

RIOMETER RECORDS OF 30 MHz COSMIC NOISE
AT SYOWA STATION, ANTARCTICA IN 1980

Masami OSE and Kenrou NOZAKI
(Radio Research Laboratories, Koganei-shi, Tokyo)

1. Introduction

Observations of cosmic radio noise with a standard riometer (relative ionospheric opacity meter) at 30 MHz have been carried out at Syowa Station, Antarctica, since February of 1966 by members from the Radio Research Laboratories. A report has been prepared which includes hourly values and chart records of cosmic noise absorption in the period from January 1 to December 31, 1980. Copies of the data are available to users on request. The request should be addressed to:

Radio Research Laboratories
Ministry of Posts and Telecommunications
2-1, Nukui-Kitamachi 4-chome, Koganei-shi
Tokyo 184, Japan.

2. Location

Syowa Station			
Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
69°00'S	39°35'E	69.6°S	77.1°E

3. Observers

Kenrou NOZAKI (Radio Research Laboratories)

4. Instrumentation

The receiver of the riometer which has a center frequency of 30 MHz and a bandwidth of 3.5 kHz is connected to a vertically directed five-element Yagi antenna whose elements are oriented in the east-west direction. The antenna is designed to match a 50 ohm coaxial transmission line (8D-2V) of 80 m in length.

The noise power output is recorded on a strip chart recorder with a 1 mm/min chart speed. Noise power levels of 1, 2, 3 and 4 dB from a reference noise diode are also recorded once a day for calibration.

5. Remarks

The cosmic noise power level shows a diurnal variation due to the passage of the radio source across the zenith. If the ionosphere is in a quiet state the diurnal variation of the cosmic noise power is easily extracted from the chart recordings. On account of the revolution of the earth, the time (local time) when the same radio source passes the zenith becomes earlier by about 4 min on each day and returns to its initial state in a year.

The hourly values of ionospheric absorption given in the CNA tables are the deviation (in dB) of cosmic noise intensity from its monthly reference level. The reference level is calculated from the diurnal variations of selected quiet days in the month.

The report supplement contains raw ionograms at intervals of 15 min (with an enlarged example) and their corresponding raw magnetograms of the horizontal component at Syowa Station, for seven selected days. These pairs of data provide good examples of the complicated phenomena occurring in the polar ionosphere.

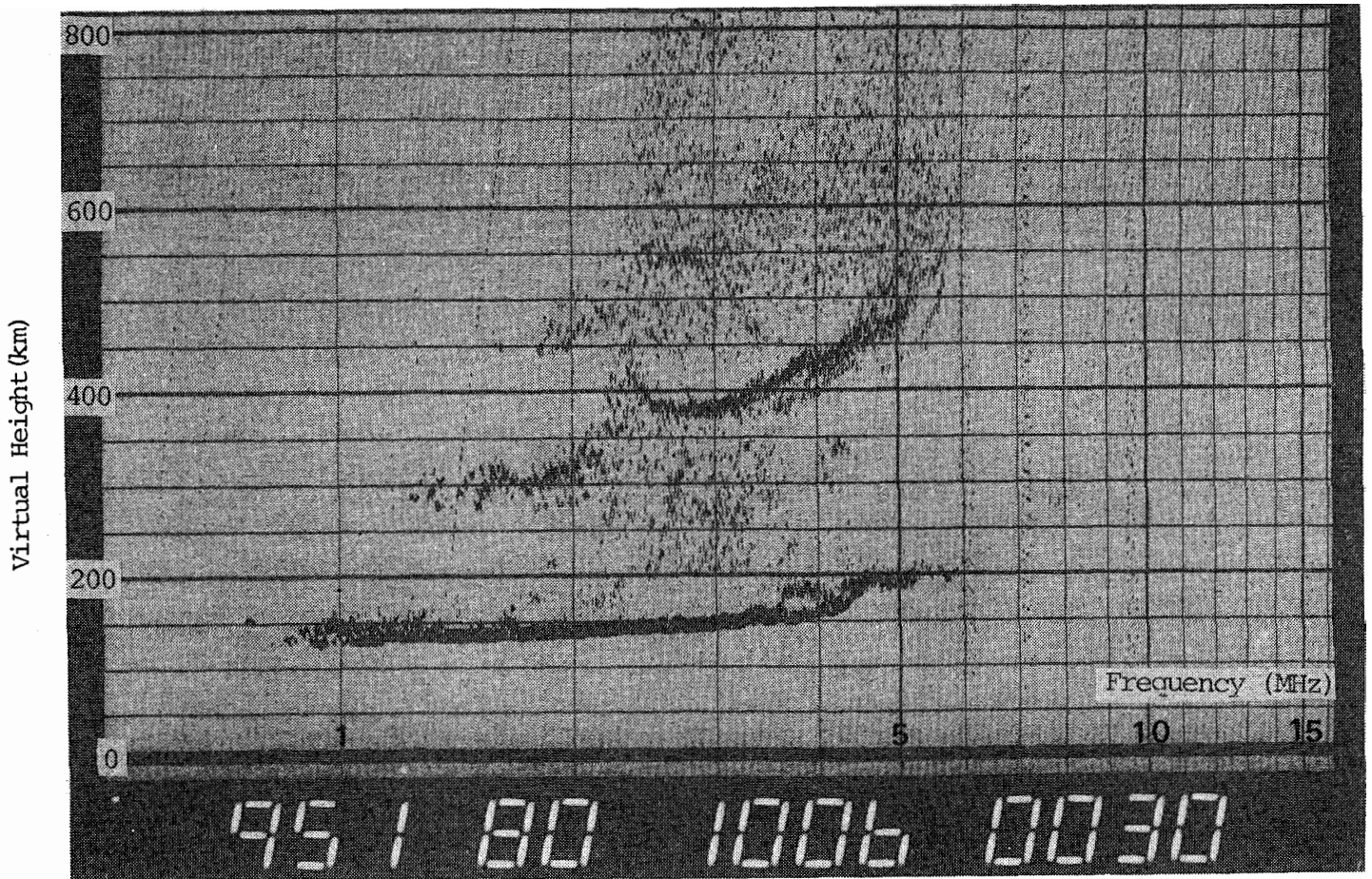
Bibliography relevant to
riometer records of 30 MHz cosmic noise at Syowa Station, Antarctica.

Observing period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
Feb. 1967 - Feb. 1968	Ose, M. Nishimuta, I.	2 (Ionosphere 1)	62	1968
Feb. 1968 - Jan. 1969	Ishizawa, K.	7 (Ionosphere 3)	65	1970
1969	Ota, Y.	8 (Ionosphere 4)	74	1970
1970	Shiro, I. Sakamoto, T.	14 (Ionosphere 5)	62	1971
1971	Ogata, T. Ose, M.	18 (Ionosphere 7)	62	1972
1972	Isozaki, S. Miyazaki, S.	20 (Ionosphere 8)	76	1973
1973	Nishimuta, I. Yabuuma, H.	24 (Ionosphere 11)	74	1974
1974	Yamazaki, I. Shiro, I.	29 (Ionosphere 13)	84	1975
1975	Sugiuchi, H. Komiya, N.	35 (Ionosphere 15)	84	1976
1976	Ose, M. Yamakoshi, A. Sasaki, T.	41 (Ionosphere 17)	87	1977
1977	Ose, M. Nishiyama, N. Sakamoto, J.	46 (Ionosphere 19)	82	1978
1978	Ose, M. Igarashi, K. Tsuzurahara, S.	51 (Ionosphere 20)	86	1979
1979	Ose, M. Ojima, S. Komiya, N.	56 (Ionosphere 22)	83	1980

SUPPLEMENTARY PART

Ionograms and Their Corresponding Magnetograms

An enlarged example for the following ionograms at intervals of 15 min for seven selected days.



Station Number

Year

Month Day

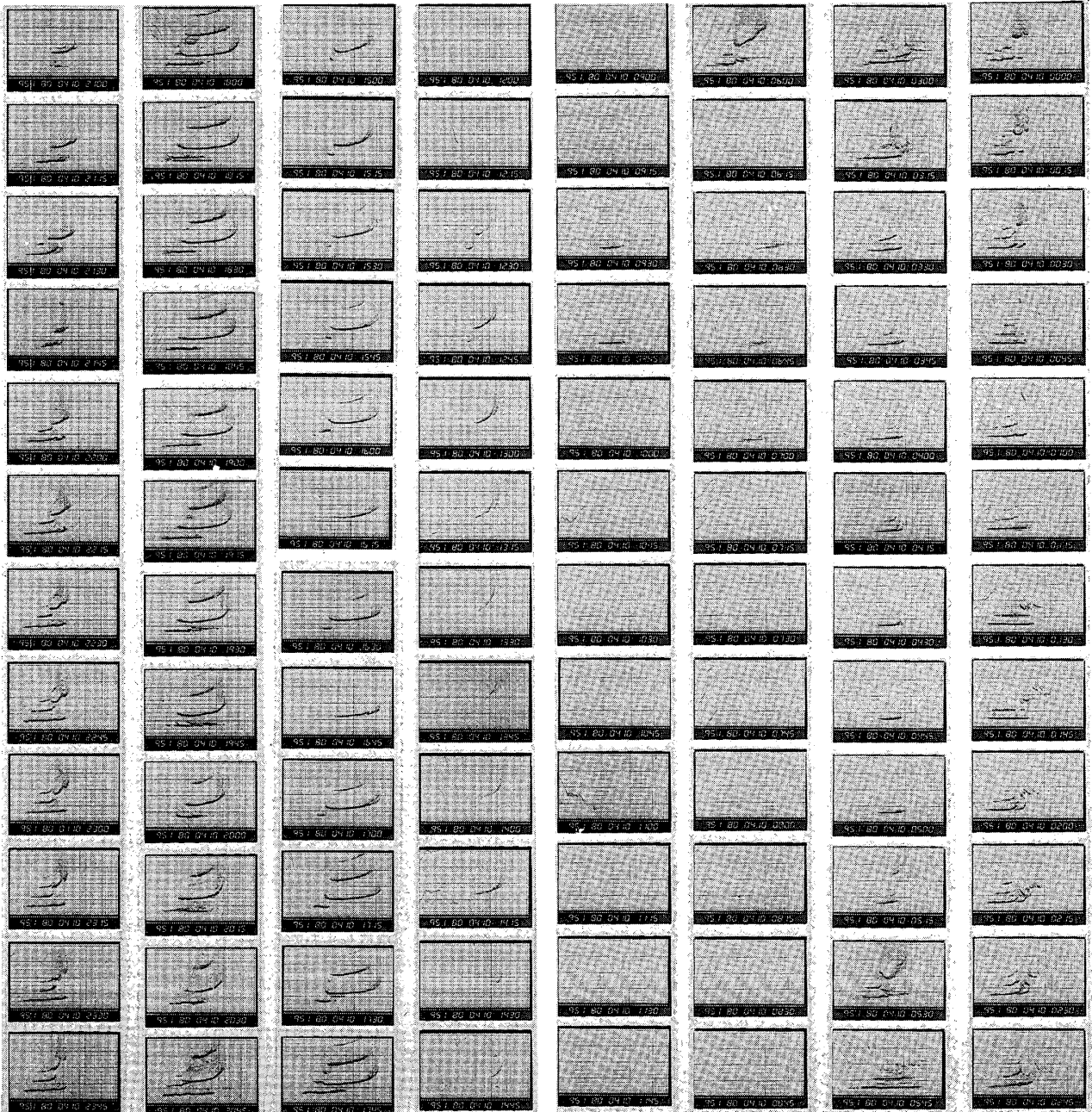
Hour Minute

IONOGRAMS

AT INTERVALS OF 15 MINUTES

SYOWA STATION APR. 10, 1980 45° EMT

(Start)
0000

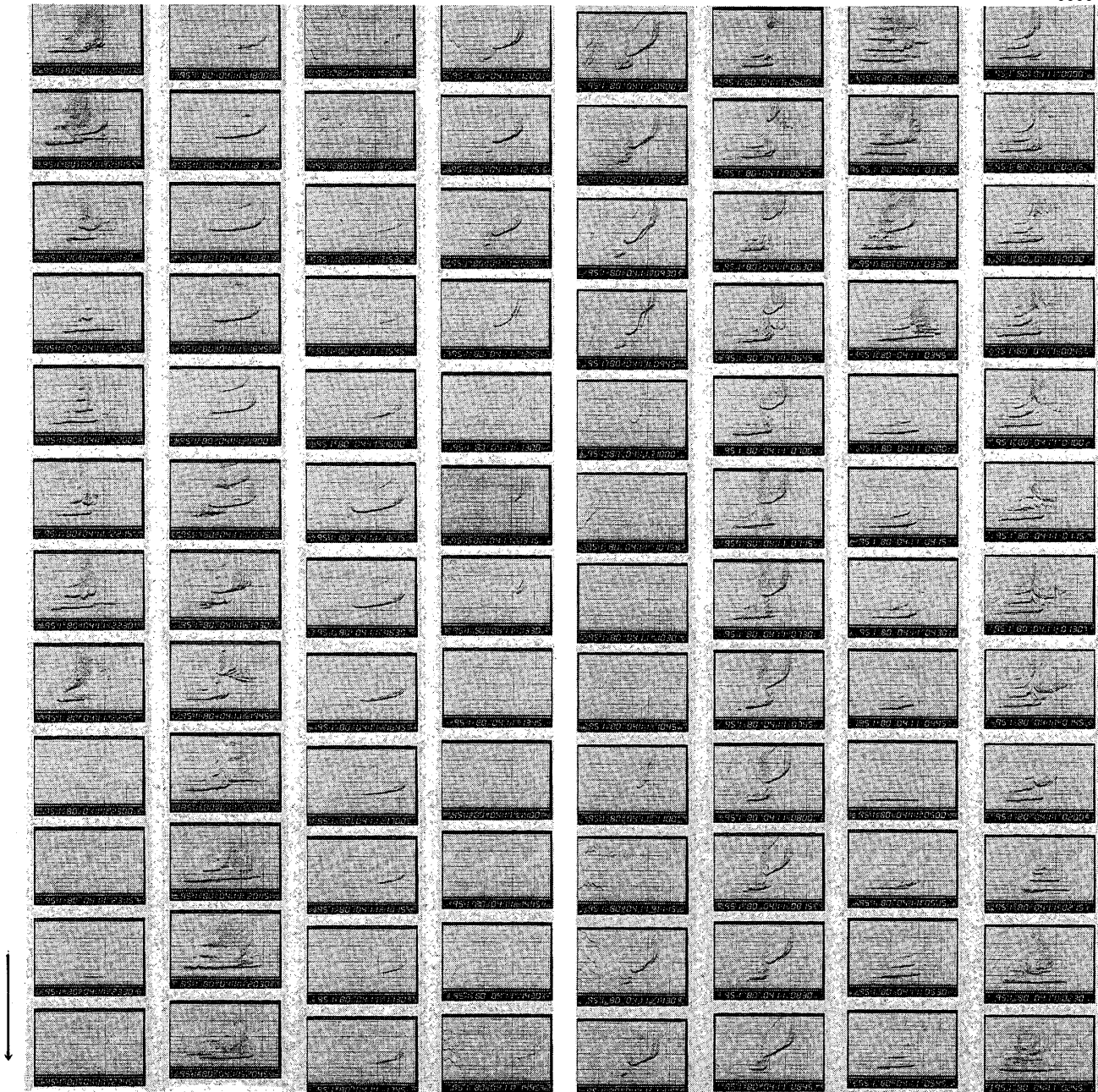


2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MINUTES

SYOWA STATION APR. 11, 1980 45° EMT

(Start)
0000

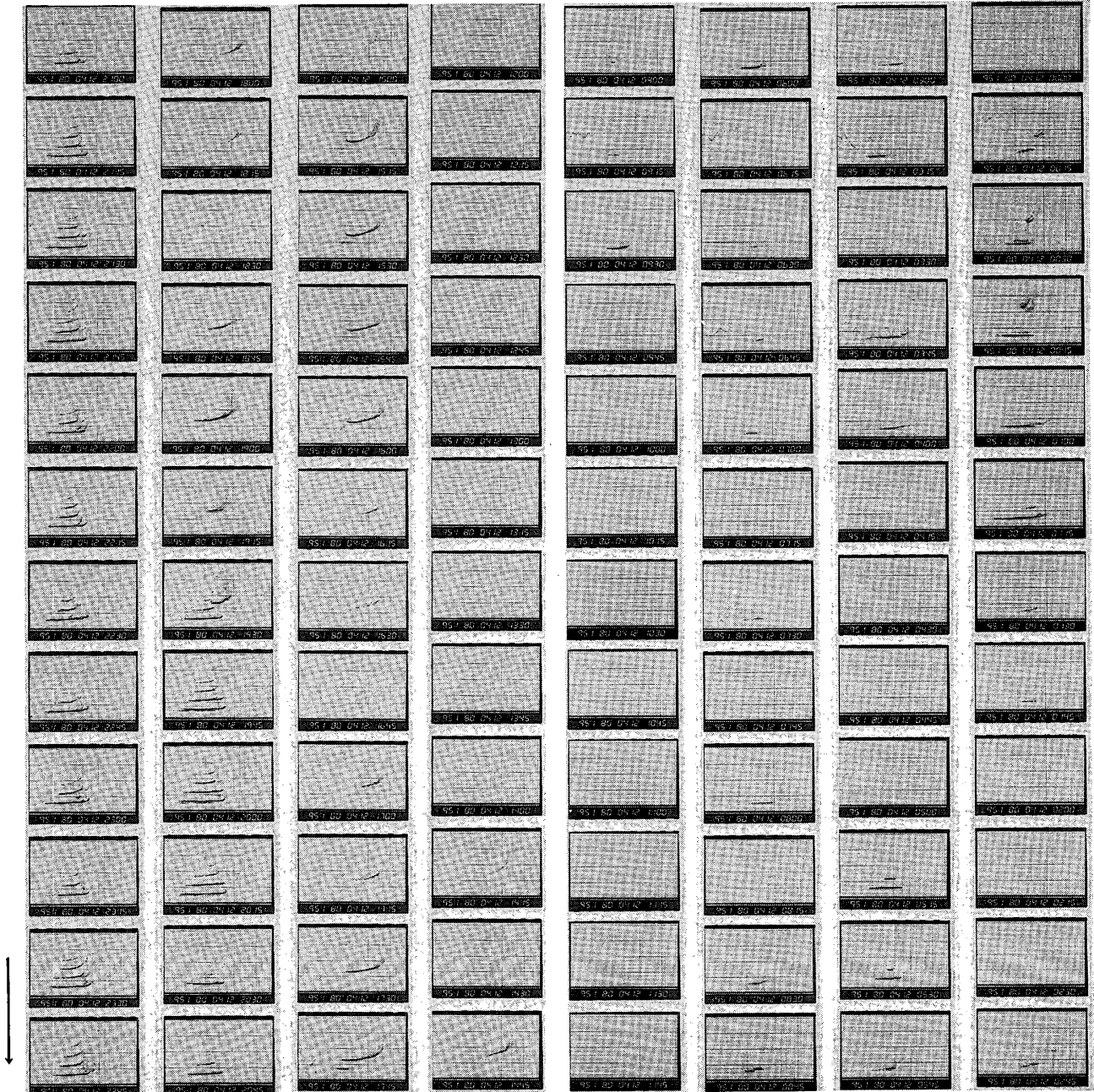


2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MINUTES

SYOWA STATION APR. 12, 1980 45° EMT

(Start)
0000



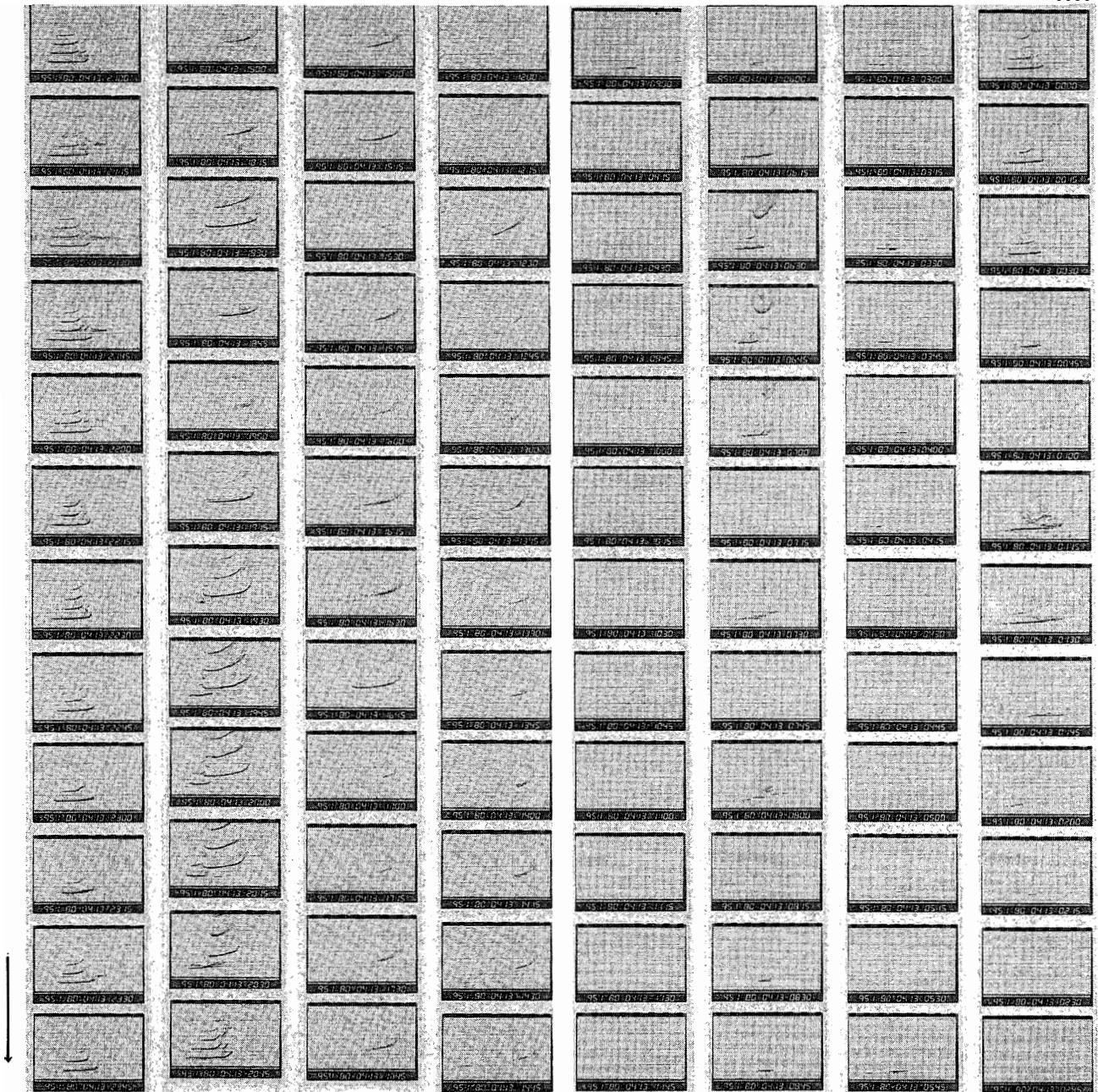
2345
(End)

IONOGRAMS

AT INTERVALS OF 15 MINUTES

SYOWA STATION APR. 13, 1980 45° EMT

(Start)
0000

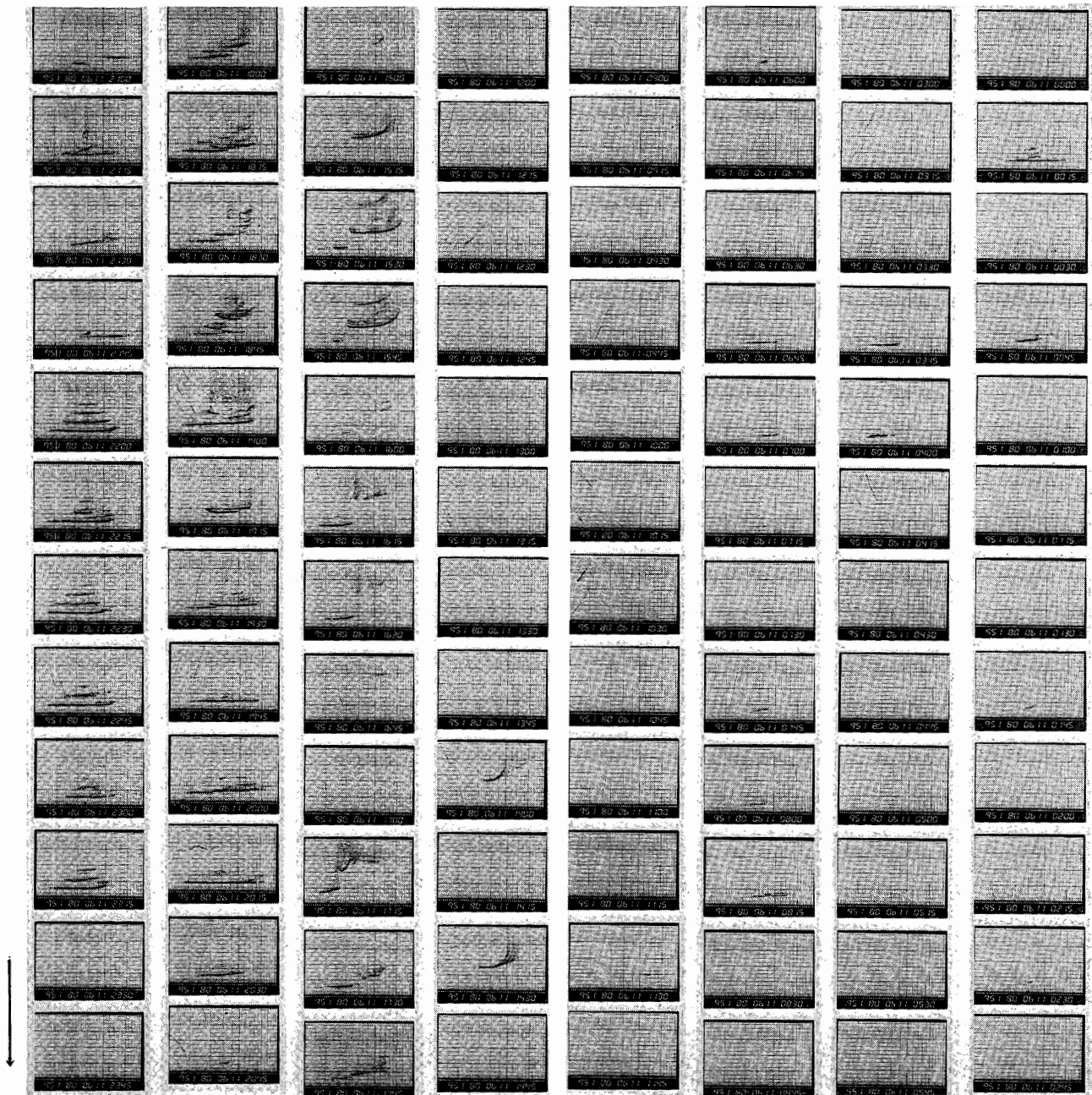


2345
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IONOGRAMS
AT INTERVALS OF 15 MINUTES

SYOWA STATION JUNE 11, 1980 45° EMT

(Start)
0000



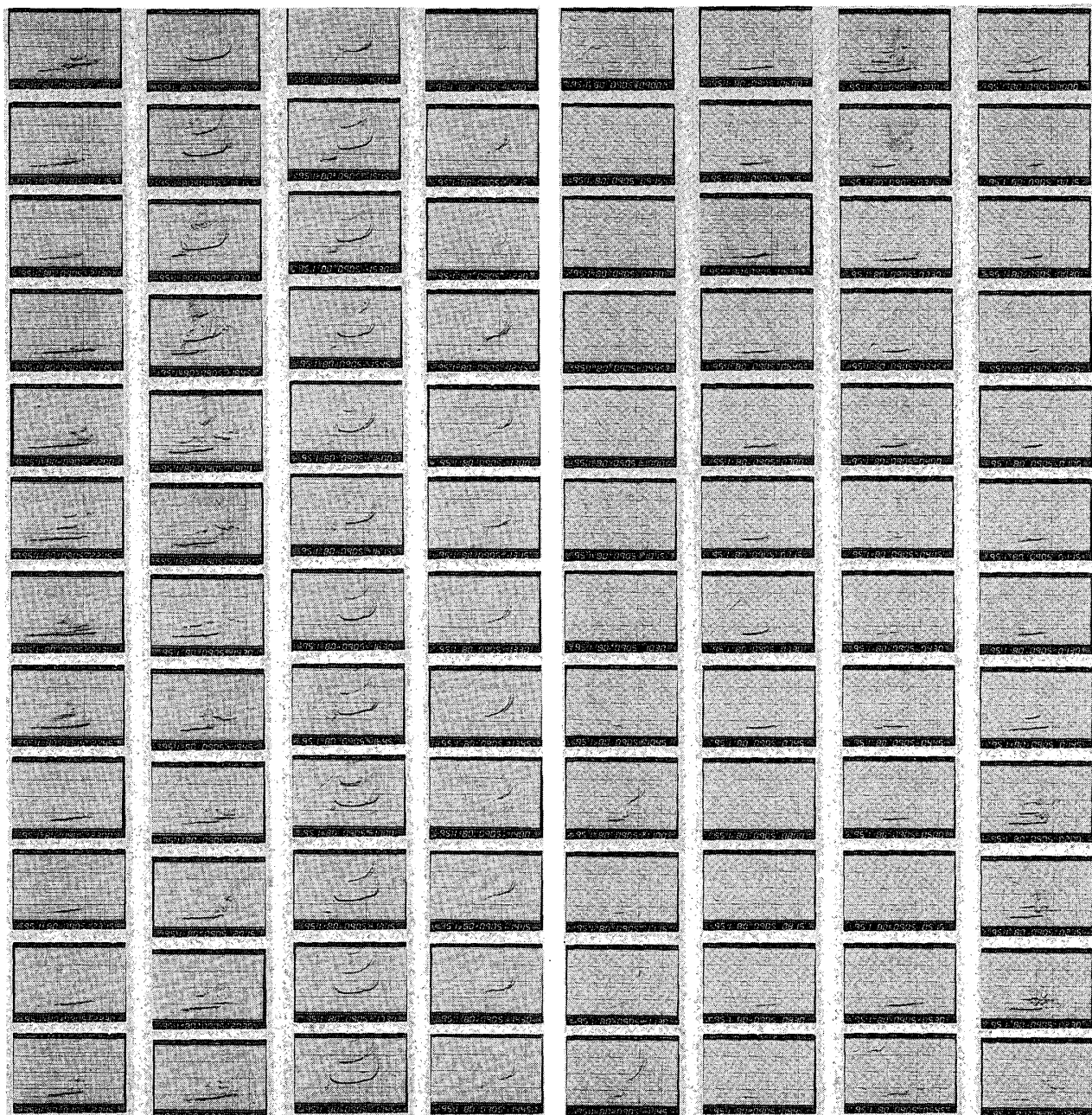
2345
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IONOGRAMS

AT INTERVALS OF 15 MINUTES

SYOWA STATION SEP. 5, 1980 45° EMT

(Start)
0000

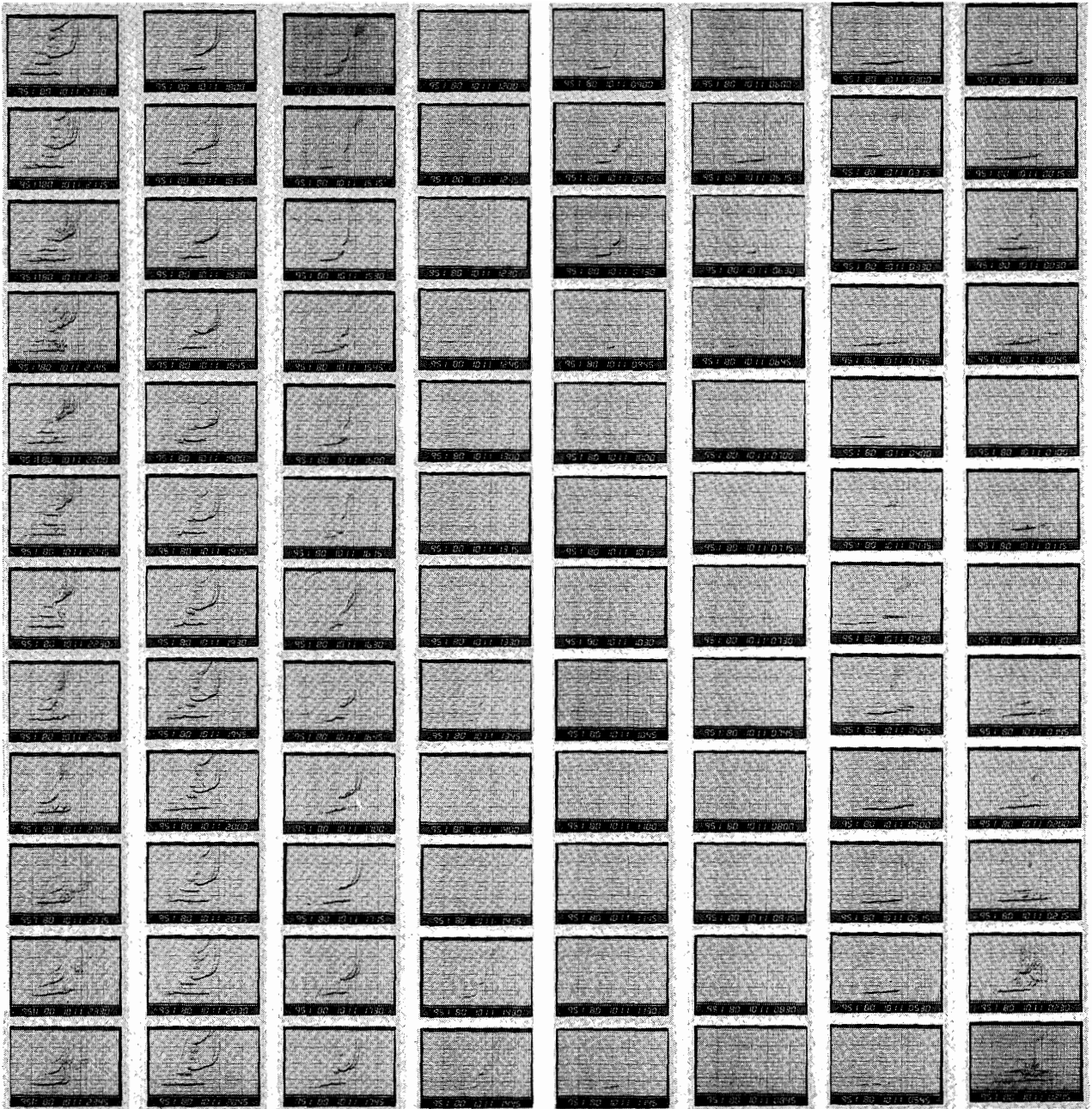


2345
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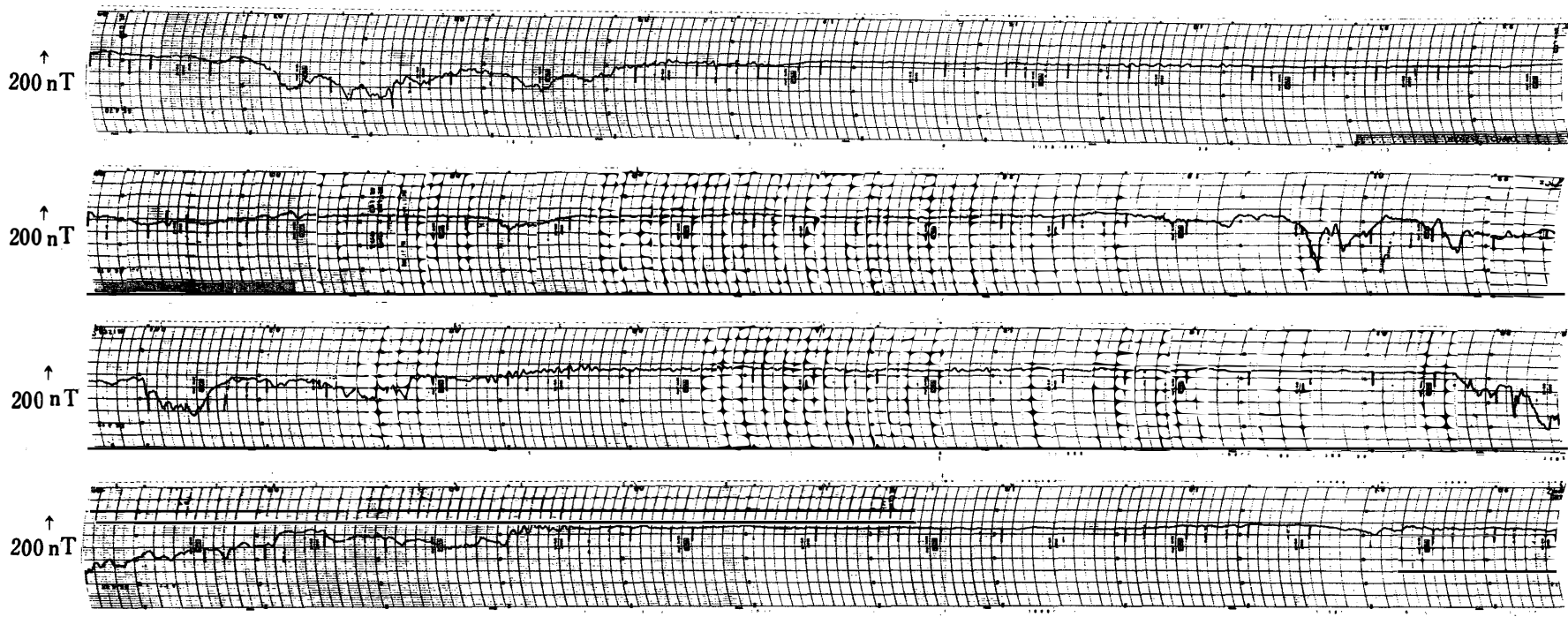
IONOGRAMS
AT INTERVALS OF 15 MINUTES

SYOWA STATION OCT. 11, 1980 45° EMT

(Start)
0000



2345
(End)

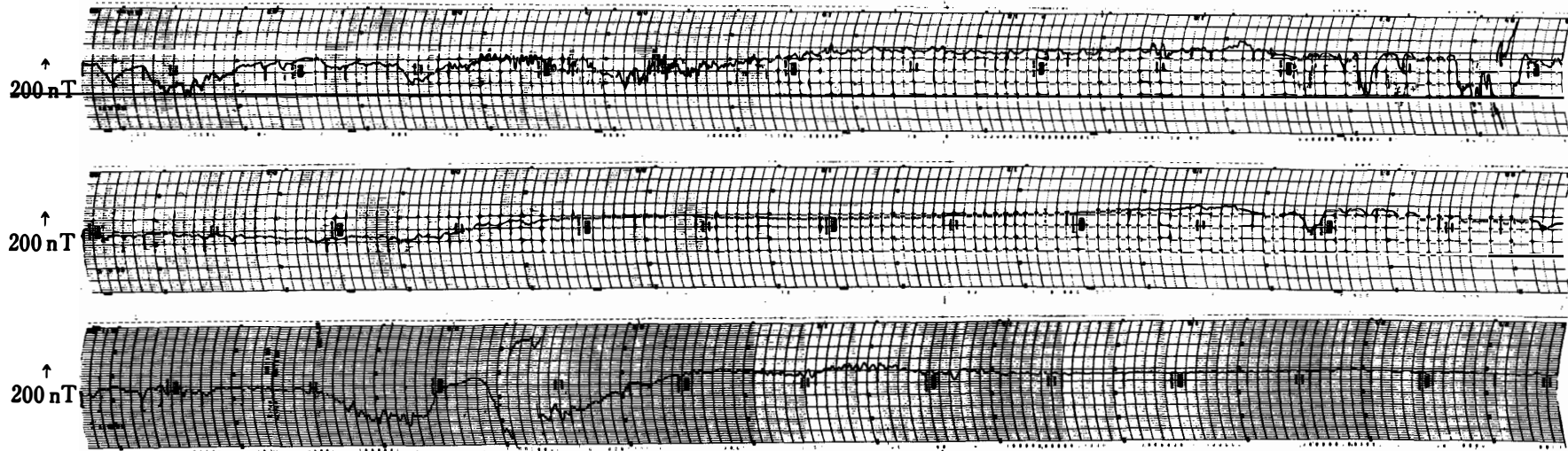


10 APR 1980
11
12
13

00 04 08 12 16 20 24

45° EAST MERIDIAN TIME IN HOURS

MAGNETOGRAMS IN THE HORIZONTAL COMPONENT



11 JUNE
 5 SEP
 11 OCT 1980

00 04 08 12 16 20 24

45° EAST MERIDIAN TIME IN HOURS

MAGNETOGRAMS IN THE
 HORIZONTAL COMPONENT

Table 1. 30 MHz cosmic noise absorption at the first minute of each hour.

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

January 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.3					0.2		0.1			0.1		0.1			0.1								
2	0.1	0.1		0.3				0.3	0.2									0.1	0.2	0.2				
3								0.5	0.3															
4	0.1		0.1							0.2	0.4										0.1			0.1
5	0.1	0.4	0.5		0.2	0.1																		
6	0.1	0.4		0.4		0.2	0.6	0.3																
* 7																				0.3	0.5			
8			1.0	0.9	0.3	0.8	0.2		0.5	0.1														
* 9											C	C	C	C	C									
* 10																								
11																	0.4		0.3	0.2				
* 12		0.3	0.1																					
13													0.5			0.7	0.1							0.2
* 14						0.1	0.1	0.2								0.2								
* 15																			0.3	0.3				
16					0.1		0.4	0.2	0.2		0.9						0.6	0.5						
17																								
* 18			0.1	0.1	0.3	0.2	0.1																	
19				0.3	0.1																			
20					0.1	0.7	0.1																	
21				0.2			0.1																	
* 22																								
* 23	0.6			0.2	0.1																			
* 24																								
* 25			0.1																					
26																								
27						0.2	0.3	0.3								0.4				0.1	0.1	0.2	0.2	0.3
28			0.1		0.4												0.5		0.1		0.6	0.3	0.4	0.3
29				0.1	0.5	0.2	0.1																	
30	0.2	0.9		0.1										0.2	0.2	0.9	0.2	0.1						
* 31						0.4																		
Mean	0.05	0.07	0.06	0.08	0.05	0.11	0.06	0.06	0.04	0.01	0.02	0.03	0.02	0.01	0.01	0.09	0.05	0.01	0.03	0.07	0.04	0.02	0.01	0.02

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

February 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		0.2	0.2	0.3	0.3	0.1				S	S	S	S	S	S	S	S	S	0.2	0.1			S	S
2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
5	S	S	S	S	S	S	C	C	S	S	S													
6		0.2	0.2	0.2			0.2	0.1		0.3			C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	S	S	S	S	S	S	S	S	S	S	S	S	C	C	0.7	0.7	0.3	0.6	0.2	0.3			0.2	S
9							0.2				0.1	0.4	C	C	C	C	C	C	C	C	C	C	0.2	S
10				0.3				0.1			0.3			0.1	0.2	0.2			0.2	0.2			C	0.1
11								0.4	0.4															
12										S	S	S	S	S						0.1				
13	*																				0.2			
14				0.4	0.1	0.2	0.3	0.2						1.0	0.5		S							0.1
15																		0.2						
16	0.5	0.2	0.2	0.2		0.1	0.9	0.2	0.1	0.2	0.2	0.3	0.8											
17						0.2																		
18							0.4	1.9	0.3		0.3	0.3	0.6	0.5	0.3					0.2				
19				0.3	0.2		0.4	0.1												0.5				
20				0.2	0.5		0.6																	
21				0.1	0.2	0.2																		0.1
22									0.3															
23															0.1	0.3	0.6	0.4						
24			0.2	0.2		0.2																		
25																								
26							0.1																	
27							0.1			0.2				1.2	0.5	0.7				0.2				
28	0.7		0.3	0.5	0.3		0.6		0.4	0.3		0.3		0.3	0.5	0.5				0.6	0.1	C	C	0.4
29	C	C	C	C	C	C	C	C										0.5	0.2	0.5				C
30																			0.2	0.5				
31																								
Mean	0.04	0.02	0.04	0.10	0.06	0.04	0.13	0.12	0.06	0.04	0.03	0.05	0.06	0.11	0.10	0.09	0.03	0.07	0.03	0.10	0.01		0.01	0.03

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

March

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								0.2						C	C	C	C	0.2					0.2	
2											0.3	0.1					0.4	0.2						
3				0.1	0.1	0.1																		
4	0.1						C	C																
5							0.2																	
6																								
7	0.8	0.6	0.4	0.2	0.1	1.0																		
8					0.2						1.0	0.5	0.2											
9		0.1		0.3								0.2												
10							0.2							1.0				0.1						
11		0.1	0.2	0.4	0.2		0.1																	
12													0.1	C	C	C	C				0.3	0.2		0.3
13	0.2						C																	
14				0.2					0.1	0.1					0.7	0.2		0.2	0.3	0.2				
15																			C					
16		0.2		0.1	0.2		C	C	C	C										0.1	0.2			
17		0.1				0.1	C	C	C	C		0.2		0.2	C	C			0.1	0.2				
18		0.1																				0.1		
19																								
20																								
21	0.2			0.2		0.1			0.3	0.4	0.1	1.6	0.1			S	0.5	0.1					0.3	
22		0.1		0.6	0.1				0.2	0.1	0.1			0.3	0.4	0.1	0.1					0.1		
23		0.3	0.2	0.2	0.4		0.2	0.4																
24							0.1	0.1																
25		0.1																						0.3
26	0.1	0.1					0.3	0.3	0.1		0.2		0.1	0.3	0.3			0.4	0.2					
27			0.4	1.3	0.1																			
28						0.3															0.2		0.5	
29	0.3		0.3	0.3	0.5					0.7	0.5										0.2	0.2	0.2	
30	0.2		0.2	0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.1	0.4									0.2	0.1		0.1
31		0.1						0.6	0.4	0.1	0.4		0.1	0.3					0.4	0.4	0.2	0.3	0.2	0.4
Mean	0.06	0.06	0.05	0.12	0.06	0.08	0.06	0.06	0.04	0.05	0.08	0.10	0.01	0.07	0.05	0.01	0.03	0.03	0.03	0.03	0.04	0.03	0.05	0.04

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

April 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		0.1																						0.2
2			S	S	S	S															0.3	0.1	0.2	
3		0.2			C				0.5														0.1	
4													0.5	0.5		0.7	0.2	0.3						
5		0.1																						
6								0.4	0.3													0.1		
7	0.1									0.2			0.1								0.4		0.1	
8		0.5	0.5	0.2	0.2		0.5	0.5	0.2		0.5						1.7	1.7				0.1	0.2	0.2
9		0.2		0.1	0.2		0.2	0.2	0.6	0.5	1.0				1.3									
10						0.1		0.6	1.0	1.8	0.6	1.6	1.2							0.2	0.2			
11												0.6			2.0	2.0	1.0	1.0						0.3
12	1.0		0.6	0.2	0.2	0.3	0.1	0.2	0.6		1.5	1.2	2.0	2.1	2.0	0.7	0.5	0.3	0.3	0.2				
13		0.2	0.2	0.8		0.2	0.1	0.1		0.2	0.3	0.2	0.2	0.4			0.2	0.2		0.2	0.2	0.2		0.1
14			0.1					0.2	0.1												0.5			0.1
15			0.5	0.4		1.1	0.2	0.3	0.2	0.2	0.9	1.0	0.3											0.1
16		0.1	0.1	0.5	0.2	0.3				0.5	1.1	0.5	0.2											
17	0.1	0.3	0.3	0.8	0.8	0.2		1.0	0.1	0.6	0.7	1.0								0.2				
18		0.7	0.3	0.2		0.1		0.2	0.1													0.1		
19																								
20	0.4	0.4				0.5	0.1		0.3	1.0	1.5	2.2	2.3	3.1	3.7	4.7	4.9	>4.7	4.9	4.5	5.0	4.2	3.9	3.5
21	3.5	3.1	3.0	2.3	1.7	2.1	2.1	2.3	2.2	2.7	3.4	2.7	2.5	2.0	2.1	1.5					0.9	0.6	0.3	0.1
22	0.2					0.3	0.3	0.1				C			C									0.4
23	0.6	0.4																						
24				0.1			0.6	0.3	0.3		C	C	C	C							0.1	0.1	0.1	0.2
25				0.7			0.1		C															
26			0.1		0.1			0.5	0.5															
27																								
28		0.1	0.2		0.3																			0.1
29	1.7	1.7	1.6	2.4	2.4	2.4	2.6	2.5	2.7	2.7	2.2	2.9	2.7	2.9	1.7	0.7	1.1	2.0	1.5	2.0	2.1	2.1	1.9	1.4
30	2.8	2.9	2.6	2.3	2.5	2.3	2.5	2.8	2.7	2.6	2.1	2.6	2.1	2.2	1.2	1.1	0.5	0.5						
31																								
Mean	0.34	0.36	0.33	0.36	0.29	0.33	0.31	0.40	0.42	0.44	0.52	0.58	0.48	0.44	0.48	0.38	0.33	0.35	0.22	0.24	0.32	0.24	0.23	0.22

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

May

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						0.2	0.1													0.2	0.1		0.1	0.3
2		0.3	0.1	1.0	0.1	0.1	0.3	0.3	0.2	0.2										0.2				
3			0.1																	0.2				
4		0.1							0.1												0.1			
5																				0.2	0.1	0.1		
6		0.1		0.3	0.3		0.2	0.1	0.1												0.2	0.1	0.1	
7		0.1																						
8						0.1	0.1	0.4	0.2	0.1														
9						0.1	0.2	0.4	0.4															
10	0.1		0.2		0.2												0.6	1.5	1.8	2.8	3.3	3.4	3.1	3.0
11	2.9	2.9	2.9	3.0	3.1	3.1	2.9	2.7	2.6	2.4	2.5	5.0	4.5	2.7	0.6	4.1	3.5	2.7	2.8	2.8	2.9	2.9	2.7	3.7
12	3.1	4.0	3.1	3.1	2.7	3.7	2.6	1.6	1.8	2.3	3.0	3.0	3.5	2.5	1.7	1.0	1.4		0.5	0.5	1.1	0.9	1.0	1.5
13	2.0	2.1	2.2	2.2	2.3	2.5	2.4	2.9	2.3	2.0	2.1	2.0	0.6	2.0	2.0		1.4	1.2		1.1	0.9	0.6	0.4	0.4
14		0.1	0.1	0.1	0.1	0.1	0.7	1.8	0.1		0.9	0.7	0.3										0.2	0.1
15		0.7	0.4								0.1	1.5	1.5											
16						0.2																		
17														0.5										
18																								
19																								
20				0.1	0.1																			
21																			0.2	0.3	0.2			
22		0.1			0.1	0.5				0.3														
23																				0.2	0.4	0.2		
24				0.3	0.2											1.2	1.5		0.4	0.3	0.4	0.2		0.1
25				0.2	0.2	0.3		0.5	0.3	0.3		0.2	2.5	0.5		0.2								
26		0.1	0.1								0.1													
27		0.1					0.1																	
28																								
29																		0.5		0.2	0.2			
30									0.4															
31							0.1	0.1	0.2	0.9														
Mean	0.26	0.34	0.29	0.33	0.30	0.35	0.31	0.34	0.28	0.27	0.28	0.40	0.41	0.26	0.13	0.20	0.27	0.19	0.18	0.28	0.31	0.27	0.24	0.29

Open spaces without figures correspond to quiet level

* : Quiet day

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

June

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1			0.2	0.6	0.3	0.5				1.4	1.3	1.3			0.9									
2		0.8	0.5	0.2	1.1		0.2																	
3			0.3		0.5													0.1	0.3	0.3				0.1
4	0.2	0.2																						
5			0.1	0.1	0.1																			
6																								
7			0.1	0.2			0.2	0.3	0.1		0.1	0.4					0.5		0.3	0.4			0.2	0.2
8		0.7	0.2	0.2	0.1	0.3	0.2	0.2	0.9	1.0	0.9	3.2	4.4	1.1		0.5	1.7			0.1				
9							0.2								0.6	0.3	1.3		0.2	0.1				
10		1.6	0.2	0.5	0.5	0.2	0.4		0.4	2.1	0.4	0.7	2.0	1.5	0.4	0.4	0.5	0.2	0.2			0.1		
11	0.4	0.4	0.4	0.3		1.9	0.4	0.5	0.2	1.1	1.5	0.6	>4.5	1.0		0.6						0.2		0.1
12	0.9		5.4	0.1	0.1	0.5	0.2		C	C	C	0.5	1.8	1.5					0.2					0.5
13	0.2		1.5	0.7	0.2		1.1	1.5	1.5	0.3	1.1	0.2		0.7	0.2	0.6		0.4	0.5					
14											0.2													
15			0.1																					
16																								
17																								
18																								
19																								
20	0.2																							
21																								
22						0.1																		
23									0.1	0.6														
24																								
25	0.1	0.2	0.1			0.4				0.3	0.2													
26		0.1	0.1	0.1	0.3	0.1																		
27								0.5	0.3															
28																								
29																								
30				0.1	0.1					0.2														
31																								
Mean	0.06	0.13	0.30	0.10	0.11	0.13	0.08	0.10	0.13	0.23	0.20	0.24	0.44	0.20	0.07	0.08	0.13	0.02	0.06	0.03		0.02	0.01	0.03

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

July

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		0.4	0.1		0.3			0.2																
2																								
3																								
4																								
5			0.1	0.1				0.2	0.5	0.5	0.3	0.4	0.2											
6			0.4																					
7			0.1	0.1		0.4	0.4							1.6			0.2	0.1	0.3				0.1	0.1
8					0.7	1.4	0.5	0.3	0.7	0.2	1.1	0.5						1.8	0.3			0.1		0.2
9		0.6	0.5	0.3	0.4	0.3	0.4	0.5	1.0	0.2			0.3				0.7	0.3	0.1					
10																								
11				0.2		0.3		0.2	0.4															
12			0.3	0.3																				
13				0.1	0.1			0.2	0.1	0.1	0.4													
14						0.3	0.7			0.1			C	C	C	C	C	C						
15							0.2												0.1					
16	0.2	0.1																						
17									0.2	0.7							0.1							0.1
18					0.1	0.4	0.1				0.6												0.1	0.1
19	0.2		0.2																					
20														0.7			0.5	0.5	0.6					
21						0.2	1.0	0.5	0.6	0.2	0.6						0.3							
22	0.3	0.3	0.1	0.1		0.4	0.4	0.2					1.0	1.4	S	0.3	1.9	1.7	1.6	1.4	1.2	1.1	1.4	1.7
23			0.2	0.1									1.5	1.9	1.7	0.6	1.7	1.6	1.5	1.3	1.2	1.2	1.4	2.1
24	1.8	2.0	2.1	2.3	2.1	2.2	2.4	2.6	2.5	2.3	2.3	2.5	1.5	1.9	1.7	0.6	1.7	1.6	1.5	1.3	1.2	1.2	1.4	2.1
25	2.3	2.1	2.0	2.0	1.9	2.0	1.9	1.9	1.8	1.7	1.7	1.8	1.8	1.8	0.6	0.3	0.4	0.3			0.1	0.1	0.2	
26	0.3	0.2	0.3	2.3	0.4	0.3	0.5	0.3					0.1									0.2		
27			0.1		0.4	0.6	0.5		0.6	0.1									0.1			0.1		0.3
28				0.2	0.2			0.3	0.6	0.3			0.5	0.2			0.5	0.3	0.4	0.6	0.2			
29									0.3	0.5														
30				0.1	0.6	0.3	0.2																0.3	0.1
31	0.1						0.5	0.3	0.4	0.1		0.4	1.0	1.2	0.6	0.3	1.1	0.6					0.4	0.1
Mean	0.16	0.18	0.20	0.29	0.23	0.29	0.31	0.24	0.31	0.22	0.22	0.18	0.21	0.29	0.09	0.05	0.24	0.24	0.16	0.10	0.02	0.08	0.12	0.15

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

August

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1													0.5	0.2									0.1	
2													0.4	0.1			0.3							
3	0.4		0.2	0.1		0.6	0.3	0.7	0.6	0.1	0.5	0.6		1.2	1.0	0.4	0.2	0.3	0.4			0.1	0.2	
4																		0.1	0.3					
5																						0.1	0.2	
6						1.7	0.1			0.2	0.1													
7	0.3	0.3	0.2	0.3	0.1	0.5	0.4	0.7	0.7	0.7	1.2	0.7	0.3	0.7	0.1	1.0	1.6	0.4		0.1				
8	0.3	0.5	0.1	0.4		0.4						0.2												
9																								
10									0.2	1.2	0.6					0.5	0.1	0.1						
11		0.1			0.1					0.5	1.3	0.8	0.2											
12		0.1			0.4	0.2																		
13																								
14					0.1	0.2	0.2																	
15																								
16																			S	S	S			
17									0.1	0.2														0.2
18	0.2	C	C	C	0.1	0.1				0.9	0.3				0.5			0.3				0.3		
19				0.1	0.1	0.1	0.5	0.7	0.3	0.2	0.2	0.2										0.4		
20																								
21				0.8	0.9	0.3	0.3		0.2	0.1	0.6	0.5	0.3											
22									0.5															
23	1.3	0.2	0.2	0.1																				
24							0.1			0.2														
25																								
26			0.3	0.2		0.3		0.5	0.3	0.2														0.1
27	0.1					0.6	0.5			0.3	1.1	0.1	0.1				S	S	S					
28																								
29			0.2	0.5		0.1																	0.2	
30	0.3	0.2	0.3					0.1	0.2	0.1	0.2		0.1	0.3	0.2									0.1
31	0.2	0.1			0.3	0.2	0.5	0.2					0.6	0.4		0.1								
Mean	0.10	0.05	0.05	0.08	0.06	0.17	0.09	0.09	0.10	0.16	0.20	0.10	0.08	0.09	0.06	0.06	0.07	0.04	0.02	0.01		0.03	0.02	0.01

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

September 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				0.3			0.5	0.2	0.1															0.2
2	0.1		0.2					0.3	0.1	0.1												0.1		0.2
3	0.2	0.3	0.1	0.2	0.2	0.2	0.6	0.2	0.2															0.1
4	0.2	0.3	0.2	0.2	0.4		0.8	0.2																0.1
5	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.5		0.2	0.3	S	0.1			0.1			0.1	0.1	0.2
6	0.1	0.1		0.1	0.4	0.1										S	S							
7		0.1	0.1	0.3	0.3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	0.1	0.1	0.1
*																								
11	0.1								0.6															
12	0.1	0.1	0.3	0.3	0.1	0.2	0.1				0.1	0.9	0.4	0.6	0.5		0.2	0.5	0.1	0.1	0.1	0.1	0.1	0.1
13	0.2	0.4	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.5	0.1	0.3	0.1	0.1	0.3	0.3	0.1	0.4	1.4	0.1	0.2	0.1	0.1	0.3
14	0.3	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.2		0.2	0.1	0.2	0.1	0.1							0.1	0.1	0.3
15	0.1	0.2	0.5	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2					S	S	0.3	0.1	0.1	0.2	0.1
16	0.1	0.1	0.6	0.1	0.1																			
17	0.2	0.5	0.4			0.1	0.9	0.5	0.1		0.2	0.1	0.2	0.3		0.9								
18	0.1	0.3	0.7	0.1	0.1	0.1			0.1	0.1	0.1	0.1	0.1					S					0.1	0.1
19	0.1		0.2	0.2	0.1		0.1	0.1											S				0.1	0.2
20		0.2	0.5	0.4	0.4	0.2	0.8	0.1	0.2	0.1	0.1													0.2
21	0.1	0.2	0.2	0.4	0.2	0.1		0.1	0.1	0.1	0.1	0.1											0.1	0.1
*																								
22																		S						
23	0.2	0.2	0.2	0.2		0.2	0.1						0.1					S						
24		0.5	0.4	0.2	0.1	0.1	0.1											S	S				0.1	0.1
25	0.2	0.1	0.1	0.2	0.1		0.1	0.6	0.2	0.2		0.1						S	S	S				
*																								
26									0.5															
27	0.1	0.1	0.1	0.1					0.7	0.4					S	S	S	S						
*																								
28					0.1										S									
29	0.2			0.1	0.2	0.1		0.2		0.1														0.2
*						0.1	0.2												S	S				
30																								
31																								
Mean	0.10	0.14	0.20	0.16	0.13	0.08	0.19	0.13	0.15	0.07	0.06	0.07	0.06	0.05	0.03	0.05	0.01	0.03	0.06	0.02	0.01	0.03	0.04	0.09

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

October 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
* 1														S	S	S	S	S	S						
* 2			0.2															S	S						
* 3																		S	S					0.3	
4		0.4	0.4	0.4	0.3	0.2	0.2	0.2		0.2	0.4			0.5				0.2	S					0.2	
5	0.3	0.1		0.2	0.3	0.9	0.5	0.5	0.2		0.1	0.3	0.2	0.2			0.2		0.3					0.2	
6	0.2	0.3	0.2	0.4	0.2	0.1	0.1	0.2	0.3	0.1	0.4	0.2				S	S	S	S	S	S	S	S	S	
7	S				0.3	0.3	0.1	0.8																	
* 8										0.3															
9					0.3												0.2								
10	0.2	0.3					0.3	0.3	0.2														0.1		
11		0.5		0.2				0.1	0.7		0.5	1.5	0.3	0.1	0.2					C	C	C	C	C	
12	C	C	C	C	C	C	C	C	C	C	C	C	C												
* 13																									
* 14																		S							
15			0.1						1.0		0.7	0.5	0.3				0.6	0.2	0.4						
* 16				0.3																					
* 17																				0.1	0.4	0.2	0.5	0.6	0.7
18	0.2	0.3	0.4	0.5	0.9	0.8	0.5	0.6	0.6	0.5										0.3	0.1	0.5	0.7	0.5	
19	0.7	0.6	0.7	0.9	0.7	0.8	0.5	0.4	0.4	0.5	0.4									0.3	0.1	0.5	0.7	0.5	
20	0.3	0.7	1.0	1.0	1.3	1.0	1.0	0.9	0.9	0.7	0.2	0.4				0.3	0.1		0.2	0.3	0.5	0.5	0.5	0.5	
21	0.1		0.1	0.2	0.3	0.4	0.2															0.3	0.1		
22				0.1	0.1	0.2	0.5	0.5		0.9	0.8	0.3		0.3	0.1	0.4	0.2	0.3	0.3	0.6	0.7	0.6	0.7	0.9	
23	1.0	0.4	1.2	0.5	0.4	0.6	0.6	0.6	0.3	0.3	1.9	0.3	0.2	0.7	0.5	0.1	0.2		0.1	0.1	0.4	0.2			
* 24																			0.4						
25				2.5	0.3	0.5	0.7	0.5	0.2	0.3	0.7	1.0	0.9	1.2	0.7	0.9	0.7	0.3	0.3	0.4	0.7	0.6	0.7	0.8	
26	0.5	1.5	1.4	0.5	1.0	0.9	0.6	0.6	0.6	1.2	1.0	0.9	1.2	0.8	0.7	0.7	0.5	0.4	0.4	0.7	0.6	0.5	0.5	0.4	
* 27																									
* 28																									
* 29																									
30									0.2	0.3										0.3					
31																			0.2				0.2		
Mean	0.11	0.17	0.19	0.25	0.21	0.22	0.19	0.20	0.18	0.17	0.23	0.18	0.10	0.12	0.07	0.07	0.08	0.04	0.07	0.11	0.11	0.11	0.13	0.15	

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

November

1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
* 1	0.1	0.2	0.2	0.2						0.2		0.5	0.5		0.2	0.1								
* 2									0.1														C	C
3	C	0.2	0.1																					
4				0.3					0.3															
5	C																1.7	C	C	C	C	C	C	C
6								3.0								C	C	C	C	C	C	C	C	C
7	C						C					C	C	C	C	C	C	C	C	C	C	C	C	C
8												C	C	C	C	C	C	S	C	C	C	C	C	C
9	C	C	C	C																				
10															0.3	0.3	1.0		1.5	0.7				
11							0.2	0.2	0.3				0.4										0.2	0.3
12	0.2	0.5	1.0	0.5			0.5	0.2	0.9		0.4	0.2	0.3	0.4	0.1		0.2	0.2	0.3	0.5	0.3			0.3
13	0.1	0.5	0.5			0.3																		
14			0.2				0.1	0.5												1.0	0.5			
15					0.3	0.4	0.4	0.2	0.2	0.6			1.0	1.9	0.6		1.5	0.1	0.2	0.5				
16			0.2		0.4		0.1	0.1	0.3	0.4							0.2							0.2
17	0.2	0.3		0.6																				
18		0.6	0.3	0.3	0.8	0.3	0.3				0.7								0.6	0.3	0.2	C	C	C
19	C	0.4				0.2	0.5	0.2	0.6					0.6		0.1	0.2	0.8	0.3					
20		C	0.5	0.4	0.2							0.6	0.2	0.3				0.4						
21									0.7	1.1	0.2	0.1												
22			0.5			0.2																		
23		0.4		0.1			0.3	0.5																0.2
* 24	0.2	0.2		0.7	0.1	0.5		0.1			0.3													
* 25																								
* 26												0.1								0.2				
27						0.3	0.6				0.4	0.8						0.2						
28						0.3	0.2	0.2			0.2	0.1	0.3	0.2	0.5	0.2		0.6						
* 29	0.2	0.5	0.2	0.1		0.3	0.3	0.2				0.8												
30																				0.1				
31																								
Mean	0.04	0.14	0.13	0.11	0.06	0.09	0.12	0.18	0.11	0.08	0.07	0.09	0.11	0.12	0.08	0.11	0.11	0.14	0.12	0.12	0.04		0.01	0.04

Open spaces without figures correspond to quiet level

* : Quiet day

C : Failure of equipment

S : Interference

SYOWA STATION

45° EAST MERIDIAN TIME (U.T. + 3 hours)

December 1980

Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					0.1			0.4	0.5		0.4								0.2					
2																								
3							0.2			C	C	C	C	C	C				0.4					
4	0.4											0.3	0.1						0.1					
5			0.1	0.5	0.2					C	C	C						0.2						
6								0.1																
7					0.2						0.1													
8		0.1			C	C	C	C	C															
9	0.2	0.1	0.1	0.1																				
10		0.5	0.3		0.3			C	C	C	C							0.1						
11																				0.6				
12		0.3	0.2		0.5			0.1		0.1	0.1													
13					0.1																			
14									0.2				0.2							0.2			0.1	0.3
15	C					0.2			0.1															
16				0.2	0.2	0.1			0.1									0.2						
17			0.2		0.2																			
18					0.2	0.2							0.5				0.2						0.2	
19				0.2	0.6	0.2				0.7	0.1							0.1						
20	0.2									0.1														
21							0.1																	0.6
22				0.4		0.3		0.2	0.2															
23				0.2		0.1			0.1															
24																								
25																								
26		0.1										S	S	S	S						0.1			
27											S	S	S	S	S	S								
28																								
29																								
30															0.1									
31						0.7	0.1	0.2																0.2
Mean	0.02	0.03	0.02	0.05	0.07	0.03	0.01	0.03	0.04	0.03	0.03	0.01	0.01	0.01	0.01		0.01	0.02	0.02	0.02	0.01		0.01	0.04

Open spaces without figures correspond to quiet level

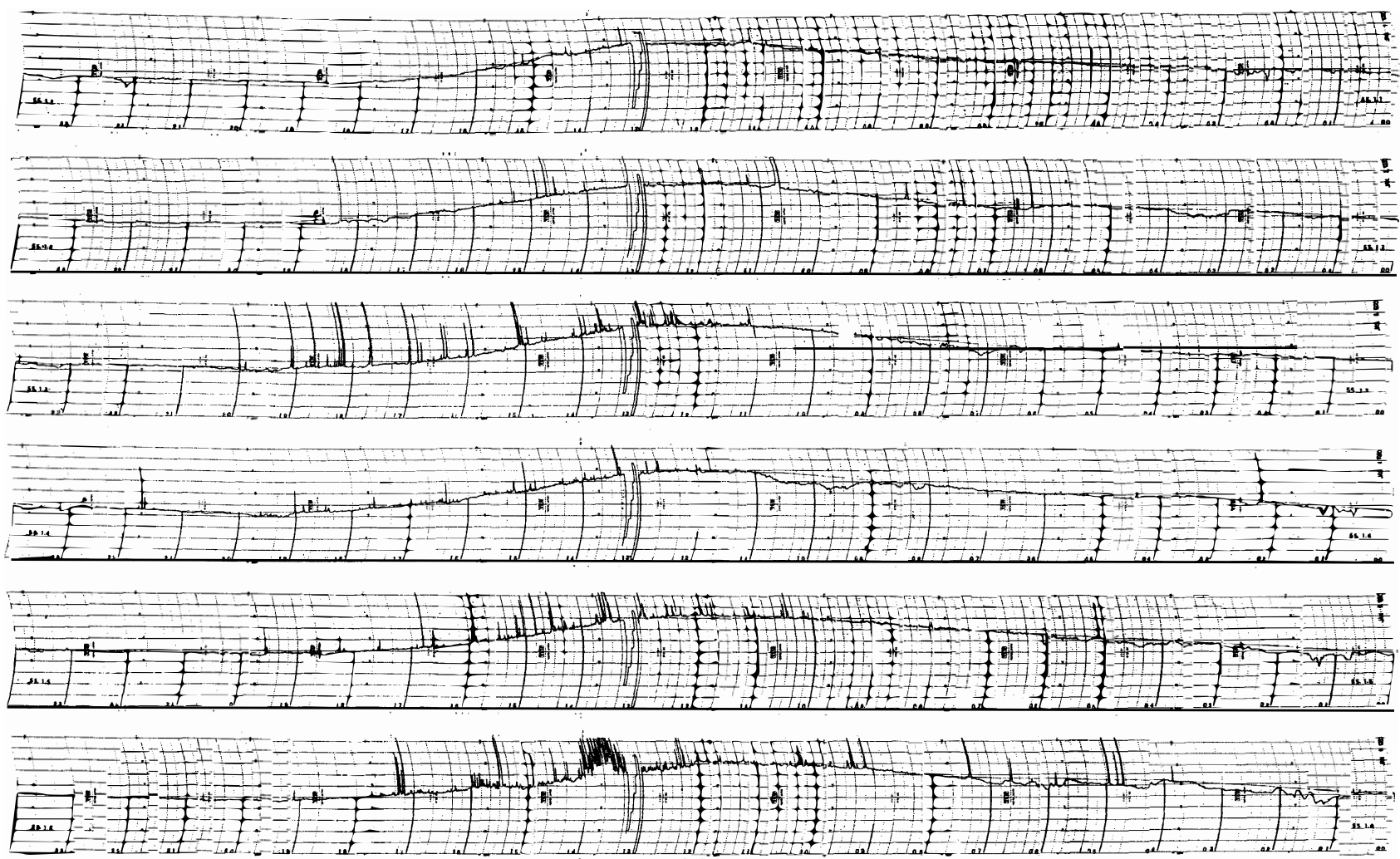
* : Quiet day

C : Failure of equipment

S : Interference

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JAN 1980



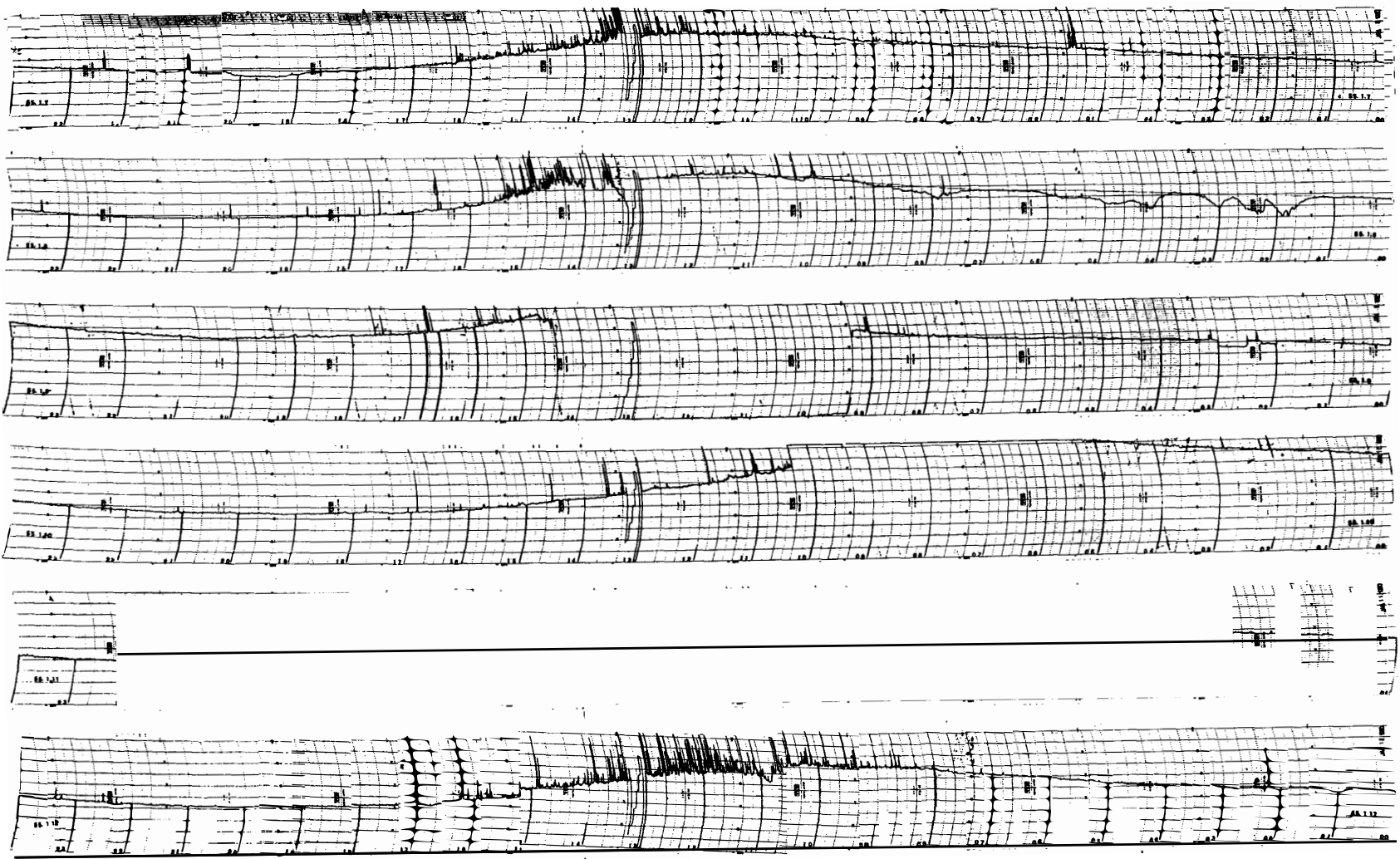
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JAN 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

13 JAN 1980

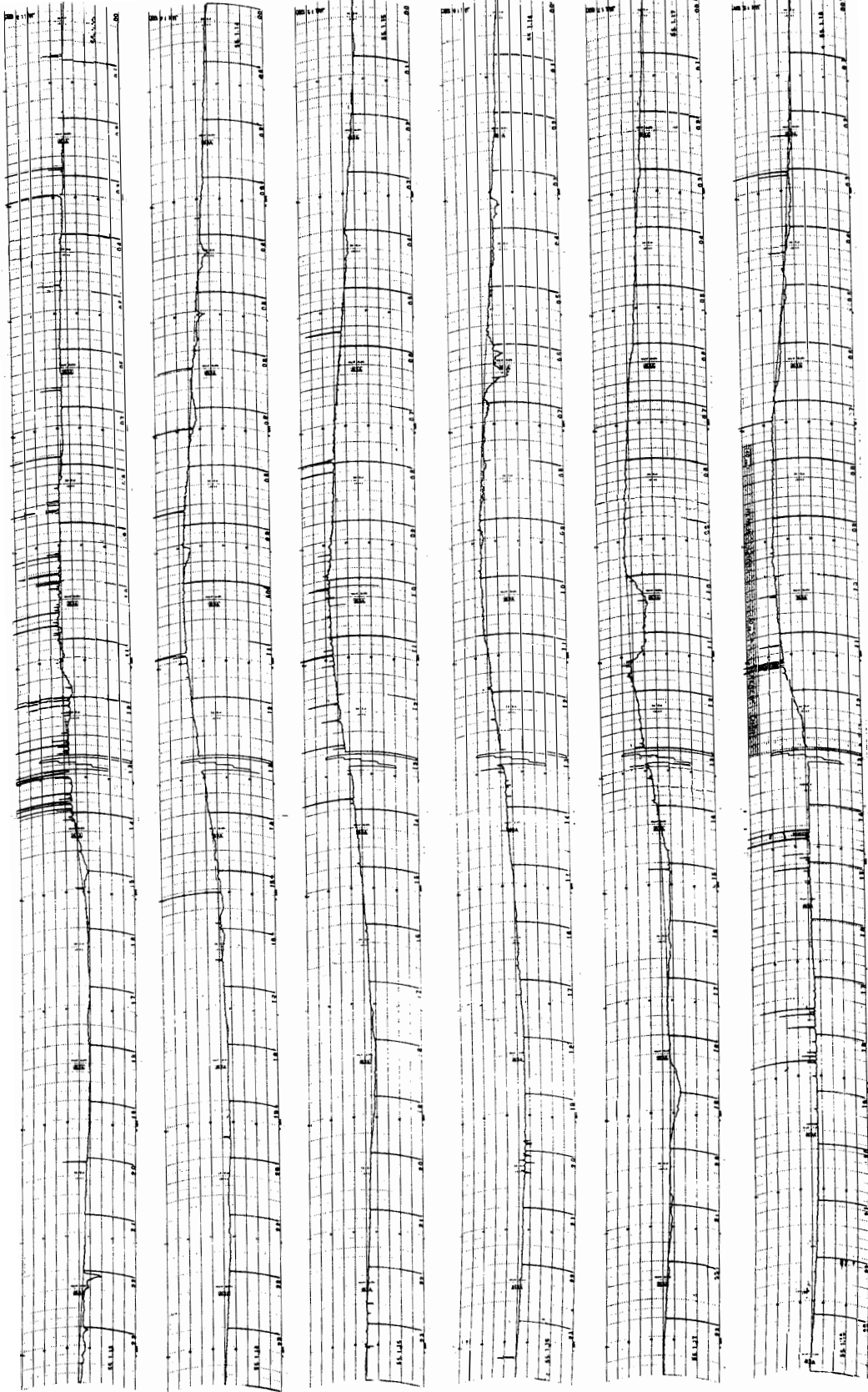
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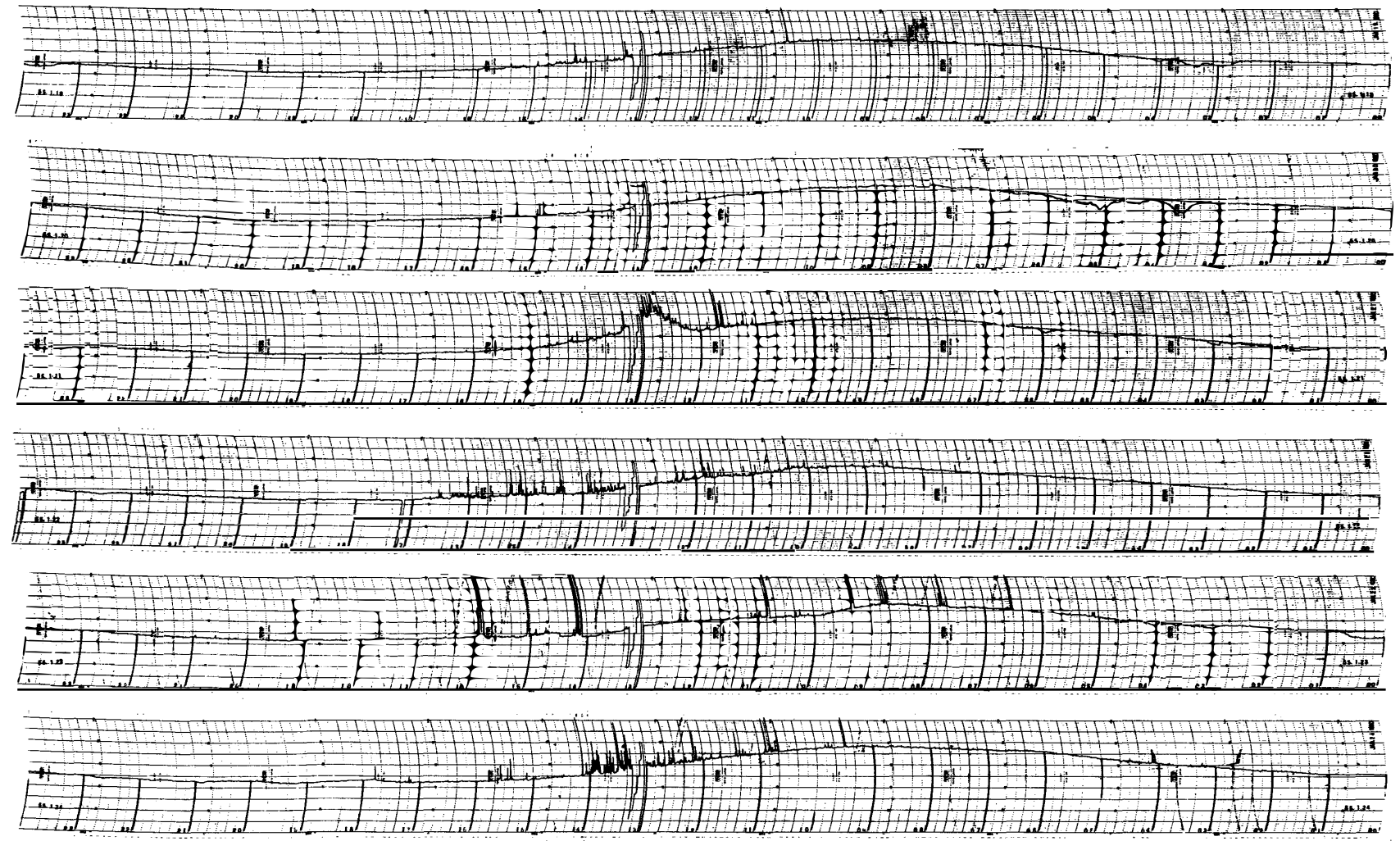
18



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

19 JAN 1980
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JAN 1980

25

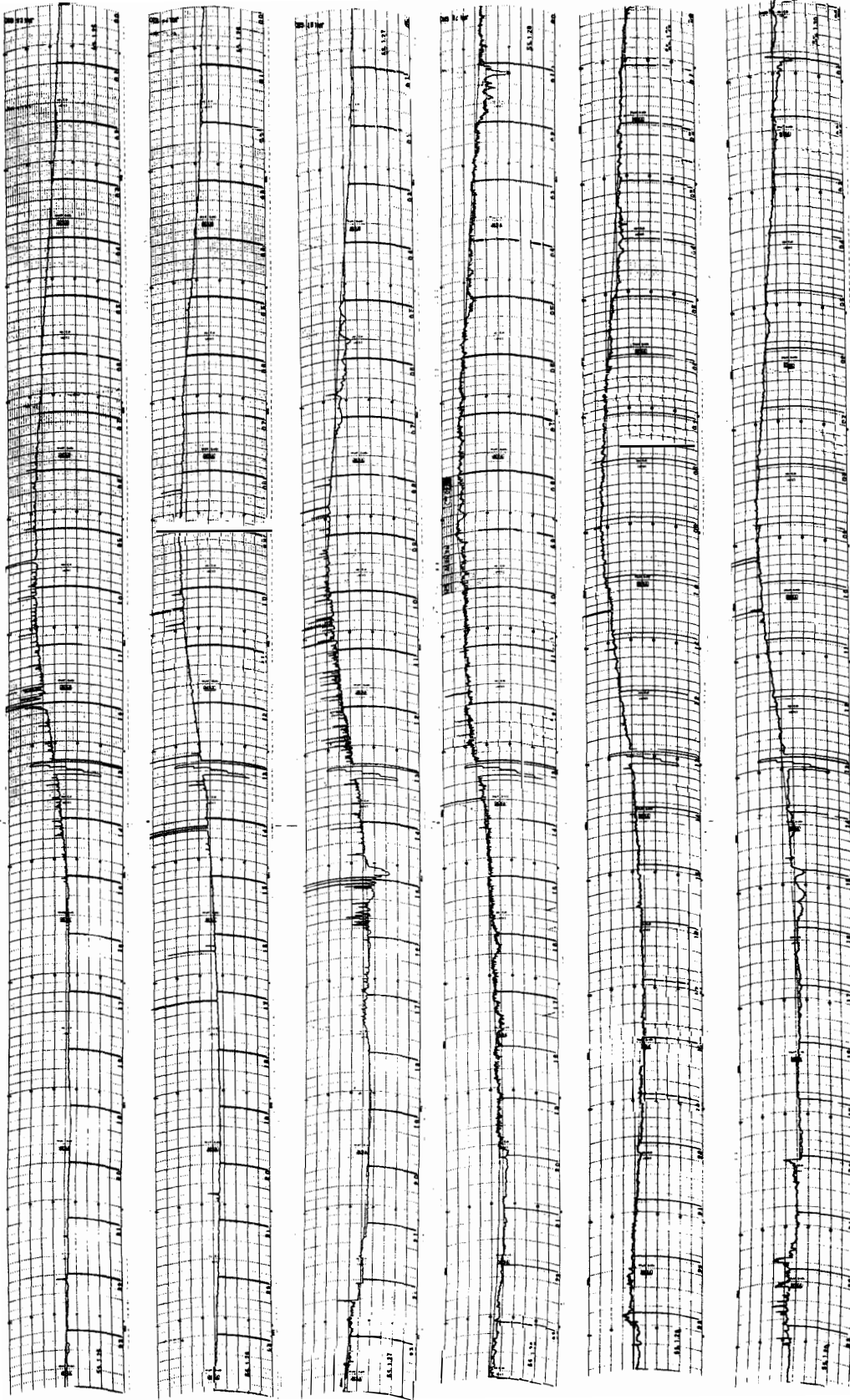
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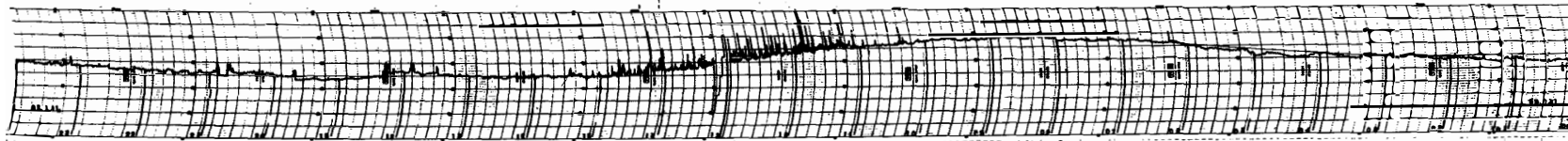
16

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30 MHz COSMIC NOISE

45° EAST MERIDIAN TIME IN HOURS



31

JAN 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

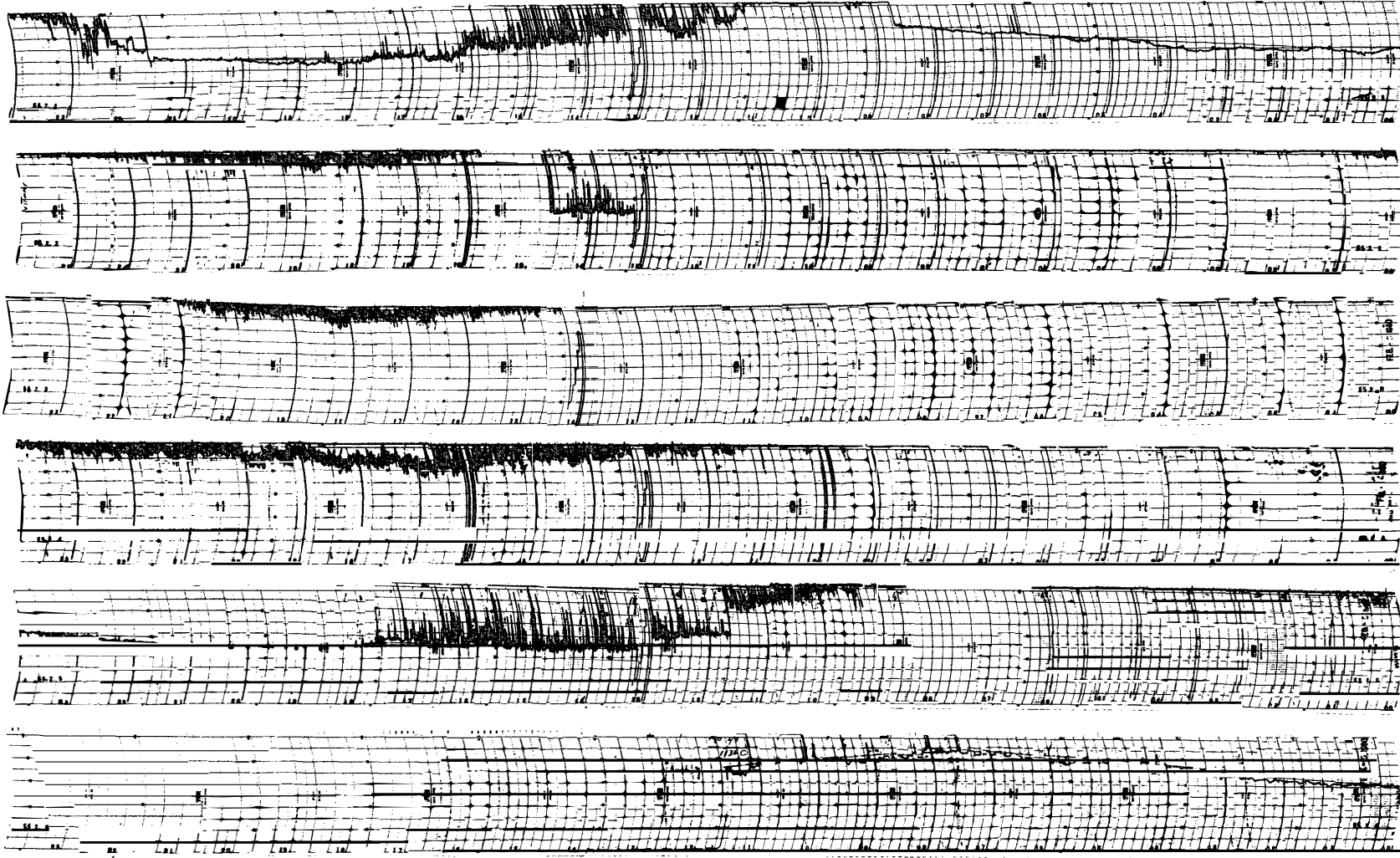
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

January 9 0920 - 1420 Failure of equipment

FEB 1 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

FEB 1980

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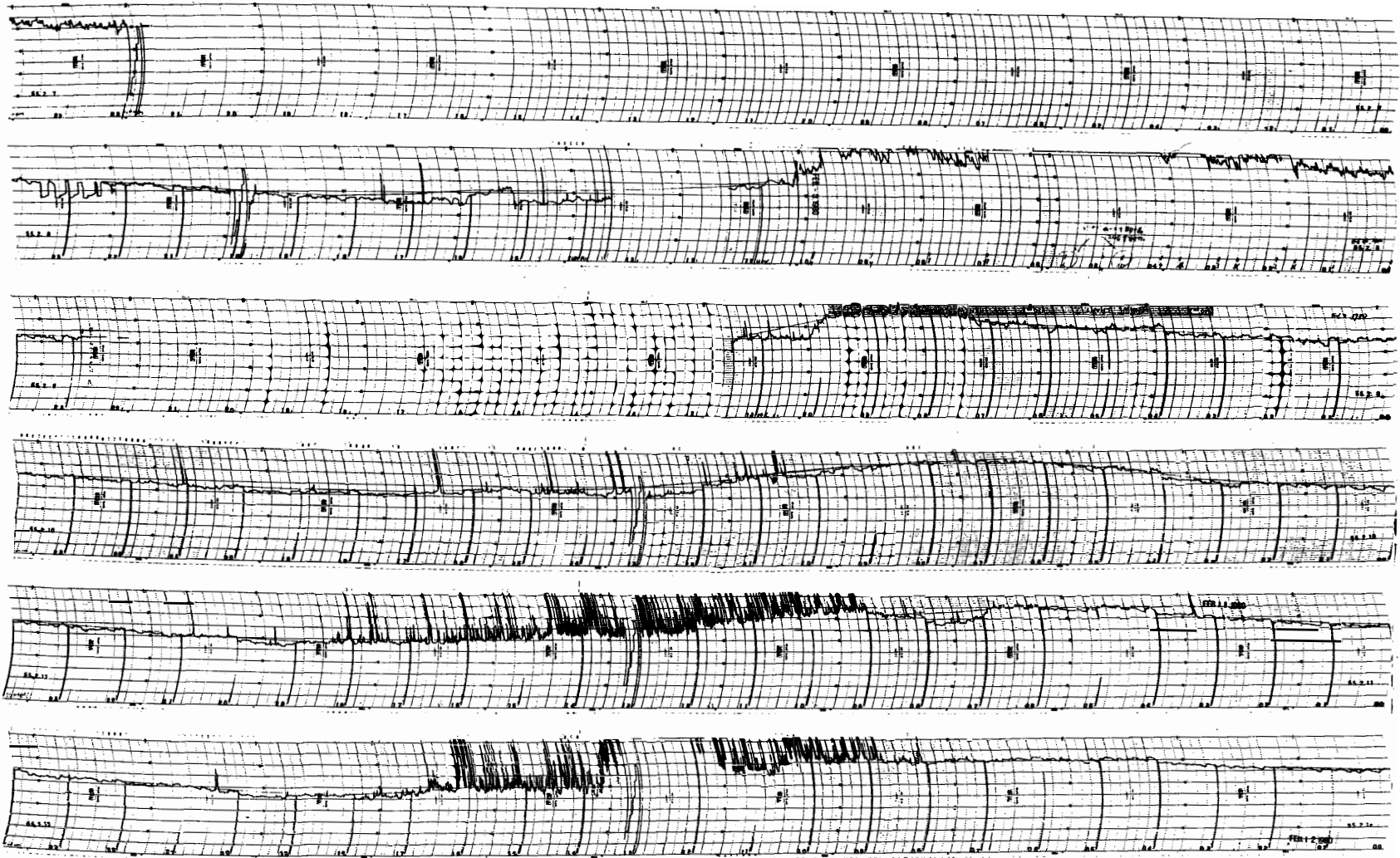
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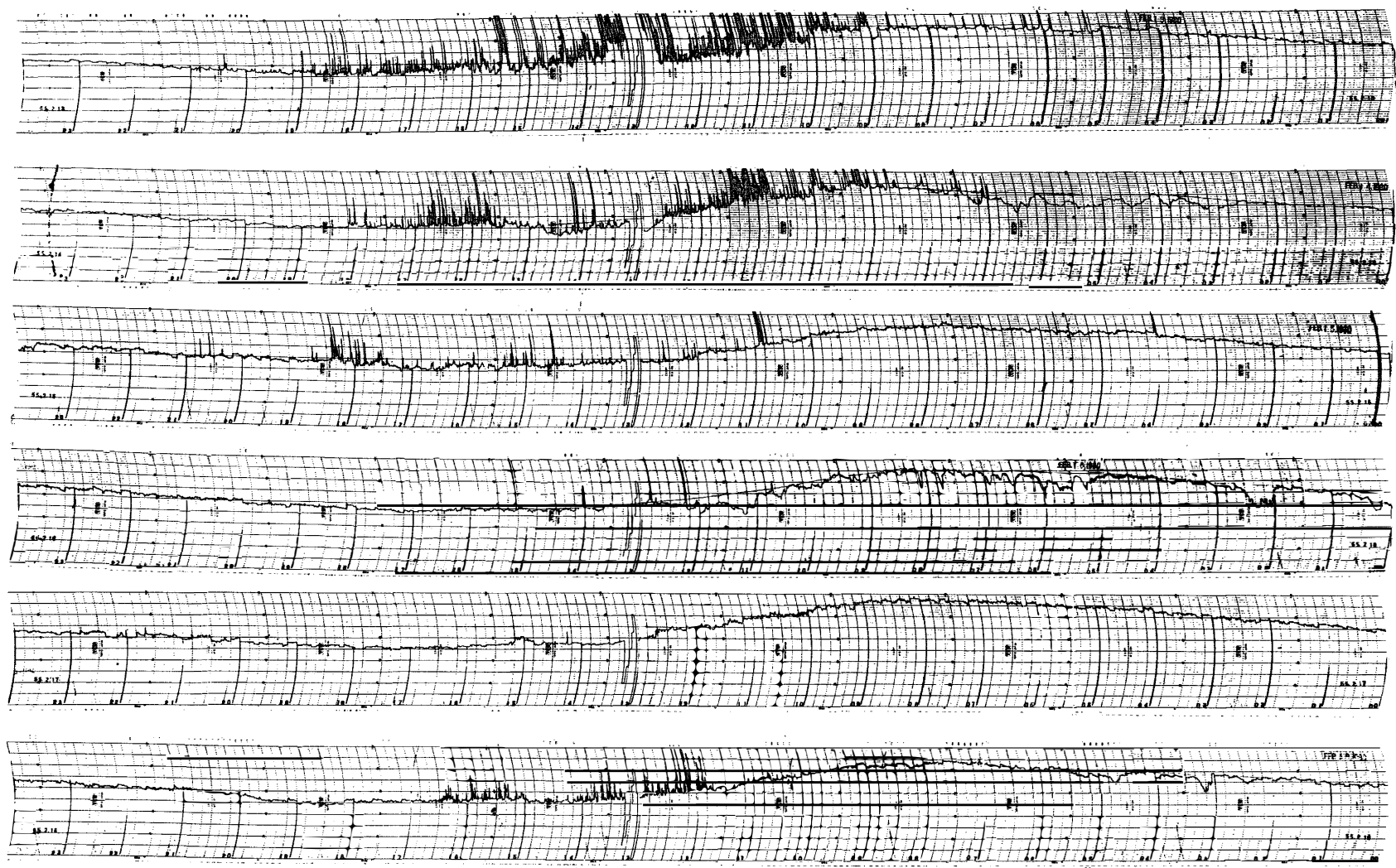
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

FEB 1980

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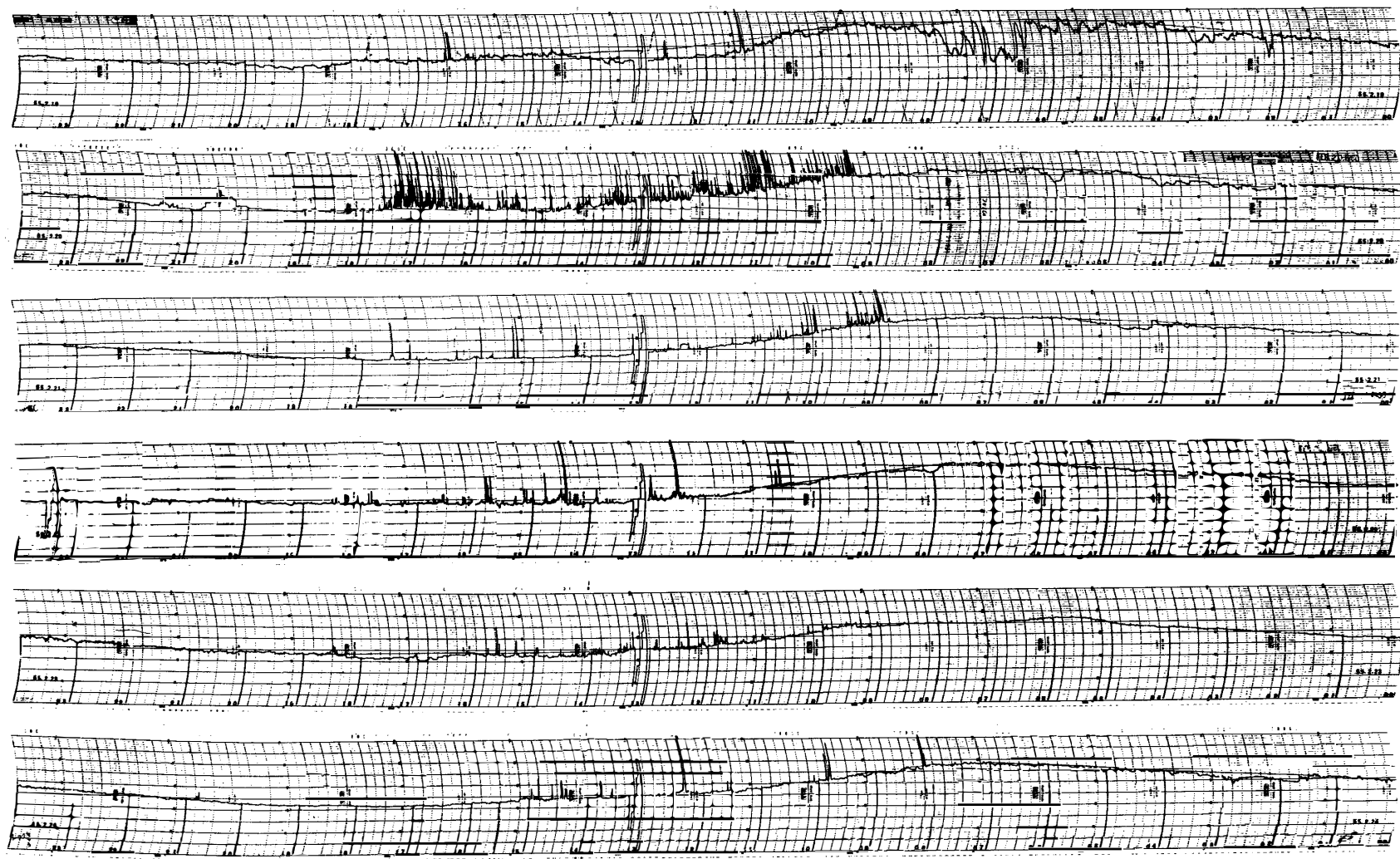
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

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FEB 1980

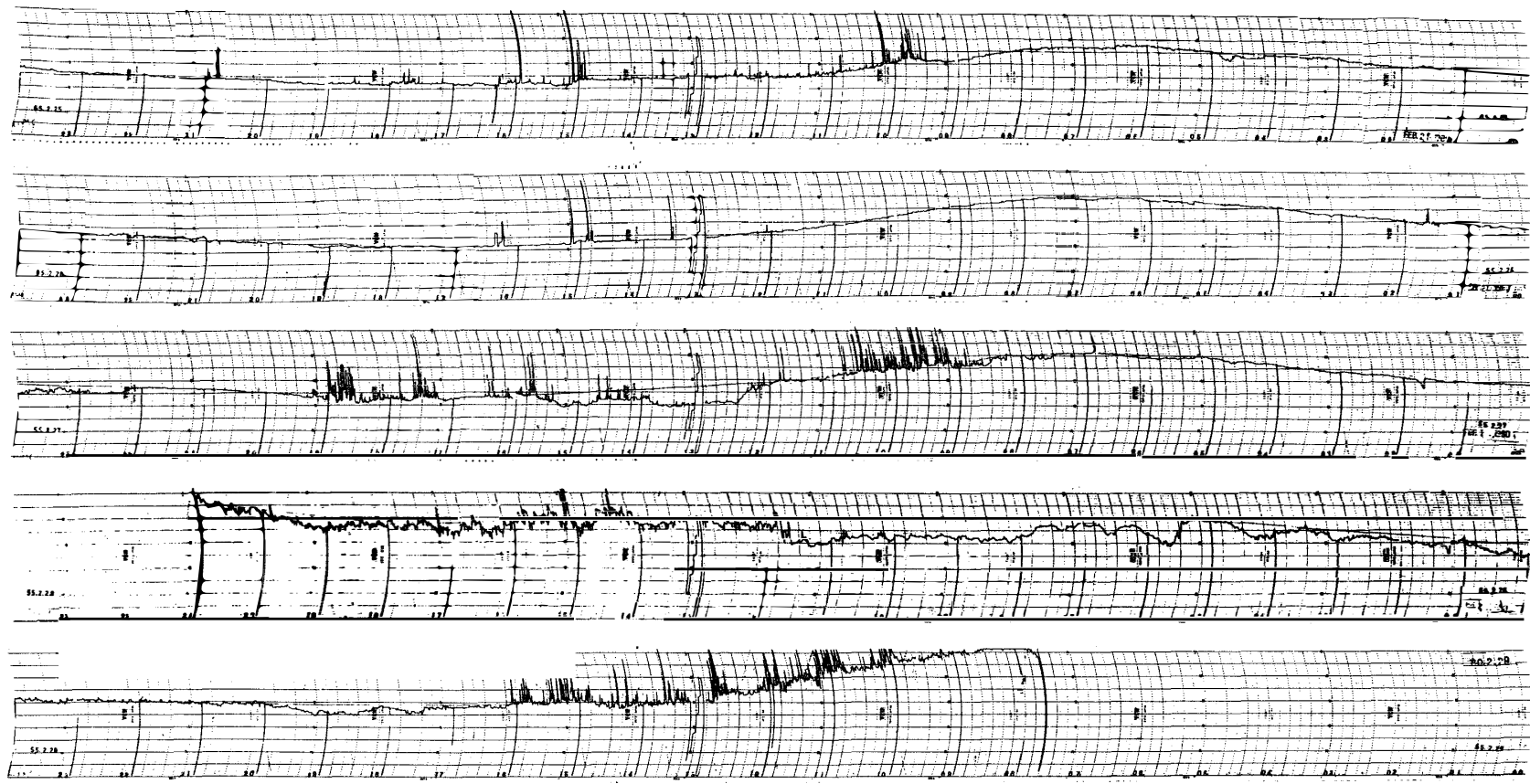


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

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FEB 1980



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

February	5	0620 - 0820	Failure of equipment
	6	1135 -	"
	7	2100	"
	8	1130 - 1330	"
	9	1130 - 2250	"
	28	2100 -	"
	29	0700	"

MAR 1980

1

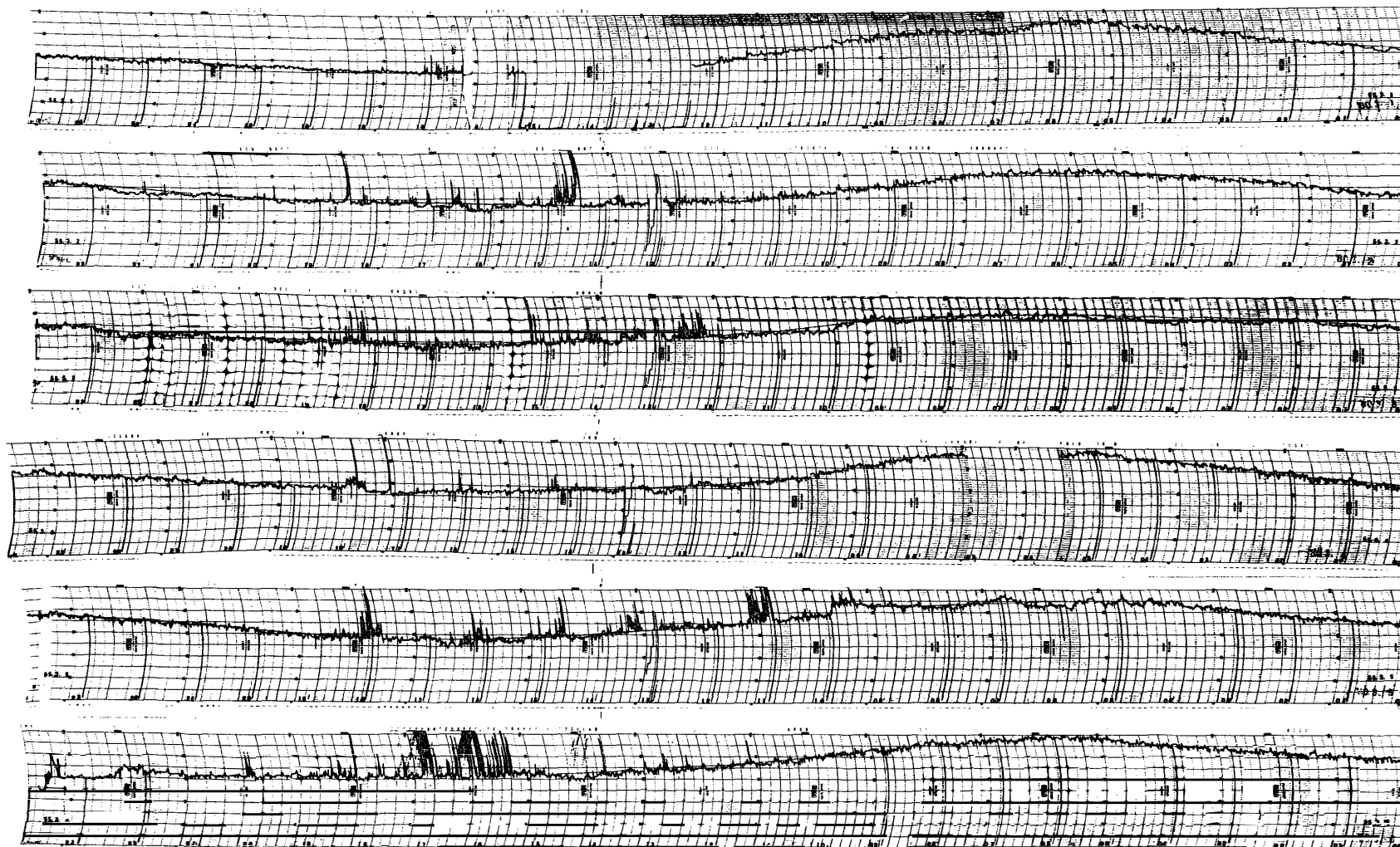
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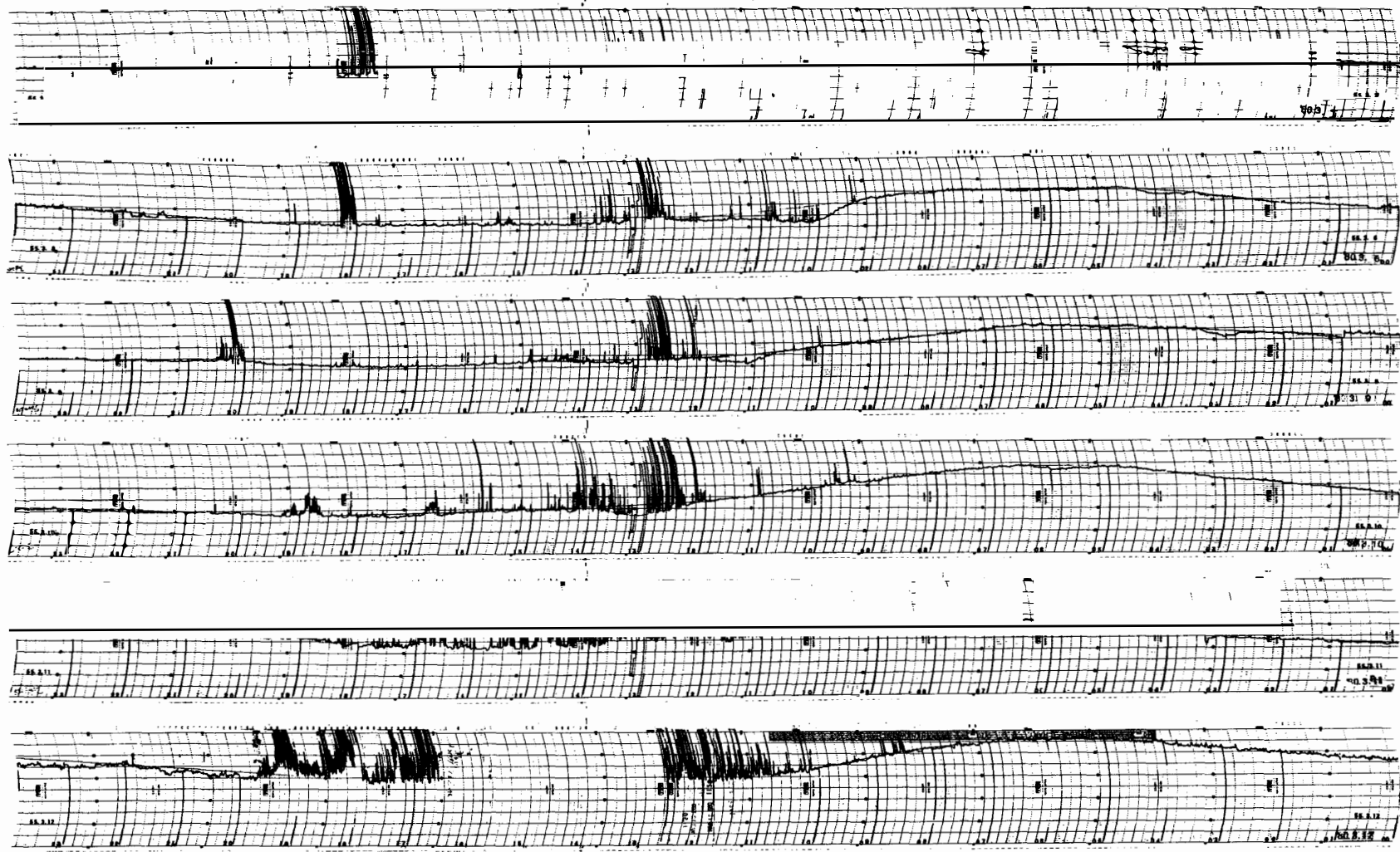
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAR 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAR 1980

13

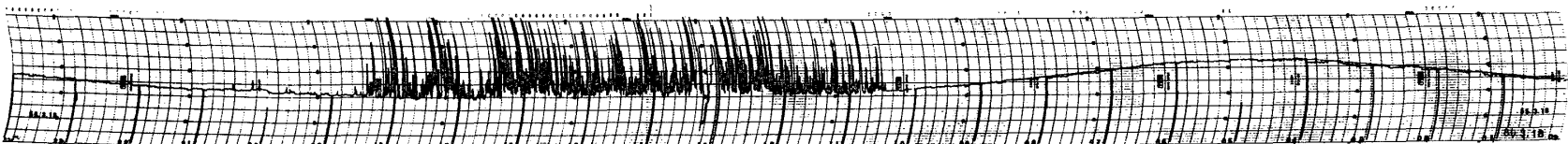
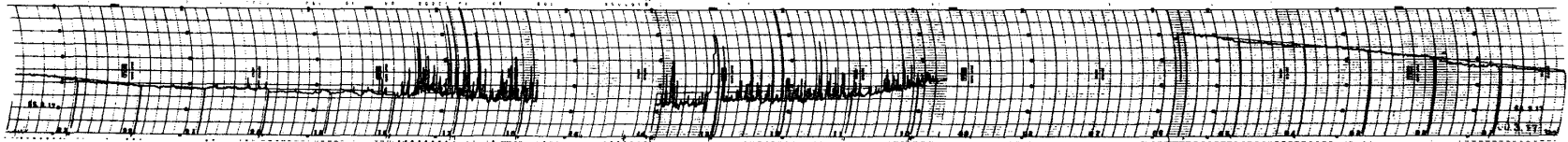
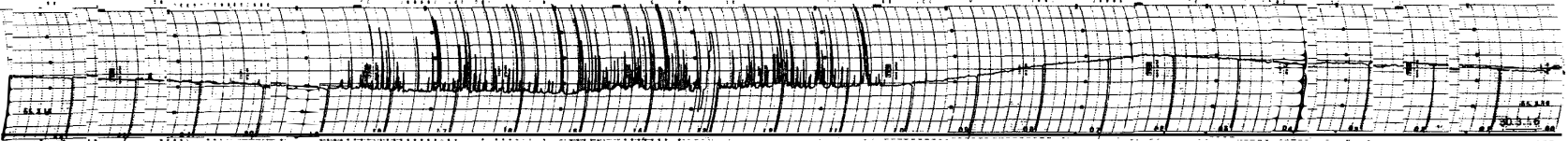
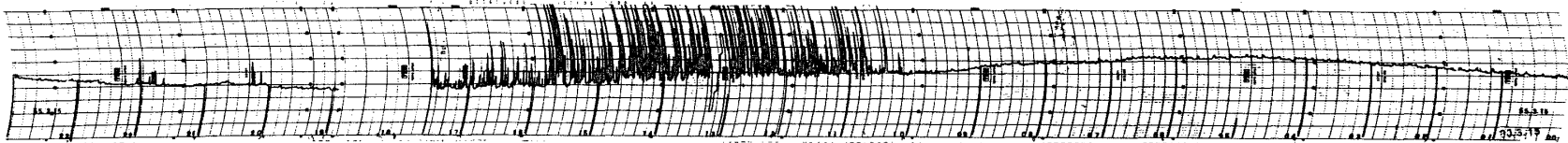
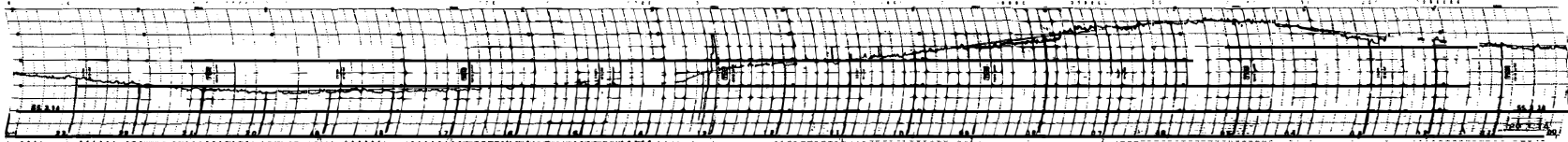
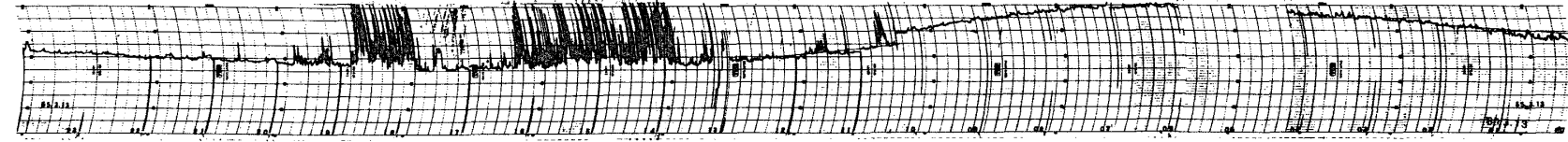
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAR 1980

19

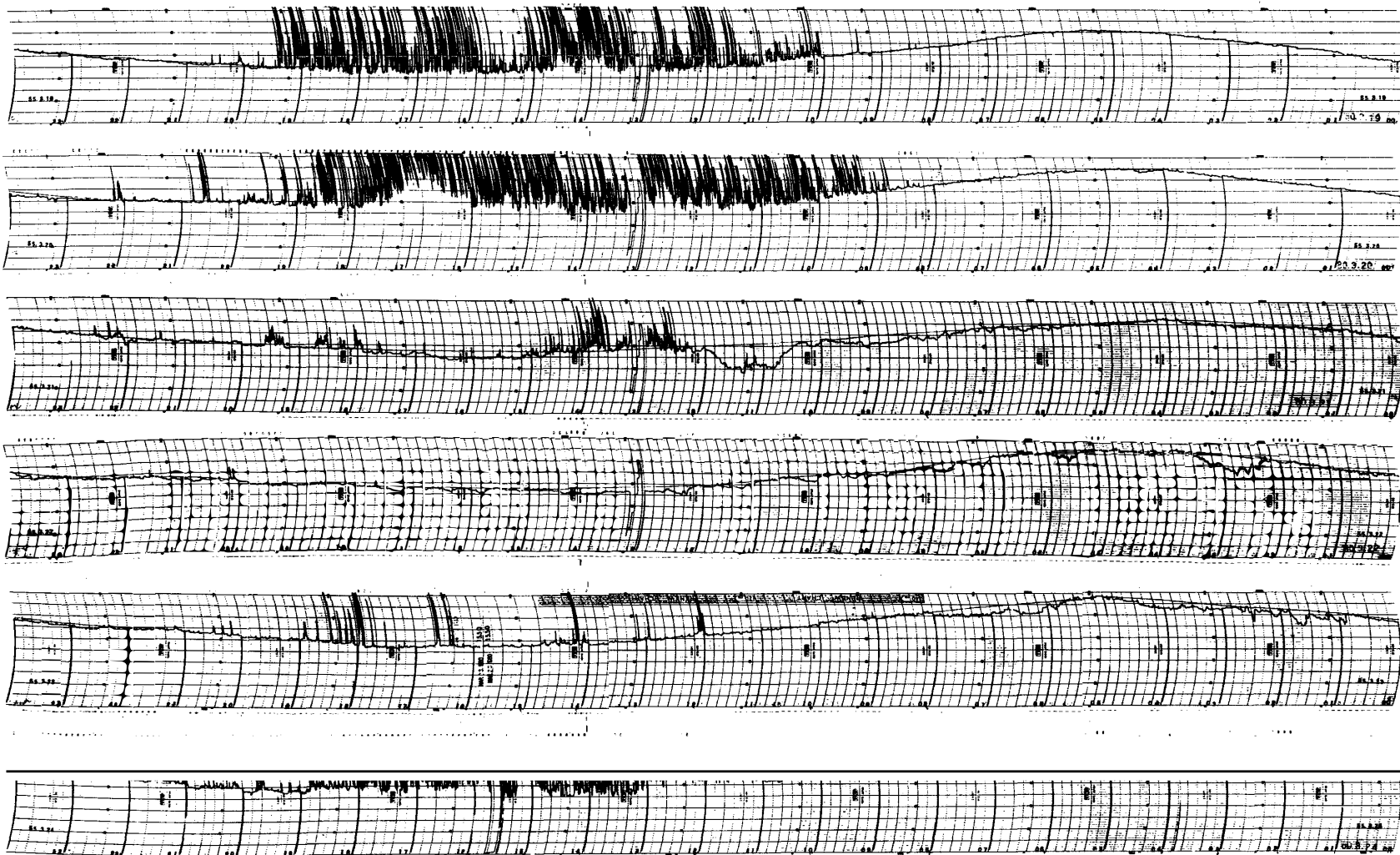
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAR 1980

25

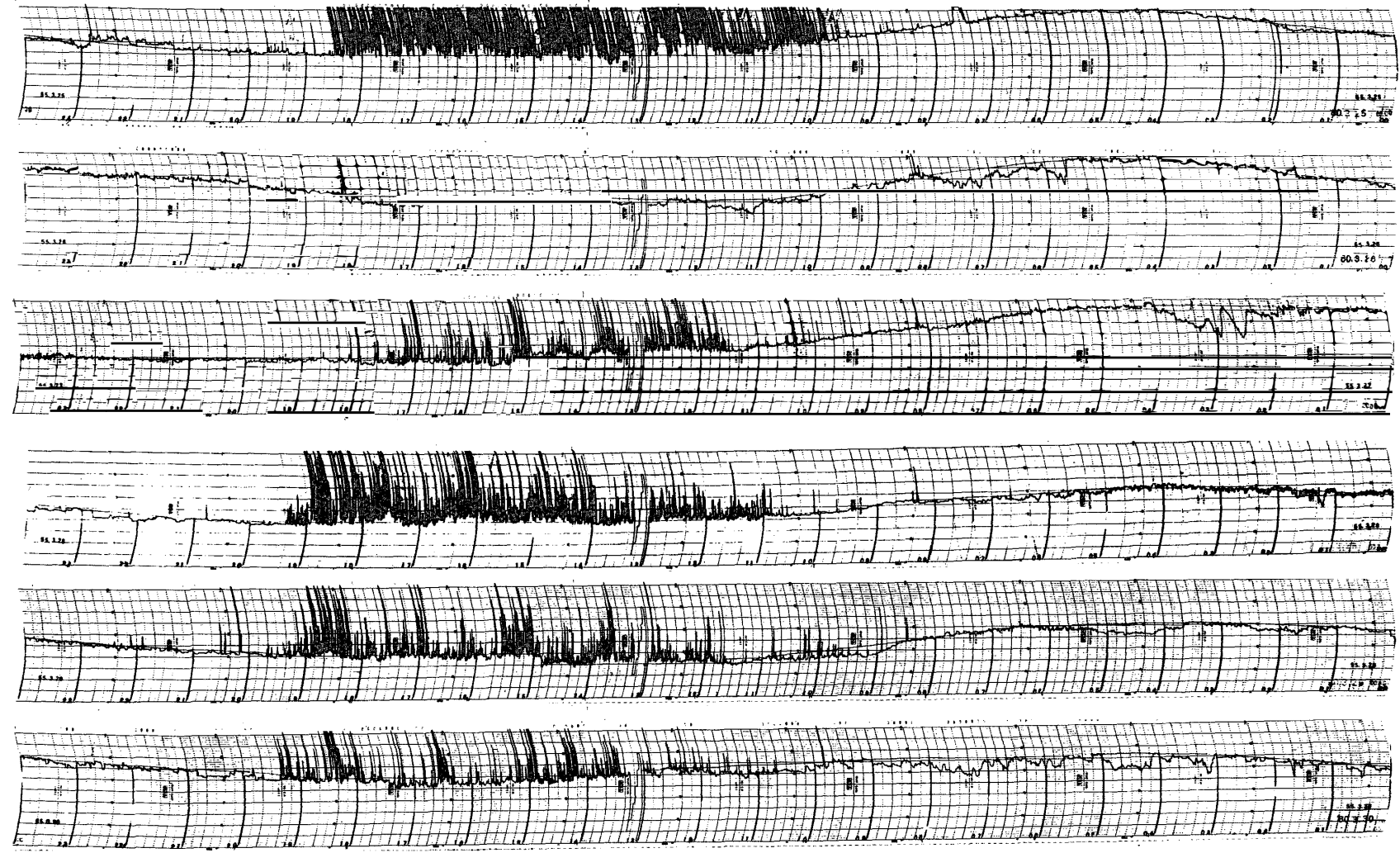
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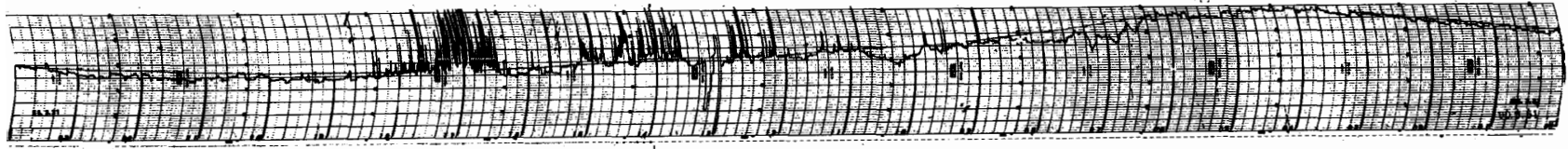
30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

MAR 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

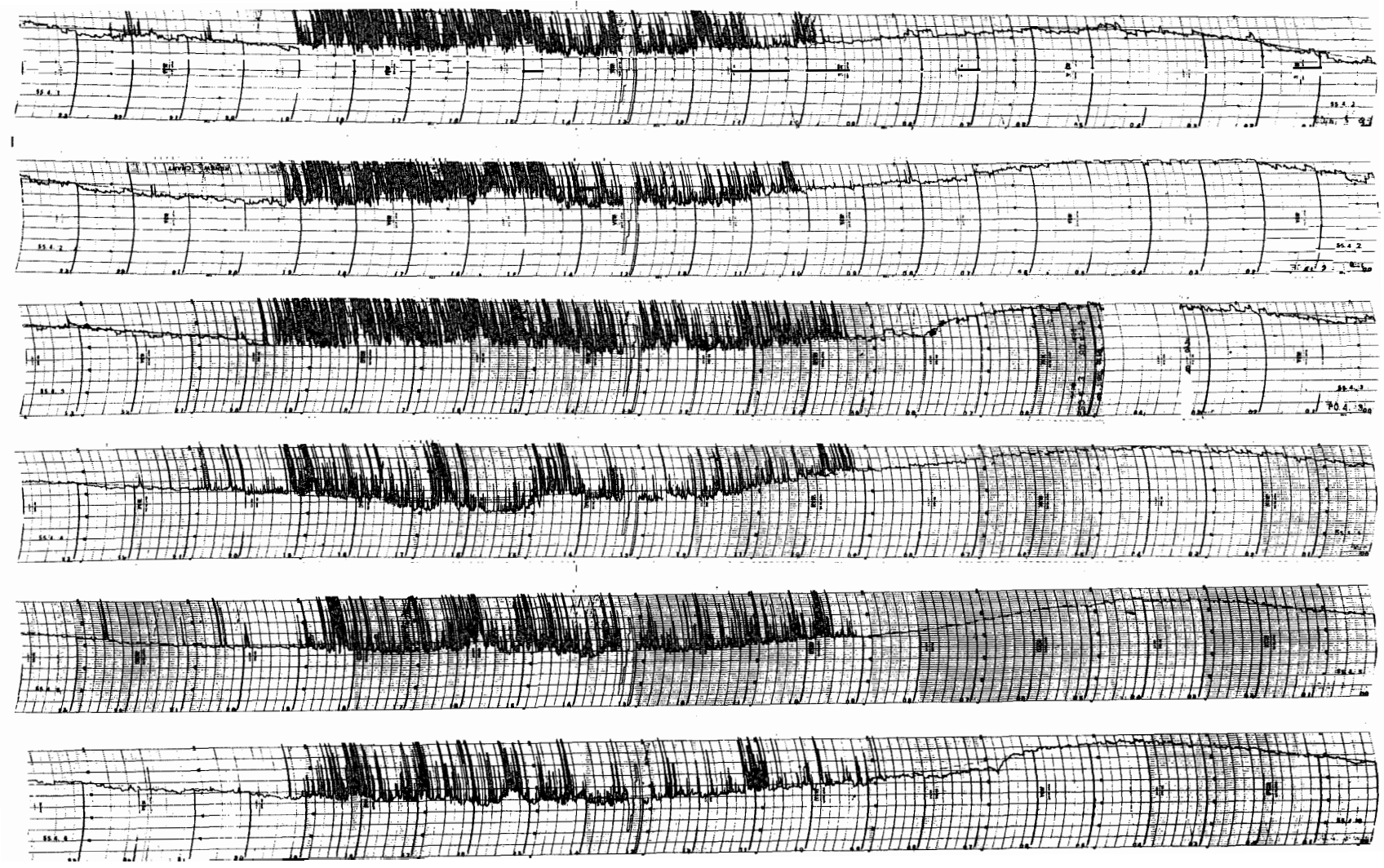
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

March	1	1228 - 1600	Failure of equipment
	4	0537 - 0710	"
	12	1237 - 1640	"
	13	0410 - 0558	"
	15	1730 - 1858	"
	17	0558 - 0930	"
	17	1348 - 1550	"

APR 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

APR 1980

7

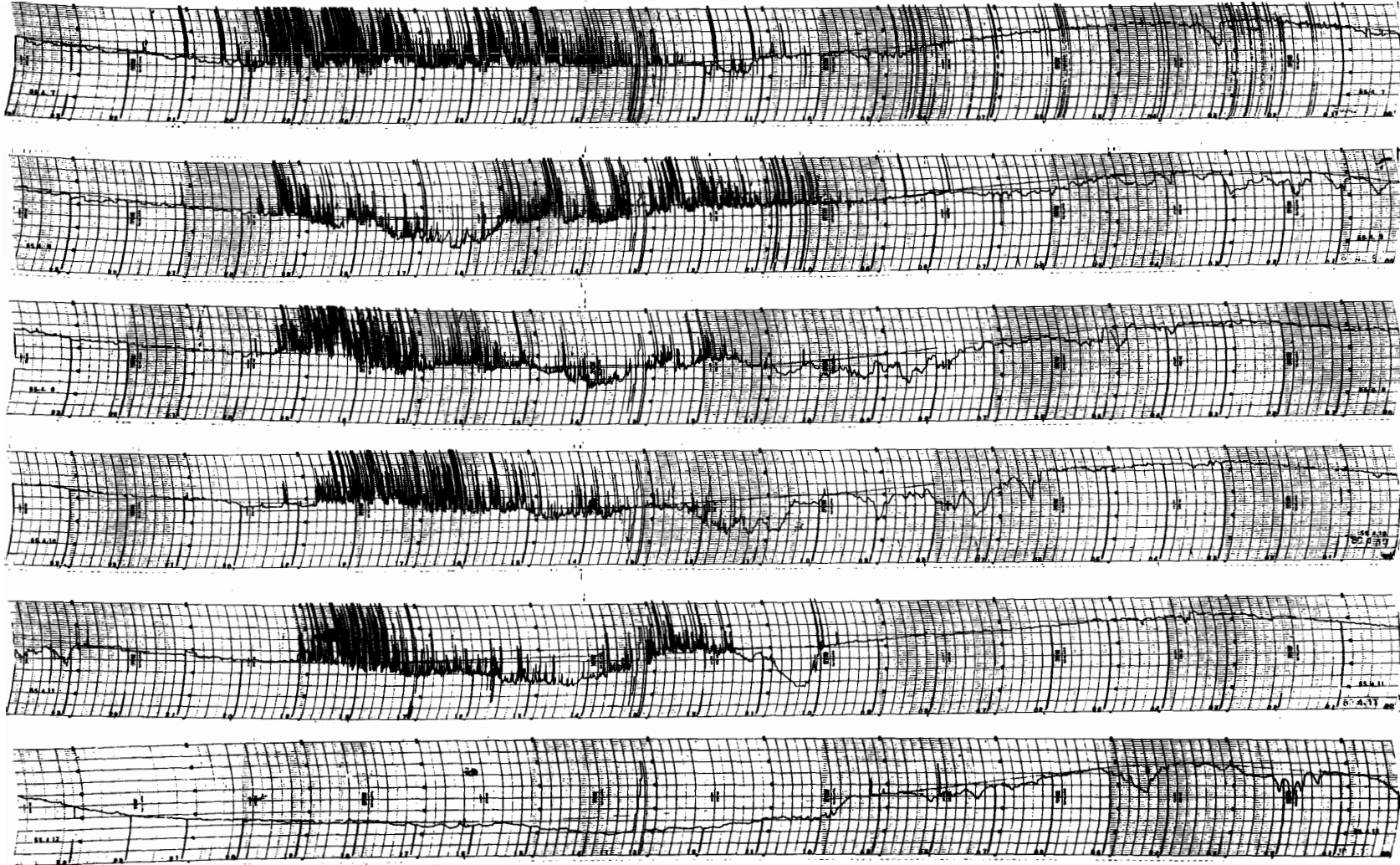
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

APR 1980

13

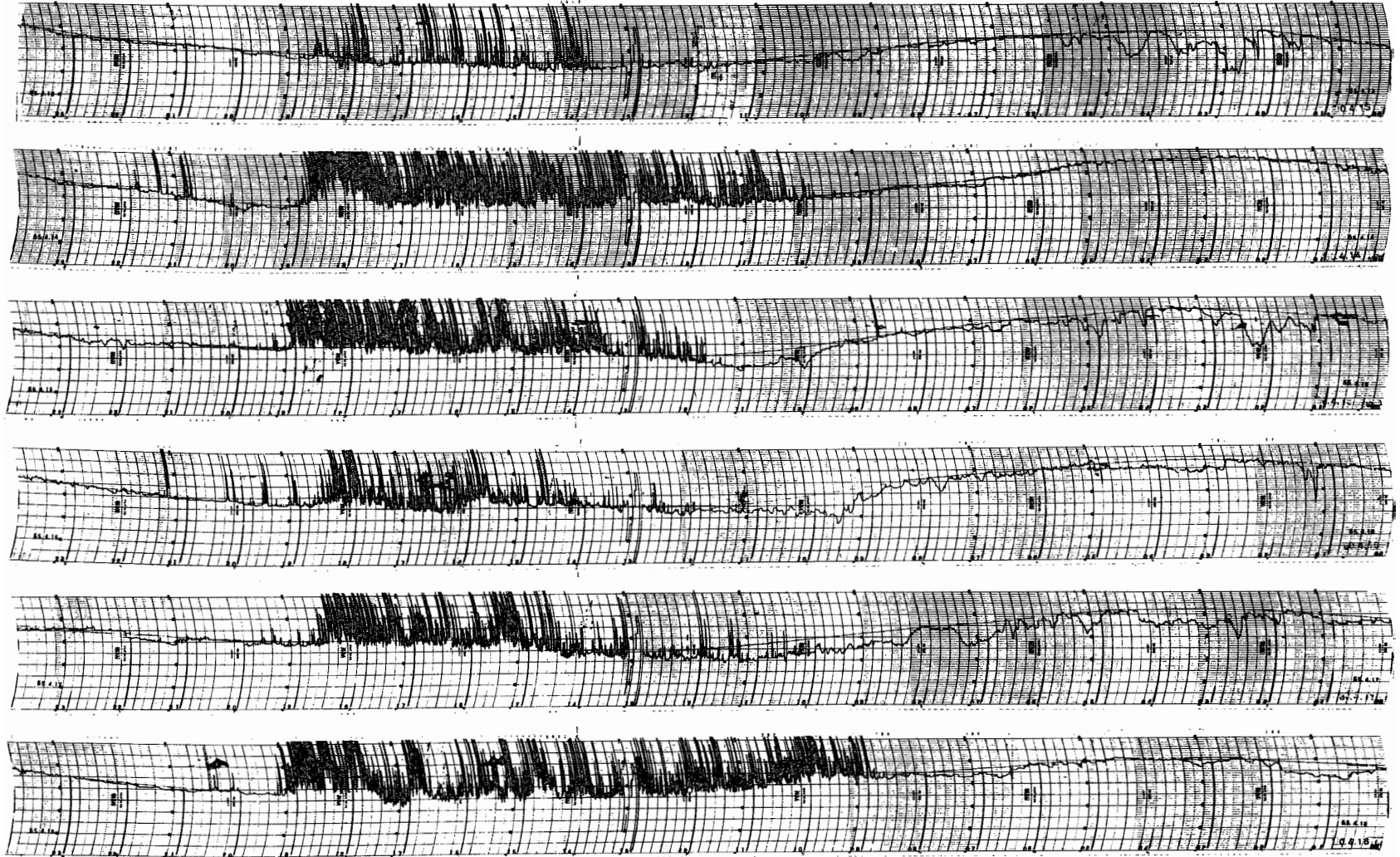
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 APR 1980

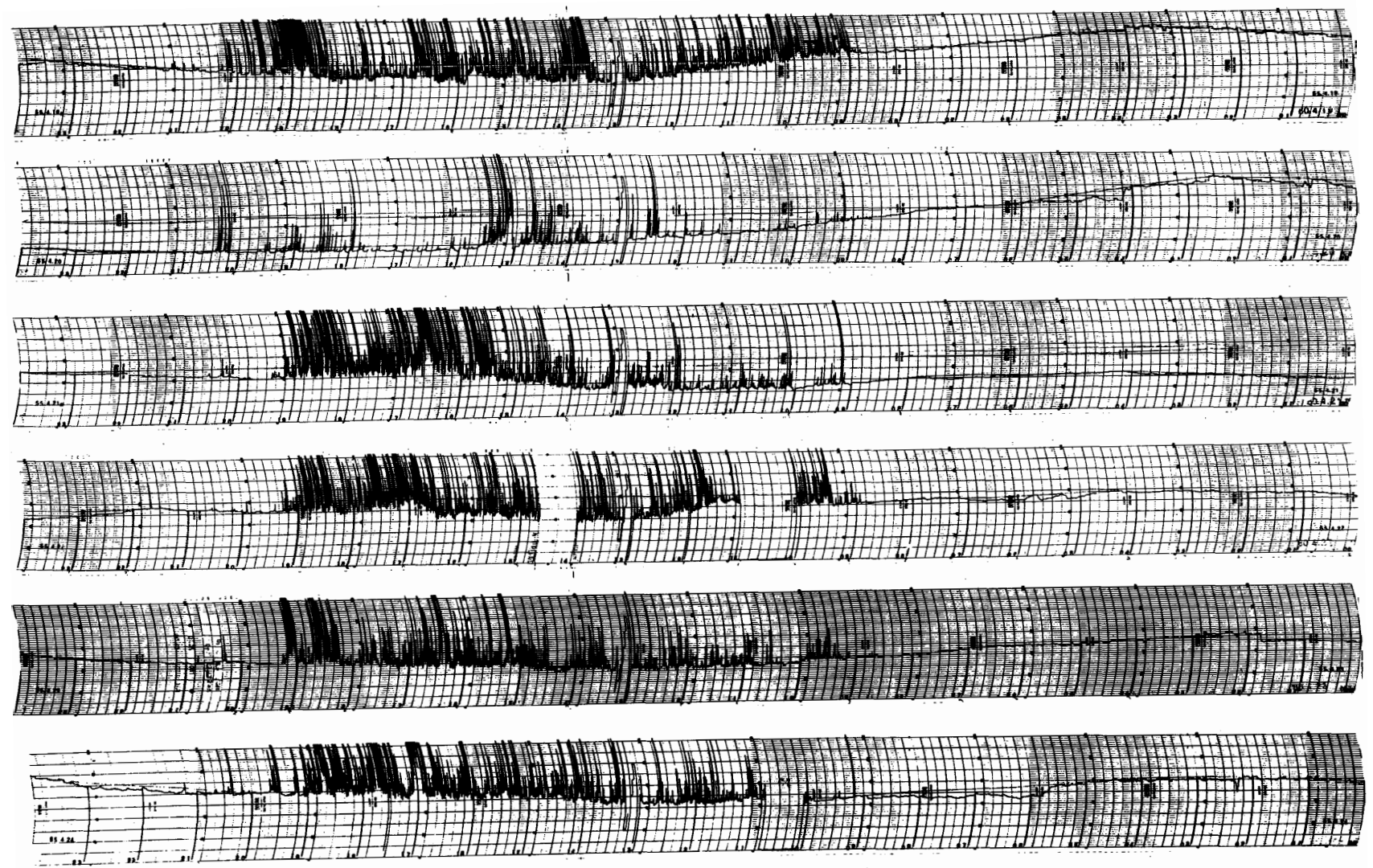
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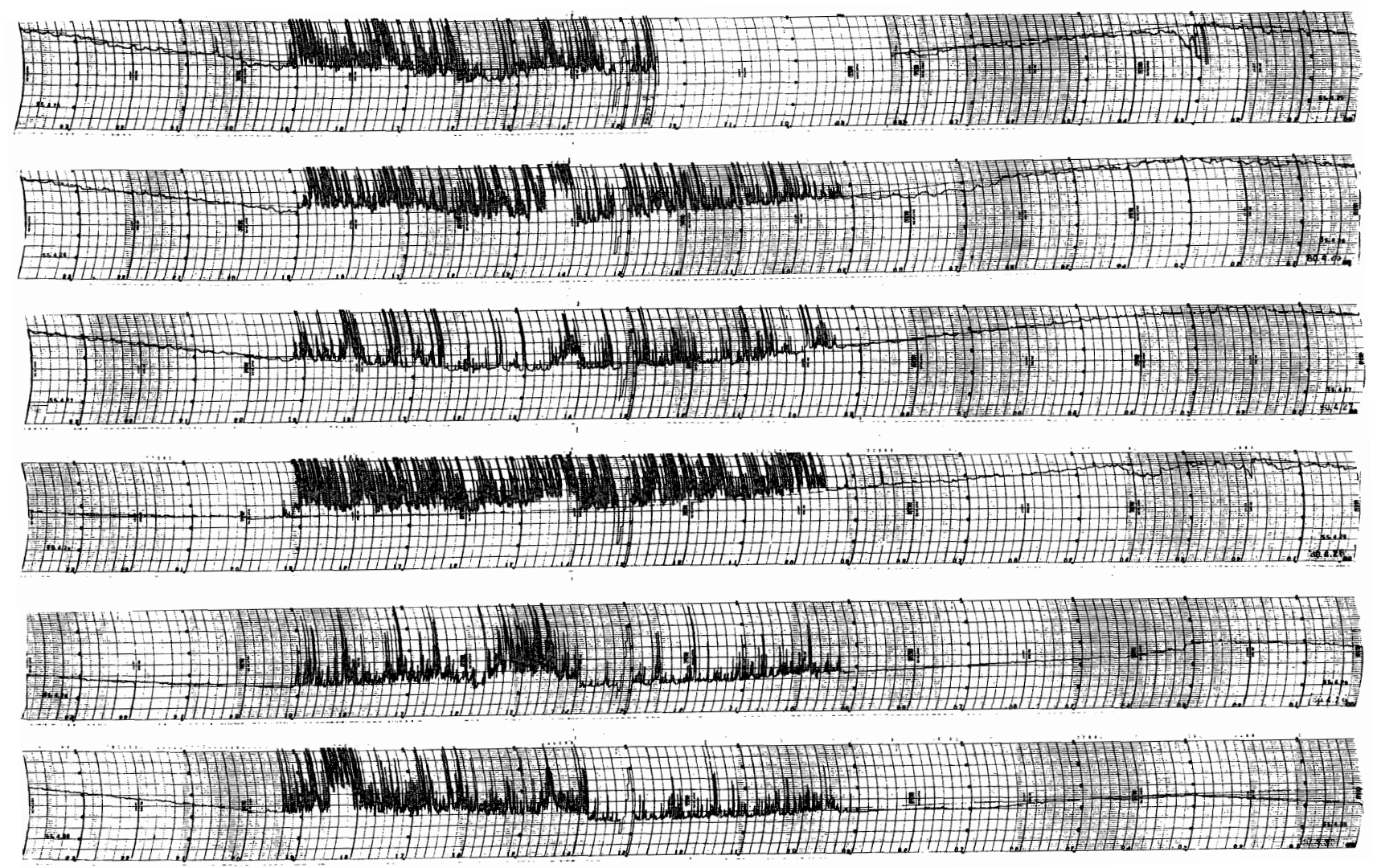


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

25 APR 1980
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

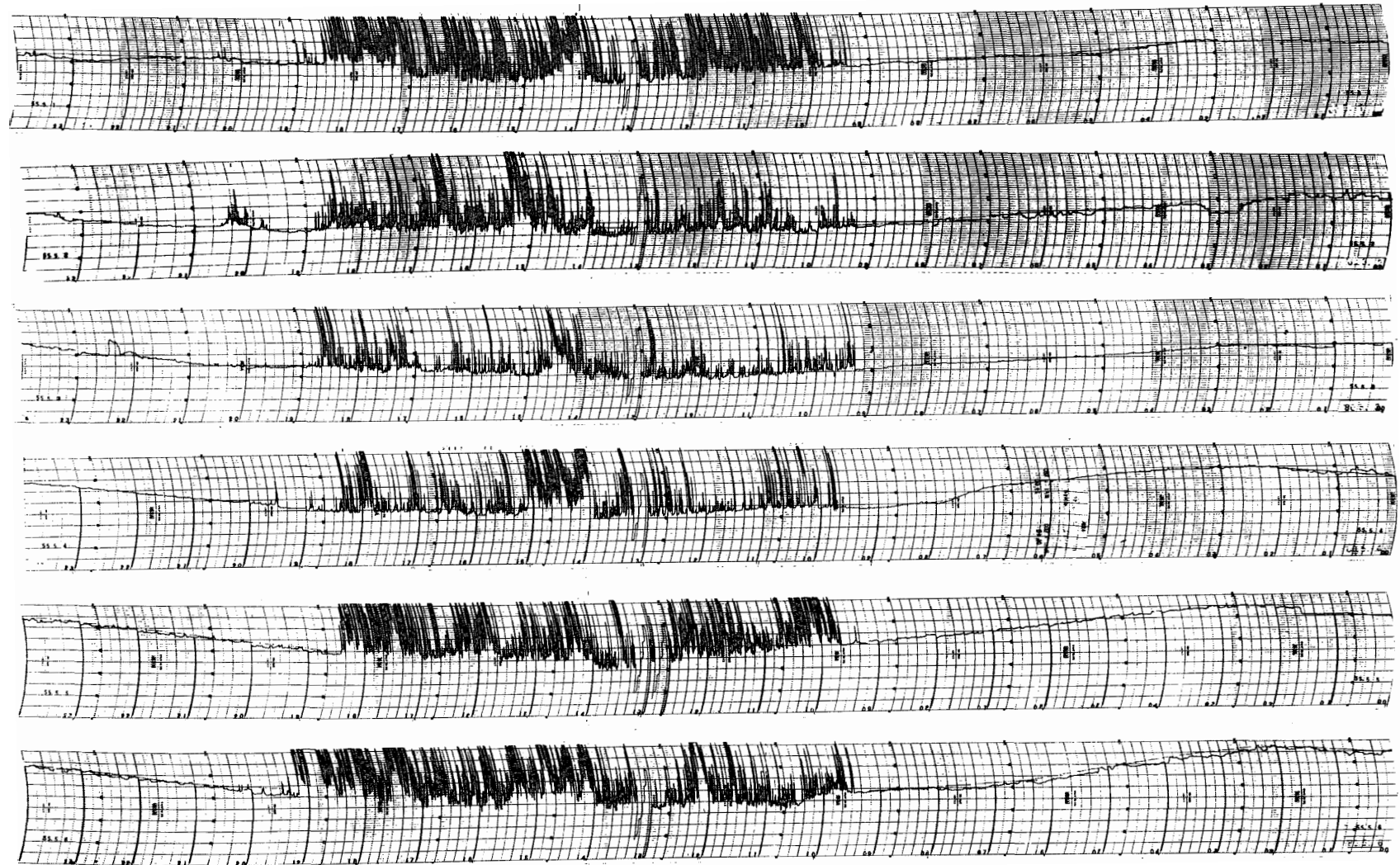
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

April	3	0320 - 0445	Failure of equipment
	22	1005 - 1105	"
	25	0820 - 1200	"

MAY 1980

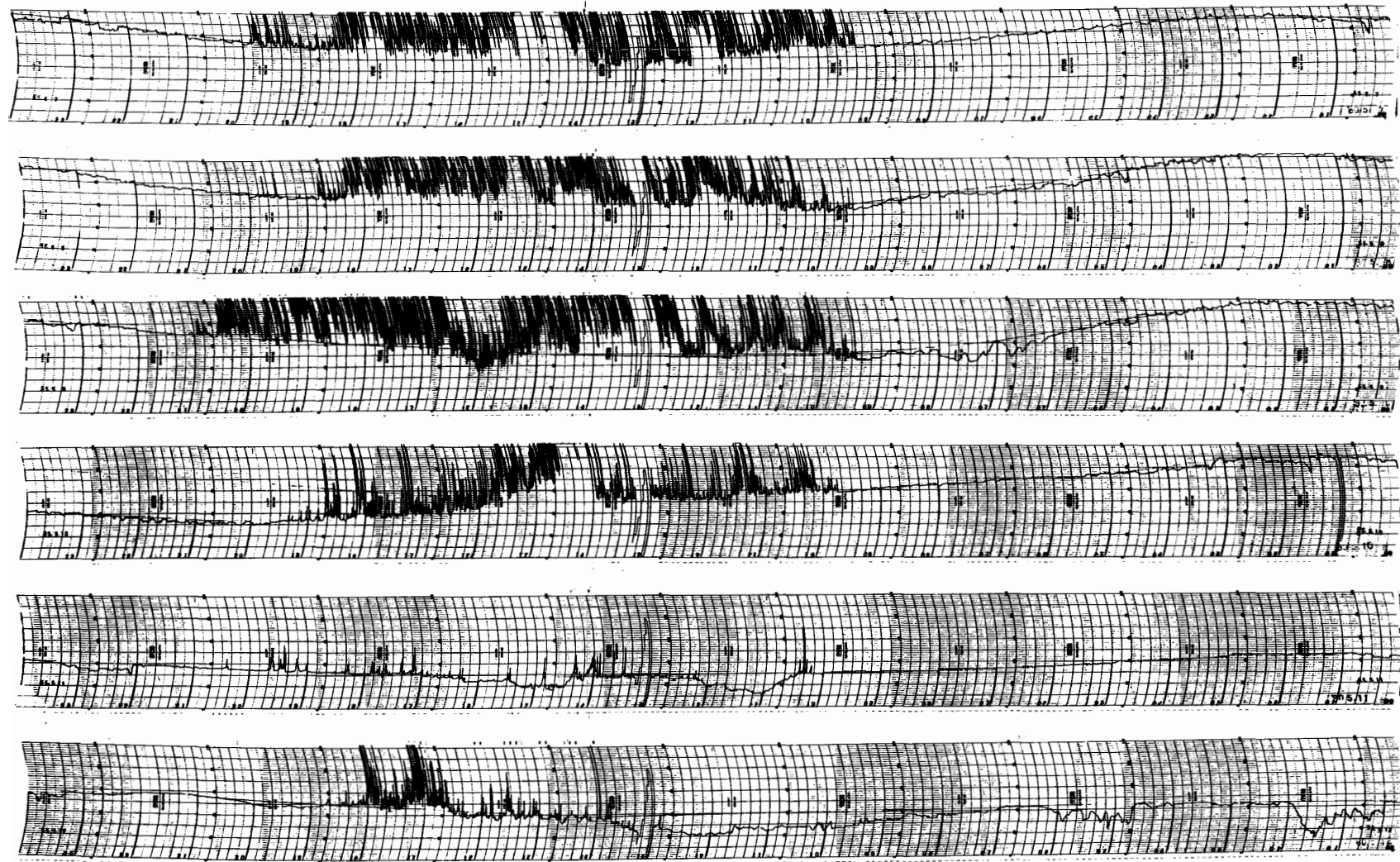
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



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MAY 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAY 1980

13

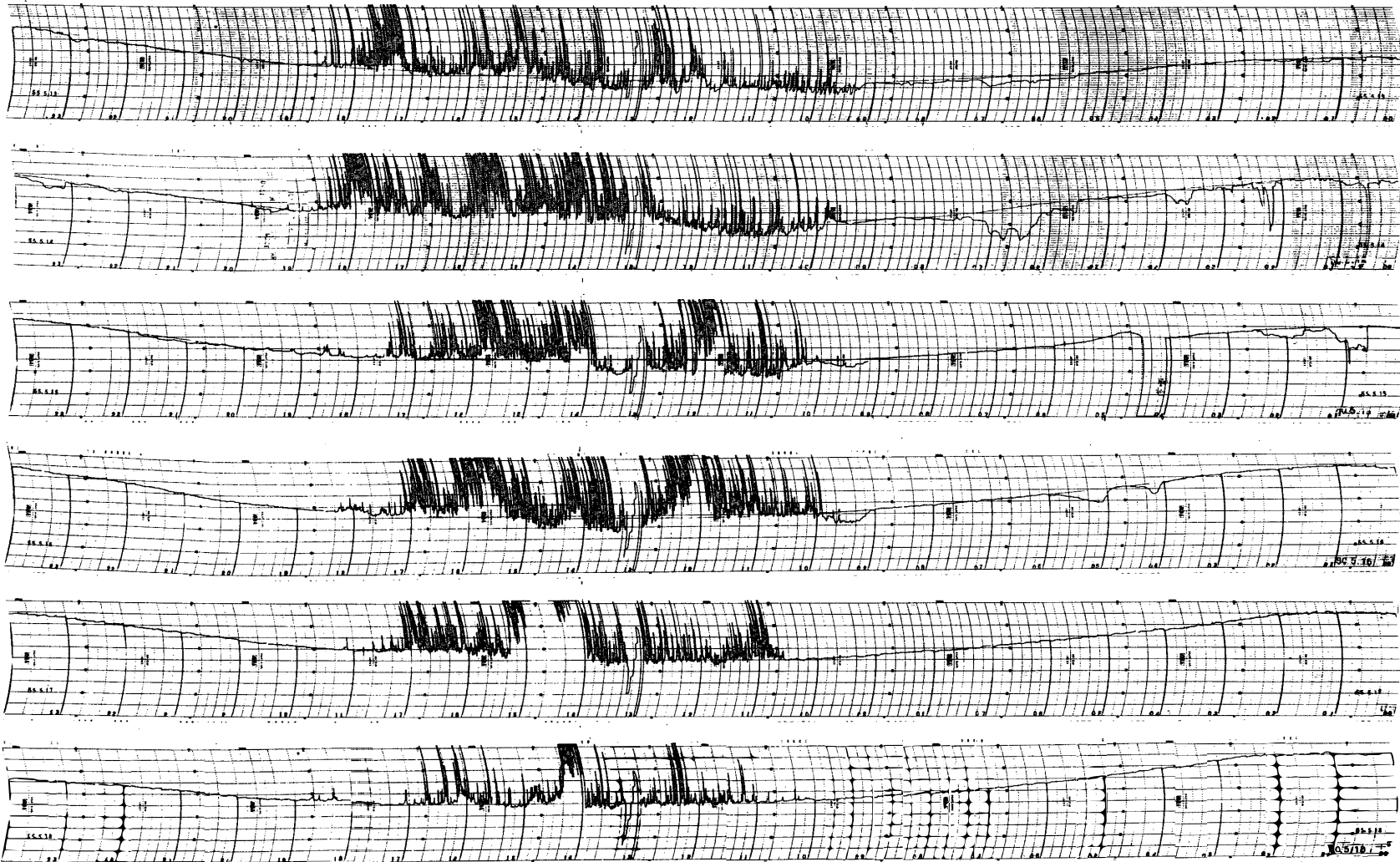
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAY 1980

19

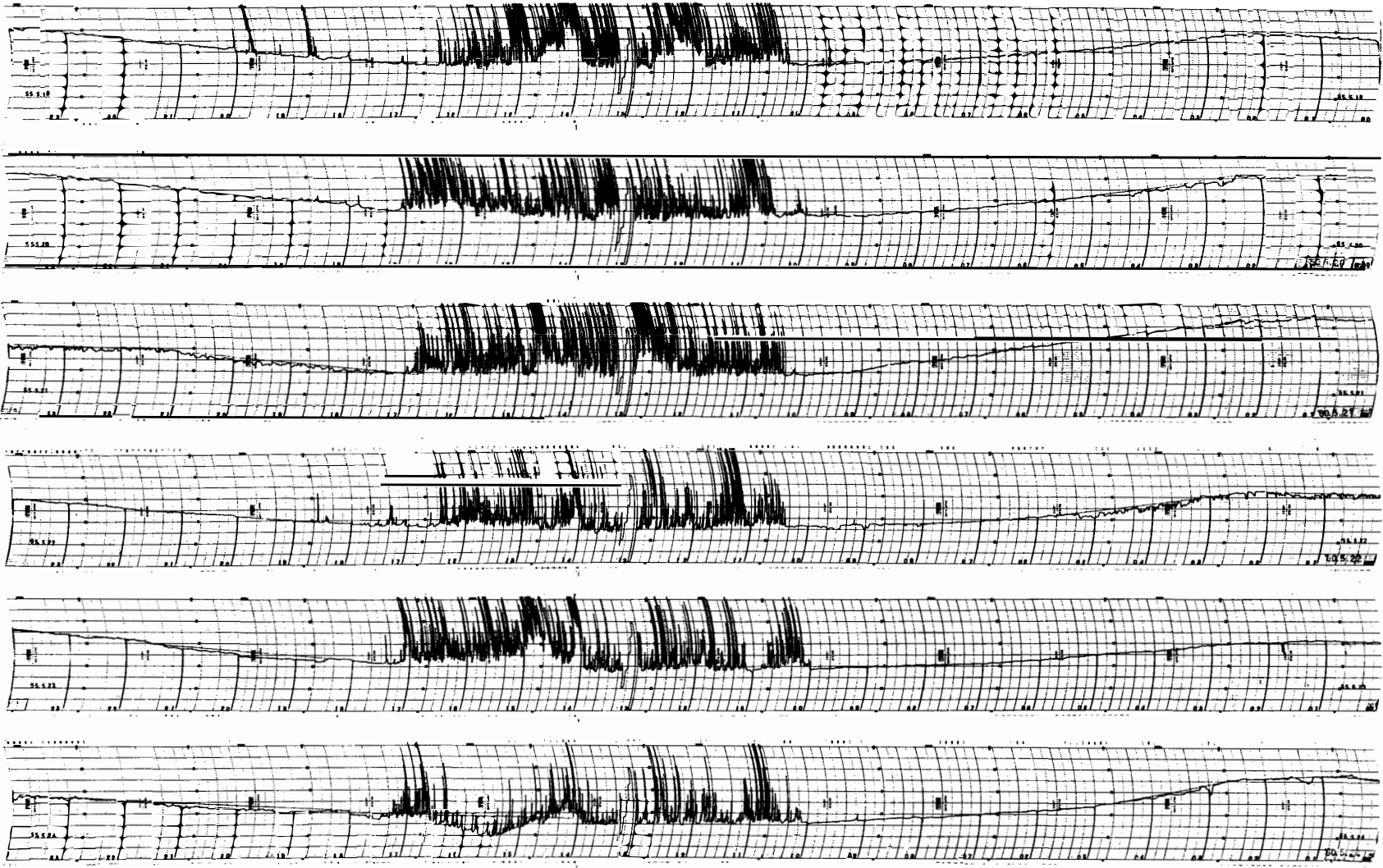
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAY 1980

25

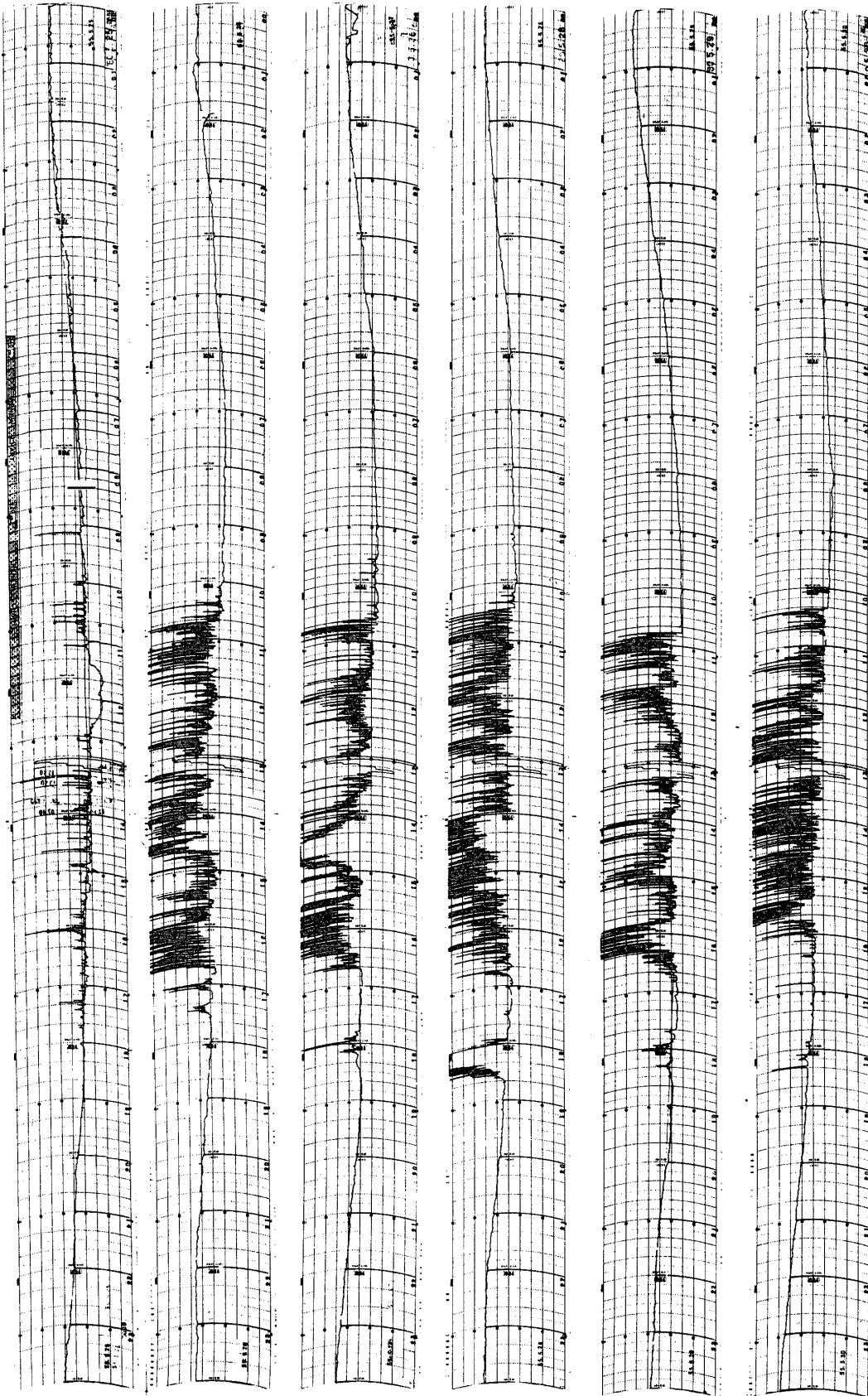
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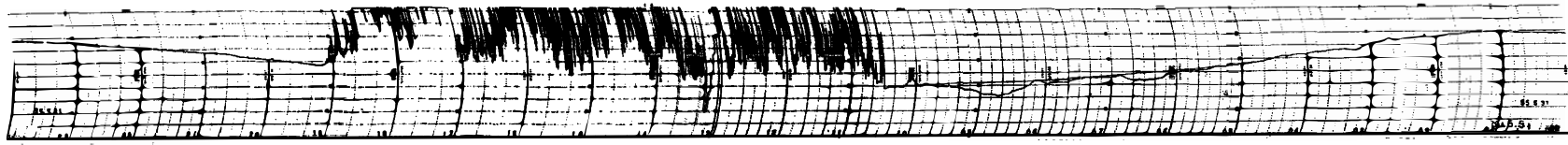
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



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MAY 1980

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45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JUNE 1980

1

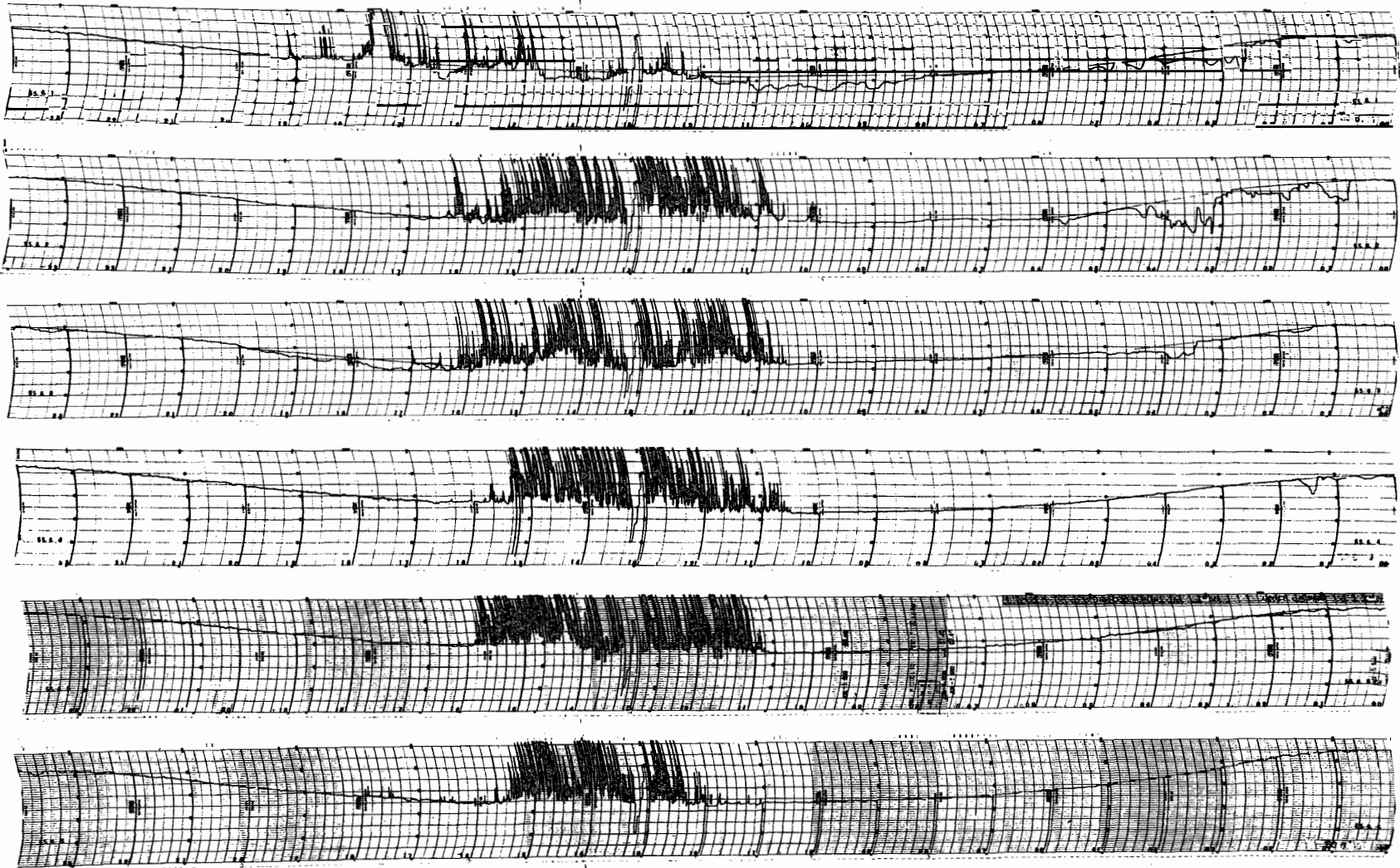
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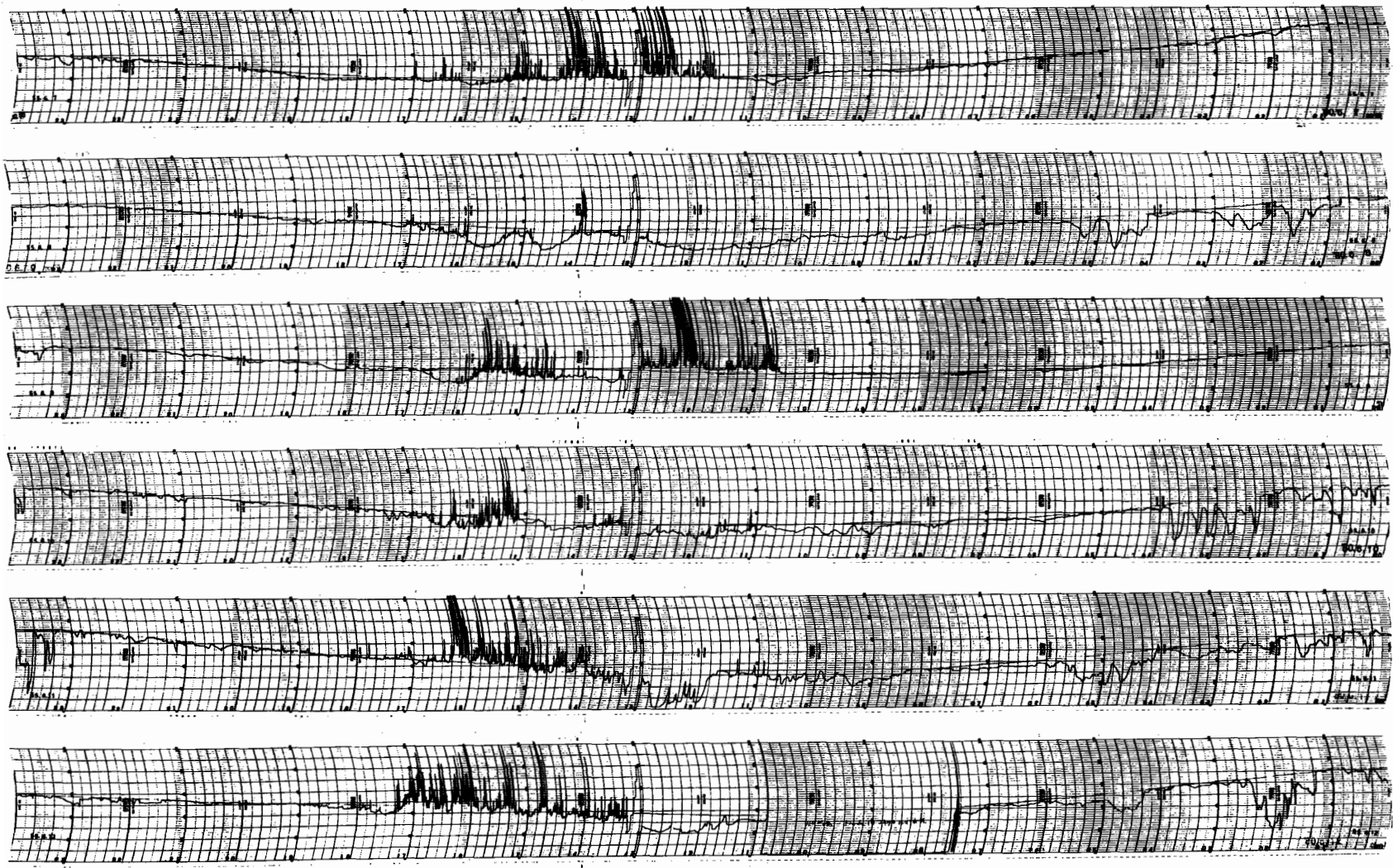


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JUNE 1980
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JUNE 1980

13

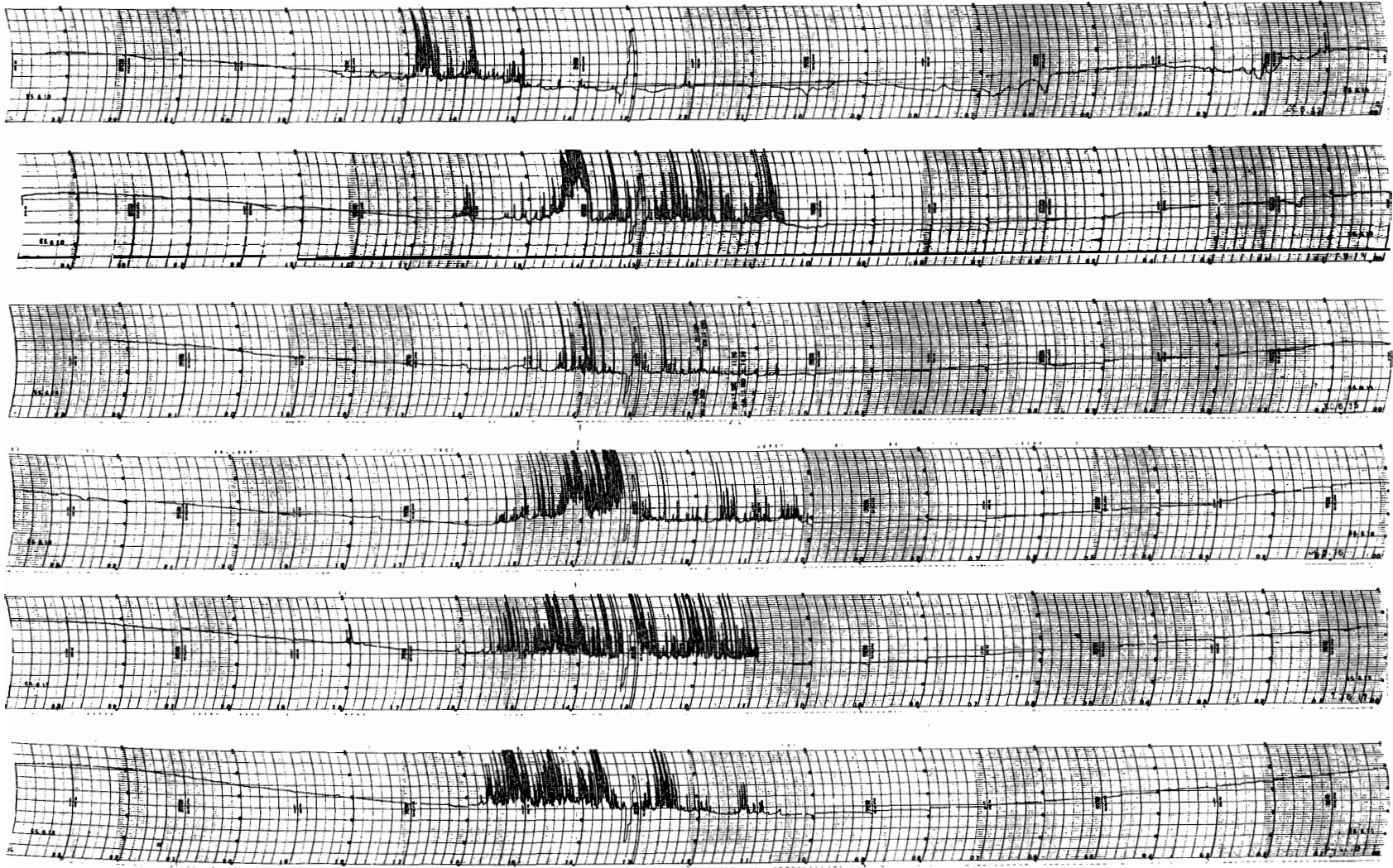
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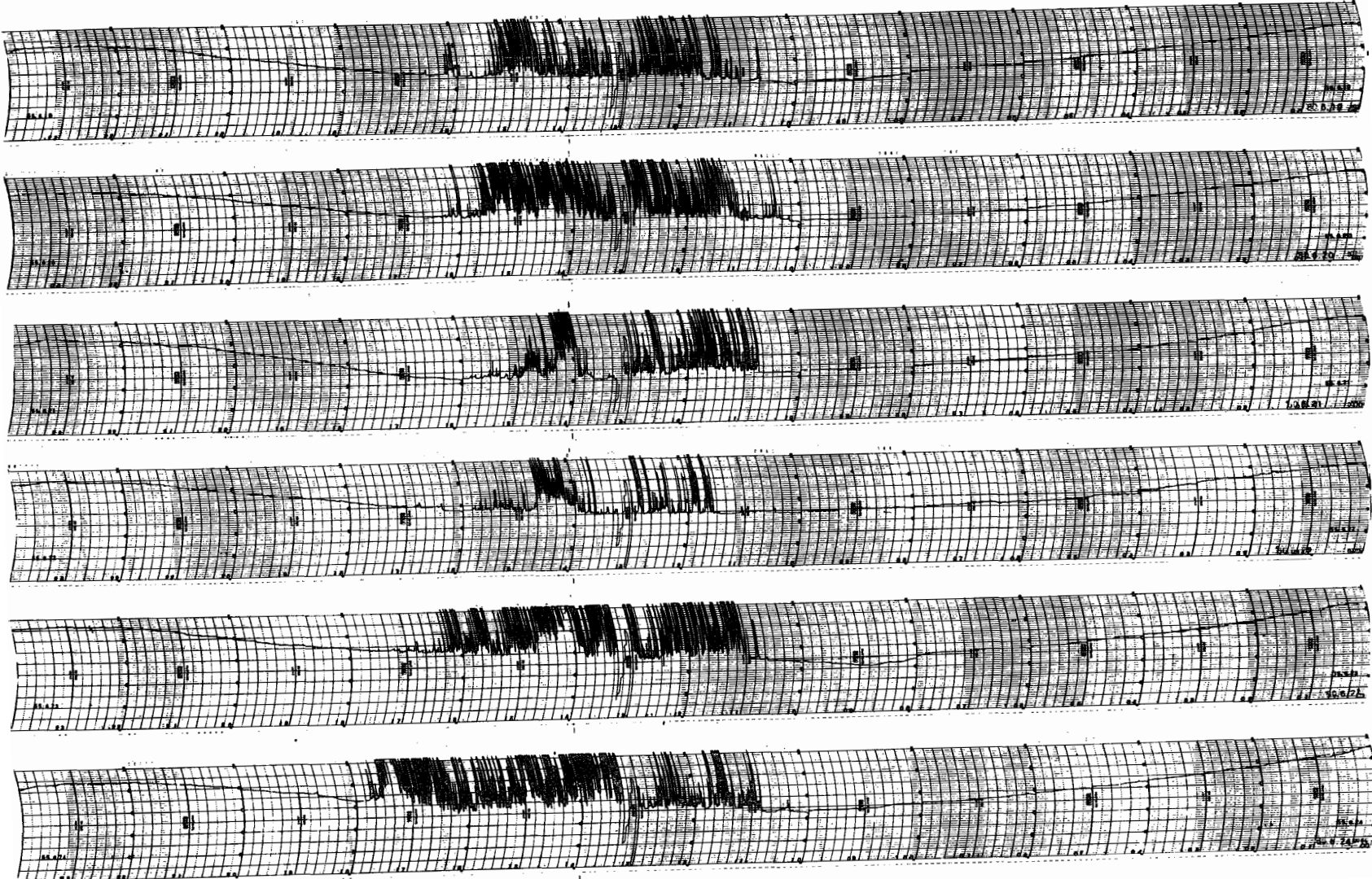


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JUNE 1980
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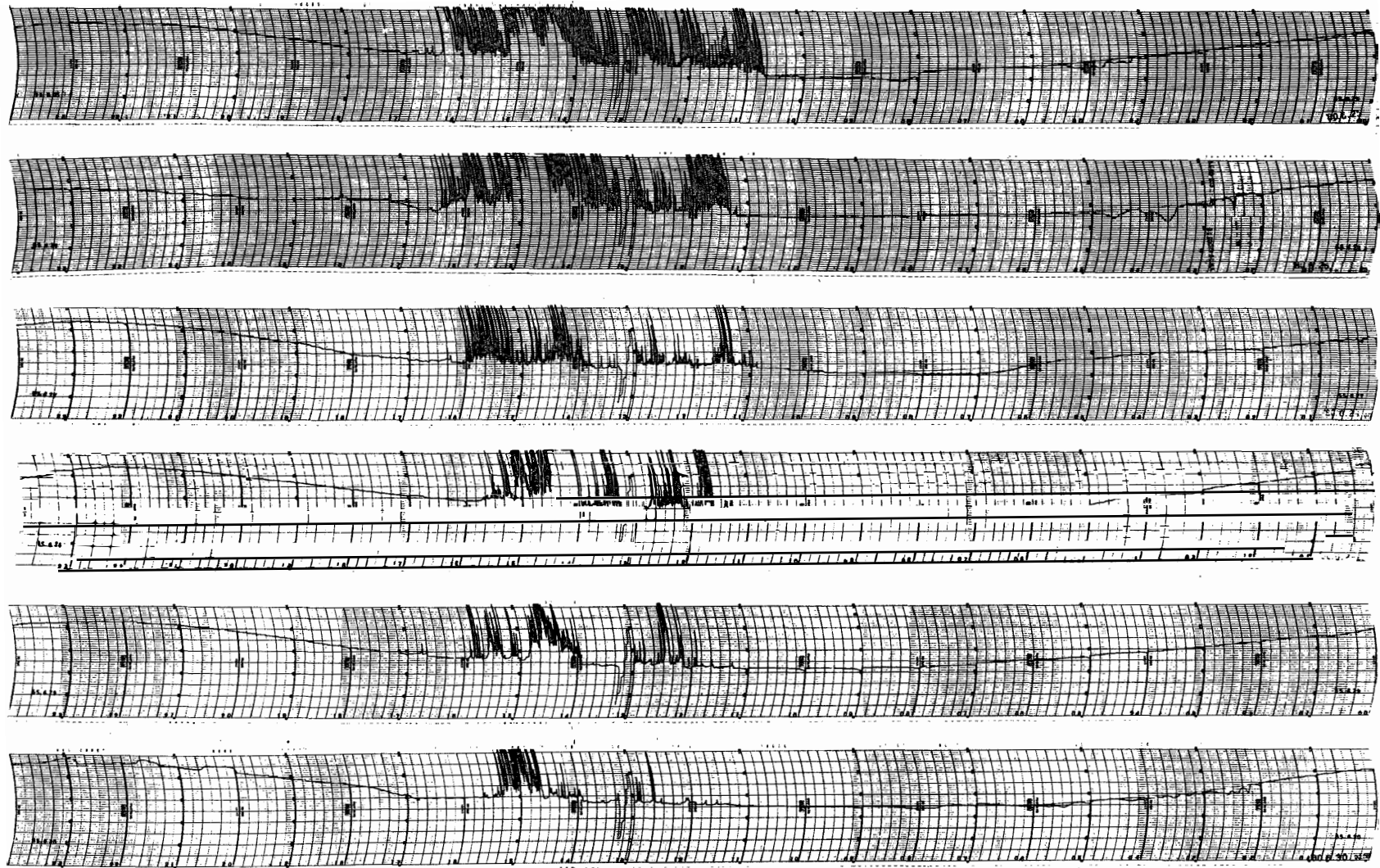
—59—

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JUNE 1980
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

June 12 0732 - 1050 Failure of equipment

JULY 1980

1

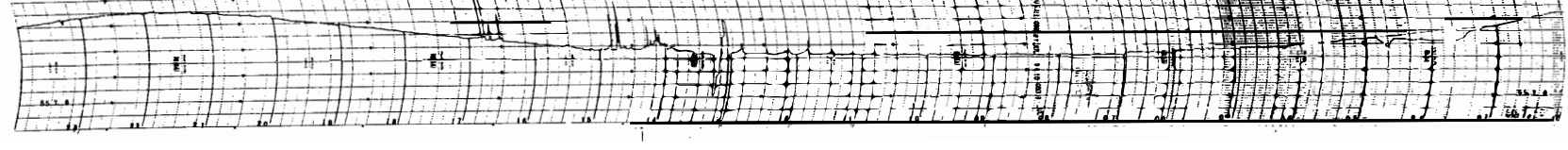
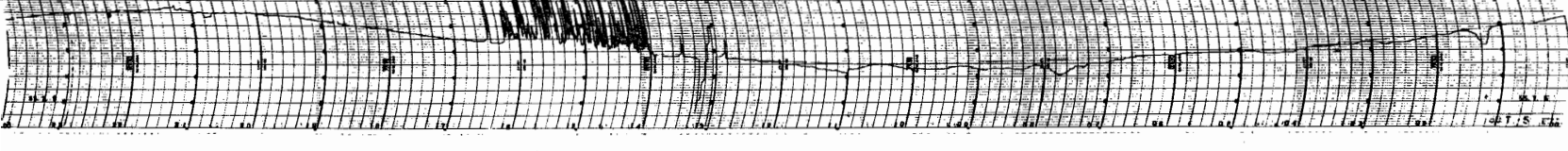
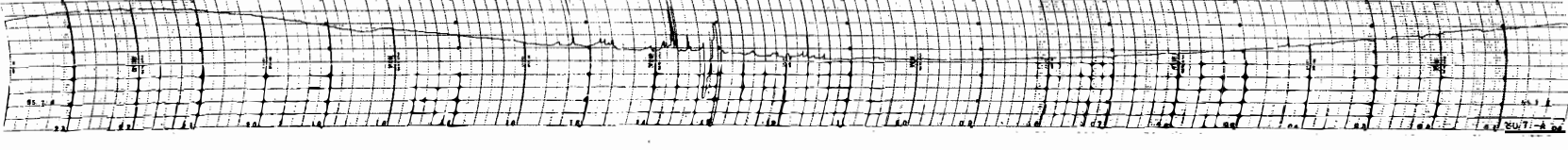
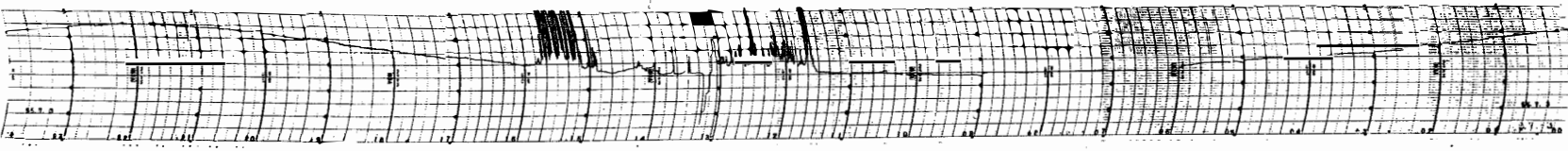
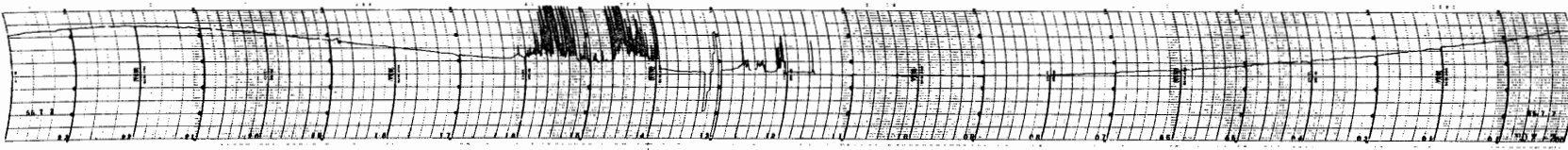
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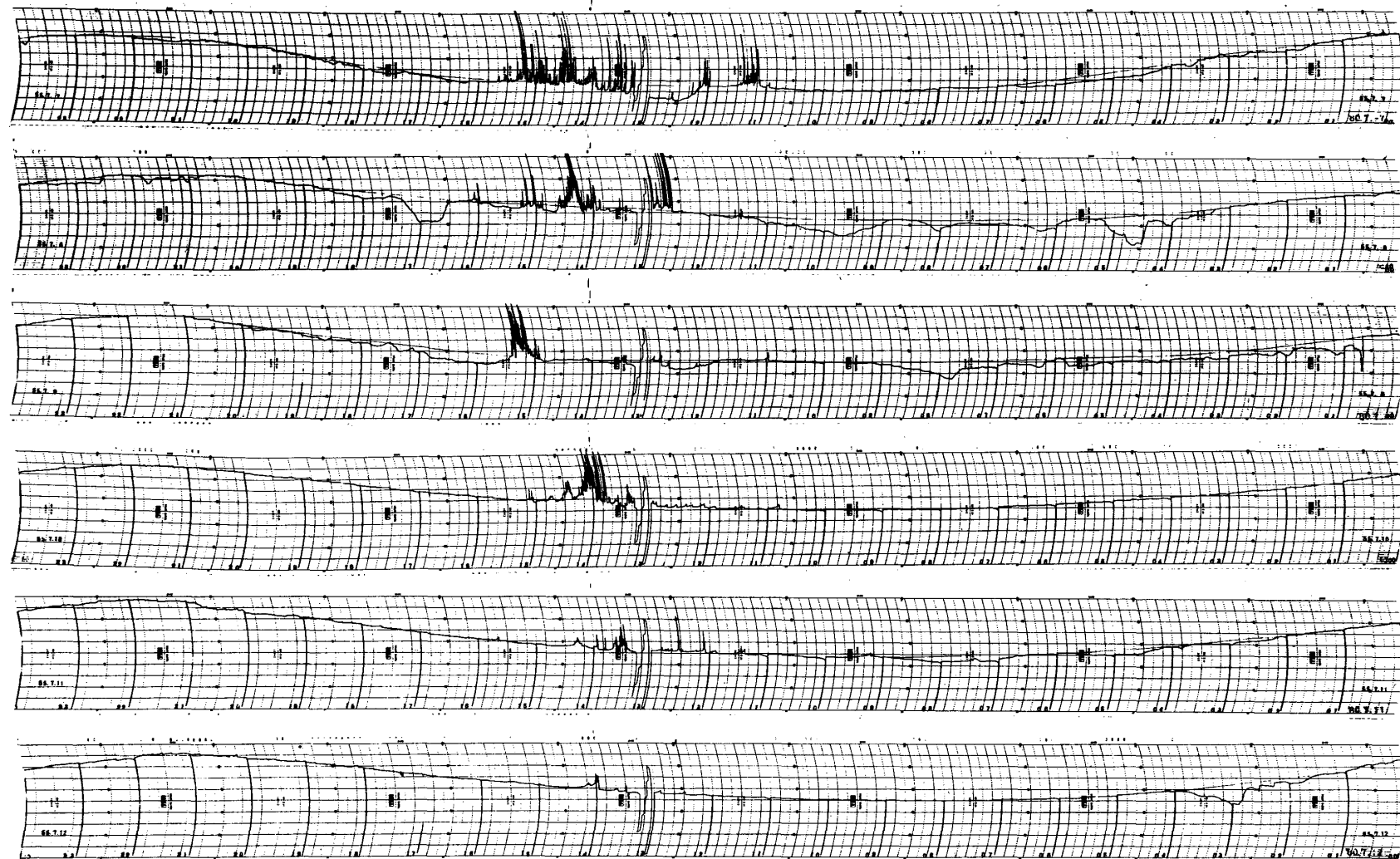
6



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



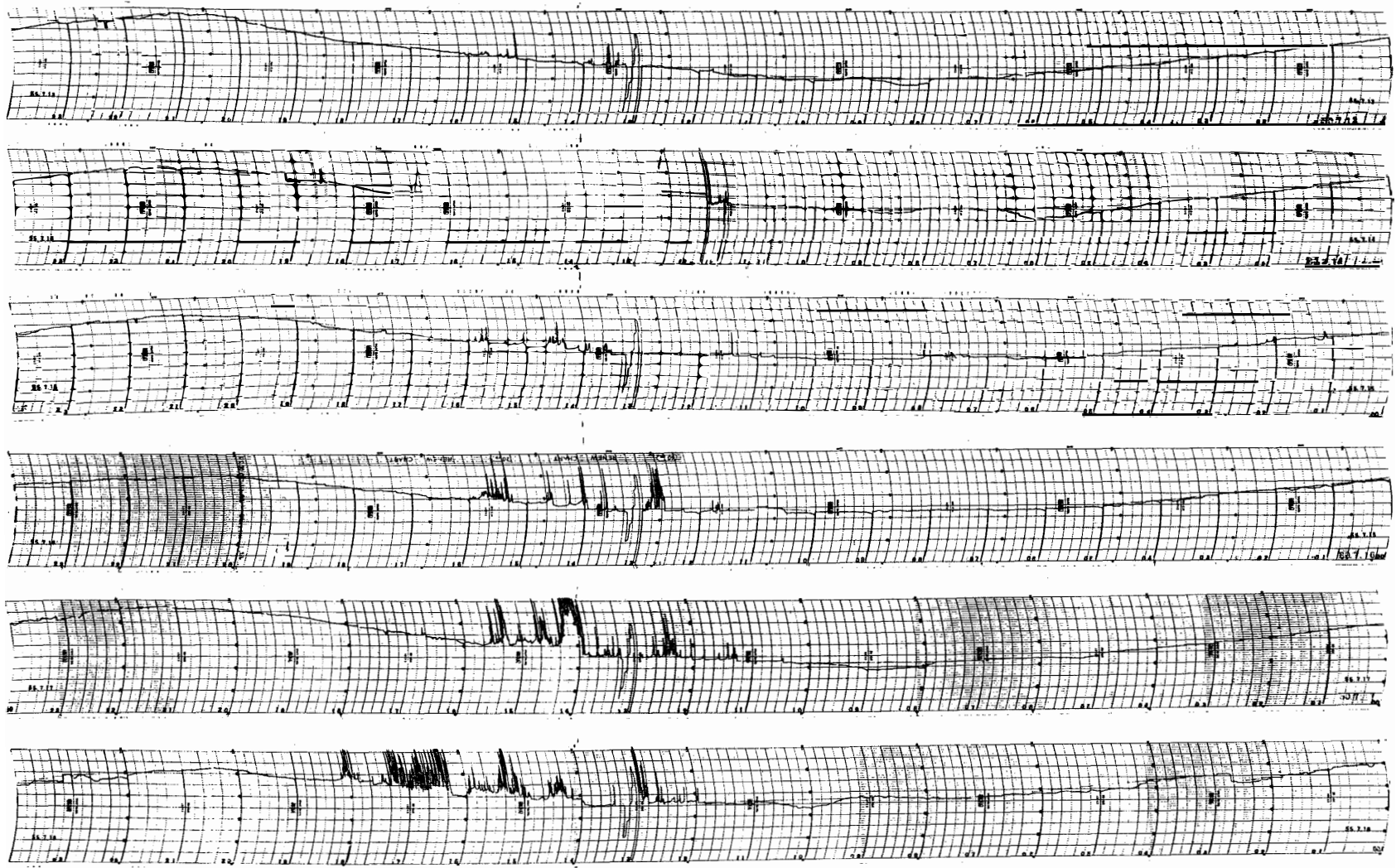
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

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JULY 1980



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 JULY 1980

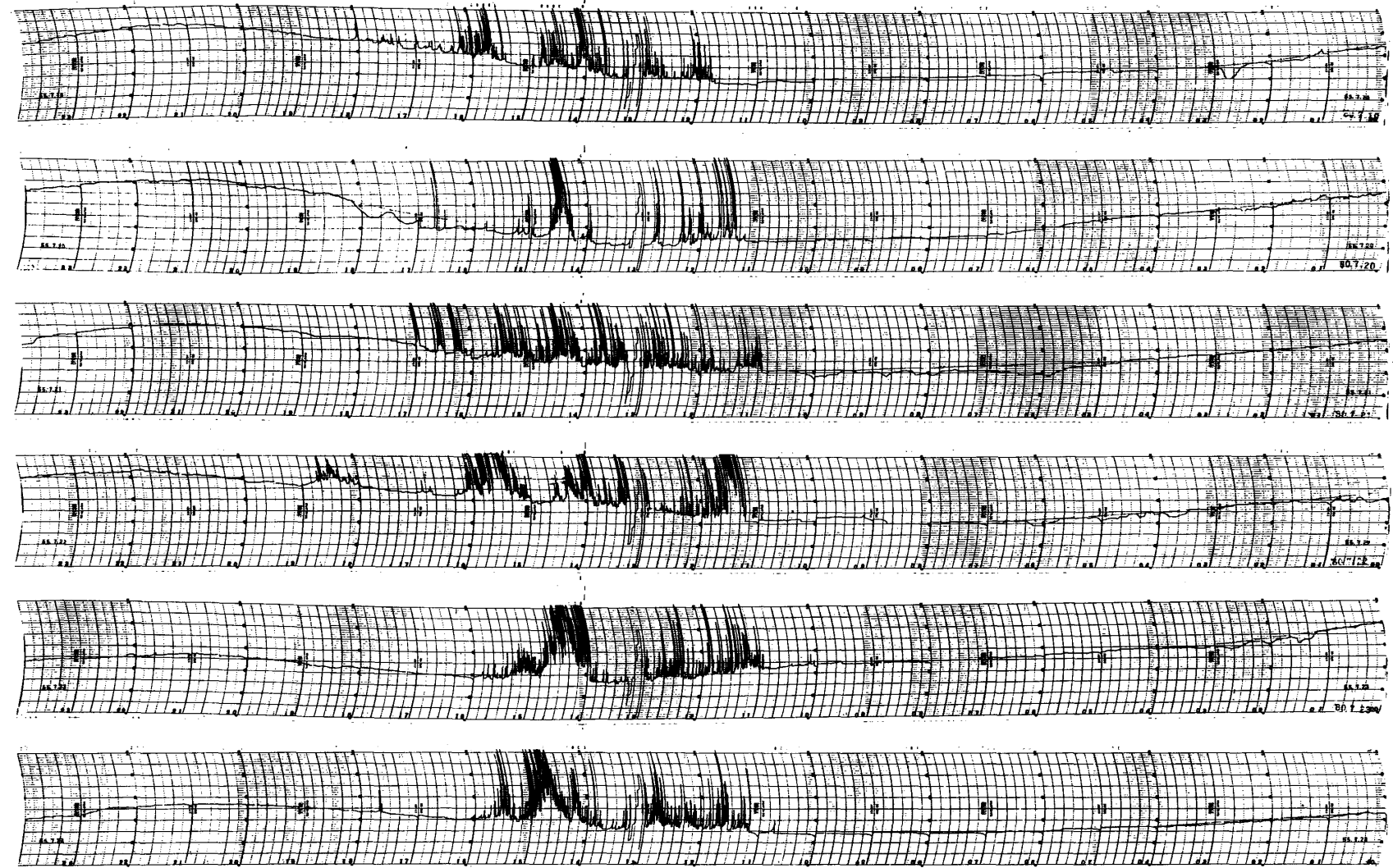
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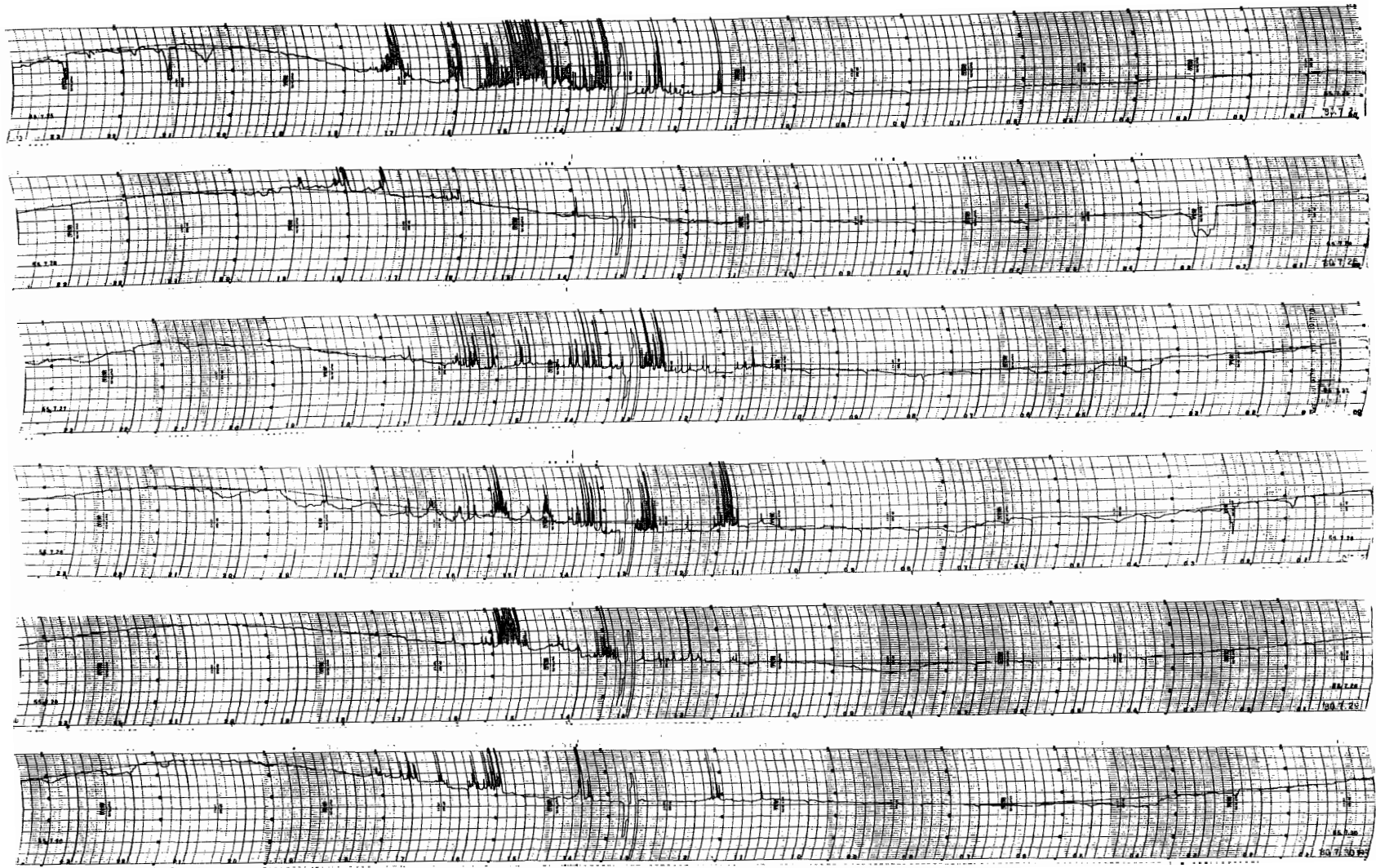
24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

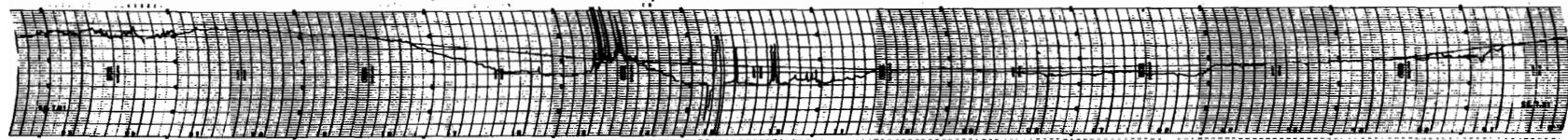


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JULY 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



31

JULY 1980

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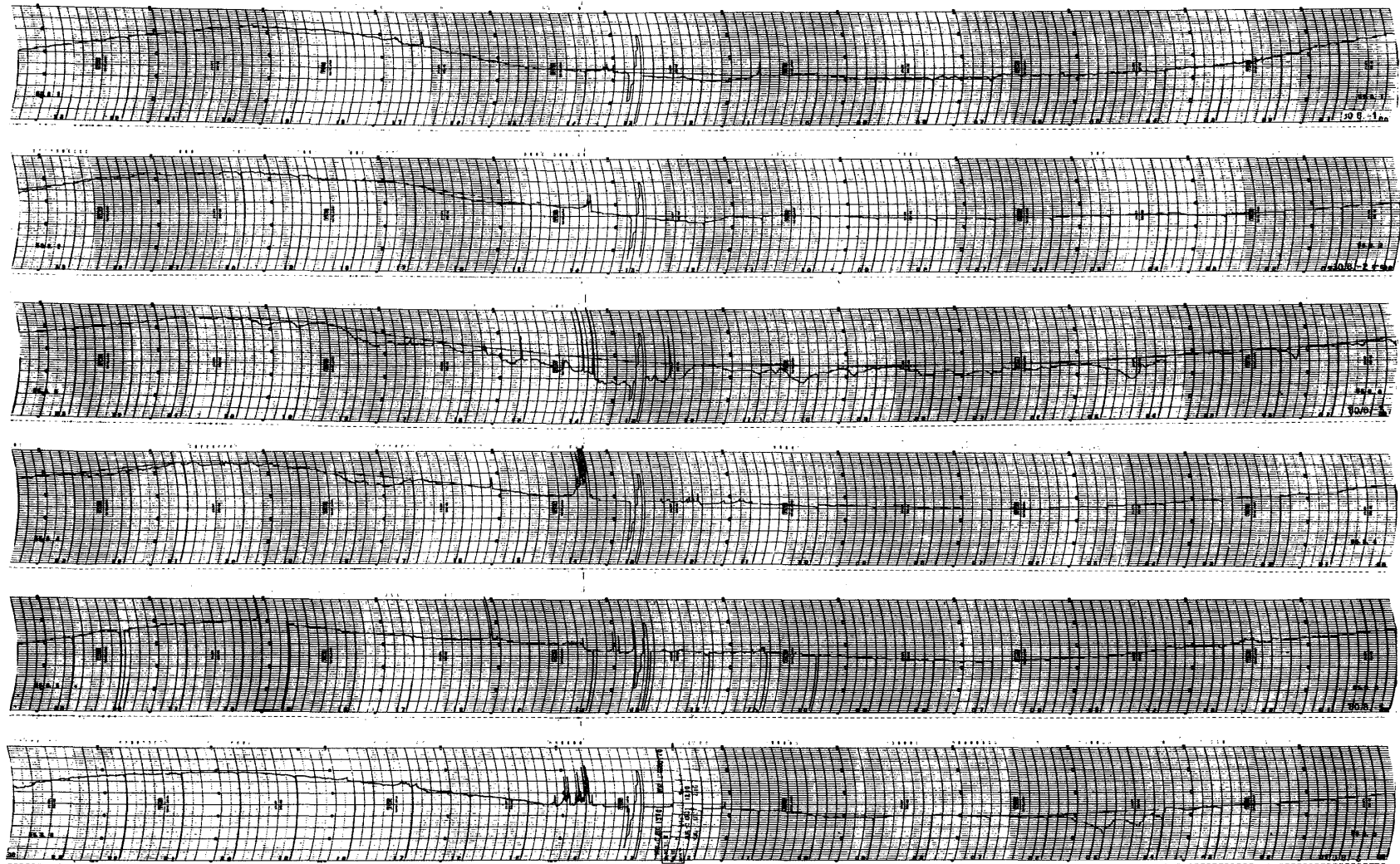
00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

July 14 1150 - 1730 Failure of equipment



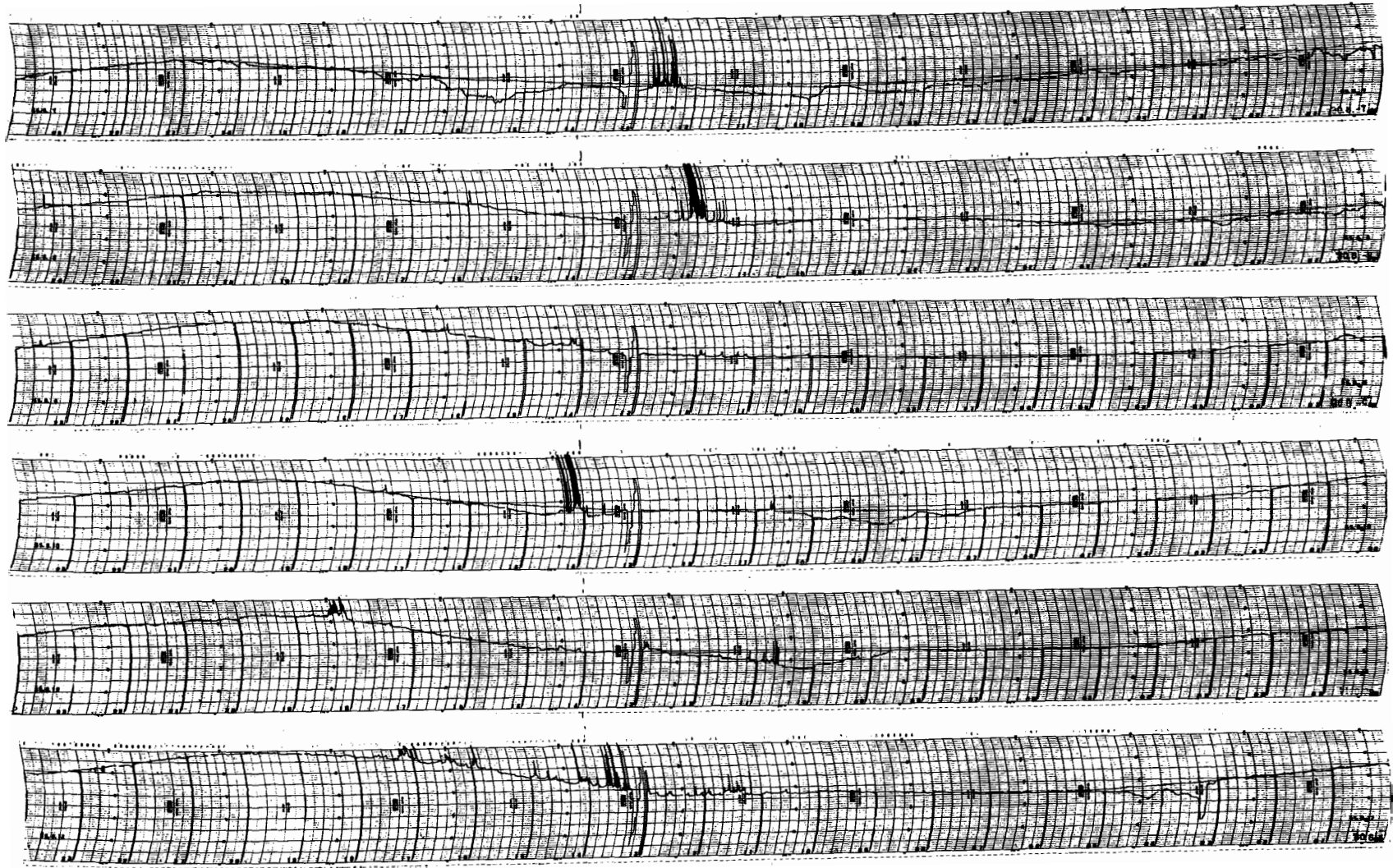
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AUG 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



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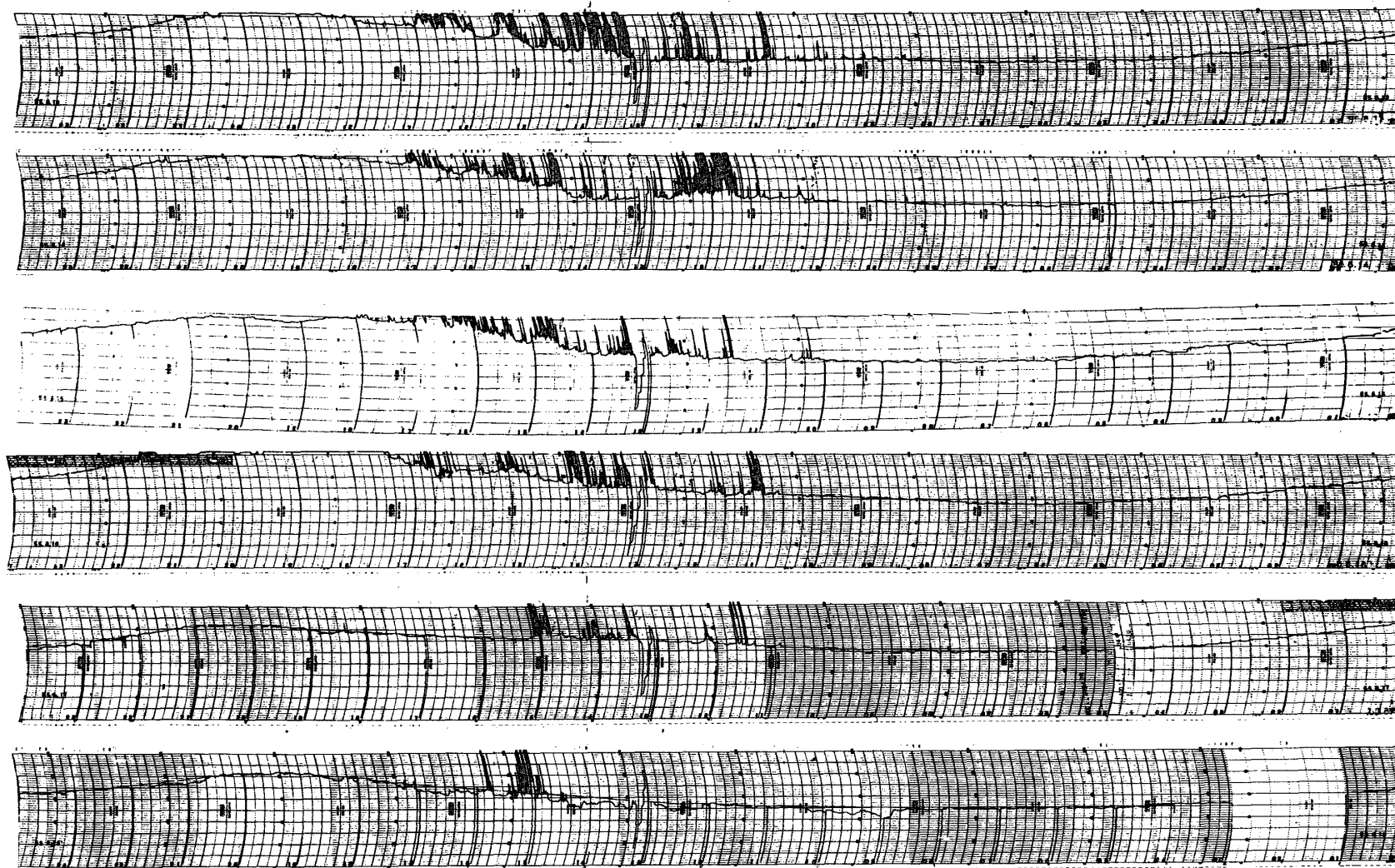
AUG 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

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AUG 1980



-70-

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

AUG 1980

19

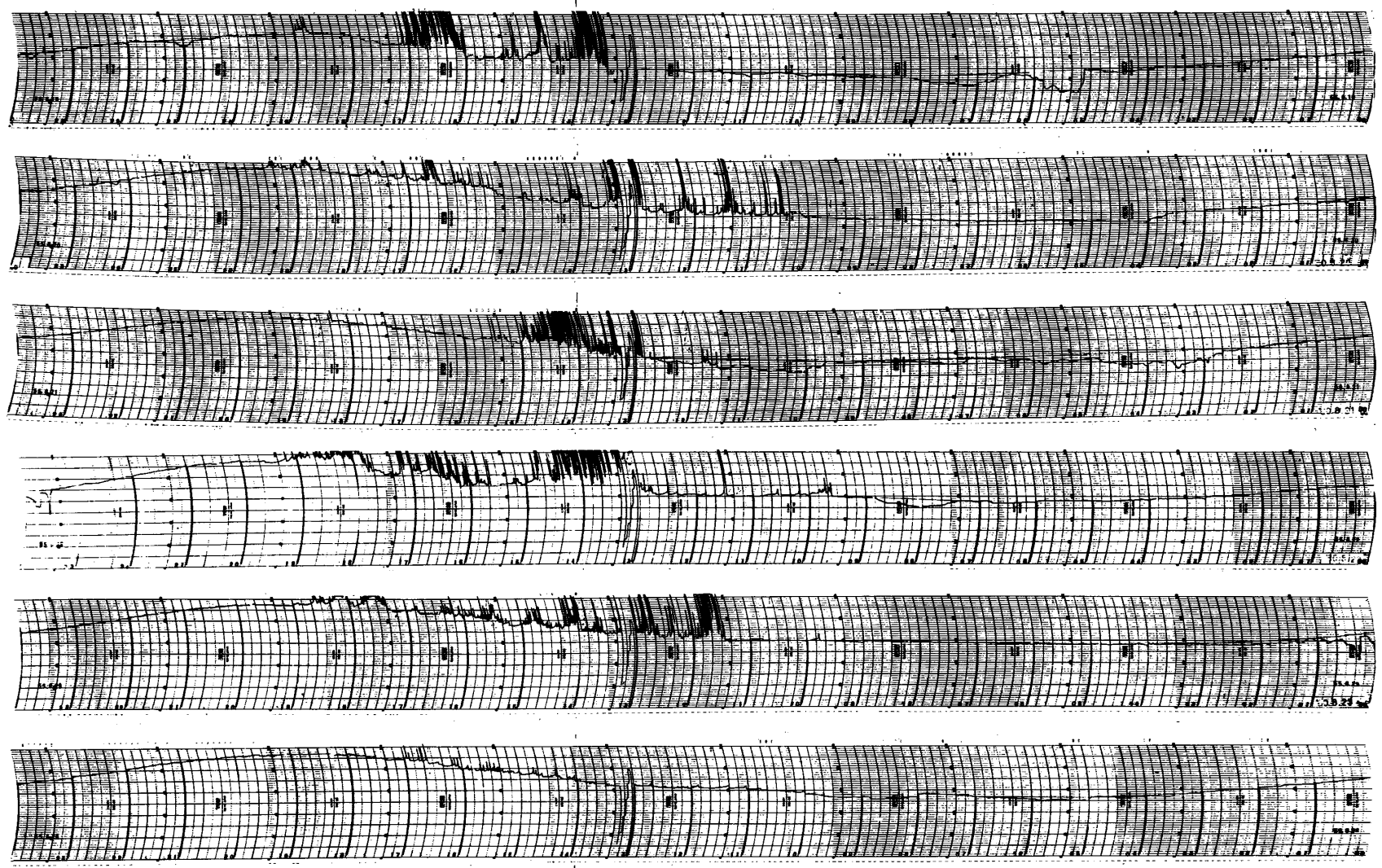
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

AUG 1980

25

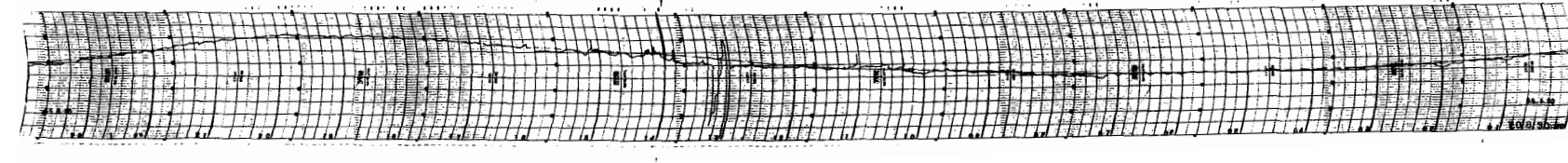
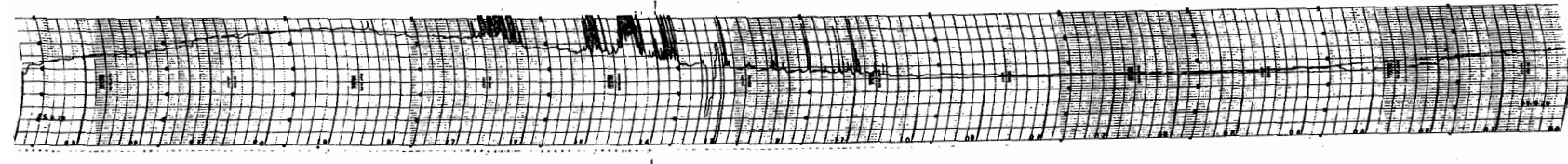
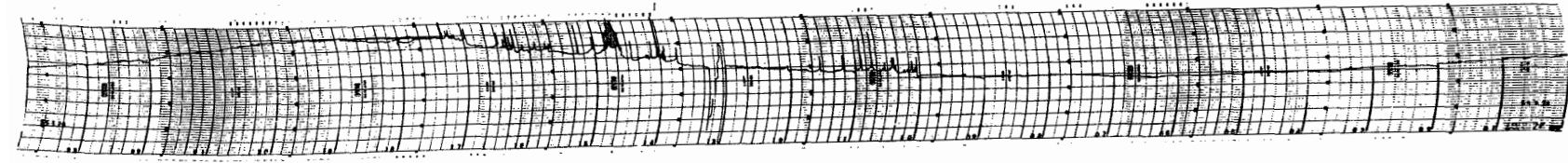
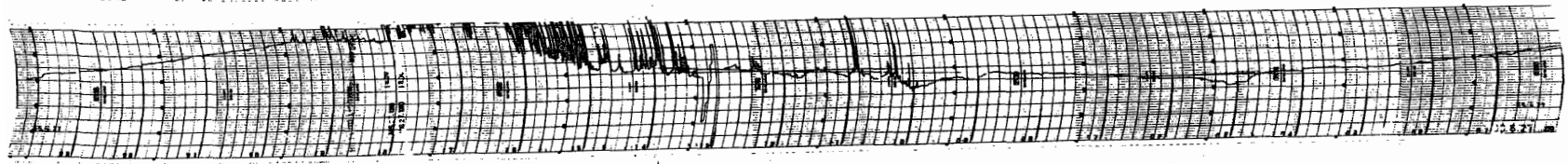
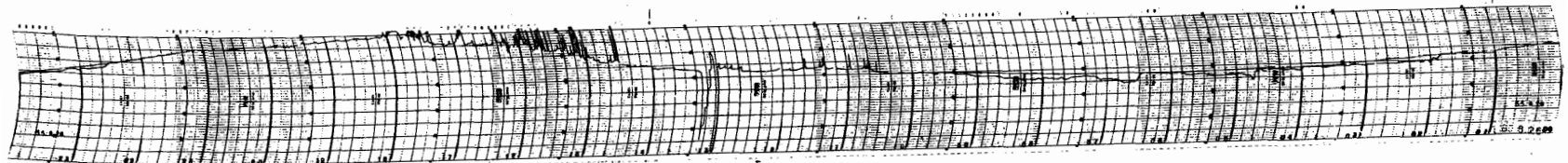
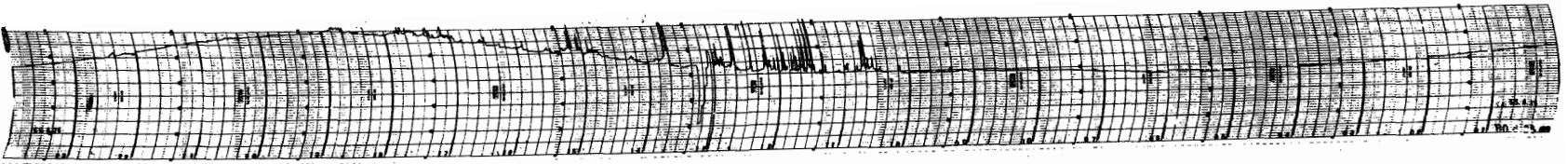
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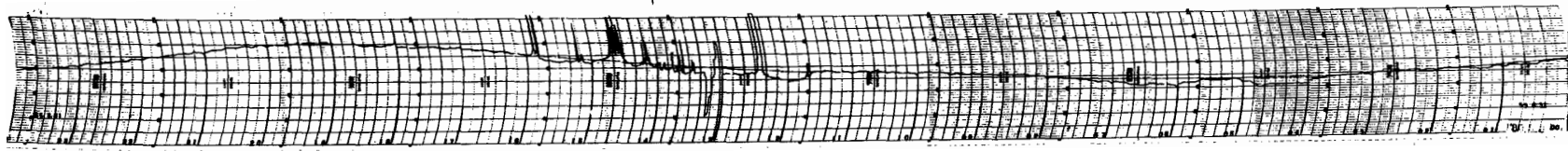
30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

AUG 1980

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45° EAST MERIDIAN TIME IN HOURS

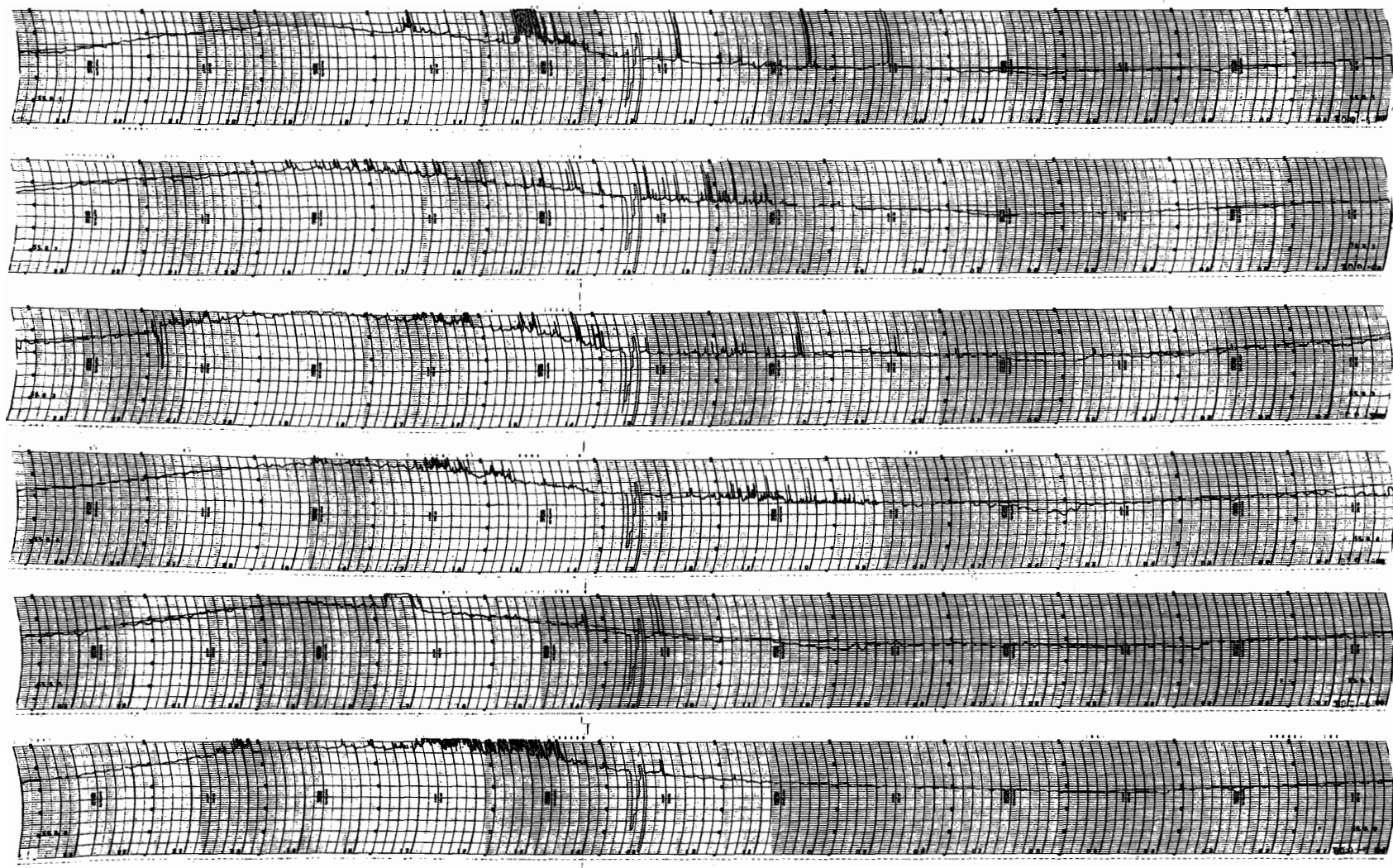
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

August 18 0100 - 0300 Failure of equipment

SEP 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

SEP 1980

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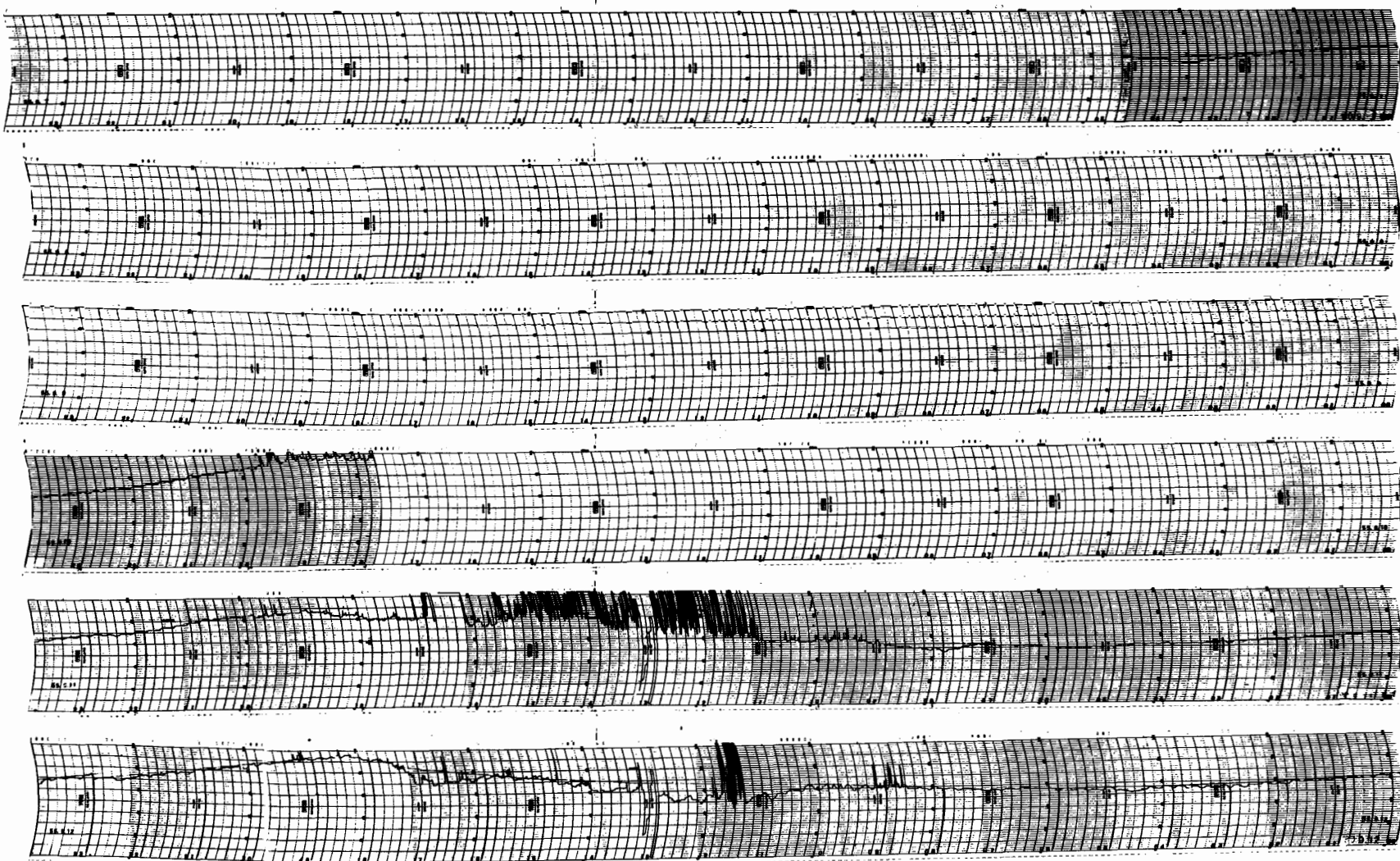
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

SEP 1980

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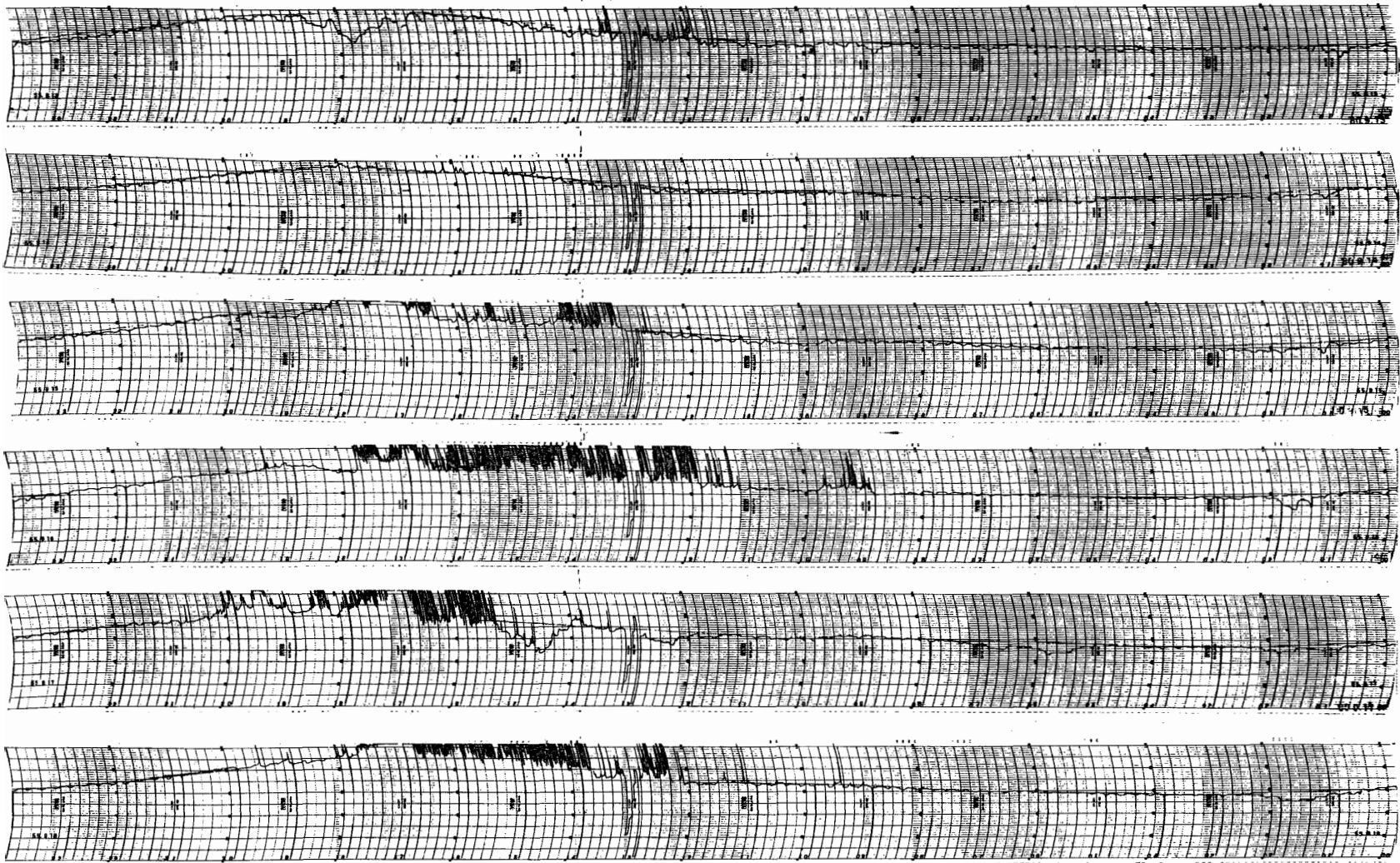
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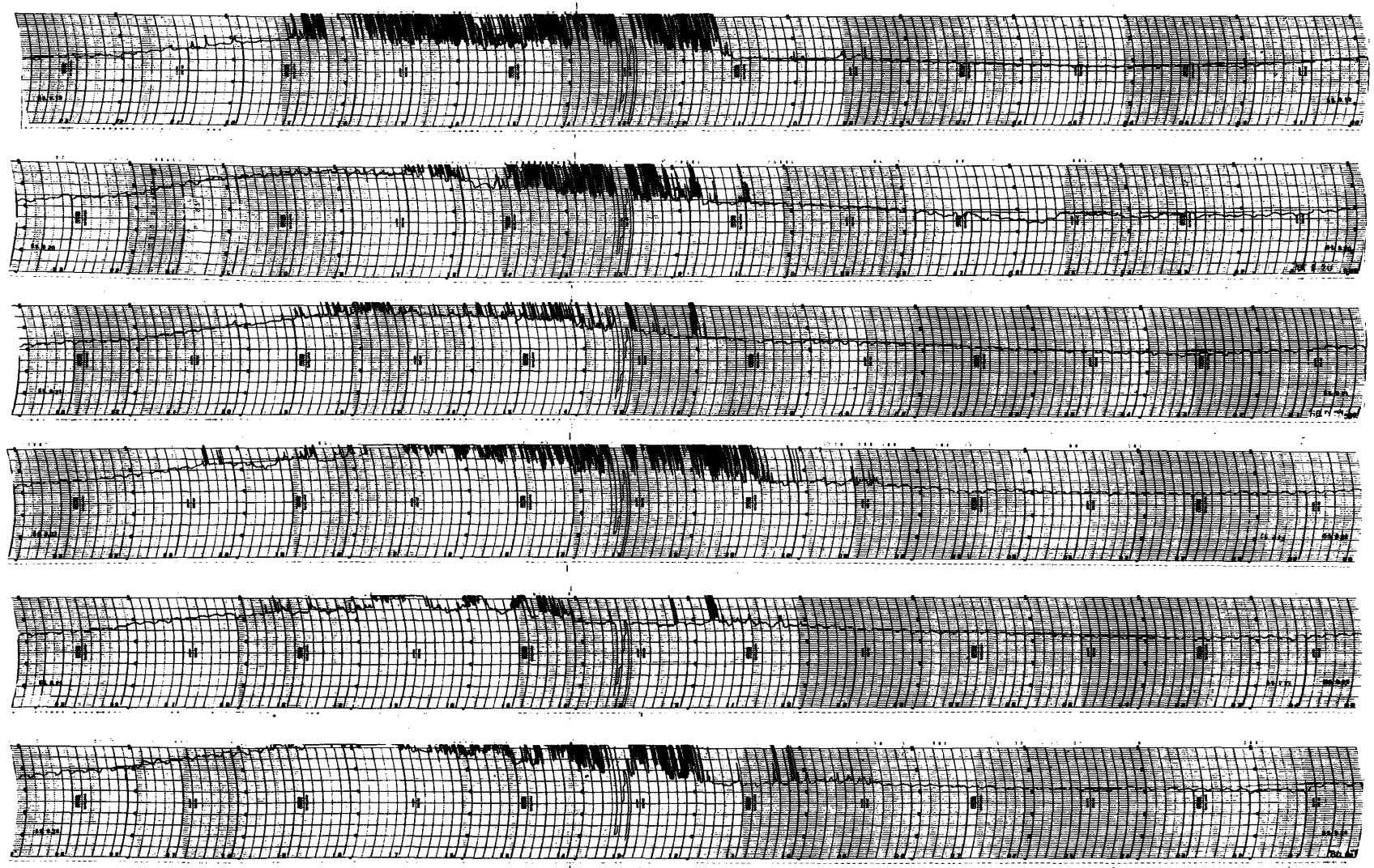


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 SEP 1980
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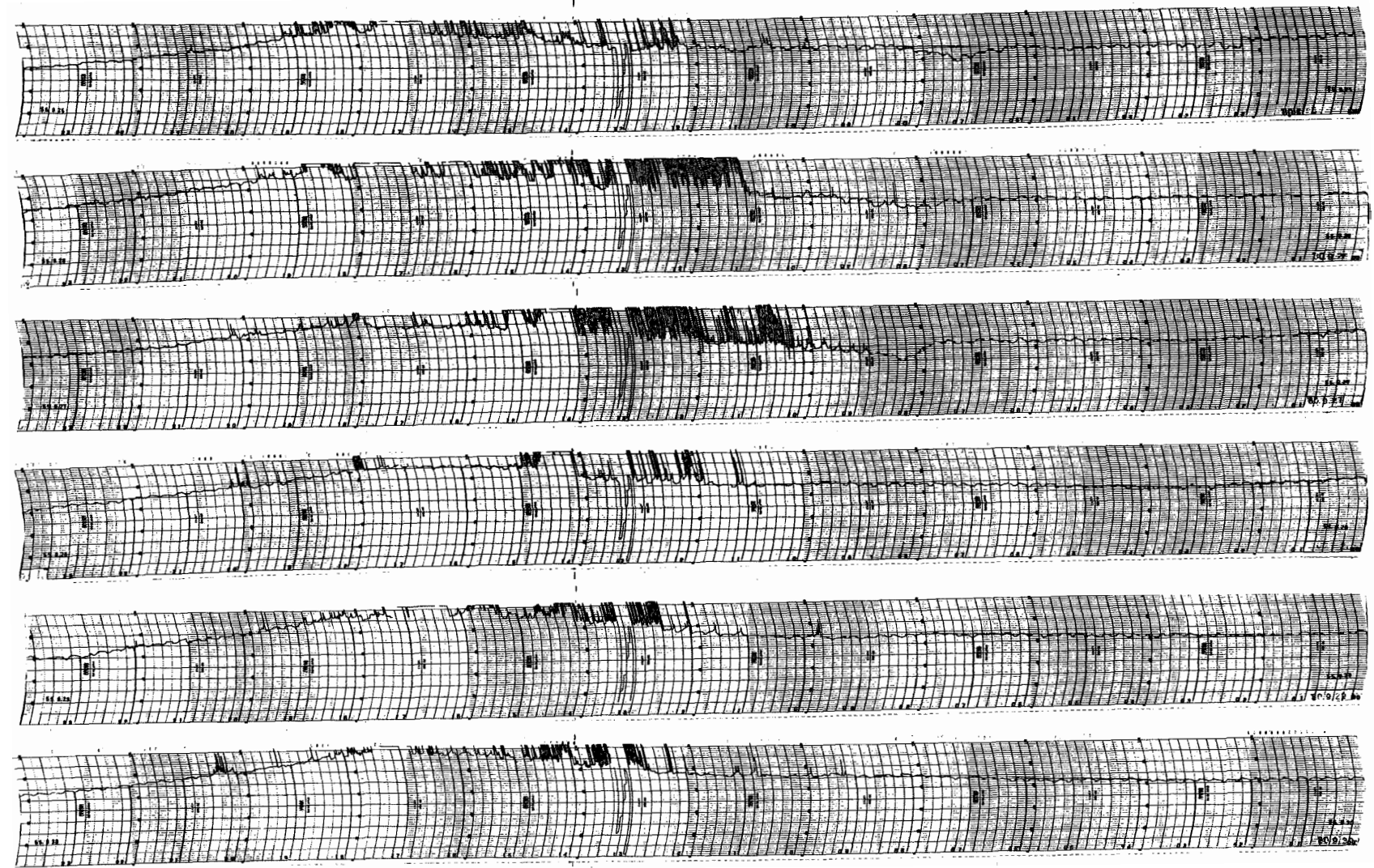


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

25 SEP 1980
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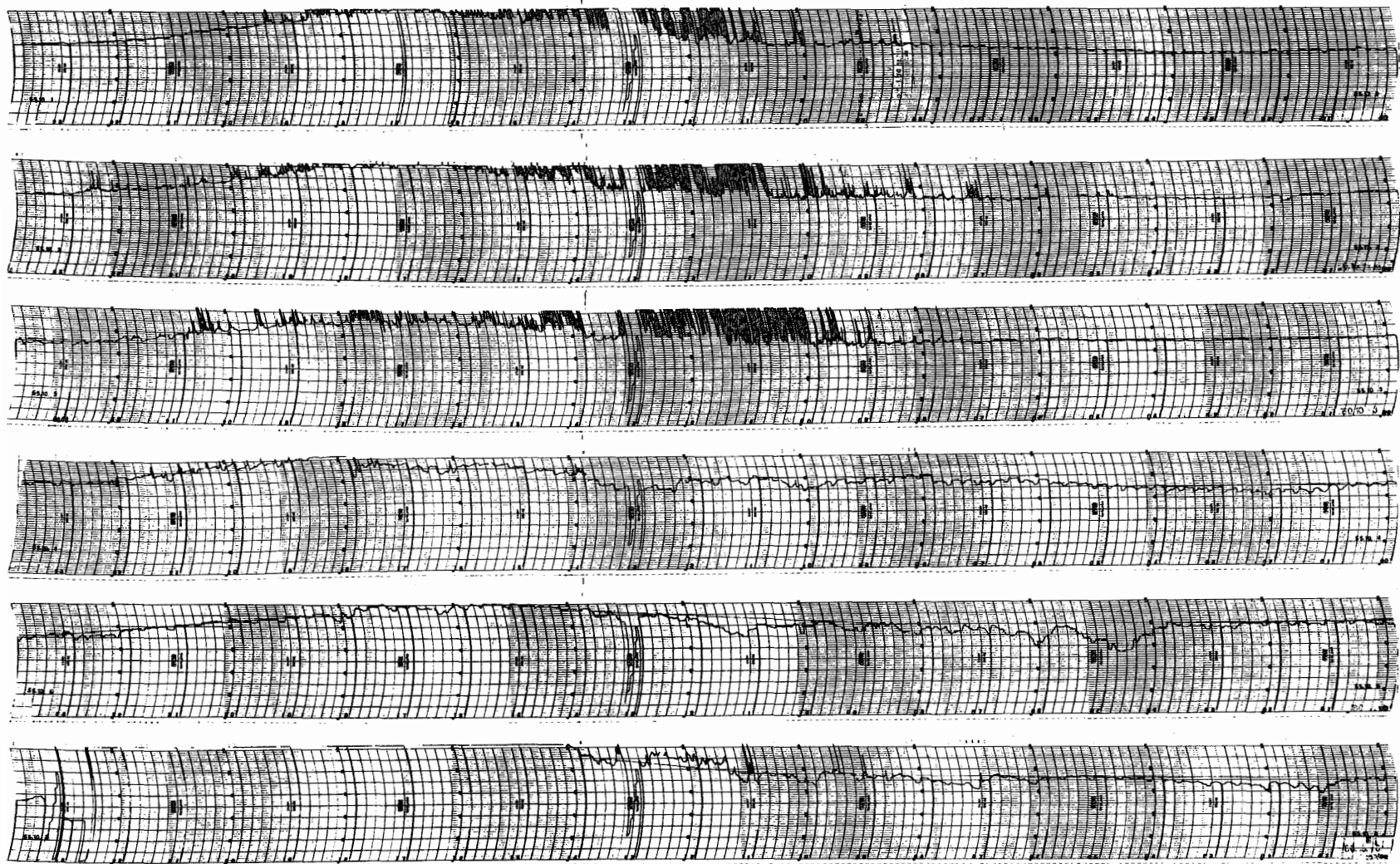
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

September 7 0450 - Failure of equipment
10 1750



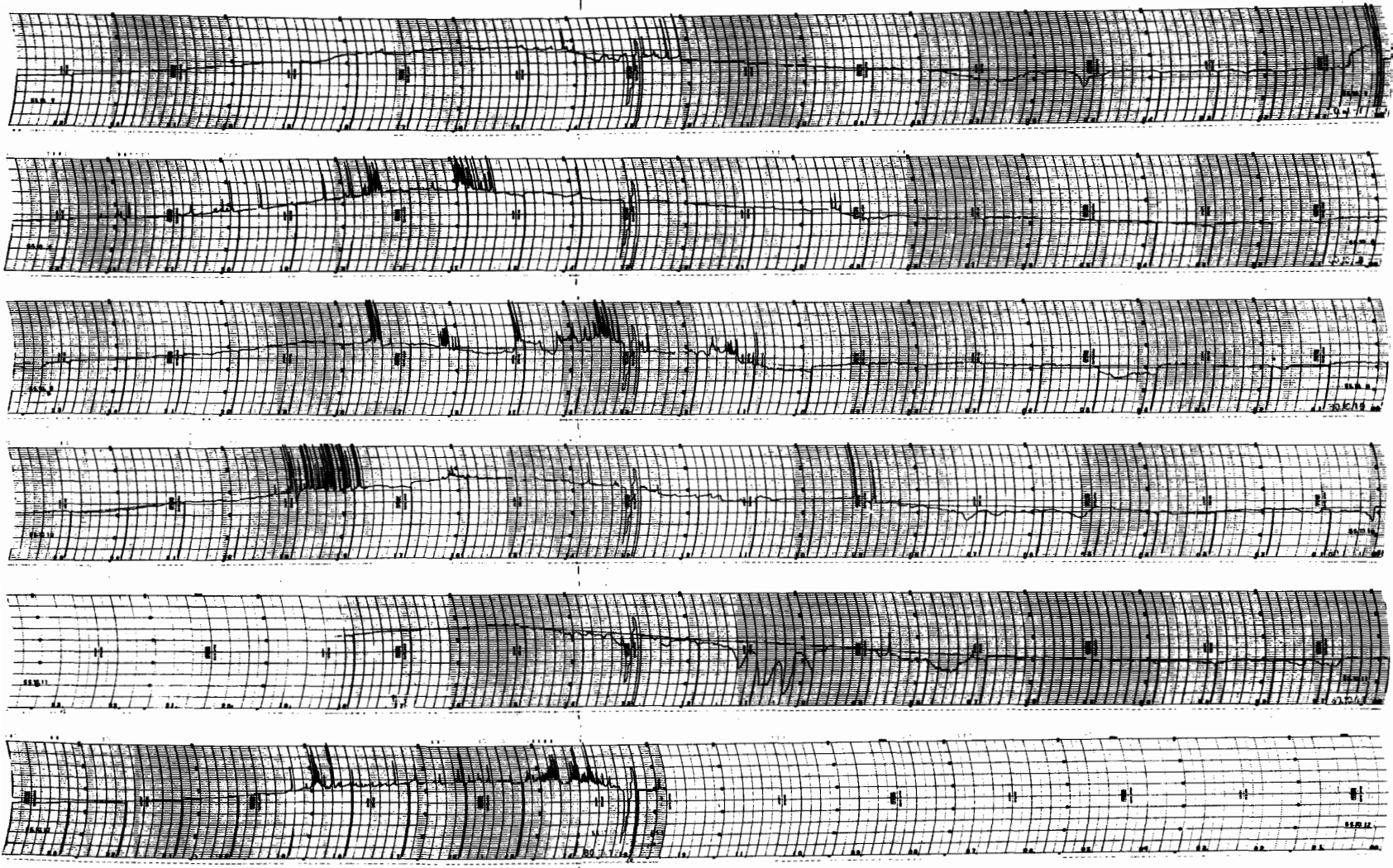
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OCT 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



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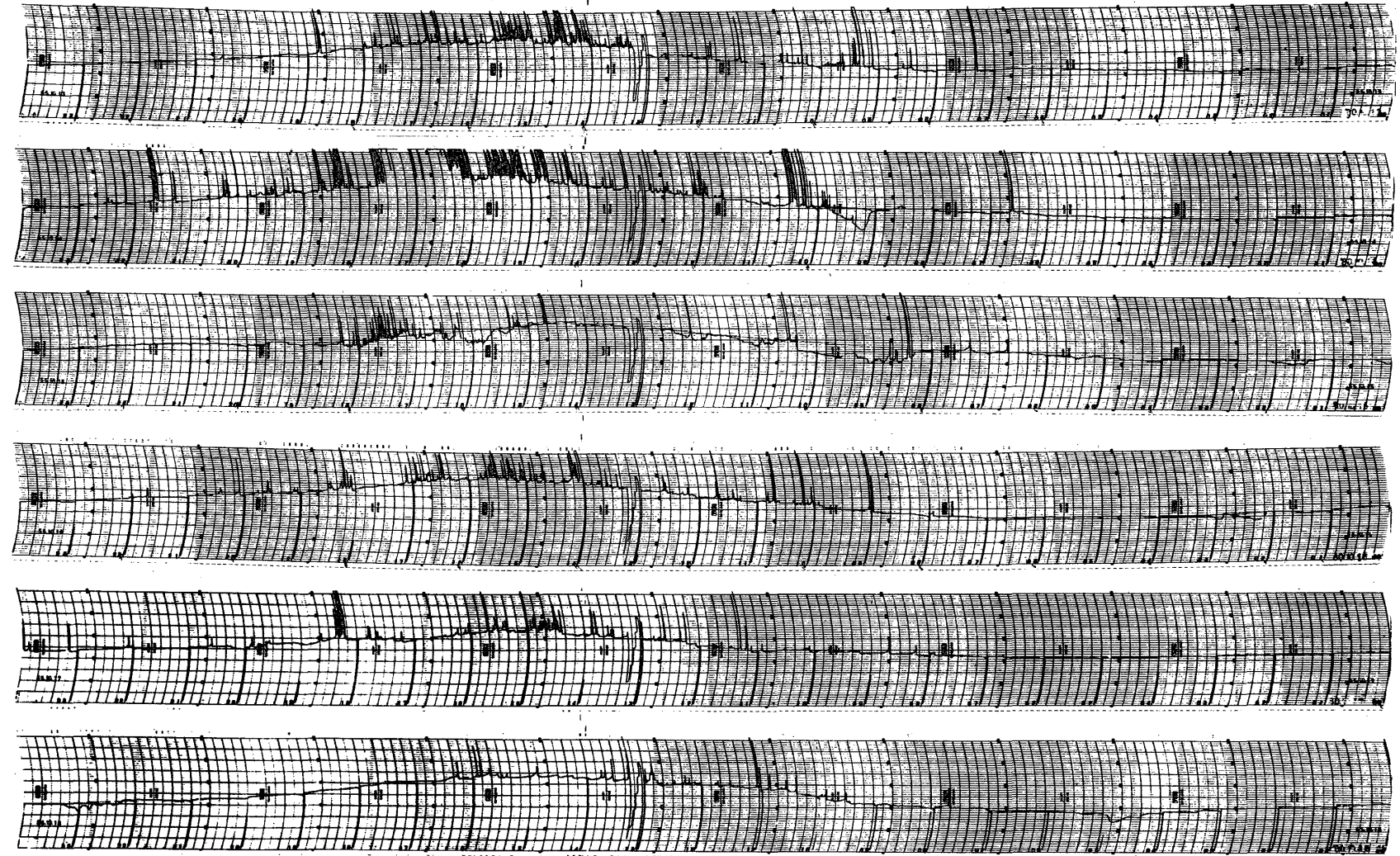
OCT 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

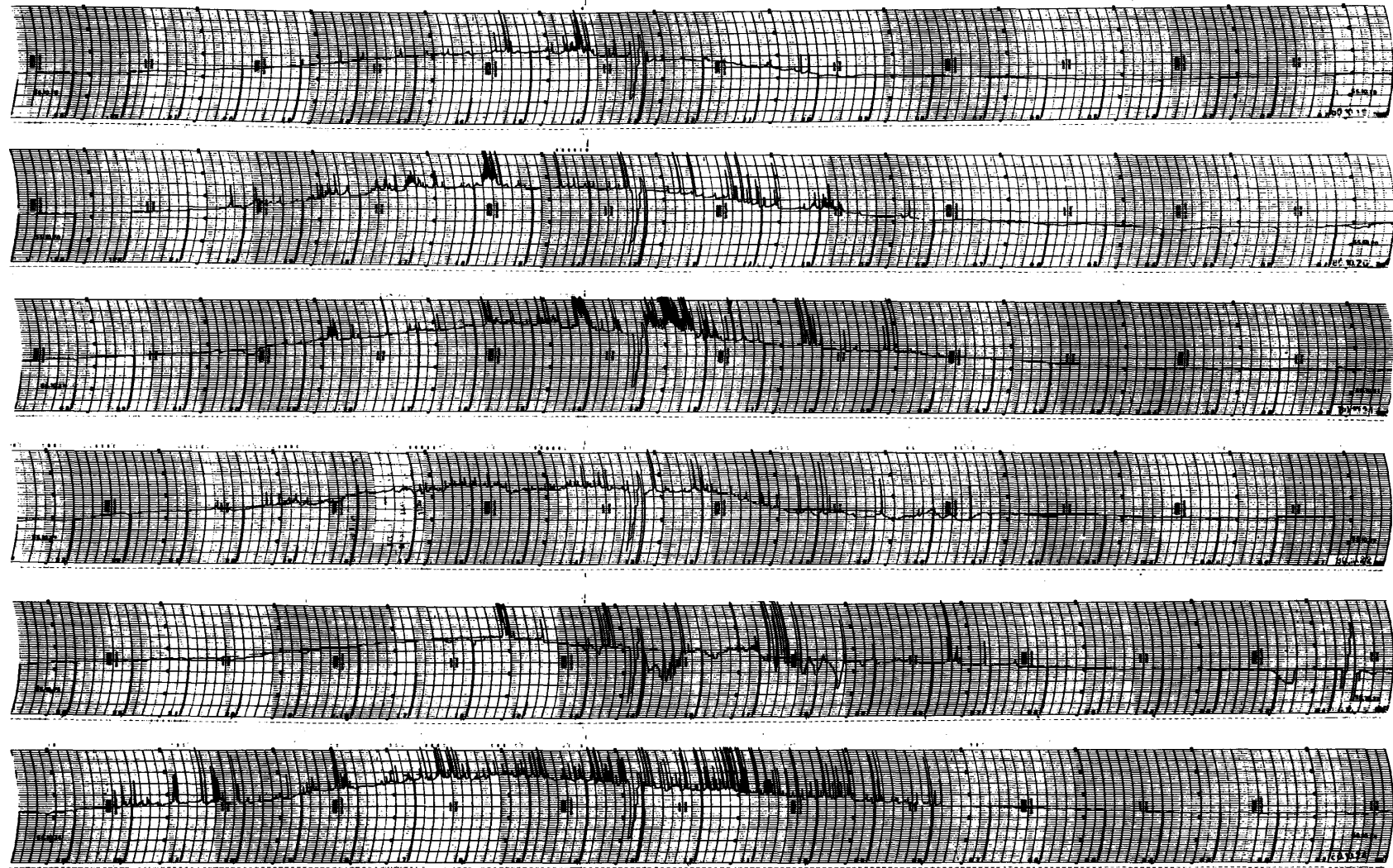
OCT 1980
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



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OCT 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

OCT 1980

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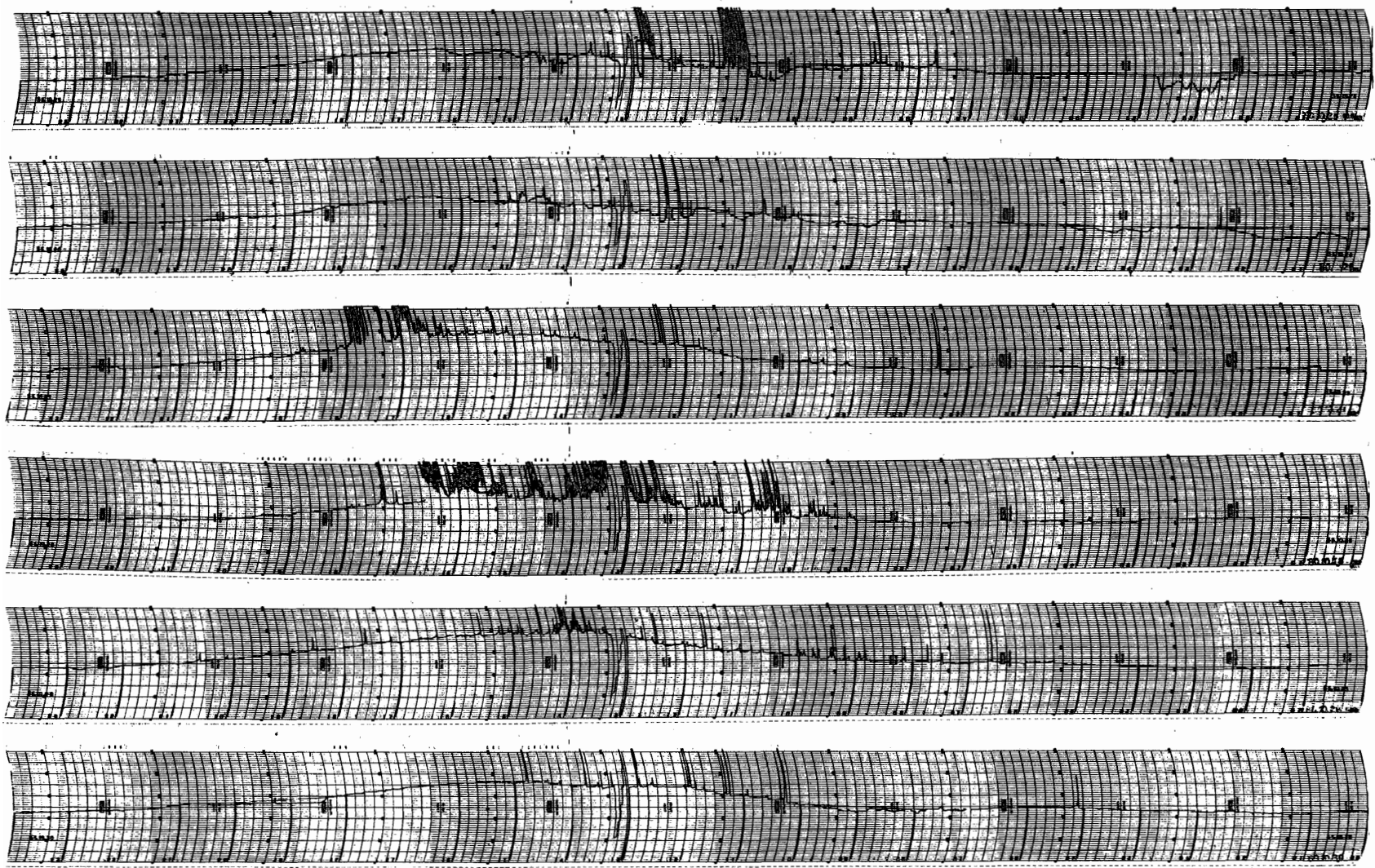
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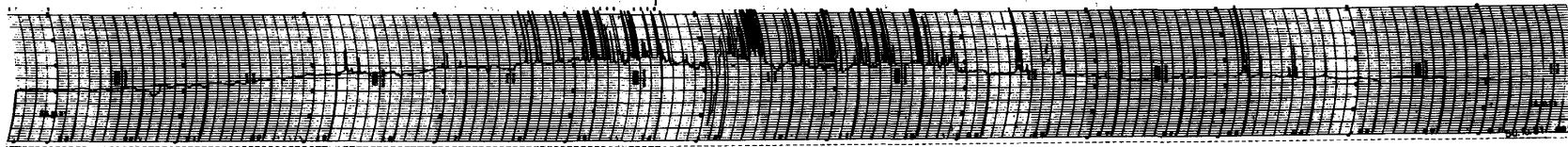
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

OCT 1980

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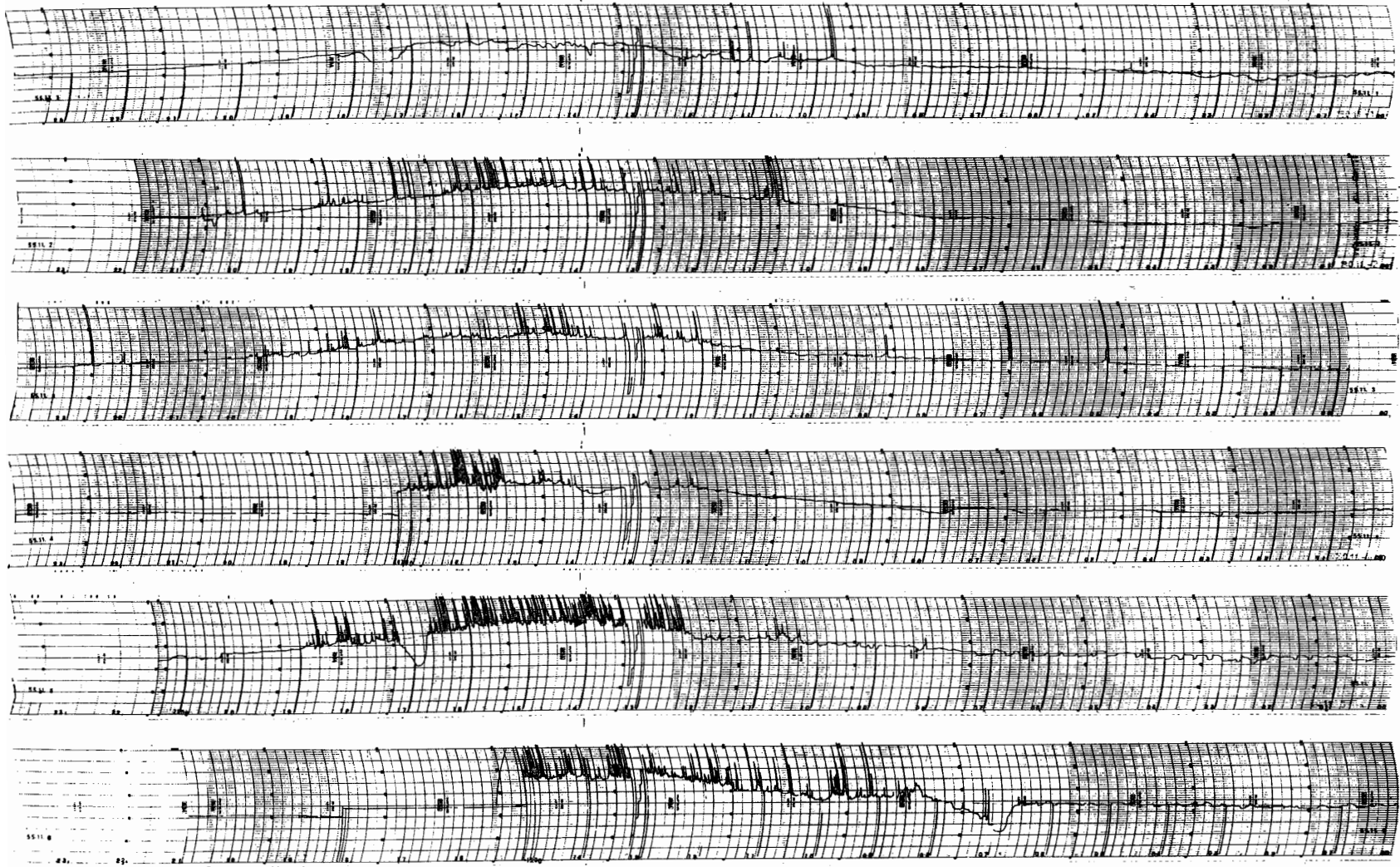
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45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

October 11	1855 -	Failure of equipment
12	1200	"



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NOV 1980

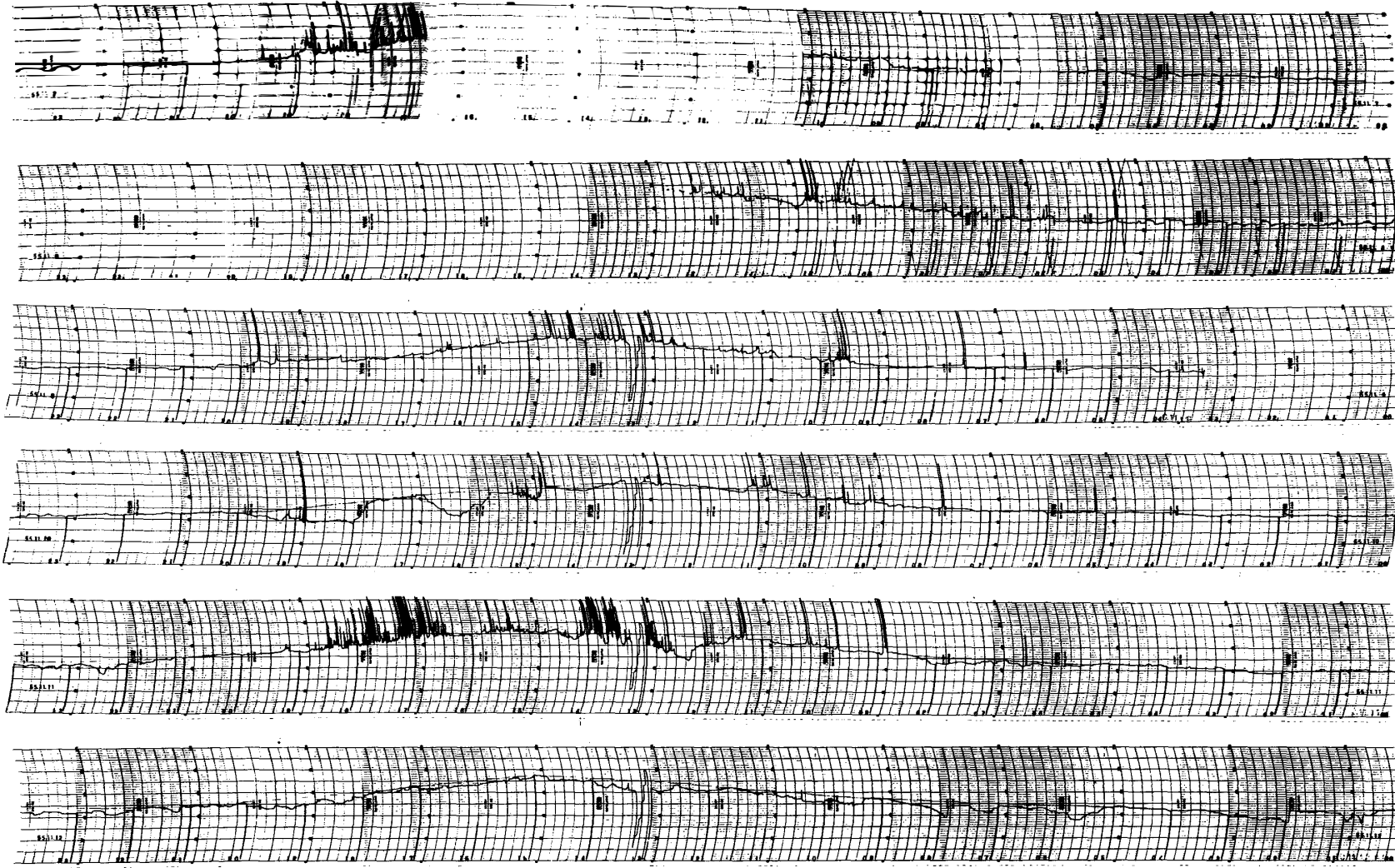
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

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NOV 1980



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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

13 NOV 1980

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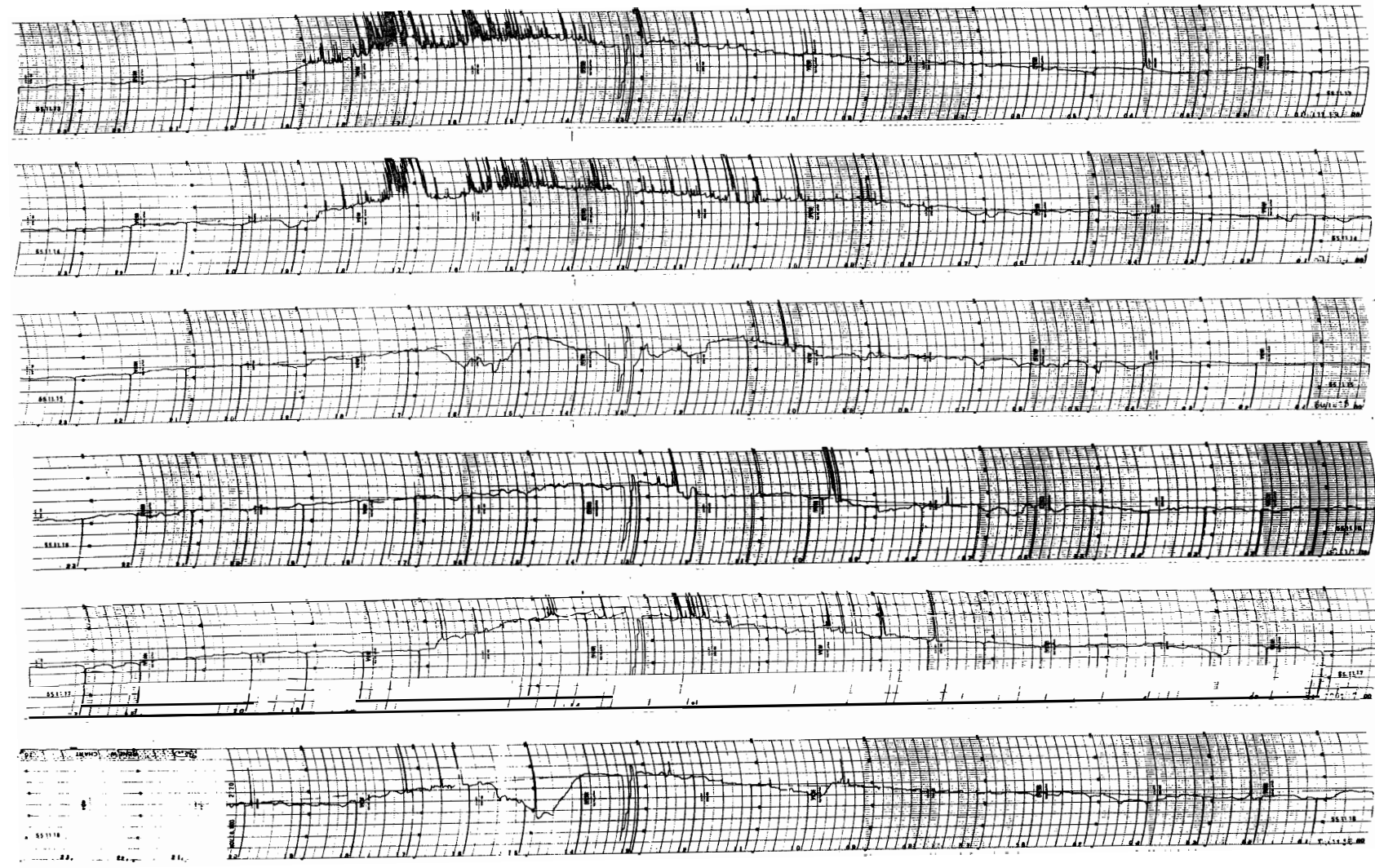
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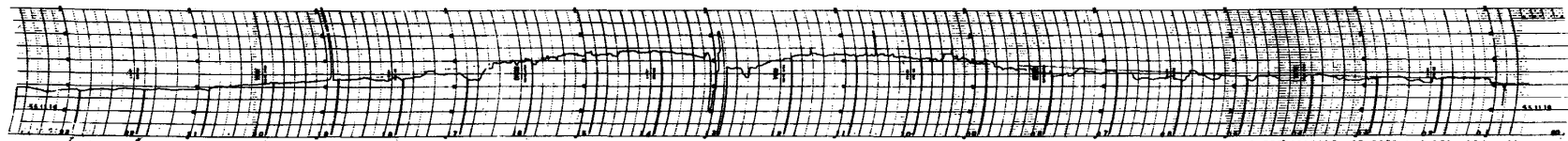
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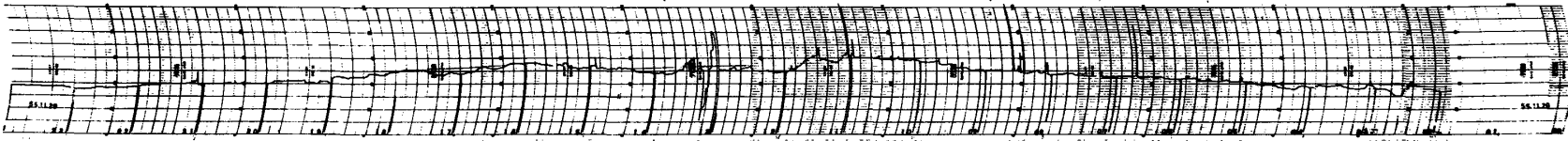
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

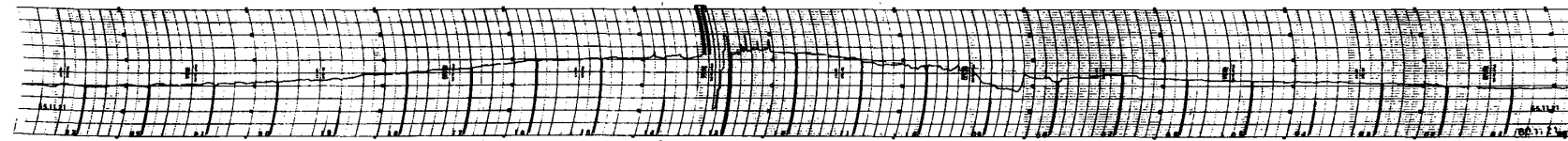




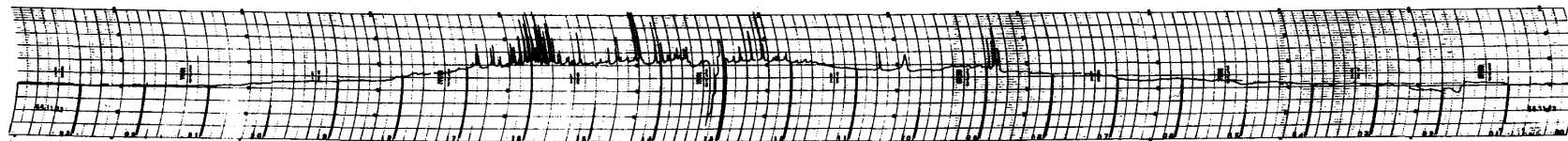
19 NOV 1980



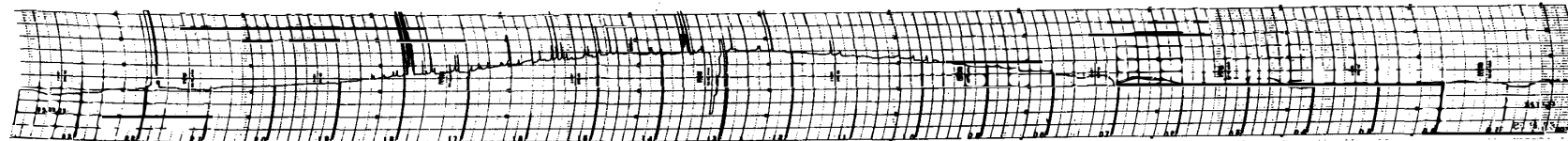
20 NOV 1980



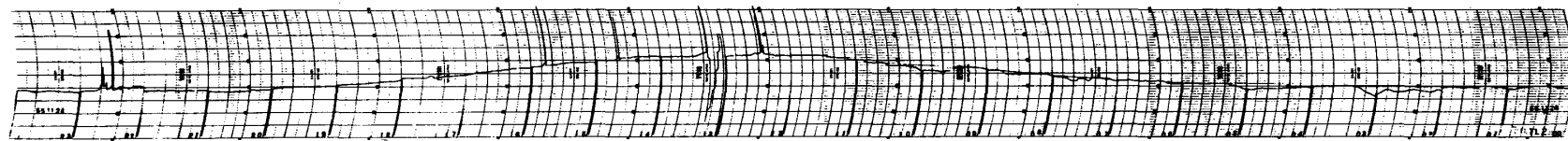
21 NOV 1980



22 NOV 1980



23 NOV 1980

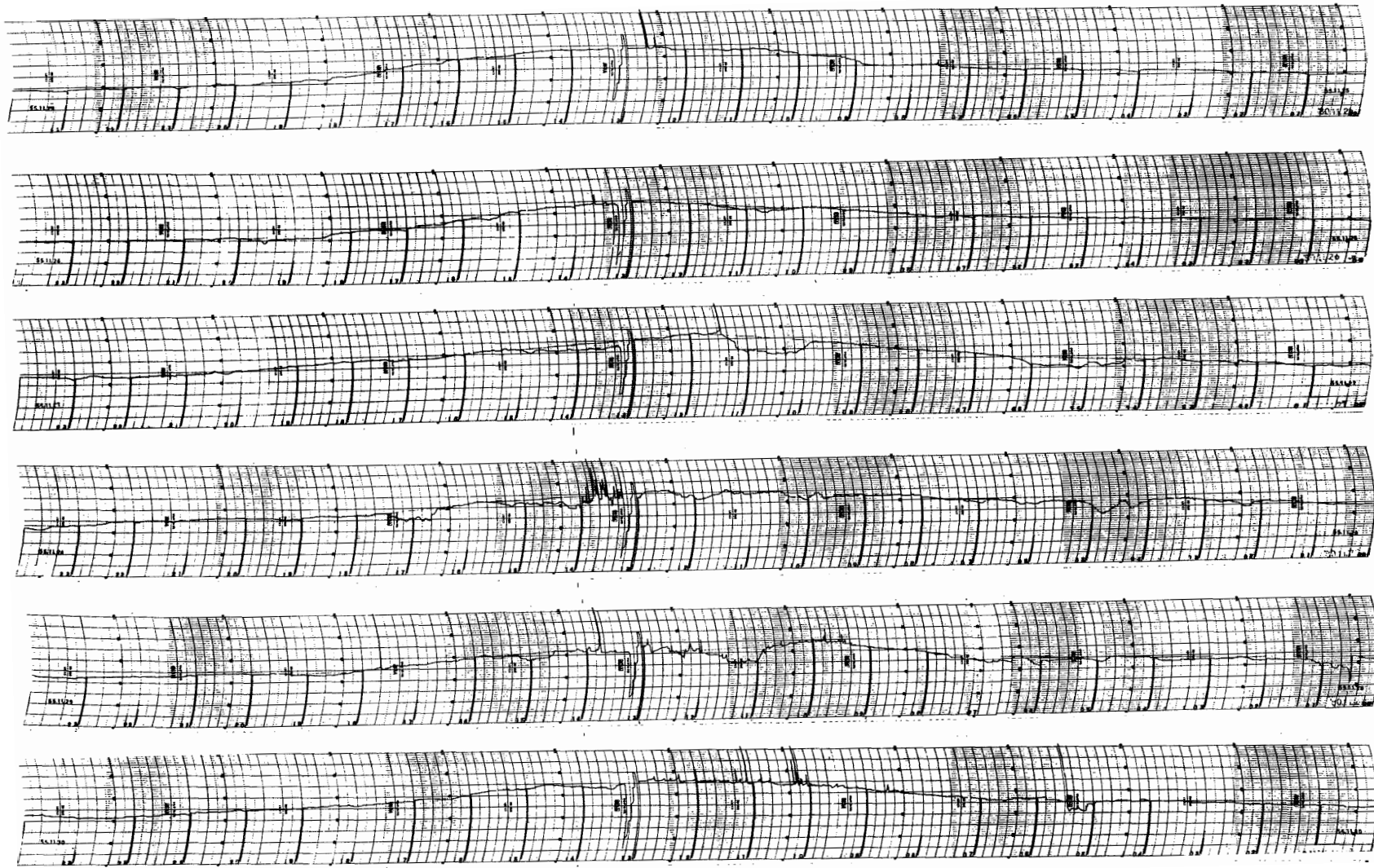


24 NOV 1980

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



25 NOV 1980

26 NOV 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

November	2	2200 -	Failure of equipment
	3	0200	"
	4	1712 -	"
	5	0200	"
	5	2136 - 2350	"
	6	1507 -	"
	7	0030	"
	7	0505 - 0659	"
	7	1030 - 1645	"
	8	1200 -	"
	9	0325	"
	18	2011 -	"
	19	0059	"
	20	0028 - 0150	"

DEC 1980

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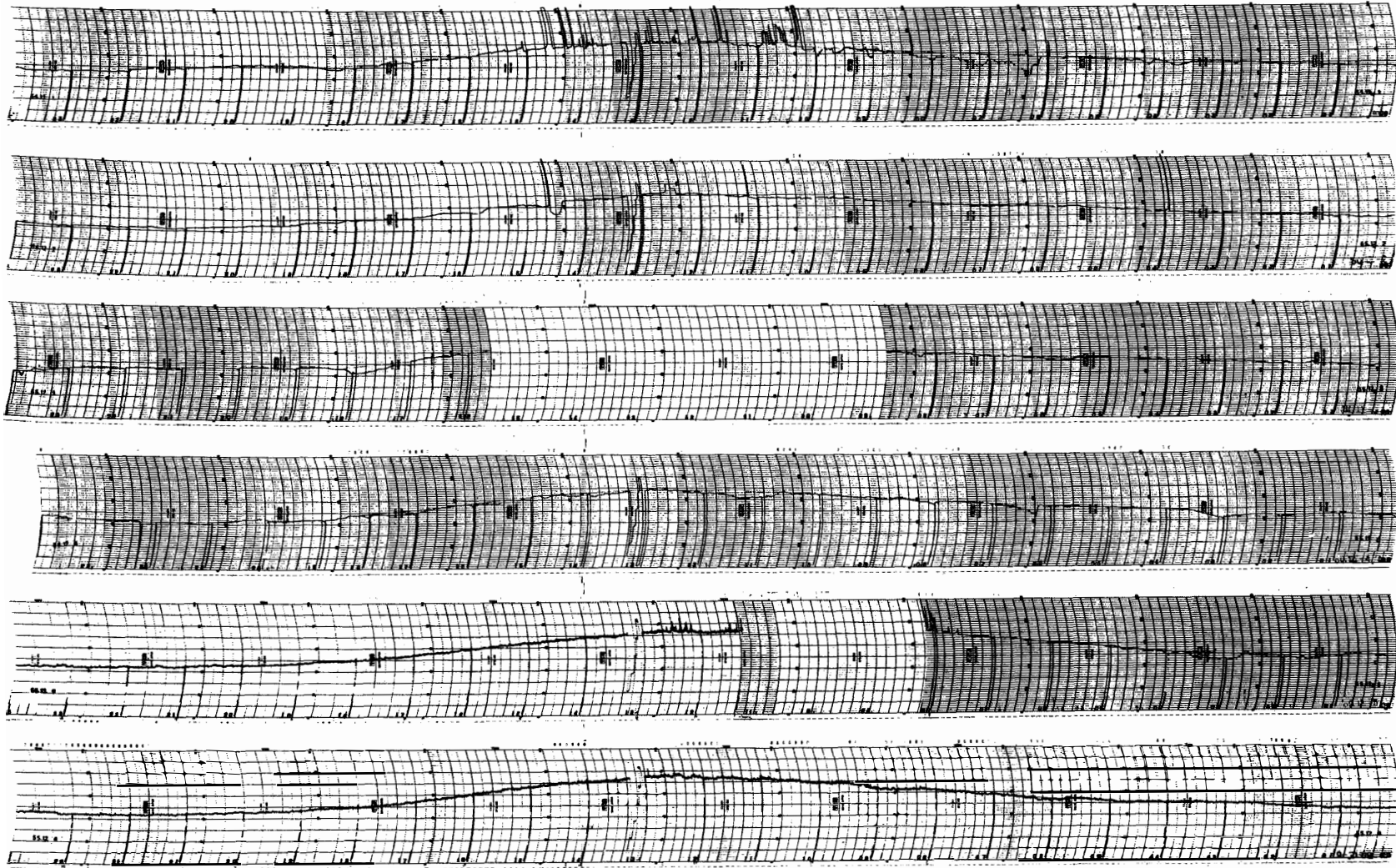
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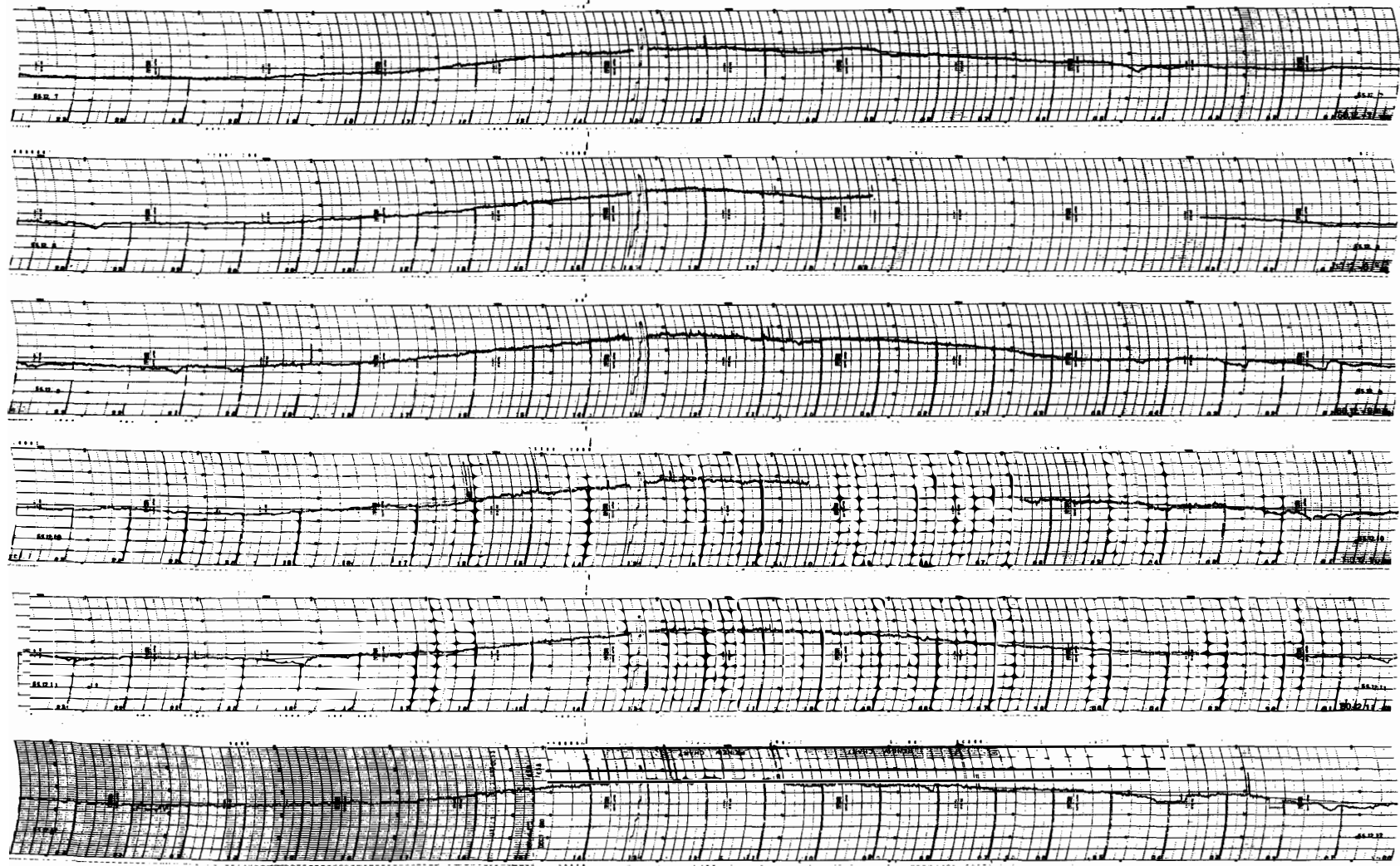
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

DEC 1980

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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

DEC 1980

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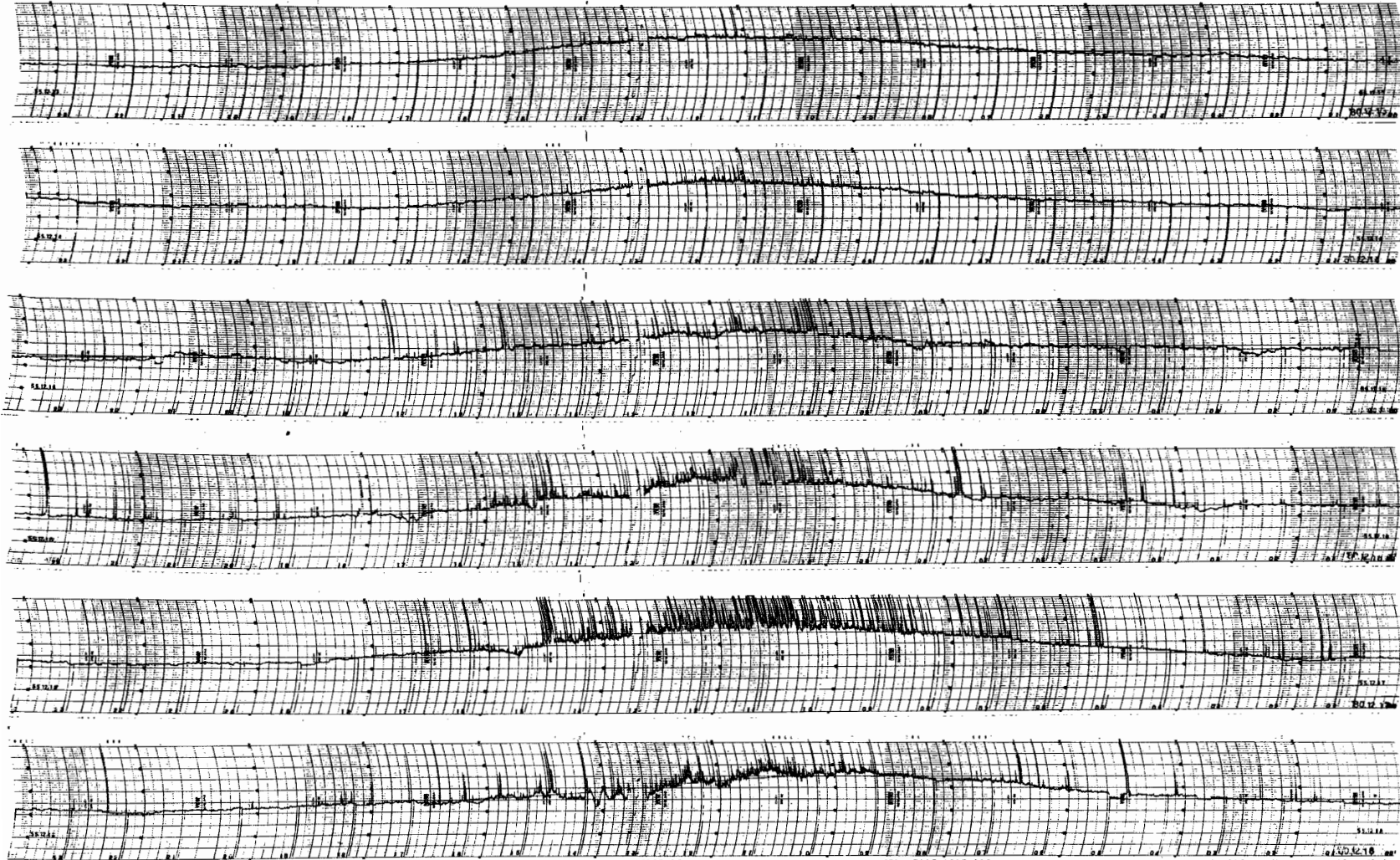
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24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

DEC 1980

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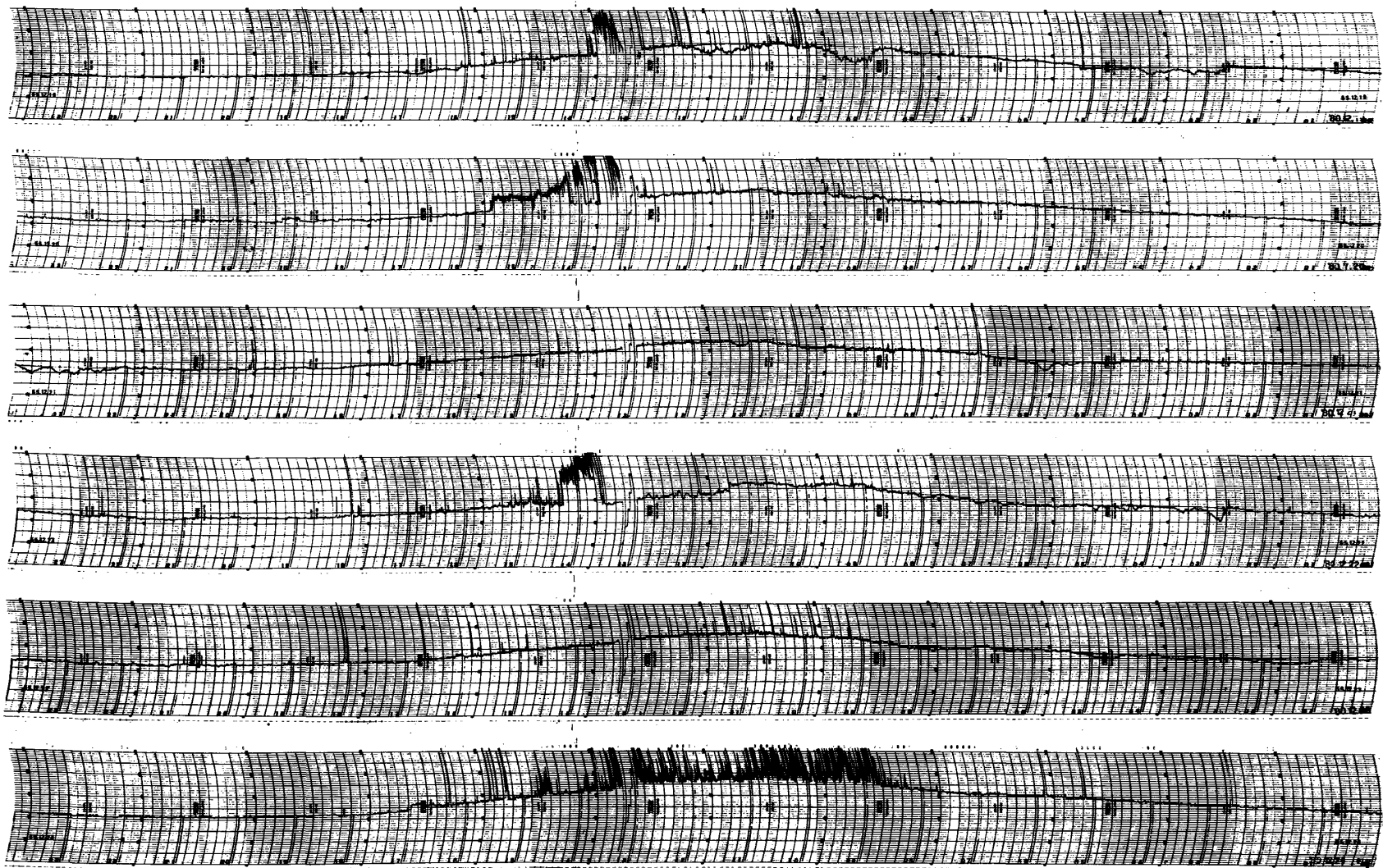
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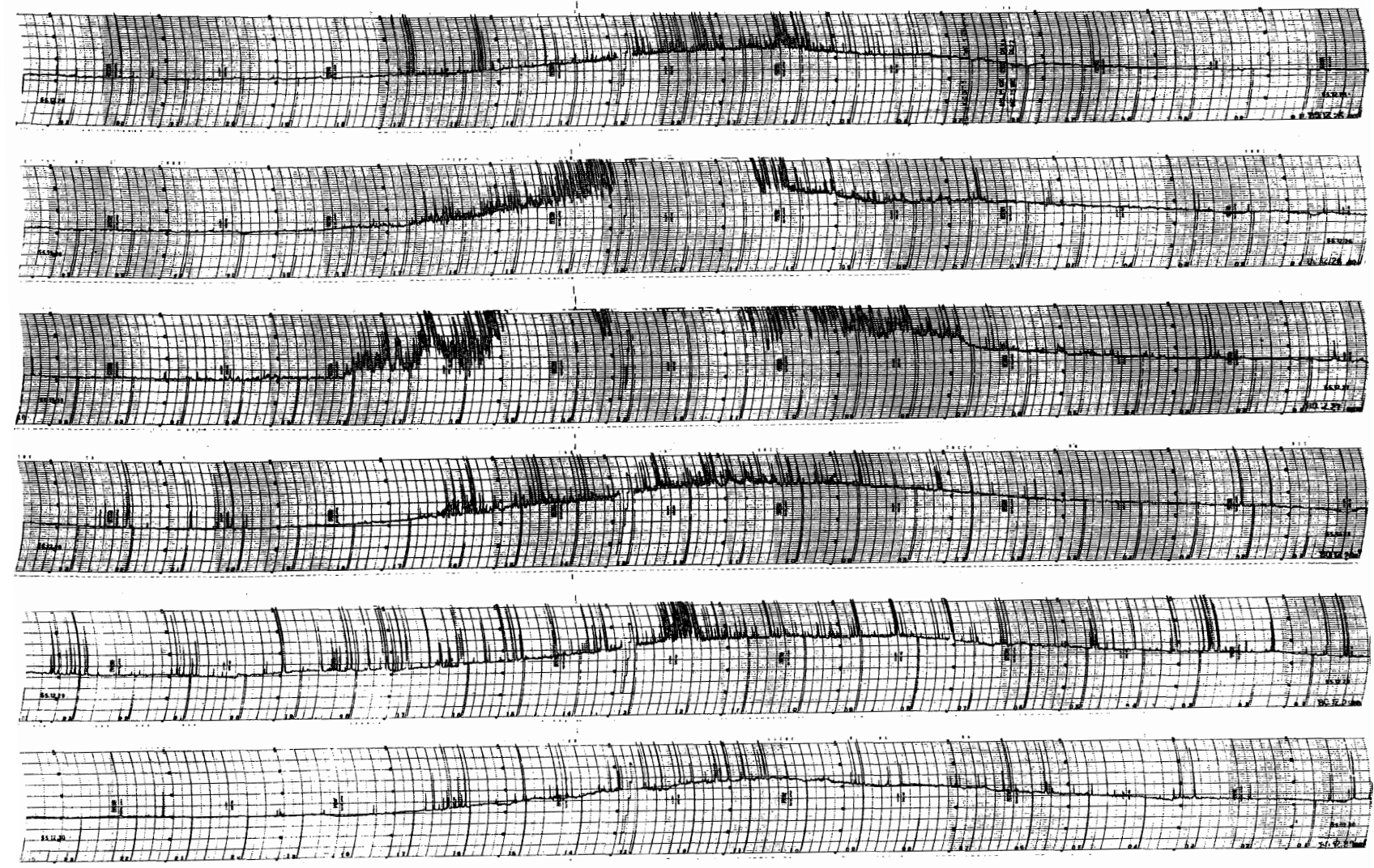
- 95 -

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

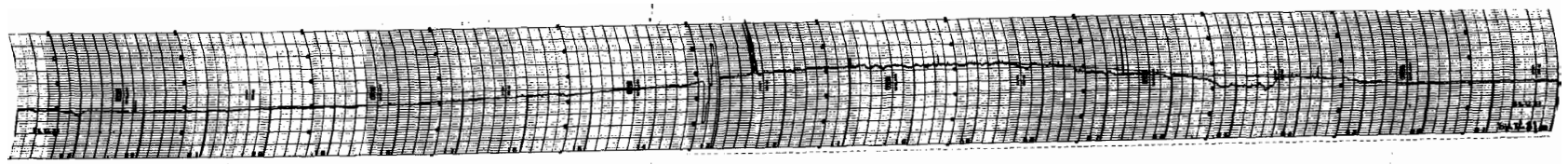
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DEC 1980



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

DEC 1980

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45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

December	3	0850 - 0140	Failure of equipment
	5	0800 - 1120	"
	8	0328 - 0800	"
	10	0630 - 1011	"
	15	0000 - 0056	"