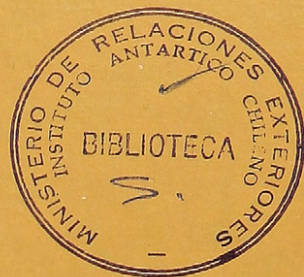


instituto antártico chileno



REGISTROS DE RUIDO RADIOELECTRICO COSMICO
OBTENIDOS MEDIANTE RIOMETRO EN LA BASE TENIENTE
RODOLFO MARSH, ANTARTICA

Publicación Ocasional INACH No 2 1985



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Santiago de Chile

REGISTROS DE RUIDO RADIOELECTRICO COSMICO
OBTENIDOS MEDIANTE RIOMETRO EN BASE TENIENTE
RODOLFO MARSH, ANTARTICA

Nelson M. Iribarren y Alberto J. Foppiano

Departamento de Física, Facultad de Ciencias
Universidad de Concepción
Casilla 947, Concepción—CHILE

1. Introducción

En febrero de 1978 se iniciaron observaciones de ruido radioelétrico cósmico en la frecuencia de 30 MHz mediante un riómetro instalado por el Instituto Antártico Chileno en las cercanías del Centro Meteorológico Antártico Presidente Frei (CMA *), bajo la responsabilidad de académicos del Instituto de Física (**) de la Universidad de Concepción.

El presente documento contiene copias de los registros originales correspondientes al período comprendido entre el 26 de febrero de 1978 y el 20 de enero de 1979. En el punto 2 se indican el lugar de observación y las características del riómetro y su antena asociada. En el punto 3 se explica cómo se pueden utilizar los registros para obtener estimaciones de absorción radioelétrica.

2. Riómetro y antena

Inicialmente el riómetro y su antena asociada fueron instalados 170 m al sur de las edificaciones del C M A , cuya ubicación se entrega en la Tabla 1. El 25 de abril de 1978 fueron trasladados a 800 m al sur del C M A para reducir interferencias diurnas.

Tabla 1

Coordenadas del Centro Meteorológico Antártico
Presidente Frei, base Marsh

Geográficas		Geomagnéticas	
Latitud	Longitud	Latitud	Longitud
62° 12' S	58° 54' W	51.0 °S	8.2 °E

El riómetro es del tipo estado sólido, marca La Jolla Sciences, y recibe señales de 30 MHz con un ancho de banda de 200 KHz.

(*) Actualmente parte de base Marsh

(**) Ahora Departamento de Física, Facultad de Ciencias

La antena consiste de dos dipolos de media longitud de onda, horizontales y paralelos, formando los lados de un rectángulo y ubicados sobre sendos reflectores. El ancho del lóbulo teórico para puntos correspondientes a la mitad de la potencia efectiva sustituyendo un ángulo de 60° en los planos de Intensidad de Campo Eléctrico (E) e Intensidad de Campo Magnético (H). Se usan elementos adaptadores de impedancia ("baluns" y "stubs") para acoplar la antena a una línea de transmisión no balanceada de 50 Ohms y 15 m de longitud.

El voltaje de salida del riómetro, que es proporcional a la potencia del ruido, se inscribe en un registrador de tinta ubicado en los edificios del C.M.A. El registro incluye marcas horarias entregadas por el riómetro, las cuales están constituidas por cuatro niveles diferentes entregados en forma secuencial por un generador de ruido de referencia. Estos niveles fueron cambiados el 5 de agosto de 1978 a las 13:00 horas (60° W) para cubrir el rango dinámico de la señal.

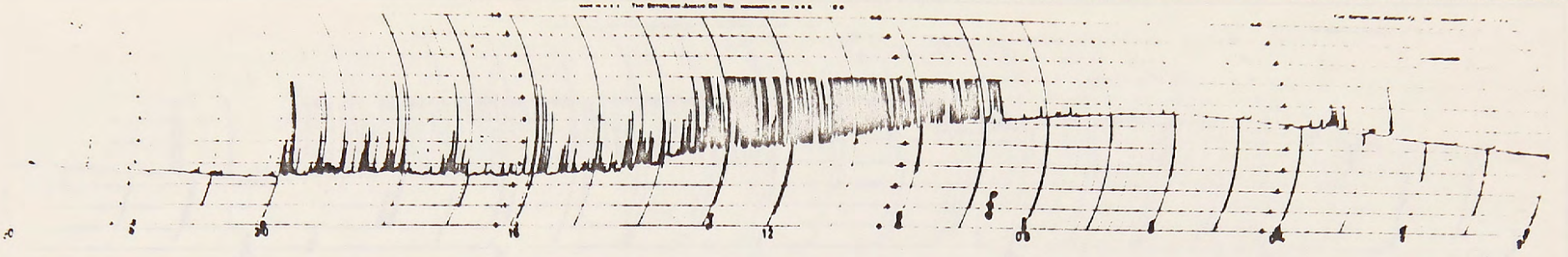
3. Determinación de absorción radioeléctrica

Como puede observarse en los registros, la intensidad de ruido cósmico sigue una variación diurna sistemática. Hay sin embargo otros cambios, de una escala de tiempo que sería de minutos a horas, que pueden atribuirse a absorción ionosférica. Una medida de esta absorción puede obtenerse por comparación entre la intensidad de ruido medida a una hora sideral determinada y la intensidad a la misma hora sideral en otro día en el cual se pueda suponer que la absorción es despreciable.

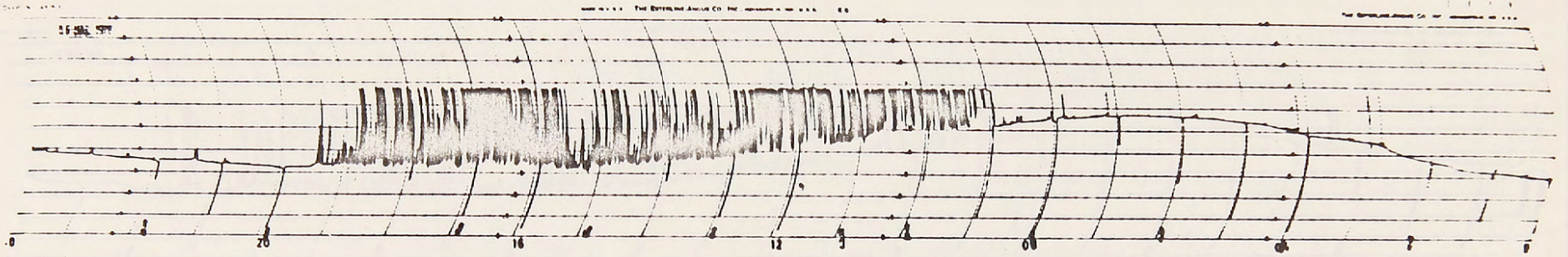
4. Agradecimientos

Se agradece la colaboración de Carlos H. Figueroa, miembro del Departamento de Física, Facultad de Ciencias, Universidad de Concepción, en la instalación del riómetro y su antena asociada. La Fuerza Aérea de Chile permitió la permanencia de uno de los autores (N.M.I.) en el C.M.A. durante un año.

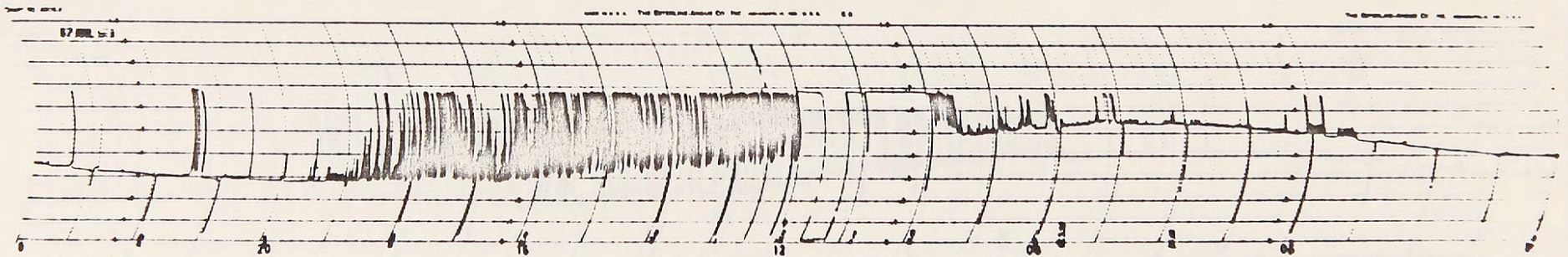
MARZO 1978
5



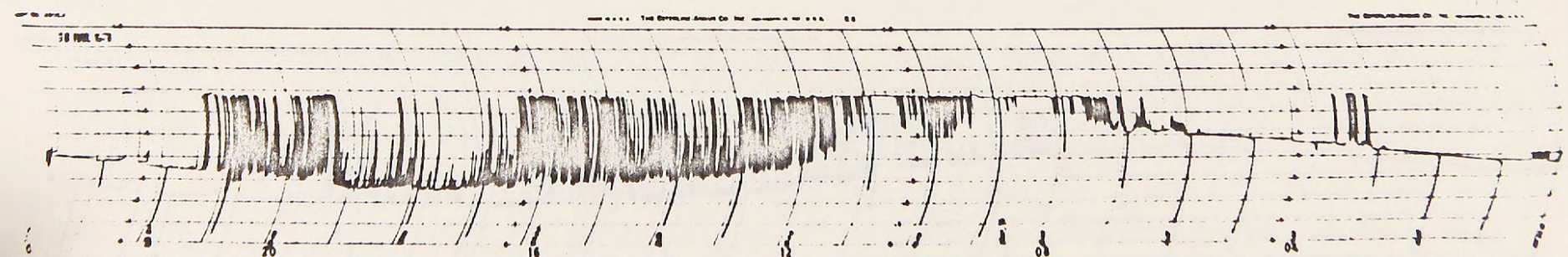
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24 18 12 06 00

RUIDO COSMICO, 30 MHz

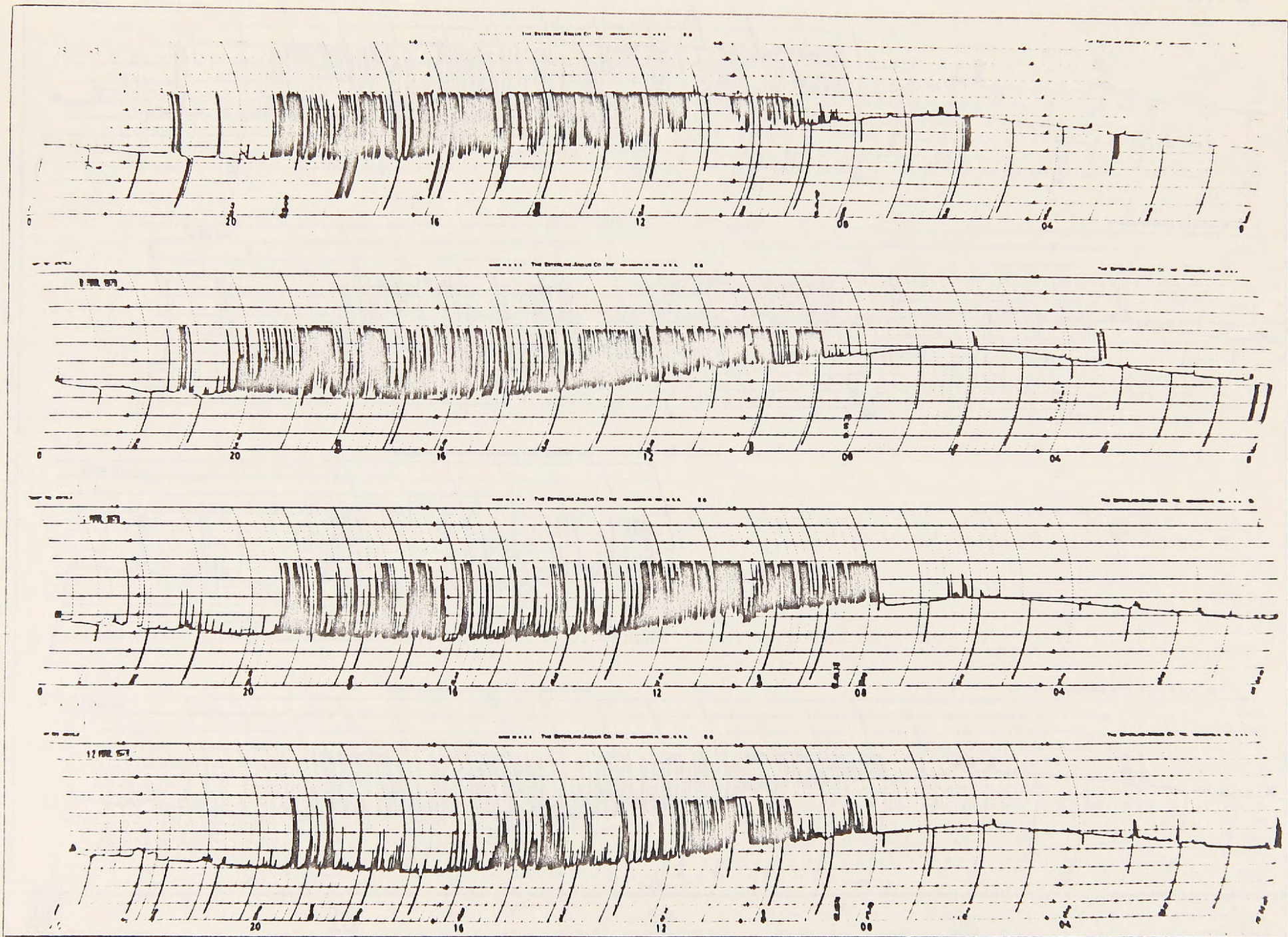
HORA LOCAL 60° W

MARZO 1978
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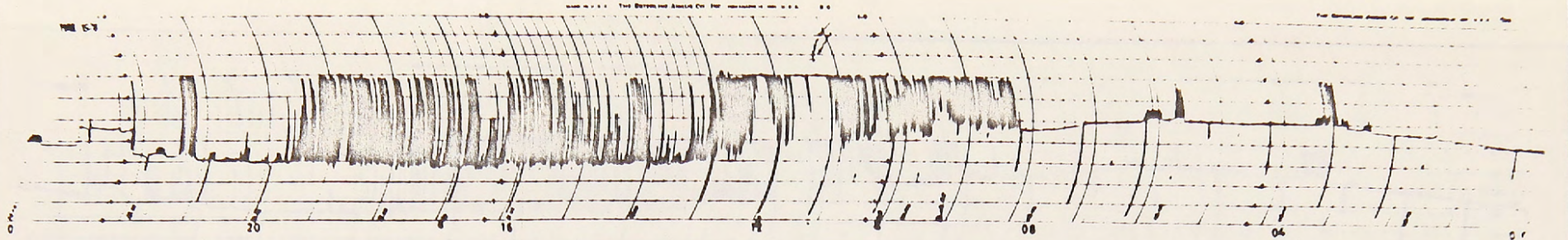
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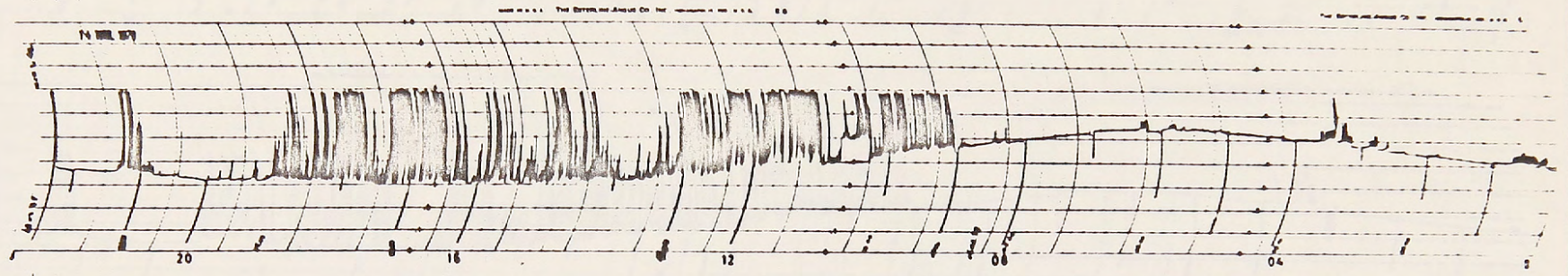
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

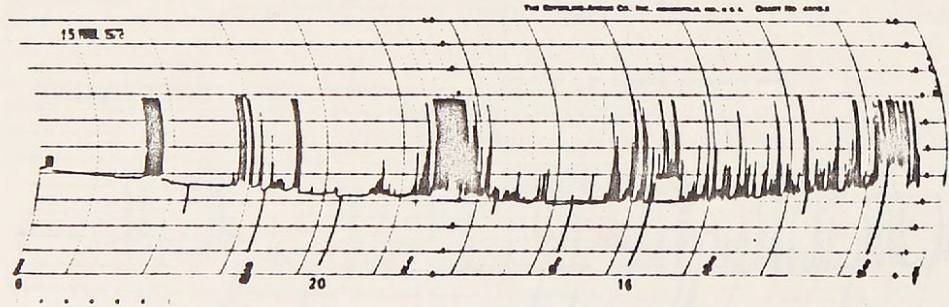
MARZO 1978



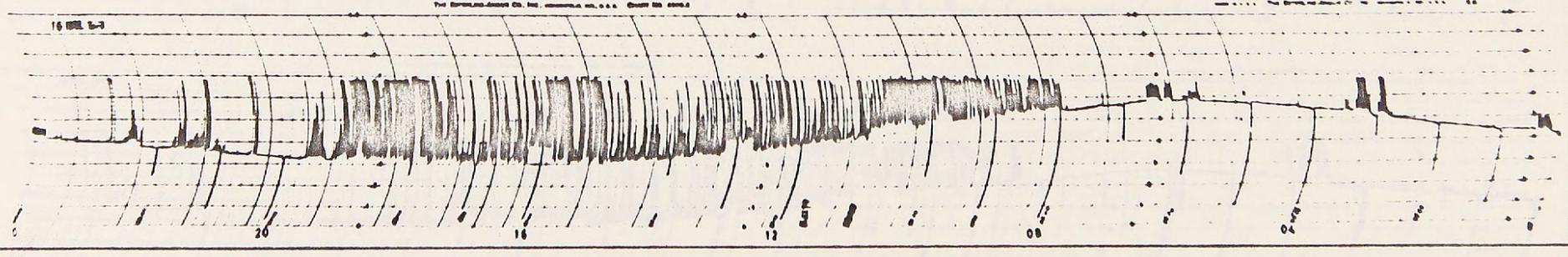
13



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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

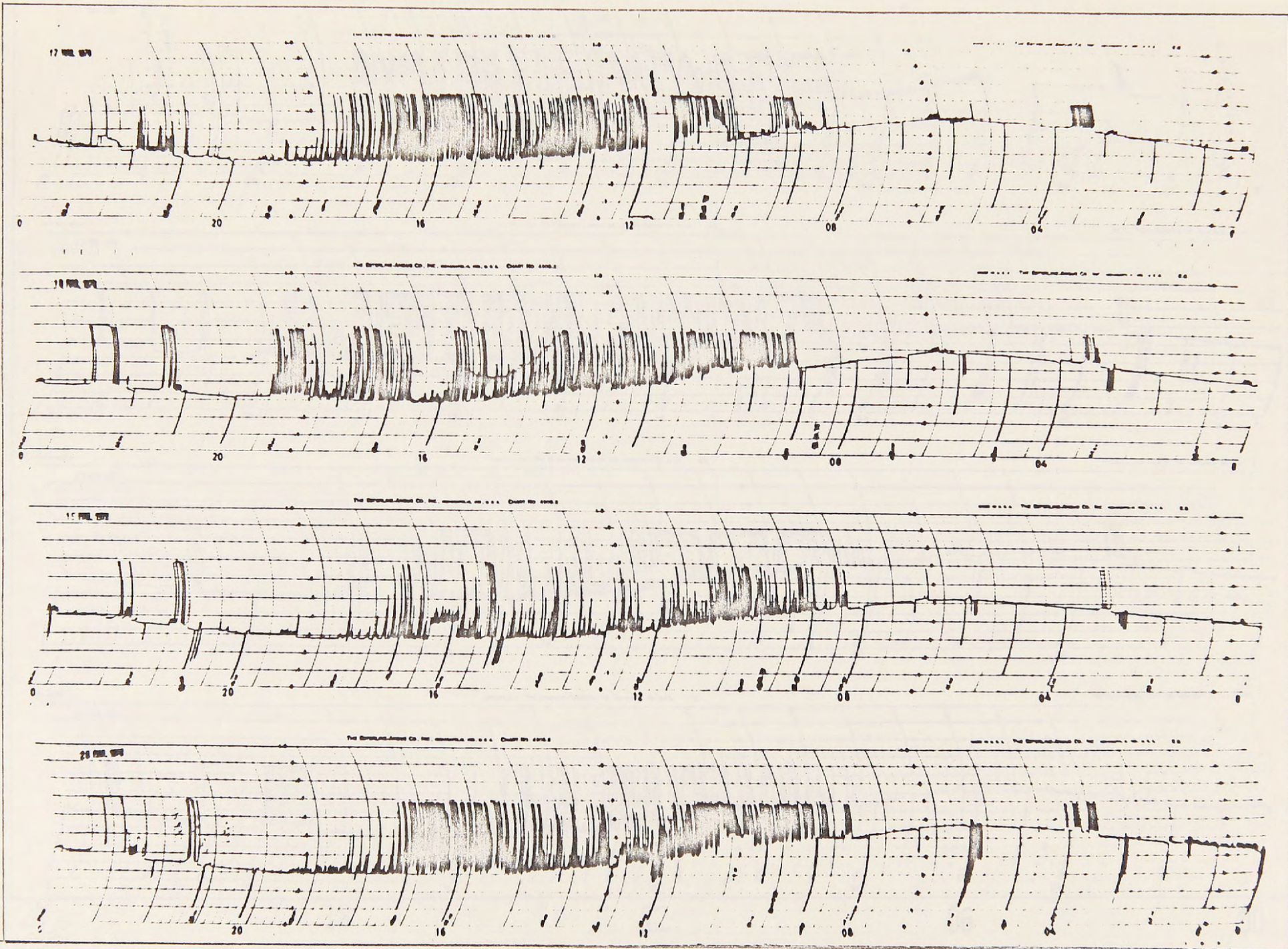
MARZO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

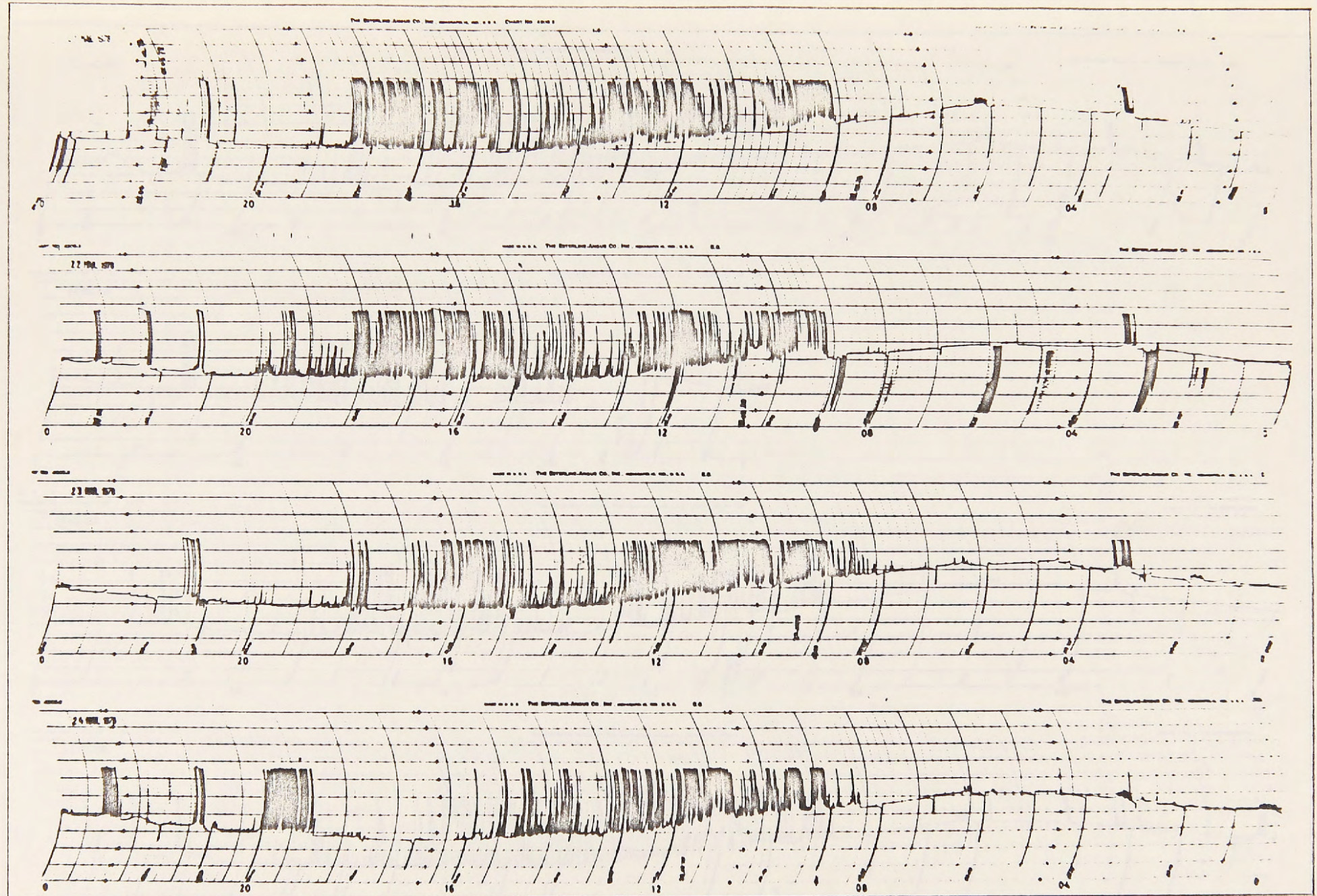
HORA LOCAL 60° W

MARZO 1978
21

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

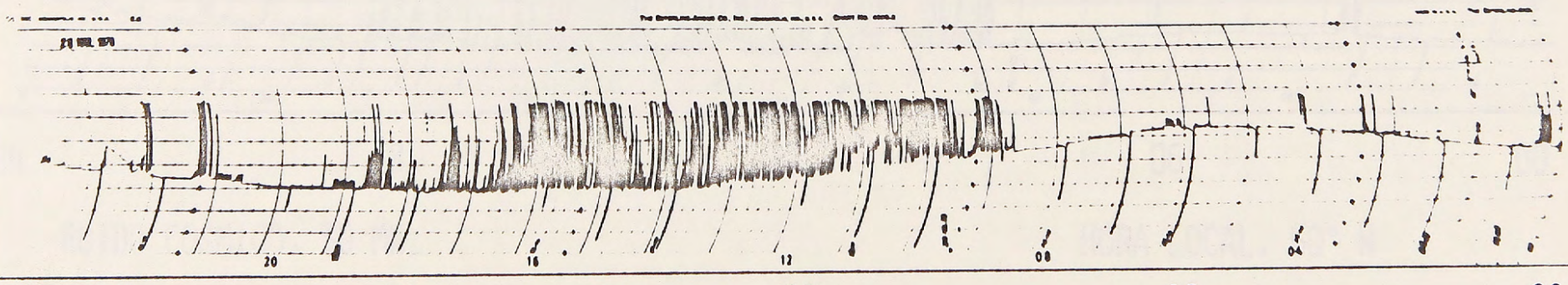
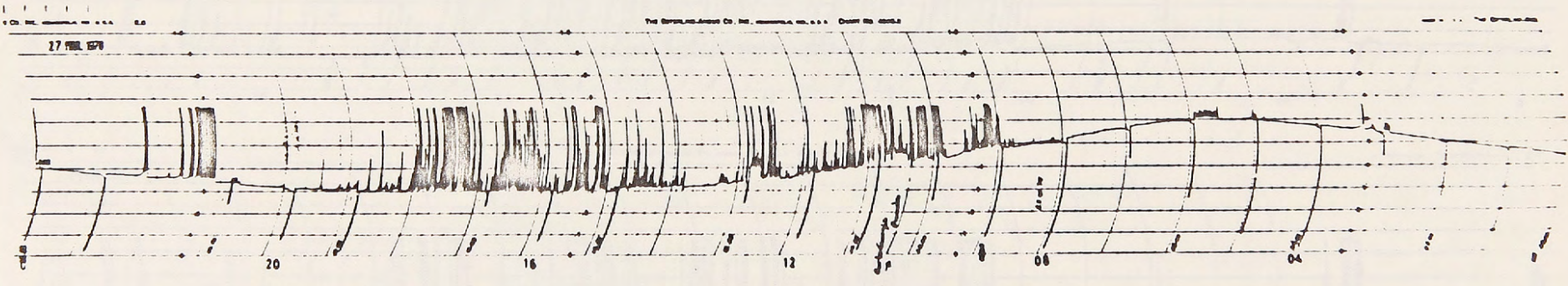
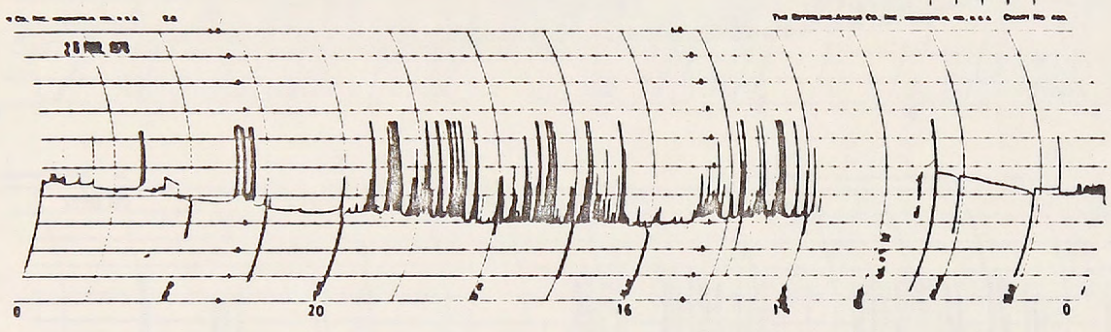
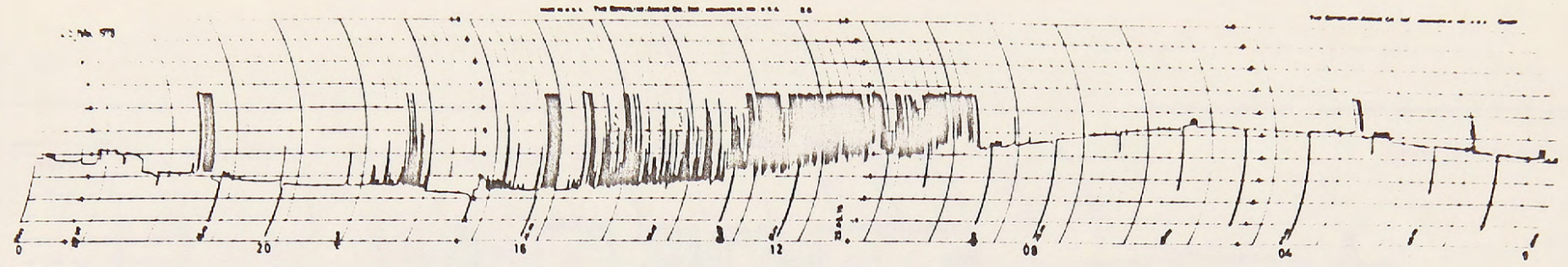
MARZO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

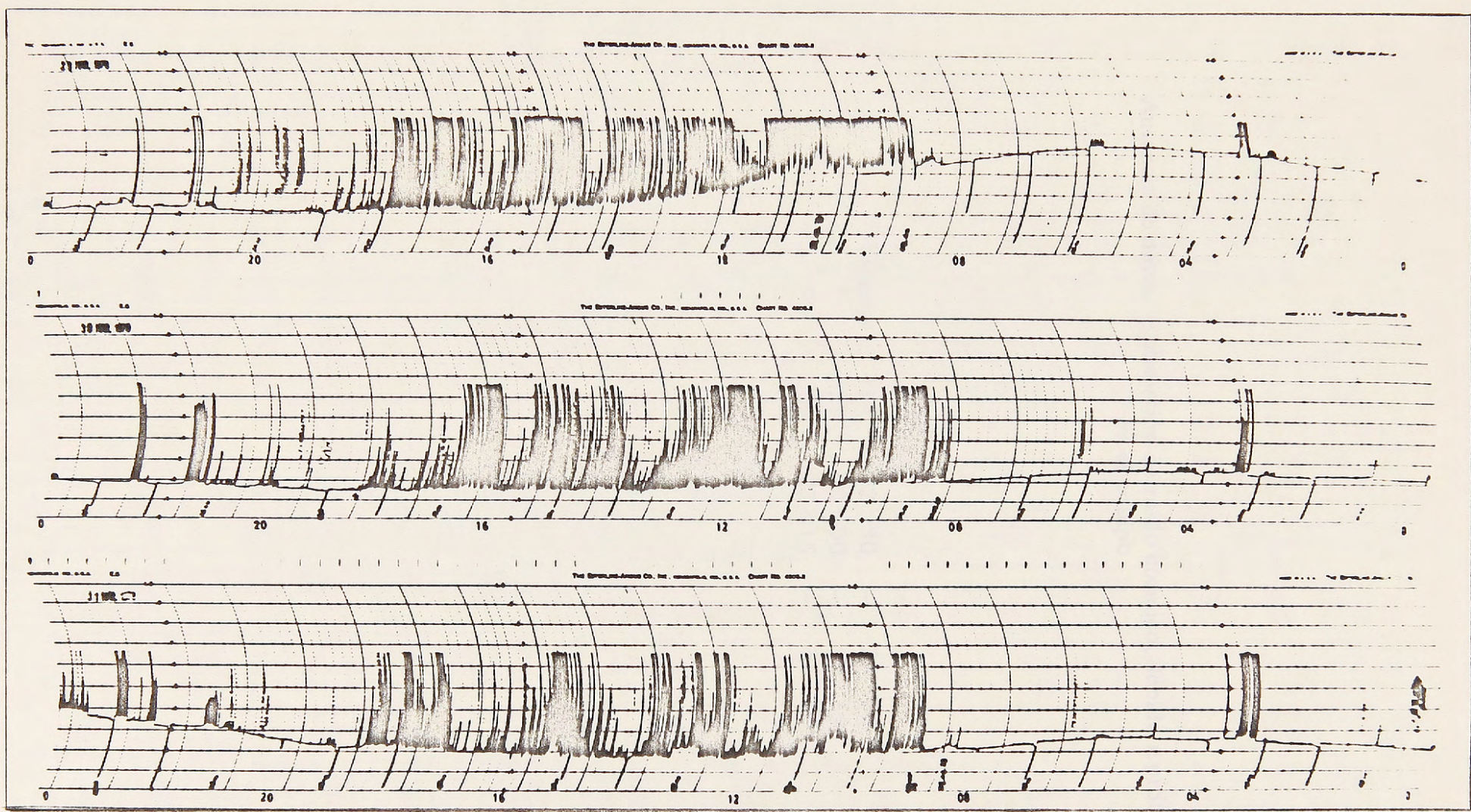
HORA LOCAL, 60° W

MARZO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

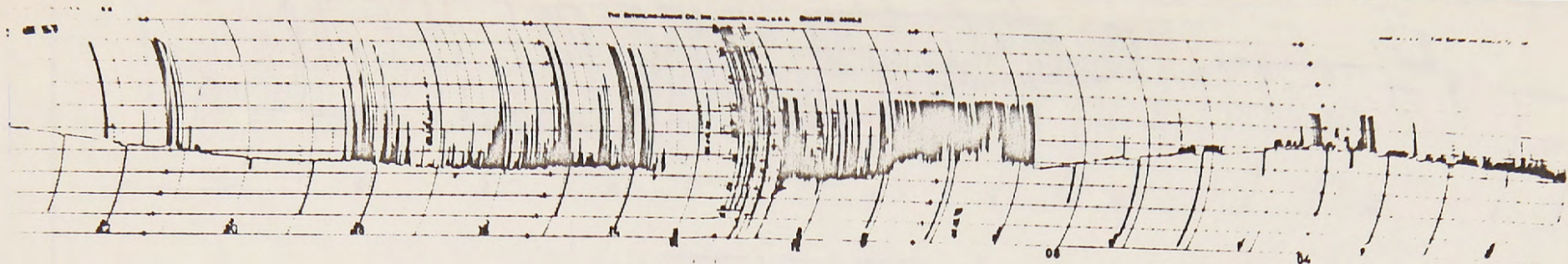
ABRIL 1978

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

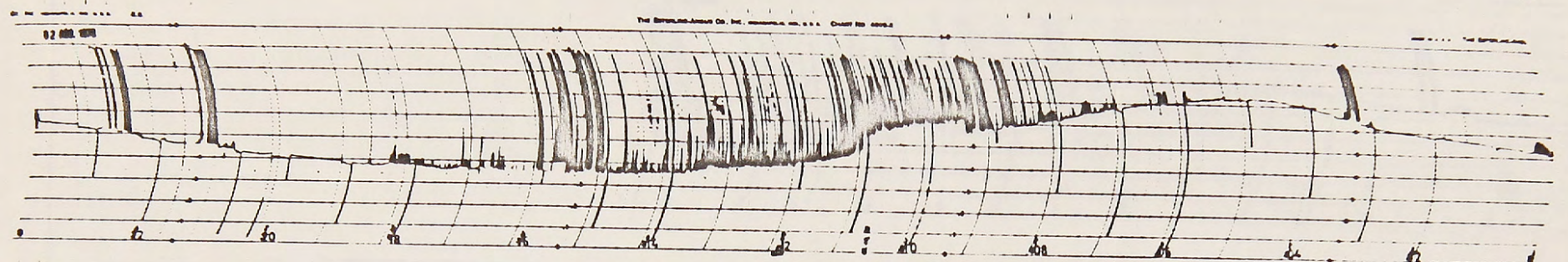
Marzo	14	22 : 30	—	23 : 59
"	15	00 : 00	—	12 : 15
"	26	02 : 15	—	14 : 00

ABRIL 1978

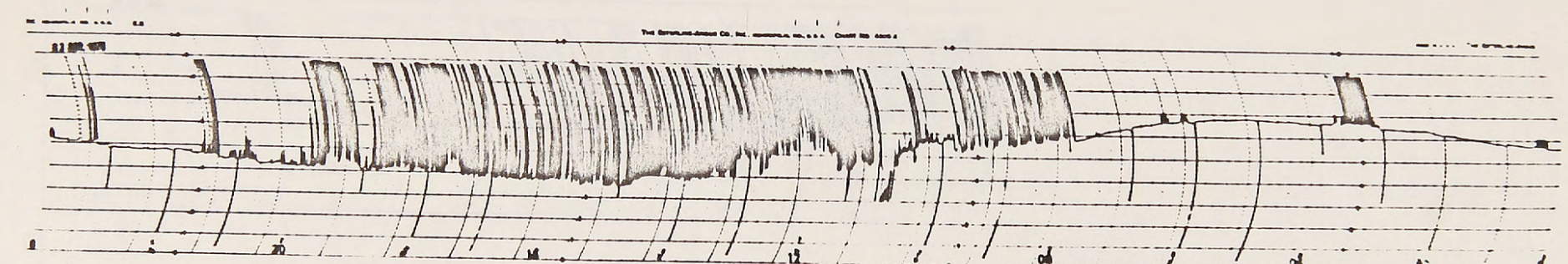
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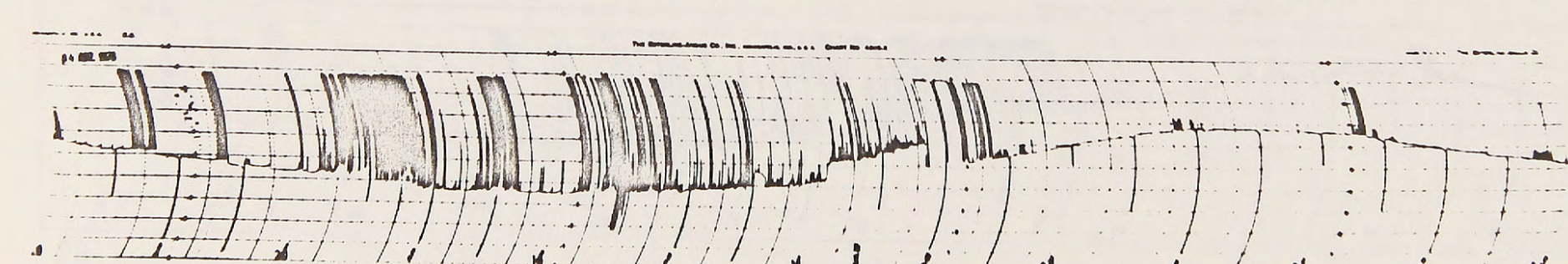
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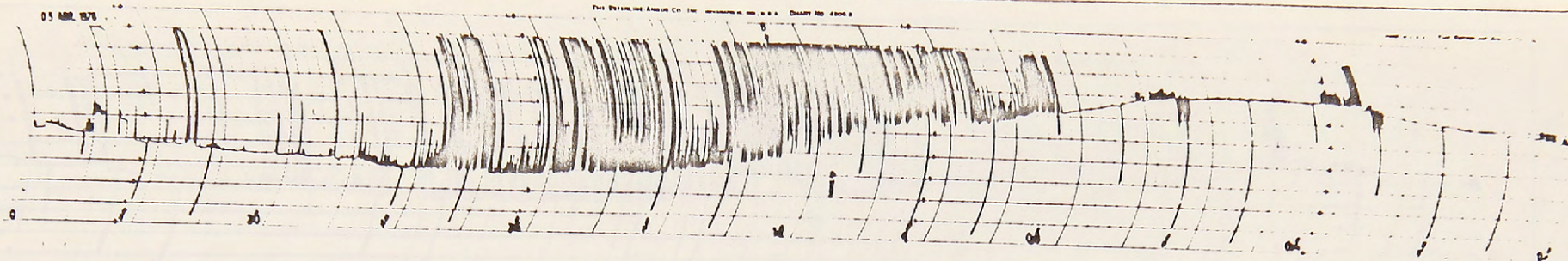
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RUIDO COSMICO, 30 MHz

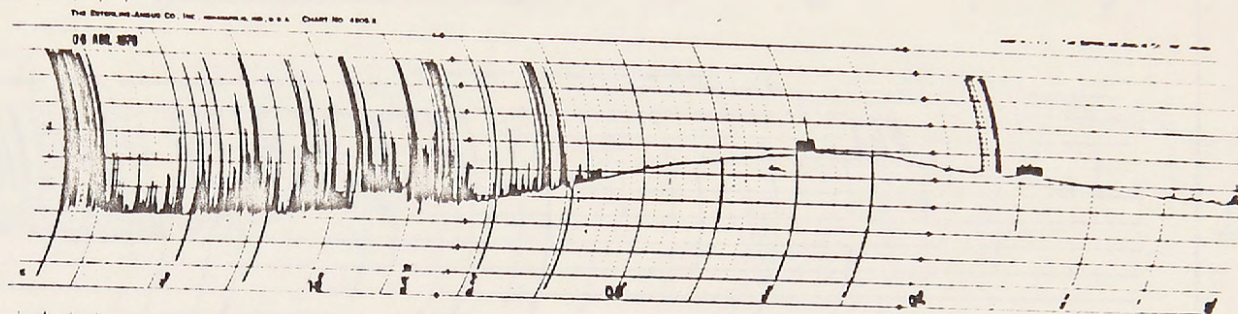
HORA LOCAL, 60° W

ABRIL 1978

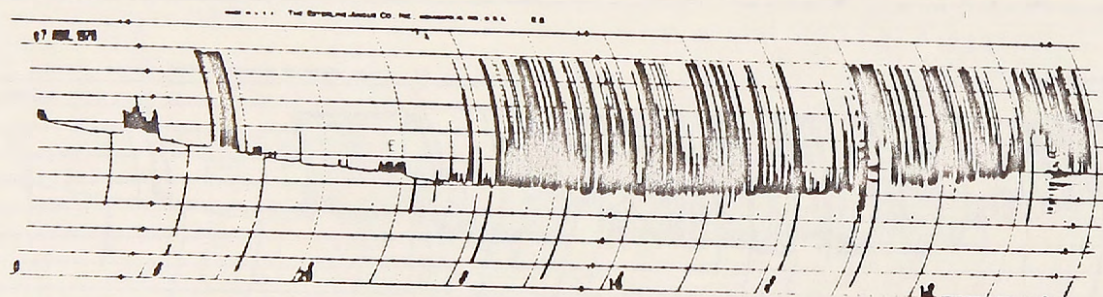
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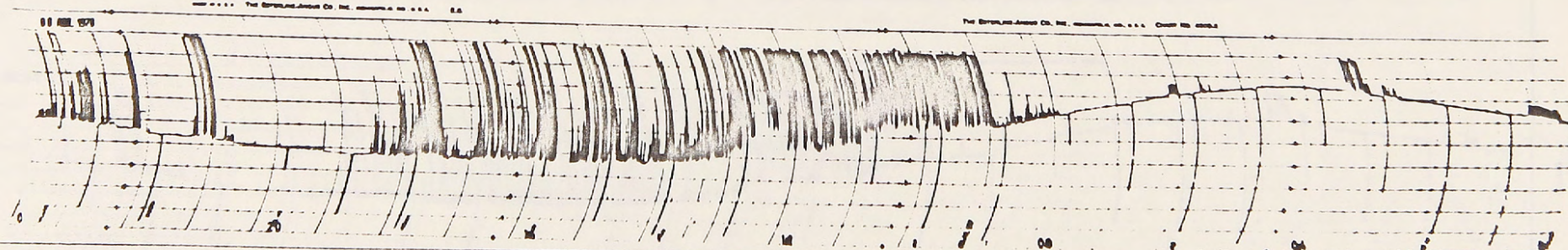
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RUIDO COSMICO, 30 MHz

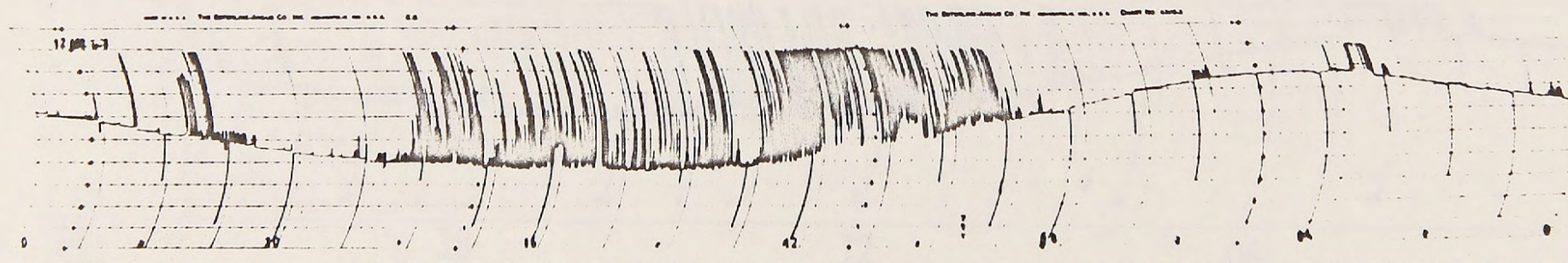
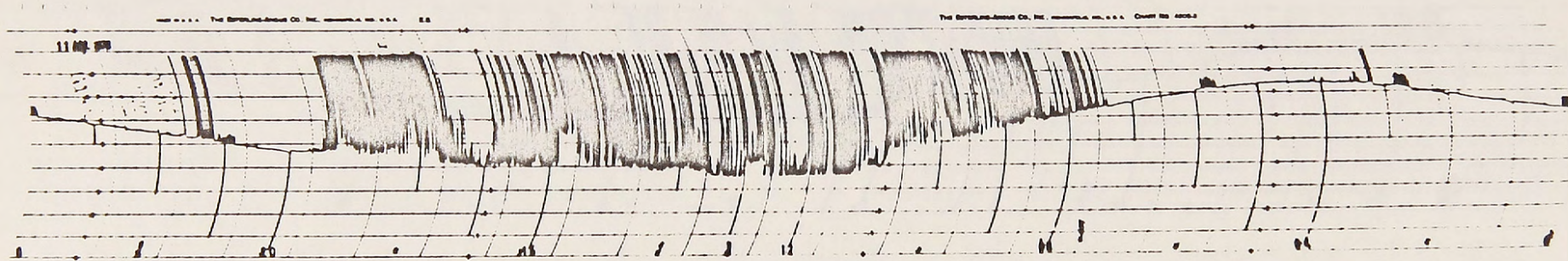
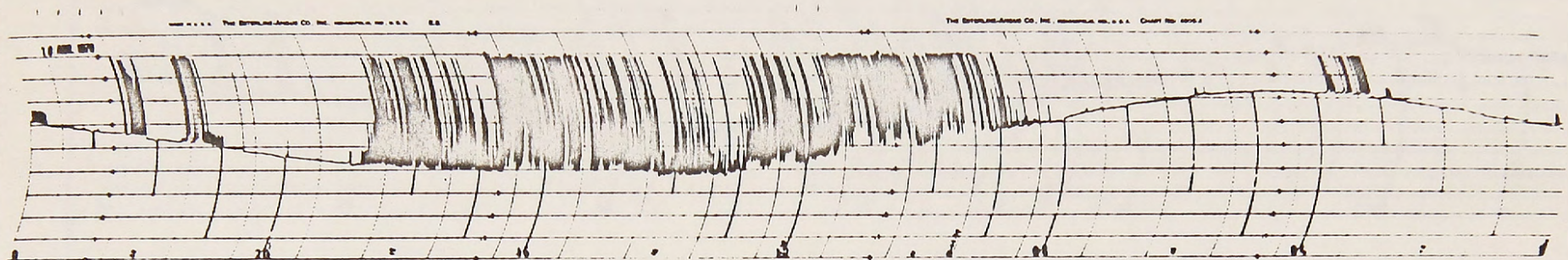
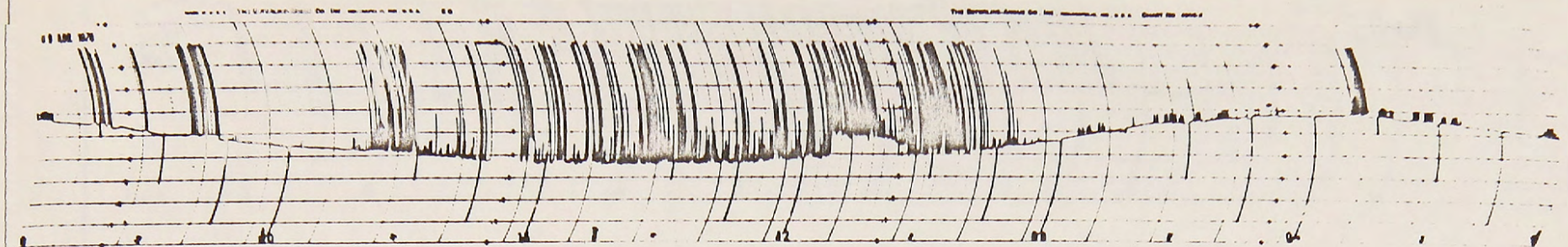
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ABRIL 1978
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24 18 12 06 00

RUIDO COSMICO, 30 MHz

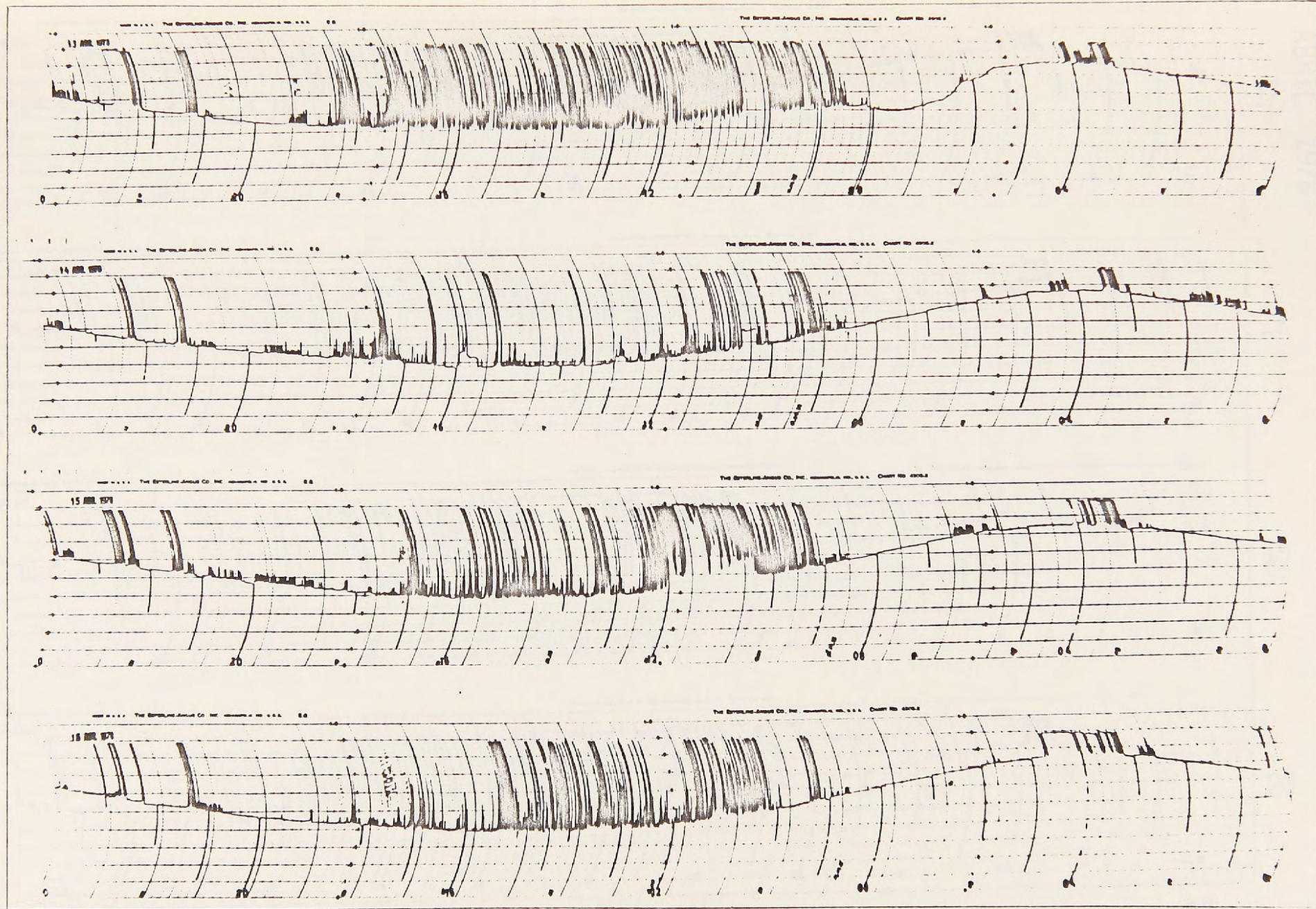
HORA LOCAL, 60° W

ABRIL 1978
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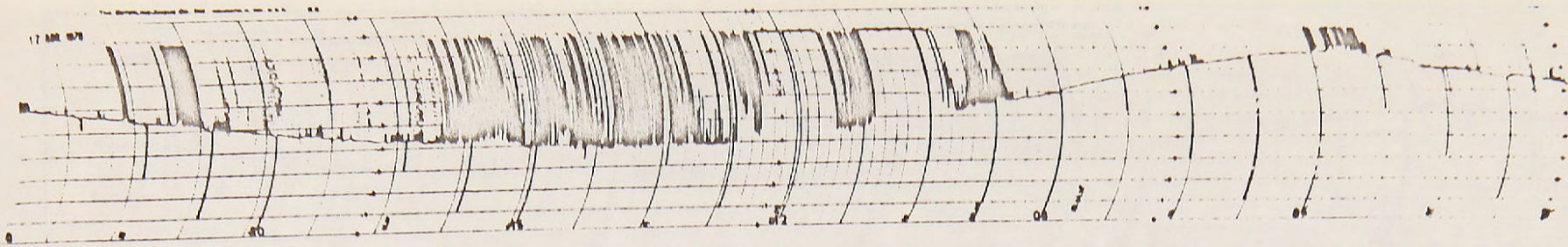


24 18 12 06 00

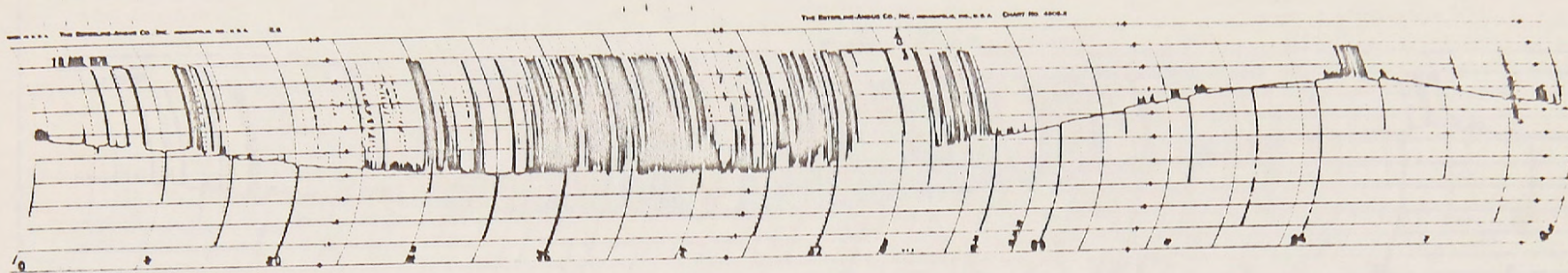
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

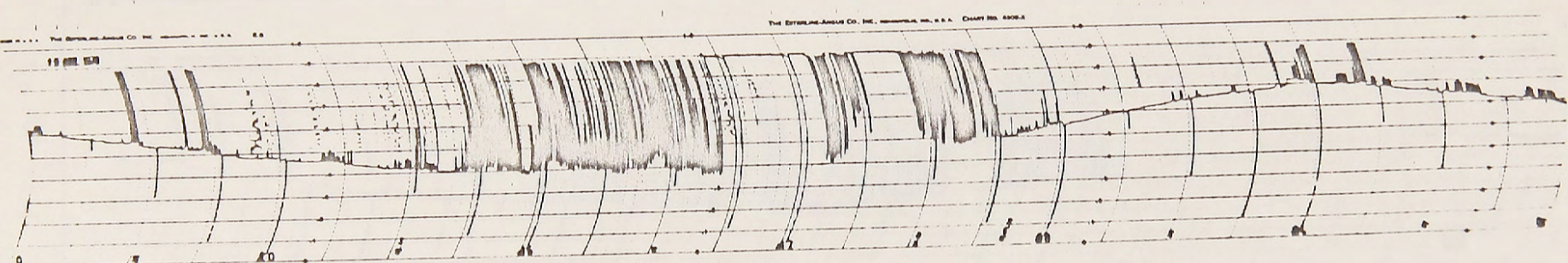
ABRIL 1978
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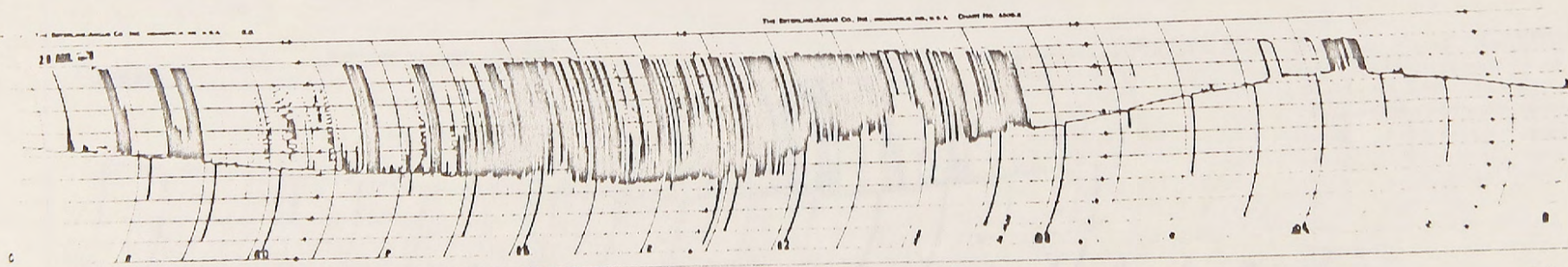
18



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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

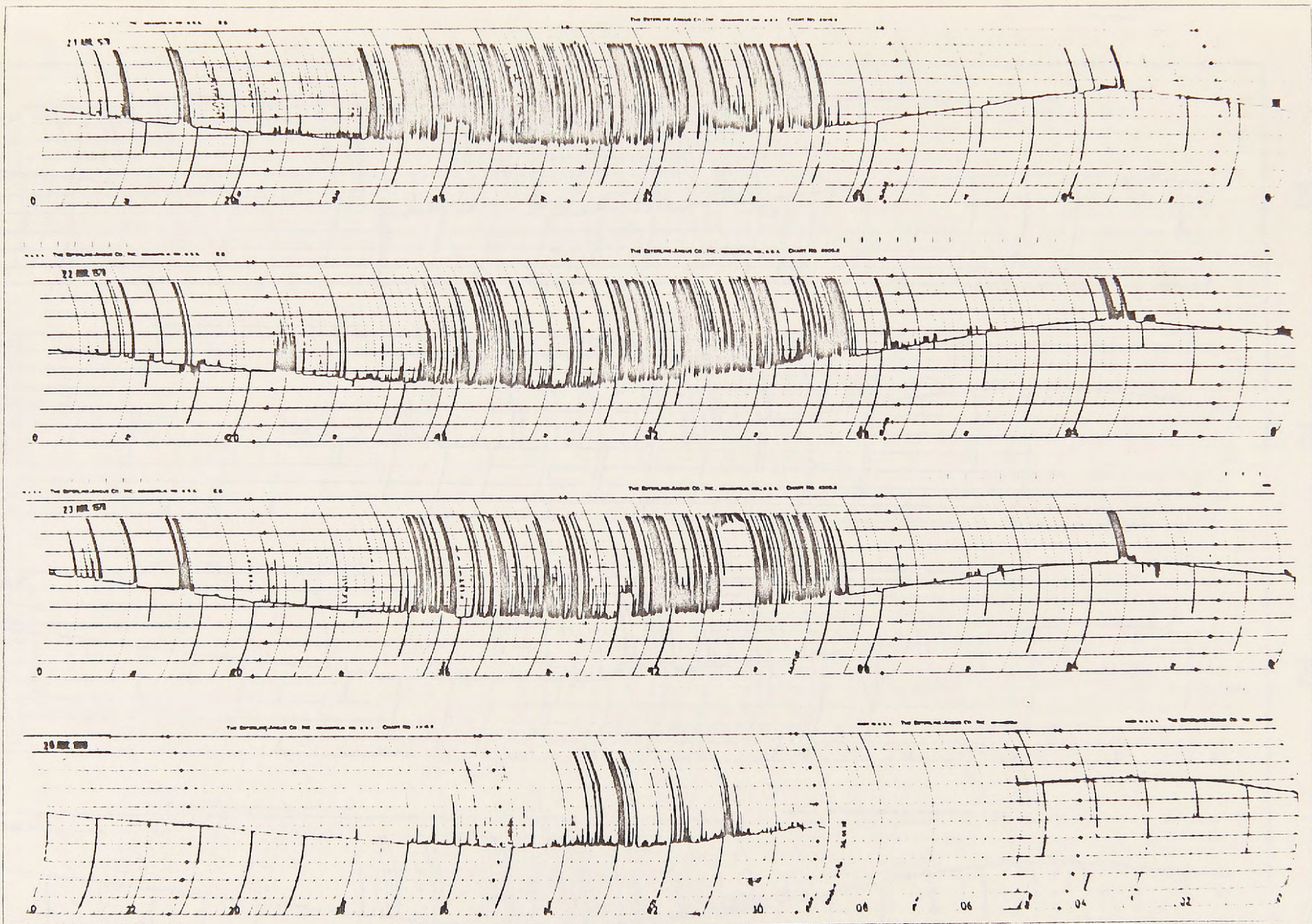
ABRIL 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

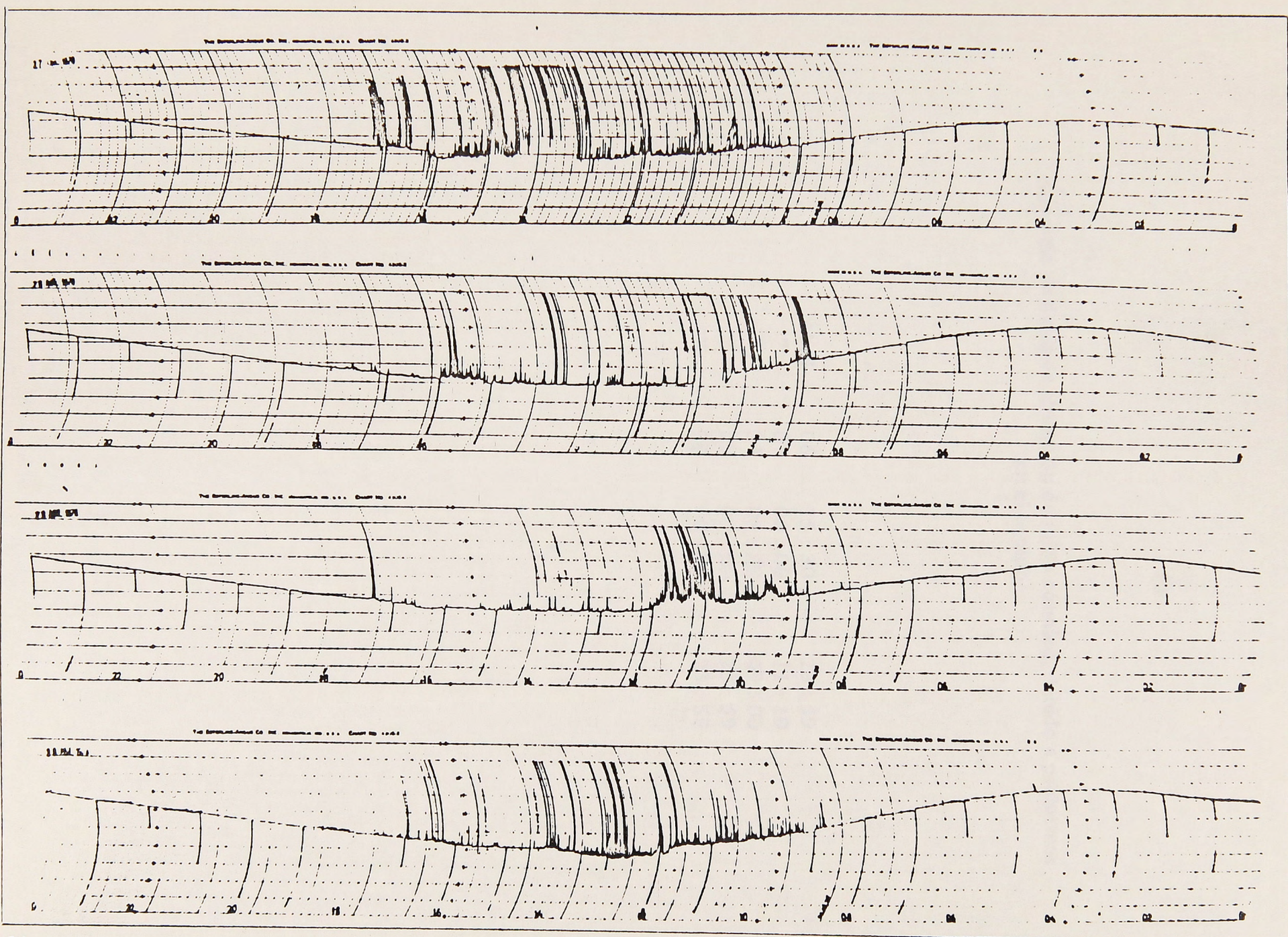
ABRIL 1978

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RUIDO COSMICO, 30 MHz

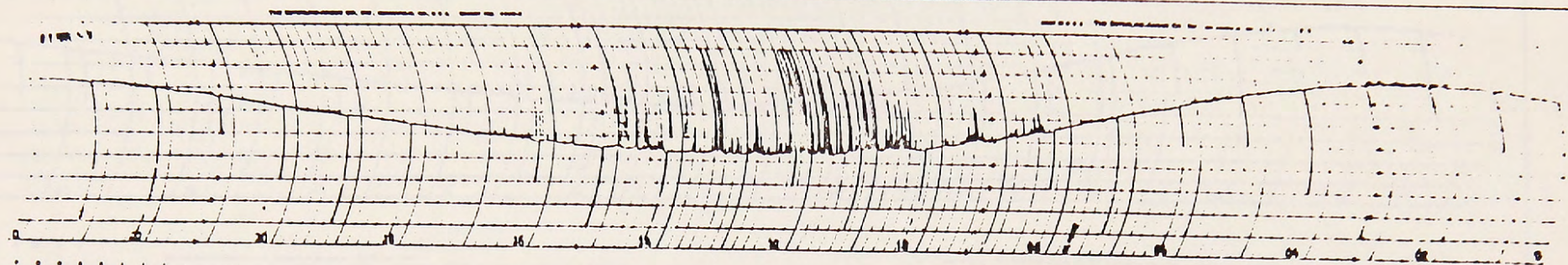
HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

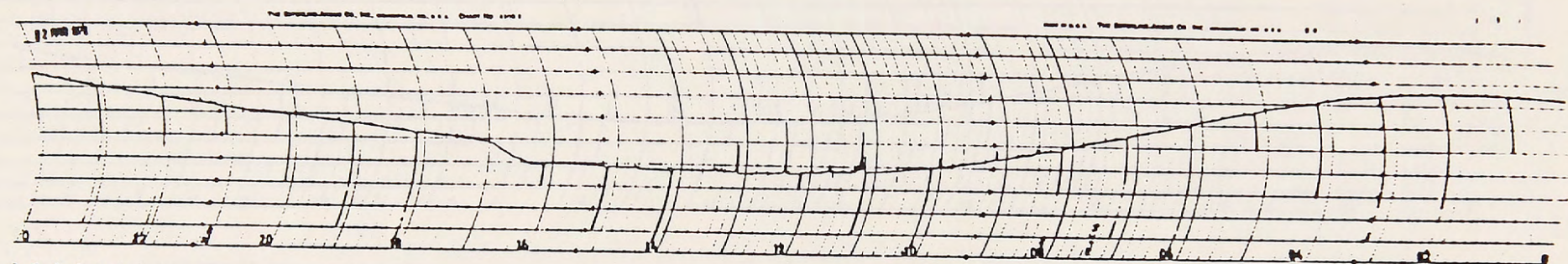
Abril	06	15 : 30	—	23 : 59
”	07	00 : 00	—	11 : 10
”	24	05 : 20	—	09 : 00
”	25	00 : 00	—	23 : 59
”	26	00 : 00	—	23 : 59

MAYO 19/8

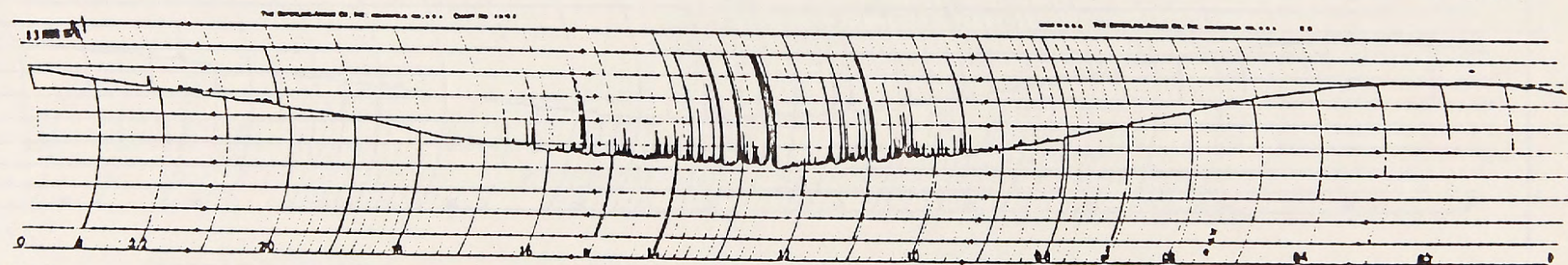
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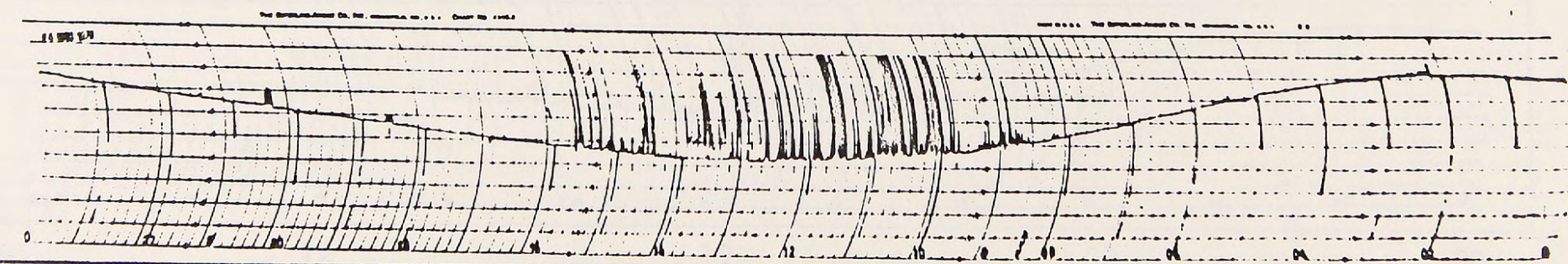
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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

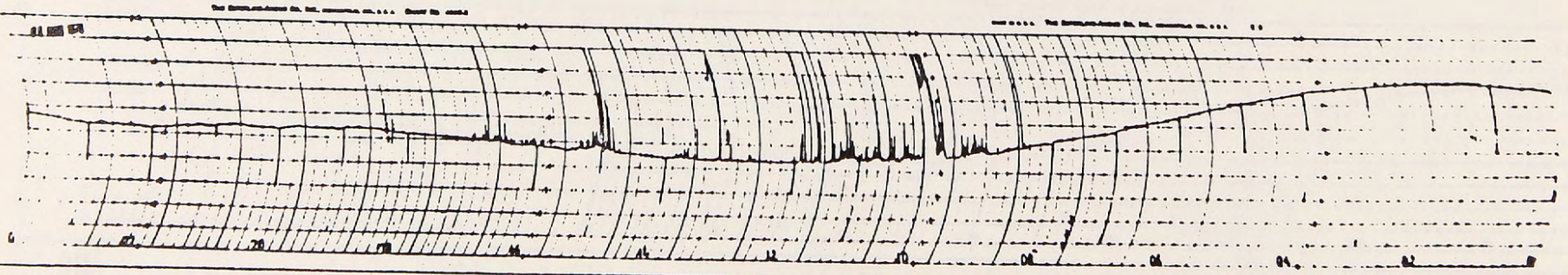
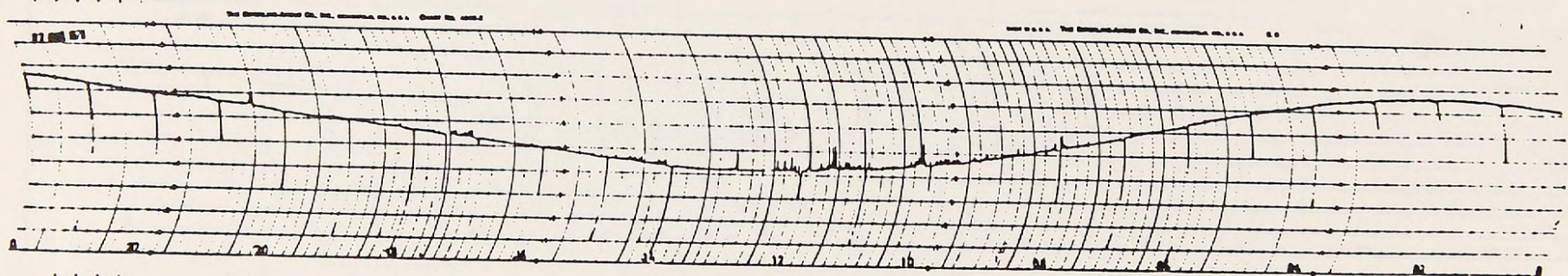
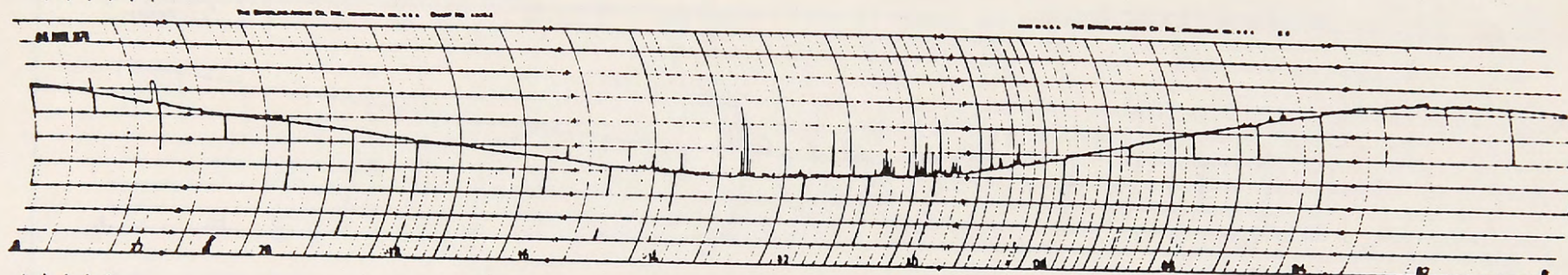
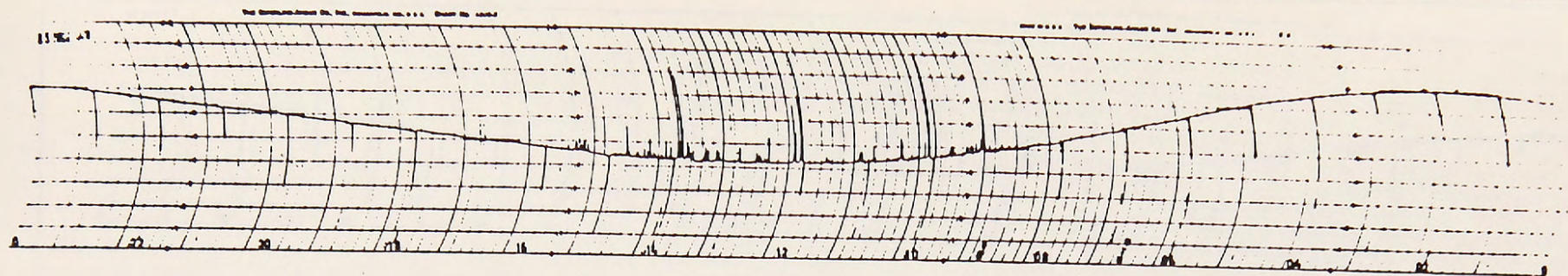
MAYO 1978

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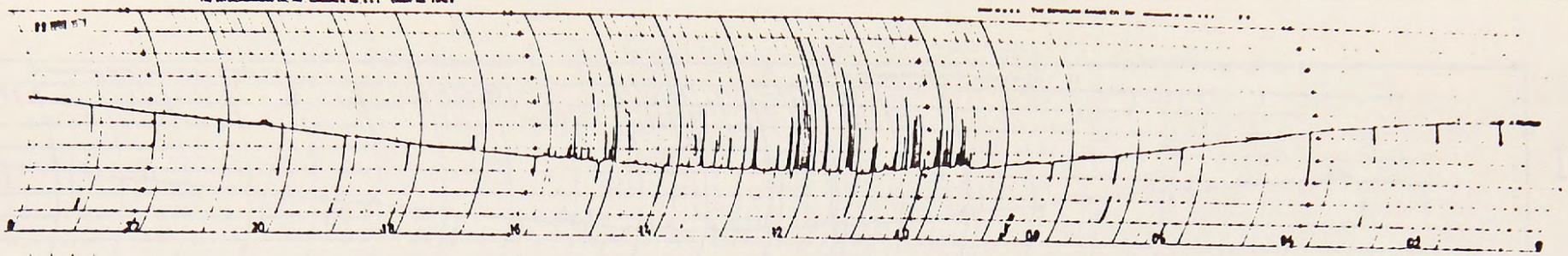
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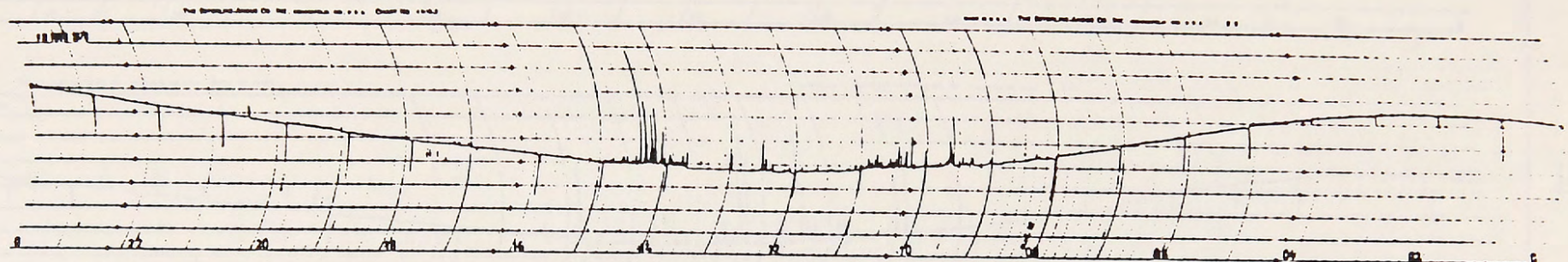
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

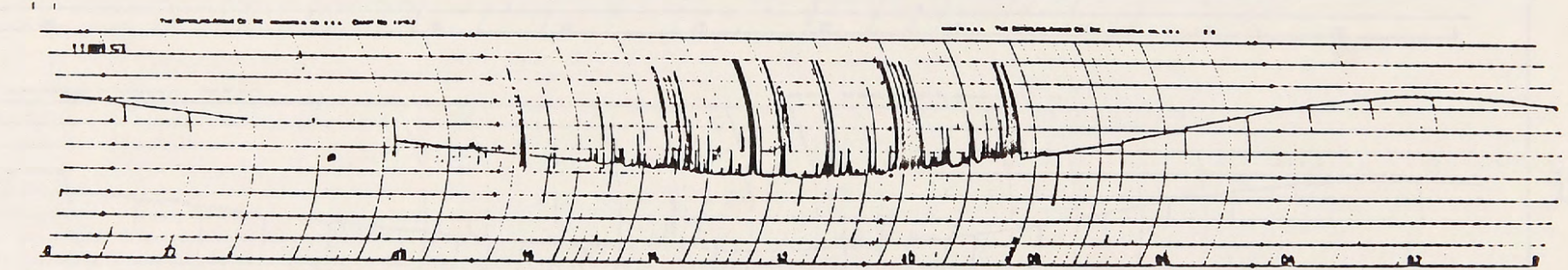
MAYO 1978
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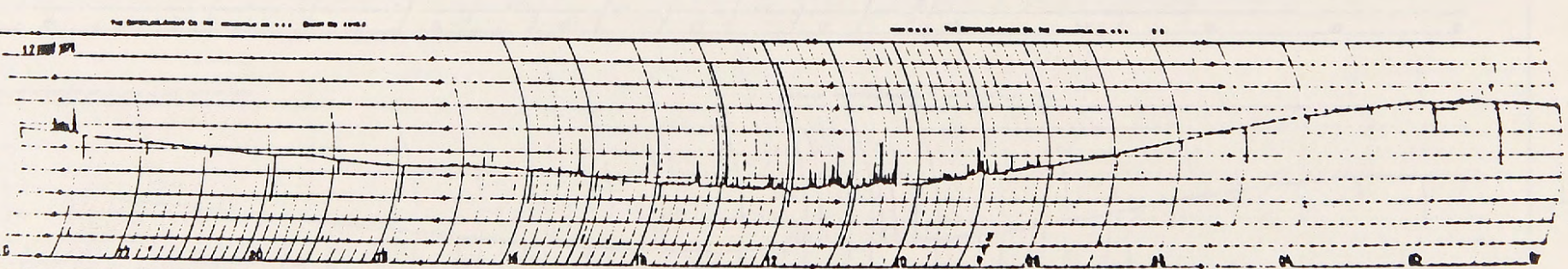
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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

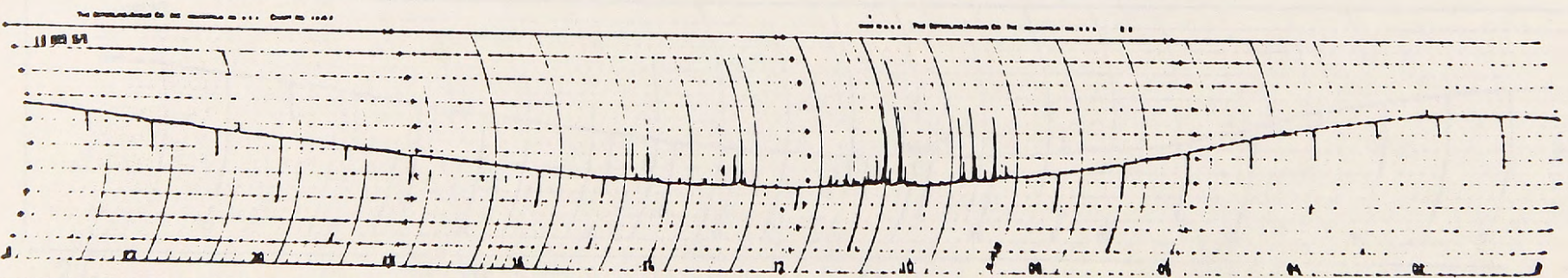
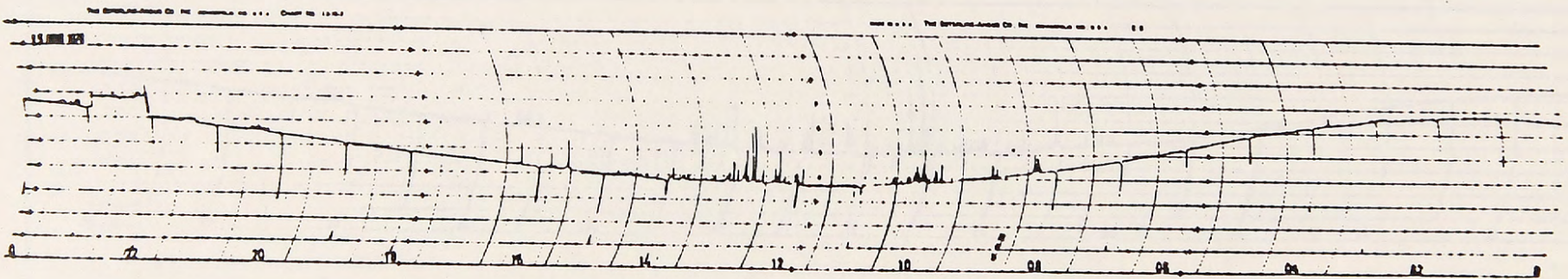
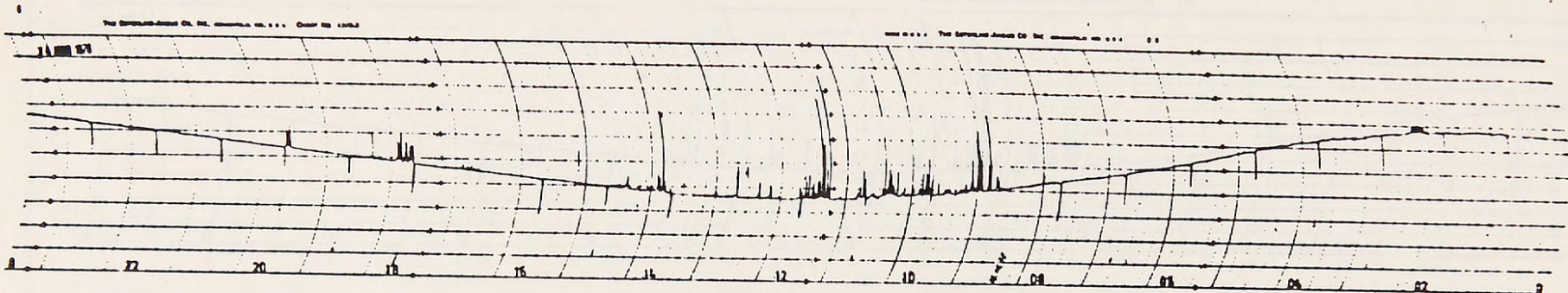
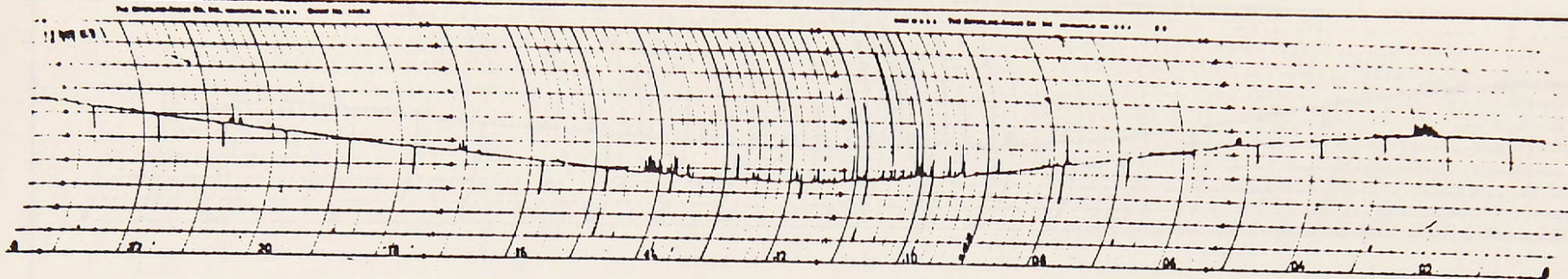
MAYO 1978

13

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

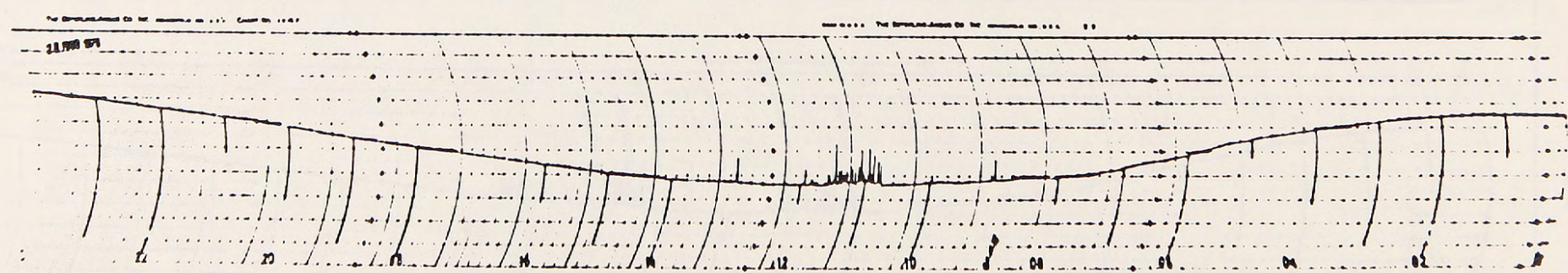
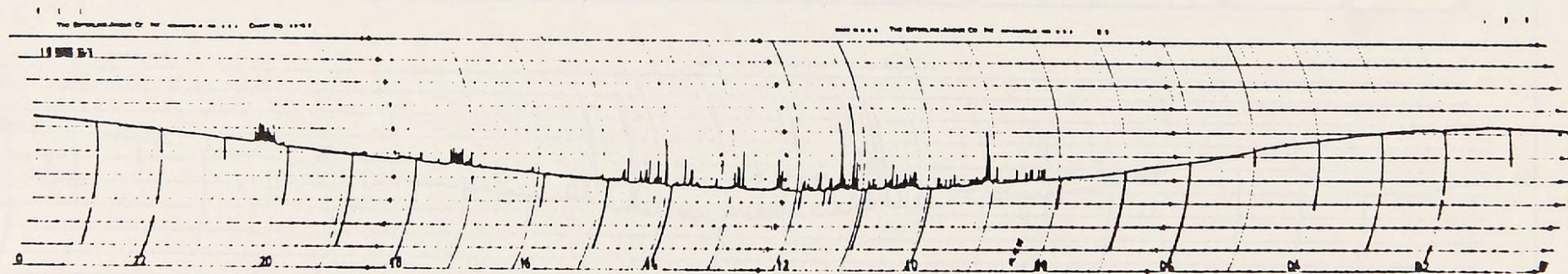
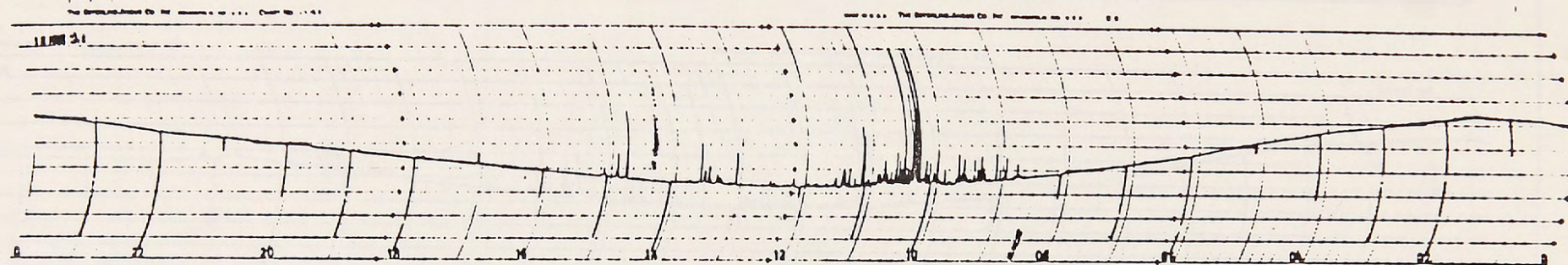
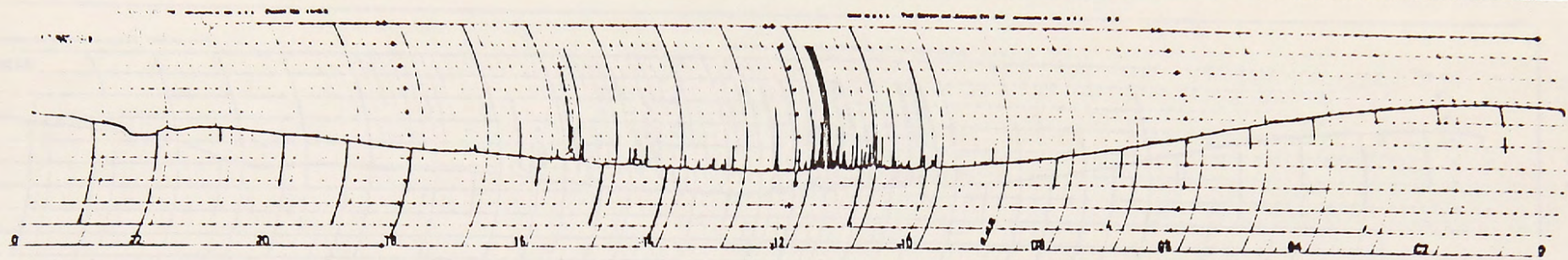
MAYO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

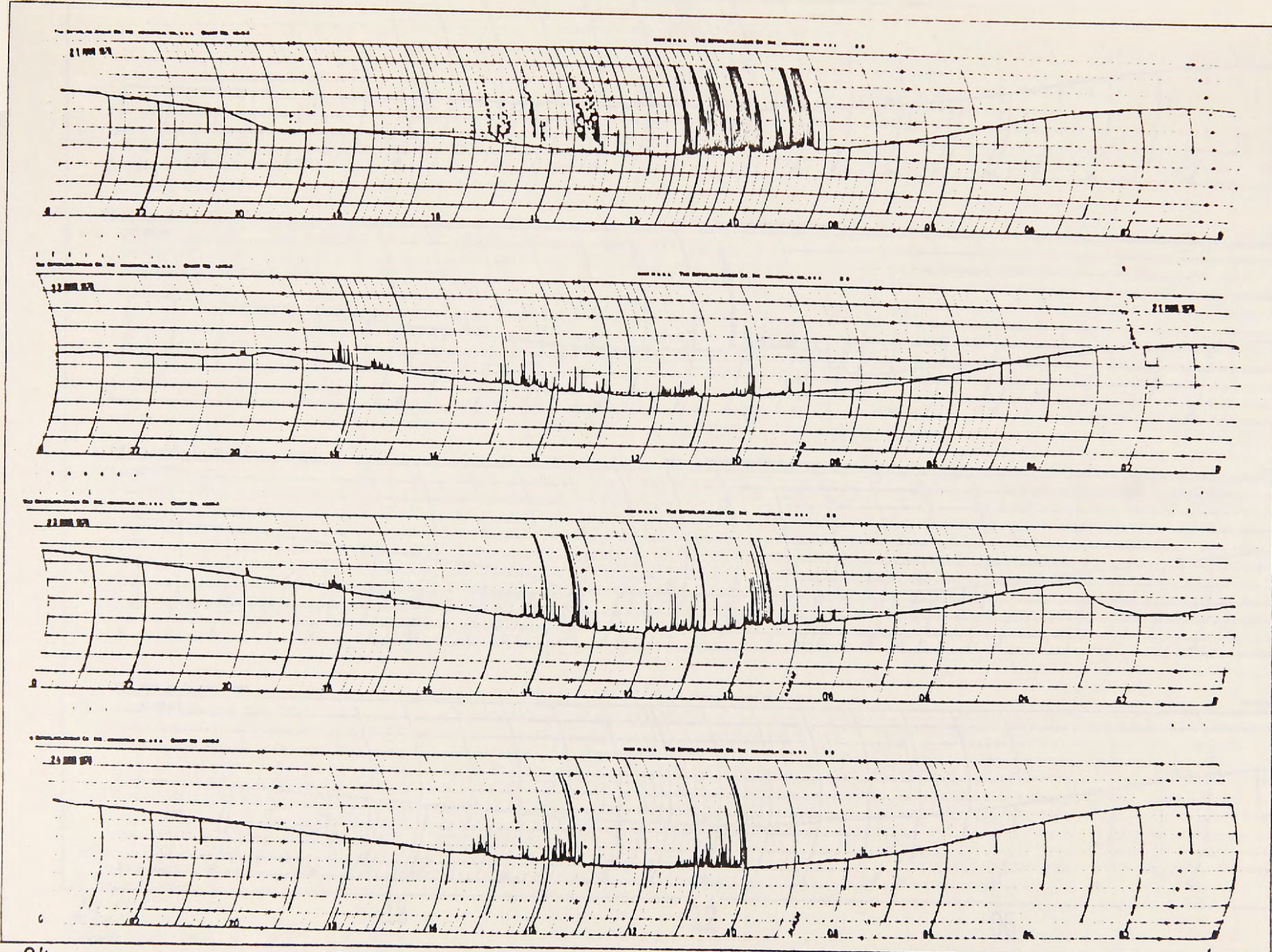
MAYO 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

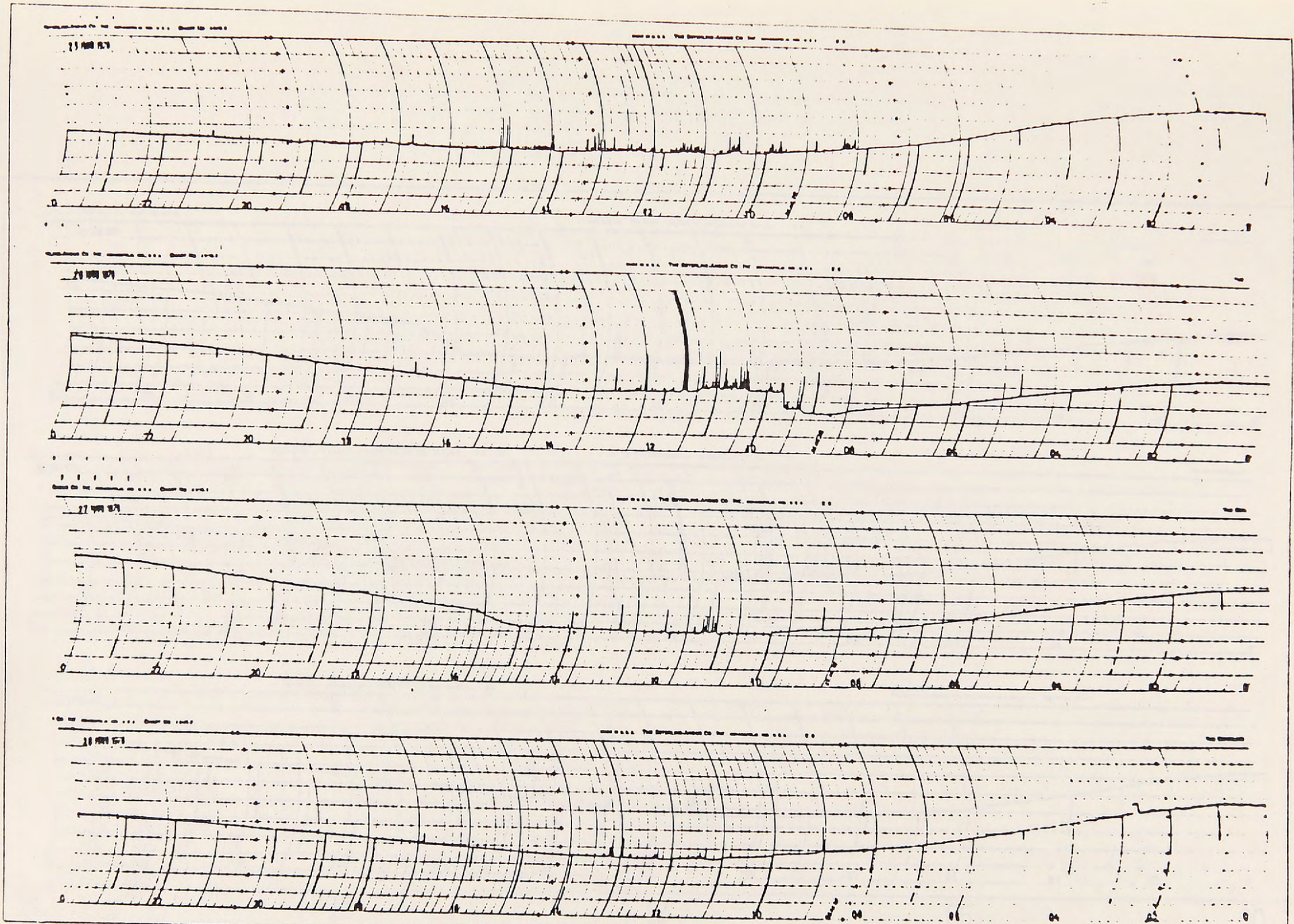
MAYO 1978

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24

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00

RUIDO COSMICO, 30 MHz

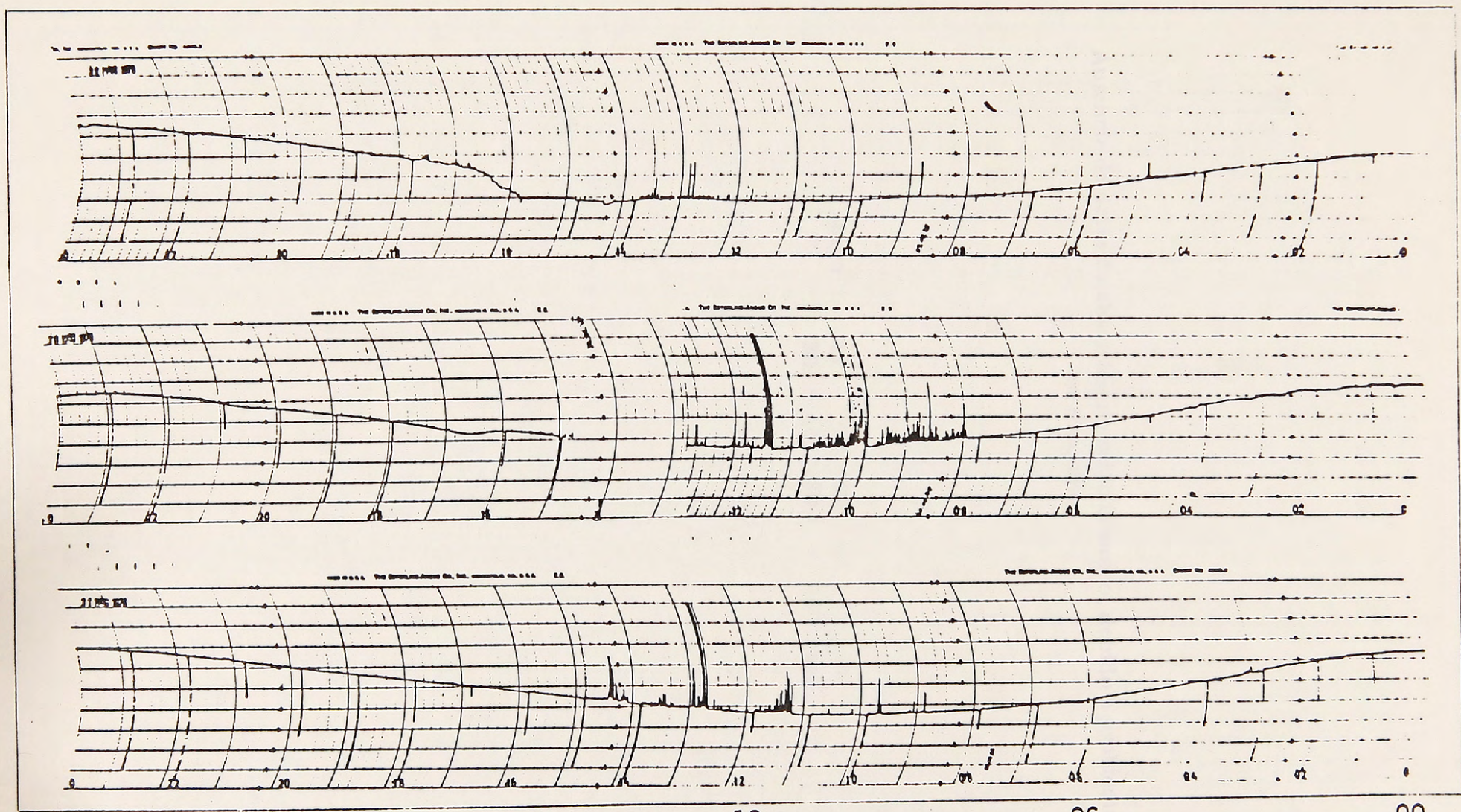
HORA LOCAL, 60° W

MAYO 1978

29

30

31



24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Mayo	11	18 : 30	—	21 : 05
"	30	13 : 10	—	15 : 00

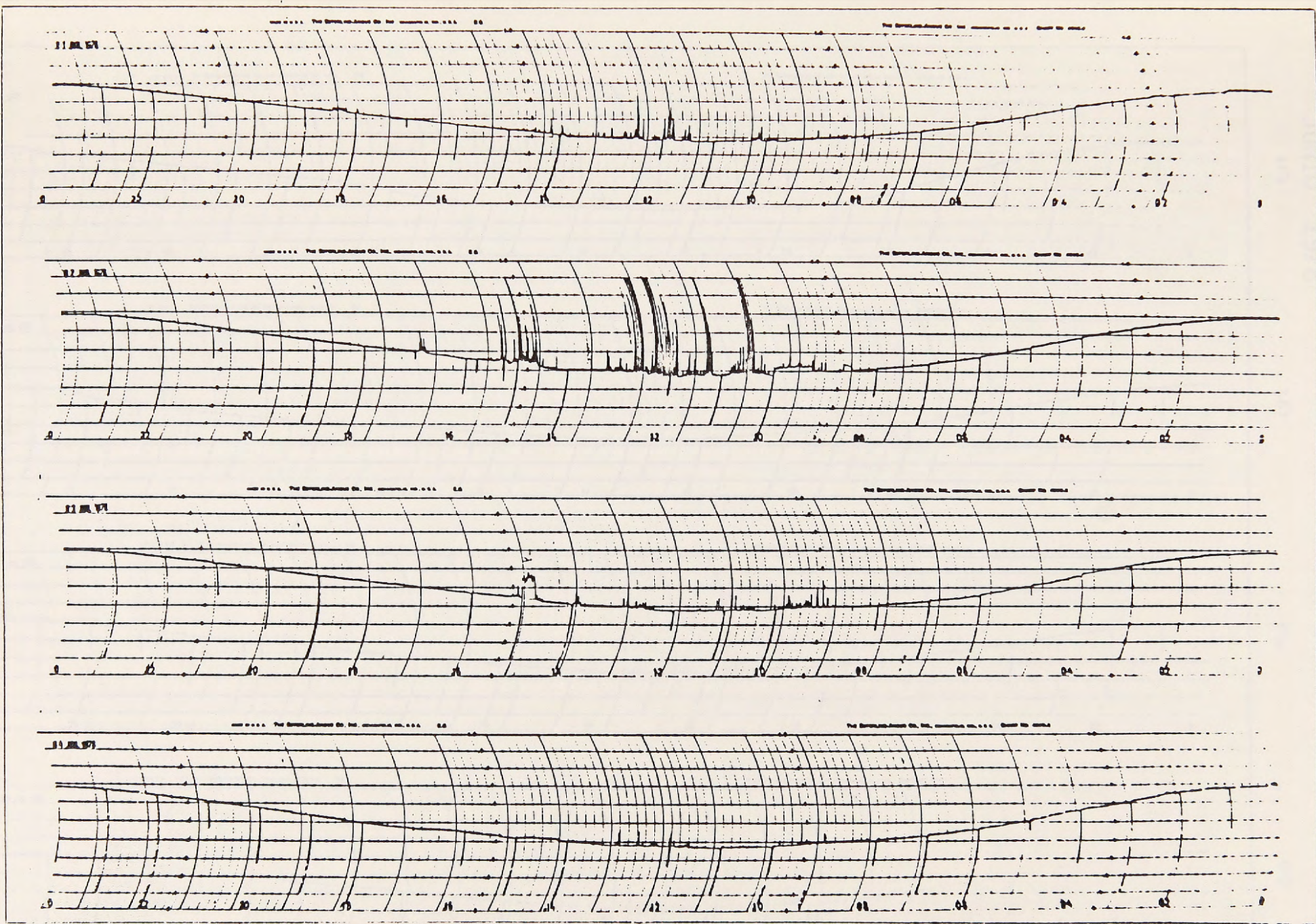
JUNIO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

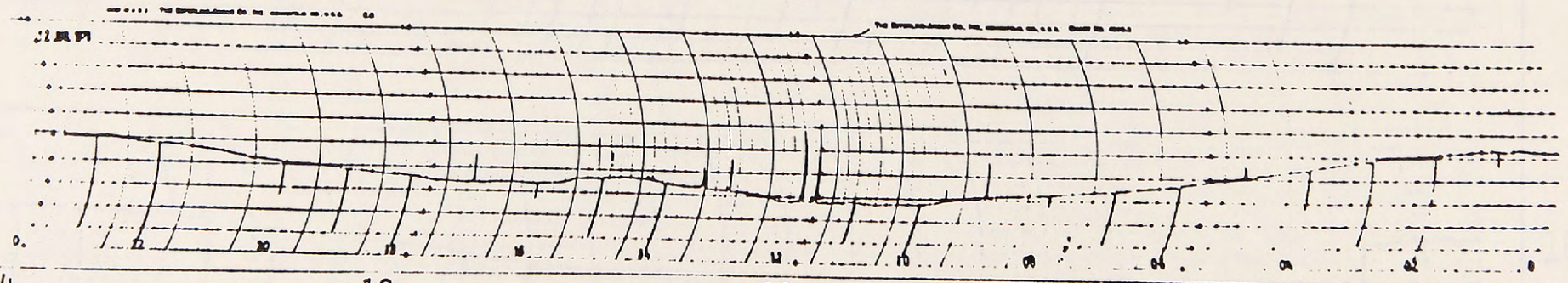
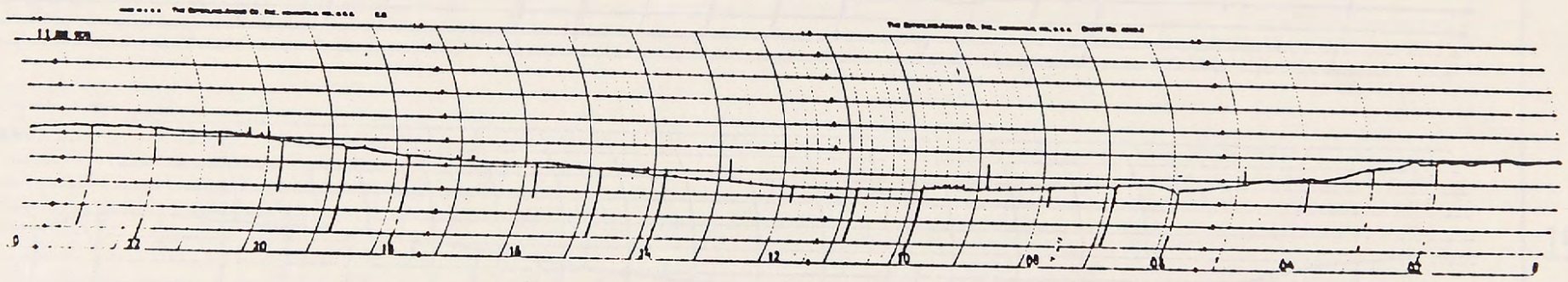
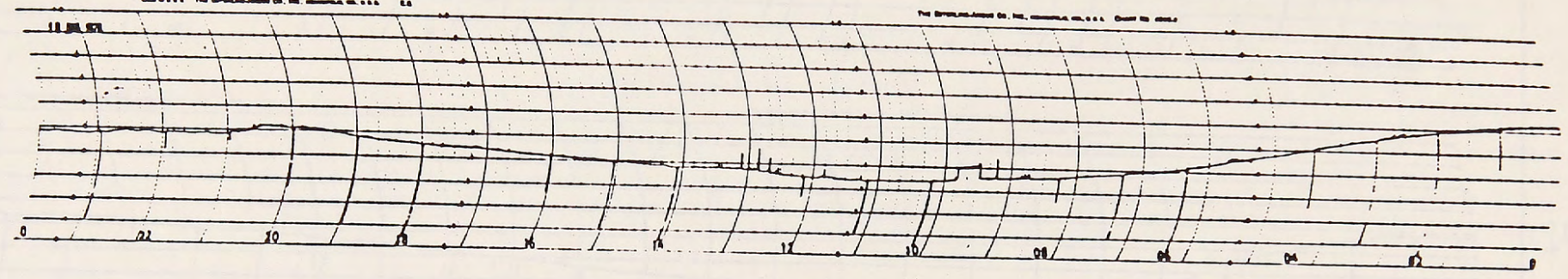
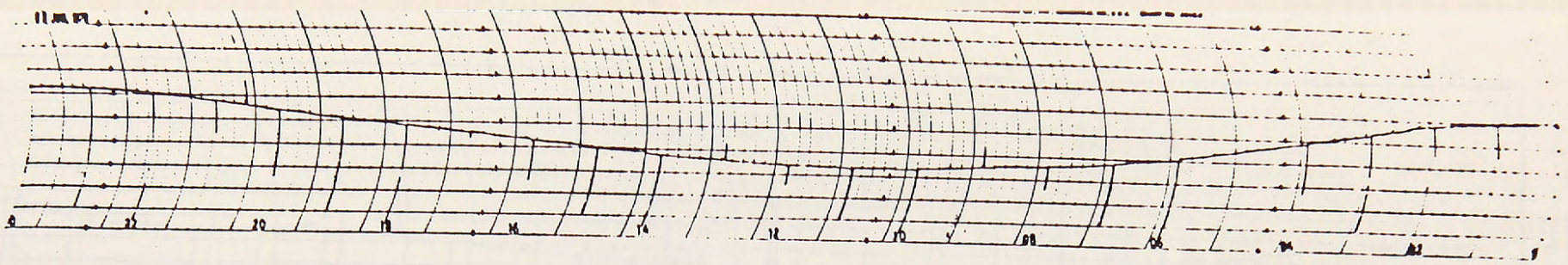
JUN 10 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

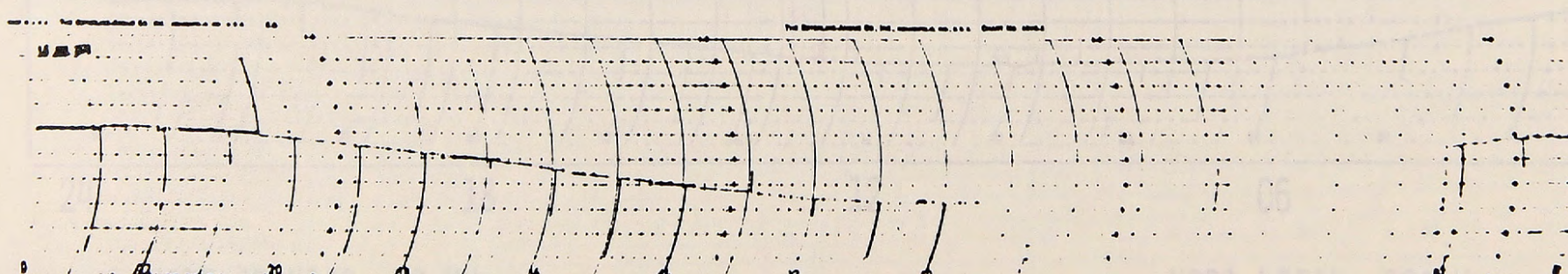
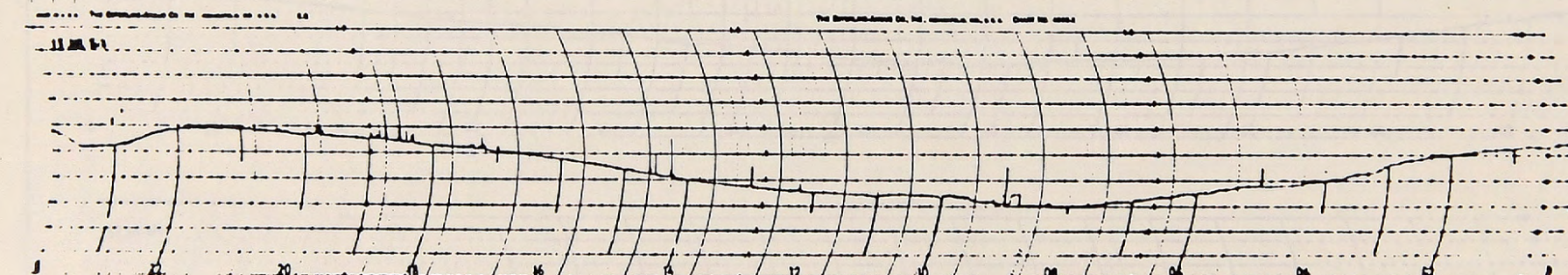
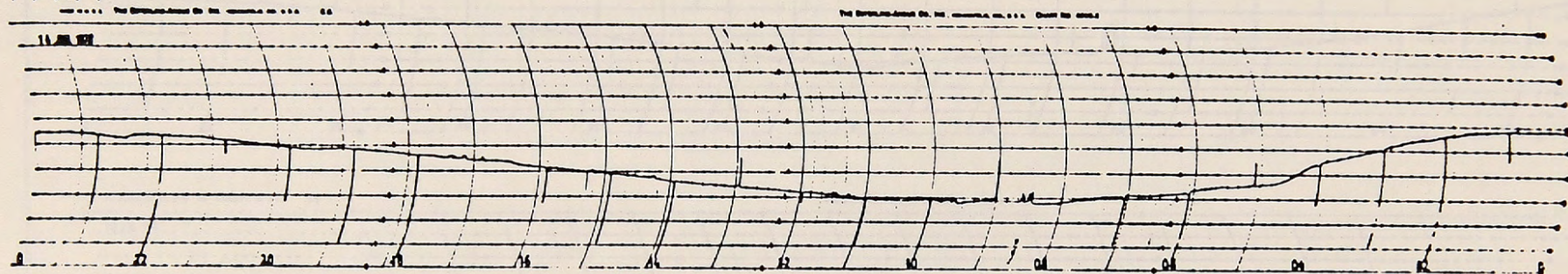
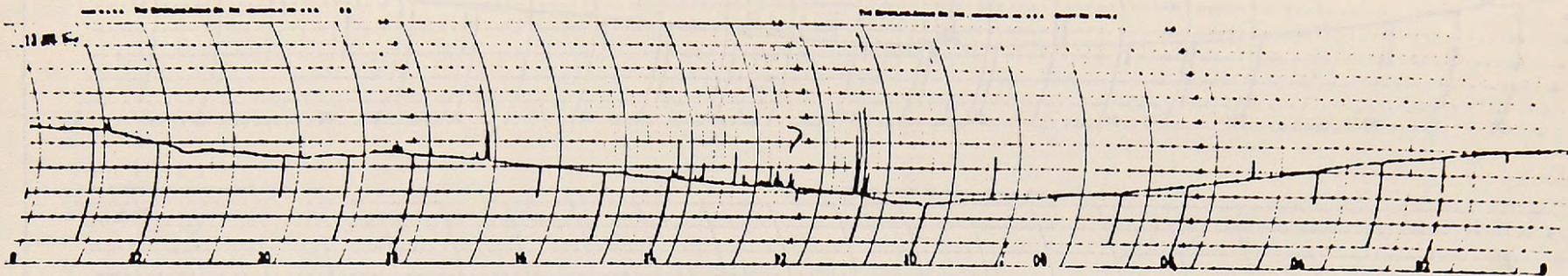
JUNIO 1978

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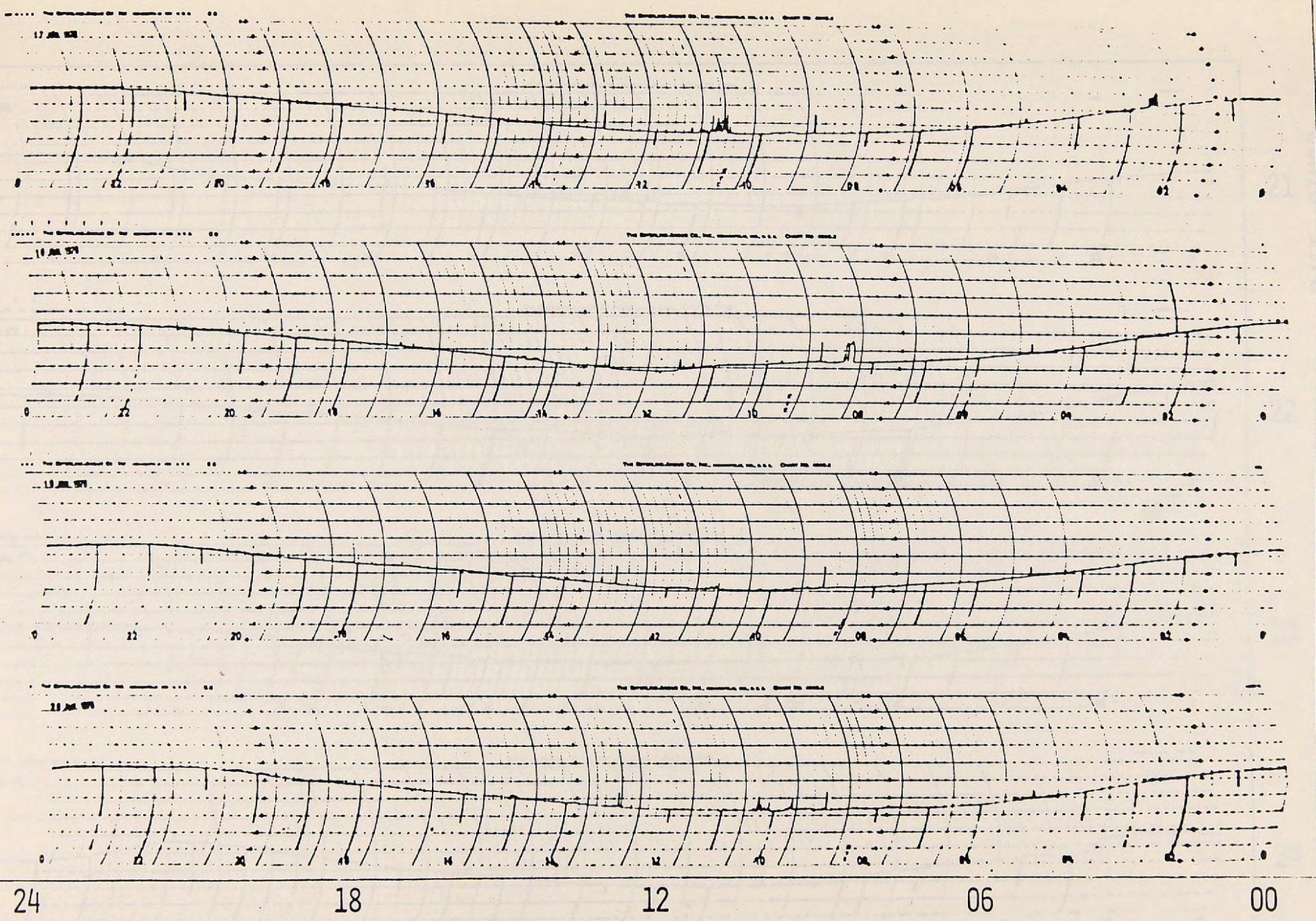
06

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

JUNIO 1968
8/6T 0100C



24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

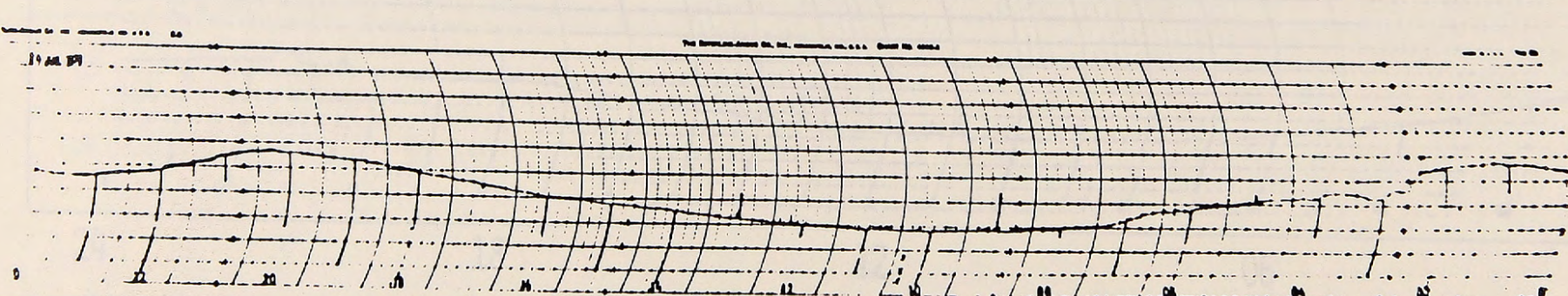
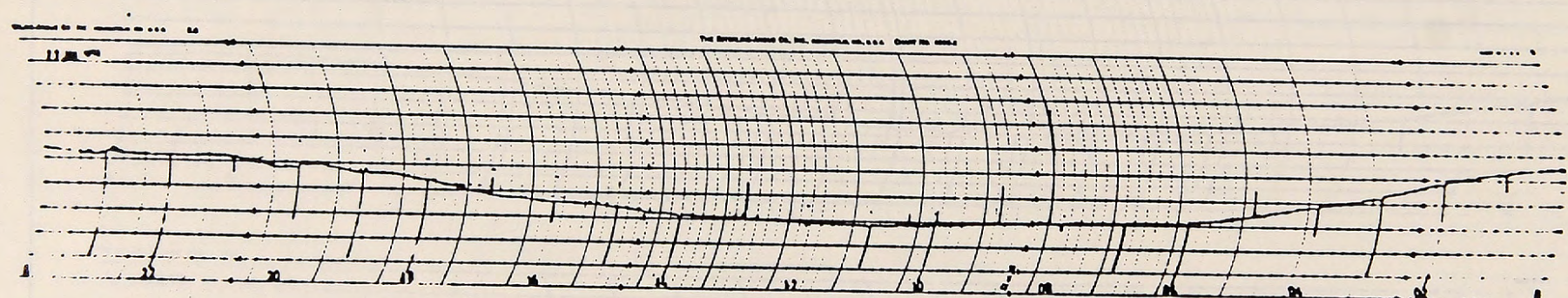
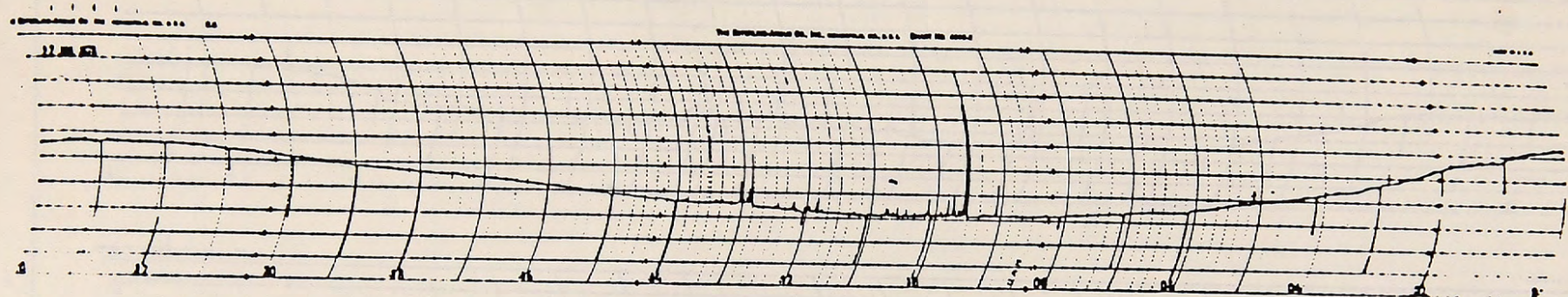
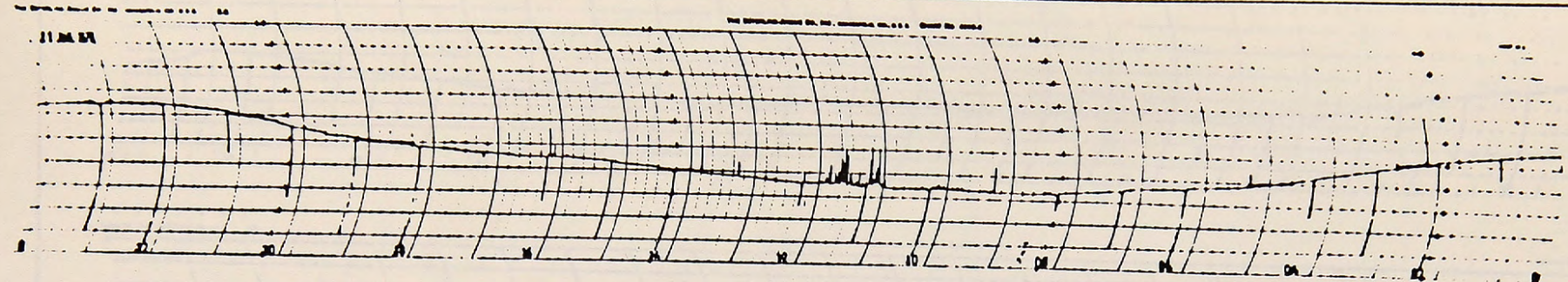
JUNIO 1978

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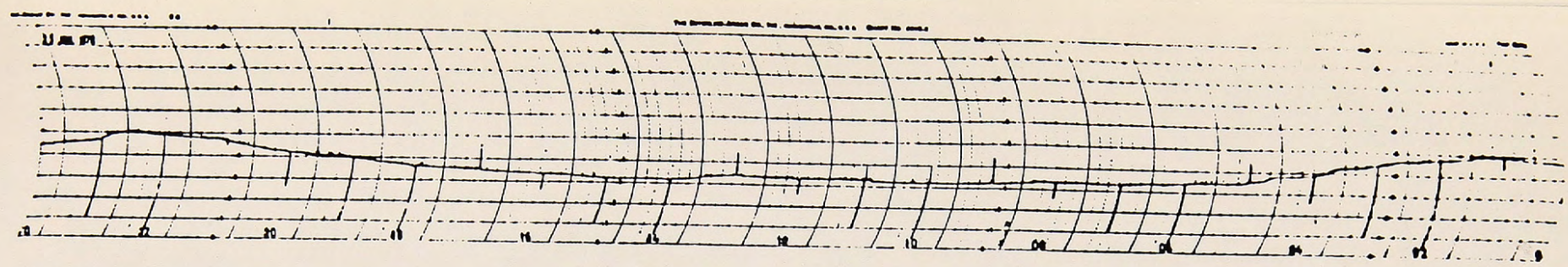


24 18 12 06 00

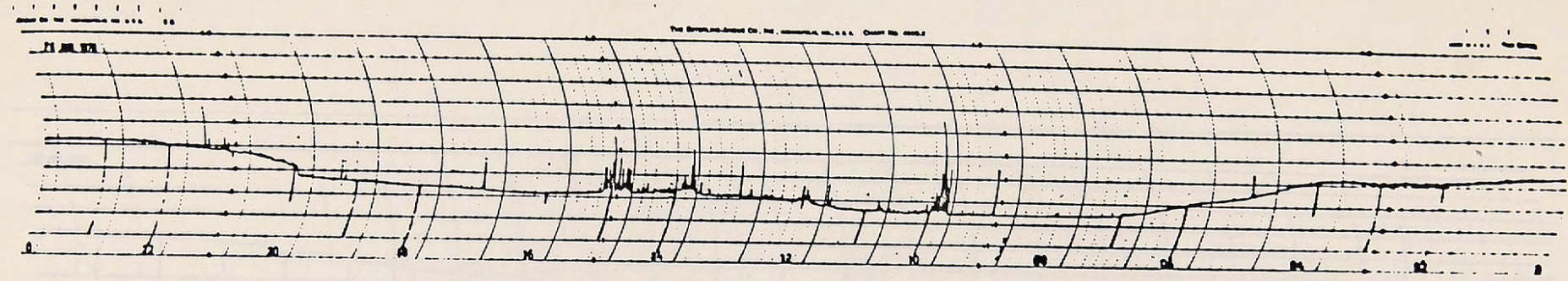
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

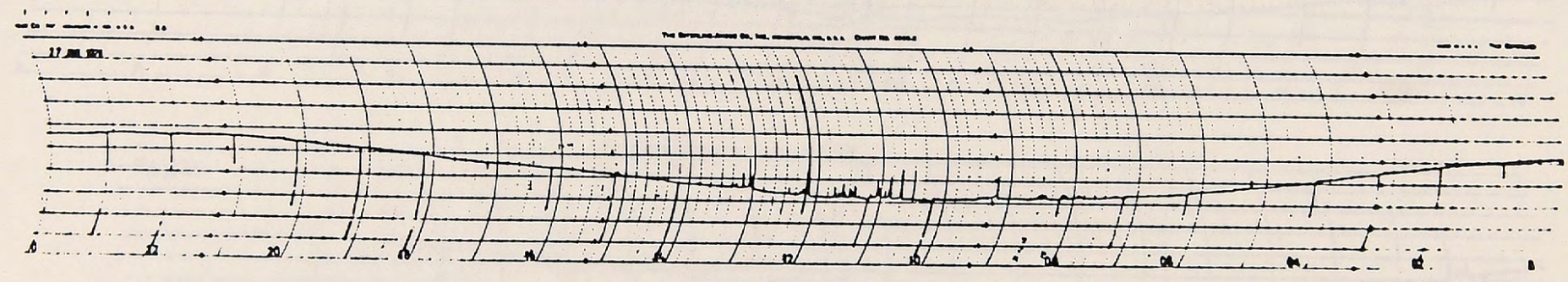
JUNIO 1967
8/6T 01N00



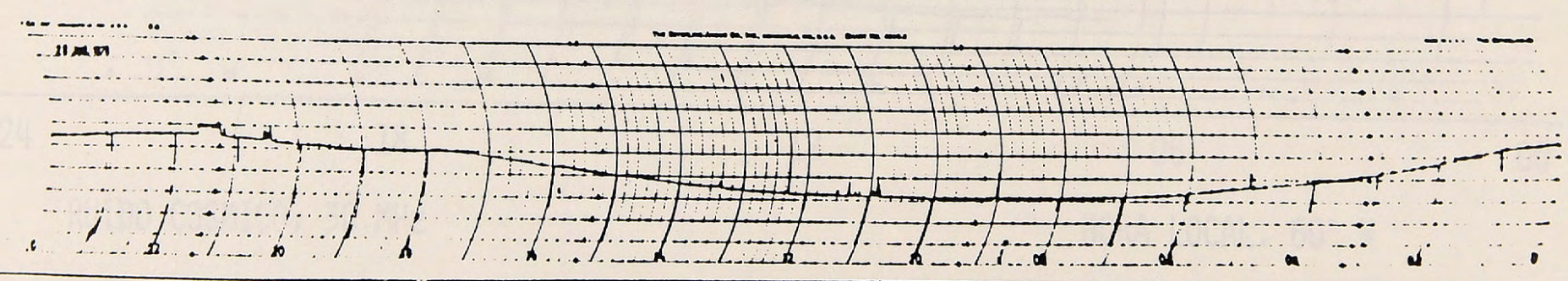
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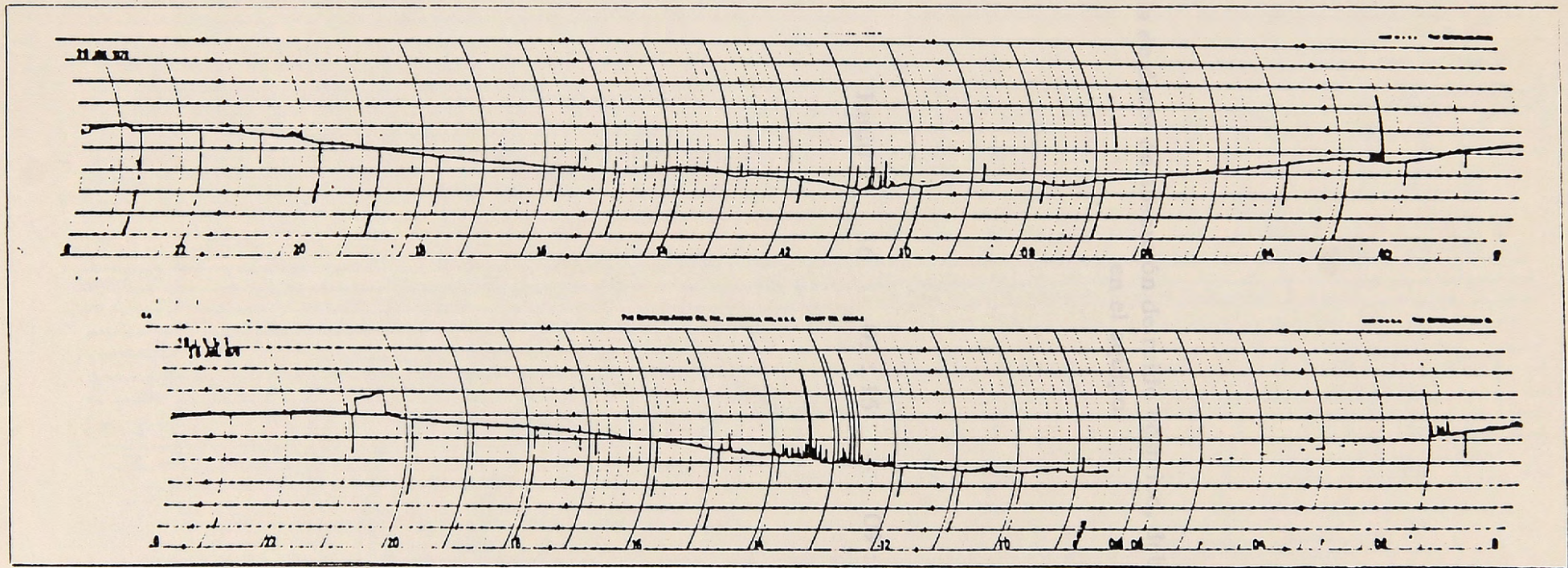
28

24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

JUN 29
Q/ST



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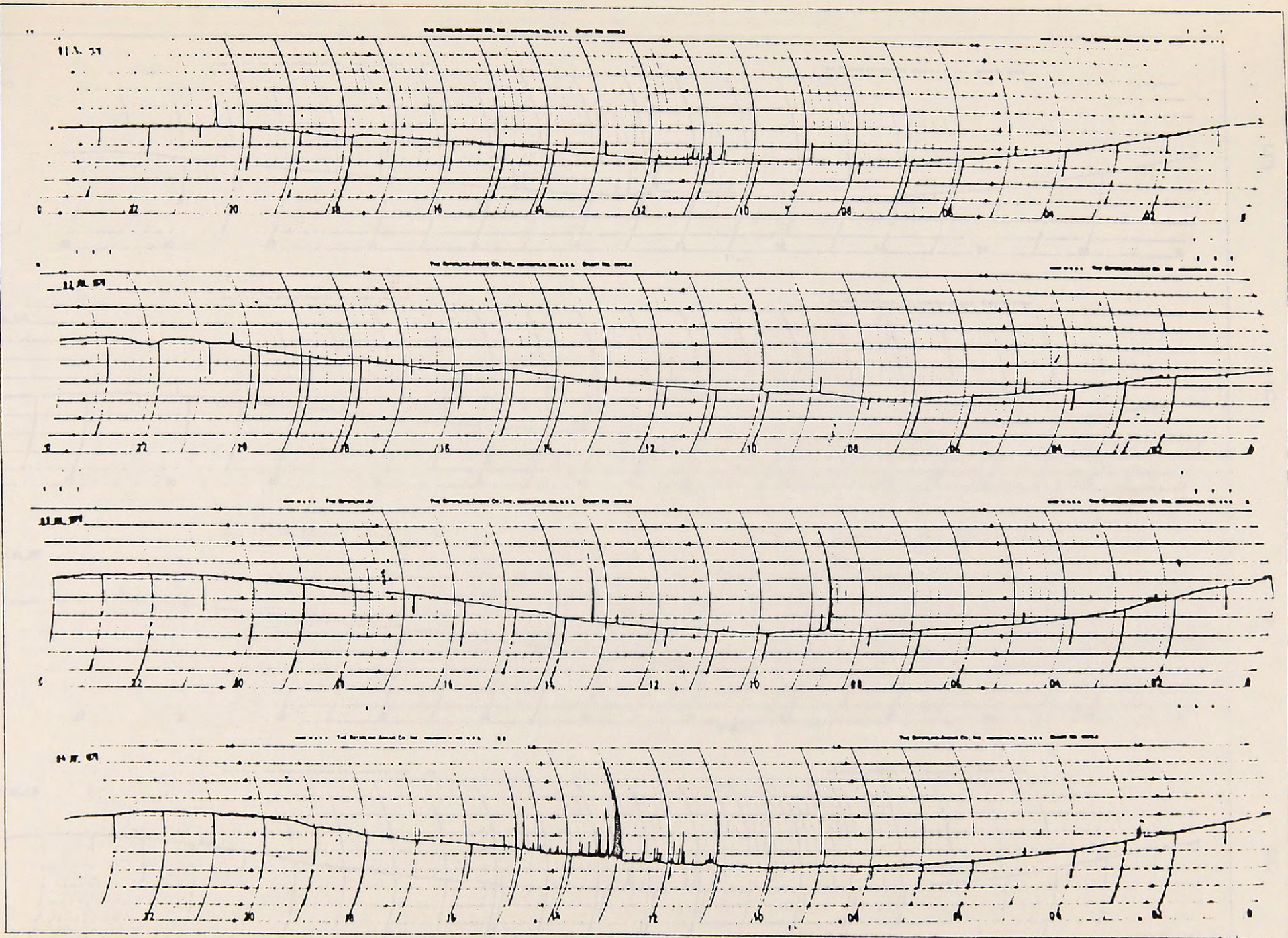
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Junio 16 02 : 15 — 09 : 30

JULIO 1968
2/6/8



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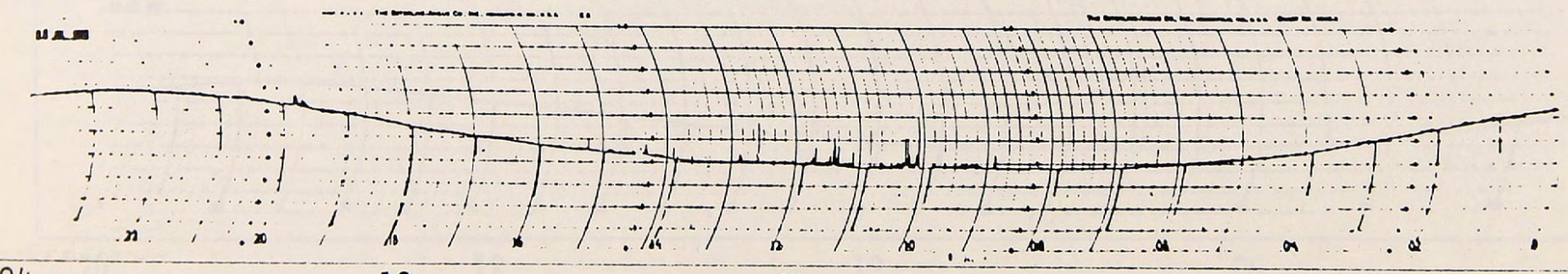
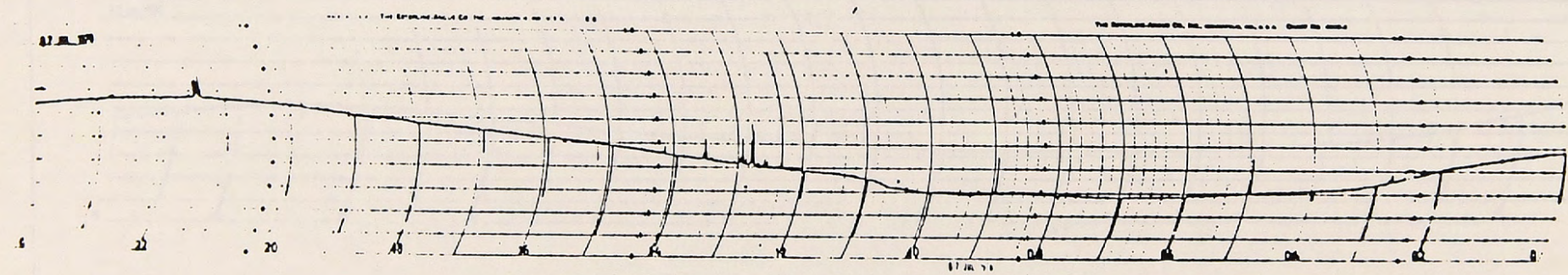
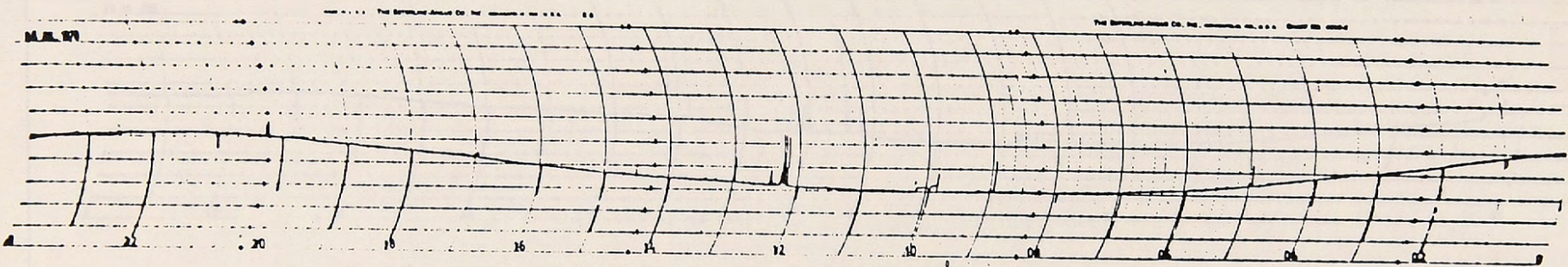
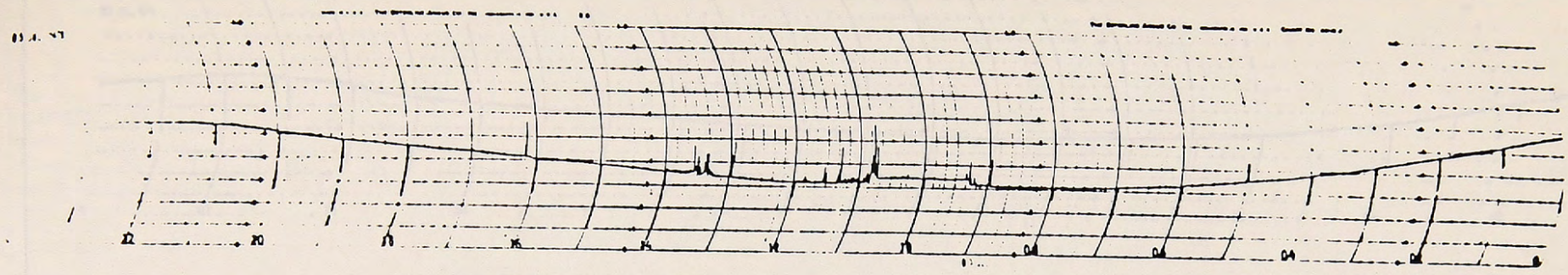
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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

5
JULIO 1978



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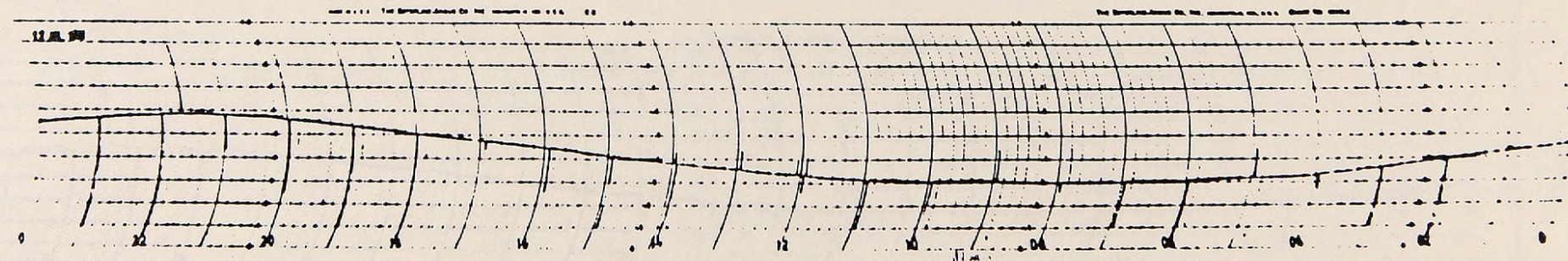
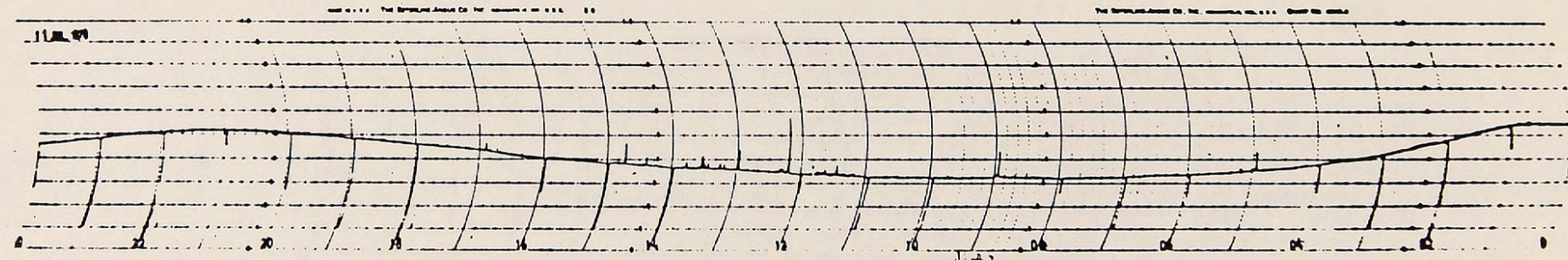
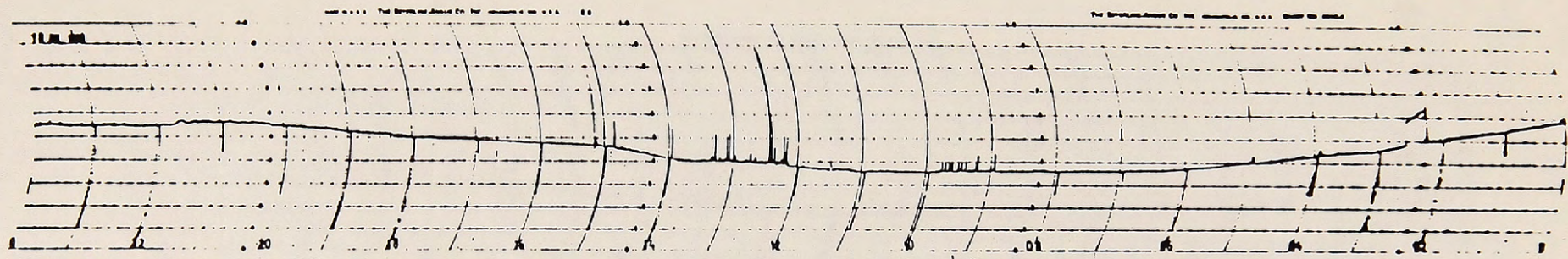
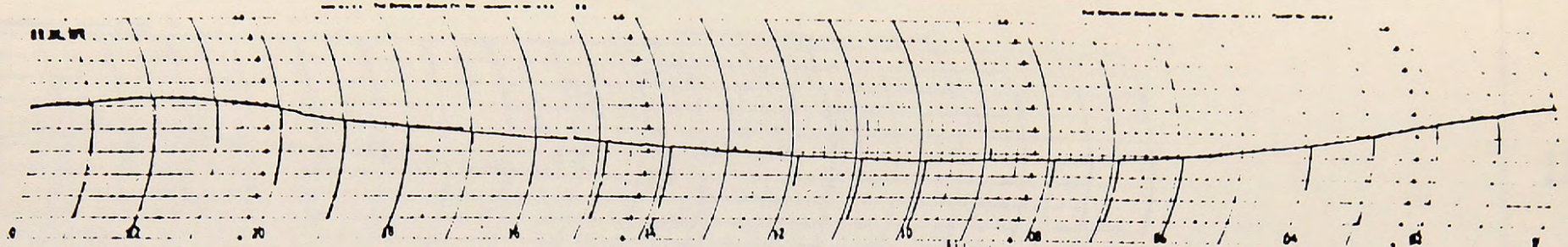
8

24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

JULIO 1978
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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

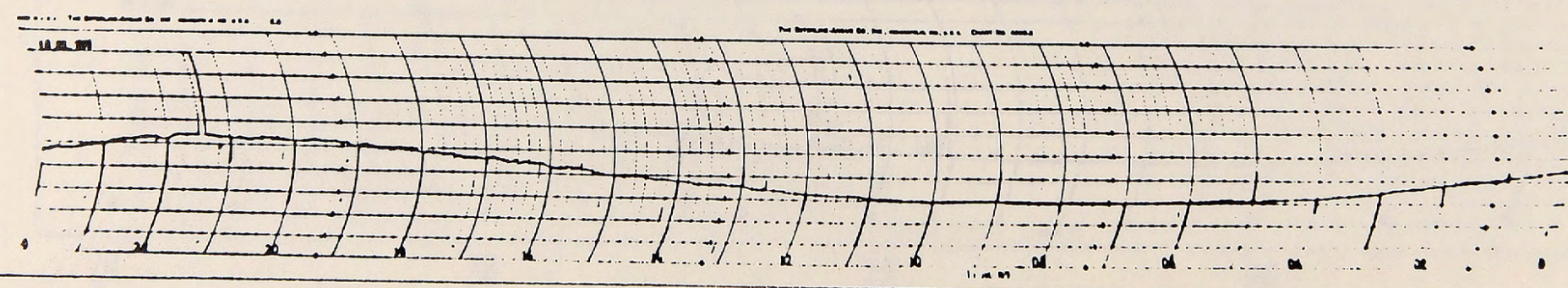
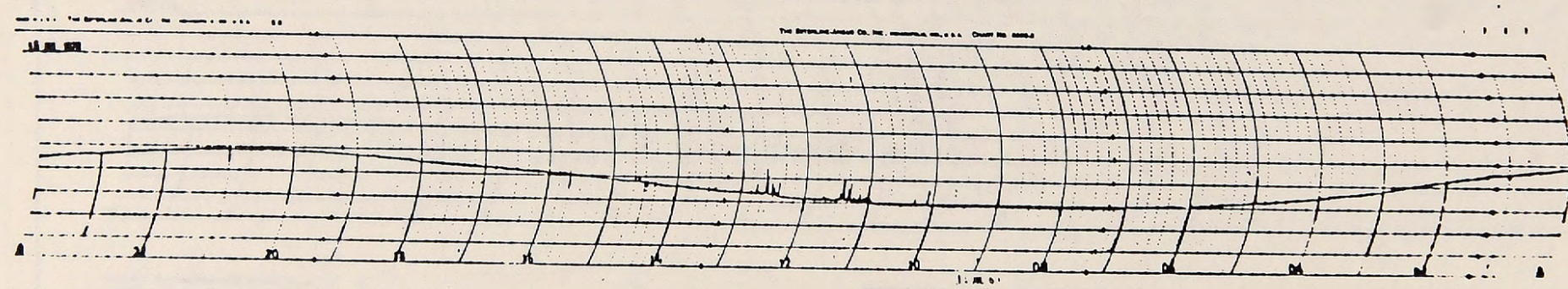
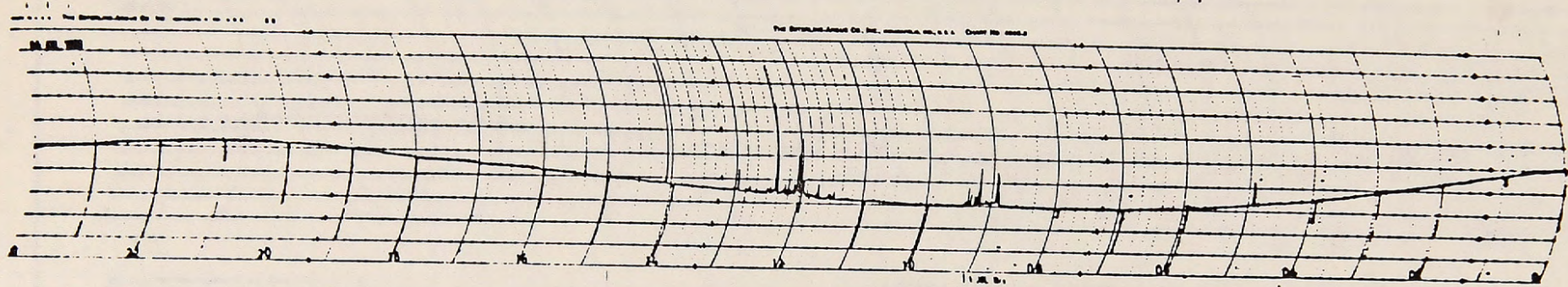
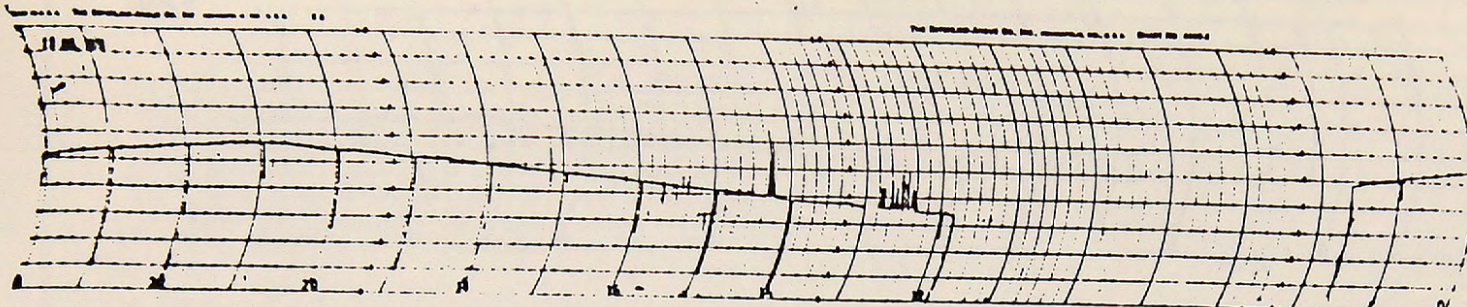
JULIO 1978

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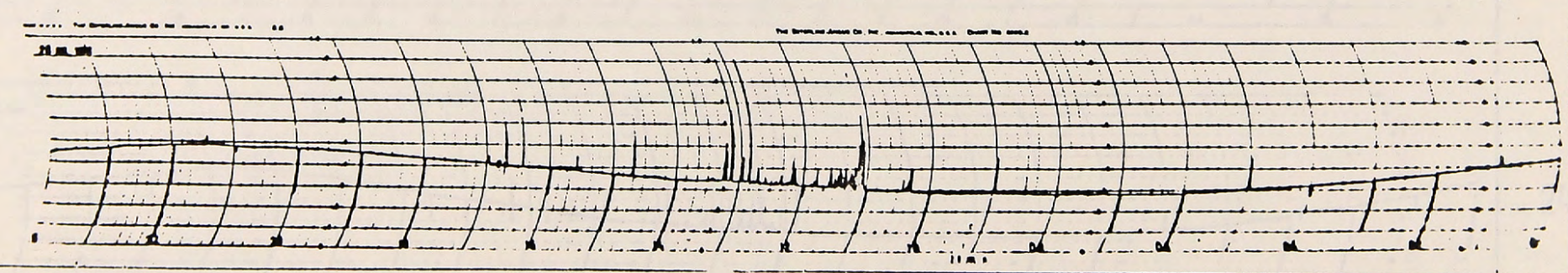
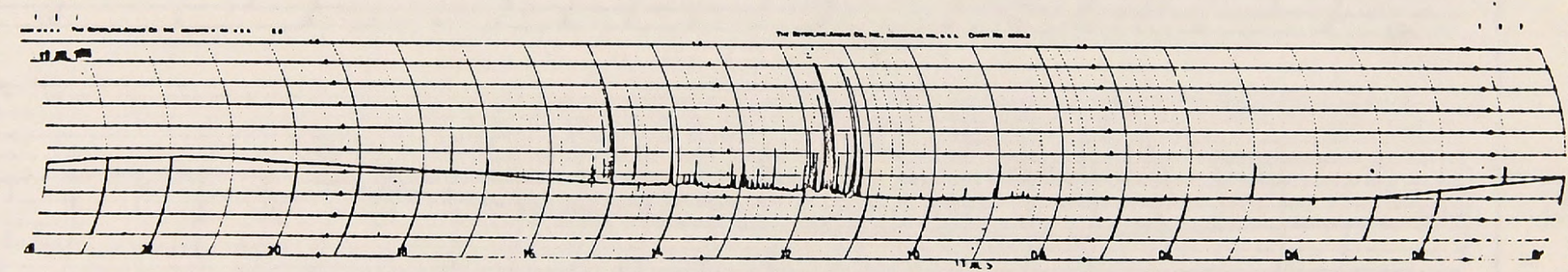
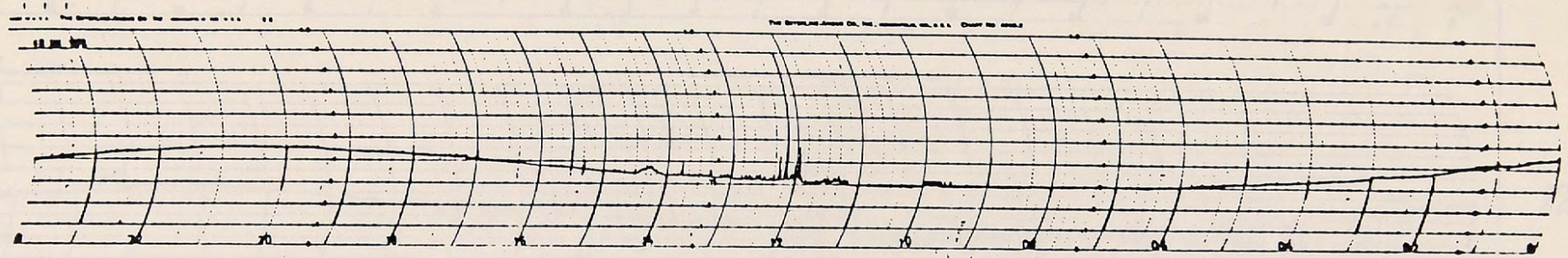
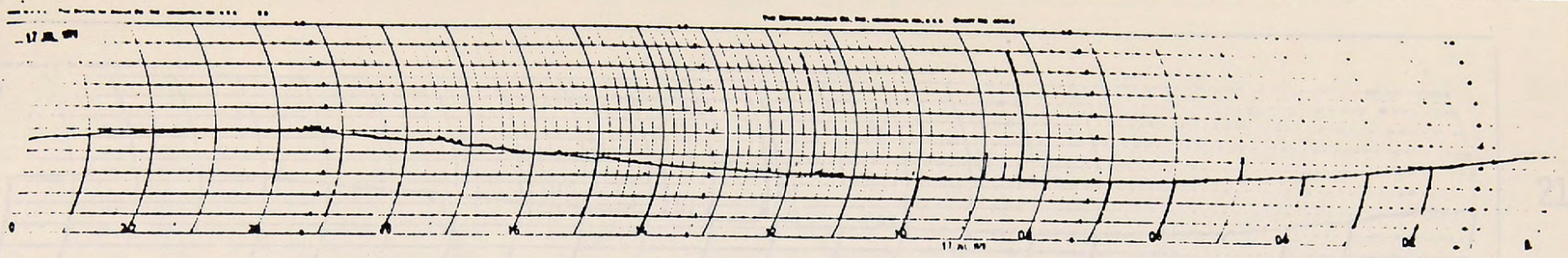


24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

JUL 10 1978



24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

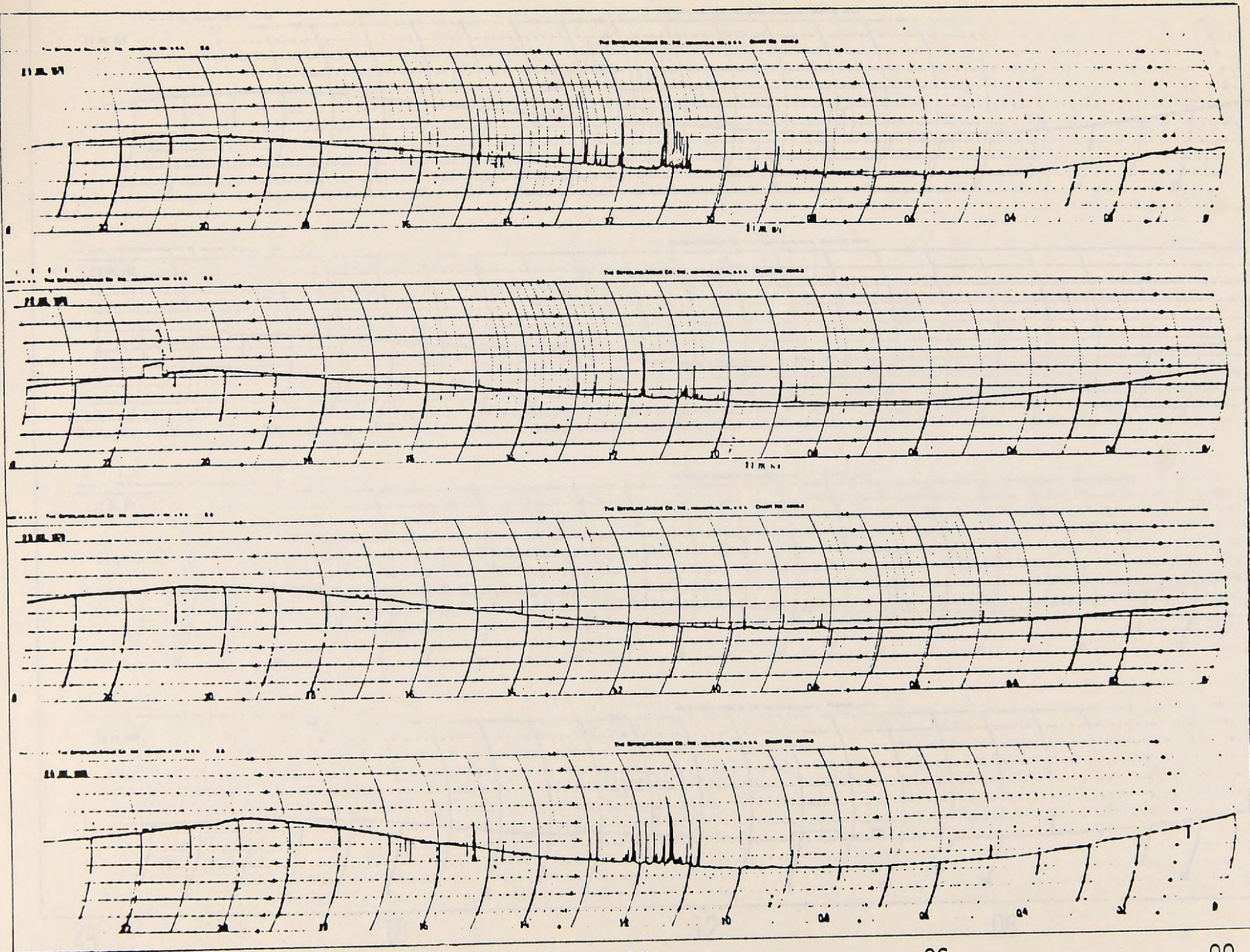
JULIO 1978

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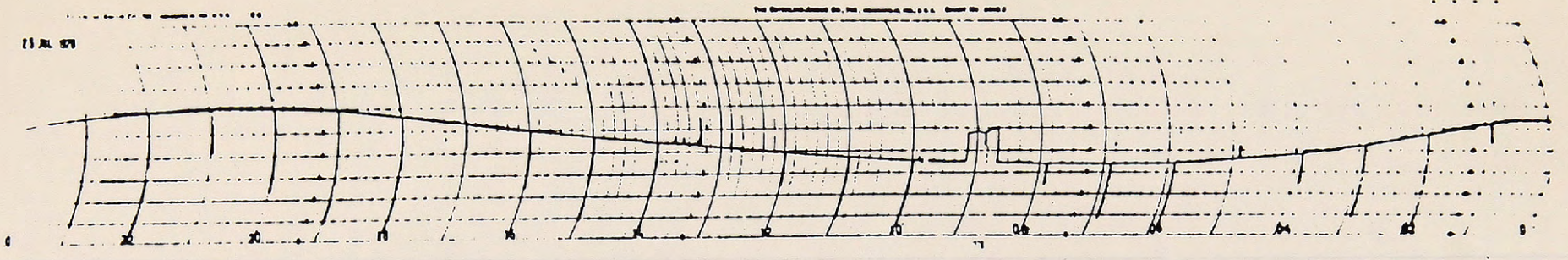
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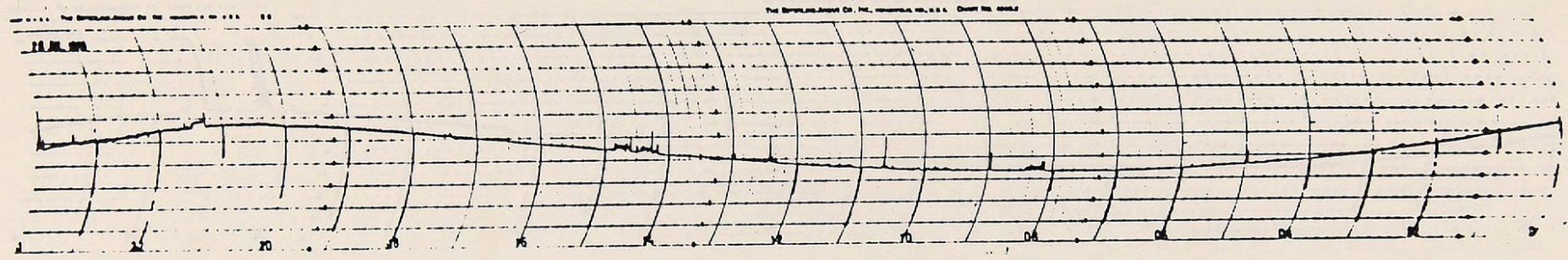
RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

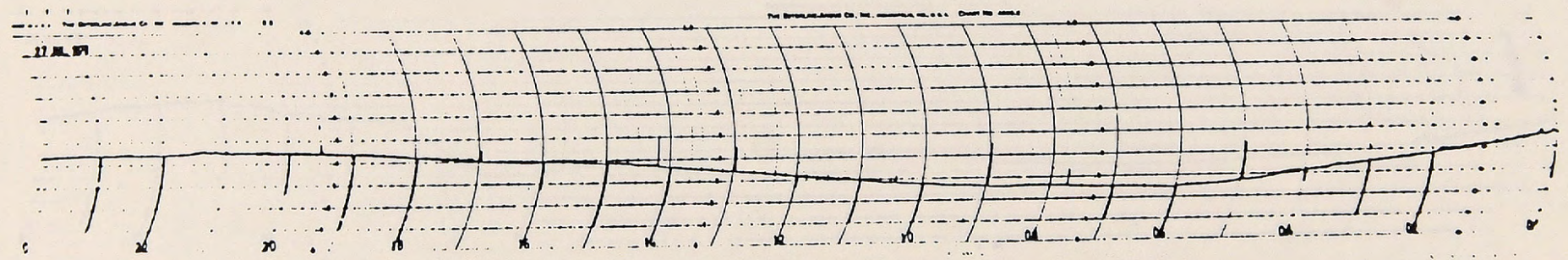
JULIO 1978
25



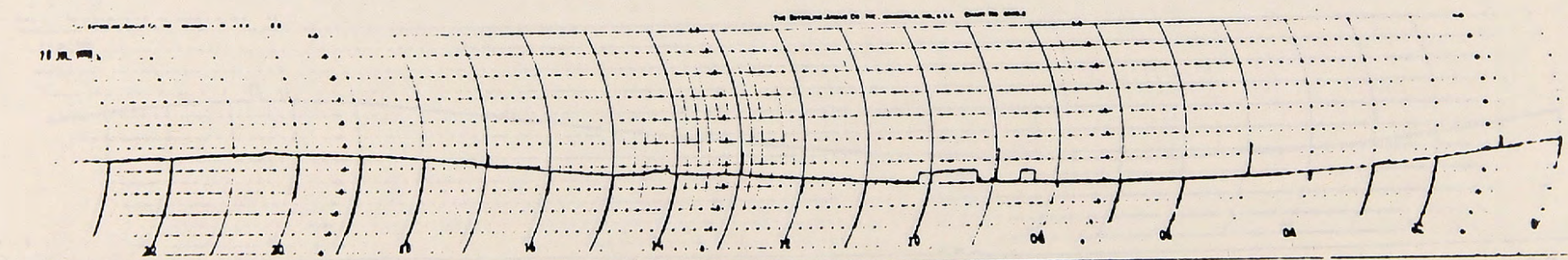
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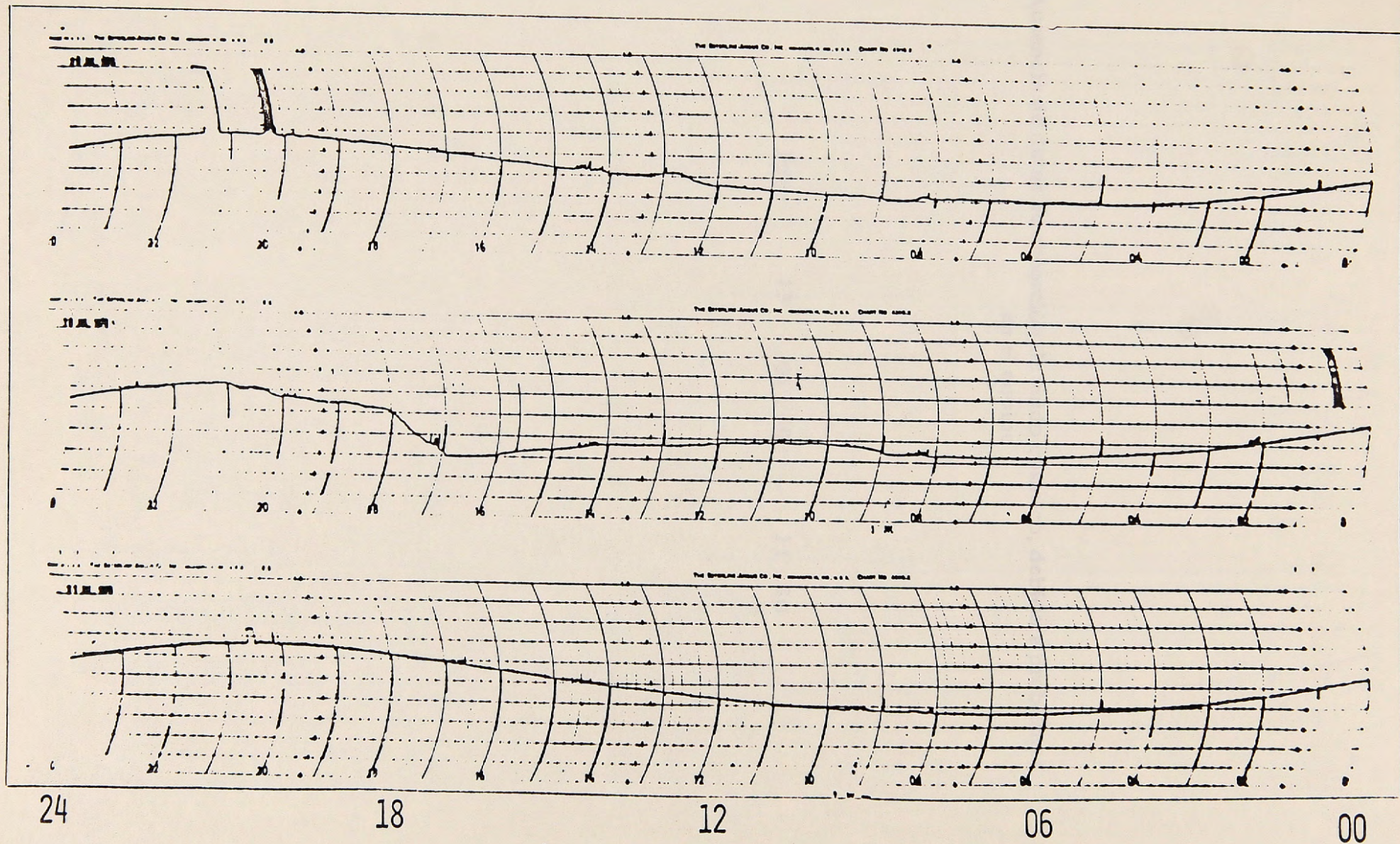


24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

JULIO 1978
8/7



RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Julio 13 01 : 40 - 11 : 50

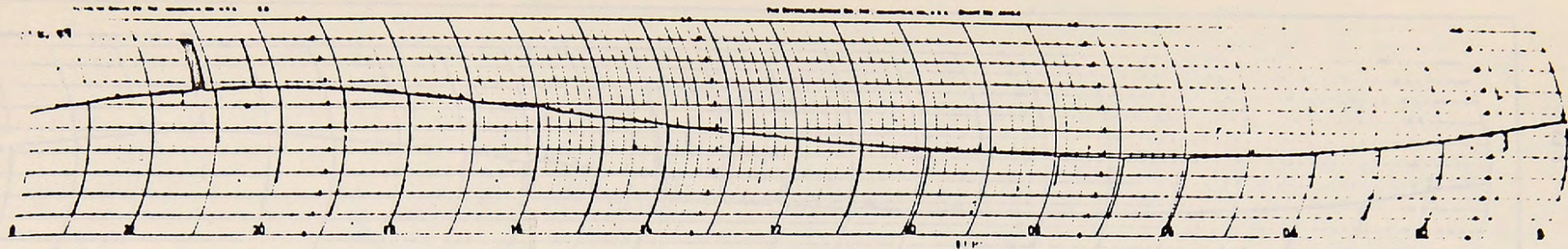
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HORA LOCAL, 60° W

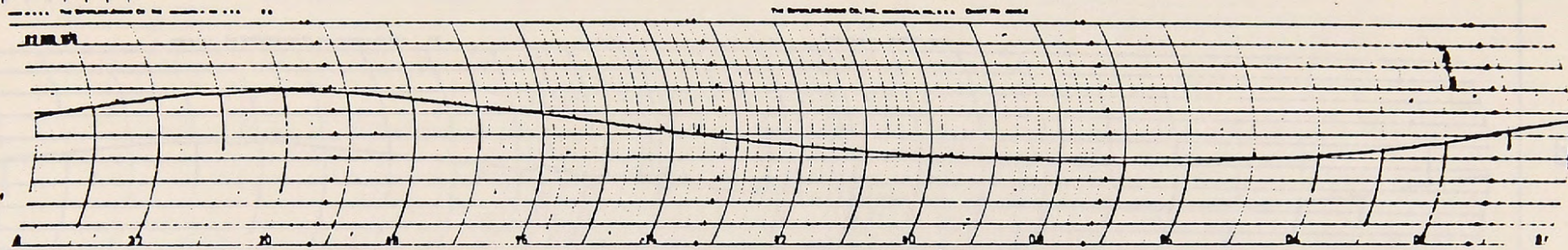
RUIDO COSMICO, 30 MHz

AGOSTO 19/8

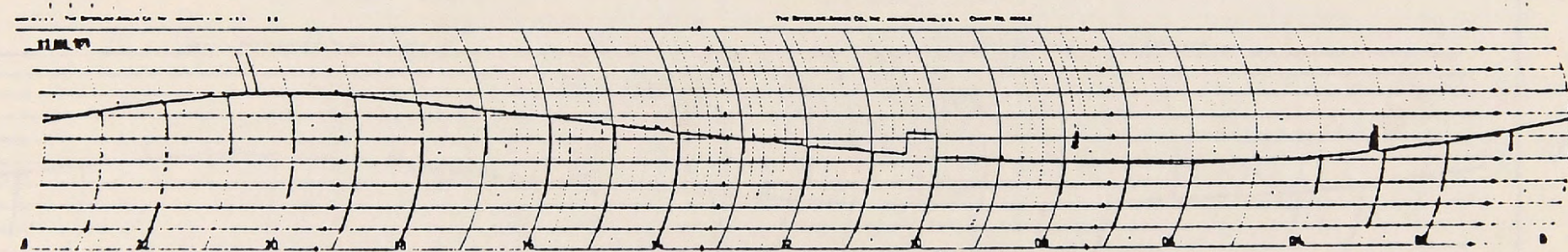
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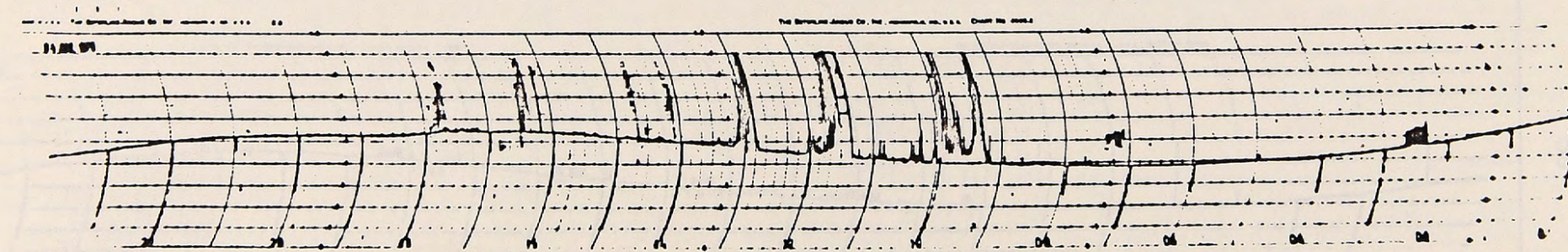
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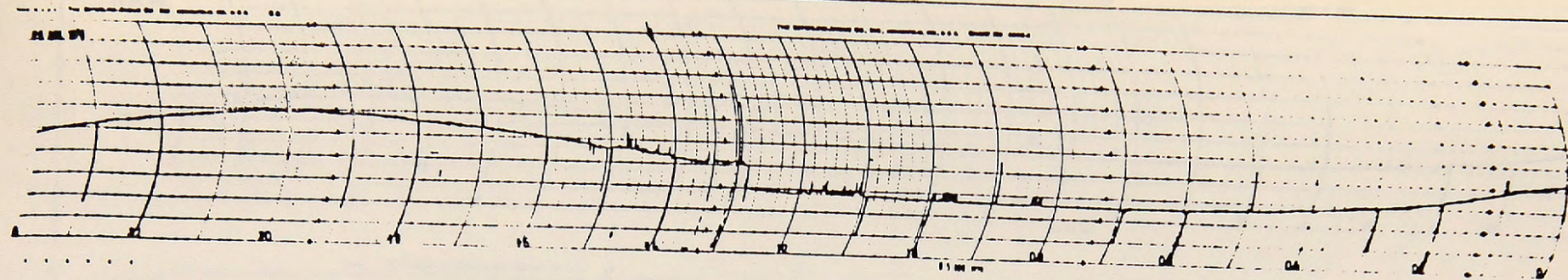
00

RUIDO COSMICO, 30 MHz

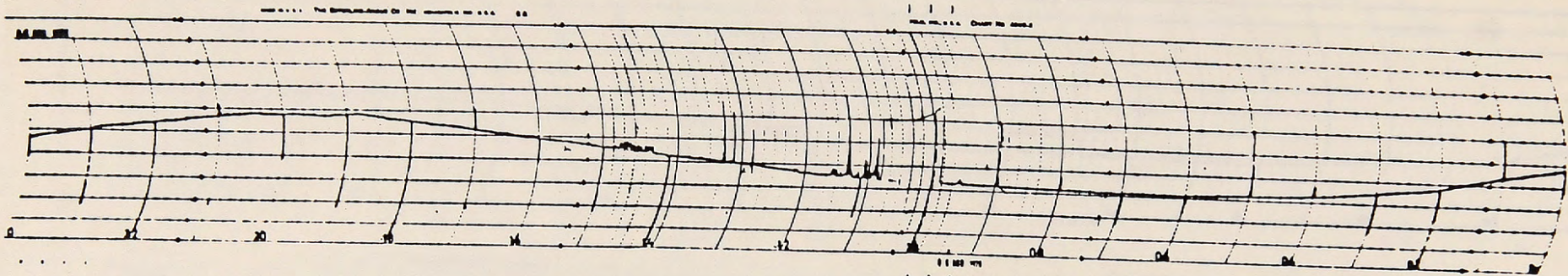
HORA LOCAL, 60° W

AGOSTO 1978

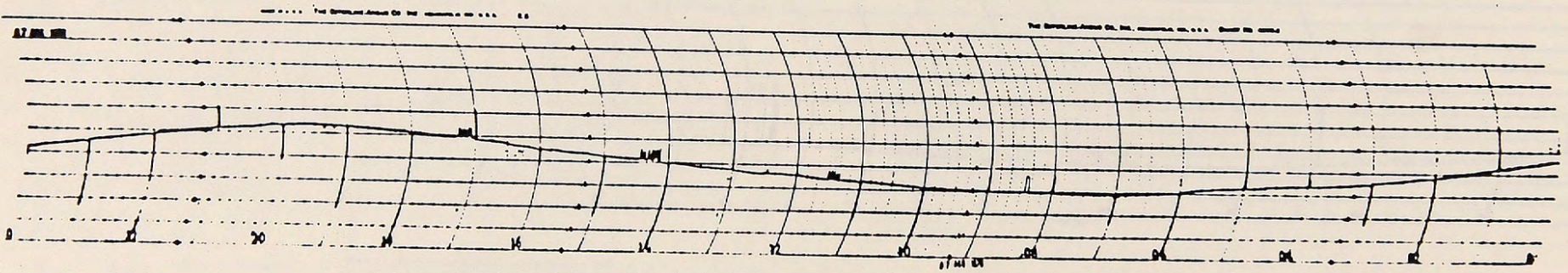
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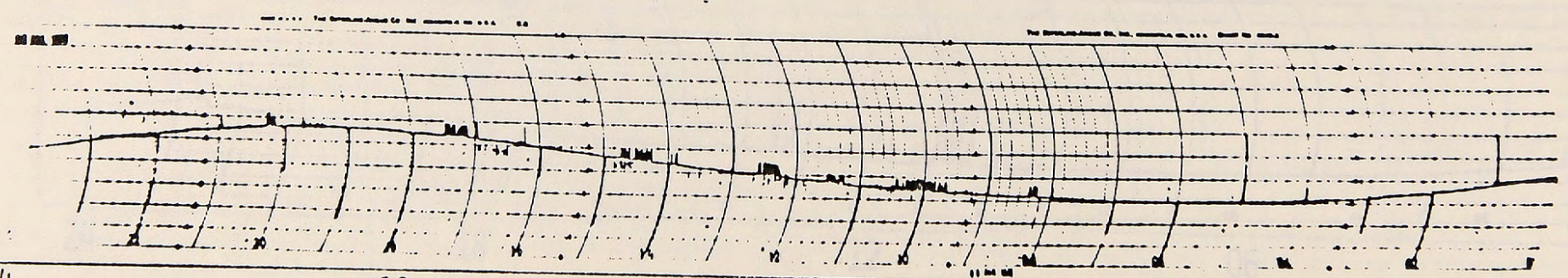
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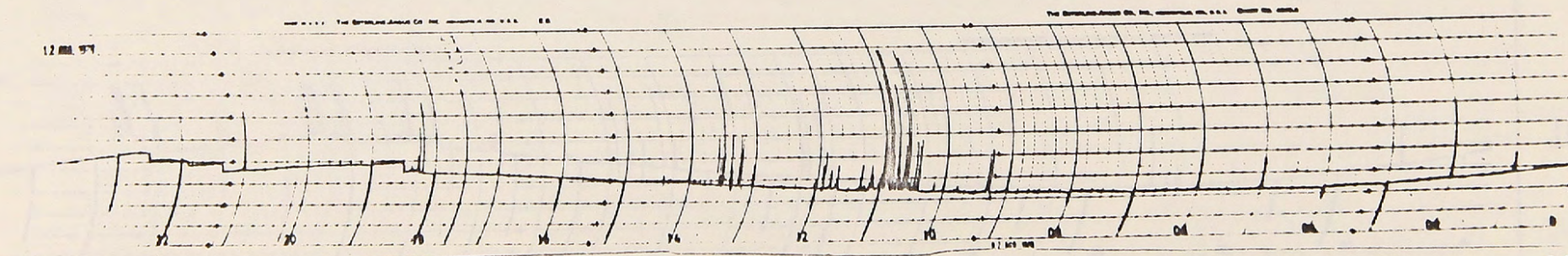
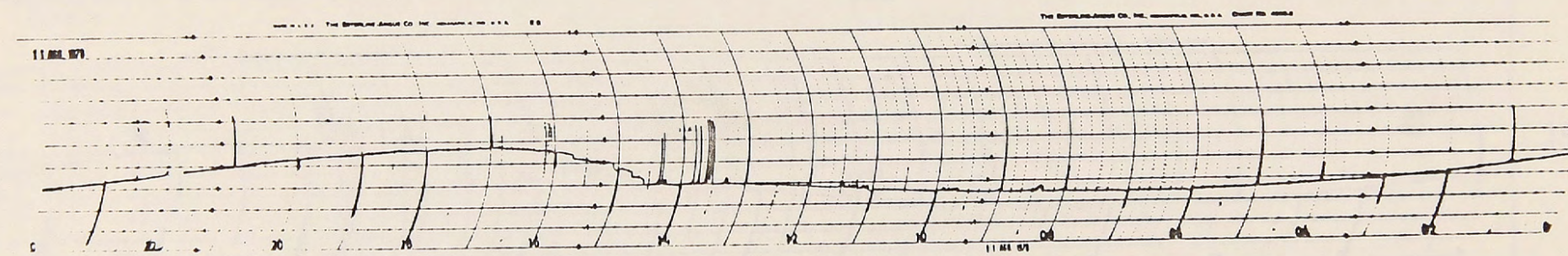
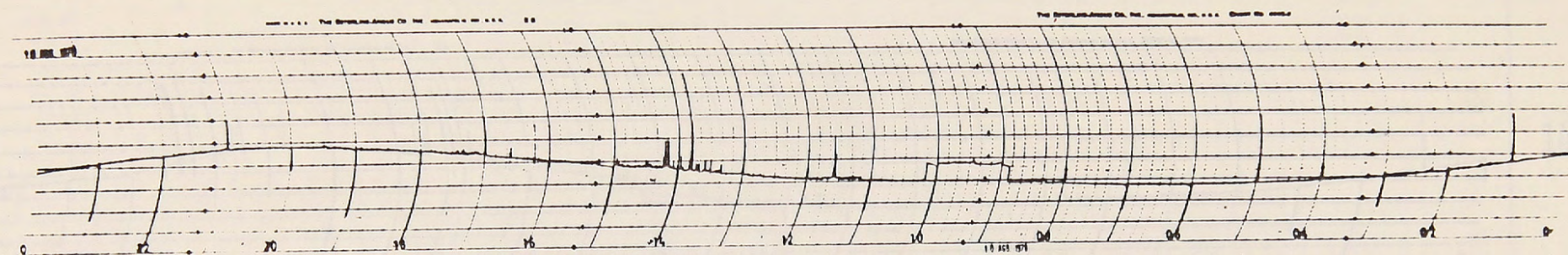
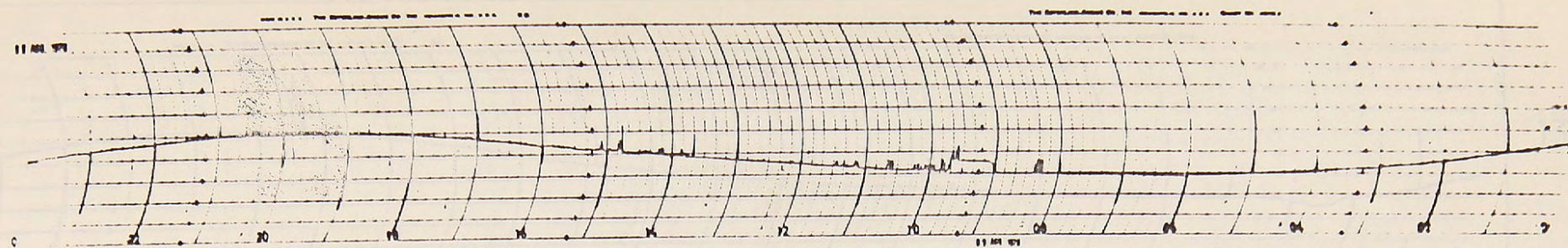
06

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RUIDO COSMICO, 30 MHZ

HORA LOCAL, 60° W

AGOSTO 1978
9



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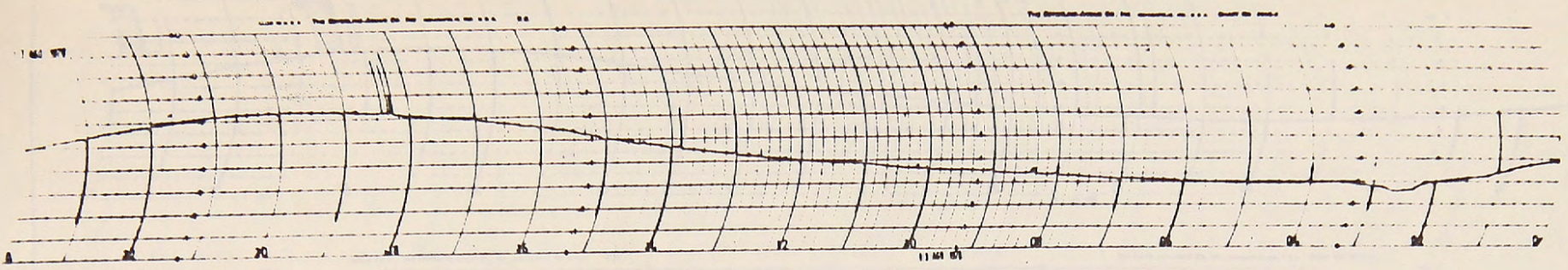
24 18 12 06 00

RUIDO COSMICO, 30 MHz

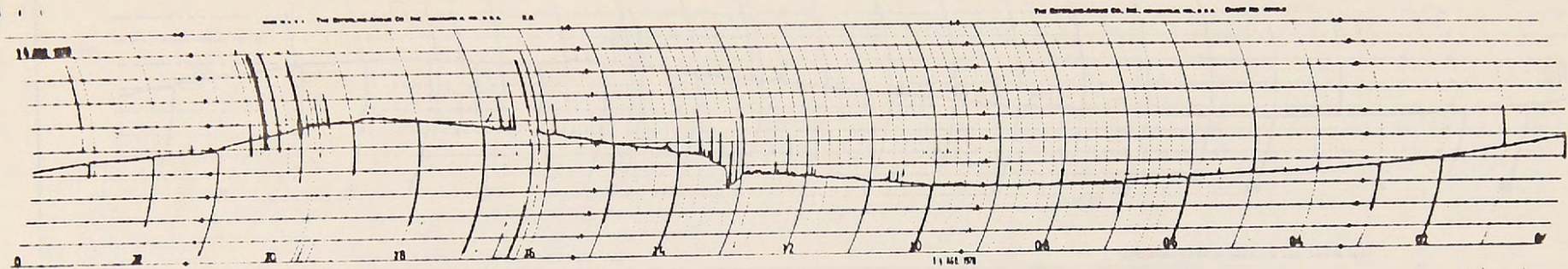
HORA LOCAL, 60° W

AGOSTO 1978

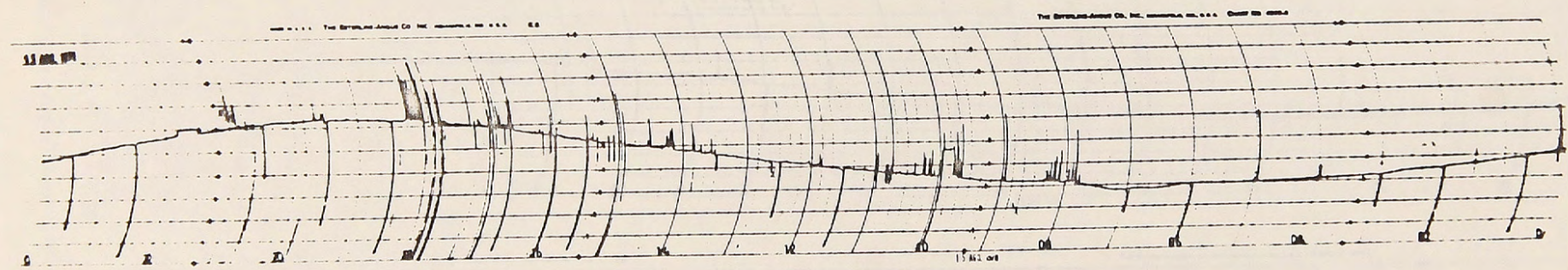
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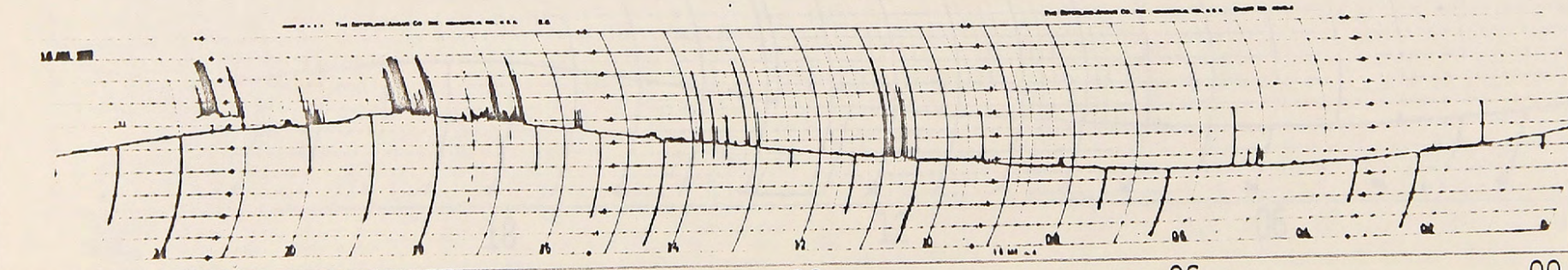
14



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16



24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

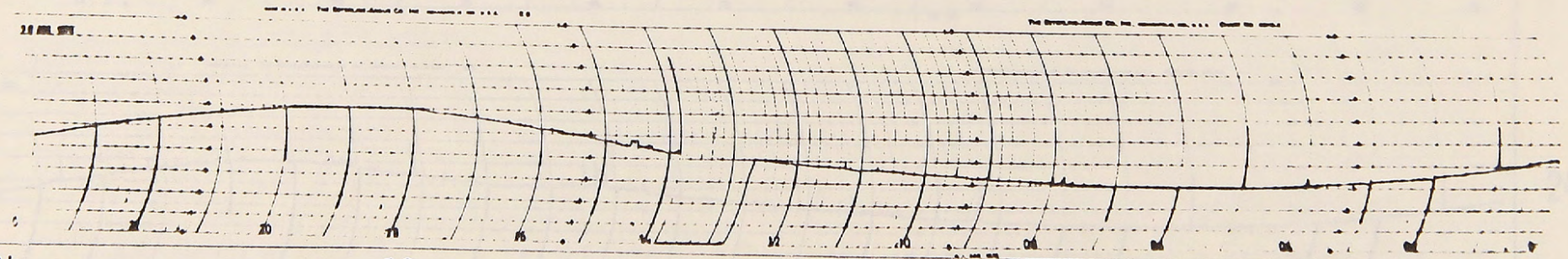
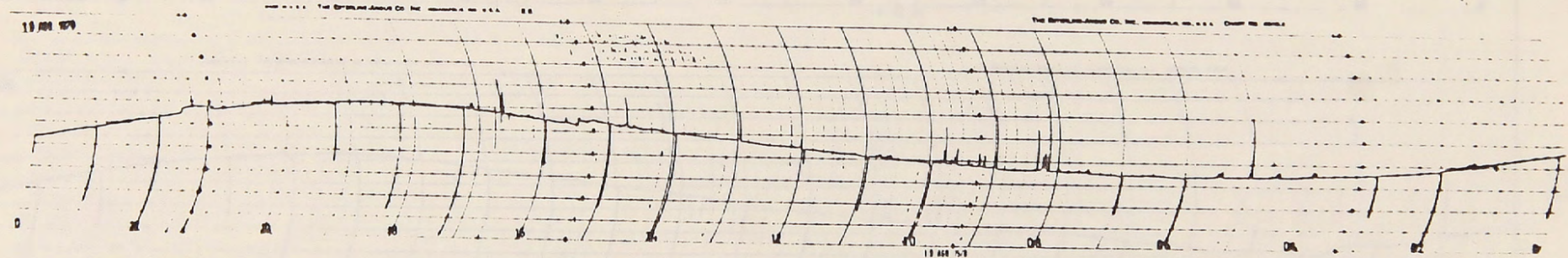
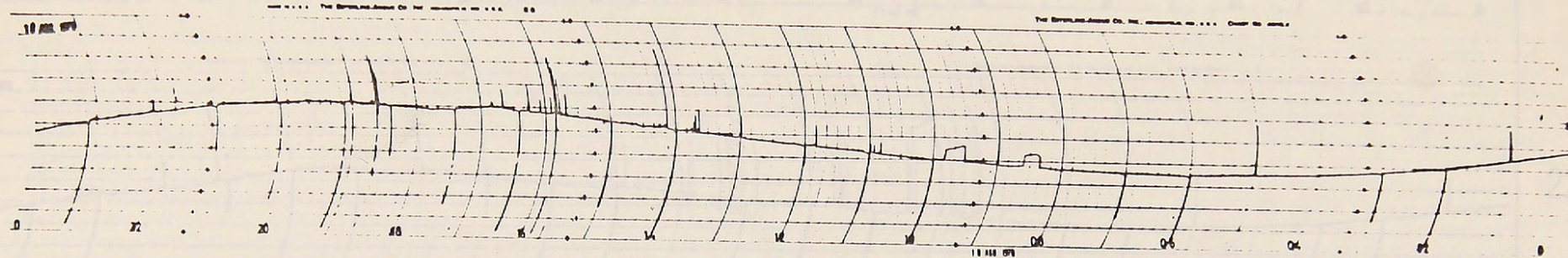
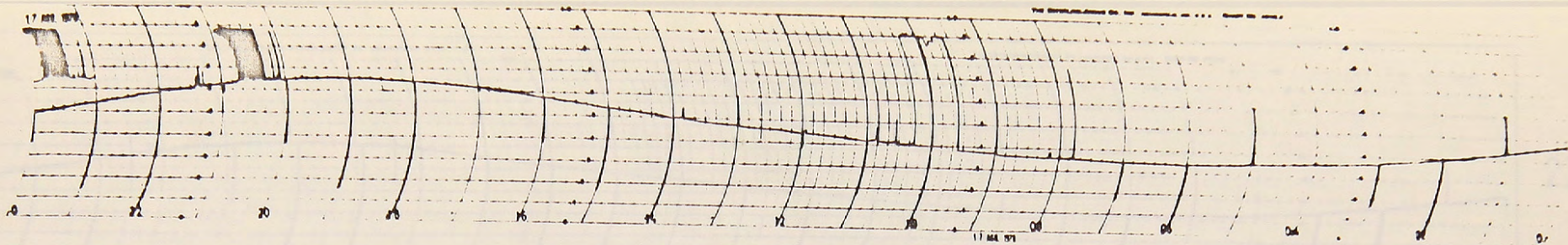
AGOSTO 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

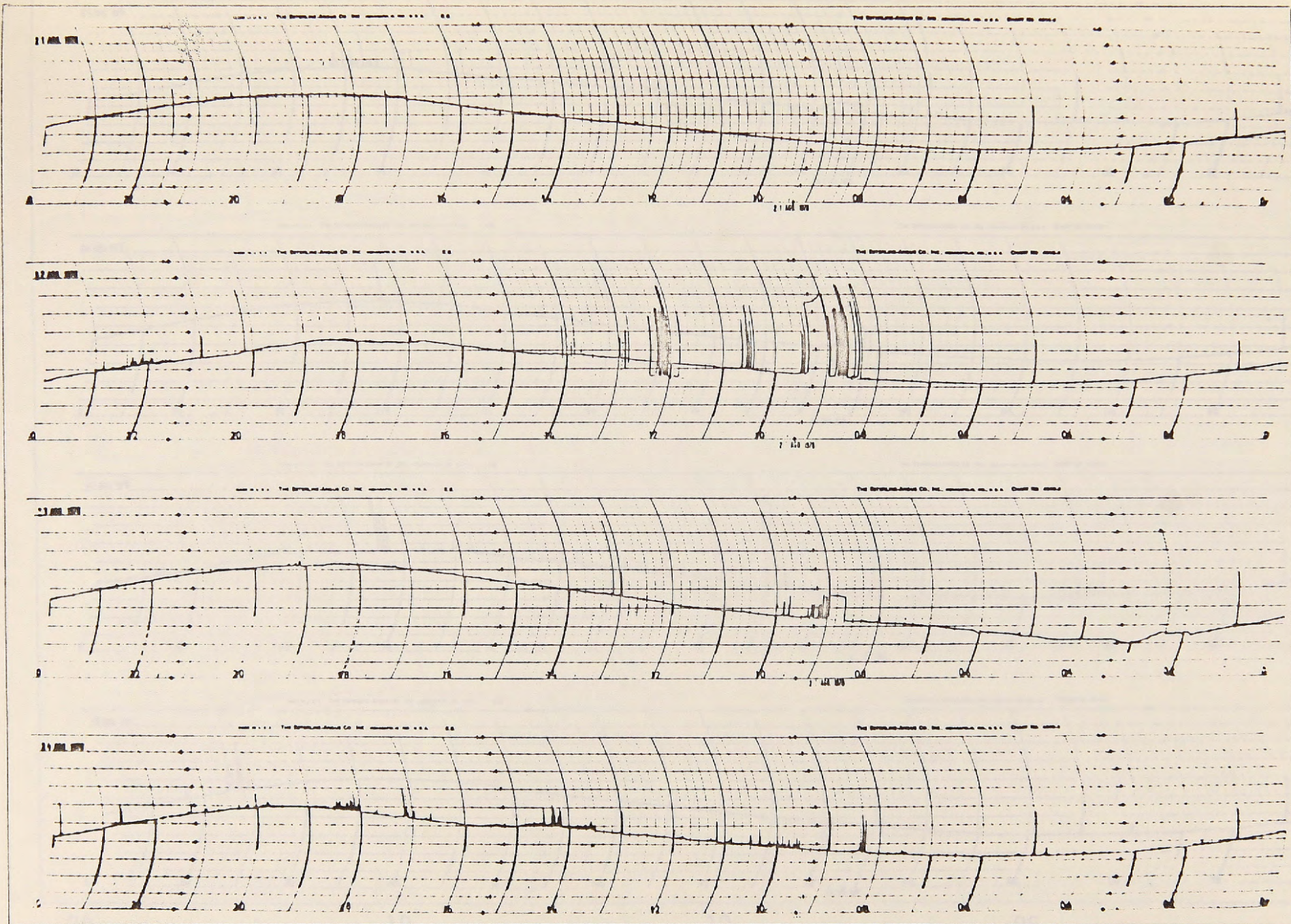
AGOSTO 1978

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RUIDO COSMICO, 30 MHz

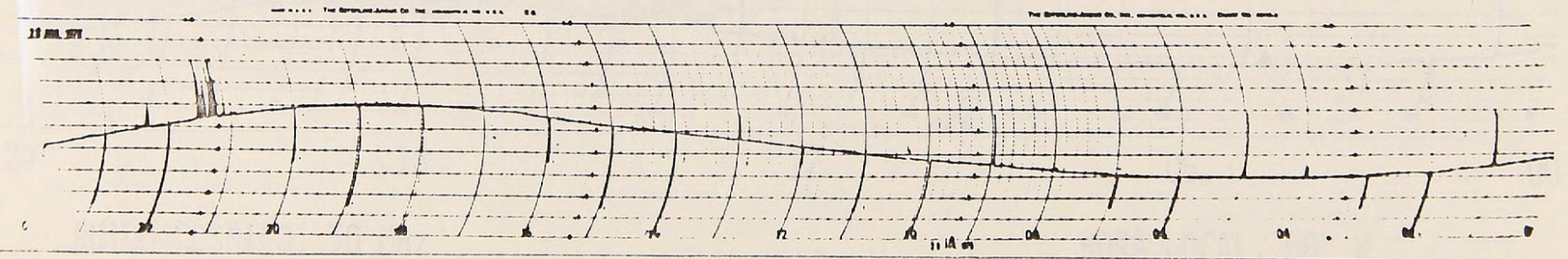
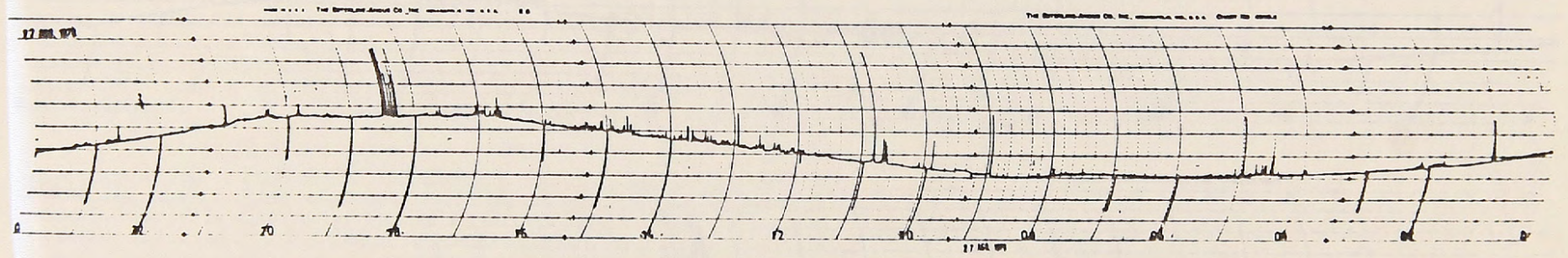
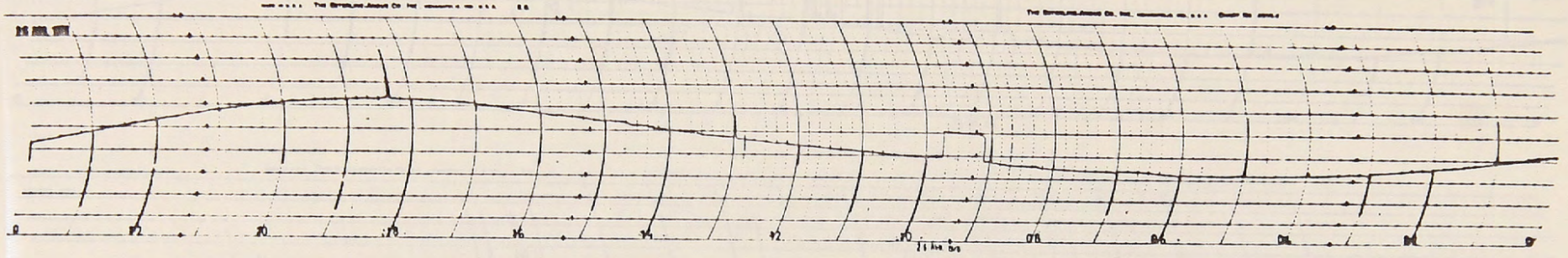
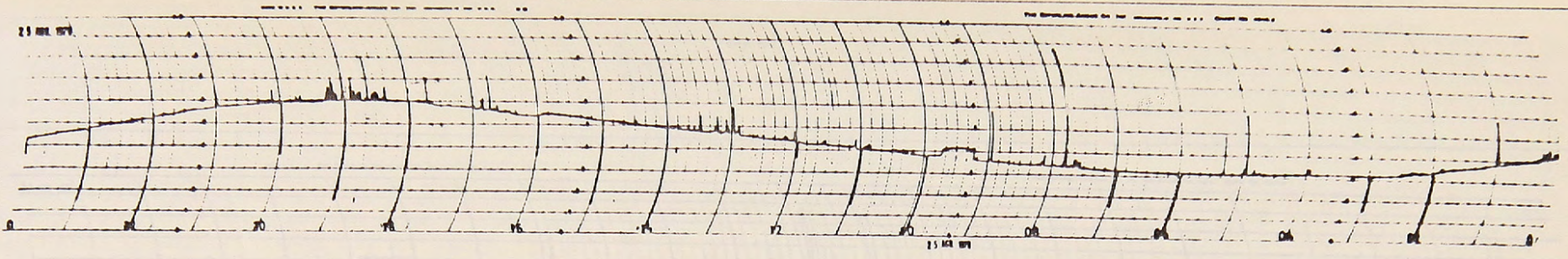
HORA LOCAL, 60° W

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

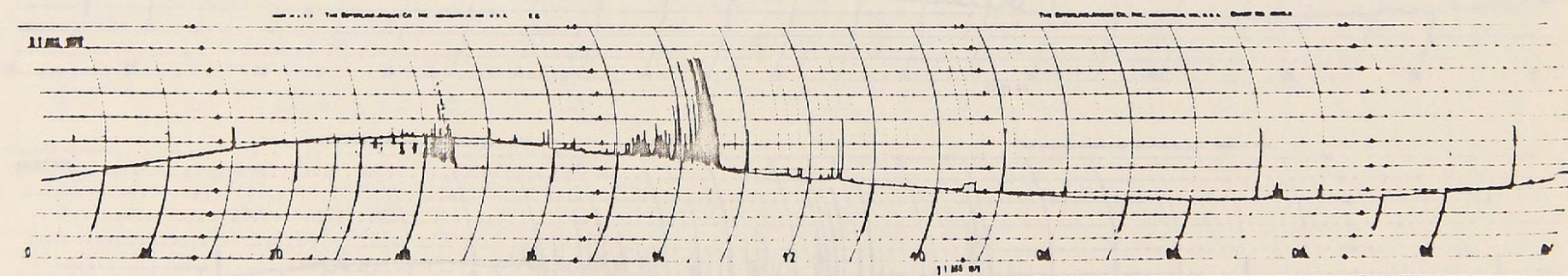
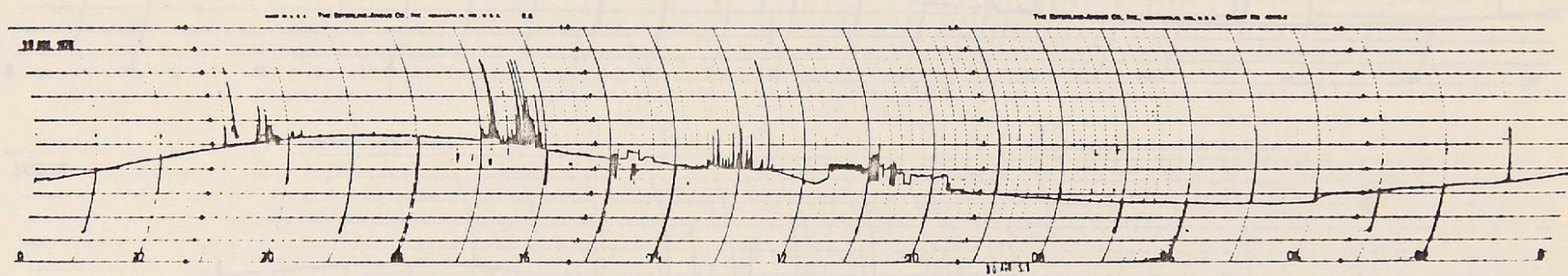
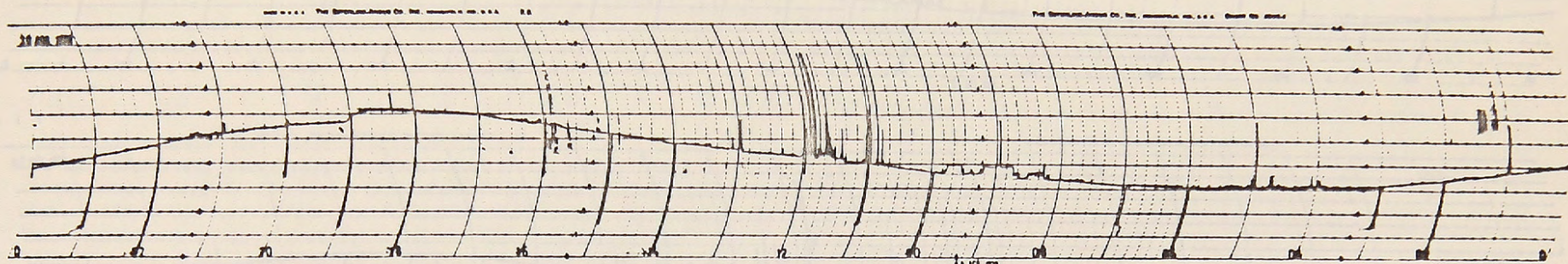
HORA LOCAL, 60° W

AGOSTO 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

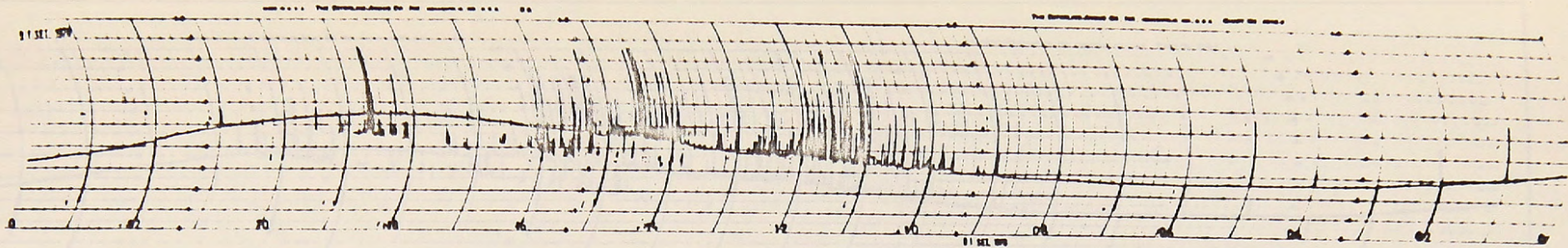
HORA LOCAL, 60° W

RUIDO COSMICO, 30 MHz

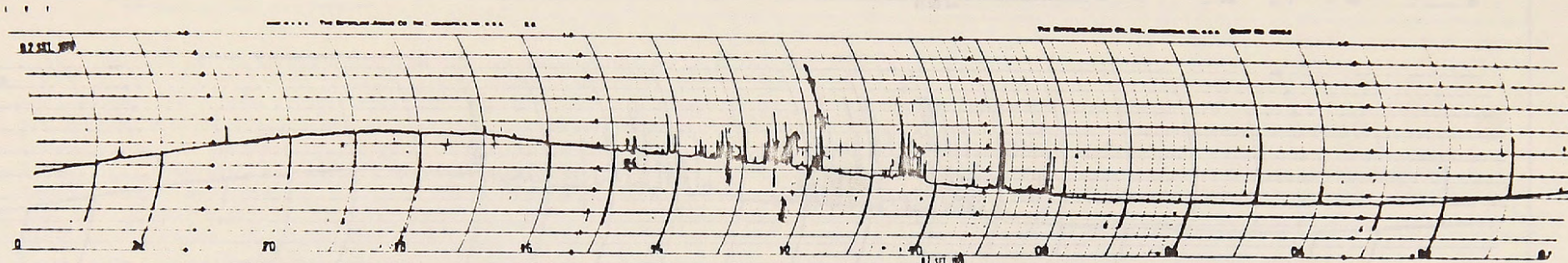
HORA LOCAL, 60° W

SEPTIEMBRE 1978

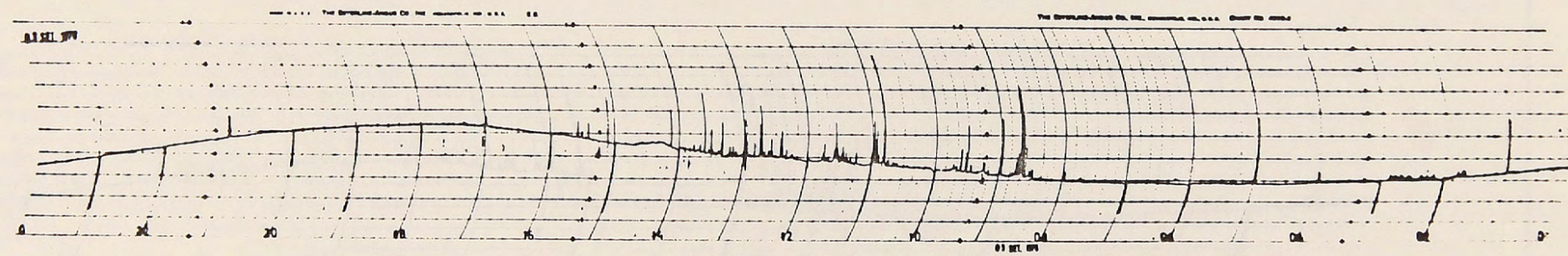
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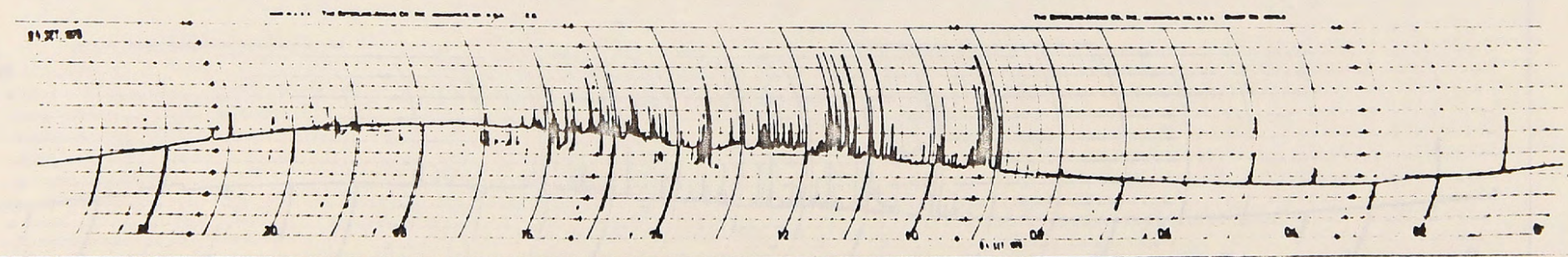
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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

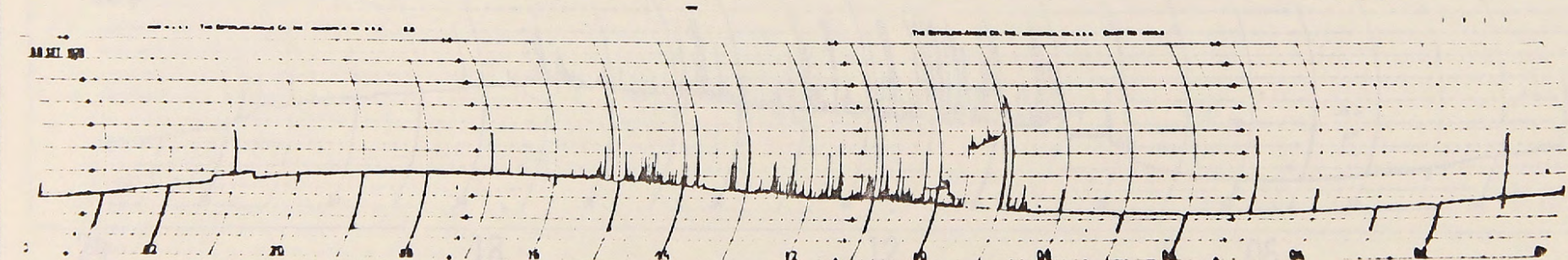
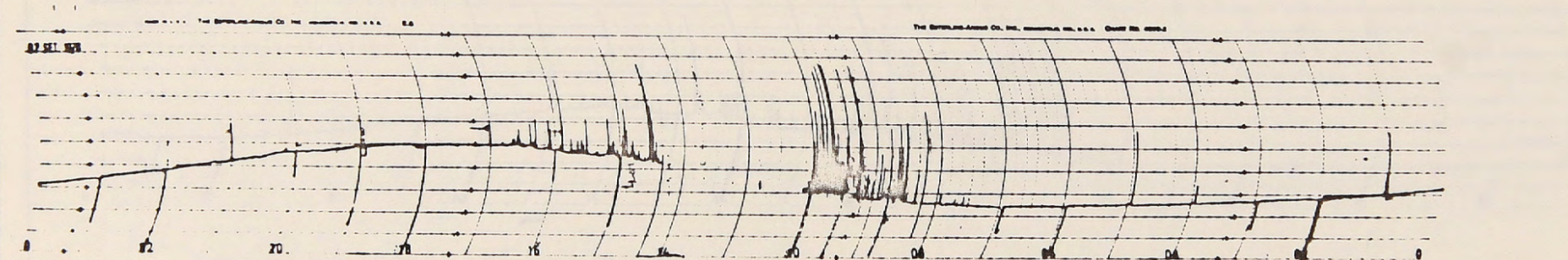
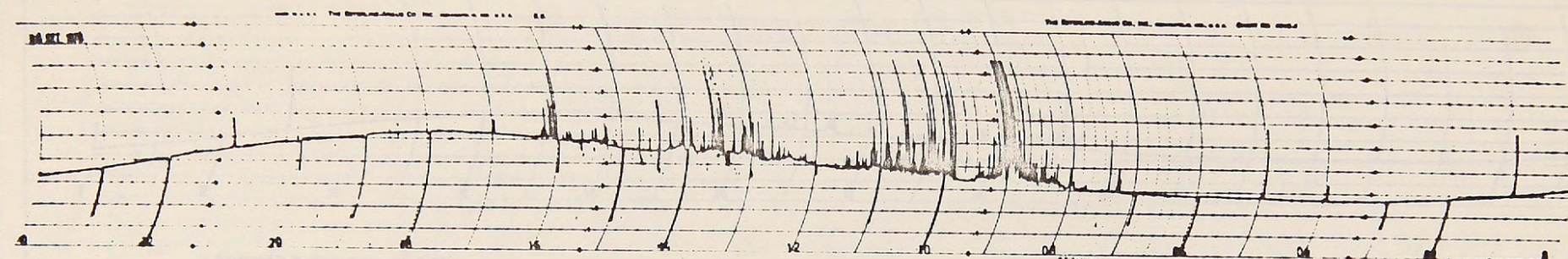
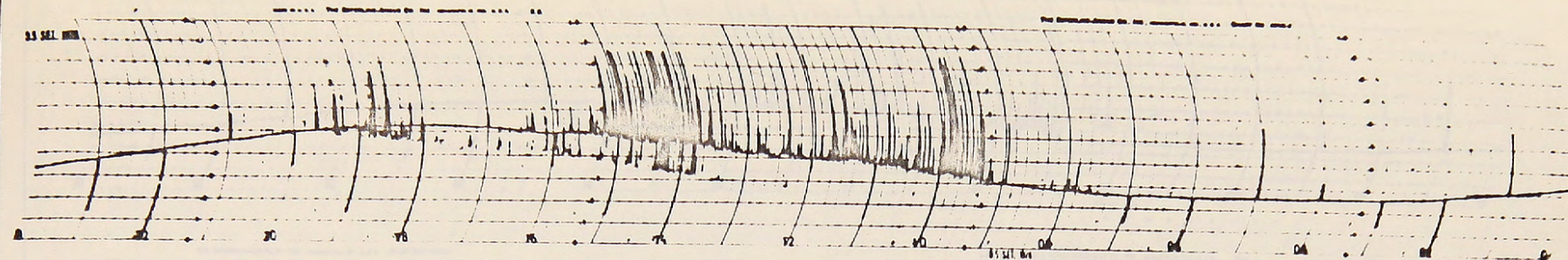
SEPTIEMBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

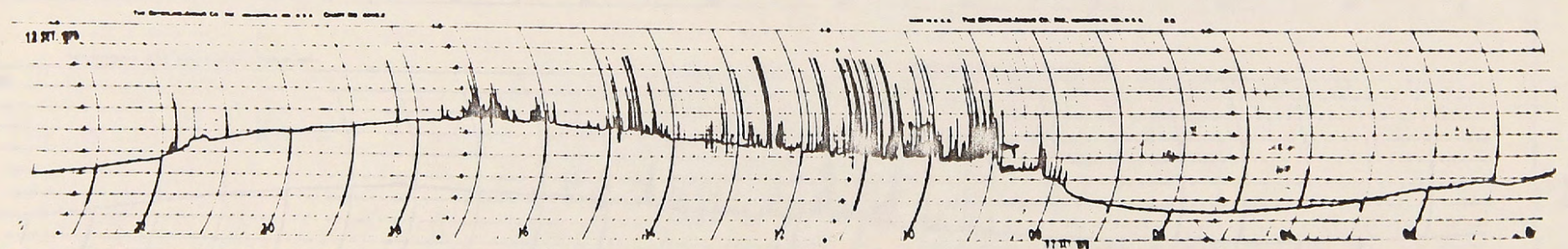
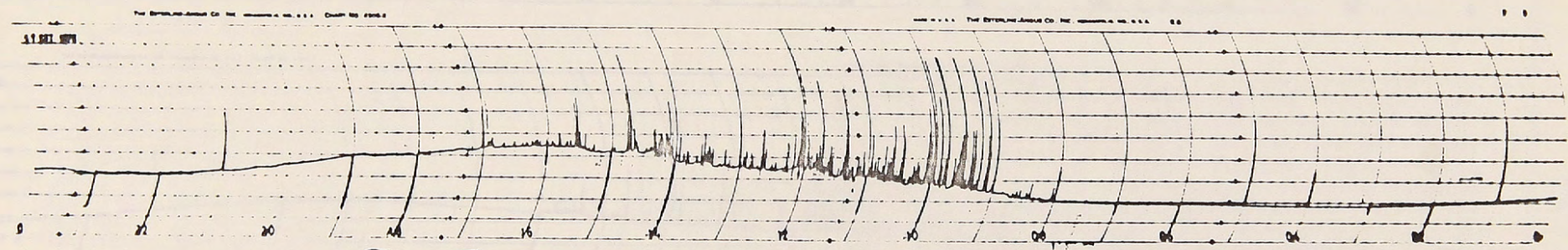
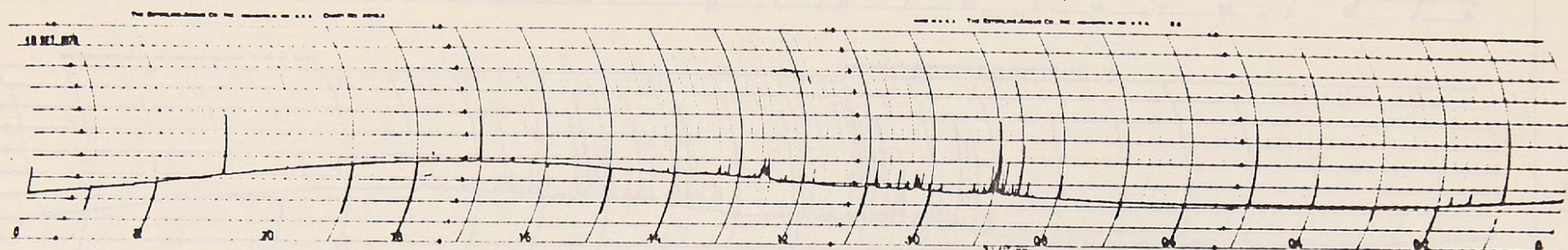
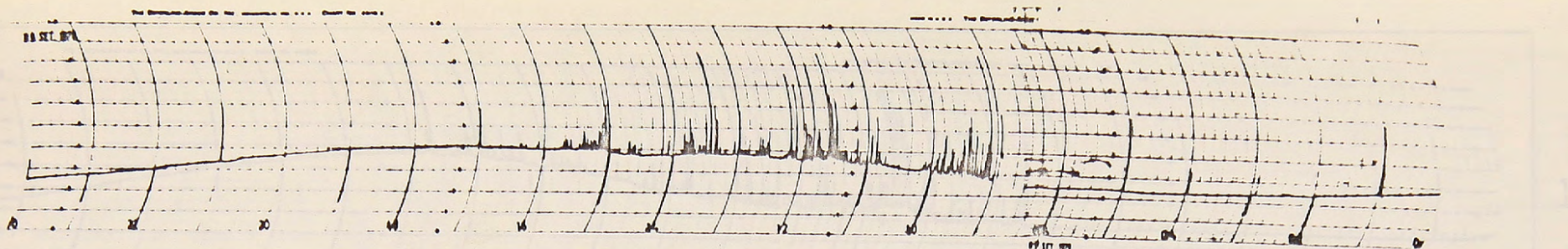
SEPTIEMBRE 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

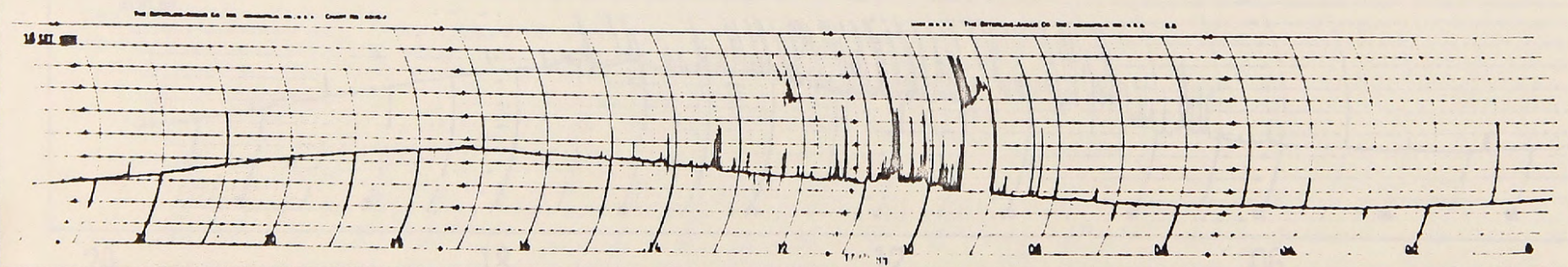
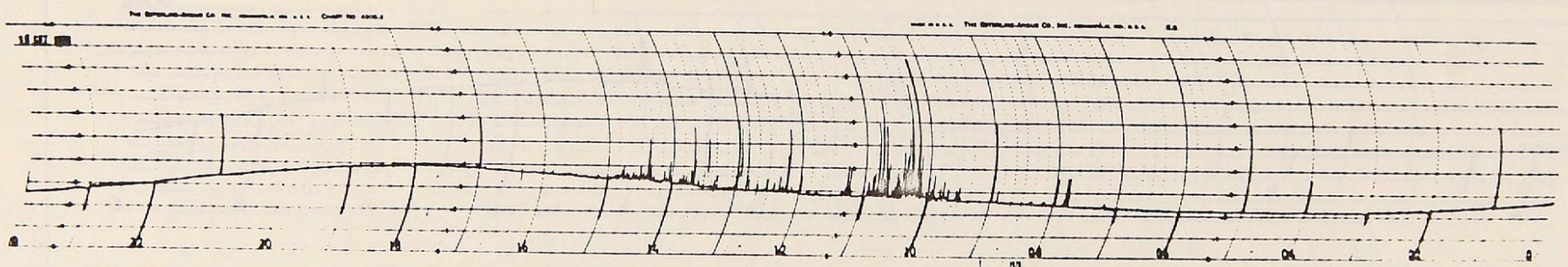
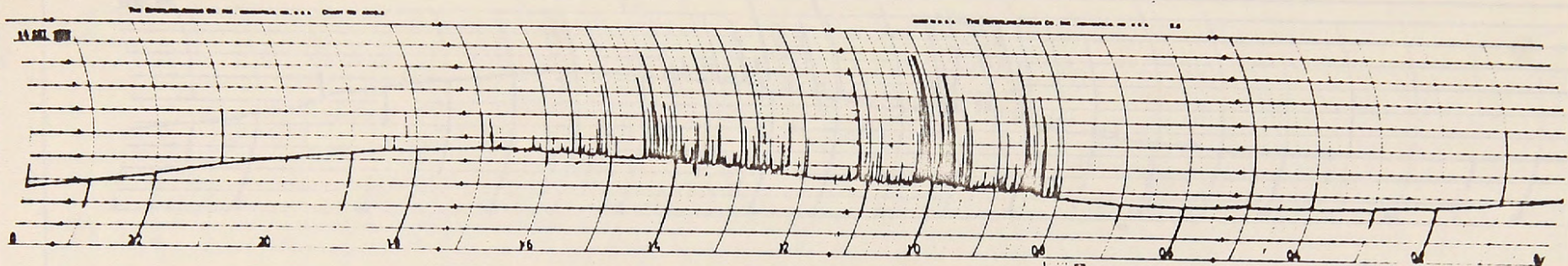
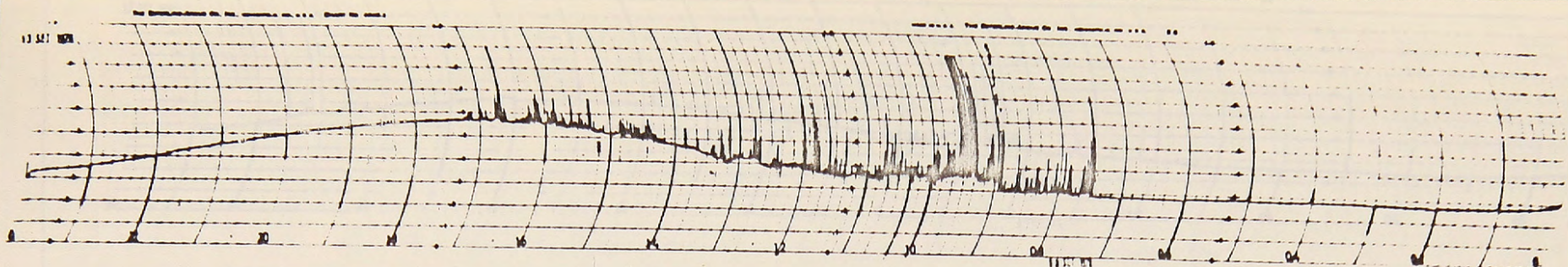
SEPTIEMBRE 1978

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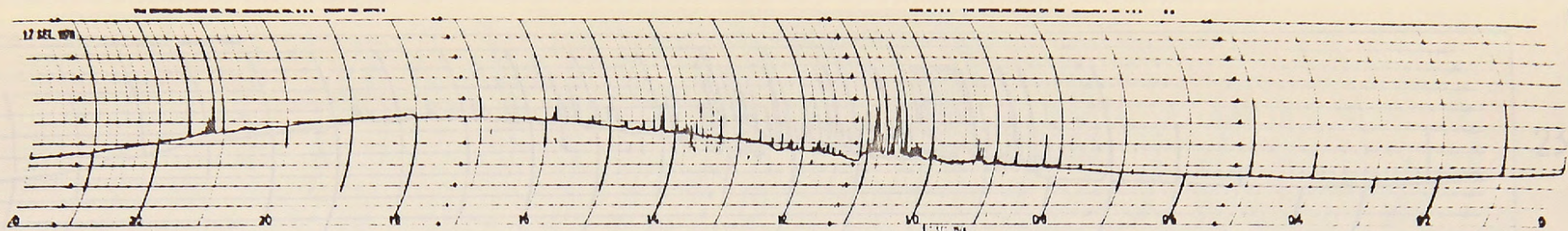
24 18 12 06 00

RUIDO COSMICO, 30 MHz

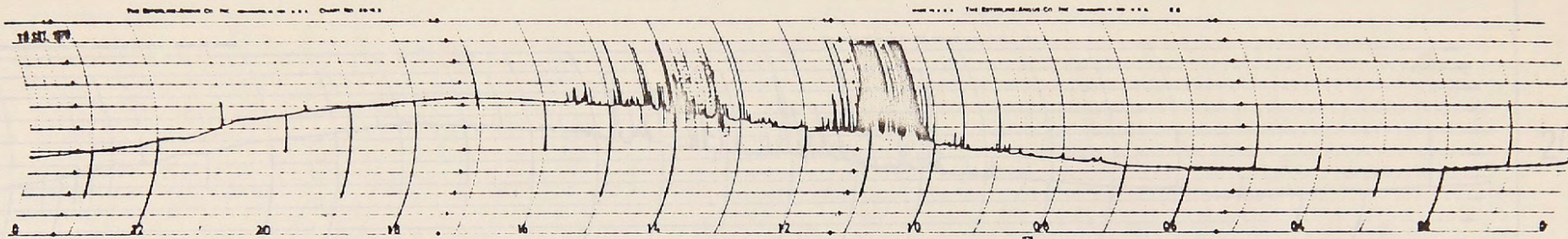
HORA LOCAL, 60° W

SEPTIEMBRE 1978

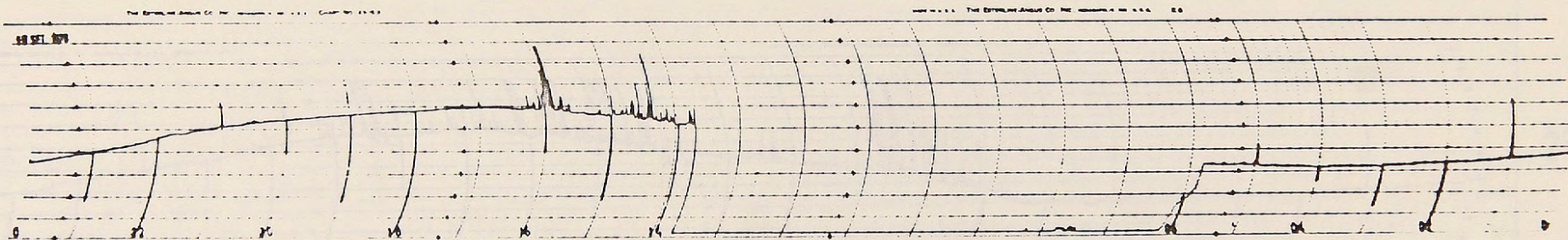
17



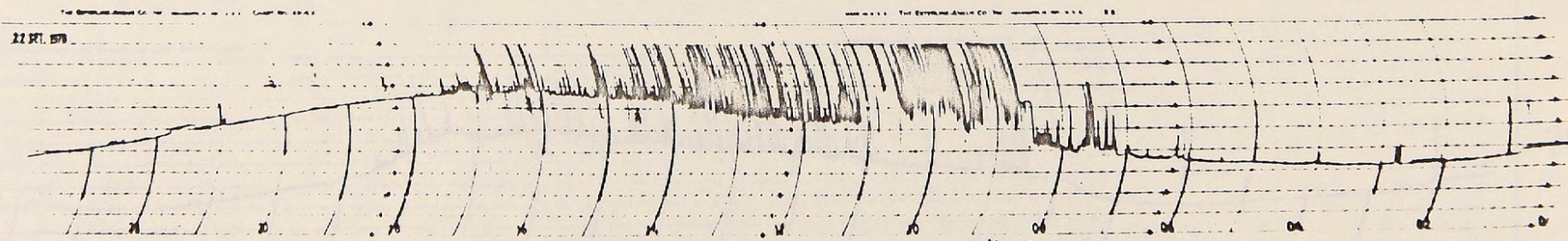
18



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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

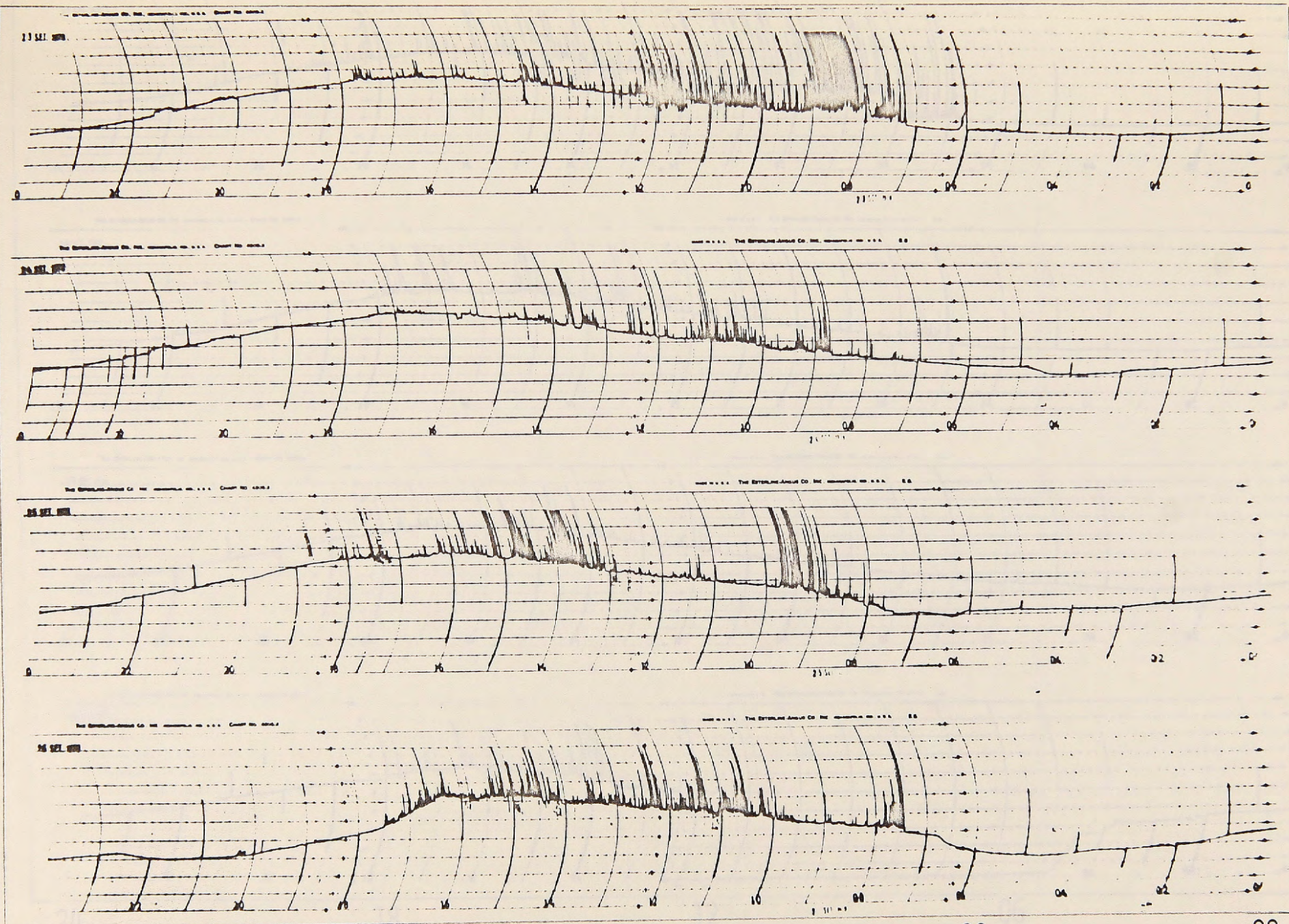
SEPTIEMBRE 1978

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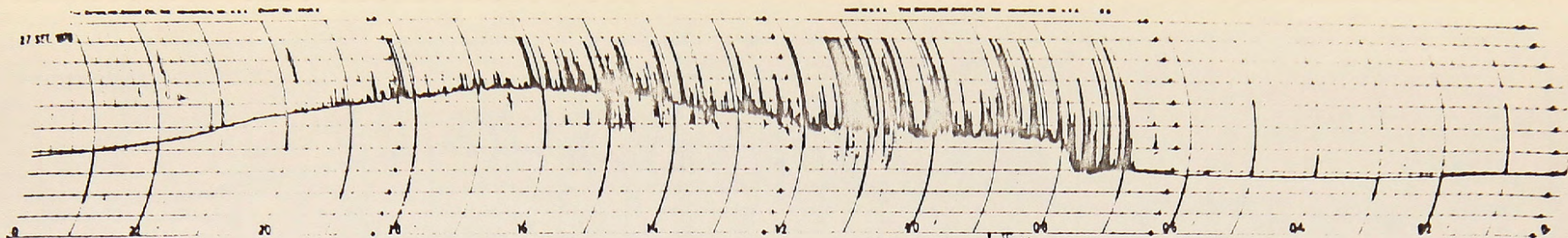
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RUIDO COSMICO, 30 MHz

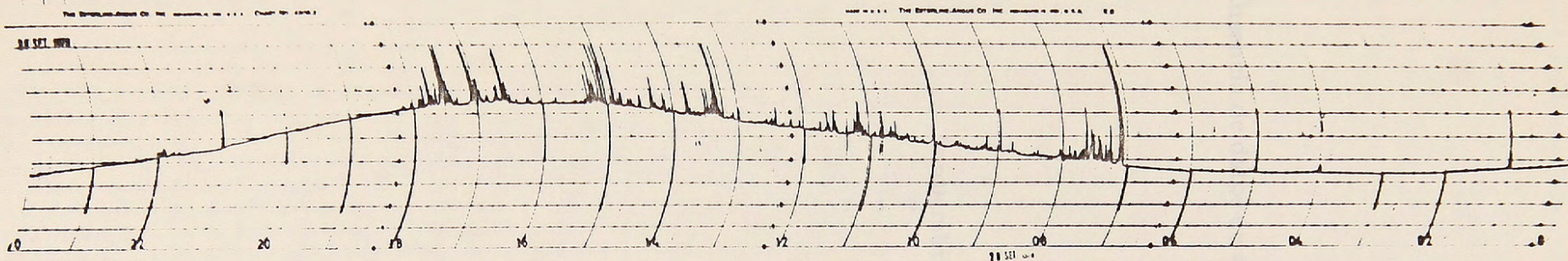
HORA LOCAL, 60° W

SEPTIEMBRE 1978

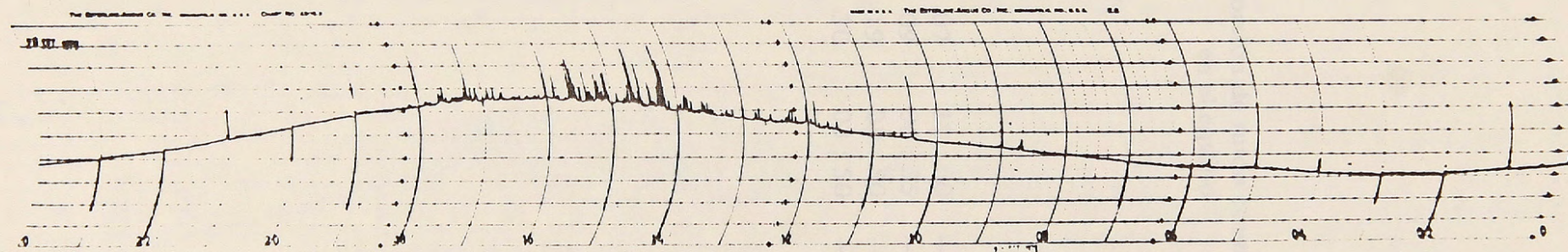
27



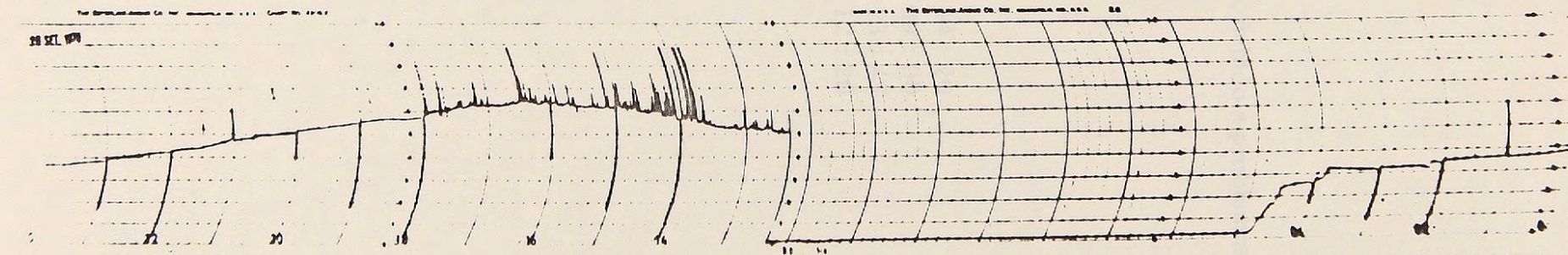
28



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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

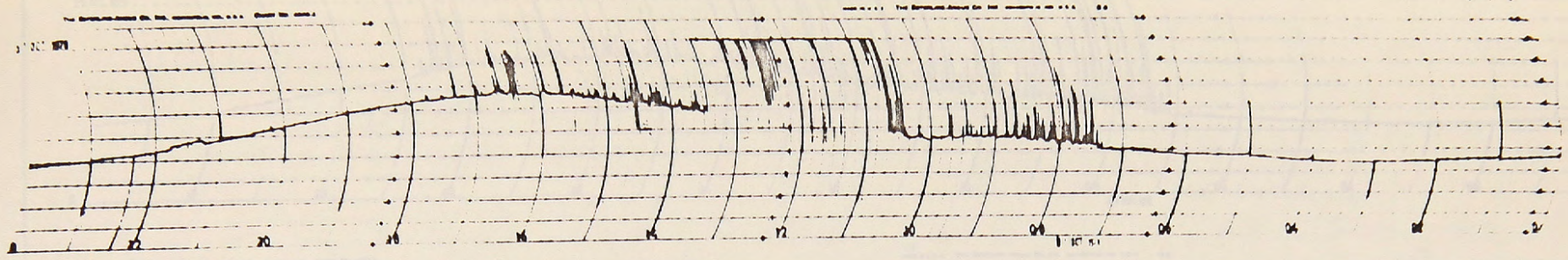
OCTUBRE 1973

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

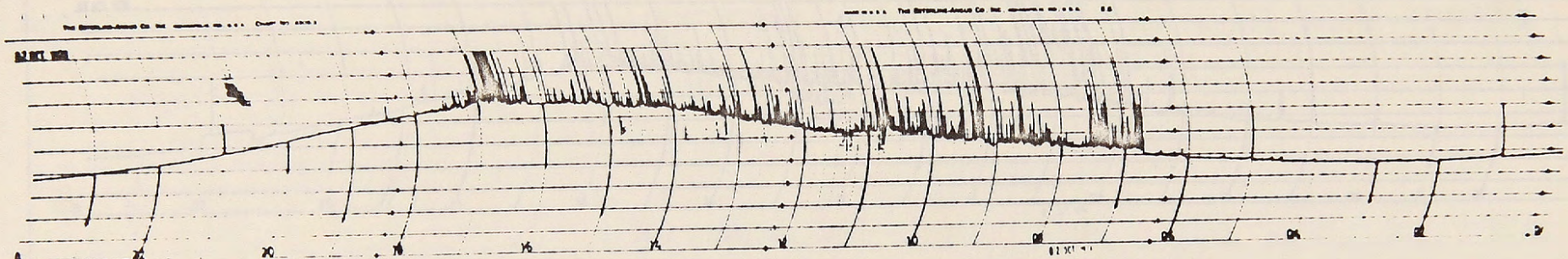
Septiembre	07	10 : 00	—	14 : 20
"	09	06 : 35	—	09 : 00
"	19	05 : 50	—	13 : 45
"	30	03 : 50	—	12 : 20

OCTUBRE 1978

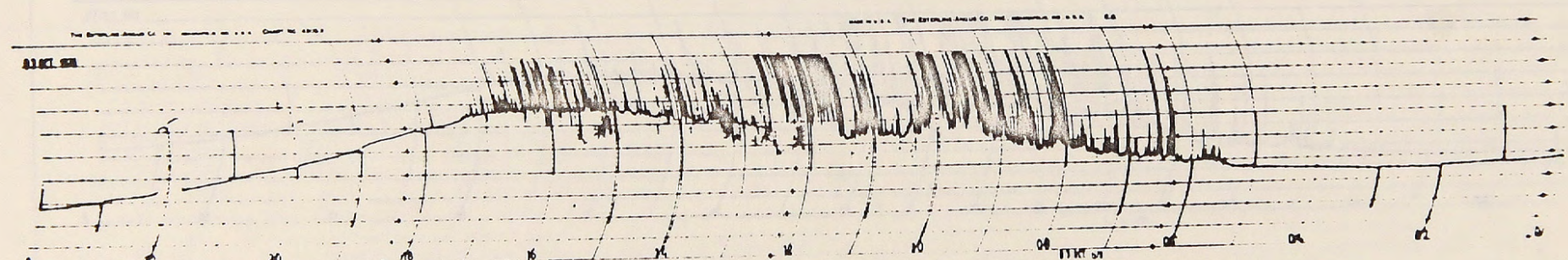
1



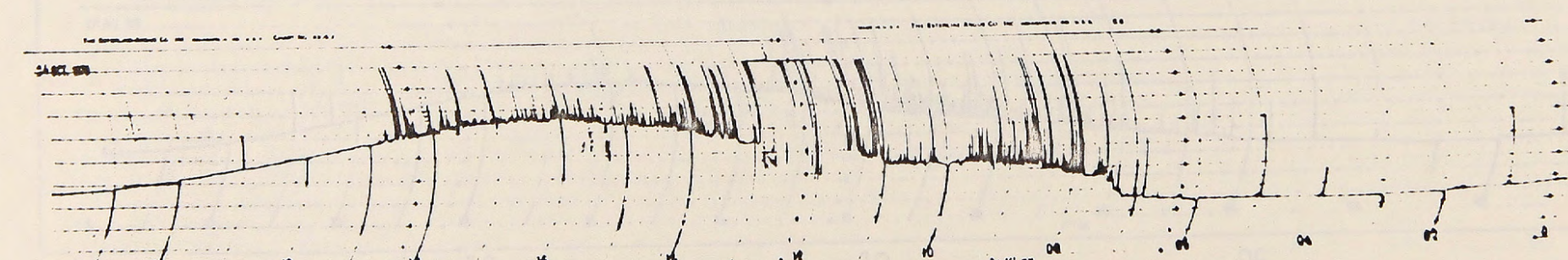
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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

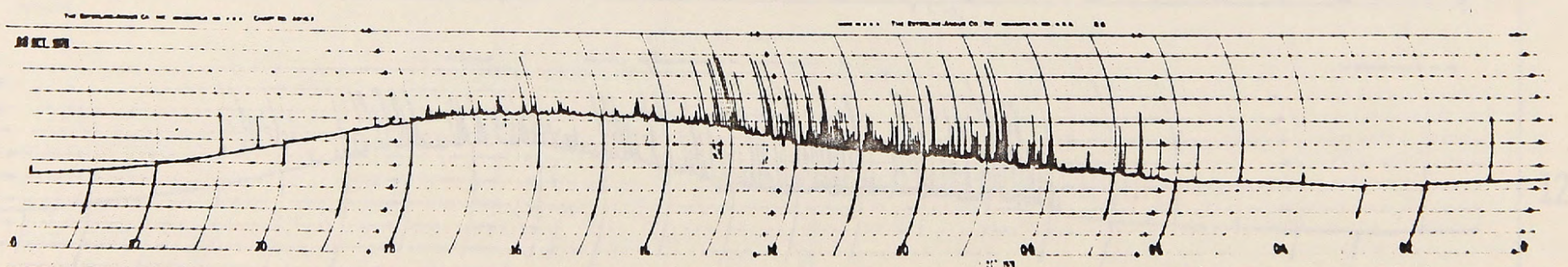
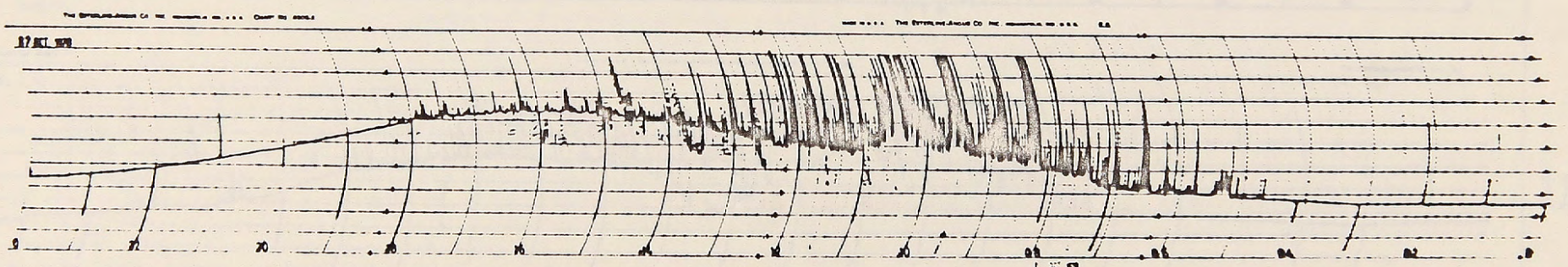
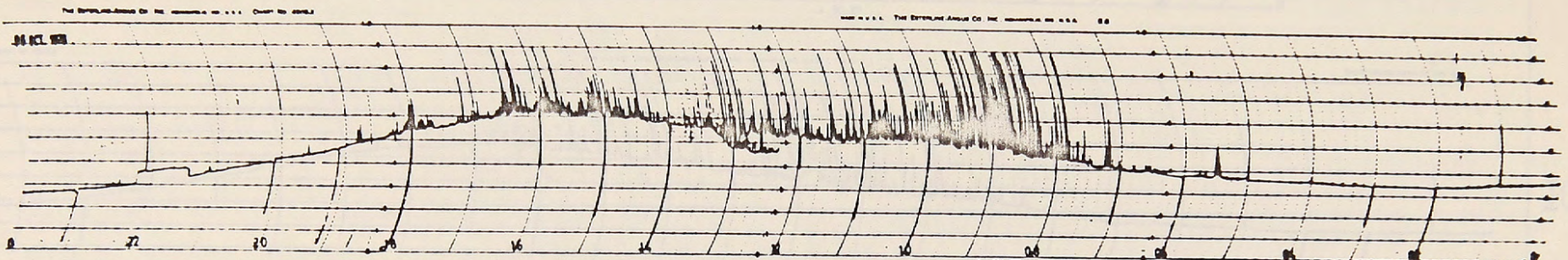
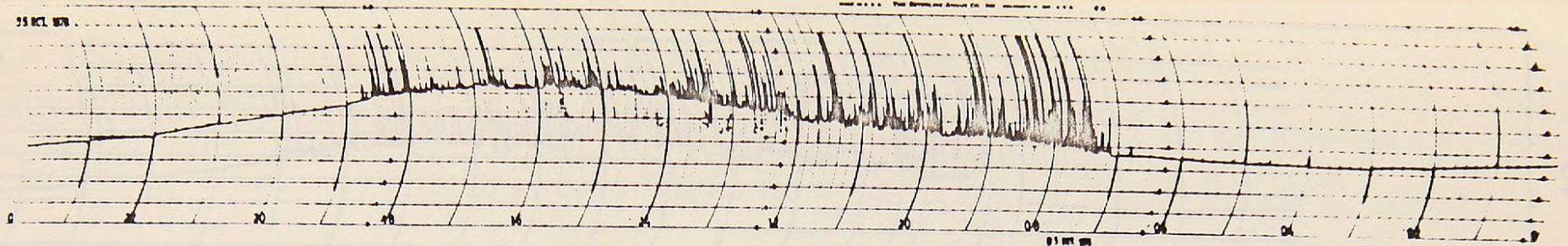
OCTUBRE 1978

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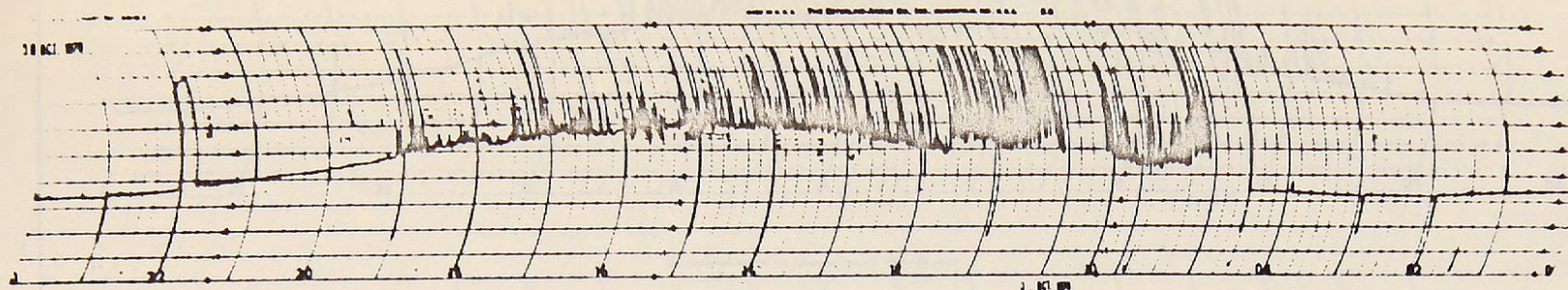
24 18 12 06 00

RUIDO COSMICO, 30 MHz

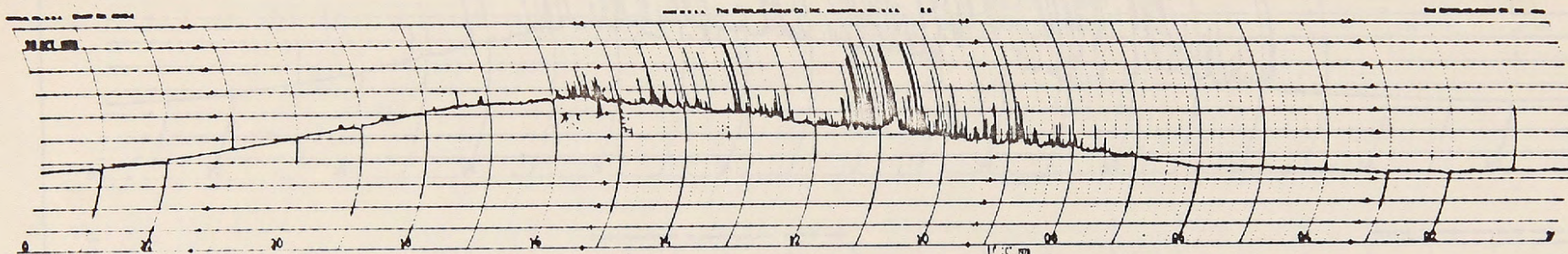
HORA LOCAL, 60° W

OCTUBRE 1978

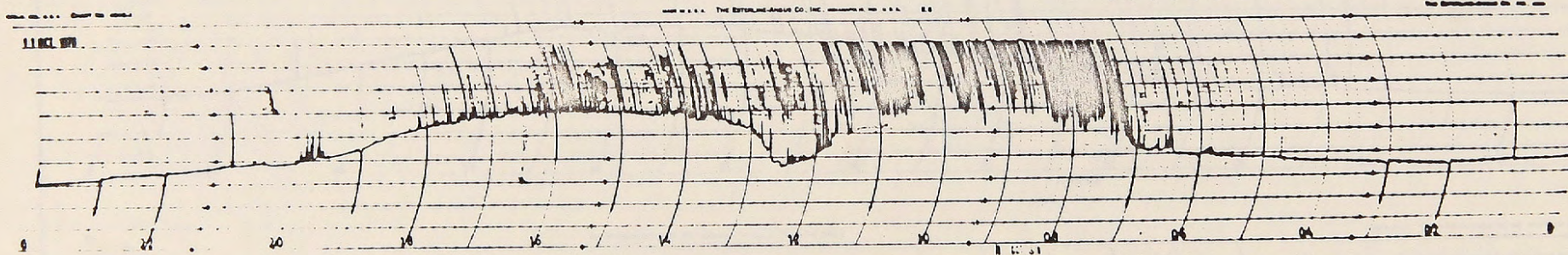
9



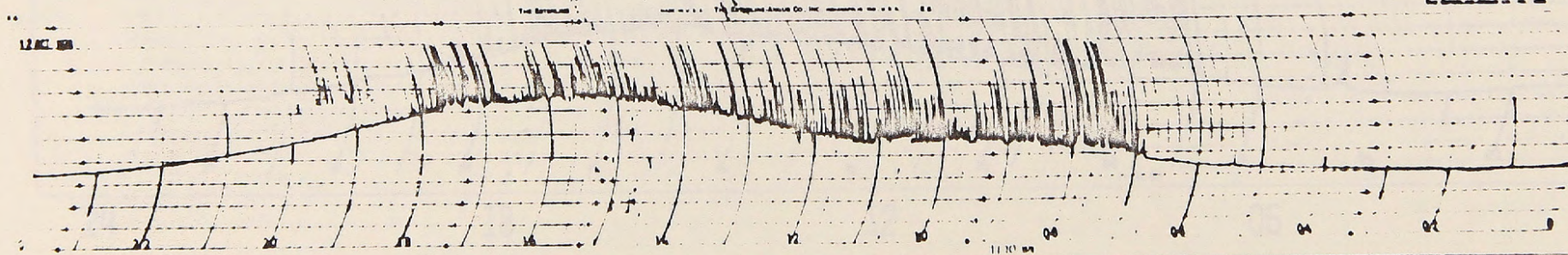
10



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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

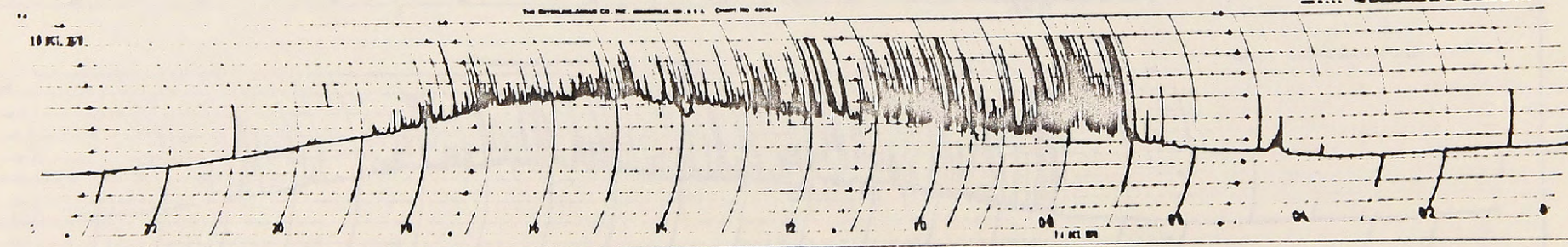
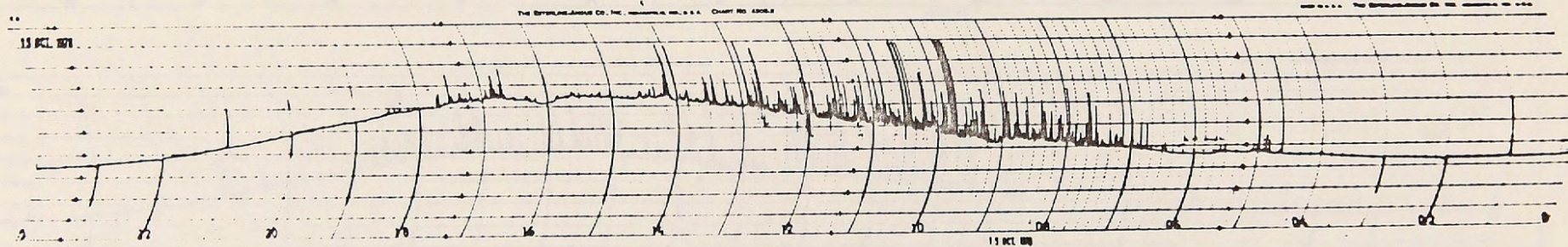
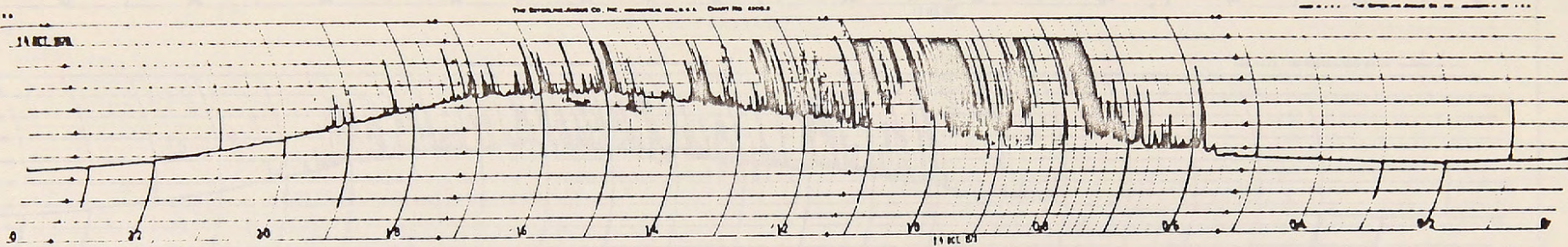
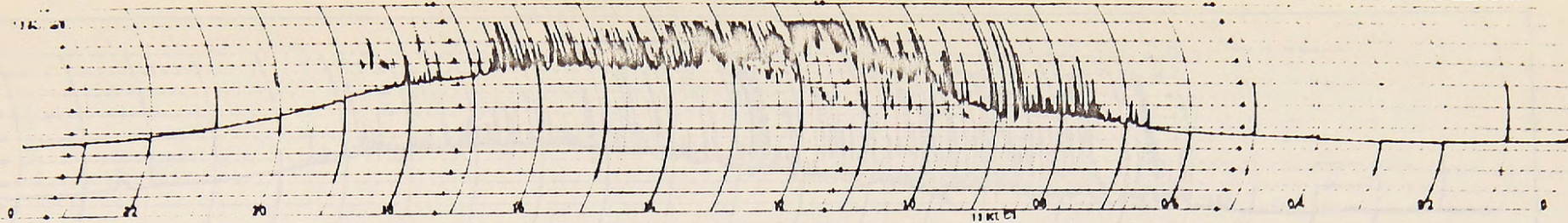
OCTUBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

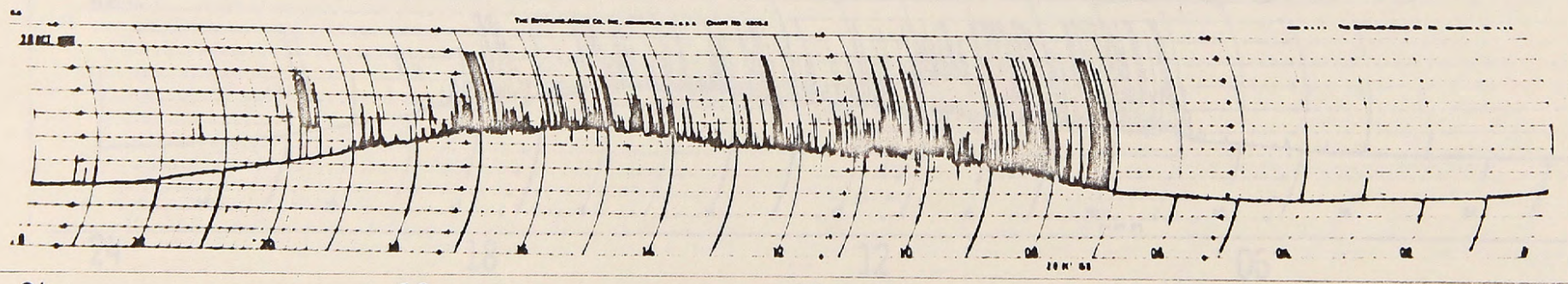
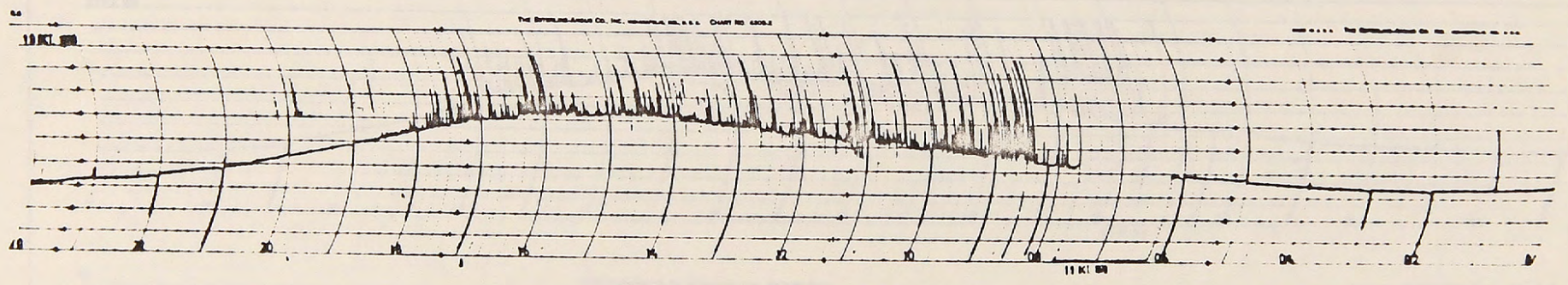
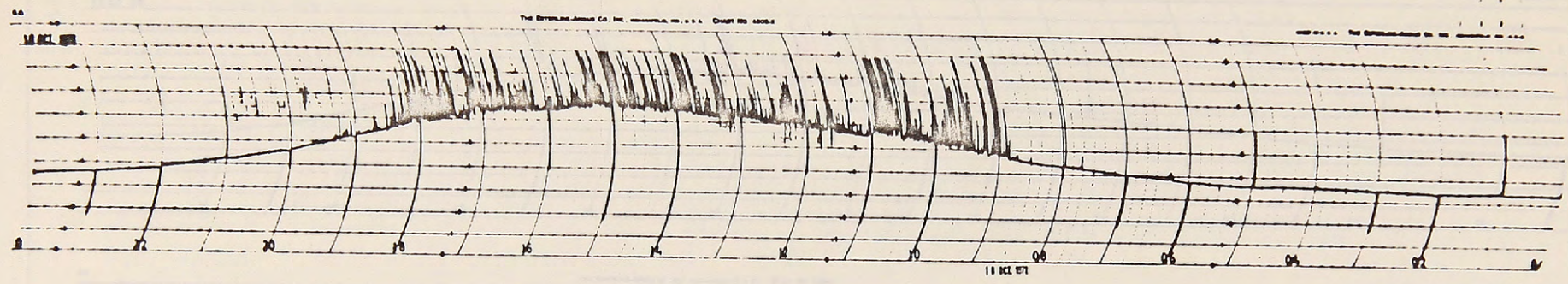
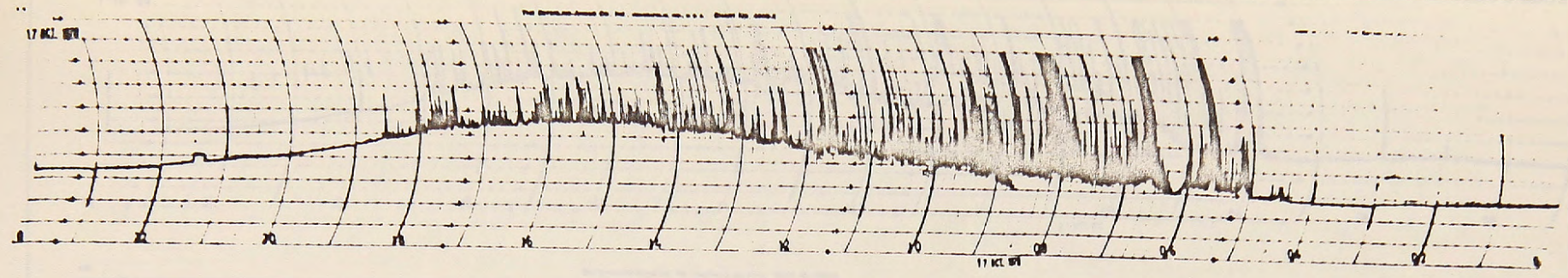
OCTUBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

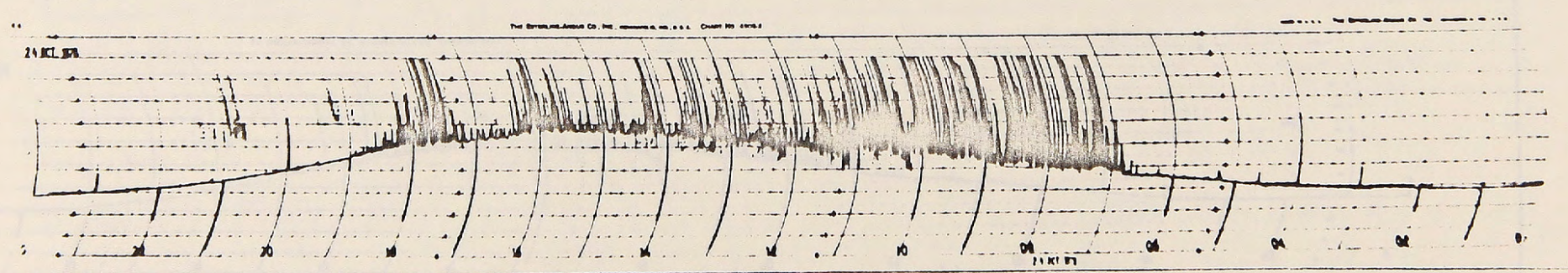
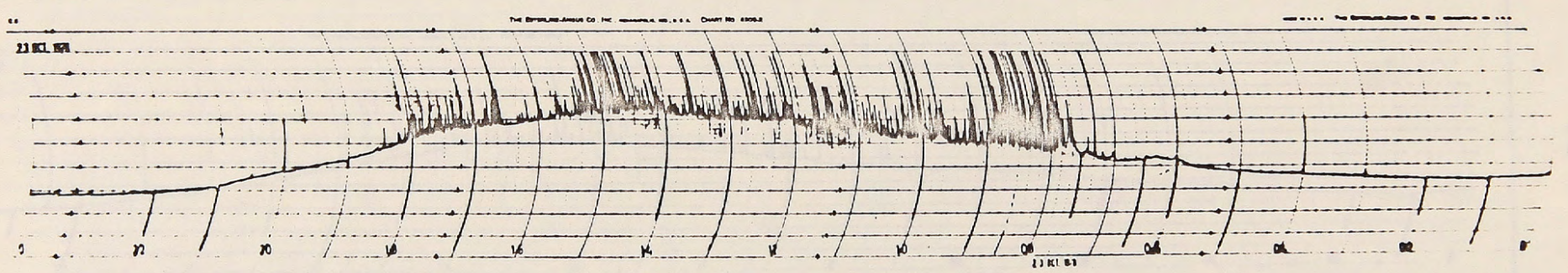
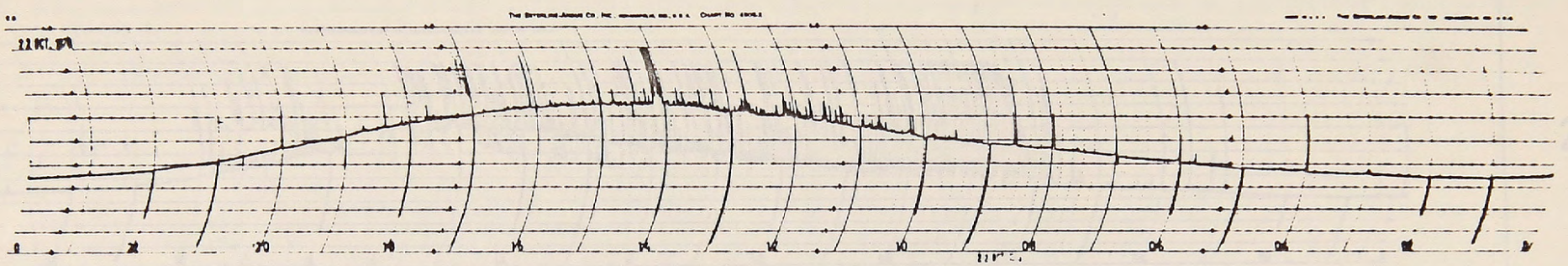
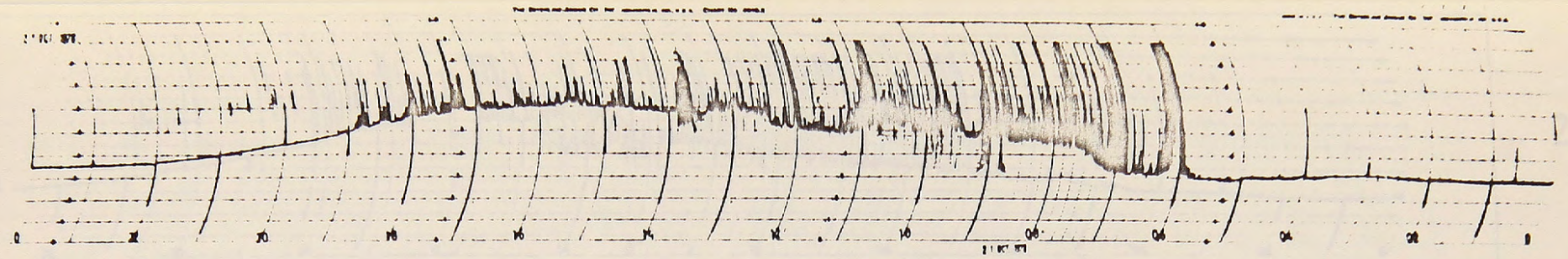
OCTUBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

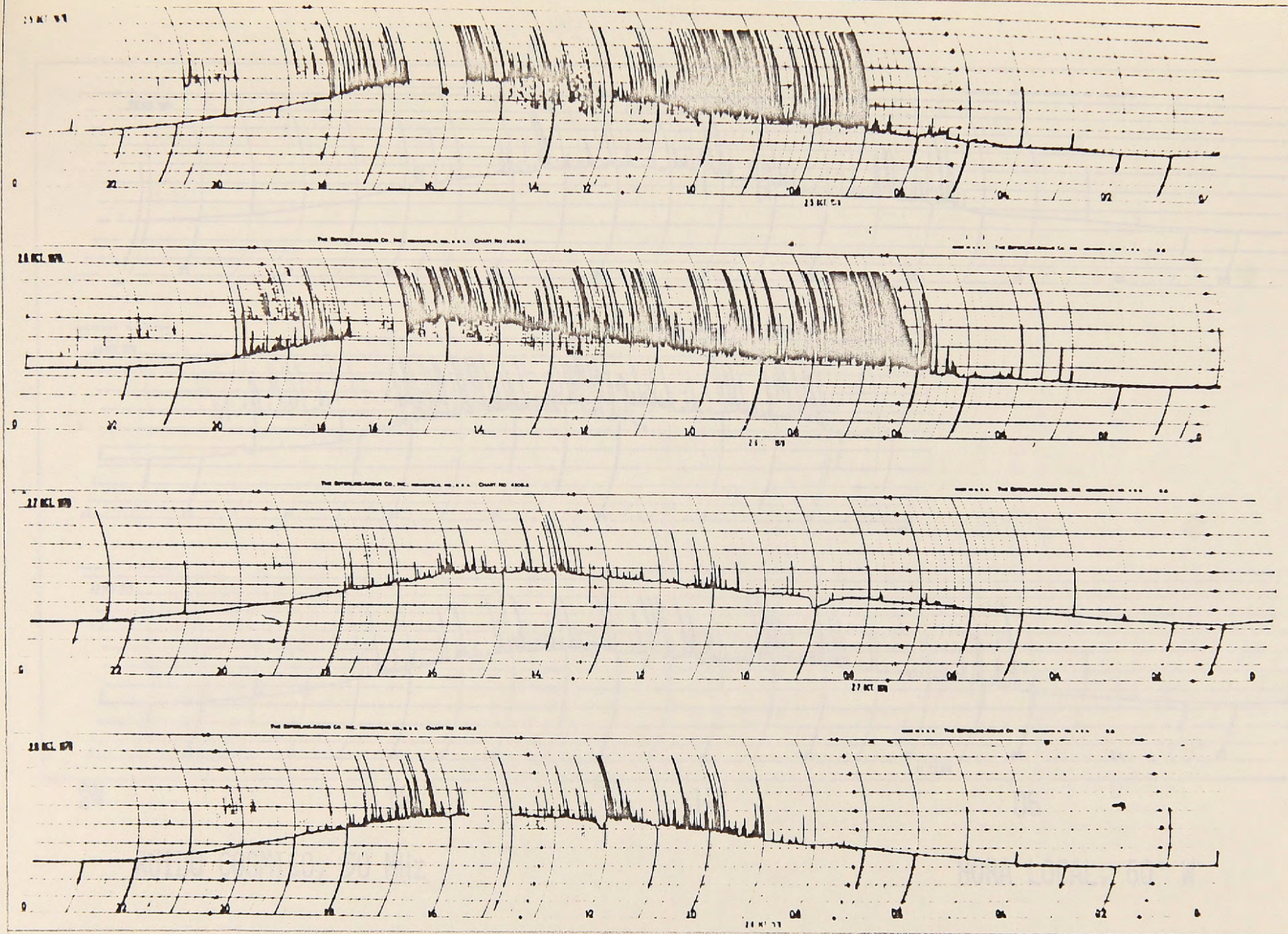
OCTUBRE 1978

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RUIDO COSMICO, 30 MHz

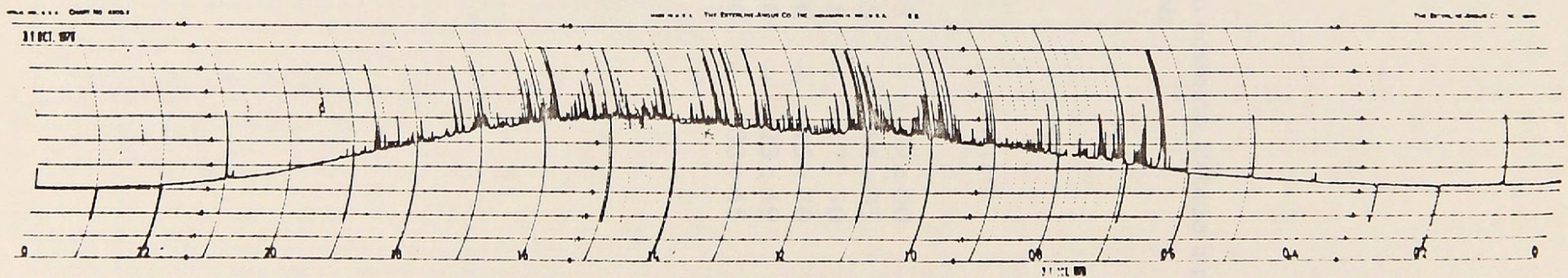
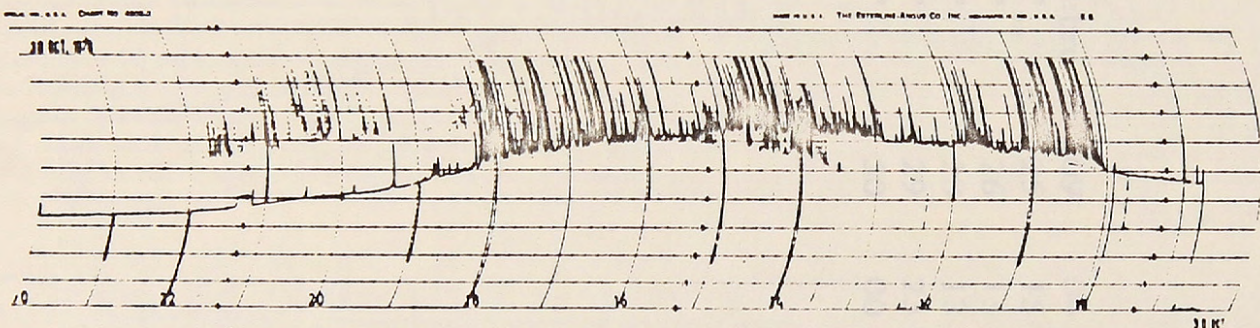
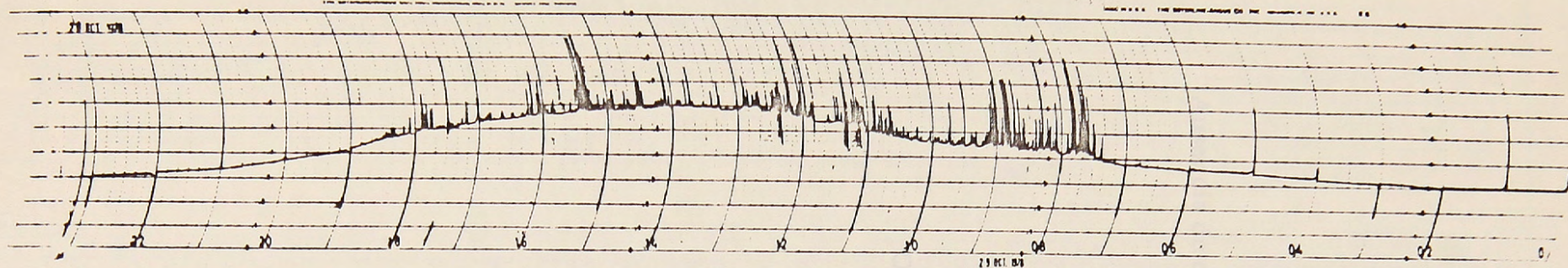
HORA LOCAL, 60° W

OCTUBRE 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

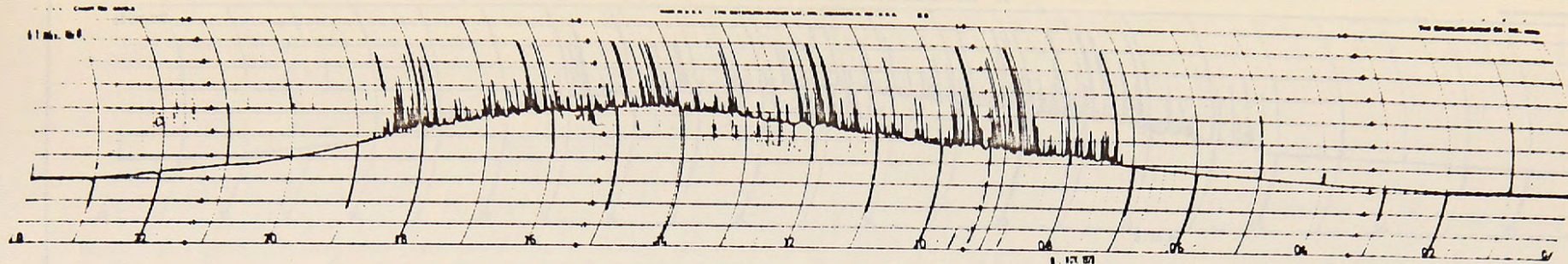
NOVIEMBRE 1978

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

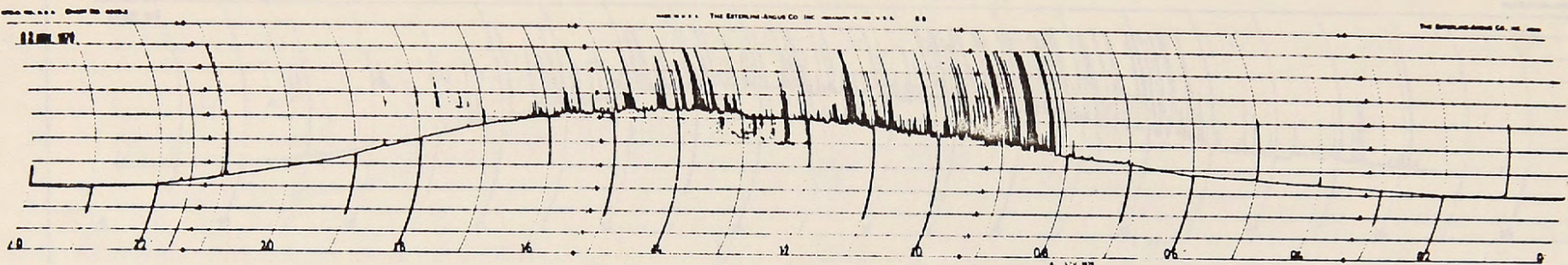
Octubre	09	04 : 35	—	09 : 00
”	25	15 : 35	—	16 : 35
”	26	15 : 45	—	17 : 50
”	28	13 : 50	—	15 : 40
”	29	23 : 10	—	23 : 59
”	30	00 : 00	—	08 : 45

NOVIEMBRE 1978

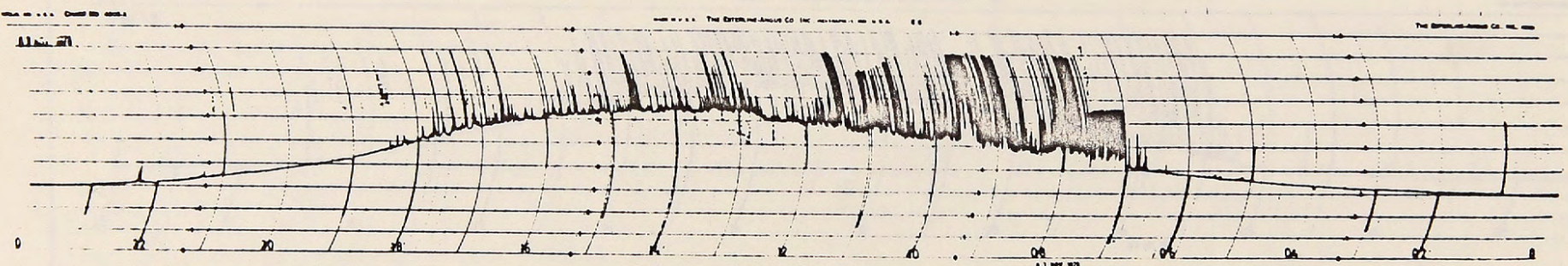
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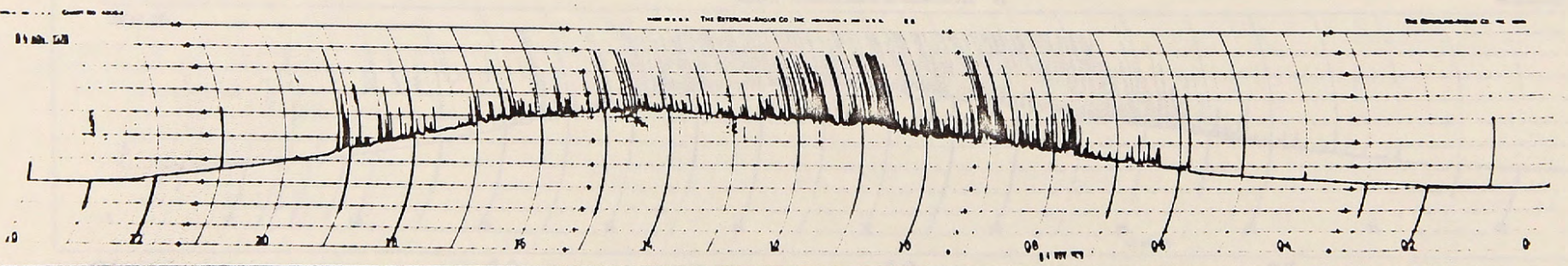
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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

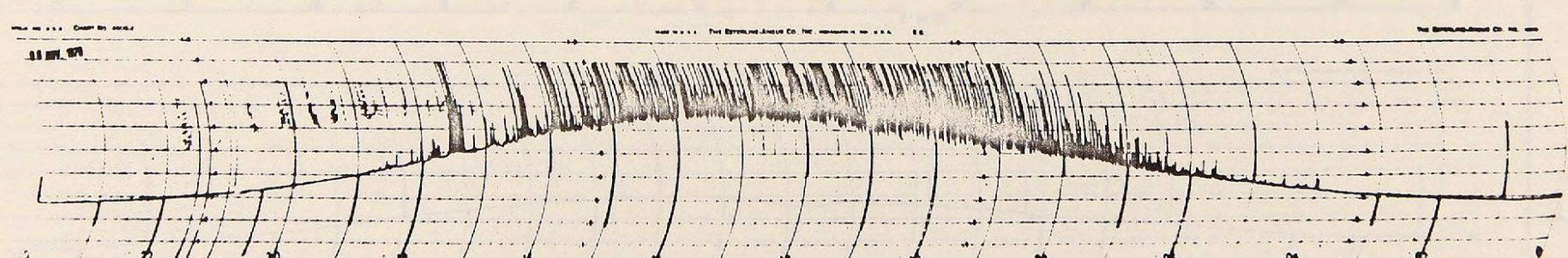
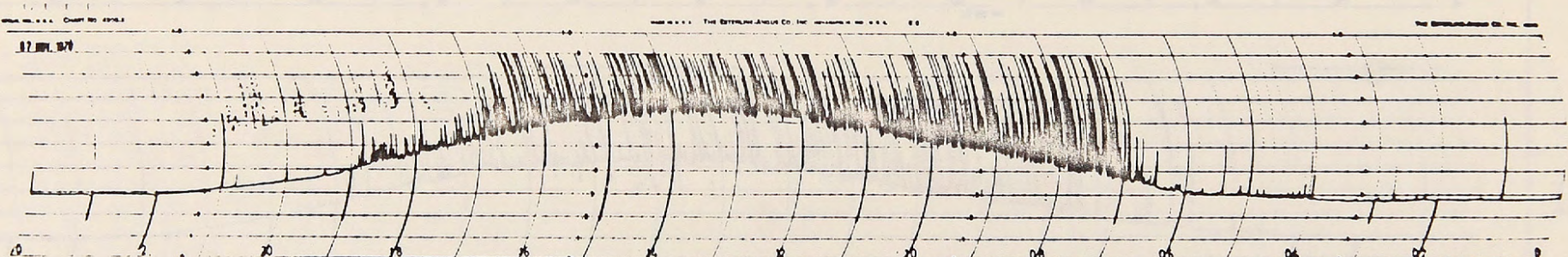
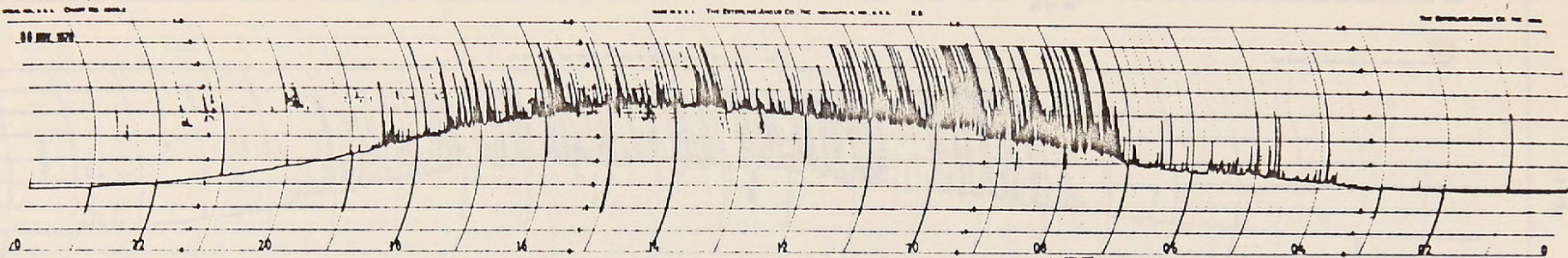
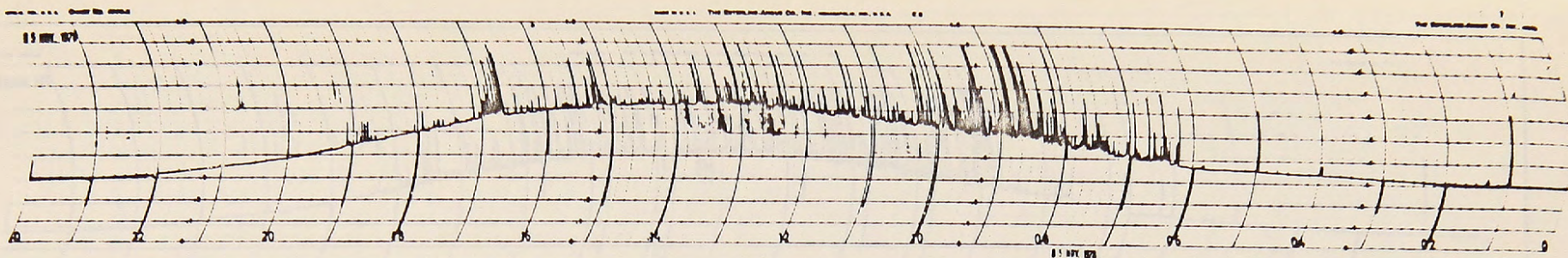
NOVIEMBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

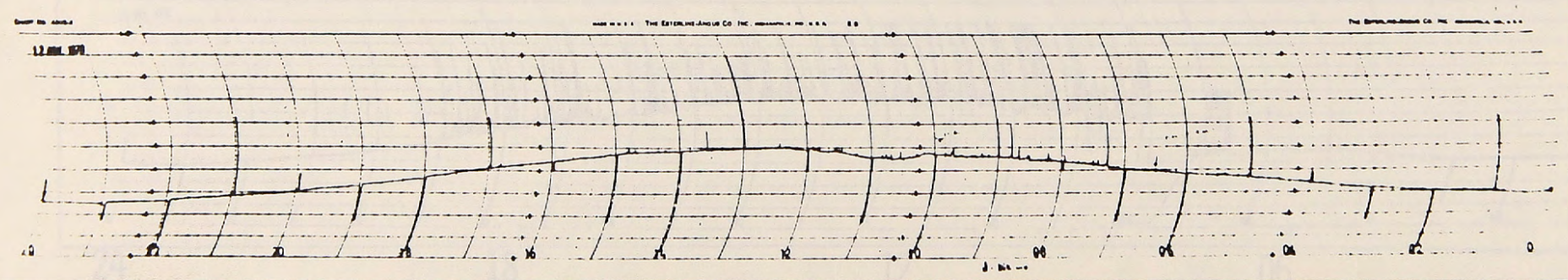
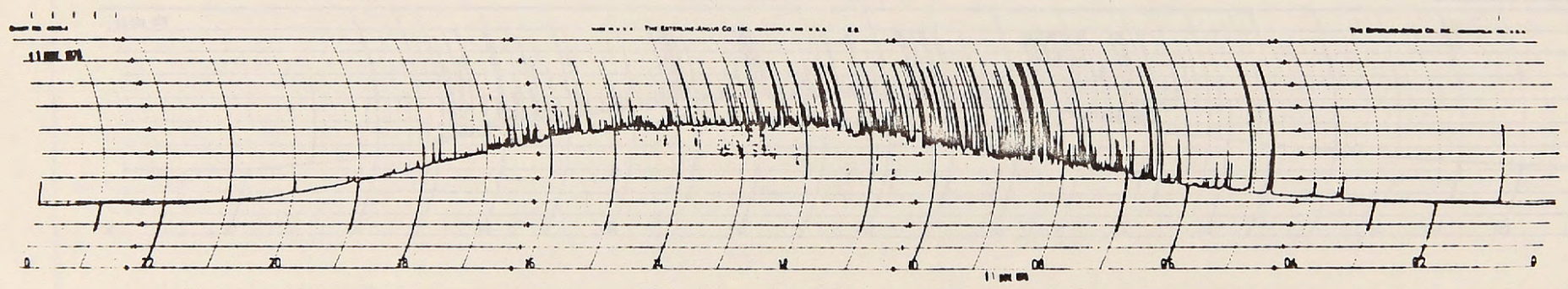
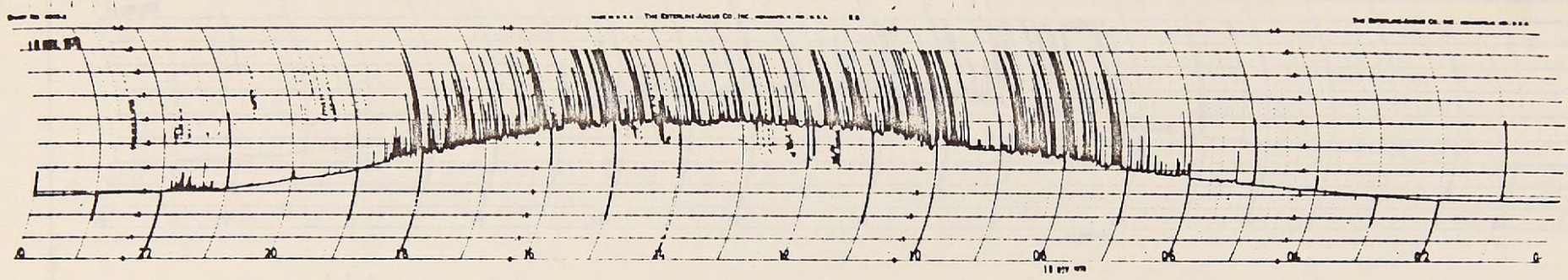
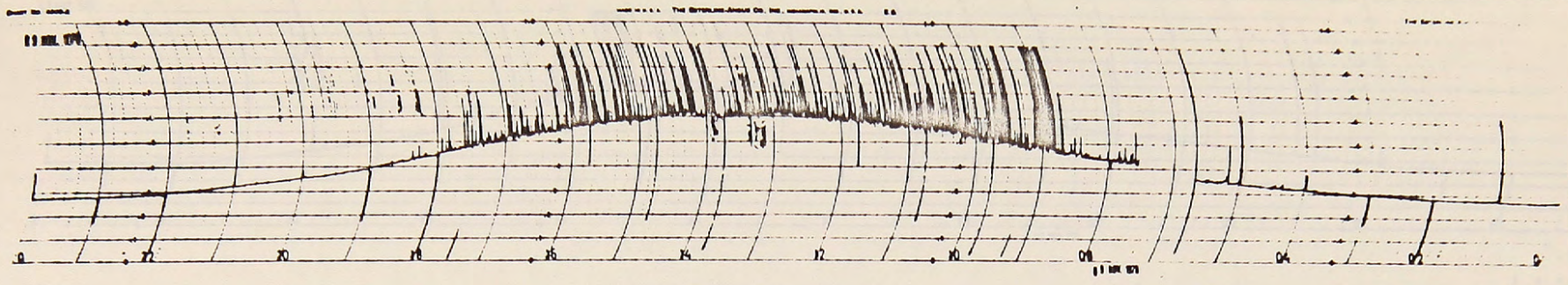
NOVIEMBRE 1978

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

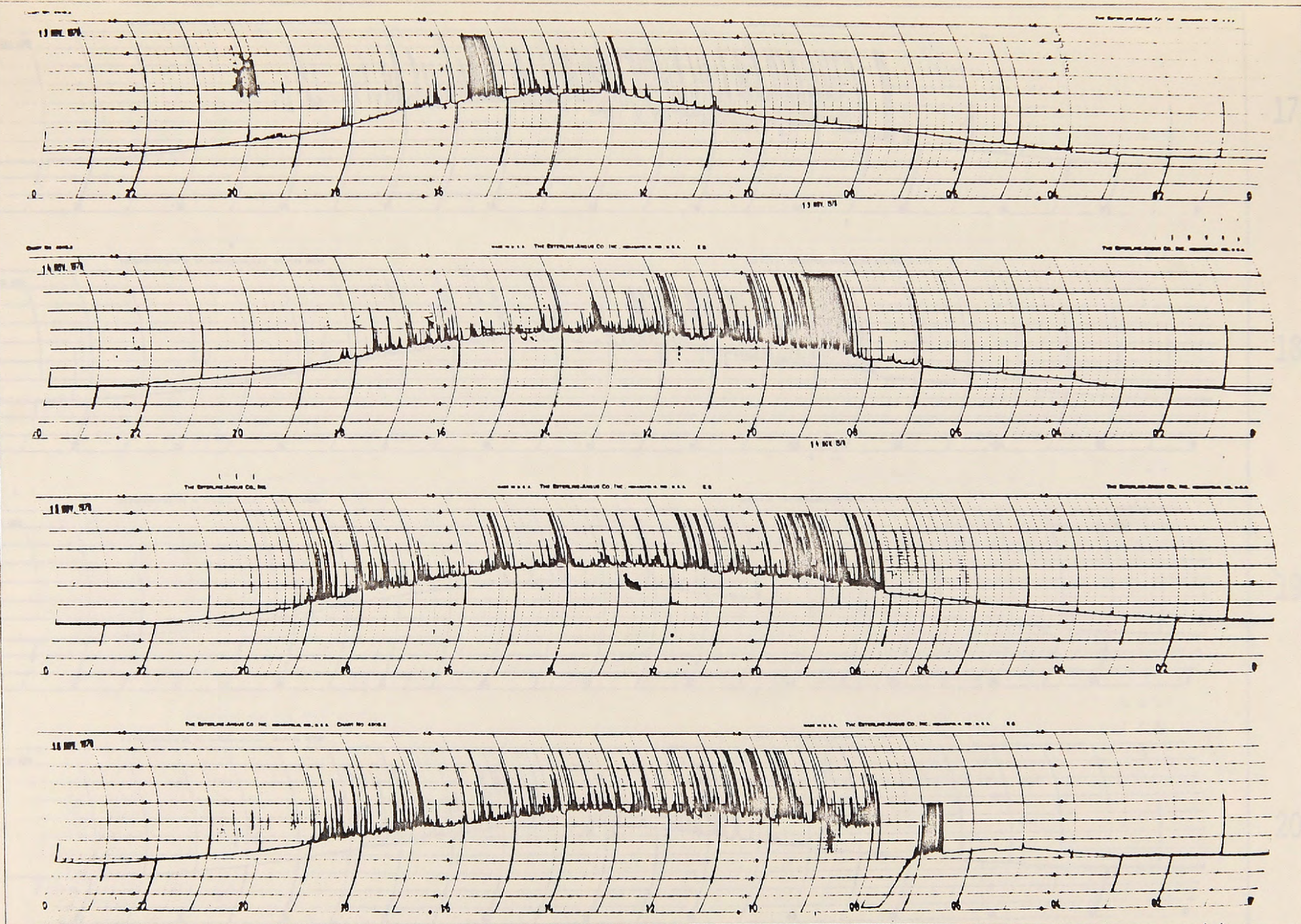
HORA LOCAL, 60° W

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

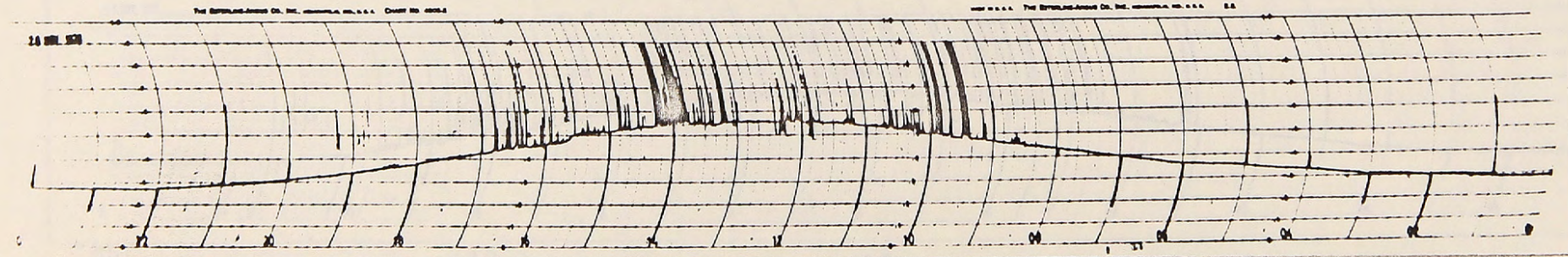
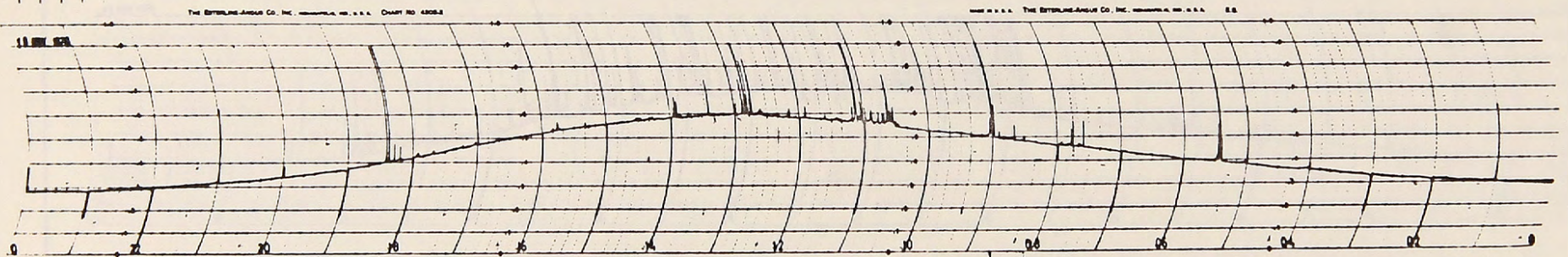
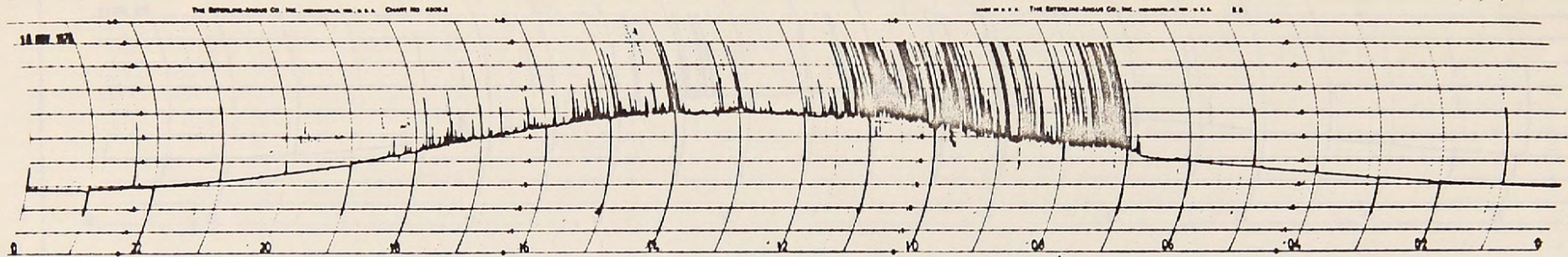
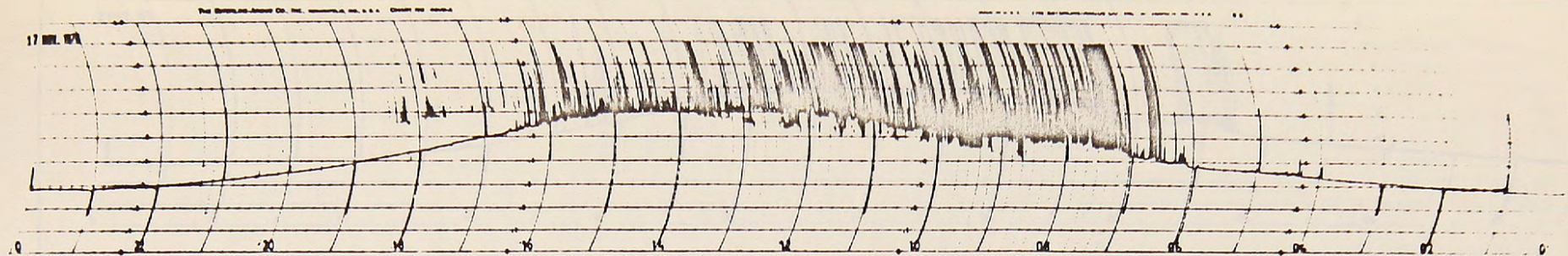
NOVIEMBRE 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

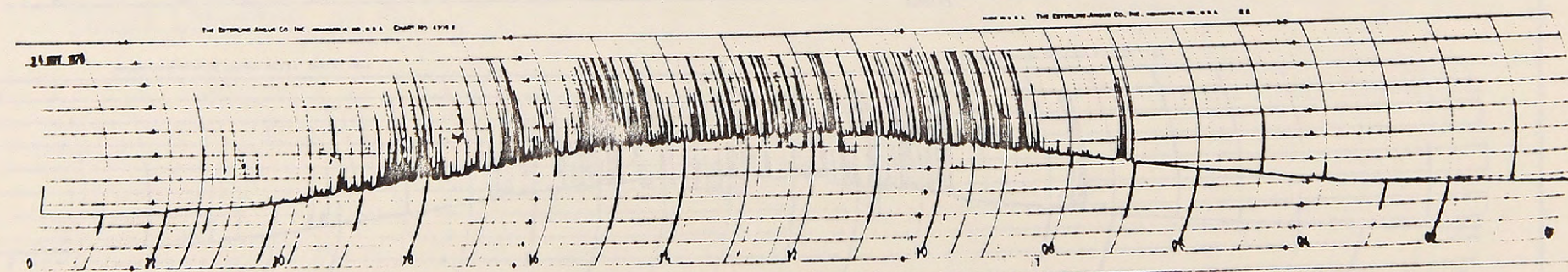
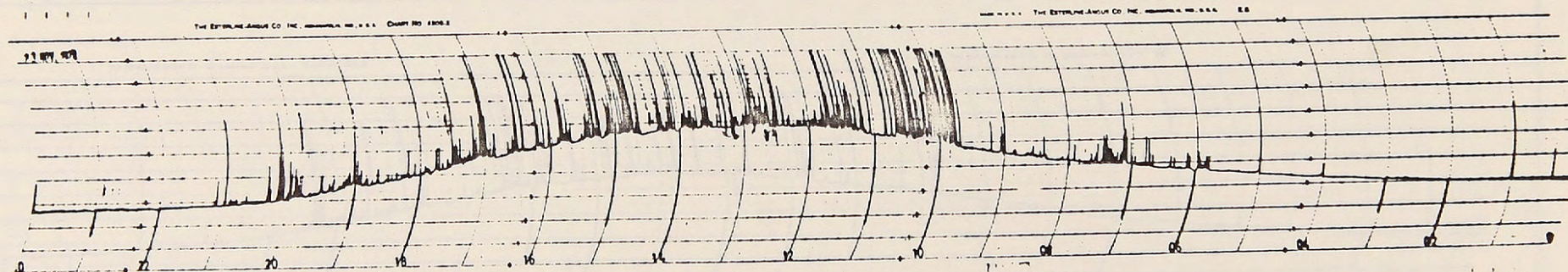
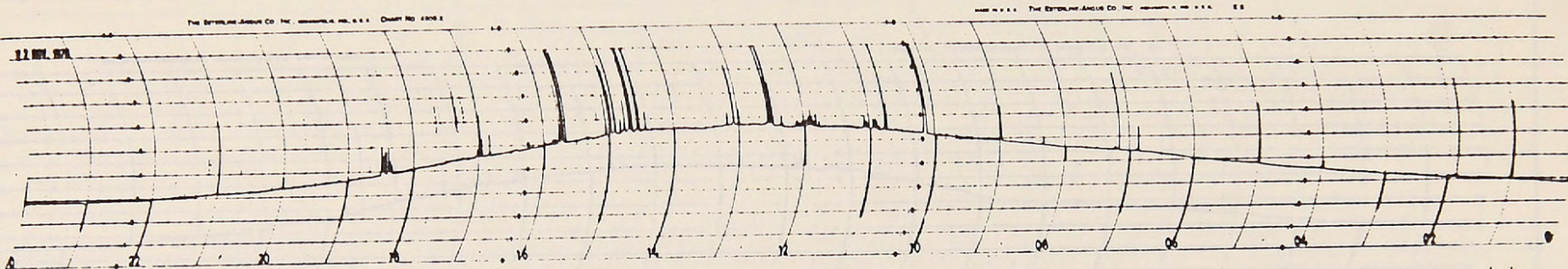
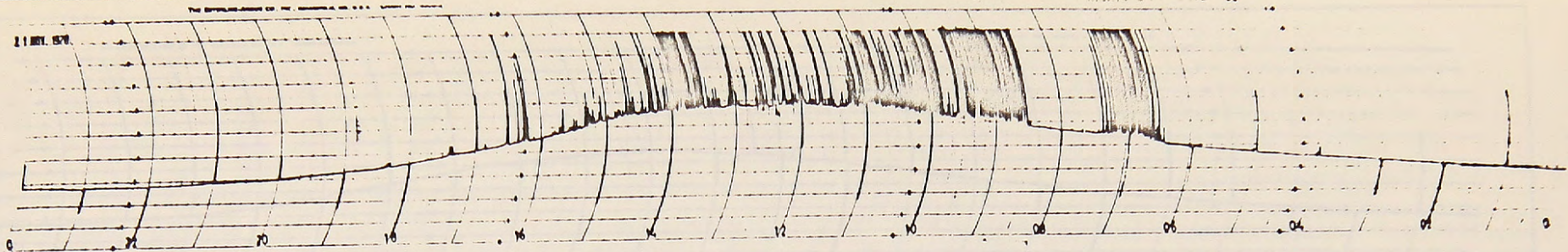
NOVIEMBRE 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

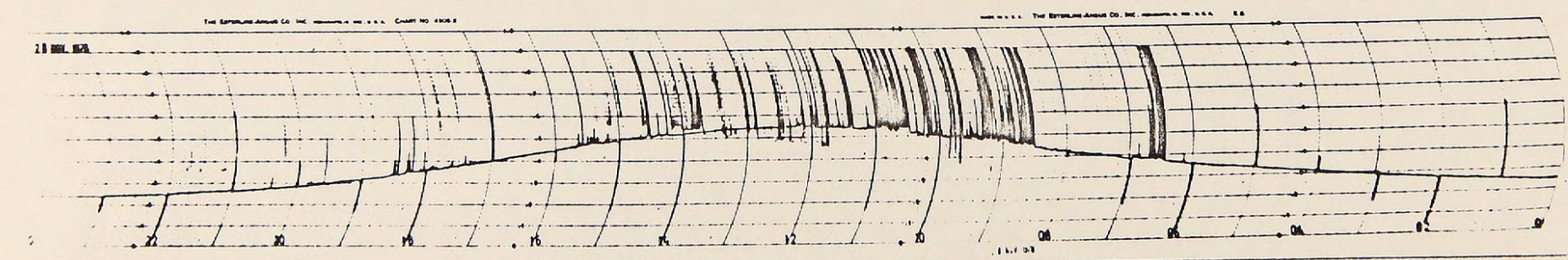
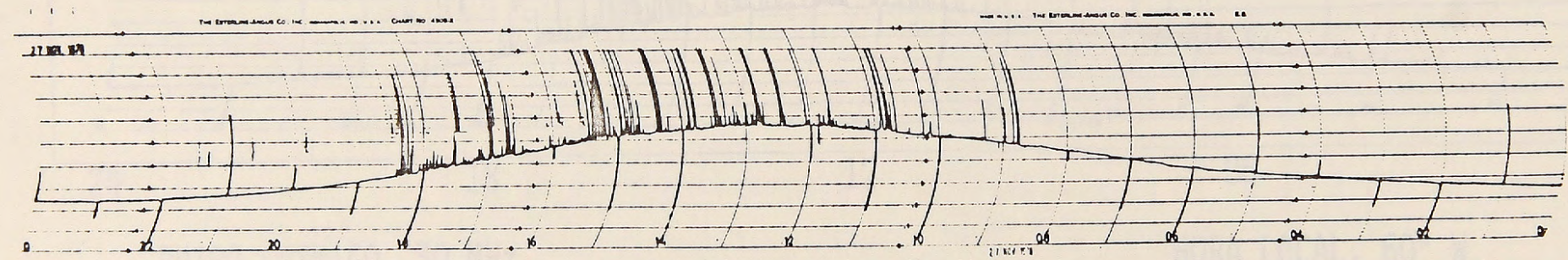
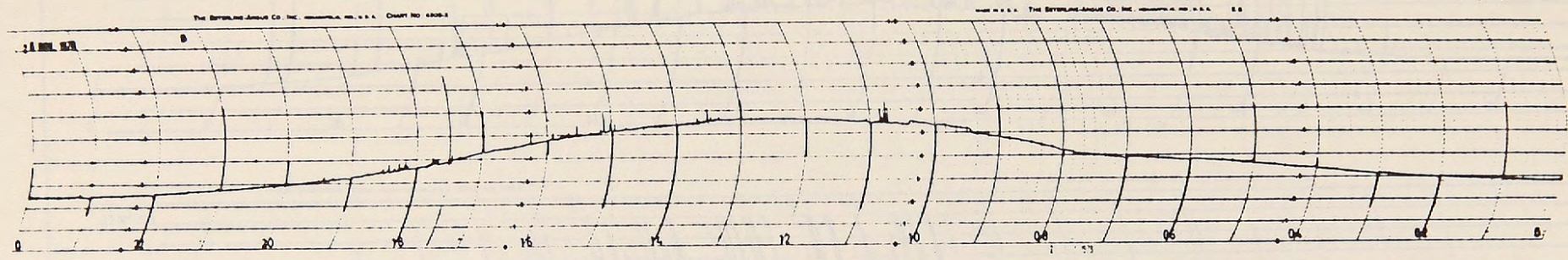
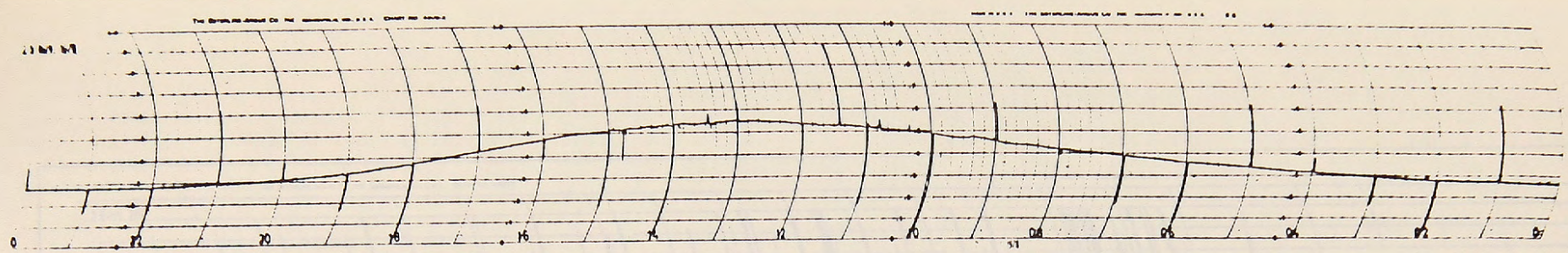
NOVEMBRE 1978

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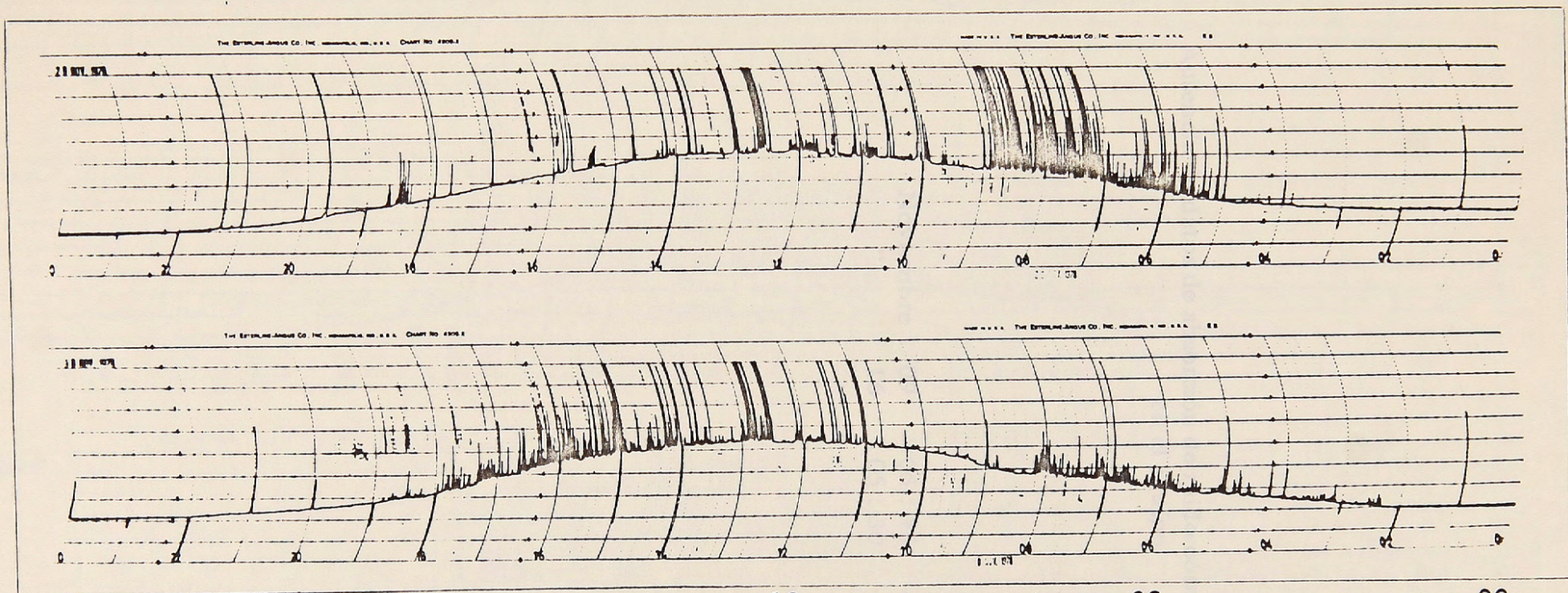
24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

NOVIEMBRE 1978

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

DICIEMBRE 1978

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Noviembre	09	05 : 40	—	07 : 45
"	16	05 : 30	—	07 : 50

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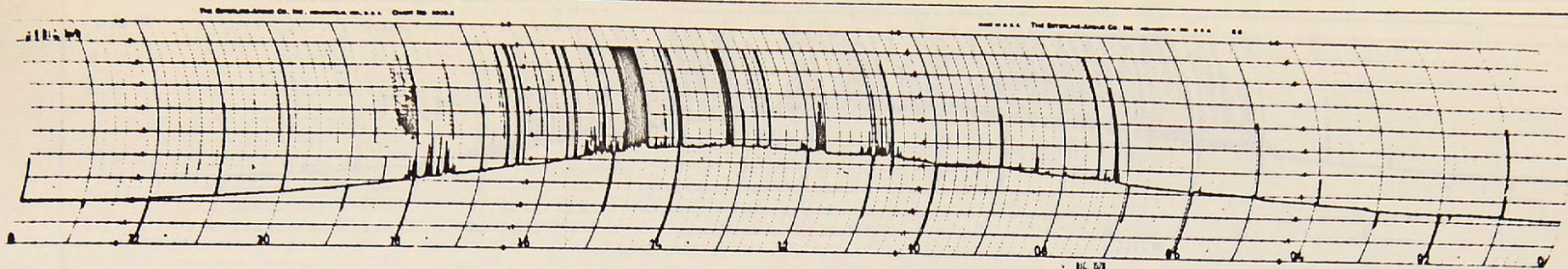
18

HORA LOCAL, 60° W

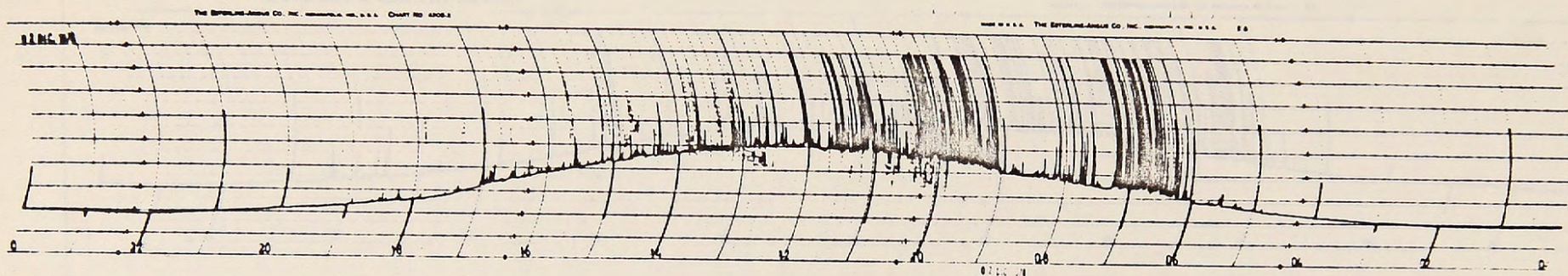
INTENSIDAD CÓSMICA, 30 MILZ

DICIEMBRE 1978

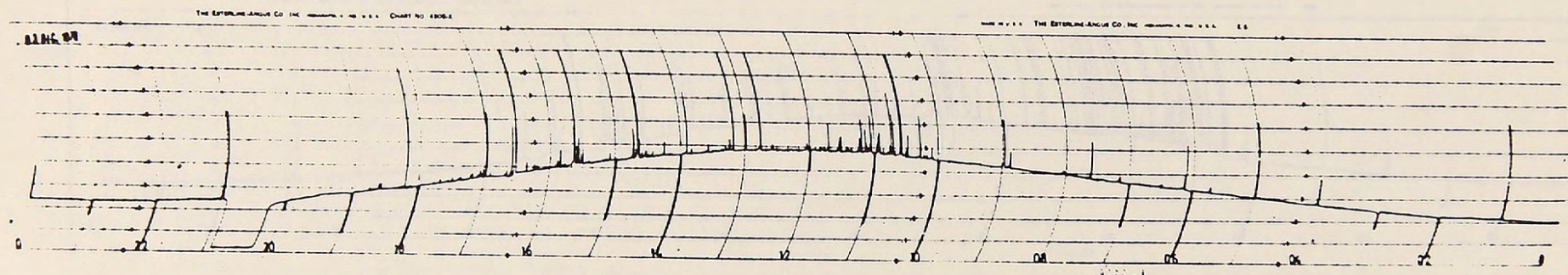
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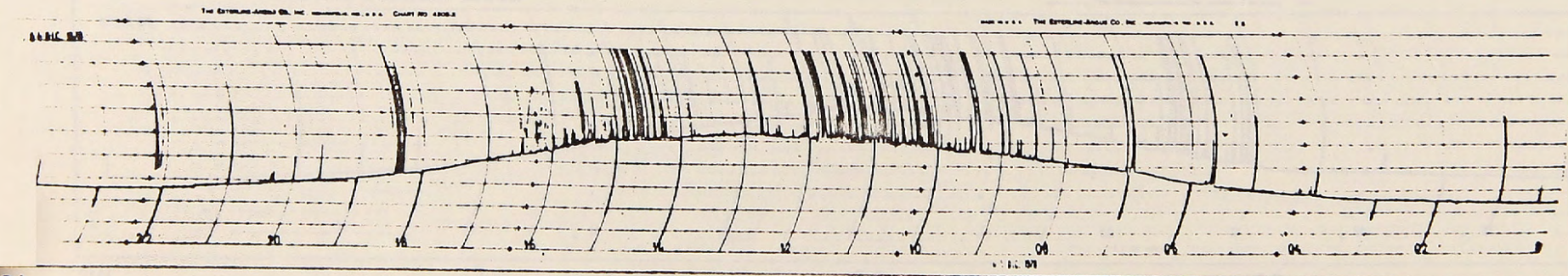
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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

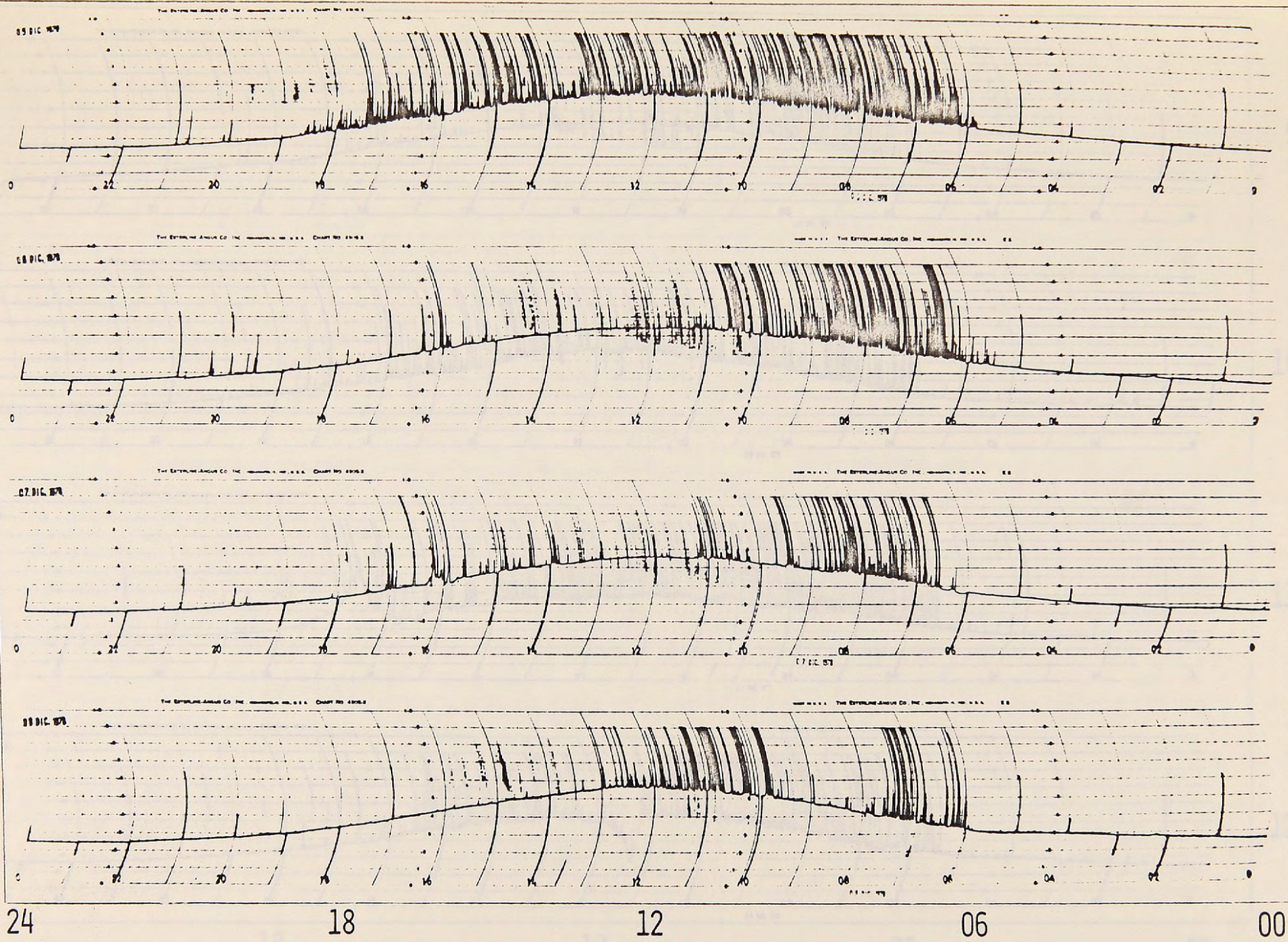
DICIEMBRE 1978

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24 18 12 06 00

• RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

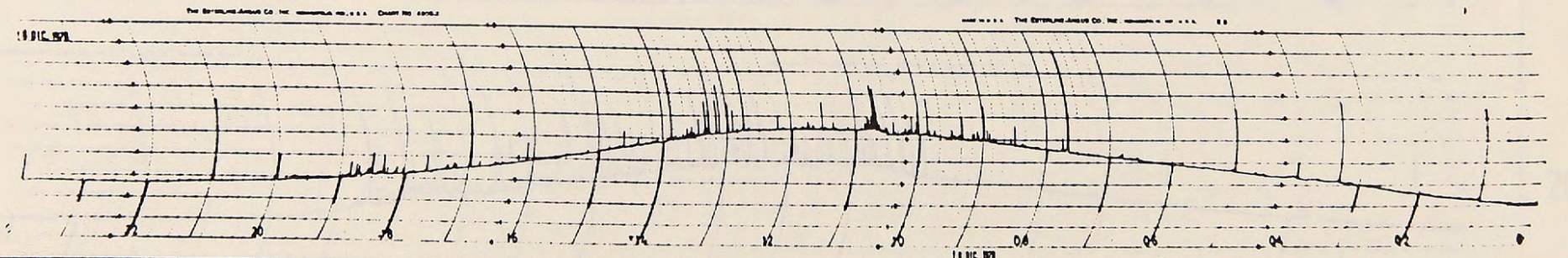
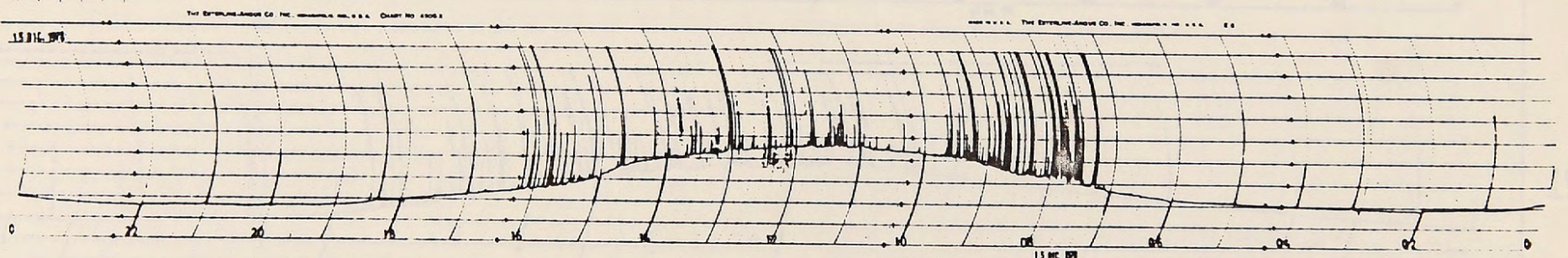
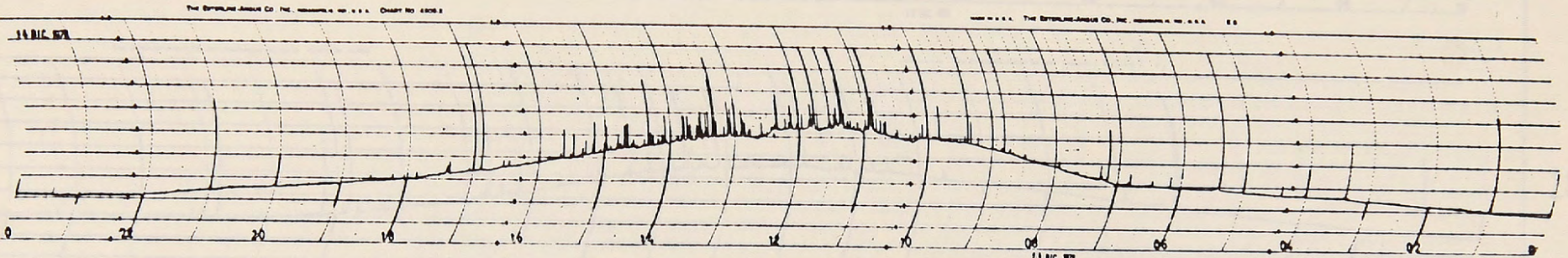
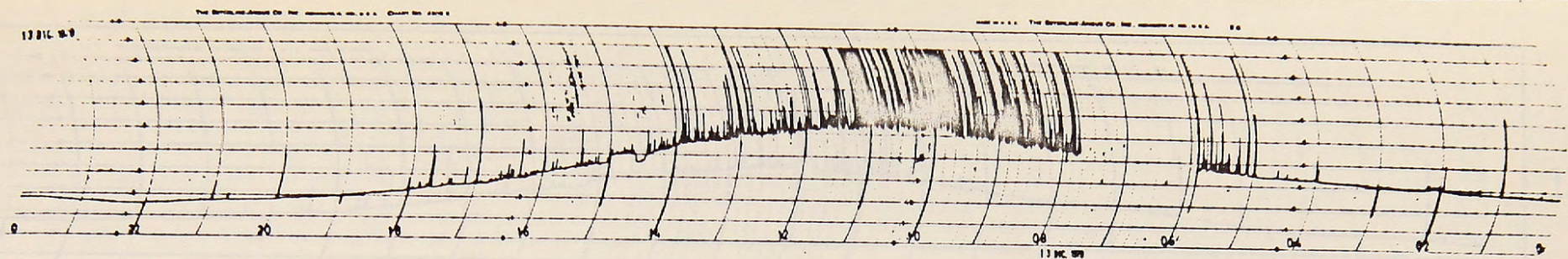
DICIEMBRE 1978

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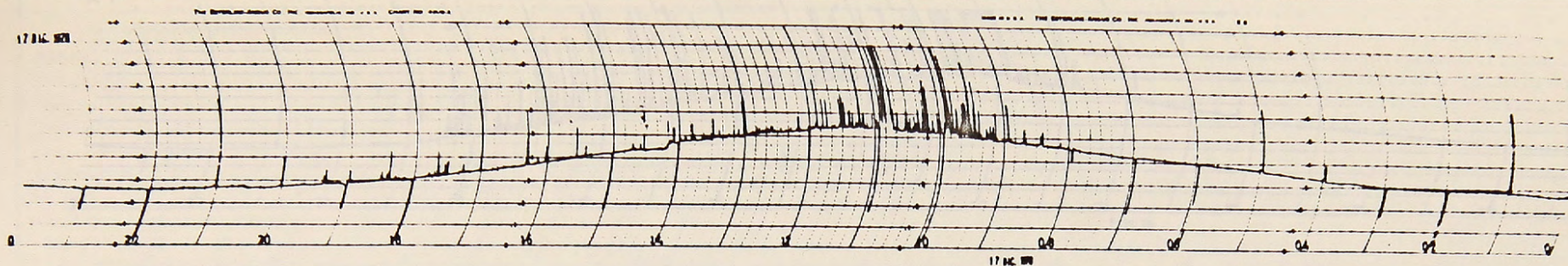
24 18 12 06 00

RUIDO COSMICO, 30 MHz

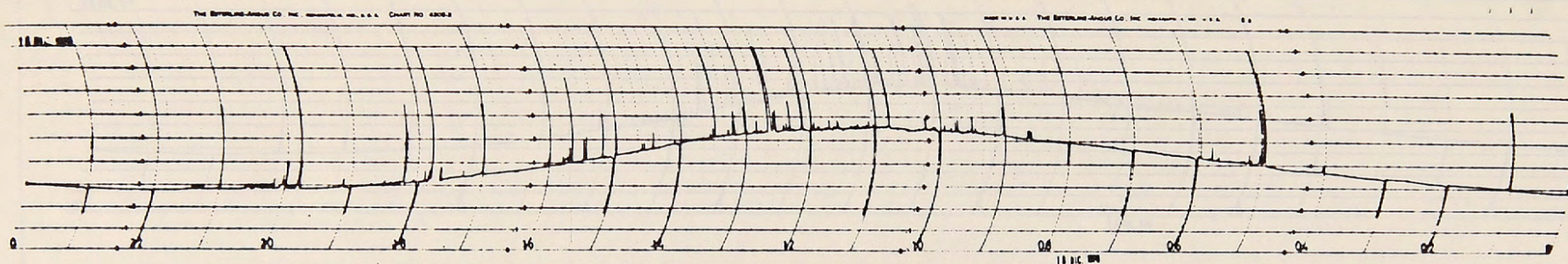
HORA LOCAL, 60° W

DICIEMBRE 1978

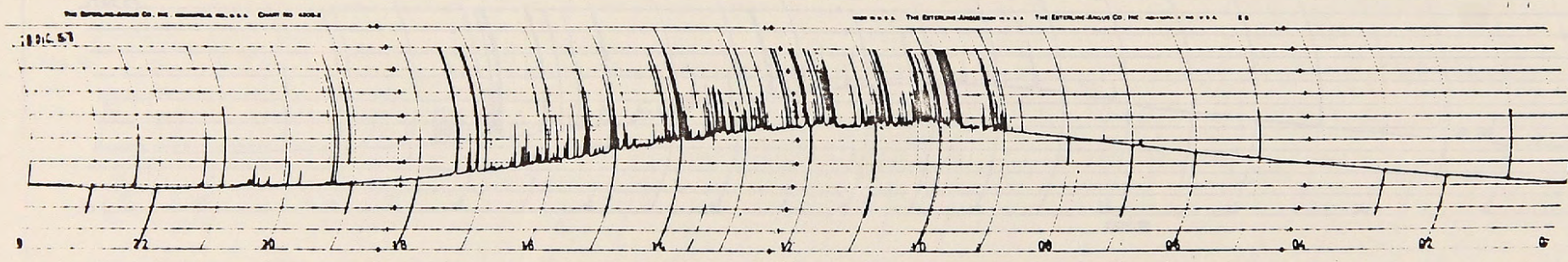
17



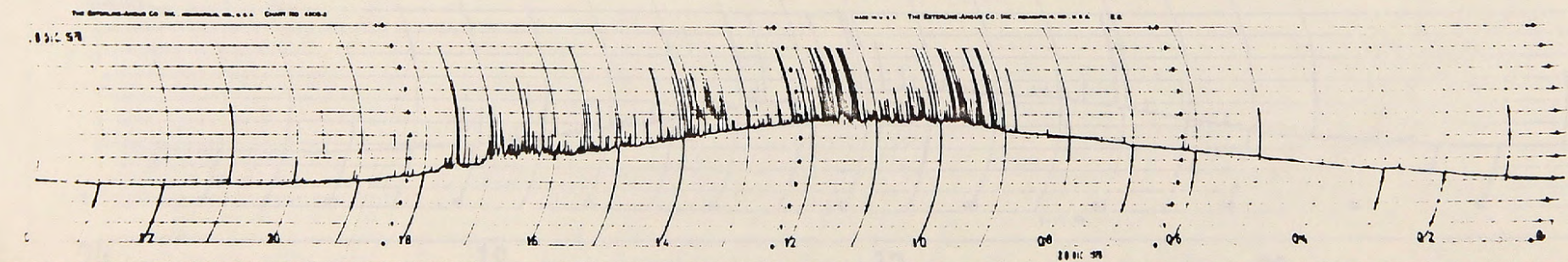
18



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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

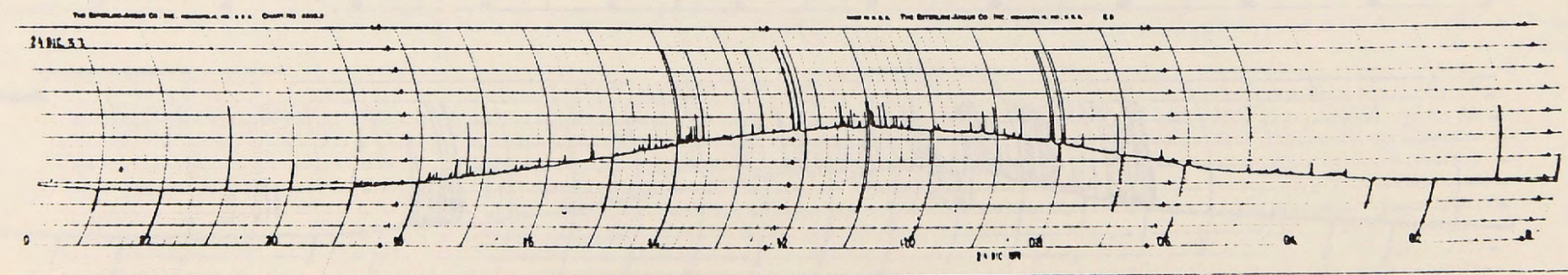
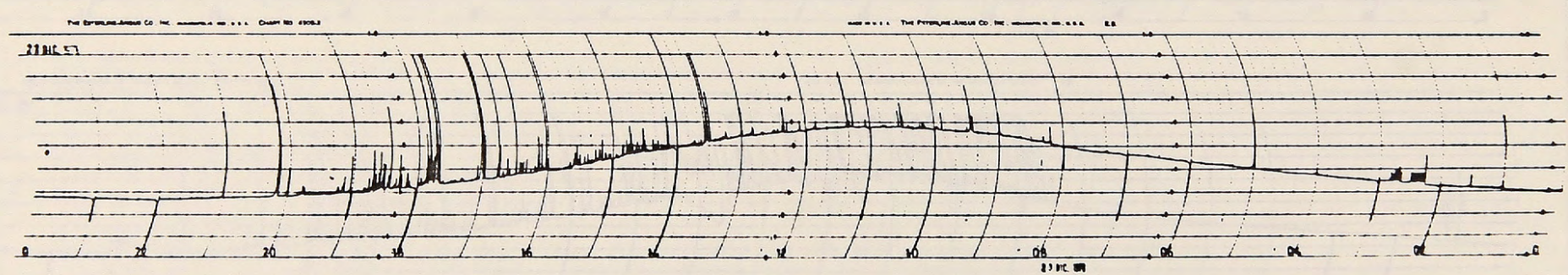
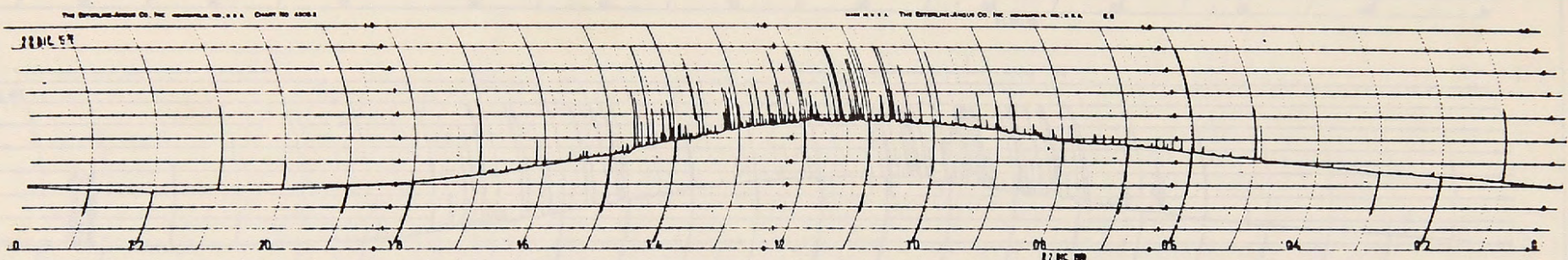
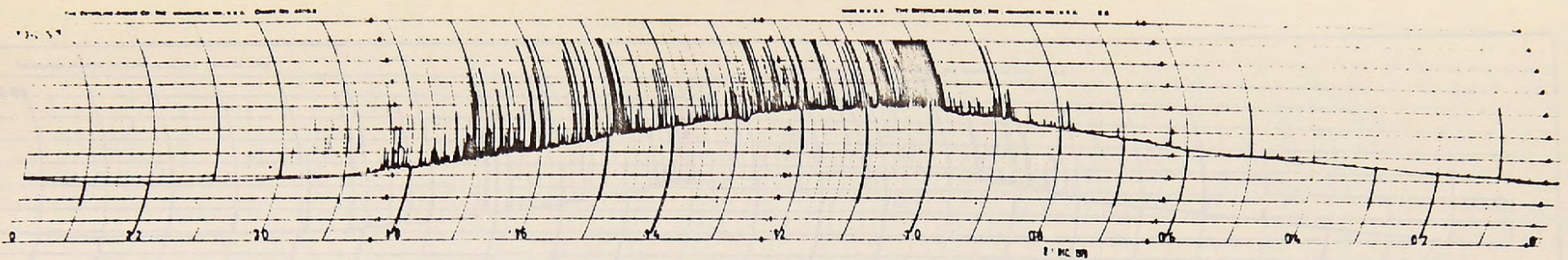
DICIEMBRE 1978

21

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

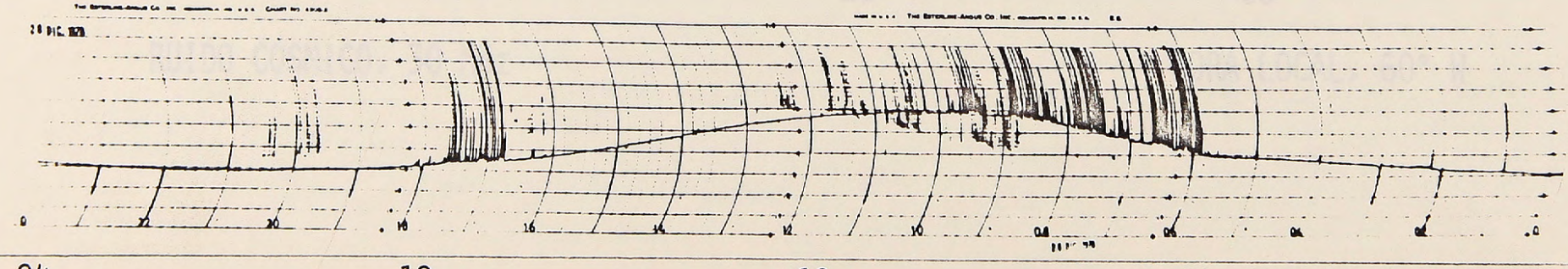
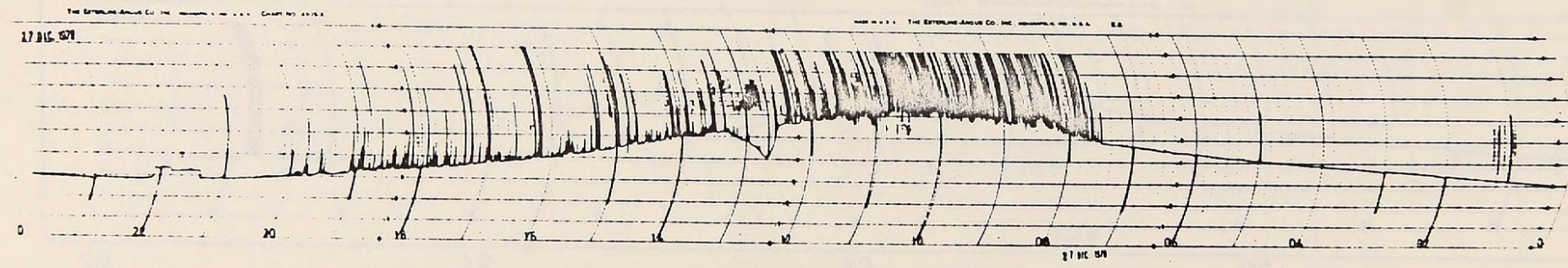
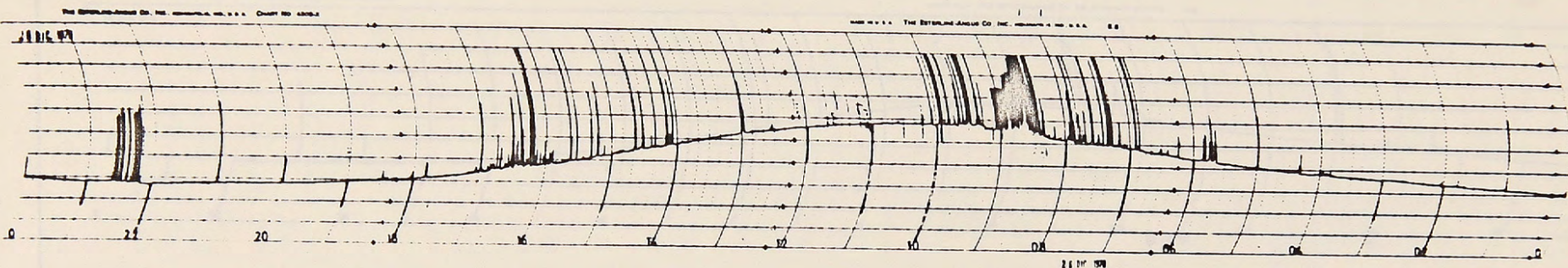
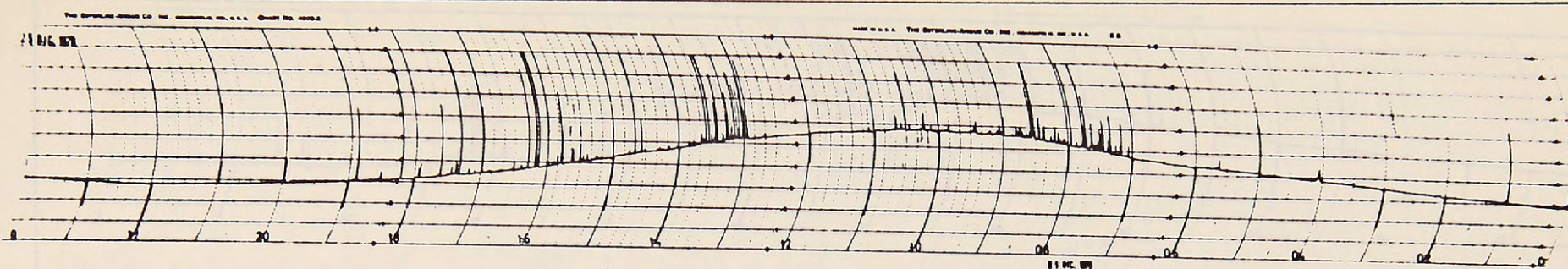
DICIEMBRE 1978

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RUIDO COSMICO, 30 MHz

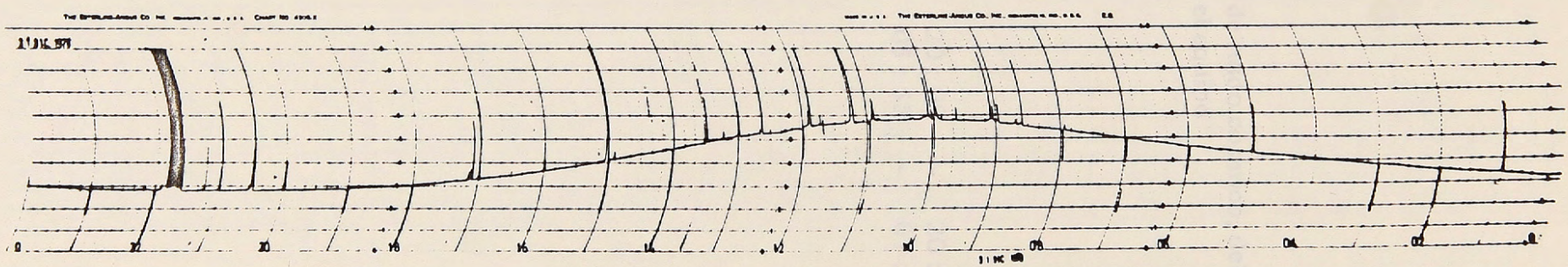
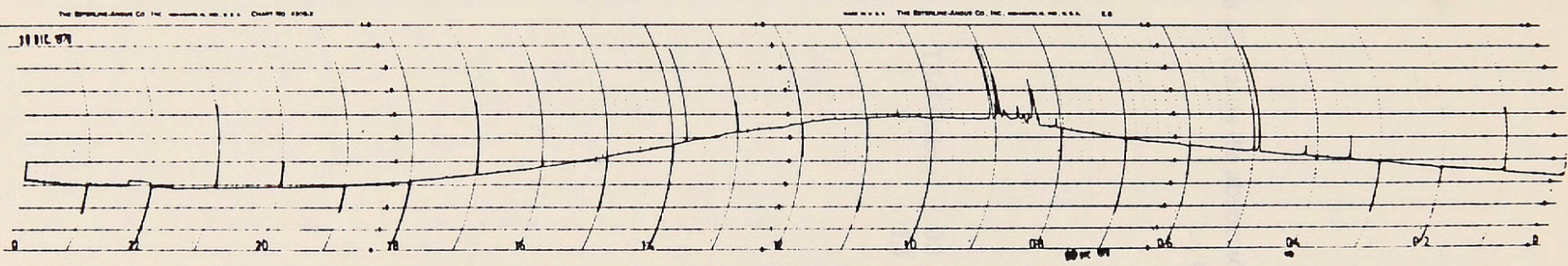
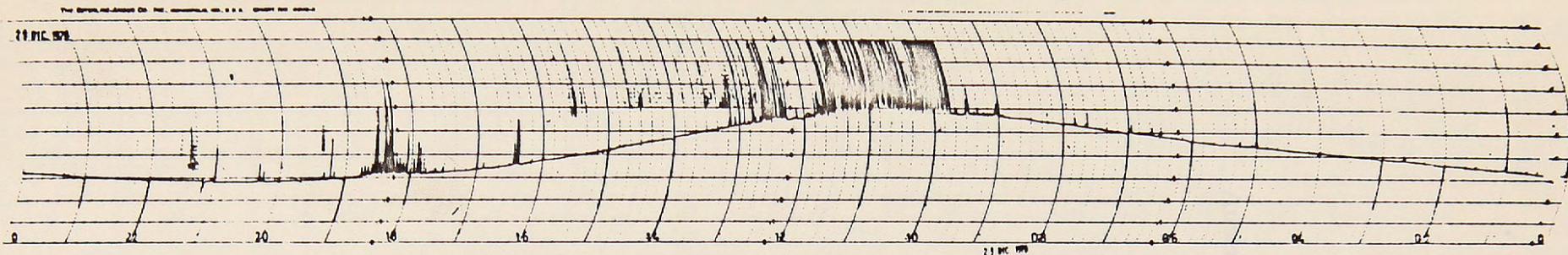
HORA LOCAL, 60° W

DICIEMBRE 1978

29

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31



24 18 12 06 00

RUIDO COSMICO, 30 MHz

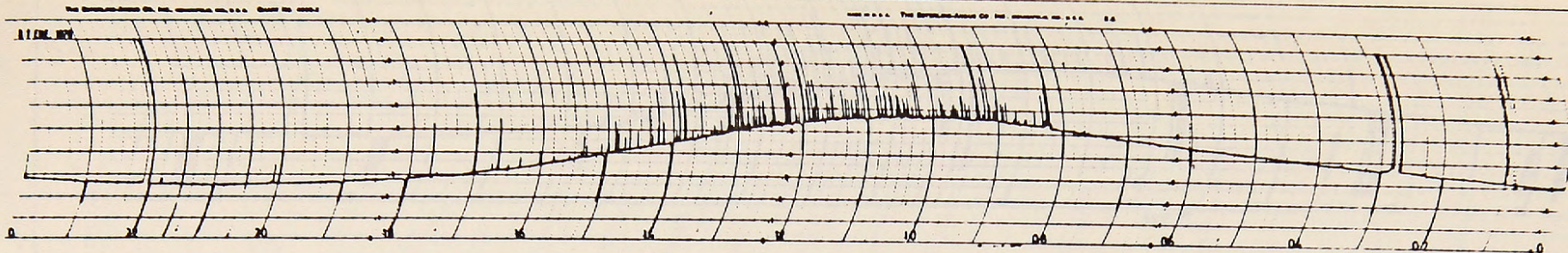
HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas en el equipo

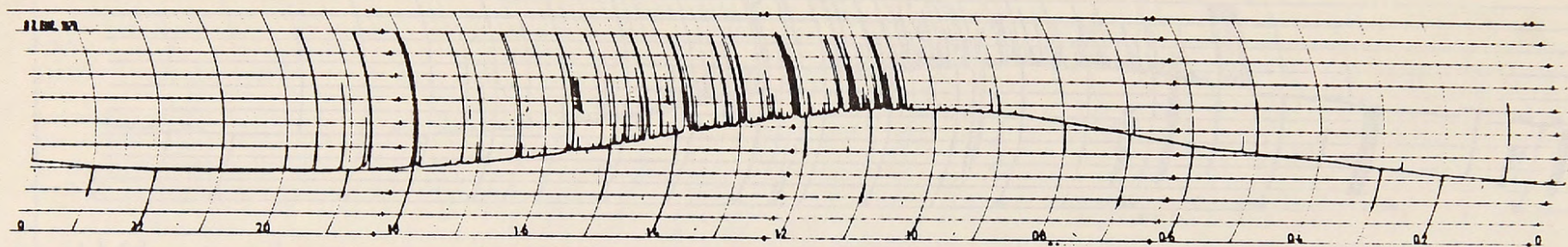
Diciembre	03	20 : 00	—	20 : 55
”	13	05 : 55	—	07 : 45

ENERO 1979

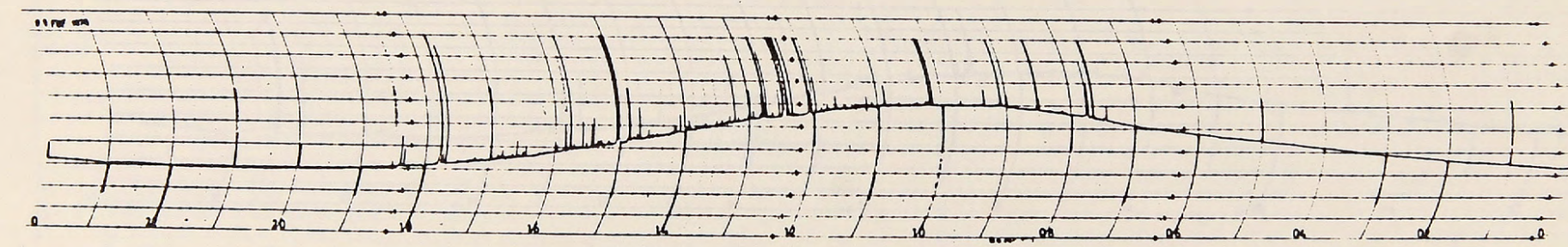
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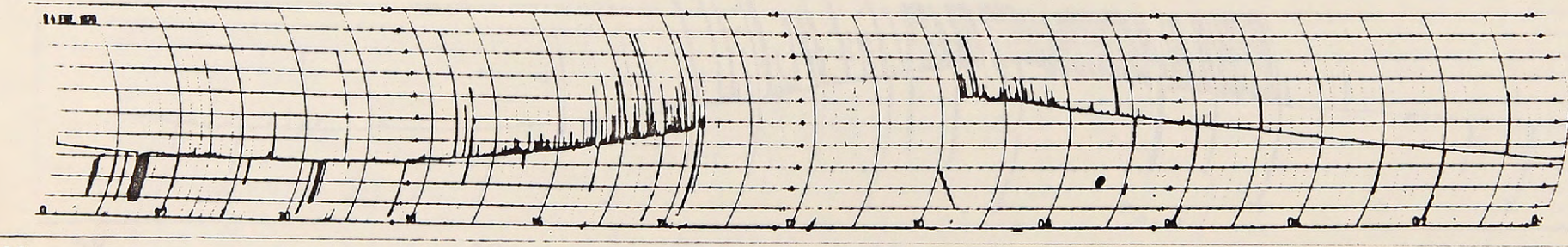
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RUIDO COSMICO, 30 MHz

HORA LOCAL 60° W

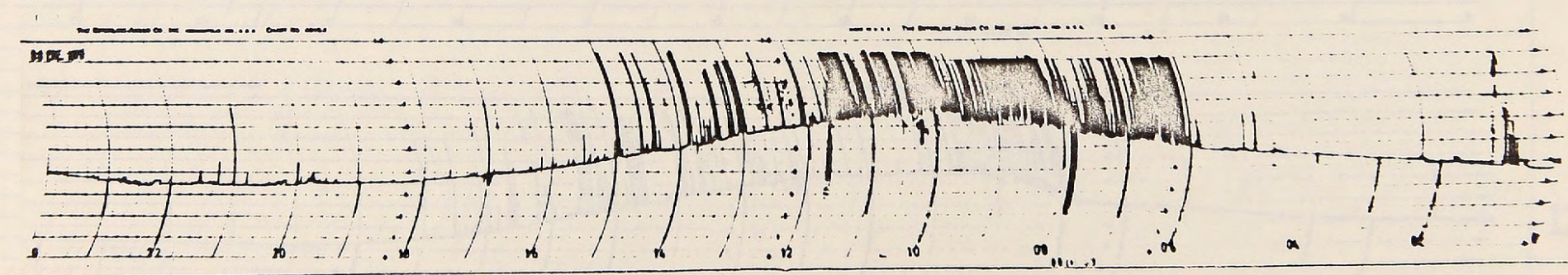
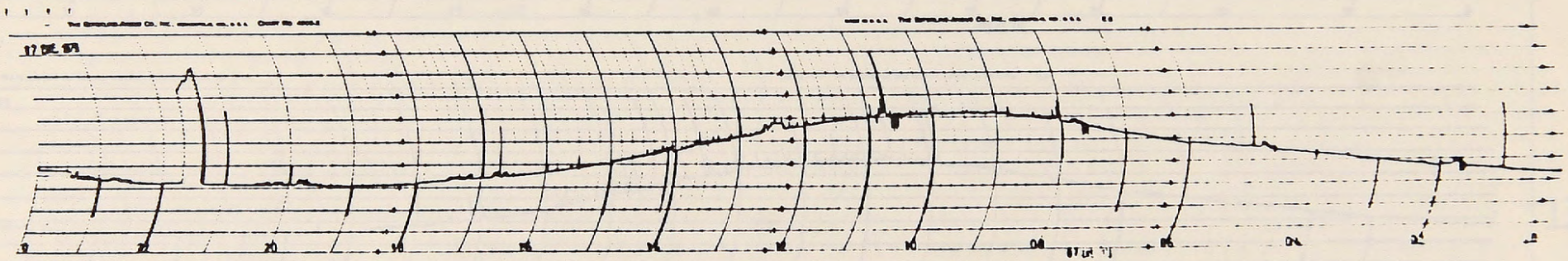
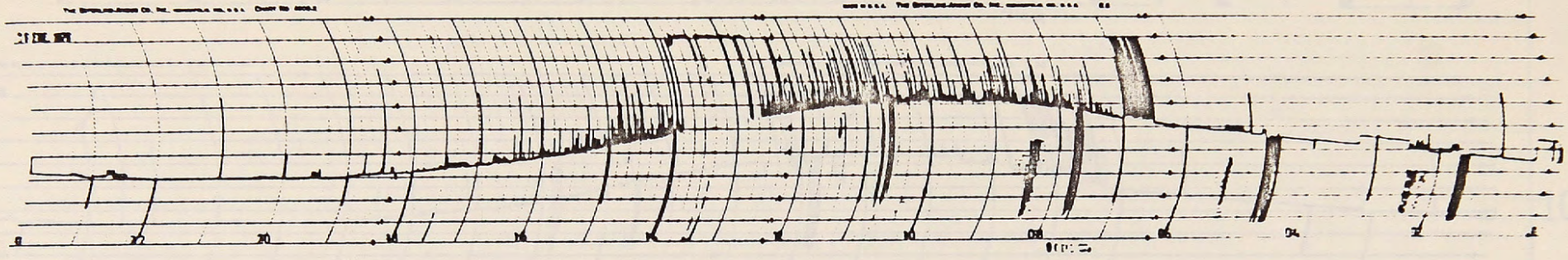
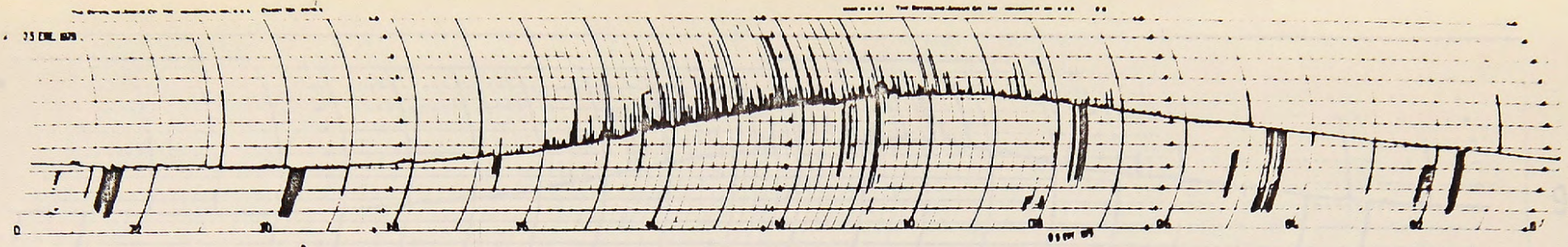
ENERO 1979

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

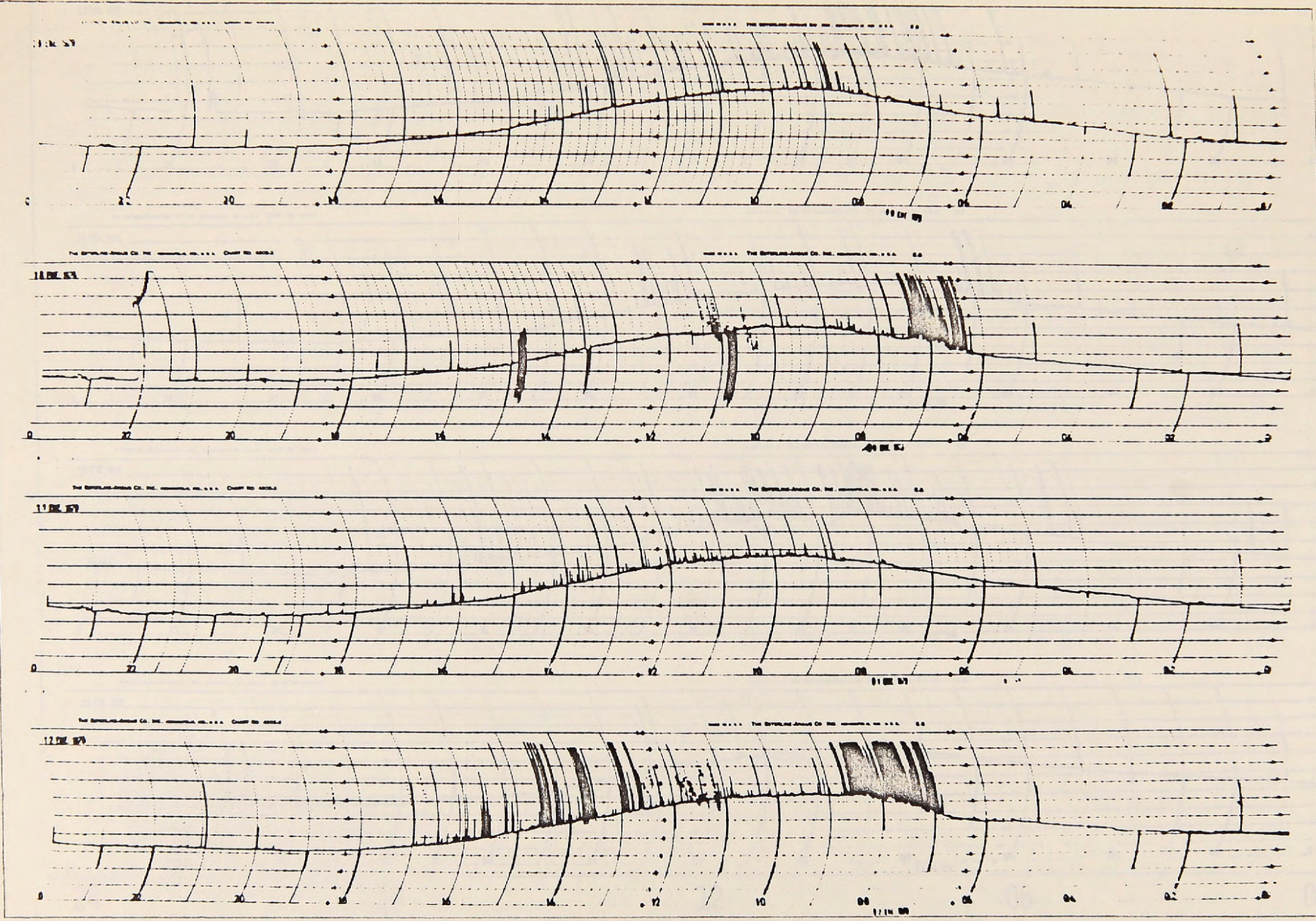
HORA LOCAL, 60° W

ENERO 1979

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RUIDO COSMICO, 30 MHz

HORA LOCAL 60° W

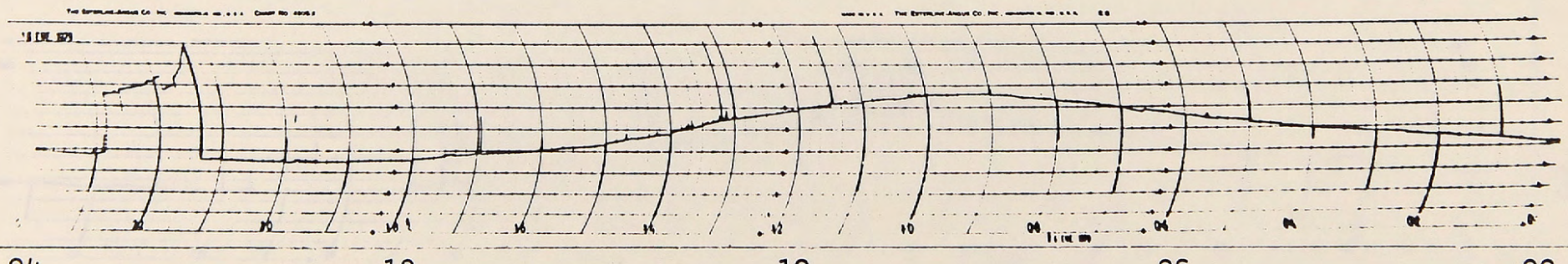
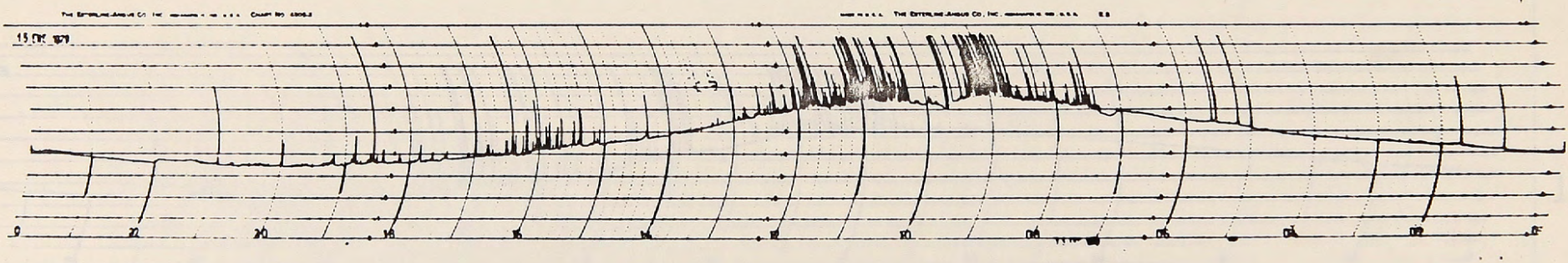
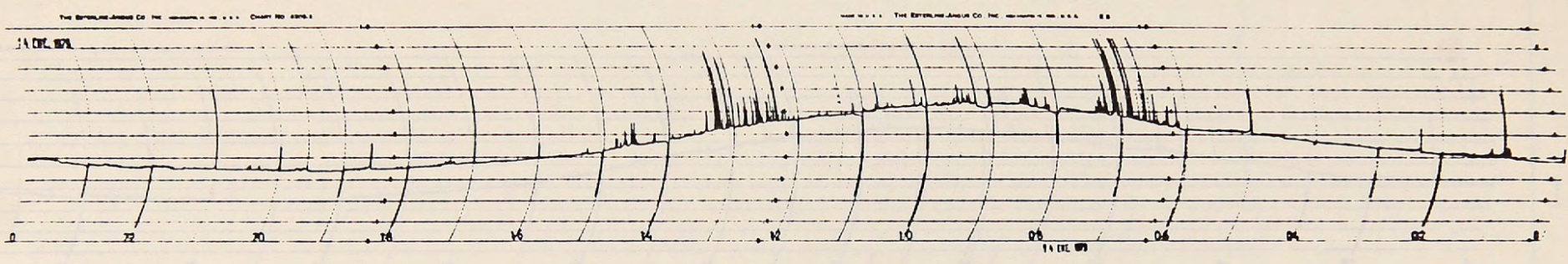
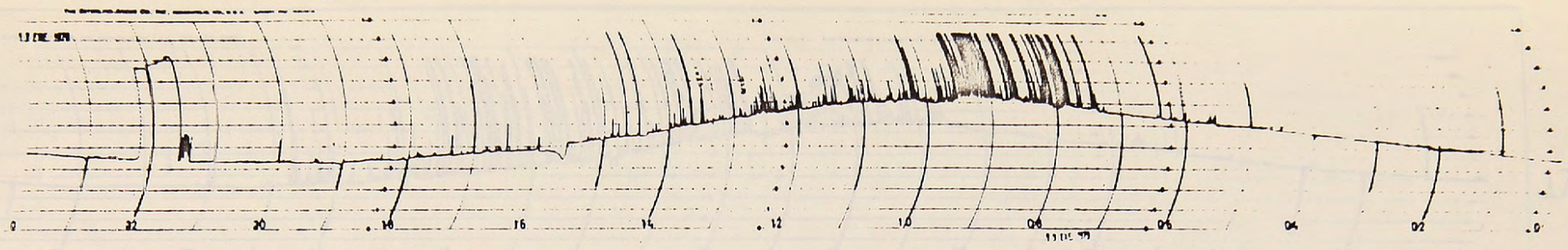
ENERO 1979

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24 18 12 06 00

RUIDO COSMICO, 30 MHz

HORA LOCAL 60° W

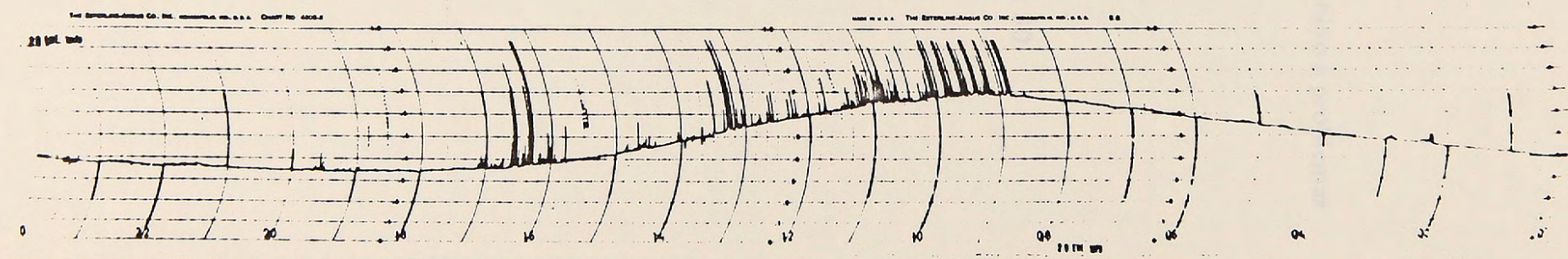
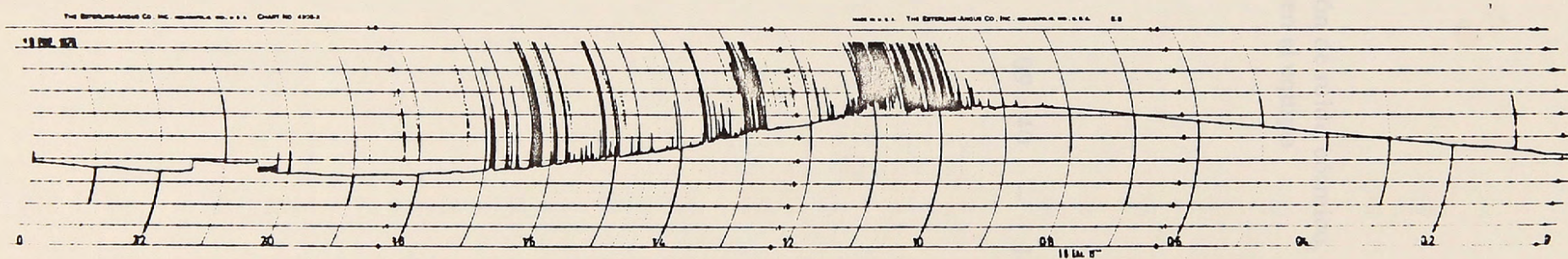
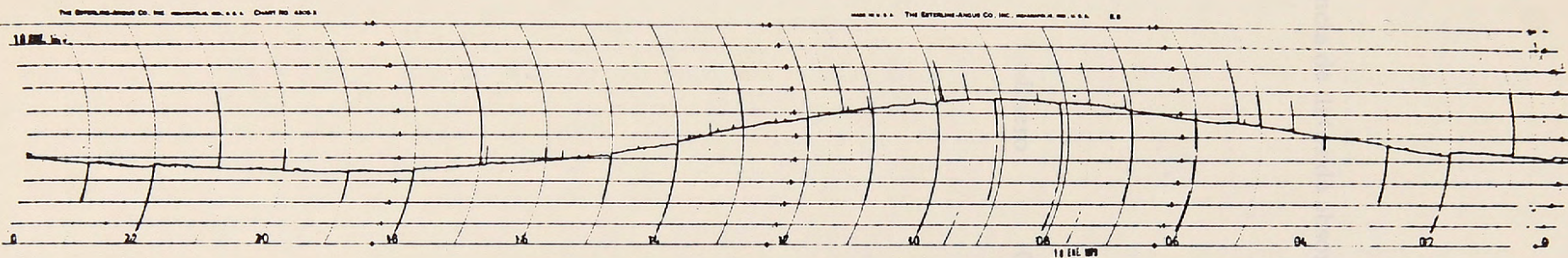
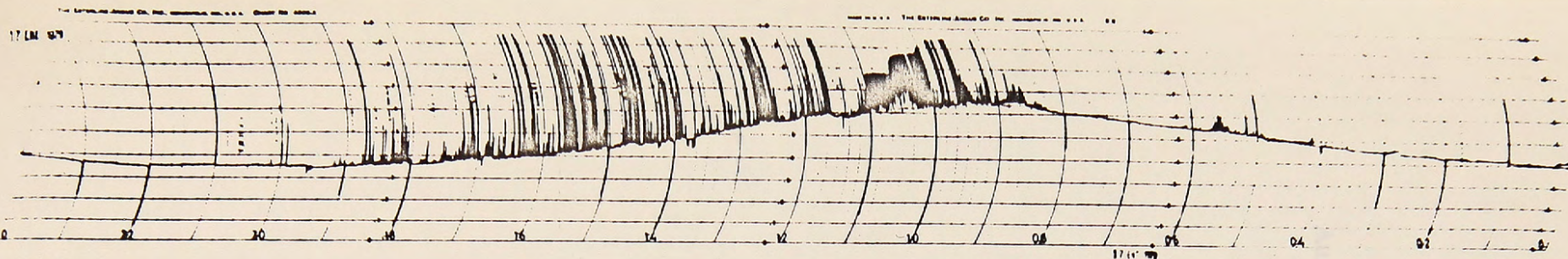
ENERO 1979

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Enero 04 09 : 40 — 14 : 30

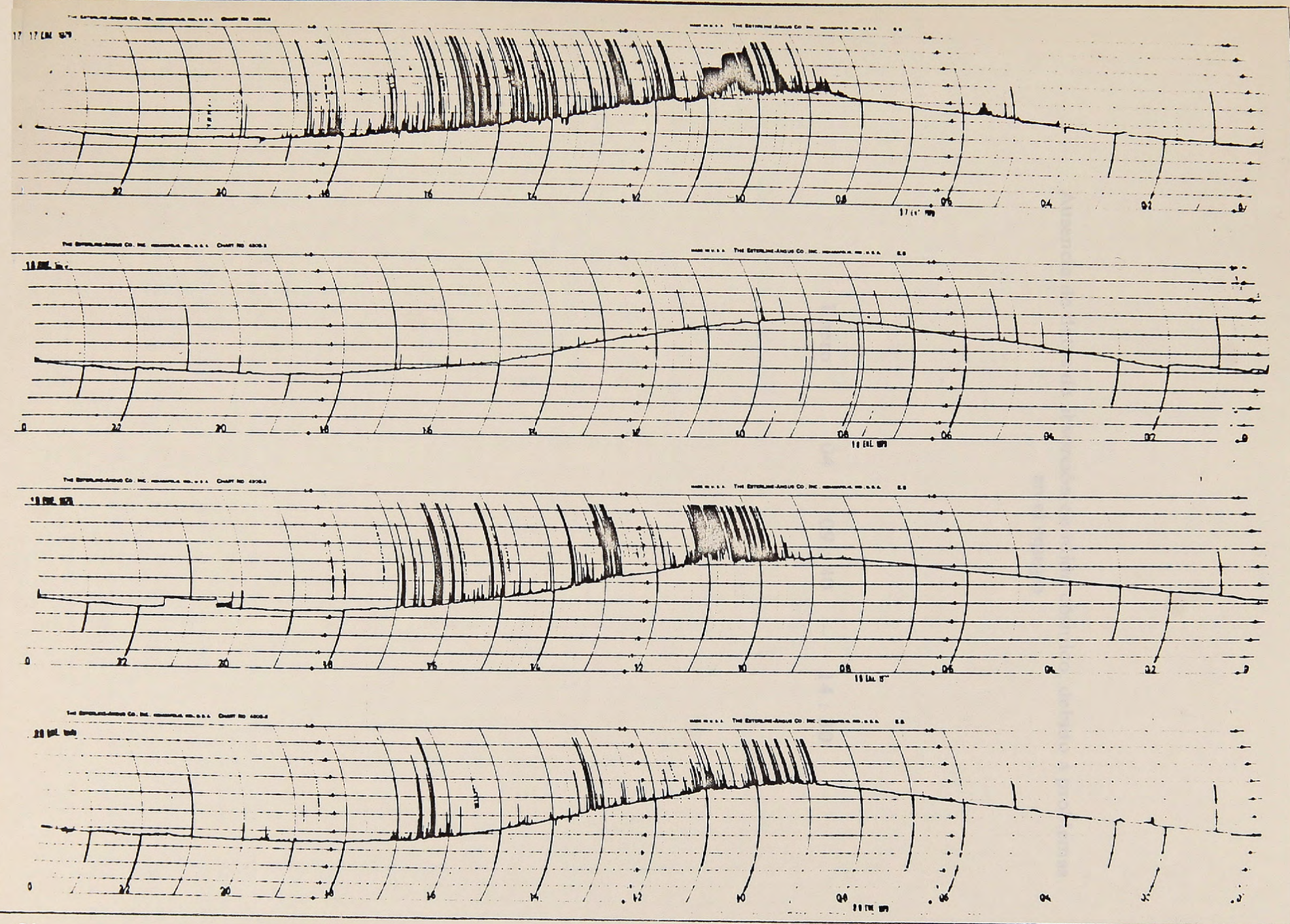
ENERO 1979

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RUIDO COSMICO, 30 MHz

HORA LOCAL, 60° W

24 18 12 06 00

Ausencia de datos de absorción de ruido cósmico, debido a problemas
en el equipo

Enero 04 09 : 40 — 14 : 30