

U

AD



AD 661084

MONTHLY
MICROCLIMATIC SUMMARY

MAY 1967

ENVIRONMENTAL DATA BASE
FOR REGIONAL STUDIES IN THE HUMID TROPICS

USATECOM Project No 9-4-0013-01

US ARMY
TROPIC TEST CENTER
Fort Clayton, Canal Zone

Sponsored by

Advanced Research Projects Agency, ARPA Order No. 740
Army Research Office, OCRD, Project No. 2M025001A724 01

P

This document has been approved
for public release and since its
classification is unclassified

DDC
RECEIVED
NOV 13 1967
RECEIVED
C

DISCLAIMER NOTICE

THIS DOCUMENT IS THE BEST
QUALITY AVAILABLE.

COPY FURNISHED CONTAINED
A SIGNIFICANT NUMBER OF
PAGES WHICH DO NOT
REPRODUCE LEGIBLY.

Destroy this report when it is no longer needed. Do not return it to the originator.

SECTION FOR	
DTI	WHITE SECTION <input checked="" type="checkbox"/>
DC	POW. SECTION <input type="checkbox"/>
NA: NOUNCED	<input type="checkbox"/>
US: I: GATION	
DISTRIBUTION/AVAILABILITY CODES	
DIST.	AVAIL. AC. OR SPECIAL

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

The use of trade names in this report does not constitute an official endorsement or approval of such commercial hardware or software. This report may not be cited for purposes of advertisement.

Distribution of this document is unlimited

ENVIRONMENTAL DATA BASE
FOR REGIONAL STUDIES IN THE HUMID TROPICS

MONTHLY
MICROCLIMATIC SUMMARY

MAY 1967

Prepared by

Michael A. Fradel, Project Officer
and
Dr. Wilfried K. Portig, Meteorologist

USATECOM Project No. 9-4-0013-01

This research was supported by the Advanced
Research Projects Agency of the Department
of Defense and by the Army Research Office,
OCRD, Department of Army

Conducted by

US Army
Tropic Test Center
Fort Clayton, Canal Zone
with contractual services provided by
Weather Engineers of Panama Corp.

TABLE OF CONTENTS

	<u>Page</u>
Introduction.	1
Sites.	1
Instrumentation	1
Data Reduction and Storage.	1
 Figures	
1. Location Map, Isthmus of Panama.	2
2. Frequency of Observations.	3
3. Albrook Forest Site Generalized Plot	4
4. Chiva Chiva Open Site, Generalized Plot.	5
5. Instrument Location on Towers.	6
 Data Summary Sheets	
Monthly Means of Air Temperature by Hour.	7
Monthly Ranges of Air Temperature by Hour	8
Monthly Means of Relative Humidity by Hour	9
Monthly Ranges of Relative Humidity by Hour	10
Monthly Means of Other Elements by Hour.	11
Monthly Means of Wet Bulb Temperature by Hour	
Monthly Means of Barometric Pressure by Hour	
Monthly Means of Precipitation by Hour	
Monthly Totals of Precipitation	
Monthly Ranges of Other Elements by Hour.	12
Monthly Ranges of Wet Bulb Temperature by Hour	
Monthly Ranges of Barometric Pressure by Hour	
Monthly Ranges of Precipitation by Hour	
Monthly Means of Wind Speed by Hour.	13
Monthly Ranges of Wind Speed by Hour	14
Relative Frequencies of Wind Directions (46 meters, Albrook). . .	15
Relative Frequencies of Wind Directions (26.5 meters, Albrook). .	16
Relative Frequencies of Wind Directions (4 meters, Albrook). . .	17
Relative Frequencies of Wind Directions (46 meters, Chiva Chiva).	18
Relative Frequencies of Wind Directions (26.5 meters, Chiva Chiva).	19
Relative Frequencies of Wind Directions (4 meters, Chiva Chiva).	20
Summary of Elements with Non-Hourly Frequencies of	
Observation	21
WBGT (Albrook)	
Evaporation (Albrook)	
Precipitation (Manual gauge network, Albrook)	
Precipitation (Stem Flow, Albrook)	
WBGT (Chiva Chiva)	
Minimum Grass Temperature (Chiva Chiva)	

BLANK PAGE

MONTHLY MICROCLIMATIC SUMMARY

Introduction

Monthly microclimatic data summarized in this series of reports were collected by the US Army Tropic Test Center and the Weather Engineers of Panama Corporation under the project, Environmental Data Base for Regional Studies in the Humid Tropics. The project is sponsored by the Advanced Research Projects Agency of the Department of Defense and by the Army Research Office, Office of the Chief of Research and Development. It is an investigation of microclimatic, air chemistry, vegetation, soils, microbiological, and macrofaunal conditions at selected sites in the principal tropical environments of the Panama Canal Zone and the Rio Hato Military Reservation. The objective of the project is to assemble quantitative environmental data for RDT&E purposes.

Sites. Data summarized in this report were collected at the Albrook Forest and Chiva Chiva sites. Figure 1 shows the site locations within the Isthmus of Panama. Geographic coordinates are shown below:

Albrook Forest 09° 01'N, 79° 33'W

Chiva Chiva 09° 01'N, 79° 35'W

The Chiva Chiva open site and the Albrook Forest site are paired for comparative study of environmental conditions in a tropical semideciduous forest and in a large clearing. Both are located in a region where the annual precipitation is approximately 80 inches and there is a pronounced dry season.

The Albrook and Chiva Chiva main sites are approximately four kilometers apart. Each has a 46-meter walk-up tower and an air-conditioned building to house the recording equipment and observers. Both sites are approximately 30 meters above sea level. The top of the forest canopy at the Albrook site is about 26.5 meters above the ground.

Instrumentation. A wide range of climatic elements are measured at the Albrook and Chiva Chiva sites. Types of observations and frequencies are shown on Figure 2. The towers at the Albrook and Chiva Chiva sites are similarly oriented. Sensing equipment is mounted at several levels on the towers to provide measurements through the vertical profile. Additional instruments are emplaced in the immediate vicinity on or near the ground. All instrument exposures are duplicated at each site. Figures 3, 4, and 5 show the instrument array at these sites.

Data Reduction and Storage. All data, as applicable, are recorded at or reduced to each full hour and transposed to punch cards. These punch cards, together with all raw data, are stored in the Tropic Test Center Technical Library Annex.

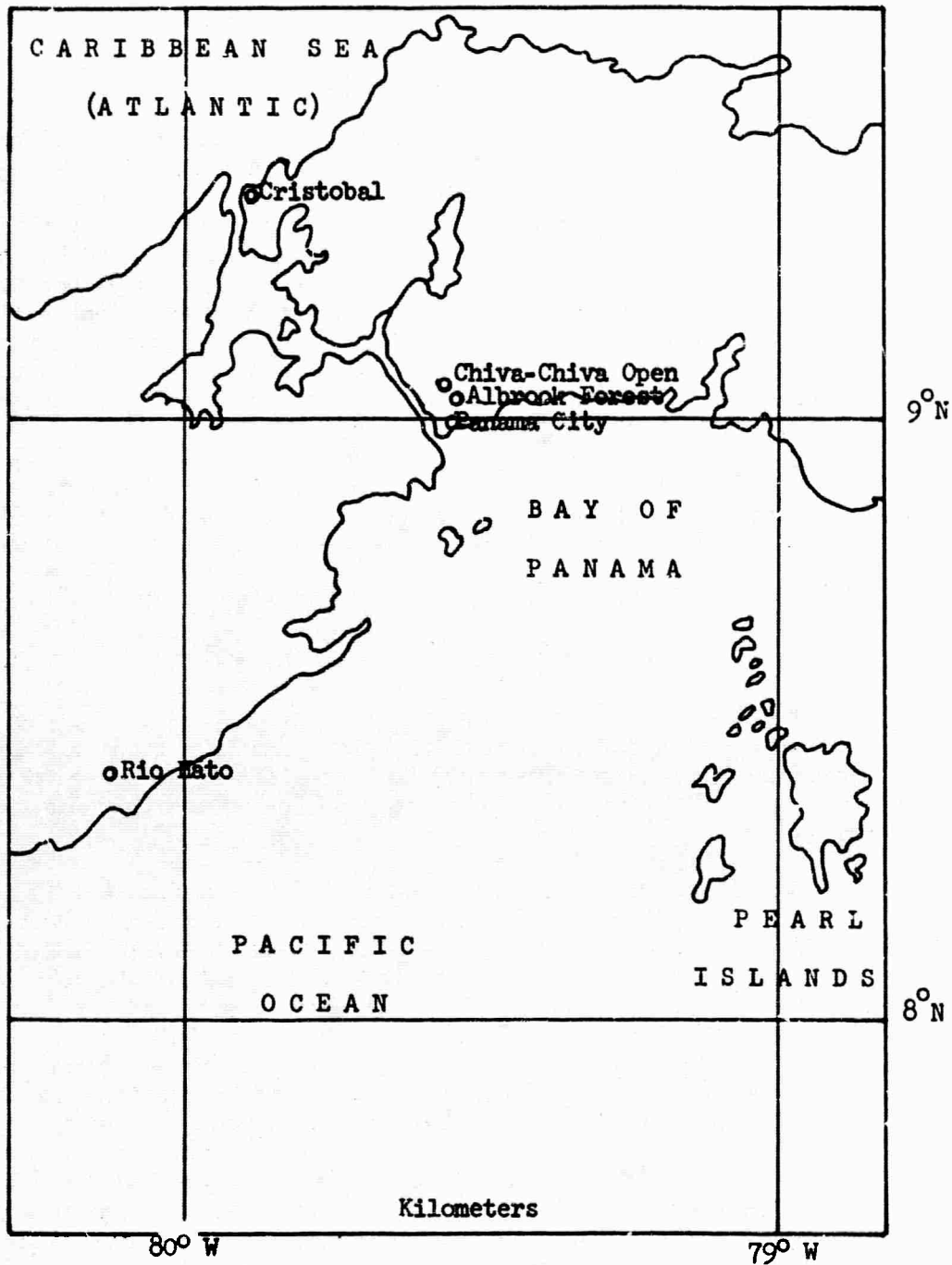


FIGURE 1. LOCATION MAP, ISTHMUS OF PANAMA

FIGURE 2. FREQUENCY OF OBSERVATIONS

# Element	Height (meters)										Frequency	
	Sfc	0.5	1.0	2.0	4.0	8.0	13.5	26.5	46.0			
Temperature:												
Dry Bulb	1	1	1	1	1	-	1	1	1	1	1	Hourly*/Continuously
Wet Bulb	-	1	-	1	1	-	-	-	-	-	-	Hourly*/Continuously
Grass Minimum	3	-	-	-	-	-	-	-	-	-	-	Once Daily
WBGT Index	-	-	1	-	-	-	-	-	-	-	-	Hourly (0600-1900 EST)
Relative Humidity	-	1	1	1	1	-	1	1	1	1	1	Hourly*/Continuously
Barometric Pressure	-	-	1	-	-	-	-	-	-	-	-	Continuously
Evaporation	1	-	-	-	-	-	-	2	2	2	2	Once Daily
Precipitation:												
Recording Gage	-	-	1	-	-	-	-	-	-	2	2	Continuously
Manual Gage	-	-	2	-	-	-	-	-	-	-	-	4 Times Daily
Stem Flow	-	-	2	-	-	-	-	-	-	-	-	4 Times Daily
Wind:												
Direction	-	-	-	-	1	-	-	1	1	1	1	Continuously
Speed	-	-	-	3**	1	-	3**	1**	1	1	1	Hourly**/Continuously

* Observations made with sling psychrometer when recorders are inoperative.

** Hourly

Instrument descriptions are contained in the Environmental Data Base semiannual reports.

1. Albrook and Chiva Chiva
2. Albrook only
3. Chiva Chiva only

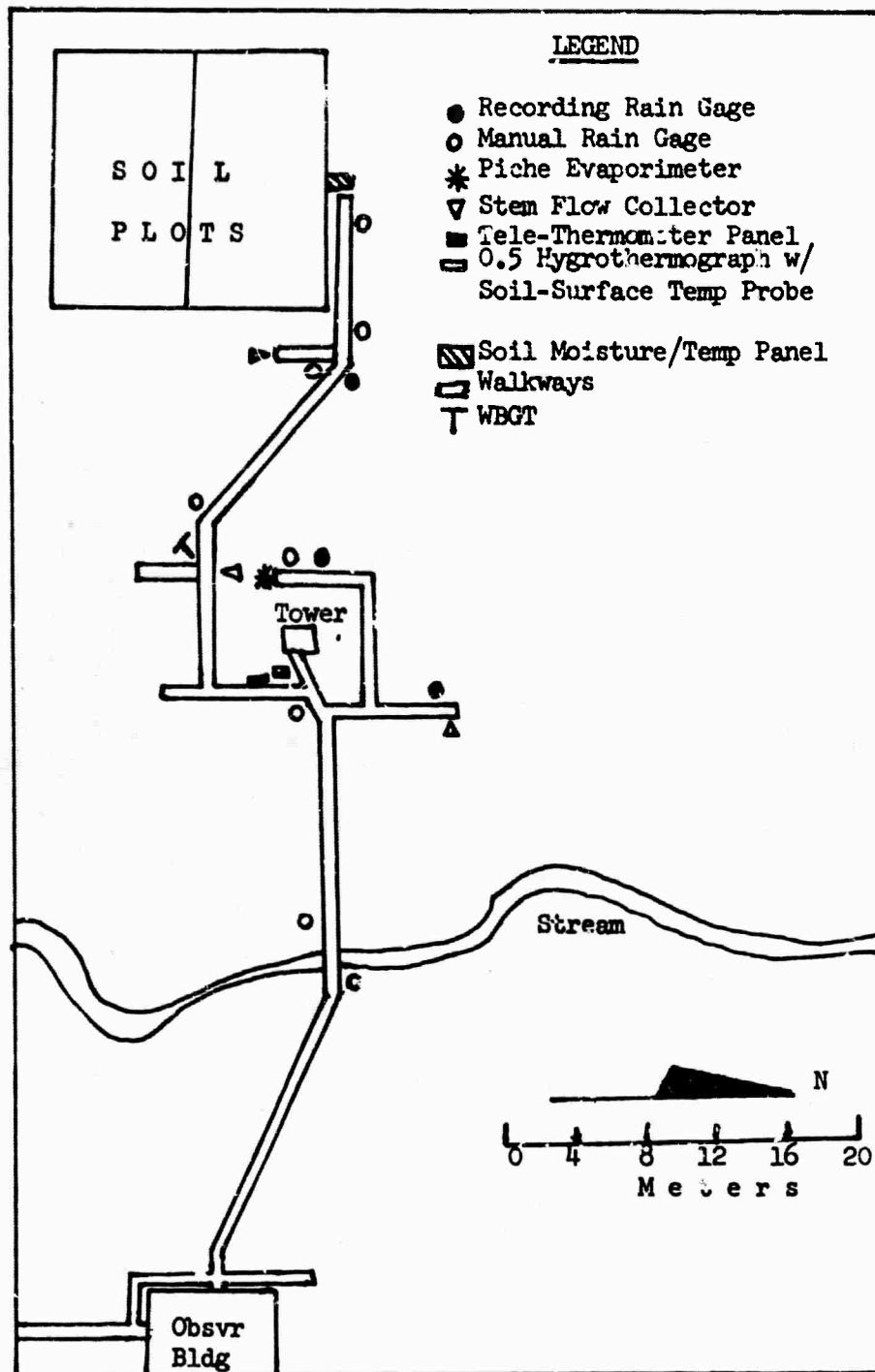


FIGURE 3. ALBROOK FOREST SITE, GENERALIZED PLOT

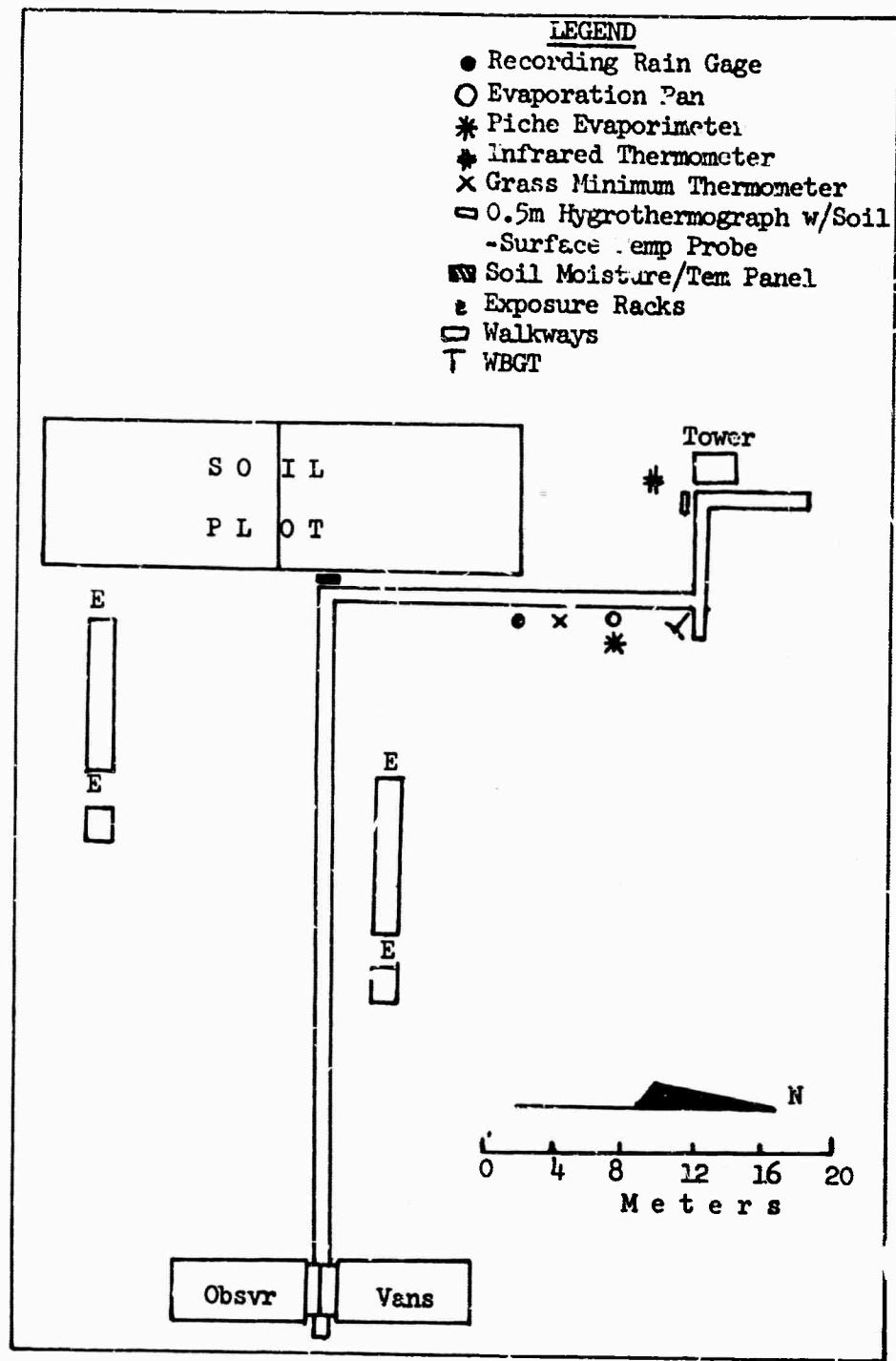


FIGURE 4. CHIVA CHIVA OPEN, GENERALIZED PLOT

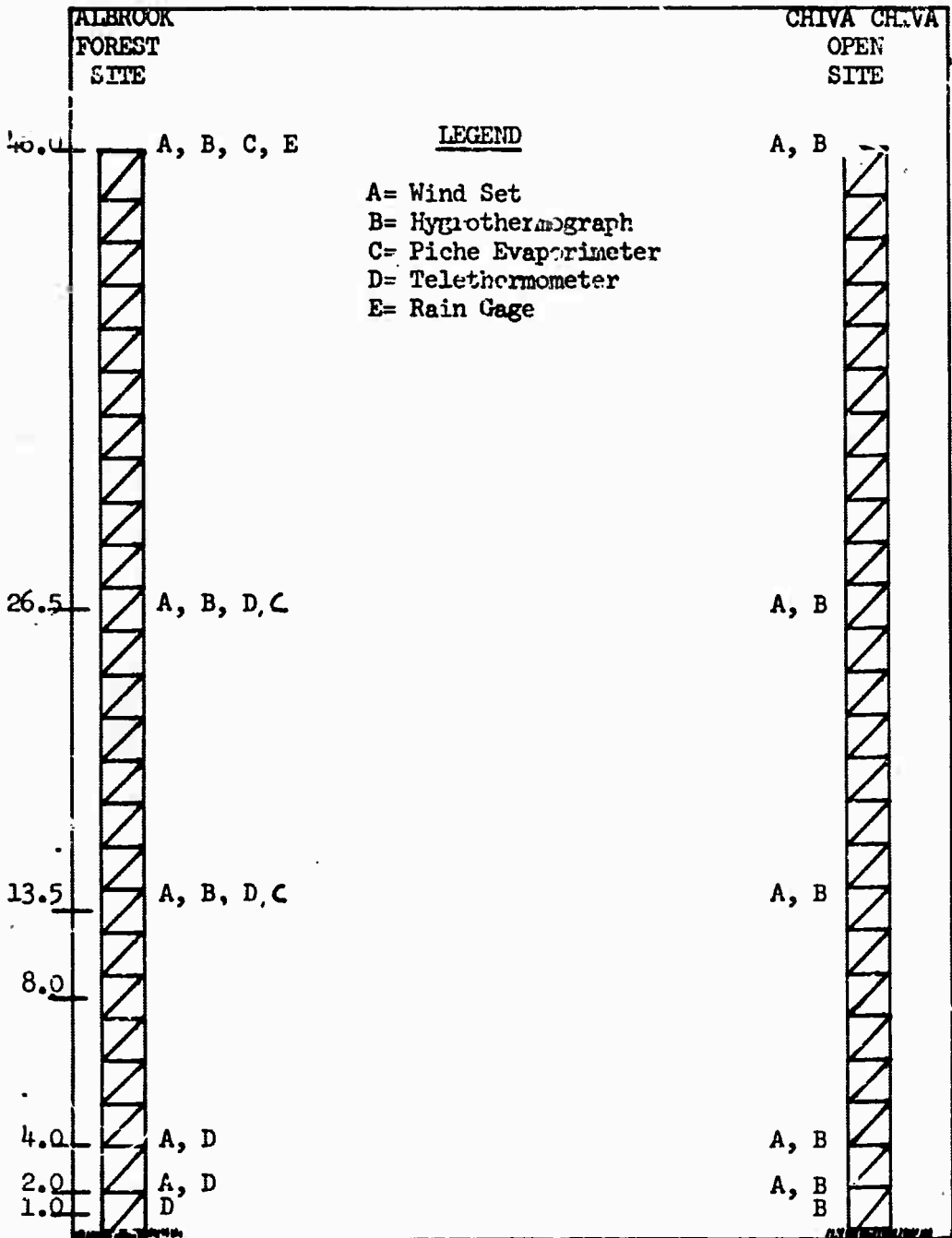


FIGURE 5. INSTRUMENT LOCATION ON TOWER

**SUMMARY OF METEOROLOGICAL OBSERVATIONS
HOURLY DATA**

MAY 1967

Exposure	Monthly Means of Air Temperature by Hour (° F)																								Monthly Summary				
	Site	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	No. of Obs.	Mean Max.		
Albrook (Forest site)	46.0 m	76.4	76.3	76.3	76.0	75.9	76.0	76.9	79.0	82.6	85.0	85.9	85.5	84.7	83.2	82.2	81.5	81.6	80.2	78.6	77.6	77.5	77.4	77.2	76.8	469	73.0	79.6	90.1
	28.5 m							This level was not instrumented for air temperature at this time																					
	26.5 m	75.8	75.6	75.5	75.2	75.1	75.0	76.5	78.8	82.1	84.1	85.1	85.0	84.7	83.7	82.6	81.6	80.9	79.3	77.6	77.0	76.7	76.5	76.3	76.0	740	72.3	79.0	89.7
	13.5 m	75.3	75.1	74.8	74.5	74.4	74.3	75.2	77.5	79.7	81.5	82.9	83.3	83.3	82.2	81.5	80.9	80.3	79.0	77.7	76.9	76.6	76.3	75.9	75.6	741	70.9	78.1	87.9
	8.0 m							This level was not instrumented for air temperature at this time																					
Albrook (Forest site)	4.0 m	74.8	74.6	74.3	74.3	74.0	73.9	75.1	77.5	80.0	81.7	82.7	83.1	82.6	81.9	81.5	80.5	79.9	78.6	77.1	76.5	76.1	75.8	75.6	75.2	744	70.5	77.8	89.5
	2.0 m	74.7	74.6	74.3	74.2	74.0	73.5	75.0	77.2	79.6	81.3	82.3	82.9	82.5	81.7	81.4	80.3	79.7	78.3	76.9	76.4	75.9	75.7	75.5	75.1	744	68.3	77.6	89.0
	1.0 m	75.0	74.9	74.7	74.5	74.4	74.0	74.9	77.3	79.2	81.2	82.1	83.1	82.5	81.3	81.2	80.4	79.8	78.4	77.0	76.7	76.4	75.9	75.7	75.3	738	70.6	77.8	88.9
	0.5 m	75.0	74.9	74.7	74.5	74.4	74.3	75.0	76.9	78.8	80.6	81.8	82.4	82.0	81.3	81.3	80.6	79.7	78.9	77.6	76.9	76.5	76.2	75.7	75.4	730	70.9	77.7	87.0

Chiva Chiva (Open site)	45.0 m	76.5	76.3	76.0	75.9	75.8	75.9	77.5	80.0	82.1	83.7	84.4	84.0	83.5	82.4	81.3	81.0	80.3	79.6	78.3	77.9	77.5	77.3	77.1	76.5	744	72.2	79.2	90.0
	28.5 m							This level was not instrumented for air temperature at this time																					
	26.5 m	76.4	76.2	75.9	75.8	75.6	75.5	77.4	80.0	81.8	83.1	84.1	84.0	83.6	82.6	81.8	81.4	80.6	79.8	78.5	77.9	77.5	77.3	77.0	76.8	744	72.3	79.2	89.8
	13.5 m	76.2	76.0	75.7	75.6	75.4	75.3	77.4	80.2	82.1	83.9	84.7	84.4	84.1	83.0	82.0	81.6	80.7	79.8	78.4	77.9	77.4	77.2	76.3	76.6	744	71.5	79.3	90.3
	8.0 m							This level was not instrumented for air temperature at this time																					
Chiva Chiva (Open site)	4.0 m	75.8	75.5	75.1	75.0	74.8	74.7	77.7	80.5	82.6	84.9	85.7	86.1	85.0	84.3	83.0	82.6	81.6	80.0	78.3	77.5	77.0	76.6	76.3	741	70.4	79.5	90.9	
	2.0 m	75.4	75.1	74.8	74.6	74.5	74.5	77.7	80.6	82.7	85.0	85.8	86.0	85.1	84.2	83.0	82.5	81.5	79.9	78.1	77.3	76.8	76.3	76.0	741	70.4	79.3	90.7	
	1.0 m	75.5	75.3	75.0	74.8	74.6	74.4	77.8	81.0	83.2	85.5	86.1	86.0	85.3	84.3	83.5	83.4	82.2	80.4	78.6	77.7	77.1	76.6	76.3	744	70.0	79.6	92.2	
	0.5 m	75.5	75.2	74.9	74.8	74.6	74.6	76.7	80.2	83.0	85.3	86.1	86.6	85.5	84.6	83.8	83.3	82.2	80.5	78.4	77.5	76.9	76.5	76.1	737	70.3	79.5	93.5	

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

MAY 1967

Exposure		Monthly Ranges of Air Temperature by Hour (°F)																								Monthly Summary*
		Site	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
46.0 m	DTF	4.1	3.7	3.8	4.8	4.2	4.9	5.4	7.2	11.7	11.1	11.4	15.0	13.7	14.0	14.9	14.5	13.8	10.1	5.6	5.5	4.0	4.1	5.2	4.7	
28.5 m		This level was not instrumented for air temperature at this time																								
26.5 m		This level was not instrumented for air temperature at this time																								
13.5 m		This level was not instrumented for air temperature at this time																								
8.0 m		This level was not instrumented for air temperature at this time																								
4.0 m	DTF	5.7	7.2	6.6	6.5	5.5	5.8	4.8	4.4	5.1	9.5	11.9	13.7	11.5	11.2	15.2	11.8	11.8	9.1	6.3	5.4	6.2	5.5	5.7	4.9	
2.0 m	DTF	4.8	6.4	6.4	6.5	6.7	5.9	5.0	5.7	3.8	9.0	10.7	13.1	11.3	11.2	14.7	11.5	11.5	8.2	6.0	5.4	6.0	5.5	5.7	4.8	
1.0 m	DTF	5.0	5.7	6.1	6.3	6.6	5.8	4.7	6.6	7.5	10.6	9.9	12.8	12.8	10.8	14.4	12.5	11.2	8.3	6.0	4.8	5.5	5.2	5.0	4.7	
0.5 m	DTF	5.0	5.8	5.5	6.3	6.6	6.1	5.1	5.9	7.2	8.7	9.9	9.7	10.1	10.7	11.8	11.2	DTF	8.5	6.4	4.7	4.6	4.6	4.8	5.3	

* Note: DTF Indicates data of doubtful validity.

* No monthly summary was computed for the ranges.

46.0 m	DTF	4.7	4.4	5.1	5.8	6.1	6.9	7.1	7.5	9.1	9.3	10.4	16.2	14.4	12.4	13.0	11.3	10.2	7.9	5.8	4.5	3.5	3.3	3.1	2.9	
28.5 m		This level was not instrumented for air temperature at this time																								
26.5 m		This level was not instrumented for air temperature at this time																								
13.5 m		This level was not instrumented for air temperature at this time																								
8.0 m		This level was not instrumented for air temperature at this time																								
4.0 m	DTF	7.5	7.5	6.6	7.0	7.7	8.0	7.0	6.5	9.1	10.0	11.2	15.8	14.1	14.4	13.3	12.8	13.1	9.0	7.2	5.2	4.5	4.5	5.2	5.6	
2.0 m	DTF	7.9	7.6	6.9	7.1	7.4	7.8	7.3	6.4	9.1	9.1	11.1	15.2	14.3	14.3	13.7	12.9	12.8	8.8	6.3	5.1	3.6	4.2	4.1	5.2	
1.0 m	DTF	8.3	8.5	7.4	7.6	8.0	8.1	7.9	8.0	11.9	13.6	13.3	17.2	16.0	16.5	16.8	15.9	13.3	9.2	6.5	5.1	4.7	4.3	4.5	4.9	
0.5 m	DTF	7.7	7.3	7.0	7.6	7.7	7.6	8.4	7.1	11.1	14.4	15.5	17.2	15.2	14.8	15.1	13.5	13.7	9.4	6.7	4.0	3.9	4.1	5.7	5.2	

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

MAY 1967

Exposure	Monthly Ranges of Relative Humidity by Hour (%)																								Monthly Summary*	
	Site	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
46.0 m	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	
28.5 m	10	10	9	10	12	10	18	22	26	33	35	36	42	41	44	43	38	34	21	16	16	12	10	16	16	
26.5 m	12	11	11	9	7	6	13	20	29	31	33	38	41	43	40	45	45	31	25	19	18	13	12	11	11	
13.5 m	14	16	13	10	10	6	13	17	27	30	38	41	39	40	41	42	36	28	25	21	16	14	15	15	15	
8.0 m	14	13	13	10	10	8	13	14	24	27	48	41	38	40	40	34	34	24	26	17	16	13	14	12	12	
4.0 m	10	11	9	8	8	6	10	12	23	27	39	37	38	38	39	39	38	25	24	18	14	13	11	13	13	
2.0 m	9	12	12	9	6	6	9	14	19	24	28	29	31	30	32	28	26	37	19	16	13	12	10	12	12	
1.0 m	9	12	12	9	6	6	9	14	19	24	28	29	31	30	32	28	26	37	19	16	13	12	10	12	12	
0.5 m	9	12	12	9	6	6	9	14	19	24	28	29	31	30	32	28	26	37	19	16	13	12	10	12	12	

Note: DT indicates data of doubtful validity.

* No monthly summary was computed for the ranges.

46.0 m	13	15	14	14	12	15	17	20	20	24	29	36	38	38	41	35	37	30	26	18	15	15	15	13	13	
28.5 m	16	16	15	15	14	16	18	19	19	24	32	38	42	42	44	38	38	30	24	18	14	15	15	13	13	
26.5 m	15	16	15	15	15	16	20	21	23	26	35	41	44	43	47	40	41	33	27	19	14	15	15	13	13	
13.5 m	18	20	16	14	14	15	19	21	23	28	35	42	49	46	50	42	42	33	27	21	17	18	17	16	16	
8.0 m	18	16	15	14	13	13	19	21	23	28	34	41	44	43	47	40	38	30	24	17	16	17	13	13	13	
4.0 m	14	13	13	12	13	12	20	24	27	36	36	42	44	47	49	42	37	30	22	12	13	12	11	12	12	
2.0 m	18	16	15	14	13	13	19	21	23	28	34	41	44	43	47	40	38	30	24	17	16	17	13	13	13	
1.0 m	14	13	13	12	13	12	20	24	27	36	36	42	44	47	49	42	37	30	22	12	13	12	11	12	12	
0.5 m	18	16	16	16	16	16	21	25	25	30	38	44	42	46	46	40	33	30	24	17	16	16	18	15	15	

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

MAY 1967

Exposure	Site (Code)	Monthly Means ² of other Elements by Hour																								Monthly Summary		
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	No. of Obs.	Mean	Max.
WB (4.0 m)	Albreck Forest site	74.0	73.9	73.7	73.7	73.5	73.5	74.2	75.6	76.5	77.0	77.6	77.6	77.5	77.3	77.4	76.9	76.6	75.9	75.0	74.9	74.7	74.7	74.5	74.3	744	70.3	75.8
		74.0	73.9	73.8	73.7	73.5	73.5	74.3	76.0	76.7	77.4	77.7	77.9	77.7	78.0	77.5	77.1	76.8	76.1	75.2	75.0	74.7	74.7	74.5	74.4	744	70.1	75.6
		74.4	74.2	74.1	73.9	73.9	73.9	74.3	76.1	77.0	77.5	78.6	78.6	78.5	78.5	78.5	77.9	77.7	76.8	76.0	75.6	75.3	75.2	74.8	74.7	731	70.5	76.1
		747	731	719	710	716	716	716	715	704	773	777	771	761	740	719	697	688	683	695	707	726	746	749	760	714	640	735
P1		0.03	0.03	0.07	0.16	0.02	0.07	0.00	0.01	0.01	0.04	0.06	0.45	0.23	0.20	0.16	0.12	0.21	0.04	0.00	0.01	0.00	0.00	0.02	56	0.01	0.82	
P2		0.03	0.04	0.04	0.06	0.02	0.03	0.06	0.00	0.00	0.00	0.03	0.57	0.09	0.09	0.17	0.09	0.09	0.01	0.00	0.00	0.00	0.00	0.00	40	0.01	5.60	
P3		0.05	0.04	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.92	0.15	0.11	0.24	0.15	0.09	0.01	0.00	0.00	0.00	0.00	0.00	45	0.01	8.31	
P4		0.05	0.04	0.11	0.11	0.04	0.04	0.00	0.00	0.00	0.00	0.07	1.07	0.15	0.13	0.15	0.16	0.18	0.00	0.00	0.00	0.00	0.00	0.00	36	0.01	6.32	

WB (4.0 m)	(China (Hiva) (Open site)	74.1	73.9	73.6	73.6	73.5	73.4	75.2	76.1	76.7	77.2	77.4	77.4	77.4	77.4	76.6	76.4	76.0	75.5	74.6	74.5	74.4	74.4	74.3	742	70.4	75.3	
		74.0	73.8	73.5	73.5	73.4	73.4	75.2	76.4	76.8	77.3	77.6	77.6	77.4	77.3	76.8	76.6	76.1	75.5	74.7	74.6	74.5	74.4	74.3	743	70.3	75.4	
		74.1	73.9	73.8	73.7	73.6	73.5	75.0	76.6	77.4	78.0	78.0	78.3	78.1	77.9	77.7	77.4	76.9	76.1	75.2	74.9	74.9	74.6	74.5	74.5	737	70.1	75.8
		742	730	714	707	709	709	717	739	758	768	771	765	740	729	709	791	780	776	796	802	820	839	851	856	744	735	828
P3		0.05	0.10	0.10	0.12	0.07	0.00	0.00	0.02	0.03	0.05	0.25	0.18	0.18	0.12	0.10	0.19	0.06	0.02	0.02	0.01	0.00	0.00	0.00	57	0.01	6.09	

WB - Wet bulb temperature (°F)
BP - Barometric pressure (in. of Hg minus 29.0)

P3 - Precipitation at 1.0 m. in open area (in.)
P1 - Precipitation at 46.0 m. above canopy (in.)
P2 - Precipitation under full canopy (in.)
P3 - Precipitation under drip canopy (in.)
P4 - Precipitation under open canopy (in.)

² Monthly means of precipitation are computed for precipitation days. Precipitation totals are substituted for the mean in the monthly summary.

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

MAY 1967

Exposure	Site	Code	Monthly Ranges ² of other Elements by Hour																								Monthly Summary*
			02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Albrook (Forest site)	WB	(4.0 m)	4.0	4.9	4.8	5.2	5.0	4.9	4.2	4.6	4.7	6.6	6.3	5.8	5.5	7.8	6.7	8.1	5.6	4.7	5.0	3.6	3.6	3.5	4.2		
			4.1	4.8	4.7	5.3	5.5	5.0	5.1	4.1	4.8	5.1	8.8	6.5	5.4	3.3	7.3	5.7	7.8	6.0	5.3	4.9	3.7	3.4	3.5	4.1	
			3.9	4.4	4.8	4.9	5.5	5.2	4.6	5.0	4.5	5.2	5.8	5.2	4.8	6.4	5.7	5.6	6.5	7.3	5.9	4.3	3.6	3.8	3.2	4.0	
			.160	.155	.150	.152	.160	.155	.135	.140	.140	.145	.145	.130	.150	.135	.160	.155	.170	.175	.160	.150	.145	.160	.168	.163	
Albrook (Forest site)	P1	(2.0 m)	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.09	1.20	0.87	0.55	0.71	0.23	0.51	0.05	0.00	0.00	0.00	0.00	0.00	0.02		
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.96	0.31	0.18	0.73	0.20	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.20	0.00	0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	1.48	0.52	0.77	0.69	0.52	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* No monthly summary was computed for the ranges.

Chiva Chiva (Open site)	WB	(4.0 m)	4.7	5.2	4.5	5.0	4.6	4.9	3.3	3.7	4.8	5.3	5.4	6.0	4.9	5.3	6.4	7.0	5.5	4.6	4.2	4.1	3.7	3.4	3.2	3.6	
			4.6	5.0	4.1	4.6	4.5	4.8	3.3	3.5	4.3	4.4	5.2	6.1	4.3	4.7	5.5	5.9	5.5	4.4	4.3	4.1	3.5	3.2	3.3	3.5	
			4.4	4.7	4.9	5.0	5.2	5.1	4.4	4.1	6.3	7.8	7.4	5.5	6.1	4.6	6.7	6.0	10.0	5.5	4.7	3.9	3.9	3.2	3.7	3.7	
			.160	.160	.160	.155	.160	.155	.145	.160	.145	.150	.150	.140	.125	.125	.150	.135	.175	.185	.165	.165	.140	.150	.155	.155	.155
Chiva Chiva (Open site)	P1	(2.0 m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

P3 - Precipitation under drip canopy (in.)
P4 - Precipitation under open canopy (in.)

PS - Precipitation at 4.0 m. in open area (in.)
P1 - Precipitation at 46.0 m. above canopy (in.)
P2 - Precipitation under full canopy (in.)

WB - Wet bulb temperature (°F)
BP - Barometric pressure (in. of Hg minus 29.0)

² Monthly ranges of precipitation are computed for precipitation days.

SUMMARY OF METEOROLOGICAL OBSERVATIONS HOURLY DATA

MAY 1967

Exposure	Monthly Means of Wind Speed by Hour (miles/hr.)																								Monthly Summary				
	Site	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	No. of Obs.	Min.	Mean	Max.
46.0 m	3	4	3	3	3	3	3	3	3	4	5	6	5	6	6	6	6	5	5	5	5	5	5	4	4	744	0	4	15
28.5 m								This level was not instrumented for wind speed at this time																					
26.5 m	1	2	1	1	1	1	2	1	2	2	2	3	2	3	3	3	2	2	2	3	2	2	2	2	744	0	2	10	
13.5 m								This level was not instrumented for wind speed at this time																					
8.0 m								This level was not instrumented for wind speed at this time																					
4.0 m	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	744	0	0	2	
2.0 m								This level was not instrumented for wind speed at this time																					
1.0 m								This level was not instrumented for wind speed at this time																					
0.5 m								This level was not instrumented for wind speed at this time																					

46.0 m	8	7	6	6	6	6	6	7	8	8	9	10	10	10	10	10	11	9	10	8	8	8	8	7	739	1	8	22
28.5 m								This level was not instrumented for wind speed at this time																				
26.5 m	5	5	4	4	4	4	4	6	7	7	8	8	9	8	9	9	9	7	6	6	6	6	5	568	0	6	21	
13.5 m	2	2	2	1	2	1	2	3	5	5	6	6	7	8	5	5	5	5	4	3	3	2	2	734	0	4	20	
8.0 m								This level was not instrumented for wind speed at this time																				
4.0 m	3	2	2	2	2	2	3	4	5	5	6	6	7	6	6	6	5	5	4	4	3	3	3	669	0	4	15	
2.0 m	1	1	1	1	1	1	1	2	3	3	4	4	5	5	3	3	3	2	2	1	1	1	1	735	0	2	13	
1.0 m								This level was not instrumented for wind speed at this time																				
0.5 m								This level was not instrumented for wind speed at this time																				

SUMMARY OF METEOROLOGICAL OBSERVATIONS

HOURLY DATA

MAY 1967

Exposure	Monthly Ranges of Wind Speed by Hour (miles/hr.)																								Monthly Summary*		
	Site	Level	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22		23	24
Albrook (Forest site)	46.0 m	8	8	9	7	8	8	8	8	8	10	9	13	15	13	12	13	13	15	13	13	12	13	11	10	8	9
	28.5 m										This level was not instrumented for wind speed at this time																
	26.5 m	4	5	4	5	5	4	5	5	4	6	6	7	10	6	7	8	9	10	6	8	7	6	5	4	5	
	13.5 m										This level was not instrumented for wind speed at this time																
	8.0 m										This level was not instrumented for wind speed at this time																
	4.0 m	1	1	0	0	1	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	1	1	1	0	0	1
	2.0 m										This level was not instrumented for wind speed at this time																
1.0 m										This level was not instrumented for wind speed at this time																	
0.5 m										This level was not instrumented for wind speed at this time																	

* Note: DTF indicates data of doubtful validity

* No monthly summary was computed for the ranges.

Chiva Chiva (Open site)	46.0 m	11	14	12	10	13	10	14	14	14	15	15	15	14	15	20	17	21	16	15	12	14	13	11	12	11	
	28.5 m										This level was not instrumented for wind speed at this time																
	26.5 m		DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF	DTF
	13.5 m	6	11	5	5	10	7	9	9	10	12	13	14	16	15	16	15	16	12	14	13	11	9	9	8	7	
	8.0 m										This level was not instrumented for wind speed at this time																
	4.0 m	6	10	7	6	8	7	11	11	9	12	11	12	11	13	13	15	14	11	11	6	8	8	8	6	6	
	2.0 m	3	6	3	3	6	4	6	6	6	10	8	12	12	13	11	7	10	10	10	7	4	5	6	3	4	
1.0 m										This level was not instrumented for wind speed at this time																	
0.5 m										This level was not instrumented for wind speed at this time																	

ALBROOK (Forest site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 46.0 m.
(%)

Hr. Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
N	3.2		3.2					6.4	16.1	16.6	13.3	10.0	3.3	6.4	6.4	3.2	3.2	19.4	6.4	3.2	3.2	6.4	3.2	3.2	
NNE										3.3	13.3	3.3	10.0	6.4	6.4	3.2	6.4								
NE										6.6	3.3	6.4	3.3	3.3				3.3							
ENE								3.2	6.4				3.3		3.2										
E									3.2	6.6				3.2											
ESE										3.3						3.2									
SE												6.6													
SSE													3.3	3.2	3.2										
S											10.0	6.6	13.3	12.9											
SSW										6.4						3.2									
SW											3.3			6.4	6.4	9.7	6.4								
WSW	9.7	19.4	22.6	6.4	12.9	9.7	3.2	6.4	6.4	6.6	3.3	6.6	3.3	6.4	6.4	9.7	9.7	9.7	9.7	16.3	9.7	16.3	9.7	19.4	25.8
W	38.7	41.9	25.8	41.9	25.8	38.7	32.2	25.8	16.1		10.0	16.6	16.6	6.4	22.6	12.9	25.8	19.4	29.0	16.1	25.8	41.9	25.8	32.2	32.2
WNW	6.4	12.9	6.4	6.4	6.4	9.7	3.2	6.4	3.2	10.0	6.6	10.0	3.3	16.1	6.4	9.7	16.1	19.4	12.9	22.6	25.8	19.4	15.1	9.7	9.7
NW	6.4	6.4	6.4	9.7	12.9	6.4	12.9	9.7	3.2	3.3	3.3	25.3	3.3	6.4	19.4	16.1	16.1	3.2	12.9	16.1	3.2	3.2	9.7	3.2	3.2
NNW	3.2			3.2						6.4	3.3	6.6	3.3	13.3	3.2			6.4	6.4	9.7				.4	3.2
CALM	3.2	19.4	32.2	32.2	41.9	32.2	41.9	35.5	32.2	33.2	33.2	13.3	23.3	12.9	16.1	22.6	16.1	19.4	22.6	25.8	16.1	19.4	19.4	19.4	22.6

* Note: Due to rounding, percentage totals do not equal 100%.

ALBROOK (Forest site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 26.5 m.
(%)

Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
N						3.2			3.2	3.2	16.1	3.2		6.4	3.2			6.4		6.4	3.2			3.2
NNE									6.4	3.2					3.2								3.2	
NE													3.2	3.2		6.4	6.4				3.2			
ENE												3.2												
E										3.2		6.4	3.2	3.2		3.2								
ESE														3.2	3.2									
SE									3.2							3.2								
SSE																								
S								3.2	5.4	22.6	12.9	19.4	16.1	19.4	3.2			3.2						
SSW						3.2		3.2						3.2										
SW									3.2					12.9	9.7		3.2	6.4	3.2			3.2		
WSW		6.4	3.2	3.2	3.2	3.2			3.2	6.4			3.2		3.2	12.9	3.2	3.2			3.2			3.2
W	9.7	19.4	16.1	3.2	16.1	6.4		12.9	6.4		6.4	3.2	3.2	6.4	12.9	9.7	29.0	9.7	9.7	19.4	16.1	9.7	16.1	9.7
WNW	38.7	19.4	12.9	25.8	25.8	25.8	29.0	22.6	6.4	16.1	6.4	12.9	12.9	6.4	12.9	3.2	9.7	32.2	16.1	16.1	32.2	25.8	19.4	25.8
NW	6.4	16.1	12.9	19.4	6.4	12.9	19.4	16.1	6.4	12.9	9.7	25.8	12.9	12.9	9.7	16.1	19.4	12.9	41.9	22.6	12.9	35.5	25.8	22.6
NNW		6.4					6.4	6.4	6.4		3.2	3.2	3.2		9.7	16.1	9.7	6.4	3.2	3.2	9.7	3.2		6.4
CAL.M	45.2	32.2	48.4	45.2	48.4	45.2	45.2	35.5	48.4	32.2	45.2	22.6	41.9	22.6	29.0	29.0	19.4	2F 8	22.6	29.0	19.4	22.6	33.2	33.2

* Note: Due to rounding, percentage totals do not equal 100%.

ALBROOK (Forest site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 4.0 m.
(%)

Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
N	3.2																3.2							
NNE												3.2												
NE													3.2		3.2		3.2							
ENE																	3.2							
E									3.2															
ESE																								
SE											3.2					3.2								
SSE																		3.2						
S									3.2	6.4	6.4	9.7	3.2	3.2										
SSW																		3.2						
SW																								
WSW																	6.4							
W		3.2									3.2							3.2		3.2				
WNW											6.4					3.2								
NW	3.2				3.2	3.2									3.2	3.2					3.2			3.2
NNTW																3.2								
CALM	93.5	96.8	100.0	100.0	96.8	96.8	100.0	100.0	96.8	90.3	83.9	87.1	93.5	96.8	93.5	87.1	83.9	93.5	96.8	93.5	96.8	100.0	100.0	96.8

* Note: Due to rounding, percentage totals do not equal 100%.

CHIVA CHIVA (Open site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 46.0 m.
(%)

Hr. Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
N	3.2	3.2	3.3		3.3		6.6		9.7	9.7	9.7	9.7	12.9	3.2	9.7	9.7	6.4		6.4	3.2	3.2	3.2	3.2	6.4	
NNE						3.3	3.3			6.4	6.4	6.4	3.2	3.2	6.4			3.2			3.2			3.2	
NE					6.6			3.2			3.2	3.2	12.9	6.4	3.2			3.2							
ENE					3.3																				
E				3.3										6.4	3.2										
ESE								3.2			3.2		3.2	3.2	3.2										
SE											3.2	6.4	3.2	6.4		3.2									
SSE																									
S				3.3	3.3			3.2		3.2		3.2	9.7	3.2			3.2								
SSW	6.4								3.2	9.7				3.2		6.4					3.2				
SW	3.2	3.2	6.6	3.3	3.3					6.4		6.4	3.2	6.4	6.4										
WSW	3.2	6.4	6.6		10.0				3.2	3.2	3.2	6.4			6.4	3.2					3.2				
W	6.4	12.9	6.6	13.3			3.3	6.6	9.7	6.4	9.7	12.9	9.7	3.2	9.7	6.4	9.7	3.2				6.4		3.2	
WNW	12.9	9.7	16.6	13.3	16.6	26.7	23.3	16.1	16.4	9.7	9.7	16.1	19.4	3.2	16.1	22.6	22.6	16.1	12.9	3.2	3.2	9.7	16.1	22.6	
NW	48.4	51.6	43.2	46.6	46.3	43.2	49.9	48.4	5	32.2	25.8	22.6	3.2	25.8	16.1	29.0	58.1	61.3	61.3	58.1	61.3	61.3	48.4	51.6	
NNW	16.1	12.9	13.3	16.6	10.0	20.0	20.0	19.4	19.4	16.1	12.9	9.7	25.8	19.4	22.6	16.1	6.4	16.1	16.1	25.8	29.0	19.4	29.0	16.1	
CALM																									

* Note: Due to rounding, percentage totals do not equal 100%.

CHIVA CHIVA (Open site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 26.5 m.
(%)

Hr. Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
N	3.3	16.6		6.6	16.6	16.6	23.3	6.8	20.0	19.4	16.6	10.0	16.6	20.0	16.6	20.0	20.0	20.0	33.2	23.3	23.3	20.0	29.9	16.6
NNE								6.8	10.0	3.2	6.4	10.0	6.6	6.6	10.0	3.3	3.3	6.6	3.3		3.3	6.5		6.6
NE		3.3			3.3	3.3	3.3	3.4	3.3	9.7	9.7	3.3	16.6	6.6	10.0	3.3	3.3	3.3		3.3	6.6			
ENE					10.0						3.3	3.3	3.3											
E											3.2			3.3	3.3									
ESE				3.3							3.2		3.3	3.3									6.6	
SE											6.4	10.0		6.6	3.3									3.3
SSE		3.3			3.3								3.3			3.3								
S					3.3		3.3			6.4	3.2		10.0	3.3		3.3	3.3	6.6						
SSW		3.3			3.3						3.2								3.3			3.3		
SW	6.6		6.6	3.3	6.6	3.3	3.3			3.2			3.2	3.3						3.3	3.3			
WSW	6.6		3.3		3.3			3.4				6.6		3.3	6.6	3.3					3.3			
W	6.6	6.6	3.3	16.6	3.3	3.3	6.6	3.4	6.6	3.2	6.4		3.3	6.6	3.3	10.0	3.3		3.3	3.3		3.3	10.0	6.6
WNW	10.0	13.3	16.6	13.3	6.6	10.0	6.6	3.4	16.6	9.7	6.4	16.6	10.0	6.6	3.3	3.3	6.6		6.6	3.3	3.3	3.3	6.6	
NW	23.3	26.6	13.3	20.0	16.6	33.2	29.9	37.6	10.0	6.4	9.7	10.0	10.0	10.0	20.0	36.6	26.6	16.6	3.3	23.3	23.3	23.3	13.3	20.0
NNW	43.2	26.6	49.8	36.6	20.0	23.3	20.0	34.1	33.2	38.7	22.6	23.3	20.0	16.6	20.0	16.6	33.2	46.6	46.6	39.9	33.2	39.9	33.2	46.6
CALM			6.6		3.3	6.6	3.3																	

* Note: Due to rounding, percentage totals do not equal 100%.

CHIVA CHIVA (Open site) MAY 1967

Relative Frequencies* of Wind Directions by Hour at 4.0 m.
(%)

Dir.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
N	6.4	3.2	3.2	6.4	6.4	9.7	6.5	9.7	9.7	9.7	10.0	3.3	6.6	9.7	12.9	3.2	3.2	12.9	9.7	12.9	16.1	9.7	6.4	3.2
NNE	3.2		6.4	3.2		3.2	3.3		3.2	6.4		3.3	10.0	3.2	12.9	3.2		3.2			3.2			6.4
NE			6.4	6.4	6.4					6.4	10.0	6.6	10.0	6.4	3.2	3.2	3.2			3.2				
ENE		6.4						3.2			3.3	3.3		3.2										
E											3.3	3.3											3.2	
ESE				3.2							3.3		3.3	6.4										
SE		3.2			6.4	3.2			3.2			6.6		3.2		3.2	3.2							3.2
SSE	3.2					3.2							3.3											
S	6.4				6.4				3.2	9.7			10.0	6.4		3.2		3.2			3.2			
SSW	6.4		3.2		3.2	3.2		3.2	3.2		3.3				3.2									3.2
SW			12.9	9.7	6.4	6.4	3.3	3.2		3.2	10.0	3.3	6.6		6.4	6.4					3.2	3.2		3.2
WSW		3.2					10.0	3.2	6.4	9.7	6.6	6.6		9.7	6.4	6.4	3.2		6.4	3.2	3.2	3.2	3.2	3.2
W	6.4	6.4	6.4	12.9	3.2	3.2	3.3		12.9		10.0	10.0	6.6		3.2	9.7	3.2	9.7	3.2	6.4		3.2	9.7	3.2
WNW	12.9	9.7	9.7	12.9	6.4	3.2	20.0	25.8	6.4	6.4	6.6	13.3	6.6	16.1	16.1	16.1	19.4	9.7	9.7	16.1	9.7	9.7	12.9	9.7
NW	32.2	32.2	32.2	22.6	19.4	38.7	16.6	29.0	32.2	38.7	16.6	23.3	20.0	17.9	12.9	22.6	32.2	45.2	41.9	32.2	41.9	48.4	32.2	41.9
NNW	19.4	19.4	6.4	12.9	12.9	6.4	20.0	22.6	19.4	9.7	16.6	13.3	16.6	19.4	19.4	19.4	32.2	19.4	25.8	19.4	16.1	12.9	25.8	19.4
CALM	3.2	16.1	12.9	9.7	22.6	19.4	16.6							3.2	3.2	3.2				3.2		3.2	6.4	3.2

* Note: Due to rounding, percentages totals do not equal 100%.

SUMMARY OF NON HOURLY DATA

MAY 1967

Summary of Elements with Non-hourly Frequencies of Observation						
Site	Element, Units and Exposure	Description	Number of Obs.	Minimum Value	Mean or Total Value	Maximum Value
Mirroon (Forest site)	WBG Index ¹ (at 1.0 meters)	Index value	426	70.7	78.0	84.6
		Dry bulb temp.	426	71.0	79.6	91.5
		Wet bulb temp.	426	70.5	77.1	84.5
		Black bulb temp.	426	71.1	80.5	91.5
	Evaporation ³ (in. at 4 levels)	Piche (46.0 m)	31	0.079	10.370*	0.659
		Piche (26.5 m)	31	0.049	7.606*	0.573
		Piche (13.5 m)	29	0.006	3.087*	0.232
		Piche (0.5 m)	29	0.006	1.521*	0.159
	Precipitation from Raingauge Network ² (in. at 1.0 meters)	Gauge # 1	21	0.01	8.27*	1.55
		Gauge # 2	23	0.01	9.33*	1.55
		Gauge # 3	24	0.01	11.07*	1.75
		Gauge # 4	23	0.01	12.05*	2.36
Gauge # 5		23	0.01	9.33*	1.25	
Gauge # 6		23	0.01	10.22*	1.60	
Gauge # 7		24	0.01	8.84*	1.61	
Gauge # 8		22	0.01	8.53*	1.45	
Stem Flow ²	Small tree	20	0.01	8.60*	1.47	
	Medium tree	19	0.01	8.83*	1.54	
	Large tree	17	.01	238.29*	154.37	
Clava Clava (Open site)	WBG Index ¹ (at 1.0 meters)	Index value	419	69.7	80.4	90.1
		Dry bulb temp.	419	70.0	82.3	94.6
		Wet bulb temp.	419	69.7	77.2	82.0
		Black bulb temp.	419	69.1	90.8	121.3
	Evaporation ³ (in. at 0.5 meters)	Piche	31	0.049	6.901*	0.518
		Pan	31	0.013	5.331*	0.363
	Minimum Grass temp ³ (°F at grass tips)	None	23	68.1	72.8	75.7

1 - Hourly observations between 0600 and 1900 hours inclusive

2 - Six hourly observations

3 - Daily observations

* Total Values

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) US Army Tropic Test Center Fort Clayton, Canal Zone		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	2b. GROUP
3. REPORT TITLE Monthly Microclimatic Summary, May 1967: Environmental Data Base for Regional Studies in the Humid Tropics			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Data Summary, May 1967			
5. AUTHOR(S) (First name, middle initial, last name)			
6. REPORT DATE September 1967	7a. TOTAL NO. OF PAGES 27	7b. NO. OF REFS	
8a. CONTRACT OR GRANT NO.		8b. ORIGINATOR'S REPORT NUMBER(S)	
8. PROJECT NO. ZM025001A724-01	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)		
9. USATECOM No. 9-4-0013-01			
4. Work Unit: USATTC #001			
10. DISTRIBUTION STATEMENT Distribution of this document is unlimited			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY Advanced Research Projects Agency Army Research Projects Office, OCRD	
13. ABSTRACT This report contains detailed microclimatic data for May 1967 from specific sites in the Panama Canal Zone and vicinity. The data are presented in tabular form, summarized for hourly and/or daily observations from surface to 46-meter levels. Elements listed are: temperature, pressure, precipitation, wind speed and direction, relative humidity, and evaporation.			

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Climate Microclimatology Tropic Environment Humid Tropics Panama Canal Zone Microclimatology Data Base						