

STANFORD'S HANSEN MICROWAVE LABORATORIES

In 1969 the anti-war movement (A3M) forced classified research and the Systems Techniques Laboratory (STL) off the Stanford campus. STL was the focal point of opposition to electronic warfare research performed at Stanford. In the furor, the almost equally important contributions of the Hansen Microwave Labs to the "art" of electronic warfare and other military technologies were ignored, primarily because many assumed unclassified research was "neutral." In fact Hansen is (and has been historically) one of the most important microwaves research centers for the military in the nation.

The research at Hansen is divided into two areas: lasers and microwave acoustic^s. Although the laser work has important implication for current, as well as future military technology, the microwave acoustics research deserves special attention.

Some notes on Microwave Acoustics Application:

- 1) The military is seeking to exploit the unique characteristics of microwave acoustics primarily for sophisticated radar systems.
- 2) More specifically, microwave acoustic delay lines and other signal processing devices are being developed as being of direct value for electronic warfare.
- 3) Stanford has been a leader in the field of microwave acoustics. Work at Stanford is cited in Microwaves magazines as having direct value to electronic warfare systems development ("Surface Acoustic Waves, New Processing Tools for Electronic Warfare," October, 1971).

Notes on Microwave Acoustic Contracts at Stanford:

- 1) Marvin Chodorow (director of Hansen Microwave Labs) holds a large contract with the Air Force's Rome Air Development Center (RADC). This is an exploratory development project (not basic research) which is part of RADC's Ground Electronics program. The Ground Electronics program has been the basis for many important Air Force weapons systems. Under this contract breadboard models (actual hardware) are to be constructed and sent to the air force.
- 2) H.J. Shaw holds another exploratory development contract with the Navy Electronics Systems Command. According to the Defense Documentation Center statement in the first SWOPSI volume on sponsored research, the intended application of this research is in electronic warfare. The funding agency is actively engaged in shipboard electronic warfare systems development.
- 3) Chodorow and Shaw jointly hold a new contract from the Army Electronics Command, to develop specific prototype electronic components using microwave acoustics. The contract states, "In the event of a conflict between Stanford University unsolicited proposal dated January, 1971, and the U.S. Army Electronics Command technical guidelines the latter shall take precedence."

This is only part of the Hansen Labs military research program. The significance of microwave research in general to the military's needs should not be underrated. Although there are civilian application of this research, the military applications overwhelmingly dominate the field. According to a 1962 SRI report (can anyone get us a more recent copy?) on the microwaves industry nearly 70-80% of all microwaves equipment sold yearly in the United States was purchased by the military. These figures at least indicate the present market situation.