

0730	A/c James	Atmosphere	Physiological Training
PSI		H ₂ O Vapor	T°
15000 (1/2) 7.35		1.5% - 2%	Stand. 15°C Sea level.
34,000 (1/4) 3.5			loss of 2°C for each
42,000 (1/6) 2.5			1000 ft
			At 35,000 levels off
			at -55°C

Divisions of

0-35,000 ft.	Troposphere	<ol style="list-style-type: none"> 1. T° change 2. H₂O vapor 3. Diff. prevailing winds
35-200,000 ft.	Stratosphere	<ol style="list-style-type: none"> 1. No T. change 2. No H₂O vapor 3. Generally K. winds

At 35000 ft. Tropopause mixing layer
 Ht. varies w. Lat. season, up to 60,000 ft. (24-60)
 Ht. determined by heat reflected from earth.

Respiration

Exchange of gases betw body & outside air.

Pressure Breathing	Normal Breathing
Rate 12-16	12-16
Inhale No eff	Effort
Exhale Effort	No effort

Blood pickup 95% O₂ in air
 Uses only 30%
 Exhales 65%

Hypoxia - any sympt. results from O₂ lack

T.U.C. - Time of useful consciousness

Hyperventilation 0840

Corrective measures

1. Automix 100% Dial safety (Man. Cont. reg (Toggle lever engage))
2. Concentrate on normal breath

3. Check O₂ equip
4. Start immed. descent (15000 or less)
5. 2 min below 15000 Auto 100% w no press. (both reg) 15-20 min

To recover from (below 5,000 ft.)

Hypoxia $\frac{1}{2}$ -1 min

Hypervent. 1-5 min

CO 15-20 min

Frostbite

1. Proper fitting clothing (preflight check)
2. Never be careless
3. Watch exposed places (hands, nose ears chin)
4. Don't touch metal w/ bare hands (worst kind)
5. Watch others for frostbite (skin blanching)

G. - forces

Can incr. G. tolerance by tensing muscles.

Positive

Negative

Transverse

Night Vision

Dark adapt.

Off-center vision.

Sensory Illusions

1. Vestibular organs

2. Autokinetic phenomena
Tricks of eye on individual

Decompression Sickness

1. Evolved (gases coming out of solution)

Bends

Chokes

Paresthesias

2. Trapped

Ears

Sinuses

Teeth

Stomach - Gas expansion

2X at 16,500

5X 34,000

7X 39,000

Denitrogenation

Bends - do not rub, massage or exercise.

Chokes - True - burning sensat. in chest, stabbing pains. (most dangerous of all sympt.)

False - breathing dry O₂ - tickling, cough

may recur after getting down. In Hosp 72 hrs for obs.

Paresthesias - itching - least dangerous.

what to do - descend below 30,000 ft.

How to prevent - Denitrogenation by breathing 100% O₂ for $\frac{1}{2}$ hr.

O₂ Equipment & Its Use

3 systems

1. High P 1800-2100 psi
2. Low P 400-450 psi - paired tanks & check valves
3. Liquid - thermos jug - 297°F
4 L. will fill 20 Low pr. tanks.
4 L. supply 1 man 14 hrs.
Disadv. - loss from evap. - vent valve is left open
A3 Converter - 70-100 psi

Regulators.

A-12A - Diluter Demand O₂ Reg.

100% O₂ at 24,000

Normal setting - for routine

100% " - hypoxia, fumes, injured crew memb.

Emergency Knob (red) open to get all O₂ out of tank.

A-14 Pressure breathing diluter demand Regulator.

100% O₂ at 24,000

P into mask,

Normal - Demand

- 0 L - 30 M'

Safety - 2" H₂O

- 30 - 40 M'

41 M' - 4" H₂O

- 40 - 40 M' Forcible exhal.

43 M' - 6" H₂O

- 41 - 43 M'

45 M' - 8" H₂O

- 43 - 45 M'

45 + above 12" H₂O

- 45 - 50 M'

Routine use

50,000 in Emerg

Diff. to tighten mask to hold pressure.

There are cabin altitude pressures.

Loss of " " - set reg. at act. alt.

10,570 taxiing behind another jet. & tail wind.

Masks to use

A-12A - Reg. - A-14 mask (exhal. valve only)

No way to hold P & P breath.

A-13A S/L. - 2 in port Val. 1 exhal. v.

Quick disconnect. - Has bailout bottle connection.

Do not use A-13A & A-12A Reg. - Too much P.

Can't exhale, & may rupt. lungs. 42 pounds P.

New disconnect - can't do second ch. of hose

New Regulator D-1

D-2 15-17 sec delay before warn
25,000 - pressure
32,000 -

A-13-A mask to D-2

H2 - Emergency O₂ Bailout bottle

Hi-Press syst. 18-2100 Don't Drop.

Hi Rocketing effect.

check - pre-flight.

Caution tag - Remove when get in in ground.

10 min supply

P.D. McCripe

(Pre-flight O₂ syst. check)

Press + quant. gage

Diaphragm reg.

Mask

1. Pr. checks

Connections at mask

1. Rubb. seal

2. 10-20 lb pull

3. Alligator clamp - clamp by 1st 3-4 teeth

Connections at Regulator

1. Metal clamp

2. Regulator hose

3. Knurled knob

Regulator

1. Automix lever.

2. Pr. dial

Indicator

Portable Unit

1. Allig. clamp.

2. Pr. gage

3. Blow back check.

Emergency Cylinder (H-2 bailout bottle)

1. When over 25,000 ft.

2. Full 1800 psi

Cabin Pressurization

Isobaric

Pressure Differential

Decompression rate

1. Vol. of hole
2. Size of hole
3. Press. diff.
4. Altitude

Emergency Exit (Ejection Seat)

1. Lower seat
2. Start Bailout Or
3. Duck

After Can. goes

Sit erect

Chin in

Feet in stirrups

Arms on rests, elbows in

Squeeze trigger

Leave seat

2-5 sec after ejection.

Release safety harness

Kick away seat

Automatic release, now

Release harness before ejection at low alt, 1000 ft or less.

Hi-speed bailout - hazards

1. Free-fall to 15000 ft.

Time - Count 101, 102 up to

60

2. Tumbling + flat spin

Hypoxia, Hyperventilation, & CO₂ (15% short time)
2% over long time
100% industry