NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.11.11

Date 1003 16 Campaign HIPPO 3 Flight TF01 From BJC To BJC

I. Preflight

A. Day(s) before flight Date = _____

__ 1) Prepare trap with clean glass beads filled to 1 inch from bottom

__ 2) Install trap in dewar Trap Letters Top/Bottom = ___ / ___

__ 3) Record cylinder pressures (or copy from prev. postflight)

LS ____ HS ____ CylT1 ____ UTC = __ : __

LT ____ WT ____

__ 4) Turn on O_2 box, start program, and record pressures (or copy from prev. postflight)

PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __

B. 2-hours before take-off Instrument Operator _____

✓ 1) Rack power switch on

✓ 2) O_2 box Power breaker on

✓ 3) Laptop power on

✓ 4) Load dry-ice in dewar to within 0.5 inches of lid UTC = __ : __

__ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)

LS 2040 / ___ HS 2290 / ___ CylT1 20.8 / ___

LT 470 / ___ WT 2210 / ___

__ 6) Open green knobs four ¼ turns and re-record pressures and any changes

LS 2080 / ___ HS 2290 / ___ CylT2 ____ / ___

LT 470 / ___ WT 2210 / ___

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

✓ 9) Start AO2 program by clicking play in higold.vdp

✓ 10) Ensure that no USB errors are present in boxes at bottom of screen

✓ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times

AO2 PC Time 4 : 38 : 02 , Rack laptop time 4 : 38 : 00

✓ 12) Log each hi-side cylinder pressure in software

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

__ 15) Record instrument pressures and changes overnight (P / Δ)

PaWT 956 / ___ PaSP 929 / ___ PLi840 19.4 / ___ TMan 25.18 ___

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 94 torr (± 1). If not, adjust.

PaCO2 329 PaO2 95

✓ 19) Click Initialize Cal Flow button

✓ 20) Ensure that flow starts through both lines (110 ± 10)

FlWT (to cell) 109 FlSP (to bypass) 111

✓ 21) Toggle changeover to check flows in other position

FlWT (to bypass) 110 FlSP (to cell) 110

✓ 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 9 : 48
✓ 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 6.62
✓ 29) Click Initialize Sample Flow button
✓ 30) Pump box Pump 1 breaker on
✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 800 SA Purge Flow 117
✓ 32) Snoop trap fittings
✓ 33) Pump box Pump 1 breaker off
✓ 34) >= 10 min. after lamp on record values in first ~~row of~~ table below
✓ 35) Enable changeover valve (uncheck disable) UTC = 5 : 03
✓ 36) >= 10 min. after change-over enable, record values in table below

Inlet 3-way valve to purge gas
Pump Breaker AT 1715
Inlet Purge Gas = HS1
P = 788

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
5:00:	WT	NA	.65	2.0	NA	NA	8.6	NA	.69	4.1	4.6
5:04:	WT	942	.59	2.4	12.8	-1.44	~~14.9~~ 5.7	15.5	~~.77~~	4.1	4.3

✓ 37) Disable changeover
✓ 38) If necessary, toggle changeover to get SP to Cell
✓ 39) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
Flag 9 Cal Interval 30 Cal Period 3 LTf 2 WTf 3
✓ 4) Click Start button on main screen
✓ 5) Click Proceed button on control screen UTC = 17 : 47 30
✓ 6) Minimize "Verify Run Plan" window
✓ 7) Note cryo temperature Cryo = ~61
✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on
✓ 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off
✓ 10) If ground hold extended > 20 min, go to Manual and run WT until take-off
✓ 11) Note time of wheels up UTC = 18 : 08 : 02

✓ 12) dimmed before taxi to runway, inlet 3-way to sample 18:07:00

II. During Flight

✓ 13) close Inlet purge green valve & on/off valve

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

~19:46 to ATL

19:47:00-30 breath on inlet 3-way & ~~inlet fittings~~ 08:31
19:48:00-30 " " inlet fittings 07:29
19:49:00-30 " " filter holder & fittings

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt

III. Postflight

1) Note time of wheels down UTC = 20:30:50
2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
3) Click Stop button MAN ✓ switched inlet 3-way 20:32:30
4) Turn off lamp
5) Close SA, WT, SP, and O2 248 valves in software
6) Select None in cylinder box control section and uncheck any purges
7) Close manual VAC valve
8) Pump box Pump 1 breaker off
9) Note cryo temperature Cryo = -57.5
10) Cylinder box Power breaker off
11) Pump box Pump 2 breaker off
12) Pump box Power breaker off
13) Record pressures for a leak check
PaWT 854 PaSP 849 PLi840 13.15 TMan 265 UTC = 20:39
14) Open cylinder box lid and record cylinder pressures for a leak check
LS 2010 HS 2290 CylT1 2 } cyl Box UTC = 20:40
LT 460 WT 2020 CylT2 ____ }
15) Close all 4 green valves
16) Close cylinder box lid — close ~~valve~~ purge supply line [cyl]
17) Log each hi-side cylinder pressure in software
18) Close program and Visual Basic
19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
20) Shut down AO2 PC
21) Shut down laptop
22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
23) Rack power switch off
24) Pull trap, jumper quick-connects, and install stopper
25) Open trap and remove glass beads

IV. Troubleshooting / procedures

A. Time sync not working: set timeserver IP of timeserver to 192.168.84.1 and click update now. Also, can try 192.168.184.10. Ask tech about any server issues.

B. Other network problems: AO2 IP address = 192.168.84.138, Laptop IP address = 192.168.84.137.

C. O_2 signal ~ 50 % low and noisy. Turn lamp off and relight, up to 10 times to try to fix. Can also try full power down and back up of instrument.

D. If PaCO2 or PaO2 are incorrect: adjust using Vac and Ambient check boxes, and external tube to attain above-ambient P if necessary.

E. Program crash upon cylinder loading or pressure logging: because of a bad entry in Data/hgcyllog.txt, which must be manually edited to fix.

F. USB errors present: stop AO2 program, exit Visual Basic, check cables, and restart; if errors persist, stop AO2 program, exit VB, shut-down windows, power-down instrument, check cables and restart.

G. Sample flow or PaSA low: check/uncheck the Pump Box Enable check box 10 times and check Pump 1 breaker.

H. WT flow low: check/uncheck the Cylinder Box Enable check box 10 times, check VAC valve, and check Pump 2 breaker.

I. Li-840 H2O reading is -1.00. H2O signal needs to be rezeroed. Stop AO2 program. Start Li-840 software, go to calibration tool and click on zero for H2O.

J. Program crash associated with one of the plots. Click debug and comment out offending line with an apostrophe and then click play again (plot will not work for rest of flights).

K. Internet time working? By right-clicking clock, selecting Adjust Date and Time, then selecting Internet Time tab.

L. Lighting lamp: select RF On check box and click "Spark for 2-seconds" button.

M. Copy to laptop: on laptop, open desktop shortcut to AO2 Data, sort files by most recent Date Modified, select YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt, then copy to desktop folder AO2 Data on Laptop. Copy to pen drive: inset in laptop, copy, unmount, remove.

N. Noise persistently above 10 (e.g. 30) – try lowering PaCO2 and flow.

V. Emergency shut-down

A. Pull all breakers.

B. Close manual VAC valve.

JUST MAINTENANCE PAY

Date 100323 Campaign HIPPO3 Flight / From / To /

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight Date = 100323

✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom

✓ 2) Install trap in dewar Trap Letters Top/Bottom = O O

✓ 3) Turn on O_2 box, start program, and record pressures

PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __

X 4) Crack and close green valves, then record cylinder pressures

LS ____ HS ____ LP ____ UTC = __ : __

LT ____ WT ____ CylT2 ____

X 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)

B. 2-hours before take-off Instrument Operator JDS

✓ 1) Rack power switch on

✓ 2) O_2 box Power breaker on

✓ 3) Laptop power on

✓ 4) Pump box Power breaker on

✓ 5) Pump box Fridge breaker on

✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 00

✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)

LS 1300 / ___ HS 1205 / ___ LP ~2150 / ___

LT 400 / ___ WT 1685 / ___ CylT2 24 / ___ (once inst. on)

✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)

LS 1305 / +5 HS 1210 / +5 LP ~2170 / +20

LT 430 / +30 WT 1700 / +15

✓ 9) Close cylinder box lid

✓ 10) Vnc into into AO2 (192.168.84.138)

✓ 11) Start AO2 program by clicking play in higold.vdp

✓ 12) Ensure that no USB errors are present in boxes at bottom of screen

✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times

AO2 PC Time 16 : 56 : 05 , Rack laptop time 16 : 56 : 01 (delay)

✓ 14) Cylinder box Power breaker on

✓ 15) Record instrument pressures and changes overnight (P / Δ)

PaWT 846 / ___ PaSP 781 / ___ PLi840 207 / ___ TMan 25.4 ___

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.

PaCO2 332 PaO2 89

✓ 19) Click Initialize Cal Flow button

✓ 20) Ensure that flow starts through both lines (110 ± 10)

FlWT (to cell) 111 FlSP (to bypass) 114

Date _____ Campaign _____ Flight _____ From _____ To _____

✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 111 FlSP (to cell) 113
X 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 17:04
X 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.6
EDIT: already open from 1B.8.
✓ 29) Open Line Purge cylinder green valve and Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = 3.2
✓ 33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 801 SA Purge Flow 119.5
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
17:04:00	NA	0.6	1.6	NA	NA	17	NA	0.3	5.0	5.3
17:20:00	500	14.2	3.3	15	-5	3.5	12.2	0.5	4.9	5.3
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 17:15
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
✓ 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

saw lag for PdO2n @ 18:23:24

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 8:45:—
✓ 5) Note fridge temperature Fridge T = 0.6
✓ 6) Note cryo temperature Cryo = -31.3
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
__ 8) Immediately before runway, switch 3-way valve to inlet UTC = __:__:__
__ 9) Note time of wheels up UTC = __:__:__
__ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date _____ Campaign _____ Flight _____ From _____ To _____

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

__ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __
__ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __
__ 3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

X 1) Note time of wheels down UTC = __ : __ : __
X 2) As soon as off runway, request permission and switch inlet 3-way to line purge
✓ 3) Note fridge temperature Fridge T = 0.8
✓ 4) Note cryo temperature Cryo = -30
✓ 5) Click Stop button
✓ 6) Close manual VAC valve
✓ **7) Close all 4 cal cylinder green valves**
✓ 8) Close cylinder box lid
X 9) Wait 5 to 10 minutes after touchdown
✓ **10) Close Line Purge green valve** and Line Purge on/off valve
✓ 11) Cylinder box Power breaker off
✓ 12) Pump box Pump 2 breaker off
✓ 13) Pump box Pump 1 breaker off
✓ 14) Pump box fridge breaker off
✓ 15) Pump box Power breaker off
✓ 16) Close program and Visual Basic
✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 18) Shut down AO2 PC
__ 19) Shut down laptop
__ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 21) Rack power switch off
__ 22) Pull trap, jumper quick-connects, and install stopper
__ 23) Open trap and remove glass beads

Date 100324 Campaign HIPPO3 Flight RF01 From BIT To ANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight

Date = 100323

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar, tighten box Trap Letters Top/Bottom = B / D
- ✓ 3) Turn on O_2 box, start program, and record pressures
  PaWT 836 PaSP 772 PLi840 24.7 TMan 26.0 UTC = 21 : 42
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1305 HS 1210 LP 2170 UTC = 21 : 44
  LT 430 WT 1700 CylT2 24.3
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) shut down all

B. 2-hours before take-off

Instrument Operator JDB

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 10
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1300 / -5 HS 1205 / -5 LP 2050 / -120 ~~-25~~ +0.7
  LT 400 / -30 WT 1600 / -100 CylT2 ~~24.50~~ 24.25 / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1300 / +10 HS 1215 / +10 LP ~2109 +50
  LT 420 / +20 WT 1600 / +0
- ✓ 9) Close cylinder box lid
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 26 : 20 , Rack laptop time 16 : 26 : 23
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 838 / (+2) PaSP 761 / (-19) PLi840 32 / (+8.7) TMan 23 / -3
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 326 PaO2 90
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 107 FlSP (to bypass) 107

Date 100324 Campaign HIPPO3 Flight RF01 From KBJC To PANC

21) Toggle changeover to check flows in other position
FlWT (to bypass) 108 FlSP (to cell) 108
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 16:43, 17:42
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.5
29) Open ~~Line Purge cylinder green valve and~~ Line Purge on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 10, 6.3
33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 799 SA Purge Flow 118
34) Snoop trap fittings 793 116
35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
16:53:20	NA	0.64	2.0	NA	NA	15.5	NA	0.35	4.1	5.8
17:03:45	458	0.75	1.18	15	0.35	8.4	16	0.26	4.3	5.3
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 16:55
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
4) Click Start button on main screen UTC = 17:46:~30
5) Note fridge temperature Fridge T = 3.6
6) Note cryo temperature Cryo = -32 ??
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = 18:43:40
9) Note time of wheels up UTC = 18:44:43
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 100324 Campaign HIPPO3 Flight RF01 From KBJC To RANR

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __ 19:58 → 3min

__ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __ 19:40 → 19:46 →

__ 3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

✓ 1) Note time of wheels down UTC = 00 : 45 : 30

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 00:46:40

✓ 3) Note fridge temperature Fridge T = 2.4

✓ 4) Note cryo temperature Cryo = 1.6

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

✓ **10) Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

__ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

__ 21) Rack power switch off

__ 22) Pull trap, jumper quick-connects, and install stopper

__ 23) Open trap and remove glass beads

__ 24) ftp data

Steps taken before flight but power off

SD2T

Date 100326 Campaign HIPPO3 Flight RF02 From PANC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight Date = 100325

1) Prepare trap with clean glass beads filled to 1 inch from bottom
2) Install trap in dewar Trap Letters Top/Bottom = ___ / ___
✓ 3) Turn on O_2 box, start program, and record pressures
PaWT 1051 PaSP 170 PLi840 ~~[illegible]~~ TMan 27.5 UTC = 18:49
✓ 4) Crack and close green valves, then record cylinder pressures
LS 1270 HS 1170 LP 2100 UTC = 18:53
LT 400 WT 1350 CylT2 25
✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights) Down 330 → ACCEPTABLE RANGE?

B. 2-hours before take-off Instrument Operator JDB

✓ 1) Rack power switch on
✓ 2) O_2 box Power breaker on
✓ 3) Laptop power on
✓ 4) Pump box Power breaker on
✓ 5) Pump box Fridge breaker on
✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16:00
__ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
LS 1290 / +20 HS 1195 / +25 LP 1600 / +500 120 → 140
LT 400 / +0 WT 1390 / +20 CylT2 ____ / ___ (once inst. on)
__ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
LS 1290 / +0 HS 1195 / +0 LP 2050 / +450
LT 395 / -5 WT 1395 / +5
✓ 9) Close cylinder box lid
✓ 10) Vnc into into AO2 (192.168.84.138)
✓ 11) Start AO2 program by clicking play in higold.vdp
✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
AO2 PC Time 16:25:28, Rack laptop time 16:25:31
✓ 14) Cylinder box Power breaker on
✓ 15) Record instrument pressures and changes overnight (P / Δ)
PaWT 992 / -9 PaSP 173 / -3 PLi840 327 / ___ TMan 23 / -4.5
✓ 16) Pump box Pump 2 breaker on
✓ 17) Manual VAC valve open
✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
PaCO2 327 PaO2 90.6
✓ 19) Click Initialize Cal Flow button
__ 20) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 107 FlSP (to bypass) 103

Because of testing inlet

Date 100326 Campaign HIPPO3 Flight RF02 From PANC To PANC

✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 107 FlSP (to cell) 103
✓ 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 16 : 36
X 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.6
✓ 29) Open ~~Line Purge cylinder green valve and~~ Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = 2.07
✓ 33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
a little low Fridge P 790 SA Purge Flow 118
✓ 34) Snoop trap ~~fittings~~
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
16 :49 : 30	NA	0.9	1.33	NA	NA	10	NA	0.47	4.8	6.2
16:59:00	489	0.9	2.4	14.7	-4.5	5.4	19	0.3	4.3	5.0
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 16 : 50
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
X 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 17:44:39
✓ 5) Note fridge temperature Fridge T = 1.3
✓ 6) Note cryo temperature Cryo = 4.9 (definitely having sensor issues)
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
✓ 8) Immediately before runway, switch 3-way valve to inlet UTC = 17:59:15
✓ 9) Note time of wheels up UTC = 17:59:50
✓ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 100326 Campaign HIPPO3 Flight RF02 From PANC To PANC

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 19 : 09 : 30 → 10:15

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 00 : 02 : 15 → 000315

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 01:54

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

19:11:30 → 19:13:30

00:02:15 ⇒ 000315

00:04:45 ⇒ 000545

III. Postflight

__ 1) Note time of wheels down UTC = 02 : 00 : __

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge

✓ 3) Note fridge temperature Fridge T = 1.4

✓ 4) Note cryo temperature Cryo = 15

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

✓ **10) Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

✓ 21) Rack power switch off

✓ 22) Pull trap, jumper quick-connects, and install stopper

✓ 23) Open trap and remove glass beads

Date 100329 Campaign HIPPO3 Flight RF03 From PANC To PHKO

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight Date = 100327

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = A / C
- ✓ 3) Turn on O_2 box, start program, and record pressures
  PaWT 866 PaSP 773 PLi840 33.1 TMan 25 UTC = 17:55
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1230 HS 1145 LP 2000 UTC = 17:58
  LT 390 WT 1105 CylT2 25
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)

B. 2-hours before take-off Instrument Operator JDR

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16:37
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1270 / +40 HS 1170 / -25 LP 1990 / -10
  LT 390 / 0 WT 1140 / +35 CylT2 ___ / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1270 / 0 HS 1170 / 0 LP 2000 / +10
  LT 400 / +10 WT 1140 / 0
- ✓ 9) Close cylinder box lid
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16:41:12, Rack laptop time 16:41:18 (+6 sec)
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 866 / 0 PaSP 768 / -5 PLi840 53 / +20 TMan 23.5 / -1.5
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 327 PaO2 92
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 107 FlSP (to bypass) 104

Date 100329 Campaign HIPPO3 Flight RF03 From PANC To PHKO

21) Toggle changeover to check flows in other position
FlWT (to bypass) 106 FlSP (to cell) 103
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 16:51
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.6
29) Open ~~Inlet Purge cylinder green valve and Line Purge~~ on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 0.7
33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 794 SA Purge Flow 117
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

(Had to adj PdO2 up to 93 to keep signal lower)

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
17:03:00	NA	0.7	1.7	NA	NA	13	NA	0.3	4.9	5
17:13:00	440	0.7	1.7	19.3	-6.8	7.9	26	0.3	4.3	4.7
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 17:03
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
4) Click Start button on main screen UTC = 19:50:35~
5) Note fridge temperature Fridge T = 0.8
6) Note cryo temperature Cryo = 12.6
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = 18:00:25~
9) Note time of wheels up UTC = 18:00:37
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 100329 Campaign HIPPO3 Flight RF03 From PANC To PHKO

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 18:32:45 ⇒ 18:33:45

did. not perform ✗ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __:__:__

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 02:15:40

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay): nothing

III. Postflight

✓ 1) Note time of wheels down UTC = 02:24:__
✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge
✓ 3) Note fridge temperature Fridge T = 1.4
✓ 4) Note cryo temperature Cryo = 20.7
✓ 5) Click Stop button 02:27:30
✓ 6) Close manual VAC valve
✓ 7) **Close all 4 cal cylinder green valves**
✓ 8) Close cylinder box lid
✓ 9) Wait 5 to 10 minutes after touchdown
✓ 10) **Close Line Purge green valve** and Line Purge on/off valve
✓ 11) Cylinder box Power breaker off
✓ 12) Pump box Pump 2 breaker off
✓ 13) Pump box Pump 1 breaker off
✓ 14) Pump box fridge breaker off
✓ 15) Pump box Power breaker off
✓ 16) Close program and Visual Basic
✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 18) Shut down AO2 PC
✓ 19) Shut down laptop
✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off
✓ 21) Rack power switch off
✓ 22) Pull trap, jumper quick-connects, and install stopper
✓ 23) Open trap and remove glass beads

Questions for Britt

1. ~~what was image we sent at beginning of 8F01?~~

Date 100331 Campaign HIPPO3 Flight RF04 From PHKO To NGN

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight Date = 100330

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = A / C
- ✓ 3) Turn on O_2 box, start program, and record pressures
  PaWT 891 PaSP 740 PLi840 28.4 TMan 18.9 UTC = 23 : 39
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1230 HS 1140 LP 1900 (eq 130 bar) UTC = 23 : 43
  LT 390 WT 900 CylT2 25
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)

B. 2-hours before take-off Instrument Operator JDB

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 24
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1240 / +10 HS 1160 / -20 LP 1950 / +50
  LT 390 / +0 WT 910 / +18 CylT2 226 / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1240 / +0 HS 1160 / +0 LP 1950 / +0
  LT 390 / +0 WT 910 / +0
- ✓ 9) Close cylinder box lid
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 18 34 : 30, Rack laptop time 18 : 34 : 37
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 909 / + 18 PaSP 758 / +18 PLi840 40.5 / + 12.1 TMan 25.7 / +6.8
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 327 PaO2 91
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 112 FlSP (to bypass) 103

Date 100331 Campaign HIPPO3 Flight RF04 From PHKO To NFFN

1700 3/23
1370 3/25
1105 3/27
900 3/30

-800/3RFs

≈267/flight

×11 flights =

2937 total needed

✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 112 FlSP (to cell) 106
X 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 18 :42
X 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 9.0
✓ 29) Open ~~Line Purge cylinder green valve and~~ Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = 2.5
✓ 33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 792 SA Purge Flow 117
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm (14)	Totm	mΔ	PdO2n	PdSPn	PdWTn
18 :55 : 00	NA	0.77	1.4	NA	NA	9.4	NA	0.3	3.9	5.4
19 :06 : 00	449	0.6	2.2	~~25~~	-10.5	2.7	25	0.3	4.8	5.0
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 18 :56
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
✓ 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 19 :40 :35
✓ 5) Note fridge temperature Fridge T = 1.6
✓ 6) Note cryo temperature Cryo = 15 (bad sensor)
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr 781
✓ 8) Immediately before runway, switch 3-way valve to inlet UTC = 20: 09 : 25
✓ 9) Note time of wheels up UTC = 20: 09 :40
✓ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 100331 Campaign HIPPO3 Flight RF04 From PHKO To NFFN

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 20 : 39 : 00 → 39:45

X 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 01:51:30 opened valves

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

1) Note time of wheels down UTC = 02:30 : 28
2) As soon as off runway, request permission and switch inlet 3-way to line purge ← 02:09:50
3) Note fridge temperature Fridge T = 1.5
4) Note cryo temperature Cryo = 15.7 just before landing (entering cal)
5) Click Stop button 02:31:18
6) Close manual VAC valve
7) **Close all 4 cal cylinder green valves**
8) Close cylinder box lid
9) Wait 5 to 10 minutes after touchdown
10) **Close Line Purge green valve** and Line Purge on/off valve
11) Cylinder box Power breaker off
12) Pump box Pump 2 breaker off
13) Pump box Pump 1 breaker off
14) Pump box fridge breaker off
15) Pump box Power breaker off
16) Close program and Visual Basic
17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
18) Shut down AO2 PC
19) Shut down laptop
20) After green "SP to Cell" light has gone out, O_2 box Power breaker off
21) Rack power switch off
22) Pull trap, jumper quick-connects, and install stopper
23) Open trap and remove glass beads

Date 100402 Campaign HIPPO3 Flight RF05 From ~~NFFN~~ NSTU To NZCH

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.03.22

I. Preflight

A. Day(s) before flight Date = 100401

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = B / D
- ✓ 3) Turn on O_2 box, start program, and record pressures
  PaWT 853 PaSP 763 PLi840 31.3 TMan 23.8 UTC = 23:22
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1230 HS 1130 LP 1900 UTC = 23 : 22
  LT 380 WT 740 CylT2 25
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)

B. 2-hours before take-off Instrument Operator JDB

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 19 : 30
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1240 / +10 HS 1150 / +20 LP 1880 / ___
  LT 390 / +10 WT 740 / +0 CylT2 ___ / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1240 / +0 HS 1150 / +0 LP 1900 / +20
  LT 390 / +0 WT 740 / +0
- ✓ 9) Close cylinder box lid
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 19 :43 :20 , Rack laptop time 19 :43 :22
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 860 / +6 PaSP 773 / +10 PLi840 42.5 / +11.2 TMan 26 / +2.4
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 329 PaO2 92
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 110 FlSP (to bypass) 106

accidentally turned on pump 1 instead of 2

Date 100402 Campaign HIPPO3 Flight RF05 From ~~NFFN~~ NSTO To NZCHP

✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 112 FlSP (to cell) 103
X 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 19 : 48
✓ 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 9.0
✓ 29) Open ~~Line Purge cylinder green valve and~~ Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = 3.9
✓ 33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 790 SA Purge Flow 118
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
20:00:20	NA	0.77	2.1	NA	NA	10.9	NA	0.4	5.0	5.5
20:12:50	452	0.6	1.8	16	-10.6	4	26	0.4	5.2	5.9
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 20:01
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
✓ 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag a Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 20:42:~~00~~
✓ 5) Note fridge temperature Fridge T = 1.2
✓ 6) Note cryo temperature Cryo = 182 ← figured out where bad connector is, on sensor side
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
✓ 8) Immediately before runway, switch 3-way valve to inlet UTC = 21:03:20
✓ 9) Note time of wheels up UTC = 21:07:03
✓ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

going to get a bit of dirty air - we've stopped

Date 100402 Campaign HIPPO3 Flight RF05 From ~~NFFN~~ NSTU To NZCH

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 21:45:30 → 46:30

X 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __:__:__ a-ok!

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 02:33

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

030120

✓ 1) Note time of wheels down UTC = 03:02:45 ~

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge

✓ 3) Note fridge temperature Fridge T = 2

✓ 4) Note cryo temperature Cryo = 184 (uncorr)

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

✓ 10) **Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

✓ 21) Rack power switch off

✓ 22) Pull trap, jumper quick-connects, and install stopper

✓ 23) Open trap and remove glass beads

Date 100406 Campaign HIPPO3 Flight RF06 From CHC To CHC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.04

I. Preflight

A. Day(s) before flight Date = 100404

✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
✓ 2) Install trap in dewar Trap Letters Top/Bottom = A / D
✓ 3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures
PaWT 1194 PaSP 769 PLi840 34.9 TMan 20.5 UTC = 13 : 33
✓ 4) Crack and close green valves, then record cylinder pressures
LS 1200 HS 1100 LP 1825 UTC = 13 : 15
LT 350 WT 510 CylT2 25.0
✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
✓ 6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off Instrument Operator SRS

✓ 1) Rack power switch on
✓ 2) O_2 box Power breaker on
✓ 3) Laptop power on
✓ 4) Pump box Power breaker on
✓ 5) Pump box Fridge breaker on (20:38)
✓ 6) Load dry-ice in dewar to within 0.5 inches of lid ~ UTC = 20 : 15
✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
LS 1175 / ___ HS 1075 / ___ LP 1800 / ___
LT 350 / ___ WT 1900 / ___ CylT2 ___ / ___ (once inst. on) New WT installed between morning Dry and Preflight
✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
LS 1200 / ___ HS 1100 / ___ LP ~~2125~~ 2150 / ___
LT 350 / ___ WT 2125 / ___
✓ 9) Close cylinder box lid
✓ 10) Vnc into into AO2 (192.168.84.138)
✓ 11) Start AO2 program by clicking play in higold.vdp
✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
AO2 PC Time 20 : 45 : 00 , Rack laptop time 20 : 45 : 00
✓ 14) Cylinder box Power breaker on
___ 15) Record instrument pressures and changes overnight (P / Δ)
PaWT 1178 / ___ PaSP 760 / ___ PLi840 52 / ___ TMan 18.1 / ___
Check change on new WT
✓ 16) Pump box Pump 2 breaker on
✓ 17) Manual VAC valve open
✓ 18) Check that ~~PaCO2 = 330~~ 335 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
PaCO2 329 PaO2 90.7
97 94
✓ 19) Click Initialize Cal Flow button

EDIT incr.

Edit

At 8:45 PACO2 339
PAO2 93

Date _____ Campaign _____ Flight _____ From _____ To _____

20) Ensure that flow starts through both lines (110 ± 10) FlWT (to cell) 103 FlSP (to bypass) 98
21) Toggle changeover to check flows in other position FlWT (to bypass) 102 FlSP (to cell) 97
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 8 : 42
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 9.66
29) Open Line Purge on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 4.3
33) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 790 SA Purge Flow 115
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
21:07:	NA	.73	3.7	NA	NA	-.39	NA	.303	5	5.28
~~21:21:~~ 21:25	419	.57	3.0	7.9	-15	-1.6	22.4	.27	3.8	5
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 21 : 07
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag 9 Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
4) Click Start button on main screen UTC = 21 : 47
5) Note fridge temperature Fridge T = 1.41
6) Note cryo temperature Cryo = 185 (sunlit)
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = 22 : 08 : 00
9) Note time of wheels up UTC = 22 : 09 : 00
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

missed shut off AT 02:01

Date _____ Campaign _____ Flight _____ From _____ To _____

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 23:54:00 Middle 01:59:00

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 04:47:37 -6 ml

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

✓ 1) Note time of wheels down UTC = 23:56

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge

✓ 3) Note fridge temperature Fridge T = 1.05

✓ 4) Note cryo temperature Cryo = ———

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

✓ 10) **Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

✓ 21) Rack power switch off

__ 22) Pull trap, jumper quick-connects, and install stopper

__ 23) Open trap and remove glass beads

__ 24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)

Date 4-8-2010 Campaign HIPPO Flight RF07 From NZCH To NSTU

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.07

I. Preflight

A. Day(s) before flight Date = 4-7-2010

✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom

✓ 2) Install trap in dewar Trap Letters Top/Bottom (A) (D)

✓ 3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures

PaWT 823 PaSP 720 PLi840 20.7 TMan 9.4 UTC = 9 : 02

✓ 4) Crack and close green valves, then record cylinder pressures

LS 1090 HS 1040 LP 1700 UTC = 9 : 25

LT 350 WT 1700 CylT2 11.9

✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)

✓ 6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off Instrument Operator Stretz/Bent

✓ ✓ 1) Rack power switch on

✓ ✓ 2) O_2 box Power breaker on

✓ ✓ 3) Laptop power on

✓ ✓ 4) Pump box Power breaker on

✓ 5) Pump box Fridge breaker on

✓ ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 20 : 20

X ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)

LS 1100 / +10 HS 1025 / -15 LP 1700 / +0

LT 350 / +0 WT 1700 / +0 CylT2 12.7 / +.8 (once inst. on)

X ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)

LS 1100 / +0 HS 1025 / +0 LP 1700 / +0

LT 375 / +25 WT 1700 / +0

X ✓ 9) Close cylinder box lid

✓ ✓ 10) Vnc into into AO2 (192.168.84.138)

✓ ✓ 11) Start AO2 program by clicking play in higold.vdp

✓ ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen

✓ ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times

AO2 PC Time 20 : 06 : 05, Rack laptop time 20 : 06 : 05

✓ ✓ 14) Cylinder box Power breaker on

X ✓ 15) Record instrument pressures and changes overnight (P / Δ)

PaWT 842 / +19 PaSP 743 / +23 PLi840 40.X / +19.4 TMan 18 / +8.6

✓ ✓ 16) Pump box Pump 2 breaker on

✓ ✓ 17) Manual VAC valve open

✓ ✓ 18) Check that PaCO2 = 325 torr (± 5) and PaO2 = 98 torr (± 1). If not, adjust.

PaCO2 330 PaO2 98

✓ ✓ 19) Click Initialize Cal Flow button

Notes

AO2 crashed 1st cal after midnight. Bounced manual/auto and restart comp. to force cal then do better 10Kft up or 19K down. Bodged a forced cal at 02:03 fixed for 1 min of DATA at top — learned my lesson!
/Join #AO2med

Press Contr. SetPoints for Low Alts stop controlling @ ~40Kft

Date 100408 Campaign HIPPO3 Flight RF07 From NZCH To NSTU

20) Ensure that flow starts through both lines (100 ± 10) 2nd set 100/96
FlWT (to cell) 100 FlSP (to bypass) 98
21) Toggle changeover to check flows in other position 100/97
FlWT (to bypass) 100 FlSP (to cell) 98
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = ~~20:15~~ 20:35
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.0
29) Open Line Purge on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 1.2
33) Ensure that Fridge P stabilizes near 795 (±10) torr after 2 min.
Fridge P 791 SA Purge Flow 98
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

Pump for 1 20:19 → repeat pump of

SP WT slpm

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
20:45:	NA	.8	1.8	NA	NA	9.3	NA	.33	4.1	6.1
: :	400	1.0	1.73	11	−10	−.5	21	3.3	4.3	5.1
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

3.3

36) Enable changeover valve (uncheck disable) UTC = 20:46
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag A Cal Interval 5.0 Cal Period 2.5 LTf 3 WTf 4
4) Click Start button on main screen UTC = 21:34
5) Note fridge temperature Fridge T = .79
6) Note cryo temperature Cryo = bleed (Ice)
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = 22:04:46
9) Note time of wheels up UTC = 22 05:53
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 100408 Campaign HIPPO3 Flight RF07 From NZCH To NSTU

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

- [x] 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings — UTC (start) = 22:37:00 (no leak)
- [x] 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings — UTC (start) = 03:09:30
- [x] 3) On final descent, open Line Purge cylinder green valve and on/off valve

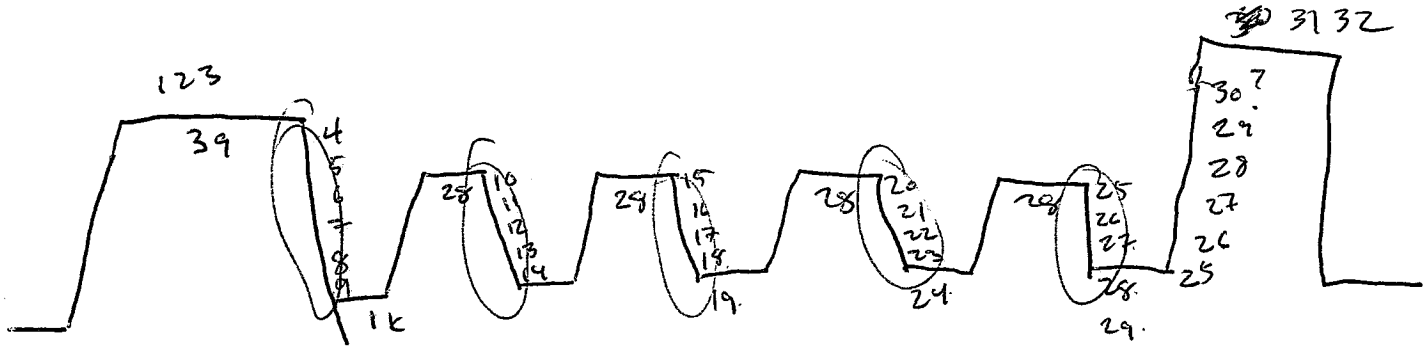
Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

- [x] 1) Note time of wheels down — UTC = 4:46:__
- [x] 2) As soon as off runway, request permission and switch inlet 3-way to line purge 4647
- [x] 3) Note fridge temperature — Fridge T = 1.15
- [x] 4) Note cryo temperature — Cryo = n/a instr
- [x] 5) Click Stop button
- [x] 6) Close manual VAC valve
- [x] 7) **Close all 4 cal cylinder green valves**
- [x] 8) Close cylinder box lid
- [x] 9) Wait 5 to 10 minutes after touchdown
- [x] 10) **Close Line Purge green valve** and Line Purge on/off valve
- [x] 11) Cylinder box Power breaker off
- [x] 12) Pump box Pump 2 breaker off
- [x] 13) Pump box Pump 1 breaker off
- [x] 14) Pump box fridge breaker off
- [x] 15) Pump box Power breaker off
- [x] 16) Close program and Visual Basic
- [x] 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
- [x] 18) Shut down AO2 PC
- [x] 19) Shut down laptop
- [x] 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off
- [x] 21) Rack power switch off
- [x] 22) Pull trap, jumper quick-connects, and install stopper
- [x] 23) Open trap and remove glass beads
- [x] 24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)

much Dry Ice left

Delayed until work By



3 6 5 5 5 6 3
5

1/2 20
15 12

Date 10 Apr 10 Campaign HIPPO-3 Flight ~~RF07~~ RF08 From NSTU To PHKO

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.07

I. Preflight

A. Day(s) before flight Date = 2010 04 09

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = A / P
- ✓ 3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures
  PaWT 839 PaSP 748 PLi840 32 TMan 20.3 UTC = 01 : 10
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1100 HS 1025 LP ~~1590~~ 1200 UTC = 1 : 23
  LT 325 WT 1590 CylT2 16.9
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off Instrument Operator Sherry

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 19:31
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1150 / ___ HS 1100 / ___ LP 1750 / ___
  LT 350 / ___ WT 1600 / ___ CylT2 23 / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  1150 LS 950 / ___ HS 1100 / ___ LP 1750 / ___
  LT 350 / ___ WT 1620 / ___
- ✓ 9) Close cylinder box lid
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 19 : 46 : 38, Rack laptop time 19 : 36 : 49
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 857 / ___ PaSP 788 / ___ PLi840 42 / ___ TMan 26 / ___
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 325 torr (± 5) and PaO2 = 98 torr (± 1). If not, adjust.
  PaCO2 324 PaO2 98
- ✓ 19) Click Initialize Cal Flow button

Date 10 APR 10 Campaign HIPPO-3 Flight RF05 From PHNL To PHKO

✓ 20) Ensure that flow starts through both lines (100 ± 10)
FlWT (to cell) 112 FlSP (to bypass) 104
✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 111 FlSP (to cell) 103
close ✓ 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 19 : 44
✓ 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 2.9
✓ 29) Open Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = 1.7
✓ 33) Ensure that Fridge P stabilizes near 795 (±10) torr after 2 min.
Fridge P 796 SA Purge Flow 104
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ (SP WT Δ)	PdO2n	PdSPn	PdWTn
20:02:	NA	.61	1.43	NA	NA	5.3	NA	.31	4.2	5.8
20:16:	399	.7	2.7	11	-11	22.6	23	.3	5	4.7
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 20 03
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
✓ 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag A Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 20 : 31 : __
✓ 5) Note fridge temperature Fridge T = 1.05
✓ 6) Note cryo temperature Cryo = Disturbed tapped off
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
✓ 8) Immediately before runway, switch 3-way valve to inlet UTC = 34 05 : __
✓ 9) Note time of wheels up UTC = 20 05 : __
✓ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 10 APR 10 Campaign HIPPO 3 Flight RF08 From NSTU To PHKO

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

W

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 21 : 39 End

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 2 : 17 : 10 End

__ 3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

__ 1) Note time of wheels down UTC = __:__:__

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge before 353

✓ 3) Note fridge temperature Fridge T = 1.9

✓ 4) Note cryo temperature Cryo = ____

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

__ **10) Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

✓ 21) Rack power switch off

✓ 22) Pull trap, jumper quick-connects, and install stopper

__ 23) Open trap and remove glass beads

— 24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)

Note

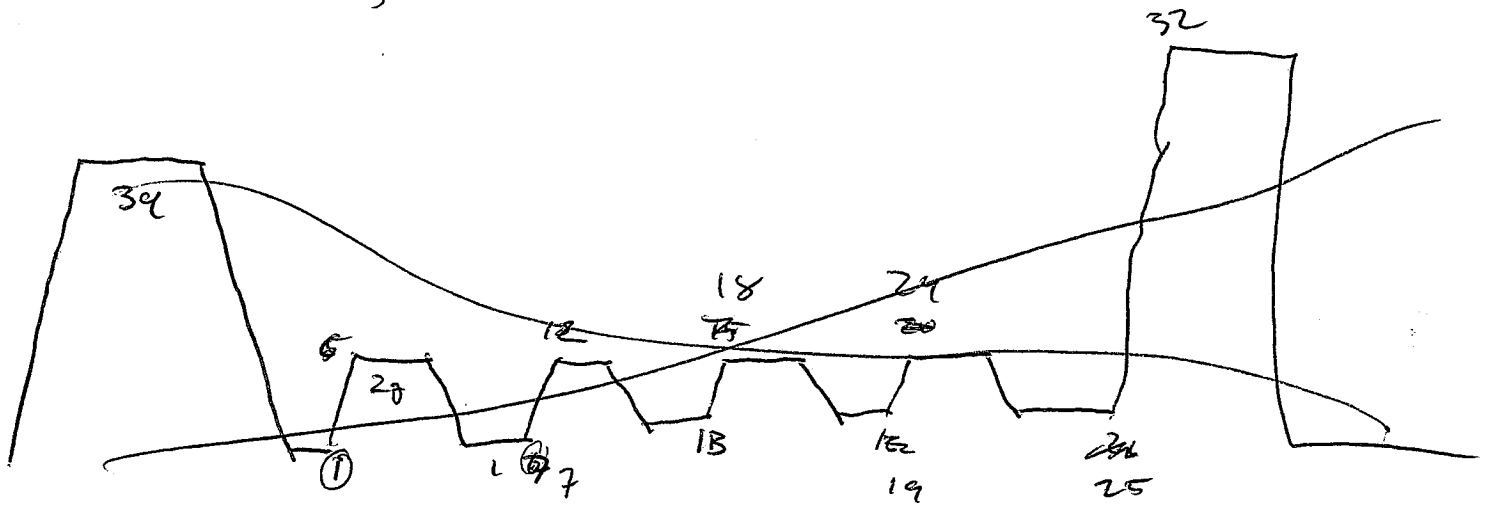
Across [illegible] Dropped out for AO2 02:50 ~ 03:20

AO2 went wacky. Around 02:30 Looked OK

Could not Do Raw Plots Again - Restart

39 43 miles

5 dips



Date 13 APR 10 Campaign HIPPO 3 Flight RF09 From PHKO To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.07

I. Preflight

A. Day(s) before flight Date = 12 APR 10

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = ___ / ___
- ✓ 3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures
  PaWT 854 PaSP 86 PLi840 36 TMan 26 UTC = 20 : 05
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1125 HS 1050 LP 1750 UTC = 20 : 10
  LT 350 WT 1450 CylT2 24.9
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

Started up Instrum to warm up. Vacuum pump flow OK!

B. 2-hours before take-off Instrument Operator Shertz

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Pump box Fridge breaker on
- ✓ 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 15
- ✓ 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1110 / ___ HS 1050 / ___ LP 1750 / ___
  LT 325 / ___ WT ~~1500~~ / 1450 CylT2 ___ / ___ (once inst. on)
- ✓ 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1125 / ___ HS 1050 / ___ LP 1750 / ___
  LT 350 / ___ WT 1450 / ___
- ✓ 9) Close cylinder box lid 19:28
- ✓ 10) Vnc into into AO2 (192.168.84.138)
- ✓ 11) Start AO2 program by clicking play in higold.vdp
- ✓ 12) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time __ : __ : __ , Rack laptop time __ : __ : __
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 837 / ___ PaSP 102 / ___ PLi840 50 / ___ TMan 24.2 ___
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 325 torr (± 5) and PaO2 = 98 torr (± 1). If not, adjust.
  PaCO2 327 PaO2 99
- ✓ 19) Click Initialize Cal Flow button

Date 13 MAR 10 Campaign HIPPO 3 Flight RF04 From PHKO To PARC

20) Ensure that flow starts through both lines (100 ± 10)
FlWT (to cell) 110 FlSP (to bypass) 103
21) Toggle changeover to check flows in other position
FlWT (to bypass) 108 FlSP (to cell) 102
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 18 : 27
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 6.9
29) Open Line Purge on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 3.0
33) Ensure that Fridge P stabilizes near 795 (±10) torr after 2 min.
Fridge P 795 SA Purge Flow 9
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
18:36:	NA	.66	1.2	NA	NA	13.6	NA	.33	4.4	5.7
18:50:	406	.74	1.7	15	-7.6	9.6	22	.34	4	5
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 18 : 37
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag ___ Cal Interval ___ Cal Period ___ LTf ___ WTf ___
4) Click Start button on main screen UTC = 19:56:__
5) Note fridge temperature Fridge T = 1.3
6) Note cryo temperature Cryo = ___
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = __ : __ : __
9) Note time of wheels up UTC = 20: 10: __
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

delete 2015

Date _____ Campaign _____ Flight _____ From _____ To _____

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

Sorry at - Busy Trouble Shoot

1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) =~~03:10:~~__

2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) =03:10:30

3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

1) Note time of wheels down UTC =04:27:__

2) As soon as off runway, request permission and switch inlet 3-way to line purge

3) Note fridge temperature Fridge T = 1.41

4) Note cryo temperature Cryo = N/A

Pump cal Verified purge @ 4:31

5) Click Stop button

6) Close manual VAC valve

7) **Close all 4 cal cylinder green valves**

8) Close cylinder box lid

9) Wait 5 to 10 minutes after touchdown

10) **Close Line Purge green valve** and Line Purge on/off valve

11) Cylinder box Power breaker off

12) Pump box Pump 2 breaker off

13) Pump box Pump 1 breaker off

14) Pump box fridge breaker off

15) Pump box Power breaker off

16) Close program and Visual Basic

17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

18) Shut down AO2 PC

19) Shut down laptop

20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

21) Rack power switch off

22) Pull trap, jumper quick-connects, and install stopper

23) Open trap and remove glass beads

24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)

Date 14 APR 10 Campaign HIPPO-3 Flight RF10 From PANC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.07

I. Preflight

A. Day(s) before flight Date = 14 APR 10

- [ ] 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- [ ] 2) Install trap in dewar Trap Letters Top/Bottom = A / D
- [ ] 3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures
  PaWT 830 PaSP 757 PLi840 12 TMan 26 UTC = 21:30
- [ ] 4) Crack and close green valves, then record cylinder pressures
  LS 1075 HS 1000 LP 1350 UTC = 21:38
  LT 325 WT 1125 CylT2 24
- [ ] 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- [ ] 6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off Instrument Operator Steve

- [ ] 1) Rack power switch on
- [ ] 2) O_2 box Power breaker on
- [ ] 3) Laptop power on
- [ ] 4) Pump box Power breaker on
- [ ] 5) Pump box Fridge breaker on
- [ ] 6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16:10
- [ ] 7) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1100/ ___ HS 1010/ ___ LP 1300/ ___
  LT 325/ ___ WT 1100/ ___ CylT2 225/ ___ (once inst. on)
- [ ] 8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1100/ 0 HS 1015/ 15 LP 1350/ 50
  LT 325/ 0 WT 1150/ 50
- [ ] 9) Close cylinder box lid
- [ ] 10) Vnc into into AO2 (192.168.84.138)
- [ ] 11) Start AO2 program by clicking play in higold.vdp
- [ ] 12) Ensure that no USB errors are present in boxes at bottom of screen
- [ ] 13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 29 : 50 , Rack laptop time 16 : 30 : 50
- [ ] 14) Cylinder box Power breaker on
- [ ] 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 827/ ___ PaSP 730/ ___ PLi840 23/ ___ TMan 22/ ___
- [ ] 16) Pump box Pump 2 breaker on
- [ ] 17) Manual VAC valve open
- [ ] 18) Check that PaCO2 = 325 torr (± 5) and PaO2 = 98 torr (± 1). If not, adjust.
  PaCO2 326 PaO2 98
- [ ] 19) Click Initialize Cal Flow button

TOOK 2 TRIES ON INIT CAL FLOW

Date 4-15-10 Campaign HIPPO 3 Flight RF10 From PANC To PANC

20) Ensure that flow starts through both lines (100 ± 10)
FlWT (to cell) 106 FlSP (to bypass) 101
21) Toggle changeover to check flows in other position
FlWT (to bypass) 106 FlSP (to cell) 102
22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 16:38
28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.07
29) Open Line Purge on/off valve
30) Ensure inlet 3-way valve to Line Purge cylinder
31) Click Initialize Sample Flow button
32) Pump box Pump 1 breaker on Fridge T = 4.01
33) Ensure that Fridge P stabilizes near 795 (±10) torr after 2 min.
Fridge P 797 SA Purge Flow 101
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
16:47:00	NA	.695	4.07	NA	NA	17	NA	1.2	6.2	5.9
~~16:49:00~~ 16:59	~~391~~ 391	.72	2.2	14	-3	6.5	18.6	.51	3.5	4.5
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 16:48
37) >= 10 min. after change-over enable, record values in table above
38) Disable changeover
39) If necessary, toggle changeover to get SP to Cell
40) Close WT 248 valve

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag 9 Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
4) Click Start button on main screen UTC = 17:38:10
5) Note fridge temperature Fridge T = 1.25
6) Note cryo temperature Cryo = N/C
7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
8) Immediately before runway, switch 3-way valve to inlet UTC = 18:02:10
9) Note time of wheels up UTC = 18:02:32
10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Start pulling T/O to close GV & PV end

RF-10

Date 15 APR 10 Campaign HIPPO 3 Flight PMNC From PMNC To _____

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 19 : 10 : 00 AT 28 K

__ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

✓ 1) Note time of wheels down UTC = 02 : 06 : 42

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 02:08:18

✓ 3) Note fridge temperature Fridge T = 1.25

✓ 4) Note cryo temperature Cryo = N/C

✓ 5) Click Stop button

✓ 6) Close manual VAC valve

✓ 7) **Close all 4 cal cylinder green valves**

✓ 8) Close cylinder box lid

✓ 9) Wait 5 to 10 minutes after touchdown

✓ 10) **Close Line Purge green valve** and Line Purge on/off valve

✓ 11) Cylinder box Power breaker off

✓ 12) Pump box Pump 2 breaker off

✓ 13) Pump box Pump 1 breaker off

✓ 14) Pump box fridge breaker off

✓ 15) Pump box Power breaker off

✓ 16) Close program and Visual Basic

✓ 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

✓ 18) Shut down AO2 PC

✓ 19) Shut down laptop

✓ 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off

✓ 21) Rack power switch off

✓ 22) Pull trap, jumper quick-connects, and install stopper

✓ 23) Open trap and remove glass beads

✓ 24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)

17
24

RF11

Date 16 Apr 10 Campaign HIPPO-3 Flight ~~RF11~~ From PANC To KBJC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 10.04.07

I. Preflight

A. Day(s) before flight Date = 16 Apr 10

DM

1) Prepare trap with clean glass beads filled to 1 inch from bottom
2) Install trap in dewar Trap Letters Top/Bottom = A / D
3) Power O_2 box, Cylinder box, and laptop/vnc, start program, record pressures
PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __
4) Crack and close green valves, then record cylinder pressures
LS 1025 HS 975 LP ____ UTC = __ : __
LT 300 WT 900 CylT2 ____
5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
6) Stop program, close Visual Basic, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off Instrument Operator Sherr

1) Rack power switch on
2) O_2 box Power breaker on
3) Laptop power on
4) Pump box Power breaker on
5) Pump box Fridge breaker on
6) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 30
7) Record hi-side cylinder pressures and changes overnight (P / Δ)
LS 1025 / ___ HS 975 / ___ LP 1600 / ___
LT 300 / ___ WT 900 / ___ CylT2 ____ / ___ (once inst. on)
8) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
LS 1050 / 5 HS 1000 / ___ LP 1600 / ___
LT 300 / ___ WT 900 / ___
9) Close cylinder box lid
10) Vnc into into AO2 (192.168.84.138)
11) Start AO2 program by clicking play in higold.vdp
12) Ensure that no USB errors are present in boxes at bottom of screen
13) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
AO2 PC Time 16 : 43 51, Rack laptop time 16 : 43 : 51
14) Cylinder box Power breaker on
15) Record instrument pressures and changes overnight (P / Δ)
PaWT 56 / ___ PaSP 780 / ___ PLi840 31 / ___ TMan 21 / ___
16) Pump box Pump 2 breaker on
17) Manual VAC valve open
18) Check that PaCO2 = 325 torr (± 5) and PaO2 = 98 torr (± 1). If not, adjust.
PaCO2 325 PaO2 99
19) Click Initialize Cal Flow button

Date 16 APR 10 Campaign RF 11 HIPPO 3 Flight ____ From PANC To KBJC

✓ 20) Ensure that flow starts through both lines (100 ± 10)
FlWT (to cell) 104 FlSP (to bypass) 102
✓ 21) Toggle changeover to check flows in other position
FlWT (to bypass) 107 FlSP (to cell) 98
✓ 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 16 : 20
✓ 28) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.1
✓ 29) Open Line Purge on/off valve
✓ 30) Ensure inlet 3-way valve to Line Purge cylinder
✓ 31) Click Initialize Sample Flow button
✓ 32) Pump box Pump 1 breaker on Fridge T = .96
✓ 33) Ensure that Fridge P stabilizes near 795 (±10) torr after 2 min.
Fridge P 790 SA Purge Flow 100
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
16 :45: 00	NA	.79	1.C	NA	NA	5.3	NA	.3	3.7	5.C
16 :58: 15	~~15~~ 375	.9	1.5	5.1	-4.5	-.33	9.6	.26	3.3	4.C
nominal vals	450	0.7	2.5	±10	±10	±10	±20	0.2	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 16 : 46
✓ 37) >= 10 min. after change-over enable, record values in table above
✓ 38) Disable changeover
✓ 39) If necessary, toggle changeover to get SP to Cell
✓ 40) Close WT 248 valve

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag A Cal Interval 50 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 17: 36: 20
✓ 5) Note fridge temperature Fridge T = .74
✓ 6) Note cryo temperature Cryo = D/C
✓ 7) Once on SA, check / adjust line purge regulator to PaSP of 785 +/- 5 torr
✓ 8) Immediately before runway, switch 3-way valve to inlet UTC = 17: 55: 15
9) Note time of wheels up UTC = 17: 55: 52
✓ 10) Close Inlet Purge cylinder green valve and Inlet Purge on/off valve

Date 16 Apr 10 Campaign HIPPO 3 Flight RF11 From PMK To KBJC

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.

Record flight notes in text file AO2_YYYYMMDD_RF##_Notes.txt and add any action items to AO2_TODO_YYMMDD_GV.doc

__ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __
__ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = __ : __ : __
__ 3) On final descent, open Line Purge cylinder green valve and on/off valve

No Hrish planned

Adjust cal schedule as necessary with a goal of sampling at least some portion of every level low and high leg, avoiding overlapping cals at same altitude on the way up and down above 29 kft, and avoiding any cals on northernmost and southernmost profile (keeping in mind 45 second inlet delay):

III. Postflight

L 1) Note time of wheels down UTC = 02:59
L 2) As soon as off runway, request permission and switch inlet 3-way to line purge
L 3) Note fridge temperature Fridge T = 6.5
L 4) Note cryo temperature Cryo = A/C
L 5) Click Stop button
L 6) Close manual VAC valve
L 7) **Close all 4 cal cylinder green valves**
L 8) Close cylinder box lid
L 9) Wait 5 to 10 minutes after touchdown
L 10) **Close Line Purge green valve** and Line Purge on/off valve
L 11) Cylinder box Power breaker off
L 12) Pump box Pump 2 breaker off
L 13) Pump box Pump 1 breaker off
L 14) Pump box fridge breaker off
L 15) Pump box Power breaker off
L 16) Close program and Visual Basic
L 17) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
L 18) Shut down AO2 PC
L 19) Shut down laptop
L 20) After green "SP to Cell" light has gone out, O_2 box Power breaker off
L 21) Rack power switch off
L 22) Pull trap, jumper quick-connects, and install stopper
L 23) Open trap and remove glass beads
__ 24) ftp YYMMDD*.mr, YYMMDD*.hr, and hgcyllog.txt to catalog.eol.ucar.edu (uname: hippo, pword, h!99o, directory ao2raw)