

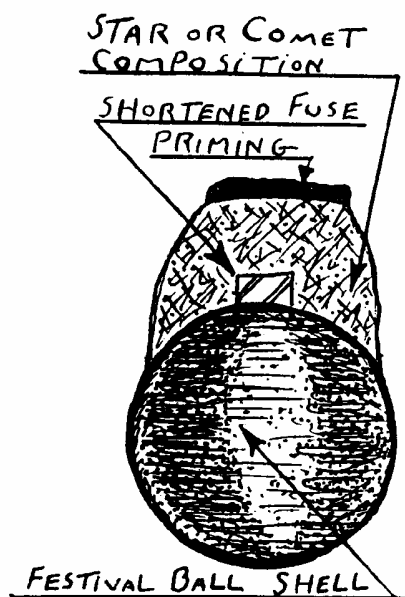
An earlier version appeared in *Pyrotechnics Guild International Bulletin*, No. 34 (1983).

## Festival Ball Comets

Ken Kosanke

Festival ball comets are inexpensive, easy to assemble and produce a nice effect. Before discussing their construction, let me acknowledge that, as far as I know, the basic idea for this firework originated with Bob Winokur.

The device consists of a festival ball shell with comet composition coating the fuse end of the shell. Festival balls are small Class "C" aerial shells, about 1-3/4" in diameter and are usually painted red in color. Unlifted, they cost about \$20.00 per hundred. Kits of 12 lifted shells with a mortar are available for five or six dollars. The small shells have stars of any of several colors and are a fairly effective firework for the price.



To assemble a festival ball comet, first the bundle of Chinese fuse on the festival ball shell is cut off 1/4 to 1/2 inch away from the shell. Next, a small amount of heavily dampened comet composition is molded around the fuse end of the shell (see the illustration to the left). Obvi-

ously, the length of the fuse remaining and the thickness of the comet composition covering the end of the fuse determine the time delay for the shell break. Essentially any comet formulation can be used; however, it is important to substitute gum Arabic as the binder. Gum Arabic bound compositions dry very hard and stick tenaciously to almost any surface, in this case, to the festival ball. With most other binders, there is significant likelihood that the comet will loosen from the festival ball and fall off during the shock of firing from the mortar. The final assembly step is to apply prime to the end of the comet composition. Homemade meal powder (75% potassium nitrate, 15% charcoal and 10% sulfur) bound with nitrocellulose lacquer is quite effective, particularly when a small amount of fine grain black powder (3 or 4 Fg) is sprinkled on the prime while it is still wet. The choice of fast drying nitrocellulose lacquer as binder is not critical.

As a mortar for these small festival ball comets, 1-1/2-inch schedule 20 PVC serves adequately. (Note: 1-1/2 inch schedule 20 PVC has an inside diameter of 1-3/4 inches.) I do not generally advocate the use of PVC mortars; however, I have not had problems using it with light weight festival balls. This past year, we fired more than 500 festival balls from racks of these thin walled PVC mortars, with the loss of only two mortars to cracking. As lift, 1/2 tablespoon of 4FA blasting powder (not 4Fg powder) seems sufficient. Obviously, the festival ball comet should be loaded into the mortar with primed comet end down.

As would be expected, the effect of these devices is an ascending comet ending in a small colored shell break. Festival ball comets can be produced for an out of pocket cost of about 25 cents each. This seems modest considering the effect produced. These devices are particularly effective when fired simultaneously in mass.