

## ELECTRICAL ELECTRONICS AND ACOUSTICS LABORATORY

In addition to the development of special electrical and electronic apparatus and the testing of electrical materials, the activities of this Laboratory included at first the calibration of electrical meters. Early in the year, however, the electrical standard equipment was taken over by the Standards Laboratory.

The principal work of the Laboratory has been the development of electronic apparatus for research and industrial applications. The work included circuits for piranti-type vacuum gauges for different degrees of high vacuum; dielectric gum-detector for preventing ungummed cigarette-papers from being included in packets; rapid electrical heating of grass for killing enzymes; design of ultra-violet-light scanner and integrator for recording the total radiation of ultra-violet light from the sky; investigation into the design of a crystal clock type of frequency standard; bridge coil oscillator and detector; wool medullometer for grading wool; portable electronic recording circuits suitable for use with resistance-type strain gauges; super-sonic methods of measuring the thickness of concrete blocks and pipes; dielectric heating-equipment for sealing Pliofilm bags; calibration of various types of hearing-aids; circuits for reverse D.C. relays; electronic seed-moisture meters; absorption meter; D.C. high-voltage supply; modification of echo-sounding equipment; testing of various electrical water-heating systems; apparatus for determining the magnetic susceptibility of rocks; magnetograph calibrator; adjustment and repair of magnetometers.

Tests of materials included attenuation tests on polyethylene cable; comprehensive tests on several different types of polyvinylchloride-covered cables for use in automobiles, and comparison with imported cables; testing of insulation boards to B.S.S. 737; moisture proofing and testing of balloon cable; dielectric constants and loss factor of fish-oil.

## RADIO AND RADAR LABORATORY

*Projects completed*

*Loran Developments.*—One of the three equipments required for establishing a local Loran chain was manufactured and installed, the original purpose being to extend the existing Pacific cover to New Zealand. The Pacific chain was, however, discontinued by the United States Forces, and the New Zealand equipment was then used as the basis of a training system for the R.N.Z.A.F. Owing to Air Force staff difficulties, the requirement finally lapsed and the project was terminated.

*General.*—Other completed projects include the design of voltage-regulating transformers; the testing, repair, and calibration of radiosondes; the development of 3 cm. wave-length power-measuring gear; and the fitting of marine radar in inter-Island steamers.

*Projects in Progress*

*Design and Construction of Micro-wave Meteorological Radar.*—Four sets of equipment operating on 10.7 cm. wave-length are being constructed for the Meteorological Service (Air Department). One set is almost complete, and the remaining three are expected to be completed by December, 1947. The first set will be installed at Whenuapai, the second at Suva, and the others at Palmerston North and Taieri or Invercargill.

*Cosmic-ray Investigations.*—An automatic radiation-recorder, using Geiger-Mueller tubes in coincidence and running from battery supplies, has been made and will be used for preliminary work in the Wellington area.

Further equipments are in development, one suitable for recording short-interval changes at a ground station with small statistical error, and a second for observing radiation at heights up to 35,000 ft. The particular interest of the latter is the investigation of the anomalous condition of meson radiation at 15,000 ft. which has recently been reported in the Northern Hemisphere.