

RADAR PREFLIGHT CHECKLIST

FLIGHT # 800805I1 AUG 5 1980

A.C. # 43RF

OPERATOR Marks/Lewis

RADAR TECH Fennel

NUMBER OF DIGITAL MAGNETIC TAPES ONBOARD 40

NUMBER OF VIDEO TAPES ONBOARD 10

NUMBER OF TAPE LABELS ON BOARD 40

COMPONENT SYSTEMS UP AND CHECKED.

RDSC
COMPUTER
DMTR1
DMTR2

VTR
DSC1
DSC2
SCOPES

just
DSC1 down after
take off

NO
LF
TA

*Tail down at take off - AFC
Problem. Ba Working on it.*

Time correction between radar time and digital time 0 *no tail
its up and then
down.*

RADAR POSTFLIGHT SUMMARY

NUMBER OF DIGITAL TAPES USED DMTR 1 4
DMTR 2 3

NUMBER OF VIDEO TAPES USED 2 *Cassettes*

SIGNIFICANT RECORDER DOWN TIME (other than for tape changes).

DMTR: LF 10-12 min.
NO 10-12 min
TA no tail

*and radar computer needed to be rebooted.
DSC2 went down on approach to
first penetration 1126 up to 1134.*

VTR: LF 10-12 min
NO 10-12 min.
TA no tail

OTHER PROBLEMS: (stabilization, interference, etc.)

*Digital Scan converter kept going down intermittently and
would have to reboot radar computer. DSC1 out the whole
flight. Tail out the whole flight. (over)*

Radarr DMTR Status panel

DMTR 1 & 2 Lights

were on sometimes
and off sometimes.

Had to check tape recording
by eye.

Also DMTR 1 and 2 lights
were reversed

DMTR 1 was indicating DMTR 2 status
and vice versa.

tail down at take off - AFC
Problem. Working on it +
notail
take off
down

Time correction between radar time and digital time
0
tail down at take off - AFC
Problem. Working on it +
notail
take off
down

RADAR POSTFLIGHT SUMMARY

NUMBER OF DIGITAL TAPES USED	DMTR 1	4
DMTR 2	3	
NUMBER OF VIDEO TAPES USED		2

SIGNIFICANT RECORDER DOWN TIME (other than for tape changes)	DMTR:	LF	10-15 min.
		NO	10-15 min
		TA	No tail
OTHER PROBLEMS: (stabilization, interference, etc.)	VTR:	LF	10-15 min
		NO	10-15 min
		TA	No tail

first penetration 1156 up to 1134
> DSC 5 went down on approach to
and radar converter needed to be reloaded.

Radarr scan converter kept going down intermittently and
would have to reboot radar converter. DSC 1 out the whole
flight. (over)

Form J-2 Cloud Physics Project Scientist Operational Checklist

DATE 80/08/05 AIRCRAFT 43RF FLIGHT 800805I

A. INSTRUMENT STATUS AND PERFORMANCE

	PreFlight	InFlight	PostFlight	Remarks	Data Units Collected
Johnson Williams	✓				
Nimbliometer	✗				
Lyman Alpha	✗				
U. V. dewpoint	✓				
Foil Impactor	✗				
Formvar	✗				
Knollenberg	✓	✓			
Raindrop	✓	✓	✓		
Cloud Droplet	✓	✓	✓		
FSSP	✗				
Data System & Displays	✓	✓✗	✓✗		
Ice Particle Counter	N/A				
Mee	(low level)				
ERT					
CO ₂ Radiometer	✗				
Microwave Radiometer	✗				
Aerosol	✓				
Filters	✗				
Bulk Water	✗				
INC	✗				
CCN	✗				

B. REMARKS

* Tape drive kept running take off spool at end. Tapes had to be manually rethreaded before rewinding.

NHEML RADAR TAPE LOG

FLIGHT 800805011 AIRCRAFT 43RF

OPERATOR Marks/Lewis SHEET 1 OF 1

TAPE #	TIME ON	TIME OFF	SOURCE RADARS			REWOUND?		COMMENTS
			NO	TA	LF	YES	NO	
DT1	105245	122429	X		X		X	off for problems then ~20 min again at 1084 elev. 3.5 at 1500 ft
DT1				X			X	down 1121 DSC2 prob. on 113426 DSC2 up wave
VT1	105857	150500				9993 counter at end		off at 1120 when DSC2 temp. down on ~1106
	120500					display frozen		down 112221 DSC2 prob.
	120544					unfrozen		on 113449 DSC2 up
	131355					scan converter down.		penetration at 113830
	131415					scan converter reset		peak wind 82 ms ⁻¹
	134550					scan converter froze at beginning of 4th penetration.		double peak second 81 ms diameter 20 mi heading 09
	134910					VTR off		8 mi thick elev. 2.5°
	135004					VTR on		
	121830					scan converter froze		122030 update on.
DT1	122443	132250	X		X		X	beginning has some data on that we don't know what it is we were fooling with. TA maybe good. Start at beginning of the second run.
						DT1 had no ring in it. But it still appeared to record.		1239 getting spoken on LF tape ran out at ^{near} end of penetration. (no ring in tape)
DT2	133128	142515	X		X		X	ended with about 1/3 tape left before data started " 135936
						ended with about 1/3 tape left before data started " 135936		at end of 3rd penetration
DT2	142515	151304	X		X		X	
VT2	151030	180100				off at counter #38		counter set to 0000
DT3	151304	161255						

NHEML RADAR LOG

RADAR DOWN-TIME LOG

ITEM	TIME DOWN	TIME UP	Allan 5 Aug. 1980 PROBLEM #1
Penetration #1 FL ~1500 m (RA)			
1126	HDG 255		
	eye wall just to left of FT. wind 107 / 107.5 mph		
1127	outer eyewall band ~10 nmi thick		
112845	eye fix from nose	bearing 300° 50 nmi	
113117	eye fix from nose	bearing 100° 40 nmi	
113400	eye fix from nose heading 15	out band diameter ~8-10 nmi 20° 30 nmi	
	digital back up 113420		
114030	outer open eyewall	340-350°	
	inner eyewall strongest at 114117 bearing 80° 5-8 nmi		
WNW-NW quadrant just to the right of our flight track seems strongest first pass.			
	Center 15.92	70.36-114259	0.9 kts min. wind speed.

ITEM LIST: VTR, DMTR1, DMTR2, COMP, ROSC, LF, NO, TA, DSCI, DSC2

114450 open eyewall 270° bearing 20 nmi
seems to be where rain band starts to

AUG 5 1980

NHEML RADAR TAPE LOG

FLIGHT 800805 I 1 AIRCRAFT 43RF OPERATOR Marks/Lewis SHEET 2 OF 2

TAPE #	TIME ON	TIME OFF	SOURCE RADARS			REWOUND?		COMMENTS
			NO	TA	LF	YES	NO	
D2T3	163720	172748	X		X		X	start at beginning of southbound penetration northbound Scan Converter down M628
								VT2 stopped at 163224 878 on Counter
								163740 turned on VT2
								1641 turned STC off LF
								164250 STC turned on again (L)
								STC seems to be bad on LF
D1T4	175755	~1838	X		X		X	? broke pattern at 175050 kept tape running on ferry back at 15000

114555 eyewall has
upside down Coma or "6" structure

Allen 5 Aug. 1980 #2

~~South~~ ^{during} penetration of south side of outer eyewall
good nose data

"eyewall looks like a hexagon" B. Lewis

115020 rainbands prevalent bearing 240-330°

weak area of eyewall moving 20-60 nmi.

toward NE side of storm

peak wind stronger on north side

south side peak wind ~100 kts

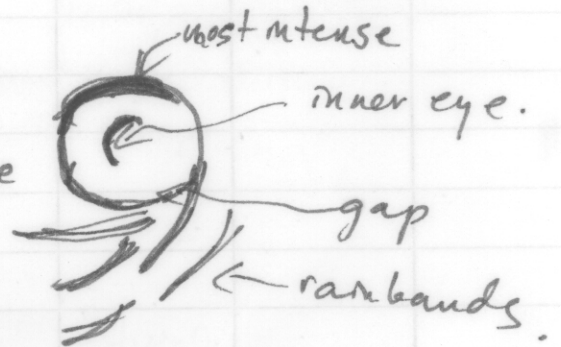
first pass impressions: rainbands on east ^{side} of storm moving toward

(marks)

1500 m

NE quadrant feeding into strong region to North.

inner eye has half moon structure



Penetration #1 FL 1500 m (RA)

1126 HDG 295

eye wall just to left of FT. wind 107 / 15 mi

1127 outer eyewall band ~10 mi thick

112845 eye fix from nose bearing 300 50 mi

113117 eye fix from nose bearing 100 40 mi

113400 eye fix from nose heading 15
out band diameter ~8-10 mi
200 30 mi

digital back up 113420

114030 open ^{outer} eyewall 340-350°

inner eyewall strongest at 114117
bearing 80° 5-8 mi

WNW-NW quadrant (just to ~~the~~ right of our flight track)
seems strongest first pass.

Center 15.92 70.36-114259 0.9 kts min. wind speed.

TEM LIST: VTR, DMTR1, DMTR2, COMP, ROSC, LF, NO, TA, DSCI, DSC2

114450 open eyewall 270° bearing 20 mi

120

being 30-40 mi bearing 240-330 30 mi
peak wind 186/53 kts
246 prevalent winds bearing 240-330 30 mi

114555 eyewall has
upside coma or "b" structure
down
during south penetration of south side of outer eyewall
good nose data
Allen 5 Aug. 1980 #2

"eyewall looks like a hexagon" B. Lewis

115020 rainbands prevalent bearing $240-330^\circ$
20-60 nmi.

weak area of eyewall moving

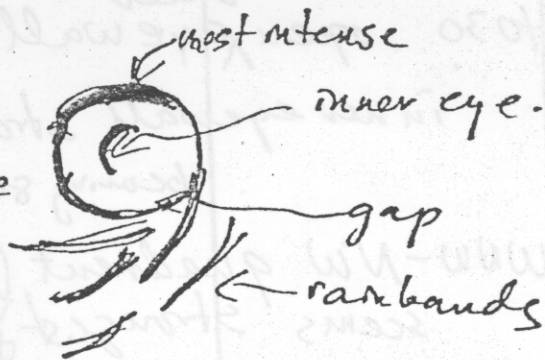
toward NE side of storm

peak wind stronger on north side

south side peak wind ~ 100 kts

first pass impressions: rainbands on east ^{side} of storm moving toward
(marks) NE quadrant feeding into strong region
1500 m to North.

inner eye has half
moon structure



Rainband Experiment. 43 RF

elev. $\sim 2.5^\circ$ #3

Allen 2nd penetration 122815

Allen
5 Aug. 1980

from the west
outer eyewall ~ 10 nmi wide

122939 ~ 40 nmi wide

nose \rightarrow inner eyewall about 12 nmi (inside)
outer eyewall a little stronger

winds
123030 030 / 132 kts
1530 m (RA)

nose seems
to be showing
structure (east)

028 / 75.2 m s^{-1} max gust in updraft region (123145)

123256. between eyewalls

LF-open eyewall bearing 30° 30 nmi 123345
where rainbands come in.

nothing at inner eyewall

1240 East - ~~SE~~ - SW side of eye wall
pretty ragged

124156 SE wall 188 / 110 kts

1243-1246 hitting good SE-E rainband
farther rainband 40 nmi farther out.

bearing 330° 40 nmi 124422 (RA) 1500 m

peak wind 186 / 53 m s^{-1}

1246 prevalent rainbands \rightarrow bearing $240-330$ 30 nmi - 50 nmi

STORM

1247 rain bands appear to be ~ 30 nmi apart
here
winds between band $\sim 180 / 40 \text{ m s}^{-1}$

125117 getting rainband out at 410 nmi
bearing

VTR
(921) counter 1252:00

end 2nd penetration ~ 1254

125350 - 125420 1.0° elev. sea clutter to 60 nmi.

125445 set level 1 to 2 counts

125518 " " to 1 "

hitting water at 90 nmi. \leftarrow check elev. $\frac{I}{I} \text{ tumble } 1500'$

125588 set level 1 back to 3 counts

125723 set elev. back to 2.5°

1258 flying between bands toward SW
 $1500'$ 810 m (RA)

3rd penetration attempt at 1500'
setting elevation angle to 3.0° for low-level
penetration to minimize sea clutter

130257 still appears to be break in east side
eye wall still has comma appearance

Allen 5 Aug. 1980
#4

130305 moderate rain at a/c

LF 3 full of sea clutter at low-level.

1706 east side appeared to close.

130954 no rain at a/c 442m near S. eyewall.

South eyewall penetration

wind - 200/6ms (13105)

205/61 (131140)

sustained near 50 m s^{-1} 1312.36 out of eye.

eyewall $\sim 8-10$ nmi wide
40 nmi wide

eyewall closed at 1500' pass.
weak region of eye wall to south

131715 set bevel one to 4 counts
at penetration of north eye wall

065 / 80.8 m s^{-1} ~ 131825 } a good one

063 / 83.2 131850

sustained 80 for about $1\frac{1}{2}$ min.
a couple of 90's (suspect)

Tape ran out ~~at~~ near end of penetration.

132700 playing with elev. went to 40°

132800 " " 35°

132900 " " 30°

DZTI didn't have a range in it.

4th penetration 5000' from north.
1480m (RA)

134255 elev. to 25°

level one set back to 3 counts.

134400 switched video to nose.

134440 " " back to LF

3 rainbands starting near farthest one moving ik.
eyewall winds

134550 scan converter froze can't repair
till eye.

135004 put data readout on VTR
till we can start radar Computer.

135410 eye ~~at~~ bearing 22° 16 nmi.
range

still double eye structure

40 nmi eye diameter - width of eyewall ≈ 10 nmi

eye still open to SE at this level

inner eye extending over 170° and

strong small band just in side inner eye

RACETRACK #2

Allen 5 Aug 1980
#5

bearing 10° 10nm 135700
135743 out of the eyewall into eye.

135936 reset radar computer started
recording again switched VTR to LF.

eye open for about 10nm
bearing 350° 28nm

1400 fooling around the eye.

Center fix by Billy and I
16.0N 71.78 W 1419.00

15.9 70.3

1143

2.5h

RACETRACK #1

5000' 5th pass ← turned around and went back through the north
eyewall
142515 TIDZ stopped with 1/3 tape left.
1540m (RA) so we could get one whole tape for penetration.

1428 penetrating north eyewall

142900 data recording lights out. I don't think we're recording
scan still updating so VTR should have
penetration.

much smoother penetration this time
rainbands are each pretty bumpy.

Alan says
we're
recording

144237 turned to go back south for 15Z fix.

144500 switched to Nose on VTR
level 4 in eyewall from nose.

14460.5 switched back to LF on VTR

144710 ^{outer} rainband penetration (one just before eyewall)
070/62.5 m s⁻¹ background 58.5 m s⁻¹

1449 Hispanola bearing. 225-270 ~ 80 mi

145200 eyewall penetration ~ 8 nmi width
still has little arc ~~and~~ eyewall inside.

inner wall (arc) and outer wall are closer
145448 ~ 6-8 nmi apart. seemed to be attached
at bearing 60° 10 nmi.

Peak wind
085/85 m s⁻¹

145610 eyewall still seems open to south-SE quadrant.
~ 5-6 nmi separation
inner eye arc growing in intensity of echo
return. (level 4)

1458 bearing 90° ~ 3-4 nmi arc attached
to outer eyewall
no wind peak associated with ^{eye} arc on NW side
of storm.

145900 starting turns for fix at 15Z

2.5° elev.

Allen 5 Aug. 1980 #6

RACETRACK #2

~1500m RA 5000'

151700 Starting toward outer eyewall
still weak portion of SE eyewall
eyewall closed at level 1

1519 NW quadrant really contorted.
appears as if 1st outer rainband
connects to ~~inner~~ ^{outer} eyewall on WNW side
of storm.

LF bearing 260° 20m, 152000
Billy says it looks like a triangle!!!
peak wind level 3's } 060/85 ms⁻¹ 152125
double max } down to 38 ms⁻¹ in between
058/86 ms⁻¹ 152215

152400 in very heavy rain right close to level 3's
beyond wind max

1525 out of outer eyewall
outer eyewall about 10-12 mi thick (thicker)
winds between rainbands 062/52-53 ms⁻¹

152906 entering 1st outer rainband

153210 turning to go South back to eye.

153545 switch to nose for VTR

153630 " " LF " "

back to south

2.5° elev.

turned between 1st and 2nd outer rainbands
153700 back in 1st rainband
going south wind max 060/57

background 062/50⁴⁵

outer eyewall is thicker again

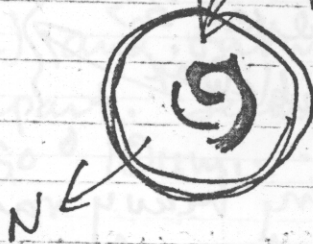
8-10 mi across

154150 LF bearing 3050° 7.5 mi.

154115
Billy
predicts

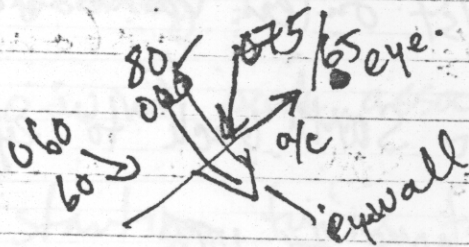
1542 Light rain between bands.

154300 nose shows Punny inner eye
structure at ^{weaker} region to SE



154420 enter outer eyewall very thick
level 3 again ~10 mi

154522 max wind 065/87.6 first max
154620 065/82.0 2nd max



strong eyewall convergence.

154820 in eye again.
tooling around eye

SE eye still weak

Allen
5 August 1980
#7

160700 upped elev. to 9.5° as we
went to 1000' for pressure verification.
weak ^{outer} eyewall to S-SE

160900 nose on Scan Converter for VTR
time check.

161000 back to LF for VTR

outer eye diameter 40 mi.

161100 very weak open eye to SSE
what a jolt going out, at 1000'

161553 in ^{very} heavy rain level 3 on LF
it looked like we hit the same wind max that
we penetrated at 5000' in the last race track.
good level 3's very heavy rain

Scan converter down at ~1628

tooling around at 5000' outside S outer eye wall
between weak rain bands.

163721 started

163840 went to nose for VTR

163920 went to LF

164500 went to nose for VTR

Starting cross-patterns 1640 1500m (RA) 5000'
aiming for same wind max on south side of the storm
this time.

164745 back to LF for VTR

Tape right out
at beginning of crosses.
between 2.0-2.5°

outer Eyewall still weak to S~~E~~ of center
open outer eyewall at level 1

165345 Billy turned off STC and set level
1 to 7 counts.

165507 went to nose for VTR / 165520 back to LF for VTR
165545 back to STC on level 1 / 3 counts

165600 starting penetration of east ^{ENE} outer eyewall

165753 m^{NE} outer eyewall ^{max} winds 115 / 60-70 ms⁻¹
level 3

eye diameter still about 40 mi.

outer eyewall - only 5-6 mi. wide.

170000 winds between 1st outer rainband and outer eyewall
~ 116 / 60 ms⁻¹

170520 starting turn to west.

170718 end of turn heading back in again. ^{toward.} WSW
turned just southwest of 1st outer rainband.
quick switch to nose and back to LF ~ 1710

Billy switched to nose for VTR 171100

back to LF for VTR 171314

1714 moving along outer eyewall
winds 055-060 / 060 ms⁻¹

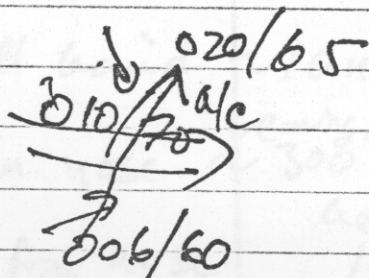
1718 ~~30~~ turning back to ~~about~~ east
through outer eyewall to do 18z fix

Allen 5 August 1980 #8

172251

outer eye wall thickness 10-15 nmi.

level 3's again. eye diameter
max wind ~~070~~/70 ms^{-1} ~ 40 nmi



inner eye wall

173329 diameter of eye look square
 $\sim 35-40$ nmi.

still weak outer eye-wall to SE,
we are heading toward weak area

1735 winds 180/50

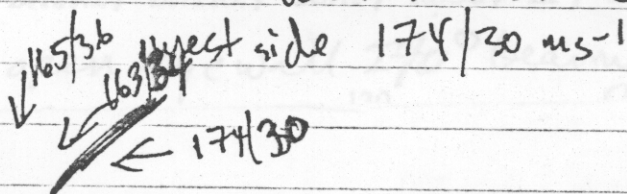
174108 switched to nose on VTR to see

174235 back to LR on VTR. rainbands

weak rainbands to E of storm.

175030 starting Ferry back to San Juan.

174741 winds near 2nd outer rainband



175050 starting climb to to 15,000' for ferry.

1815-1818 some good graupel in the outer bands.