

MOD. 5—PG-650-C  
FOR PULSE SUPERPOSITION



The McSkimin technique of Pulse Superposition allows velocity determinations of 1 part in  $10^4$  or  $10^5$ . ARULAB PG-650-C in Mod. 5 versions now provide the high p.r.f.'s 300-500 KC as well as high power and pulse stability required.

Standard units for ultrasonic, nuclear magnetic and other purposes will give the following performance:

|                                                                 |                                            |
|-----------------------------------------------------------------|--------------------------------------------|
| R.F. Output Min into 93 ohms                                    | 0-300 v/p. to p. or 0-600 v. special order |
| Pulse Length—continuous                                         | $1\frac{1}{2}$ —20 usec                    |
| Pulse droop                                                     | 5%                                         |
| Noise output                                                    | Thermal noise from termination             |
| Harmonic Output (Mostly third)                                  | 10%                                        |
| R.F. Leakage                                                    | Negligible                                 |
| Calibrated Delays                                               | 120, 1100, 11000 usec                      |
| Gate Output available for intensifying and blanking purposes.   |                                            |
| External pulse modulation of r.f. oscillator with 110 KC limit. |                                            |
| Special coils for coverage from .01 to 210 MC                   |                                            |
| Operation in gated amplifier, gated modulator or C.W.           |                                            |
| Modes.                                                          |                                            |
| Extra Fast Rise units                                           | 0.1-0.2 usec now available.                |

PREAMPLIFIER, PA-620 and PA-620L.

These preamplifiers are a general purpose device for matching ultrasonic transducers and cables with capacities as high as 100 pfd between 5 and 65 MC in the PA-620, and 0.5 to 20 MC in the PA-620L and to provide a limited amount of gain with a good signal to noise ratio. Two of the three stages have variable bandwidth as well as center frequencies. An additional feature is a comparer stage with separate gain control.

|                         |                 |
|-------------------------|-----------------|
| Specifications—         |                 |
| Input impedance         | 93 to 3200 ohms |
| Band widths             | 0.5-17 MC       |
| Low noise cascade input | (6922 tube)     |

WIDE BAND AMPLIFIER, WA-600D



This amplifier allows coverage from 6-60 MC while performance under any conditions of pulsed operation is exceptional due to the quick recovery time. An R.F. output and pickoff point allow direct presentation of the signals and mixing with other systems.

|                                          |                   |
|------------------------------------------|-------------------|
| Features—                                |                   |
| Bandwidth (3 db) minimum                 | 6-60 MC           |
| Gain                                     | 65-85 db          |
| Video Bandwidth after full wave detector | 10 MC             |
| Recovery time from 100 volt signal       | 4 usec            |
| Output Voltage Max.                      | 10 volts positive |
| R.F. Output                              | 6 volts max.      |

Modifications—  
Low frequency section DC to 10 KC bandwidth for use with demodulated signals from sweep or audio modulated generators. Cabinet optional.

Low frequency cut off can be extended between 1 and 10 MC. Cathode follower circuit for 10 volt r.f. circuit available.

FOR DETAILS AND PRICE LIST WRITE TO:  
ARENBERG ULTRASONIC LABORATORY, INC.

94 Green St., Jamaica Plain, Mass. 02130  
TEL: JAmaica 2-8640 A.C. 617

## SCIENCE EDUCATION

### Berkeley physics course

A new two-year elementary physics course being developed at Berkeley has produced its first textbook, *Laboratory Physics, Part A*, which appeared at the end of September. Work on the course goes back to 1962, when an interuniversity committee was formed at Berkeley to develop it. Specific objectives of the committee were to introduce coherently the ideas of special relativity, quantum physics, and statistical physics into an elementary curriculum. The material which is emerging is intended for all students who have had a physics course in high school and who are taking a calculus course concurrently.

Five volumes have been projected for the course. These include *Mechanics* (Ruderman, Knight, and Kittel), *Electricity and Magnetism* (Purcell), *Waves* (Crawford), *Quantum Physics* (Wichmann), and *Statistical Physics* (Reif).

To accompany the course, A. M. Portis has designed the *Berkeley Physics Laboratory*, of which *Laboratory Physics, Part A*, is the first section. It will appear in three parts, each including twelve experiments plus supplementary material.

Each volume of the course will have been tested for three or more semesters before the preparation of the final manuscript. The first volume is scheduled for January 1965, and the second volume for the summer of 1965. This fall, a preliminary version of the first volume is in use by regular classes at the University of Texas, Austin; the University of Michigan; Long Beach State College; and at the Santa Barbara and Berkeley campuses of the University of California. In addition, the preliminary version of the second volume is being used this semester at MIT, Austin, and Berkeley.

A special effort has been made by the large-scale use of questionnaires to locate specific difficulties experienced by students with the draft course material. In general, the new material

has been observed to interest a wide range of students, teaching assistants, and instructors.

The course and laboratory materials are being published by the McGraw-Hill Book Company, Inc. Copies of the preliminary materials as available can be obtained by persons concerned with undergraduate instruction by writing to Mrs. Gerald Maloney, Berkeley Physics Course Committee, Department of Physics, University of California, Berkeley 4, Calif.

The project was encouraged by the Commission on College Physics, and has been supported by the National Science Foundation through a grant to Educational Services Incorporated. Members of the original Berkeley Physics Course Committee included L. W. Alvarez, W. B. Fretter, C. Kittel, W. D. Knight, P. Morrison, E. M. Purcell, M. A. Ruderman, and J. R. Zacharias. Several of the original members have dropped out, and A. M. Portis, E. D. Commins, F. Reif, F. S. Crawford, Jr., and E. H. Wichmann have joined the committee. Many other people, including astronomers, biophysicists, geophysicists, and mathematicians, have helped with the program.

### Twin-tower observatory

This fall, Northwestern University will begin construction of a twin-tower observatory as the first step in its projected Benjamin F. Lindheimer Astronomical Research Center. The new observatory, designed for on-site research by students and faculty, will cost almost \$1 million and will be supported by matching grants from the National Science Foundation and the family of the late Mr. Lindheimer. The facility will consist of two 70-foot-high domed towers connected by a structure housing a telescope control room and various equipment. A 40-inch Cassegrainian/Coudé reflecting telescope will be the principal optical instrument in one of the domes, and the addition of an electronic image conversion device to this telescope is expected to increase its light detecting ability an estimated 100 times. The dome on top of the other observatory tower will house a 16-inch reflector telescope. At the base of the towers