

# The Age of the Cruise

by James Blackwell

## *What if the Bad Guys Got the Technology?*

*Editor's Note: At the time of the planning of this issue, President Clinton had just made the decision to launch a massive cruise missile attack on the Iraqi intelligence agency in Baghdad. In most scenarios, cruise missile technology is discussed in terms of the West's ability to strike enemy targets from up to 1,000 miles away. But what if the tables were turned? TIE asked expert James Blackwell for a real-world assessment.*

**T**HE CRUISE MISSILE HAS BECOME THE weapon of choice for post-Cold War military operations. Having proved their effectiveness in the Persian Gulf War, the U.S. launched Tomahawk missiles in January and again in June 1993 against Baghdad. A U.S. Tomahawk cruise missile launched from a site in Chicago could reportedly fly itself all the way to Washington, D.C. and make its way through the football field goal posts at RFK Stadium. Only the former Soviet Union could rival the capability of the United States for that kind of range and accuracy in a missile.

But soon others may have capabilities approaching that of the Tomahawk. In fact, already some 66 countries around the world are in possession of one kind of cruise missile or another, mostly of a short-range type and not even the best Soviet designs rival the capability of the most capable U.S. models. Still, these lesser varieties have created new regional military balances that threaten global security in ways that have only recently begun to attract the concern of the West.

Most of the designs currently proliferating have a range of less than 100 kilometers and have essentially only a tactical utility that renders their strategic value negligible. China, for example, has been prolific in making various versions of its Silkworm missile available to a variety of customers including Bangladesh, Egypt, North Korea, Pakistan, Iran, and Iraq. A longer-range (150 km) improved version was sold to Iran in 1991.

In spite of their short range, these tactical cruise missiles are proliferating, and their deployment in regional flashpoints could have far-reaching consequences. For example, Iranian stationing of improved Silkworms on Abu Musa Island could give Teheran the ability to threaten vital oil infrastructure facilities in Saudi Arabia as well as Kuwait and the Emirates. Soviet-made SS-N-3 Sepal cruise missiles are in the possession of Syria and can reach fully 450 kilometers. Libyan cruise missiles could reach the Italian mainland and North Korean missiles could target Japan.

Most of these short-range cruise missiles are basically pilotless airplanes that carry enough fuel on board to fly themselves out to the point at which some form of terminal guidance takes over and directs the craft to a target. In-flight guidance is provided by on-board inertial navigation systems using gyroscopes that can get the craft to within several hundred meters of the intended aim point. For most, the guidance to final impact is directed by some form of radar attuned to zero in on a large, dense metal object such as a ship or an oil tank. Some have other sensing mechanisms that get the missile to within detonation radius of the warhead loaded with conventional high explosives.

These are not modern concepts, by the way. They

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were first conceived by the Germans in World War II. Two kinds of missiles were developed at the Nazi Penemunde facility. The V-1 was a kind of a cruise missile in that it was an aerodynamic, rocket-powered drone that flew on wings across the English Channel. The other design, the V-2, was a larger missile that flew up, over and down in the characteristic parabolic path of a ballistic missile.

The sophisticated cruise missiles, such as the Tomahawk, are guided by complex computer systems that are programmed to follow digital map data loaded into on-board microchips. Special sensors in the missile "look" at terrain in way-points in flight to keep it on course and other devices allow it to guide itself to its target to within a few feet of a specified aim point.

While no third-world state could build such a craft on its own for the foreseeable future, it is possible that regional military powers could develop and deploy cruise missiles of about 1,000 kilometers range with accuracies of 50 meters. With the commercial availability of the U.S. Global Positioning System or the Soviet GLONASS network, the navigational requirements can easily be met.

The propulsion and airframe components for such a cruise missile capability have been available for some time commercially. A determined third-world state need only develop the capability to integrate those components in order to create for itself an intermediate-range ground-launched cruise missile of the type banned by the U.S. and the USSR in the INF Treaty of 1987.

Such a missile in the hands of a third-world state is not far in the future. In fact, it probably is only a year or two away. Already, according to the authoritative *Jane's Defence Weekly* of January 30, 1993, South Africa has developed a Remotely Piloted Vehicle that can fly out to 800 kilometers and employs a GPS guidance system to return on

its own when its radio control signal is lost. Many analysts currently speculate that Iran may soon initiate a cruise missile program that would give it the ability to build such a cruise missile, which would give it the capacity to strike targets accurately in all of Iraq and Syria, and well into Lebanon, Jordan, Saudi Arabia, Afghanistan, Pakistan, and the Central Asian republics of the former Soviet Union. ◆

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## Blackwell's Black Box: Thinking the Unthinkable

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