

# WHO SAYS THERE'S A SPACE RACE?

*by Eberhardt Rechtin*

Over the past two years there has been a great deal of discussion about a situation called the "space race." There have been statements that the United States is involved in such a space race. There have also been statements that the United States is *not* in a space race at all, but is pursuing an unhurried, but scientific, exploration of the space environment.

It would seem that the first question to be answered is whether or not there really is a race.

A race has certain required elements. There must be a reward or a prize. There must be a significant achievement made in order to acquire this reward. There must be an interested audience. And there must be at least one participant. It is worth noting that it is not necessary to have two participants in order to make a race. We can all think of examples of a single participant who is racing against time, racing to beat his own previous record, or racing as a sheer and often beautiful exhibition of skill and strength.

If the ingredients of a reward, a significant achievement, an interested audience, and at least one participant are taken as the criteria for a race, then there most certainly is a space race, since we have one highly demonstrative participant—the Russians—and ample evidence of the achievements, rewards, and interest to the audience.

Let us then consider the race from the point of view of the Communist government and society of the USSR. The Russian Communists have certain overall objectives. They want a strong Russian Communistic society. They want to expand their sphere of in-

fluence. And they want an increasingly favorable economic situation for Russia — i.e., a higher standard of living, greater productivity, and a favorable world market which will permit them, in capitalistic terms, to make a profit.

The Russian Communist government must therefore decide if the overall objectives would be met by putting money and energy into space activity. There is not much question that the original Soviet missile program was a direct consequence of a military need to counter our Strategic Air Command. In the simplest terms, it was necessary for the Soviets to be able to fire at and over the SAC bases and to be able to fire accurately and swiftly. The Soviets therefore had considerable incentive for a missile program.

At about the same time, the United States recognized this Soviet move and consequently also embarked on a missile program with considerable incentive. However, this missile program, although it has been essential in producing large boosters, is not the same thing as a space program. This difference is evident even in the Russian program.

According to the Soviet scientists, it was no simple task for them to get their space program started. Apparently it took several years. As the possibly apocryphal story goes, a very serious question was raised in the upper Soviet government circles as to whether or not the Soviets should launch space vehicles at all. Supposedly, certain members of the Soviet government were very seriously concerned that such space activity might trigger the United States into engaging in this race of missiles and space before the Russians had a sufficient advantage. In other words, these Soviet officials felt that they would like to have the United States sleep on a bit longer. However, the decision was made to fire satellites and so the space age began.

Judging from the results, it appears to me that neither the Russians nor the Americans remotely

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guessed the prizes which the Russians would pick up as a result of their success. The Russians probably guessed a bit better than we did, but there is ample evidence that even they did not understand the full story. I base my opinion on the fact that the Russians are still going around picking up prizes which, had they foreseen the situation, they would have been prepared to pick up a long time ago.

### *The prizes*

The prizes which the Russians have picked up in these early laps of the space race are well worth looking at in a little detail. Some of the prizes can be valued in cold cash. The Russians probably spent on the order of 500 million dollars in order to launch the first several sputniks. As a direct result of these launchings, the Russian technical prestige took a large discrete jump upwards in the world market. Making a highly conservative guess of the cash value of this jump, based upon the size of the world market and the size of various governmental expenditures, the first several sputniks meant a return on the world market on the order of five billion dollars. Therefore, by spending 500 million dollars the Russians got back about ten times that amount.

To illustrate the economic effect with a story: Suppose that you were a civil servant in South America or in Asia and you were responsible for choosing a contractor to build a bridge. Because your own country has no bridge-building contractors, you must look to other countries of the world.

We will consider two cases. First, consider the case when you are trying to decide on this contractor in about 1954. You would probably consider getting your bridge from the United States, the United Kingdom, or perhaps West Germany. It is unlikely that you would consider a Russian contractor too seriously. For the second case, let's change the date to 1958. The countries which immediately come to mind to perform this technical task of building a bridge are now Russia and the United States.

Well, the prize of technical prestige in obtaining more of the world market is relatively obvious. Another prize, very easily overlooked by us, is an advantage which is probably of even greater value to the Russian Communist leaders. The Russian Communists have clearly identified themselves in the minds of the Russian people with the success of the space race. The Russian people are understandably and justifiably quite proud of this remarkable technical achievement. Such an achievement is an enormous boost to nationalism and patriotism, and the Russian Communists have succeeded in adding this asset of patriotism to support for Russian Communism.

The fact that the Russian Communist government is now in far better standing with the Russian people is evidenced by at least two facts. The one fact is

that the absolute dictator of Russia could afford to be out of his country for a period of three months. Secondly, we no longer hear that "if we could only reach the Russian people directly, they would throw off the Communist yoke." Such talk no longer seems quite realistic.

The sputniks also greatly changed the world picture of the average Russian. I was talking to a Norwegian the other day and he remarked that the stereotyped picture of the Russian used to be somewhere between an ape and a Tartar on a frothing horse. The massive, violent, and not too intelligent Russian bear is no longer a very good description of the country that can launch space vehicles. It would have to be a pretty intelligent bear to take pictures of the far side of the moon. This re-evaluation of the Russians has also shown up in such things as very well attended classes in Russian at the Jet Propulsion Laboratory. The attendees recognize that it is going to be quite worthwhile to be able to listen to what the Russians say *in Russian*. Not too many years ago, the attendees would have been investigated by Senator McCarthy.

### *An effective demonstration*

Continuing on our list of prizes, we find that the Russians have managed to demonstrate to the world the detailed characteristics of the ICBM technology in a way which is perhaps even more effective than going to war. Not too many years ago there was a question whether the Russians had any rockets at all. Then the question changed to whether they had very much thrust to their rockets. Until very recently there was the question of whether or not, given a large thrust, the Russians could hit anything with their rockets. Now the only remaining question is whether the Russians can recover a device from a long ballistic flight outside the atmosphere. It is reasonable to expect that demonstration within about three months.

The Russian demonstration of ICBM technology has been almost oriental in the air of mystery which has been given to it. The Russians have yet to show the U. S. a picture of their ICBM, perhaps because a picture tends to dispel some of the mystery. And yet, the Russians have essentially told our military people that they have rockets which are more than capable of landing sufficient payload anywhere on the earth with an accuracy of five miles or better. They have shown us the threat without telling us how to build the club.

It is probably no coincidence that the Russians began mentioning (and we began considering) co-equal summit meetings just after the launchings of the sputniks. It is now no longer Russia, Great Britain, and the United States as the three great powers; it is now Russia versus the West, even-up. That particular advantage Mr. Khrushchev probably appreciated very quickly after the first sputniks. However, there

was another prize which he evidently did not see (or choose to exploit) until very recently. This prize was the direct association of the space successes with "the results of forty years of Communist Society" as a compelling argument in the Communistic conversion campaigns.

We often disposed of the earlier claims of the Communists that their political society was better than our political society by a simple comparison of our standards of living. Now, however, Mr. Khrushchev has made it quite clear that he wishes to compare, not present status, but rather rate of progress when considering the two societies.

The Soviets have recently added another element to this particular line by announcing that they were now going to make loans on the world market quite comparable to those made by the United States, but with the exception that there would be fewer visible strings. We can expect to hear of the remarkable achievement of the Russian Communists in evidencing such a complete recovery of a country by its own efforts within 15 years of an obliterating war.

The real surprise is that the *expected* prize of all this space activity was supposed to be science and discovery, and yet this prize seems to come last on the list. Until very recently the Russians had not made any astonishing scientific discoveries, and it almost appeared as if the United States held the monopoly. Unfortunately, that U. S. monopoly no longer exists, and the Russians have made scientific discoveries which are recognized as such throughout the world. The Russians have told us that the moon has no magnetic field, nor does it have any Van Allen belt. It is unlikely that anyone will question this discovery. The Russians have taken a picture of the other side of the moon and have named the various topological features. It is doubtful if there will be any argument as to whether the Russian names will be adopted.

### *What will the Russians do next?*

The Russians will most certainly continue in the space race since this race very well meets the overall objectives of the Russian Communist society. The race, to them, is economically, politically, and psychologically a sound program to direct against the principal competitor of the USSR, the United States. The Russians have succeeded in putting us in the position of "acute embarrassment" which they can certainly exploit ruthlessly. In the long run, the Russians probably realize, as we do, that exploration has always paid for itself, if you have the time to wait for the final returns.

From the economic standpoint, it can be shown that certain types of space vehicles will more than pay for themselves. Both communication and weather satellites can be used to make money. The Russians, could, for example, set up a worldwide communication system which would be considerably better and

more reliable than our high frequency radio system in use today. The Russians could then rent and control this communication system.

The Russians have, of course, long since told us that they intend to stay in the space race. Recently, two well-known Russian scientists, Federov and Blagonravov, reportedly \*outlined a Russian space program which might very well be underway. These two scientists are recognized professionals who help direct the USSR program and who are not given to idle comment or spectacular proposals in the public press. They were reported as stating that a Soviet satellite bearing two men will orbit the earth for 14 days by the end of this year. Four weeks after that firing, two men with a TV camera will make a round-trip to the moon, circling it twice.

In March or April of next year, two men and two women are scheduled to make a trip around the moon for more than half a year. The program intends to send rockets to Mars and Venus during 1961, to Mercury and Jupiter shortly thereafter, and to send manned ships carrying from two to six men to Mars and Venus. If this sounds fantastic to us, we should remember that, from their advanced position, the view of the immediate future might well be clearer than what we see from further back. In some ways, this difference in what we see is one of the more dramatic illustrations of the relative positions of Russia and the U.S.

Based on this kind of evidence, I think it is fair to conclude that there is a race. What we may not have realized is that the Russians are in it whether we are in it or not. In a sense, we are so far behind that the Russian competition does not even look back to find out where we are.

### *Should the United States enter the race?*

Fortunately, or otherwise — as you prefer — the United States at the moment is neither in nor out of the space race. We have made no declaration to accept the Russian challenge. We have no programs whose avowed intent is to close the gap between ourselves and the Russians. We have one or two programs whose hopeful intent is to try to keep the gap from getting wider. At the present time, one of the most remarkable features of the U.S. position is the almost complete lack of urgency to the space program. This lack of urgency is justified, presumably, by a statement that we are in a scientific program and not a race. I have not yet figured out why coming in second in science is any different or better than coming in second anywhere else.

The remaining indication that we are neither in nor out of the space race is the present funding level. The National Aeronautics and Space Administration bud-

\*The authenticity of the report, published in *Missiles and Rockets*, is not known. While its dates might be questioned, its order and choice of missions are plausible.

get is now somewhat less than what the United States pays to ship and store surplus wheat. Our space program is less than two percent of our defense budget. The space program costs less than ten dollars per year per U.S. adult, or roughly one evening's entertainment per year.

On the other hand, we have not declared ourselves *out*, either, and unless we do, the rest of the world probably assumes we are in. The results of continuing at our present level are not particularly encouraging. In the last two years we have dropped six months to a year further behind in the process of organizing, re-evaluating, carving out paper empires, and fighting over who is going to be the boss to tell the professional what to do.

The results of continuing as we are were illustrated the other day in a meeting at JPL in which we were attempting to plan the missions for a set of space vehicles in 1961 and 1962. We went through the process of setting up a logical and technically sound program, only to be shocked at the end of our efforts to find that the first half of our fine program had already been accomplished by the Russians. The frustration of the few professionals in the space business was well illustrated by the comment made by a colleague of mine just last week. He stated that the closer you get to the space program, the more of a sinking feeling you get.

### *A waste of money*

Putting it in somewhat different words, continuing at the present level is largely a waste of money. At the moment, we are paying for the privilege of being the perfect straight man for the Russians. As Dr. T. Keith Glennan, NASA Administrator, has stated: "We cannot run second very long and still talk of leadership."

In a perfectly objective way, we should therefore consider the results of declaring ourselves out of this game. We might well save ourselves a great deal of embarrassment. We would have to yield the field to the Russians and admit that they are highly successful. What would hurt is that we would have to admit by inference that their stated reason for success, namely the Communist society, might also be true.

If we declared ourselves out of the race, we would definitely need a different race as a substitute. This other race must have drama and interest and must have exportable advantages. Unfortunately, neither our standard of living nor our foreign aid can be used as a satisfactory substitute. The statement that "we went military" is not a particularly good counter-argument to the Russians' space activity because the Soviets went military too. On the other hand, we would at least quit being the straight man, quit wasting our money, and stop some of the endless frustrations.

We should also consider the results of declaring ourselves *in* the space race. It will certainly cost us

more money than we are presently spending. However, even if the amount spent was trebled or quadrupled over the present NASA budget, the net effect on the nation would still be very small. If the NASA budget was quadrupled to two billion dollars a year — to take an extreme case — it would represent less than three percent of the national budget, less than five percent of the defense budget, and less than one-half of one percent of the gross national product (one measure of our standard of living). Space is therefore not in the same class as the defense business, or our standard of living.

### *Why meet the challenge?*

On the other hand, one might question why meeting the Russian *space* challenge is more important than meeting their challenges in other fields. There are at least two reasons for meeting the space challenge. Missiles and space vehicles, by their very nature, require high competence in many different technical disciplines; consequently, success in space reflects success in mathematics, physics, chemistry, propulsion, medicine, communications. A space success reflects broad competence. The second reason is that space is a very good investment in terms of value returned per effort spent; i.e., the prizes are well worth the trouble.

As another feature in declaring ourselves in, we are going to need clearly defined goals — specifically, whether or not we intend to accept the Russian challenge. We will need facilities and priorities. We need a very hard-boiled look at the past performance of groups in the United States, and a willingness to let the finally-chosen professionals run their own race. As I see it, one of the most effective ways is to give both support and authority to the NASA to do its legally assigned job. A major step in this direction was taken by the President in making his decision that the Army's rocket expert, Wernher von Braun, and his team should join NASA.

Even if we declare ourselves in tomorrow morning, it will take some years of not being first. It will take a great deal of patience from the American public.

On the asset side, there is very little question that we would get the approval of the free world. We have often been an underdog, but so far we have never yet refused a fight. The Russians have picked up a lot of prizes. There is no reason why we should not pick up similar prizes, including such things as national pride, sales in the world market, and world communications systems. The space business is a fair and dramatic field in which we can display our own talents. We too can acquire some of the benefits of new discovery.

After all, there is undoubtedly some truth in the story that the Russians were doubtful as to the desirability of launching the space age. The United States is no insignificant competitor in any field in which it accepts the challenge.