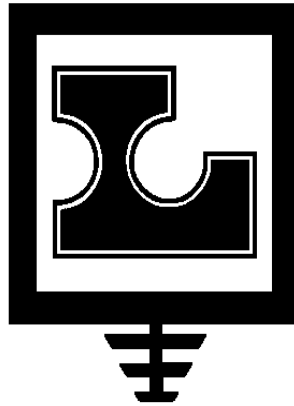


# **ASSEMBLY AND MAINTENANCE INSTRUCTIONS**



LINDGREN RF ENCLOSURES  
400 High Grove Boulevard  
Glendale Heights, IL 60139

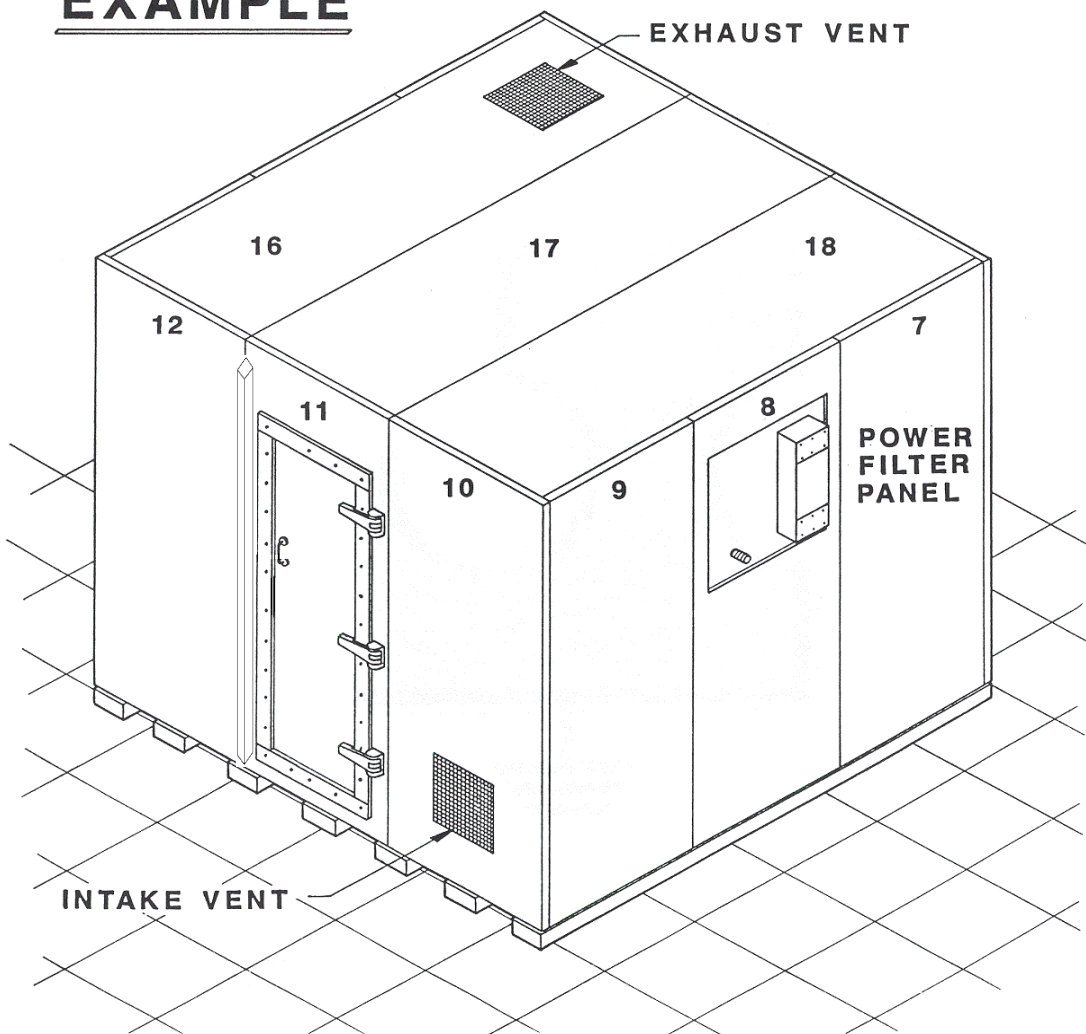
Phone: (630) 307-7200  
Fax: (630) 307-7571

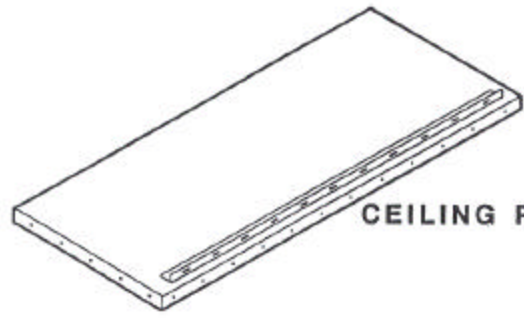
MODEL NO. -----  
SHIELD MATERIAL (S) -----  
-----

---

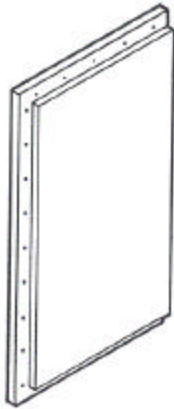
---

## EXAMPLE





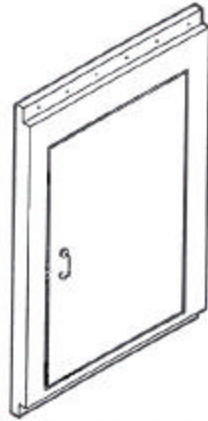
**CEILING PANELS**



**CORNER PANELS**

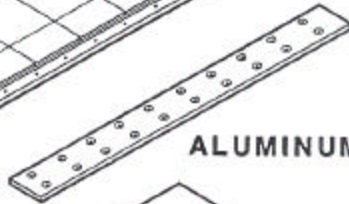
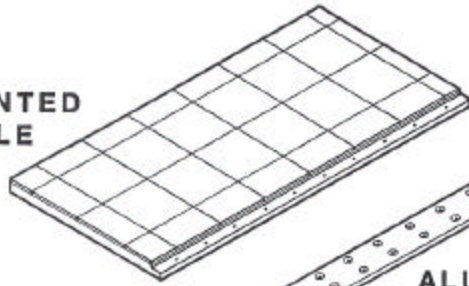


**WALL PANELS**

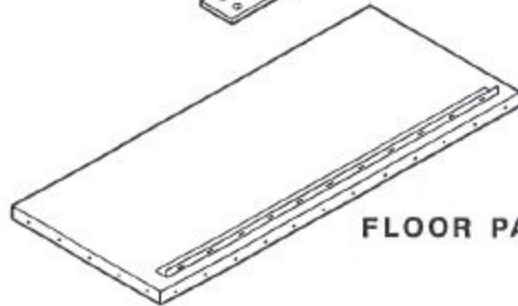


**DOOR & JAMB**

**PRE-MOUNTED  
FLOOR TILE  
PANELS**

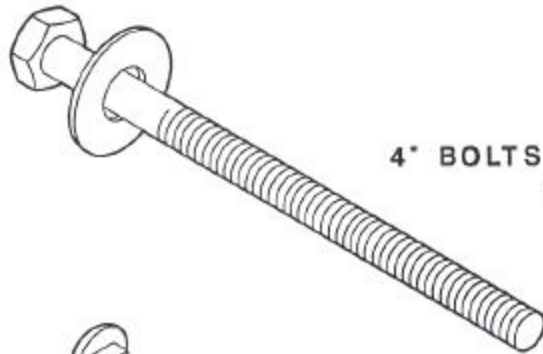


**ALUMINUM STRIP**

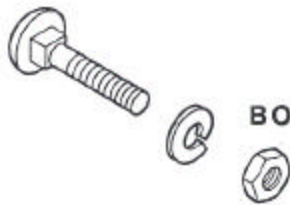


**FLOOR PANELS**

**THE ASSEMBLY OF THIS LINDGREN  
ENCLOSURE IS COMPLETED USING  
THE HARDWARE PICTURED BELOW**



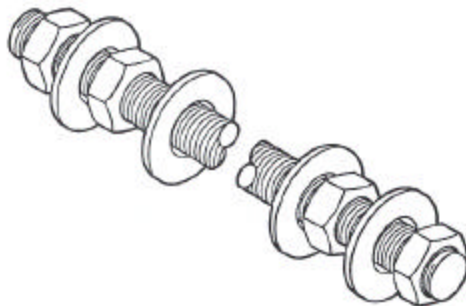
**4' BOLTS with 1" FLAT WASHERS  
(WALL BOLTS)**



**BOLTS with LOCKWASHERS and NUTS  
(ALL SEAM JOINTS)**



**3/4" LAG SCREW (ALUM. STRIPS)**



**GROUND STUD  
(1 per ROOM)**

# **IMPORTANT**

**READ THROUGH THIS MANUAL  
BEFORE YOU START  
ASSEMBLY OF THE ENCLOSURE**

## **STEP 1**

Remove debris and clean the area where the enclosure is going to be installed.

## **STEP 2**

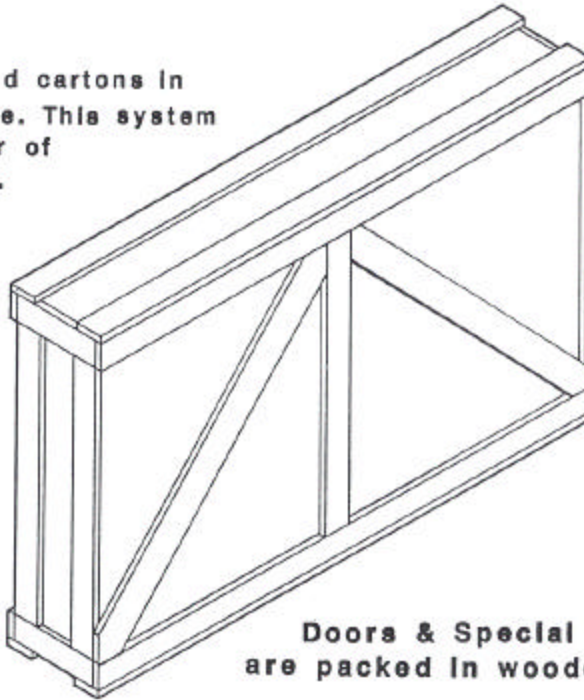
Using the enclosed drawings, determine the area required and mark this location onto the floor.

### **STEP 3**

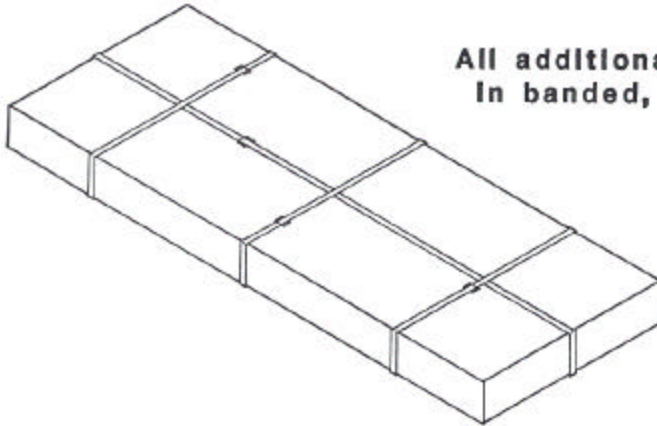
Open all crates and cartons in numbered sequence. This system indicates the order of panel construction.

**IMPORTANT**  
Do NOT force the panel out of the crate if it becomes jammed.

Loosen the lumber of the crate or disassemble to remove the panel.

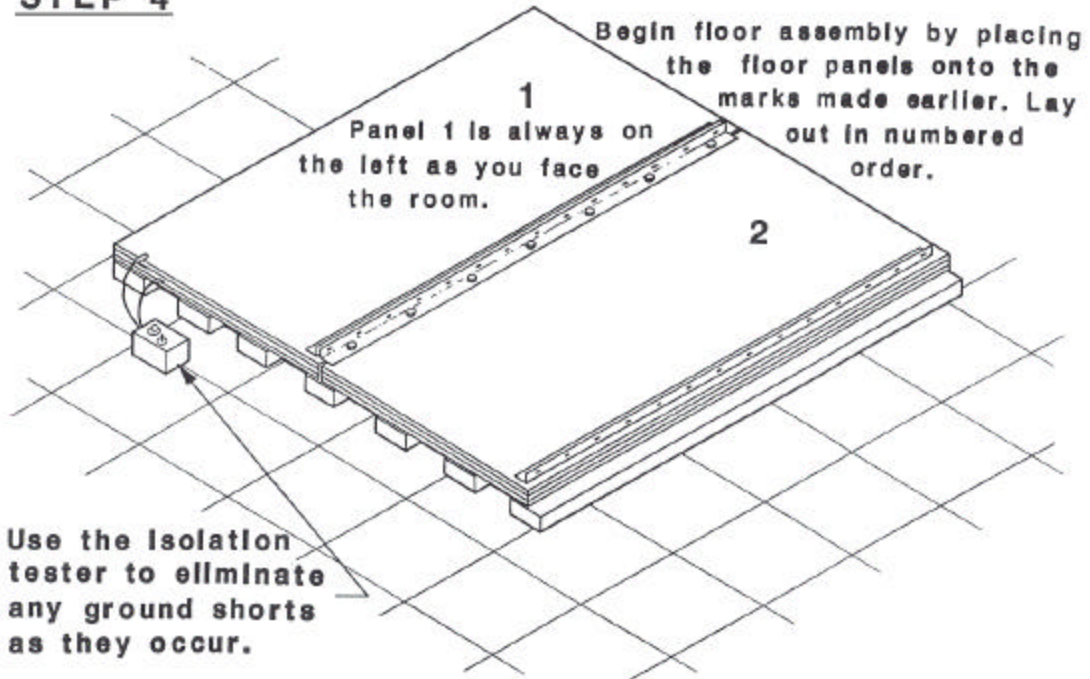


**Doors & Special Panels are packed in wooden crates.**

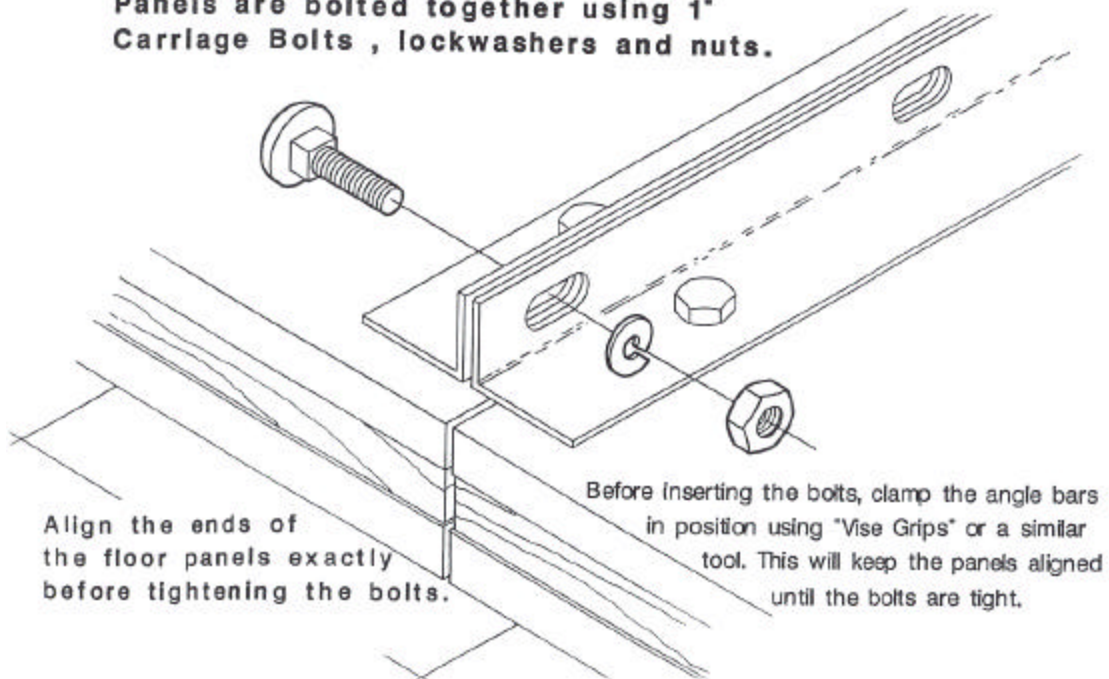


**All additional panels are packed in banded, cardboard cartons.**

## **STEP 4 ASSEMBLING FLOOR PANELS**

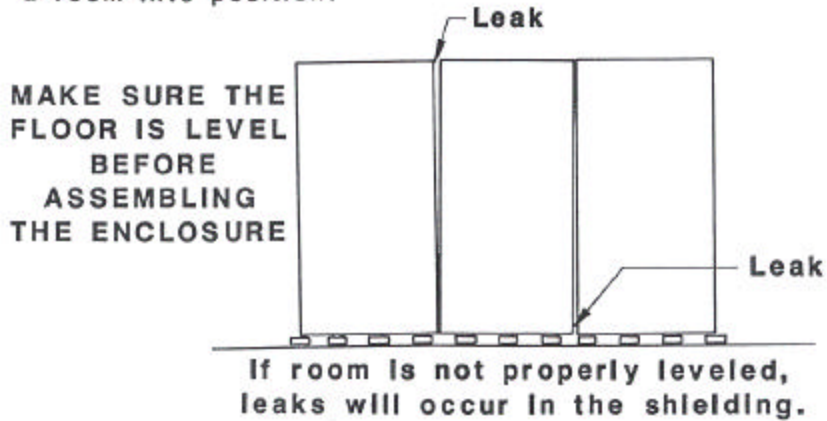


**Panels are bolted together using 1" Carriage Bolts , lockwashers and nuts.**



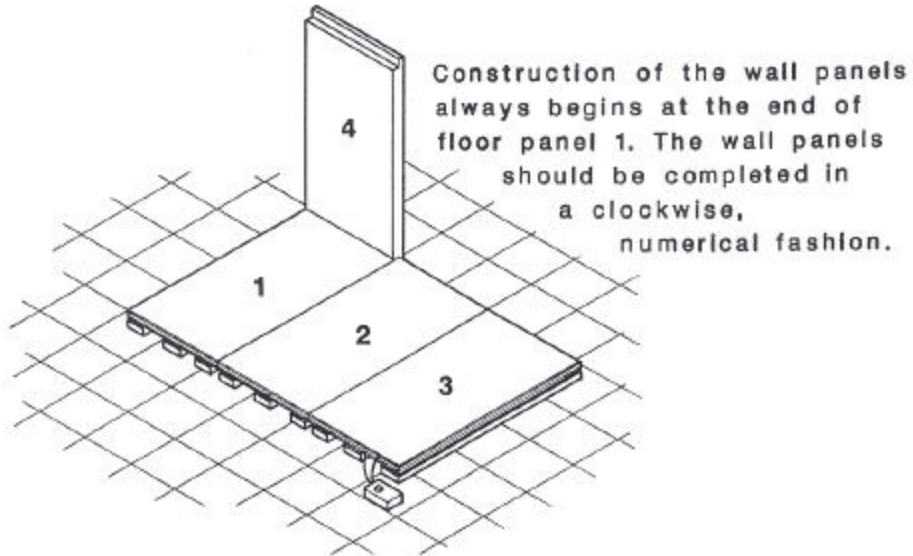
## STEP 5

If you encounter a job site with limited access space, the enclosure can be pre-assembled and slid into location. Make sure that there is no contact with any metal objects (ductwork etc.) when sliding a room into position.



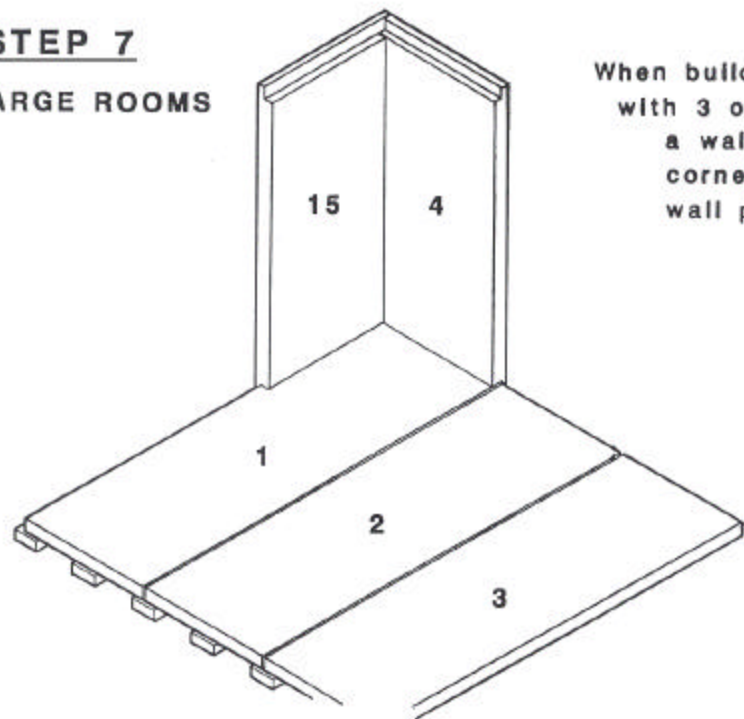
---

## STEP 6 ERECTING WALL PANELS



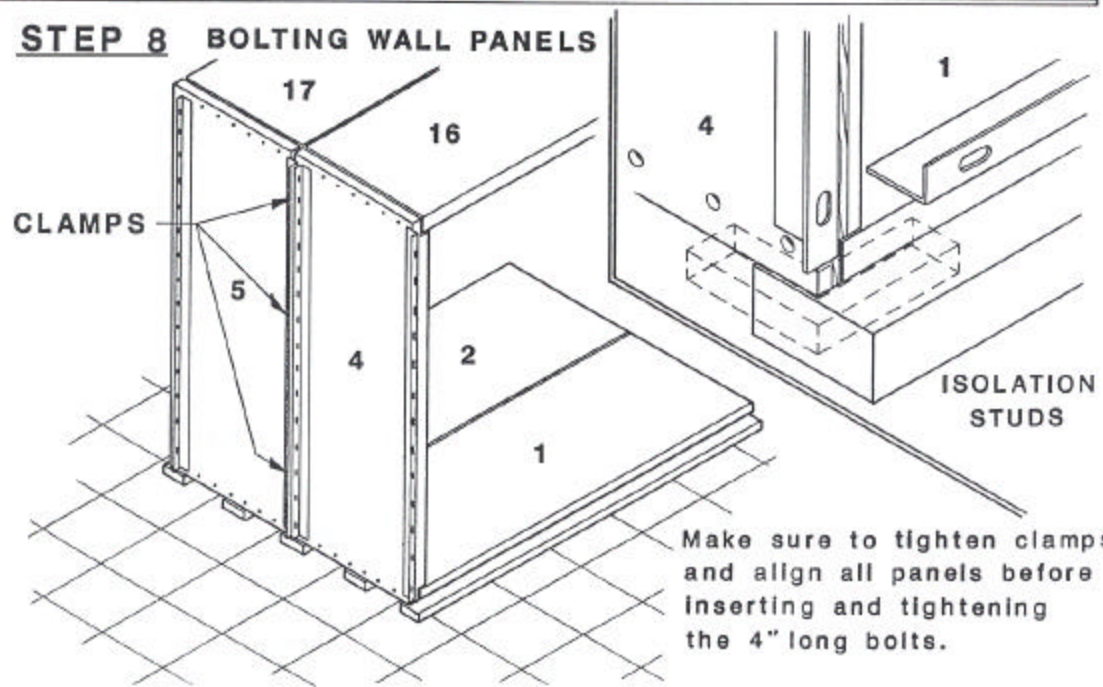


**STEP 7**  
**LARGE ROOMS**



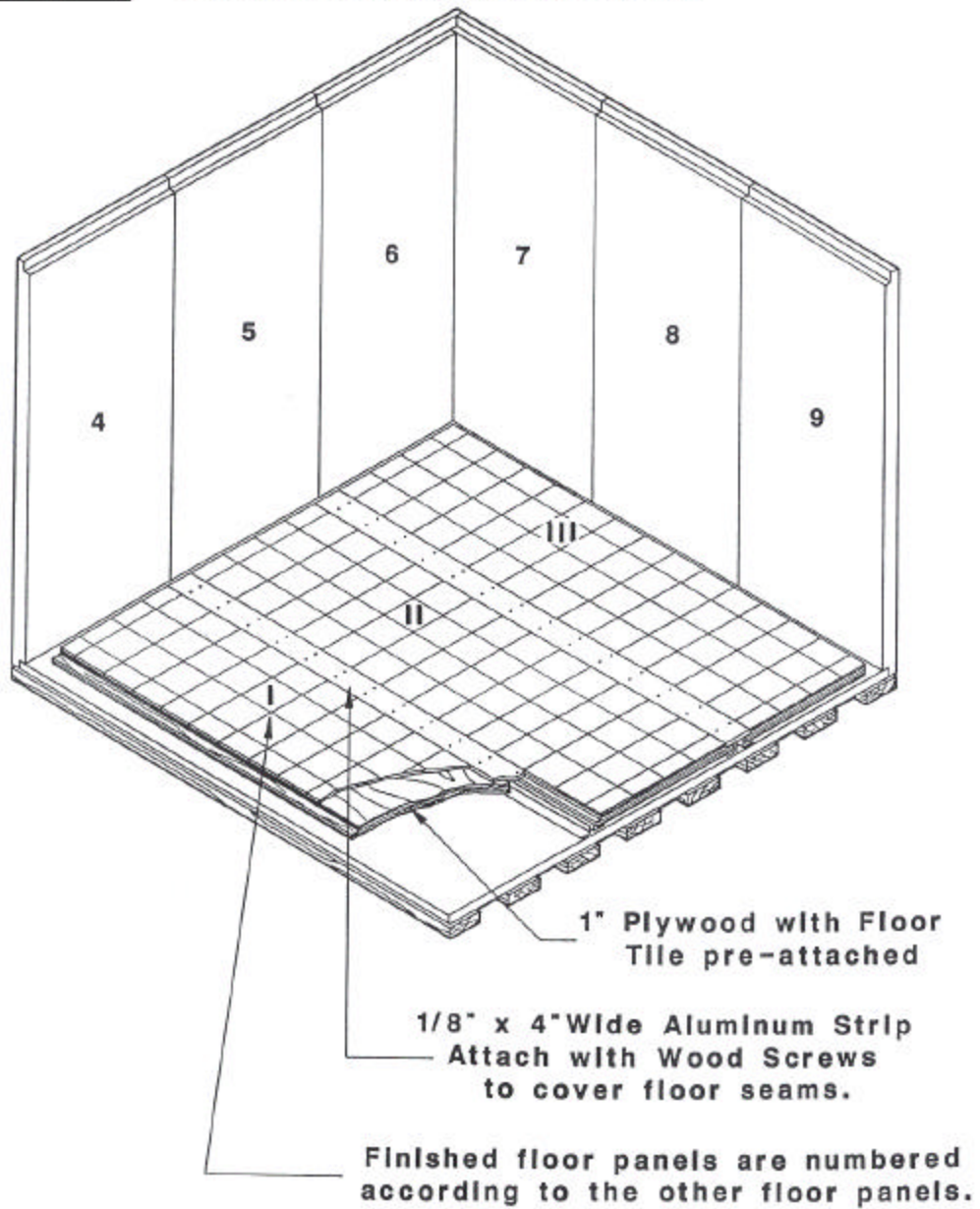
When building an enclosure with 3 or more panels to a wall, construct a corner using the final wall panel as shown.

**STEP 8** **BOLTING WALL PANELS**



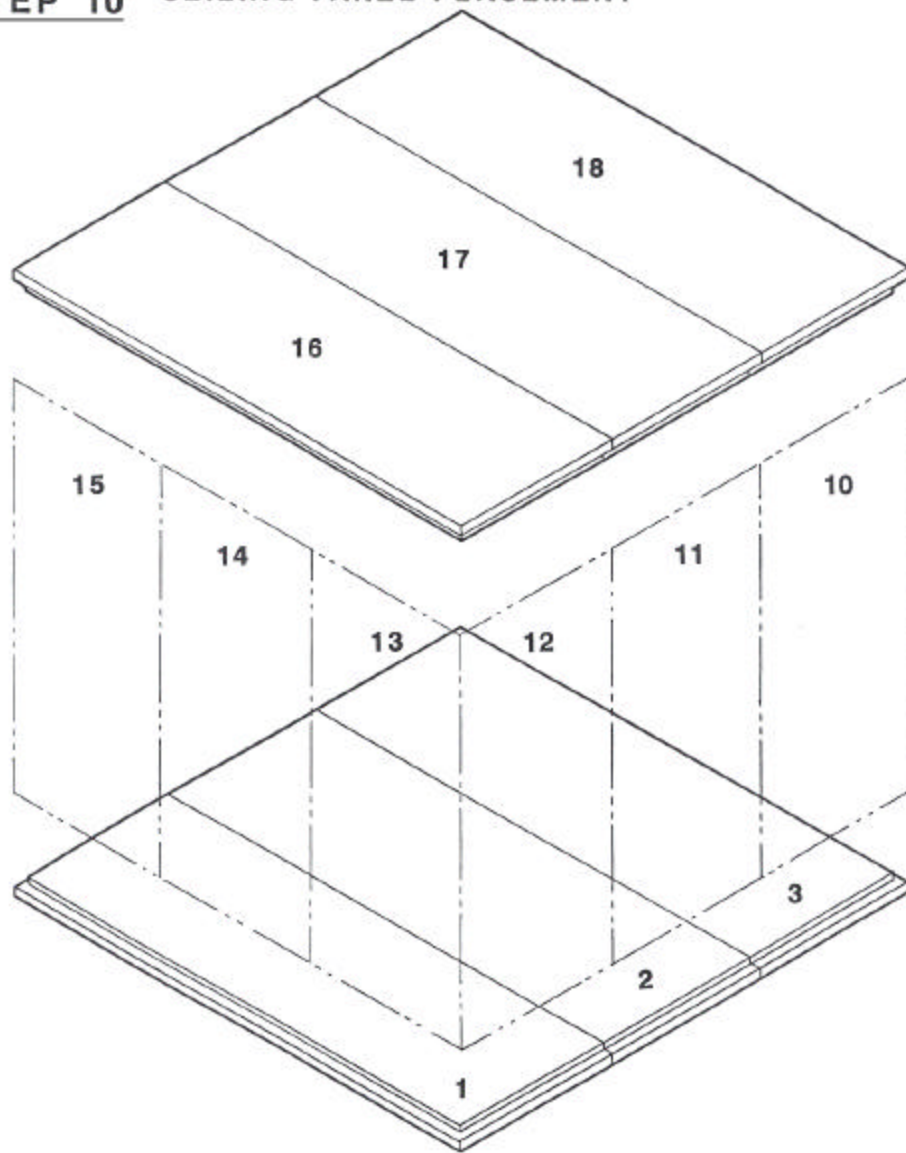
Make sure to tighten clamps and align all panels before inserting and tightening the 4" long bolts.

**STEP 9 FINISHED FLOOR INSTALLATION**



**Lay the finished floor panels in place before continuing the assembly.**

**STEP 10 CEILING PANEL PLACEMENT**

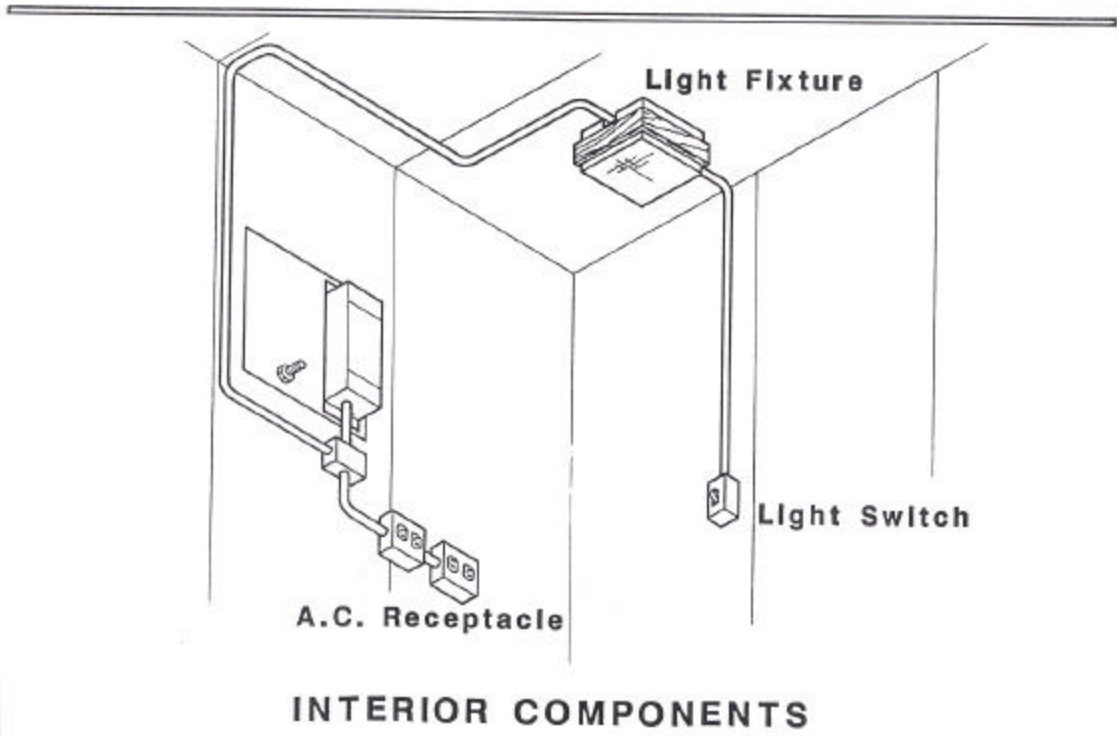
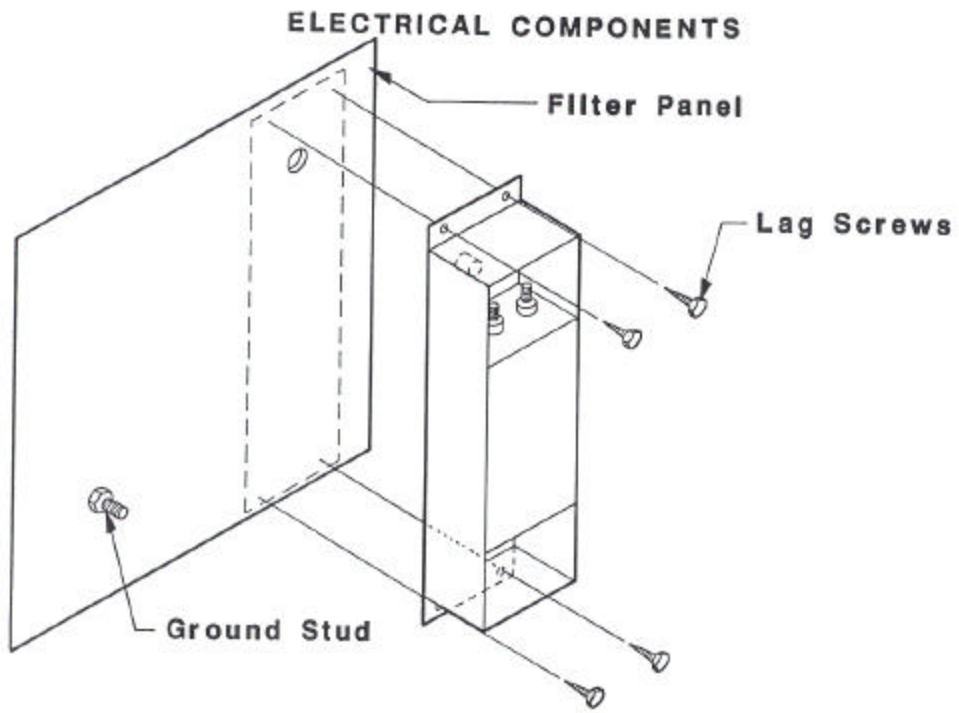


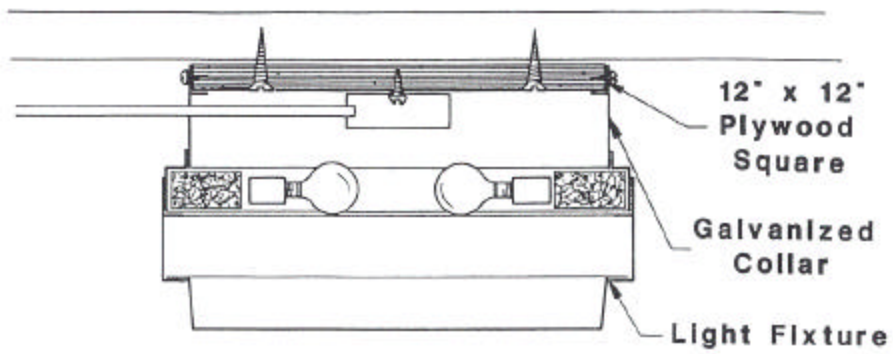
Begin ceiling panel assembly with the lowest numbered panel.  
Position this panel directly over floor panel 1.  
Place all panels in the direction shown in the above diagram.

## **STEP 11**

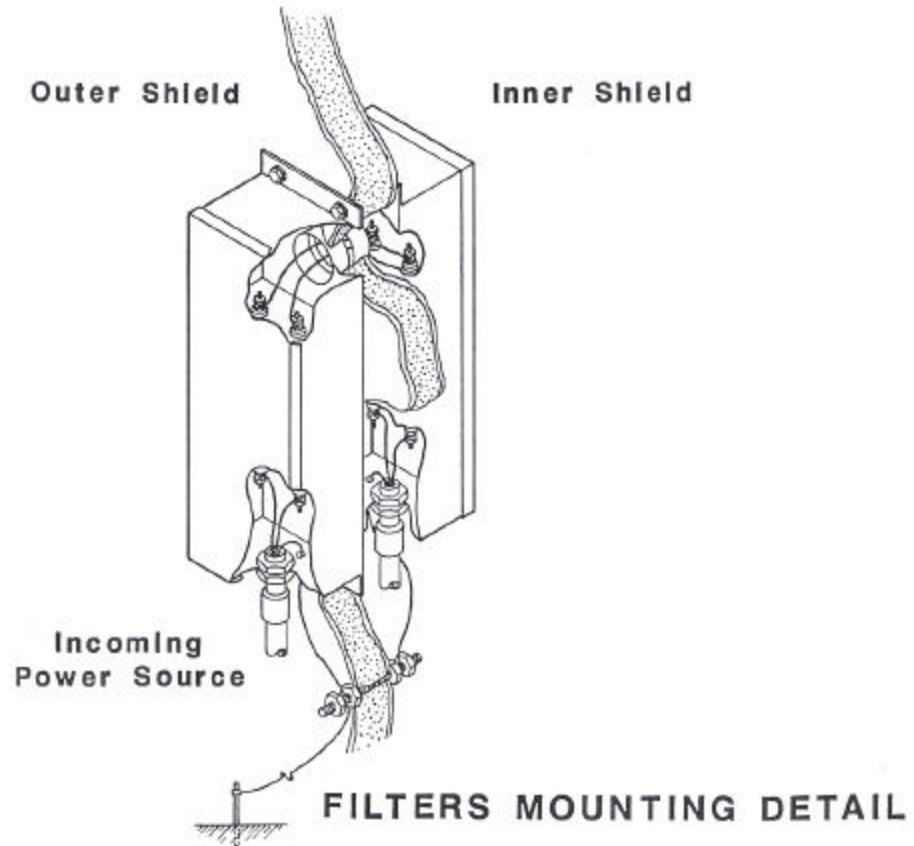
### **REVIEW OF PROCEDURES**

1. Clean the area to be used for construction of the room.
2. Mark out space on the floor where the room will be built.
3. Remove panels from the crates or cartons only as they are needed to avoid damaging them.
4. Locate, position and bolt together all of the floor panels as shown on the drawings.
5. After the main floor panels are assembled, place the interior floor panels (with floor tile) on top of them.
6. Attach the 4" wide aluminum strips between each of the interior panels and secure with the wood screws.
7. Wall and ceiling panels should be assembled as shown in this manual.
8. Be sure to securely bolt the wall panel seams before inserting and tightening the 4" bolts into the floor panels.
9. Check alignment of the panels as they go together to avoid disassembling and re-adjusting the panels at a later time.
10. To ease insertion of the ceiling panels, you can loosen some of the 4" bolts to allow for some movement of the wall panels.
11. When inserting and tightening the 4" bolts into the ceiling panels, make sure that you maintain solid contact along all of the seams.

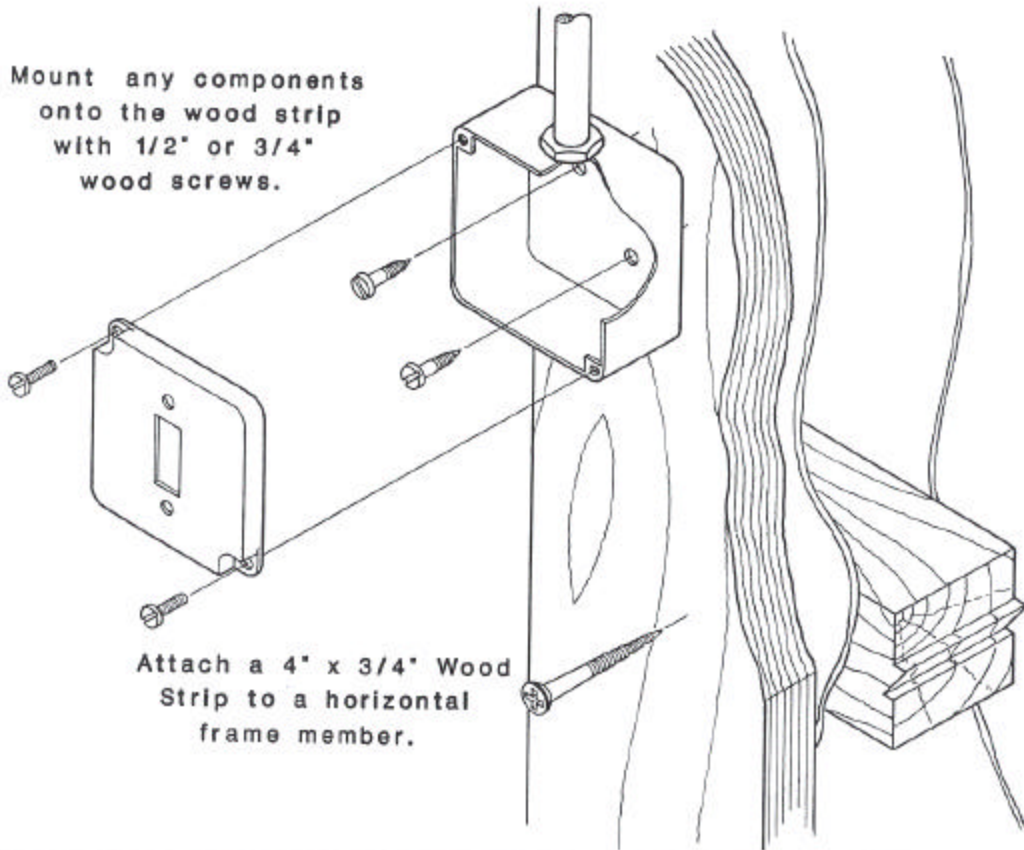




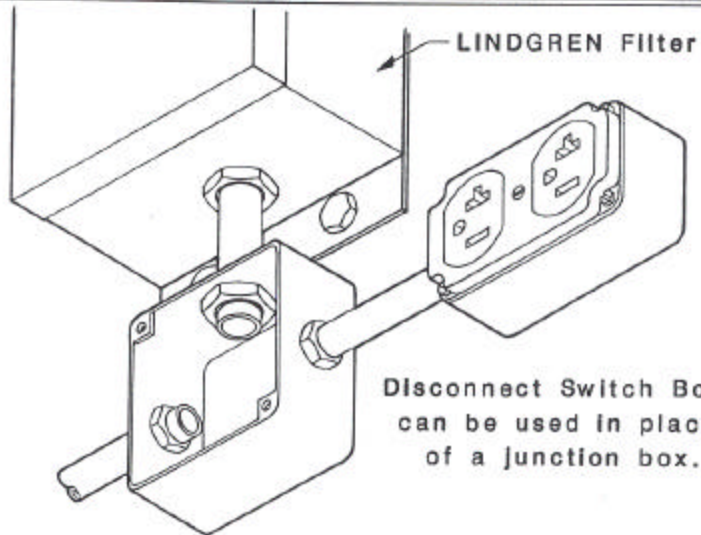
**LIGHT FIXTURE MOUNTING**



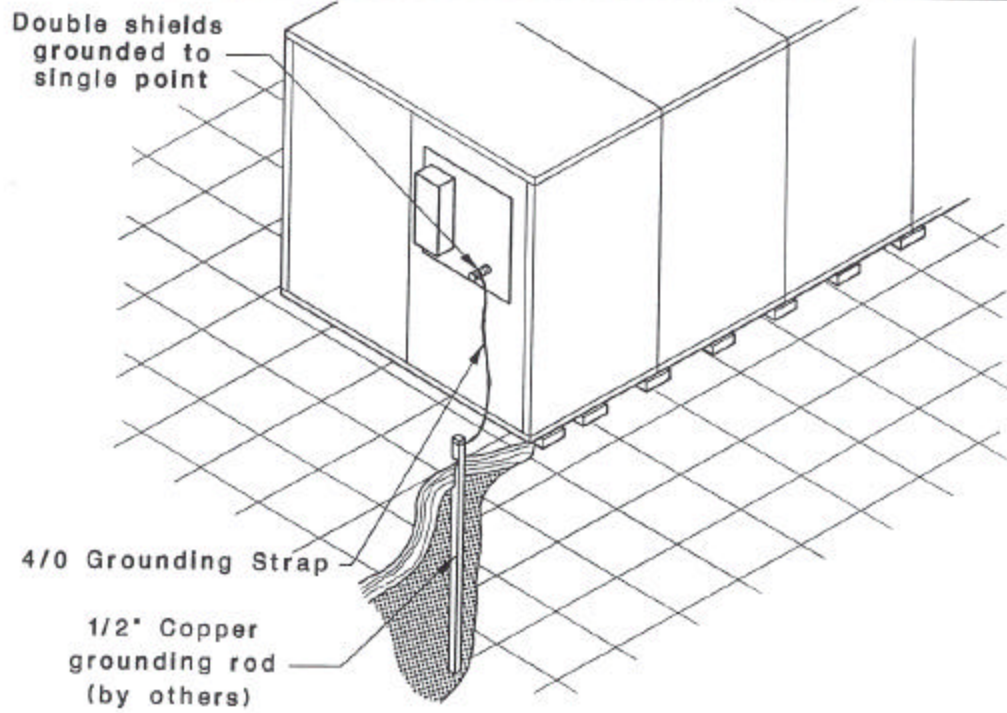
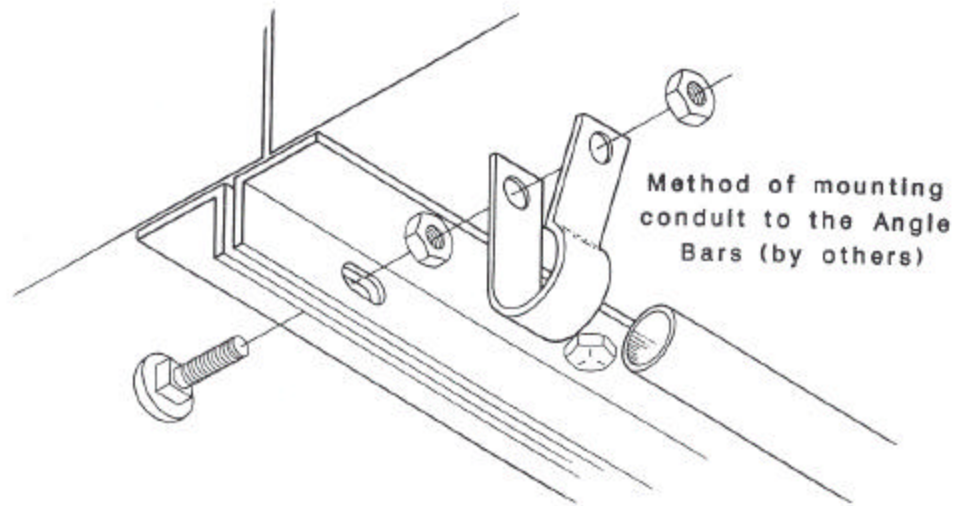
Mount any components  
onto the wood strip  
with 1/2" or 3/4"  
wood screws.



Attach a 4" x 3/4" Wood  
Strip to a horizontal  
frame member.



Disconnect Switch Box  
can be used in place  
of a junction box.





# **MAINTENANCE OF THE LINDGREN DOUBLE ELECTRICALLY ISOLATED ROOMS**

## **GENERAL**

The following notes are suggestions and comments on the assembly and maintenance of a Lindgren enclosure. As the room is being assembled, remember that the most critical parts of each frame are the two contact surfaces along the edges. These are the areas that contact the connecting panels. The contact edges must be kept clean at all times. As the room is being assembled for the first time, visually inspect all of the contact surfaces. This inspection is especially important on an all metal enclosure (not a screen room). The contact surfaces should be clear of any paint, grease or dirt as well as corrosion. If the panels have been stored in a damp environment, the edges are more likely to be slightly corroded.

Separation of the inner and outer shields is also very important for peak performance of your enclosure. The use of the Shield Isolation Indicator (with the ground stud removed) will allow you to catch and correct a short as soon as it occurs. The use of the Shield Isolation Indicator is shown on Page 22. If contact is made between the inner and outer shields, the buzzer will sound. By locating and correcting the erroneous contact before proceeding with assembly, you can save your crew a lot of time later on in the procedure.

Many things can cause contact between the shields. Metal filings, a strand of screen wire or an errant screw are some of the most common. Many of these causes can be located visually without disassembling the panels. If the cause is not obvious, take the panels down one by one until the warning buzzer stops. Check carefully the final panel removed for the cause of the short.

## **ASSEMBLY**

The assembly of any Lindgren RF Enclosure must be done with great care. An RF leak can be created by simply tightening one of the bolts improperly. An RF leak can cause a large loss in attenuation. At the time of the final RF attenuation testing, a low reading indicates a leak or many leaks in the shielding.

All Lindgren RF Enclosures are assembled and tested at the factory before they are crated and shipped to a job site. This assures the customers of their room's ability to provide adequate shielding.

## **HOW TO CORRECT LEAKS**

Panels can form leaks, particularly where floor and wall panels are joined. Pages 8 and 18 illustrate proper methods of attaching and aligning panels. As shown, the bolts must be loosened before alignment is made. All the bolts on a seam must be loosened for a consistent panel fit. The edges of the wall and ceiling, or wall and floor panels must line up perfectly. Page 18 illustrates the use of a wood block and a hammer to align a wall panel. Be sure NEVER to use a hammer directly on the shielding material.

## **LEAKS IN TOP AND SIDE PANELS**

Leaks can also develop between the corners of two parallel top panels where they meet two parallel side panels. The illustrations on Page 19 show two methods of correcting these leaks. If the RF leak is small, the space can be filled with folded 3 oz. copper and covered with a second strip, as indicated. Remove the angle bars and place the ends of the outer strip of copper beneath the angle bars and re-bolt them in place.

***DO NOT ATTEMPT TO USE ANY OTHER MATERIAL  
TO FILL THE SPACE BETWEEN PANELS.***

A second method of sealing a small leak is to tap along the seam with a block of wood and a hammer as shown on the bottom of Page 19. There is no need to loosen any bolts or remove any hardware for this procedure. This second method is very effective on 24 or 26 gauge steel or 24 oz. copper enclosures.

## **LEAKS AROUND THE DOOR**

The door and jamb play a crucial part in the integrity of the RF enclosure. The following items need to be properly set up for the door assembly to be effective.

1. The inner and outer shields must be separated electrically.
2. The threshold of the door jamb must be absolutely level to insure proper operation of the door. Use wood shims to bring the threshold level if adjustment is necessary.

## **LEAKS AROUND THE FILTERS**

***DANGER: AFTER THE FILTERS HAVE BEEN POWERED UP,  
ONLY A CERTIFIED TECHNICIAN SHOULD PERFORM ANY WORK REQUIRED,  
DUE TO THE CHARGE STORED INSIDE !***

If a leak is detected at the filter location, there are two common solutions. The first is to simply tighten the lag bolts that hold the filter to the panel. If a leak still exists, remove the filter and place 3 oz. copper around the feedthru pipe and re-mount the filter. Be sure to tighten the lag screws correctly before re-testing. Page 22 contains an illustration detailing this procedure.

The same steps can be taken to seal a leak on a bolt in waveguide airvent (newer vents are soldered in place). Page 17 also has a detail of this assembly.

## **CLEANING OF THE CONTACT SURFACES**

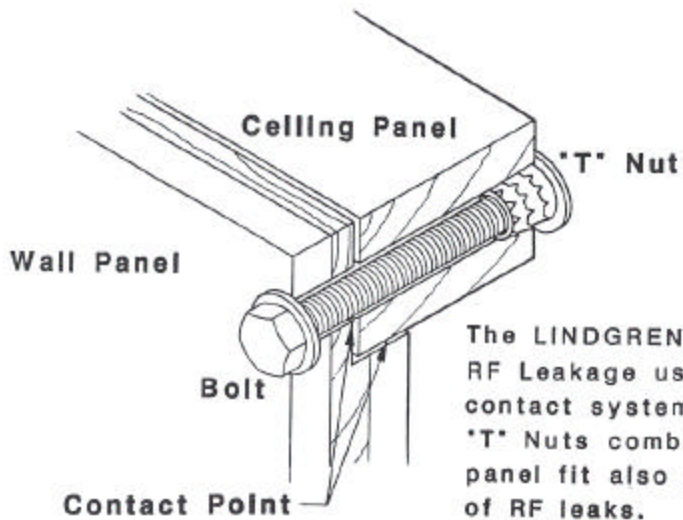
All Metal: Use an abrasive pad and scrub the contact surfaces of each panel. Wipe any remaining particulate from the edges, using a clean rag dampened with rubbing alcohol or a similar fluid. Use extra caution when cleaning a panel covered in 3 oz. copper due to the more sensitive surface of this metal. Avoid touching the edges with your bare hands once it has been cleaned. The oil of the skin can reduce contact between panels.

Screen Room: To clean the edges of a screen covered panel, simply use a light steel brush to remove excess dirt before bolting panels into position. Using a heavy duty vacuum after brushing will eliminate any loose dirt from the contact surface. It is recommended that the surface of a screen enclosure be cleaned about every three months. Page 21 gives some information on this step.

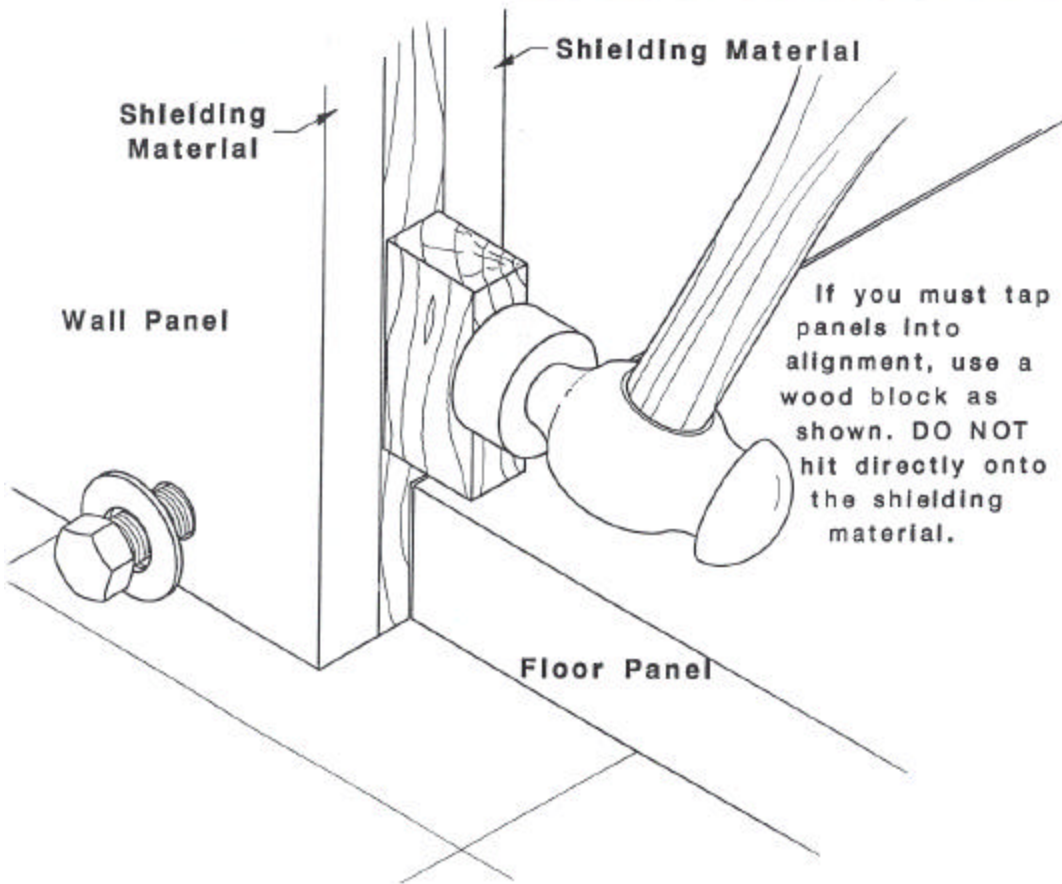
Table Model: These enclosures are simply smaller versions of our other rooms. Use the same cleaning methods described to keep them in top condition.

## **LIST OF MATERIALS**

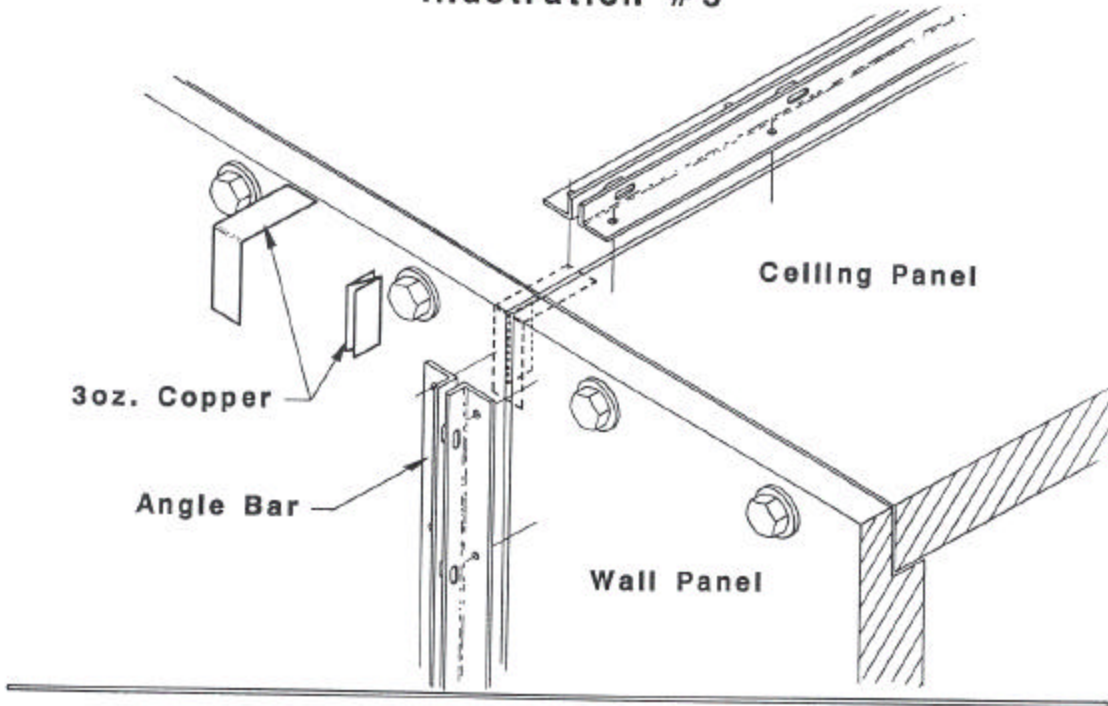
Shield Isolation Indicator  
Small Hand Tools  
Abrasive Pads  
Rubbing Alcohol  
Clean Rags  
Shim Stock  
Step Ladder  
Hammer  
Wood Blocks  
3 oz. Copper Strips  
Wire Brush  
Vacuum Cleaner  
Power Screw Gun (Optional)  
Ohmmeter (Optional)



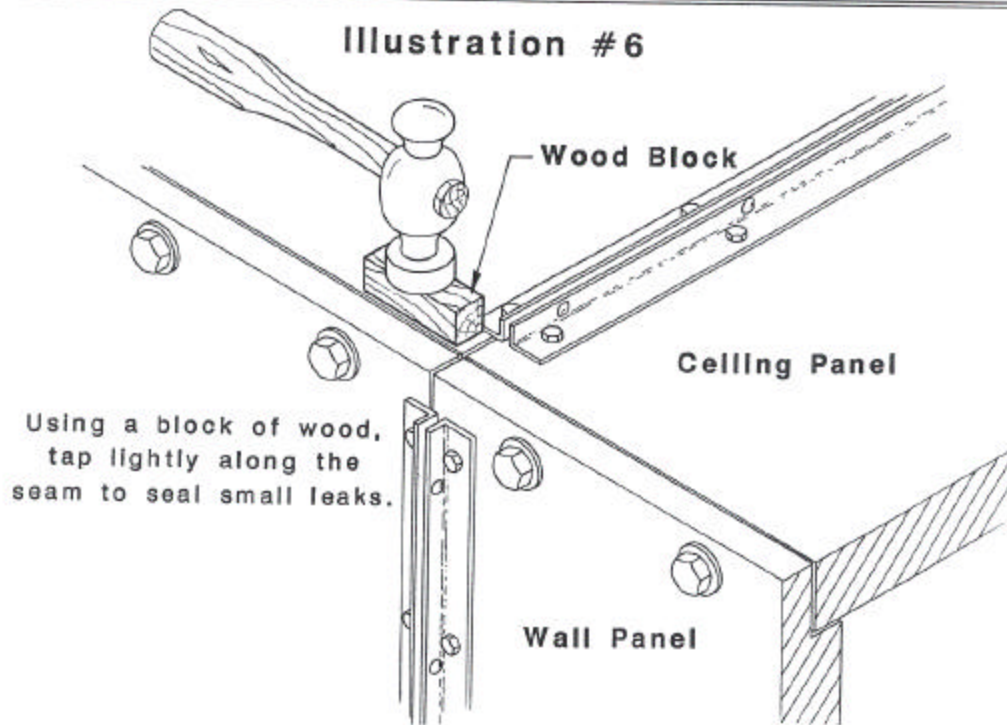
The LINDGREN Enclosure eliminates RF Leakage using a unique 2 point contact system. The bolts and 'T' Nuts combined with the tight panel fit also provides a minimum of RF leaks.



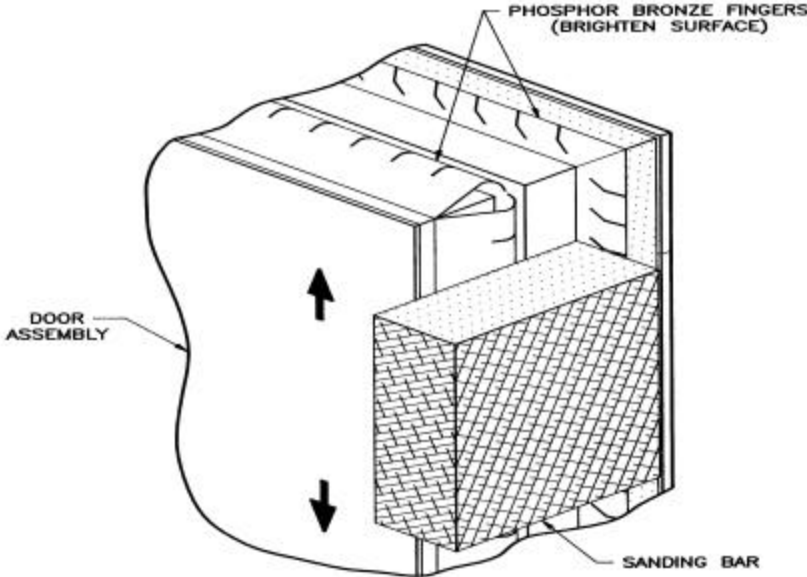
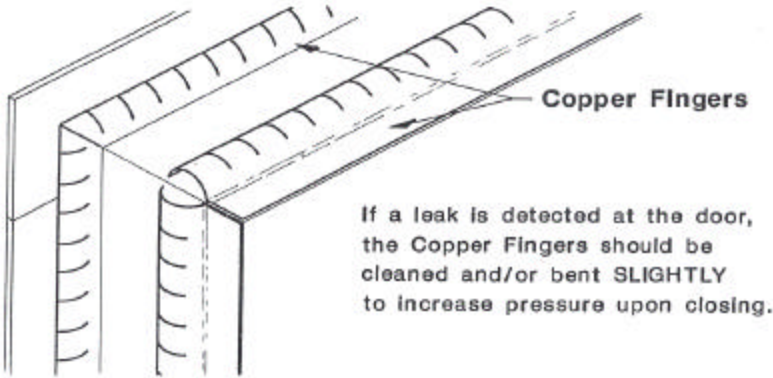
**Illustration #5**

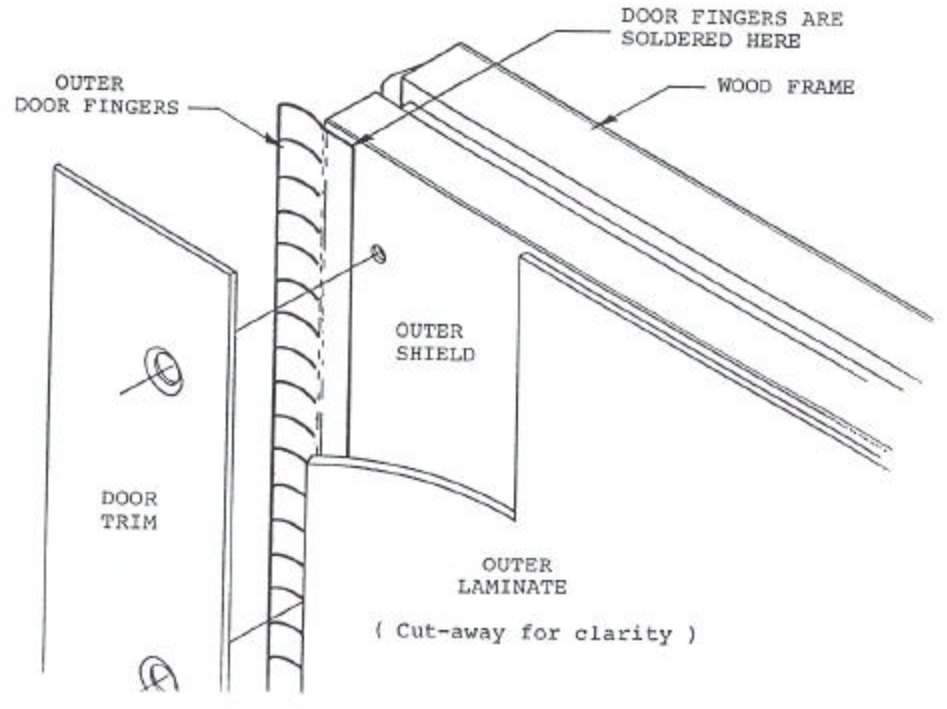
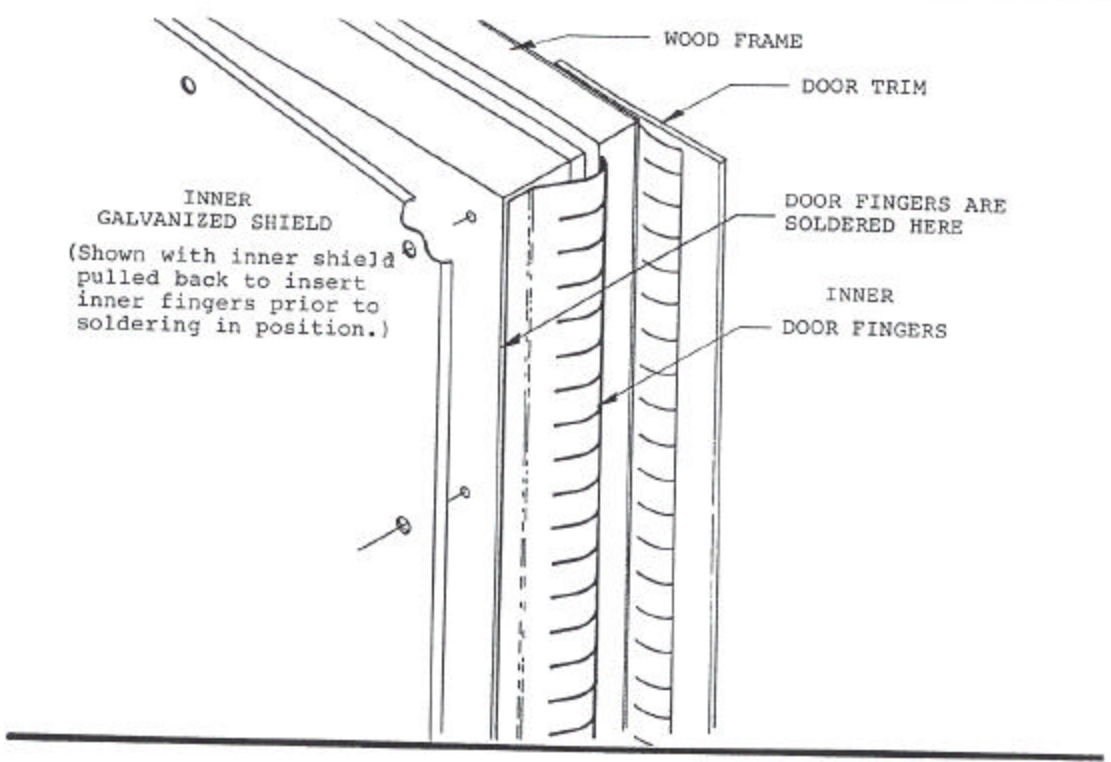


**Illustration #6**



**Illustration #7**





# HIGH PERFORMANCE DOOR FINGER REPLACEMENT PROCEDURES

## MATERIALS REQUIRED:

500 W Soldering Iron  
New Finger Stock  
Flux  
60/40 Solder  
Scraping Tool  
Denatured Alcohol

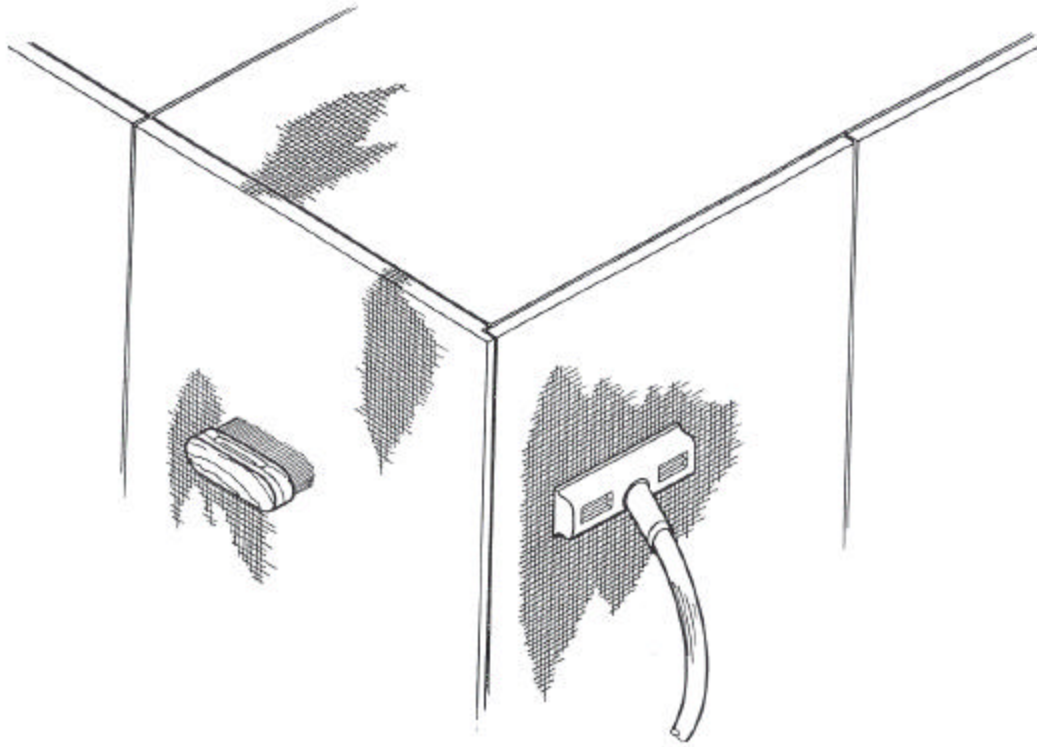
## OUTER FINGER REPLACEMENT

- Remove the door trim by taking out all of the screws.
- Pull away only enough of the outer laminate to expose the damaged finger stock.
- Using the soldering iron, heat the solder to remove the damaged finger stock.  
***(CARE MUST BE TAKEN TO AVOID DAMAGING THE BACKING FOAM AND MICROWAVE ABSORBER IF THE DOOR IS SO EQUIPPED).***
- If necessary, scrape the area to remove any old solder.
- Before attaching the new finger stock, wipe down the area with denatured alcohol.
- Apply flux to the new finger stock and the area to be soldered.
- Align the new section of finger stock with the existing fingers and solder in place.  
Scrape away excess solder.
- Replace the laminate and door trim.

## INNER FINGER REPLACEMENT

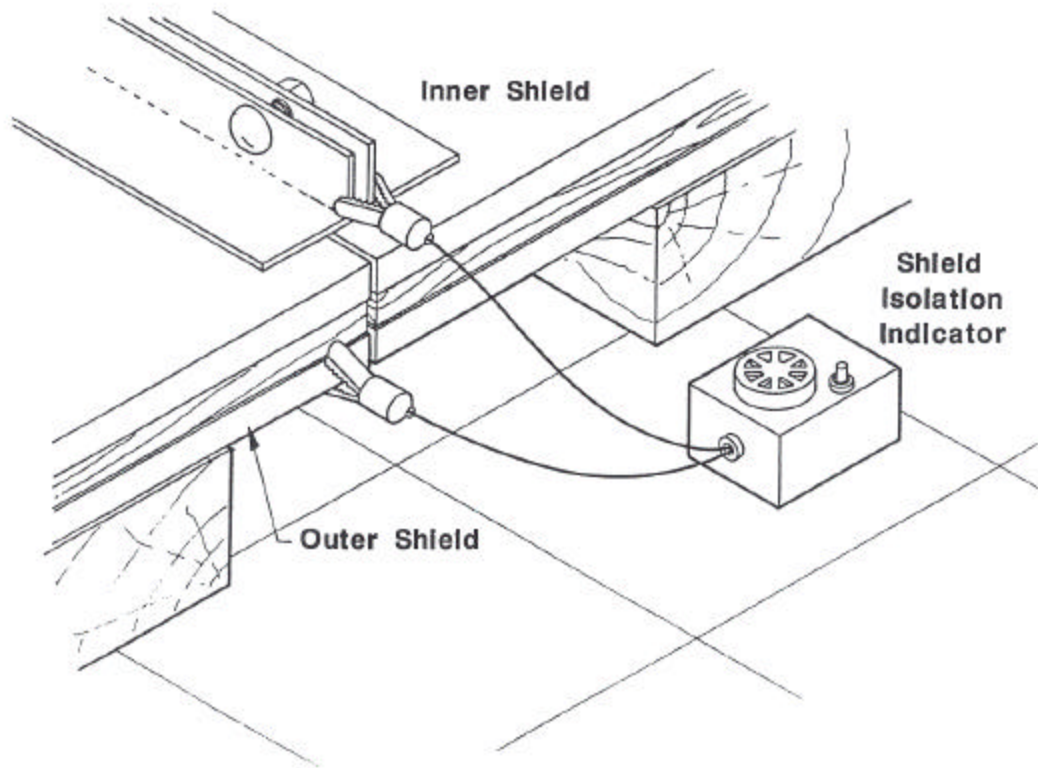
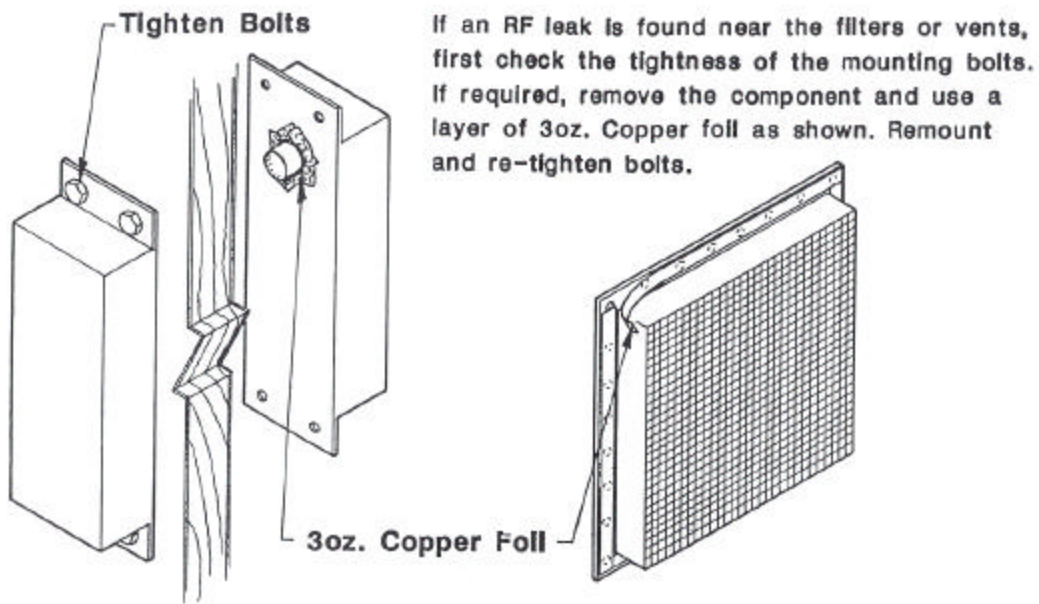
- Loosen the galvanized shield in the area of the damaged fingers by taking out the necessary screws.
- Using the soldering iron, heat the solder to remove the damaged finger stock.  
***(CARE MUST BE TAKEN TO AVOID DAMAGING THE BACKING FOAM AND MICROWAVE ABSORBER IF THE DOOR IS SO EQUIPPED).***
- Scrape the area to remove old solder and wipe down the section with denatured alcohol.
- Apply flux to the new finger stock and the area to be soldered.
- Align the new section of finger stock with the existing fingers and solder in place.  
Scrape away excess solder.
- Replace the galvanized shield.





About every 3 months, it is a good idea to clean the surface of a screen enclosure. This can be done with a brush or it can be vacuumed carefully.

**NOTE:** Dust and dirt on a screen room will not affect RF integrity.  
Visibility through the screen will be affected if the build-up is severe enough.

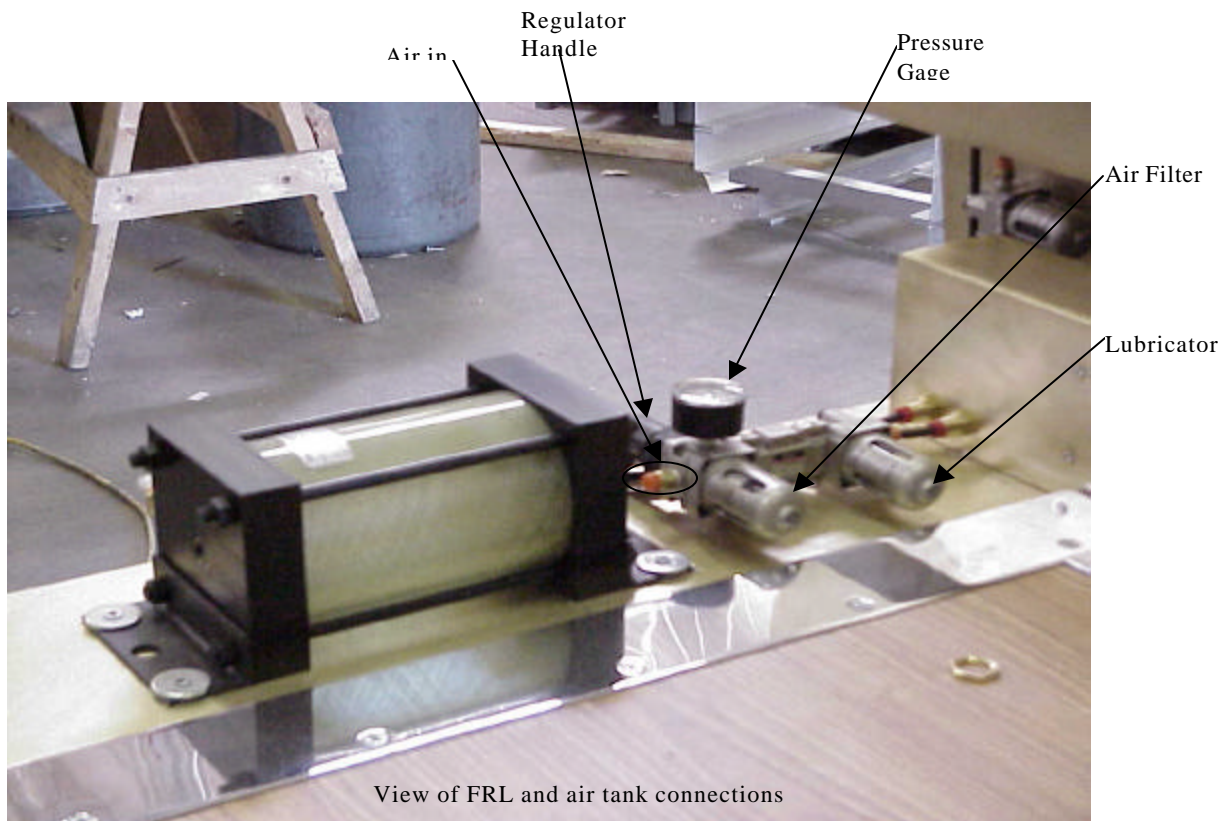


**INSTRUCTIONS FOR  
LINDGREN RF ENCLOSURES, INC.'s  
AUTO-LATCHING MECHANISM FOR DEI DOORS**

**IMPORTANT!!!** Keep all hands and fingers away from the latch mechanism while connecting pneumatic power! While precautions have been taken to insure that bodily injury will not occur, the latch mechanism can operate in a fast motion, which may startle persons unaware of the operations of the door latch. Care should always be exercised when using or connecting automated or semi-automated equipment.

**BEFORE USING THE DOOR**

- 1 For the door mechanism to work perfectly an air supply is needed with a scfm rate of 1.44/s. The mechanism air consumption in scfm is 0.0291 for one complete cycle (close and open the door). Also make sure that the air supplied to the door mechanism is clean and dry.
- 2 Connect a 1/4" airline to the male connector on the regulator valve. The pressure regulator valve is preset to 85psi output. Do not tamper with the preset pressure on the valve.



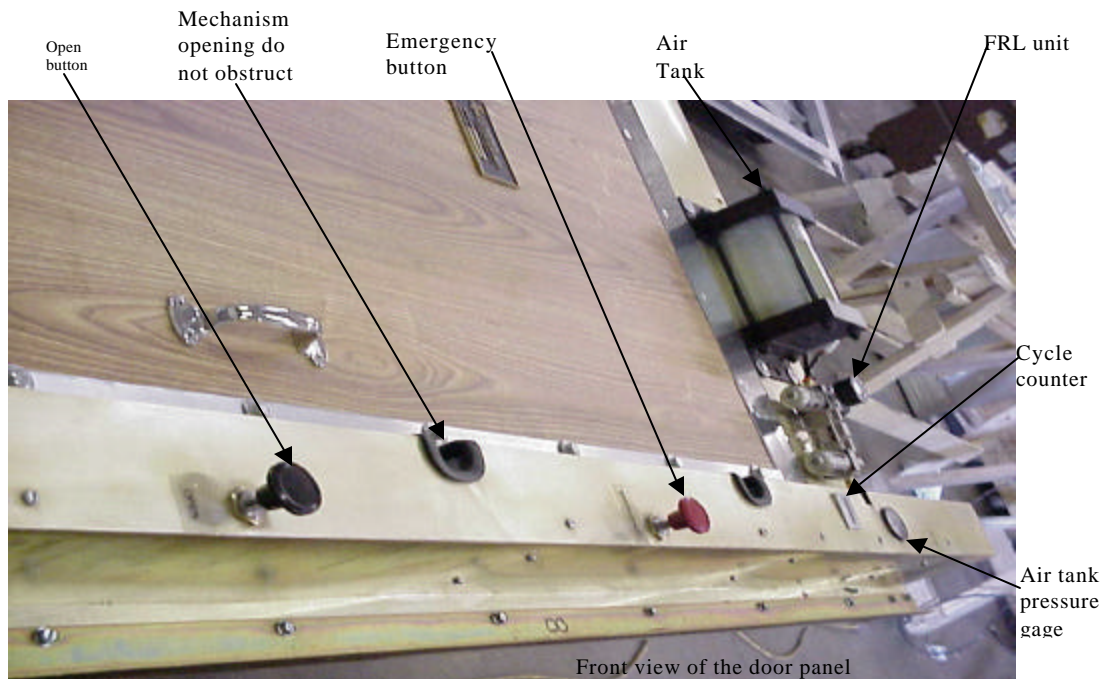
- 3 Make sure that the two red buttons (labeled as "EMERGENCY") are depressed. After checking the red buttons, use the back of a pen or pencil to press the reset button located under the cover. Use the hole immediately

above the counter labeled as “RESET”. If the two emergency buttons are not depressed the reset button will not reset.

- 4 Check if the lubricator has sufficient oil. If not follow the instructions in the “maintenance instructions“ below to add lubricant.
- 5 Note the number indicated by the counter on your service list. It is needed for the maintenance of the door (see service list).

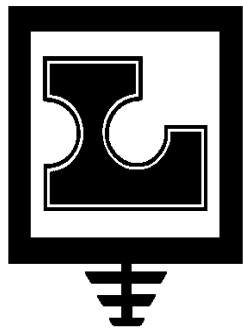
### USING THE DOOR

- 1 To close, push (or pull) the door slowly until the cam followers on the door contact the mechanism latches and continue to maintain closing pressure on the door until the mechanism activates. Always use the pull handle to close or open the door.
- 2 In order to open the door, push the black button on either side of the door. Allow the cams to disengage and swing the door open
- 3 If for any reason the black button fails to open the door, use the Red (“EMERGENCY”) button. This will allow a one-time access to the room. Lindgren must be called for instructions on how to proceed to identify and correct the problem. The emergency button should only be used for emergencies or for the periodical testing and maintenance.
- 4 Cover openings where the cams operate must remain clean and free of any obstructions. If obstructions are present the door mechanism will be damaged and may result in injuries.



## **MAINTENANCE**

- 1 The door should be maintained regularly to ensure maximum performance.
- 2 Regularly check the air filter. If there is water in the filter press the bottom of the filter from the bottom to drain. Make sure not to stand under the filter when draining. The air filter is located above the door opening on the jamb next to the air tank.
- 3 There is a lubricator next to the air filter. Make sure the lubricator has the correct and sufficient oil. It should only apply one drop every hour. The oil flow can be can adjusted with the plastic screw above the lubricator. Over-lubrication will result in filling the pneumatic components of the door mechanism with oil (lubricant). As a result lubricant will be dripping from all pneumatic components and malfunctions may occur.
- 4 Every 10,000 cycles the cam followers must be checked for wear. They should be changed every 20,000 cycles. All four are located on the angle bar on the latch side of the door.
- 5 The speed of the latching mechanism can be adjusted by turning the flow control port screws exposed on the front cover plate, at the very bottom of the door. These flow controls only control the speed of operation, not the pressure to the cylinder.
- 6 Every two months a test must be made for the door emergency system. Stand outside of the room and close the door. Then instead of using the black button to open the door use the red "EMERGENCY" button. When the door opens depress the red button and using a pen or pencil press the reset button located under the cover. Then get inside the room and follow the same procedure using the inside emergency button. If the system fails during the test contact Lindgren to identify and solve the problem.



**LINDGREN  
RF ENCLOSURES**

**400 HIGH GROVE BLVD.  
GLENDALE HEIGHTS, IL 60139**

**(630) 307-7200**