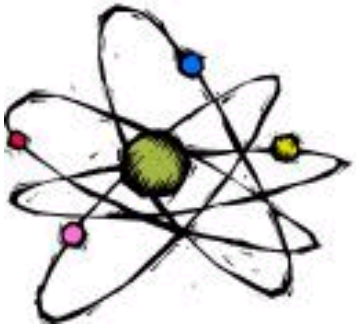
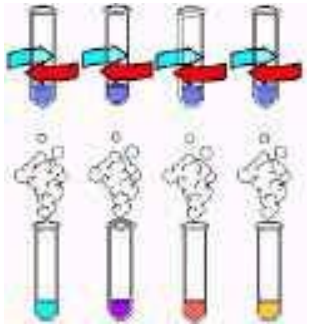
Lesson Topic 1.3

GAS FREE PROTECTIVE MEASURES





INTRODUCTION

As Gas Free Engineer personnel you need to know the protective measures needed for safe and effective Gas Free evolutions.

ENABLING OBJECTIVES

- Describe common gases, solvents and fuels characteristics, locations, and safety hazards in accordance with NSTM Chapter 074 Vol. 3, Gas Free Engineering and NSTM Chapter 550, Industrial Gases Generating, Handling and Stowage.

ENABLING OBJECTIVES

- Describe protective clothing worn for gas free operations in accordance with NSTM Chapter 074 Vol. 3, Gas Free Engineering
- Describe the use and operation of the Personal Alert Safety System (PASS) in accordance with the PASS manufactures technical manual.

ENABLING OBJECTIVES

- Describe the elements of the Respiratory Protection Program in accordance with OPNAVINST 5100.19, series.

ENABLING OBJECTIVES

- Select statements which describe the characteristics and uses of Mechanical filters, Chemical cartridges and Combination filters in accordance with OPNAVINST 5100.19, series.

ENABLING OBJECTIVES

- Describe the use, components and parameters associated with the SAR/SCBA in accordance with the SAR/SCBA technical manual, NAVSEA 0910-LP-708-0000.

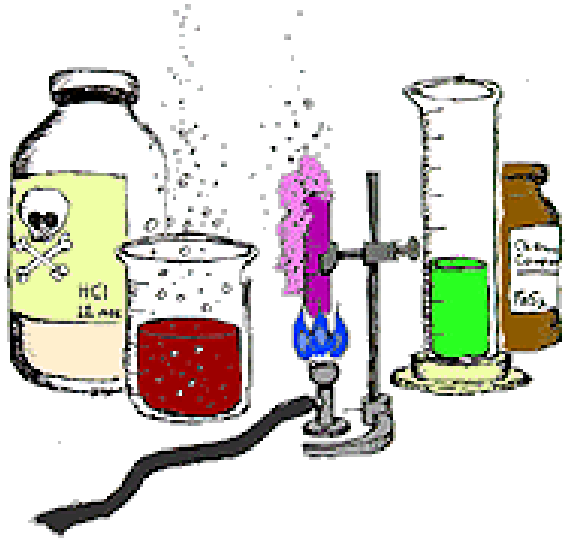
ENABLING OBJECTIVES

- Describe the use, components and parameters associated with the Con-Space communication system in accordance with Navy/SAR Gas Free Communications System Technical Manual.

Gases, solvents, and fuels

Characteristics

- A ship is a special structure composed of a large number of tanks, voids or spaces with different types of cargo.



Gases, solvents, and fuels

Toxic gas/vapors can enter the human body 3 ways

Gases, solvents, and fuels

Toxic gas/vapors can enter the human body 3 ways

- Respiratory tract

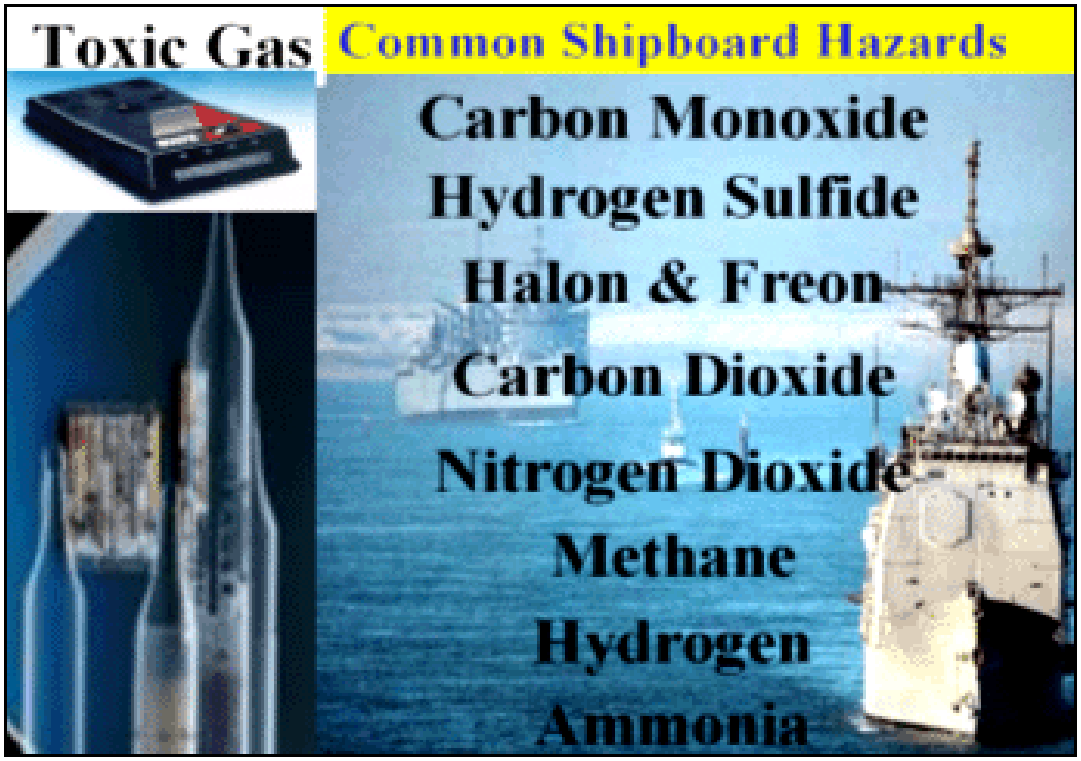
- Skin

- Digestive tract

Gases, solvents, and fuels

Gases most common to ships

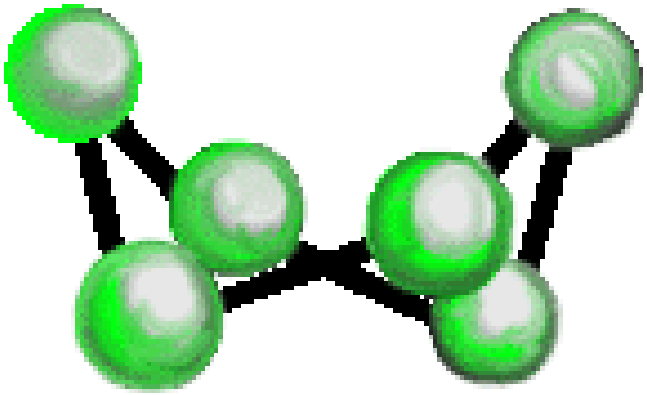
- Hydrocarbons
- Halogens
- Toxins



Gases, solvents, and fuels

Hydrocarbons

- An organic compound (such as acetylene, benzene, or methane) containing carbon and hydrogen as a base.



Gases, solvents, and fuels

Hydrocarbons

- Gas/Vapor: Acetylene:
  - Acetylene is a gas that produces a very wide range of flammable concentrations in air. It is a mild narcotic. Has been used to some extent as an anesthetic.
  - Lighter than air

Gases, solvents, and fuels

Hydrocarbons

- Gas / Vapor: Propane
  - A heavy flammable gaseous paraffin based hydrocarbon found in crude petroleum and natural gas products.
  - Much heavier than air

Gases, solvents, and fuels

Hydrocarbons

- Gas / Vapor: Gasoline
  - Used in Motor fuels, P-250 mod I pumps, and autos.
  - Lighter than air

Gases, solvents, and fuels

Hydrocarbons

One gallon of vaporized gasoline has the explosive effect of 83 lbs. of dynamite.

Gases, solvents, and fuels

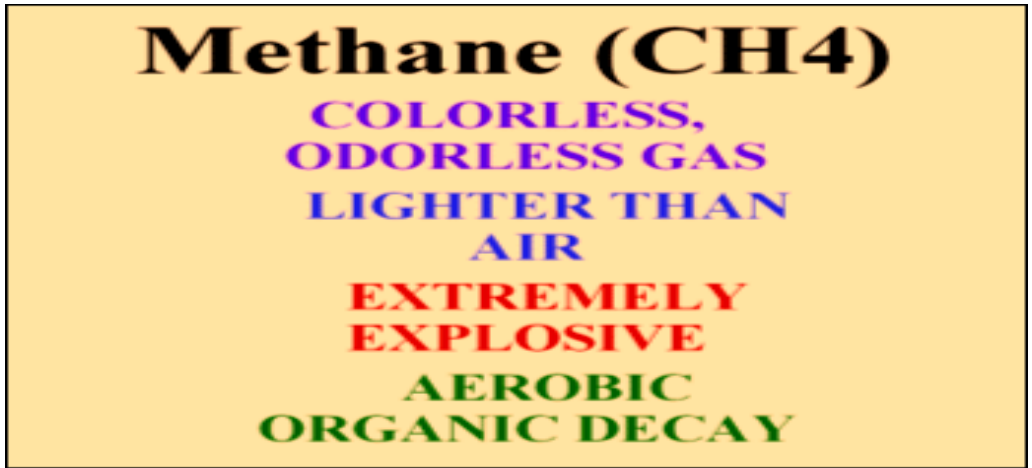
Hydrocarbons

- Gas / Vapor: JP-5 and DFM-76
  - Used for fuel onboard ships
  - Heavier than air

Gases, solvents, and fuels

Hydrocarbons

- Gas / Vapor: Methane
  - A simple asphyxiant containing a colorless hydrocarbon that is a product of the decomposition of organic matter.
  - Location: CHT systems and reefer areas.
  - Lighter than air



Gases, solvents, and fuels

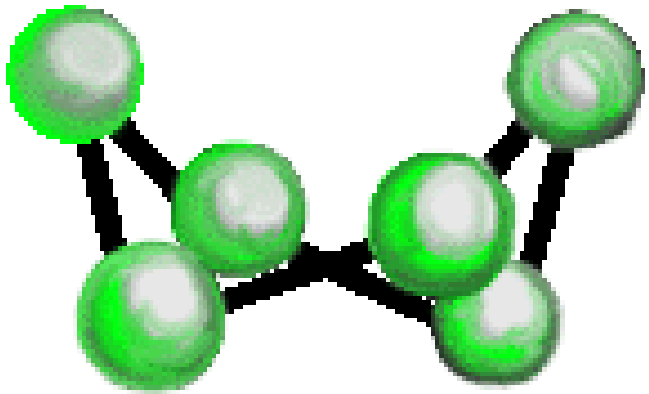
Hydrocarbons

- Gas / Vapor: Benzene
  - A highly flammable, clear colorless liquid, suspected of carcinogenic (cancer) potential.

Gases, solvents, and fuels

Halocarbon/Fluorocarbons

- Chemical compound containing carbon and fluorine, used chiefly as a lubricant, refrigerant, and in making resins and plastics.



Gases, solvents, and fuels

Halocarbon/Fluorocarbons

- Gas / Vapor: Freon
  - Used as a refrigerant and as a propellant for aerosols.

Gases, solvents, and fuels

Halocarbon/Fluorocarbons

- Gas / Vapor: Freon

WARNING: Heat turns freon into phosgene gas which will produce dry throat, pain in the chest, shortness of breath and even death..

Gases, solvents, and fuels

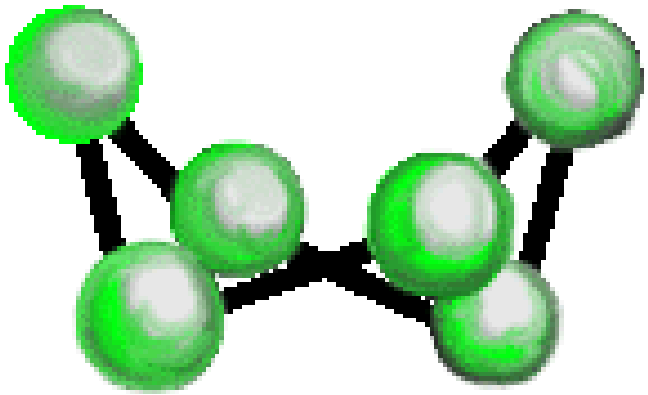
Halocarbon/Fluorocarbons

- Gas / Vapor: Hydrogen fluoride
  - Toxic and severely corrosive to skin, eyes, and mucous membranes.
  - Post-fire gas free test is required when a fire has been extinguished using HALON 1301 fire extinguishing system.
  - Slightly heavier than air

Gases, solvents, and fuels

Halogens

- Chlorine
- Bromine
- Iodine
- Fluorine
- Astatine



- Used mainly by chemical industry to make synthetic cleaning fluids and fire extinguishing agents.

Gases, solvents, and fuels

Halogens

- Gas / Vapor: Chlorine
  - A highly irritating gas destructive to the mucous membranes of the respiratory passages.
  - Chlorine is an active bleaching agent and germicide.
  - Heavier than air

Gases, solvents, and fuels

Halogens

- Gas / Vapor: Bromine
  - Liquid nonmetallic element.
  - It is obtained from natural brine in wells and sea water.
  - Heavier than air

Gases, solvents, and fuels

Other common gases and vapors

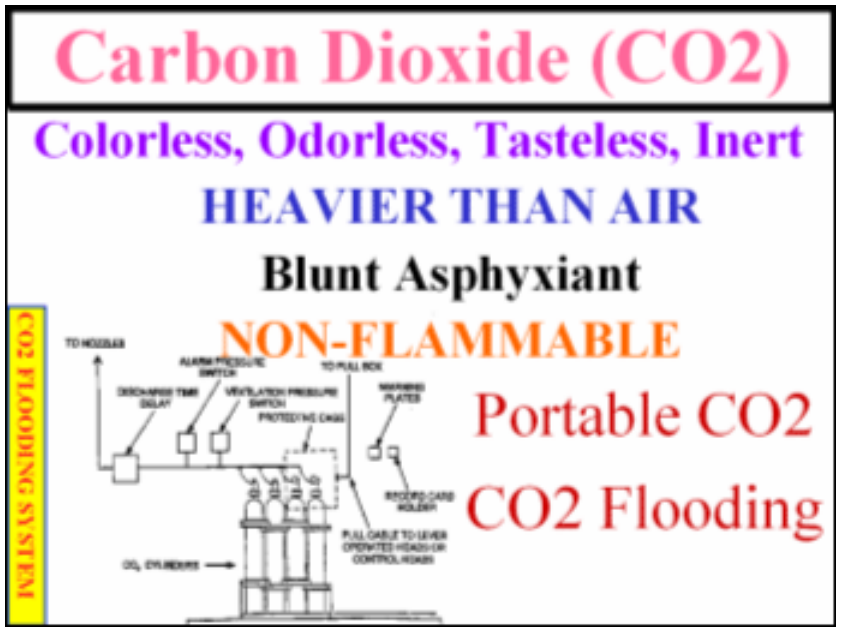
- Gas / Vapor: Carbon Monoxide (CO)
  - Colorless, odorless gas generated by combustion of common fuels and incomplete burning of these fuels.
  - Poisoning is entirely by inhalation.
  - The oxygen carrying cells in the blood stream (hemoglobin) will attract carbon monoxide 210 times faster than oxygen.
  - Slightly lighter than air

Carbon Monoxide (CO)

Gases, solvents, and fuels

Other common gases and vapors

- Gas /Vapor: Carbon Dioxide (CO2)
  - Produced by complete combustion or decaying organic materials.
  - Much heavier than air



Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Nitrogen Dioxide
  - Produced during
    - During hot work,
    - From wool, nylon and polyester fires.
    - When using nitric acid
    - By internal combustion engines
  - Heavier than air

Nitrogen Dioxide (NO_2)

- DARK BROWN, PUNGENT GAS
- CHOKING AGENT -- Absorbed
- HEAVIER THAN AIR
- NON FLAMMABLE

Produced From Hot Work, Fires, & Internal Combustion Engines

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Hydrogen

Hydrogen (H)

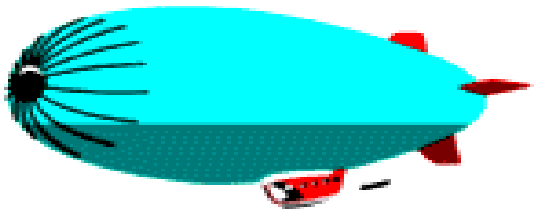
ODORLESS, COLORLESS GAS

LIGHTER THAN AIR

EXTREMELY EXPLOSIVE

LEAD-ACID BATTERIES

RUST



Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Hydrogen Sulfide
  - Colorless gas with odor of rotten eggs .02% and below.
  - Produced by decomposition of sulfur-bearing organic material.
  - In small concentrations, sensitivity to odors disappears.
  - Heavier than air

Hydrogen Sulfide (H_2S): #2 Killer of Sailors

ORGANIC DECAY

COLORLESS GAS

ROTTEN EGG SMELL

HEAVIER THAN AIR

FLAMMABLE

Attacks Nerves:

Apnea, Coma

Anaerobic Organic Decay

WHERE H2S HIDES:

FIREMAIN

AFFF SYSTEM

ROTTING FOOD

GARBAGE GRINDER

SEWAGE SPACES

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Sulfur Dioxide
  - Used as an insecticide and a chemical preservative food additive.
  - Heavier than air

Gases, solvents, and fuels

Other common gases and vapors

- Gas/Vapor: Oxygen
  - It forms about 21% of the atmosphere and is combined in water.

Gases, solvents, and fuels

Other common gases and vapors

- Oxygen requirements:
  - 20.9% in normal air
  - 19.5 - 22% needed to post certificate "safe for personnel".
  - More than 22% is an oxygen enriched atmosphere.

Gases, solvents, and fuels

Other common gases and vapors

WARNING: Keep oxygen away from oil and grease

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Hydrocyanic Acid
  - Has an odor of bitter almonds.
  - It is produced by burning plastics and foam insulation for chill water piping.
  - Slightly heavier than air

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Hydrogen Chloride
  - It is produced when polyvinyl chloride electrical cable jackets burn.
  - Heavier than air

Gases, solvents, and fuels

Other common gases and vapors

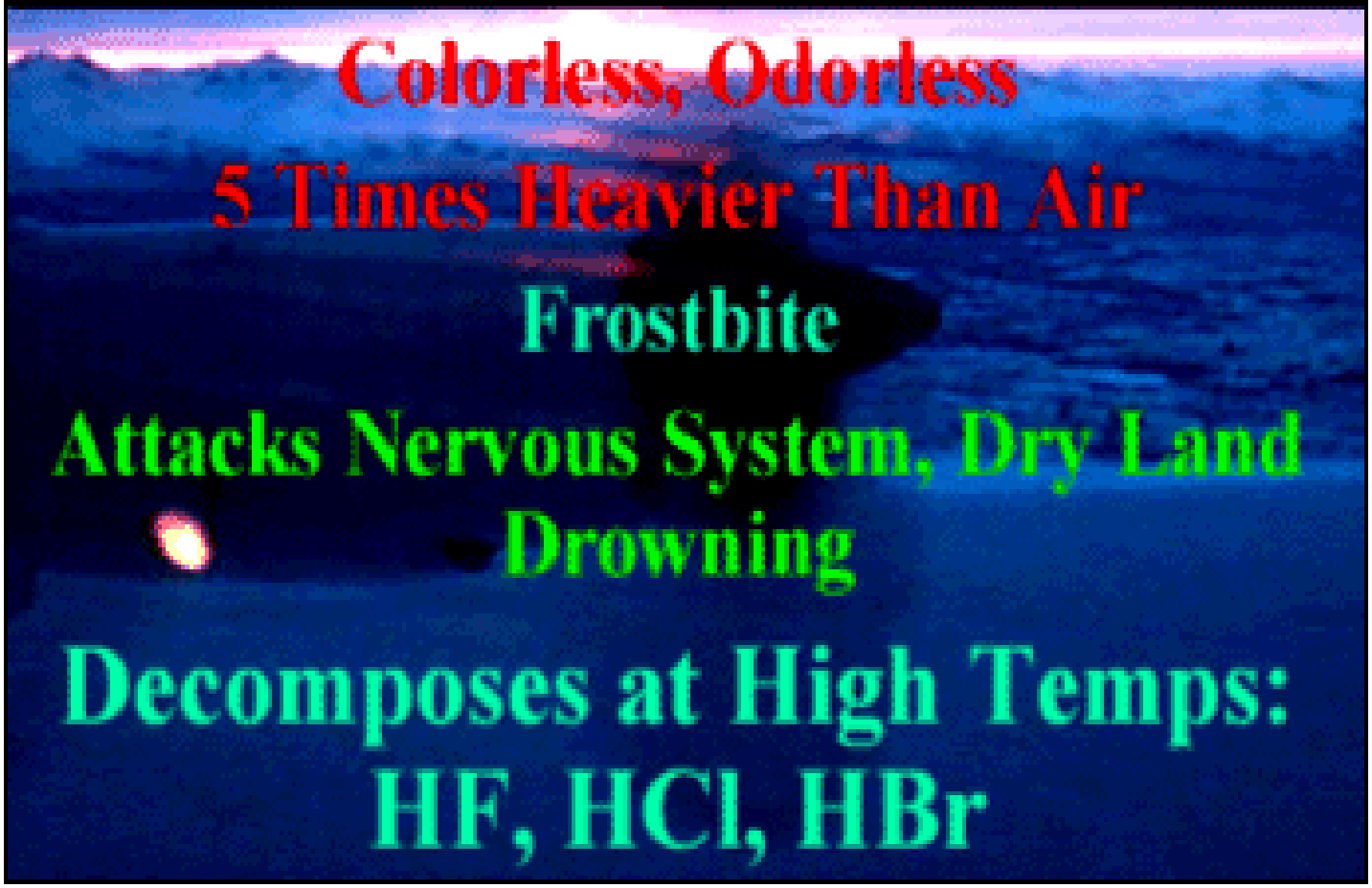
- Gas / Vapor: Ozone
  - Causes irritation of the eyes, throat. Produces cough, chronic respiratory disease.
  - Pungent sulfur like odor
  - Urban air, arcing of electrical equipment, 02 generators, E-S precipitators.
  - Lighter than air

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Trichloroethane
  - Causes eye irritation, headaches, central nervous system depression.
  - Solvents, adhesives and degreasers
  - Heavier than air

HALON 1301
(BromoTriFlouroMethane)



HALON 1301

5 - 7 % for 10 min: No Health Danger

7 - 10% : Dizziness, Tingling Extremities, Mild Anesthesia

> 10 % : Very Dizzy, Nearly Unconscious, Lose Physical & Mental Dexterity

Gases, solvents, and fuels

Other common gases and vapors

- Gas / Vapor: Ammonia
  - Causes irritation of eyes, nose, throat, and respiratory tract. Produces chest pains, eye and skin burns
  - Scrubbers and carbon beds
  - Lighter than air

How do you know what toxicants to test for in a space? Appendix E

How do you know what Draeger Tubes are available? Appendix L

How do you know the PEL and IDLH limits for Toxicants? Appendix G

Protective Clothing

Protective Clothing

Gloves

- Proper selection is extremely important
  - Length
  - Finish
  - Weight
  - Material

Protective Clothing

Boots

- Come in many styles, sizes and colors.
  - Length
  - Soles
  - Material
  - Kinds / types of boot material.

Protective Clothing

Coveralls / protective clothing

- Navy standard issue
  - Cotton
  - Fire retardant
  - Disposable (White paper, CHT)

Protective Clothing

Coveralls / protective clothing

WARNING: DO NOT USE PLASTIC COVERALLS IN SPACES THAT MAY CONTAIN EXPLOSIVE GASES BECAUSE OF STATIC ELECTRICITY BUILD-UP

Protective Clothing

Goggles

- Designed for use in all types of working conditions

Protective Clothing

Face shields

- Added protection to regular goggles
- Accommodates respiratory protection devices.

Protective Clothing

Safety glasses

- Required for eye protection.
- Protects eyes from impact.

Personal Alert Safety System (PASS)

Personal Alert Safety System (PASS)

Purpose

- Used by personnel working in confined spaces.
- Sounds an alarm whenever the user is motionless for 25-35 seconds.
- Can be manually activated.

Personal Alert Safety System (PASS)

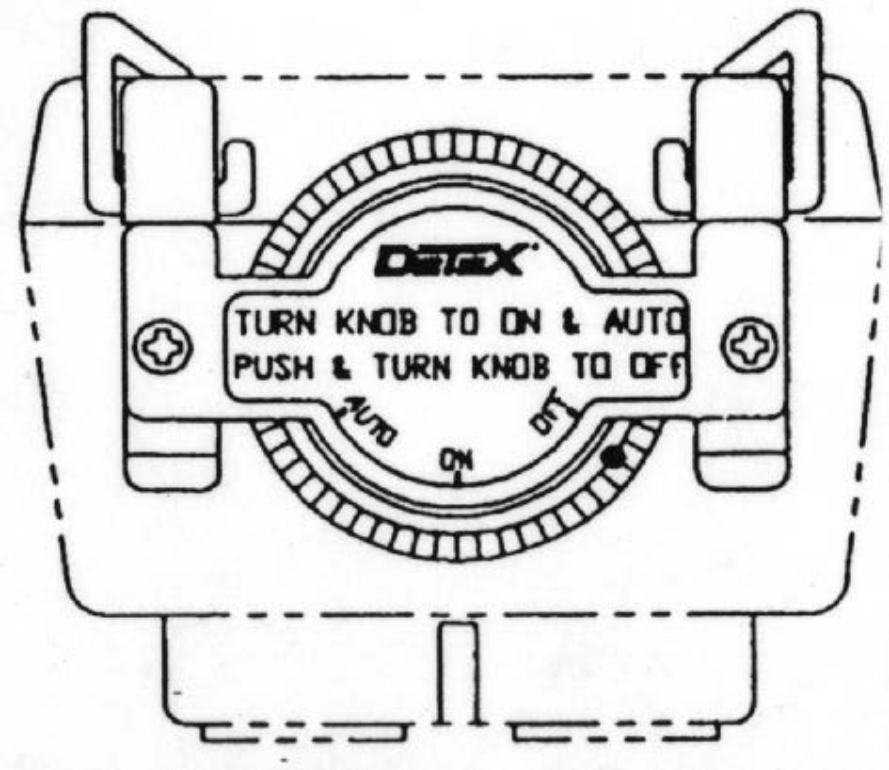
Characteristics

- 4.5 inches by 2.75 inches by 1.75 inches and weighs 12 ounces.
- Requires one 9 volt battery (lasts 1 hour)

Personal Alert Safety System (PASS)

Operation

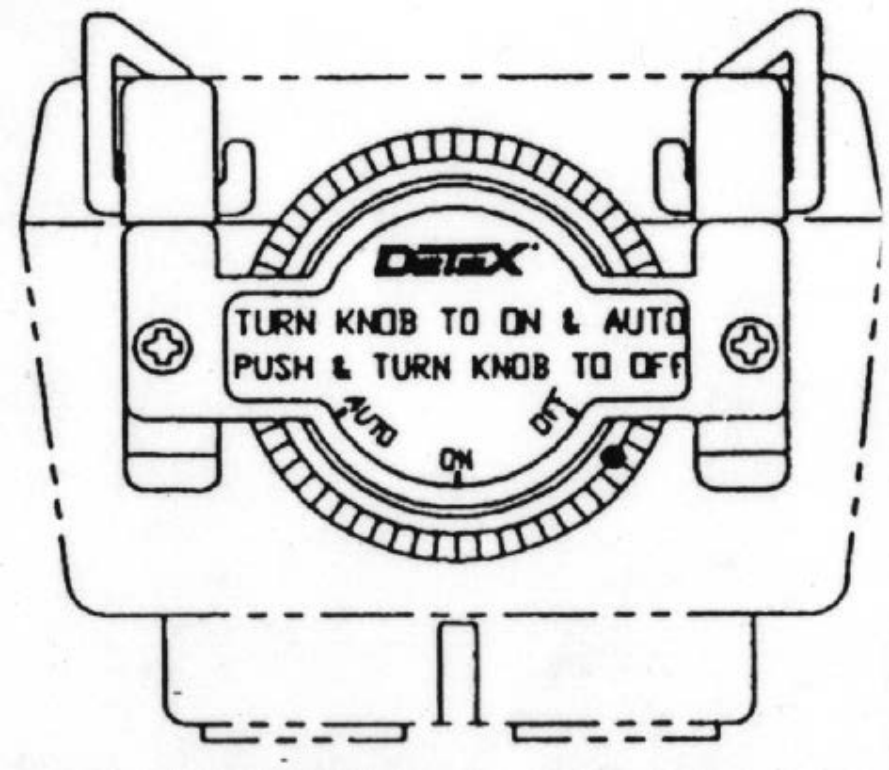
- OFF
- Manual
  - Sounds the alarm signal as soon as it is switched to Manual



Personal Alert Safety System (PASS)

Operation

- Automatic
  - Sounds its alarm when there has been no motion for 25-35 seconds.
  - A pre-alert signal will begin 7 - 10 seconds before the alarm signal.



Respiratory Protection Program

Respiratory Protection Program

- Respiratory protection programs are regulated by OSHA and those regulations are applied to the Navy's program.

Respiratory Protection Program

Administration

- The CO designates a Respiratory Protection Officer to oversee the program.

Respiratory Protection Program

Administration

- The Respiratory Protection Officer:
  - Monitors and evaluates the program.
  - Ensures training is conducted.
  - Writes and reviews the operating procedures.
  - Provides guidance on respirator stocking and selection.
  - Ensures fit testing is conducted.

Respiratory Protection Program

Administration

- The Medical Department Representative screens and medically qualifies each respirator user.

Respiratory Protection Program

Administration

- The safety officer and divisional safety petty officers train and monitor respirator users.
- Division officers and work center supervisors ensure the proper types and adequate quantities of respirators are available to workers.

Respiratory Protection Program

Administration

- All respirator users are responsible for wearing only those respirators for which they have been fit tested and qualified.

Respiratory Protection Program

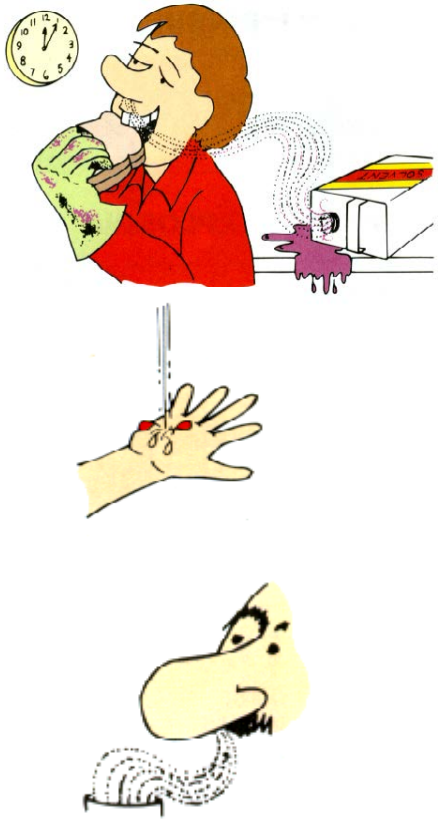
Knowledge of respiratory hazards

- Toxic materials enter the body three ways:

Respiratory Protection Program

Knowledge of respiratory hazards

- That's right... GOOD JOB
  - By mouth
  - Through the skin
  - Into the lungs



Respiratory Protection Program

Hazard control

- Hazard control should start at the same time as any work project that might produce a hazardous atmosphere.

Respiratory Protection Program

Selection of respiratory equipment

- Respiratory protective devices vary in design, application and protective capability.
- ***ONLY NIOSH/MSHA APPROVED***

NIOSH

U.S. Department of Labor
MSHA
Mine Safety & Health Administration

Respiratory Protection Program

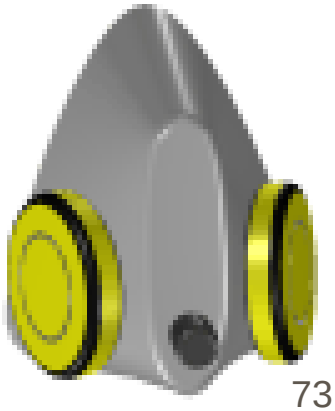
Selection of respiratory equipment

- The user must assess the inhalation hazard and understand the specific use and limitation of the equipment to make the proper selection.

Air-purifying devices

Air-purifying devices

- Air-purifying devices remove contaminants from the atmosphere and can be used only in atmosphere containing sufficient oxygen to sustain life.



Air-purifying devices

- Various chemical cartridge filters remove specific gases and vapors.
  - Mechanical filters remove particulate matter.
  - Combination filter cartridge filters out particulate and chemicals.

Supplied Air Respirator / Self-Contained Breathing Apparatus (SAR/SCBA)

SAR/SCBA

- To ensure all SAR/SCBA equipment is in good operation and properly maintained, use the SAR/SCBA Check Sheets.
- Can be found on DC Website, www.dcfp.navy.mil

SAR/SCBA

UPDATED: 23 August 2005

SUPPLY AIR RESPIRATOR /SELF-CONTAINED RESPIRATOR (SAR/SCBA) EQUIPMENT CHECK SHEET

FOR USS _____

Date:_____

REF: (A) PMS 5519/015 SAR/SCBA
(B) 0910-LP-708-0000
(C) PMS 5000/009 FLEX HOSES

	IAW	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT	SAT/ UNSAT
SERIAL NUMBER											
A. SCBA & SCBA CYLINDER INSPECTION:											
1. Is cylinder pressure between 2500 and 3,000 psi?	M-1R, Q-1R										
2. Are external surfaces of the SCBA HP air cylinder free of damage?	S-4R										
3. Has the SCBA HP air cylinder been hydrostatically tested in the last 3 years?	S-1										
4. Has the SCBA been overhauled in the last 6 years by the manufacture and maintaining records? Note 3 of S-1R.	S-1										
5. Are SCBA hoses in good condition?	Q-1R										
6. Were all SCBA connections tight?	M-1R, Q-1R										
7. Are pressure gages in good condition?	Q-1R										
8. Is SCBA carry pouch, waist belt and shoulder strap in good working order?	Q-1R										
9. Are LP hoses free of damage, paint, and corrosion?	A-2R										
10. Are hydrostatic test data tags installed on LP hoses? Note: LP air hose are hydrostatically tested to 200psi.	A-2R										
SERIAL NUMBER											
B. SCBA FACE PIECE:											
1. Is the head harness free of cuts, tears and deterioration?	Q-1R										
2. Is the ultravue facepiece lens free of cracks and scratches?	Q-1R										
3. Is the facepiece exhalation valve clean and easy to operate?	Q-1R										
4. Is the facepiece inlet assembly free of damage?	Q-1R										
5. Is the spider gasket and inhalation disk valve present and not damaged?	Q-1R										

NOTE: Each ship was issued 4 SCBA's for every PASP unit. Ship should have a minimum of 8 SCBAs.

SERIAL NUMBER													
C. CYLINDERS & STORAGE CASE PASP/RASP:													
1. Is the cylinder pressure between 3,375 to 4,500psi?	S-3R												
2. Are the external surfaces of the PASP/RASP HP air cylinders free of damage?	S-4R												
3. Have the PASP/RASP hp air cylinders been hydrostatically tested with in the last 3 years?	S-3R												
4. Are the PASP/RASP cylinder cases free or cracks and any other damage that would cause installing or removing hp air cylinders or in handling the case?	S-3R												

Note: Ship should have a minimum of 12 cylinders between the PASP AND RASP.

SERIAL NUMBER			
D. PASP & RASP COMPONENTS:			
1. Is PASP hold down bracket in good condition and tight?	S-3R		
2. Is the PASP control panel is in good working order and all required component hardware present?	S-3R, Ref. B		
3. Are the following gauges calibrated AHP-g201, AHP-g202, and the hp air pressure gauge in the tool kit.	36M-1		

SAR/SCBA

4. Is PASP case weldment free of cracks or other damage that would cause difficulty installing or removing cylinder? Ensure rubber pad is in place.	S-3R			
5. Does regulator (AHP-V205) operate IAW PMS?	A-1R			
6. Are HP hoses free of damage, paint, and corrosion?	A-3 Refers to MIP 5000/009 A-1			
7. Are hydrostatic test data tags installed on HP hoses? Note: HP air hose are hydrostatically tested to 6,750psi.	A-3 Refers to MIP 5000/009 A-1			

NOTE: Ship will have a minimum of 2 PASP units and 5 RASP units.

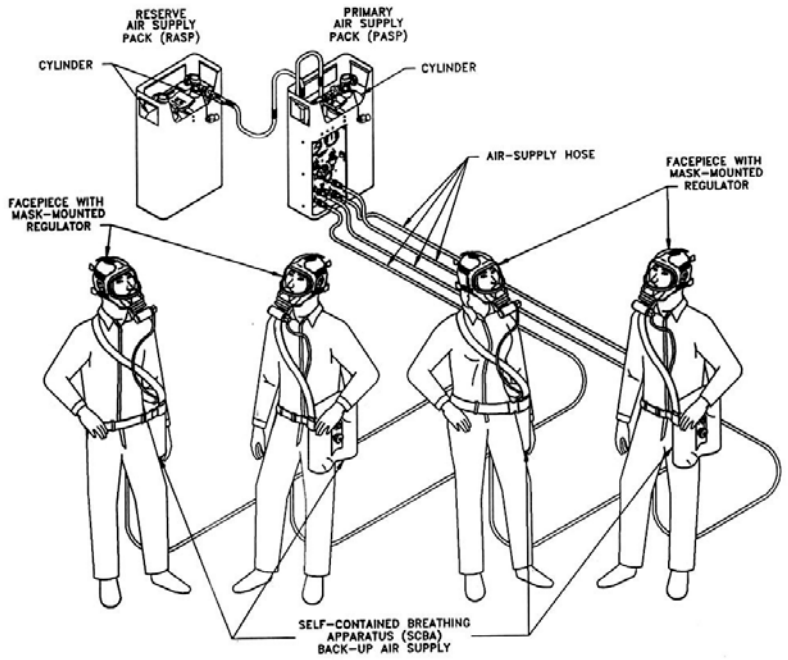
SERIAL NUMBER					
E. OPERATIONAL TEST:					
1. Will all valves cycle.	S-2				
2. Did SCBA operate properly and was it leak free? - Test two SCBAs if they fail test two more.	Q-1R(b&c)				
3. Did SCBA audible alarm (whistle) work?	Q-1R, Ref. B				
4. Did PASP operate and was it leak free?	S-3R				
5. Did the PASP audible alarm (bell) work?	Ref. B. Table 2-4, step 12.				
6. Does the PASP regulator operate and was it adjusted properly?	A-1R				
a. Regulator adjusted to 125 to 130psi when regulator knob is turn fully CW.	A-1R				
b. Test relief valve set correctly? - Starts opening at 140 +/- 5 psi. - Fully open at 160 +/- 5 psi. - Note: regulator must be reset.	A-1R				
c. Test regulator with airflow adapter installed? - Adjust CW to 60-80 psi. - Adjust CCW to 0 psi. - Regulator should adjust air smoothly. **Note: Airflow adapter/ special tool/ fitting is the male quick disconnect fitting.**	A-1R				

REMARKS:	

ASSESSOR(S):_____DATE: _____

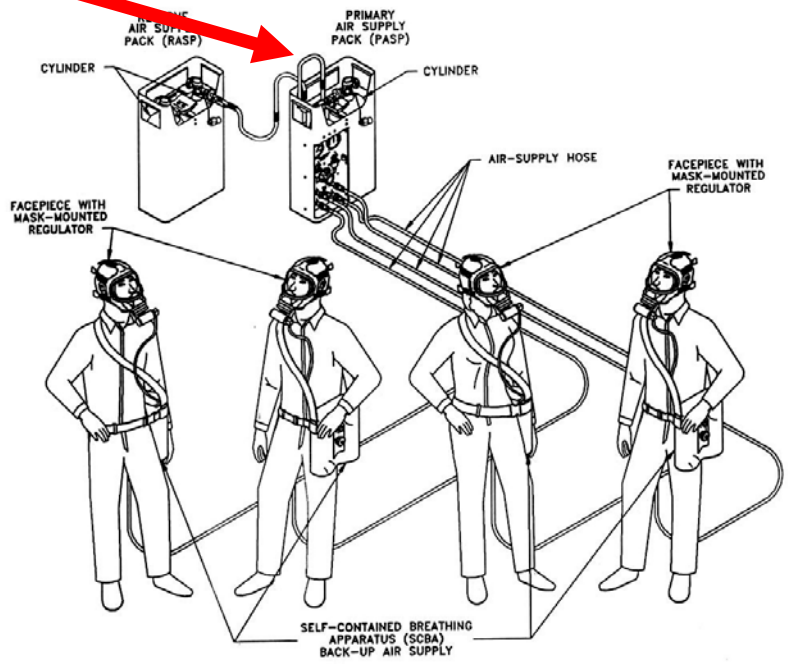
SAR/SCBA

- Developed by Mine Safety Appliances Co. (MSA)
- Uses grade “D” air



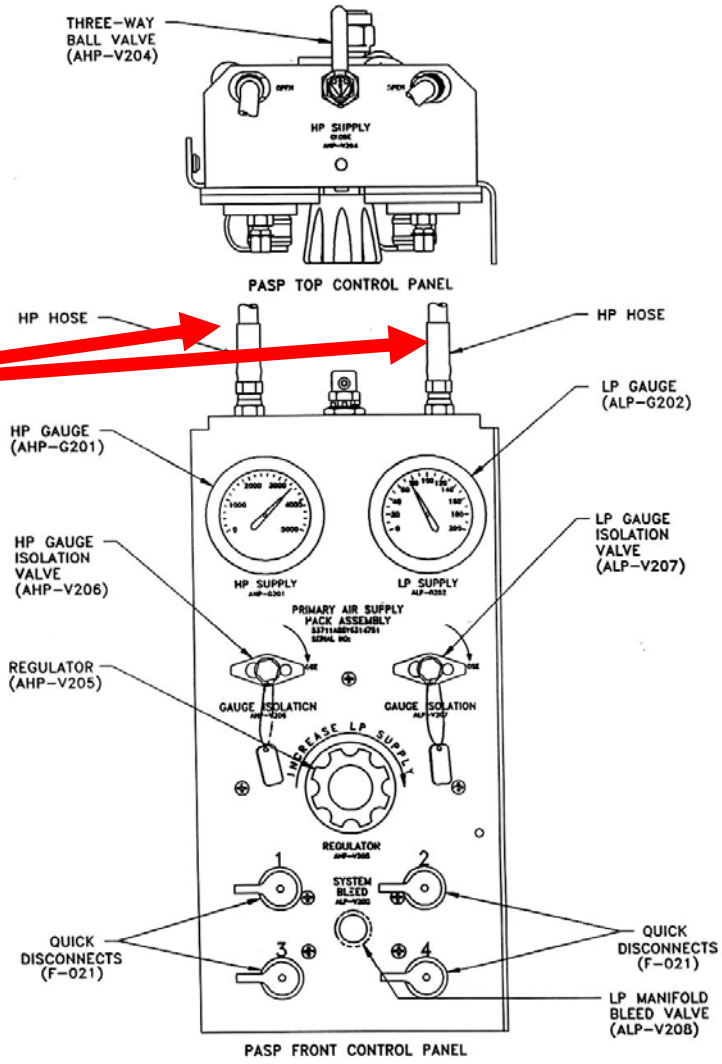
SAR/SCBA

- Primary Air Supply Pack (PASP)
  - One air cylinder contains 87 Standard Cubic Feet (SCF) at 4500 psig
  - Approximately 55 min.



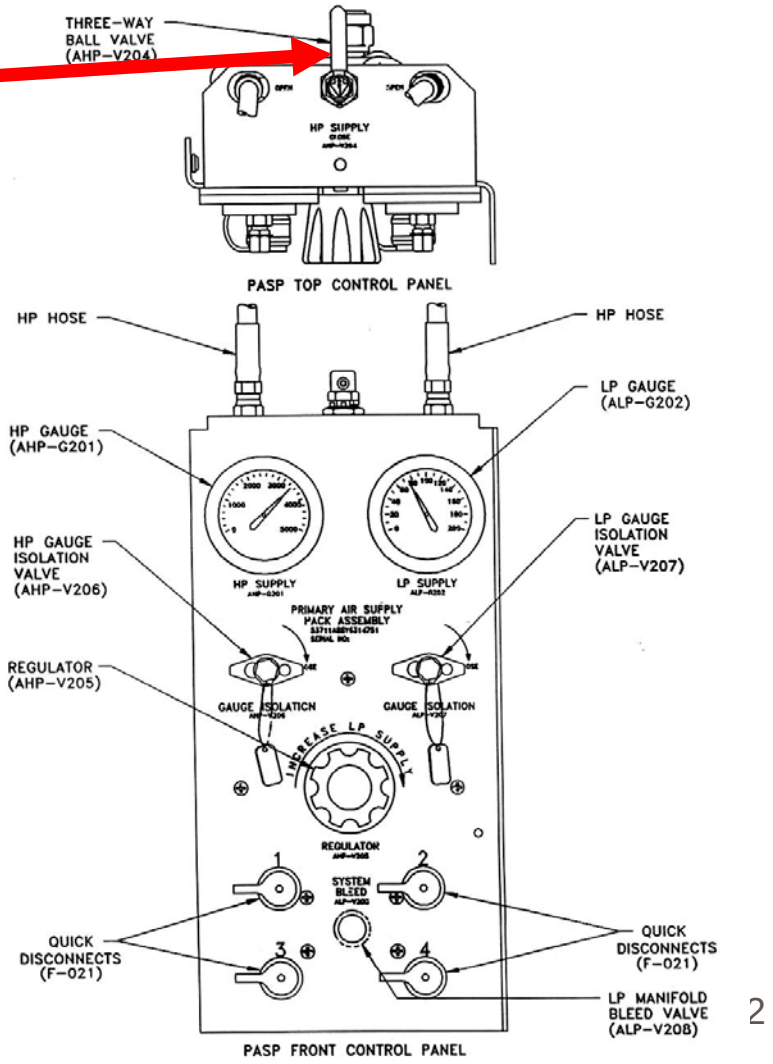
SAR/SCBA

- Control Panel Assembly (CPA)
  - Two HP air hoses connect the air cylinders to the 3-way ball valve.



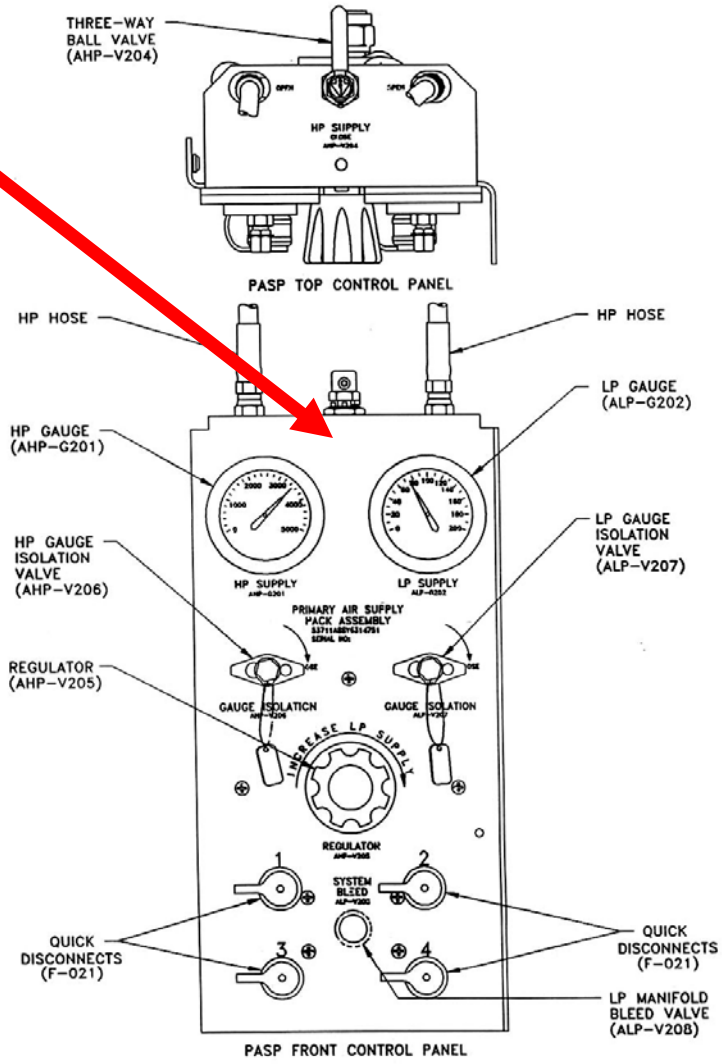
SAR/SCBA

- 3-Way Ball Valve
  - Used to select which air cylinder is to be on-line supplying air.



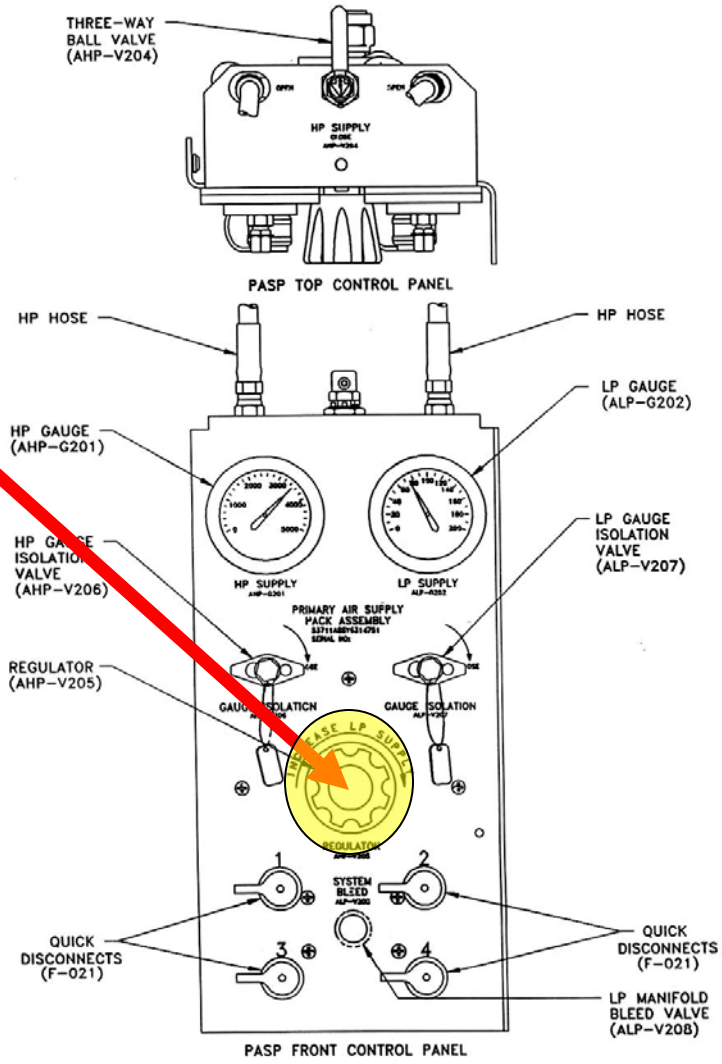
SAR/SCBA

- HP air in-line filter
  - In-line filter is located below the 3-way ball valve.



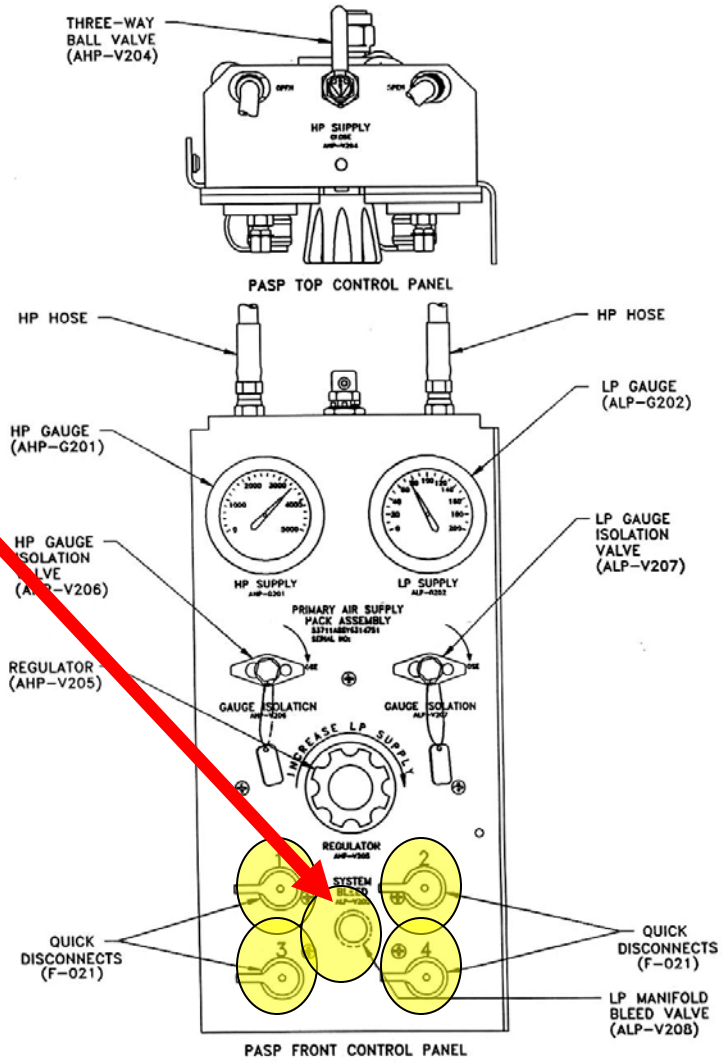
SAR/SCBA

- Regulator
  - Reduces HP air to 60-80 psig, for delivery to LP manifold.



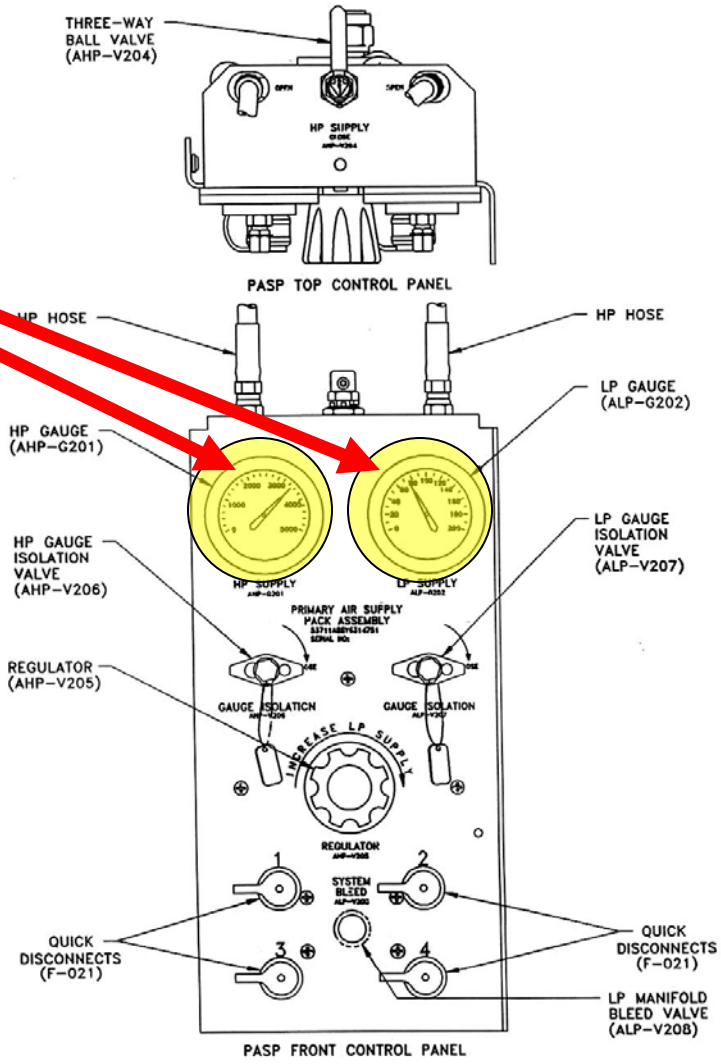
SAR/SCBA

- LP Manifold
  - Four brass quick disconnect fittings.
  - One bleed valve



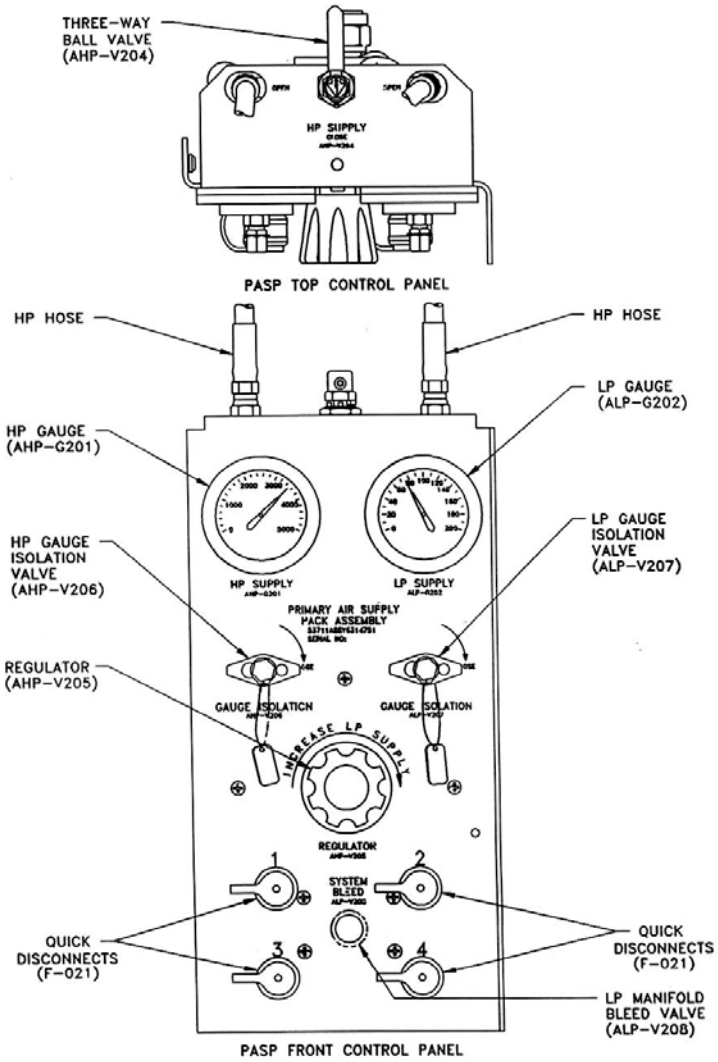
SAR/SCBA

- HP and LP pressure gauges
  - HP air gauge range is 0-5000 psi.
  - LP air gauge range is 0-200 psi.



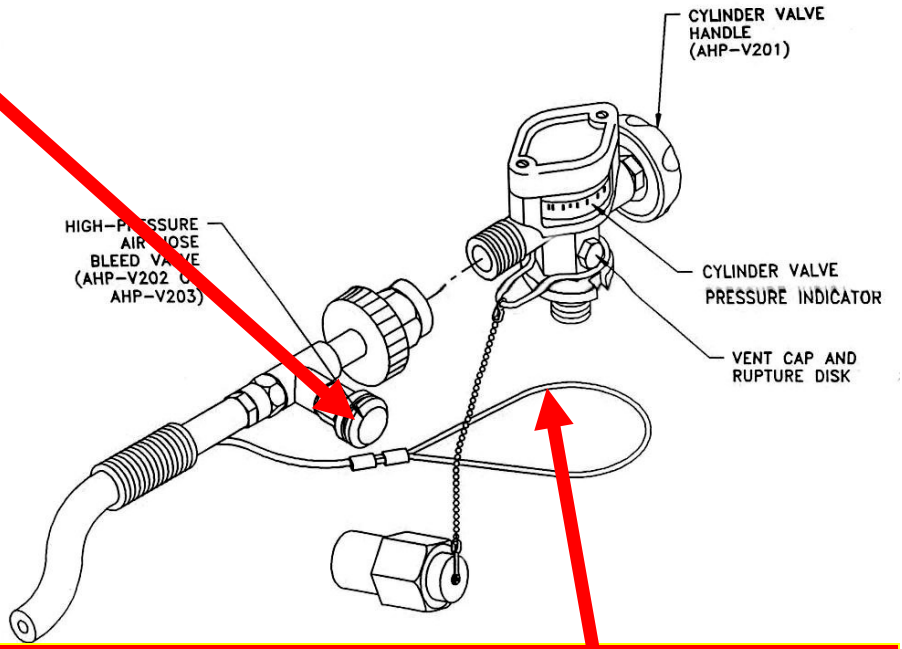
SAR/SCBA

- LP alarm
  - Audible alarm (bell) sounds when the HP cylinder air pressure decreases to 500 psig.



SAR/SCBA

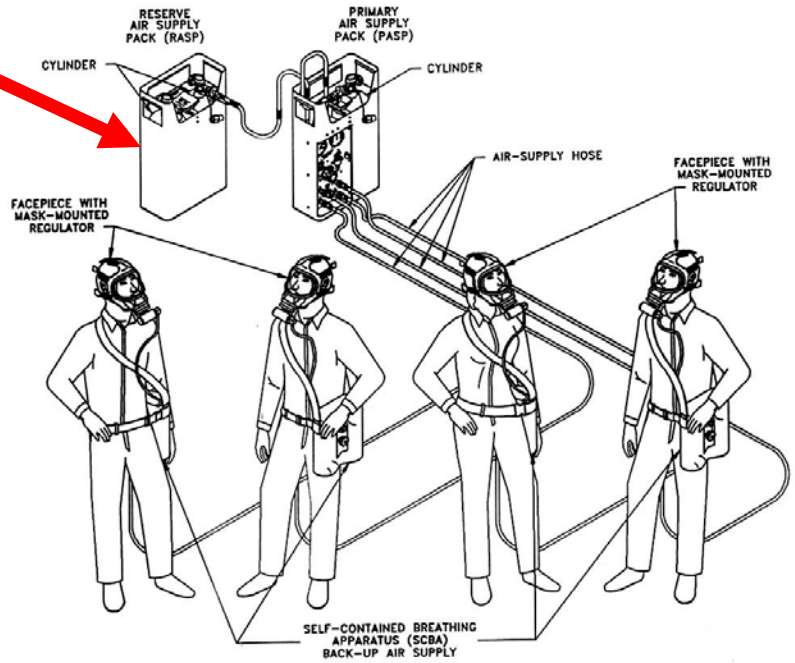
- HP Bleed Valves
  - Used to depressurize hose



WARNING: Prior to use, loop the wire rope lanyard, which is connected to the HP hose, around the base of air cylinder valve, to prevent hose whip.

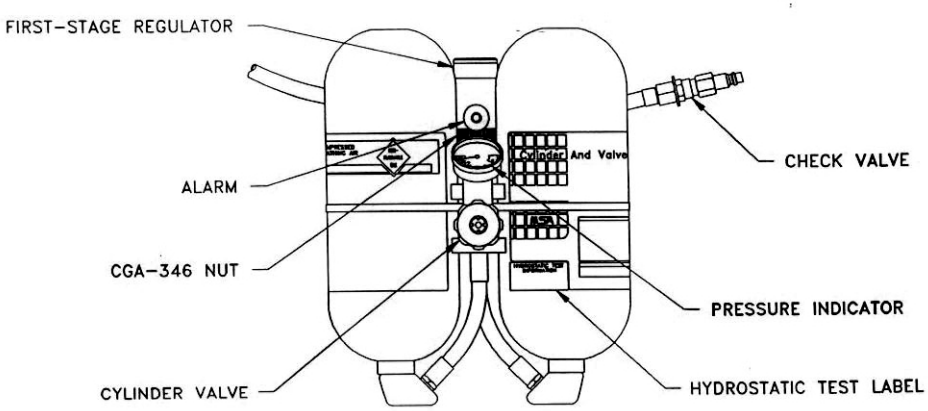
SAR/SCBA

- Reserve Air Supply Pack (RASP)
  - Two HP air cylinders



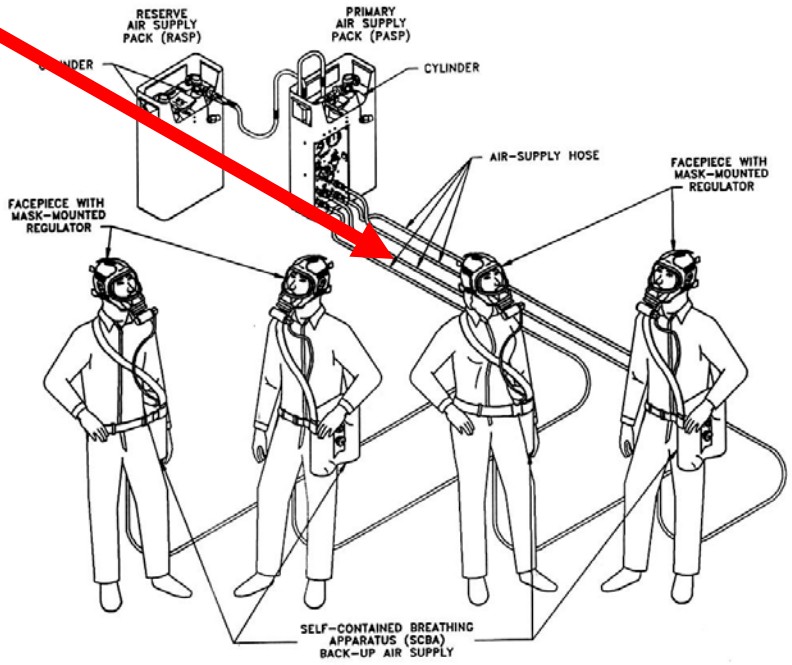
SAR/SCBA

- Backup Self Contained Breathing Apparatus (SCBA)
  - 2 air cylinders containing a total of 26.8 scf of air at 3000 psig. This will support the user for approximately 15 minutes.
  - LP alarm set at 700 psi.



SAR/SCBA

- LP air supply hoses
  - Each hose is 75 feet long



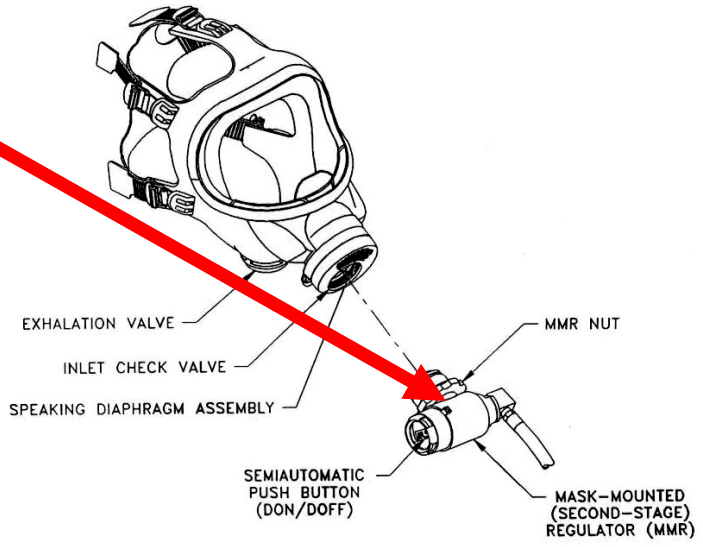
SAR/SCBA

WARNING: DO NOT ENTER CONTAMINATED ATMOSPHERE USING ONLY BACKUP SCBA AIR CYLINDERS.

NOTE: The backup SCBA is for emergency escape only, If backup SCBA is required to be used, the wearer must evacuate the space to fresh air.

SAR/SCBA

- Mask-Mounted Regulator (MMR)
  - Reduces air pressure from 60-80 psig to a breathable level.



SAR/SCBA

- Ship Set
  - 2 PASP's
  - 5 RASP's
  - 8 backup SCBA's (each with one 75 ft LP air hose).
  - 4 Canvas Bags (excess hose storage for 2 hoses each).

SAR/SCBA

- Equipment Limitations
  - Ambient temperature for use:
    - Max. 212 degrees F
    - Min. -25 degrees F
  - Ambient temperature for storage
    - 150 degrees F
    - 0 degrees F Max.
  - Hose Length: 300 feet (4 hoses) to each user.

Confined Space/Gas Free Communication Equipment

CON-SPACE
COMMUNICATIONS LTD.

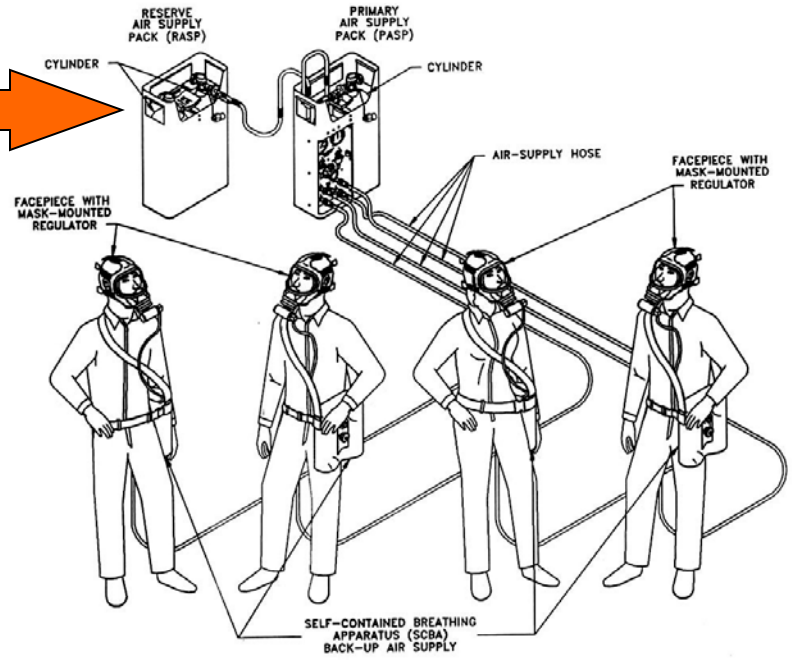
Safety in Communication®

Con-Space

- Provided for safe and reliable means of hard line communication for personnel entering into confined space and hazardous areas.

Con-Space

- Con-Space can be used in conjunction with the SAR/SCBA



Con-Space

- All CON-SPACE Communications Systems are Intrinsically Safe Approved by Factory Mutual for use in all Hazardous Environments.

Why Hardline Communications?

- Handsfree
- No garbled messages
- Uninterrupted two way communications
- Not affected by RFI or EMI
- Will not affect Gas Detectors or other sensitive equipment
- Not subject to dead spots
- Works in all shielded areas
- Use with existing SAR/SCBA
- Continuous entrant monitoring

Con-Space Applications

- Tank Entry
- Fuel Cell
- Void Spaces
- Cofferdams
- Ballast Tanks
- Hydro and Sandblasting
- Corrosion Control and Inspection
- Facilities Engineering
- Rescue

Con-Space Benefits

- Reduce down time
- Reduce accident rate
- Increase productivity
- Minimal personnel training
- Effective communications while wearing Breathing Apparatus
- Effective communication in High Noise Environments
- Will not cause an explosion
- Does away with shouting, hand signals, tapping and rope tugs

CON-SPACE Kit Components

Description	Justification and Approval Number	Part Number
Navy SAR/Gas Free Communication System	99-006	0105-01-001

ITEM	QTY	DESCRIPTION
A	1	CSI-1100 Communication Module
B	1	Single Sided Headset
C	1	Cable Splitter
D	2	Face Mask Comm Sets w/Speaker
E	2	Speaker Harnesses
F	2	75’ Cables With Cable Strain Relief
G	1	10’ Operator Extension Cable
H	1	50’ Cable
I	1	CSI-2130 Talk Box
J	2	Spiral Cable Wrap
K	1	CSI-1000 System Hard Case

This system configuration is referenced in US Navy Justification and Approval # 99-006

Note: The mask is not included with the system

CSI-1100 Communications Module Basic Operation

- Allows an Attendant to effectively communicate with multiple Entrants
- Powered by 4 Alkaline ‘AA’ Batteries.

CSI-1100 Communications Module Basic Operation

- Allows an Attendant to effectively communicate with multiple Entrants
- Powered by 4 Alkaline ‘AA’ Batteries.
- Batteries last approximately 200 hours

CSI-1100 Communications Module Basic Operation

- Has a low battery warning beep that is heard in the operators headset.

CSI-1100 Communications Module Basic Operation

- Has a low battery warning beep that is heard in the operators headset.
- Once the beeping starts the system will operate for at least **12 hours**.

CSI-1100 Communications Module Basic Operation

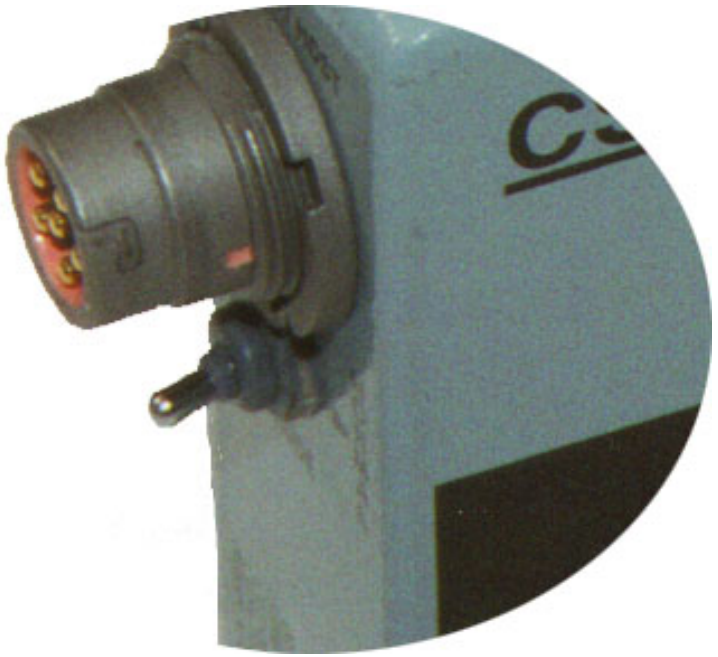
- Individual Volume Controls for the Attendant and Entrant Ports
- The Attendant Volume Control is used to turn the Module ‘ON’ and ‘OFF’

CSI-1100 Communications Module Basic Operation

- To connect cables and accessories to the system simply line up the red marks on the connectors, push and twist to connect the Stainless Steel waterproof MIL SPEC Connectors.

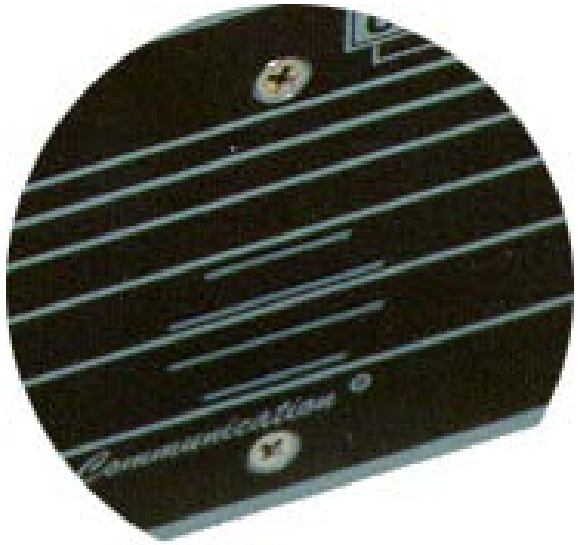
CSI-1100 Communications Module Basic Operation

- Ensure that the Mode Switch, located under the Entrant Port, is set correctly. Either to ‘NORMAL’ for use with Comm Sets or ‘TALK BOX’ for use with the Talk Box.



CSI-1100 Communications Module Basic Operation

- The CSI-1100 has an integral Alarm Sounder that can be activated by an Entrant in the event that the attendant temporarily removes his or her headset.



Attendant Head Set

- The Attendant Headset is a Rugged MIL SPEC Single Sided Headset with an adjustable boom mounted microphone.

Attendant Head Set

- The Boom Mic should be positioned 1/4” - 1/2” from the Attendants mouth

Face Mask Comm Set

- Offers the Entrant clear voice communication while wearing Breathing Apparatus, SAR/SCBA Systems or Respirators.

Face Mask Comm Set

- For best performance the Throat Mic Strap should be fit to make good contact with the skin.
- The element should be positioned to the left or right of your ‘Adams Apple’.

Face Mask Comm Set

- The Universal Speaker is installed by attaching the loop of Velcro around the Spider of the Face Mask and then tucking the speaker between the strap and your ear.

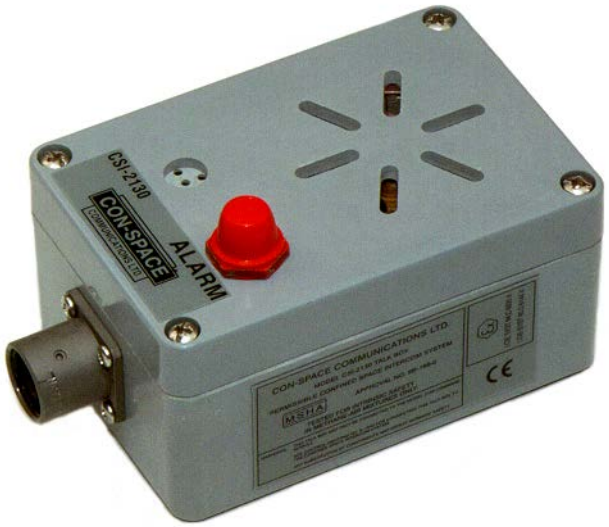
Face Mask Comm Set

- In the event that the Entrant does not have to wear Respiratory Protection the Head Harness is used to hold the Universal Speaker securely and comfortably in place over the ear.

Face Mask Comm Set

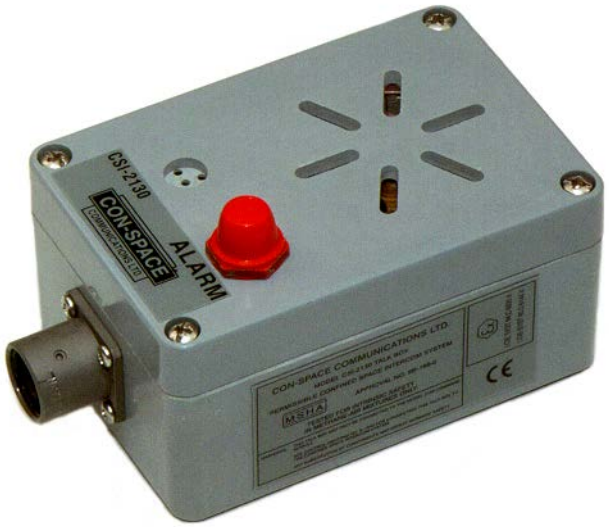
- The red button located on all of the communication accessories is used to activate the Alarm on the CSI-1100 Module.
- Simply push to activate, push to deactivate.

Talk Box



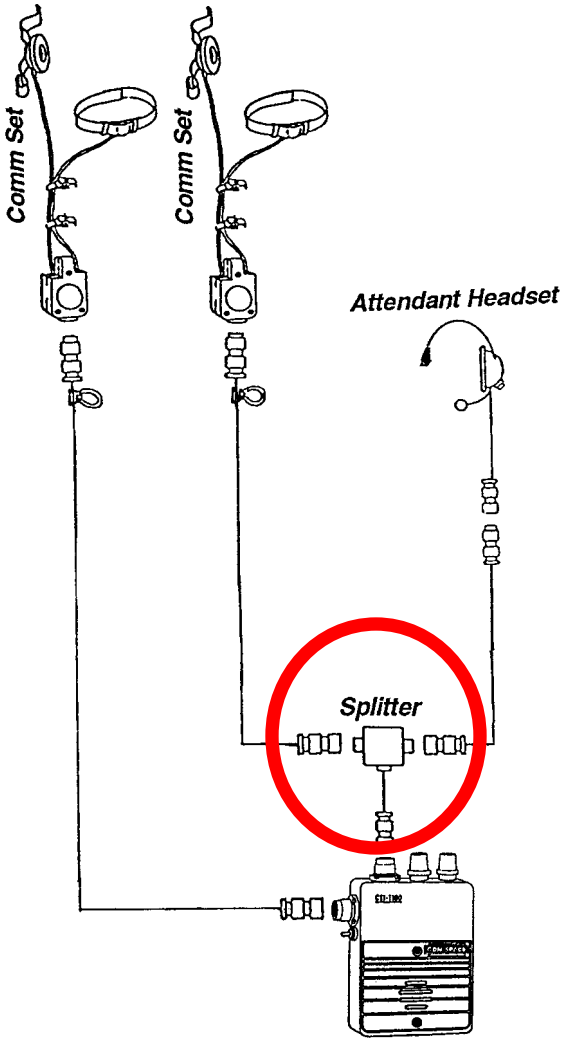
- It is a Speaker and Microphone that can be placed inside the confined space for easy monitoring of entrants.

Talk Box



- It is a Speaker and Microphone that can be placed inside the confined space for easy monitoring of entrants.
- The Talk Box Accessory is best used in Low Noise Environments where the entrants do not require respiratory protection.

Cable Splitter

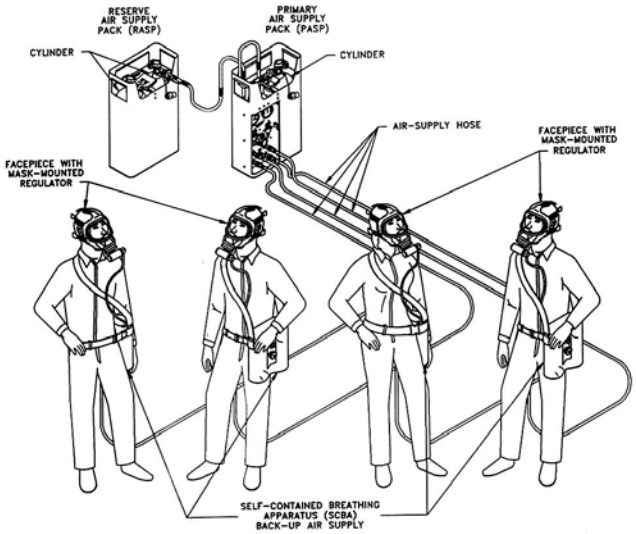


- Expands the CSI-1100 Module to accommodate one additional user for a maximum of three

Cables with strain relief and snap hook

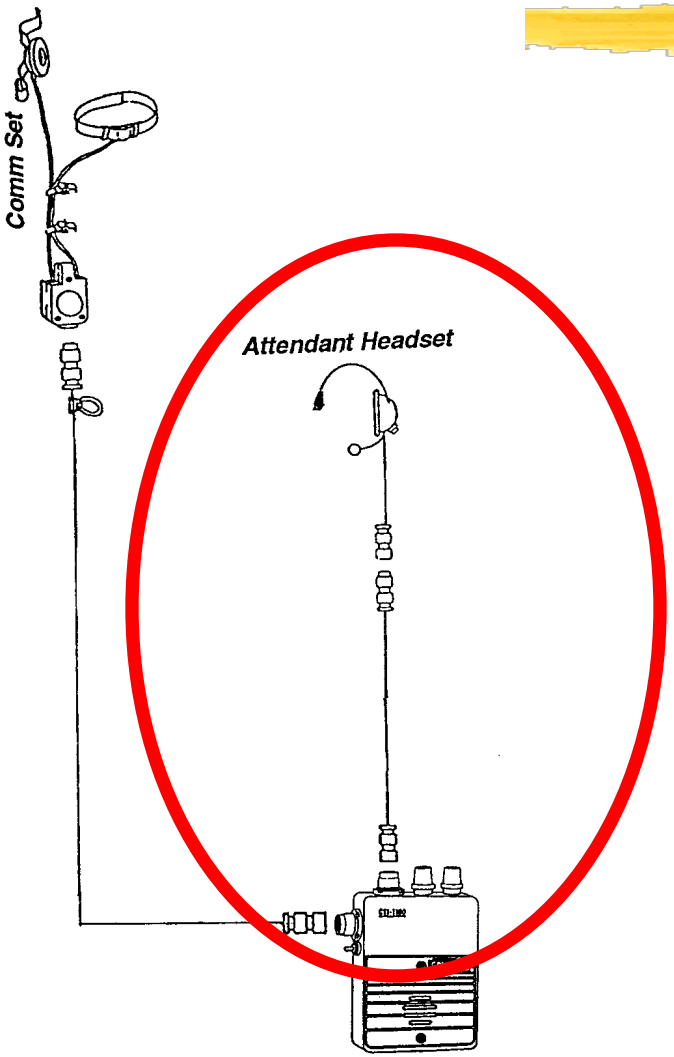
- Communication cable length matches the 75' breathing air hoses that come standard with the SAR/SCBA

Cables with strain relief and snap hook



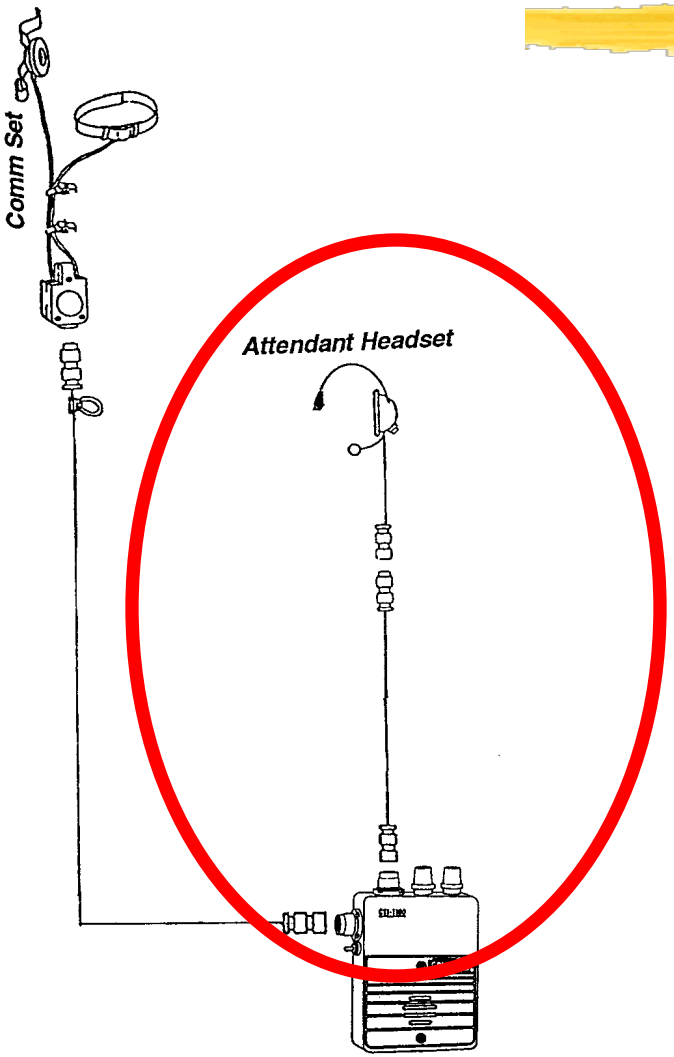
- These cables can be joined together with the SAR/SCBA to create an umbilical.

10' Operator Extension Cable with heavy duty clip



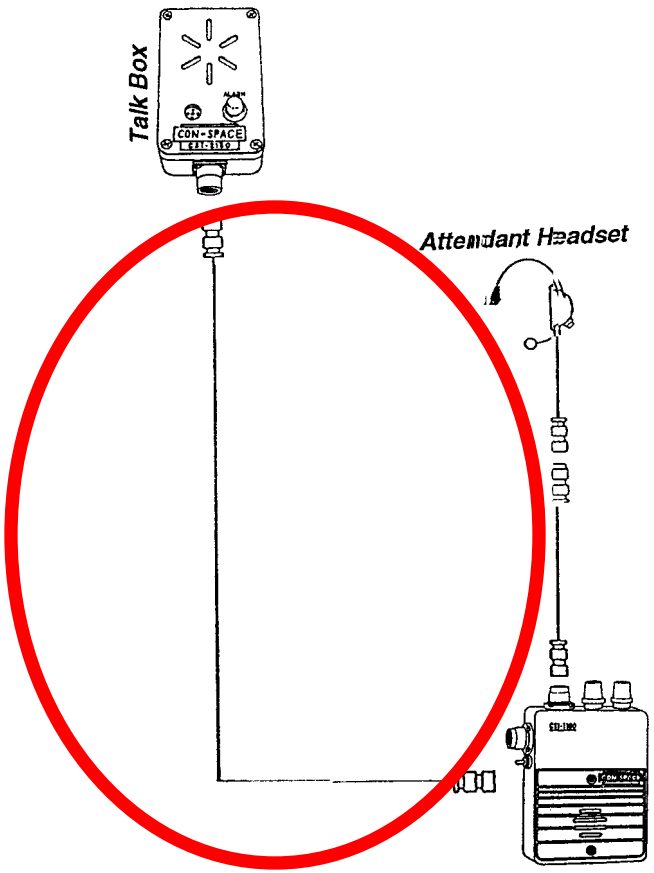
- Attaches between the attendant headset and the CSI-1100 Communications Module

10' Operator Extension Cable with heavy duty clip



- Attaches between the attendant headset and the CSI-1100 Communications Module
- This cable gives the Attendant room to move around and allows the CSI-1100 to remain attached to the SAR unit.

50' Cable



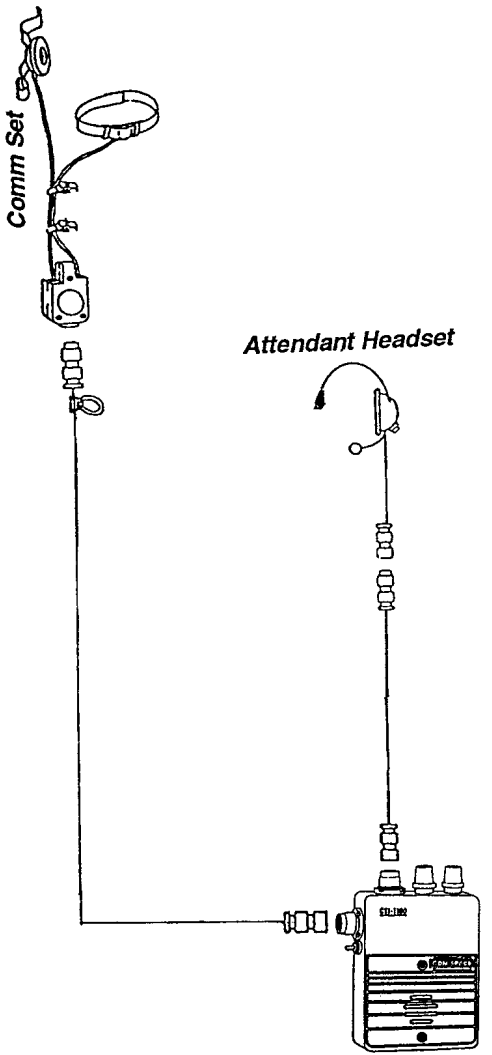
- This cable is included to allow the Talk Box to be dropped into a low noise, vented space and to have a cable available that is not attached to the SAR/SCBA airline

Cable/Hose Wrap

- Nylon spiral wrap is used to join the breathing air hose and the communication cable together as a single umbilical

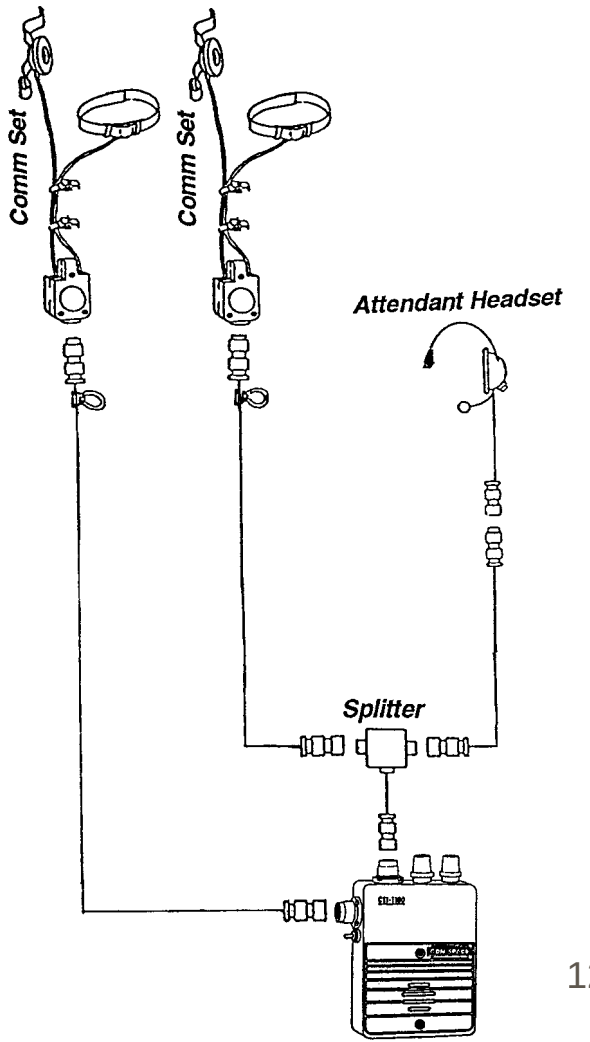
CON-SPACE Configuration with Single Entrant

- This configuration allows a Safety Attendant to monitor a single entrant in a Confined Space.



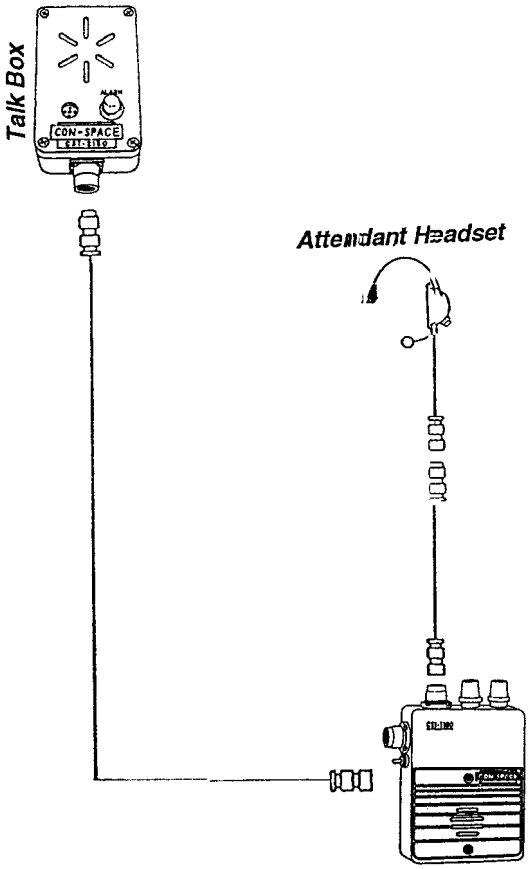
CON-SPACE Configuration with Two Entrants

- By connecting the Cable Splitter to the Attendant Port on the CSI-1100 an additional entrant can be added to the system, all three people can now communicate on this full duplex system.



CON-SPACE Configuration with Talk Box

- With the Talk Box connected to the Entrant Port and the Mode Switch in the TALK BOX position an Attendant can monitor several entrants in a Low Noise Confined Space.

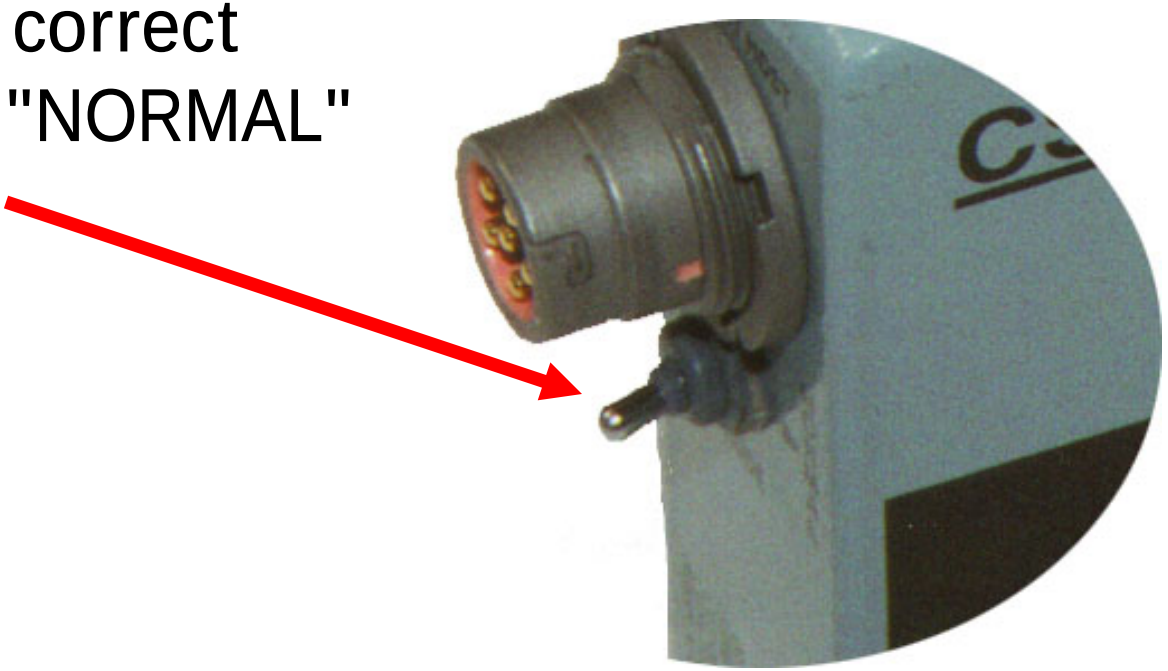


Operation

- Turn the volume control switch to the "ON" position on the CSI-1100 module

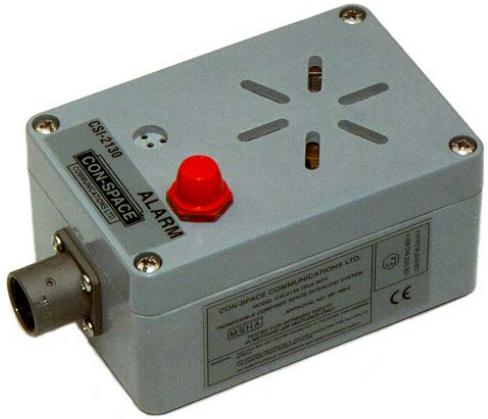
Operation

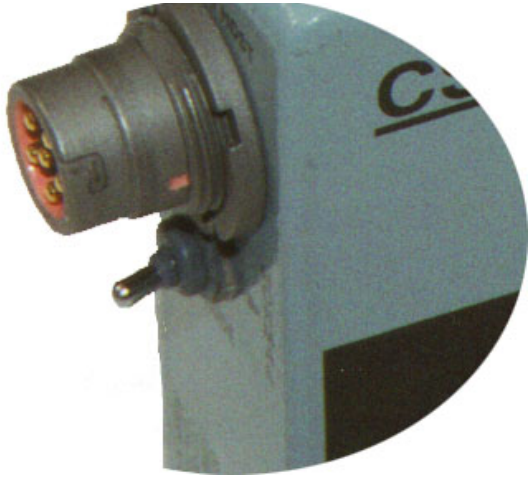
- Ensure that the Mode Switch is in the correct position, either "NORMAL" or "TALK BOX"



Operation

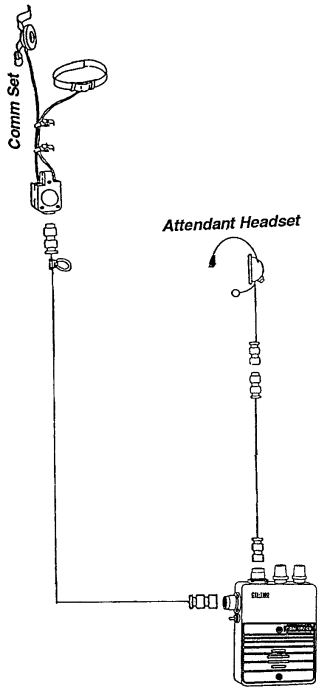
- When using the Talk Box ensure that the Mode Switch is set to "TALK BOX", the entrant volume is set to maximum and the Attendant microphone is properly positioned.

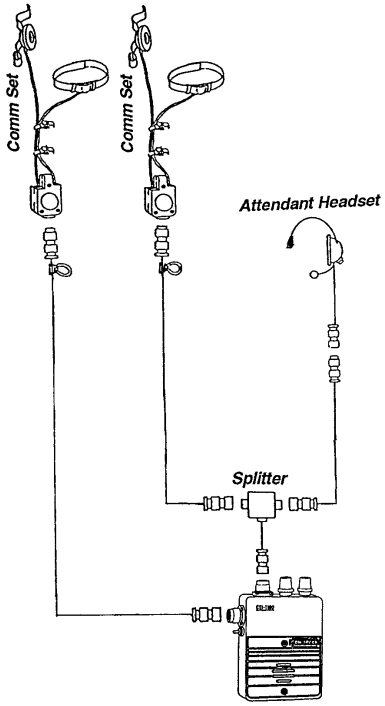


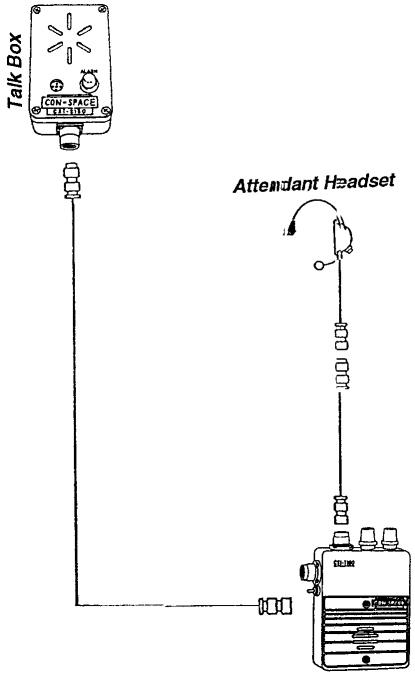


Operation

- Make sure accessories and cables are properly connected to the communications module





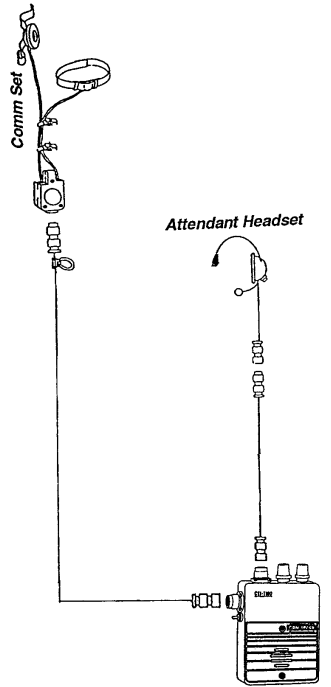


Operation

- All microphones and speakers are positioned for optimum comfort and output signal.

Operation

- Check that there is full two-way communication with each entrant (adjust volume levels)



Operation

- Check that each Red Alarm Button activates the Emergency Alarm (Click "ON" and "OFF").

Operation

- After use ensure the Communications Module is turned off, all cables are disconnected, and all components and accessories are put away in the System carry case.

Con-Space Web site

Confined Space? - Microsoft Internet Explorer

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Address http://www.con-space.com/confined_space/frameset_confined_space.html

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FEEDBACK & LITERATURE

Confined Space

http://www.con-space.com

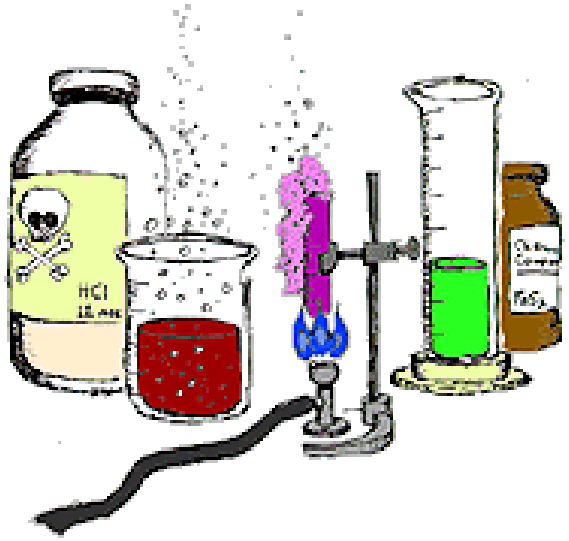
What is a Confined Space?

Definition: Confined Space n. a space large enough and so configured that a person can bodily enter to perform assigned work; has limited or restricted means for entry or exit; is not designed for continuous occupancy. May contain or have the potential to contain, a hazardous atmosphere; has an internal

REVIEW AND SUMMARY

Review and Summary

- Gases, solvents, and fuels

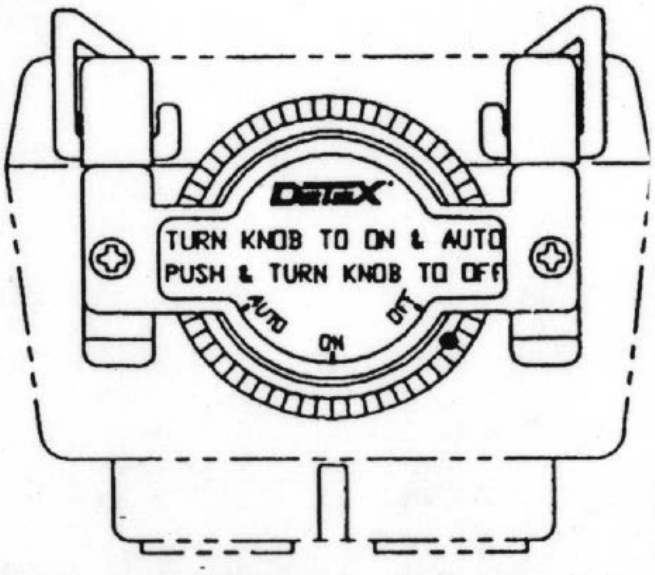


Review and Summary

- Protective clothing

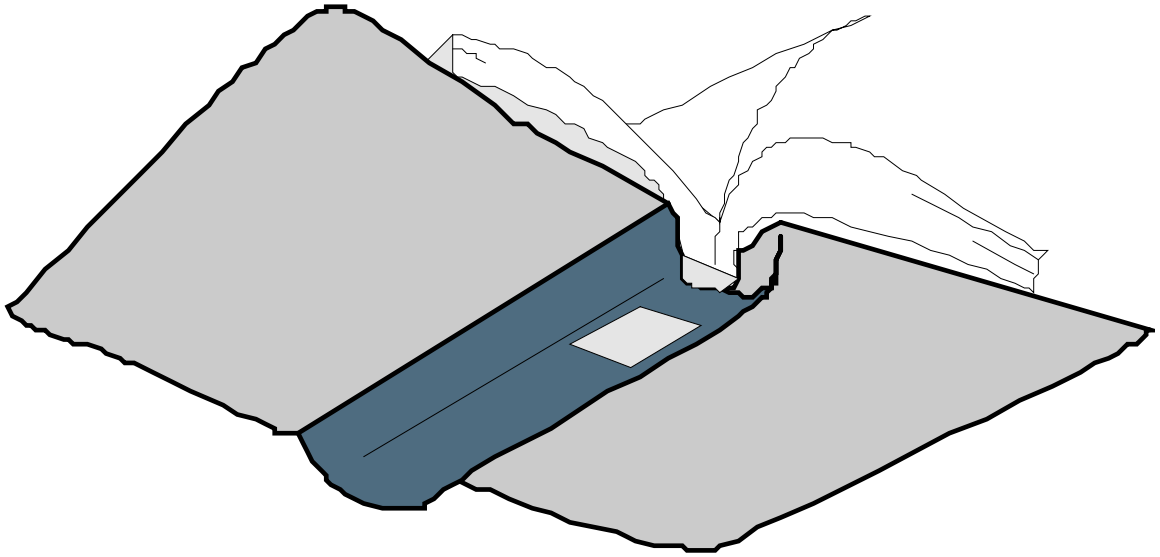
Review and Summary

- Personal Alert Safety System (PASS)



Review and Summary

- Respiratory Protection Program

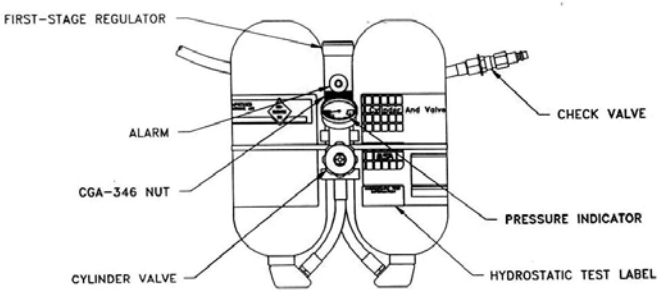


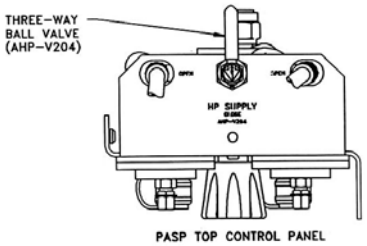
Review and Summary

- Air-purifying devices

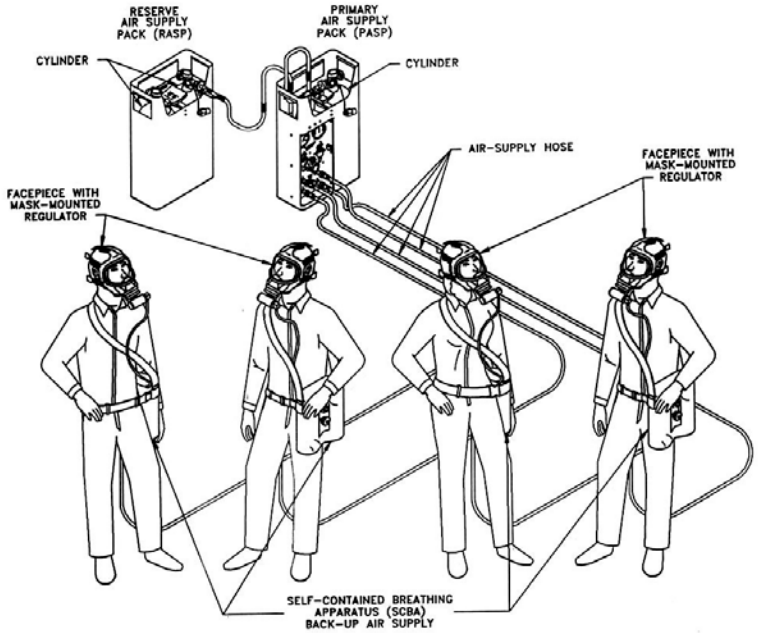
Review and Summary

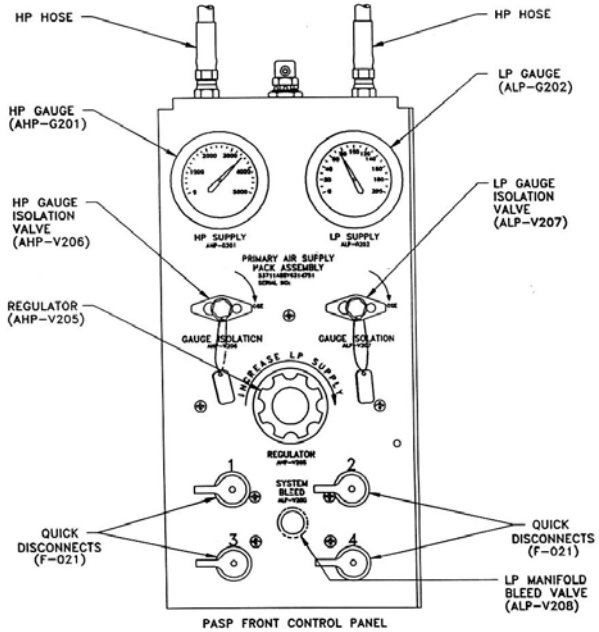
- SAR/SCBA





PASP TOP CONTROL PANEL





PASP FRONT CONTROL PANEL

Review and Summary

- Con-Space


THE END