

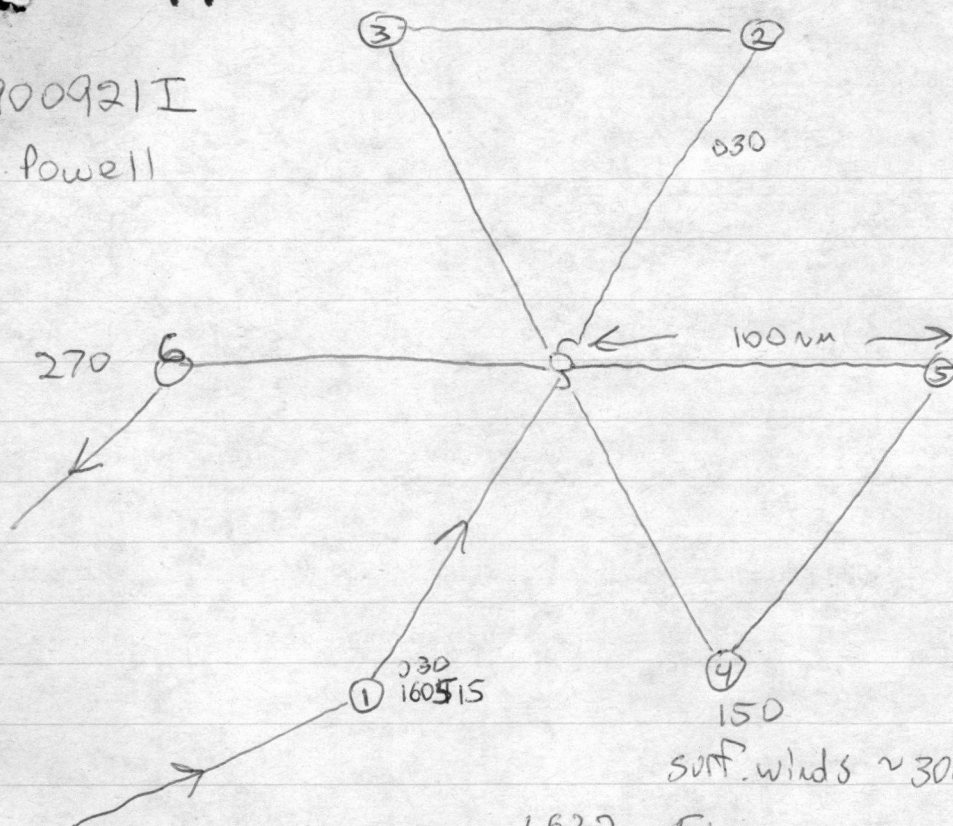
19900921I-SFMR

1/2

900921I

M. Powell

17.9 50.3
NW/5



surf. winds ~ 300° SW of center

1622 Fix

Photography from
Station #5 Propsonde

35mm ASA 200 Kodacolor

1627 sun plint near center

1629 STATION SWIM in center

no white caps to determine winds except to SW of center
then weak winds + cloud obscuration made it difficult

1642 wt. caps very short lined (against swell?) ~ 120°? ^{WD SFC}

1647 near band of conv. cells oriented NNW SSE

higher off. winds

1652 070 WD SFC

1655 090 WD SFC

1657 075

1658 turn to 270°

1700 090

500' Descent 1701

170930 end of descent to 80m Fume 17 ^{looking} _{APT.}

171230 WD SFC 090°

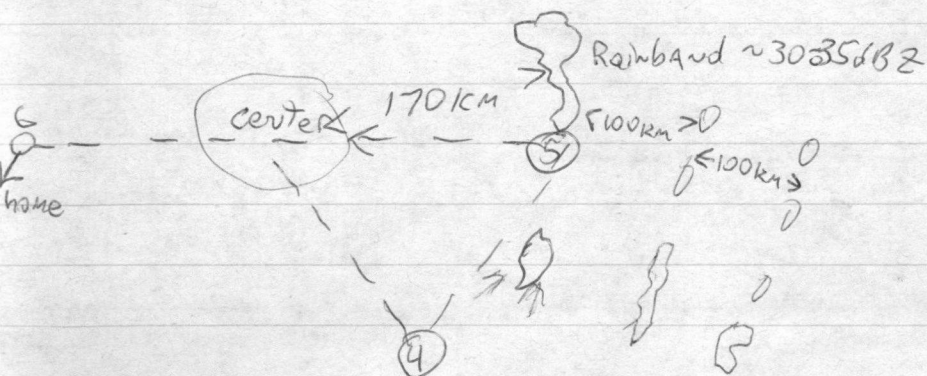
172130 turn to 150

1727 060 WD SFC

1746 1004 mb P_{SFC} 1749 fix

2/2

M. Powell

900921I ~~TD~~ TD

1756 Trk 150 to SE of center

1759 240° WD SFC

1800 S extent of band ~ 80 km ahead

1804 WD SFC 240°

1809 WD SFC ~ 260° BAND PASSAGE

1812 WD SFC ~ 240

1814 WD SFC ~ 210 inflow to band (?)

1816 TAVG. 26.6

1822 195° WD SFC

182830 TURN @ PT. 4

183000 Hdg. 030 in

183030 in middle rainband

183607 190 WD SFC

184100 190 WD SFC

1910 135 WD SFC Hdg. 270

1919 140 WD SFC

1955 $\frac{270}{315}$ 315° WD SFC

2002 330° WD SFC

2019 340° WD SFC

Frame 19 MAMATS from
inner side of middle
rainband
(somehow went thru
it twice)

900921 Z

1602 - afe scattered whitecaps
afe WD = 330 SPWS = 10 kt
PLWD/WS = 270/13

1610 afe WD = 300 SPWS = 7 kt
PLWD/WS = 290/9

cloud tops at 1450 m

1614 afe WD = 320 SPWS = 6.1 m SST = RD = 25.5
PLWD/WS = 025/5

1616 SPWS = 18 kt afe WD = 070
19 SPWS = 6 kt 060
040
PLWD/WS = 116/8

1620 afe wind near cal SPWS = 6 kt
PLWD/WS = 110/3 RD~~SST~~ = 25.9
26.1
17°17'0 50°51.8 SST = 28.5

1622 PLWD/WS = 209/2

1625 RD = 26.3

1630 θ_e in center = 360 K

1635 afe WD = 130 SPWS = 0.
T_{ant} = 26.8 PLWD/WS = 119/11

sfc looks mottled, like swell from
2 or 3 different directions are interacting

1647 sfc WD = 080 $SPWS = 1$
FL WD/WS = 095/12

48 sudden increase in sfc WS
 $SPWS = 6$ kt

1650 $SPWS = 5.5$

sfc wind estimates seem a bit low
now, after maneuvering in center
 $SPWS = 8$ kt vis est = 15 kt
FL WD/WS = 102/13
many whitecaps

1655 sfc $SPWS = 16$ kt $FLWD = 080$
vis sfc est = 20-25 kt

	1500	1500		25.7 WS	De
		1200		25.8	
	1150		25.5	26.6	
	750	760	26.5 26.5	27.0	25-24
		550		27.3	
	250	350		27.4	28
	151			27.6	29
500'	170	180		27.6 (27.6)	29 (25) 36
250'	80			27.1	27
				27.8	27 076
170930	80			27.7	25 079
				SSR = 28.0	

old base = 600m

1714 SFWS ≈ 5.4 no ext + descent ≈ 24 kt
PLWDWS $\approx 083/21$

1730 afe WD $= 060$

1812 afe WD $= \overset{240}{120}$ SFWS ≈ 7.8

1815 wind shift as we pass S. end of band
afe WD $= 210$ SFWS $= 6.3$
PLWDWS $\approx 245/24$ SST ≈ 25.5

1823 afe WD $= 190$ SFWS $= 8.4$
PLWDWS $\approx 250/25$

1833 afe WD ≈ 220 SFWS ≈ 3.5 no ≈ 20 kt
PLWDWS $\approx 240/28$

what is effect of sunlight on SFMR?
winds seem lower when cirrus arrive overhead

1845 new cal - old winds too weak

old	1845 new	2017	2648 hi
47.60	47.00	47.38	47.46
54.84	54.33	54.53	54.83
56.40	56.00	56.38	56.28
59.93	59.28	59.59	58.95
58.84	58.09	58.57	58.52
53.83	53.29	53.54	53.72
winds too low	↑ winds too hi		

after cal, noise in rain rate is lower
3-5 mm/hr $\rightarrow$ 0 $\rightarrow$ 1.0 mm/hr

how about an auto cal?

- * step thru different WS, SST guesses
and minimize RR and σ_{rr}
- * also average TB¹⁵ first

1855 afc WD = 170° SFWS = 10.5 SST = 25.4
P2WD/WS = 210/20

fluctuations in wind much smaller for SFWS > 10 m/s
in between bands, no clouds below
AC & Ci above
 $D_e \approx 351$ as opposed to 362 near center at
top of stratoc

1905 alt Cu base just above us ~ 2000 m

1913 afc WD = 180 SFWS = 11.4
P2WD/WS = 183/20

1923 good band penetration
SFWS = 12.5 afc WD = 180
P2WD/WS = 176/12 kt
vis est afc WS = 20 kt

1935 afc WD = 180 vis est WS = 12-15 kt SFWS = 9.6
P2 = 190/10

small CB's tilting toward S with height

1939 FL 180/8 sfc SFWS = 10.9 m/s
vis est WS = 10 kt WD = 180
 $\theta_e = 362$

scattered whitecaps $\Rightarrow$ 12-14 kt

1945 FL 010/8

$17^\circ 15.2'$ $50^\circ 46.7'$

vis sfc = calm, no whitecaps SFWS = 9.3

* also improve atm attenuation transmissivity calc.

assume const wind, calc change in δ , τ , T_B with alt during descents & ascents

1954 FL 002/10 vis sfc = calm SFWS = 7.5

1956 sfc WD = 3/5 vis WS = 7-10 kt SFWS = 10.0

FL WD/WS = 0/6/10

min-yang RR, ^{der} won't work!

20 21 ch

2000	24.5	SST = 28.0
3150	23.8	
3950	23.0	
4500	22.6	
5000	22.5	
5500	22.2	
5900	22.5	
6300	22.8	

how about a SFMR antenna on back of TA ant
& rotate it about fuselage?

* there is a drift in the calibration constants
of the SFMR - they decrease, then increase
in course of the 90% hr flight

lower freqs change least, higher freqs
change most

change of .5 - ~~to~~ .7 causes a wind
speed change of 15 kts (7.5 m/s)

look at changes in ant Tant + others - see if
coef is the right one

* calibrations vary more ~~&~~ within a flight
than they do from flight to flight