12 February 1957

Orville Carlisle
420 Norfolk Ave.
Norfolk, Nebr.

Dear Orville:

I have the sneaking hunch that you knew exactly what you were doing when you sent that bunch of Rock-A-Chutes down to me. We're testing the living daylights out of them.

We've fired about fifty rounds thus far with only two malfunctions -- the ones I wrote you about Sunday. The reliability is beyond question. Also the safety. There has been 100% chute deployment.

Almost all the FFF9, Charge 7, and Charge 6 boosters are gone. We're flying now with what is left of the group of 5's and 4's, and using the 3's for static testing.

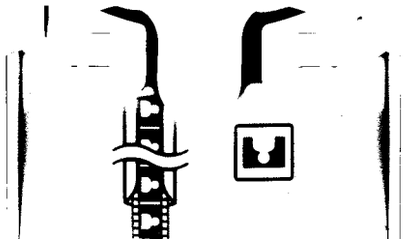
The Navy photogs used several rounds for trying out their new tracking cameras. Within a few weeks, we should have colored movies on hand. They were taken at 200 frames per second and shows the bird leaving the launcher. This should slow things down enough to find out if we're getting any launcher tip-off or vibration as the bird goes up the dowel. Also got high speed photos of chute ejection at 200 frames per second with telephoto.

We've tried some temperature & runs and discovered why I had the two malfunctions Sunday. Don't let the booster units sit in the sun. Keep them between 85 and 45 degrees F., and they work best. Performance really gets hot at about 90 degrees, but there is a tendency for the unit to burn thru through. Below 40 degrees, they don't want to push at all.

The boosters are insensitive to shock. We gave them the works. Shook the hell out of them, dropped them, kicked them, and they went fine. When stepped on or run over by a car, they tend to go bang, however.

Charge 7 and FFF9 gave some pretty good velocities, about 200 feet per second at burn-out, average. FFF9 is a better charge; it burns longer and the initial acceleration is lower, but the delay should be a couple of seconds longer; we had mm some FFF9 rockets deploy their chutes on the way up just a few seconds before peak.

When you get the units ready to sell, you won't have any trouble down here. Two questions were always asked: (1) "Where can I get a couple?" and (2) "How much do they cost?" We have a sneaking hunch they will make fine demonstration rockets for the crowds of VIP's, generals, and admirals we



have down here with great regularity.

Your unit has a nickname here. It isn't known as the Rock-A-Chute. Everybody calls it "The Poor Man's Pogo." I think I told you about the Pogo Project.

Your rockets also have a couple of honors: They have been fired on the WSPG range and they have been tracked by radar.

I drew crowds of elated professional rocket men everywhere I lit one off.

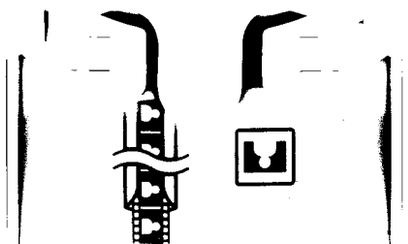
Two items you can do for me: (a) load me up a pile of 7's and FFF9's and bill me for same; (b) please let me know what they cost and when they will be available. We've run out of 7's and FFF9's; down here nobody was particularly impressed by the performance of the lower charges, so we've just about shot up all the high-powered stuff. And everybody wants to know where to get them.

The Pogo Project has one of your units and was popping chutes with great regularity. I think you will hear from them.

Several people are at work on advanced models. We have yet to check the aerodynamics, but we're cutting the diameter down to 3/4" to gain better fineness ratio without making the unit longer and heavier. Also, we've come up with an improved airframe design which is lighter. It's made with one sheet of ordinary typewriter paper just like the one I'm writing on. To give it strength after it has been rolled and coated with three coats of clear dope, four stringers are cemented along the sides parallel to the longitudinal axis. This gives the necessary stiffness while saving weight. Ogival nose cones are being turned for the new models. We are going to four fins of smaller diameter and shaped like the Aerobee's. To make the rocket aerodynamically clean when it leaves the launcher, we're trying several stunts. One involves a two-rail launching tower with rails on both sides of the bird and four small guide lugs, two on each side, a set fx forward, and a set aft by the booster holding ring. We're trying to cut the weight down and redistribute it for better stability, make it aerodynamically clean, and soup up its performance. We'd like to get the weight down between an ounce and and ounce-and-a-half at takeoff; this will give it 1000-foot performance or better.

We can't work on this during regular hours, as you probably realize, but it's making one of the best lunch-hour projects we've had in a long time.

The most impressive thing to people down here is the complete safety and astounding reliability. Everybody bites their nails until it leaves the launcher; then they bite their nails again until it goes ka-pow and pops the chute. We keep looking for it to fail, but it doesn't. To



White Sands people, this is utterly beyond belief because we are used to having them fail and are always waiting for it. I gave up worrying about it because I found out that it doesn't fail if you work with it right.

Item: we have found it best to keep the booster units stored in a silver or white metal can lined with corrugated cardboard. This prevents some joker from dropping cigarette ashes and setting off the works. The white or silver color also helps keep the can cool if you have it sitting in the sun -- something that shouldn't be done in the first place. The cardboard also keeps the units cool and away from the metal sides of the can.

Another item: it would not hurt to punch a hole in the peak of the chute. A quarter-inch hole improves the stability of the chutes and helps keep it from oscillating. Your anti-oscillation holes help, but a non-porous chute like that needs to have a hole in the peak. It also helps keep the air out when it is rolled on packing.

Oh, yes! We're going to try a thin nylon chute in the new model. This is required in order to pack it into the smaller diameter. Undoubtedly, this new job will or can be the deluxe job for prospective record-breaking rocketeers.

All of which leads me to say you sure knew what you were doing when you sent it down here. Some of the highest-priced and most experienced help in America is playing with it now, applying the tricks of the trade. Not that we think we can do a better job than you have, but that we're applying a few tricks of the trade almost unknown anywhere else. And you've gained our utmost admiration.

I have already written Mechanix Illustrated and am about to contact the American Rocket Society. Also, we somehow managed to ship rockets all over the United States; I'm looking into the matter of how it is done because you should be able to do it too.

Anyhow, that is the report from here at this time. How about some more boosters? I'm paying for them this time.

Cordially,

G. Harry Stine