TABLE OF CONTENTS

1. INTRODUCTION
2. CHANGE LOG
3. LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM
    a. URL to S/C “Remarks” field
    b. URL to S/C “Materials” field
    c. URL to Experiment “Remarks” field
    d. URL to Experiment “Materials” field
    e. URL to Data Set “Remarks” field
    f. URL to Data Set “Materials” field
    g. Items e and f for additional data sets from this experiment, if needed
    h. Items c thru g for additional experiments from this spacecraft, if needed
    i. Items a thru h for additional spacecraft, if needed
4. CATALOG MATERIALS.

1. Introduction:

The documentation for this data set was originally on paper kept in NSSDC's Data Set Catalogs (DSCs). The offline tape datasets have now been migrated from the original magnetic tape to magnetic disk (starting in mid-2004). Accordingly, statements in the format descriptions that address such tape relevant factors as blocking and but density are no longer applicable. The paper documentation in the Data Set Catalogs have been scanned and made into digital images of the pages, the collected into a single PDF file for each Data Set Catalog.

The inventory information in these DSCs is current as of July 1, 2004. But this inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system, and the user should go to that interface (JIN) if further information existing in the DSCs is now not needed for locating data files, but we did not go to the trouble of removing that inventory information.

2. CHANGE LOG

Version	Date	Person	Page	Description of Change
01				

3. LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:
[NOTE: ANY OF THE INFORMATION FIELDS MIGHT BE BLANK.]
[THE "MATERIALS FOR DISTRIBUTION" FIELD IS HERE CALLED JUST "MATERIALS"]

"Remarks" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--remark--

"Materials" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--mat--

"Remarks" for SCNAME1 experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A&ex=09--remark--

"Materials" for SCNAME experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102&ex=09--mat--

"Remarks" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa,gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME3:

"Materials" for EXNAME1 data set DSNAME3:

"Remarks" for SCNAME1 experiment EXNAME2:

"Materials" for SCNAME1 experiment EXNAME2:

"Remarks" for EXNAME2 data set DSNAME1:
"Materials" for EXNAME2 data set DSNAME1:

"Remarks" for EXNAME2 data set DSNAME2:
"Materials" for EXNAME2 data set DSNAME2:

“Remarks” for spacecraft SCNAME2”:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A--??--

“Materials” for spacecraft SCNAME2:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A--??--

“Remarks” for SCNAME2 experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A&ex=03--??--

“Materials” for SCNAME2 experiment EXNAME1”
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1978-079A&ex=03--??--

“Remarks” for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE--00011--remark--

“Materials” for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE--00011--remark--

“Remarks” for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Materials” for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Remarks” for EXNAME1 data set DSNAME3:

“Materials” for EXNAME1 data set DSNAME3:

“Remarks” for SCNAME2 experiment EXNAME2:

“Materials” for SCNAME2 experiment EXNAME2:

“Remarks” for EXNAME2 data set DSNAME1:

“Materials” for EXNAME2 data set DSNAME1:

“Remarks” for EXNAME2 data set DSNAME2:

“Materials” for EXNAME2 data set DSNAME2:

“Remarks” for data set DSNAME3:

“Materials” for EXNAME data set DSNAME3:

“Remarks” for SCNAME2 experiment EXNAME3:

“Materials” for SCNAME2 experiment EXNAME3:

“Remarks” for EXNAME3 data set DSNAME1:

“Materials” for EXNAME3 data set DSNAME1:

“Remarks” for EXNAME3 data set DSNAME2:

“Materials” for EXNAME3 data set DSNAME2:

=-=-= -
=-=-= -

ALTERNATE OPTION:

For SCNAME2:

“Remarks” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Materials” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--mat--

can be shown as

“Remarks” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=78-079A-03C--remark--

“Materials” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=78-079A-03C--mat--

=-=-= -
=-=-= -

4. CATALOG MATERIALS:

DATA SET CATALOG #11

Explorer 18 Energetic Particles

63-046A-05A 2 tapes

IMP-A

GM TUBE & ION CHAMBER COUNTS, DATA

63-046A-05A

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY TWO 7-TRACK, 800 BPI TAPES, WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN EBCDIC. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR003337	DS003337	D000077	1-1262	11/28/63 - 04/21/64
		D000078	1263-2177	02/23/64 - 03/26/65

TABLE OF CONTENTS

Time Span Information	1
Description of the Data Format on Tapes	2
BCD Tape Format	3
Data User's Note	4
List of First 3 files of D-00077	5
List of Last 2 files of D-00077	6
List of File 1 of C-00029	7
List of Last 3 files of C-00029 (dupe)	8
List of First 3 files of D-00078	9
List of Last 3 files of D-00078	10
List of file 1 of C-00030 (dupe)	11
List of Last 3 files of C-00030 (dupe)	12

EXPLORER 18 - ENERGETIC PARTICLES

63-046A-05A

Information on the time spans of the Tapes:

D-00077 & C-00029 (dupe)
D-00078 & C-00030 (dupe)

D-00077 has a start time of Nov. 27, 1963 and an end time of May 30, 1964 on its tape label.

D-00078 has no start time or end time on its label.

Actual listings of the tapes show:

D-00077 Nov. 28, 1963 - April 21, 1964
D-00078 Feb. 23, 1964 - March 26, 1965

as the start and end times.

Launch data was Nov. 26, 1963 and significant data was obtained until May 1965. Eleven minutes of data was obtained on May 10, 1965.

63-046A ~~GSF~~ OSR (Expl. 18)
2

II. DESCRIPTION OF THE DATA FORMAT ON MAGNETIC TAPES SUPPLIED TO THE NATIONAL SPACE SCIENCE DATA CENTER

The magnetic tapes submitted to the National Space Science Data Center contain all the data from the University of California experiments on the IMP-1, 2 and 3 spacecraft. They were generated by stacking many short data tapes received from Goddard Space Flight Center on a few 2400 foot reels. The stacked tapes were written on an IBM 360/40 system. They contain external BCD characters written in 7 track mode in even parity at 800 char/in density.

The first file on each stacked tape is a one record file which serves as an index to that tape. The physical record (gap to gap) is 1032 characters long and consists of 86 twelve character logical records. There is one index entry for each of the GSFC short reels stacked on the larger tape. The entries are in the following format:

Chars

-6 GSFC reel number

-9 Number of files contained on the GSFC tape

-12 Blank

Following the index file is the stacked experiment data copied from the GSFC reels. The data is in the same file by file format as it appeared on the original tapes except that a 12-character field has been prefixed to each record to identify it to UC programs using these tapes. The individual records are 1032 characters (including prefix field) and are formatted as follows:

Chars

1-6 The GSFC reel number on which this record originally appeared

7-9 The file number within that GSFC reel

10-12 The record number within the above file

13-1032 The experimental data in its original format (see separate tape format sheet)

The last file on each of the GSFC tapes is a one record file with the twelve character identification field (i.e., Satellite No., Month, Day, etc.) set to nines. This file has also been copied onto the stacked tape. Thus the first record of the following file on the stacked tape will have a different GSFC reel number and a file number of 1 in the prefix field. Two end of file marks will follow the last valid data file on the stacked tape.

The following is a description of the three non-numeric characters which can occur in the data and their significance.

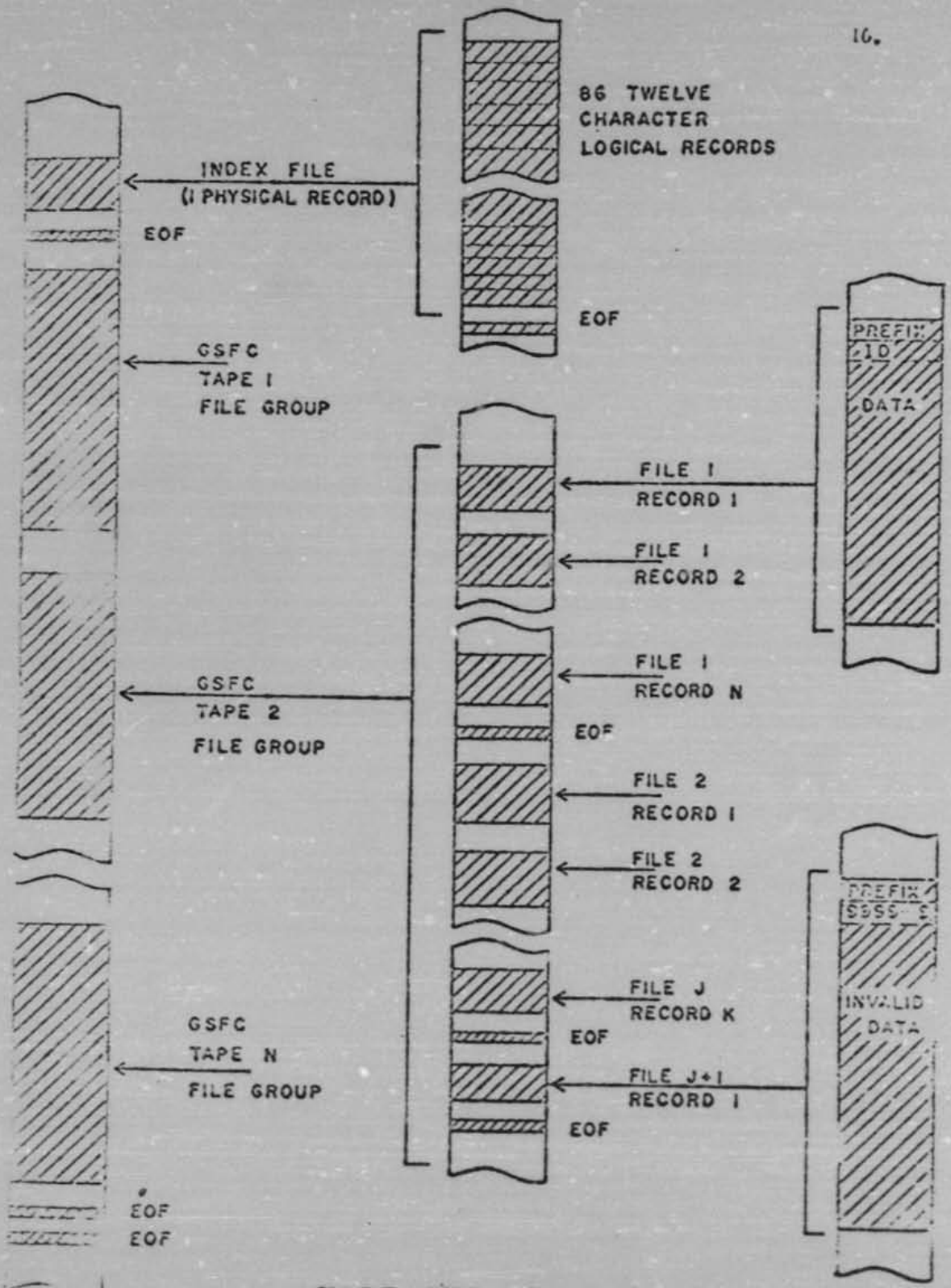
(1) "@" represents a system error

(2) "=" represents missing data

(3) ":" represents loss of synchronization

The "@" and "=" symbols appear only in the data. The ":" can appear anywhere in the sequence. Once a colon is present, no other character but a colon can follow. As a result the frame length computation may be in error; however, the sequence count is correct and may be used to fill in missing time.

Time gaps appear as a result of the loss of synchronization or in the absence of a signal in which case the "=" symbol is generated.



TAPE STRUCTURE

Figure 8

IMP-1 Stacked Data Tape Format

Item	Tape Chars	Significance	
1	1-6	Original GSFC reel number	
2	7-9	File number within GSFC reel	Prefix field
3	10-12	Record number within above file	
4	13-14	Satellite number	
5	15-16	Month of analog tape generation	
6	17-18	Day of analog tape generation	ID field
7	19	Year of analog tape generation	
8	20-21	Station number	
9	22-24	Analog tape number	
10	25-27	Universal time - day	
11	28-29	Universal time - hours	
12	30-31	Universal time - minutes	
13	32-36	Universal time - milliseconds	
14	37-41	Sequence counter	
15	42	Frame time in seconds	
16	43-45	Frame time in milliseconds	
17	46	Sequence ID	Data field
18	47	ET flag 1	
19	48-52	F1 data - background counter	
20	53	ET flag 2	
21	54-58	F4 data - Beta counter	
22	59	ET flag 3	
23	60-64	F9 data - background counter if sequence ID is different from 1. Ion chamber read-out if sequence ID equals 1	
24	65	ET flag 4	
25	66-70	F12 data - Beta counter	
26	71-74	OA. data, AZANG	
27	75-76	OA. data, PS	
28	77-80	OA. data, SPIN	

Repeat items 10-28 seventeen times

Note 1: Items 19, 23 and 21, 25 are decimal integers representing the counts from accumulators 5 and 6 respectively. The raw count rates B_R and BKD_R may be calculated as follows:

$$B_R = \frac{4 \times B}{39.36} \quad , \quad BKD_R = \frac{4 \times BKD}{39.36}$$

where

B = the value of item 21 or 25

BKD = the value of item 19 or item 23 when sequence ID is different from 1

The Ion Chamber rate is calculated as follows:

$$IC_c = \frac{32767 - IC}{327.68}$$

where

IC = the value of item 23 when sequence ID equals 1.

All rates are in pulses per second.

Note 2: Items 26, 27, 28 are raw optical aspect data. Items 26 and 28 are given as decimal integers. Item 27 is given as an octal integer. The spin period, polar solar angle and the azmuthal angle may be found as follows:

A. Spin period (in seconds) = SPIN/200

B. Polar solar angle, B, (the spin axis, spacecraft, sun angle) is found directly from Table II using the value of item 27, PS.

C. Azmuthal angle, ψ°, (the sun, spacecraft, optical sensor angle) as a particular sequence is calculated by:

$$\psi^{\circ} = -f(B) + \left[\frac{\left(To,o - T_{4,0} - \frac{AZANG}{200} \right)}{\frac{SPIN}{200}} \times 360^{\circ} \right]$$

where AZANG is the value of item 26

SPIN is the value of item 28

$T_{4,0}$ is the time of frame 4, channel 0

f(B) is the correction factor found from Table "I

To,o is the time of frame 0, channel 0.

EXP. 18 IMP 1 CHARGED PARTICLE EXPERIMENT

Figure (1)
Page 1 of 1

BCD TAPE FORMAT

63-01144-05b

Symbol	Format	Description
1-6		Sequence counter
7-8		Station number
9-11		Universal time - day
12-13		Universal time - hours
14-15		Universal time - minutes
16-20		Universal time - milliseconds
21		Frame time in seconds
22-24		Frame time in milliseconds
25		Sequence ID
26		ET1
27-31		F1 data - background counter
32		ET2
33-37		F4 data - Beta counter
38		ET3
39-43		F9 data - background counter if Sequence ID is $\neq 1$, Ion chamber readout if Sequence ID = 1,
44		ET4
45-49		F12 data counter
50-53		Azimuthal angle
54-55		Polar solar angle
56-59		Spin period
60		Blank

DATA USERS' NOTE

NSSDC 67-38

EXPLORER 18 (1963 46A)

ENERGETIC PARTICLES EXPERIMENT

AUGUST 1967

NATIONAL SPACE SCIENCE DATA CENTER

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION · GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.

DATA USERS' NOTE
NSSDC 67-38

EXPLORER 18 (1963 46A)
ENERGETIC PARTICLES EXPERIMENT

EXPERIMENTERS
K. A. Anderson
H. K. Harris

AUGUST 1967

FOREWORD

This Data Users' Note is specifically designed to help potential data users decide if they can make use of the data obtained in the Explorer 18 (1963 46A) energetic particles experiment. Once a data user decides that he requires the data, it will serve as the unifying element — the key — in the actual use of the data available at the National Space Science Data Center (NSSDC). To achieve these goals, the Note briefly describes the experiment, including the instrumentation and measurements, the telemetry, and the operational experience. All available details are then provided on the actual reduction techniques and format of recorded data. For those desiring more details, names and addresses of the experimenters are provided to facilitate direct contact. As a further aid, detailed references (and bibliography) are also included. When available, NASA accession numbers* are given. The primary purpose of these references is to identify the sources containing complete information concerning the subject under discussion. Most of these references are physically available at NSSDC — those that are not are readily obtainable.

Inquiries concerning the availability of data should be directed to:

National Space Science Data Center
Goddard Space Flight Center
Greenbelt, Maryland 20771
Area Code 301 982-6695

*For example, N64-2243 is an accession number for an article reported in the *Scientific and Technical Aerospace Reports* (STAR), and A63-5921 refers to an entry in the *International Aerospace Abstracts* (IAA).

SAFETY FILM ◆▲ KODAK

CONTENTS

Page

BACKGROUND 1

EXPERIMENTERS 2

EXPERIMENT

- Instrumentation and Measurements 2
- Calibration 3
- Telemetry 4
- Operational Experience 6

DATA

- Reduction Techniques 7
- Timespan of Data 7
- Format of Available Data 7

REFERENCES 17

BIBLIOGRAPHY 19

LIST OF FIGURES

Figure

1 Explorer 18 Experiments 1
2 Ionization Chamber Calibration Curve 5
3 Explorer 18 Stacked Data Tape Format 8
4 IMP 1 Optical Aspect Sensor Calibration 11

KODAK ◆▲ SAFETY ▲ FILM

EXPLORER 18 (1963 46A)
ENERGETIC PARTICLES EXPERIMENT

BACKGROUND

The Explorer 18 (1963 46A) energetic particles experiment was designed by researchers at the University of California to measure absolute fluxes of geomagnetically trapped particles and to continue the mapping of the outer boundary of geomagnetic trapping over a certain range of sun-earth-satellite angles. This experiment was one of seven (see Figure 1) carried aboard the Explorer 18 (1963 46A) satellite.

FIGURE 1
EXPLORER 18 EXPERIMENTS

No.	Experiment	Investigator(s)	Affiliation
01	Retarding Potential	G. P. Serbu	GSFC*
		E. Maier	GSFC*
02	Magnetic Fields	N. Ness	GSFC*
03	Solar and Galactic Protons (Cosmic-Ray)	J. A. Simpson	University of Chicago
		C. Y. Fan	University of Chicago
		G. Gloeckler	University of Chicago
04	Cosmic-Ray	F. B. McDonald	GSFC*
		G. Ludwig	GSFC*
		V. Balasubrahmanyan	GSFC*
		T. L. Cline	GSFC*
05	Energetic Particles	K. A. Anderson	University of California
		H. K. Harris	University of California
06	Ames Plasma Probe	J. H. Wolfe	ARC**
		R. W. Silva	ARC**
07	Plasma Probe	H. S. Bridge	MIT***
		A. Egidi	MIT***
		A. Lazarus	MIT***

*Goddard Space Flight Center.
**Ames Research Center.
***Massachusetts Institute of Technology.

The Explorer 18 satellite, also known as IMP 1, was launched from Cape Canaveral (Cape Kennedy), Florida, on November 27, 1963, at 0230 UT. The satellite achieved an initial apogee of 197 616 km (geocentric) and a perigee altitude of 192 km. IMP 1 had an initial period of ~ 93.5 hr, an inclination to the earth's equator of 33.3 deg, and an eccentricity of 0.937. The spacecraft was spin stabilized at an initial rate of 22.3 rpm with an initial satellite spin-axis sun angle of 111 deg, measured by the spacecraft optical aspect sensor.[1,2]

EXPERIMENTERS

*K. A. Anderson - University of California
*H. K. Harris - University of California

EXPERIMENT

Instrumentation and Measurements

Three energetic particle detectors were used for this experiment - two Geiger-Mueller tubes and an ionization chamber radiation monitor.

Two Lionel-Anton type 213 Geiger-Mueller tubes were used to detect fluxes of electrons with energy > 45 kev. One tube (GM1) was directed toward an .008-in. gold foil designed to scatter electrons into the detector's mica window. The second tube (GM2) served as a background detector. Both tubes had a total shielding of 3.09 gm/cm^2, including epoxy, eccofoam, stainless steel, and 2.8 gm/cm^2 of copper. GM1 had a mica end window with a density thickness of 1.7 ± .3 mg/cm^2. This shielding and the energy loss due to backscattering set the low-energy limit of 45 kev for electrons detected through the aperture. The gold foil was directly accessible to the space environment through the satellite skin. The acceptance cone for electrons was about 60 deg full angle. In order to enter the detector's mica window, particles had to be scattered through the approximately 114-deg scatter angle, an occurrence which was highly improbable for heavier particles. The arrangement was based on the assumption that electrons over a wide energy range would scatter back into the counter window with moderately high efficiency, and that protons would lose most or all of their energy before traversing enough matter to undergo a large angle scattering.[1,3]

The ionization chamber was a 3-in. diameter aluminum sphere filled with argon gas at a pressure of 7 atm. The chamber was used in conjunction with

*Address: Space Sciences Laboratory, University of California, Berkeley, California, 94720.

a Neher type electrometer. Any radiation with sufficient energy to penetrate the ionization chamber wall ionized the argon gas, and the negative charge thereby formed was collected on the positively charged platinum-coated rod in the center of the chamber. A tungsten fiber, located near the base of the collector rod, was attracted to the collector when the voltage between the collector rod and the fiber reached a critical value V_c. The accumulated electric charge (negative) of the collector rod then flowed through the fiber, yielding a pulse at the ionization chamber terminal. The charge per pulse for a typical chamber is 3×10^{-10} coulombs.

The ionization chamber had a shielding of 0.43 gm/cm^2 provided by the aluminum wall of the chamber and 2 cm of eccofoam.[3]

Calibration. The effectiveness of the Geiger-Mueller detector (GM1) was directly confirmed using a beam of 4-Mev protons from a cyclotron. Only an upper limit to the efficiency for detecting protons either directly or indirectly by X-ray excitation could be obtained. This upper limit was 0.1%. Additional verification of the effectiveness of discrimination came from the fact that, during the flight of Explorer 18, fluxes of low-energy protons were encountered by other experiments using proton detectors, but at these times the electron counter showed no observable increases in its directional scatter response. The electron scatter efficiency was about 13 ± 2% in the geometry employed (although only 7% of the electrons which scattered from the gold foil actually reached the active portion of the GM tube), and was constant over a wide range of energy. This result was obtained by means of a beta-ray spectrometer that was used to make measurements with a variable-energy electron beam. The device was thus a nonweighting spectrum integrator.[1]

The minimum electron energy to which the counter responded was determined by two factors. It was known from previous experiments that the Geiger-tube window transmits electrons into the active volume with a 30% efficiency at 40 kev. The energy loss in the gold foil as the electron backscatters is 5 kev or less for the lowest energy electron entering the counter based upon β-particle spectrometer measurements. The counter thus has a threshold energy of approximately 45 kev. This counter could, therefore, be compared with type 213 counters aboard satellites such as Explorers 12 and 14. The 5-kev difference in threshold is probably negligible, considering the errors present in determining geometry factors and window thickness and in making dead-time corrections.[1]

The absolute flux of electrons > 45 kev incident on the scatter geometry is given by

$$J_0 = \frac{4\pi}{\epsilon G_1} R_t = \frac{4\pi}{\epsilon G_1} \frac{R}{1 - \tau R}$$

In this expression, the flux has been assumed to be isotropic over 4π ster. G_1 is the telescope factor of the opening from the gold foil into free space. The numerical value is 2.5×10^{-2} cm^2 ster. The quantity ϵ is the fraction of electrons incident on the gold foil from the entrance geometry that reaches the active volume of the Geiger tube; this fraction is 7×10^{-2}. R is the apparent rate of the detector as determined from the accumulated counts in the scalers. τ is the dead time of the Geiger tube; its value is 100 μsec. The omnidirectional electron flux is thus

$$J_o = 7000\, R_t \text{ cm}^{-2} \text{ sec}^{-1}$$

One precaution is necessary. For counting rates less than about 10 sec^{-1}, the cosmic-ray background rate must be subtracted before using the above conversion factor. For the Geiger counter used in this experiment, the cosmic-ray background rate varied from 0.9 sec^{-1} early in the satellite's lifetime to about 1.4 sec^{-1} during the more quiet solar periods.[1]

The calibration of the ionization chamber was based on the absorption of energy in units of roentgens per hour. The dynamic range of a typical chamber is 10^{-3} pulses per second (2 mr/hr) to 7 pulses per second (approximately 100 r/hr), although its response to radiation begins to depart from linearity at about 0.4 pulses per second (approximately 1 r/hr). Absolute calibration of pulse rate vs radiation level in roentgens per hour has been obtained with +2% accuracy. A typical calibration curve is shown in Figure 2.[3]

Telemetry

The Explorer 18 telemetry system used a hybrid, time-multiplexed, pulse-frequency modulation (PFM) encoding technique. The basic telemetry format consisted of 256 channels arranged 16 channels in a frame, with 16 frames in a sequence. One sequence was required to sample all experiments and required 81.92 sec. The 256 channels making up a sequence were commutated samples of data in the form of an audio frequency.[4]

Signal processing for both of the Geiger tubes was nearly identical, the exception being an electronic switch in the GM2 channel. Outputs from the detectors were fed to pulse shapers, which drove divide-by-four stages. The divide-by-four stage output of GM1 was fed to a buffer stage, whereas the divide-by-four stage output of GM2 went first to an electronic switch and then to a buffer stage. The buffer stages provided transformer-isolated drive to

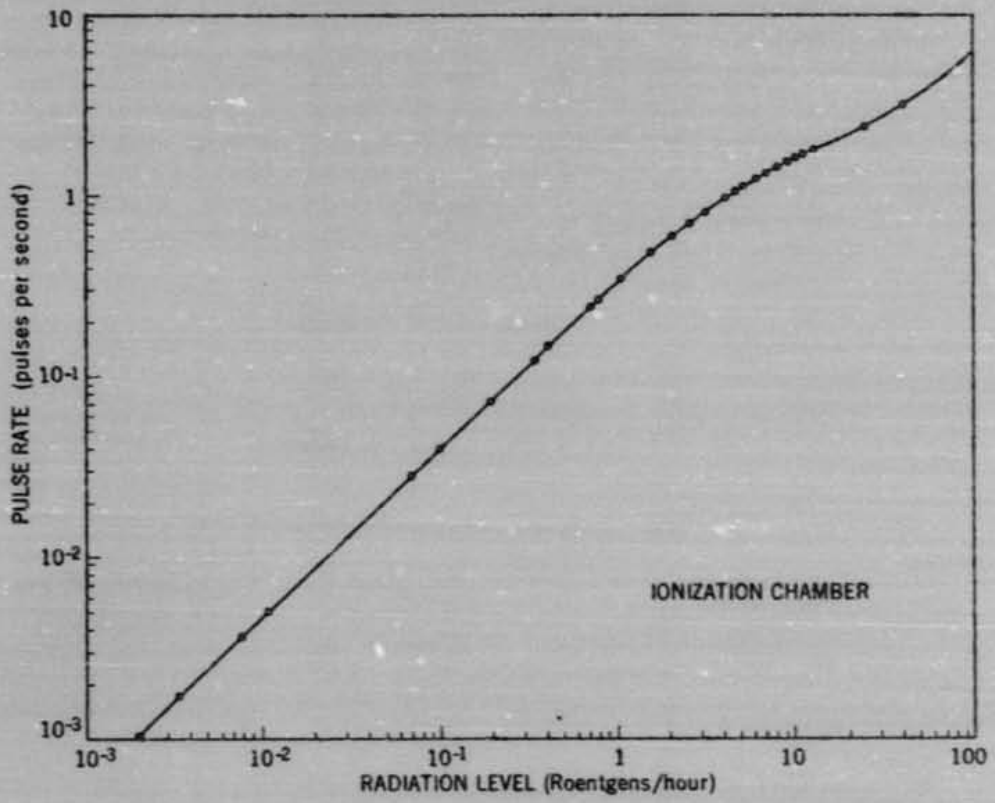


Figure 2. Ionization Chamber Calibration Curve

the 2^{15} accumulators (GM1 tc accumulator #6, GM2 to accumulator #5) in the Explorer 18 encoder. These accumulators were read out twice per telemetry sequence (every 40.96 sec) and were reset after each readout. The readout of each accumulator required 1.6 sec; No. 6 read out 15.36 sec after No. 5.

Synchronization (timing) information was fed to the experiment via four lines to identify the 1.6-sec readout positions in the telemetry format of both accumulators, No. 5 and No. 6. The third line identified the first readout position of No. 5 in each sequence, and the fourth line identified the occurrence of sequence 4. From these four lines, the experiment derived the necessary timing information to operate the two electronic switches and the clock.

In the Explorer 18 telemetry format, which was essentially composed of a cycle of four equal time intervals called sequences (each equal to 81.92 sec),

accumulators No. 5 and No. 6 were read out twice in each of the first three telemetry sequences. In sequence 4, these accumulators were not "seen" in the telemetry, although they were still accumulating for each 40.96 - 1.6 = 39.36-sec interval. The GM1 detector was thus "seen" by the No. 6 accumulator six times every four sequences, or $39.36/40.96 \times 6/8 \times 100\% = 72.1\%$ of real time. The GM2 detector readout was similar to that of GM1, the differences being that the second readout position of accumulator No. 5 in sequence 1 was occupied by ionization chamber information rather than GM2 count-rate data. GM2 was thus "seen" by the No. 5 accumulator five times every four sequences, or $39.36/40.96 \times 5/8 \times 100\% = 60.1\%$ of real time.[3]

Because of the normally slow pulse rate of the ionization chamber information, a 2^{15} accumulator was incorporated for temporary storage of the ionization chamber information. With this scheme, the probability of missing a random ion chamber pulse was reduced to $1.6/327.68 \times 100\% = 0.49\%$, and the ion chamber was "seen" during $326.08/327.68 \times 100\% = 99.5\%$ of real time.[3]

Operational Experience

The apogee of Explorer 18 was lower than planned and continued to decrease with time. Thus, on the day following launch (November 28, 1963), the apogee was measured at 197 615.8 km as compared with the nominal figure of 277 184 km. By January 16, 1964, it had decreased to 195 552.8 km. The experimenters were of the opinion, however, that the accomplishment of the scientific mission was not compromised by the lower apogee.[2]

The spacecraft functioned satisfactorily until May 30, 1964, when it began to turn off and turn on in a repetitive series. There was no further continuous operation until November 12, 1964, when the station at Mojave acquired and recorded the signal from Explorer 18 for about 6 hr. The satellite operated approximately 90% of the time from then until December 15, 1964. There were only intermittent periods of operation thereafter. Eleven min of data were obtained on May 10, 1965, and all attempts at further data acquisition were abandoned.[5]

Both the Geiger counters and the ionization chamber performed satisfactorily throughout the active lifetime of the satellite, which made about 100 passes through the radiation zone.[1]

DATA

Reduction Techniques

Data from this experiment were recorded on 37 data tapes, which GSFC delivered to the University of California for reduction and analysis. These 37 tapes were stacked to generate two magnetic tapes containing all of the experimental data. The stacked tapes were written on an IBM 360 system and contain BCD characters written on a 7-track tape in even-parity at a density of 800 bpi.[6]

Timespan of Data

Data from this experiment available at NSSDC cover the period of November 27, 1963, to May 30, 1964.

Format of Available Data

The first file on each of the two stacked tapes is a one-record file that serves as an index to that tape. Each of these physical records is 1032 characters long and consists of 86 twelve-character logical records. There is one index entry for each of the GSFC short reels stacked on the larger tape. Tape 1 contains 20 entries; tape 2 contains 17 entries. The remaining index entries are blank. The entries are in the following format:

Characters	Description
n + 1-n + 6	GSFC reel number
n + 7-n + 9	Number of files contained on the GSFC tape
n + 10-n + 12	Blank

where n = 0, . . . , 19; and n = 0, . . . , 16 respectively.

The stacked experiment data copied from the GSFC reels follows the index file. The data are in the same file-by-file format as appeared on the original tapes, except that a 12-character field has been prefixed to each record in order to identify it to the University of California programs using these tapes. The individual physical records are 1032 characters and include 24 characters for prefix and identification fields and 18 repetitions of a 56-character data field. The governing format for each physical record is given in Figure 3. The ET flags are explained in the following paragraphs.

FIGURE 3
EXPLORER 18 STACKED DATA TAPE FORMAT

Item	Tape Characters	Significance	
1	1-6	Original GSFC reel number	
2	7-9	File number within GSFC reel	Prefix field
3	10-12	Record number within above file	
4	13-14	Satellite number	
5	15-16	Month of analog tape generation	
6	17-18	Day of analog tape generation	ID field
7	19	Year of analog tape generation	
8	20-21	Station number	
9	22-24	Analog tape number	
10	25-27	Universal time - day	
11	28-29	Universal time - hours	
12	30-31	Universal time - minutes	
13	32-36	Universal time - milliseconds	
14	37-41	Sequence counter	
15	42	Frame time in seconds	Data field
16	43-45	Frame time in milliseconds	
17	46	Sequence ID	
18	47	ET flag 1 see page 12	
19	48-52	F1 data - background counter*	
20	53	ET flag 2 see page 12	
21	54-58	F4 data - Beta counter*	
22	59	ET flag 3 see page 12	
23	60-64	F9 data - background counter if sequence ID is different from 1; ion chamber readout if sequence ID equals 1*	
24	65	ET flag 4 see page 12	
25	66-70	F12 data - Beta counter*	
26	71-74	Azimuthal angle (AZANG)**	
27	75-76	Polar solar angle (PS)**	
28	77-80	Spin period (SPIN)**	
Then repeat items 10-28 for 17 more times.			

* Items 19, 23 and 21, 25 are decimal integers representing the counts from accumulators 5 and 6, respectively. The raw count rates β_R and BKD_R may be

FIGURE 3 (Cont'd)

calculated as follows:

$$\beta_R = \frac{4 \times B}{39.36} \qquad BKD_R = \frac{4 \times BKD}{39.36}$$

where

β = the value of item 21 or 25
BKD = the value of item 19 or item 23 when sequence ID is different from 1

The Ion Chamber rate is calculated as follows:

$$IC_c = \frac{32767 - IC}{327.68}$$

where

IC = the value of item 23 when sequence ID equals 1. All rates are in pulses/second.

** Items 26, 27, 28 are raw optical aspect data. Items 26 and 28 are given as decimal integers. Item 27 is given as an octal integer. The spin period, polar solar angle and the azimuthal angle may be found as follows:

A. Spin period (in seconds) = SPIN/200

B. Polar solar angle, B, (the spin axis, spacecraft, sun angle) is found directly from Figure 4 using the value of item 27, PS.

C. Aximuthal angle, ψ°, (the sun, spacecraft, optical sensor angle) as a particular sequence is calculated by:

$$\psi^\circ = -f(B) + \frac{\left(T_{0.0} - T_{4.0} - \frac{AZANG}{200}\right)}{\frac{SPIN}{200}} \times 360^\circ$$

FIGURE 3 (Cont'd)

where AZANG is the value of item 26.

SPIN is the value of item 28.

T4, 0 is the time of frame 4, channel 0.

f(B) is the correction factor found from Figure 4.

To, o is the time of frame 0, channel 0.

The last file on each of the GSFC tapes is a one-record file with the 12-character identification field (i.e., satellite number, month, day, etc.) set to nines. This file has also been copied onto the stacked tape. Thus the first record of the following file on the stacked tape will have a different GSFC reel number and a file number of 1 in the prefix field. Two end-of-file (EOF) marks will follow the last valid data file on the stacked tape.

The three non-numeric characters that can occur in the data, and their significance, are as follows:

"@" represents a system error
"=" represents missing data
":" represents loss of synchronization

The "@" and "=" symbols appear only in the data; the ":" symbol can appear anywhere in the sequence. Once a colon is present, no other character but a colon can follow. As a result, the frame-length computation may be in error; however, the sequence count is correct and may be used to fill in missing time.

Time gaps appear as a result of the loss of synchronization or in the absence of a signal, in which case the "=" symbol is generated.[6]

SIGNIFICANCE OF ET FLAGS

The following is a complete description of ET flags as presented in reference 7 and refers to the processing the data underwent before being sent to the experimenters.

Even ET FLAGS mean that all program checks were made. Odd ET FLAGS mean that data were processed without some important checks, and the satellite clock reading could be in error.

FIGURE 4

IMP 1
OPTICAL ASPECT SENSOR CALIBRATION

PS Octal	B	f(B)	PS Octal	B	f(B)
40	0° 10'	-		94° 18'	
41	1° 24'	-	21	96° 10'	1.52°
43	4° 42'	-	23	99° 10'	1.54°
42	5° 10'	-	22	99° 50'	1.55°
46	11° 04'	17.25°	26	105° 54'	1.55°
47	12° 0'	8.70°	27	107° 50'	1.65°
45	17° 02'	8.00°	25	110° 59'	1.67°
44	18° 12'	5.85°	24	113° 08'	1.70°
54	22° 52'	5.45°	34	117° 56'	1.76°
55	24° 36'	4.40°	35	120° 08'	1.80°
57	28° 53'	4.12°	37	123° 01'	1.95°
56	29° 44'	3.48°	36	124° 56'	2.07°
52	34° 42'	3.42°	32	129° 51'	2.18°
53	36° 16'	2.90°	33	132° 08'	2.40°
51	40° 14'	2.80°	31	134° 56'	2.52°
50	41° 40'	2.60°	30	137° 31'	2.70°
70	46° 42'	2.56°	10	141° 39'	2.88°
71	48° 36'	2.22°	11	143° 52'	3.18°
73	52° 08'	2.17°	13	146° 46'	3.45°
72	52° 56'	2.00°	12	147° 22'	3.75°
76	58° 50'	1.96°	16	152° 44'	3.80°
77	60° 26'	1.88°	17	156° 0'	4.72°
75	64° 14'	1.80°	15	159° 16'	5.40°
74	65° 32'	1.76°	14	161° 16'	5.95°
64	70° 58'	1.72°	04	163° 36'	6.65°
65	72° 55'	1.65°	05	168° 04'	7.80°
67	76° 18'	1.60°	07	169° 44'	10.1°
66	77° 04'	1.56°	06	173° 0'	11.60°
62	82° 56'	1.54°	02	175° 44'	16.60°
63	84° 30'	1.50°	03	180° 0'	22.50°
61	87° 14'	1.50°	01		-
60	90° 30'	1.50°			
20		1.50°			

It should be noted that an ET FLAG of ∅ means that everything is probably good, and 4 means that, because of noise, NSFUDG was guessed. (NSFUDG is defined in the next section.) ET FLAGS will be even provided that the following was done;

1. The analog line was continuously checked through the program and five consecutive bad normal sequences never appeared with line errors. If random buffer (in the telemetry system) errors occurred, data for the suspect frame or frames in the sequence were "at" signal out.

2. CDNSFUDG was checked by means independent of most of the past history of the satellite. NSFUDG is thus probably correct. (CDNSFUDG is defined in the next section.)

3. The insert of station ID (DAY, MONTH, AND YEAR) by the analog line operator was checked, and the day, month, and year were correct as determined by the program.

One should thus be wary of odd ET FLAGS and have a high degree of confidence in even ET FLAGS.

Some necessary definitions are as follows:

NSFUDG = the five-character decimal number that the experimenter receives to indicate the sequence count. This number goes from 00000 to 99999 in about 90 days. Each normal telemetry sequence will thus be tagged with a unique number over a 3-mo period. The ET FLAG will indicate how good this number is. If the flag is ∅, it means that this number is thought to be excellent. If the flag is ODD, the number could be fine, but there is a good possibility that it is incorrect.

RNS = the sequence rate in seconds for sequence. (The nominal value is 81.92 sec/seq.) The program for the Master Data Tape (MDT) obtains this value in two ways for each pass. Both values represent the integrated value over the entire pass. The time that appears on the experimenter's tape is obtained from the values of RNS and NSFUDG, and not from the station time appearing on the analog tape. Thus it is extremely important that the significance of the ET FLAG is understood because it directly implies the quality of recorded time. The ET FLAG also gives valuable information as to the quality of the line operation and the data. If the flag is ∅, the line and satellite are working well and the signal is probably clean. An ET FLAG of 1 means the same, but the time may be wrong; in fact, it may be so wrong as to have the wrong year.

DNS = the decimal equivalent of the satellite clock value. No fudge factors are involved in this number; its value covers the range of 00000 to 32767.

CNSNOW = the computed value of NS now. When the program initializes a file using the satellite clock CNSNOW ≡ DNS, from this point on CNSNOW is incremented by "1" each sequence. Thus, if there are no "gaps" in the data, CNSNOW should always equal DNS. In the presence of noise, when DNS may not be obtained, CNSNOW is used to determine NSFUDG with an ET FLAG of 4. Whenever CNSNOW ≠ DNS, records are stored by the program for 10 consecutive normal sequences, and a decision is made as to what happened (e.g., there was a gap in the data; the satellite went into undervoltage, thus starting the satellite clock off in a different place; the odometer flipped; etc.). When this decision can be made, the program goes back and makes the change (CNSNOW ≡ DNS), and the process continues.

GOOD UPDATE: When CNSNOW = DNS

BAD UPDATE: When CNSNOW ≠ DNS

CDNSFUDG = the value fed into the computer by a card that gives the fudge factor required to make NSFUDG (the 90-day function) from DNS (a 30-day function at best, e.g., if no undervoltages occur in the satellite). It is emphasized that it is most important to check CDNSFUDG independent of most of the past history of the satellite.

BASIC EQUATION:

$$NSFUDG = DNS\ k + CNSNOW\ (1-k) + CDNSFUDG$$

where k = 1 if the signal is good enough to get DNS and if DNS = CNSNOW

(ET FLG = 0 or 2) or 1 or 3

k = ∅ if the signal is too noisy to obtain DNS or if the signal is clean but DNS ≠ CNSNOW (ET FLG = 4, 6, or 8) or 5, 7, or 9

ESTO: This is essentially a "filter" and is the heart of the program. As soon as a bad update occurs [e.g., on ET FLAG of 6 (or 7) or 8 (or 9)], information is stored in the program while the MDT is produced. If a good update does not occur in 10 consecutive normal sequences (noise is not counted as a good update, of course), it is assumed that ESTO's have occurred; the program stops putting out the MDT and analyzes what happened during the 10 ESTO's. The most likely event to occur is a "noise gap" in

which the analog line found six noisy sequences and stopped processing until it could again obtain telemetry data synchronization. The program determines that this has happened by a process of elimination. First it checks that the 10 ESTO's make sense (are in order); if they do not, it reinitializes. Then it determines that the mode did not change (if it is too noisy, it reinitializes). Then it determines that the odometer did not flip (if it did, it computes a new CDNSFUDG and continues). If none of the above occurred, it determines that the satellite did not go into undervoltage. (If it did go into undervoltage, a process occurs in which new cards are punched.) During any of the re-initializations, it is necessary to check for a code change. If the 10 ESTO's are fairly clean, the odometer did not flip, and no satellite undervoltage occurred, the program commences to close the noise gap. If it does this correctly (i.e., the gap station time is equal to the gap by the satellite clock), the program rewinds the tape to the first ESTO, computes a new CNSNOW, and again starts to process.

The experiment will have the ET FLAG of 6 or 8 changed to a $\not{0}$.

The foregoing gives a qualitative indication of what the ET FLAG means. To sum up, an odd ET FLAG means that the time may be wrong (incorrect CDNSFUDG) and/or the MDT was made at the request of the analog line, without checking for line errors.

An ET FLAG of $\not{0}$ (or 1) means that the satellite is probably working correctly and that the signal is clean, since both clock readouts were clean and equal to each other. In addition, there was a good update (DNS = CNSNOW) and DNS was used to compute NSFUDG.

An ET FLAG of 2 (or 3) means that the satellite is probably working well, but noise or line errors have perturbed one of the clock readings. The clock reading that was clean, however, caused a good update (DNS = CNSNOW) and DNS was used to compute NSFUDG.

An ET FLAG of 4 (or 5) means that both clock readings were perturbed by noise or line errors so that the update could not be checked. It was necessary to use CNSNOW to compute NSFUDG.

IMPORTANT NOTE: Any time an ET FLAG of 4 occurs and the first non-4 following it is a $\not{0}$ or 2, the guess for NSFUDG was probably correct for the 4. If the first non-4 following it is a 6, 8, or 9, something drastic happened that the program could not analyze, so that time for the sequences with a 4 was probably incorrect. It is hoped that 4's will be followed by $\not{0}$ or 2 most of the time because this means that the program successfully closed a

"noise gap." If the 4's are followed by a 9, it means that the program completely gave up and reinitialized at the record with the ET FLAG of 9. If the 4's are followed by a 6 or 8, the two most likely events are: (1) the end of the tape was near so the program could not get 10 consecutive sequences with bad updates and gave up, or (2) some mysterious event occurred that gave a bad update for a few sequences and then straightened itself out again.

An ET FLAG of 6 (or 7) means that one of the clock readings was clean, but it caused a bad update (DNSNOW $\neq$ DNS). This would start ESTO, and NSFUDG was computed from CNSNOW.

An ET FLAG of 8 (or 9) means that both of the clock readings were clean and equal to each other; there was a bad update, however, since CNSNOW $\neq$ DNS. This event would start ESTO. After 10 ESTO's, the program can usually determine what happened (ODOMETER FLIP OR NOISE GAP) and update CNSNOW so that the experimenter will receive an ET FLAG of $\not{9}$ because the program had backspaced and closed the gap correctly. The ET FLAG will signify that this occurred.[6,7]

REFERENCES

1. Anderson, K. A., H. K. Harris, and R. J. Paoli, "Energetic Electron Fluxes in and beyond the Earth's Outer Magnetosphere," J. Geophys. Res., 70, 1039-1050, Mar. 1, 1965. A65-20448.

2. Carr, F. A., "Interim Status Report: Interplanetary Monitoring Platform IMP-I — Explorer XVIII," GSFC, Feb. 1964. X-672-64-32.

3. Anderson, K. A., R. J. Paoli, and G. H. Pitt, "I. Technical Description of the University of California IMP-1 Energetic Particles Equipment," Technical Report on NAS 5-2989, Series 7, Issue 32, Space Sciences Laboratory, University of California at Berkeley, Sep. 1, 1966.

4. Piazza, F., "Computer Analysis of Interplanetary Monitoring Platform (IMP) Spacecraft Performance," NASA TN D-3340, Mar. 1966.

5. Carr, F. A., "Flight Report: Interplanetary Monitoring Platform IMP-I — Explorer XVIII," NASA TN D-3352, Apr. 1966.

6. Anderson, K. A., R. J. Paoli, and G. H. Pitt, "II. Description of the Data Format on Magnetic Tapes Supplied to the NASA Data Center," Technical Report on NAS 5-2989, Series 7, Issue 32, Space Sciences Laboratory, University of California at Berkeley, Sep. 1, 1966.

7. White, H. D., "Significance of the ET Flag in the S-74 (IMP) Information Processing System (Preliminary)," Nov. 1, 1963.

BIBLIOGRAPHY

Anderson, K. A., "Energetic Electron Fluxes in the Tail of the Geomagnetic Field," J. Geophys. Res., 70, 4741-4763, Oct. 1, 1965.

Anderson, K. A., "Energetic Electron Spikes in and beyond the Transition Region," presented at the Ninth International Conference on Cosmic Rays, Proceedings, 520-527, London, 1965.

Anderson, K. A., "Radial Dependence of Energetic Electron Fluxes in the Tail of the Earth's Magnetic Field," Phys. Rev. Letters, 14, 888, 1965.

Anderson, K. A., and H. K. Harris, "Studies of Electrons above 45 Kev in the IMP-I Satellite," presented at the Goddard Scientific Symposium, Results of IMP/I, GSFC, Mar. 12, 1964.

Anderson, K. A., and R. P. Lin, "Observations on the Propagation of Solar Flare Electrons in Interplanetary Space," Phys. Rev. Letters, 16, 1121, 1966.

Anderson, K. A., and N. F. Ness, "Correlation of Magnetic Fields and Energetic Electrons on the IMP 1 Satellite," J. Geophys. Res., 71, 3705-3727, Aug. 1, 1966. NASA-TM-X-55467, X-612-66-109, N66-24403, A66-38201.

Anderson, K. A., H. K. Harris, and R. J. Paoli, "Energetic Electron Fluxes in and beyond the Earth's Outer Magnetosphere," J. Geophys. Res., 70, 1039-1050, Mar. 1, 1965. A65-20446.

Anderson, K. A., R. J. Paoli, and G. H. Pitt, "I. Technical Description of the University of California IMP-1 Energetic Particles Equipment," Technical Report on NAS 5-2989, Series 7, Issue 32, Space Sciences Laboratory, University of California at Berkeley, Sep. 1, 1966.

Anderson, K. A., R. J. Paoli, and G. H. Pitt, "II. Description of the Data Format on Magnetic Tapes Supplied to the NASA Data Center," Technical Report on NAS 5-2989, Series 7, Issue 32, Space Sciences Laboratory, University of California at Berkeley, Sep. 1, 1966.

Carr, F. A., "Flight Report: Interplanetary Monitoring Platform IMP I — Explorer XVIII," NASA TN D-3352, Apr. 1966.

Carr, F. A., "IMP I Shadow Fact Sheet," GSFC, May 7, 1964.

Carr, F. A., "Interim Status Report: Interplanetary Monitoring Platform IMP I — Explorer XVIII," GSFC, Feb. 1964. X-672-64-32.

Ehrlich, E., "NASA Particles and Fields Spacecraft," AIAA Paper No. 64-337, presented at the 1st AIAA Annual Meeting, Washington, D. C., June 29 - July 2, 1964. N64-23229.

Harris, H. K., and K. A. Anderson, "Energetic Electrons in the Transition Region," Trans. Am. Geophys. Union, 46, 529, 1965.

Lin, R. P., and K. A. Anderson, "Periodic Modulations of the Energetic Electron Fluxes in the Distant Radiation Zone," J. Geophys. Res., 71, 1827-1835, Apr. 1, 1966.

Mish, W. H., "Timing Errors — Their Detection and Correction in the IMP Information Processing System, GSFC, Oct. 1964. NASA TM-X-55146, X-612-64-328, N65-18264.

Murayama, T., "Spatial Distribution of Energetic Electrons in the Geomagnetic Tail," Enrico Fermi Institute for Nuclear Studies, University of Chicago, Preprint No. EFINS 66-64, June 1966.

Piazza, F., "Computer Analysis of Interplanetary Monitoring Platform (IMP) Spacecraft Performance," NASA TN D-3340, Mar. 1966.

White, H. D., "Significance of the ET Flag in the S-74 (IMP) Information Processing System (Preliminary)," Nov. 1, 1963.

D-00077

BCD list of first 3 files

Start Time -

day - 331 · Nov. 28
hr. - 03
min. - 49
yr. - '63

1009 [illegible] 1008 [illegible] 1022 02 000 1045 05A000 1087 07 000 1065 05F000 1104 06F0
[illegible] 1137 [illegible] 1085 [illegible] 1155 [illegible] F095 [illegible]
8000 1272A07H000 1363A06F000 1312 07 000

07 000 1065 05E006 110A 06E000 1C20 07A000 18 REC 1, LENGTH 1032

FILE-#1

```
1009 00A00A74112731600233103494042600081511929015729003229001059323230432250541 3
9310009113139410009813049802562505403310353461680008451191100083127880132691126 93
8082000855119210156812598910007112492302702505423310356299960008651193100070124 03
0540331035913824000885119130005032077933274731981702912505413310400357380008951 19
1181360120250540331040157652000905119330003131751230003331716904892505433310404 41
1154461327381150280150250541331040603394000935119210002611443310002411414505222 50
4511931000231137011000211133290354250540331041009136000965119110001811259713275 41
4113105000097511921000131119401000141115350392250540331041252964000955119310001 31
2625054233104153679200100511911000131109221327611107410437250541331041658706001 01
0012110425027325054033104182062000102511931000111101091000111099630109250541331 04
0010109620132764109249032425054 1

1009 00A00B74112731600233104222636200105511921000121090351000071087000162250541 3
9310000810847910000810838800012505413310426321040010851191100008108035132764107 78
4018001095119210000910753910000810733700612505413310429159320011051193100008107 15
0541331043159760001125119110000810629813276610605601252505413310433216740011351 19
1055050508250541331043443588001145119310000910509110000610480403512505413310437 27
1038251327671036270038250541331043849330001175119210001010336610000710310704242 50
8511931000051028011000071026440268250541331044255072001205119110000910217213276 61
4441696600121511925000055*****5*****5*****************331044538900001225119330000 83
9125054233104482272800124511911000061010331327671009280427250541331044944642001 25
0006100806027425054133104510655600126511931000091007251000051006510122250541331 04
0007100528132767100504036125054 2

1009 00A00C74112731600233104551229800129511921000061004631000071004030210250541 3
9310000810039010000410037100592505423310459180400013251191100007100320132767100 30
9954001335119210000610029610000210025901522505423310502018680013451193100007100 25
0541331050607658001375119290000690025690000590026201012505413310507295690013851 19
1002560496250543331051135332001415119290000790026490000990025500562505413310512 57
1002731=====1002760454250541331051541080001445119 5*****5*****5*****5*************
5511923000073003243000073003360017250542331051824912001465119310000510033310000 81
5210874400148511913*****3*****332767300374012725054133105223066000149511921000071
2525054333105235257600150511931000071004641000041005420384250541331052636408001 52
2767301081009825054133105275832400153511921000081012201000071013050498250541331 05
0010101373100009101530035625054 2

1009 00A00D74112731600233105320407200156511915*****5*****577=775*****00742505423
9210000910206910000510204104762505413310534479040015851193100010101977100006101 82
1736001605119 13*****3*****332766301343005625054233105385365200161511921000071025 0
=0363310540155680016251193100008101381100006101283032125054233105425940000164511 9
3008370043250543331054421316001655119210000610079210000510068404472505423310545 43
1005721000081005150310250541331054827064001685119110000410028413276710022500352 50
9511921000081001721000091002120441250543331055110896001705119310000910020310000 81
5535472800172511913*****3*****332767300129003225054233105551664400173511921000061
3825054333105563856000174511931000061002261000081002220304250542331055922392001 76
2767300208003425054133106004430800177511921000061002141000061002520441250542331 06
0005100263100009100280030725054 2

1009 00A00E74112731600233106045005600180511913*****3*****332767300218004025054 23
9210000810017010000510015804492505423310607338880018251193100005100134100006100 14
7720001845119 13*****3*****332767300116005025054233106113963600185511921000091001
0542331061301552001865119310000510013010000710012703292505413310615453840018851 19
3001290065250542331061707200001895119210000610012110000410010804762505423310618 29
1001281000071001210345250543331062113048001925119 13*****3*****332767300156008425 0
3511921000061001611000051001560496251 0=633106235688000194511931000081001581000071
6264071200196511913*****3*****332767300229010825054133106280262800197511921000081
2025054233106292454400198511965000065*****5*****5*****************331063208376002 00
2767300689013525054233106333029200201511921000061006671000081007960007250543331 06
0007100830100007100866042225054 2

1009 00A00F74112731600233106373604000204511913*****3*****332767300734016725054 23
9210000710069610000710063300402505433310640198720020651193100008100511100007100 4
5373002055120290000990038590000690048800762505433310645473010021051203100009100 4
```

22900 1059323230432250541331035102340000825 11 REC 1, LENGTH 1032
911000831278801326911269370444250542331035 50
99960008651193100070124036101562123172009625
0541331040035738000895119210004111887510004 3
3171690489250543331040441490000925119110003 0
1144331000241141450522505413310407253080009
651191100018112597132754112313001825054033 10
41252964000985119310001312612=100016111211 02
37250541331041658706001015119210000911063710
0011109963010925054133104210444800104511911 0

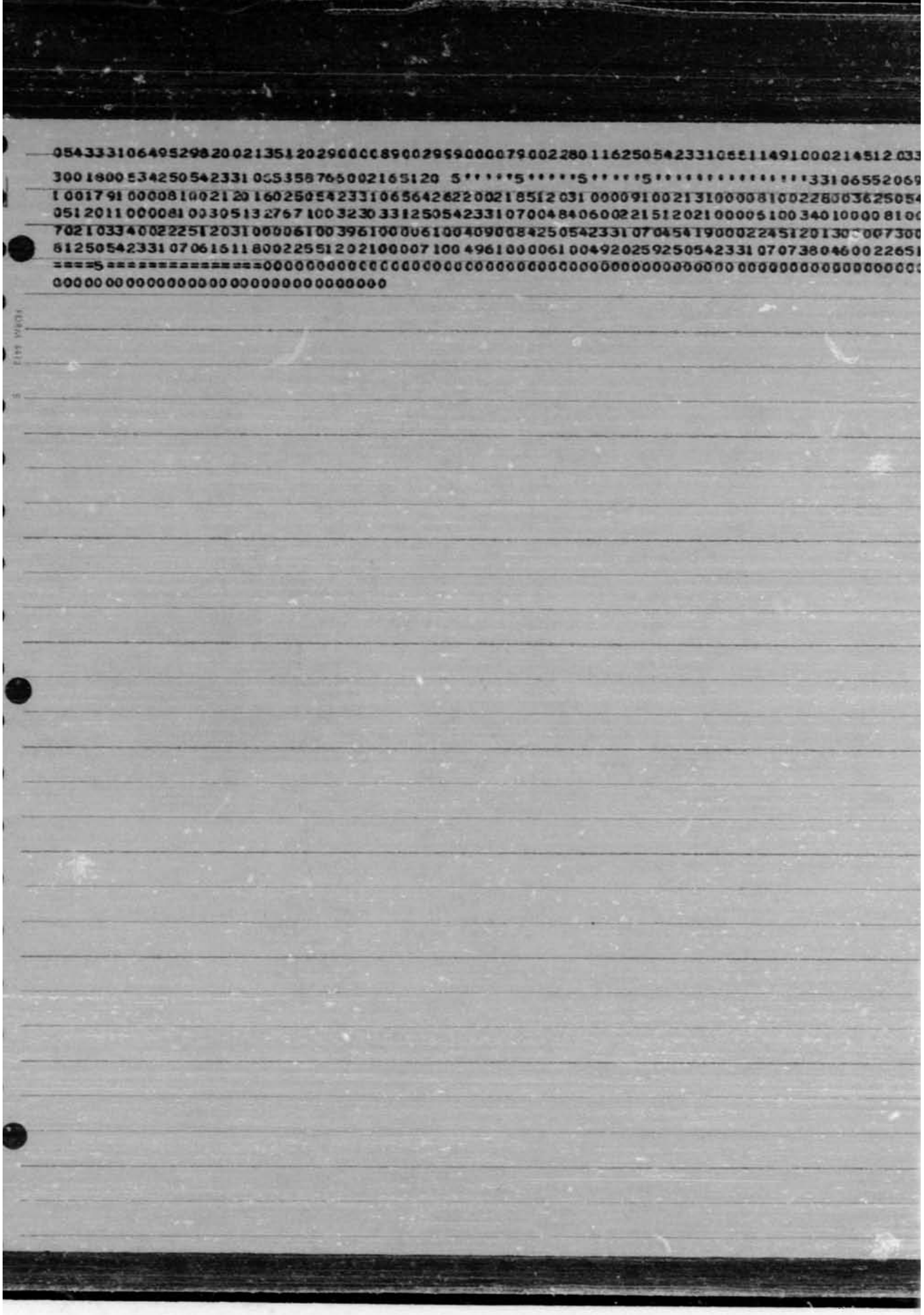
351000071087000162250541331042348276001065 11 REC 2, LENGTH 1032
911000081080351327641077870221250541331042 75
59320011051193100008107154100006106920044225
0541331043321674001135119210000810574510000 5
1048040351250541331043727416001165119110000 7
1033661000071031070424250542331044011244001 1
0511911000091021721327661019710499250541331 0
4453890000122511933000083014933000043014330 1
2725054133104494464200125511921000091008521 0
0005100651012225054133104535038400128511911 0

631000071004030210250541331045634212001305 11 REC 3, LENGTH 1032
911000071003201327671003040301250542331050 03
1868001345119310000710025110000710025500042 5
0541331050729569001385119310000810024910000 7
9002550056250541331051257248001425119310000 7
5*****5*****5***************331051702996001 4
6511931000051003331000081003280414250542331 0
5223066000149511921000071003751000071004340 5
8425054133105263640800152511913*****3******33
0007101305049825054133105292024000154511931 0

577=775***007425054233105332598800157511 REC 4, LENGTH 1032
9310001010197710000610182303352505423310537 3
3652001615119210000710250=100007101442=71325
0542331054259400001645119 13*****3*****332767
1006840447250542331054543232001665119310000 8
1002841327671002250035250542331054948980001 6
0511931000091002031000081001970305250543331 0
5551664400173511921000061001531000071001960 4
0425054233105592239200176511913*****3*****33
0006100252044125054233106020622400178511931 0

**3327673002180040250542331060611972001815 11 REC 5, LENGTH 1032
9310000510013410000610014603152505433310610 1
9636001885119210000810011410000510012904602 5
0541331061545384001885119 13*****3*****332766
1001080476250542331061829216001905119310000 7
3*****3327673001560084250542331062234964001 9
4511931000081001581000071001800366250542331 0
6280262800197511921000081003211000061004560 5
********331063208376002005119 13*****3******33
0008100796000725054333106345220800202511931 0

**3327673007340167250542331063857956002055 11 REC 6, LENGTH 1032
9310000810051110000710045604562505433310644 2
7301002105120310000910041210000910042204922 5



0543331064952982002135120290000890029990000790022801162505423310551149100021451203 3

3001800534250542331065358765002165120 5*****5*****5*****5**********33106552069

1001791000081002120160250542331065642622002185120310000910021310000810022800362505 4

0512011000081003051327671003230331250542331070048406002215120210000610034010000810 0

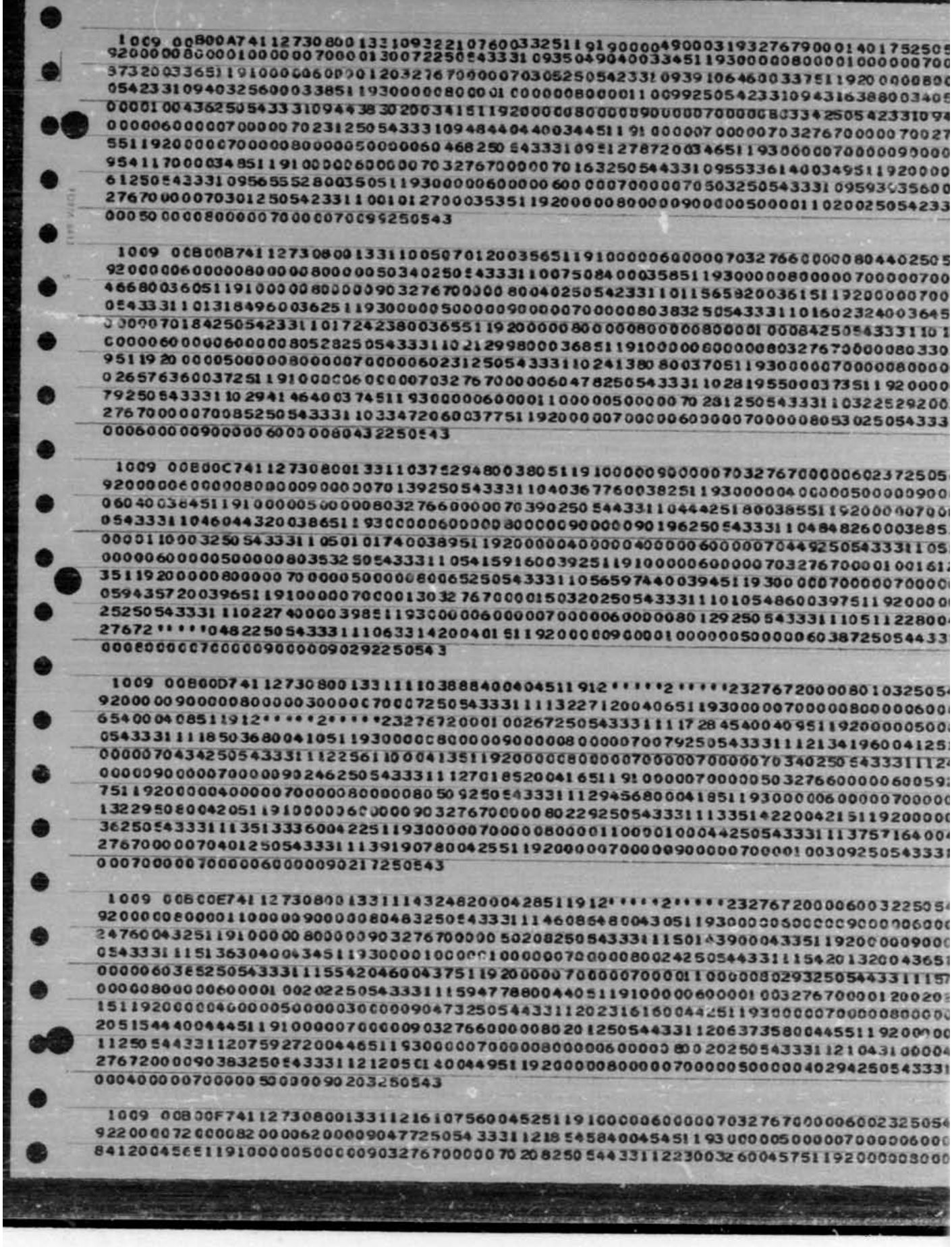
7021033400222512031000061003961000061004090084250542331070454190002245120130 007300

8125054233107061611800225512021000071004961000061004920259250542331070738046002265 1

====5==========0000000000000000000000000000000000000000000000000000000000000000000

00000000000000000000000000000000

```
50542331065114910002145120330000830016430000=
75''''''''''''''''''33106552069400217512021=0007
91002131000081002280036250543331065926478002 2
21512021000061003401000081003930207250542331 0
07045419000224512013000730047633276730045203
25925054233107073804600226512035000065=====5=
0000000000000000000000000000000000000000000000
```



```
003193276790001401752505433310933429900033351 1   REC     1. LENGTH  1032
119300000800001000000700000705112505433310937 4
910646003375119200000800000800000800000802022 5
250542331094316388003405119100000800000703276 7
070000080334250542331094600216003425119300000 7
070000070327670000070027250543331095005958003 4
346511930000070000090000050000060366250543331 0
109553361400349511920000050000080000070000070 0
050325054333109593935600352511910000060000070 3
000005000011020025054233110022318400354511930 0
```

FILE - #3

```
000703276600000804402505433311006289260035751 1   REC     2. LENGTH  1032
119300000800000700000700000702402505433311010 3
156582003615119200000700000900000600001104822 5
250543331101602324003645119100000700000603276 7
080000100084250543331101846152003665119300000 7
080000080327670000080330250543331102251894003 6
370511930000070000080000070000090132250543331 1
110281955000373511920000070000080000080000060 3
281250543331103225292003765119100000500000903
000070000080530250543331103509120003785119300
```

```
000703276700000602372505433311039148620038151 1   REC     3. LENGTH  1032
193000004000005000009000006004225054333110432
425180038551192000007000010000007000007029325
250543331104848260003885119100000500001103276 7
600000704492505433311051320880039051193000007
600000703276700001001612505443311055378300039
945119300000700000700000700001205122505433311
110105486003975119200000600001200000700001002
129250543331110511228004005119120000620000723
000050000060387250544331110755056004025119300
```

```
'''232767200008010325054333111120079800405511   REC     4. LENGTH  1032
193000007000008000006000007045625054333111160
284540040951192000005000009000006000008017325
505433311121341960041251191000006000008032767
700000703402505433311124180240041451193000009
700000503276600000600592505433311128237660041
185119300000600000700000600001104152505433311
113351422004215119200000800000700000600000801
044250543331113757164004245119100000800000803
000070000100309250543331114040992004265119300
```

```
'''232767200006003225054333111444673400429511   REC     5. LENGTH  1032
193000006000009000006000009039125054333111495
143900043351192000009000007000007000007011725
505443311154201320043651191000006000004032767
100000802932505443311157039600043851193000005
600001003276700001200202505433311201097020044
425119300000700000800000800000803822505443311
120637358004455119200000800000900000700000801
020250543331121043100004485119 12'''''2'''''23
000050000040294250543331121326928004505119300
```

```
007032767000006002325054333112173267000453511   REC     6. LENGTH  1032
193000005000007000006000009038725054333112213
003260045751192000008000010000004000008012025
```

```
0543331 1224222400 04585 1 193000005 C00008000000800000500302505433311227060680046
00000803952505433311228279820046 151 19200000400000500000700000 80 306250 543331 12
000009000006000007 02 17 250 54333 1123233 7240 0464511 91 0000080000007032767000008004
551 1920000070000070000070000 0804952505433311235175520046651 1930000070000007000
238013800046851 191000000800001 003276700000 70 2302505 3331 12392329400469511 192000
41250544331 12 404520800 7 )51 1930 0000 8000009000000600000 8005325054433 1 1243290360
276700000704212505433311244509500047351 19 200000 80 0000800U00700000703332505433
000700000070000050000 1 0024525 0544

1009  00800G741 127308001331 1248566920047651 1 91 000008000007032 76600000800070250
92000 008000 01 000000700000 70526250544331 125140520004785 1 1930000060000008000 0090
43480048051 1 91 00000800000603276700000802652505433311 25546262004815 1 192000 0050
05433311 257081760048251 1930000070000070000060000080091250543331 12595200400484
00000704612505433311 301 139180048551 19200000700000600000700000703742505433311 13
0000080000600000080287250544331 1305196600048851 1910000050000070327670000090 1 1
951192000008000000600000600000500282505433311 3080348800490511 9320000620000 9200
31047316004925119 14==0=04=0=0=4=====40=0=1047 =251 ==73311 31209230004935 11924==
43=5==3 =3311 31331 14400494511932 0=0==2=0== 72000052000070 2=52=1=3=331 1316149720
====4============== 331 1317368860049751 1922=====2=====2 000072 000070427250 5433
00060000060000070 00007034225054 3

1009  00800H741 12 73 08001331 13214262800500511 91000006000007032767000607017 1250
920000090000050000050000090086250543331 1324264560050251 1930000060000007000006000
02840050451 191 4000054 =2===4'''''4''''''''''''''''3311328321 9 5005 0551 1920000060
0543331 132954112005 0651 193000008000010000000800000702042505433311 33237940005 08
00000800352505433311 333598540050951 19220000820000720000 62=====04932505443311 13
4''''''4''''''4'''''''''''''''''''000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000
```

```
02505433311227060680046051191000007000009032767
0070000090306250543331122949896004625119300000 8
00800000703276700000800402505433311233556380046
04665119300000700000700000600000604062505433311
31123923294004695119200000700000800000800000701
80053250544331124329036004725119100000400000903
80000070000070333250543331124612864004745119300

00007032766000008007025054433112501860600477511   REC      7. LENGTH   1032
51193000006000008000009000009043925054333112542
55462620048151192000005000011000006000007017825
12505433311259520040048451191000006000008032767
00700000703742505433311302358320048651193000005
00500000703276700000901142505443311306415740048
04905119320000620000920000 62=====04852505433311
31131209230004935119 24==00640=0==40====4=0=06=3
702=52=1=3=33113161497200496511914000064=====4=
2000072000070427250543331131858800004985119300

00007032767000007017125054333113230454200501511   REC      8. LENGTH   1032
11930000060000070000060000080000250544331132 71
83219800505511920000060000050000070000090289 25
25054333113323794000508511910000080000050327 66
062=====04932505443311335217680051051193 4*****
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
```

D-00077

BCD list of last 2 files

Stop Time -

DAY - 109 Apr. 21
hr. - 20
MIN. - 17
YR. - '64

1312 06100A740418455012109194428557516105119390001790=55390001991042==1=461=7221
9120001120541 32===25205 [illegible]
62155161451193000008007216000010 01=062=26261=7221091952400435161651191000008009 12
=7221091954019575161751192000008010061000009010517=57261=7231091955238725161851 19
011680=44161=7231091958077005162051191000010012835 0====0013316=16=61=7231091959 29
4141784000094145 10==3=61=7211092000515295162251193000 00=0148970000090 35=10=62261=
4511910000100 40=650====2017413=34=61=7211092004572725162551192200010217802200012 2
0061918651626511930000110189610000130 19246==5761=7221092009030145162851191000009 0
2=61=7211092010249295162951192200014 24=43=20001324=631=36761=7221092011468435163 0
001304=36==24=61=7221092014306725163251191000016019789 0===65019378=7=161=72210920
00180189620000200 18592=55161=722

ye. DAY m.s

1312 06100874041845501210920171450051634511932000 18242=51200021241=44=42161=7231
910000250155050==540340=2=14361=7211092021202435163751192400024432 3=340002741255
2157516365119300002701167600002701095 3=6=561=7221092025259865164051191400043 41=42
=7211092026479005164151192000 0=301446=0000720124=2=2==61=7231092028098145164251 19
20=252==526==7221092030536435164451191400 24=4021==4===1=400617=5=761=7221092032 15
400==340036540145==37261=7221092033374725164651193200=5520179320070920=0=6=24561=
8511912017572303=42==5=324001==7=661=72=10920374321451649511924=====4=====4=====4
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000

REC 1. LENGTH 1032

FILE #1261

REC 2. LENGTH 1032

DAY HR MI MS

```
 1312 07 00A999999999999 1092017245005163451193200018242=51200021241=44=42161=
910000250155950===540340=2=14261=7211 09202120243516375119240002443 23=34000274
215751638119300002701167600002701095 3=6=561=7221092025259865164051191400043 4
=7211092026479005164151192 0000=301446=0000720124=2=2==61=72310920280981451642
20=252==526==7221092030536435164451191400 24=4021==4===1=400617=5=761=72210920
400==3400365401 45==37261=72210920333747251646511932 00=5520179320070920=0=6=24
85119120175723 03=42==5=324001==7=661=72=10920374321451649511924=====4=====4==
0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000
```

```
51200021241=44=42161=72310920195832951636511  REC     1. LENGTH  1032
924000244323=3400027412552==1261=72310920224
2598651640511914000434 1=4214===3=41=011=3276=
=72310920280981451642511932001 0=2103=220013=
400617=5=761=72210920321555751645511924002 74
20179320070920=0=6=24561=72110920362130051 64
9511924=====4=====4=====4=======00======0000
000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000
```

FILE - #1262

File 1 of C00029 7

```
|000 1065 05F|000 1104 06F|000 1020 07A|00  18  REC   1, LENGTH  1032
A5471 06F|000 1082 07|000 1261 06E|000 1235 07
```

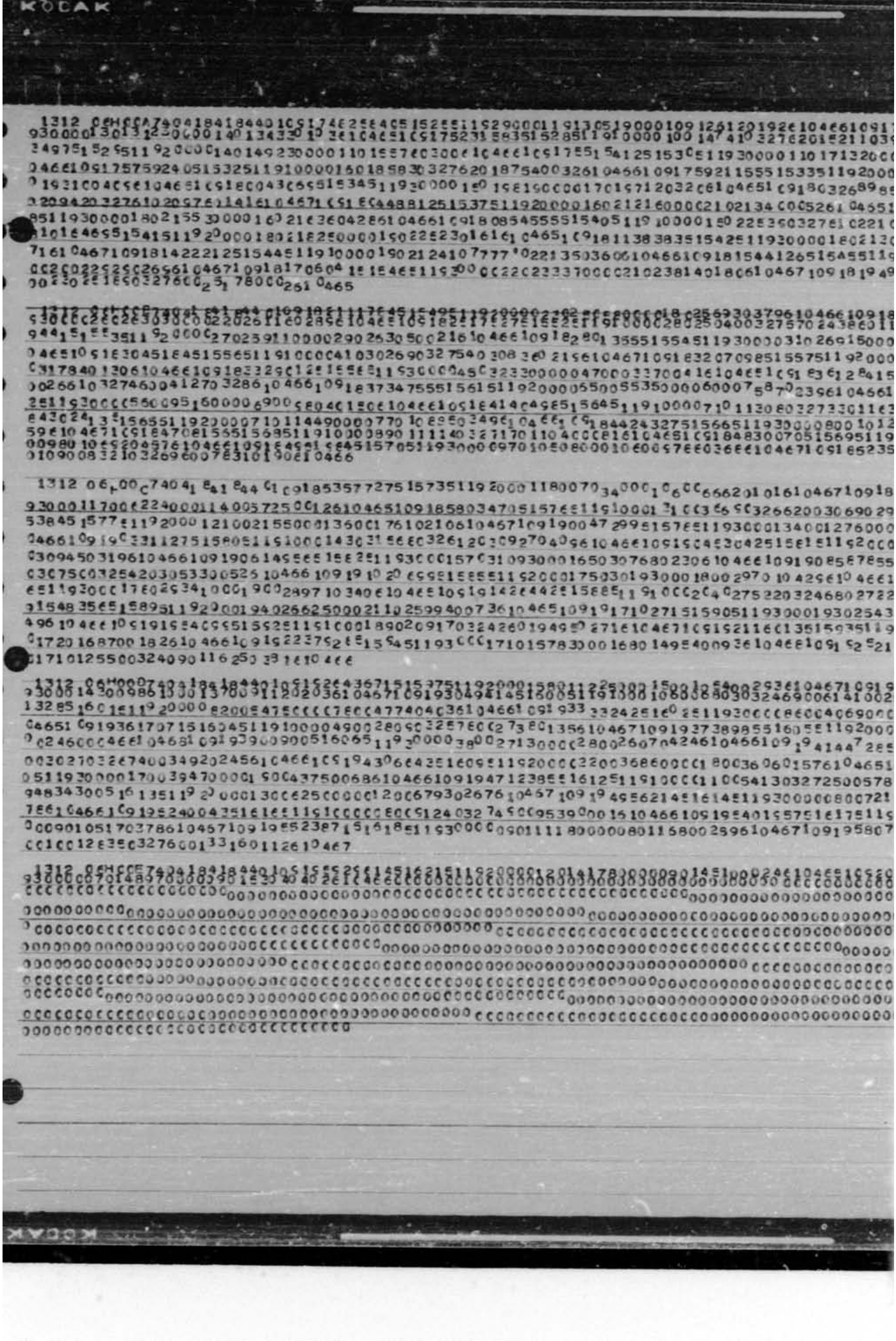
dupe of D-00077

```
229001059323230432250541331035102340000825 11  REC   2, LENGTH  1032
911000831278801326911269370444250542331035 50
999600086511931000701240361015621231720096 25
054133104003573800089511921000411188751000 43
317169048925054333104044148000092511911000 30
114433100024114145052225054133104072530800 09
6511911000181125971327541123130018250540331 0
412529640009851193100013126 12=10001611121102
372505413310416587060010151192100009110637 10
001110996301092505413310421044480010451191 10

0351000071087000162250541331042348276001065 11  REC   3, LENGTH  1032
911000081080351327641077870221250541331042 75
159320011051193100008107154100006106920044225
054133104332167400113511921000081057451000 05
104804035125054133104372741600116511911000 07
1033661000071031070424250542331044011244001 1
205119110000910217213276610197104992505413310
044538900001225119330000830149330000430143301
427250541331044944642001255119210000910085210
000051006510122250541331045350384001285119110

63100007100403021025054133104563421200130511  REC   4, LENGTH  1032
191100007100320132767100304030125054233105003
018680013451193100007100251100007100255000425
505413310507295690013851193100008100249100007
990025500562505413310512572480014251193100007
'5'''''5'''''5''''''''''''''''33105170299600 14
465119310000510033310000810032804142505423310
052230560001495119210000710037510000710043405
384250541331052636408001525119 13'''''3'''''33
000071013050498250541331052920240001545119310

'''577=775'''''007425054233105332598800157511  REC   5, LENGTH  1032
193100010101977100006101823033525054233105373
536520016151192100007102 50=100007101442=71325
505423310542594000016451191 3'''''3'''''332767
510063404472505423310545432320016651193100008
410028413276710022500352505423310549489800016
705119310000910020310000810019703052505433310
055516644001735119210000610015310000710019604
304250542331055922392001765119 13'''''3'''''33
000061002520441250542331060206224001785119310

'''332767300218004025054233106061197200181511  REC   6, LENGTH  1032
193100005100134100006100146031525054333106101
396360018551192100008100114100005100129046025
```

C-00029
dupe of
D-00877

BCD list of last
3 files

Stop Time -
day - 109 - Apr. 21
hr. - 20
min. - 17
yr. - '64



REC 1, LENGTH 1032

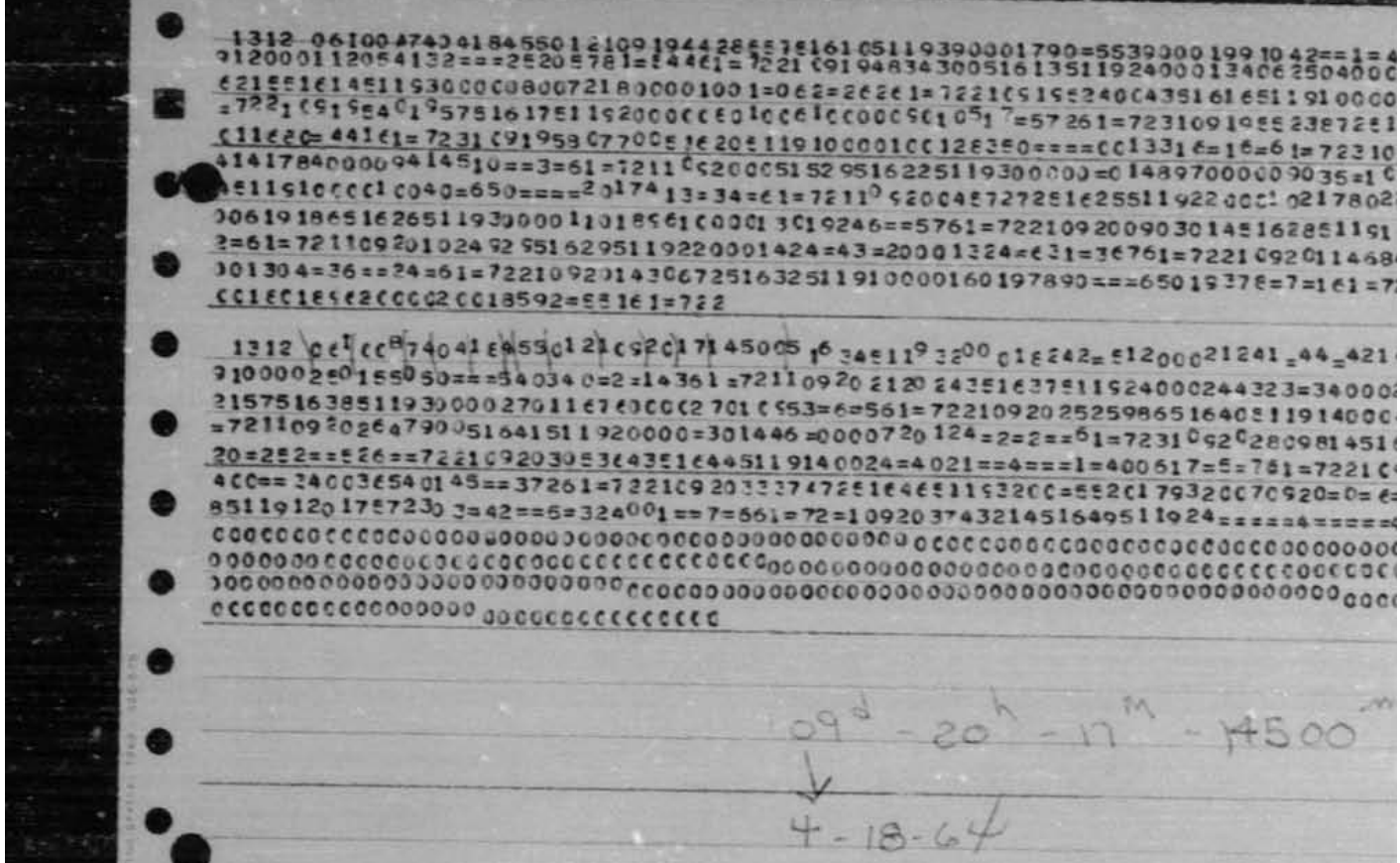
FILE - #1260

REC 2, LENGTH 1032

REC 3, LENGTH 1032

REC 4, LENGTH 1032

REC 5, LENGTH 1032



$09^{d} - 20^{h} - 17^{m} - 14500^{m}$

↓

4-18-64

REC 1. LENGTH 1032

FILE - #1261

REC 2. LENGTH 1032

- 4500 mc.

1312 07 00A99999999999910920171450051634511932000182 42=51200021241=44=42161=72310
91000025001550 50===540340=2=14361=7211092021202435163751192400024432 3=340002741255
21575163851193000027011676000027010953=6=561=7221092025259865164051191400043 41=421
=7211092026479005164151192000 6=301446=000072012 4=2=2==61=7231092028098145164251193
20=252==526==7221092030536435164451191400 24=4021==4===1=400617=5=761=722109203215
400==340036540145==37261=7221092033374725164651193200=55201793200709 20=0=6=24561=7
85119120175723 03=42==5=324001==7=661=72=10920374321451649511924=====4=====4=====4=
000000000000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000

$10^{9d} - 20^{h} - 17^{m} - 14500^{ma}$

REC 1 • LENGTH 1032

FILE - # 1262

7M - 14500 mo.

D-00078

BCD list of first 3 files.

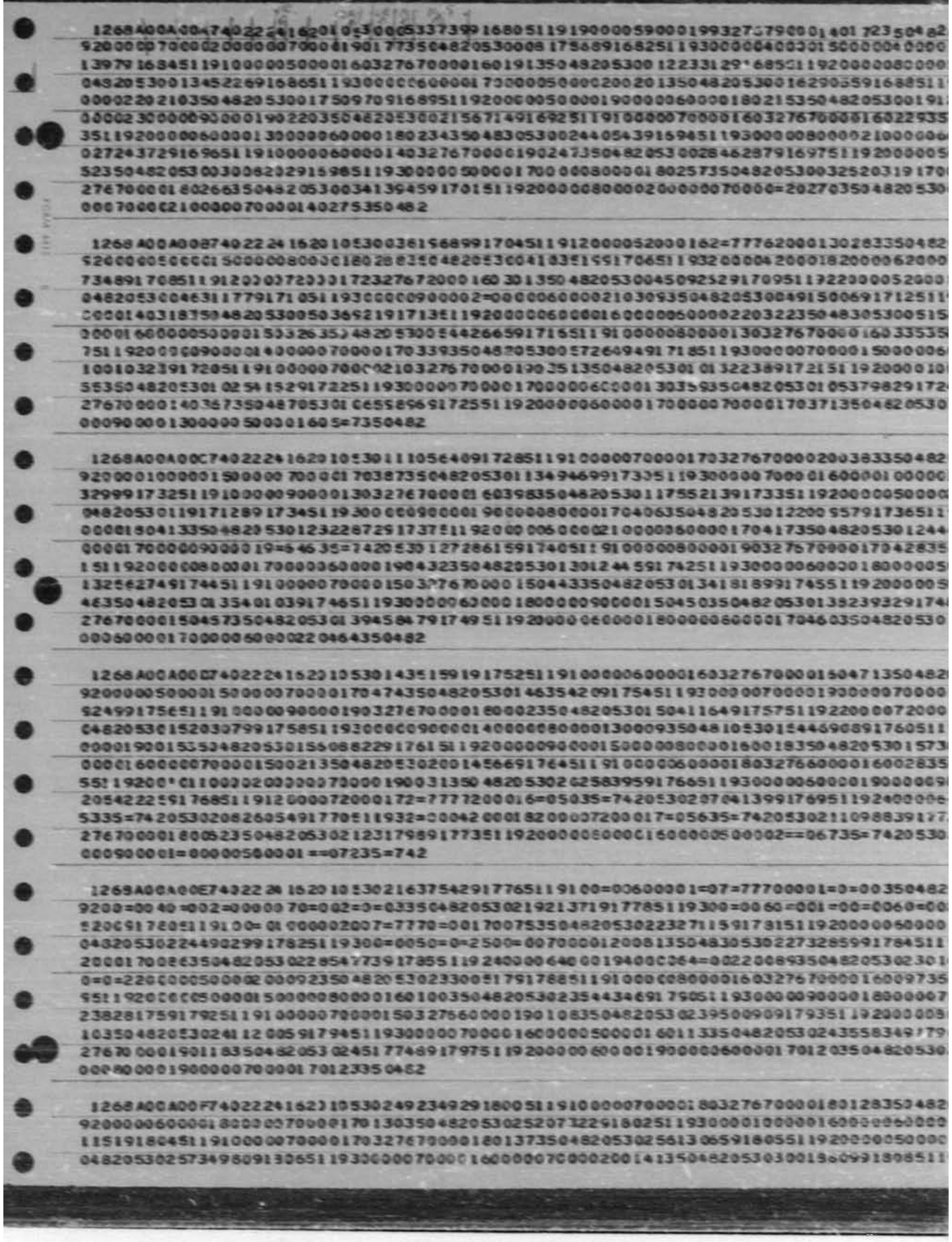
Start Time -

day - 53 - Feb. 23
hr. - 00
min. - 05
yr. - '64

1268A061000 1350 07D000 1355 C7C000 1163 06 000 1375 06H000 1383 07B000 1392 06B00
0 04HC00B8760 05E000 8750 05H000B8728 07A000B8610 08 000A9914 07 000 1413 00B000 2
B000

HOOO 1383 078000 1392 068000 5421 041000 552 REC 1. LENGTH 1032
A9914 07 000 1413 008000 267380080008259 00

File #1



```
19932767900014017235048205300065565391681511   REC     1. LENGTH  1032
93000004003015000004000016018135048205300110
33129168551192000008000016000009000019019635
04820530016290559168851191000006000013032767
00001802153504820530019128859169051193000009
00001603276700001602293504820530023186299169
45119300000800002100000600001802383504820530
02846287916975119200000500001500000500001302
57350482053003252031917005119100000600001703
00070000=20270350482053003535860917025119300
```

File #2

```
162=7776200013028335048205300394160491705511   REC     2. LENGTH  1032
93200004200018200006200013029235048205300434
92529170951192200005200015200005200014030535
04820530049150069171251191000005000016032767
00002203223504830530051588359171451193000006
00001303276700001603353504820530056045799171
85119300000700001500000600001903433504820530
10132238917215119200001000001700000500001903
5935048205301053798291724511910000000001703
00070000170371350482053010821811917265119300
```

```
17032767000020038335048205301122755591729511   REC     3. LENGTH  1032
93000007000016000010000016039135048205301163
52139173351192000005000021000008000015040235
04820530122009579173651191000009000019032766
00001704173504820530124447869173851193000008
00001903276700001704283504820530128505309174
25119300000600001800000500001504363504820530
13418189917455119200000500001700000800001704
50350482053013823932917485119100000700001703
00080000170460350482053014107762917505119300
```

```
16032767000016047135048205301451350591753511   REC     4. LENGTH  1032
93000007000019000007000013047735048205301491
116491757511922000072000182=6==0200017000535
04810530154469089176051191000008000015032767
00001600183504820530157307379176251193000009
00001803276600001600283504820530201364819176
65119300000600001900000900001600343504820530
207041399176951192400006400019400005400018=0
5635=742053021109883917725119100000700001703
000500002==06735=742053021353712917745119300
```

```
1=07=77700001=0=0035048205302175945691777511   REC     5. LENGTH  1032
9300=0060=001=00=0060=00210=0635048205302220
711591781511920000060000140000070=0023007835
04830530227328599178451191200010200019232767
4=002200893504820530230166889178651193000008
00001603276700001600973504820530234224329178
05119300000900001800000700001801033504810530
23950090917935119200000800001600000400001601
13350482053024355834917965119100000600001903
00060000170120350482053024639663917985119300
```

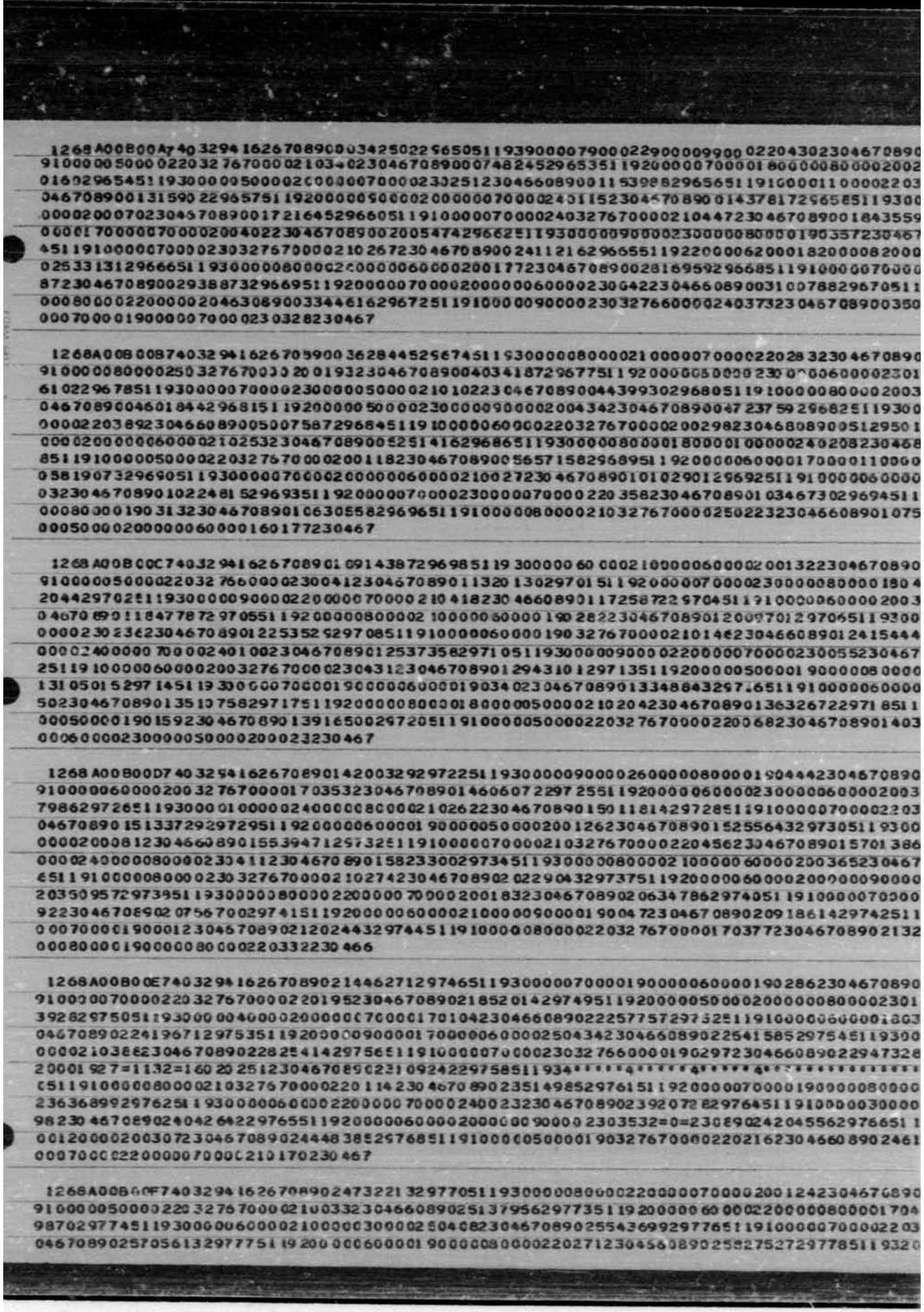
```
18032767000018012835048205302504540791801511   REC     6. LENGTH  1032
93000010000016000006000015013235048205302545
30659180551192000005000017000005000020013935
04820530300186099180851191000009000018032767
```

0000220146350482053030140724918055119200000800001100001000001701483504820530303
0600016000009000017015035048205303054646891812511910000060000150327670000150155 3
351192000007000019000008000017015735048205303083029791814511930000080000140000 0
311141269181651191000007000016032767000022016335048205303123604191817511920000 0
65350482053031357955918185119300000500001800006000017016735048205303164178591 8
27662000160171350482053031803699918215119200000700001800000700001801733504820 53
000800002000006000015017535048 2

1268A00A00G7402224162010530322094439182451191000009000022032767000015017935048
92000007000017000006000015018135048205303245327291826511930000060000150000070 00
71029182851191200006200017232767200015018635048205303285901691829511920000700 0
04820530330209319163051193000008000017000007000019019035048205303330476091832 51
00001801933504820530334266759183351192000008000017000005000018019535048205303 35
00002200000500001801973504810530338324189183651191000007000025032767000019020 03
75119200000600002400000700002103202350481053034116248918385119300000500001500 000
34400077918405119100000700002003276700002102063504820530345219929184151192000 00
08350482053034643906918425119300000600001800000800002002093504820530349277359 18
====2========435====0000000000000000000000000000000000000000000000000000000000 00
00000000000000000000000000000000000000

```
000001701483504820530303026389181051193000007
600001503276700001501553504820530307083829181
1451193000008000001400000800001801593504820530
03123604191817511920000070000170000090000180 1
1673504820530316417859182051191200008200001323
0000700001801733504820530319256149182251193 00
```

```
022032767000015017935048205303233135891825511   REC      7, LENGTH  1032
193000060000150000070000150182350482053032 73
590169182951192000070000160000070000140188 35
504820530333047609183251191000006000017032767
500001801953504820530335485899183451193000006
700002503276700001902003504820530339543391 83
385119300000500001500000500001502033504820530
034521992918415119200000600002000000600002302
209350482053034927735918445119120000720002 32=
000000000000000000000000000000000000000000000000
```



```
00022900009900 0220430230467089000626331296525 11   REC     1. LENGTH  1032
5119200000700001800000800002002962304660890009 1
1153988296565119100001100002203276700002101602 3
2304670890014378172965851193000007000021000007
7670000210447230467089001843559296615119200000 8
0090000230000080000190357230467089002249302296 6
9665511922000062000182000082000230222230467089 0
9900281695929668511910000070000220327670000210 0
0042230466089003100788296705119300000800002100
0327660000240373230467089003506530296735119200
```

File #3

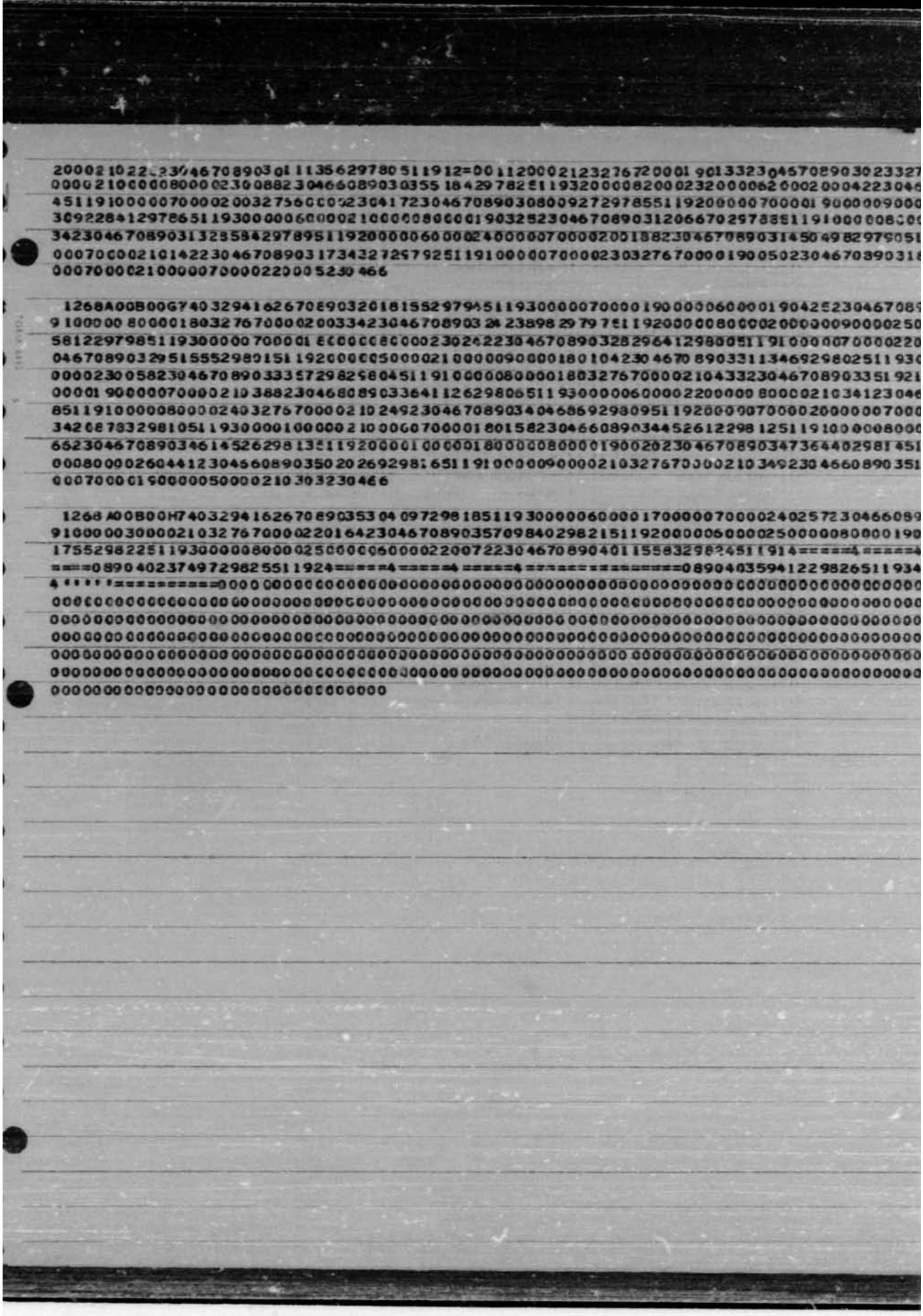
```
00021000007000022028323046708900391227329676511   REC     2. LENGTH  1032
5119200000600002300000600002301492304660890041 5
4399302968051191000008000020032767000023001223
2304670890047237592968251193000008000019000006
7670000200298230468089005129501296855119200000 8
0080000180000100000240208230468089005535244296 8
6895119200000600001700001100002200722304670890
9010102901296925119100000600002103276700001904
0358230467089010346730296945119300000700001800
0327670000250223230466089010752473296975119200
```

```
00021000006000020013223046708901115821529700511   REC     3. LENGTH  1032
5119200000700002300000800001804632304670890114 4
7258722970451191000006000020032767000018032723
2304670890120097012970651193000004000020000007
7670000210146230466089012415444297095119200001 0
0900002200000700002300552304670890128211862971
7135119200000500001900000800001903862304670890
9013348843297165119100000600002003276700001902
0204230467089013632672297185119300000500001600
0327670000220068230467089014038415297215119200
```

```
00260000080000190444230467089014444157297245 11   REC     4. LENGTH  1032
5119200000600002300000600002003082304670890147 2
0118142972851191000007000022032766000022017123
2304670890152556432973051193000007000018000008
7670000220456230467089015701386297335119200000 7
0800002100000600002003652304670890201071292973
7375119200000600002000000900002302292304670890
9020634786297405119100000700002303276700001800
0047230467089020918614297425119300000900001800
0327670000170377230467089021324357297455119200
```

```
00190000060000190286230467089021730100297485 11   REC     5. LENGTH  1032
1192000005000020000008000023014923046708902201
2577572973251191000006000018032767000017001223
2304660890225415852975451193000010000021000005
6600001902972304660890229473282975751192 20=006
**4*****4*****4*****************0890233530712976
7615119200000700001900000800002300682304670890
9023920728297645119100000300002203276700002003
03532=0=230890242045562976651193000007000019 00
0327670000220216230466089024610299297695119200
```

```
00220000070000200124230467089025016042297725 11   REC     6. LENGTH  1032
1192000006000022000008000017045423046708902525
5436992977651191000007000022032767000024031623
2304560890258275272977851193200007200020200007
```



```
720001 9013323046708903023327029781511920000006
8200023200006200020004223046708903063901329 78
855119200000700001 90000090000=50371230467089 0
0312066702978851191000008000020032767000022 02
1882304670890314504982979051193000009000019 00
3276700001900502304670890318562412979351192 00

0190000060000190425230467089032301984297965 11   REC      7. LENGTH   1032
1920000080000200000090000250288230467089032 54
2964129800511910000070000220327670000210150 23
3046708903311346929802511930000070000210000 07
7000021043323046708903351921229805511920000 08
5000022000008000021034123046708903392495529 80
0951192000007000020000007000020020423046608 90
0344526122981251191000008000=2403276600002 200
0202304670890347364402981451193000009000018 00
3276700002103492304660890351421832981751192 00

0170000070000240257230466089035547926298205 11   REC      8. LENGTH   1032
1920000060000250000080000190118230467089035 83
1558329824511914=====4=====4=====4===========
=====0890403594122982651193 4=====4=====4*****
0000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000
```

D-00078

BCD list of last 3 files

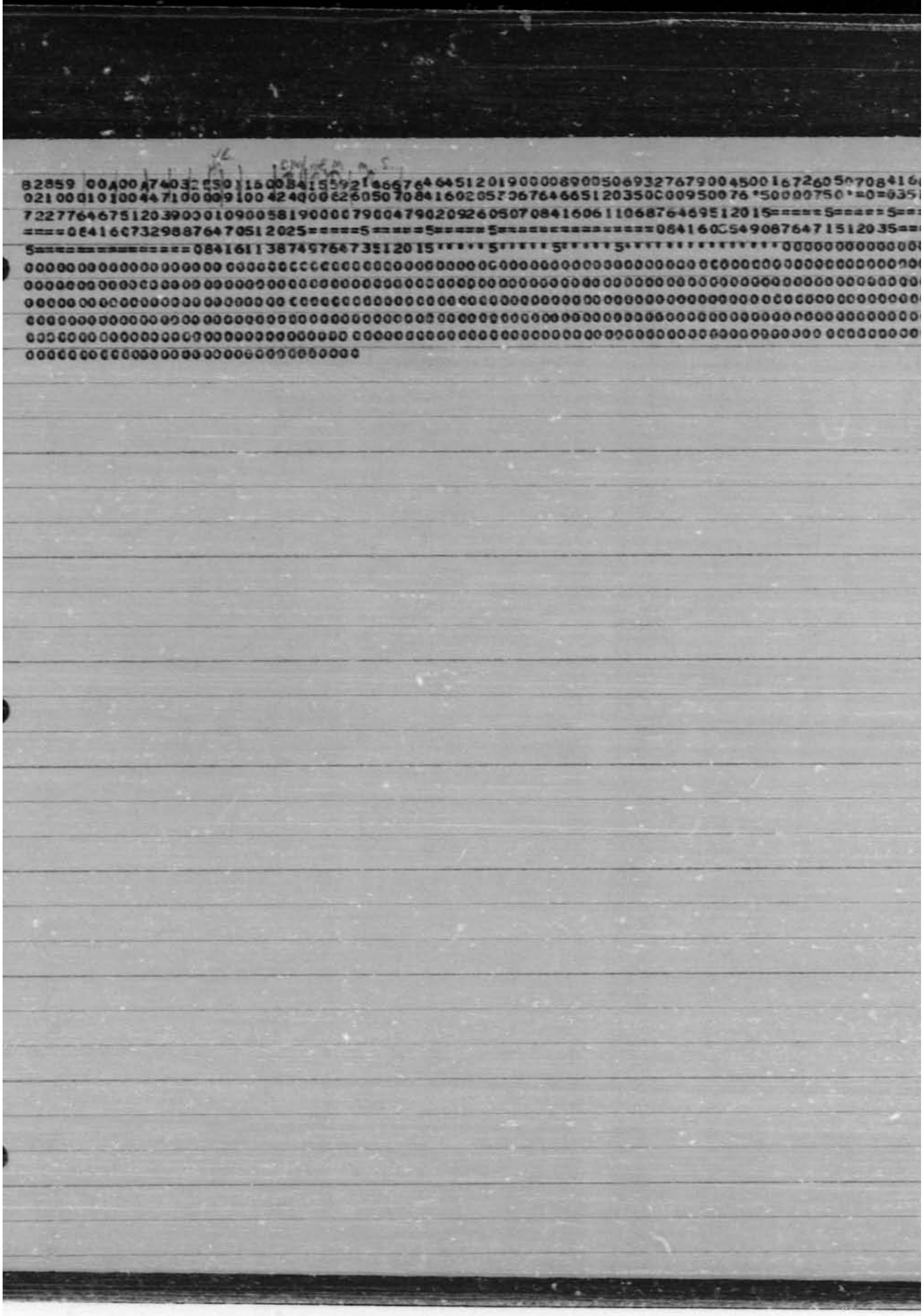
Stop Time -

day - 84 - March 26
hr. - 15
min. - 59
yr. - '65

2673800800A9999999999999347152154143765085119110000091000191327671000180462350592347
921000081000191000081000160056350592347152437973765105119310000610001910000071000160
180276512511911000071000181327661000190022350592347152843717765135119210000071000191
05923471530056327651451193 5=====5=====5'''''5================0000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000

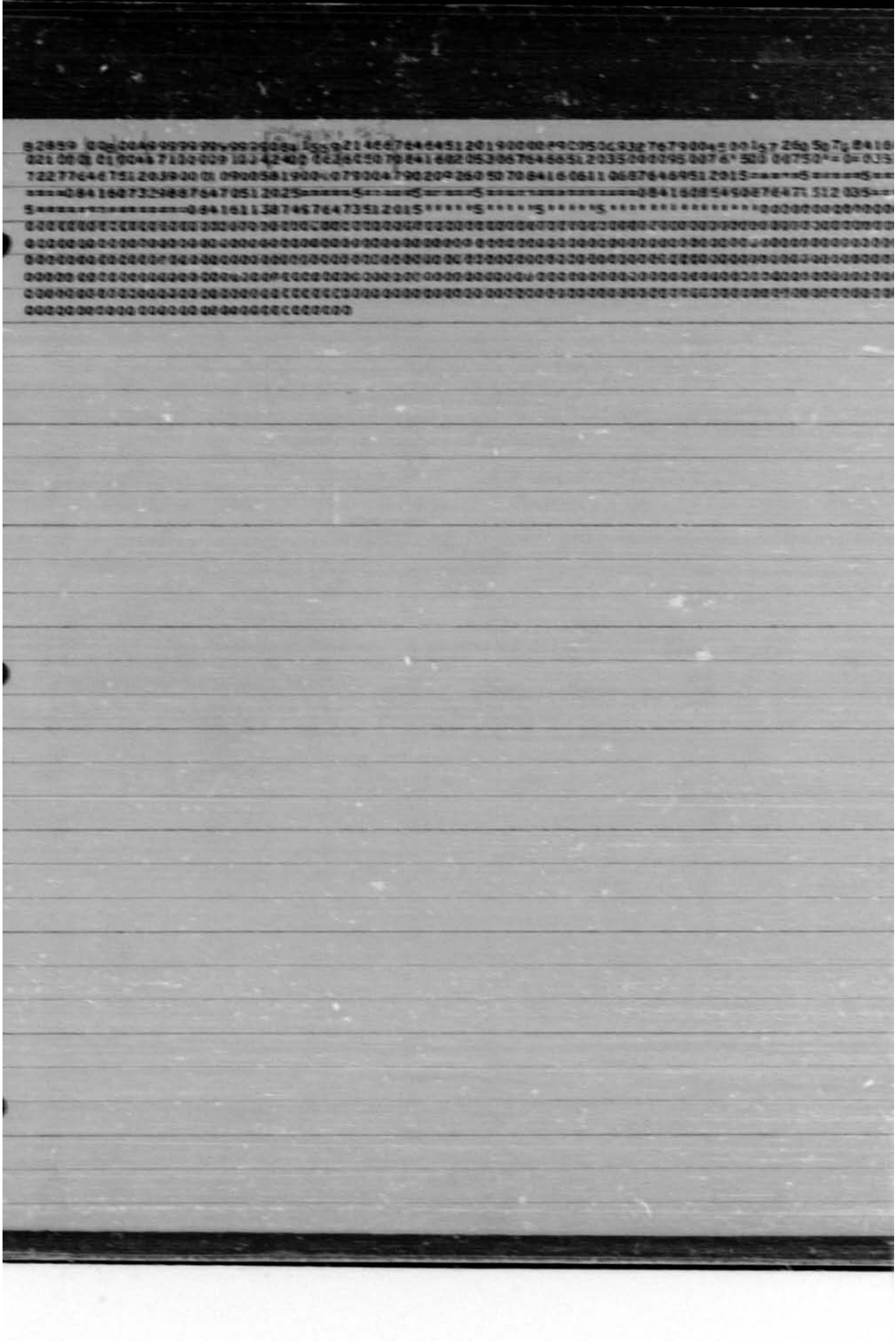
671000180462350592347152316058765095 11 REC 1. LENGTH 1032
061000191000071000160242350592347152 72
513511921000071000191600071000180208 35
000000000000000000000000000000000000000000
000C000000000000000000000000000000000000 00
000000000000000000000000000000000000000000
000C000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000 000000000000000000000000000000000000000
000000000000000000000000000000000000000000

FILE #913



```
)32767900450016726050708416004338676465512  REC     1. LENGTH  1032
50C00950076*50000750*=0=0351260507084160 32
6876469512015=====5=====5=====5===========
==0841600549087647151203 5=====5=====5=====
*****************00000000000000000000000000000
)000000000000000000000000000000000000000000
)000000000000000000000000000000000000000000
)000000000000000000000000000000000000000000
)000000000000000000000000000000000000000000
)000000000000000000000000000000000000000000
```

FILE #914



```
506932767900450016726050708416004338676465512  REC      1. LENGTH  1032
2035000095007 6'500 00750'=0=035126050708416032
11 06876469512015=====5=====5=====5===========
=====0841608549087647151 2035=====5=====5=====
'5'''''''''''''''''0000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000
```

File #915

9

1268A061000 1350 073000 1355 070000 1163 06 000 1375 064000 1383 078000 13
3 04H00CB8760 05E000 8750 05H00CB8728 C7 000B8610 08 00CA9914 07 000 1413 0
8000

6

69
74
73
60
68
72
62
49
48
55
58
70
80
70
2
2
912

915

File 1 C-00030 11

75 06H000 1383 078000 1392 068000 5421 041000 552 REC 1. LENGTH 1032
8 00CA9914 07 000 1413 008000 2673B00B00082859 CC

dupe of
D-00078

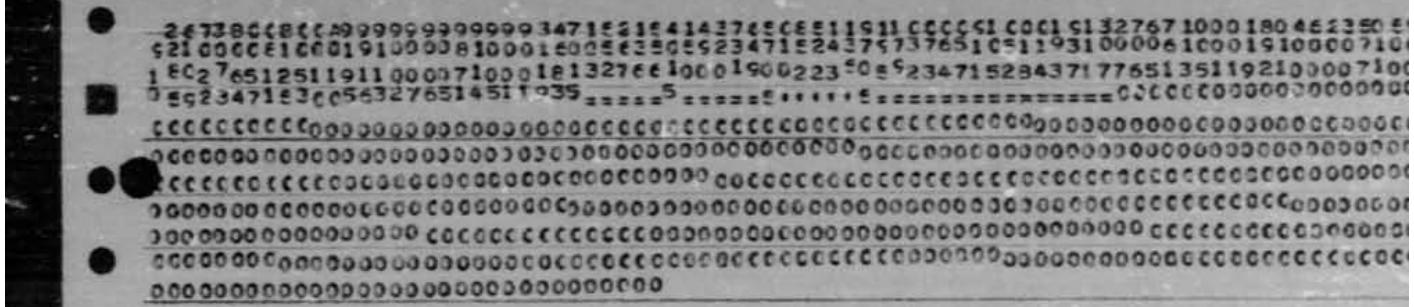
915

file

C-00030
dupe of
D-00078

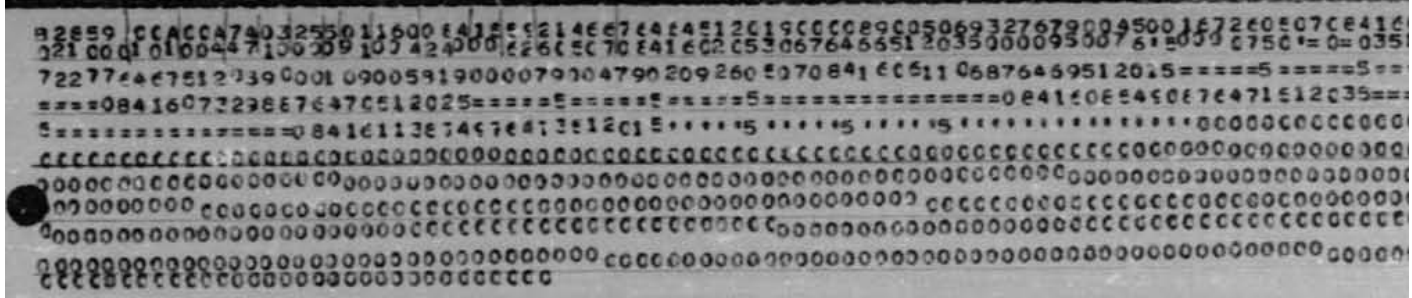
BCD list of last
3 files

Stop Time -
DAY - 84 Mon. 26
hr. - 15
MIN. - 59
YR. - '65



REC 1, LENGTH 1032

FILE - * 913



$34^{d} - 15^{h} - 59^{m} - 21466^{mc}$.

3-25-65

REC 1. LENGTH 1033

FILE. #914

$84^{d} - 15^{h} - 59^{m.} - 21466$ mo

REC 1. LENGTH 1032

FILE - #915

T. -2146G md.