

TOM SWIFT AND HIS MEGASCOPE SPACE PROBER

VICTOR APPLETON II

No. 20 in the Tom Swift Jr. series.

(1962)

From the front:

“Someone has stolen your invention!” Bud Barclay tells his pal Tom Swift Jr. And when a scientist in France publicly tests a helium-extraction machine, it seems Bud is right. The machine explodes, precisely as Tom predicted any model made from his own unperfected plans would do. But the explosion is only the beginning of one of the strangest mysteries in the young scientist-inventor’s career. Time and again he is forced to combat a sinister secret enemy while he works to complete his megascope space prober, designed to “keep an eye on the universe.”

Meanwhile, Bud is offered the opportunity to participate in a manned government space probe to Venus. Although the project is being directed by the Astro-Dynamics Corporation, a competitor of Swift Enterprises, Tom encourages his friend to make the flight in the interest of the United States.

When another secret invention of Tom’s becomes the target of his enemy, all evidence points to the fact that an unidentified traitor at Swift Enterprises is in league with a criminal mastermind outside the plant.

How Tom is trapped when he unmasks his enemies, how he engineers a bizarre escape, and how he executes a fantastic rescue when Bud’s spaceship goes out of control on its flight to Venus are just a few of the suspense-filled highlights in the young space pioneer’s latest challenge.

The Tom Swift Jr. series:

1 Tom Swift and his Flying Lab (1954)

- 2 Tom Swift and his Jetmarine (1954)
- 3 Tom Swift and his Rocket Ship (1954)
- 4 Tom Swift and his Giant Robot (1954)
- 5 Tom Swift and his Atomic Earth Blaster (1954)
- 6 Tom Swift and his Outpost in Space (1955)
- 7 Tom Swift and his Diving Seacopter (1956)
- 8 Tom Swift in the Caves of Nuclear Fire (1956)
- 9 Tom Swift on the Phantom Satellite (1956)
- 10 Tom Swift and his Ultrasonic Cycloplane (1957)
- 11 Tom Swift and his Deep-Sea Hydrodome (1958)
- 12 Tom Swift in the Race to the Moon (1958)
- 13 Tom Swift and his Space Solartron (1958)
- 14 Tom Swift and his Electronic Retroscope (1959)
- 15 Tom Swift and his Spectromarine Selector (1960)
- 16 Tom Swift and the Cosmic Astronauts (1960)
- 17 Tom Swift and the Visitor from Planet X (1961)
- 18 Tom Swift and the Electronic Hydrolung (1961)
- 19 Tom Swift and his Triphibian Atomicar (1962)
- 20 Tom Swift and his Megascoppe Space Prober (1962)
- 21 Tom Swift and the Asteroid Pirates (1963)
- 22 Tom Swift and his Repelatron Skyway (1963)
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- 24 Tom Swift and his 3D Telejector (1964)
- 25 Tom Swift and his Polar-Ray Dynasphere (1965)
- 26 Tom Swift and his Sonic Boom Trap (1965)
- 27 Tom Swift and his Subocean Geotron (1966)

- 28 Tom Swift and the Mystery Comet (1966)
- 29 Tom Swift and the Captive Planetoid (1967)
- 30 Tom Swift and his G-Force Inverter (1968)
- 31 Tom Swift and his Dyna-4 Capsule (1969)
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THE NEW TOM SWIFT JR. ADVENTURES

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CHAPTER I

SUSPICIOUS NEWS

"Tom! Someone has stolen your invention!" gasped Bud Barclay as he scanned a news story on the front page of the Shopton Bulletin.

Tom Swift Jr., a crew-cut blond youth of eighteen, looked up in astonishment from a blueprint he had just taken from the office file.

"Stolen my invention?" Tom echoed. "Which one?"

"Your new machine for extracting helium from the air!" Bud jumped up from the leather armchair in which he had been seated and thrust the paper in front of his chum.

Tom frowned at the news item. It was headed:

French scientist invents revolutionary new helium source!

With growing excitement, Tom read the story. It stated that Jacques Gaspard, a French engineer, had developed a method of extracting helium from the atmosphere. The United States now controlled the world's supply of helium gas, but Gaspard's machine would make it economical to produce helium anywhere.

Details of his invention were not given. A demonstration would take place Monday of the following week in Paris, however, to which scientists from all over the world were being invited.

"Quite a coincidence," Tom murmured.

"Coincidence my hat!" Bud snorted. "You just perfected the same kind of machine a few days ago!"

Tom nodded. "I know. Of course, Gaspard might have thought it up himself. But let's check, anyhow."

Tom slid the blueprint back into the file and the two boys hurried from the big attractive double office at Swift Enterprises which Tom shared with his distinguished scientist father. On its huge desks and conference table stood colored plastic models of the Swifts' world-famous inventions.

Tom and Bud hopped into a jeep and sped off across the grounds of the sprawling, four-mile-square experimental station.

When they reached a modernistic glass-walled building of striking design, Tom braked to a halt. Inside was his private laboratory, crammed with the latest in research equipment.

The boys sprinted to the lab, where Tom beamed an electronic key at a steel wall cabinet.

The door slid open and Tom hastily ruffled through a sheaf of blueprints, sketches, and typed data sheets.

"Nothing missing," he announced presently.

Bud, a husky, dark-haired young flier who was a space pilot for Swift Enterprises, glared at the mass of papers. Then he shook his head, unconvinced. "I still think there's something fishy about that guy's coming up with the same invention!"

Tom gazed into space, a worried expression on his face. "I'll admit I'd like to have a look at Gaspard's machine."

Bud snapped his fingers. "Hey! Wait a minute! Didn't that news story say scientists from all over the world were being invited to Gaspard's demonstration? So that includes you."

"But Dad and I haven't received an invitation."

Bud thumped his fist angrily on the laboratory workbench. "There's your answer, pal. Tom Swift Jr. and Sr. are two of America's most famous scientists. If anyone rated invitations, you both did-which proves Gaspard wasn't taking any chances on being found out!"

By now Tom was almost as convinced as Bud. "Could be," he conceded. "Let's check with Harlan."

In moments the boys reached the office of Harlan Ames, the slim, dark-haired security chief of Swift Enterprises.

"Trouble, skipper?" Ames inquired.

"I'm not sure." Tom filled him in quickly on Gaspard's news announcement, then asked, "Has anyone come into or left the plant with any blueprints or other data since I started work on my own helium machine?"

Ames pressed a button and had an aide bring him the file of daily logs kept by the plant guards at the main gate. After scanning the recent log sheets, Ames shook his head.

"No, we keep a close check on that. But there's been nothing taken in or out in the past two weeks except those new rocket-tube designs sent to Swift Construction."

That was the company that manufactured the Swifts' inventions. It was managed by Tom Sr.'s old friend and associate, "Uncle Ned" Newton. Although not a relative of the Swifts, they felt that Ned was almost a member of the family.

Tom looked quizzically at Bud. "We've hit a dead end."

"If Gaspard stole your idea," Bud declared stubbornly, "I intend to find out."

"How?" Ames asked.

"I'll cable him for an invitation to his big show and hop over to Paris. And don't think I won't fire plenty of questions at him!"

Bud picked up a pad and wrote a cablegram to Gaspard. It read:

AM ENGAGED IN LOW-TEMPERATURE RESEARCH. HIGHLY INTERESTED IN YOUR
NEW HELIUM-EXTRACTION MACHINE. REQUEST INVITATION TO PARIS
DEMONSTRATION. CABLE REPLY COLLECT.

BARCLAY, PRESIDENT

CRYOGENIC RESEARCH

LABORATORY

Tom and Harlan burst into laughter. "What, no Ph.D. after your name?" Tom inquired jokingly.

Nothing more was said, but unbeknown to Tom and his father, Bud did send a cable to the French scientist, saying he would like to bring the famous Swifts to the demonstration. During the next two days, Bud phoned the telegraph office half a dozen times. But no reply from France was received.

Saturday evening, as the Swifts were enjoying a week end at home, Bud dropped in for a brief visit. He discussed the Gaspard mystery with Tom and his father in the den.

“It does seem odd,” admitted Mr. Swift, to whom Tom bore a striking resemblance. The elder scientist and his tall, lanky son had the same keen features and deep-set eyes.

Bud told them about the cable. “Gaspard paid no attention. What’s more, I called ten different people around the country-outstanding American scientists, all of them-and not one of them has received a bid to Gaspard’s demonstration.”

“Evidently he doesn’t trust anyone from our country,” said Mr. Swift, puzzled.

Tom Jr. said soberly, “Dad, if Gaspard did use the plans for my invention, this machine of his could be dangerous.”

“Dangerous! How so, son?”

Tom’s own helium-extraction device had been designed as part of a revolutionary new space telescope on which Tom was working. The telescope required a very powerful high-gain signal amplifier-part of which worked at an ultra low temperature. This low temperature, near absolute zero of -273° centigrade, was maintained by the use of liquid helium.

At first Tom had tried using helium from his amazing undersea helium wells-a discovery related in Tom Swift and His Deep-Sea Hydro-dome. But this had proved inconvenient, so Tom had invented a machine to remove the helium gas from the air and change it to a liquid, thus producing a ready supply.

“When I tested my original design,” Tom explained, “a few bugs showed up. For one thing, the register was no good. It was made out of organic material and was too susceptible to carbon monoxide.”

“So?” Bud put in with a puzzled look.

“I redesigned that feature of my machine,” Tom replied, “but Gaspard may not know that.” The youthful inventor added excitedly, “Unless he perfected the register himself, the machine may blow up!”

Bud gave a low whistle. Mr. Swift’s expression was grave.

“Should I warn Gaspard, Dad?” Tom asked uneasily. “Or try to stop the demonstration?”

The elder scientist shook his head. “Frankly, I’m afraid there’s nothing you can do. If you tried to stop Gaspard, the authorities might construe it to mean you’re calling him a thief. You can’t risk that. And don’t forget, Gaspard is a renowned scientist. So let’s hope he knows what he’s doing.”

The demonstration in Paris was scheduled for six o’clock Monday morning, which would be one a.m. in Shopton. Bud and the Swift family planned to watch the proceedings on television.

Sandra Swift, Tom’s vivacious, blond seventeen-year-old sister, was delighted when she heard that Tom and Bud planned to sit up late. “Wonderful!” she announced with a giggle. “I’ll ask Phyl over and we’ll make it a late, late TV party!”

Phyllis Newton, the attractive, dark-haired daughter of Ned Newton, was Tom’s favorite date. The two often double-dated with Sandy and Bud.

On Sunday evening Bud brought Phyl over to the Swifts’ home in his convertible. Both had been invited to spend the night. Mrs. Swift, a slim and pretty woman, welcomed the guests warmly. After one of her

delicious chicken dinners, the young people played records, danced, and chatted until the time for the demonstration approached.

“Will we be receiving the picture direct from France?” asked Phyl as Tom switched on the TV set.

Tom nodded. “Via our outpost in space.” This was the space station the young scientist had built to provide an assembly line beyond the earth’s atmosphere for charging his solar batteries with the sun’s unshielded rays. It had been a major step forward in the Swifts’ space research and was also used for relaying television signals from point to point around the world.

“We’ll be getting a short-wave radio broadcast in English, too, from the American networks,” Tom added.

An early-morning program of setting-up exercises came into focus on the screen. This was followed by a special news program featuring the telecast demonstration of Gaspard’s helium machine.

Bud tuned in the American radio broadcast. “We bring you now an on-the-spot account of an important scientific event, direct from Paris, France,” the commentator began. “Monsieur

Jacques Gaspard is about to demonstrate his new machine for extracting helium from the atmosphere to a gathering of the world’s leading scientists.”

The TV camera dollied in on Gaspard himself, a hawk-faced man with spectacles and a ragged, dark mustache. He made a brief speech in French, pointing out the features of his invention.

“That phony!” Bud gritted. “His machine looks just like yours, Tom!”

His friend was too absorbed to comment. The whole group, including Mr. and Mrs. Swift, watched the screen closely as Gaspard threw a switch to start his machine in operation.

The helium was to be collected in a tank. Gaspard watched smugly, occasionally checking a valve or dial, amid murmurs of appreciation from his audience.

Suddenly there came a loud explosion! The picture quivered on the screen. When it settled into focus again, the demonstration hall was in turmoil. The horrified viewers in the Swift living room saw that the helium machine had blown apart. Debris was scattered about and a number of people, including Gaspard, had been knocked off their feet.

“Something has gone wrong!” the television announcer was shouting above the screams of the audience. “That blast you heard was the machine blowing up!”

Later, the commentator reported that none of the injuries appeared to be serious, although all the victims were being rushed to a hospital.

“Exactly what I was afraid of, Dad,” Tom said grimly. “The machine failed to eliminate the carbon monoxide—just like my first design!”

“Perhaps Bud is right in his suspicions,” Mr. Swift said cautiously.

“I’d sure like to find out!” Tom declared.

At eight o'clock he and Bud left for work at the plant. Tom took the lead in his sleek, silver sports car, with Bud following in his red convertible.

Part of the road lay through a stretch of woods. Suddenly Bud saw Tom's car veer wildly into the opposite lane.

"Hey! Watch it, pal!" Bud gasped.

For a moment it looked as though Tom had brought his car under control. But the next instant it shot off toward the shoulder of the road, teetered on the edge of the ditch, and then turned over!

CHAPTER II

RAY-GUN SNIPER

HAD Tom been hurt, perhaps seriously?

Bud, thoroughly alarmed, slammed on the brakes of his own car and swerved the convertible toward the side of the road. As the wheels screeched to a skidding stop, and he leaped out, Bud caught a momentary glimpse of a figure darting off among the trees and underbrush. Could he have had anything to do with Tom's accident?

"Stop!" Bud yelled. But the man had already disappeared from view into the woods.

Bud turned toward the ditch and scrambled down the sloping shoulder. Tom had been thrown clear of his car and was lying motionless a few feet away. Bud knelt beside him in a frenzy of fear.

"Tom! Tom!" he cried out.

To Bud's immense relief, his pal moved and opened his eyes. "Oh!" he said and rubbed his forehead dazedly.

"You'll be all right," Bud said hopefully.

"Yes, I'm all right-I guess," Tom murmured. "Just shaken up."

Bud made sure his friend had suffered no broken bones or other serious injury, then helped Tom to his feet. The young inventor's face and his T shirt were smudged with dirt.

"What happened to your car?" Bud asked with a puzzled frown.

"Search me. The car went out of control all of a sudden," Tom said. "Wouldn't seem to answer the wheel. I'll check right now."

"Nothing doing, pal," Bud retorted as Tom started toward the overturned sports car. "You're going

straight to sick bay and let Doc Simpson do the checking up.”

Overriding Tom’s protests, Bud guided him to the red convertible and helped him inside. Then, taking his own place at the wheel, Bud sped to Swift Enterprises. They passed through the main gate and pulled up outside the plant’s infirmary.

Dr. Simpson, the young medic of Enterprises, eyed Tom with a look of comic dismay as the two boys entered his office.

“Good grief, skipper!” he said, seeing Tom’s visible scrapes and bruises. “You have a lab accident?”

Bud grinned. “No. He was just doing a somersault with his car. Kind of early in the morning to start cutting up, wouldn’t you say, Doc?”

Doc Simpson laughed. “Sure is. Anyway, I’m the one who’s supposed to do the cutting up around here.” He reached for a medical kit.

“Well, don’t start on me.” Tom chuckled. “All I have are a few black-and-blue marks.”

The physician examined Tom carefully and treated a few slight cuts, but said that otherwise he found the patient uninjured. Nevertheless, he ordered Tom to rest for an hour or two on a cot in one of the treatment rooms.

“Listen, I can’t stay here,” Tom argued as he put on his T shirt. “I have to find out what went wrong with that car.”

“It’ll wait,” Doc insisted, shepherding Tom into a treatment room. “In the meantime, you stretch out on this cot.”

“Relax,” Bud told his pal. “I’ll go see about your car.”

When Tom tried to object, Doc Simpson added persuasively, “We’re saving you for the last play of the fourth quarter, Tom Swift!”

Grumbling, Tom lay down while Bud hurried off to the huge garage-and-maintenance shop which housed Enterprises’ fleet of trucks and jeeps. Soon a wrecker was on its way with Al Roster, a mechanic, at the wheel and Bud beside him.

When they arrived at the scene of the accident, Al said, “Wow! Tom Jr. was lucky!”

Tom’s car was hoisted out of the ditch with the tow crane. The mechanic checked the steering system but could find nothing wrong. Bud then tried driving the sports car a short distance down the road. It seemed to steer and operate perfectly. The only apparent damage was a fender dent and a few body scratches.

“Sure the skipper didn’t black out or something?” the mechanic asked.

“Are you crazy?” Bud said scornfully. “Even if Tom’s brain was only hitting on half the cylinders, it’d still rev faster than most do at full choke.”

Al shrugged. “Okay, we’ll take the car back to the shop and tear it down.”

When they reached Enterprises, every part of the car's running gear was dismantled and checked. No possible cause for the accident could be found.

"That baby's honed to perfection," Al announced as he finished the reassembly job and wiped his hands on some clean waste. "I figured there couldn't be anything out of kilter, the way Tom takes care of it."

Bud scowled. "Guess you're right, Al. We've been following the wrong trail."

Without explaining his last remark, Bud hurried off to talk to Tom. The two boys discussed the problem over trays of lunch brought in by a nurse. Tom had already bathed and changed his clothes.

"You know, Bud, I've been thinking," he mused. "Some kind of ray could have been used on my car—a ray which temporarily froze the steering."

"I've been doing some thinking myself, pal," Bud said. "If the car was sabotaged by remote control, I think I spotted the guy who did it."

Tom eyed his friend in surprise. "When was this?"

"Right after you went in the ditch," Bud replied, and told Tom about the furtive figure he had seen darting off into the woods. "I yelled at him—mostly because it seemed suspicious that he was running away from the accident. He wouldn't stop."

"I think we'd better tell Harlan," Tom said grimly.

They hurriedly finished eating and went to the office of the security chief. He became alarmed upon hearing the boys' story. Picking up the telephone, Ames called Shopton police headquarters. Chief Slater, an old friend of the Swifts, promised to meet them immediately at the scene of the accident.

Shortly after Tom and his two companions arrived, a police car pulled up alongside. Chief Slater listened to an account of what had happened, then turned to Bud.

"What did this fellow you saw running away look like?"

"I caught only a brief glimpse of him," Bud said. "He was very thin and dressed in rough clothes. I'm not sure how tall he was because he was sort of crouched over as he plunged into the brush. My impression is he's dark-haired."

The sergeant who had accompanied Chief Slater made a note of this, then Slater asked, "Can you point out exactly where he went?"

"I think so."

Bud led the way toward the spot where the stranger had disappeared into the woods. The trees grew close together near the road, then thinned into a marshy area of low ground. Suddenly Ames gave a cry of excitement and pointed to a series of footprints in the soft muck.

"That's his trail, I'll bet!" Bud exclaimed.

Chief Slater bent to examine them and frowned. "Pretty wide shoe prints for a slender man," he stated.

Ames remarked that the fugitive might have worn hunter's boots over his own shoes. The group followed the trail for a few minutes, but as the ground sloped upward and became more rocky, the prints disappeared.

"He must've flown away," Bud muttered as they turned back.

When they returned to the spot where Bud had glimpsed the man disappearing into the woods, Tom pursued a theory of his own. He was hoping to find some scientific clues to the method used in disabling his car. A path of trampled underbrush showed the stranger's movements before he had fled. Tom followed the trail from the edge of the woods to a single huge oak tree standing close to the roadside.

Tom beckoned excitedly to his companions. "Come here and take a look at this."

The others examined some scorches on the bark of the tree trunk. The charred area had been made recently.

"What's your theory, skipper?" Ames asked.

Tom explained that some kind of electromagnetic ray might have been used to "freeze" the steering mechanism of his car. "These marks could be slight burns from a ray gun the man was holding."

Chief Slater nodded. "Just about the right height."

"But who was the dirty rat?" Bud growled. "And why is he out to get you?"

Tom shrugged ruefully. "Wish I could tell you, chum. My crystal ball is a bit clouded."

Both Chief Slater and Harlan Ames promised to check out every possible lead. Tom, meanwhile, decided to put the whole matter from his mind and resume work on his latest project. Late that afternoon, Mr. Swift dropped into Tom's private laboratory. Bud was there, bent over his friend's drawing board, watching Tom sketch out ideas for his revolutionary new space telescope.

"How's your 'Window on the Universe' coming, son?" Mr. Swift inquired, his eyes twinkling.

"Still in the planning stages," Tom replied, "although I have my high-gain signal amplifier worked out."

Bud grinned. "It's still sort of a Greek puzzle to me, skipper. You mean this rig will let us see things in the universe that are way beyond range of the biggest observatory telescopes?"

Tom nodded. "I hope so. Actually it won't give us light images of heavenly bodies such as we see with an optical telescope. Instead, we'll be scanning outer space with a high-powered radio signal -and the reflected signal will 'paint' a picture electronically on a cathode-ray tube."

"I get it," Bud said. "Like seeing a transmitted picture of the star on a TV screen, eh?"

"Right."

"An exciting idea," Mr. Swift said enthusiastically. "Imagine peering into every corner of the universe-seeing stars and galaxies we never dreamed of before! This could be your greatest invention yet, Tom."

Tom flushed with pleasure at the praise. “Thanks, Dad, but it’s a long way from being worked out.”

“Got a name for this Mighty Eye?” Bud asked Tom.

“I’ve decided to call it a megascope space prober,” the young inventor said thoughtfully.

“‘Mega’ stands for ‘million’-or at least ‘much greater’-and ‘scope’ stands for ‘seeing’ or ‘viewing.’”

“Whew!” Bud gave an awed whistle. “Seeing a million times farther than ever before! Nice going, Tom!”

The wall phone rang and Mr. Swift, being closest, answered. The boys saw a look of excitement flash over his face as he took the message.

“We’ll be there, sir!” Mr. Swift said, just before hanging up.

“Long distance?” Tom asked.

“Yes, son, from Washington. Boys, the National Aeronautics and Space Administration has just invited the three of us to attend a conference tomorrow morning to discuss a manned government space probe to Venus!”

“Venus? Wow!” Bud leaped to his feet.

Tom’s eyes lighted up with interest as he and his father exchanged glances. Was there a chance Swift Enterprises would get the assignment?

CHAPTER III

PILOT FOR VENUS

THE next day Tom ate a hurried breakfast, kissed his mother and Sandy good-by, and drove to the plant with his father. Both shared a feeling of stifled excitement. If the Swifts were assigned the manned space flight to Venus, it would be the most daring venture they had ever undertaken 1

Bud met them on the Enterprises airfield, eager for the trip ahead. A Swift jet plane stood ready for take-off on the runway, and within half an hour they were landing in Washington.

At NASA headquarters Dr. Lars Norstrom, a lean man with Viking-blond hair, greeted them warmly. “Thanks for coming on such short notice,” he told the Swifts as he shook hands. Dr. Norstrom, coordinator of the national space flight program, was an old friend of the Swifts.

“We’re happy you called on us,” said Mr. Swift. “This is Bud Barclay.”

Dr. Norstrom beamed at the young flier. “Delighted to meet you, Bud. We’re particularly eager to have

you at this meeting.”

Bud and the Swifts were somewhat mystified at the man’s last remark but made no comment. Norstrom led them to a conference room. Another NASA official was there and two other men -John Clarke and Arnold Franklin, the president and the chief engineer of the Astro-Dynamics Corporation.

“We’ve met before, many times.” Clarke flashed a friendly smile as he and the Swifts shook hands. “Always a pleasure to see America’s greatest space pioneers again.”

Using chalk and a blackboard, Norstrom outlined the details of the planned Venus flight. Then he added, “We’ll be using an Astrodyne booster for the space vehicle.”

Tom was thunderstruck. The Astrodyne was a huge rocket manufactured by Astro-Dynamics. Though the rocket was well engineered, he considered it inferior in thrust and refinements to the Swifts’ rockets.

“Then the contract’s already been awarded?” Mr. Swift asked in surprise.

Norstrom nodded. “Yes. For various reasons we think the Astrodyne is the rocket for this particular job. We also like the space vehicle they’ve come up with.”

Franklin spread out several blueprints and described a nuclear-powered ion-thrust ship already in the final testing stages.

“Our problem now,” said Clarke, “is getting an experienced astronaut. Tom Swift would be our first choice, but we know he’s too busy. Therefore we’d like to borrow Bud Barclay.”

Bud drew in a long breath. He was completely flabbergasted by the offer. Tom, too, was speechless.

Mr. Swift smiled and looked understandingly at the young flier. “Bud, it’s up to you.”

Tom quickly mastered his own disappointment and said gamely, “It’s a terrific challenge, pal!”

Bud gulped uncomfortably. “I-I don’t know what to say. I’d like to think it over, sir.”

Mr. Swift glanced at his watch. “Suppose we give you our answer after lunch,” he suggested.

The others were agreeable, and the meeting broke up. As they ate lunch at a hotel, Bud and the Swifts discussed the situation.

“Frankly, I’d rather not take the job,” Bud said bluntly. “Sure, it’s exciting, but I consider myself a Swift man-first, last, and always.”

Tom grinned at him. “Thanks, Bud. I’m glad you feel that way, but don’t let it stop you. This would be an honor-a chance to skipper the greatest space flight so far.”

“Tom’s right,” added Mr. Swift. “We appreciate your loyalty, but this program is in our nation’s interest.”

Bud beamed excitedly. By the time lunch was over, he had agreed to accept Astro-Dynamics’ offer. His decision brought smiles and handshakes that afternoon at NASA headquarters.

“We’ll expect you in Florida on Thursday, Bud,” Clarke told him, “to begin your test work and general indoctrination.”

Back aboard the jet, Tom took the controls. The others could see that he was still feeling the sting of Enterprises’ not having been given a chance to compete in the Venus project. After taking off, Tom swung in a large arc until he was ten miles up and a hundred miles from shore.

“I think I’ll wring this crate out a bit before we land,” he announced.

Bud grinned. “Let ‘er rip!” He knew this was Tom’s way of getting the Venus project out of his mind.

“Aerobatics?” Mr. Swift inquired, as he and Bud pulled their safety belts tighter.

Tom lowered the nose of the plane to gain speed. As he eased steadily back on the control stick, the horizon gradually dropped below the nose of the aircraft. Only blue sky could be seen as Tom passed over the top of a perfect loop. The occupants felt the steady G force mounting to almost three times their own weight.

Tom did a roll, first to the right, then to the left. Diving for speed again, he pulled the stick back and to the right, causing the plane to roll in a vertical climb.

“Not bad,” Bud said jokingly. “Not bad.”

Tom half-rolled the airplane upside down. As he attempted to recover right-side-up, Tom’s face muscles tensed.

“What’s wrong?” Mr. Swift questioned.

“The control stick! I can’t move it!” The plane sped along upside down. Tom strained to free the stick. It would not budge. “The boosters in the control system must be jammed!”

“How about the booster-release lever?” Bud yelled.

Tom reached for a lever to his left and pulled it hard. He tried to move the stick. “No good! The release doesn’t work, either!”

The plane entered an inverted dive.

“The air speed is increasing,” Mr. Swift warned.

Tom continued to struggle with the control stick but had no success. He tried a hand-operated hydraulic pump, but he could not regain pressure. “I’ll try the trim controls.”

He reached to his left where two dials were located. One of them read: aileron-trim control. He turned it slowly. The plane shuddered slightly, then started to respond.

“We’re rolling out!” Bud cried.

Tom continued to adjust the aileron-trim control. Gradually the plane came out of its upside-down position.

“Hurray!” Bud cheered.

“We’re not out of this yet!” Tom said.

“Have you any control at all?” Mr. Swift asked him.

“I have rudder control, but I still can’t raise or lower the nose.”

“How’re we going to land?” Bud looked tense.

“I’ll use the elevator-trim control. It’ll be tricky, but it’s worth a try.”

Tom carefully adjusted the trim controls. He managed to turn the plane toward Shopton, then tuned the radio. “Swift tower,” he called. “This is Tom. . . . Mayday! . . . Mayday! . . . Mayday!”

The radio receiver crackled and a voice emerged from the speaker. “This is Swift tower! What’s your difficulty?”

“Aileron and elevator controls inoperative! I’m one hundred and fifty miles due east. Going to attempt a landing using trim controls!”

“Roger! You are cleared for an emergency landing on east-west runway! Winds are northwest at one-six! We have you on the radar! Emergency crew standing by!”

Tom maneuvered the aircraft east of Enterprises’ huge landing field. He then turned west in order to line up with the landing runway.

“Swift tower, this is Tom on final approach”

“You are cleared to land!”

Tom reduced power slightly for a descent. “We’ll have to come in faster than normal to keep the trim controls effective.”

“Ground’s coming up pretty fast!” Bud warned.

Tom adjusted the elevator-trim-control dial constantly as the plane approached the end of the runway. He increased power momentarily, reduced it again, then turned the trim control to nearly full nose-up position. The plane responded slowly and flared out about fifteen feet above the runway.

“Hold on!” Tom ordered.

A wing dipped. Tom adjusted the aileron-trim control frantically. The plane gradually leveled out. Then the nose began to lower again. He turned the elevator-trim dial to full nose-up and increased power slightly. The aircraft hovered, then dropped hard and fast onto the runway surface. The tires screeched! Tom cut power completely. The plane rolled fast.

“We’re almost out of runway!” Bud murmured.

Tom applied brakes harder and harder. Just short of the boundary, the craft finally stopped.

“Whew!” Bud mopped his forehead, then pumped Tom’s hand. “Nice going, genius boy! You had the plane under control the whole while!”

“Don’t think I wasn’t scared,” Tom retorted.

Mr. Swift patted his son quietly on the back. “Well done,” he said.

The three climbed out and immediately started tracing the cause of the trouble. With practiced skill they checked out the plane’s control system. Tom soon found a shorted-out winding in one of the servomotors. When the ground crew arrived at the scene, all congratulated Tom.

“Guess my passengers have had enough air stunting for the day. Me too!” Tom said, grinning. He then pointed out the trouble and asked that it be repaired.

That evening Sandy was excited when she learned that Bud was going on the Venus probe project. “This calls for a farewell celebration,” she said, and immediately phoned Phyl to plan a big party for him the next evening. Phyl was enthusiastic at the idea, but Bud, when sounded out over the telephone, begged off.

“Let’s keep it a foursome,” he suggested. “A day in the mountains with a picnic lunch, and then dinner and dancing at Range View Inn.”

“Wonderful!” Sandy agreed. “It’s a date!”

Range View Inn, high in the mountains overlooking Lake Carlopa, catered to hikers and flying enthusiasts. The inn maintained its own small flying field on lower ground.

The next morning Tom, Bud, and the two girls boarded a helicopter at Enterprises and flew to the inn’s field. They ate their picnic lunch near a small stream whose banks were strewn with wild flowers. Later they hiked slowly to the inn, arriving in the late afternoon ravenously hungry. After dancing a while to the music of the Range View band, they settled down to a hearty roast turkey dinner.

“Aren’t you worried about Bud’s making a play for Venus?” Phyl teased Sandy.

“Why should I be?” Sandy said impishly. “I’ll find myself a new steady with a classic profile like Mars.”

Bud pretended to be alarmed. “What are you two trying to do?” he asked. “Scare me off this project before I even get started?”

Sandy giggled. “I didn’t know you cared!”

“Don’t be too sure of him, Sis,” Tom joked. “His heart belongs to a rocket ship.”

“Not the Astrodyne, or that sky buggy they’ve planned for me,” Bud said disgustedly. “The Swifts’ Challenger can fly rings around both of ‘em!” The Challenger was Tom’s amazing repelatron-powered space craft in which he had reached the moon.

After dessert and more dancing, the four friends were about to leave when the waiter handed Tom a note. He opened it and read:

Better not go home in helicopter or your life will be in danger!

CHAPTER IV

ANOTHER AMBUSH?

THE warning note was unsigned. Without betraying his reaction, Tom folded the paper again, stuffed it into his pocket, and turned to Bud.

“Let’s go wash, fly-boy, before we start home. Excuse us, girls?”

“Yes,” Sandy answered.

In the washroom Tom took out the note and showed it to Bud. Bud’s face flamed with anger as he read the message.

“Those dirty rats!” he cried. “They must have trailed our copter by car-and seen us come down on the field. Skipper, I don’t know who sent this, but after what happened to your car, I wouldn’t take a chance!”

Tom did not underrate the danger, but pointed out, “This note may have been written by some crank and might have no connection with that road ambush.”

“I still say, don’t risk it,” Bud insisted.

Tom considered a moment. “Let’s leave it to the girls and their feminine intuition,” he said with a grin.

The boys returned to their table and Tom revealed the situation calmly to Sandy and Phyl. The girls were alarmed and puzzled.

“Maybe Bud’s right,” said Sandy, after they had read the note and heard Bud’s opinion. “Why not leave the helicopter at the field, Tom? We can call a taxi-or even rent a car.”

“Where would we rent a car at this time of night way up here?” asked Tom.

“Simple. Just call this number.” Sandy handed him a card. “A man came around while you two were gone and left one of these at each table.”

The card read:

cars for hire

Any time of day or night 24-Hour Service

There was a telephone number at the bottom.

Tom glanced at the card, then handed it to Bud, as he looked sharply at his sister. "Where's the fellow who left this, Sis?"

Both girls peered around the room.

"Guess he's gone," Sandy said. "I didn't pay much attention to him." Suddenly she noticed Tom's suspicious expression. "Oh, my goodness! You don't suppose this was all part of the plot?"

"If I have an enemy," Tom said evenly, "he may want me on the road in a rented car so he can attack me."

"I'll bet you've hit it right on the button, skipper," Bud said. "So in that case what do we do? We still can't be positive the warning about the copter wasn't on the level."

Sandy's blue eyes met Phyl's brown ones in a look of fear.

"Is it even safe to go back to the airfield?" Sandy asked nervously.

Phyl had a suggestion. "Don't you think we should play safe and ask for a police escort to the field, Tom?"

He agreed and beckoned to the waiter. As Tom paid the bill, he queried the waiter about the man who had given him the note.

"To tell you the truth, sir, I never saw him before," the waiter replied. "He wasn't one of the guests."

"What did he look like?" Bud persisted.

Again the waiter was unable to give much information. "The man just slipped me the note when I was standing near the door. I hardly got a look at him." About the only description the waiter could offer was that the man was of medium build.

Tom asked to see the manager and explained the situation quickly, requesting the man to call Captain Rock at the nearby State Police barracks. Twenty minutes later a highway patrol car with two troopers pulled up outside the inn.

Corporal Gibbons, who had met Tom before, listened to his story and asked to see the warning note. "Do any of you recognize this writing?" Gibbons asked after reading the message.

Tom shook his head. Bud and the girls were also unable to identify it.

"Okay, we'll run it through the test lab and send a copy to your security department, Tom," Gibbons promised.

"One other thing," Tom said, handing over the rental-car notice. "This card is printed, but it's not a neat job-as if someone ran it off in a hurry on a hand press. How about checking on the phone number?"

The corporal nodded. "Good idea."

He gave the number to the police dispatcher over his car radio, then the group started off down the mountain road. The summer evening was beautiful, with a fresh breeze blowing through the pines. But the

young couples were too worried to enjoy the ride.

When they reached the airfield, Tom, Bud, and the corporal's partner, who was a mechanic, inspected the helicopter carefully. It seemed to be in perfect condition. Meanwhile, Corporal Gibbons questioned the airfield manager, who was certain no one had had an opportunity to tamper with the ship.

Gibbons reported this to Tom, then asked if he and his friends would prefer to ride back to Shop-ton in the patrol car. Tom glanced at the girls and Bud, then declined.

"Thanks for the offer and all your help. We'll take the chopper."

The flight to Enterprises was accomplished without incident. Bud drove the others to their homes in his red convertible.

Thursday morning at the plant Tom checked with Harlan Ames on the case. "No leads yet on the phony warning note," Ames reported. "But your hunch about that rental-car notice was right."

"The police traced the number?" Tom asked eagerly.

"Yes. It turned out to be the call number of an outdoor telephone booth," the security chief said. "The booth is outside a gas station, within plain sight of the inn's entrance."

The man who left the cards at the dining tables, Ames theorized, had probably gone straight to the booth and waited there for a possible call. Meanwhile, his partner-the man who had handed the waiter the warning note-probably had been hiding somewhere nearby in a car, ready to pick up Tom and his companions if they took the bait and phoned.

"Instead," Ames concluded, "you were too wary to fall into their trap. When the State Police car arrived, the man in the phone booth spotted it, tipped off his partner, and they pulled out fast."

"Pretty clever," Tom said grimly.

Ames agreed. "This definitely proves someone's out to get you, skipper. What's more, he's watching every move you make-ready to strike any time you let down your guard."

Tom promised to be careful.

"In the meantime," Ames added, "I'm doubling the security guards around here."

Before leaving Harlan Ames's office, Tom asked if there had been any further word on Gaspard and the helium-machine explosion in Paris.

"No. Gaspard was still in the hospital, last I heard. There seems to be a news blackout on the whole business."

Deep in thought, Tom hopped into his car and drove to his private laboratory. He was baffled and angry at the attempts to injure him. Who was behind the cunning plots? And why?

The Swifts and their revolutionary scientific inventions had often been targets for scheming criminals and subversive agents. Recently, in his triphibian atomicar, Tom had fought for his life against deadly enemies while on a difficult engineering mission in the Middle East. In both outer space and under the sea, the

young scientist had faced heavy odds in his restless urge for new achievements.

But in the past, his enemies had been after some valuable prize—often one of Tom’s own inventions. This time their motive was a total mystery. Heaving a sigh, Tom gave up trying to solve the puzzle for the present and strode into his lab.

“Too much to do to spend time worrying,” Tom thought, settling down at his workbench.

He soon was engrossed in the problems of his space telescope. To obtain a televised likeness of a distant body, he would have to transmit a concentrated radio beam through trackless reaches of space. But how could he do this when the radio energy kept scattering itself in constantly expanding waves, like ripples spreading outward in a pond?

“I sure can’t run a coaxial cable out in space whenever I want to view something,” Tom said to himself with a wry grin.

Somehow, without the use of reflectors, he would have to find a way to make the radio impulses correct themselves and stay focused in a single beam during their whole journey through space.

For weeks Tom had wrestled with the glimmering of an answer. The signals would have to be generated with a special type of oscillator circuit.

Grabbing a pencil and a slide rule, Tom was soon covering sheet after sheet of paper with diagrams and computations.

Satisfied at last that he was on the right track, Tom plunged into the job of electronic construction. A tangled assembly of transistorized components and wiring gradually took shape on his workbench.

“Tom! . . . Tom!” A bellowing foghorn voice suddenly shattered the young inventor’s concentration.

He looked up as a roly-poly figure came clomping into the laboratory with a clatter of high-heeled cowboy boots. He was Charles Winkler, nicknamed Chow, the former chuck-wagon cook from Texas who had attached himself to the Swifts on one of their atomic research trips to the Southwest. Now he was chef on most of the long journeys, and served meals to Tom and his father at the lab.

As usual, Chow was sporting a gaudy shirt, and a ten-gallon hat perched atop his bald dome. Oddly, his leathery sun-bronzed face looked pale.

“What in thunderation’s goin’ on around here?” Chow gasped. “I got fireworks poppin’ in my galley!”

CHAPTER V

SPECTRAL FIREWORKS

WITH his mind still on his work, Tom stared at the quivering cowpoke. “Fireworks! Chow, what are

you talking about?”

Chow grabbed Tom by the arm. “Come see for yourself, boss!” the cook begged. “Brand my space spinach, it’s plumb spooky! Either the galley’s haunted, or them Martian pals o’ yours is playin’ some kinda joke on us!” Chow was referring to the Swifts’ mysterious friends from Planet X with whom the Swifts had been in communication for many months.

Tom and Chow ran down the corridor to the private galley. At the cook’s request, it had been installed in the lab building so he could “whomp up” special meals for his beloved young boss whenever Tom was hard at work on a new invention.

In the doorway of the galley the young inventor halted in amazement. Tiny explosions of hissing vapor were popping out across the whole length of the room—each one making a noisy report like a small firecracker! The ghostly stuff seemed to be materializing out of nowhere!

“Good night! You weren’t kidding, Chow!” Tom gasped. “Spectral fireworks!”

“You mean spooks is causin’ it?” Chow gulped, turning paler than ever.

“Well, I didn’t mean that exactly—but I agree, it certainly does look spooky.” Tom shook his head in total bafflement.

The “fireworks” were dancing not only in midair, but also from the top of the range, the cabinets, and the wall surfaces. Tom noticed that the vapor explosions appeared to be spaced equal distances apart. As the explanation suddenly occurred to him, the young inventor burst into laughter.

“Brand my rocket scooter, what’s so all-fired funny?” Chow demanded, suspicious that Tom might have been playing a joke on him.

“Relax, old-timer,” Tom said. “I think I know what’s causing it. Just wait here a second.”

The chef looked none too comfortable at the prospect of being left alone with such ghostly goings-on. But he waited obediently while Tom dashed back to his laboratory. When the young inventor returned a few moments later, the spectral fireworks had vanished!

Chow looked mystified. “What in tarnation did you do, Tom?”

“Just turned off my new anti-inverse-square-wave generator.” As Chow’s jaw dropped open, Tom grinned. “It’s part of the new space telescope I’m working on. It generates a special type of radio waves. But I’m not using it right now.”

Tom went on to explain that the radio beam had been passing straight through Chow’s galley. A pulse of tremendous energy was sent out every few seconds. At the nodal points of the waves, intense heat was produced. This caused the water vapor in the air to expand tremendously, each pulse producing a set of small but noisy explosions. Tom pointed out that water vapor was high in the kitchen and only water, not the dry air, absorbed the radio waves.

Chow mopped his forehead with a huge red bandanna. “Jest plain ole steam, eh? Brand my loco weed, I’m sure glad to hear it! Had me flippin’ for a while there!”

The cook brightened as a new thought struck him. “Say, them lil spook fireworks was kinda cute, at

that. How about turnin' 'em on again, boss, so's I can enjoy lookin' at 'em?"

"Sure thing." Repressing a smile at Chow's interest and his sudden about-face attitude, Tom went off to oblige. Then he returned to the galley and watched the ghostly display with Chow until the novelty wore off.

"Bet you never saw anything like that in a Texas chuck wagon," Tom remarked, smiling.

"If I had, I'd have give up cookin' right spang on the spot!" Chow declared fervently.

Late that afternoon, Bud dropped around to the lab to say good-bye before leaving for Florida. Though excited at the prospect ahead, the young pilot seemed subdued at parting from Tom and the familiar surroundings of Swift Enterprises. Tom, too, felt a pang of sadness. After sharing so many adventures on their daring space voyages, he would not be with his pal on this new cruise into the unknown.

"Let me know what you find under that cloud cover up on Venus, rocket boy," Tom said, trying to sound cheerful.

"It won't be half so much fun without you along, skipper." Giving Tom a playful but half-hearted poke in the ribs, Bud strode off abruptly.

Feeling somewhat downcast, Tom went back to work on his wave generator. The young inventor was still depressed that Swift Enterprises had not been invited to participate in the Venus probe project.

"Oh, well," Tom said to himself, snapping out of his mood, "if I can perfect my megascope space prober in time, I can watch Bud's whole trip!"

Spurred by this hope, Tom worked almost continuously through most of the following two days.

He kept in touch with Ames, but no fresh leads to his mysterious enemy turned up.

"I'll try some detecting myself as soon as I finish the main work on my prober," he determined. By the middle of the following week, Tom had a small pilot model of his wave-generating equipment working perfectly.

Greatly elated, he demonstrated the model to his father. Mr. Swift was amazed.

"Son, you've licked one of your biggest problems," the elder scientist declared. "Frankly, I was doubtful whether it could be done. This device alone can have a revolutionary effect in the communications field-especially for military use."

Tom nodded. "You're right, Dad. In fact, I have an idea myself for using it in radio communication."

When his father had gone, he telephoned Hank Sterling and Arvid Hanson and asked them to come to his office. Hank, blond and square-jawed, was the chief patternmaking engineer and trouble shooter at Enterprises. His hard-driving tactics had helped push many of the Swifts' projects to success. Arv, a burly six-footer, was an all-round expert craftsman who turned out the pilot models of Tom's inventions.

"How's your space telescope coming?" Hank asked.

"Just finished one part of it," Tom replied. "I'll show you how it works in miniature. Then I'd like you

fellows to get cooking on a full-sized version.”

Both men watched with interest as Tom explained his small-scale pilot model. Besides the signal-generating equipment and amplifier, the device had a curious-looking antenna. It was composed of a series of wire rings connected together into a tubelike framework.

Arv Hanson looked puzzled when Tom called the setup an “anti-inverse-square-wave generator.” “Say that again,” he murmured, frowning.

Tom grinned. “Well, you’ve heard of the inverse-square law,” he began. “It says that the strength of a signal is inversely proportional to the square of the distance from its source.”

Using chalk and a blackboard, Tom dashed off a simple example. “If twenty units of light are received two feet away from an electric bulb, then only five units will be received at a distance of four feet,” Tom explained.

“That’s because light and other forms of energy travel in spreading waves so that you pick up only a smaller and smaller bit of the signal the farther away you are,” Tom went on. “But I call my generator an-inverse-square type because the signal doesn’t get weaker. It stays focused in a constant beam.”

Hank Sterling rubbed his jaw dubiously. “Neat trick,” he said, “but how do you do it?”

“Watch.” Tom opened a window and aimed his antenna, by means of a computer device, toward a hill just visible on the horizon. “I have a receiver hookup on that hill,” Tom explained. “The strength of the signal it picks up will be telemetered back to us here in the lab.”

After tuning his equipment, Tom flicked a switch, and a meter on his control panel registered the strength of the transmitted signal. A needle on a twin meter swung to the same wattage, showing that the hillside receiver had picked up the signal full strength.

Both Hank and Arv were amazed, although they found it somewhat difficult to follow fully the complicated wave analysis which Tom wrote down to explain how he had accomplished the phenomenon. The drawings and data which the young inventor gave them for his full-scale generator, however, were routine engineering.

“We’ll put the night shift on full blast and have this gizmo assembled by tomorrow,” Arv promised. “What’s next on the program?”

Tom ran the fingers of one hand through his bristling crew cut. “I have an idea for a special kind of radio I’d like to play around with,” he said. “But first I’m going to take time out to do a little detective work.”

Both Hank and Arv had heard of the attempts on Tom’s life. Hank frowned in concern. “Watch yourself, skipper. Whoever’s behind that strong-arm stuff may be playing for keeps.”

“Sure looks that way,” Tom agreed. “But don’t worry-I’ll be taking Harlan Ames and a couple of security boys with me.”

Half an hour later, at the wheel of an Enterprises jeep, Tom pulled up along the wood-fringed roadside where his sports car had mysteriously overturned. Ames, together with his stocky, barrel-chested assistant, Phil Radnor, and Pete Harris, another security man, were with Tom.

“We’ll comb this whole patch of woods,” Tom said. “That ray gunner, or whatever he was, must have come here in a car or some other kind of vehicle. He may have circled back to the road where it was parked. Even without his boot marks, we might be able to reconstruct his movements and pick up a clue.”

The security men nodded as they started off, spreading out in order to cover as wide an area as possible.

In a few moments they reached the marshy area where the footprints had been seen. By now they had almost disappeared, but Tom knew that the police had made plaster casts to preserve the size and sole markings.

The four plodded up the rocky slope, down the other side, and came to a shallow stream. As they forded it, Tom suddenly cried out:

“Look over there!”

CHAPTER VI

STOLEN CLUE

THE security men stopped short in midstream, and turned around to stare in the direction Tom was pointing. Wedged between two rocks, on the bank to their right, was a hunter’s boot!

“Nice going, Tom!” Ames shouted back.

He and his aides followed, splashing through the water, as Tom hurried toward the spot. The boot was jammed so tightly between the rocks that Tom was unable to pull it loose.

“The fellow who wore this must have got his foot stuck when he tried to scramble across in a hurry,” Radnor observed.

Tom struggled to extricate the rubber boot. “The guy was lucky to free himself, the way this is wedged in!”

Radnor and Pete finally managed to tug the two huge boulders apart enough for Tom to yank the boot free. He examined his prize closely, especially the pattern of the heavy corrugated sole. Then he handed the boot to Ames with a quizzical glance.

The security chief, too, studied the sole markings and nodded triumphantly. “They look like the same marks the police picked up,” he declared. He ran his hand inside the boot, but it contained nothing except accumulated lint, some of which Ames tucked into a pocket of his jacket. “We’ll take this boot to the police,” he added. “The lint might have come from the trousers the man was wearing.”

Ames conjectured that the fugitive might have found wearing one boot uncomfortable and discarded it

somewhere on land. "Let's hunt around for it," he suggested.

Over an hour was spent searching but without success, and there was no sign of the fugitive's trail beyond the stream. Finally the group returned to the creek bank where Ames had left the first boot.

"Hey! It's gone!" Phil Radnor yelled.

The boot was nowhere in sight! A frantic hunt was made under the water in case the boot had fallen into the stream. But no one found it.

"What a boner I pulled!" Ames was furious at himself. "I should have known better than to leave it unguarded!"

"Never mind, Harlan!" Tom exploded, as a sudden idea struck him. "This means the guilty person thought it was safe to come back for the boot, or else he's been trailing us, and is nearby. Let's find him!"

The four went splashing across the creek, with Tom in the lead. They raced back along the beaten path to the road, scanning the woods to right and left. Suddenly they heard the distant noise of a car starting and speeding away.

"Too late!" Tom exclaimed.

Nevertheless, he and his companions sprinted forward to try catching the license number. But by the time they cleared the screen of trees and burst onto the road, the car had disappeared from view. Panting, the searchers looked at one another for a moment, too angry and breathless to speak. Then Radnor growled, "Tough break!"

Tom said thoughtfully, "We had no way of knowing my enemy was watching. At least we've found out he is around and we have that sample of the lint out of his boot."

"I wish I knew what his game is," Ames brooded. "Well, hereafter, skipper, we'll take no chances. I'll have someone shadow anyone who shadows you!"

Tom grinned. "In that case I'd better watch my step! No blind dates, no--"

They piled into the jeep and drove back to Swift Enterprises. In his private laboratory once more, Tom ate lunch by himself—a steaming bowl of oyster stew with crackers and a thick slab of lemon meringue pie brought in by Chow Winkler. The kindly cook sensed that his young boss was wrestling with some inner problem and made no attempt to interrupt, except to say:

"Eat hearty, buckaroo!"

"Thanks, Chow."

Again and again Tom turned over in his mind the mystery of the attempts on his life. What was behind them? Who was his mysterious enemy?

Finally, as he finished lunch, the worried young inventor decided again to put the whole matter out of his mind. He was eager to try out his plan for using the anti-inverse-square-wave principle in a new kind of radio.

Two separate receiver-transmitters would be needed for the experiment. The idea was so clear in Tom's head that he plunged into the job of constructing the units at once, with only rough preliminary sketches or circuit diagrams which he had already drawn.

"The radios can be very small and fairly low powered," Tom reasoned, "since they'll transmit on a very narrow beam of radiation."

Each would need a small computer in its base. Tom produced these quickly by converting two of his "Little Idiots"-amazing midget electronic brains which he had invented for his expedition to the phantom satellite.

Several hours went by while Tom labored at his workbench. It was soon strewn with electronic paraphernalia. As usual, when on one of his inventive spurts, Tom worked at feverish speed.

The new radios, like his space telescope, had extremely sensitive amplifying circuits that would have to be supercooled by liquid helium. This meant that the circulating tubes and housing must withstand ultra high pressures.

"That'll make it tough to keep the sets very light in weight," Tom mused.

Suddenly the answer came to him. "Durastress! Why didn't I think of that before?"

Durastress was a plastic he had invented that had fantastic properties-far stronger than any metal of comparable lightness. Tom had used it to contain the revolutionary atomic dynamo in his triphibian atomicar.

The plastic could be worked easily, and Tom soon had the radio housings and helium coils constructed. Next would come the job of installing the electronic circuitry and chassis.

As the radio sets neared completion, Tom slowed down the pace of his work. Again the problem of the ray-gun attack, the unsuccessful attempt to ambush him, and the vanished hunter's boot recurred, and kept dogging his brain.

Once more, Tom tried to push the matter out of his mind, but failed. He slumped down on a lab stool to think it all out if possible.

Presently a new thought occurred to him. Could the explosion of the helium machine in France have had anything to do with the mysterious attacks? What if Gaspard-or whoever else was responsible for the possible theft of his design -blamed Tom Swift for the failure of the demonstration?

Maybe the plotter or plotters with their warped minds were seeking revenge!

"It's only a hunch," Tom thought, "but it might be worth checking." He went to the phone, called Harlan Ames, and explained his theory.

"It's possible, I guess," the security chief agreed. "At least we have no other theories. Have you any procedure in mind, Tom?"

"How about asking the police to investigate every French person in Shopton?"

Ames promised to do so. "But it'll take time, skipper," he warned.

As Tom hung up, the door to the laboratory opened and in walked Bud Barclay! Tom was amazed and delighted.

"What happened?" he asked, and added kiddingly, "Don't tell me you were fired!"

Bud gave a half-hearted smile. "No, but a problem has developed on the Venus project, Tom. I'm thinking of resigning as pilot!"

CHAPTER VII

DANGER!

"RESIGNING?" Tom stared at Bud. "Are you serious?"

"I'm dead serious," Bud declared as he parked himself on a high stool.

"But why?" Tom persisted. "Don't you realize this is an honor? You'll be the first space pilot from earth to make it to another planet!"

Bud's answer was a stubborn shrug. He seemed to be groping for words to express whatever was troubling him.

"It's not only an honor, it's a government request," Tom went on. "This isn't just a private job you're doing for Astro-Dynamics. It's a project undertaken in our nation's interest!"

"Sure, sure, I know." Bud squirmed uncomfortably.

"Then what's your problem?"

"My copilot, that's what!" Bud blurted out in exasperation. "The guy's an absolute pain!"

Tom eased his own lanky frame onto a stool, his forehead wrinkling thoughtfully. He knew Bud was no quitter. If trouble had developed between him and his copilot, it must be near the battling stage for Bud even to think of resigning.

"What's this fellow's name?" Tom asked.

"Chippy Holbrook. He was a Navy pilot. Everyone calls him Lieutenant Holbrook."

"Never heard of him."

"I wish I hadn't," Bud retorted. "He's young, but a real hard-nosed type."

“Does he know his stuff?”

“Sure, he’s a good enough rocketeer,” Bud admitted. “He’s done a lot of tune-up flights down at Canaveral. But what a pest to work with! He bugs me practically every hour, on the hour!”

Holbrook’s usual tactics, Bud said, were to criticize his handling of the controls during checkout procedures or on simulated flight routine. He was constantly offering suggestions which Bud felt were mainly intended to rattle him-perhaps to the point of his making some mistake which might disqualify him as pilot for the Venus flight.

“Another stunt he likes to pull,” Bud went on, “is to throw a lot of needling questions at me whenever we have a skull session with Clarke or Franklin.”

“What sort of questions?” Tom asked.

Bud answered irritably, “Oh, about the ion drive, and stuff like that. He was familiar with the design of the Astro-Meteor right from the start, so he knows it backwards, whereas I’m still learning its features.”

The Astro-Meteor, Bud explained, was the name of the space vehicle which would make the flight to Venus, after being hurled aloft by the Astrodyne booster. Its power plant was different from those used on the Swifts’ various space crafts.

“His idea, of course, is to trip me up and make me look silly in front of the big brass,” Bud said, clenching his fist and confessing that he and Holbrook had almost come to blows the day before.

Tom watched uneasily as his husky friend got up and began to pace back and forth. “What’s behind Holbrook’s attitude?” Tom finally asked.

“He’s jealous. What else?” Bud snapped. “He figured all along he’d get the job as captain. You can’t blame him, I guess, for feeling sore-but what am I supposed to do about it?”

Tom realized that the situation was a potentially ugly one. Even under the best circumstances two crewmates thrown together in cramped quarters on a long space flight could easily get on each other’s nerves. If they started the trip as enemies, even before blast-off, their very lives-let alone the success of the Venus probe-might be endangered.

Tom got up to throw his arm around Bud’s shoulders. “Listen, pal,” he said quietly, “I can see you’re up against a tough problem, all right, but remember, this project is an important step forward in America’s space program. You can’t let the whole country down!”

“I sure don’t want to, Tom, but I just don’t see any other way out.” Bud sighed unhappily.

“Look at it this way,” Tom said. “Which one of you is better qualified to pilot that space crate -you or Chippy Holbrook?”

Bud looked embarrassed. “I’ve asked myself that a hundred times. Holbrook’s a good rocket-man, but he’s never been outside the earth’s orbit. Besides, he strikes me as a bit high-keyed. I’m not so sure how he’d react if the going got rough out there.”

“In other words-?” Tom’s eyebrows lifted quizzically.

“If you want a straight answer, I honestly think I’m a better bet for the job.”

“So do I!” Tom slapped his friend on the back. “You must have ten times as much space-flight experience in your log as Holbrook and I know you can take it in a tight spot. That being the case, are you going to let him buzz you out of your rightful place on the Venus probe?”

Bud’s grim expression slowly relaxed. “When you put it that way-no!” His face broke into a grin. “Guess I never thought of it quite like that. Or maybe it’s just getting the thing off my chest. Anyhow, I feel better.”

Tom grinned too. “Think how you’ll feel when you flash back word that you’ve reached Venus!”

Bud held up crossed fingers. “I’m not there yet.”

Chuckling, Tom went back to his workbench. Bud followed, noticing with interest the two odd-looking radio sets on which Tom had been working. Each had a small, spherical all-directional antenna mounted on top.

“What’re these, Tom?” he inquired. “Your latest brain children?”

“Yes, and they’re twins. I designed them for a special kind of radio communication which should be pretty useful in our space work.”

“Well, don’t keep me in suspense,” Bud pleaded. “What’s the angle?”

“With radios like these,” Tom said, “we won’t need to use a scrambling device for secrecy.”

“How come?”

“Because no one else in the world can eavesdrop on our conversation.”

Bud looked startled. “Are you kidding?”

“No, it’s on the level,” Tom replied. “Oh, it’s barely possible that someone might poke his antenna exactly in the path of our two-way beam. But it’s a zillion-to-one chance-and then we would have instant warning, because it would break our two-way contact.”

Bud settled down on a stool again, his eyes glinting with interest. “Tell me more.”

Tom explained his anti-inverse-square-wave principle by which a radio signal could be transmitted any distance in a single, self-enclosed beam.

“When you first start broadcasting,” Tom continued, “the radio will transmit in the usual fashion. But as soon as you make contact with the station you’re calling, the anti-inverse-square-wave effect comes into play.

“By means of the computer in the base of each radio, the two sets would instantly ‘lock’ onto each other. From then on, the transmission would take place in a very narrow beam of radiation- with no other listeners able to tune in.”

“Wonderful!” Bud exclaimed enthusiastically. “Strictly private, eh? No party-line kibitzers!”

“I hope so-assuming it works right.” Tom smiled. “Which gives me a good idea for a name.”

“Such as?”

“You’ve heard of private eyes,” Tom replied jokingly. “Well, this radio will be known as the Private Ear.” Bud burst out laughing, his good humor completely restored.

Tom proceeded to hook up a system of tubing from a helium cryostat to one of the radio sets.

“What’s that for?” Bud asked.

“The amplifying circuits will be working with such delicate signals that they have to be bathed in liquid helium,” Tom explained. “Otherwise, unless they’re supercooled, the molecular motion sets up too much noise.”

“Whew! I guess that’s about as delicate as you can get, eh?”

Tom grinned. “After I get the set loaded with coolant, there’s a small cryostatic compressor inside that will keep the helium liquefied whenever the radio is in operation. Sort of a midget-sized refrigerator.”

Suddenly both boys jumped back as a cloud of white steam burst from the top of the radio housing! A deadly chill seemed to sweep through the laboratory.

“G-good grief! What happened?” Bud gasped, his teeth chattering.

Table tops, file cabinets, and laboratory equipment quickly became rimed with frost. The two boys shivered as Tom hastily shut off the flow of helium.

“I just broke Newton’s law of gravity!” Tom said in awe.

“Please, professor! No jokes!” Bud pleaded.

“It’s no joke; it’s a fact.” Tom explained that the filler neck connection in the base of the radio had fractured. The liquid helium had instantly crawled upward inside the radio housing in order to escape. “You see, liquid helium in this supercooled condition is what’s known as a ‘superfluid.’ It’s the only substance in the world that can spill upward all by itself.”

The white “steam,” Tom added, was condensed water vapor from the air which had been produced when the liquid helium evaporated and cooled the outside air.

“Boy, now I’ve heard of everything,” Bud said. “Better watch it, Tom. You’ll be a marked man if the police find out you just broke the law of gravity!”

“Wow!” Tom slapped a hand to his forehead. “For a pun like that, I ought to break a few bones.”

Although reluctant to leave, Bud had to embark on his flight back to Florida a short time later. Tom watched him take off in a small jet plane from the Enterprises airfield.

By now it was almost closing time at the plant and Tom decided to go home. He was tired from the day’s activities and the intense work session in his laboratory. Bud’s trouble with Chippy Holbrook also

weighed on his mind.

Tom drove his sports car out through the main gate and headed toward the wooded shortcut to the Swift residence. Dusk was falling and the trees along the roadside cast deep pools of shadow across the pavement.

Tom switched on his headlights somewhat absent-mindedly. Suddenly he was roused from his thoughts by the insistent honking of a horn.

Tom glanced in his rear-view mirror. A heavy truck was bearing down on him fast. Yet the honking evidently was not coming from the truck-it sounded more like the horn of a car following close behind the truck.

The short hairs prickled on the back of Tom's neck. He felt a strange premonition of danger.

"Oh-oh!" Tom gasped as his car suddenly began to sway and waver. Again it was refusing to respond to the wheel!

Tom acted with lightning swiftness. He jammed on the brakes and switched off the ignition. Then he flung himself across the seat, jumped out the door, and dashed into the field adjoining the road.

There was an earsplitting screech of brakes as the truck plowed to a dead stop, inches behind Tom's car. He whirled, just in time to see the automobile which had been honking pull alongside the truck.

A voice barked a sharp command through the gathering darkness. "Put up your hands!"

CHAPTER VIII

NIPPING A PLOT

TOM felt a surge of relief. The voice was that of Harlan Ames! Everything had happened so fast-the raucous honking, his car going out of control, his split-second dash for safety-that Tom was uncertain about exactly what had taken place.

As he strode back toward the road, Tom saw three figures jump from the car which had blocked off the truck's escape. One was Ames, another a uniformed policeman. The third Tom recognized as Sergeant Camp, a plain-clothes man in the Shopton Police Department.

The three surrounded the truck. Sergeant Camp walked around to the driver's side of the truck and yanked open the door. "All right, you. Get out! Make it snappy!"

Two men emerged, hands in the air. The driver was a stocky, tough-looking fellow in a leather jacket. His companion, tall and slender, wore a tweed sports coat and slacks. A felt hat, pulled low over his eyes, failed to obscure his sharp-featured face.

“What’s the big idea?” he whined.

“That’s what we intend to find out!” Ames snapped. “Why were you trailing Tom Swift?”

“Who said we were trailing him?” the driver retorted belligerently. “I’ve never even seen the kid before! Any law against driving on the same road with him?”

Ames’s eyes drilled into the man coldly. “There’s a law against trying to kill someone- and it could put you two behind bars for a good long stretch!”

The driver’s face took on a look of feigned astonishment. “We never touched him!”

“A few days ago,” Ames said, “Tom’s car suddenly went out of control on this same road and overturned. It was put out of control by someone waiting in ambush. Tonight you two were following right behind him in your truck and the same thing happened. Right, Tom?”

“Right! That’s why I slammed on the brakes and jumped,” Tom replied.

Sergeant Camp turned to the policeman and said, “Frisk ‘em, Mike!”

The policeman searched the driver and found a .38 revolver slung in a shoulder holster under his jacket.

“Got a permit for this?” The driver shook his head sullenly.

A search of the tall man disclosed a metal combination cigarette case and lighter in his inside coat pocket. The policeman put it back, then discovered a snub-nosed automatic in the man’s right-hand pocket.

“I suppose you’re carrying that gun as a good-luck charm,” Sergeant Camp said sarcastically. The tall man glared but said nothing. “Okay, Mike. Take a look in the truck.”

As the policeman went around to the back of the van, a faint suspicion stirred in Tom’s mind. “Mind if I take a look at that cigarette case?” he asked.

“Yeah, I do mind,” the owner said.

Sergeant Camp promptly plucked the case out and handed it over. Tom turned the case toward the tall man and pretended he was about to snap the lighter mechanism at the top.

“Hey! Watch where you’re aiming that!” the man yelled, growing pale.

Ames’s eyes flared with interest. “What is that gadget, skipper?”

Tom smiled wryly. “Some kind of ray machine, unless I miss my guess.”

He flicked open the cover of the case. Both Ames and Sergeant Camp gave a gasp of astonishment as they saw what was inside. Instead of cigarettes, the case contained a tightly packed assembly of electronic parts!

“Apparently this thumb mechanism on top that looks like a lighter is what triggers it,” Tom said, fascinated.

Meantime, Mike had been searching the van and then the cab with a flashlight. He now reported that the truck was empty, except for a jack and a few other tools.

“Can we put our hands down?” the driver growled.

“All right,” Sergeant Camp said. “And while you’re at it, let’s see your driver’s license. You too,” he added to the tall man.

Both took out their wallets and complied. The driver’s name was William Tappan, his partner’s Raymond Dunstan. The sergeant returned the wallets without comment. “We’re taking you both to headquarters,” he said. “You’re under arrest for conspiracy and assault with a deadly weapon.”

“Deadly weapon!” the tall man exclaimed. “Are you talking about my cigarette case? How could a little gadget like that be deadly?”

“Tell us that at headquarters,” Tom said. “You seemed scared enough when I aimed it at you.”

“You can’t haul me in on that charge!” the driver snarled. “I never saw the thing before!”

“Carrying a concealed weapon without a permit will do for a starter,” Sergeant Camp told him, “unless you can convince a judge you never saw that .38 before, either.”

The two officers hustled their prisoners into the police car. Ames volunteered to bring the truck. Tom would drive his own automobile.

Before leaving, Tom said gratefully to Ames, “Thanks, Harlan. You and the police sure came along at the right time!”

Ames explained that he and the two officers had trailed Tom all the way from the plant. “We saw that truck pull out of a side road and go speeding after you. We figured something sinister was up, so Camp’s partner started leaning on the horn to warn you.”

When they arrived at headquarters, Chief Slater listened with keen interest as Sergeant Camp reported what had happened. The prisoners, still handcuffed, stood by sullenly.

Slater fixed the truck driver with a gimlet-eyed stare. “Shorty Tappan, eh? So now you’re operating around Shopton.”

The driver flushed but said nothing. Evidently he had hoped not to be recognized.

“Who is he?” Tom asked.

“He’s got a police record as a strong-arm man,” the chief explained. “Well, speak up!” Slater snapped. “What’s this all about?”

“Don’t ask us,” Shorty Tappan replied. “Your dicks stopped us on the road and hauled us in. That’s all we know, ain’t it, Ray?”

The tall man nodded and said, “You’ve got nothing to hold us on, Chief. We were carrying guns for protection against hijackers.”

At that moment another officer stepped into the room and slipped a scribbled note to Slater. The chief read it, then looked up at the prisoners with contempt.

“Protection against hijackers?” he snorted. “That’s a hot one! That truck you two were driving was stolen! Also, it was empty.”

The prisoners’ eyes met in a quick glance of dismay. Slater followed up his advantage with a drumfire of questions but could elicit nothing more from the prisoners. Finally he gave up in disgust and turned to Tom.

“What about that ray machine?”

Tom handed the metal case over for the chief’s inspection.

“Any idea how it works?”

“My hunch is it’s some sort of repulsion-ray device, like my own repelatron,” Tom explained. “But this probably has a pulsating or sweep action. That would explain what caused my car to waver back and forth on the road.”

Chief Slater suggested that they test the device in the paved courtyard fronting the police garage. Tom stood some distance away while a policeman drove a car slowly toward him. By aiming the case and thumbing the lighter mechanism, Tom was able to move the car from side to side, regardless of how the officer steered.

“If the driver were outside the car, would the ray have any dangerous effect on him?” Ames asked.

Tom chuckled, shaking his head. “No, that’s a stunt I pulled to scare Dunstan. He probably doesn’t know beans about this machine, except how to trigger it.”

“Whoever designed this must be quite a scientist,” Ames remarked.

“I’m afraid you’re right, Harlan. And the same person may be the one who’s behind these attacks.”

Back in the chief’s office, the prisoners remained uncooperative. Dunstan insisted he had never used the ray machine and had never been in the woods bordering the road where Tom’s car had overturned. He had only been carrying the ray device, he said, as a favor for someone.

“Who?” Slater demanded.

Dunstan shrugged, his lips set tight.

“All right, book them both,” Chief Slater told the sergeant. “Maybe a spell behind bars will change their minds about talking.”

Tom arrived home long after dinnertime, but found that his mother had kept some food hot in the oven. Not wanting to worry her, Tom said nothing about the latest attack on him. But later he gave his father a full report.

Tom Sr., though inwardly upset, took the news with his usual calmness. “I know I don’t need to advise

caution, son,” he said. “But this ray device makes it plain you’re up against a dangerous enemy-particularly because he’s evidently a clever scientist.”

Tom nodded grimly. “I know that, Dad. Don’t worry. I’ll watch my step.”

Later that evening, Bud Barclay phoned Sandy long distance from Florida. Tom had already told her about Chippy Holbrook and his attempts to belittle Bud at every opportunity. He was pleased to hear his sister say:

“Holbrook sounds like a complete drip. But never mind, Bud. I just know you’ll show him up sooner or later.”

The pilot chuckled. “Thanks, Sandy. With someone like you to boost my morale, how can I miss?”

After they had chatted a while, Sandy called to her brother, “Bud wants to speak to you.”

Tom picked up the receiver. “Hi, spaceman. How goes it?”

“That remains to be seen,” Bud answered. “Listen, skipper, I think I’ve stumbled onto something here that you should know about. But I don’t want to discuss it over the phone. I’ll fly up soon as I can, and tell you.”

Tom was puzzled but intrigued by his friend’s message. “Okay, Bud. Be seeing you.”

The next morning, when the young inventor reached his laboratory, he was confronted with another puzzle. He could not unlock the door, either with his usual electronic key or with a mechanical one which he also carried.

Tom’s eyes narrowed. “That’s strange.”

He walked down the corridor a few paces to another door which led to a small apartment adjoining his laboratory. Tom sometimes ate and slept here when working on a round-the-clock experiment.

Flicking his electronic key to a new frequency, Tom beamed it at the lock. The door opened readily and Tom hurried on through the apartment to an inner door which opened into the laboratory. Tom tried both keys on this. But again neither would work.

Lock trouble at both entrances to his laboratory!

“This isn’t just a coincidence!” Tom thought excitedly.

CHAPTER IX

MYSTERIOUS MARKINGS

“NO SENSE wasting time guessing,” Tom murmured. He picked up the room phone and dialed a plant number.

“Hi, Jack. This is Tom,” he said when a voice answered. “Got a lock job for you, here at my lab.”

“Sure thing, Tom. Be right over.”

Jack, a dark-haired man of thirty-five, arrived in the hall a few minutes later carrying a satchel of tools. Slender and stoop-shouldered, with long sensitive-looking fingers, Tunbridge Jackson was the expert locksmith of Enterprises.

His almost uncanny ability with locks and electronic-eye devices had earned him the nickname of “Open Door Jack.” More than once, outside firms had called him in to crack the combinations of safes or vaults.

“What seems to be the trouble?” he asked Tom.

“I can’t unlock the door to my lab. The inside door won’t open, either.”

“May I try your keys?”

Tom handed them over. Jackson tried first the electronic one, then the mechanical key. His practiced fingers seemed to be trying to “feel” what was causing the difficulty.

“Hm.”

Without another word, Jackson opened his satchel, took out a picklock, and proceeded to probe at the inner mechanism of the lock. After ten minutes of frowning effort, he gave up with a puzzled look.

Jackson stared at the lock silently, then said, “Of course, this is the nearest thing to an unpickable lock ever made-but ordinarily I’d have it open in two minutes.”

“Want to try the inside door?” Tom suggested.

“Might as well.”

They walked into the apartment, and Jackson repeated his routine on the second door lock. But this too resisted his efforts.

“I guess you made those locks a little too good,” Tom said with a chuckle.

Jackson shook his head in mystification. “It’s certainly odd,” he mused. “Were you doing some experiment that would have ‘frozen’ the lock mechanisms?”

Tom confessed with a grin, “I did have a liquid-helium leak in there yesterday afternoon, and it got chilly enough to freeze a brass monkey.” Seeing that Jackson was taking him seriously, Tom added hastily, “But of course I realize you’re not talking about that kind of a freeze-up.”

The locksmith opened his tool satchel again. “Looks as though I’ll have to take the whole thing apart,” he announced.

The mechanism was so complicated that it took him almost half an hour to remove it from the door. Tom

immediately took the device into his laboratory and went over all the parts with a small hand-vacuum cleaner. They yielded only a tiny amount of dust and other particles. Nevertheless, Tom emptied them into a test tube. He also scraped several smears of grease from the lubricated parts onto a glass slide. Then he analyzed all the material under a Swift spectroscope.

“Nothing unusual here,” he muttered.

Tom picked up the lock mechanism again and went over it with a magnifying glass.

“Hey! Here’s something!” he thought, noting that the exposed metal surfaces showed peculiar scorings-wavy-looking scratch marks that seemed too regular to be accidental. The tracings were so faint that Tom would have missed them had he not been using a magnifying glass.

He thought, “Could the experiments with my anti-inverse-square-wave generator or the Private Ear radios have caused such scorings? I sure don’t see how. On the other hand, certain forms of radiation do have odd effects which are still unexplored by science.”

Meanwhile, Open Door Jack had removed the lock from the other door to the laboratory.

“Let me see it,” Tom said.

He examined the lock mechanism under his magnifying glass. This, too, showed the same peculiar scorings. Tom handed the lock back to Open Door Jack, who took it off to his workshop, saying he would try to repair it.

After the locksmith had gone, Tom stood for a few moments lost in thought. His eyes wandered absently about the laboratory. Suddenly he noticed something that had escaped his attention before.

A number of metal objects in the room were topsy-turvy! A metal rack of test tubes had fallen on its side, cracking a couple of the glasses. A soldering gun and other tools lay on the floor and several trays of screws and fittings had spilled off the hardware shelves.

Tom pounced eagerly on this fresh evidence. But none of the metal items, so far as he could find, showed the scorings he had noticed on the locks.

“It’s like hitting a dead-end street,” the young inventor thought.

Since the locks were the only objects which showed the mysterious markings, Tom concluded they must have been tampered with outside the laboratory.

But why? Had there been a robbery attempt?

Tom made a quick survey of the lab. Nothing seemed to be missing. Recalling the possible theft of his helium-machine design, Tom hastily checked through his files. But, again, all the plans and blueprints of his previous inventions seemed to be in their proper places.

“This is really weird,” Tom murmured.

Presently Open Door Jack returned with two brand-new locks. “I’m afraid the mechanisms are ruined on the old ones,” he reported.

After he had installed the new locks in the doors to the laboratory, Jackson started packing his tool satchel. He was about to throw in the other lock from which Tom had made his spectroscopic dust analysis.

“Wait! I think I’ll keep that,” Tom said.

The locksmith hesitated, surprised by Tom’s request. “It’s no good,” he said. “Just clutter up your lab. Maybe I can salvage a few parts from the lock.”

“Don’t worry,” Tom said with a grin. “It might give me a clue to what happened.”

Jackson handed over the lock without another word and walked off, his thin, bony face showing disapproval. Tom chuckled, then sat down on a lab stool and tried again to thresh out the mystery.

Suppose his first hunch was correct, that the markings on the locks had been caused by some kind of radiation? But the radiation could not have been from his own experiments since nothing inside the laboratory showed such scorings.

“That means it was done outside the lab,” Tom reasoned. But who at Swift Enterprises would have used a ray or radio beam on the doors to his lab?

Suddenly Tom remembered what had happened to his car, and the ray machine discovered in Dunstan’s possession the night before. Had the same sort of device been used on the door locks?

“Too bad I left that gadget with Chief Slater,” Tom thought. “I could test it and find out.”

The chief had said he would send the ray machine immediately to the FBI laboratories in Washington. By now the metal case probably was on its way. However, another thought occurred to Tom.

“I can check the car!” he muttered.

Taking his magnifying glass with him, Tom hurried outside to the spot where he had parked his sports car. Here he began a careful inch-by-inch examination of the body surface.

The job seemed rather hopeless at first, since the body already bore several scratch marks from when it overturned. These might have obscured the scorings for which he was looking.

Tom persisted in his search and finally, near the right-door handle, he discovered several faint wavy scratches in the enamel.

“They resemble the scoring on the locks!” he said to himself excitedly.

Tom returned to his laboratory, still puzzled. Dunstan and Tappan certainly could not have tampered with the locks since both had spent the night in jail. So if Tom’s theory about a ray being used on the locks was correct, the young inventor must have another enemy who was still at large 1

“And it must be someone right here,” Tom realized unhappily. “Someone who either works at Enterprises or has access to the plant!”

Tom phoned Harlan Ames and gave him a full report. The security chief was equally shocked by the thought that Tom’s enemy might be someone they both knew.

“Are you sure these marks on your car are the same as the scorings on the lock metal?” Ames asked.

“No, I can’t be positive,” Tom admitted. “The scratches look fresh, but they might have been caused when the car overturned, like the other scratch marks were. I think we ought to follow up on it, though, Harlan.”

“So do I,” Ames agreed emphatically. “I’ll check with the police and get a rundown on all known acquaintances of Tappan and this Raymond Dunstan. Then we’ll see if any of them might have a connection here at the plant.”

“Thanks, Harlan,” Tom said. “I sure hope I’m wrong.”

“For once, so do I, skipper!”

He now went back to perfecting the Private Ear, then continued work on his megascope space prober. “I’ll have to get cooking if I hope to watch Bud’s flight to Venus.”

The next step would be to work out a way for focusing his prober on a given point in space. It would have to be done by manipulating his anti-inverse-square-wave beam, Tom realized.

The young inventor was deep in thought when Chow Winkler came clomping into the laboratory. “Got a delivery for you, boss! Want it in here?”

CHAPTER X

A SUDDEN WARNING

TOM looked up absent-mindedly. “What is it, Chow?”

The leathery-faced cook jerked a thumb toward the corridor. “Some kinda gas tank, I reckon. Got it right outside.”

“Oh, yes, I ordered some extra helium in case I want to use it,” said Tom. “Bring it in.”

Chow hurried through the door, then returned wheeling an orange-banded tank on a hand truck.

“Where do you want this, boss?”

“Over there by the wall for now, thanks,” Tom said. “Better leave it on the truck so I can move it later.”

The Texan parked his heavy load but seemed reluctant to leave. He stood staring at the tank for a moment, scratched his double chin, and cleared his throat loudly.

“Brand my space galluses,” he murmured, “that sure is a purty orange color-jest like my shirt.”

“Hm?” Tom glanced up. “Oh, you mean the orange color on the tank. That shows it contains helium. Different colors are used for different gases,” he added.

“Oh, so that’s what it’s fer, huh?” The Westerner sounded faintly disappointed.

Tom looked at him, puzzled. Suddenly a great light dawned. “Hey! Where’d you get that little number you’re wearing, old-timer?” he exclaimed.

Chow’s fondness for loud haberdashery, especially in shirts, was a standing joke around Enterprises. It was a whim that gave the cook endless pleasure. He boasted about owning the choicest wardrobe of cowboy shirts east of the Pecos, and it contained a peacocklike assortment in every color of the rainbow.

But the present number topped them all, Tom thought, almost wincing at the glare. The shirt was not only a dazzling orange in color-it was trimmed in sequins!

“Kinda eye-catchin’, eh?” Chow beamed. “I picked it up fer only a fraction of its value.”

“It was a steal, all right,” Tom agreed, but thinking with an inward chuckle that Chow had been the victim at any price!

“I could get you one jest like it, boss, next time I go by the store,” Chow offered generously.

“Well-uh-no thanks.” Tom shook his head. “That would be a low-down trick, depriving you of the sole honor of sporting a knockout like that.”

“No call to feel thataway.” The cook took Tom’s explanation at face value. “‘Tis kind o’ nice, though, wearin’ a w-nique number like this an’ watchin’ folks’ eyes pop. Gives you that well-dressed feelin’.”

“I’ll bet it does.” Tom’s eyes twinkled.

Chow’s face broke into a satisfied grin as he stomped off, crooning “Home on the Range” in his hoarse off-key baritone.

Tom smiled and went back to work. “I’ll concentrate on the scanning problem later,” he said to himself. “First I must figure out how to adjust a beam properly to the exact distance of the space object I want to see.”

But how? It seemed impossible to make the signal stop short after traveling a given distance. “I sure can’t chop off a radio beam as one would a length of link sausage,” Tom mused.

Chow’s visit reminded him of the spook fireworks episode in the galley. The fireworks had occurred at the nodal points of the radio waves. Tom’s prober beam would naturally have to terminate at the nodal point of the wave, too.

Or would it?

“Of course not!” Tom realized excitedly. “I can stop the beam at any point, simply by canceling it out with another signal 180 degrees out of phase.”

In other words, he would need to project, not one, but two radio signals at the same time. Tom grabbed a pencil and began sketching out the circuit diagrams.

“The precise tuning to carry out this idea will be a real challenge!” he thought. “I’d better go take a look at the prober and get a clear picture in my mind of the whole setup.”

Hank Sterling and Arv Hanson had delivered on schedule the full-scale model of his anti-inverse-square-wave generator. The huge directional antenna had been taken to the Swifts’ private observatory atop Enterprises’ main building, where it would be mounted on a rotating pedestal.

The wave generator was enclosed in a boxlike console, which also contained the high-gain amplifier and helium-extraction machine. Tom unscrewed the back panel of the console and inspected the workmanship.

“Neat job,” he observed. “But I’ll need a bigger housing for the whole deal.”

Tom went back to his lab and tackled the job of altering the generator to provide for his new “wave-terminal technique.” This was the label he had mentally given the newest part of his megascope space prober.

The young inventor worked on steadily through lunchtime and into the afternoon. He was just checking the final circuits when Bud Barclay walked into the laboratory.

“Hi, skipper!”

Tom started up in surprise. “Hi, you old rocket hot-shot!” he exclaimed warmly. “I didn’t expect to see you again so soon!”

“They’re letting me play hooky while they check out the telemetering equipment,” Bud said. “What gives with your space prober?”

“I’ve been mapping out how to get the exact range on whatever I’m looking at,” Tom reported.

“Give me a fill-in,” Bud begged. As always, he was keen to follow the progress of his friend’s latest invention.

Tom explained his wave-terminal technique, but Bud found it hard to grasp from words alone. So Tom went to the blackboard and picked up a piece of chalk.

“Suppose we want to see the moon close up,” he began. “We beam out two signals at the same instant-but with a tiny difference in wave length.”

Tom wrote down his example. “One signal would have a wave length of say, 100 meters, the other of 100.0001 meters.” He did some hasty arithmetic.

“As you can see, the waves will become more and more out of phase as they travel along through space. By the time they reach the moon, they’ll be exactly 180 degrees out of phase- which means they cancel each other out. And this gives us our terminal point for scanning the moon’s surface.”

Bud blinked. “I get it-but boy, imagine on-the-spot television, anywhere in the universe!”

“Let’s not get too ambitious,” Tom cautioned with a grin. “How’re things at Astro-Dynamics?”

“Okay on the Venus probe,” Bud reported. Then, looking serious, he added, “But wait’ll I tell you the latest. I didn’t want to discuss it over the phone in case someone was eavesdropping on the line.

“The Astro-Dynamics Corporation,” Bud went on, “has just arranged for its engineers to attend a demonstration of a revolutionary new type of radio. It was developed by a Swedish company, R. Selland, Inc. Their American agent, a Jules Furster, has approached Astro-Dynamics about the radio.

“From what they tell me, the radio works exactly like your Private Ear set, Tom!” Bud said angrily. “It operates on a narrow beam, and locks on after making contact so no one else can tune in.”

Tom was stunned by the news. “It’s sure hard to believe that’s a coincidence, Bud,” he said slowly, “especially after I came up with such a set only yesterday.”

“You’re telling me!” Bud growled.

“I’d like to know more about it. Let me know the report on the demonstration.” Bud promised to do so, and Tom went on, “After that business in France with Gaspard and the helium machine, it’s possible other plans of mine have been stolen in the same mysterious way. The radio plans were only a rough draft-but a scientist could get the idea. One thing is sure-if they were copied somehow, it was after we left the lab yesterday.”

“Any theories as to who’s guilty?”

Tom shook his head. “No, it’s still a complete mystery. And another mystery popped up this morning.”

He told Bud about the “frozen” locks on the doors to his laboratory. Bud was equally baffled by this latest development. The boys talked about it for a while, then Tom went back to work. Bud perched on a lab stool to watch.

The young inventor wheeled the tank of helium over to his workbench and began to draw off some of the gas into his cryostat. Suddenly there was a clatter of high-heeled boots down the corridor, and Chow let out a bellowing cry:

“Boys! Run fer your lives!”

Bud and Tom exchanged a split-second startled glance. Then they catapulted into action.

As they dashed out the door, a terrific explosion shook the laboratory!

CHAPTER XI

MOON JAUNT

THE concussion from the laboratory blast bowled the youths over. Bud struck his head against the wall, and Tom was hurled along the corridor.

“Boss! Boss! Are you all right?”

Chow’s voice seemed muffled, as if he were shouting through layers of cotton batting. Tom shook his head, trying to clear his brain.

“I’m-I’m all right.” Tom struggled up, with Chow helping him. “Better see about Bud!”

As the cook hurried to Bud’s prostrate form, Tom saw Harlan Ames running up the hall. He was white-faced with anxiety.

“Thank heavens you’re all right, skipper!” he panted. “And you, Bud?”

“Still with you.” Bud was not yet on his feet, but conscious and grinning painfully. He touched a swelling bump on the back of his head as Chow helped him up.

Meanwhile, employees were rushing into the hall from both directions. The blast had evidently been heard all over Enterprises, judging by the shouting outside the building.

“Exactly what happened?” Tom asked Ames.

“I got an anonymous phone tip,” Ames explained. “The caller said someone had substituted hydrogen for helium in a tank just delivered to you. I tried to reach you by phone and the plant intercom but got no answer, so I hopped into a jeep and blazed over here. Just as I reached this corridor, I saw Chow and shouted to him to warn you.”

“Just in time,” Bud said grimly. “One more second and we’d have been dead ducks!”

“It was a miracle,” Tom agreed as he and Bud shook hands with Chow and Ames, “You two saved our lives,” Tom told them.

“Thank that anonymous phone caller,” Ames answered.

“I’ll be happy to if we ever find out who it was,” Tom said. “Let’s survey the damage.”

As the two boys and Ames made their way into the lab through the throng of employees, Chow stayed behind to calm the crowd.

“It’s okay, buckaroos,” the Texan drawled, like a cowhand soothing a herd of steers.

Meanwhile, inside the lab, Tom was heartsick as he beheld the destruction caused by the blast. The whole shop was a shambles. Windows had been blown out, filing cases lay toppled on the floor, shelves and workbench were littered with electronic debris and broken glass.

“Good grief!” Bud muttered.

For a moment the only sound was the dripping of liquids from the broken bottles of chemicals. Then Tom walked over to examine the remains of his megascope space prober equipment. The console looked as if it had been smashed open by a sledge hammer. The electronic circuitry inside had been

ruined beyond repair.

“It’s a tough break, skipper,” Ames murmured.

Bud slapped the young inventor on the back. “You’ve had tougher ones, Tom, and they haven’t stopped you yet. Neither will this one.”

Tom swallowed hard and summoned up a grin. “No, it won’t,” he declared firmly, “but it looks as though our unknown playmate has managed to slow me down a bit. At least my Private Ear radios weren’t around to get pulverized.”

The latter inventions had already been sent to Fearing Island, the Swifts’ rocket base, for space testing.

“It’s strange that Harlan couldn’t raise us over the phone or the intercom,” Bud mused. He lifted the telephone receiver. “No dial tone!” he reported. The intercom also proved to be dead.

Ames and the two boys began looking for the cause of trouble. Bud found it almost immediately. All the communications wiring entered the laboratory through a single conduit. At the outlet, the cable insulation had burned through, fusing several wires together and short-circuiting both the telephone and the intercom system.

Ames flashed Tom a questioning look. “Sabotage?”

“I think not. The insulation could have been worn just enough to start a leakage of current. It’s even possible my experiments affected the wiring by induction.”

The young inventor made a careful examination and concluded the electrical failure was accidental.

“It was sheer luck the hydrogen plot didn’t succeed,” Ames said thankfully.

Tom wanted to get out of his lab if only for a short while. Just now the sight of his ruined experiments was too disheartening.

“We’ll go over to sick bay and have Doc Simpson take a look at your noggin,” he told Bud.

His husky friend objected. “You don’t think a little bump would bother a thick skull like mine, do you?”

Tom chuckled. “Frankly no, but we live in the age of miracles, you know.”

“Skipper’s right. Better have it looked at,” Ames said with a smile. He added, “In the meantime, I’ll check into that gas-tank switch.”

Grumbling but sensing Tom’s real reason, Bud accompanied his two friends out to the jeep. Tom took the wheel, dropped Ames at the security building, then drove on to the infirmary.

The medic made a brief examination and agreed that Bud’s injury was not serious. The boys left and stopped at Ames’s office.

“Good news! We have a clue!” the security chief greeted them jubilantly. He showed the boys a dirty scrap of paper, using a pair of tweezers to handle it.

The paper bore a scribbled notation: H2 for He. TS.

“Hydrogen for helium-Tom Swift!” Bud exclaimed, translating the message at a glance.

“Where did it come from, Harlan?” Tom asked excitedly.

“Radnor found it on my desk after I took off to warn you at the lab,” Ames said. “There was a lot of excitement around here when I couldn’t get through to warn you. Whoever left this managed to slip in unnoticed.”

“Probably the same person who phoned in the anonymous tip-off,” Tom conjectured.

Ames nodded. “He must have found this paper and doped out what it meant.”

“But who wrote it in the first place?” Bud demanded angrily. “And if the phone tipster left this in your office, Harlan, he must be someone who works right here at Enterprises!”

“No doubt about that,” Tom agreed. “We already know from that lock business that some employee is involved in a plot against me. But judging from the phone call, he won’t go along with anything too deadly. As a matter of fact, he may not even know who wrote the note.”

“Or he may know but be afraid to expose the person masterminding the plot,” Ames put in.

“In any case,” the security chief went on, “the note gave the tipster a definite clue. It may bear fingerprints of the writer or the mysterious informer who delivered it to my desk. The paper itself can be analyzed to trace the manufacturer and seller. This might turn up additional leads.”

“Let me know the minute you learn anything.”

“You can count on that, skipper!”

Bud had dinner with the Swifts that evening. Afterward, Sandy played some records and danced with the young space pilot. Tom prowled restlessly about the house and finally dropped into his father’s den.

The two Toms chatted a while, discussing the day’s bewildering events. Then, noticing his son’s dejection, Mr. Swift suggested:

“Perhaps you need a change. How about a trip to the moon to try out your new two-way radio?”

Tom brightened at once. “Dad, that’s a swell idea! And while I’m out in space there’s something else I can test—the ‘constant one-G system’ we were talking about the other day!”

“What’s that?” asked Bud, who had just entered the study with Sandy in search of Tom.

“A way to get where you’re going in space as fast as possible,” Tom replied, “without ever taking too much shock from G force.”

“But you never do feel many G’s aboard the Challenger/” Sandy said, curling up on a couch. “At least not so much as on a rocket ship.”

“That’s true,” Tom agreed, “because there’s no sudden shock from blast-off. But we still accelerate

pretty fast with our repulsion rays and then coast on our momentum.”

The “constant one-G system,” Tom explained, would avoid completely any burst of acceleration. Instead, the ship would accelerate smoothly and easily at the rate of only one G, keeping this up for six thousand seconds. Then it would decelerate, or slow down, at the same rate for another six thousand seconds—at the end of which time the ship would be standing still on the moon.

“Wow!” Bud said. “If my arithmetic’s right, that’s just two hundred minutes to the moon!”

“Correct. Or a little over three hours,” Tom said. “And not a jolt all the way!”

Bud shook his head in disbelief. “Sounds great. I sure wish I were going with you, pal.”

“So do I,” said Tom.

Bud spent the night at the Swifts’. The next morning the two boys parted with a handshake on the Enterprises airfield. Bud took off by jet for Florida, while Tom hopped seaward in one of his Whirling Ducks, a combination helicopter-jet plane he had invented.

Fearing Island lay just a few miles off the coast in a straight line east from Shopton. A thumb-shaped stretch of sand dunes and scrubgrass, it had been converted into the Swifts’ top-secret rocket laboratory, tightly guarded by drone planes and radar. Their fleet of seacopters and jetmarines was also berthed there.

As the island came into view beneath a low-lying cloud bank, Tom radioed the tower for clearance and was guided through the ring of protective drone jets which hovered over the spot. He landed and sped by jeep to the launch area.

The Challenger stood out in strange contrast to the huge, needle-nosed rockets which loomed against the sky. Tom’s moon ship looked like a great silver gyroscope. It had a boxlike cabin suspended inside a spherical framework of rails. These rails were the tracks on which the ship’s repelatron radiators swiveled about, enabling the pilot to aim the repulsion rays in any direction as he steered the craft through space.

“Hi, skipper!” Slim Davis greeted Tom as he arrived. “We’re all set for take-off.”

Slim, a Swift test pilot and spaceman, had been alerted for the trip the previous evening, along with a crew of five.

Tom and Slim immediately boarded the hangar-deck elevator, to take them to the flight compartment. Tom took his place at the controls and Slim strapped himself into the copilot’s seat.

A quick instrument checkout followed. Then came the voice of George Billing, the Swifts’ radio chief, “All clear!”

Tom flicked on the repelatron and analyzer circuits. Lights flashed overhead on the element selector panel. A low hum filled the cabin as Tom fed power to the radiators. With a gentle whoosh, the Challenger lifted skyward.

“I’m setting our thrust for one G,” Tom said, pointing to the power dial as he tuned a control knob.

Slim nodded. He had been thoroughly briefed on the planned flight procedure. "I'll watch our position for the halfway point."

Soon the Challenger was soaring through the ionosphere into the black, star-twinkling void of outer space. Through the quartz-glass window they could see Tom's space outpost—a glittering twelve-spoked wheel-floating in its steady orbit above the earth.

"Good cruise and happy landings!" the wheel's radioman hailed them.

Tom grinned as he flicked on his mike. "We'll send you a postcard from the moon!"

For an hour and a half the cruise continued smoothly. Slim watched the right-hand control board. This was studded with computer-fed dials showing the Challenger's distance and angle from the moon and other heavenly bodies. At the precise midpoint between earth and moon, Slim signaled Tom, who eased a lever forward to decelerate.

Dead ahead, in their view pane, they saw the moon growing larger and larger. Soon they could make out its craters and jagged peaks with startling clearness. About fifty miles short of a landing, Tom beamed the repelatrons for a hovering halt and gazed at the lunar landscape.

"Right on the button," Slim said with a glance at his watch.

Three of the crewmen from the power deck and radiation-monitoring room came into the flight compartment to join their mates.

"You mean we're here already?" one of them asked jokingly.

"Boy, what a sweet flight!" another added.

Tom busied himself warming up and tuning the Private Ear radio he had brought along. After giving his call letters, he said, "Challenger calling Fearing. Can you read me?"

After several seconds came a faint response, too blurred with static to be understood.

"We'll have to do better than that," Tom muttered. He adjusted the output and worked with the fine-tuning control, then repeated his call.

Two or three seconds went by as the signals traversed the void between earth and moon.

"We read you loud and clear, Tom. How was the trip?" It was Billing's voice from the rocket base.

"Couldn't have been better, George. From now on, the constant one-G system will be standard routine for the Challenger."

Tom continued to converse with the base. Suddenly the signal was interrupted as the set developed a shrill whistling noise. Tom hastily adjusted the tuning controls but was unable to re-establish contact. The whistling seemed to be growing louder.

"I don't like this interference," Tom said in a low voice to Slim.

His copilot shot him a questioning glance. "What is it? An enemy?"

“Or a heavenly body on the loose,” Tom declared.

CHAPTER XII

PHANTOM THIEF

SLIM Davis was startled. He wondered fleetingly if the young inventor had meant his remark as a joke. But Tom’s face was deadly serious.

The eyes of the astronaut darted to the space position finder. This was a huge fluorescent screen on Tom’s left.

“Look!” he cried.

A fine faint line of light seemed to be tracing itself on the screen. Was an object streaking toward them? A missile perhaps? The position finder gave a broad picture of the heavens, but its scale was not designed for an accurate pickup of smaller nearby phenomena.

“Quick! Warm up the search radar!” Tom snapped.

As Slim obeyed, the inventor’s brain was frantically weighing the odds against them. Should he race for earth? Or try circling for cover beyond the moon? He had to make a split-second decision -the whistling noise was mounting to a shrill whine. “We’d better lie low-and pronto!” Tom decided.

His hands flew to the controls as Slim pointed to a splash of light on the radarscope.

“Something’s coming, all right! Holding a straight course!” Slim muttered tensely.

The Challenger was already responding to a burst of power from Number Three repelatron. As the repulsion ray pushed them farther away from earth, the ship zoomed downward toward the moon’s surface. Tom had lined up on a huge crater near the lunar plain called the Mare Imbrium.

“The crater walls will give us some protection!” he told Slim.

His voice was drowned out as the whistle grew to an earsplitting crescendo. The next instant an enormous glittering meteor went streaking past their right-hand field of view!

The Challenger rocked as it rebounded from the shift in position and the sudden stop. The crewmen gasped and clawed the bulkhead for support.

“Any closer and we’d have been space particles ourselves!” Slim wisecracked, although his face was pale. “You got us out of there just in time, skipper!”

Tom smiled faintly. He was as shaken as the others, but his mind was already back on the problem of

perfecting his Private Ear radio.

“I guess this proves one thing,” the inventor told Slim. “The set will sure have to do a better job of filtering out interference. You heard the noise that meteor kicked up before it even crossed our radio beam.”

By now they were up and hovering over the moon crater. “Too bad we don’t have time for a landing,” Tom said as he headed the Challenger earthward again.

As soon as they had landed at Fearing Island, Tom removed the Private Ear radio from the ship and collected the other set from Billing at base communications. He spent the night on the island. Early the next morning he boarded his Whirling Duck for the flight back to Shopton, and a quiet Sunday.

Tom arrived at the plant on Monday morning and went straight to his father’s laboratory. He would use it until his own was cleaned up. Mr. Swift was not there.

Tom was eager to tackle work on the radio circuits. Several ideas had occurred to him for sharpening the fine tuning and eliminating interference. “Maybe I can improve the antenna design, too,” he said to himself.

The radio chassis soon stood stripped on the laboratory workbench while Tom frowningly studied the wave patterns flashing on an oscilloscope. He worked on steadily through the afternoon. By quitting time he felt he had corrected the trouble.

That evening Tom ate a hearty roast beef dinner. Then he played a few fast sets of Ping-pong with Sandy in the recreation room, finished a mystery novel he had been reading, and went to bed early.

“Dad was right,” Tom thought as he changed into pajamas. “That moon jaunt really snapped me out of the doldrums-even if we did have a close call with a meteor!”

The next morning after a quick shower Tom felt ready to tackle anything, including the job of rebuilding his megascope space prober.

“Hope it doesn’t take me too long to put the lab back in shape,” he remarked to his father at the breakfast table.

“I’ll stop by there with you,” Mr. Swift said. “Perhaps I can give you a hand.”

Tom and his father drove to the plant together, and parked outside the gleaming glass-walled laboratory building. In the corridor Tom beamed his electronic key at the new door lock. It buzzed in response and Tom opened the door. But the two had barely stepped inside when Tom stopped in amazement.

The laboratory was in perfect order!

“D-dad! What happened?” Tom stammered. “I mean, there’s no trace of the explosion!” He looked around questioningly at his father.

Mr. Swift wore a smile. “Forgive me, son. I couldn’t resist coming along to enjoy your reaction. Hank, Arv, Chow, and I decided to do a quick cleanup while you were gone. Of course we had plenty of help on some of the repairs.”

Most amazing of all, the megascope space prober stood by Tom's workbench-new and gleaming, without even a cracked dial to show the extent of the recent damage.

"Dad, this is wonderful! I can hardly believe it!" Tom gasped as he hurried over to inspect the new model of his invention.

"I hope the anti-inverse-square-wave generator and all the rest of it are just like yours," Mr. Swift said. "We followed your notes and drawings."

Tom checked over the parts hastily. The workmanship was flawless. Even the new wave-terminal circuitry was complete to the last transistor. Tom had had time only to sketch the larger housing for the equipment, but this too had been provided.

"Dad, it's tremendous!" Tom exclaimed. "I don't know what to say except thanks."

"Then don't try, son." Mr. Swift chuckled and patted the youth's shoulder. "Let's just say we all enjoyed helping the march of science."

Nevertheless, as soon as his father had left the laboratory, Tom's first move was to pick up the phone. He called Hank Sterling, Arv Hanson, and Chow and thanked each one warmly.

The restored laboratory gave Tom's spirits a tremendous lift. He felt as if days of work had been telescoped into the twinkling of an eye. Instead of retracing lost ground, he was now free to plunge ahead on the job of perfecting his space telescope.

The next part needed for the prober would be a sort of radiation "lens." This would be in the form of a third signal projected in addition to the two signals which produced the wave terminal. This third signal would act as a scanner of the light waves in the area where the prober was aimed. Part of the signal would be reflected back from the wave terminal, to be descanned by a super receiver which would yield an image of the heavenly object on the prober viewing screen.

"I'm sure the idea will work," Tom said to himself, "if I can just transmit and receive the carrier signal properly."

The morning passed quickly as Tom worked feverishly at his bench. He took time out to have final blueprints of his new radio made and filed away. For lunch he munched a ham sandwich while struggling with a set of circuit analysis equations. Hour after hour went by.

The telephone rang. As Tom picked up the receiver, he glanced at the clock. It was almost seven-thirty!

"Tom, dear, don't you think you'd better come home and have dinner?" his mother asked.

"Oh, I'm sorry I didn't phone," Tom apologized. "Chow has some stew cooking for me and it smells pretty good. I'll sleep here at the lab apartment tonight."

"All right, son. Do get to bed before morning, though!"

Tom ate a lonely meal and went back to work. It was almost midnight when he finally went to undress in the small apartment adjoining his laboratory. He fell asleep immediately but was awakened by a faint noise.

“It’s coming from the lab,” he thought, and instantly was on the alert.

He arose silently, took the electronic key from his slacks, and beamed open a small peephole placed in the wall. Tom had had this built so that he could observe his dangerous experiments without entering the lab.

“For Pete’s sake!” Tom thought.

A masked man with a flashlight was removing drawings from a file drawer in the laboratory.

CHAPTER XIII

BEHIND THE MASK

“THE thief who has been rifling my lab!” Tom thought angrily. “Looks as though Bud was right about my helium-machine plans being pirated.”

It was hard for Tom to distinguish much about the phantom intruder through the peephole. The reflected glow of the man’s flashlight only partly revealed his figure. But he appeared to be tall and slender. His face was hidden by the mask and his hair was concealed by a dark hat pulled low over his forehead.

Tom’s first impulse was to rush in and overpower the man. But after pondering a moment, he decided on another course of action. “I’ll shoot motion pictures of the thief right in the act, with my infrared movie camera!” Tom grinned with satisfaction. “That’s one kind of evidence he’ll never be able to talk his way out of in court.”

But first Tom opened a secret panel in the wall and pressed a button which sounded an alarm in the security building. He then tiptoed to a cabinet and took out a special portable motion-picture camera. It was loaded with supersensitive infrared film which would photograph every movement of the intruder by the infrared heat waves given off by his body.

Meanwhile, Tom’s phantom visitor seemed in no hurry. He was slowly leafing through a sheaf of drawings as if searching for one particular design.

Tom placed the lens of the camera into the peephole and pressed the starter button. As the film whirred softly, Tom kept his ear close to the wall. Presently he heard the rustling of papers, followed by the sound of the file drawer closing.

“I’d better remove the camera and take a look myself,” Tom thought.

Peering into the laboratory, he could see the ghostly figure moving toward the workbench. He held several sheets in one hand.

The intruder laid out the sheets and his flashlight on the bench. Then he took a miniature camera with a flash attachment out of his coat pocket and began photographing the papers.

Quickly Tom recorded the action with his infrared movie camera. Hearing footsteps, Tom switched off the camera and peered through the hole. The man was replacing the papers in the file and evidently preparing to leave.

“Okay, mister. You’ve got what you wanted and so have I,” Tom thought grimly. “Now to nail you on the way out!”

Tom laid down his camera, tiptoed across the apartment, and quietly stepped into the corridor. The laboratory door opened and the masked figure emerged furtively.

As he paused to close the door behind him, Tom went into action. He took two quick steps down the hallway, cleared the short remaining distance in a leap, and grabbed the surprised intruder in a flying tackle. Both went down in a tangled, struggling heap.

Tom pulled at the man’s mask, but the intruder, half crazed with panic, fought like a wild man. Beating Tom off, he struggled to his feet.

Tom was up just as quickly. He swung an up-percut that connected with his opponent’s jaw. The man reeled and gasped in pain but punched back furiously. Again and again Tom’s blows went home. But the man remained on his feet, fighting with a last-ditch desperation.

“Good grief! Won’t he ever go down?” Tom wondered.

Suddenly from down the corridor came the sound of running footsteps. A switch clicked and lights blazed. Rushing forward were two young plant guards from Enterprises’ security office.

Leaping into the fray, one of them grabbed the intruder around the neck and hurled him to the floor. The other quickly pinioned his arms and handcuffed him.

“Whew! Thanks!” said Tom, who stood by, panting for breath.

“Sorry we took so long getting here,” one of the security men apologized. “We’ve been out on a call.”

“Just as well. It gave me time to take infrared movies of him stealing plans from my lab,” Tom said.

The two plant guards yanked their prisoner to his feet. Then Tom removed the man’s mask and gave a gasp of astonishment.

The phantom intruder was Open Door Jack!

Tom was stunned. It was upsetting enough to catch a company employee rifling his laboratory. But to learn that a mild-mannered, seemingly loyal friend like Tunbridge Jackson was a thief was a double shock.

“Well, what have you to say for yourself?” Tom spoke quietly. “I think you’d better do some explaining-and fast.”

The locksmith’s eyes tried to meet Tom’s level gaze, then turned away shiftily. He gulped and stared at the floor.

“You might as well tell us what this is all about.” Tom said sternly. “Things will go harder for you if you don’t.”

Open Door Jack forced himself to look up. “I have nothing to say,” he shrilled in a high pitched voice, “except that you’ll get what’s coming to you someday, Tom Swift, for your sly trickery!”

Jackson’s pale, watery gray eyes seemed to shine with a fanatical light. Veins were standing out on his scrawny neck.

“Must be off his rocker,” one of the security men muttered.

Tom was puzzled. What had Jackson meant by his weird remark about Tom’s “sly trickery”? In any case, it seemed hopeless to question the locksmith further in his present overwrought state.

“I guess you’d better turn him over to the police,” Tom said wearily. “But first I’ll take the film out of his camera.”

Tom took the miniature camera from Jackson’s pocket, removed the film, then turned the camera over to the guards. As soon as they had taken the prisoner away, Tom developed the film in his laboratory darkroom.

The shots Jackson had taken showed the complete plans and computations for Tom’s Private Ear radio!

“Another clue to the jigsaw puzzle,” Tom mused. “But where does it fit in?”

A sudden thought came to him. Suppose Bud’s hunch was right about the helium-machine design having been copied from Tom’s. Maybe his friend’s second idea was right, too, about the new Swedish radio gear in which Astro-Dynamics was interested. It sounded just like Tom’s Private Ear set, and now an attempt had been made to steal the complete plans.

The next morning Harlan Ames dropped into the Swifts’ private office, where Tom and his father had been discussing the previous night’s events.

“I’ve learned something rather interesting,” Ames reported. “So far, we’ve found no suspicious persons of French background here in Shop-ton. But I’ve been checking on Gaspard’s own background. His mother was an American named Tunbridge.”

“Tunbridge?” Tom repeated thoughtfully. “Why, that’s Jackson’s first name.”

“Right, skipper. It could mean they’re related. If so, that might be the reason for Jack slipping Gaspard the plans of your helium machine.”

Tom mulled this over. “And you think Jack is the one who’s been trying to harm me—maybe out of revenge because Gaspard’s Paris experiment failed?”

Ames nodded. “Could be.”

“Is Jack friendly with Tappan or Dunstan?”

“I don’t know yet, but I intend to find out,” Ames answered. “Incidentally, we found no fingerprints on that scrap of paper about the hydrogen. But we did find out that the tank was brought to the plant by a

phony delivery truck- we learned that from the company whose name the driver used, but there are no leads yet on who drove it.”

“And I’m still wondering how the helium-machine plans were relayed from Enterprises,” Tom brooded. “But I have an idea on that, Harlan. The camera business gave it to me. I’ll let you know when I figure it out.”

The telephone rang. Mr. Swift, who had been listening to the conversation with keen interest, picked up the receiver.

“Swift speaking.” Suddenly his deep-set blue eyes turned toward Tom. He broke off and cupped his hand over the instrument. “Son, this is a Mr. Furster-the man who’s going to demonstrate that new radio to Astro-Dynamics. He has heard we’re interested and would like to show it to us I”

CHAPTER XIV

LAB IN THE WILDS

AN OFFER to show the radio which Bud suspected had been pirated from Tom’s Private Ear set! “What a break!” Tom thought. Aloud he said, “When can we see Mr. Furster?”

“He wants us to meet him at his office in New York City late this morning,” Mr. Swift replied. “Says he’ll drive us out to his lab.”

“Swell! I vote we accept the invitation!”

Mr. Swift nodded and uncupped the phone. “Yes, we can make it, Mr. Furster.” He jotted the address on a memo pad.

“What luck!” Tom exclaimed. “Now we’ll find out for sure whether Furster and his outfit had anything to do with these lab thefts.”

Ames grinned, then added cautiously, “If it looks as though their radio was copied from yours, skipper, say nothing. Let security and our legal staff take over from there.”

Mr. Swift agreed. “But, in the meantime, Furster is going to have an interested audience for his sales demonstration-eh, son?”

Tom chuckled. “Extremely interested!”

He and his father took off in a Whirling Duck. They landed a short time later at the Hudson River heliport and took a taxi.

“One thing puzzles me, Dad,” Tom mused as they rode in the cab. “If Furster’s company has already copied my Private Ear radio, why that attempt to steal the plans last night?”

“Perhaps,” Mr. Swift said, “they wanted the final blueprints to check. Or, it may mean that Open Door Jack has no connection with Furster. This trip may give us a few answers.”

Furster’s office was in a midtown skyscraper. It looked small and bare and there was no receptionist. Jules Furster himself emerged from an inner room adjoining the office to greet the visitors. He was a blond, wiry, sharp-eyed man of medium height with a beaklike nose.

“Well, well! A pleasure indeed to greet two such distinguished scientists 1” Furster spoke in a quick, barking voice.

There was something almost foxlike about him, Tom thought, as he sized up the sales representative.

“We appreciate this chance to see your company’s new radio equipment,” Mr. Swift said. “It sounds most interesting.”

“The word is ‘revolutionary/ my friends! The armed forces and the aerospace industry will swamp us with orders when they find out what we’ve got. We’re not in full production yet.”

Furster paused and darted a sly grin at Tom. “I-er-hear you’ve been working on a similar type of radio, young man.”

“Enterprises is always working on new scientific developments,” Tom said noncommittally, though curious as to the source of the man’s information.

“Cautious type, eh?” Furster laughed loudly.

“When may we see your radio?” Tom asked pointedly, with a glance at his wrist watch.

“We’ll grab a bite next door, then pick up my car and leave,” Furster promised.

Half an hour later they were on their way out of Manhattan and heading for the Lincoln Tunnel to New Jersey. Furster kept up a joking but inquisitive chatter. The Swifts, though polite, parried his questions about Tom’s latest inventions.

Leaving the industrial and concentrated residential areas behind, they came to the open countryside. The terrain became wilder, with wooded hills bordering the road.

“Your lab must be in a rather out-of-the-way place,” Mr. Swift remarked.

“We like privacy for our test work,” Furster explained. “Better radio reception, too.”

Presently he turned down a rutted dirt lane. After a few minutes of bumpy travel, he pulled up outside a startling structure. It looked to the Swifts like a giant silver igloo!

“Here we are,” Furster said as he switched off the ignition and climbed from the car.

The odd-shaped laboratory was built of narrow sheets of aluminum woven together in crisscross fashion. Though very light in weight, it probably was ultrastrong and rigid, Tom realized. Nearby stood a small windowed shed.

“Quite a surprise to see such a place out here in the woods,” Tom said admiringly.

Furster smirked. “You’ll be even more surprised when we go inside.”

Something about his tone made Tom glance at the man sharply. Furster returned a bland smile and ushered them into the building.

The Swifts’ eyes widened at sight of the completely outfitted laboratory. Banks of electronic gear, racks and coils of chemical equipment, a miniature electric furnace for smelting alloys, high-precision optical devices—everything of the newest and best design.

Two men were lounging at a workbench. One was heavily built, about fifty, with a bulldog jaw. The other was a hard-faced younger man with slick black hair.

“My research assistants,” Furster introduced them. “Bruggin and Howard.”

As Tom and his father shook hands with them, they heard a snickering laugh, and whirled to face their host. Furster was holding a gun!

“We can skip the comedy now that I have you two covered,” he told the inventors.

“What’s the meaning of this?” Mr. Swift asked icily. “You said you were bringing us here to show us your company’s new radio.”

“We’ll have it soon, I trust,” Furster said. “That is, if you two want to stay healthy.”

“Just what does that mean?” Tom demanded.

“I mean we want your new radio, bright boy, and we’re keeping you and your father prisoners here until we get it.” Furster’s tone of voice held a deadly menace. “I’ve already sold the idea of a demonstration to Astro-Dynamics. And I intend to do that, then fill orders, using your design. My plan for obtaining your final blueprints—er—didn’t pan out.”

Tom looked around at Bruggin and Howard. Both had pulled out guns and were grinning. Tom could hardly control his fury. He and his father had been neatly decoyed into Furster’s trap!

Mr. Swift was tight-lipped. “You’ll never get away with this, Furster. Our security chief knows we were going to meet you.”

Furster sneered. “I’ll deny ever phoning you. If the police trace that call this morning, they’ll find it came from a drugstore booth.”

“I see.” Mr. Swift considered coolly. “And how do you expect to get your hands on Tom’s radio as long as we’re here?”

“Simple. You’ll write a note to your secretary, telling her to have the radio plus all drawings and data on the set turned over to the messenger. You can say he’s to bring the stuff to my laboratory so you and your son can make a comparison of the two designs.”

“You’re crazy if you think that plan will work!” Tom snapped. “Our security department double checks and okays any plans of new inventions that are taken out of the plant.”

“They’d better okay this,” Furster warned.

Tom noticed that Furster’s henchmen exchanged worried glances. He pretended to be frightened. “Security wouldn’t release my plans,” Tom stated. “So, why not let me build a duplicate of the radio right here?”

“Sounds like a smart idea, boss,” Bruggin said in relief. “Let’s play it safe.”

Furster eyed Tom suspiciously. “Very well. How long will it take?”

“Not too long. With luck, a couple of days.”

“Okay, that’s a deal,” Furster agreed.

Tom gestured toward the guards. “But you’ll have to keep these two men out of my hair if I’m going to get the work done.”

“O.K.,” Furster said. “But remember, don’t try any funny stuff. Oh, and this dome is grounded, so don’t expect to send out radio messages for help.”

He and his henchmen then exited cautiously and locked the door behind them.

Mr. Swift flashed Tom a worried frown. “Are you sure it was wise to make that deal, son?”

“Ten to one they plan to kill us no matter what we do, Dad,” Tom replied in a low voice.

He beckoned his father closer to the door. Each put an ear against the wall. Furster and his men were conversing in whispers outside, but the sheet aluminum made a perfect sounding board to transmit their voices.

“What happens when the kid finishes the radio, boss?” Howard was asking.

“I’ll check it out,” Furster replied. “If it works okay, you two will see that the Swifts meet with a slightly fatal accident. Get me?”

“We get you, boss!” Bruggin rasped.

Tom drew his father away from the wall. “At least we know what we’re up against, Dad. In the meantime, I have a plan of escape,” he whispered. “You’ll notice they have some tanks of liquid helium here and a vacuum pump-also a supply of my Durastress plastic that we put on the market. With all the equipment in this lab, it should be easy to cook up a batch of Durabuoy.”

Durabuoy was an incredible foam material, much lighter than air, which Tom had developed by forming Durastress into a myriad of tiny cells.

“How much do you suppose this aluminum igloo weighs, Dad?” Tom asked abruptly.

“Mm. Under ten thousand pounds I’d say.”

“Check. Now look at the way it’s anchored,” Tom went on, pointing toward the base of the laboratory

wall. "Just bolted down on a concrete floor slab."

Mr. Swift listened with quiet interest as Tom explained his plan. His face broke into a smile.

"Terrific idea, son! Let's get started!"

The two Swifts set to work like beavers. They continued on through the night and into the next day, breaking only for catnaps and the meals handed to them at gunpoint.

While Tom carried out the chemical process for producing Durabuoy, Mr. Swift constructed an imposing-looking radio chassis. Much of the time he kept the speaker volume tuned loud, purposely making the signal crackle with static or fade so the guards would think the set was not yet perfected. Neither Bruggin nor Howard showed any scientific interest in the Swifts' work.

"I'll bet they're afraid we might jump them," Tom whispered with a chuckle.

"We're lucky they haven't grown inquisitive," Mr. Swift agreed. "By the way, I wonder how long Furster will stay away?"

"Long enough, I hope," Tom said grimly.

As Bruggin handed in their supper the second evening, he asked, "When are you two geniuses gonna be done with that radio?"

"By morning we'll be all set," Tom told him.

Mr. Swift and Tom ate hastily and returned to work. Several hours later two large Durabuoy spheres had taken shape. To these Tom attached handgrips, while Mr. Swift unscrewed the igloo's floor bolts, except for two on opposite sides of the structure to hold it down. Then they started up the Durabuoy producer at full speed, beginning to fill the top of the dome with little vacuum-filled spheres—each one very effective because of the great strength of Durastress.

Tense moments went by as father and son waited for enough Durastress to be pumped out into the lab's air space. Would Tom's daring plan succeed?

If not, the Swifts knew they were doomed.

CHAPTER XV

THE FLYING IGLOO

TOM'S eyes flicked back and forth from his wrist watch to the pressure dials on the machines. He had mentally calculated the amount of Durabuoy needed to lift the weight of the aluminum igloo.

"Should be about ready, Dad!" he whispered. "Let's unscrew those last two floor bolts."

Mr. Swift nodded, a smile of excitement playing about his lips.

“Dad’s actually enjoying this tight spot we’re in!” Tom thought with admiration.

He and his father picked up wrenches and moved to opposite sides of the laboratory. Tom had attached a Durabuoy sphere by a bracket to the wall above each of the two remaining floor bolts.

At that moment came a pounding on the door. “Hey! What’s up?” Howard demanded.

The noise of air being forced out of the dome had evidently alerted the guards!

The Swifts were dismayed. Were they about to be trapped within seconds of escaping?

“We-uh-we’re pumping the helium coolant into the receiver amplifier!” Tom called back.

As he spoke, the two Swifts were straining at the last few turns of their wrenches. The well-fastened floor bolts were almost out.

“Oh yeah? Maybe we’d better come in and see for ourselves!” Bruggin grumbled.

Tom and his father heard the sound of his key in the lock.

“We can’t be caught!” Tom thought in panic.

Just then the aluminum igloo gave an upward surge as the last floor bolt came loose. Tom and his father grabbed the handgrips of the Durabuoy spheres.

The next instant the igloo went soaring aloft like a free balloon! The two Swifts rose with it, clinging to the plastic-foam spheres as the entrapped Durabuoy pushed the structure up into the moonlit sky.

“We’re off!” Tom yelled joyfully.

Below lay the concrete floor slab and all the laboratory equipment. The two guards gaped up at them, openmouthed in sheer disbelief.

“So long!” Tom shouted down at the men. “Give our regards to your boss!”

“It’s magic!” Bruggin cried, a look of terror on his face.

Howard was the first to collect his wits. He whipped out an automatic and poured a volley of shots skyward. But by this time the flying igloo and its two strap-hanging passengers were well out of gun range.

“I’ll bet we shocked ‘em out of a year’s growth!” Tom called to his father. “Imagine Jules Furster’s face when they tell him this story!”

Mr. Swift’s answering chuckle drifted back on the wind. “Yes, he won’t believe it!”

The laboratory site lay far below now, and the figures of the two guards had dwindled to mere specks. A stiff breeze was carrying the igloo toward a nearby range of hills.

“Are your arm muscles holding up, son?” Mr. Swift called.

“Feeling a bit stiff and strained, but I can hang on,” Tom replied. “How about you, Dad?”

“Perfectly okay. I suggest we hang on until we’re floating over this ridge we’re coming to, then drop off. It’ll give us less of a jolt.”

Tom gazed at the countryside below as a southeast wind bore them along through the darkness. There were no towns or crossroad villages in sight, and the nearest highway he could make out seemed to lie miles away.

After several minutes they neared the wooded ridge to which Mr. Swift had referred.

“All set, Tom?” the elder scientist called.

“Right, Dad!”

The Durabuoy spheres had been fastened to the igloo wall brackets by wing nuts. Tom unscrewed his and Mr. Swift did the same—each hanging on by one hand while he did the disconnecting.

“Geronimo!” Tom cried as the sphere separated from the lab wall.

Tom had made the plastic-foam spheres just large enough to provide a little less buoyancy than he and his father needed for staying in the air. Now they began sinking gently toward the hilltop while the igloo floated onward, sustained by the Durabuoy trapped under its dome.

Within moments the fliers were nearing the ground. Mr. Swift landed with a gentle bump. Tom’s sphere caught in a pine tree, but he grabbed a branch, and swung himself downward, suffering only a few scratches.

“Are you all right, Tom?” Mr. Swift asked as he hurried to join the younger inventor.

“Right as rain, Dad. Now the problem is to find our way out of these woods. If we can only reach a house or roadside service station, we can phone the local police to pick up Bruggin and Howard before they run off.”

Tom Sr. nodded. “Let’s hope we can make it in time. I’m afraid we’re in for a long hike.”

Fortunately, Tom carried a small pocket flashlight. Using its slender yellow beam to guide them, they picked their way down through the tangled underbrush of the ridge.

“Let’s head away from our line of flight,” Tom said. “Furster’s men may be tracking the lab shell on radar.”

Mr. Swift agreed. They began trudging northeastward, since the highway Tom had noticed from the air lay in that direction.

The night passed slowly as they pushed on through woods and brush. Dawn paled the sky. The sun was just coming up as Tom and his father sighted a farmhouse. A light inside indicated that the occupants were already awake.

Weary and disheveled, the Swifts tramped up to the back door and knocked. A grizzled farmer in shirt sleeves opened the door.

“What d’ ye want?” he demanded suspiciously.

“We’re lost,” Mr. Swift said. “Would you be kind enough to help us?”

“Lost? Ye mean yer car broke down?”

“Not exactly,” Tom said. “We had a brush with some criminals. They were holding us captive but we got away. We’ve been walking all night.”

He refrained from telling the whole story for fear the farmer would think they were escaped mental patients.

“Mebbe ye’re tellin’ the truth and mebbe ye ain’t,” the farmer said. “But I ain’t takin’ no chances by lettin’ ye inside.”

“Then would you at least call the State Police?” Mr. Swift pleaded.

“Yep. Reckon I can. Jest stay right there.”

The door slammed in their faces. The Swifts looked at each other and nearly burst out laughing. They sat down on the porch steps.

Within twenty minutes a police car with two state troopers in it arrived at the farmhouse. They introduced themselves as Callan and Jensen. The latter recognized the Swifts as soon as Tom and his father identified themselves. He had frequently seen pictures of the two famous inventors in the newspapers.

“How on earth did you get into a fix like this?” he asked.

Mr. Swift gave a quick account of their capture and imprisonment at Furster’s laboratory. When Tom described the escape of the two scientists in the flying igloo, the troopers gave a whistle of surprise and looked at each other.

“So that’s what started all the excitement!” Callan exclaimed. “Our post had a flock of calls last night from people who sighted some unidentified flying object in the moonlight.”

“We’ll report this right away,” Jensen said.

He jotted down the information which Tom and his father provided about the location of the laboratory site, and also Furster’s office address in New York.

“Our dispatcher will contact the New York police,” he promised, “and we’ll rush a squad car out to that lab-or what’s left of it. Also, we’ll notify the Air Force about that flying igloo, so that they can destroy it.”

He hurried off to make the call over his car radio. Meanwhile, the farmer and his wife had been standing in the doorway, listening wide-eyed to the whole conversation. Both were red-faced as they realized they had almost turned away two famous inventors.

“Hope yell excuse my poor manners,” the farmer said. “Come on inside, and Sarah will cook ye up the finest breakfast ye ever et.”

The Swifts gladly accepted the invitation. After washing and phoning to Mrs. Swift, they sat down to an enormous farm-style breakfast.

The state troopers had offered to drive the Swifts to the nearest town, but the farmer brushed this aside. “I’ll drive ‘em plumb into New York to pick up their helicopter,” he insisted.

The trip in his very old car proved to be a long and bumpy one. But after stopping en route to buy clean shirts, Tom and his father finally arrived at the heliport. A message was waiting for them there. It read: Phone Shopton at once!

CHAPTER XVI

REPORT FROM SWEDEN

“SHALL I phone the plant, Dad?” Tom glanced at his father as the heliport clerk who had brought the message walked away.

Mr. Swift nodded. “Right, son. I’ll taxi the Duck out for take-off.”

Tom hurried to the heliport waiting room. He found a telephone booth, dropped in several coins, and dialed Enterprises. He asked for Harlan Ames. The security chief had already received a full police report of the Swifts’ kidnaping and escape.

“There was no one at Furster’s lab, skipper, when the state troopers arrived,” Ames reported. “The two guards must have pulled out last night and warned Furster. At least he hasn’t shown up at his New York office this morning.”

“Have the police got it staked out?” Tom asked.

“Yes, every entrance to the office building will be kept under surveillance. But the main reason I called, Tom, is to warn you and your dad to be careful on the way back here. Furster may be out for revenge.”

“Good point, Harlan,” Tom said. “We’ll check the ship for signs of sabotage before we take off. Meantime, how about contacting the Selland outfit in Sweden for a line on Furster? That’s the company which he claimed to represent.”

“I’ll do it right away,” Ames promised. “And remember now-watch yourselves!”

“Wilco!” Tom said and hung up.

The young inventor hurried back to rejoin his father. Mr. Swift had already decided on the need for

extra caution and Tom found him still in the hangar, going over the helijet carefully.

“Those men wouldn’t stop at anything to gain their ends,” he said seriously.

The Swifts completed their checkout in half an hour, then took off on the flight back to Enterprises.

As soon as they landed at the plant, Tom said, “Dad, I’ll go see if Harlan has any news yet.”

“All right. Let me know if anything develops.”

Tom hopped into a jeep and sped to the security building. Ames was just putting down the telephone as Tom walked into his office.

“I finally got a transatlantic call through to Sweden,” Ames reported. “Fortunately, the manager of the Seland Company speaks English.”

“What about Furster?” Tom asked eagerly.

“You were right-the company never heard of him. In fact, they have no agent in New York for radios or anything.”

“Another blank wall,” Tom remarked in disgust. “Furster’s whole story was a lie!”

He lunched with his father in their office. Mr. Swift inquired if Open Door Jack or the other police prisoners had done any talking yet.

“I was just wondering that myself, Dad,” Tom said, as he finished eating a chicken sandwich. “I’ll call police headquarters and find out.”

Chief Slater informed Tom that Jackson seemed to be in a state of depression and still refused to answer questions. Tappan and Dunstan were also keeping a stubborn silence.

“Thanks, Chief,” Tom said gloomily. “Call us, please, if any one of them shows signs of opening up.”

“Sure thing,” Slater promised.

Tom accomplished little in his laboratory that afternoon. He was not only worn out from strain and lack of sleep due to the previous night’s adventure-he was also disturbed because Furster and his two thugs had eluded capture.

“If the police don’t find them, they’re sure to strike again,” Tom thought. “And what’s the connection between Furster and Open Door Jack, if any? That’s as much of a mystery as ever.”

Even before quitting time at the plant, Tom locked up his lab and drove home. Mrs. Swift gave him a fond hug.

“Oh, Tom, I’m so glad you’re back safe again,” she murmured. “Not that I was really worried, but still-“

“I know,” Tom said affectionately, realizing the effort it cost his mother not to show her fears whenever her husband and son were exposed to danger. “It was pretty rough on you and Sandy. But Dad and I always manage to bounce out of a tight spot, somehow.”

He told her briefly how they had been kidnaped by Furster and kept imprisoned at his igloo laboratory. But he made no mention of Furster's whispered orders to the guards to kill the Swifts later. No sense worrying her and Sandy needlessly, Tom told himself.

To celebrate her husband and son's safe return, Mrs. Swift had prepared some of their favorite dishes, including steak pie and a delicious chocolate cake.

"What a terrific meal!" Tom smiled at his mother. "I'll bet I ate too much to sleep tonight!"

Mr. Swift chuckled and laid down his napkin. "No danger, son, if you're as tired as I am."

Tom was. By nine-thirty that evening he was in bed, deep in slumber. By the next morning he was greatly refreshed.

In his laboratory Tom eagerly plunged back to work on the final stage of his megascope space prober. He was engaged in a delicate transistor assembly job when Chow Winkler came in at noon, wheeling a lunch cart.

"Chow down, buckaroo!" he announced cheerfully. "Pitch in while the vittles are hot!"

Tom grinned, "Okay, since you're twisting my arm, old-timer."

While Tom ate, Chow plied him with questions about his latest invention.

"You say you're goin' to get sky pictures with that thingamajig when it's all done?" Chow asked.

Tom nodded. "This is the last part of my space prober. It'll be sort of a radiation lens."

"Like on a camera?" Chow scowled and scratched his bald head in perplexity. "Brand my cactus salad, I thought lenses was made out o' glass!"

"That's right. I was just using a figure of speech," Tom explained. "What I meant was, this will serve the same purpose as the lens of a camera or the objective lens of a telescope. Here, I'll show you."

Using chalk and a blackboard, Tom sketched a simple diagram of a camera to show Chow how the lens bent the light to form an image on the film. Then he diagramed the way in which his prober would beam three radio waves out into space. Two of these would cancel out at the wave terminal point-whatever distance the viewer wished to see.

"In other words, they give us our point of view," Tom said. "And the third wave signal acts as our lens. It picks up an 'image,' you might say, from the light rays reflected by the object we want to look at-and transmits the image back to our receiver, so we can see it on a screen."

Chow circled cautiously around the workbench, squinting at the electronic apparatus from all angles.

"Where is this here 'third wave signal' you're talkin' about, boss?"

Tom smiled. "You won't be able to see any of the three waves that the prober beams out into space, Chow," he explained. "They're invisible, just like all radio signals."

“Well, I’ll be jing-whistled!” Chow eyed the young inventor in amazement. “An invisible camera lens that makes pictures you can see! Tom, that’s remarkable!”

“I’ll be satisfied if it’s just plain workable,” Tom said, laughing.

Doggedly he kept at the job day and night. Early Tuesday morning he had the final circuitry completed. The whole prober apparatus-his high-gain amplifier with the helium-extraction device, the anti-inverse-square-wave generator, the wave-terminal equipment, and the radiation “lens”-was enclosed in a neat console, ten feet high, ten feet wide, and two feet deep. The front of it was studded with dials, control knobs, and the receiver viewing screen.

Tom had the device moved into the observatory atop Enterprises’ main building. Here the huge wirework antenna had already been mounted on a swiveling pedestal.

“So far, so good,” the inventor murmured after completing the hookup. “Let’s see how she works.”

He aimed the antenna and adjusted the controls for a view of the grounds below. A clear picture of the experimental station appeared on the screen.

Next, Tom scanned the highway outside the plant. A quarter of a mile from the main gate was an Enterprises’ truck containing several helium-extracting machines which he had ordered shipped to the Swift Construction Company. Suddenly a black sedan sped up behind the truck and tried to force it to the roadside.

“Hijackers!” Tom gasped. “Spies!”

CHAPTER XVII

HELPLESS HIJACKERS

FOR an instant Tom stared unbelievably at the screen of the prober as the speeding sedan forced the truck off the road.

“Those thieves are after my helium machines!” he said to himself. “Furster’s henchmen, I’ll bet!”

Desperately, Tom tried to think of a way to prevent the valuable devices from falling into the hands of his enemies. He dashed to the wall and pressed an alarm button while his eyes raked the observatory room.

“I must do something and fast!” Tom thought.

Suddenly he noticed that one of his small repelatron was lying in a corner.

“What a break!” Tom muttered. “Maybe there’s a chance I can stop those hijackers!”

He grabbed the repelatron and dashed out onto the balcony which ringed the observatory dome. It was

high enough for a clear view of the highway. The truck and the hijackers' car were in plain sight. By now the truck driver had braked to a stop on the shoulder of the road to avoid a crash. Tom saw two figures leap from the sedan. They seemed to be holding guns, though it was difficult for Tom to make out details at such a distance.

Would the repelatron's force rays have enough power at such range?

"It's only a small portable model," Tom reflected.

He pressed the frame against the dome, aimed the repelatron, and put his thumb on the trigger. An instant later he whooped with satisfaction.

"I've nailed 'em!" Tom exclaimed triumphantly.

The figures of the two hijackers seemed to have frozen almost immobile in their tracks! Tom could sense their frantic efforts as they writhed and twisted helplessly-struggling against the invisible force which kept them pinned down.

"Only one problem," Tom thought, sobering quickly. "The truck driver is as helpless as the two crooks! He can't capture them!"

"Boss! Boss! Where in tarnation are you?"

"Chow!" Tom cried gratefully as he heard the clatter of the Westerner's cowboy boots racing up the stairs.

"Here, Chow! On the balcony!" Tom yelled.

The Texan came dashing out in response, then stopped short in amazement.

"B-b-brand my buffalo stew, what's wrong?" he stuttered.

"Hijackers!" Tom snapped, pointing toward the highway. "Here! Take this repelatron and keep it aimed at them while I phone Security!"

Chow took in the situation quickly as Tom handed him the repulsion-ray device. Then the young inventor ran back into the observatory, snatched up the receiver of the wall phone, and called for assistance.

Phil Radnor, at the other end of the line, said Ames and two security guards were already speeding to the observatory in a jeep in response to Tom's alarm signal.

"I'll pass the word to 'em by walkie-talkie," Radnor said, "and then get going myself!"

"Good! I'll call the police too!" Tom said.

As soon as he hung up, Tom dialed police headquarters. The dispatcher promised to have a police car on the way within seconds.

Tom went back to the balcony and found Chow roaring with laughter at the helplessness of the hijackers.

“Brand my runnin’ iron,” the cook chortled, “we sure got them rustlers roped an’ hawgtied!

This here repelatron’s even better’n a six-gun fer dealin’ with such varmints!”

Soon he and Tom saw two jeeps from Enterprises racing to the scene. Before they reached the area where the rays were in effect, Tom turned off the repelatron.

Security men piled from the jeeps and quickly surrounded the thugs. Then a police car from Shopton came speeding to the spot. The hijackers were quickly disarmed, handcuffed, and taken away.

“What a close call!” Tom sighed in relief.

Chow’s portly frame was still shaking with mirth. “Sure wish I coulda seen their faces up close! I’ll bet them owlhoots was the most surprised hombres east or west o’ the Texas Panhandle!”

“It’s the last rustling they’ll do for a while,” Tom agreed. “You can carve another two notches on your skillet, pardner!”

Tom hurried to his sports car and drove to police headquarters. He found Chief Slater and Ames questioning the two prisoners. “Who are they?” Tom asked.

“We got their names from their licenses,” Ames said, “but neither seems to have a police record. And they claim they never heard of Furster.”

“Record or not, we’ve got them dead to rights on this job,” Chief Slater said. “Neatest trick I ever heard of, Tom, the way you captured them.”

The hijackers glared at the young inventor.

Tom returned their gaze coolly. “If they don’t care to talk now, let them take the full rap with Furster,” he suggested, hoping to trap them into an admission of guilt.

“You ain’t caught him yet, wise guy,” one of the prisoners snarled.

The other turned on his partner with a look of rage. “Shut up, you dope!”

Chief Slater chuckled. “Looks as if you scored again, Tom. Now at least we know who hired them.”

Neither of the prisoners would say another word. Slater ordered them booked and jailed.

Tom left and went back to work. When he arrived home that evening, Phyl Newton was in the living room with Sandy.

“Hi!” Tom greeted the girls. “Good to see you, Phyl.”

She smiled and blushed slightly as Tom squeezed her arm. “I’m glad you didn’t have to stay at the plant and work late,” she said, “or you would have missed a surprise.”

“What is it?” Tom asked.

“Sandy has a guest coming to dinner,” said Mrs. Swift, who had just come into the room with her

husband.

Sandra kept looking at her watch and casting occasional anxious glances out the front window. "I had a phone call warning us our guest might be late," she said.

Just then a car pulled into the drive. Presently the doorbell rang. "Must be one of Sandy's close chums," Tom thought, since the alarm buzzer had not sounded.

The Swifts' home was surrounded by an electromagnetic field which actuated the alarm system when a caller or prowler approached. To avoid setting off the system needlessly, all of the family and close friends wore wrist watches containing neutralizer coils.

Sandy hurried to answer the door and brought her guest into the living room. "Bud!" Tom exclaimed.

The astronaut spoke to Mr. and Mrs. Swift and Phyl, then exchanged a warm handshake with his chum.

Tom grinned in pleasure. "Don't tell me you've jumped the reservation again?" he needed.

Bud chuckled. "Just a short breather before I go into solitary."

"Then the flight's all scheduled?"

"It's tentatively set for the day after tomorrow," Bud said. "They're hurrying things up to take advantage of Venus coming into inferior conjunction with the earth."

"Venus inferior?" Sandy giggled. "I thought she outrated all your other girl friends."

"Except for a certain blonde," Bud quipped. "I only meant that Venus will soon pass between the earth and the sun. In other words, she'll be at her closest point to earth and save us a few hundred thousand miles of space travel."

Sandy winked at Phyl. "Do you suppose Bud and Tom would ever travel that far to see us?"

"We'd probably have to bait the invitation with some of your mother's marvelous cooking," Phyl teased.

Her remark brought a chuckle from Mr. Swift. "You may have something there, Phyl," he said. "Mary Nestor always did know the way to a man's heart!"

Mrs. Swift, whose maiden name had been Nestor, blushed prettily as she said, "Shall we go to the table?"

The tasty roast beef dinner was enjoyed by all, amid a lively exchange of banter among Tom, Bud, and the two girls. Later, Tom drew Bud aside and suggested that he take one of the Private Ear radios back with him to use during the Venus probe.

"Thanks, skipper. That's a swell idea," Bud said gratefully. "In my opinion, Astro-Dynamics' equipment is inferior to Enterprises' all down the line."

Bud seemed happier than on his previous trips back to Shopton. He told Tom he had made many good friends among the engineers and technicians on the Venus project.

“In fact, they’re all regular guys,” Bud said, but scowled as he added, “except Chippy Holbrook. No kidding-how I’m going to stand that guy all the way to Venus and back is beyond me!”

Tom tried to reassure his chum and Bud’s good humor returned. The next few hours were spent by the young people dancing and talking, and after a late snack, Bud declared he was ready to “take on Chippy Holbrook.”

Bud and Phyl stayed overnight at the Swift home. The next morning after breakfast, the young space pilot prepared to leave for Florida.

“Thanks for the bon voyage party,” Bud told Sandy. “It was swell.”

Sandy’s voice trembled a bit as she said, “Come back soon-and safely!”

Tom drove him to Enterprises to pick up the radio. Later, on the airfield, as they shook hands in farewell, Tom said:

“Keep in touch with me on the channel marked SE. And remember, fly-boy-if you need any help, I’ll come a-runnin’!”

“Thanks, pal.” Bud’s face became thoughtful. “You know, it might be a good idea if we use a few code words,” he went on, “so Holbrook won’t know everything we’re saying. It’s a cinch his ears will be flapping whenever we talk.”

Tom grinned. “Maybe you’re right at that. What do you suggest, Bud?”

After talking it over, the boys decided that “The midnight up here is great for sleeping” would mean that everything was going smoothly on the Venus flight. On the other hand, “This black void is hard to take” would indicate trouble between Bud and Chippy.

“Okay, I have it,” Tom said. “But let’s hope you don’t have to use that second sentence.”

“Ditto!” Bud agreed fervently.

A short while later his jet was roaring down the runway, then streaking aloft. As Tom waved from the Enterprises airfield, Bud dipped his wing in a parting salute.

The young inventor slowly walked back toward his office. Bud’s conversation before take-off had left Tom strangely uneasy.

Somehow, he had the feeling that his best friend was headed for trouble on the flight to Venus.

CHAPTER XVIII

BUD’S FRANTIC MESSAGE

WHEN Tom entered the office which he and his father shared, Mr. Swift was busy dictating some letters to Miss Trent, their efficient secretary. Rather than interrupt, Tom went topside to the observatory. He was eager to try out his megascope on some of the heavenly objects.

Switching on power to the equipment, Tom aimed the antenna for a view of the space outpost. The glittering sky wheel appeared on the screen in clear-cut detail, bristling with its communications antennas, latticework telescope, and reflecting mirrors.

“Like seeing it close up from one of our cargo rockets about to arrive there,” Tom thought.

He scanned some of the other man-made satellites hurtling through the sky on their ceaseless orbits. Then Tom turned his space prober to much farther range and studied the details of the moon’s surface. Next, he tried for a view of Venus.

“Not that I’m likely to see much.” Tom tuned the video for sharper contrast.

He knew that the earth’s sister planet was covered by an opaque atmosphere which kept its surface completely hidden. Nevertheless, as Venus settled into focus on the screen, Tom could discern its mysterious bright patches and darker areas, and studied them with keen interest.

“Wonder what kind of information Bud will bring back from his flight,” Tom mused.

Whatever was learned from the highly sensitive instruments crammed into the Astro-Meteor, he reflected, was sure to increase man’s scientific knowledge of Venus a thousandfold.

This thought gave Tom a fresh pang of frustration. If only Swift Enterprises had been given the Venus probe assignment! Instead of Chippy Hoi-brook, he himself would be Bud’s fellow astronaut on the daring space voyage.

“No use moping about it,” Tom said to himself. “There’ll be other space shots-to Venus, and Jupiter, too! Maybe even a Venus landing one of these days.”

Tom switched off the megascope, then descended from the observation dome and went to his private laboratory. From there, he called Hank Sterling.

“I’ve just been testing the megascope, Hank,” Tom reported. “It seems to have worked out pretty well.”

“Nice going, skipper,” Hank said. “I’m eager to do a bit of stargazing with that gadget myself. I suppose Swift Construction will have to schedule a production run on it when word gets around, eh?”

“Probably,” Tom agreed. “In the meantime, I’d like you and Arv to build a duplicate model- for the Challenger, It may come in handy.”

On a sudden afterthought, Tom requested that the job be done as soon as possible. “Dole out the subassemblies among the various Enterprises departments.”

“Sure, I’ll have it for you in twenty-four hours,” Hank promised. “Worried about Bud, aren’t you?”

“To tell you the truth, I am, Hank. I’d just like to be ready for anything that comes up. So long.”

“Good-by.”

Presently the telephone rang. Tom scooped up the instrument.

“Tom Swift Jr. speaking.”

“This is Chief Slater,” said the voice at the other end. “We may have a break in this case- Open Door Jack wants to talk to you.”

“Good! I’ll be right over, Chief,” said Tom.

“Another bit of news,” the police chief added. “Our friend Dunstan was definitely the ray-gun sniper who overturned your car.”

“You mean he has confessed?”

“Not yet. But our lab analyzed the lint from the inside of that hunting boot-and one piece of textile thread matches the fabric of Raymond Dunstan’s trousers.”

“Nice work,” Tom said jubilantly. “Maybe he’ll change his tune when he hears you’ve pinned the attack on him!”

As soon as Chief Slater rang off, Tom dashed excitedly from the lab building and leaped into his car. He headed directly for Shopton.

At headquarters, Tom followed a guard to the locksmith’s cell. Inside, Tunbridge Jackson was slouched on his cot, looking pale and hollow-eyed. The door was unlocked. Tom entered and sat down on a chair facing the prisoner.

“I was told you want to see me, Jack,” he said.

The locksmith looked up and nodded. “I’ve been a fool,” he said finally in a quavering voice. “But all I did wrong was borrow some of your blueprints to copy.”

“This is more than a case of theft,” Tom said coldly. “Attempts were made to kill me.”

“I had nothing to do with them!” Jackson insisted, his eyes widening in alarm. “Why, you know I’d never harm you-or anyone! In fact, I even saved your life once. I phoned Ames about that tank of hydrogen.”

Jackson said that at a gas station near the plant he had overheard two strangers in a truck discussing the plot to substitute hydrogen for some helium being shipped to Tom’s laboratory. Later, after they had driven off, he had picked up a note which had fallen from the truck cab. He had phoned a warning to Ames immediately and had also sneaked into the security chief’s office to leave the note on his desk.

“I’m willing to take my punishment,” he ended pleadingly. “But for heaven’s sake don’t charge me with attempted murder!”

Tom eyed the locksmith’s haggard face. “I’ll think over what you’ve told me,” he said non-committally. Suddenly Tom shot another question at the prisoner. “Why did you freeze the locks on my lab doors?”

Jackson gulped. “I-I was experimenting with an invention.”

“What kind of invention?”

“One to trap burglars who try to break in through a locked door. My invention automatically jams all the locks in a protective system, so they can’t be jimmed open. I wanted to try it out on your lab-door locks, since they’re especially tricky. Worked like a charm, tool” Jackson added with a flash of boastfulness.

Tom’s steel-blue eyes blazed accusingly at the locksmith. “But you used the same kind of ray machine that you gave your buddies who tried to kill me!” he snapped.

“No! I swear that’s not true I” Jackson said.

His tone was so vehemently fearful that Tom was convinced he was telling the truth. If so, the scorings on Tom’s car must have been accidental scratch marks caused when it overturned.

Tom decided to try a gentler approach. “Okay, Jack, you sound as if you’re leveling with me,” he said. “But why did you slip those plans for my helium machine to Jacques Gaspard?”

The question took the locksmith off guard. He gave a guilty start, and the color drained from his face. Evidently he had not known the Swifts were aware of that theft, Tom realized.

“J-Jacques Gaspard is my cousin,” Jackson stammered. “He had the idea for such a machine before you did, anyhow. Besides, yours will be used for military purposes. Cousin Jacques’ was intended solely for the good of humanity. Of course, it failed-and you know why.”

Tom thought grimly that this must have been the “sly trickery” Jackson had accused him of, “To whom did you give the plans?” he asked.

“I don’t know the name of the person who received them. That’s the truth. All I know is they were to be passed on to my cousin.”

Tom felt sure that Furster had been the middle man in the plot. “How did you transfer the plans without taking them from Enterprises?” he went on.

Jackson shifted his eyes from Tom’s icy gaze. His only answer was a stubborn shrug.

“Never mind. I’ve already guessed the answer,” Tom said. “You sent copies by scanned-radio pictures on my new type of transmitter and they were reproduced as exact photographs at the receiver. Also, the rough plans for my radio.”

Jackson’s jaw dropped open in stunned amazement. His reaction was all Tom needed to know that his guess was correct. Since Tom’s own machine had been used, rather than an unlicensed transmitter, the Federal Communications Commission had not reported the sending to the FBI.

“All right, Jack,” Tom said, getting up from his chair. “If you’ve told me the truth, I’ll try to see that things don’t go too hard with you. Meantime, if there’s anything more you want to get off your chest, you know how to reach me.”

The locksmith watched shamefacedly as Tom walked out of the cell. Before leaving headquarters, the inventor suggested to Chief Slater that they confront Dunstan with the evidence gleaned from the hunting

boot. Slater readily agreed. Dunstan seemed shaken by the news, but still refused to talk. Tappan, too, remained as tight-mouthed as ever.

“Better think it over,” Chief Slater warned them both before he and Tom left the cellblock. “If you birds think some tricky lawyer can get you out of this rap, you’ve got another think coming!”

As Tom was lunching with his father that noon, he received a long-distance call from Florida.

“It’s Bud,” said Miss Trent.

“Put him on!” Tom exclaimed eagerly.

“Wish me luck, pal,” Bud said. “They’ll be putting me into a space suit for the long countdown at midnight. If all the systems check out and the weather permits, we’ll be blasting off at seven tomorrow.”

“We’ll be watching you all the way on my megascope space prober,” Tom said.

“That gives me an extra dose of confidence,” Bud said with a chuckle.

The boys chatted for a while. Then Tom handed the telephone to Mr. Swift, who added his own best wishes for a safe and successful flight.

The next morning all the Swifts and Newtons gathered in the Enterprises observatory to witness the start of the daring space voyage. Tom had had a viewing screen from the Swifts’ private video network installed in the observatory so they could observe the blast-off more conveniently.

All were breathless as they gazed at the huge Astrodyne rocket poised on its launching pad. The watchers felt a twinge of apprehension at the thought of Bud and his crewmates strapped into the tiny space vehicle at the top.

“Oh, dear!” Sandy murmured tensely. Her knuckles whitened as she gripped Phyl’s hand.

“There she goes!” came the voice of Kane, the Swifts’ Key West telecaster.

Smoke and flame billowed from the Astrodyne. For a moment it seemed to hang motionless above the pad as it gathered momentum. Then it started arrowing up into the blue!

All eyes shifted to the megascope screen to watch the ascent. The antenna moved almost imperceptibly as a computer-guided gear train kept it aimed on the soaring rocket. Presently the Astrodyne booster fell away. Then the second stage dropped, leaving the Astro-Meteor spaceship hurtling upward on its own.

Moments passed. Suddenly Bud’s voice crackled over the Private Ear radio:

“Hi, Tom! This black void is hard to take!”

Tom experienced a shock of apprehension. He quickly explained the code to the others, then called back a reply over the microphone. Silence fell as everyone stared at the screen intently.

Suddenly they heard another voice reporting:

“Lieutenant Holbrook taking over! Captain Barclay has become ill, but there’s no need for us to return!”

The watchers were stunned. What had happened?

CHAPTER XIX

OUTER-SPACE RESCUE

“OH, TOM!” Sandy cried, coming over to stand beside her brother. “I know something must be terribly wrong! Bud’s had an accident!”

“Lieutenant Holbrook only said he’d been taken ill, dear,” Mrs. Newton ventured. “Perhaps it’s just the effects of weightlessness, now that the astronauts are on their way.”

Tom hated to add to everyone’s fears, especially Sandy’s, but he shook his head.

“Bud has been on too many space missions to suffer nausea or disorientation from that cause.”

Tom clenched his fists. He felt a desperate need to take action, now that his chum was in possible danger!

“Dad, I’m going after Bud in the Challenger!” Tom blurted out suddenly.

Mr. Swift laid a hand on his son’s arm. “Steady, boy. We’ll have to be patient until we know more of what’s going on.”

The elder scientist’s reasonable tone helped somewhat to calm the young inventor.

“You’re right, Dad,” he said, swallowing hard. “But I sure hope we get some word soon.”

Tom wanted to grab the microphone and pin Holbrook down regarding Bud’s condition. But he knew the copilot would be too busy, now that he had taken over full control of the ship, and this was no time to distract him.

All eyes were glued to the megascope screen. Outwardly, the Astro-Meteor seemed perfectly shipshape and spaceworthy as it sped farther and farther away from the earth. Then, gradually, as Tom noticed its flight attitude shift on the screen, he realized it was veering off course.

“Dad! The ship’s stopped its probe!” Tom gasped. “It’s going into orbit!”

Mr. Swift had already realized this. Before he could answer, Chippy Holbrook’s voice came over the radio, strident with alarm:

“Mayday! . . . Mayday! . . . Something’s gone wrong with the controls! I-I can’t bring us back on course!”

Tom seized the microphone. "Tom Swift to Meteor! . . . Let me speak to Bud Barclay!"

"N-no! That's impossible!" Holbrook stammered back. "He's too ill!"

"You heard me, Holbrook!" Tom snapped. "Let me speak to Bud!"

There was a long pause. Then Bud's voice came through, sounding weak and faint.

"Rescue us, Tom! . . . Please rescue us!"

The young inventor needed no more. "Roger! Wilco, Bud! Keep your chin up!" Tom switched off the mike and said tersely. "How about it, Dad?"

Mr. Swift could not refuse. "Go ahead, son. But first, check with Astro-Dynamics."

"Good idea." Tom flicked on the videophone and called their Key West telecaster. "Kane, please get John Clarke and Arnold Franklin. Tell them it's urgent that I speak to them at once!"

"Will do, skipper!" Kane's voice faded as he turned to snap an order to one of his crew.

People could be seen milling excitedly about the launching area. Evidently word had already flashed through the crowd that the Venus probe was in trouble. Presently Clarke and Franklin came hurrying up to the camera from one of the control blockhouses.

"Here they are, Tom!" Kane said, then held out his microphone to John Clarke.

The president of Astro-Dynamics looked haggard with strain. "I take it you already know what's happened, Tom?" he asked bluntly.

"I know they're in orbit and calling for assistance," Tom replied. "What are the details?"

"We scarcely know ourselves," Clarke admitted. "The ship's completely out of control. It won't respond to telemetered guidance and Hoi-brook seems unable to maneuver the capsule manually."

"Any objection to my taking over the rescue operation?" Tom asked.

The faces of Clarke and Franklin showed their relief clearly.

"None at all, Tom," the president said with an eager note of hope. "We'll be eternally grateful if you can get those men down safely!"

"Okay. Stand by and we'll keep you posted. I'm signing off for now," Tom added.

He darted to the observatory wall phone and began issuing a stream of orders. First he contacted Slim Davis on Fearing Island, telling him to round up a crew and prepare the Challenger for immediate take-off.

"Roger! She'll be ready when you get here!"

Then Tom called Hank Sterling to inquire about progress on the duplicate model of the megascope. When Hank reported it completely assembled, Tom asked him to have it trucked out to the airfield for

loading aboard a cargo jet. Next, he alerted Doc Simpson that his services might be needed and requested him to fly to the Florida missile base immediately. A final call to Hangar C brought a promise that a ship would be waiting on the runway for the hop to Fearing.

As Tom hung up and turned to the others, Mr. Swift patted him on the shoulder. "Good luck, son. I'll man the space prober and the radio here night and day until you and the boys out there are back to earth."

"Thanks, Dad." Tom tried to keep his voice steady as they shook hands. "I know I can depend on you to give us the coaching we'll need to get back safely."

Uncle Ned Newton, his wife, and Phyl added their wishes for success. Last came a hug from his mother and a parting kiss from Sandy.

"I'll be keeping my fingers crossed, Tom," she murmured in a trembling voice.

"Don't worry, Sis. It's in the bag." Tom squeezed her arm and grinned with a confidence he was far from feeling.

He leaped down the observatory stairs and sped by jeep to the airfield. As the duplicate megascope was being stowed aboard the cargo jet under Hank Sterling and Arv Hanson's supervision, Chow came speeding up on a jet scooter.

"Brand my coyote cutlets, you ain't takin' off without your space cook, are you, boss?" the stout Texan panted anxiously.

"Not a chance, Chow! Climb aboard!"

Minutes later, the jet was streaking toward the rocket base. A truck roared out on the island's airfield to meet it as the landing gear braked to a halt. The passengers piled in and sped to the launching area where the oddly shaped Challenger lay glistening in the sunlight.

Tom briefed Slim Davis quickly on the megascope space prober. "Hank and Arv and I will mount the antenna outside on the hangar platform," he explained. "You and your crew get a winch going and load the control console aboard. Put it in the flight compartment and hook it up to a power supply."

Slim nodded and hurried off to organize the operation. Precious minutes went by, with Tom striving to control his impatience as they drilled the holes for the antenna mount. Even Hank Sterling, usually the iciest-nerved man at Enterprises, seemed to be on edge with anxiety.

At last Tom was buckling himself into the pilot's seat. He waited for radio clearance from George Billing, then sent the Challenger zooming aloft. All could feel the G force building up as he pressed the ship to top speed. A steady stream of computer data from Astro-Dynamics' tracking crew guided them toward the helpless probe craft.

Finally the silvery form of the Astro-Meteor could be seen, gleaming through the blackness of the space void, dead ahead but somewhat above their own altitude. Tom increased speed slightly to climb closer to its orbit.

"Going to grapple 'em?" Slim asked Tom.

The pilot shook his head. "Too dangerous up here. The inductive effect could wreck our instrumentation." He switched on the Private Ear radio and spoke into the mike. "We're here, Bud. How goes it?"

"Not too good, skipper," Bud's voice replied weakly. "I feel ... as if ... as if I may pass out for good."

White-faced, Tom ordered Holbrook to switch off all power systems. But the copilot seemed to have panicked. His voice quivered on the verge of hysteria as he replied:

"Are you crazy? We can't do that! We have to keep our radiation-repulsion network charged or we may be killed!"

"Listen!" Tom ordered. "We can warn you if we hit a storm of particles. Do as I say!"

Meanwhile, Mr. Swift was working with a bank of computers at Enterprises to plot a safe re-entry procedure into the atmosphere. Tom waited tensely for the information while continuing his argument with Holbrook.

Suddenly Arv Hanson, who was manning the megascope, let out a cry of alarm.

"Tom! A missile is heading straight for us!"

CHAPTER XX

A DESPERATE MANEUVER

TOM whirled. A glance at the megascope screen showed him what had triggered Arv's cry—a nose-on view of a speeding missile!

The deadly object was approaching so fast Arv's twirling fingers at the control knobs could barely keep it in focus.

"Men! Brace yourselves for action!" Tom yelled over the intercom. His hands darted among the control switches and levers.

As the Challenger zoomed steeply out of orbit, however, the missile too could be seen shifting course. Again its fearsome collision aspect showed on the screen.

"It's homing on us!" Arv reported tensely.

Twice more Tom tried to side-step the approaching deadly onslaught by altering course and speed. But each time the missile responded by duplicating the ship's action and locking on as before.

Instant by instant it was drawing closer. If the missile was armed with a proximity fuse, Tom knew the range might narrow enough at any moment to explode its warhead. Beads of perspiration glistened on his

forehead.

“Them yellow-striped, bush-whackin’ polecats!” Chow mumbled, evidently referring to the ones who had launched the sneak attack. He and the others in the flight compartment—Arv, Hank, and Slim—stood watching the screen in hypnotized suspense.

Tom’s brain was working at top speed, groping for some escape tactic. “Get me a radar bearing on it, Hank!” he snapped. “Quick!”

Hank spun into action. “Bearing two-five-seven, elevation three-six!”

Tom was already wheeling the stand-by repelatron into position. As he fixed the aim, Tom gunned their repulsion beams to full power.

As if by magic, the image of the missile suddenly dwindled on the screen! Arv managed to refocus fast enough to catch the flash of light as the mysterious rocket plunged into the atmosphere and disintegrated.

“B-brand my knockin’ knees!” Chow gasped. “You saved us, boss! But how in the name o’ gopher holes did you do it?”

“I blasted it away from us with repelatron rays,” Tom explained tersely. He cut short the cheers of the others. “We still have a job to do, fellows. Remember?”

Before returning to the Astro-Meteor’s orbit, Tom radioed a report of the strange missile to Ames.

“We already know what happened, Tom,” the security chief told him. “We were following the whole thing on radar—and praying you’d come up with the right answer. We have computers backtracking the missile’s flight course and we’ll soon know where it was launched.”

“Good work, Harlan. It didn’t look American-made,” Tom replied. “The prober’s video tape recorded a picture of it. I’ll have Arv transmit it to you. Over and out!”

Presently the Challenger was drawing slowly abeam of the Astro-Meteor. Holbrook’s hysterical voice came in over the radio again:

“Do something! For heaven’s sake, do something! The ship’s completely out of control, I tell you! Don’t leave us stranded in—” The words ended in a gasp and confused sounds of a scuffle. Then a calmer voice came through:

“Meteor to Tom Swift! I’m Hawkins, the flight engineer! Give us your orders and we’ll try to carry them out!”

“Roger! All power off and stand by!”

The two ships raced along side by side in orbital flight. Presently Mr. Swift radioed that he had solved the re-entry problem.

“This is going to require some tricky, delicate navigating, son,” he said grimly. “The whole undertaking will be a desperate maneuver—but I don’t need to tell you that. If the Astro-Meteor should get away from you once you hit the atmosphere, both ship and crew are done for!”

Tom's voice remained cool. "I realize the danger, Dad. We'll do our best."

"Good! Now here's the procedure--"

As Mr. Swift dictated the necessary data, Tom fed the figures into the Challenger's flight computers. "All set, Dad," he said at last. "Wish us luck!"

Tom maneuvered the two ships until the Astro-Meteor was just above him in almost a pickaback position. He did this by using one set of repelatrions to hold back the rocket ship and the other set to slow his ship down by repelling the earth and slackening his speed for the gradual descent into lower orbits.

Continents and oceans became more clearly visible as the ships raced around the earth. Suddenly a red light flashed on the Challenger's control panel, signaling the moment for the final descent through the atmosphere.

Tom's eyes flew over the banks of instruments as he breathed a silent prayer. The slightest miscalculation now would be fatal. The Challenger could always pull out-but Bud and his crew-mates would burn to flaming cinders!

"Holding steady, Meteor?" Tom radioed.

"Like a rock," Hawkins called back.

Tom yanked back on the power lever. Both craft bit deep into the earth's air blanket. Down they plunged like twin shooting stars!

No one spoke as the tense moments ticked by. The calculations of surface temperature held up -never reaching a danger state. Mountains and rivers shot past below like a swiftly unfolding relief map. The coastline of Florida took shape. Then they were easing into the final descent at the missile base there.

"Marvelous job, son!" Mr. Swift's voice shook with emotion.

"Your calculations were perfect, Dad!" Tom replied.

Astro-Dynamics' rocket base swarmed into life as the young inventor landed. A gantry crane swung the Astro-Meteor to the ground. Newsmen and TV cameras greeted Tom and his crew. "AD's public relations officer will give you a rundown on what happened," Tom said tersely. "Right now we're too concerned about members of the Meteor's crew to say more."

His face whitened as he saw Bud Barclay being removed from the ship on a stretcher, unconscious. Holbrook was carried out next, wild-eyed and strapped down securely.

Doc Simpson took immediate charge and the patients were rushed by ambulance to the base infirmary. Here Hawkins, the Meteor's flight engineer, told Doc and Tom the full story.

"Chippy blew his top completely when the ship's steering system failed," Hawkins said. "He got so wild we finally had to restrain him by force-but I guess you heard that, Tom?"

The young inventor nodded.

“What you didn’t hear was the babbling he did later,” Hawkins went on. “From what he said, he must have slipped some slow-acting knockout drug into Bud’s food during our final meal before the countdown. He did it out of jealousy, I guess.”

“I gathered as much from Bud’s symptoms,” Doc said. “I’ve already administered an antidote and his pulse is slowly returning to normal. Don’t worry, Tom-your pal’s okay. But we may have to keep him here a day or so.”

Tom breathed a sigh of relief. “That’s the best news I’ve heard today, Doc!”

More good news was waiting when Tom arrived at Shopton the next morning. Ames reported that Furster and his henchmen had been arrested in New York. Tom and the security chief flew there to interview the ringleader in his jail cell.

His bravado gone, Furster was obviously a broken man. He confessed to being a scientist, and that he had hoped to become rich through inventions made at his secret lab, even though they might be secured by dishonest means, such as his lie about representing the Selland Company.

“You win, Swift,” he said dejectedly. “I’ve been on the run ever since you and your father got away from my lab. I had just completed it, too. That hijack attempt was my last hope of cashing in.”

“Tappan and Dunstan were working for you?” Ames asked.

Furster nodded listlessly. “You’re bound to find out sooner or later. I figured Tom Swift might be ‘dangerous, once he tumbled to that helium-machine theft, so I doped out a ray gadget to help us get rid of him. But Tappan and Dunstan bungled that angle. The men who delivered the hydrogen tank bungled too—they were supposed to wait until I got your final radio plans.”

Furster also said he received the plans Open Door Jack transmitted, and sold those for the helium extractor to a go-between for Gaspard. Jackson was guilty only of what he had confessed. Furster and an accomplice had tried to kidnap Tom at the Range View Inn through the warning ruse and the cars-for-hire cards. At that point, Furster had figured Tom would be more useful to him alive.

Before Tom and Ames left New York, the security chief received a phone call from Phil Radnor. After a long conversation he smiled.

“The last link, Tom,” Ames reported. “That missile was launched from a spot near the French Alps as our computers indicated. Gaspard fired it out of revenge. A real zany. Interpol has arrested him and he has made a full confession.”

Tom, despite his regret that a scientist would use such dishonest tactics, gave a wide grin. “I guess that wraps it up, Harlan. Let’s go home.”

The following evening Bud arrived from Florida. Tom and the two girls greeted him at the airport as he came off the plane. The husky young astronaut gave a yell of delight when he saw them.

“Hey! A welcoming committee!” He gave Tom a quick bear hug, wrung Phyl’s hand, and whirled Sandy around.

“Well! I can see you’re all right again!” She giggled breathlessly.

“After that prize flop of the Venus probe, I hardly expected to be greeted by such smiling faces,” Bud wisecracked.

“Don’t be silly, fly-boy!” Tom retorted. “We’re here to hail the returning hero!”

Grinning broadly, Bud accompanied them to Sandy’s car. When they reached the Swift home, Mrs. Swift had a gala dinner prepared.

“But I don’t know what’s keeping Tom Sr.,” she said.

At that moment, Mr. Swift arrived. His face was jubilant, and he said excitedly, “Just had a call from Washington. Astro-Dynamics has given up the Venus project and the space agency wants Enterprises to take over—with you, Tom, as pilot, and Bud as copilot on a brand-new flight!”

Tom’s eyes lighted up with the thought of a new adventure. How close he could come to reaching Venus would be a tremendous challenge. He was to find this out after a hair-raising adventure with The Asteroid Pirates.

Bud pounded his friend on the back and shouted excitedly, “Venus, here we come!”

THE END

TOM SWIFT AND HIS MEGASCOPE SPACE PROBER

BY VICTOR APPLETON II

No. 20 in the Tom Swift Jr. series.