19910807I1_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.

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 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 910807I1

Aircraft # 43RF

Operators Kabeche/Houze/Yuter/Testud

Radar Tech. Lynch

Number of digital magnetic tapes on board >15

Number of tape labels on board >100

Component systems up and checked:

MARS	✓	Computer	✓
DMTR1	✓	DMTR2	✓
LF	✓	R/T#	
TA	✓	R/T#	

Time correction between radar time and digital time _____

Radar Postflight Summary

Number of digital tapes used:

DMTR1 2

DMTR2 1

Significant down time:

DMTR 1 _____

DMTR 2 _____

Radar LF 1857-1911 system crashed

Radar TA 212605-212745 restarted. tape error

Other problems:

apparently system hangs up when tape went done in turbulence (went off line). I put tape online and radar system restarted. Terry Lynch says system very sensitive to tape errors.

French antenna

AUG 7 1991 G = 35dB

Form E-5
Page 2 of 3

HRD Radar Tape Log

Flight 910807I1 Aircraft 43RF Operator many Sheet 1 of 1

Tape #	Time On (HHMMSS)	Time Off (HHMMSS)	Comments
D1T1	184812	1857	radar down 1857
	191136		up again 191136
	1920		working cloud in ORL area in Utah network
	1933		working cloud SE of last cloud
		~201827	good stuff in SW lobe.
D2T1	~201827		
	211330		punching cloud on way home
		212605	radar system stop in big hurt.
	212750		radar system up
	2130	2130	landing.
	2138	land MIA	

Sweep 350 750

TA sweep
350
430
630
750

AUG 7 1991

Form E-5
Page 3 of 3

HRD Radar Down-Time Log

Operator Marks Sheet 1 of 1

Item	Time Down (HHMMSS)	Time Up (HHMMSS)	Problem
system	1857	1911	radar system crashed
tape error	210605	212745	tape error in turb. caused system to have restarted when put Tape on line again.

Item List: DMTR1, DMTR2, COMP, MARS, LF, TA.

Field mill
charge
Replica

Hallett

49
07

Wed - Jim De Gannet.

Constant rotation in rate of propellers;

Blades ±60° Jump 0°

Planned T/O 2-30 (local).

Cloud work at CAPE. Site

Clive / Paul / Bob. / JH. 07 Dec 91 Wed

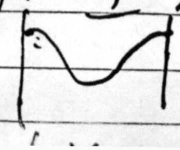
Replicator OK
F mills / acft charge OK.

charge probe - after fixing input voltage,

2.38 Take off. (local)

Noise level : ± 1 V (both)
± 1/2 V (none)

Noise no filter p/p ± 2 V
0.3 ms



Replicate broke here -

the Needle

pull K & to
wrong

To write top.

(K K ~~top~~ 12.05)

?,

Chuck 1 old mail! ~ 3 20

(2) old ~~mail~~.. 2, 28.
2 3 29

Replicator T & moved 4600

Relocate: from Sec dn. 3.38

bring ~~down~~ back up and

↓↓

K to top #3 - again

Next Pos 3.53

→ moved replicator film. -
broke on shed / early in
session

475 Pass. moderate turbulence? short pass.

Much off 20 29 00

Upper mill failure: (breaker open) (will not close.)

off Miami over ocean.

Pass one/ Near Port gateway. 5.13. 48 Dbz
(Fast take line)
(on return to Miami)
moderate turbulence;

One region with v. low visibility at start of cloud.

Brightest rainbow

Pass 2. (to N) 5.15
mod. turbulence.

Pass 3. 5.20. N→S
bumps in clear air to N)

? Cut off upper blob?

Pass x 'Fat bump. 524.
Now all to w of above. 1000ft

35
07

This mill has been specially adapted to [illegible] water inclusions → Replace Top Mill

6-30 Wed 7 Aug.

Wed Top mill 1006

Remove 1007
contained ~ 5cc water.
send to Reno Thurs.

Summary flight 07 Aug.

Instruments: Upper mill failed part way through mission; contained water
charge probe - no data on tape recorder because of 400Hz noise.
Replicator - film probe in [illegible] level passes because of ?. box compression + [illegible] fix by [illegible] [illegible] [illegible]

later low level passes ok.

Note E field data is reasonable for all flight as 3 mills functioned.

Test - Thurs - high readings on all channels
9 ✓ 6 ✓ 8 ✓
SW? 1KS Aug

Unchanged with Calibration.

Thursday - chase down noise problem on charge probe. - trace to 1K resistor used to short heater to ground. This acted as a pickup for 400 hz!

Saunders notes

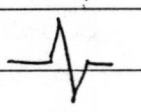
Particle Charge Miami CaPE Project August 1991

Ground test of Q probe gives 3V p/p noise (400Hz) (probably due to ground loop — but disconnecting all possible grounds makes no difference. [3V p/p with no filter]

From Martin Hill notes :- Threshold Bits = p/p Noise volts x 91 Bits
= 3 x 91 = 273 Bits

Accept Ratio = 3
Output shifts = 4
Trigger Count = 3

With filter :- LP Noise 1V p/p 400Hz
HP " 2.5V p/p High V
Both filters " 0.2 V (200mV)

Data is  = ~~2kHz~~ 1.7×10^3 Hz
Harmonic

With no filter :- A/C power, noise still 3V p/p
With engines running " " "

Flight 1

Wednesday 7 Aug 91 (First flight with Q probe)
Take off ~~10.35 Z~~ for 6 hr mission to CAPE

In climb vibration noise = 4V p/p.

Record o/p from MHill box on JVC tape recorder Left channel.

With Q probe heater ON, noise is still 4V p/p but there is more noise. But MHill box continues to show no

Number of question marks to be written in this margin

Due to increased noise — reset MH box

Threshold Bits = 4×91 = 364 Bits ∴ 4V RI

Accept Ratio = 3

Shifts = 4

Trigger = 3

↓ No filter ↓

Cloud 1 Tape recorder ON Frame = 0000

Start 19 22 00

Stop 19 23 30

Cloud 2 Start 192430

@ sat at +4V

Stop. 1925 30

Cloud 3 start 19 28 30

Saturated at ± 4V

Old Cu Stop 19 31 20

Now new cloud. Use <u>BOTH</u> filters ↓

Same MH settings as above.

Cloud 4 start 193330 <u>Lighting</u> strike to plane

Building Cu. Stop 1935 10

with filters, no saturation

Cloud 5 (4 again) start 193830 20 m/s updraft + Light

194105 at <u>start</u> of runs.

Noise with filters = 2V p/p.

first MH box 182 / 3/4/3

Cloud 6 (Again) start 194600 194803 Lightning

1900 ish

Number of question only to be written in this margin

In passes, with the filter, the signal does not saturate but goes to ZERO for a while

Cloud 7 ON 195340
OFF 195450 Glaciated Cu

Cloud 8 New top? ON 195902 2 passes/clouds.
OFF 200206

Photos – 2 of cloud just penetrated – one of KSC.

Cloud 9 (Same as?) Noise in clear air with filters = 0.5V p/p
Leave Mlt setting.

↳ TRON 201535
Leave wing under anvil in rain?
OFF 201823

Noise = 0.4V p/p – re-set Mlt to
with Both filters 0.4 x 91 = 36.4 / 3/4/3
But this gives o/p in clear air.

Set to 1V p/p i.e. 91/3/4/3

Cloud on ON 211400 (Gap after last data)
Way home OFF 211550 Mlt with filters
In cloud P/P signal about ± 2V (4
Thro' again So could do with more ga

ON 211802
OFF 211910

ON 212050
OFF 212345

New line 21 25 15 " "