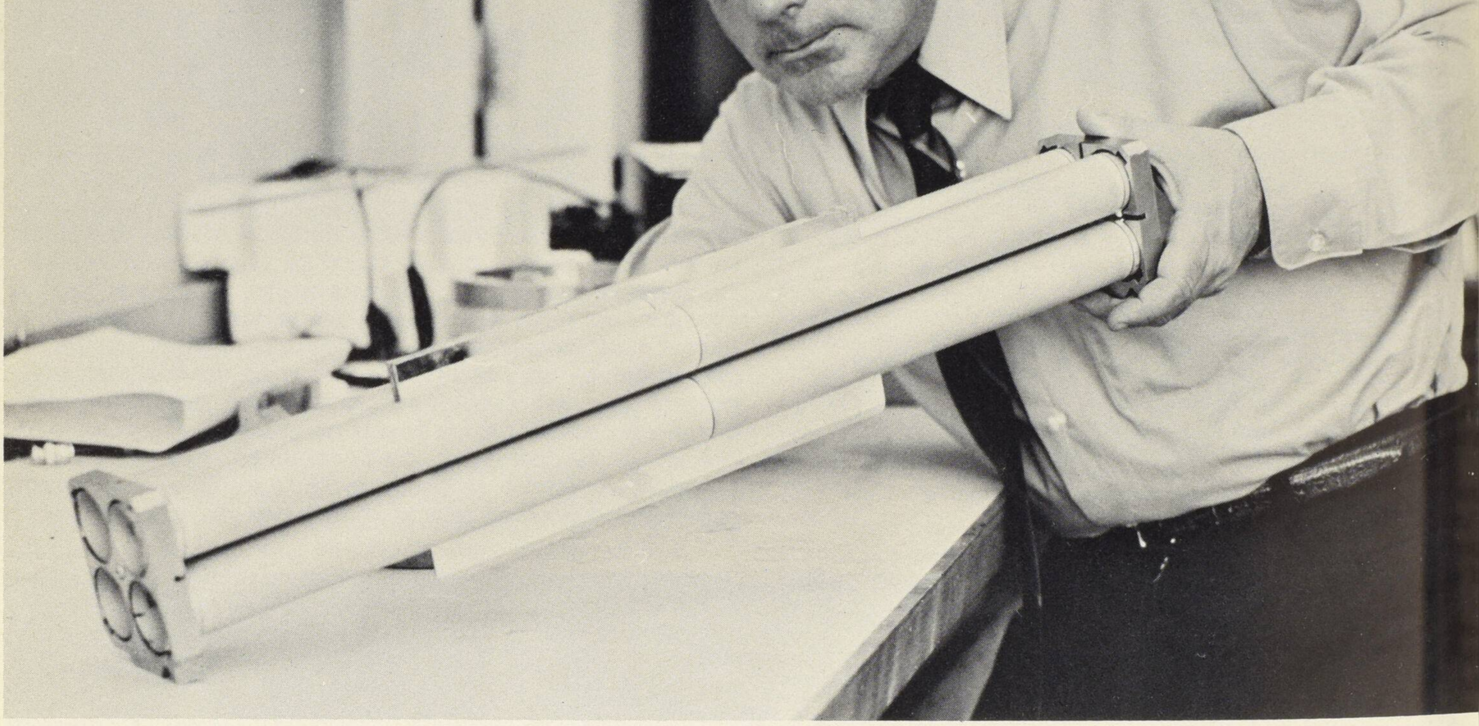

Dr. David Makow checks alignment of the four cylinders on the Lincap. ● Le Dr. David Makow vérifie l'alignement des quatre cylindres du "Lincap".

systems of measurement. However, in addition to having a limited accuracy, screws — even very precise screws — wear out and are slow in operation.

"The whole philosophy of precision measurement apparatus," explains Dr. Makow, "is to find ways of designing an instrument so that it is not influenced by vibration, wear, temperature, humidity, pressure and voltage variations and that does not require extremely high tolerances of machining and assembly."

In a search for solutions which would overcome the limitations of the screw, the Section considered electrical methods based on the measurement of capacitance (which is the ratio of electrical charge stored in a capacitor or condenser to the voltage applied). Developments in this direction published in the literature had not led to very accurate measuring systems over a reasonable range because the capacitance to be measured depended upon three dimensions of the capacitor — for example, on the spacing, width and length in the case of the plate capacitor — and such structure was not stable enough to permit precise repeatability at all times when one dimension was varied.

"So if you wanted to measure capacitance as a function of length," says Dr. Makow, "you had to account for all three dimensions. It would obviously be much easier to measure just one, if we could assume that the other two do not matter."

It happened that several years previously, Dr. Makow had attended a lecture in the Radio and Electrical Engineering Division, where a new type of capacitor invented in Australia (presently the International Absolute Standard of Capacitance) had been described. In that capacitor, the capacitance depended primarily on only one dimension.