Date 110607 ? Campaign Test Flights Flight JF1 From Dry Run in Hgr To _____

i.e. Dry Run in hangar w/ Jonathon

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.06

I. Preflight

A. Day(s) before flight

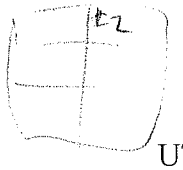
Date = 110607

- X 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- X 2) Install trap in dewar — Trap Letters Top/Bottom = B / D
- ✓ 3) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 850 PaSP 800 PLi840 19 TMan 24.5 UTC = 20:44
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1830 HS 2030 LP 1590 UTC = 21:30
  1960 ~~LT 2460~~ WT 1720 CylT2 22.49
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights) ~~Stop~~ shutdown AO2 w/ ~~Flows~~
- __ 6) Stop program, close Visual Basic, ~~and vnc~~, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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
- X 5) Load dry-ice in dewar to within 0.5 inches of lid — UTC = __ : __



- __ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1730 / ~~3.5~~ 100 HS 2020 / ~~3.5~~ 10 LP 1590 / ~~4~~ 0
  LT 1945 / ~~2.5~~ WT 1700 / ~~4.6~~ 20 CylT2 ~~400~~ / ~~4~~ 2 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1840 / +110 HS 2052 / +30 LP ~1600 / 0
  LT 1945 / 0 WT 1700 / 0
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 19 : 06 : 50, Rack laptop time 19 : 06 : 47
- ✓ 13) Cylinder box Power breaker on
- __ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 851 / +1 PaSP 788 / -12 PLi840 223 / +13.3 TMan 24 / +.5
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 88 torr (± 1). If not, adjust.
  PaCO2 324 PaO2 87.0
- ✓ 18) Click Initialize Cal Flow button

Date 110607 Campaign HIPPO4 Flight JF01 From Dry Run in Hangar To _____

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 106 FlSP (to bypass) 107
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 106 FlSP (to cell) 106
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 19 : 16
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 9.26
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
X 32) If necessary, adjust Line Purge regulator to 1 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 100 ← NOISY
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

NOISY ↓

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn	PaSAn
19 :26	NA	0.64	1.2	NA	NA	13	NA	0.02	5.4	4.1	15.0
19 :40	600	0.6	4.8	14.3	-5	3.8	18.7	0.02	4.6	4.3	16.5
nominal	450	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 19 :30
✓ 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 EDIT: "click close WT" to close WT248Vch

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 : 46 : __
X 5) Note cryo temperature Cryo = _____
X 6) Immediately before runway, switch 3-way valve to inlet UTC = __ : __ : __
X 7) Note time of wheels up UTC = __ : __ : __
X 8) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

Date 110607 Campaign HIPPO4 Flight RF01 From Dry Run h Keyser 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
X 3) Note cryo temperature Cryo = _____
✓ 4) Click Stop button
✓ 5) Close manual VAC valve
✓ 6) **Close all 4 cal cylinder green valves** EDIT: ALL 5 includes Line Pg
✓ 7) Close cylinder box lid
✓ 8) Wait 5 to 10 minutes after touchdown
✓ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Pump 1 breaker off
✓ 13) Pump box Power breaker off
✓ 14) Close program and Visual Basic
✓ 15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
○ 16) Shut down AO2 PC
○ 17) Shut down laptop
__ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 19) Rack power switch off
__ 20) Pull trap, jumper quick-connects, and install stopper
__ 21) Open trap and remove glass beads
__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)
__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110607 Campaign HIPPO4 Flight TF01 From BJC To BJC (via FMN

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.06

I. Preflight

A. Day(s) before flight

Date = 110606

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1900 HS 2400 LP 1690 UTC = 20 : 30
  LT 2000 WT 1900 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 and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off

Instrument Operator BBS

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Load dry-ice in dewar to within 0.5 inches of lid — UTC = 14 : 00
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS ~~1930~~ / ~~-120~~ HS ~~2050~~ / ~~-80~~ LP 1900 / +10
  LT 1980 / -20 WT 1870 / -30 CylT2 26.8 / — (once inst. on)

leaks → fix? found bubbles on LS Y8 u → tightened two Y8u fittings on bulk LS + HS

- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1900 / +120 HS 2100 / +50 LP 1700 / —
  LT 1980 / — WT 1880 / +10
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 2 : 27 : 28 , Rack laptop time 2 : 27 : 30
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 838 / — PaSP 822 / — PLi840 20.08 / — TMan 26 / —
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 88 torr (± 1). If not, adjust.
  PaCO2 326 PaO2 87
- ✓ 18) Click Initialize Cal Flow button

Date 110607 Campaign HIPPO4 Flight TF01 From ~~BJC~~ To ~~BJC~~ EHTT ?

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 110 FlSP (to bypass) 110
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 110 FlSP (to cell) 110
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 14:57
X 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.79
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 791 SA Purge Flow 100
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

~~EDIT~~ 110613

change prgfl in code to 110

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn	PaSAn
15:02	NA	0.8	3.5	NA	NA	11	NA	0.03	5.3	4.7	3.6
15:40	609	0.8	1.9	10	-6	1	16	0.02	4.8	4.6	4.0
nominal	450	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

EDIT

✓ 36) Enable changeover valve (uncheck disable) UTC = 15:07
✓ 37) >= 10 min. after change-over enable, record values in table above
X 38) Disable changeover
X 39) If necessary, toggle changeover to get SP to Cell
X 40) Close WT 248 valve

C. ~~20~~ 120-min before take-off

EDIT

X 1) WT 248 valve to Auto (uncheck close)
X 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 2.5, 3, 4)
Flag A Cal Interval 20 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 15:42:55
✓ 5) Note cryo temperature Cryo = -80
✓ 6) Immediately before runway, switch 3-way valve to inlet UTC = 17:03:17
7) Note time of wheels up UTC = 17:04:58
X 8) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

M change to 30 during flight

edited H2O cals to -50 to get LP on scale + change in code

@ 16:51 PST after CT cal set to LS for taxi and take-off (also looking @ LS rollover)
16:02:30 ozhmac rebooting data system
16:59:06-12 taxi start 17:07:22 → AUTO
17:58:30 lamps

Date 110607 Campaign HIPPO4 Flight TF01 From ~~BJC~~ To BJC [EOTT]?

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) = 17:27:40

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 18:22:05

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):

17:57:00 low over FMN, 18:11 (had tried to abort cal, but acc. forced) went to MAN to get back to SA

III. Postflight

✓ 1) Note time of wheels down 18:23:50 back to AUTO UTC = 18:56:48

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

✓ 3) Note cryo temperature Cryo = -80.4

✓ 4) Click Stop button — allow any HS/LS cals in prog to finish [EOTT]

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

__ 17) Shut down laptop

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

__ 19) Rack power switch off

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

__ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

18:40 - big bumps

18:52:30 LS forcing cal to see bumps on landing... (LS @ 35:40...)

Date 20110609 Campaign HIPPO4 Flight TF02 From KBJC To KBJC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.06

I. Preflight

A. Day(s) before flight

Date = 20110608

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS ____ HS ____ LP ____ UTC = __ : __
  LT ____ WT ____ 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 and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

B. 2-hours before take-off

Instrument Operator JDB (+BS)

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Load dry-ice in dewar to within 0.5 inches of lid — UTC = 14 : 15
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1770 / — HS 2010 / — LP 1600 / —
  LT 1950 / — WT 1690 / — CylT2 25.1 / — (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1855 / +85 HS 2055 / +45 LP 1570 / -30 (very rough - hard to see)
  LT 1960 / +10 WT 1695 / +5
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 14 : 33 : 11 , Rack laptop time 14 : 33 : 14
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 831 / — PaSP 766 / — PLi840 2324 / — TMan 19.7 / —
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 88 torr (± 1). If not, adjust.
  PaCO2 325 PaO2 89
- ✓ 18) Click Initialize Cal Flow button

Date 20110609 Campaign HIPPO4 Flight TF02 From BJC To BJC

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 101 FlSP (to bypass) 105
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 103 FlSP (to cell) 103
✗ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 14:29
✗ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.7
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✗ 32) If necessary, adjust Line Purge regulator to 1 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 104 → much better than yesterday
✓ 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	PaSAn
14:51	NA	0.77	1.0	NA	NA	9	NA	0.03	4.6	4.1	3.3
15:03	534	0.67	1.4	19	-7.9	4.8	27	0.03	4.7	4.3	3
nominal	450	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 19:53
✓ 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 EDIT: Click "Close WT" to close WT 248

EDIT — C. 20-min before take-off

get 2 cals in before flight... set cal/int to 15 initially and start. 25 min before flight...

✓ 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 20 Cal Interval 20 Cal Period 2.5 LTf 3 WTf 4
✓ 4) Click Start button on main screen UTC = 15:28:26
✓ 5) Note cryo temperature Cryo = -81
✓ 6) Immediately before runway, switch 3-way valve to inlet UTC = 16:36:50
✓ 7) Note time of wheels up UTC = 16:36:50
✓ 8) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

17:13 - closed inlet on/off valve + forgot to @ inletoff

✓ reset cal int to 45 from 20

16:42 changed to 45 min cal int

Date 20110609 Campaign HIPPO Flight TF02 From KBJC 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) = 17:15:00

__2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings conducted early UTC (start) = 20:33:00

__3) On final descent, open Line Purge cylinder green valve and on/off valve 22:35:00 ~

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 = 22:40:10

__2) As soon as off runway, request permission and switch inlet 3-way to line purge 22413

__3) Note cryo temperature Cryo = -80.0

__4) Click Stop button

__5) Close manual VAC valve

__**6) Close all 4 cal cylinder green valves**

__7) Close cylinder box lid

__8) Wait 5 to 10 minutes after touchdown

__**9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

__10) Cylinder box Power breaker off

__11) Pump box Pump 2 breaker off

__12) Pump box Pump 1 breaker off

__13) Pump box Power breaker off

__14) Close program and Visual Basic

__15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

__16) Shut down AO2 PC

__17) Shut down laptop

__18) After green "SP to Cell" light has gone out, O_2 box Power breaker off

__19) Rack power switch off

__20) Pull trap, jumper quick-connects, and install stopper

__21) Open trap and remove glass beads

__22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__23) email a scan of this checksheet to BBS (or fax if scanner not available)

Sunken
Anne
Laurel

To Do:

- [ ] Add some sort of aid for reading Linepurge ~~valve~~ dial - mirror? strip on side
- [ ] Turn AO_2 cylinder in MED rack around check whether this will fit — mounting rack may need to be remade.
- [ ] Load old checksheet scans onto AO_2 ~~laptop~~ → on pendrive ⇒ laptop
- [ ] Add edits to AOR checklist to extend chart key time for whole flight and to record
- [ ] Grab kitchen timer for AO_2 rack for sample time reminders
- [ ] Flush flasks 1,17 w/ low CO_2 air.

MED breathes 17:24:45 → 17:26:30

- [ ] Bypass P creeps up/down to equil w/ something seems to want to go to ~840, so locks like it's leaking to sample P, prob on upstream side to mater PSA
- [ ] MED_PSA and MED_byp. signals coming out of rack to Aeros are reversed
- [ ] Talk to Greg about reversing these
- [ ] check if Trap 2 outlet is at all iced

Date 110614 Campaign HIPPO4 Flight RF01 From KBJC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110613

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = A/—
- ✓ 3) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 837 PaSP 807 PLi840 28 TMan 29 UTC = 22:13
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1810 HS 2030 LP 1570 UTC = 22:18
  LT 1960 WT 1480 CylT2 25
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 19:13
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1730/-50 HS 1980/-50 LP 1580/+10
  LT 1960/0 WT 1490/-10 CylT2 26.6/-24 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1855/+125 HS 2050/+80 LP 1590/+10
  LT 1960/0 WT 1495/+5
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 19:23:33, Rack laptop time 19:23:34
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 831/-6 PaSP 800/-7 PLi840 29.6/-1.6 TMan 29.9/-1.1
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 88 torr (± 1). If not, adjust.
  PaCO2 325 PaO2 92.8
- ✓ 18) Click Initialize Cal Flow button

Date 110614 Campaign HIPPO 4 Flight RF01

19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 110 FlSP (to bypass) 110
20) Toggle changeover to check flows in other position
FlWT (to bypass) 110 FlSP (to cell) 110
21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
23) Close cylinder box lid
24) Return to WT selected when done checking regulators
25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
26) Light lamp and ensure that it comes on UTC = 14 : 36
27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.2
28) Open manual Line Purge on/off valve
29) Ensure inlet manual 3-way valve to Line Purge cylinder
30) Click Initialize Sample Flow button
31) Pump box Pump 1 breaker on
32) If necessary, adjust Line Purge regulator to 1 psig
33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 791 SA Purge Flow 106.
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	PaSAn
14 : 46	NA	0.7	2	NA	NA	13.5	NA	0.03	5	4.7	3.7
15 : 00	563	0.6	2.6	18	-15	1.2	33	0.02	5.3	5.1	3.2
nominal	450	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 14 : 26
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) Click Close WT 248 valve

C. 40-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (initially set to a, 15, 2.5, 3, 2)
Flag a Cal Interval 15 Cal Period 2.5 LTf 3 WTf 2
4) Click Start button on main screen UTC = 15 : 36 : 40
5) Note cryo temperature Cryo = -81
6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4 → 16:07:05
7) Immediately before runway, switch 3-way valve to inlet UTC = 16 : 02 : 30
8) Note time of wheels up UTC = 16 : 03 : 42
9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

Date 110614 Campaign HH Flight RF01

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 110614_AO2_breath1 UTC (start) = 16 : 45 : 00 - 16:46:15

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 20 : 35 : 00 → 20:36:00

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 21:28:00

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 = 21 : 53 : 35

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

✓ 3) Note cryo temperature Cryo = -78

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

✓ 19) Rack power switch off

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

✓ 21) Open trap and remove glass beads

✓ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

✓ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

To do in Anchorage:

- ○ As much as possible, write code to run postflight to analyze flows, etc.
- ○ Finish introduction
- ✓ Correct all AO_2 checksheets to reflect '45 mins before ticket and Calper → 3.0 instead of 2.5
- ○ Test 125 torr inlet Psetpoint
- ○ Fix LJ leak?
- ✓ Upload data
- ✓ Upload checksheet scans.
- ○ Sort out access to wiki
- ○ Change prepurge in Rabbit to 50 seconds.

Date 110616 Campaign HIPPO 4 Flight RF02 From PANC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110615

Used one from plastic bag prepared in RNF, Checked: dry w/ beads

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

PaWT 989 PaSP 967 PLi840 26 TMan 21 UTC = 17:42

Noted @ 19:30 on 110615 hi/low

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

LS 1750 HS 1940 LP 1520 UTC = 17:46

LT 1880 WT 1270 CylT2 24.99

LS - 1740/3.4

HS - 1950/3.8

LT - 1890/2.7

WT - 1270/4.35

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

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

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

✓ 1) Rack power switch on

✓ 2) O_2 box Power breaker on

✓ 3) Laptop power on ← cyl box power on (in order to get

✓ 4) Pump box Power breaker on

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

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

LS 1715 / -35 HS 1900 / -40 LP 1500 / -20

LT 1890 / +10 WT 1290 / +20 CylT2 18.47 / -6.5 (once inst. on)

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

LS 1760 / +45 HS 1979 +70 LP 1500 / 0

LT 1900 / +10 WT 1290 / 0

✓ 8) Close cylinder box lid

✓ 9) Vnc into into AO2 (192.168.84.138)

~~10) Start AO2 program by clicking play in higold.vdp~~

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

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

AO2 PC Time 16 : 24 : 58 , Rack laptop time 16 : 25 : 00

✓ 13) Cylinder box Power breaker on

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

PaWT 965.7 -23 PaSP 956 / -11 PLi840 31 / +5 TMan 18 / -3

✓ 15) Pump box Pump 2 breaker on

✓ 16) Manual VAC valve open

✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.

PaCO2 319 PaO2 93

✓ 18) Click Initialize Cal Flow button

Date 110616 Campaign HIPPO4 Flight RF02

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 96 FlSP (to bypass) 94
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 96 FlSP (to cell) 93
✓ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 16 : 38
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.5
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 795 SA Purge Flow 108
✓ 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	PaSAn
16:51	NA	.346	1.0	NA	NA	8.2	NA	0.028	6.0	4.5	4.15
17:13	492	.375	1.9	25	-13	0.6	26	0.022	6.2	4.4	4.7
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

circled values taken @ 17:25 because not recorded earlier

✓ 36) Enable changeover valve (uncheck disable) UTC = 16 : 57
✓ 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) Click Close WT 248 valve

close enough that two just skipped 39, 40 and went to C.3

C. 45 -min before take-off

✗ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 17 : 21 : 16
✓ 5) Note cryo temperature Cryo = -78
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 18 : 08 : 15
✓ 8) Note time of wheels up UTC = 18 : 09 : 20
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

Date 110616 Campaign HIPPO 4 Flight RF02

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 : 28 : 20 → 19:29:30 BUT BADLY CHOSEN TIMING TRANSITIC ZONE ~ TROPOPAU

__ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 02 : 18 : 10

__ 3) On final descent, open Line Purge cylinder green valve and on/off valve -02:18:50

Forgot to Save PNG

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 = 03 : 04 : 20

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

__ 3) Note cryo temperature Cryo = -78.6

__ 4) Click Stop button

__ 5) Close manual VAC valve

__ **6) Close all 4 cal cylinder green valves**

__ 7) Close cylinder box lid

__ 8) Wait 5 to 10 minutes after touchdown

__ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

__ 10) Cylinder box Power breaker off

__ 11) Pump box Pump 2 breaker off

__ 12) Pump box Pump 1 breaker off

__ 13) Pump box Power breaker off

__ 14) Close program and Visual Basic

__ 15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

__ 16) Shut down AO2 PC

__ 17) Shut down laptop

__ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off

__ 19) Rack power switch off

__ 20) Pull trap, jumper quick-connects, and install stopper

__ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

could'n't

Date 110618 Campaign HIPPO4 Flight RF-03 From PANC To PHKO

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 20110617

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 846 PaSP 837 PLi840 21 TMan 23.6 UTC = 18 : 18
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1710 HS 1900 LP 1490 UTC = 18 : 23
  LT 1860 WT 1000 CylT2 16.3

was (in log)
1750 1900
1880 1240

- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 05
- 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1720 +10 HS 1880 +20 LP 1430 / -70
  LT 1890 / +30 WT 980 / +20 CylT2 19.5 / -1 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1720 / +0 HS 1910 / +30 LP 1460 / +90
  LT 1890 / +0 WT 990 / +10
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 28 : 01 , Rack laptop time 16 : 28 : 02
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 832 / -14 PaSP 814 / -23 PLi840 24.7 / +3.7 TMan 18 / -5.6
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 320 PaO2 93 (BS says this is fine)
- ✓ 18) Click Initialize Cal Flow button

Date 110618 Campaign HIPPO 4 Flight RF03

19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 98 FlSP (to bypass) 97
20) Toggle changeover to check flows in other position
FlWT (to bypass) 97 FlSP (to cell) 95
21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
23) Close cylinder box lid
24) Return to WT selected when done checking regulators
25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
26) Light lamp and ensure that it comes on UTC = 16 : 56
27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.1
28) Open manual Line Purge on/off valve
29) Ensure inlet manual 3-way valve to Line Purge cylinder
30) Click Initialize Sample Flow button
31) Pump box Pump 1 breaker on
32) If necessary, adjust Line Purge regulator to 2 psig
33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 110
34) Snoop trap fittings
35) >= 10 min. after lamp on record values in first row of table below

17:23 ≈ 9.7

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn	PaSAn
16 : 49	NA	0.78	1.0	NA	NA		NA				
17 : 23	563	0.8	4	.14	−9	0.4	26	0.03	6.65	5.31	6.3
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

brought P_aCO_2 up to 355 to get flow up to 110, tried moving HA-3, but it didn't seem to achieve anything

36) Enable changeover valve (uncheck disable) UTC = 17 : 06
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) Click Close WT 248 valve

C. ~~40~~ 45-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (initially set to a, 15, ~~2.5~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
4) Click Start button on main screen UTC = 17 : 25 : 25
5) Note cryo temperature Cryo = −78.8
6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4 → 18:03:05
7) Immediately before runway, switch 3-way valve to inlet UTC = 17 : 59 : 50
8) Note time of wheels up UTC = 18 : 01 : 06
9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

18:03:40

keep looking

Date 110618 Campaign HIPPO4 Flight RF03

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

110618_AO2_breath test_33_34.png

✓ 1) At high point of first ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 18 : 33 : 00 - 18:34:00

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 01 : 39 : 00 -

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 02:29:50

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 = 02:37:25

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 023810

✓ 3) Note cryo temperature Cryo = -77.2

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

__ 17) Shut down laptop

__ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off

__ 19) Rack power switch off

__ 20) Pull trap, jumper quick-connects, and install stopper

__ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110622 Campaign HIPPO4 Flight ~~RF01~~ RF04 From PANC To RAR

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight

Date = 110620

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 846 PaSP 837 PLi840 30.8 TMan 21.9 UTC = 21:45
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1710 HS 1900 LP 1410 UTC = 21:48
  LT 1900 WT 775 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 and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

USB Error on CB box originally prob. because USB @ CB was knocked during post-flight of RF03. Realigned/connected and reentered CB and no more USB errors.

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 21:15
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1760/+50 HS 1835/-65 LP 1890/+20
  LT 1930/+30 WT 690/-15 CylT2 24.4/ ( ) (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1750/-10 HS 1930/+95 LP 1430/+40
  LT 1930/10 WT 770/+80
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 21 : 34 : 57, Rack laptop time 21 : 34 : 59
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 864 / +18 PaSP 846 / +9 PLi840 21.5 / -9.3 TMan 26.8 / +4.9
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 329 PaO2 86.5 (acceptably low from conversation before RF03)
- ✓ 18) Click Initialize Cal Flow button

Date 110622 Campaign HIPPO4 Flight ~~RF04~~ RF04

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 113 FlSP (to bypass) 106
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 114 FlSP (to cell) 104
? ✓ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 21 : 47
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.02
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 109
✓ 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	PaSAn
21 : 57	NA	0.7	1.1	NA	NA	9.2	NA	0.07	4.8	4.5	4.6
22 : 08	579	0.68	3.5	18	-9.6	1.4	21.4	0.02	4.9	5.6	4.8
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 21 : 58
✓ 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) Click Close WT 248 valve

Now 50 mins before take-off

C. 45 ~~40~~-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2.5~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = ~~22~~ 21 : 10 : 46
✓ 5) Note cryo temperature Cryo = -79.8
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 23 : 15 : 38
✓ 8) Note time of wheels up UTC = 23 : 16 : 13
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

SP2 issue caused 10 min delay. Forced one cal, and set back to 50

EDIT add time

@ 13:20:00

Date 110622 Campaign HIPPO4 Flight ~~RF03~~ RF04

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) = 23:42:00 - 43:00

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

D.N.T merge

✓ 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 = 07:36:15

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

✓ 3) Note cryo temperature Cryo = -78.1

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

8) Wait 5 to 10 minutes after touchdown

9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve

10) Cylinder box Power breaker off

11) Pump box Pump 2 breaker off

12) Pump box Pump 1 breaker off

13) Pump box Power breaker off

14) Close program and Visual Basic

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

16) Shut down AO2 PC

17) Shut down laptop

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

19) Rack power switch off

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

21) Open trap and remove glass beads

22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

23) email a scan of this checksheet to BBS (or fax if scanner not available)

To Do 06/23

- Set up run (by changing AOZ comp time → 23:59) that runs LP over midnight.

Date 110625 Campaign HIPPO4 Flight RF05 From RAP To N2CY

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight

Date = 110623

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT ~~867~~ PaSP ~~848~~ PLi840 25 TMan 23 UTC = 21 : 37
  (HS jumps up)
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS ~~1660~~ HS 1860 LP 1370 UTC = 21 : 42
  LT 1855 WT 530 CylT2 18.8
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

Purging LP from ~21:50 →

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 30
- 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1710 / +50 HS 1875 / +25 LP 1300 / -30
  LT 1880 / +25 WT 470 / -60 CylT2 ~~21.5~~ 41.5 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1700 / -10 HS 1900 / +25 LP 1310 / +10
  LT 1900 / +20 WT 470 / -0
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times (AO2 PC Time had to manually update)
  AO2 PC Time 06 : 42 : 08, Rack laptop time 06 : 42 : 08 (server had just come on)
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 925 / +58 PaSP 825 / +23 PLi840 ~~33~~ 29.4 / +4.4 TMan 24 / +1
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 327 PaO2 87
- ✓ 18) Click Initialize Cal Flow button

Date 110625 Campaign HIPPO 4 Flight RF05

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 105 FlSP (to bypass) 100
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 107 FlSP (to cell) 100
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 18 : 48
X 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.75
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 795 SA Purge Flow 107
✓ 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	PaSAn
19 :00	NA	0.75	0.58	NA	NA	7.6	NA	0.03	5.7	4.4	4.3
19 : 11	581	0.8	20	18	-15	1.2	33	0.03	5.3	5.3	4.0
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 19 : 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) Click Close WT 248 valve

C. 45 ~~40~~-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable) 3.0
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~25~~, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 5 WTf 2
✓ 4) Click Start button on main screen UTC = 20 : 08 : 00 (110623: 23:56:20)
✓ 5) Note cryo temperature Cryo = -78.6
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 21 : 29 : 30
✓ 8) Note time of wheels up UTC = 21 : 30 : 10
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve
21:43:30

Date 110625 Campaign HIPPO4 Flight RF05

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) = 22:07:00 -08

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 @ 04:03

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 = 04:18:13

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 041936

✓ 3) Note cryo temperature Cryo = -77.8

✓ 4) Click Stop button 04:33 - after 1st cal, as second was starting

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

✓ 19) Rack power switch off

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

✓ 21) Open trap and remove glass beads

✓ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

✓ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

A02 leak test

- run all 4 regs in all way
- then all the way back out
- Note PAs on low side @ start, 15 mins later Note PASA if possible.
- Note Ps, PASA next morning

	LS	HS	LT	WT	PASA
04:37	12.6	11.9	11.2	13.5	~~811~~
04:55	12.7	11.0	11.0	13.4	~~785~~
05:25	12.7	10.95	11.0	13.4	784

Black knobs all way out after ~~Purti~~ spinning all way in Green values then close & Power off. Have 45 min. still so powered up. PaSA = 26 @ 5:10
PaSP = 785

Date 110628 Campaign HIPPO4 Flight RF06 From NZCH To HBA

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

(2 takeoff delays - so many additional notes here and on 110628_RF06_

I. Preflight

A. Day(s) before flight Date = 110627

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures ← 110628

  PaSA 27.1 1034 PaWT 3.5 PaSP -0.7 PLi840 12.0 TMan 23.8 UTC = 03 : 46 (110628 8:4)

- ✓ 4) Crack and close green valves, then record cylinder pressures HS/LS (1550/13.0 1740/)

  LS 1580/12.9 HS 1780/11.4 LP 1200/1.5 UTC = 01 : 47

  LT 1880/2.6 WT 1880/15.5 CylT2 10.3 (1780/4.8 1840/11)

- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 20 : 30
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)

  LS 1640/-10 HS 1720/-20 LP 1180/-20

  LT 1750/-30 WT 1800/-40 CylT2 1147/09 (once inst. on)

  recorded @ 22:51 but I believe I remember temps were around 11 earlier due to cold night
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)

  LS 1550/+10 HS 1750/+30 LP 1200/+20

  LT 1770/+20 WT 1800/+0
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times

  AO2 PC Time 20 : 21 : 21, Rack laptop time 20 : 21 : 22
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)

  PaWT 850/ N/A PaSP 770/ N/A PLi840 236/ N/A TMan 20.2/ +3.6
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open 310
- ✓ 17) Check that PaCO2 = ~~325~~ torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.

  PaCO2 304 PaO2 87 ⟹ later, at 22:51 they ase 313/90
- ✓ 18) Click Initialize Cal Flow button

Date 110628 Campaign HIPPO4 Flight RF06

Adjusted HA3

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 95 FlSP (to bypass) ~~86~~ 85 => 94 / 91

✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 90 FlSP (to cell) 88 => 95 / 89

✓ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm

✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr

✓ 23) Close cylinder box lid

✓ 24) Return to WT selected when done checking regulators

✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling

✓ 26) Light lamp and ensure that it comes on UTC = 20 : 48 (21:25 on 20110628)

✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.1

✓ 28) Open manual Line Purge on/off valve

✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder

✓ 30) Click Initialize Sample Flow button

✓ 31) Pump box Pump 1 breaker on

X 32) If necessary, adjust Line Purge regulator to 2 psig

✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 795 SA Purge Flow 106.7

✓ 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	PaSAn
20:58	NA	0.8	1.1	NA	NA	8.3	NA	0.02	5.8	4.6	5.6
21:13	533	0.79	1.79	10	-12	-3	21	0.03	5.5	4.2	4.8
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 20 : 59

✓ 37) >= 10 min. after change-over enable, record values in table above

X 38) Disable changeover

X 39) If necessary, toggle changeover to get SP to Cell

X 40) Click Close WT 248 valve

C. 45-min before take-off

X 1) WT 248 valve to Auto (uncheck close)

X 2) Enable changeover (uncheck disable)

✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2.5~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 30 LTf 3 WTf 2

✓ 4) Click Start button on main screen UTC = 21 : 15 : 40

✓ 5) Note cryo temperature Cryo = -78.4

✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4

21:38 closed WT disabled changeover SP to cell

— 7) Immediately before runway, switch 3-way valve to inlet UTC = 23 : 08 : __

— 8) Note time of wheels up UTC = 23 : 09 : 30

✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve 00:06

✓ When 30 mins before WT248 → open enable changeover & adjust to 15/30/3/1

✓ Then WTfreq → 4 Calint → 50 @ 22:59

22:08 - set WT back to auto calint to 15 WTfreq to 1 ✓

22:34 : takeoff further delayed WT → closed changeover off SP → cell

22:43 : Now aiming for 11:00 takeoff, so WT auto, changeover on

Date 110628 Campaign ~~RF06~~ HIPPO4 Flight RF06

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) = 00 : 09 : 00 → 06:11:00

__ 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 = 06 : 28 : 50 ? 28:50

__ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 06:29:20

__ 3) Note cryo temperature Cryo = -78

__ 4) Click Stop button

__ 5) Close manual VAC valve

__ 6) **Close all 4 cal cylinder green valves**

__ 7) Close cylinder box lid

__ 8) Wait 5 to 10 minutes after touchdown

__ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve

__ 10) Cylinder box Power breaker off

__ 11) Pump box Pump 2 breaker off

__ 12) Pump box Pump 1 breaker off

__ 13) Pump box Power breaker off

__ 14) Close program and Visual Basic

__ 15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive

__ 16) Shut down AO2 PC

__ 17) Shut down laptop

__ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off

__ 19) Rack power switch off

__ 20) Pull trap, jumper quick-connects, and install stopper

__ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110630 Campaign HIPPO4 Flight RF07 From ~~YHB~~ YMHB To YPDN

Hobart, Tasmania Darwin, Australia

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight

Date = 110629

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 847 PaSP 761 PLi840 33.6 TMan 18.5 UTC = 00:34 on 110629
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1530 HS 1730 LP 1110 UTC = 00:36
  LT 1755 WT 1605 CylT2 11.0
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 2210
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1525/+5 HS 1720/−20 LP 1130/+20
  LT 1760/+5 WT 1600/−5 CylT2 11 / 0 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1530/+5 HS 1725/+5 LP 1140/+10
  LT 1760/0 WT 1600/0
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 22 : 21 : 47, Rack laptop time 22 : 21 : 48
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 853/+6 PaSP 768/+7 PLi840 45.5/+11.9 TMan 19.8/+1.3
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open 305
- ✓ 17) Check that PaCO2 = ~~325~~ torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 303 PaO2 88
- ✓ 18) Click Initialize Cal Flow button

Date 110630 Campaign HIPPO4 Flight RF07

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 89 FlSP (to bypass) 83
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 87 FlSP (to cell) 86
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 22:29
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.89
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
X 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 108
✓ 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	PaSAn
22:42	NA	1.0	1.0	NA	NA	5.2	NA	.03	5.4	4.9	5.2
22:56	544	0.77	1.8	7.4	-14	-5.9	21.6	0.03	5.7	5.5	4.2
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 22:43
✓ 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) Click Close WT 248 valve

C. 45-min before take-off

Cleared GMT MidNight 23:59:59 w/o issue while on SA

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 23:18:30
✓ 5) Note cryo temperature Cryo = -78.3
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 00:03:40
✓ 8) Note time of wheels up UTC = 00:04:53
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve 00:13:15

CalInt=730 to catch profile out of Cape Grim Obs

Some additional values, taken @ 23:58
O_2V=7.97 PaWT=813 PaSP=778 P_{CO_2}=311 P_{O_2}=89.9

✓ set calint to 50 @ 0:17:00 (LS purging)

Date 110630 Campaign HIPPO4 Flight RF07

C60 descent/ascent started 00:28:10

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) = 01 : 27 : 00 – 29:00

FORGOT ✗ 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 06:36

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):

CABIN PRESSURE TEST 11:30 – 11:44

650–750 torr

III. Postflight 01:48 set cal to start w/ WT, LT at the alternate cabin pressure near 605 torr

✓ 1) Note time of wheels down UTC = 06:52:48

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 0653:40

✓ 3) Note cryo temperature Cryo = -78.3

✓ 4) Click Stop button OOH, yikes, accidentally hit STOP button right as cal started

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

✓ 19) Rack power switch off

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

✓ 21) Open trap and remove glass beads

✓ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

✓ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110704 Campaign HIPPO4 Flight RF08 From YPDN To PGSN
Darwin Saipan

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110703

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 842 PaSP 760 PLi840 23.1 TMan 24.5 UTC = 1 : 00
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1610 HS 1810 LP 1110 UTC = 1 : 03
  LT 1860 WT 1510 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 and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

EDIT
Add in 1-2 hrs of LP: Pump 1 on, Enable Pump Box, SA Purge, Set Purge Val to 2.1 V, Set flow, Watch SA purge ~100 Start UTC 1:20

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 23 : 00
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1600 / -10 HS 1795 / -15 LP 1060 / -50
  LT 1855 / -5 WT 1495 / -15 CylT2 [redacted] / [redacted] (once inst. on) → 22.4 / -2.5
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1605 / +5 HS 1800 / +5 LP 1100 / +40
  LT 1855 / 0 WT 1505 / +10
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 23 : 12 : 02, Rack laptop time 23 : 12 : 03
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 847 / +5 PaSP 763 / -3 PLi840 26.6 / ___ TMan 248 / +03
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 313 PaO2 89
- ✓ 18) Click Initialize Cal Flow button

Date 110704 Campaign HIPPO4 Flight RF08

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 103 FlSP (to bypass) 95
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 102 FlSP (to cell) 96
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 23 : 24
X 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 6.7, rising
7.1 @ 0:29
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig (first time I have needed to)
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 107
✓ 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	PaSAn
23:48	NA	0.89	0.92	NA	NA	0.77	NA	0.03	5.1	4.31	3.14
23:59	570	0.67	1.59	15.3	-14	-0.38	29	0.03	4.6	4.03	5.22
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 11 : 49
✓ 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) Click Close WT 248 valve

C. ~~40~~ 45-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2.0~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 0 : 44 : 18
✓ 5) Note cryo temperature Cryo = -78.6
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4 01:22
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 01 : 43 : 30
✓ 8) Note time of wheels up UTC = 01 : 44 : 12
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

Inlet Purge valves closed @ 148:45

Door close 01:24:30

Date 110704 Campaign HIPPO4 Flight RF05

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) = 02:25:00 - 27:00

✓ 2) At high point of last ascent, while sampling air, conduct 30-second breath test on inlet fittings UTC (start) = 07:03:00 - 04:00

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve 07:04:31

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 = 07:42:54

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 07:43:30

✓ 3) Note cryo temperature Cryo = -78.3

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

✓ 19) Rack power switch off

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

__ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110706 Campaign HIPPO4 Flight RF09 From P65N To PMDY
Saipan M. Dwarf

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight

Date = 110705

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 838 PaSP 770 PLi840 25.4 TMan 22.7 UTC = 0:35
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1560 HS 1770 LP 1060 UTC = 0:45
  LT 1810 WT 1300 CylT2 20.8
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack
- ✓ 7) Enable Pump + Cyl boxes by clicking BoxT/enable & Box enable 10x each. Open LP green + on/off. Ensure 3-way to LP?

Added a small amt. of dry ice to dewar that Ravel had leftover from OMS

B. 2-hours before take-off

Instrument Operator JDB

0:40

Turn Pump Box on (and cyl)

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Pump box Power breaker on
- ✓ 5) Load dry-ice in dewar to within 0.5 inches of lid UTC = 00:35
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1520/-40 HS 1610/+40 LP 990/-10
  LT 1895/+55 WT 1340/+40 CylT2 29.7/+5 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1520/ 0 HS 1610/ 0 LP 1080/ +90
  LT 1895/ 0 WT 1340/ 0
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 00:44:19, Rack laptop time 00:44:22
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 862/+24 PaSP 790/-20 PLi840 30.4/+5 TMan 63/29
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 319 PaO2 87
- ✓ 18) Click Initialize Cal Flow button

✓ 6) close LP/on/off

click init. sample flow. Check that SA Purge = 110

Date 110706 Campaign HIPPO4 Flight RF09

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 111 FlSP (to bypass) 102
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 111 FlSP (to cell) 104
X 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 00 : 54
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.94 PaO_2 → 81
✓ 28) Open manual Line Purge on/off valve → Adjusted PaO_2 down to increase signal from 6.4 → 8.9
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
X 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 790 SA Purge Flow 107
✓ 34) Snoop trap fittings
✓ 35) >= 10 min. after lamp on record values in first row of table below

between, plane taxied and P went up and down, causing sigs of noise↑

UTC	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn	PaSAn
01 :09	NA	0.77	0.77	NA	NA	6.4	NA	0.026	4.3	4.4	5.8
01 :27	689	0.64	1.7	15.6	-11.9	2.2	27	0.02	5.7	4.5	4.8
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

coming down

✓ 36) Enable changeover valve (uncheck disable) UTC = 01 : 10
✓ 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) Click Close WT 248 valve

C. 45 ~~40~~ min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable) 3:10
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2.0~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 01 : 32 : 15
✓ 5) Note cryo temperature Cryo = -78.8
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 02 : 25 : 30
✓ 8) Note time of wheels up UTC = 02 : 26 : 15
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve 02:28:40

EDIT: Set alarm to remind

Date 110706 Campaign HIPPO4 Flight RF09

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) = 03 : 06 : 00 - 08:00

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

FORGOT AGAIN

✓ 3) On final descent, open Line Purge cylinder green valve and on/off valve ~08:11

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

08:46:30 cals → auto

✓ 1) Note time of wheels down UTC = 08 : 50 : 09

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 0511 10

✓ 3) Note cryo temperature Cryo = -78.7

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

X 19) Rack power switch off

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

✓ 21) Open trap and remove glass beads

__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Edit: ✓24) check that all boxes on check sheet are checked/filled.

Replace AO2 filter

- Pull vacuum w/ sa 248 closed and 5A selected and SP248 open
- Check PaSA before/after to verify leak
- Replace w/ 1µm cellulose nitrate

Date 110709 Campaign HIPPO-4 Flight ~~RF11~~ Maint Dy From PANC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110709

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

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

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

PaWT 797 PaSP 794 PLi840 39 TMan 28 UTC = 23 : 40

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

LS 1500 HS 1690 LP 940 UTC = 23 : 40

LT 1770 WT 860 CylT2 17.3

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

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

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) Pump box Power breaker on

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

__ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)

LS ____ / ___ HS ____ / ___ LP ____ / ___

LT ____ / ___ WT ____ / ___ CylT2 ____ / ___ (once inst. on)

__ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)

LS ____ / ___ HS ____ / ___ LP ____ / ___

LT ____ / ___ WT ____ / ___

__ 8) Close cylinder box lid

✓ 9) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time __ : __ : __ , Rack laptop time __ : __ : __

✓ 13) Cylinder box Power breaker on

__ 14) Record instrument pressures and changes overnight (P / Δ)

PaWT ___ / ___ PaSP ___ / ___ PLi840 ___ / ___ TMan ___ / ___

✓ 15) Pump box Pump 2 breaker on

✓ 16) Manual VAC valve open 308 ~~90~~ 81

__ 17) Check that PaCO2 = ~~325~~ torr (± 5) and PaO2 = ~~90~~ torr (± 1). If not, adjust.

PaCO2 ____ PaO2 ____

__ 18) Click Initialize Cal Flow button

Date 110709 Campaign HIPPO4 Flight RF04 Maint-Dry

__ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 102 FlSP (to bypass) 96
__ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 102 FlSP (to cell) 97
__ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
__ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
__ 23) Close cylinder box lid
__ 24) Return to WT selected when done checking regulators
__ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
__ 26) Light lamp and ensure that it comes on UTC = __ : __
__ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = ____
__ 28) Open manual Line Purge on/off valve
__ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
__ 30) Click Initialize Sample Flow button
__ 31) Pump box Pump 1 breaker on
__ 32) If necessary, adjust Line Purge regulator to 2 psig
__ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA ___ SA Purge Flow ____
__ 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	PaSAn
25 :04	NA	0.77	0.8	NA	NA	2.2	NA	.02	5.0	5.1	2.9
23 :24	613	0.63	1.7	10.3	-9.4	-0.02	20	0.02	5.7	5.0	5.1
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 23 : 11
__ 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) Click Close WT 248 valve

C. 45 40-min before take-off

__ 1) WT 248 valve to Auto (uncheck close)
__ 2) Enable changeover (uncheck disable) 3.10
__ 3) Adjust / record program parameters (initially set to a, 15, 2.5, 3, 2)
Flag ___ Cal Interval ___ Cal Period ___ LTf ___ WTf ___
__ 4) Click Start button on main screen UTC = __ : __ : __
__ 5) Note cryo temperature Cryo = _____
__ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
__ 7) Immediately before runway, switch 3-way valve to inlet UTC = __ : __ : __
__ 8) Note time of wheels up UTC = __ : __ : __
__ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

Date 110707 Campaign HIPPO4 Flight RF10 From PMDY To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110706

- ✓ 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) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures
  PaWT 889 PaSP 828 PLi840 24.7 TMan 32.4 UTC = 23 : 29
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1530 HS 1750 LP 1000 UTC = 23:3
  LT 1810 WT 1110 CylT2 21.1
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack
- ✓ 7) Enable PB, CB; init. sample 23:45 ? – 00:27 (short on time this maintenance)

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 13:50
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1590 / +60 HS 1810 / -60 LP 960 / -40
  LT 1890 / +80 WT 1120 / +10 CylT2 29.3 / +8.2 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1590 / 0 HS 1810 / 0 LP 980 / +20
  LT 1890 / 0 WT 1130 / +10
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 14 : 07 : 15 , Rack laptop time 14 : 07 : 16
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 867 / -22 PaSP 7987 +30 PLi840 27 / +2.3 TMan 264 - 6
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 321 PaO2 81
- ✓ 18) Click Initialize Cal Flow button

Date 110707 Campaign HIPPO4 Flight RF10

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 107 FlSP (to bypass) 101
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 103 FlSP (to cell) 102
✓ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 02:15
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 8.40
✓ 28) Open manual Line Purge on/off valve =7 8.89 @
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 792 SA Purge Flow 100.2
✓ 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	PaSAn
14:26	NA	0.7	1.4	NA	NA	7.6	NA	0.03	6	4.4	3.1
14:37	650	0.7	1.5	17	-8.8	9.8	26	0.03	5.1	5.1	5.0
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 14:27
✓ 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) Click Close WT 248 valve

C. 45 ~~40~~ min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 14:50:40
✓ 5) Note cryo temperature Cryo = -78.8
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 15:31:26
✓ 8) Note time of wheels up UTC = 15:33:52
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

15:38:10

Date 110707 Campaign HIPPO4 Flight RF10

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) = 16 :04 :30 - 06:30

✓ 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

could'nt - system shut down

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 = 21 :48 :30 ~

✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 21:49:22

✓ 3) Note cryo temperature Cryo = -79.2

✓ 4) Click Stop button

✓ 5) Close manual VAC valve

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

✓ 7) Close cylinder box lid

✓ 8) Wait 5 to 10 minutes after touchdown

✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve

✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off

✓ 12) Pump box Pump 1 breaker off

✓ 13) Pump box Power breaker off

✓ 14) Close program and Visual Basic

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

✓ 16) Shut down AO2 PC

✓ 17) Shut down laptop

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

X 19) Rack power switch off

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

✓ 21) Open trap and remove glass beads

✓ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)

✓ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Does PRWT → +5 when man vac is closed and WT248 is open postflight

Date 110710 Campaign HIPPO4 Flight RF11 From PANC To PANC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110709

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = ___ / ___
- ✓ 3) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures 797 794 39
  PaWT ~~852~~ PaSP ~~826~~ PLi840 ~~856~~ TMan 28 UTC = 23 : 40
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1500 HS 1690 LP 940 UTC = 23 : 40
  LT 1770 WT 860 CylT2 17.3
- ✓ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 20
- ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1480 / -20 HS 1520 / -170 LP 810 / -130
  LT 1270 / -500 WT 180 / -680 CylT2 18.3 / -1 (once inst. on)
- ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1490 / +10 HS 1700 / +180 LP 910 / -30
  LT 1780 / +510 WT 810 / +630
- ✓ 8) Close cylinder box lid
- ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 39 : 01 , Rack laptop time 16 : 39 : 05
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures and changes overnight (P / Δ)
  PaWT 835 / +35 PaSP 779 / -15 PLi840 22.8 / -5.5 TMan 19.6 - 8.4
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 304 PaO2 86
- ✓ 18) Click Initialize Cal Flow button

~~We left it~~ No alarm necessary - we had to shut system down in a rush at the end of maint day while system was mid-cal, (new lower settings from maint day (see separate checksheet and ADR book))

JDB

Date 110710 Campaign HIPPO4 Flight RF11

✓ 19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 91 FlSP (to bypass) 87
✓ 20) Toggle changeover to check flows in other position
FlWT (to bypass) 90 FlSP (to cell) 89
✓ 21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 23) Close cylinder box lid
✓ 24) Return to WT selected when done checking regulators
✓ 25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 26) Light lamp and ensure that it comes on UTC = 16:41
✓ 27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.66
✓ 28) Open manual Line Purge on/off valve
✓ 29) Ensure inlet manual 3-way valve to Line Purge cylinder
✓ 30) Click Initialize Sample Flow button
✓ 31) Pump box Pump 1 breaker on
✓ 32) If necessary, adjust Line Purge regulator to 2 psig
✓ 33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 710 SA Purge Flow 107
✓ 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	PaSAn
16 :52	NA	0.74	1.4	NA	NA	17.1	NA	0.02	5.28	4.58	4.62
17 :03	573	0.89	2.1	17.9	-2.2	7.8	20.4	.026	5.16	4.56	4.82
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

✓ 36) Enable changeover valve (uncheck disable) UTC = 16:52
✓ 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) Click Close WT 248 valve

C. 45 ~~40~~-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (initially set to a, 15, ~~2.5~~ 3.0, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
✓ 4) Click Start button on main screen UTC = 17:17:13
✓ 5) Note cryo temperature Cryo = −78.6
✓ 6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4
✓ 7) Immediately before runway, switch 3-way valve to inlet UTC = 18:05:35
✓ 8) Note time of wheels up UTC = 18:06:41
✓ 9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve

@ 18:51:30

Date 110710 Campaign HIPPO4 Flight RF11

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) = 18:49:00 - 51:00

well, this time I wrote a note to myself and set an alarm. The note was 2 hours too early; the alarm went off literally at the exact moment that Steve announced our final Descent.

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 02:14:30

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 = 02:23:36
✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge
✓ 3) Note cryo temperature Cryo = -78.8
✓ 4) Click Stop button 02:24:21
✓ 5) Close manual VAC valve
✓ **6) Close all 4 cal cylinder green valves**
✓ 7) Close cylinder box lid
✓ 8) Wait 5 to 10 minutes after touchdown
✓ **9) Close Line Purge cylinder green valve** and manual Line Purge on/off valve
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Pump 1 breaker off
✓ 13) Pump box Power breaker off
✓ 14) Close program and Visual Basic
✓ 15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 16) Shut down AO2 PC
✓ 17) Shut down laptop
✓ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off
X 19) Rack power switch off
✓ 20) Pull trap, jumper quick-connects, and install stopper
✓ 21) Open trap and remove glass beads
✓ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)
✓ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Date 110711 Campaign HIPPO4 Flight RF12 From PANC To KBJC

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 2011.06.12

I. Preflight

A. Day(s) before flight Date = 110711

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = B / D
- X 3) Power rack, O_2 box, Cylinder box, laptop, vnc, start program, and record pressures Couldn't get; not enough time - no maint. day
  PaWT ____ PaSP ____ PLi840 ____ TMan ____ UTC = __ : __
- ✓ 4) Crack and close green valves, then record cylinder pressures
  LS 1430 HS 1600 LP 900 UTC = 03 : 40
  LT 1730 WT 620 CylT2 19
- ___ 5) Log each hi-side cylinder pressure in software (pressures must be logged at least once between flights)
- ✓ 6) Stop program, close Visual Basic and vnc, shut down Windows, power down O_2 and Cylinder box, power down laptop and rack

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
- X 5) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 10
- X ✓ 6) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1430 / 0 HS 1560 / -40 LP 880 / -20
  LT 1730 / +10 WT 600 / -20 CylT2 15.1 / -3.9 (once inst. on)
- X ✓ 7) Open green knobs four ¼ turns and note any pressure changes (P / Δ)
  LS 1440 / +10 HS 1640 / +80 LP 900 / +20
  LT 1740 / +10 WT 620 / +20
- X ✓ 8) Close cylinder box lid
- ✓ ✓ 9) Vnc into into AO2 (192.168.84.138)
- ✓ ✓ 10) Start AO2 program by clicking play in higold.vdp
- ✓ ✓ 11) Ensure that no USB errors are present in boxes at bottom of screen
- X ✓ 12) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 37 : 39 , Rack laptop time 16 37 : 41
- ✓ ✓ 13) Cylinder box Power breaker on
- ✓ ✓ 14) Record instrument pressures and changes overnight (P / Δ) 816/796/18/229
  PaWT 851 / X PaSP 776 / ^ PLi840 12 / X TMan 19.4 / X
- ✓ ✓ 15) Pump box Pump 2 breaker on
- ✓ ✓ 16) Manual VAC valve open
- ✓ ✓ 17) Check that PaCO2 = 325 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  PaCO2 304 PaO2 86 305/85
- ✓ ✓ 18) Click Initialize Cal Flow button

LOG CYLINDER VALS

Get wrenches for cabin CO_2 test out ready

Date 110711 Campaign HIPPO4 Flight RF12

19) Ensure that flow starts through both lines (110 ± 10)
FlWT (to cell) 91 FlSP (to bypass) 88 94/92
20) Toggle changeover to check flows in other position
FlWT (to bypass) 90 FlSP (to cell) 90 93/91
21) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
22) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
23) Close cylinder box lid
24) Return to WT selected when done checking regulators
25) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
26) Light lamp and ensure that it comes on UTC = 16 :43 17:32
27) If necessary, adjust PaO2 to keep signal below 9.5 V O_2 signal = 7.62
28) Open manual Line Purge on/off valve
29) Ensure inlet manual 3-way valve to Line Purge cylinder
30) Click Initialize Sample Flow button
31) Pump box Pump 1 breaker on
32) If necessary, adjust Line Purge regulator to 2 psig
33) Ensure that PaSA stabilizes near 795 (±10) torr after 2 min.
PaSA 795 SA Purge Flow 105
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	PaSAn
16 :55	NA	0.88	1.3	NA	NA	11.9	NA	0.026	4.4	5.1	3.4
17 : 06	563	0.91	1.5	12	-1.6	4.7	14	0.024	4.1	4.1	4.1
nominal	500+	0.7	2.0	±10	±10	±10	±20	0.05	5.0	5.0	5.0

36) Enable changeover valve (uncheck disable) UTC = 16:56
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) Click Close WT 248 valve

C. 45 40-min before take-off

@ 17:15, Henry accidentally shutoff power. Going back through checklist.

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable) 3.0
3) Adjust / record program parameters (initially set to a, 15, 2.5, 3, 2)
Flag a Cal Interval 15 Cal Period 3.0 LTf 3 WTf 2
4) Click Start button on main screen UTC = 17 : 36 : 30
5) Note cryo temperature Cryo = -78
6) After 3rd Cal cycle (37.5 min after clicking start, sequence: WT-HS-LS-LT-SA-LS-HS-SA-HS-LS-WT) set Cal Interval to 50 and WTfreq to 4 18:16:00
7) Immediately before runway, switch 3-way valve to inlet UTC = 18 : 23 :55
8) Note time of wheels up UTC = 18:24 : 22
9) Close Inlet Purge cylinder green valve and manual Inlet Purge on/off valve
18: 29:50

OH, HENRY!

Announce water on CO_2 cabin values

Date 110711 Campaign HIPPO4 Flight RF12

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 : 08 : 00 - 19:10:00
__ 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 01:27:15

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):

193605 - manually forced cal

III. Postflight

✓ 1) Note time of wheels down UTC = 00 : 55 : 50 DONE!
✓ 2) As soon as off runway, request permission and switch inlet 3-way to line purge 56:48
✓ 3) Note cryo temperature Cryo = -80.5
✓ 4) Click Stop button
✓ 5) Close manual VAC valve
✓ 6) **Close all 4 cal cylinder green valves**
✓ 7) Close cylinder box lid
✓ 8) Wait 5 to 10 minutes after touchdown
✓ 9) **Close Line Purge cylinder green valve** and manual Line Purge on/off valve
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Pump 1 breaker off
✓ 13) Pump box Power breaker off
✓ 14) Close program and Visual Basic
✓ 15) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 16) Shut down AO2 PC
__ 17) Shut down laptop
__ 18) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 19) Rack power switch off
__ 20) Pull trap, jumper quick-connects, and install stopper
__ 21) Open trap and remove glass beads
__ 22) ftp *.mr, *.hr, hgcyllog.txt, and AO2_*_Notes.txt files for this flight to the ao2raw directory on catalog.eol.ucar.edu (or email if ftp does not work)
__ 23) email a scan of this checksheet to BBS (or fax if scanner not available)

Cabin P test

Manual cal → 10 mins one P
10 mins charging
10 mins back ?

55:00 → LP
19:53:20 → open cabin

20:18 Panel leaves chair → front of plane
20:26 back to sample.
line closed @ T.

Cabin CO_2 test

Get wrenches out

1) close LP
2) Unscrew 1/8" plug on tee near LP valve
3) Switch 3-way to LP

Ask ppl not to get too close to inlet

4) "Sample" whole way down/up to see variable effect.

22 2944 - @ 43kft, back to cabin air sucking into system,
22:38~ cal
2246 ~ back to sampling cabin
2249:55 - back to SAMPLE

PCASS Test

21:46 - forced purge → cal. Purging
21 50 - Manual control. Purge1 off. LS purging
21:58 - charging P down (cabin) from 640 → 620
22:04 - charging P back up from 620 → 640
22 15 - back to cal cycle