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8.1A SAMPLE INTERCHANGE OF MST RADAR DATA FROM THE URBANA RADAR

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INTRODUCTION

As a first step in interchange of data from the Urbana MST radar, a sample tape has been prepared in 9-track 1600-bpi IBM format. It includes all Urbana data for April 1978 (the first month of operation of the radar). The 300-ft tape contains 260 h of typical mesospheric power and line-of-sight velocity data.

The tape is available at no cost from the authors at the Aeronomy Laboratory. The header file is reproduced below.

HEADER FILE

The data on this tape are provided in accordance with the MSTRAC project (MST Radar Coordination) of the Middle Atmosphere Program of SCOSTEP (Scientific Committee on Solar-Terrestrial Physics). The remaining files on this tape contain data taken at the Aeronomy Laboratory Field Station, approximately 10 km northeast of the University of Illinois at Urbana (40 deg 10 min N, 88 deg 10 min W). Transmitting frequency is 40.92 MHz and peak transmitted power is approximately 1250 kW. The transmitted pulse width is 20 μs. The antenna consists of 1008 half-wavelength dipole elements divided into three parallel sections. The ground where the antenna is located slopes 1.5 deg to the south of east, so that the on-axis antenna position is off by the same amount. The transmitter and receiver are both connected to the antenna via a gas-filled-tube transmit/receive switch. The receiver system consists of a low-noise broad-band preamplifier, a filter and a single conversion receiver with a bandwidth of 230 kHz centered around 40.92 MHz. The signal is quadrature-phase-detected, and the two components fed through a multiplexer and a 10-bit analog-to-digital converter with a conversion time of 10 microseconds. Data processing is done on a Digital Equipment Corporation PDP-15 minicomputer with a 32 k of core memory. Pulse repetition frequency is 400 Hz and 20 altitudes are sampled. Twenty-five consecutive samples from each altitude range are coherently integrated so as to give an integrated sample each 1/8 sec. Autocorrelation functions are calculated on-line with 12 lags 1/8 sec each. The correlation functions are then incoherently integrated for one minute. These one-minute averaged autocorrelation functions are stored for post-processing. Scattered power and line-of-sight velocity are calculated from the autocorrelation function and stored on floppy disk. The files on the floppy disk were used to make this tape.

Each file has the following format.

Title String	April 3, Power (Logplot)
Start Time Hours	13
Start Time Minutes	46
Number of Minutes in File	120
Minimum Value	6.28
Maximum Value	7.58
Average Value	6.53346485
Base Height (km)	57
Data Data Data Data ...	635 647 645 695 ...

Data are stored height-by-height, first minute to last. The first 120 data points correspond to minutes 1 to 120 for the altitude (base height + 1.5 km). The next 120 points correspond to minutes 1 to 120 for (base height + 3.0) km. This continues on for each height until (base height + 30) km is completed. The height resolution is 1.5 km.

Note: Data stored on this tape are 100 times greater than the actual data. This was done to allow an integer format without loss of precision. Simply divide each data value by 100 to obtain the proper values (power-bels, velocity-m/s). Additional information which may prove useful.

Label = (M, NL)
DCB = (RECFM = FB, LRECL = 80, BLKSIZE = 4000)
EBCDIC
9 Track
1600 BPI
129 Data Files

Questions concerning these data, and requests for additional data, should be made to Prof. Sidney A. Bowhill, Director, Aeronomy Laboratory, Department of Electrical Engineering, University of Illinois, 1406 W. Green Street, Urbana, Illinois 61801, USA. The remainder of this file contains a menu of the tape.

FILE	DATA	STARTTIME	DATE
1	Power	1346	4-3-78
2	Velocity	1346	4-3-78
3	Power	950	4-4-78
4	Power	1158	4-4-78
5	Power	1406	4-4-78
6	Velocity	950	4-4-78
7	Velocity	1158	4-4-78
8	Velocity	1406	4-4-78
9	Power	1206	4-7-78
10	Velocity	1206	4-7-78
11	Power	517	4-10-78
12	Power	717	4-10-78
13	Power	917	4-10-78
14	Power	1141	4-10-78
15	Power	1632	4-10-78
16	Velocity	517	4-10-78
17	Velocity	717	4-10-78
18	Velocity	917	4-10-78
19	Velocity	1141	4-10-78
20	Velocity	1632	4-10-78
21	Power	509	4-11-78
22	Power	800	4-11-78
23	Power	1000	4-11-78
24	Velocity	509	4-11-78
25	Velocity	800	4-11-78
26	Velocity	1000	4-11-78
27	Power	504	4-12-78
28	Power	704	4-12-78
29	Power	904	4-12-78
30	Power	1124	4-12-78
31	Power	1324	4-12-78
32	Power	1524	4-12-78
33	Power	1742	4-12-78
34	Velocity	504	4-12-78
35	Velocity	704	4-12-78

36	Velocity	1124	4-12-78
37	Velocity	1324	4-12-78
38	Velocity	1524	4-12-78
39	Velocity	1742	4-12-78
40	Power	514	4-13-78
41	Power	714	4-13-78
42	Power	1016	4-13-78
43	Power	1216	4-13-78
44	Power	1416	4-13-78
45	Power	1655	4-13-78
46	Velocity	514	4-13-78
47	Velocity	714	4-13-78
48	Velocity	1216	4-13-78
49	Velocity	1416	4-13-78
50	Velocity	1655	4-13-78
51	Power	537	4-14-78
52	Power	737	4-14-78
53	Power	937	4-14-78
54	Power	1151	4-14-78
55	Power	1351	4-14-78
56	Power	1551	4-14-78
57	Velocity	537	4-14-78
58	Velocity	737	4-14-78
59	Velocity	937	4-14-78
60	Velocity	1151	4-14-78
61	Velocity	1351	4-14-78
62	Velocity	1551	4-14-78
63	Power	1221	4-18-78
64	Power	1421	4-18-78
65	Power	1621	4-18-78
66	Velocity	1221	4-18-78
67	Velocity	1421	4-18-78
68	Velocity	1621	4-18-78
69	Power	504	4-19-78
70	Power	704	4-19-78
71	Power	904	4-19-78
72	Power	1113	4-19-78
73	Power	1313	4-19-78
74	Power	1513	4-19-78
75	Power	1726	4-19-78
76	Velocity	504	4-19-78
77	Velocity	704	4-19-78
78	Velocity	904	4-19-78
79	Velocity	1113	4-19-78
80	Velocity	1313	4-19-78
81	Velocity	1513	4-19-78
82	Velocity	1726	4-19-78
83	Power	518	4-20-78
84	Power	718	4-20-78
85	Power	918	4-20-78
86	Power	1156	4-20-78
87	Power	1356	4-20-78
88	Power	1556	4-20-78
89	Velocity	518	4-20-78
90	Velocity	718	4-20-78
91	Velocity	918	4-20-78
92	Velocity	1156	4-20-78
93	Velocity	1356	4-20-78
94	Velocity	1556	4-20-78
95	Power	454	4-21-78

96	Power	654	4-21-78
97	Power	854	4-21-78
98	Power	1131	4-21-78
99	Power	1331	4-21-78
100	Power	1531	4-21-78
101	Power	1741	4-21-78
102	Velocity	454	4-21-78
103	Velocity	654	4-21-78
104	Velocity	854	4-21-78
105	Velocity	1131	4-21-78
106	Velocity	1331	4-21-78
107	Velocity	1531	4-21-78
108	Velocity	1741	4-21-78
109	Power	441	4-24-78
110	Power	641	4-24-78
111	Power	841	4-24-78
112	Power	1109	4-24-78
113	Power	1509	4-24-78
114	Power	1719	4-24-78
115	Velocity	441	4-24-78
116	Velocity	641	4-24-78
117	Velocity	841	4-24-78
118	Velocity	1109	4-24-78
119	Velocity	1309	4-24-78
120	Velocity	1509	4-24-78
121	Velocity	1719	4-24-78
122	Power	444	4-25-78
123	Power	644	4-25-78
124	Power	844	4-25-78
125	Power	1054	4-25-78
126	Velocity	444	4-25-78
127	Velocity	644	4-25-78
128	Velocity	844	4-25-78
129	Velocity	1054	4-25-78