

# Dear Virginia about SDI

Dear Virginia,

If you believe that the Strategic Defense Initiative (SDI) will work then... yes, Virginia, there is a Santa Claus.

True, Uncle Ronny has promised us all that SDI will give the United States of America "the means of rendering these nuclear weapons impotent and obsolete." And he believes it.

He also believes SDI would allow people "to live secure in the knowledge that their security did not rest upon the threat of instant U.S. retaliation."

Uncle Ronny thinks that once SDI is in place, the U.S. will be able to blow anything the Russians shoot at them out of the sky. Once the U.S.S.R. recognizes that the U.S. is invulnerable to anything they might aim at it, they'll just leave the U.S. alone. I guess that's why Uncle Ronny calls SDI the "Peace Shield".

Sounds like a good idea, Virginia, but there are some pretty major problems with SDI. Let me explain...

Theoretically, SDI would be made up of a bunch of weapons placed both on earth and in orbit around the earth. These weapons, which would include lasers, kinetic kill vehicles, and just plain old anti-ballistic missiles, would be primed to detect and destroy any missiles that the U.S.S.R. might launch. Kind of gives you a warm feeling, like a cup of hot chocolate, until you start thinking about how easy it is going to be for the Russians to louse up these best laid plans.

Basically, Virginia, what the Ruskies will be shooting at the U.S. are long skinny things called Intercontinental Ballistic Missiles (ICBM)... these take all of half an hour to reach their targets so we're not looking at a lot of time to stop them.

In the best of all of Uncle Ronny's worlds, the U.S. would shoot down these missiles during their boost phase... that's when the missile is travelling from its safe little launch pad outside of downtown Gorky to just beyond the earth's atmosphere.

This is a good time to aim because the rockets on the missiles are burning and you can see just where they are. All the boys from the U.S. have to do is aim their lasers, burn a hole through the missile casing, and blow it out of the sky.

Right... as long as the Ruskies cooperate. You see, all the Russians have to do to make their missiles less vulnerable to the U.S. lasers is forget to paint the casing... If the Russians leave the missiles a nice shiny metallic silver, the laser beams will bounce off... not unlike a flashlight beam would bounce off a mir-

ror. As a result, the U.S. lasers would be virtually impotent.

Then again, if the Russians did decide to paint their ICBM's, they could use something pragmatic called an oblativ coating which would just burn off when the laser hit it leaving the rest of the ICBM intact. Or, and the Russian options go on, they could just add a few little wings to the bottom of their missiles, thereby putting a little bit of a spin on them. To function the lasers have to focus on a point on the missile for some time... it is hard to focus on a spinning missile. Apparently, SDI relies heavily on Russian cooperation.

Further, the Russians could really play dirty and bunch all their missile launching pads together. Unless the U.S. had SDI equipment floating around all over the sky above Russia, a concentrated launch would surely tax the system beyond its limits and several missiles would surely get through.

Finally, most of Uncle Ronny's calculations are based on the premise that the Russian boost phase would last between three and five minutes. Unfortunately for him, the Russians have access to what we call short boost rockets. Using these, they would be able to shorten the boost phase to under one minute. Virginia, the U.S. would have a lot less time to aim their lasers. Tsk, tsk. The Russians just won't play fair, and it really doesn't cost them much to play dirty. Typical.

In fact, a scientist named Christopher Cunningham looked into the Russians' dirty dealing and figured out some pretty disturbing stats. (Incidentally, he works out of the Lawrence Livermore Laboratories in the United States of America... so I imagine he knows what he is talking about). Anyway, Mr. Cunningham plugged a bunch of figures into a computer. He described U.S. technology for the anticipated SDI system to the computer and then what the Russians might do to foil the U.S. plans. The results weren't exactly comforting. If those wiley Ruskies refused to cooperate and left their missiles silver, launched them all from the same place, stepped up the boost phase, and knocked out just one of the space

by Suzanne Lundrigan

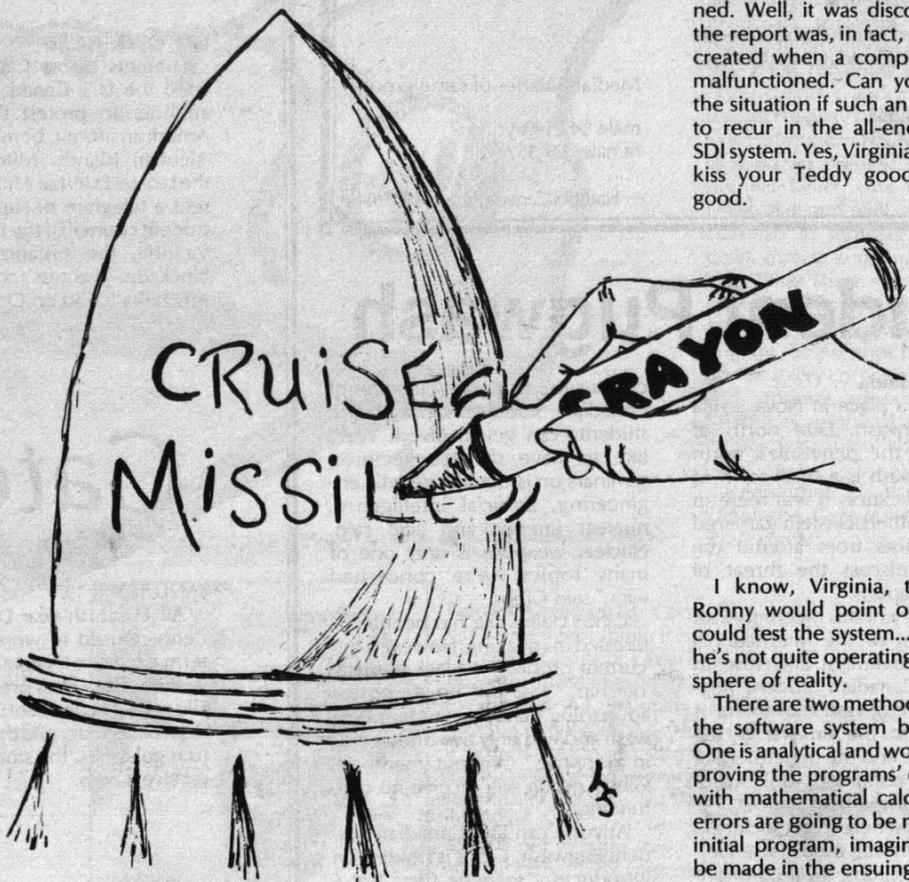
based weapon stations... the much touted SDI system would miss every missile launched out of Russia. Perhaps Uncle Ronny should take a look at Mr. Cunningham's studies... he is funding them.

The odds don't look too good, Virginia. You have to admit that some of those pesky ICBM's are going to get past the U.S. defenses during the boost phase. Unfortu-

would fog up the best of radar systems. Nasty Ruskies that they are, they make it hard to aim when we can't see the targets.

Oh, by the way, the U.S. now has only 20 minutes to put an end to all this nonsense. If the U.S. misses now, and it seems pretty likely... they have one minute left once the ICBM re-enters the atmosphere over the land of apple pie.

One famous case of computer glitch disease occurred on June 3, 1980. On that date, the North American Aerospace Defense Command (NORAD) reported that the U.S. was under missile attack. Yes, Virginia, everyone was very concerned. Well, it was discovered that the report was, in fact, a false one, created when a computer circuit malfunctioned. Can you imagine the situation if such an error were to recur in the all-encompassing SDI system. Yes, Virginia, you could kiss your Teddy good night for good.



I know, Virginia, that Uncle Ronny would point out that we could test the system... but again, he's not quite operating within the sphere of reality.

There are two methods of testing the software system behind SDI. One is analytical and would involve proving the programs' correctness with mathematical calculations. If errors are going to be made in the initial program, imagine those to be made in the ensuing proofs.

Empirical testing would be the ideal. Obviously the U.S. would have a hard time convincing Uncle Mikhail that the looming shapes overhead are just fakes, so I guess a full scale test would be impossible. It would be nice to know that the system actually worked before the U.S. started bragging about it.

Left with limited testing, the U.S. does its best... they call this simulation. Unfortunately, during a simulated test, not all parameters can be reproduced exactly. The testers cannot anticipate all variable factors. For example, what affect would simultaneously exploding nuclear warheads have on defense stations placed in space?

The limitations of simulated testing are clearly illustrated in the story of the Aegis air defense system. Aegis was designed to track hundreds of missiles and destroy 20 at a time as they come into range. During simulated tests, the Aegis performed flawlessly. However, during actual testing, the Aegis did not perform as well. In fact, it missed six out of 16 targets which came into range. Virginia, these are not very good odds for something destined to save the "free world" from destruction.

Not that I'd want you to have nightmares at night, Virginia, but really, Uncle Ronny's "Peace Shield" isn't everything he promised it would be. Perhaps, Virginia, you should drop a line to Uncle Ronny to let him know how you feel.

nately, once they sneak past that point and enter what is called the orbital phase, they become even more difficult to detect. Those Ruskies are a clever lot. Once beyond the atmosphere, the ICBM's break into hundreds of parts... some of those parts are actual warheads and the rest are decoys. The real trouble begins now.

For every ICBM which gets through the atmosphere there will be hundreds of objects to be shot down. The U.S. would have to hit every one to make sure they got their prize... just like at the exhibition. By the way, Virginia, it is likely that the Russians would include thousands of pieces of foil which, once released into the atmosphere,

All we've got left on re-entry are anti-ballistic missiles. These are reasonably accurate, but the whole explosion is a tad close for comfort. Having nuclear warheads explode overhead doesn't exactly make for a white Christmas... besides, think of poor Santa Claus and his reindeer flying through that mess.

The limitations of the glorious SDI are pretty apparent.

Ignoring all these considerable difficulties, the software to coordinate this venture boggles the mind. Let's face it, Virginia, there is no room for computer glitches in this system. The idea is that there will be a computer coordinating the identification and destruction of hundreds of thousands of flying bodies. U.S. computer systems are not above reproach.

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