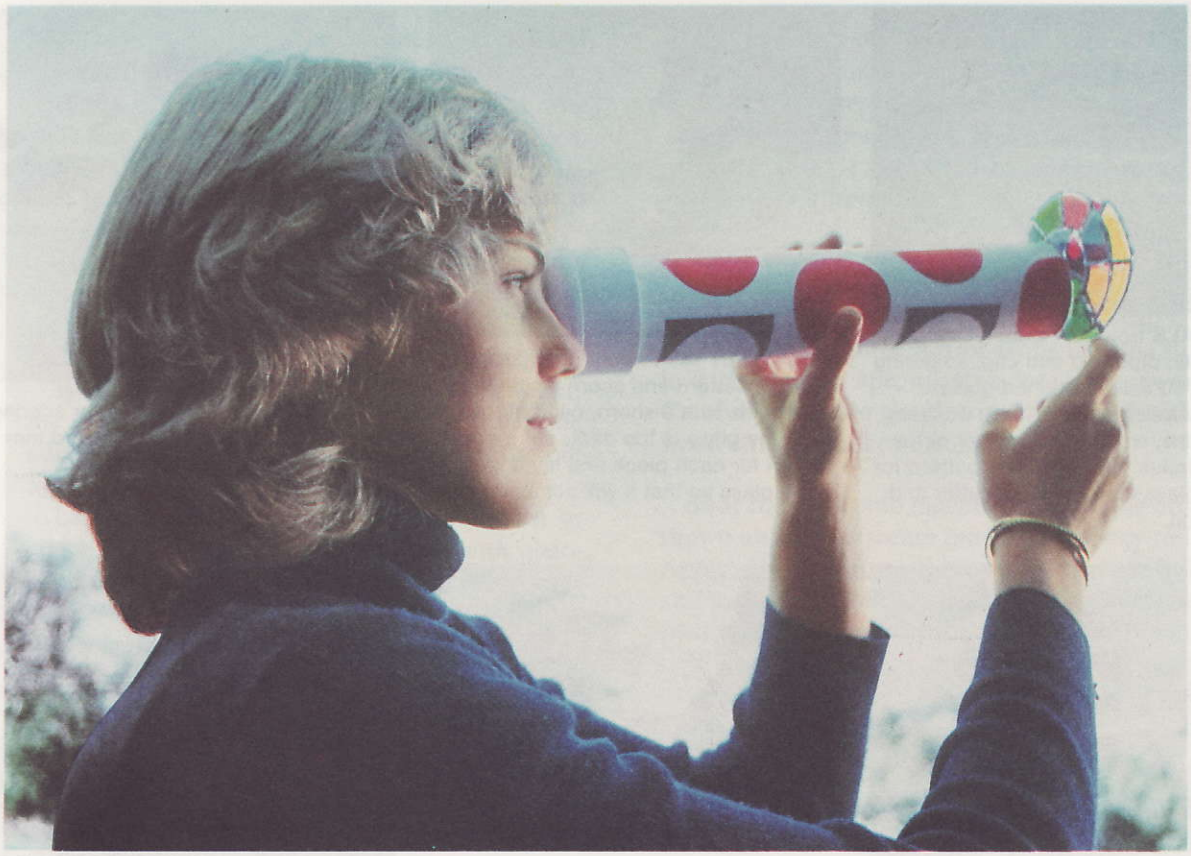


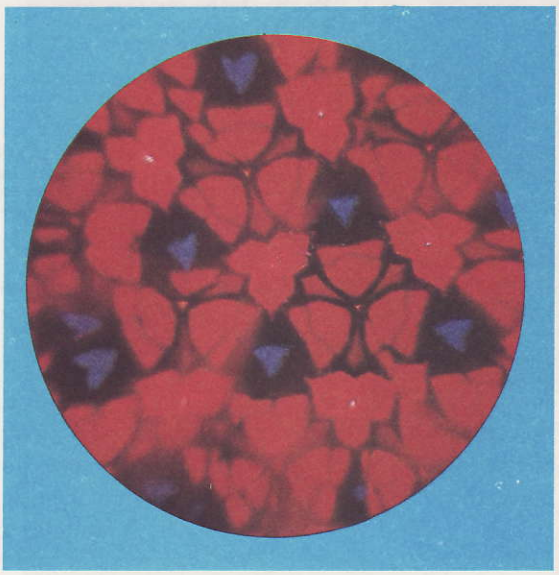
THE KALEIDOSCOPE provides endless entertainment for a person of any age. A slight turn of the stained-glass wheels creates infinite variations of brilliant color, as shown by photos (below) taken through the tube.

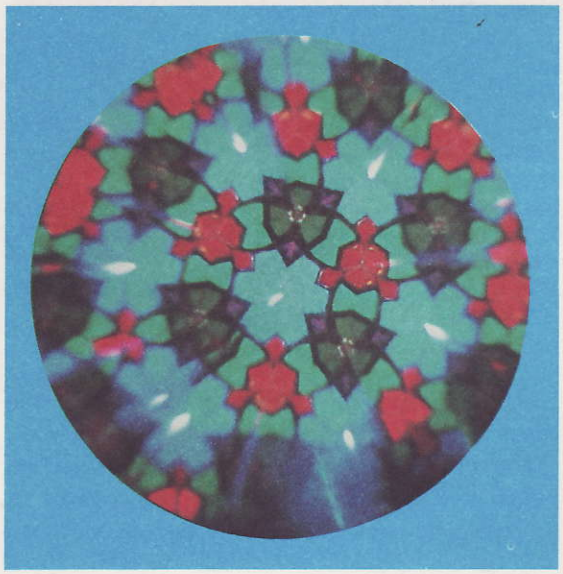
Dazzle everyone with this kaleidoscope

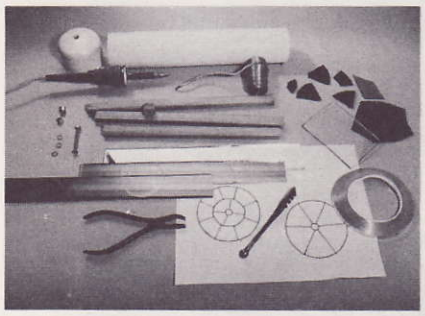
PUT THIS color-filled tube to your eye, and in seconds you'll see countless patterns of fiery red, sunny amber or icy blue. You can use up to 18 different colors and patterns of glass in the kaleidoscope. The greater the number of colors you use, the more vibrant the designs.

The kaleidoscope tube is a 1-ft. piece of plastic plumbing pipe (A) with an end cap (B). Bore the

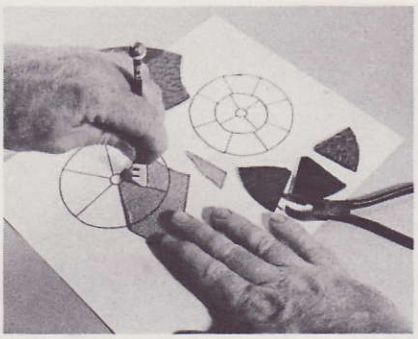
By DAN A. ROBERTSON



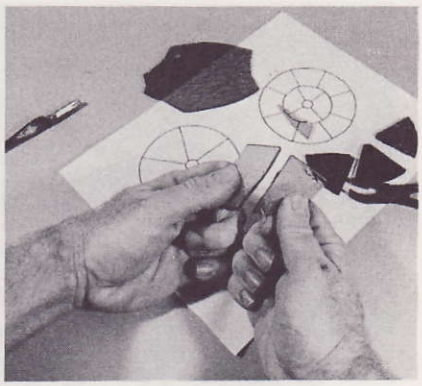




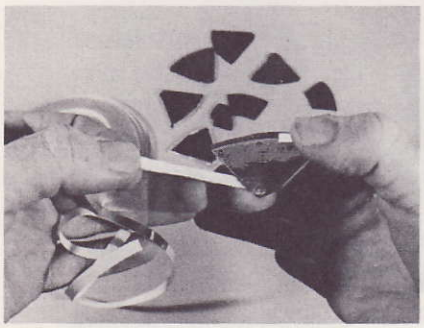
MATERIALS from top: 2-in. inside diameter plastic pipe and end cap, soldering iron, 50/50 solder, stained-glass scraps, copper spacers, bolt, washers, wood strips, wood block, mirror strips, acrylic circles, glazier pliers, pattern for stained-glass wheels, glass cutter and copper foil.



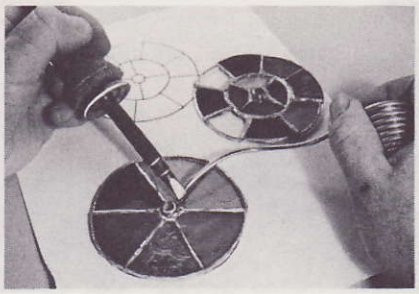
IF YOU CAN see through the glass, lay it on the pattern and score inside the inked lines with a sharp, oiled glass cutter. If the glass is too dark, cut a paper pattern for each piece and lay it on top of the glass so that it will act as cutting guide.



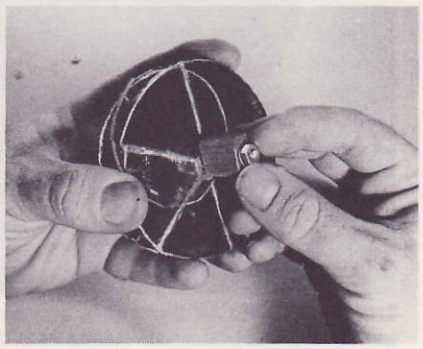
SNAP GLASS immediately after scoring it, using a downward and outward motion. Use pliers to break off small pieces. Rub edges of two pieces together to dull any sharp spots.



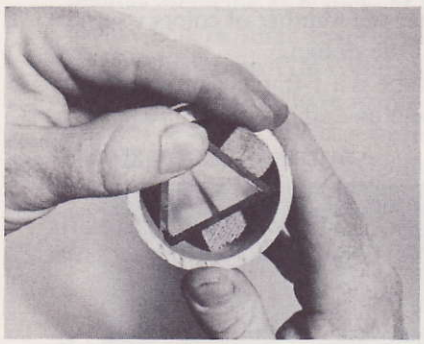
CAREFULLY center copper foil on edges of each piece of glass and wrap it tightly. Then smooth foil with dowel. Foil won't stick to greasy glass.



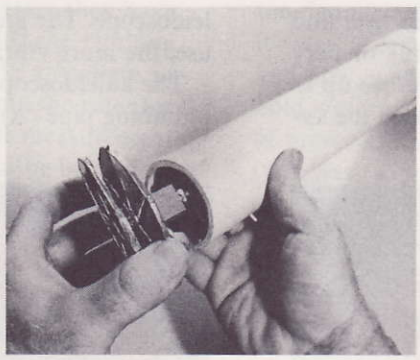
AFTER POSITIONING glass pieces on pattern and fluxing copper foil, run a bead of solder along edges, using a 60- to 100-watt iron. Then solder a piece of copper tubing in center as a spacer.



ASSEMBLE revolving unit; it consists of two glass wheels, acrylic disc, a wood block, bolt and nut.



SLIDE MIRRORS into tube so they form a triangle, mirror side facing inward. Wood strips that hold mirrors should fit snugly, but be careful not to scrape any of the backing off the mirrors.



CEMENT end cap and acrylic eyepiece to one end of tube, and cement the glass assembly into the other end. Clean parts before assembly.

MATERIALS LIST—KALEIDOSCOPE

Key	No.	Size and description
A	1	2" i.d. (2⅜" o.d.) × 12" plastic plumbing pipe
B	1	2" i.d. plastic end cap
C	2	⅛ × 1⁹/₁₆ × 12" mirror
D	1	⅛ × 1¾ × 12" mirror
E	2	⅛ × 2⅜"-dia. clear-acrylic disc
F	2	½ × ¾ × 12" wood strip
G	1	½ × ¾ × 10½" wood strip
H	1	½ × ¾ × 1" wood block
I	2	¼ × ⅜"-dia. copper tube
J	1	No. 8-32 × 2" machine bolt
K	1	3/16" i.d. nut
L	4	3/16" i.d. washer

Misc.: 1 roll of ¼-in.-wide copper foil tape, 1 roll of 50/50 or 60/40 solid-core wire solder, 18 pieces of colored stained glass, glass cutter, pliers, oleic-acid flux, flux brush, cutting oil, 60 to 100-w. soldering iron, PVC solvent cement, epoxy resin cement, contact paper, inked wheel pattern.

eyehole in the center of the cap and smooth the edges with fine (180-grit) sandpaper or steel wool.

Draw a full-size pattern of each color wheel on paper with a dark felt-tip pen. Lay a piece of stained glass over a section of one color wheel, with the smooth side of the glass facing up. Dip a sharp glass cutter into cutting oil or kerosene, then press the cutting wheel onto the glass along the inside of one of the inked lines. When you make the score, you should hear a slight hissing as the cutter travels over the glass, scratching a faint line into the surface. *Never* go over a scored

line twice, however, or your cutter will quickly become dull.

If the glass you're using is so dark that you can't see the inked pattern through it, make a duplicate pattern on stiff paper. Cut out the pattern pieces and lay one on top of the glass to guide your cutter.

To make a quick break, form fists with both hands and grip the glass so your thumbs straddle the score line with fingers under the glass. Move your hands in a down-and-out motion to snap it.

Wash the glass with detergent and hot water, dry it, and then wrap copper foil around the edges of each piece so edges are centered on foil. Smooth foil with a dowel or pencil.

Lay the foil-wrapped glass on the pattern to check for fit. Then brush the copper with oleic-acid flux and solder the pieces together with 50/50 or 60/40 solid-core wire solder. Solder spacers (I) into the center of each wheel. Next cut the three mirror strips (C and D). Make the scores on the glass side, not on the silvered side. Then snap off the strips as you would any other glass.

Cut two clear-acrylic discs (E) to seal the ends of the tube. In one of the discs bore a ¼-in.-dia. hole with a center that is 7/16 in. from the edge. To secure the mirrors inside the tube, cut three wood strips (F and G) and wood block H. Bore a 5/16-in.-dia. hole through H.

Make sure all glass, mirror and acrylic parts are clean. Then cement the acrylic disc without the hole to one end of the tube. Slip end cap B in place. Slide the three mirror strips into the tube in a triangular shape, mirror sides facing inward. Carefully slide the wood strips in place. Position wood strip G under mirror D.

Slide the parts onto machine bolt J in the order shown above and secure nut K with epoxy resin. Apply epoxy resin to the open rim of the tube and to the wood block where it will be in contact with the tube. Position the wheel assembly and tape disc E in place until the epoxy hardens.

As a final touch, you might decorate the kaleidoscope with self-adhesive vinyl cut into simple shapes.