Laurels for 1969

The great aerospace achievement of this year was, of course, the manned landings on the moon. Indeed, the accomplishment of the Apollo program is the greatest technological feat in aerospace history since the Wright brothers started it all at Kitty Hawk. Contrary to the prediction of early false prophets, the technology has proceeded in a pretty straight line from the sand dunes of North Carolina to the maria of Tranquility and Storms. So has the courage and skill required of the pilots. It was fitting that the Apollo 11 crew members carried bits and pieces of an early Wright Flyer with them to the moon to express that continuity of technology and spirit.

The engineers who designed the fabulously complex and reliable Apollo hardware, the technicians who built and supported it and the astronauts who flew it, have all had their share of honor since that epochal July 20, 1969, when man's foot made its first imprint in the lunar soil. But perhaps the greatest feat of all in the Apollo program, and its most significant long-range benefit, is its superb management. It is the Apollo managers who we propose to honor with our laurels for 1969 as the outstanding contributors of this year.

This space is not large enough to include all those managers who merit mention. We will gladly accept additions from our readers for subsequent notation on the letters page. But these are the managers we think made a major contribution to organizing and operating the most complex and expensive program in the technical history of man.

There are really three generations of Apollo management, with some persons involved in all phases. First were the conceivers and organizers back in the pre-Kennedy days before even Vostok had carried the first man into space. **Bob Gilruth** was in this group and has marched on with ever-growing responsibilities through the manned spaceflight program. So were **Wernher von Braun** and **Kurt Debus.**

Then, there were the middle-era managers who had the enormous task of building the program after President Kennedy made the moon landing a national goal. In this group, the gushing drawl of **James Edwin Webb,** "Ole Massa Nasa" himself, was a leitmotif that almost concealed the enormously effective job he straw-bossed in organizing the technopolitics of Apollo. **Brainerd Holmes, Bob Seamans, Jim Elms, George Mueller** and **Joe Shea** were some of his lieutenants whose efforts produced the program acceleration in this hurly-burly growing phase.

The tragic fire on Launch Complex 34 shook up the management structure and personnel for the final, grueling drive that put man on the moon twice before the end of the decade deadline. **Sam Phillips,** with the experience of running the Minuteman ICBM program under his belt, was the key manager in this stretch drive. Largely overlooked in their contributions were a sizable contingent of Air Force and Navy development-experienced officers loaned to NASA and sprinkled through all echelons of Apollo. **Rip Bolender** on the lunar module and **Davey Jones** in NASA headquarters were typical of these hard-driving technical managers. **George Hage,** Apollo mission director in Washington; **Arthur Rudolph** and **Lee James** in the Saturn 5 program at Huntsville played key roles. **George White** brought a new standard of reliability and quality control to the Apollo system.

At Kennedy Space Center, **Rocco Petrone,** launch operations director, and his test conductors, **Paul Donnelly** and **Walt Kapryan,** set a record of precise liftoffs that is impossible to surpass. At Houston, **George Low** and **Chris Kraft** provided a rare blend of engineering-operational management. Kraft's mission controllers, **Glenn Lunney, Cliff Charlesworth** and **Gene Kranz** did superb jobs. **Donald "Deke" Slayton,** one of the great unsung heroes of the manned space flight program, pioneered training of lunar astronauts to the finely honed standards that were proved in the performance of two lunar landings. **Phil Bolger** enforced high standards of flight safety for lunar operations.

In the key industry organizations that built the Apollo system hardware, these managers were outstanding:

Bill Bergen, Dale Myers and **Bastian "Buzz" Hello** of North American Rockwell Space Systems Div.

George Stoner of Boeing's Technical Integration and Evaluation (TIE) organization.

Dr. Charles Stark Draper of Massachusetts Institute of Technology Instrumentation Laboratory and his Apollo guidance program director, **David Hoag.**

Paul Blasingame and **Hugh Brady** of General Motors AC Electronics Div., guidance system controls and stabilized platform.

Ron Greenslade of Raytheon, digital guidance computer for the guidance system.

Joe Gavin and **Tom Kelly** of Grumman, for the lunar module.

Dr. George Mansur and **Arthur Wulfsburg,** Collins Radio, unified S-band communications system.

Chuck Weatherred of Bendix Space Systems Div., program manager for the EASEP and ALSEP scientific instrumentation stations deployed on the moon by the Apollo 11 and 12 crews.

Charles Able, Jack Bromberg and **Ted Smith,** McDonnell Douglas Astronautics Co., for the reliable S-4B third stage of the Saturn 5 booster.

Sam Hoffman, Dave Aldridge, Paul Castenholz and **Jack Armstrong** of North American Rockwell Rocketdyne Div., for the F-1, J-2 and lunar module ascent engines.

Len Shepard, ILC Industries, for the Apollo crew suits.

Cal Beggs, Hamilton Standard Div. of United Aircraft, for the portable life support systems.

Many of these men have gone on to other jobs since the Apollo 11 mission. Part of the true measure of their managerial success is that their second and third tier successors did such a superb job with Apollo 12, indicating the depth of capable management developed during the Apollo program.

—Robert Hotz