Date: 110809 Campaign: HIPPO V Flight: RF01 From: BJC To: BJC

NCAR/SCRIPPS MEDUSA Checklist V. 2011.08.08

I. Preflight

A. Day(s) before flight Date (YYMMDD) = _____

- ✓ 1) Prepare new traps w/ clean beads filled to 2" up from the bottom and bring to plane
- ✓ 2) Install new traps Upstream: ____ Downstream: ___
- ✓ 3) Load flasks, confirm old IDs by checking check boxes in previous Flask ID table
- ✓ 4) Record new flask IDs, and inspect o-rings
- ✓ 5) Record Flask Box Numbers: Box #1 15 Box #2 102
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that all lines are strain relieved, don't touch shield, and no flasks feel stuck
- ✓ 9a) Replace cover shields and ✓ 9b) complete rack book
- ✓ 10) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED-110811-RF02
- ✓ 11) Make sure to change date in excel file body and title
- ✓ 12) If necessary, download data from previous flight to laptop and pen drive
- ✓ 13) Check that flask table is clear. If not, "clear all"
- ✓ 14) Complete flask leak check procedure #1 ~~Start UTC ___:___~~ EDIT
- ✓ 15) Wait as long as possible, 1-hour preferred, then complete flask leak check procedure #2 ~~Start UTC ___:___~~ EDIT
- ? ___ 16) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ___ 17) Record Ps: Pup ____ Pdown____ Pbypass ___ then all power off

Flask ID Table (View from Front of Box)

13 ✓ 1118	12 ✓ 1225	5 ✓ 1097	4 ✓ 1130
14 ✓ 1085	11 ✓ 1257	6 ✓ 1273	3 ✓ 1234
15 ✓ 1153	10 ✓ 1362	7 ✓ 1010	2 ✓ 1042
16 ☐ 1249	9 ✓ 1051	8 ✓ 1098	1 ✓ 1223

17 ☐	24 ☐	25 ☐	32 ☐
18 ☐	23 ☐	26 ☐	31 ☐
19 ☐	22 ☐	27 ☐	30 ☐
20 ☐	21 ☐	28 ☐	29 ☐

POSSIBLE THAT MEDUSA CLOCK WAS 1 MINUTE OFF? (POS. MED was 1 minute ahead)

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	5.3	965	~~150/620~~	16:52:58	2700	#2	20:15	**AO2 Breath Test 1**
2	5.3	966	170/450	16:55:58	6268			
3	5.3	965	170/450	16:58	10197			
4	5.3	966	141	18:22:17	18.9	#4		
5	5.2	966	"	18:26:26	10.0			Forgot +45
6	5.3	966	"	18:30:17	4027			
7	5.3	967	"	18:36:24	3.0			
8	5.3	967		18:39:13	6.1	#5		**After 1st dive => Fl Pl 2**
9	5.3	967		18:42:33	11.2			
10	5.3	967		18:45:	16.1			Exactly 45 sec after hit 100C
11	5.3	967		18:49:54	22.2			
12	4.5	967	125/620	18:54:31	29.1			Switch to FC1 @18:50:30
13	4.0	967	90/710	19:00:06	37.5			Switch to FC3 @ 18:53:46
14	4.0	965	90/710	19:43:11	25.3			Switch to FC2 @ 18:55:20 → 19:46
15	5.3	965	170/	19:51:17	11.9			
16	5.3	965	"	19:55:37	11.8		V	

✓1) After sampling flask 16, close flasks 1-16 UTC: 20 : 15 Trap T: 40.7

✓2a) Turn Pump off X 2b) Replace upstream trap X 2c)Turn pump back on

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17							20:22	
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								**AO2 Breath Test 2**
31								
32							V	

✓3) After sampling flask 32, close flasks 17-32 UTC: 20 : 22 Trap T: 39.9

_____ (start) *(Pencil is preferred)* Dips (Alt ↑, Time →) (end) _____

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

__ 1) 28 V breaker on, Valve box on, Pump box on
__ 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
__ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
__ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
__ 5) Adjust prepurge time to 20 seconds
__ 6) Toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
__ 7) Run 20-second prepurge to evacuate lines. Start:_____ Finish:_____
__ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks_____
__ 9) Close Pdn, turn pumps off (will leave in position 1)
__ 10) Turn bypass on

Flask Leak Check Procedure #2:

__ 1) "Clear All" EDIT Note Pup Pdn PlgMPSA
__ 2) Valve box off, main breaker off then on to reset, then valve box back on
__ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
__ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
__ 5) Close Pdn and turn pumps off
__ 6) Adjust prepurge time to 20 seconds
__ 7) Run 20-second prepurge to check all flask downstream tube Ps
__ 8) Record times for AEROS matching. Start:_____ Finish:_____
__ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks_____
__ 10) Turn bypass on

BYPSET = 1

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute EDIT ±10
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160 4/155/164
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again. GOOD TIME TO BRING UP AEROS? OR WORK ON A0 2
✓ 7) After 5 minutes, record values again
✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
✗ 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

EDIT?

Time (UTC)	Pup	Pdn	Pbypass	Comments
14:05:00	7	156	165	
14:06:00	8	156	165	
14:11:00	12	156	166	PC1 in Auto thru test.

Date: 110811 Campaign: HIPPOS Flight: RF02 From: KBJC To: KBJC Page 1 of 6

Jeffco Jeffco

NCAR/SCRIPPS MEDUSA Checklist **V. 2011.08.08**

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110810

✓ 1) Prepare new traps w/ clean beads filled to 2" up from the bottom and bring to plane

✓ 2) Install new traps Upstream: D Downstream: E

✓ 3) Load flasks, confirm old IDs by checking check boxes in previous Flask ID table

✓ 4) Record new flask IDs, and inspect o-rings

✓ 5) Record Flask Box Numbers: Box #1 103 Box #2 102

✓ 6) Install flask box retaining pins

✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up

✓ 8) Confirm that all lines are strain relieved, don't touch shield, and no flasks feel stuck

✓ 9a) Replace cover shields and ✓ 9b) complete rack book

✓ 10) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO3\MEDUSA XLS TAB PNG\Flask Positions\ MED_110811_RF02.xls

✓ 11) Make sure to change date in excel file body and title

✓ 12) If necessary, download data from previous flight to laptop and pen drive

✓ 13) Check that flask table is clear. If not, "clear all"

✓ 14) Complete flask leak check procedure #1 Start UTC 16 : 49 ← EDIT not needed - noted elsewhere

✓ 15) Wait as long as possible, 1-hour preferred, then complete flask leak check procedure #2 Start UTC 18 : 43

✓ 16) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed

✓ 17) Record Ps: Pup 4 Pdown 157 Pbypass 168 then all power off EDIT Time 09 58 UTC

Flask ID Table (View from Front of Box)

13 ✓ 1209 ←	12 ☐ 1391	5 ✓ 1241 ←	4 ✓ 1398
14 ✓ 1218	11 ✓ 1101	6 ✓ 1060	3 ✓ 1191
15 ✓ 1250	10 ✓ 1268	7 ✓ 1029	2 ✓ 1279
16 ✓ 1210 ↓	9 ✓ 1084 ←	8 ✓ 1199	1 ✓ 1201
17 ✓ 1392	24 ✓ 1003 →	25 ✓ 1106	32 ☐ ~~1410~~ ~~1408~~
18 ✓ 1086	23 ✓ 1081	26 ✓ 1093	31 ☐ ~~1050~~
19 ✓ 1015	22 ✓ 1284	27 ✓ 1221	30 ☐ ~~1167~~
20 ✓ 1108 →	21 ✓ 1111	28 ✓ 1230 →	29 ☐ ~~1369~~

LAST 4 NOT SAMPLED

Pos 20 - originally flask 1109, but stem broke. Moved flask 32 → 20 and replaced Pos 32 w/ new flask - 1410

110811 HIPPOS 16:03 ^ 16:07 <

Date: ~~HIPPOS~~ Campaign: ~~RF02~~ Flight: RF02 From: KBJC To: KBJC

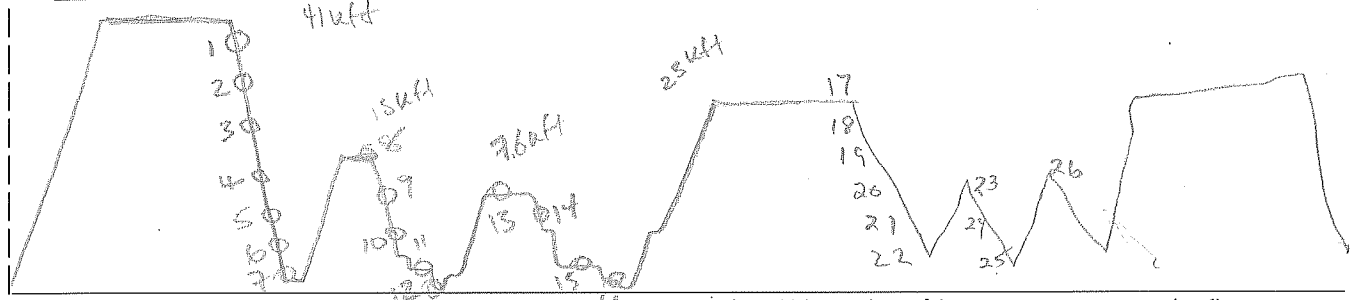
Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	3.97	805	90/710	15:49:05	38	1	15:50:00	**AO2 Breath Test 1**
2	5.36	909	170/450	15:54 50	27.1	1	15:55:30	15:51:00 → 170/450
3	5.33	903	170/450	15:58 10	20.0	1	15:58:45	acc. closed flask 4 first
4	5.33	908	170/450	16:02 16	13.0	1	16:02:50	
5	5.31	904	170/450	16:05 31	8.0	1	16:06:20	
6	5.31	901	170/450	16:10:44	4.8	1	16:11:20	
7	5.30	897	170/450	16:~~14:45~~	2.2	1	16:15:30	→(16:14:45)
8	5.32	902	170/450	16 33 01	15.0	2	16:34:10	**After 1st dive => Fl Pl 2**
9	5.32	900	170/450	16:36:07	9.1	2	16:37:00	
10	5.31	896	170/450	16:39:30	5.0	2	16:40:00	
11	5.30	892	170/450	16:45 11	4.0	2	16:45:30	
12	5.30	893	170/450	16:48:39	3.2	2	16:49:10	
13	5.30	897	170/450	16:53:04	7.7	2	16:53:40	
14	5.28	887	170/450	17:15:30	6.0	3	17:16:40	
15	5.27	900	170/450	17:19:07	3.0	3	17:19:40	Methane high ~1900 hazy
16	5.28	887	170/450	17:29:31	2.2	3	17:30:20	

__1) After sampling flask 16, close flasks 1-16 UTC: ___ : ____ Trap T: _____

__2a) Turn Pump off __2b) Replace upstream trap __2c)Turn pump back on

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.21	960	170/450	18:07:06	~~8.25.0~~	4	18:07:50	
18	5.27	956	"	18:14:40	18.6	4	18:15:20	
19	5.27	956	"	18:17:00	14.0	4	18:18:00	
20	5.28	934	"	18:19:45	8.5	4	18:20:20	
21	5.26	949	"	18:23:30	4.3	4	18:40:20	
22	5.25	953	"	18:33:21	0.6	4	18:40:20	
23	5.28	930	"	18:45:12	7.0	5	18:49:00	
24	5.26	925	"	18:52:02	3.4	5	12:04:50	
25	5.26	926	"	19:00:21	1.2	5	19:04:50	
26	5.29	937	"	19:11:37	11.9	6	19 14 45	
27	5.25	922	"	19:19:41	2.8	6	before 20:05	~19:30 closed
28	5.30	922	"	19:26:06	0.9	6	" "	~19:30 closed
29								
30		Saving	for next	flight				**AO2 Breath Test 2**
31								
32								

__3) After sampling flask 32, close flasks 17-32 UTC: ____ : ____ Trap T: _____



_____ (start) *(Pencil is preferred)* Dips (Alt ↑, Time →) (end) _____

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds
✓ 6) Toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 16:49:25 Finish: 17:04:12
__ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO5\MEDUSA XLS TAB PNG\Leakchecks\ 110810_RF02_Leakcheck 1p/f
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on 2 155 167

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times). 59, 168, 176
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 18:43:05 Finish:_____
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO5\MEDUSA XLS TAB PNG\Leakchecks\ 110810-RF02-Leakcheck-2a
2-
✓ 10) Turn bypass on

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
x 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
13:36:00	5	148	158	
13:37:00	6	148	158	
13 38:00	7	148	158	
13:39:00	8	148	158	
13:42:00	10	148	158	

Date: 110816 Campaign: HIPPOS Flight: RF05 From: KBJC To: PANC

NCAR/SCRIPPS MEDUSA Checklist V. 2011.08.12

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110812

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps Upstream: E Downstream: D
- ✓ 3) Record Flask Box Numbers: Box #1 E Box #2 D
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes 23
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  - ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- ✓ 10) Make sure to change date in excel file body and file name EDIT
- X 11) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 12) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 13) Complete flask leak check procedure #1 *(see pg. 5)*
- ✓ 14) Complete rack book
- ✓ 15) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_110816_RF05
- 16) Wait as long as possible, 1-hour preferred, then complete flask leak check procedure #2
- X 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 21:40 Pup 18 Pdown 162 Pby 172 MEDPSA 54
- ✓ 19) All power off

Flask ID Table (View from Front of Box)

13 ✓ 1423 ~~1216~~	12 ✓ 1416	5 ✓ 1404	4 ✓ 1424
14 ✓ 1002	11 ✓ 1408	6 ✓ 1216 ~~1423~~	3 ✓ 1226
15 ✓ 1421	10 ✓ 1431	7 ✓ 1434	2 ✓ 1445
16 ✓ 1237	9 ✓ 1429	8 ✓ 1305	1 ✓ 1412
17 ✓ 1050	24	25	32
18 ✓ 1167	23	26	31
19 ✓ 1410	22	27	30
20 ✓ 1369	21	28	29

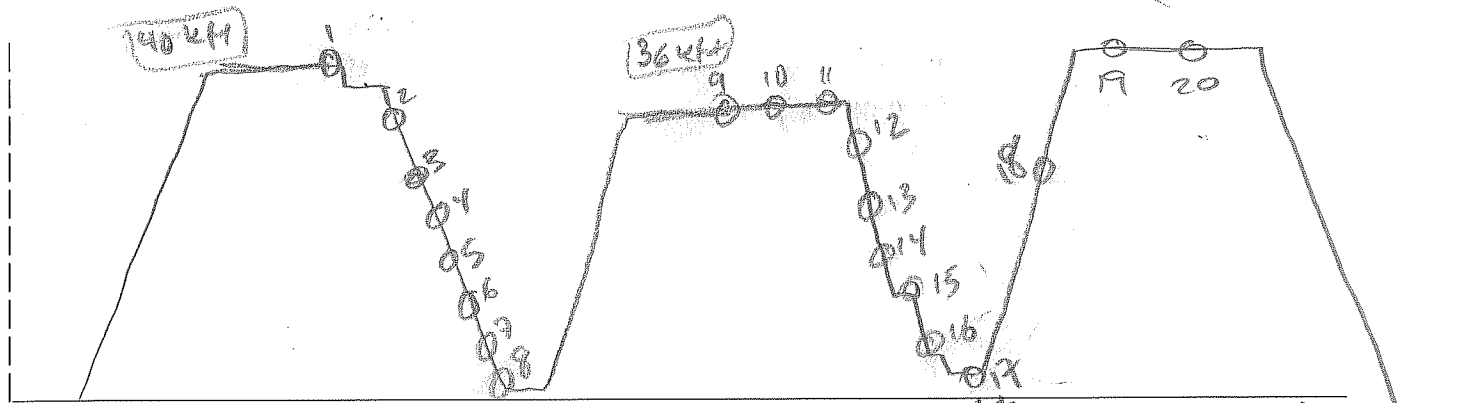
chipped o-ring surface - poss not a good seal. consider possible suspect (though leak check seemed fine)

NO FLASKS MOUNTED FOR POS 21-32

Date: 110816 Campaign: HIPPO 5 Flight: RF03 From: KBJC To: PANC

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.64	826	125/620	16:22:00	40	1	16:23:15	AO2 Breath Test 1 ✓
2	4.64	822	125/620	16:30:47	33	1	16:31:10	16:31:40 → FLPL 2
3	5.31	899	170/450	16:36:46	25.3	1	16:37:00	
4	5.31	900	170/450	16:41:17	19.9	1	16:42:00	
5	5.31	903	"	16:45:50	13.5	1	16:46:20	
6	5.31	900	"	16:49:34	8.7	1	16:50:20	sample (not ~~total~~ all sample
7	5.30	896	"	16:54:30	3.8	1	16:55:40	just before airport
8	5.30	895	"	16:59:16	2.8	1	17:01:45	After 1st dive => Fl Pl 2
9	5.31	893	"	18:26:19	36	2	18:27:00	Just before strat
10	5.31	891	"	18:37:27	36	2	18:38:00	Some strat signal
11	5.31	894	"	18:50:05	36	2	18:50:35	
12	5.30	892	"	18:59:46	24	2	19:00:45	
13	5.32	900	"	19:03:05	19	2	19:03:25	
14	5.32	896	"	19:07:33	14	2	19:08:00	
15	5.31	913	"	19:12:51	11	2	19:13:20	clouds - thick - hold
16	5.31	898	"	19:17:24	5.5	2	19:18:00	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.31	904	"	19:29:17	28	2	19:32:30	
18	5.31	966	"	19:45:00	29	3	19:45:45	19:46:30 → FP 3 90/7
19	4.10	815	90/710	20:00:20	43	3	20:01:00	Strat air
20	4.01	807	90/710	20:09:20	43	3	20:10:00	
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								AO2 Breath Test 2
31								
32								



KBJC (start) (*Pencil is preferred*) Dips (Alt ↑, Time →) Watson Lake (end) PANC

Check NBDP1 against ~~NBDP~~ PSXC P1 PSXC

↳ SEE P6/6 for values TIME

MEDUSA leak check procedures

VLV1SET VLV2SET VLV3SET

Flask Leak Check Procedure #1:

- ✓ 1) 28 V breaker on, Valve box on, Pump box on
- ✓ 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
- ✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
- ✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
- ✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
- ✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200 (BYPASS)
- ✓ 7) Run 20-second prepurge to evacuate lines. Start: 17:04:10 Finish: 17:20
- ✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110815_RF03_Leakcheck1p/f.png
- ✓ 9) Close Pdn, turn pumps off (will leave in position 1)
- ✓ 10) Turn bypass on *(return to pg. 1)*

→ 210830 → 21:23:12

Flask Leak Check Procedure #2:

MAKE SURE MEDPSA, MEDTAT2 are reading properly

- ✓ 1) "Clear All"
- ✓ 2) Valve box off, main breaker off then on to reset, then valve box back on (wait 8 mins after)
- ✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
- ✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
- ✓ 5) Close Pdn and turn pumps off
- ✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
- ✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
- ✓ 8) Record times for AEROS matching. Start: 13:35:50 Finish: 13:51
- ✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
  (YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110816_RF03_Leakcheckp/f
- ✓ 10) Turn bypass on. There should now be a total of ~~6~~ 4 leak check PNGs.

NO whole leakcheck bc2 done overnight

Bypass / System Leak Check Procedure:

- ✓ 1) Ensure bypass on, close PC1 and open PC2
- ✓ 2) Turn on pump breaker and let run for 1 minute
- ✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
- ✓ 4) Switch PC2 to closed and turn off pump
- ✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
- ✓ 6) After 1 minute, record values again.
- ✓ 7) After 5 minutes, record values again
- ✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
- X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
- ✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
14:26:35	6	154	164	
14:27:59	7	154	164	
14:33:08	10	154	164	

Date: 110818 Campaign: HIPPO5 Flight: RF04 From: PANC To: PANC Page 1 of 6

Anchorage Anchorage

NCAR/SCRIPPS MEDUSA Checklist **V. 2011.08.15**

☆ NEW ANALOG DSM CARD INSTALLED MORNING OF 110817 ☆

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110817

✓ 1) Prepare new traps new beads--2" up from bottom

✓ 2) Install new traps Upstream: E Downstream: D

? 3) Record Flask Box Numbers: Box #1 ? Box #2 ?

✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes 105?

✓ 5) After flasks loaded, record new flask IDs below

✓ 6) Install flask box retaining pins

✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up

✓ 8) Confirm that:

✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck

✓ 9) Replace cover shields

X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*

✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***

✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*

✓ 13) Complete rack book

✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_110818_RF04.xls

✓ 15) Make sure to change date in excel file body and file name

✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**

✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed

✓ 18) Record Ps: UTC: 2014 Pup 2 Pdown 172 Pby 177 MEDPSA 260

✓ 19) All power off

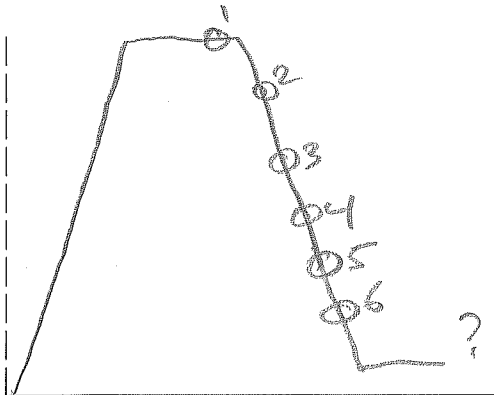
Flask ID Table (View from Front of Box)

13 ☐ 1383	12 ☐ 1339	5 ☑ 1288	4 ☑ 1224
14 ☐ 1155	11 ☐ 1145	6 ☑ 1275	3 ☑ 1245
15 ☐ 1263	10 ☐ 1154	7 ☐ 1147	2 ☑ 1088
16 ☐ 1252	9 ☐ 1026	8 ☐ 1109	1 ☑ 1046
17 ☐ 1393	24 ☐ 1008	25 ☐ 1136	32 ☐ 1148
18 ☐ 1030	23 ☐ 1133	26 ☐ 1064	31 ☐ 1428
19 ☐ 1156	22 ☐ 1107	27 ☐ 1073	30 ☐ 1014
20 ☐ 1206	21 ☐ 1208	28 ☐ 1336	29 ☐ 1403

only samples 1-6 taken. Rest sampled on RF05

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.97	838	125/620	185911	40	1	185940	**AO2 Breath Test 1**
2	4.69	832	125/620	19:06:18	33.5	1	190645	→190/450 @ 19:07:30
3	5.32	905	170/450	19:11:00	26.5	1	19:11:25	
4	5.31	901	170/450	19:15 44	19.4	1	19:16:30	
5	5.30	902	170/450	19:2006	12.6	1	19 2040	
6	5.31	899	170/450	19:2513	7.9	1	19:26:40	REST OF FLIGHT CANCELLED
7								
8								**After 1st dive => Fl Pl 2**
9								
10								
11								
12								
13								
14								
15								
16								

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								**AO2 Breath Test 2**
31								
32								



PANC (start) (*Pencil is preferred*) Dips (Alt ↑, Time →) (end) PANC

NOT SURE ON REMAINING - CAN FILL IN LATER

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 18:33:25 Finish: 18:48:20
✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110817_RF04_Leakcheck1p/f
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on *(return to pg. 1)*

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times). 47 196 198
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 19:57:50 Finish: 20 12 45
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110817_RF04_Leakcheck2 p/f
✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs. -wholep

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
X 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

NOTE Techs changed calibrat codes for new Analog card between LC1 and LC2. whi is why MEDPSA, STATZ etc change suddenly. NOT sign of a leak or a problem.

Time (UTC)	Pup	Pdn	Pbypass	Comments
17:07:00	2	169	175	
17:08:00	4	169	175	
17:12:00	7	170	176	

Date: 110819 Campaign: HIPPO5 Flight: RF05 From: PANC To: PANC

NCAR/SCRIPPS MEDUSA Checklist V. 2011.08.15

* EXCEPTIONAL CASE: NO MAINT DAY RCF THIS IS REPEAT OF RF04 (QCLS FAILED @ FLIGHT START AND RF04 WAS SCRAP

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110818

✓ 1) Prepare new traps new beads--2" up from bottom

✓ 2) Install new traps Upstream: B Downstream: F

✓ 3) Record Flask Box Numbers: Box #1 ? Box #2 ?

✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes

✓ 5) After flasks loaded, record new flask IDs below

✓ 6) Install flask box retaining pins

✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up

✓ 8) Confirm that:

✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck

✓ 9) Replace cover shields

X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*

✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***

X 12) Complete **flask leak check procedure #1** *(see pg. 5)*

X 13) Complete rack book

✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ 110819_RF05.xls

✓ 15) Make sure to change date in excel file body and file name MED_

X 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**

X 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed

X 18) Record Ps: UTC:_____ Pup____ Pdown____ Pby____ MEDPSA____

✓ 19) All power off

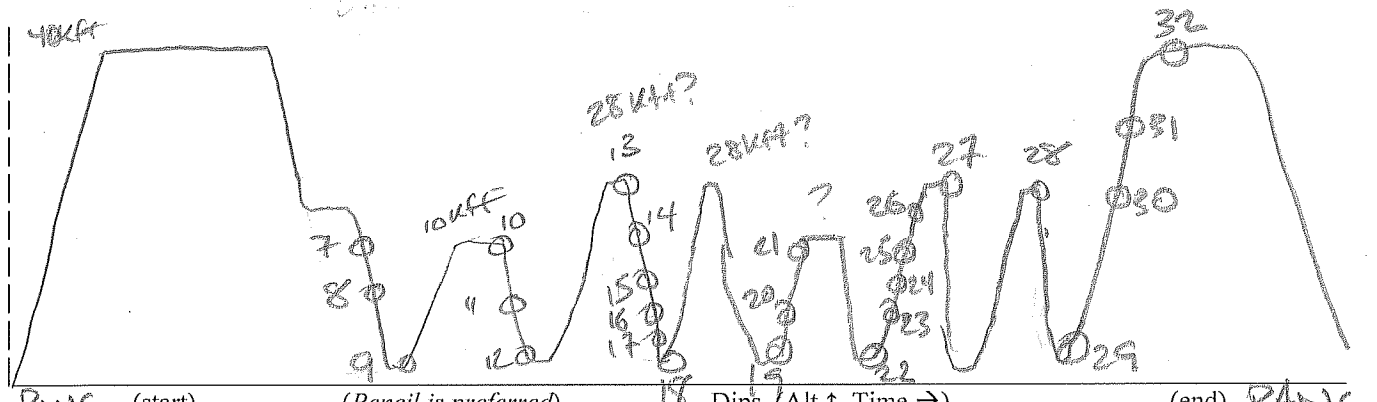
Flask ID Table (View from Front of Box)

13 ☑ 1383 ←	12 ☑ 1339	5 ☑ 1288 ←	4 ☑ 1224
14 ☑ 1155	11 ☑ 1145	6 ☑ 1275	3 ☑ 1245
15 ☑ 1263	10 ☑ 1154	7 ☑ 1147	2 ☑ 1088
16 ☑ 1252	9 ☑ 1026 ←	8 ☑ 1109	1 ☑ 1046
↓			
17 ☑ 1393	24 ☑ 1008 →	25 ☑ 1136	32 ☑ 1148
18 ☑ 1030	23 ☑ 1133	26 ☑ 1064	31 ☑ 1428
19 ☑ 1156	22 ☑ 1107	27 ☑ 1073	30 ☑ 1014
20 ☑ 1206 →	21 ☑ 1208	28 ☑ 1336 →	29 ☑ 1403

Date: 110819 Campaign: HIPPOS Flight: RF05 From: PANC To: PANC

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.67	835	125/620	18 41 23	40	0		AO2 Breath Test 1
2	4.66	831	"	18 47 01	40	0		NOTING ONLY
3	4.66	829	"	18 59 37	40	0		FOR PURPOSES
4	4.64	826	"	19 08 22	30?	0		OF METADATA
5	4.63	826	"	19 11 09	26	0		ON FLASK POSITIONS
6	5.31	911	170/450	19 19 55	20	0		AND MATCHING
7	5.30	903	170/450	19 27 07	9.6	1	19:27:40	=> FP2 @ 19:11:54
8	5.30	902	"	19 31 10	4.2	1	19:31:40	After 1st dive => Fl Pl 2
9	5.30	900	"	19:36:51	0.5	1	19:37:20	water looks green
10	5.30	901	"	19:48:04	10	2	19:48:35	
11	5.30	901	"	19:52:16	4.2	2	19:52:40	In a
12	5.30	901	"	20:00:21	0.5	2	20:00:45	in clouds
13	5.31	907	"	20:23:52	28	3	20:24:20	
14	5.32	907	"	20:29:53	20	3	20:30:15	
15	5.30	918	"	20:35:02	13	3	20:35:25	
16	5.30	904	"	20:37:43	8.9	3	20:38:00	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.29	906	"	20:41:00	4	3	20:42:00	seeing ice @ 75.2°
18	5.27	959	"	20:49:57	0.5	3	20:50:35	(parking)
19	5.27	955	"	21:41:56	0.5	4	21:42:45	cracked ice
20	5.28	935	"	21:50:08	7.8	4	~~21:51:00~~	21:57:20
21	5.28	966	"	21:56 44	15	4	~~21:57:20~~	22:16:00
22	5.27	966	"	22:19 24	0.5	5	22:16:00	
23	5.28	944	"	22:21 15	6.7	5	22:22:00	
24	5.28	938	"	22:24 15	11.3	5	22:25:00	
25	5.28	936	"	22:27 41	16.5	5	22:28:30	
26	5.30	939	"	22:31:28	22	5	22:32:20	
27	5.30	940	"	22:38:27	28	5	22:39:20	Deicing could change sample
28	5.30	945	"	23:29:53	28	6	23:30:50	
29	5.29	930	"	23:53:34	0.5	6	23:54:50	
30	5.29	950	"	00:45:37	27.5	7	00:46:30	AO2 Breath Test 2
31	5.29	961	"	00:50:26	34.3	7	00:51:10	=> 90/710 @ 00:50:50
32	3.93	818	90/710	01:01:10	41	7	01:01:20	



NOT QUITE DONE IF THIS IS 100% DONE W/O ALT profiles in front of me.

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

- 1) 28 V breaker on, Valve box on, Pump box on
- 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
- 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
- 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
- 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
- 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
- 7) Run 20-second prepurge to evacuate lines. Start:_____ Finish:_____
- 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks_____
- 9) Close Pdn, turn pumps off (will leave in position 1)
- 10) Turn bypass on *(return to pg. 1)*

SEE RF04 sheet, Pgs.

Flask Leak Check Procedure #2:

- 1) "Clear All"
- 2) Valve box off, main breaker off then on to reset, then valve box back on
- 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
- 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
- 5) Close Pdn and turn pumps off
- 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
- 7) Run 20-second prepurge to check all flask downstream tube Ps
- 8) Record times for AEROS matching. Start:_____ Finish:_____
- 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
  (YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks_____
- 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

- 1) Ensure bypass on, close PC1 and open PC2
- 2) Turn on pump breaker and let run for 1 minute
- 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
- 4) Switch PC2 to closed and turn off pump
- 5) Wait 15 seconds and note Pu, Pd, Pb in table below
- 6) After 1 minute, record values again.
- 7) After 5 minutes, record values again
- 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
- 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
- 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
17:10:15	0	166	172	
17:19:15	9	168	173	

Date: 110822 Campaign: HIPPO5 Flight: RF06 From: PANC To: PHKO Page 1 of 6

Anchorage to Kona

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight

Date (YYMMDD) = 110821

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps — Upstream: E Downstream: D
- ✓ 3) Record Flask Box Numbers: Box #1 23 Box #2 116
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  - ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- ✓ 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
- ✓ 13) Complete rack book
- ✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_110822_RF06.xls
- ✓ 15) Make sure to change date in excel file body and file name
- ✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
- ✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 19:08 Pup 3 Pdown 169 Pby 175 MEDPSA 215
- ✓ 19) All power off

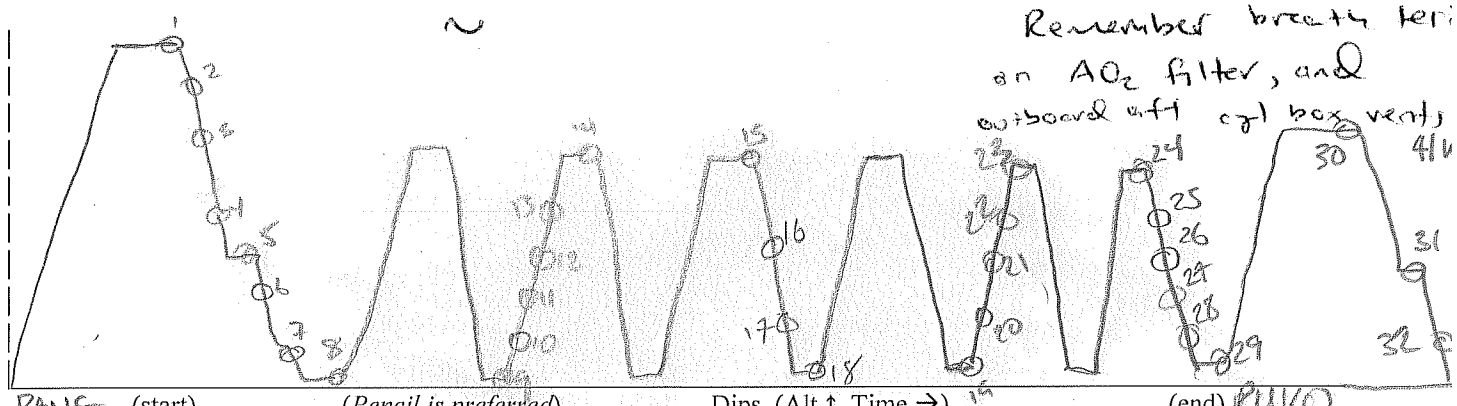
Flask ID Table (View from Front of Box)

13 ✓ 1075	12 ✓ 1066	5 ✓ 1349	4 ✓ 1185
14 ✓ 1276	11 ✓ 1140	6 ✓ 1342	3 ✓ 1027
15 ✓ 1138	10 ✓ 1113	7 ✓ 1178	2 ✓ 1187
16 ✓ 1054	9 ✓ 1160	8 ✓ 1069	1 ✓ 1353
17 ✓ 1407	24 ✓ 1401	25 ✓ 1163	32 ✓ 1025
18 ✓ 1433	23 ✓ 1103	26 ✓ 1055	31 ✓ 1287
19 ✓ 1222	22 ✓ 1169	27 ✓ 1366	30 ✓ 1442
20 ✓ 1157	21 ✓ 1414	28 ✓ 1444	29 ✓ 1422

~~slight chip on thread surface~~ ~~should be sealed well~~

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.63	827	125/620	19:09:58	40	1	19:10:30	**AO2 Breath Test 1**
2	4.63	822	125/620	19:14:00	34	1	19:14:50	19:14:11 → 170/450
3	5.31	905	170/450	19:18:52	26.1	1	19:19:15	
4	5.30	899	"	19:25:07	17.1	1	19:25:40	
5	5.29	902	"	19:29:18	11.8	1	19 30 00	just above clouds
6	5.29	900	"	19:37:04	8.7	1	19:37:40	
7	5.29	896	"	19 41:00	2.8	1	19:41:25	
8	5.29	895	"	19:44:24	0.5	1	19:44:45	**After 1st dive => Fl Pl 2**
9	5.28	893	"	20:28:33	0.5	2	20 29 00	
10	5.28	893	"	20:32:23	5.9	2	20:32:50	
11	5.29	895	"	20:36:05	11.7	2	20:36:30	
12	5.29	897	"	20:39:29	16.4	2	20:40:10	
13	5.30	901	"	20:43:13	22.3	2	20:43:50	V. interesting CO_2 as crossing jetstream w/
14	5.30	899	"	20:51:46	28	2	20:52:20	other pollution high. (See notes)
15	5.28	912	"	21:35:02	28	3	21:35:30	
16	5.29	900	"	21:47:19	11.6	3	21:47:50	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.28	900	"	21:53:18	2.2	3	21:56:45	
18	5.24	945	"	21:56:46	0.5	3	21:57:10	
19	5.24	945	"	22:40:57	0.5	4	22:41:30	
20	5.26	928	"	22:44:22	5.3	4	22:45:45	slightly early to get underlevel signature
21	5.26	956	"	22:46:08	11.6	4	22:47:00	~~STRONG STRATIFIED~~
22	5.26	961	"	22:55:35	21.6	4	22:26:15	SIGNAL @ 5 kft
23	5.25	942	"	23:03:29	28	4	23:04:00	w/ low alt CO_2 drawdown
24	5.28	934	"	23:45:50	28	5	23:46:50	high alt homog.
25	5.27	930	"	23:51:36	20	5	23:52:30	mixed higher CO_2 effect
26	5.26	924	"	23:55:44	13.7	5	23:56:40	
27	5.26	925	"	23:59:20	8.1	5	00:00:20	
28	5.25	921	"	00:03:30	2.0	5	00:04:00	
29	5.24	912	"	00:06:36	0.5	5	00:07:45	
30	3.86	804	"	01:18:36	41	6	01 20:00	**AO2 Breath Test 2**
31	3.76	796	"	01:45:04	11.1	6	01:45:00	
32	5.24	957	"	01:51:33	3.5?	6	01:52:00	



MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 = 1, Box #2 = 1, 6-way = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
X 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 175828 Finish: 18:18 ~
✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110821_RF06_Leakcheck 1p/f.png
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on *(return to pg. 1)*

1 flask was open (sticky valve) so, ran back through positions to bring MED054 back down a bit.

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x9)***
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 185002 Finish: 19:05
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110821 - RF06 - Leakcheck p/f whole
✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
X 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
165500	3	171	175	
165800	6	172	176	
171900	22	174	179	

Date: 110824 Campaign: HIPPO5 Flight: ~~RF06~~ RF07 From: ~~CASE~~ PHKO To: ~~PHKO~~ NCRG

Page 1 of 6

Kona Rarotonga, Cook Islands

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110823

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps Upstream: F Downstream: B
- ✓ 3) Record Flask Box Numbers: Box #1 ~~23~~ F Box #2 ~~12~~
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  - ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
- ✓ 13) Complete rack book
- ✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_110824_RF07.xls
- ✓ 15) Make sure to change date in excel file body and file name
- ✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
- ✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 2104 Pup ~~8~~ 12 Pdown ~~175~~ 200 Pby ~~176~~ 201 MEDPSA 218
- ✓ 19) All power off

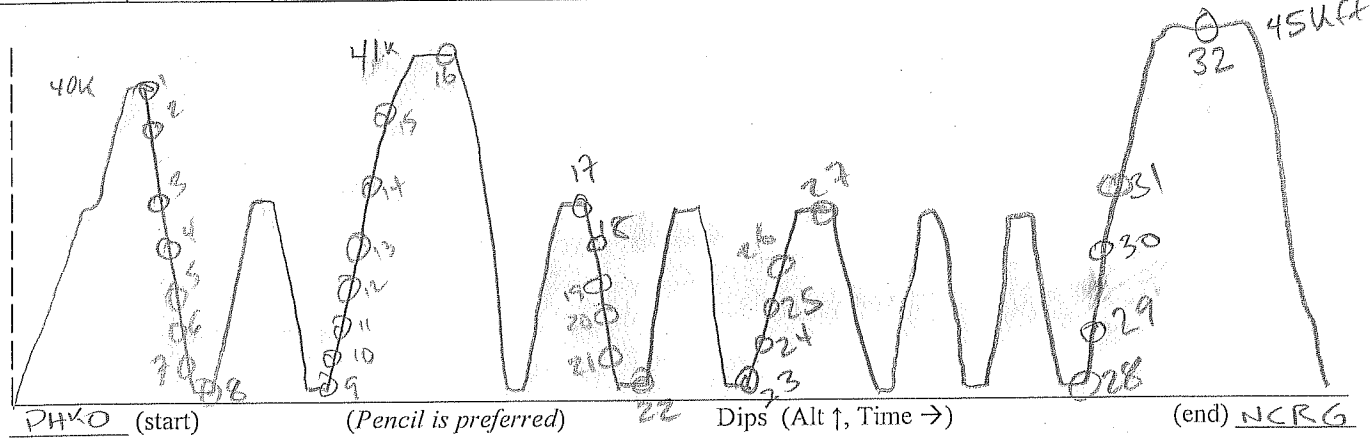
Flask ID Table (View from Front of Box)

13 ✓ 1056	12 ✓ 1152	5 ✓ 1271	4 ✓ 1215
14 ✓ 1332	11 ✓ 1260	6 ✓ 1247	3 ✓ 1415
15 ✓ 1195	10 ✓ 1396	7 ✓ 1092	2 ✓ 1162
16 ✓ 1286	9 ✓ 1265	8 ✓ 1304	1 ✓ 1180

17 ✓ 1174	24 ✓ 1335	25 ✓ 1384	32 ✓ 1018
18 ✓ 1013	23 ✓ 1192	26 ✓ 1350	31 ✓ 1293
19 ✓ 1203	22 ✓ 1282	27 ✓ 1079	30 ✓ 1261
20 ✓ 1151	21 ✓ 1337	28 ✓ 1194	29 ✓ 1125

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.62	828	125/620	204109	40	1	204140	**AO2 Breath Test 1**
2	4.67	825	125/620	204637	33	1	204720	
3	4.62	824	125/620	205038	26.5	1	205055	205056 → 170/450
4	5.28	897	170/450	205539	19.0	1	205605	
5	5.27	899	170/450	205908	13.5	1	205950	
6	5.27	896	170/450	210232	8.5	1	210305	
7	5.2	889	170/450	210545	4	1	210630	
8	5.26	886	170/450	21:10:22	0.5	1	211110	After 1st dive => Fl Pl 2
9	5.25	883	170/450	215419	0.5	2	215450	
10	5.25	879	170/450	215837	6.5	2	215920	
11	5.26	885	170/450	220157	11.6	2	220240	clouds
12	5.27	888	170/450	220531	16.8	2	220600	
13	5.27	892	170/450	220944	22	2	221010	
14	5.28	892	170/450	221406	29.7	2	221425	
15	5.28	910	170/450	221812	35	2	221900	
16	4.59	818	125/620	222923	41	2	223000	=> 125/620 @ 22:14

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.24	889	170/450	23:22:31	28	3	23:23:30	=> 170/450 @ 230710
18	5.26	953	170/450	232922	19.5	3	23:30:15	
19	5.25	944	170/450	233329	13.2	3	233415	
20	5.25	924	170/450	233632	8.7	3	233732	
21	5.23	944	170/450	233953	3.5	3	23:40:45	
22	5.23	947	170/450	234404	0.5	3	234430	
23	5.23	923	170/450	00 2621	0.5	4	002700	
24	5.24	921	170/450	00 3020	6.2	4	003100	
25	5.24	921	170/450	003333	11.1	4	003400	AO2 lamp died
26	527	925	170/450	00 4123	22.5	4	00 42:15	
27	5.26	933	170/450	00 4943	28	4	06	
28	5.15	~~914~~	170/450	02:39:24	0.5	5	02:40:13	
29	5.24	920	170/450	02:46:40	11	5	02:48:30	
30	5.25	936	170/450	02:53:55	22	5	02:55:30	**AO2 Breath Test 2**
31	5.25	945	170/450	03:02:32	35	5	03:04:30	Changed flow to 90/710
32	3.82	809	90/710	03:16 46	45	5	03:17:10	



MEDUSA leak check procedures

Flask Leak Check Procedure #1:

- ✓ 1) 28 V breaker on, Valve box on, Pump box on
- ✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
- ✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
- X 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
- ✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
- ✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
- ✓ 7) Run 20-second prepurge to evacuate lines. Start: 193414 Finish: 19:49
- ✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110823_RF07_Leakcheck1p/f png
- ✓ 9) Close Pdn, turn pumps off (will leave in position 1)
- ✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)*

Flask Leak Check Procedure #2:

- ✓ 1) "Clear All"
- ✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
- ✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
- ✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
- ✓ 5) Close Pdn and turn pumps off
- ✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
- ✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
- ✓ 8) Record times for AEROS matching. Start: 204222 Finish: 2057 ~
- ✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
  (YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110823_RF07_Leakcheck2p/f Leakcheck_whole p/f
- ✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

- ✓ 1) Ensure bypass on, close PC1 and open PC2
- ✓ 2) Turn on pump breaker and let run for 1 minute
- ✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
- ✓ 4) Switch PC2 to closed and turn off pump
- ✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
- ✓ 6) After 1 minute, record values again.
- ✓ 7) After 5 minutes, record values again
- ✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
- X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
- ✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
184715	7	169	178	
184815	11	169	178	
185015	14	169	178	
185215	15	170	178	

Date: 110827 Campaign: HIPPO5 Flight: RF08 From: NCRG To: NZCH Page 1 of 6

Rarotonga, Cook Islands Christchurch, NZ

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110826

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps Upstream: E Downstream: D
- ✓ 3) Record Flask Box Numbers: Box #1 7 Box #2 114
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
- ✓ 13) Complete rack book
- ✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_110827_RF08.xls
- ✓ 15) Make sure to change date in excel file body and file name
- ✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
- ✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 2114 Pup 10 Pdown 177 Pby 178 MEDPSA 178
- ✓ 19) All power off

Flask ID Table (View from Front of Box)

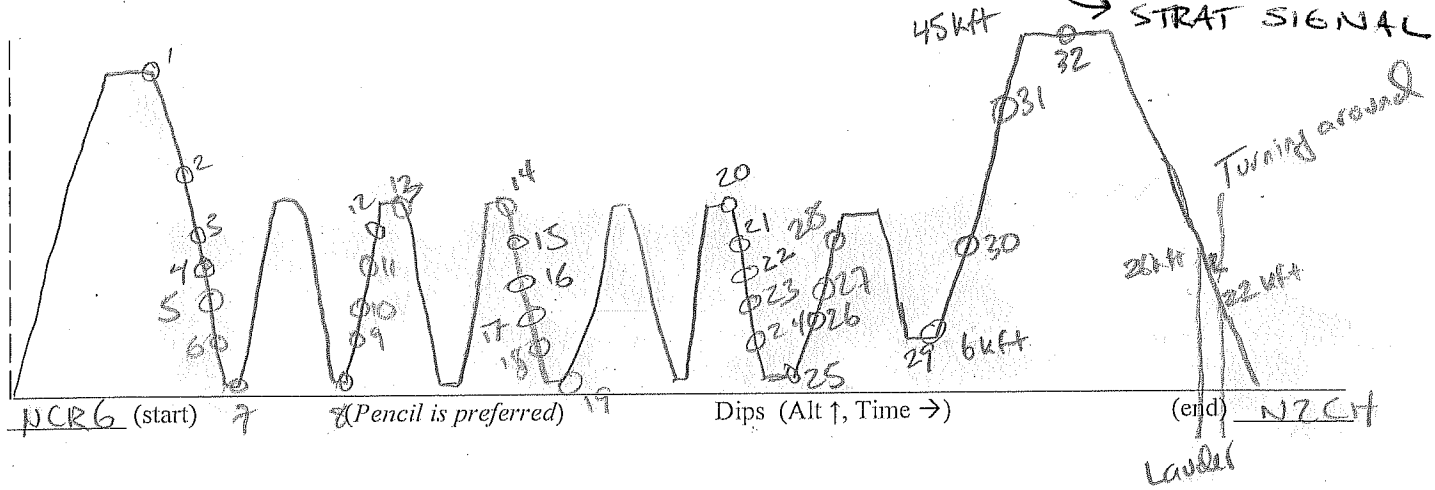
13 ✓ 1357	12 ✓ 1316	5 ✓ 1053	4 ✓ 1272
14 ✓ 1363	11 ✓ 1382	6 ✓ 1281	3 ✓ 1193
15 ✓ 1129	10 ✓ 1164	7 ✓ 1319	2 ✓ 1032
16 ✓ 1360	9 ✓ 1358	8 ✓ 1351	1 ✓ 1179

17 ✓ 1121	24 ✓ 1438	25 ✓ 1355	32 ✓ 1437
18 ✓ 1346	23 ✓ 1035	26 ✓ 1189	31 ✓ 1364
19 ✓ 1329	22 ✓ 1373	27 ✓ 1285	30 ✓ 1457
20 ✓ 1244	21 ✓ 1202	28 ✓ 1124	29 ✓ 1214

Broke after Sampling

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.62	823	125/620	21:40:57	40	1	214200	AO2 Breath Test 1
2	4.60	820	125/620	21 47 12	32	1	214740	214725 => 170/450
3	5.28	890	170/450	21 52 55	24	1	215325	
4	5.27	890	170/450	21 56 09	18.9	1	215630	
5	5.26	893	"	21 59 44	13.5	1	220010	
6	5.26	889	"	220409	6.8	1	220435	
7	5.25	883	"	220950	0.5	1	221015	
8	5.26	885	"	225447	0.5	2	225530	After 1st dive => Fl Pl 2
9	5.26	886	"	225953	7.4	2	230030	
10	5.27	887	"	230258	12	2	230325	
11	5.28	890	"	230617	17	2	230640	
12	5.28	894	"	231013	23	2	231130	
13	5.28	896	"	231617	28	2	231645	
14	5.29	894	"	000153	28	2	000220	
15	5.28	908	"	000925	19.6	3	001010	
16	5.28	894	"	001325	13.7	3	001410	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.27	895	"	001641	8.7	3	001710	
18	5.24	946	"	002038	2.9	3	002515	(turbulence - seatbelts o
19	5.22	941	"	002427	0.5	3	002515	
20	5.26	934	"	013037	28	4	013120	
21	5.27	956	"	013806	20	4	013900	
22	5.26	957	"	014204	13.9	4	014250	
23	5.26	935	"	014530	8.7	4	014610	
24	5.25	926	"	014854	3.7	4	014900	
25	5.25	921	"	015304	0.5	4	015400	
26	5.25	921	"	015858	8.3	5	015950	
27	5.27	926	"	020220	13.5	5	020300	
28	5.26	931	"	020931	24.4	5	021020	
29	5.26	926	"	022958	6	6	023050	
30	5.27	938	"	024156	23	6	024230	AO2 Breath Test 2
31	5.27	950	"	024930	35	6	025020	After Breath Test
32	3.55	807	90/710	030200	45	6	030300	=> 90/710 @ 025030



MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 20:14:00 Finish: 20 28 42
✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ ~~MED~~ 110826_RF08_Leakcheck1 p/f.png
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)*

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 20 56 15 Finish: 20:11
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110826_RF08_Leakcheck2p/f
whole p/f.png
✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
1903 30	6	174	176	
19 10 30	13	175	~~177~~	

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight — Date (YYMMDD) = 110828

__ 1) Prepare new traps new beads--2" up from bottom

• 2) Install new traps — Upstream: E Downstream: D

✓ 3) Record Flask Box Numbers: Box #1 107 Box #2 18

__ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes

✓ 5) After flasks loaded, record new flask IDs below

✓ 6) Install flask box retaining pins

✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up

✓ 8) Confirm that:

✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck

__ 9) Replace cover shields

X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*

✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***

__ 12) Complete **flask leak check procedure #1** *(see pg. 5)*

✓ 13) Complete rack book

✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_20110829.xlsx

✓ 15) Make sure to change date in excel file body and file name

✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**

__ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed

__ 18) Record Ps: UTC:_____ Pup _____ Pdown_____ Pby_____ MEDPSA_____

__ 19) All power off

Oops forgot 17-19 Power left on.

Flask ID Table (View from Front of Box)

13 ✓ 1181 ←	12 ✓ 1242	5 ✓ 1198 ←	4 ✓ 1238
14 ✓ 1120	11 ✓ 1067	6 ✓ 1150	3 ✓ 1019
15 ✓ 1227	10 ✓ 1232	7 ✓ 1016	2 ✓ 1361
16 ✓ 12 53	9 ✓ 1292 ←	8 ✓ 1127 BROKE	1 ✓ 1078

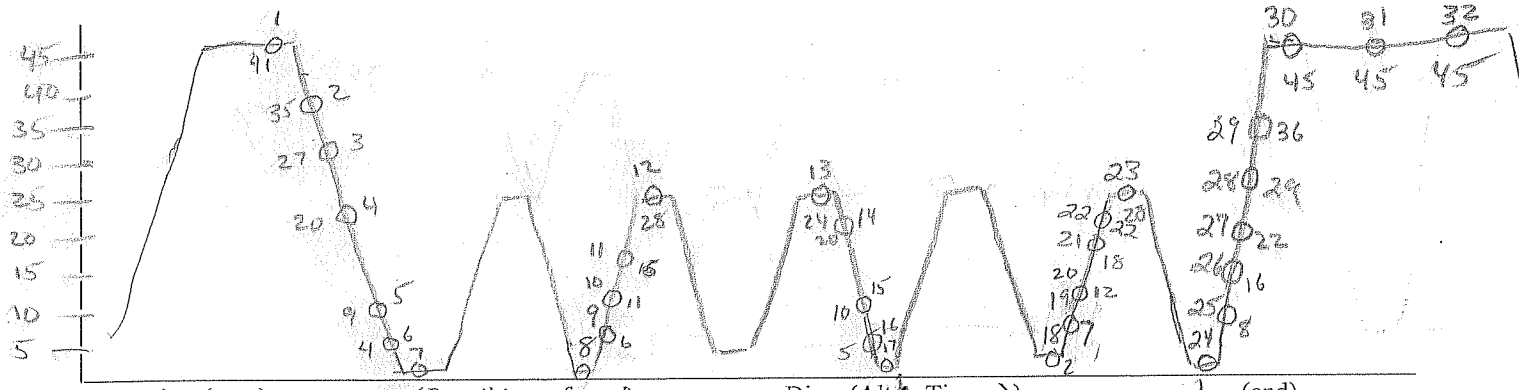
17 ✓ 1143	24 1024 1188 →	25 1188 1024	32 ✓ 1115
18 ✓ 1417	23 ~~103~~ 1259	26 ✓ 1182	31 ✓ 1331
19 ✓ 1346 1448	22 ✓ 1059	27 ✓ 1165	30 ✓ 1450
20 ✓ ~~1448~~ 1311 →	21 ✓ 1091	28 ✓ 1017 →	29 ✓ 1119

22:55:56

Date: 110829 Campaign: HIPPO 5 Flight: RF09 From: CHC To: CHC

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.6	830	~~41K~~	~~22:52:00~~ 30 41K		1	~22:57	AO2 Breath Test 1
2	4.6	829	125/640	22:59:41	35K	1	23:10	
3	4.6	829	125/640	23:05:05	27K	1	23:06:06	
4	4.6	828	125/640	23:10:39	19K	1	23:12	
5	4.6	828	125/640	23:17:05	9.9K	1	23:17:46	
6	4.6	827	125/640	23:20:25	3.9K	1	23:22:11	
7	4.5	826	125/640	23:24:45	0.68	1	23:25:20	Switched to 170/470 @ 23
8	5.1	~~826~~	170/470	00:10:32	0.82	~~2~~ 3	00:11:30	After 1st dive => Fl Pl 2
9	5.2	881	"	00:14:11	6.2	~~2~~ 3	00:14:53	
10	5.2	887	"	00:17:30	11.5	~~2~~ 3	00:18:45	
11	5.2	882	"	00:20:50	16.2	3	00:23:00	
12	5.1	885	"	00:31:30	27.9	3	00:32?	(Soon, anyway)
13	5.2	887	"	01:17:44	24.4	4	01:18:40	
14	5.2	884	"	01:22:14	20.1	4	01:28:30	
15	5.2	897	"	01:29:47	9.3	4	01:28:35	
16	5.2	885	"	01:33:10	4.2	4	02:09:15	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.2	887	"	01:38:00	1.3	4	02:13:45	
18	5.2	773	"	02:22:38	2.7	6	02:27:50	
19	5.2	928	"	02:25:37	7.1	6	02:28:00	
20	5.2	917	"	02:28:36	11.7	6	02:43:00	Brake Valve off
21	5.2	941	"	02:32:50	18.0	6	02:43:10	
22	5.2	945	"	02:35:42	22.3	6	02:43:20	
23	5.2	925	"	02:42:02	27.9	6	02:43:45	
24	5.2	770	"	03:11:28	1.3	7	03:23:15	
25	5.2	770	"	3:19:40	8.4	7	03:23:25	67°S!
26	5.2	913	"	3:25:07	16.6	7	03:27	
27	5.2	916	"	3:28:36	21.8	7	3:29	
28	5.1	917	"	3:33:22	29.0	7	3:41	
29	5.2	921	"	3:38:14	36.3	7	3:41	
30	3.8	800	90/710	3:52:30	45.1	7	3:54:30	AO2 Breath Test 2
31	3.8	862	"	5:20:18	45.1	~~8~~ 7	5:23:15	
32	3.8	805	"	5:56:38	47.1	~~8~~ 7		



MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 23:20:00 Finish: 23:35
✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110828_RF09_MEDUSA_ leakcheck1 .png
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)*

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 01:29 Finish: 01:44
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110829_RF09_MEDUSA_ leak-check2/wholep/f EDIT
✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and ~~open~~ PC2 Pup Cntrl closed Pdn Cntrl open
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160 1/170 Pdn Cntl closed
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to ~~10~~ Pup Cntl/Pdn Cntl
✗ 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary Pdn Cntl
✓ 10) Return PC1 and PC2 to auto
↳ Pup Cntrl and Pdn Ctrl

Time (UTC)	Pup	Pdn	Pbypass	Comments
10:31:10	3	171	172	
10:32:10	5	171	173	
10:37:10	10	172	174	

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight — Date (YYMMDD) = 110831

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps — Upstream: E Downstream: D
- ✓ 3) Record Flask Box Numbers: Box #1 24 Box #2 109
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  - ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- ✓ 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
- ✓ 13) Complete rack book
- ✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_20110901_RF10
- ✓ 15) Make sure to change date in excel file body and file name
- ✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
- ✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 2:60:12 Pup 9 Pdown 175 Pby 175 MEDPSA 217
- ✓ 19) All power off

Flask ID Table (View from Front of Box)

13 ✓ 1426	12 ✓ 1418	5 ✓ 1219	4 ✓ 1559
14 ✓ 1134	11 ✓ 1441	6 ✓ 1266	3 ✓ 1435
15 ✓ 1070	10 ✓ 1430	7 ✓ 1446	2 ✓ 1413
16 ✓ 1089	9 ✓ 1449	8 ✓ 1450	1 ✓ 1220
17 ✓ 1377	24 ✓ 1368	25 ✓ 1374	32 ✓ 1022
18 ✓ 1380	23 ✓ 1372	26 ✓ 1395	31 ✓ 1290
19 ✓ 1375	22 ✓ 1367	27 ✓ 1378	30 ✓ 1090 1347
20 ✓ 1370	21 ✓ 1379	28 ✓ 1376	29 ✓ 1381

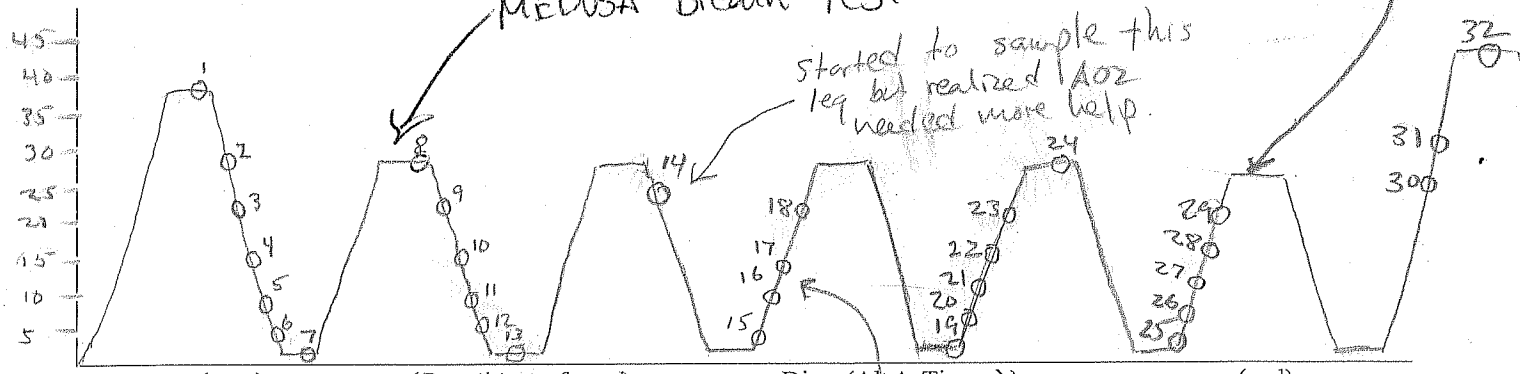
1090 brave after leak check 1

Noted in flask positio file

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes No PALTF: GSALT(m
1	4.5	828	125/640	22:33:04	11.8 m	1	22:31:45	**AO2 Breath Test 1**
2	5.2	887	170/470	22:46:36	8.2 m	1	22:44:55	
3	5.2	882	" "	22:50:19	21.4 ft	1	22:51:40	Now PALTF back
4	5.2	889	" "	22:55:14	4.5 m	1	22:53:35	PALTF gone again
5	5.2	888	" "	22:59:10	2.7 m	1	22:59:30	
6	5.2	886	" "	23:02:32	1.3 m	1	23:00:55	
7	5.2	881	" "	23:07:35	0.6 ft	1	23:08	PALTF melts free
8	5.2	883	" "	23:31:30	28.0K	2	23:31:50	**After 1st dive => Fl Pl 2**
9	5.2	882	" "	23:36:28	20.3 ft	2	23:36:50	Set Pdn = 470
10	5.2	882	" "	23:40:38	14.0	2	23:40:55	
11	5.2	882	" "	23:43:51	9.2	2	23:42:05	
12	5.2	883	" "	23:47:22	3.8	2	23:47:50	(its @ 7!)
13	5.2	882	" "	23:51:44	0.6	2	23:52:05	
14	5.2	883	" "	00:18:48	26.3	3	00:19:10	
15	5.2	895	" "	00:39:08	2.3	3	00:39:45	
16	5	884	" "	41:52	4.5	3	00:42:15	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.2	888	" "	00:44:42	10.7	3	00:55	
18	5.2	937	" "	00:56:36	19.6	3	00:55	
19	5.2	929	" "	01:22:27	0.6	4	01:24	
20	5.2	914	" "	01:26:00	5.8	4	01:30	
21	5.2	937	" "	01:29:18	10.7	4	01:30	125/640 @
22	5.2	940	" "	01:32:40	15.8	4	01:35	03:12:30
23	5.2	920	" "	01:36:37	21.8	4	01:37	
24	5.2	917	" "	01:46:39	26.9	4	01:52	Screwed up here. Thought it was Final climb.
25	5.2	911	" "	02:06:30	0.5	5	02:07	
26	5.2	907	" "	02:10:25	6.3	5	02:12	
27	5.2	913	" "	02:13:25	10.7	5	02:14	
28	5.2	915	" "	02:16:43	15.7	5	02:18	
29	5.2	911	" "	02:20:45	21.7	5	03:14	
30	5.2	920	" "	03:10:39	28.7	6	03:14	**AO2 Breath Test 2**
31	4.5	849	125/640	03:16:18	36.7	6	03:18	
32		799	" "	03:27:26	45.1	6	03:34	

MEDUSA Breath Test 23:27:00 – 23:28:00



22:00 (start) (*Pencil is preferred*) Dips (Alt ↑, Time →) (end) _____

Started to sample this leg but realized AO2 needed more help.

Still kinda screwed up here w/ AO2 problems going on.

23:54:00 back to Alt 6

It may be screwy Anne had to play w/ valve to get it to screw in.

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

✓ 1) 28 V breaker on, Valve box on, Pump box on
✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
✓ 7) Run 20-second prepurge to evacuate lines. Start: 22:21:20 Finish: 22:38:38 (two bad positions)
8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 110831_RF10_Leakcheck1p/f_bad.1
✓ 9) Close Pdn, turn pumps off (will leave in position 1)
✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)*

Second Attempt: 001551 → 00032 ✓

Flask Leak Check Procedure #2:

✓ 1) "Clear All"
✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
✓ 5) Close Pdn and turn pumps off
✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
✓ 8) Record times for AEROS matching. Start: 01 43 12 Finish: 01:58:03
✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks_____
✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

✓ 1) Ensure bypass on, close PC1 and open PC2
✓ 2) Turn on pump breaker and let run for 1 minute
✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
✓ 4) Switch PC2 to closed and turn off pump
✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
✓ 6) After 1 minute, record values again.
✓ 7) After 5 minutes, record values again
✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
✓ 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
21:04:00	2	170	171	
21:05:00	4	171	172	
21:10:00	8	172	173	

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110901

✓ 1) Prepare new traps new beads--2" up from bottom

✓ 2) Install new traps Upstream: E Downstream: D

✓ 3) Record Flask Box Numbers: Box #1 9 Box #2 118

✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes

✓ 5) After flasks loaded, record new flask IDs below

✓ 6) Install flask box retaining pins

✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up

✓ 8) Confirm that:

✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck

✓ 9) Replace cover shields

✓ 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*

✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***

✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*

x 13) Complete rack book tomorrow

✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MEO_20110902_RF11.xlsx

✓ 15) Make sure to change date in excel file body and file name

✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**

✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed

✓ 18) Record Ps: UTC: 22:16:00 Pup 9 Pdown 175 Pby 176 MEDPSA 196

✓ 19) All power off

Flask ID Table (View from Front of Box)

13 ☑ 1105	12 ☑ 1258	5 ☑ 1278	4 ☑ 1168
14 ☑ 1137	11 ☑ 1096	6 ☑ 1087	3 ☑ 1158
15 ☑ 1371	10 ☑ 1033	7 ☑ 1072	2 ☑ 1170
16 ☑ 1340 ~~1297~~	9 ☑ 1317	8 ☑ 1236	1 ☑ 1132

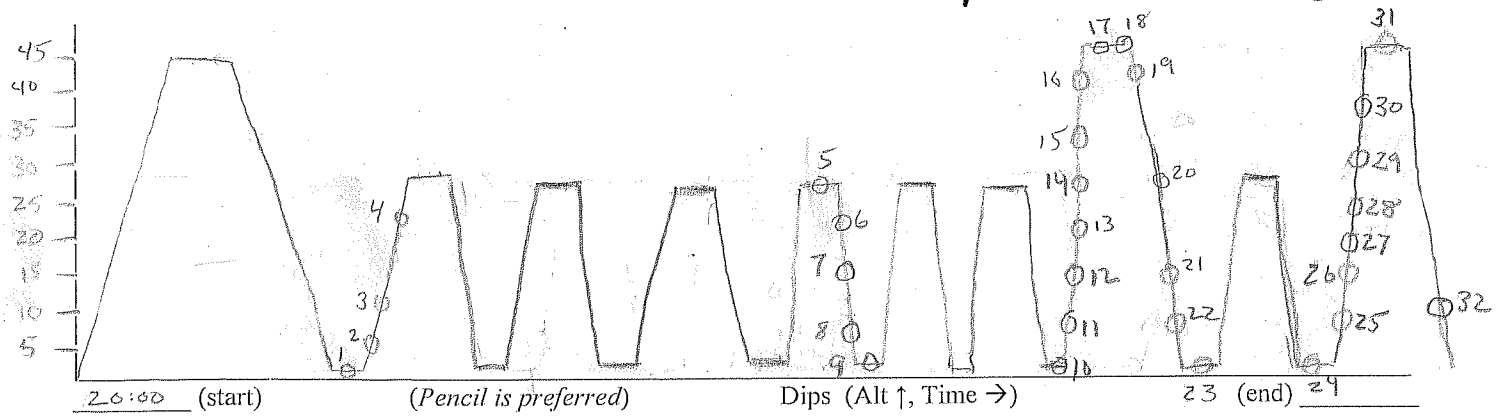
17 ☐ 1402	24 ☐ 1419	25 ☐ 1406	32 ☐ 1399
18 ☐ 1397	23 ☐ 1425	26 ☐ 1432	31 ☐ 1389
19 ☐ 1394	22 ☐ 1387	27 ☐ 1112	30 ☐ 1427
20 ☐ 1291	21 ☐ 1411	28 ☐ 1440	29 ☐ 1420

1297 broke during first leak check (#12)

Date: 110903 Campaign: HIPPO 5 Flight: BF 11 From: NCRG To: PHKO

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	~~5.4~~ 5.2	~~886~~ 877	170/470	21:08:02	0.42	1	21:08:44	**AO2 Breath Test 1**
2	5.2	872	" "	21:11:41	5.7	1	21:12:05	
3	5.2	869	" "	21:14:58	10.6	1	21:15:30	
4	5.2	877	" "	21:22:34	22.0	1	21:23:15	
5	5.2	880	" "	23:42:36	28.5	5	23:51:30	
6	5.2	877	" "	23:50:55	~~21.0~~ 20.2	5	23:51:40	
7	5.2	874	" "	23:54:53	14.2	5	23:55:10	
8	5.2	866	" "	00:01:32	4.2	5	~~00~~ 00:05:50	**After 1st dive => Fl Pl 2**
9	5.2	864	" "	00:05:15	0.55	5	00:05:55	Pdownset => 470
10	5.1	858	" "	01:33:30	0.56	7	01:33:50	
11	5.2	861	" "	01:37:47	5.9	7	01:38:10	
12	5.2	867	" "	01:41:08	10.8	7	01:41:25	
13	5.2	871	" "	01:44:23	15.8	7	01:42:40	
14	5.2	871	" "	01:48:25	21.8	7	01:48:50	
15	5.2	887	" "	01:53:23	29.3	7	01:54:00	
16	5.2	885	" "	01:58:24	36.9	7	01:59:00	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	4.7	751	" "	02:03:58	41.0	7	02:12	
18	4.5	840	125/640	02:06:30	41.0	8	02:12	
19	4.5	846	" "	02:10:30	35.2	8	02:12	
20	4.5	829	" "	02:15:44	27.3	8	02:17	
21	4.6	845	" "	02:2~~9~~3~~4~~	14.1	8	02:50	
22	5.2	929	170/470	02:3~~7~~1:17	3.9	8	02:50	
23	5.2	903	" "	02:34:30	0.56	8	02:50	
24	5.2	895	" "	03:20:15	0.50	9	03:21	
25	5.2	898	" "	03:23:57	5.9	9	03:28	
26	5.2	897	" "	03:2~~7~~1:18	10.9	9	03:28	
27	5.2	903	" "	03:30:36	15.9	9	03:31	
28	5.2	907	" "	03:34:49	22.2	9	~~03:35~~	Closed 9/5 8:30 Loca
29	5.2	907	" "	03:39:3	29.4	9	03:45	
30	4.5	839	125/640	03:44:30	36.6	9	03:45	**AO2 Breath Test 2**
31	4.3	801	" "	03:55:31	45.1	9	03:57	
32	5.2	936	170/470	04:27:28	9.0	10	9/5 8:30	Closed local.



20:00 (start) (*Pencil is preferred*) Dips (Alt ↑, Time →) 23 (end) 24

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

1) 28 V breaker on, Valve box on, Pump box on
2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute Saved w/- bad.png
4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
7) Run 20-second prepurge to evacuate lines. Start: 20:02:30 Finish: NO- redo. Cyl #16
8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110901_RF11_MEDUSA_Leakcheck1p/f.png Broke #1279 #1297
9) Close Pdn, turn pumps off (will leave in position 1)
10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)* 2nd try started at 20:35 – 21:01:15

Flask Leak Check Procedure #2:

1) "Clear All"
2) Valve box off, main breaker off then on to reset, then valve box back on
3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
5) Close Pdn and turn pumps off
6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
7) Run 20-second prepurge to check all flask downstream tube Ps
8) Record times for AEROS matching. Start: 21:56:09 Finish: 22:10:55
9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
(YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110901_RF11 etc.
10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

1) Ensure bypass on, close PC1 and open PC2
2) Turn on pump breaker and let run for 1 minute
3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
4) Switch PC2 to closed and turn off pump
5) Wait 15 seconds and note Pu, Pd, Pb in table below
6) After 1 minute, record values again.
7) After 5 minutes, record values again
8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
19:31:00	10	170	175	
19:32:30	11	171	175	
19:37:30	15	172	176	

NCAR/SCRIPPS MEDUSA Checklist V. 2011.08.15

I. Preflight

A. Day(s) before flight Date (YYMMDD) = 110905

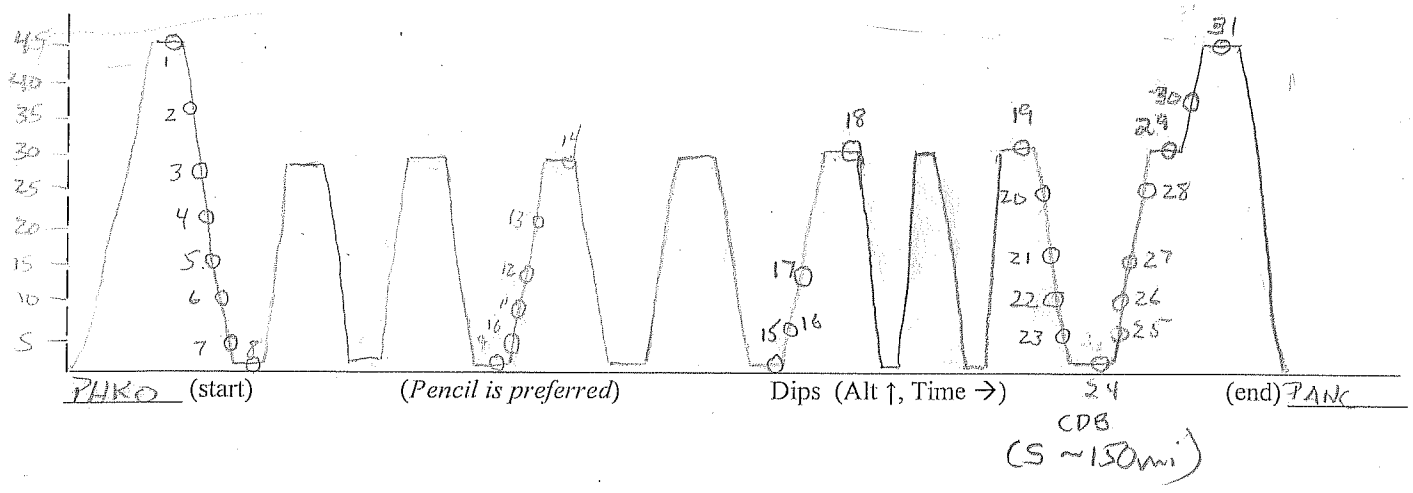
✓ 1) Prepare new traps new beads--2" up from bottom
✓ 2) Install new traps Upstream: D Downstream: E
✓ 3) Record Flask Box Numbers: Box #1 113 Box #2 ~~118~~ 117
✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
✓ 5) After flasks loaded, record new flask IDs below
✓ 6) Install flask box retaining pins
✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
✓ 8) Confirm that:
✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
✓ 9) Replace cover shields
X 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
X 13) Complete rack book tomorrow after opening
✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\MED_20110906_RF12
✓ 15) Make sure to change date in excel file body and file name
✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
✓ 18) Record Ps: UTC: 22:00 Pup 41 Pdown 178 Pby 179 MEDPSA 354
✓ 19) All power off

Flask ID Table (View from Front of Box)

13 ✓ 1233	12 ✓ 1038	5 ✓ 1126	4 ✓ 1277
14 ✓ 1037	11 ✓ 1058	6 ✓ 1269	3 ✓ 1341
15 ✓ 1142	10 ✓ 1061	7 ✓ ~~1001~~ 1345	2 ✓ 1299
16 ✓ 1065	9 ✓ 1267	8 ✓ 1122	1 ✓ 1229
17 ✓ 1205	24 ✓ 1207	25 ✓ 1184	32 ✓ JUMPERED ~~1237~~
18 ✓ 1123	23 ✓ 1356	26 ✓ 1344	31 ✓ 1255
19 ✓ 1270	22 ✓ 1175	27 ✓ 1034	30 ✓ 1077
20 ✓ 1243	21 ✓ 1028	28 ✓ 1309	29 ✓ 1231 1345

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.5	819	125/640	21:24:08	41k	1	21:25:00	**AO2 Breath Test 1**
2	4.5	817	" "	21:32:19	34.8	1	21:32:39	
3	4.5	815	" "	21:37:40	26.8	1	21:38:02	
4	4.5	815	" "	21:42:17	19.8	1	21:42:35	
5	4.5	816	" "	21:46:29	13.5	1	21:46:50	
6	4.5	816	" "	21:49:36	8.8	1	21:34:55	
7	4.5	810	" "	21:52:52	3.9	1	21:53:24	
8	4.5	810	" "	21:57:21	0.37	1	21:57:52	**After 1st dive => Fl Pl 2**
9	5.2	861	170/470	23:27:01	0.51	3	23:27:25	PDown set =>470
10	5.2	859	" "	23:30:48	5.8	3	23:31:15	
11	5.2	865	" "	23:34:10	10.9	3	23:34:30	
12	5.2	868	" "	23:37:27	15.8	3	23:37:48	
13	5.2	874	" "	23:41:27	21.8	3	23:41:50	
14	5.2	875	" "	23:50:06	28.0	3	23:50:25	
15	5.2	879	" "	00:55:27	0.63	5	00:56:06	
16	5.2	869	" "	00:59:44	6.9	5	01:01:00	

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.2	876	" "	01:05:38	15.8	5	01:07:05	
18	5.2	933	" "	01:17:10	28.0	5	01:19	
19	5.2	929	" "	02:44:56	28.0	8	02:46	
20	5.2	909	" "	02:51:29	20.1	8	02:52	
21	5.2	932	" "	02:55:22	14.2	8	02:56	
22	5.2	935	" "	02:58:43	9.2	8	03:00	
23	5.2	912	" "	03:02:02	4.2	8	03:03	
24	5.2	907	" "	03:05:47	1.0	8	03:10	
25	5.2	905	" "	03:09:32	5.8	8	03:10	
26	5.2	904	" "	03:12:52	10.8	8	03:14	
27	5.2	908	" "	03:16:09	15.8	8	03:17	Valve cracked on close
28	5.2	911	" "	03:20:14	21.8	8	03:22	
29	5.2	911	" "	03:26:05	28.0	8	03:29	Levelled off @ 28k
30	4.5	837	125/640	03:34:13	37.1	8	03:34	**AO2 Breath Test 2**
31	4.3	801	125/640	03:45:02	45.1	8	03:48	
32		BYPASSED						



MEDUSA leak check procedures

#7 valve broken after install, tight check. Redo

Flask Leak Check Procedure #1:

- ✓ 1) 28 V breaker on, Valve box on, Pump box on
- ✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
- 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
- ✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
- ✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)*** 19:44:50
- ✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
- ✓ 7) Run 20-second prepurge to evacuate lines. Start: 19:26:26 Finish: before 20:11
- ✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\20110906_RF12_MEDUSA_Leakcheck1p/f
- ✓ 9) Close Pdn, turn pumps off (will leave in position 1)
- ✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)*

Flask Leak Check Procedure #2:

- ✓ 1) "Clear All"
- ✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
- ✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
- ✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
- ✓ 5) Close Pdn and turn pumps off
- ✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
- ✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
- ✓ 8) Record times for AEROS matching. Start: 21:17:55 Finish: _____
- ✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
  (YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\20110906_RF12_MEDUSA_Leakcheck2p/f
- ✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

- ✓ 1) Ensure bypass on, close PC1 and open PC2
- ✓ 2) Turn on pump breaker and let run for 1 minute
- ✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
- ✓ 4) Switch PC2 to closed and turn off pump
- ✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
- ✓ 6) After 1 minute, record values again.
- ✓ 7) After 5 minutes, record values again
- ✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
- X 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
- ✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
19:12:09	14	173	178	More than 15 sec
19:14:09	15	173	178	
19:19:09	18 19	174	178	

NCAR/SCRIPPS MEDUSA Checklist

V. 2011.08.15

I. Preflight

A. Day(s) before flight

Date (YYMMDD) = 110907

- ✓ 1) Prepare new traps new beads--2" up from bottom
- ✓ 2) Install new traps — Upstream: 11 Downstream: ___
- ✓ 3) Record Flask Box Numbers: Box #1 101 Box #2 108
- ✓ 4) Load flasks, confirm old IDs *(put checks in boxes of previous Flask ID table)*, inspecting the o-rings of old and new flasks for damage, cardboard flakes
- ✓ 5) After flasks loaded, record new flask IDs below
- ✓ 6) Install flask box retaining pins
- ✓ 7) Connect plumbing. Confirm lines are correctly installed with red label up
- ✓ 8) Confirm that:
  ✓ lines are strain relieved ✓ lines don't touch splinter shield ✓ no flasks feel stuck
- ✓ 9) Replace cover shields
- ✓ 10) If necessary, download data from last flight to laptop *(see "MEDUSA Supplement")*
- ✓ 11) Check that flask table is clear. If not, "clear all" ***(Menu x3; set; shift; "clear all")***
- ✓ 12) Complete **flask leak check procedure #1** *(see pg. 5)*
- ✓ 13) Complete rack book tomorrow when open flasks
- ✓ 14) Record flask IDs into an Excel file on laptop (MED_YYMMDD_RF##.xls) under Desktop\HIPPO_\MEDUSA XLS TAB PNG\Flask Positions\ MED_ 20110908_RF13.xlsx
- ✓ 15) Make sure to change date in excel file body and file name
- ✓ 16) Wait as long as possible, 1-hour preferred, then complete **flask leak check procedure #2**
- ✓ 17) Pull bypass pressure down (PC2 open), then pumps off and PC2 closed
- ✓ 18) Record Ps: UTC: 23:09 Pup 7 Pdown 175 Pby 177 MEDPSA 206
- ✓ 19) All power off

Flask ID Table (View from Front of Box)

13 ✓ 1212	12 ✓ 1264	5 ✓ 1094	4 ✓ 1400
14 ✓ 1217	11 ✓ 1289	6 ✓ 1248	3 ✓ 1146
15 ✓ 1159	10 ✓ 1436	7 ✓ 1405	2 ✓ 1365
16 ✓ 1354	9 ✓ 1117	8 ✓ 1280	1 ✓ 1045
17 ✓ 1011	24 ✓ 1057	25 ✓ 1196	32 ✓ 1318 1303
18 ✓ 1303 ~~1318~~	23 ✓ 1040	26 ✓ 1141	31 ✓ 1102
19 ✓ 1052	22 ✓ 1295	27 ✓ 1451	30 ✓ 1039
20 ✓ 1386	21 ✓ 1439	28 ✓ 1166	29 ✓ 1390

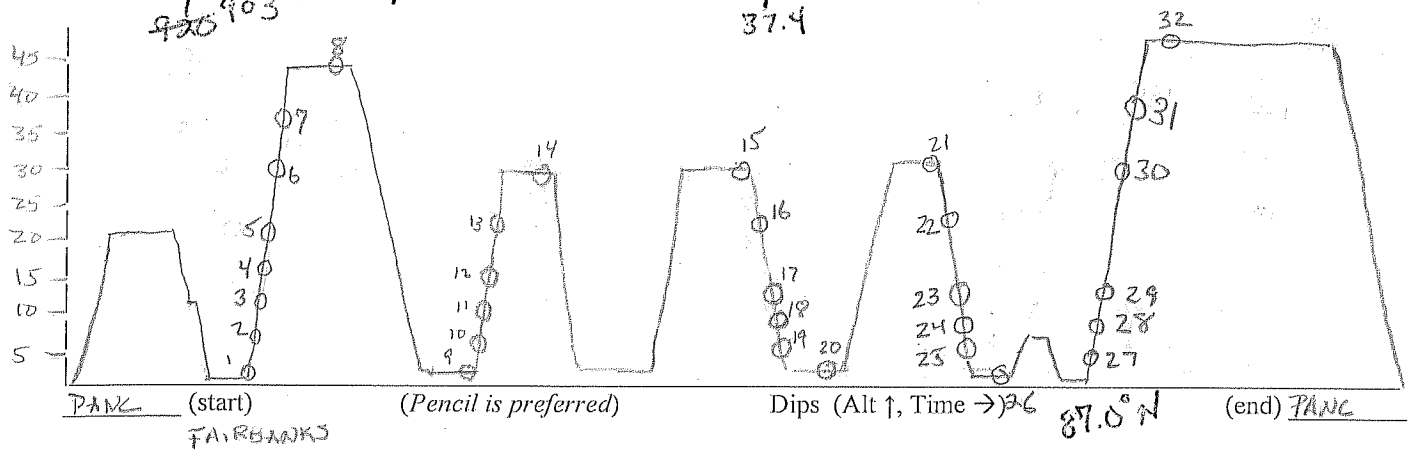
Date: 110908 Campaign: HIPPO 5 Flight: RF13 From: PANC To: PANC

Pos	Flow (V)	Psa (torr)	PC Setpts	End Time	PALTF	Profile #	Close Time	Notes
1	4.5	814	125/640	17:48:43	1.3	1	17:51:00	**AO2 Breath Test 1**
2	4.5	812	" "	17:51:23	7.4	1	17:52:00	Just finished flush
3	4.5	811	" "	17:54:32	12.1	1	18:02:20	" " "
4	4.5	814	" "	17:57:16	16.2	1	18:02:20	
5	4.5	813	" "	18:01:37	22.8	1	18:02:20	
6	4.5	813	" "	18:05:53	29.2	1	18:06:10	
7	4.5	814	" "	18:12:03	36.9	1	18:12:25	
8	4.5	820	" "	18:21:29	41.0	1	18:21:50	**After 1st dive => Fl Pl 2**
9	5.2	874	170/470	18:54:57	0.45	2	18:55:25	Set Pdn = 470
10	5.2	870	" "	18:59:59	7.7	2	19:00:30	
11	5.2	872	" "	19:02:20	11.2	2	19:03:30	
12	5.2	876	" "	19:05:22	15.8	2	19:05:45	
13	5.2	878	" "	19:09:20	21.8	2	19:09:50	
14	5.2	890	" "	19:17:05	27.9	2	19:17:40	
15	5.2	893	" "	20:07:22	27.9	4	20:07:50	
16	5.2	880	" "	20:12:34	20.0	4	20:13:05	

878 20:16:28 14.2

Pos	Flow (V)	Psa (torr)	P Setpts	End Time	PALTF	Profile #	Close Time	Notes
17	5.2	~~880~~	" "	~~20:12:34~~	~~20.0~~	4	20:18:10	
18	5.2	931	" "	20:19:46	9.2	4	20:21	
19	5.2	928	" "	20:23:10	4.1	4	20:25	
20	5.2	938	" "	20:32:30	0.58	4	~~20:34~~ ~~21:08~~ 20:34	
21	5.2	938	" "	21:07:08	27.9	5	~~21:15~~ 21:08	
22	5.2	940	" "	21:13:26	18.3	5	21:15	
23	5.2	917	" "	21:16:12	14.2	5	21:17	
24	5.2	911	" "	21:19:51	9.4	5	21:21	
25	5.2	907	" "	21:25:01	3.7	5	21:26	
26	5.2	907	" "	21:34:56	0.83	5	21:40	
27	5.2	908	" "	21:57:06	5.8	6	21:58	
28	5.2	910	" "	22:00:28	10.8	6	22:01	
29	5.2	908	" "	22:03:45	15.8	6	22:05	
30	5.1	920	" "	22:13:02	29.7	6	22:15	**AO2 Breath Test 2**
31	5.2	~~930~~	" "	22:18:09	~~36.8~~	6	22:22	22:18 FP 1 Pdn = 640
32	4.2	801	125/640	22:38:04	45.0	6		

~~930~~ 903 37.4



PANC (start) FAIRBANKS (*Pencil is preferred*) Dips (Alt ↑, Time →) 87.0° N (end) PANC

MEDUSA leak check procedures

Flask Leak Check Procedure #1:

- ✓ 1) 28 V breaker on, Valve box on, Pump box on
- ✓ 2) Ensure Box #1 (VLV1SET) = 1, Box #2 (VLV2SET) = 1, 6-way(VLV3SET) = odd, Bypass on
- ✓ 3) Pup Ctrl Closed, Pdn Ctrl Open, Pump On - pull down bypass line for 1 minute
- ✓ 4) If necessary, "Clear All" (after being sure data from last flight secure on laptop)
- ✓ 5) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
- ✓ 6) Use bypass key to toggle between bypass on/off 6 times over 1-min to pull PSA down to < 200
- ✓ 7) Run 20-second prepurge to evacuate lines. Start: 19:38:10 Finish: 20:05 (before) 19:53
- ✓ 8) Save PNGs of AEROS p/f to laptop (YYMMDD_RF##_Leakcheck1p/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110907_RF13_MEDUSA_Leakcheck1 p/f/b
- ✓ 9) Close Pdn, turn pumps off (will leave in position 1) #18 looks weird. Tighten & redo
- ✓ 10) Turn bypass on (***Menu x1, Set x2***) *(return to pg. 1)* start: 20:29:10 20:41:04 18 still screwy. Moved to 32 20:55:54

Flask Leak Check Procedure #2:

- ✓ 1) "Clear All"
- ✓ 2) Valve box off, main breaker off then on to reset, then valve box back on
- ✓ 3) Ensure AEROS is running with MEDP1,MEDP2, MED_PSA, MEDPBYP recording
- ✓ 4) Open Pdn, turn pumps on and evacuate sample and bypass (toggle 6 times).
- ✓ 5) Close Pdn and turn pumps off
- ✓ 6) Adjust prepurge time to 20 seconds ***(Menu x2, Set x10)***
- ✓ 7) Run 20-second prepurge to check all flask downstream tube Ps
- ✓ 8) Record times for AEROS matching. Start: 22:49 Finish: 23:03:58
- ✓ 9) Save 4 PNGs of AEROS to laptop of p/f for Leakcheck2 and whole leakcheck
  (YYMMDD_RF##_Leakcheck2p/f.png, YYMMDD_RF##_Leakcheck_wholep/f.png)
  Desktop\HIPPO_\MEDUSA XLS TAB PNG\Leakchecks\ 20110908_RF13_MEDUSA_Leakcheck2_wholep/f
- ✓ 10) Turn bypass on. There should now be a total of 6 leak check PNGs.

Bypass / System Leak Check Procedure:

- ✓ 1) Ensure bypass on, close PC1 and open PC2
- ✓ 2) Turn on pump breaker and let run for 1 minute
- ✓ 3) Verify Pup ~ 10, Pdown ~160, Pbypass ~160
- ✓ 4) Switch PC2 to closed and turn off pump
- ✓ 5) Wait 15 seconds and note Pu, Pd, Pb in table below
- ✓ 6) After 1 minute, record values again.
- ✓ 7) After 5 minutes, record values again
- ✓ 8) If Pdown and Pbypass <2 torr/5 mins, skip to 10
- ✓ 9) If values are not ok, turn PC1/PC2 to auto, run gas for 15 seconds, close PC2 for 1 second, and then shut off pump to pressurize system in bypass. Snoop trap fittings, and fittings between and to boxes, and fix/tighten as necessary
- ✓ 10) Return PC1 and PC2 to auto

Time (UTC)	Pup	Pdn	Pbypass	Comments
16:18:40	6	172	173	
16:19:45	8	172	174	
16:25:45	12	173	175	