Late ’72 Scout launches showing excellent results

During the last few weeks of 1972, the Vought Systems Division Scout orbited three important satellites in rapid succession. It took the dependable launch vehicles only a few minutes to put each payload in orbit, but scientists will be studying new data about the earth’s environment, the galaxy and the universe for a long time to come.

NASA officials report that Explorer 48, or Small Astronomy Satellite B, launched Nov. 19, is operating flawlessly, conducting the most comprehensive study of celestial gamma rays ever undertaken.

The satellite carries a single experiment — a spark chamber gamma ray telescope — but it’s a detector with about 10 times the sensitivity of any gamma ray detector previously orbited.

Since the experiment was turned on, SAS-B has observed gamma rays in the region of the galaxy’s center, and the galactic plane, and various X-ray sources including the Crab Nebula. It is on its way toward making the first complete map of the celestial sphere to show in detail origins of gamma ray energy.

Studies of the galactic plane are of special interest, because they have a direct relationship to understanding the dynamics of the earth’s galaxy, the Milky Way, and some of the major energy transfer mechanisms in the universe.

Gamma rays should, for example, provide data on supernovae, which are large dying stars whose collapse explodes material out into space that mixes with primordial hydrogen of the universe, ultimately to form other stars. Our sun is one of these stars, thought to contain the debris of countless others that exploded before it was formed.

Gamma rays are a form of electromagnetic radiation similar to photon particles in visible light but with energies at least 200,000 times as powerful. While gamma rays cannot be detected from the earth’s surface because they are absorbed in the atmosphere, they can be recorded readily from SAS-B’s vantage point. NASA is planning to publish the first scientific results from the satellite in the near future.

Less than a week after SAS-B was launched from Italy’s San Marco sea platform off the east coast of Kenya, Africa, ESRO IV was launched from the Western Test Range in California. All experiments are exceeding expectations, and some surprising early data have been recorded.

ESRO IV carried six experiments to investigate and measure several phenomena in the polar ionosphere, a region of high ion density that begins in the upper atmosphere and extends to an indefinite height in space.

Prof. U. von Zahn of Bonn University reported the university’s gas analyzer experiment has observed two phenomena not previously measured: existence of a concentration of argon gas over the earth’s summer pole measured to be at least 10 times greater than that over the winter pole; and considerable heating of the upper atmosphere over and near the polar caps, caused partly by solar wind particle interaction with the upper atmosphere.

Early data indicate that temperatures in the upper atmosphere are higher over the poles than over the equator.

The third recent Scout satellite is Germany’s AEROS, launched Dec. 16 from the Western Test Range to measure electron density, solar ultraviolet radiation, electron and ion temperatures, density of ions and neutral particles and other phenomena.

Dornier Systems, prime contractor for the satellite, reports that AEROS made its 1,000th orbit in late February and has recorded and relayed to German ground stations more than 720 million bits of information. Evaluation of data has begun and should keep scientists busy well into the months ahead.