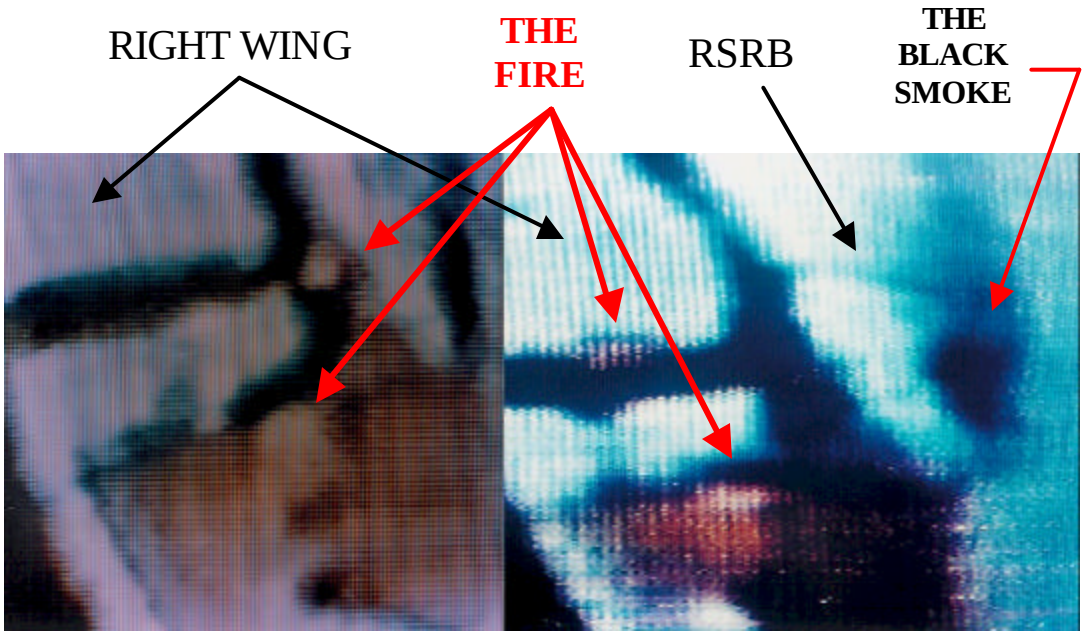
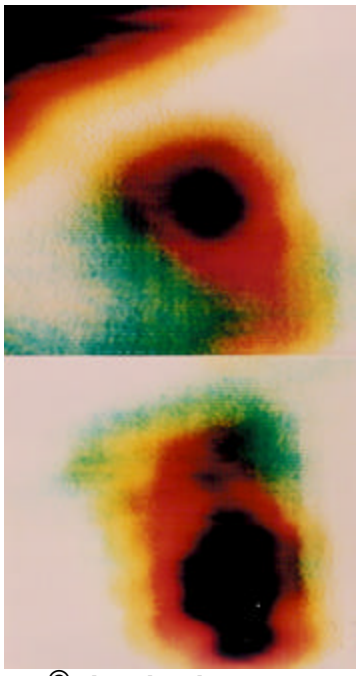
Thank you Hawaii, "Rizz." One of my projects in the beautiful State in 1975 or 76 helped me to find the Challenger fire at lift-off. A contractor wanted to use polyurethane foam, then new and now in every hardware store, in the project. That created a problem, the OSHA requirements. Is the material flammable? I had tested metals, alloys and composites used in spacecraft structures in laboratory environment, but this was an unusual test. We arranged for sheets of aluminum to be sprayed with the foam (ET?), invited the OSHA inspector, and had the welders go at it with vengeance. I had the welders scorch the foam from many angles while I inspected things carefully. Polyurethane is not flammable, but talk about black smoke! I did the test next to the antenna that overlooks beautiful Sunset Beach. Suddenly, there was a commotion. Apparently, the folks on Sunset Beach called the Fire Department about a possible fire in the Comsat Earth Station on the north shore. Things calmed down quickly, but I did not forget the distinct black smoke clouds. There were angles where I knew there was intense fire, but all I could see was the bellowing dark smoke!

While trying to resolve the serious liftoff loads issue in 1986, I began to study the film record carefully. I was primarily looking for evidence to support my "dynamic overshoot" findings. The Hawaii experience was useful. The brightness of the day, intensity of plumes and white colors saturated the cameras. By simply filtering the glow effect, the intense fire became vividly visible. I took pictures of these. The BIS photos mentioned before are shown here.



I don't have the exact NASA camera Id for these views now, but this camera was behind the assembly. As the Challenger moved up and slightly forward, the black smoke wrapped around the right booster, as seen on the far right. The fire is clearly visible below the outer tip of the right wing and a small flame made it through the hinge line of the elevons. Notice the bright spot in the shadow of the wing in the left photo. This is also fire. I did geometric model analysis to eliminate the possibility of reflection from any source, including, sunlight, plumes, etc. Also, the motionless fire in the photos can be clearly seen undulating and surging in video. There is no peer-review for this kind of thing. As Feynman said, all one needs are eyes.

NASA did photo enhancements and CAD analysis to construct thermal footprints of the fire in flight and generated black-and-white contours (with shades of gray) of the fire at T+58.716, T+59.0441, T+59.516 and T+60.866 seconds (see Figs. 138 and 139, Commission, Vol. III, N-83). You see the thermal contours of the lift-off fire that I captured in the two photos on the right. On the upper left corner of the top photo, you see the edge of the right wing and below it the intense fire leak – black hottest and green is cold. As the stack moves up, (2nd picture), you see the wind effect washing the fire down. There are many other pictures of the lift-off fire, and I hope that the photos here will convince many, if not all. Still, the video is more convincing. Some of you may want to go further. Get your Shuttle model or pictures, get oriented with the geometry involved, and study the locations of the fire, the right booster and the stricken joint with other input.



I was severely criticized by many. I forged the fire, they said and wrote! How do you do that? I know fire when I see it. When I was a small boy, I caused great damage to our home playing with matches next to a first-aid cabinet that had lot of cotton, alcohol bottle and medicines that went up in flames and burned many things before antiquated fire equipment arrived and battled the results of my foolishness then.

There is another picture that I like to post here. To "fragmeister," here is a photo of the recovered right wing of Challenger (a NASA release). Look at the exact locations of the fire in the first two photos and compare with the burned-out parts of the wing.

Challenger Recovered Right Wing

I was mesmerized by the detailed evidence of the Titanic, nearly a century after that tragedy. I thought about it a lot from different perspectives. Challenger touched all of us. I hope you will think about the evidence before you.

Ali