

19890917II - RAPAR

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

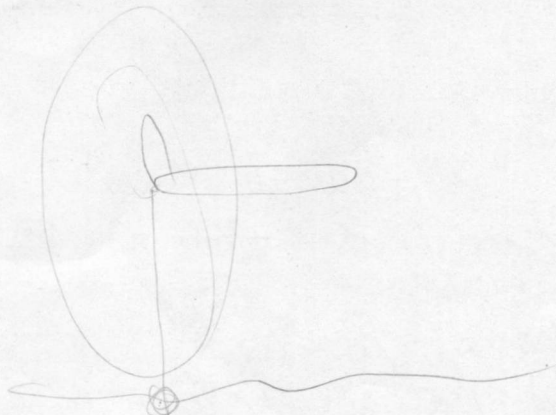
- _____ 1. Determine the status of equipment and report results to the on-board lead project scientist (LPS).
- _____ 2. Confirm mission and pattern selection from the on-board LPS.
- _____ 3. Select the operational mode for radar system(s) after consultation with the HRD/DRS and the on-board LPS.
- _____ 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 Operate the system(s) as specified in the operator's manual and as directed by the HRD/DRS, unless superseded by directions from the on-board LPS or as required for aircraft safety as determined by the OAO flight director or aircraft commander.

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 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 OAO 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 890917I 1
Aircraft # 43
Operators MARKS / DODGE
Radar Tech. ROLES

Number of digital magnetic tapes on board enough

Number of tape labels on board plenty

Component systems up and checked:

MARS	_____	Computer	_____
DMTR1	_____	DMTR2	_____
LF	<u>SN 121</u> ←	R/T#	_____
TA	<u>SN 204</u> ←	R/T#	_____

Time correction between radar time and digital time _____

Radar Postflight Summary

Number of digital tapes used:

DMTR1 6
DMTR2 5

Significant recorder down time:

DMTR 1	<u>X</u>	Radar LF	<u>X</u>
DMTR 2	<u>X</u>	Radar TA	<u> </u>

Other problems:

① 2239-2244 Tail elevation out to lunch;
"fixed itself". During this time TA was pitched all the
way forward as it rotated. This data was recorded.

② 00:16 Tail Azimuth went out to lunch - so something
went bad with ACU or servos.

③ SWITCHED ~~INE 1~~ ~~LINE 2~~ to INE 1 at 22:23 ~~045~~ on A/C data
system. Radar system switched at 22:26:45. TAPE GAP to 22:33

HRD Radar Down-Time Log

Operator _____

Sheet ____ of ____

[illegible]

Item List: DMTR1, DMTR2, COMP, RDSC, LF, TA, DSC1, DSC2.

HRD Radar Tape Log

10 AUG 890810I1

Calibration Flight:

Gamache Dodge, LI

Only running TA - and
that only during Ferry because
guys on 42 are working on
it. JG noticed a return
elevated over land - where
no apparent scatterers. Maybe
some ducting of
side lobes?

12:18:10 - data system &
radar system crash - but
doesn't matter to us - radars
were off anyway. However, re-boot
did require tape - so will have
to use second tape if we want
data on the way back

13:05 42's data system down
~13:45 YAW maneuvers

~1405-1410 intercomparison -
many photos.

14:30 - lost engine #4 -

we'll finish legs at 180 KTS
and then head back.

S/N 204 Trans

S/N 201 IQ Processor

890917I1

PI HEW

ODW RBurpee

Cloud Fly ^{FMarks} PW ^{ODW} Radar Marks & Dodge
TRY HUGO ONE MORE TIME

Set Radar up on INE #2 - J. Parrish
has data system on
INE #2

16:12 B take off

16:45 1/2 systems up, displays checked

16:58 tape start, 1/2 flight

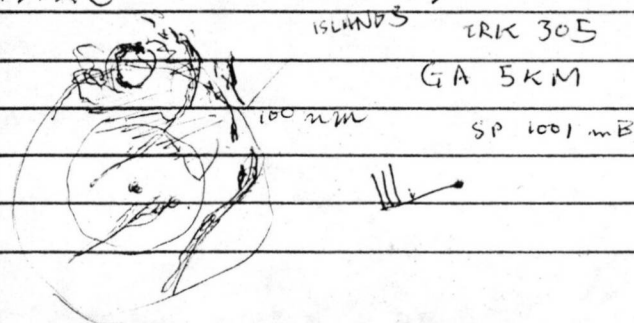
TA Thrash raised from 1.3
to 1.7 JBT to get rid of some CACA

17:03 eye vis on LF ~180 NM away
we're still above bright band. (-3°C)

TA tilt $\rightarrow +0.4^\circ$,

~~17:17~~ 17:17 TA tilt $\rightarrow 0.5^\circ$ (guess who
is at the controls)?

17:20 PLANE at $15^\circ 11'$, $63^\circ 7'$



890917I1 (2)

17:25 in second band now. 6 175 KM
Away. PYCCKM is in the storm with
us

ODW #1 15°26' 63°17'

at 17:27:05

but a streamer, alas. But no
it's OK 17:30. (except no winds?)

we're turning orbiting at IP 100 km
south of 6 while AF and CCEP work
out details in 6 AF can't drop
CCEP below them. We can't get clearance
for 12000 ft. if we don't get it in
5-10 min we'll stay at 16000'.

CCEP will leave 1800 GMT, AF also.

We'll leave Hugo all to ourselves!!

1739 American 699 is relaying our request
for clearance to Piarca Center

1741 clearance is approved to 12 kft.
Start descent to 12 kft.

1745 - 2nd tape started

1749 eye 150 KM away.



eye struc



at 17:53

(3)

17:55 eye 100 KM away. we're heading
~~33~~ 345° TRK 354° GA 3761 KM
picking up some ~~48~~ dBZ far side
of eye.

~~18~~ 18:01 some sea clutter to RIGHT?

18:04



~50KM radius sort of elliptical

18:06 in eye SP ~ 938 mB

18:07 rolling back and forth
to get fix, I guess

18:08 ODW #2 16°54' 63°29'

heading tracking 340° into
INTENSE side of eye.

18:12 136 KTS GRAUPEL ~~3~~

17°14' 63°36' - 80° 114 KTS
SP 979

18:24 ODW #2 GOOD We're flying
in stratiform crud now - nice
bright band on TA

TAPE 1-2ST 18:26 18° 3' 9 63° 35
83° 65 KTS 1003

18:33 turning for diagonal leg

18:34:20 ODW #3 18°30' 63°41'

Puerto Rico vis on 1/2 display

390917 I 1 (4)

NW 26
1845 going down wind looking
at Dop. interesting vertical shear
structure outflow at 3 separate
levels. ?? Why no zero radial
velocity below plane strongly down
(away) motion below plane ??

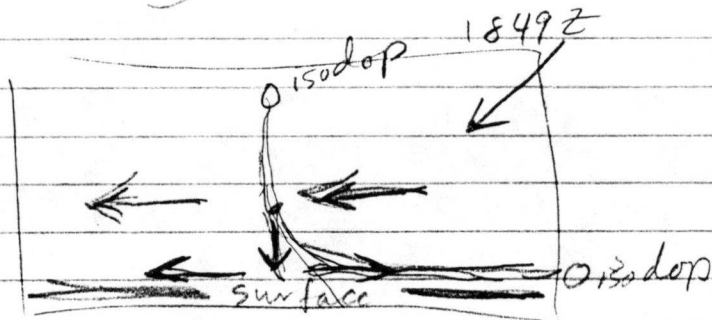
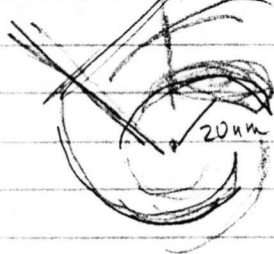
Pitch 2.4°

A 2.3°

R -1.5°

S 1.3°

D. -1.0°



1851 ^{Dop} starting to look OK again.

EM says maybe remnant of inner eye?

18:57 DOP looks OK, I'm eating
fish sandwich, FLYING that is. We're
in the clear E of G - $17^\circ 4' 65^\circ 17'$

$11^\circ 47$ KTS 1004 mB

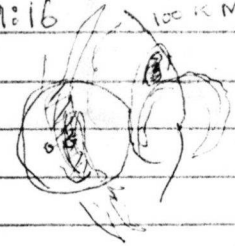
19:03 turn $16^\circ 50' 65^\circ 23'$

19:04:38 ODW #4 $65^\circ 18'$

19:13 $16^\circ 50' 64^\circ 41' 352^\circ 49$ KTS 998 mB

eye ~ 120 km away

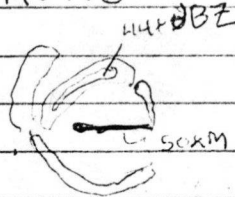
19:16 100 km Tom Nunn & Barry
talking FOOTBALL



19:20 $4^\circ 73$ KTS
 $16^\circ 50' 64^\circ 11' 989$ mB

19:22 eye wall max ~ 95 KTS?
no maybe 110 KTS "sustained" (10 sec)

19:26



eye full of sand crust
SP 93.6
 $16^\circ 54' 63^\circ 36'$
CENTER

19:30 - sustained 120 KTS
max ~ 136 in eastern eye wall
118 KTS at $16^\circ 52' 63^\circ 18'$

STILL over 110 KTS at $16^\circ 52' 63^\circ 11'$

19:34

#6
19:38 in a band 16°52' 62°52'
169°60 KTS 993 MB

19:45 bounding around in
inners band ~ 150 KM east of eye
168°56 KTS 16°52 62°18' 999

19:52 turning to track 12°
just inside of islands and a rainband

19:57 17°12' 61°55' 162°55 KTS

19:58 brief receding on both
sides in TA dop

20:02 17°33' 6
62°11' 152°52 KTS 1003.6 MB

20:09 turning at 18°4' 62°35'
131°56 K 1003 MB

20:17 eye looking symmetrical now,
not so elliptical.

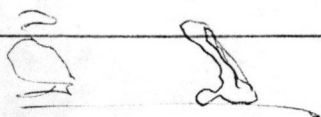
20:20 130°75 KTS 17°31' 63°10'
100 KM NE of EYE 20:24 CLEAR NICE
SEA STATE

20:26 cellular eye wall

20:27 125 KTS SUSTAINED
MAX 130 - at least 10 sec's

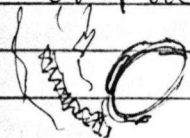
20:29:54 INWARD LEANING STUFF
ON TA EYE FULL

of cloud, though



890.17E1 #7
20:32:52 16°5 63°5
ODW#5 SP 934 Jack thinks
it's dropped 3 mb each penetration!

20:36 I think eye is still
elliptical, with some funny KINKS.



ODW Splash Pressure
940 MB.

20:55 - Turning to track 92°
at 15°44 64°50' 326°39 KTS 1003 MB

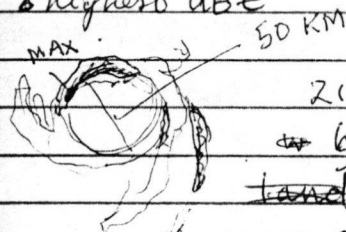
21:18 TRKING 91° 15°50' 62°53'
SP1002 218°42K

21:21 turn to TRK 315

ODW#6 at 21:23:01 15°56' 62°45'

[GOOD DROP] WD 212° 45 KTS SP 1002
and we're headed back into eye.

HUGO appears to be intensifying and
even from SE the NW part of G looks
highest DBZ



21:34 HEW sugg. that
G is BEING INFLUENCED
by land masses,
may explain raggedly
nature of things...

21:37 16°38' 63°30' 215°/91 KTS
SP 986.

890917I1 ⑧

21:42 in eye again...

17°06' 18°59' 63° 47' (21:44)

SP 932

NW Quad has couple concentric strips
≥ +44 dBZ

21:47 GRAPEL, lots a rain, lightning

21:49 17°17' 64° 8' 55°/93 KTS

SP 985

finally starting to get tired of this. No
fun when it gets dark! We're in
extensive stratiform precip again...

FRANK TOOK SOME SLIDES ~ 21:57
of LF, TA

22:09 17°57' 65°13' 28°/56 KTS

ISLAND TO OUR ~~SEA~~ SP 1004

RIGHT. Ocean really stirred up, but
lots of visibility... we're about 50 KM
from Puerto Rico. 22:14 beautiful
rainbow to Port...

22:23 turning

to
SHIFTED INE 1

ODW #7 22:23:29 17°6' 65°37'

3°/53 KTS SP 1004.5

FRANK M switched 1/2 sys to
INE i at 22:26:45

caused tape gap to 22:33 -

when Dave Turner gave us a
beautiful sunset view - a five minute
intermission...

890917I4 ⑨

22:46 headed into eye again -
it's dark so nothing to see
except RADAR.

2239 - 2244 : TAIL antenna control
unit probably flaky - TAIL pegged all the
way forward.

22:50 ODW ^⑧ DOP 17°06' 63°55'

FIX

22:52 SP 932

OMEGA bad.

KTS 145 max "official" (150+ unofficial)

23:00 17°8' 63°9' 180°/74 KTS SP 992

in pretty good rainband (even
though it looks stratiform)

939 ODW Splash Pressure

23:14:14 ODW ^⑨ 17°13' 62°20'

162°/54 KTS

SP 1004

23:17 we're headed NW now - to set up
for last eye penetration.

23:40 turning at 18°46' 64°7'

to give HUGO one more tickle.

23:42 86°/54 KTS SP 1004

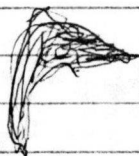
18°39' 64°4'

23:46 in the stratiform blob
~ 125 KM N of STORM -

890917I1 (10)

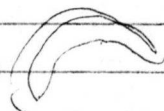
23:567 Heading into IT last shot today

23:59 some grouse, lightning



10 m/s ↑

Shape changed to



00:03 17° 63°

930 sp

00 04 52 928 mBSP

00:08 Jack agrees with Air Force estimate of 934 mB

00:16 TAIL AZ out to lunch - FM hypothesis - out because of lightning hit early in flight.

00:22 recording off