ABSORPTION MEASUREMENTS WITH RIOMETER

C.N.Pq.

Data Summary for the period
October 1964 through March 1965

by
M. V. SETTE

and
F. DE MENDONÇA

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REPORT Nº LAFE-28
July 1965

The measurements reported herein
were performed in cooperation with
Stanford Research Institute and
A.F. Cambridge Research Laboratories

Comissão Nacional de Atividades Espaciais
São José dos Campos
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RIOMETER MEASUREMENTS

DATA SUMMARY Nº 6

I - INTRODUCTION

This summary is a catalogue of reduced riometer data , for the period of observations from October 1964 through March 1965 . Equipment failure occurred during the months October and November , so that , no absorption data is available for those months.

This summary will show (fig. 1) 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 value of absorption is 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 value are indicated in the same table . See for instance Tables II through IX . Note that fig. 2 also shows the monthly medians mentioned above .

A listing of the registered solar flares bursts, and related absorption effects during the period under consideration is presented in the Table I .

II - DESCRIPTION OF THE EQUIPMENT

RIOMETER : The riometer (Relative Ionospheric Opacity Meter) is a device for measuring ionospheric absorption using the cosmic noise method.

A high gain and stable receiver is switched automatically between one antenna and a noise diode at a given switching frequency (340 cps) .

The antenna , which in our station is an east - west four elements Yagi, points vertically and receives the cosmic noise . If there is a difference between the antenna power and the noise diode power , a wave at the switching frequency appears at the detector of the receiver . The detector output is a DC voltage which has an amplitude that is proportional to the difference between the antenna and the diode signal . The voltage is used to adjust the current of a servo diode in order to reduce the above mentioned difference to zero . The diode noise power is proportional to the current which in turn is directly proportional to the antenna noise power . The diode current is recorded in a common pen recorder .

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

The frequency used of 30 Mc/s is low enough to be sensitive to

the non - deviative absorption effects of the lower ionosphere and yet it is sufficiently high so that a signal is detectable even under iono - spheric disturbances.

III - MEASUREMENTS TECHNIQUE

In the noise method already mentioned, the absorption is measured by comparing the signal actually received with the signal that would be received in the same sidereal time under conditions of zero absorption.

In order to measure the absorption it is necessary to establish the local "quiet - day" curve. This curve is obtained from the riometer recording in the hours before the sunrise, when absorption is low. The values of current observed are transferred to the corresponding sidereal time. The highest reliable readings are considered points of the "quiet - day" curve, which is assumed, as pointed before, to represent values of zero absorption condition.

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

$$A\ (db) = 10 \log_{10} Ir/Iq$$

where:

Ir = power noise actually received at a given time
Iq = power noise from the "quiet - day" curve for the corresponding sidereal time.

IV - TYPE OF SCALING AND DATA REDUCTION

In reducing the riometer data, scaling TYPE I (URSI - AGI Commitee 1958) has been used.

The absorption during the first minute of each hour of every day throughout a given period of observation is recorded and then averaged. The results give a picture of the daily and seasonal variation of absorption.

The data reduction was performed in the following manner:

The "quiet - day" curve, assumed to represent zero absorption is plotted and hourly values of Iq is obtained. The actual values of current for each hour are translated to the correct sidereal time and the ratio $\frac{Iq}{I}$ is calculated. For the given ratio, the absorption in db is obtained from regular tables.

The following qualifying symbols have been used for values obtained indirectly 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 the attenuation of the cosmic noise reaching the antenna. Sometimes prior to the observation of attenutation and depending on the relative position of the Sun and antenna bean, one observes an increase in the flux of energy reaching the antenna as a result of the Sun's HF radio emissions, during solar bursts of intensity greater than 1 .

Some flares occurring during the local sunlight hours could be clearly related to absorption effect showed in the riometer records.

The information on solar flares, published on the Solar Geophysical Data - Part B - of the Central Radio Propagation Laboratory was used to analyse the absorption effects on the riometer records. There is a good correlation between the increase in the absorption and solar flares accompained by ionospheric effects S - SWF (sudden drop-out and slow recovery) .

For the period December 1964 through March 1965, the solar activity was low and there were no observed flares which produced absorption effects .

Some bursts occurred, as indicated below, producing a current peak on the riometer record. Local thunderstorms which occurred frequently during this period produced interference, making unclear in many cases the presence of bursts .

TABLE I

Date	Burst				Remarks
	Type	In-tensity	Time Interval	Frequence Range Mc/s	
1964					
Dec. 1	III	1	1504:30 - 1505	21 - 41	
3	III	1	1655 - 1655:30	20 - 41	
26	III	2	1620:30 - 1621	21 - 41	
30	III	1 -	1519:30 - 1519:45	25 - 41	
	III	1 -	1617 - 1617:15	19 - 41	
1965					
Feb. 2	III	1 -	1512 - 1512:15	20 - 41	
	III	1	1512:30 - 1512:45	20 - 41	
	III	1+	1529:30 - 15:30	15 - 41	
	III	1	1613:30 - 1614:15	16 - 41	
	III	1 -	1614:30 - 1614:45	20 - 41	
	III	1	1615 - 1615:45	16 - 41	
	III	1	1706:45 - 1707	24 - 41	
	III	1+	1707:15 - 1707:45	16 - 41	
	III	1	1708:15 - 1708:45	20 - 41	
	III	1 -	1709:30 - 1709:45	20 - 41	
	III	1 -	1710 - 1710:15	21 - 41	
	III	1 -	1744:30 - 1744:45	19 - 41	
	III	1 -	1747 - 1747:15	21 - 41	
	III	1+	1859:30 - 1901:45	20 - 41	
3	III	1 -	1559 - 1559:45	21 - 41	
5	III	1+	1758 - 1759:15	24 - 41	associated flare started 1750 UT max 1810 UT end 2006 UT importance 2
	II	2	1800 - 1817	14 - 41	
	IV	1	1810 - 1905	22 - 41	
March 12	III	2	1714:30 - 1715	20 - 41	
	III	2	1721 - 1721:30	18 - 41	
13	III	1+	1549 - 1551	19 - 41	

VI - " QUIET - DAY " CURVE

The " quiet - day " curve for this station has been obtained from all the available data from the operation of the riometer during a period of relatively low absorption .

However in this procedure it seems that some errors have been introduced in the " quiet - day " curve, which became apparent while reduction of riometer data was performed in terms of daily absorption. They occurred as a consequence of including values obtained from hours when the absorption was low but could not be disregarded or considered equal to ZERO .

The whole " quiet - day " curve is being revised continuously using data corresponding to local time between 0300 AM and 0600 AM, when the absorption is low .

Due to equipment failure which occurred during the regular operation of the riometer, care should be taken while using the " quiet-day " curve to reduce riometer data (see Appendix I) .

During the months of October and November, 1964 the riometer records presented a distortion on the daily curve with the ratio $\frac{I\ max}{I\ min}$ reduced of 15% to 25% . This was attributed to an equipment failure rather than to an external cause, solar or ionospheric . For the above reason the data of October was considered unreliable and was not reduced to absorption .

Starting with December, 1964 the absorption is obtained by assuming an average " quiet - day " curve for each month which is presented in Fig. II .

The time scale in the " quiet - day " curve is the sidereal hour (referred to the first point of Aries) . The sidereal time corresponding to 0000 GMT for the middle of each month is given in the table in Appendix II .

VII - CONCLUSION

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

The riometer records are quite free from man made interferences.

Due to the reasons mentioned before, the results on the absorption deduced from the " quiet - day " curve as it stands now, should be considered qualitative rather than quantitative information

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

This station will continue its operation and will provide data on ionospheric absorption in a 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 .

Acknowledgement :

The riometer in operation at this site was provide to us by the Air Force Cambridge Research Laboratories . We appreciate this opportunity for participating in their program of Global Riometer Measurements .

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7) Goldman, S. C. and Horowitz, S. - " Global Riometer Measurement " .

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MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station ..... - SJ
Month ..... - December
Year ..... - 1964
Riometer ..... - Mark II

Lat. ..... - 23º12'43"S
Long. ..... - 45º51'35"W
DIP ..... - 22. 5ºS
Mag. Lat. ..... - 11. 7ºS
Alt. ..... - 623m

Freq. ..... - 30 Mc/s
Bandwidth ..... - 30 Kc/s
Diode Load Resist... - 750 ohm
Audio Threshold .... - 3
Int Time ..... - 4 sec
ACG Time ..... - 4 sec

TABLE II

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	0.40	0.40	0.40	0.50	0.60	0.40	0.40	0.50	0.50	0.40	0.30	0.50	0.60	I 0.70 C	I 0.80 C	I 0.70 C	0.60	0.50	0.40	0.50	0.60	0.40	0.10	0.20
2	0.10	0.20	0.30	0.30	I 0.30 C	I 0.40 C	I 0.40 C	I 0.40 C	I 0.30 C	C	C	C	C	C	I 0.80 C	I 0.70 C	C	C	C	C	0.60	0.10 C	0.30 C	0.20
3	0.30 C	0.20	I 0.10 C	I 0.30 C	0.30 C	0.30 C	0.20 C	0.30 C	0.20 C	0.20 C	0	0.20 C	0.40	0.40 S	0.50 S	0.60 S	0.60 S	0.50 S	0.50 S	I 0.50 C	μ 0.60 S	μ 0.20 S	0.40 S	I 0 S
4	0.10	0.10	0.30	0.30	0.30	0.20	0.30	0.30	0.50	0.30	0.10	0.20	0.40	0.50	0.40	0.40	0.50 S	0.50 S	0.40 S	0.50	0.20	0	0	0
5	-0.10 S	-0.10	-0.20	0	0.10	0.10	0	0	0	0	0	0	0.10	0.20	0.30	0.40	0.50	0.50	0.50	0.60	0.40	0.30	0.20	0.20
6	0.10	0.10	0.20	0.10	0.10	0.10	0	0	0	0	0	0.20	0.30	0.30	0.40	0.40	0.50	0.60	0.60	0.70	0.50	0.30	0.50	0.20
7	0	0	0	0.10	0	0.10	0	0	0	0	0.10	0.20	0.30	0.30	0.40	0.50	0.70	0.80	0.80 S	0.70 S	0.30 S	0.30 S	0.40	0.20
8	0.10	0.20	0.10	0.10	0.10	0.20	0.20	0.10	0	0.10	0.10	0.20	0.30	0.50	0.40	μ 0.60 S	μ 0.80 S	0.80 S	0.80 S	0.70 S	0.40 S	μ 0.10 S	0.20 S	0.10 S
9	0.10	0.20	0.10 S	0.20	0.40	0.30	0.20	0.20	0.20	0	0.20	0.30	0.40	0.60	0.60	0.60	0.60 S	0.80 S	0.70 S	0.80 S	0.50 S	0.20 S	0.40	0.30
10	0.30	0.20	0.10	0.20	0.10	0.20	0.20	0.10	0 S	0	0.10	0.40	0.40	0.50 S	0.80 S	0.60 S	C	C	0.70 S	0.80 S	0.50 S	0.20 S	0.40	0.30
11	0.30	0.30	0.40	0.40	0.50	0.50	0.30	0.40	0.30	0.30	0.30	0.50	0.50	0.50	0.50	0.60	0.50 S	0.60 S	0.60 S	0.70	0.60	0.20	0.10 S	0.30 S
12	0.50	0.30	0.40	0.50	0.50	0.50	0.30	0.30	0.30	0.20	0.20	μ 0.30 S	μ 0.40 S	μ 0.60 C	μ 0.80 S	0.70 S	0.60 S	μ 0.70 S	0.60 S	0.60 S	0.40	0.10 S	0.10 S	0.20
13	0.10	0.20	0.30	0.30	0.40	0.30	0.20	0.30	0.10	0.10	0.20	0.50	0.50	0.50	0.60	0.70 S	S	0.60 S	S	S	0.90 S	0.80 S	0.50 S	μ 0.30 S
14	0.50	0.60	0.60	0.80	0.70	0.70	0.30	0.40	0.40	0.40	0.40	0.50	0.50	0.60	0.80	0.80	0.70	0.80	1.00	1.10	0.80	0.60	0.30	0.20
15	0.30	0.20	0.20	0.20	0.20	0.10	0.10	0.10	0	0	0.20	0.10	0.30	0.30	0.40	0.50	0.50	0.60	0.60	0.40	0	0	0	0.10 S

TIME - UT

Month: December
Year: 1964

TABLE III

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	0.20	0.20	0	0.10	0	0.10	0	0.10	0	0	0	0	0.20	0.30	0.40	0.50^{S}	$^{\mu}$0.60^{S}	0.50	0.60^{S}	0.50^{S}	0.20^{S}	0^{S}	0^{S}	$^{\mu}$0.30^{S}
17	0.60	0.40	0.50	0.30	0.40	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.50	0.40^{S}	0.40	0.40	0.50^{S}	$^{\mu}$0.50^{S}	0.60^{S}	^{S}0.60^{S}	0.70^{S}	0.70^{S}	0.40^{S}	0.30^{S}
18	0.60	0.60	0.60	0.50	0.60	0.60	0.60	0.50	0.40	0.50	0.40	0.10	0.30	0.50	0.60	0.70	0.80^{S}	0.80^{S}	0.80^{S}	0.30^{S}	0.10	0	0.30	0.10
19	0.10	0.30	0	0.20	0.30	0.10	0.10	0.20	0	0	0.10	0.20	0.30	0.40	0.50	0.60	0.70^{S}	0.70^{S}	0.90	0.80^{S}	0.30^{S}	0^{S}	0	0.10
20	0.20	0.30	0.10	0.20	0.30	0.30	0.10	0.20	0	0	0.20	0.20	0.30	0.40	0.50	0.50^{S}	0.70^{S}	0.70^{S}	0.80^{S}	0.70	0.30	0.20	0.20	0.10
21	C	0.30	0.30	0.40	0.30	0.30	0.40	0.30	0.30	0.20	0.30	0.30	0.40^{S}	0.50^{S}	0.70^{S}	0.80^{S}	0.80^{S}	0.80^{S}	0.70^{S}	1.00^{S}	0.30^{S}	0.20^{S}	0.20^{S}	0.10
22	0.20	0.30	0.10	0.30	0.30	0.30	0.40	0.20	0	0.10	0.30	0.30	0.30	0.50	0.50^{S}	0.60^{S}	0.60^{S}	0.60^{S}	0.80^{S}	C	C	C	C	C
23	C	0.50	0.60	0.40	0.50	0.50	0.60	0.50	0.50	0.50	0.40	0.40	0.50	0.40	0.60	0.70	0.60	0.60^{S}	0.80^{S}	0.70^{S}	0.50^{S}	0.40	0.20	0.10
24	0.20	$^{\mu}$0.50^{C}	$^{\mu}$0.60^{C}	$^{\mu}$0.60^{C}	0.60	0.60	0.60	0.50	0.50	0.50	0.40	0.60	0.70	0.60	0.60	0.60	0.60	0.60	C	C	C	0.10	0.20	0.10
25	0.20	0.40	0.20	0.30	0.30	0.30	0.40	0.30	0.10	0.10	0.20	0.30	0.30	0.30	0.30^{S}	0.30^{S}	0.50	0.60	0.60	0.50^{S}	0.50	0.10	0.20	0.10
26	0.20	0.20	0.10	0.10	0.10	0.10	0.20	0.30	0^{S}	0^{S}	0.10^{S}	0.20^{S}	0.20^{S}	0.40^{S}	0.40^{S}	0.40^{S}	0.60^{S}	0.60^{S}	0.90^{S}	1.00^{S}	0.40^{S}	0.10^{S}	0.20^{S}	0.10
27	0.20^{S}	0.20^{S}	0.10^{S}	0.10^{S}	0.10^{S}	0.10^{S}	0.40^{S}	0.40^{S}	0.20^{S}	0.20^{S}	0.30	0.40	0.40	0.40	0.50	0.60	0.70^{S}	0.70^{S}	0.80^{S}	0.60^{S}	$^{\mu}$0.30^{S}	0.10^{S}	-0.10^{S}	0.10^{S}
28	0.20	0.20	0.20	0.10	0.30	0.10	0.20	0.10	0	0	0.20	0.20	0.30	0.50	0.50	0.60^{S}	0.50^{S}	0.90^{S}	$^{\mu}$0.90^{S}	0.60^{S}	0.30^{S}	0.30^{S}	0.30^{S}	0.40^{S}
29	0.40	0.40	0.30	0.40	0.30	0.30	0.40	0.30	0.20	0.40	0.40	0.50	0.50	0.50	0.60	0.60	0.50^{S}	0.70^{S}	S	S	$^{\mu}$0.60^{S}	0.70	0.60	0.80
30	0.90	0.90	0.90	1.00	0.50	0.60	0.60	0.40	0.30	0.40	0.30	0.50	0.50	0.60	0.60	0.70	0.60	0.70	0.60	0.60	0.60	0	0.10	0.10
31	0.20	0.20	0.20	0.20	0.30	0.10	0.10	0.10	0	0	0.10	0.20	0.30	0.40	0.50	0.50	0.50	0.60	0.50	0.50	0	0	0.10	0.10
Count	29	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	28	29	27	26	29	30	30	30
UQ	0.30	0.40	0.40	0.40	0.50	0.40	0.40	0.40	0.30	0.30	0.30	0.40	0.50	0.50	0.60	0.70	0.70	0.70	0.80	0.70	0.60	0.30	0.40	0.30
Median	0.20	0.20	0.20	0.30	0.30	0.30	0.30	0.30	0.20	0.10	0.20	0.30	0.40	0.50	0.50	0.60	0.60	0.60	0.70	0.60	0.50	0.20	0.20	0.10
LQ	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0	0	0.10	0.20	0.30	0.40	0.40	0.50	0.50	0.60	0.60	0.50	0.30	0.10	0.10	0.10

TIME-UT

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MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station ..... - SJ
Month ..... - January
Year ..... - 1965
Riometer ..... - Mark II

Lat. ..... - 23°12'43"S
Long. ..... - 45°51'35"W
DIP ..... - 22.5°S
Mag. Lat. ..... - 11.7°S
Alt. ..... - 623m

Freq. ..... - 30 Mc/s
Bandwidth ..... - 30 Kc/s
Diode Load Resist... 750 ohm
Audio Threshold .... - 3
Int Time ..... - 4 sec
ACG Time ..... - 4 sec

TABLE V

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	0.30	0.30	0.20	0.20	0.10	0.10	0.20	0	0	0	0	0.20	0.20	0.30	0.40	0.60	0.50	0.90S	0.80S	0.50S	0.50S	0.30S	0.30S	0.60S
2	0.70	0.60	0.60	0.50	0.50	0.60	0.70	0.40	0.30	0.30	0.90	0.50	0.40	0	0.60	0.70	0.80S	0.80S	0.70S	0.80S	0.60S	0 S	0.20S	0.20S
3	0.30S	0.30S	0.30	0.30	0.30	0.40	0.30	0	0.10	0	0.10	0.30	0.50	0.60S	0.60S	0.80S	0.90S	1.00S	0.80S	0.70S	0.70S	0.60S	0.30S	0.30S
4	0.50S	0.60	0.80S	0.60	0.50	0.40	0.30	0	0	0.20	0.20	0.40	0.40	0.50S	0.60S	0.60S	0.70S	0.90S	0.80S	0.70	0.50	0.40	0.30	0.30
5	0.30	0.30	0.40	0.20	0.30	0.20	0.20	0	0	0	0.10	0.10	0.30	0.30	0.30	0.40	0.50	0.60	0.60	0.40	0.50	0.40	0.30	0.20
6	0.20	0.10	0.10	0.20	0.10	0.10	0	0	-0.10	-0.10	0	0.10	0.10	0.30	0.40	0.50	0.50	0.60	0.70	0.60	0.30	0.20	0.20	0.20
7	0.10	0.10	0.10	0.30	0.10	0	0.10	0	-0.10	-0.10	0	0.10	0.20	0.30	0.40	0.60	0.70	0.40	0.70	0.60S	0.50	0.20	0.20	0.20
8	0.30	0.10	0.10	0.30	0.10	0.20	0.10	0	0	0	0.10	0.20	0.30	0.40	0.90	0.60	0.60S	0.80S	0.80	0.50S	0.70S	0.20S	0.30S	0.30S
9	0.40S	0.40S	0.70S	0.60S	0.60S	0.60	0.50	0.30	0.30	0.30	0.30	0.20	0.50	0.60	0.70	0.70	0.90	0.70	0.60	0.60	0.50	0.20	0.10	0.20
10	0.30	0.20	0.40	0.30	0.10	0.10	0.20	0	0	0	0	0	0.10	0.20	0.30	0.30	0.50	0.60	0.80	0.80	0.50	0.20	0.20	0.20
11	0.40	0.50	0.40	0.30	0.30	0.20	0.30	0.10	0	0.10	0.10	0.10	0.20	0.30	0.30	0.40	0.60	0.70	0.60S	0.70S	0.30S	0.30S	0.30S	0.50S
12	0.50	0.20	0.50	0.50	0.50	0.20	0.30	0.10	0.20	0.10	0.20	0.20	0.30	0.40	0.50	0.50	0.70S	0.80S	0.80S	0.70S	0.60S	0.30S	0.30S	0.20S
13	0.50	0.30	0.40	0.30	0.30	0.20	0.30	0.10	0.10	0.20	0.20	0.40	0.40	0.60	0.60	0.70	0.80S	0.80S	0.70S	0.80S	0.80S	0.60S	0.30S	0.40S
14	0.50S	0.50S	0.50S	0.50	0.30	0.40	0.30	0.30	0.10	0.20	0.30	0.30	0.40	0.50	0.50	0.60S	0.60S	0.50S	0.30S	0.40S	0.40S	0.40S	0.60S	0.70S
15	0.50S	0.50	0.70S	0.60	0.60	0.50	0.30	0.20	0.20	0.30	0.30	0.50	0.30	0.50	0.50	0.60	0.70S	0.90S	0.50S	0.40S	0.70	0.90S	0.90	0.80S

TIME - UT

Month: January
Year: 1965

TABLE IV

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	0.90^S	0.80^S	0.50	0.50	0.30	0.50	0.30	0.20	0.20	0.20	0.30	0.30	0.30	0.40	0.50	0.60	0.50^S	5	0.40^S	0.70^S	0.70^S	0.60^S	0.60^S	0.70^S
17	0.60^S	0.80^S	0.60	0.60	0.60	0.70	0.50	0.50	0.40	0.30	0.30	0.50	0.60^S	0.40^S	0.50^S	0.50^S	0.70^S	0.70^S	0.50^S	0.70^S	0.70^S	0.40^S	0.30^S	0.30^S
18	0.30^S	0.60^S	0.80^S	0.60	0.60	0.50	0.50	0.40	0.30	0.40	0.50	0.40	0.40	0.50	0.60	0.80^S	C	1.20^S	1.00^S	0.70^S	1.00^S	0.60^S	0.60^S	0.70^S
19	0.70^S	0.90	0.60	0.60	0.70	0.60^S	0.50^S	0.40^S	0.50^S	0.50^S	0.70^S	0.60^S	C	0.60^S	0.50^S	0.80^S	1.10	0.80	0.80	0.60^S	0.60^S	0.70^S	0.60^S	0.70^S
20	0.70	0.60	0.60	0.60	0.70	0.70	0.50	0.50	0.50	0.60	0.60	0.50	0.60	0.60^S	0.60	0.50	0.70	0.80	0.60	0.60	0.60	0.60	0.30	0.30
21	0.20	0.30	0.20	0.10	0.20	0.20	0	0	0	0.10	0.20	0.40	0.40	0.50	0.50	0.60	0.90	0.90	0.90	0.90	0.60	0.40	0.30	0.30
22	0.30	0.30	0.30	0.30	0.20	0.20	0.10	0	0.10	0.10	0.30	0.20	0.40	0.40	0.60	0.70	0.90	1.00^S	0.80^S	0.60^S	0.30^S	0.60^S	0.70^S	0.80
23	0.60	0.70	0.60	0.50	0.40	0.30	0.30	0.10	0	0.10	0.30	0.20	0.30	0.40	0.50	0.60^S	0.70^S	0.70^S	0.80^S	0.50^S	0.30^S	0.60^S	0.30^S	0.40^S
24	0.30	0.30	0.30	0.30	0.20	0.20	0.10	0.10	0	0.20	0.20	0.30	0.30	0.50	0.70^S	0.80^S	0.90	0.60^S	0.80^S	0.80^S	0.60^S	0.30^S	0.30^S	0.50^S
25	0.40^S	0.30^S	0.30^S	0.30^S	0.20^S	0.30	0.10	0.10	0	0.20	0.20	0.30	0.40	0.40	0.50	0.70^S	0.60^S	0.30^S	0.30^S	0.40^S	0.30^S	0.60^S	0.30^S	0.40^S
26	0.50^S	0.50^S	0.30	0.30	0.40	0.30	0.10	0.20	0	0.10	0.10	0.30	0.30	0.40	0.60	0.80^S	0.70^S	0.50^S	0.50^S	0.80^S	0.60^S	0.30^S	0.40^S	0.40^S
27	0.50^S	0.50	0.60	0.60	0.40	0.40	0.20	0.20	0.10	0.30	0.20	0.30	0.30	0.60	0.60	0.70^S	0.80^S	0.70	0.20	0.70^S	0.90^S	0.90^S	0.60^S	0.60^S
28	0.80^S	0.60	0.50^S	0.50	0.40	0.40	0.20	0.20	0.10	0.20	0.20	0.30	0.30	0.50	0.50	0.90^S	1.00	1.00^S	1.00	1.20^S	0.90^S	0.40^S	0.90^S	0.90^S
29	0.90^S	0.80	0.60	0.70	0.60	0.60	0.60	0.70	0.50	0.60	0.50	0.70	0.70	0.80	0.80	1.10	1.10	0.90	0.80^S	0.70	1.00	1.00	1.10	0.90
30	0.80	1.00	0.90	0.90	0.80	0.90	0.60	0.50	0.50	0.50	0.50	0.50	0.70	0.70	0.70	1.00	1.10	1.00	1.00	1.00	1.00	1.00	1.00	0.90
31	0.90	0.70	0.50	0.60	0.40	0.40	0.70	0.10	0.10	0.20	0.20	0.20	0.40	0.50	0.60	0.80	0.80^S	0.80^S	1.00^S	1.10^S	1.00	1.00^S	1.10	1.20
Count	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	30	30	31	31	31	31	31	31
UQ	0.70	0.70	0.60	0.60	0.60	0.50	0.50	0.30	0.30	0.30	0.30	0.40	0.40	0.60	0.60	0.80	0.90	0.90	0.80	0.80	0.70	0.60	0.60	0.70
Median	0.50	0.50	0.50	0.50	0.40	0.40	0.30	0.10	0.10	0.20	0.20	0.30	0.40	0.50	0.50	0.60	0.70	0.80	0.80	0.70	0.60	0.40	0.30	0.40
LQ	0.30	0.30	0.30	0.30	0.20	0.20	0.20	0	0	0.10	0.10	0.20	0.30	0.50	0.50	0.60	0.60	0.70	0.60	0.60	0.50	0.30	0.30	0.30

TIME-UT

PR - CNPq
Comissão Nacional de Atividades Espaciais
São José dos Campos - SP - Brasil

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station ..... - SJ
Month ..... - February
Year ..... - 1965
Riometer ..... - Mark II

Lat. ..... - 23°12'43"S
Long. ..... - 45°51'35"W
DIP ..... - 22.5°S
Mag. Lat. ..... - 11.7°S
Alt. ..... - 623m

Freq. ..... - 30 Mc/s
Bandwidth ..... - 30 Kc/s
Diode Load Resist.. - 750 ohm
Audio Threshold ... - 3
Int. Time ..... - 4 sec
ACG Time ..... - 4 sec

TABLE VI

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	0.90	1.00^{S}	0.90	0.70	0.80	0.60	0.50	0.50	0.40	0.50	0.50	0.50	0.90	0.50	0.60	0.80	0.90	0.80	1.00	0.70^{S}	0.60	0.30	0.30^{S}	0.60^{S}
2	0.50^{S}	0.40	0.30	0.70^{C}	0.70	0.50	0.30	0.30	0.40	0.30	0.50	0.50	0.30	0.90	0.70	0.80^{S}	0.80	0.70	0.70	0.70^{S}	0.60^{S}	0.30^{S}	0.30^{S}	0.30^{S}
3	0.20	0.20^{S}	0.10	0.10	0	0	0	-0.10	0	0.10	0	0.20	0.30	0.50	0.60	0.80	0.80^{S}	0.70^{S}	0.60^{S}	0.40^{S}	0.60^{S}	0.60^{S}	0.50^{S}	0.30
4	0.20	0.20	0.30	0.30	0.30	0.20	0.10	0	0	0.10	0.10	0.20	0.30	0.40	0.70	0.70^{S}	0.80^{S}	0.60^{S}	1.20^{S}	1.00^{S}	0.90^{S}	0.30^{S}	0.30^{S}	0.60^{S}
5	0.60	0.60	0.50	0.60	0.50	0.40	0.20	0.20	0.20	0.20	0.20	0.30	0.40	0.50	0.70	0.90^{S}	0.90	0.90^{S}	1.06^{S}	0.40^{S}	0.30	0.30	0.30	0.10
6	0.30	0.30	0.30	0.40	0.20	0	0	0	0	0	0	0.20	0.30	0.40	0.80	0.90	0.80^{S}	0.80^{S}	0.80	0.90^{S}	0.60^{S}	0.30^{S}	0.30^{S}	0.10
7	0.30^{S}	0.30	0.30	0.20	0.20	0	0.10	0	0	0	0	0.10	0.20	0.50	0.70	1.00	1.10	0.90^{S}	0.90^{S}	0.60^{S}	0.60^{S}	0.60^{S}	0.80^{S}	0.90
8	0.90	0.30	0.30	0.20	0.20	0.10	0.10	0.20	0.10	0	0.20	0.30	0.40	0.40	0.60	0.80	0.70	0.80	0.80	0.90^{S}	0.80^{S}	0.30^{S}	0.40	0.10
9	0.10	0.30	0.10	0.20	0.20	0	-0.10	0	0	-0.10	0^{S}	0.10^{S}	0.30	0.40	0.70	0.80	0.80	0.90	1.10	1.10	0.90^{S}	0.90^{S}	0.50	0.60
10	0.50	0.50	0.50	0.60	0.50	0.10	0.10	0	0.10	0.10	0	0.10	0.30	0.50	0.70	0.90	0.90	0.90	1.10^{S}	1.00^{S}	1.00^{S}	0.90^{S}	0.40^{S}	0.60
11	0.50	0.30	0.30	0.40	0.20	0.10	0	0.10	0.10	0.10	0	0.20	0.30	0.40	0.60	0.60	0.50^{S}	0.70	0.60^{S}	0.90	0.90	0.90	0.80	0.70
12	0.50	0.50	0.30	0.40	0.30	0.10	0	0.10	0	0	0	0.30	0.30	2.40	0.70	0.80	0.80	0.80^{S}	1.10^{S}	0.90^{S}	0.90	1.09^{C}	1.10^{C}	0.80^{S}
13	1.00^{S}	1.10^{S}	0.70	0.80	0.60	0.40	0.40	0.40	0.30	0.30	0.30	0.40	0.40	0.40	0.60	0.70	0.70	0.80	0.80^{S}	1.00^{S}	1.00^{S}	0.70^{S}	0.50	0.50
14	0.90	0.40	0.50	0.40	0.30^{S}	0.10^{S}	0.40	0.30	0.30	0.30	0.30	0.40	0.40	0.50^{S}	0.60^{S}	0.70^{S}	0.50^{S}	0.50^{S}	0.70^{S}	0.60^{S}	0.60^{S}	0.90	C	C
15	C	C	C	C	C	C	0	0	0	0	0	0.20	0.30	0.30	0.60^{S}	0.80^{S}	0.60	0.60^{S}	0.30^{S}	0.20^{S}	0.30^{S}	0.30^{S}	0.30^{S}	0.30

TIME - UT

Month: February
Year: 1965

TABLE VII

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	0.90	0.30	0.40	0.20	0.10	0	0	0	0	0	0	0.20	0.40	0.50	0.80	0.90	0.80	1.00 S	0.70 S	0.60 S	0.60 S	0.70 S	0.50 S	0.30
17	0.20 S	0.30	0.10	0.10	0	-0.10	0	0	0	0	0.10	0.20	0.50	0.60	0.80	0.80	0.70	0.70 S	1.10 S	1.00 S	0.90	0.90 S	0.50 S	0.30 S
18	0.20 S	0.30 S	0.30 S	0.30 S	0.20 S	0	0	0	0	0	0	0.10	0.20	0.90	0.60	0.80	0.70	1.20	0.70	0.30 S	0.30 S	0.30	0	0.20
19	0.40	0.30	0.10	0.20	0	0	0	0	0	0.40	0	0.20	0.30	0.90	0.60	0.80	0.90	0.90	1.00 S	0.90	0.90	0.80	0.60	0.30
20	0.50	0.50	0.40	0.20	0	0	0	0	-0.10	-0.10	0	0.10	0.20	0.40	0.60	0.60	0.60	0.90	1.00	0.90	0.60 S	0.50	0.30	0.20
21	0.30	0.10	0.20	0.20	0.20	0	0	0	0.10	0	0.10	0.10	0.20	0.10	0.50 S	0.50 S	0.60	0.90 S	0.90 S	1.00	1.00 S	1.00 S	1.00 S	0.60
22	0.50	0.30	0.40	0.20	0	0	0.10	0.90	0	0	0.10	0.20	0.30	0.50	0.60	0.50	0.80	0.90	0.90 S	1.00 S	1.10 S	0.80 S	0.60 S	0.60
23	0.50	0.60	0.70	0.90	0.50	0.90	0.30	0.10	0.10	0.10	0.20	0.40	0.30	0.50	0.60	0.60	0.80	0.80 S	0.90 S	1.00 S	0.90 S	0.80 S	0.60 S	0.90 S
24	0.50	0.50	0.90	0.20	0.10	0.10	0 S	0	0	0	0.10	0.20	0.30	0.40 S	0.50	0.60 S	0.80 S	U 1.10 C	U 0.90 C	U 1.00 C	U 1.10 C	U 1.10 C	U 1.10 C	1.00
25	0.90 S	0.50 S	0.60	0.50	0.30	0.40	0.40	0.40	0.30	0.30	0.40	0.50	0.60	0.70	0.70	0.80	0.90	1.10	1.10	C	C	1.10	0.70 S	0.50
26	0.60 S	0.50 S	0.40	0.30	0.10	0.10	0.20	0.10	0.10	0.20	0.30	0.30	0.50	0.60	0.80	0.80	0.80 S	0.80 S	0.90 S	C	1.40 S	1.30 S	0.80 S	0.70 S
27	0.60 S	0.50	0.40	0.30	0.20	0.10	0.20	0.30	0.20	0.30	0.30	0.40	0.50	0.60	0.70	0.80	0.80	1.00	1.00	1.50	1.60	1.10 S	1.10	1.10
28	1.10	0.90	0.70	0.40	0.20	0.30	0.30	0.10	0	0.20	0.20	0.30	0.40	0.80	0.80	1.20	1.50	1.70	1.50	1.50	1.60	1.10 S	0.90	1.00
29																								
30																								
31																								
Count	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	26	27	28	27	27
UQ	0.60	0.50	0.50	0.50	0.30	0.30	0.30	0.30	0.20	0.30	0.30	0.40	0.40	0.50	0.70	0.80	0.90	0.90	0.90	1.10	1.00	1.00	0.90	0.80	0.60
Median	0.50	0.40	0.40	0.30	0.20	0.10	0.10	0	0	0.10	0.10	0.20	0.30	0.50	0.60	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.60	0.50	0.50
LQ	0.20	0.30	0.30	0.20	0.10	0	0	0	0	0	0	0.20	0.30	0.40	0.60	0.70	0.70	0.70	0.70	0.60	0.60	0.30	0.30	0.30

TIME-UT

PR - CNPq
Comissão Nacional de Atividades Espaciais
São José dos Campos - SP - Brasil

MEAN VALUE OF ABSORPTION DURING THE FIRST MINUTE OF EACH HOUR

Station ..... - SJ
Month ..... - March
Year ..... - 1965
Riometer ..... - Mark II

Lat. ..... - 23°12'43"S
Long. ..... - 45°51'35"W
DIP ..... - 22.5°S
Mag. Lat. ..... - 11.7°S
Alt. ..... - 623 m

Freq. ..... - 30 Mc/s
Bandwidth ..... - 30 Kc/s
Diode Load Resist. - 750 ohm
Audio Threshold .. - 3
Int. Time ..... - 4 sec
ACG Time ..... - 4 sec

TABLE VIII

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	0.9	0.7	0.8	0.9	0.5	0.4	0	0.2	0.1	0.3	0.3	0.3	0.3	0.4	0.5^{S}	0.5^{S}	0.7^{S}	1.0^{S}	1.0^{S}	1.3^{S}	1.3^{S}	1.4^{S}	1.2^{S}	1.0
2	0.9	0.7	0.5	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6^{S}	0.5^{S}	1.0^{S}	C	C	0.3^{S}	0.3^{S}	0.2	0.5	0.5
3	0.3^{S}	0.3^{S}	0.5	0.4	0.3^{S}	0.1	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.6^{S}	0.8^{S}	C	0.9	1.0^{S}	0.8	0.9^{S}	0.9^{S}	0.9^{S}	1.2^{S}	1.0
4	0.6	0.6	0.5	0.4	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.6	0.9	1.0^{S}	1.0^{S}	1.4^{S}	1.1	1.4	1.0^{S}	0.8
5	0.6	0.7	0.7	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.6	1.0^{S}	1.1^{S}	1.0^{S}	1.0^{S}	0.7^{S}	0.6^{S}	0.3^{S}	0.5
6	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.8	0.6	C	C	C	1.0^{S}	1.2^{S}	1.0^{S}	0.9^{S}	0.6^{S}
7	0.5^{S}	0.4^{S}	0.5^{S}	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.5	0.5	0.8	0.9	1.0^{S}	1.0^{S}	^{U}1.9^{C}	1.0^{S}	0.9^{S}	0.6^{S}
8	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.5	0.6^{S}	0.9	0.8^{S}	0.9^{S}	0.8	0.6^{S}	0.4^{S}	0.3^{S}
9	0.3	0.4	0.3	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	^{U}0.2^{C}	^{U}0^{C}	0.3	0.5	0.8^{S}	1.1^{S}	1.0^{S}	1.0^{S}	1.2^{S}	1.1^{S}	0.9	0.8
10	0.6	0.4	0.3	0.1	0.2	0.2	0.2	^{U}0.1^{C}	^{U}0.1^{C}	^{U}0.1^{C}	^{U}0^{C}	^{U}0^{C}	^{U}0.1^{C}	^{U}0.1^{C}	^{U}0.2^{C}	^{U}0.4^{C}	0.9	0.9	1.0	1.0	1.2	1.1^{S}	0.5	0.5
11	0.3	0.4	0.3	0	0.2	0.1	0.2	0	0	0	0	0	0	0.3	0.1	0.2	0.5	0.6	0.8	1.0	1.6	1.6	0.7	0.5
12	0.3	0.2	0.3	0.1	0	0.1	0.1	0	0	0	0	0	0.1	0.2	0.1	0.4	0.5	0.6	0.8	1.1^{S}	1.6^{S}	2.3	0.7	^{I}0.5^{S}
13	0.3	0.2	0.1	0.1	0.3	0.2	0.2	0	0	0.1	0^{S}	0^{S}	0.1^{S}	0.1^{S}	0.1^{S}	0.1^{S}	0.3	0.6	0.5^{S}	1.1	1.3	1.4	0.7^{S}	0.5^{S}
14	0.3	0.2^{S}	0.1^{S}	0.1	0.1	0.2	0.1	0	0	0	0.1	0.1	0.2	0.3	0.3	0.6	0.4^{S}	0.6^{S}	0.5^{S}	1.1^{S}	0.5^{S}	^{U}0.3^{C}	^{U}0.2^{S}	0.1
15	0.1^{S}	0.2^{S}	0.1^{S}	0.2	0.2	0.1	0.1	0.1	0.1	0	0	0^{S}	0.1	0.1^{S}	0^{S}	0.3^{S}	0.5	0.6^{S}	0.9^{S}	0.6^{S}	0.5^{S}	0.3^{S}	0.2^{S}	0.3

TIME - UT

Month: March
Year: 1965

TABLE IX

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	0.10	0.30^{S}	0.10	0	0	0.20	0.20	0	0.10	0.10	0	0	0.20	0.10	0.20	0.60	0.70^{S}	0.90^{S}	0.90^{S}	0.90^{S}	1.20^{S}	1.20^{S}	1.40^{S}	1.30^{S}
17	1.20	0.70	0.60	0.30	0.30	0.30	0.40	0	0	0	0	0	0.10	0.20	0.40	0.50	0.70^{S}	0.50^{S}	0.90^{S}	1.00^{S}	0.60^{S}	0.30^{S}	0.50^{S}	0.30^{S}
18	0.30^{S}	0.30	0.20	0.10	0.10	0.30	0.30	0.20	0.20	0.10	0.10	0	0.10	0.30	0.30	0.60	1.00	1.00	1.70	1.10^{S}	0.90^{S}	0.50^{S}	0.40^{S}	0.50
19	0.30	0.30	0.20	0.30	0.20^{S}	0.20	0.20	0.10^{S}	0^{S}	0.30^{S}	0.20^{S}	0.10	0.30	0.30	^{S}0.30^{S}	0.60^{S}	0.70^{S}	0.50	^{U}0.90^{S}	^{U}1.00^{S}	^{U}0.70^{S}	^{U}0.30^{S}	^{U}0.30^{S}	^{U}0.30^{S}
20	^{U}0.40^{S}	^{U}0.30^{S}	0	0.20^{S}	0.20^{S}	0.20^{S}	0.10^{S}	0.10^{S}	0	0	0	0	0.20	0.20	0.60	0.90^{S}	0.90^{S}	1.00^{S}	1.00^{S}	1.00^{S}	0.70^{S}	0.30^{S}	0.50	0.30^{S}
21	0.10	0.30	0.30^{S}	0.20	0.20	0.20	0.10	0	0	0	0	0.10	0.20	0.30	0.50	0.90	1.10	1.00^{S}	0.90	1.20^{S}	1.30	1.00^{S}	0.80	0.50
22	0.40	0	0	0.10	0.10	0.10	0.20	0.10	0.10	0	0	0.10	0.10	0.20	0.30	0.60	0.60	1.00	1.00^{S}	1.20^{S}	1.50^{S}	0.90^{S}	0.60	0.50
23	0.40	0.30	0.30	0.10	0.10	0.20	0.30	0.10	0.20	0.20	0.10	0.10	0	0.30	0.30	0.80	1.10	1.30	1.00^{S}	^{S}1.20^{S}	1.30^{S}	0.60^{S}	0.50^{S}	0.10
24	0.20	0.30^{S}	0.30	0.20	0.20	0.20	0.30	0.10	0.10	0	0	0	0.10	0.40^{S}	0.50^{S}	^{S}0.80^{S}	0.90^{S}	^{U}1.30^{S}	1.70^{S}	2.10^{S}	1.40^{S}	0.60^{S}	0.60^{S}	0.50^{S}
25	0.40^{S}	0.30	0.30	0.20	0.40	0.30	0.20	0.10	0.10	0	0	0	0	0.20	0.70	0.80^{S}	0.90^{S}	1.00^{S}	1.00^{S}	1.20^{S}	S	S	S	S
26	^{U}0.20^{S}	^{U}0^{S}	0^{S}	0	0.10^{S}	0.30	0.10	0.10	0	0	0	0	0	0.10^{S}	0.40	0.80	1.00	1.00	1.00	1.30^{S}	1.40^{S}	0.90	0.60^{S}	0.50
27	0.40^{S}	0.30^{S}	0.20	0.10	0.10	0.10	0.10	0.10	0	0	0	0	0	0.20	0.60	0.80	0.90	1.00	1.10^{S}	1.30^{S}	0.80^{S}	0.50^{S}	0.30^{S}	0.30
28	0.40	0.30	0.10	0.20	0.20	0.40	0.20	0.10	0.10	0.10	0.10	0.30	0.10	0.30	0.60	1.00	1.00	1.50	1.50	1.30	0.90	0.70	0.60	0.50
29	0.40	0.30	0.20	0.20	0.20	0.10	0.10	0.10	0	0	-0.20	0.10	0.30	0.50	1.00	1.20	1.00	1.30	1.40	1.30^{S}	0.80	0.50	0.30	0.30
30	0.20	0.10	0	0.30	0.10	0.20	0.10	0.10	0	-0.10	0	0	0.20	0.30	0.60	1.00	1.00	1.30	1.10^{S}	1.20^{S}	0.80^{S}	0.50^{S}	C	0.60
31	0.50	0.30	0.30	0.30	0.20	0.20	0.20	0	0.10	0.10	0	0.20	0.10	0.40	0.70	1.20	1.00	1.40	1.40	1.40	0.90^{S}	0.20^{S}	0.30^{S}	0.30
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	29	29	31	30	30	29	30
UQ	0.50	0.40	0.50	0.30	0.30	0.30	0.30	0.20	0.10	0.20	0.20	0.20	0.20	0.40	0.60	0.80	1.00	1.10	1.00	1.30	1.30	1.10	0.80	0.60
Median	0.40	0.30	0.30	0.20	0.20	0.20	0.20	0.10	0.10	0.10	0	0.10	0.20	0.30	0.40	0.60	0.90	1.00	1.00	1.10	0.70	0.60	0.50	0.50
LQ	0.30	0.30	0.10	0.10	0.10	0.30	0.10	0	0	0	0	0	0.10	0.20	0.30	0.50	0.80	0.90	0.90	1.00	0.80	0.50	0.40	0.30

TIME-UT

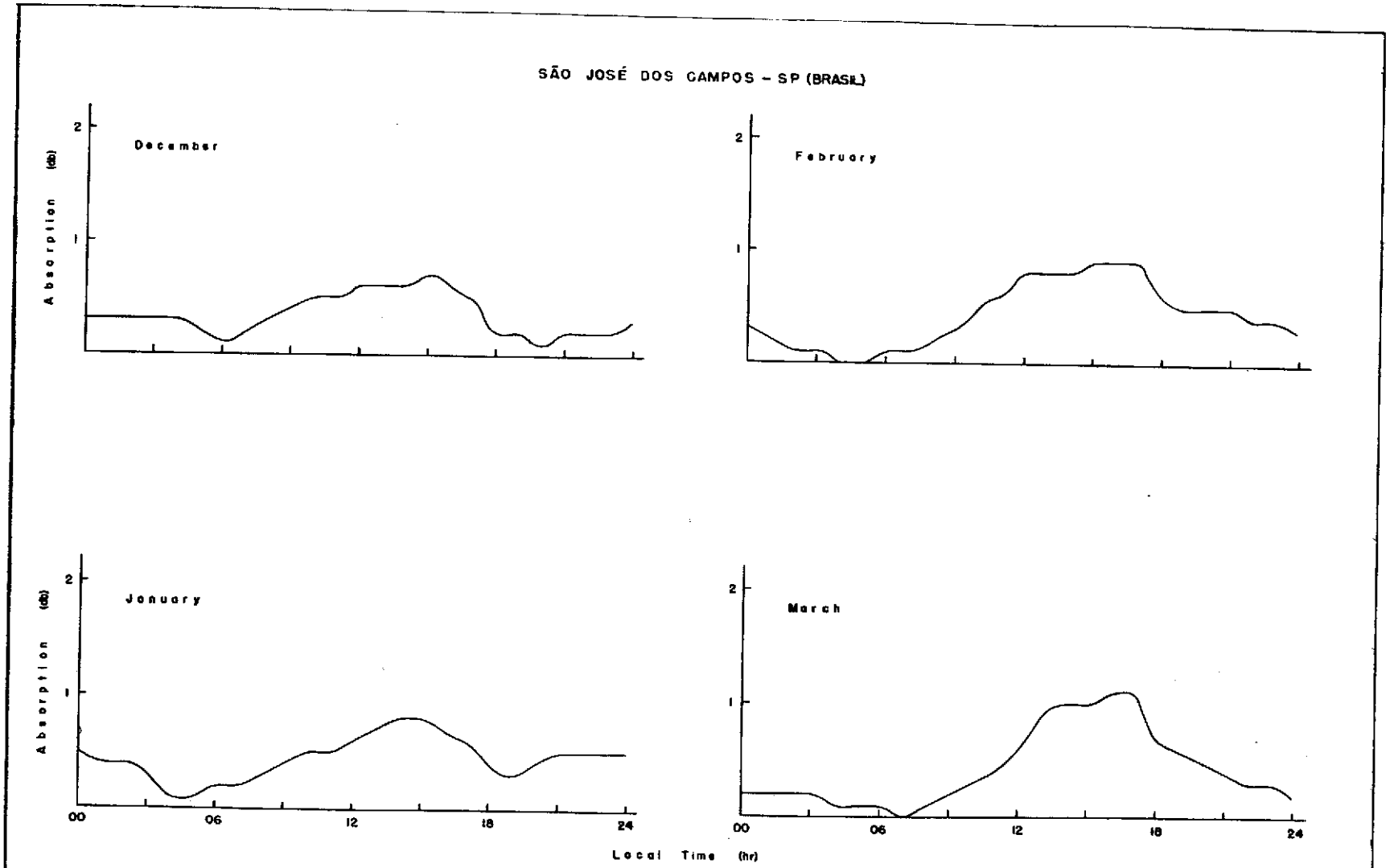

FIG. I MEDIAN MONTHLY ABSORPTION CURVES (December,1964 — March,1965)

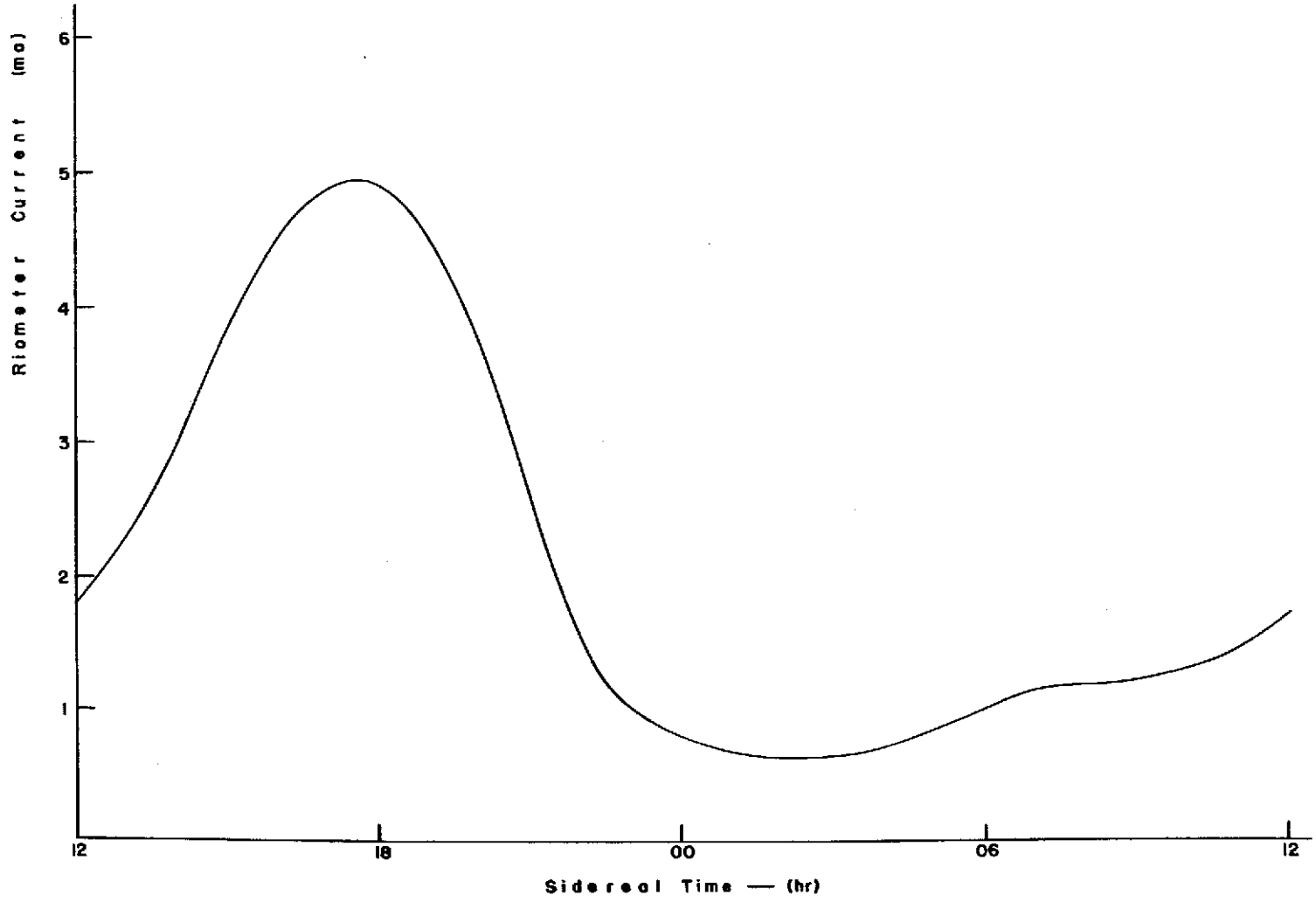

FIG. II – QUIET DAY CURVE

APPENDIX I

" EXPLANATION ON THE USE OF THE "QUIET - DAY" CURVE TO REDUCE THE RIOMETER DATA FROM SÃO JOSÉ DOS CAMPOS " .

During the regular operation of the riometer at this site which started in March 1963, some equipment failure occurred for short periods . After each time the equipment failed, it was recalibrated and reset, but the output did not repeat exactly the former characteristics, presenting a different level on the daily recorded current . In order to reduce the current to absorption, an adequate "quiet - day" curve, must be used for the different periods of operation of the riometer .

For the period April 1 to July 24, 1963, the "quiet - day" curve is shown in Fig. I, curve a . It was obtained with data acquired during the first few months of operation and should be considered as an approximation to the "quiet - day" curve .

Curve b in Fig. I, was obtained with more data of regular operation of the riometer . It can be considered as the basic " quiet - day " curve for our station (São José dos Campos)

Corrections should be introduced in this curve in order to compensate for the different levels of current which occurred after each time the equipment failed .

The adequate correction factor for the different periods of operation is indicated in the table below :

Period	Correction
Aug. 1 - Dec. 31 1963	Add 0.25 MA to the values of the " quiet - day " curve, Fig. I, curve b .
Jan. 1 - May 4 1964	Curve b of Fig. I is adequated for this period .
May 6 - Sept. 5 1964	Divide the values of curve b in Fig. I by the factor 1.12 MA .
Sept. 7 - Sept. 26 1964	Divide the values of curve b in Fig. I by the factor 1.15 MA .

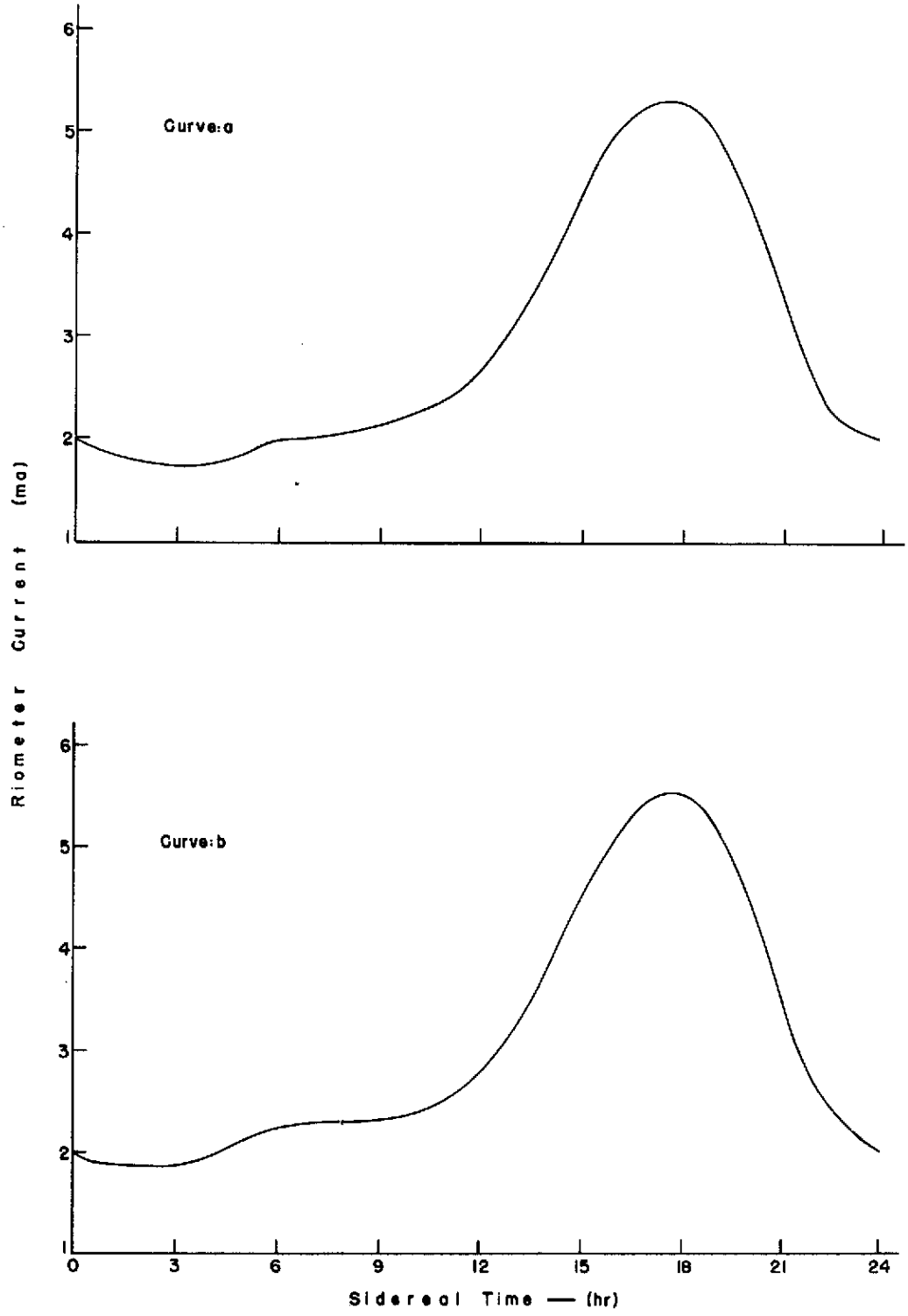

FIG. I – QUIET DAY CURVE

APPENDIX II

" NOTE ON THE TIME SCALE OF THE " QUIET - DAY " CURVE , PRESENTED IN THE ABSORPTION MEASUREMENTS WITH RIO - METER DATA SUMMARY; REPORT Nº LAFE 9, 12, 16, 17, 22 " .

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 17 h 36 m 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 17 h 36 m or SHA = 96º .

The table below indicates the sidereal time corresponding to 00:00 GMT for the middle of each month starting on 1963 .

GMT hour	Month	Sidereal Time					
		1963		1964		1965	
h...m..		h.....m.....		h.....m...		h.....m.....	
00:00	Jan., 15	04	33	04	33	04	36
"	Feb., 15	06	35	06	35	06	38
"	March, 15	08	26	08	29	08	28
"	April, 15	10	28	10	30	10	30
"	May, 15	12	26	12	30	12	27
"	June, 15	14	28	14	30	14	29
"	July, 15	16	26	16	28	16	27
"	August,15	18	31	18	34	18	33
"	Sept., 15	20	33	20	36	20	35
"	Oct., 15	22	31	22	34	22	33
"	Nov., 15	24	33	24	36	24	35
"	Dec., 15	02	31	02	34	02	33