

19980830H1 - RADAR

E.5 Doppler Radar Scientist (On-Board)

The on-board Doppler radar scientist (DRS) is responsible for data collection from all radar systems on his/her assigned aircraft. Detailed operational procedures and check lists are contained in the operator's manual supplied to each operator. General supplementary procedures follow. (Check off and initial.)

E.5.1 Preflight

- ☒ 1. Determine the status of equipment and report results to the on-board lead project scientist (LPS).
- ☒ 2. Confirm mission and pattern selection from the on-board LPS.
- ☒ 3. Select the operational mode for radar system(s) after consultation with the on-board LPS.
- ☒ 4. Complete the appropriate preflight calibrations and check lists as specified in the radar operator's manual.

E.5.2 In-Flight

- ☒ 1. Operate the system(s) as specified in the operator's manual and as directed by the on-board LPS or as required for aircraft safety as determined by the AOC flight director or aircraft commander.
- ☒ 2. Maintain a written commentary in the radar logbook of tape and event times, such as the start and end times of F/AST legs. Also document any equipment problems or changes in F/T, INE, or signal status.

E.5.3 Postflight

- ☒ 1. Complete the summary check lists and all other appropriate check lists and forms.
- ☒ 2. Brief the on-board LPS on equipment status and turn in completed forms to the LPS.
- ☒ 3. Hand-carry all radar tapes and arrange delivery as follows:
 - a. Outside of Miami - to the HRD Field Ground Operations Center (FGOC).
 - b. In Miami - to MGOC or to AOML/HRD. [Note: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]
- ☐ 4. Debrief at the appropriate operations center (FGOC or MGOC).
- ☐ 5. Determine the status of future missions and notify the appropriate operations center (FGOC or MGOC) as to where you can be contacted.

Doppler Radar Scientist Check List

Flight ID: 980830^H
Aircraft Number: N42 RF
Doppler Radar Operators: FEUER/DODGE
Radar Technician: JIM BARR
Number of digital magnetic tapes on board: 3

Component Systems Status:

MARS <u>✓</u>	Computer <u>✓</u>
DAT1 <u>✓</u>	DAT2 <u>✓</u>
LF <u>✓</u>	R/T Serial # <u>102 LF</u>
TA <u>✓</u>	R/T Serial # <u>123/202 TA</u>

Time correction between radar time and digital time: 1 second

Radar Postflight Summary

Number of digital tapes used: 2

DAT1	<u> </u>
DAT2	<u> </u>

Significant down time:

DAT1	<u>~ 0159-0228</u>	Radar LF	<u>✓</u>
DAT2	<u>NO</u>	Radar TA	<u>✓</u>

Other Problems:

NO

HRD Radar Tape Log

Flight 980830 Aircraft N42RF Operator FEUER/DODGE Sheet 1 of 8
 LF RPM 2 TA RPM 10

(Include start and end times of DATs, as well as times of F/AST legs and any changes of radar equipment status)

183757 TAKEOFF

Tape #	F/AST On?	Event Time (HHMMSS)	Event
1	YES	193530	START RECORDING - IN F/AST MODE DUAL PRF
		1955	I.P. - 23°21' - TRACKING 030° ① 76°30'
		2053	NOTE 2 RAINBANDS + EYEWALL TO NNE
		2057	IN EYEWALL
		2059	ENTERING EYE ② - BEGIN ORBIT C.C.W.
		2102	EYE SOUNDING - 27°42' - 986 mb 73°59'
		2104	EYE SOUNDING - 27°48' - 986 mb 74°04'
		2107	RESUMING 30° TRACKING
		2110	IN NE EYEWALL
		2113	NOTE 2 RAINBANDS BEYOND EYEWALL W/ CELLS HAVING DBZ > 40
		2216	TURN - START HEADING 260° ③
		2221	HEADING 270° ON DOWNWIND LEG
		2323	TURN ④
		2324	TRACKING 140°
		0000	EYE PRESENT 150 N.M. TO SE - AFFIX at 27°56'N 74°12'W 983mb
		0022	SEVERAL RAINBANDS PRESENT W/ WELL DEFINED EYEWALL - ALL > 40 DBZ CELLS EMBEDDED
		0025	~ 9 m/s UPDRAFT
		0027 - 0029	SEVERAL STRONG UPDRAFTS/DOWNDRAFTS
		0029	ENTERING EYE - VERY WELL-DEFINED EYEWALL NE-N-NW-W W/ DBZ > 45
✓	✓	0031 6	CENTER FIX 27°56'N 74°14'W ②

N43RF
Fix at
27°44'N
74°01'W
982mb

HRD Radar Tape Log

Flight 980830H Aircraft N42RF Operator FEVER/DODGE Sheet 2 of
 LF RPM 2 TA RPM 10

(Include start and end times of DATs, as well as times of F/AST legs and any changes of radar equipment status)

Tape #	F/AST On?	Event Time (HHMMSS)	Event
1	YES	0032	TRACKING 150°
		0034	EYE ~20 N.M. WIDE + RAGGED
		0036	NO EYEWALL PRESENT TO S OR SE OF CENTER
		0039	3 RAINBANDS PRESENT S, SE, E OF EYE
		0128	BEGIN TURN - CLIPPING LEG BY 25 N.M. (5)
		0129	HEADING 030°
		0130	TRACKING 025° ON D.W. LEG
	RADAR DOWN	0159 0217	RADAR DOWN - REBOOTED
		0223	BEGIN TURN (6)
		0224	TRACKING 270° TOWARDS EYE
2	RADAR UP - YES	0228	start Tape 2 after Sys down
		0236	NOTE RAINBANDS 100+150 N.M. TO W + SW
		0253	EYE IS 110 N.M. TO THE W
		0302	IN STRONG RAINBAND FEATURE
		0306	CHANGED RANGE SCALE OF TA TO 10 KM BINS
		0310	TRACKING 265°
		0312	IN RAINBAND NEAR EYEWALL
		0315	IN EYEWALL
		0316	ENTERING EYE ON E SIDE (2)
		0319	2 EYE SOUNDINGS IN SUCCESSION:
		11	AT 28°10'N - 74°20'W - 980 mb - FIX

AFFix of
28°10'
74°21' - 980
mb

2421 2426 2431 2436 2447?

1

[illegible]

Item List: DAT1, DAT2, COMP, MARS, LF, TA.

Include serial numbers of any new R/Ts.

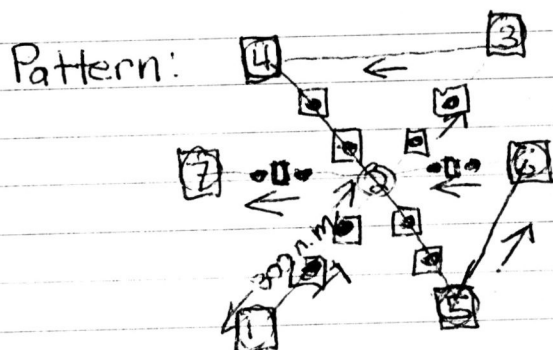
DANIELLE 980830H

XCDX-42 - rotating figure-4s - ^{SIX}300 n.m. / ^{eg}radials
- Also: modified Air-Sea Interaction - 43 (see below)
synoptic surveillance - 49
NASA stuff - ERA, DC-8

CREW: Willoughby - LPS
Aberson - GPS-sonde
Feuer - Doppler, BT
Dodge - Wkstation, Doppler
Majumdar - Observer
Lawrence - Gas Measurements

OPF → OPF

Takeoff: 183757



cur mess
2233

- Drops
- AXBTs
- Drops + AXBTs at all turn points
- Drops - no BTs - in eye of ②

Flight Level: 18,000 ft

193530 - Started Recording F/AST

TA - Tilt 21.9
Speed - 100
LF - Tilt 0.0
Speed - 2.0

dual PRF on HURR3:

PRF1 = 2100 PRF2 = 1400 P. WID = 375.45

① 1955 - I.P. @ 23°21'N, 76°50'W

↳ Tracking 030°

↳ Drop #1 - failed

1956 - Drop #2 (backup for #1) - no winds

1957 - BT #1 (corresponds w/ drop #2)

2007 - Drop #3 (backup for #1 + #2) - failed

2017 - Drop #4

2018 - BT #2 (corresponds w/ drop #4)

2039 - Drop #5 + BT #3

2044 - Fix at 27°41'N, 74°01'W - 982 mb

2053 - In Rainband SW of ② - f/l wind = 50.5 kts

↳ 3 distinct bands present - 2 R.B.'s + Eyewall

2054 - Eye is distinct but tiny on LF display

↳ f/l wind = 55 kts in RB.

2057 - In Eyewall - f/l wind ~ 54 kts

② 2059 - Entering Eye ②

2100 - Orbiting C.C.W. in Eye.

2102 - Drop #6 - sounding @ 27°42'N, 73°51'W - 986 mb

2104 - Drop #7 - sounding @ 27°48'N, 74°04'W - 986 mb

2105 - Eye appears to be only 10-12 n.mi wide

↳ some cloud w/ clear patches

2107 - At center again - resuming 030° tracking

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Reserved for 98053011

- 2110 - in NE eyewall - max fll wind ~ 52 kts.
2113 - 3 bands observed on LF display in NE quad
↳ 2 RB's + Eyewall - outside rainbands have higher reflectivity (> 40 dBZ) than eyewall
↳ fll wind ~ 54 kts.
2117 - Rainband - fll wind = 50 kts
2131 - Drop #8 + BT #4
↳ Attempted to fix date problem on workstation
couldn't figure out password
2153 - Drop #9
2154 - BT #5 (corresponds w/ drop #9)
2215 - Drop #10
③ 2216 - [TURN] - Tracking 260°
↳ BT #6 (corresponds w/ drop #10)
2221 - Tracking 270° on d/w leg
④ 2324 - [TURN] - Tracking 140° toward 6
↳ Drop #11
2325 - BT #7 (corresponds w/ drop #11) - failed
2326 - Workstation Rebooted
2347 - 2 RB's present at 100 + 150 n. mi to the SE
2353 - cells w/ reflectivity > 40 dBZ in rainband
125 n. mi to the SE
2354 - Drop #12 + BT #8
0000 - Eye present ~ 150 n. mi to the SE
↳ AF Fix @ 27° 56' N, 74° 12' W - 983 mb
0009 - Drop #13
0010 - BT #9 (corresponds w/ drop #13)
0020 - Eye is 50 n. mi ahead

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Reserved for 98082011

- 0022 - several rainbands present again -
↳ 2 outside RB's + NW eyewall all have cells > 40 dBZ
↳ max. fll wind = 61 kts in first R.B.
0025 - ~ 9 m/s updraft
0027 - 7 m/s updraft followed by 3 m/s downdraft in next R.B.
0028 - Bumpy! - 7 m/s updraft followed by ~ 4 m/s down-draft in Eyewall - max. fll wind = 67 kts
↳ encountered another 2 successive 6 m/s updrafts
0029 - Entering 9 - Very well defined eyewall present on LF display NE-N-NW-W
↳ max. reflectivity > 45 dBZ in NW quad
② 0031 - Center fix 6 @ 27° 56' N, 74° 14' W - 978 mb extrap
0032 - Tracking 150°
0034 - Eye appears to be ~ 20 n. mi wide + ragged
0036 - No eyewall present to S-SE of 6 - open
↳ max. fll wind = 56 kts.
0037 - 3 RB's SE of 6 - approaching one - others 15 + 28 n. mi away
0040 - Bumpy - 5.5 m/s updraft associated w/ rainband
0042 - in next RB - large reflectivity max. to the SW-SE
↳ 6 m/s updraft
0046 - reflectivity max. > 40 dBZ in rainband cell to E
0047 - Large dBZ to SW in band elongated WNW-ESE
that is 25 n. mi long + 60-75 n. mi away (> 40 dBZ)
↳ huge cell 30 n. mi south
0054 - Drop #14
0055 - BT #10 (corresponds w/ Drop #14)

0105 - Maneuvering between 2 high reflectivity cells in RB.
to S+E w/ dBZ > 45

0116 - Drop #15

⑤ 0123 - ~~TURN~~ - Cutting leg short by 25 n. mi outboard

0129 - Tracking 030° - Drop #16

0130 - Tracking 025° on dlw leg

↳ BT #11 (corresponds w/ drop #16)

0159 - RADAR DOWN - System Froze

0217 - RADAR REBOOTED

⑥ 0223 - ~~TURN~~ - Cutting leg short by 25 n mi inbound

0224 - Tracking 270° towards 9 - Drop #17

0225 - BT #12 (corresponds w/ drop #17)

0228 - RADAR UP - recording F/AST on new tape

0235 - Drop #18

0232 - RBs present 100 & 150 n mi to the W & SW

↳ eye is 180 n mi to west on LF display

1 0246 - BT #13

0253 - Well-defined curved rainband extending SE-E-NE-N
about 50-130 n. mi away

↳ eyewall present on east side of 9 about 100 n mi ahead

0257 - Drop #19

0302 - at RB feature - strong reflectivity max. 40-50 n. mi
west of eye (> 40 dBZ) - Tracking 265°

0306 - Changed Range Scale of TA to 10 km bins - max f/l
wind = 54 kts

0312 - in RB, near eyewall - well-defined eye appears more
circular than other 2 passes - f/l wind ~ 70 kts

0313 - Updraft of ~ 5 m/s - AF fix at 28°10'N, 74°21'W - 981 mb

0315 - at E eyewall - max f/l wind ~ 69 kts

③ 0316 - Entering 9 on E side

0319 - Drops #20 & 21 - 9 soundings @ 28°10'N, 74°20'W - 980 mb
for both

0320 - Tracking 270° - Eye is less ragged & is closed

↳ Hook feature of low reflectivity connected to W eyewall

0323 - at W eyewall - Tracking 280°

0324 - in gap between cells in western eyewall w/
dBZ > 45 to the north

↳ f/l winds = 61 kts

0325 - passing through rainband immediately behind
eyewall - large reflectivity max. to the north

↳ approaching 3rd band just 10 km to the W

↳ f/l winds = 55 kts

0327 - at 3rd RB - line of high reflectivity oriented
NNW-SSE

0330 - narrow 4th RB west of 9 appearing 20 n mi
WNW to 50 n mi S to 120 n mi SE

0334 - Tracking 250° to avoid cell w/ hook on north
end of 4th RB

↳ Encountered two 5 m/s updrafts

0336 - Resuming 280° track

0337 - Lightning observed by captain 80 n. mi ahead

0342 - Drop #22

0353 - BT #14

0404 - Drop #23

⑦ 0422 - F.P. @ 28°12'N, 79°39'W

↳ Drop #24 - no winds

↳ BT #15 - failed

↳ early turn due to proximity to land

0425 - Stopped KPAC

042813 - Stopped Recording

(Sorry, no illustrations)

H. Earl

980902I1

9 2037 29°04.7' 87°09.1'
N24A43 15,000 ft.

707C 29°09' 88°18' turn to SE
Sonde & BT - 30°C

210246 BT & GPS

~~21~~ 28°34' 87°29'

29°08'

87°08'

221106

29°06'

87°07'

This SW to NE pass should
make a very interesting

211658 BT

212036 GPS

212132 GPS

29°36' 86°37'

29°43' 86°33'

213213 GPS

214353 GPS

214437 GPS

214544 BT

30°15' 86°24'

29°32' 86°50'

29°30' 86°52'

29°45' 86°55'