

Appendix J

Operational Checklists

19800805I1-LPS

FORM J-1

On-board Lead Project Scientist Checklist

DATE 8/5/80AIRCRAFT 43RFFLT 800805

A. Participants

Function	Participant	Function	Participant
Lead Proj. Sci.	<u>Black</u>	Gust Probe	
Cloud Physics	<u>Falls</u>	Omega Sonde	
AXBT	<u>Powell</u>	Sys Eng	<u>Lambrecht</u>
Hot Film	<u>—</u>	Data Tech	<u>Fennel</u>
Radar	<u>Lewis/Marks</u>	El Tech	
Flt DIR/MET	<u>McFadden</u>	Other	
Pilot: <u>Turner</u> Eng <u>Rice</u> Cop. <u>Noble</u>			

Time Off 1025Z Location

Time On

Location

B. Past and Forecast Storm Position - Observed Positions

Date	Time	Lat	Lon	Date	Time (Z)	Lat	Lon	MSLP
<u>8/5</u>	<u>122</u>	<u>15.5</u>	<u>70.3</u>	<u>8/5</u>	<u>12</u>	<u>15°55'</u>	<u>70°21'</u>	<u>935</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>15</u>	<u>16°12'</u>	<u>71°28.7'</u>	<u>935</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18</u>	<u>16°30.3'</u>	<u>72°10.9'</u>	<u>935</u>

C. Mission Briefing

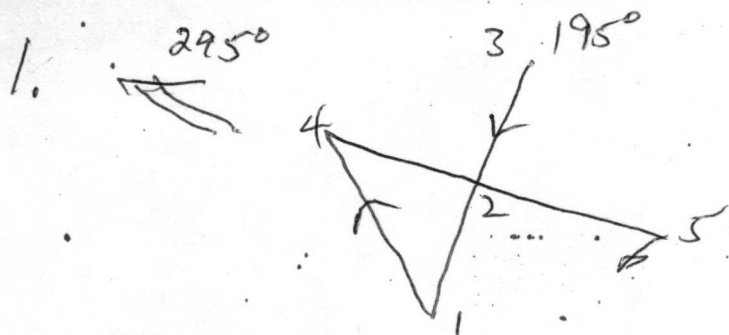
D. Equipment Status

<u>Equipment</u>	<u>Pre Flt</u>	<u>In Flt</u>	<u>Post Flt</u>	<u>Reports Collected</u>
Aircraft	✓			
Radar	✓			
Cloud Physics	✓			
Data Sys	✓			
Omega Sondes	—			
AXBT	no			
Gust Probe	—			
Hot Film	—			
Photography	no at first on 1-25-51/103			
ASDL	✓			

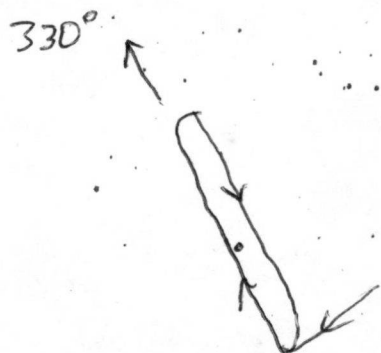
REMARKS

1. R.H.I out just after take-off
2. Delay^{in T.O.} due to data syst. prob (minor) - fixed
3. Conducted test of direct SSR phase patch
come to NHEML; worked great

E. Proposed Flight Patterns

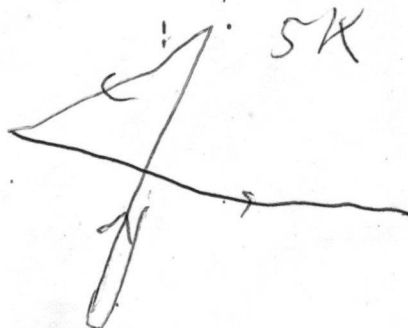
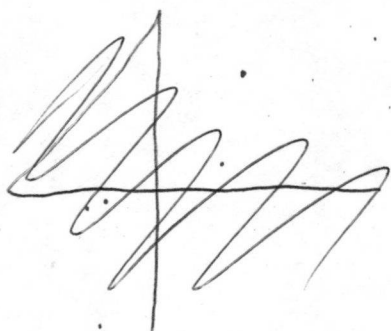
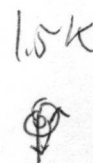
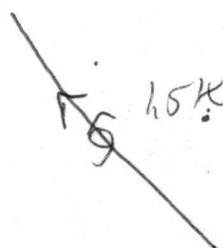
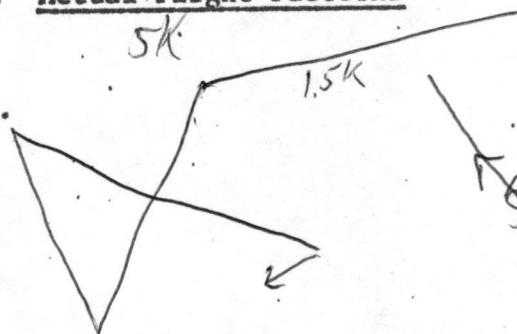


legs 60 n.m. long



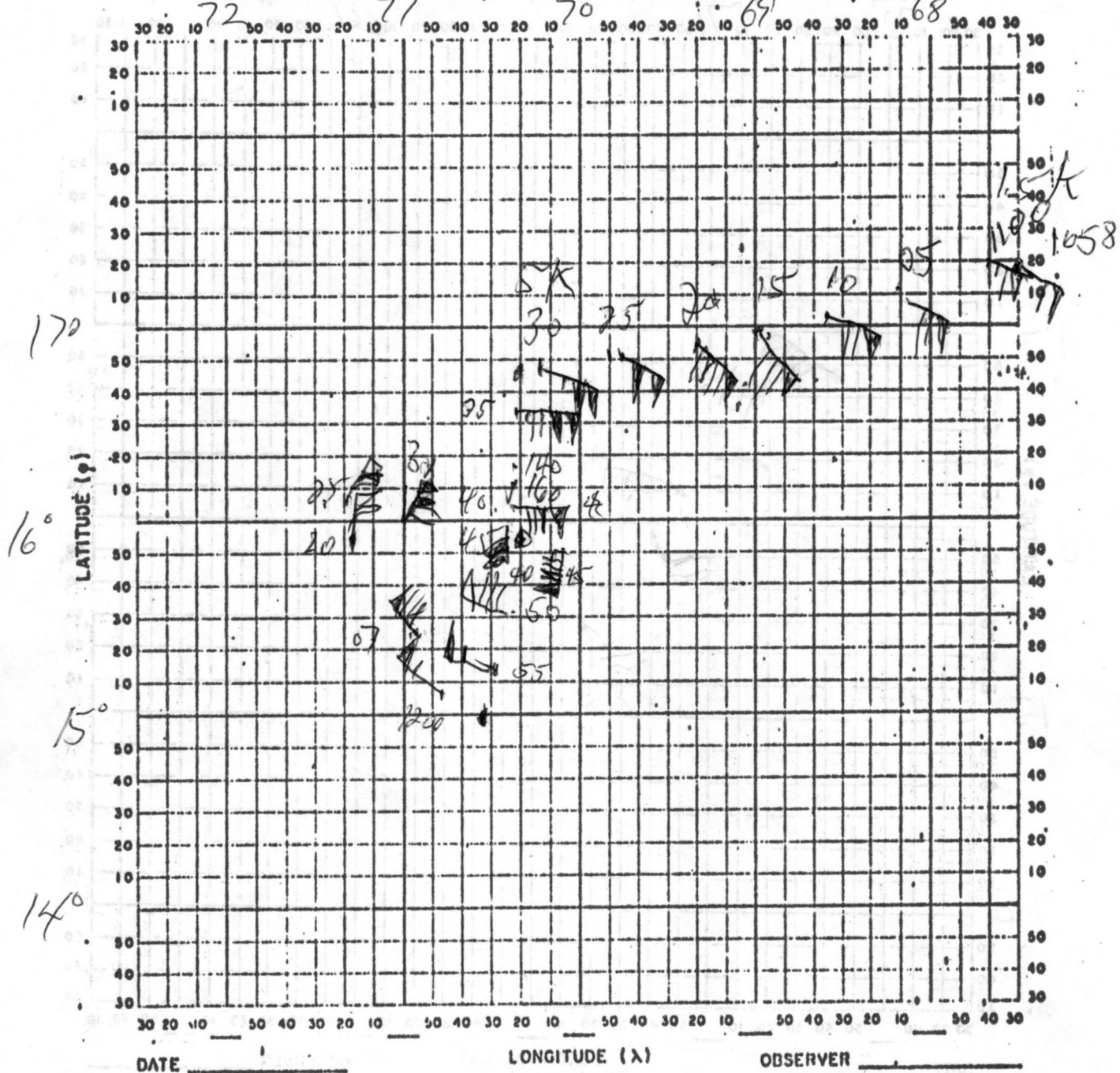
legs 40 n.m. long

F. Actual Flight Patterns



HURRICANE RECCO PLOTTING CHART

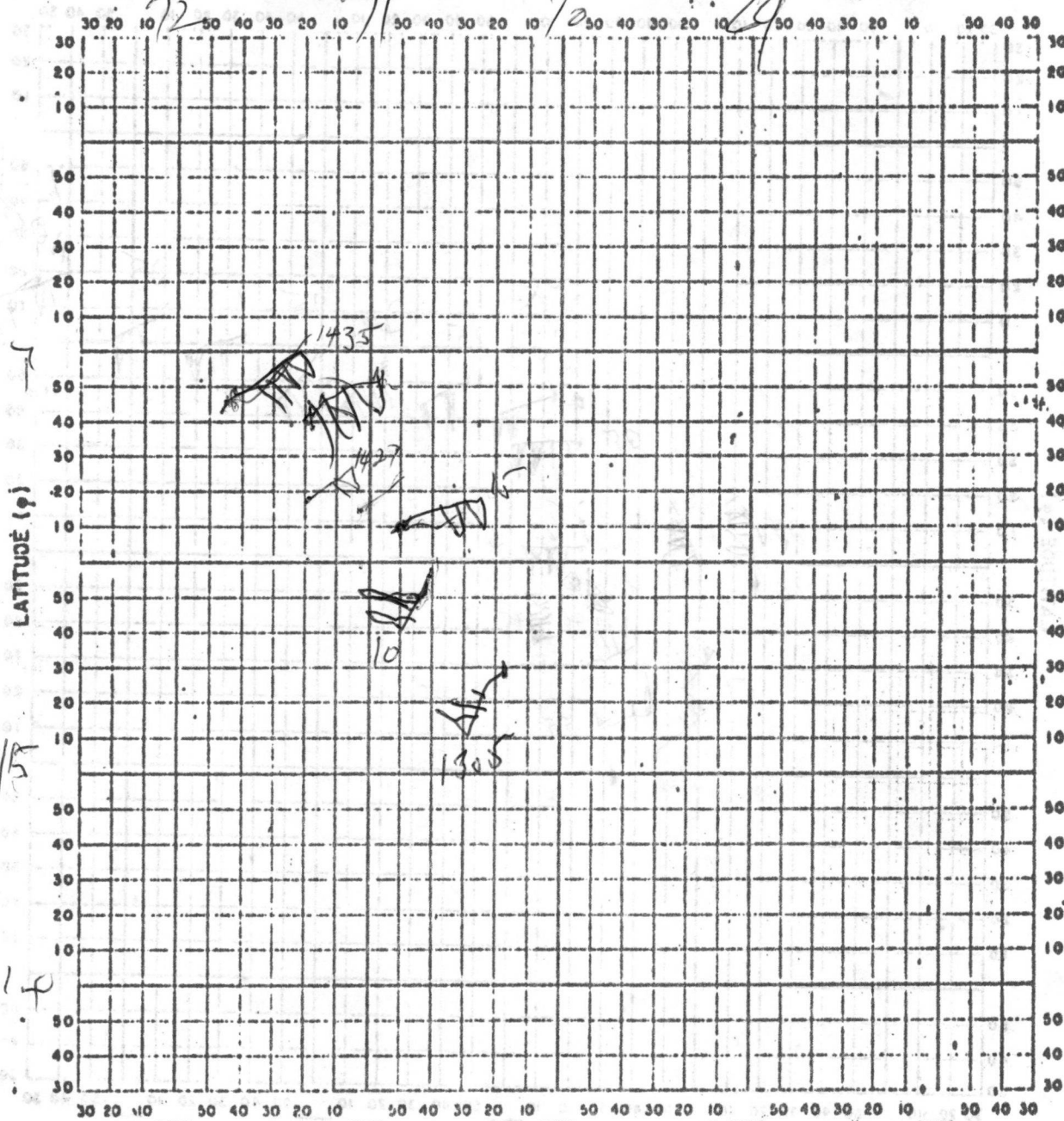
TRUE AT 25° LATITUDE, IN DEGREES AND MINUTES OF ϕ AND λ



NOTE: LABEL FULL DEGREES ACCORDING TO LOCATION OF FLIGHT AREA

HURRICANE RECCO PLOTTING CHART

TRUE AT 25° LATITUDE, IN DEGREES AND MINUTES OF ϕ AND λ



DATE _____ LONGITUDE (λ) _____ OBSERVER _____

NOTE: LABEL FULL DEGREES ACCORDING TO LOCATION OF FLIGHT AREA

FLIGHT DATA LOG

FLIGHT: 800805 43R12 STORM: Allen

TIME: _____ TO: _____

ON-BOARD LEAD PROJECT SCIENTIST: P. Black

Flight summary (include status of instrumentation and recording equipment, as well as any problems, malfunctions or outages with approximate times):

no tail radar
no side camera data
several radar data outages

DATA VOLUME

STANDARD METEOROLOGICAL TAPES: 1

FAST TAPES: n

RADAR TAPES: DIGITAL 7 VIDEO 2 LF ☒ TA ☒ NO ☒

CLOUD PHYSICS/KNOLLENBERG TAPES: 18

FORMVAR? ☒ FOIL? ☒

NO AXBT's? ☒ NO. of DROPS: _____ PRINTOUT? ☒

OMEGA DROPWINDSONDES? ☒ NO. of DROPS: _____

NO NO. of CASSETTES _____ PRINTOUT? ☒ STRIP CHARIS? ☒

PHOTOGRAPHY: VERTICAL? ☒ SIDE? ☒ NOSE? ☒

(IF KNOWN) RATE: 1 per sec RATE: _____ RATE: _____

NO SEEDING MISSION? ☒ FROM THIS A/C? ☒ NO. of FLARES: _____

TEM

TIME DOWN

TIME UP

Alton 5 Aug. 1980

PROBLEM

#1

Penetration #1 FL 1500 m (RA)

1126

HOG 255

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

1127 outer eyewall band ~10 nmi thick

112845 eye fix from nose ^{bearing 0} ~300 50 nmi113117 eye fix from nose ^{bearing 10°} 40 nmi113400 eye fix from nose ^{heading 15} out band diameter ~8-10 nmi
20° 30 nmi

Digital back up 113420

114030 ^{outer} open eyewall 390-350°inner eyewall strongest at 114117
bearing 80° 5-8 nmiWNW-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, DMTRI, DMTR2, COMP, ROSC, LF, NO, TA, DSCI, DSC2

114450 open eyewall 270° bearing 20 nmi

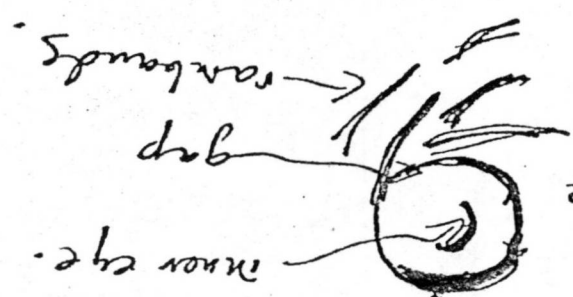
130

114555 eyewall has upside down comma or "6" structure
 during south penetration of south side of outer eyewall
 good nose data
 B. Lewis

"eyewall looks like a hexagon" B. Lewis
 115020 rainbands prevalent bearing 240-330°
 20-60 mi.

weak area of eyewall moving toward NE side of storm
 peak wind stronger on north side
 south side peak wind ~100 kts
 rainbands on east side moving forward
 NE quadrant feeding into strong region to North.

first pass: rainbands on east side
 (marks) 1520 m
 inner eye has half worn structure
 most intense
 inner eye.
 gap
 rainbands.



Allen 5 Aug. 1980 #2

Rainband Experiment. 43 RF

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

Allen 2nd penetration 122815
from the west

Allen
5 Aug. 1980

outer eyewall ~ 10 nmi wide
122939 ~ 40 nmi wide

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

wind
123030 030 / 182 kts
1530 m (RA)

nose seems
to be showing
structure best

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 eyewall
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 to 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. $\frac{1}{2}$ turn 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.

1306 east side appeared to close.

130954 no rain at 442m near S. eye wall.

South eye wall penetration

wind - 200/6ms (13105)

205/61 (13140)

sustained near 50ms⁻¹ 1312.36 out of eye.

eyewall ~ 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 ms⁻¹ ~ 131825 } a good one
063 / 83.2 131850 }

a couple of 90's (suspect) sustained 80 for about 1 1/2 min

Tape ran out at near end of penetration.

132700 playing with elev. went to 40°

132800 " " 3.50

132900 " " 3.00

DZTI didn't have a viny in it.

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

134255 elev. to 2.5°

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 eyewall 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 inside inner eye

Allen 5 Aug 1980
#5

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

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

eye open for about 10 nmi
bearing 350° 28 nmi

1400 fooling around the eye.

Center fix by Billy and I

16.0N 71.78 W 1419.00

15.9 70.3

1143

RACETRACK #1

2.5 h.

5th pass

Turned around and went back through the north
eyewall

5000' 142515 TIDZ stopped with $\frac{1}{3}$ 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.

144605 switched back to LF on VTR

1st ^{outer} rainband penetration (one just before eyewall)

144710

070/62.5 m s⁻¹ background 58 m s⁻¹

1449 Hispaniola 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 fix at 15Z

2.5° elev.

Allen 5 Aug. 1980 #6

RACE TRACK #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 060/85 ms⁻¹ 152125
level 3's down to 38 ms⁻¹ in between
double max 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 VPR

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 nmi across

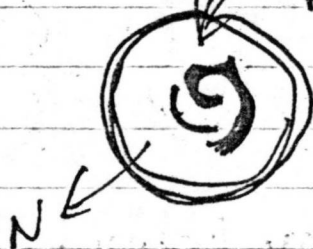
154150 LF bearing 3050° 7.5 nmi.

154115
Billy
says
predicts

1542 Light rain between bands.

154300 nose shows funny inner eye
structure

at center weak region to SE



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

154522 max wind

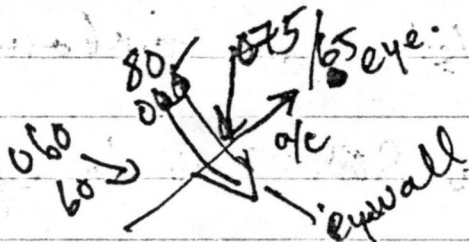
065/87.6

first max

154620

065/82.0

2nd max



strong eyewall
convergence.

154820 in eye again.
tooling around eye

SE eye still weak

Alheim

5 August 1980

#7

160700 upped elev. to 8.5° 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 nmi.

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 light out at beginning of crests. crests running between $2.0-2.5^\circ$

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 115/68-70 m s⁻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
 $\sim 116 / 60 \text{ m s}^{-1}$

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 m s⁻¹

171830 turning back to ~~about~~ east
through outer eyewall to do 18Z fix

1750

Allen 5 August 1980 #8

172251

outer eye wall thickness 10-15 nmi.

level 3's again. eye diameter
max wind ~~000~~/70 kts-1 ~40 nmi

020/65
~~010/70~~
006/60

inner eye wall

173329 diameter of eye look square
~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.

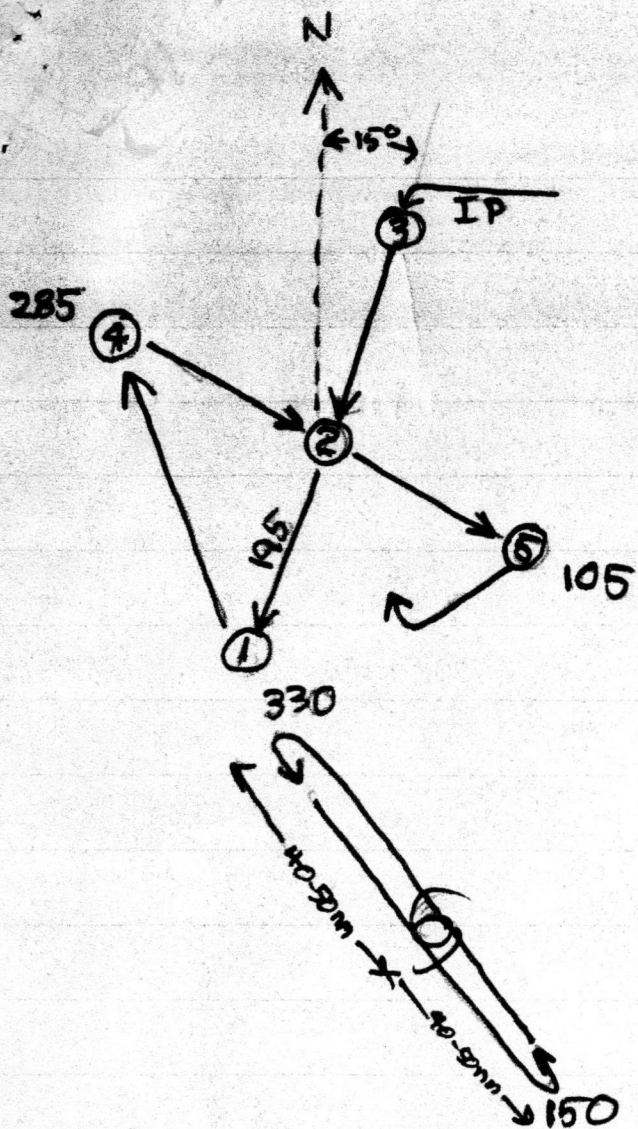
175030 starting Ferry back to San Juan.

174741 winds near 2nd outer rainband

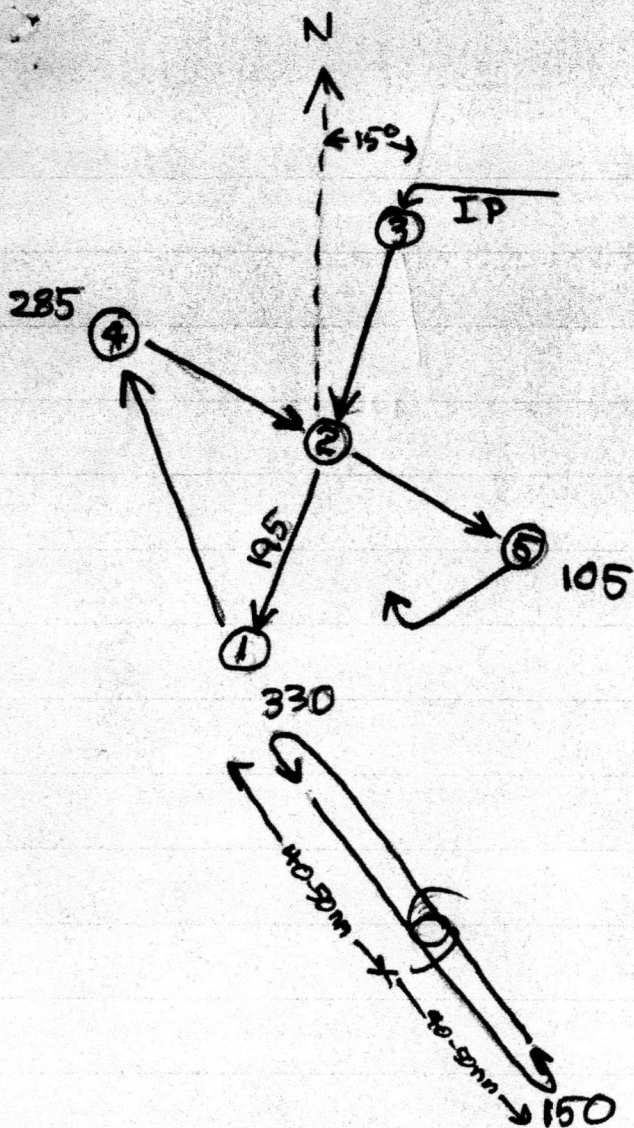
165/36 west side 174/30 kts-1
~~169/34~~
← 174/30

175050 starting climb to 15,000' for ferry.

1815-1818 some good graupel in the outer bands



SYMMETRIC ABOUT
CENTER



SYMMETRIC ABOUT
CENTER