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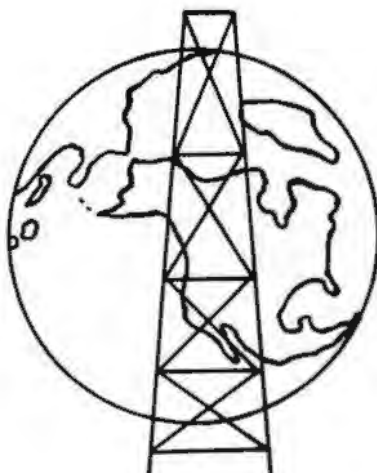
Technical Report

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AN ANALYSIS OF CARBON DIOXIDE IN THE ARCTIC ATMOSPHERE AT POINT BARROW, ALASKA

1961-1962-1963

BY JOHN J. KELLEY JR.



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IN THE ARCTIC ATMOSPHERE
AT POINT BARROW, ALASKA"

by

JOHN J. KELLEY, JR.
University of Washington

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ABSTRACT

The results of measurements of carbon dioxide in air at Point Barrow, Alaska, and the principle of operation of the infrared gas analyzer are described. Reference gas comparison data are given in tables, and the method of calculations discussed. The average daily concentrations of atmospheric carbon dioxide are tabulated for the period 10 July 1961 to 20 February 1963. The diurnal variations of carbon dioxide during this period are also presented. Results of the analyses of carbon dioxide in air collected in flasks from several other Alaskan locations are given.

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PREFACE

This report presents a summary of measurements of the concentration of carbon dioxide gas in specially prepared mixtures of nitrogen gas used in the analysis of carbon dioxide at Point Barrow, Alaska.

The investigations were carried out under the general supervision of Dr. Phil Church, Chairman, Department of Atmospheric Sciences, of the University of Washington. The work was supported under a contract from the Office of Naval Research (ONR477 (24)). The analytic program was conducted cooperatively with Dr. C. D. Keeling's (The Scripps Institution of Oceanography, La Jolla, California) atmospheric carbon dioxide program at Mauna Loa, Hawaii, and the South Pole Station, Antarctica.

The carbon dioxide program at Point Barrow was initiated and maintained from July 1961 to August 1962 by Mr. John J. Kelley. Operation of the carbon dioxide analyzer was continued by Mr. John Unger from September 1962 to March 1963, and from April 1963 to the present time by Mr. Leander Stroschein.

Director of the Arctic Research Laboratory M. C. Brewer and his staff have provided invaluable assistance to the project.

INTRODUCTION

A program was initiated during the summer of 1961 at Point Barrow, Alaska, to observe the concentration and fluctuation of carbon dioxide in the Arctic atmosphere.

A field station was set up near the Arctic Research Laboratory at Point Barrow, $71^{\circ} 20'N$ latitude and $156^{\circ}39'W$ longitude (Figure 1). The site was located on the shore of the Arctic Ocean about one mile northeast of the laboratory and six miles northeast of the Eskimo village. To the south is flat tundra and to the north the Arctic Ocean. During the summer, poor surface drainage results in the formation of many shallow lakes up to several miles in diameter, as well as a variety of temporary melt ponds. The ocean is generally clear of ice from 20 to 100 miles through the latter part of August, September, and October.

The lower atmosphere was continuously monitored by infrared analysis to observe the effects of the tundra and the sea on the seasonal variation of carbon dioxide concentration.

SECTION I

METHODS OF FIELD ANALYSIS

Direct Infrared Analysis

A block diagram (Figure 2) shows the air sampling scheme for infrared analysis at Point Barrow. Air is drawn through ports at four levels on an eight-meter mast by the edge of the sea and conducted to the analyzer through aluminum tubing. The air then passes through a manifold which can either manually or automatically sample the reference gas or air. The air flow is checked and adjusted by a flow meter and needle valve to give a flow rate of 0.5 liters per minute at atmospheric pressure. Because water vapor absorbs infrared radiation, it is necessary to remove it from the system or greatly reduce its effects by passing both the air and reference gas through a freezer cell held at -55°F . The regulated flow of reference gas and air, after passing through the freezer cell, goes to the analyzer.

Analysis of the air is accomplished by comparing air with reference gas standards. These standards are supplied by Dr. Charles Keeling of the Scripps Institution of Oceanography, and are similar to those used in his atmospheric carbon dioxide program at the South Pole and at Mauna Loa, Hawaii. The principle of operation of the infrared gas analyzer is given in Appendix I and shown by block schematic diagram in Figure 5.

Reference Gas

Mixtures of carbon dioxide in nitrogen were prepared by various commercial suppliers during the period of analysis at Point Barrow.

Stainless steel reference gas cylinders contain about 6000 liters of gas, at an initial pressure of about 2200 p.s.i. An initial determination of the carbon dioxide provisional concentration in p.p.m. by volume dry air (referred to as CO₂ index units) was made at Scripps before shipping the cylinders to the Barrow station. The reference cylinders were returned to Dr. Keeling's laboratory for final analysis when the gas pressure reached 400 p.s.i.

During the course of analysis at Point Barrow, the response of the infrared analyzer was checked by comparing the air reference gases with a succession of standards. The general method used by Scripps Institution for tank standardization (Figure 3) was modified somewhat at Point Barrow during the period covered by this report. Initially, two reference gases were compared with air every 30 minutes. After modifying the automatic operation of the analyzer, three reference gases were employed. Two of the reference gases were used as comparison standards. The third reference gas was ranked as a "working reference" and compared with air every 30 minutes. The "working reference" was compared directly to the comparison standards, primary and span (high or low) in the absence of a suitable secondary reference at Point Barrow. The modifications were brought about due to availability of standards and the general evolution of the operation of the infrared analyzer. The results of the reference gas analyses are given in the section on Summary of Reference Gas Analyses.

Reference tanks were mutually compared, as a rule, three times during the life of a "working reference" tank: at the beginning of use, when the gas pressure was half depleted, and at 400 p.s.i. before return of the

cylinder to Scripps for final calibration.

Data

Each complete day of analysis, 48 comparisons of air with the "working reference" gas were scaled from the recorder (Speedomax H) chart data. A complete trace for one comparison during automatic operation contained six five-minute traces per cycle. The first trace contained the output of the analyzer due to the working reference gas; the second gave information only when a span or second reference was periodically used. The remaining four traces indicated a scale value for air from each of the four ports on the eight-meter mast.

The charts were reduced daily by drawing straight lines through each of the traces belonging to the reference gas or air. The difference between reference gas and air was read in terms of the number of units departure from the reference gas to air on a standard scale of 30 divisions per inch. One unit was defined as 10 divisions on the scale. The departure from reference gas in units was recorded for each half-hour cycle as OBSERVED SCALE DIFFERENCE on daily data sheets.

The daily data sheets, in addition to the chart scale values, contained information on wind direction, speed, atmospheric pressure and air temperature for each hour. A trace for air which showed a greater amplitude than the reference gas was recorded as variable. Differences between the individual air traces were noted as evidence of contamination.

A staggered replacement of the aluminum tubing was carried out as an aid in determining possible sources of flow contamination.

A plot of the OBSERVED SCALE DIFFERENCE versus time for each half-hour cycle was carried out daily. The OBSERVED SCALE DIFFERENCE was converted to carbon dioxide concentration by multiplication of a RECORDER SCALE FACTOR and adding or subtracting the product from the value of the reference gas concentration. (Addition or subtraction will depend on whether the air value was higher or lower than the reference gas value.) Final values of the concentration of carbon dioxide were obtained only after all of the reference gases had received final analysis at Scripps--a delay of one to two years (Pales and Keeling, 1963). The final values usually differed by not more than the experimental uncertainty in the air data (about +0.2 p.p.m.)

Flask Sampling

Arrangements to collect air samples at ground level in evacuated 1.8 or 5.0 l glass flasks were made in September, 1961. Samples were taken twice a month at the analyzer site and sent to Scripps for analysis. The purpose of this program was to check independently the progress of the infrared analyzer. The net departure of the flask values from the infrared analyzer values for the period covered by this report is -0.2 p.p.m. The results of these data are given in Table 5.

In addition to the flask sampling at Point Barrow on the first and fifteenth of each month, a similar flask sampling program was initiated on Ice Island ARLIS II in October, 1961. Flask samples were also taken twice a month on Fletcher's Ice Island (T-3) from June 15 to August 30, 1962.

Periodic air-sampling flights were made at three locations south of Point Barrow, and coincided with the flask sampling schedule at Barrow and

ARLIS II. The places selected were Umiat (69°23'N, 152°08'W), Anaktuvuk Pass (68°12'N, 151°48'W), and Bettles (66°55'N, 151°31'W), and Figure 4 outlines the flight path. All of the flasks were opened at ground level at Umiat, Anaktuvuk Pass, and Bettles, Alaska, until September 16, 1962. Umiat is located on the tundra near the Colville River north of the Brooks mountain range, Anaktuvuk Pass at the crest of the Brooks Range, and Bettles on the Koyukuk River south of the Brooks Range.

Analysis of the data from these three locations south of Barrow indicated that the carbon dioxide concentration near the ground was strongly affected by local conditions of vegetation, and mountain and valley winds.

Air samples at 10,000 feet aloft on December 31, 1962, were taken over the same locations. An Arctic Research Laboratory Cessna 180 was used to collect the upper air samples. Air was taken through a Pitot tube near the wingtip and conducted through plastic tubing (TYGON) to a small manifold in the cabin. The flow rate was regulated to 1 liter per minute and samples of air were collected in 18 liter evacuated flasks. An additional sampling site over Rampart on the Yukon River was planned for the 1963 program.

The variation of carbon dioxide concentration with height over Point Barrow was investigated on December 28, 1962, by collecting samples of air in flasks from ground level to 15,000 feet. Results of the analyses of the flask samples are given in Table 8b.

A survey of the atmospheric carbon dioxide concentration over the sea was carried out on the Arctic Research Laboratory vessel Natchik from August 17, 1962, to September 12, 1962. Air was sampled in 1.8 liter

evacuated glass flasks, and observations were made of temperature (air and sea), wind speed and direction, and barometric pressure. The survey stations of the Natchik from Point Barrow and Nome are shown in Figure 4. The results of the air sample analyses are given in Table 8c.

SECTION II

SUMMARY OF REFERENCE GAS ANALYSES

Introduction

A summary of the concentration of carbon dioxide in specially prepared mixtures in nitrogen gas (reference gases), and the results of the air index values at Point Barrow are given in the tables at the end of this section. The air index values from special air sampling programs are found in Table 8a, 8b, and 8c. The format procedure generally follows that used at the Scripps Institution of Oceanography (SIO 1958, 1959, 1961).

Index values proportional to concentration have been calculated from observed differences in scale readings of the analyzer record; an explanation of the data follows.

Definition of Terms

Certain terms are used throughout the tables to identify a particular use for a gas or to denote an operation with the data. These are:

1. STANDARD TANKS: These are reference gases with concentrations established by Dr. C. D. Keeling's Laboratory, Scripps Institution of Oceanography. The index values of these gases are used in the Point Barrow standardization scheme to determine recorder scale factors for the infrared analyzer.

2. COMPARED TANK: This term is applied to reference gases used as "working reference" gases in the daily comparison of air versus reference gas. The index of the compared tank is compared with the index of two

standard references normally three times during the life of the "working reference" (Table 1).

3. RECORDER SCALE FACTOR: Two methods have been used to obtain recorder scale factors during the period covered by this report. From July 10, 1961, to November 16, 1961, air was compared continuously with two reference gases. The index difference between the two gases divided by the number of scale divisions (30 div/inch) between the recorder chart traces for each reference was recorded as the recorder scale factor in units. Ten divisions on the scale were equal to one unit. The standardization scheme was changed in September, 1961, to the mutually compared tanks method (and is discussed further in Table 3).

4. OBSERVED SCALE DIFFERENCE: The number of units of scale divisions between any two reference gases or reference gas and air.

5. COMPUTED INDEX DIFFERENCE: The number of index units difference (provisional p.p.m.) between any two reference gases or reference gas and air.

6. COMPUTED INDEX: The index value of any compared tank obtained from mutually compared tank standardization or the value for air (air index) obtained from a comparison of air and reference gas.

Mutually Compared Tanks

The following format has been adopted from the Scripps (SIO reports 1-4) scheme for tank standardization, where the standard tank index values have been assigned the symbols A and B, and the compared tank, without such assignment, X:

TABLE 3

STANDARD TANK NO.	COMPARED TANK NO.	OBSERVED SCALE DIFFERENCE	NO. OF COMPARISONS
A	X	X-A	a
B	X	X-B	b
A	B	Y*	(a or b)*

$$Y = (X-A) - (X-B) = (B-A)$$

* indicates the calculated value

The number of comparisons assigned to Y is a or b, whichever is smaller. The tank comparisons are shown in Table 3. The observed scale differences were taken from the averages of the individual chart scale differences (Figure 6).

Index differences shown in Table 3, Column 5, were obtained from index values of the standard tanks as follows:

10063 vs. 7351	310.57 - 273.35 = 40.06
10063 vs. 4283	310.57 - 342.91 = 32.34
10063 vs. 6074	310.57 - 299.04 = 11.53
10063 vs. 4291	310.57 - 335.19 = 24.62

The index values quoted above are based on comparisons obtained at the Scripps Institution of Oceanography (SIO Report 4, 1961), as follows:

TANK NO.	AT SIO BEFORE USE AT BARROW		AT SIO AFTER USE AT BARROW		WEIGHTED AVERAGE	
	No. of Comparisons	Index	No. of Comparisons	Index	No. of Comparisons	Index
10063	50	310.57	--	---	50	310.57
7351	124	273.35	--	---	124	273.35
6074	10	299.04	10	298.94	20	298.99
4291	60	335.19	--	---	60	335.19

Reference Gas Comparisons

A comparison of the reference gases and standards used at Point Barrow is presented in chronological order in Table 1. The observed scale differences in Column 4 were taken from the original chart data summarized on sheets (Figure 6). The index values for the standards (Column 1) and working reference gases are summarized in Tables 6 and 7 (a,b).

Index values are computed on the basis of the calibration for that day as expressed by the recorder scale factor listed in Column 5.

The recorder scale factors are summarized in chronological order from July 10, 1961, to April 20, 1963, in Table 2. Weighted averages are taken for groups of single-set comparisons which changed whenever "chart span" adjustments were made on the analyzer. The weighted recorder scale factors are used in the calculation of the air index values from July 10, 1961, to December 15, 1961 (Table 9).

Recorder Scale Factors determined from values in Table 3 are given in Table 2a. These factors are used in the computation of the air index values from January 3, 1962, to February 20, 1963.

Recorder Scale Factors computed by the tank comparison method are presented in Table 3.

A comparison between the infrared analyzer air index values and the index values for the flask samples collected at Point Barrow, Alaska, are presented in Table 4. The flasks were analyzed at the Scripps Institution of Oceanography and data are included from September 15, 1961, to January 1, 1963. The average departure of the infrared gas analyzer values

from the flask index values (uncorrected for atmospheric pressure) is -0.15 p.p.m. In Table 5 the results given in Table 4 are summarized, but contain corrections for changes in the recorder scale factor due to changes in atmospheric pressure. The correction is:

$$\text{Corrected Scale Difference} = \bar{\sigma} \frac{\bar{P}}{P_{\text{obs}}} \bar{\mu}$$

Where: $\bar{\sigma}$ = Recorder Scale Factor (average)
 \bar{P} = Average atmospheric pressure during the calibration period
 P_{obs} = Atmospheric pressure at time of flask sample
 $\bar{\mu}$ = Average scale difference for infrared analyzer air index at time flasks were opened

The corrected scale difference is added algebraically to the index for the reference tank for that period to obtain the corrected air index.

The index values of working reference gases and reference gases retired from use comprise Table 6. The working reference tank number, the number of comparisons against the primary standard at Point Barrow, and its computed index are given in Columns 2, 3, and 4. A weighted average index is computed for the reference gas when it is retired from use (Column 6).

A comparison of the index of the working reference gases prior to use at Point Barrow, at the Point Barrow station, and final analysis at Scripps forms Table 7. The weighted average index given in Column 10 was used to calculate the air values contained in Table 9. Preliminary air index values were calculated daily during the course of analysis by using the initial index value assigned to each reference gas at Scripps. The index values for the reference gases listed in Table 7a were determined at

Scripps. These gases were used at Barrow during the period when two references were compared with air (July 10 to September 18, 1961). Table 7b lists the standard tank sequence at Point Barrow. Tank 10063 was designated as the primary reference gas.

The result of the analyses of air collected in flasks at Ice Island ARLIS II and Point Barrow is presented in Table 8, and Table 8a lists the results of the flask sampling survey on Ice Island T-3, at Umiat, at Anaktuvuk Pass, and at Bettles, Alaska. Index values for air sampled at selected heights over Point Barrow are given in Table 8b; Table 8c presents the results of the analysis of the air samples collected on the Natchik cruise from Point Barrow to Nome, Alaska, during August and September, 1962.

SECTION III

CONCENTRATION OF CARBON DIOXIDE IN AIR

The daily average air index (Column 9) reported as provisional parts per million by volume dry air was calculated from the reference gas indices given in Table 7 (a, b) and are reported in Table 9. The reference gas concentration was determined (absolutely) by manometric methods at Scripps, where it was found that a conversion factor[†] had to be applied to all of the air data taken from the infrared analysis to convert it to the Scripps manometric concentration (Column 10) in parts per million by volume dry air. The conversion to manometer concentration is given:

$$\text{Manometer Concentration}^* = (\mu - 311.51) 1.2186 + 311.51 \text{ p.p.m.}$$

where μ is the index unit.

The monthly average concentration of carbon dioxide in air at Point Barrow, Alaska, from July 1961 to February 20, 1963, is summarized in Table 10.

The diurnal course of carbon dioxide was computed from the hourly index values and is presented in Table 11.

† Personal communication: Dr. C. D. Keeling, Scripps Institution of Oceanography, La Jolla, California

* Based on September, 1959 calibration at Scripps Institution of Oceanography

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Scripps Institution of Oceanography
La Jolla, California
- _____ (1961) Research Report II
- _____ (1961) Research Report III
- _____ (1961) Research Report IV
- _____ (1961) Report I
Mauna Loa Carbon Dioxide Project
Scripps Institution of Oceanography
La Jolla, California
- and Pales, J.

APPENDIX I

PRINCIPLE OF OPERATION OF THE INFRARED GAS ANALYZER

The analyzer used at Point Barrow is designed to measure the concentration of one constituent of a mixed stream of gases (air) by measuring the amount of infrared radiation absorbed by that constituent (CO_2). Carbon dioxide concentration is related to the amount of radiation absorbed by standardizing or calibrating the instrument using gases with accurately known compositions. The analyzer distinguishes between the infrared radiation absorbed by the carbon dioxide, and that absorbed by the air, by selective sensitization of the radiation detectors and by selective filtering of the wave-lengths of radiation transmitted through the gas stream to the detectors.

Radiant energy from two matched sources at 550°C is chopped into pulses by a slotted disc rotated by a synchronous motor. Pulses of infrared energy pass simultaneously through two parallel cells to the detectors. The cells include sections through which the air to be analyzed passes, and sections filled with carbon dioxide acting as radiation filters. The transducer section of each detector is a condenser microphone. The output signals of the two microphones are combined. The polarization of the microphones is such that these output signals are of opposite sign and will tend to cancel each other. The remaining signal, which is the difference between the output signals of the two microphones, is amplified and rectified by a synchronous rectifier to a DC signal whose magnitude and sign is a measure of the difference in output of the two detector microphones.

This DC signal is amplified and used as a correction bias on the

polarizing voltage of one of the microphones. The other microphone has a constant polarizing voltage. This change in polarizing voltage changes the magnitude of the output signal from the microphone and the magnitude of the difference signal being fed to the amplifier. The phase of the demodulator is chosen so that the effect on the difference signal is to make it smaller--the AC signal being fed to the analyzer is zero. The electronic portion of the analyzer is designed to maintain the electrical output signal from the two detectors always equal in magnitude. This is done by adjusting the polarizing voltage of one detector microphone, while the polarizing voltage of the other selector microphone is held constant.

When the air containing carbon dioxide, the infrared absorber, is passed through a cell in one path of radiation but not the other, a lesser amount of radiation reaches the detector in that path, and the output signal of the detector microphone is reduced. The analyzer amplifier will now change the polarizing voltage of one microphone, and the amount of the change is a function of the amount of infrared energy absorbed, and the amount of carbon dioxide in the air. The control unit (see Figure 5) converts the change in polarizing voltage to a millivolt signal suitable to drive a potentiometric recorder (L & N Speedomax H). The millivolt output signal then becomes a measure of the amount of infrared absorbing gas (CO₂) present in the sample.

A block schematic diagram of the Analytic Systems Co. Model 700 Analyzer is shown in Figure 5.

APPENDIX II

TABLES

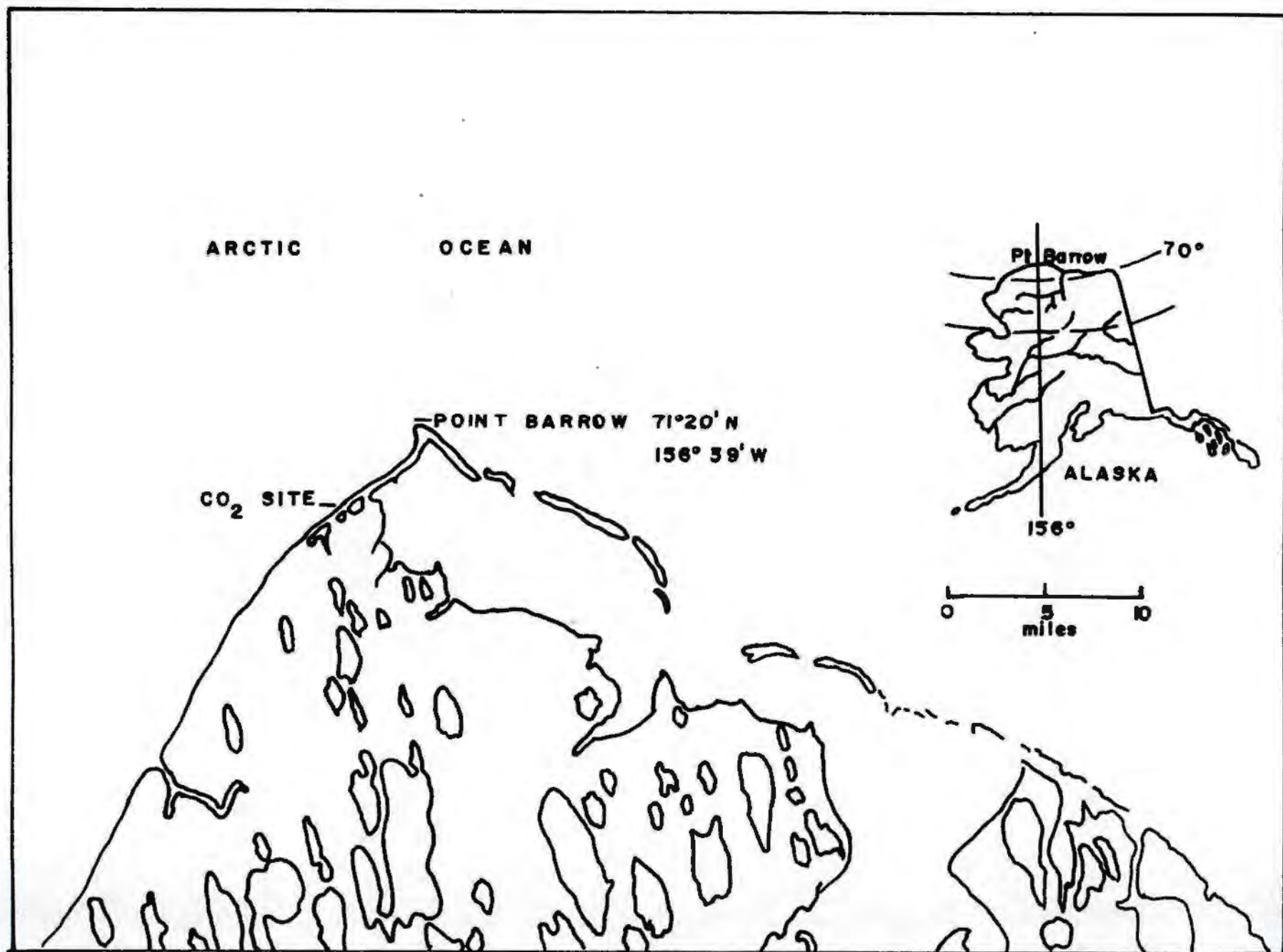


Fig. 1

FLOW DIAGRAM

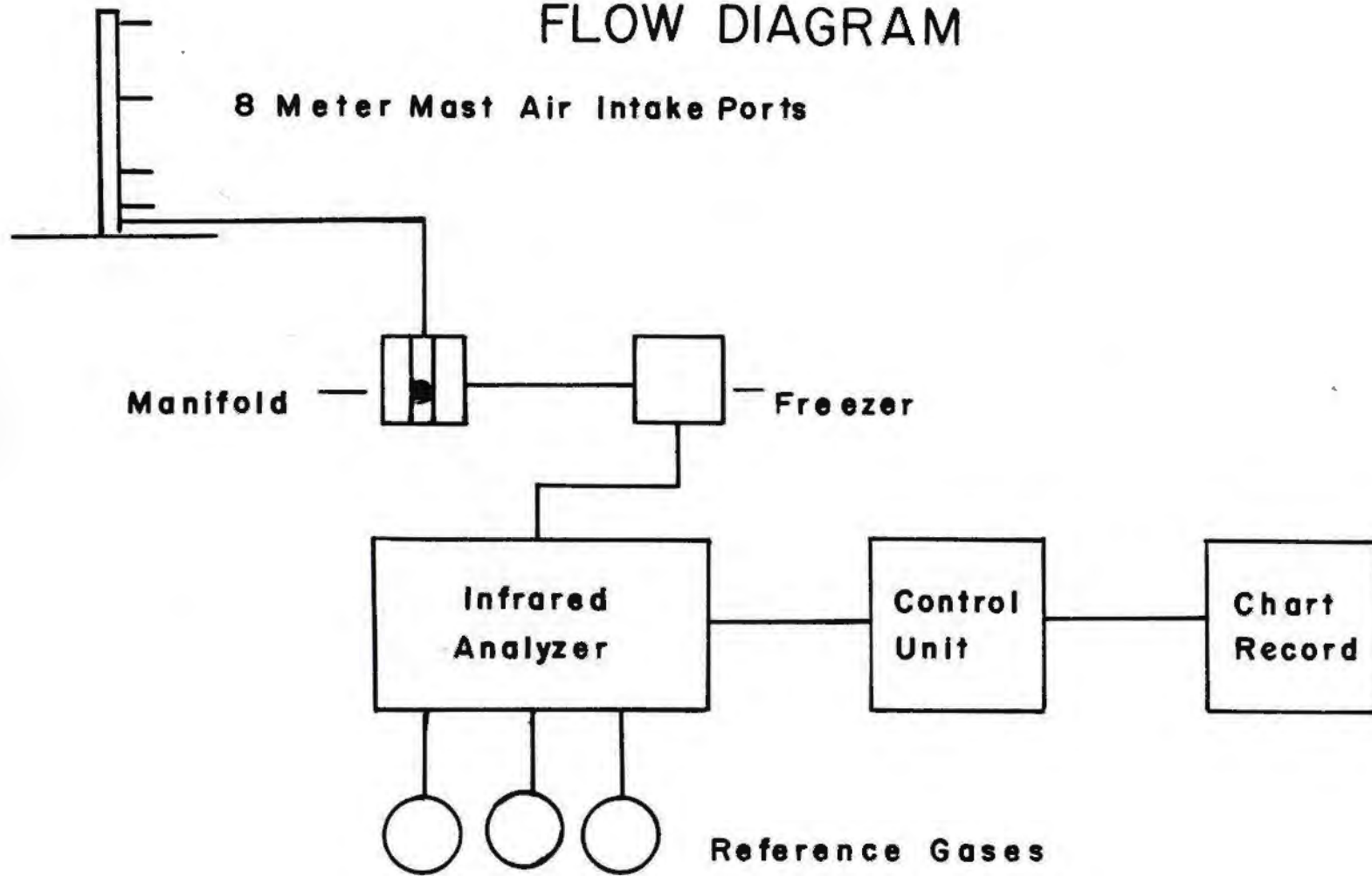


Fig. 2

REFERENCE GAS TANK STANDARDIZATION

Definition of Symbols:

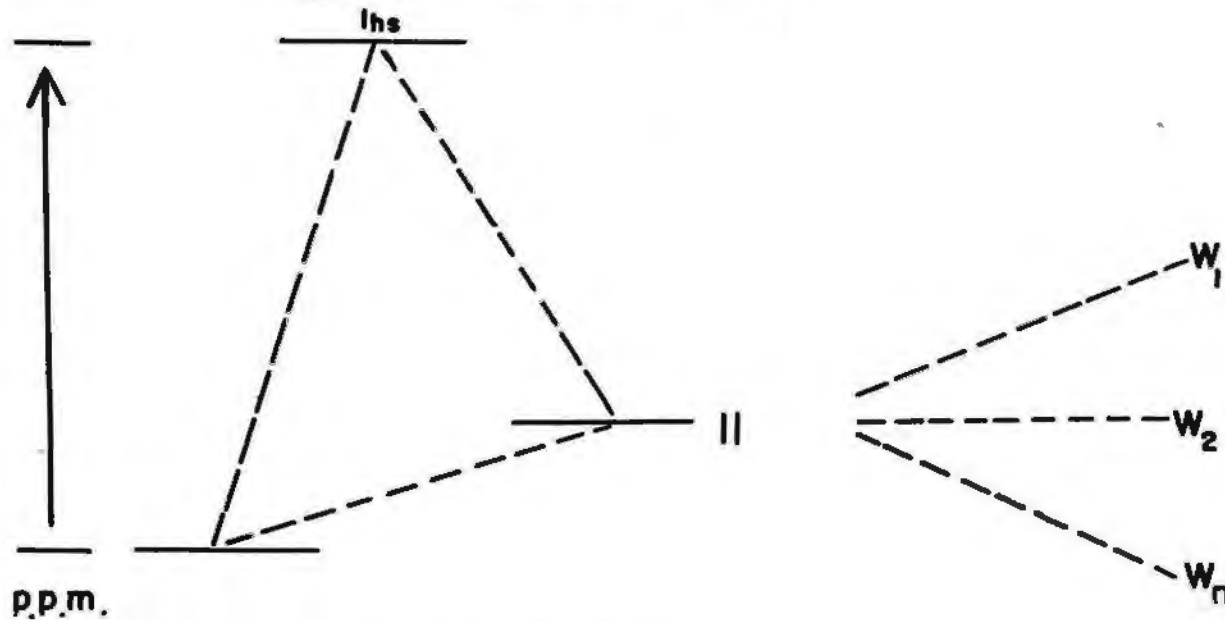
I = Primary Tank

II = Secondary Tank

I_{hs} = High Span

I_{ls} = Low Span

$W_{1,2,\dots,n}$ = Working Tanks

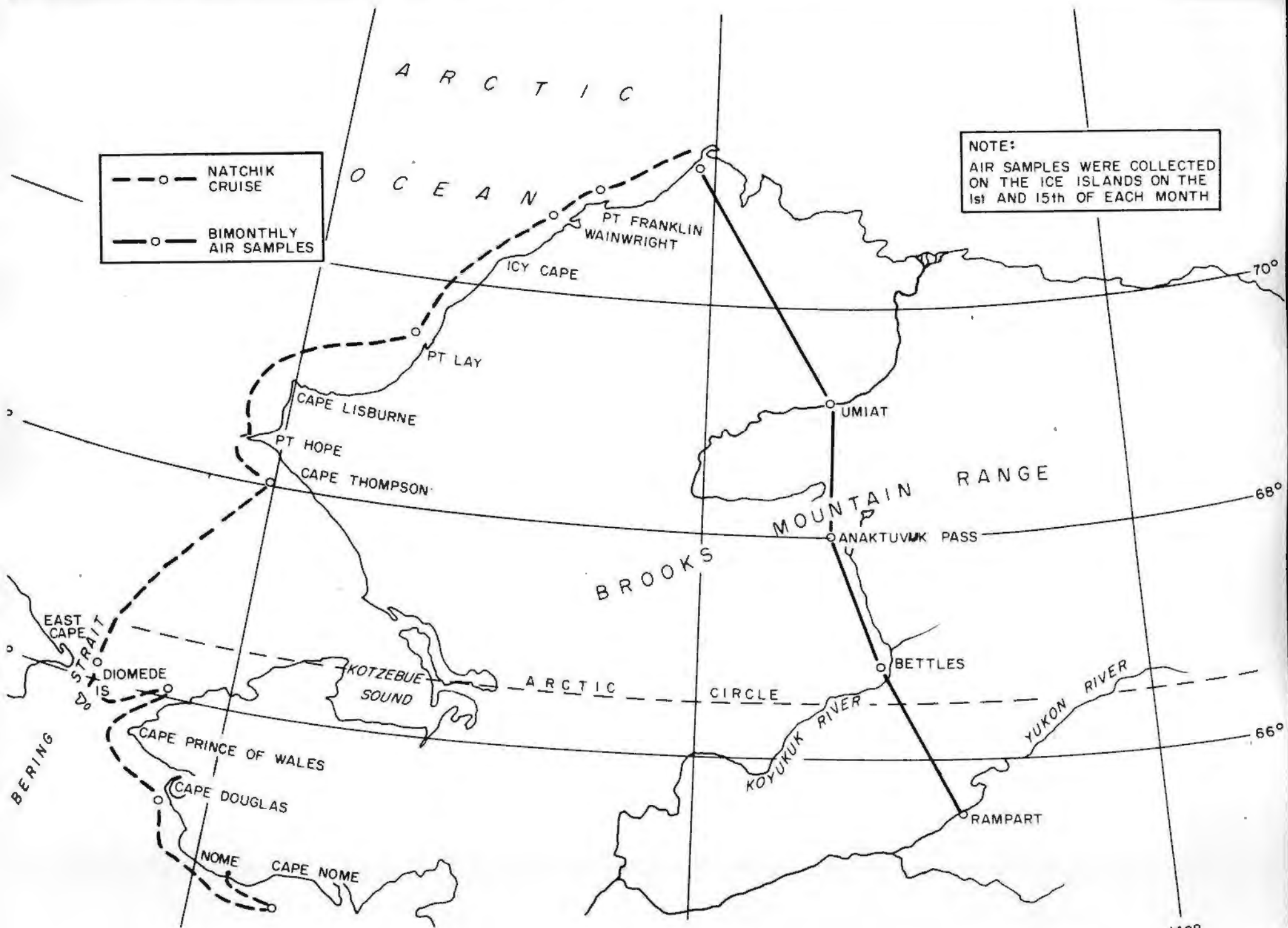


p.p.m.

I_{ls} instead of I_{hs} when necessary

$W_1 \dots W_n$ instead of II when necessary

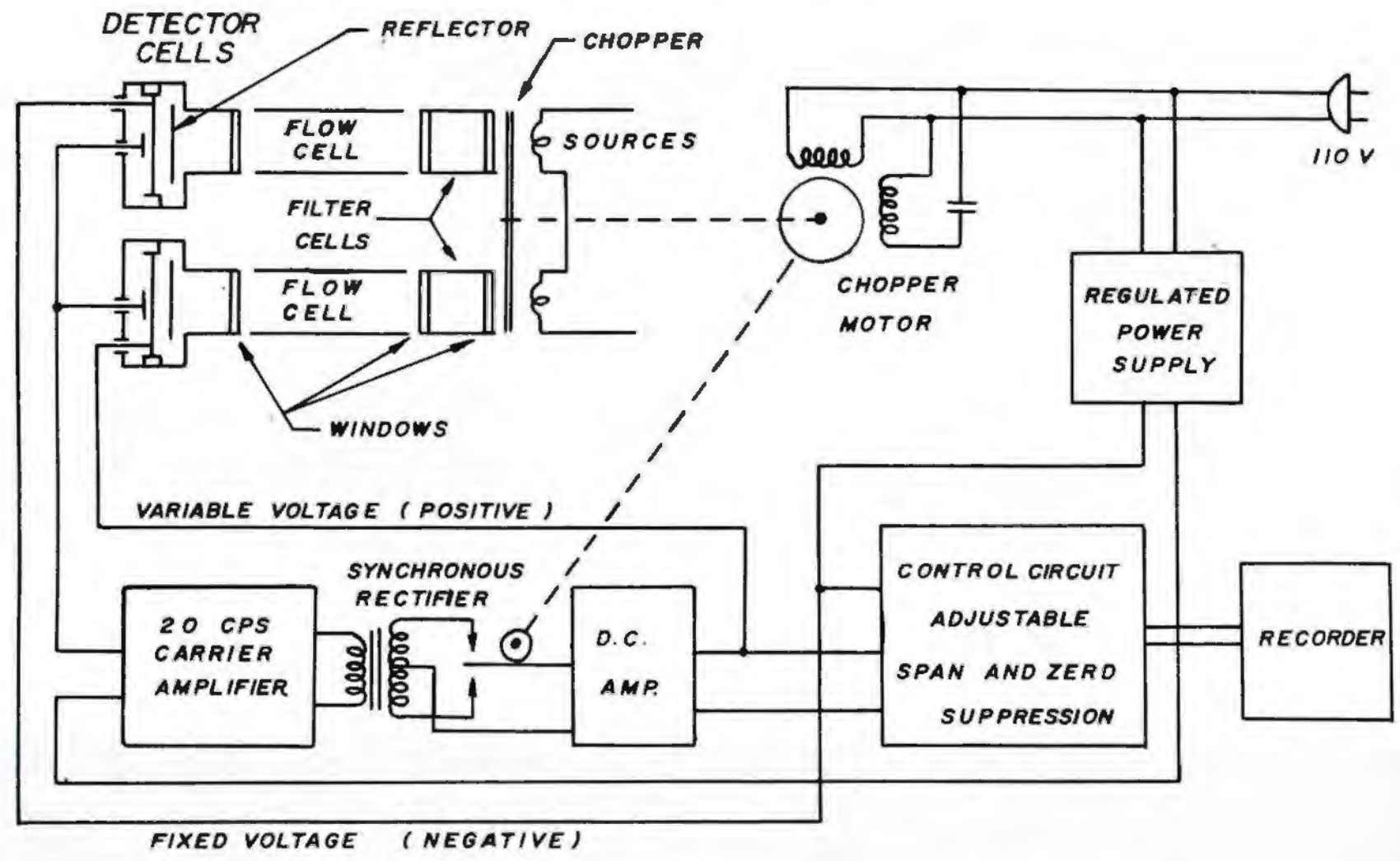
FIG. 3



-○- NATCHIK CRUISE
 -○- BIMONTHLY AIR SAMPLES

NOTE:
 AIR SAMPLES WERE COLLECTED
 ON THE ICE ISLANDS ON THE
 1st AND 15th OF EACH MONTH

INFRARED ANALYZER



ATMOSPHERIC CARBON DIOXIDE PROGRAM

DATE April 20, 1963

POINT BARROW, ALASKA

ONR 477/24

Tank No.	7351 7362	10063 7362	7351 10063		7362	10063	7351
Scale Diff. 1	17.37	2.15	15.02	Tank Press (PSI):	1800	1020	1500
2	17.28	2.21	14.99	Flow Rate (LPM):	0.5		
3	17.22	2.19	15.01	Zero Setting:	527/442/548		
4	17.23	2.19	15.06	Span Setting:	594		
5	17.22	2.06	15.07	Time Test Began:	1200		
6	17.18	2.14	15.12	Time Test Ended:	1730		
7	17.24	2.10	15.06	Freezer Temp. °F:	-55		
8	17.13	2.10	15.06	Freezer Defrosted (hours ago):	5		
9	17.28	2.14	15.05	Scale Used on Chart:	30 div/inch (= 3.0 units)		
10	17.29	2.13	15.00				
	172.44	21.41	150.43				
Av. Scale Diff.	17.24	2.14	15.04				

SAMPLE REFERENCE TANK
DATA SHEET

Fig. 6

TABLE 1: REFERENCE GAS COMPARISONS, POINT BARROW, ALASKA

Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
10063	3755	-4.04	5	1.43	-5.78	304.82	September 26 - 1961
10063	6074	7.97	3				
6074	3755	3.98	6		5.69	304.82	
10063	3756	-8.85	16	1.52	-13.45	297.12	November 27
10063	6074	--	--				
6074	3756	-1.35	10		-2.05	297.10	
10063	3756	-8.18	9	1.62	-13.25	297.32	January 6 - 1962
10063	6074	7.06	9				
6074	3756	-1.15	9		-1.86	297.27	
10063	3756	-8.16	9	1.61	-13.13	297.44	7
10063	6074	7.08	9				
6074	3756	-1.10	9		-1.77	297.36	
4291	10071	-6.61	17	2.43	-16.06	319.13	17
10063	4291	10.09	17				
10063	10071	3.55	17		8.63	319.20	
10063	10073	-4.63	10	2.48	-11.48	299.09	March 24
10063	4291	9.94	5			--	
4291	10073	-14.53	5		-36.03	299.16	
10063	10071	3.54	10	2.48	8.78	319.35	26
10063	4291	9.86	5			--	
4291	10071	-6.44	10		15.97	319.22	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	10068	-0.55	10	2.51	-1.32	309.13	March 28 - 1962
	10063	4291	9.69	6		---		
	4291	10068	-10.38	10		-26.05	309.14	
	10063	10068	-0.59	10	2.50	-1.48	309.09	April 29
	10063	4291	9.83	10				
	4291	10068	-10.46	10		-25.95	309.24	
	10063	6078	-2.81	9	2.52	-7.08	303.49	
	10063	4291	9.75	10				
	4291	6078	-12.60	10		-31.75	303.44	
	10063	6078	-2.74	10	2.49	-6.82	303.75	May 19
	10063	4291	9.87	10				
	4291	6078	-12.66	9		-31.52	303.67	
	10063	6078	-2.87	10	2.49	-7.15	303.42	May 26
	10063	4291	9.91	10				
	4291	6078	-12.71	10		-31.65	303.54	
	10063	10068	-0.50	9	2.45	-1.22	309.35	May 28
	10063	4291	9.92	10				
	4291	10068	-10.65	10		-26.09	309.10	
	10063	3757	-4.36	10	2.57	-11.21	299.36	June 5
	10063	7351	14.59	10				
	7351	3757	10.04	10		25.08	298.43	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	3757	-4.36	10	2.54	-11.07	299.50	June 23 - 1962
	10063	7351	14.04	10				
	7351	3757	10.37	10		26.34	299.59	
	10063	3757	-4.49	10	2.50	-11.22	299.35	July 7
	10063	7351	14.88	10				
	7351	3757	10.37	10		25.93	299.28	
	10063	2427	-5.13	10	2.50	-13.34	297.22	July 10
	10063	7351	14.71	10				
	7351	2427	8.78	10		22.83	296.18	
	10063	2427	-4.95	10	2.54	-12.57	298.00	July 20
	10063	7351	14.84	10				
	7351	2427	9.55	10		24.25	297.51	
	10063	2427	-4.65	10	2.55	-12.37	298.20	August 11
	10063	7351	14.65	10				
	7351	2427	9.62	10		24.53	297.52	
	10063	2426	-1.13	10	2.49	-2.81	307.75	
	10063	7351	15.00	10				
	7351	2426	13.68	10		34.06	307.41	
	10063	3756	-0.20	10	2.40	-0.50	310.07	August 21
	10063	7351	14.93	10				
	7351	3756	15.94	10		37.70	311.05	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	3756	-0.15	10	2.50	-0.30	310.00	Sept. 7 - 1962
	10063	7351	14.90	10				
	7351	3756	14.71	10		30.70	310.13	
	10063	2420	--		2.49			Oct. 4
	10063	7351	14.95	10				
	7351	2420	13.73	10		34.19	307.54	
	10063	2400	--		2.53			Oct. 9
	10063	7351	14.72	10				
	7351	2400	15.38	10		30.15	311.50	
	10063	2400	--		2.55			Oct. 17
	10063	7351	14.02	10				
	7351	2400	15.11	10		30.53	311.60	
	10063	10071	--		2.56			Oct. 19
	10063	7351	14.53	10				
	7351	10071	11.19	10		20.02	301.97	
	10063	10071	--		2.40			Nov. 13
	10063	7351	14.09	10				
	7351	10071	11.32	10		28.07	301.42	
	10063	10071			2.49			Nov. 20
	10063	7351	14.93	10				
	7351	10071	11.27	10		20.00	301.41	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	10072	--		2.46			Dec. 7 - 1962
	10063	7351	15.02	10				
	7351	10072	16.72	10		41.47	314.22	
	10063	10072	1.90	10	2.47	4.69	315.26	Jan. 12 - 1963
	10063	7351	15.04	10				
	7351	10072	17.06	10		42.14	315.49	
	10063	4278	1.61	10	2.43	3.91	314.48	Feb. 1
	10063	7351	15.37	6				
	7351	7278	15.78	6		40.75	314.13	
	10063	4280	1.40	10	2.53	3.74	314.31	March 15
	10063	7351	14.51	10				
	7351	4286	15.41	9		41.52	314.87	
	10063	4286	1.54	10	2.46	3.82	314.39	April 1
	10063	7351	15.00	10				
	7351	4280	15.40	10		40.82	314.17	
	10063	7362	2.14	10	2.40	5.20	315.03	April 20
	10063	7351	15.04	10				
	7351	7362	17.24	10		42.41	315.76	
	10063	7362	2.11	10		5.23	315.85	May 6
	10063	7351	14.97	10	2.50			
	7351	7362	17.00	10		42.50	315.05	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	7352	2.09	10		5.14	315.71	May 18 - 1963
	10063	7351	15.23	10	2.40			
	7351	7352	17.32	10		42.61	315.96	
	10063	4284	4.75	10		11.16	321.73	May 19
	10063	4283	13.70	10	2.35			
	4283	4284	-8.99	10		-21.22	321.78	
	10063	4284	4.90	10		11.37	321.94	June 13
	10063	4283	13.92	10	2.32			
	4283	4284	-9.13	10		-21.16	321.73	
	10063	4284	5.01	10		11.52	322.09	June 29
	10063	4283	14.10	10	2.30			
	4283	4284	-9.09	10		-20.94	322.07	
	10063	4272	0.81	8		1.96	312.55	July 6
	10063	7351	15.29	10	2.44			
	7351	4272	16.07	10		39.21	312.56	
	10063	3757	0.84	10		-2.05	312.62	
	10063	7351	15.29	10	2.44			
	7351	3757	16.11	10		39.31	312.66	
	10063	10204	1.70	10		4.11	314.68	July 29
	10063	7351	15.36	9	-2.42			
	7351	10204	17.03	10		41.21	314.56	

TABLE 1: REFERENCE GAS COMPARISONS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Computed Index	Date of Analysis
	10063	18204	11.73	10		4.19	314.76	August 10 - 1963
	10063	7351	15.41	9	2.42			
	7351	18204	17.20	9		41.62	314.97	
	10063	18204	1.70	9		4.08	314.65	August 21
	10063	7351	15.48	10	2.40			
	7351	18204	17.27	10		41.45	314.80	

TABLE 2: RECORDER SCALE FACTOR IN CHRONOLOGICAL ORDER
POINT BARROW, ALASKA

Standard Tank No.	Compared Tank	No. of Comparisons	Recorder Scale Factor		Date of Analysis
			Single Set	Weighted Average	
148	10072	30	2.56		July 10 - 1961
		39	2.64		
		39	2.55		
		45	2.52		
		6	2.54		
		20	2.72	2.582	
10070	10064	20	4.30		15
		44	4.22		16
		27	4.25		17
		4	4.23		19
		9	4.24		20
		8	4.22		21
		14	4.21		23
		2	4.26		24
		2	4.21		26
		11	4.20	4.237	27
		2	4.41		28
10070	10065	3	4.41		29
		2	4.43		30
		27	4.34	4.356	31
		34	2.57		August 2
		21	2.57		
2	2.53		4		
13	2.73		5		
4	2.69		6		
10069	10065	10	2.77		7

TABLE 2: RECORDER SCALE FACTOR IN CHRONOLOGICAL ORDER

Standard Tank No.	Compared Tank	No. of Comparisons	Recorder Scale Factor		Date of Analysis
			Single Set	Weighted Average	
10069	10077	2	3.38	3.374	Aug. 7 - 1961
		1	3.39		8
		6	3.45		9
		5	3.44		11
		3	3.39		13
		21	3.34		14
		17	3.36		15
		12	3.38		16
		1	3.36		17
		10069	6074		11
6	2.12			18	
7	2.14			19	
10069	6074	55	2.54	2.60	Aug. 21
		5	2.63		22
		7	2.68		23
		7	2.68		24
		8	2.51		27
		10	2.60		28
		41	2.53		29
		2	2.60		30
		1	2.60		31
		9	2.60		Sept. 1
		2	2.63		2
		28	2.57		5
		32	2.63		6
		7	2.63		7
		8	2.62		9

TABLE 2: RECORDER SCALE FACTOR IN CHRONOLOGICAL ORDER

Standard Tank No.	Compared Tank	No of Comparisons	Recorder Scale Factor		Date of Analysis
			Single Set	Weighted Average	
6074	3755	7	2.63	2.593	September 13 -1961
		7	2.63		
		4	2.63		16
		4	1.75		18
		5	1.46		21
		1	1.41		22
		2	1.55		23
		5	1.39		24
		1	1.34		25
		5	1.40		26
		1	1.45		27
		4	1.43		28
		7	1.43		29
		11	1.47		October 1
		13	1.47		2
		8	1.46		3
		3	1.39		4
		2	1.39		8
		4	1.45		9
		8	1.44		10
1	1.39	11			
2	1.34	12			
2	1.43	13			
1	1.43	14			
2	1.43	15			
2	1.43	16			
1	1.43	17			
2	1.43	18			
2	1.43	19			

TABLE 2: RECORDER SCALE FACTOR IN CHRONOLOGICAL ORDER

Col:	1	2	3	4	5	6
	Standard Tank No.	Compared Tank	No. of Comparisons	Recorder Scale Factor		Date of Analysis
				Single Set	Weighted Average	
	6074	3755	3	1.45		Oct. 20 - 1961
			2	1.43		21
			2	1.44		22
			7	1.45		24
			1	1.45		25
			2	1.39		26
			2	1.42		27
			2	1.43		28
			2	1.42		29
			2	1.39		30
			2	1.42		31
			1	1.41		Nov. 1
			2	1.40		2
			2	1.43		3
			2	1.40		4
			2	1.42		5
			2	1.43	1.468	7
	6074	3756	3	1.57		Nov. 8
			3	1.57		9
			2	1.57		10
			1	1.57		11
			3	1.57	1.570	13
	6074	3756	10	1.31	1.310	Nov. 14
	6074	3756	26	1.29	1.280	Nov. 25

TABLE 2: RECORDER SCALE FACTOR IN CHRONOLOGICAL ORDER

Standard Tank No.	Compared Tank	No. of Comparisons	Recorder Scale Factor		Date of Analysis	
			Single Set	Weighted Average		
6074	3756	5	1.47		Nov. 27 - 1961	
		7	1.49		28	
		2	1.47		29	
		4	1.44		Dec. 1	
		5	1.52		2	
		10	1.42		4	
		2	1.44		5	
		4	1.44		7	
		4	1.38		8	
		3	1.44		9	
		1	1.44		10	
		3	1.50		12	
		2	1.50		13	
		1	1.50		16	
					1.455	

TABLE 2a: RECORDER SCALE FACTORS IN CHRONOLOGICAL ORDER
(TRIANGLE METHOD)

Standard Tank	Compared Tank	No. of Comparisons	Scale Factor Wt'd. Average	Date of Analysis
10063	3755	8	1.43	Sept. 26 - 1961
	3756	10	1.52	Nov. 27
	3756	18	1.62	Jan. 6 - 1962
	3756	17	1.61	Jan. 7
	10071	34	2.43	Jan. 17
	10073	10	2.48	Mar. 24
	10071	15	2.48	Mar. 26
	10068	16	2.51	Mar. 29
	10068	20	2.50	Apr. 29
	6078	19	2.50	
	6078	19	2.49	May 19
	6078	20	2.49	May 26
	10068	19	2.45	May 28
	3757	20	2.57	June 5
	3757	20	2.54	June 23
	3757	20	2.50	July 7
	2427	20	2.60	July 10
	2427	20	2.50	July 20
	2427	20	2.55	Aug. 11

TABLE 2a: RECORDER SCALE FACTORS IN CHRONOLOGICAL ORDER

Standard Tank No.	Compared Tank No.	No. of Comparisons	Scale Factor Weighted Average	Date of Analysis
10063	2426	20	2.49	Aug. 11 - 1962
	3756	20	2.49	Sept. 7
	3756	20	2.50	Sept. 7
	7351	10	2.49	Oct. 4
	7351	10	2.53	Oct. 9
	7351	10	2.55	Oct. 17
	7351	10	2.56	Oct. 19
	7351	10	2.43	Nov. 13
	7351	10	2.49	Nov. 23
	7351	10	2.40	Dec. 7 - 1963
	10072	20	2.47	Jan. 12
	4270	16	2.43	Feb. 1
	4286	19	2.53	Mar. 16
	4286	20	2.49	Apr. 1
	7362	20	2.47	Apr. 20

WEIGHTED AVERAGE - - January 17, 1962 - April 20, 1963 = 2.5000

TABLE 3: RECORDER SCALE FACTORS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Factor Wted Average	Date of Analysis
	10063	6074	7.97	3	11.44	1.43		September 26 - 1961
	10063	3755	4.04	5				
	6074	3755	3.98	6				
	10063	6074	8.02*	5	11.44	1.43		
				3			1.43	
	10063	6074	--		11.44			Nov. 27
	10063	3756	2.85	16				
	6074	3756	1.35	10				
	10063	6074	7.50*	10*	11.44	1.52		
				10				
	10063	6074	7.06	9	11.44	1.62		Jan. 6 - 1962
	10063	3756	8.13	3				
	6074	3756	1.15	9				
	10063	6074	7.03*	9*	11.44	1.62		
				18			1.62	
	10063	6074	7.06	8	11.44	1.61		Jan. 7
	10063	3756	8.16	9				
	6074	3756	1.10	9				
	10063	6074	7.06*	9*	11.44	1.62		
				17			1.62	

TABLE 3: RECORDER SCALE FACTORS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	4291	10.09	17	24.62	2.44		Jan. 17 - 1962
	10063	10071	3.55	17				
	4291	10071	-6.61	17				
	10063	4291	10.16*	17*	24.62	2.42		
				34			2.43	
	10063	4291	9.94	5	24.62	2.48		Mar. 24
	10063	10073	-4.62	10				
	4291	10073	-14.53	5				
	10063	4291	9.90*	5*	24.62	2.49		
				10			2.48	
	10063	4291	9.86	5	24.62	2.50		Mar. 26
	10063	10071	3.54	10				
	4291	10071	-6.44	10				
	10063	4291	9.98*	10*	24.62	2.47		
				15			2.48	
	10063	4291	9.69	6	24.62	2.54		Mar. 28
	10063	10068	-0.55	10				
	4291	10068	-10.38	10				
	10063	4291	9.83*	10*	24.62	2.50		
				16			2.51	
	10063	4291	9.83	10	24.62	2.50		Apr. 29
	10063	10068	0.59	10				
	4291	10068	-10.46	10				
	10063	4291	9.87*	10*	24.62	2.49		
				20			2.50	

TABLE 2: RECORDER SCALE FACTORS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	4291	9.75	10	24.62	2.53		Apr. 29 - 1962
	10063	6078	2.81	9				
	4291	6078	12.60	10				
	10063	4291	9.73*	9*	24.62	2.52	2.52	
				15				
	10063	4291	9.87	10	24.62	2.49		May 19
	10063	6078	2.74	10				
	4291	6078	-12.66	9				
	10063	4291	9.92*	9*	24.62	2.49	2.49	
				19				
	10063	4291	9.91	10	24.62	2.49		May 26
	10063	6078	2.87	10				
	4291	6078	12.71	10				
	10063	4291	9.84*	10*	24.62	2.50	2.49	
				20				
	10063	4291	9.92	10	24.62	2.48		May 28
	10063	10068	9.59	9				
	4291	10068	10.65	10				
	10063	4291	10.15*	9*	24.62	2.42	2.45	
				10				
	10063	7351	14.59	10	37.22	2.55		June 5
	10063	3757	4.35	10				
	7351	3757	10.04	10				
	10063	7351	14.49*	10*	37.22	2.58	2.57	
				20				

TABLE 3: RECORDER SCALE FACTORS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	7351	14.64	10	37.22	2.54		June 23 - 1962
	10063	3757	4.36	10				
	7351	3757	10.37	10				
	10063	7351	14.73*	10*	37.22	2.53		
				20			2.54	
	10063	7351	14.88	10	37.22	2.50		July 7
	10063	3757	4.49	10				
	7351	3757	10.37	10				
	10063	7351	14.86*	10*	37.22	2.50		
				20			2.50	
	10063	7351	14.71	10	37.22	2.53		July 10
	10063	2427	5.13	10				
	7351	2427	8.78	10				
	10063	7351	13.91*	10*	37.22	2.67		
				20			2.60	
	10063	7351	14.84	10	37.22	2.51		July 20
	10063	2427	4.95	10				
	7351	2427	9.55	10				
	10063	7351	14.50*	10*	37.22	2.57		
				20			2.54	
	10063	7351	14.66	10	37.22	2.54		August 11
	10063	2427	4.85	10				
	7351	2427	9.62	10				
	10063	7351	14.47*	10*	37.22	2.57		
				20			2.55	

TABLE 3: RECORDER SCALE FACTORS

Col:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	7351	15.00	10	37.22	2.48		Aug. 11 - 1962
	10063	2426	1.13	10				
	7351	2426	13.68	10				
	10063	7351	14.81*	10*	37.22	2.51		
				20			2.49	
	10063	7351	14.93	10	37.22	2.48		Aug. 21
	10063	3756	0.20	10				
	7351	3756	15.14	10				
	10063	7351	14.91*	10*	37.22	2.50		
				20			2.49	
	10063	7351	14.90	10	37.22	2.50		Sept. 7
	10063	3756	0.15	10				
	7351	3756	14.71	10				
	10063	7351	14.86*	10*	37.22	2.50		
				20			2.50	
	10063	7351	14.95	10	37.22	2.49		Oct. 4
	10063	7351	14.72	10	37.22	2.53		Oct. 9
	10063	7351	14.62	10	37.22	2.55		Oct. 17
	10063	7351	14.53	10	37.22	2.56		Oct. 19
	10063	7351	14.99	10	37.22	2.48		Nov. 13
	10063	7351	14.98	10	37.22	2.49		Nov. 28
	10063	7351	15.02	10	37.22	2.48		Dec. 7

TABLE 3: RECORDER SCALE FACTORS

Col: 1	2	3	4	5	6	7	9
Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
10063	7351	15.04	10	37.22	2.48		January 12 - 1963
10063	10072	1.90	10				
7351	10072	17.08	10				
10063	7351	15.16*	10*	37.22	2.46		
			20			2.47	
10063	7351	15.37	10	37.22	2.42		February 1
10063	4278	1.61	6				
7351	4278	16.78	6				
10063	7351	15.17*	6*	37.22	2.45		
			16			2.43	
10063	7351	14.51	10	37.22	2.57		
10063	4286	-1.48	10				
7351	4286	15.41	9				
10063	7351	14.93*	9*	37.22	2.49		March 16
			19			2.53	
10063	7351	15.00	10	37.22	2.48		April 1
10063	4286	-1.54	10				
7351	4286	16.46	10				
10063	7351	14.92*	10*	37.22	2.49		
			20			2.49	
10063	7351	15.04	10	37.22	2.47		April 20
10063	7362	-2.14	10				
7351	7362	17.24	10				
10063	7351	15.10*	10*	37.22	2.46		
			20			2.47	

TABLE 3: RECORDER SCALE FACTORS

C-1:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	7351	14.97	10	37.22	2.49		May 6 - 1963
	10063	7362	-2.11	10				
	7351	7362	17.00	10				
	10063	7351	14.89*	10*	37.22	2.50	2.50	
				20				
	10063	7351	15.03	10	37.22	2.48		May 18
	10063	7362	-2.09	10				
	7351	7362	17.32	10				
	10063	7351	15.23*	10*	37.22	2.44	2.46	
				20				
	10063	4283	13.78	10	32.34	2.35		May 19
	10063	4284	4.75	10				
	4283	4284	8.90	10				
	10063	4283	13.74*	10*	32.34	2.35	2.35	
				20				
	10063	4283	13.92	10	32.34	2.32		June 10
	10063	4284	4.90	10				
	4283	4284	9.13	10				
	10063	4283	14.03*	10*	32.34	2.31	2.32	
				20				
	10063	4283	14.10	10	32.34	2.29		June 29
	10063	4284	5.01	10				
	4283	4284	9.06	10				
	10063	4283	14.07*	10*	32.34	2.30	2.30	

TABLE 3: RECORDER SCALE FACTORS

C-1:	1	2	3	4	5	6	7	8
	Standard Tank No.	Compared Tank No.	Observed Scale Diff.	No. of Comparisons	Index Diff.	Recorder Single Set	Scale Fac. Weighted Average	Date of Analysis
	10063	7351	15.29	10	37.22	2.43		
	10063	4272	5.01	3				
	7351	4272	15.07	10				
	10063	7351	15.26*	10*	37.22	2.44	2.44	July 5, 1963
				20				
	10063	7351	15.29	10	37.22	2.43		
	10063	3757	5.34	10				
	7351	3757	10.11	10				
	10063	7351	15.27*	10*	37.22	2.44	2.44	July 6
				20				
	10063	7351	15.36	9	37.22	2.42		
	10063	10204	1.73	10				
	7351	10204	17.03	10	37.22	2.43	2.42	July 23
	10063	7351	15.33*	10*				
				20				
	10063	7351	15.41	9	37.22	2.42		
	10063	10204	1.73	10				
	7351	10204	17.20	3				
	10063	7351	15.47*	10*	37.22	2.41	2.42	Aug. 10
				20				
	10063	7351	15.48	10	37.22	2.43		
	10063	10204	1.70	9				
	7351	10204	17.27	10				
	10063	7351	15.57*	9*	37.22	2.39	2.40	Aug. 21
				20				

TABLE 4: POINT BARROW CARBON DIOXIDE PROJECT
 (NOT CORRECTED FOR BAROMETRIC PRESSURE)
 COMPARISON BETWEEN FLASK AND IR ANALYZER

Date	Local Time	Flask Index Values	Av. Flask Index Value	OBS. SC. Diff.	R. S. F.	Computed Scale Diff.	Refer. Tank		Air Index	Av. Air Index	Depart. from Fl. Val.	Time
							No.	Index				
1961												
Sept. 15	1030	309.24	309.28	-.95	2.593	-2.46	10069	312.30	309.74	309.32	+0.04	0930
		309.33		-1.35		-3.50			308.70			1000
Oct. 16	1600	313.23	313.18	6.10	1.468	8.95	3755	304.51	313.46	313.41	+0.23	1530
		313.14		6.15		9.03			313.54			1600
				5.95		8.73			313.24			1630
Nov. 22	1500	314.87	315.05		NO	D A T A						
		315.23										
Dec. 12	1415	320.61*	316.51	12.80	1.455	18.62	3756	297.26	315.88	315.93	+0.42	1330
		316.51		12.85		18.70			315.96			1400
				12.85		18.70			315.96			1430
1962												
Jan. 1	1545	317.10	317.10		NO	D A T A						
Jan. 15	1545	317.42	317.38	-0.55	2.500	-1.38	10071	319.23	317.85	317.39	+0.01	1530
		317.33		-0.85		-2.13			317.10			1600
				-0.80		-2.00			317.23			1630
Feb. 1	1530	317.94	317.96	-0.65	2.500	-1.63	10071		317.60	317.60†	-0.36	1700
		317.98		-0.65		-1.63		317.60	1730			
Feb. 15	1530	318.89	318.80	-0.30	2.500	-0.75	10071		318.48	318.56	-0.24	1500
		318.70		-0.25		-0.50		318.73	1530			
				-0.30		-0.75		318.48	1600			

* Contaminated

† No IR values prior to 1700 h.

TABLE 4: POINT BARROW CARBON DIOXIDE PROJECT

COMPARISON BETWEEN FLASK AND IR ANALYZER

Date	Local Time	Flask Index Values		Av. Fl. Index Value	OBS. SC. Diff.	R.S.F.	Computed Scale Diff.		Refer. Tank No. Index		Air Index	Av. Air Index	Depart. from Fl. Val.	Time
1962														
Mar. 1	1445	317.57			7.45	2.500	18.63	10073	290.83	317.46				1400
		317.76	317.65	7.50	18.75		317.58					1430		
				7.45	18.63		317.46			317.50	-0.15	1500		
Mar. 15	1045	317.29			7.50	2.500	18.75	10073		317.58				1830
		317.29	317.29	7.55	18.83		317.71				1900			
				7.35	18.38		317.21		317.50	+0.21	1930			
Apr. 2	1550	317.18			3.50	2.500	8.75	10068	309.04	317.79				1530
		317.37	317.28	3.50	8.75		317.79					1600		
				3.45	8.63		317.67			317.75	+0.47	1630		
Apr. 15	1430	318.03			3.65	2.500	9.13	10068		318.17				1400
		318.03	318.03	3.70	9.25		318.29		318.23	+0.20	1430			
		NO DATA FOR 1500 ^h										1500		
May 1	1550	319.14			6.50	2.500	16.25	6078	302.81	319.06				1530
		319.14	319.14	6.45	16.13		318.94					1600		
				6.40	16.00		318.81			318.94	-0.20	1630		
May 15	1500	318.96			6.15	2.500	15.38	6078		318.19				1430
		318.96	318.96	6.20	15.50		318.31		318.25	-0.71	1500			
		VARIABLE TRACE NO DATA FOR 1530										1530		
June 1	1520	318.77			6.20	2.500	15.50	6078		318.31				1500
		318.93	318.85	6.45	16.13		318.94		318.63	-0.22	1530			

TABLE 4: POINT BARROW CARBON DIOXIDE PROJECT

COMPARISON BETWEEN FLASK AND IR ANALYZER

Date	Local Time	Flask Index Values	Av. Fl. Index Value	OBS. SC. Diff.	R.S.F.	Computed Scale Diff.	Refer. Tank		Air Index	Av. Air Index	Depart. from Fl. Val.	Time
							No.	Index				
1962												
June 15	1445	318.40		7.50	2.500	18.75	3757	299.38	318.13			1430
		318.40	318.40	7.50		18.75			318.13	318.13	-0.27	1500
July 1	1355	314.44		5.95	2.500	14.88	3757		314.26			1330
		314.55	314.50	5.80		14.50		313.88	314.07	-0.43	1400	
July 15	1340	313.20		6.18	2.500	15.45	2427	297.64	313.09			1330
		312.99	313.10	6.18		15.45			313.09	313.09	-0.03	1400
Aug. 1	1300	310.31		4.85	2.500	12.13	2427		309.77			1230
		310.31	310.31	4.63		11.58		309.22	309.50	-0.81	1330	
Aug. 15	1045	307.41										
		307.41	307.41									
NO DATA												
Sept. 1	0900	308.25		-1.12	2.500	-2.80	3756	310.16	307.36			0830
		308.35	308.30	-0.82		-2.05			308.11			0900
				-0.98		-2.45			307.71	307.72	-0.58	0930
Sept. 15	1600	309.06	309.06									
Variable: Daily Av. 310.76												
Oct. 1	1400	312.28										
		312.28	312.28									
NO DATA AT TIME OF SAMPLE												
Oct. 15	1415	312.65		0.25	2.500	0.63	2400	310.99	311.62			1400
		312.46	312.56	0.40		1.00			311.99	311.80	-0.76	1430
Nov. 1	1500	316.02		5.70	2.500	14.25	10071	301.63	315.88			1430
				5.60		14.00			315.63			1500
		316.02	316.02	5.75		14.38			316.01	315.84	-0.18	1530

TABLE 4: POINT BARROW CARBON DIOXIDE PROJECT

COMPARISON BETWEEN FLASK AND IR ANALYZER

Date	Local Time	Flask Index Values	Av. Fl. Index Value	OBS. SC. Diff.	R.S.F.	Computed Scale Diff.	Refer. No.	Tank Index	Air Index	Av. Air Index	Depart. from Fl. Val.	Time
1962												
Nov. 15	1300	316.39		5.65	2.500	14.13	10071	301.63	315.76			1200
		316.48	316.44	5.85		14.63			316.26		1300	
				6.00		15.00			316.63	316.22	-0.22	1330
Dec. 15	1100	317.04		0.90	2.500	2.25	10072	314.88	317.13			0900*
		316.95	317.00	0.75		1.87			316.75	316.94	-0.06	1100
1963												
Jan. 1	2230	317.94		1.20	2.500	3.00	10072		317.80			2200
		318.03	317.98	1.35		3.38		318.26	318.07	+0.09	2230	

AVERAGE DEPARTURE = -0.15_u

* Variable

TABLE 5: SUMMARY OF R.S.F. AND BAROMETRIC PRESSURE CORRECTIONS.

σ = Scale factor
 μ = Average air index

\bar{P} = Average atmospheric pressure
 P_{OBS} = Pressure at time of flask sample

Date	σ	\bar{P}	P_{OBS}	$\sigma \frac{\bar{P}}{P_{OBS}}$	μ Scale	$\frac{\sigma \bar{P}}{P_{OBS}}$	Corr. Air Index	Time	Flask Value Index	Depart. from Flask	Refer. No.	Tank Index
1961												
Sept. 15	2.593	29.73	29.66	2.598	-1.15	-2.99	309.31	1030	309.24 309.33	+0.07 -0.02	10069	312.30
Oct. 16	1.468	29.83	29.61	1.479	6.13	9.07	313.58	1600	313.23 313.14	+0.33 +0.44	3755	304.51
1962												
Jan. 15	2.500	30.06	30.15	2.493	-0.73	-1.82	317.41	1545	317.42 317.33	-0.01 +0.08	10071	319.23
Feb. 1	"	"	29.75	2.526	-0.65	-1.64	317.59	1530	317.94 317.98	-0.35 -0.39	10071	
Feb. 15	"	"	30.40	2.472	-0.28	-0.69	318.54	1445	318.89 318.70	-0.35 -0.16	10071	
Mar. 1	"	"	30.07	2.500	7.47	18.68	317.51	1845	317.57 317.76	-0.06 -0.25	10073	298.83
Mar. 15	"	"	30.68	2.449	7.47	18.29	317.12	1550	317.29 317.29	-0.17 -0.17	10073	
Apr. 2	"	"	30.42	2.470	3.48	8.60	317.64	1430	317.18 317.37	+0.46 +0.27	10068	309.04
Apr. 15	"	"	30.05	2.500	3.67	9.18	318.22	1550	318.03 318.03	+0.19 +0.19	10068	
May 1	"	"	30.22	2.487	6.45	16.04	318.85	1500	319.14 319.14	-0.29 -0.29	6078	302.81

TABLE 5: SUMMARY OF R.S.F. AND BAROMETRIC PRESSURE CORRECTIONS

σ = Scale factor
 μ = Average air index

\bar{P} = Average atmospheric pressure
 P_{OBS} = Pressure at time of flask sample

Date	σ	\bar{P}	P_{OBS}	$\frac{\bar{P}}{P_{OBS}}$	\bar{p} Scale	$\frac{\sigma \bar{P}}{P_{OBS}}$ μ	Corr. Air Index	Time	Flask Value Index	Depart. from Flask	Refer. Tank		
											No.	Index	
1962													
May 15	2.500	30.06	29.51	2.547	6.17	15.15	317.96	1520	318.96 318.96	-1.00 -1.00	6078		
June 1	"	"	29.85	2.517	6.33	15.93	318.74	1445	318.77 318.93	-0.03 -0.19	6078		
June 15	"	"	29.97	2.507	7.50	18.80	318.18	1355	318.40 318.40	-0.22 -0.22	3757	299.38	
July 1	"	"	29.83	2.511	5.87	14.74	314.12	1340	314.44 314.55	-0.32 -0.43	3757		
July 15	"	"	30.03	2.500	6.18	15.45	313.09	1300	313.20 312.99	-0.11 +0.10	2427	297.64	
Aug. 1	"	"	29.82	2.520	4.74	11.94	309.58	0900	310.31 310.31	-0.73 -0.73	2427		
Sept. 1	"	"	30.11	2.496	0.97	-2.42	307.74	1415	308.25 308.35	-0.51 -0.61	3756	310.16	
Oct. 15	"	"	29.60	2.539	0.33	0.84	311.83	1500	312.65 312.46	-0.82 -0.63	2400	310.99	
Nov. 1	"	"	30.18	2.490	5.70	14.19	315.82	1300	316.02 316.02	-0.20 -0.20	10071	301.63	
Nov. 15	"	"	30.23	2.486	5.83	14.49	316.12	1100	316.39 316.48	-0.27 -0.36	10071		
Dec. 15	"	"	29.97	2.508	0.83	2.08	316.96	2230	317.04 316.95	-0.08 +0.01	10072	314.88	
1963													
Jan. 1	"	"	30.17	2.491	1.27	3.16	318.04	1200	317.94 318.03	+0.10 +0.01	10072		
										AVG. DEPARTURE.....	- 0.263		

TABLE 6: INDEX VALUES OF WORKING REFERENCE GASES AND RETIRED STANDARDS

COL: 1	2	3	4	5	6	7	8	9
Standard Tank No.	Compared Tank No.	Single No. of Compar.	Set Index.	Wgt'd No. of Compar.	Average Index	Compared Tank No.	Tank Pressure (PSI)	Date of Analysis
10063	3755	5	304.02	5	304.02	3755	1875	Sept. 26 - 1961
10063	3756	16	297.12				1600	Nov. 27,
10063	3756	9	297.32				440	Jan. 6 - 1962
10063	3756	9	297.44	34	297.25	3756	410	Jan. 7
10063	10071	17	319.20				1750	Jan. 17
10063	10071	10	319.35	27	319.25	10071	450	March 26
10063	10073	10	299.09	10	299.09	10073	420	March 24
10063	10068	10	309.19				2000	March 28
10063	10068	10	309.09				500	April 29
10063	10068	9	309.35	29	309.21	10068	470	May 20
10063	6078	9	303.49				2000	April 29
10063	6078	10	303.75				1120	May 19
10063	6078	10	303.42	29	303.55	6078	740	May 26
10063	3757	10	299.36				2000	June 5
10063	3757	10	299.50				1110	June 23
10063	3757	10	299.35	30	299.40	3757	470	July 7
10063	2427	10	297.22				1950	July 10
10063	2427	10	298.00				1500	July 20
10063	2427	10	298.20	30	297.80	2427	610	Aug. 11
10063	2426	10	307.76				2100	Aug. 11
7351	2426	10	307.54	20	307.65	2426	400	Oct. 4
10063	3756	10	310.07				1900	Aug. 21
10063	3756	10	310.19	20	310.13	3756	1070	Sept. 7
7351	2400	10	311.50	10	311.50	2400	860	Oct. 9
7351	10071	10	301.97				2100	Oct. 19
7351	10071	10	301.42				1095	Nov. 13
7351	10071	10	301.41	30	301.60	10071	500	Nov. 28
7351	10072	10	314.82				2160	Dec. 7

TABLE 6: INDEX VALUES OF WORKING REFERENCE GASES AND RETIRED (SUB)STANDARDS

Col: 1	2	3	4	5	6	7	8	9
Standard Tank No.	Compared Tank No.	Single No. of Compar.	Set Index	Wgt'd No. of Compar.	Average Index	Compared No.	Tank Pressure (PSI)	Date of Analysis
10063	10072	10	315.25	20	315.04	10072	500	Jan. 12 - 1963
10063	4278	10	314.48	10	314.40	4278	1340	Feb. 1
10063	4286	10	314.31				1170	Mar. 16
10063	4286	10	314.39	20	314.35	4286	460	Apr. 1
10063	7362	10	315.63				1000	Apr. 20

TABLE 7: COMBINED SCRIPPS AND POINT BARROW INDEX VALUES OF WORKING REFERENCE GASES

Col:1	2	3	4	5	6	7	8	9	10	11	12
Tank No.	At Scripps Prior to Use		At Point Barrow		At Scripps After Use		Pressure	Wt'd Average		Tank No.	Date Use Began
	No. of Compar.	Index	No. of Compar.	Index	No. of Compar.	Index		No. of Compar.	Index		
I _O Tank 10083 in use:											
3755	12	304.38	5	304.82	10	306.13*	130	17	304.51	3755	Sept. 21 - 1961
3756	13	297.15	34	297.25	10	297.43	390	57	297.26	3756	Nov. 8
I _{LS} Tank 7351 in Use:											
10071	13	319.12	27	319.25	10	319.29	400	47	319.23	10071	Jan. 10 - 1962
10073	30	298.77	10	298.77	10	298.73	400	50	298.83	10073	Feb. 16
10068	21	308.80	29	309.21	12	309.05	450	62	309.04	10068	Mar. 27
6078	20	302.73	29	303.55*	10	302.96	420	59	302.81	6078	Apr. 30
3757	21	298.30	30	299.40	10	299.33	340	61	299.30	3757	June 1
2427	26	297.36	30	297.60	10	297.92	280	66	297.64	2427	July 9
2426	20	307.51	20	307.65	10	307.68	280	50	307.60	2426	Aug. 15
3756	10	310.32	20	310.13	9	310.37	320	39	310.16	3756	Aug. 17
2400	113	310.94	10	311.50	11	311.00†	510	134	310.99	2400	Oct. 5
10071	21	301.68	30	301.60	--	--	--	51	301.63	10071	Oct. 18
I _O Tank 10063 in Use:											
10072	20	314.75	20	315.04	11	314.84†	400	51	314.88	10072	Dec. 6
4278	20	314.24	10	314.48	12	314.35†	--	42	314.33	4278	Jan. 13 - 1963

† Preliminary value

* = Not used in computation of weighted average

TABLE 7a: SCRIPPS INDEX VALUES OF WORKING REFERENCE GASES

Col: 1	2	3	4	5	6	7	8	9	
Tank No.	At Scripps Prior to Use		At Scripps After Use		Pressure	Wt'd Average		Tank No.	Date Use Began
	No. of Compar.	Index	No. of Compar.	Index		No. of Compar.	Index		

I_o Tank in Use 148:

10072	55	299.35	10	299.30	40	65	299.34	10072	July 10 - 1961
10064	12	298.68	10	298.03	100	22	298.38	10064	July 15
10065	10	297.24	10	297.06	250	20	297.15	10065	July 28
10077	51	279.35	20	280.02	-	71	279.53	10077	Aug. 6
6074	10	299.04	10	298.94	600	20	298.99	6074	Aug. 17
148	13	339.32	10	339.79	148	23	339.52	148	July 10
10070	11	364.75	--	--	--	11	364.74	10070	July 15
10069	52	312.27	55	312.33	390	107	312.30	10069	Aug. 1

TABLE 7b: STANDARD TANK SEQUENCE AT POINT BARROW

Tank No.	Index (Initial) SIO #	Use Dates
10063	310.57	Sept. 26, 1961
6074	299.04	Aug. 17, 1961 to Jan. 5, 1962
4291	335.19	Jan. 6, 1962 to June 1, 1962
7351	273.35	June 1, 1962

* Scripps Institution of Oceanography

TABLE 8: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
FLASK SAMPLE INDEX VALUES

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Value	Average Index	Sampling Location
1961						
i-2	1.8 l.	Aug 19	1545	307.85	307.85*	On the Staten Island & ARLIS II
i-1	1.8 l.	Aug 20	1045	312.77	312.77*	On the Staten Island en route from ARLIS II 74° 26'N, 162° 19'W
i-3	1.8 l.	Sept 15	1030	309.24	309.28	Point Barrow--Kelley
i-4	1.8 l.	Sept 15	1030	309.33		Point Barrow--Keeling
i-5	1.8 l.	Sept 18	1645	310.08	310.08	ARLIS II, 76° 06'N, 173° 15'W
i-6	1.8 l.	Sept 18	1645	310.08		ARLIS II
i-7	1.8 l.	Oct 16	1600	313.23	313.1	Point Barrow
i-8	1.8 l.	Oct 16	1600	313.14		Point Barrow
i-9	1.8 l.	Nov 22	1500	314.87	315.05	Point Barrow
i-10	1.8 l.	Nov 22	1500	315.23		Point Barrow
L-45	1.8 l.	Dec 11	2010	316.50	316.50	ARLIS II
L-46	1.8 l.	Dec 11	2010	316.50		77° 27'N, 177° 25'E
i-11	1.8 l.	Dec 12	1415	320.61	316.51*	Point Barrow
i-12	1.8 l.	Dec 12	1415	316.51		Point Barrow
i-129	5.0 l.	Dec 15	1400			Point Barrow
i-132	5.0 l.	Dec 15	1400			Point Barrow
L-23	1.8 l.	Dec 17	1645	317.59	317.64	ARLIS II
L-24	1.8 l.	Dec 17	1645	317.68		77° 21'N, 178° 20'E
1962						
i-124	5 l.	Feb 1	1530	317.94		Point Barrow
i-125	5 l.	Feb 1	1530	317.98	317.96	Point Barrow
L- 71	1.8 l.	Feb 2	1400	319.45		Arlls II
L- 72	1.8 l.	Feb 2	1400	319.45	319.45	78° 33'N, 177° 43'E
i-121	5 l.	Feb 15	1530	318.89		Point Barrow
i-122	5 l.	Feb 15	1530	318.70	318.80	Point Barrow
L- 95	1.8 l.	Feb 15	1700	318.51		ARLIS II

*Single value

TABLE 8: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
FLASK SAMPLE INDEX VALUES

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Value	Average Index	Sampling Location
L- 96	1.8 l.	Feb 15	1700	---+	318.51	78° 52'N, 175° 17'E
i-123	5 l.	Mar 1	1445	317.57		Point Barrow
i-126	5 l.	Mar 1	1445	317.76	317.66	Point Barrow
L- 93	1.8 l.	Mar 1	1440	318.04		ARLIS II
L- 94	1.8 l.	Mar 1	1440	318.04	318.04	79° 10'N, 175° 15'E
L- 91	1.8 l.	Mar 15	1845	317.29		Point Barrow
L- 92	1.8 l.	Mar 15	1845	317.29	317.29	Point Barrow
L- 25	1.8 l.	Mar 16	0220	317.42		ARLIS II
L- 26	1.8 l.	Mar 16	0220	317.60	317.51	79° 57'N, 170°47'E
L- 57	1.8 l.	Apr 1	1445	317.83		ARLIS II
L- 58	1.8 l.	Apr 1	1445	317.83	317.83	79° 55'N, 171° 00'E
L- 9	1.8 l.	Apr 2	1550	317.18		Point Barrow
L- 10	1.8 l.	Apr 2	1550	317.37	317.28	Point Barrow
i-137	5 l.	Apr 15	1430	318.03		Point Barrow
i-138	5 l.	Apr 15	1430	318.03	318.03	Point Barrow
L- 33	1.8 l.	Apr 16	1425	317.83		ARLIS II
L- 34	1.8 l.	Apr 16	1425	318.01	317.92	80° 18'N, 172° 52'E
i-135	5 l.	May 1	1550	319.14		Point Barrow
i-139	5 l.	May 1	1550	319.14	319.14	Point Barrow
L- 83	1.8 l.	May 2	1615	318.93		ARLIS II
L- 84	1.8 l.	May 2	1615	318.84	318.88	80° 52' N, 172° 24'E
140	5 l.	May 15	1500	318.96		Point Barrow
141	5 l.	May 15	1500	318.96	318.96	Point Barrow
L- 47	1.8 l.	May 16	1810	318.65		ARLIS II
L- 48	1.8 l.	May 16	1810	318.75	318.70	81° 04'N, 171° 35'E
142	5 l.	June 1	1520	316.77		Point Barrow
L- 60	1.8 l.	June 1	1520	318.93	318.85	Point Barrow
L- 99	1.8 l.	June 2	1945	319.11		ARLIS II
L-100	1.8 l.	June 2	1945	319.11	319.11	81° 30'N, 175° 30'E

+Stopcock loose - no value

* Single value

TABLE 8: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
FLASK SAMPLE INDEX VALUES

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Value	Average Index	Sampling Location
1962						
143	5 l.	June 15	1445	318.40		Point Barrow
144	5 l.	June 15	1445	318.40	318.40	Point Barrow
L-103	1.8 l.	June 16	1425	319.14		ARLIS II
L-104	1.8 l.	June 16	1425	319.14	319.14	81° 56'N, 166° 50'E
i- 1	5 l.	July 1	1355	314.44		Point Barrow
i- 2	5 l.	July 1	1355	314.55	314.50	Point Barrow
L- 3	1.8 l.	July 2	1455	315.98		ARLIS II
L- 4	1.8 l.	July 2	1455	316.29	316.14	82° 07'N, 165° 50'E
i- 3	5 l.	July 15	1340	313.20		Point Barrow
i- 4	5 l.	July 15	1340	312.99	313.10	Point Barrow
L- 53	1.8 l.	July 16	1450	314.74		ARLIS II
L- 54	1.8 l.	July 16	1450	314.74	314.74	82° 12'N, 162° 12'E
i- 5	5 l.	Aug 1	1300	310.31		Point Barrow
i- 6	5 l.	Aug 1	1300	310.31	310.31	Point Barrow
L- 45	1.8 l.	Aug 2	1425	310.10		ARLIS II
L- 46	1.8 l.	Aug 2	1425	310.10	310.10	81° 28.4'N, 167° 47'E
i- 7	5 l.	Aug 15	1045	307.41		Point Barrow
i- 8	5 l.	Aug 15	1045	307.41	307.41	Point Barrow
L- 25	1.8 l.	Aug 16	1410	308.45		ARLIS II
L- 26	1.8 l.	Aug 16	1410	308.45	308.45	82° 20'N, 161°52'E
i- 9	5 l.	Sept 1	0900	308.25		Point Barrow
i-192	5 l.	Sept 1	0900	308.35	308.30	Point Barrow
L- 97	1.8 l.	Sept 2	1435	307.83		ARLIS II
L- 98	1.8 l.	Sept 2	1435	307.94	307.88	82°37'N, 163° 31' E
i- 10	5 l.	Sept 15	1600			Point Barrow
i- 11	5 l.	Sept 15	1600	309.06	309.06*	Point Barrow
165		Sept 16	2200			Point Barrow
166		Sept 16	2200			Point Barrow
L-101	1.8 l.	Sept 16	1440	308.25		ARLIS II
L-102	1.8 l.	Sept 16	1440	308.14	308.20	82° 26.5'N, 160° 17'E

TABLE 8a: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
INDEX VALUES FOR FLASK SAMPLES TAKEN AT VARIOUS ALASKAN LOCATIONS 1962

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Value	Average Index	Sampling Location
		1962				
i-13	5 l.	June 15	0225	315.88		Ice Island T-3
i-16	5 l.	June 15	0225	315.57	315.72	76.2°N, 170°W
i-17	5 l.	June 30	0126	316.50		T-3
i-19	5 l.	June 30	0126	316.50	316.50	76.8° N, 170.3°W
i-18	5 l.	July 15	0150	313.51		T-3
i-22	5 l.	July 15	0150	313.82	313.67	77.5° N, 168.6° W
i-14	5 l.	July 30	0244	311.96		T-3
i-15	5 l.	July 30	0244	311.54	311.75	77.2° N, 164.6°W
i-21	5 l.	Aug 15	0247			T-3
i-24	5 l.	Aug 15	0247	310.51	310.51	78.2° N, 163.0°W
i-20	5 l.	Aug 30	0600	308.25		T-3
i-23	5 l.	Aug 30	0600	308.25	308.25	78.4°N, 164.2°W
134	1.8 l.	Apr 15	1315	317.76	317.76*	Umiat
L-23	1.8 l.	July 1	0830	316.95		Umiat
L-24	1.8 l.	July 1	0830	316.86	316.90	Umiat
L-51	1.8 l.	Aug 1	1600	304.39		Umiat
L-52	1.8 l.	Aug 1	1600	304.08	304.24	Umiat
i-187	5 l.	Sept 1	1210	308.55		Umiat
i-190 Brk'n	5 l.	Sept 1	1210		308.55*	Umiat
243	1.8 l.	Sept 16	1510	312.37		Umiat
244	1.8 l.	Sept 16	1510	312.58	312.48	Umiat
190	1.8 l.	Dec 31	0830	315.42	315.42**	Umiat
133	1.8 l.	Apr 15	1415	318.22	318.22*	Anaktuvuk Pass
L-23	1.8 l.	July 1	0900	311.82		Anaktuvuk Pass
L-24	1.8 l.	July 1	0900	311.82	311.82	Anaktuvuk Pass
L-99	1.8 l.	Aug 1	1830	299.21		Anaktuvuk Pass
L-100	1.8 l.	Aug 1	1830	299.52	299.36	Anaktuvuk Pass
i-181	5 l.	Aug 15	2045	316.91		Anaktuvuk Pass
i-183	5 l.	Aug 15	2045	324.54	316.91*	Anaktuvuk Pass

* Single value

+ Flask(s) opened at 10,000 ft.

TABLE 8a: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
INDEX VALUES FOR FLASK SAMPLES TAKEN AT VARIOUS ALASKAN LOCATIONS 1962

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Value	Average Index	Sampling Location
1962						
i-185	5 l.	Sept 1	1330	308.04		Anaktuvuk Pass
i-193	5 l.	Sept 1	1330	308.55	308.30	Anaktuvuk Pass
241	1.8 l.	Sept 16	1630	313.92		Anaktuvuk Pass
242	1.8 l.	Sept 16	1630	314.23	314.03	Anaktuvuk Pass
191	1.8 l.	Dec 31	0925	315.52	315.78+	Anaktuvuk Pass
192	1.8 l.	Dec 31	0945	315.93		Anaktuvuk Pass
136	1.8 l.	Apr 15	1510	319.14	319.14*	Bettles
L- 85	1.8 l.	July 1	1030	310.96		Bettles
L- 8c	1.8 l.	July 1	1030	311.53	311.24	Bettles
L- 9	1.8 l.	Aug 1	2100	314.06		Bettles
L- 10	1.8 l.	Aug 1	2100	314.45	314.66	Bettles
i-186	5 l.	Aug 15	2005	309.59		Bettles
i-189	5 l.	Aug 15	2005	308.35	308.97	Bettles
i-184	5 l.	Sept 1	1500	306.70		Bettles
i-183	5 l.	Sept 1	1500	306.70	306.70	Bettles
228	1.8 l.	Dec 31	1045	316.44	316.44+	Bettles
227	1.8 l.	Dec 31	1110	316.44		Bettles

* Single value

+ Flask(s) opened at 10,000 ft.

TABLE 9b: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
 INDEX VALUES AT SELECTED HEIGHTS OVER POINT BARROW, ALASKA

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Altitude (ft.)	Index Value	Av. by Level	Location
1962							
222	1.8 l.	Dec 28	2220	15,000	315.62		Point Barrow
221	1.8 l.	Dec 28	2305	15,000	316.95	316.28	Point Barrow
223	1.8 l.	Dec 28	2335	8,000	315.93		Point Barrow
224	1.8 l.	Dec 28	2355	8,000		315.93*	Point Barrow
226	1.8 l.	Dec 29	0020	2,000	316.44		Point Barrow
225	1.8 l.	Dec 29	0040	2,000	317.25	316.84	Point Barrow

* Single value only

TABLE 8c: S.I.O. - UNIVERSITY OF WASHINGTON CARBON DIOXIDE PROJECT COOPERATIVE PROGRAM
INDEX VALUES FOR NATEKIK CRUISE, POINT BARROW TO NOME, ALASKA

Flask No.	Flask Size	Date Exposed	Time L.S.T.	Index Values	Average Index	Location
1962						
171	1.8 l.	Aug 17	2330	309.37		Point Barrow
172	1.8 l.	Aug 17	2330	309.17	309.27	Point Barrow
175	1.8 l.	Aug 31	2030	314.03		Wainwright
176	1.8 l.	Aug 31	2030	314.34	314.18	Wainwright
180	1.8 l.	Sept 1	1730	308.86	308.86*	Point Lay
67	1.8 l.	Sept 7	1630	310.51		Cape Thompson
68	1.8 l.	Sept 7	1630	310.41	310.46	Cape Thompson
71	1.8 l.	Sept 8	1930	310.31		Little Diomedes Island
72	1.8 l.	Sept 8	1930	310.00	310.16	Little Diomedes Island
63	1.8 l.	Sept 9	0830	309.48		Cape Prince of Wales
64	1.8 l.	Sept 9	0830	309.27	309.38	Cape Prince of Wales
163	1.8 l.	Sept 10	1000	308.75		Cape Douglas
164	1.8 l.	Sept 10	1000	308.75	308.75	Cape Douglas
157	1.8 l.	Sept 12	1000	309.06		Cape Nome
158	1.8 l.	Sept 12	1000	309.17	309.12	Cape Nome

* Single value only

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index Inde	Manometer Concent. p.p.m.
						No.	Index		
1961									
July 10	0300-1030, 1430-1830 2100-2400	-10.29	29	2.582	-26.57	148	339.52	312.95	313.26
11	0000-0100, 0330-1700 2000-2100	- 9.86	32		-25.46			313.94	314.47
12	0800-1030, 1130-2230	-10.87	38		-28.07			311.45	311.44
13	0000-2230	-10.26	43		-26.49			313.03	313.36
14	0030-0230	-10.24	7		-26.44			313.08	313.42
15	1300-2400	-12.57	20	4.237	-53.26	10070	364.74	311.48	311.47
16	0000-2400	-12.52	44		-53.05			311.69	311.73
17	0000-1300	-12.46	29		-52.79			311.95	312.05
17	1600-2400	2.67	14		11.31	10064	298.38	309.69	309.29
19	0000-1300, 1600-2400	3.15	43		13.35	10070	364.74	311.73	311.78
20	0000-0930, 1530-2400	3.08	37		13.05	10064	298.38		
20	1130-1500	-12.45	8		-52.75	10070	364.74	311.43	311.41
21	1100-1130, 0100	-12.49	6		-52.92			311.99	312.09
21	0000-0930, 1200-2400	3.20	42		13.56	10064	298.38	311.82	311.89
22	0000-2400 all	3.24	47		13.73			311.94	312.03
23	2100-2400	2.36	4		10.00			312.11	312.24
23	0000-2030	-13.13	13		-55.63	10070	364.74	308.38	307.70
24	2200-2230	-13.15	2		-55.72			309.11	308.59
24	0000-2130, 2300-2400	2.67	43		11.31	10064	298.38	309.02	308.48
25	0000-2400	2.67	46		11.31			309.69	309.29
26	0030-0830, 1700-2330	2.57	31		10.89			309.69	309.29
26	0000, 1600-1630	-13.00	3		-55.08	10070	364.74	309.27	308.78
27	0000-2400*	2.53	36		10.72	10064	298.38	309.66	309.26
27		-12.96	10		-54.90	10070	364.74	309.10	308.57
28	0000-1530	2.78	31		11.78	10064	298.38	309.84	309.47
								310.16	309.86

* variable

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concentr. p.p.m.
						No.	Index		
1961									
July 28	1700-2400	2.46	14	4.356	10.72	10065	297.15	307.87	307.07
29	0000-2400	2.39	46		10.41			307.55	306.70
30	0000-2400	2.22	45		9.67			306.82	305.79
31	0000-0830	3.09	17		13.46			310.61	310.41
31	0930-2200	-13.26	26	4.237	-56.18	10070	364.74	308.55	307.92
Aug 1	0000-1500	2.72	30	4.356	11.85	10065	297.15	309.00	308.45
2	2000-2400	5.00	8	2.623	13.12			310.27	310.00
2	0000-1930	-1.05	33		-2.75	10069	312.30	309.55	309.12
3	0930-1000, 1700-2130	-0.80	12		-2.10			310.00	309.91
3	0000-0900, 1030-1200	5.05	23		13.25	10065	297.15	310.40	310.16
4	0000-1030	5.51	23		14.45			311.60	311.62
5	1130-1830	-1.37	11		-3.59	10069	312.30	308.71	308.10
5	0100-1100	4.43	20		11.62	10065	297.15	308.77	308.17
6	1700-1830	-1.46	4		-3.83	10069	312.30	308.47	307.81
6	1900-2400	11.06	10		29.01	10077	279.53	308.54	307.89
7	0000-1430	11.17	25		29.30			308.83	308.24
7	1500-2200, 2300	-1.36	11		-3.57	10069	312.30	308.73	308.12
8	0000-2400	8.47	47	3.374	28.58	10077	279.53	308.11	307.37
11	1430-1600	8.51	5		28.71			308.24	307.53
11	1230-1400, 1630	-1.17	5		-3.95	10069	312.30	308.35	307.66
14	0000-0100, 1030-1900	-1.22	21		-4.12			308.18	307.45
14	0130-1000	8.37	15		28.24	10077	279.53	307.77	306.95
15	1530-2300	-1.71	16		-5.77	10069	312.30	306.53	305.44
16	0130, 1530-2130, 2200-2400	-2.28	13		-7.69			304.61	303.10
16	0000-0100, 0200-1330	8.29	31		27.97	10077	279.53	307.50	306.62
17	0000-1400, 1430	8.78	29		29.62			300.15	308.63
17	2100-2330	2.46	6	2.185	5.38	6074	298.99	308.07	302.81

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concent. p.p.m.
						No.	Index		
1961									
Aug 18	0000-1930	3.71	37	2.185	8.106	6074	298.99	307.11	306.15
18	2100-2400	-3.53	6		-7.71	10069	312.30	304.59	303.08
19	0000-0330	-2.82	7		-6.16			306.14	304.97
19	0400-1330	5.06	20		12.80	6074	298.99	311.79	311.85
21	1700-2400	-2.11	14	2.593	-5.47	10069	312.30	306.93	305.81
22	1200-1400	-1.03	5		-4.75			307.55	306.68
22	0000-1330, 1430-2400	3.11	42		0.04	6074	298.99	307.03	306.05
23	0000-1100, 1530-2400	3.39	40		8.79			307.78	306.96
23	1130-1500	-1.71	6		-4.43	10069	312.30	307.67	307.07
24	0000-1030	3.67	23		9.52	6074	298.99	308.51	307.85
24	1100-1600	-1.63	6		-4.36	10069	312.30	307.94	307.16
27	1200-1530	-1.71	7		-4.43			307.67	307.07
28	1300-2400	-1.80	10		-4.67			307.63	306.78
29	0000-1000, 1230-2400	-1.04	40		-4.77			307.53	306.66
30	0000-2400	3.35	45		2.69	6074	298.99	307.63	306.84
31	0000-2400	3.54	40		9.18			308.17	307.44
Sept 1	0000-0730, 1430-2400	3.57	35		9.26			308.25	307.54
1	1000-1400	-1.60	9		-4.15	10069	312.30	303.15	307.42
2	0000-0930	3.90	21		10.11	6074	298.99	309.10	308.57
5	0000-0030, 0000-2400	4.59	43		11.90	10069	312.30	310.89	310.75
6	0000-1530	6.23	32		16.28			315.27	316.09
7	0200-1030	3.72	13		9.65			308.64	308.01
7	1200-1500, 1530	-1.39	8		-3.60	10069	312.30	308.70	308.09
9	0930-1130	-1.45	8		-3.70			308.54	307.89
9	0100, 2200-2330 0130-0900, 1230-2400	3.56	37		9.23	6074	298.99	308.22	307.50

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7		8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Constant.	
						No.	Index		p.p.m.	
1951 Sept	10	0000-1300								
	13	1430-1930	3.54	27	2.593	9.18	6074	298.99	308.17	307.44
	13	1130-1400, 2000-2100 2400	3.76	14		9.75			308.74	308.13
	14	0000-1430	-1.40	11		-3.63	10069	312.30	308.67	308.05
	14	0000-1430	-1.53	30		-3.97			308.33	307.63
	15	0000-0930, 1200-2400	-1.25	43		-3.24			309.06	308.65
	16	0000-2400	-1.25	45		-3.24			309.06	308.65
	17	0000-0800	-1.16	19		-3.01			309.29	308.80
	18	0000-0830	-1.52	19		-3.04			309.36	307.67
	21	1630-2400	4.20	15	1.468	6.17	3755	304.51	310.68	310.50
	22	0000-0630, 1000-2400	4.63	41		6.80			311.31	311.27
	23	0000-1730, 2200-2400	4.97	38		7.30			311.81	311.88
	24	0000-2400	4.30	40		6.31			310.02	310.67
	25	0000-2400	3.00	40		5.58			310.09	309.78
	26	0000-1400, 1700-2400	5.67	41		8.32			312.83	313.12
	27	0000-2400	7.31	40		10.73			315.24	316.06
	28	0000-2400	5.60	47		8.22			312.73	313.00
	29	0000-2400	5.22	47		7.66			312.17	312.31
	30	0000-1100	4.15	23		6.09			310.60	310.40
Oct	1	1400-2400	4.17	18		6.12			310.63	310.44
	2	0000-2400	4.25	47		6.24			310.75	310.53
	3	0000-2400	4.24	48		6.22			310.73	310.56
	4	0000-2400	4.52	48		6.64			311.15	311.07
	8	0000-2400	5.30	47		7.73			312.29	312.46
	9	0000-2400	5.61	48		8.24			312.75	313.02
	10	0000-2400	5.78	46		8.49			313.00	313.33
	11	0000-2400	5.51	46		8.09			312.60	312.94
	12	0000-2400	4.87	46		7.15			312.68	311.69
	13	0000-1400	5.46	20		8.02			312.73	312.75

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concent. p.p.m.
						No.	Index		
1961									
Oct 14	1200-2400	7.20	23	1.408	10.57	3755	304.51	315.00	315.06
15	0000-0800	6.28	17		9.22			313.73	314.22
16	0000-2400	7.30	43		10.72			315.23	316.04
17	0000-1930	6.29	39		9.22			313.73	314.22
18	0200-2400	7.29	44		10.70			315.21	316.02
19	0000-2400	8.06	43		11.83			316.34	317.40
20	0000-2400	7.36	43		10.00			315.31	316.14
21	0600-2400	9.15	47		13.43			317.94	319.35
22	0000-2400	9.91	45		14.55			319.06	320.71
23	0000-0130, 0800-0830 1200-2400	9.16	23		13.45			317.96	319.37
24	0000-1400, 1630-2400	9.80	40		14.68			319.19	320.87
25	0100-0600, 1100-2400	9.10	36		13.36			317.87	319.26
26	0000-2400	7.06	47		10.36			314.87	315.60
27	0000-2400	7.37	46		10.82			315.33	316.17
28	0030-0830, 1030-2400	8.06	45		11.83			316.34	317.40
29	0000-2400	7.76	44		11.39			315.90	316.86
30	0000-2400	8.24	47		12.10			316.61	317.72
31	0000-2400	8.23	47		12.08			316.59	317.70
Nov 1	0030-2400	8.09	44		11.88			316.39	317.46
2	0000-2400	8.41	48		12.34			316.85	318.02
3	0000-2400	9.15	47		13.43			317.94	319.35
4	0000-0630, 1130-2400	8.08	38		11.86			316.37	317.43
5	1400-2400	6.62	19		9.72			314.23	314.82
6	0000-2400	6.81	44		10.00			314.51	315.17
7	0000-2400	7.08	42		10.39			314.90	315.64
8	0000-0930	7.04	21		10.33			314.04	315.57

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col:	1	2	3	4	5	6	7	8	9	10
	Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank No.	Index	Air Index	Manometer Concent. p.p.m.
1961										
Nov	8	1830-2400	10.81	11	1.570	15.97	3756	297.26	314.23	314.82
	9	0000-2400	10.39	48		17.10			314.36	314.92
	10	0000-2400	11.54	48		18.12			315.38	316.23
	11	0000-2400	11.39	44		17.33			315.14	315.93
	12	1330-2400	11.50	21		19.06			315.32	316.15
	13	0000-2400	11.10	41		17.43			314.69	315.39
	14	0000-0930	11.21	20		17.60			314.86	315.59
	14	1630-2400	12.94	13	1.310	16.95			314.21	314.30
	25	0030-1130	14.33	29	1.280	18.34			315.60	316.49
	27	0100-1100, 1700-2400	12.91	34	1.455	19.78			315.04	317.03
	28	0030-1030, 1530-2400	12.72	38		18.51			315.77	316.70
	29	0000-2400	13.10	46		19.06			316.22	317.25
Dec	1	1130-2400	12.42	25		18.07			315.33	316.17
	2	0000-1130, 1500-2400	12.52	42		18.22			315.49	316.35
	3	0000-2030	12.61	42		18.35			315.61	316.51
	4	0000-2400	12.60	41		18.33			315.59	316.48
	5	0000-1800	13.11	36		19.08			316.34	317.40
	6	0000-0630, 2130-2400	13.17	16		19.16			316.42	317.49
	7	0000-1830, 2130-2400	13.34	41		19.41			316.67	317.80
	8	0930-2400	13.10	29		19.06			315.32	317.37
	9	0000-0500, 1200-1700	12.71	21		18.40			315.75	316.69
	10	0130-0530, 1230-1800	12.60	18		18.45			315.71	316.63
	12	0000-0300, 1100-2400	12.95	41		18.34			316.10	317.10
	13	1700-2400	13.29	14		19.34			316.60	317.71
	14	0000-1100	13.56	23		19.73			316.99	318.19
	16	1000-1330	13.28	8		19.32			316.58	317.69

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concnent. p.p.m.
						No.	Index		
1962									
Jan 3	1800-2200, 2300	12.72	14	1.520	20.61	3756	297.20	317.87	319.26
4	0000-2400	13.52	40		21.90			318.16	320.84
5	0000-1500	14.38	29		23.29			320.55	322.53
7	0200-0400, 0500-1830*	11.37	24		18.42			315.60	316.59
10	1200-2300	0.939	23	2.500	-2.47	10071	319.23	316.76	317.91
11	0000-1300, 1700-2400	0.978	41		-2.46			316.77	317.92
12	0000-0830, 1030-1530 1700-2400	1.034	42		-2.59			316.74	317.73
13	0000-2400	1.001	43		-2.50			316.73	317.77
14	0000-2400	0.953	45		-2.39			316.85	318.02
15	0000-2200	0.817	43		-2.04			317.19	318.43
16	0000, 1200-2400	1.000	44		-2.50			316.73	317.87
17	0000-0900, 1330-2400	0.390	30		-2.23			317.00	318.20
18	0000-0830, 1130-2400	1.111	43		-2.73			315.45	317.53
19	0000-2400	1.159	47		-2.92			316.31	317.36
20	0000-2400	0.809	46		-2.02			317.21	318.46
21	0000-2400	0.627	45		-1.57			317.66	319.00
22	0000-1430, 1800-1930 2100-2330	0.152	43		-0.39			318.35	320.45
23	0000-2400	0.595	47		-1.49			317.74	319.10
24	0000-1330, 1630-2400	0.148	44		-0.37			318.06	320.47
25	0000-2400	0.203	46		-0.51			318.72	320.30
26	0000-1000, 1200, 1530-2400	0.237	32		-0.72			318.51	320.04
27	0000-2400	0.415	48		-1.04			318.29	319.65
28	0000-2100, 2300-2400	0.033	40		-0.08			319.15	320.92
29	0000-0530, 1200-2400	0.311	36		-0.79			318.45	319.97
30	0000-1530, 1700-2400	0.589	45		-1.47			317.79	319.15

* variable traces excluded

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference No.	Tank Index	Air Index	Manometer Concent. p.p.m.
1962									
Jan 31	0000-2400	0.682	47	2.500	-1.71	10071	319.23	317.52	318.93
Feb 1	0000-0400, 0600-0900 1530-2030, 2200, 2300-2400	0.548	28		-1.37			317.86	319.25
2	0000-1230, 1600-2400	0.399	40		-1.00			318.23	319.70
3	0000-2400	0.540	45		-1.35			317.88	319.27
4	0000-2400	0.581	45		-1.45			317.73	319.15
5	0000-1300, 1700-2400	0.744	41		-1.86			317.37	318.65
6	0000-2400	0.759	45		-1.90			317.33	318.60
7	0000-1300, 1500-2400	0.709	44		-1.77			317.46	318.76
8	0000-2400	0.486	44		-1.22			318.01	319.43
9	0000-2400	0.512	44		-1.23			318.00	319.42
10	0000-0900, 1200-1430, 1600-1830	0.601	31		-1.50			317.73	319.09
11	1430-2400	0.950	19		-2.33			316.05	318.02
12	0000-1400, 1600-2330	0.817	44		-2.04			317.19	318.43
13	0030-2400	0.564	46		-1.41			317.02	319.20
14	0000-1400, 1700-1830, 1930-2400	0.432	42		-1.08			318.15	319.60
15	0000-2400	0.392	43		-0.90			318.25	319.72
16	0000-1700	0.562	34		-1.41			317.02	319.20
16	1830-2400	7.50	10		18.75	10073	298.83	317.58	319.91
17	0000-2400	7.63	47		19.08			317.91	319.31
18	0000-2400	7.75	48		19.38			318.21	319.67
19	0000-2400	7.68	45		19.20			318.03	319.46
20	0000-2400	7.61	44		19.63			317.06	319.25
21	0000-2400	7.68	47		19.20			318.03	319.46

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Records Used	Observer Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Constant, p.p.m.
1962									
Feb 22	0000-2400	7.74	47	2.500	19.35	10073	298.83	318.12	319.56
23	0000-2400	7.57	47		18.92			317.69	319.04
24	0000-2400	7.49	46		18.72			317.49	318.80
25	0000-2400	7.54	47		18.85			317.62	318.96
26	0000-2400	7.67	46		19.17			317.97	319.38
27	0000-2400	7.30	47		18.40			317.17	318.41
28	0000-2400	7.44	43		18.60			317.37	318.65
Mar 1	0000-1600, 1800-2400	7.51	42		18.52			317.29	318.55
2	0000-2400	7.48	46		18.72			317.49	318.80
3	0000-2400	7.53	47		18.82			317.59	318.92
4	0000-2400	7.46	47		18.65			317.42	318.71
5	0000-2400	7.72	47		19.30			318.07	319.50
6	0000-2400	7.55	47		18.87			317.64	318.98
7	0000-1600	7.59	33		18.97			317.74	319.10
8	1600, 1730-1930, 2200	7.50	6		18.77			317.54	318.96
9	1900-1930, 2100-2400	7.34	9		18.35			317.12	318.35
10	1100-2400	7.83	26		19.57			318.34	319.83
11	0000-2400	7.72	47		19.30			318.07	319.50
12	0000-0230, 1730-2400	7.27	19		18.17			316.94	318.13
13	0000-2400	7.20	45		18.00			316.77	317.92
14	0000-2400	7.42	47		18.55			317.32	318.59
15	0000-2400	7.43	43		18.70			317.47	318.77
16	0000-1630, 1800	7.50	33		18.75			317.57	318.89
17	1800-2400	7.52	12		18.80			317.63	318.97
18	0000-2400	7.50	43		18.75			317.52	318.83
19	0000-2400	7.59	43		18.97			317.74	319.10
20	0000-2400	7.61	47		19.02			317.79	319.16

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Coe. cent. p.p.m.
						No.	Index		
1962									
Mar	21	0000-2400							
	22	0000-2400	7.54	45	2.500	18.05	10073	298.83	317.62
	23	0000-2400	7.65	48		19.12			317.69
	24	0000-2400	7.61	45		19.02			317.79
	24	0000-1500	7.57	30		18.92			317.69
	27	1700-2230	3.43	12		0.50	10068	309.04	317.62
	28	0000-0900, 2030-2400	3.27	23		0.10			317.22
	29	0000-1430, 1800-2400	3.34	40		0.35			317.39
	30	0000-2400	3.42	39		0.55			317.59
	31	0000-2400	3.38	46		0.45			317.49
Apr	1	0000-2400	3.45	47		0.62			317.66
	2	0000-2400	3.32	45		0.30			317.34
	3	0000-2000, 2330	3.45	43		0.62			317.66
	4	0000-2400	3.16	47		7.90			316.94
	5	0000-2000, 2200-2400	3.45	45		0.63			317.67
	6	0000-2400	3.49	46		0.73			317.77
	7	0000-2400	3.52	46		0.30			317.64
	8	0000-2200	3.56	43		0.90			317.94
	9	0000, 0230-2400	3.03	43		9.73			318.77
	10	0000-2400	3.54	43		8.85			317.69
	11	0000-0900, 1100-1600							
	11	1700-2000, 2130	3.39	57		0.43			317.52
	12	0000-2400	3.60	48		9.00			318.04
	13	0000-2400	3.48	43		0.70			317.74
	14	0000-0930, 1730-2400	3.51	32		0.70			317.62
	15	0000-1430, 1700-2400	3.57	44		0.93			317.97
	16	0000-2400	3.62	46		9.05			318.09
	17	0000-2400	3.50	45		0.90			317.94

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Constant. P.P.M.
						No.	Index		
1962									
Apr 18	0000-2400	3.70	48	2.500	9.25	10068	309.04	318.29	319.77
19	0000-1000, 1800-2400	3.65	33		9.13			318.17	319.63
20	0000-1530, 2000-2400	3.53	40		8.83			317.87	319.26
21	0000-2400	3.56	45		8.90			317.94	319.35
22	0000-2400	3.71	46		9.28			318.32	319.81
23	0000-0900 1700-2400	3.64	33		9.10			318.14	319.59
24	0000-1100, 1300 1530-2400	3.75	41		9.40			318.44	319.5
25	0000-1630, 1930-2400	3.80	43		9.50			318.54	320.33
26	0000-1530, 1900-2400	3.72	43		9.30			318.34	319.33
27	0000-1530, 1800-2400	3.94	44		9.60			318.64	320.20
28	2100-2400	3.53	4		8.83			317.87	319.26
29	0000-1200	3.91	27		9.73			318.82	320.42
30	0130-0930, 1830-2400	6.14	28		15.35	6078	302.81	318.52	320.05
May 1	0000-1800	6.34	37		15.85			318.66	320.22
2	1200-2300	6.12	20		15.30			318.11	319.55
3	0000-1600, 1830-2400	6.10	44		15.25			318.06	319.49
4	0000-2400	6.22	46		15.55			318.36	319.86
5	0000-1300, 1500-2400	6.46	45		16.15			318.96	320.59
6	0000-2400	6.26	47		15.65			318.46	319.98
7	0000-1530, 1800-2400	6.33	44		15.95			318.76	320.34
8	0000-1530, 1700-2400	6.26	46		15.65			318.46	319.98
9	0000-2400	6.26	44		15.65			318.46	319.98
10	0000-2400	6.33	45		15.83			318.64	320.20
11	0000-1600, 1830-2400	6.35	44		15.88			318.69	320.26
12	0000-2400	6.32	45		15.80			318.61	320.16
13	0000-2400	6.31	47		15.78			318.58	320.14

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Comment. p.p.m.
1962									
May 14	0000-0300, 1200-1500, 1800-2400	6.17	25	2.500	15.43	6078	302.81	318.24	319.71
15	0000-1500, 1700-2400	6.29	45		15.73			318.54	320.08
16	0000-0600, 1130-1600, 1800-2400	6.26	36		15.65			318.46	319.98
17	0000-1500, 1700-1800	6.27	34		15.60			318.49	320.02
18	1800-2400	6.01	11		15.03			317.84	319.22
19	0000-0830, 1900-2300	6.19	26		15.48			318.29	319.77
20	0000-2400	6.17	48		15.43			317.24	318.49
21	0000-1500, 1830-2400	6.37	42		15.93			318.74	320.32
22	0000-1430, 1700-2400	6.18	44		15.45			318.26	319.74
23	0000-1530, 1730-2400	6.19	45		15.48			318.29	319.77
24	0000-2400	6.37	46		15.93			318.74	320.32
25	0000-2400	6.29	47		15.73			318.54	320.08
26	0000-1100, 1700-2400	6.26	37		15.65			318.46	319.98
27	0000-2400	6.40	47		16.00			318.81	320.41
28	0000-1030, 1700-2400	6.38	36		15.95			318.76	320.34
29	0000-1330, 1630-2400	6.23	43		15.59			318.39	319.89
30	0000-2400	6.24	46		15.60			318.41	319.92
31	0000-0330, 1830-2000	6.57	23		16.43			319.24	320.93
June 1	1000, 1200-1530	6.12	9		15.30			318.11	319.55
1	1800-2400	7.74	12		19.35	3757	299.38	318.73	320.31
2	0000-1430, 2200-2400	7.69	34		19.23			318.67	320.24
3	0000-2400	7.78	47		19.45			318.83	320.43
4	0000-2400	7.79	45		19.47			318.85	320.45
5	0000-0900	7.84	19		19.60			318.98	320.61
6	0930-2330	7.54	27		18.85			318.82	320.70

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10	
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concent. p.p.m.	
						No.	Index			
1962										
June	7	0000-2400	7.66	44	2.500	19.15	3757	299.38	318.53	320.06
	8	0000-2400	7.93	48		19.83			319.21	320.89
	9	0000-2400	8.29	46		20.73			320.11	321.99
	10	0000-0630, 1130-1530	7.99	22		19.98			319.36	321.08
	11	1130-2330	8.43	26		21.03			320.46	322.42
	12	0000-2400	7.54	48		13.85			319.23	319.70
	13	0000-2400	6.82	46		17.05			316.43	317.51
	14	0000-2400	6.79	47		16.98			316.36	317.42
	15	0000-2400	7.05	47		17.33			317.01	318.21
	16	0000-2400	6.96	48		17.40			316.78	317.93
	17	0000-1430, 1900-2400	7.51	40		19.73			318.16	319.61
	18	0000-1100, 1430-2400	7.65	42		19.13			319.51	320.04
	19	0000-1400, 1700-2400	6.50	43		16.25			315.63	316.53
	20	0000-2400	6.27	46		15.67			315.05	315.02
	21	0000-2400	7.14	45		17.85			317.23	318.48
	22	1130-2400	7.32	25		16.30			317.63	319.03
	23	0000-1000, 1700-2400	7.35	35		18.33			317.03	318.24
	24	0000-2400	7.14	43		17.85			317.23	318.48
	25	0000-2400	6.90	45		17.45			316.83	317.99
	26	0000-2200	7.05	45		17.63			317.01	318.21
	27	0000-2400	7.03	45		17.58			316.96	318.15
	28	0000-2400	7.02	48		17.55			316.93	318.11
	29	0000-2400	7.00	48		17.50			316.88	318.05
	30	0000-2400	6.52	45		16.30			315.68	316.59
July	1	0000-2400	5.93	47		14.57			313.95	314.48
	2	0000-1030, 1300-2400	6.73	44		16.83			316.21	317.24
	3	0000-2400	6.82	40		17.05			316.13	317.51

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concent. p.p.m.
						No.	Index		
1902									
July 4	0000-1300, 1600-2400	6.51	42	2.500	16.23	3757	299.38	315.66	316.57
5	0000-0500, 0730-2400	6.52	44		16.30			315.60	316.59
6	0000-2400	5.02	44		14.05			313.43	313.85
7	0000-0930, 1030-2400	6.22	31		15.55			314.93	315.60
8	0000-2400	5.37	46		13.43			312.01	313.09
9	0000-0030	5.90	13		14.95			314.33	314.95
9	0900-1500, 1630-2400	6.59	23		16.40	2427	297.64	314.12	314.69
10	0000-0900, 1700-2400	6.55	35		16.31			314.02	314.57
11	0000-2400	6.30	45		15.05			313.59	314.04
12	0000-2400	6.21	48		15.53			313.17	313.53
13	0000-0900, 1100-2400	5.93	45		14.00			312.47	312.60
14	0000-2400	5.44	40		13.60			311.24	311.10
15	0000-2400	5.02	47		14.55			312.19	312.34
16	0000-1000, 1200-2400	4.01	45		12.03			309.67	309.27
17	0000-0930, 1200-2400	3.06	43		9.65			307.29	306.37
18	0000-2400	3.97	43		9.93			307.57	306.71
19	0000-2400	4.44	47		11.10			306.74	306.13
20	0000-0900, 1000-2400	4.26	33		10.65			306.29	307.59
21	0000-2400	6.25	40		15.63			313.27	313.65
22	0000-2400	6.07	40		15.10			312.32	313.11
23	0000-1330, 1700-2400	5.01	42		14.52			312.16	312.30
24	0000-1030, 2230-2400	5.39	24		13.48			311.12	311.03
25	0000-1030, 1030-2030	5.76	31		14.40			312.04	312.16
26	0030-2400	5.05	31		12.63			310.27	310.00
27	0000-2400	4.92	40		12.30			309.94	309.60
28	0000-2400	3.90	40		9.75			307.39	306.49
29	0000-0400, 1030-2400	4.93	35		12.33			309.97	309.63
30	0000-2400	4.90	47		12.25			309.89	309.54
31	0000-2400	5.00	40		12.50			310.00	309.84

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Concent. P.P.M.
						No.	Index		
1962									
Aug 1	0000-2400	4.96	47	2.500	12.40	2427	297.64	310.04	309.72
2	0000-2400	4.18	47		10.45			308.09	307.34
3	0000-2400	3.76	42		9.40			307.04	306.06
4	0000-2400	3.69	47		9.23			306.87	305.86
5	0000-2400	4.18	48		10.45			308.09	307.34
6	0000-2400	3.85	47		9.63			307.27	306.34
7	0000-2400	3.57	47		8.93			306.57	305.49
8	0000-2400	3.90	48		9.75			307.39	306.49
9	0000-2400	3.68	47		9.25			306.84	305.82
11	0000-1300	3.05	22		7.63			305.27	303.91
12	0000-2400	4.50	47		11.25			308.88	308.32
13	0000-1630, 2200-2400	3.76	37		9.40			307.04	306.06
14	0000-1530	2.55	34		6.33			304.02	302.38
15	1430-2400	-0.36	19		-0.90	2426	307.60	305.70	305.65
16	0000-0800, 1030-2400	-0.77	44		-1.93			305.67	304.39
17	0000-1330		34		-0.73			306.87	305.86
17	2100-2400	-1.11	6		-2.78	3756	310.16	307.33	306.48
18	0000-2400	-0.76	45		-1.90			308.26	307.55
19	0000-2400	-0.60	46		-1.50			308.66	308.04
20	0000-2400	-0.41	48		-1.03			309.13	308.61
21	0000-0830, 1200-1230, 1730-2400	-0.55	33		-1.38			308.79	308.18
22	0000-2400	-0.59	48		-1.48			308.68	308.06
23	0000-2400	-0.40	48		-1.00			309.16	308.65
24	0000-2400	-0.50	47		-1.25			308.91	308.34
25	0000-2400	-0.77	47		-1.93			309.23	307.51
27	0000-2400	-1.11	45		-2.78			307.33	306.48
28	0000-2400	-0.94	48		-2.35			307.81	307.00
29	0000-2130	-0.69	43		-1.70			308.88	307.79

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10	
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Constant. p.p.m.	
						No.	Index			
1962										
Aug	30	1800-2400	-1.03	15	2.500	-2.57	3756	310.16	307.59	306.73
	31	0000-2400	-0.98	42		-2.45			307.71	306.88
Sept	1	0000-2400	-0.78	48		-1.95			308.20	307.48
	2	0000-2400	-0.94	48		-2.35			307.81	307.00
	3	0000-2400	-0.95	48		-2.38			307.78	306.96
	4	0000-1630	-0.40	33		-1.00			309.16	308.65
	6	1200-2300	-0.66	21		-1.55			308.51	307.85
	7	1600-1900	-0.57	7		-1.43			308.73	308.12
	8	1600-1900	-0.41	47		-1.03			309.13	308.61
	9	0000-2400	0.98	47		2.20			312.36	312.55
	10	0000-0600, 1930-2400	0.44	22		1.10			311.26	311.21
	11	0000-2400	-0.48	48		-1.20			308.96	308.40
	12	0000-2400	-0.16	48		-0.40			309.76	309.38
	13	0000-2400	-0.11	48		-2.75			307.41	306.51
	14	0000-2400	0.17	48		0.45			310.61	310.41
	15	0000-1300, 1600-2400	0.18	42		0.45			310.61	310.41
	16	0000-0600, 0830-2400	0.36	44		0.90			311.06	310.96
	17	0000-2400	-0.44	48		-1.10			309.06	308.52
	18	0000-1330, 1600-2400	0.73	43		1.83			311.99	312.09
	19	0000-2400	-0.24	44		-0.60			309.56	309.13
	20	0000-1230	-0.31	25		-0.78			309.38	308.91
	21	1330-2400	-0.40	18		-1.00			309.16	308.65
	23	0000-2400	-0.14	48		-0.35			309.61	309.44
	24	0000-1300, 1630-2400	0.05	36		0.13			310.29	310.02
	25	0000-1400	0.03	29		0.08			310.54	309.96
	25	1430-2400	1.19	19		2.98	2426	307.60	310.58	310.38
	26	0000-2200	1.15	44		2.88			310.40	310.25

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Factor	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank		Air Index	Manometer Constant, p.p.m.
						No.	Index		
1962									
Sept 27	0000-2400	1.23	46	2.500	3.08	2426	307.60	310.68	310.50
28	0000-1700	1.32	37		3.30			310.90	310.77
29	0830-2400	1.23	27		3.08			310.68	310.50
30	0000-0300, 0600-1200 1530-2330	1.21	36		3.03			310.63	310.44
Oct. 1	0000-1030, 1530-2400	1.57	37		3.94			311.54	311.55
2	0000-2400	1.66	49		4.15			311.75	311.80
3	0000-1030, 1830-2400	1.58	38		3.95			311.55	311.56
4	0000-1030, 1730-2400	1.64	34		4.10			311.70	311.74
5	0930, 1000-1230	2.27	21		5.67			313.27	313.65
5	1300-1530, 2230-2400	0.23	11		0.58	2400	310.00	311.57	311.58
6	0000-1300, 1730-2400	0.11	44		0.27			311.26	311.21
7	0000-2130	0.02	44		0.05			311.04	310.94
8	0000-1230	0.00	25		0.00			310.99	310.88
9	1700-2030	-0.34	8		-0.85			310.14	309.84
10	0100-2400	-0.11	46		-0.28			310.71	310.54
11	0000-0900, 1100-2400	0.16	45		0.40			311.39	311.36
12	0000-2400	0.15	47		0.38			311.37	311.34
13	0000-2400	0.24	48		0.60			311.59	311.61
14	0000-1400, 1600-2400	0.16	44		0.40			311.39	311.36
15	0000-2400	0.32	47		0.80			311.79	311.85
16	0000-1000	0.21	21		0.52			311.51	311.51
18	1400-2400	4.12	19		10.30	10071	301.63	311.93	312.02
19	0000-0800, 1230-2330	4.25	40		10.62			312.25	312.41
20	0000-1200, 1430-2400	4.55	44		11.38			313.01	313.34
21	0000-2400	4.88	48		12.20			313.03	314.34
22	0000-0930, 2200-2400	4.74	24		11.85			313.43	313.91

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10	
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Concent. p.p.m.	
1962										
Oct	23	0000-2400	4.92	48	2.500	12.30	10071	301.63	313.93	314.46
	24	0000-1800	4.86	36		12.15			313.78	314.28
	25	1530-2400	4.96	17		12.40			314.03	314.58
	26	0000-2400	5.09	48		12.72			314.35	314.97
	27	0000-2400	5.86	48		14.65			316.28	317.32
	28	0000-2400	4.98	48		12.45			314.08	314.64
	29	0000-2400	5.97	48		14.92			316.55	317.65
	30	0000-2400	6.14	47		15.35			316.98	318.18
	31	0000-2400	5.74	48		14.35			315.98	316.96
Nov	1	0000-0100, 0930-2400	5.71	32		14.28			315.91	316.87
	2	0000-2400	5.68	48		14.20			315.83	316.77
	3	0000-2400	5.72	48		14.30			315.93	316.90
	4	0000-2400	5.73	48		14.32			315.95	316.92
	5	0000-2400	5.58	48		13.95			315.58	316.47
	6	0000-2400	5.61	47		14.02			315.65	316.56
	7	0000-2400	5.43	48		13.58			315.21	316.02
	8	0000-0200, 0930-2400	5.18	34		12.95			314.58	315.25
	9	0000-1400	5.08	28		12.70			314.33	314.95
	10	1200-2400	5.47	24		13.68			315.31	316.14
	11	0000-2400	5.63	48		14.08			315.71	316.63
	12	0000-0300, 0800-2400	5.58	39		13.95			315.58	316.47
	13	0000-0930, 1500-2400	5.52	38		13.80			315.43	316.29
	14	0000-2400	5.98	47		14.95			316.58	317.69
	15	0000-2400	6.26	48		15.65			317.20	318.54
	16	0000-2330	5.94	44		14.85			316.48	317.57
	17	1130-2400	5.64	25		14.10			315.73	316.65
	18	0000-2400	5.59	48		13.98			315.63	316.51
	19	0000-2400	5.39	45		13.48			315.11	315.20

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tauk No.	Index	Air Index	Manometer Concent. p.p.m.
1962									
Nov	20	0000-2400							
	21	0000-1430		2.500	13.40	10071	301.63	315.03	315.80
	22	1400-2400			13.88			315.51	316.38
	23	0000-1900			14.08			315.71	316.63
	24	0900-2400			13.90			315.53	316.41
	25	0000-2400			14.58			316.21	317.24
	26	0000-2400			15.12			316.75	317.90
	27	0000-2400			16.38			318.01	319.43
	28	0000-1300, 1700-2400			16.45			318.08	319.52
	29	0000-2400			15.80			317.43	318.72
	30	0000-2400			15.42			317.05	318.26
					15.25			316.88	318.05
Dec	1	0000-2400							
	2	0000-2400			15.18			316.81	317.97
	3	0000-2400			14.47			316.10	317.10
	4	0000-2400			15.53			317.21	318.46
	5	0000-2400			16.95			318.58	320.13
	6	0000-2400			17.32			318.95	320.58
	6	0000-1330			16.38			318.01	319.43
	6	1430-2400			3.30	10072	314.88	318.18	319.64
	7	0000-0900, 1230-2400			4.25			319.13	320.30
	8	0000-2400			3.32			318.20	319.66
	9	0000-2400			2.82			317.70	319.05
	10	0000-2400			2.75			317.63	318.97
	11	0000-2400			2.58			317.46	318.76
	12	0000-2400			2.20			317.08	318.30
	13	0000-2400			2.32			317.20	318.44
	14	0000-1230, 1500-2400			2.03			316.36	318.15
	15	0000-2400			1.90			316.08	318.03

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10			
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Index Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Concent. p.p.m.			
1962												
Dec 16	0000-2400	0.77	40	2.500	1.92	10072	314.88	316.00	317.96			
17	0000-2400	0.77	42		1.92			316.00	317.96			
18	0000-1000, 1630-2400	0.79	38		1.75			316.63	317.75			
19	0000-1130	0.65	24		2.12			317.00	318.20			
20	0000-1330, 1400, 1530-2400	0.81	40		2.02			316.90	318.00			
21	0000-2400	0.90	40		2.25			317.13	318.36			
22	0000-2400	0.70	40		1.75			316.63	317.75			
23	0000-2400	0.72	47		1.65			316.60	317.81			
24	0000-2400	0.80	46		2.40			317.33	318.50			
25	0000-2400	0.99	43		2.50			317.90	318.66			
26	0000-2400	0.79	46		1.90			316.66	317.03			
27	0000-2400	0.82	46		2.05			316.93	318.11			
28	0000-2400	1.09	40		2.70			317.50	318.91			
29	0000-1330, 1530-2400	1.01	45		2.52			317.40	318.69			
30	0000-2400	0.79	40		1.90			316.66	318.03			
31	0000-2400	0.91	40		2.30			317.26	318.52			
1963												
Jan 1	0000-2230	1.93	46		2.50			317.46	318.76			
3	0000-1230	0.87	24		2.10			317.00	318.27			
4	0000-2400	1.07	46		2.60			317.56	318.88			
5	0000-1100	1.04	23		2.50			317.40	318.79			
7	1630-2400	1.55	15		3.00			318.76	320.34			
8	0000-2400	1.42	43		3.55			318.43	319.94			
9	0000-2400	1.16	42		2.90			317.70	319.15			
10	0000-2400	1.10	43		2.75			317.63	318.97			
11	0000-2400	1.40	43		3.50			318.30	319.80			

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1963

MONTH:

JANUARY

FEBRUARY

A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	317.84	319.2	319.25	321.0
01-02	317.96	319.4	319.37	321.1
02-03	317.98	319.4	319.37	321.1
03-04	317.98	319.4	319.31	321.0
04-05	318.05	319.5	319.19	320.9
05-06	318.04	319.5	319.19	320.9
06-07	318.07	319.5	319.16	320.9
07-08	317.95	319.4	319.70	321.5
08-09	318.05	319.5	319.25	321.0
09-10	317.99	319.4	319.22	320.9
10-11	317.75	319.2	319.21	320.9
11-12	317.63	318.9	319.19	320.9
12-13	317.89	319.3	319.02	320.6
13-14	318.07	319.5	319.11	320.8
14-15	317.95	319.4	319.14	320.8
15-16	317.89	319.3	319.12	320.8
16-17	317.86	319.3	319.32	321.0
17-18	317.89	319.3	319.12	320.8
18-19	317.92	319.3	319.18	320.9
19-20	317.85	319.3	319.36	321.1
20-21	317.84	319.2	319.32	321.0
21-22	317.94	319.3	319.22	320.9
22-23	318.05	319.5	319.24	320.9
23-24	318.02	319.4	319.15	320.9

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

COL: 1	2	3	4	5	6	7	8	9	10	
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Scale Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Concent. p.p.m.	
1963										
Jan	12	0000-0730, 1600-2400	1.38	32	2.500	3.45	10072	314.88	318.33	319.82
	13	0000-1100	1.32	23		3.30			318.18	319.64
	13	1930-2400	1.17	9		2.92	4278	314.33	317.25	318.50
	14	0000-2400	1.34	47		3.35			317.68	319.03
	15	0000-2400	1.40	48		3.50			317.83	319.21
	16	0000-2400	1.69	48		4.22			318.55	320.09
	17	0000-2400	1.26	46		3.15			317.48	318.77
	18	0000-2400	1.39	46		3.48			317.31	319.18
	19	0000-2400	1.48	46		3.09			317.42	318.73
	20	0000-2400	1.58	48		3.95			318.28	319.75
	21	0000-0530, 0.30-2400	1.87	42		4.68			319.01	320.65
	22	0000-2400	1.35	47		3.38			317.71	319.07
	25	0000-1430	1.27	29		3.10			317.51	318.82
	26	1300-1630	1.36	8		3.40			317.73	319.09
	27	1200-2400	1.03	24		2.70			317.03	318.24
	28	0000-2400	1.01	48		2.53			316.96	318.03
	29	0000-2400	0.98	48		2.45			316.78	317.93
	30	0000-2400	2.13	47		5.32			319.65	321.43
	31	0000-2400	1.90	40		4.75			319.08	320.73
Feb	1	0000-1200, 1700-2400	2.07	39		5.18			319.51	321.26
	2	0000-2400	1.93	47		4.93			319.16	320.83
	3	0000-2400	1.87	48		4.68			319.01	320.65
	4	0000-2400	2.23	48		5.58			319.91	321.75
	5	0000-2400	2.54	48		6.35			320.63	322.68
	6	0000-2400	2.47	48		6.18			320.51	322.43
	7	0000-2400	2.43	47		6.03			320.41	322.36

TABLE 9: POINT BARROW, ALASKA, CARBON DIOXIDE PROJECT

Col: 1	2	3	4	5	6	7	8	9	10
Day of Month	Hours of Record Used	Observed Scale Diff.	No. of Comparisons	Recorder Scale Factor	Computed Scale Diff.	Reference Tank No.	Tank Index	Air Index	Manometer Constant, p.p.m.
1963									
Feb 8	0000-2400	2.27	43	2.500	5.67	4278	314.33	320.00	321.86
9	0000-2400	1.89	43		4.73			319.06	320.71
10	0000-2400	2.21	43		5.53			319.86	321.69
11	0000-2400	2.09	43		5.23			319.56	321.32
12	0000-2400	1.79	46		4.48			318.81	320.41
13	0000-2400	1.73	46		4.32			318.65	320.21
14	0000-2400	1.65	46		4.13			318.46	319.98
15	0000-2400	1.57	47		3.93			318.26	319.74
16	0000-2400	1.90	48		4.75			319.08	320.73
17	0000-2400	1.69	48		4.23			318.56	320.10
18	0000-2400	1.45	47		3.63			317.53	319.37
19	0000-2400	1.46	48		3.65			317.98	319.39
20	0000-2400	1.70	45		4.25			318.58	320.13

TABLE 10: MONTHLY AVERAGE CONCENTRATION OF CARBON DIOXIDE IN AIR BY INFRARED ANALYSIS

Month	No. of Comparisons	Average Air Index	Manometer P.p.m.
1961			
July	806	310.52	310.30
August	746	307.80	306.99
September	815	310.10	309.79
October	1151	314.56	315.35
November	696	315.39	316.24
December	397	316.11	317.12
1962			
January	1039	317.69	319.04
February	1199	317.75	319.13
March	1073	317.56	318.88
April	1228	318.02	319.44
May	1235	316.45	319.97
June	1175	317.73	319.09
July	1323	312.02	312.13
August	1218	307.63	306.78
September	1143	309.44	308.98
October	1171	312.74	313.01
November	1235	316.00	316.98
December	1396	317.32	318.59
1963			
January	1078	317.88	319.27
February *	938	319.20	320.88

* Average taken over 20 days

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1961		AUGUST		SEPTEMBER		
MONTH:	JULY					
A.S.T.*	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	310.76	310.6	308.03	307.3	310.49	310.3
01-02	310.18	309.9	308.20	307.5	310.64	310.5
02-03	311.42	311.4	308.21	307.5	310.65	310.5
03-04	311.40	311.4	308.73	308.1	310.77	310.6
04-05	311.54	311.6	309.22	309.7	310.90	310.8
05-06	311.25	311.2	309.20	308.7	310.80	310.6
06-07	311.24	311.2	309.15	308.7	310.81	310.7
07-08	311.28	311.2	309.39	308.9	310.75	310.6
08-09	311.07	311.0	309.12	308.6	310.84	310.7
09-10	310.93	310.9	308.22	307.5	311.10	311.0
10-11	310.74	310.6	308.32	307.6	310.72	310.6
11-12	310.59	310.4	308.34	307.7	310.76	310.6
12-13	310.82	310.7	307.86	307.1	310.41	310.2
13-14	310.79	310.6	307.63	306.8	310.60	310.4
14-15	310.42	310.2	307.91	307.1	310.48	310.3
15-16	310.42	310.2	307.70	306.9	310.84	310.7
16-17	310.54	310.3	307.47	306.6	310.55	310.3
17-18	309.73	309.3	307.59	306.7	310.77	310.6
18-19	309.37	309.5	307.15	306.2	310.60	310.4
19-20	309.62	309.2	307.37	306.5	310.36	310.1
20-21	310.13	309.3	307.86	307.1	310.06	309.7
21-22	310.55	310.3	307.36	306.5	310.13	309.3
22-23	310.39	310.2	307.33	306.4	310.67	310.5
23-24	309.99	309.7	307.04	306.1	310.79	310.6

* Alaska Standard Time

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1961

MONTH:	OCTOBER		NOVEMBER		DECEMBER	
A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	314.73	315.4	315.53	316.4	315.38	317.0
01-02	314.73	315.4	315.61	316.5	315.95	317.0
02-03	314.75	315.5	315.56	316.5	315.39	317.0
03-04	314.74	315.5	315.59	316.5	316.07	317.1
04-05	314.72	315.4	315.66	316.6	315.93	316.9
05-06	314.67	315.4	315.25	316.1	315.96	316.9
06-07	314.85	315.6	315.62	316.5	316.15	317.2
07-08	314.69	315.4	315.50	316.4	316.22	317.3
08-09	314.94	315.7	315.60	316.5	316.22	317.3
09-10	314.61	315.3	315.74	316.7	316.04	317.0
10-11	314.83	315.6	315.88	316.8	316.44	317.5
11-12	314.65	315.6	315.95	317.0	316.31	317.4
12-13	314.61	315.3	315.59	316.5	316.01	317.0
13-14	314.63	315.4	315.78	316.7	316.00	317.0
14-15	314.87	315.6	315.62	316.5	315.90	317.0
15-16	314.59	315.3	315.46	316.3	315.91	317.0
16-17	314.65	315.3	315.45	316.3	315.83	316.8
17-18	314.46	315.1	315.65	316.6	317.90	319.3
18-19	314.50	315.3	315.63	316.6	315.97	317.0
19-20	314.74	315.5	315.62	316.5	315.99	317.0
20-21	314.64	315.3	315.70	316.6	316.04	317.0
21-22	314.79	315.5	315.46	316.3	316.22	317.3
22-23	314.53	315.2	315.57	316.5	316.02	317.0
23-24	314.64	315.3	315.52	316.4	316.20	317.2

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1962

MONTH:	JANUARY		FEBRUARY		MARCH	
A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	317.74	319.1	317.79	319.2	317.58	319.0
01-02	317.81	319.2	317.74	319.1	317.58	318.9
02-03	317.75	319.1	317.79	319.2	317.68	319.0
03-04	317.71	319.1	317.82	319.2	317.64	319.0
04-05	317.74	319.1	317.71	319.1	317.70	319.2
05-06	317.66	319.0	317.73	319.2	317.80	319.2
06-07	317.65	319.0	317.84	319.2	317.76	319.1
07-08	317.56	318.9	317.86	319.3	317.75	319.1
08-09	317.65	319.0	317.91	319.3	317.79	319.2
09-10	317.89	319.3	317.88	319.3	317.75	319.1
10-11	317.49	318.8	317.55	319.0	317.64	319.0
11-12	317.59	319.9	317.76	319.1	317.75	319.1
12-13	317.53	318.9	317.69	319.0	317.63	319.0
13-14	317.43	318.7	317.74	319.1	317.63	319.0
14-15	317.57	318.9	317.86	319.3	317.68	319.0
15-16	317.60	318.9	317.81	319.2	317.63	319.0
16-17	317.40	318.7	317.72	319.1	317.62	319.0
17-18	317.33	318.6	317.71	319.1	317.59	318.9
18-19	317.40	318.7	317.56	318.9	317.45	318.8
19-20	317.63	319.0	317.70	319.1	317.61	318.9
20-21	317.51	318.8	317.79	319.2	317.58	318.9
21-22	317.63	319.0	317.86	319.3	317.59	318.9
22-23	317.68	319.0	317.87	319.3	317.58	318.9
23-24	317.79	319.2	317.94	319.2	317.65	319.0

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1962

MONTH	APRIL		MAY		JUNE	
A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	317.91	319.3	318.64	320.2	317.57	318.9
01-02	317.97	319.4	318.68	320.3	317.81	319.2
02-03	318.01	319.4	318.66	320.2	317.85	319.2
03-04	318.03	319.5	318.75	320.3	317.66	319.0
04-05	318.10	319.5	318.75	320.3	317.98	319.4
05-06	318.15	319.6	318.72	320.3	317.71	319.1
06-07	318.16	319.6	318.65	320.2	317.97	319.4
07-08	318.21	319.7	318.80	320.4	317.83	319.2
08-09	318.01	319.4	318.72	320.3	317.71	319.1
09-10	317.94	319.4	318.52	320.1	317.63	319.0
10-11	318.07	319.5	318.53	320.1	317.66	319.0
11-12	318.03	319.5	318.43	319.9	317.85	319.2
12-13	317.98	319.4	318.30	319.9	317.66	319.0
13-14	317.93	319.3	318.29	319.8	318.00	319.4
14-15	317.89	319.3	318.27	319.8	317.96	319.4
15-16	317.94	319.4	318.29	319.8	317.70	319.1
16-17	317.81	319.2	318.21	319.7	317.53	318.9
17-18	317.77	319.1	318.10	319.5	317.29	318.6
18-19	317.70	319.1	318.13	319.6	317.50	318.8
19-20	317.91	319.3	318.21	319.7	317.41	318.7
20-21	318.02	319.4	318.34	319.8	317.24	318.5
21-22	318.09	319.5	318.47	320.0	317.34	318.6
22-23	318.17	319.7	318.56	320.1	317.30	318.6
23-24	318.10	319.5	318.62	320.2	317.03	318.2

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1962

MONTH:	JULY		AUGUST		SEPTEMBER	
A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	312.62	312.9	307.01	307.0	309.07	309.5
01-02	312.47	312.7	307.66	306.8	309.96	309.6
02-03	313.11	313.5	307.53	306.7	310.08	309.8
03-04	312.64	312.9	308.14	307.4	310.51	310.3
04-05	312.62	312.9	307.54	306.6	310.06	309.7
05-06	312.50	312.7	307.72	306.9	310.01	309.7
06-07	312.24	312.4	307.50	307.6	310.09	309.8
07-08	312.25	312.4	307.60	306.9	309.95	309.6
08-09	312.10	312.4	307.70	306.9	310.13	309.0
09-10	311.95	312.1	307.72	306.9	309.61	309.6
10-11	311.62	311.6	307.22	306.3	309.99	309.7
11-12	311.60	311.6	307.14	306.2	309.78	309.4
12-13	310.96	310.8	307.17	306.2	309.52	309.1
13-14	311.11	311.0	307.01	306.0	309.71	309.3
14-15	310.94	310.8	307.29	306.4	309.61	309.2
15-16	310.94	310.8	307.02	306.0	309.67	309.3
16-17	310.93	310.9	307.24	306.3	309.29	308.8
17-18	311.20	311.2	307.76	306.9	309.74	309.4
18-19	311.23	311.2	307.74	306.9	309.91	309.6
19-20	311.30	311.4	307.75	306.9	310.00	309.7
20-21	311.22	311.2	308.70	308.1	310.07	309.8
21-22	311.31	311.3	308.44	307.8	310.26	310.0
22-23	311.53	311.5	308.07	307.3	310.31	310.1
23-24	311.59	311.6	307.44	306.6	310.01	309.7

TABLE 11: DIURNAL COURSE OF CARBON DIOXIDE AT POINT BARROW, ALASKA

1962

MONTH: OCTOBER			NOVEMBER		DECEMBER	
A.S.T.	Index	Manometer p.p.m.	Index	Manometer p.p.m.	Index	Manometer p.p.m.
00-01	312.80	313.1	315.55	316.4	317.34	318.5
01-02	312.32	312.5	315.63	316.6	317.24	318.5
02-03	312.83	313.1	316.11	317.1	317.25	318.5
03-04	312.55	312.8	316.17	317.2	317.36	318.6
04-05	312.83	313.1	316.20	317.2	317.46	318.8
05-06	312.90	313.3	316.18	317.2	317.45	318.8
06-07	312.91	313.2	316.18	317.2	317.39	318.7
07-08	312.61	312.9	316.13	317.1	317.38	318.7
08-09	312.84	313.1	316.22	317.3	317.40	318.7
09-10	312.62	313.1	316.13	317.1	317.04	318.3
10-11	312.97	313.3	316.10	317.1	317.28	318.5
11-12	312.43	312.7	316.01	317.0	317.04	318.3
12-13	312.75	313.0	315.86	316.8	317.24	318.5
13-14	313.34	313.7	315.96	316.9	317.24	318.5
14-15	313.33	313.8	315.62	316.8	317.13	318.4
15-16	313.23	313.6	315.80	316.7	316.88	318.1
16-17	313.20	313.6	315.97	316.8	316.95	318.1
17-18	312.84	313.1	316.02	317.0	317.14	318.4
18-19	312.83	313.1	316.03	317.0	316.87	318.0
19-20	312.97	313.3	316.13	317.1	317.21	318.6
20-21	312.81	313.1	316.18	317.2	317.37	318.7
21-22	313.06	313.4	316.17	317.2	317.33	318.6
22-23	313.08	313.4	316.07	317.1	317.39	318.7
23-24	313.02	313.4	316.01	317.0	317.41	318.7

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