

## Total solar eclipse of October 24, 1995 II.

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### 1. Introduction

General characteristics and the importance of observing a total solar eclipse were discussed in a previous article (Singh 1994). Further, we had also discussed the local circumstances for the eclipse of October 24, 1995 and the weather conditions along the path of totality in India. Here we discuss the details of the totality track in India. In table 1 we list longitude; latitude of northern limit, southern limit and central line; beginning of the eclipse on IST; sun's altitude and Azimuth; width of the totality path and duration of total phase at the central line for the umbral track in India. Figs 1 – 6 show places which lie in the path of totality. Big towns and cities near the totality path, railway lines and good roads crossing the totality path have also been shown in these Figures. Here we have restricted the information to total phase and totality path in India. NASA Reference Publication No. 1344, on Total Solar Eclipse on 1995, October 24, gives detailed information regarding partial phases of the eclipses and the general information about the eclipse.

### 2. Experiment

Fortunately the path of the total solar eclipse of October 24, 1995 will pass over a large portion of easily accessible regions in northern and eastern India. The weather is expected to be favourable along the ~ 2000 km long track passing through Rajasthan, Uttar Pradesh, Bihar and West Bengal. We can generate continuous data for about 20 minutes by observing the solar corona from different places along the whole length of the totality path. White light pictures obtained this way will help in the study of intensity variations and dynamics of coronal structures. Keeping in view the length of the totality path and duration of totality at various places, it appears that about 30 observing teams, each consisting of 2-3 persons and 50-60 km apart, may be sufficient to obtain a continuous sequence of coronal pictures in white light. Table 2 lists the places from where this experiment can be conducted.

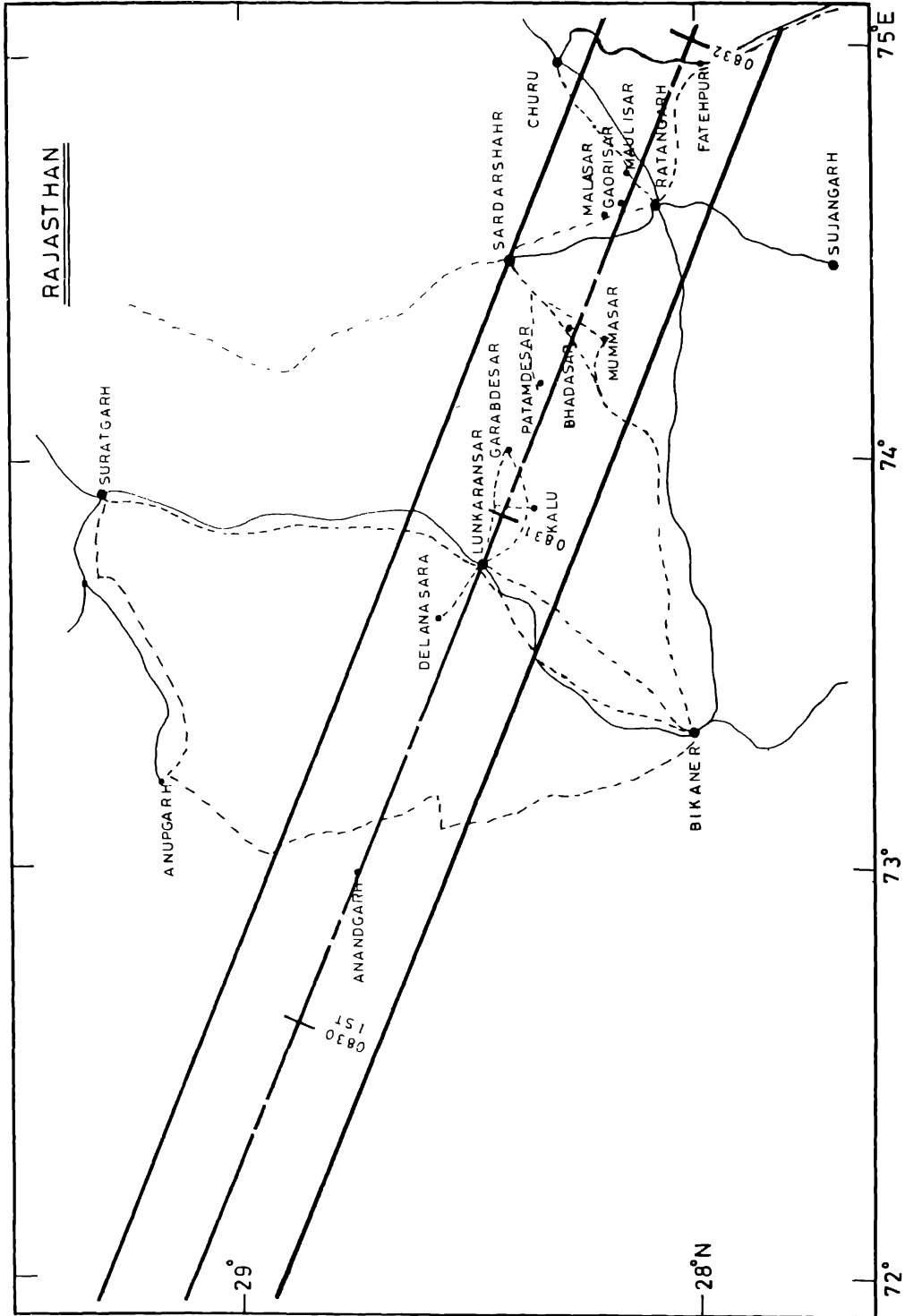
It is planned to use telescopes and telephoto lenses with focus of about  $600 \pm 200$  mm coupled with 35 mm cameras containing Kodak 2415 film. This arrangement will enable us to record the coronal structures up to 4 solar radii in one direction and 6 in the perpendicular direction. To obtain the uniformity in the data, it is planned that all the films may be developed at the Indian Institute of Astrophysics, Bangalore under identical developing conditions. This time-sequence of coronal pictures will be digitised using PDS machine and analysed using computer programs to study the dynamics of coronal structures. This proposal was discussed in a NCSTC meeting held at Delhi and all groups of amateur astronomers showed a keen interest to conduct this experiment during the eclipse. Amateur astronomers plan to work out the details of logistics and the location of each group at a meeting of Confederation of Indian Amateur Astronomers to be held at Bhubaneswar in January 1995.

**Table 1.** Coordinates for the totality path in India of the eclipse of October 24, 1995.

Longitude (East)	Latitude (North)			IST Time at			Circumstances on the centreline			
	Northern limit	Southern limit	Centre line	Northern line	Southern limit	Centre line	Sun Alt. 0	Sun AZ 0	Path Width (Km)	Centre Durat. (Sec.)
71°	29° 37.6'	29° 16.9'	29° 27.3'	08:28:50	08:28:47	08:28:48	19	116	36	42
72°	29° 17.2'	28° 55.8'	29° 06.5'	08:29:33	08:29:30	08:29:31	20	116	37	43
73°	28° 56.3'	28° 34.3'	28° 45.3'	08:30:19	08:30:19	08:30:17	21	117	38	45
74°	28° 34.9'	28° 12.2'	28° 23.5'	08:31:08	08:31:06	08:31:07	22	118	39	47
75°	28° 13.0'	27° 49.6'	28° 01.3'	08:32:00	08:31:58	08:31:59	23	118	40	49
76°	27° 50.6'	27° 26.4'	27° 38.5'	08:32:55	08:32:55	08:32:55	24	119	41	51
77°	27° 27.7'	27° 02.8'	27° 15.2'	08:33:54	08:33:54	08:33:54	26	120	42	52
78°	27° 04.2'	26° 38.6'	26° 51.4'	08:34:56	08:34:57	08:34:57	27	120	43	54
79°	26° 40.2'	26° 13.9'	26° 27.1'	08:36:02	08:36:04	08:36:03	28	121	44	56
80°	26° 15.7'	25° 48.6'	26° 02.2'	08:37:12	08:37:15	08:37:14	29	122	45	59
81°	25° 50.7'	25° 22.7'	25° 36.7'	08:38:26	08:38:30	08:38:28	30	123	47	61
82°	25° 25.0'	24° 56.3'	25° 10.7'	08:39:44	08:39:49	08:39:46	32	123	48	63
83°	24° 58.9'	24° 29.4'	24° 44.1'	08:41:06	08:41:12	08:41:09	33	124	49	65
84°	24° 32.1'	24° 01.8'	24° 17.0'	08:42:32	08:42:40	08:42:36	34	125	50	67
85°	24° 04.8'	23° 33.7'	23° 49.3'	08:44:03	08:44:12	08:44:07	35	126	51	70
86°	23° 36.9'	23° 05.0'	23° 21.0'	08:45:38	08:45:49	08:45:44	37	126	52	72
87°	23° 08.5'	22° 35.8'	22° 52.2'	08:47:19	08:47:31	08:47:25	38	127	54	74
88°	22° 39.5'	22° 05.9'	22° 22.8'	08:49:04	08:49:18	08:49:11	39	128	55	77
89°	22° 09.9'	21° 35.5'	21° 52.8'	08:50:54	08:51:11	08:51:02	41	129	56	79
90°	21° 39.8'	21° 04.6'	21° 22.2'	08:52:50	08:53:08	08:52:59	42	130	57	82

**Table 2.** List of places where the observing camps may be set up.

Sl. No.	Name	Approximate longitude	Remarks
1.	Anandgarh	72°50'	Near Indo-Pak border
2.	Chhattargarh	73°10'	On Anupgarh-Bikaner road
3.	Lunkaransar	73°45'	On Suratgarh-Bikaner rail line
4.	Bhadasar	74°18'	On Sardarshahr-Bikaner road
5.	Maulisar/Ratangarh	74°40'	Ratangarh is a good town about 10 km south of central line of totality
6.	Fatehpur	74°58'	On Ratangarh-Sikar road
7.	Nawalgarh	75°15'	On Jhunjhunun-Sikar road
8.	Nim ka Thana	75°50'	On Delhi-Ajmer rail line
9.	Pragpura	76°10'	~ 90 km from Jaipur on Delhi-Jaipur road
10.	Akbarpur	76°30'	~ 18 km from Alwar on Alwar-Jaipur road
11.	Lachhmangarh	76°50'	~ 30 km SE of Alwar
12.	Loharu	77°18'	~ 20 km from Bharatpur on Bharatpur-Jaipur road
13.	Khairagarh	77°50'	~ 10 km west of the main road from Agra to Dhaulpur
14.	Pahari	78°05'	~ 25 km NE of Dhaulpur
15.	Bhind	78°50'	~ 30 km from Etawah on Etawah-Gwalior road
16.	Kalpi	79°45'	On Kanpur-Jhansi road & ail line
17.	Hamirpur	80°10'	~ 60 km from Kanpur
18.	Ghazipur	80°45'	~ 20 km south of Fatehpur
19.	Karari	81°25'	~ 50 km west of Allahabad
20.	Allahabad	81°50'	Short duration of eclipse ~ 30 seconds
21.	Lalganj	82°20'	About ~ 25 km from Mirzapur
22.	Robertsganj	83°05'	On the rail line from Varanasi to Daltanganj
23.	Muhammadganj	83°50'	On the rail line from Dehri to Daltanganj
24.	Panki	84°25'	~ 50 km by road from Daltanganj
25.	Ramgarh	85°30'	On the Hazaribag- Ranchi road
26.	Jhalida	85°58'	On Dhanbad-Ranchi rail line
27.	Puruliya	86°20'	~ 15 km away from central-line. Duration will be about 35 seconds
28.	Manbazar	86°40'	~ 60 km from Puruliya
29.	Simla pal	87°05'	~ 60 km from Bankura
30.	Ghatal	87°45'	~ 15 km away from central line. Duration about 40 seconds.
31.	Kola	87°50'	On Calcutta-Kharagpur road
32.	Diamond Harbour	88°25'	About 50 km from Calcutta



**Figure 1.** Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the eclipse has been indicated at the central line in IST at an interval of one minute.

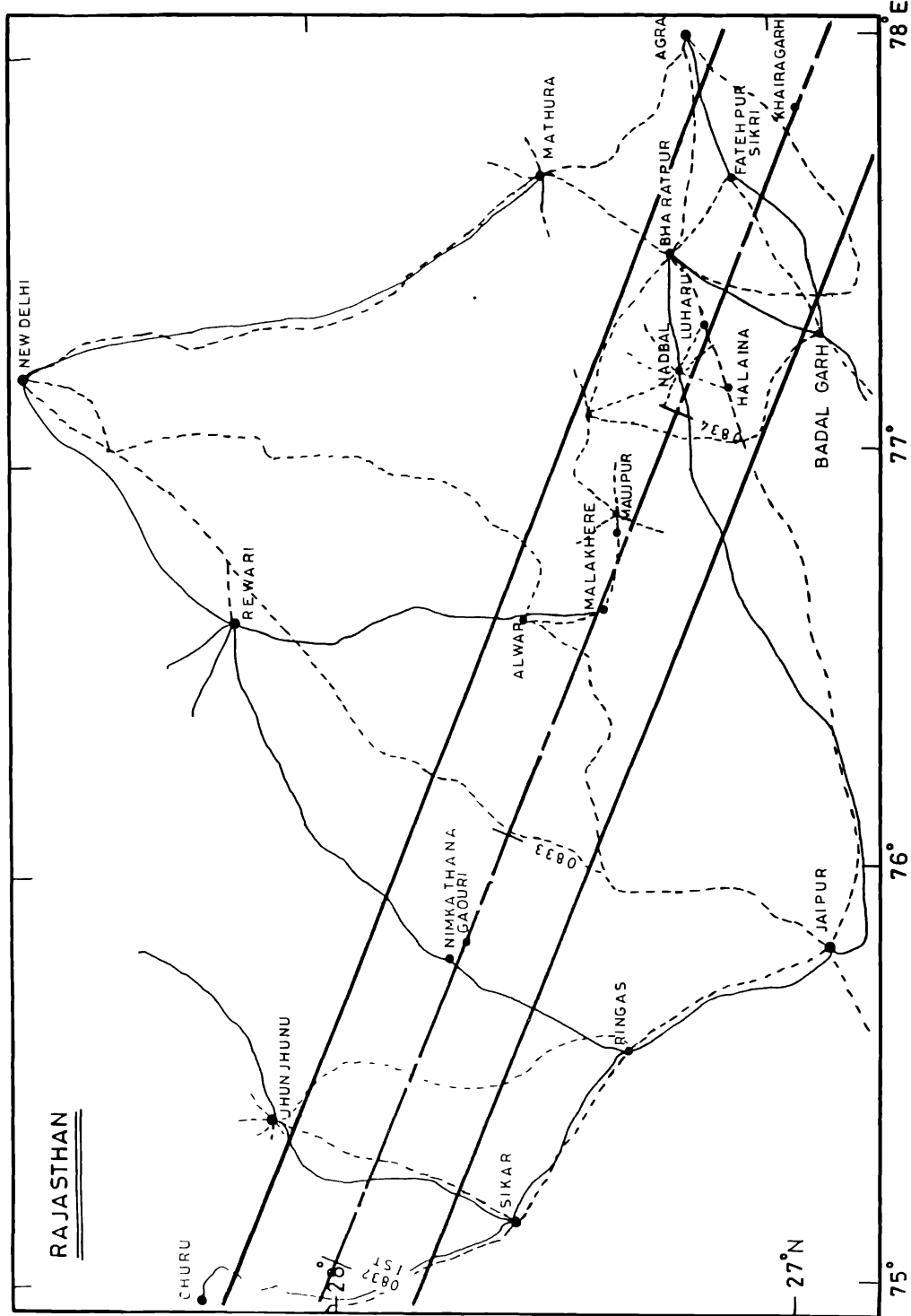
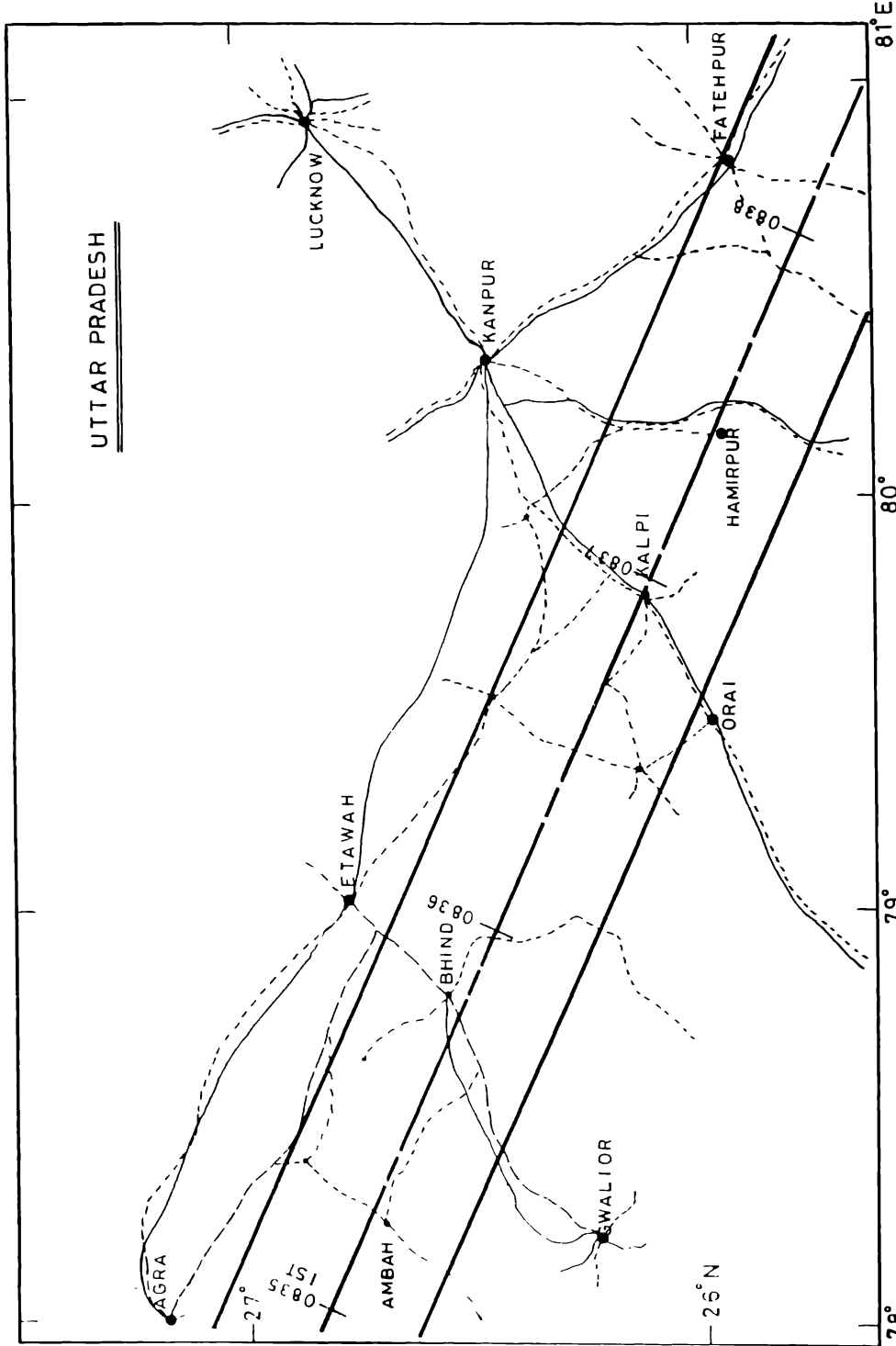
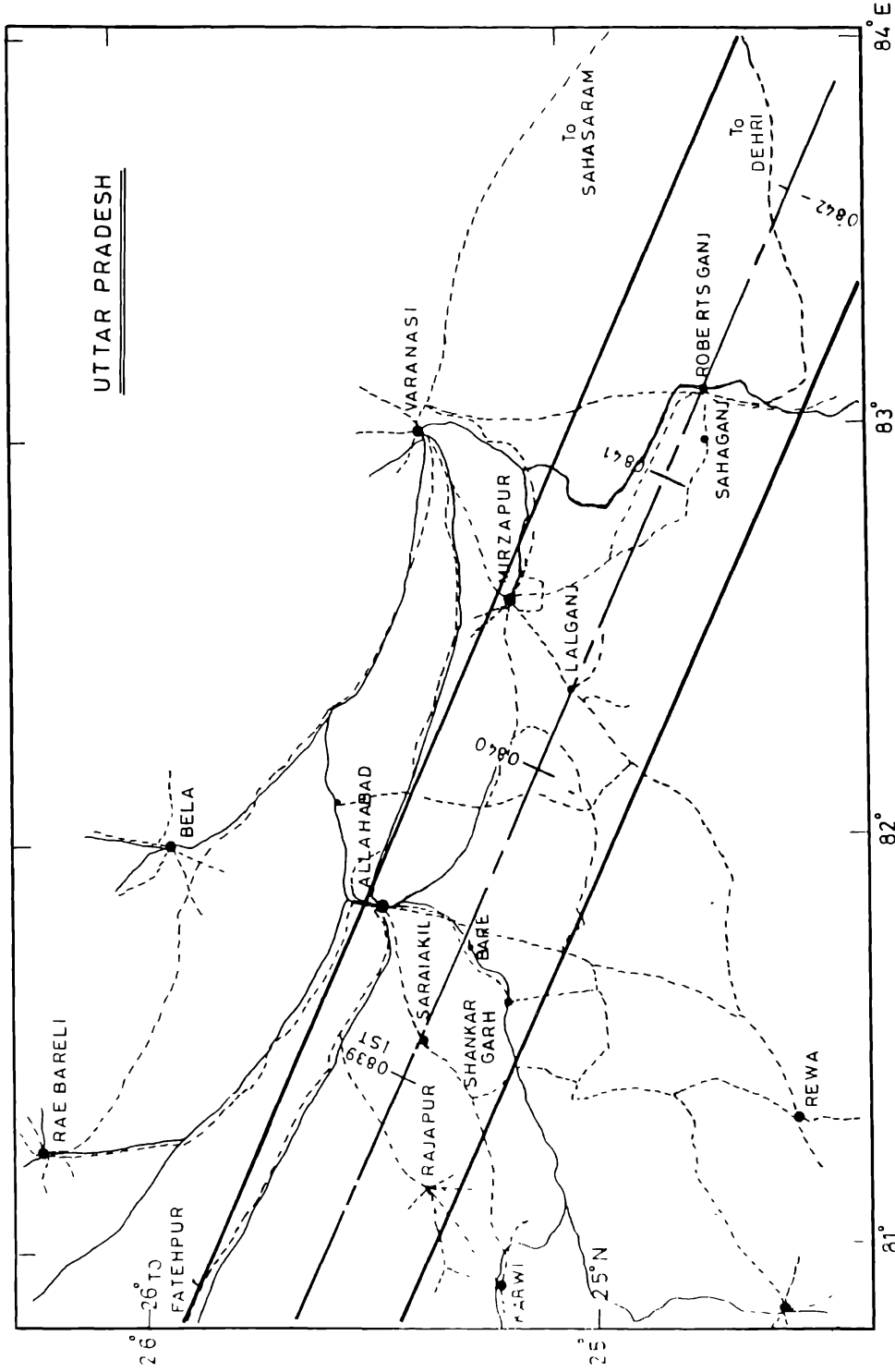


Figure 2. Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the total phase of the eclipse has been indicated at the central line in IST at an interval of one minute.



**Figure 3.** Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the eclipse has been indicated at the central line in IST at an interval of one minute.



**Figure 4.** Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the total phase of the eclipse has been indicated at the central line in IST at an interval of one minute.

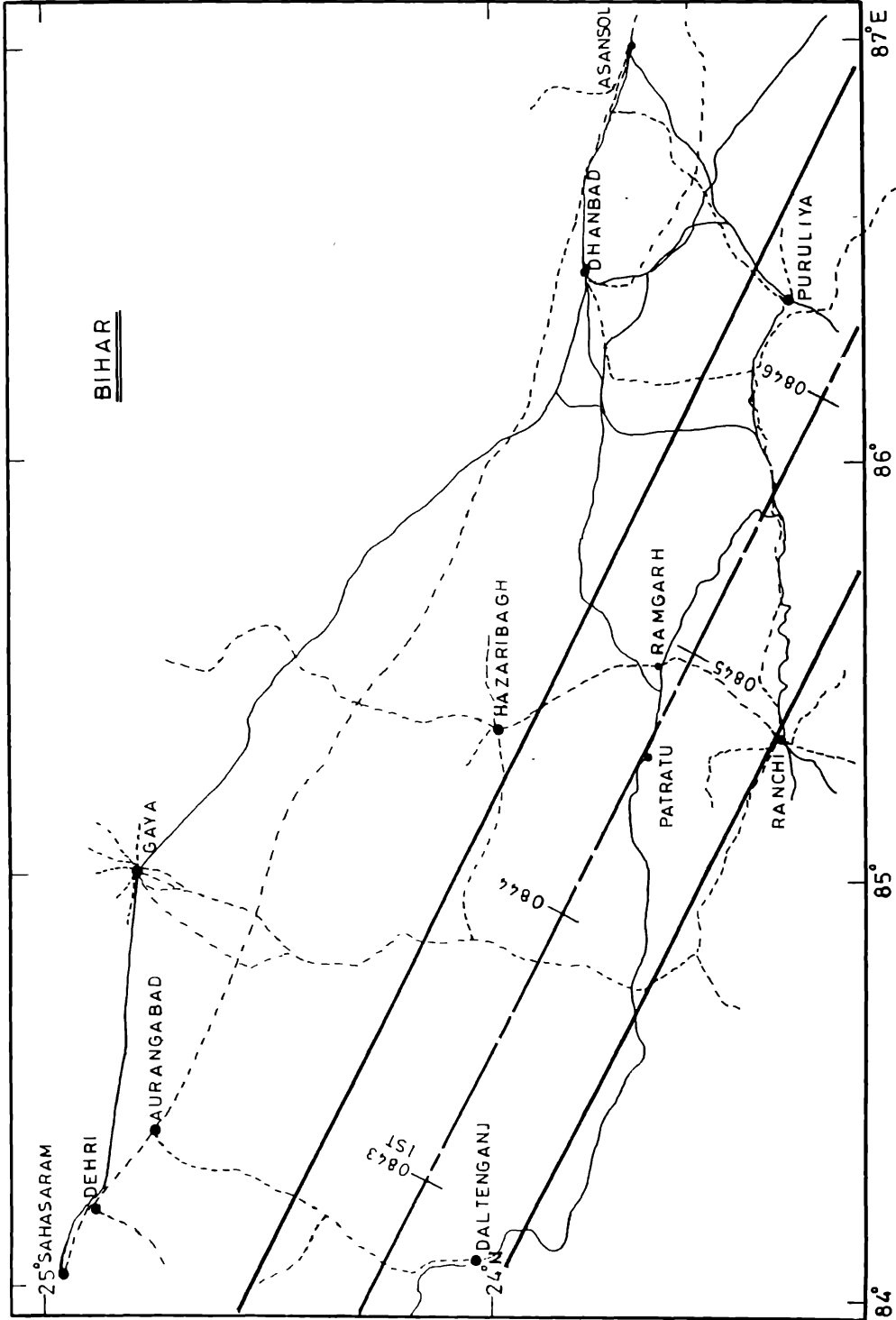


Figure 5. Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the total phase of the eclipse has been indicated at the central line in IST at an interval of one minute.



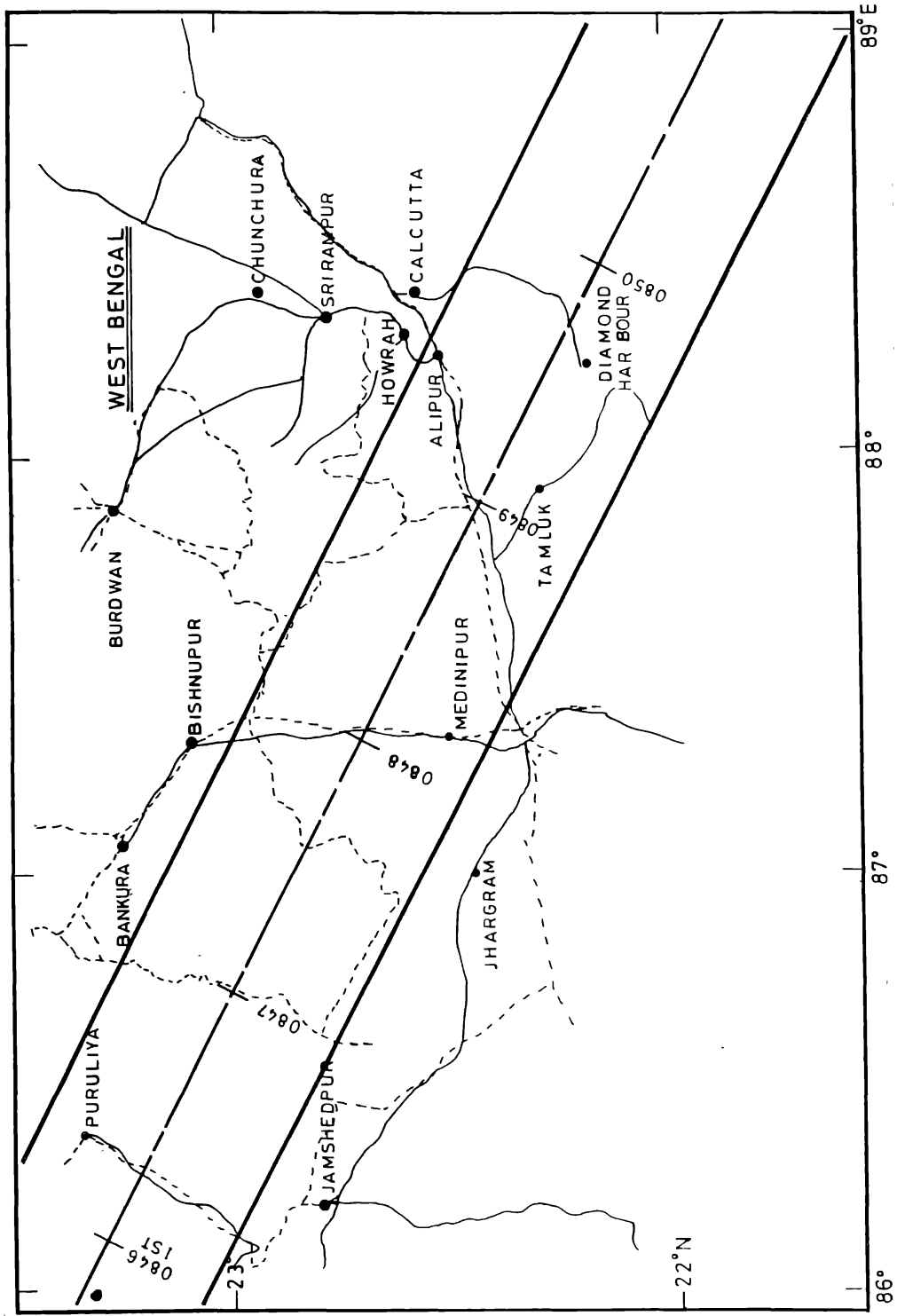


Figure 6. Thick solid lines indicate the path of totality in India during the total solar eclipse of October 24, 1995. Thin solid lines and dotted lines show the rail lines and metalled roads respectively. The time of beginning of the total phase of the eclipse has been indicated at the central line in IST at an interval of one minute.

## References

- Espenak F., Anderson J., 1994, NASA Reference Publication No. 1344  
Singh J., 1994, Bull. Astr. Soc. India, 22, 339.