NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.01.21

Flight Date (YYMMDD) 091020 Flight (e.g. RF01) TF01 (HIPPO III)

I. Preflight

A. ~~Day(s) before flight~~ to day Date = 10/20

- ✓ 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) Record cylinder pressures (or copy from prev. postflight) UTC = 18 : 10
  - LS 1810 HS 1890
  - LT 280 WT 2190
- __ 4) Turn on instrument, record pressures (or copy from prev. postflight) UTC = __ : __
  - PaWT _____ PaSP _____ PLi840 _____

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

- ✓ 0) Rack power switch on
- ✓ 1) O_2 box Power breaker on
- ✓ 2) Laptop power on
- __ 3) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 12
- ✓ 4) Record hi-side cylinder pressures for overnight leak check (P / Δ)
  - LS 1810 / 12.4 HS 1890 / 12.4
  - LT 280 / 13.2 WT 490 / 9.3
- ✓ 5) Open green knobs four ¼ turns and re-record pressures and any changes
  - LS 1910 / 12.4 HS 1960 / 12.4
  - LT 280 / 13.2 WT 2230 / 9.3
- ✓ 6) Close cylinder box lid
- ✓ 7) ~~Open terminal on laptop and vnc ("vncviewer ao2-daq")~~ into AO2 vnc right to 192.168.84.158
- ✓ 8) Start AO2 program by clicking play in higold.vdp
- ✓ 9) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 10) Check that NTP time sync is working
  - AO2 PC Time 6 : 39 : 45, Rack laptop time 6 : 39 : 45
- ✓ 11) Log each hi-side cylinder pressure in software
- ✓ 12) Pump box Power breaker on
- ✓ 13) Cylinder box Power breaker on
- X 14) Record instrument pressures for overnight leak checks (P / Δ)
  - PaWT ____ / ___ PaSP ____ / ___ PLi840 ____ / ___
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  - PaCO2 328 PaO2 94
- ✓ 18) Click Initialize Cal Flow button
- ✓ 19) Ensure that WT flow starts through both lines (110 ± 10)
  - FlWT ✓114 FlSP ✓113
- X 20) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
- ✓ 21) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr

EDIT

VENT doesn't work → man. vented all 4 cyls 1910 1970 240 2220

first time

✓ 22) Return to WT selected when done checking regulators
✓ 23) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 24) Light lamp and ensure that it comes on UTC = 18:46
✓ 25) >= 10 min. after lamp on, record values in first row of table below
✓ __ 26) Once outside and fueling finished, click Initialize Sample Flow button
✓ __ 27) Pump box Pump 1 breaker on
✓ __ 28) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
799/116 Fridge P ___ SA Purge Flow ____
__ 29) Snoop trap fittings
✓ 30) Enable change-over valve ~UTC = 18:55
✓ 31) >= ~~10~~ 5 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
18:52:40	WT	NA	0.5	8.6	NA	NA	12	NA	2.3	6.0	5.2
19:00:00	WT	460	0.5	8.2	124	2	12	11	2.2	5.6	4.6
19:33:49	WT	462	0.5	5.9	9.0	-7.5	1.5	16	1.4	4.2	4.2
19:38:23	WT	472	0.5	10.0	7	-11	1.1	13	2.8	5.4	5.4

C. 20-min before take-off

✓ 1) Adjust / record program parameters (nominally set to a, 40, 2.7, 3, 4)
Flag 30 Cal Interval 30 Cal Period 3.0 LTf 2 WTf 3
✓ 2) Click Start button on main screen
✓ 3) Click Proceed button on control screen UTC = 19:39:08
✓ 4) Minimize "Verify Run Plan" window
✓ 5) Note time of wheels up UTC = 20:21:29

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.
Record flight notes in text file YYMMDD_RF##_Notes.txt

III. Postflight

✓ 1) Note time of wheels down UTC = 22:50:10
✓ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
✓ 3) Click Stop button
✓ 4) Turn off lamp
✓ 5) Close SA, WT, SP, and O2 248 valves in software
✓ 6) Select None in cylinder box control section and uncheck any purges
✓ 7) Close manual VAC valve
✓ 8) Pump box Pump 1 breaker off
✓ 9) Note cryo temperature Cryo = -70.6 warm?
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off

~~upgrade AEROS~~
laptop
~~[illegible] / crashed / timing~~

ADS CO2	AO2CO2	ADS O2	AO2O2
297	136	695	639
297	198	643	700

✓ 13) Record pressures for a leak check
PaWT 837.9 PaSP 802.6 PLi840 12.23 UTC = 22:55

✓ 14) Open cylinder box lid and **close green valves**

✓ 15) Record cylinder pressures for a leak check
LS 1870/3.9 HS 1930/3.5 UTC = 22:59
LT 2040/4.2 WT 2100/3.9

✓ 16) Close cylinder box lid

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

✓ 18) Close program and Visual Basic

✓ 19) ~~Scp~~ data to laptop and copy to pen drive - ~~rt-click, send to ao2, *.mr, *.hr, *.txt~~ copy

✓ 20) Shut down AO2 PC

✓ 21) Shut down laptop

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

✓ 23) Rack power switch off

24) Pull trap and replace with stopper. Open trap and remove glass beads

EDIT

9/10 power stopped

~~D AEROS~~

~~U PCAB-SP2~~

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.01.21

Flight Date (YYMMDD) 091022 Flight (e.g. RF01) TF02

I. Preflight

A. Day(s) before flight Date = 091021

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- __ 2) Install trap in dewar Trap Letters Top/Bottom = A
- ✓ 3) Record cylinder pressures (or copy from prev. postflight) UTC = 22:45
  - LS 1870/3.9 HS 1940/3.7
  - LT 2300/3.9 WT 1900/3.9
- ✓ 4) Turn on instrument, record pressures (or copy from prev. postflight) UTC = 22:35
  - PaWT 842 PaSP 838 PLi840 14.8

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

- ✓ 0) Rack power switch on
- ✓ 1) O_2 box Power breaker on
- ✓ 2) Laptop power on
- ✓ 3) Load dry-ice in dewar to within 0.5 inches of lid UTC = ~~15:55~~ ~1400
- ✓ 4) Record hi-side cylinder pressures for overnight leak check (P / Δ)
  - ✓ LS 1880 / 3.3 ✓ HS 1900 / 3.7
  - ✓ LT 240 / 3.8 ✓ WT 1850 / 3.9
- ✓ 5) Open green knobs four ¼ turns and re-record pressures and any changes
  - LS 1880 / 3.9 HS 1910 / 3.7
  - LT 240 / 3.8 WT 1900 / 4.3
- ✓ 6) Close cylinder box lid
- ✓ 7) Open terminal on laptop and vnc ("vncviewer ao2-daq") into AO2
- ✓ 8) Start AO2 program by clicking play in higold.vdp
- ✓ 9) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 10) Check that NTP time sync is working
  - AO2 PC Time 4:03:00, Rack laptop time 4:02:59
- ✓ 11) Log each hi-side cylinder pressure in software
- ✓ 12) Pump box Power breaker on
- ✓ 13) Cylinder box Power breaker on
- ✓ 14) Record instrument pressures for overnight leak checks (P / Δ)
  - PaWT ~~840/-72~~ PaSP 766/-72 PLi840 12.87/-2.7
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  - PaCO2 327 PaO2 91→92
- ✓ 18) Click Initialize Cal Flow button
- ✓ 19) Ensure that WT flow starts through both lines (110 ± 10)
  - FlWT 112 FlSP 112 toggle ch'over FlWT 112 FlSP 111
- X 20) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
- ✓ 21) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr

check old

may have reset

✓ 22) Return to WT selected when done checking regulators
✓ 23) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 24) Light lamp and ensure that it comes on UTC = 16 : 15
✓ 25) >= 10 min. after lamp on, record values in first row of table below mΔ ~1.8
✓ 26) Once outside and fueling finished, click Initialize Sample Flow button UTC = ___
✓ 27) Pump box Pump 1 breaker on ~16:29 @ 16:33 O2n = 2.7, PdO2n = 0.3, PdSPn = 4.1, PdWTn = 4.6
✓ 28) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 800 SA Purge Flow 115
✓ 29) Snoop trap fittings
✓ 30) Enable change-over valve UTC = 16 : 35
✓ 31) >= 10 min. after change-over enable, record values in table below

EDIT EDIT

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
16 : 25 : 00	WT	NA	0.6	1.9	NA	NA	14	NA	0.3	3.7	4.6
16 : 45 : 00	WT	448	0.6	3.5	12	-5	3	17	0.44	3.5	5.4

C. 20-min before take-off

✓ 1) Adjust / record program parameters (nominally set to a, 40, 2.7, 3, 4)
Flag a Cal Interval 40 Cal Period 2.5 LTf 3 WTf 4
✓ 2) Click Start button on main screen
✓ 3) Click Proceed button on control screen UTC = 16 : 47 : 00
✓ 4) Minimize "Verify Run Plan" window
✓ 5) Note time of wheels up UTC = 17 : 19 : 48

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.
Record flight notes in text file YYMMDD_RF##_Notes.txt

III. Postflight

✓ 1) Note time of wheels down ~ UTC = 21 : 47 : ___
✓ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
✓ 3) Click Stop button
✓ 4) Turn off lamp
✓ 5) Close SA, WT, SP, and O2 248 valves in software
✓ 6) Select None in cylinder box control section and uncheck any purges
✓ 7) Close manual VAC valve
✓ 8) Pump box Pump 1 breaker off
✓ 9) Note cryo temperature Cryo = -70.5 (start?)
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off

17:53:00 / 53:30 — CO2 squirt / breath test @41

17:00, changed LT freq to 1, WT freq to 1 + cal int to 10 to force another 4-pt cal.
~17:48 changed back, but had already tripped for 3.0 loop

✓ 13) Record pressures for a leak check
PaWT 849 PaSP 157 PLi840 12.03 UTC = 21 : 52

✓ 14) Open cylinder box lid and **close green valves**

✓ 15) Record cylinder pressures for a leak check
UTC = 21 : 53
LS 1820 HS 1870
LT 230 WT 1730

✓ 16) Close cylinder box lid

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

✓ 18) Close program and Visual Basic

✓ 19) Scp data to laptop and copy to pen drive - rt-click, send to ao2, *.mr, *.hr, *.txt

✓ 20) Shut down AO2 PC

✓ 21) Shut down laptop

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

✓ 23) Rack power switch off

✓ 24) Pull trap and replace with stopper. Open trap and remove glass beads

EDIT

→ plug QCCs w/ U

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.01.21

Flight Date (YYMMDD) 091031 Flight (e.g. RF01) RF01

I. Preflight

A. Day(s) before flight

Date = 10/30

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar — Trap Letters Top/Bottom = A / C
- X 3) Record cylinder pressures (or copy from prev. postflight)
  - LS ____ HS ____ — UTC = __ : __
  - LT ____ WT ____
- X 4) Turn on instrument, record pressures (or copy from prev. postflight)
  - PaWT _____ PaSP _____ PLi840 _____ — UTC = __ : __

B. 2-hours before take-off

Instrument Operator RBS

- ✓ 0) Rack power switch on
- ✓ 1) O_2 box Power breaker on
- ✓ 2) Laptop power on
- ✓ 3) Load dry-ice in dewar to within 0.5 inches of lid — UTC = 18:40
- 4) Record hi-side cylinder pressures for overnight leak check (P / Δ)
  - LS 1810 / ___ HS 1830 / ___
  - LT 230 / ___ WT 1710 / ___
- ✓ 5) Open green knobs four ¼ turns and re-record pressures and any changes
  - LS 1860 / +50 HS 1880 / +50
  - LT 230 / — WT 1720 / +10
  - (STHS have been closed for ~ 1 week)
- ✓ 6) Close cylinder box lid
- ✓ 7) Open terminal on laptop and vnc (~~"vncviewer ao2-daq"~~) into AO2 (192.168.84.138)
- ✓ 8) Start AO2 program by clicking play in higold.vdp
- ✓ 9) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 10) Check that NTP time sync is working
  - AO2 PC Time 2 : 13 : 00 , Rack laptop time 2 : 13 : 03
  - rechecked 15:59:30 > no diff 15:59:30
- ✓ 11) Log each hi-side cylinder pressure in software
- ✓ 12) Pump box Power breaker on
- ✓ 13) Cylinder box Power breaker on
- X 14) Record instrument pressures for overnight leak checks (P / Δ)
  - PaWT 823 / — PaSP 793 / — PLi840 20.08 / —
- ✓ 15) Pump box Pump 2 breaker on
- ✓ 16) Manual VAC valve open
- ✓ 17) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.
  - PaCO2 332 PaO2 90
- ✓ 18) Click Initialize Cal Flow button
- ✓ 19) Ensure that WT flow starts through both lines (110 ± 10)
  - FlWT to Bypass 113 FlSP to cell 112
  - FLWT to Cell. 113 FlSP to Bypass 110
- X 20) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
- ✓ 21) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr

Li840 384 / 1.1

✓ 22) Return to WT selected when done checking regulators
✓ 23) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 24) Light lamp and ensure that it comes on UTC = 14 : 36
✓ 25) >= 10 min. after lamp on, record values in first row of table below
✓ 26) Once outside and fueling finished, click Initialize Sample Flow button
✓ 27) Pump box Pump 1 breaker on
✓ 28) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 798 SA Purge Flow 121
✓ 29) Snoop trap fittings
✓ 30) Enable change-over valve UTC = 14 : 50
✓ 31) >= 10 min. after change-over enable, record values in table below

EDIT

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
14:47:45	WT	NA	0.6	2.7	NA	NA	12	NA	0.3	4.9	4.3
15:01:30	WT	463	0.6	4.9	15	-3	7.5	18	0.3	4.2	5.0

→ 15:37 PaO2 = 89, O2 sig: 10.15 upped P to 92, sig 9.0

C. 20-min before take-off

✓ 1) Adjust / record program parameters (nominally set to a, ~~40~~ 45, ~~2.7~~ 2.5, 3, 4)
Flag a Cal Interval 40 Cal Period 2.5 LTf 3 WTf 4
✓ 2) Click Start button on main screen
✓ 3) Click Proceed button on control screen UTC = 15 : 39 : 40
✓ 4) Minimize "Verify Run Plan" window
✓ 5) Note time of wheels up UTC = 16 : 20 : 50

EDIT

II. During Flight

15:40-15:50 trap blocked! [illegible] - fixed & back up just before to SP (cal mt to '1' to loop)

Keep VNC off as much as possible, only connecting when necessary to adjust cals.
Record flight notes in text file YYMMDD_RF##_Notes.txt

III. Postflight

✓ 1) Note time of wheels down ~ UTC = 22 : 36 : __
✓ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
✓ 3) Click Stop button
✓ 4) Turn off lamp
✓ 5) Close SA, WT, SP, and O2 248 valves in software
✓ 6) Select None in cylinder box control section and uncheck any purges — purge + volts → 0
✓ 7) Close manual VAC valve
✓ 8) Pump box Pump 1 breaker off
✓ 9) Note cryo temperature Cryo = -68 !?
✓ 10) Cylinder box Power breaker off
✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off

want: "wheels up" button SA/LS/WT
– ability to loop w/out SA
– then pump on to check P3 then off until taxi

✓ 13) Record pressures for a leak check
PaWT 976 PaSP 971 PLi840 1203 UTC = 20 : 41

✓ 14) Open cylinder box lid and **close green valves**

✓ 15) Record cylinder pressures for a leak check
LS 1780 HS 1820 UTC = 22 : 42
LT 220 WT 1490

✓ 16) Close cylinder box lid

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

✓ 18) Close program and Visual Basic

✓ 19) Scp data to laptop and copy to pen drive - rt-click, send to ao2, *.mr, *.hr, *.txt

✓ 20) Shut down AO2 PC

✓ 21) Shut down laptop

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

✓ 23) Rack power switch off

✓ 24) Pull trap and replace with stopper. Open trap and remove glass beads

~~files off~~

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.01.21

Flight Date (YYMMDD) 091102 Flight (e.g. RF01) RF02

I. Preflight

A. Day(s) before flight

Date = 11/10/9

✓ 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) Record cylinder pressures (or copy from prev. postflight)

LS 1780 HS 1820 UTC = 22 : 42 (10/31)

LT 220 WT 1490

✓ 4) Turn on instrument, record pressures (or copy from prev. postflight)

PaWT 976 PaSP 971 PLi840 1203 UTC = 20 : 41 (10/31)

B. 2-hours before take-off

Instrument Operator BS

✓ 0) Rack power switch on

✓ 1) O_2 box Power breaker on

✓ 2) Laptop power on

✓ 3) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16 : 25

✓ 4) Record hi-side cylinder pressures for overnight leak check (P / Δ) (e.g. 1820, -20)

LS 1790 / -10 HS 1830 / -20

LT 220 / — WT 1480 / -10

✓ 5) Open green knobs four ¼ turns and re-record pressures and any changes + topped

LS 1810 / +20 HS 1840 / +10

LT 216 / -10 WT 1570 / +20

✓ 6) Close cylinder box lid — replace?

✓ 7) Open terminal on laptop and vnc ("vncviewer ao2-daq") into AO2

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

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

EDIT ✓ 10) Check that NTP time sync is working on laptop + AO2

AO2 PC Time 4 : 55 : 00, Rack laptop time 4 : 55 : 03

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

✓ 12) Pump box Power breaker on

✓ 13) Cylinder box Power breaker on — leak?

✓ 14) Record instrument pressures for overnight leak checks (P / Δ)

PaWT 971 / -5 PaSP 871 / -100 PLi840 12.01 / —

✓ 15) Pump box Pump 2 breaker on

✓ 16) Manual VAC valve open

EDIT ✓ 17) Check that PaCO2 = 330 torr (± 5) and PaO2 = 90 torr (± 1). If not, adjust.

PaCO2 339 PaO2 99.5

✓ 18) Click Initialize Cal Flow button

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

FlWT 103 FlSP 101 / 105 99

X 20) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm

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

all were ~ 925 !?

→ SP trap constriction? → sea level!

→ PaSP gauge err—? X agree w/ WT

__ 22) Return to WT selected when done checking regulators
__ 23) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
__ 24) Light lamp and ensure that it comes on 0253 9.85 V UTC = 10 : 02
__ 25) >= 10 min. after lamp on, record values in first row of table below
__ 26) Once outside and fueling finished, click Initialize Sample Flow button
__ 27) Pump box Pump 1 breaker on
__ 28) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 800 SA Purge Flow 115
__ 29) Snoop trap fittings
__ 30) Enable change-over valve UTC = 17 : 23
__ 31) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
17 : 22 : 30	WT	NA	0.7	4.5	NA	NA	16	NA	0.6	3.9	5.0
: :											

C. 20-min before take-off
__ 1) Adjust / record program parameters (nominally set to a, ~~40~~ 50, ~~2.7~~ 3.0, 3, 4)
Flag a Cal Interval 50 Cal Period 3.0 LTf 3 WTf 4
__ 2) Click Start button on main screen
__ 3) Click Proceed button on control screen UTC = 18 : 20 : 55
__ 4) Minimize "Verify Run Plan" window
__ 5) Note time of wheels up UTC = 18 : 37 : 50

II. During Flight

Keep VNC off as much as possible, only connecting when necessary to adjust cals.
Record flight notes in text file YYMMDD_RF##_Notes.txt

III. Postflight

__ 1) Note time of wheels down UTC = 1 : 59 : 10
__ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
__ 3) Click Stop button
__ 4) Turn off lamp
__ 5) Close SA, WT, SP, and O2 248 valves in software
__ 6) Select None in cylinder box control section and uncheck any purges
__ 7) Close manual VAC valve
__ 8) Pump box Pump 1 breaker off
__ 9) Note cryo temperature Cryo = -65.5
__ 10) Cylinder box Power breaker off
__ 11) Pump box Pump 2 breaker off
__ 12) Pump box Power breaker off

13) Record pressures for a leak check
PaWT 844 PaSP 759 PLi840 1205 UTC = 2:02

14) Open cylinder box lid and **close green valves**

15) Record cylinder pressures for a leak check
LS 1750 HS 1790 UTC = 2:05
LT 190 WT 1730

16) Close cylinder box lid

17) Log each hi-side cylinder pressure in software

18) Close program and Visual Basic

19) Scp data to laptop and copy to pen drive - rt-click, send to ao2, *.mr, *.hr, *.txt

20) Shut down AO2 PC

21) Shut down laptop

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

23) Rack power switch off

24) Pull trap and replace with stopper. Open trap and remove glass beads

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.11.03

Date 091109 Campaign HIPPO2 Flight RF03 From ANC To ~~KOA~~ HKO

I. Preflight

A. Day(s) before flight Date = 091109

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

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

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

LS 1760 HS 1790 UTC = 1 : 06

LT 200 WT 1200

X 4) Turn on instrument, record pressures (or copy from prev. postflight)

PaWT _____ PaSP _____ PLi840 _____ UTC = __ : __

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 17 : 05

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

LS 1770 / +10 HS 1790 / — (tap)

LT 190 / -10 WT 1180 / -20

✓ 6) Open green knobs four ¼ turns and re-record pressures and any changes (tap)

LS 1780 / +10 HS 1810 / +20

LT 190 / — WT 1190 / +10

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time 5 : 22 : 14 , Rack laptop time 5 : 22 : 15

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

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

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

PaWT 823 / X PaSP 782 / X PLi840 1205 / —

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 92 torr (± 1). If not, adjust.

PaCO2 331 PaO2 92

✓ 19) Click Initialize Cal Flow button

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

✓ 21) Toggle changeover to check flows

WT to Cell: FlWT 105 FlSP 103

same page! FlWT FlSP FlWT FlSP

WT to Bypass: FlWT 106 FlSP 102

- X 22) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
- ✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
- ✓ 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 = 17 : 28
- ✓ 27) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 9.17
- ✓ 28) Click Initialize Sample Flow button
- ✓ 29) Pump box Pump 1 breaker on
- ✓ 30) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
  Fridge P 788 SA Purge Flow 117
- ✓ 31) Snoop trap fittings
- ✓ 32) Pump box Pump 1 breaker off
- ✓ 33) >= 10 min. after lamp on record values in first row of table below
- ✓ 34) Enable change-over valve UTC = 17 : 49
- ✓ 35) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
17:47:00	WT	NA	0.7	4.0	NA	NA	[illegible]	NA	0.3	4.3	5.2
18:10:45	WT	421	0.7	2.1	9	-0.5	4	90	0.3	4.4	5.6

C. 20-min before take-off

- ✓ 1) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
  Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4
- ✓ 2) Click Start button on main screen
- ✓ 3) Click Proceed button on control screen UTC = 18 : 47 : 15
- ✓ 4) Minimize "Verify Run Plan" window
- ✓ 5) Note cryo temperature Cryo = -65
- ✓ 6) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on 18:55
- ✓ 7) Note time of wheels up UTC = ~~18:55:05~~ 21:57:28

delay for landing gear repair → see NOTES.txt

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

III. Postflight

- ✓ 1) Note time of wheels down UTC = 4 : 57 : 45
- X 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
- ✓ 3) Click End of Flight button — old way
- ✓ 7) Close manual VAC valve
- ✓ 8) Pump box Pump 1 breaker off
- ✓ 9) Note cryo temperature Cryo = -64
- ✓ 10) Cylinder box Power breaker off

work

✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off
✓ 13) Record pressures for a leak check
PaWT 876 PaSP 783 PLi840 12.03 UTC = 5:01
✓ 14) Open cylinder box lid and **close green valves**
✓ 15) Record cylinder pressures for a leak check
LS 1710 HS 1730 UTC = 5:04
LT 180 WT 880
✓ 16) Close cylinder box lid
✓ 17) Log each hi-side cylinder pressure in software
✓ 18) Close program and Visual Basic
✓ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 20) Shut down AO2 PC
✓ 21) Shut down laptop
✓ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
✓ 23) Rack power switch off
✓ 24) Pull trap, jumper quick-connects, and install stopper
✓ 25) Open trap and remove glass beads

✓ swap WT2 + LT ?

180

1480 as is
vented 4
now 1990
ran ~~reg~~ knob n/out ~~x~~
cracked green again ⇒ 1990/11.3 5:26

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.03**

Date 091107 Campaign ~~HIPPO2~~ Flight RF04 From ~~KOA~~ HKO To RAR

I. Preflight

A. Day(s) before flight Date = 091106

✓ 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) Record cylinder pressures (or copy from prev. postflight)

LS 1770 HS 1810 UTC = 1:25

LT 2130 WT 890

✓ 4) Turn on instrument, record pressures (or copy from prev. postflight)

PaWT 912 PaSP 732 PLi840 22.6 UTC = 1:25

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

✓ 1) Rack power switch on

✓ 2) O_2 box Power breaker on

✓ 3) Laptop power on

✓ 4) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18:28

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

LS 1770 / — HS 1810 / —

LT 2100 / -20 WT 896 / —

cyl T 1 24.3

EDIT

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

LS ~~1830~~ 1830 / +10 HS 1820 / +10

LT 2130 / +20 WT 922 / +30

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time 6 :50 :04, Rack laptop time 6 :50 :05

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

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

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

EDIT

PaWT 891 / -21 PaSP 696 / -36 PLi840 25.6 / +3.0 T Man Air 24.3

cooler

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = ~~91~~ 94 torr (± 1). If not, adjust.

PaCO2 330 PaO2 94.5

✓ 19) Click Initialize Cal Flow button

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

✓ 21) Toggle changeover to check flows

WT to Cell: FlWT 112 FlSP 104

WT to Bypass: FlWT 113 FlSP 104

X 22) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 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 : 00
✓ 27) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 8.38
✓ 28) Click Initialize Sample Flow button
✓ 29) Pump box Pump 1 breaker on
✓ 30) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 800 SA Purge Flow 115
✓ 31) Snoop trap fittings
✓ 32) Pump box Pump 1 breaker off
✓ 33) >= 10 min. after lamp on record values in first row of table below
✓ 34) Enable change-over valve UTC = 19 : 10
✓ 35) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
19 : 10 : 00	WT	NA	0.74	1.5	NA	NA	11	NA	0.3	4.1	5.1
19 : 21 : 00	WT	445	0.67	2.1	16	-10	4	25	0.3	4.2	4.9

chover to cell
chover off
close WT

open WT
chover OK

C. 20-min before take-off

✓ 1) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
Flag 4 Cal Interval 50 Cal Period 3 LTf 3 WTf 4
✓ 2) Click Start button on main screen
✓ 3) Click Proceed button on control screen UTC = 19 : 44 : 05
✓ 4) Minimize "Verify Run Plan" window
✓ 5) Note cryo temperature Cryo = -61
✓ 6) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on
~ 7) Note time of wheels up ~ UTC = 20 : 05 : 30
(roll @ 20:05:00)

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

III. Postflight

✓ 1) Note time of wheels down UTC = 4 : 18 : 15
✓ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
✓ 3) Click End of Flight button (~~not up~~ not working yet)
✓ 7) Close manual VAC valve
✓ 8) Pump box Pump 1 breaker off
✓ 9) Note cryo temperature Cryo = -62
✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off
✓ 13) Record pressures for a leak check
PaWT 846 PaSP 838 PLi840 12.68 UTC = 4 : 22

EDIT

✓ 14) Open cylinder box lid and **close green valves**
✓ 15) Record cylinder pressures for a leak check
LS 1700 HS 1720
LT 2030 WT 680
UTC = 4 : 23
combine

✓ 16) Close cylinder box lid
✓ 17) Log each hi-side cylinder pressure in software
✓ 18) Close program and Visual Basic
✓ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 20) Shut down AO2 PC
✓ 21) Shut down laptop
✓ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
✓ 23) Rack power switch off
✓ 24) Pull trap, jumper quick-connects, and install stopper
✓ 25) Open trap and remove glass beads

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.11.03

Date 091109 Campaign HIPPO2 Flight RF05 From RAP To CHC

I. Preflight

A. Day(s) before flight Date = 091108

✓ 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) Record cylinder pressures (or copy from prev. postflight)

LS 1710 HS 1740 cyl 24.4 UTC = 23 : 50

LT 2080 WT 680

✓ 4) Turn on instrument, record pressures (or copy from prev. postflight)

PaWT 841 PaSP 330 PLi840 12.03 28.7 UTC = 23 : 52

Tmanair

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 20

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

LS 1710 / — HS 1739 -10

LT 2090 / -10 WT 680 / —

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

LS 1730 / +20 HS 1780 / +50 (+topped)

LT 2100 / +10 WT 680 / —

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time 6 : 44 : 49, Rack laptop time 6 : 44 : 51

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

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

✓ 15) Record instrument pressures and changes overnight (P / Δ) Tmanair 24.9

PaWT 835 / -6 PaSP 323 / -7 PLi840 1205 / —

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 92 torr (± 1). If not, adjust.

PaCO2 329 PaO2 95

✓ 19) Click Initialize Cal Flow button

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

✓ 21) Toggle changeover to check flows → wait 2 min

FlWT (to Cell) FlWT 112 FlSP 101

[COOL]

✓ toggle chlover → re record

FlWT(to Bypass) FlWT 111 FlSP 100

X 22) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr ✓ close cyl. box
✓ 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 : 57
X 27) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 7.73
✓ 28) Click Initialize Sample Flow button
✓ 29) Pump box Pump 1 breaker on
✓ 30) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min. → SA purge flow = 110 ± 10
Fridge P 800 SA Purge Flow 115
✓ 31) Snoop trap fittings
✓ 32) Pump box Pump 1 breaker off
✓ 33) >= 10 min. after lamp on record values in first row of table below
✓ 34) Enable change-over valve UTC = 19 : 16
✓ 35) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
19:16:00	wT	NA	0.8	4	NA	NA	6	NA	0.6	4	5
19:26:00	wT	421	0.6	4	15	-9	3	23	0.7	5	5

✓ chlover WT to BP, WT close, chlover off

C. 20-min before take-off
✓ UTC auto, chlover on
✓ 1) Adjust / record program parameters (nominally set to a, 50, 3, 0, 4)
Flag 9 Cal Interval 50 Cal Period 3 LTf 3 WTf 4
✓ 2) Click Start button on main screen
✓ 3) Click Proceed button on control screen UTC = 19 : 41 : 56
✓ 4) Minimize "Verify Run Plan" window
✓ 5) Note cryo temperature Cryo = -61 — what does cryo read when warm?
✓ 6) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on
✓ 7) Note time of wheels up UTC = 20 : 18 : 36

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

III. Postflight

✓ 1) Note time of wheels down UTC = 3 : 16 : 29
X 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
✓ 3) Click End of Flight button (old way)
✓ 7) Close manual VAC valve
✓ 8) Pump box Pump 1 breaker off
✓ 9) Note cryo temperature Cryo = -59
✓ 10) Cylinder box Power breaker off

✓ 11) Pump box Pump 2 breaker off
✓ 12) Pump box Power breaker off
✓ 13) Record pressures for a leak check
PaWT 840 PaSP 669 PLi840 12.4 UTC = 3 : 19
✓ 14) Open cylinder box lid and **close green valves**
✓ 15) Record cylinder pressures for a leak check
LS 1670 HS 1680 UTC = 3 : 21
LT 2010 WT 490
✓ 16) Close cylinder box lid
✓ 17) Log each hi-side cylinder pressure in software
✓ 18) Close program and Visual Basic
✓ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
✓ 20) Shut down AO2 PC
✓ 21) Shut down laptop
✓ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
✓ 23) Rack power switch off
✓ 24) Pull trap, jumper quick-connects, and install stopper
✓ 25) Open trap and remove glass beads

NOT OFFICIAL RF06 CHECKSHEET — SEE UPDATED V. 2009.11.11 FOR OFFICIAL

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.03**

Date ~~091110~~ ~~091112~~ 091111 Campaign HIPPO7 Flight RF06 From NZCH To NZCH

I. Preflight

A. Day(s) before flight (091111 LOCAL NZ) Date = 091111 UTC

- ✓ 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) Record cylinder pressures (or copy from prev. postflight)
  - LS 1630 HS 1655 1670 1680 UTC = 19 : 51 ~~GMT~~
  - LT 2010 WT 440 370 1980
- ✓ 4) Turn on instrument, record pressures (or copy from prev. postflight)
  - PaWT 829 PaSP 619 PLi840 17.65 UTC = 20 : 01
  - 860 854 12.03

"O2 Box" = not instrument

P button

All draws lines are done on Maintn. day

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = __ : __ 20 : 04
- ✓ __ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)
  - LS ____ / ___ HS ____ / ___ 1630/0 1655/~~0~~ 0
  - LT ____ / ___ WT ____ / ___ 2010/0 440/0
- ✓ __ 6) Open green knobs four ¼ turns and re-record pressures and any changes
  - LS ____ / ___ HS ____ / ___ 1630/0 1670/~~0~~ +15
  - LT ____ / ___ WT ____ / ___
- ✓ __ 7) Close cylinder box lid 2010/0 430/~~0~~ -10
- ✓ __ 8) Vnc into into AO2 (192.168.84.138)
- ✓ __ 9) Start AO2 program by clicking play in higold.vdp
- ✓ __ 10) Ensure that no USB errors are present in boxes at bottom of screen
- — __ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  - AO2 PC Time __ : __ : __ , Rack laptop time __ : __ : __

DATA SYSTEM NOT UP

- ✓ __ 12) Log each hi-side cylinder pressure in software
- ✓ __ 13) Pump box Power breaker on (Coded earlier)
- ✓ __ 14) Cylinder box Power breaker on (Actually earlier)
- ✓ __ 15) Record instrument pressures and changes overnight (P / Δ) (From Dominago)
  - PaWT ____ / ___ PaSP ____ / ___ PLi840 ____ / ___ 829/0 619/0 17.65/0
- ✓ __ 16) Pump box Pump 2 breaker on
- ✓ __ 17) Manual VAC valve open
- ✓ __ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 92 torr (± 1). If not, adjust.
  - PaCO2 332 PaO2 92.7 (adjusted) (adjusted)
- ✓ __ 19) Click Initialize Cal Flow button
- ✓ __ 20) Ensure that flow starts through both lines (110 ± 10) (101, 97)
- ✓ __ 21) Toggle changeover to check flows
  - WT to Cell: FlWT ____ FlSP ____
  - FlWT 103 FlSP 97
  - FlWT 105 FlSP 97

Cal lines so that first line of P2 steps on P1

WT to Bypass: FlWT ____ FlSP ____

__ 22) If necessary, adjust HA-3 to match bypass and cell flow on WT ±2 sccm
__ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
__ 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 = __ : __ 20:33
__ 27) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal ~~8.8~~ —
__ 28) Click Initialize Sample Flow button
__ 29) Pump box Pump 1 breaker on
__ 30) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P ___ SA Purge Flow ____ F ~~795~~ S 786
__ 31) Snoop trap fittings
__ 32) Pump box Pump 1 breaker off
__ 33) >= 10 min. after lamp on record values in first row of table below
__ 34) Enable change-over valve UTC = 21 : 11
__ 35) >= 10 min. after change-over enable, record values in table below

had to adjust PaO2 to 9.5 (now Volts was 10.2)

"Uncheck "disable change-over" to enable

(0.84 SP-WT slope diff)

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
21 :10 : —	SA/WT	NA	0.812	2.75	NA	NA	1.06	NA	0.341	4.09	7.17
21 :20 : -	SA/WT	422	0.821	1.71	~~1.84~~	0.23	0.37	1.65	0.529	3.35	5.9

C. 20-min before take-off

chover off, chover toggle → WT to bypass SP to 0, WT close, WT auto, chover enable

__ 1) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
Flag ___ Cal Interval ___ Cal Period ___ LTf ___ WTf ___ CP — LTF — WTF —
__ 2) Click Start button on main screen
__ 3) Click Proceed button on control screen UTC = __ : __ : __ 21 50 —
__ 4) Minimize "Verify Run Plan" window
__ 5) Note cryo temperature Cryo = _____ -0.25 C
__ 6) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on @22:00
__ 7) Note time of wheels up UTC = __ : __ : __ — — —

II. During Flight

(turned Sa Pu 1 off because we sucked through wet air by not potting dry ice in for maint day -JDB 22:17 on 091110 UTC)

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

III. Postflight

__ 1) Note time of wheels down UTC = __ : __ : __
__ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
__ 3) Click End of Flight button
__ 7) Close manual VAC valve
__ 8) Pump box Pump 1 breaker off
__ 9) Note cryo temperature @22.19 1.6 Cryo = _____
__ 10) Cylinder box Power breaker off

4,5,6 from oil checklist

(turn off lamp, int stop, close SA WT SP, O2 24s values, select none in cyl box control section and uncheck any purges

__ 11) Pump box Pump 2 breaker off
__ 12) Pump box Power breaker off
__ 13) Record pressures for a leak check 849 840 12.03 22 21
PaWT _____ PaSP _____ PLi840 _____ UTC = __ : __
__ 14) Open cylinder box lid and **close green valves**
__ 15) Record cylinder pressures for a leak check
LS ____ HS ____ 1690 1660 UTC = __ : __
LT ____ WT ____ 2010 580 22 25
__ 16) Close cylinder box lid
__ 17) Log each hi-side cylinder pressure in software
__ 18) Close program and Visual Basic
__ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
__ 20) Shut down AO2 PC
__ 21) Shut down laptop
__ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 23) Rack power switch off
__ 24) Pull trap, jumper quick-connects, and install stopper
__ 25) Open trap and remove glass beads

CylT1/T2 don't make sense where they are bc Cyl box, pump box aren't on (does this matter?) and because program isn't yet running

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.11**

Date 091111 Campaign HIPPO II Flight RF06 From NZCH To NZCH

I. Preflight

A. Day(s) before flight Date = 091110

- ✓ 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) Record cylinder pressures (or copy from prev. postflight)
  LS 1670 HS 1680 CylT1 X was not an option when UTC = 19 : 51
  LT 370 WT 1980
- ✓ 4) Turn on O_2 box, start program, and record pressures (or copy from prev. postflight)
  PaWT 860 PaSP 854 PLi840 12.03 TMan X UTC = 20 : 01
  option to record doesn't exist 091110

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 10
- ✓ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1620/-50 HS 1640/-40 CylT1 13.5 / X
  LT 360/-10 WT ~~1980~~ / ~~1980~~ 1910 -70 ← possibly missed (?)
- ✓ 6) Open green knobs four ¼ turns and re-record pressures and any changes
  LS 1630 / +10 HS 1640/ 0 CylT2 ~~1980~~ / X
  LT 370 / +10 WT 1980/ +70

13.477	15.039
14.438	14.459
14.165	14.244

- ✓ 7) Close cylinder box lid
- ✓ 8) Vnc into into AO2 (192.168.84.138)
- ✓ 9) Start AO2 program by clicking play in higold.vdp
- ✓ 10) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 19 : 56 : 38, Rack laptop time ~~19:56:37~~ 19:56:40 ← had to do no internet access yet later
- ✓ 12) Log each hi-side cylinder pressure in software
- ✓ 13) Pump box Power breaker on
- ✓ 14) Cylinder box Power breaker on
- 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 841 / -19 PaSP 793/-61 PLi840 12.94 +0.89 TMan 5.0/ X
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 94 torr (± 1). If not, adjust.
  PaCO2 330 PaO2 94
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 100 FlSP (to bypass) 94

X

✓ 21) Toggle changeover to check flows in other position

FlWT (to bypass) 100 FlSP (to cell) 94

22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
24) Close cylinder box lid
25) Return to WT selected when done checking regulators
26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
27) Light lamp and ensure that it comes on UTC = 19 : 29
28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 8.46
29) Click Initialize Sample Flow button
30) Pump box Pump 1 breaker on
31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 796 SA Purge Flow 166
32) Snoop trap fittings
33) Pump box Pump 1 breaker off
34) >= 10 min. after lamp on record values in first row of table below 20:00
35) Enable changeover valve (uncheck disable) UTC = ~~11:58~~
36) >= 10 min. after change-over enable, record values in table below

delete column

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
19 :58: 55	WT	NA	0.768	1.8	NA	NA	4.78	NA	0.005	4	5.73
20 :08:	WT	437	0.648	2.08	11.5	-7.95	1.02	19.5	0.007	4.2	5.6

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

C. 20-min before take-off

1) WT 248 valve to Auto (uncheck close)
2) Enable changeover (uncheck disable)
3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4
4) Click Start button on main screen
5) Click Proceed button on control screen UTC = __ : __ : __ 20:45 ?
6) Minimize "Verify Run Plan" window
7) Note cryo temperature Cryo = -60.05
8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on 20:56:
9) If ground hold extended 10-20 min., set CalInt to 1 until take-off
10) If ground hold extended > 20 min, go to Manual and run WT until take-off
11) Note time of wheels up UTC = 21 : 12 : 36

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

III. Postflight

1) Note time of wheels down UTC = 05 : 08 : 20
2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
3) Click Stop button
4) Turn off lamp
5) Close SA, WT, SP, and O2 248 valves in software
6) Select None in cylinder box control section and uncheck any purges
7) Close manual VAC valve
8) Pump box Pump 1 breaker off
9) Note cryo temperature Cryo = -60.16
10) Cylinder box Power breaker off
11) Pump box Pump 2 breaker off
12) Pump box Power breaker off
13) Record pressures for a leak check
PaWT 566 PaSP 825 PLi840 12.03 TMan 26.33 UTC = 5 : 17
14) Open cylinder box lid and record cylinder pressures for a leak check
LS 1605 HS 1620 CylT1 24.996 UTC = 5 : 20
LT 370 WT 1740 CylT2 24.996
15) **Close all 4 green valves**
16) Close cylinder box lid
17) Log each hi-side cylinder pressure in software
18) Close program and Visual Basic
19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
20) Shut down AO2 PC
21) Shut down laptop
22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
23) Rack power switch off
24) Pull trap, jumper quick-connects, and install stopper
25) Open trap and remove glass beads

IV. Troubleshooting / procedures

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

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

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

check

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.11**

Date 20091114 Campaign HIPPO 2 Flight RF07 From NZCH To AGGH (Honiara, Solomon Islands)

I. Preflight

A. Day(s) before flight Date = 091113 UTC 091114 LOCAL NZ

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

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

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

LS 1540 HS 1590 CylT1 24.995 UTC = 22 : 10

LT 370 WT 1680

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

PaWT 854 PaSP 709 PLi840 2967 TMan 18 UTC = 20 : 12

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 19 : 00

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

LS 1590 / +50 HS 1610 / +20 CylT1 25 / 0

LT 360 / -10 WT 1720 / +40

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

LS 1610 / +20 HS 1640 / +30 CylT2 25 / 0

LT 370 / +10 WT 1750 / +30

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time 7 : 39 : 00 , Rack laptop time 7 : 39 : 00

12) Log each hi-side cylinder pressure in software

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

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

PaWT 862 / +6 PaSP 709 / 0 PLi840 363 / -7 TMan 19.1 / +1

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

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

PaCO2 334 PaO2 94

✓ 19) Click Initialize Cal Flow button

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

FlWT (to cell) 105 FlSP (to bypass) 100

✓ 21) Toggle changeover to check flows in other position

FlWT (to bypass) 106 FlSP (to cell) 101

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

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

✓ 24) Close cylinder box lid

✓ 25) Return to WT selected when done checking regulators

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

✓ 27) Light lamp and ensure that it comes on UTC = 19 : 38

✓ 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 8.5

✓ 29) Click Initialize Sample Flow button

✓ 30) Pump box Pump 1 breaker on

✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.

Fridge P 800 SA Purge Flow 116

✓ 32) Snoop trap fittings

✓ 33) Pump box Pump 1 breaker off

✓ 34) >= 10 min. after lamp on record values in first row of table below

✓ 35) Enable changeover valve (uncheck disable) UTC = 19 : 56

✓ 36) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
19 : 56 : 00	WT	NA	0.72	1.63	NA	NA	6.9	NA	0.23	4.02	5.02
20 : 03 : 00	WT	444	0.7	2.04	16.1	-12.3	2.77	28.3	0.292	3.46	5.33

✓ 37) Disable changeover

✓ 38) If necessary, toggle changeover to get SP to Cell

✓ 39) Close WT 248 valve

C. 20-min before take-off

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

✓ 2) Enable changeover (uncheck disable)

✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)

Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4

✓ 4) Click Start button on main screen

✓ 5) Click Proceed button on control screen UTC = 20 : 40 10

✓ 6) Minimize "Verify Run Plan" window

✓ 7) Note cryo temperature Cryo = -60.5

✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on

✓ 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off

✓ 10) If ground hold extended > 20 min, go to Manual and run WT until take-off

✓ 11) Note time of wheels up UTC = 20 : 11 : 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

III. Postflight

- ✓ 1) Note time of wheels down UTC = 05:04:N
- ✗ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
- ✓ 3) Click Stop button
- ✓ 4) Turn off lamp
- ✓ 5) Close SA, WT, SP, and O2 248 valves in software
- ✓ 6) Select None in cylinder box control section and uncheck any purges
- ✓ 7) Close manual VAC valve
- ✓ 8) Pump box Pump 1 breaker off
- ✓ 9) Note cryo temperature Cryo = -60.67
- ✓ 10) Cylinder box Power breaker off
- ✓ 11) Pump box Pump 2 breaker off
- ✓ 12) Pump box Power breaker off
- ✓ 13) Record pressures for a leak check
  PaWT 884 PaSP 746 PLi840 14.2 TMan 2433 UTC = 05:05
- ✓ 14) Open cylinder box lid and record cylinder pressures for a leak check
  LS 1580 HS 1600 CylT1 ____ 13.2 ? UTC = 05:10
  LT 370 WT 1480 CylT2 ____ 13.2 ? is what i recall but actually 25 bez of step 10 or 11)
- ✓ **15) Close all 4 green valves**
- ✓ 16) Close cylinder box lid
- ✓ 17) Log each hi-side cylinder pressure in software
- ✓ 18) Close program and Visual Basic
- ✓ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
- ✓ 20) Shut down AO2 PC
- ✓ 21) Shut down laptop
- ✓ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
- ✓ 23) Rack power switch off
- ✓ 24) Pull trap, jumper quick-connects, and install stopper
- ✓ 25) Open trap and remove glass beads Shut off breaker by rack laptop. Data may or may not have transf to mem stick.

IV. Troubleshooting / procedures

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

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

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

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.11**

Date 091116 Campaign HIPPO II Flight RF08 From A664 To PHKO

I. Preflight

A. Day(s) before flight Date = 091115

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = C / B
- ✓ 3) Record cylinder pressures (or copy from prev. postflight)
  LS 1605 HS 1650 CylT1 17.1 UTC = 21 : 06
  LT 370 WT 1530 Recorded to Cyl Rec: 23:08
- ✓ 4) Turn on O_2 box, start program, and record pressures (or copy from prev. postflight)
  PaWT 887 PaSP 714 PLi840 21.03 TMan 22.7 UTC = 22 : 25

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 19 : 50
- ✓ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1650 / +45 HS 1680 / +30 CylT1 24.5 / +7.4
  LT 370 / +0 WT 1570 / +40
- ✓ 6) Open green knobs four ¼ turns and re-record pressures and any changes
  LS 1670 / +20 HS 1680 / 0 CylT2 25.5 / X
  LT 370 / 0 WT 1570 / 0
- ✓ 7) Close cylinder box lid
- 8) Vnc into into AO2 (192.168.84.138)
- ✓ 9) Start AO2 program by clicking play in higold.vdp
- ✓ 10) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 21 : 22 : 30 Rack laptop time 21 : 22 : 32
- ✓ 12) Log each hi-side cylinder pressure in software
- ✓ 13) Pump box Power breaker on
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 900 / +13 PaSP 710 / -4 PLi840 26.2 / +5 TMan 24.6 +1.9
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 94 torr (± 1). If not, adjust.
  PaCO2 341 PaO2 94
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 114 FlSP (to bypass) 110

✓ 21) Toggle changeover to check flows in other position

FlWT (to bypass) 115 FlSP (to cell) 109

X 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm
✓ 23) Check / adjust regulator pressures for all 4 gases to PaSP of 785 +/- 5 torr
✓ 24) Close cylinder box lid
✓ 25) Return to WT selected when done checking regulators
✓ 26) Check that PdWT (±0.1), PdSP (±0.1), and PdO2 (±0.01) are controlling
✓ 27) Light lamp and ensure that it comes on UTC = 21 : 29
X 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 7.54
✓ 29) Click Initialize Sample Flow button
✓ 30) Pump box Pump 1 breaker on
✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.
Fridge P 799 SA Purge Flow 714
✓ 32) Snoop trap fittings
✓ 33) Pump box Pump 1 breaker off
✓ 34) >= 10 min. after lamp on record values in first row of table below
✓ 35) Enable changeover valve (uncheck disable) UTC = 21 : 44
✓ 36) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
21:43:30	WT	NA	0.61	3.7	NA	NA	8.4	NA	0.33	4.22	5.62
21:53:00	WT	460	0.63	1.94	18	-12.1	4	30	0.24	4.34	4.76

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

* Temp 1 = 18.5 Temp 2 = 22.6
Temp 3-6 ≈ 22.1-9

C. 20-min before take-off

✓ 1) WT 248 valve to Auto (uncheck close)
✓ 2) Enable changeover (uncheck disable)
✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)
Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4
✓ 4) Click Start button on main screen
✓ 5) Click Proceed button on control screen UTC = 22 : 37 : 00
✓ 6) Minimize "Verify Run Plan" window
✓ 7) Note cryo temperature Cryo = -59.4
✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on
X 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off
X 10) If ground hold extended > 20 min, go to Manual and run WT until take-off
✓ 11) Note time of wheels up UTC = 23 : 00 : 00

II. During Flight

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

AO2 inlet test: 01:48:30 374.9 ± 0.5
01:49:30 374.5 ± 0.5

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

III. Postflight

__ 1) Note time of wheels down UTC = 07 : 36 : 2
__ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
__ 3) Click Stop button
__ 4) Turn off lamp
__ 5) Close SA, WT, SP, and O2 248 valves in software
__ 6) Select None in cylinder box control section and uncheck any purges
__ 7) Close manual VAC valve
__ 8) Pump box Pump 1 breaker off
__ 9) Note cryo temperature Cryo = -58
__ 10) Cylinder box Power breaker off
__ 11) Pump box Pump 2 breaker off
__ 12) Pump box Power breaker off
__ 13) Record pressures for a leak check
PaWT 896 PaSP 703 PLi840 12.75 TMan 23.9 UTC = 07 : 40
__ 14) Open cylinder box lid and record cylinder pressures for a leak check
LS 1580 HS 1600 CylT1 13.8 UTC = 07 : 42
LT 360 WT 1220 CylT2 15
__ **15) Close all 4 green valves**
__ 16) Close cylinder box lid
__ 17) Log each hi-side cylinder pressure in software
__ 18) Close program and Visual Basic
__ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
__ 20) Shut down AO2 PC
__ 21) Shut down laptop
__ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 23) Rack power switch off
__ 24) Pull trap, jumper quick-connects, and install stopper
__ 25) Open trap and remove glass beads

IV. Troubleshooting / procedures

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

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

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

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.11**

Date 091119 Campaign HIPPO2 Flight RF09 From PHNL To PANC

I. Preflight

A. Day(s) before flight Date = 091117

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

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

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

LS 1595 HS 1605 CylT1 24995 UTC = 21 : 45

LT 355 WT 1265

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

PaWT 907 PaSP 681 PLi840 17.9 TMan 22.3 UTC = 22 : 57

Instrument Operator JDB

B. 2-hours before take-off

✓ 1) Rack power switch on

✓ 2) O_2 box Power breaker on

✓ 3) Laptop power on

✓ 4) Load dry-ice in dewar to within 0.5 inches of lid UTC = 18 : 46

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

LS 1605 / +10 HS 1630 / +25 CylT1 25 / ___

LT 350 / -5 WT 1285 / +20

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

LS 1620 / +15 HS 1645 / +15 CylT2 25 / ___

LT 350 / +0 WT 1290 / +5

✓ 7) Close cylinder box lid

✓ 8) Vnc into into AO2 (192.168.84.138)

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

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

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

AO2 PC Time 18 : 55 : 32, Rack laptop time 18 : 55 : 33

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

✓ 13) Pump box Power breaker on

✓ 14) Cylinder box Power breaker on

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

PaWT 907 / ___ PaSP 660 / ___ PLi840 29.3 / ___ TMan 21.5 / ___

✓ 16) Pump box Pump 2 breaker on

✓ 17) Manual VAC valve open

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

PaCO2 340 PaO2 94

✓ 19) Click Initialize Cal Flow button

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

FlWT (to cell) 112 FlSP (to bypass) 108

★ Pump box and cylinder box

✓ 21) Toggle changeover to check flows in other position

FlWT (to bypass) 115 FlSP (to cell) 107

X 22) If necessary, adjust HA-3 to match FlWT on bypass and cell to ±2 sccm

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

✓ 24) Close cylinder box lid

✓ 25) Return to WT selected when done checking regulators

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

✓ 27) Light lamp and ensure that it comes on UTC = 19:01

X 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 6.67

✓ 29) Click Initialize Sample Flow button

✓ 30) Pump box Pump 1 breaker on

✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.

Fridge P 805 SA Purge Flow 116

✓ 32) Snoop trap fittings

✓ 33) Pump box Pump 1 breaker off

✓ 34) >= 10 min. after lamp on record values in first row of table below

✓ 35) Enable changeover valve (uncheck disable) UTC = 19:11

✓ 36) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
19:11:~~07~~	WT	NA	0.78	3.35	NA	NA	10.7	NA	0.376	4.36	6.1
19:26:~~42~~	W1	456	0.835	2.36	~~805~~	-8.68	6.27	27	0.226	4.0	5.32

~~27.0~~ 18.1

✓ 37) Disable changeover

X 38) If necessary, toggle changeover to get SP to Cell

✓ 39) Close WT 248 valve

C. 20-min before take-off

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

✓ 2) Enable changeover (uncheck disable)

✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)

Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4

✓ 4) Click Start button on main screen

✓ 5) Click Proceed button on control screen UTC = 19:40:00

✓ 6) Minimize "Verify Run Plan" window

✓ 7) Note cryo temperature Cryo = -58.4

✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on 19:52

X 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off

X 10) If ground hold extended > 20 min, go to Manual and run WT until take-off

✓ 11) Note time of wheels up UTC = 20:08:10

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

III. Postflight

__ 1) Note time of wheels down UTC = 03 : 51 : ~
__ 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
__ 3) Click Stop button
__ 4) Turn off lamp
__ 5) Close SA, WT, SP, and O2 248 valves in software
__ 6) Select None in cylinder box control section and uncheck any purges
__ 7) Close manual VAC valve
__ 8) Pump box Pump 1 breaker off
__ 9) Note cryo temperature Cryo = -58
__ 10) Cylinder box Power breaker off
__ 11) Pump box Pump 2 breaker off
__ 12) Pump box Power breaker off
__ 13) Record pressures for a leak check
PaWT 862 PaSP 764 PLi840 14.3 TMan 24.7 UTC = 03:53
__ 14) Open cylinder box lid and record cylinder pressures for a leak check
LS 1580 HS 1600 CylT1 16.9 UTC = 03:58
LT 350 WT 1010 CylT2 16.2
__ **15) Close all 4 green valves**
__ 16) Close cylinder box lid
__ 17) Log each hi-side cylinder pressure in software
__ 18) Close program and Visual Basic
__ 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
__ 20) Shut down AO2 PC
__ 21) Shut down laptop
__ 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
__ 23) Rack power switch off
__ 24) Pull trap, jumper quick-connects, and install stopper
__ 25) Open trap and remove glass beads

NOTE T1, T2

IV. Troubleshooting / procedures

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

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

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

NCAR Airborne Oxygen Instrument (AO2) Checklist V. 09.11.11

Date 091121 Campaign HIPPO2 Flight RF10 From PANC To PANC

I. Preflight

A. Day(s) before flight Date = 091120

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = C / B
- ✓ 3) Record cylinder pressures (or copy from prev. postflight) UTC = 20:28
  LS 1540 HS 1595 CylT1 18.06
  LT 345 WT 990 1708
- ✓ 4) Turn on O_2 box, start program, and record pressures (or copy from prev. postflight)
  PaWT 865 PaSP 737 PLi840 21.2 TMan 23.3 UTC = 20:30

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

- ✓ 1) Rack power switch on
- ✓ 2) O_2 box Power breaker on
- ✓ 3) Laptop power on
- ✓ 4) Load dry-ice in dewar to within 0.5 inches of lid UTC = 16:45
- ✓ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1560 / +10 HS 1585 / -10 CylT1 18.0 recorded @ 18:05
  LT 340 / -5 WT 1000 / +10
- ✓ 6) Open green knobs four ¼ turns and re-record pressures and any changes
  LS 1560 / +10 HS 1595 / +10 CylT2 18.3
  LT 340 / 0 WT 1000 / 0
- ✓ 7) Close cylinder box lid
- ✓ 8) Vnc into into AO2 (192.168.84.138)
- ✓ 9) Start AO2 program by clicking play in higold.vdp
- ✓ 10) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 16 : 01 : 10 , Rack laptop time 16 : 01 : 09
- ✓ 12) Log each hi-side cylinder pressure in software
- ✓ 13) Pump box Power breaker on
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 858 / -7 PaSP 703 / -34 PLi840 28.4 / +7.2 TMan 18.5 / -9.8
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 94 torr (± 1). If not, adjust.
  PaCO2 336 PaO2 94
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 108 FlSP (to bypass) 106

* Got a USB error -200478 twice. Measurements: Specif. operations cannot be performed when there are no channels in the task. RESTARTED AO2 Computer

10 km ≈ 33 kft

✓ 21) Toggle changeover to check flows in other position

FIWT (to bypass) 110 FISP (to cell) 105

X 22) If necessary, adjust HA-3 to match FIWT on bypass and cell to ±2 sccm

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

✓ 24) Close cylinder box lid

✓ 25) Return to WT selected when done checking regulators

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

✓ 27) Light lamp and ensure that it comes on UTC = 18:08

X 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 6.6

✓ 29) Click Initialize Sample Flow button 6.9 @ 18:22

✓ 30) Pump box Pump 1 breaker on

✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.

Fridge P 798 SA Purge Flow 116

✓ 32) Snoop trap fittings

✓ 33) Pump box Pump 1 breaker off

✓ 34) >= 10 min. after lamp on record values in first row of table below

✓ 35) Enable changeover valve (uncheck disable) UTC = 18:16

✓ 36) >= 10 min. after change-over enable, record values in table below

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
18:16:00	WT	NA	0.776	3.13	NA	NA	11.6	NA	0.354	4.35	4.4
18:33:00	WT	418	0.64	2.0	9.9	-6.3	+1.7	16	0.45	4.2	6.3

✓ 37) Disable changeover

X 38) If necessary, toggle changeover to get SP to Cell

✓ 39) Close WT 248 valve

C. 20-min before take-off

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

✓ 2) Enable changeover (uncheck disable)

✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)

Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4

✓ 4) Click Start button on main screen

✓ 5) Click Proceed button on control screen UTC = 18:47:40

✓ 6) Minimize "Verify Run Plan" window

✓ 7) Note cryo temperature Cryo = -57.6

✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on 18:57 while taxiing

X 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off

X 10) If ground hold extended > 20 min, go to Manual and run WT until take-off

✓ 11) Note time of wheels up UTC = 19:08:10

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

III. Postflight

1) Note time of wheels down UTC = 02:34:55
2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
3) Click Stop button
4) Turn off lamp
5) Close SA, WT, SP, and O2 248 valves in software
6) Select None in cylinder box control section and uncheck any purges
7) Close manual VAC valve
8) Pump box Pump 1 breaker off
9) Note cryo temperature Cryo = -55.5
10) Cylinder box Power breaker off
11) Pump box Pump 2 breaker off
12) Pump box Power breaker off
13) Record pressures for a leak check
PaWT 869 PaSP 779 PLi840 340 TMan 25.2 UTC = 02:46
14) Open cylinder box lid and record cylinder pressures for a leak check
LS 1520 HS 1560 CylT1 17.4 UTC = 02:46
LT 340 WT 790 CylT2 16.0
15) Close all 4 green valves
16) Close cylinder box lid
17) Log each hi-side cylinder pressure in software
18) Close program and Visual Basic
19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
20) Shut down AO2 PC
21) Shut down laptop
22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
23) Rack power switch off
24) Pull trap, jumper quick-connects, and install stopper
25) Open trap and remove glass beads

IV. Troubleshooting / procedures

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

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

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

NCAR Airborne Oxygen Instrument (AO2) Checklist **V. 09.11.11**

Date 091122 Campaign HIPPO2 Flight RF11 From PANC To KBJC

I. Preflight

Maintenance Day cancelled

A. Day(s) ~~before~~ of flight NO day before flight 5? Date = 091122

- ✓ 1) Prepare trap with clean glass beads filled to 1 inch from bottom
- ✓ 2) Install trap in dewar Trap Letters Top/Bottom = C / B
- ✓ 3) Record cylinder pressures (or copy from prev. postflight)
  LS 1490 HS 1540 CylT1 16.9 UTC = 16 : 21
  LT 335 WT 775
- ✓ 4) Turn on O_2 box, start program, and record pressures (or copy from prev. postflight)
  PaWT ~~865~~ PaSP 737 PLi840 21.95 TMan 19.1 UTC = 16 : 25

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) Load dry-ice in dewar to within 0.5 inches of lid UTC = 17:00
- ✓ 5) Record hi-side cylinder pressures and changes overnight (P / Δ)
  LS 1490 / 0 HS 1540 / 0 CylT1 16.9 / ___
  LT 335 / 0 WT 775 / 0
- ✓ 6) Open green knobs four ¼ turns and re-record pressures and any changes
  LS 1520 / +30 HS 1560 / +20 CylT2 16.7 / ___
  LT 340 / +5 WT 800 / +25
- ✓ 7) Close cylinder box lid
- ✓ 8) Vnc into into AO2 (192.168.84.138)
- ✓ 9) Start AO2 program by clicking play in higold.vdp
- ✓ 10) Ensure that no USB errors are present in boxes at bottom of screen
- ✓ 11) Check that NTP time sync is working on AO2 and laptop, >5-min after first sync, record times
  AO2 PC Time 17 : 17 : 02, Rack laptop time 17 : 17 : 01
- ✓ 12) Log each hi-side cylinder pressure in software
- ✓ 13) Pump box Power breaker on
- ✓ 14) Cylinder box Power breaker on
- ✓ 15) Record instrument pressures and changes overnight (P / Δ)
  PaWT 869 / 0 PaSP 737 / 0 PLi840 22 / 0 TMan 19.3 / +.2
- ✓ 16) Pump box Pump 2 breaker on
- ✓ 17) Manual VAC valve open
- ✓ 18) Check that PaCO2 = 330 torr (± 5) and PaO2 = 94 torr (± 1). If not, adjust.
  PaCO2 336 PaO2 95
- ✓ 19) Click Initialize Cal Flow button
- ✓ 20) Ensure that flow starts through both lines (110 ± 10)
  FlWT (to cell) 108 FlSP (to bypass) 104

~30 min

✓ 21) Toggle changeover to check flows in other position

FIWT (to bypass) 109 FISP (to cell) 103

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

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

✓ 24) Close cylinder box lid

✓ 25) Return to WT selected when done checking regulators

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

✓ 27) Light lamp and ensure that it comes on UTC = 17 : 35

✓ 28) If necessary, adjust PaO2 to keep signal below 10 V O_2 signal 6.6

✓ 29) Click Initialize Sample Flow button

✓ 30) Pump box Pump 1 breaker on

✓ 31) Ensure that Fridge P stabilizes near 805 (±10) torr after 2 min.

Fridge P 797 SA Purge Flow 115

✓ 32) Snoop trap fittings

✓ 33) Pump box Pump 1 breaker off

✓ 34) >= 10 min. after lamp on record values in first row of table below

✓ 35) Enable changeover valve (uncheck disable) UTC = 17 : 49

✓ 36) >= 10 min. after change-over enable, record values in table below

all were in range for first time since before RF06 PROBABLY BECAUSE AC ISN'T ON FULL BLAST FOR CALS !!!

UTC	Gas	O2d	CO2n	O2n	SPm	WTm	Totm	mΔ	PdO2n	PdSPn	PdWTn
17 :48: 00	WT	NA	0,73	2,6	NA	NA	11.8	NA	0.28	3.9	4.03
18 :02 :00	WT	423	0.82	1,5	9.6	0,01	5.6	9.8	0.27	4,1	4,96

✓ 37) Disable changeover

✓ 38) If necessary, toggle changeover to get SP to Cell

✓ 39) Close WT 248 valve

C. 20-min before take-off

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

✓ 2) Enable changeover (uncheck disable)

✓ 3) Adjust / record program parameters (nominally set to a, 50, 3, 3, 4)

Flag a Cal Interval 50 Cal Period 3 LTf 3 WTf 4

✓ 4) Click Start button on main screen

✓ 5) Click Proceed button on control screen UTC = 06 : 27 : 20

✓ 6) Minimize "Verify Run Plan" window

✓ 7) Note cryo temperature Cryo = -56

✓ 8) Before LT starts (after HS-LS) or upon taxi, Pump box Pump 1 breaker on

✓ 9) If ground hold extended 10-20 min., set CalInt to 1 until take-off

✓ 10) If ground hold extended > 20 min, go to Manual and run WT until take-off

✓ 11) Note time of wheels up UTC = 18 : 38 : 53

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

III. Postflight

- [x] 1) Note time of wheels down — UTC = 23:24:50
- [x] 2) Let any calibration cycles finish (up to < 5-min on ground and/or 2 gases)
- [x] 3) Click Stop button
- [x] 4) Turn off lamp
- [x] 5) Close SA, WT, SP, and O2 248 valves in software
- [x] 6) Select None in cylinder box control section and uncheck any purges
- [x] 7) Close manual VAC valve
- [x] 8) Pump box Pump 1 breaker off
- [x] 9) Note cryo temperature — Cryo = -57.7
- [x] 10) Cylinder box Power breaker off
- [x] 11) Pump box Pump 2 breaker off
- [x] 12) Pump box Power breaker off
- [x] 13) Record pressures for a leak check
  PaWT 745 PaSP 791 PLi840 7.4 TMan 24 — UTC = 23:38
- [x] 14) Open cylinder box lid and record cylinder pressures for a leak check
  LS 1510 HS 1550 CylT1 15.6 — UTC = 23:39
  LT 330 WT 640 CylT2 16.0
- [x] **15) Close all 4 green valves**
- [x] 16) Close cylinder box lid
- [x] 17) Log each hi-side cylinder pressure in software
- [x] 18) Close program and Visual Basic
- [x] 19) Copy data (*.mr, *.hr, *.txt) to laptop and then data and notes, etc. to pen drive
- [x] 20) Shut down AO2 PC
- [x] 21) Shut down laptop
- [x] 22) After green "SP to Cell" light has gone out, O_2 box Power breaker off
- [x] 23) Rack power switch off
- [x] 24) Pull trap, jumper quick-connects, and install stopper
- [x] 25) Open trap and remove glass beads

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

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