

RECORDS OF RADIO AURORA AT SYOWA STATION,

ANTARCTICA IN 1982

Kiyoshi IGARASHI and Yasukazu KURATANI

(Radio Research Laboratories, Koganei-shi, Tokyo)

1. Introduction

Observation of ionospheric irregularities has been carried out at Syowa Station, Antarctica, by means of an auroral radar since March 1966. A report has been prepared which includes the periods of radio auroral echoes detected in 1982 and characteristic examples of echo intensity-time variation.

Inquiries about details of the data should be addressed to:

Radio Research Laboratories

Ministry of Posts and Telecommunications

2-1, Nukui-Kitamachi 4-chome, Koganei-shi

Tokyo 184, Japan.

Three kinds of data are available: a) 35 mm film records of radio auroral echo intensity with range (A-scope), b) 35 mm film records of range-time intensity (A'-scope), and c) chart records of the time variation of echo intensity.

2. Location

Syowa Station			
Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
69°00'S	39°35'E	-70.0°	79.4°

### 3. Observers

Kiyoshi Igarashi (Radio Research Laboratories)

Yasukazu Kuratani (Radio Research Laboratories)

### 4. Method of Measurement

A new auroral radar was installed at Syowa Station in 1982. It has two radar beams directed toward the geomagnetic south and 32.8° west from the geomagnetic south. The radar beams were switched every 13 - 27 seconds by turns.

The A-scope record was taken every 5 minutes. The A'-scope record and the chart record were made continuously throughout the day.

Characteristics of the system are as follows:

Frequency	: 50 MHz
Peak power	: 15 kW
Pulse width	: 100 $\mu$ s
Pulse repetition frequency	: 50 Hz
Antenna	: Three 14-element coaxial collinear(two-way)
Antenna gain	: 25 dB
Antenna beamwidth	: 4°(half power) in horizontal plane
Receiver bandwidth	: 10 kHz
Receiver noise figure	: less than 4 dB
Display and recorder	: A-scope display, A'-scope display and 6-channel dot recorder

## 5. Explanation of Diagrams Contained in the Report

Figs. 1(1-12) show the periods of radio auroras and operation status of the auroral radar. Time used in 45° EMT (= UT + 3 h).

Symbols used in the figures are as follows:

————— : occurrence of radio aurora  
← C → : no observation  
Blank : no radar echo.

Figs. 2(1-12) show the typical examples of radio auroral echo intensity at the frequency of 50 MHz with the simultaneously recorded geomagnetic H-component and the 30 MHz cosmic noise absorption detected by riometer.

Bibliography relevant to  
records of radio aurora at Syowa Station, Antarctica.

Observing period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
Mar. 1966 - Jan. 1968	Ose, M. Hasegawa, S. Takeuchi, T. Nishimuta, I. Isobe, T.	5 (Ionosphere 2)	64	1969
Apr. 1970 - Feb. 1971	Shiro, I. Sakamoto, T.	15 (Ionosphere 6)	34	1972
Feb. 1972 - Dec. 1972	Isozaki, S Miyazaki, S.	23 (Ionosphere 10)	22	1974
Feb. 1973 - Jan. 1974	Nishimuta, I. Yabuuma, H.	26 (Ionosphere 12)	23	1975
Mar. 1974 - Dec. 1974	Shiro, I. Yamazaki, I.	33 (Ionosphere 14)	89	1976
1975	Shiro, I. Sugiuchi, H. Komiya, N.	37 (Ionosphere 16)	105	1977
1976	Shiro, I. Yamakoshi, A. Sasaki, T.	42 (Ionosphere 18)	105	1978
Apr. 1978 - Dec. 1978	Igarashi, K. Tsuzurahara, S.	53 (Ionosphere 21)	23	1980
Jan. 1979 - Dec. 1979	Igarashi, K. Ojima, S. Komiya, N.	58 (Ionosphere 23)	28	1980
Jan. 1980 - Dec. 1980	Igarashi, K. Nozaki, K.	68 (Ionosphere 24)	28	1982
Jan. 1981 - Dec. 1981	Ose, M. Kurihara, N.	81 (Ionosphere 28)	28	1983



January 1982

Date

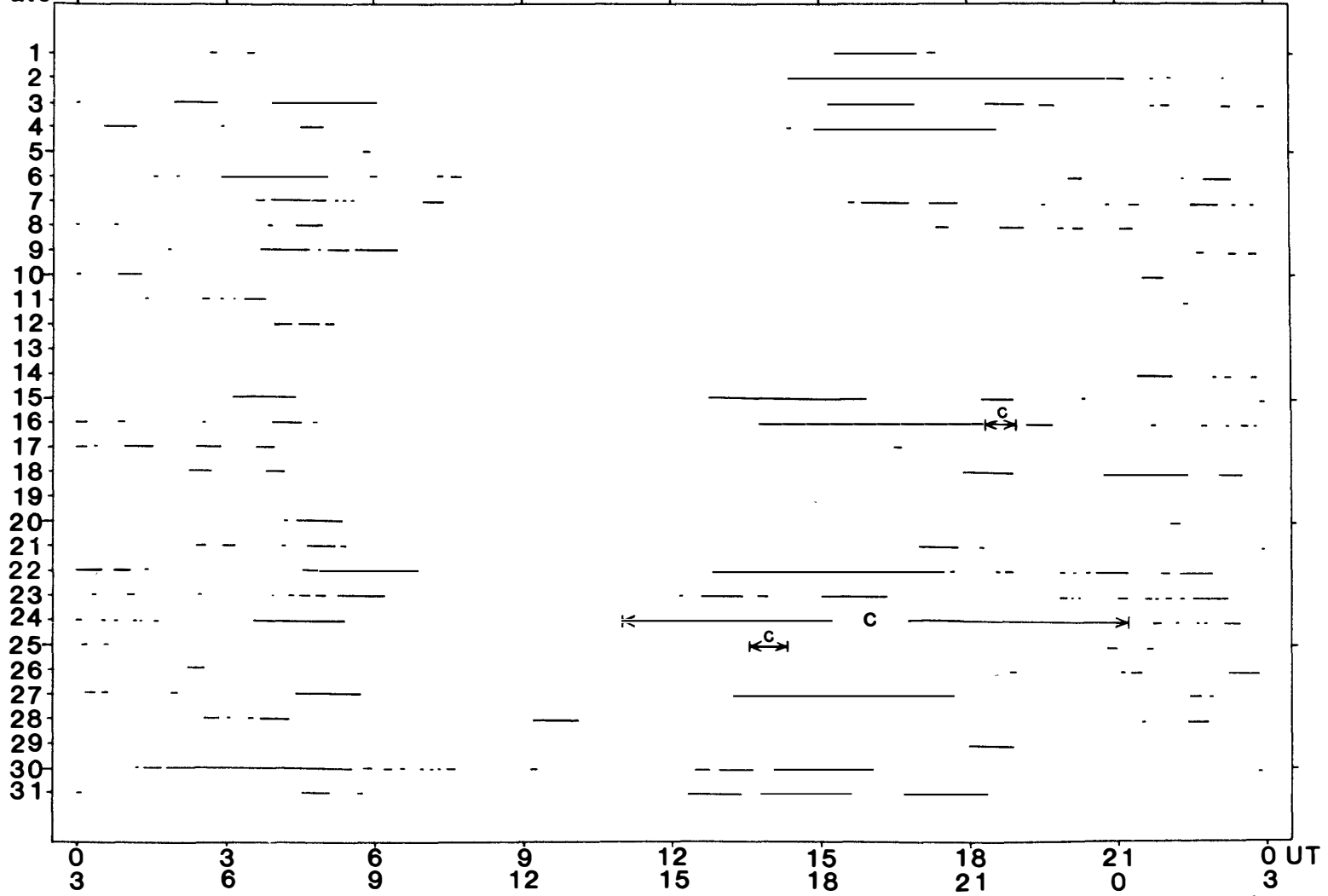


Fig.1 (1).

45°E.M.T.

February 1982

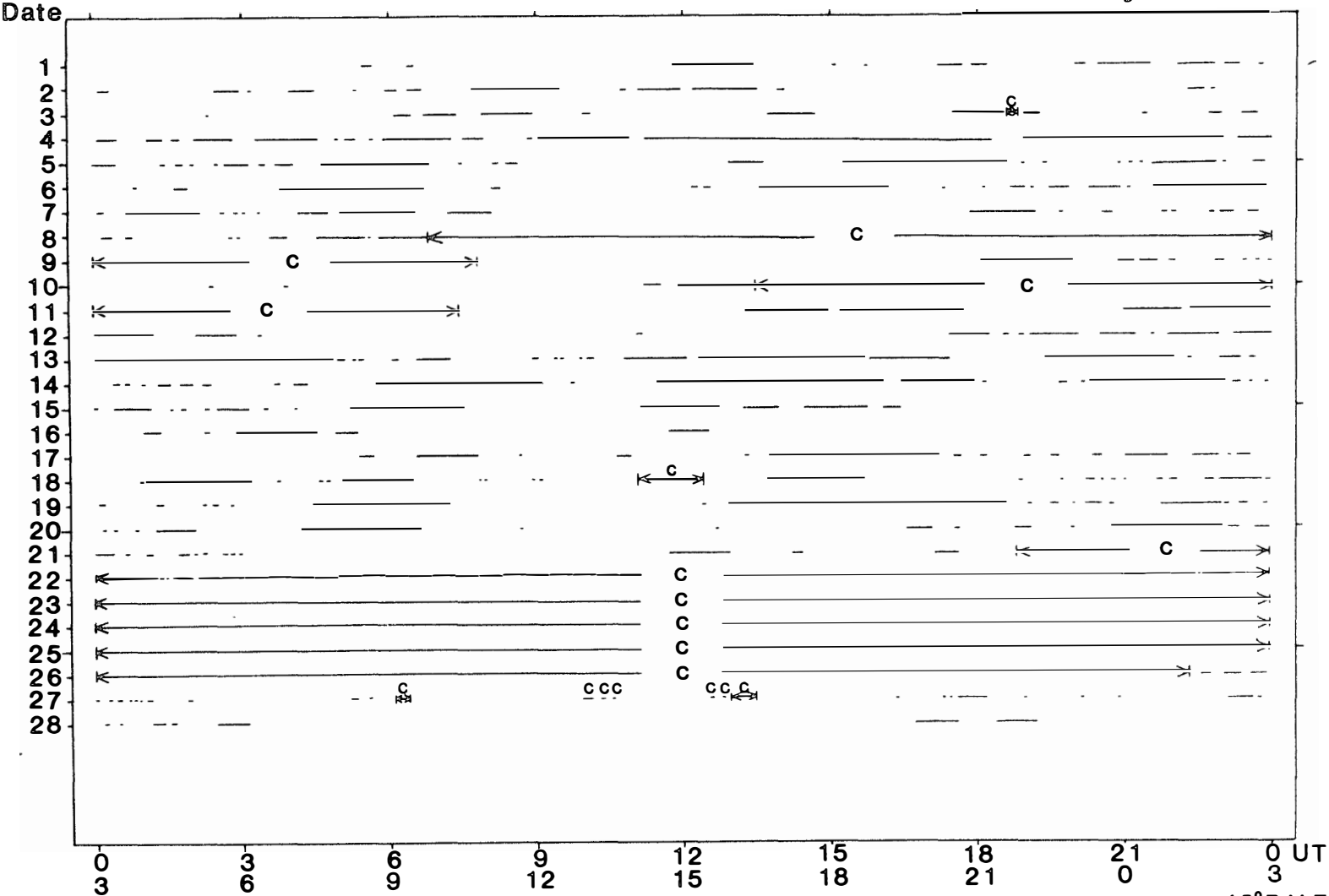


Fig.1 (2).

45° E.M.T.

March 1982

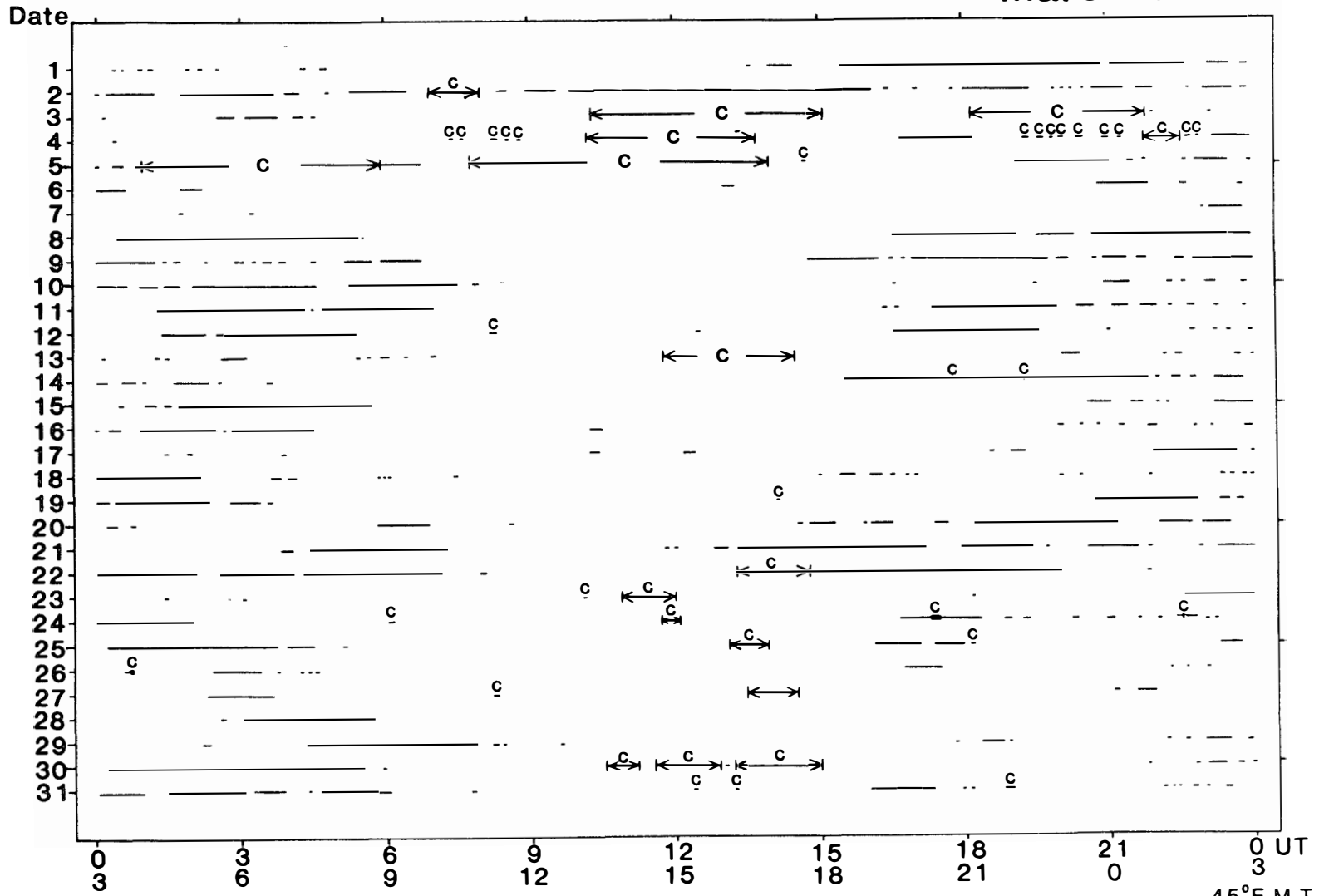


Fig.1 (3).

April 1982

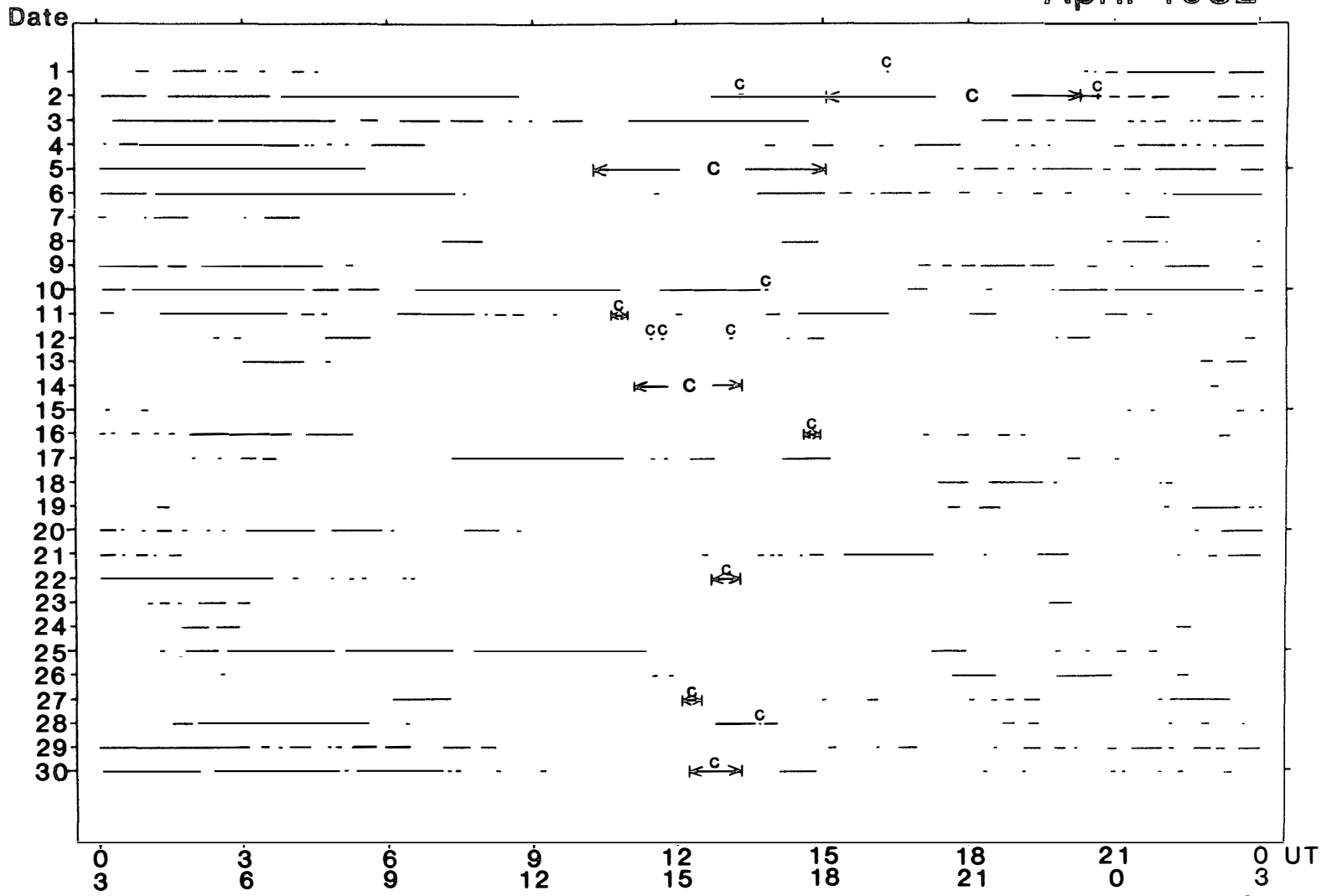


Fig.1 (4).

45°E.M.T.

May 1982

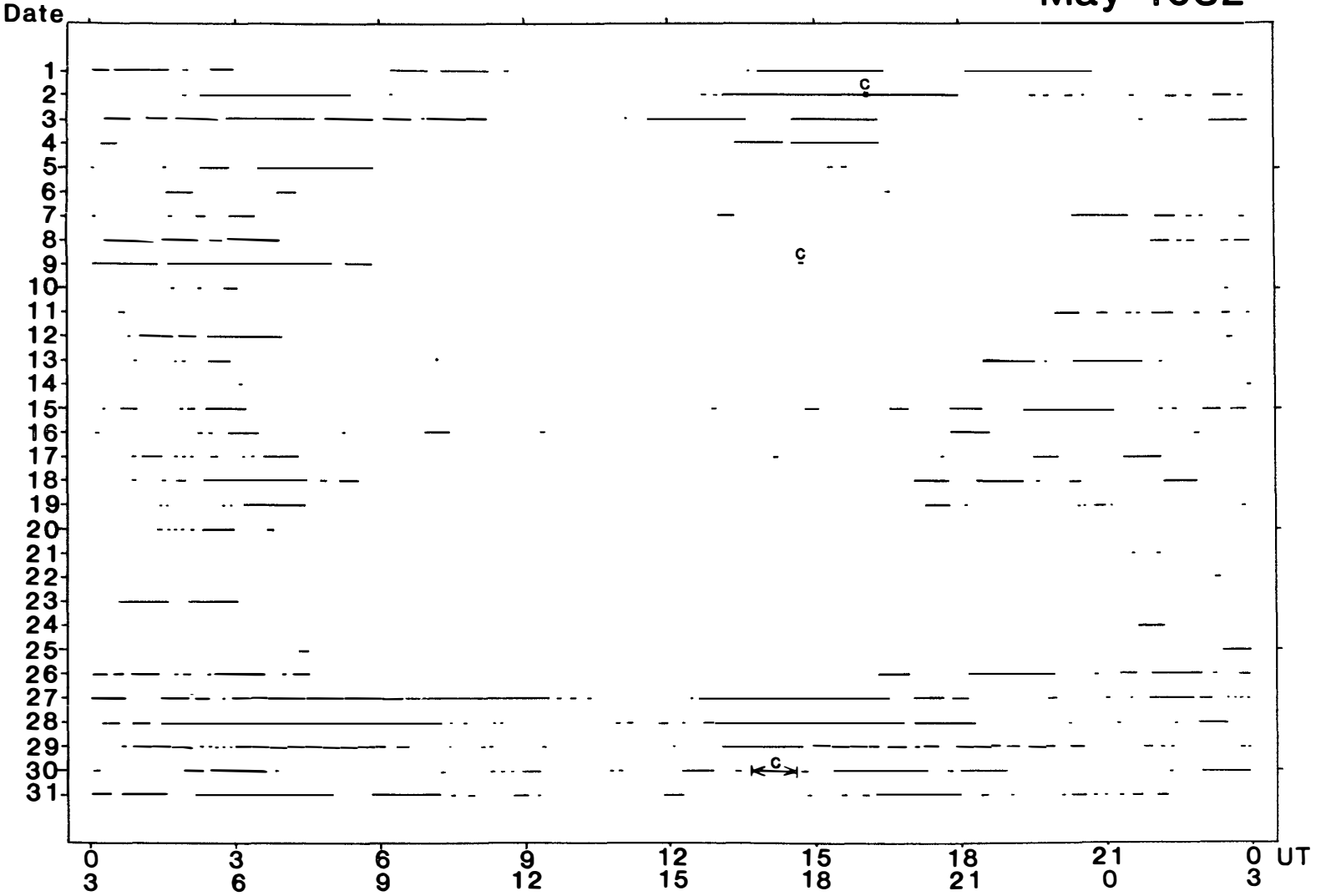
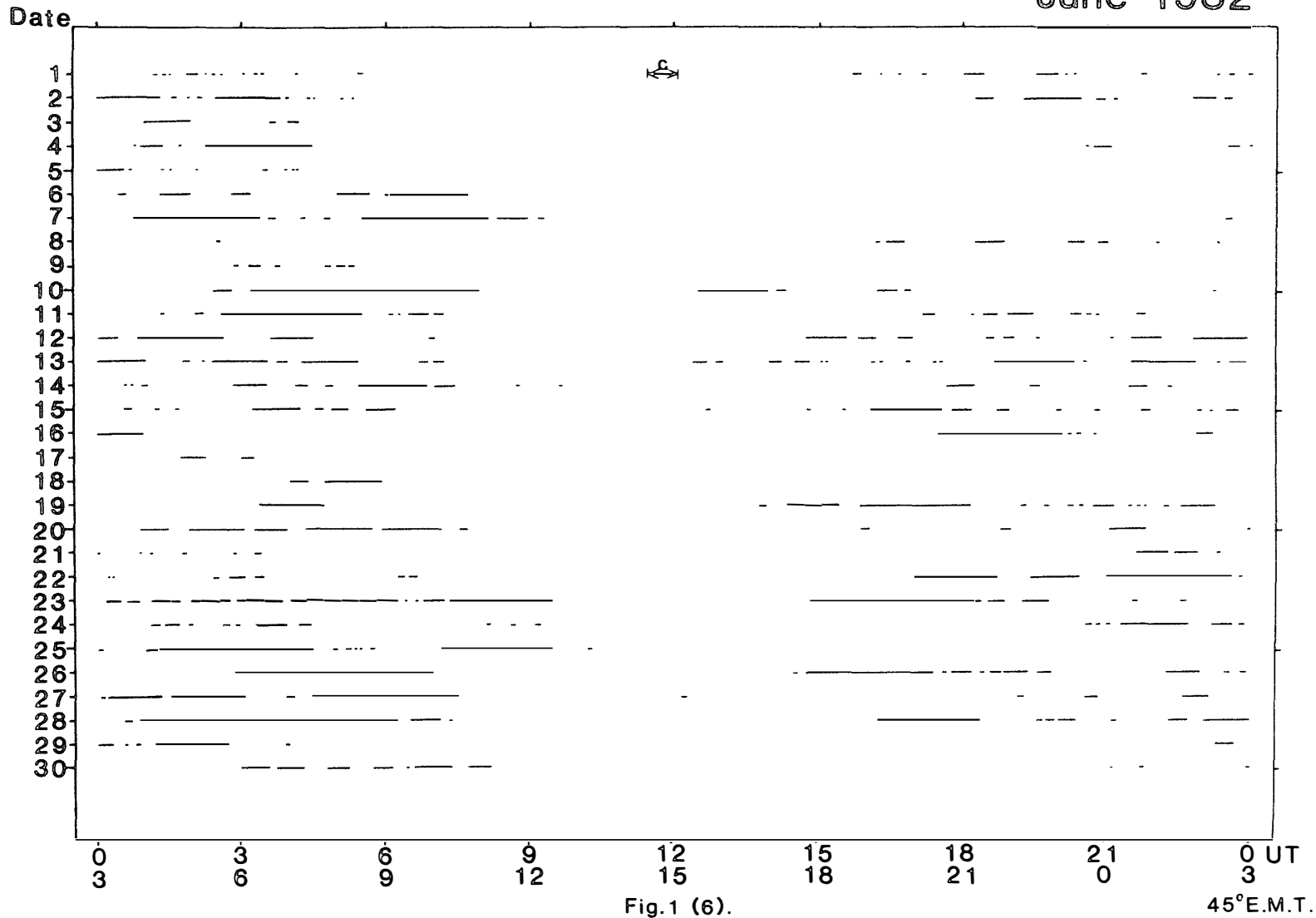


Fig.1 (5).

45°E.M.T.

June 1982



July 1982

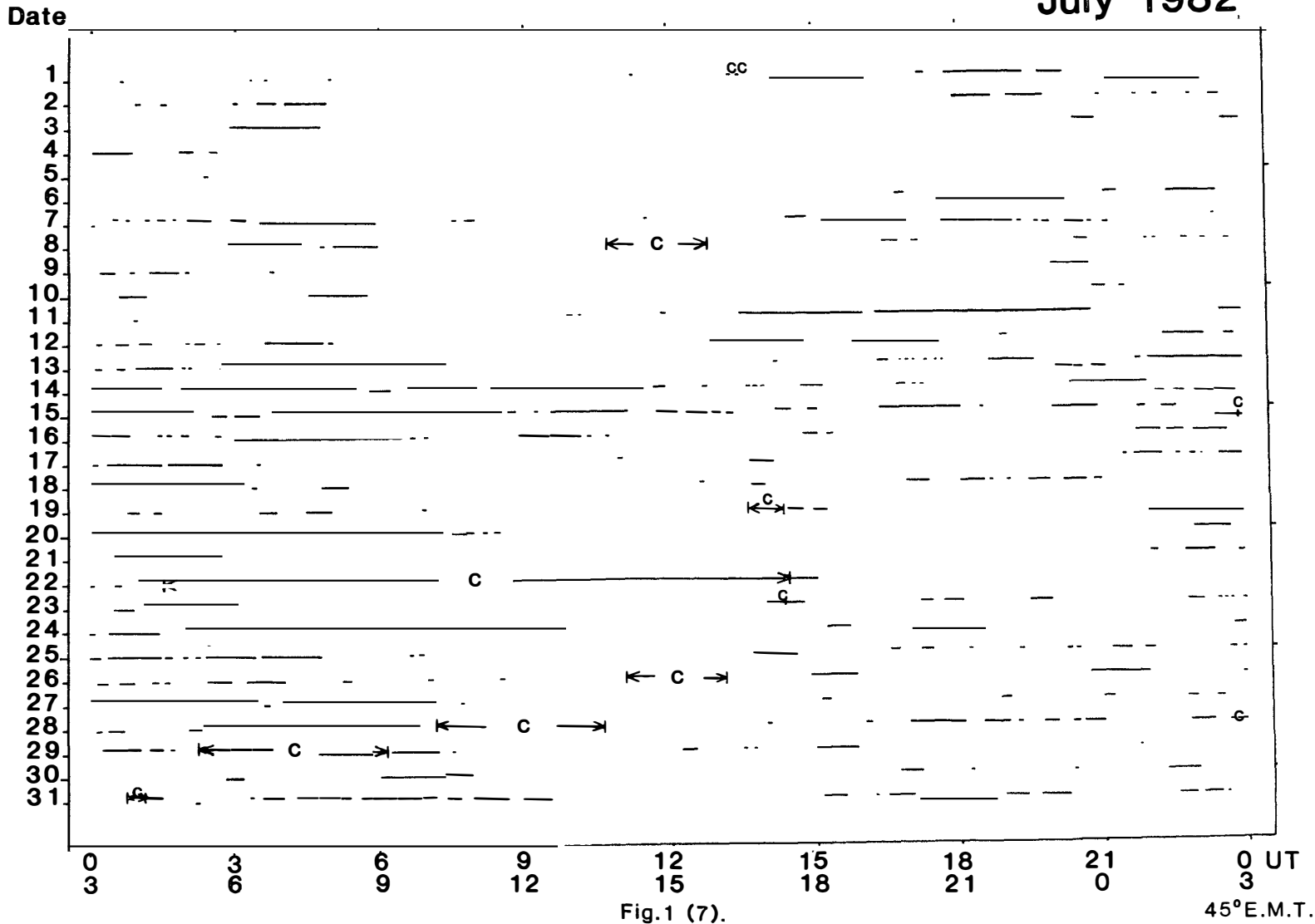


Fig.1 (7).

45°E.M.T.

August 1982

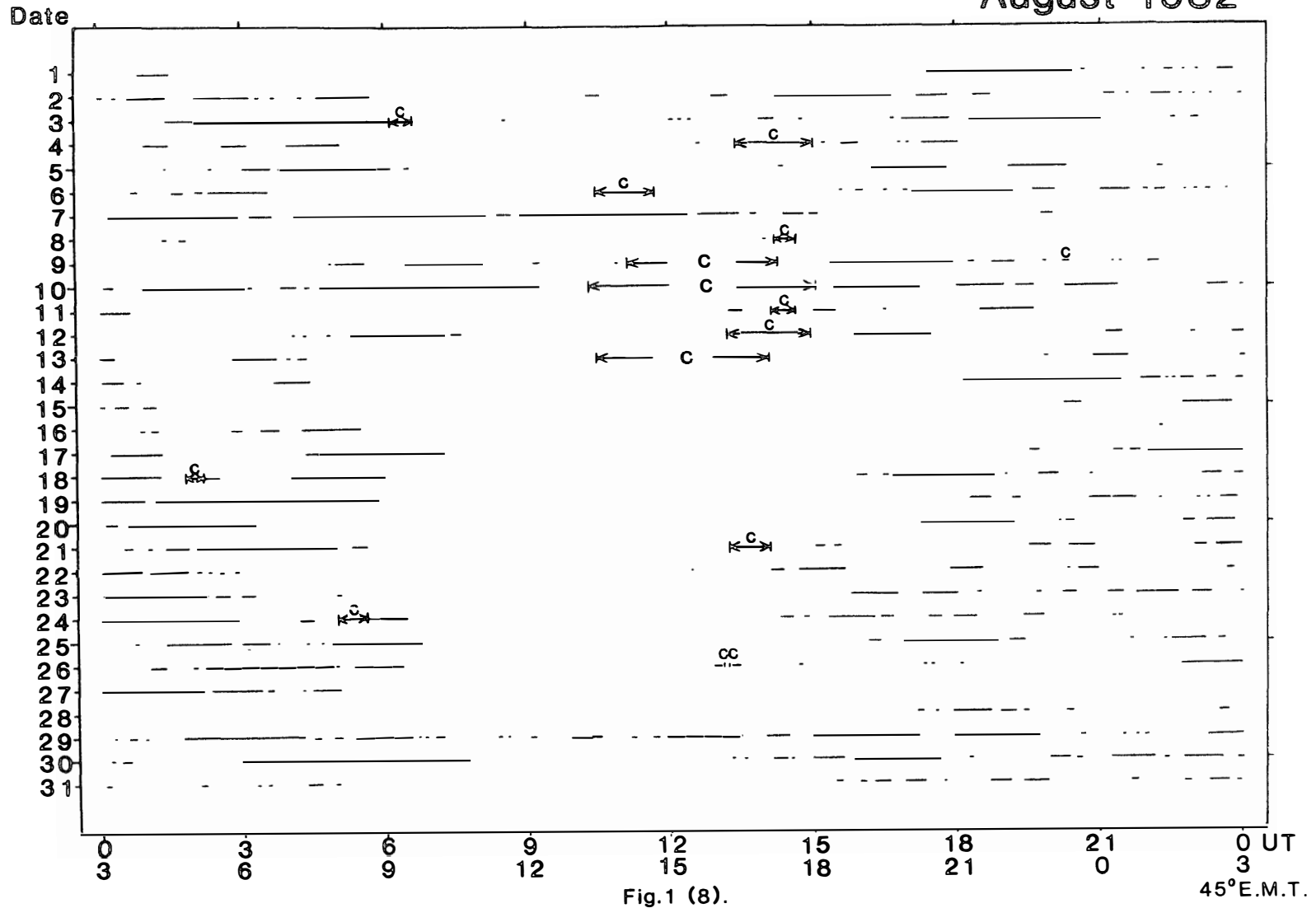


Fig.1 (8).



September 1982

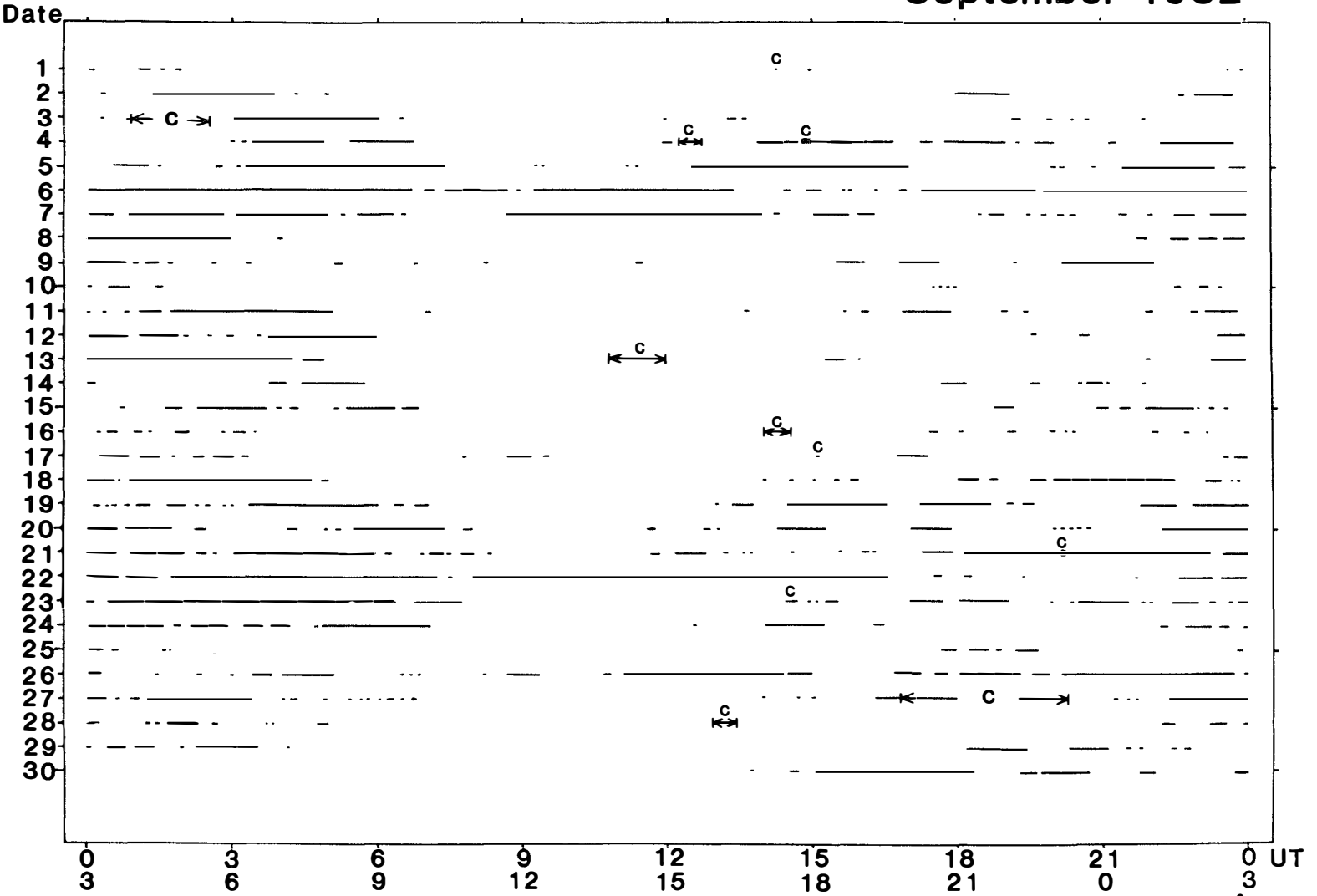


Fig.1 (9).

45°E.M.T.

October 1982

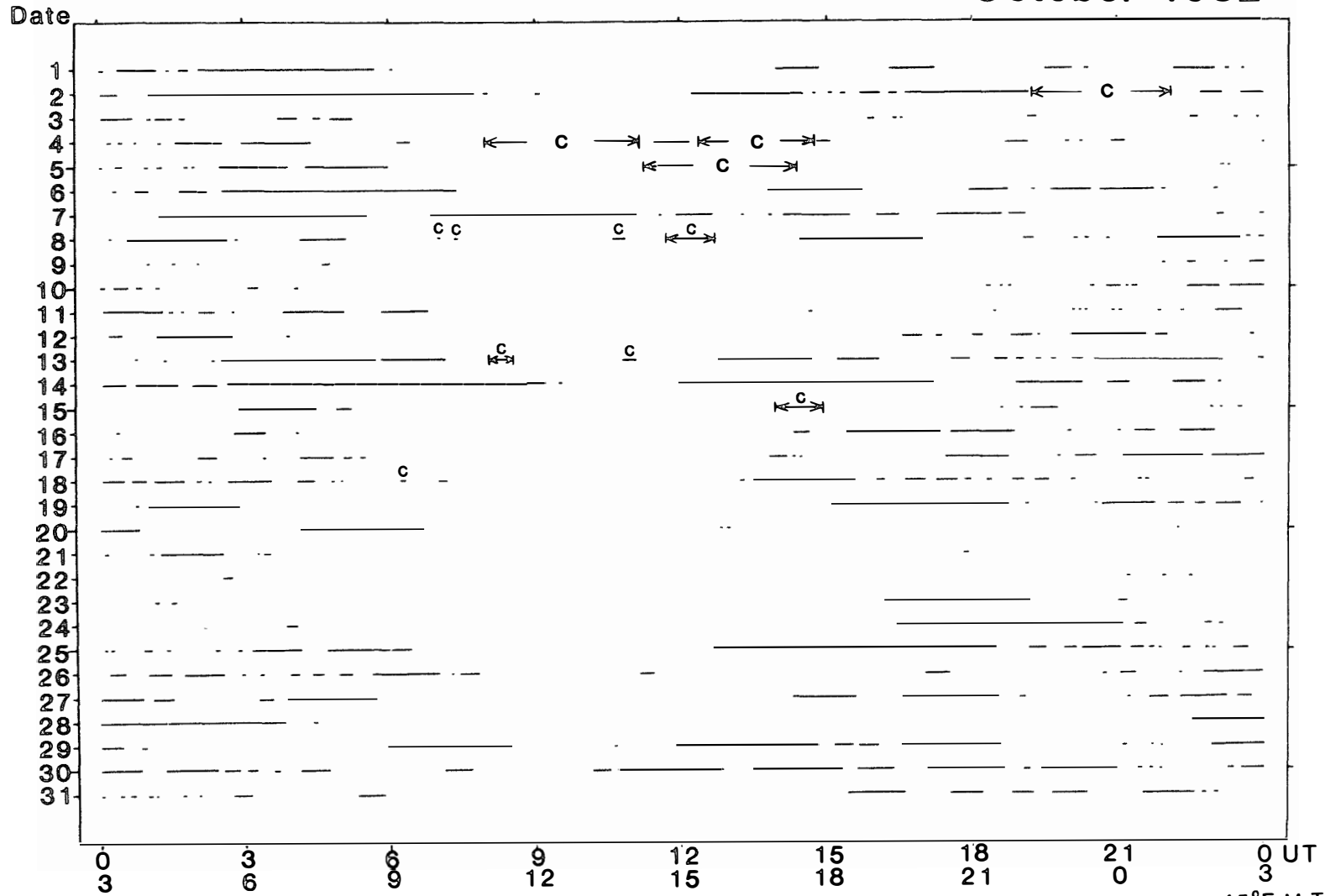


Fig. 1 (10).

45°E.M.T.

# November 1982

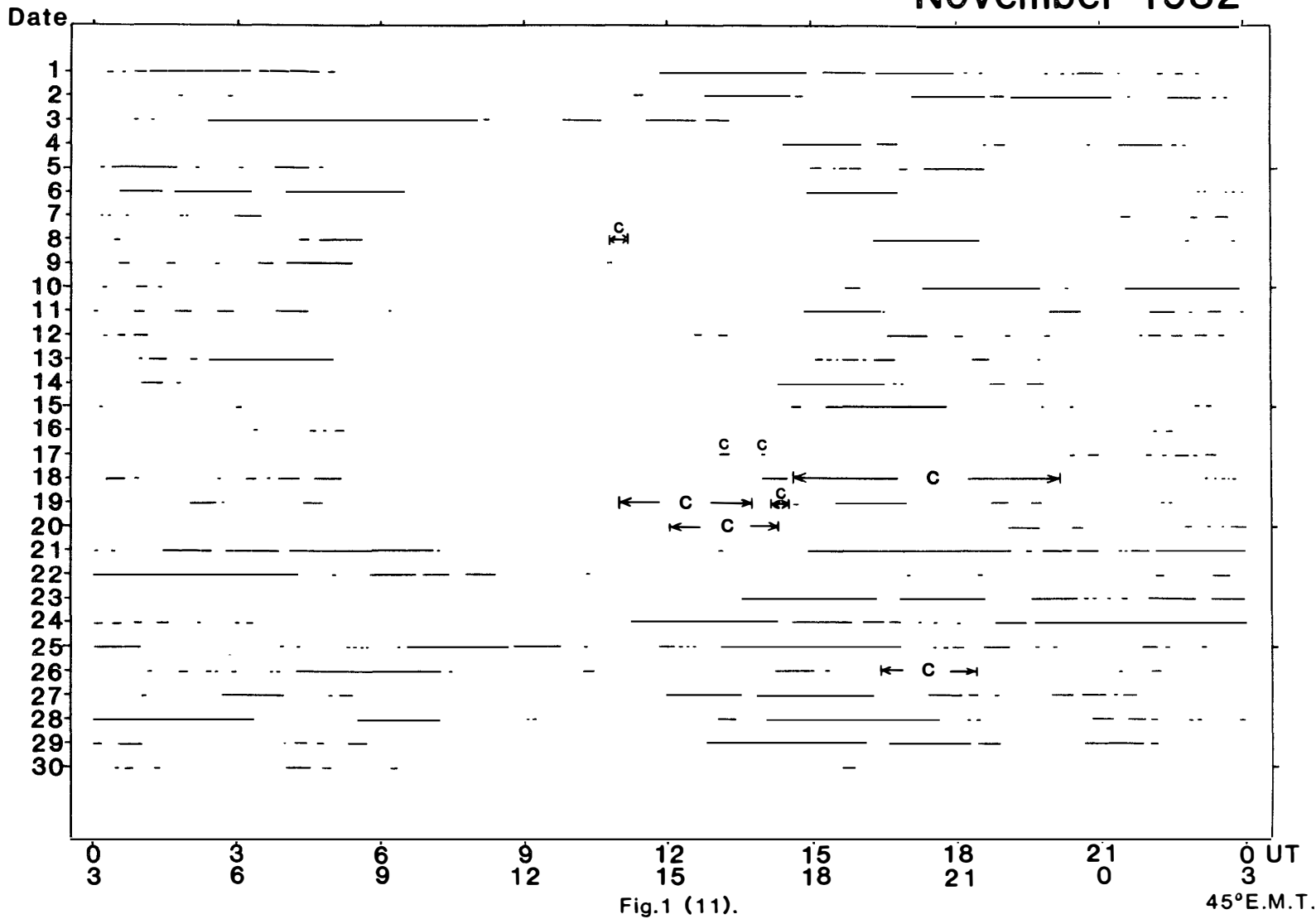


Fig.1 (11).

45°E.M.T.

December 1982

Date

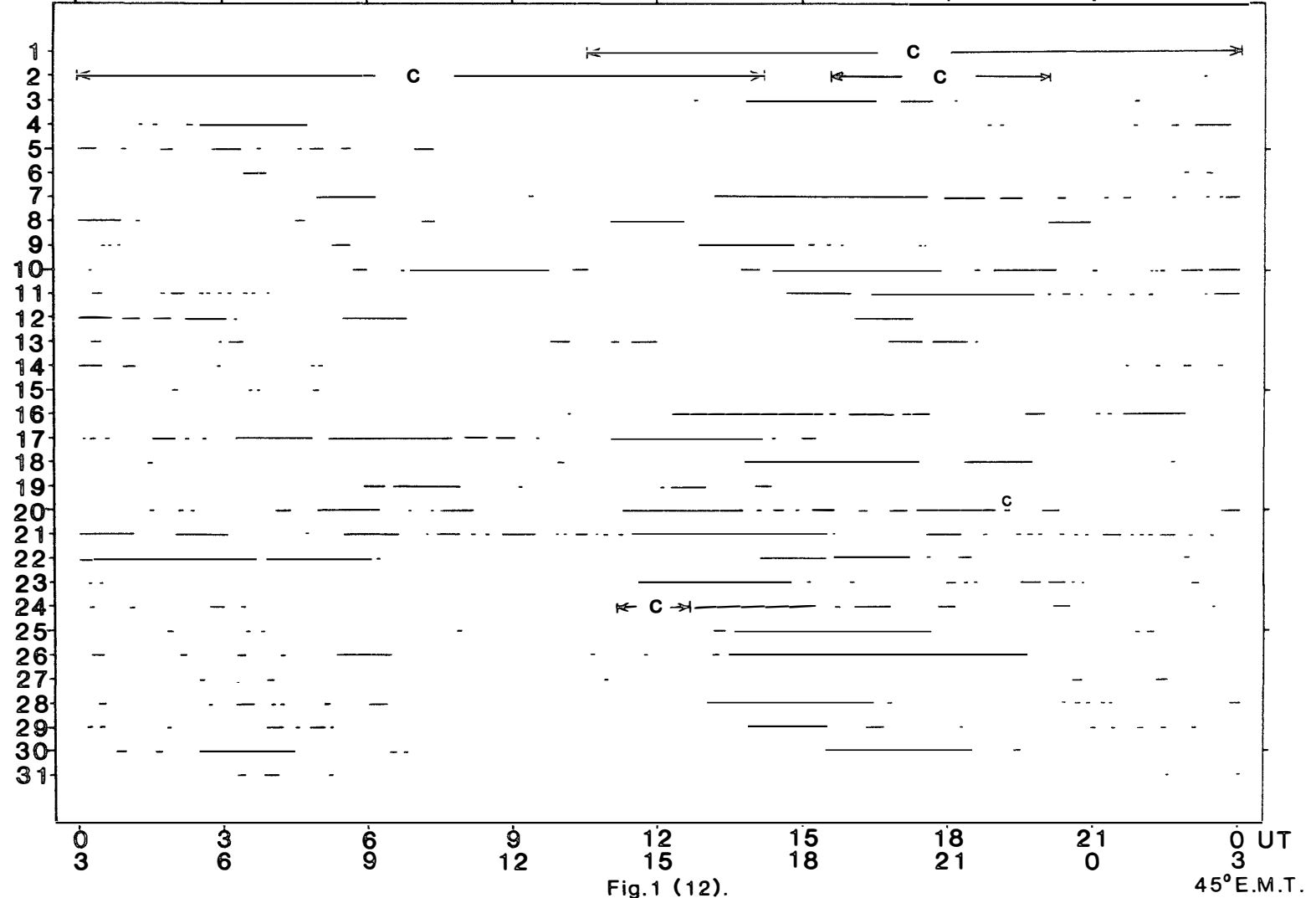


Fig.1 (12).

45°E.M.T.

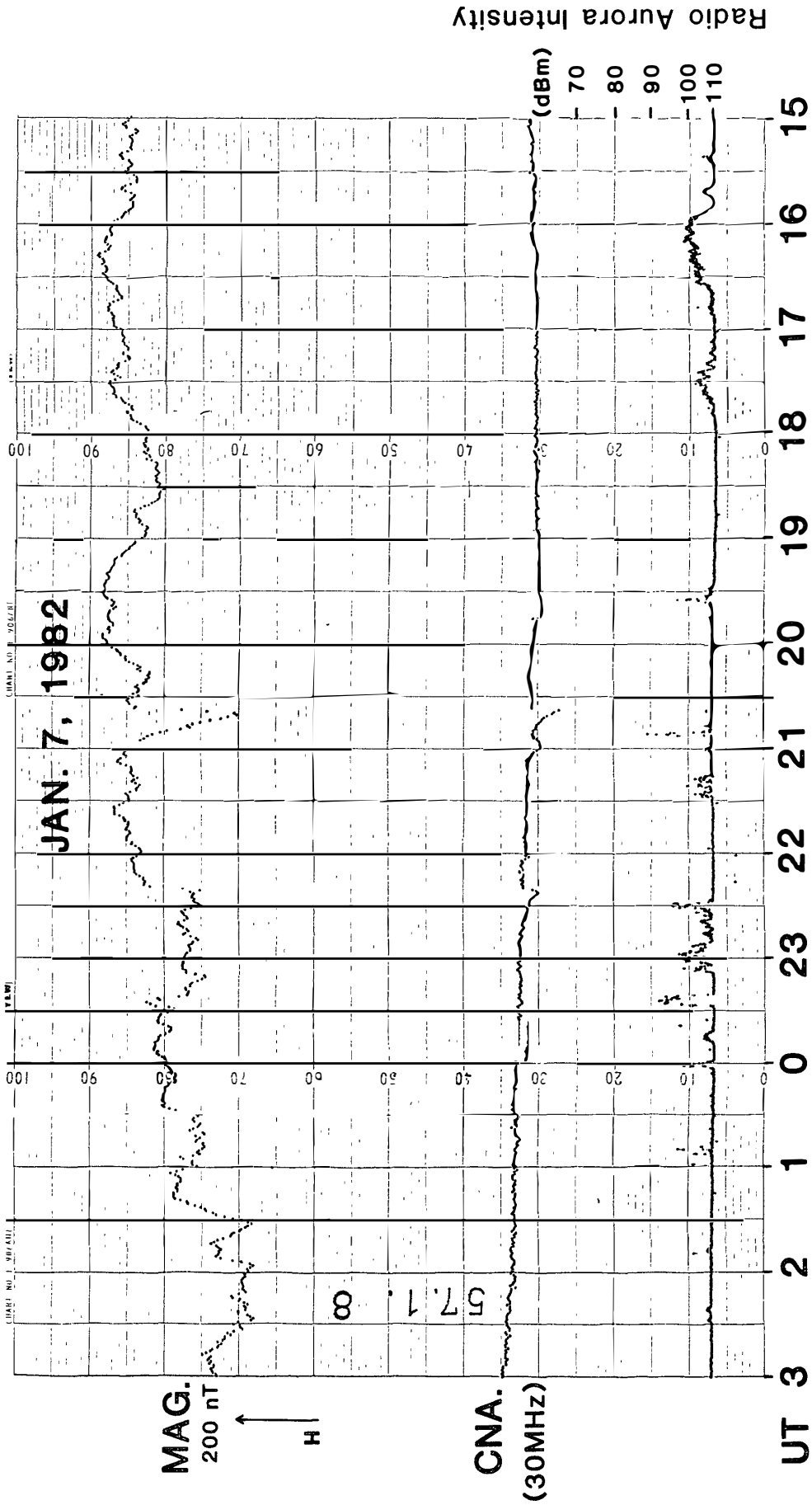


Fig. 2 (1).

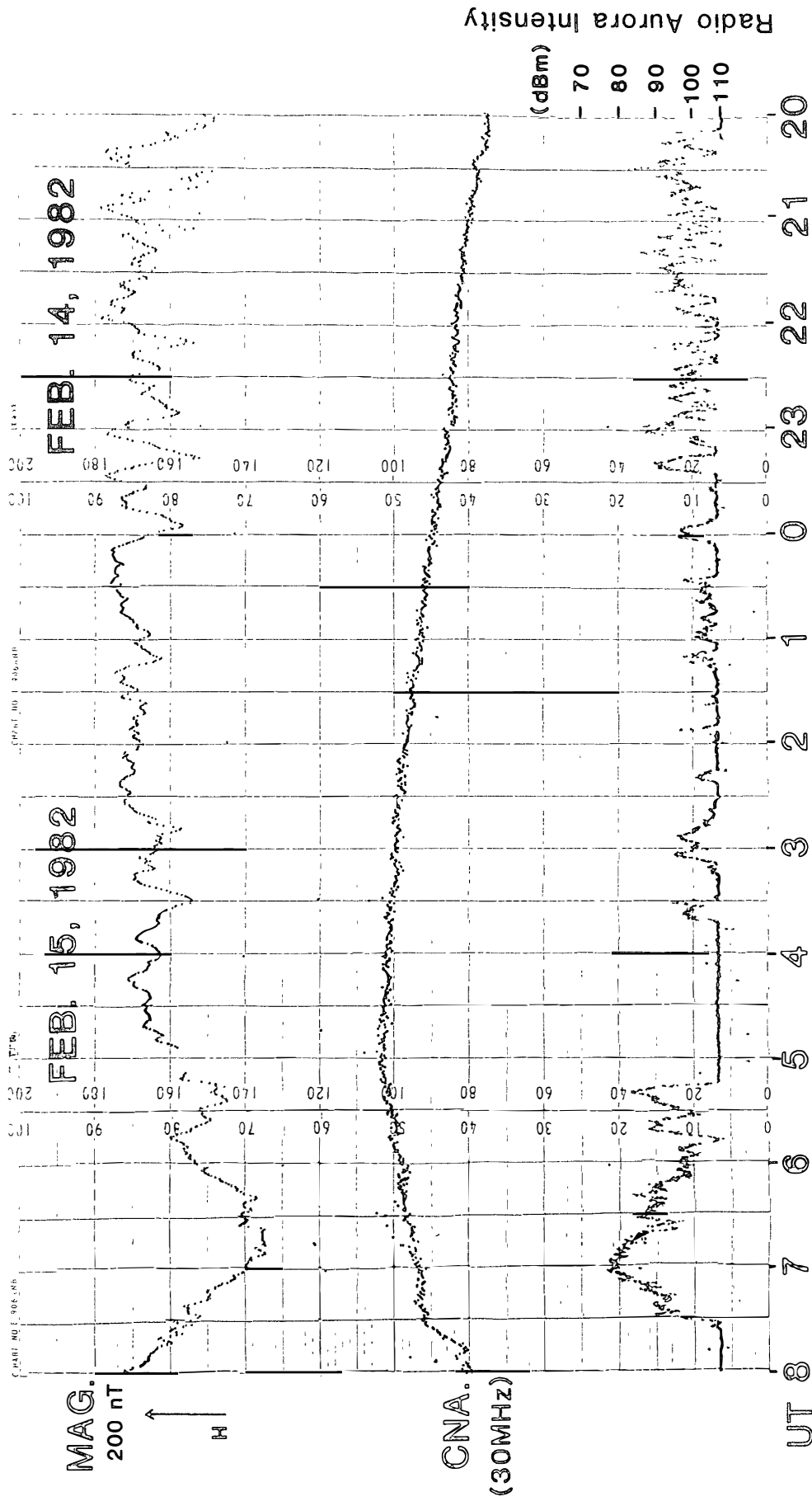


Fig. 2 (2).

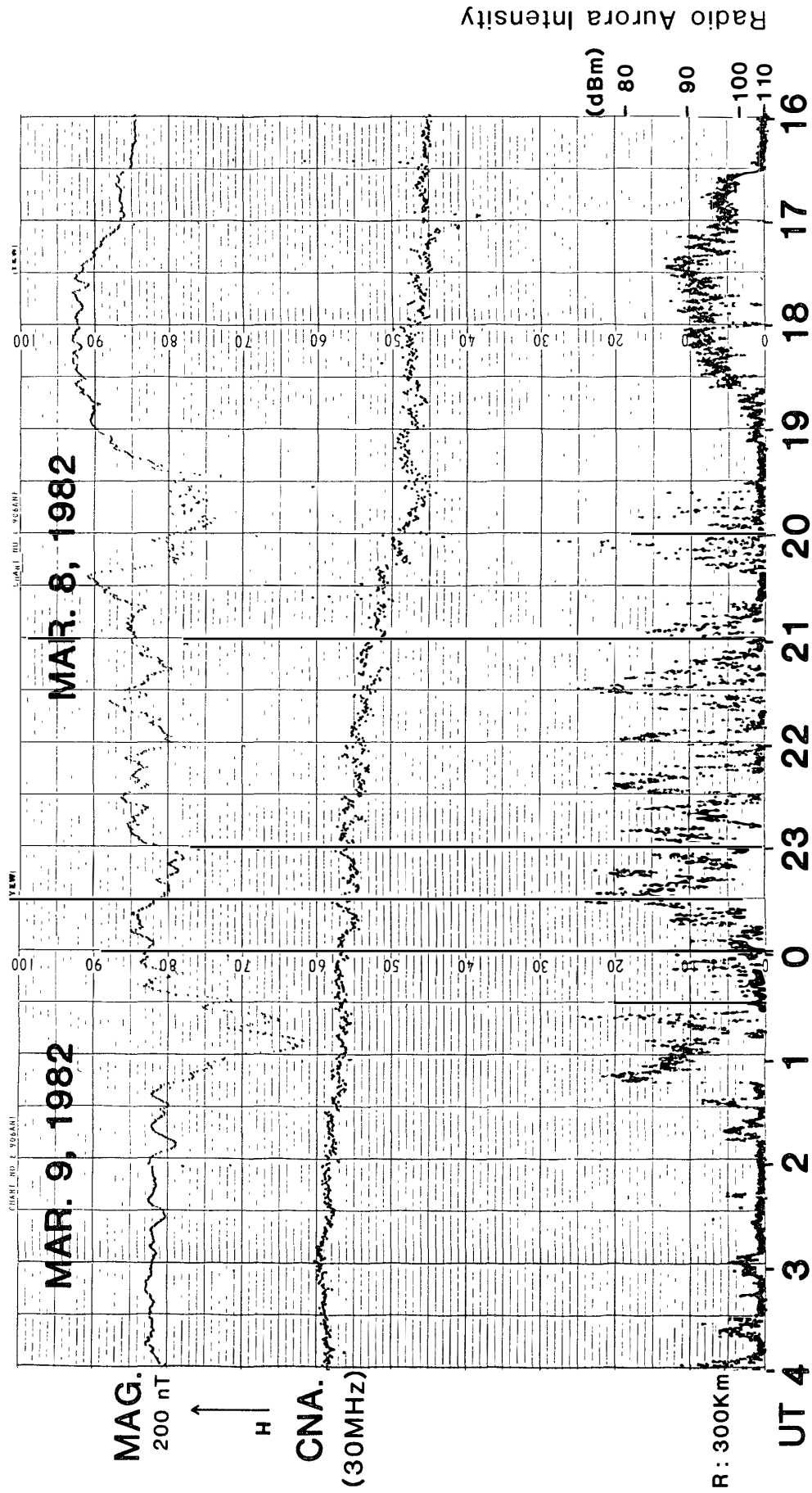


Fig. 2 (3).

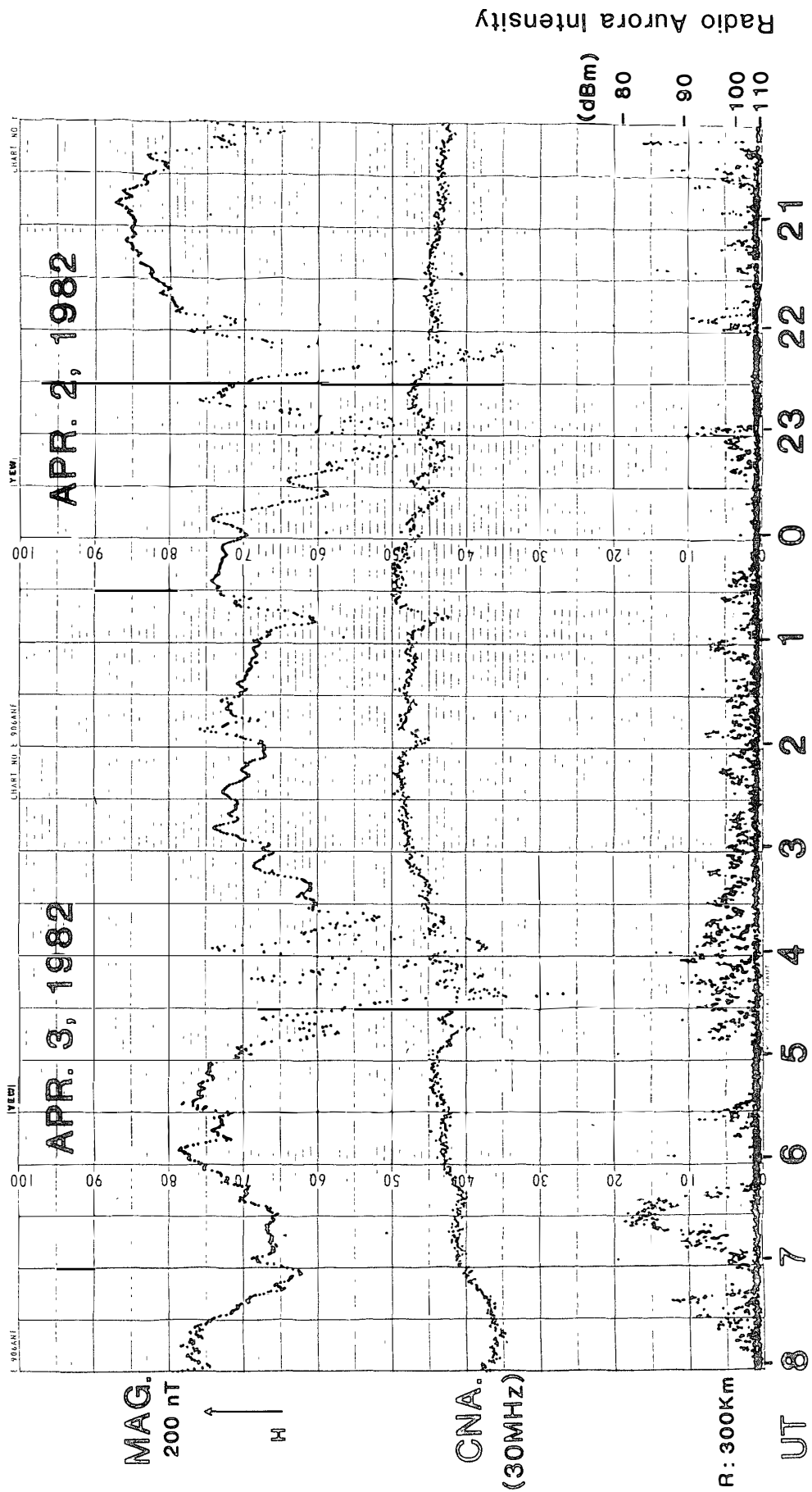


Fig. 2 (4).



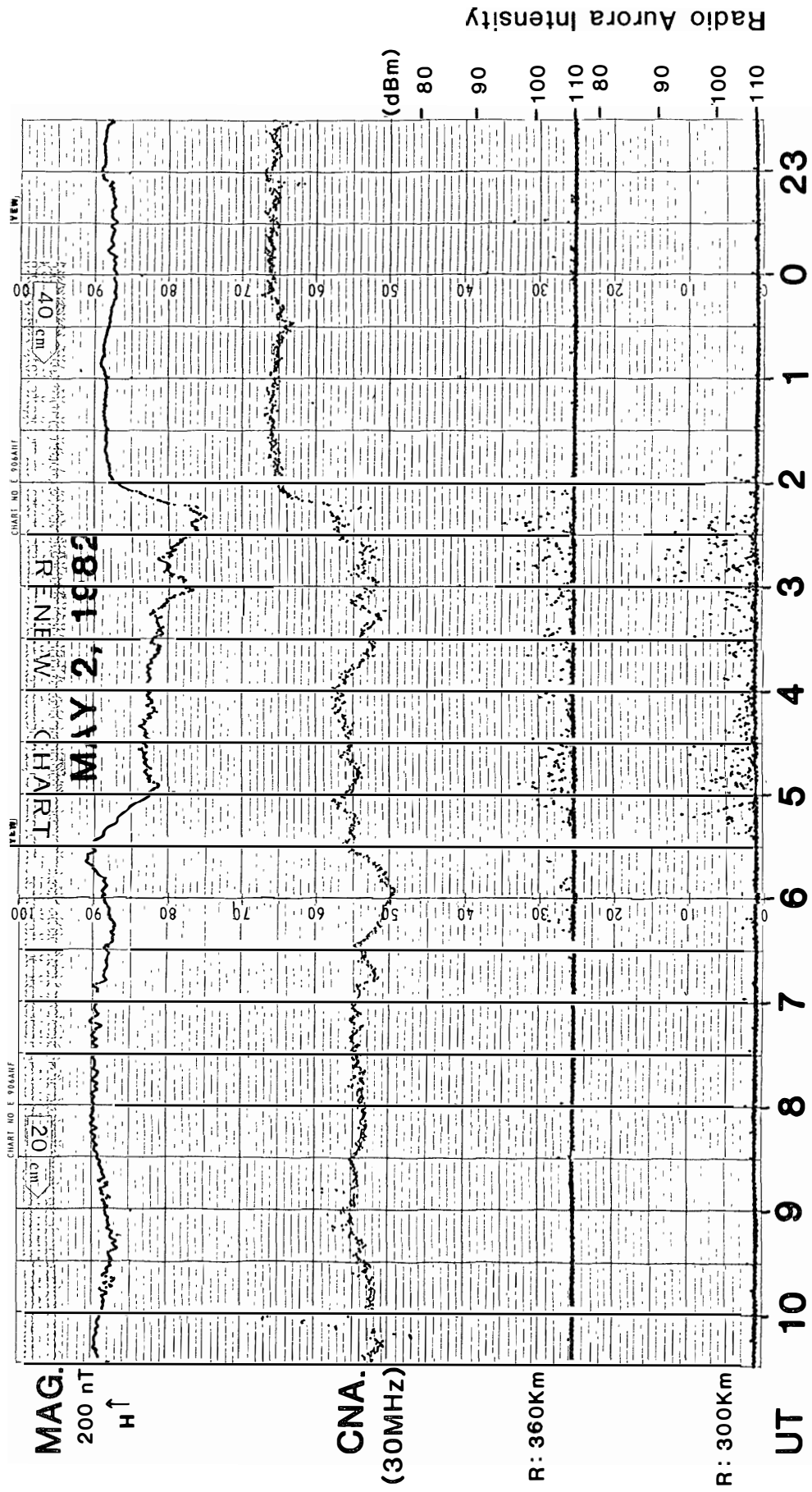


Fig. 2 (5).

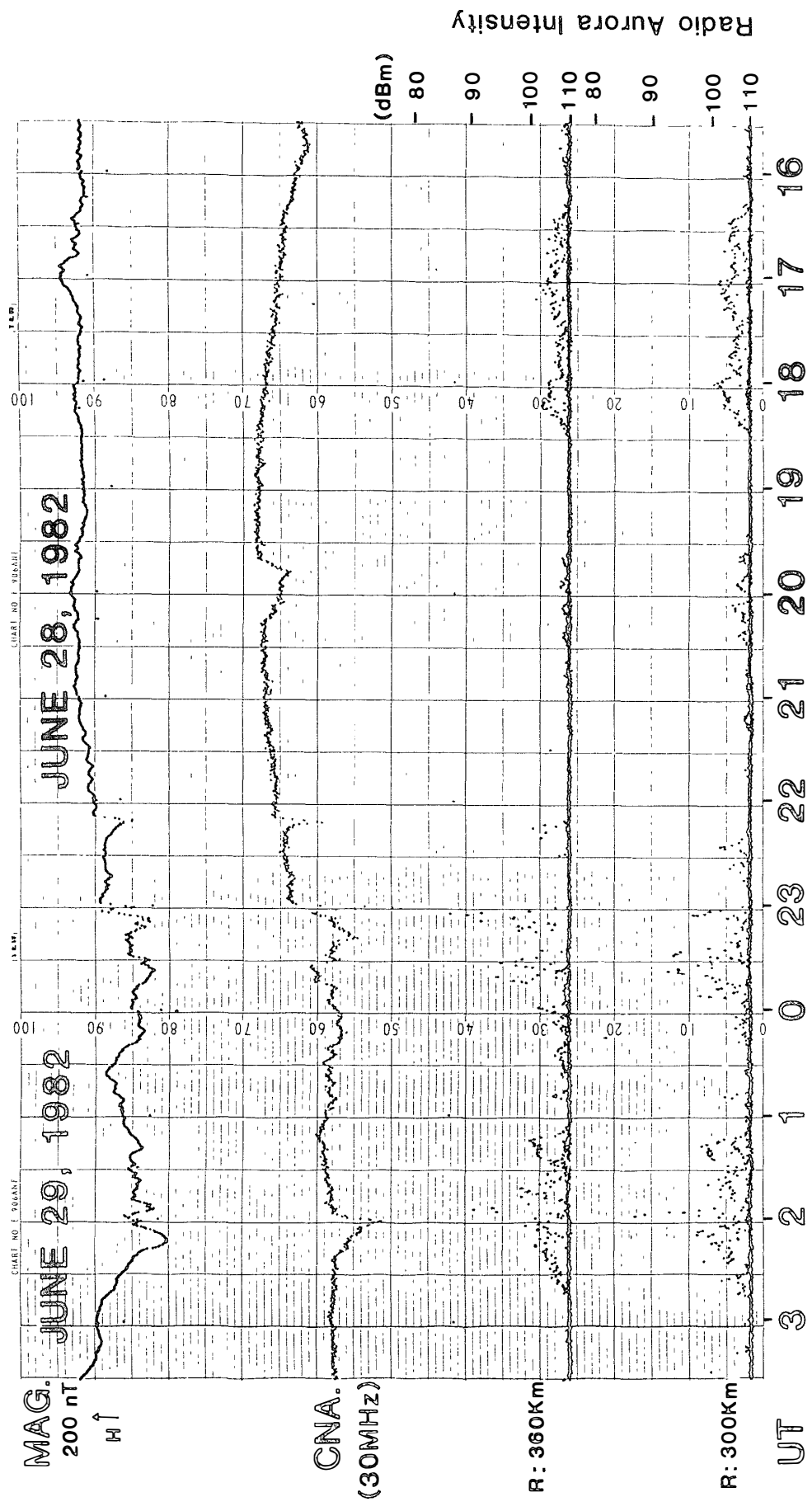


Fig. 2 (6).

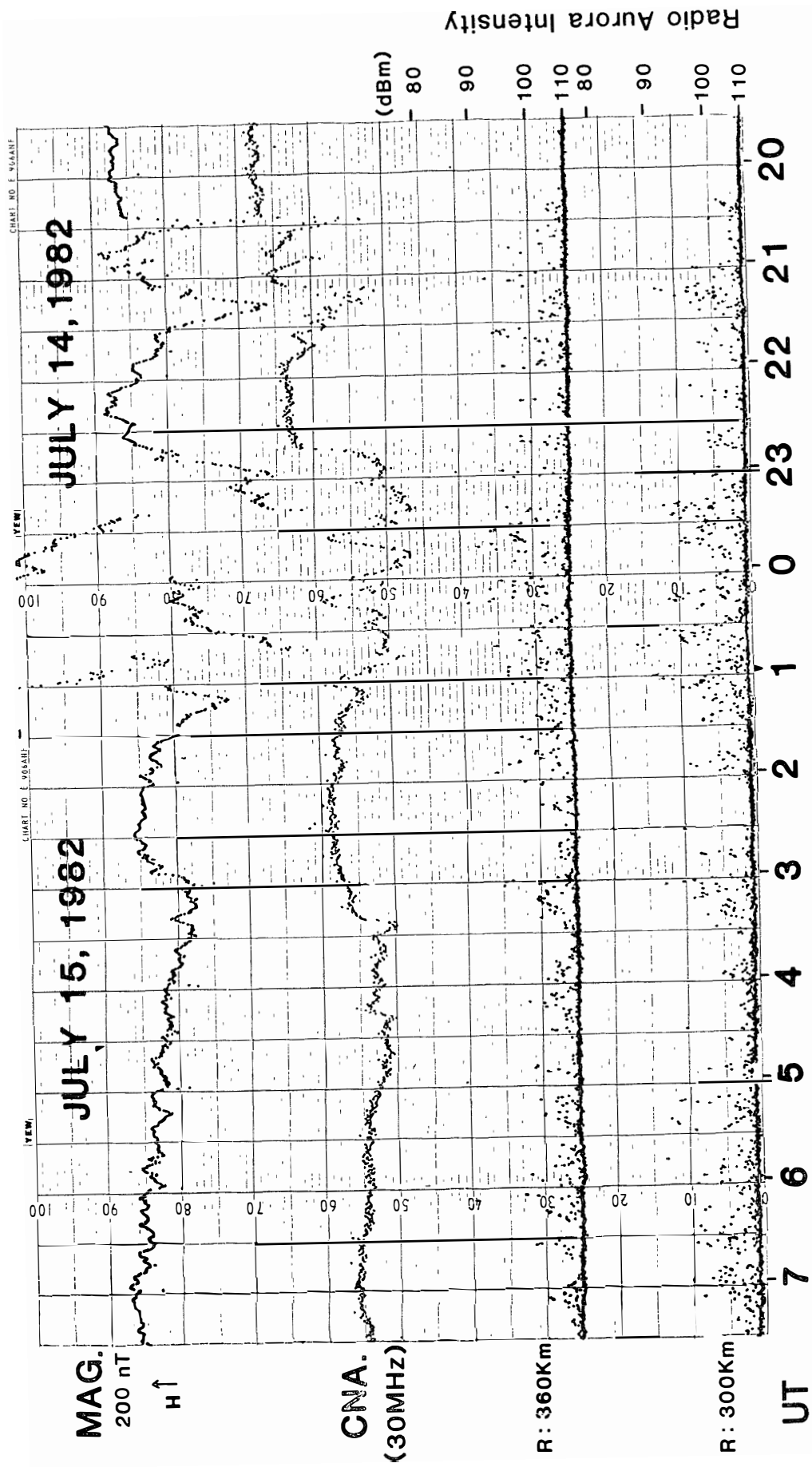


Fig. 2 (7).

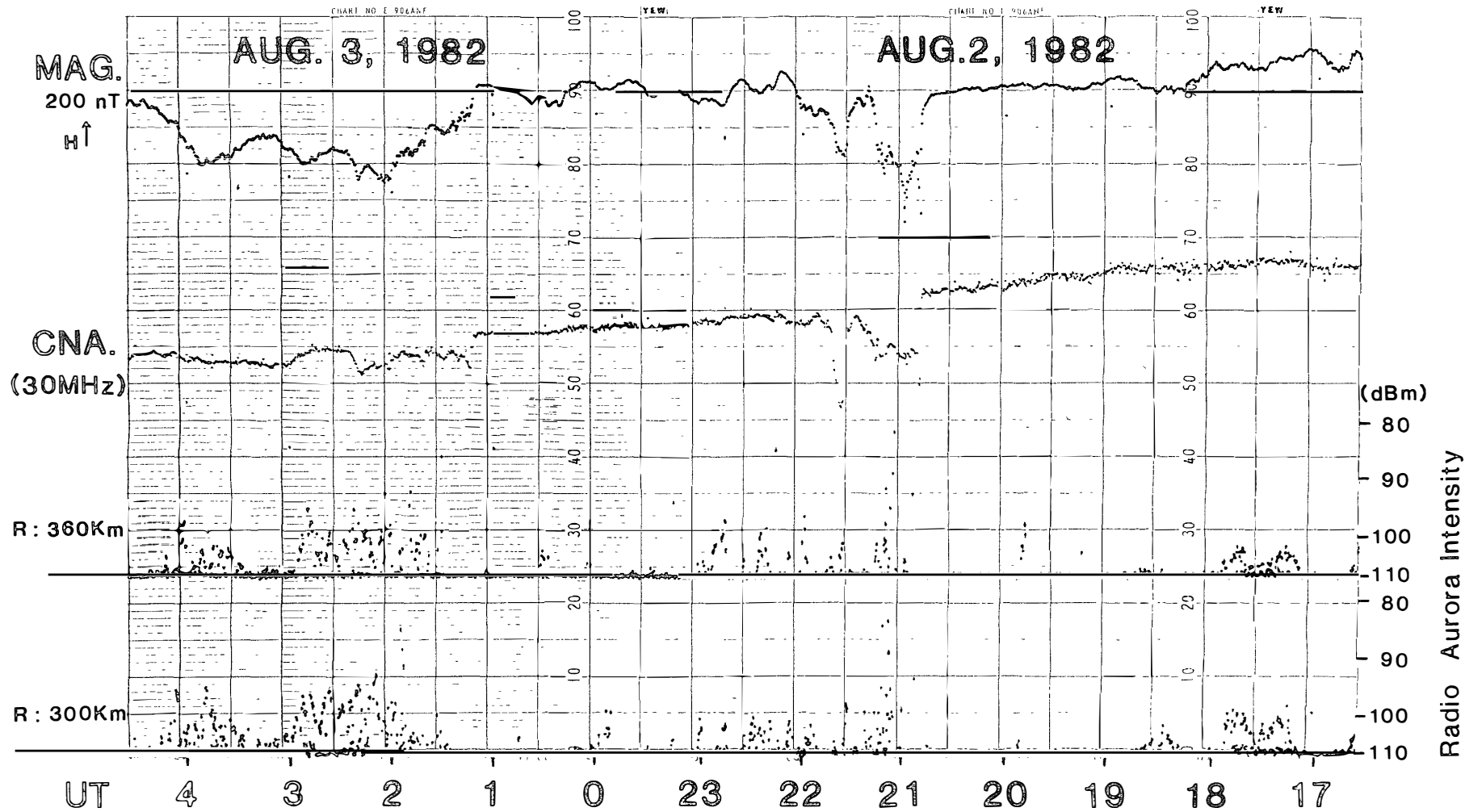


Fig. 2 (8).

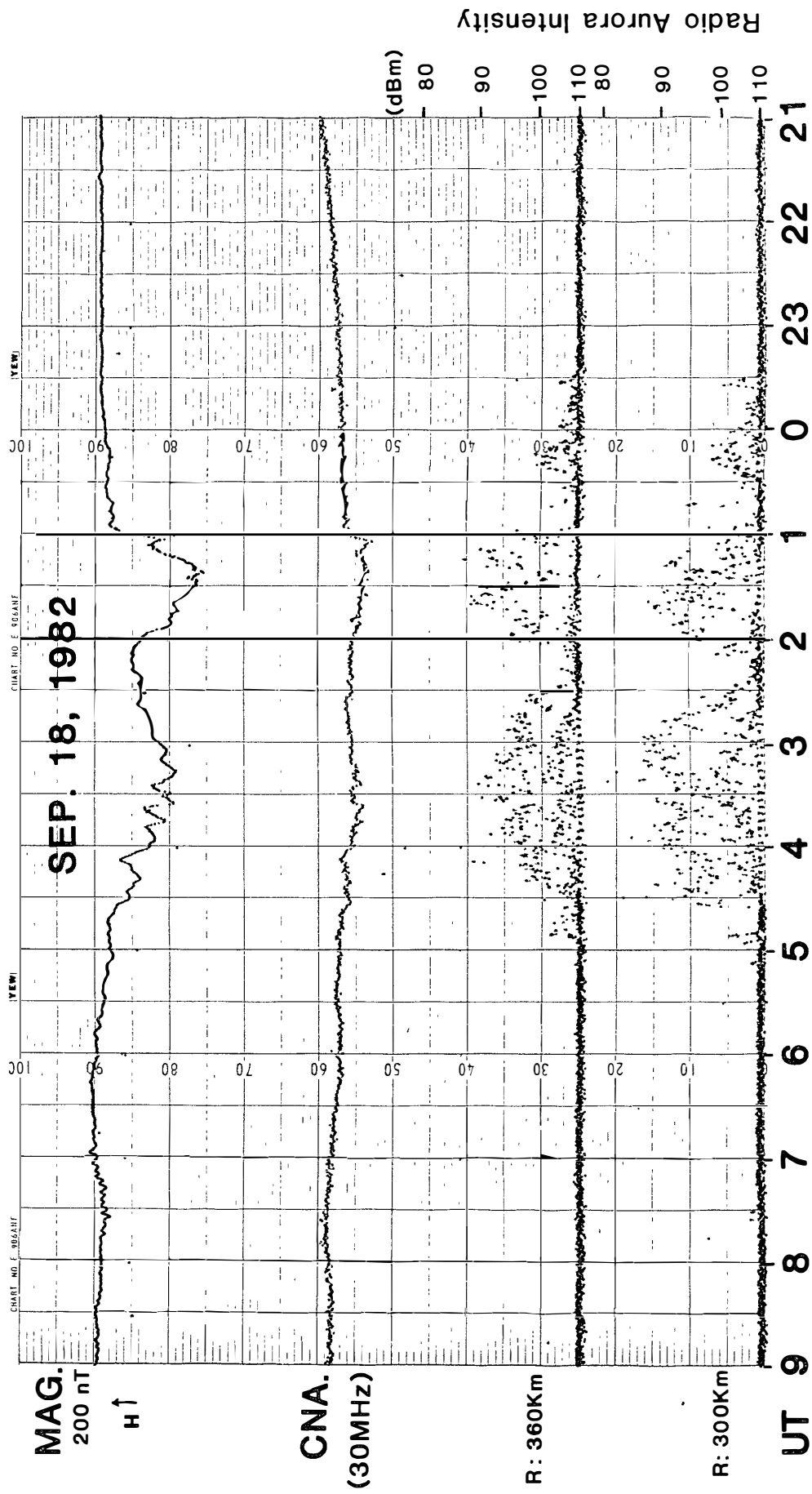


Fig. 2 (9).

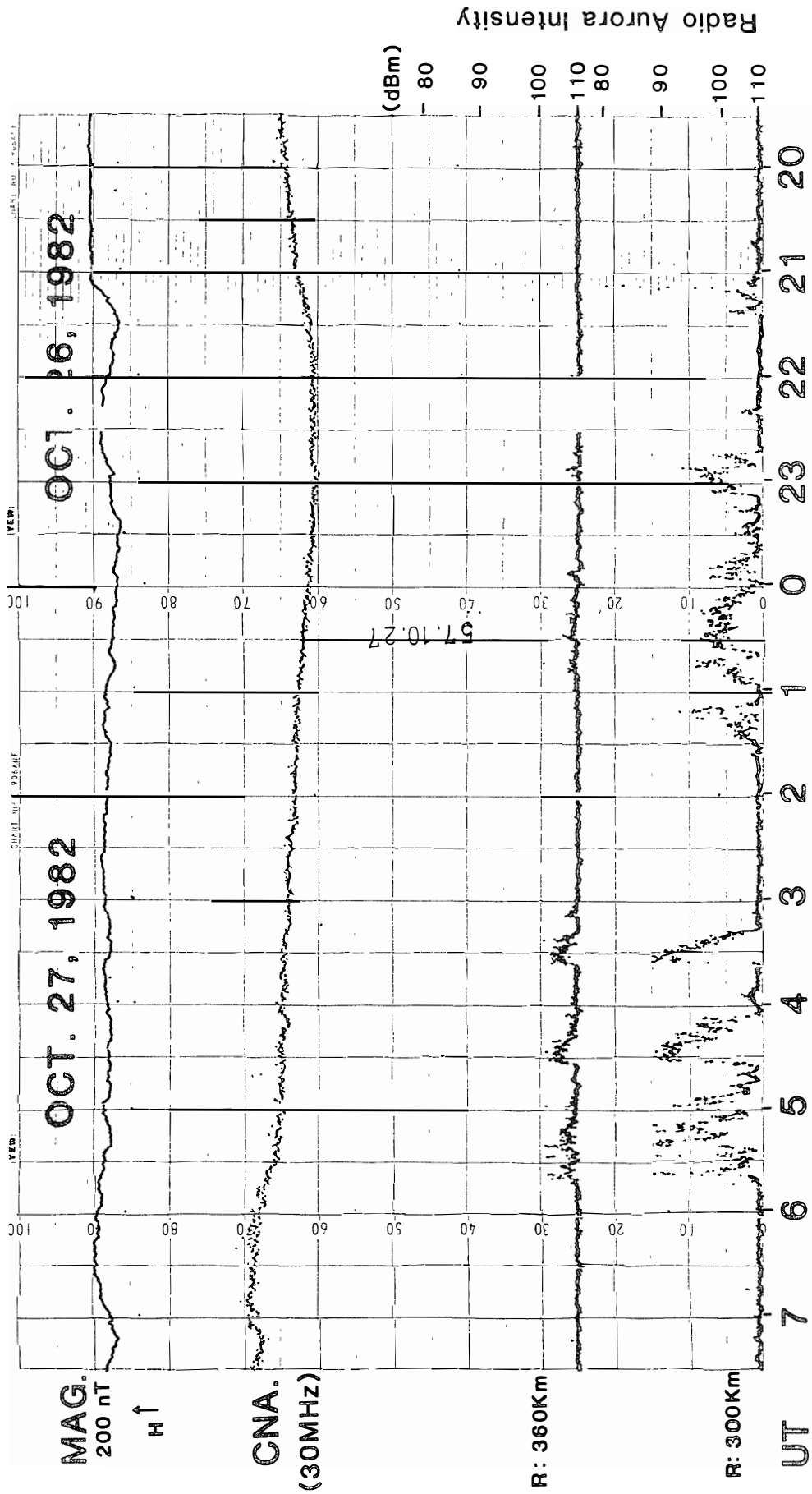


Fig. 2 (10).

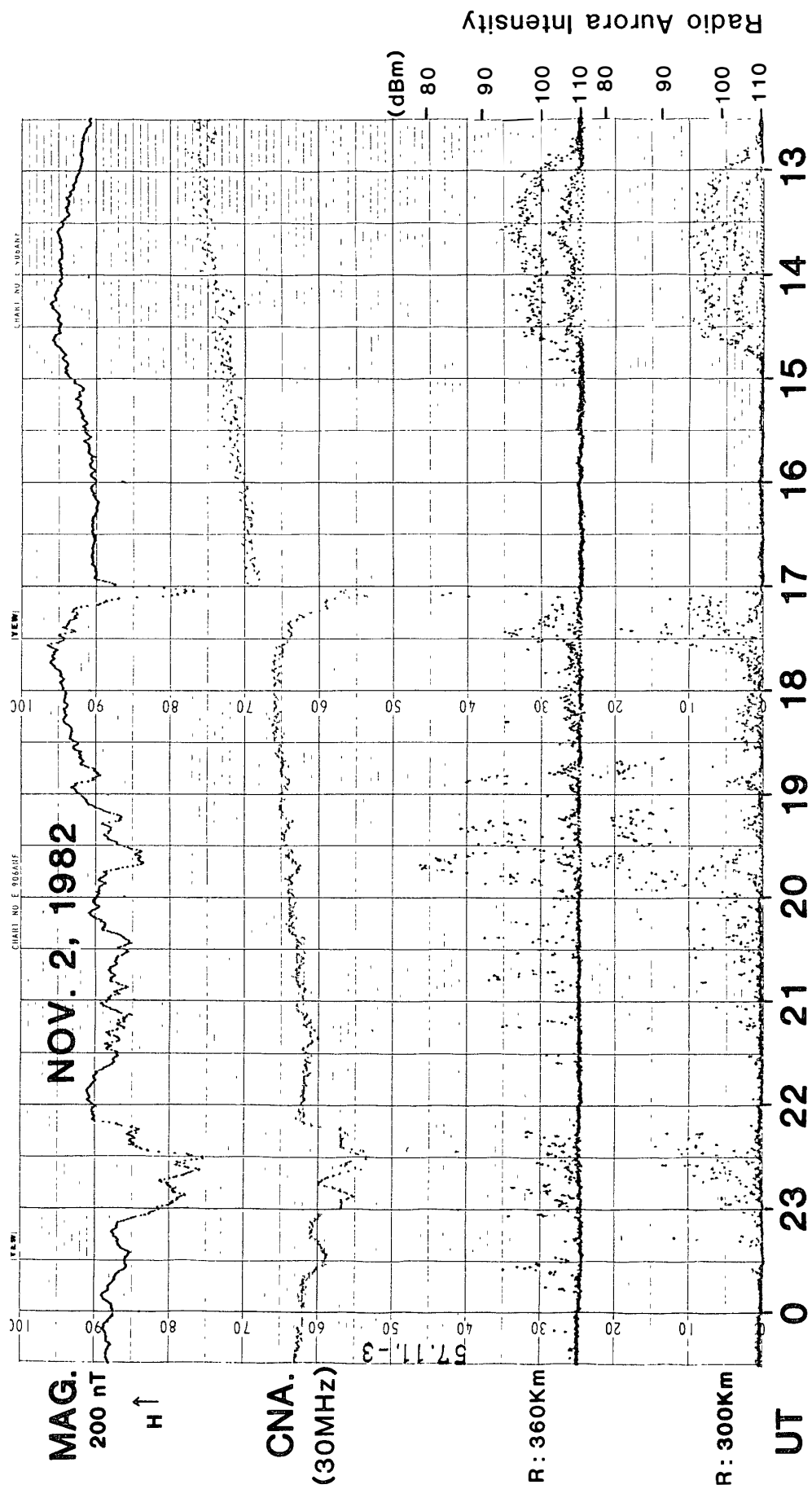


Fig. 2 (11).

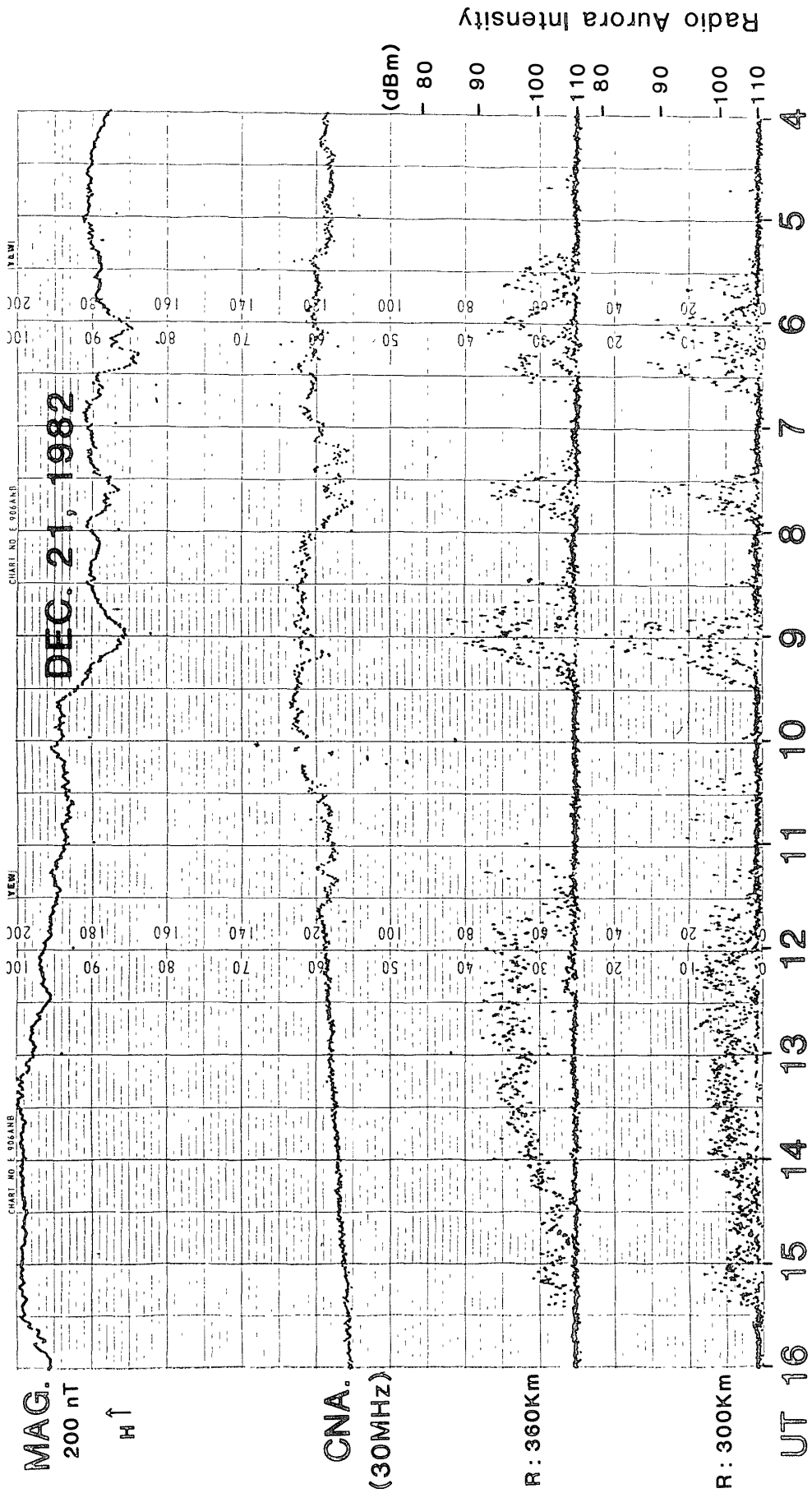


Fig. 2 (12).