

RIOMETER RECORDS OF 30 MHz COSMIC NOISE
AT SYOWA STATION, ANTARCTICA IN 1981

Masami OSE and Noriyuki KURIHARA

(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, 1981. 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	-70.0°	79.4°

3. Observer

Noriyuki KURIHARA (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.

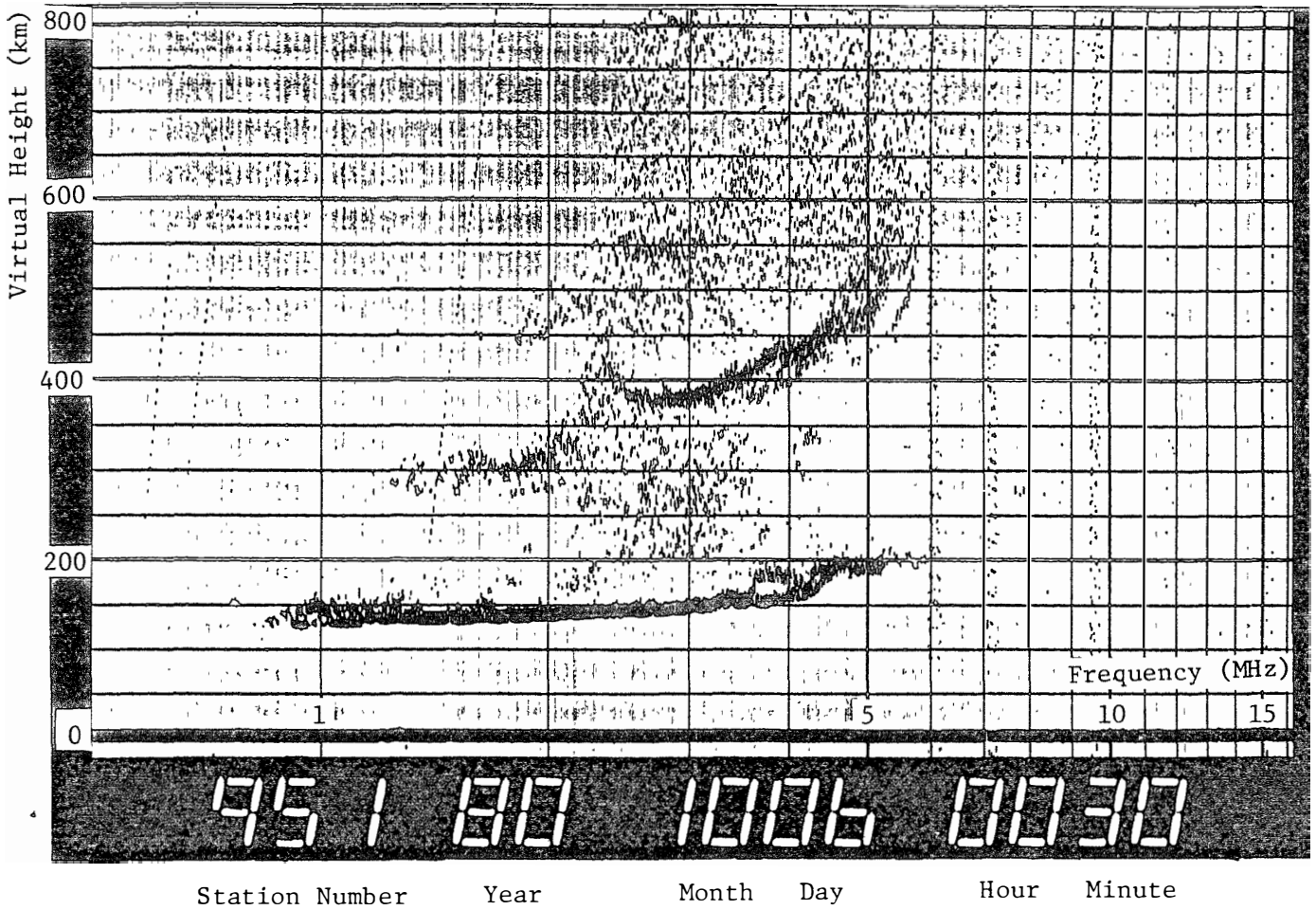
Bibliography relevant to
riometer records of 30 MHz cosmic noise at Syowa Station, Antarctica.

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)	84	1980
1980	Ose, M. Nozaki, K.	70 (Ionosphere 26)	97	1982

SUPPLEMENTARY PART

Ionograms and Their Corresponding Magnetograms

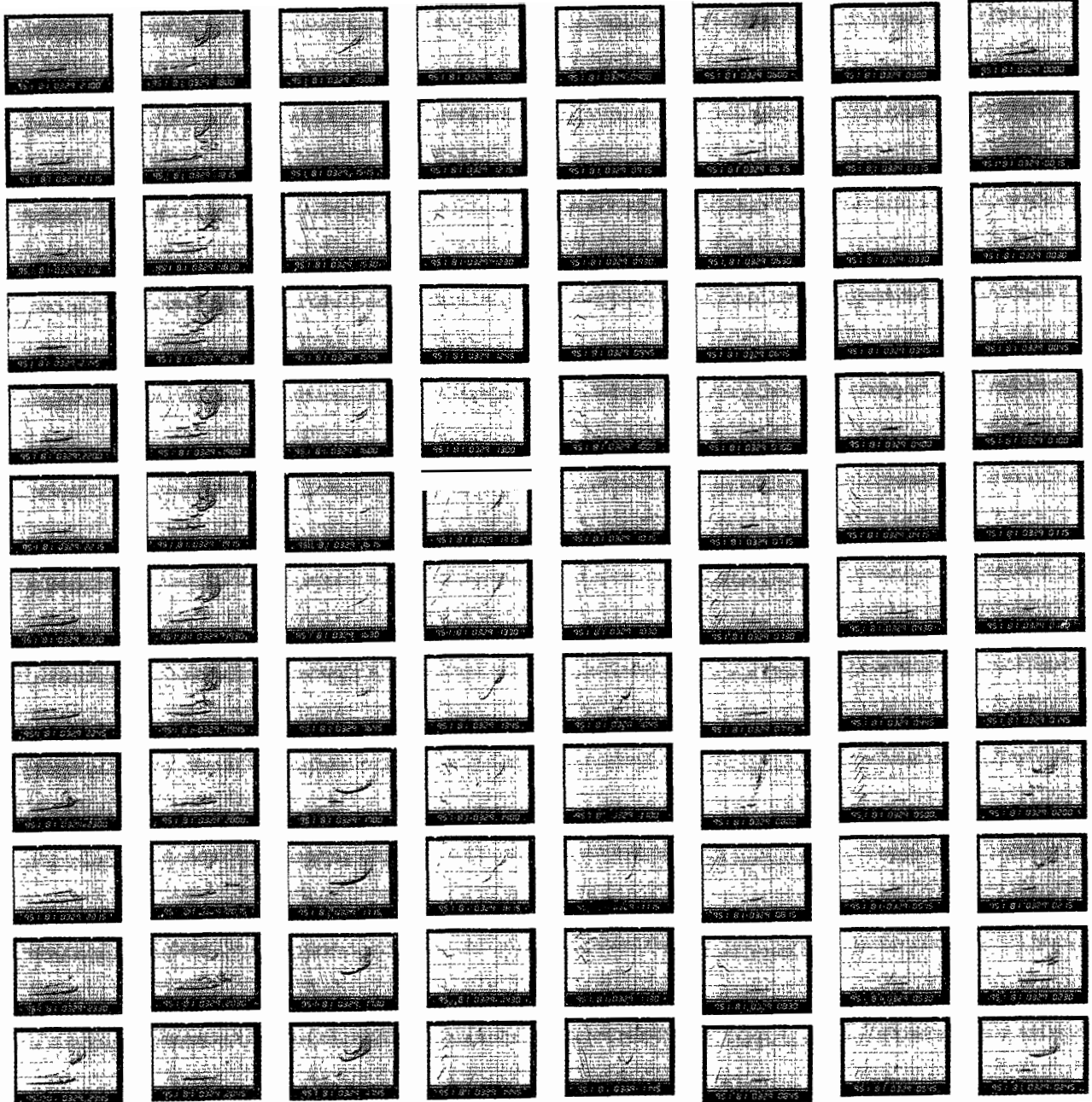
An enlarged example for the following ionograms at intervals of 15 min for the selected seven days.



IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION MAR. 29, 1981 45° EMT

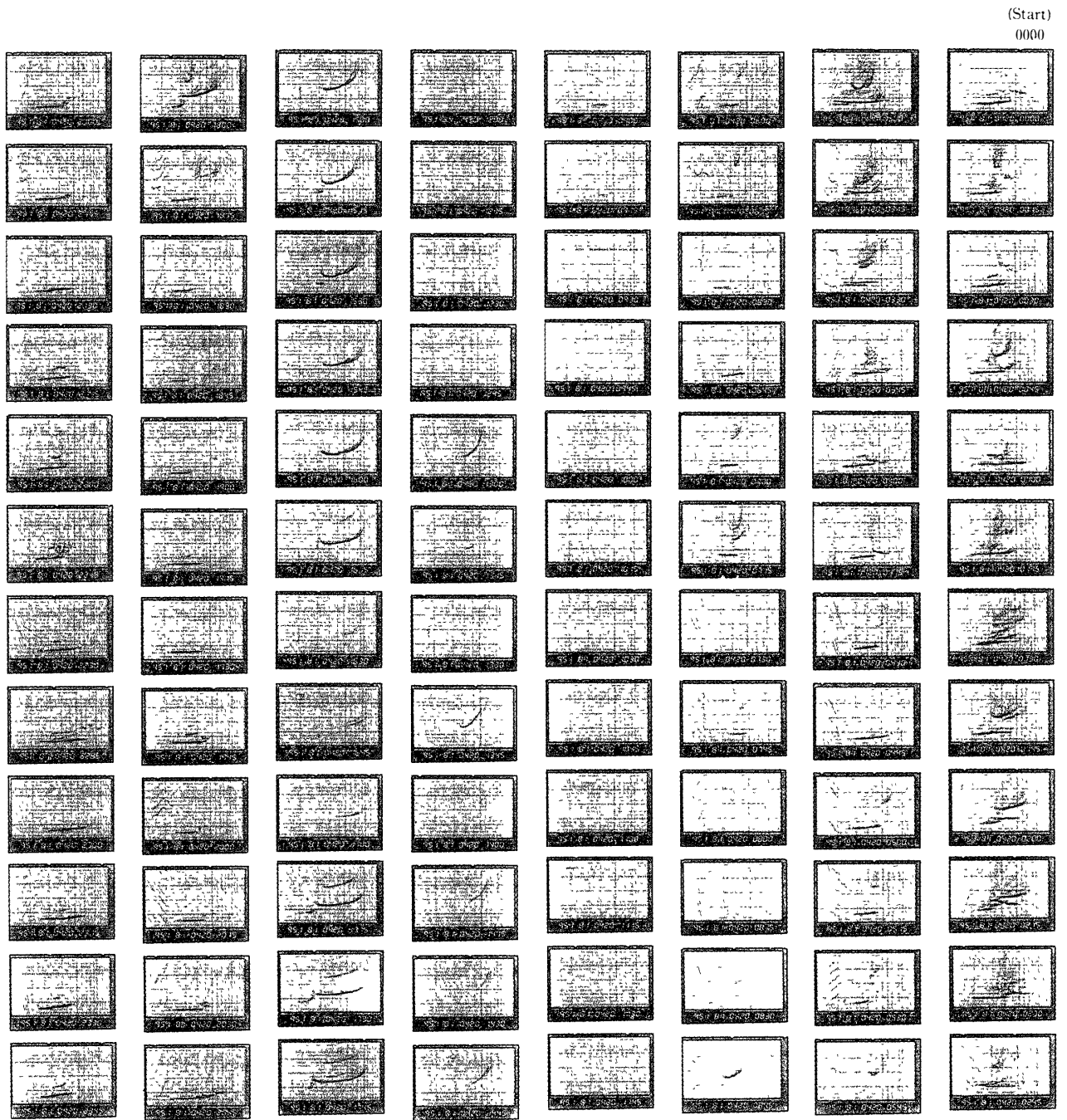
(Start)
0000



2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION APR. 20, 1981 45° EMT

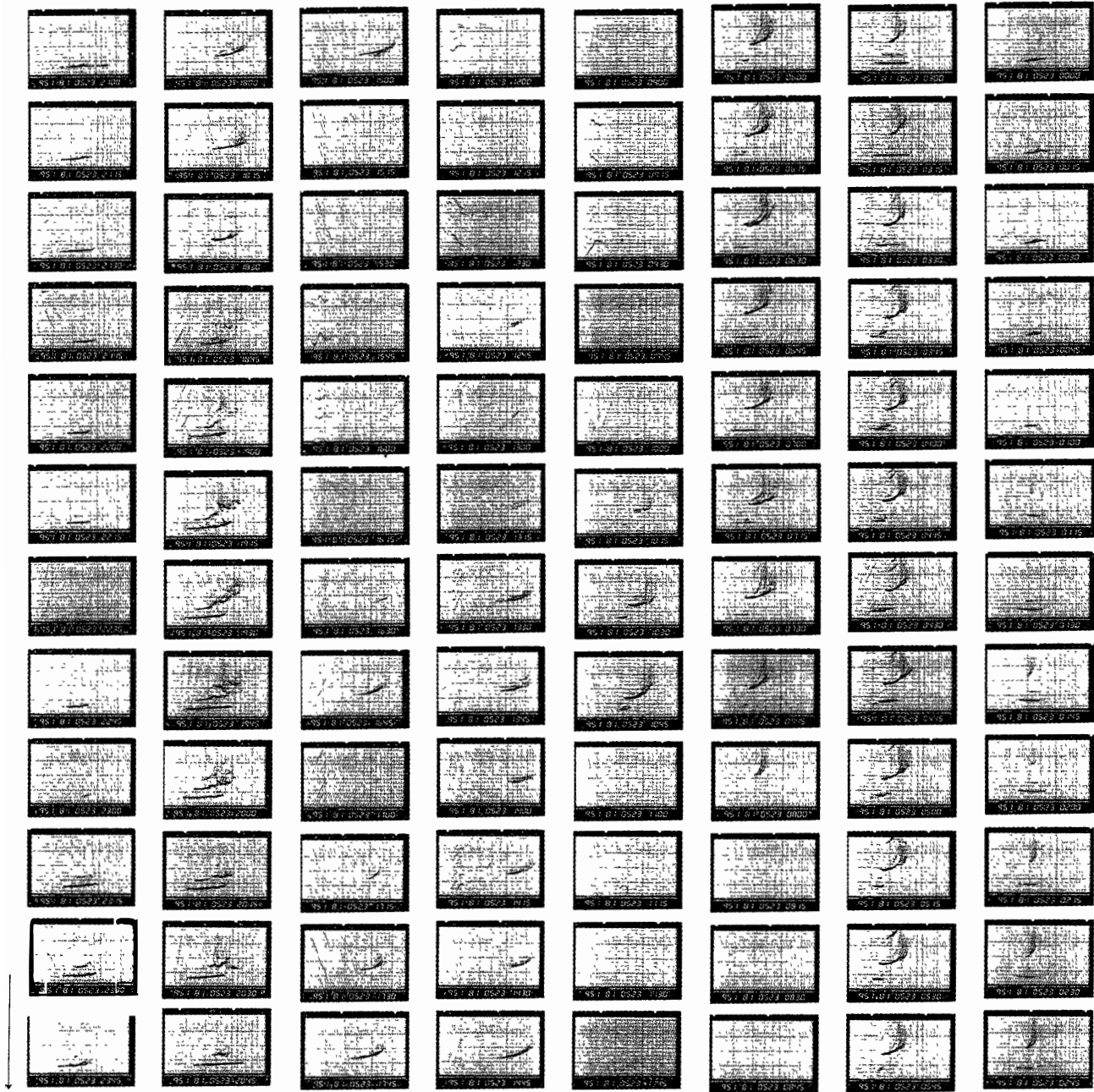


2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION MAY 23, 1981 45° EMT

(Start)
0000



2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION JUNE 30, 1981 45° EMT

(Start)
0000



2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION JULY 15, 1981 45° EMT

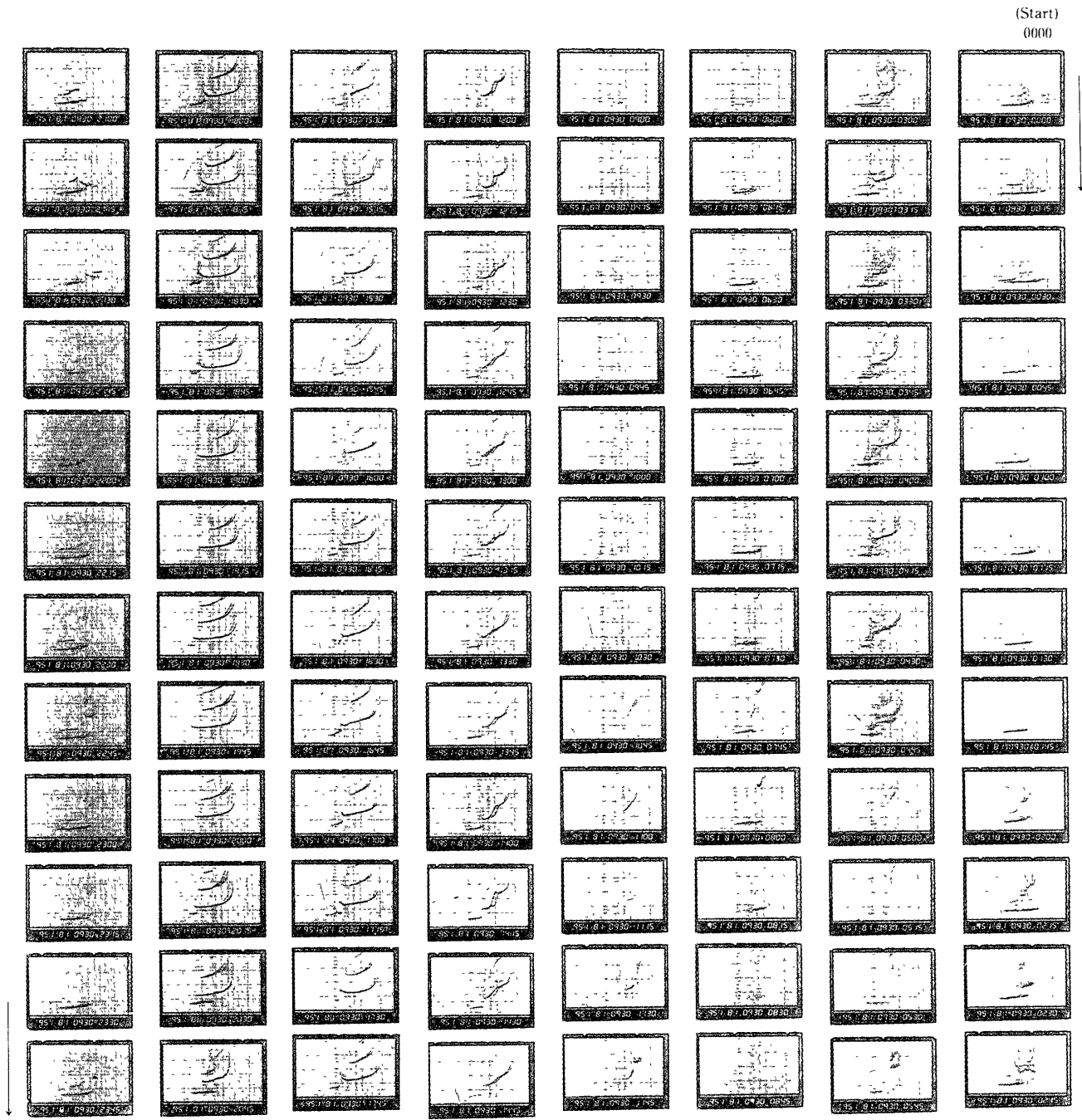
(Start)
0000



2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION SEP. 30, 1981 45° EMT



2345
(End)

IONOGRAMS
AT INTERVALS OF 15 MIN

SYOWA STATION OCT. 7, 1981 45° EMT

(Start)
0000



2345
(End)

MAR

APR

MAY

JUNE

JULY

1981

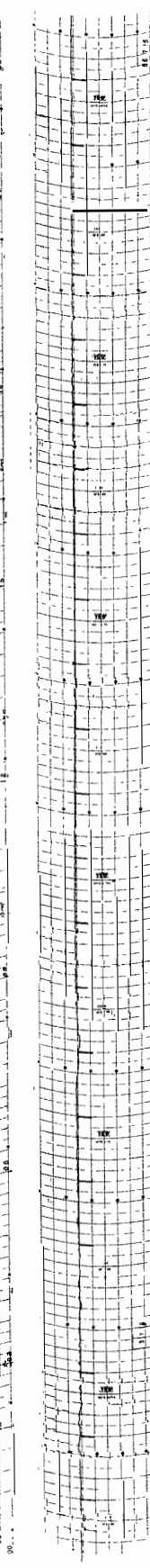
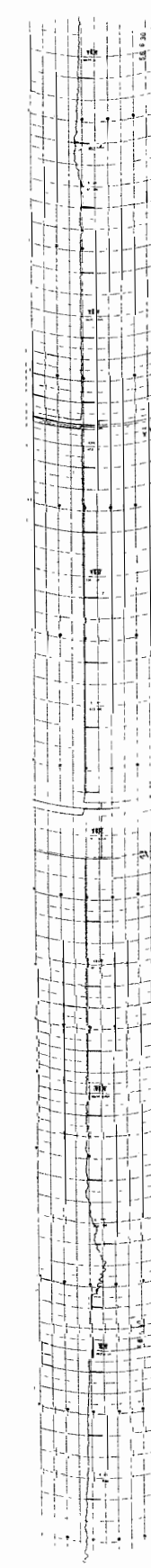
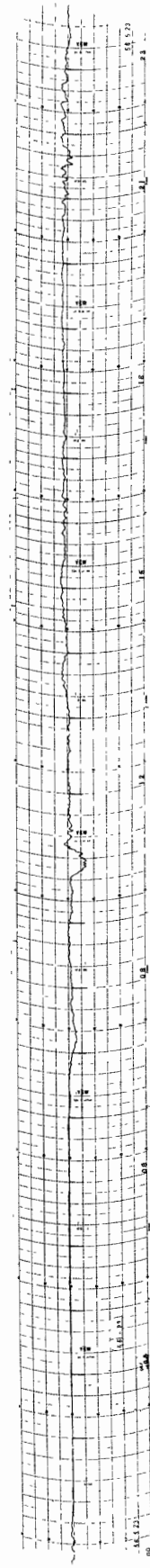
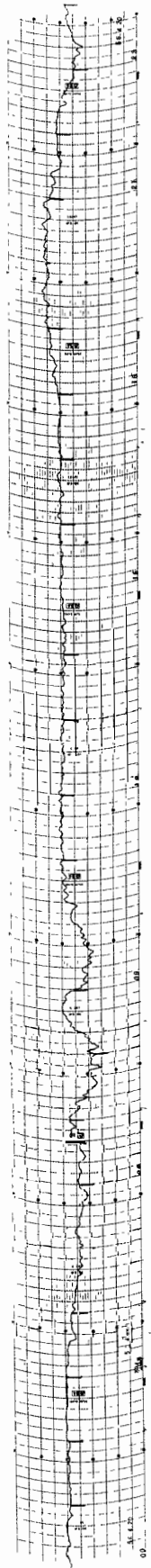
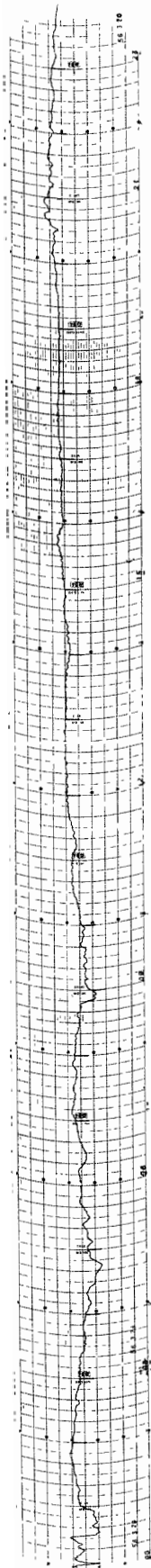
29

20

23

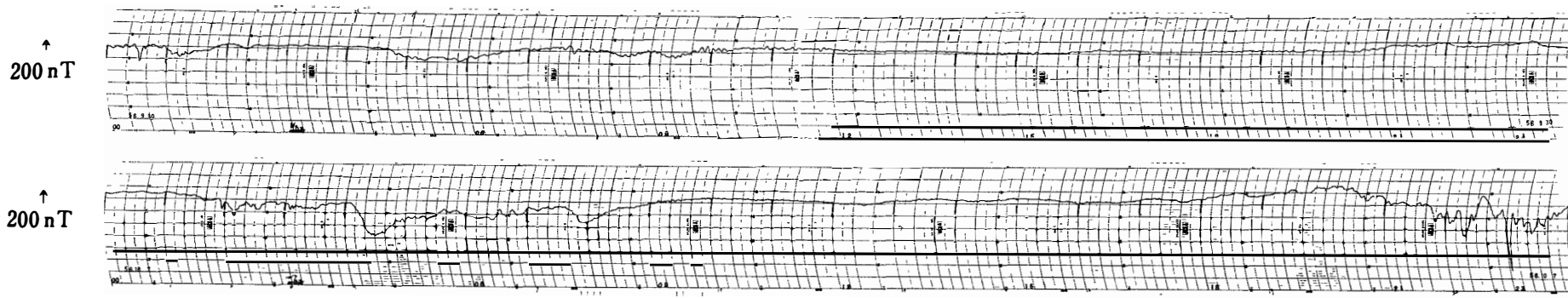
30

15



00 04 08 12 16 20 24

45° EAST MERIDIAN TIME IN HOURS
MAGNETOGRAMS IN THE
HORIZONTAL COMPONENT



30

SEP

7

OCT

1981

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 1981

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	0.8	0.4	0.3					0.2				0.5	0.2	0.1	0.6	1.0	0.3						0.3	0.2
2		0.1					0.1																	
3			0.2	0.4	0.2							0.2	0.2											
* 4					0.3	0.2																		0.2
5					0.1															0.2				0.6
6		0.2	0.3	0.3	0.3	0.4																		
7					0.3	0.2																		
8								0.1																
9		0.1						0.1										0.5	0.5		0.1			
* 10							0.1	0.1				S	S	S										
11	0.1								0.6	0.2														
12	0.4			0.1				0.7																
13			0.1	0.1	0.1																			
14			0.1							0.1														
15		0.1	0.1	0.2		0.1				0.2		0.2	0.7						0.5	0.4				
										0.2									0.1	0.3	0.1	0.2		
16			0.1				0.8			0.1						0.1	0.2							
17							0.1						0.6	0.3										
18		0.2	0.1	0.2		0.2	0.1																	
* 19							0.4																	
20		0.3	0.2	0.1	0.1					*														
* 21																								
* 22												S	S	S										
* 23																								
24																								
25		0.2	0.1									0.5	0.2		0.1									
												0.5	0.5		0.1									
26	0.2																							
27						0.2											0.3							
28						0.1			0.1	0.1					0.9									
* 29				0.3											0.1									
30						0.1						0.1			0.2									
31											0.5				0.2	0.5	0.1	0.1	0.1					
Mean	0.04	0.05	0.05	0.05	0.05	0.06	0.04	0.03	0.03	0.02	0.01	0.04	0.07	0.03	0.04	0.05	0.02	0.01	0.03	0.03	0.01	0.01	0.01	0.03

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

SYOWA STATION

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

February 1981

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		0.1	0.1		0.2		0.1	0.1									0.7		0.1				
2						0.4							0.6						0.2					0.1
3		0.1			0.4	0.3	0.6											0.7	0.2	0.3		0.1		
4												S	S	S	S	S	S					0.1	0.1	
5		0.1	0.3	0.4			0.3		0.1		0.4						0.9	0.8						
6		0.1	0.1			0.5																		0.5
7																								
8																								
9				0.1														0.2						
10																				0.1				
11											S	S						S	S					
12																								
13									0.1													0.1		
14						0.1																		
15																					0.1			0.2
16			0.2																					
17																			0.4	0.7				
18																								
19								0.1																
20											0.3	C	0.5	0.3	0.2		S	S						
21											0.2	0.2	0.2											
22			0.1							S		0.2				0.2	0.5	0.1	0.4	0.4	0.5	0.2		
23	0.1		0.2		0.3	0.4				0.3														
24						0.1		0.1	0.2	0.2	0.2	0.5	0.4	0.1					0.1			0.1	0.1	0.1
25	0.4	0.1	0.1							0.2	0.7	0.6	1.6	0.8	0.2	0.5	0.4	0.1			0.1	0.1	0.2	
26			0.1			0.8	0.4	0.1			0.1	0.4	0.1	0.1	S	0.4	0.1	0.2	0.1	0.2	0.1			
27	0.7			C	C	C	C	C	C	C	C													0.5
28	0.2	0.2		0.1										1.2	0.6	0.9	0.3	0.1						0.1
29																	0.1							
30																								
31																								
Mean	0.05	0.02	0.04	0.02	0.06	0.10	0.04	0.01	0.01	0.02	0.07	0.07	0.12	0.10	0.03	0.07	0.08	0.10	0.05	0.06	0.02	0.02	0.01	0.05

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

1981

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	0.1		0.5	0.5						0.1	0.7			0.2									
2			0.3			0.6					0.2	1.1	1.9	S	S	0.2	0.2	0.1	0.1				0.1		
3						0.2			0.1		S	S	S												
4	0.6	0.2		0.5	0.2					0.1	0.2	0.6	0.8	0.4	S	S	0.2	0.2	0.1	0.1					
5							0.2	0.5	0.3	2.0	0.8	S		0.2	0.5		0.5	0.4	0.2		0.5		0.7	0.5	
6	0.2	0.2									0.3	0.3				0.4	0.5	0.2							
7															0.3	0.5	1.3	0.2					C	C	C
8	C	C		0.1		0.1						0.2	0.1	0.5	0.6	0.4	0.4	0.4	0.6	0.1			0.2	0.1	
9														S	S	S	S			S		0.1	0.1	0.2	
10					0.1	0.1					0.7	0.3		0.1		0.8	0.8	0.3		0.2					
11																									
12													0.6	0.5	1.0			0.2						0.2	
13					0.2									S	S										
14		0.5	0.3						0.1		0.5	0.2	0.3		0.6	0.4	0.4	0.5	0.7	0.5	0.4	0.5	0.3	0.1	
15	0.2	0.2		0.3		0.1		0.1	0.2	0.7	0.7	0.8		0.2		0.1	0.2		0.2				0.2	0.4	
16	0.4	0.1	0.2	0.4	0.7		0.1	0.3			0.3	0.3	0.3	0.1	0.4	0.4	0.2	0.4	0.1	0.1	0.2	S			
17		0.1		1.1	1.3	0.4	0.2	0.5	0.4	0.1				0.3	S	S	S	0.3	0.4	0.7	0.1				
18				0.4	0.4	0.5	0.4	0.1	0.9	1.3	1.2	1.4	1.2	0.7	0.6	0.6	1.1	0.3	0.1	0.1	0.1	0.1	0.2	0.1	
19												S	S	S	S	S	S	S	S	S	0.2	0.2	0.1	0.1	
20				0.3	0.2				0.3				0.1		S	S	S	S	S	S	0.3				
21											S	S	S	S	S	S	S	S	S	S			0.1		
22		0.5	0.3		0.2	0.1			0.5	0.1						0.3		0.2							
23											S	S	S	S	S	S	S	S	S	S					
24										S	S	S	S	S	S	S	S	S	S	S					
25		0.2	0.1	0.3	0.4	0.5	0.4	0.4	0.9	1.4	0.4	0.8	0.6	S	S	S	0.4	0.1	0.1	S		0.1	0.2	0.1	
26	0.1	0.1		0.3	0.3	0.1			0.2	0.4	0.4	0.7	0.6	0.3	0.3	S	0.7	0.5	0.3	0.3	0.2				
27	0.1	0.2	1.2	1.2	0.2	0.3	0.2	0.5	1.0	1.5	0.8	1.3	1.4	0.8	S	S	S	S	S	0.9	0.6	0.5	0.2	0.1	
28	0.3		0.7	0.6	0.1	0.6			0.1	0.5	0.5	0.4			S	0.3	S		0.1		0.2	0.2	0.1	0.1	
29	0.2	0.3	0.1	0.1	0.1	0.4		0.3	0.3	0.7	1.9	0.8	1.5	1.1	0.3	0.9	1.0	0.2	0.1						
30				0.5		0.1					S	S	S	S	S	S	S	S	S	S	0.2	0.2	0.2		
31	0.5	0.3		0.1		1.9	0.1	0.8	0.4	0.4	0.3	0.3	0.9	0.7	S	S	S	S	S						
Mean	0.08	0.11	0.10	0.19	0.16	0.21	0.05	0.11	0.18	0.29	0.29	0.30	0.35	0.19	0.14	0.17	0.24	0.14	0.10	0.09	0.09	0.06	0.09	0.06	

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)

April

1981

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	0.5	0.5	0.8	0.4	0.1		0.1	1.0	1.2	1.1	1.3	2.6	1.6	0.5	1.7	1.4	0.8	0.1			0.3	0.5
2	0.2	0.2	0.2	0.4									0.7	0.7		S	S	S	S	S	S			
3		0.1	0.1		0.2	0.3	0.8	0.4				S	S	S	S	S	S	S	S	S	0.1			
4	0.2	0.1	0.8	0.2	0.1	0.2	0.3					S	S	S	S	S	S	S	S	S	0.1	0.1		
* 5				0.2	0.1						S	S	S	S	S	S	S	S	S	S				
6			0.1	0.3	0.1					S	S	S	S	S	S	S	S	S	S	S				
7			0.3	0.1	0.1	0.3				S	S	S	S	S	S	S	S	S	S	S			0.1	0.1
8		0.1	0.2	0.1	0.2	0.1	0.2			S	S	S	S	S	S	S	S	S	S	S				0.2
9		0.2	0.2	0.6	0.5	0.3	0.2	0.1	0.1		S	S	S	S	S	S	S	S	S	S				
* 10				0.1						S	S	S	S	S	S	S	S	S	S	S				
* 11										S	S	S	S	S	S	S	S	S	S	S				0.1
12					0.4	0.1		0.4	0.4							0.1	0.3	0.1						0.1
13	0.2		0.1		0.1	0.1	0.2	0.1		0.2			1.9	0.5										
14	0.1		1.1	0.1	0.3	0.9	0.6	0.3	0.3	0.7		1.2	S	S	S	S	S	S	S	S				
15	0.3	0.1									S	S	S	S	S	S	S	S	S	S	S			
16			0.1	0.1	0.1	0.3				S	S	S	S	S	S	S	S	S	S	S	S			
17			0.2	0.2	0.1	0.1			0.1	0.2	2.6	0.7	3.0	0.8		S	S	1.8	S	S	S			
* 18			0.1		0.3						S	S	S	S	S	S	S	S	S	S	S			
19			0.1	0.1	0.1		0.1	0.2	0.3	0.5		S	S	S	S	S	S	S	S	S	S			0.2
20	0.2	0.3	0.2			0.1	0.3	0.2	0.5		1.2	1.5	0.8		S	S	S	S	S	S				
21		0.1	0.5	0.3	0.3	0.2		0.7	0.5	0.3	0.5		4.2			S	S	S	S	S		0.1	0.1	
22	0.9	0.1	0.2	4.3	0.7			0.3	0.8	0.3	0.9		3.2	S	S	S	S	S	S	S			0.3	0.1
23	0.1	0.1	0.2	0.5	2.6		0.2		0.9	0.4	2.6	1.8	0.7	4.0	2.5	S	S	S	S	S				
24	0.8	0.5		0.1					0.5	2.9	0.5	S	S	S	1.6	5.4	1.5	S	S	S			1.8	0.1
25	0.1	0.4	0.5	0.9	0.3	0.1	0.9	0.5	0.5	0.3	0.6	2.0	3.5	1.2	S	S	1.0	1.3	S	S				
26	0.1	0.2	0.6	0.4	1.6	0.2		0.5	3.0	1.2	1.0	0.2	3.5	2.1	0.3	1.7	2.1						0.2	0.2
27		0.7	0.1		0.3		0.5		0.4	4.2	3.4	3.1	2.6	1.0	1.5	0.8	1.2	S	S	S				
28	0.1		0.5				0.2			0.6	S	S	S	S	S	S	S	S	S	S				
29		0.2	0.1	0.1		0.5					1.0	S	S	S	S	3.0	1.6	S	S	S	S			
30		0.4	0.4			0.3	0.2			0.2	S	S	S	S	S	S	S	S	S	S				
31																								
Mean	0.11	0.13	0.24	0.32	0.29	0.16	0.16	0.12	0.28	0.42	0.51	0.38	0.84	0.43	0.25	0.38	0.37	0.09	0.02	0.01	0.01	0.01	0.10	0.04

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

SYOWA STATION

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

May

1981

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	S	S	S	S						
2		0.2	0.1	0.3	0.1	0.1	0.1				S	S	S	S	S	S	S	S	S	S						
3													2.0	1.0	S	S	S	S	S	S						
4											S	S	S	S	S	S	S	S	S	S						
5										S	S	S	S	S	S	S	S	S	S	S						
6									0.2		S	S	S	S	S	S	S	S	S	S						
7											S	S	S	S	S	S	S	S	S	S						
8											S	S	S	S	S	S	S	S	S	S						
9								0.4	0.9	0.4	2.6	0.6	0.4	0.5	0.3	0.5										
10				0.1							0.4	S	S	S	1.5	0.7		S	S			0.4	0.3			
11		0.1	0.2		0.2		0.6	0.5	0.2	1.8	2.2	3.3	2.1	1.8	4.0	3.5	1.7	0.3								
12													S	S	S	S	S	S	S	S				0.2		
13	0.1		0.1	0.1			0.4		0.6	1.5		S	S	S	S	S	S	S	S	S						
14										2.3	S	S	S	S	S	S	S	S	S	S						
15			0.1			0.1	0.1	0.3	0.1	1.1		1.2	0.5	0.7	1.3	0.1										
16	0.5	0.8	0.1	0.2		0.2	0.6	0.5		0.1	2.6	0.9										0.1	0.2	0.3	0.2	
17	0.1	0.3	0.5	0.1			0.2		0.2	0.8			0.5	S	0.3							0.2	0.4	0.2	0.5	0.4
18	0.4	1.0	1.0	0.2	0.2				0.4		0.7	0.1	0.6	0.3	0.5	0.1	0.3	0.3							0.4	
19	0.1	0.3	0.3	0.1						0.7	1.0	1.4	2.0	S	S	1.7	S	S	S							
20	0.1			0.6		1.0	3.2	0.9	2.8	3.2	0.1	0.5	0.3	S	S	S	S	S	S			0.1	0.3	1.7		
21	0.1		0.1	0.3	0.5	0.3	0.6	0.4	0.8	1.7	2.3	S	S		S	0.2		S	1.0	0.6	0.2		0.1			
22	0.2	0.9	0.4		0.6	0.2	0.1	0.5	1.8	0.8	0.8	S		S	S	S	S									
23										1.1	0.7	3.0	2.0	0.6	1.5	1.3	3.0	0.2					0.1	0.1		
24		0.2	0.5	0.1	0.6	0.1	1.3	0.9	0.7	1.5	2.4	3.3	0.6			0.4							0.3			
25		0.1	0.5			0.6		0.4	0.6	1.1	0.5	0.2			S	0.3	0.2	S						C		
26	C	C	C	C	0.1								S	S	S	S	S	S	C				C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			C	C	C	
28		0.3	0.2	0.5	1.1	0.4	1.7			0.7	0.1	S	S	S	S	S	S			0.3		0.2				
29	0.2	0.1		0.1		0.1	0.2					S	S	S	S	S	S									
30					0.1	0.8	1.5	1.0	0.7	0.2	0.2	S	S	S	S	S										
31						0.5		0.3		0.1	1.5	1.6	0.6	S	S	S	S	0.2	0.2	0.2	0.1	0.2	0.1			
Mean	0.06	0.14	0.14	0.09	0.11	0.14	0.35	0.20	0.33	0.63	0.60	0.53	0.38	0.16	0.31	0.29	0.17	0.03	0.04	0.04	0.02	0.04	0.06	0.09		

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

SYOWA STATION

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

June

1981

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		1.0	S	S	S	S	S	S	0.9	1.3	1.0	1.0	1.5	1.5	1.7
2	2.0	1.6	1.4	1.2	1.7	2.1	1.9	2.0	2.2	2.4	1.8	2.5	S	S	S	S	S	S	0.3	0.9	0.8	0.7	0.3	0.6
3	0.3	0.2										0.5	1.5	S	S	S							0.1	
4	0.4	0.4			0.2							S	S	S	S	S								
5				0.3							1.1	1.3	S	S	S	S								
* 6															S	0.6			0.2					0.2
7	0.1	0.1	0.2	0.2				0.7	1.5	1.5	1.5	4.5	3.2	2.1	0.2	0.3	0.7	0.2	0.3	0.4	0.3		0.1	0.4
8		0.2	0.3	0.1		0.3	0.1			0.2	0.2	0.5	S	S	S		0.4		0.2	0.2	0.1	0.3	0.4	
9			0.1		0.5	0.3	0.1										0.3	0.2		2.0	1.5	1.5	1.8	1.5
10	1.3	0.8	0.6	0.4	0.3	0.3																		
* 11																								
* 12	0.2																							
13									0.2	0.2	0.7	1.0	0.2	0.2			0.2	0.2		0.2				
14		0.2			0.1	0.1	0.2										0.5	0.7	0.2	0.2	0.2			0.1
15				0.1		0.1	0.2	0.1		1.7	0.1						0.5	0.7	0.3		0.1	0.1		0.1
16	0.1	0.2	0.2	1.5	0.5	0.1	0.1	1.0	1.3	0.2		0.1	0.2	2.5	1.7	1.2	0.5	0.4	0.1	0.2	0.2	0.4	0.4	0.1
17		0.1	0.1	0.1	0.3				0.6	0.4	0.3	2.7	2.5		S	0.2		0.2	0.5	0.4	0.2		0.1	0.2
18										1.5	1.4	0.6	0.3	S	S	S	0.5	0.2	0.1	1.2	0.3			
19			0.2	0.4	0.3	0.2	0.1	0.2		0.4	0.3	0.3	0.1	2.5	1.5	S	0.5	1.1	0.5	0.3	0.1			0.1
20	0.4		0.4	0.6	0.5	0.5	0.5	0.5	0.2	0.5	0.3	0.3	4.2	1.7	1.5	S			0.4	0.6	0.4	0.3		
21						0.1	0.8	2.2	3.0	3.2	1.7	0.5	0.5			0.2	0.2							
* 22																								
23									0.2	0.5	0.1	0.2	0.2				1.3	1.3	0.6	0.2	0.2			0.2
24									0.2	0.2		0.3	1.1	1.9	1.6	S	1.3	1.3	0.6	0.2	0.2			0.2
25				0.2	0.3	0.2			0.2	0.1		0.2	1.0	1.2	0.1	S	0.2	0.2	0.2	0.1	0.2	0.4	0.5	0.8
26	0.8	1.0	1.0	0.7	1.2	0.2		0.2	0.3	0.7	0.5	1.0	0.2	0.5	2.0	0.6		1.1	0.7	0.9	0.2	0.1	0.1	
27				0.6	0.1	0.2		0.1	0.4	0.5	0.7	1.3	3.4	2.8	0.5	0.2	0.2	0.2	0.5	0.3	0.2	0.2	0.3	0.2
28	0.2	0.1	0.1	0.2	0.7	0.7	0.5	0.3	0.7	0.5	3.5	2.7	2.1	2.3	2.2	2.3	1.8	1.8	3.6	3.8	4.7	4.1	4.4	4.0
29	4.0	4.2	5.0	4.4	3.5	3.0	3.0	3.0	2.7	2.5	2.5	2.3	2.4	2.3	2.5	2.7	3.0	3.2	4.0	2.9	2.5	2.1	2.0	2.3
30	2.5	2.9	3.3	3.8	3.3	4.5	3.9	3.7	3.0	3.1	3.0	3.0	3.0	2.5	2.5	S	0.9	0.7	0.7	1.0	1.4	1.5	1.2	1.1
31																								
Mean	0.41	0.40	0.41	0.48	0.45	0.43	0.39	0.46	0.57	0.67	0.69	0.86	0.87	0.75	0.54	0.27	0.37	0.42	0.48	0.51	0.52	0.44	0.43	0.46

* : Quiet day

Open spaces without figures correspond to quiet level

S : Interference

SYOWA STATION

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

July

1981

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		1.7	1.6	1.5	1.5	1.2	2.5	2.5	2.0	3.0	3.5	3.0	3.0	3.0	3.8	S	1.0	0.4	0.2	0.5				
2		0.3	0.5	0.5	0.3	0.5	0.5	0.5	1.5	3.5	2.1	0.9	3.6	3.6	2.5	1.5	1.2	1.0	0.1	0.5	0.3	0.3	0.2	0.3
3	0.1	0.4	0.5	0.1	0.4	0.1	0.1	0.1	0.1					0.2	0.2	0.5	0.2	0.8	0.2	0.2			0.1	
4			4.3	0.7	0.5	0.3	0.6	0.6	1.2	1.0	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.8	0.9	1.0	1.0
5	1.3	2.0	1.9	3.0	2.6	2.6	3.4	3.1	2.9	2.6	2.5	2.3	2.7	1.5	0.5	1.0	0.3	0.3	0.3	0.7	0.6	0.1		
6		0.1	0.1		0.2	0.2	1.0	2.2	2.1	2.1	2.0	3.5	3.5	2.2	1.3	0.9	1.0	0.8	0.5	0.1	0.1	0.1		0.1
7	0.3	0.1	0.2	0.2	1.0	0.5	0.5	0.3	0.3	1.0	2.0	0.7	0.7	0.2		1.6	0.4	0.2	0.7	0.3	0.1			
8				0.1			0.5	1.0	1.5	1.5	2.1	1.0	0.5	1.5	1.7	2.0	0.2	0.4	0.1			0.2	0.1	0.2
9	0.1	0.1	0.1			0.1	1.2	0.7	1.2	0.2	2.2	1.5	0.5		S		0.1	0.6	0.6	0.2				
10										1.7	0.3	0.6	0.5											
11											0.2	2.2	1.3	1.2	2.6	3.0	3.0	2.3	2.2	1.7	0.9	0.6	1.5	
12	1.2	1.5	1.5	1.7	2.0	2.0	2.5	2.7	4.0	2.5	3.2	3.3	3.0	3.0	1.5	1.7	3.1	3.2	2.0	1.3	0.9	0.8	0.8	1.1
13	0.8	1.1	2.0	1.2	0.4	1.1	2.0	2.3	2.0	1.7	1.7	1.5	1.5	1.5	1.0	0.5	2.0	2.2	1.7	1.0	0.4	0.3	0.2	
14	0.2	0.2			1.7	1.5	0.5	0.7	1.2	2.1	1.0	1.0	1.2	1.4	2.0	2.4	2.0	1.7	1.3	1.5	1.4	0.8	0.9	1.0
15	1.4	1.6	1.6	1.7	1.8	1.6	1.2	1.0	1.7	1.7	1.5	1.5	1.3	1.0	0.9	0.5			0.2	0.4	0.6	0.7	0.7	0.9
16	0.9	1.0	0.9	0.5	0.6	1.0	1.2	0.5	0.3	0.5	0.3	1.0	0.5											
17	0.2	0.4			0.5								1.0		0.9	3.8	0.3	0.3						
18	0.4	1.7	1.5	0.2	0.2	0.5						1.0	0.5	0.5	0.5	0.5	0.6	0.2						
19				0.1	0.2	0.1			0.5	0.7	0.3						0.5	0.6		0.3		0.1		
20				0.2	0.9													0.5				0.1		
21							1.0	1.2	0.6			0.5										0.1		
22								0.8	1.2	0.1					2.5	1.0	1.2	1.4	0.1	0.3	0.1			0.1
23	0.2				0.1	0.2	0.2				2.5	1.0		S	0.5	0.2	0.3		0.2		0.2			
24	0.2	0.5	0.5														0.2	0.4	0.2	0.1	0.1			
25		0.2	0.3		0.5				0.2	2.5	2.5	0.6	0.3	S	1.5	0.3	0.5	0.5	0.5	0.1	0.2	0.2	0.2	0.2
26			0.3	1.5	0.7	1.7	2.5	4.1	4.1	1.5	3.5	3.0	1.2	1.0	1.0	2.6	0.2	0.2	1.1	0.2	0.1			
27			1.1	0.5	1.3	2.3	2.0	2.5	3.5	3.2	3.4	3.5	3.1	2.5	2.0	1.5	1.2	1.5	1.2	1.3	0.7	0.4	0.1	0.2
28	0.3	0.2	0.4	0.7	0.3	0.2	0.5	0.2	0.5	1.8	2.8	1.7	3.9	1.6	1.5	S	1.2	0.9	0.1	0.3	0.4	0.1		0.1
29	0.3			0.1	0.3	0.6	1.5	0.5																0.1
30			0.7							0.1	2.0	1.7	0.3	0.1	0.4	0.3	0.2	0.7	0.3	0.1				
31	0.2	0.3	0.6	0.6	0.7	1.0	1.1	1.3	1.5	1.5	2.0	1.5	0.5	0.2	0.5	0.5	0.5	0.5						
Mean	0.27	0.43	0.66	0.48	0.60	0.62	0.85	0.60	1.10	1.17	1.40	1.18	1.14	0.84	0.90	0.90	0.69	0.70	0.44	0.39	0.27	0.20	0.15	0.21

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

SYOWA STATION

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

August

1981

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	C																		C	C	C	C	C	
* 2																			C	C	C	C	C	
* 3																			C	C	C	C	C	
4									1.2			3.0	4.0	1.2	0.7	0.8	0.1							
5										1.6	4.5	1.5	1.6		0.5	0.5	0.2	0.4	0.3	0.1				
6																								
7										3.1	3.7	4.1	2.0	1.8	1.2	0.5	1.5	0.8		0.1				
8									0.7	2.0	0.6						0.9	1.3	0.7	0.1				
* 9			0.3		0.2																			
* 10						1.0	0.5																	0.1
11																								
12	0.3	0.5		0.2	0.5	0.7	1.2	0.5	0.3	2.0	1.0													
13			0.5	1.0			0.2		1.7	0.5	0.2	0.1	0.2	1.6	0.2									
14				0.5	1.1	1.0	0.7								1.3	2.4	0.5	0.1		0.1				
15								2.4	1.4	1.0	0.1													
16	0.3	0.4	0.3	0.2						1.7	0.5													
17				0.2	0.1							0.5	0.5	0.5	0.3	0.6	0.5	0.1				0.4		
18		0.4	0.3	0.2	0.1	0.4					0.2	4.0	1.2	S	S	S	1.1	1.5	0.2	0.2				0.1
19					0.2		1.1	0.7	0.5	0.7	0.1			S	S	S	S	S	S	0.9	0.2			
20				0.3			0.5	0.6	0.3	0.5		S	S	S	S	S	S	S	S					
21		0.2	0.2	0.2								3.7	S	S	S	S	S	1.3	0.6					
22							0.2	1.0	0.3	0.1	0.3	0.2	0.6		0.2	S	S			0.2				
23					0.7	0.6	1.2	1.5	1.3	1.4	2.6	0.7	0.5	1.7	1.2	0.5	3.2		0.2					
24			0.2				0.5	0.5	0.5				S	S	S	S								0.2
25	1.0	0.2	0.5	1.3	1.7	0.5	0.3					0.1	1.2	0.2									0.1	0.3
26	1.5	0.1	0.5								S	S	S	S	S	S								
27					0.3	0.4					S	S	S	S	S	S								0.1
28							0.3	0.3	0.2	1.1	0.2	1.5	1.6		0.2	0.6	S	S	S					
29		2.0	0.5	0.2		0.3						0.2	S	S	S	S	S	S	S					
30				0.2	0.7	1.2	1.0	2.0	1.2	0.7	0.7	1.2			0.1	0.1	0.6				0.3	0.2		
31			0.2	0.4			0.2	0.7			0.2	S	S	S	S	S	S	S	S					
Mean	0.10	0.12	0.11	0.15	0.18	0.19	0.25	0.32	0.30	0.52	0.48	0.67	0.48	0.22	0.19	0.19	0.27	0.17	0.06	0.06	0.02		0.01	0.02

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

--21--

SYOWA STATION

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

September

1981

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	0.8	0.3	0.5	0.9	0.5	S	S	S	S	S	S	S	S	C					
* 2												1.0	S	S	S	S	S	S	S					
* 3												S	S	S	S	S	S	S	S					
* 4						0.2		0.3				S	S	S	S	S	S	S	S	S				
* 5				S	S	S			0.5	0.2	0.6	0.6	0.7	0.2						S				0.2
6		0.1						0.4	0.5	0.4	0.3	S	S	S	S	S	S	S	S					
7				0.7							S	S	S	S	S	S	S	S	S					
8									1.1	0.5	S	S	S	S	S	S	S	S	S					
9				0.1			0.4	0.7	0.2		S	S	S	S	S	S	S	S	S					
10											S	S	S	S	S	S	S	S	S					
11					0.1	0.5	0.1	0.4		1.3	1.1	1.1	1.0	1.6	0.5	0.2				0.5				
12			0.2	0.2	0.3	0.4	0.6	0.3	0.2	0.2	0.8	S	S	S	S	S	S	S	S					
13				0.4	0.5		0.1		0.5	1.3	0.5	0.5			0.2					0.1				
14			0.1								S	S	S	S	S	S	S	S	S					
15												S	0.9	0.5	1.0	0.2								
16							0.1	0.1	0.2			S	S	S	S									
* 17											S	S	S	S	S									
* 18											S	S	S	S	S									
* 19	0.5	1.0										0.2	0.3											
* 20												0.5												
21				0.5	0.5	0.4								S	S	S								
22				0.2	0.3			C	0.3			0.7	1.0		0.2									
23				0.3	0.8		0.5							S	S	S								
24								0.1		S	S	S	S	S	S	S	S	S	S	S	S			
25							0.3		0.1									0.3	S	S				
26		0.2	0.5	1.0	0.7		1.0	0.4	0.6	0.5		0.2	>6.0	1.6	S	S	S	S						
27	0.2	0.2	0.2	2.0	0.9	0.6		0.3	0.3	0.6	1.3	5.1	2.7	0.3	0.2	0.1	0.1	S	S			0.1	0.5	0.3
28	0.1	0.2	0.1	0.1									S	S	S	S	S	S	S					
29		0.3	0.5	0.6	0.4	0.2		0.1	0.6	1.0	0.3		S	S	S	S	S	S	S					
30	0.5	0.2	0.2	0.2		0.5	0.2	0.1	0.2	0.5	1.0	0.3	0.3		0.1	0.2				0.1			0.1	0.1
31																								
Mean	0.04	0.07	0.06	0.21	0.16	0.12	0.12	0.12	0.20	0.23	0.19	0.33	0.23	0.28	0.12	0.02	0.01	0.01	0.01	0.01		0.01	0.02	0.01

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

SYOWA STATION

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

October 1981

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	0.5	1.5	1.4	1.2	0.8	0.4	0.2	0.2								S	S						
2			0.3	0.2	1.1	1.0	0.1	0.1		C	C	C	C	C										
3	0.5		0.2							0.7	0.5	4.0	1.0	1.0	0.8	0.5		0.1						
4	0.2	1.7	2.0	1.2					1.5	2.3	2.7	3.3	2.7	2.0	0.7	0.6	0.9	S	0.6	1.1				
5		0.5			0.5						2.3	3.6	2.4	1.8	1.2	1.0	0.9							
6													S	S	S	0.5	S	0.5	0.4	S	0.3			
7	0.2		0.6	0.2	0.3	1.2	0.5	0.9	0.5	0.5	0.5	0.5	0.8	2.0	0.7	0.8	0.8	0.2		S			0.3	
8	0.5			0.2						0.7	1.0	1.0	4.7	2.1	1.2	0.7	1.0							
9					0.1	0.5	0.5	0.5	2.3	1.3	1.0	0.9	1.5	1.7	2.0	1.1	0.7	0.5						
10		0.5		0.1	1.0	1.1	1.1	1.2	2.1	2.2	1.8	3.0	4.2	3.0	2.1	2.0	1.0	0.2						
11	0.2	0.1		1.0	0.2	1.0	2.0	1.5	2.5	2.5	3.3	3.2	3.2	2.1	2.2	1.8	1.3	1.0	0.7	1.2	0.7	0.2		
12	0.2	0.1						1.9	2.1	3.4	S	S	S		0.2	0.2			0.4		C	C		
13				0.1	1.6	2.3	2.2	2.2	2.2	2.5	3.5	4.5	5.4	5.7	5.7	5.0	4.2	3.5	2.6	2.4	2.3	2.3	1.0	1.7
14	2.2	2.2	2.2	2.4	2.2	2.2	2.2	2.2	2.6	4.2	5.2	S	S	S	1.5	0.5	1.5	0.6	3.0	3.0	3.0	1.1		
15		0.7	0.5	0.5	0.8	1.5	2.2	2.1	2.0	S	S	S	S	S			0.3	0.6	1.0	0.4	0.1			
* 16																								
* 17						0.3	0.5	0.7	0.8	0.7	0.7	0.1	0.2					S						
* 18				0.7														S						
19					0.2			0.2	0.4	0.2	0.9	1.0	0.2			3.1		S						
20		0.3	0.8	1.2	0.7	0.7	0.2	0.3		0.4	0.8	2.2	1.2	0.8			0.2				0.1	0.5		
21									0.2			0.3		0.2		0.2	0.2	0.2						
22		0.1	0.4				0.2		0.2	0.2	0.3					0.2							1.0	
* 23		0.2		1.3	1.0	C	C	C	C	C	C	C	1.5	1.6	1.2	1.0	0.5							
* 24																								
25		3.3	1.5	1.1	0.2	0.2	0.5	0.7	0.6	0.7	0.2	2.1	0.8	0.2		0.2		0.7			S			
* 26																								
* 27						0.1																0.1		
28												0.4	1.9	1.8	1.5	1.3	1.1							
29	1.0	1.2	1.5	1.0	0.7		0.1	0.7		0.4														
30			1.5	0.5	0.2	0.5									0.9	1.0	0.4	0.8	0.5	0.5	1.0			
31	0.1	0.5	0.2	0.5	0.2	0.2																		
Mean	0.16	0.38	0.42	0.41	0.40	0.44	0.40	0.49	0.67	0.78	0.85	1.03	0.94	0.86	0.70	1.45	0.48	0.28	0.29	0.27	0.25	0.14	0.07	0.05

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

SYOWA STATION

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

November 1981

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			0.7	1.3	0.5	0.7	0.2	0.2	0.4							0.4		0.5						
2																								
3																								
4																								
5					0.5	0.5	0.2	0.5	0.2	0.3	0.3	S	S	S	S			0.6	0.5	0.2				
6						0.1		0.5				S	S	S	S	S	S	S	S	S				
7								0.7	0.7	1.4	0.8													
8											S	S	S		S									
9																								
10													S	S	S	2.3	S	S						0.5
11			0.5																		0.6	0.5		
12						0.2	0.3						0.3	S	1.5	0.4		0.2						
13										S	S	S	S	S	S	S	S	S	S					
14			0.8	0.1											0.2									
15		0.3								0.5	1.7		0.8	0.2	0.3		0.3							
16			0.2	0.4	0.1	0.4		1.7	0.3	0.2	0.8	1.2	0.1	0.7	0.2									
17	1.2														0.8	0.3								0.2
18			0.3	1.0							0.5	1.2	S	0.2	S	0.6	0.1							1.7
19	0.3	1.2	0.7	0.2	0.2	0.5	0.5	0.7	0.8	0.5	0.2		0.5	0.2	0.5	0.2		0.2	0.3			0.2		0.9
20	0.9	0.1			0.2	0.2	0.2				0.3	0.5												
21		0.6														0.2	0.8							
22	0.3	0.3																						
23				0.3	0.2		0.4	1.0	0.5	0.2	0.3	0.2	0.2	0.3	0.2			0.4	0.4					
24				1.2				0.2		C	C	C	C	C	C			0.3				0.2		
25							0.8	0.3				0.2	0.4											
26			0.5	1.0				0.5		0.4														
27		0.5																						
28					0.2	C	C	C					S	S	S									
29				0.2			0.2	0.2																
30																								
31																								
Mean	0.09	0.10	0.13	0.18	0.07	0.07	0.15	0.19	0.09	0.17	0.18	0.07	0.10	0.03	0.12	0.14	0.04	0.07	0.05	0.01	0.02	0.02	0.01	0.11

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

- 24 -

SYOWA STATION

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

December 1981

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			
* 2																0.5								
3	0.5	0.1		0.3															0.5	0.2		0.3		
4			C							1.0					0.5									
5					0.8						0.5	0.2		0.4	C	C	C							
6		0.2							0.2	0.2			0.2	0.3										
7			0.1																			0.2	0.2	0.2
8						0.1		0.1			0.3											0.2		
9						0.2		0.3		0.2	0.4													
10						0.2				0.2			0.5											
* 11																								
12			C	C	C	C	C	C	C	C										0.1	0.4	1.2	1.5	1.3
13	1.3					0.2				0.4	0.1												0.1	0.4
14									0.1	0.1	0.2	0.1	0.1	S	S	S	S		0.3					
15	0.1	0.4						0.2						S	S	S	S							
* 16																								
17											S	S	S	S	S	S	S	S				0.3		
18											0.1		0.1	0.2		0.1	0.2		S	S		0.1	0.2	
19		0.4		0.8		0.5		0.3																
20		0.3		0.6	0.2		0.4	0.3	0.2															
				0.5	0.8			0.3														0.1		0.2
21		0.7		0.3	0.5	0.4	0.2															0.3	0.8	
22	0.2	0.2	0.2						0.2	0.5	0.1													0.3
23								0.2	0.5	0.2														
24								0.2	0.4	0.2														
* 25						C	C	C	C	C														
* 26																								
* 27	0.2																							0.2
28	0.2		0.4						0.1													0.3	0.1	0.2
29		0.1							0.8		0.2	0.4	0.5	0.4	0.3	0.2								
30							0.2	0.3	0.3	0.2	0.4	0.7	0.4	0.1					0.3	1.0	1.0	0.1	0.3	0.5
31													0.3	0.2	0.1	0.3			0.1			0.6		
Mean	0.08	0.07	0.02	0.08	0.07	0.04	0.02	0.06	0.09	0.08	0.07	0.04	0.06	0.05	0.03	0.03	0.01	0.02	0.05	0.04	0.05	0.10	0.11	0.07

Open spaces without figures correspond to quiet level

* : Quiet day

S : Interference

C : Failure of equipment

1 JAN

1981

1

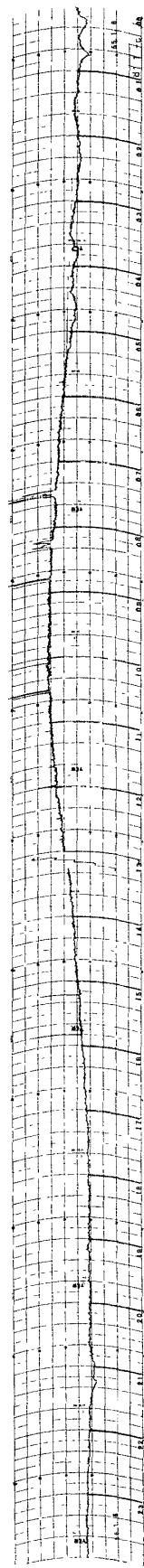
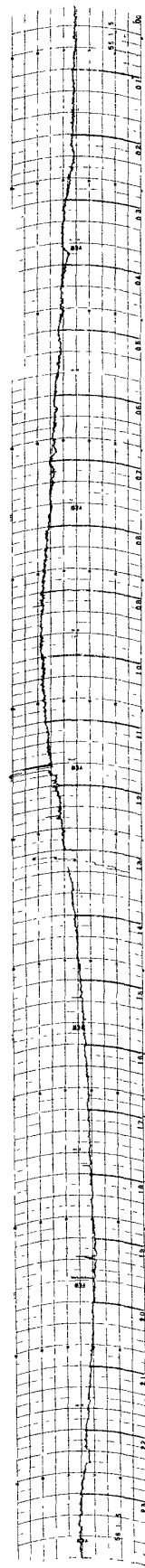
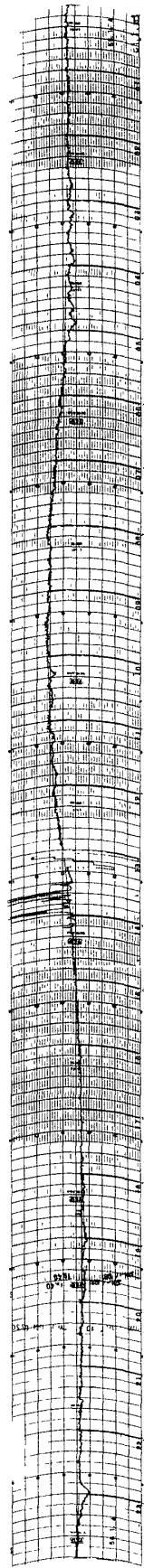
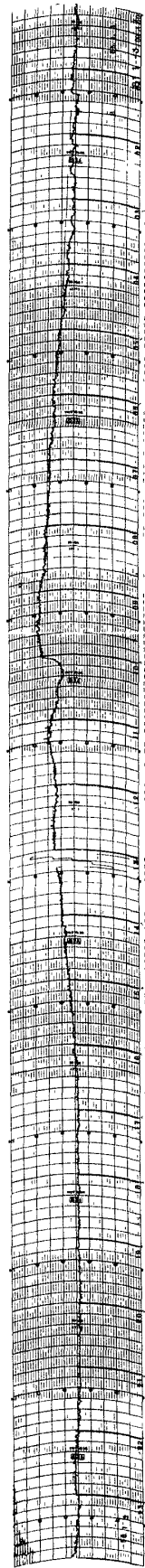
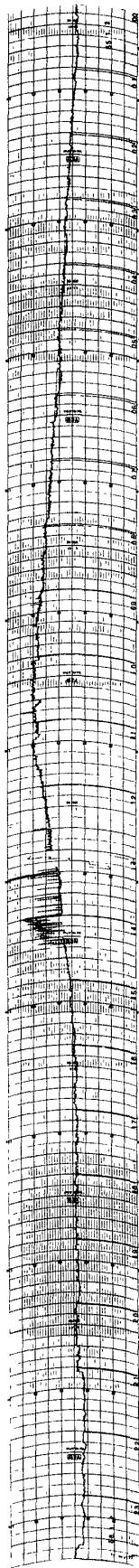
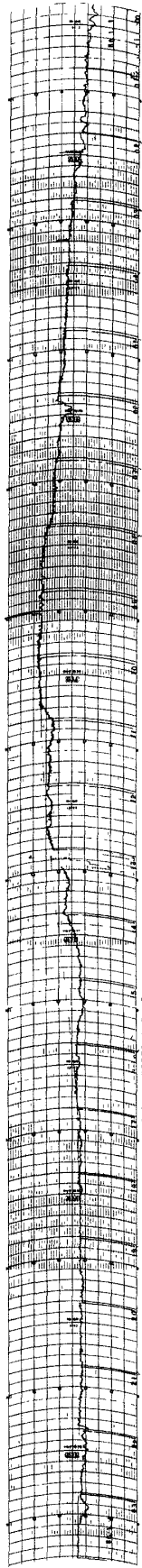
2

3

4

5

6

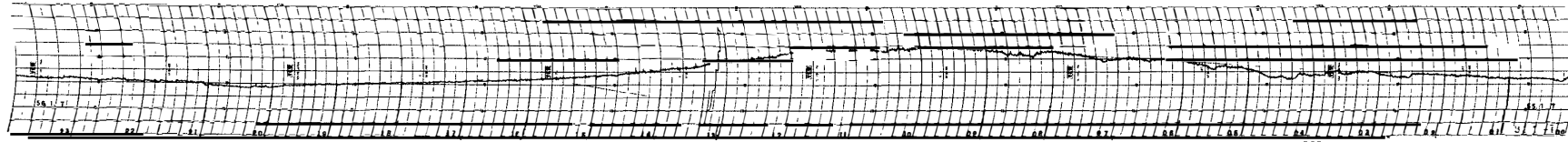


24 20 16 12 08 04 00

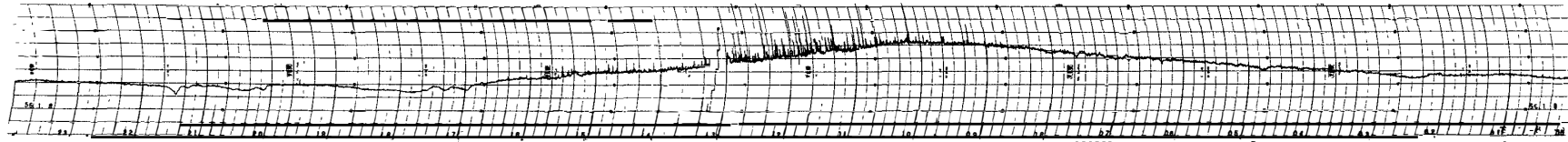
45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

JAN 1981

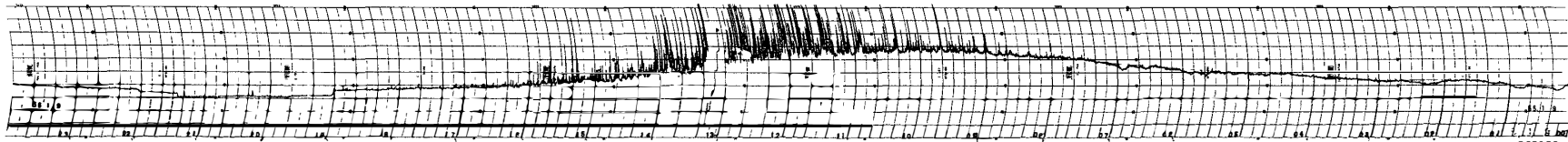
7



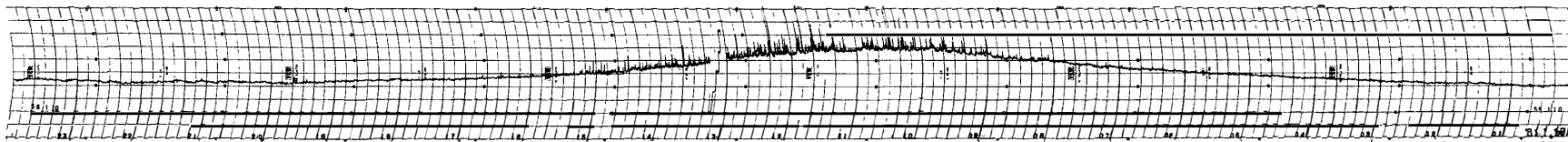
8



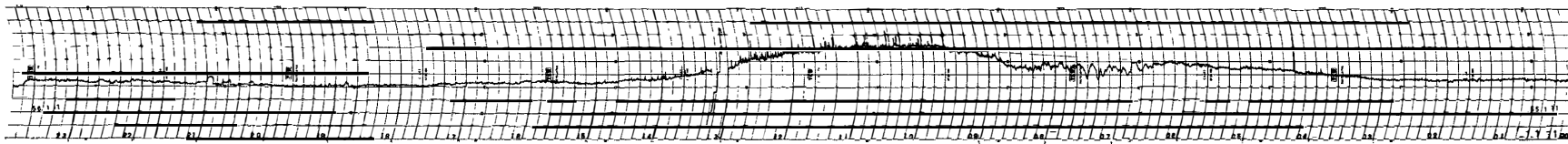
9



10



11



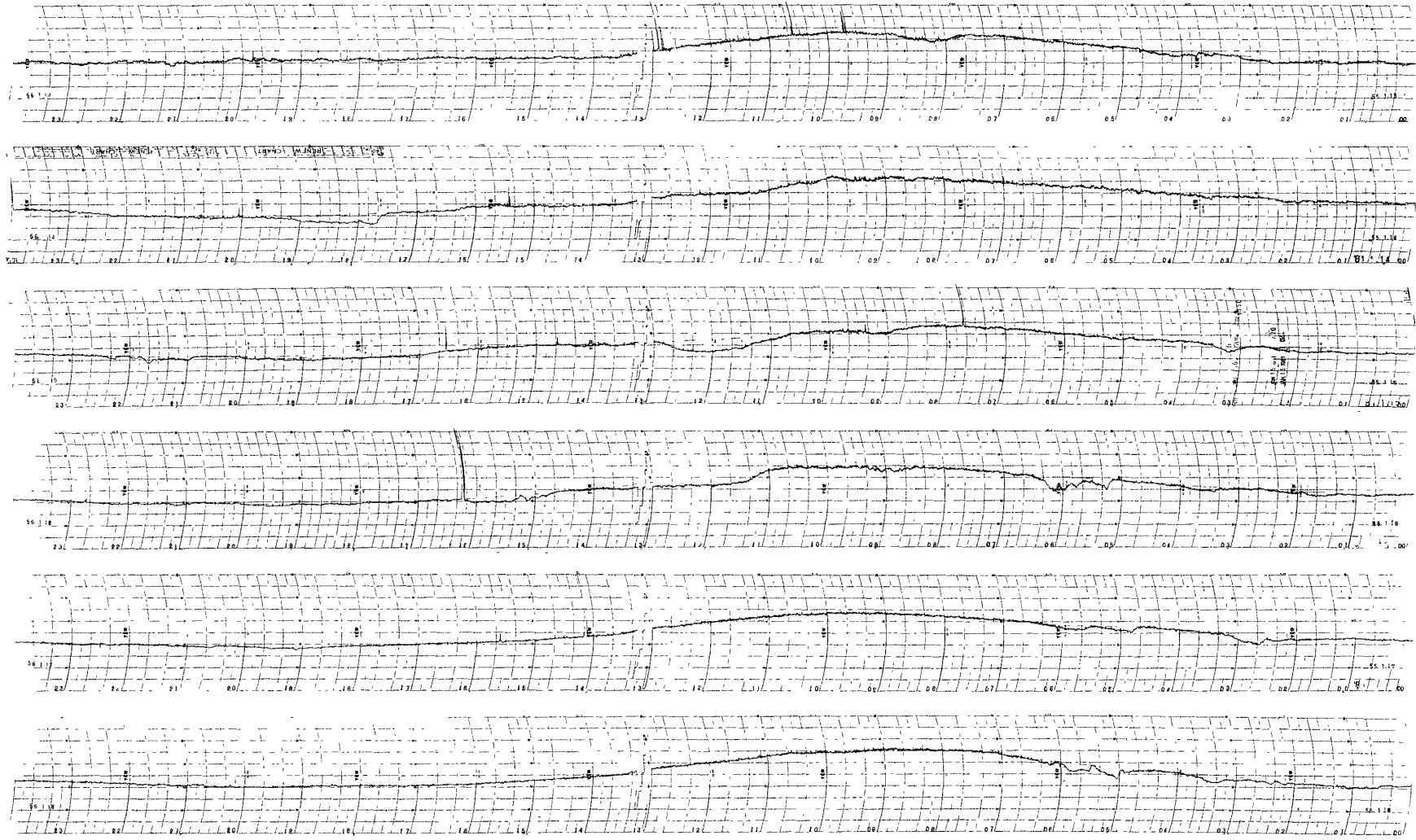
12



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



13
14
15
16
17
18

JAN 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 JAN

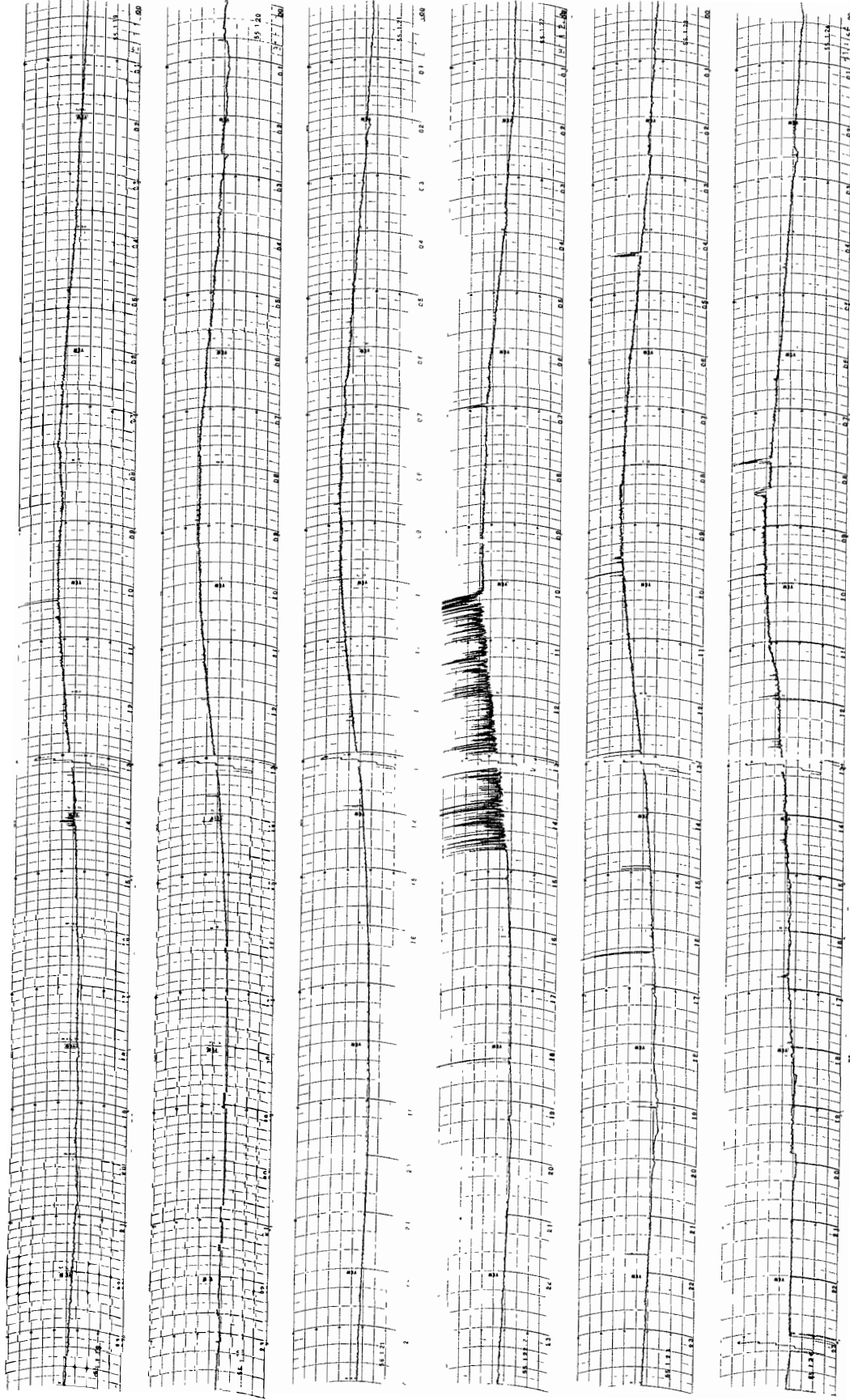
20 1981

21

22

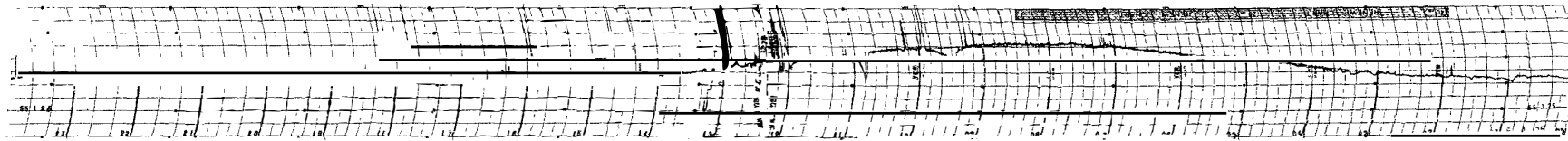
23

24

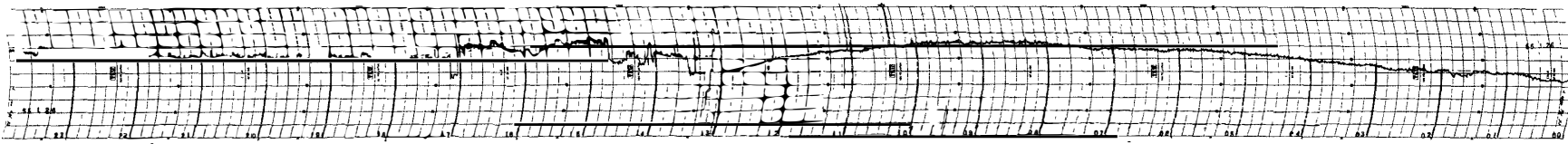


24 20 16 12 08 04 00

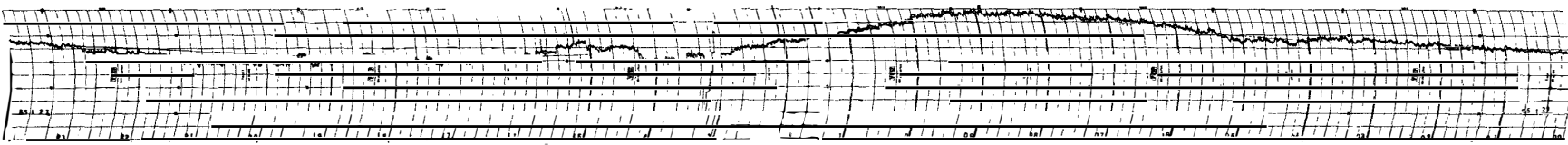
45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



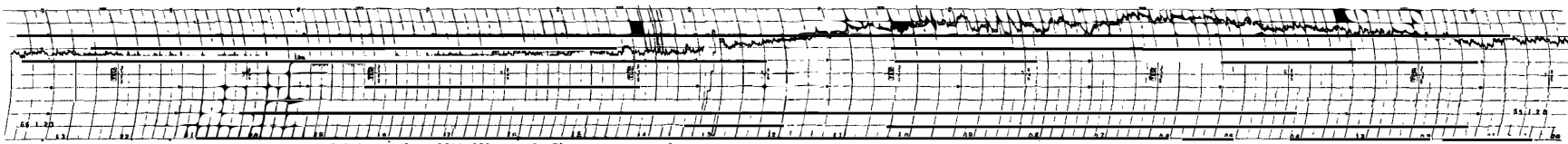
25 JAN 1981



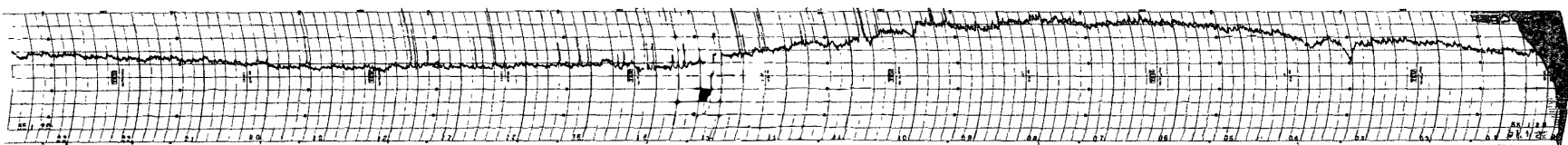
26 JAN 1981



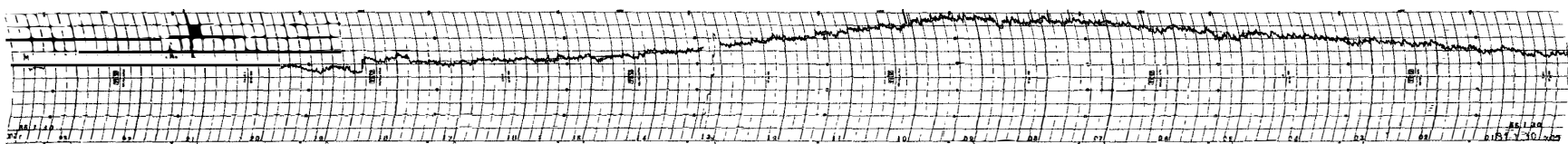
27 JAN 1981



28 JAN 1981



29 JAN 1981

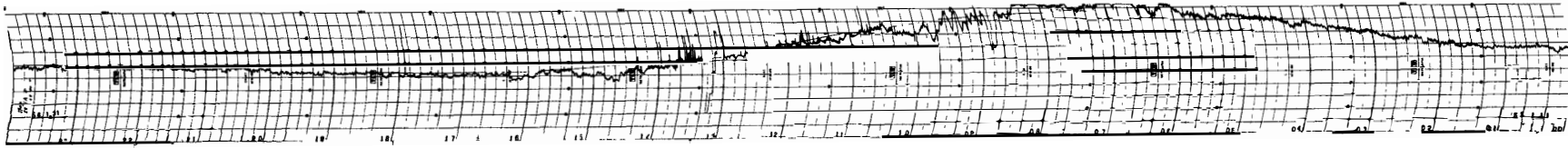


30 JAN 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

JAN 1981

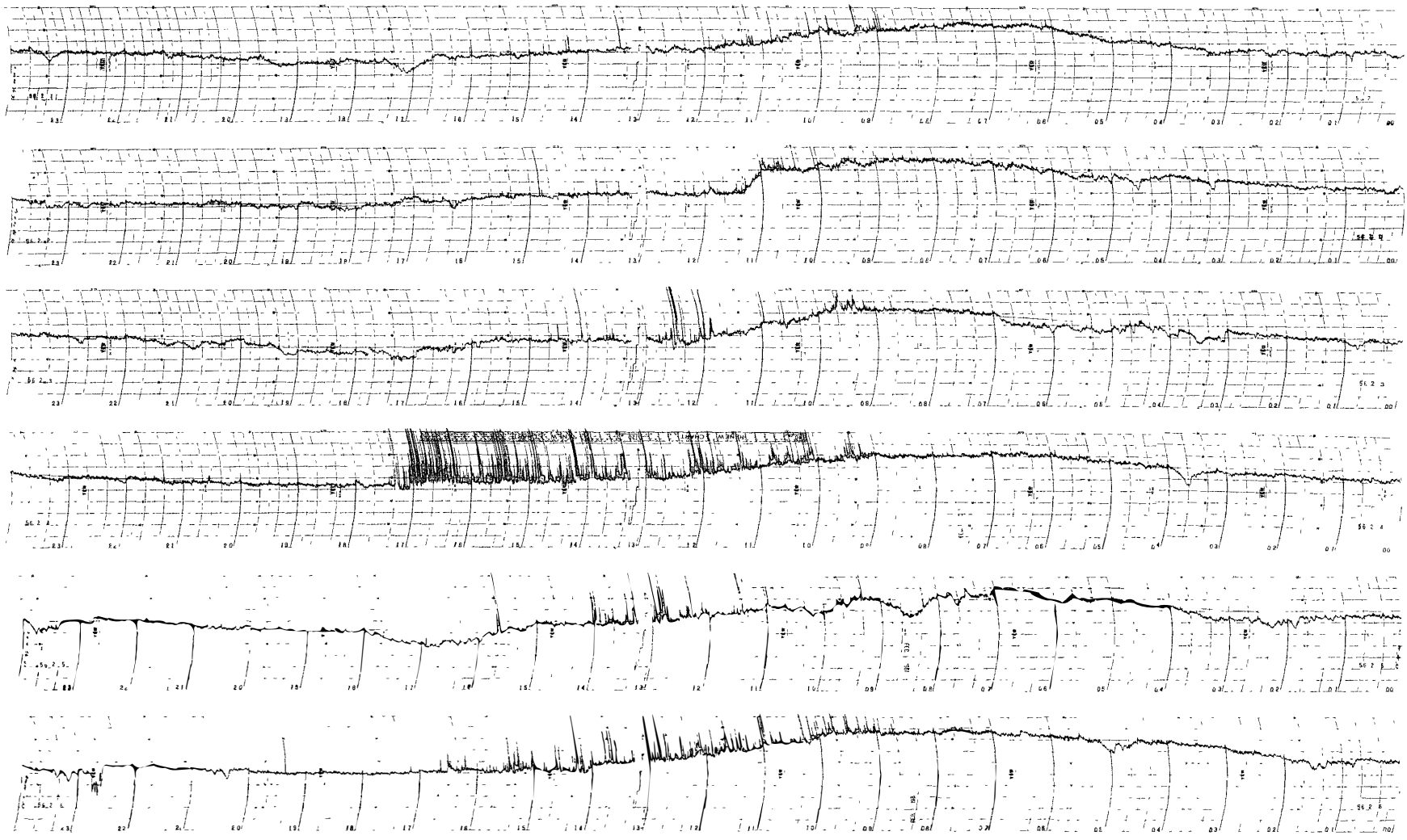
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

FEB 1981

1
2
3
4
5
6



-32-

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

7 FEB 1981

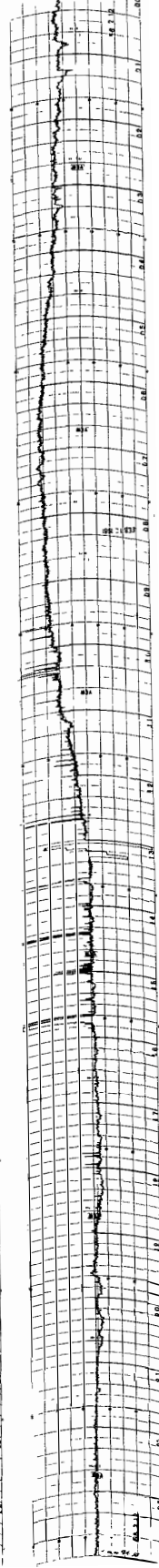
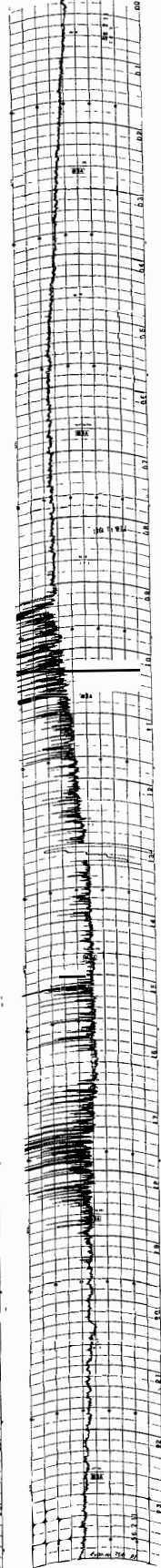
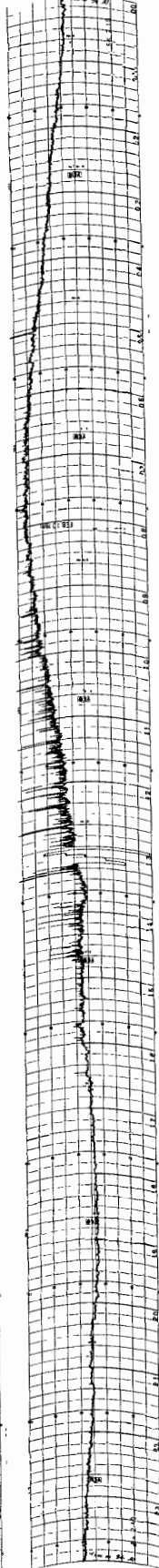
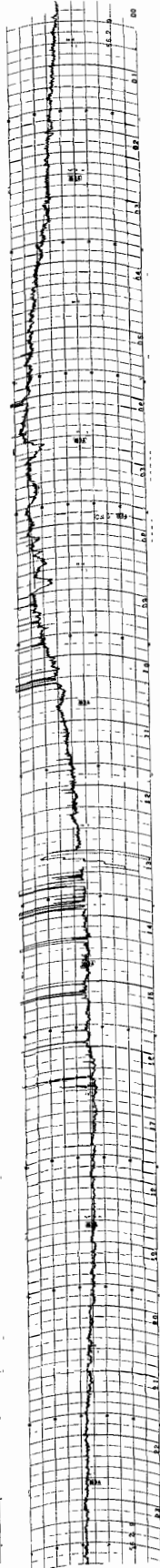
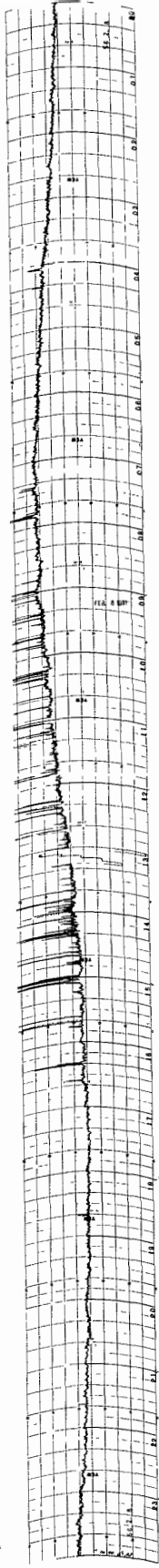
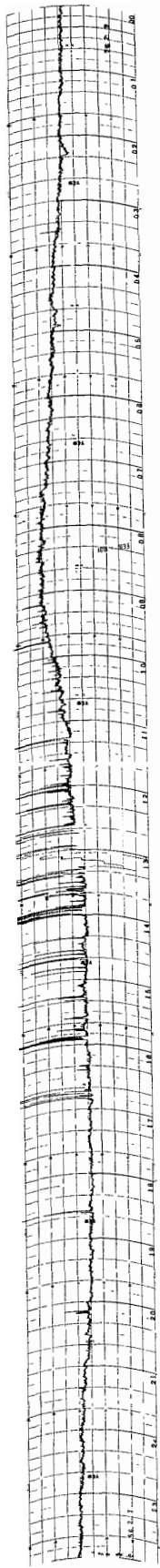
8

9

10

11

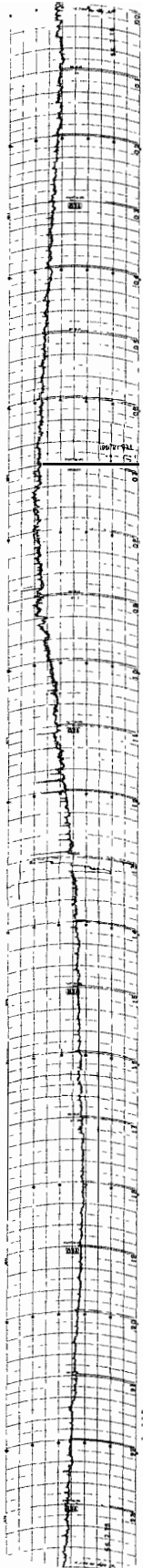
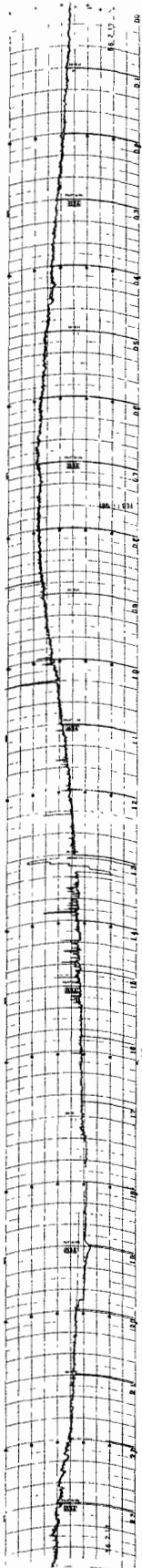
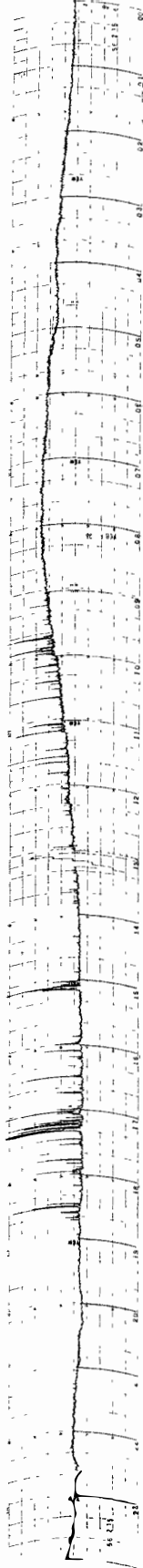
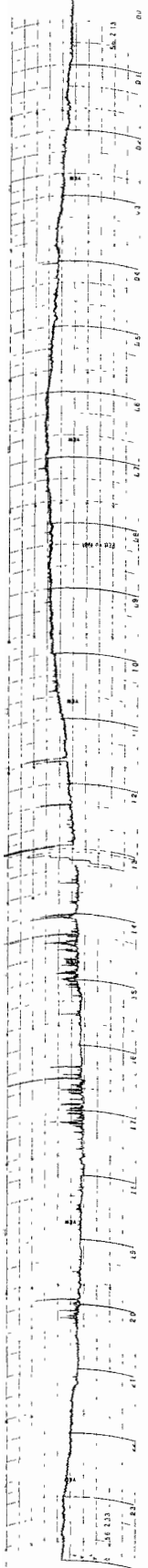
12



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

13 FEB 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

FEB 1981

19

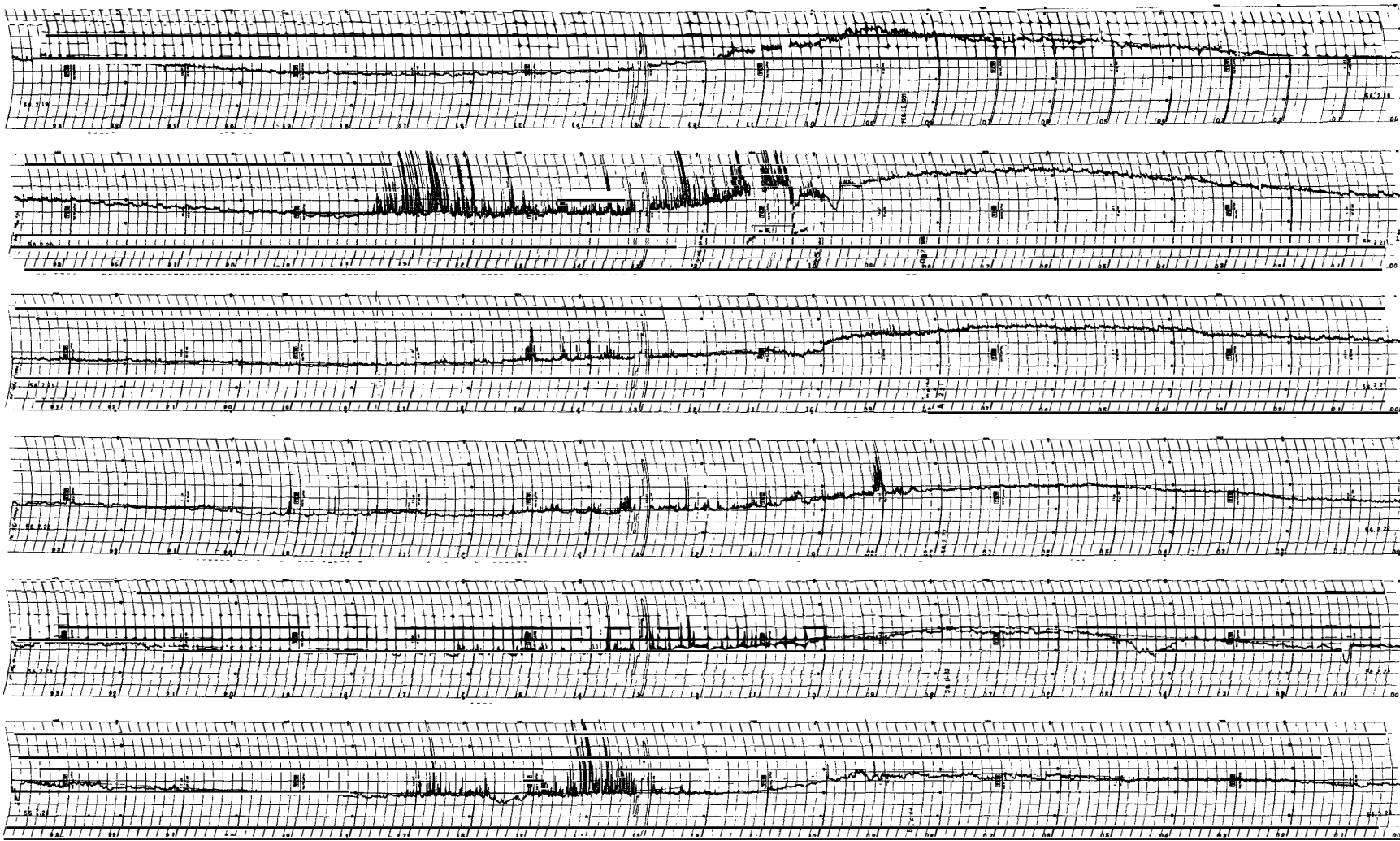
20

21

22

23

24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

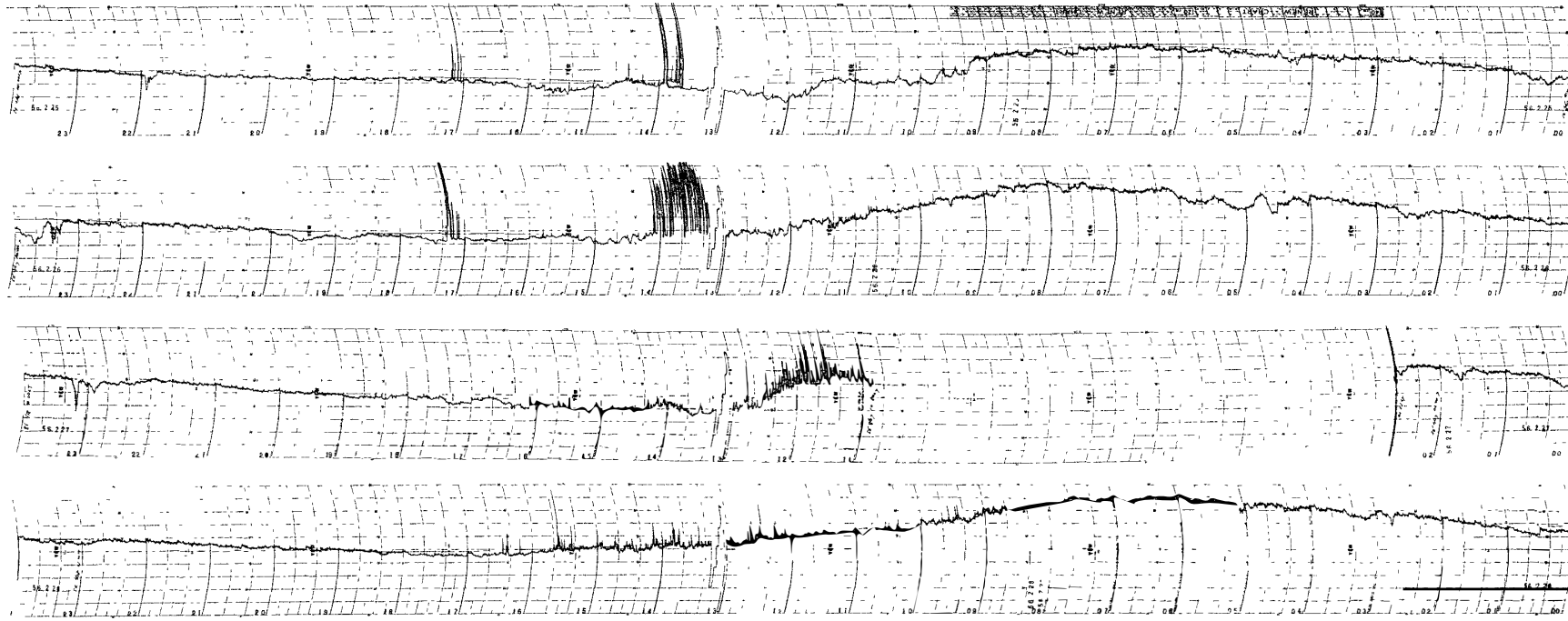
FEB 1981

25

26

27

28



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

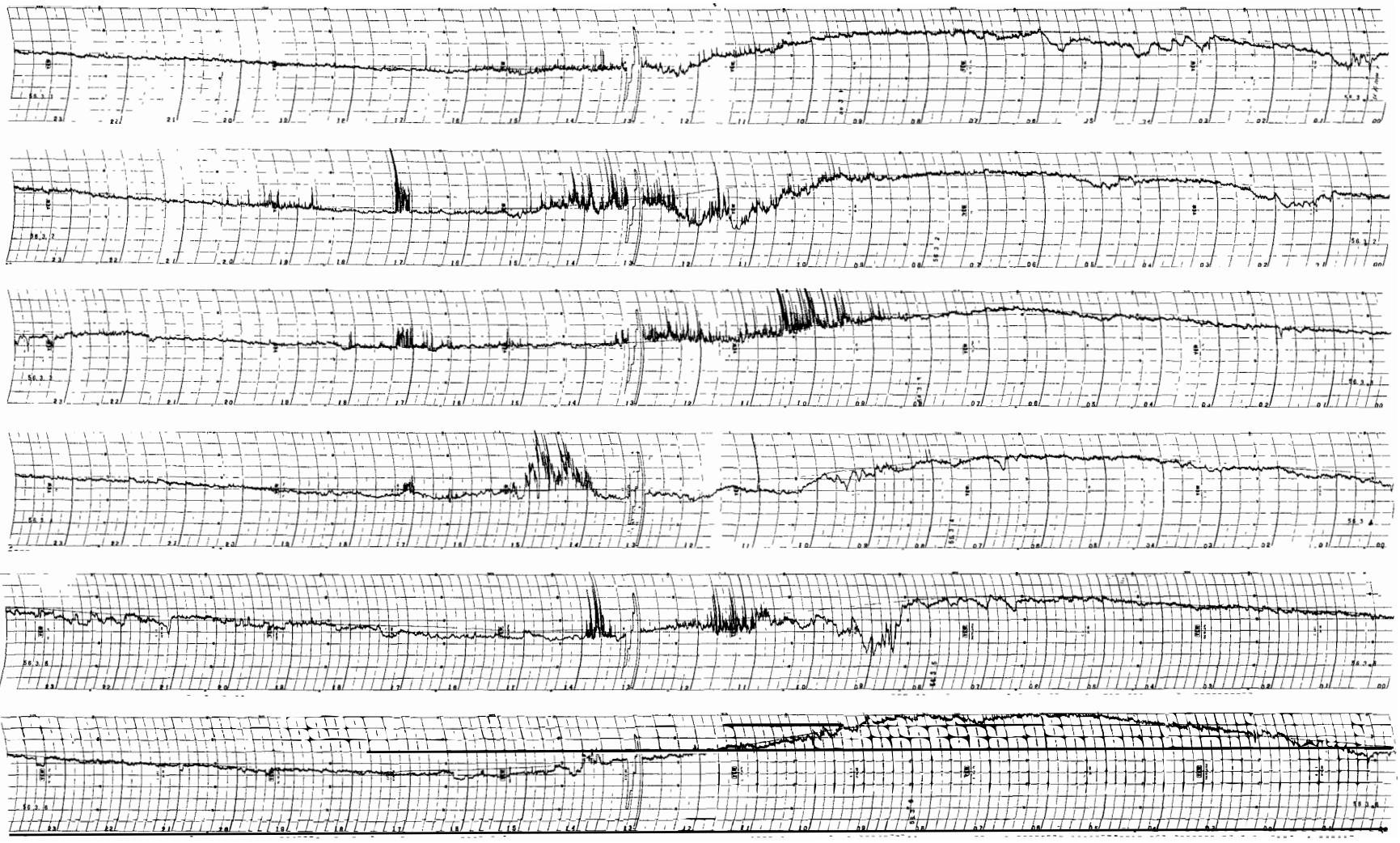
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

February	20	1030 - 1110	Failure of equipment
	27	0231 - 1050	"

MAR 1981

1
2
3
4
5
6



24 20 16 12 08 04 00

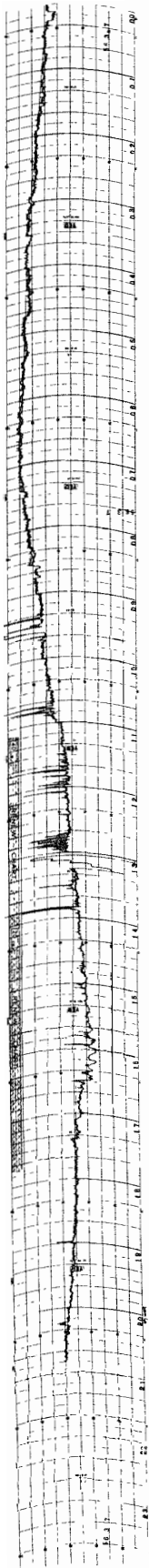
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

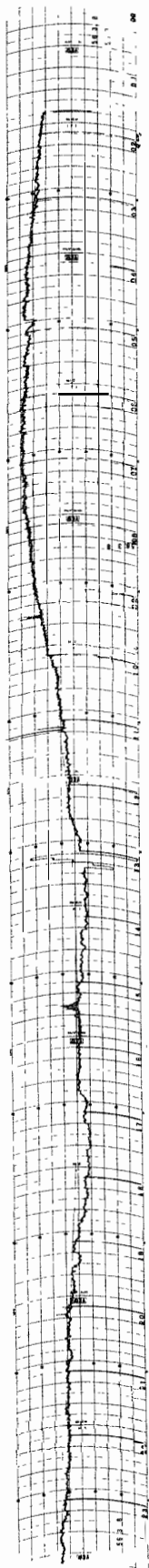
37

MAR 1981

7



8



9



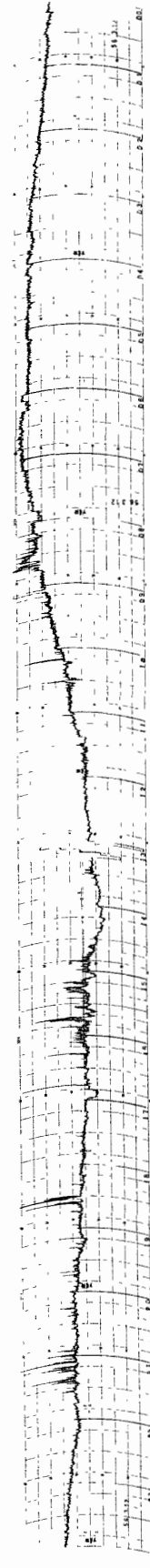
10



11



12



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

MAR 1981

13

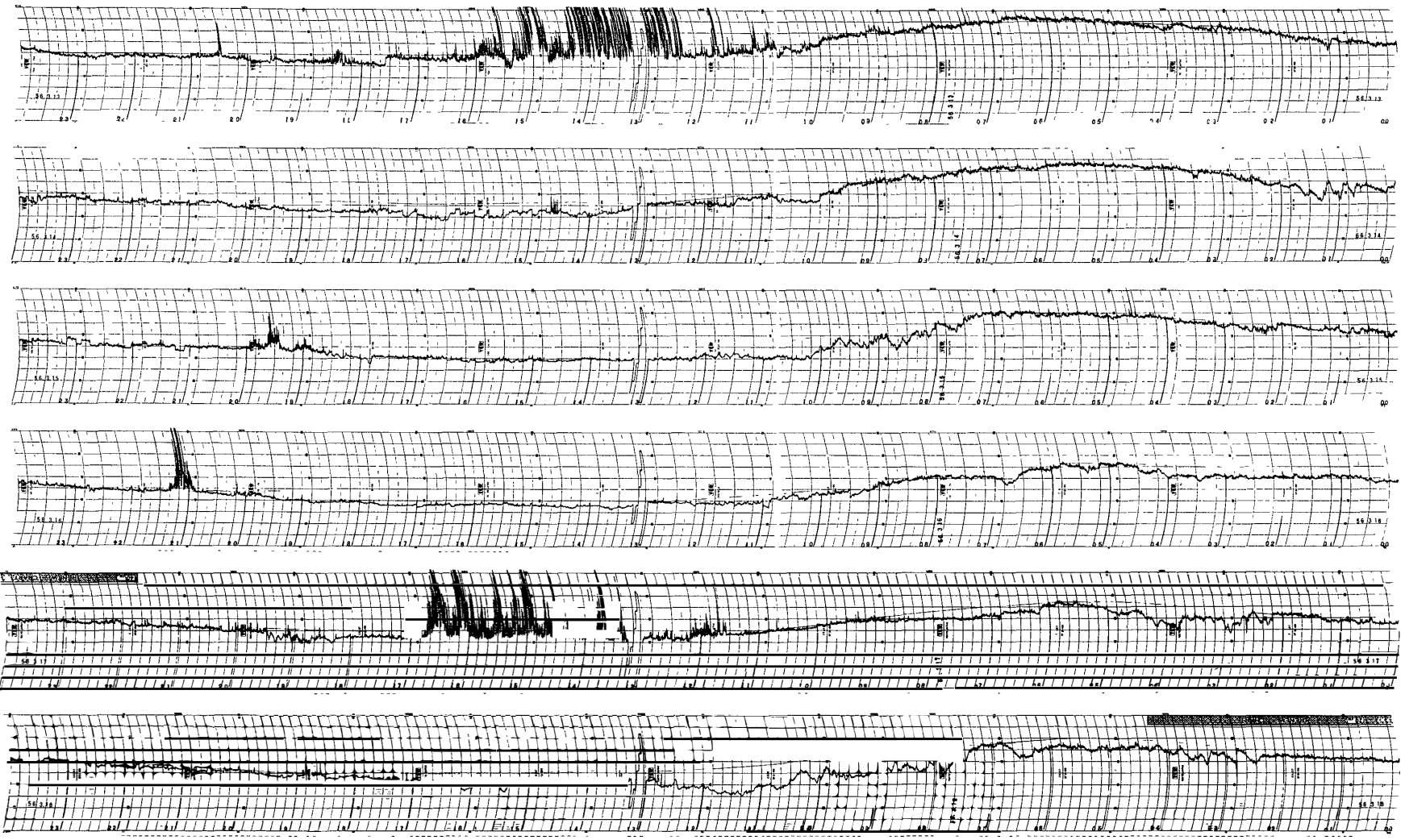
14

15

16

17

18

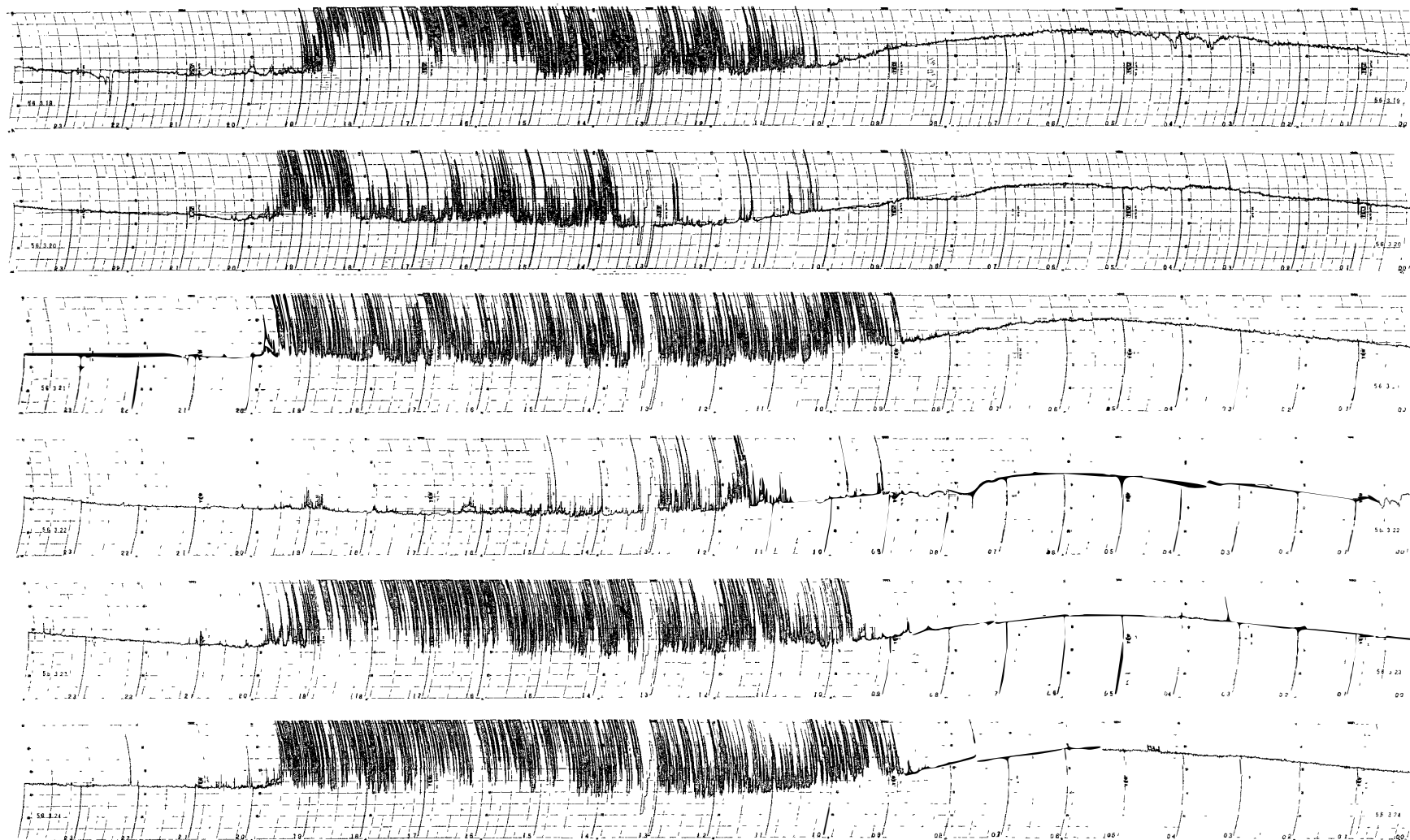


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 MAR 1981
20
21
22
23
24



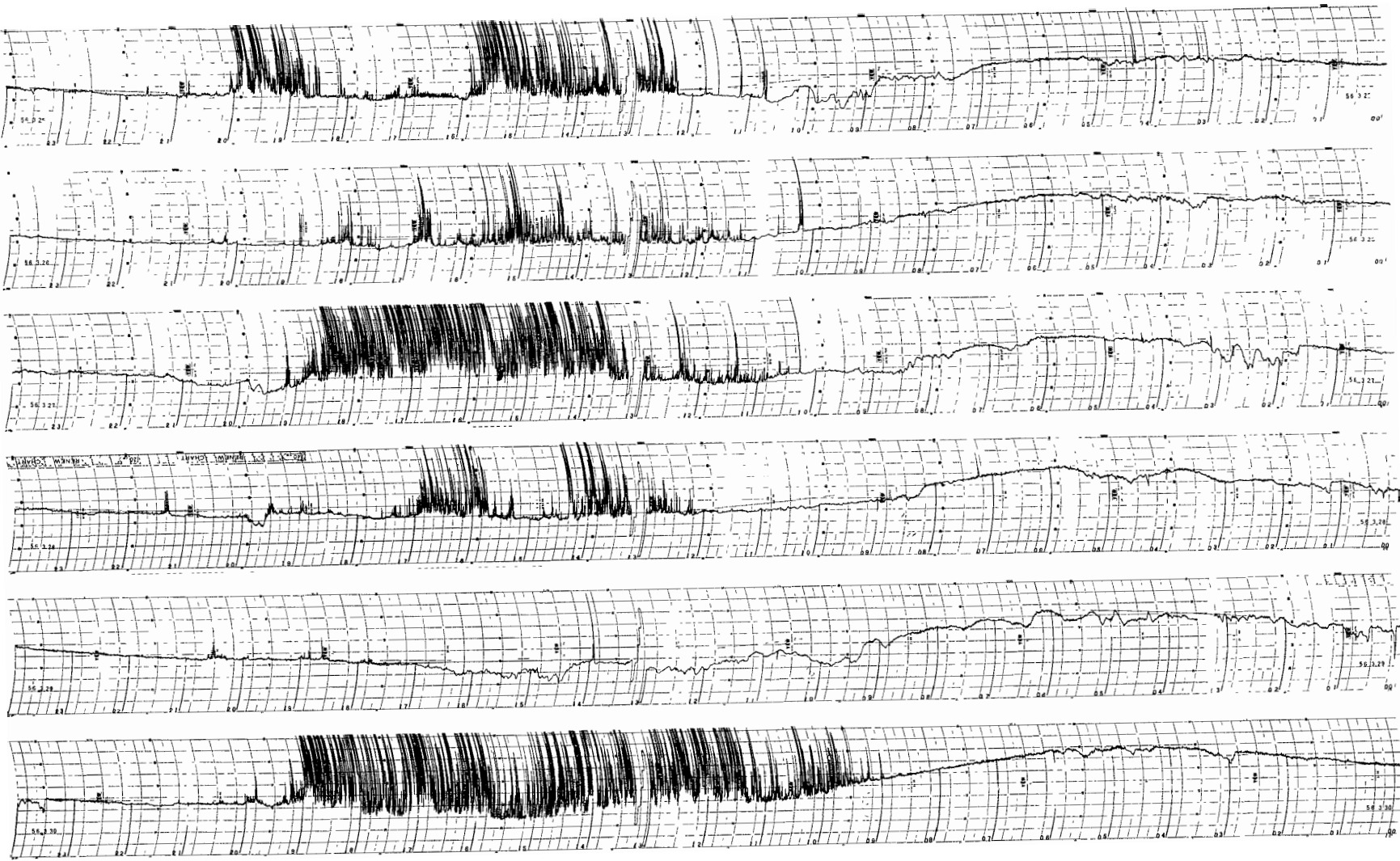
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

MAR 1981

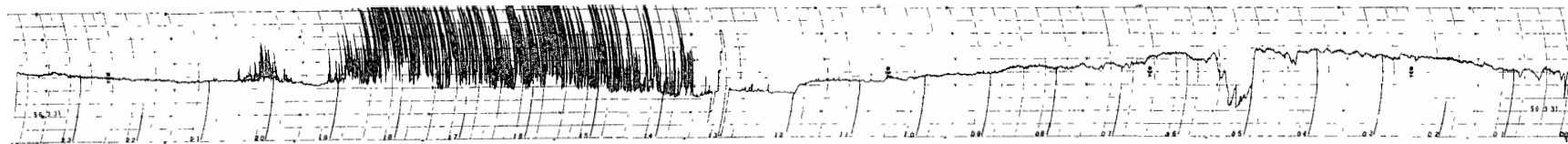
25
26
27
28
29
30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

MAR 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

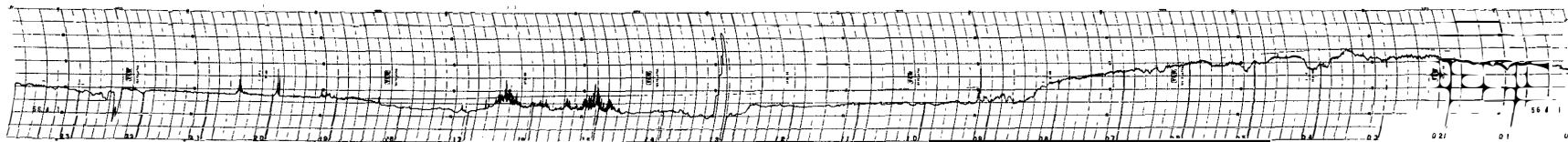
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

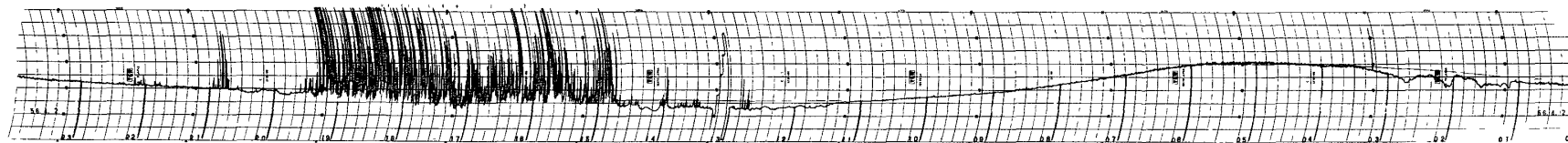
March	7	2050	-	Failure of equipment
	8		0139	

APR 1981

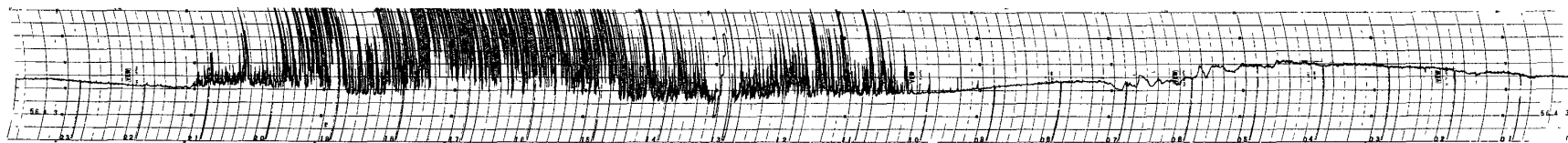
1



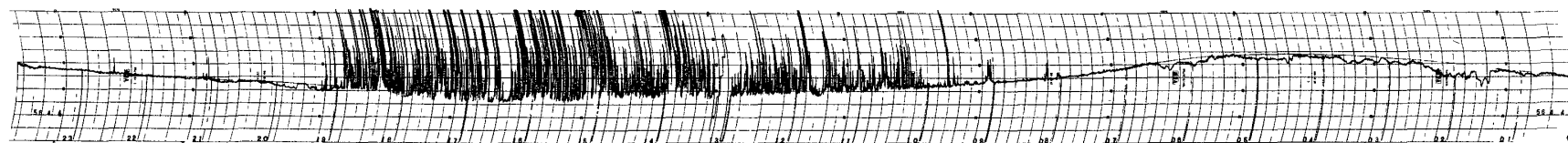
2



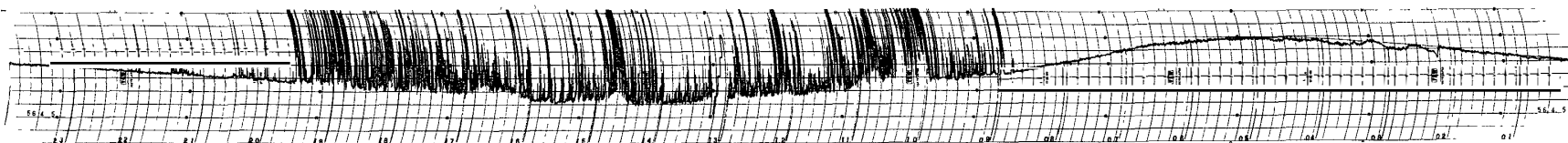
3



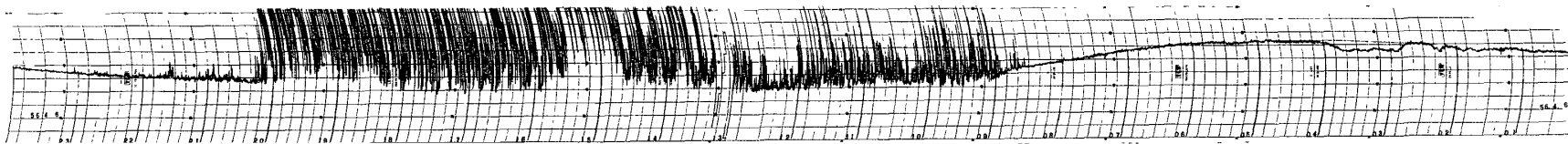
4



5



6



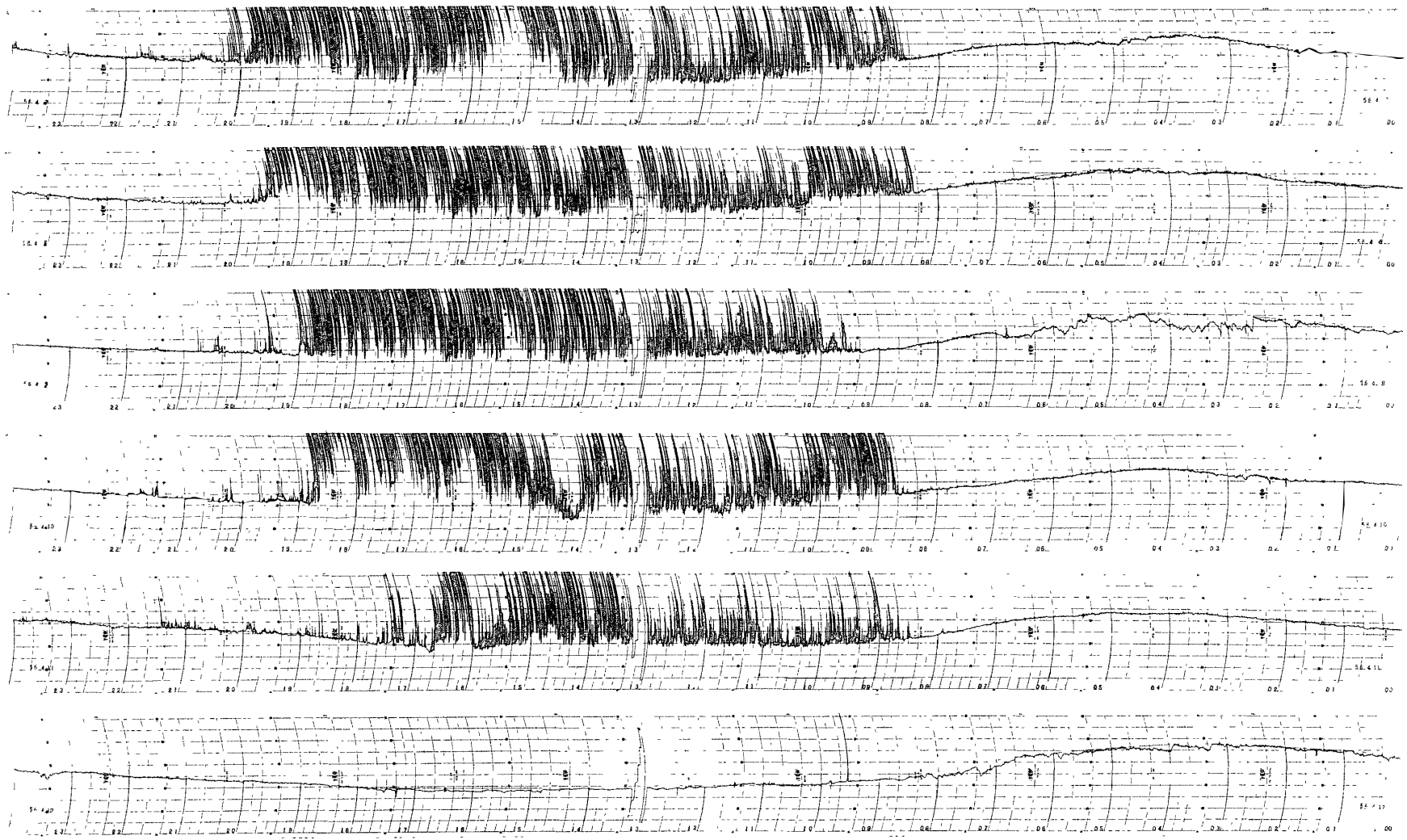
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

APR 1981

7
8
9
10
11
12

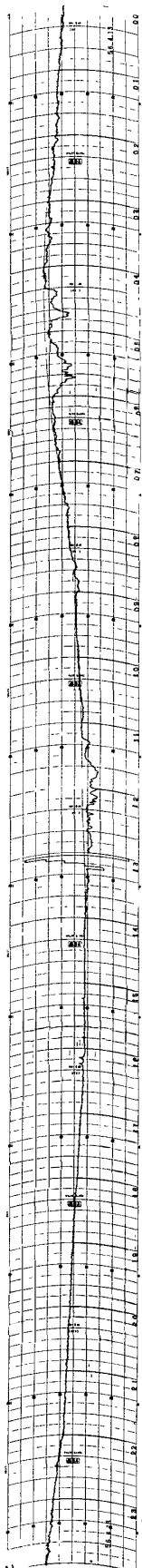


24 20 16 12 08 04 00

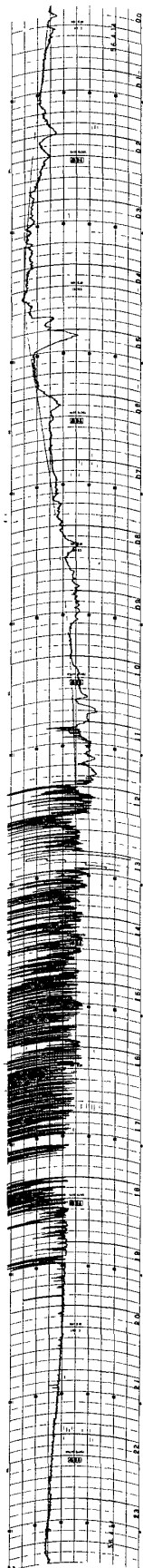
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

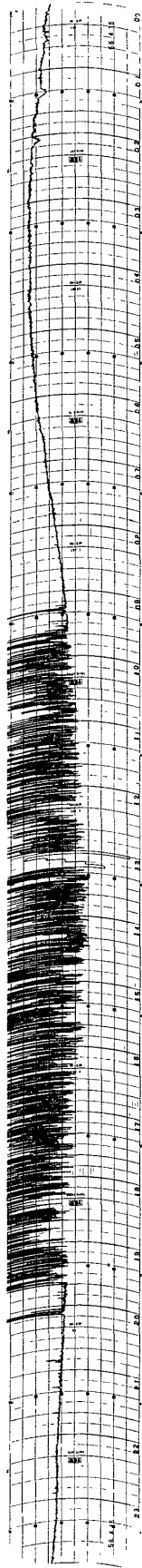
13 APR 1981



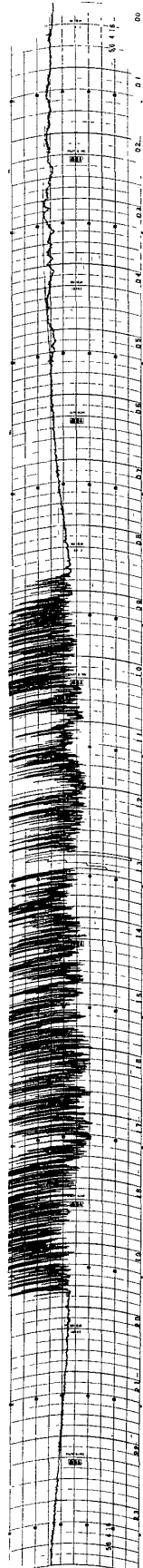
14



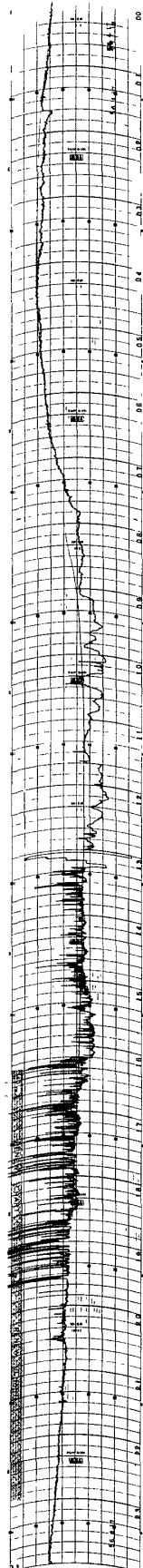
15



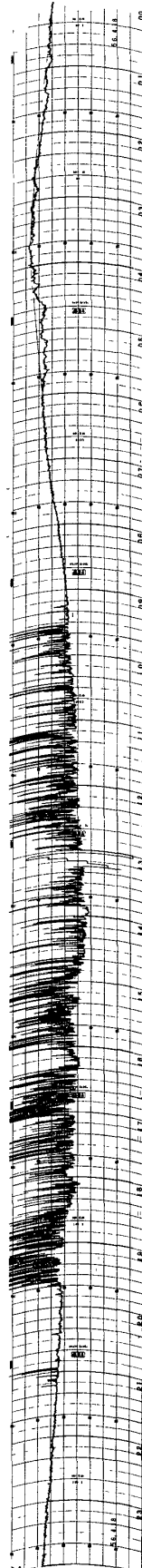
16



17



18

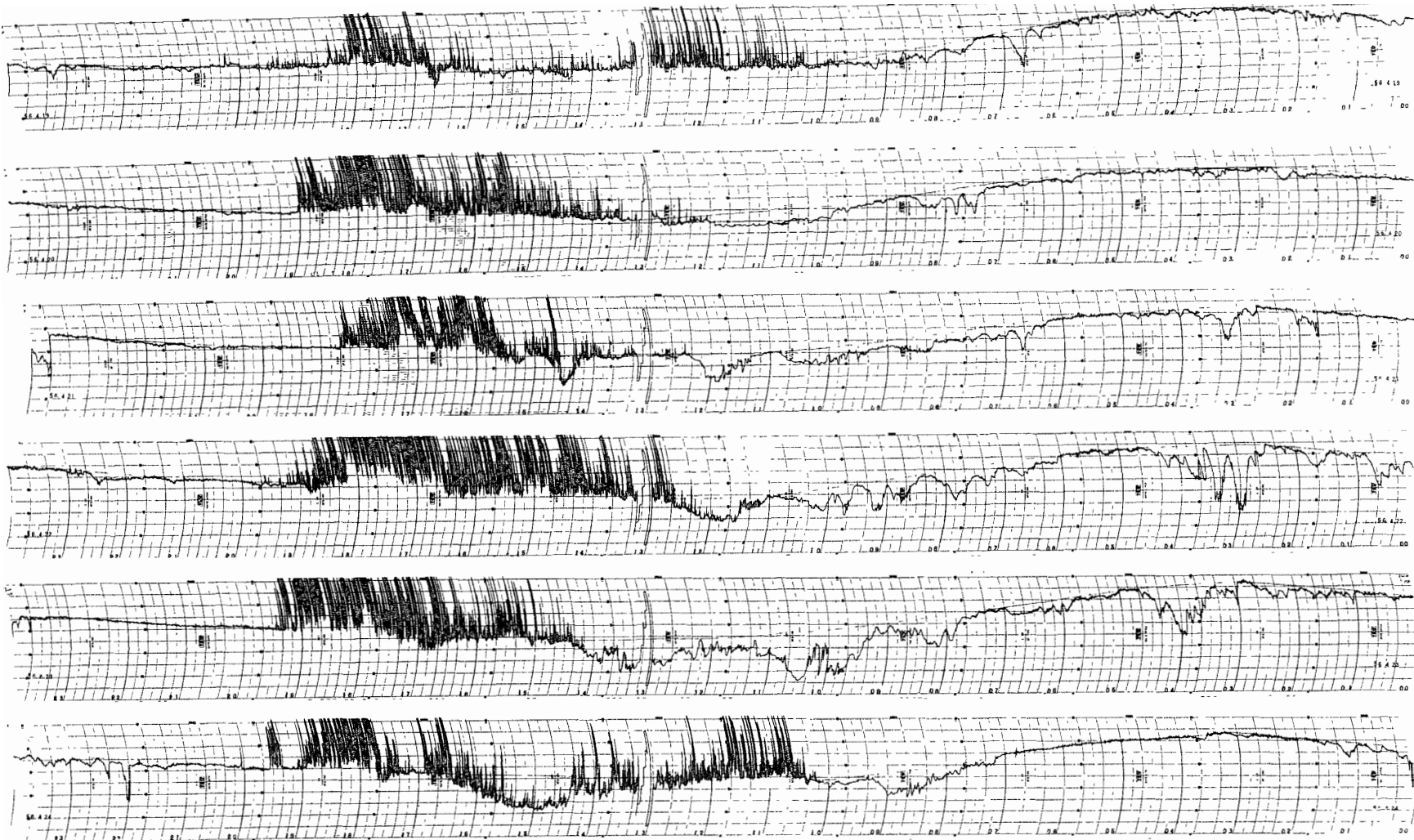


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

APR 1981

19
20
21
22
23
24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

APR 1981

25

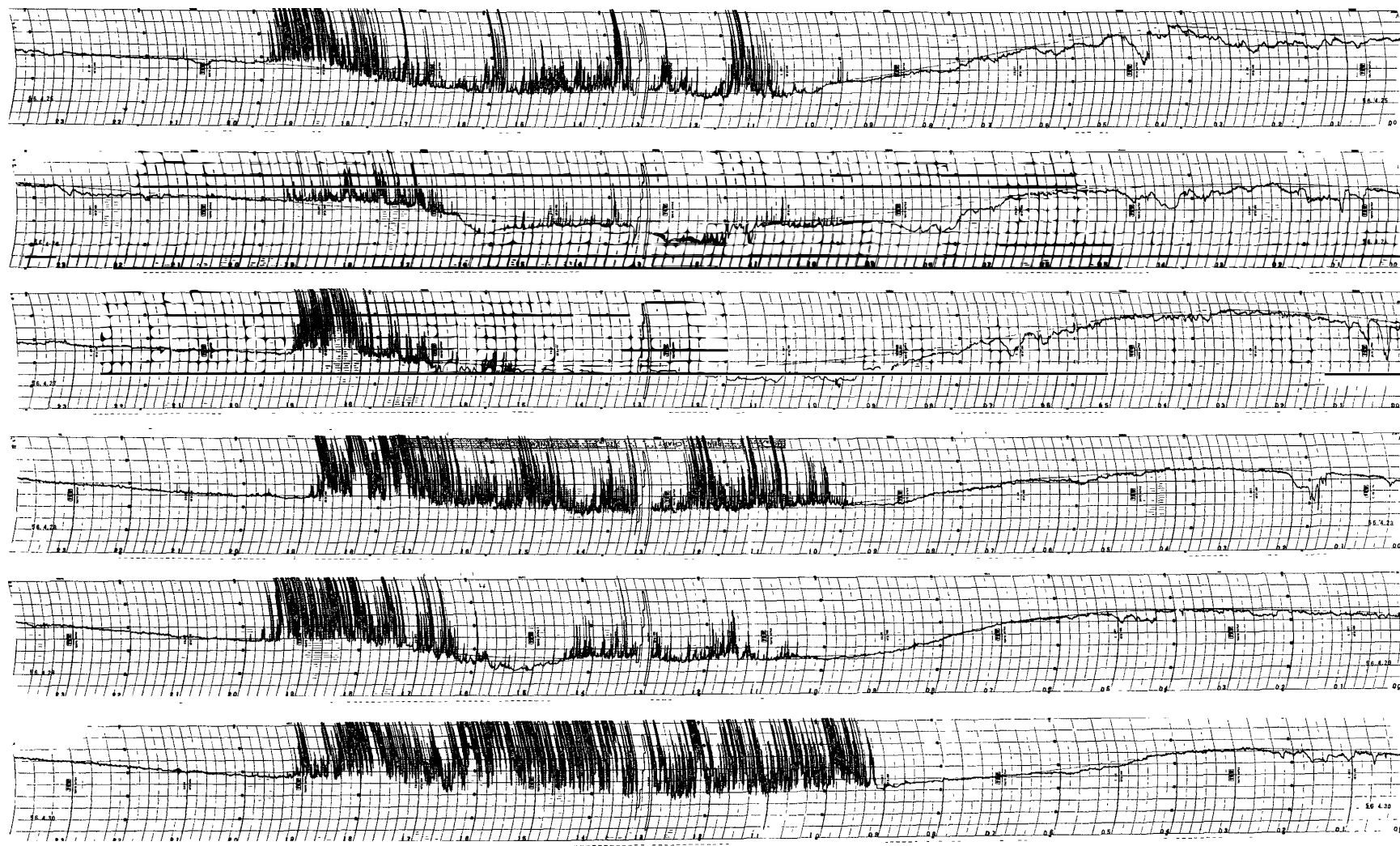
26

27

28

29

30



24 20 16 12 08 04 00

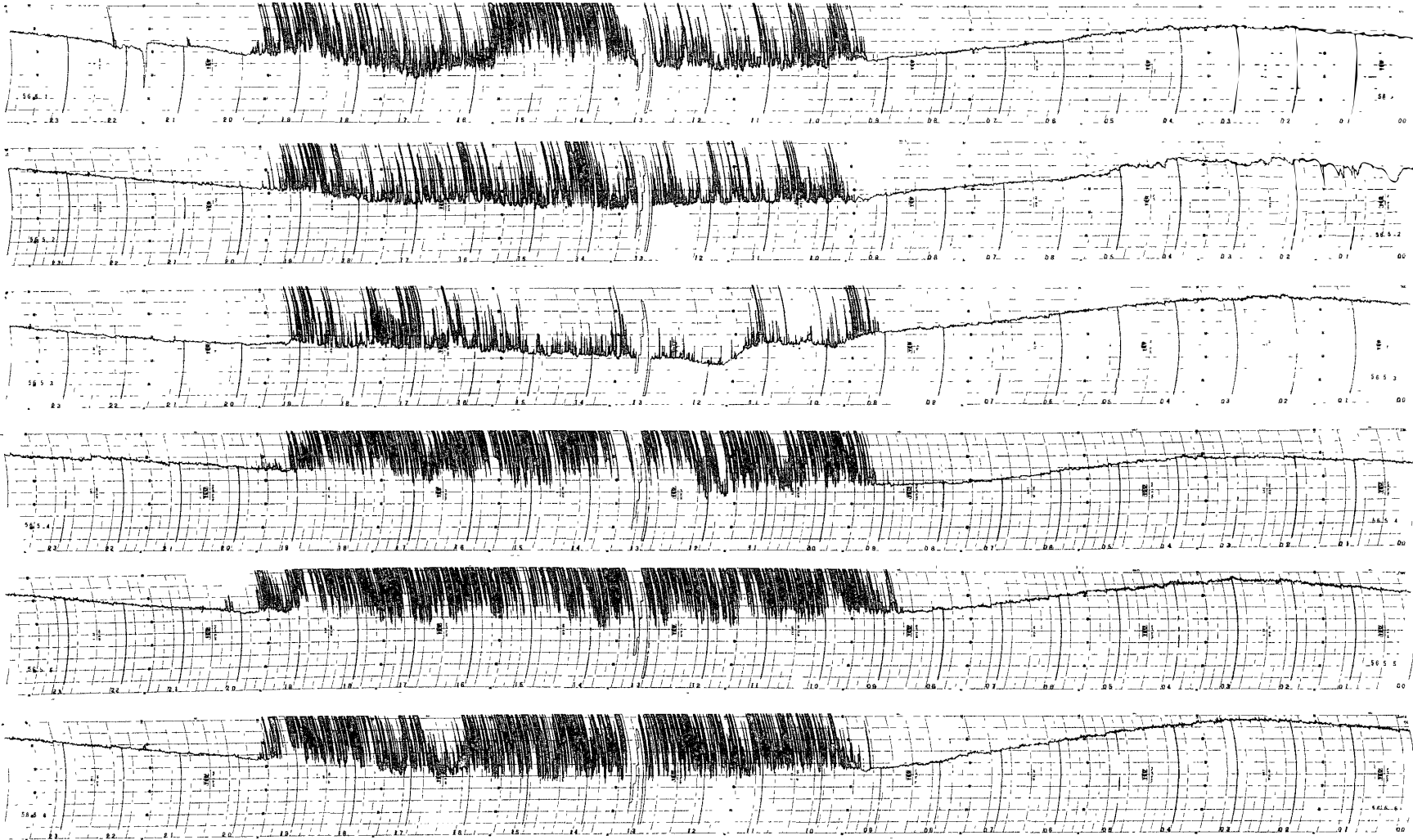
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

-47-

MAY 1981

1
2
3
4
5
6



24 20 16 12 08 04 00

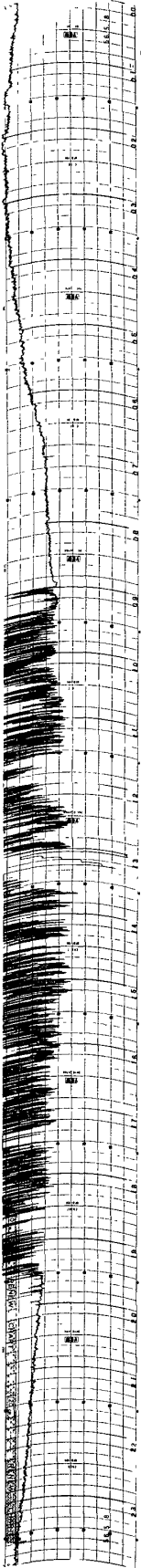
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

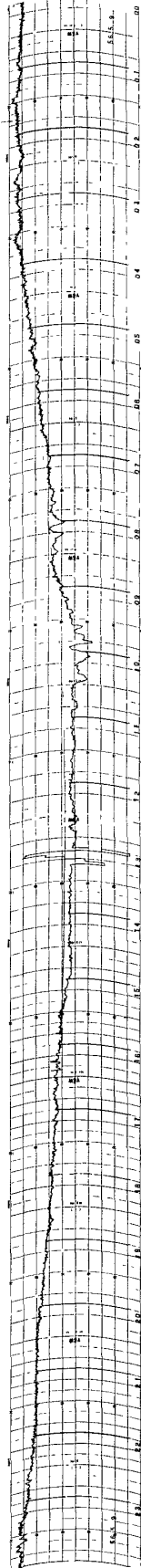
7 MAY 1981



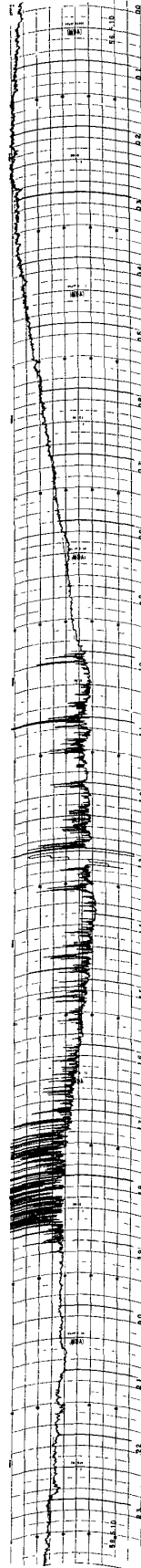
8



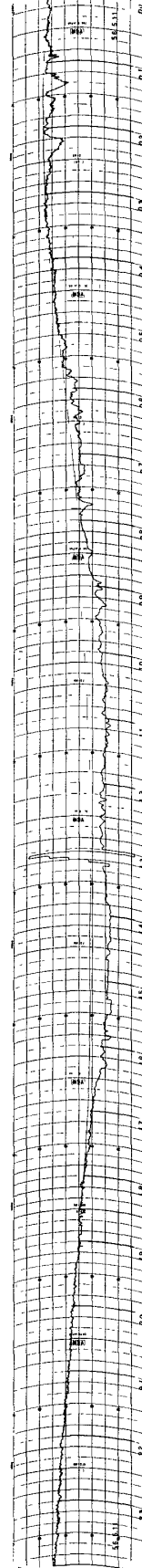
9



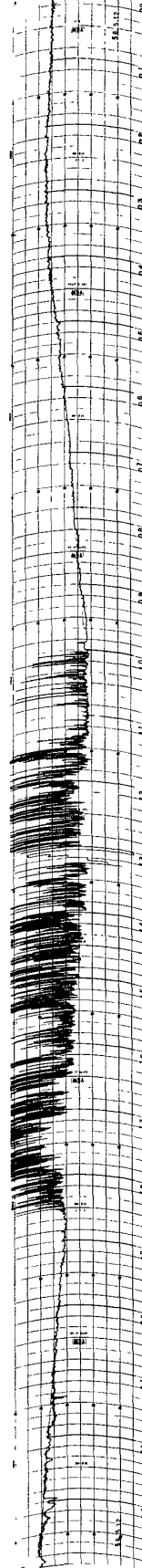
10



11



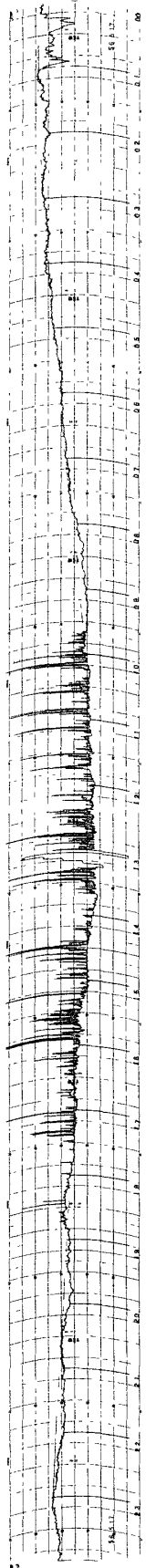
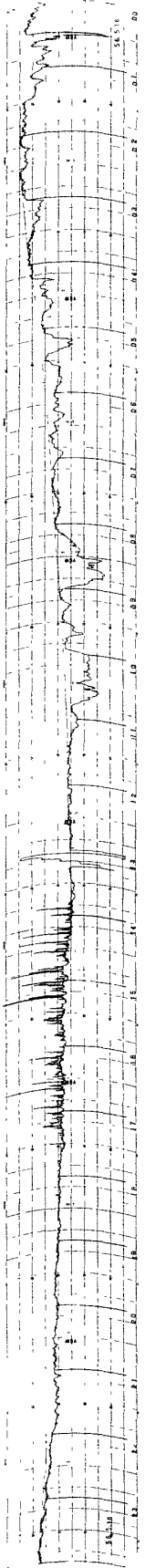
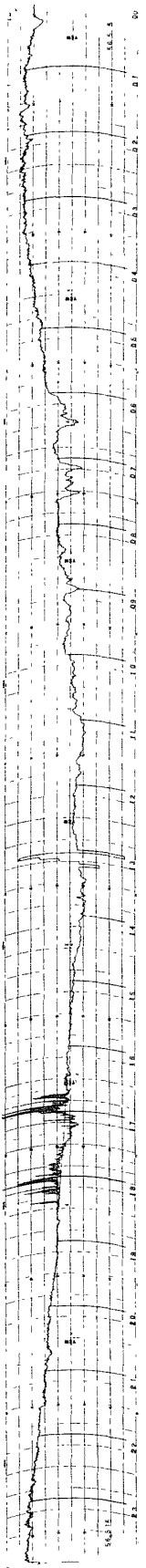
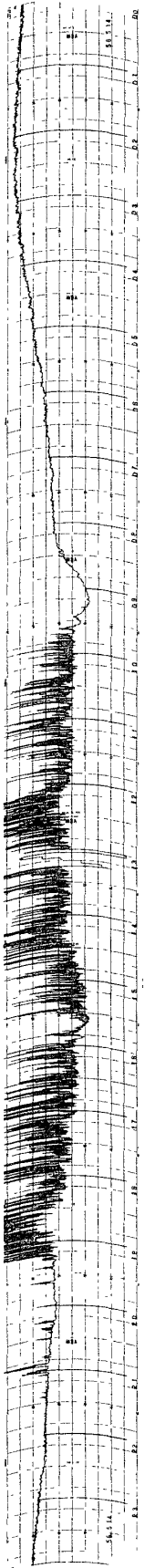
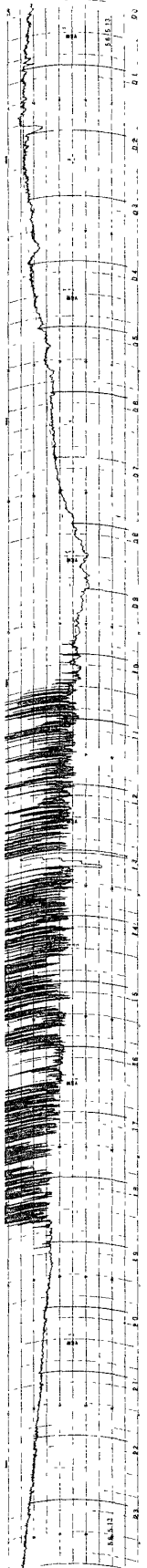
12



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

13 MAY 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

MAY 1981

19

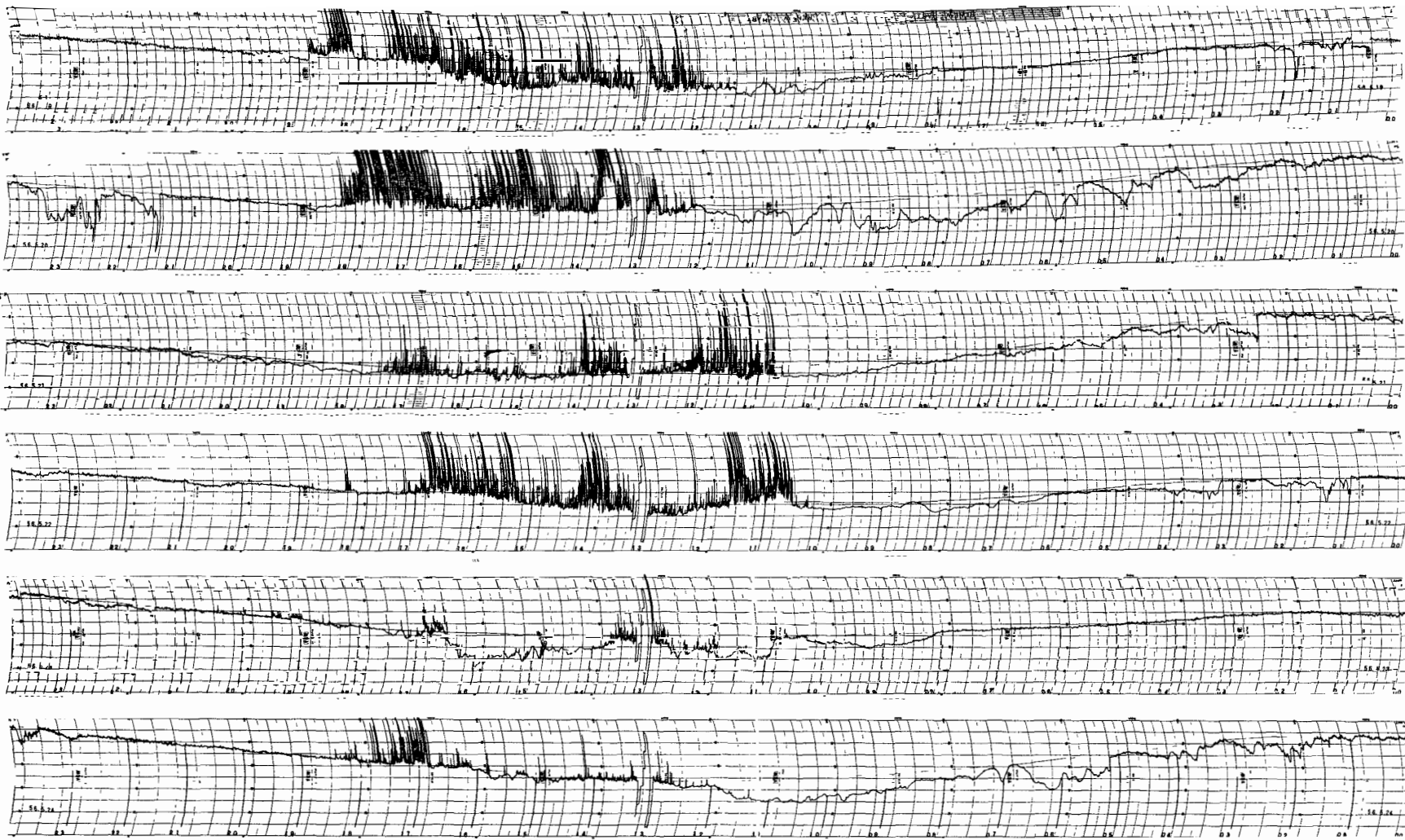
20

21

22

23

24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

25 MAY 1981
26
27
28
29
30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

MAY 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

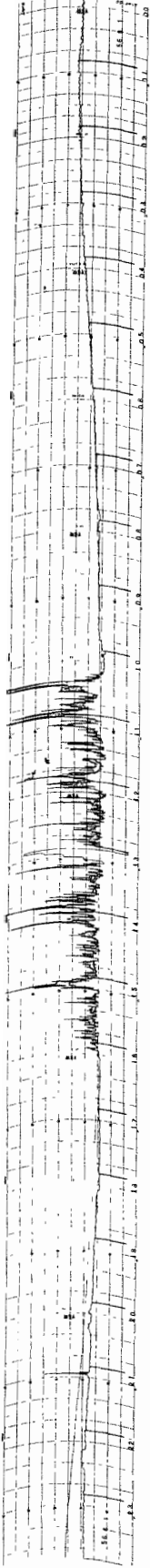
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

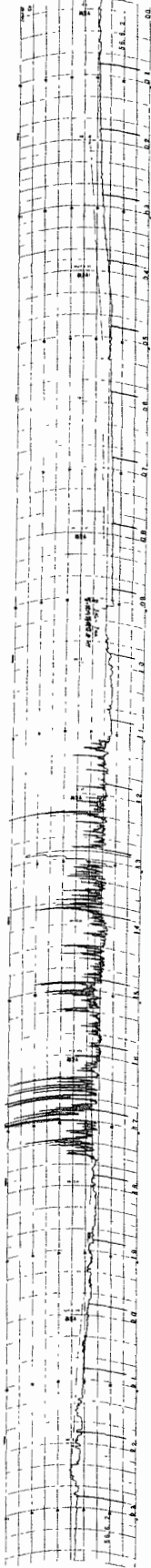
May	25	2230	-	Failure of equipment
	26		0310	
	26	2030	-	"
	27		2310	

JUNE 1981

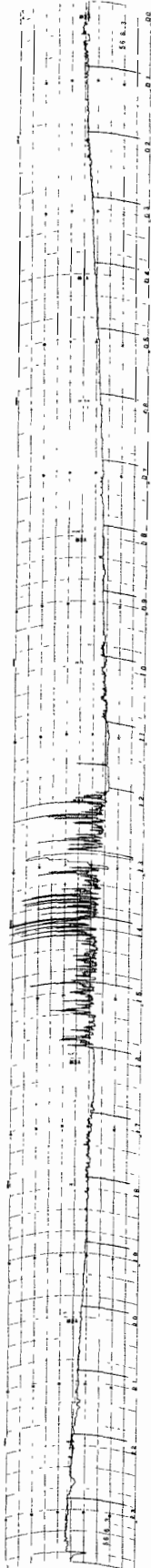
1



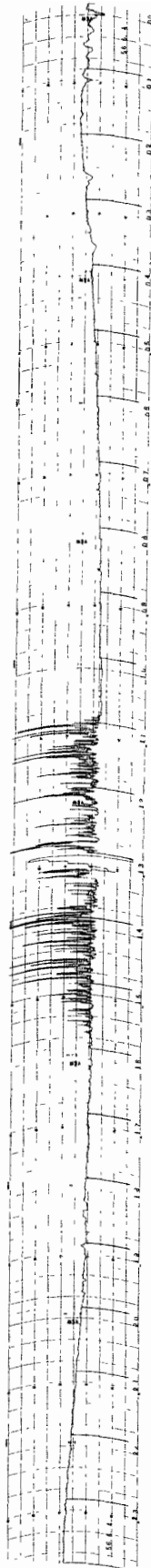
2



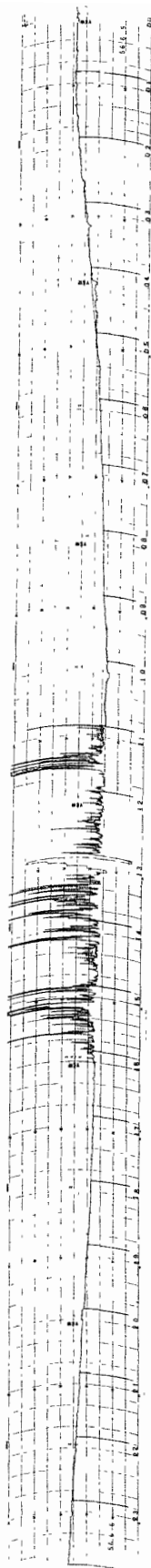
3



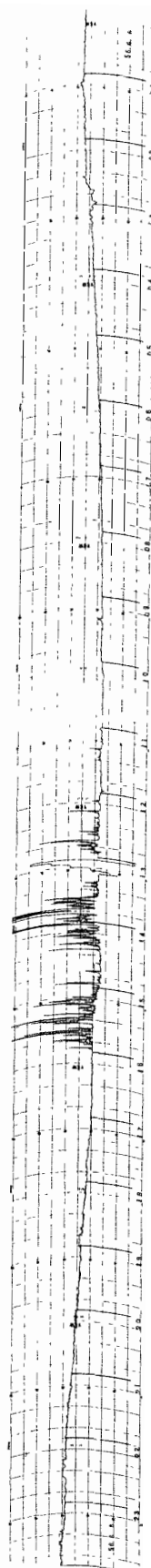
4



5



6



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

JUNE 1981

7

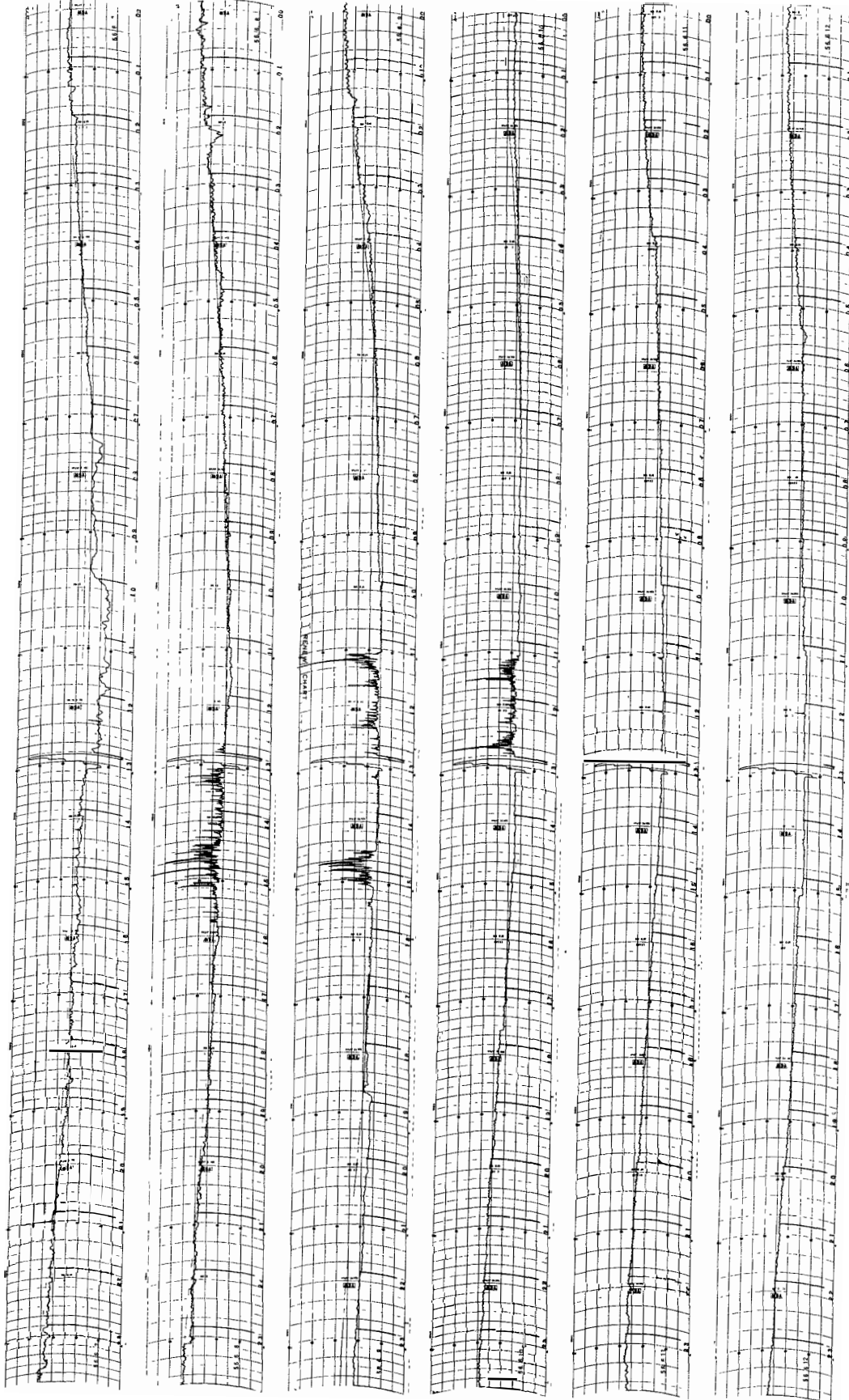
8

9

10

11

12

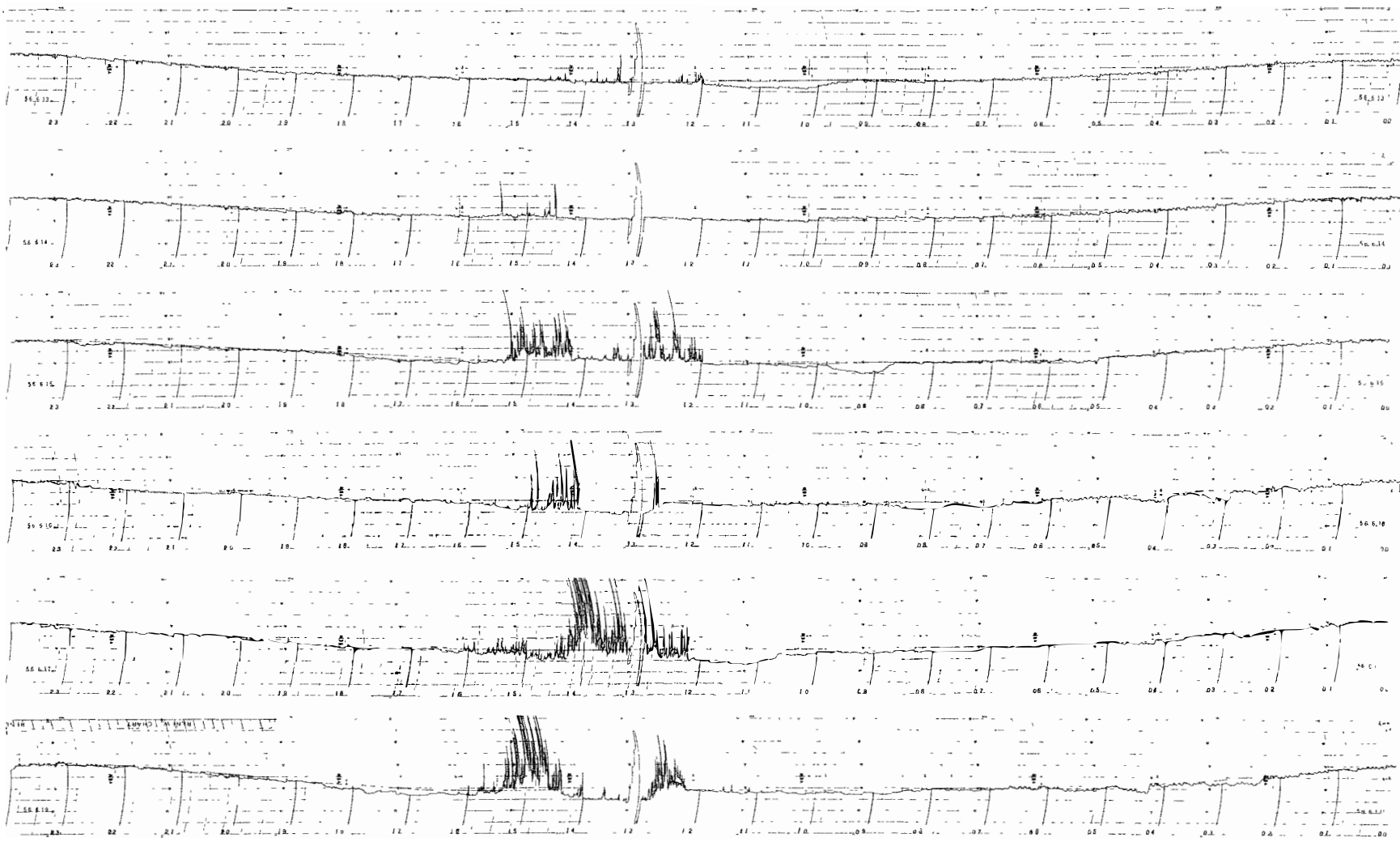


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

JUNE 1981

13
14
15
16
17
18



-56

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 JUNE 1981

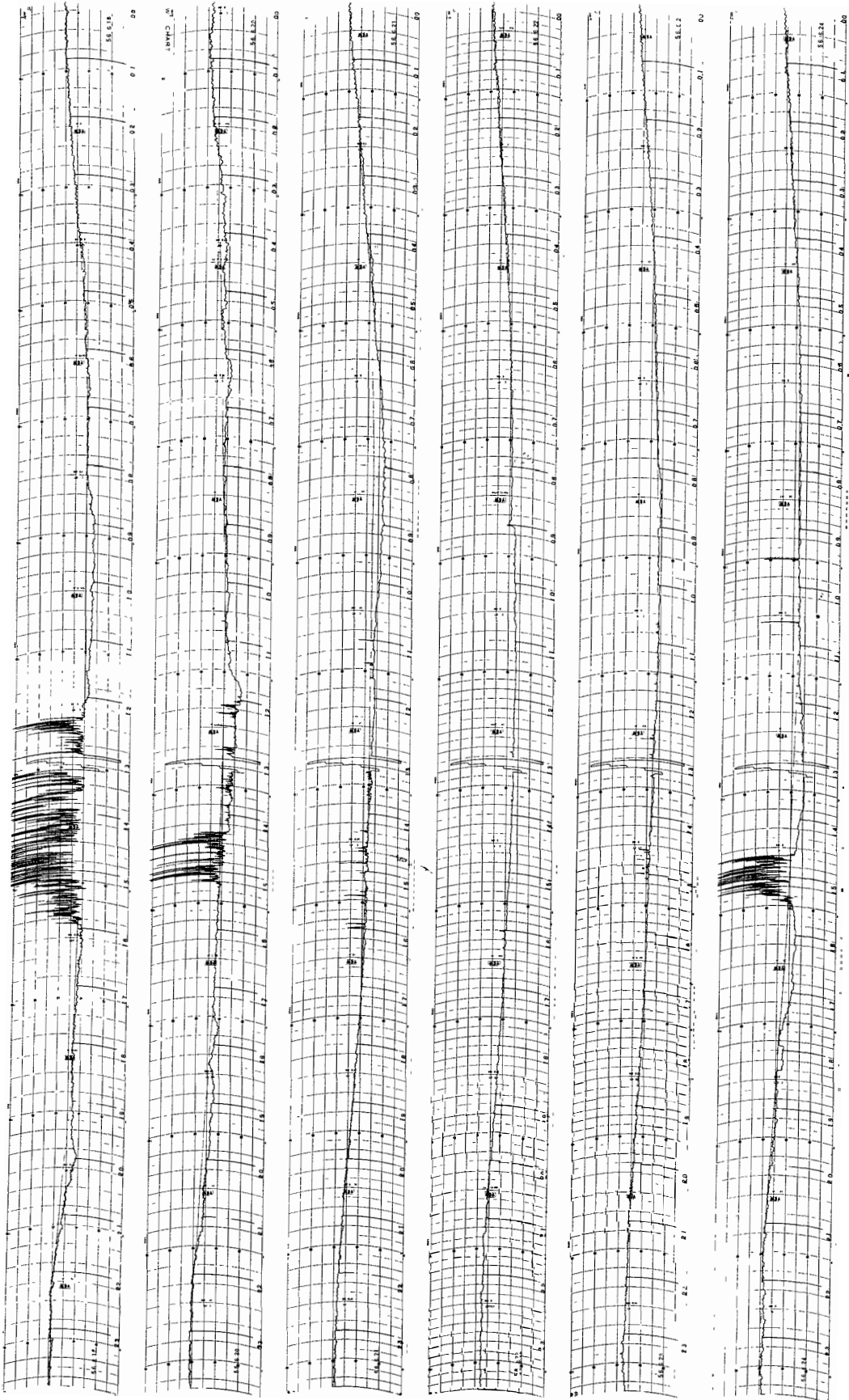
20

21

22

23

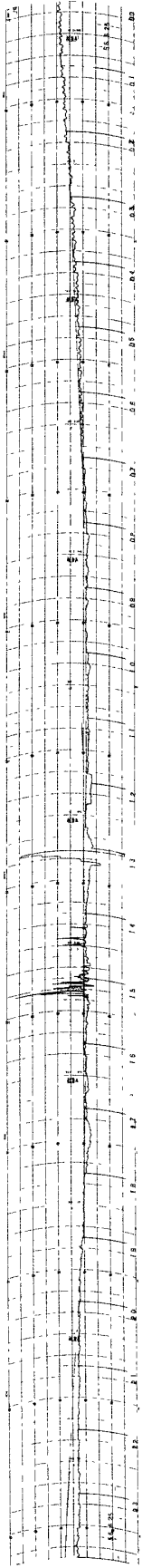
24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

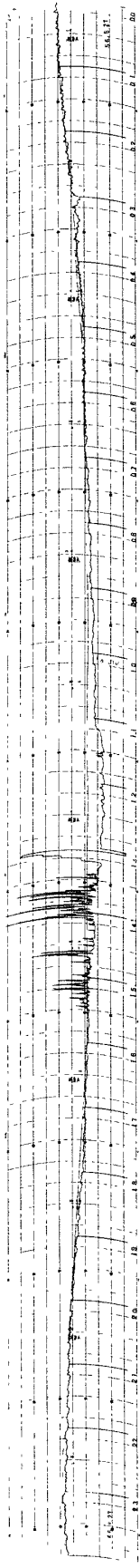
25 JUNE 1981



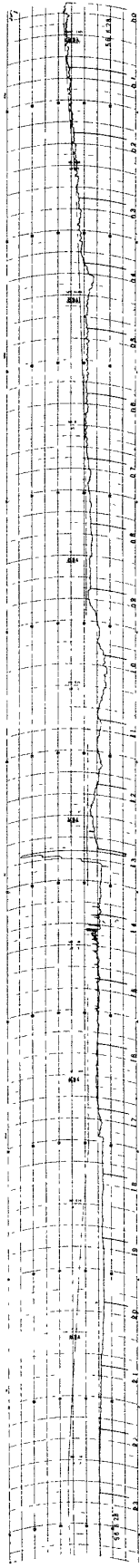
26 1981



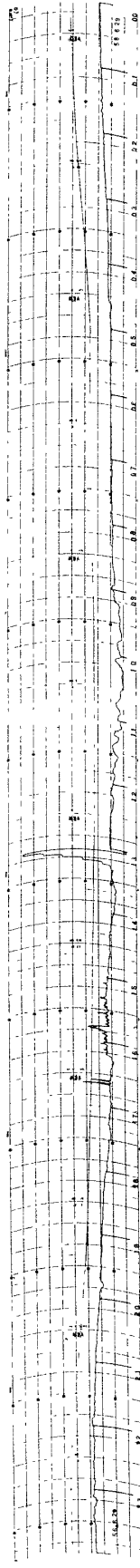
27



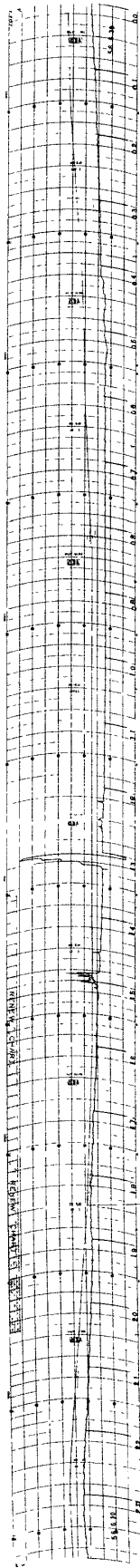
28



29

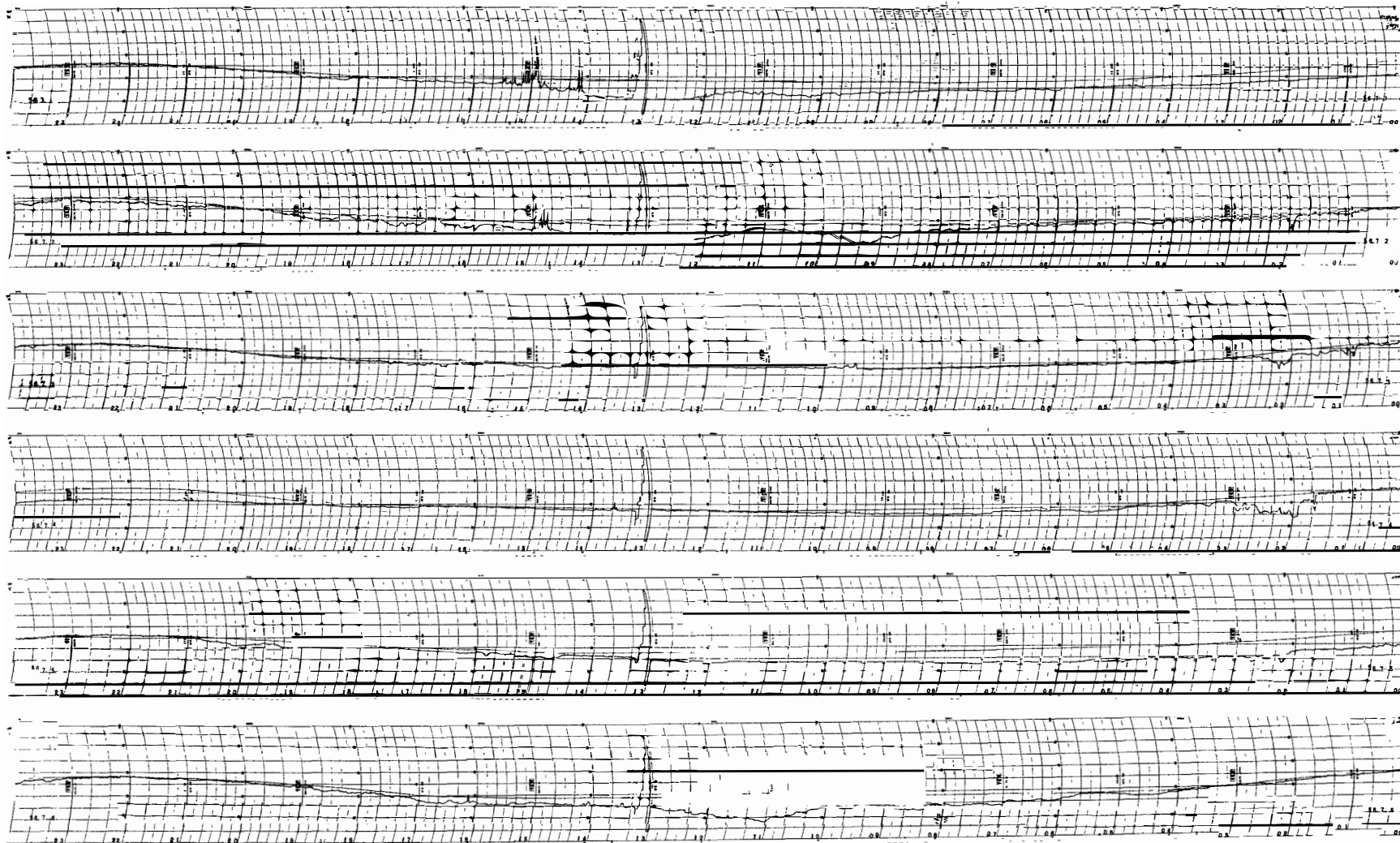


30



24 20 04 08 12 16 20 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



1
2
3
4
5
6

JULY 1961

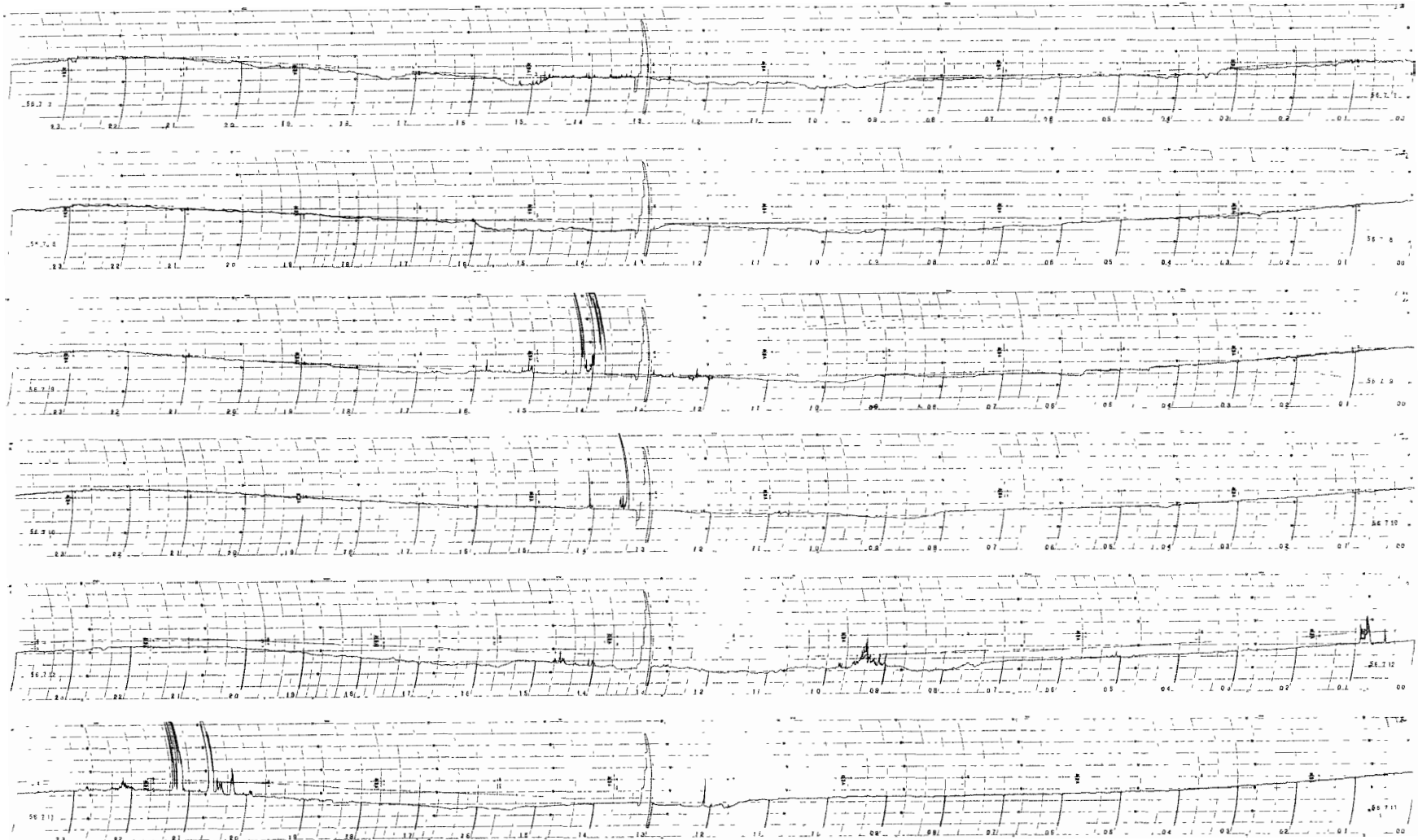
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

7
8
9
10
11
12

JULY 1981



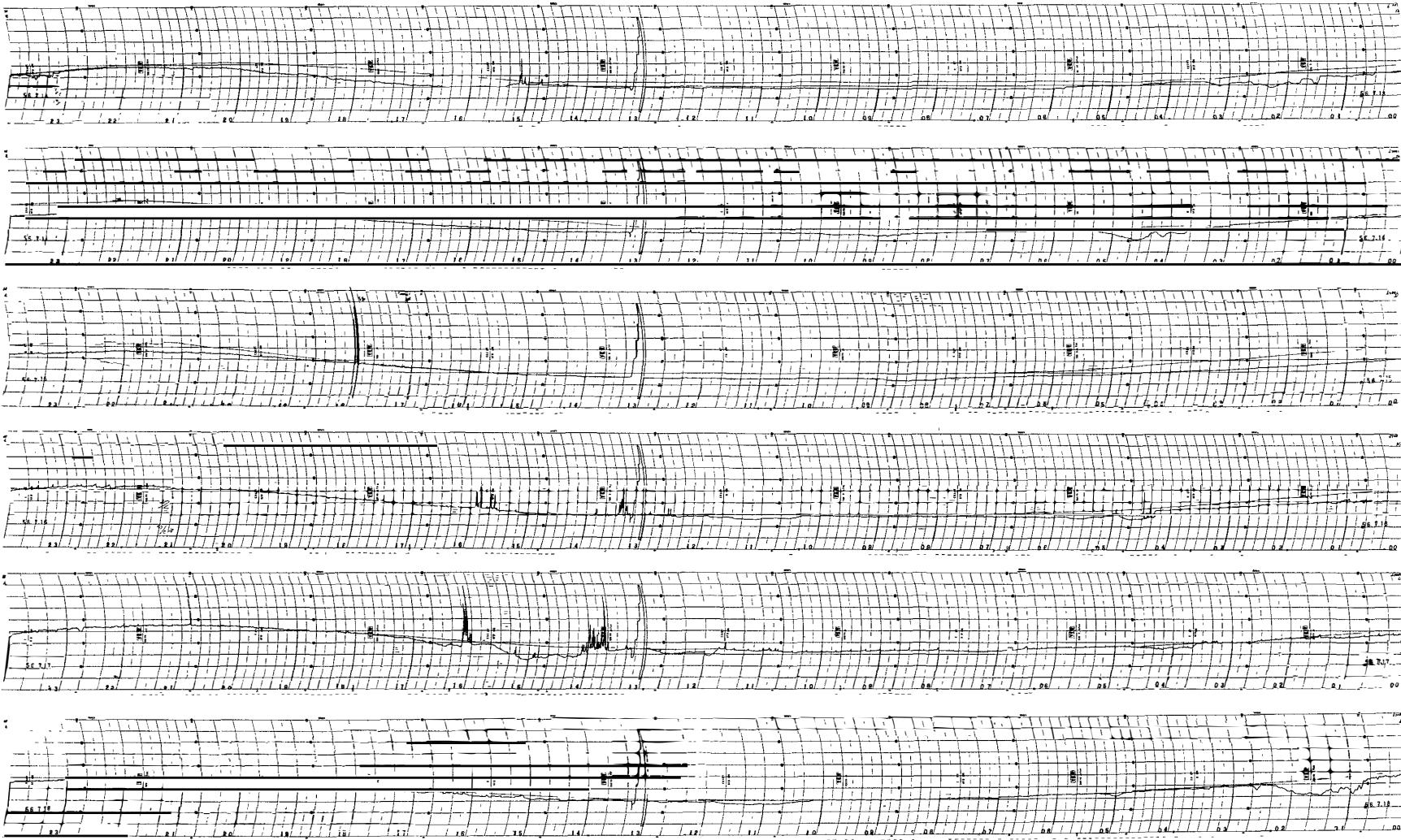
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

JULY 1961

13
14
15
16
17
18

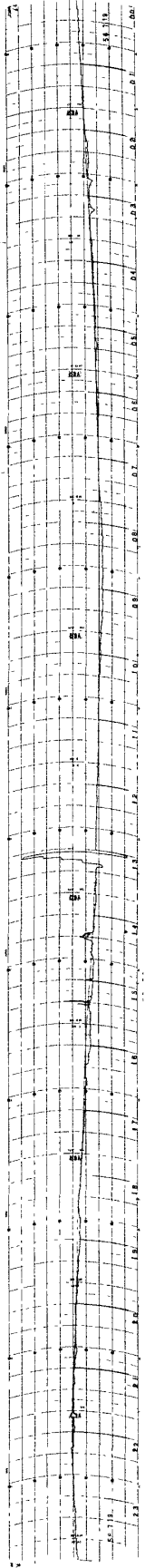


24 20 16 12 08 04 00

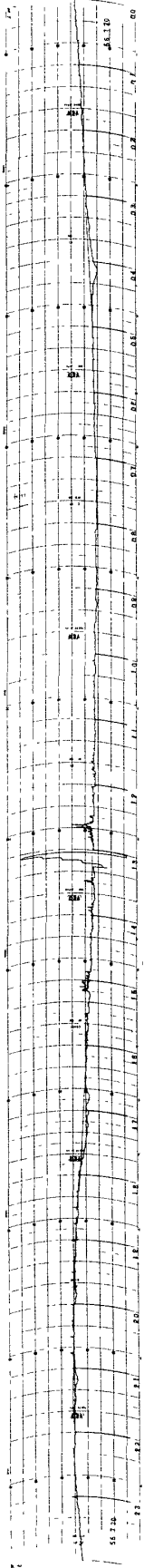
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

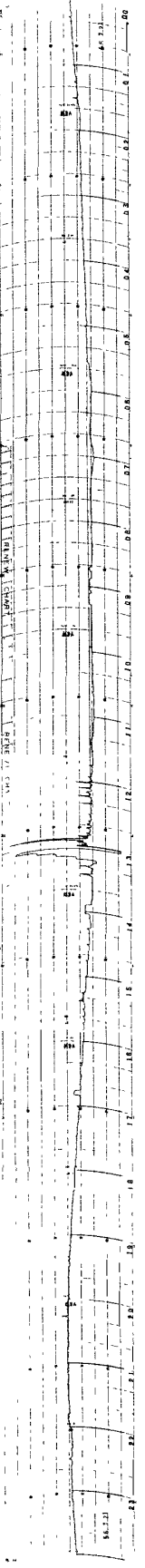
19 JULY 1981



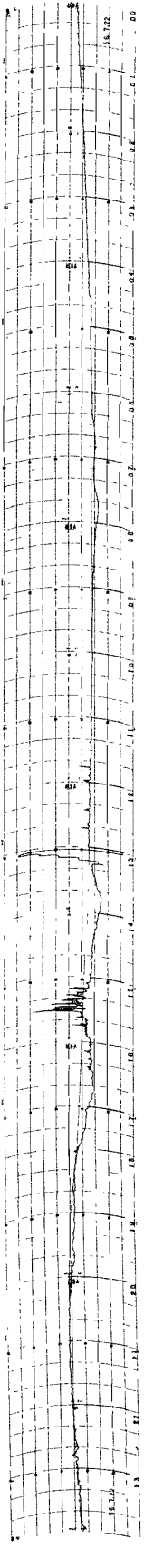
20 JULY 1981



21 JULY 1981



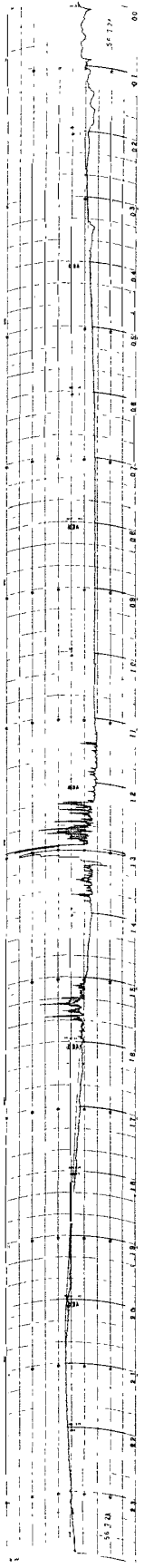
22 JULY 1981



23 JULY 1981



24 JULY 1981



24 20 08 12 16 20 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

25 JULY 1981

26

27

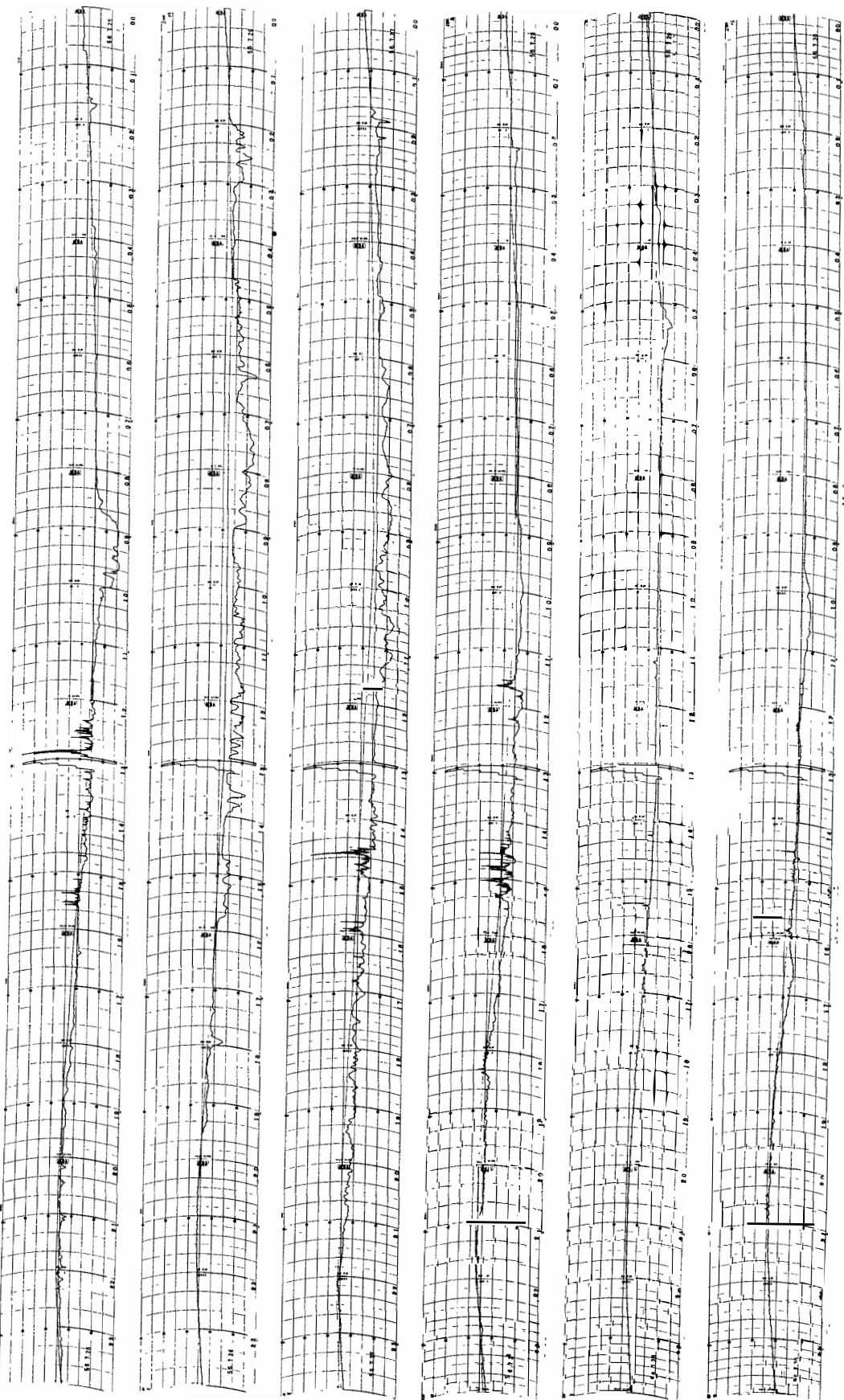
28

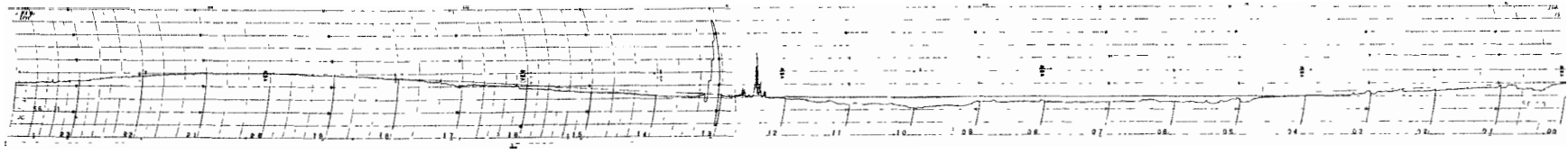
29

30

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE





24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

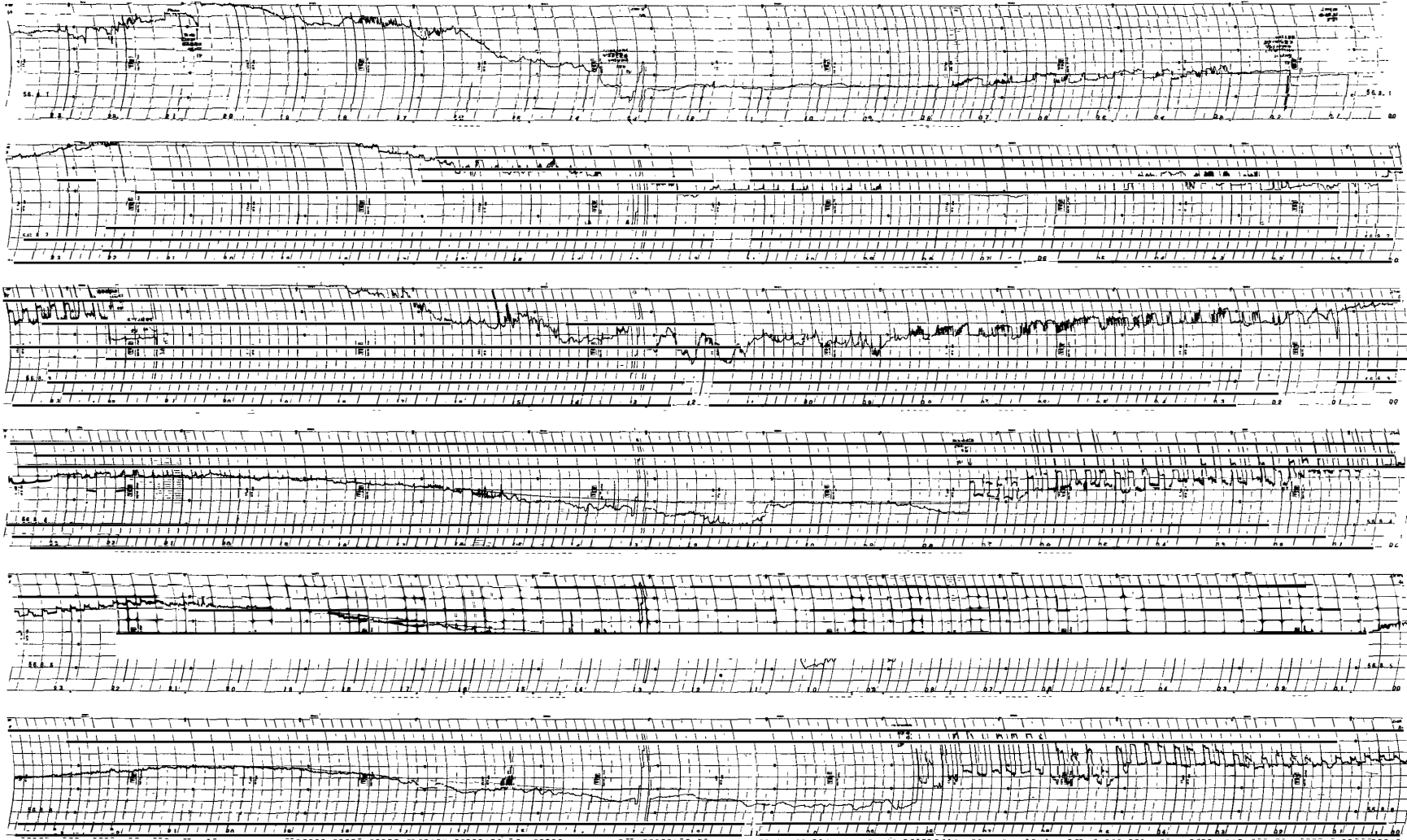
30 MHz COSMIC NOISE

31

JULY 1961

AUG 1981

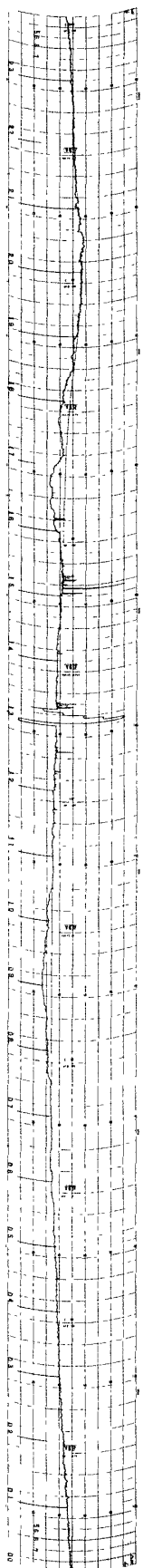
1
2
3
4
5
6



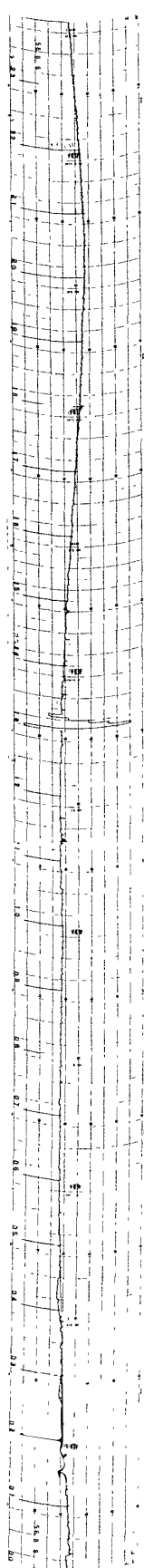
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

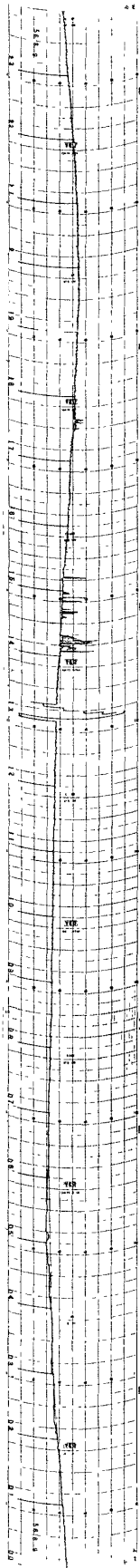
30 MHz COSMIC NOISE



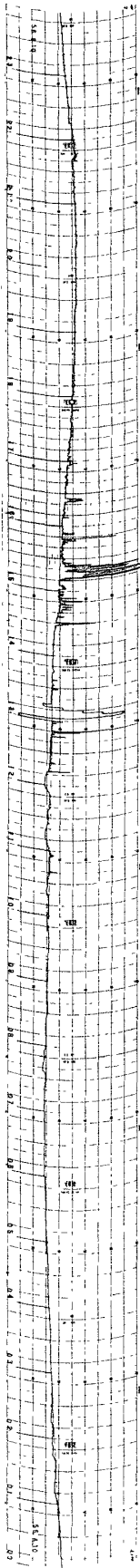
7
AUG
1981



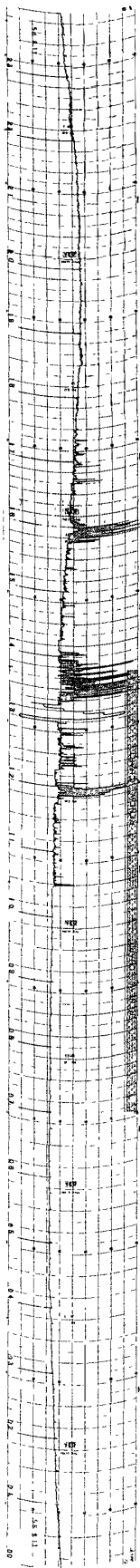
8
1981



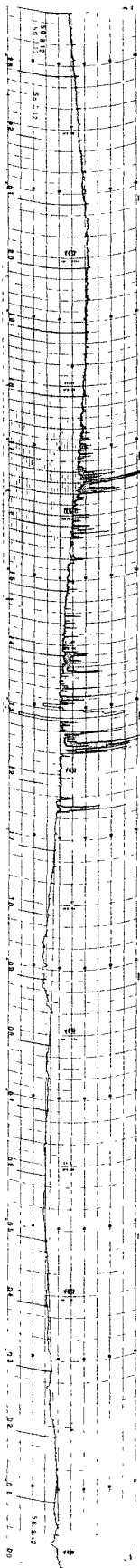
9



10



11



12

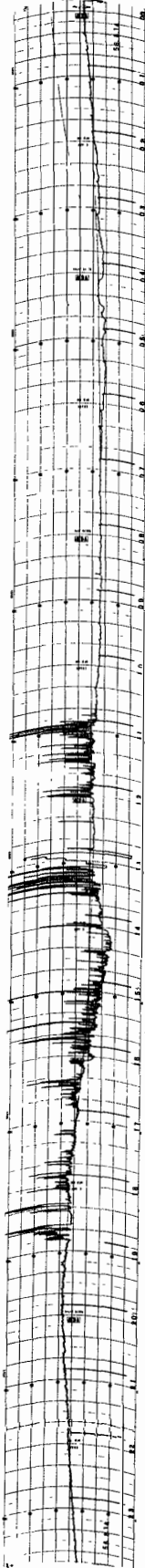
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHZ COSMIC NOISE

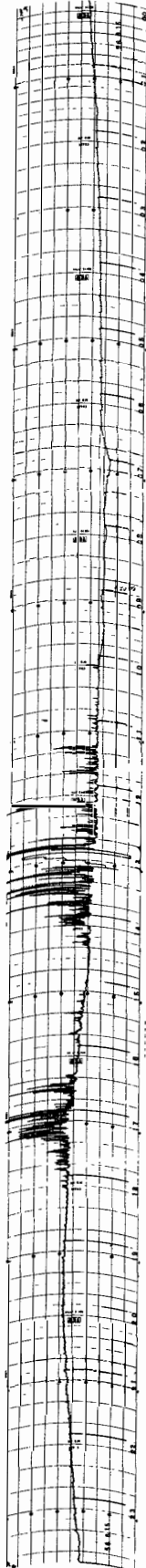
13 AUG 1981



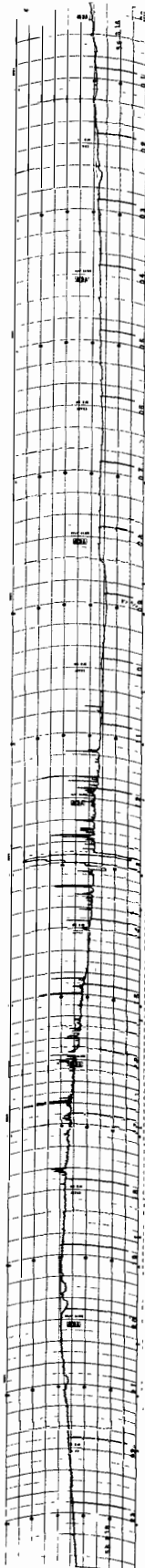
14



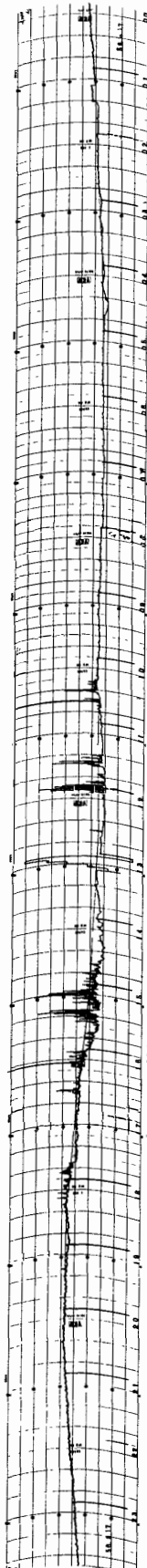
15



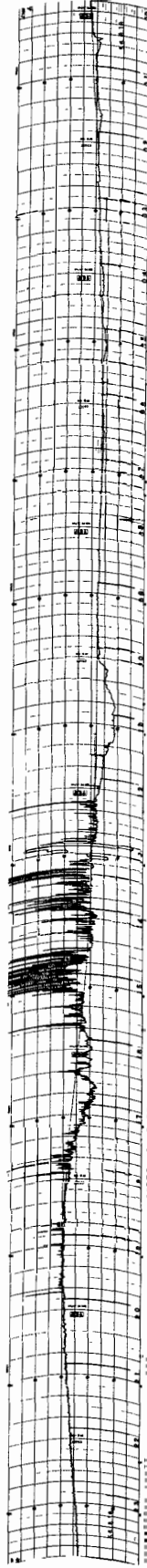
16



17

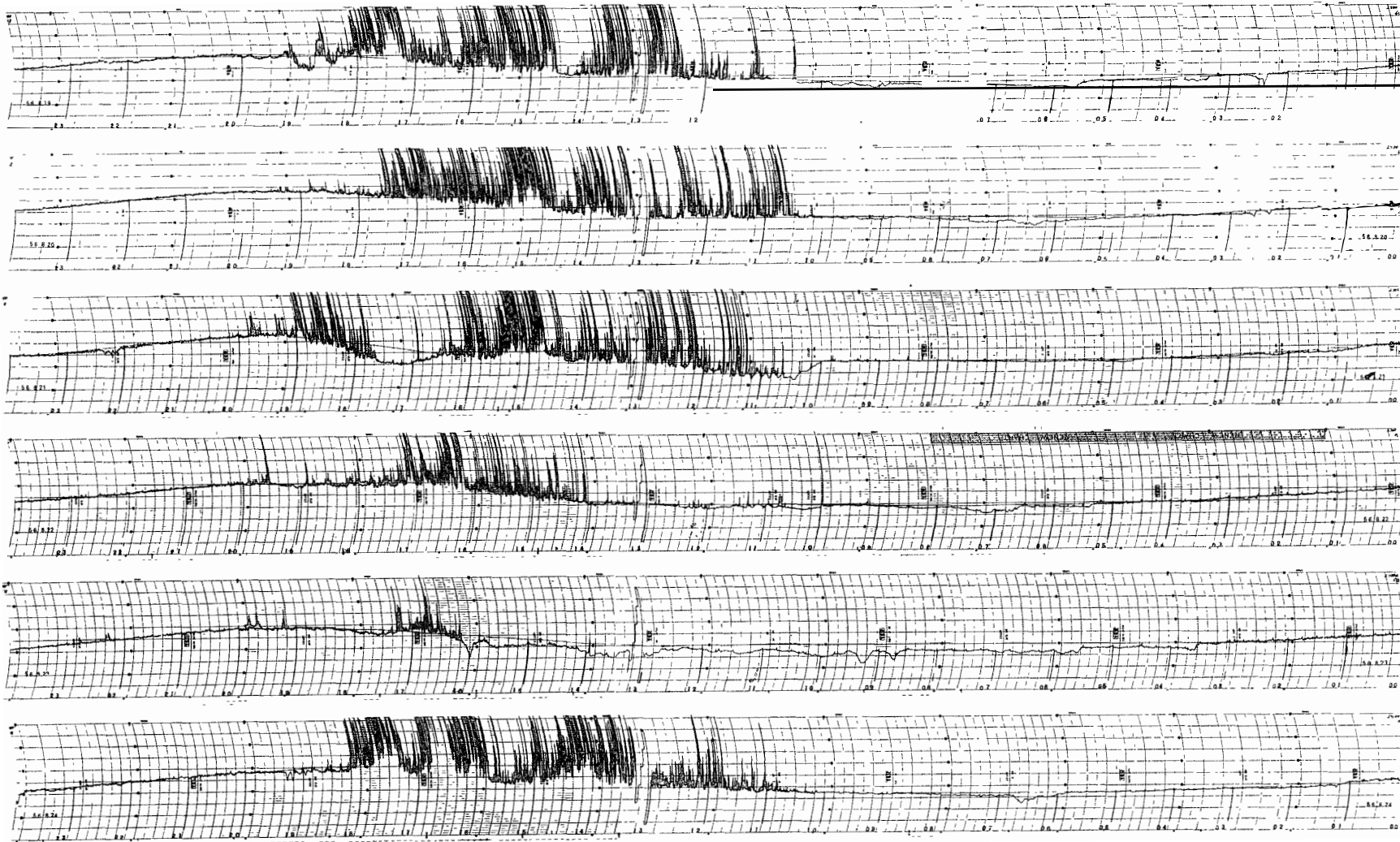


18



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



19

20

21

22

23

24

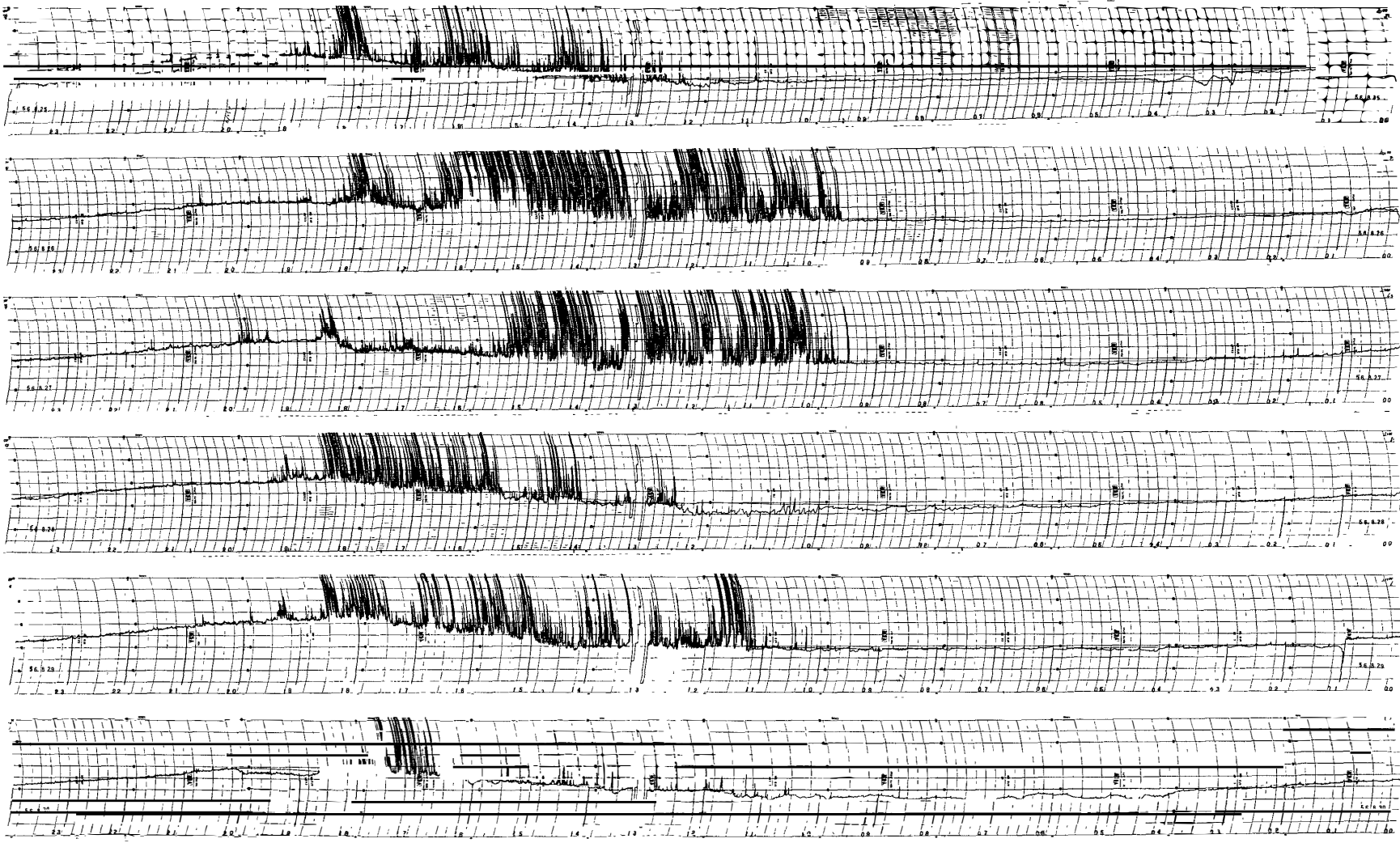
AUG 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

25
26
27
28
29
30
AUG 1981

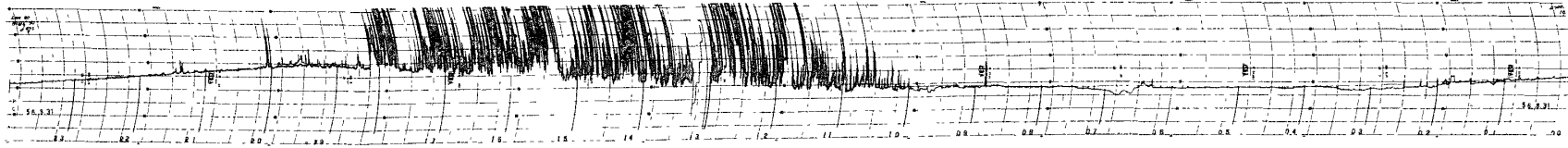


69

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

AUG 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

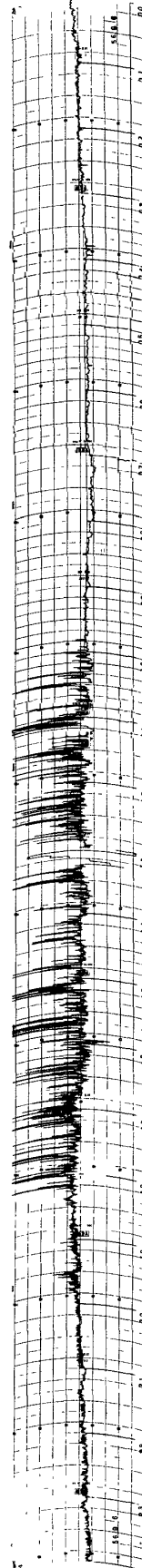
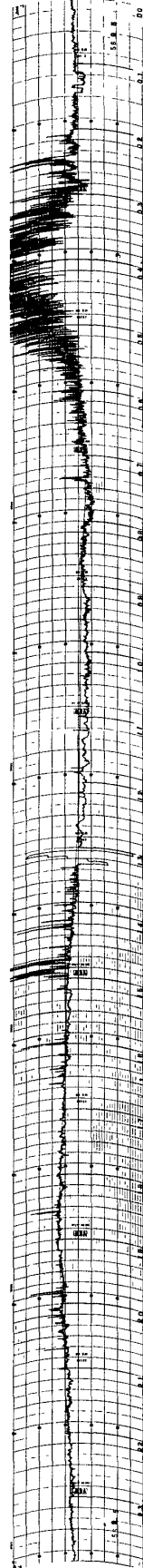
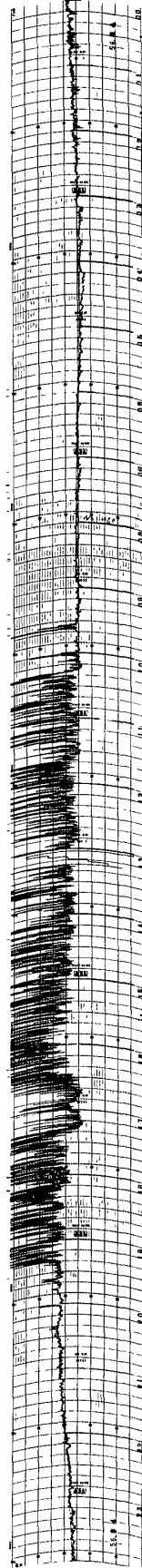
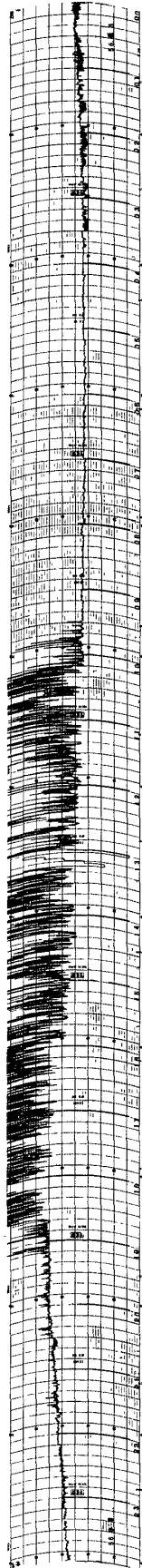
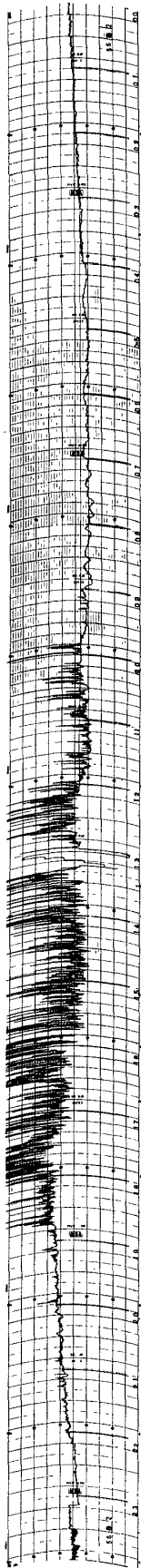
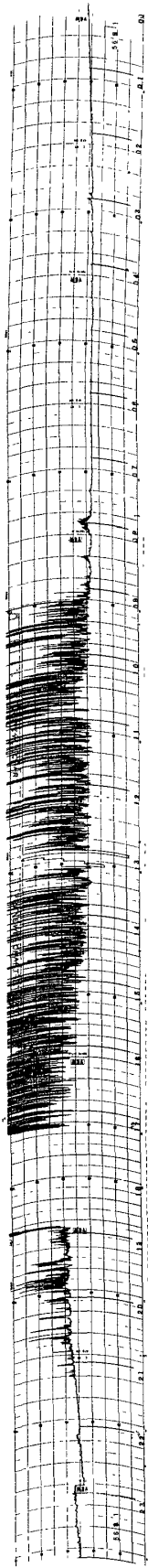
30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

August	1	0000	-	0100	Failure of equipment
	2	1753	-	2230	"
	3	1800	-	2130	"

1 SEP

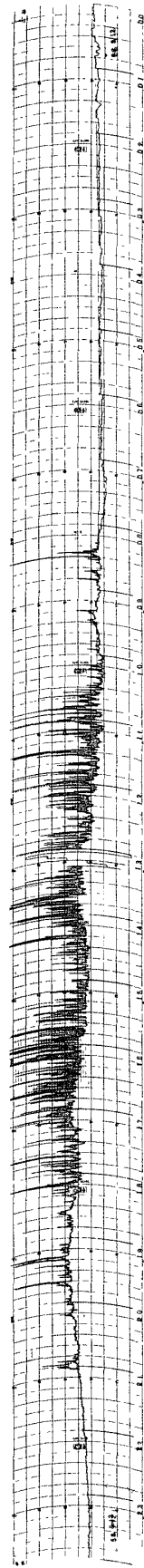
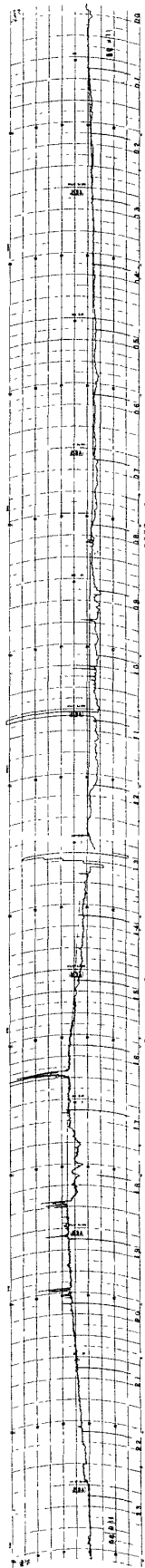
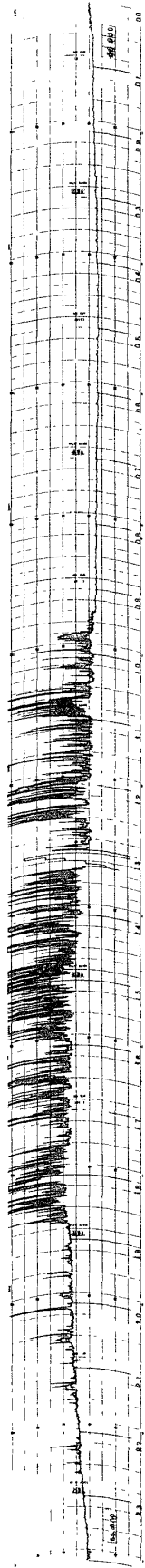
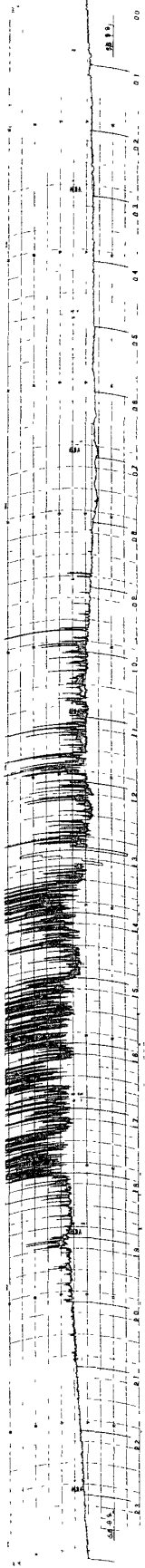
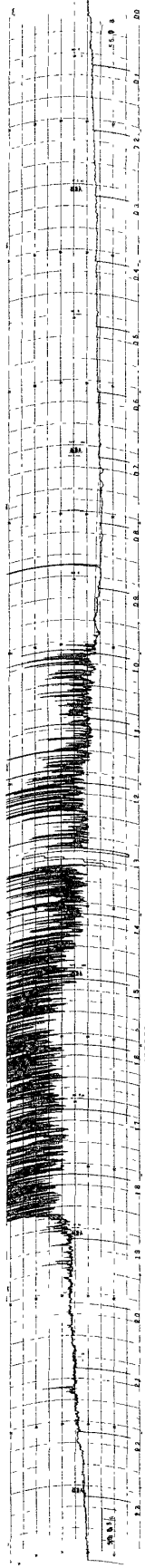
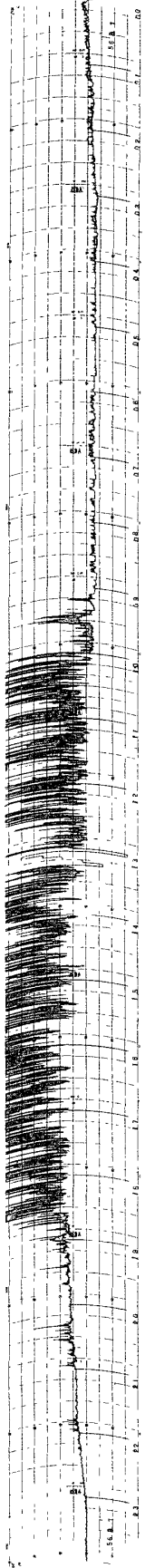
2 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

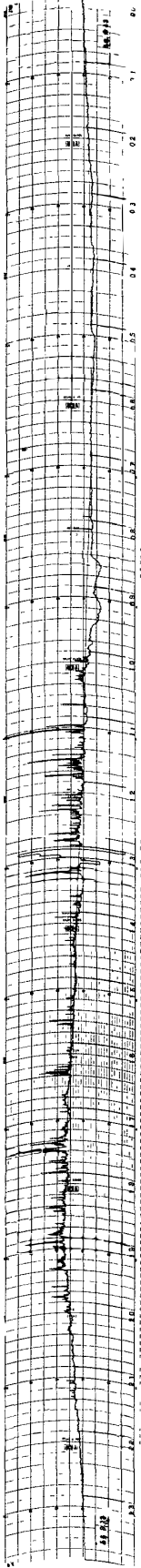
7 SEP 1981



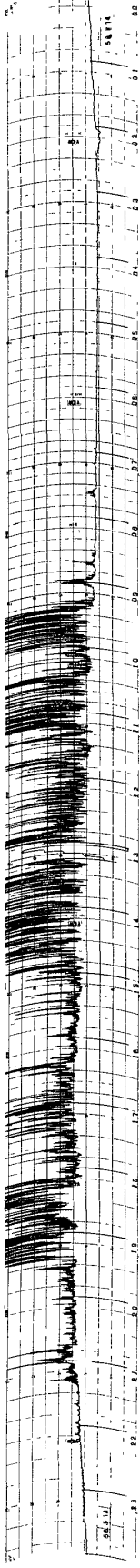
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

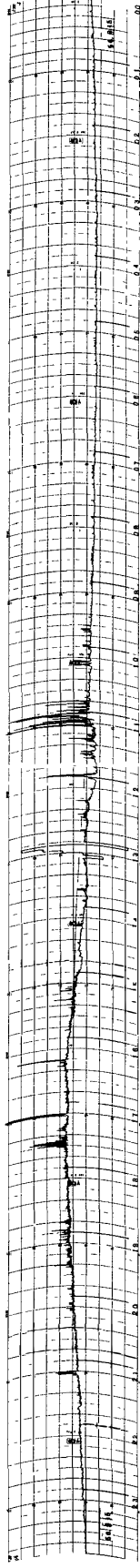
13 SEP 1981



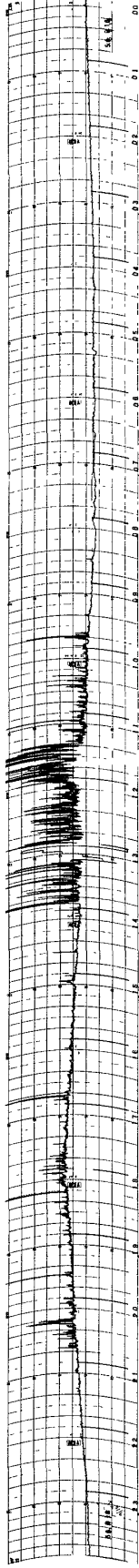
14 SEP 1981



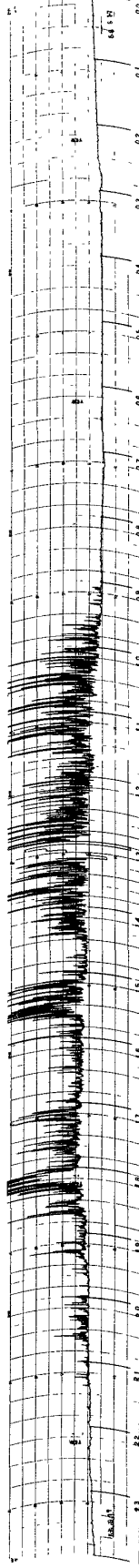
15 SEP 1981



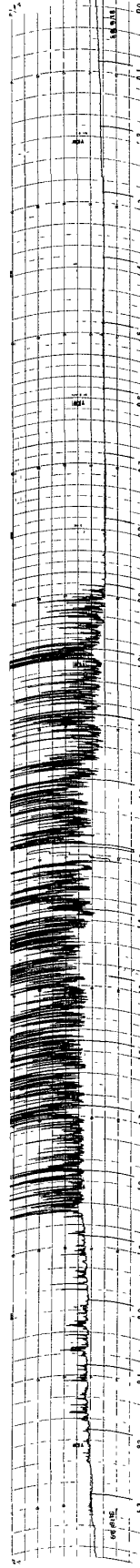
16 SEP 1981



17 SEP 1981



18 SEP 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

19 SEP

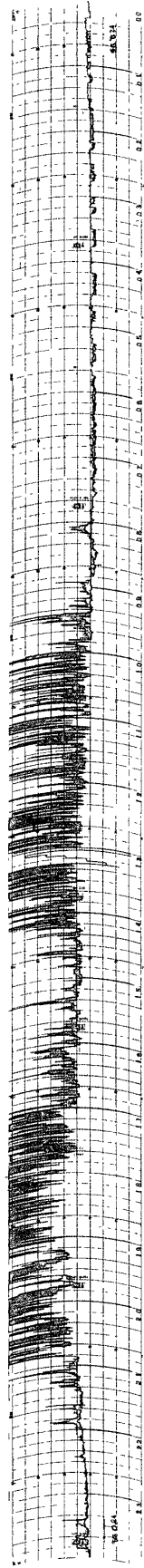
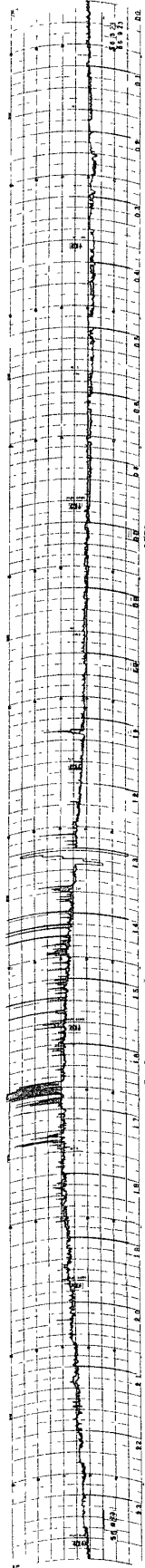
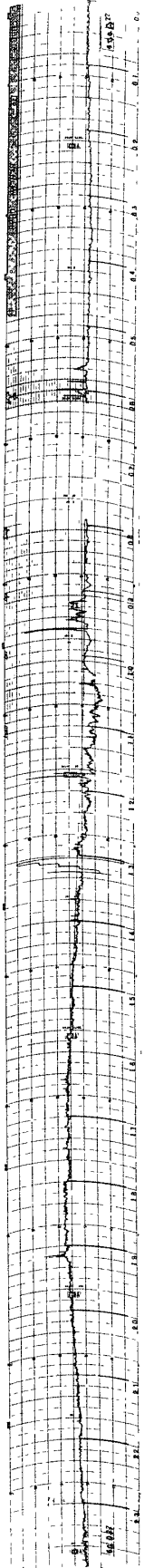
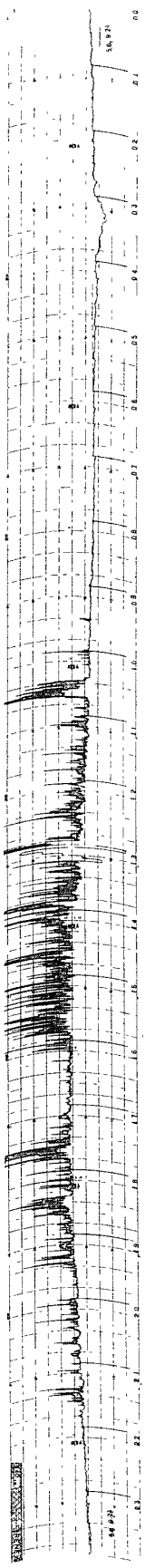
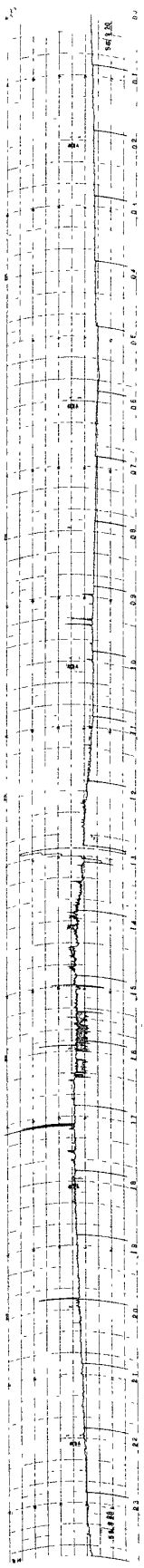
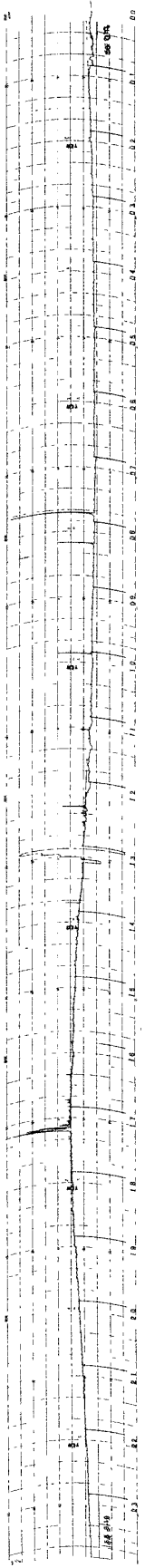
20 1988

21

22

23

24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHZ COSMIC NOISE

25 SEP

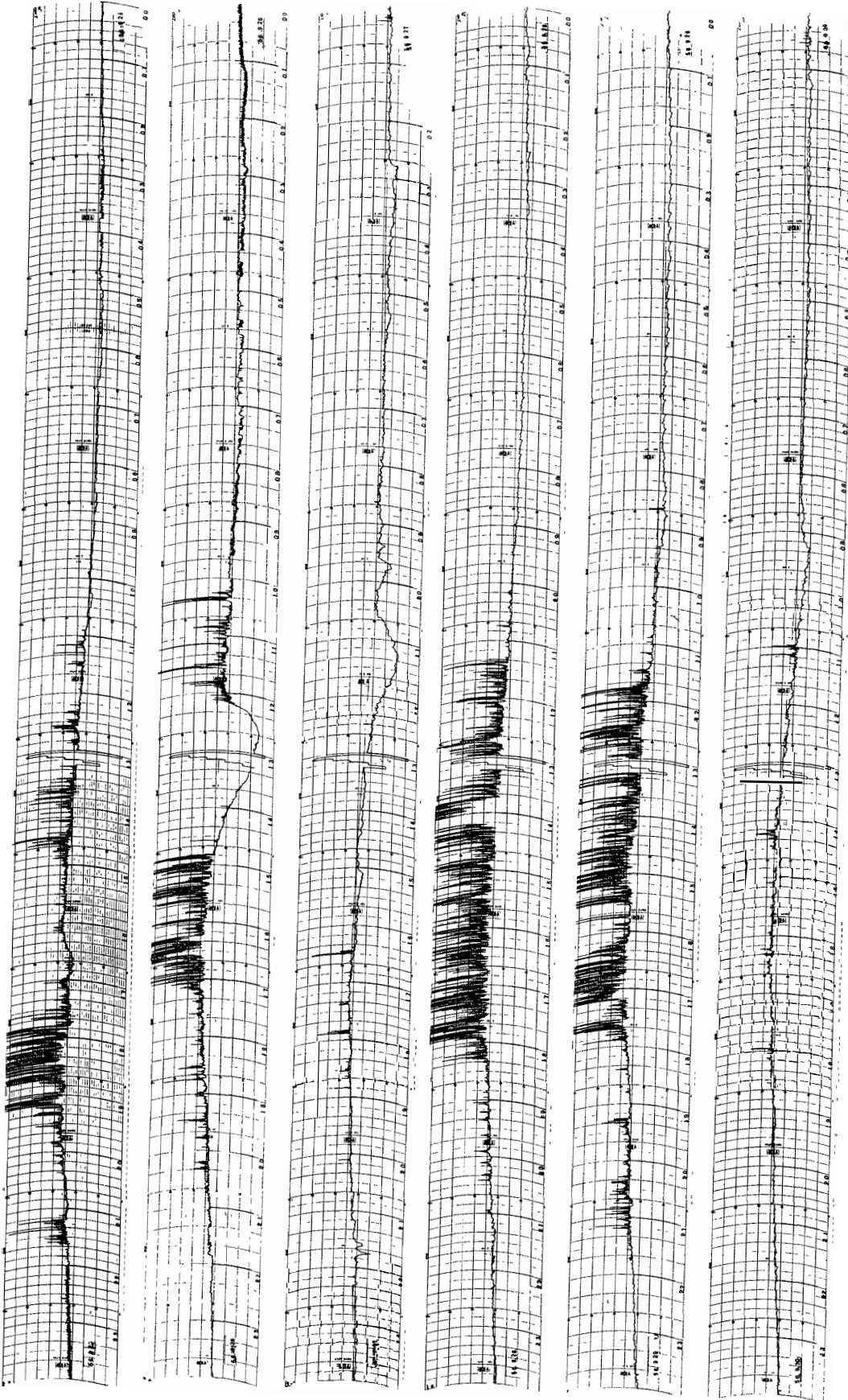
26 1981

27

28

29

30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

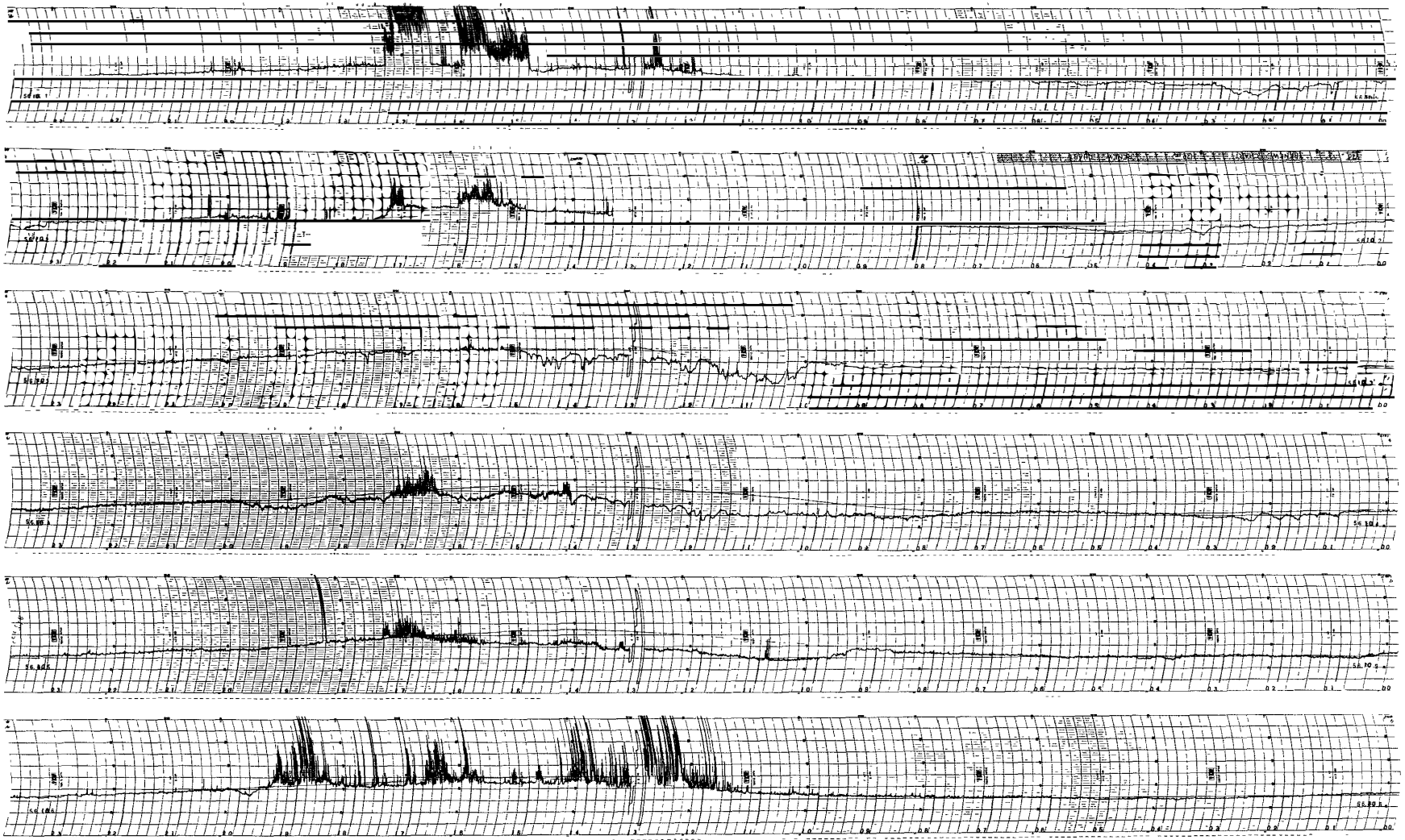
Cosmic noise level obscured or equipment malfunction.

September	1	1710	-	1855	Failure of equipment
	22	0610	-	0755	"

77-

1
2
3
4
5
6

OCT 1981

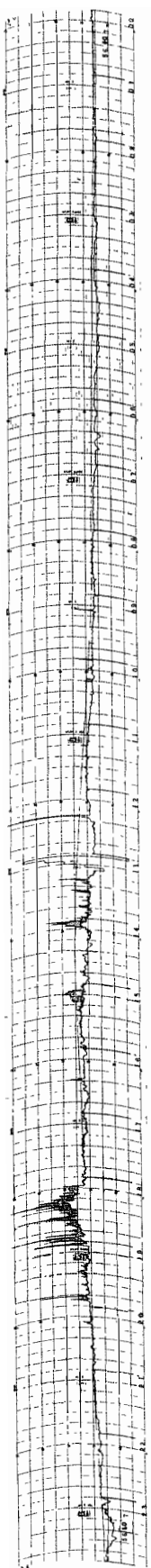


24 20 16 12 08 04 00

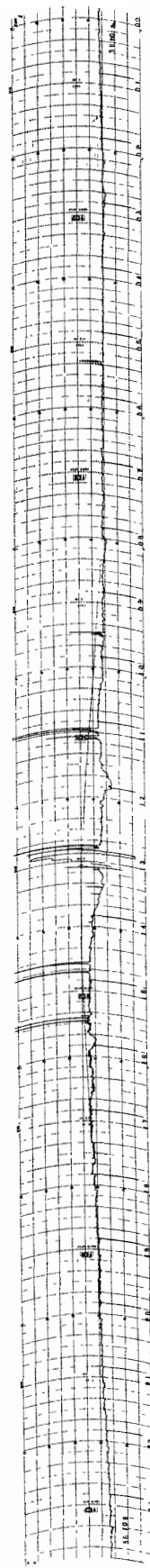
45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

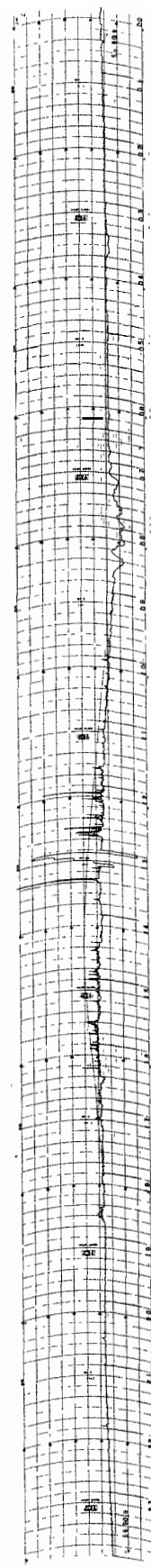
7 OCT 1981



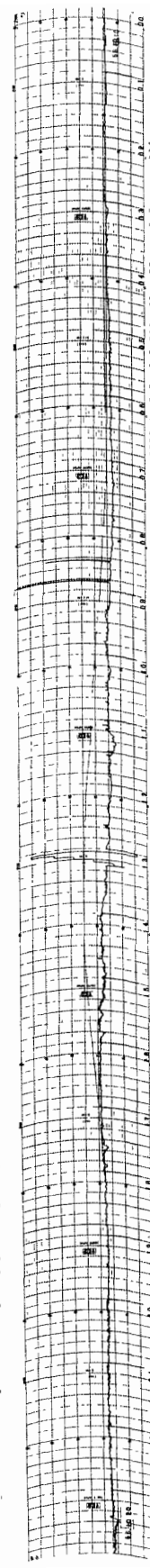
8



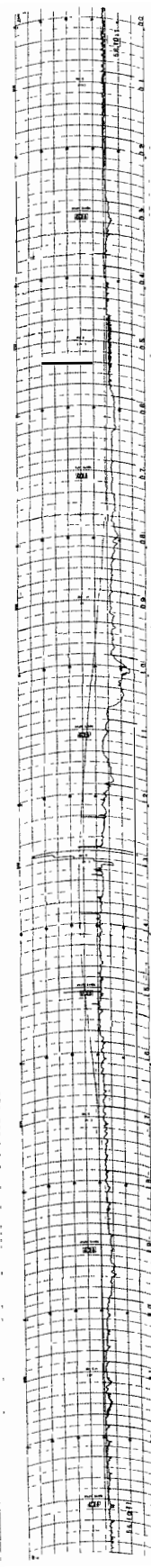
9



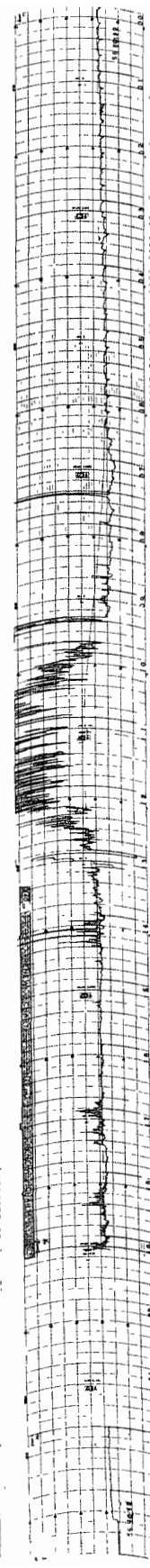
10



11



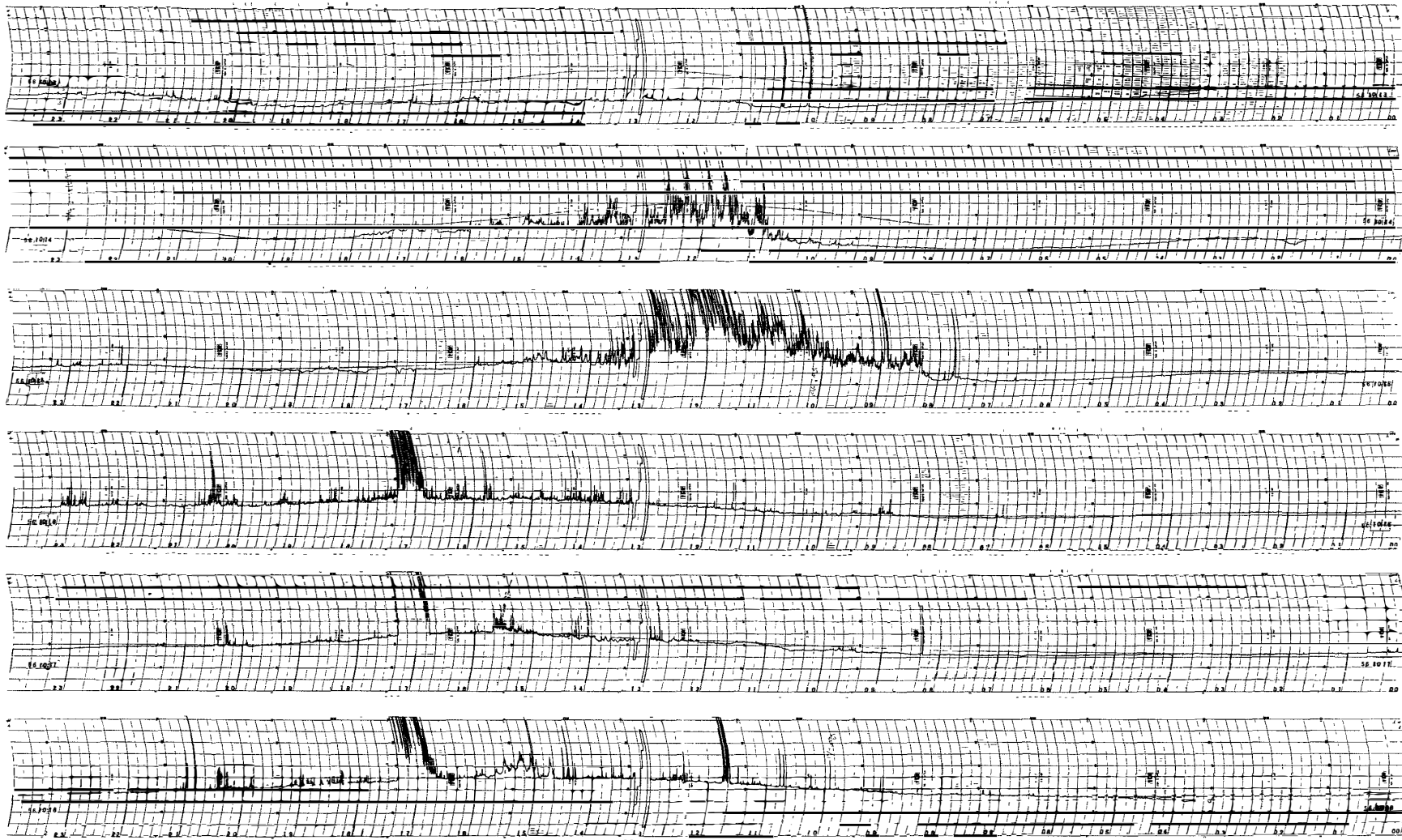
12



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

13
14
15
16
17
18
OCT 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



19
20
21
22
23
24

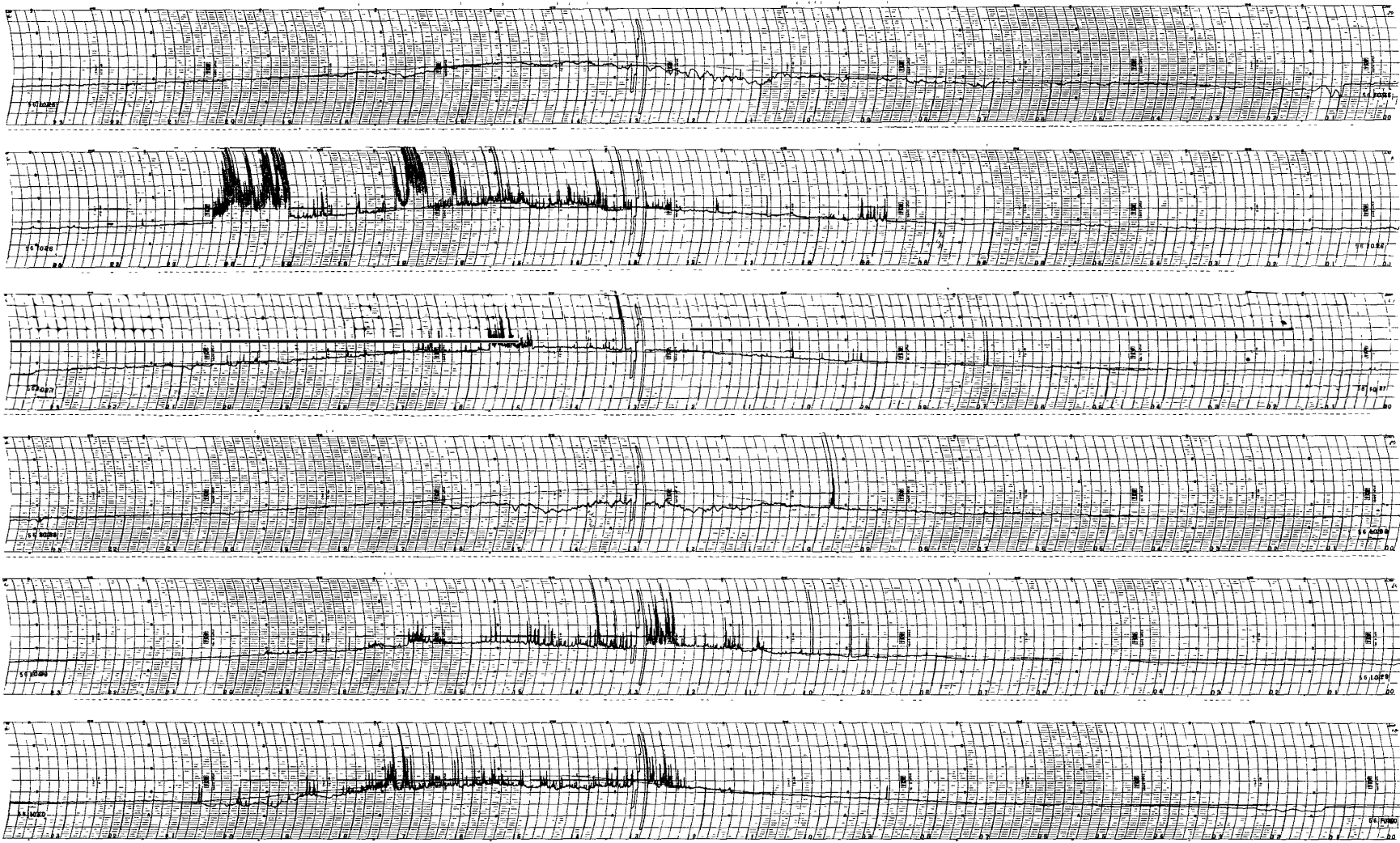
OCT 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

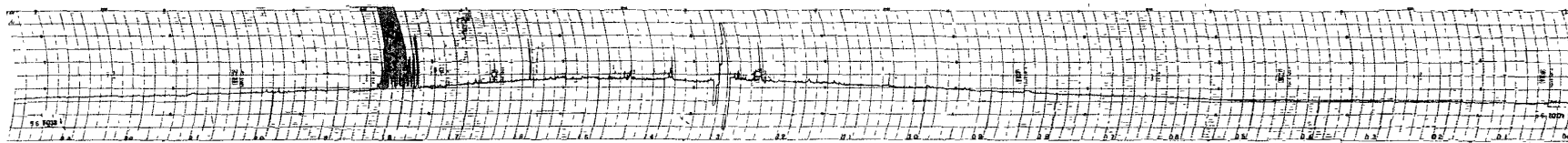
25
26
27
28
29
30
OCT 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE



31

OCT
1981

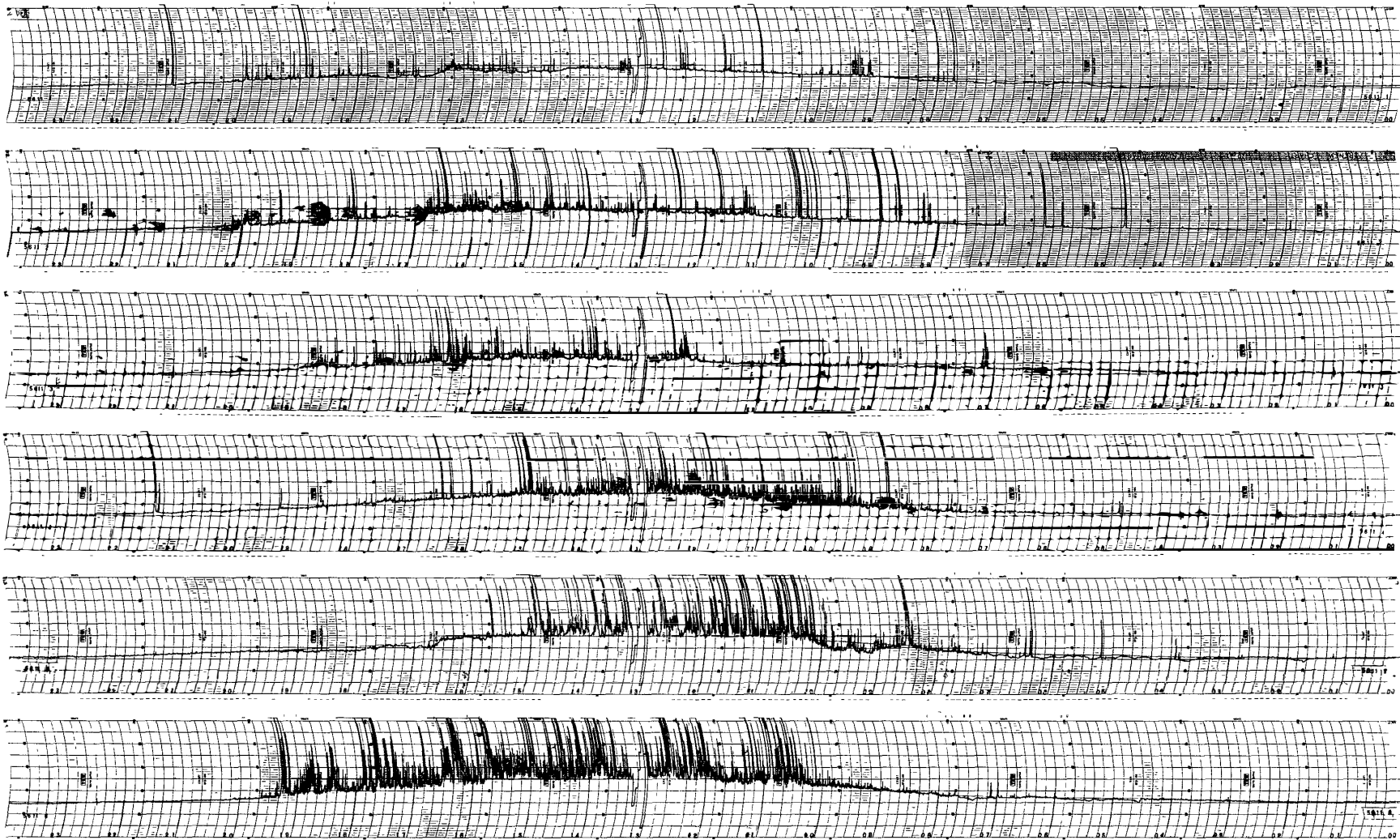
24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

October	2	0815	-	1330	Failure of equipment
	12	1912	-	2100	"
	23	0426	-	1102	"



1
2
3
4
5
6

NOV
1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

7
8
9
10
11
12

NOV 1961

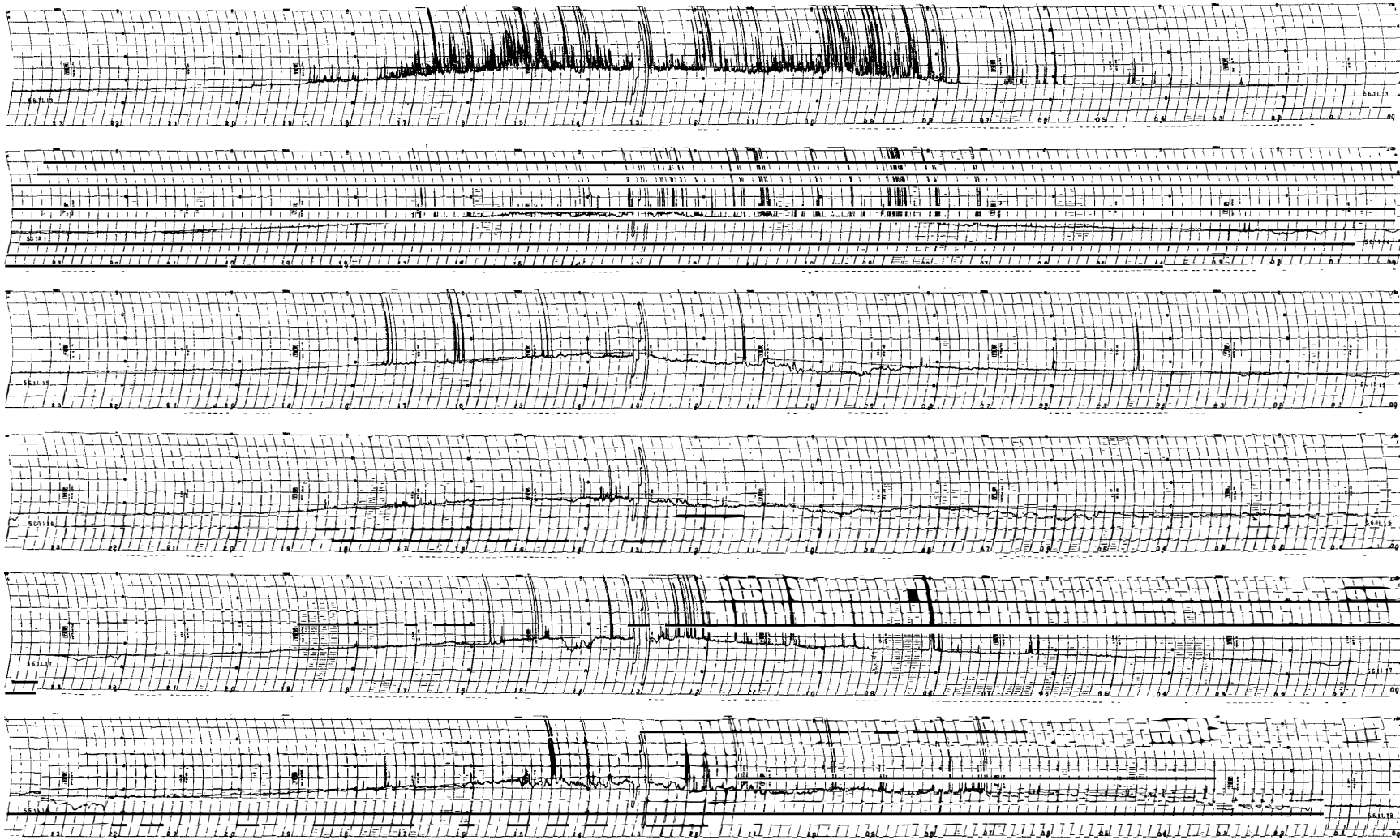


24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

13
14
15
16
17
18
NOV 1981



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

58

19 NOV

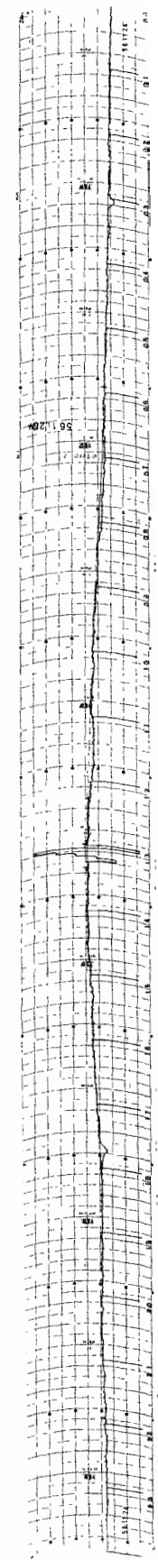
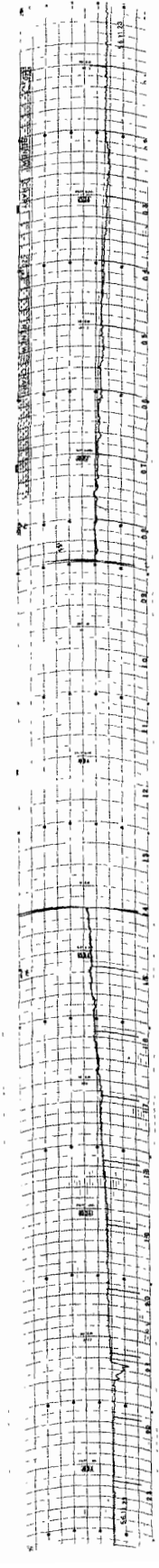
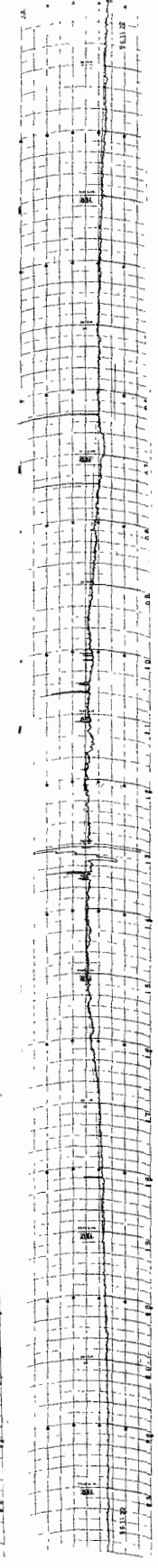
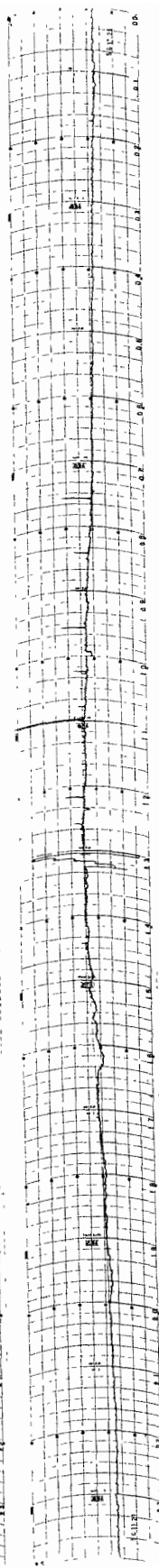
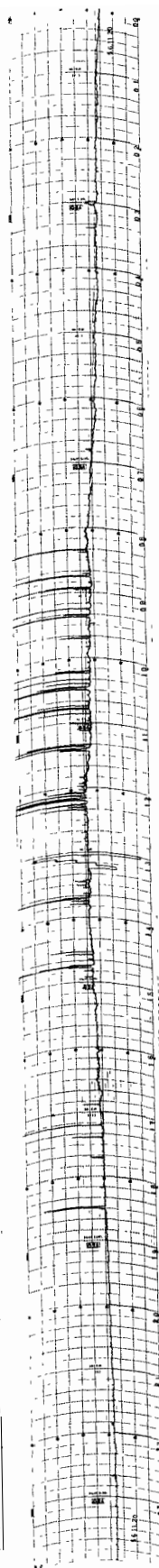
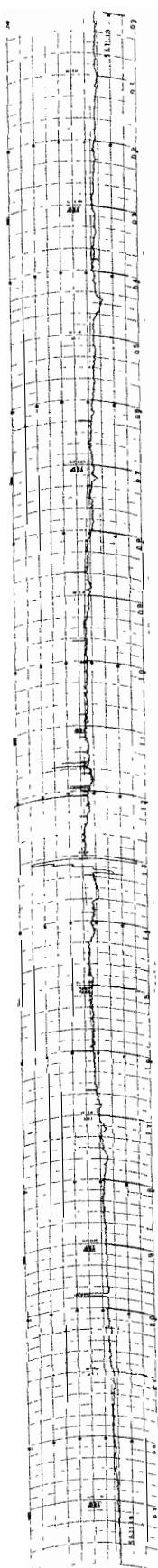
20 1981

21

22

23

24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

25 NOV

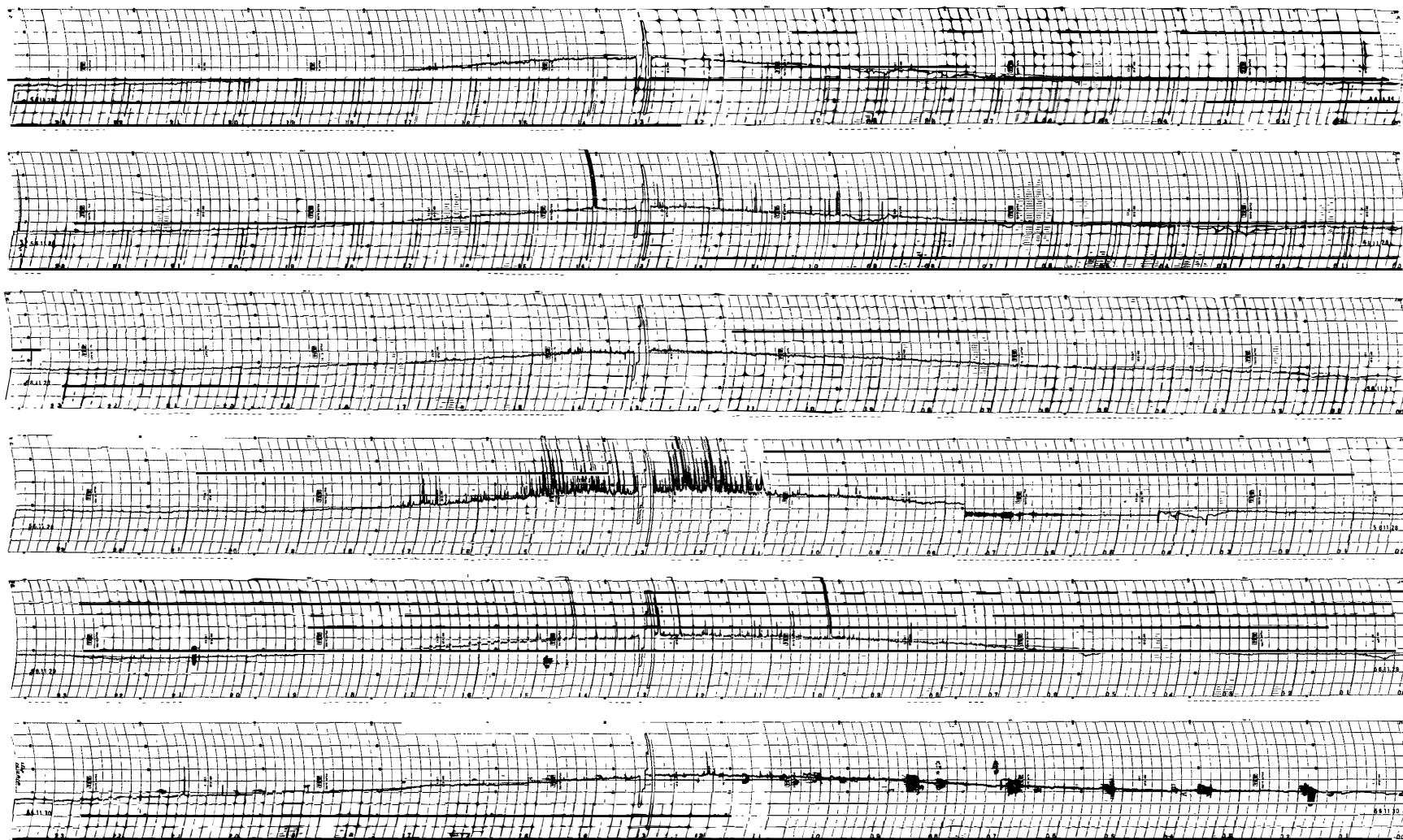
26 1981

27

28

29

30



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	23	0838	-	1407	Failure of equipment
	28	0421	-	0740	"

DEC 1981

1

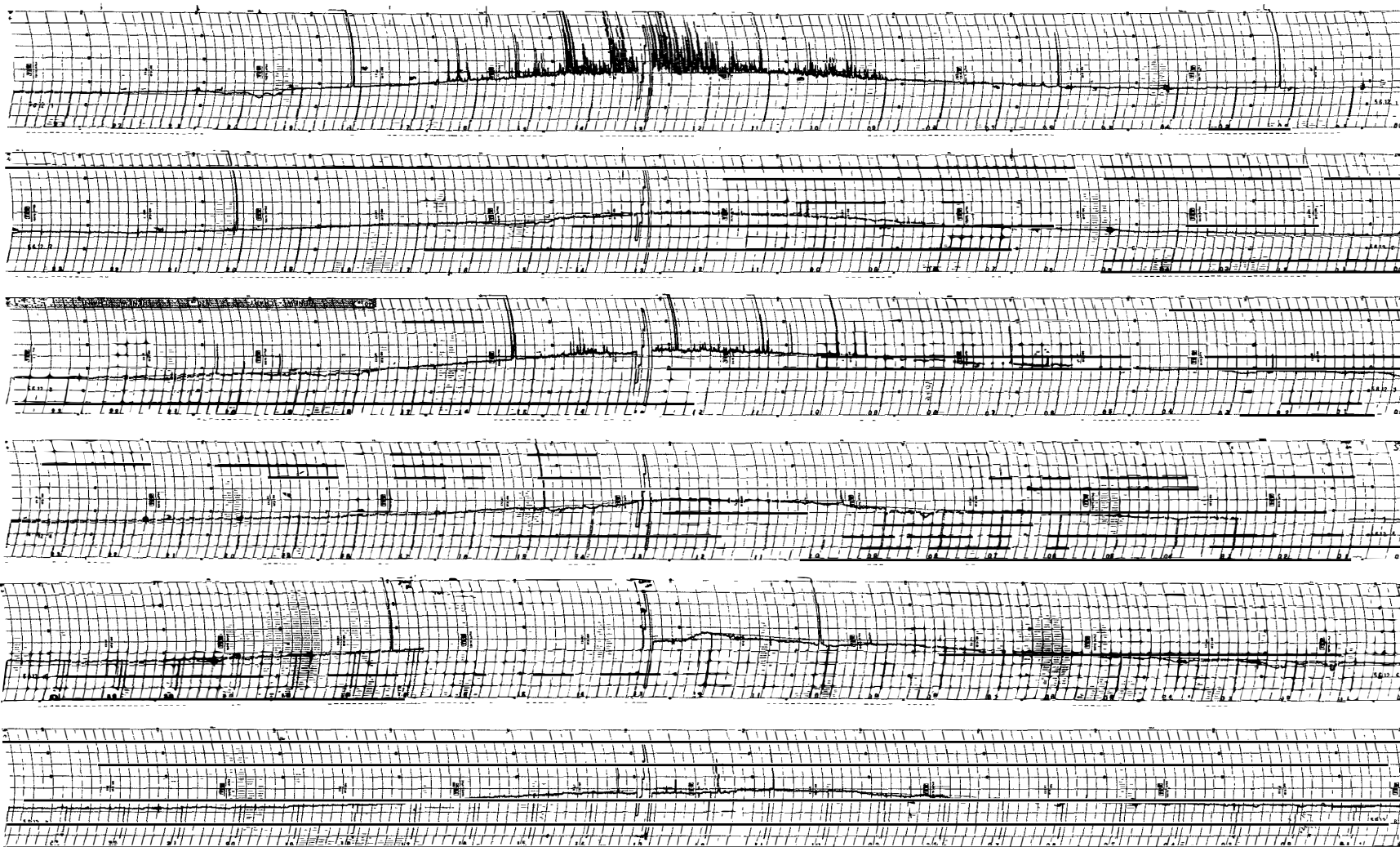
2

3

4

5

6



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

DEC 1981

7
8
9
10
11
12



06

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

DEC 1981

13

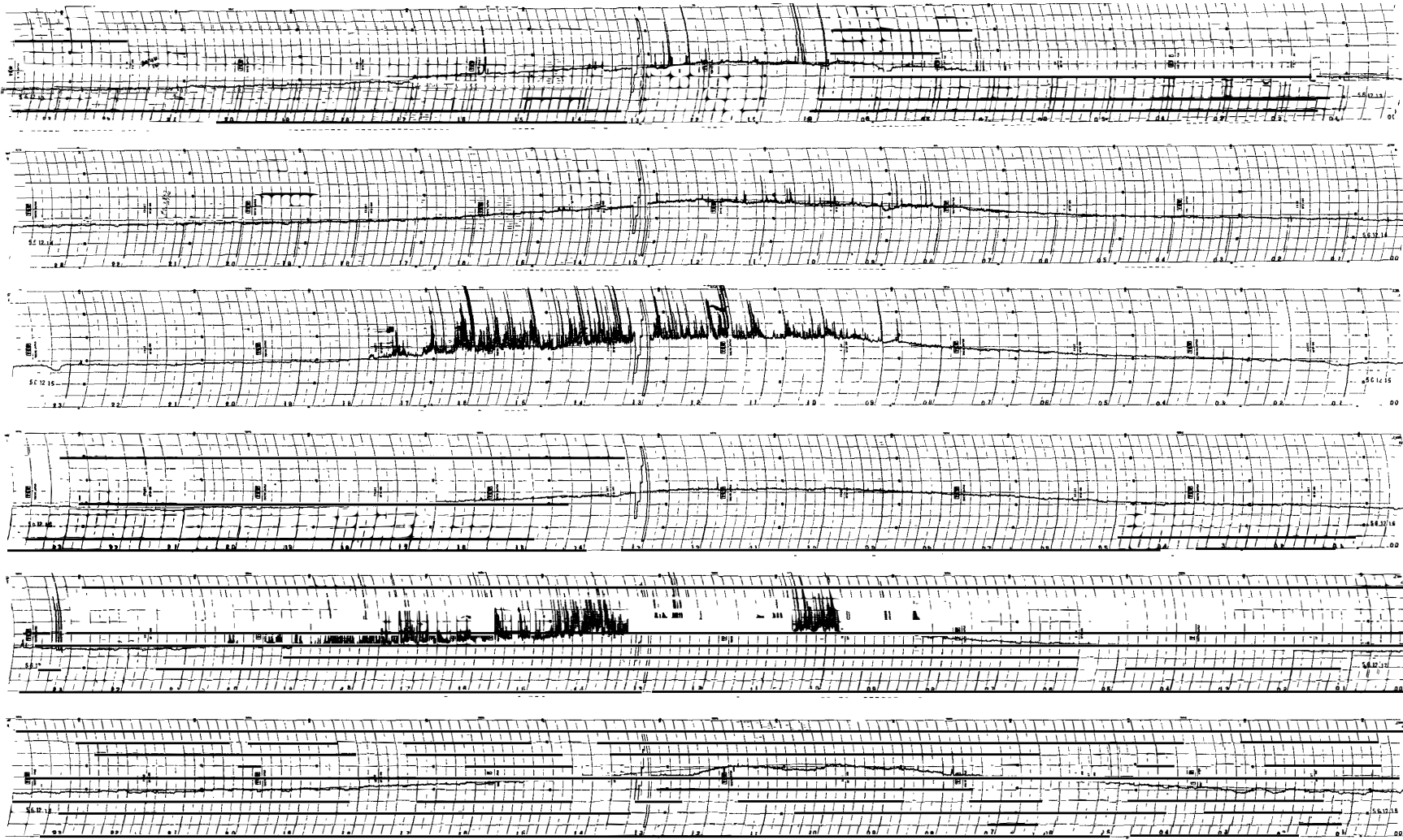
14

15

16

17

18



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

19 DEC

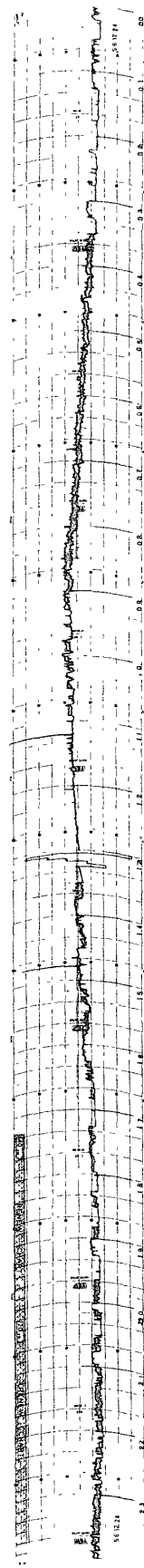
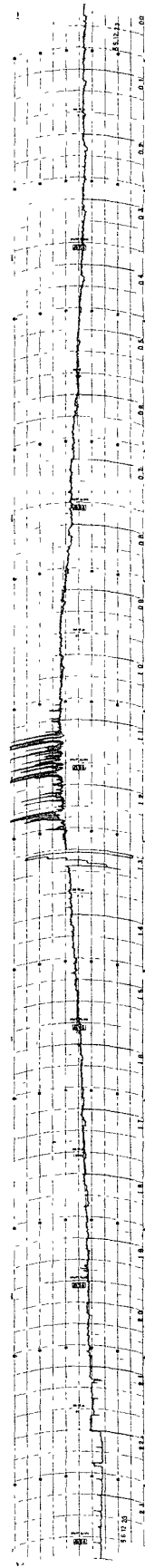
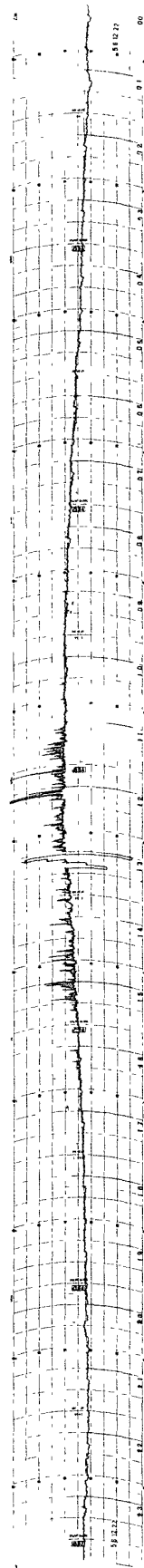
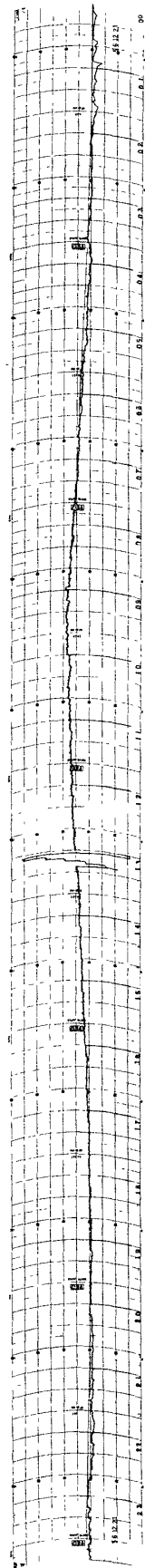
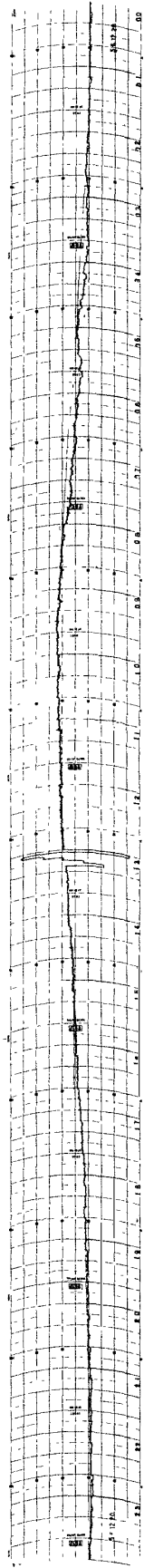
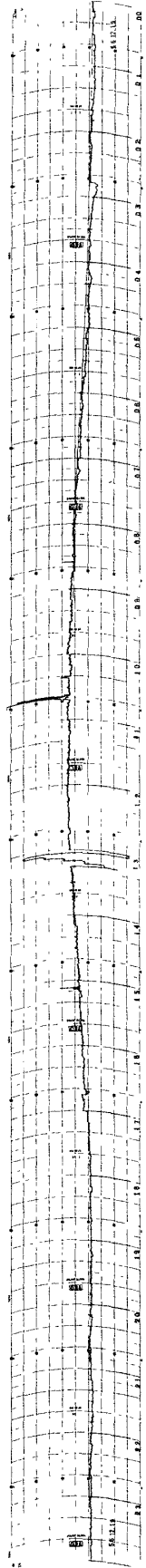
20 1981

21

22

23

24



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE

25 DEC 1981

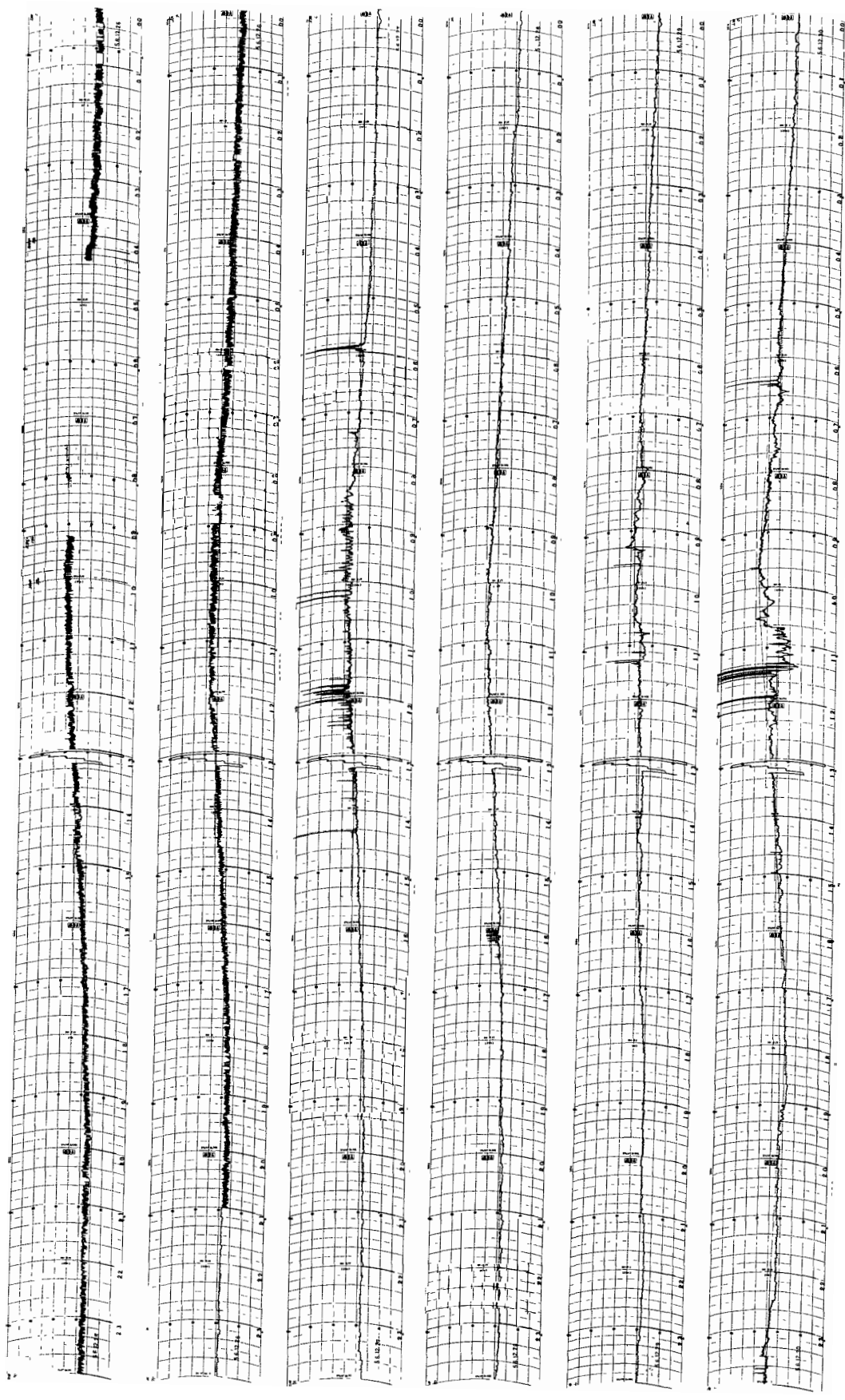
26

27

28

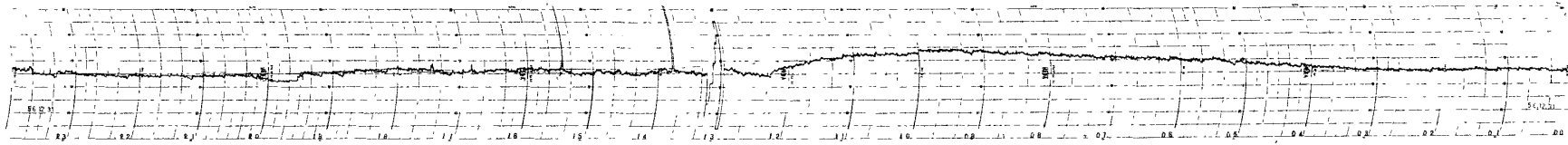
29

30



24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS 30 MHz COSMIC NOISE



31

DEC 1981

24 20 16 12 08 04 00

45° EAST MERIDIAN TIME IN HOURS

30 MHz COSMIC NOISE

Cosmic noise level obscured or equipment malfunction.

December	4	0106	-	0258	Failure of equipment
	5	1305	-	1640	"
	12	0121	-	0930	"
	25	0425	-	0915	"