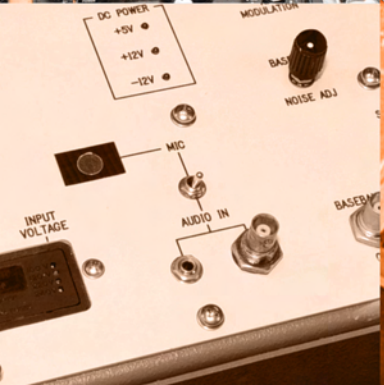
LISTENING IN:

ELECTRONIC EAVESDROPPING IN THE COLD WAR ERA



INTRODUCTION

During the Cold War, intelligence services on each side of the conflict attempted to gather as much information as possible on their opponent's capabilities and intentions. From 1955 to 1985, a number of U.S. embassies were penetrated by listening devices, primarily wired microphones and radio transmitters. Teams of specially trained engineers were sent out to hunt for these devices, carrying specialized equipment to inspect for "bugs." These examples were used by U.S. Department of State countermeasures teams during the Cold War. Also depicted are wired microphones and models of transmitters recovered during that period.

MAGNETIC MICROPHONE

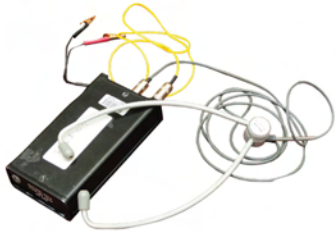
During the Cold War, a number of microphones similar to this were recovered from U.S. embassies in Eastern Europe. The long wooden tube attached to the microphone allowed it to be deeply recessed in walls, picking up conversations in the room through a tiny pinhole at the end of the tube.

SIMPSON MULTIMETER

In hunting for microphones, engineers examined wiring for the presence of voltages that might indicate that the wires were used to power microphones. Other wires carried signals produced by the microphones. Durable, clunky multimeters like the Simpson 260 were used to trace wiring and make measurements.

AUDIO AMPLIFIERS

If a pair of wires carried a suspicious voltage, it was important to know if voices were on the wires, and whose voices they were. This helped engineers locate the microphone. Audio amplifiers like these were used to listen to faint signals.



CLANDESTINE TRANSMITTERS

During the Cold War, a number of "drop" transmitters were recovered from American embassies in Eastern Europe and Africa. At a time when most embassy office furniture was made of oak, these transmitters were housed in milled or laminate cases that looked very much like the piece of furniture to which they were attached. A foreign intelligence service would provide a duplicitous embassy employee, often a member of the cleaning crew, with the wooden block. Several of these transmitters had sharp push pins at each end of the block, allowing the installer to slip the transmitter out of a pocket and press it firmly against the underside of a desk or coffee table while cleaning the furniture.

On one occasion, a U.S. ambassador was entertaining a guest in his dining room. During the dinner he set a magnum of champagne on a sideboard, knocking loose a wood block which fell to the floor. Recognizing the wood block as a transmitter, the ambassador kicked it under the sideboard until his guest departed. Several security engineers, on learning of this new search technique, asked for their own magnums of champagne.

MASON A3B RECEIVER

To look for a transmitter, engineers needed a receiver, preferably one that could be moved from room to room without looking like a radio. The Mason A3 broke new ground for a portable technical surveillance countermeasures receiver. Rugged and dependable, it could see AM, FM, TV, and CW signals, and it could be tuned from 2 KHz to 10 GHz. In an age where recovered transmitters sometimes hid their signals on sub-carriers, it could double-demodulate a radio signal. The Mason also had a video display unit that doubled as a television monitor.

WATKINS-JOHNSON RS-111 RECEIVER

This receiver was popular in technical surveillance countermeasures work during the 1960s and 1970s. Durable, sensitive, and easy to use, it combined a practical display with smooth tuning and many useful signal outputs.

MELPAR SPR RECEIVER

As clandestine transmitters became more complex, the information they were gathering was not simply broadcast on a radio signal but was hidden on a sub-carrier of a larger signal, and sometimes masked with noise. While the RS-111 was an excellent receiver, it was not designed to detect sub-carriers. A second receiver coupled to the RS-111 was needed, one which could tune away from the main signal and recover the hidden information. The Melpar SPR served that purpose.

TEKTRONIX 492 SPECTRUM ANALYZER

Spectrum analyzers were added to the technical surveillance countermeasures hardware suite in the mid-1970s. These instruments gave engineers a wider view of the radio spectrum and many new tools with which to analyze radio signals.

PLA-2 POWER LINE ANTENNA

This small black box allowed sensitive radio receivers to hunt for radio signals carried on power lines.

IBM SELECTRIC TYPEWRITER

Because the Selectric coupled a motor to a mechanical assembly, pressing different keys caused the motor to draw different amounts of current that were specific for each key. By closely measuring the current used by the typewriter, it was possible to determine what was being typed on the machine. To prevent such measurements, State Department Selectric typewriters were equipped with "inertia" motors coupled to a large flywheel. The spinning flywheel absorbed the stress of the mechanical assembly and masked the messages being typed.

TRAINING TRANSMITTER

Analyzing radio signals required substantial training. To help engineers practice signal recognition skills, this training transmitter was developed in the 1970s. It could duplicate the signals generated by clandestine transmitters.

COOKE TELEPHONE ANALYZER

The Cooke Telephone Analyzer was designed as an inspection tool for Western Electric multi-line telephones, which were used in American embassies and consulates from the 1960s to the 1980s. Each phone was coupled to a 50-pin connector. The large number of wire pairs coming into the phone offered foreign intelligence services many ways to exploit the instrument. The Cooke was designed to examine all available pathways to and from a telephone, simplifying the examination process.

WESTERN ELECTRIC 1565HK MULTI-LINE TELEPHONE

This is an example of the type of telephone the Cooke Analyzer was designed to inspect.

ULTRASONIC TEST SET

One area of interest in countermeasures work is the audio frequency spectrum above human hearing. This ultrasonic test set is a receiver for those sounds: it converts them into the normal audio hearing range. Many mechanical and electronic devices normally produce ultrasonic sound, and this instrument could pinpoint the locations of those devices even if their sounds could not be heard.

SAN-BAR LINE CARD

In an office area, multi-line phones were connected to a number of outside lines through a Key Telephone Unit (KTU). When the phones were not in use, these special line cards electrically disconnected each telephone from the outgoing lines.

WECO B-66 TELEPHONE LINE BLOCK

Within a building, telephone lines are routed to gathering points or terminal blocks, which are in turn wired back to "frames" in an embassy's telephone frame room. In years past, terminal blocks like these were used to support multi-line telephone systems. Countermeasures personnel checked all wiring associated with the embassy phones.

INFRA-RED TELESCOPE

In the 1970s, most high energy lasers emitted energy that was concentrated toward the infra-red side of the visible light spectrum. This device, a German-made night vision viewer, was very sensitive to infrared light. Because incoming laser radiation coming through a window was scattered slightly by the window glass, there was a (slim) chance that this device might see laser energy coming through a window as a circular spot on the glass.

MICROLAB FXR NON-LINEAR JUNCTION DETECTOR

Almost all transmitters and many amplified microphone systems contain transistors. Given the ability of radio signals to penetrate furniture, bookcases, walls, floors and ceilings, a device that is designed to find transistors with radio waves is very useful in countermeasures work. The Non-Linear Junction Detector shown here was a basic item of countermeasures equipment in the 1970s and 1980s. Lightweight, powerful, easy to use, and fairly portable, it could find a transmitter hidden in a desk even when the transmitter was turned off. "Sweeping" an office with this tool allowed inspections without the need to disassemble furniture.

May 26, 1960: U.S. Ambassador Henry Cabot Lodge, Jr. (left) holds a listening device placed inside a wood carving of the Great Seal of the United States, presented to U.S. Embassy Moscow by the Soviet Union in 1945. A State Department Security technical officer discovered the espionage device in 1952. Lodge displays the bug to the United Nations Security Council to rebuff Soviet bluster about U-2 over flights by the United States.

April 1964: Marvin Gentile, Director, Office of Security (1964-1974), displays a magnetic microphone found at the U.S. Embassy in Moscow.

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Bureau of Diplomatic Security
U.S. Department of State
Washington, D.C. 20522-2008

Released July 2008

www.diplomaticsecurity.state.gov