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CRPL-F 252 PART A

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PART A
IONOSPHERIC DATA

ISSUED
AUGUST 1965

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 252
PART A

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
31 Aug. 1965

IONOSPHERIC DATA

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IONOSPHERIC DATA

The CRPL-F series bulletins are issued as part of the responsibility of the Central Radio Propagation Laboratory for the exchange and distribution of ionospheric and related geophysical data. Part A, "Ionospheric Data," and Part B, "Solar-Geophysical Data," of the CRPL-F series present a variety of data collected by CRPL in the course of its research and service activities. Through the CRPL-F series, as part of the general exchange of scientific information, these data are made available for use by others in research on radio propagation and the ionosphere, and in other geophysical applications.

In the CRPL-F series, Part A, tables of monthly median values of vertical-incidence ionospheric data are presented accompanied by graphs of critical frequencies and M(3000)F2. The tables include the number of values entering into the median determination (count). When available, the upper and lower quartile values (indicated by UQ and LQ) are listed for foF2, foF1, foEs, M(3000)F2, h'F2 and h'F. Space limitations do not permit inclusion of quartile values for the other characteristics. The tables are prepared by machine methods and the graphs are plotted automatically.

The tables and graphs present the ionospheric data as received from the originating laboratory. Responsibility for the accuracy and reliability of the data rests entirely with the originator. Medians of data for the U.S. stations are computed by CRPL in accordance with the recommendations of the World-Wide Soundings Committee.

Data will appear in the F-series, Part A, only when the complete daily-hourly tabulations have been received by the CRPL or the World Data Center A for Airglow and Ionosphere. In general, priority of publication is given to the most current data. Data received too long after the month of observation may experience an indefinitely prolonged delay before finding space in the F series, Part A.

Information on symbols, terminology and conventions may be found in the "URSI Handbook of Ionogram Interpretation and Reduction of the World-Wide Soundings Committee," edited by W. R. Piggott and K. Rawer (Elsevier, 1961), which supersedes previous documents. A list of symbols is available from CRPL on request.

Units and Abbreviations of Ionospheric Data Tables

foF2, foEs - - - Tenthths of a megacycle	MED - Median
foF1, foE - - - Hundredths of a megacycle	CNT - Count
h'F2, h'F, h'E - Kilometers	UQ - Upper Quartile
M(3000)F2 - - - Hundredths	LQ - Lower Quartile

Key to Points of Ionospheric Data Graphs

foF2: x

foE : o

M(3000)F2 : ◊

foF1; A

foEs: +

< Less-than value indicated. > Greater-than value indicated.

- - - Interpolated value indicated.

The following table contains the latest available information on twelve-month smoothed average of observed Zurich relative sunspot numbers, beginning with the minimum of April 1954. Final numbers are listed through June 1964, the succeeding values being based on provisional data.

Smoothed Observed Zurich Relative Sunspot Number

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

THE IONOSPHERIC DATA PRESENTED IN THE 100 TABLES AND GRAPHS OF THIS ISSUE WERE ASSEMBLED BY THE CENTRAL RADIO PROPAGATION LABORATORY FOR ANALYSIS, CORRELATION, AND DISTRIBUTION. THE FOLLOWING ARE THE SOURCES OF DATA.

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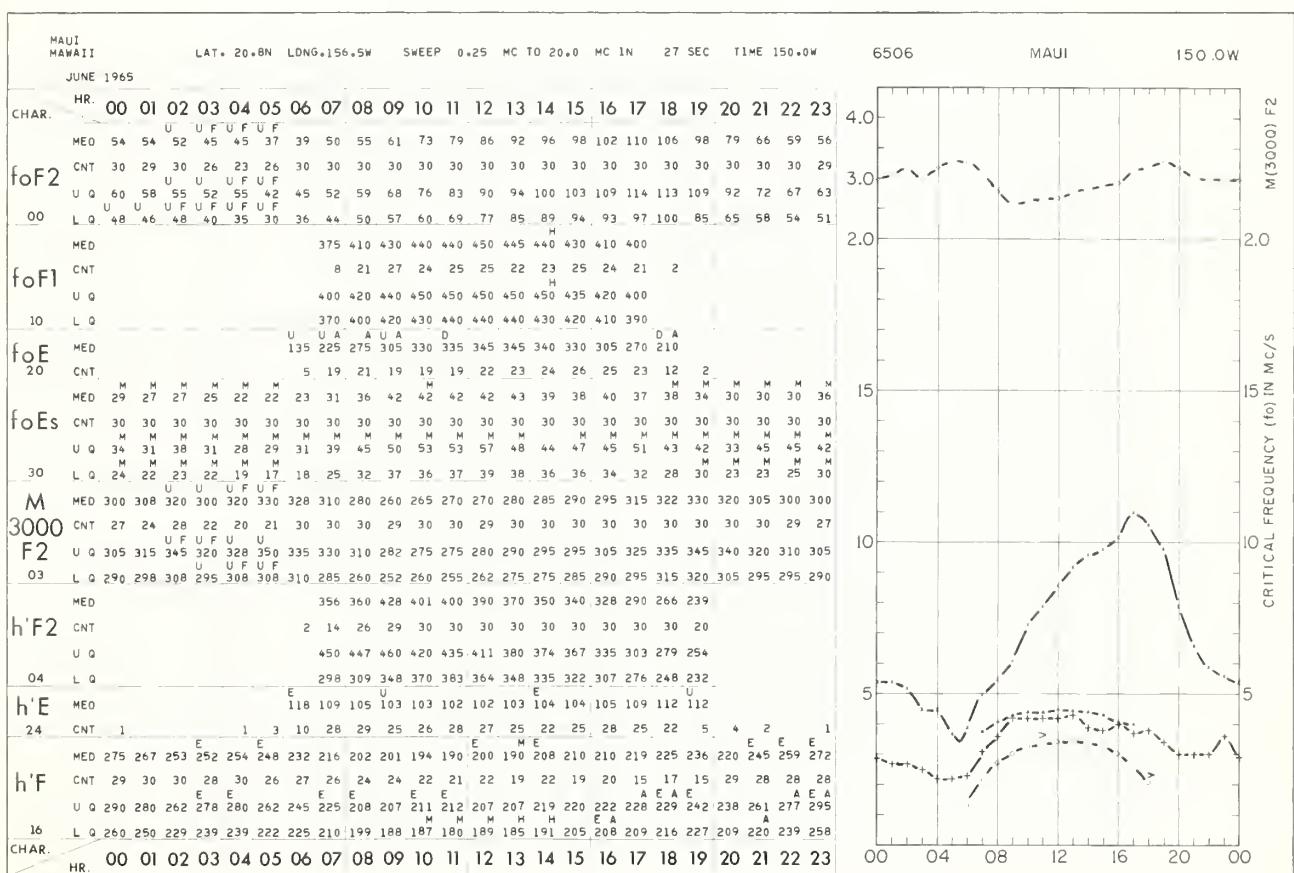
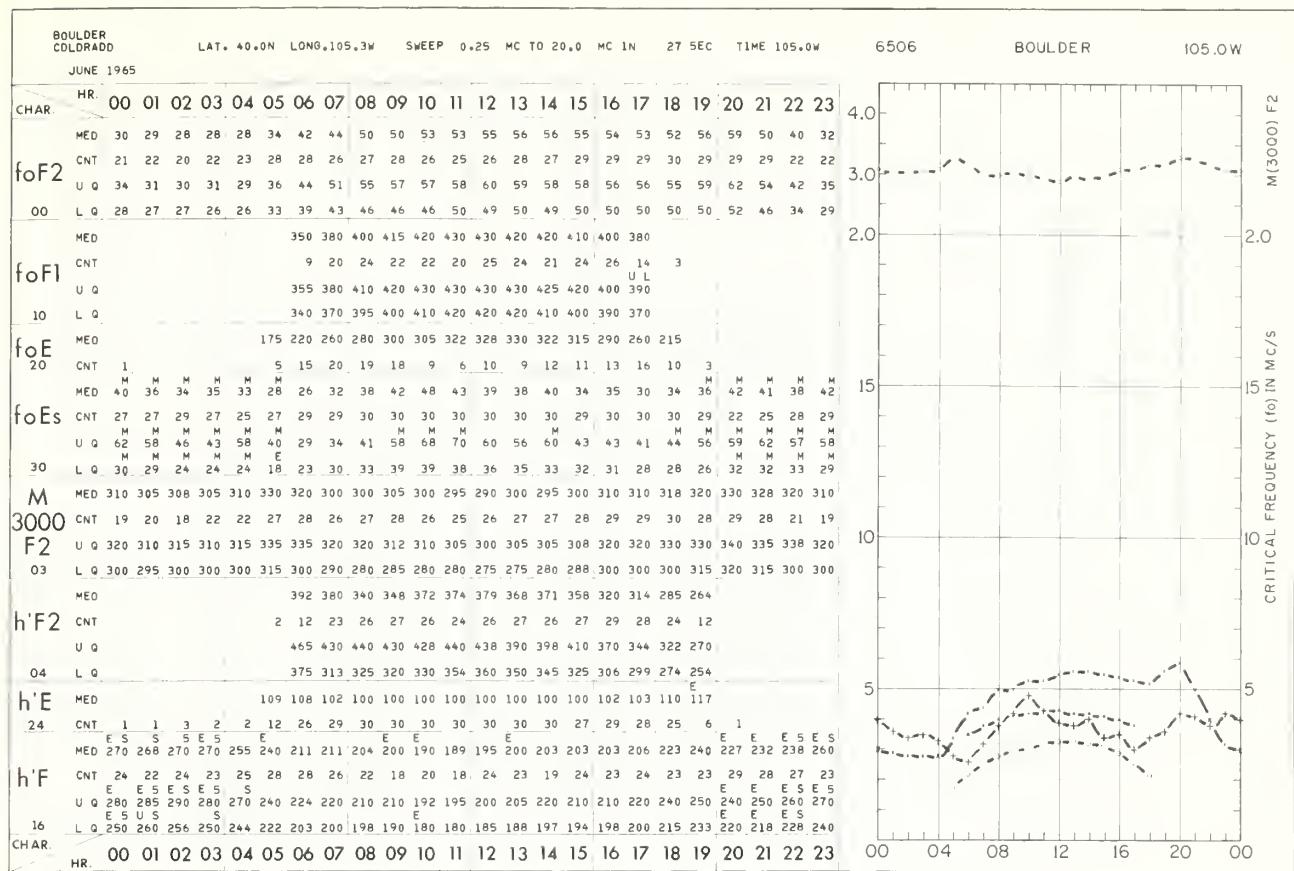
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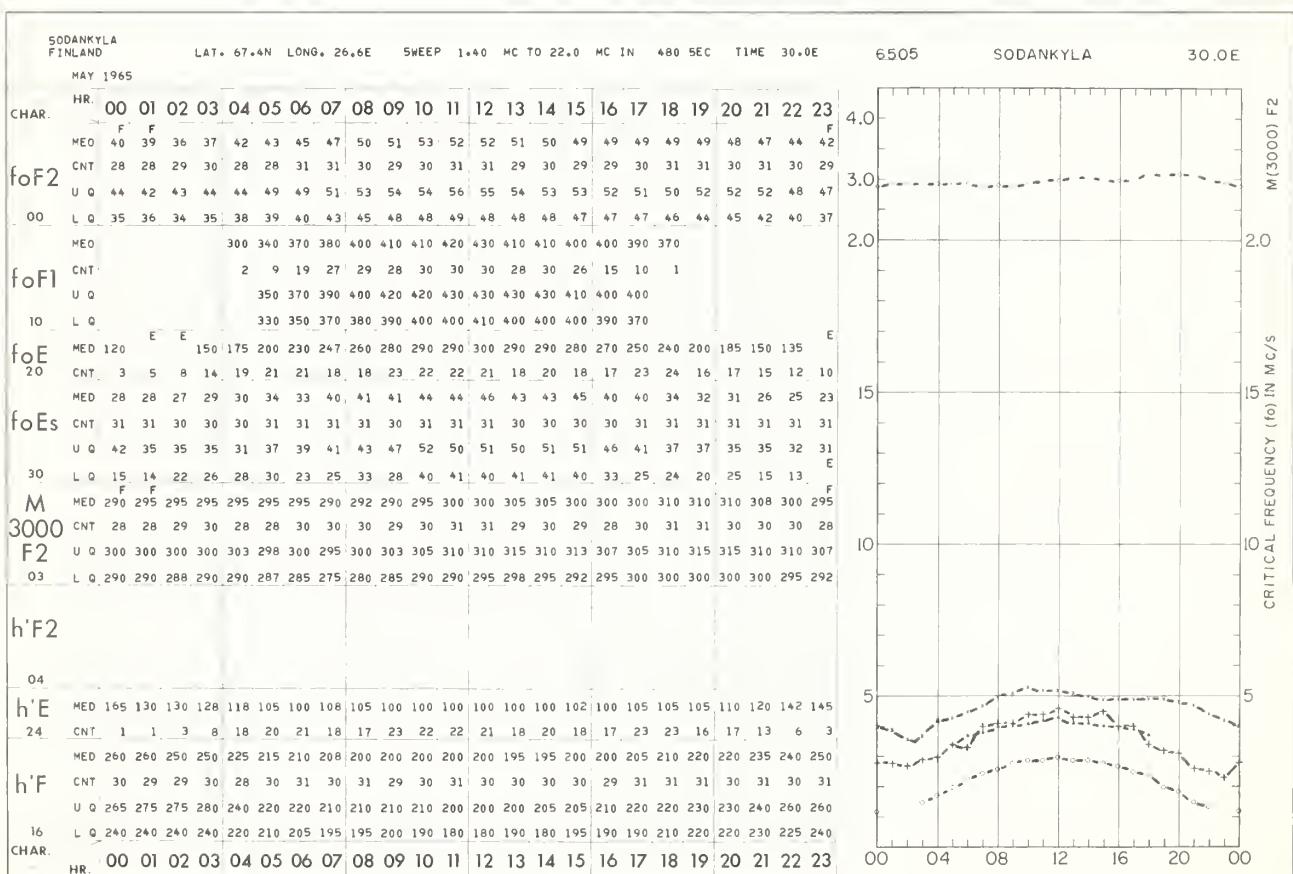
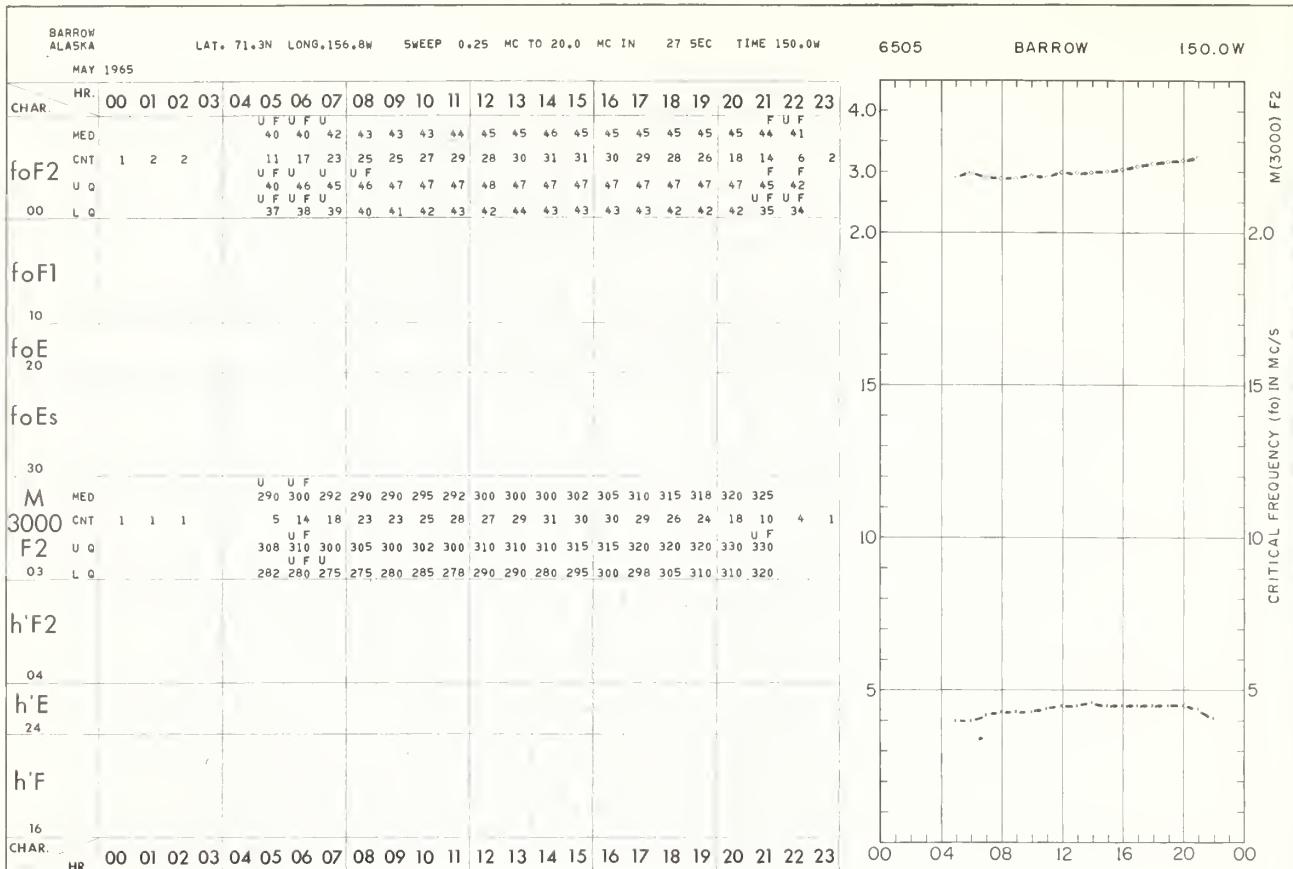
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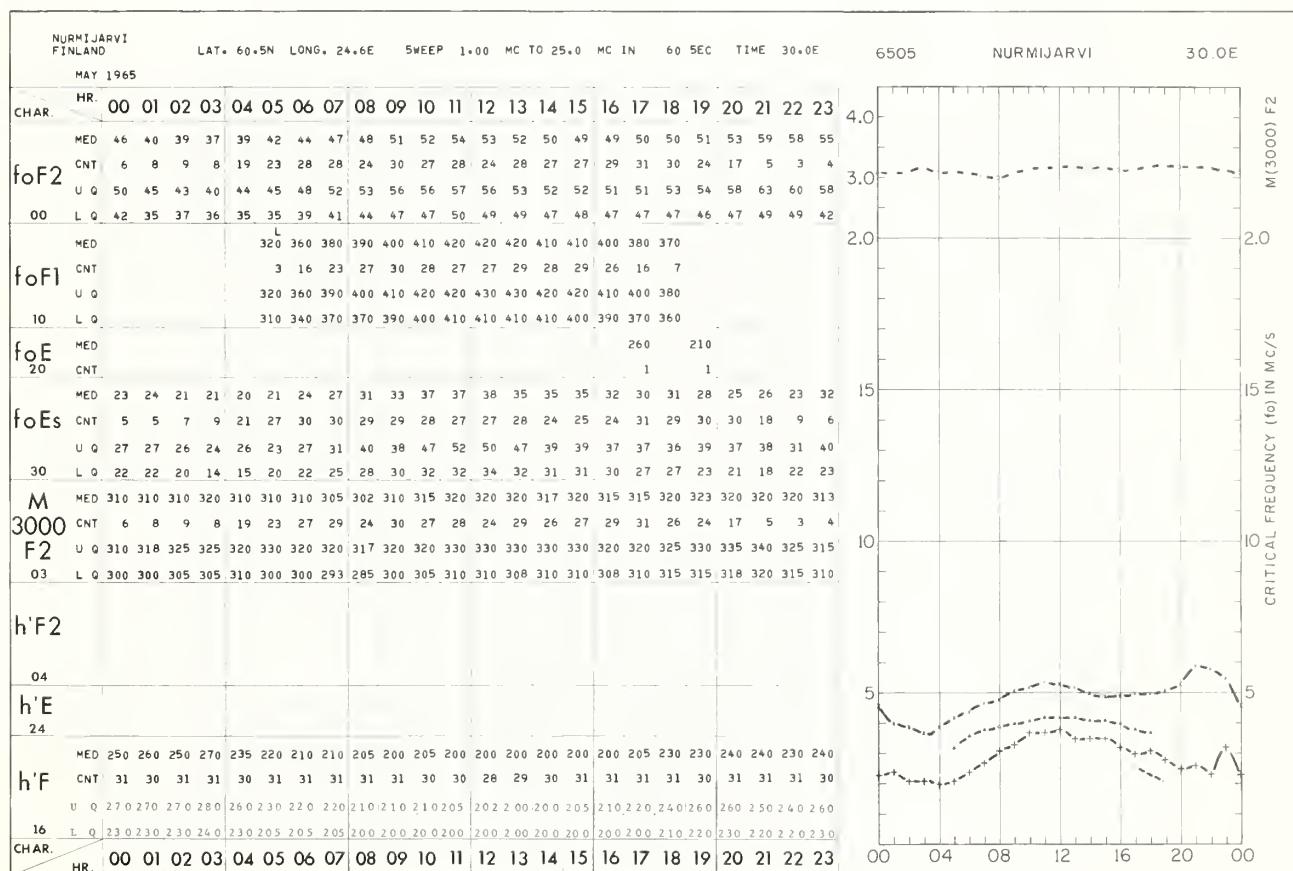
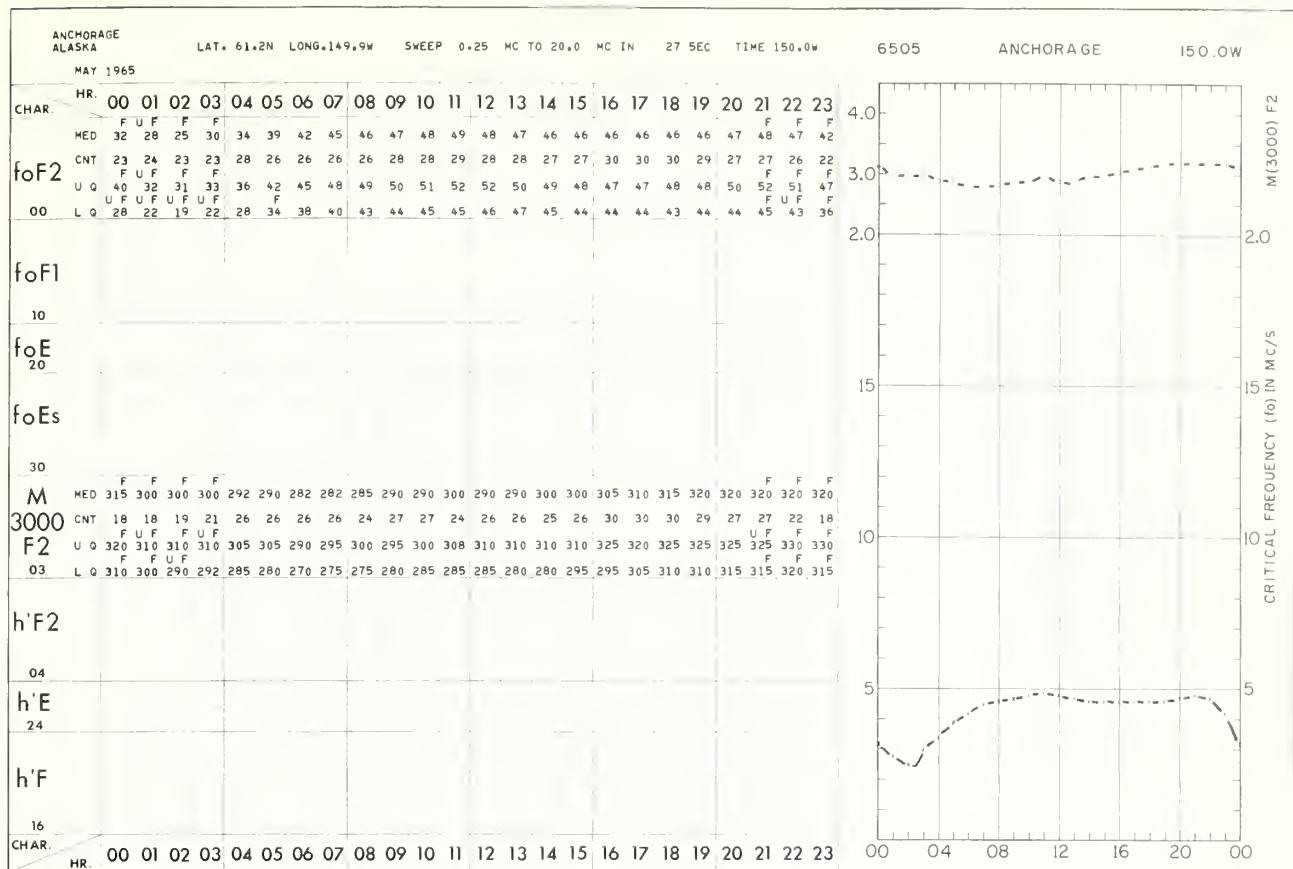
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TABLES AND GRAPHS OF IONOSPHERIC DATA

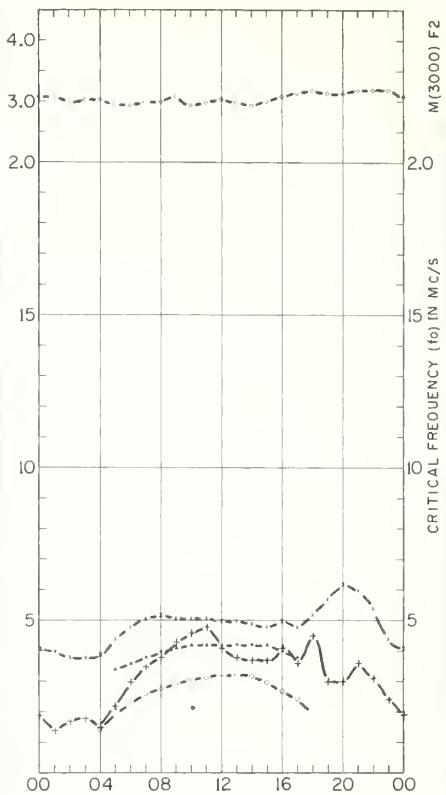
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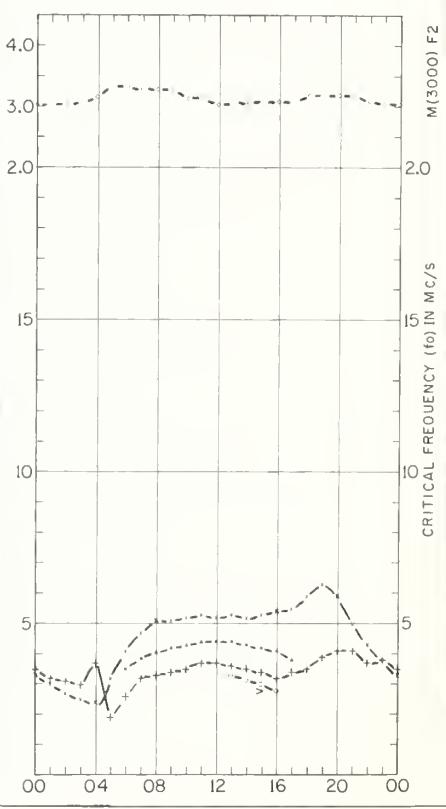


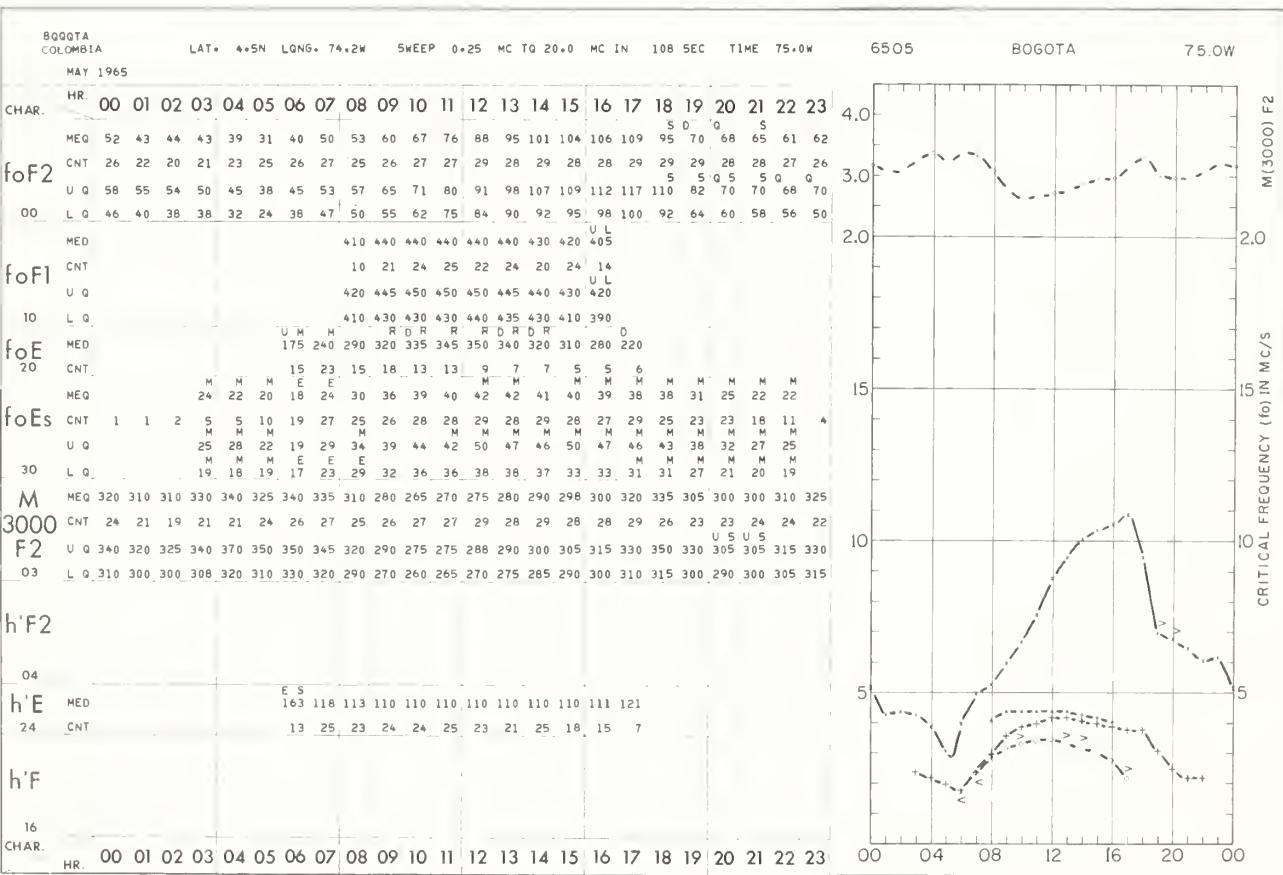
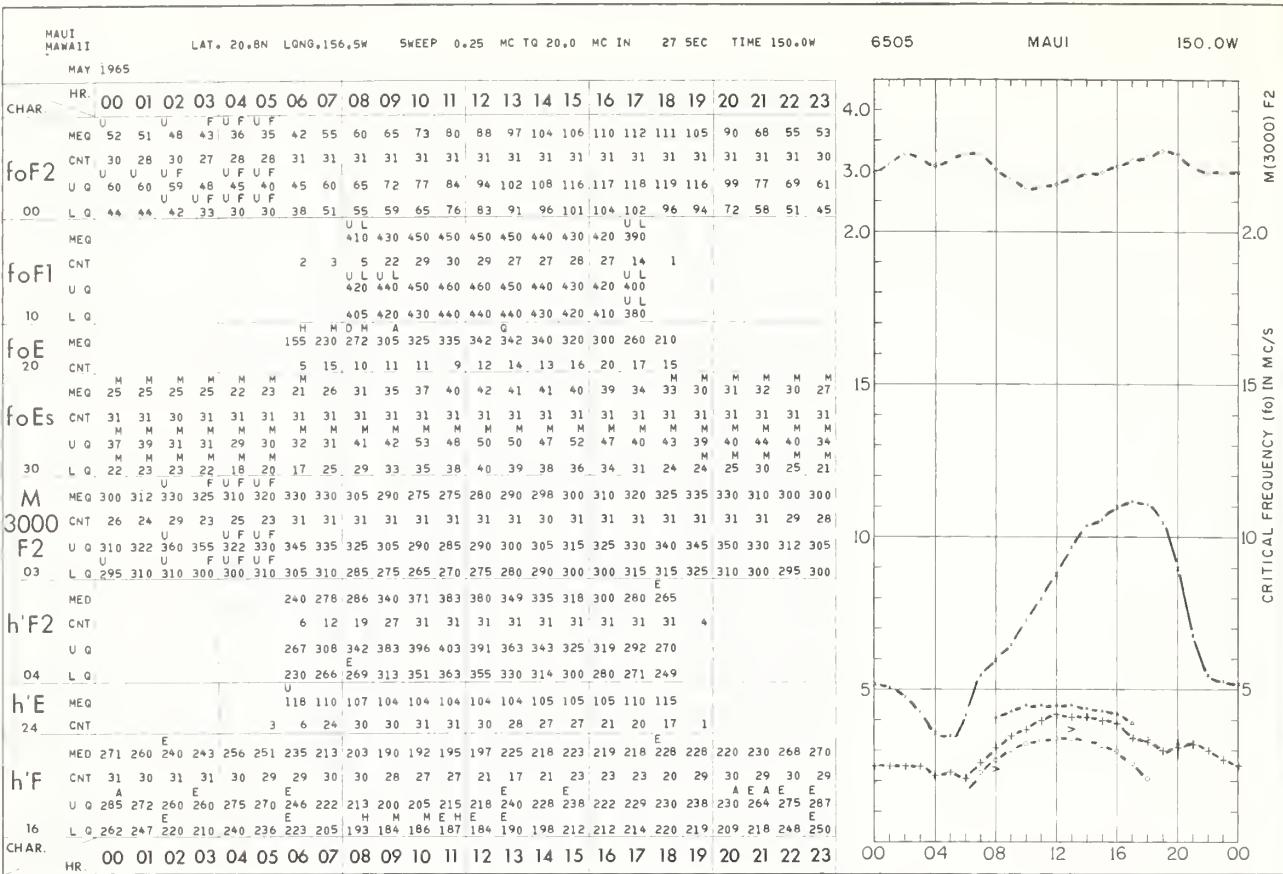


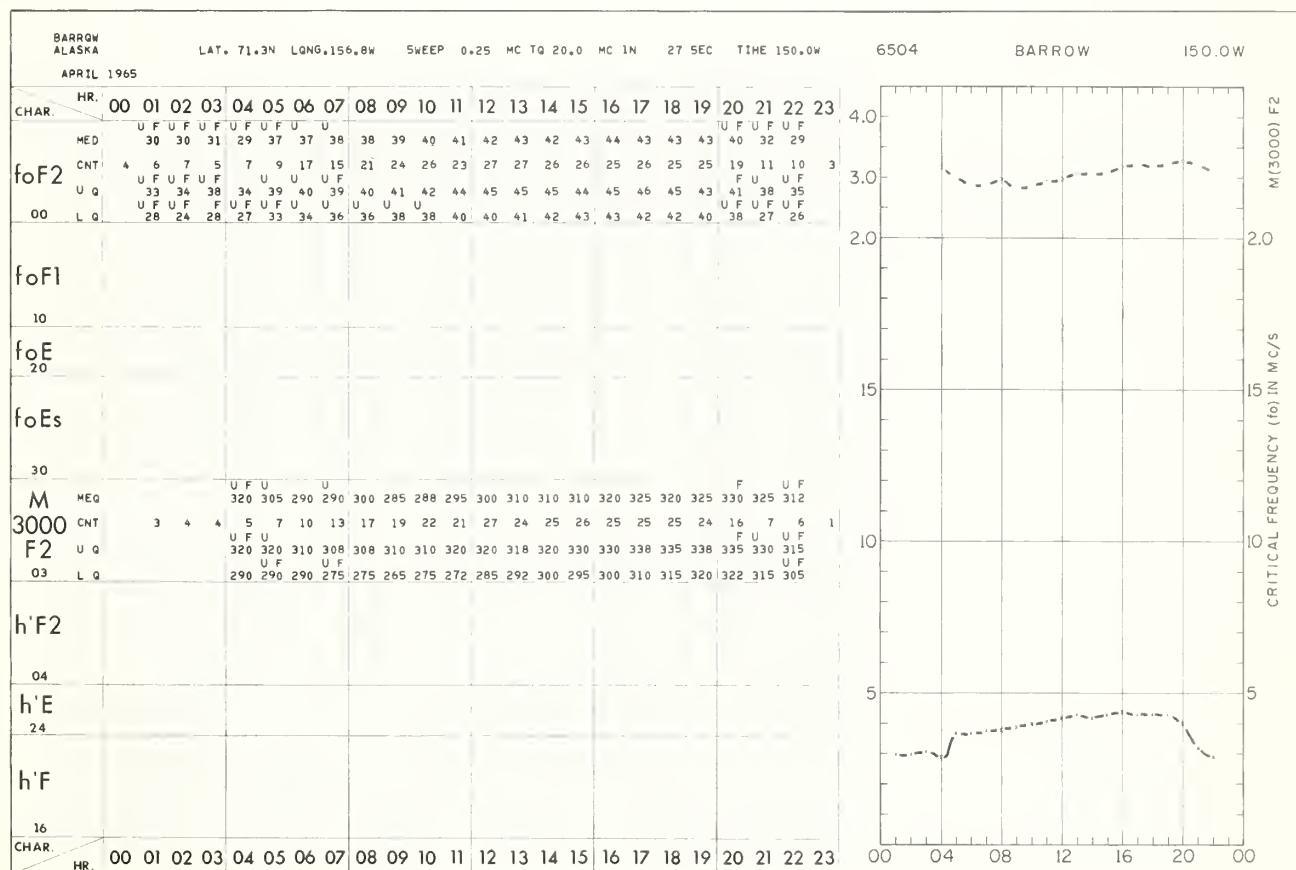
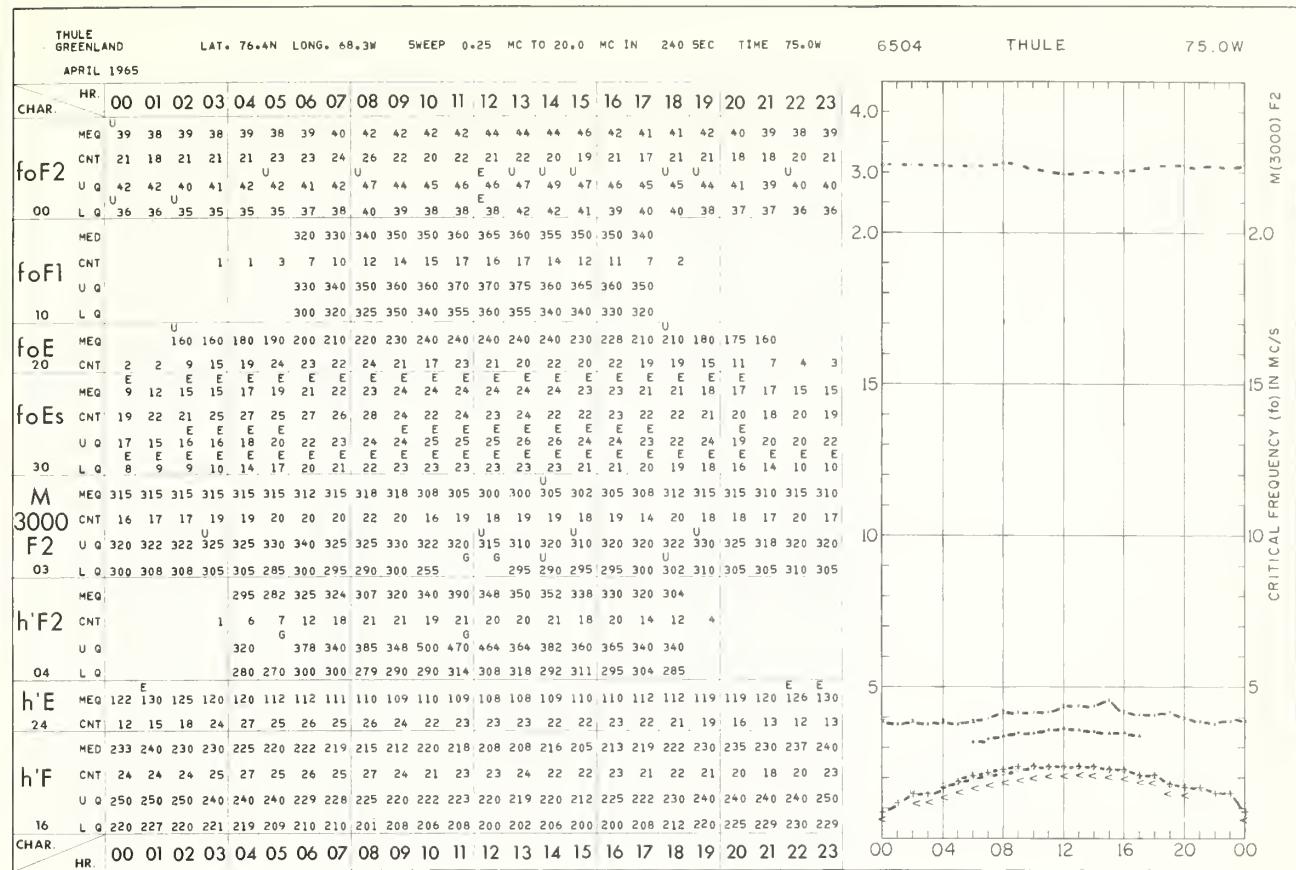
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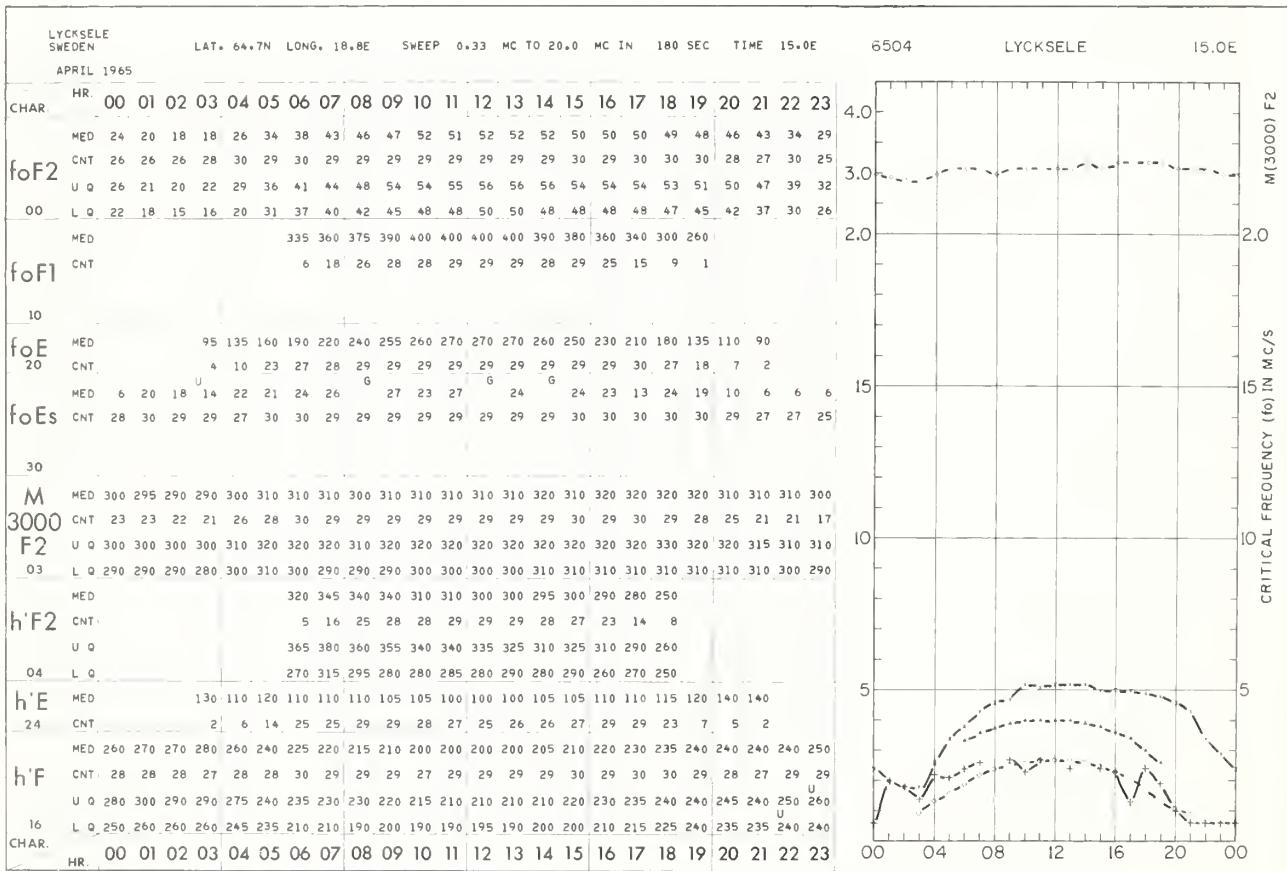
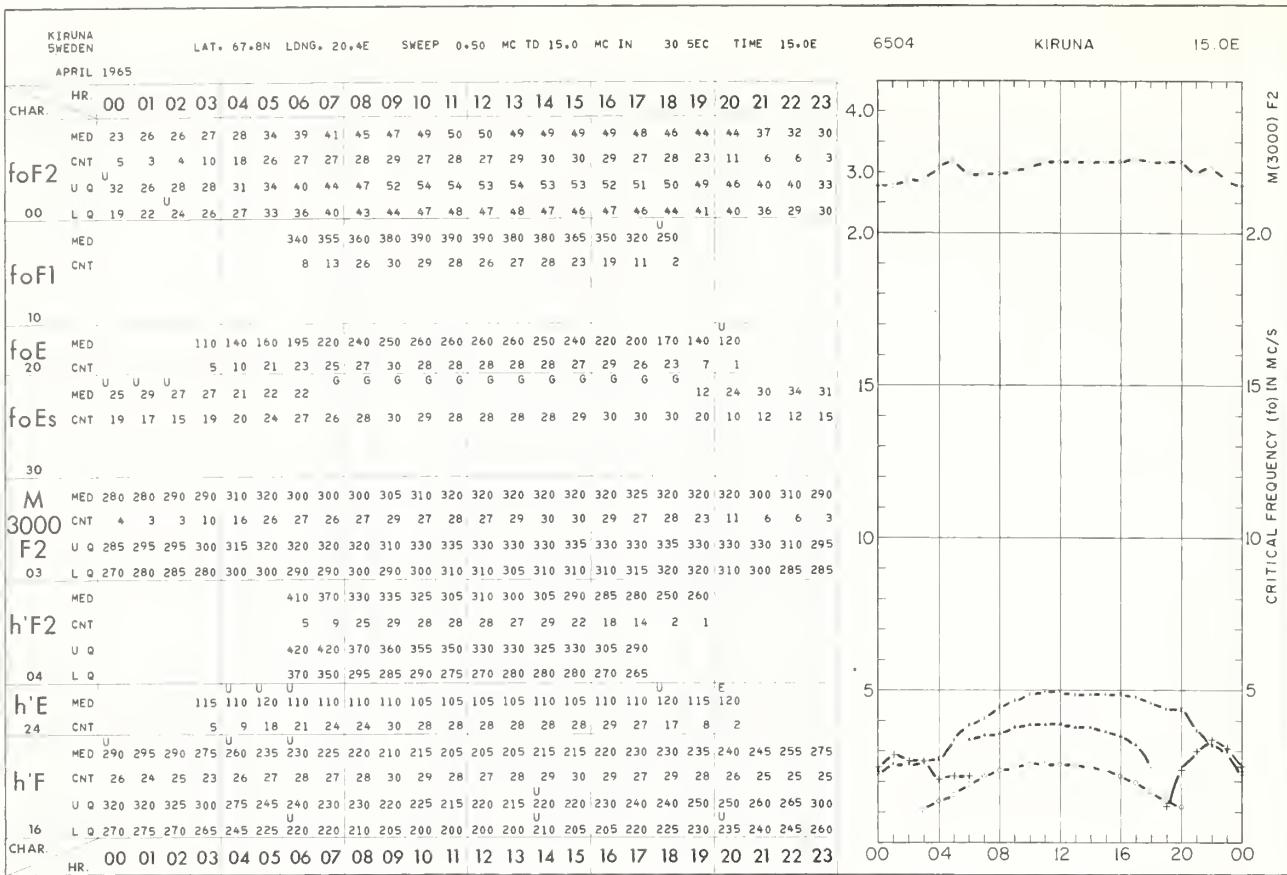


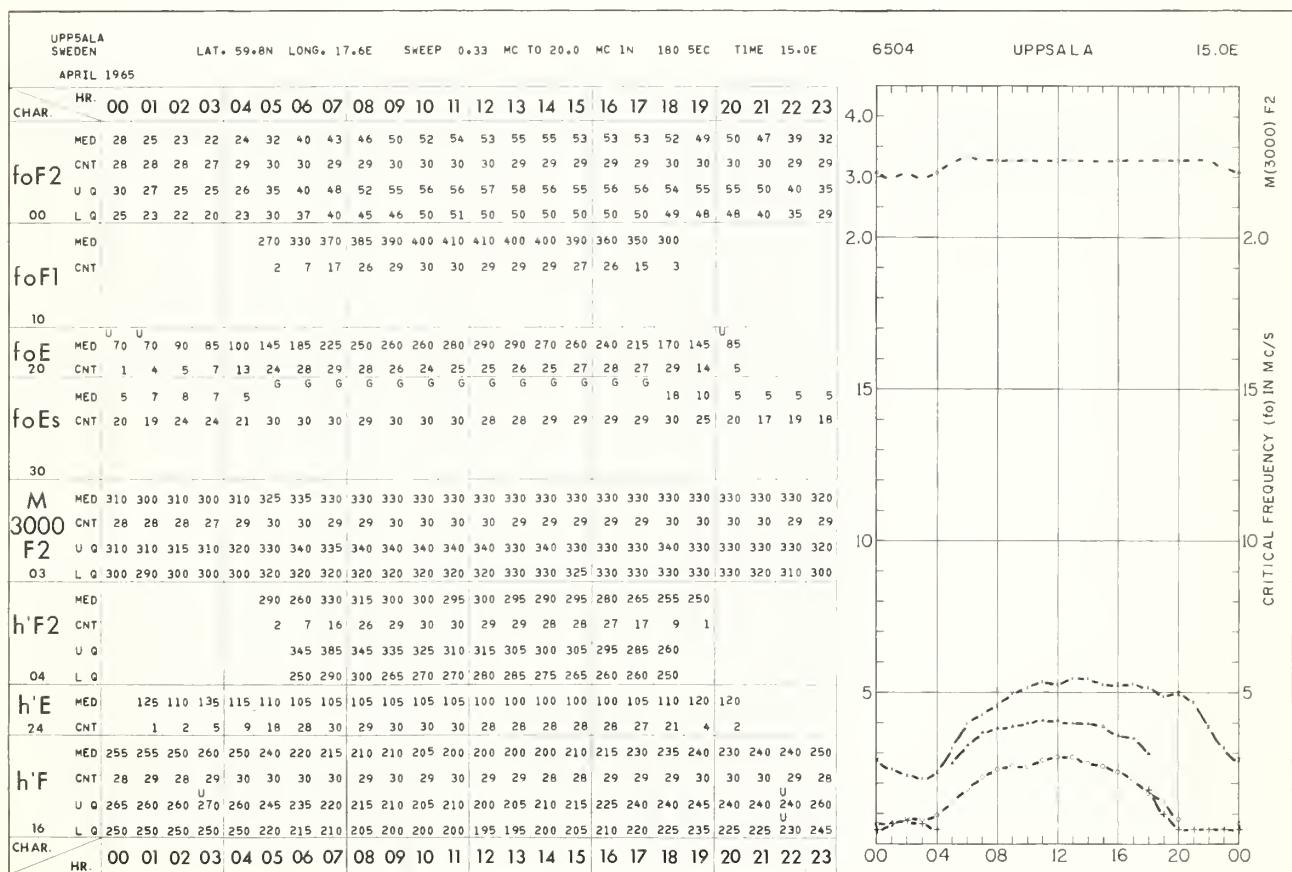
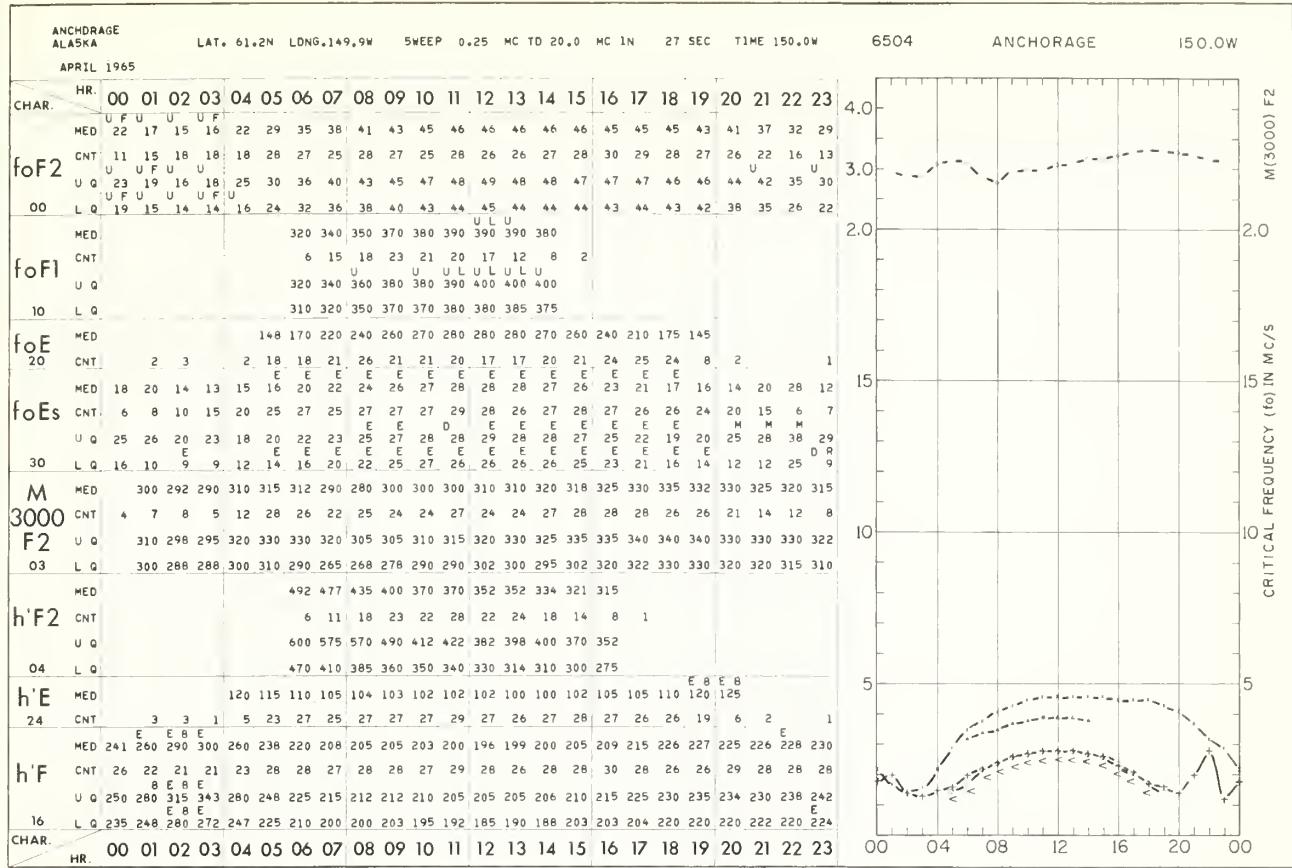
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MAY 1965												
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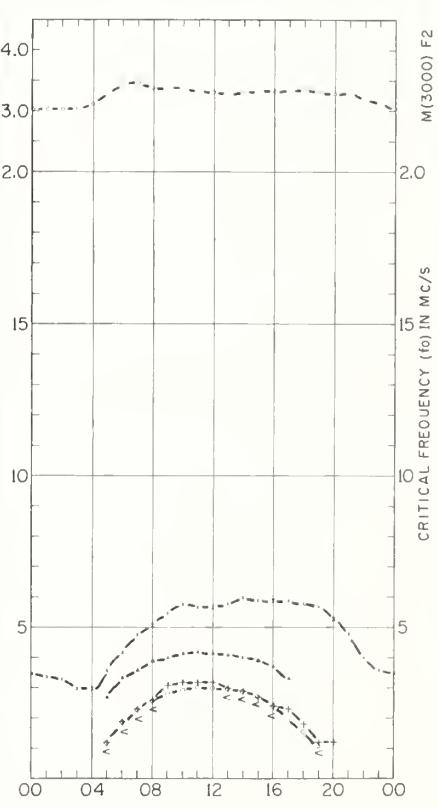
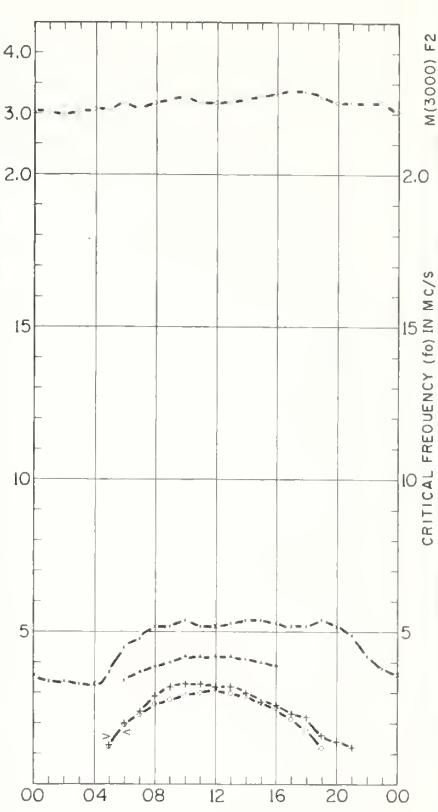


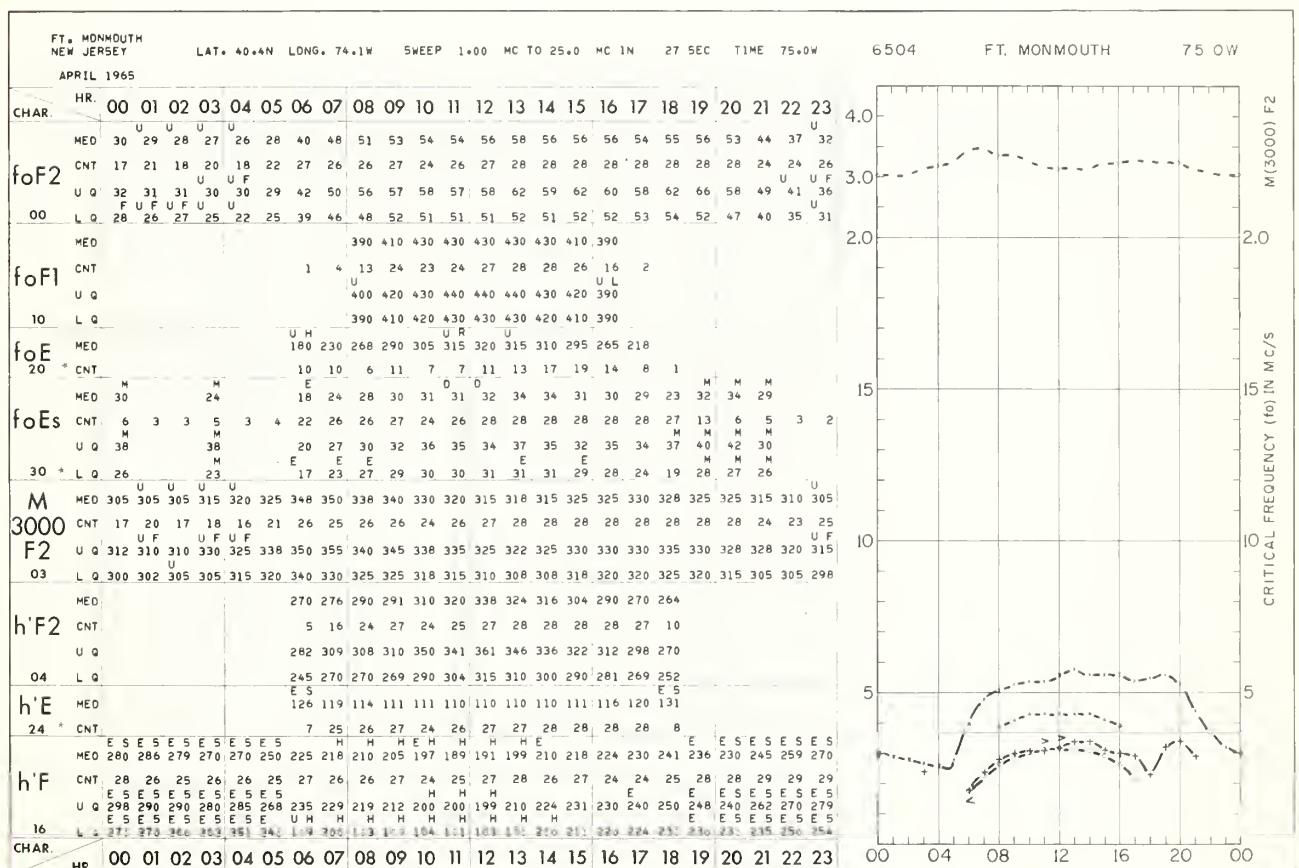
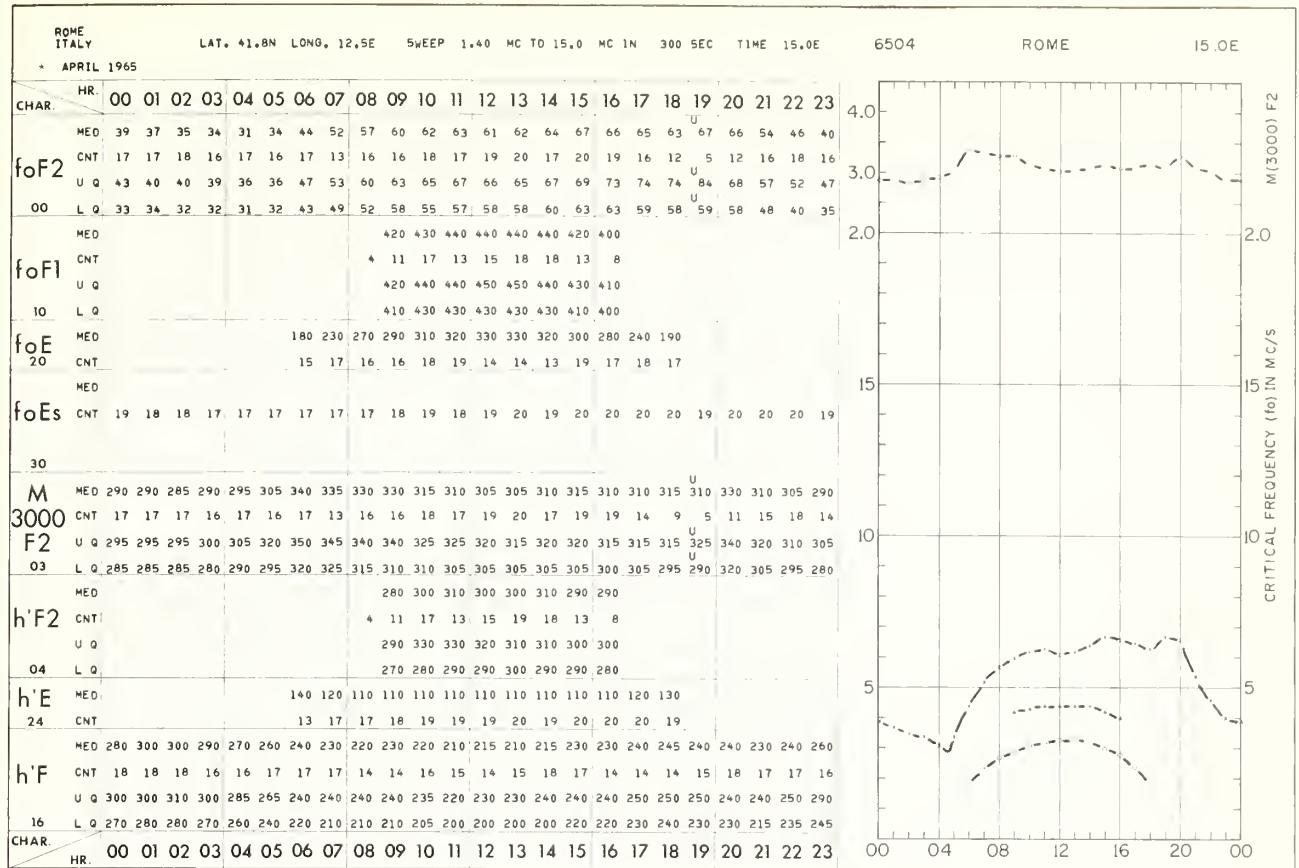




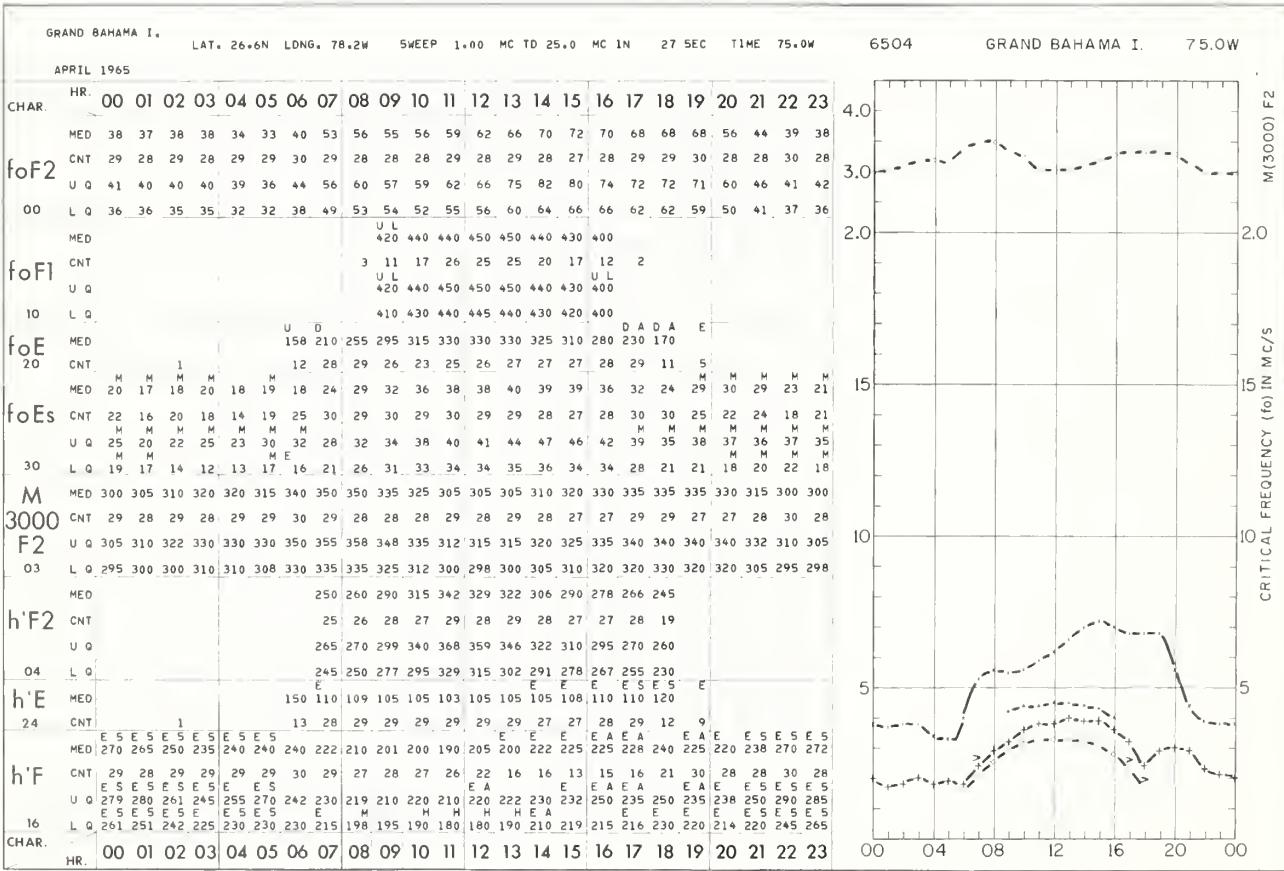
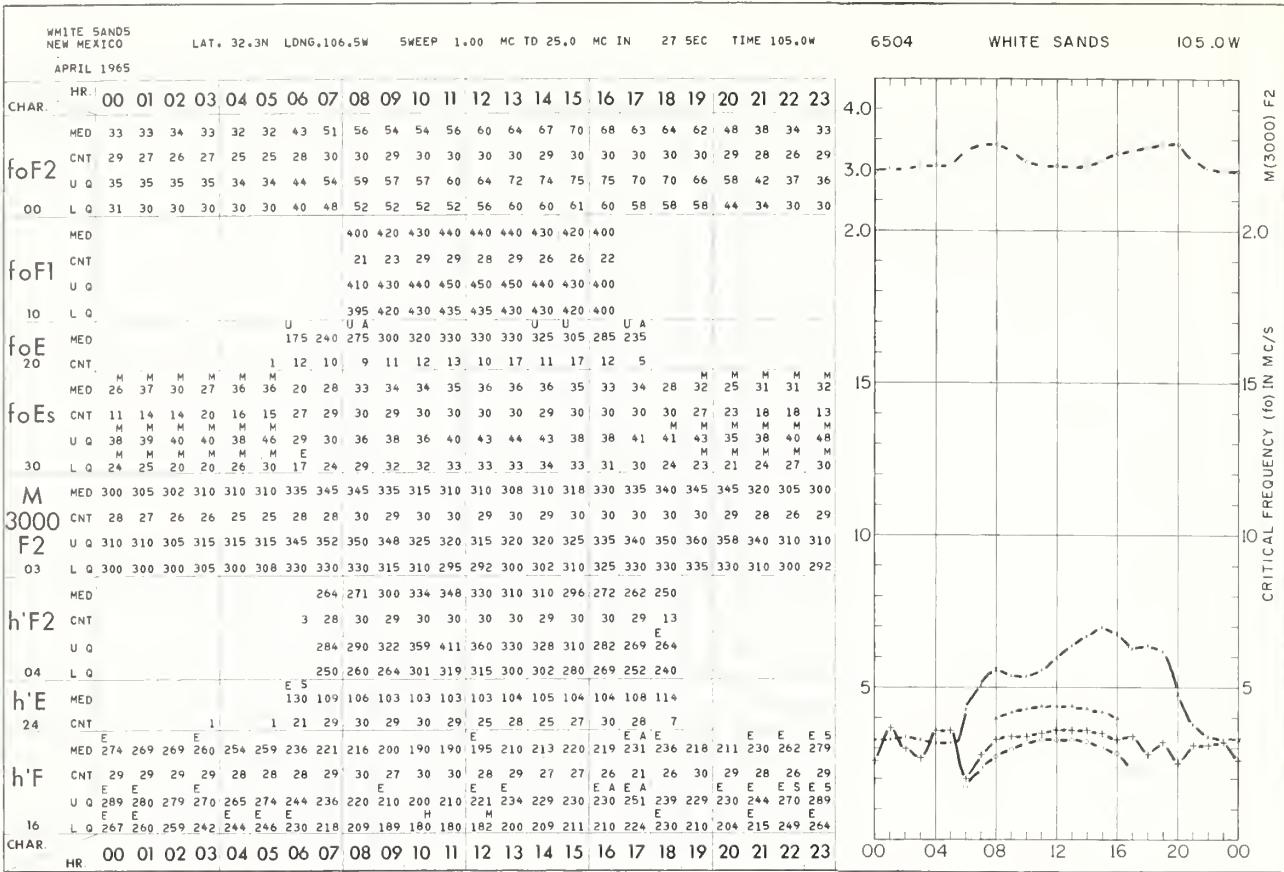


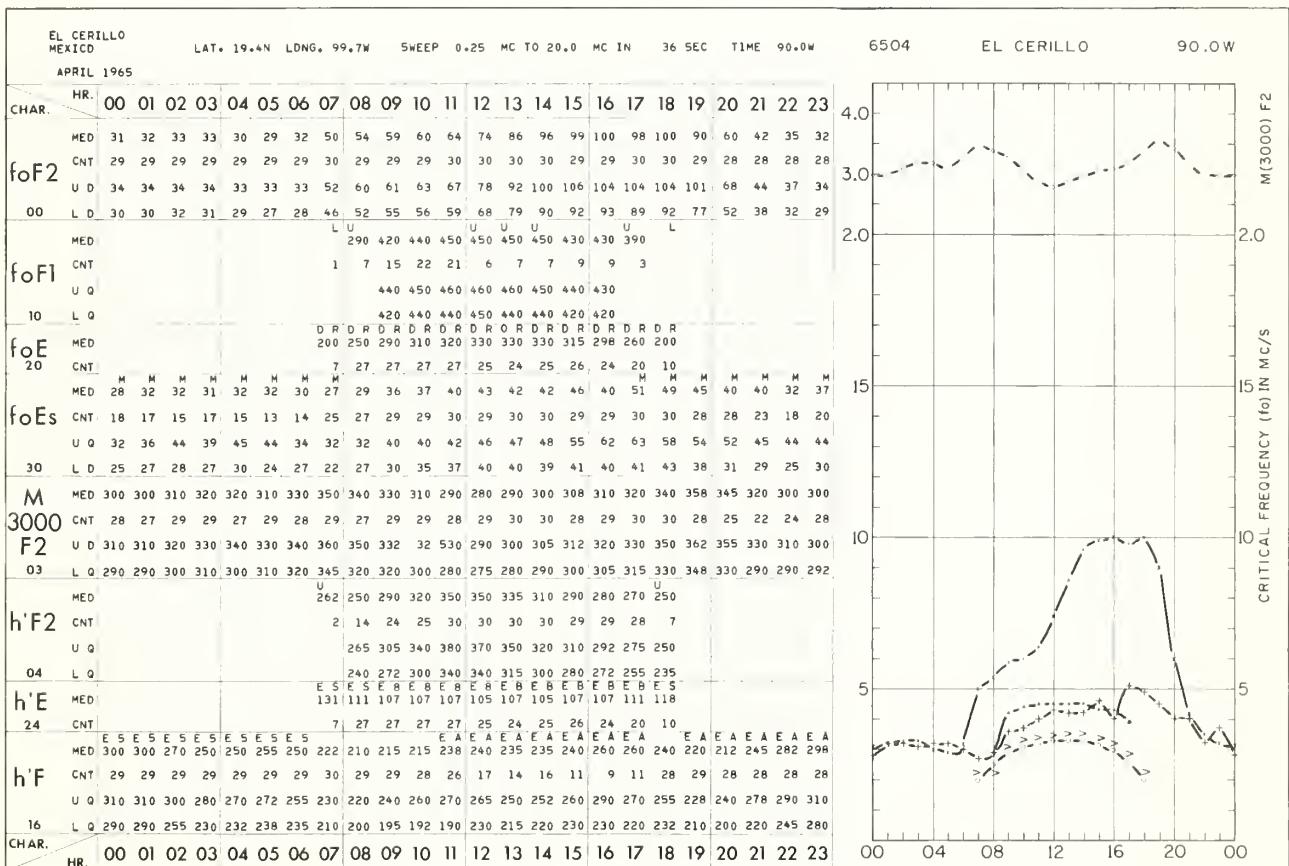
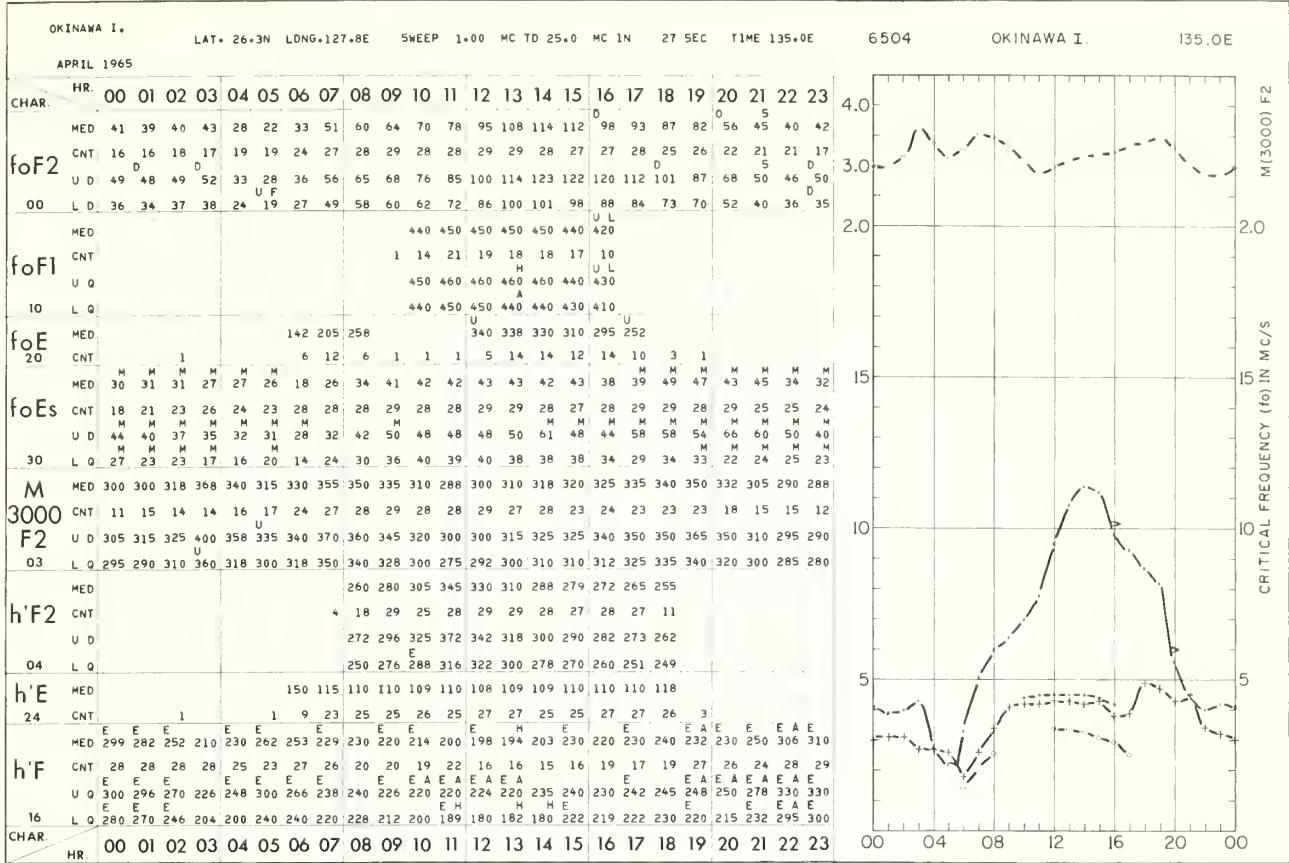
ADAK ALASKA		LAT: 51°N	LDNG: 176.6W	SWEET	1.00	MC TQ	25.0	MC IN	27 SEC	TIME	180.0W															
APRIL 1965																										
CHAR:	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
foF2	MED	36	34	34	33	33	37	45	48	52	52	54	52	52	53	54	54	53	52	52	54	52	49	42	38	
	CNT	29	30	29	29	29	29	29	30	30	30	30	30	30	29	30	29	30	30	30	30	30	29	29	29	28
foF1	U Q	38	37	35	36	36	39	47	51	53	57	58	55	58	58	57	57	56	55	54	60	56	52	48	40	
	00	L Q	32	31	32	32	30	34	41	45	48	47	49	48	51	49	51	50	49	49	50	48	48	42	39	33
foE	MED	340 370 390 400 420 420 420 420 420 410 400 390																								
	CNT	3 10 16 28 29 30 30 30 26 25 16 9 3 1 1																								
foEs	U Q	350 370 400 410 420 420 420 420 420 400 390																								
	10	L Q	330 360 385 400 410 420 420 420 410 395 380																							
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	CNT	125 195 230 265 280 295 302 315 300 290 270 250 215 180 120																								
foF2	U Q	1 1 6 13 25 25 26 25 24 18 15 19 16 21 23 26 15 7 7 1 1 1																								
	E	E	E	E	E	13	20	24	29	32	33	33	32	32	30	27	26	23	22	16	14	12				
foEs	CNT	28	27	28	29	28	27	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	27	24		
	U Q	12	12	12	11	12	17	21	27	31	35	34	35	34	34	35	35	31	26	25	24	17	14	15	12	
	30	L Q	E E E E E E E E E E E E																							
M	MEQ	305	305	300	305	310	310	320	310	320	325	330	320	320	320	325	330	335	340	338	330	320	320	320	320	
3000	CNT	29	30	28	29	28	29	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	29	29	28	
F2	U Q	315	310	305	310	320	325	340	335	340	335	340	335	330	338	335	342	340	340	345	340	330	330	330	325	
	03	L Q	12 18 23 26 28 31 31 31 30 28 26 23																							
M	MEQ	305	305	300	305	310	310	320	310	320	325	330	320	320	320	325	330	335	340	338	330	320	320	320	320	
	CNT	300 295 295 298 300 300 305 300 300 310 310 310 315 310 315 320 320 330 330 320 315 315 315 302																								
h'F2	MED	360 343 324 310 306 288 309 318 317 310 282 285 260 255																								
	CNT	6 14 24 30 29 30 30 30 27 27 27 24 25 17 7 1																								
	U Q	412 385 369 340 356 339 356 340 361 332 300 312 286 269																								
	04	L Q	277 285 272 270 282 274 288 296 287 285 268 262 248 248																							
h'E	MED	E H H H H H H H H H H E																								
	CNT	130 111 105 104 104 103 104 105 103 104 105 108 121																								
	24	CHAR:	1	1	1	7	23	30	30	30	30	30	30	30	30	29	28	27	27	26	7	1	1	1		
	MED	250	258	260	253	250	237	229	220	220	210	201	195	192	187	189	215	224	230	234	235	228	234	228	232	
h'F	CNT	30	30	30	30	30	28	29	30	30	30	29	28	30	29	29	29	29	30	30	30	30	30	30	30	
	U Q	263	269	269	267	265	248	238	230	227	217	208	204	205	201	212	224	236	238	241	241	242	238	239	255	
	16	L Q	0_238	244	250	246	244	230	222	213	208	206	190	189	182	183	202	210	224	230	225	226	225	220	227	
CHAR:	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

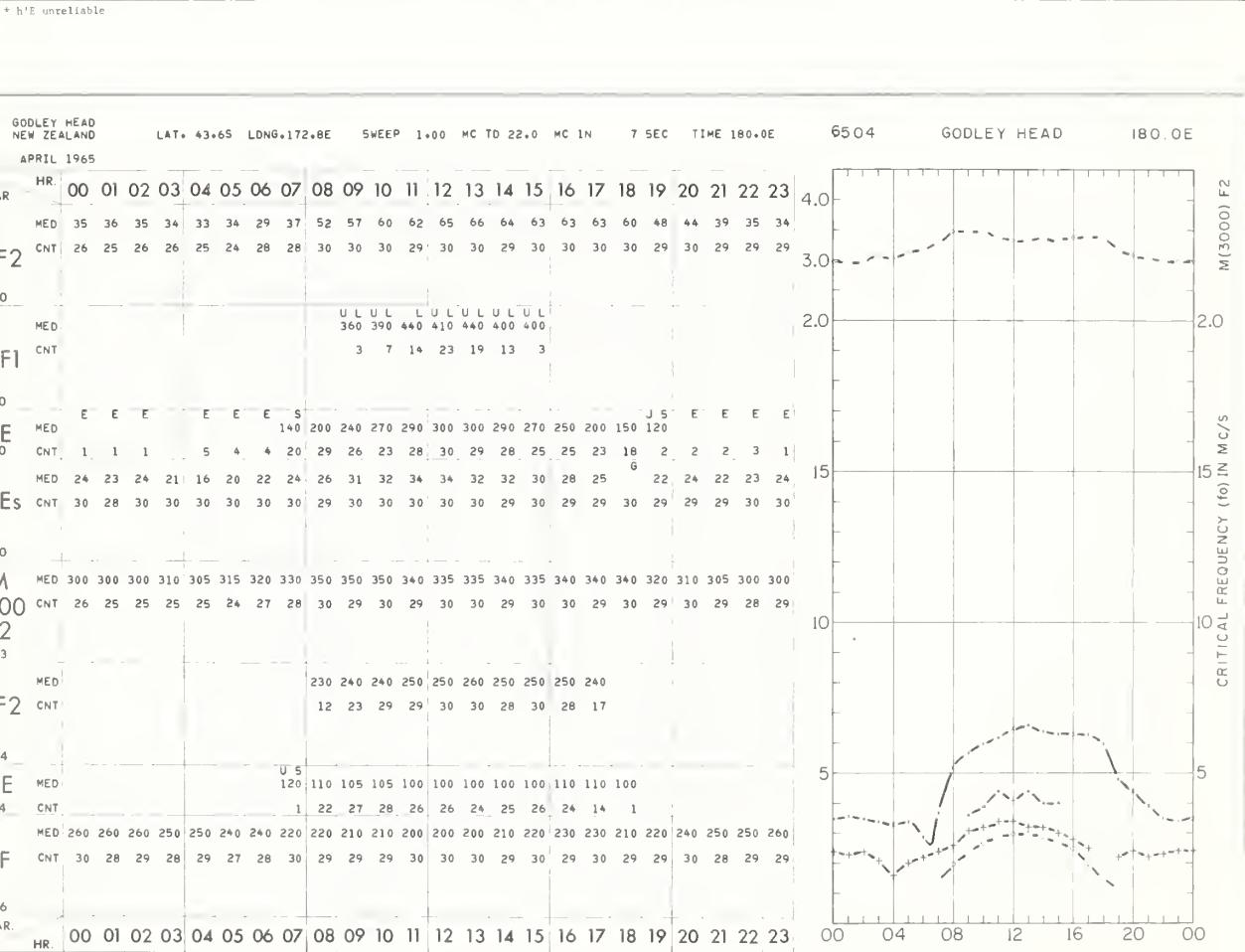
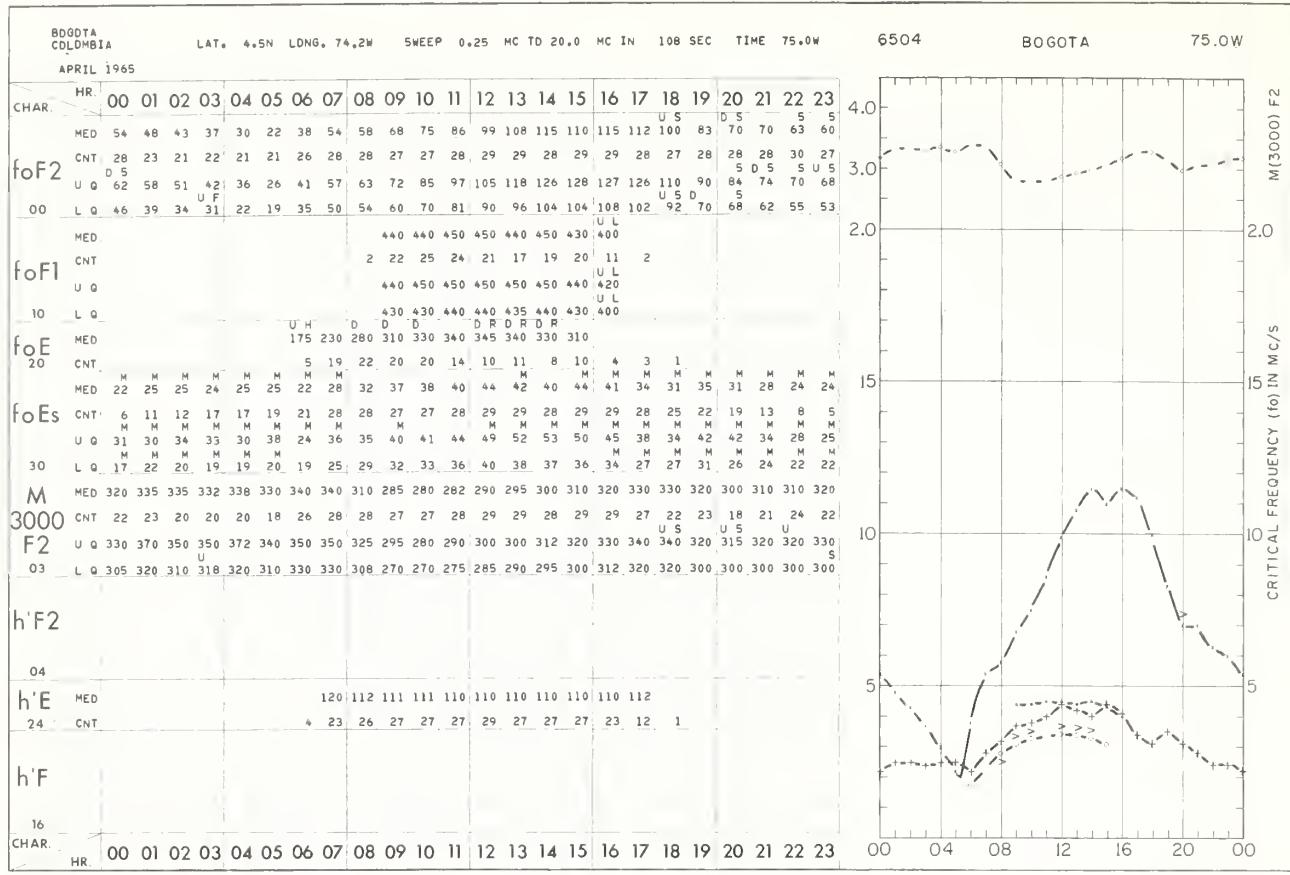


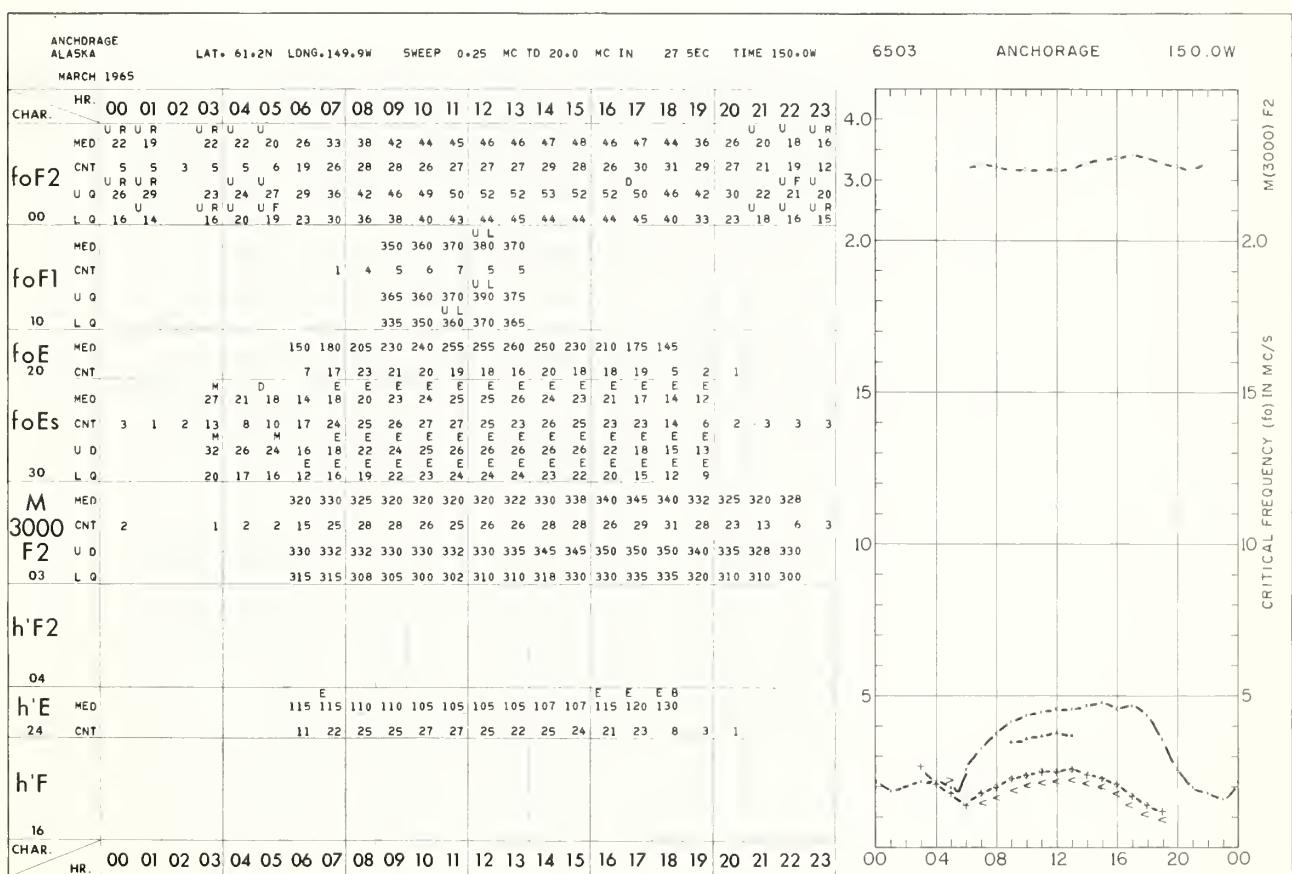
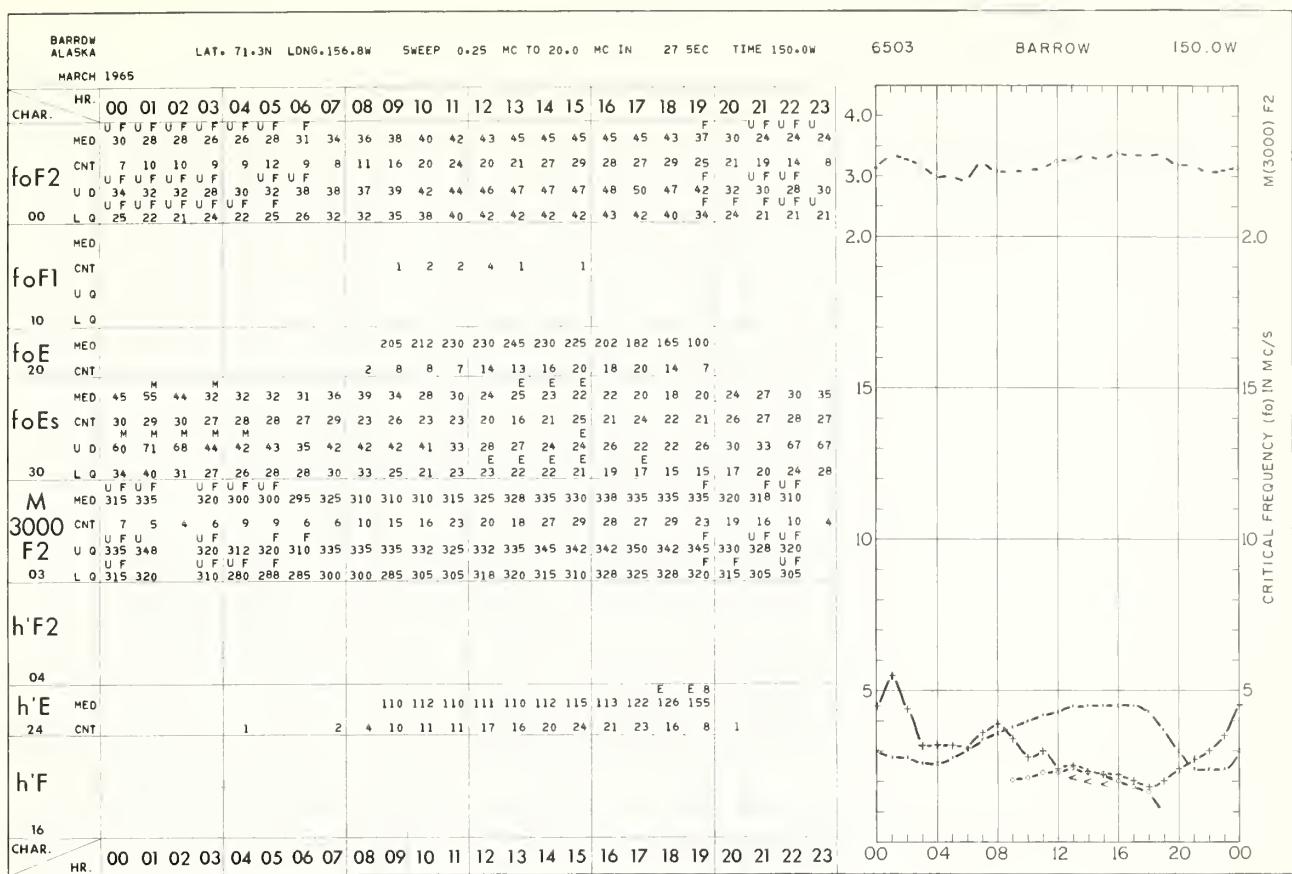


* E region values unreliable



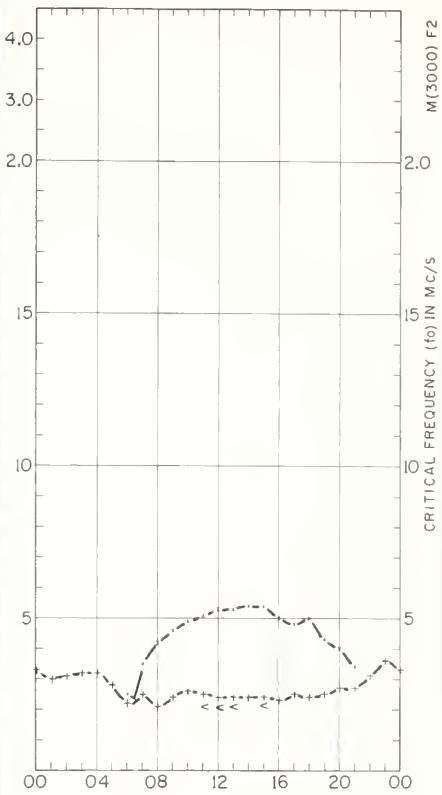






NARSSARSSUAQ
GREENLAND
MARCH 1965

T. 61.2N LONG. 45.4W SWEEP 0.25 MC TD 20.0 MC IN 33 SEC TIME 45.0W 6503 NARSSARSSUAQ 45.0



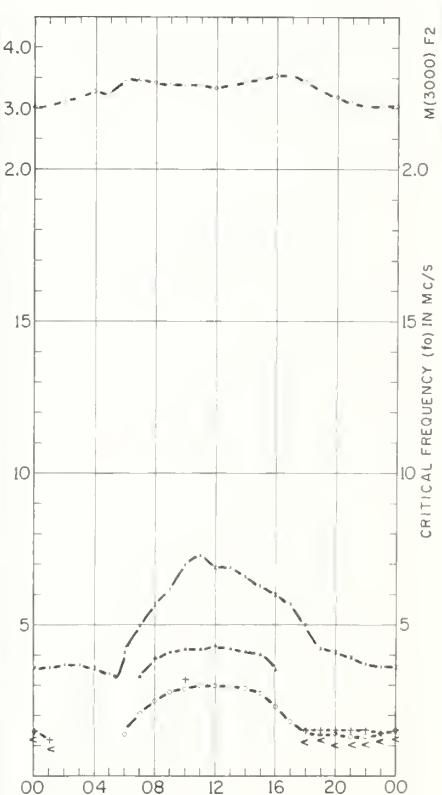
WAKKANAI
JAPAN

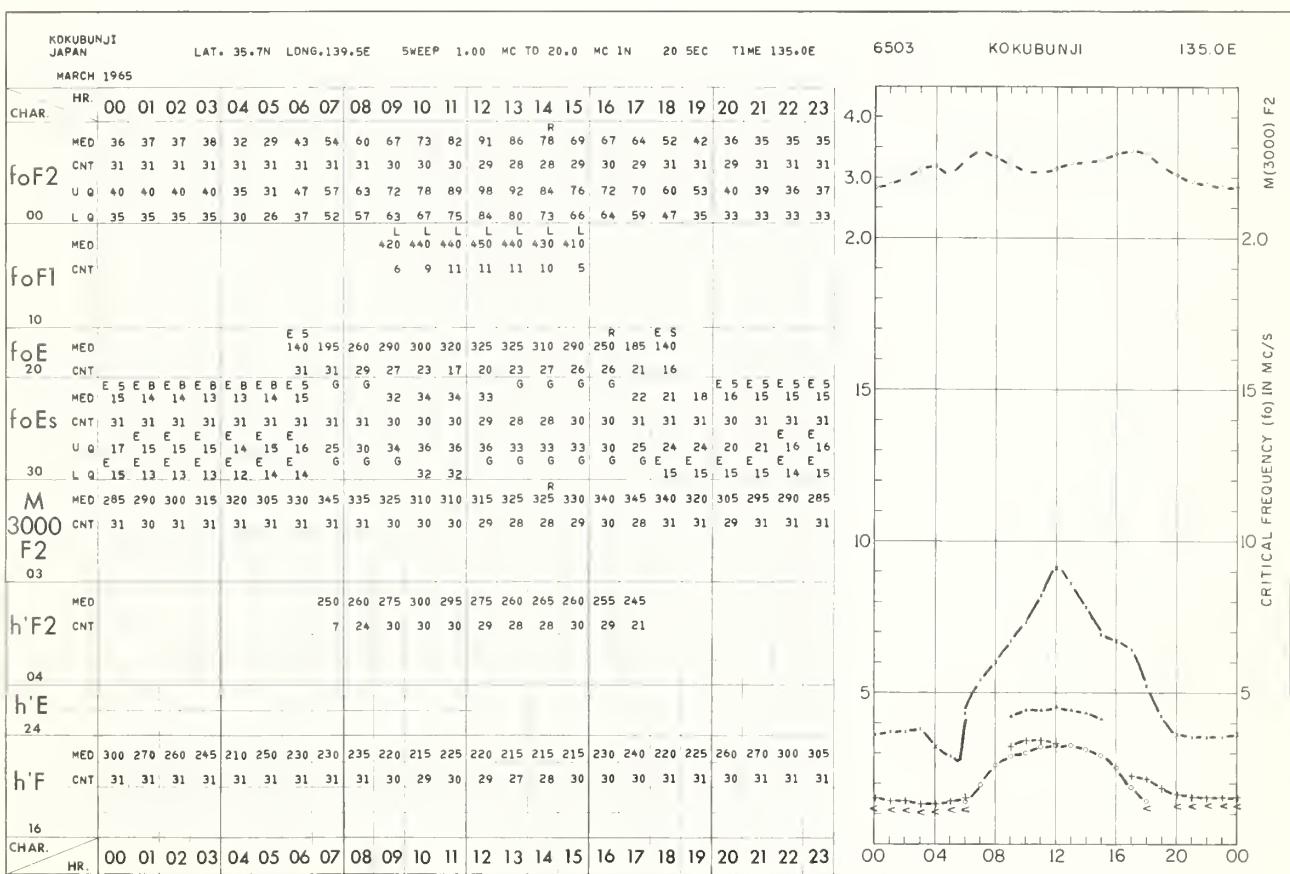
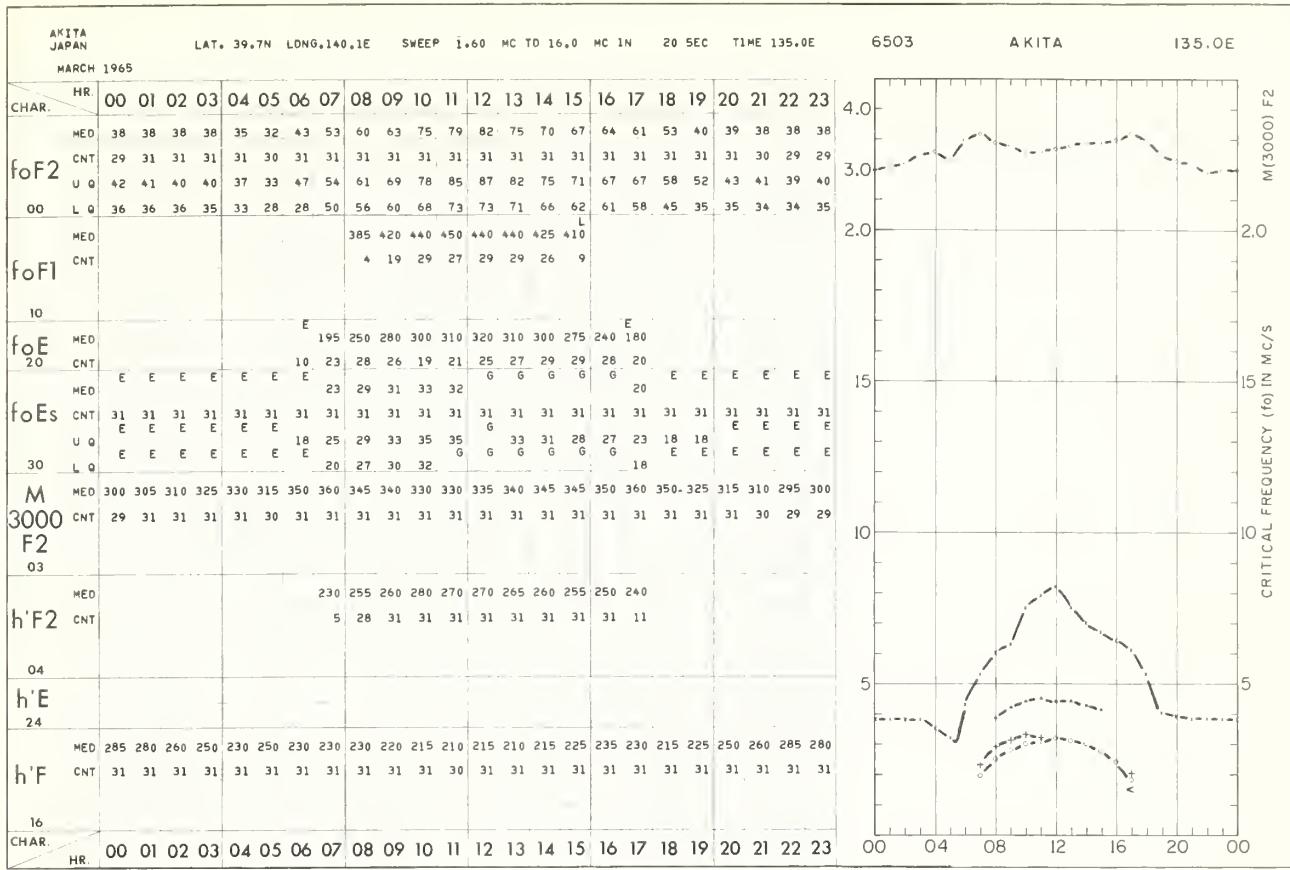
LAT: 45°AN LONG:141°ZE SWEEP 1.00 MC TD 18°0 MC IN 40 SEC TIME 135°OF

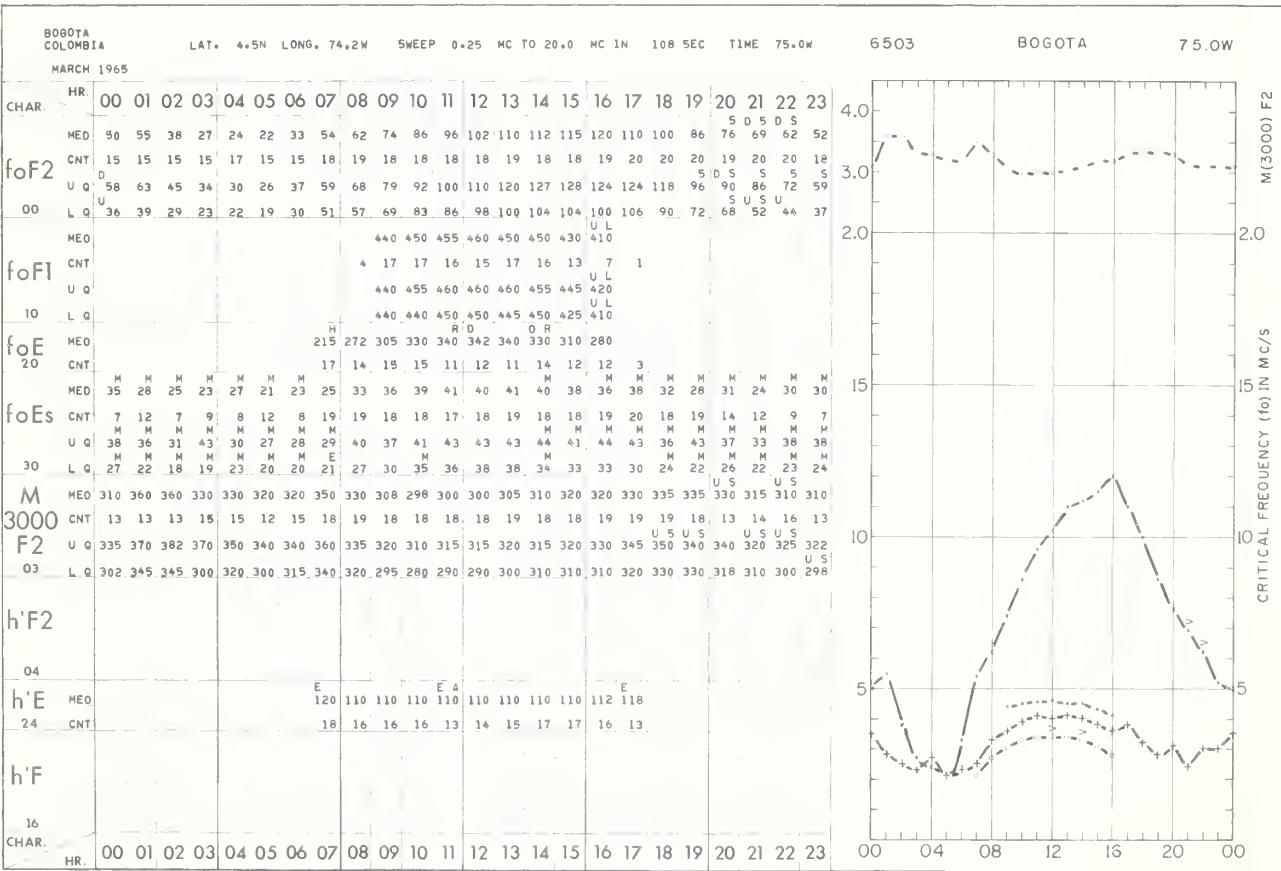
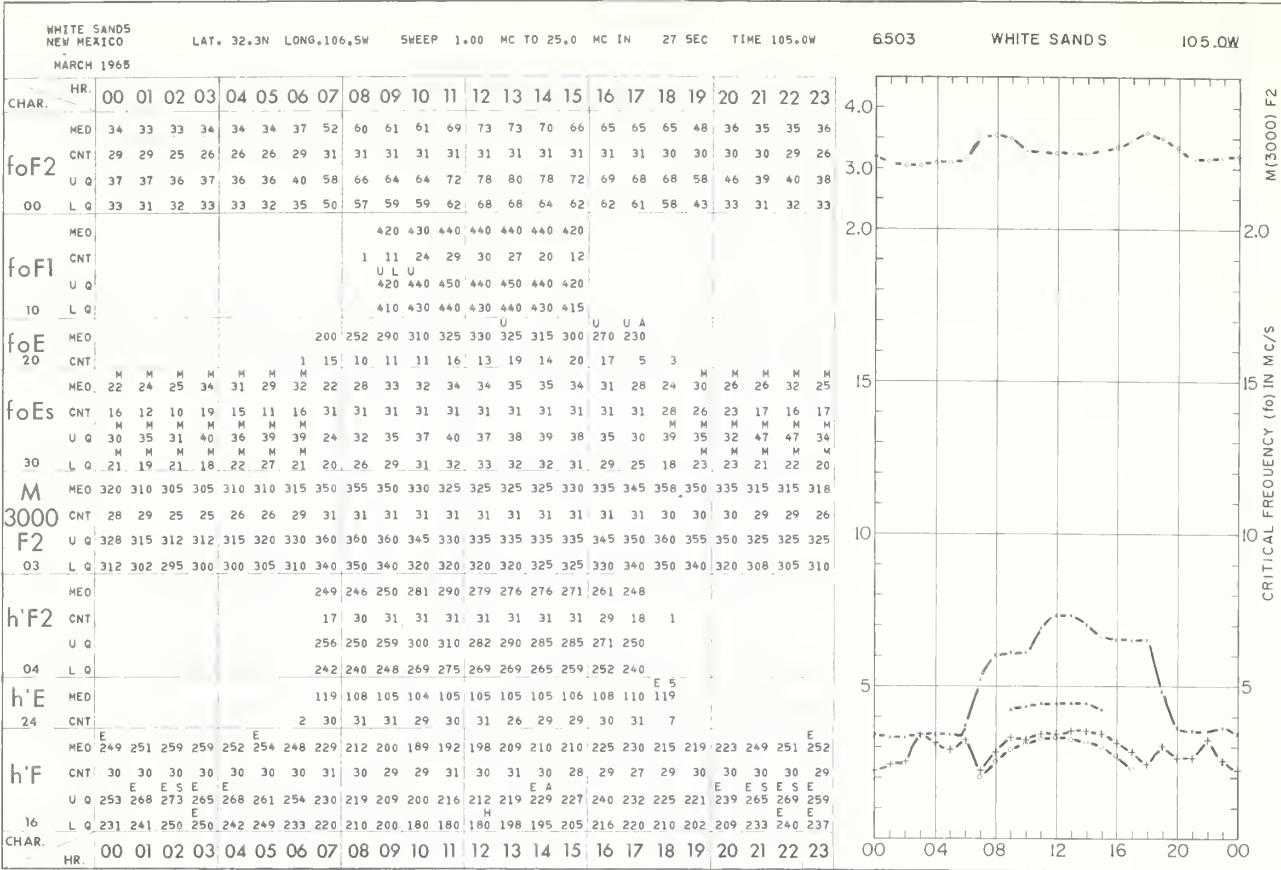
6503

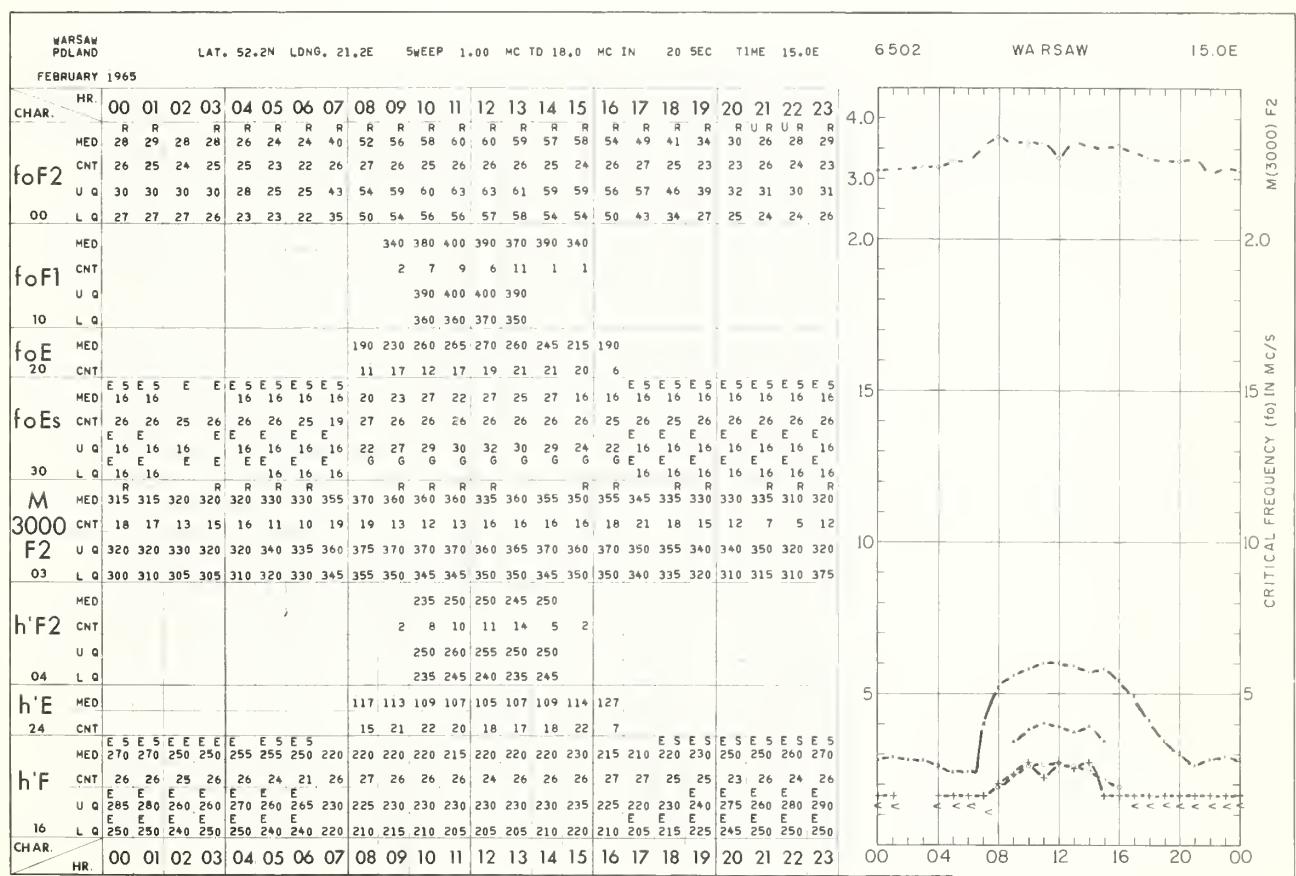
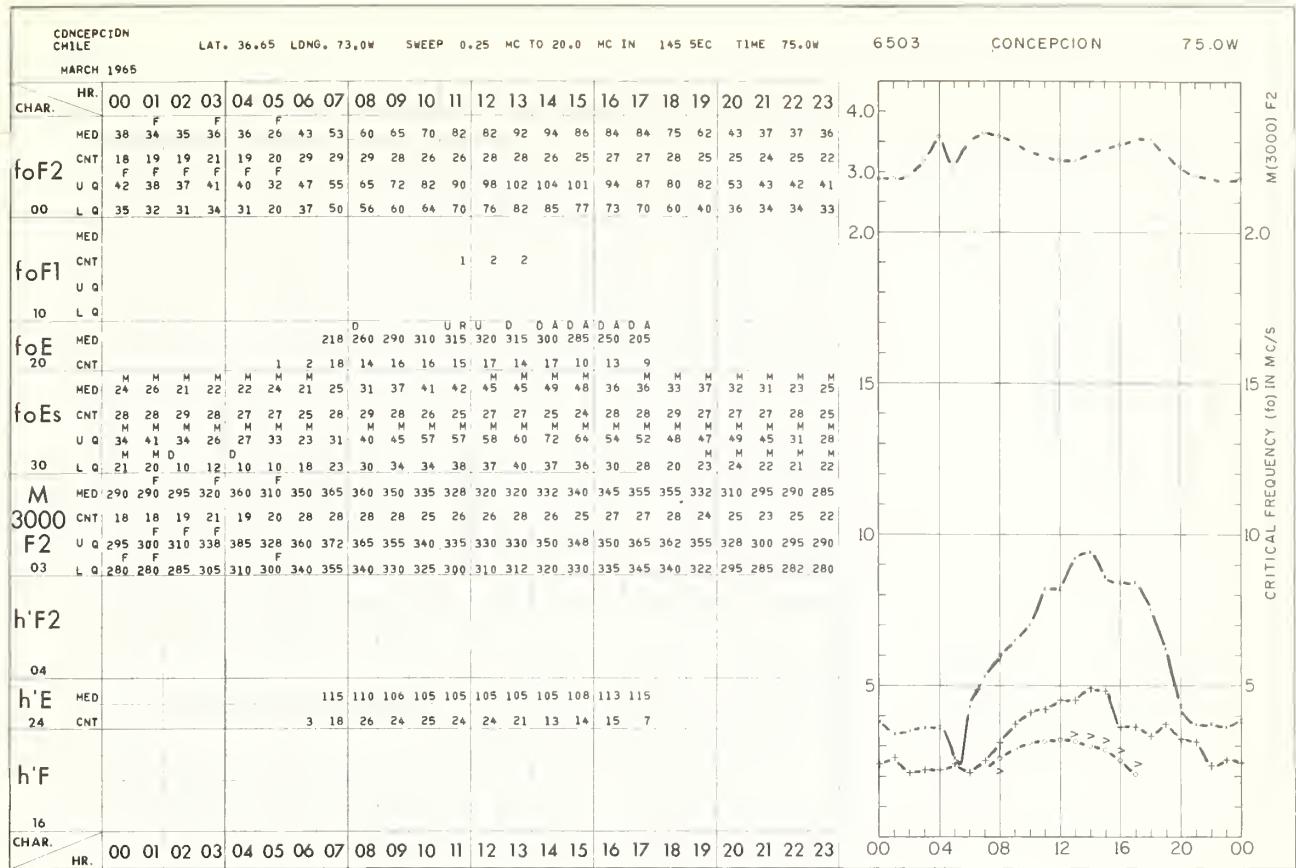
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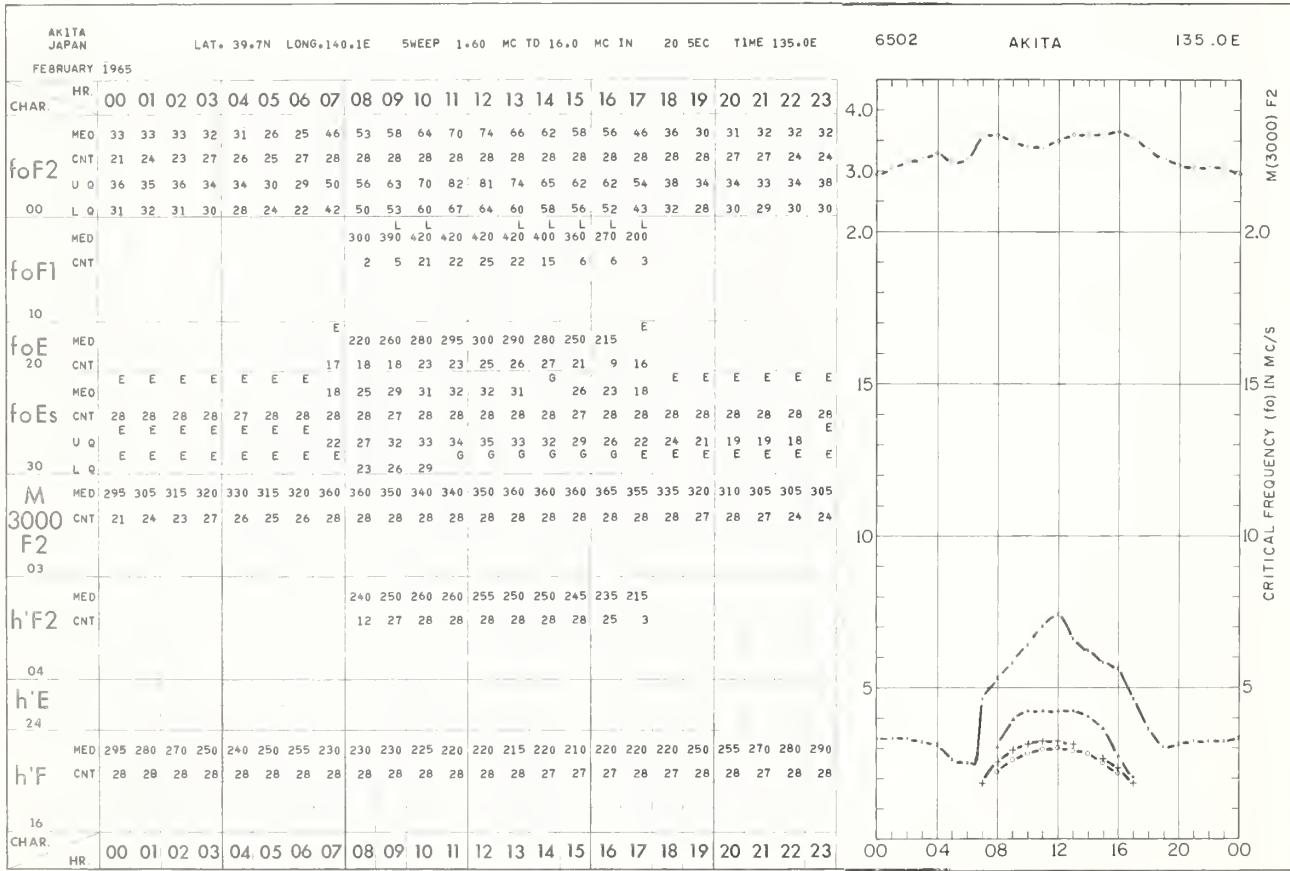
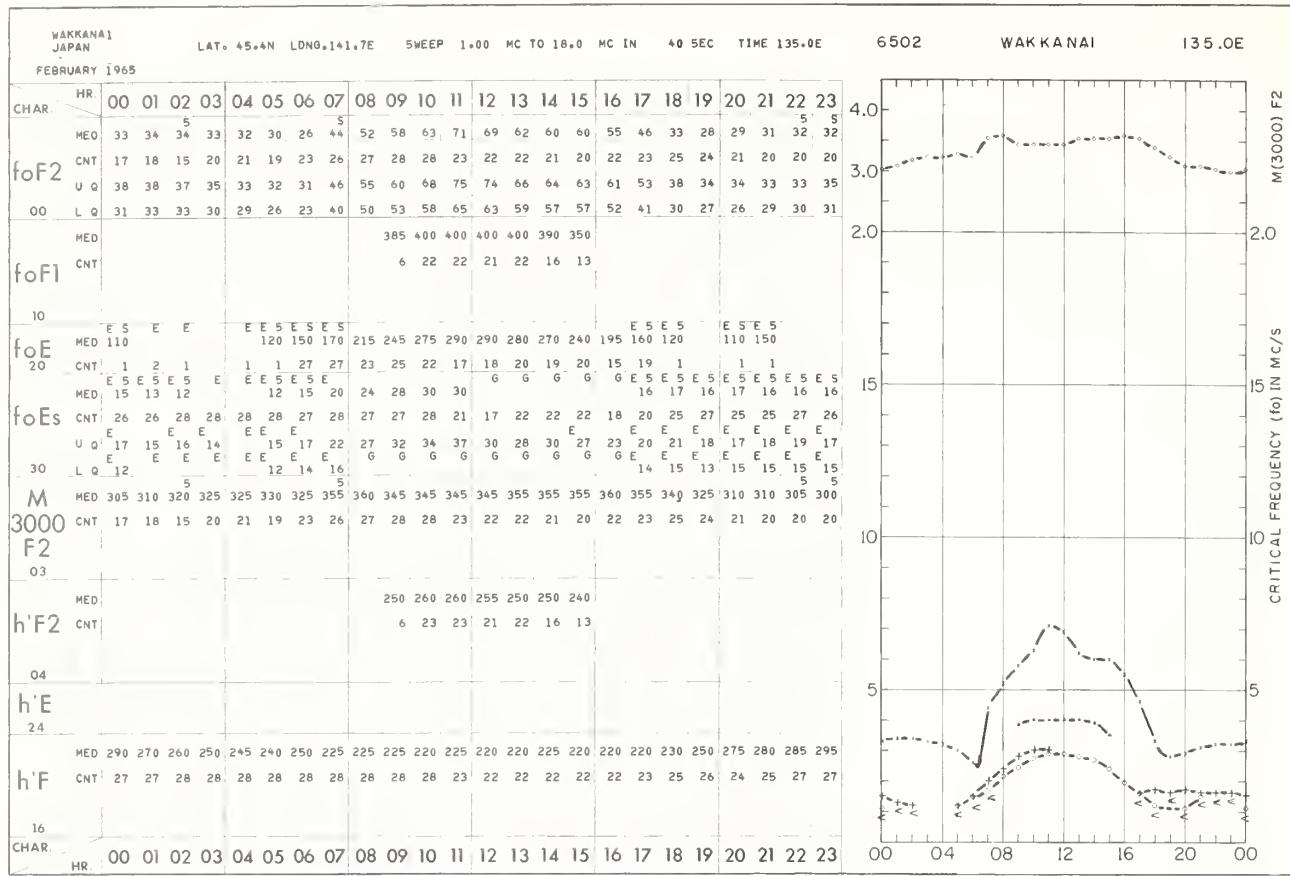
135 QE

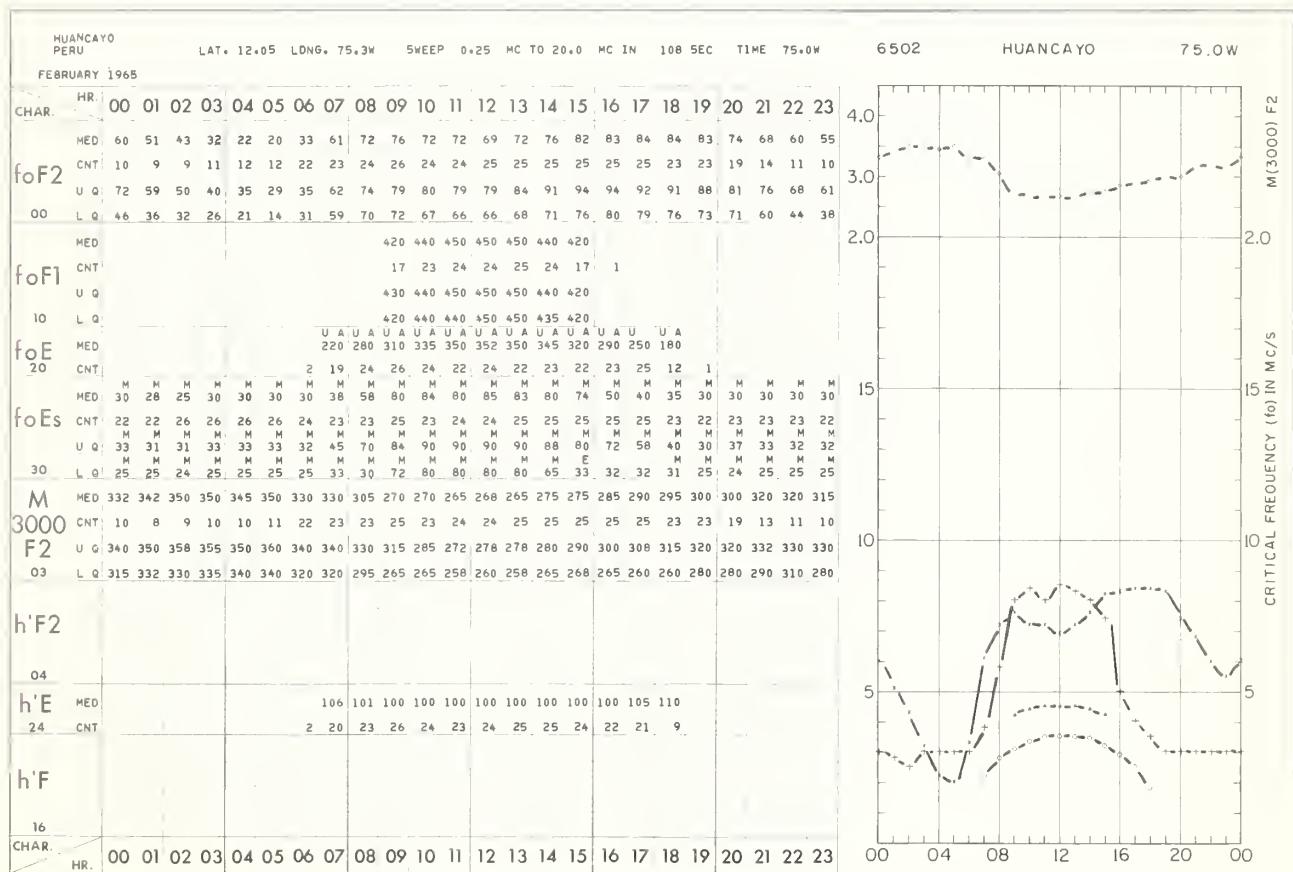
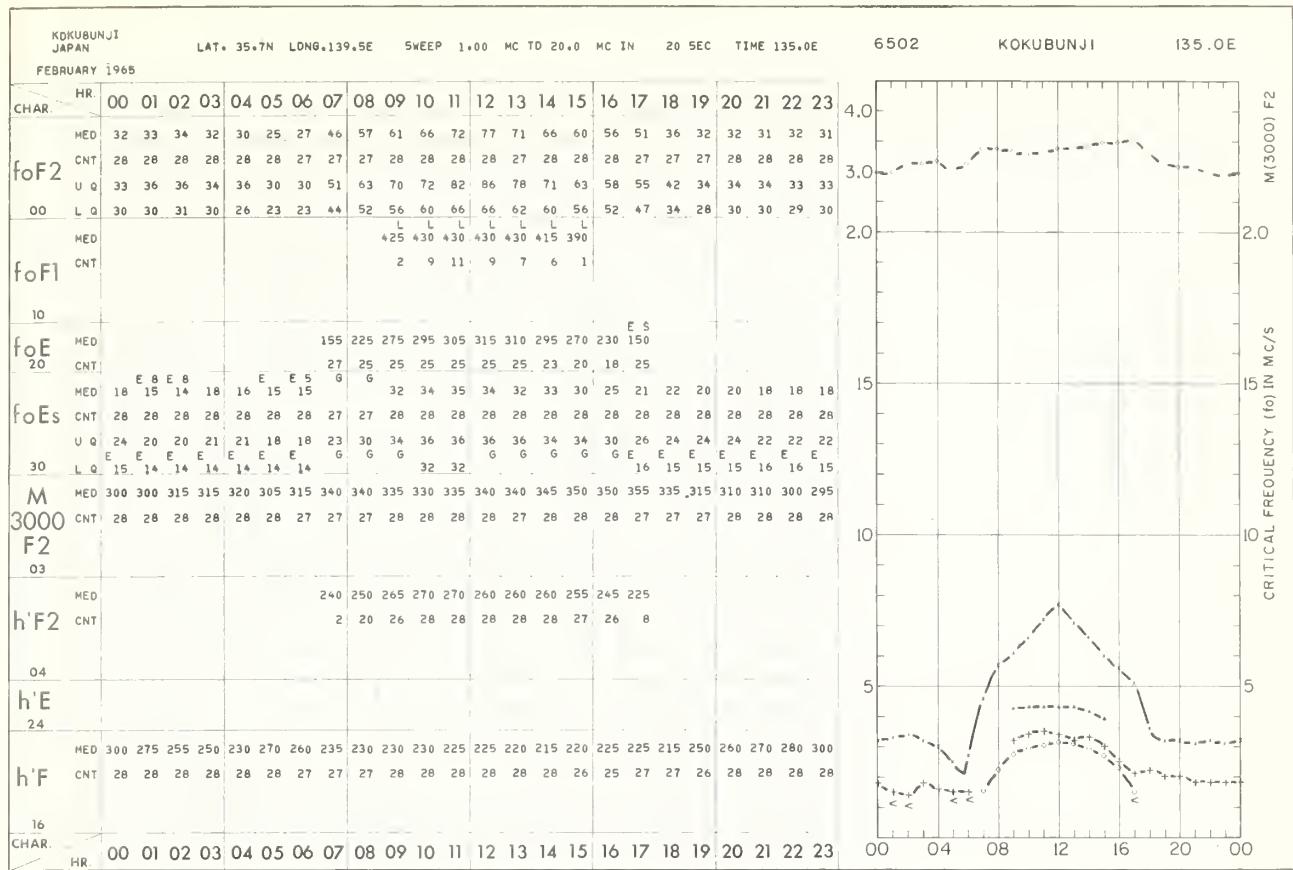












LA PAZ

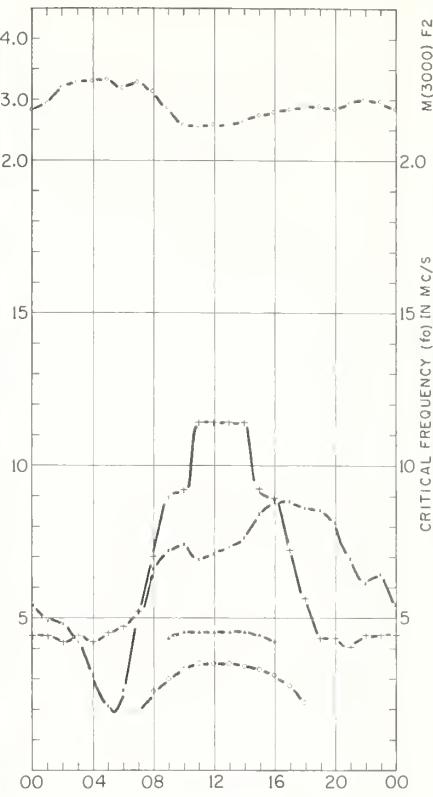
LAT. 16.55 LDNG. 68.1W SWEEP 0.25 MC TD 20.0 MC IN 140 SEC TIME 60.0W

6502

60.0W

FEBRUARY 1965

CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
						U	U																			
foF2	MED	54	49	48	42	31	21	26	52	66	72	74	69	71	73	76	84	88	88	86	85	81	69	61	64	
	CNT	8	6	6	8	8	13	12	25	26	24	24	18	15	22	22	22	24	25	25	25	23	13	8	8	
	U Q	63	62	55	46	44	32	30	53	68	77	80	81	84	80	82	87	96	96	92	91	85	80	68	76	
	00	L D	45	39	33	34	24	17	20	49	61	69	70	61	58	64	70	79	80	82	80	76	70	67	50	52
	MED					430	450	450	450	450	450	450	440													
foF1	CNT									5	17	18	11	21	18	14	11									
	U Q									U L																
	10	L D								415	440	450	450	445	440	430	410									
foE	MED					190	258	300	330	350	350	350	340	330	310	275	220									
20	CNT					1		13	16	11	14	15	10	15	14	12	11	15	18							
	MED	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
foEs	CNT	24	24	26	25	26	24	25	24	26	24	24	18	15	22	23	23	24	25	25	25	19	20	18	18	
	U D	M	M	H	M	M	H	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
	30	L D	34	36	30	35	31	37	36	42	44	57	74	90	90	90	90	84	76	48	47	37	31	31	36	37
M	MED	285	295	322	330	332	335	333	320	330	315	288	260	258	260	255	265	270	285	280	290	290	285	295	302	298
3000	CNT	8	6	6	7	8	9	9	24	26	24	23	18	14	22	22	22	24	25	25	25	22	11	8	8	
F2	U Q	298	305	330	360	350	342	342	345	335	320	295	265	265	270	270	280	295	300	300	308	290	310	312	302	
	O3	L Q	278	280	290	310	318	328	305	320	300	270	245	240	250	250	250	270	258	268	265	268	265	280	292	278
	MED												312	345	368	375	385	365	335							
h'F2	CNT									4	16	19	18	14	22	21	21		16	6						
	U D									328	370	390	435	415	385	355		330	320							
	04	L D								290	330	360	360	355	350	328		310	275							
h'E	MED								121	108	104	103	101	101	101	101	101	101	107	111						
	CNT		1	1					11	22	20	19	17	15	21	20	21		20	17	16	1				
	U F	292	278	248	225	235	240	250	235	212	200	195	190	190	190	190	190	190	185	185	205	255	275	275	285	290
h'F	CNT	20	20	20	21	22	19	12	25	22	19	17	15	12	19	17	14	17	17	21	25	23	20	17	15	
	E F	E	F	E	F	U	F	E	E	5																
	U Q	320	300	278	250	245	250	270	240	220	210	202	195	195	195	190	190	190	190	195	230	260	290	300	310	300
	16	L D	280	258	220	212	215	235	242	230	210	180	185	190	185	185	185	185	180	172	182	250	260	255	252	260
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

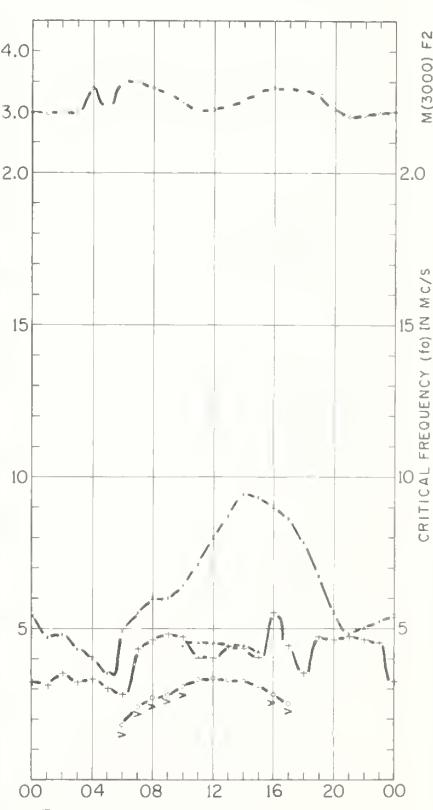


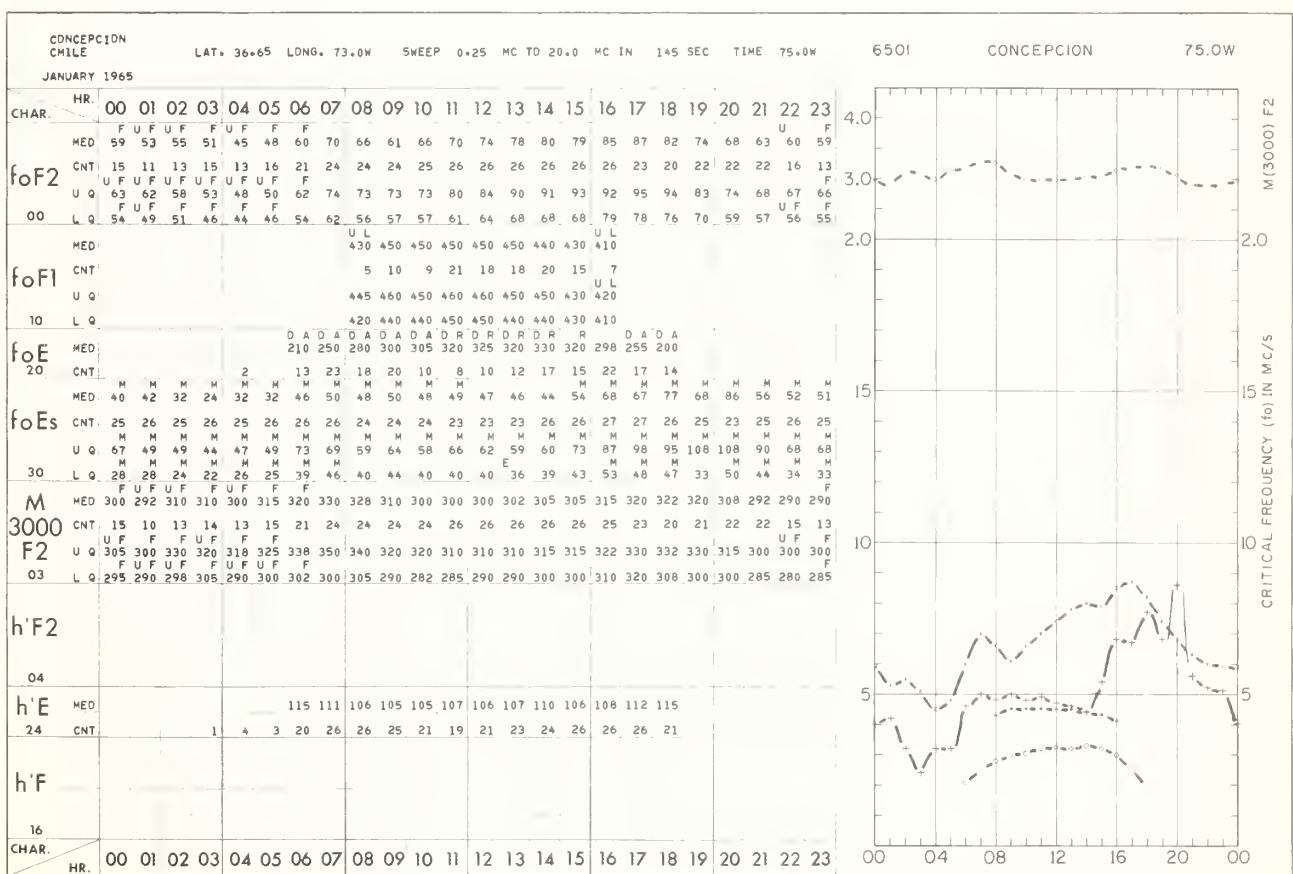
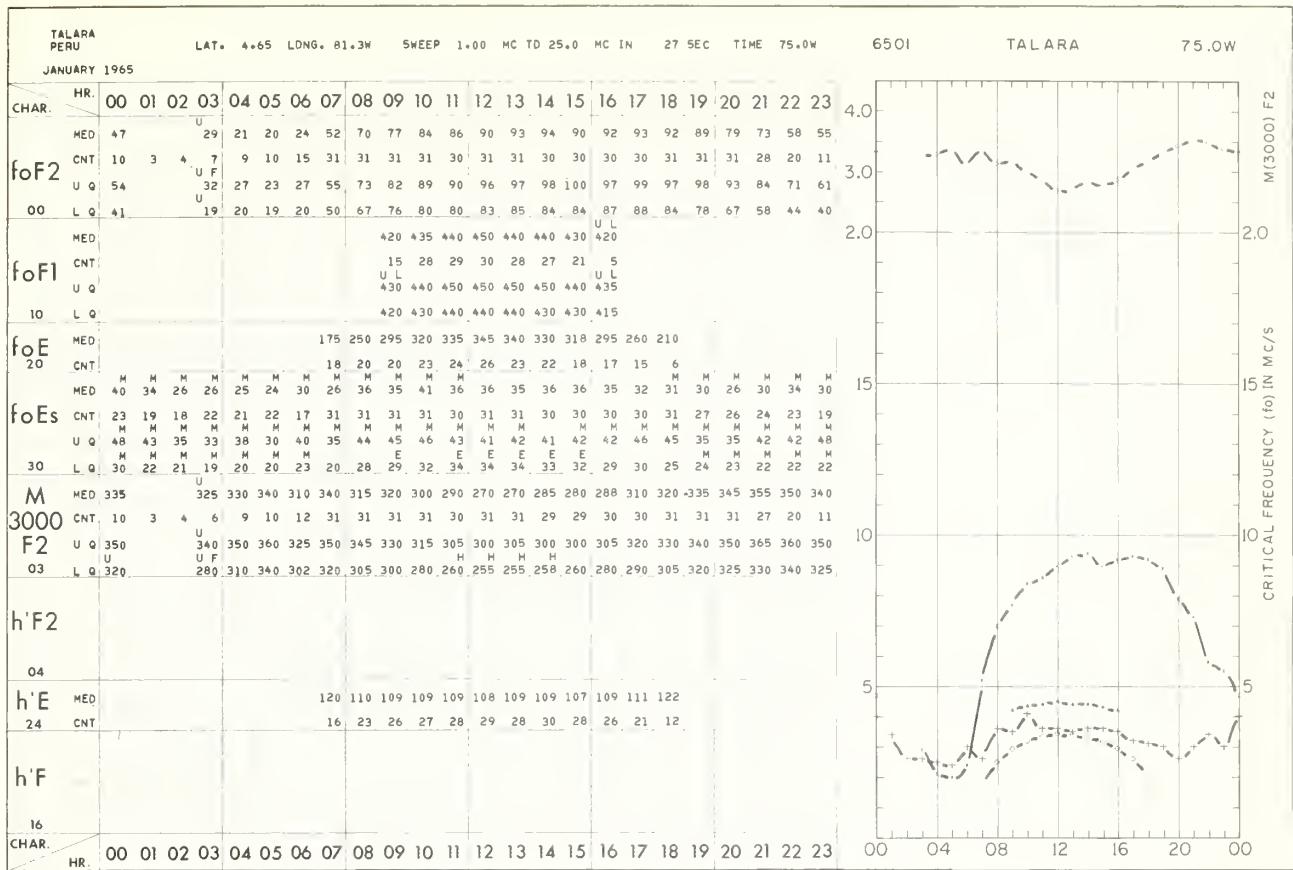
CONCEPCION

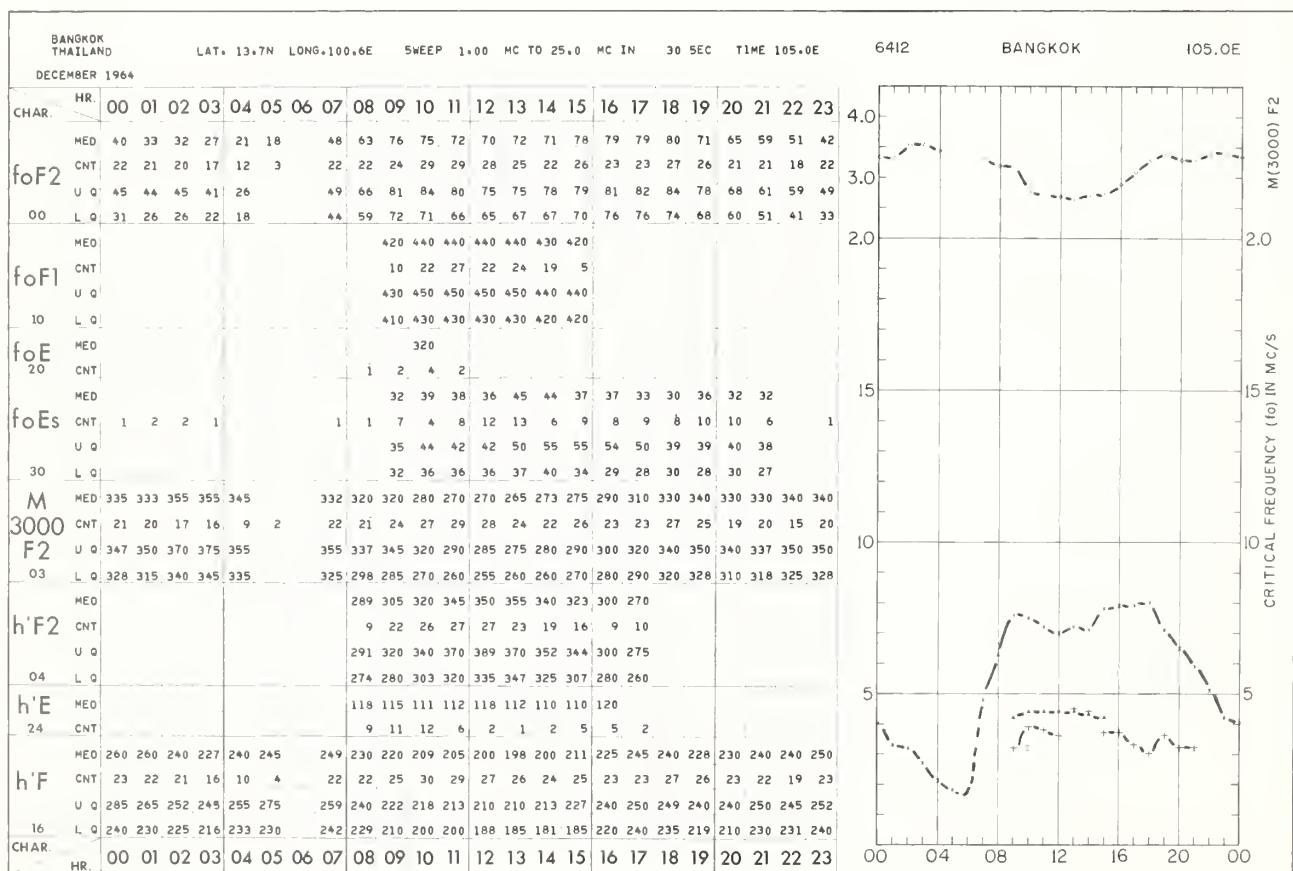
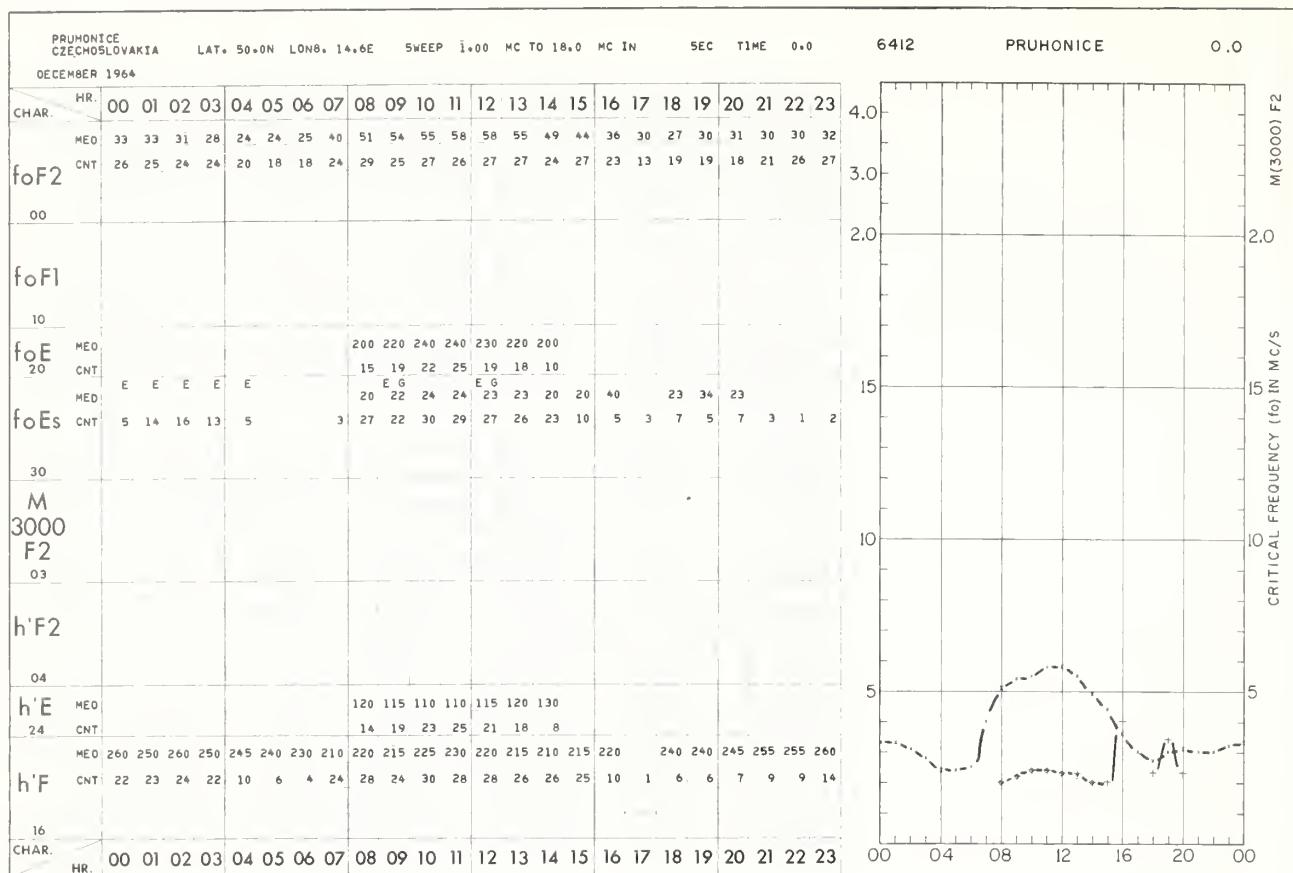
€ 503

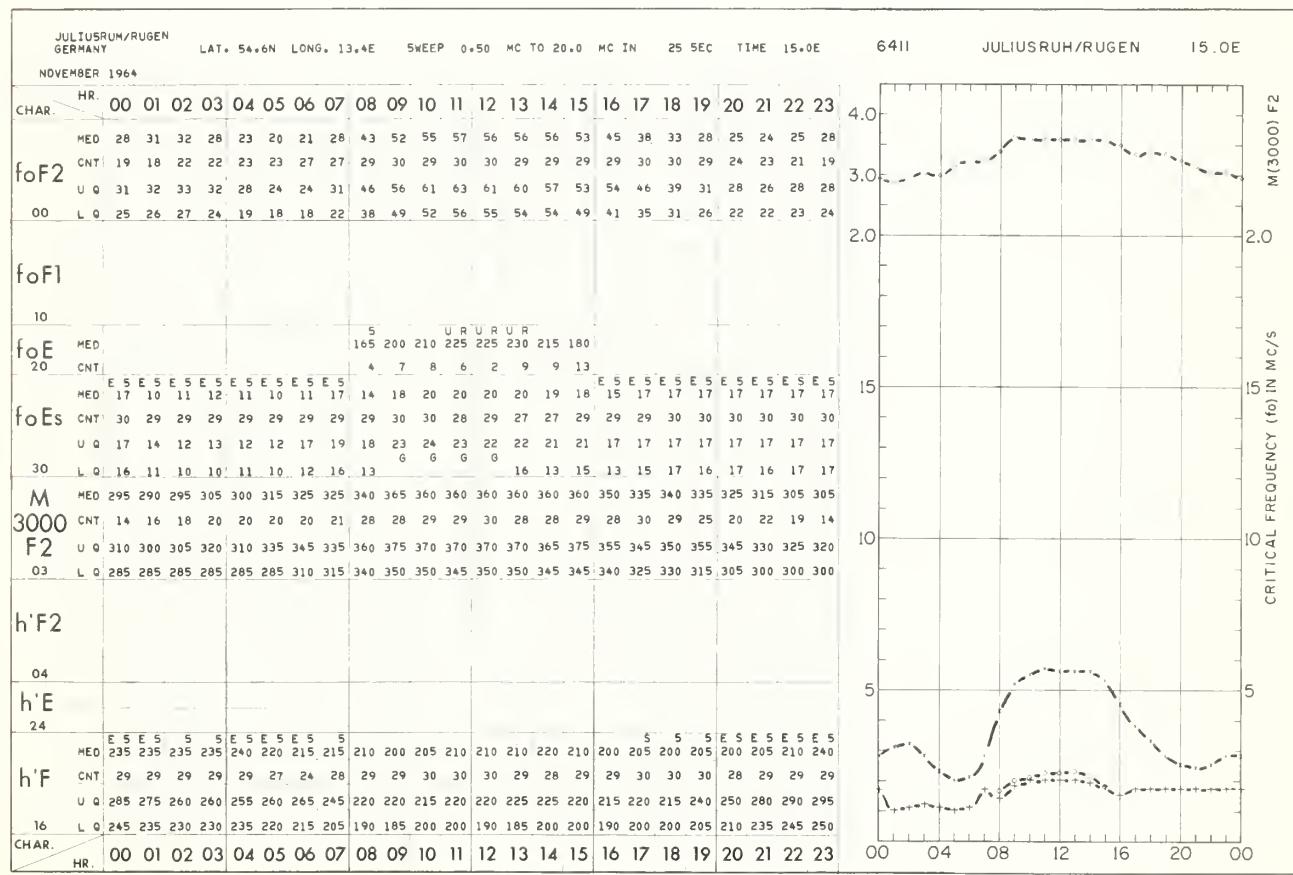
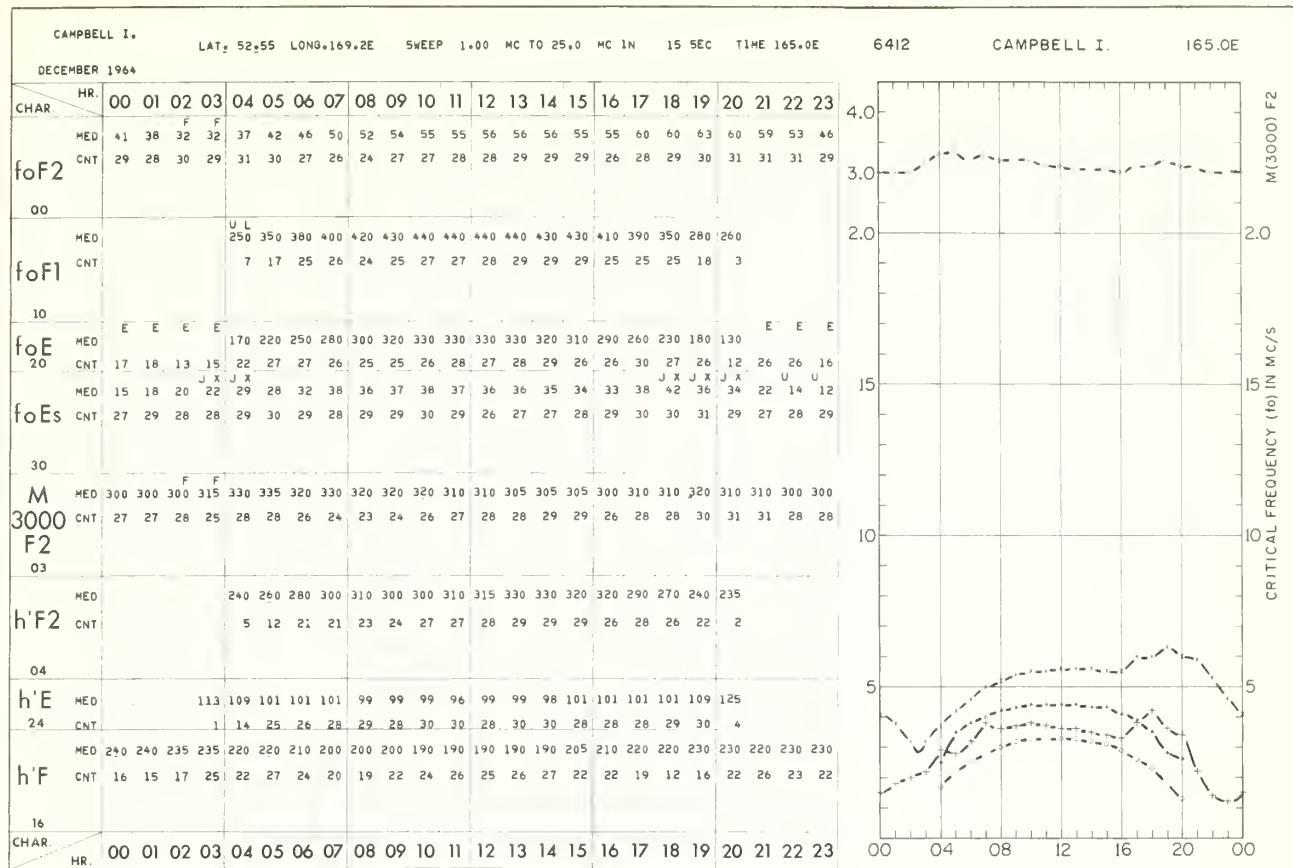
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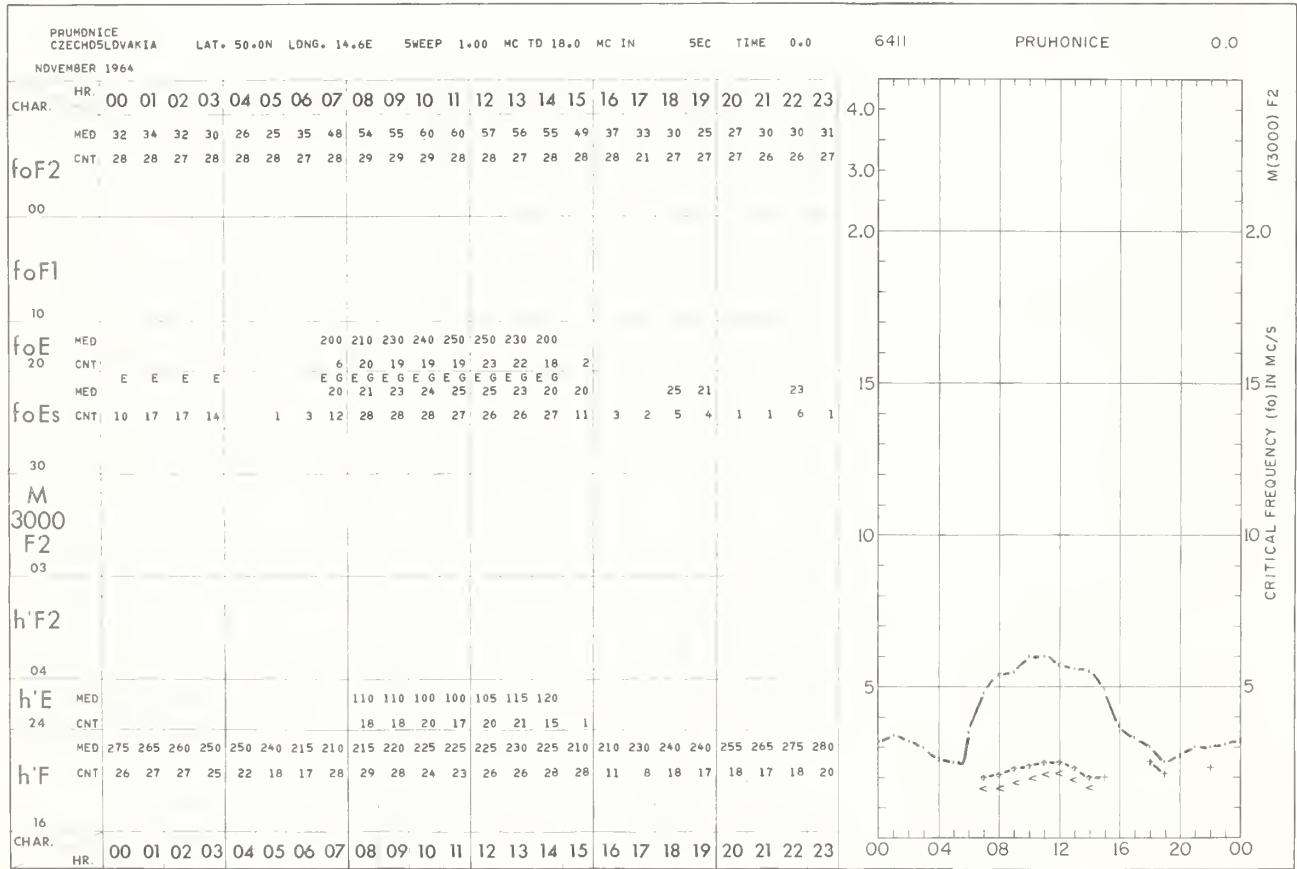
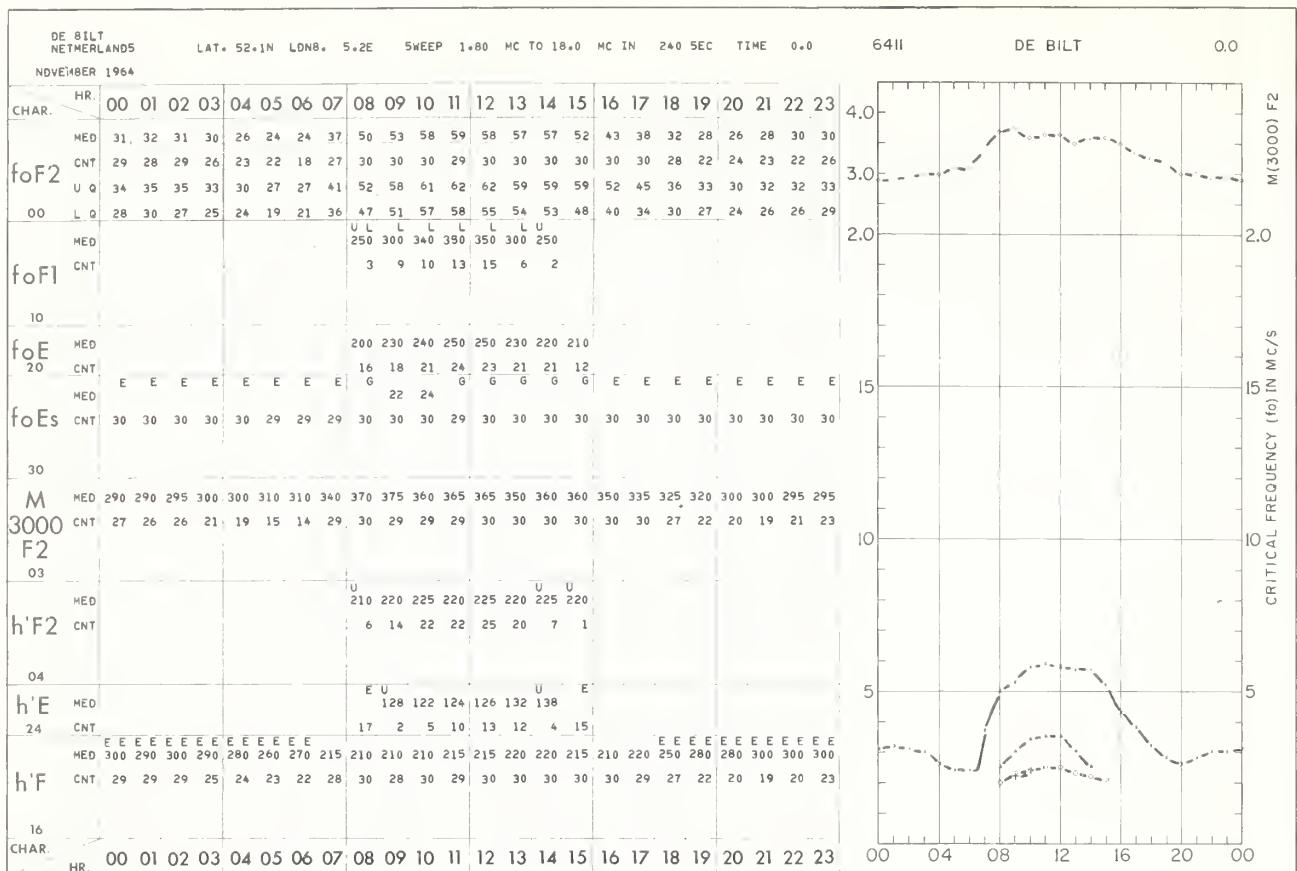
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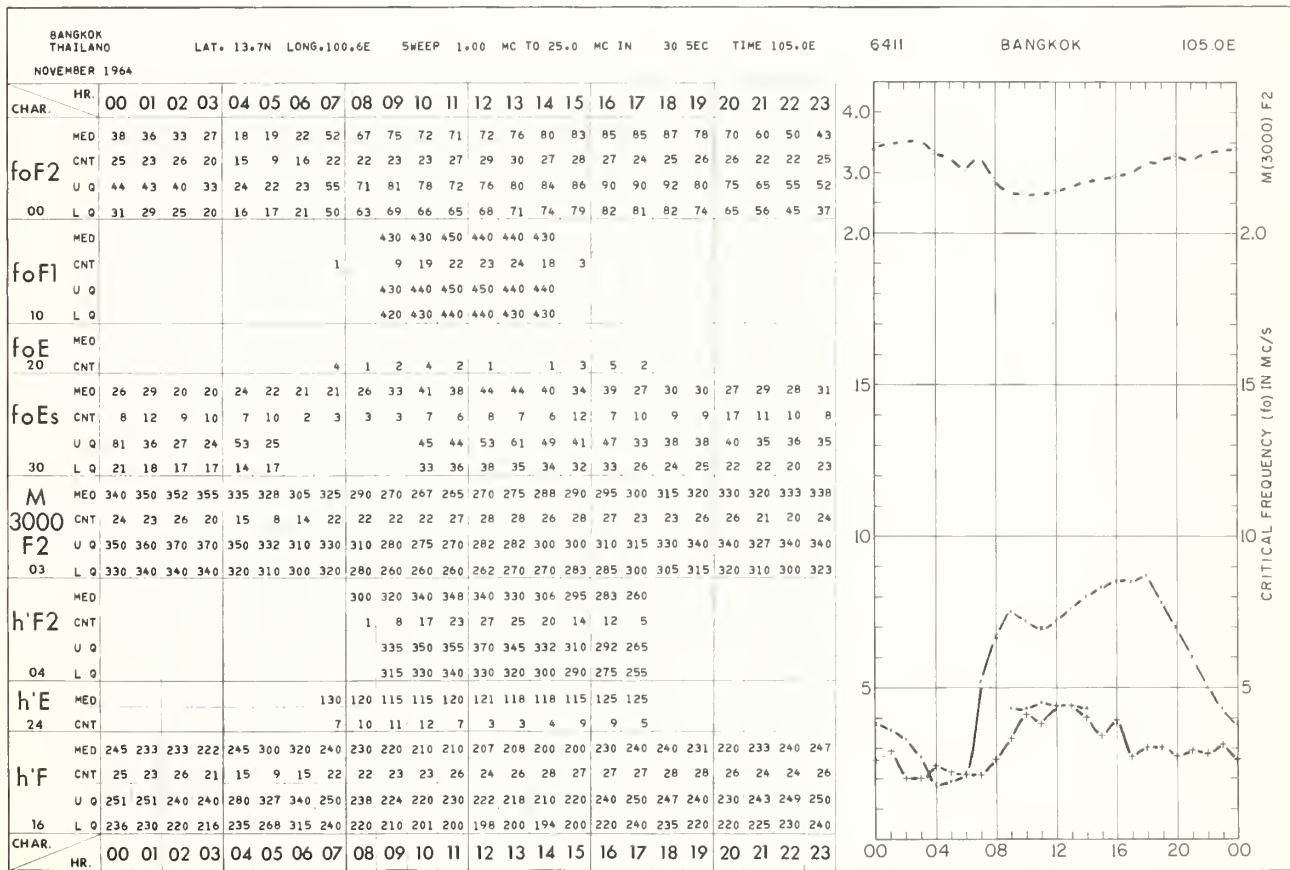
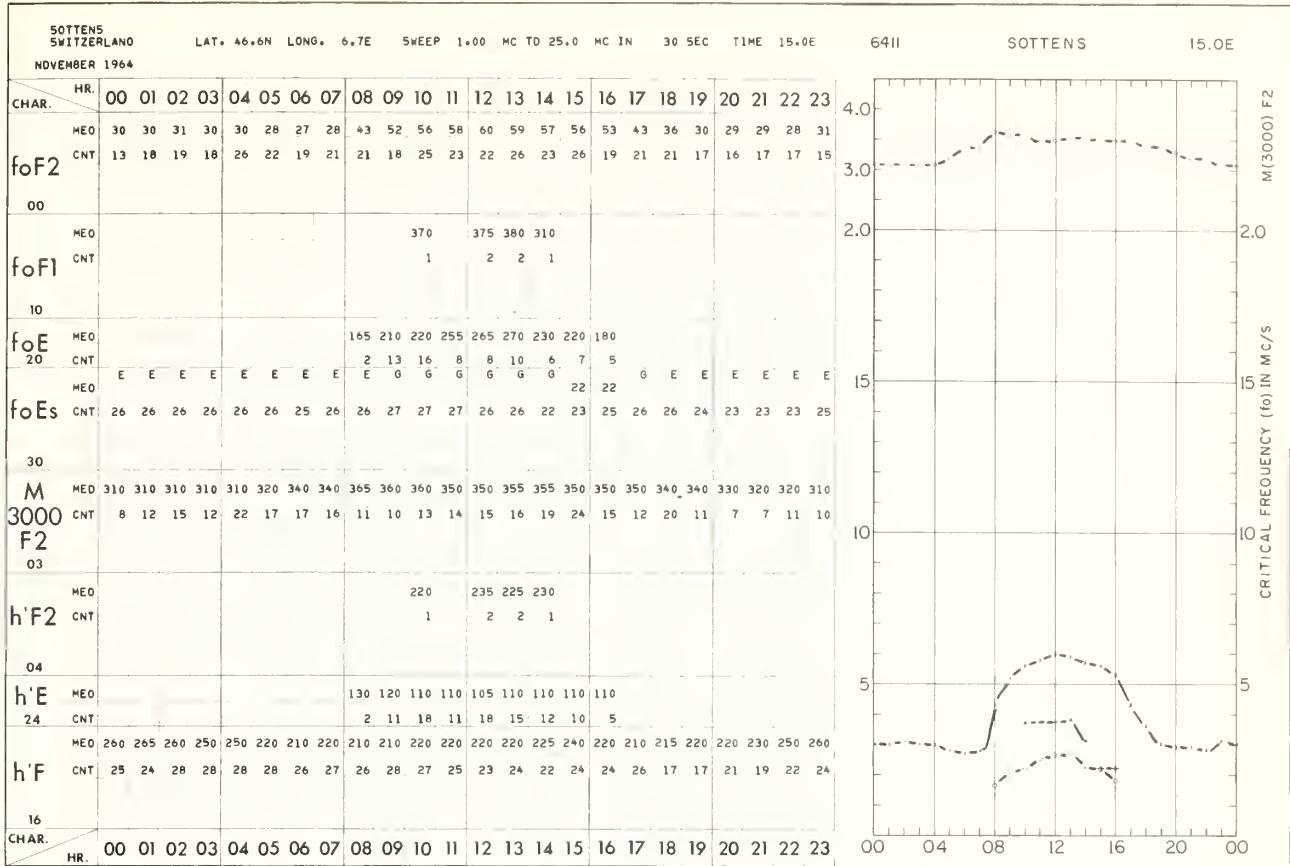


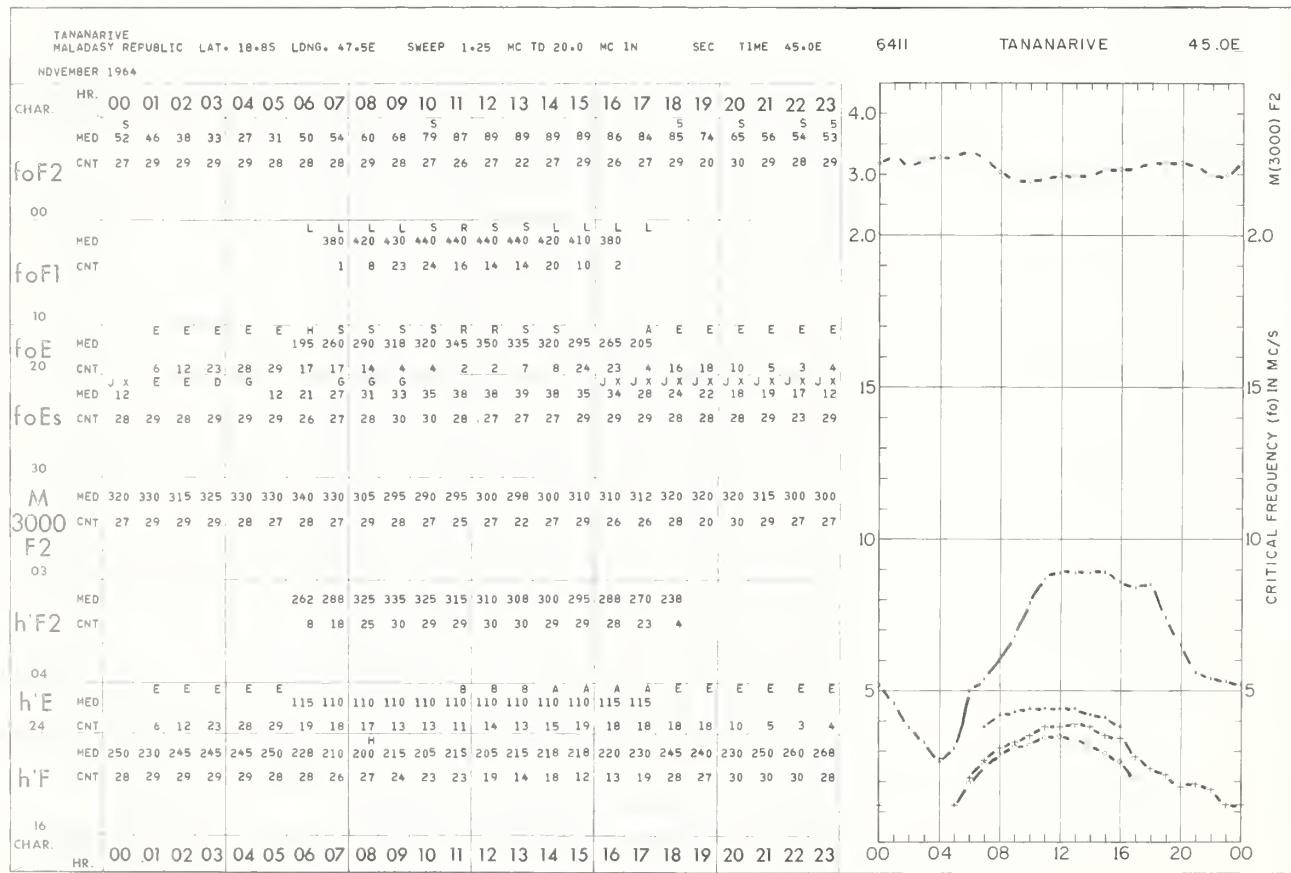
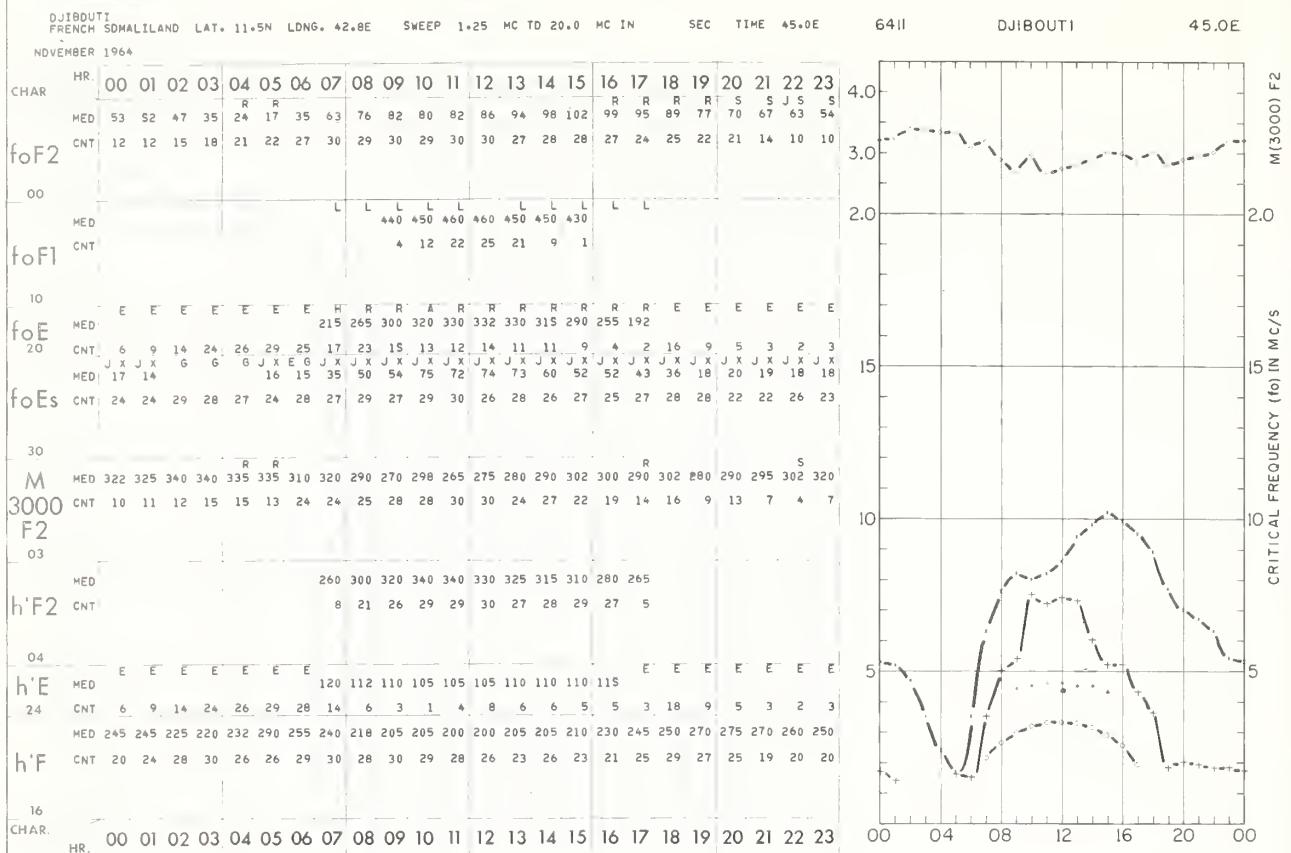


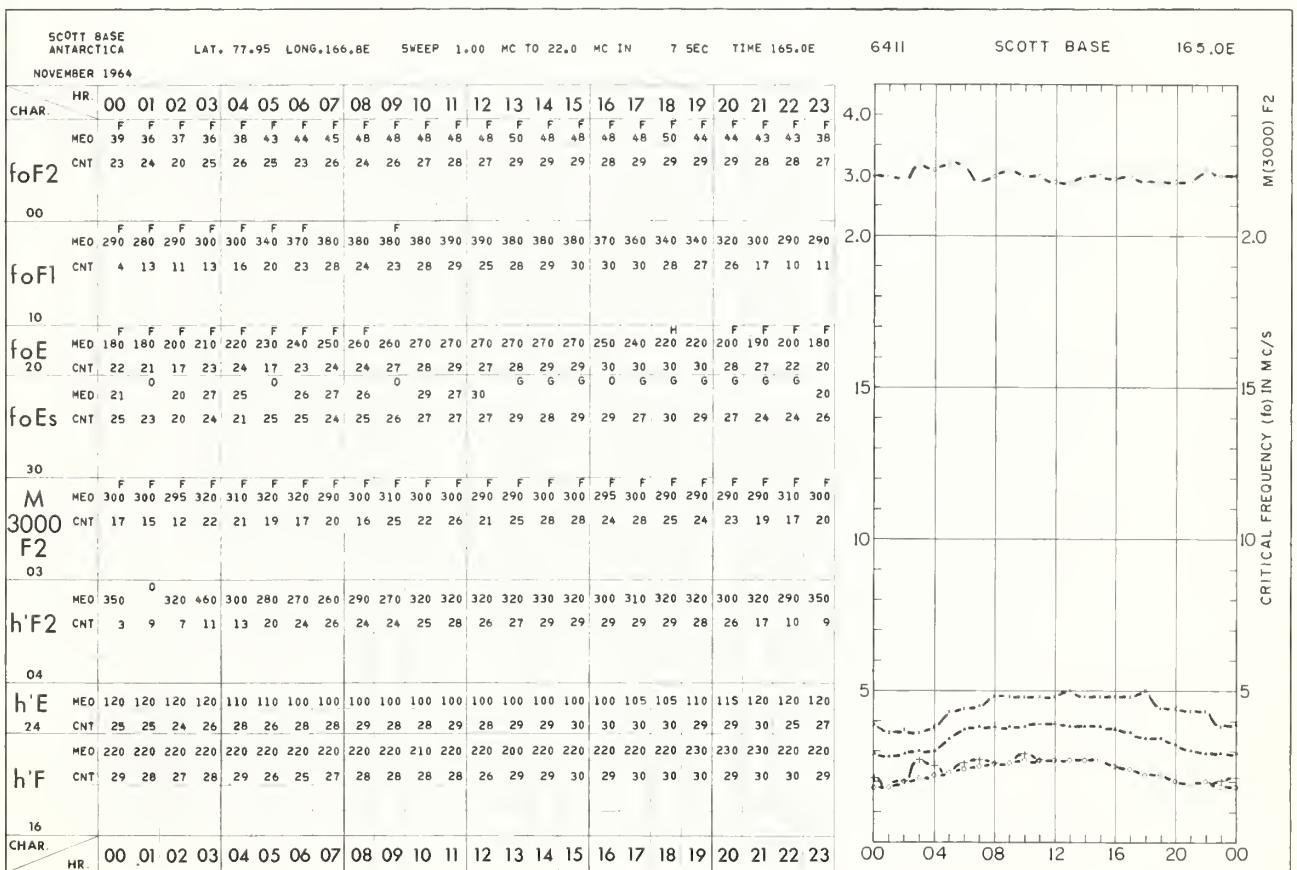
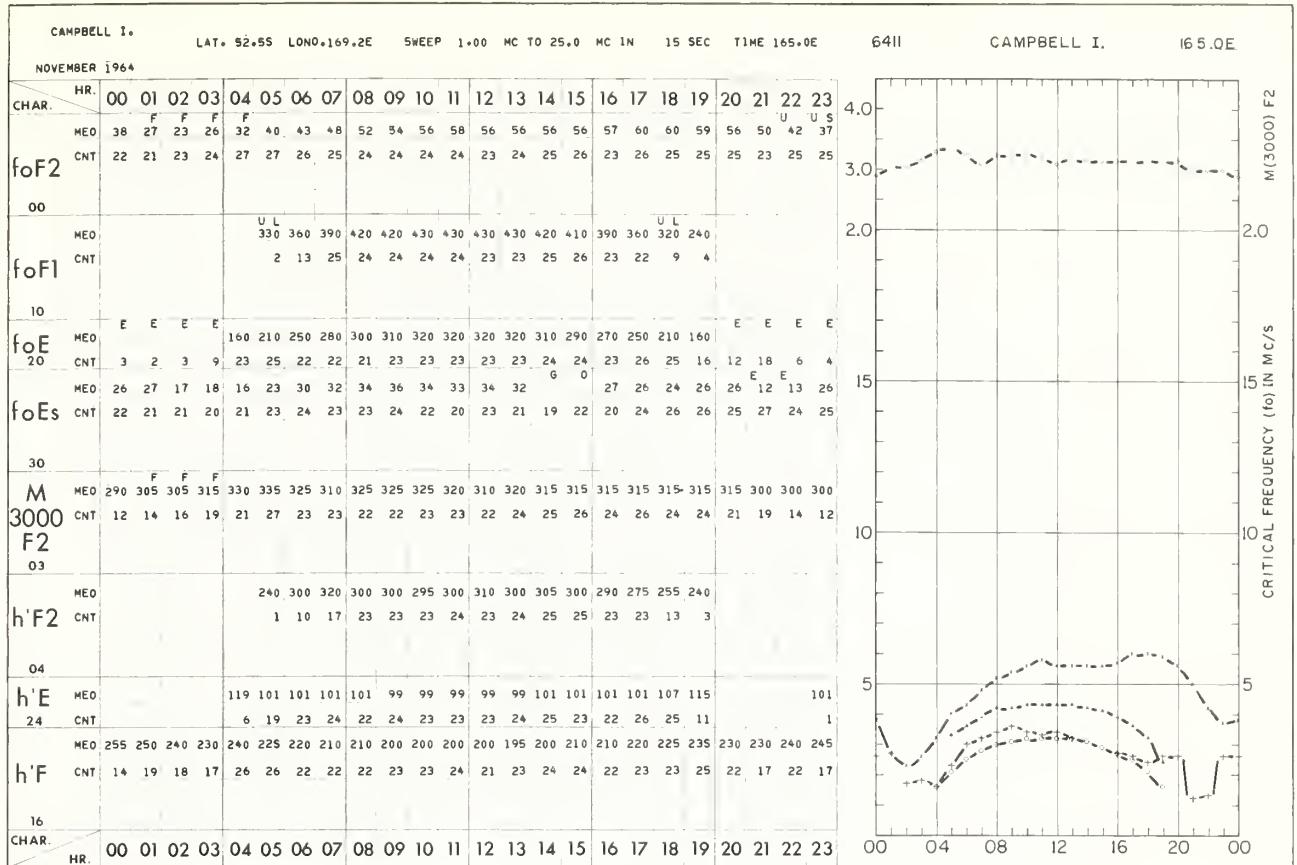


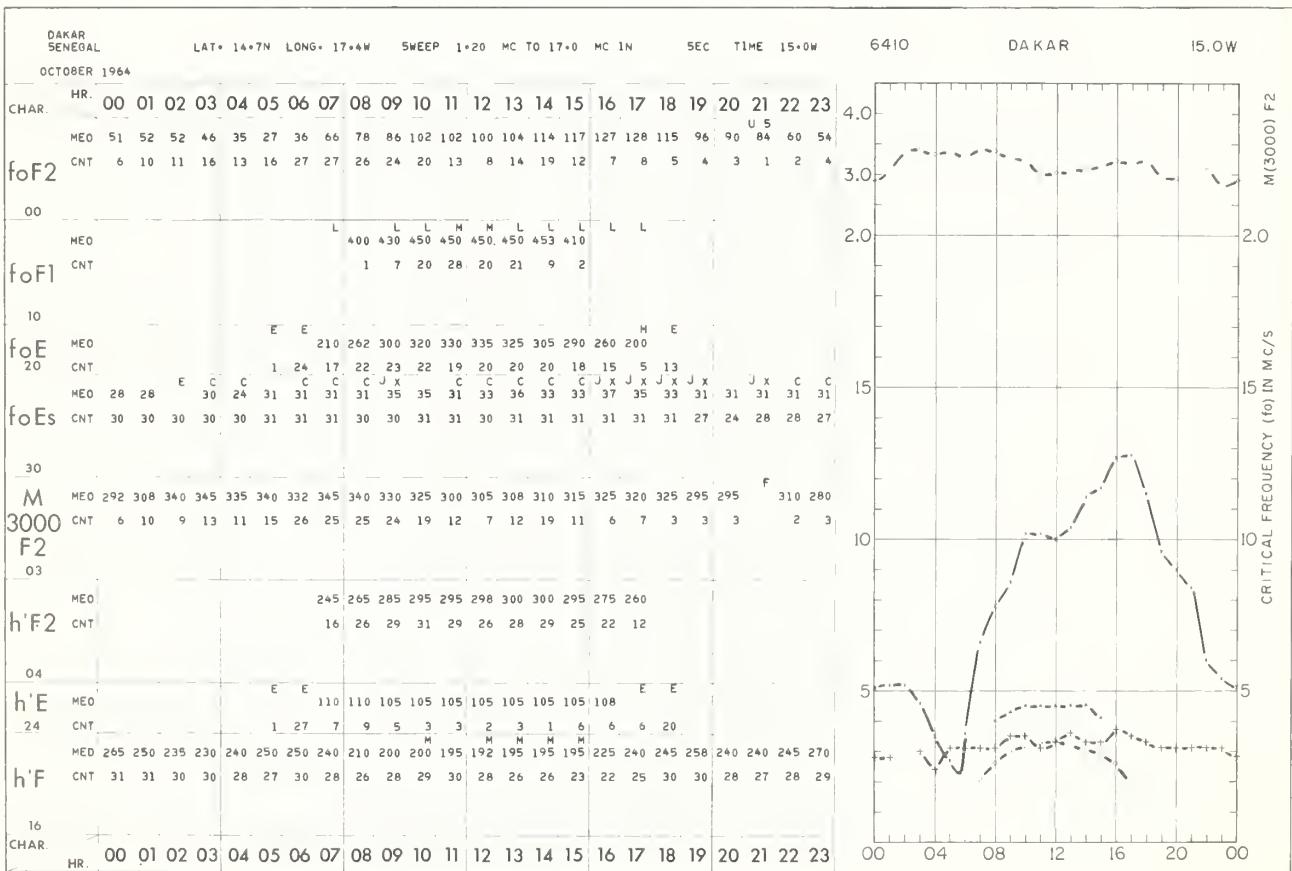
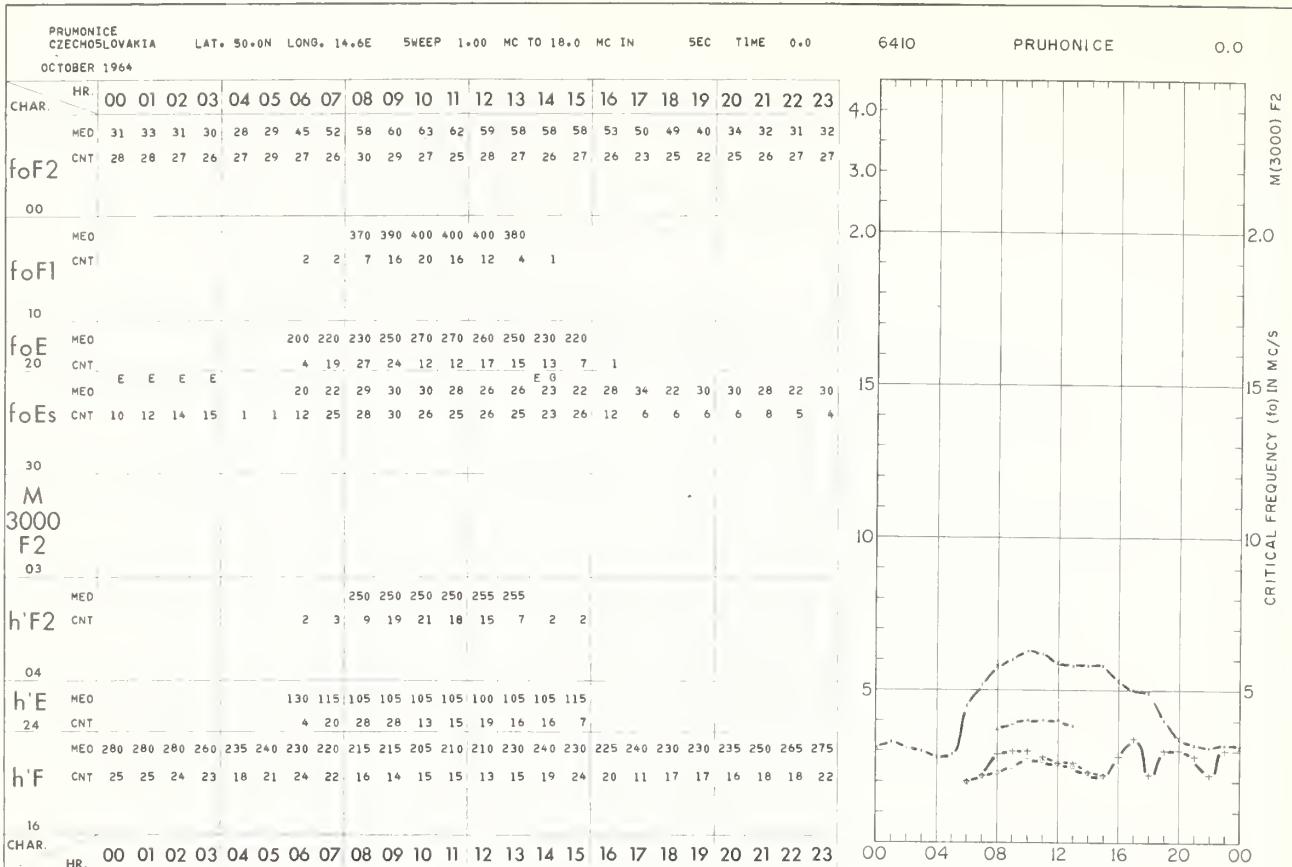








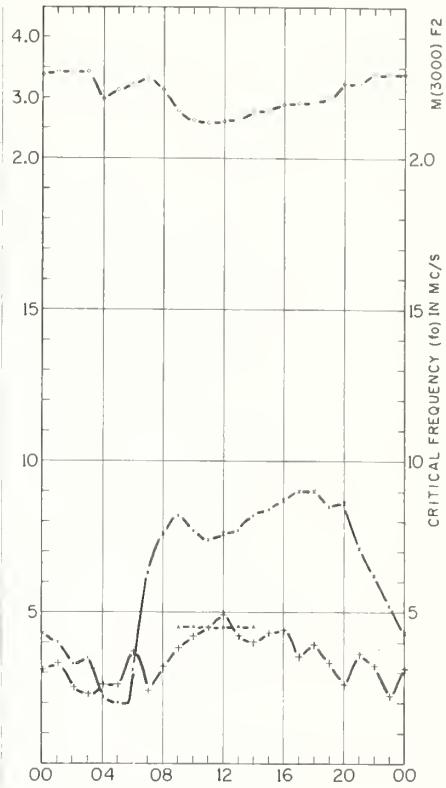




BANGKOK
THAILAND
OCTOBER 1964

LAT. 13°N LONG. 100.6E SWEEP 1.00 MC TO 25.0 MC IN 30 SEC TIME 105.0E 6410 BANGKOK 105.0E

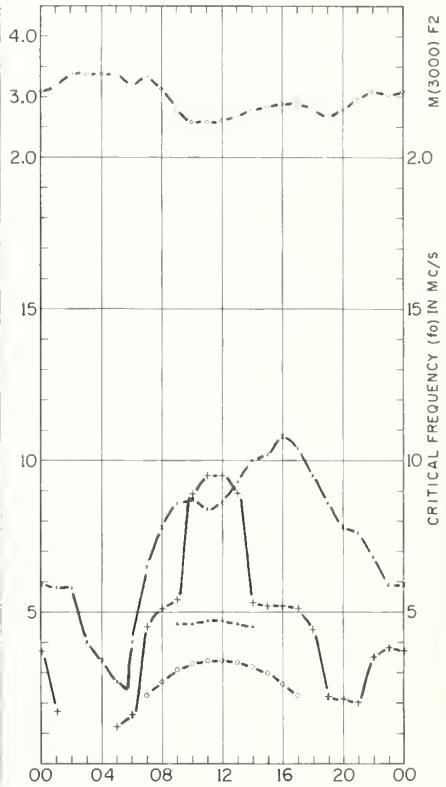
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
	MEO	43	40	33	35	22	20	31	63	76	82	77	74	76	77	82	84	87	90	90	85	86	71	62	52		
foF2	CNT	9	11	8	10	7	5	9	12	12	15	13	14	17	16	16	15	10	11	7	5	7	10	12	12		
	U Q	64	51	45	28	40	28	35	67	82	68	83	78	80	79	88	90	90	91	93	88	87	84	71	54		
	00	L Q	34	26	25	23	18	18	28	60	72	79	72	72	71	73	79	80	85	88	90	79	79	68	57	47	
	MEO									450	450	450	450	450	450	450	450	450	450	450	450	450	450	450	450		
foF1	CNT									4	9	11	13	9	8												
	U Q									460	460	460	480	450	450												
	10	L Q								440	450	450	450	440	440	440											
foE	MEO																1	1	2								
	20	CNT																									
	MEO	31	33	25	23	26	26	37	24	32	38	42	45	49	42	40	43	44	35	39	33	33	26	36	32	22	
foEs	CNT	5	6	4	5	8	4	2	6	6	6	8	5	6	5	6	9	5	6	3	3	2	9	6	6		
	U Q	36	35	25	27	32	29		33	33	48	48	50	57	47	45	56	66	37	47		39	38	36			
	30	L Q	23	30	23	18	18	21	21	27	36	39	40	46	39	37	35	33	28	29		23	30	21			
M	MED	340	345	345	345	300	315	325	335	315	280	265	260	263	265	278	280	290	293	295	300	325	325	340	340		
3000	CNT	9	11	8	10	7	5	9	10	12	15	11	11	16	16	16	15	10	10	6	5	7	9	12	12		
F2	U Q	342	360	360	350	360	345	335	345	325	310	275	270	267	275	285	295	300	310	320	325	330	330	352	348		
	03	L Q	325	330	340	330	315	295	318	330	305	260	255	255	258	258	270	265	285	290	290	295	310	315	325	328	
h'F2	MED								260	290	307	340	350	350	332	328	300	285									
	CNT								5	8	8	9	9	17	14	14	11	8	2								
	U Q								265	300	330	345	365	370	340	335	310	300									
	04	L Q							260	283	300	333	295	332	330	310	291	278									
h'E	MEO									2		1		1		1											
	24	CNT																									
	MED																										
h'F	CNT									4	10	15	20	19	6												
	13	16	15	13	7	5	11	12	14	15	14	13	14	13	15	14	14	16	14	10	9	11	12	13			
	U Q	265	255	240	258	280	289	270	242	235	240	248	220	230	219	240	230	240	242	257	260	240	240	250	270		
	16	L Q	226	225	210	223	240	233	265	232	220	220	210	213	210	210	200	200	228	240	250	230	220	220	220	229	
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		

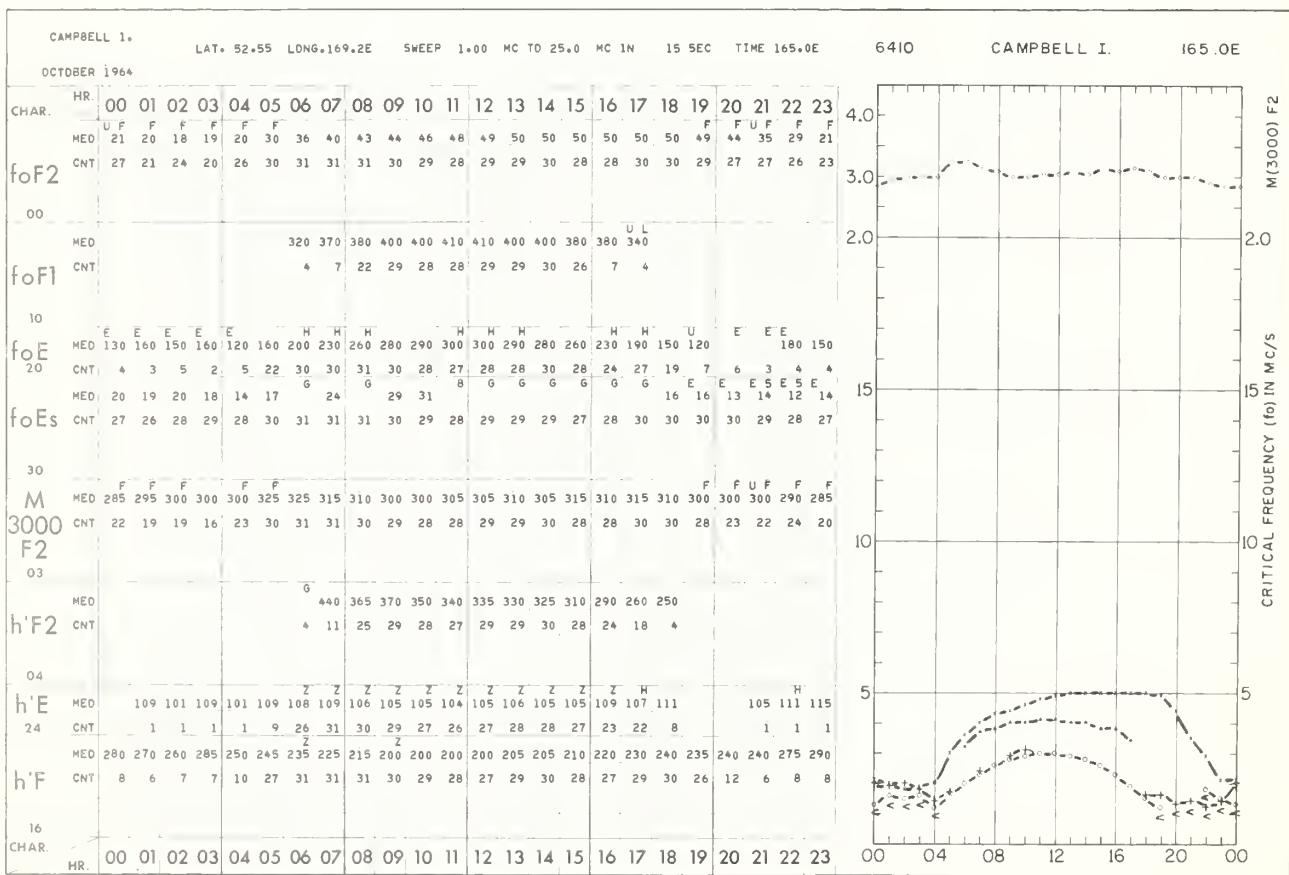
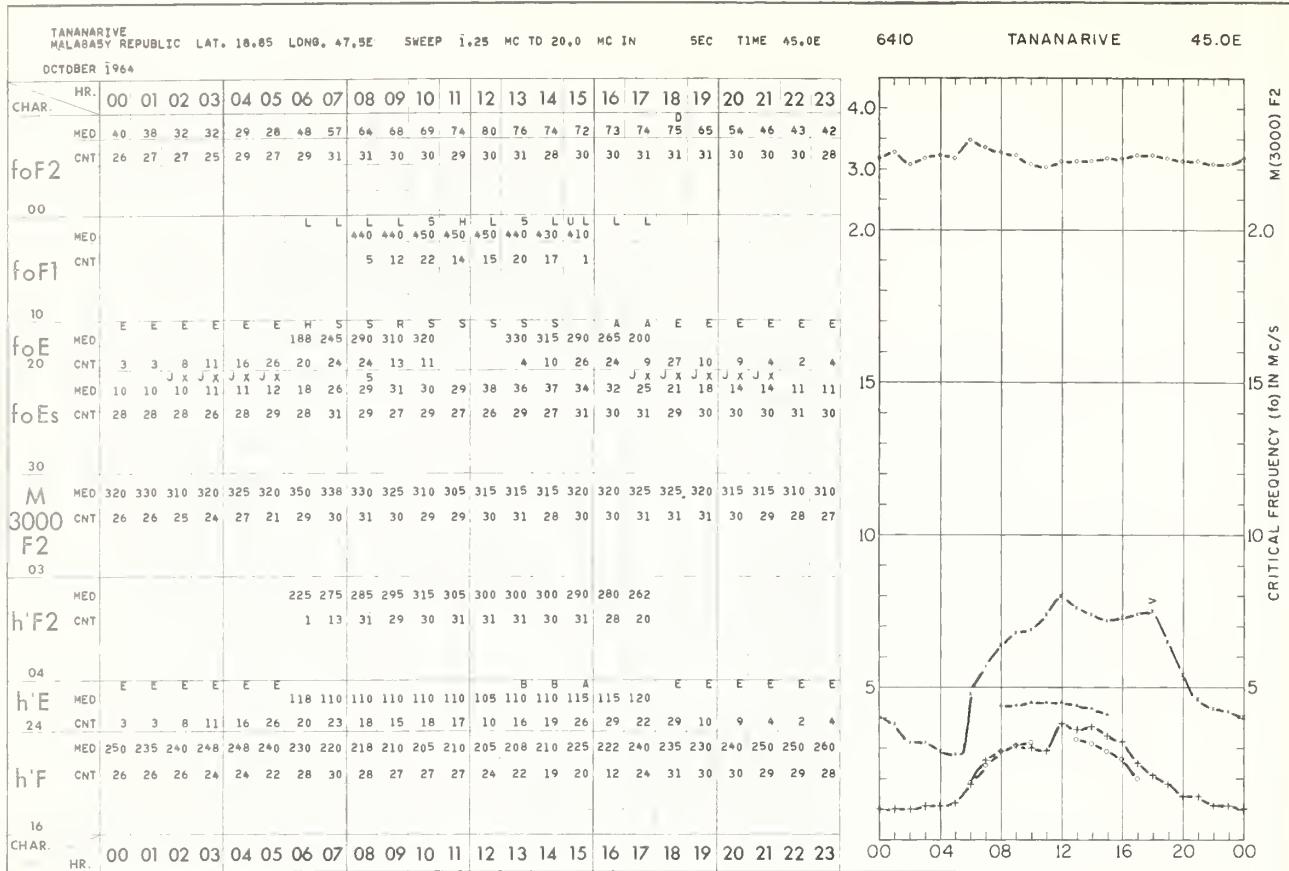


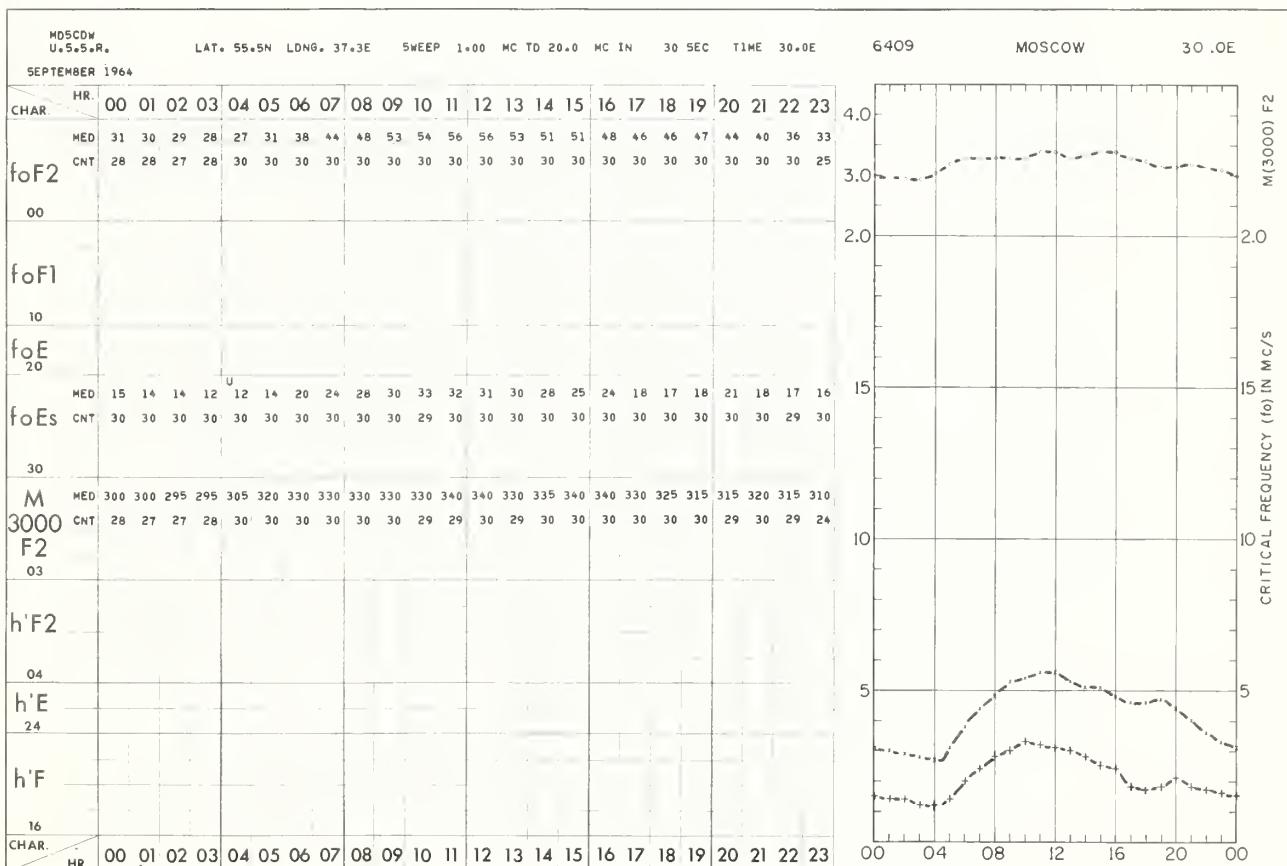
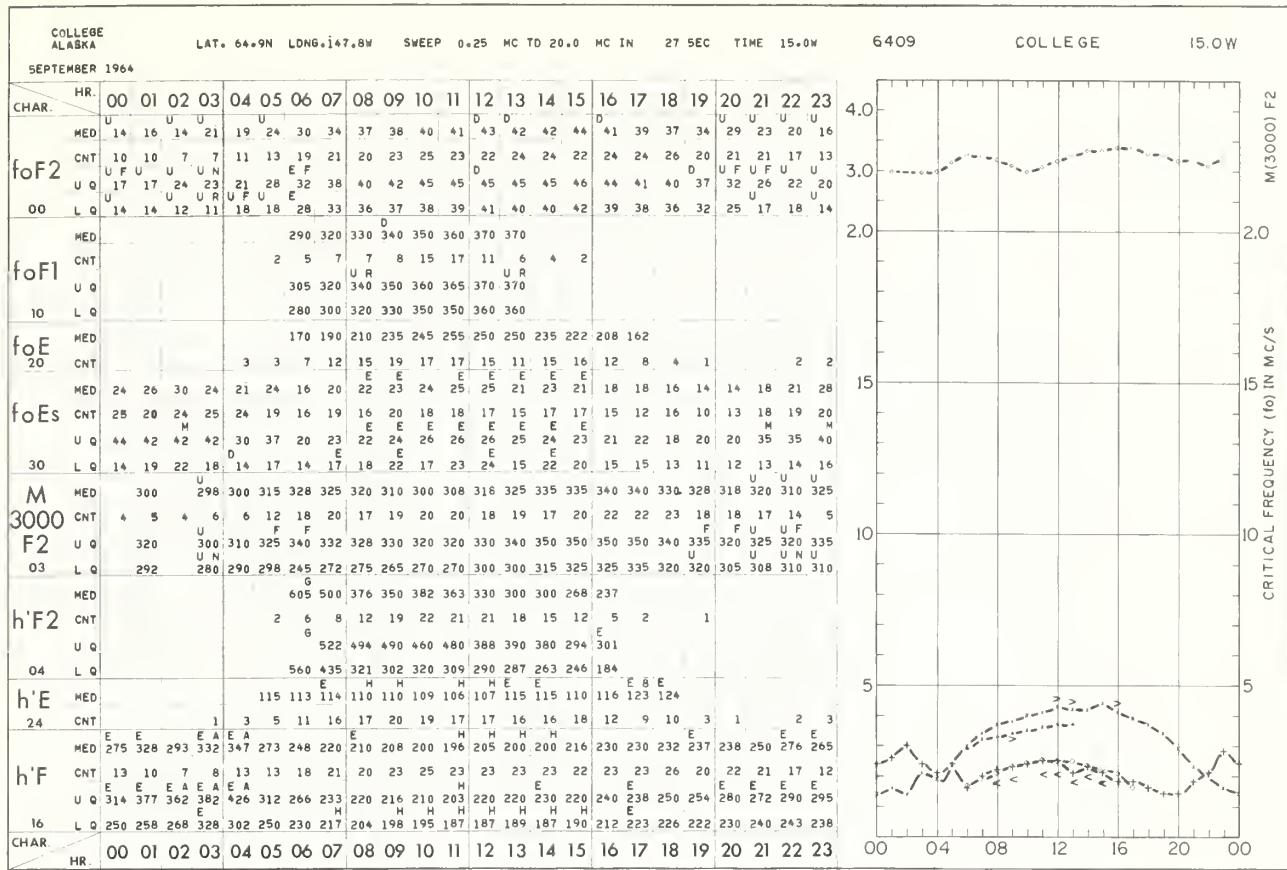
DJIBOUTI
FRENCH SOMALILAND LAT. 11°5N LONG. 42°E SWEEP 1.25 MC TO 20.0 MC IN 30 SEC TIME 45.0E 6410 DJIBOUTI 45.0E

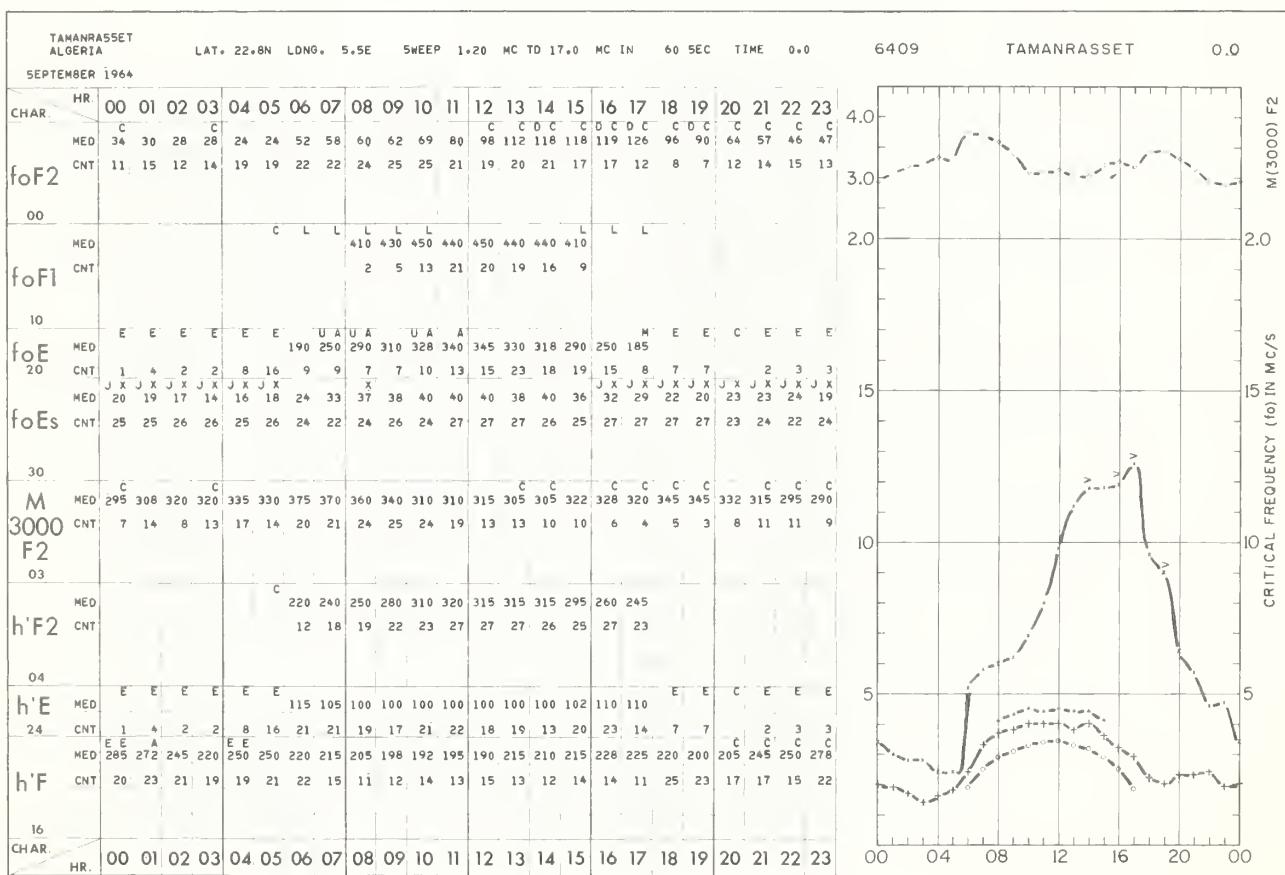
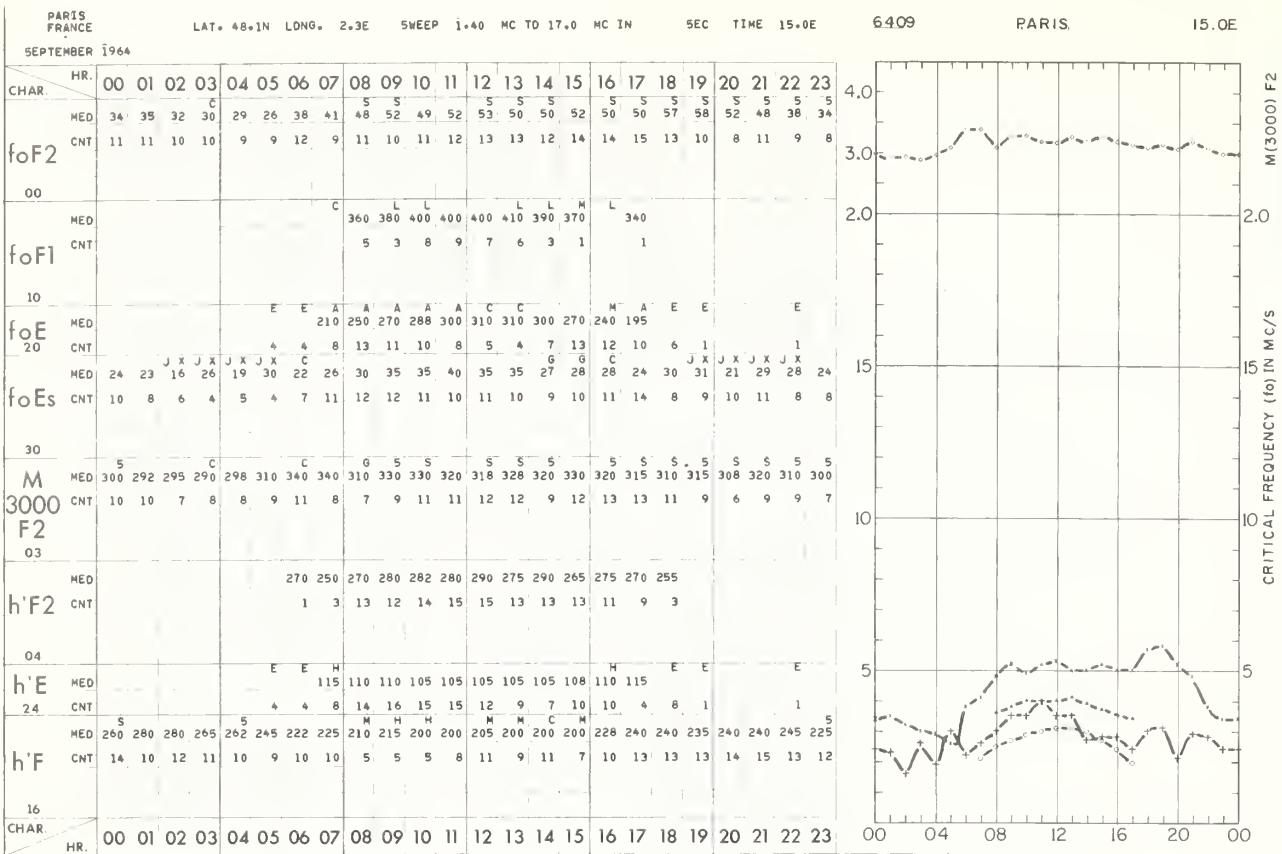
OCTOBER 1964

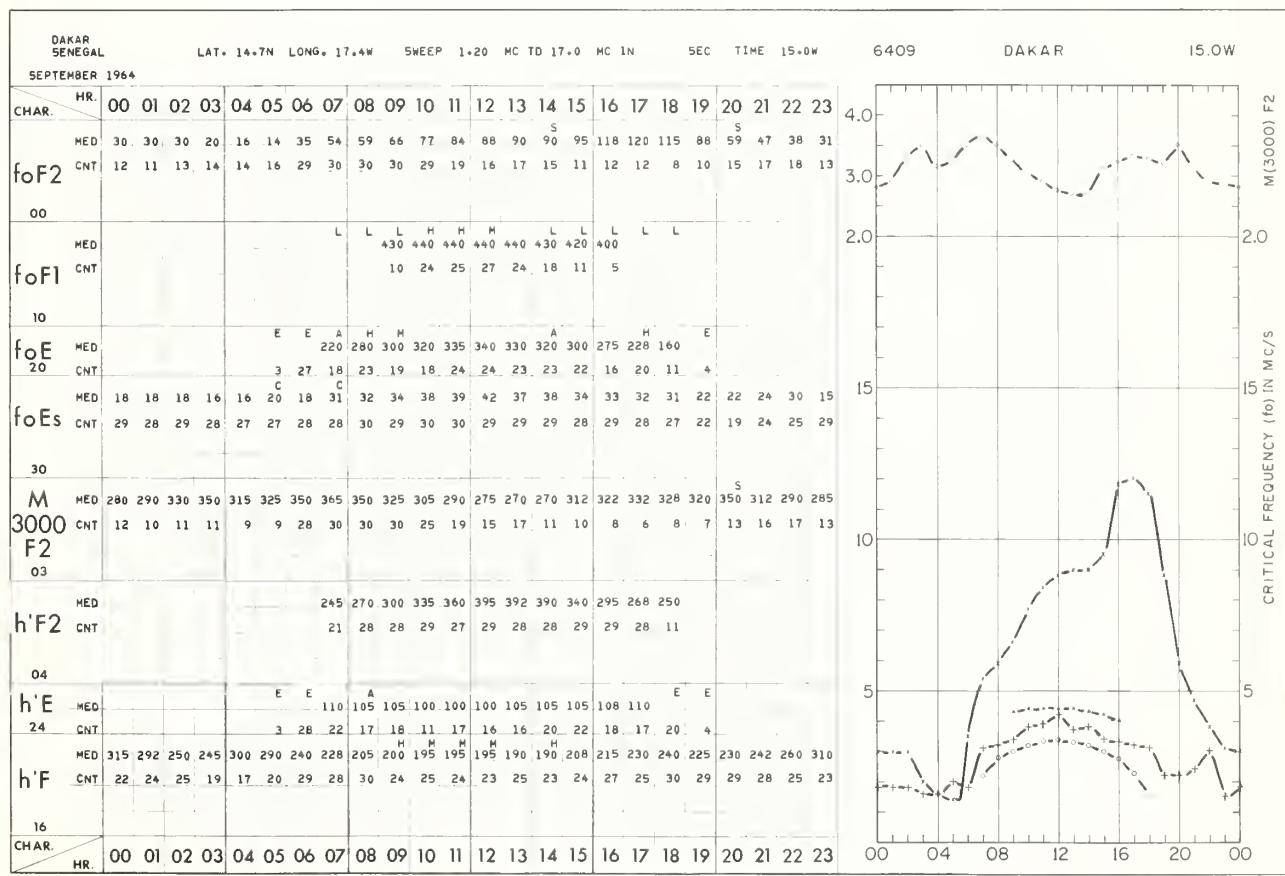
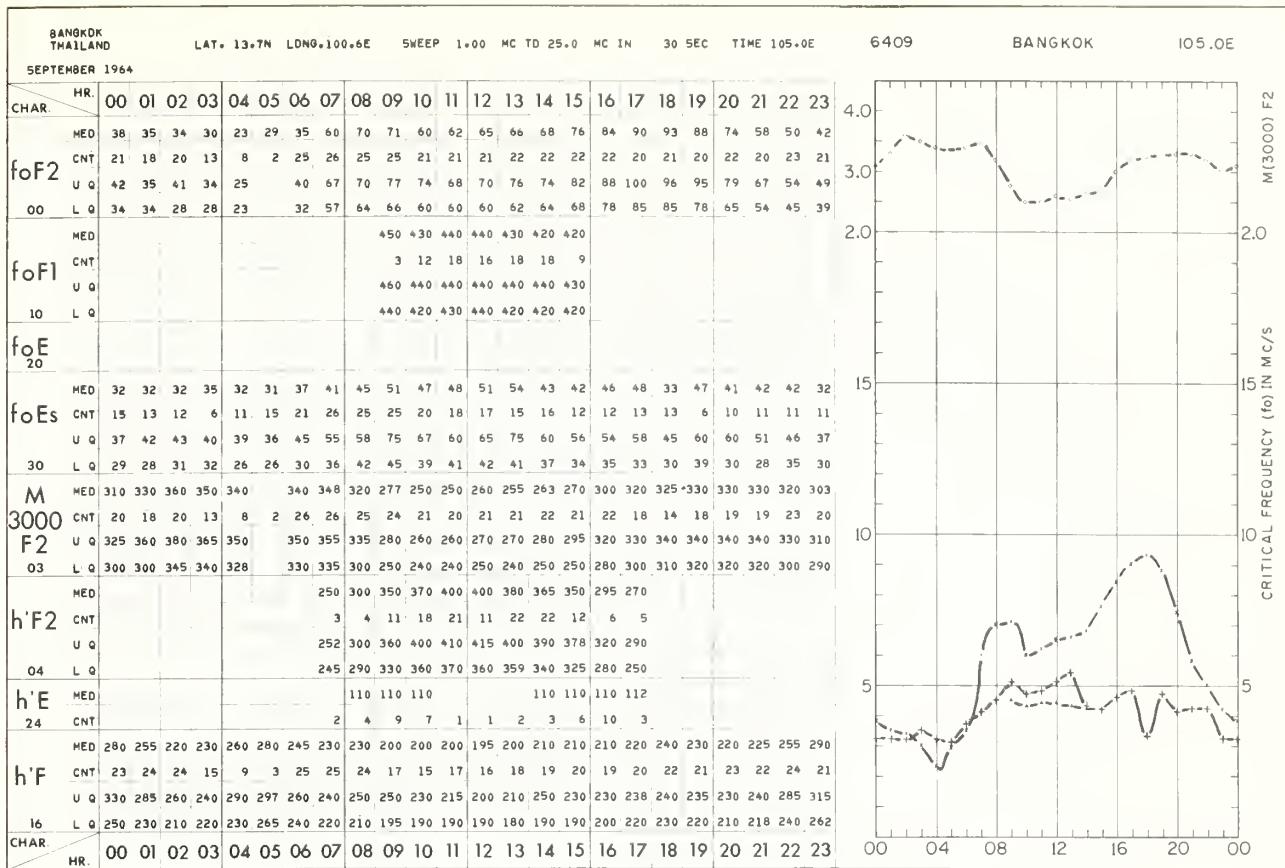
CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
	MEO	59	58	58	40	34	27	40	65	78	86	87	84	86	93	100	102	108	104	95	86	78	76	68	59	
foF2	CNT	18	20	20	26	26	29	30	29	31	29	30	29	30	30	30	28	25	21	19	25	20	13	13	17	
	00									L	L	L	L	L	L	L	L	L	L	L	L	L	L	L		
	MED									460	460	470	470	460	450											
foF1	CNT									4	10	15	20	19	6											
	10																									
foE	MEO	E	E	E	E	E	R	R	R	R	R	R	R	R	R	R	R	J	R	J	R	E	E	E	E	
	20	CNT	4	7	6	15	20	24	21	13	17	11	10	15	10	12	12	8	4	1	11	9	5	2	1	2
	MEO	37	17			G	J	X	J	X	X	J	X	J	X	J	X	J	X	J	X	J	X	J	X	
foEs	CNT	21	21	27	30	29	29	29	31	29	29	28	29	29	30	29	28	28	28	28	27	23	23	27	25	
	30																									
M	MEO	310	320	340	340	340	340	320	335	315	282	260	260	262	270	280	285	290	290	282	268	280	298	310	305	
3000	CNT	12	17	14	18	23	20	30	23	29	28	25	27	30	28	30	28	15	6	8	8	11	8	8	14	
F2	03																									
	MED									260	290	320	340	350	350	335	325	310	300	275						
h'F2	CNT									20	21	25	27	29	29	30	30	30	25	5						
	04																									
h'E	MED	E	E	E	E	E	E	E	E	120	115	115	110	108	110	110	115	115	115	120	H	E	E	E	E	
	24	CNT	4	7	6	15	20	24	30	15	6	5	5	6	10	8	7	5	6	2	15	9	5	2	1	2
	MEO	255	250	238	230	230	240	250	240	225	210	200	205	208	210	205	210	225	248	260	278	280	270	250	270	
h'F	CNT	27	29	30	31	29	29	31	28	29	25	25	22	23	23	24	18	22	28	28	27	23	25	25	25	
	16																									
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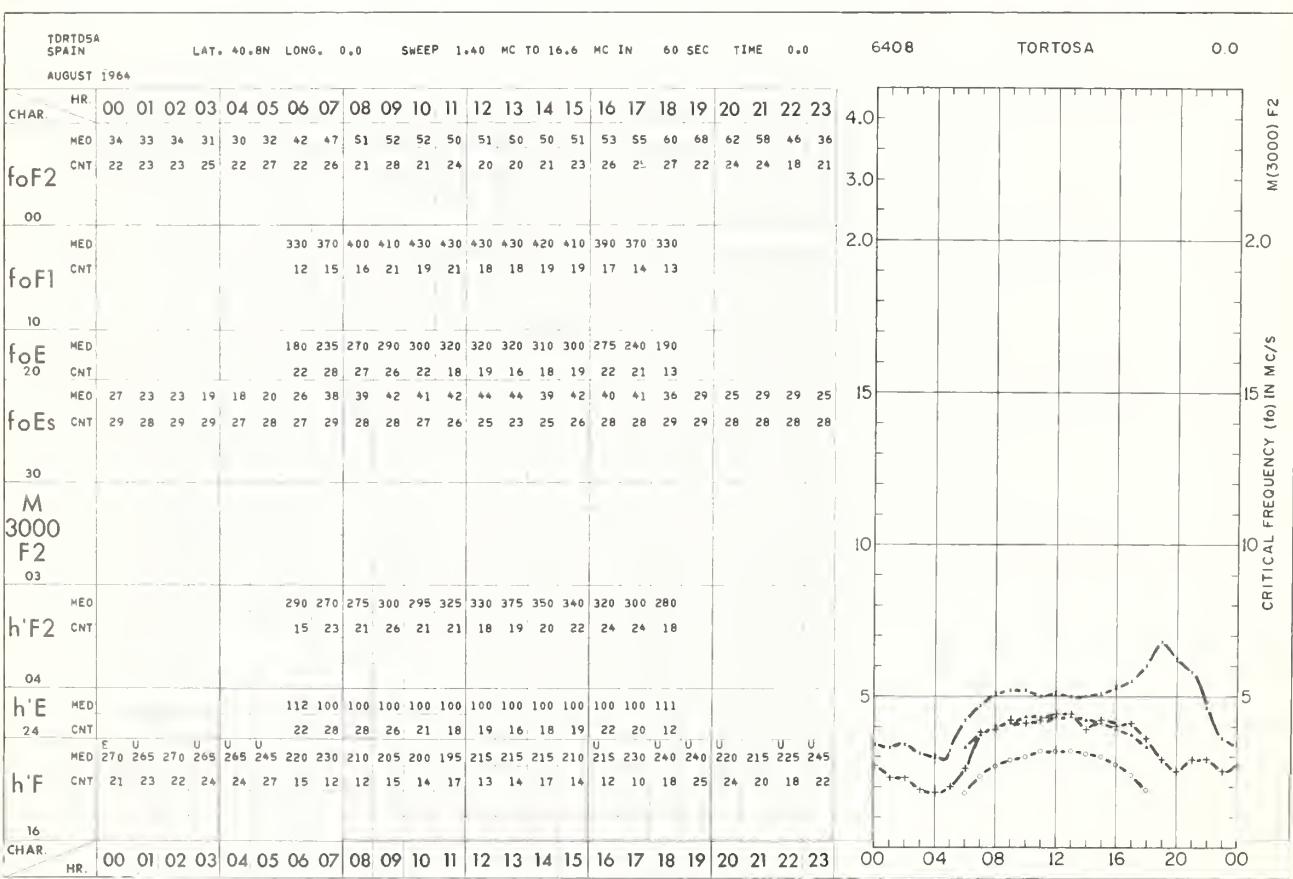
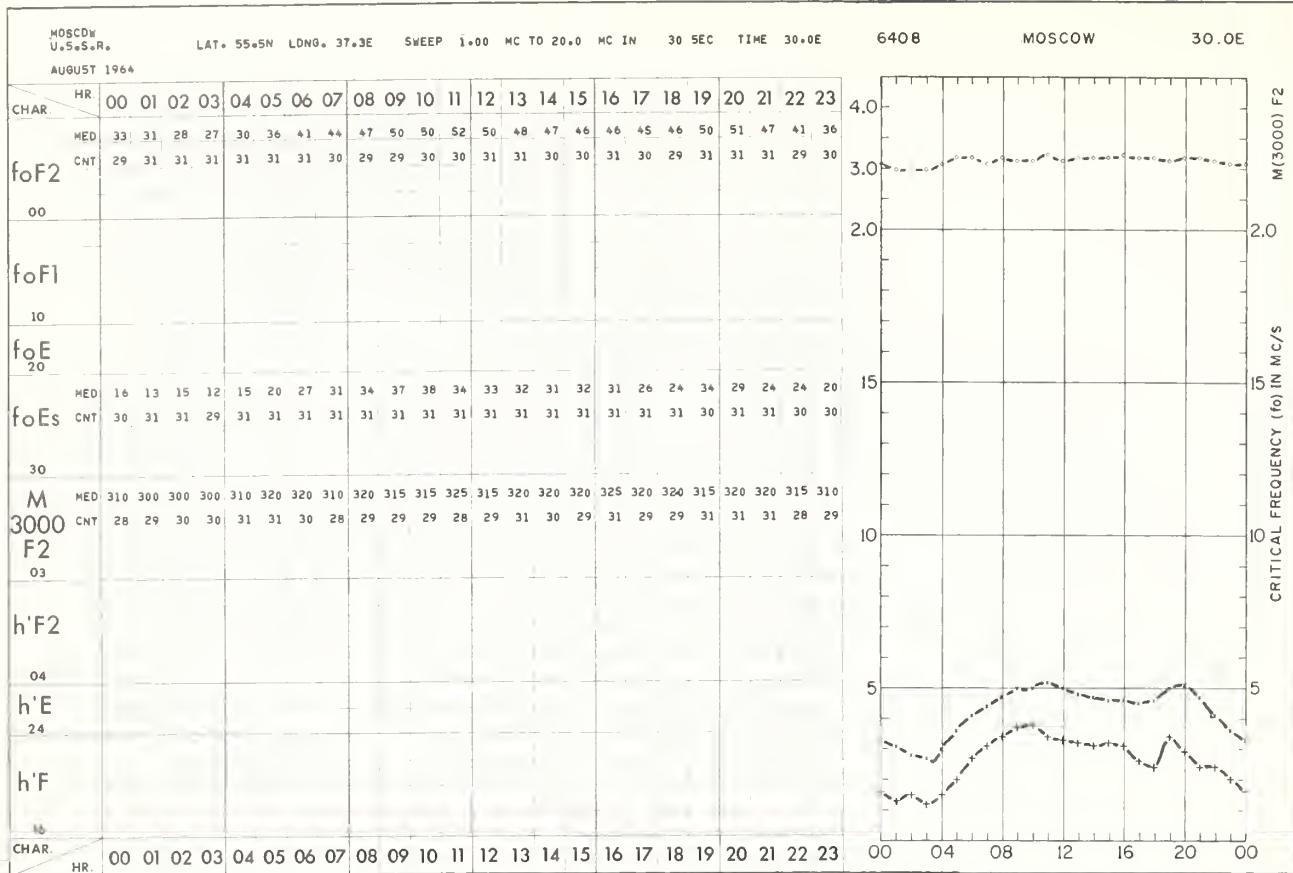


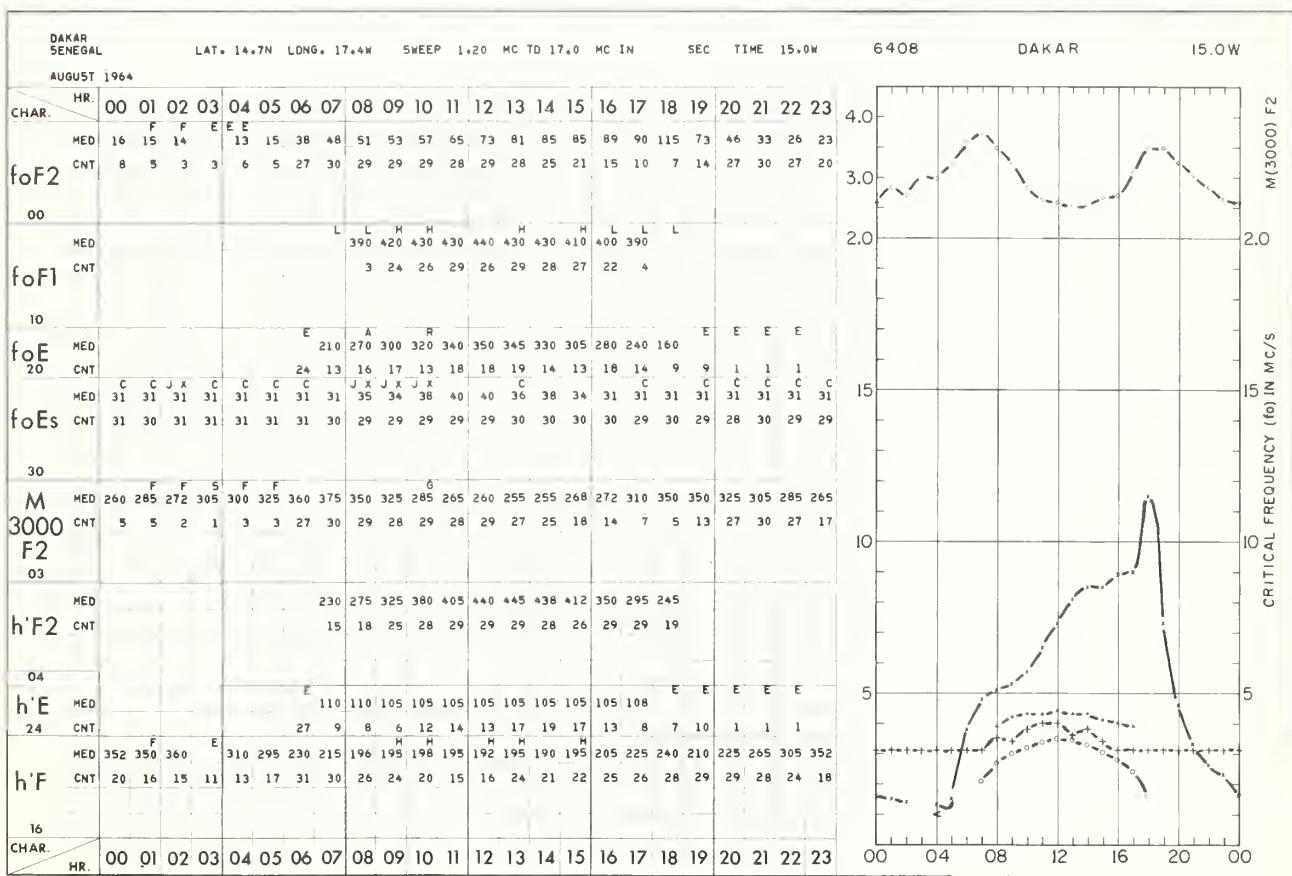
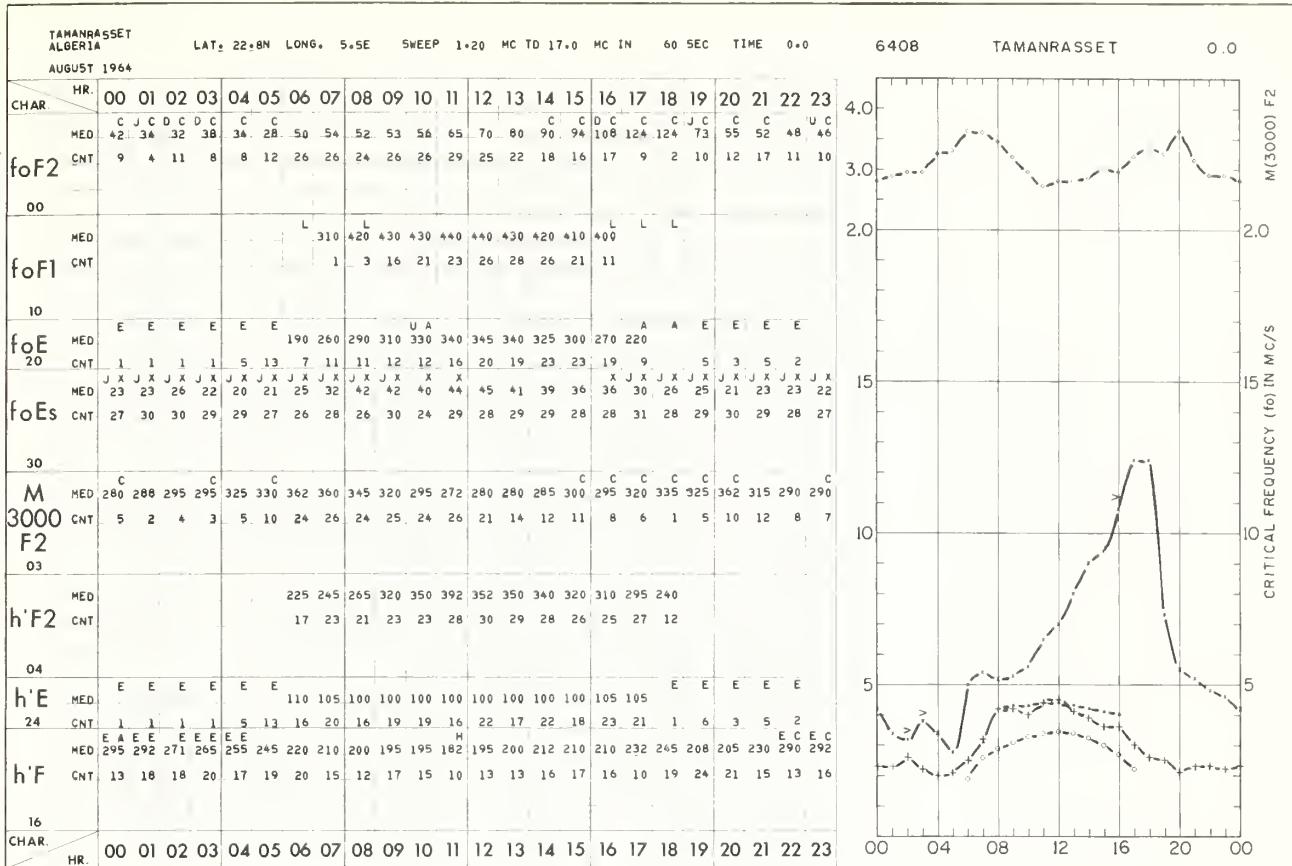


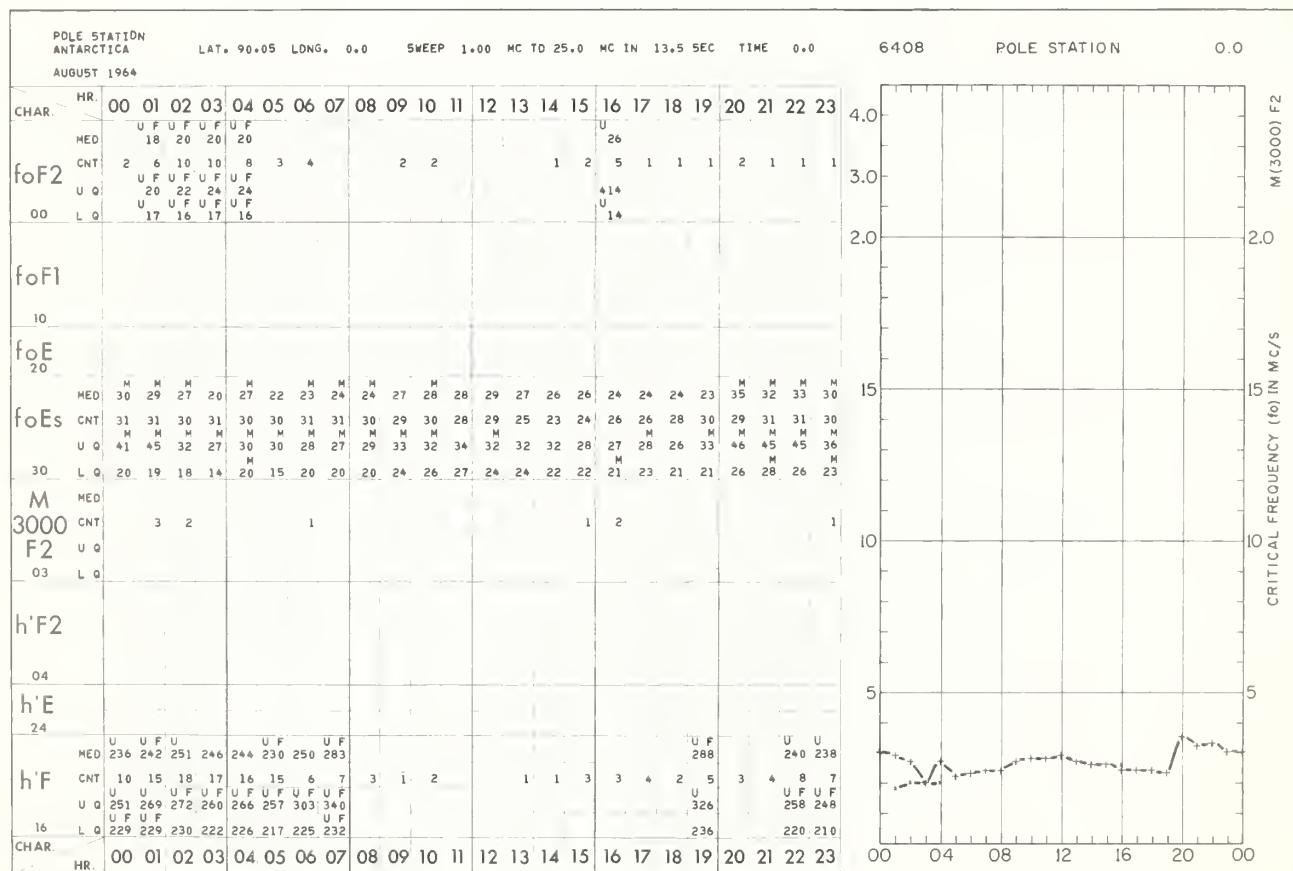
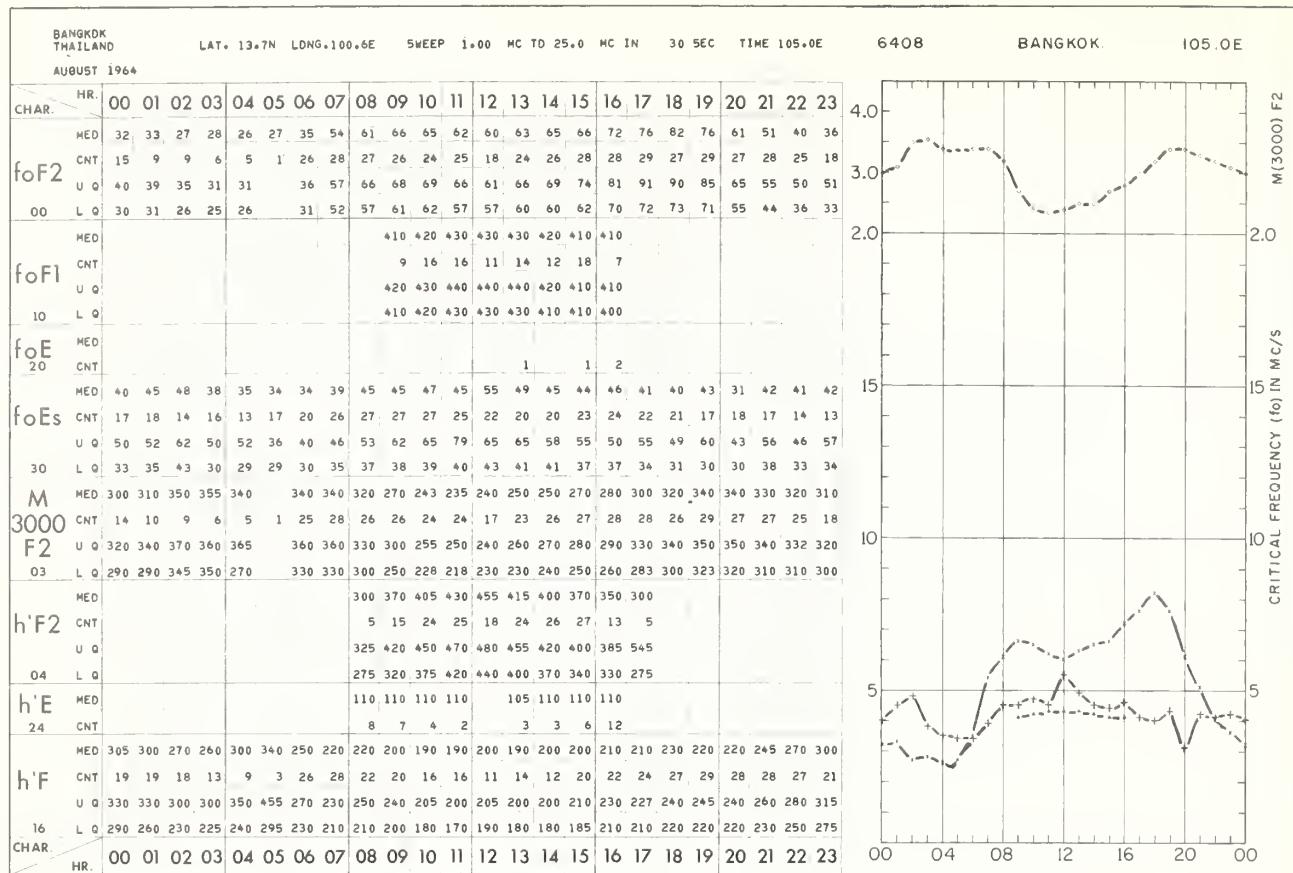












TORTOSA SPAIN

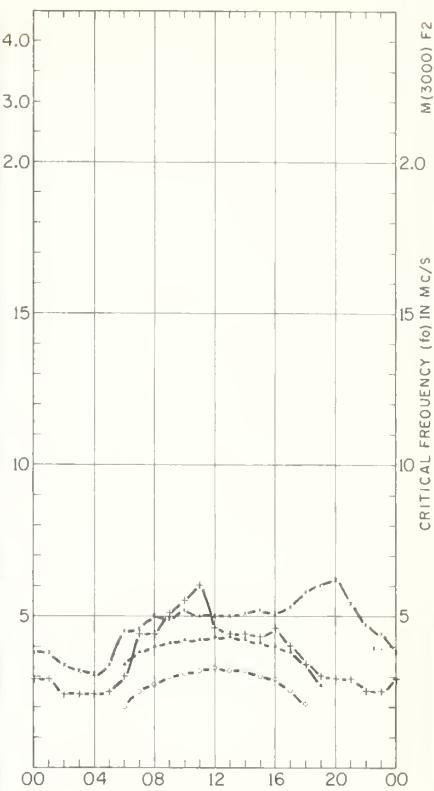
LAT: 40.8N LON: 0.0 SWEEP 1-40 MC TO 16.6 MC IN 60 SEC TIME 0-0 6407 TORTOSA 0.0 JULY 1964

CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
foF2	MED	38	38	34	32	31	34	45	46	50	49	52	50	50	50	51	52	51	53	58	60	62	54	47	44					
foF2	CNT	17	18	20	23	23	24	16	14	15	15	15	12	14	18	17	19	21	22	20	24	24	20	20	20					
foF1	00																													
foF1	MED					340	380	400	410	420	420	430	430	420	410	400	380	340	380	340	270									
foF1	CNT					10	9	11	12	12	10	14	16	15	14	15	19	16	9											
foE	10																													
foE	MED					200	250	275	300	310	320	330	320	320	300	290	255	210												
foE	CNT					20	19	19	24	22	19	19	22	21	21	21	22	17												
foEs	20																													
foEs	MED					29	29	24	24	24	25	30	44	44	51	55	60	46	44	44	43	46	40	34	30	29	29	25	25	
foEs	CNT					25	25	24	26	26	24	24	23	22	26	27	28	27	27	23	25	26	26	26	25	27				
M	30																													
M	3000																													
F2																														
F2	03																													
h'F2	30																													
h'F2	MED					250	350	280	330	350	375	385	375	370	360	350	325	280	270											
h'F2	CNT					12	13	17	14	14	13	13	17	17	18	19	21	18	10											
h'E	40																													
h'E	MED					100	100	100	100	100	100	100	100	100	100	100	100	100	100	105										
h'E	CNT					20	19	19	25	22	19	19	22	20	21	17	21	17												
h'F	40																													
h'F	MED					U	255	E	270	U	250	260	250	230	230	205	210	200	215	195	200	200	200	220	220	220	220	225	225	U
h'F	CNT					18	18	19	24	24	18	11	8	8	8	5	9	11	15	11	9	10	11	9	21	24	19	18	19	
16	CHAR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
16	CHAR.	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				

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2.0
1.0
0.0

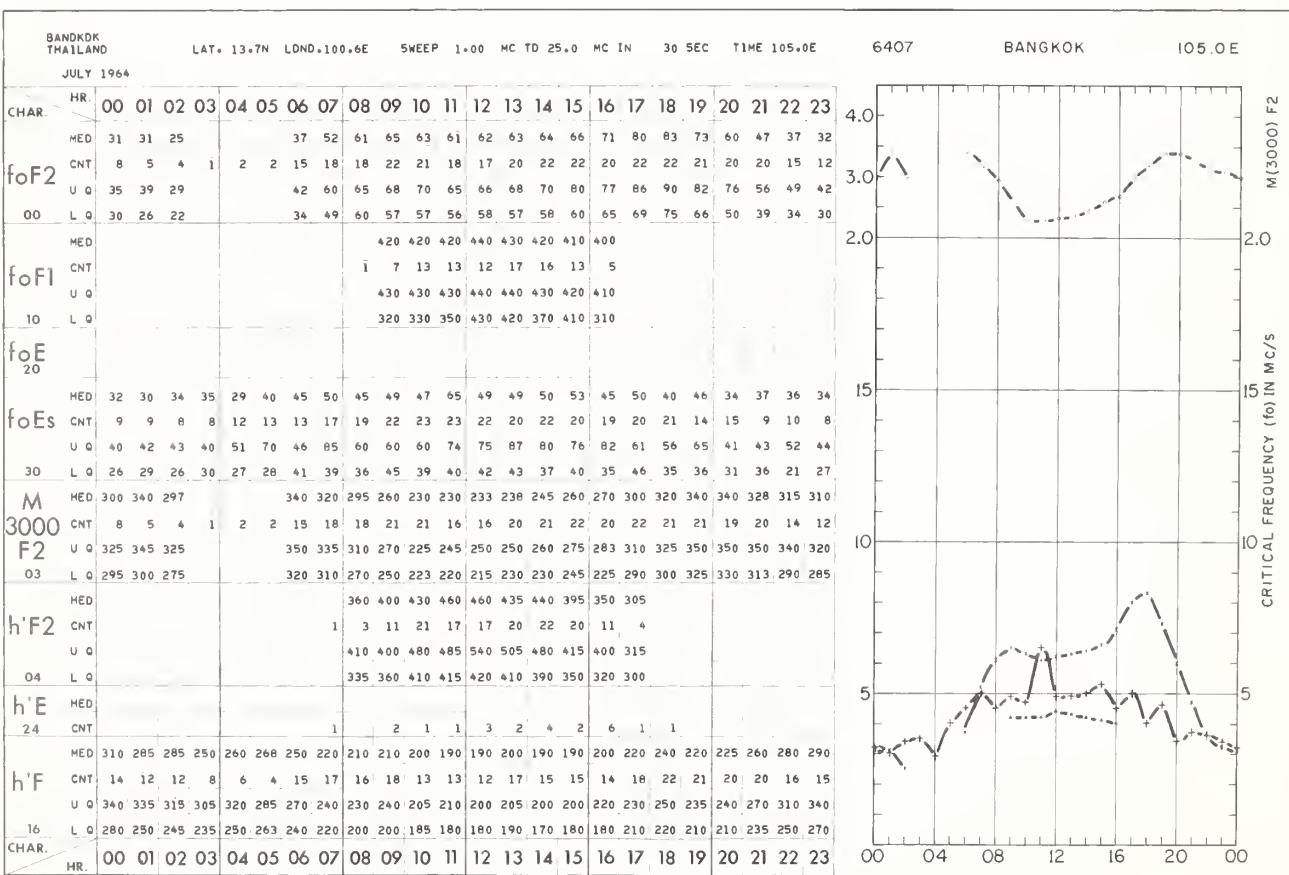
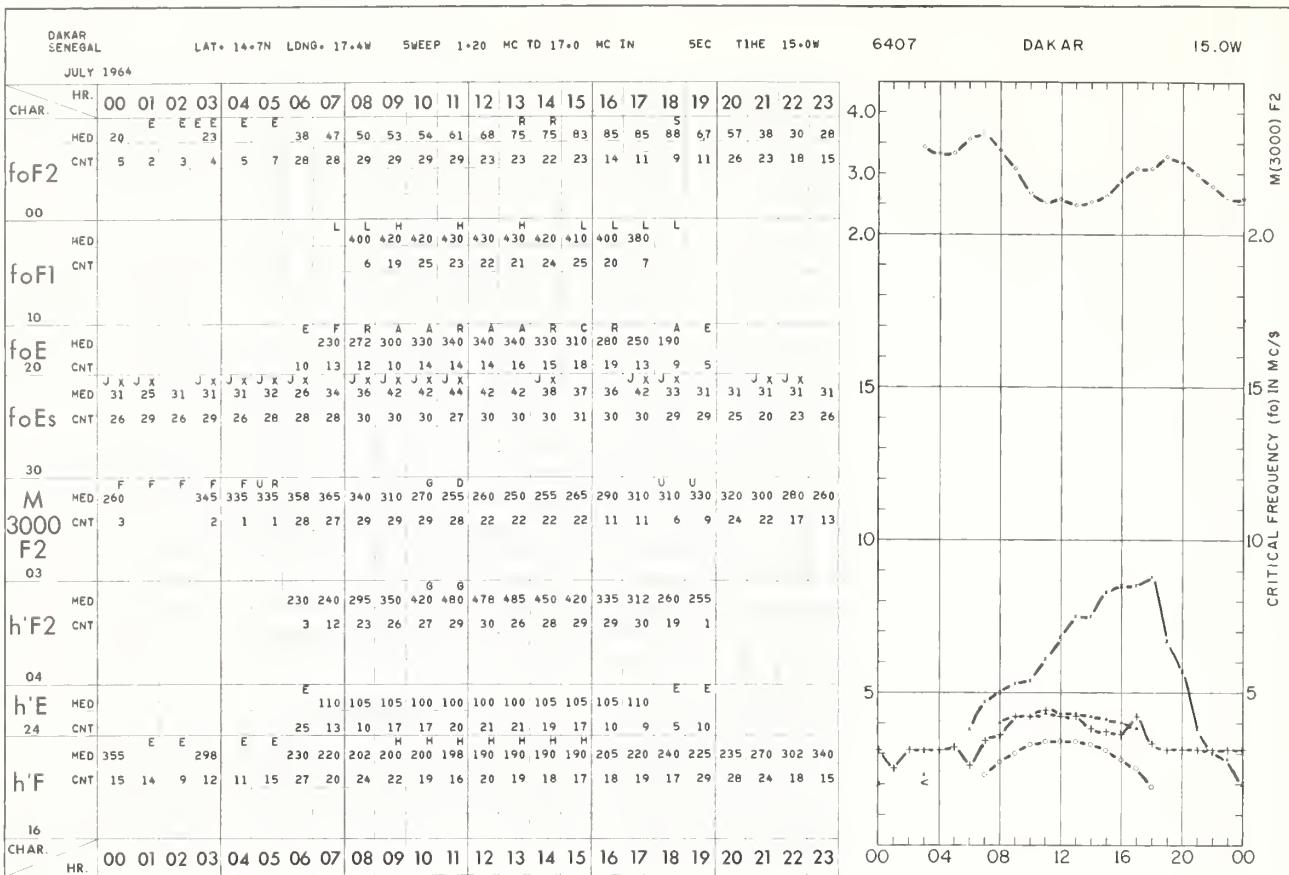
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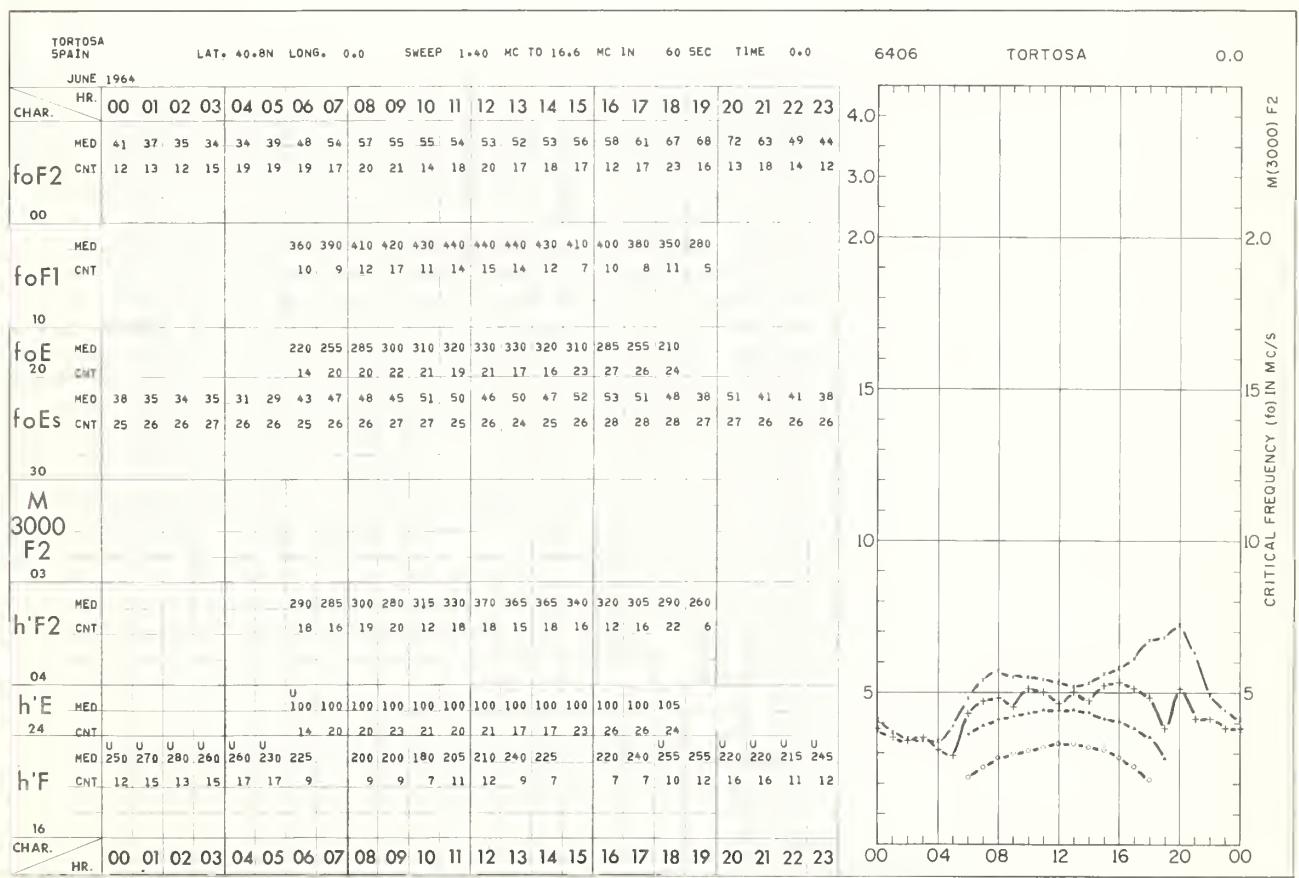
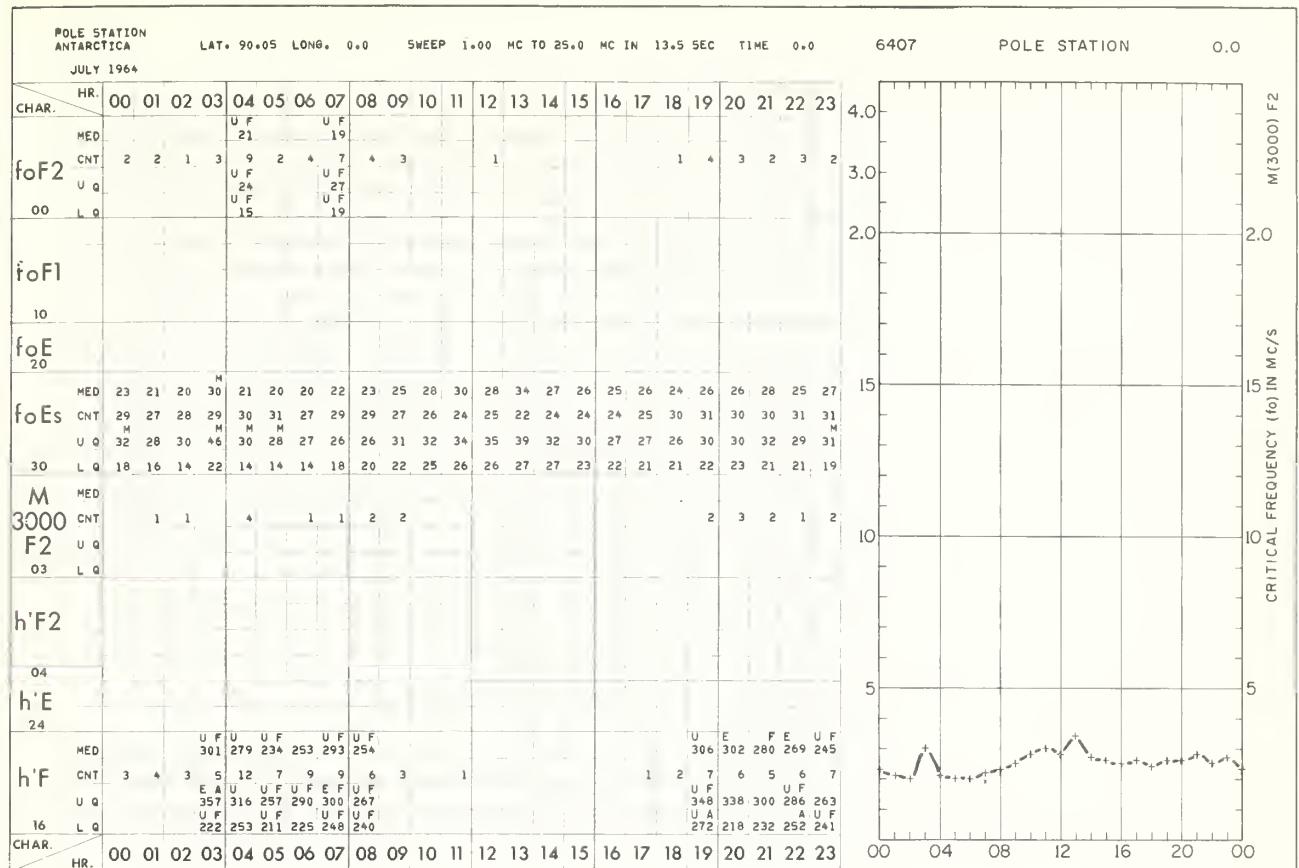
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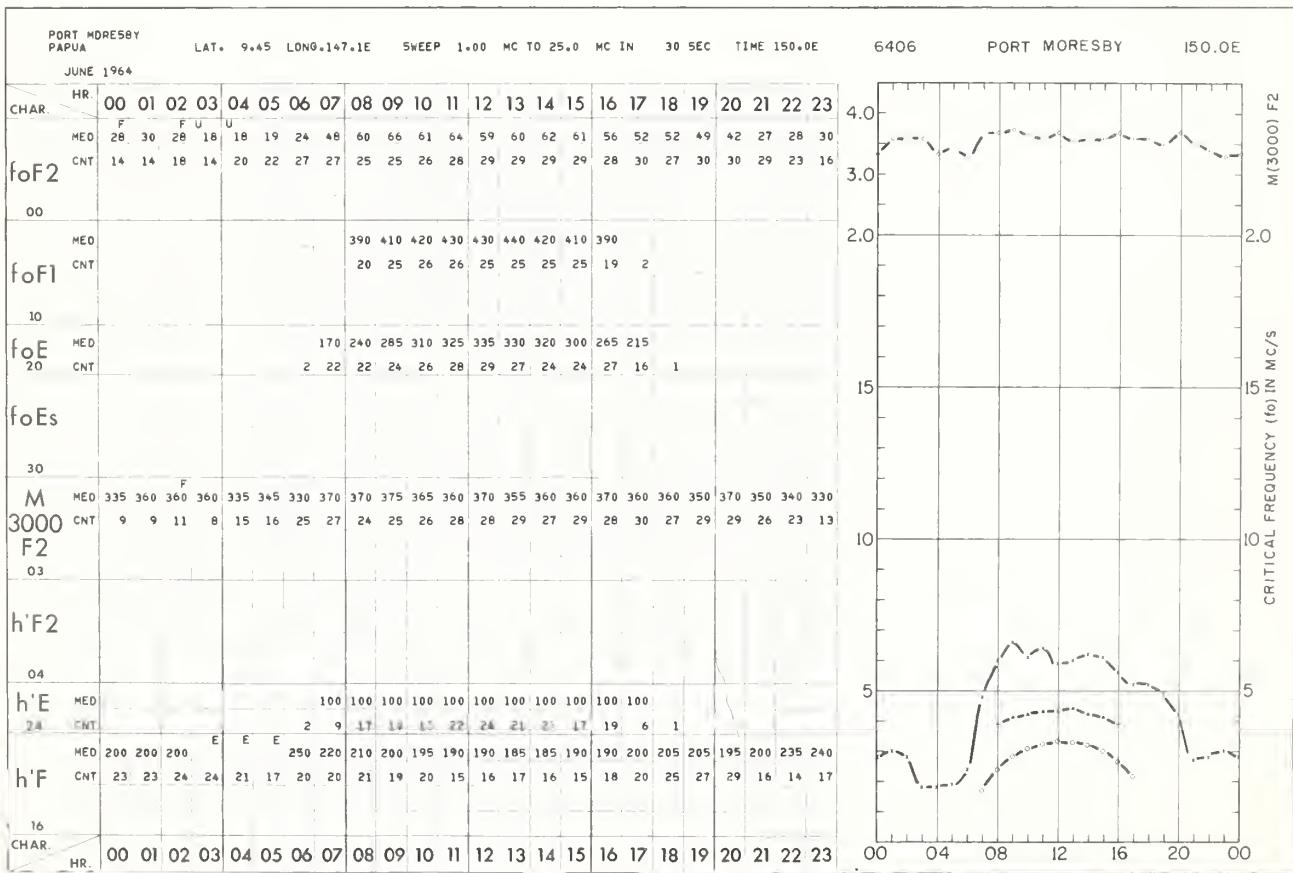
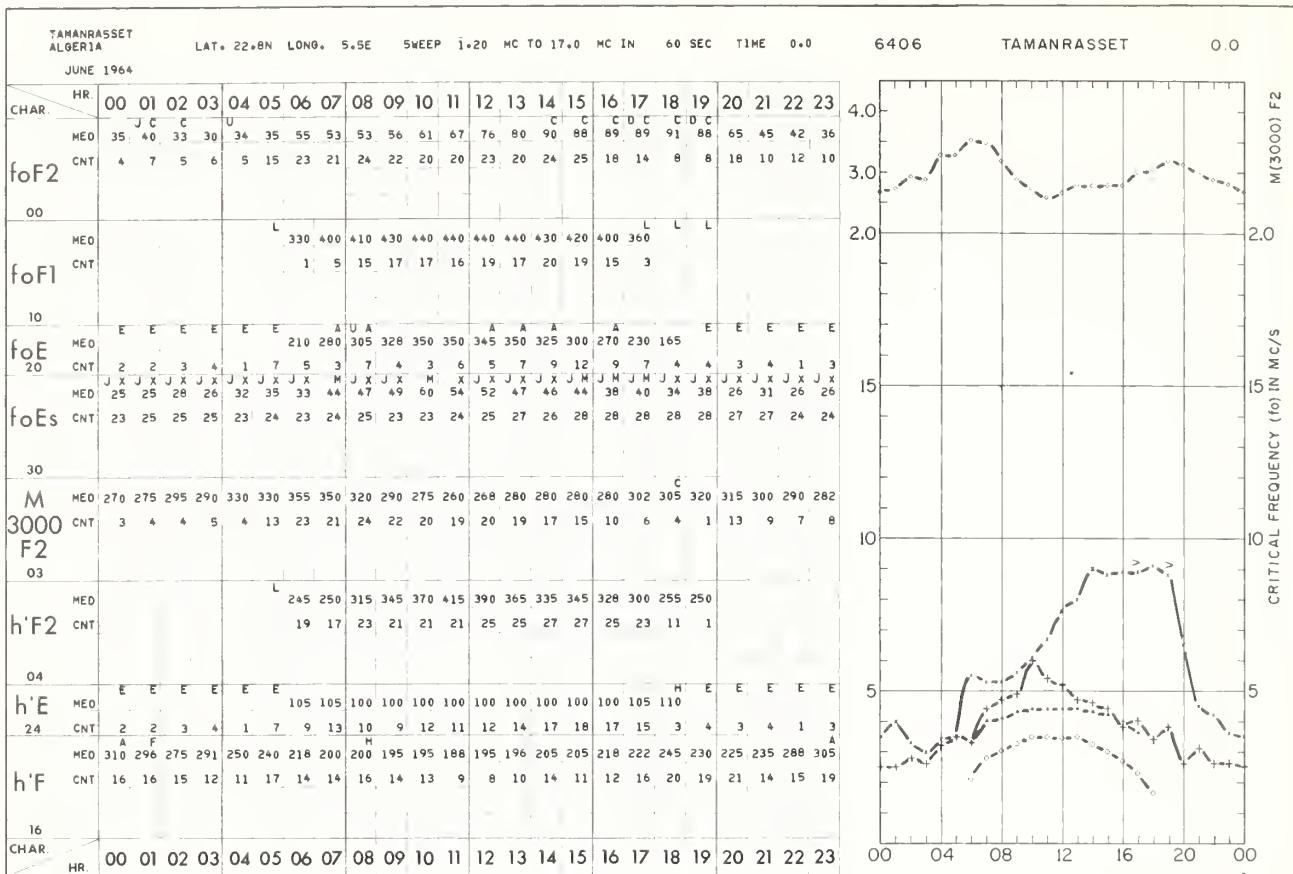


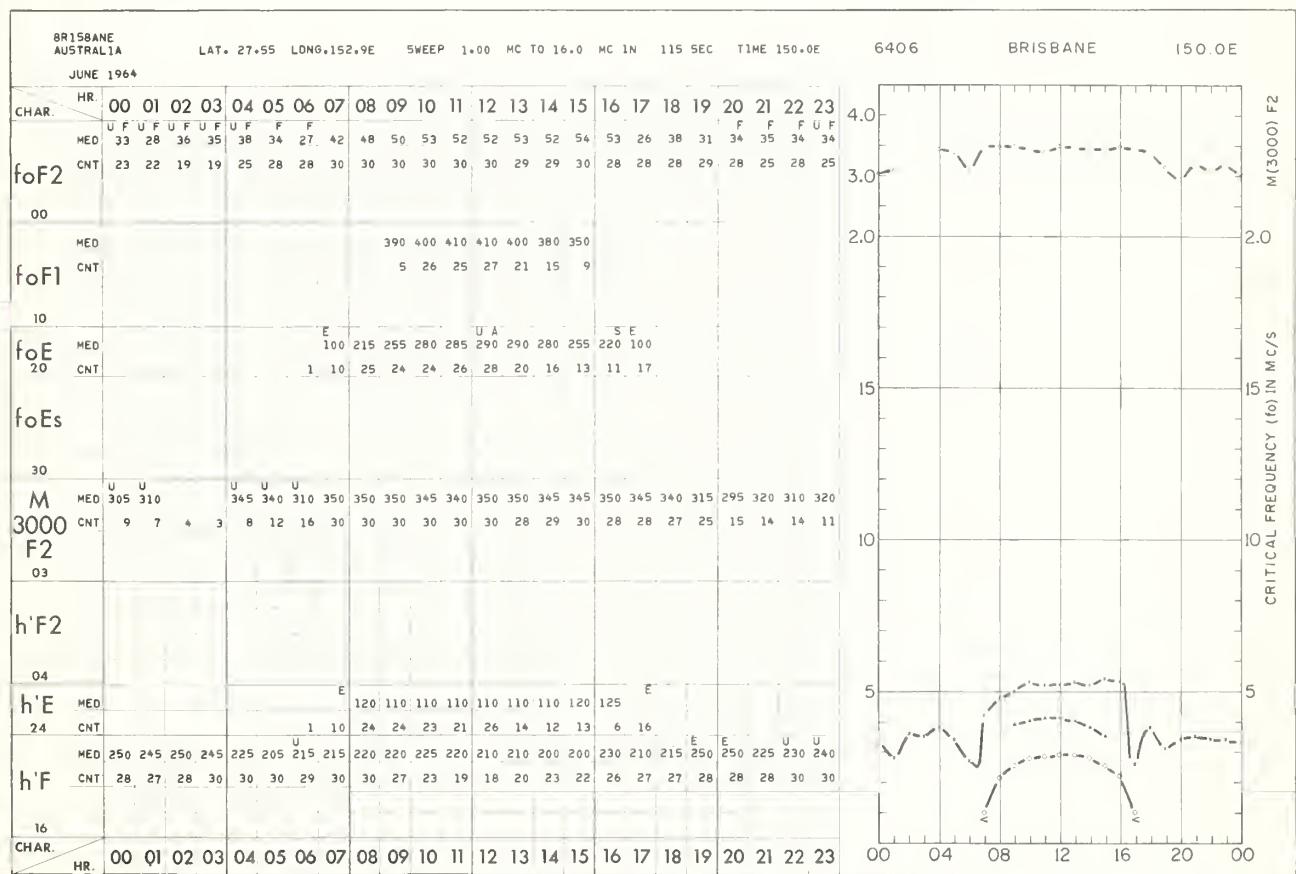
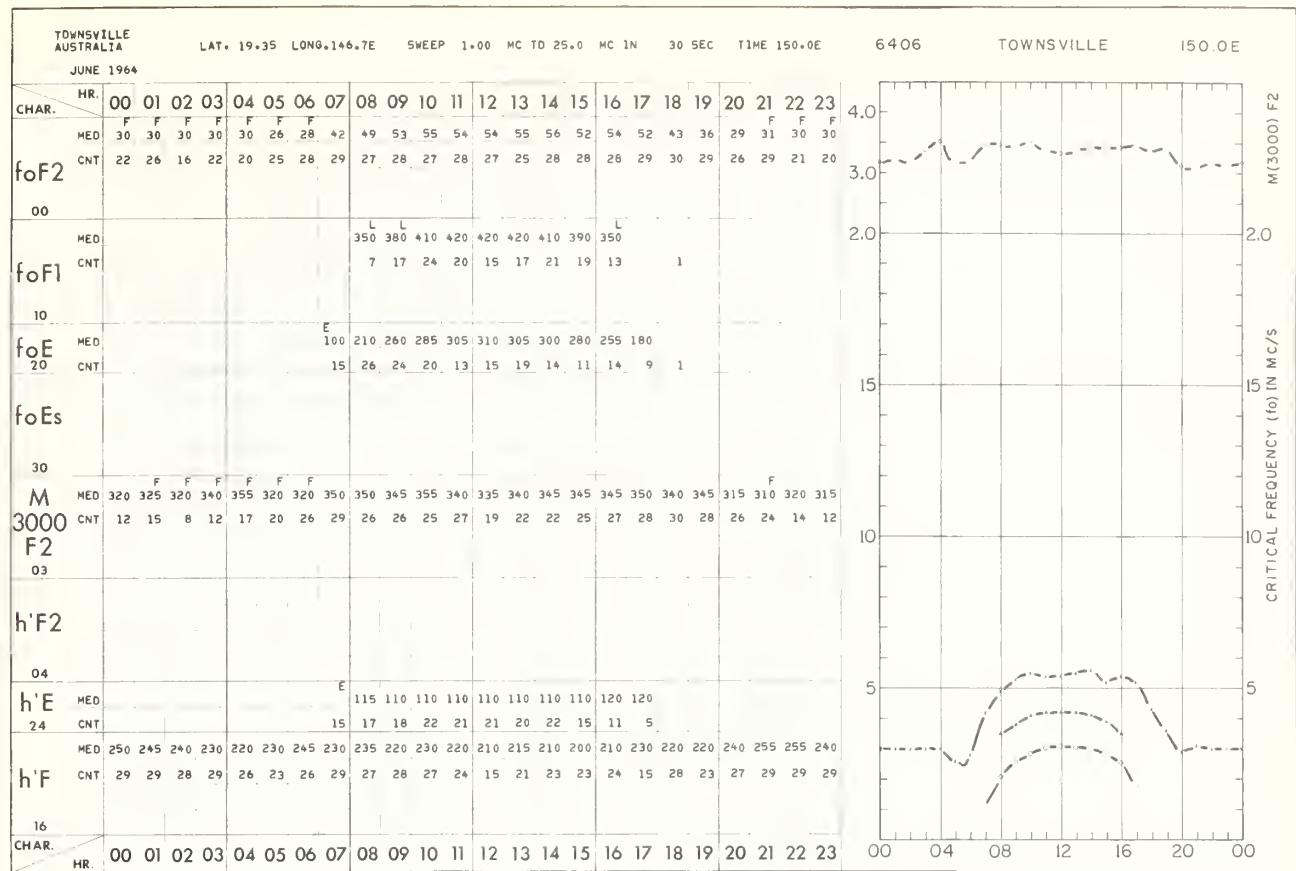
TAMANRASSET ALGERIA LAT. 22°8'N LDNG. 5°5'E SWEEP 1+20 MC TO 17.0 MC IN 60 SEC TIME 0+0 6407 TAMANRASSET 0.0 JULY 1964

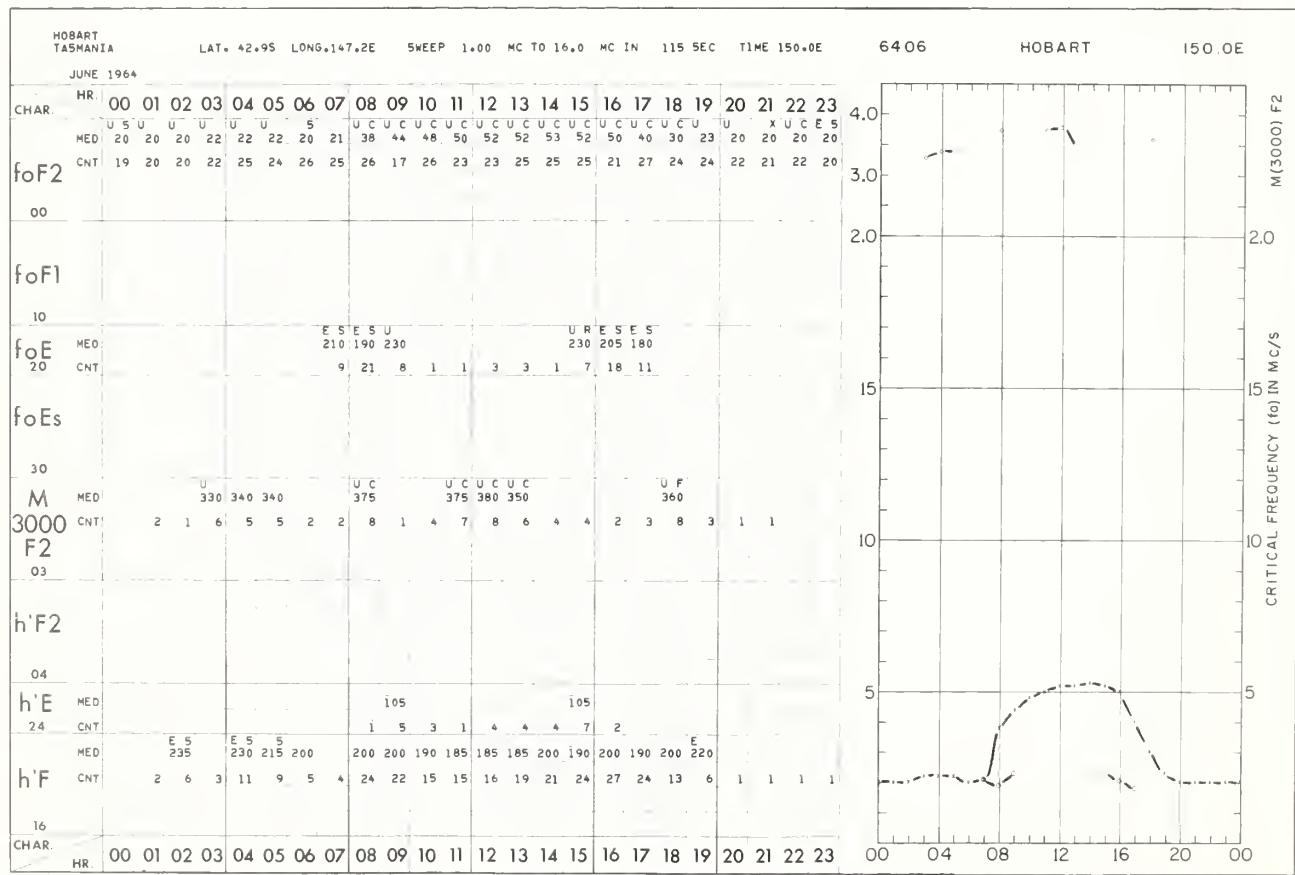
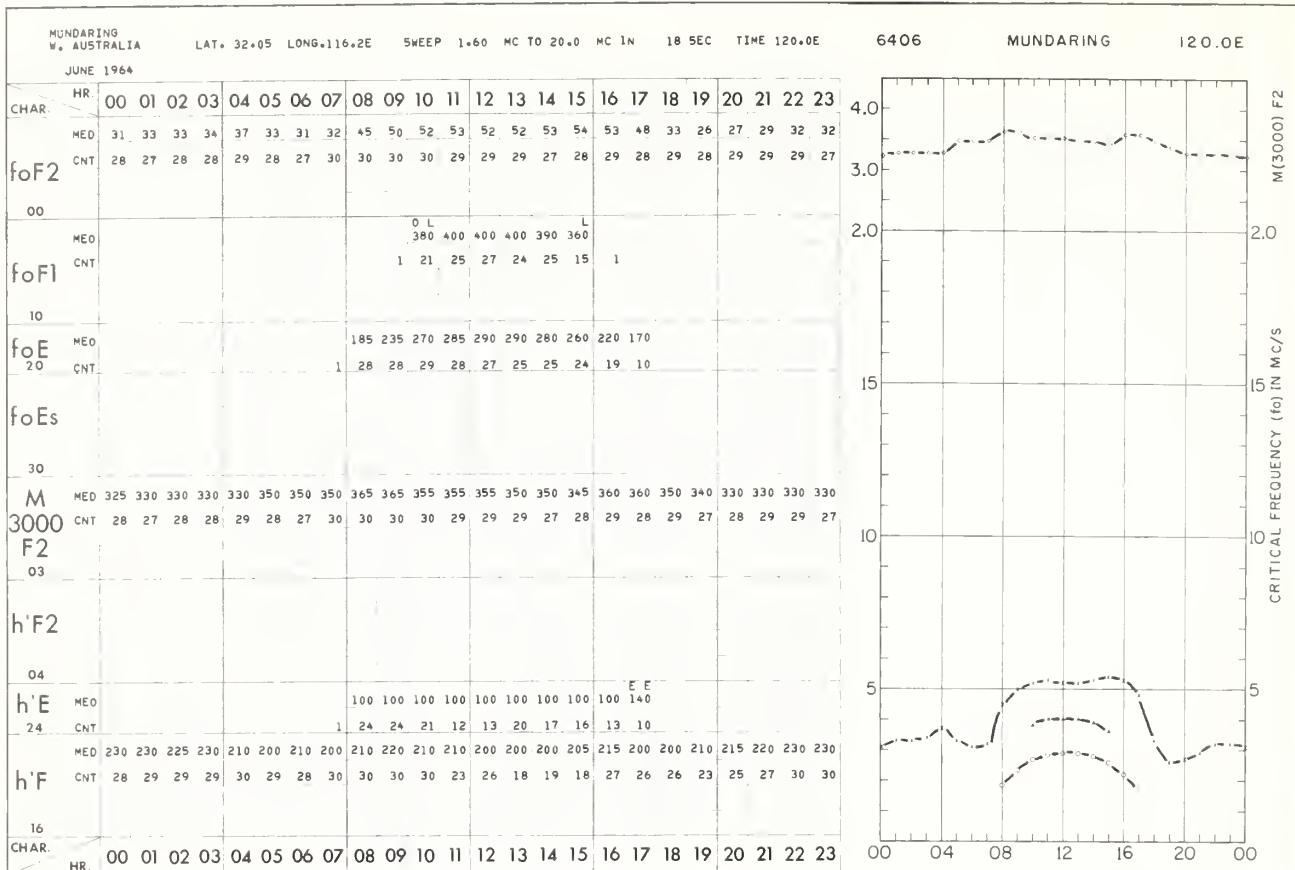
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foF1	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foE	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foEs	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
M	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
F2	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
h'F2	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
h'E	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
h'F	HR.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
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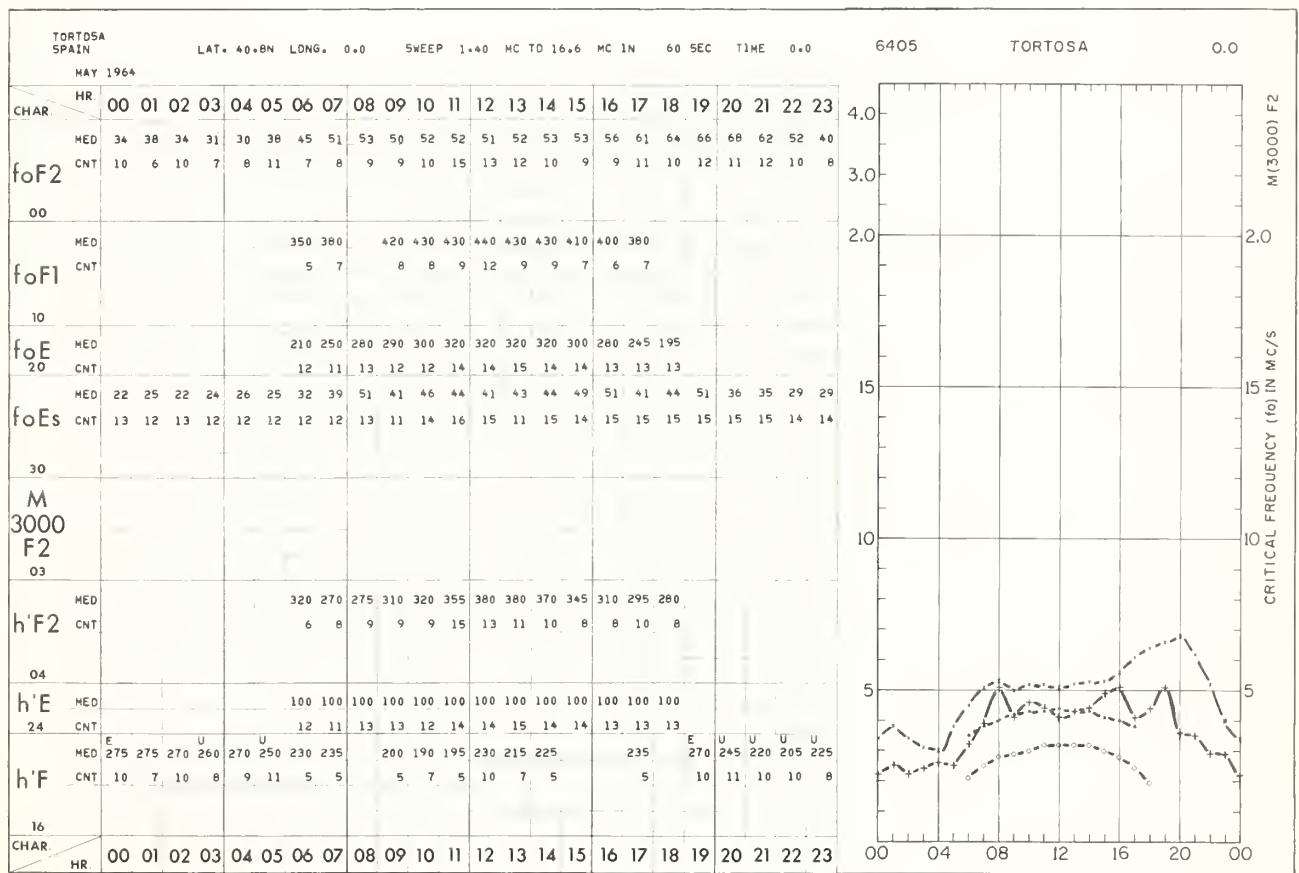
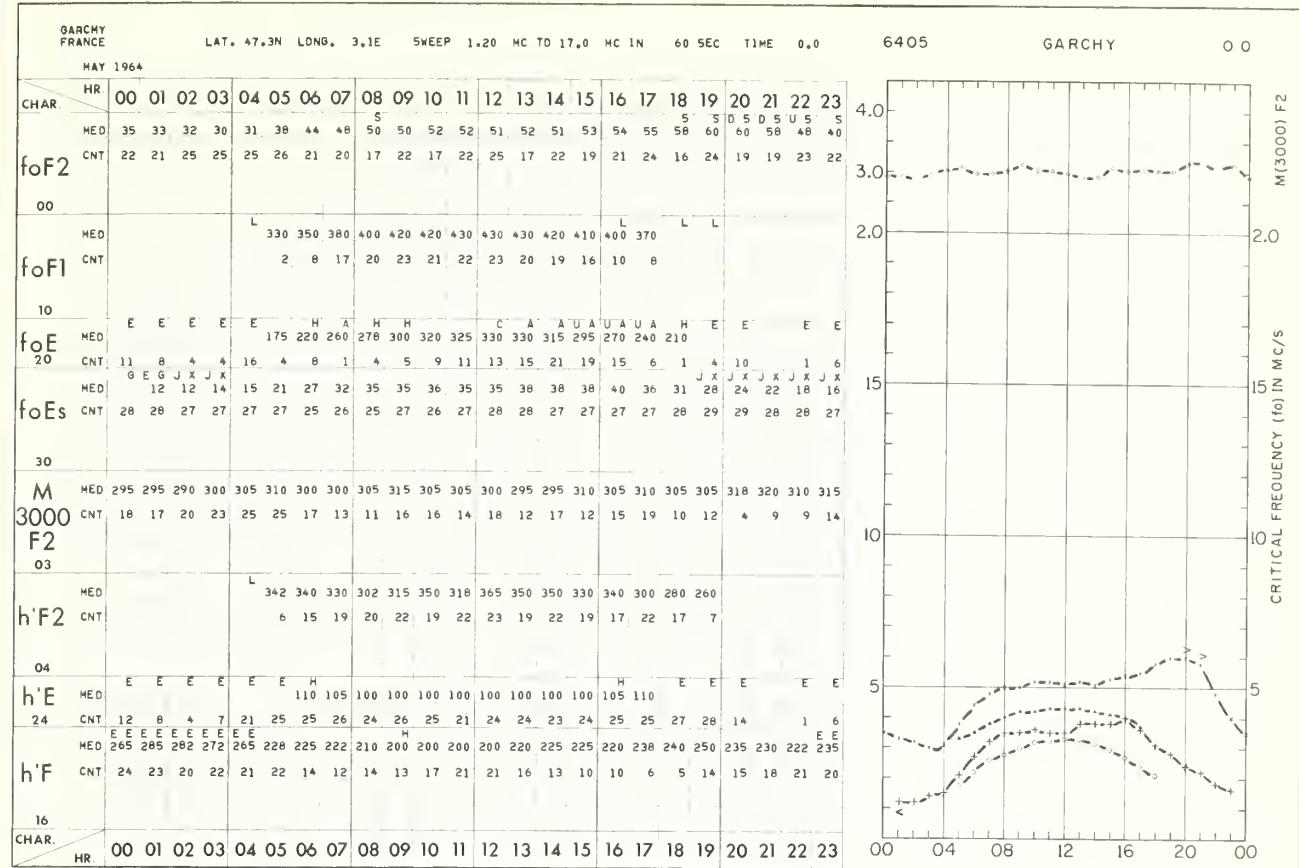


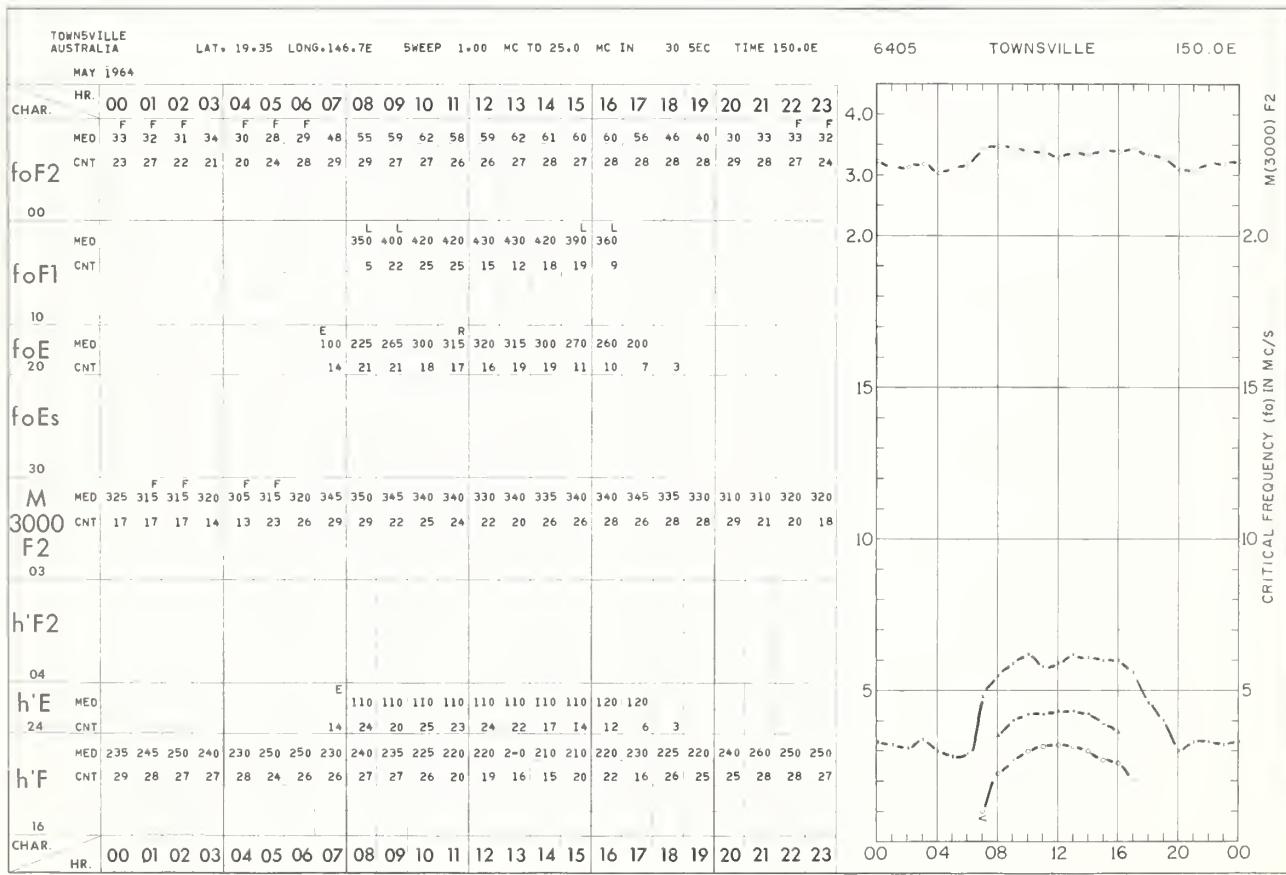
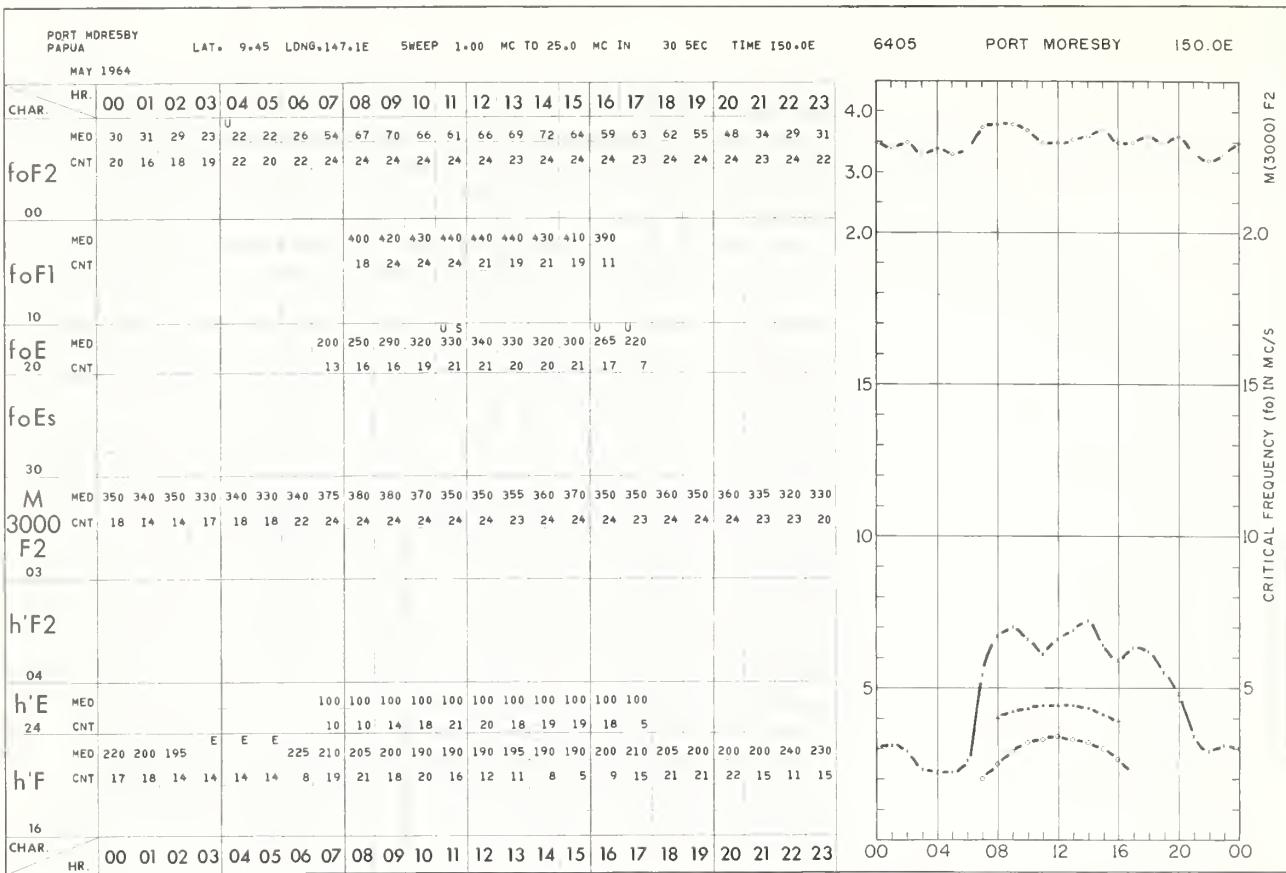


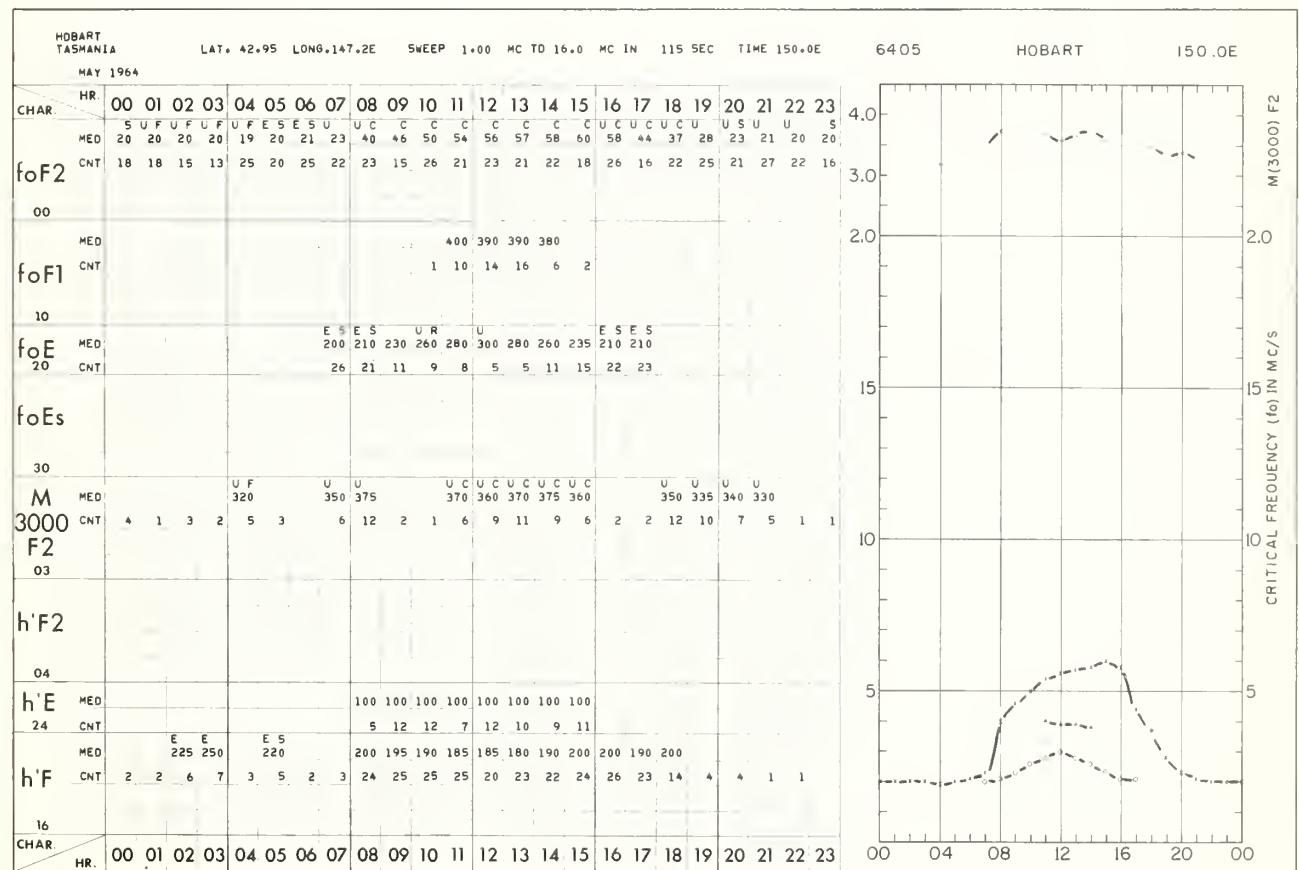
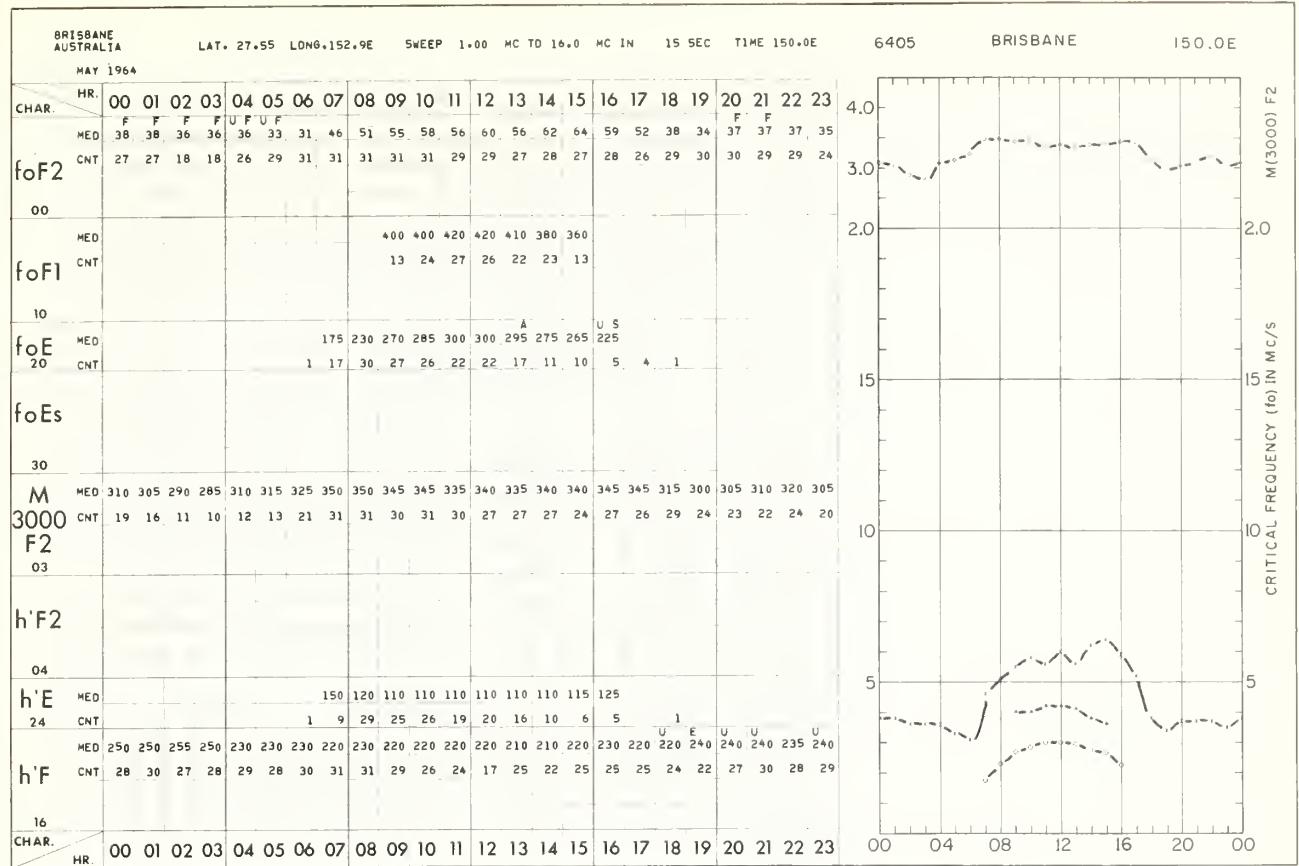


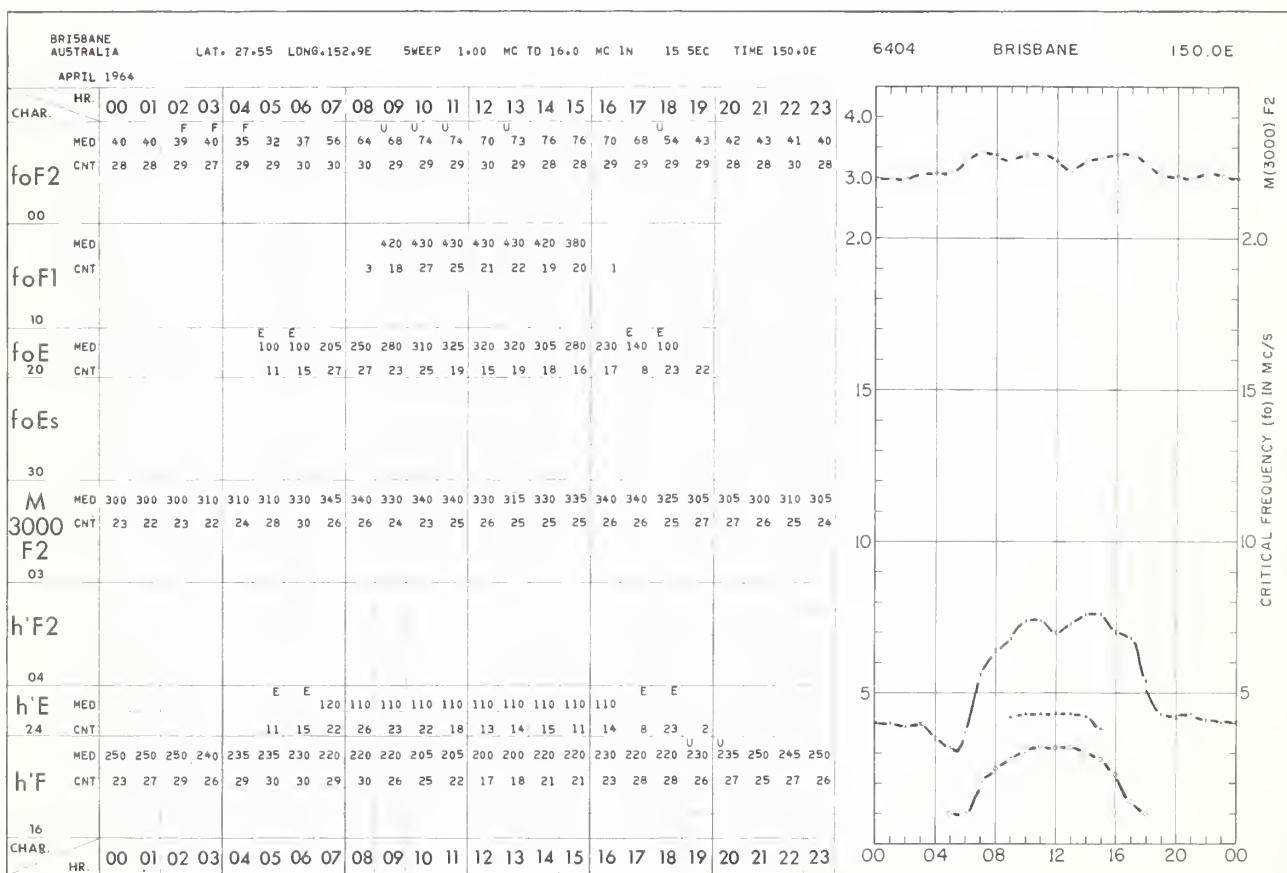
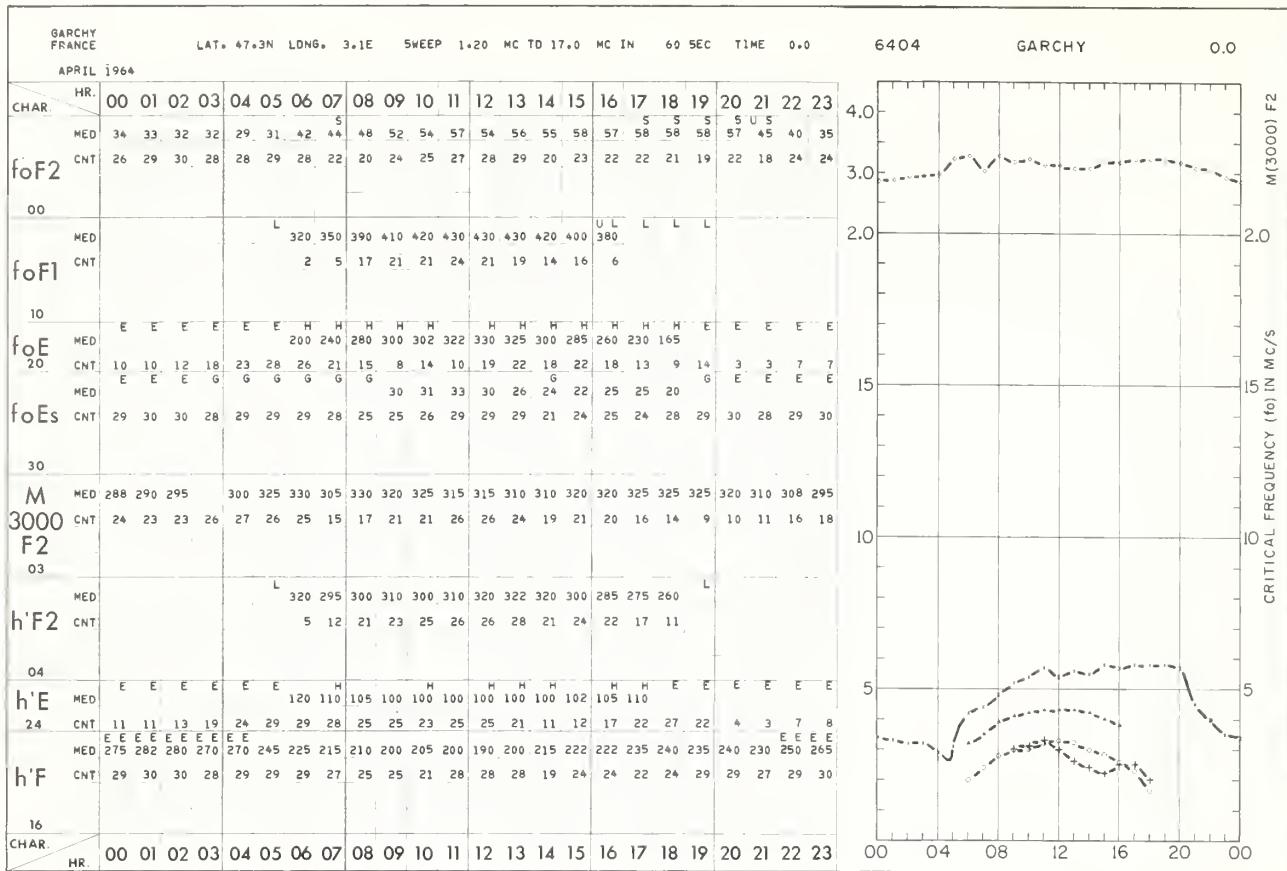


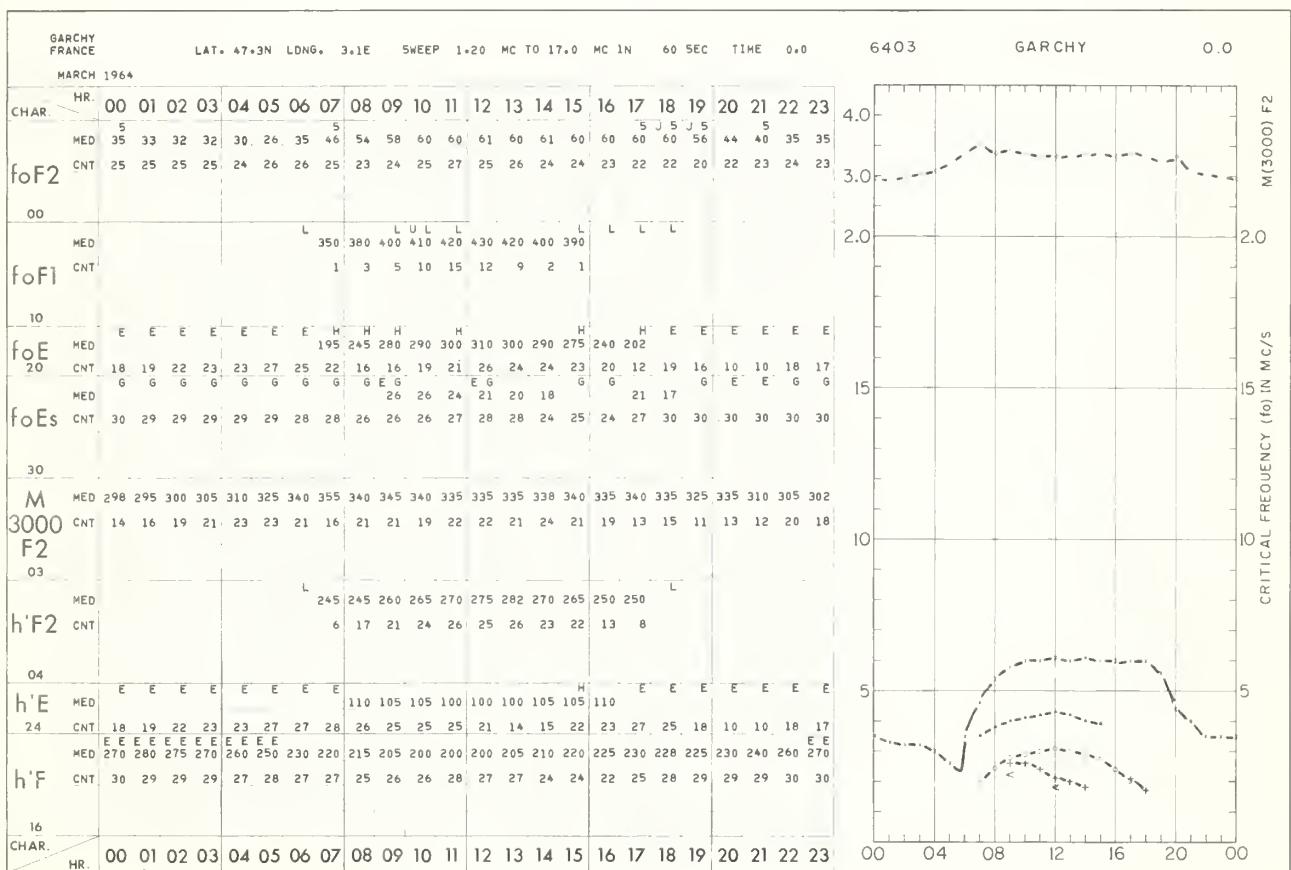
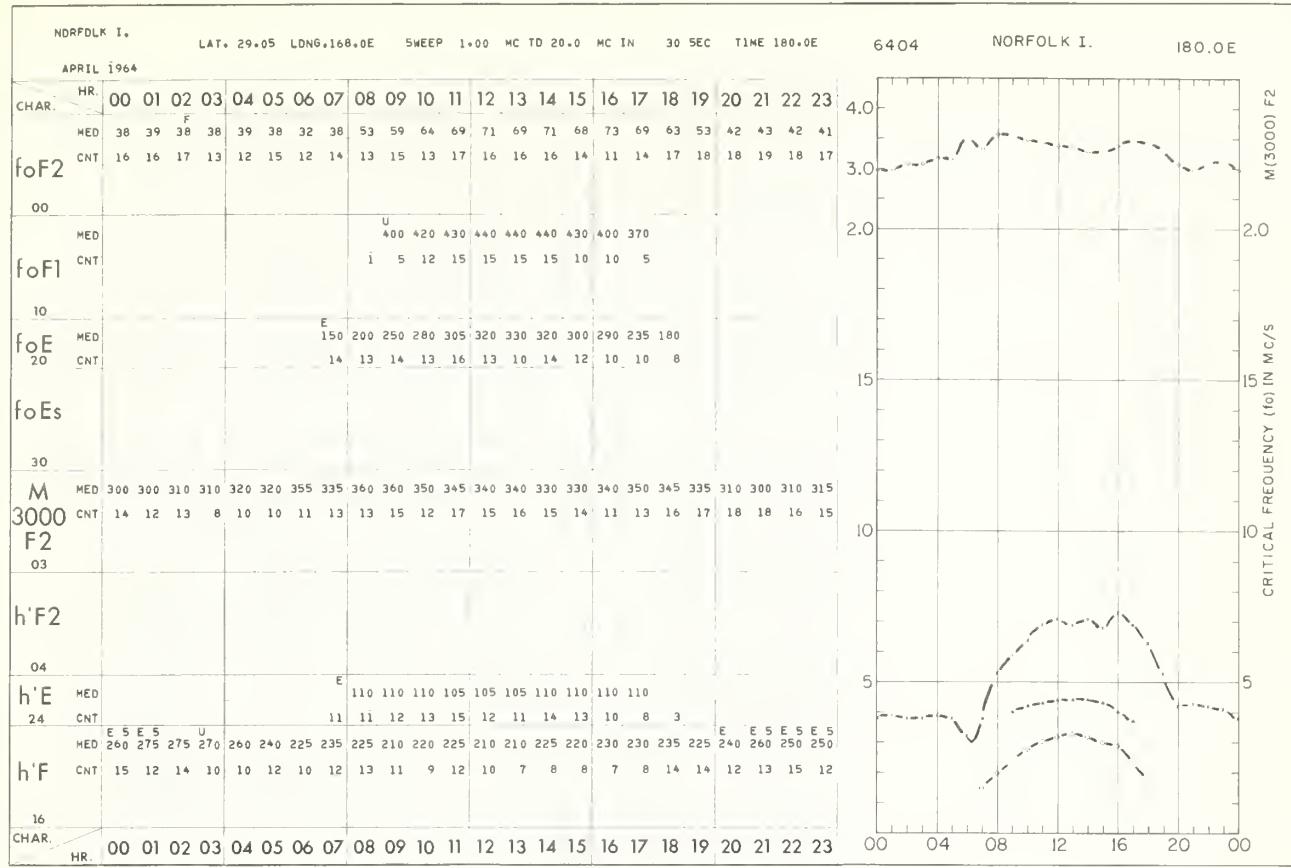


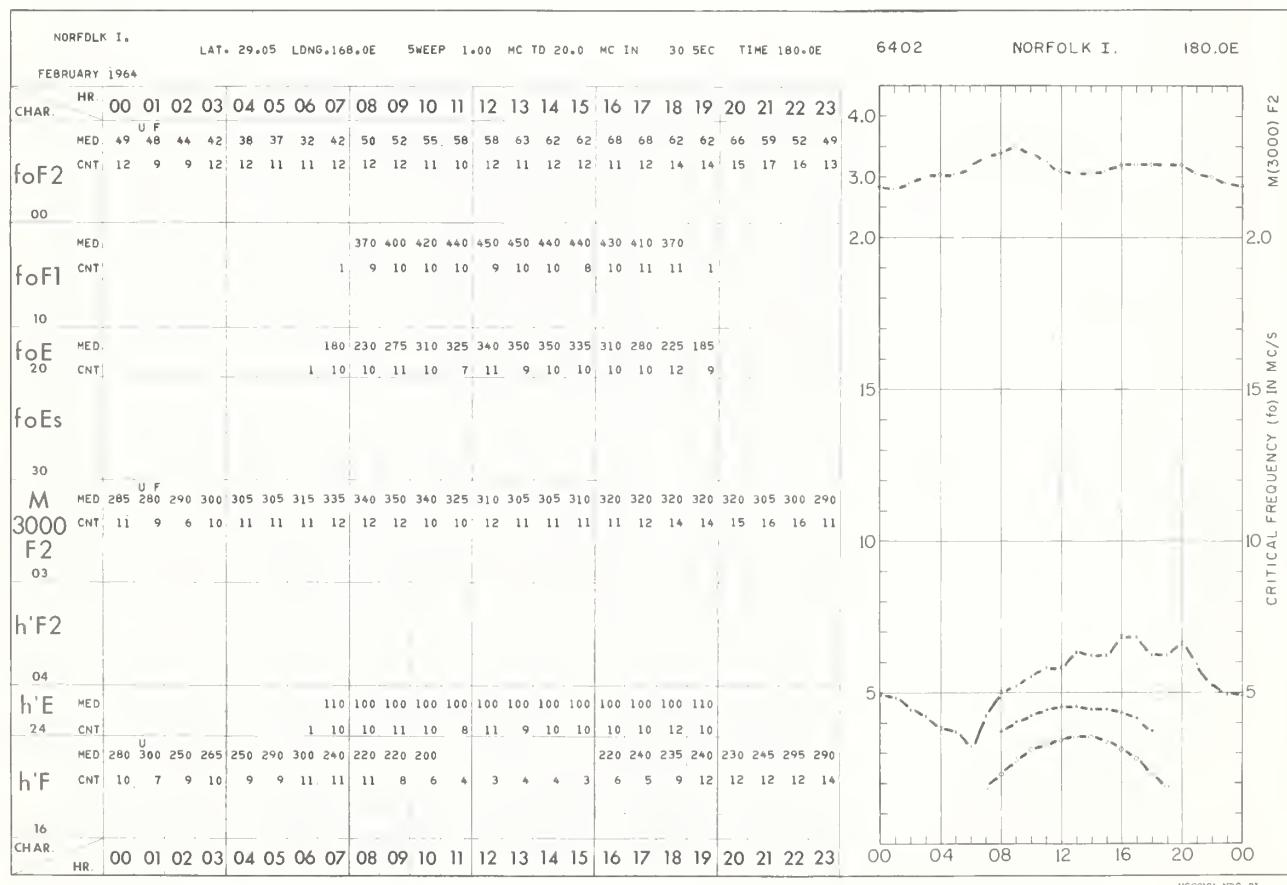
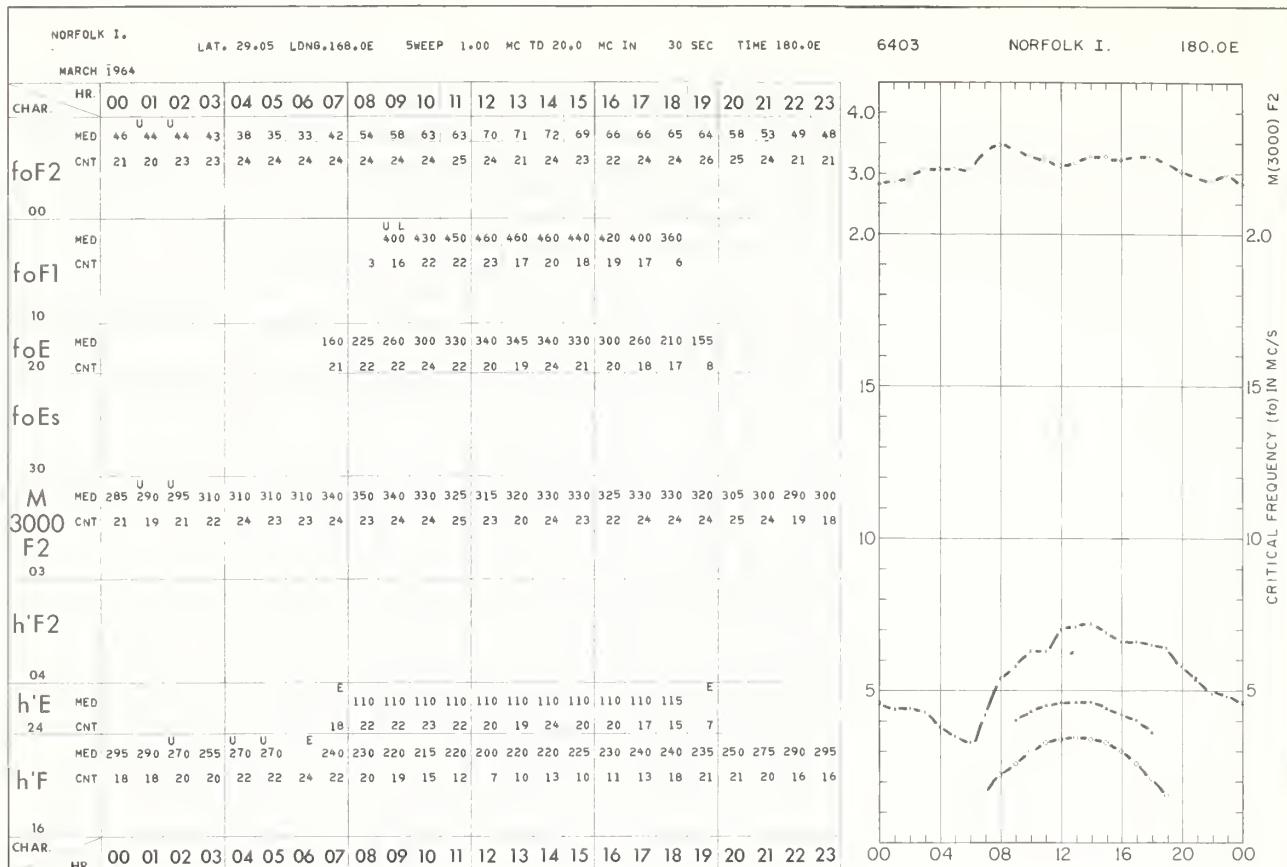












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Nov 06, 2011