

against the Yankee. The nuclear-powered Yankee leaves no oil fumes to be detected by the S-2's "sniffer," and it cruises too deep for changes in water temperature caused by its engines to be picked up by Bracken's infrared scanner. And if he were to use the familiar sonar that finds its quarry by sending out *pings* of sound and then listening for the echo rebounding off a hull, the Yankee would pick up the impulse and take off in a new direction before the sonar could locate him precisely.

The only way to find a Yankee is to listen for him passively. At cruising speeds his propellers create a roar as they thrash through the water. Some pumps and generators are bound to be running, and a crewman may be scraping paint or using a wrench on a piece of machinery. There is a chance that Bracken can pick up these noises, however faint they may be.

"**Maypole Twelve Is Hot!**" Bracken uses a device called the "sonobuoy," a slender cylinder about three feet long. Dropped into the sea, this buoy automatically raises an antenna above the water and lowers a hydrophone—an electronic ear—to a preset depth. It becomes a tiny but extremely sensitive radio station that can broadcast anything it hears beneath the surface to the aircraft circling above.

"Dropping Maypole One," announces Bracken. The sonobuoy sparkles in the sun as it falls toward the sea. Releasing more sonobuoys,

Bracken stakes out a trapline with the two other S-2s.

Three hours into the mission, Myron Mitchell, a technician in the stern of Bracken's plane, sees a jagged pattern of yellow lines on his scope. "Maypole Twelve is hot!" he calls. Instantly, Bracken banks toward the spot.

Using their ultra-sensitive equipment, Mitchell and a second technician, Jim Higgins, separate the hodgepodge of signals into components. They are looking for distinctive elements that make up a Yankee's "signature"—tracings they had spent hundreds of hours studying on the carrier. Now one faint set looks unmistakable. "We've got a Yankee!" Mitchell announces.

**Fish Hawk and Trout.** At an altitude of only 100 feet, the three S-2s begin moving back and forth across the sea in an elaborate minutet. One after another, more sonobuoys splash into the sea and come on the air, some with positive signals.

To establish the sub's course, Mitchell needs data from at least three sonobuoys. He tunes in a number in succession, then charts the path. For the next half-hour, the three planes track the submarine, "holding" it on their scopes. Then a relief flight of three S-2s comes on station, and Bracken's aircraft return to the *Intrepid*.

All during the next day, S-2s catapult off the *Intrepid* to follow the Yankee as silently and intently as a fish hawk gliding over a trout in a

stream. Then, at two o'clock the following morning, Bracken goes aloft again. His mission now is not merely to track the Yankee but to pin it down so precisely that, in theory, it could be successfully attacked. To do this, Bracken must use sonar, which will disclose his presence to the sub's commander.

Methodically, the S-2s begin dropping sonobuoys. The Yankee is still on course. The S-2s are joined by two Sea King helicopters. Hovering like dragonflies, they lower their listening gear into the water on cables.

Now: "We're going active!" announces Bracken, and releases a sonobuoy containing a miniature sonar set which sends sound waves searching through the water. Bracken can imagine the scene down below. *Ping!* The first sonar impulse hits the Yankee. Coming without warning, it must have exploded in the listening gear like a bugle call.

In the stern of Bracken's S-2, the two technicians study their instruments, waiting for the reaction. Suddenly the graphs and scopes come alive. "Damn!" cries Mitchell. "Look at him take off!"

Like a sounding whale, the Yankee plunges downward, its speed zooming to more than 30 knots. The S-2s place a line of sonobuoys ahead of the sub, and the helicopters hopscotch forward, pausing to dunk and listen as they go. The sky is alive with the flashing red lights of circling aircraft. The Yankee swerves,

cuts circles in the water, then twists away from the S-2s and the helicopters. For a while, they can hear it faintly, very far off. Then they catch and follow it again and, anticipating its moves, gradually establish its exact location.

"That's the way to do it, you guys!" Bracken says over the intercom as he finally breaks off the pursuit. "He knows we had him good."

In a real combat situation, all the S-2 pilots would have dropped M-46 torpedoes, each one guided by its own sonar. And each could be armed with a nuclear warhead.

**Polaris vs. Yankee.** The U.S. Navy frankly admits that it cannot keep track of all the Yankees in the Atlantic. "We just don't have enough planes and enough ships," explains Adm. Charles Duncan, who recently retired as the supreme American and NATO commander in the Atlantic. The problem is certain to get worse as the Yankee fleet builds up from an estimated 25 submarines in 1972 to the total of 62 agreed to last May at the end of the first Strategic Arms Limitations Talks (SALT I).

Although SALT I allows the Polaris fleet to grow from its present 41 submarines to only 44, the Americans more than make up for their lack of numbers with greater firepower and accuracy: each Polaris missile can carry up to ten separate warheads, and each can be aimed at a different target. (The Yankees' missiles now have only one warhead each.) As long as the Polaris is safe