LOS ANGELES COUNTY
FIRE DEPARTMENT
CONTEXT TRAINING PROGRAM

SELF CONTAINED BREATHING
APPARATUS
1. **General Information**

**BREATHING APPARATUS**

**SURVIVAIR PANTHER SCBA**
*For use with all front-line apparatus*

**SURVIVAIR MARK 2 SCBA**
*For use with all reserve apparatus*

To properly utilize the SCBA protective devices, all Firefighters must be thoroughly trained and have frequent drills on the use and care of Self-Contained Breathing Apparatus. They must have an understanding of when to use the equipment and what limitations might be expected. **Individual components which make up SCBA’S are:**

<table>
<thead>
<tr>
<th>Panther SCBA</th>
<th>Mark II SCBA</th>
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</thead>
<tbody>
<tr>
<td>1. Backpack and harness frame</td>
<td>Backpack and harness.</td>
</tr>
<tr>
<td>2. Air cylinder</td>
<td>Air cylinder and gauge.</td>
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<tr>
<td>3. First stage regulator and hose</td>
<td>First stage regulator/audio alarm.</td>
</tr>
<tr>
<td>5. Second stage regulator</td>
<td>Second stage regulator/pressure gauge/bypass valve.</td>
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<tr>
<td>6. Facepiece</td>
<td>Low-pressure inhalation tube.</td>
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<td>7. Voice Projection Unit</td>
<td>Face piece.</td>
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<tr>
<td>8. Integrated PASS Device</td>
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</table>

The air cylinder is constructed of lightweight aluminum with a fiberglass over-wrap. It has a capacity of 45 cu. ft. for 30-minute cylinders and 87 cu. ft. for 60-minute cylinders at 4500 psi (4.5) and weighs 16 and 25 lbs. respectively when fully charged. The air cylinder will generally furnish compressed air to the wearer for a period of 10 to 30 minutes depending on the workload. When pressure falls below 4000 psi, the bottle should be exchanged with a fully charged cylinder. A hydrostatic test is to be conducted on air cylinders every 3 years.

The first stage regulator assembly combines the pressure regulator reducer and the audio low air alarm mechanism. The pressure regulator reducer receives air from the cylinder and reduces it to 100 psi and 120 psi for the Panther and Mark II respectively. The audio low air alarm mechanism begins ringing when the remaining air in the cylinder is approximately 900 to 1125 psi. This leaves approximately 5 minutes of air remaining in the cylinder indicating that the Firefighter must exit to a safe environment. A high-pressure hose supplies the Gauge/Low Air Warning Light on the right shoulder.
SELF CONTAINED BREATHING APPARATUS

The Panther SCBA has a Gauge/Low Pressure Warning Light assembly attached to the right shoulder strap. The assembly is protected by a rubber cover, and may be swiveled 360 degrees for easy viewing, or turned inward to protect the gauge lens. The gauge is luminescent for low light viewing and indicates the quantity of air remaining in the air cylinder once the air cylinder valve is opened. Air pressure is illustrated from full “F” to empty “E” using quarter increments “¼ ½ ¾” similar to a fuel gauge on a vehicle. *The red low air warning light activates when the remaining air pressure drops to approximately 900 and 1125 psi.*

The intermediate pressure hose connects the first stage regulator to the second stage regulator.

With the Panther SCBA, the second stage regulator is attached to the facepiece employing the air klic system. This system allows the regulator to lock in place, in any orientation, when pushed into the air klic port on the facepiece. The second stage regulator is activated by the First Breath On mechanism or by the manual override button on the front of the regulator. To disengage the regulator from the facepiece two steps need to be followed. First, press the black rectangular shut-off button on the regulator to stop the air supply. Second, depress both opposing blue release buttons and pull the regulator from the facepiece. The second stage regulator is capable of supplying the user in excess 350 liters per minute of breathing air. The large red knob on the regulator controls the adjustable bypass valve. Turning the bypass valve knob counterclockwise provides a constant flow of breathing air. The bypass valve is intended for emergency use only to supply breathing air should regulator failure occur. The bypass valve is capable for supplying a maximum of 130 liters per minute of breathing air. When not in use the regulator should be stored in the regulator belt clip located on the left waist strap. The second stage regulator supplies breathing air via an 18-inch intermediate pressure hose with a male quick connect fitting. The male fitting attaches to the dual quick connect fitting attached to the left shoulder.

With the Mark II SCBA, the second stage regulator maintains a slight positive pressure (greater than atmospheric pressure 1/3 psi) within the face piece during normal operation. The regulator will flow a maximum of 400 liters per minute. The second stage regulator case is surrounded by a large, red, ribbed ring which controls the bypass valve. Turning the ring 1/8 turn clockwise (from the user’s viewpoint) initiates full bypass flow, which is limited to 130 liters per minute.

The face piece is equipped with a spring loaded exhalation valve that is designed to maintain a positive pressure in the face piece at all times. The face piece has a speaking diaphragm and the face shield has anti-fog and anti-scratch coatings.
2. **DAILY INSPECTION**

Panther and Mark II SCBAs shall be visually inspected at the beginning of each duty day and after each use. After completing the inspection, initial and note the air cylinder pressure on the appropriate Form-20. Each component should be inspected for visual damage. Check to make sure a fully charged air bottle is in place and that the face piece is intact and ready for use.

3. **WEEKLY INSPECTION**

The weekly inspection of the breathing apparatus shall include all the requirements of the daily inspection and include the Facepiece Leak Test, the SCBA Leak and Audible Alarm Test, and the SCBA Function Test.

4. **CLEANING AND SANITIZING**

All SCBAs shall be cleaned and sanitized after each use. Always remove the Voice Projection Unit and Second Stage Regulator prior to rinsing or immersing the facepiece in water, cleaning solution, or disinfecting solution.

The **face piece** shall be **cleaned** by making a cleaning solution of warm (110 degrees F maximum) water and mild soap or Simple Green D. Immerse the facepiece top first in the solution until the exhalation valve is covered. Agitate the facepiece and gently clean with a soft brush if necessary. Thoroughly rinse the facepiece in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the exhalation valve.

The **face piece** shall be **sanitized** by making a hypochlorite disinfecting solution of 2 tablespoons of chlorine bleach per gallon of warm (110 degrees F maximum) water. Immerse the facepiece top first in the solution until the exhalation valve is covered. Soak the facepiece for 2 to 3 minutes. Thoroughly rinse the facepiece in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the exhalation valve. Allow the facepiece to drip dry. A clean lint free cloth may be used to dry exterior surfaces. **Do not use compressed air at any time.**

The **second stage regulator** is **cleaned** by following manual guidelines and always holding the regulator with the outlet tube facing downward and the protective cleaning cap installed during washing and rinsing. Dirt or soap residue could degrade regulator performance. **Do not submerge regulator in water or cleaning solution. Do not allow water to enter the intermediate pressure hose at the male quick connect fitting.**

The **backpack harness assembly** is **cleaned** by using only a damp cloth when possible. If more extensive cleaning is required, make a cleaning solution of warm (110 degrees F maximum) water and a mild soap.
5. **REPAIR PROCEDURE**

If any damage, deterioration, or malfunction of the SCBA or individual component of the unit is found, the entire SCBA, minus the air cylinder and Form 20, shall be sent for repair to the Breathing Apparatus Repair Shop at the Pacoima Warehouse. The 47 and the tag shall list the problem and/or the needed repairs. SEE "SAFETY"

6. **THREE METHODS OF DONNING BCBA**

The three methods of donning a SCBA are the Sling, the Overhead and the Cross Hand Method.

7. **DONNING FACE PIECE**

With the Panther SCBA, there is only one type of face piece harness. It is comprised of a 5 point adjustable head strap, nose cup, voice projection unit, exhalation valve and air klic port.

With the Mark II SCBA, there are two types of face piece harnesses, the 4-strap harness and the 5-strap harness.

8. **DONNING THE SELF-CONTAINED BREATHING APPARATUS (SCBA)**

   a. Prepare to don the S.C.B.A.
   b. Open the cylinder on the S.C.B.A.
   c. Don S.C.B.A., adjust all straps and close the snap hook over waist strap "D" ring.
   d. Loosen the chin strap on the helmet and move the helmet to the rear.
   e. Don the face piece and use the 10-second seal check.
   f. Don the protective hood.
   g. Don and secure helmet.
   h. Don gloves, signal when completed.
   i. Record the time in seconds.
   j. All personnel shall be able to correctly don a Panther SCBA within 75 seconds.
9. **SAFETY**

a. On any emergency incident where an injury occurs because of S.C.B.A. failure, the **ENTIRE** unit SHALL be kept together and tagged at the emergency scene. The unit will be thoroughly investigated.

b. The face piece shall be kept in a canvas bag to protect it from scratches and prevent debris from entering.

c. The wearing of corrective lenses are:

   1. Specifically prohibited when *hard non-permeable* contact lenses are used while utilizing a self-contained breathing apparatus.

   2. *Approved when permeable contact lenses are used while utilizing a self-contained breathing apparatus.*

   3. *Prohibited if the temple bars on eyeglasses pass through or interfere with the face piece seal.*

d. Do not wear regular glasses while wearing the SCBA **WEAR THE APPROVED GLASSES KIT.** *(SEE THE ATTACHED E.P.)*

e. Do not use "Green soap" in the cleaning of the SCBA except as noted for the Panther SCBA facepiece cleaning procedure.

f. *Air Cylinders shall not be filled without the proper hydrostatic test identification markings.* The hydrostatic test date **shall** be checked prior to filling each air cylinder. Any air cylinder found to be out of hydrostatic date (every 3 years) shall be immediately removed from service, tagged, and sent to be hydrostatic tested.

g. The use of self-contained breathing apparatus for water rescue incidents is **PROHIBITED.**

h. *Should a fire fighter find himself or herself trapped underwater, maneuver to a horizontal face-up position.* This orientation can trigger the SCBA to operate in a pressure demand mode extending the users available air supply.

i. The use of self-contained breathing apparatus does not offer complete protection in atmospheres containing gases or vapors that are absorbed through the skin, i.e., Hydrocyanic Acid (Hydrogen Cyanide) Methyl Bromide. **Do not enter these atmospheres until thoroughly ventilated and approved by hazardous materials personnel.**

**ADDITIONAL INFORMATION: REFER TO VOL. 4, CHAP. 7 SUBJ. 1**
COUNTY OF LOS ANGELES FIRE DEPARTMENT
SELF CONTAINED BREATHING APPARATUS
RATERS ASSESSMENT QUESTIONS

1. The three methods used to don breathing apparatus are:
   a. Crosshand, Sling, and Overhand
   b. Overhand, Crosshand, and Overcoat
   c. Sling, Crosshand, and Overhead
   d. Crossfoot, Sling, and Elbows Tucked in

2. Breathing apparatus facepieces are cleaned and sanitized:
   a. Daily
   b. After each use
   c. Weekly
   d. Seldom

3. During the daily inspection of a breathing apparatus, it is determined that there is an internal leak in the first stage regulator. Who is authorized to make repairs?
   a. Factory authorized repairperson
   b. Engineer
   c. Person finding the leak
   d. Captain

4. All personnel shall inspect their assigned SCBA and initial the Form 20
   a. Daily
   b. Weekly
   c. Monthly
   d. None of the these answers

5. When cleaning the facepiece of a breathing apparatus, you shall use:
   a. Dishwasher soap and water
   b. Kerosene, and a clean rag
   c. Mild soap or Simple Green D and water
   d. Ammonia and water

6. SCBA air cylinders shall be hydrostatically tested once
   a. Every year
   b. Every three years
   c. Every five years
   d. Every ten years
7. All air cylinders intended for use with SCBAs have a maximum fill capacity of ______________.
   a. 3800 psi 
   b. 4000 psi 
   c. 4500 psi  
   d. 5000 psi 

8. The use of a SCBA to affect a water rescue is ____________________.
   a. OK in less 10 ft. of water 
   b. OK in less than 15 feet of water 
   c. OK in fresh water 
   d. Prohibited at all times 

9. A negative pressure facepiece test should be conducted by blocking the air inlet with the palm of hand, inhale, and hold seal for not less than:
   a. 3 Seconds 
   b. 5 Seconds 
   c. 7 Seconds 
   d. 9 Seconds 

10. Small continuous air leaks around the facepiece seal can cause "eddy currents." This can cause:
   a. Second stage regulator malfunction 
   b. Fogging of the facepiece lens 
   c. Hyperventilation 
   d. Contaminated air to enter the facepiece 

11. The Audible Low Air Warning Device on a SCBA will sound when the remaining pressure in the air cylinder reaches approximately ________ to ________ psi.
   a. 500 to 1000 
   b. 800 to 1250 
   c. 900 to 1125 
   d. 1000 to 1300 

12. When using a SCBA and the Audible Low Air Warning sounds, you should ______________.
   a. Tell your Captain 
   b. Get out 
   c. Find out what's wrong 
   d. Continue what you are doing
13. SCBAs needing repairs shall be tagged and sent to _________________.
   a. the Vendor
   b. the SCBA Shops at the Pacoima Warehouse
   c. the Fire Shops
   d. the Battalion SCBA Coordinator

14. The Emergency Bypass valve is intended to be used if the ________________ fail(s).
   a. First stage regulator
   b. First and second stage regulators
   c. Second stage regulator

15. A self-contained breathing apparatus with a full air cylinder will last the wearer:
   a. 30 minutes
   b. 20 minutes
   c. Duration of the fire
   d. Depends upon workload

16. Lubrication of a SCBA is accomplished using?
   a. WD40
   b. All-purpose grease
   c. No lubricants should be used
   d. Silicon grease

17. Opening the bypass valve while using a SCBA _____________________________.
   a. increases the amount of air to the wearer
   b. decreases the amount of air to the wearer
   c. supplies the same amount of air as normal operation
   d. bypasses the first stage regulator

18. To properly clean the backpack and harness assembly:
   a. Use mild soap and water, rinse thoroughly with clean water
   b. Use one part bleach to ten parts water and rinse thoroughly
   c. Use kerosene to clean the backpack and water to clean the harness
   d. The backpack and harness do not require cleaning
COUNTY OF LOS ANGELES FIRE DEPARTMENT
SELF CONTAINED BREATHING APPARATUS
RATERS ASSESSMENT QUESTIONS

19. Air cylinders shall be refilled when the pressure drops to ______ PSI.
   a. 4000
   b. 3800
   c. 3500
   d. 2800

20. The Panther SCBA requires ____________________ to operate the visual low air warning light on the gauge/alarm assembly.
   a. a nine volt battery
   b. one AA battery
   c. two ½ AA lithium batteries
   d. two AAA batteries
DONNING SELF CONTAINED BREATHING APPARATUS

NAME_________________________EMP#__________DATE________

WORK LOCATION BN___STATION_______SHIFT___________________

OBJECTIVE: 1. To don Self Contained Breathing Apparatus in a safe, efficient manner, following Department procedures.

2. To answer general information questions about the PASS unit and the S.C.B.A.

3. To record the time taken to the S.C.B.A.

EQUIPMENT: Chair, PASS unit (separate PASS unit needed only if using a Mark II SCBA) and a S.C.B.A.

DESCRIPTION OF EVOLUTION:

Given: Wearing Departmental work uniform, Personal Safety Equipment with PASS unit (necessary only if using a Mark II SCBA) and a Self Contained Breathing Apparatus ready to don. This equipment will be arranged in front of member.

1. Answer general questions about the PASS unit and the Self Contained Breathing Apparatus.

2. Rater signals member to don a Self Contained Breathing Apparatus.

3. Assessment stops when member signals task is completed.

4. The rater shall informally record the time on a separate piece of paper without recording the name of the Firefighter being assessed.

RATER__________________________________________
INDIVIDUALS NOT MEETING THE INDIVIDUAL SKILLS STANDARD WILL REQUIRE ADDITIONAL TRAINING IN THAT SKILL.

<table>
<thead>
<tr>
<th>ASSESSMENT AREAS:</th>
<th>YES</th>
<th>NO</th>
<th>COMMENTS:</th>
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<tbody>
<tr>
<td>1. Answers questions about the S.C.B.A.</td>
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<td>2. Remove breathing apparatus from mounting.</td>
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<td>3. Open the air cylinder valve fully assuring the valve handle locking sleeve is engaged.</td>
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<td>4. If the second stage regulator is flowing air, close the red by-pass valve and depress the manual shut-off button.</td>
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<td>5. Position the SCBA with the harness facing the wearer, air cylinder valve away from the body, and the harness straps spread to each side.</td>
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<td>6. Using the Overhead, Sling, or Crosshand Method, don the SCBA and pull the harness adjustment straps until the back support rests in the small of the back.</td>
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<td>7. Fasten and adjust the waist belt buckle.</td>
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<td>8. Readjust the shoulder harness straps so that the weight of the SCBA is distributed properly on the hips.</td>
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<tr>
<td>9. Don face piece and use 10 the second seal check.</td>
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INDIVIDUALS NOT MEETING THE INDIVIDUAL SKILLS STANDARD WILL REQUIRE ADDITIONAL TRAINING IN THAT SKILL.

<table>
<thead>
<tr>
<th>INDIVIDUAL HAS MET THE STANDARD:</th>
<th>YES</th>
<th>NO</th>
<th>COMMENTS:</th>
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**ASSESSMENT AREAS:**

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<tr>
<td>10.</td>
<td>Remove the second stage regulator from the waist strap and insert the regulator into the air klic on the facepiece.</td>
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<tr>
<td>11.</td>
<td>Don protective hood.</td>
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<tr>
<td>12.</td>
<td>Don and secure helmet.</td>
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<tr>
<td>13.</td>
<td>Don gloves, signal completed.</td>
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**RATER**

______________________________
PERSONAL ALERT SAFETY SYSTEM
1. **General Information**

**INTEGRATED PASS DEVICE**
**WITH SURVIVAIR PANTHER SCBA**
*For use with all front-line apparatus*

The integrated PASS device attaches to the dual quick connect fitting on the left shoulder strap. Opening the air cylinder valve arms the PASS device as air pressurizes the intermediate pressure hose. The PASS can be manually armed by one click of the manual on/off switch.

An ascending tone and green flashing LED lights indicate activation.

Lack of movement will start the staged alarm in approximately 20 seconds. The LED lights will alternate flashing green and red. The alarm will increase in volume approximately every 5 seconds until full alert at 30 to 40 seconds. In full alert, the LED lights flash red.

The PASS device can be manually triggered to full alert by depressing and holding the on/off switch for 2 to 3 seconds. Once the PASS reaches full alert, it can only be turned off by 2 slow and deliberate clicks of the on/off switch. Shutoff is indicated by a descending tone.

The manual on/off switch is protected by a raised edge to minimize accidental activation.

The PASS device is powered by a 9-volt battery. When battery voltage is low, the PASS will emit a single tone every 20 seconds and the amber low battery light will blink. The battery can be replaced using a Phillips screwdriver; care should be taken to properly seat the O-ring that seals the battery compartment.
PERSONAL ALERT SAFETY SYSTEM (PASS)

SURVIVAIR PANTHER SELF-CONTAINED BREATHING APPARATUS: INSPECTION, TESTING, CLEANING AND SANITIZING

1. DAILY INSPECTION: Panther SCBAs shall be visually inspected at the beginning of each duty day and after each use. After completing the inspection, initial and note the air cylinder pressure on the appropriate Form-20

   a) PASS DEVICE: Inspect the PASS Device for cracks or damage. Ensure that the unit is securely attached to the dual quick connect fitting. Manually activate the PASS, note the ascending tone and green flashing LED lights. Allow the PASS to cycle to full alert; the LED lights should flash green and red as the alert tone increases in volume. At full alert the LED lights should flash red. Turn off PASS device.

2. WEEKLY TEST: The weekly tests shall include all requirements of the daily inspection and include the following:

   a) SCBA Leak and Audible Alarm Test

      1. Allow the PASS to cycle to full alert; the LED lights should flash green and red as the alert tone increases in volume. At full alert the LED lights should flash red.

      2. Manually click the on/off button twice to turn the PASS device off.

S survivair Mark 2 SCBA
For use with all reserve apparatus

The Personal Alert Safety System (PASS) is equipped with a three-position control switch.

1. “Auto” or Automatic Mode shall be utilized when engaged in emergency operations per Department Policy.

   a. Actively engaged in structural fire fighting, hazardous material incidents, confined spaces or similar dangerous operations.

   b. Actively engaged in "over the side" rescue operations, where rescuer is out of sight of potential help.

   c. Commanding officer determines that it is necessary for personnel safety.

   d. In this operating position if the wearer is incapacitated and/or remains motionless, the alarm signal will sound within 20 to 50 seconds.
2. “On Mode” shall be utilized by the wearer to summon assistance (help).

3. “Off Mode” shall be used for storage.

4. Inspection
   a. Inspection shall be done daily and after severe or long duration usage.
   b. Ensure watertight integrity of the case
      1. No cracks
      2. No cuts
      3. No splits
   c. Evidence of exposure to heat:
      1. Warping or cracking
      2. Discoloring
      3. Blistering
   d. Ensure that the battery cover is tight.

3. Testing
   a. “ON Mode” listening for a momentary operational signal.
   b. “Auto Model” (the light in the front will flash). Allow the PASS to remain motionless until the unit cycles through the pre-alert signal and the alarm becomes fully active.
      1. “Low battery” will be indicated in this mode.
      2. The PASS will function as designed for approximately one (1) hour after low battery warning is initially noted.

4. Maintenance
   a. Clean with mild detergent, rinse well and dry with paper or cloth towels.
   b. To replace battery, remove small cover on back, install new battery, replace cover (ensure gasket is in place), and secure screws.

Additional Information
Refer to Volume 4, Chapter 7, Subject 2 for information about the PASS unit.
1. WHEN IS THE P.A.S.S. UNIT INSPECTED AND TESTED?
   A. DAILY AND AFTER SEVERE OR PROLONGED USE.

2. WHAT ARE THE THREE POSITIONS ON THE CONTROL SWITCH OF THE P.A.S.S. UNIT?
   A. OFF, ON AND AUTO

3. WHAT POSITION ON THE CONTROL SWITCH CAN BE USED TO SUMMON ASSISTANCE (HELP)?
   A. "ON" POSITION

4. WHAT POSITION ON THE CONTROL SWITCH IS USED WHEN WORKING HAZARDOUS MATERIALS INCIDENT?
   A. "AUTO" POSITION

5. HOW ARE P.A.S.S. UNITS CLEANED?
   A. WASH IN MILD DETERGENT AND DRY WITH PAPER OR CLOTH TOWEL.

6. WHERE ARE SPARE P.A.S.S. UNITS KEPT IN YOUR BATTALION?
   A. BATTALION HEADQUARTERS

7. WHERE ARE P.A.S.S. UNITS SENT FOR MAINTENANCE?
   A. PACOIMA WAREHOUSE

8. WHEN YOUR P.A.S.S. UNIT EMITS A LOW VOLUME TONE EVERY 4 SECOND. WHAT IS THIS AN INDICATION OF?
   A. LOW BATTERY

9. HOW LONG WILL THE P.A.S.S. OPERATE WITH A LOW BATTERY?
   A. ONE HOUR (AFTER INITIALLY HEARING LOW VOLUME TONES)
10. **WHAT SWITCH POSITION IS THE P.A.S.S. UNIT STORED WHILE NOT IN OPERATION?**
   
   **A.** "OFF" POSITION

11. **WHEN THE UNIT IS SENT IN FOR REPAIRS, THE ACCOMPANYING FORM 47 AND TAG SHALL REFLECT _________________.**
   
   **A.** THE PROBLEM WITH THE UNIT AND/OR REPAIRS NEEDED.