Technical Note No. 206-5

THE NORMAL PHASE VARIATIONS OF THE 16 kc/s SIGNALS FROM GBR OBSERVED AT COLLEGE, ALASKA

J. H. CRARY AND A. C. MURPHY

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

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CONTENTS

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Observations of the normal phase variations of the 16 kc/s signals radiated from Rugby, U.K., and received in College, Alaska, U.S.A., are given in the form of 15-day averages and standard deviations at 5 minute intervals. The relations between the diurnal phase variations and the diurnal variation in the percentage of the path in darkness are shown. The values of the short term phase differences are also given.

Key Words: VLF, phase, normal, diurnal, England-Alaska.

1. Introduction

This is the fifth of a series of reports, each of which summarizes the normal (or undisturbed) behavior of the phase of signals from various VLF transmitters as observed at particular receiving sites. This report deals with the reception at College, Alaska (lat. N 64° 51' 36", long. W 147° 33' 48"), of 16 kc/s transmission of GBR, Rugby, U.K. (lat. N 52° 22' 10", long. W 1° 11' 15"), a path length of 6651 km.

The earlier four reports in this series deal with the reception of NBA at Frankfurt, Germany [Brady et al., 1963], Maui, Hawaii [Brady et al., 1964a], Boulder, Colorado [Brady et al., 1964b] and College, Alaska [Crary and Murphy, 1965].

It is the purpose of these reports merely to present the reduced phase data, with a minimum of discussion. The data in these reports will be used in subsequent papers, each of which will deal with a specific aspect of the data on all the paths.

2. Data Analysis

All the phase data used in these reports have been taken, reduced, and presented in a uniform manner as described in the first of the series [Brady et al., 1963]. Thus tables 1-12 contain monthly phase averages (AVER) at 5 minute intervals, standard deviations (SDV), the number of observations (NO) used in obtaining these quantities, the quiet average (QAV), which is the average after values more than one standard deviation from AVER are discarded, and the number (NO) of values used in QAV. (A fuller description of these tables is given in the first note of this series).

3. Diurnal Phase Variations

The monthly mean phase changes and standard deviations for 1962, taken from tables 1-12, are plotted in figures 1 and 2. The average diurnal phase change for 1962 is 125°. Because of the annual change in the diurnal variation of illumination, this value is difficult to interpret. The maximum diurnal phase change of 315° during the 15-day periods shown in table 13 occurs from September 25 to October 5. During this period the illumination should be nearly symmetrical about the equator and should change from zero to 100%. According to the mode theory of VLF propagation [Wait, 1962], this phase change corresponds to a change in the effective height of the ionosphere along the whole path of 20.8 km (assuming that the ionosphere is sharply bounded and that the mean of the daytime and nighttime heights is 80 km).

3.1 Seasonal Variation in Diurnal Phase Change

The mean diurnal phase change for each 15-day period is listed in table 13. The seasonal variation in diurnal phase change is plotted in figure 15 versus the percentage diurnal change in illumination along the path. The approximately linear relationship between the relative phase change and the change in illumination is apparent from this figure although a large amount of scatter is present, especially when the illumination is changing rapidly. Because of this large amount of scatter and the rapid variations in illumination that occur along this path, it was not deemed worthwhile to perform a Fourier analysis of the seasonal variation in the diurnal height change.

3.2 Variation of Phase with Amount of Illuminated Path

The monthly average phase variation shown in figures 1 and 2 shows typical superficial dependence on the length of path which is in daylight [Crombie et al., 1958; Pierce, 1957]. A more detailed examination of the relationship is given by plotting the diurnal phase changes at sunrise and sunset, together with variation in the length of illuminated path (at appropriate heights) at these times. This has been done in figures 3-14, which show the sunrise and sunset variations for each 15-day period for 1962. The figures have been drawn so that the maximum diurnal phase variation of 315° fits the full "percent darkness" scale in each case.

The calculations of the length of illuminated path were made in the way described by Brady and Crombie [1964] and Crary [1965]. It is assumed in these calculations that the screening height of the earth's atmosphere is 30 km. Sunrise or sunset at the heights of 0 and 80 km are thus equivalent to solar zenith angles of 90° and 97° .

3.3 Sunrise and Sunset Variations

Figures 3-14 show that the smooth diurnal phase change follows fairly closely the percentage of the path in darkness. On a high latitude path, such as this one, the sunrise and sunset times change very rapidly at most times of the year. It is therefore difficult to make generalizations about the details of the time of the phase changes relative to the percentage of the path in darkness. In general the phase is bracketed fairly well by the ground and 80 km (or alternatively χ = 90 or 97°) curves.

4. Phase Stability

It was pointed out in the first paper of this series that both day-to-day phase stabilities and the phase variations over periods of time up to an hour or so were of interest. Typical values for the path being considered have been given in each paper.

The day-to-day standard deviations of phase observed at College are given at 5 minute intervals for each month of 1962 in tables 1-12, and are also plotted in figures 1 and 2. Since this is a high latitude path, the diurnal and seasonal variations in illumination are very rapid. The time intervals in which maximum darkness or daylight occurs can be very short in summer or winter, respectively; daylight or darkness does not always occur under these conditions.

During the hours when the path is completely daylit, the day-to-day standard deviations have a value of about 10° without any seasonal trend being apparent. When the path is dark, the day-to-day standard deviations vary between about 10° and 30°, again without a perceptible seasonal variation. A change of 1° in phase corresponds to a calculated change in the effective height of the ionosphere of 0.065 km along the entire path. If these observed phase changes are considered to occur along the whole path, they are equivalent to effective height changes of 0.7 km during the day and 0.7 to 2.1 km during the night.

The method of obtaining the short term phase variations has been described in the first of this series [Brady et al., 1963]. Table 14 contains the rms phase differences calculated in this way for intervals of 10-90 minutes (T). The data are given for both daytime and nighttime conditions during each month of 1962. As noted in the other papers of this series, the rms phase differences increase as the time interval T increases, particularly when T is small. During the summer months there is also a general tendency for the magnitude of the fluctuations for small T to be greater at night than during the day. The reverse situation tends to be true during the winter. There is a tendency for these characteristics to also be true for large T but there are exceptions to this. The difference in magnitude between the day and night values tends to be greater in the summer and for large values of T.

5. Acknowledgment

The observations at College, Alaska, were obtained by Dr. H. F. Bates and Mr. Paul Albee of the Geophysical Institute at the University of Alaska. The work was supported under Contract CST-7338 of the National Bureau of Standards from the Advanced Research Projects Agency, Washington, D. C., under Order No. 183, which also supported the work at NBS.

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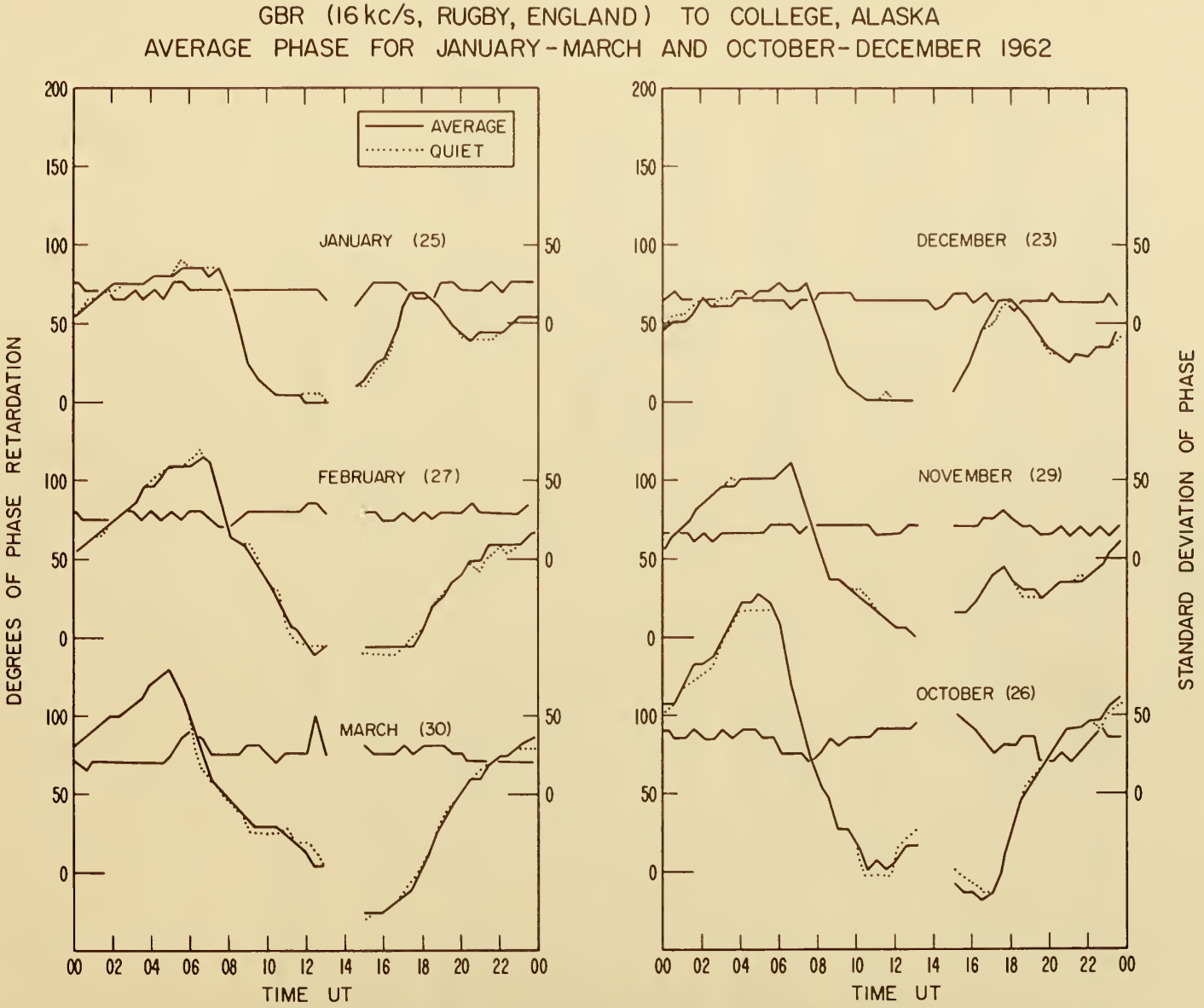

Figure 1. Mean phase variations and standard deviations in degrees from GBR Rugby to College, Alaska, January-March and October-December 1962.

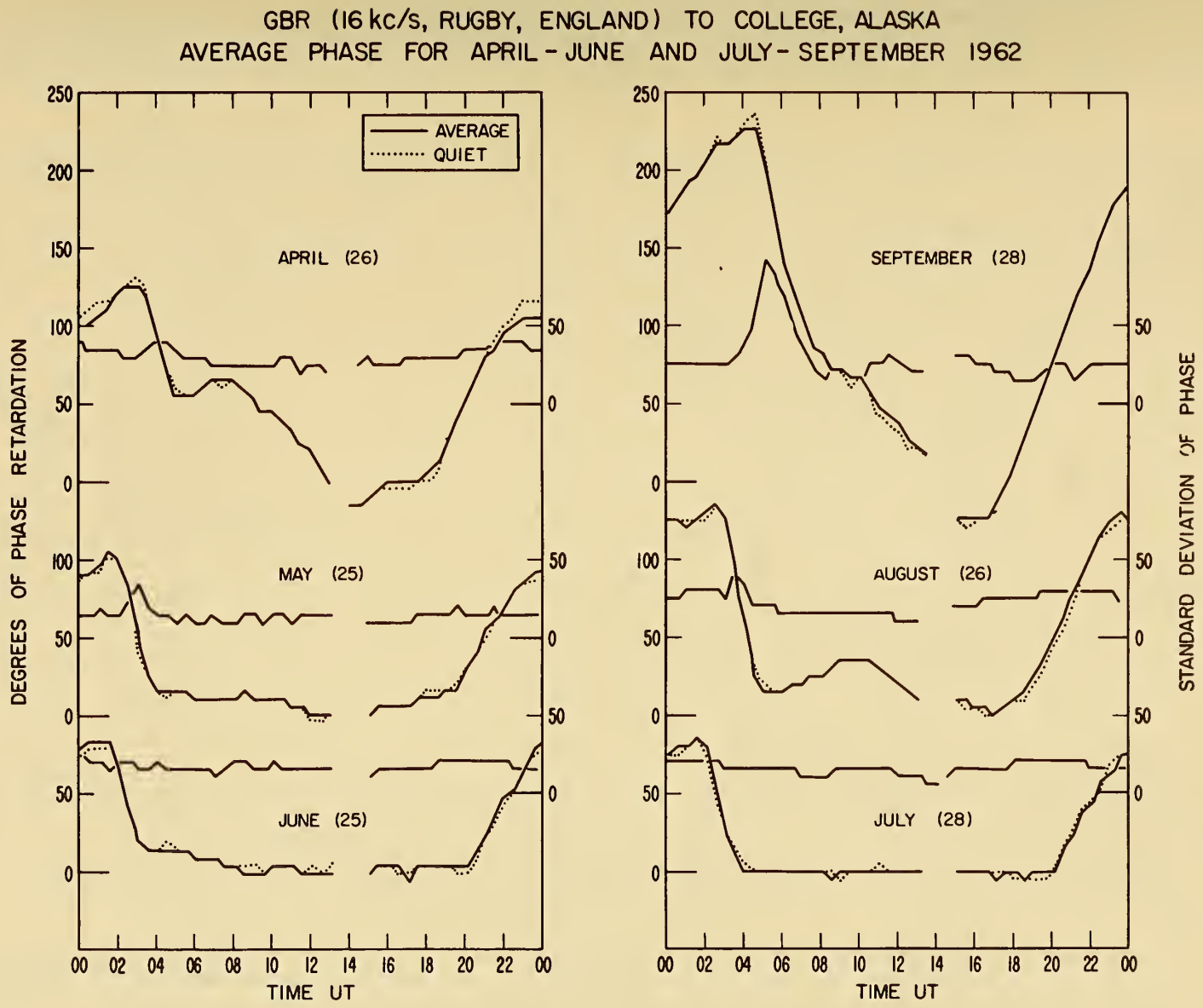

Figure 2 Mean phase variations and standard deviations in degrees for GBR Rugby to College, Alaska, April-June and July-September 1962

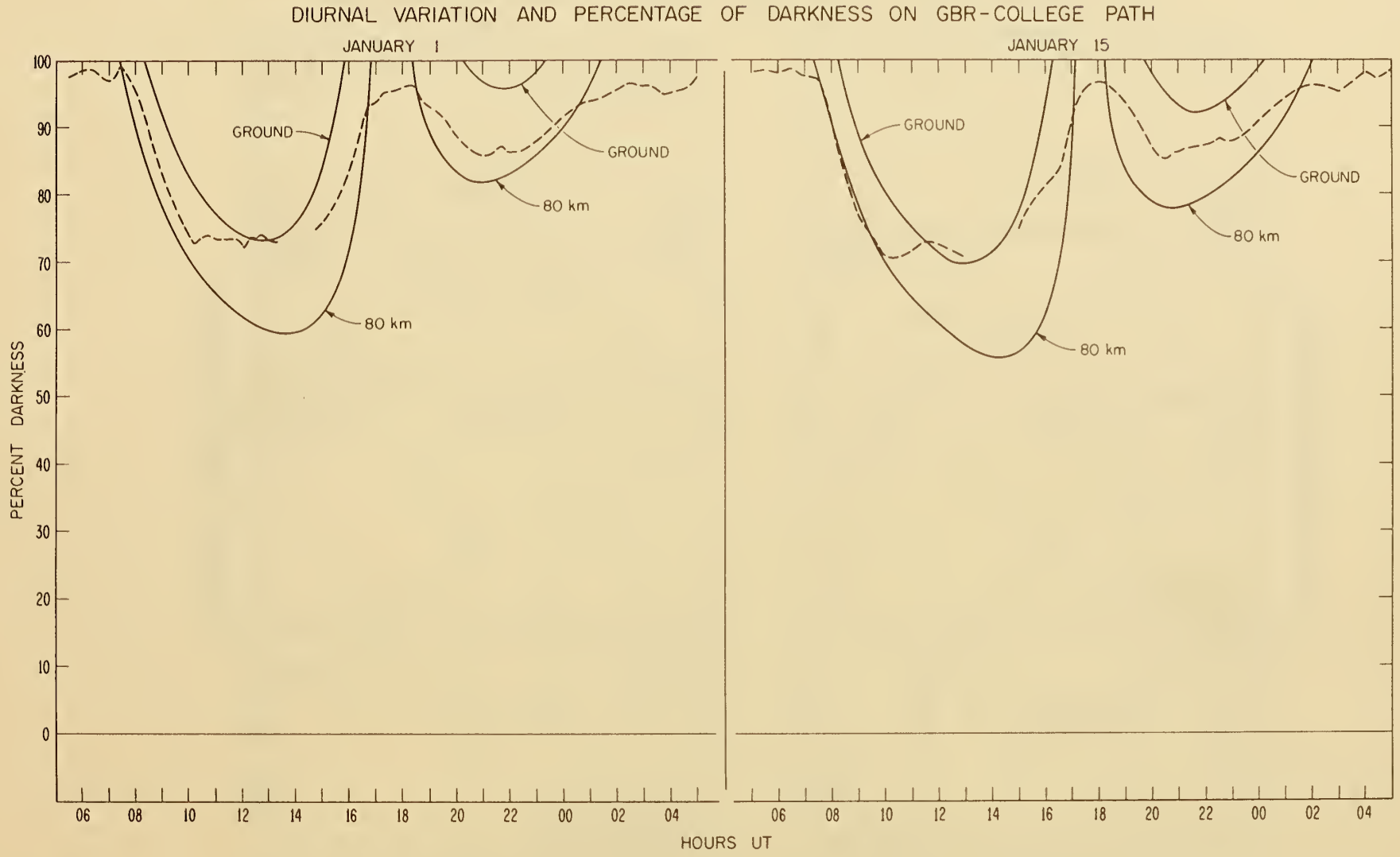

Figure 3. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on January 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

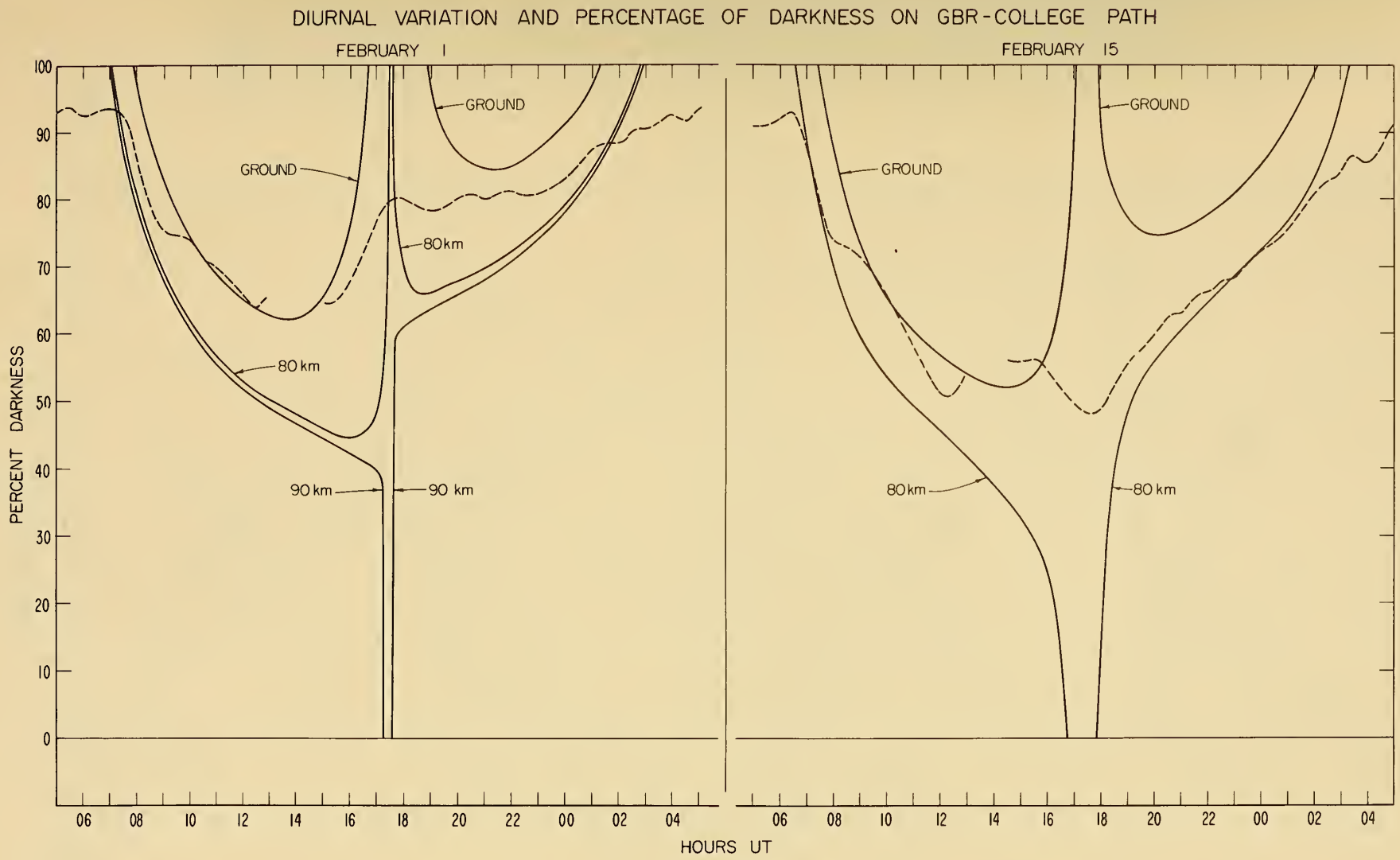

Figure 4. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on February 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

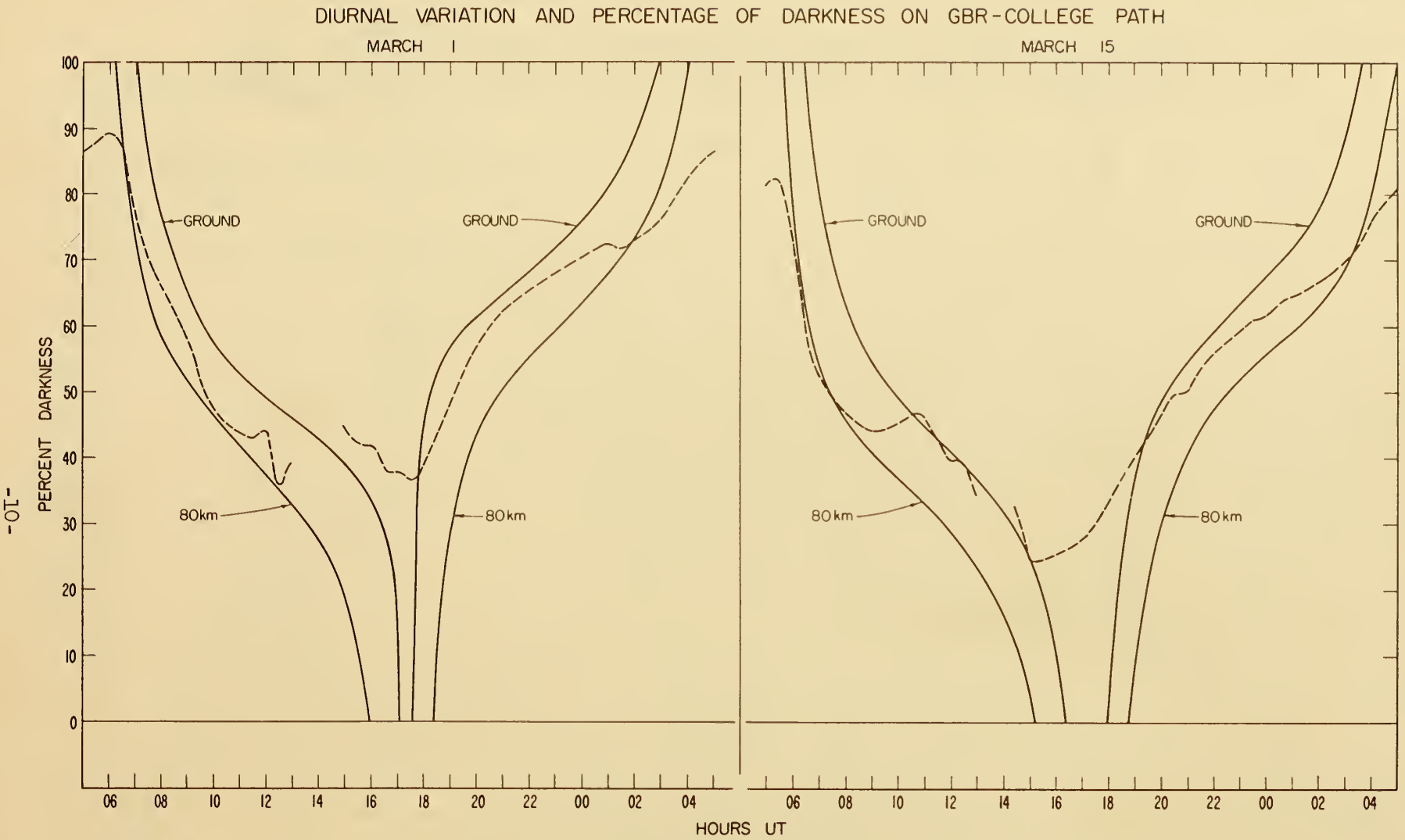

Figure 5. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on March 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

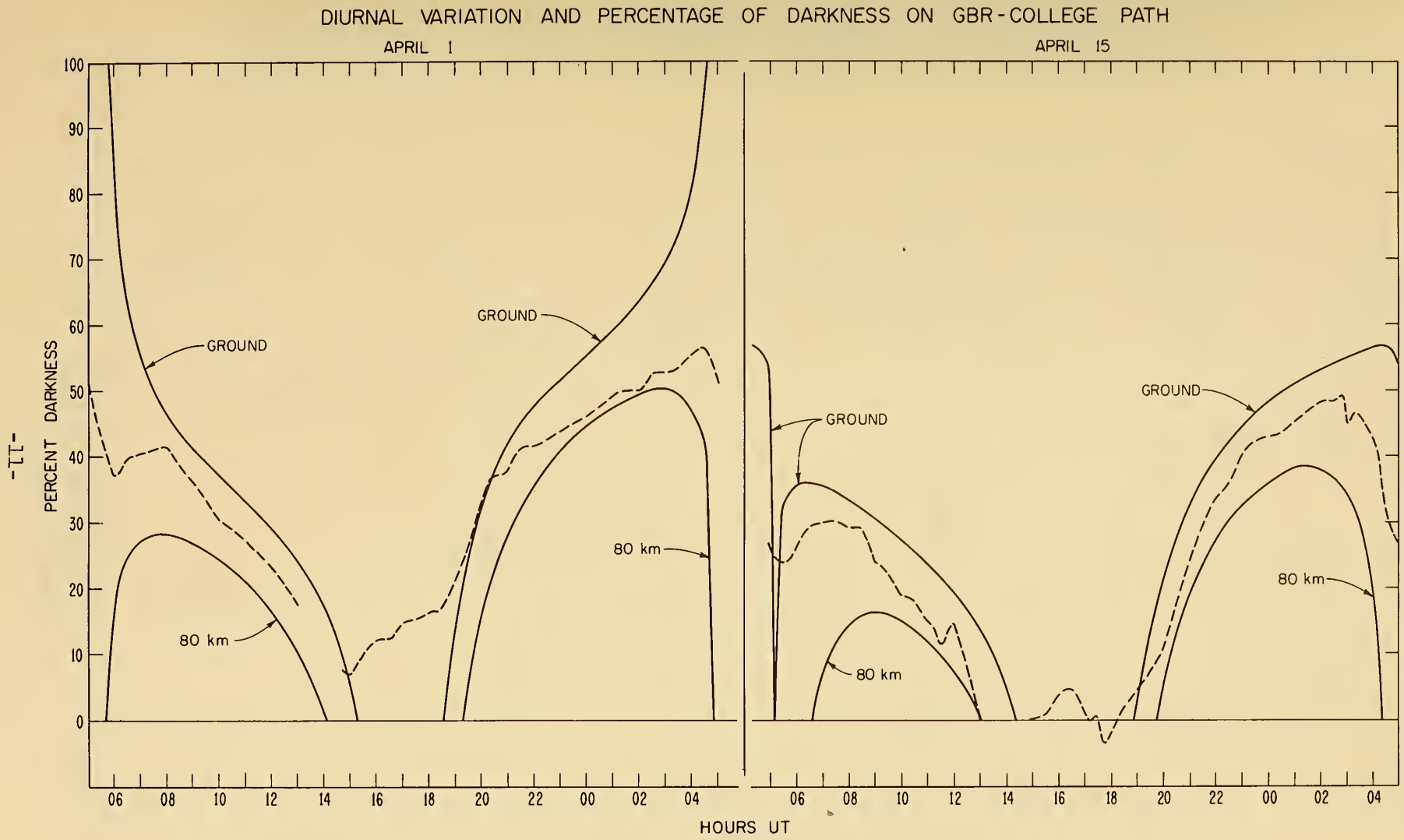

Figure 6. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on April 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

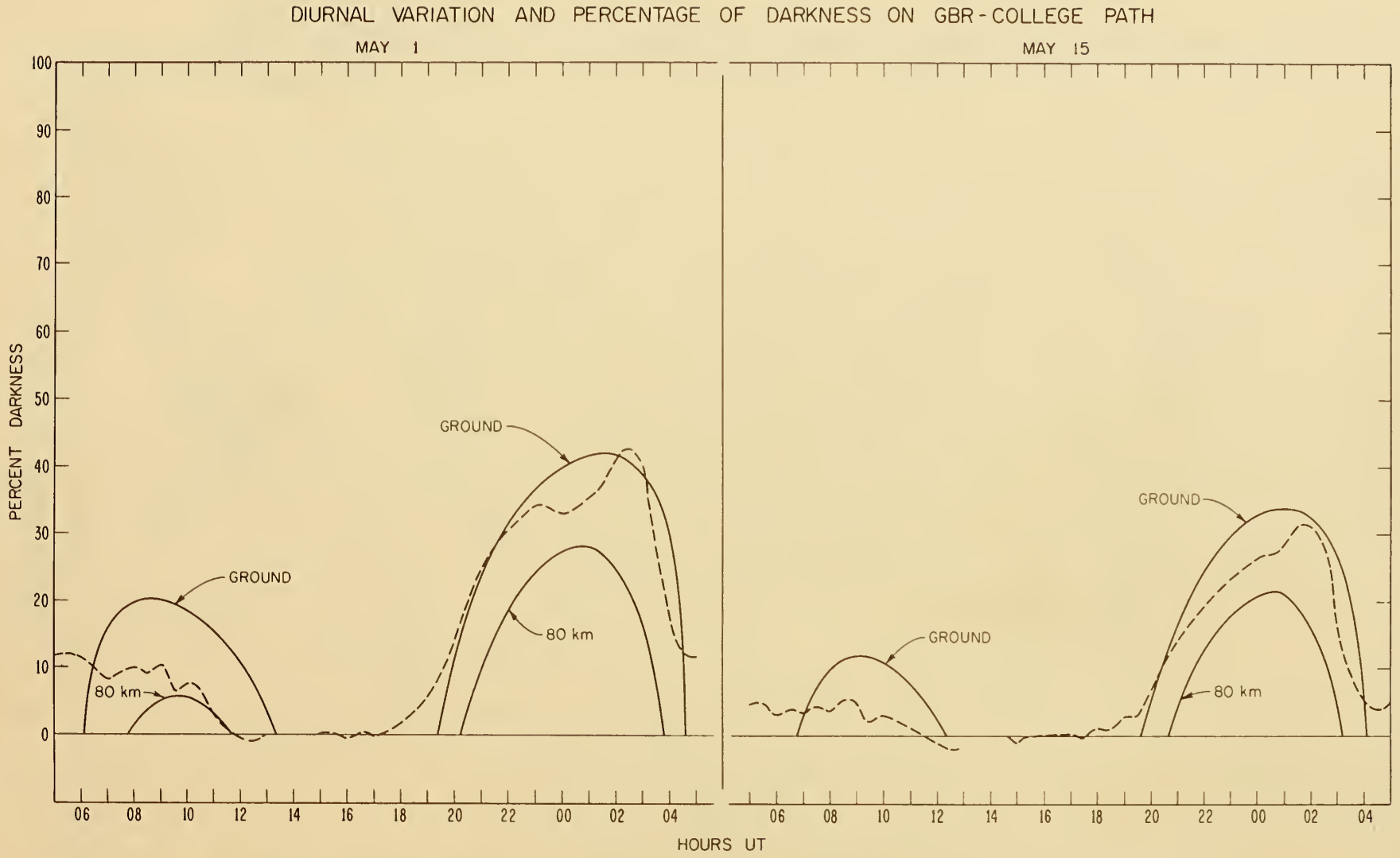

Figure 7. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on May 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variations which has occurred.)

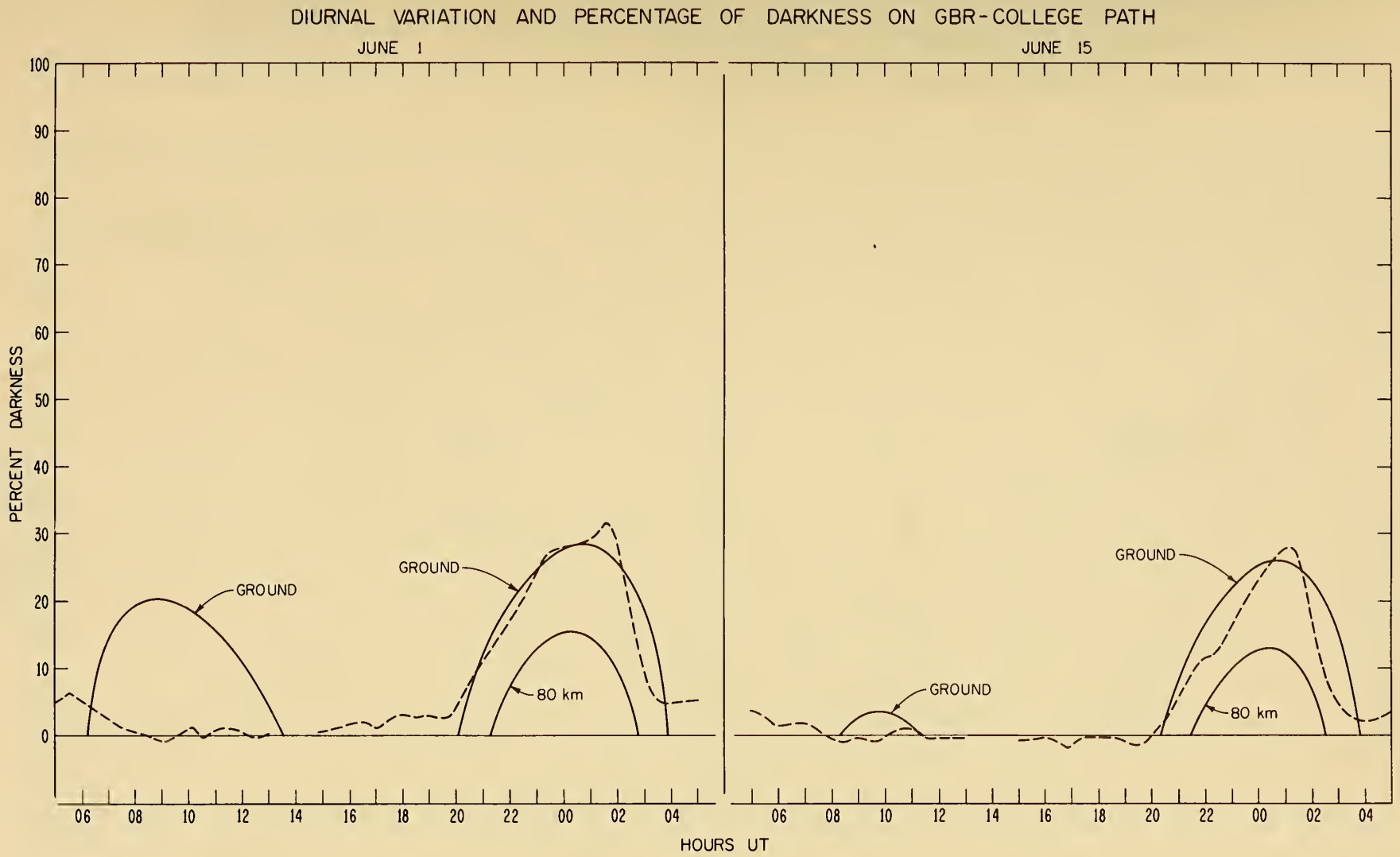

Figure 8. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on June 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

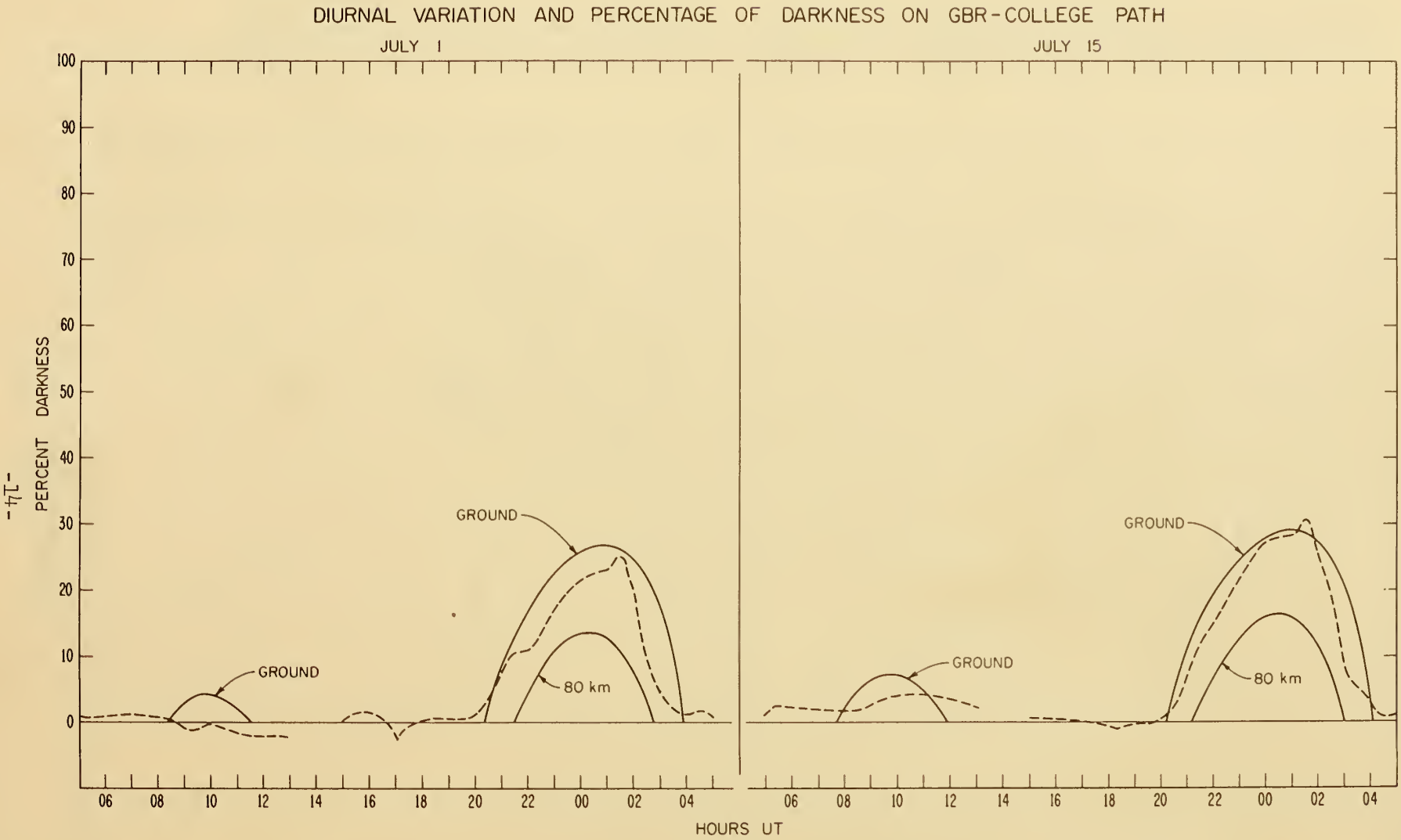

Figure 9. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on July 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

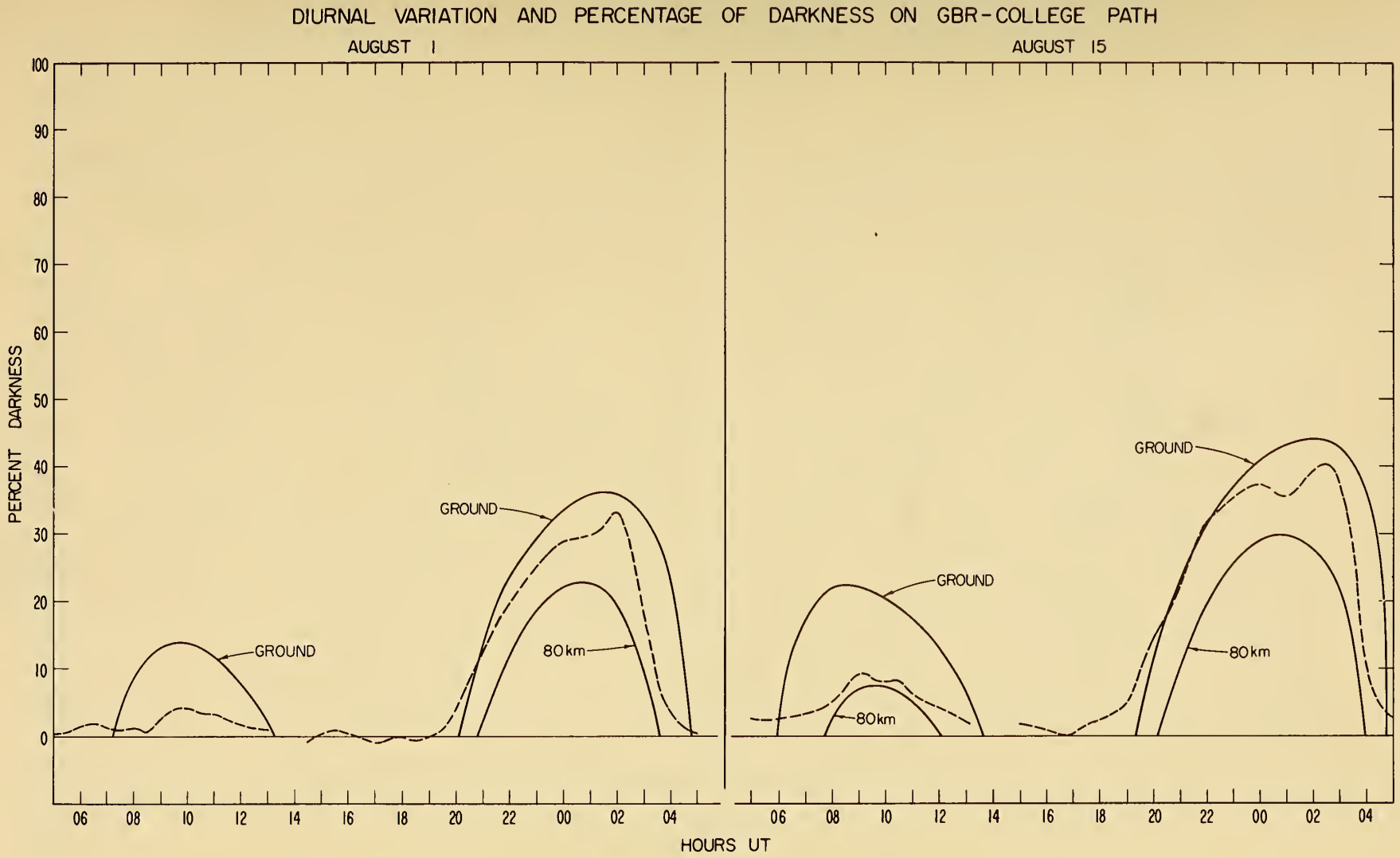

Figure 10. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on August 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

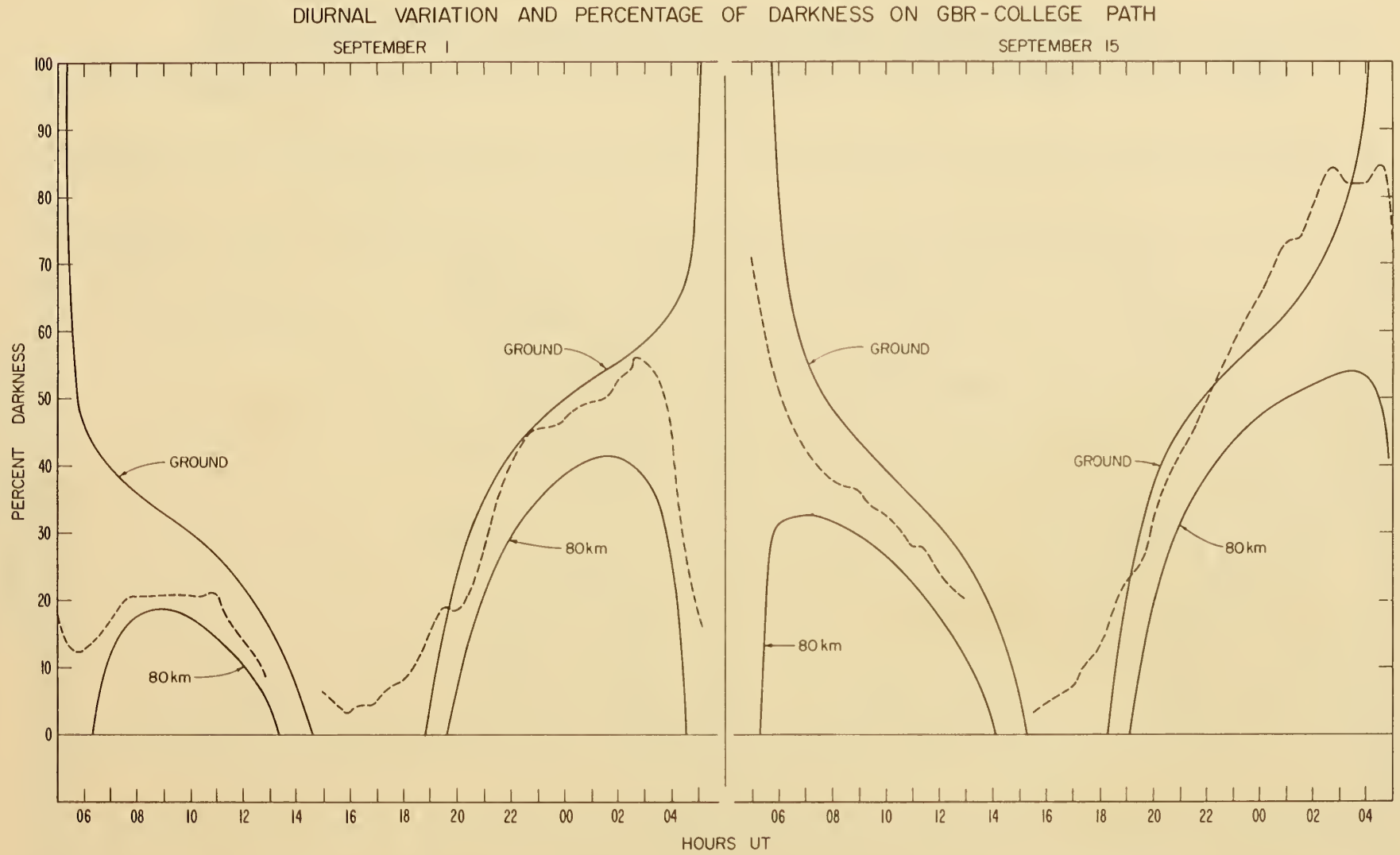

Figure 11. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on September 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

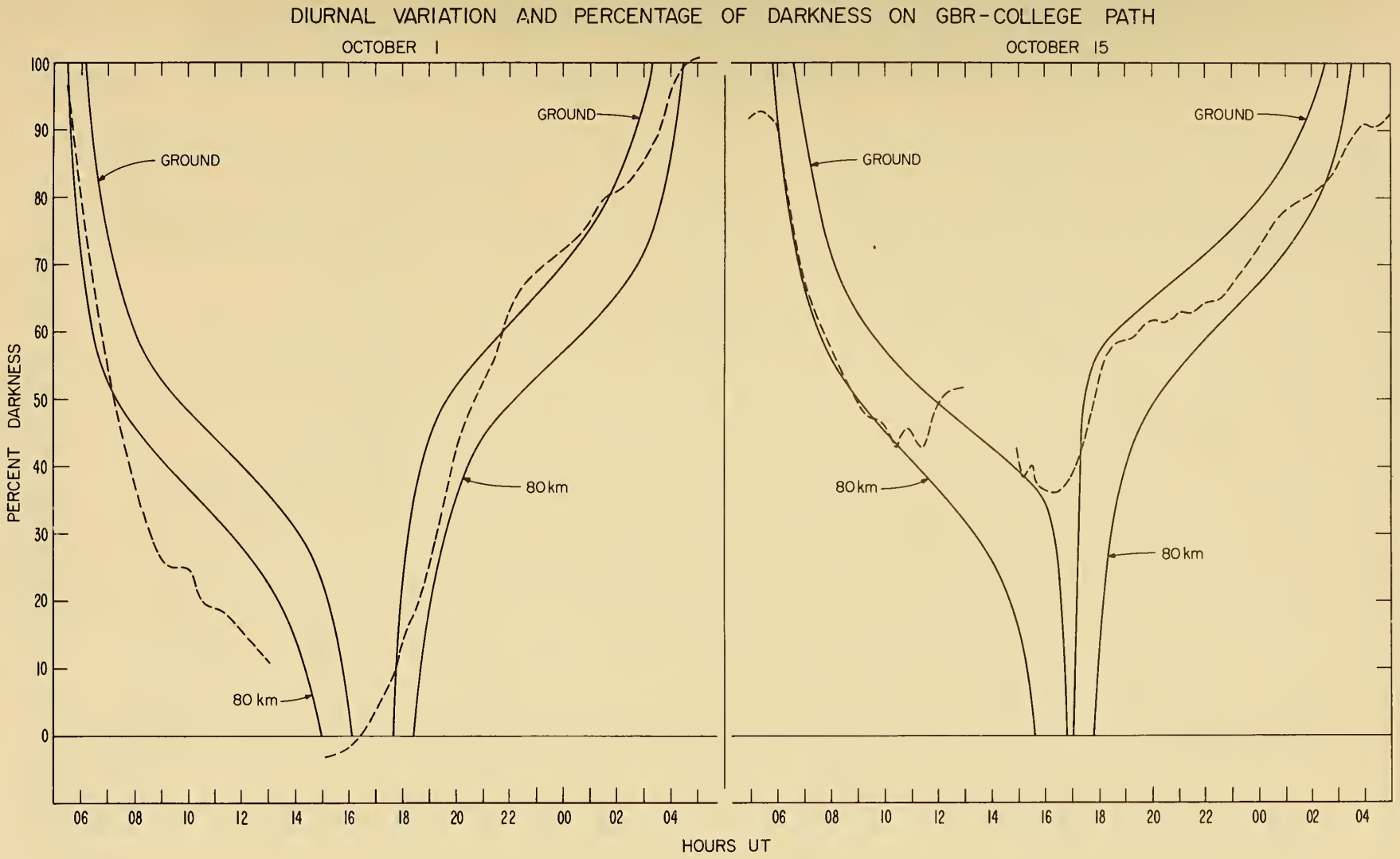

Figure 12. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on October 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

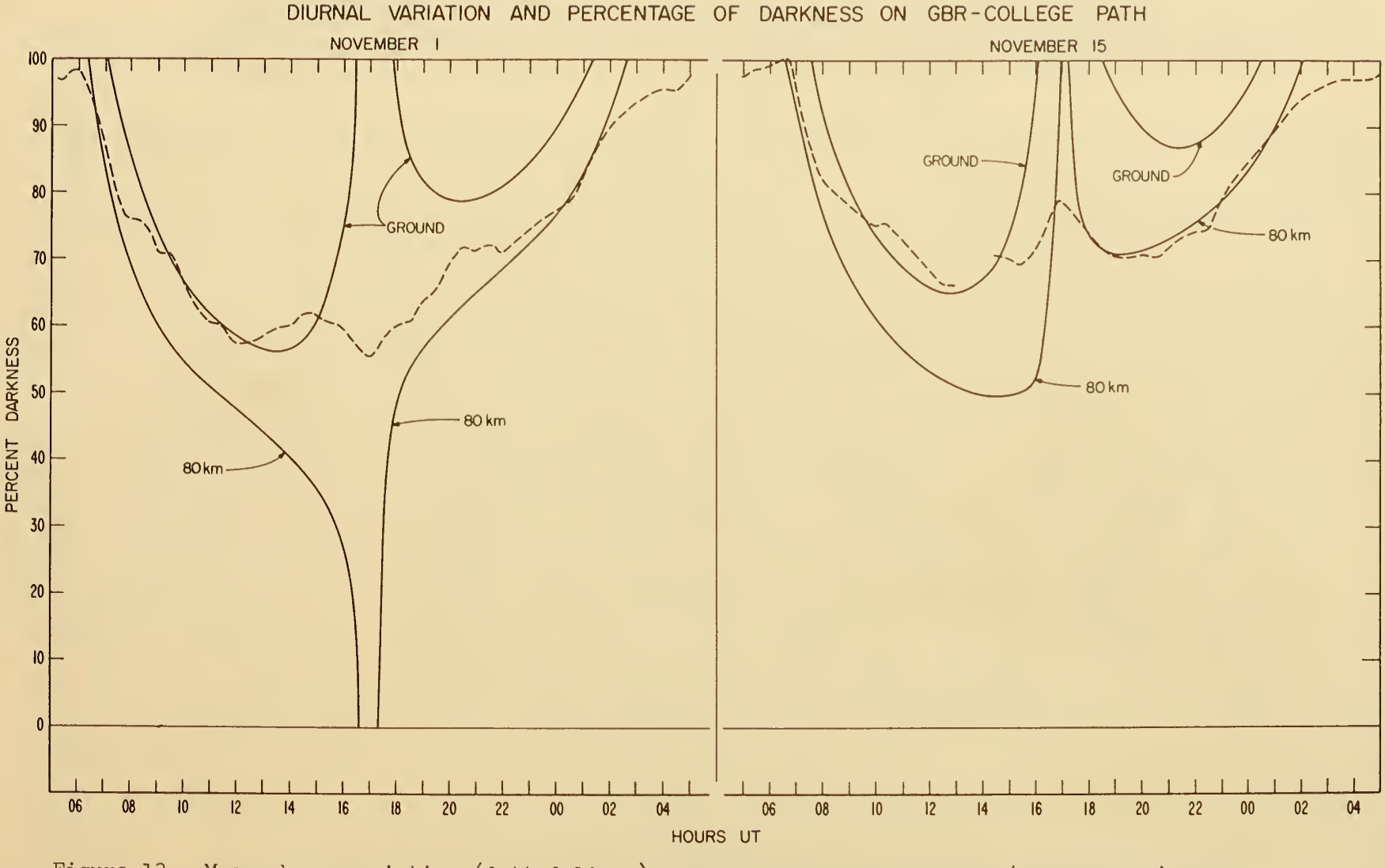

Figure 13. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on November 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

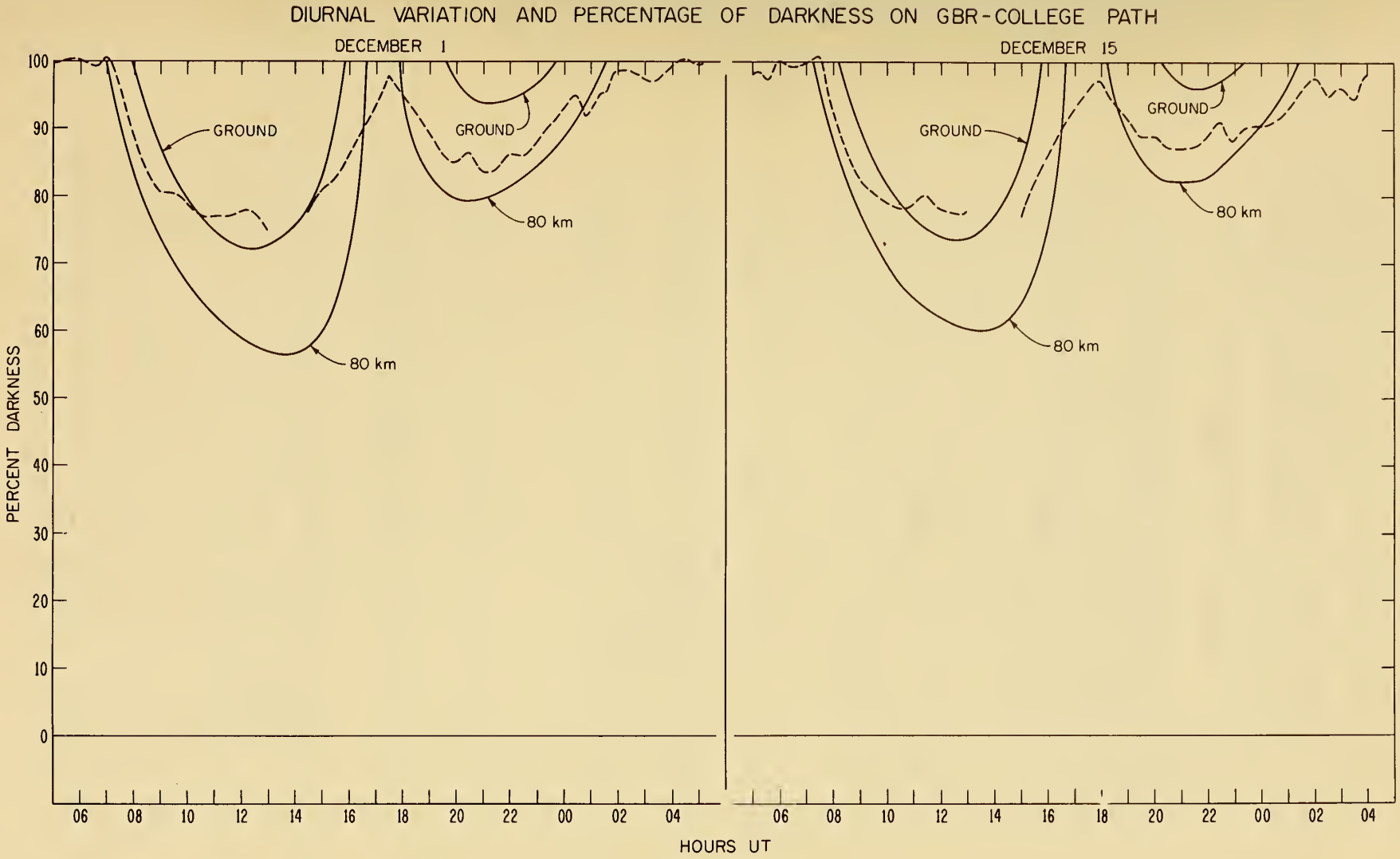

Figure 14. Mean phase variation (dotted lines) and percentage of darkness (solid lines) on GBR, Rugby to College, Alaska, path for 15 day intervals centered on December 1 and 15, 1962. (Note: The ordinate also gives the percentage of the yearly maximum diurnal phase variation which has occurred.)

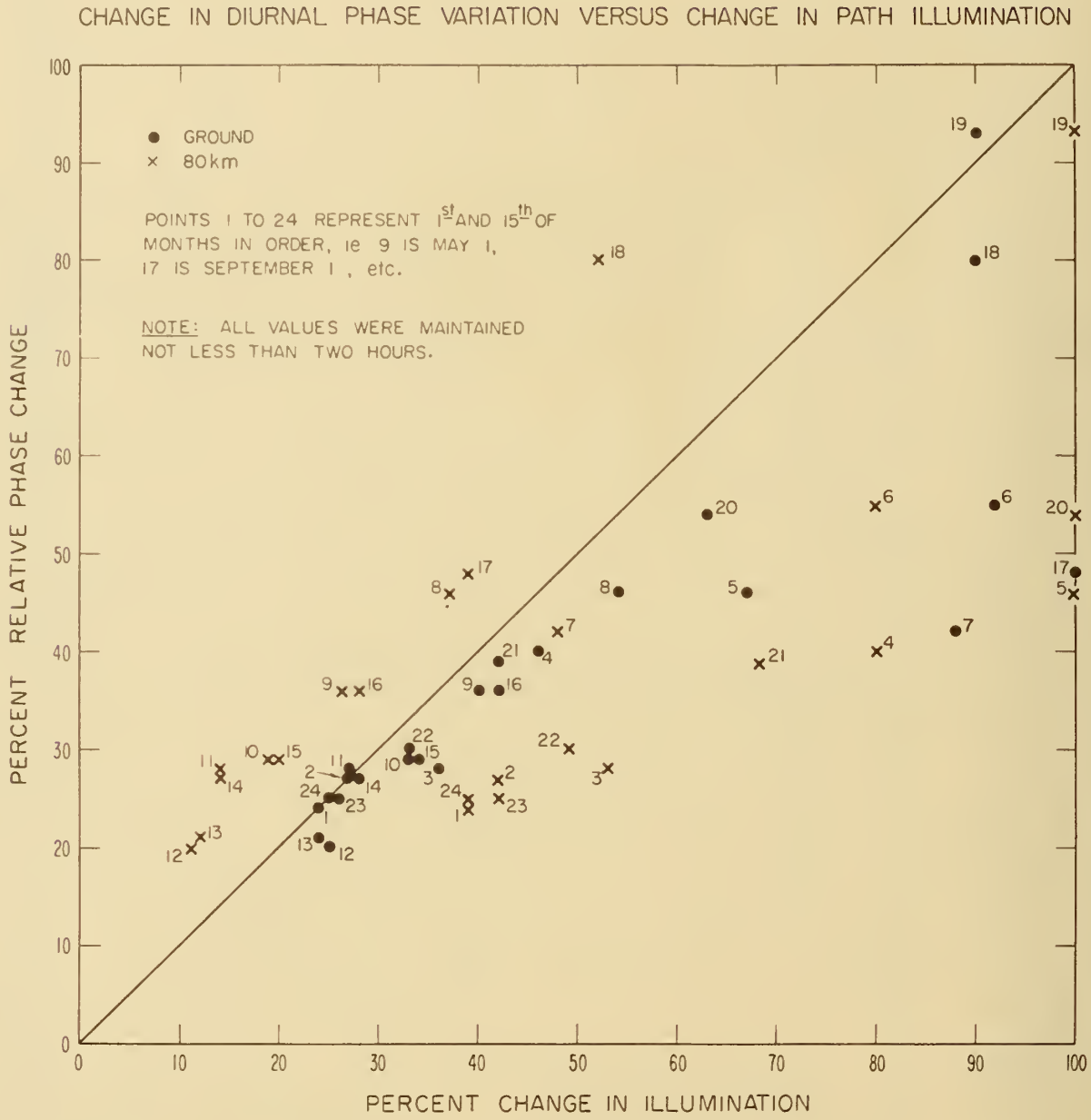

Figure 15. Mean diurnal phase change for 15 day intervals on GBR, Rugby to College, Alaska, path versus the corresponding diurnal change in path illumination.

Table 1

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 1 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	505.	23.24	508.16	506.	22.24	508.16	507.	22.24	509.16	508.	21.24	510.16	509.	21.24	512.16	510.	20.24	513.16
	511.	21.24	513.16	512.	20.24	514.16	514.	20.24	515.16	514.	19.24	514.16	514.	19.24	514.16	516.	19.24	514.15
01	517.	19.24	515.15	518.	18.24	517.15	520.	18.24	521.16	521.	18.24	521.16	521.	19.24	520.16	522.	18.24	521.16
	523.	18.24	522.15	522.	18.24	521.16	522.	17.24	521.16	522.	17.24	519.17	521.	16.24	519.17	522.	17.24	520.17
02	523.	17.25	521.17	524.	17.25	521.17	524.	18.25	523.16	525.	17.25	525.15	525.	17.25	526.16	525.	17.25	526.15
	525.	17.25	524.14	525.	17.25	525.14	525.	17.25	525.14	525.	17.25	526.15	525.	17.25	526.15	525.	17.25	526.15
03	525.	18.25	524.14	524.	18.25	524.14	523.	18.25	524.15	524.	17.25	526.16	525.	17.25	528.16	525.	17.25	529.17
	525.	17.25	528.15	525.	17.25	527.16	525.	17.25	527.17	527.	17.25	527.16	528.	18.25	528.16	529.	18.25	528.16
04	530.	18.25	528.17	530.	18.25	529.18	530.	18.25	529.18	530.	17.25	528.17	529.	17.25	528.15	529.	16.25	529.15
	530.	17.25	529.15	530.	17.25	531.14	530.	19.25	533.15	529.	21.25	530.15	529.	24.25	530.17	531.	23.25	531.17
05	533.	23.25	532.17	533.	24.25	533.17	535.	24.25	536.16	535.	24.25	535.16	535.	23.25	539.14	535.	23.25	539.14
	535.	23.25	538.15	535.	23.25	540.14	535.	23.25	538.15	535.	22.25	538.15	535.	21.25	539.16	535.	20.25	538.15
06	535.	19.25	537.14	535.	18.25	533.16	534.	19.25	533.19	535.	19.25	534.19	536.	20.25	536.18	536.	19.25	537.19
	536.	20.25	534.18	535.	18.25	534.17	533.	17.25	533.17	533.	17.25	534.18	532.	18.25	534.18	532.	18.25	533.17
07	533.	18.25	533.17	533.	18.25	532.18	533.	18.25	532.17	533.	19.25	534.18	534.	20.25	532.18	534.	19.25	533.17
	534.	18.25	534.17	532.	17.25	530.16	530.	17.25	528.17	527.	17.25	528.17	524.	18.25	525.15	522.	18.25	522.15
08	519.	20.25	518.14	516.	18.25	514.17	512.	17.25	510.17	508.	17.25	508.17	504.	18.25	501.15	500.	18.25	498.15
	497.	18.25	496.17	493.	18.25	492.17	488.	17.25	489.16	485.	18.25	484.15	481.	19.25	481.17	479.	20.25	478.17
09	476.	20.25	476.17	473.	18.25	474.18	470.	17.25	471.18	469.	17.25	469.17	468.	17.25	468.18	467.	17.25	467.18
	466.	18.25	465.17	465.	18.25	464.17	464.	19.25	464.19	463.	18.25	462.17	461.	18.25	460.17	460.	19.25	461.18
10	459.	20.25	459.19	459.	19.25	459.19	459.	19.25	460.18	459.	19.25	460.18	458.	20.25	458.19	457.	20.25	456.20
	456.	21.25	456.20	456.	21.25	457.19	457.	22.25	456.18	455.	22.25	459.17	454.	22.25	458.17	454.	22.25	458.17
11	455.	22.25	456.17	456.	21.25	458.16	457.	20.25	457.17	455.	21.25	456.18	453.	22.25	452.17	453.	22.25	454.16
	453.	22.25	454.15	452.	23.25	454.18	451.	23.25	452.19	451.	23.25	453.18	451.	22.25	454.18	450.	21.25	454.19
12	450.	21.25	454.19	449.	21.25	453.19	447.	21.25	451.18	448.	20.25	452.19	448.	20.25	453.19	448.	19.25	453.19
	448.	19.25	453.18	448.	18.25	453.19	447.	18.25	450.20	447.	18.25	449.18	448.	17.25	450.17	452.	13.18	451.12
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	478.	-0. 1	479. 1	478.	-0. 1	478. 1	479.	-0. 1	479. 1	483.	-0. 1	483. 1	487.	-0. 1	487. 1	483.	-0. 1	483. 1
14	479.	-0. 1	479. 1	477.	-0. 1	477. 1	463.	13. 2	463. 2	462.	13. 2	462. 2	460.	13. 2	460. 2	460.	13. 2	460. 2
	461.	10. 4	461. 2	461.	11. 4	461. 2	460.	15.19	456.14	460.	15.19	457.14	459.	15.21	457.15	460.	14.21	459.16
15	465.	21.25	461.22	463.	15.25	461.16	462.	14.25	460.18	466.	15.25	463.16	470.	21.25	465.18	472.	23.25	466.19
	474.	25.25	469.19	476.	26.25	469.19	478.	27.25	472.18	477.	27.25	470.19	477.	27.25	469.20	479.	27.25	472.19
16	480.	27.25	474.19	482.	25.25	474.18	484.	24.25	478.17	485.	22.25	481.18	486.	21.25	481.16	488.	22.25	484.16
	491.	23.25	490.16	494.	21.25	490.16	497.	20.25	493.17	501.	19.25	498.16	505.	19.25	503.16	508.	18.25	507.17
17	512.	18.25	509.18	513.	15.23	512.15	516.	15.24	515.18	517.	15.24	517.17	519.	16.24	517.16	520.	16.24	517.17
	522.	16.24	519.16	522.	16.24	522.16	523.	16.24	521.16	523.	16.24	521.16	522.	16.24	522.17	522.	16.24	520.18
18	521.	16.24	521.17	521.	16.24	520.16	522.	16.24	519.16	520.	16.24	516.17	519.	17.24	515.16	518.	17.24	515.17
	517.	17.24	514.17	515.	18.24	512.17	514.	19.24	508.17	513.	20.24	507.17	511.	21.24	507.18	510.	22.24	505.18
19	508.	23.24	503.17	507.	23.24	501.18	506.	24.24	502.18	505.	23.23	502.17	503.	22.23	500.17	503.	23.23	500.17
	502.	23.23	499.17	501.	22.23	498.17	499.	22.23	495.16	498.	22.23	492.17	497.	23.23	491.17	496.	22.23	491.17
20	495.	22.24	493.16	495.	22.24	492.16	495.	22.24	491.17	494.	20.24	489.18	493.	19.24	490.19	492.	19.24	490.19
	492.	18.24	490.19	492.	18.24	492.19	492.	17.24	491.18	492.	18.24	492.18	492.	19.24	491.17	493.	19.24	491.17
21	494.	20.24	491.17	494.	20.24	490.17	494.	20.24	489.17	495.	22.24	490.17	496.	23.24	491.17	496.	23.24	490.16
	496.	23.24	490.16	496.	23.24	490.16	496.	23.24	490.16	496.	22.24	490.16	496.	22.24	490.16	496.	21.24	493.17
22	497.	21.24	495.16	498.	21.24	495.17	499.	22.24	499.17	499.	22.24	499.17	500.	23.24	498.14	500.	23.24	503.15
	501.	24.24	501.16	502.	24.24	502.16	503.	25.24	503.16	503.	24.24	504.16	503.	23.24	504.16	503.	23.24	504.16
23	503.	24.24	506.15	504.	24.24	507.15	505.	25.24	505.16	506.	25.24	505.17	508.	25.24	506.18	507.	25.24	506.18
	506.	25.24	505.18	506.	26.24	505.18	506.	26.24	505.18	507.	26.24	506.18	509.	27.24	510.17	511.	28.24	512.17

Table 2

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 2 1962

UT	AVER	SDV NO	QAV NO	+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	505.	28.27	506.18	505.	28.27	507.18	507.	29.27	506.19	507.	29.27	506.19	507.	29.27	506.19	509.	28.27	508.17
	511.	27.27	509.17	511.	27.27	509.19	511.	27.27	510.18	511.	27.27	511.18	512.	27.27	510.19	513.	26.27	513.18
01	515.	26.27	514.18	516.	25.27	513.19	517.	25.27	514.19	517.	25.27	513.20	518.	26.27	513.20	518.	25.27	514.20
	518.	24.27	515.20	518.	24.27	515.20	519.	24.27	517.21	520.	24.27	517.21	521.	25.27	517.20	523.	25.27	520.19
02	525.	26.27	523.18	526.	26.27	524.18	527.	27.27	527.19	528.	28.27	526.18	529.	29.27	528.18	530.	29.27	529.18
	531.	29.27	529.17	532.	29.27	529.17	532.	29.27	530.17	534.	27.27	532.19	536.	26.27	534.19	536.	27.27	534.21
03	536.	28.27	533.21	538.	28.27	534.20	540.	28.27	537.19	541.	28.27	540.20	542.	28.27	541.20	544.	27.27	541.21
	545.	27.27	544.21	546.	27.27	544.21	546.	27.27	544.21	546.	27.27	544.21	546.	28.27	546.22	546.	28.27	546.22
04	547.	28.27	548.21	548.	28.27	549.21	549.	28.27	550.22	550.	28.27	551.22	551.	28.27	552.20	552.	27.27	553.20
	552.	26.27	554.20	553.	27.27	556.21	555.	29.27	557.20	558.	27.26	558.20	559.	27.26	559.20	559.	27.26	559.20
05	559.	28.26	559.18	560.	27.25	559.19	560.	27.25	559.19	560.	26.25	559.19	560.	27.25	561.20	560.	27.25	562.20
	560.	27.25	560.19	561.	27.25	562.20	561.	28.25	565.19	562.	28.25	566.19	562.	28.25	565.18	562.	28.25	565.18
06	561.	28.25	565.18	568.	38.25	569.19	574.	61.25	566.23	570.	38.25	571.19	565.	29.25	573.19	566.	28.25	572.18
	566.	28.25	570.19	566.	28.25	570.19	565.	29.25	568.18	565.	29.25	569.19	565.	29.25	569.19	562.	26.25	564.18
07	559.	23.25	560.18	555.	22.25	554.16	551.	22.25	551.15	547.	20.25	549.15	543.	18.25	549.14	540.	17.25	543.15
	535.	17.25	537.15	531.	18.25	530.17	527.	20.25	525.18	524.	20.25	522.18	520.	20.25	519.20	518.	20.25	518.20
08	515.	21.25	515.20	513.	21.25	514.20	511.	22.25	513.20	510.	22.25	512.20	509.	23.25	512.21	508.	23.25	511.21
	508.	24.25	510.21	507.	25.25	511.20	505.	25.25	511.20	506.	26.25	512.21	506.	27.25	511.20	504.	27.25	509.20
09	502.	28.25	507.20	501.	28.24	506.19	499.	28.25	503.19	500.	25.24	504.19	497.	26.24	501.19	496.	27.24	500.19
	494.	28.24	497.18	492.	28.24	497.19	490.	29.24	494.19	489.	29.24	493.19	487.	30.24	492.19	486.	30.24	489.18
10	485.	30.24	486.19	481.	31.23	482.18	479.	32.23	479.18	477.	32.23	480.17	475.	32.23	476.18	474.	32.23	479.18
	473.	32.23	478.18	471.	32.23	473.19	468.	32.23	471.19	468.	31.23	470.19	466.	31.23	465.17	464.	31.23	462.17
11	462.	32.23	460.19	460.	31.23	456.18	459.	32.23	453.16	458.	32.23	453.16	457.	32.23	452.16	455.	32.23	453.17
	454.	32.23	451.17	452.	31.23	451.18	449.	30.23	450.19	448.	30.23	449.19	446.	30.23	448.19	446.	32.23	447.19
12	444.	34.24	446.19	443.	33.24	447.18	441.	33.24	444.17	440.	33.24	442.16	440.	33.24	439.17	440.	33.24	439.17
	440.	33.24	442.16	439.	33.24	442.16	438.	32.24	444.15	437.	32.23	437.14	436.	33.23	438.15	444.	32.18	445.13
13	445.	31.18	443.12	437.	21. 6	427. 5	436.	22. 6	426. 5	446.	28. 3	426. 2	448.	28. 3	428. 2	493.	-0. 1	493. 1
	480.	19. 2	480. 2	478.	19. 2	478. 2	476.	20. 2	476. 2	475.	23. 2	475. 2	474.	26. 2	474. 2	474.	26. 2	474. 2
14	473.	26. 2	473. 2	473.	26. 2	473. 2	453.	35. 3	447. 1	454.	36. 3	450. 1	443.	39. 4	434. 2	445.	37. 4	436. 2
	455.	34. 5	454. 3	454.	33. 5	453. 3	446.	34.16	438.10	446.	34.16	441. 9	443.	32.21	441.13	443.	31.21	439.14
15	443.	30.23	439.16	443.	29.23	437.15	443.	28.23	436.15	443.	28.23	436.15	443.	29.23	441.13	443.	28.23	439.14
	444.	28.23	442.13	443.	28.23	444.14	443.	28.23	444.14	444.	27.23	443.15	445.	27.23	444.15	445.	25.23	443.15
16	444.	24.23	439.15	444.	25.23	438.15	443.	25.23	437.16	443.	24.23	437.16	443.	23.23	440.17	443.	23.23	438.16
	443.	23.23	438.16	443.	24.23	439.15	442.	26.23	443.17	443.	26.23	444.19	443.	27.23	444.19	444.	27.23	445.19
17	445.	29.23	446.19	444.	29.23	444.19	443.	30.23	444.18	444.	28.23	445.18	444.	27.23	445.18	445.	26.23	446.18
	446.	26.23	447.17	447.	26.22	449.16	448.	26.22	448.17	450.	27.22	449.16	452.	28.22	451.16	454.	28.22	453.16
18	457.	28.22	454.17	458.	28.22	458.16	460.	29.22	461.16	462.	28.22	463.16	464.	27.22	467.19	467.	26.22	469.19
	469.	26.22	470.18	470.	26.22	469.17	472.	26.22	470.17	474.	26.22	476.17	475.	29.23	478.16	477.	29.23	478.17
19	476.	31.26	482.18	478.	31.26	483.18	479.	31.26	484.18	481.	31.26	486.18	483.	30.26	487.17	484.	30.26	487.17
	485.	30.27	487.18	486.	30.27	488.18	488.	30.27	490.18	489.	31.27	491.18	490.	32.27	490.19	491.	32.27	491.21
20	492.	32.27	491.21	493.	31.27	492.21	494.	31.27	492.20	496.	32.27	495.21	498.	32.27	495.20	499.	33.27	497.21
	500.	35.27	498.21	501.	34.27	496.20	501.	33.27	497.20	501.	33.27	496.20	501.	33.27	495.21	501.	32.27	493.20
21	501.	31.27	493.20	501.	31.27	495.19	502.	32.27	500.20	503.	31.27	500.21	504.	31.27	502.21	506.	30.27	503.22
	509.	31.27	505.22	508.	29.27	503.21	507.	28.27	503.21	508.	28.27	506.22	510.	28.27	508.22	510.	28.27	508.22
22	510.	29.27	508.22	510.	28.27	508.22	511.	28.27	509.21	511.	28.27	509.21	511.	29.27	509.21	510.	30.27	508.21
	509.	30.27	507.21	509.	30.27	506.20	510.	29.27	506.20	510.	30.27	506.20	511.	31.27	507.20	511.	31.27	510.20
23	512.	31.27	509.19	513.	31.27	513.19	514.	31.27	514.19	514.	31.27	513.20	514.	31.27	510.18	515.	32.27	515.18
	516.	34.27	516.18	517.	33.27	517.18	518.	33.27	519.18	518.	32.27	514.21	518.	32.27	514.21	518.	32.27	514.21

Table 3

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 3 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	528.	18.30	530.21	529.	17.30	529.22	529.	16.30	530.22	531.	15.30	530.23	532.	14.30	530.25	534.	15.30	532.24
	536.	16.30	536.22	536.	16.30	536.24	537.	17.30	534.22	538.	17.30	535.24	538.	17.30	536.23	539.	18.30	538.22
01	541.	19.30	539.22	541.	19.30	539.20	541.	19.30	537.22	541.	18.30	537.22	542.	18.30	539.21	543.	18.30	540.20
	544.	18.30	542.19	544.	19.30	543.19	544.	19.30	544.19	545.	19.30	544.19	545.	19.30	546.20	546.	19.30	547.20
02	547.	19.30	548.20	548.	19.30	549.20	548.	18.30	550.20	549.	19.30	550.20	550.	20.30	550.19	551.	20.30	551.19
	551.	20.30	551.19	553.	19.30	554.18	554.	18.30	553.20	555.	18.30	555.19	554.	19.30	555.19	554.	20.30	555.19
03	554.	20.30	554.19	555.	19.30	554.20	557.	18.30	555.21	557.	18.30	556.20	558.	19.30	553.20	560.	19.30	555.21
	562.	19.30	558.19	564.	18.30	560.20	566.	18.30	562.18	567.	18.30	564.19	568.	19.30	566.19	568.	20.30	567.19
04	568.	21.30	569.20	569.	22.30	570.22	570.	22.30	572.21	571.	23.30	572.20	572.	23.30	573.20	574.	22.30	575.19
	576.	22.30	576.20	576.	23.30	576.20	576.	23.30	576.18	577.	23.30	577.18	579.	23.30	581.18	579.	23.30	582.18
05	580.	25.30	583.18	578.	26.30	580.21	577.	29.30	579.21	576.	31.30	579.19	575.	33.30	576.20	573.	33.30	572.20
	570.	34.30	569.20	569.	34.30	567.20	567.	36.30	563.21	565.	38.30	561.21	562.	41.30	562.19	558.	41.30	553.17
06	553.	41.30	551.18	549.	40.30	544.19	546.	39.30	536.21	541.	38.30	532.20	537.	38.30	527.20	533.	35.30	523.21
	529.	33.30	521.22	526.	33.30	516.21	522.	32.30	511.22	520.	30.30	509.22	517.	29.30	507.22	515.	27.30	508.21
07	512.	25.30	508.20	511.	24.30	506.19	510.	24.30	506.19	508.	25.30	505.21	507.	25.30	508.22	506.	25.30	505.21
	505.	25.30	504.21	504.	25.30	503.21	503.	24.30	499.21	501.	24.30	496.20	500.	24.30	494.20	499.	24.30	494.21
08	498.	24.30	493.21	497.	24.30	491.21	496.	25.30	493.22	495.	26.30	491.22	494.	28.30	491.23	492.	27.30	491.22
	490.	27.30	487.23	489.	27.30	485.22	487.	29.30	484.23	487.	29.30	483.23	486.	29.30	484.24	484.	28.30	481.25
09	482.	28.30	480.24	482.	28.30	479.25	482.	28.30	479.24	481.	28.30	478.24	480.	27.30	477.24	479.	27.30	477.24
	479.	28.30	476.24	479.	27.30	477.24	479.	27.30	475.22	480.	27.30	475.22	480.	27.30	477.22	479.	27.30	474.22
10	478.	26.30	474.22	478.	25.30	474.22	479.	25.30	480.22	479.	25.30	478.23	478.	24.30	480.21	478.	23.29	479.18
	477.	22.29	476.17	477.	21.29	476.19	477.	21.29	474.19	476.	21.29	474.19	475.	22.29	475.20	476.	22.29	475.20
11	476.	23.29	477.20	476.	24.29	476.19	475.	25.29	474.20	474.	25.29	473.18	473.	25.29	471.17	472.	24.28	471.19
	469.	27.29	469.22	469.	26.29	469.22	468.	26.29	467.21	467.	26.29	466.21	465.	26.29	467.20	466.	26.29	470.22
12	466.	27.29	472.21	461.	33.29	466.21	455.	54.29	467.27	455.	52.29	466.27	455.	50.29	466.27	455.	50.29	465.27
	454.	50.29	465.27	458.	34.29	463.23	458.	28.29	461.19	456.	27.28	460.17	455.	28.28	456.18	452.	24.26	451.17
13	452.	24.26	455.17	463.	16. 8	464. 4	467.	18. 7	467. 5	454.	4. 2	454. 2	452.	4. 2	452. 2	-1.	-1. 0	-1. 1
	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2
14	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 2	-1.	-1. 0	-1. 2
	437.	22. 4	433. 2	438.	21. 4	428. 3	437.	29.16	434. 9	437.	29.16	433. 9	431.	29.24	427.13	430.	28.24	424.14
15	424.	32.29	419.18	425.	31.29	419.18	425.	30.29	420.18	425.	29.29	421.18	426.	28.29	424.17	426.	28.29	424.17
	426.	27.29	423.18	426.	26.29	426.18	426.	26.29	428.17	426.	26.29	428.17	425.	26.29	427.17	426.	25.29	427.17
16	426.	24.30	426.19	426.	24.30	428.18	427.	24.30	431.20	427.	23.30	430.21	428.	22.30	430.22	428.	23.30	430.20
	429.	23.30	430.20	429.	23.30	432.19	430.	24.30	432.18	430.	27.30	432.19	431.	30.30	435.20	432.	29.30	438.21
17	434.	29.30	437.19	437.	27.29	440.21	437.	28.29	439.18	439.	28.29	440.20	440.	28.29	441.20	441.	27.29	445.20
	442.	27.29	446.20	443.	29.29	448.20	444.	30.29	449.20	445.	30.29	450.20	447.	30.29	452.20	448.	30.29	455.21
18	450.	31.29	455.20	452.	30.29	460.22	455.	30.29	462.22	457.	30.29	464.22	459.	31.29	465.21	462.	30.29	466.22
	465.	30.29	470.21	467.	30.29	470.22	468.	31.30	473.22	470.	30.30	473.21	473.	29.30	476.21	475.	28.30	479.22
19	477.	28.30	484.22	479.	27.30	483.24	481.	27.30	485.24	482.	27.30	486.24	484.	27.30	488.24	486.	26.30	490.24
	488.	25.30	493.23	490.	25.30	493.24	491.	25.30	495.24	493.	24.30	496.21	495.	24.30	499.20	496.	23.30	499.21
20	498.	23.30	502.22	500.	22.30	504.22	503.	21.30	505.21	503.	21.30	505.22	504.	21.30	507.19	505.	21.30	508.21
	507.	21.30	509.20	508.	21.30	508.20	509.	21.30	512.21	510.	20.30	514.23	511.	20.30	514.22	511.	20.30	515.22
21	512.	20.30	515.22	513.	20.30	516.22	514.	20.30	517.22	515.	20.30	519.21	516.	19.30	518.19	517.	19.30	519.19
	518.	19.30	521.18	519.	20.30	520.19	520.	20.30	521.21	520.	20.30	522.20	522.	20.30	523.20	522.	20.30	524.20
22	522.	20.30	522.22	523.	20.30	525.22	524.	21.30	526.21	524.	21.30	526.20	525.	21.30	527.20	525.	21.30	526.21
	525.	20.30	526.21	525.	19.30	525.20	526.	19.30	525.17	527.	18.30	526.17	528.	18.30	527.18	528.	18.30	528.19
23	529.	18.30	531.23	530.	18.30	530.18	530.	19.30	530.20	531.	18.30	530.21	532.	18.30	532.20	532.	18.30	532.21
	533.	18.30	532.22	532.	20.30	531.22	530.	25.30	532.23	533.	21.30	532.22	536.	20.30	535.24	538.	23.30	535.23

Table 4

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 4 1962

UT	AVER	SDV NO	QAV NO	+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN		
00	546.	38.26	551.19	545.	39.26	551.19	545.	39.26	551.19	546.	39.26	552.19	547.	38.26	552.19	548.	37.26	552.19
	548.	37.26	555.18	548.	36.26	554.18	547.	35.26	554.18	549.	35.26	555.18	550.	35.26	557.18	550.	35.26	555.17
01	551.	33.26	559.19	552.	32.26	558.20	552.	32.26	557.20	552.	33.26	557.19	553.	35.26	558.19	553.	35.26	561.20
	554.	35.26	559.21	556.	35.26	560.18	559.	36.26	562.18	561.	35.26	561.17	563.	36.26	563.19	564.	35.26	563.18
02	566.	34.26	566.19	567.	34.26	571.19	568.	34.26	572.19	569.	33.26	573.19	570.	31.26	570.17	571.	30.26	568.18
	572.	29.26	569.18	573.	30.26	572.19	573.	31.26	576.19	573.	30.26	578.20	574.	30.26	576.20	573.	30.26	575.20
03	572.	30.26	574.20	572.	30.26	572.19	572.	30.26	574.20	571.	31.26	574.20	570.	33.26	573.20	569.	33.26	571.20
	568.	33.26	569.20	566.	34.26	569.21	563.	35.26	567.19	559.	36.26	562.20	555.	37.26	557.19	550.	39.26	555.20
04	545.	42.26	548.21	543.	42.26	543.20	540.	42.26	542.19	537.	42.26	541.20	534.	41.26	534.18	529.	40.26	529.18
	523.	40.26	525.19	519.	40.26	520.19	513.	41.26	514.19	511.	39.26	508.19	508.	37.26	508.20	505.	34.26	506.21
05	502.	33.26	504.21	501.	32.26	501.20	500.	33.26	499.20	500.	32.26	499.20	499.	30.26	501.19	498.	30.26	501.20
	498.	29.26	502.21	498.	28.26	499.21	497.	29.26	500.19	497.	29.26	498.20	498.	29.26	499.20	498.	28.26	501.19
06	499.	28.26	500.18	500.	28.26	503.19	502.	27.26	502.17	503.	27.26	501.18	504.	27.26	505.18	505.	28.26	504.19
	506.	28.26	505.19	506.	28.26	506.19	507.	27.26	505.18	508.	26.26	508.17	508.	26.26	509.18	509.	25.26	510.18
07	509.	25.26	509.17	509.	25.26	508.16	510.	26.26	507.14	509.	25.26	508.15	509.	25.26	505.16	509.	25.26	506.15
	508.	26.26	506.17	509.	25.26	505.16	509.	25.26	506.15	509.	25.26	506.15	509.	25.26	508.16	510.	25.26	511.15
08	510.	25.26	512.15	510.	25.26	512.15	510.	24.26	512.15	508.	22.26	510.15	506.	21.26	507.17	506.	22.26	508.16
	505.	23.26	508.16	505.	23.26	508.16	505.	22.26	510.17	505.	22.26	509.17	505.	22.26	508.16	504.	23.26	507.16
09	503.	25.26	500.16	501.	25.26	497.14	499.	25.26	490.14	497.	25.26	492.16	495.	25.26	491.15	494.	25.26	491.17
	492.	24.26	492.18	493.	24.26	491.17	494.	23.26	492.17	494.	22.26	494.18	492.	21.26	493.19	491.	23.26	493.20
10	491.	24.26	490.19	490.	25.26	491.20	490.	26.26	490.20	488.	28.26	490.19	487.	30.26	490.19	486.	29.26	486.22
	484.	30.26	484.22	483.	29.26	484.22	483.	29.26	482.23	482.	29.26	481.21	481.	29.26	480.21	480.	29.26	481.22
11	479.	30.26	481.22	477.	29.26	479.22	476.	28.26	478.22	475.	27.26	477.21	474.	26.26	478.20	472.	23.26	475.19
	470.	22.26	473.19	470.	21.26	470.19	470.	20.26	469.18	469.	21.26	470.21	467.	22.26	468.19	465.	23.26	468.18
12	463.	25.26	466.18	462.	26.26	464.17	461.	27.26	464.18	459.	27.26	460.19	457.	29.26	456.20	456.	27.26	455.18
	455.	26.26	453.18	454.	26.26	450.17	452.	26.26	450.16	454.	25.25	451.15	453.	25.25	451.15	445.	21.20	446.14
13	445.	22.20	444.13	438.	10. 2	438. 2	437.	10. 2	437. 2	454.	-0. 1	454. 1	463.	-0. 1	463. 1	460.	-0. 1	460. 1
	456.	-0. 1	456. 1	453.	-0. 1	453. 1	450.	-0. 1	450. 1	441.	-0. 1	441. 1	431.	-0. 1	431. 1	431.	-0. 1	431. 1
14	432.	-0. 1	432. 1	429.	-0. 1	429. 1	426.	-0. 1	426. 1	422.	-0. 1	422. 1	418.	-0. 1	418. 1	415.	-0. 1	415. 1
	428.	25. 6	432. 4	428.	27. 6	431. 4	437.	31.21	433.14	437.	31.21	432.15	436.	31.24	432.16	436.	31.24	431.16
15	437.	30.26	434.17	438.	29.26	435.17	438.	28.26	435.17	439.	28.26	436.17	439.	27.26	436.17	440.	26.26	438.17
	442.	26.26	439.17	442.	26.26	439.17	443.	26.26	440.17	443.	26.26	440.17	444.	26.26	441.17	444.	25.26	441.19
16	444.	25.26	441.19	444.	25.26	441.19	445.	26.26	443.20	445.	26.26	443.20	446.	26.26	443.20	445.	26.26	443.20
	445.	27.26	443.19	445.	27.26	442.20	445.	28.26	440.19	446.	28.26	442.18	447.	28.26	443.18	447.	28.26	442.18
17	447.	28.26	441.19	448.	28.26	441.19	448.	29.26	443.18	448.	29.26	443.18	449.	29.26	444.18	448.	29.26	444.20
	447.	29.26	443.20	448.	29.26	443.21	448.	29.26	444.21	449.	30.26	443.22	450.	31.26	442.21	450.	31.26	445.21
18	450.	30.26	445.21	451.	30.26	446.21	452.	30.26	448.21	453.	30.26	449.21	455.	31.26	450.21	455.	31.26	450.21
	455.	32.26	451.21	456.	32.26	452.21	458.	33.26	453.21	460.	33.26	455.21	462.	33.26	458.21	464.	33.26	460.21
19	467.	32.26	464.20	469.	32.26	466.20	472.	32.26	469.20	474.	32.25	470.20	478.	32.25	472.21	481.	31.25	475.21
	484.	31.25	479.21	484.	30.25	482.22	487.	30.25	484.22	491.	30.25	487.22	494.	30.25	491.22	497.	31.25	493.22
20	497.	37.25	496.21	498.	37.25	499.21	502.	35.25	499.20	505.	34.25	502.20	508.	33.25	504.20	510.	33.25	506.20
	513.	33.25	512.18	515.	33.25	514.19	518.	33.25	517.19	520.	33.25	518.20	523.	34.25	521.20	524.	35.25	523.20
21	525.	36.25	525.20	527.	36.25	527.20	528.	36.25	528.20	529.	37.25	529.20	529.	39.25	530.20	531.	40.25	532.20
	532.	41.25	534.20	534.	41.25	538.21	535.	42.25	540.21	537.	42.25	541.21	538.	42.25	543.21	539.	41.25	543.21
22	539.	41.25	544.21	540.	42.25	545.21	540.	42.26	546.23	541.	42.26	547.23	542.	41.26	548.23	543.	41.26	550.21
	545.	41.26	551.21	546.	41.26	553.21	548.	41.26	555.21	548.	40.26	555.21	549.	40.26	555.21	550.	39.26	556.21
23	552.	39.26	559.22	553.	38.26	560.22	554.	38.26	562.22	554.	38.26	561.22	554.	38.26	559.21	554.	37.26	559.21
	553.	36.26	560.20	552.	36.26	560.20	552.	36.26	558.21	553.	36.26	558.21	552.	37.26	557.21	551.	39.26	557.21

Table 5

MONTHLY AVERAGE CN PATH 1 2 FOR MONTH 5 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	559.	14.26	557.15	558.	14.26	557.15	558.	14.26	557.16	558.	14.26	559.16	558.	15.26	558.18	559.	15.26	560.18
	560.	15.26	559.19	561.	15.26	560.19	562.	16.26	561.20	562.	16.26	560.19	563.	16.26	563.17	564.	17.26	563.16
01	565.	19.26	562.17	568.	20.26	567.19	570.	21.26	566.19	571.	20.26	569.17	572.	19.26	568.20	573.	17.26	570.19
	574.	15.26	573.18	575.	14.26	574.18	576.	14.26	575.18	575.	14.26	574.18	574.	14.26	573.16	573.	15.26	572.16
02	571.	17.26	571.16	569.	16.26	569.16	568.	16.26	564.18	565.	17.26	564.15	562.	18.26	558.13	559.	21.26	554.14
	556.	26.26	554.14	553.	27.26	548.15	548.	29.26	542.16	542.	30.26	534.17	536.	32.26	530.15	536.	32.25	526.15
03	523.	33.25	509.17	520.	31.24	506.17	515.	30.24	503.16	508.	26.24	499.16	501.	22.24	497.16	499.	20.24	497.17
	496.	18.25	496.19	494.	17.25	494.19	491.	17.25	490.18	490.	17.25	490.19	489.	17.25	489.19	488.	17.25	487.18
04	487.	17.25	486.16	486.	16.25	487.17	485.	15.25	485.18	485.	15.25	484.18	485.	14.25	482.19	484.	14.25	482.19
	484.	13.25	482.19	483.	13.25	483.19	483.	13.25	484.20	482.	13.25	484.19	482.	13.25	485.20	483.	12.25	485.19
05	484.	12.25	485.18	484.	12.25	484.17	484.	13.25	485.18	484.	13.25	484.19	485.	13.25	485.18	485.	13.25	485.19
	485.	13.25	485.18	485.	13.25	484.18	483.	13.25	483.17	483.	12.25	484.17	483.	12.25	484.17	482.	11.25	483.19
06	481.	12.25	483.18	481.	11.25	482.18	480.	11.25	482.20	481.	11.25	482.20	481.	11.25	482.20	480.	10.25	482.20
	480.	10.25	482.18	480.	11.25	482.21	480.	12.25	482.20	479.	12.25	480.17	478.	13.25	481.17	478.	13.25	482.18
07	478.	13.25	481.17	478.	13.25	481.17	479.	12.25	481.16	480.	12.25	482.16	481.	11.25	483.16	480.	10.24	482.15
	481.	10.24	481.13	481.	10.24	480.14	481.	11.24	480.18	481.	11.24	480.18	481.	12.24	480.18	481.	11.24	481.17
08	482.	12.25	481.15	482.	12.25	481.16	481.	14.25	481.19	482.	13.25	481.19	483.	13.25	483.18	483.	13.25	483.18
	484.	13.25	484.18	484.	13.25	485.19	484.	14.25	486.19	484.	14.25	485.19	484.	14.25	484.18	483.	14.25	483.18
09	482.	14.25	482.18	482.	13.25	482.18	481.	14.25	482.17	481.	14.25	481.17	481.	14.25	481.17	481.	13.25	481.17
	481.	12.25	480.18	481.	12.25	481.19	481.	14.25	481.20	481.	14.25	482.20	482.	14.25	482.18	481.	13.25	482.18
10	480.	16.25	482.17	479.	15.25	481.17	478.	14.25	480.17	479.	14.25	478.17	479.	14.25	478.17	479.	13.25	480.18
	479.	13.25	479.15	480.	12.25	480.18	479.	13.25	478.19	479.	12.25	478.19	478.	12.25	477.19	477.	12.25	477.17
11	476.	12.25	475.14	476.	12.25	476.16	477.	13.25	477.18	476.	13.25	477.17	476.	13.25	475.16	475.	13.25	475.18
	474.	14.25	473.18	473.	13.25	473.18	472.	13.25	472.17	472.	13.25	472.17	471.	13.25	470.16	470.	13.25	469.16
12	470.	14.25	467.17	470.	14.25	467.17	469.	13.25	466.17	468.	13.25	467.16	468.	14.25	466.14	468.	14.25	466.15
	469.	14.25	467.16	469.	13.25	469.16	469.	13.25	469.14	470.	13.24	469.12	470.	13.24	469.15	471.	13.23	470.16
13	470.	13.23	469.16	477.	13. 5	472. 4	476.	14. 5	470. 4	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1
	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1
14	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1
	461.	14. 3	459. 1	461.	13. 3	458. 1	472.	11.16	476.11	473.	11.16	477.11	472.	12.23	476.15	473.	12.23	476.14
15	472.	12.24	472.16	472.	11.24	474.16	472.	11.24	473.14	473.	11.24	474.15	473.	11.24	474.17	474.	11.24	474.16
	474.	11.24	475.15	474.	10.24	475.16	474.	10.24	475.16	474.	10.24	475.16	474.	10.24	476.15	475.	10.24	476.15
16	475.	10.24	475.15	476.	11.24	475.15	476.	12.24	475.13	476.	12.24	476.12	475.	12.24	476.15	475.	12.24	476.16
	476.	12.24	476.17	476.	12.24	476.16	475.	12.24	474.16	476.	12.24	476.14	476.	12.24	475.17	476.	11.24	476.17
17	476.	11.24	477.18	477.	12.24	476.16	478.	12.24	475.14	478.	13.24	476.14	479.	13.24	477.15	479.	13.24	479.17
	478.	13.24	480.17	479.	13.24	480.16	480.	13.24	481.16	480.	14.24	482.16	480.	14.24	483.17	481.	14.24	483.17
18	481.	14.24	483.16	481.	13.24	482.14	482.	13.24	483.16	482.	14.24	483.16	482.	14.24	483.16	482.	14.24	483.16
	482.	15.24	483.17	482.	15.24	484.17	482.	15.24	483.16	483.	16.24	484.17	484.	17.24	486.16	484.	17.24	485.17
19	485.	17.24	485.18	485.	17.24	484.19	485.	17.24	484.19	487.	17.24	486.19	486.	19.24	488.18	486.	20.24	488.18
	487.	19.24	489.18	489.	17.24	490.18	491.	17.24	494.18	494.	16.24	494.18	495.	16.25	495.19	496.	16.25	496.18
20	499.	16.26	498.17	500.	16.26	501.19	502.	16.26	503.19	504.	16.26	505.19	506.	16.26	507.19	509.	15.26	508.21
	512.	15.26	511.21	514.	16.26	513.19	516.	17.26	515.19	518.	18.26	518.19	521.	19.26	519.19	522.	17.26	519.19
21	523.	17.26	520.18	524.	17.26	521.18	525.	18.26	524.18	527.	17.26	525.19	529.	18.26	528.18	529.	18.26	526.18
	530.	18.26	529.18	532.	18.26	531.18	535.	17.26	534.19	535.	17.26	534.20	537.	17.26	538.18	538.	16.26	538.20
22	540.	16.26	540.20	542.	16.26	540.21	544.	16.26	543.20	545.	16.26	545.19	547.	17.26	548.18	549.	16.26	548.18
	550.	16.26	551.19	551.	16.26	552.17	553.	17.26	551.19	554.	16.26	552.16	556.	15.26	554.17	556.	15.26	554.17
23	556.	15.26	554.17	557.	16.26	555.17	557.	17.26	554.16	558.	16.26	554.17	559.	16.26	555.17	559.	16.26	555.17
	560.	17.26	556.17	560.	17.26	557.16	560.	18.26	559.18	561.	17.26	559.17	562.	16.26	561.16	562.	16.26	563.17

Table 6

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 6 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	559.	27.25	557.20	559.	26.25	557.20	559.	26.25	556.20	563.	21.24	56[illegible].18	564.	21.24	562.18	564.	20.24	562.18
	564.	19.24	561.16	565.	18.24	561.19	565.	18.24	562.18	565.	17.24	562.19	565.	16.24	562.19	565.	17.24	561.18
01	565.	20.24	561.19	565.	20.24	562.18	566.	21.24	563.18	566.	21.24	563.18	567.	20.24	562.18	566.	18.24	563.18
	566.	16.24	562.15	563.	16.24	561.15	560.	15.24	557.14	555.	15.24	551.15	547.	21.25	544.19	544.	20.25	542.20
02	541.	20.25	539.20	537.	20.25	537.19	534.	20.25	533.18	531.	20.25	530.19	528.	20.25	526.19	524.	19.24	524.17
	519.	19.24	518.18	516.	18.24	515.18	511.	18.25	512.18	509.	17.25	508.18	506.	17.25	506.19	504.	17.25	502.18
03	501.	17.25	501.18	500.	17.25	500.20	499.	17.25	499.20	498.	17.25	498.20	497.	16.25	496.20	496.	16.25	494.21
	494.	17.25	494.20	494.	17.25	494.20	494.	18.25	495.21	495.	18.25	495.21	495.	18.25	495.21	494.	18.25	495.19
04	494.	18.25	495.19	494.	18.25	495.19	495.	18.25	496.19	495.	17.25	496.19	495.	17.25	495.18	495.	17.24	497.18
	495.	17.24	499.18	495.	16.24	499.19	496.	16.24	497.19	496.	16.24	495.19	497.	16.24	498.19	497.	16.24	498.19
05	496.	16.24	497.18	496.	16.24	496.18	495.	16.24	495.18	496.	16.24	496.18	496.	16.24	497.17	496.	16.24	496.18
	496.	16.24	497.19	496.	15.24	496.20	495.	16.24	493.18	495.	15.24	494.19	495.	15.24	493.19	494.	15.24	492.19
06	493.	15.24	491.18	493.	15.24	492.18	494.	15.24	493.19	493.	15.24	492.18	493.	14.24	493.17	493.	14.24	492.16
	492.	13.24	493.17	493.	13.24	492.16	493.	14.24	493.17	492.	13.24	492.14	491.	12.24	492.16	490.	12.24	491.16
07	490.	11.24	489.17	489.	11.24	488.18	489.	12.24	488.17	488.	12.24	487.17	488.	13.24	487.17	487.	13.24	487.17
	486.	13.24	487.18	486.	14.24	487.20	486.	15.24	488.20	486.	16.24	486.19	485.	17.24	486.19	485.	17.24	485.19
08	484.	18.24	485.19	484.	18.24	485.19	484.	18.24	485.19	484.	18.24	485.19	484.	18.24	485.20	483.	18.24	486.19
	483.	18.24	486.19	483.	18.24	487.20	483.	18.24	487.20	483.	18.24	485.21	482.	18.24	484.19	482.	17.24	483.20
09	482.	17.24	483.20	481.	17.24	483.20	481.	18.24	482.20	481.	18.24	483.20	482.	18.24	484.20	481.	18.24	484.19
	480.	17.24	483.18	481.	18.24	485.19	483.	18.24	485.19	483.	18.24	487.20	484.	18.24	487.20	484.	18.24	486.20
10	484.	18.24	487.19	484.	18.24	487.19	484.	17.24	486.19	484.	17.24	486.19	484.	17.24	486.19	484.	17.24	485.18
	483.	16.24	485.18	483.	16.24	485.19	484.	16.24	485.19	483.	15.24	485.19	483.	15.24	484.19	484.	15.24	486.20
11	485.	15.24	486.21	485.	15.24	486.22	484.	15.24	487.20	484.	15.24	486.21	483.	15.24	485.20	483.	14.24	484.21
	482.	14.24	481.19	482.	14.24	482.19	483.	14.24	485.20	483.	13.24	484.20	482.	13.24	483.21	482.	13.24	483.21
12	482.	13.24	484.20	482.	14.24	484.19	481.	14.24	483.20	481.	14.24	484.19	482.	14.24	484.19	481.	14.24	483.19
	481.	15.24	482.20	482.	15.24	483.20	483.	15.24	484.20	482.	15.24	483.20	481.	15.24	483.19	481.	15.22	483.19
13	481.	15.22	484.18	480.	17. 9	486. 8	480.	17. 9	486. 8	473.	26. 3	491. 2	472.	26. 3	491. 2	463.	20. 2	463. 2
	462.	27. 2	462. 2	436.	-0. 1	436. 1	437.	-0. 1	437. 1	437.	-0. 1	437. 1	438.	-0. 1	438. 1	439.	-0. 1	439. 1
14	441.	-0. 1	441. 1	443.	-0. 1	443. 1	445.	-0. 1	445. 1	446.	-0. 1	446. 1	447.	-0. 1	447. 1	447.	-0. 1	447. 1
	469.	21. 2	469. 2	469.	20. 2	469. 2	480.	14.15	481.12	480.	14.15	483.11	483.	13.23	483.18	483.	13.23	484.18
15	482.	12.24	483.18	483.	12.24	483.18	484.	13.24	485.17	484.	12.24	485.17	484.	12.24	484.17	485.	13.24	486.16
	486.	14.24	487.16	486.	14.24	485.18	486.	14.24	486.18	486.	14.24	485.18	485.	14.24	485.18	485.	14.24	485.18
16	485.	13.24	485.17	486.	14.24	484.17	486.	15.24	483.17	486.	14.24	484.17	485.	14.24	483.16	485.	14.24	483.17
	484.	14.24	482.17	485.	14.24	482.17	485.	14.24	482.17	483.	13.24	482.18	480.	16.24	480.19	479.	16.24	479.19
17	478.	17.24	479.19	480.	16.24	479.19	482.	16.24	482.18	483.	16.24	483.16	484.	17.24	483.18	484.	17.24	484.18
	484.	17.24	485.17	484.	17.24	485.17	485.	17.24	487.18	485.	17.24	485.18	485.	18.24	484.17	485.	17.24	484.17
18	486.	17.24	485.18	485.	16.24	486.19	485.	16.24	485.19	486.	17.24	486.19	486.	18.24	485.18	486.	18.24	486.19
	486.	18.24	486.19	486.	18.24	486.19	487.	18.24	485.18	486.	18.24	485.18	486.	18.24	485.18	487.	18.24	485.18
19	486.	18.25	484.19	486.	18.25	484.19	485.	19.25	483.19	485.	19.25	484.18	484.	20.25	480.18	484.	19.25	481.19
	483.	20.25	480.20	484.	20.25	480.20	484.	20.25	480.20	485.	20.25	481.19	486.	21.25	482.19	486.	20.25	482.20
20	486.	19.25	483.20	487.	19.25	483.20	488.	20.25	484.20	489.	19.25	486.20	491.	19.25	489.21	493.	19.25	489.21
	496.	20.25	492.20	498.	20.25	493.21	499.	20.25	496.20	501.	20.25	496.21	503.	19.25	499.21	505.	19.25	500.21
21	507.	20.25	503.20	510.	20.25	506.20	513.	20.25	510.19	515.	20.25	512.19	518.	20.25	514.20	518.	20.25	515.20
	519.	19.25	517.19	521.	18.25	519.19	524.	18.25	521.20	525.	18.25	522.20	526.	17.25	523.20	528.	18.25	525.20
22	530.	18.25	526.20	530.	17.25	527.20	531.	16.25	528.19	533.	17.25	529.19	535.	17.25	531.18	536.	17.25	532.19
	537.	17.25	533.19	540.	17.25	536.19	542.	17.25	540.17	544.	16.25	543.16	546.	17.25	544.17	548.	17.25	544.17
23	551.	17.25	548.18	553.	17.25	549.17	554.	18.25	552.18	556.	18.25	554.17	558.	18.25	556.19	558.	17.25	554.17
	559.	17.25	557.19	560.	17.25	559.21	561.	18.25	560.21	562.	17.25	560.20	563.	17.25	562.18	564.	18.25	565.17

Table 7

MONTHLY AVERAGE CN PATH 1 2 FOR MONTH 7 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	561.	22.29	560.21	561.	22.28	559.21	561.	21.28	559.21	562.	21.28	561.21	563.	21.28	560.20	563.	20.28	560.20
	564.	20.28	561.22	564.	20.28	561.22	564.	21.28	563.23	564.	21.28	561.21	565.	21.28	563.23	564.	20.28	564.24
01	565.	20.28	564.22	566.	19.28	565.22	566.	19.28	567.23	568.	19.28	568.22	570.	20.28	569.21	571.	19.28	570.23
	572.	19.28	570.23	572.	19.28	570.22	572.	19.28	571.23	571.	20.28	570.23	570.	21.28	569.23	568.	21.28	565.21
02	565.	22.28	563.20	562.	22.28	556.21	558.	22.28	553.20	554.	21.28	550.21	549.	21.28	545.22	545.	21.28	542.22
	540.	22.28	537.22	535.	22.28	529.21	529.	21.28	525.20	524.	20.28	521.21	518.	20.28	516.20	514.	18.28	512.21
03	510.	16.28	510.23	507.	15.28	507.22	504.	14.28	505.22	502.	15.28	503.22	500.	16.28	501.23	498.	16.28	500.23
	497.	16.28	498.23	495.	15.28	496.23	492.	15.28	495.25	491.	14.28	493.23	489.	14.28	492.22	488.	14.28	492.22
04	487.	15.28	489.22	486.	14.28	489.23	485.	14.28	488.21	485.	14.28	486.21	484.	15.28	486.21	484.	14.28	486.21
	484.	14.28	487.21	484.	14.28	487.20	484.	14.28	487.20	484.	14.28	487.18	484.	15.28	488.19	484.	14.28	487.19
05	484.	14.28	486.20	483.	14.28	486.18	483.	14.28	484.18	483.	14.28	484.19	483.	14.28	484.19	483.	14.28	484.19
	483.	14.28	486.19	484.	14.28	486.19	484.	14.28	485.20	484.	14.28	487.21	485.	14.28	487.20	485.	14.28	487.20
06	485.	14.28	487.20	485.	14.28	487.20	486.	14.28	488.21	485.	13.28	486.22	485.	13.28	486.22	485.	13.28	485.21
	485.	13.28	485.21	485.	13.28	485.20	484.	12.28	485.20	484.	12.28	485.20	484.	12.28	485.20	484.	12.28	485.20
07	484.	12.28	485.19	484.	12.28	485.19	484.	12.28	485.19	485.	12.28	485.20	485.	12.28	486.21	485.	11.28	484.21
	484.	11.28	485.20	484.	11.28	485.20	484.	11.28	483.20	484.	11.28	484.19	484.	12.28	485.18	484.	12.28	486.17
08	484.	12.28	487.18	484.	12.28	485.16	483.	13.28	484.18	483.	13.28	484.18	482.	13.28	484.19	482.	13.28	484.20
	482.	13.29	483.20	483.	13.29	484.19	483.	14.29	485.19	484.	13.29	486.20	484.	13.29	485.21	484.	14.29	483.18
09	484.	13.29	482.17	483.	14.29	481.20	483.	17.29	483.23	482.	19.29	484.25	483.	17.29	484.24	483.	16.29	483.22
	484.	15.29	483.23	484.	15.29	483.23	484.	15.29	484.22	485.	14.29	485.23	485.	15.29	486.23	486.	14.29	486.22
10	487.	14.29	486.21	487.	14.29	487.22	486.	14.29	487.21	486.	14.29	485.21	486.	14.29	485.20	486.	13.29	485.20
	486.	13.29	484.19	486.	13.29	485.22	486.	12.29	488.20	486.	12.29	488.22	485.	12.29	486.21	486.	12.29	487.23
11	486.	13.29	488.22	486.	12.29	488.21	486.	11.29	487.22	485.	12.29	486.22	484.	13.29	486.21	484.	13.29	485.21
	484.	14.29	485.20	484.	13.29	484.21	484.	13.29	484.21	484.	13.29	484.22	484.	13.29	483.21	484.	12.29	485.20
12	484.	12.29	485.20	484.	12.29	485.20	483.	12.29	484.20	484.	11.29	485.20	484.	11.29	486.21	484.	10.29	486.21
	484.	11.29	486.20	484.	10.29	486.20	485.	10.29	486.20	484.	10.29	486.20	484.	10.29	485.21	484.	11.28	485.20
13	484.	12.28	486.21	485.	9.10	487. 8	485.	9.10	485. 7	485.	5. 5	484. 3	482.	6. 5	480. 4	483.	5. 5	480. 4
	484.	5. 5	482. 4	484.	4. 5	483. 3	484.	4. 5	484. 3	485.	3. 4	486. 2	484.	3. 4	485. 2	485.	3. 4	485. 2
14	486.	3. 4	486. 2	486.	1. 4	486. 2	485.	4. 4	485. 2	485.	3. 4	483. 3	484.	5. 6	485. 4	484.	6. 6	484. 4
	481.	10. 8	483. 6	482.	10. 8	484. 6	485.	15.21	483.19	485.	15.21	483.19	485.	14.25	484.22	484.	14.25	483.23
15	483.	14.28	484.24	484.	14.28	484.25	485.	14.28	485.25	485.	14.28	485.25	485.	14.28	484.24	485.	14.28	484.24
	484.	15.28	484.24	484.	15.28	484.23	484.	15.28	485.24	484.	16.27	485.23	484.	16.27	484.23	484.	15.27	484.23
16	484.	15.27	484.23	484.	15.27	484.23	484.	16.27	484.23	484.	16.27	484.23	483.	16.27	483.23	483.	16.27	483.23
	483.	16.27	484.22	483.	16.27	483.24	484.	16.27	483.24	484.	16.27	483.24	483.	17.27	484.22	483.	17.27	484.22
17	483.	17.27	484.22	483.	17.27	483.23	484.	17.27	485.22	484.	17.27	484.23	485.	17.27	484.23	484.	17.27	484.23
	484.	17.27	483.22	484.	17.27	483.22	484.	18.27	483.22	484.	16.27	483.22	484.	18.27	481.23	483.	18.27	481.23
18	483.	19.27	481.23	483.	19.27	480.24	484.	19.27	480.24	484.	19.27	480.24	483.	20.27	480.24	483.	20.27	480.23
	483.	20.27	480.23	483.	20.27	480.23	483.	20.27	480.23	483.	21.26	480.22	483.	21.26	480.23	484.	20.26	480.23
19	484.	20.27	481.24	485.	20.27	481.24	484.	19.28	481.25	484.	19.28	481.25	484.	19.28	481.25	485.	19.28	481.25
	485.	19.28	482.27	486.	19.28	483.27	486.	19.28	482.25	486.	19.28	483.26	486.	19.28	485.25	487.	19.28	487.23
20	488.	19.28	487.24	489.	19.28	489.24	490.	19.28	490.24	492.	19.28	492.24	494.	19.28	495.23	496.	19.28	496.24
	498.	19.28	498.24	500.	19.28	501.24	503.	19.28	503.24	505.	19.28	505.23	507.	20.28	506.22	510.	19.28	508.22
21	512.	19.28	512.23	515.	18.28	516.22	518.	18.28	520.23	519.	18.28	520.23	520.	18.28	523.22	522.	18.28	523.23
	524.	19.28	525.23	525.	19.28	524.23	527.	19.26	525.23	526.	13.27	523.18	528.	14.27	525.16	529.	14.27	528.17
22	531.	14.27	529.17	533.	14.27	531.17	534.	14.27	533.18	536.	14.26	536.18	539.	15.26	538.18	541.	15.26	540.18
	543.	15.26	543.18	544.	15.26	542.17	545.	16.26	542.16	547.	16.26	544.17	549.	17.26	546.17	550.	17.26	547.17
23	552.	17.27	554.20	553.	17.27	553.18	555.	17.28	555.19	556.	17.28	556.18	559.	17.28	557.19	560.	17.28	558.20
	561.	17.28	559.20	562.	17.28	560.21	563.	18.28	560.22	564.	18.28	560.22	566.	22.29	561.22	565.	19.28	562.22

Table 8

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 8 1962

UT	AVER	SDV NO	OAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	573.	26.26	574.19	573.	26.26	574.19	573.	26.26	573.19	573.	26.26	573.19	573.	26.26	574.19	573.	26.26	574.19
	573.	27.26	576.20	573.	27.26	575.20	572.	27.26	575.20	572.	27.26	575.20	572.	28.26	575.20	572.	28.26	575.20
01	572.	28.26	575.20	571.	28.26	573.19	570.	27.26	571.19	571.	29.26	572.19	572.	31.26	572.19	573.	31.26	574.19
	575.	31.26	578.18	575.	31.26	574.18	576.	30.26	575.18	577.	29.26	575.18	578.	28.26	576.20	579.	28.26	577.20
02	581.	28.26	577.19	583.	28.26	583.18	585.	27.26	585.18	585.	28.26	583.17	586.	29.26	583.17	586.	29.26	586.17
	585.	29.26	586.17	584.	28.26	587.18	583.	28.26	586.18	580.	28.26	584.18	578.	27.26	583.17	576.	27.26	577.18
03	574.	27.26	575.17	570.	29.26	571.17	566.	31.26	568.16	561.	33.26	568.14	555.	36.26	563.14	551.	38.26	558.14
	546.	40.26	547.14	540.	40.26	542.14	534.	40.26	528.15	528.	41.26	522.15	521.	42.26	516.16	515.	39.26	511.18
04	508.	37.26	504.18	502.	34.26	501.17	496.	32.26	496.18	491.	28.26	492.20	485.	25.26	488.20	482.	23.26	485.21
	477.	22.26	481.20	476.	21.26	478.19	474.	19.26	476.19	472.	19.26	475.19	470.	19.26	473.20	466.	19.26	472.21
05	466.	19.26	471.20	465.	19.26	469.21	464.	19.26	468.21	464.	19.26	467.20	463.	19.26	466.20	463.	18.26	466.20
	463.	18.26	466.19	463.	17.26	467.19	463.	17.26	467.20	463.	16.26	466.20	463.	15.26	467.20	463.	15.26	467.19
06	464.	15.26	467.19	465.	15.25	469.17	465.	14.25	468.18	466.	15.25	469.18	467.	16.25	470.18	468.	15.25	470.20
	468.	14.25	470.20	469.	14.25	471.20	469.	14.25	471.19	470.	14.25	471.18	471.	14.25	472.18	471.	14.25	472.18
07	471.	14.25	472.18	471.	14.25	472.18	471.	14.25	473.19	471.	14.25	472.18	471.	14.25	474.18	472.	14.25	472.18
	474.	15.26	474.19	474.	15.26	475.18	475.	16.26	476.18	475.	15.26	477.17	476.	15.26	478.17	477.	14.26	477.18
08	478.	14.26	478.18	477.	14.26	477.17	477.	13.26	478.15	478.	13.26	480.17	479.	14.26	479.17	479.	14.26	480.15
	480.	14.26	480.18	481.	14.26	481.18	483.	14.26	483.19	484.	14.26	484.18	485.	14.26	486.17	486.	14.26	487.15
09	487.	14.26	488.13	487.	14.26	487.16	488.	15.26	488.17	488.	15.26	488.16	488.	16.26	487.14	487.	15.26	485.15
	486.	16.26	487.13	487.	15.26	488.14	486.	15.26	489.12	486.	15.26	486.14	486.	16.26	487.15	486.	15.26	487.15
10	486.	15.26	485.14	486.	15.26	486.14	487.	14.26	485.17	487.	14.26	485.17	487.	13.26	486.16	487.	13.26	486.18
	486.	13.26	484.18	486.	13.26	484.20	485.	13.26	484.20	485.	14.26	485.19	484.	14.26	485.20	484.	14.26	484.20
11	483.	14.26	483.17	482.	14.26	482.17	482.	13.26	481.17	481.	13.26	482.18	479.	12.26	481.18	477.	11.26	479.16
	475.	13.26	476.17	474.	12.26	475.18	473.	12.26	473.17	472.	12.26	472.16	471.	12.26	472.18	471.	12.26	472.15
12	470.	12.26	473.17	469.	12.26	472.17	468.	13.26	469.18	467.	12.26	467.15	465.	12.26	465.15	466.	12.26	466.17
	466.	12.26	464.19	465.	12.26	465.19	465.	12.26	464.20	465.	12.25	463.20	464.	12.25	463.19	464.	12.24	462.18
13	463.	12.24	462.18	462.	7. 4	463. 2	462.	7. 4	466. 3	460.	8. 3	461. 1	458.	9. 3	460. 1	463.	-0. 1	463. 1
	466.	-0. 1	466. 1	469.	-0. 1	469. 1	473.	-0. 1	473. 1	478.	-0. 1	476. 1	484.	-0. 1	484. 1	484.	-0. 1	482. 1
14	480.	-0. 1	480. 1	481.	-0. 1	481. 1	483.	-0. 1	483. 1	482.	-0. 1	482. 1	472.	6. 3	468. 2	472.	7. 3	467. 2
	469.	9. 4	466. 2	470.	10. 4	465. 3	463.	17.21	462.17	463.	18.20	461.16	461.	18.23	461.18	461.	18.23	462.18
15	460.	19.23	458.17	460.	19.23	458.17	460.	20.23	458.17	460.	21.23	458.17	460.	21.23	458.17	459.	21.23	457.17
	459.	21.23	458.16	458.	21.23	457.16	458.	21.23	457.16	458.	22.23	457.16	457.	22.23	456.16	457.	22.23	456.14
16	457.	22.23	456.14	457.	22.23	455.14	456.	23.23	453.15	455.	23.23	456.15	455.	23.23	455.15	454.	23.23	453.16
	454.	23.23	452.16	454.	23.23	451.17	454.	23.23	450.17	454.	23.23	451.17	454.	23.23	451.17	453.	23.23	452.17
17	453.	23.23	448.16	454.	23.23	451.17	455.	23.23	452.17	455.	23.23	453.17	455.	24.23	453.17	456.	24.23	454.17
	457.	26.23	454.17	457.	26.23	454.17	458.	26.23	454.18	459.	26.23	454.18	460.	26.23	457.17	461.	26.23	458.17
18	462.	27.23	459.17	462.	27.23	459.17	463.	27.23	461.17	464.	27.23	461.17	466.	27.23	463.17	466.	27.23	463.17
	466.	26.24	461.17	467.	26.24	463.19	468.	26.24	464.19	470.	26.24	466.19	472.	26.24	468.19	473.	26.24	469.19
19	473.	25.25	471.19	475.	26.25	473.17	478.	26.25	475.17	479.	27.25	478.17	482.	28.25	480.17	484.	28.25	480.16
	486.	29.25	482.16	489.	29.25	484.16	491.	30.25	487.16	493.	29.25	489.16	495.	29.25	489.17	497.	28.25	491.17
20	499.	29.25	495.15	500.	28.25	494.17	502.	28.25	496.17	504.	28.25	497.16	505.	28.25	499.17	508.	28.25	502.16
	510.	29.25	504.16	512.	29.25	509.16	514.	29.25	510.19	516.	29.24	513.18	518.	29.24	515.18	521.	29.24	517.18
21	524.	30.24	520.18	527.	30.24	523.18	529.	31.25	525.19	531.	30.25	528.19	535.	30.25	533.18	538.	30.25	536.18
	542.	31.25	540.18	545.	31.25	543.18	548.	31.25	545.19	551.	32.25	548.19	553.	33.25	550.19	555.	32.25	552.19
22	557.	32.25	557.17	559.	31.25	558.18	561.	31.25	560.18	562.	31.25	561.18	562.	31.25	562.18	564.	31.25	563.18
	565.	32.25	565.18	567.	31.25	567.18	569.	30.25	567.17	570.	29.25	567.16	571.	29.25	571.18	572.	29.25	572.18
23	573.	28.25	572.17	573.	28.25	572.17	574.	27.25	573.17	575.	27.25	577.18	577.	27.25	579.18	578.	28.25	576.16
	578.	26.25	576.16	578.	25.25	574.17	578.	25.25	574.17	579.	24.25	574.17	579.	24.25	573.18	579.	24.25	575.19

Table 9

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 9 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	571.	24.28	572.23	573.	24.28	572.24	576.	25.28	574.23	577.	26.28	575.23	579.	26.28	577.24	581.	25.28	579.24
	583.	24.28	581.22	584.	25.28	582.22	585.	26.28	582.21	587.	26.28	587.21	589.	26.28	588.21	590.	26.28	591.22
01	592.	27.28	592.22	593.	26.28	592.21	593.	25.28	592.18	594.	26.28	589.17	594.	27.28	589.16	595.	27.28	591.18
	596.	26.28	593.18	598.	26.28	595.18	599.	24.28	598.19	601.	24.28	602.18	603.	25.28	606.19	606.	24.28	607.18
02	608.	24.28	608.21	611.	25.28	609.20	614.	25.28	615.19	615.	25.28	616.21	616.	23.28	618.20	616.	24.28	619.21
	616.	26.28	618.20	616.	26.28	616.19	618.	26.28	615.21	618.	26.28	615.21	618.	27.28	614.20	618.	26.28	616.22
03	617.	27.28	615.22	618.	27.28	616.18	618.	28.28	618.19	619.	28.28	618.18	620.	27.28	620.17	620.	28.28	623.17
	620.	29.28	621.18	622.	29.28	623.15	622.	29.28	622.16	623.	32.28	629.14	624.	35.28	632.15	624.	37.28	629.15
04	624.	39.28	628.15	624.	43.28	627.16	624.	46.28	631.15	624.	49.28	635.16	624.	52.28	631.16	626.	56.28	637.19
	625.	60.28	637.19	623.	65.28	633.18	623.	71.28	648.17	620.	77.28	639.15	615.	82.28	627.14	610.	86.28	625.15
05	603.	89.28	608.14	598.	90.28	599.14	591.	90.28	570.13	585.	88.28	570.14	578.	86.28	569.15	572.	82.28	564.15
	567.	80.28	565.16	560.	77.28	564.15	555.	76.28	555.14	551.	73.28	556.15	545.	71.28	549.15	542.	68.28	546.15
06	538.	65.28	542.15	534.	61.28	538.15	531.	58.28	535.15	527.	54.28	532.16	522.	51.28	523.17	518.	47.28	520.17
	514.	43.28	518.16	511.	40.28	516.17	508.	36.28	513.17	506.	33.28	511.17	503.	31.28	503.17	501.	29.28	501.17
07	498.	28.28	499.17	496.	27.28	497.17	494.	26.28	493.18	492.	24.28	493.19	489.	24.28	490.20	488.	22.27	489.18
	488.	19.28	487.21	485.	18.28	486.21	483.	17.28	484.21	483.	16.28	484.21	482.	15.28	483.22	481.	16.28	482.22
08	480.	17.28	481.21	479.	16.28	478.22	477.	18.28	477.21	476.	18.28	476.22	474.	20.28	474.19	474.	20.28	473.19
	473.	20.28	471.20	472.	20.28	471.19	472.	20.28	473.19	472.	19.28	472.18	472.	19.28	471.17	471.	19.28	470.17
09	470.	19.28	470.18	470.	18.28	471.19	470.	18.28	470.18	469.	18.28	468.17	468.	18.28	464.16	467.	17.28	464.17
	465.	17.28	461.16	466.	17.28	463.16	467.	18.28	465.15	466.	18.28	464.14	465.	17.28	461.17	465.	17.28	463.17
10	465.	17.28	465.17	464.	17.28	461.19	462.	19.28	460.18	461.	20.28	460.21	460.	23.28	455.20	458.	22.28	455.20
	455.	24.28	453.19	452.	22.28	451.19	449.	24.28	448.17	448.	24.28	445.18	447.	25.28	444.18	447.	25.28	443.19
11	447.	25.28	443.19	447.	26.28	444.18	446.	26.28	445.18	446.	26.28	443.18	446.	28.28	442.19	444.	28.28	438.20
	443.	29.28	435.21	439.	26.25	436.18	439.	25.25	436.18	438.	25.25	436.16	438.	25.25	437.15	436.	25.25	433.17
12	433.	25.25	429.17	432.	25.25	431.15	430.	25.25	430.15	429.	23.25	428.15	427.	22.25	426.15	427.	22.25	424.16
	426.	22.25	422.15	426.	22.25	423.14	425.	23.25	426.16	424.	22.25	424.15	423.	22.25	425.14	421.	21.24	423.13
13	421.	21.24	422.13	411.	15. 4	404. 3	410.	15. 4	407. 2	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1	-1.	-1. 0	-1. 1
	413.	-0. 1	413. 1	413.	-0. 1	413. 1	442.	30. 2	442. 2	442.	31. 2	442. 2	441.	31. 2	441. 2	441.	30. 2	441. 2
14	441.	29. 2	441. 2	440.	29. 2	440. 2	439.	29. 2	439. 2	466.	-0. 1	466. 1	464.	-0. 1	464. 1	462.	-0. 1	462. 1
	409.	31. 4	392. 3	409.	30. 4	392. 3	380.	29.17	376.13	380.	28.17	377.12	382.	29.22	380.15	381.	29.22	379.15
15	378.	28.26	377.19	377.	28.26	374.18	377.	28.26	374.18	376.	28.26	373.18	375.	29.26	373.17	376.	28.26	372.18
	376.	28.26	373.18	373.	25.25	373.16	373.	25.25	374.16	374.	24.25	374.16	374.	24.25	374.16	374.	24.25	373.15
16	374.	23.25	374.14	375.	23.25	375.14	376.	22.25	376.14	376.	23.24	375.13	376.	24.24	377.14	377.	24.24	378.14
	378.	24.24	376.15	379.	23.24	378.15	382.	22.24	379.16	382.	22.24	382.15	383.	22.24	383.15	383.	22.24	382.16
17	384.	22.24	382.14	387.	22.24	384.15	390.	22.24	389.16	392.	22.24	392.16	395.	22.24	396.17	396.	21.24	397.17
	397.	21.24	400.17	399.	20.24	400.18	401.	20.24	402.18	403.	19.24	404.18	405.	18.24	408.17	407.	17.24	410.17
18	410.	16.24	411.16	412.	16.24	412.18	416.	17.25	415.19	419.	16.25	417.18	422.	16.25	420.18	424.	15.25	422.18
	428.	15.25	424.17	429.	14.24	430.15	433.	15.24	434.15	436.	15.24	436.16	439.	15.24	441.15	441.	15.24	443.15
19	444.	16.24	443.17	446.	16.24	444.18	447.	17.25	446.18	449.	17.25	448.18	454.	19.27	452.19	457.	18.27	455.19
	460.	18.27	457.18	464.	18.27	463.18	468.	19.27	470.19	471.	19.27	473.19	473.	20.28	477.19	476.	21.28	478.22
20	478.	23.28	481.22	481.	22.28	486.21	484.	22.28	486.20	486.	22.26	487.18	489.	23.26	490.16	492.	23.26	492.16
	496.	24.26	495.16	500.	21.25	502.17	503.	21.25	503.18	506.	20.25	507.17	509.	19.25	511.17	511.	18.25	512.16
21	513.	17.25	515.17	516.	16.25	516.16	519.	16.26	519.19	521.	17.26	520.18	522.	20.28	524.19	525.	21.28	525.20
	528.	22.28	525.18	530.	22.28	527.20	532.	23.28	528.20	535.	23.28	531.22	539.	23.28	533.21	542.	23.28	538.21
22	545.	23.28	542.21	548.	24.28	543.20	551.	26.28	548.18	553.	25.28	551.18	556.	26.28	550.19	559.	26.28	553.21
	561.	25.28	557.20	563.	24.28	558.21	565.	24.28	561.20	568.	25.28	564.20	571.	26.28	568.20	572.	26.28	572.18
23	574.	27.28	575.17	575.	26.28	575.18	578.	27.28	577.18	579.	27.28	577.19	580.	27.28	579.19	582.	26.28	581.21
	585.	27.28	585.20	586.	28.28	588.21	587.	29.28	588.20	589.	30.28	591.21	591.	31.28	592.20	593.	33.28	596.21

Table 10

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 10 1962

UT	AVER	SCV NO	QAV NO	+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	534.	38.27	530.20	534.	37.27	532.19	535.	36.27	533.19	535.	34.27	533.21	537.	34.27	534.21	537.	34.27	537.20
	538.	35.27	538.20	539.	35.27	537.21	540.	36.27	540.20	542.	36.27	540.21	544.	37.27	544.20	546.	37.26	545.19
01	548.	37.26	545.20	549.	37.26	547.19	552.	37.26	548.20	553.	38.26	549.20	553.	38.26	548.21	556.	39.25	550.20
	558.	40.25	552.20	558.	40.25	552.18	559.	39.25	552.19	560.	37.25	554.19	561.	37.25	556.20	559.	31.24	558.18
02	562.	33.26	558.20	563.	32.26	559.20	564.	32.26	559.20	564.	32.26	559.20	566.	33.26	561.20	567.	34.26	560.21
	568.	35.26	560.21	569.	36.26	561.21	571.	38.26	566.21	574.	38.26	567.20	578.	38.26	572.20	579.	38.26	572.20
03	579.	38.26	574.19	580.	37.25	578.19	584.	36.26	583.18	586.	38.26	585.18	588.	40.26	585.21	590.	39.26	588.21
	592.	37.26	587.20	593.	38.26	591.19	595.	40.26	593.19	597.	41.26	595.19	596.	42.26	596.18	598.	43.26	598.20
04	600.	41.26	595.18	600.	42.26	594.18	599.	39.26	597.19	600.	39.26	595.18	603.	40.26	595.19	602.	40.26	594.19
	603.	40.26	596.18	604.	39.26	592.16	606.	41.26	591.17	606.	40.26	591.17	608.	41.26	592.17	607.	38.26	592.17
05	606.	37.26	595.18	606.	37.26	595.20	604.	35.26	593.18	603.	37.26	594.21	603.	37.26	595.22	602.	35.26	595.20
	601.	34.26	596.19	598.	32.26	595.18	595.	30.26	591.17	593.	27.26	594.19	591.	26.26	594.18	588.	26.26	593.18
06	585.	27.26	592.19	580.	26.26	586.20	576.	26.26	581.20	572.	25.26	574.18	567.	26.26	567.17	560.	27.26	564.15
	553.	27.26	557.15	548.	26.26	553.16	543.	25.26	547.18	540.	25.26	540.16	534.	26.26	533.16	530.	25.26	530.17
07	525.	25.26	525.17	520.	21.25	521.16	516.	20.25	517.17	513.	20.25	515.18	509.	20.25	512.16	506.	20.25	507.15
	501.	19.25	502.15	500.	19.24	501.14	496.	20.24	501.17	494.	20.24	500.16	492.	21.24	495.16	488.	20.24	490.14
08	486.	24.25	490.16	483.	25.25	487.16	484.	30.26	485.18	481.	31.26	481.18	478.	32.26	475.19	477.	33.25	475.18
	476.	33.25	471.20	473.	32.25	469.19	469.	32.25	467.18	467.	32.25	464.19	465.	33.25	461.18	462.	32.25	461.19
09	457.	32.25	456.18	455.	31.25	453.18	453.	31.25	452.17	454.	32.25	455.18	454.	33.25	455.18	454.	35.25	454.18
	454.	36.25	453.18	453.	37.25	451.18	450.	38.25	446.19	450.	36.25	442.19	448.	36.25	443.17	446.	35.25	442.17
10	445.	34.25	441.17	442.	32.25	436.18	439.	31.25	435.17	437.	30.25	433.18	435.	29.25	434.17	432.	31.25	427.19
	430.	33.25	426.18	430.	35.25	426.18	430.	37.25	426.18	432.	40.25	428.18	435.	42.25	427.18	435.	40.25	432.18
11	434.	40.25	428.17	433.	39.25	426.17	432.	38.25	423.18	432.	37.25	425.19	431.	36.25	424.17	432.	36.25	423.18
	432.	38.25	423.18	433.	35.25	427.17	434.	34.25	433.16	436.	35.25	438.17	439.	37.25	441.17	438.	37.25	444.16
12	438.	38.25	442.15	436.	40.24	439.16	436.	43.24	440.16	437.	43.24	444.17	438.	43.24	449.16	442.	42.23	452.16
	445.	42.23	452.15	445.	41.23	453.15	445.	41.23	454.16	446.	42.22	456.15	446.	43.22	456.15	445.	43.22	458.14
13	444.	43.22	455.13	442.	40. 5	447. 3	443.	43. 5	449. 3	467.	33. 3	491. 2	468.	37. 3	495. 2	470.	34. 3	494. 2
	471.	31. 3	494. 2	473.	32. 3	495. 2	475.	32. 3	498. 2	477.	32. 3	500. 2	450.	57. 4	464. 2	445.	58. 4	475. 3
14	435.	54. 5	447. 3	435.	54. 5	446. 3	434.	54. 5	446. 3	432.	52. 5	421. 2	427.	48. 5	431. 3	431.	48. 5	436. 3
	424.	51. 6	423. 2	421.	52. 6	438. 3	428.	45.20	438.14	426.	46.20	436.14	425.	47.21	436.15	424.	47.21	433.14
15	421.	49.25	430.14	420.	48.25	429.14	419.	48.25	430.14	419.	47.25	428.14	418.	46.25	428.14	417.	45.25	425.16
	417.	43.25	424.16	417.	43.25	426.17	418.	42.25	425.17	417.	42.25	424.17	417.	41.25	423.17	416.	40.25	422.17
16	416.	39.25	421.17	415.	38.25	420.17	415.	37.25	422.16	414.	35.25	419.17	414.	32.25	418.17	413.	30.25	416.17
	412.	28.25	417.19	412.	27.25	416.18	413.	27.25	415.17	414.	27.25	415.17	414.	27.25	415.17	415.	27.25	416.17
17	416.	27.25	417.17	418.	27.24	420.16	422.	29.24	424.16	424.	28.24	425.16	427.	28.24	428.18	429.	28.24	434.18
	432.	28.24	437.18	436.	28.24	438.17	440.	28.24	439.19	445.	29.24	447.18	450.	31.24	453.18	453.	31.24	456.18
18	457.	32.24	462.19	462.	31.23	468.18	465.	32.23	471.18	467.	33.23	473.18	468.	34.23	475.18	471.	34.23	478.18
	473.	35.23	482.19	475.	34.23	482.18	477.	35.23	484.18	480.	32.23	489.17	482.	31.23	491.17	485.	32.22	490.17
19	487.	33.22	491.19	486.	31.22	485.18	487.	30.22	488.17	490.	28.22	493.16	493.	26.22	495.18	493.	24.22	496.16
	494.	22.22	494.16	496.	22.22	497.17	498.	23.22	497.16	500.	20.22	498.16	502.	18.22	502.14	505.	18.22	504.14
20	508.	20.22	506.14	509.	20.22	507.14	511.	22.22	511.15	511.	21.22	512.13	512.	20.22	511.12	513.	21.22	512.12
	514.	23.22	514.13	513.	22.22	512.14	514.	21.22	511.15	516.	20.22	510.13	518.	20.22	517.13	520.	21.22	515.12
21	521.	22.22	522.13	522.	24.22	520.15	520.	30.23	522.15	522.	30.23	525.16	523.	30.23	524.17	523.	28.23	523.16
	521.	27.24	522.16	522.	30.24	521.17	522.	34.24	524.16	523.	34.24	526.17	522.	34.25	527.17	523.	36.25	523.17
22	525.	37.25	523.17	526.	38.25	525.17	528.	39.25	524.18	526.	38.25	519.17	525.	37.25	519.18	526.	38.25	520.18
	527.	38.25	519.19	528.	37.25	520.19	531.	36.26	526.21	532.	35.26	529.20	533.	35.26	529.19	535.	36.26	528.20
23	535.	34.26	531.21	534.	34.26	529.21	534.	35.26	533.19	536.	35.26	532.21	538.	35.26	534.23	539.	34.26	536.22
	540.	34.26	538.22	540.	35.26	536.21	540.	34.26	537.21	540.	35.26	539.22	540.	35.26	540.21	542.	36.26	544.20

Table 11

MONTHLY AVERAGE CN PATH 1 2 FOR MONTH 11 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	507.	17.28	510.18	509.	17.28	512.19	511.	17.28	513.20	512.	17.28	514.20	515.	17.28	518.19	515.	16.28	518.20
	516.	15.28	518.20	514.	14.28	517.18	514.	15.28	518.22	516.	15.28	518.21	517.	15.28	520.21	519.	15.28	520.20
01	521.	14.28	523.19	522.	13.28	524.18	523.	13.28	524.20	524.	13.28	525.17	526.	14.28	527.20	527.	13.28	529.20
	529.	12.29	530.19	531.	12.29	532.20	534.	14.29	534.21	536.	14.29	537.21	537.	15.29	537.22	537.	15.29	538.22
02	538.	15.29	538.19	539.	16.29	538.20	541.	17.29	541.24	542.	16.29	544.22	543.	15.29	544.24	542.	13.29	542.22
	541.	12.29	542.22	541.	14.29	543.22	542.	15.29	545.22	543.	14.29	546.20	545.	14.29	547.20	545.	13.29	546.22
03	546.	14.29	546.19	546.	14.29	547.20	546.	14.29	548.20	546.	14.29	548.20	547.	15.29	550.21	547.	14.29	550.21
	547.	14.29	550.20	549.	15.29	551.22	550.	17.29	552.22	550.	15.29	552.22	551.	15.29	550.21	551.	15.29	550.19
04	551.	16.29	553.20	551.	17.29	553.17	551.	17.29	555.19	552.	16.29	555.21	552.	17.29	555.21	552.	16.29	553.21
	551.	16.29	551.20	552.	17.29	553.22	552.	20.29	554.22	553.	18.29	554.21	554.	17.29	555.20	553.	17.29	554.19
05	552.	17.29	552.20	552.	16.29	553.19	552.	16.29	554.20	552.	16.29	552.20	553.	17.29	553.21	552.	17.29	552.20
	552.	18.29	552.18	551.	19.29	551.20	551.	21.29	551.22	551.	21.29	550.20	551.	20.29	551.19	553.	19.29	554.18
06	554.	19.29	555.17	554.	18.29	554.16	554.	17.29	554.17	555.	16.29	556.19	557.	16.29	556.19	558.	17.29	556.19
	558.	18.29	559.17	558.	15.29	559.19	559.	15.29	558.18	556.	14.29	558.19	554.	15.29	554.20	549.	14.29	549.19
07	545.	15.29	545.19	540.	14.29	540.18	535.	15.29	538.19	532.	17.29	532.19	528.	20.29	529.20	524.	20.29	522.21
	520.	22.29	516.20	517.	21.29	514.21	513.	20.29	511.20	510.	20.29	507.18	506.	20.29	505.21	502.	19.29	501.17
08	498.	18.29	497.18	495.	18.29	495.22	493.	21.29	494.21	491.	21.29	492.19	489.	21.29	488.19	488.	22.29	487.20
	488.	22.29	488.19	487.	22.28	489.21	485.	23.28	487.21	486.	22.28	487.21	487.	22.28	486.21	487.	21.28	487.22
09	486.	19.28	485.20	485.	19.28	486.19	484.	19.28	484.19	484.	20.28	484.17	485.	21.28	485.17	483.	20.28	484.18
	481.	20.28	479.20	481.	19.28	480.19	480.	17.28	481.20	480.	17.28	482.21	480.	16.28	481.20	478.	17.28	480.20
10	477.	19.28	479.21	476.	21.28	478.20	476.	23.28	478.20	474.	22.28	478.20	473.	22.28	476.18	473.	20.28	474.19
	473.	19.28	474.19	471.	19.28	474.21	469.	18.28	471.21	468.	18.28	470.22	467.	18.28	467.22	466.	16.28	466.22
11	464.	16.28	464.21	464.	16.28	465.21	464.	17.28	463.23	463.	17.28	462.23	462.	18.28	461.21	462.	17.28	460.20
	462.	17.28	460.18	461.	15.28	460.18	460.	14.28	461.20	459.	14.28	460.19	458.	14.28	458.21	458.	14.28	458.21
12	457.	15.28	456.22	457.	15.28	455.21	457.	16.28	455.21	456.	18.28	455.20	455.	20.28	456.21	454.	19.28	456.19
	454.	20.28	456.19	453.	19.28	456.19	453.	21.28	455.19	452.	21.28	452.21	451.	23.28	452.21	451.	21.28	453.21
13	451.	21.28	452.19	454.	15.12	455. 8	455.	16.12	456. 6	457.	18. 6	460. 4	456.	19. 6	458. 4	448.	19. 4	458. 3
	448.	21. 4	453. 2	427.	14. 2	427. 2	428.	19. 2	428. 2	429.	22. 2	429. 2	425.	21. 2	425. 2	448.	-0. 1	448. 1
14	454.	-0. 1	454. 1	456.	-0. 1	456. 1	462.	19. 2	462. 2	465.	18. 2	465. 2	462.	16. 3	451. 2	465.	16. 3	459. 1
	468.	15. 6	460. 3	468.	15. 6	460. 3	461.	15.14	459.10	462.	15.14	460.11	466.	18.25	464.17	466.	18.25	466.16
15	466.	18.27	465.17	465.	18.27	465.18	465.	18.28	463.21	465.	18.28	463.21	466.	18.28	463.21	465.	19.28	464.20
	464.	20.28	466.21	465.	20.28	465.20	465.	19.28	464.19	466.	21.28	462.19	466.	22.28	464.18	468.	22.28	467.19
16	470.	22.28	471.20	473.	22.28	471.19	475.	22.28	472.20	476.	22.28	474.19	477.	23.28	476.20	479.	23.28	478.20
	480.	23.28	481.19	482.	24.28	484.19	484.	25.28	485.20	485.	26.28	486.19	487.	27.28	486.19	488.	26.28	489.18
17	490.	26.28	492.17	492.	27.27	495.18	496.	28.28	498.19	495.	29.28	497.19	495.	29.28	495.18	495.	29.28	497.20
	494.	30.28	495.19	494.	30.28	495.18	493.	31.28	495.17	492.	30.28	492.18	490.	29.28	490.18	488.	28.28	489.18
18	487.	27.28	484.18	485.	27.28	484.19	483.	26.28	482.19	482.	25.28	481.19	481.	24.28	481.19	480.	23.28	478.19
	480.	22.28	478.19	480.	22.28	479.18	480.	22.28	476.19	480.	21.28	476.19	479.	21.28	476.20	480.	18.27	479.18
19	479.	18.27	476.20	478.	18.27	478.20	478.	18.27	477.20	477.	15.27	477.20	476.	14.27	476.17	476.	14.27	477.17
	476.	14.27	478.18	477.	14.27	480.18	477.	14.27	477.16	478.	14.27	480.19	480.	14.27	480.18	481.	15.27	482.18
20	482.	16.27	483.19	482.	15.27	482.20	482.	15.27	481.20	483.	15.27	482.20	485.	16.27	484.20	484.	17.27	486.18
	484.	18.28	486.19	484.	17.28	486.19	484.	16.28	486.19	484.	16.28	487.20	484.	17.28	487.19	485.	17.28	487.19
21	485.	17.28	488.16	484.	17.28	485.18	484.	18.28	483.17	484.	19.28	482.18	485.	19.28	485.19	487.	19.27	489.18
	488.	19.27	488.19	489.	18.27	491.18	490.	17.27	493.19	489.	17.27	491.18	489.	17.27	493.15	490.	16.27	494.17
22	492.	15.27	493.18	492.	15.27	493.18	493.	15.27	495.17	494.	16.27	495.18	495.	18.27	497.20	495.	19.27	497.20
	495.	19.27	497.16	496.	18.27	499.16	498.	18.27	499.18	499.	17.27	497.18	500.	17.27	499.19	502.	16.27	500.18
23	505.	17.27	503.18	506.	17.27	504.18	507.	17.27	508.18	507.	17.27	506.18	508.	18.28	506.20	509.	18.28	507.20
	511.	19.28	511.21	513.	20.28	512.21	514.	21.28	513.19	516.	21.28	517.19	518.	22.28	518.18	520.	22.28	523.20

Table 12

MONTHLY AVERAGE ON PATH 1 2 FOR MONTH 12 1962

UT	AVER	SDV NO	QAV NO		+ 5 MIN			+10 MIN			+15 MIN			+20 MIN			+25 MIN	
00	503.	14.22	506.16	504.	16.22	506.15	506.	15.22	507.14	506.	17.22	510.13	508.	18.22	511.13	508.	19.22	512.16
	509.	18.22	513.14	510.	15.22	512.13	511.	15.23	513.14	510.	15.23	513.15	510.	16.23	513.15	510.	17.23	513.15
01	511.	17.23	513.16	512.	16.23	515.16	513.	16.23	514.17	514.	16.23	514.16	515.	17.23	515.16	516.	16.23	516.16
	517.	16.23	519.16	518.	17.23	518.18	520.	18.23	520.17	521.	18.23	521.18	522.	18.23	522.17	523.	17.23	522.18
02	524.	17.23	523.18	523.	17.23	522.18	522.	17.23	523.17	522.	17.23	522.18	521.	17.23	521.18	521.	15.23	522.19
	521.	16.23	521.18	519.	21.23	523.18	519.	21.23	523.18	520.	20.23	522.18	520.	19.23	521.17	521.	16.23	521.17
03	522.	16.23	523.16	523.	15.23	523.17	523.	15.23	524.17	523.	15.23	524.17	523.	16.23	523.17	520.	17.23	525.16
	520.	18.23	525.16	520.	18.23	526.14	522.	18.23	524.16	522.	18.23	524.16	523.	19.23	523.15	524.	18.23	525.16
04	525.	18.23	526.16	526.	17.23	526.15	526.	17.23	526.13	526.	15.23	527.16	526.	15.23	526.16	526.	15.23	525.15
	527.	14.23	525.17	527.	15.23	526.17	528.	15.23	527.17	528.	16.23	529.17	528.	17.23	529.17	529.	16.23	529.16
05	530.	16.23	530.16	529.	16.23	532.16	530.	17.23	531.17	529.	17.23	530.18	529.	18.23	530.18	529.	16.23	529.18
	529.	14.23	529.17	530.	14.23	531.18	530.	14.23	531.18	531.	14.23	530.14	532.	14.23	532.15	533.	14.23	534.14
06	533.	13.23	534.13	532.	12.23	534.14	531.	12.23	532.15	531.	12.23	530.14	531.	12.23	532.17	530.	12.23	529.15
	531.	11.23	529.15	531.	10.23	530.16	530.	10.23	530.16	531.	11.23	534.16	533.	13.23	533.15	531.	13.23	530.14
07	532.	13.23	531.12	532.	13.23	528.13	532.	13.23	532.13	534.	13.23	533.15	535.	13.23	534.14	534.	12.23	534.15
	533.	13.23	533.15	532.	15.23	532.15	531.	17.23	533.16	529.	17.23	530.15	526.	19.23	529.16	523.	19.23	525.15
08	517.	21.23	519.17	515.	21.23	516.14	509.	24.23	508.16	506.	26.23	505.18	503.	25.23	505.16	500.	21.23	502.15
	498.	19.23	499.15	494.	20.23	498.16	490.	22.23	489.16	487.	22.23	485.15	484.	23.23	487.16	483.	23.23	485.16
09	480.	22.23	479.17	479.	20.23	478.17	477.	20.23	476.17	474.	19.23	474.18	474.	19.23	474.18	472.	18.23	472.17
	470.	18.23	470.15	469.	18.23	470.14	465.	18.23	466.15	464.	17.23	465.15	464.	17.23	462.14	464.	16.23	461.16
10	463.	17.23	465.14	463.	16.23	463.15	463.	15.23	466.14	462.	16.23	463.13	462.	15.23	461.14	460.	13.23	459.15
	461.	13.23	460.14	461.	13.23	461.14	462.	13.23	463.14	462.	14.23	463.13	463.	16.23	463.15	461.	14.23	464.15
11	461.	15.23	463.14	461.	15.23	463.15	462.	16.23	466.17	463.	14.23	464.15	463.	12.23	464.15	462.	14.23	465.13
	460.	17.23	464.15	460.	14.23	464.14	461.	13.23	461.13	460.	12.22	461.13	459.	13.22	460.14	459.	13.22	459.15
12	461.	13.22	460.14	461.	13.22	461.15	461.	13.22	462.15	461.	12.22	461.15	461.	13.22	461.15	460.	13.22	461.14
	459.	14.22	461.13	460.	13.22	461.12	461.	13.22	462.13	461.	13.22	458.13	459.	13.22	461.15	460.	13.22	461.15
13	461.	14.22	462.15	456.	13. 8	460. 5	457.	14. 8	461. 5	453.	14. 4	451. 2	454.	14. 4	451. 2	454.	14. 4	451. 2
	454.	15. 4	451. 2	453.	14. 4	446. 3	452.	13. 4	445. 3	456.	13. 3	454. 1	457.	13. 3	455. 1	459.	12. 3	457. 1
14	460.	11. 3	459. 1	461.	11. 3	460. 1	463.	11. 3	462. 1	464.	11. 3	464. 1	465.	11. 3	467. 1	466.	10. 3	468. 1
	461.	17. 6	467. 3	462.	17. 6	467. 3	463.	19.18	464.11	462.	20.19	461.11	465.	21.21	465.13	466.	20.21	467.12
15	467.	20.22	471.14	467.	20.22	470.15	469.	18.22	471.15	471.	18.22	473.13	473.	19.22	474.13	475.	19.22	476.13
	476.	21.22	476.12	478.	22.22	476.13	478.	26.22	477.14	480.	23.22	480.15	482.	19.22	485.14	486.	17.22	487.13
16	489.	16.22	489.14	493.	15.22	491.15	496.	14.22	496.16	499.	15.22	498.14	502.	17.22	502.14	504.	18.22	501.12
	507.	20.22	503.10	509.	19.22	505.12	511.	19.22	508.13	513.	18.22	509.15	515.	17.22	513.16	515.	16.22	511.15
17	515.	15.22	511.15	516.	16.21	512.13	517.	17.21	514.13	519.	17.21	517.12	521.	18.21	520.13	523.	16.21	519.13
	523.	16.21	523.15	523.	15.21	525.15	524.	13.21	524.15	525.	12.21	524.14	526.	11.21	524.12	526.	10.21	525.11
18	525.	11.21	527.11	524.	12.21	525.13	524.	13.21	523.14	523.	13.21	521.15	522.	13.21	520.14	521.	12.21	520.15
	520.	13.21	519.16	518.	13.21	519.15	516.	12.21	515.15	515.	12.21	515.13	512.	12.21	515.15	511.	13.21	513.14
19	508.	13.21	510.13	508.	13.21	510.15	507.	13.21	508.16	506.	13.21	506.15	503.	15.21	505.14	500.	16.21	501.15
	500.	17.21	501.15	499.	16.21	501.15	498.	16.21	499.14	498.	16.21	498.15	496.	18.21	497.15	496.	17.21	497.15
20	495.	18.21	492.14	493.	18.21	492.14	492.	18.21	491.13	491.	17.21	490.13	490.	16.21	488.14	491.	16.21	491.12
	492.	16.21	492.14	490.	19.21	487.13	490.	21.21	487.14	489.	19.21	487.14	489.	18.21	489.13	488.	17.21	485.11
21	488.	17.21	488.13	488.	17.21	485.11	488.	17.21	484.11	489.	17.21	486.12	489.	16.21	485.11	490.	16.21	487.12
	490.	16.21	488.13	491.	16.21	490.13	494.	16.21	494.13	494.	16.21	494.13	495.	17.21	494.13	494.	16.21	491.15
22	492.	15.22	491.16	493.	16.22	494.15	493.	17.22	495.15	493.	16.22	494.12	495.	16.22	493.13	495.	16.22	496.14
	497.	15.22	497.15	497.	16.22	497.16	498.	16.22	499.15	497.	16.22	497.12	498.	17.22	495.12	496.	19.22	493.14
23	497.	18.22	497.12	498.	17.22	496.12	498.	16.22	496.14	500.	16.22	496.15	501.	17.22	497.13	501.	16.22	497.15
	503.	16.22	502.13	504.	16.22	501.14	504.	17.22	499.16	504.	17.22	501.14	506.	16.22	502.16	507.	15.22	504.15

Table 13

Semi-monthly mean diurnal phase change
(GBR-College path)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Dates													
1962 11-20	85	130	175	135	100	75	80	120	245	165	95	65	degrees
1962 25-5*	85	145	145	130	90	85	100	155	315	125	75	70	degrees

*Begins in month as shown to 5th of next month

Table 14

RMS phase difference between observations
separated by time T (GBR-College path)

1962 Month	Time of Day	T									
		10	20	30	40	50	60	70	80	90	minutes
Jan.	Night	6.9	10.4	12.2	14.3	16.1	17.3	18.6	20.8	23.5	degrees
"	Day	9.3*	11.8*	13.8*	17.8*	20.3*	24.0*	27.3*	31.4*	35.3*	"
Feb.	Night	7.4×	14.2×	20.3×	26.6×	32.8×	38.3×	44.2×	49.1×	52.9×	"
"	Day	6.6*	7.3*	6.4*	8.2*	8.5*	7.7*	6.0*	7.3*	6.4*	"
Mar.	Night	15.0	26.5	37.8	46.7	57.0	62.2	69.6	78.9	88.7	"
"	Day	14.2	27.8	40.3	52.1	62.8	73.3	83.7	94.3	105.2	"
Apr.	Night	11.5	20.0	27.6	35.6	43.3	50.5	57.2	63.8	70.6	"
"	Day	7.2	11.8	15.2	19.4	23.1	25.3	27.6	30.5	33.6	"
May	Night	11.2	19.3	25.4	30.8	36.1	40.4	44.0	46.9	48.4	"
"	Day	4.7	6.7	9.1	11.5	13.4	15.8	18.1	20.9	23.3	"
June	Night	13.3×	22.4×	30.3×	35.3×	39.4×	43.4×	46.9×	48.7×	54.7×	"
"	Day	5.7	5.8	7.8	7.8	9.2	8.5	10.4	10.3	11.0	"
July	Night	13.5×	22.5×	30.4×	36.8×	41.3×	44.7×	47.7×	47.5×	51.6×	"
"	Day	4.2	5.7	6.5	7.2	7.9	8.5	9.2	10.2	10.7	"
Aug.	Night	12.1	20.2	28.0	35.2	41.2	46.2	49.9	53.1	54.1	"
"	Day	6.2	10.6	15.0	19.3	23.8	26.9	30.2	32.2	33.8	"
Sept.	Night	12.4	23.1	33.6	44.3	54.8	64.4	73.5	81.5	87.4	"
"	Day	14.7*	25.0*	36.8*	47.0*	56.6*	65.4*	74.0*	80.1*	90.1*	"
Oct.	Night	14.6×	27.0×	35.7×	43.0×	50.9×	55.7×	59.7×	62.4×	66.8×	"
"	Day	14.4*	22.4*	25.8*	28.8*	34.2*	39.6*	44.2*	48.2*	51.9*	"
Nov.	Night	8.2	11.9	15.1	18.2	21.2	22.8	23.6	24.9	26.3	"
"	Day	12.2	22.0	31.7	41.0	48.8	57.3	63.7	71.2	76.2	"
Dec.	Night	7.5	10.4	11.0	12.9	13.5	15.0	17.2	19.4	22.0	"
"	Day	8.7	10.1	12.4	13.2	15.2	14.8	13.9	13.6	14.3	

*unreliable because of short duration of full path daylight
×unreliable because of short duration of full path darkness

GPO 852-782

U.S. DEPARTMENT OF COMMERCE
WASHINGTON, D.C. 20230

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