

VENTILATION KIT ASSEMBLY AND OPERATING INSTRUCTIONS

TAKE THIS BOOK TO
SHELTER MANAGER IMMEDIATELY



OFFICE OF CIVIL DEFENSE

OFFICE OF THE SECRETARY OF THE ARMY

OCTOBER 1965

PACKAGE VENTILATION KIT (PVK)

Assembly and Operating Instructions

TO SHELTER MANAGER:

Without proper ventilation shelter may become too hot within an hour. Assign Package Ventilation Kit (PVK) assembly to two men familiar with machinery.

TO VENTILATION TEAM:

The ventilation equipment draws air into shelter by forcing hot and humid stale air from the shelter.

STEP A: POSITION VENTILATOR(S) IN SHELTER. See page 3.

STEP B: ASSEMBLE VENTILATION SYSTEM. See page 7.

STEP C: OPERATE VENTILATOR UNIT(S). See page 13.

PVK CONTENTS

The Package Ventilation Kit (PVK) is a mechanical ventilating system which can be operated by either electric or pedal power. Either one or two pedal-drive modules are supplied depending on shelter requirements. Included are:

Fan assembly; with stand, duct adapter and accessories
Drive module(s); with saddle, pedals, chain and handlebar

Accessories:

Instructions	Electric plug, grounding
Duct, plastic	Lubricant
Elbows, duct	Scissors
Tape, adhesive	Wrench
Electric plug, screw base	Screwdriver

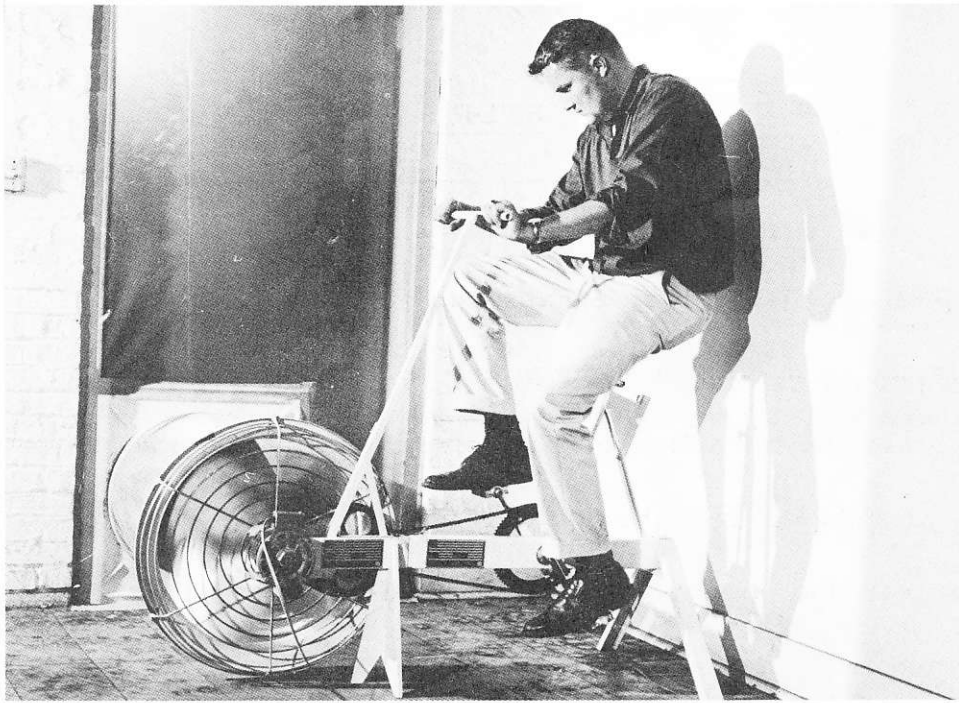


Figure 1. — PVK air discharge assembly in doorway, with duct adapter.
Fresh air enters through distant openings.

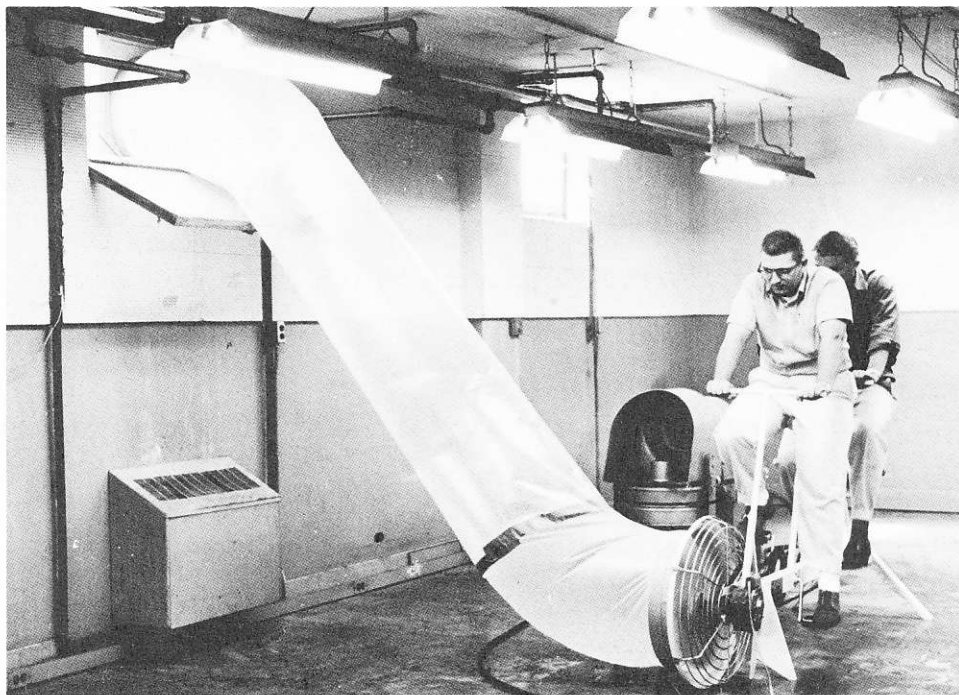


Figure 2. — PVK air discharge assembly in window, with duct adapter.
Fresh air enters through distant openings.

STEP A

POSITION VENTILATOR(S) IN SHELTER

The PVK ventilator is an exhaust fan operated by either one or two persons. The motor can be used if electric power is available. Position all ventilators stocked in this shelter according to instructions. Move maximum amount of air by keeping duct length short with few elbows and turns. Where possible locate fan near doorway or window to keep duct short. One elbow restricts air flow as much as 70 feet of straight duct. An elbow near the fan restricts air flow less than an elbow near end of duct.

Place fan unit as far from air inlet doors and windows as possible to obtain maximum air distribution benefit from windows, stairwells, or elevator shafts. Fan unit should be placed at opposite corner or opposite side of shelter from air inlet openings to provide airflow across or throughout occupied shelter space. Place fan unit in shelter area so flexible discharge air duct is straight as possible, uniformly supported by the floor, and passes through a doorway or low window to the outside.

Each PVK will supply sufficient air for 100 to 200 people depending on climatic conditions. In many cases more than one PVK will be stocked in each shelter. Use the following typical shelter sketches as a guide in placement of the fan unit(s). Basic methods of utilizing the PVK to ventilate a shelter, depending on location of window and door openings, are shown.

Method No. 1. Whenever cross-ventilation is available, with windows or doors on opposite sides of shelter, place fan next to a door using duct adapter as shown in Figure 1.

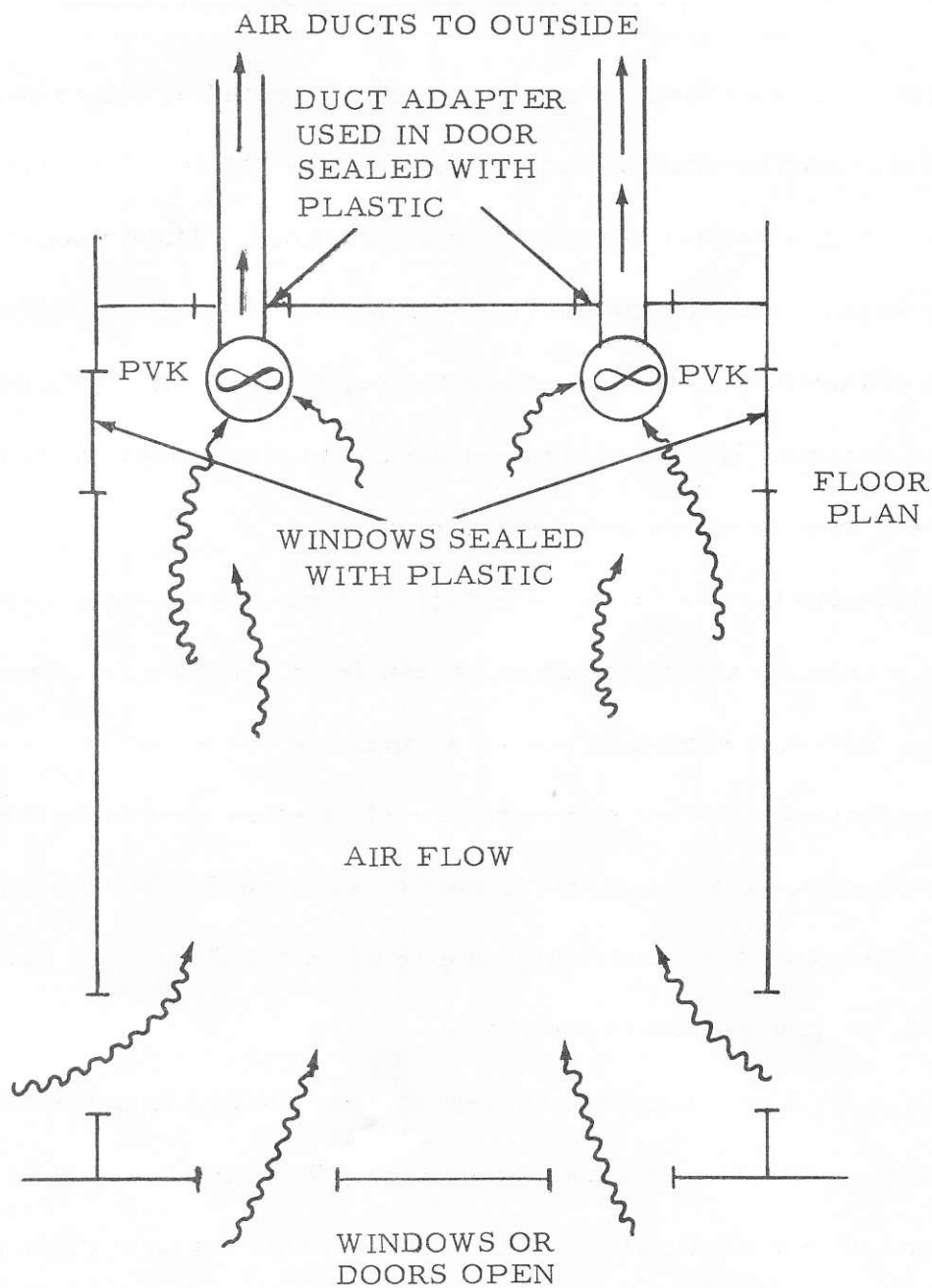


Figure 3. — Use of duct adapter when cross-ventilation is available.

Method No. 2. Two examples of shelters and fan installations illustrating this method follow:

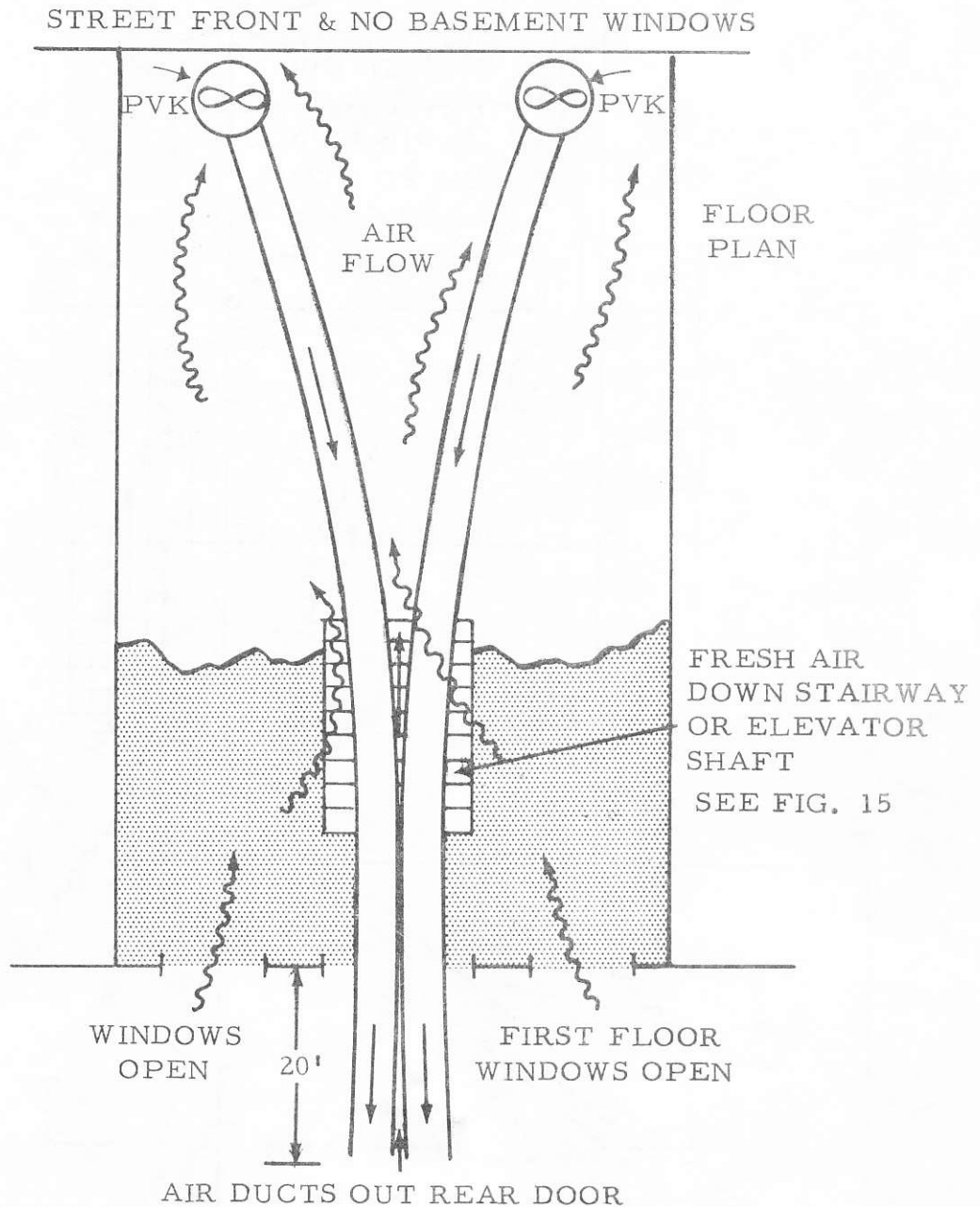


Figure 4 (Example A). — Typical store basement with opening on one end only and no windows. Place fan in remote corner as far as possible from air inlet.

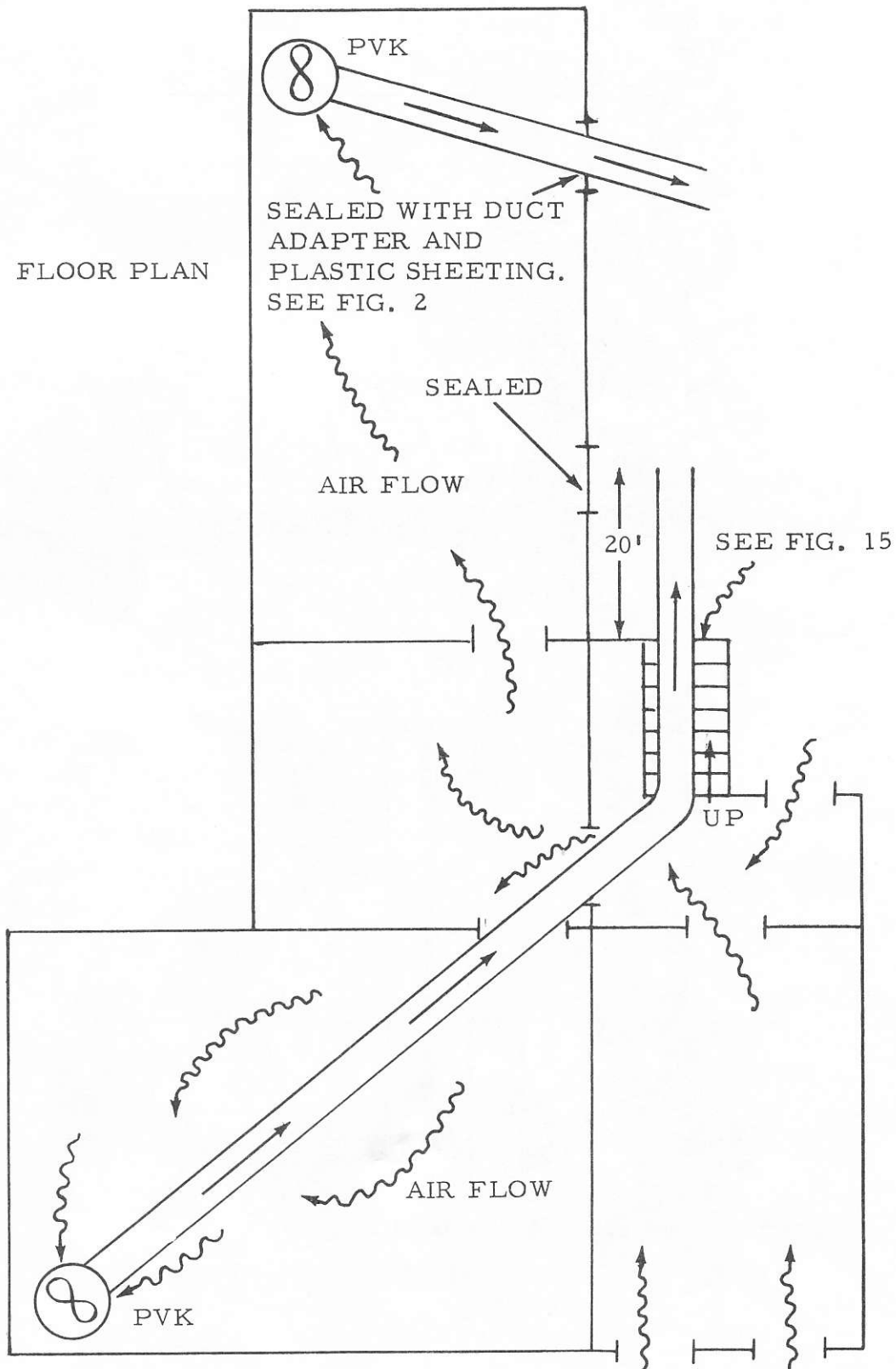


Figure 5 (Example B).— Typical multiroom basement shelter found in hospitals, apartments and public buildings.

STEP B
ASSEMBLE VENTILATION SYSTEM

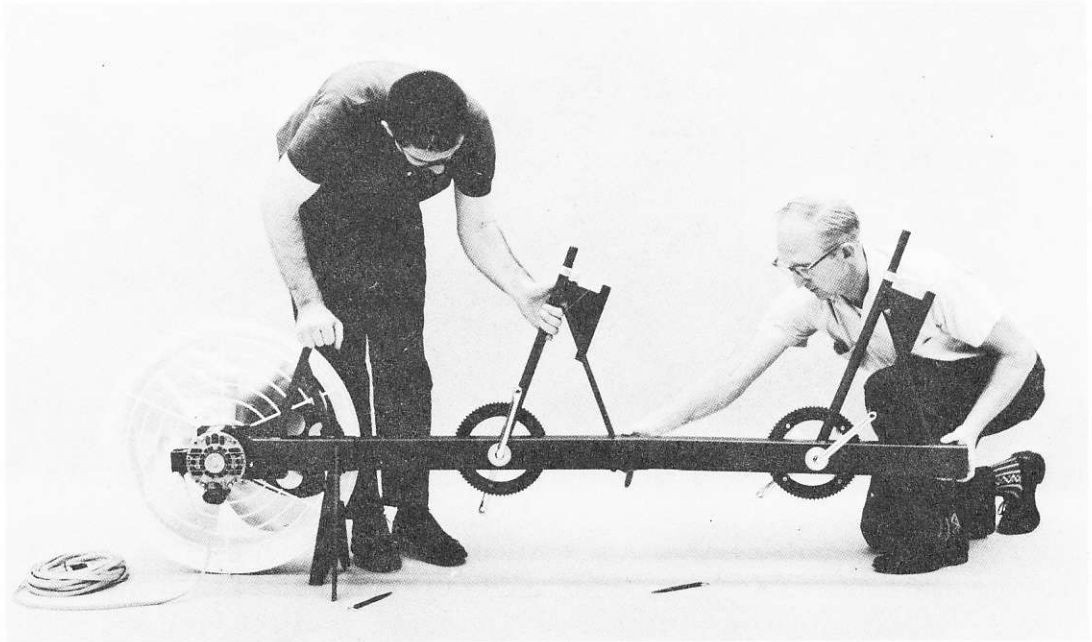


Figure 6. — Insert drive module(s) into fan assembly without pins.

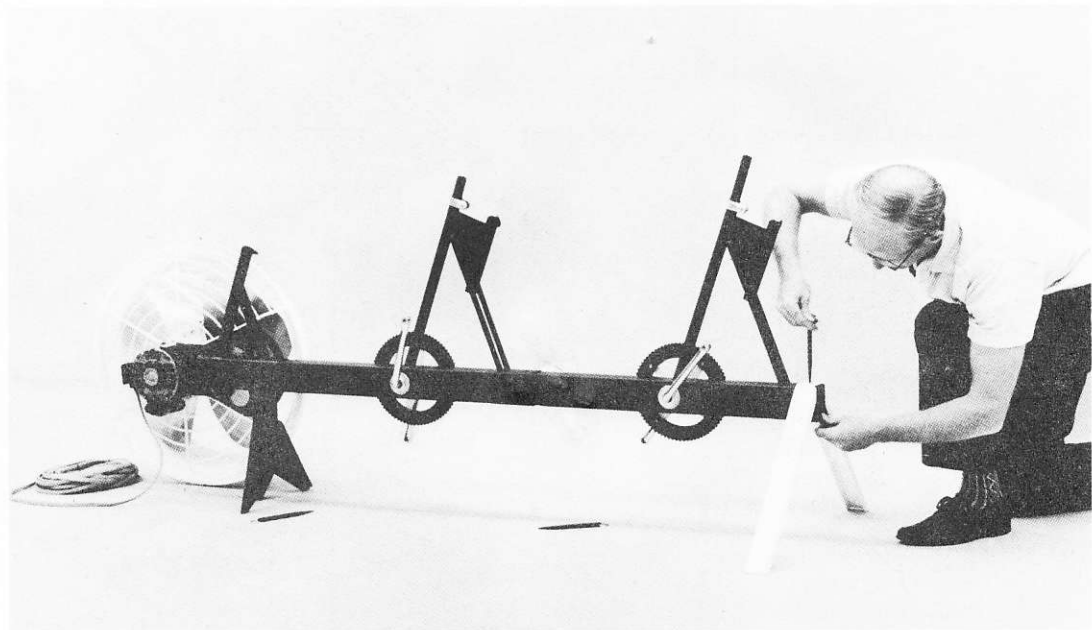


Figure 7. — Mount last drive module on stand and insert pin.

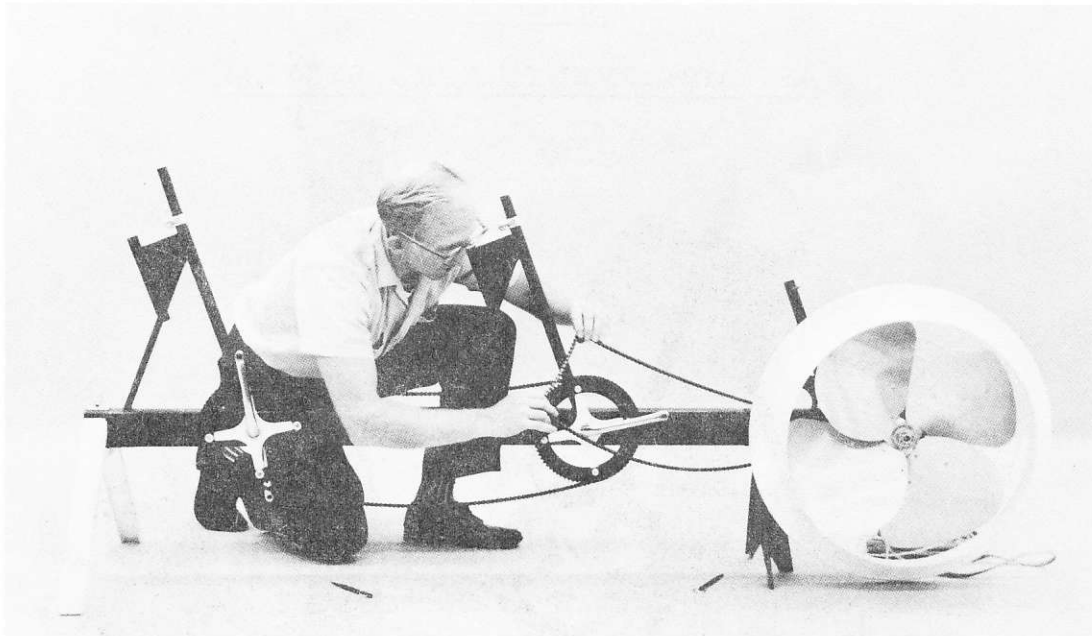


Figure 8. — On multiple units install module-to-module chain on inside sprockets and set pedal cranks at right angles to each other to equalize crank effort. Do not install module-to-fan chain if electric power is to be used.

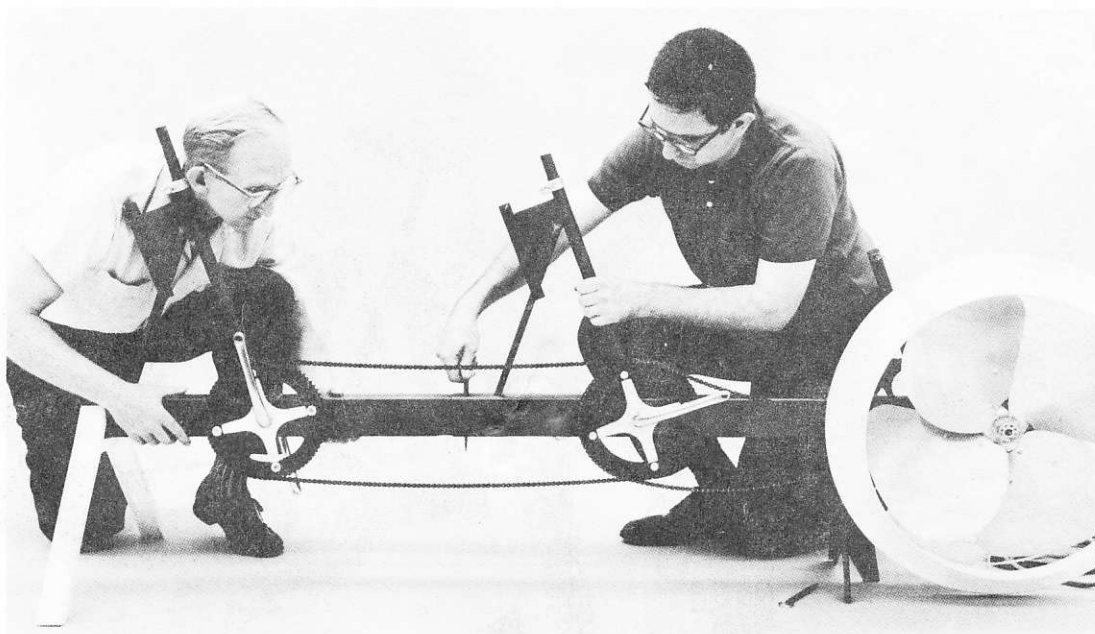


Figure 9. — Separate components until pin holes align and insert pins.

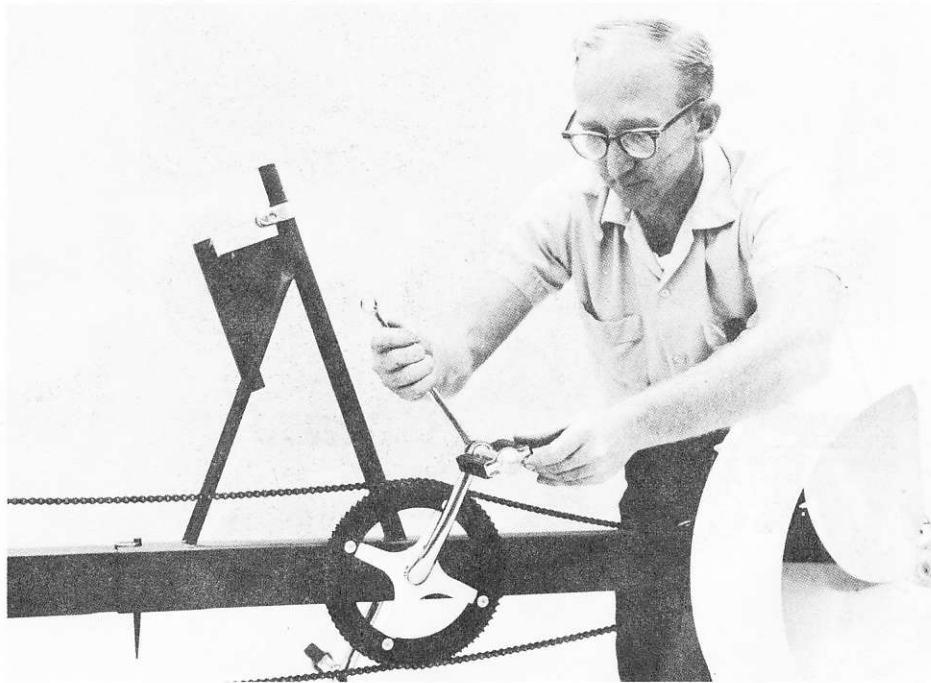


Figure 10. — Install pedal marked "L" on left side by threading in counter-clockwise direction, and pedal marked "R" on right side in clockwise direction. Tighten pedals with wrench.



Figure 11. — Install saddle and handlebars.

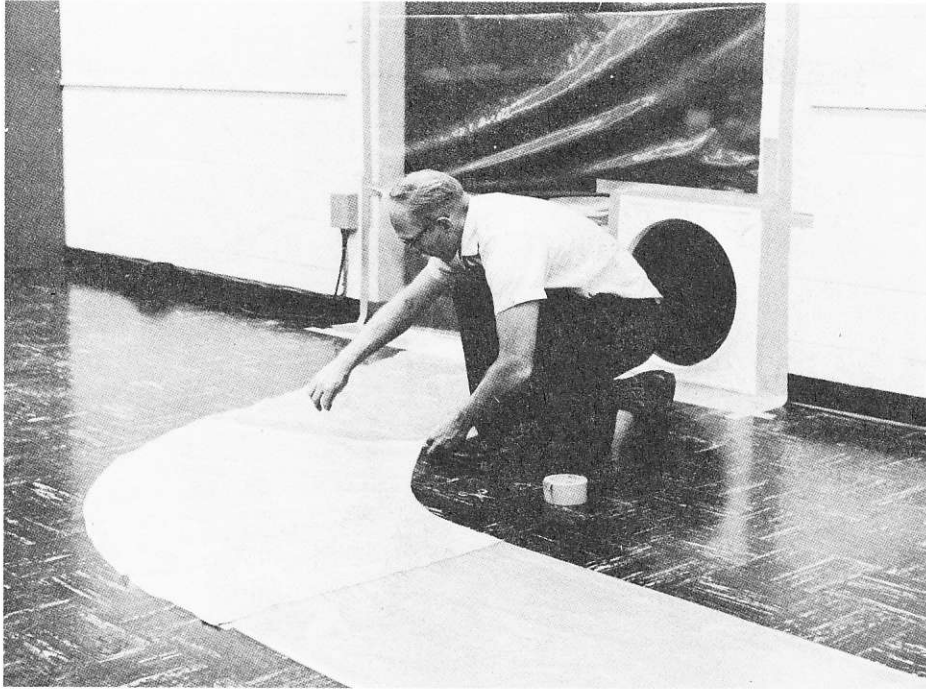


Figure 12. — Slip tubing and elbow inside each other a few inches in direction of air flow. Elbows can be cut if less than right-angle bends are needed. Seal openings around duct adapters with excess plastic duct and tape.

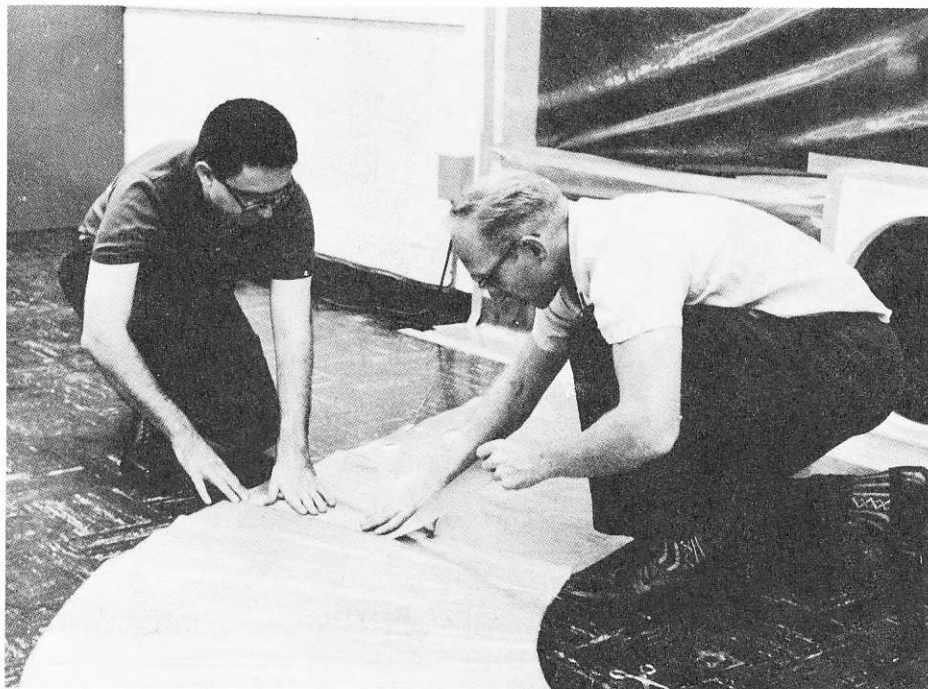


Figure 13. — Tape duct-joint seams on one side, turn over and tape other side.

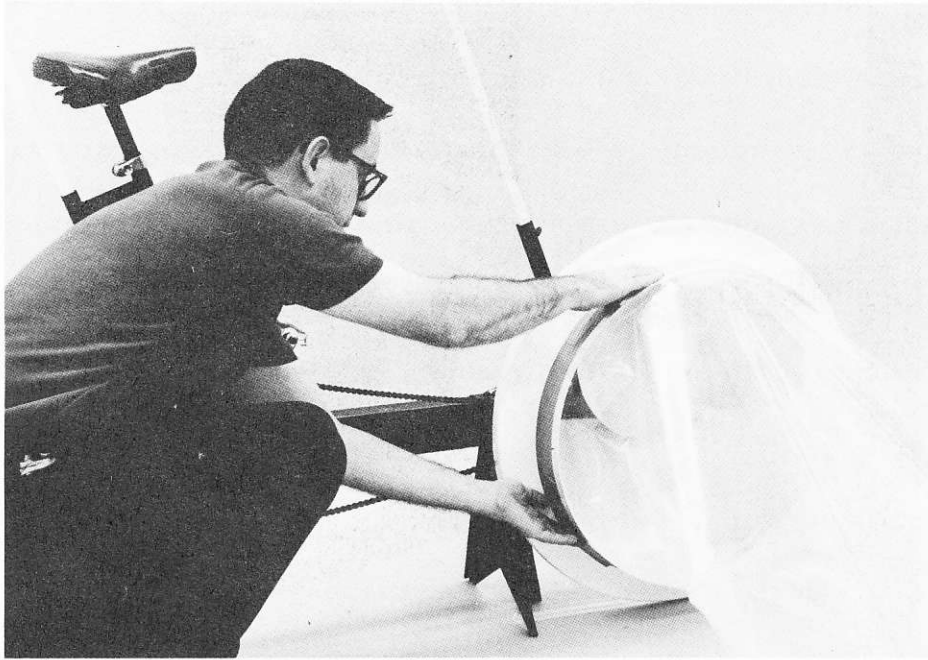


Figure 14. — Connect duct to fan, tape securely without twisting, and route duct to outside of shelter.

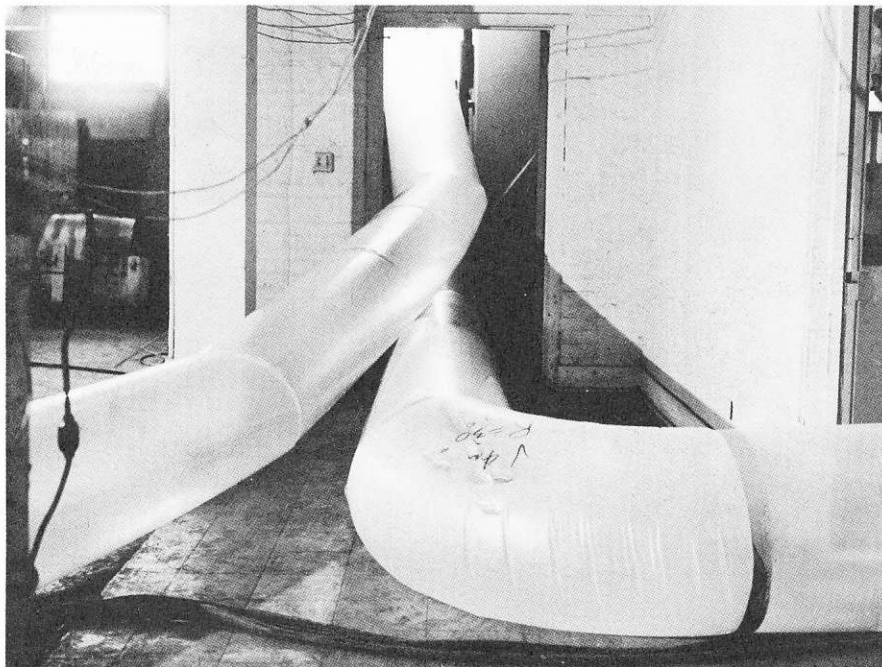


Figure 15. — Discharge ducts leaving shelter. Fresh air enters through same opening. Two other duct systems are shown in Figures 1 and 2.

Sufficient plastic discharge duct is included for cutting sheeting to use in sealing openings which might cause short circuiting of air to the fan. Scissors and sealing tape are supplied. A duct adapter is included to assist in sealing around discharge duct where it passes through a sealed doorway adjacent to the fan. See Figure 1. Make duct as short as possible with few bends. A straight duct assembly or a duct with smooth bends provides greater air flow with less power.

Plastic ducting is furnished in two rolls, 90 feet and 130 feet in length. Carefully route air duct in as straight a line as possible to the outside. If entire length is not needed, cut tubing to length required. Tape is furnished to connect ducting or repair leaks. Care must be taken when turning or bending plastic air duct to avoid any constriction or reduction of size, as this reduces airflow and increases power requirements.

Two plastic duct elbows are supplied. Other duct bends may be made by cutting out triangular sections from the duct and taping duct together as shown in Figure 13.

STEP C

OPERATE VENTILATOR UNIT(S)

Lubricate motor and chains with oil from container furnished. Add oil to motor through small hole at top of each end of motor. Pedal-crank ball bearing needs no lubrication as it has been permanently lubricated.

When fan is operated electrically, remove drive module-to-fan chain before connecting power. Use screwdriver to attach plug adapter grounding-wire pigtail to a screw in electric outlet. If electric power is not available, shelterees should pedal at a comfortable rate, about 45 to 60 revolutions per minute.

The PVK is used as an exhaust fan to pump stale air out of the shelter, causing fresh air to enter through controlled openings; such as windows, stairwells or elevator shafts. Every means of natural ventilation available, especially cross-ventilation, should be utilized in conjunction with the PVK. Windows and doors should be closed or sealed only when necessary to prevent direct short circuit of fresh air to the fan.

Ventilation is required when temperature and humidity become excessive or breathing difficulty is noted among shelterees, caused by excessive carbon dioxide or lack of oxygen in shelter.