

THE RITE OF SPACE

Poking his wobbly way through the scrub, stubble and sand of Florida's Cape Canaveral comes a creature from the ages. The armadillo, his precision-made armor plate intermeshing fluidly, moseys along, oblivious of time. Skittering across his path is another anachronism, the beady-eyed, evil-looking horned lizard, uglier than the sum of the menacing spikes that jut from his body. On trundles the armadillo, scarcely noticing a wide hole in the ground. From the hole run two telephone lines; a few feet away, they connect to a pair of phones lying in a ditch. The armadillo scratches ahead. The lizard leaps from a rock. The telephones are mute. For an instant, the desolate scene seems like the end of the world.

Not the world's end but the beginning of the future is mirrored here, for rising in that ancient, sandy patch is an orchestration of new sounds hammered out by an instrumentation unknown anywhere else in the free world. The solo tone of an old-fashioned foghorn is overcome by the shriek of liquid oxygen as it pours under high pressure through valves and pipes. Clanging chords of hammer on steel, the humming sostenuto of machinery, the blip-blip rhythms bouncing onto radar screens from a network of grotesque antennas—the counterpoint races on in time to a thousand clocks, paced by thousands of hard-hatted men, their ears attuned,

their hands ready at buttons, keys, switches, knobs, cranks and valves, their eyes darting from tube to dial, their pulses shooting over the unhurried step of time. And then the fire, the roar, the chorus of triumphant cries.

THIS is the rite of space that is performed day and night at the Air Force Missile Test Center at Cape Canaveral, the point from which the first U.S. man—possibly the first man in the world—will journey to the moon and beyond. Cape Canaveral is the U.S. Spaceport of the Future, and today it is in full-dress rehearsal—a monumental, \$370 million stage where, day and night, civilian and military scientists and technicians work with freshly blueprinted tools over the incredibly complex mechanisms of space travel. With each launching of an Atlas, Jupiter or Thor—though flames may consume the bird only minutes later—the men of Cape Canaveral are testing and proving everything from an idea to a pump, amassing the knowledge that will ensure the success of man's epochal flight into space as well as the reliability of space-ranging weapons of war.*

* And last week had to wrestle with a new problem when the Army's Jupiter-C-powered Explorer II satellite failed to fire in the fourth stage and burned up in the atmosphere 1,900 miles southeast of the Cape.

Wrapped up in Cape Canaveral's future is an organization as complex as a missile itself. It is an industrial cooperative of 15,000 acres, operated for the Air Force by Pan American World Airways and RCA. The facilities are shared by a score of missile contractors (e.g., Convair, Lockheed, General Electric), who use the testing equipment and range for development of their projects for the Army, Navy and Air Force. The man who makes it run is Air Force Major General Donald Yates (West Point '31). Headquartered at Patrick Air Force Base, 18 miles south of the Cape, onetime Meteorologist Yates, 48, juggles an armory of problems that range from interservice rivalry to housing and road-building plans—even to labor troubles (e.g., a dispute with a union on whether a missile is a "common carrier").

The Fever

Able, urbane Don Yates has so far kept contractors, military services and unions happy, for the one unifying force at Cape Canaveral is a widespread epidemic of missile fever. In nearby Cocoa Beach, and in towns up and down the coast, missile-men and their families have infected the whole populace with the fever. In motels, bars and restaurants, the prevailing talk is rocketry, its failures and its triumphs. One restaurant is fitting out its roof garden with telescopes; sons of missilemen are





Ralph Morse—LIFE

SPACEPORT BOSS YATES

shooting their own miniature rockets; a ladies' luncheon club has dubbed itself the Missile Misses; and no sooner does a contractor develop a new weapon than a new motel (e.g., Polaris, Vanguard) of the same name springs up in the scrub.

The space fever renews itself before daylight each morning, when long necklaces of auto headlights form along the highways that lead to Cape Canaveral's heavily guarded gates. Security guards check for pink windshield stickers, examine badges, wave the privileged on to their work. Construction workers peel off toward half-finished launching facilities. Others spike off to hangars, laboratories, snack wagons and a hundred separate sites. At the lox plant, they run the machinery that daily chews up a chunk of damp Florida air and transforms it into 75 tons of liquid oxygen.

At Hangar C in the Snark compound, a bus disgorges a squad of Strategic Air Command trainees assigned to study the air-breathing missile. Another group runs a test on an 80-ft.-high telemetry antenna whose dish spreads 60 ft. wide. At the Cape fire station, the crew gets a lecture in handling fires that might break out in the unearthly, exotic fuels. In a grey and silver building, one man takes charge of 53 spools of colored wire used to maintain the big IBM 704 impact predictor computer. On the launching pads, workers clamber along the service-tower catwalks to tinker with the steel-fisted launcher that holds a missile down during thrust buildup.

Poker & Launch

In the assembly hangars, engineers work over birds just arrived from manufacturing points. In the concrete blockhouses, experts cluster over their consoles, check the hundreds of telemetry receiving boxes that are stacked around the room like filing cabinets. They peer out of their redoubts through the eyes of closed-circuit TV cameras spotted around the launch pad (once, a camera zoomed in at the base of a gantry to discover a group of unwary poker players). At Central Control, sports-shirted young engineers tune in on an eleven-hour countdown that precedes a

missile firing, timing each monotonous checkoff point with the red-flashing sequencer count-light (on the bulletin board is a sign, OUT TO LAUNCH).

In the control center as well are the thousands of tubes and circuits that form the "time generator." This is the space age's electromechanical clockwork that provides the correct time to the thousandth of a second, so that when data is collected from all the film, tape, pen recorders, oscillographs and ballistic cameras up and down the 5,000-mile missile test range (see map), it can be correlated with absolute precision to give the story of just what happened when.

Taxis and Dishes

As the countdown gets within an hour of a missile firing, a converted B-17, outfitted with radar and television, begins a steady sweep of the range, flashes back to Central Control the position of any ship that may be in the area. A twin-engined Convair 340 cruises off the coast near the range corridor, monitors the flock of special telemetering frequencies. A missile transmits on these frequencies coded reports from hundreds of tiny, delicate instruments that tell the scientists what they want to know most about missile behavior. (One missile shoot was delayed last October when an Air Force transmitter at Goose Bay, Labrador, unaccountably interfered with the telemetry transmission from the missile. The range operation officials asked Goose Bay to shut down its transmitter till the missile test was completed.)

Down range, the island tracking stations point their antennas and radar dishes overhead. Their mission: to monitor the rocket as it whistles by, destroy it if its course imperils humans, pick up anew the multitude of information telemetered to its receivers. From Puerto Rico northwest to the Cape, the data flows through an \$18 million submarine cable. Over radio-telephones and Cape intercoms

crackles the futuristic vocabulary of missileland that is nearly as hard to decipher as the telemetered data (see glossary).

Records & Failures

In the blockhouse, heavy with a deceptive air of boredom, the countdown goes on. Engineers study the banks of telemetry equipment that records specific measurements—temperature, valve operation, electric motors. If one instrument should fail, the countdown is held until it can be fixed. Sometimes the problems are solved by old-fashioned methods: during a recent Atlas countdown, a technician rushed to the launching pad, climbed the service tower, opened an entry plate in the monster bird, gave a stuck valve a sharp rap with the palm of his hand, closed the plate, dashed back to safety.

At last, with down-range stations reporting ready, the countdown leaps to zero. The orchestration's climax surges to an unworldly cacophony as a new Goliath storms into the air. In his headquarters at Patrick, General Yates watches a closed-circuit TV screen like a benign Big Brother, puffs on a Tareyton, ponders the flight, picks up the direct-line phone to take an accounting of the bird's programing. Long inured to so-called failures, Don Yates and the thousands of men at the Cape know that each launching—each of the thousands of reams of telemetered information—will teach a thousand lessons that must be learned for the future.

As night comes on, the missilemen turn for home, and patches of light fleck the Cape's darkness. Fresh beads of lights form at the gates as the night workers arrive. The rites of space go on, playing and replaying the themes that promise tomorrow's new world of space flight. In the shadows, on the sand, the two silent telephones connect inexplicably to a place beyond, the sluggish armadillo pokes on, out of place, out of time.

MISSILE GLOSSARY

Ball-Peen Adjustment: *lit.*, a strike of a hammer, as in "I made a ball-peen adjustment on that sticky valve."

Cooking Bird: a missile that is building up thrust.

Green Bird: a missile that launches and flies perfectly.

Red Bird: a missile that fails.

Counting: operating, moving on time.

Destruct: *v.t.*, barbarism of destroy; also *adj.*, as used in "destruct button."

Drum Patter: one who feels drums, containing unstable propellants, for signs of heat.

EGADS (for Electronic Ground Automatic Destruct Sequencer): the ground-operated mechanism that destroys a missile in flight.

Eyeball Instrumentation: a look with the peepers, *i.e.*, without the aid of instruments.

Holding: stymied, stalled.

Input: hot news or modification thereof; anything from a new bow tie to a fresh rumor.

Lox: liquid oxygen.

Lox on the Rocks (humor): a stiff drink.

Loxed Up: stewed to the gills.

Orbiting Wheel: supervisor at a busy launching pad.

Plugged In: ready for action; e.g., a Missile Miss, stopping by to pick up a friend before repairing to the beach to watch a missile launching, asks: "Are you plugged in?"

TGIF: *lit.*, Thank God it's Friday, *i.e.*, payday, end of the work week, etc.