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Microwave Review

Significant developments in microwave business and technology

"Moscow Microwaves: Lethal Intrigue"

by K. Gheleta



Many questions still remain concerning the Russian admission that microwaves are being beamed at the American Embassy in Moscow. It now seems possible that the radiation has been going on for over 25 years. In fact embassy personnel, perturbed by the U.S. State Dept.'s unwillingness to apply protective measures, have been complaining for at least 15 years.

Originally, the Soviet government newspaper, *Izvestia*, described the radiation issue on February 18, 1976, as a "trumped-up story from beginning to end." It claimed that if there were an unusual level of electro-magnetic radiation in the building, it was caused by stray emissions from nearby industrial enterprises or by communications equipment in the embassy itself. Now the Russians admit the microwave energy is being beamed at the embassy to jam rooftop antennas used for intelligence purposes.

Soviet use of microwaves for espionage is nothing new. During the Cold War years they used microwaves to activate bugs. In the 40's and 50's, for example, rf energy was beamed at the U.S. Embassy to activate a listening device—an incident subsequently named "The Great Seal of the U.S. Bug Case."

A gift plaque that hung on the wall of the embassy contained a condenser microphone, inductor and capacitor arranged to become a voice transmitter when illuminated by microwaves from a source outside the building.

To date the Americans deny any use of microwaves for Soviet surveillance. However, President Ford and Premier Brezhnev are reported to have agreed a few months ago for the U.S. to get rid of some of its intelligence collection devices at their embassy in downtown Moscow. In return, the Soviet Union has promised to stop its microwave bombardment.

Engineers speculate that the present capabilities of microwaves in reconnaissance work are now far greater than ever before because of solid-state developments. According to C. Louis Cuccia, microwave specialist at Aeronutronic Ford in Palo Alto, California, microwaves can be radiated through a building and received on the other end or bounced back to indicate who is in what room, where they move, if they are carrying anything, or even what kind of food they are eating.

Microwave radiation can also pick up small vibrations of windows or air conditioning ducts, that vibrate like

a primitive microphone when sound waves from voices strike the surfaces. When microwaves are beamed on these surfaces, the crudely modulated microwave signal can be recovered and the returns decoded.

Credence to this theory is suggested by a secret briefing given by Ambassador Walter J. Stoessel, Jr., to his embassy staff on February 6. Stoessel told his staff that the Soviets were listening in on embassy conversations by means of high power radiation beams. The energy densities to do this, however, are far in excess of the 10 mW/cm² dosage levels considered safe by U.S. standards.

If the Soviets were in fact using microwaves solely for jamming rooftop receivers, the required power to jam would be quite low since receivers are sensitive at the microwatt level.

To detect voices and movement within rooms as is now suspected, a substantial level of radiation would be required. This amount, in continuous doses, far exceeds the U.S. maximum safe density level of 10mW/cm² and is considered hazardous to health.

The British, however, have a different theory. According to a senior American engineer who recently returned from

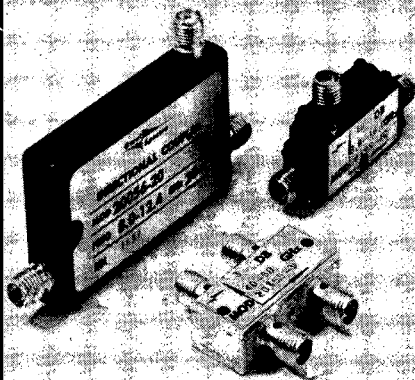
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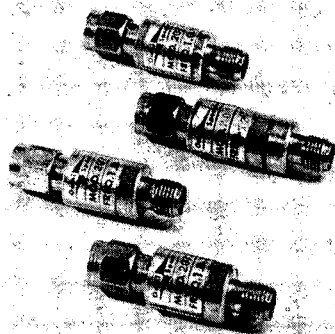
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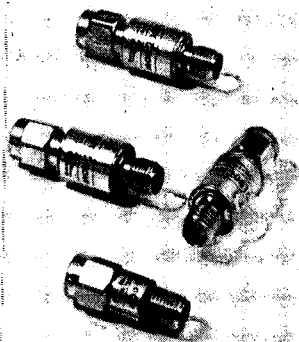
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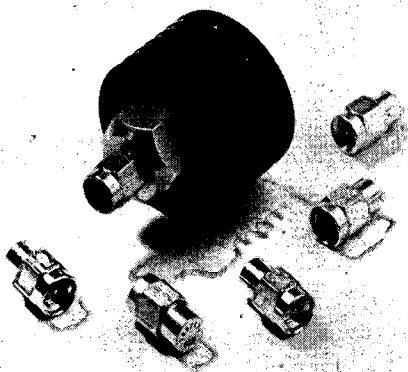
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MICROWAVE REVIEW

the U.K., they believe the Soviets are trying to pass radiation through people and by recording the change in absorption, via the change in the wavefront, monitor movement of the lips.

Several megawatts are required to do this. By the time the microwave power is coupled from an antenna and free-space propagated to a person, say within a few hundred meters, the space loss is approximately 90-100 dB. This is still considered a high enough level to cause physical harm because of the high power transmitters used.

The body's response to high and low levels of microwaves is not well known and has been a topic of hot debate for several years throughout the world. In fact, the Russians themselves have long acknowledged this radiation health hazard and have a maximum safe dosage level 30 dB less than the American standard. The more obvious effects from prolonged exposure to an excessive amount of microwave radiation are sterility and, if observed directly, the formation of cataracts on the eyes.

According to the *Los Angeles Times*, a laboratory technician who can make detailed blood analyses and perform other tests has been permanently assigned to the embassy's medical dispensary. Also, a radiation specialist,

identifiable only as a Dr. ^{Heals?} Pollack, flew to Moscow for a few days from the United States.

The *Times* also reported that in November of last year, Ambassador Stoessel returned home with some medical problem reputedly involving his eyes.

These reports make it apparent that security is not the only thing at stake. The health of all those occupying the top floors of the embassy where classified work is conducted is in possible jeopardy.

According to Soviet sources, the level of radiation beamed at the U.S. Embassy has dropped over the past few weeks. It has been suggested that this decrease is due to press reports that radiation had risen over the past nine months to levels felt to be dangerous to health by the Americans.

In addition, embassy countermeasures, including the taping of plastic sheeting with egg carton-like depressions to the windows to foil the eavesdropping purpose of the beams, have for the time being reduced the level of microwave radiation hitting the embassy.

K.G.

Kathy Sheeta

Davis Named MSN's Executive Editor

We're pleased to note to our readers that Richard T. Davis has joined our staff as Executive Editor. Dick brings over seven years of industrial journalism experience to his new position, having most recently been Managing Editor of *MicroWaves Magazine*.

In 1970, Dick Davis received the coveted Jesse H. Neal Editorial Achievement award for his special report on electronic countermeasures which appeared in *MicroWaves*. The Neal Award is the industrial equivalent of the famous Pulitzer Prize for Journalism.

Prior to his entry into publishing, Dick was with Sanders Associates where he first developed his taste for writing and preparing proposals for various ECM system modifications. Before that he was with Varian Beverly, where as an Applications Engineer he wrote extensively.

Dick picked up some microwave design experience while with Raytheon's Micro-State Electronics Division, then located in Murray Hill, New Jersey, where he worked on solid state sources. Prior to that he was engaged in various radar front end projects for RCA-Moorestown.

A graduate of Worcester Polytechnic Institute in 1961 with a BSEE, Dick continued his studies at Brooklyn Poly where received an MS in Electrophysics in 1965. Before doing his graduate work, he served in the Army Signal Corps from 1961 to 1962 as a 2nd Lieutenant stationed at Ft. Gordon, Georgia.

Dick is a highly respected member of the microwave community and we're certain that his contribution will generate editorial dividends for our entire readership.

Investor\$ Corner

[Results of the Reader-Gram survey conducted in the February/March issue have been tabulated and, by a margin of nearly four to one, MSN's readers have voted for continuation of the Microwave Market Index—the industry's only indicator of how securities of microwave companies are performing on the Big Board, the American Exchange and Over-the-Counter.]

Believe it or not, at the final bell on April Fool's Day, 1976, the **Microwave Market Index** closed at **276.10**, a healthy **12% rise** from its **23 January** level of **246,809**. These numbers take on a much more dramatic meaning when the Dow-Jones 30 industrials are studied during the same nine-week period. Despite the fact that the DJIA hit a 1976 high of 1010 on March 24, a week later it had fallen below the magic 1000 barrier and started April only four percent ahead of its late January reading.

NYSE volume continues to make headlines despite the slowing upward trend of the broad-based stock indices. On February 20, Big Board turnover surged to an all-time record 44.51 million shares—a respectable week's volume just a few years ago. After three months and one day of trading in 1976, more than 1.78 billion shares have changed hands on the NYSE, 31% above the record levels of a year earlier.

Why, with favorable economic news pointing to a robust recovery for virtually all US industry, did the Microwave Market Index advance three

times faster than the Dow average? There are no simple answers to that question, but investors' belief that, for once, Congress would not cut the US defense budget for FY '77, certainly had to positively impact microwave securities. US Defense Secretary Rumsfeld—and Schlesinger before him—waged an active campaign to convince the American public and Congressional leaders of the necessity to shore up US defenses during a détente-dominated dialog with the Soviet Union, which is spending almost one-fifth of its annual GNP on weapons and armaments. It would appear that microwave stocks benefited from the persuasive powers of Mr. Rumsfeld.

MSC Enters the Power FET Market

Microwave Semiconductor Corp., Somerset, NJ, is now developing power FETs and plans to be offering devices in the 5 to 10 GHz range. Heading this GaAs FET effort is Dr. Ira Drukier, formerly of RCA Princeton Labs. Dr. James Thompson formerly of Raytheon is in charge of materials development. Charles Jackson is being transferred over to the position of Processing Manager. According to George Gilbert, Exec. V.P., this new capability, plus current efforts to develop bipolar devices above 4 GHz, will give MSC a complete power transistor capability over the 1 to 10 GHz band.

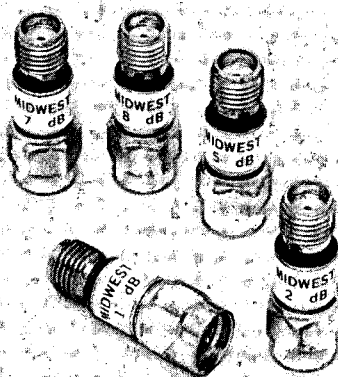
Personnel-ities

Crown Microwave, Inc. has a new Manager of Marketing Services: **Richard B. Moffett**, formerly of Alpha Industries. Pending stockholder approval, Crown will become a subsidiary of Microwave Semiconductor Corp. (see MSN, Feb./Mar. '76, pg. 18)—**Jim Sedin**, most recently affiliated with Varian Associates, has joined **Frequency-West** in a senior technical post—**OmniYig, Inc.** has appointed **Paul Tipon** to the newly-created position of Systems Department Manager—**Diamond Antenna & Microwave Corp.** (Winchester, MA) has appointed **Robert F. Patterson, Jr.** as Chief Engineer—New Vice President and Director of Engineering of **Wavecom Industries'** Northridge, CA operation is **Robert G. Hiller**—**Dr. John W. Greiser** has been promoted to Director of Engineering at **Transco Products** (Venice, CA)—**Cutler-Hammer's AIL Division** has elevated **Joseph W. Kearney** to Vice President, Plans & Business Development—**Bernard Leibowitz**, moving to a newly-established post of Vice President—Operations, will be responsible for all manufacturing and engineering functions at **Narda Microwave** (Plainview, NY)—**Olektron Corporation** (Dudley, MA) named **Dr. John P. Curtis** as Vice President—Technical Director. In his prior post, Curtis was company's Sr. VP for Development—New Director of National Marketing for **Microwave Associates' Communications Equipment Division** is **Curtis I. Kring**—**Wescom**,

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