



ABSORPTION MEASUREMENTS WITH RIOMETER

Data Summary N.º 12 for the period
July through December 1967

C. SOLANO PEREIRA

Y. NAKAMURA

and

F. de MENDONÇA

Scientific Report LAFE-82

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The measurements reported herein were
performed in cooperation with the U.S.A.F.
under Grant AF-AFOSR 1019-66, monitored
by AFCRL

Conselho Nacional de Pesquisas
Comissão Nacional de Atividades Espaciais
Laboratório de Física Espacial

São José dos Campos
São Paulo — Brasil

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I - INTRODUCTION

This summary is a catalogue of reduced riometer data, for the period of observation from July through December 1967.

Figure 1 shows a "quiet day" curve for São José dos Campos station which was obtained from the available data since the riometer was set in operation at this site, on March 15, 1963.

For each month, the values of the observations are tabulated for the first minute of each hour to the nearest 0.1 db, and the total number of readings for the month as well as the median and quartiles values are indicated in the same table. See for instance tables V through XVI. Note that figs. 2 and 3 also show the monthly medians mentioned above.

Table I shows a listing of important flares which occurred under sunlit periods for the station, whereas tables II and II contain all burst and SCNAs respectively under sunlight period as published by H. A. O. Boulder (Colorado).

The absorption events measured at São José dos Campos are listed in table IV carrying time interval, maximum value of absorption, maximum variation about cosmic noise level, and eventual flare to which they are correlated.

The figures 4 through 6 show three portions of riometer records registered at the São José dos Campos station during time intervals containing important solar flares and associated events.

This station will continue its operation and provide data on ionospheric absorption as during the cooperative program for the International Quiet Sun Year (1964-1965).

Data will be sent to the World Data Center, as established in the Guide to International Data Exchange, CIG-IQSY Committee. The recordings are reproduced in the AFCRL publication Geophysics and Space Data Bulletin.

II - DESCRIPTION OF THE EQUIPMENT

The equipment consists essentially of a Riometer (Relative Ionospheric Opacity METER) and, as implied, the instruments finds principal use in precisely measurements changes in ionospheric absorption of extraterrestrial radio noise. It consists of a superheterodyne receiver which is switched between an antenna and a noise diode at an audio rate determined by a local oscillator. The receiver audio output is a square wave at the switching frequency with amplitude proportional to the percent difference between antenna and local diode noise. This square wave is synchronously demodulated to produce a d-c error signal that is applied to the noise diode as a control. The servo loop formed acts to minimize the error by making the noise diode output the same as the signal receiver from the antenna. A recording of the noise diode anode current gives as accurate display of antenna noise with excellent long term stability according with the riometer equivalent equation:

$$T_A = T_R * 5.800 I . R.$$

T_A : equivalent antenna temperature ($^{\circ}K$)

T_R : physical temperature of servo diode noise resistor ($^{\circ}K$)

I : servo diode current (d-c amperes)

R : servo diode load resistor (ohms)

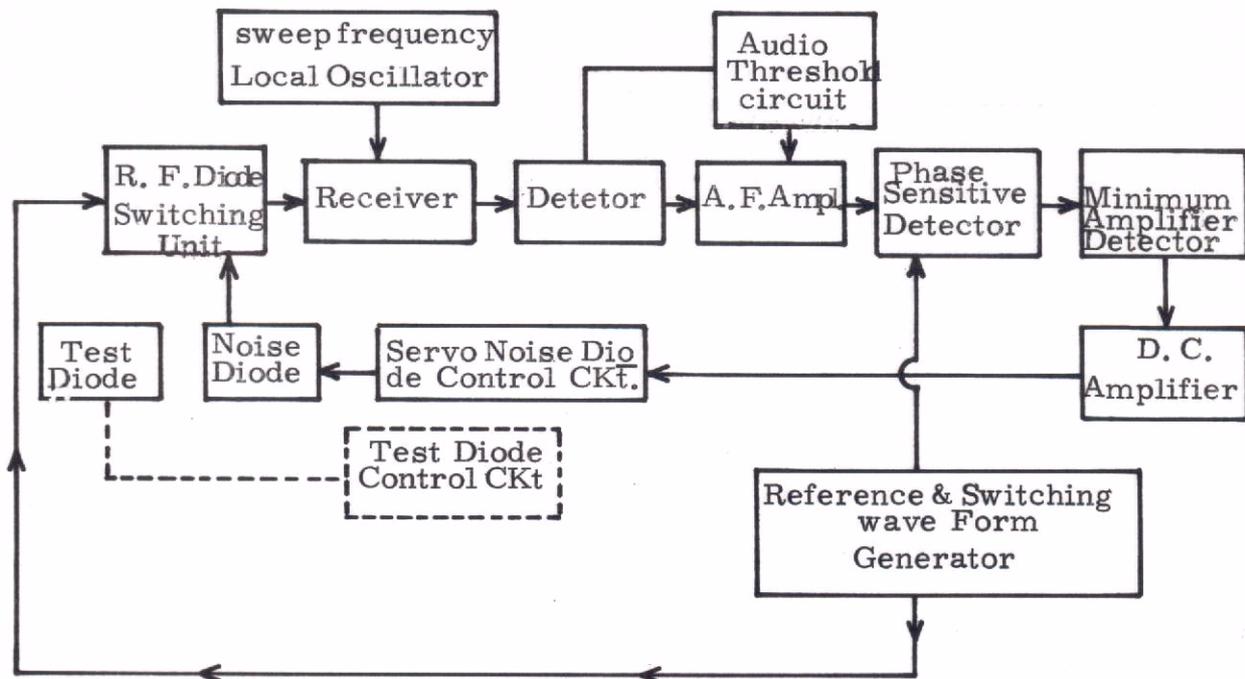
It is possible to relate any noise power P_n received over a given bandwidth B , to its equivalent radio noise temperature T_A given by:

$$P_n = K . T_A . B$$

So the riometer operates by:

- 1) comparing the signal of interest with a local source of noise.
- 2) providing a detected output which is a voltage proportional to the difference between the two signals, and
- 3) using this voltage output (error voltage) to control the noise diode

current in such a way as to equate its noise output to that of antenna noise.



The riometer is calibrated daily by connecting a test noise diode in place of the antenna and passing different values of currents for readings of the riometer.

The antenna which is in our station is an East-West four elements Yagi, points vertically and receives the cosmic noise.

The frequency used of 30 MHz is low enough to be sensitive to the nondeviative absorption effects to the lower ionosphere and yet it is sufficiently high so that a signal is detectable even under ionospheric disturbances.

III - MEASUREMENTS TECHNIQUE

Riometer measurements of ionospheric absorption require a knowledge of the cosmic noise power that would be observed in the

absence of absorption. It is assumed, that the unabsorbed noise power with the antenna oriented in a given direction of space is constant for each sidereal time. The variation of this incident noise power, as the fixed antenna system scans across the sky owing to the earth's rotation, establishes the "quiet day" curve for the system.

The local quiet day curves is obtained from the riometer recording in the hours before the sunrise (3-6hs), when absorption is low. The values of current observed are transferred to the corresponding sidereal time. The highest reliable readings are considered point of the "quiet-day" curve, which is assumed as pointed before, to represent values of zero absorption.

Using the "quiet-day" curve, one can obtain the absorption in db at any given time by the relation:

$$A \text{ (db)} = 10 \log_{10} (I_q/I_r)$$

I_r : noise power actually received at a given time.

I_q : noise power from the "quiet-day" curve for the corresponding sidereal time.

IV - TYPE OF SCALING AND DATA REDUCTION

In reducing the riometer data scaling TYPE (URSI-AGI Committee 1968) has been used.

The absorption during the first minute of each hour of every day throughout a give month is recorded and transferred to the correct sidereal time (I_r).

The "quiet-day" curve represents the zero absorption and the values of I_q for those correspondent sidereal time are obtained and the ratio I_q/I_r is calculated. For the given ratio, the absorption in db is obtained and tabulated.

For each hour the median is calculated during the month and curves are plotted. The results give a picture of the daily and seasonal variation of absorption.

The following qualifying symbols have been used for val

ues obtained in directly from the record:

C : failure of equipment

S : interference

U : value uncertain

I : value interpolated.

V - ABSORPTION EFFECTS ASSOCIATED WITH SOLAR FLARES

The Sun's ionizing radiation during solar flares is normally enhanced and reaches the lower level of the ionosphere increasing the absorption through the D-region producing of the cosmic noise reaching the antenna. Sometime prior to the observation of attenuation and depending on the relative position of the Sun and antenna beam an enhancement of noise current is observed as a result of the Sun's HF radio emissions, during solar bursts of intensity greater than 1.

Several flares occurred during the local sun-light hours, and six of them could be clearly related to the absorption effects observed in the riometer records showing a maximum variation ranging between 0, 26 and 0, 90 db.

Some of these solar flares will be described in the following paragraphs.

A large number of events of noise enhancements of the frequency used in the riometer is correlated to radio emissions from the sun on 30 MHz, during solar burst phenomena.

VI - FLARE OF 29 AUGUST 1967 (FIG. 5)

The H.A.O. of Boulder gives the followings associate events:

S	1332 - 1354 UT, importance 3
SEA	1334 - x UT, importance 1
SPA	1334 - x UT, importance 1
SES	1334 - x UT, importance 1

VII - FLARES OF 13 DECEMBER OF 1967

As per H. A. O. of Boulder the associated events are:

SPA 1345 - x
SES 1349 - x
SL 1340 - x, importance 1

VIII - CONCLUSION

Except for very strong interference by thunder storms, typical of the summer in this latitude, this station is placed in a very quiet location.

The riometer records are quite free from man made interference.

Whit riometer data of 1967 it was observed that:

1) Variation of the absorption with local time:

- minimum absorption: 4, 0 - 6, 0 hs
- maximum absorption: 12:30 - 14:30 hs

2) Seasonal variation of the absorption

The seasonal behaviour of the absorption can be seen clearly from fig. 7 in which the monthly median maximum and minimum of the absorption are plotted versus the months of the year. These curves show that the maximum absorption occurs in March and October and the minimum absorption occurs in June.

3) Behaviour of the absorption with the solar cycle.

The figures 2 and 3 show with the approximation of the maximum solar activity a great night absorption and the appearance of the secondary maximum between 20 and 22 hours. Considering data since 1963 it can be seen that the absorption increases when the solar activity become maximum. It must

be considered that these conclusions are more qualitative than quantitative ones because it is probable that some variations occurred in the receiver output.

More results with consistent operation of the riometer are needed and provide data for detailed study of the seasonal and solar cycle variation of non deviative absorption.

Appendix

In order to reduce the time scale of the "quiet-day" curve to the true sidereal time (referred to the first point of Aries) one should add 17h36m to the hours indicated in the figure showing the "quiet-day" curve. That is, the maximum value of the curve corresponds approximately to the sidereal hour 17h36m of SHA = 96°.

The table below indicates the sidereal time corresponding to 00.00 GMT for the middle of each month starting on 1965.

<u>GMT</u>		<u>Month</u>	<u>Sidereal Time</u>					
<u>hour</u>			<u>1965</u>		<u>1966</u>		<u>1967</u>	
h	m		h	m	h	m	h	m
00	00	Jan. 15	04	36	04	36	04	36
00	00	Feb. 15	06	38	06	38	06	37
00	00	Mar. 15	08	28	08	28	08	28
00	00	Apr. 15	10	30	10	31	10	29
00	00	May. 15	12	27	12	29	12	28
00	00	Jun. 15	14	29	14	31	14	30
00	00	Jul. 15	16	27	16	29	16	29
00	00	Aug. 15	18	33	18	32	18	31
00	00	Sep. 15	20	35	20	34	20	33
00	00	Oct. 15	22	33	22	32	22	31
00	00	Nov. 15	00	35	00	34	00	34
00	00	Dec. 15	02	33	02	32	02	32

TABLE I

LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SAO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY	
		START	MAX PHASE	END		
July	2	1 n	11:18	-----	11:28	H. A. O. Boulder
		1 n	13:29	-----	13:58	"
		1 n	13:49	14:00	15:15	"
		1 n	15:06	15:13	15:31	"
		1 n	16:47	17:06	17:24	"
	3	1 f	10:49	10:52	11:08	"
	4	1 b	9:57	10:12	10:37	"
		1 f	17:08	-----	17:21	"
		1 b	b 17:20	17:30	17:55	"
	5	1 n	18:33	-----	19:28	"
	6	1 n	12:55	-----	14:15	"
	7	1 n	15:26	15:30	15:38	"
		1 n	19:48	19:48	20:12	"
	15	1 n	15:28	15:31	15:46	"
	20	1 n	14:45	14:56	15:03	"
		1 n	14:59	15:02	15:15	"
	21	1 b	9:28	9:50	10:17	"
		1 b	11:36	11:40	12:40	"
	22	1 b	14:17	14:20	14:53	"
		1 n	16:34	16:39	17:12	"
	23	2 b	12:44	13:02	13:10	"
		1 b	18:19	18:25	-----	"
	24	1 n	9:28	9:33	10:41	"
		2 n	9:51	9:59	10:19	"
1 f		11:15	-----	11:45	"	
2 b		11:45	12.01	12.38	"	
1 n		11:46	11:50	12:08	"	
2 n		11:51	11:57	12:17	"	
1 n		b 19:45	19:55	-----	"	
2 b		20:13	21:05	21:39	"	

TABLE I

LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
25	1 n	10:05	-----	11:10	H. A. O. Boulder
	2 b	11:08	11:20	-----	"
	1 b	12:13	12:15	12:40	"
	1 n	13:03	13:06	13:16	"
	1 n	13:20	-----	-----	"
	1 b	14:23	-----	15:00	"
	1 n	15:00	-----	-----	"
	1 n	16:14	16:49	17:06	"
	1 n	17:20	-----	17:49	"
26	1 b	11:51	11:56	12:04	"
	1 n	13:03	-----	13:15	"
	1 n	13:44	13:47	14:28	"
27	1 n	11:07	11:20	11:50	"
	1 n	13:58	14:04	14:21	"
	1 f	15:03	-----	15:11	"
	1 n	17:31	17:36	17:44	"
	1 n	17:59	18:03	18:18	"
28	1 n	11:59	12:02	12:14	"
	1 n	13:15	-----	13:36	"
	1 n	16:20	-----	16:40	"
	1 n	18:49	-----	19:04	"
29	2 n	14:43	-----	15:03	"
	1 n	14:53	-----	15:53	"
	1 n	17:37	17:46	-----	"
	1 n	19:01	19:42	-----	"
	1 b	19:41	19:50	-----	"
	2 n	19:45	-----	20:08	"
30	1 b	10:47	10:53	11:40	"
	1 n	14:09	-----	14:47	"
	1 b	15:54	16:01	16:16	"
	1 n	16:11	16:34	16:53	"

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DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY	
		START	MAX PHASE	END		
August	31	1 b	19:49	-----	20:05	H. A. O. Boulder
		1 n	10:40	-----	11:33	"
		1 b	11:15	11:20	11:57	"
		2 b	12:25	12:29	12:52	"
		1 n	14:50	15:12	15:51	"
		1 n	15:01	15:26	15:56	"
		1 n	15:18	-----	15:24	"
		1 b	17:03	17:05	17:34	"
		1 n	20:14	20:20	20:40	"
	1	2 b	17:21	17:41	18:08	"
		1 n	17:41	17:52	18:06	"
	2	1 n	14:30	14:34	15:05	"
		1 n	15:17	15:21	15:46	"
		1 n	17:26	17:30	17:48	"
		1 n	17:50	17:55	18:25	"
4	1 n	14:05	14:09	14:27	"	
	1 n	14:56	15:20	-----	"	
	2 n	15:12	15:14	16:00	"	
5	1 b	18:07	-----	-----	"	
6	1 n	11:02	11:05	11:22	"	
	2 n	14:34	14:37	15:33	"	
7	1 b	13:02	13:10	13:33	"	
9	1 b	18:10	-----	18:58	"	
12	2 b	15:49	16:10	17:05	"	
14	1 n	12:42	12:50	12:58	"	
	1 n	13:01	13:05	13:19	"	
	1 f	13:24	13:27	13:37	"	
	1 n	13:41	13:44	13:52	"	
16	1 b	11:21	-----	-----	"	

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LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
17	1 n	12:06	12:11	12:47	H. A. O. Boulder
	1 b	12:06	12:11	12:47	"
18	2 b	19:51	-----	-----	"
	1 n	20:12	20:26	20:49	"
20	1 n	13:12	13:18	13:40	"
	2 n	16:10	16:15	16:43	"
	1 n	20:29	20:32	-----	"
21	1 b	13:26	13:31	14:58	"
	1 n	18:33	18:44	19:17	"
23	1 n	10:17	10:18	10:30	"
24	1 n	9:58	9:59	10:06	"
	1 n	12:13	12:15	12:21	"
	1 n	13:37	13:39	14:05	"
	1 n	20:48	20:49	21:04	"
25	1 b	13:58	14:08	14:08	"
26	1 n	9:41	9:47	10:05	"
	1 f	20:35	20:36	20:59	"
27	1 n	11:48	-----	12:18	"
	1 b	15:16	15:29	15:40	"
28	2 b	12:06	12:11	12:39	"
29	2 b	11:55	-----	13:17	"
	2 b	13:29	-----	13:54	"
	1 n	17:58	18:03	18:10	"
	1 b	19:46	19:51	20:20	"
	1 b	19:55	-----	-----	"
	1 b	20:35	20:40	21:25	"
31	1 n	20:50	-----	-----	"
September 1	1 f	9:09	9:18	9:31	"

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AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
2	1 b	20:30	-----	21:05	H. A. O. Boulder
3	1 n	10:41	10:44	10:58	"
10	1 n	10:32	-----	10:42	"
27	1 n	9:22	9:24	9:38	"
	1 n	13:09	-----	13:24	"
28	1 n	11:36	-----	12:22	"
	1 f	14:53	15:26	15:53	"
29	1 n	11:38	-----	12:44	"
	1 f	16:43	-----	17:05	"
30	2 f	13:03	-----	13:37	"
	1 f	13:22	-----	14:02	"
October 1	1 b	9:30	9:45	10:30	"
	1 n	13:16	13:20	13:28	"
2	1 b	19:47	-----	20:30	"
3	1 b	9:17	9:29	9:35	"
	1 n	16:26	16:29	16:56	"
	1 n	17:52	17:56	18:15	"
5	1 n	10:42	-----	10:56	"
	1 n	13:38	-----	13:55	"
	1 n	13:54	14:06	14:32	"
6	2 n	11:00	11:15	-----	"
	2 n	12:13	12:23	-----	"
	1 n	13:16	13:20	13:44	"
7	1 n	11:32	11:38	-----	"
8	1 n	14:40	-----	-----	"
	1 b	15:07	-----	15:15	"
	1 b	20:44	20:50	21:25	"
10	1 b	17:33	17:45	-----	"
12	1 n	11:59	12:08	12:36	"

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 AT SAO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
13	1 n	19:00	-----	-----	H. A. O. Boulder
14	1 n	9:41	9:44	10:25	"
	1 n	12:33	-----	13:18	"
	1 n	20:55	-----	20:50	"
18	1 n	10:53	10:57	11:15	"
	1 n	9:25	9:30	9:50	"
20	1 n	10:09	10:22	19:48	"
	1 n	11:04	-----	11:30	"
	1 b	11:31	11:36	11:54	"
	1 n	11:52	11:56	12:12	"
	1 n	12:18	12:24	12:45	"
	1 n	15:56	-----	13:45	"
21	2 b	19:45	20:05	20:39	"
	1 n	20:02	20:56	21:46	"
	1 n	20:52	21:04	21:20	"
22	1 b	10:08	10:12	10:45	"
	1 f	12:30	12:32	12:43	"
	1 n	18:57	-----	-----	"
23	1 f	8:51	8:59	-----	"
	1 b	13:00	13:02	-----	"
	1 b	15:20	16:23	17:10	"
24	1 f	10:40	-----	10:56	"
	1 b	16:07	-----	17:20	"
	1 n	20:34	-----	-----	"
25	1 b	13:27	13:48	14:43	"
26	1 n	9:29	-----	10:28	"
	1 n	10:35	10:39	11:01	"
27	1 f	9:16	-----	9:40	"
	1 b	11:08	-----	11:25	"
	1 n	14:27	14:28	14:42	"

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AT SAO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
	1 n	16:46	16:49	17:13	H. A. O. Boulder
	1 f	19:44	19:46	19:51	"
	1 f	19:48	19:50	19:54	"
	1 n	20:29	20:30	20:36	"
28	1 f	8:54	-----	9:34	"
	1 n	11:55	12:00	12:20	"
	1 f	14:02	14:45	-----	"
	1 n	18:49	-----	19:15	"
29	2 n	8:35	-----	9:20	"
	1 n	11:53	-----	-----	"
30	1 n	11:03	-----	-----	"
	1 n	13:17	-----	-----	"
	1 n	14:30	14:38	15:18	"
	1 b	20:05	20:10	20:15	"
31	2 b	11:24	11:26	12:16	"
	1 b	15:19	15:22	15:40	"
	1 f	16:15	-----	16:58	"
November 1	1 x	15:37	-----	-----	"
2	2 b	8:59	8:58	9:20	"
	2 b	13:33	13:40	13:50	"
	1 n	15:53	15:54	16:01	"
3	1 b	11:55	12:04	12:15	"
4	1 n	11:52	-----	12:20	"
	1 b	13:52	13:55	15:15	"
5	1 n	8:59	9:04	9:48	"
	1 f	10:16	-----	10:26	"
6	1 f	9:08	-----	9:19	"
	1 n	16:58	-----	17:26	"
	1 f	18:08	-----	18:53	"

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LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
	1 n	21:10	21:34	-----	H. A. O. Boulder
7	1 n	21:18	22:47	23:22	"
8	1 n	18:49	19:00	-----	"
	1 f	19:18	19:30	19:50	"
10	1 b	8:53	8:56	9:30	"
	1 n	13:38	13:42	14:30	"
	1 n	19:30	-----	19:55	"
	1 b	21:15	-----	21:30	"
12	1 n	8:40	8:53	9:09	"
13	1 n	10:05	-----	-----	"
	1 n	18:18	18:18	18:47	"
16	1 b	10:06	-----	11:11	"
	1 n	13:40	-----	-----	"
	2 b	20:03	20:10	20:40	"
	3 b	21:20	21:45	23:15	"
17	2 b	8:17	8:25	9:45	"
	1 b	14:51	14:53	15:05	"
	2 b	15:35	15:39	16:00	"
	2 f	17:20	17:51	19:18	"
	1 n	18:50	18:58	19:18	"
18	1 n	18:12	18:45	19:42	"
	1 n	18:24	18:41	18:49	"
19	1 b	10:25	10:28	11:34	"
	1 b	15:17	15:19	15:30	"
	1 f	16:21	-----	16:50	"
	1 n	18:32	18:46	18:54	"
	1 n	20:07	20:28	20:50	"
20.	1 n	21:00	-----	22:20	"

TABLE I

LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
21	1 n	10:59	-----	11:20	H. A. O. Boulder
	1 n	15:44	15:58	16:23	"
22	1 n	17:03	17:07	17:07	"
	1 n	17:45	17:59	18:35	"
	1 f	19:08	-----	-----	"
23	1 n	13:47	-----	14:11	"
24	1 n	19:25	-----	19:38	"
25	1 b	10:40	10:45	10:58	"
	1 b	13:20	13:21	13:49	"
	1 n	14:58	15:03	15:17	"
	1 n	15:40	15:53	16:47	"
	1 n	18:09	18:22	18:44	"
	1 n	19:22	-----	19:49	"
	1 n	19:55	-----	20:10	"
26	1 f	14:46	-----	-----	"
	1 n	16:57	17:00	17:29	"
27	1 n	9:10	-----	9:30	"
	1 f	9:40	-----	10:00	"
	1 b	10:55	-----	11:40	"
	1 n	16:00	16:10	16:40	"
28	1 f	20:25	20:36	21:05	"
29	1 n	10:13	-----	10:56	"
	1 n	11:10	-----	11:25	"
	2 b	12:00	-----	-----	"
	1 b	16:08	-----	-----	"
	1 n	17:43	17:45	18:15	"
	1 n	20:05	-----	20:20	"
30	1 n	8:43	-----	9:16	"
	1 n	16:22	16:34	17:11	"

TABLE I

LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY	
		START	MAX PHASE	END		
December	1 n	16:23	16:42	16:56	H.A.O. Boulder	
	1 n	18:26	18:35	19:04	"	
	1 f	20:02	20:24	20:33	"	
	1	1 n	9:40	-----	-----	"
		2 b	12:43	12:52	-----	"
		1 b	14:59	-----	15:19	"
		1 n	17:42	-----	-----	"
		1 n	19:32	19:44	20:12	"
		1 n	19:52	20:00	20:33	"
	3	1 n	21:23	21:28	22:20	"
	4	1 n	10:15	10:30	11:20	"
		2 n	13:02	-----	13:23	"
		1 n	17:25	17:38	18:35	"
	5	1 n	13:50	-----	-----	"
		1 b	14:38	-----	15:20	"
		1 n	15:17	15:28	15:37	"
	6	1 f	8:31	-----	9:05	"
		1 n	11:09	11:12	12:07	"
		1 n	16:15	16:21	16:44	"
	7	1 n	9:42	-----	10:23	"
		1 n	9:53	10:05	11:53	"
	1 n	9:58	10:01	10:29	"	
	1 f	16:03	-----	-----	"	
	1 f	18:31	18:45	19:02	"	
8	1 n	15:29	15:43	16:07	"	
9	1 b	9:47	9:55	10:25	"	
	1 n	18:56	19:05	19:34	"	
10	2 b	8:25	-----	-----	"	
11	1 n	18:59	19:04	19:21	"	

TABLE I
LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
12	1 f	16:33	16:41	17:04	H. A. O. Boulder
13	1 f	8:51	-----	9:06	"
	2 b	13:41	-----	15:21	"
14	1 n	15:34	15:40	-----	"
	1 n	11:00	-----	12:39	"
15	1 n	7:53	-----	8:16	"
	1 f	10:50	-----	11:30	"
	1 f	13:50	-----	14:12	"
16	1 b	9:30	9:40	10:49	"
	1 n	12:44	12:55	13:07	"
	1 n	14:17	14:22	14:33	"
	1 n	15:00	15:09	15:16	"
	1 n	15:39	15:41	16:16	"
	1 f	17:18	-----	-----	"
	2 f	19:04	19:05	19:17	"
	1 n	21:00	21:07	21:55	"
17	1 n	8:38	8:44	9:10	"
	1 b	8:30	-----	8:50	"
	1 b	16:30	-----	-----	"
	1 n	18:41	-----	-----	"
18	1 n	8:15	-----	8:24	"
	1 n	10:16	-----	10:25	"
	2 n	14:34	14:54	15:33	"
	2 n	14:34	14:50	15:24	"
	1 b	15:23	15:33	15:54	"
	1 n	18:41	18:48	-----	"
	1 n	20:58	21:17	21:42	"
19	1 b	8:10	-----	8:30	"
	1 f	10:40	10:44	11:00	"
	1 n	16:23	16:41	16:56	"

TABLE I

LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
AT SAO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
	1 n	21:20	21:25	21:47	H. A. O. Boulder
20	1 n	13:55	14:00	14:23	"
21	1 n	9:10	-----	9:28	"
	1 n	9:49	10:07	10:08	"
22	1 n	8:30	-----	9:30	"
	1 b	11:40	12:00	12:15	"
	1 n	13:15	-----	13:29	"
	1 b	13:55	-----	14:15	"
	1 n	18:03	18:16	18:52	"
23	1 n	17:52	18:10	18:34	"
	1 n	19:02	19:12	19:20	"
	2 b	21:01	21:06	22:04	"
24	1 f	11:57	-----	-----	"
25	1 f	10:10	10:15	10:55	"
26	1 n	9:50	-----	11:40	"
	1 b	10:10	10:15	10:25	"
	1 b	12:00	12:40	-----	"
	2 b	12:54	13:05	13:15	"
	1 f	13:38	13:44	14:15	"
	2 n	19:26	19:33	19:44	"
	2 n	20:22	20:27	20:44	"
27	2 b	8:38	8:41	9:45	"
	1 f	13:45	-----	13:53	"
	1 f	13:54	-----	14:01	"
	1 b	14:09	14:10	-----	"
	1 f	19:28	19:33	-----	"
	1 n	20:38	20:42	20:47	"
28	1 n	14:24	14:52	15:25	"
	1 n	20:41	20:55	21:06	"

TABLE I
 LISTING OF IMPORTANT FLARES WHICH OCCURRED UNDER SUNLIT PERIOD
 AT SÃO JOSÉ DOS CAMPOS

DATE 1967	FLARE IMPOR- TANCE	TIME INTERVAL			OBSERVED BY
		START	MAX PHASE	END	
29	1 n	11:20	11:24	11:34	H. A. O. Boulder
	1 b	11:21	11:22	11:38	"
	1 n	11:58	12:06	12:28	"
	1m	18:40	18:46	-----	"
30	1 f	14:20	-----	14:45	"

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967		TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)		
July	1	x	Cont.	b 1130	a 0159	16 - 41	
		x	III g	1143.60	1145.10	11 - 41	
		x	III g	1633.40	1642.30	7.5 - 41	
			III	1712.70	1713.20	8 - 41	
			III	1757	1757.10	9 - 41	
			III	1925	1929.30	8 - 41	
		2	x	III	1215.4	1215.60	17 - 41
			x	Cont.	1228.90	1438.70	18 - 41
			x	III g	1338.40	1339.30	16 - 41
			x	III	1345.70	1346.40	16 - 41
			x	III g	1400.30	1401.30	16 - 41
			x	III g	1411.50	1415.70	14 - 41
			x	III g	1426.80	1429.10	12 - 41
			x	Cont.	1438.70	1602	17 - 41
				Cont.	1602	a 0140	16 - 41
			x	III g	1701.50	1705.30	13 - 41
			x	III g	1751.50	1759.20	7.5 - 41
				III g	1930.60	1932	7.5 - 41
				III	1951.30	1951.60	11 - 41
		3		III g	1218.60	1220.80	19 - 41
			x	Cont.	1355	a 2300	22 - 41
		4	x	Cont.	1221	1557	20 - 41
			x	III	1416.10	1416.40	18 - 41
			x	III	1434.40	1434.90	22 - 41
			x	III	1449.10	1449.50	18 - 41
			x	Cont.	1710.10	1736	22 - 41
			x	III G	1716	1725.30	7.6 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III	1828.20	1828.80	7.6 - 41
	III	1835.10	1835.90	7.6 - 41
	III g	1840.10	1840.50	20 - 41
	III g	1851.10	1856	22 - 41
5	III	1219.30	1219.80	16 - 41
	III	1252.30	1252.60	24 - 38
x	III	1320.70	1322	12 - 41
x	III	1336.40	1344.70	20 - 41
x	III G	1450.30	1451.20	22 - 41
x	III G	1512	1516.10	76 - 41
x	III G	1528	1529.60	10 - 41
	III G	1538.40	1539.20	10 - 41
	III	1600.50	1601.20	20 - 41
x	III	1606.70	1607	10 - 41
x	III G	1613.20	1620.70	7.6 - 41
	III	1630.20	1630.60	20 - 41
	III	1659.70	1700.10	26 - 41
x	III G	1715.40	1723	10 - 41
	III	1727	1727.30	18 - 41
x	III G	1842	1851.70	7.6 - 41
	IV	1907.30	2120	26 - 41
	III	2010.70	2011.50	20 - 41
	III	2023.10	2023.70	20 - 41
	III	2028.30	2028.90	16 - 41
6	III	1524.80	1525.30	25 - 41
x	III	1635.30	1635.80	24 - 41
	III G	1648	1650.70	25 - 41
	III G	1826.90	1831.50	24 - 41
x	III G	1903.50	1912	24 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)	
7 x	III	1228.60	1229.50	12 - 41	
	III	1236.60	1236.90	14 - 41	
	III	1326.80	1327.20	23 - 41	
	III G	1621.30	1624.40	20 - 41	
	III	1959.60	2000	19 - 41	
8	III	1730.50	1731	28 - 41	
	III G	1945.50	1948.90	20 - 41	
9	III G	1644.60	1650.70	22 - 41	
	III G	1735.30	1736.30	20 - 41	
	III G	1742.30	1744.80	12 - 41	
10	III G	1323.70	1327.60	22 - 41	
	III	1632.90	1633.20	26 - 40	
11	III	1632.80	1633.20	20 - 35	
12 x	III g	1535.60	1536.20	25 - 41	
	III	1626.40	1626.70	22 - 41	
	x	IIIg	1745.70	1746.30	16 - 41
	x	Cont.	1805	1836	26 - 41
	x	III g	1959.90	2001.80	20 - 32
13	III	1328.50	1328.80	22 - 41	
16 x	III	1234.80	1235.60	16 - 41	
	III	1302.10	1302.50	24 - 41	
	x	III g	1536.20	1537.20	12 - 41
	x	III g	1550.80	1555.10	12 - 41
	x	III g	1848	1850.80	20 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC.AS PUBLISHED BY H.A.O. BOULDER(COLORADO) AND AS OBSERVED(x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
17 x	III g	1500.20	1502.30	24 - 41
x	III g	1510.30	1513.70	20 - 41
	Cont.	1635.60	1646	23 - 41
	III	1656.10	1659.40	22 - 41
x	III	1711.80	1712.10	24 - 41
	III g	1952.90	1955.60	12 - 41
	III g	2027.60	2028.30	7.6 - 41
18 x	III g	1325	1329.60	20 - 41
	III	1715.50	1716.30	22 - 41
	III	1808.30	1808.60	24 - 41
19	III g	1545.40	1554.80	28 - 41
	III	1726.70	1727.10	25 - 41
	III g	1759	1803	26 - 41
	III g	1910.20	1911.40	26 - 41
20	III	1243.40	1243.70	30 - 41
	III g	1301.50	0108.30	22 - 41
	III	1357.70	1358	22 - 41
x	III	1718.50	1719.40	20 - 41
z x	III	1757.50	1757.90	30 - 38
x	III	1903.40	1903.80	23 - 41
x	III	1917	1917.80	24 - 41
	III	1929.50	1930	18 - 41
x	III	1950.70	1951	26 - 41
x	III g	2014.60	2018.30	20 - 41
21 x	III g	1230.70	1235.10	24 - 41
x	III g	1315.10	1320.90	22 - 41
	III	1343.80	1344	24 - 38
	III	1351.30	1351.60	30 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED H. A. O. BOULDER(COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III	1419.40	1419.70	24 - 41
x	III g	1454.50	1500.60	25 - 41
	III	1535.50	1535.80	26 - 41
x	III g	1559.10	1604.80	23 - 41
x	Cont.	1846.10	0010	24 - 41
x	III g	1854.60	1858.20	20 - 41
	III	2018	2018.50	12 - 41
22 x	Cont.	b 1217	a 0200	22 - 41
x	III g	1418.10	1421.90	24 - 41
x	III G	1547	1559.20	7.6 - 41
x	III	1606	1608.50	18 - 41
x	III g	1701.10	1702.50	30 - 41
23 x	Cont.	1220	2111.50	20 - 41
x	III G	1240.40	1249.80	20 - 41
x	III g	1256	1302.80	16 - 41
x	III	1440	1440.60	20 - 41
x	III	1506.10	1507.70	16 - 41
x	III	1529.80	1532.40	12 - 41
x	III g	1542.50	1546.60	16 - 41
x	III G	1557.20	1606.90	12 - 41
x	III	1629.90	1630.70	12 - 41
x	III g	1638.50	1640.90	14 - 41
x	III g	1650.30	1652.50	10 - 41
x	III g	1726.80	1728.30	12 - 41
x	III G	1808.70	1825.20	12 - 41
	III g	1828.90	1833	12 - 41
	III g	1908.90	1913.40	12 - 41
x	III g	1919	1929	12 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	x III g	2006.60	2018.30	12 - 41
	x III	2038.20	2038.80	20 - 41
24	x III g	1240.70	1241	16 - 41
	x Cont.	1306.60	1920.80	22 - 41
	x III g	1306.60	1310.90	20 - 41
	x III g	1327.50	1328.90	20 - 41
	x III g	1443.80	1447.60	12 - 41
	x III	1530.10	1531.10	16 - 41
	x III G	1647.90	1650.60	12 - 41
	x III	1655.70	1656.20	12 - 41
	x III	1731.10	1731.60	12 - 41
	x III	1744.40	1745	7.6 - 41
	III	1755.30	1755.70	7.6 - 41
	x III g	1805.30	1806.70	7.6 - 41
	III g	1820.20	1822.50	12 - 41
	x III G	1853	1859.10	7.6 - 41
	x Cont.	1920.80	2058	12 - 41
	x III g	1920.80	1927.10	9 - 41
	x III g	1932.80	1934.10	9 - 41
	III	2051.50	2022	7.6 - 41
25	x Cont.	b 1219	1452.20	22 - 41
	x III G	1303.70	1308.10	18 - 41
	x Cont.	1452.20	1715.20	20 - 41
	x Cont.	1715.20	2036	18 - 41
	III G	1803.70	1814.10	11 - 41
	III	1945.40	1946	10 - 41
	x Cont.	2036	2312.50	22 - 41
26	x Cont.	b 1217	1800	18 - 41
	x III	1330.10	1331	19 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)	
	x	III G	1359.40	1412.20	18 - 41
	x	III g	1506.10	1506.60	10 - 41
	x	III g	1520.90	1530.60	12 - 41
	x	III	1619.10	1619.70	13 - 41
	x	III G	1712.80	1725.50	10 - 41
	x	Cont.	1800	1952.60	12 - 41
		IV	1812.60	1930	22 - 41
	x	Cont.	1952.60	2253.70	12 - 41
27	x	IV	b1216	a 0200	18 - 41
	x	III g	1227.30	1222.30	16 - 41
	x	III g	1242.20	1243.30	20 - 41
	x	III g	1302.90	1302.80	16 - 41
	z x	III	1400.50	1401.10	12 - 41
	x	III	1511.50	1512	16 - 41
	x	III g	1531.50	1535.70	10 - 41
	x	III g	1550.50	1554.70	9 - 41
	x	III g	1605.70	1610.30	9 - 41
	x	III	1616.90	1617.50	14 - 41
		III	1752.60	1753.40	10 - 41
		III	1804.20	1804.80	9 - 41
	x	III g	1905.90	1914.30	9 - 41
		III g	1921.10	1922.80	11 - 41
	x	III g	1951.50	1952.80	10 - 41
	x	III g	2008.60	2014	10 - 41
		III g	2029	2036.50	12 - 41
28	x	Cont.	1219	1607.40	18 - 41
	x	III g	1400	1403.30	12 - 41
	x	III G	1458.60	1514.60	10 - 41
	x	III G	1529	1540.40	9 - 41
	x	Cont.	1607.70	0017.50	12 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	III g	1616	1621.50	12 - 41
x	III G	1626.60	1639.60	10 - 41
x	III G	1718.50	1740.80	7.6 - 41
x	III G	1829.70	1851.80	9 - 41
	III G	1927.40	1938.70	10 - 41
x	III G	2032	2051.70	10 - 41
29 x	Cont.	1219	1512.50	18 - 41
x	III g	1222.70	1224.70	14 - 41
x	III G	1339.20	1353.50	17 - 41
x	Cont.	1512.50	1600	15 - 41
x	III g	1515.70	1517.90	9 - 41
x	III G	1525.70	1531.80	10 - 41
x	III g	1552.90	1554.20	9 - 41
x	Cont.	1600	1652	9 - 41
x	III G	1633.90	1649.20	8 - 41
	III g	1704.40	1705.20	8 - 41
x	III g	1731.30	1739	7.6 - 41
	III g	1749.10	1750.50	7.6 - 41
x	III g	1809.80	1812.60	7.6 - 41
x	III	1836.10	1838.20	7.6 - 41
	III g	1907.30	1918.80	12 - 41
	III G	1923.30	1935.60	8 - 41
	III G	1941.50	1952	7.6 - 41
	IV	1952	2056	23 - 41
	III g	1959.90	2003.20	12 - 41
	III	2013.90	2014.50	9 - 41
	Cont.	2016	2027.30	23 - 41
	III g	2031.70	2041.10	12 - 41
30 x	Cont.	1238	1434.90	16 - 41
x	III g	1416.40	1418.40	12 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	II	1428	1438.50	16 - 41
x	IV	1434.90	1600.20	18 - 41
x	III G	1457.60	1513.60	8 - 41
x	III g	1535.60	1541.70	12 - 41
x	III	1557.70	1600.20	10 - 41
x	Cont.	1600.20	1649.20	12 - 41
x	III G	1610.60	1616.60	7.6 - 41
x	III G	1625.60	1636	7.6 - 41
	IV	1649.60	1730.50	19 - 41
	III	1708.60	1709.70	7.6 - 41
x	III g	1718	1726.80	7.6 - 41
	Cont.	1730.50	2050.20	10 - 41
	III G	2043	2050.20	7.6 - 41
31	x Cont.	b 1219.30	a 0129	20 - 41
	x III g	1219.20	1226.20	16 - 41
	x III g	1543.10	1546.30	16 - 41
	III	1755.90	1756.50	12 - 41
	III	1822.60	1823.20	12 - 41
	III g	1835.40	1837.70	9 - 41
	III	1842.60	1843.50	11 - 41
	x III	1918.70	1919.40	12 - 41
August	1 x III	1227.20	1227.6	15 - 41
	x III g	1301.80	1309.80	22 - 41
	III	1459.60	1500.80	25 - 41
	III g	1547.50	1548.70	18 - 41
	x Cont.	1730.20	1808.20	20 - 41
	x III g	1730.90	1737.10	10 - 41
	x Cont.	1823.40	2017.50	20 - 41
	2 x Cont.	1220	1334.60	26 - 41

TABLE II
 LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS
 PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON
 THE RIOMETER OF SÃO JOSÉ DOS CAMPOS

DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
x	III g	1227.60	1232.90	22 - 41
x	III g	1243.50	1245.10	20 - 41
x	III g	1301.70	1304.10	20 - 41
x	III	1329.20	1329.90	24 - 41
x	III G	1452	1503.50	22 - 41
x	III G	1536.80	1541.70	20 - 41
x	III g	1549.90	1558.10	24 - 41
x	III g	1621	1627	24 - 41
	III	1634.40	1634.70	28 - 35
	III	1645.60	1646.10	26 - 41
x	III	1705	1705.50	20 - 41
	III g	1729	1731.80	12 - 41
	III g	1926.30	1927.50	28 - 41
x	III g	1957.20	2007.30	7.6 - 41
	III g	2024.60	2028.70	25 - 41
x	III g	2041.10	2044.80	12 - 41
3	III	1151	1151	22 - 33
x	III	1227.70	1228	28 - 41
	III	1253.70	1254	28 - 41
	III g	1325.80	1326.80	28 - 41
x	III g	1342.30	1348.30	15 - 41
	III	1436.60	1436.80	28 - 41
x	III	1449.20	1449.60	24 - 41
x	III g	1502	1508.60	16 - 41
x	III	1512.20	1514	24 - 41
x	III	1547.40	1547.60	24 - 41
x	III	1629.30	1629.60	24 - 41
	III	1800.40	1800.60	28 - 41
x	III	1900.10	1900.60	24 - 41
	III	1923.60	1924	24 - 41
	III	1950.80	1951.10	30 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)	
	x	III	2017.40	2017.70	20 - 41
		III g	2041.40	2045.80	20 - 41
4	x	III g	1226.60	1230	20 - 41
	x	III g	1259.10	1303.20	22 - 41
		III g	1332.60	1336.40	25 - 41
		III g	1455.60	1458.70	25 - 41
	x	III g	1611.50	1612.60	10 - 41
		III	1617.70	1618	32 - 41
	x	III	1738.30	1738.60	23 - 38
	x	III g	1827.10	1829.60	25 - 41
	x	III g	1842.50	1846.60	25 - 41
	x	III	1933.30	1933.60	26 - 38
		III g	2016.20	2017.30	18 - 41
5		III	1734	1734.30	22 - 36
		III	2024.40	2027.30	12 - 41
6		III	1244.80	1245	22 - 34
		III	1405.60	1406	22 - 39
		III g	1427.80	1428.70	26 - 38
	x	III	1506	1506.30	20 - 38
	x	III g	1640.10	1642.70	8 - 41
		III g	1843.60	1846.20	7.6 - 41
7		III	1639.70	1639.90	25 - 38
		III g	1845.90	1850.20	10 - 41
	x	III	1951.80	1952	24 - 41
	x	Cont.	2002.40	2100.80	25 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED(x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)	
8	x	III	1307.90	1308.60	20 - 41
	x	III g	1431.60	1433.40	18 - 41
	x	III g	1604.60	1606.70	12 - 41
		III	1726.30	1726.50	20 - 34
		III	1826.70	1827.40	26 - 41
		III	2020.40	2020.70	25 - 35
9	x	III	1301.50	1301.90	20 - 41
		III	1411.80	1412.30	20 - 31
	x	III G	1422.70	1427.30	12 - 41
		III	1512.80	1513	26 - 36
		III	2020.50	2020.70	20 - 41
10		III g	1354	1356.20	28 - 41
		III	1404.30	1404.50	28 - 41
	x	III	1511.40	1511.80	20 - 41
	x	III	1544.60	1545.10	16 - 41
	x	III	1643.20	1643.40	24 - 35
		III	1849.30	1849.60	30 - 41
		III	1920	1920.30	25 - 41
11		III	1338.60	1339.10	22 - 41
	x	III	1346.20	1346.80	24 - 41
		III	1504.80	1505.10	26 - 41
	x	III	1511	1511.20	25 - 36
		III	1523	1523	19 - 41
		III	1552	1552	19 - 41
		III g	1632.50	1636.80	25 - 41
	x	III g	1643	1653.60	20 - 41
		III g	1724.50	1725.30	26 - 36
	x	III	1734.80	1735.60	18 - 41
	x	Cont.	1758	1821	18 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III	1804.60	1805.10	76 - 41
	III g	1835.20	1839.70	7.6 - 41
	III	1854.50	1854.80	18 - 41
x	III G	1901	1923	19 - 41
x	III g	1909.20	1916	20 - 41
	III	1932.30	1932.90	26 - 41
x	Cont.	2007	2349.70	24 - 41
12 x	Cont.	b1239.40	1400.50	22 - 41
x	III g	1340.70	1344.20	16 - 41
x	III	1410	1411.20	17 - 41
x	III	1503.40	1504.50	25 - 41
x	Cont.	1521.30	1547.20	25 - 41
	III g	1633.80	1635.90	26 - 41
x	III g	1700.70	1701.40	10 - 41
	III	1709.40	1709.80	21 - 38
x	Cont.	1725.50	2041.20	20 - 41
x	III	1831.50	1832.40	7.6 - 41
	III g	1842.30	1843.60	7.6 - 41
	III g	1940.80	1944	11 - 41
	III	2008	2009	19 - 41
13	Cont.	1542.10	1559.70	28 - 41
x	III g	1654.80	1665.50	24 - 41
	III	1714.70	1714.90	25 - 35
	Cont.	1734	0053.50	22 - 41
x	III g	1809	1810	22 - 41
	III	2018.80	2019.10	13 - 41
14	III	1323.60	1323.90	24 - 41
	III	1338	1338.30	28 - 41
	III	1346.10	1346.50	22 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	III	1354.10	1354.60	26 - 41
x	III G	1408.10	1413.40	16 - 41
x	III g	1426.10	1428.20	16 - 41
x	III	1444.30	1444.60	13 - 41
	III	1448.20	1448.50	22 - 41
x	III	1510.20	1510.90	20 - 41
x	III g	1531.70	1538.10	12 - 41
	III	1555.60	1555.80	22 - 41
	III	1616.80	1617.40	18 - 34
	III	1645.80	1646.20	24 - 41
	III	1722.90	1723.30	12 - 41
x	III	1739.80	1740.30	12 - 41
x	III	1807	1807.50	22 - 41
	III	1838.50	1838.90	22 - 41
	III g	1847.50	1855.10	12 - 41
	III g	1907.70	1914.50	7.6 - 41
x	III	1927.80	1931.10	10 - 41
	III g	1936.20	1937.60	7.6 - 41
	III g	1944.70	1944.80	22 - 41
15 x	III	1710	1711	20 - 39
x	Cont.	b1758	a2019	20 - 41
16 x	Cont.	b1800	a1947	10 - 41
17 x	III g	1853.70	1857	7.6 - 41
18 x	Cont.	1907.70	1916.70	7.6 - 41
	III	1929.20	1929.80	25 - 36
	III	1942.60	1943	20 - 41
	III g	1946.60	1948.20	7.6 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III g	1951.50	1957	20 - 41
	III	2013.90	2014.20	14 - 41
	III g	2029.80	2031.50	7.6 - 41
	III	2040.50	2040.60	16 - 41
	III	2045.60	2046.30	7.6 - 41
19 x	III	1139	1141	19 - 41
	III	1300.90	1301.50	22 - 41
x	III	1305.80	1306.50	14 - 41
	III g	1310	1311.80	22 - 41
x	III	1448	1448.30	28 - 41
	III	1705.10	1705.50	20 - 41
	III	1737	1738.30	10 - 41
	III	1753.60	1754.20	23 - 38
20	III	1249.90	1250.20	22 - 36
	III	1256.50	1256.90	28 - 41
	III	1338.70	1339.10	18 - 41
	III g	1430.30	1433	23 - 41
x	Cont.	1451	2005	22 - 41
	III g	1803	1803.80	16 - 41
x	Cont.	2005.50	0118	22 - 41
21 x	III	1212	1213	20 - 39
x	III g	1245.30	1249.50	20 - 41
x	III g	1253.10	1257.50	16 - 41
x	III G	1314.50	1320.20	16 - 41
x	III g	1326.50	1335.20	22 - 41
x	III	1350.70	1351	28 - 41
	III g	1405.30	1406.10	24 - 36
	III	1416.80	1417	24 - 35

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	x III g	1434.50	1436.40	20 - 41
	III	1443.10	1443.30	20 - 33
	x III	1547.20	1549.30	16 - 41
	x Cont.	1628	a0115	24 - 41
	x III g	1720	1722	12 - 41
	III	1801.60	1802.20	10 - 41
	III	1945.50	1946.80	10 - 41
	III	2023.50	2024.10	10 - 41
22	III	1325.10	1325.40	24 - 36
	x III g	1403.50	1408.10	24 - 41
	x III g	1417.50	1422.10	15 - 41
	III	1509.60	1510.10	25 - 41
	x III g	1527.50	1528.90	24 - 41
	x III g	1612.50	1624.40	12 - 41
	x III g	1642.80	1644.40	25 - 35
	x III	1642.50	1642.70	24 - 35
	x III	1816.30	1816.60	23 - 41
	III g	1901.40	1902.90	26 - 41
	x Cont.	1922	2034	24 - 41
23	IV	1143	1423	27 - 41
	x Cont.	1242	1423	22 - 41
	x III g	1611.20	1615.80	16 - 41
	III	1916	1916.40	28 - 41
	III g	2047.40	2050.70	28 - 41
24	IV	1143	1423	25 - 38
25	x II	1417.80	1423.30	26 - 41
	II	1424.90	1428.90	26 - 41

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LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED(x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967		TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)	
September	26	x	III	1313.80	1314.80	21 - 41
			III	1350.80	1351.10	20 - 41
			III	1758.20	1758.50	12 - 41
		x	III g	1806.50	1808.50	10 - 41
			III g	1835.40	1838.40	24 - 41
			III	1933.50	1936	12 - 41
			III	2040.60	2040.90	25 - 37
	27		III	1303.10	1303.90	17 - 41
		x	III	1623	1623.70	12 - 41
	28		III	1711	1715.10	7.6 - 41
		x	Cont.	1801.30	1811.10	22 - 41
	29		III	1632.80	1633.10	24 - 41
	30		III	1522.70	1523.00	24 - 41
			III g	1740.40	1742	30 - 41
	1	x	III	1433.2	1433.4	16 - 41
			III	1552	1553	19 - 39
		x	III	1649	1649.6	25 - 41
			III	1755	1755.1	27 - 41
		x	III	1902.5	1902.7	26 - 39
x		III g	1930.2	1931.8	26 - 41	
2		x	III	1713.8	1714.1	17 - 41
		x	III g	1723.5	1724.2	18 - 41
		x	III g	1851.5	1852.5	25 - 41
			III g	2023.5	2024.4	13 - 41
			III g	2037.1	2038.4	25 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H.A.O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III g	2037.1	2038.4	25 - 41
3 x	III g	1548.8	1556.7	25 - 41
x	III g	1620.4	1626.5	13 - 41
	III	1805.4	1805.5	26 - 39
	III	1845.1	1845.5	25 - 41
	III g	1902.3	1906.4	25 - 41
	III	1926.7	1926.8	30 - 41
	III	2022	2022.6	25 - 38
4 x	III	1316.5	1316.6	29 - 41
x	III g	1355.1	1357.2	25 - 41
x	III	1429.1	1429.5	24 - 41
	III	1646.1	1646.2	27 - 41
	III	1737.4	1737.6	26 - 41
	III	1916.5	1916.6	26 - 34
x	III	2018.5	2023.8	7 - 41
5 x	III	1054	1056	19 - 39
x	III	1217	1220	19 - 39
x	III	1249.2	1249.6	26 - 41
x	III	1341.5	1341.8	25 - 41
x	III g	1424.3	1426.7	19 - 41
x	III g	1500.4	1505.2	15 - 41
x	III	1515	1515.2	24 - 41
x	III	1604.1	1604.9	24 - 41
x	III	1611.4	1611.8	25 - 41
x	III g	1630.4	1633.7	26 - 38
x	III g	1657	1658.2	25 - 41
x	Cont.	1658.2	1755	28 - 41
x	III g	1812.7	1820.5	12 - 41
	III g	1927	1930.4	12 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III	1939	1939.3	25 - 41
6 x	III	1336	1337.5	20 - 41
7	III g	1558.2	1559.8	26 - 39
x	III	1714.6	1714.7	28 - 41
x	III	1724.6	1724.8	25 - 41
8	III	1250.8	1251	21 - 38
x	III	1347.8	1348.2	22 - 41
	III	1929.3	1929.4	27 - 41
9 x	III g	1331.9	1333.1	26 - 41
x	III	1421.9	1422.8	21 - 41
x	III	1556.1	1556.3	24 - 41
x	III	1619.3	1619.4	29 - 41
	III	1726.7	1727.3	22 - 41
x	III	1743.1	1744	7.6 - 41
	III g	1903.8	1905.7	11 - 41
10 x	III	1423.8	1424	25 - 41
x	III g	1445.8	1448.6	24 - 41
x	III	1623.3	1624.7	12 - 41
	III g	1635.6	1636	26 - 41
	III	1726	1727	19 - 41
x	III	1739.6	1740.5	7.6 - 41
	III	1743	1743	19 - 41
	III g	1750	1754.1	12 - 41
	III g	1841.7	1842.8	12 - 41
	III g	1945.2	1946.4	7.6 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
11	III g	1432.6	1436.1	25 - 38
	III g	2047.8	2048.9	10 - 41
12 x	Cont.	1426.5	1437	28 - 41
x	III g	1429.1	1429.7	23 - 41
x	III	1614.3	1614.7	16 - 41
x	III g	1634.6	1636.9	14 - 41
x	III g	1813	1813.5	22 - 41
	III	1821.5	1821.9	12 - 41
13 x	III g	1309.5	1311.1	18 - 41
x	III g	1351.6	1353.8	24 - 41
x	III	1409.5	1409.8	28 - 36
x	III g	1440.8	1441.8	20 - 41
x	III	1544.2	1544.6	16 - 41
	III	1553.4	1553.7	25 - 41
	III	1718.9	1719.2	25 - 38
14 x	III	1134	1134	19 - 41
	III	1910.7	1011.1	18 - 35
x	III g	2003.4	2007.8	10 - 41
	III g	2053.2	2059	22 - 41
17 x	IV	b1244	1433	22 - 41
	III g	1923.4	1924.6	28 - 41
x	Cont.	2009	2044	24 - 41
x	III	2034	2034.5	16 - 41
18 x	III g	1627.6	1630.5	16 - 41
19	III g	1324.2	1325.4	25 - 41
x	III	1523.4	1523.6	28 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	Cont.	1919	2123	28 - 41
20 x	III	1435	1435.2	26 - 41
x	III g	1443.3	1446.5	24 - 41
x	III	1624.9	1625.1	28 - 41
x	Cont.	1754.1	2120	26 - 41
21 x	III	1319.9	1320.2	25 - 4f
	III g	1550	1554.3	16 - 41
x	III g	1619.8	1621.5	20 - 41
24 x	III	1636.5	1636.8	24 - 41
25 x	III	1610	1610.4	20 - 41
x	III g	1719	1721.2	26 - 38
x	III g	1834.9	1836.2	26 - 41
x	Cont.	1947	2048	28 - 41
26 x	III	1515.9	1516.3	28 - 41
x	III	1602.8	1603.1	22 - 41
x	III	1640.2	1640.5	24 - 41
x	Cont.	1814	1830	26 - 41
x	III g	1819.1	1825.1	24 - 41
x	Cont.	1850	2030	26 - 41
x	III G	1934.7	1939	16 - 41
x	III	1959.6	2000	16 - 41
x	III	2050.9	2051.2	24 - 36
27 x	III	1313.8	1314.1	30 - 41
x	III	1522.8	1523	26 - 41
x	Cont.	1549	2105	28 - 41
x	III g	1553.7	1556.1	24 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)	
x	III g	1610.4	1612	19 - 41	
x	III g	1712.1	1714.3	26 - 41	
x	III g	1907.7	1908.2	19 - 41	
x	III g	1914	1918.1	24 - 41	
28 x	III	1333	1333.3	24 - 41	
x	Cont.	1556	2205	25 - 41	
x	III g	1510.1	1510.8	24 - 41	
29 x	Cont.	b1248	0020	25 - 41	
x	III g	1530	1534	20 - 41	
x	III	1547.8	1557.4	25 - 41	
x	III	1827.5	1829.5	20 - 41	
	III	2023.3	2023.7	16 - 41	
30 x	Cont.	b1518	a0007	24 - 41	
x	III	1817.6	1817.9	24 - 41	
	III g	1858.8	1900.2	24 - 41	
	III g	1944.8	1945.7	14 - 41	
x	III g	2040	2042	16 - 41	
October	1	Cont.	b1315	1506	26 - 41
x	Cont.	1506	1810	26 - 41	
x	Cont.	1810	2110	26 - 41	
x	III g	2008.1	2014.8	12 - 41	
2 x	III	1311	1311.4	25 - 41	
	III	1317.8	1318	30 - 41	
x	III g	1423	1425.2	24 - 41	
	III g	1455.1	1456.7	26 - 41	
x	III	1518.7	1519.1	26 - 38	
	III g	1547.3	1551.1	28 - 41	

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS

DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
x	III g	1556.6	1603	16 - 41
x	III	1608.2	1608.8	25 - 41
x	III g	1616.5	1617.8	12 - 41
x	III	1626.2	1626.4	26 - 41
x	III	1632.3	1632.6	16 - 41
x	Cont.	1701.5	a2355	26 - 41
x	Cont.	1703	1703.4	12 - 41
x	III	1710.9	1711.2	22 - 41
x	III	1737.6	1738	11 - 41
x	III g	1747.7	1748.7	12 - 41
	III	1824.2	1824.4	14 - 41
x	III g	1831.5	1831.9	28 - 41
	III	2101.9	2102.3	22 - 41
4 x	III g	1319.8	1322.7	25 - 41
x	III g	1334.5	1338.3	26 - 41
	III	1440	1440.2	28 - 41
x	III G	1445.9	1452.3	24 - 41
x	III g	1459.8	1504.5	25 - 41
x	III	1551.4	1551.8	24 - 41
x	III g	1603.5	1604.4	24 - 41
x	III g	1627.8	1630.5	16 - 41
x	III g	1654.3	1657.4	25 - 41
x	III g	1738.5	1739.4	14 - 41
x	Cont.	1742	1850	26 - 41
x	III	1747.5	1747.9	28 - 41
	III g	1801.5	1802	26 - 41
	III	1809.3	1809.2	24 - 41
x	III	1858.1	1858.9	28 - 41
x	III	2000.2	2000.6	30 - 41
x	Cont.	2029	2058	25 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III G	2031.5	2038.7	20 - 41
5 x	III	1313.4	1313.8	30 - 41
x	III g	1344.6	1348.1	26 - 41
x	III	1404.7	1404.8	28 - 41
	III	1419.2	1419.5	26 - 41
	III	1928.4	1928.7	30 - 41
	III	2013.7	2013.9	30 - 41
6 x	III g	1300.3	1307.4	26 - 41
x	III g	1328	1332.4	26 - 41
x	III	1452.2	1452.4	28 - 41
x	Cont.	1526	1559	26 - 41
x	III g	1553.1	1556.8	22 - 41
x	Cont.	1625	2256	25 - 41
x	III g	1650.2	1655.1	16 - 41
x	III g	1713	1715.6	16 - 41
x	III g	1720.1	1725.3	25 - 41
x	III	1748.3	1748.8	25 - 41
x	III G	1758.1	1804	16 - 41
	III	1840.1	1840.8	16 - 41
7 x	III	1353.7	1353.9	28 - 36
x	III g	1525.5	1533	18 - 41
x	Cont.	b1617	a0020	26 - 41
x	III g	1619	1620.5	18 - 41
x	III G	1628.7	1637.7	14 - 41
x	III G	1654.9	1704.4	14 - 41
x	III g	1726.9	1730.2	24 - 41
	III g	1858.8	1900.3	25 - 41
	III	1914	1914.5	26 - 41
	III g	1954.4	1955.4	18 - 41

TABLE II

LISTING OS BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
	III g	2005.4	2009.9	18 - 41
	III g	2048.5	2052.6	17 - 41
8 x	III	1421.8	1422.6	25 - 41
x	III g	1472.2	1430.2	26 - 41
x	III g	1503	1506	28 - 41
x	III g	1607.8	1609.8	14 - 41
x	III	1704.5	1704.8	26 - 41
	Cont.	1722	1739	27 - 41
x	III	1837.7	1837.9	30 - 41
	III	1855.2	1855.5	28 - 41
x	Cont.	2035	2055	25 - 41
9 x	III	1354.3	1554.7	20 - 41
x	III g	1450.7	1451.8	28 - 41
	III g	1458.1	1459.2	22 - 41
x	III g	1509.6	1513.9	22 - 41
x	III g	1554.5	1555.1	30 - 38
x	III g	2014	2015.1	25 - 41
	III	2020.3	2020.5	28 - 36
	III	2053.7	2054	30 - 41
10 x	III g	2030.2	2033.1	26 - 41
11 x	III g	1415.7	1421.1	28 - 41
	III	1544.4	1544.7	28 - 41
x	III g	1602.9	1607	26 - 41
x	III	1622.1	1622.4	24 - 41
x	Cont.	1701	1725	24 - 41
x	Cont.	1750	2104	24 - 41
x	Cont.	2104	2248	26 - 41

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DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
12 x	Cont.	b1315	1838	25 - 41
x	III	1518.3	1518.7	26 - 41
x	III	1540.6	1541	24 - 41
x	III	1834.2	1835.3	15 - 41
	Cont.	1838	2340	25 - 41
13 x	Cont.	b1322	1830	26 - 41
x	III g	1728	1732.2	16 - 41
x	Cont.	1830	1909	24 - 41
	IV	1909	2120.7	24 - 41
14 x	Cont.	b1312	1750	26 - 41
	III	1923.8	1924.1	28 - 41
	III	2034	2034.1	28 - 41
15 x	III	1324.2	1324.4	30 - 38
	III	1636.5	1636.8	30 - 41
	III	1719	1722	19 - 39
	III	1731	1733	19 - 39
	III	1854	1858	19 - 39
	IV	1905	2030	19 - 39
16	IV	1931.5	1932.4	18 - 41
17 x	III g	1528.5	1533.5	24 - 41
18 x	III	1437.3	1437.6	30 - 41
x	III g	1515.6	1517.5	25 - 41
x	III g	1537.2	1541.5	20 - 41
x	III	1657.5	1657.8	20 - 41
19	Cont.	1630	1646	28 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
20	x III	1414.2	1414.5	28 - 41
	x III	1601.2	1601.5	25 - 41
	x Cont.	1705	1745	26 - 41
	x Cont.	1835	2259	28 - 41
21	III g	1755.2	1756.6	17 - 41
	III g	1802.1	1802.5	25 - 41
	III	1814.3	1814.6	26 - 36
	III g	1827.3	1829	22 - 41
	III g	1912	1913.2	20 - 41
22	x III g	1358.3	1401.6	30 - 41
	x III g	1549.8	1552.6	25 - 41
	x III g	1623.8	1624.3	22 - 41
	x III g	1706.9	1708.4	26 - 41
	III g	1731.5	1732.8	25 - 41
	III G	1739.5	1751	18 - 41
	x III	1817.6	1817.8	28 - 41
	III	2037.1	2037.5	30 - 41
24	III	1654	1654.2	28 - 41
	III	1737.3	1737.5	28 - 41
	x III	1821.5	1821.9	26 - 41
	x III	1904.2	1904.4	28 - 41
	x III	2009.5	2009.5	20 - 41
	III	2103.5	2103.8	28 - 41
25	III	1436.8	1437.5	30 - 41
	III	2049.2	2049.4	30 - 41
26	III	1834.5	1834.8	28 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	III	1839.5	1839.8	26 - 41
x	III	1845.6	1848.3	20 - 41
x	Cont.	2044	2108	24 - 41
27	III	2047.6	2047.9	24 - 41
	III	2051.3	2051.5	25 - 35
28	III	1517.7	1518.2	26 - 41
	III	1657.2	1657.5	25 - 41
x	III	1700.4	1700.6	28 - 38
	III	1910.6	1911	22 - 41
	III	1956.8	1957	18 - 41
	III g	2013.2	2018.8	22 - 41
x	Cont.	2058.5	2116	20 - 41
29	III g	1407.5	1409.1	30 - 41
x	III g	1429.7	1431	22 - 41
x	III	1441.5	1441.9	26 - 41
x	III	1446.9	1447.3	25 - 41
x	III	1508.9	1509.2	22 - 38
x	III g	1528.3	1531.9	22 - 41
x	III G	1544	1553.6	16 - 41
x	III	1613.3	1613.8	16 - 41
	III	1654.9	1655.2	26 - 38
x	III	1710.5	1710.9	16 - 41
x	III g	1731.1	1733.2	24 - 41
x	III g	1741.2	1744.3	16 - 41
	III	1805.1	1805.4	28 - 41
	III	1826	1826.2	16 - 41
	III g	1852.3	1853.9	16 - 41
x	III G	1859.6	1907.2	14 - 41
	III g	1910.6	1914.9	16 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)	
	III	1933	1933.3	26 - 41	
	III g	1955	1956.3	26 - 41	
	III	2023.6	2023.9	25 - 41	
	III g	2038	2044.7	16 - 41	
	III g	2051.2	2052.1	24 - 41	
30 x	Cont.	b1401	1548	27 - 41	
x	Cont.	1548	1804.2	28 - 41	
x	Cont.	1840.5	2107.6	26 - 41	
31 x	Cont.	1124	1130	29 - 39	
x	III	1230	1231	19 - 39	
x	Cont.	b1357	1612.2	28 - 41	
x	Cont.	1612.2	1726	28 - 41	
x	Cont.	1726	1901.5	26 - 41	
x	III g	1737.7	1738.6	14 - 41	
x	III	1753.7	1754.3	18 - 41	
	III	1852.8	1853.8	16 - 41	
x	Cont.	1901.5	2241	28 - 41	
November	1 x	III	1730	1900	19 - 39
		IV	1738	1740	19 - 39
		III	1743	1743	19 - 39
		III	1754	1755	19 - 39
		III	1817	1817.40	28 - 41
		III	1834.20	1834.60	25 - 41
		III	1853	1854	19 - 39
		III g	2017.70	2020.30	24 - 41
	2 x	IV	1143	1200	29 - 39
	x	Cont.	1337	1340	19 - 39
	x	III g	1337.30	1340.10	28 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	III	1346.60	1346.80	28 - 41
x	III g	1417.30	1420.30	28 - 41
x	III	1451.30	1451.60	26 - 41
x	III	1519.60	1519.90	24 - 41
	III	1614.30	1614.50	26 - 41
3 x	III g	1714.10	1714.90	22 - 41
	III	1938.10	1938.50	28 - 41
4	III	1742.90	1743.20	30 - 41
	III	2049	2049.20	30 - 41
5	III g	1911	1912.10	26 - 41
	III	2020.40	2029.60	24 - 41
x	III	2034.40	2034.60	26 - 41
	III	2121.10	2121.50	25 - 41
6 x	III	1642.60	1643	30 - 41
7	III g	1958	2005	26 - 41
x	Cont.	2058	2320	26 - 41
10 x	IV	1749	1834.20	26 - 41
	III g	1816.60	1825.20	26 - 41
x	III g	1827.50	1834.20	16 - 41
x	IV	1834.20	1912	26 - 41
x	II	1834.60	1840.20	20 - 41
x	III g	1843.40	1848.50	16 - 41
	III g	1852.50	1857.10	28 - 41
11	III	2017.90	2018.30	24 - 41
	III g	2053.60	2054.30	30 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
12	III g	1634.40	1635.70	28 - 41
	x III g	2109.80	2112.10	22 - 41
14	III	2100.60	2100.90	24 - 36
15	III g	2027.20	2030.60	22 - 41
16	III	1744.70	1745	26 - 41
	III	1901.20	1901.50	24 - 41
	x III	1934.50	1934.90	22 - 41
	III	2005	2006	19 - 41
	x III	2104.50	2104.80	25 - 41
17	x III g	1521.40	1523.70	24 - 41
	III g	1525.40	1530	24 - 41
	x Cont.	1747	1851	25 - 41
	x III g	1839.30	1843	22 - 41
18	III g	1650.20	1650.90	25 - 41
	III	1706	1706.60	24 - 41
	III g	1732	1739.70	24 - 41
	III	1819.10	1819.30	24 - 41
	III	1900	1900	19 - 41
	Cont.	1951.80	2017.50	28 - 41
	III	2040.20	2040.60	28 - 41
19	x III	1456.30	1456.70	30 - 41
	x Cont.	1532	1546	26 - 41
	x III	1541.10	1541.50	16 - 41
	III	1639.70	1640	26 - 41
	x III	1650.70	1651.10	19 - 41
	Cont.	1716	2115	28 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
x	III g	1833.50	1840.70	16 - 41
	III	1906.90	1907.10	24 - 41
	III g	2004.80	2013.10	24 - 41
	III g	2028.60	2030	20 - 41
20 x	Cont.	1516.80	a2320	25 - 41
x	III	1712.90	1713.80	24 - 41
x	III	1712.50	1722.20	18 - 41
x	III g	1835.50	1836.50	18 - 41
21 x	Cont.	b1445	a2320	24 - 41
22	III	1448	1448.30	26 - 41
x	Cont.	1603	a2245	26 - 41
23 x	Cont.	b1414.10	1615	28 - 41
x	Cont.	1615	a2135	25 - 41
24 x	Cont.	1407	2130	28 - 41
25	III g	1759.70	1801.40	26 - 41
	III g	1959.80	2004.80	25 - 41
26	Cont.	1408.50	1452.10	26 - 41
	Cont.	1452.10	1547	26 - 41
x	Cont.	1547	2059.70	24 - 41
	Cont.	2059.70	2123	26 - 41
	Cont.	2123	a2235	26 - 41
27 x	III	1333	1334	19 - 41
x	III g	1430.90	1432.80	26 - 41

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DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
	x	Cont.	1515 1930	26 - 41
	x	Cont.	1930 2045	26 - 41
	x	III g	1930.70 1933.80	18 - 41
	x	III g	1935.40 1939.40	18 - 41
		III g	2040.40 2041.80	18 - 41
		Cont.	2045 a2330	24 - 41
		III	2114.80 2115.40	25 - 41
	28 x	Cont.	b1350 1610.60	26 - 41
	x	II	1428.10 1444.10	28 - 41
	x	IV	1526.80 1610.60	26 - 41
	x	Cont.	1610.60 1655	25 - 41
	x	Cont.	1655 2005	22 - 41
	x	III	1710 1712	26 - 35
	x	III	1714 1716	26 - 35
		II	1724 1728	30 - 41
		III	2020.60 2020.80	30 - 41
		III g	2147.20 2148.30	30 - 41
	29 x	Cont.	1505 2204	26 - 41
	30 x	Cont.	b1416 1705	28 - 41
	x	III g	1624.40 1625.40	22 - 41
	x	Cont.	1804 1845	28 - 41
December	1 x	III	1532 1534	20 - 40
	x	III	1611 1612	19 - 41
	x	Cont.	b1620 1900	25 - 41
	x	III	1808.20 1808.70	26 - 41
	x	III g	1855.30 1858.80	26 - 41
		III	2049.20 2049.40	30 - 41
		III	2100.90 2101.20	28 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
2 x	Cont.	1650	a2327	30 - 41
3	III	1404	1404	25 - 41
x	Cont.	1501	1730	28 - 41
	III	1616.10	1616.40	20 - 41
	III	1621.50	1622	22 - 41
	III g	1629.40	1632.20	26 - 41
	III	2009.20	2009.40	26 - 41
	III g	2023.50	2025.70	22 - 41
	III	2052.40	2052.60	24 - 41
x	Cont.	2120	a2315	25 - 41
4	III	1423.30	1423.50	30 - 41
	III g	1438.20	1442	25 - 41
x	Cont.	1515	1554	27 - 41
x	III	1521.90	1522.30	28 - 41
	III g	1548.40	1549.10	26 - 41
5 x	Cont.	1506.80	1626	26 - 41
6 x	III	1654	1702	19 - 41
x	III g	1718.20	1721.10	28 - 41
	III g	1732.60	1734.10	22 - 41
x	Cont.	1753	1945	24 - 41
x	III G	1933	1935.90	20 - 41
7 x	Cont.	1504.80	1637	26 - 41
	III g	1516.80	1517.20	28 - 41
x	Cont.	2105	2140	28 - 41
8 x	Cont.	1731	1749	26 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III g	1746.80	1647.90	20 - 41
9 x	Cont.	1457	1800	26 - 41
	Cont.	2021	2040	25 - 41
10	Cont.	1738	1830	26 - 41
	III	1807.40	1807.70	18 - 41
	III g	1824.90	1827.20	20 - 41
	Cont.	1920	2000	30 - 41
11	Cont.	1550	1607	30 - 41
x	III	1655.90	1656.20	22 - 41
	III g	1714.30	1718	24 - 41
12	III	1930.50	1930.80	24 - 41
	III	1935.30	1935.50	26 - 41
13	III	1351	1352	25 - 39
	II	1353	1356	25 - 40
x	Cont.	b1356	1438.20	30 - 41
	II	1438.20	1455.50	28 - 41
	IV	1455.50	1543	26 - 41
	IV	1543	1617	26 - 41
x	III	1647.10	1647.30	30 - 41
	Cont.	1947	2048	27 - 41
14 x	Cont.	1557	1735	28 - 41
	III g	1606.30	1607.50	24 - 41
x	Cont.	1735	1830	26 - 41
x	Cont.	1830	a2153	26 - 41
	III g	2042.50	2049.70	18 - 41

TABLE II

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DATE 1967	TYPE	TIME INTERVAL(UT)		FREQ. RANGE (MHz)
15 x	III g	1711.80	1714.40	22 - 41
	III	1913.40	1913.70	22 - 41
	III	1919.60	1920	26 - 41
	III	1942.40	1942.60	30 - 41
	III	1955.60	1956	20 - 41
16 x x x x	III g	1411.50	1412.30	30 - 41
	Cont.	1424	1510	26 - 41
	Cont.	1536	a2333	28 - 41
	III	1555.60	1558	22 - 41
	III g	1729.30	1730.30	20 - 41
	III g	1902.30	1905.90	24 - 41
	III g	1941.70	1942.70	22 - 41
17 x x x x x	III	1336	1339	19 - 39
	III g	1433.10	1436.30	28 - 41
	III	1542.40	1542.80	30 - 41
	Cont.	1841.50	1900	22 - 41
	III	1844.20	1845.70	20 - 41
	II	1854.60	1900	28 - 41
	IV	1900	1908	24 - 41
	III	1906.80	1907.70	21 - 41
	IV	1908	1935	26 - 41
	III	2124.80	2125.30	28 - 41
18 x	II	1441	1443	30 - 40
20 x x	III	1249	1249	26 - 41
	Cont.	1459	1534	25 - 41
	II	1524.60	1534	29 - 41
	III g	1526.80	1531	26 - 41
	IV	1534	1622.20	26 - 41

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DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	x Cont.	1622.20	a2305.70	22 - 41
	x II	1814.50	1818.40	28 - 41
	x III g	1942.10	1943.20	22 - 41
21	x III	1335	1336	19 - 41
	x Cont.	b1428	a2330	26 - 41
	III	1737	1740	24 - 39
	x III g	1909.60	1912.70	20 - 41
	III g	1929.50	1933	24 - 41
	III	1941	1943	19 - 31
	III g	1946.60	1952.60	24 - 41
	x III	2028.80	2033.50	22 - 41
22	x Cont.	b1652	a2200.80	25 - 41
	III	1808	1808	19 - 41
	III	1912	1912	19 - 41
	III	1953	1953	19 - 41
	III	2028.90	2029.50	22 - 41
	III	2149.20	2149.90	25 - 41
23	Cont.	b1929	a2258	25 - 41
	III g	2021.50	2022.50	22 - 41
	III g	2041.40	2042.30	20 - 41
	III g	2049	2050.60	24 - 41
24	III	1653.40	1653.70	24 - 41
	x Cont.	1706	1736	26 - 41
	x III g	1732.30	1733.70	25 - 41
	III	1924.90	1925.30	30 - 41
	Cont.	1939	2015	25 - 41

TABLE II

LISTING OF BURST WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SAO JOSÉ DOS CAMPOS (BRASIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
25 x	III	1345	1348	19 - 41
26 x	Cont.	b1551	2009	25 - 41
x	Cont.	2009	2206	24 - 41
27 x	Cont.	b1425	1606	26 - 41
x	Cont.	1606	1700	25 - 41
	Cont.	1700	2001.40	28 - 41
	Cont.	2001.40	2026	20 - 41
	IV	2002	2023	27 - 41
	Cont.	2026.30	a2340	25 - 41
x	III g	2127.40	2128.70	20 - 41
28 x	IV	1428	1500	24 - 41
x	II	1433	1441	24 - 41
x	IV	1530	a1715	24 - 41
	Cont.	1901	a2330	24 - 41
	III g	2036.50	2037.20	16 - 41
29 x	III	1320	1321	19 - 41
x	III	1524.90	1525.20	23 - 41
	III	1548	1548.30	29 - 41
x	Cont.	1605	2219	26 - 41
x	III g	1638	1638.90	26 - 41
x	III	1645	1646	19 - 41
x	III	1729.40	1730.10	24 - 41
x	III	1745	1745.50	24 - 41
x	III	1800.20	1800.60	22 - 41
x	III g	1857.20	1901.70	22 - 41
	III g	1922.80	1923.10	20 - 41
30 x	Cont.	b1422	2309	26 - 41

TABLE II

LISTING OF BURSTS WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H. A. O. BOULDER (COLORADO) AND AS OBSERVED (x) ON THE RIOMETER OF SÃO JOSÉ DOS CAMPOS (BRAZIL)

DATE 1967	TYPE	TIME INTERVAL (UT)		FREQ. RANGE (MHz)
	III g	2028.20	2030.40	20 - 41
31	III g	1742	1748.30	28 - 41
x	III g	1824.70	1825.50	27 - 41
	III g	1955.40	1956.70	28 - 41
	III	2040.20	2040.60	27 - 41

TABLE III

SCNAs WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED
BY H. A. O. BOULDER (COLORADO)

DATE 1967	IMPOR- TANCE	Time Interval (UT)		Related SCNA at SJC Riometer	
		START	END	START	END
July	4	2	1725	1807	
		1	1913	1925	
		1	2000	2015	
	7	-	1957	x	1948 20:10
	12	2	2002	2007	
	24	1	2030	2120	
	25	2	1428	1448	1426 1445
		1 +	1625	1715	
	27	1	1735	1743	1737 1743
August	1	2	1734	1815	1737 1750
	3	2 +	1632	1647	1630 1645
	4	1 -	1227	1248	
		1 -	1406	1425	
		2	1515	1529	1515 1523
	5	1	1806	1826	
	9	1	1825	1843	
	13	1	1736	1738	
		1	1835	1836	
	14	1	1254	1322	

TABLE III

SCNAs WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H.A.O. BOULDER (COLORADO)

DATE 1967	IMPOR- TANCE	time Interval (UT)		Related SCNA at SJC Riometer		
		START	END	START	END	
	18	-	1949	2047		
	20	1	928	945		
		1	2027	2050		
	21	1	1835	1925		
	28	1	1206	x		
	29	1	1802	1812		
		1+	1944	2000		
		1	2049	2104		
	31	1+	1947	2205		
Sept.	2	1+	2037	2049		
	6	1	1810	1820		
		1	1858	1907		
	9	3	1525	1602		
	12	1 -	1346	1438		
Oct.	6	1	1223	1232		
	26	-	1015	1029		
	29	1	1015	1029		
		2+	1150	1220	1145	1215

TABLE III

SCNAs WHICH OCCURRED UNDER SUNLIT PERIOD AT SJC AS PUBLISHED BY H.A.O. BOULDER (COLORADO)

DATE 1967	IMPOR- TANCE	Time Interval (UT)		Related SCNA at SJC Riometer	
		START	END	START	END
Nov. 2	-	0856	0910		
3	1+	1206	x	1200	1305
4	1 -	1157	1248		
6	3	1913	1945		
10	1	0856	0912		
	1 -	1333	1402		
12	1 -	0944	x		
	1	1338	x	1347	1410
	1 -	1715	x		
16	1 -	2008	2018		
17	-	0821	0925		

TABLE IV

SCNAs OBSERVED WITH THE RIOMETER OF SÃO JOSÉ DOS CAMPOS

Date	Absorption						Related Flare		
1967	Period (UT)			Max	Max	Im-	Period (UT)		
	Start	Max	End	Value		por-	Start	Max	End
		Phase		(db)		tance		Phase	
Jul. 7	19:48	19:53	20:10	0.80	0.30	-	19:57	-	x
25	14:26	14:33	14:45	1.14	0.80	2	14:28	-	14:48
27	17:37	17:43	17:43	0.1	0.40	1	17:35	-	17:43
Aug. 1	17:37	17:40	17:50	1.0	0.71	2	17:34	-	18:15
3	16:30	16:35	16:45	1.3	0.60	2+	16:32	-	16:47
4	15:15	15:25	15:23	1.34	0.64	2	15:15	-	15:29
29	13:30	13:38	13:47	1.85	0.90	2 b	13:29	-	13:54
Oct. 29	11:45	11:50	12:15	1.14	0.33	2+	11:50	-	12:20
Nov. 3	12:00	12:10	13:05	1.46	0.64	1+	12:06	-	x
12	13:47	13:55	14:10	2.04	0.40	1	13:38	-	x
17	15:35	15:40	15:50	2.58	0.68	2 b	15:35	15:39	16:00
25	13:20	13:28	13:35	1.66	0.26	1 b	13:20	13:21	13:49
Dec. 1	13:00	13:08	13:10	2.18	0.68	2 b	12:43	12:52	-
6	8:42	8:46	8:50	0.52	0.52	1 f	8:31	-	9:05
13	14:10	14:13	14:20	0.36	0.32	2 b	13:41	-	15:21
16	13:10	13:16	13:20	1.90	0.50	-	-	-	-
17	14:20	14:32	14:50	2.38	0.28	-	-	-	-

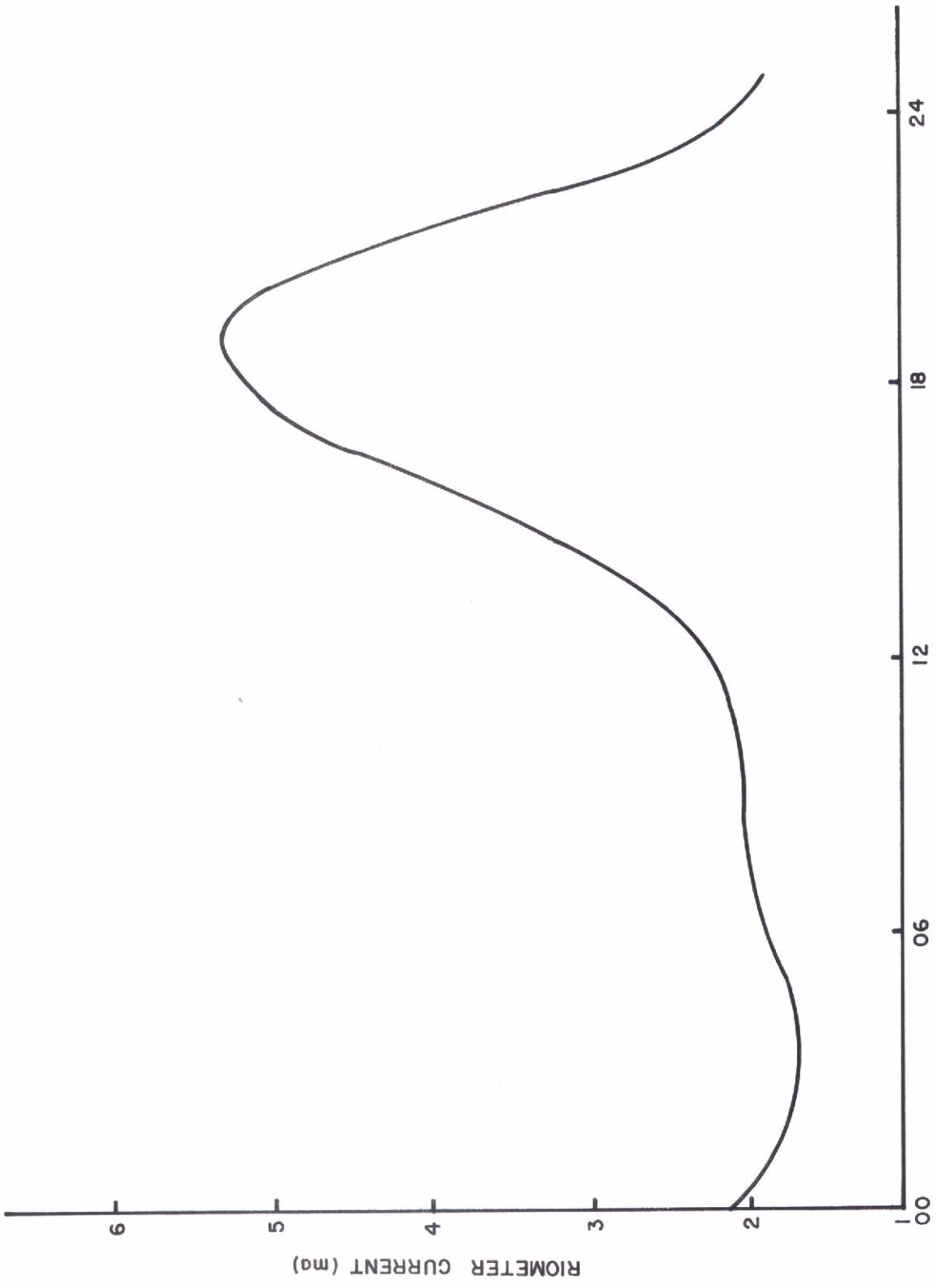


FIG. 1 - QUIET-DAY CURVE

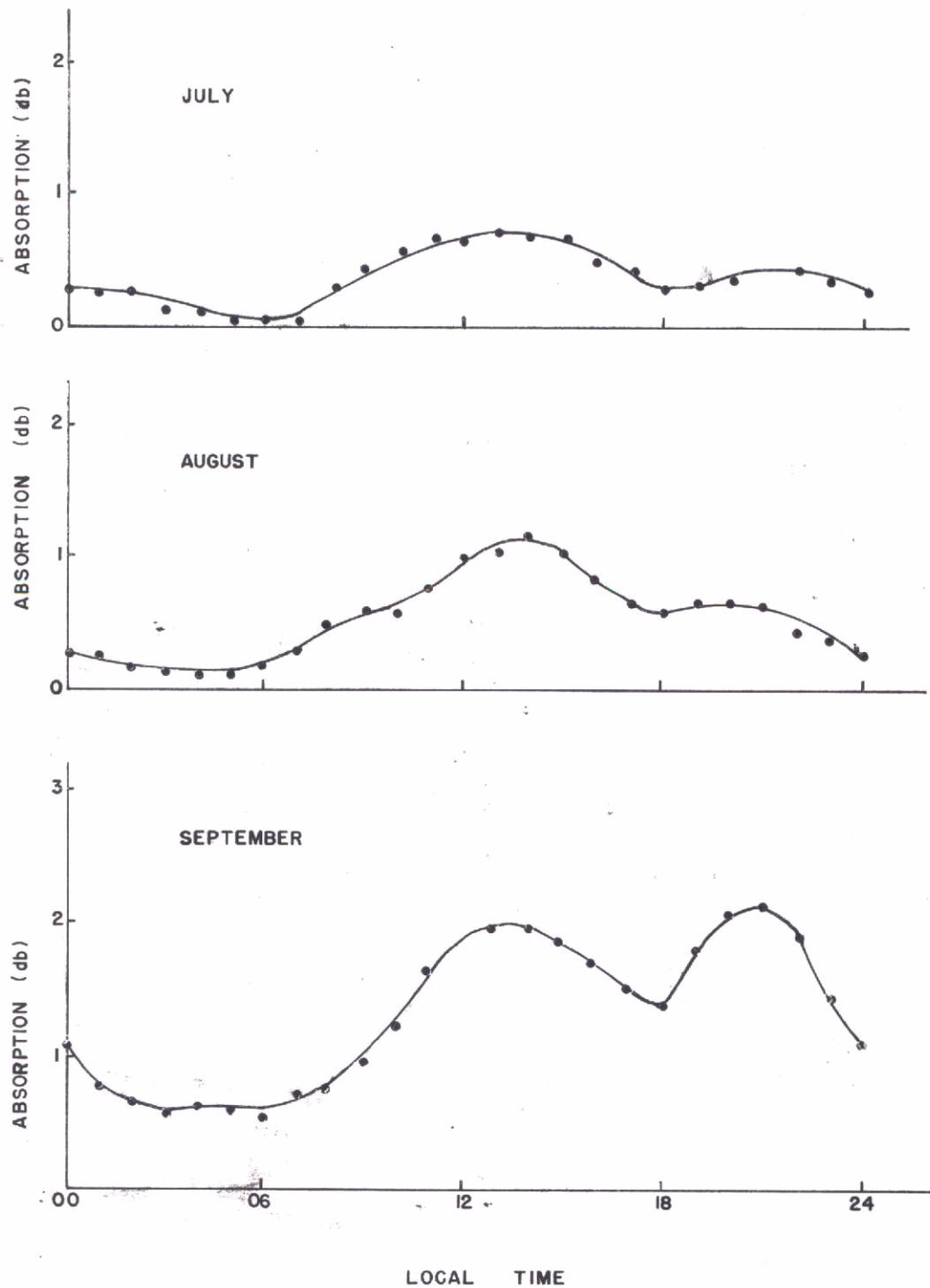


FIG. 2 - MEDIAN MONTHLY ABSORPTION CURVES (JULY - SEPTEMBER - 1967)

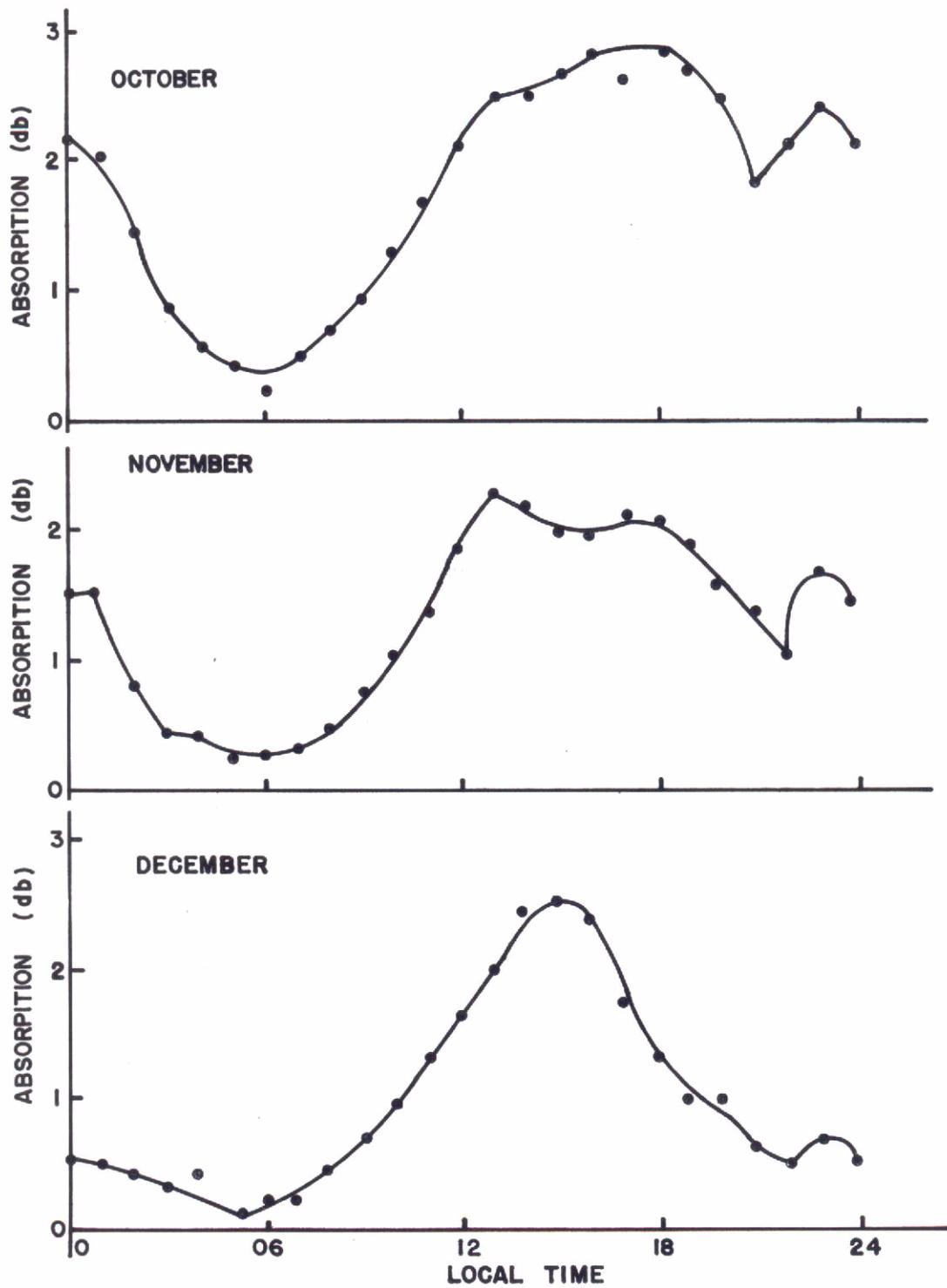


FIG. 3- MEDIAN MONTHLY ABSORPTION CURVES(OCTOBER - DECEMBER - 1967)

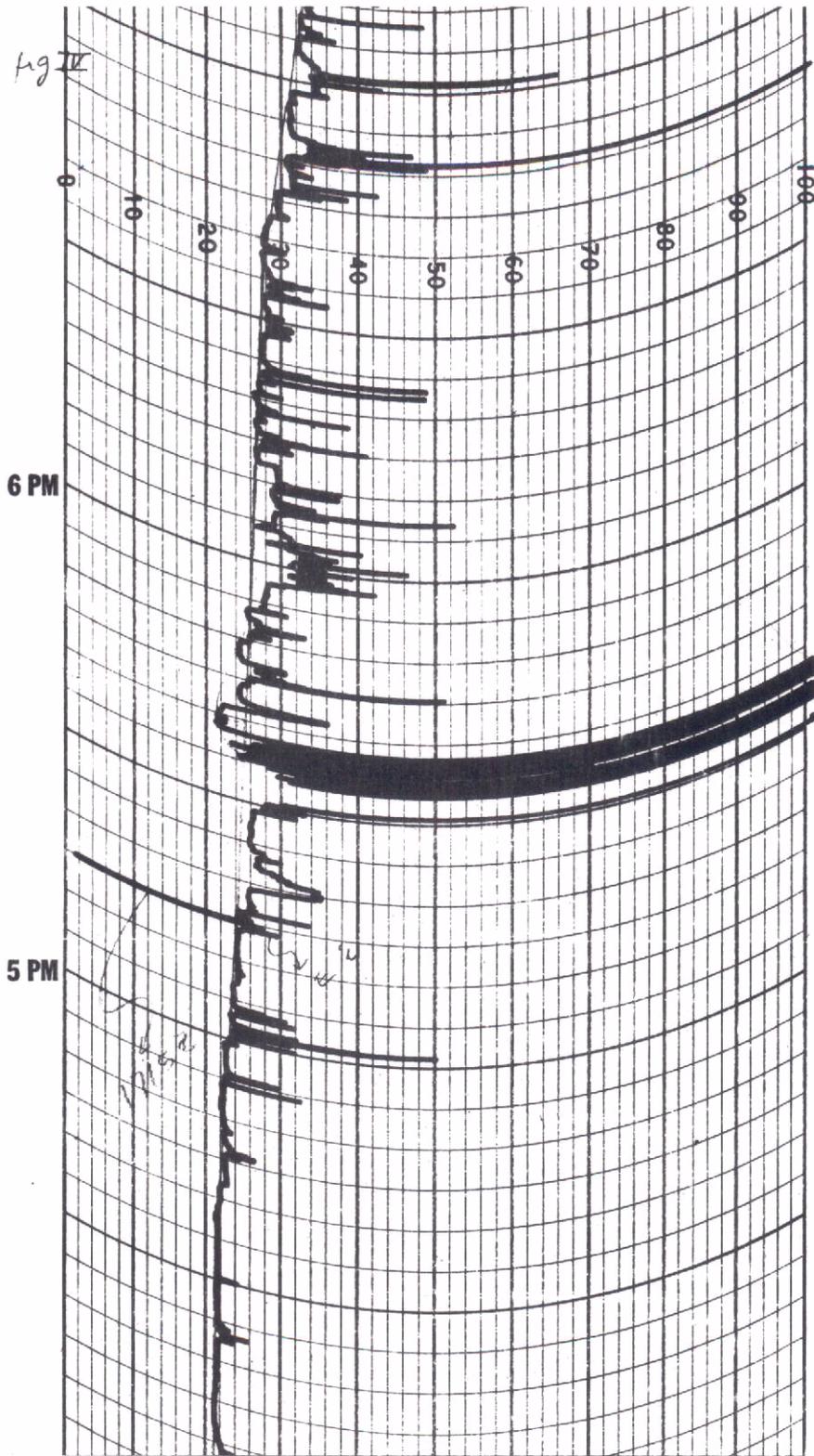


FIG. 4 - SCNA OF 1 AUGUST 1967 OBSERVED WITH A 30 MHz RIOMETER
AT SÃO JOSÉ DOS CAMPOS (BRAZIL)

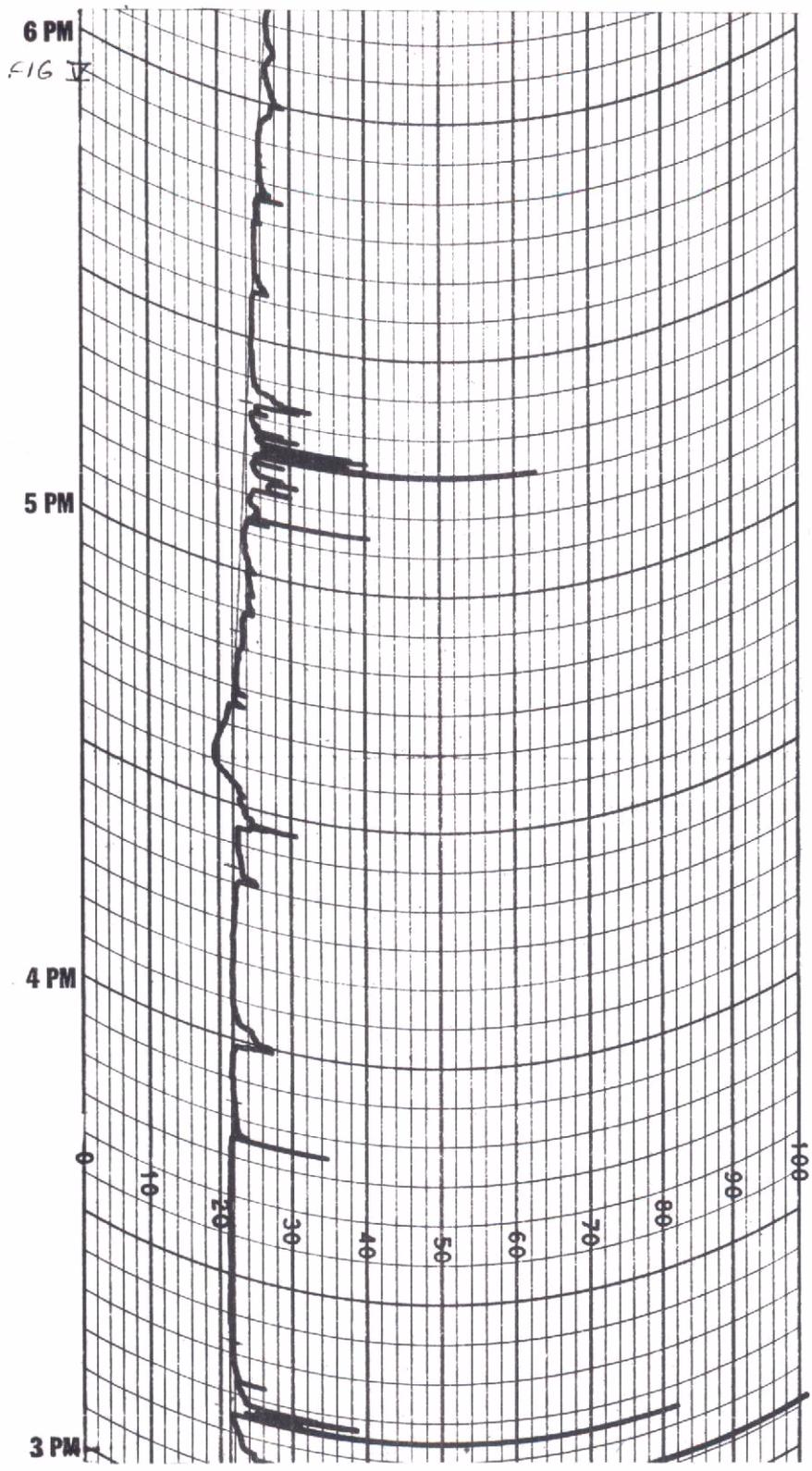


FIG. 5 - SCNA OF 3 AUGUST 1967 OBSERVED WITH A 30 MHz RIOMETER AT SÃO JOSÉ DOS CAMPOS (BRAZIL)

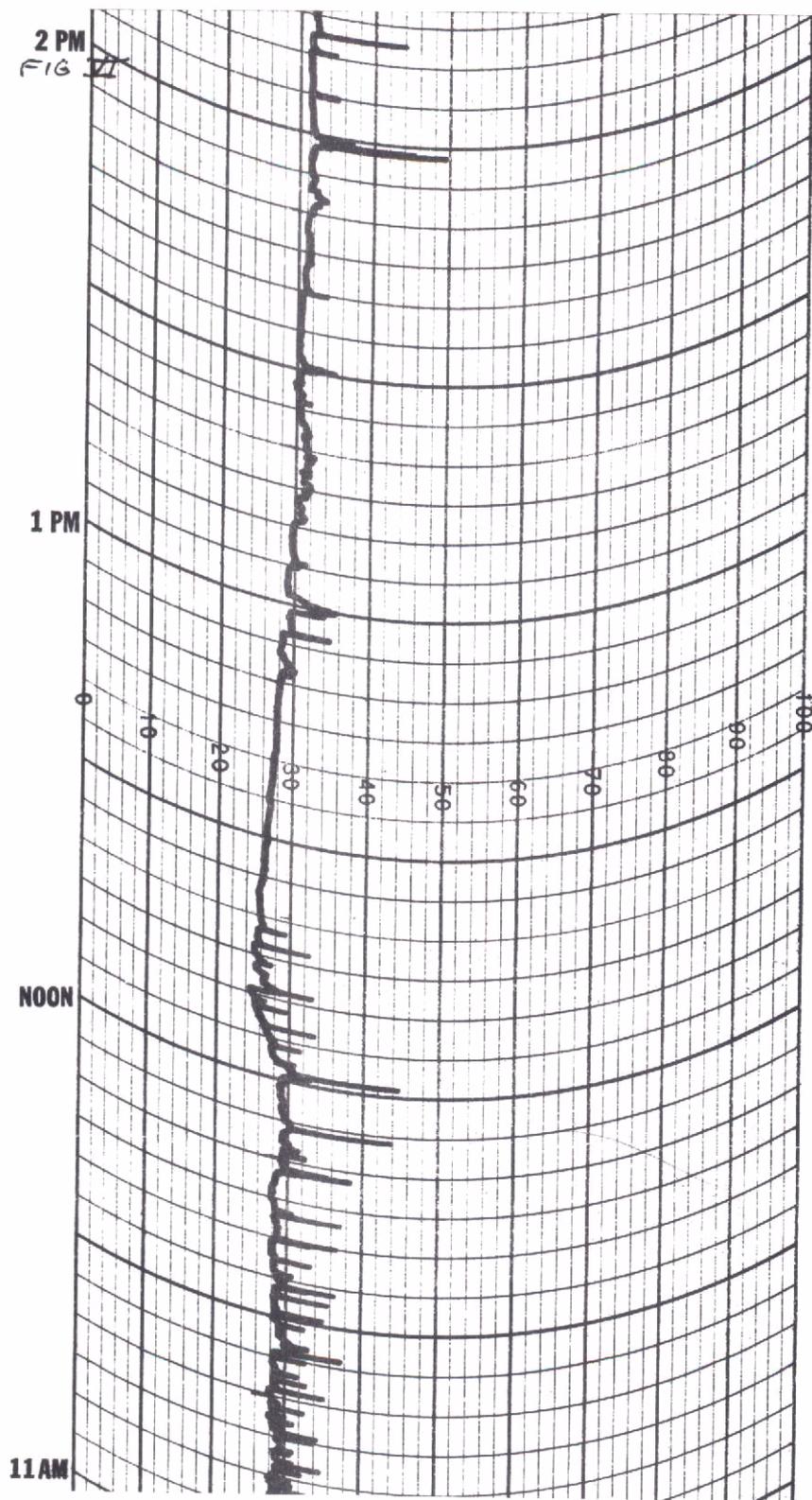


FIG. 6 - SCNA OF 3 NOVEMBER 1967 OBSERVED WITH A 30 MHz RIOMETER AT SÃO JOSÉ DOS CAMPOS (BRAZIL)

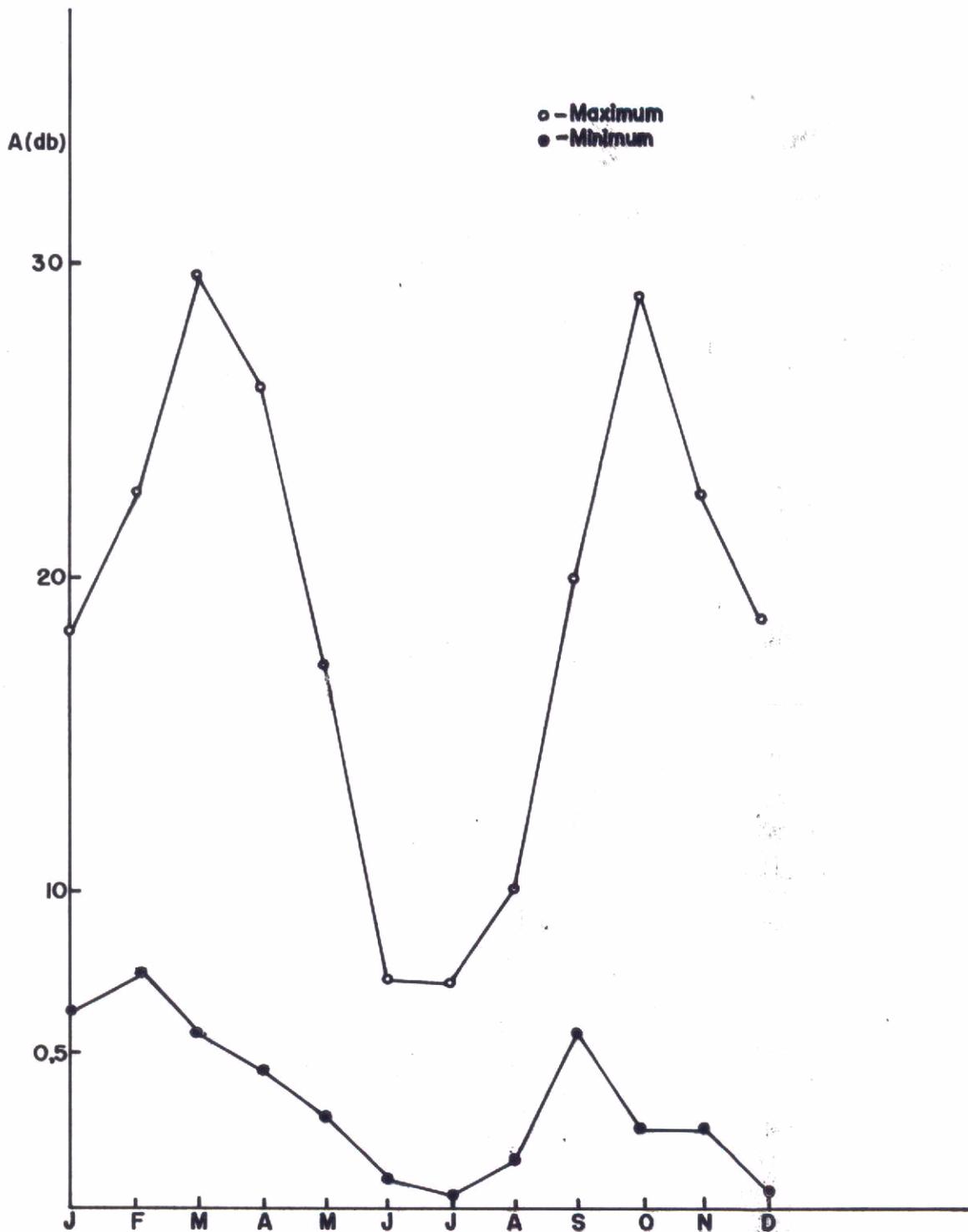


FIG. 7- SEASONAL BEHAVIOUR OF THE ABSORPTION

P. R. - CNPq.
 Comissão Nacional de Atividades Espaciais
 São José dos Campos - SP

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station..... - SJ
 Month..... - July
 Year..... - 1967
 Riometer..... - Mark II
 Lat. - 23°12'43"S
 Long..... - 45°51'35"W
 DIP - 22.5°
 Mag. Lat. - 11.7°
 Alt. - 623 m
 Freq..... - 30 MHz
 Bandwidth - 30 KHz
 Diode Load Resist. - 750 ohm
 Audio Threshold .. - 3
 Int. Time..... - 4 sec
 ACG Time - 4 sec

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.57	0.64	0.64	0.64	0.37	0.25	0.17	0.09	0.09	0.00	0.00	0.35	0.53	0.45	0.36	0.79	0.35	0.68	0.76	0.45	0.49	0.37	0.17	0.33
2	0.45	0.53	0.41	0.41	0.29	0.29	0.21	0.25	0.04	0.00	0.00	0.25	0.33	0.49	0.46	0.19	0.68	0.68	0.79	0.68	0.55	0.13	0.15	0.25
3	0.49	0.68	0.41	0.37	0.25	0.21	0.13	0.17	0.00	0.00	0.21	0.21	0.33	0.29	0.53	0.64	0.68	0.68	0.61	0.53	0.29	0.29	0.17	0.29
4	0.37	0.41	0.41	0.37	0.29	0.25	0.21	0.13	0.13	0.00	0.00	0.25	0.37	0.53	0.68	0.83	0.83	0.86	0.79	0.72	0.49	0.31	0.31	0.33
5	0.45	0.57	0.49	0.41	0.41	0.37	0.37	0.13	0.09	0.00	0.00	0.25	0.37	0.35	0.55	0.64	0.68	0.53	0.49	0.41	0.21	0.25	0.21	0.29
6	0.41	0.35	0.33	0.29	0.17	0.17	0.13	0.09	0.04	0.00	0.00	0.25	0.61	0.57	0.57	0.64	0.68	0.53	0.64	0.25	0.25	0.17	0.25	0.45
7	0.49	0.45	0.41	0.37	0.21	0.21	0.21	0.04	0.04	0.00	0.00	0.25	0.37	0.37	0.72	0.33	0.83	0.86	0.85	0.61	0.61	0.49	0.29	0.49
8	0.61	0.68	0.57	0.37	0.25	0.25	0.13	0.17	0.00	0.00	0.25	0.41	0.41	0.61	0.72	0.83	0.83	0.72	0.68	0.45	0.49	0.37	0.37	0.37
9	0.41	0.45	0.37	0.29	0.17	0.29	0.04	0.13	0.00	0.00	0.25	0.41	0.41	0.64	0.72	0.33	0.83	0.86	0.86	0.45	0.49	0.37	0.37	0.37
10	0.53	0.45	0.45	0.41	0.29	0.33	0.29	0.29	0.17	0.04	0.21	0.29	0.45	0.37	0.61	1.04	1.04	1.07	0.86	0.59	0.37	0.35	0.37	0.45
11	0.45	0.49	0.41	0.45	0.25	0.37	0.25	0.25	0.13	0.04	0.21	0.29	0.45	0.37	0.61	0.49	0.49	0.41	0.21	0.21	0.17	0.21	0.29	0.45
12	0.41	0.41	0.41	0.33	0.25	0.29	0.17	0.00	0.00	0.00	0.29	0.29	0.49	0.45	0.41	0.49	0.49	0.57	0.61	0.57	0.21	0.21	0.29	0.41
13	0.41	0.41	0.41	0.37	0.29	0.29	0.13	0.17	0.09	0.04	0.21	0.29	0.49	0.61	0.61	0.68	0.68	0.57	0.61	0.41	0.25	0.13	0.35	0.37
14	0.49	0.49	0.49	0.33	0.21	0.25	0.09	0.13	0.09	0.04	0.21	0.29	0.49	0.45	0.61	0.68	0.68	0.57	0.41	0.35	0.13	0.17	0.41	0.41
15	0.53	0.49	0.45	0.33	0.17	0.25	0.13	0.09	0.04	0.04	0.25	0.29	0.33	0.49	0.61	0.68	0.49	0.57	0.45	0.37	0.41	0.21	0.13	0.25

TIME - UT

Month: July
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	0.41	0.41	0.37	0.29	0.17	0.17	0.09	0.09	0.04	0.00	0.25	0.33 ^s	0.33	0.40	0.64	0.68	0.68 ^s	0.61	0.68	0.49 ^s	0.49 ^s	0.29 ^s	0.33	0.32
17	0.45	0.41	0.33	0.25	0.21	0.21	0.04	0.04	0.00	0.00	0.25	0.33 ^s	0.37 ^s	0.49 ^s	0.64 ^s	0.68 ^s	0.49	0.49 ^s	0.49 ^s	0.29 ^s	0.29 ^s	0.33	0.33	0.29
18	0.37	0.41	0.29	0.21	0.13	0.13	0.21	0.00	0.00	0.00	0.25	0.33 ^s	0.37 ^s	0.53 ^s	0.64 ^s	0.68 ^s	0.68	0.79 ^s	0.72 ^s	0.45 ^s	0.41 ^s	0.49 ^s	0.45	0.53
19	0.49	0.41	0.37	0.29	0.17	0.21	0.17	0.13	0.00	0.00	0.04	0.13 ^s	0.41 ^s	0.68 ^s	0.64	0.68 ^s	0.49	0.64 ^s	0.59 ^s	0.33 ^s	0.09 ^s	0.13 ^s	0.25 ^s	0.21
20	0.35	0.17	0.17	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.04	0.17 ^s	0.45 ^s	0.68 ^s	1.04 ^s	1.04 ^s	0.86 ^s	0.64 ^s	0.57 ^s	0.37 ^s	0.21	0.09	0.21	0.29
21	0.41	0.25	0.25	0.21	0.09	0.00	0.09	0.00	0.00	0.00	0.04	0.33 ^s	0.57 ^s	0.57 ^s	0.64 ^s	0.68 ^s	0.68 ^s	0.64 ^s	0.57 ^s	0.41 ^s	0.09 ^s	0.13 ^s	0.33	0.33
22	0.41	0.33	0.29	0.13	0.04	0.00	0.04 ^s	0.00	0.00	0.00	0.04	0.17	0.49 ^s	0.33 ^s	1.04 ^s	1.04 ^s	1.07 ^s	0.83 ^s	0.57 ^s	0.25 ^s	0.00 ^s	0.00 ^s	0.13 ^s	0.21
23	0.25	0.17	0.09	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.37 ^s	0.57 ^s	0.68 ^s	0.83 ^s	0.72 ^s	0.86 ^s	1.14 ^s	0.72	0.25 ^s	0.25	0.25	0.27
24	0.55	0.25 ^s	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09 ^s	0.37 ^s	0.72 ^s	1.04 ^s	1.04 ^s	1.07 ^s	1.24 ^s	1.30 ^s	1.10 ^s	0.79 ^s	0.53 ^s	0.53 ^s	0.49 ^s
25	0.37	0.25	0.04 ^s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09 ^s	0.41 ^s	0.61 ^s	0.68 ^s	0.68 ^s	0.72 ^s	0.86 ^s	0.86 ^s	0.83 ^s	0.86 ^s	0.79	0.41	0.53
26	0.49	0.21	0.09	0.13	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.09 ^s	0.41 ^s	0.61 ^s	0.68 ^s	0.68 ^s	0.72 ^s	0.90 ^s	1.04 ^s	1.04 ^s	0.79 ^s	0.41	0.29 ^s	0.29
27	0.25	0.21	0.13	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.13 ^s	0.41 ^s	0.61 ^s	0.68 ^s	0.68 ^s	0.72 ^s	0.90 ^s	0.90 ^s	0.76 ^s	0.83 ^s	0.79 ^s	0.64 ^s	0.45
28	0.41	0.33	0.25	0.13	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.13 ^s	0.45 ^s	0.61 ^s	0.83 ^s	1.04 ^s	1.10 ^s	1.30 ^s	1.27 ^s	1.10 ^s	0.57 ^s	0.33 ^s	0.29	0.35
29	0.33	0.33	0.29	0.25	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.17 ^s	0.49 ^s	0.76 ^s	1.04 ^s	1.04 ^s	1.10 ^s	1.10 ^s	1.14 ^s	0.86 ^s	0.69	0.49	0.64	0.90
30	0.57	0.45	0.33	0.25	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17 ^s	0.49 ^s	0.76 ^s	1.04 ^s	1.04 ^s	1.10 ^s	1.10 ^s	1.14 ^s	0.86 ^s	0.66	0.66	0.76 ^s	0.83
31	0.16	0.72	0.49	0.25	0.21	0.13	0.04	0.04	0.00	0.25	0.33	0.57 ^s	0.86 ^s	1.00 ^s	1.04 ^s	0.68 ^s	0.57 ^s	0.64 ^s	0.68 ^s	0.33 ^s	0.41 ^s	0.33 ^s	0.41	0.41
	31	31	31	31	29	21	23	21	17	11	22	31	31	31	31	31	31	30	31	31	31	31	31	31
	0.49	0.49	0.41	0.37	0.25	0.29	0.21	0.17	0.09	0.04	0.21	0.29	0.47	0.66	0.86	0.83	0.83	0.86	0.86	0.74	0.59	0.41	0.37	0.45
	0.45	0.41	0.37	0.29	0.21	0.25	0.13	0.13	0.04	0.04	0.04	0.25	0.41	0.57	0.68	0.68	0.72	0.70	0.68	0.49	0.41	0.29	0.33	0.37
	0.41	0.33	0.27	0.17	0.17	0.21	0.09	0.04	0.00	0.00	0.00	0.15	0.37	0.49	0.62	0.68	0.68	0.61	0.57	0.37	0.23	0.17	0.25	0.29

TIME - UT

P. R. - CNPq.
 Comissão Nacional de Atividades Espaciais
 São José dos Campos - SP

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station - SJ
 Month - August
 Year - 1967
 Riometer - Mark II
 Lat. - 23° 12' 43" S
 Long. - 45° 51' 35" W
 DIP. - 22.5° S
 Mag. Lat. .. - 11.7°
 Alt. - 623 m
 Freq. - 30 MHz
 Bandwidth - 30 KHz
 Diode Load Resist. - 750 ohm
 Audio Threshold. - 3
 Int. Time - 4 sec
 ACG Time - 4 sec

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.76	0.68	0.53	0.64	0.33	0.29	0.13	0.13	0.13	0.13	0.21	0.13	0.90	1.17	1.40	1.27	1.14	0.97	0.76	0.35	0.99	0.63	0.86	0.86
2	0.76	0.68	0.49	0.47	0.41	0.13	0.13	-	-	0.00	0.13	0.21	0.73	0.61	0.79	1.09	0.93	1.00	0.53	0.41	0.53	0.68	0.97	0.97
3	0.86	0.64	0.64	0.72	0.76	0.45	0.25	-	-	0.00	0.13	0.37	0.75	0.90	0.93	0.93	1.07	1.19	1.04	0.86	0.68	0.79	0.79	0.90
4	0.83	0.76	0.76	0.64	0.41	0.41	0.21	0.21	0.13	0.17	0.25	0.41	0.68	0.47	0.93	1.17	1.07	0.97	0.90	0.61	0.25	0.37	0.33	0.45
5	0.29	0.21	0.21	0.25	0.33	0.17	0.04	0.03	0.13	0.17	0.25	0.41	0.53	0.57	0.61	0.61	0.76	0.68	0.64	0.63	0.33	0.33	0.25	0.33
6	0.25	0.21	0.25	0.17	0.25	0.17	0.17	0.03	0.13	0.17	0.25	0.41	0.75	0.61	0.75	1.17	1.10	1.24	1.14	0.68	0.25	0.21	0.17	0.17
7	0.17	0.09	0.09	0.21	0.21	0.13	0.00	-	-	0.04	0.17	0.33	0.53	0.61	0.61	0.83	0.97	1.27	1.00	0.86	0.33	0.25	0.33	0.25
8	0.21	0.25	0.25	0.19	0.25	0.25	-	0.04	0.13	0.37	0.33	0.61	0.75	0.61	0.75	0.97	1.14	1.40	1.76	1.37	0.68	0.53	0.41	0.41
9	0.37	0.25	0.25	0.25	0.29	0.21	0.25	0.17	0.33	0.37	0.33	0.61	0.72	0.75	0.93	0.97	1.53	1.67	1.75	1.21	0.41	0.33	0.33	0.29
10	0.25	0.25	0.25	0.25	0.21	0.17	0.09	0.17	0.13	0.17	0.33	0.33	0.72	0.75	0.75	0.84	0.75	1.00	0.33	0.72	0.61	0.45	0.45	0.68
11	0.64	0.57	0.41	0.43	0.33	0.33	0.25	0.17	0.13	0.17	0.33	0.33	0.61	0.61	0.61	0.64	0.83	1.00	0.97	1.07	0.68	0.41	0.13	0.17
12	0.17	0.17	0.17	0.13	0.00	-	-	0.00	-	0.05	0.04	0.37	0.37	0.61	0.61	1.00	1.40	1.40	1.04	0.72	0.33	0.21	0.25	0.25
13	0.17	0.04	0.00	0.04	0.04	0.04	0.00	0.00	-	0.05	0.04	0.37	0.53	0.61	0.61	1.00	0.86	1.21	1.21	1.17	0.50	1.00	0.86	0.68
14	0.41	0.21	0.13	0.03	0.00	0.00	0.00	0.00	-	1.04	1.04	0.41	0.63	0.75	0.79	0.90	0.86	0.72	0.53	0.57	0.64	0.33	0.33	0.41
15	0.33	0.25	0.33	0.21	0.25	0.00	-	0.13	0.00	-	0.04	0.31	0.53	0.61	0.61	0.68	0.67	0.76	0.72	0.45	0.45	0.67	0.45	0.53

TIME - UT

Month: August
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	0.45	0.33	0.37	0.13	0.05	-	-	-	0.00	0.03	0.13	0.41	0.57	0.61	0.75	0.68	0.76	0.75	0.86	1.04	1.52	1.40	1.21	1.00
17	0.68	0.45	0.41	0.25	0.17	0.13	-	-	0.00	0.13	0.17	0.45	0.57	0.61	0.61	0.72	0.61	0.63	0.37	0.25	0.37	0.21	0.13	0.13
18	0.02	0.17	0.21	0.21	0.13	0.05	-	-	0.00	0.13	0.17	0.45	0.57	0.61	1.15	0.72	0.57	0.72	0.53	0.33	0.25	0.64	1.04	1.10
19	0.73	0.45	0.33	0.13	0.04	-	-	-	0.04	0.13	0.57	0.75	0.33	1.17	1.40	1.30	1.33	1.61	1.82	1.46	0.33	0.90	0.76	0.33
20	0.45	0.37	0.37	0.21	0.21	0.04	-	-	0.04	0.25	0.57	0.93	0.53	0.83	0.57	1.10	1.00	0.75	0.79	0.53	0.41	0.25	0.33	0.37
21	0.37	0.17	0.13	0.13	0.00	-	-	-	0.04	-	0.03	0.49	0.57	0.61	0.61	1.10	1.24	1.30	1.43	1.24	1.24	1.00	0.53	0.66
22	0.72	0.61	0.53	0.45	0.13	0.00	-	-	0.04	-	0.13	0.33	0.45	0.45	0.83	1.10	1.04	1.17	1.43	1.21	1.24	1.00	0.53	0.66
23	0.68	0.68	0.72	0.37	0.45	0.13	0.17	0.13	0.17	0.33	0.45	0.68	0.79	0.79	0.57	1.33	1.85	2.33	1.55	1.40	0.57	0.61	0.37	0.25
24	0.33	0.37	0.53	0.25	0.41	0.25	0.17	0.13	0.17	0.21	0.25	0.49	0.61	0.61	0.64	0.75	0.57	1.07	1.07	0.57	1.00	1.04	0.72	1.04
25	0.86	0.76	0.64	0.53	0.21	0.03	0.17	0.13	0.17	0.33	0.53	0.53	0.61	0.61	0.83	1.19	1.33	1.46	1.43	1.67	1.42	1.07	1.10	1.10
26	1.27	1.00	0.83	0.45	0.45	0.25	0.17	0.13	0.17	0.25	0.33	0.53	0.61	0.75	e	e	e	1.30	1.04	0.75	0.76	0.61	0.61	1.55
27	1.24	0.64	0.75	0.44	0.45	0.25	0.13	0.13	0.21	0.37	0.72	e	e	e	e	e	0.64	1.04	1.10	0.84	0.57	0.61	1.14	1.33
28	1.52	1.33	1.67	1.21	0.61	0.33	0.13	0.13	0.21	0.25	0.37	0.53	0.61	0.61	1.00	1.07	1.07	0.93	0.45	0.45	0.72	1.14	2.03	2.12
29	1.45	1.46	1.30	0.64	0.37	0.33	0.13	0.13	0.21	0.25	0.37	0.41	0.61	0.53	1.00	1.31	1.24	1.24	1.21	1.27	0.90	1.30	1.30	2.55
30	2.05	1.52	1.49	0.93	0.53	0.33	0.57	0.37	0.21	0.45	0.41	0.53	0.75	0.53	1.67	2.15	2.28	2.55	2.35	2.35	1.76	1.43	1.10	1.37
31	1.30	1.33	1.24	1.07	0.64	0.45	0.57	0.57	0.68	0.68	0.76	0.76	0.53	1.90	1.45	2.17	1.85	1.99	1.30	1.27	0.57	1.10	1.90	3.19
	31	31	31	31	27	27	0.1	20	35	38	31	30	23	30	25	25	30	31	31	30	31	31	31	31
	0.85	0.68	0.64	0.53	0.34	0.23	0.17	0.17	0.33	0.33	0.35	0.57	0.72	0.75	0.97	1.17	1.27	1.33	1.33	1.21	0.95	1.00	0.57	1.07
	0.64	0.45	0.41	0.25	0.25	0.17	0.17	0.13	0.13	0.17	0.23	0.45	0.61	0.61	0.75	1.00	1.07	1.17	1.04	0.84	0.68	0.61	0.68	0.66
	0.46	0.23	0.25	0.15	0.15	0.11	0.13	0.11	0.04	0.13	0.15	0.41	0.53	0.61	0.61	0.75	0.86	0.53	0.88	0.57	0.35	0.35	0.33	0.35

TIME - UT

Month: September
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	288	185	117	064	025	033	037	025	033	041	057	079	117	170	217	190	153	133	0	033	064	093	173	212
17	199	161	114	083	068	057	057	025	037	045	057	079	093	149	173	262	269	281	294	297	288	276	283	235
18	238	137	110	230	164	104	083	068	053	064	057	093	117	149	196	265	274	286	286	258	233	274	279	301
19	301	260	186	146	114	104	061	049	057	045	079	079	097	130	155	176	194	121	146	127	127	133	121	124
20	097	100	090	072	064	033	061	076	061	068	057	093	097	155	179	225	230	243	149	097	086	090	155	233
21	267	201	146	117	110	104	107	076	079	068	093	117	121	155	204	228	269	336	383	400	378	371	423	431
22	435	371	187	114	137	130	107	097	107	068	079	079	097	155	185	230	245	286	290	240	204	217	209	439
23	378	303	230	187	107	057	061	079	064	049	061	079	097	158	209	281	294	326	358	354	338	297	255	276
24	265	276	228	133	061	076	061	079	064	049	061	061	121	158	187	238	276	299	342	314	250	230	262	350
25	364	243	173	133	083	076	064	057	068	053	079	093	083	083	114	161	193	225	258	238	286	297	290	344
26	356	344	170	130	107	076	064	057	057	053	061	079	086	104	114	167	196	161	173	110	167	225	258	338
27	400	338	215	155	104	104	064	061	057	053	061	079	100	117	152	204	222	222	225	167	190	190	207	253
28	248	293	161	124	079	104	064	064	061	053	061	079	100	121	155	209	225	255	269	292	230	290	367	130
29	137	248	336	299	279	209	161	133	076	076	079	093	100	124	158	199	209	190	173	173	124	140	235	396
30	497	391	330	255	279	281	161	137	097	114	140	140	149	167	253	260	250	212	222	193	201	240	342	412
31	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	30	30	30	28	29	29	30	30	30
	301	263	176	133	110	104	064	068	076	064	079	093	117	155	196	230	250	260	263	238	204	230	262	301
	215	192	147	112	079	070	057	064	061	055	072	079	097	125	162	196	197	200	188	173	153	137	183	210
	137	127	097	079	061	057	057	057	049	049	061	079	093	104	149	161	164	155	151	127	107	090	114	133

TIME - UT

P. R. - CNPq.
 Comissão Nacional de Atividades Espaciais
 São José dos Campos - SP

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station	- SJ	Lat.	- 23°12'43"S	Freq.	- 30 MHz
Month	- October	Long.	- 45°51'35"W	Bandwidth	- 30 KHz
Year	- 1967	DIP	- 22.5°S	Diode Load Resist ..	- 750 ohm
Riometer	- Mark II	Mag. Lat.	- 11.7°	Audio Threshold ...	- 3
		Alt.	- 623 m	Int. Time	- 4 sec
				ACG Time	- 4 sec

Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	360	260	230	225	238	430	090	093	076	076	093	090	110	190	201	265	265	203	459	250	255	312	402	425
2	352	285	362	352	130	104	068	072	079	057	079	093	149	173	260	265	338	250	307	288	265	258	262	299
3	269	230	230	196	182	104	068	053	064	057	079	093	149	176	262	294	299	332	310	265	250	255	283	310
4	240	199	149	114	104	107	072	076	068	057	061	097	152	199	267	350	348	288	258	223	161	199	253	233
5	187	223	143	137	104	107	072	079	068	057	079	097	152	179	272	328	373	378	316	0	0	0	0	0
6	c	c	c	c	c	c	c	e	e	e	e	e	152	204	225	283	334	312	274	269	253	250	272	190
7	222	322	316	217	209	155	124	061	068	057	061	097	110	140	185	209	253	265	322	328	286	322	312	265
8	133	209	243	217	209	187	124	064	072	061	061	097	137	187	212	248	312	336	297	297	297	279	322	425
9	196	228	137	133	152	110	100	110	086	067	079	097	114	156	193	240	283	307	356	352	367	367	371	371
10	243	258	209	155	209	158	127	110	086	093	093	143	161	190	196	243	303	272	274	256	324	330	402	412
11	344	350	238	185	152	158	130	114	072	067	061	100	140	173	201	262	344	350	362	369	322	342	324	367
12	340	301	262	185	152	137	130	072	072	079	079	100	117	152	204	253	318	292	243	307	0	0	0	0
13	c	c	c	c	e	c	c	c	c	e	e	086	121	173	238	235	235	185	212	0	0	0	0	0
14	176	290	258	152	104	114	045	037	021	025	025	068	086	124	161	220	230	272	258	253	253	276	485	336
15	393	332	230	185	152	161	117	076	053	025	061	104	146	185	238	269	281	330	338	328	316	286	276	320

TIME - UT

Month: October
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	240	330	297	281	212	161	137	176	057	025	045	068	093	150	152	187	215	215	217	250	226	224	290	207
17	117	124	223	238	185	021	049	064	090	025	045	057	061	083	124	149	167	207	196	230	283	350	334	552
18	380	322	223	152	130	093	076	064	041	025	223	072	097	137	176	212	250	283	265	301	364	415	367	267
19	173	049	290	324	283	117	053	041	025	009	013	041	064	053	150	170	255	233	292	312	330	310	257	290
20	037	093	140	279	440	199	149	033	025	025	013	041	068	110	133	176	248	290	292	286	301	292	310	283
21	193	187	245	238	215	146	045	033	025	025	027	061	104	133	170	245	294	274	269	298	301	268	201	114
22	097	140	243	279	215	149	063	017	004	025	029	045	053	083	114	176	228	253	269	262	253	288	250	278
23	079	029	137	209	235	170	127	049	025	009	029	045	057	100	133	182	230	265	260	310	305	305	272	209
24	182	029	187	238	245	152	064	049	049	049	000	045	076	090	121	173	235	238	262	286	314	272	228	143
25	072	090	185	279	378	303	158	072	026	009	013	068	045	093	143	152	182	179	207	225	260	328	272	170
26	127	026	212	258	245	158	090	072	045	026	013	265	072	097	117	158	170	185	187	225	267	307	307	233
27	146	104	130	104	110	041	037	021	025	025	033	037	053	090	110	137	187	230	205	245	250	272	253	228
28	076	021	212	279	288	266	114	053	025	025	033	037	053	090	140	212	225	209	230	279	286	297	297	263
29	297	233	185	192	190	182	140	053	025	025	053	072	107	140	143	215	217	190	190	190	179	199	262	223
30	183	017	209	482	490	358	167	090	025	009	017	021	061	100	124	179	176	215	205	207	209	207	167	127
31	083	072	104	212	223	090	009	004	000	000	004	025	064	086	130	185	124	152	133	185	230	272	212	187
	29	29	29	29	29	29	29	29	29	29	29	29	31	31	31	31	31	31	31	29	28	28	28	28
	269	288	258	279	237	167	127	076	072	067	079	104	146	176	207	265	303	293	337	307	307	322	323	320
	185	208	245	217	208	149	090	064	049	025	033	072	097	137	170	215	258	257	265	298	265	292	277	253
	127	090	209	181	152	117	068	049	025	025	027	045	064	097	150	176	225	205	217	245	255	272	262	223

TIME - UT

P. R. - CNPq.
 Comissão Nacional de Atividades Espaciais
 São José dos Campos - SP

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station	- SJ	Lat.	- 23° 12' 43" S	Freq.	- 30 MHz
Month	- November	Long.	- 45° 51' 35" W	Bandwith	- 30 KHz
Year	- 1967	DIP.	- 22.5° S	Diode Load Resist. .	- 750 ohm
Riometer	- Mark II	Mag. Lat. . .	- 11.7°	Audio Threshold . . .	- 3
		Alt.	- 623 m	Int. Time	- 4 sec
				ACG Time	- 4 sec

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.27	0.93	1.65	2.40	3.38	1.24	0.09	0.41	0.00		0.04	0.17	0.33	0.93	1.33	1.76	2.30	2.17	2.30	2.30	2.25	2.48	2.15	1.61
2	1.79	1.93	3.73	3.26	1.96	1.67	1.24	0.93	0.45	0.29	0.57	0.64	1.04	1.24	1.93	2.25	2.17	3.03	3.12	3.10	3.03	2.79	2.30	2.30
3	1.99	1.93	1.83	1.82	1.46	0.49	0.45	0.45	0.09	0.29	0.21	0.33	0.87	1.17	1.55	1.90	1.95	2.53	2.88	2.65	2.28	2.53	2.43	2.79
4	2.53	1.61	1.00	1.07	0.72	0.76	0.45	0.45	0.09	0.13	0.41	0.64	0.76	1.21	1.67	2.17	2.48	2.81	2.88	2.80	2.12	2.65	2.38	1.55
5	0.97	0.64	1.30	0.83	0.93	1.00	0.17	0.25	0.09	0.13	0.41	0.42	0.68	0.97	1.27	1.85	3.16	2.15	1.99	1.40	1.49	1.76	1.70	0.53
6	0.33	0.61	0.57	1.07	2.01	1.24	0.17		0.00	0.13	0.25	0.49	1.40	1.10	1.61	2.04	1.96	2.15	1.76	1.41	1.52	1.97	2.23	1.43
7	0.90	0.61	2.38	3.28	2.30	1.27	0.97		0.00	0.29	0.25	0.25	0.57	1.04	1.49	2.22	2.33	2.80	2.62	2.33	2.67	2.23	2.60	1.83
8	1.61	1.55	1.30	1.37	0.79	0.64	0.49	0.45	0.09	0.29	0.25	0.29	0.49	0.79	0.37	1.52	2.01	2.62	2.65	2.05	2.88	2.85	2.79	2.30
9	1.79	1.10	0.57	0.61	0.37	0.33	0.41		3.25	0.29	0.13	0.39	0.64	1.00	1.49	2.15	2.48	2.74	2.48	1.96	1.96	2.09	1.73	2.04
10	1.58	1.87	1.52	2.17	2.07	0.68	0.53	0.45	0.09	0.33	0.49	0.37	0.86		1.40	1.70	2.28	2.30	2.15	2.39	2.33	2.22	1.93	1.27
11	0.57	0.79	1.30	1.10	1.55	0.72	0.72	0.45	0.09	0.13	0.33	0.64	0.86		1.49	1.73	2.07	2.30	2.33	2.26	2.38	2.28	1.87	1.70
12	3.01	1.85	1.82	1.10	0.61	0.37	0.41	0.09	0.09	0.13	0.33	0.59	0.53		1.00	1.49	2.42	2.30	2.01	2.15	2.35	2.40	1.79	2.15
13	2.74	2.81	1.52	1.10	1.07	1.17	0.90	0.61	0.25	0.33	0.27	0.41	0.53		1.00	1.49	1.90	1.79	1.67	1.79	2.28	2.67	2.23	2.12
14	1.49	1.30	1.52	1.61	1.33	1.64	0.72	0.79	0.25	0.33	0.21	0.25	0.83		1.52	1.85	1.90	1.70	1.37	1.76	2.38	2.61	2.65	2.07
15	0.93	0.79	1.30	1.40	1.64	1.21	0.76	0.45	0.09	0.37	0.46	0.76	1.00		1.85	1.79	1.85	1.95	1.96	1.79	1.70	1.00	1.87	1.07

TIME - UT

Month: November
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	0.25	0.67	0.57	0.68	0.93	0.64	0.41	0.25	0.25	0.37	0.09	0.53	0.61	1.07	1.30	1.79	1.79	1.90	1.52	1.37	1.82	1.85	1.85	1.04
17	0.90	2.50	1.52	2.30	3.20	0.79	0.21	0.09	0.13	0.04	0.27	0.15	0.68	0.86	1.37	1.85	1.93	1.67	1.30	1.10	1.33	1.58	1.58	0.37
18	0.09	3.38	0.79	3.38	2.53	0.61	0.25	0.25	0.20	0.21	0.45	0.61	0.79	1.04	1.10	1.56	1.70	1.99	1.87	1.58	1.67	1.85	1.59	1.46
19	1.14	3.86	2.15	3.86	2.53	0.79	0.41	0.25	0.05	0.26	0.33	0.64	0.76	1.24	1.46	1.67	1.83	1.87	1.65	1.96	1.96	1.93	1.93	1.93
20	1.37	2.55	1.87	2.55	1.79	0.68	0.25	0.05	0.13	0.25	0.37	0.83	1.04	1.30	1.40	1.73	2.04	2.07	2.12	1.70	1.61	1.33	1.00	0.68
21	0.41	2.30	1.07	2.30	1.27	0.00			0.13	0.29	0.38	0.45	0.72	0.93	1.30	1.79	2.07	2.07	1.95	1.92	1.90	1.33	1.04	
22	1.58	1.49	1.55	1.49	0.64	0.17	0.26	0.09		0.13	0.05	0.17	0.72	1.04	1.40	1.79	1.76	2.17	2.07	1.73	1.50	2.12	2.07	2.05
23	2.15	2.04	2.86	2.04	1.53	1.07	0.93	0.45	0.49	0.64	0.76	0.67	1.17	1.33	1.64	1.79	0.07	2.04	1.96	2.15	2.35	1.82	1.75	1.73
24	1.55	1.24	1.58	1.24	1.30	1.49	0.83	0.45	0.29	0.45	0.33	0.49	0.83	0.86	1.24	1.52	1.76	1.64	2.04	2.40	2.30	2.01	2.01	1.82
25	1.53	2.07	2.45	2.07	1.85	1.80	0.83	0.61	0.33	0.49	0.49	0.53	0.86	1.20	1.58	1.93	2.04	1.90	2.23	2.23	2.58	2.17	2.01	2.38
26	2.12	3.05	1.87	3.05	1.96	1.32	0.93	0.61	0.49	0.49			0.86	1.20	1.58	2.03	2.23	1.56	2.17	2.28	2.05	2.36	1.79	
27	1.85	3.52	3.82	3.52	2.69	2.04	1.17	0.25	0.13	0.21	0.41	0.49	0.61	0.97	1.24	1.79	2.09	2.30	2.07	2.12	2.10	2.25	1.93	1.55
28	1.52	2.12	2.45	2.12	1.64	1.10	0.51	0.45	0.33	0.21	0.29	0.53	0.64	1.10	1.40	1.70	1.79	2.17	1.82	1.67	1.30	0.86	0.72	0.75
29	0.57	0.64	0.68	0.64	0.76	0.41	0.09	0.09	0.17	0.21	0.23	0.29	0.79	0.96	1.24	1.27	1.49	1.58	1.70	1.76	2.44	1.70	1.58	1.17
30	0.79	0.50	0.68	0.50	0.76	0.76	0.61	0.25	0.17	0.19	0.33	0.61	0.64	0.68	1.21	1.35	2.23	2.17	2.22	2.05	2.23	1.62	1.52	0.68
31																								
	30	30	30	30	30	30	29	2.6	2.8	3.0	2.5	2.9	2.9	2.3	2.9	2.8	3.0	3.0	3.0	3.0	3.0	2.9	3.0	3.0
	172	172	2.15	2.57	2.07	1.34	0.90	0.45	0.25	0.35	0.42	0.51	0.85	1.06	1.55	1.90	2.07	2.30	2.30	2.30	2.30	2.35	2.18	2.07
	137	110	1.52	1.49	1.55	0.75	0.45	0.45	0.25	0.35	0.33	0.45	0.75	1.04	1.40	1.85	2.27	2.15	1.93	1.96	2.12	2.05	1.93	1.51
	0.79	0.79	1.00	1.07	0.93	0.64	0.25	0.25	0.09	0.17	0.22	0.33	0.64	0.83	1.27	1.70	1.50	1.50	1.63	1.70	1.84	1.70	1.73	1.07

TIME - UT

P. R. - CNPq.
 Comissão Nacional de Atividades Espaciais
 São José dos Campos - SP

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station - SJ
 Month - December
 Year - 1967
 Riometer - Mark II

Lat. - 23° 12' 43" S
 Long. - 45° 51' 35" W
 DIP - 22.5° S
 Mag. Lat. - 11.7°

Alt. - 623 m

Freq. - 30 MHz
 Bandwidth - 30 KHz
 Diode Load Resist. - 750 ohm
 Audio Threshold ... - 3

Int. Time - 4 sec
 ACG Time - 4 sec

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.76	0.79	0.40	0.37	0.45	0.21	0.25	0.25	0.04	0.35	0.37	0.25	0.29	0.52	0.40	0.76	0.61	0.61	0.90	1.82	2.55	1.67	1.61	1.46
2	0.57	0.33	0.21	0.37	0.41	0.29	0.25	0.09	0.00	0.00	0.00	0.25	0.41	1.00	0.61	2.17	2.09	3.10	3.77	3.05	3.05	2.33	2.01	1.67
3	1.52	1.52	1.17	0.41	0.29	0.25	0.09	0.00	0.00	0.00	0.00	0.25	0.41	0.45	0.97	1.67	2.09	2.67	3.67	2.90	2.50	1.76	1.24	0.68
4	0.33	0.25	0.25	0.53	0.61	0.57	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.93	1.40	1.79	2.43	3.26	2.83	2.22	1.27	1.00	0.68
5	1.30	1.07	0.72	0.57	0.57	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.53	1.07	1.79	2.62	3.32	2.79	2.12	1.45	1.00	0.14
6	0.33	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	1.64	2.35	3.40	4.24	4.02	3.46	2.25	1.21	0.72	0.41
7	0.13	0.17	0.28	0.25	0.49	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.86	1.33	2.25	2.94	3.42	3.95	3.62	2.65	1.85	1.14	0.93
8	0.76	0.41	0.00	0.37	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	1.06	1.58	2.60	2.76	3.90	3.52	2.65	2.69	1.93	1.37
9	0.57	0.41	0.00	0.37	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	1.10	1.49	2.04	2.83	3.73	3.24	2.48	1.52	0.83	0.61
10	0.57	0.41	0.267	0.33	0.21	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	1.10	1.49	2.04	2.83	3.73	3.24	2.48	1.52	0.83	0.61
11	0.33	0.29	0.37	0.21	0.21	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	1.10	1.49	2.04	2.83	3.73	3.24	2.48	1.52	0.83	0.61
12	0.13	0.04	0.04	0.04	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	1.27	1.97	2.60	3.38	3.65	2.55	1.85	1.21	0.79	0.57
13	0.57	1.10	0.41	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	1.07	1.70	2.30	2.81	3.63	3.60	2.92	1.95	1.30	0.33	0.18
14	0.76	0.21	0.29	0.04	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.25	1.04	1.43	1.61	2.09	2.88	2.67	2.40	1.67	1.10	0.79	0.33
15	0.13	0.21	0.29	0.41	0.41	0.25	0.00	0.00	0.00	0.00	0.00	0.286	0.61	1.46	1.93	2.22	2.55	2.97	3.12	2.96	1.67	1.40	0.72	0.57

TIME - UT

Month: December
Year : 1967

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
16	0.79	0.68	0.68	0.61	0.41	0.25	0.00	—	—	—	—	0.00	0.76	1.87	1.56	1.56	2.99	3.77	3.05	2.43	1.61	0.86	0.29	0.13
17	0.13	0.21	0.49	0.64	0.87	0.25	0.00	—	—	—	—	0.29	0.61	1.45	1.56	2.55	2.81	2.81	1.78	1.49	1.17	1.07	0.72	0.57
18	0.33	0.45	0.76	1.00	0.90	0.83	0.83	0.57	0.50	0.17	0.05	0.53	0.97	1.24	1.58	2.05	2.33	2.22	1.96	1.58	1.55	1.07	0.90	1.04
19	0.87	0.72	0.53	0.45	0.57	0.45	0.28	0.37	0.04	0.33	0.21	0.49	1.00	1.27	1.82	1.90	1.87	1.50	2.53	1.91	1.52	1.46	1.14	1.52
20	1.33	1.21	1.00	0.79	0.67	0.45	0.25	0.25	0.09	0.49	0.17	0.33	0.76	0.93	1.17	1.24	1.24	1.26	1.55	2.12	1.49	0.97	1.10	1.30
21	0.61	0.49	0.83	0.83	0.76	0.61	0.61	0.41	0.37	0.05	0.21	0.37	0.61	0.97	1.46	1.45	1.33	2.04	1.73	1.46	1.37	0.93	0.04	1.52
22	0.41	0.57	0.83	1.07	0.93	0.83	0.64	0.45	0.15	0.25	0.49	0.64	0.83	1.10	1.40	1.70	1.70	1.99	2.09	1.73	1.40	1.40	1.15	1.52
23	1.37	1.27	1.55	1.49	1.61	1.17	0.83	0.00	0.17	0.21	0.33	0.72	0.86	1.17	1.30	1.46	1.55	2.07	1.87	1.61	1.85	1.37	1.37	1.50
24	0.41	0.37	0.68	0.86	0.93	0.93	0.83	0.45	0.17	0.41	0.37	0.64	0.86	1.17	1.58	1.85	2.01	1.56	1.90	1.58	1.79	1.61	1.55	1.30
25	0.61	0.83	1.14	0.86	0.61	0.45	0.49	0.21	0.41	0.41	0.29	0.68	0.76	1.10	1.14	1.17	1.46	1.64	1.52	1.10	1.24	0.83	1.07	1.04
26	0.64	0.61	0.93	1.07	0.81	0.61	0.49	0.33	0.08	0.17	0.21	0.33	0.45	0.76	0.97	1.43	1.64	1.70	1.55	1.40	1.21	1.30	1.04	1.30
27	0.64	0.86	0.72	0.90	0.93	0.79	0.68	0.37	0.35	0.21	0.41	0.41	0.72	0.93	1.14	1.61	1.73	1.49	1.07	1.00	0.72	1.00	1.04	0.79
28	0.64	0.86	1.17	0.90	0.61	0.25	0.33	0.21	0.04	0.25	0.49	0.45	0.76	0.97	1.00	1.14	1.17	1.49	1.40	1.14	1.10	0.97	0.99	0.79
29	0.64	0.86	0.41	0.41	0.45	0.45	0.33	0.37	0.17	0.33	0.21	0.61	0.61	0.53	1.10	1.21	1.52	1.87	1.96	1.46	1.10	0.93	0.75	0.75
30	0.21	0.45	0.76	0.57	0.45	0.45	0.37	0.25	0.05	0.09	0.17	0.64	0.83	1.21	1.43	1.96	1.75	1.85	1.67	1.64	1.56	1.46	1.30	1.04
31	0.90	0.90	0.76	0.57	0.45	0.45	0.37	0.25	0.05	0.09	0.17	0.64	0.83	1.21	1.43	1.96	1.75	1.85	1.67	1.64	1.56	1.46	1.30	1.04
	31	31	31	30	30	30	24	16	15	16	16	18	23	30	30	30	30	31	31	31	31	31	31	31
	0.80	0.86	1.00	0.90	0.61	0.61	0.49	0.45	0.17	0.27	0.37	0.64	0.83	1.17	1.61	2.09	2.50	2.97	3.65	2.92	2.25	1.67	1.30	1.30
	0.62	0.49	0.72	0.67	0.57	0.45	0.33	0.37	0.09	0.25	0.21	0.45	0.72	0.97	1.33	1.61	1.99	2.43	2.53	2.40	1.76	1.37	1.04	1.04
	0.55	0.33	0.39	0.37	0.41	0.35	0.19	0.25	0.04	0.17	0.17	0.33	0.41	0.76	1.10	1.46	1.70	1.85	1.87	1.58	1.40	1.07	0.72	0.57

TIME - UT

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