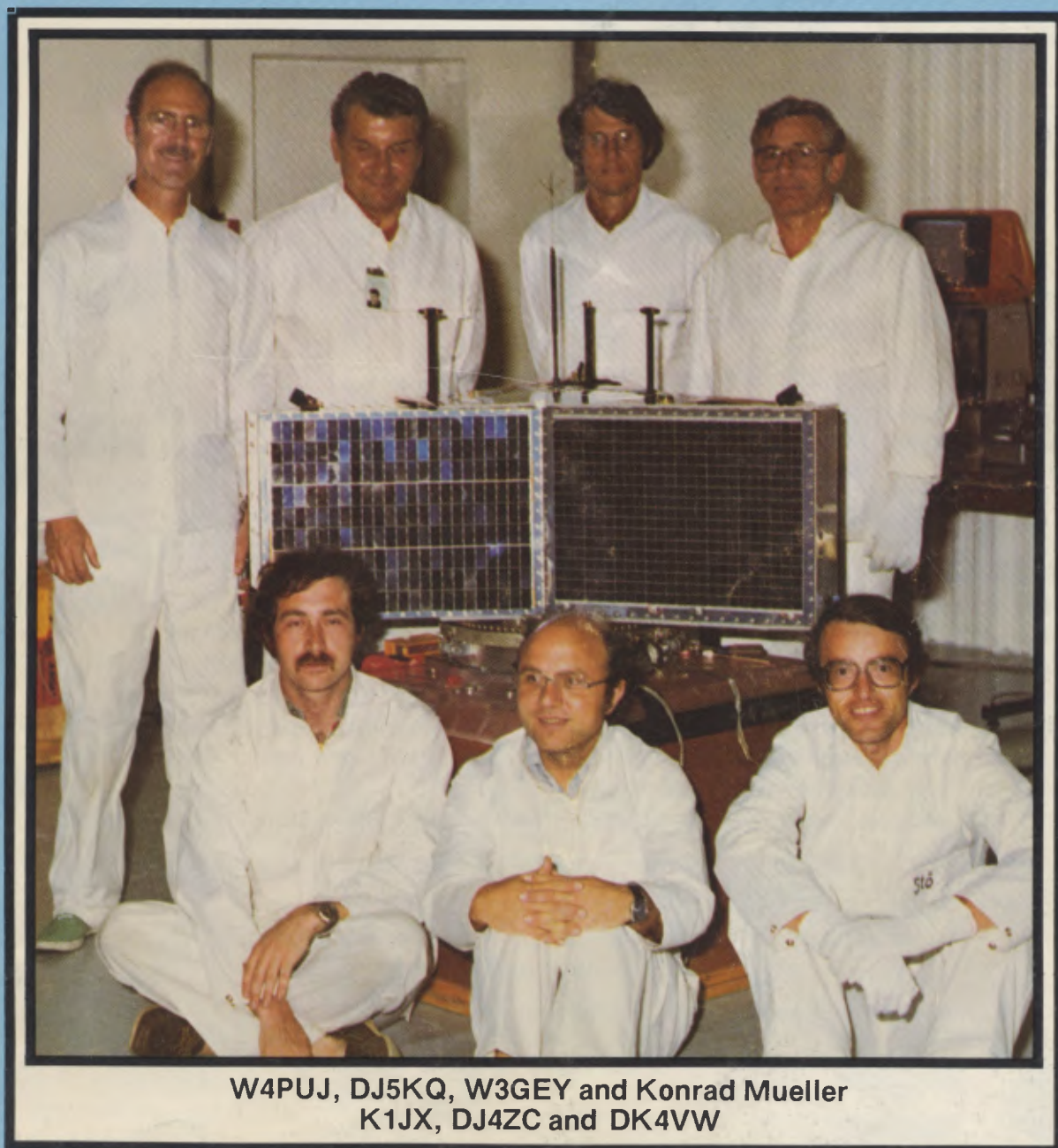


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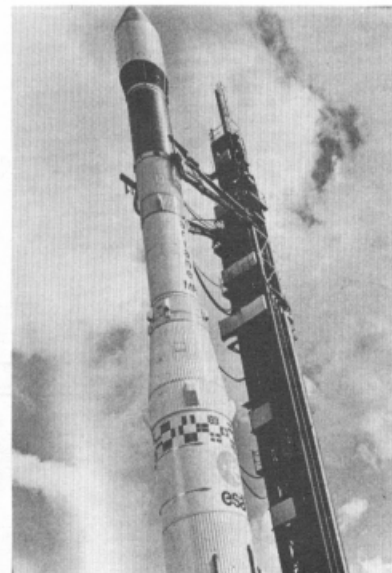
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ARIANE LAUNCH VEHICLE MALFUNCTIONS

PHASE IIIA SPACECRAFT LOST!



By Tom Clark,* W3IWI
and Joe Kasser,** G3ZCZ

Friday, May 23, 1980 will be long remembered by all active satellite users. The potential was there, the promise was known, but..... When the launch window opened at 1130 U.T.C. The AMSAT Launch Information Networks (ALINS) was in full bloom. Radio amateurs all over the world listened to the voice of Tom Clark, W3IWI, describing the status of the launch of the AMSAT-Phase IIIA satellite. Almost three hours later, seconds before the launch window closed, the Ariane LO2 rocket majestically rose from the launch pad. A few moments later, the first stage malfunctioned and the vehicle exploded.

After the launch failure, all of us who were involved in the planning, fabrication, testing and operations aspects of Phase IIIA felt a deep loss, not unlike that caused by the death of a family member. To many of the users who had only heard of the promises of the Phase III satellite, the loss was probably like a still-birth, a miscarriage. But to many of us who had lived, slept, eaten and breathed Phase III for upwards of five years, please realize that the satellite was much, much more. Jan King, W3GEY, stated, "the community will never know what they lost today" while choking away a tear of remorse. The Phase IIIA satellite represented the zenith, the culmination, the pinnacle of five years of hard work. To date, we know that more than 30 man-years have gone into the program. The AMSAT budget was \$150,000 plus countless (don't even ask how much) donations from other sources. Many of the hard-core workers have invested their own personal resources, never thinking of being compensated for hundreds of dollars spent on telephone calls, postage, time, parts, etc. Yes the loss was deeply felt by the community, but even more deeply felt by those few who really had "paid their dues."

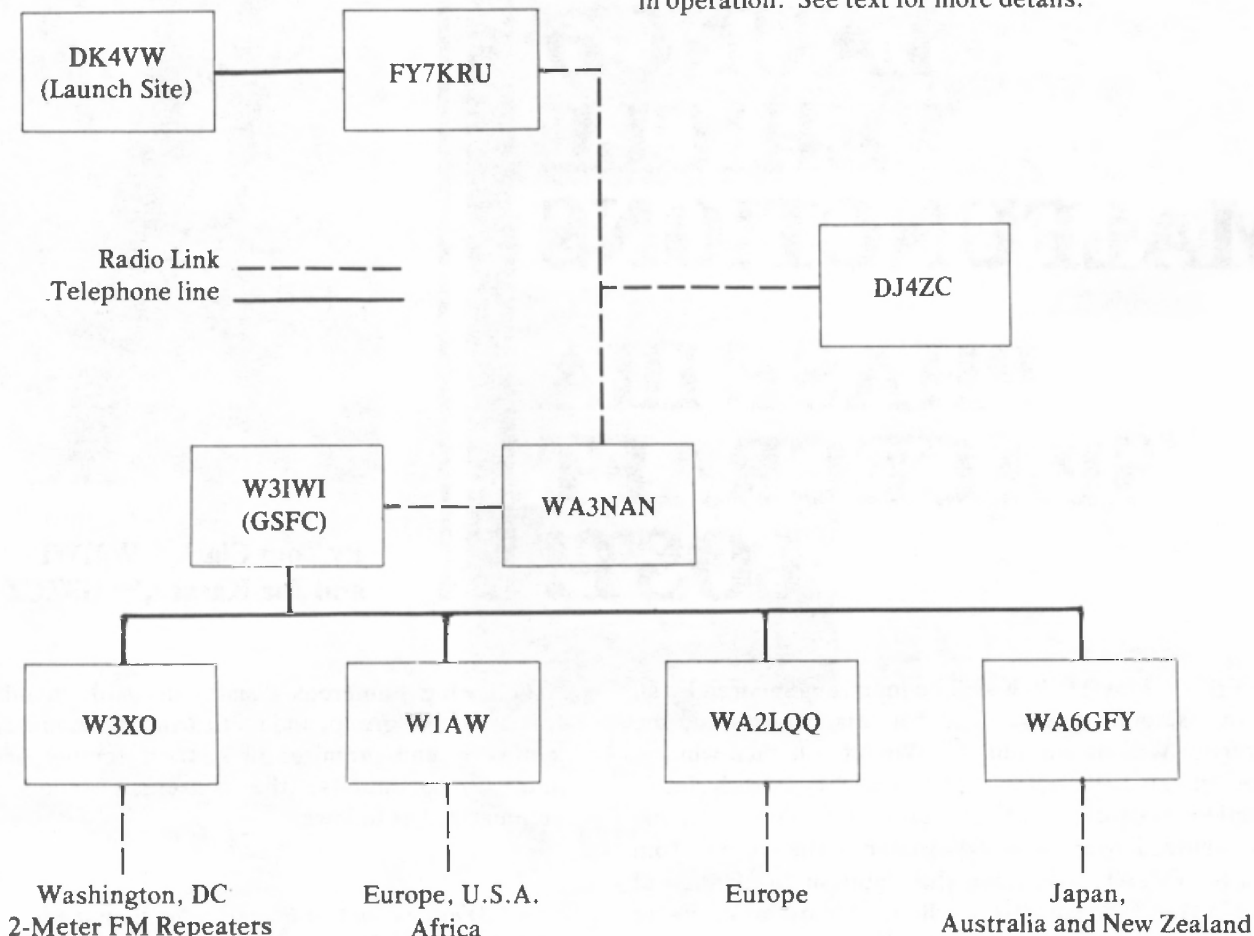
Following numerous discussions with members of this hard-core group, and on hearing the expressions of sympathy and promises of support coming from the amateur community, the consensus seems to be summarized as follows:

What we lost on Black Friday was sheet metal, solar cells, batteries, transistors, a lot of sleep and a major portion of our lives for the last few years. What we gained over those same years was knowledge; knowledge that we could make a complicated spacecraft. Knowledge in areas of aerospace technology that none of us had before. Knowledge that we could work as a team, despite national boundaries, differences in our cultures, lifestyles and personalities. Knowledge that, from within the ranks of Amateur Radio, we could draw upon enough resources to attempt a project with a complexity rivaling commercial satellite endeavors funded at levels of tens of millions of dollars. The knowledge is still intact. We even had the forethought to purchase a duplicate set of sheet metal that constitutes the spaceframe. We have a second set of solar panels, batteries and sensors. We have on hand the documentation and artwork necessary to replicate all the printed-circuit boards. We have in place and ready to go a network of ground telecommand stations.

*President, AMSAT

**Editor, ORBIT Magazine

Fig.1 - ALINS (AMSAT Launch Information Networks) in operation. See text for more details.



AMSAT is investigating launch opportunities, but that is a time consuming process. Given a little luck, a Phase IIIB spacecraft could be on the launch pad in two to three years. Your support is needed in that time frame. The launch was not insured because insurance is as yet unavailable for the Ariane launch vehicle. AMSAT has thus had to bear the full cost of the mishap. Funding for your organization was planned on the basis of a near-zero bank balance at launch time, budgeting that new memberships attracted by an operational satellite would provide further funding following the launch. Money is needed for the day to day operations and for support of the on-going hardware programs such as the Canadian Synchronous transponder project and the British Scientific satellite due for launch in late 1981. We knew that May 1980 would be a month of change for the organization, what with the office relocation and the launch. We did not however, anticipate the nature of the change.

From our point of view, the Phase III program is still active. The vision of W3GEY and DJ4ZC pointed out the potential of the Phase III program. Their visions were expanded by others in all directions. Software and hardware were developed. A world-wide AMSAT

Telemetry Tracking and Control Network was established, and still exists. The potential of the satellite for public service, computer communications networks, emergency relief, education and a host of other things was recognized, developed and published. The Spacecraft itself was integrated, tested and loaded aboard the launch vehicle in a timely manner. AMSAT had done all it could, and on the 23rd of May, we were ready.

At the launch center in Kourou, Ulrich, DK4VW in the block house was in telephone contact with the Radio Amateur Club Station FY7KRU. FY7KRU was in contact with DJ4ZC in Marburg, Germany and WA3NAN at the NASA Goddard Space Flight Center (GSFC) near Washington, DC. Amongst those present at Kourou were FY7AS, FY7BC, FY7BK, F6ADU, F8LC, F8ZS, F9CE and Conrad Mueller. Operating at WA3NAN were K1HTV and K9LF. WA3NAN used two-meter fm simplex to communicate with the GSFC control room. K9LF translated the French into English. Amongst those active or observing at the GSFC Control Room were W3GEY, W3IWI, W3PJM, W3PK, W4PUJ, W4RI, WB4NFB, WB5MMB, WB7ADU, G3ZCZ, LU9HGB and Martha. W3IWI held down the position of launch information officer. He was in direct tele-

phone contact with W1AW (WB1EYI and K1JX), WA2LQQ, W3XO and WA6GFY (W6XN, W6TWU, N6OO) who relayed the launch data around the world. Other stations around the world relayed the activity on vhf/uhf for local coverage.

There were many holds during the launch window. These were associated with apparent equipment malfunctions or a local cloudburst at the launch site. Jan, W3GEY requested and obtained several telemetry readings of the battery voltage, worrying about baby-sitting his progeny right through the launch window. Finally, with seconds to go before the close of the window, the countdown reached zero at 14 hours, 29 minutes and 40 seconds. Liftoff was 2.3 seconds later.

The AMSAT network link via WA3NAN and FY7KRU provided better information flow than the NASA/ESA link. In fact at times the amateurs were able to provide NASA with information concerning the "holds" before the ESA/NASA link did.

The progress of the flight was announced over ESA/NASA link. At 14:32:57 we heard an announcement to the effect that both launch vehicle transponders were off. The joking and verbal interplay in the control center ceased abruptly. This was soon followed by the words "non-nominal flying....problem in one engine.... the rocket is going down.... Kourou radar still tracking" and at 14:36:38 we heard the words "splashdown."

It was the first time that a satellite in the OSCAR series had failed to reach orbit.

AMSAT today stands at a crossroads. We have the knowledge and technology to build more communications satellites. We have a lot of the critical hardware and software. We have on going construction programs in Canada, England and Japan. With your support, the failure of the Phase IIIA launch will prove to be only a temporary setback to the Radio Amateur Satellite Program.



Tom Clark, W3IWI, telling Radio Amateurs around the world about the progress of the launch.

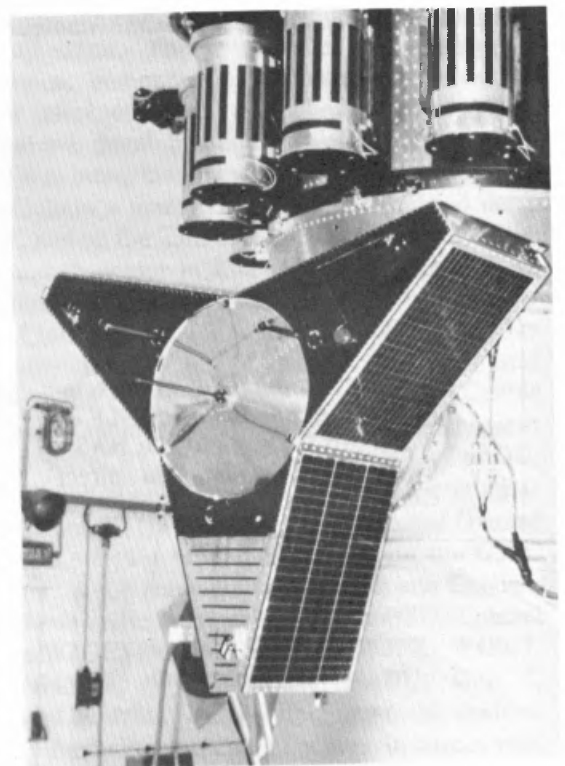
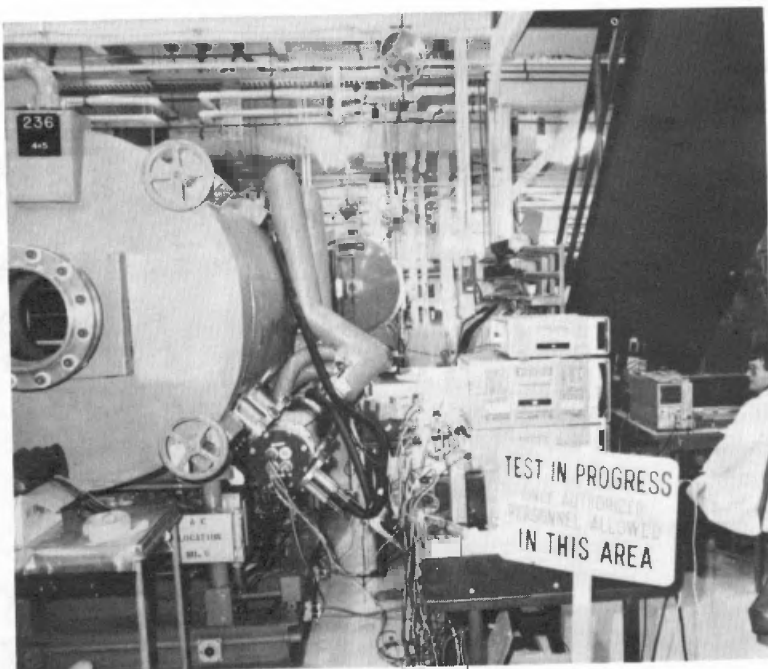
Rich Zwirko, K1HTV, at the telephone and Bill Brown, K9LF at WA3NAN. They put the NASA GSFC Control Room in direct contact with FY7KRU at the launch site.





**Above: WA6GFY Antenna System.
Below: Our Phase III Spacecraft ready to go.**

Shown above and below is the Phase IIIA Satellite under test.





**Above: Jan, W3GEY, before the final countdown.
Below: Steve, WB1EYI operating at W1AW.**

