELS(I	Ь. Н	
\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	ЕXР		90
DA IF(JTRIB(2),_E0,_2)MEXP=2 JTR[9(5]=Nn(J9+200)+1 MP=2 MP=2 MP=2 MP=2 MP=2 MP=2 MP=2 MP=2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2 MPE2	1 1231*****	TE IF SINGLE EXPOSURE FILM OR MOVIE FILW' IS USF	041
IF(JTRIB(2),EC.2)#FXP=2 JTR[4(5)=Na(Ja+200)+1 MP=2 MP=2 ****TEST TO SEE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL #****TEST TO SEE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL #FIEQ USF	5		D A J
IF(JTRIB(?),E0.2)WFXP=2 JTR9(5)=NA(J3+200)+1 MA=2 MA=2 A****TEST TO SFE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL *****TEST TO SFE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL IF(JTR14(5)-F0-1)MR=1			100
JTRTA(5)=NA(JG+200)+1 MP=7 MP=7 (5)=NA(JG+200)+1 MP=7 10 SE IF FILM IS 10 BE PLACED BACK INTO THF VAULT IMMFDIATEL ASTE9 USF IF(JTRTA(5)-FG-1)MR=1		R . 2 IMEXP=	L V J
MP=2 ****TEST TO SEE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL #****TEST TO SEE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATEL #FLJRTAGF.FG.THMR=1		1+1002+0	0 8 1
			, a c
*****TEST TO SFE IF FILM IS TO BE PLACED BACK INTO THF VAULT IMMFDIATELDA beteq usf If(jiri4(5).f0.11mm=1			č
DA bf129 USF [f(J]R[4(f).fQ.])MR=] [f(J]R[4(f).fQ.])MR=]	I ISSIAAAA	EF TE FTIM TS TO BE PLACED BACK INTO THE VAULT	ы Ш
00 If(JIRIA(F).FQ.])MR=1	AFT70		
IF(JIRI3(5).F0.11MR=1			5.01
	Ľ.		

TABLE B-7. (Concluded)

)•JKA=f•3]•RET(MR) •I2•5X •I2•7X •I3•11X•I3•5X•A1•F6•0•3X • 0ATN15			RNT • 9300) 0ATN119	F(JCOUNT . EQ. 40)WRITF(NPRNT, 9001)			NTTNJE DATNI 230		- INDICATES VUMBER OF EXPOSURES RATHER THAN FOOTAL			I - ]		F (NG(I).NE.1)GO TO 400		RIB(6)=0 DATN320	(I & NSE T & QSET)		TO SET UP THE EXPERIMENT/CANISTER FILES.	DATN1 370	INSET OSETD DATNIZE	ITTIALIZE JCELS AND SUMA ARRAYS	DATN1410		
ມ ມ ເອ ເອ	]F6。1。6X。F7。2。9X。A3] 40710+233	38 0 0		IF (JCOUNT "EQ "40) WRITE()	IF(JCOUNTSEQ.40)50 TO	00 0	202	WP JTE (NPRNT «9000)	303 F	ندا	ULLIF(NPRNT.99001)	FOR FOR	ē	IF (NG(I) "NE" I) GO TO 40	CALL RMOVE(MFE(I) . I. NS	JTRIB(6)=Q	ALL FILEM	DO CONTINUE	****CALL CDATA	υ	ALL CDATA INSET OSET	*****INITIALIZE JCELS AND	υ	JC OUNT = D	

TABLE B-8. FORTRAN LISTING OF GASP SUBPROGRAM ERROR

4]]550*TPFS。FRR09

	20						80			110	120	130			-		170	
EROR	EROR	EROR	5023	EROR	EROR	EROR	EROR	EROR	EROR	EROR	EROR	FROR			EPOR	EROR	FROR	
11300 INVESTICATE STATES		CLEAR AND	COMPAN IN THATMALL JORNAN AND NATATION AND AND AND AND AND AND AND AND AND AN	JICCONTRACTOR NOV NO PORTING STATE OF A DO	νιαιάνι μετάλαμα. Ποιάντατα το του του του του του του του του του	**************************************	2008284884 83% 61 7 7 7 8 6 4 00 3 8 5 0 4 5 1 8 5 0 4 4 2 0 8 5 1 8 5 1 8 4 8 4 6 1 8 4 P 2 0 3 4 0 N			CO FORMAR STATE			TOT FORMAT(//S6XI6HERROR TAILS STREETSATH ERRORS//S11 STEL STREETS		CAN DETLE (NSET, QSET)			F ND
5 ' C	P=1 (	~ 1	¥ (م	ri	n u	C P	- a	, c	л. с	- • - •	~ (	N	Banat Marija	ររ ត		Г. <b>1</b> ан д	2	pur.

TABLE B-9. FORTRAN LISTING OF GASP SUBPROGRAM FILEM

400550*TPFS FILFM

## TABLE B-10. FORTRAN LISTING OF GASP SUBPROGRAM FINDN

400550*TPFS.FINDN

50*TPF9	5 () * T P F S • F I N P N		
-	SUBROUTINE FINDN(NVAL.MCODE+JG+JATT+KCOL+NSET+GSET)	FINN	10
~		FINN	20
m	COMMON ID. IM. INII. CEVNI. C4VII. MFA. MSTOP. MX. MX C. NCL CI. VIISI.	N N N I J	30
7	INOG *NORPT *NOT *NPRMS + NPUN • NPUNS + NST # T + OUT + SCALE + ISEED + TNCU *	F I NN	40
ſ	778E3+1fIN+MXX+NPRNT+NCRDR+NEP+VNQ(400)+IMM+M4X9S+M4XNS	FINN	50
Ľ	COMMON ATRIB(15).END(400).INN(400).JCELS(20.22).KRANK(400).	FINN	09
~	1 M & X NG( 4 3 3) + M ™ E ( 4 0 0 ) + M L C ( 4 0 0 ) + N C E L S ( 2 0 ) + N 3 ( 4 3 3 ) +	NNI 2	70
α	2P AR AM (40.4) • 01 IME (400) • SSUMA (20.5) • SUMA (20.5) • NAME (6) • NPR0J• MON•	F I NN	80
e	JNDAY.NYR.JCLR.JTRIR(17)	N N N I 1	06
10		FINN	100
	C*****I49 COLUMN WHICH IN THE BEST CANDIDATE IS KREST	シアール	110
12		FINN	120
20		FIVN	130
14		FINN	140
l s	C*****I1E NEXT COLUMN TO BF CONSIDERED AS A CANDIDATE IS VEXTH	7 I VN	150
16		FINN	160
17	_	F I VN	170
1 P	TF(NEXTK) ]6.1.2		180
6	9.5 CALL STROP (99.NST1.0SE1)	277,	07.0
70			2 00
E		F I NN	210
~ 1	TO THE TOTAL STREATED THAT SEADER AND THE STREATED TO		122
	ANAMORA IN TO TOTATION TO AND THE STRATT AND THE TOTATION TO AN ANALY AND		
5.5			250
	TO THE THE CARL ANYON TO STATE THE TENDED TO THE ANY CONTRACTOR	E T MIN	2010
П.С.	C 0 60 TO 111101131131141012		220
		FINN	280
		FIUN	0.60
		FINN	300
		FINN	310
		FINN	320
		NN1 1	330
a M	GRNV	FINN	340
35		FIKN	350
35	G0 10 20	FINN	360
37	1	NNI 3	370
8	I - I NM 9 MN	FINN	<b>08</b> ⊵.
<b>6</b>	LL 40 + X XH 4 LL + X XH 4 L + X XH 1 0 Z	NNI 4	390
2	TEIMORNATINS		
	*****UNEN FOILA	FINN	4 2 0
	****SPETTETED VALUE	FIVN	430
44		FINN	440
5	21	FILN	450
4 F	66 IF (MCODF-5)6.4.F	FINN	4 60
47	I ^c (K9EST)]6.8.7	F I VN	470
4 B	7 IF(NMANN*(NSET(INDX)-NSET(KINDX)))4+4+8		180
0		2711	
C 5			226
5			
<b>.</b> .			
		F T NN	1 3
. n	< 0 F	FINN	' L'I
r u n u		FINN	560

## TABLE B-11. FORTRAN LISTING OF GASP SUBPROGRAM FINDQ

6CV];"2777560

1 D F			
-	SUBROUTINE FINDG(OVAL+MCODE+JG+JATT+TOL+KCOL+NSET+3SET)	FING	10
•		ίνI μ	20
m	COMMON ID+IM+INII+JEVN1+JMMII+MFAFMSIOP+MX.C+NCECT+NHIST+	FING	Ω
a	1 NO3+ NO4P1+NO1+ NPRMS+NRUN+N2UNS+NS1B1+DU1+ SCBLE+ISIS+1NO4+	GVI 3	40
u	218FG.1F1N.MXX.NPRN1.NCRDR.NFP.VN0(400).IMM.MAXG5.MAXN3	FING	50
u	COMMANN BIRISI.SNO(4000).INN(400).CELS(20.22).KJANK(600).	FIVO	ĒŪ
		FIND	710
- œ	23454M (111) - 21 M (111) - 22 M (120-2) - 21 M (20-2) - 20 M (20-2) - 20 M (20-2) - 20 M (20-2) - 20 M (20-2)	CN1 L	
σ		FIND	5
		E T N D	001
	Commentation of the sect faulture of the sect faulture of the sect	E T NO	
- :	**************************************	C 1 1 2	2001
		777 - L	
M	KRFNETU 1	3211	1 30
		1 1 4 6	2 4 6
<b>.</b>	C*************************************	E I NO	150
ч Г		CNI L	150
17	EXTK=MFF(J0)	FING	D/ 1
8	I = ( NFXTK) ] 5 + ] + 2		180
6	ALL FRR		1 5 0
5	¥	6 X I 4	200
12	RE T UR N	FING	210
62		5714	220
23	****XGRNV	FING	2 30
24	WAMN IS I FOR MAXIMUM AND -I FOR MINIMUM	FIV9	240
25	*****FOR SEARCH FOR EQUALITY THE	FING	2 5 N
7 F		UNI 1	260
77	2 GB 10 (11,12,13,14,11),MCODF	FING	270
â	GRWV=1.	FING	280
20	X MAMN= 1	FING	062
102		FING	300
1.5	аŰ	FING	310
32		E ING	320
м М	G0 10 2U	FING	330
34		FING	340
34	XTEMNET.	FING	350
36	10 T C C T C C	E I VO	360
37	GRNV=	FING	370
38		θNIE	180
۹. ۵	ZI INDX=(NFXTK-))*1MM+JATT	FING	390
C a	I 4 M 8 H X 3 H N A ( 0 VE I ( I N ) X ) - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N P - 3 N	FING	400
4 ]		<b>UNI</b>	410
47	1) - 1	FINO	420
е 3	7FW=-7EMP	FING	4 30
5 7	IF(TEM-TOL121+	EING	440
4 5	33 IF(TFMP)4.2].66	FING	450
41		Ü≻Ií	460
47	****UHEN	FING	470
4 B	(FIE)		4 8 () * 2 2 2
47 0		FING	05 0
50		DNI 4	200
5		FING	210
52	I C (KBCST)15+8+7	СNІз	520
53	7 IF (XMJMN*(GCE14INDX)-GSE1(KINDX)))4.4.8	FIND	530
54		F 1 40	540
ις Γ	KINDX	F 1 N 0	550
ц.	4 1 MDSH4 V F X T K 1 & M X X - 1	5.1.	200

(Concluded)		
LE B-11.		
TABLE	•	

FING 570	FING 580	FING 590	FING 500	FING 610
NEXIK=NSET(INDS)	IF (NEX1K-7777)20,1,1	IS KCOLENEXTK	RETURN	END
15	a a	5 G	ភ្ល	÷

## TABLE B-12. FORTRAN LISTING OF GASP SUBPROGRAM GASP

Z     CUPRENSION MEETILIS ENTILISE     ESTEL	-	SUBROUTINE GASP(NSET+0SET)	GISP	
COPPORT       DOI: 10.11. EUM J. JUNITIATIATIATIATIATIATIATIATIATIATIATIATIA	~	DIMENSION NSET(1) & QSET(1)	GASP	
THODUNDET.NOT.NERT.NOL.NEWS.NEWLANGLY, SCIENCE.NOL.       SCIENC	<b>P</b>	• AFIST	6 t S t 3	
ZTEES-FIFUNCTION-INFORMERT       CONTRACTOR TETER OF THE OFFICE TO THE OFF	4	NOO, NORPT, NOT, NPRMS, NPUN, NBUNS, NSTAT, OUT, SCALE, ISEED, TNOW.	GASP	
COMMON ATTERTIS. FUNCTION CONTINUE CONTRACTION CONTRACTION CONTRACTOR CONTRACTOR CONTRACTON CONTRAC	J.	2 TBFG. TFTN * MXX N RWT • NCRDR • NEP • VN C (400) • TMM = MAX 65 • MAX N S	515	
<pre>pressure constrained constrained constrained constrained pressure constrained constrained constrained constrained interval form write (constrained constrained) interval form (constrained) interval form (</pre>		COMMON ATRIB(15).FNO(400).INN(400)CEIS(70.22).KRANK(400).	GA SP	
<pre>presention:intrificion:ssumirzi:singumirzi:singmet.enu. disp</pre>		1# AXA6(450) - HFE(400) - HIC(400) - HIC(40)	E L Z F	~
Total manual for the second formation of the second form of the second form marker and the second form of the second form	α	20 A D A M 4 4 1 - 0 T T M 5 (4 0 1) - S S S M 4 7 7 5 5 1 - S M 4 7 7 5 5 1 - S M A F (5 1 - N D D 0.1 - M N N	GACD	•
<pre>Definition of the second second</pre>	<b>,</b> c	101 3121114 01414 04 101 4101 4101 4101 101 01 01 01 01 01 01 01 01 01 01 01		
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Construction is Event code Call Rangelion is Event code Terre - Arristonio Terre - Arristonio Construct Pro GR Amt BR Event Routines Construct Pro GR Amt BR Event Routines Construction - 100113:12.66 13 I = Cunt Fund (1.4557:40551) Construction - 100113:12.66 Construction - 100113:12.66 Const	13	*****CBTAIN NEXT EVENT WHICH IS FIRST ENTRY IN FILF 1. ATRIP(1) IS E		
Contract       Call Revolution       Call Revolution         Call Revolution       Call Revolution       Call Revolution         Contract       IFLJEWIT - INTENTION       Case         Contract       Fristion       Case         FfLJEWIT - INTENTION       Case       Case         FfLJEWIT - IDD113:12:6       Case       Case         IfL EWIT - IDD113:12:6       Case       Case         If I = _EUNI       Case       Case       Case         Case       Call EWIS (INSET/GSET)       Case         Case       Call EWIS       Call EWIS (INSET/GSET)       Case         Case       Case       Case       Case         Case       Call ERROS       Call ERROS       Case <t< td=""><td>14</td><td>****ITME . ITRIB(]) IS EVENT CODE</td><td></td><td></td></t<>	14	****ITME . ITRIB(]) IS EVENT CODE		
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True and a montant and a monta		10 CALL DWOVE CHEF (11.1		
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C       IF(JEVNT - 10D)13:12.6       6458         13       I = .EWT       600113:12.6         13       I = .EWT       600113:12.6         C       call EWTS EVENT ROLTIMES       6459         C       call EWTS (1:NSET:05E1)       6459         C       call EWTS (1:NSET:05E1)       6459         C       mstrop = 0       0         HSTOP = 0       auns at Nuns       6459         C       strusts = nuns       1         NRUN = NUNU + 1       nsun = .       6459         C       attics = nuns       6459         C       attics = nuns       6459         C       attics = nuns       1         C       attics       attics	20	*****TEST TO SEE IF THIS EVENT IS A MONITOR	GASP	
IF(JEVNT - 100)13:12.46 GASP 13 J =EVNT C =EVN	21		E≴SF	
13 I = JENT C = JENT C = LEUNT C = CALL EUNTS (I.WEST.GSET) C = CALLE C =	22	F(JEVNT - 100)13+12+	GASP	
C C C C C C C C C C C C C C	23	11 11 11	**	230
Construct FG RAWNERS EVENT ROLTINES Call EWN'S (INSET40SET) Call EWN'S (INSET40SET) Construction of the state of the st	24			
C CALL EWN'S (1.WSET.QSET) C CALL EWN'S (1.WSET.QSET) C CALL EWN'S (1.WSET.QSET) C C CASP C C C CASP C C C C C C C C C C C C C C C C C C C	25	***** CALL PROGRAMMERS EVENT ROUTINE	E # 5F	2
CALL EWN'S (1.NSET.4GSET) CALL EWN'S (1.NSET.4GSET) CASP C TE (FSICP) 40.81.42 H MSTOP = 0 MSTOP = 0 MSTOP = 0 C TE (WRUNS-T)14.91.23 C TE (WRUNS-T)14.91.23 C TE (WRUNS-T)14.91.23 C TE FRUNS-T)14.91.23 C TE FRUNS-T) C TE FRUNS-T) C TE FRONC93.NSET.43SET C TE FRONC93.NSET C TE FRONC	26		GASP	
C C T F (YSTOP) 40.88.42 40 MSTOP = 0 40 MSTOP = 0 50 SF 50 SF 40 TO 10 50 SF 50 SF	27	CALL EVNTS	EASF	
C C C C C C C C C C C C C C C C C C C	28		GASP	
IF (YSTGP) 40.81.42       645P         40 MSTOP = 0       645P         41 MSTOP = 0       645P         22 FF(MRUNS-1114.9.23       645P         42 FF(MRUS-1114.9.23       645P         42 FF(MRUS-1114.9.23       645P         42 FF(MRUS-1114.9.23       645P         42 FF(MRUS-1114.9.23       645P         53 ARUN = NRUNS - 1       645P         73 ARUN = NRUNS - 1       645P         80 TG 1       11         60 TG 1       645P         60 TG 10       645P         60 TO 10       645P         60 TO 10       600 TO 10         12 FF(LMMT114.30.31)       645P         60 TO 10       600 TO 10         12 FF(LMMT114.30.31)       645P         60 TO 10       600 TO 10         13 UMLT       600 TO 10         60 TO 10       600 TO 10         13 UMLT       600 TO 10         600 TO 10       600 TO 10	5.6	****TEST METHOE FOR STOPPIN	6.4.S.P	
40       M570P = 0       6.5F         41       M570P = 0       6.0.8         42       F(MRUNS-1)14.9.23       6.5P         42       F(MRUNS-1)14.9.23       6.5P         42       7.4NUNS-1)14.9.23       6.5P         43       7.4N       8.8N         43       7.4N       8.8N         44       7.4N       8.8N         45       8.8N       1         46       7.4       8.8N         47       7.4N       8.8N         48       8.8N       1         49       6.70       1         40       10       1         40       10       1         41       1.4       1         42       6.10       10         43       1.4       1.4         44       1.4       1.4         45       6.4       1.4         46       1.4       1.4         47       1.4       1.4         48       1.4       1.4         49       1.4       1.4         40       1.4       1.4         40       1.4       1.4         40	30		ICA SP	
40 MSTOP = 0       658P         C.*****TEST NUMBER OF RUNS REMAINING       658P         C.*****TEST NUMBER OF RUNS -1114,9:23       658P         23 RRUNS -1114,9:23       678P         80 T0 10       60 T0 10         C.*****RESET JMMIT       645P         60 T0 10       63 T0         12 F(JUMMIT)144,30,31       645P         60 T0 10       63 T0         12 F(JUMMIT)144,30,31       645P         60 T0 10       63 T0         12 F(JMMIT)144,30,31       645P         60 T0 10       60 T0         31 JM_17 = 1       60 T0         60 T0 10       60 T0         31 JM_17 = 1       60 T0         60 T0 10       60 T0         60 T0 10       50 BE PRINTED         61 F(JMMIT)144,10,32       645P         62 CALL FFLE (NSET+65ET)       645P	31		5 ° S F	
C C C C C C C C C C C C C C C C C C C	32	= 4012M DH	GASP	
Current EST NUMER OF RUNS REMAINING 42 [F(NRUNS-1)14,9:23 23 ARUNS = NRUN + 1 23 ARUNS = NRUN + 1 64 SP 60 T0 1 14 CALL FRIE (NSET+6SET) 60 T0 10 C.*****RESET JMNIT 12 [F(JMNIT)14,30,3] 13 JMAJ = 1 13 JMAJ = 1 13 JMAJ = 1 14 JMAT 14,30,3] 15 JMAT 10,2 17 JMAT 114,30,3] 18 JMAJ = 0 19 JMAJ = 0 10 JMAJ = 1 10 JMAJ = 0 10 JM	£ E		5.55	
42       17       NRUNS-1114,9.23       6.85P         23       NRUNS = NRUNS - 1       6.45P         0       TO IL       NRUNS - 1       6.45P         0       TO IL       REUNS + 1       6.45P         60       TO I       I       6.45P         60       TO I       CALL PFLE (NSET+0.5ET)       6.45P         60       TO IO       I       I       CALL PFLE (NSET+0.5ET)       6.45P         7       T       T       L       L       L       6.45P         60       TO IO       I       I       CALL       6.45P         60       TO IO       I       CAL       6.45P         60       TO IO       CAL       6.45P         60	54	*****IEST NUMBER OF RUNS RE	1243	
42       FT (NUNS-FII 4-13-23       555         42       FT (NUNS-FII 4-13-23       555         60       TG       1       565         14       CALL       FRUNS - 11       565         60       TG       1       561       565         60       TG       1       561       565         6       TG       1       561       563         6       TG       1       561       563         6       TG       10       10       563         6       TG       10       10       563         7       F(J)MIT)14+30+31       564       564         7       F(J)MIT)14+30+31       564       564         7       T       T       564       564         7       T       T       564       565         30       JALT       = C       564       545         31       JALT       = C       565       545         5       TO<10	5 E		E S S F	
23 RUNN = NRUNN - 1 0 TO I = NRUNN + 1 0 TO I = NRUNN + 1 6 O TO I = ROS(93, NET+ 3SET) 6 CALL PFLL FROS(93, NET+ 3SET) 6 CALL PFL (NET+ 4SET) 6 CALL PFL (NET+ 4SET) 6 CASP 7 I I LAWIT114, 30, 31 7 J J M T = 1 6 O TO IO 3 J J M T = 1 6 O TO IO 3 J J M T = 0 6 O TO IO 6 O TO IO 7 O	36	IF (NRUNS-1)14.	6 A S P	
NEUN = NEUN + 1 0 TO I = NEUN + 1 60 TO I = NEUN + 1 60 TO IO 6.45F 6.0 TO IO 6.45F 6.45F 6.45F 6.45F 7. $12 \ F_{1,4}MIT114, 30, 31$ 7. $12 \ F_{1,4}MIT114, 30, 32$ 8. $12 \ F_{1,4}MIT$	57	ARCNS = NRUNS -	C & SF	
14       CALL       ERERR(93, NSET, oSET)       GASP         6       CALL       ERERR(93, NSET, oSET)       GASP         6       CALL       EFTL(NT)       GASP         6       CALL       EFTL(NT)       GASP         6       CALL       EFTL(NT)       GASP         6       C+++++       C       GASP         7       F(J)       E       C+S         6       C+++++       GASP       GASP         7       F(J)       E       C+S         7       F(J)       E       GASP         7       J       MA       J       GASP         7       J       J       A       GASP         7       J       MA       J       GASP         7       J       MA       J       GASP         30       JMA       J       C       GASP         31       J       MA       J       GASP         60       T       T	38	NRUN +	GASP	
I CALL FRARGETSANSETASETA I CALL FRARGETSANSETASETA 6 CALL PFLE (NSETASET) 6 CALL PFLE (NSETASET) 6 CASP 7 I JUNIT 7 I JUNIT 7 I JUNIT 8 I JUNIT 6 CASP 8 I JUNIT 6 CASP 6	6	60 IC I	E S F	
6 CALL PFILE (NSET.05SET)       6 CAL 6 0 TO 10       6 CASP 6 0 TO 10         C       12 [F(JHNIT)14, 30, 31]       6 ASP 6 ASP 7 JMAJT = 1       6 ASP 6 ASP 6 ASP 7 JMAJT = 1         0 TO 10       0 TO 10       6 ASP 7 JMAJT = 1       6 ASP 6 ASP 6 ASP 6 ASP 6 ASP 6 ASP 6 ASP 7 JMATT = 0       6 ASP 6 ASP	07	4 CALL ERROR(93, NSET	GASP	
60 T0 10 C*****RESET JMNIT C 12 F(JMNIT)14*30*31 30 JMAJ ⁷ = 1 60 T0 10 31 JMAJ ⁷ = 1 60 T0 10 61 SF 60 T0 10 61 SF 62 SF 64 SF 65 SF	41	CALL PFILE (NSET, GSE	G A SF	
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C*****RESET JMNIT 12 [F(JMNIT)14*30*31 30 JMAJ = 1 60 T0 10 31 JMAJ = C 61 SF 60 T0 10 64 SF 64 SF	43		5.00	
C 12 [f(JMMIT)14,30,3] 645P 30 JMAT = 1 60 T0 10 31 JMAT = C 60 T0 10 60 T0 10 61 T0 10 645P 645F 645F 645T 10 SEE IF EVENT [N IS T0 BE PRINTED 645P 645F 645F 645T 645T 665ET 645F 645F 645T 655ET 645F 645F 645F 655ET 645F 645F 645F 655ET	44	***RESET	GASP	
12 F (JUNIT) 14, 50, 51 12 J (JUNIT) = 1 31 JNLT = 1 60 T0 10 60 T0 10 60 T0 10 60 T0 10 64 SP 64 S	ង ភ		C I S F	
$\begin{array}{c} 30  \text{MMT} = 1 \\ 60 \ \text{CD} & \text{CD} & \text{CD} \\ 10 \ \text{MMT} & \text{CD} & \text{CD} \\ 31 \ \text{MMT} & \text{CD} & \text{CD} \\ 61 \ \text{CD} & \text{CD} & \text{CD} \\ 61 \ \text{CD} & \text{CD} & \text{CD} \\ 62 \ \text{CD} & \text{CD} & \text{CD} \\ 62 \ \text{CD} & \text{CD} & \text{CD} \\ 63 \ \text{CD} & \text{CD} & \text{CD} & \text{CD} \\ 63 \ \text{CD} & \text{CD} & \text{CD} & \text{CD} & \text{CD} \\ \ CD} & \text{CD} & \text{CD} &$	46	2 IF (JMNI F) 14. 50	GA SP	
50 TO 10 31 JML T = C 60 TO 10 C 545F 60 TO 10 C 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F 545F	 	I AMAIT	6 Å 5 F	
31 JMAII = E GO TO 10 C.*****TEST TO SEE IF EVENT INFORMATION IS TO BE PRINTED C.*SE C.*****TEST TO SEE IF EVENT INFORMATION IS TO BE PRINTED C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.*SE C.	418	60 TO 10	GASP	
GO TO ID CASP C*****TEST TO SEE IF EVENT INFORMATION IS TO BE PRINTED C *****TEST TO SEE IF EVENT INFORMATION IS TO BE PRINTED C ****** C ***** C **** C ***** C **** C **** C **** C **** C **** C **** C ***** C **** C **** C **** C **** C ***** C **** C **** C ***** C ***** C **** C **** C **** C ***** C **** C ***** C **** C ***** C ****** C ****** C ***** C ****** C ***** C ***** C ***** C	с <b>1</b> 1	H LLWND L	6 8 5 F	
C C C C S S C S S C S S C S C S S C S S S S S S S S S S S S S	50	10	GASP	
C*****TEST TO SEE IF EVENT !NFORMATION IS TO BE PRINTED GASP 4 C B IF1JMLT1)14.10.32 32 Call PFILE[NSET.6SET] 64SP 4 C TO 10 10 10 10 10 10 10 10 10 10 10 10 10	51		C 5 5	
C 8 IF (JMNIT)14+10+32 6457 4 32 CALL PFILE (NSET+0SET) 6455 6 6 7 7 1 1 1 6 765 6 6459 5 6 6459 5	52	*****TEST TO SEE IF EVENT INFORMATION IS TO BE PRINTE	GASP	<b>a</b> :
	50	L (		<b>T</b> .
	- 10 - 11 - 11	8 I' (JMN1) 14010032	1040	<b>t</b> u
	n u	c (ALL 'FILE (MJE'FG) Go to 10	ε.	21

## TABLE B-12. (Concluded)

555 55 50 50 50 50 50 50 50 50 50 50 50
C # SP 531 G A SP 540 G A SP 541 G A SP 541 C A SP 550 C A SP 550
ALL RUNS ARE COMPLETED RETURN TO MAIN PROGRAM FOR INSTRUCTIONS GASP Turn D
FOR
P R OGR A M
MAIN
10
RETURN
COMPLETED
RE
RUNS
*IF ALL F Return End
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TABLE B-13. FORTRAN LISTING OF GASP SUBPROGRAM HISTO

403550*1PFS.HIST0

	COMMON ID.IM.INIT. JEVNI.JMNII.MFD.MSIOP.MX.MXC.NCLCI.VAISI.	-
	1NOQ.NORPT.NOT.NPRMS.NRUN.NRUNS.NSTAT.OUT.SCALE.ISEED.TNOW.	HI ST
	ZIBE3.IIIN.MXX.NPRNI.NCRDR.NIP.VNO(400).IMM.MX05.4AXNS	HIST
	COMMON ATRIB(15), ENG(400), INN(400), JCELS(20,22), KRANK(400);	HIST
	1 MAXN0(433),MFE(400),MC2(433),MLE(400),NCELS(20),N3(403),	HIST
	2PARAM(40,41,40,1ME(400),5SUMA(20,5),5UMA(20,5),NAME(6),NPROJ,MON,	HIST
	3NJÅY «NYR«JCLR«JTRIR(17)	<b>ISIH</b>
ις,	5 IF (N-NHIST) 33011°2	HISTH
N	• WRITE (NPRNT 250) N	HIST
250	) FORMAT(19H ERROR IN HISTOGRAM.I4//)	HIST
	28FL 5317	HIST
62. 622	13 IF (N12+2+3	HIST
		HISTH
* * * *	**TRANSLATE X1 BY SUBTRACTING A IF X.LE.A THEN ADD 1 TO FIRST CELL	HI ST
ų		HIST
<b>1</b> 47)		HIST
	LL. Şemî	HISTH
ις.	() mail	HIST
2	50 10 8	HIST
U		HIST
***	**JEFFRMINE CELL NUMBER IC. DOD 1 FOR LOWER LIMIT CELL AND 1 FOR	HISTH
5 4 4 4 C	* TRUNCATION	HIST
		HISTH
~	7 IC = X/₩ ÷ 2°+°0001	S
	I F (IC - NCELS(N) - 1) 8,8,9	HISTH
o	JIC = NCELS(N)+2	HIST
er	) JCELS(N+IC) = JCELS(N+IC) + 1	HISTH
	RETURN	5

OGRAM RMOVE
GASP SUBPROGRA
LISTING OF GASP S
FORTRAN
TABLE B-14.

&00550*TPFS。RMOVF

The second strain and strain	8	URROUTINE R	RMOV	10
COMMON ID.TW. MIT.JENIT.FA.MSTOP.MX.WX.*NC.CCT.NHIST.       RMOV         NOG.NORDT.WOITMOT.NERKS.NENU.NEUNS.NSTATODJ.       PMOV         TIJESJTTN.MXX.WDRMK.NENU.NEUNS.NSTATODJ.       PMOV         TIJESJTTN.MXX.MDRMK.NEUNS.NSTATODJ.       PMOV         TIJESJTTN.MXX.MDRMK.NEUNS.NSTATODJ.       PMOV         TIJESJTTN.MXX.MDRMK.NEUNS.NEUNS.NEUNS.NEUNK (400).       PMOV         TMXX04TLCR.JTR191.MLCRDD.MLCCLS.STD.X514001.       PMOV         TKOLLECOLL(1)       PMOV4201.         TKOLLECOLL(1)       PMOV4201.         TKOLLECOLL(1)       PMOV4201.         TKOLLECOLL(1)       PMOV4201.         TEKCOLL(1)       PMOV4201.         TKOLLECOLL(1)       PMOV4201.         TEKCOLL(1)       PMOV4200.         TEKCOLL(1)       PMOV4200.         TEKCOLL(1)       PMOV4200.         TEKCOLL(1)       PMOV4200.         TEKCOLL(1)       PMOV4200.         TECLLERROR (97.000.       PMOV4200.	r	DIMENSION NSET(I)+0SET(I)+KCOLL(I)	RMOV	20
1006.NORPT.NOT.NPRNY.NRUN.NRUNS.NRIAT.DUT.SCALE.ISEED-TNOW.       700         7153.71.71*******       715.47********         7153.71*******       714.44         7153.71******       714.44         7153.71*****       714.44         7153.71****       714.44         7153.71****       714.44         7153.71***       714.44         714.4       715.14         714.4       715.14         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         714.4       714.400         715.4       714.400         716.4       714.400         717.4       714.400         716.4       714.400         717.4       71	. PC;	• NHIST	NOMY	30
713E5.TTIN.#XX.NPRNT.NCRDR.NCP.VN0(4001.JMM, MAX05, MAXN5       2000         713E5.TTIN.#XX.NPRNT.NCRDR.NCP.VN0(4001.JCR20.25).KRANK (4001).       2000         7000       1000       1100       1000       1000       2000         713E5.TTIN.#XX.NPRNT.NCRDR.NCP.VN0(4001.JCR20.25).NAME(4001.MC       2000       2000       2000         7000       27AAV.NCR.JCLR.JTR18(17)       5500       1000       2000       2000       2000         7000       1000       5500       1000       5500       1000       1000       2000       2000       2000         7000       1000       5500       1000       5500       1000       1000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000       2000	3	NOO *NORPT * NOT *NPRMS *NRUN •NRUNS • NSTAT • DUT • SCALE • ISEED • TNOW	RMOV	40
COMMON ATTERIS.ENG(400).FIN(400).JCELS(20.22).KRANK(400). HMAXNG(40).FE(4000.MEC(400).MEC(400).MCELS(20).NAME(5).NPROJ.MON. ZPARAN(40.4).GTTME(400).SSUMA(20.5).SUMA(20.5).NAME(5).NPROJ.MON. RMOV RMOV FCCCLIS.IS.Z CALL EROR (97.NSFT.40SEI) FCKCOLIJS.IS.Z NCCJOJ = KCOL IN ATTRIA FCKCOLIJS.IS.Z NCCJOJ = KCOL IN ATTRIA FCKCOLIJS.IS.Z NDZ = KCOL IN ATTRIA FCKCOLIJS.IS.Z RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RM	r.	T3E5.TTIN.MXX.NPRNT.NCRDR.NEP.VN0(4DD).IMM.MAXOS.MAX	ACMà	50
<pre>7 IMAXNG(400).ME(400).MLC(400).MCE(201.N3(400). 7 2PARAM(40.4).GTTRE(400).SSUMA(20.5).SUMA(20.5).NAME(E).NPROJ.MON. 7 800 7 7 800 7 8 8 8 8 8 8 8 8 8 8 8 8</pre>	c	K (400)	VOMA	60
ZPARAM(40.4).4TIME(400).5SUMA(20.5).5UMA(20.5).NAME(6).NPROJ.MON.       RMOV         RMOV       If (KCOL161)       RMOV         IF (KCOL161)       IF (KCOL161)       RMOV         IF (KCOL161)       RMOV       RMOV         IF (KCOL161)       RMOV       RMOV         IF (KCOL161)       RMOV       RMOV         Z MLC(JO)       KCOL       RMOV         R MOV       RMOV       RMOV         R R NOV       RMOV       RMOV	~	MAXNO(430).MFE(400).MLC(403).MLE(400).NCELS(20).N3(40	VOMS	70
100010001000100010001111111111100010001213141000100010001000100013141000100010001000100010001010001000100010001000100010001010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000100010001000 <td< td=""><td>60</td><td>P &amp; R &amp; M ( 40.4 ) , 01 I M E ( 400) , 5 S U M A ( 20, 5 ) , 5 U M A ( 20, 5 ) , N M E ( 6 ) , N P R O J , M O N</td><td>RMOV</td><td>80</td></td<>	60	P & R & M ( 40.4 ) , 01 I M E ( 400) , 5 S U M A ( 20, 5 ) , 5 U M A ( 20, 5 ) , N M E ( 6 ) , N P R O J , M O N	RMOV	80
<pre>KCOL=KCOLL(1) KCOL=KCOLL15:15.2 FF(KCOL15:15.2 CALLERROR (97.NSTT.0SEI) FC ALLERROR (97.NSTT.0SEI) F MOV 1 F MOV 1 CALLERROR (97.NSTT.0SEI) F MOV 1 COT 3 FILERROR (97.NSTT.0SEI) CALLERROR (97.NSTT.0SEI) F MOV 1 F MOV 2 F MOV 1 F MOV 2 F MOV 2 F MOV 1 F MOV 2 F MOV</pre>	с С		VCMS	90
IF (KCOL)15.15.2 IF CALL ERROR (97.NSFT.0SET) Z MLC(J0) = KCOL Z MLC(J0) = KCOL Z MLC(J0) = KCOL MDX=(KCOL-1)*IMM DO 3 I=1.1M DO 10 I=1. INDX=(KCOL-1)*MXX DO 10 IIIIM INDX=(KCOL-1)*MXX DO 10 IIIIM INDX=(KCOL-1)*MXX DO 10 IIIIM INDX=(KCOL-1)*MXX DO 10 IIIIM INDX=(KCOL-1)*MXX DO 10 IIIIM INDX=(KCOL-1)*MXX RMOV 7 RMOV	0	KC 0L = K C0LL ( 3 )	RMOV	100
IS CALL ERROR (97.NSFT.0SE1) Z MLC(JO) = KCOL C MLC(JO) = KCOL NDX=(KCOL-1)*IMM DO 3 T=:*IM TNDX=F(XCOL-1)*IMM DO 3 T=:*IM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDX=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*IMM TNDY=F(XCOL-1)*I	. 26200	I F & K COL ) 3 6 # 3 6 # 2 # 2	YOWY	110
<pre>2 MLC(J0) = KCOL 2 MLC(J0) = KCOL 2 INDX=(KCOL-1)*IMM 2 INDX=(KCOL-1)*IMM 2 INDX=(KCOL-1)*IMM 2 INDX=(KCOL-1)*IMM 3 ATRIB(1)=0SET(INDX) 3 ATRIB(1)=0SET(INDX) 3 ATRIB(1)=0SET(INDX) 1 NDX=(KCOL-1)*MXX 2 NDX=10X+1 2 NDX=10X+1</pre>	~	S CALL ERROR (97.NSFT. QSET	RMOV	120
C C*****PUT VALUES OF KCOL IN ATTRI3 C INDX=1KCOL-1)*IMM DO 3 T=1*IM INDX=TNJX*1 NDX=TNJX*1 NDX=TNJX*1 NDX=TNJX*1 NDX=TNJX*1 NDX=TNDX*1 NDX=1KCOL-1)*MXX RMOV 7 RMOV 7 RMO	~	2 MLC(J0) = KC	VCMN	130
C C*****PUT VALUES OF KCOL IN ATTRI3 C INDX=(KCOL-1)*IMM POD 3 T=1*IMM INDX=TNJX+1 RMOV 1 RMOV 1 RMOV 2 RMOV 2	ង		RMOV	140
C INDX=(KCOL-1)*IMM DO 3 T=1*IM DO 3 T=1*IM NDX=(KCOL-1)*IMM ATRIB(I)=05ET(INDX) INDX=(KCOL-1)*MXX RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMOV RMO	M: ,em	****PUT VALUES OF KCOL IN ATTRI	VCMA	150
<pre>7 INDX=1KCOL-1)*IM 7 INDX=1KCOL-1)*IM 7 NOX=INJX+1 7 NOX=INJX+1 7 NOX=INJX+1 7 NOV 10 151.1*MX 7 NOV 10 151.1*MX 7 NOV 10 151.1*MX 7 NOV 10 151.1*MX 7 NOV 151.1*MX 7 NOV 151.1*MX 7 NOV 151.1*MX 7 NOV 151.1*M 7 NOV</pre>	u u		RMOV	160
003T=1.TM1INDX=TNDX+13ATRIB(1)=05ET(INDX)1INDX=(KCOL-1) *MXX2INDX=(KCOL-1) *MXX2D0101JTRIB(1)=NSET(INDX)3103JTRIB(1)=NSET(INDX)3101JTRIB(1)=NSET(INDX)3101JTRIB(1)=NSET(INDX)3101JTRIB(1)=NSET(INDX)57777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777 <td>6 3</td> <td>I NDX = ( K COL - ] ) * I</td> <td>ACMA</td> <td>170</td>	6 3	I NDX = ( K COL - ] ) * I	ACMA	170
INDX=INDX+1INDX=INDX+1INDX=IKCOL-1)*MXXINDX=IKCOL-1)*MXXD0 10 11 I=1*IMINDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX=INDX+1INDX+1INDX=INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1INDX+1 <td>8</td> <td>O 3 I=1.IM</td> <td>NOWA</td> <td>180</td>	8	O 3 I=1.IM	NOWA	180
3       ATRIB(I)=0SET(INDX)         1       INDX=(KCOL-1) *MXX         2       INDX=(KCOL-1) *MXX         3       INDX=(KCOL-1) *MXX         3       INDX=(KCOL-1) *MXX         3       INDX=(KCOL-1) *MXX         3       INDX=(NC)         4       INDX=(KCOL-1) *MXX         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C <td><b>0</b>.</td> <td>*XCNI=XON</td> <td>NOWN</td> <td>190</td>	<b>0</b> .	*XCNI=XON	NOWN	190
1       INDX=FKCOL-1)*MXX         2       D0 10 I=1*IM         3       INDX=INDX+1         3       JTRIB(I)=NSET(INDX)         5       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         8       C <td< td=""><td>20</td><td>ATRIB(I)=05ET</td><td>RMOV</td><td>2 00</td></td<>	20	ATRIB(I)=05ET	RMOV	2 00
2       D0 10 I=1.IM         3       INDX=INDX+1         3       JTRIB(I)=NSET(INDX)         5       C         7       C         6       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7 <t< td=""><td>23</td><td>I NDX = ( COL - ] ) *</td><td>ACMA</td><td>210</td></t<>	23	I NDX = ( COL - ] ) *	ACMA	210
3INDX=INDX+1576777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777777 <td>22</td> <td>MI * I= I OI O</td> <td>RMOV</td> <td>220</td>	22	MI * I= I OI O	RMOV	220
4     \$D     \$D     \$TRIB(I)=NSET(INDX)     RMOV 2       5     C     \$RMOV 2     \$RMOV 2       7     C     \$C*****CET OUT=1 AND CALL SET TO REMOVE ENTRY FROM WSET     RMOV 2       7     C     \$OUT=3     \$RMOV 2       7     C     \$OUT=3     \$RMOV 2       7     C     \$C******CET OUT=1 AND CALL SET TO REMOVE ENTRY FROM WSET     \$RMOV 2       7     C     \$C*******     \$RMOV 2       7     C     \$C******     \$RMOV 2       8     \$C*****     \$RMOV 2       9     \$C***     \$SETURN       1     \$END     \$RMOV 3       2     \$FND     \$RMOV 3	23	XCNI=XON	VCMS	230
5       C         6       C*****5ET OUT=1 AND CALL SET TO REMOVE ENTRY FROM WSET         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         7       C         8       C         8       C         8       C         8       C         8       C         8       C         8       C         8       C         8       C         8	24	D JTRIB(I)=NSET	RMOV	240
6       C*****5ET OUT=1 AND CALL SET TO REMOVE ENTRY FROM WSET       RMOV 2         7       C       0UT = 3.         8       0UT = 3.       RMOV 2         9       CALL SET (J0.NSET.0SET)       RMOV 2         1       END       RMOV 3         2       FND       RMOV 2         7       C       0UT = 3.         9       CALL SET (J0.NSET.0SET)       RMOV 2         7       C       RMOV 2         8       ROV 2       RMOV 2         7       END       RMOV 3         7       FND       RMOV 3	52		N OM Y	250
7 C RMOV 2 8 C DUT = 3. RMOV 2 9 CALL SET (JO.NSET.0SET) RMOV 2 0 RETURN RMOV 2 1 END 2 FND 2 FND	26	*******ET OUT=J AND CALL SET TO REMOVE ENTRY FROM MSE	RMOV	260
RMOV 2         RMOV 3         RMOV 3<	77		RMOV	270
9 CALL SET (JO•NSET•OSET) RMOV 2 D RETURN END 1 END 2 FND RMOV 3 2 FND	28	UT = 3	RMOV	280
D RETURN 1 END 2 FND 2 FND	50	ALL SET (JO.NSET, OSE	ACMA	2 90
1 END RMOV 3 FND 2 FND	30	ETURN	RMOV	300
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TABLE B-15. FORTRAN LISTING OF GASP SUBPROGRAM SET

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<pre>CFT 3 37 KNT ± 3 CFT 3 CF</pre>	C*****SET KNT TO ONE SINCE & COMPARISON WAS MAD		11	5
<pre>17 KNT = 1 C = ==================================</pre>			4 E I	5
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C+++++EST MFA AGATMST PREDECESSOR OF MLEX RY LFTTING MLEX FQUAL SET 1 C+++++PRESESSOR OF MLFX. C ENDLEMETX-MXX MLEX-METATMDX I F(MLEX-METATMDX) SET 1 I F(MLEX-MLE) 11+16+11 SET 1 SET 2 SET 1 SET 1 S	Ē		SE T	φ
C+++++++++++++++++++++++++++++++++++++	C*****TEST MFA AGAINST PREDECESSOR OF MLEX BY LEITING		SET	9
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	ן דו ( ML בא - אנר כי ו מיני		. L	i u
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171	Ű	SET	1710
172	15 INDX=MFA*MXX	SET	1720
173	נ t n d x 1 = KL 5	SET	1730
174	MFE ( JO) = MFA	SF T	1740
175		1 1 1	1750
176 177	C*****SUCCESSOF OF MEA IS MEEX AND PREDECESSOR OF MEEX IS MEA. INDIE AL C*****THE DOTNE MEEX E MEEX IF VE WAS HEAD.	SET S	1770
178		SE T	1780
179	75 INDX=M*&**XX-1	SET	1790
180	NSET (INDX) = MFEX		1800
181		- 12	
281		SET	1930
184	THE STRUCTURE STATES AND AN ANALYSIS AND AN ANALYSIS AND AN ANALYSIS AND AN	SE T SE T	1840
	THE PARTY OF THE DEST PROPERTY OF THE POINT		10001
187	**************************************	25	1870
168	****PREVJOUSLY AT STATEMENT 10.	SET	1881
1 89		SET	1990
190	6 IF (MFFX) 1000.10.19	561	1900
141	ST RANKING VALUF OF NEW TTEM AGAINST VALUE OF TTEM IN COLUMN	132	1920
197		SF T	1930
194		SET	1940
195	19 30 TO	56 1	1950
196			1960
191			0/61
198	IFUSEILINDXJJ~USEILADXYZJJZU-ZJ-ZJ 1221 TMMYJ-LWEA-IJ±MYY+KS	2 F	1991
	1 N Y Y + (N Y + 1 ) + M X + K + (N Y + 1 ) + M X + K + (N Y + 1 ) + M X + K + (N Y + 1 ) + M X + K + (N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y + N Y +	5.51	2000
201	IFUNSTITUTED - NSFT(INDX2))23.21.21	SET	2010
202	DE L'ANDER DE L'ANDE DE L'ANDERES ACATURA DE L'ANDERES ACATURAS DE	551	2020
202	ФФФФФФТ• МЕЖ МАДОС ДТ ДОДЕК• МТА ЧОЗ! ЗЕ СОЛГАХСО РОАТУСТ ЗОССЕЗЗЗОВ ОГ ФФФФФФМЕСУ.	1 1 2 2	0102
205		SET	2050
206	2D KWT = 1	SE T	2060
207		561	2070
208 209	C*****LET MPRE = MFEX AND LET MFEX BE THE SUCCESSOR OF MFEX. T	55.7	2080
210	MPRF I MFEX	SFT SFT	2100
211		SET	2110
212	ET ( INDX )	SET	2120
213	IF (NFEX-KOL) 19+24+19	192	2130
216	U UF IS ATCASE. IT SADULD BE INSERTED BETWEEN MEEN AND ITS	SET	2150
215	****PREDECESOR*	SE T	2160
217	*****FFKNT = 2* MFEX HAS NO PREJECESSOR. GO TO STATEMENT 16. IF XNT	SET	2170
218	****= ] A COMPARTSON WAS MADE AND A VALUE OF MPRE HAS ALREADY BEEN	SE 1	2180
612	BTAINED ON THE PREVIOUS ITERATION. SFT KNT = 2 TO INDICATE THIS.	261	2190
720		251	0022
122			00000
222	2 Z INW 2	SET	2230
224	*****MFA IS TO RE INSERTED AFTER MPRE. MAKE MORE THE PREDFCESSOR OF	SE T	2240
225	*****₩F& ΔNJ M=A THF SUCCESSOR J= MPRE.	SET	2250
22F 223		- 15	2260
V.		;	

229 230	NP X = MPRE * MXX	SE T	2290
-			102 0
		551	100
		<b>د ۲</b>	2310
***	**I F KNT WAS NOT REVET TO 2. THERE IS NO SUCCESSOR DF 4FA.	SSET	2321
* * * * U	**ARF UPDATED AT STATEMENT 17. IF #NT =	SE T	2331
C * * *	*	SE T	2341
U 		SET	2351
	30 10 111.263 KNT	ςET	2361
L		< E T	2371
** U	**REMOVAL OF AN ITEM FROM FILT JO.		238(
	** DESET OUT TO U AND PLAD COLUMN DEMOVED . FT H FOLAL SUCCESSOR		1950
* * *	**** COLUMN PEMOVED AND AK COLOUIA CONFIGURATION OF A COLUMN REMOVED.	22	2400
	**IE H - KOL M F UAS AST SULPATE H - K E. M - G UAS FTST		241
۽ پر	** M 2 JO 2	1 1	7 4 7
**	**SUCCESSOR OF JK AND JK IS PREDECESSOR OF JI -		243
			244
;		SF T	24 5
IJ		SET	246
***	**UPDATE POINTING SYSTEM TO ACCOUNT FOR REMOVAL OF MEN 1JQ).	SE T	247
ໍ່	**RMOVED IS ALWAYS SET TO 4. C(JO) BY SURROUTINE 240V5.	55.1	248
C		551	249
	T NDX = [ M   C( JO ) - ] ) # 1 MM	SET	250
	WI III O	SE T	25.1
		SET	252
5		SET	25.3
		SET	254
		SET	25.5
		SET	2560
1300	NSFT(INDX)=D	SET	257
	I NDX = MC C1 C3 + W X X	SET	258
		551	253
		SFT	260
	IF 1 JL - KOL ) 33 • 34 • 33	211	261
-	3 [=(JK-KLF)35,36,35	251	262
<b>W</b>			25.0
			2.64
			ς. Γ. Γ.
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***	##AUPJ#1: POINTES.		5 4 4 7 4 7 4 7 4 7 4 7 4 7 4 7 4 7 4 7 4
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7 6		1	274
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e e		ZE T	277
L		551	7780
	**IIDPATTMC ETLE STATTCTTCS	1 1 2 2	2790
ן  -  -		SET	
		¢E T	31
82	((CF)]3% I L C ~ MOV() * CV ) + C (C) ) E ( C (C) ) CV ] = (C	SET	24
	VNG ( 101 = VNG ( 10) + XNG * XNG * ( 1 NOG - G 1 IME ( 10) )	SET	2831
	011MF 101=1NOU	557	

TABLE B-15. (Concluded)

285	N 2 ( 7 2 ) = N 2 ( 7 2 ) - 1	ц.,	2850
285	RETURN	SET	28ED
787	Ĺ	145	2970
Ø	C*****MLC WAS FIRST ENTRY BUT NOT LAST FNTRY. UPDATE POINTERS.	ы÷	2880
ΩC		LL:	2890
ഗ	Z	ليا	2960
o	NSEY	لعا	2910
ഗ	FF(JQ)	ы	2920
σ	GO TO 37	ш	2 930
		تعا	2940
o	U	LL I	2950
ത	C*****MLC WAS LAST ENTRY RUT NOT FIRST ENTRY. UPDATE POINTERS.	υ	2960
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8 m	ť	ω	3050
C	= (Or)	. بيا	3060
C	0000	41	3070
0	10	Le J	3080
C	130 CALL ERROR(88,NSET,0SET)	تبا	3090
7 ] U	RF TURN	تعا	3100
\$cent)	F N D	ц <i>л</i>	3110

## APPROVAL

## SKYLAB FILM USAGE ANALYSIS PROGRAM

## By Ronald A. Schlagheck

The information in this report has been reviewed for security classification. Review of any information concerning Department of Defense or Atomic Energy Commission programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

This document has been reviewed and approved for technical accuracy.

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