

The Growth of an Instrument Company

THE DEVELOPMENT OF test equipment has not always kept in the past pace with the requirements of the radio and communications industries; in fact, prior to 1936, with a few important exceptions, a great many of the instruments in use were no more than expedients devised by the engineers who needed them; alternatively the gap would be filled by imported apparatus.

It was to solve a problem of mutual interest and concern therefore that, in 1936, Marconi's Wireless Telegraph Co. Ltd. and E. K. Cole Ltd. decided to co-operate in the design and production of a range of electronic measuring instruments. Marconi's had already evolved a number of standards for radio frequency measurement and Ekco a useful assortment for many other applications: there were obvious advantages, then, in pooling their resources.

A new, jointly-owned company was formed under the name Marconi-Ekco Instruments Ltd. It would operate as the sales outlet for equipment to be produced at Chelmsford and at the Ekco factory at Southend. Its headquarters would be at Electra House, London.

On these lines, rapid progress was made during the next few years. The new Company's activities were not confined to communications test gear since other promising markets presented themselves. Industry as a whole was increasingly receptive to the advantages of electronic instrumentation and was by no means well-served at the time. A number of instruments were therefore conceived and constructed for laboratory research in connection with telecommunication and industrial applications. The medical profession too, was interested in new techniques and therefore in developing the possibilities of electro-medical apparatus. To meet this demand, several units for surgery, therapy and diagnosis were added to a catalogue which was fast assuming impressive proportions.

Of those engaged in producing the first Marconi-Ekco instruments, a number are still actively employed; their long experience is greatly valued by the Company.

At the outbreak of war the military value of the Company's existing designs was soon demonstrated, and during the Battle of Britain large contracts were placed for the earliest possible completion. The limited production facility at Southend at once became inadequate. It was already, of course, extremely vulnerable and the Company therefore removed to temporary accommodation in St. Albans and High Wycombe where its war-time programme was carried through to the end. None of the buildings occupied was ideal for its new purpose but by prodigious and ingenious effort each was geared for the full-scale manufacture of a varied range of instruments. The labour available—apart from key personnel—was at best semi-skilled and it was necessary as a consequence to reduce each production process to its simplest possible essentials.

In parallel with this manufacturing programme a number of development

projects were also undertaken and the engineering department thereafter bore a consistently heavy load co-operating as they did with the military research establishments to evolve new production lines and keep the Company's products constantly in line with requirements, thus making a valuable contribution to the war effort.

Owing to the complications of dual control in war-time, the shares belonging to E. K. Cole Ltd. were acquired in 1941 by Marconi's Wireless Telegraph Co. Ltd., thus making the Instrument Company—retitled Marconi Instruments Ltd.—a wholly-owned Marconi subsidiary.

During the war, over 50,000 instruments were completed, chiefly for the maintenance of communications, and a further 9000 made on sub-contract by other firms. Despite this preoccupation with test gear, however, some capacity was also devoted to industrial measuring equipment for use by companies engaged on Government work. Electro-medical apparatus too, was not neglected, being destined for hospital units in the field.

At the end of the war the company found itself with a vastly increased potential. Its wares had become known almost all over the world and had established a reputation in keeping with Marconi traditions. To realise future objectives, however, the establishment of a permanent factory was the first essential: each of the dispersal buildings in any event was to be relinquished just as soon as possible to enable the respective own-

ers to regain their property for the revival of their peace-time pursuits.

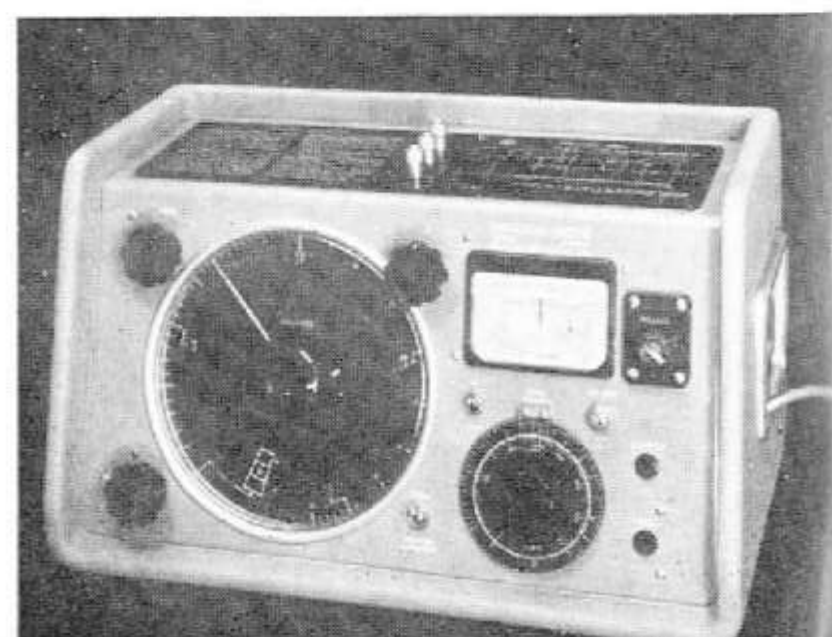
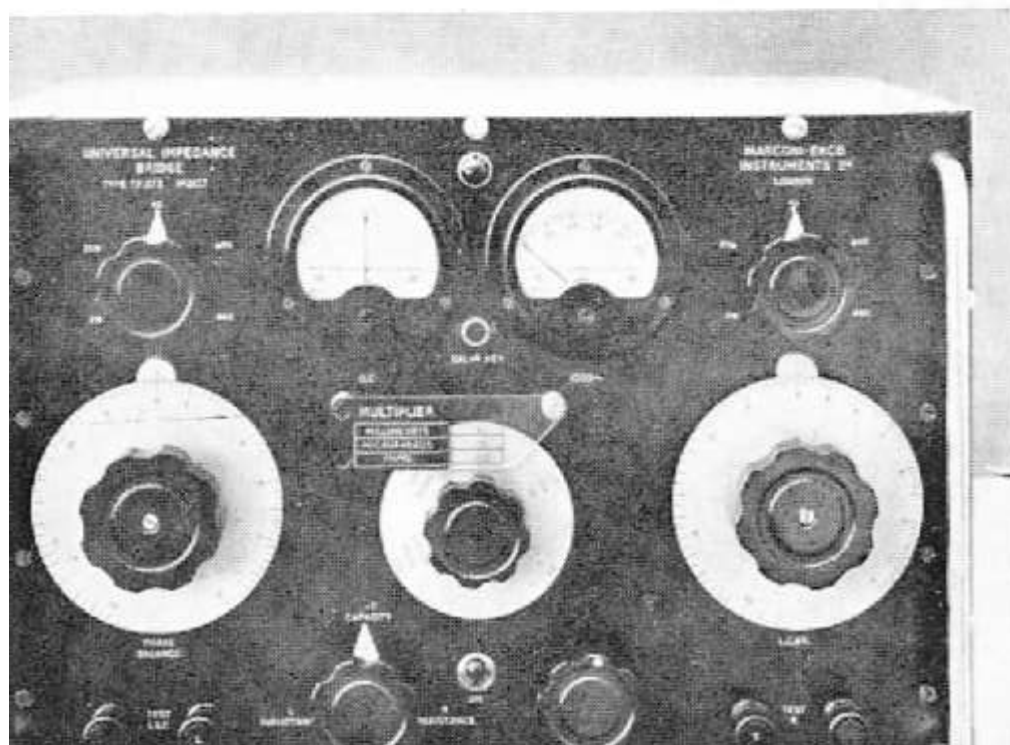
Although confronted by many difficulties, negotiations were pursued with appropriate Government departments and a successful conclusion reached with the acquisition of a buffer storage depot on the outskirts of St. Albans. By this transaction the Company avoided the dispersal of the technical and experienced employees who constituted its most valued asset. Plans were drawn up for the conversion of the property into an instrument factory, a great deal of structural alteration being necessary as well as additional building. As fast as a section was ready for occupation, plant and personnel from the locality and High Wycombe were moved into it.

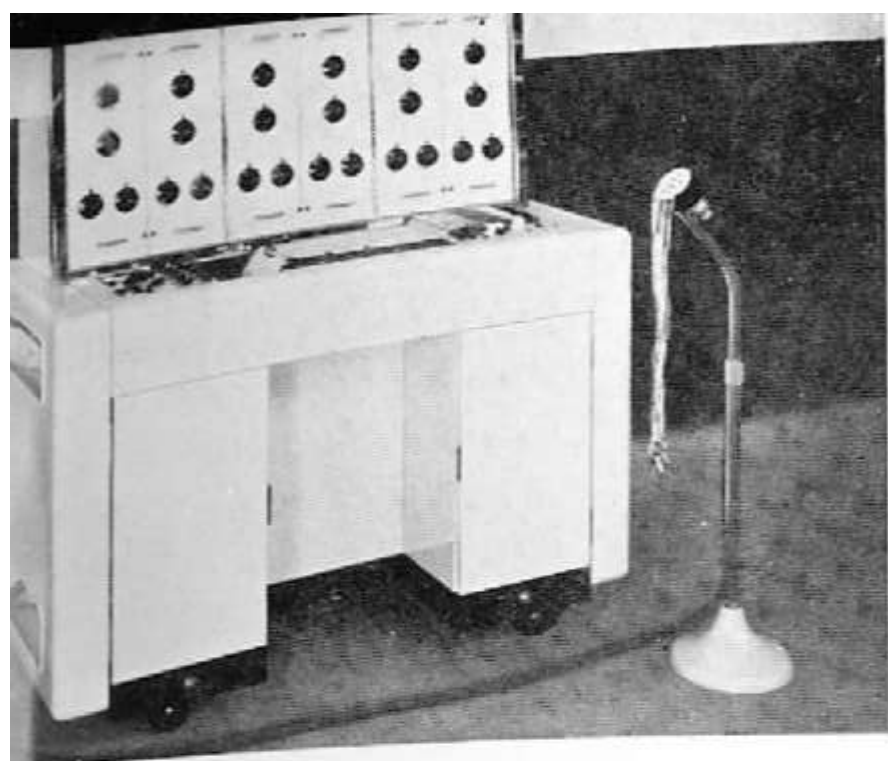
The transfer of the various departments was completed over a period of 10 months, all without serious interruption of production. By June 1947, the reorganisation was complete and the entire complement of Marconi Instruments Ltd. housed under one roof.

Throughout this transitional phase, close attention was given to the expansion of the Company's sales force which, during the war, was of the skeleton variety. Area offices were set up in strategic parts of the country, accommodation for the Company's staff being provided through the good offices of The Marconi International Marine Communication Co. Ltd.

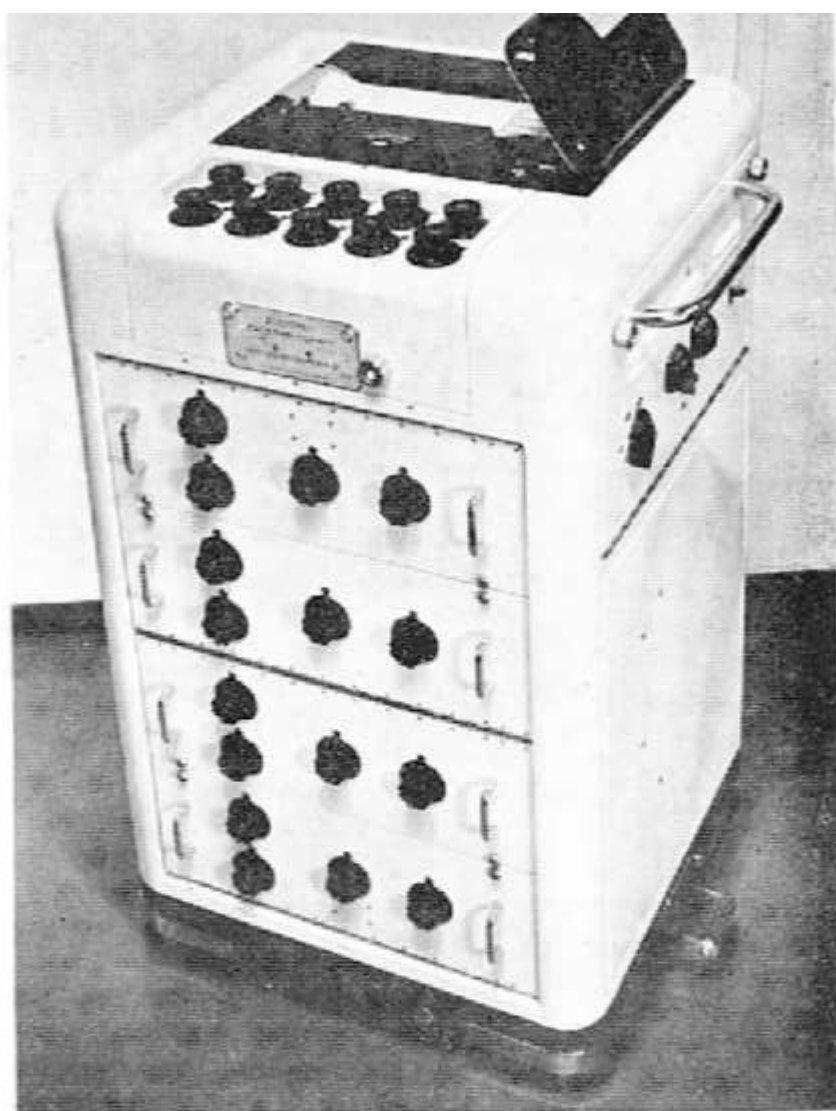
Overseas representation had similarly to be resuscitated since the Company intended to play its full part in the nation's

The Universal Bridge as it used to be (left) and as it is today restyled on modern lines





The famous Electro-Encephalograph showing (left) how the requirements of present-day technique have been satisfied. On the right is the original model



export drive. In most cases the appointed agents were those acting for Marconi's Wireless Telegraph Co. Ltd. but in certain countries firms specialising in the instrument business were selected. It is gratifying to record that associated companies and selling agents have worked so well that a large percentage of the St. Albans output is regularly consigned to territories overseas, and, in the interest of sales promotion and co-ordination, a special Instrumentation Export Office has been organised within the Export Department of the Marconi Company at Electra House, London.

It is interesting to reflect today on the changed and changing face of the Marconi range of instruments. Originally conforming to a conventional pattern they now are styled for functional convenience as well as electrical efficiency. The photographs show how modern standards of design have been applied to the instruments in the course of their technical evolution. It may safely be said, as a consequence, that these Marconi products are as distinguished in appearance as in performance—a feature of no small importance in the capture of the world's markets.

To the three original classes of equipment made at St. Albans must now be added a new and impressive range for, some three years ago, a comprehensive X-ray project was launched and a pilot plant constructed for the manufacture of prototypes of established design. The work entailed could not be undertaken without additional manufacturing facilities, necessitating the construction of a new factory wing which virtually doubled the workshop space. The extension has now been completed and equipped with the latest plant, a considerable Ministry of Health contract having been undertaken. With the steady acquisition of the all-important "know-how" the Company's engineers are now busily engaged on the development of a Marconi series of diagnostic and therapeutic X-ray units second to none in performance.

The foregoing is the relatively brief history of the instrument component of the Marconi Group. Following in the footsteps of the parent concern and with the powerful support of the English Electric Co. the Instrument Company goes from strength to strength. Of particular interest is the opening of an office in New

York under the guidance of the Group representative; for some months a determined attack has been launched on the coveted dollar market.

Hitherto, the character of the instruments designed at St. Albans has been described only in general terms. It may be appropriate therefore to deal with them in greater detail particularly where they are not directly related to the types with which the name Marconi is most frequently associated.

Broadly to appreciate the activities of Marconi Instruments Ltd., it must be remembered that we live in an age where scientific instrumentation is of vital importance; every stride forward in knowledge or technique brings in its train the need for measuring, testing and investigating the results of putting such discoveries into practice. And whether for laboratory, factory or plant, the electronic engineer provides the means by which scientific effects may be studied,

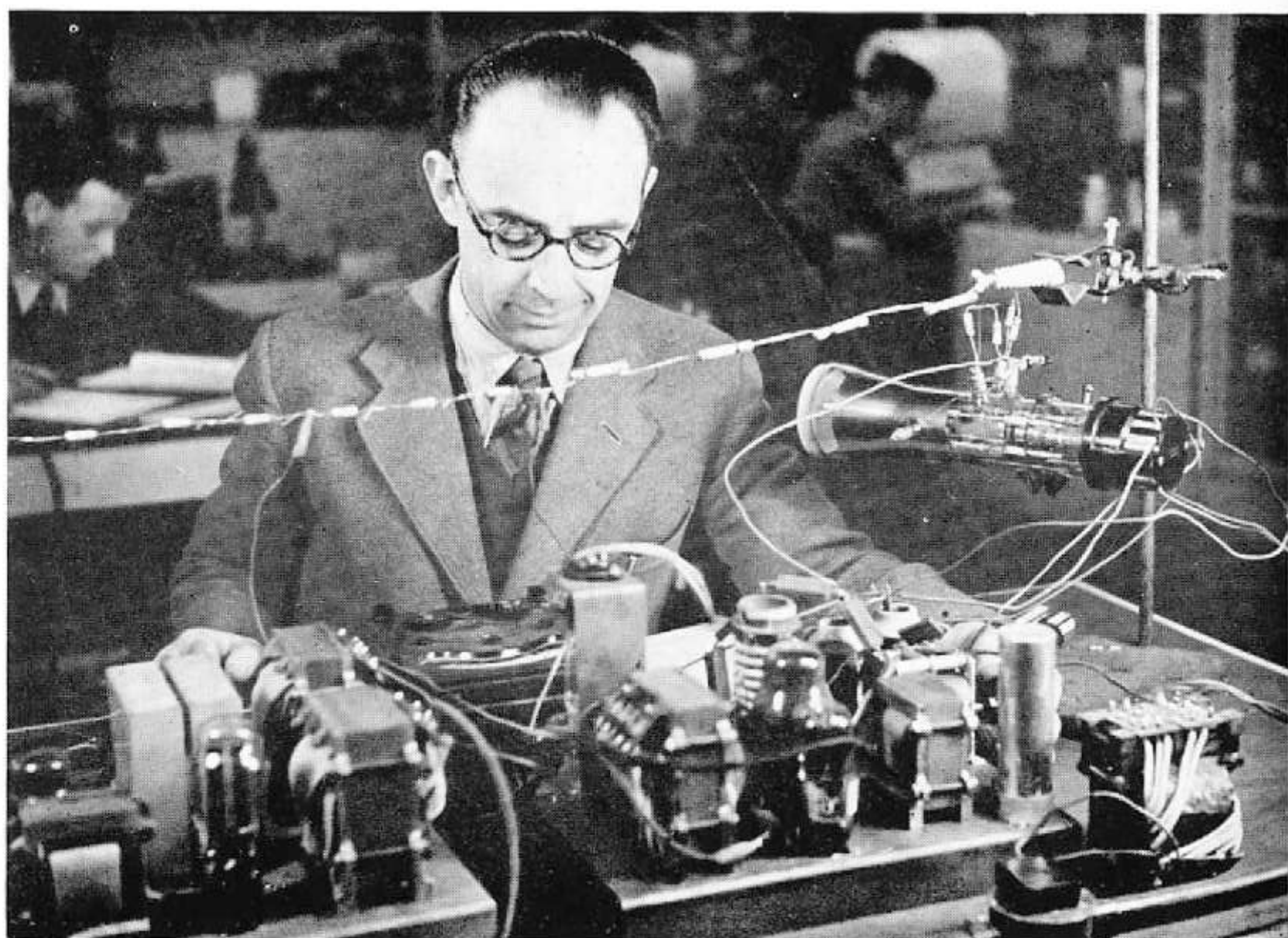
manufacturing processes perfected and quality production achieved.

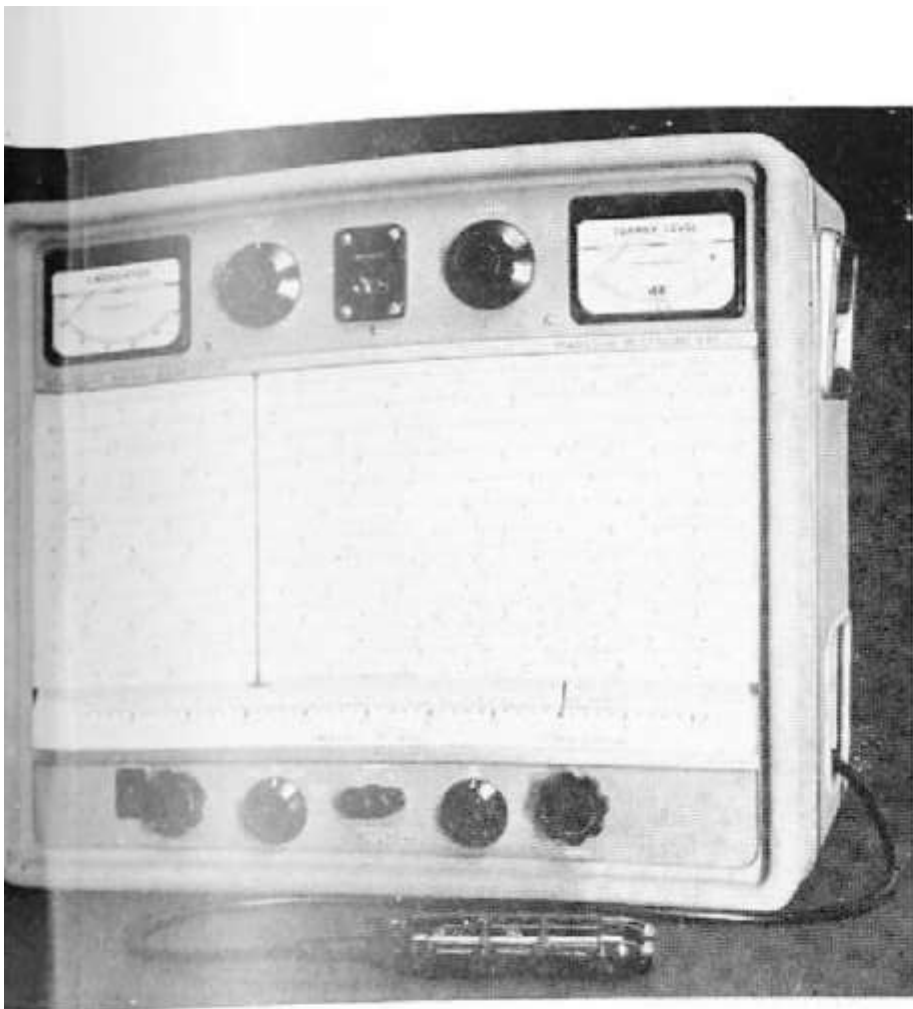
Where intended for medical applications, the apparatus supplied must conform to exacting standards, for the absolute safety of both patient and operator must at all times be assured. Soundness of design and workmanship, therefore, can hardly be over-emphasised and it is entirely logical that a Marconi company should excel in so exacting a branch of electrical engineering. Indeed, few firms have established a finer reputation.

TEST GEAR

To many engineers, the function of communications test gear is already well known and its uses appreciated. In industry, Universities, research establishments and telecommunications service stations the Instrument Company's signal generators are well to the fore together with equipment for frequency measurement. Bridges and oscillators

An early stage in the electrical design of a Marconi Instrument





A superlative example of instrument design—the Signal Generator TF 867

are additional specialities followed closely by others too numerous to mention.

In this sphere, day-to-day co-operation with Marconi's Wireless Telegraph Co. Ltd. is at its closest, for often a need for test equipment arises directly out of orders or contracts placed for Marconi transmitters or receivers. The sales divisions of both companies are in constant touch so that no opportunity is lost of offering the products of the subsidiary with those of the principals.

For radio and telecommunications, the range of instruments made is designed to satisfy the most varied technical requirements. The widest possible selection is therefore available to the customer so that, either for the utmost accuracy or the more routine measurement, an appropriate type can be supplied. Latterly the selection has been extended for the benefit of the service engineer who, particularly since the advent of television, cannot always make do with the cheap mass-produced article hitherto regarded as satisfactory.

INDUSTRIAL EQUIPMENT

Of the many electronic devices evolved those intended for the determination of

moisture content have an extensive sale at home and overseas: they enable once complicated tests to be made in the simplest fashion.

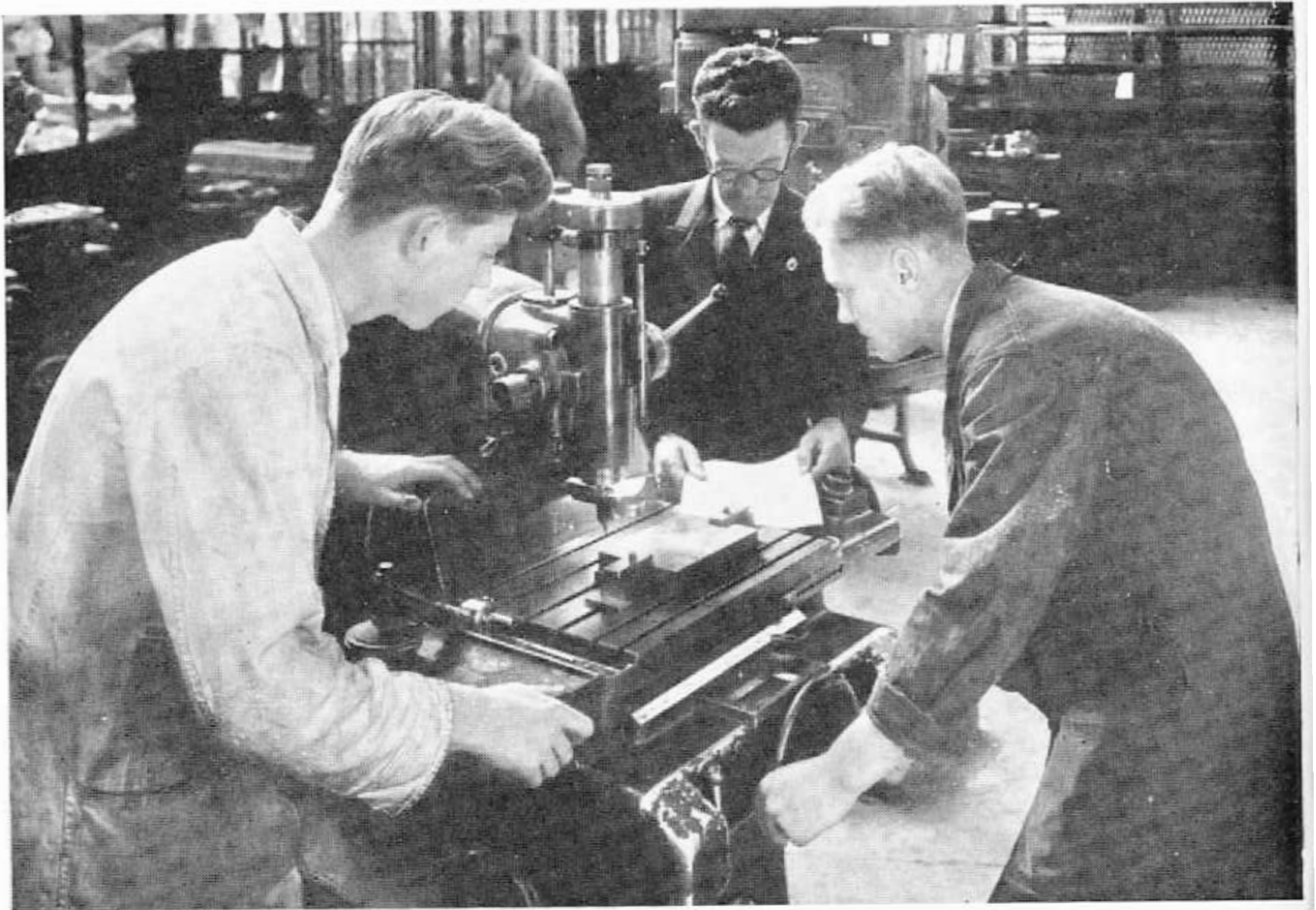
The same advantages apply in what is called "pH determination" the measurement of the acidity or alkalinity of an aqueous solution. The electrometric method exploited by Marconi pH Meters is a development far removed from the litmus paper tests with which most schoolboys are familiar.

Other functions of instruments for industry involve electronic counting, tests of plating thickness and the recording of electrolytic conductivity.

ELECTRO-MEDICAL APPARATUS

For many types of surgical procedure, the electrical cutting current is nowadays preferred; it often makes a positive contribution to the success of an operation. In a large number of hospitals, electro-surgery is carried out with the Marconi surgical diathermy; it provides a smooth cutting current and is completely dependable under operative conditions.

In the treatment of many nervous and muscular complaints penetrating heat is administered to the patient; it can be generated for the purpose by the Company's short-wave units known respectively as the Theracoupler and Thera-therm. Again, one of the problems arising at the onset of deafness is the correct assessment of the degree of the sufferer's disability, and here the Marconi "audiometer" is often employed in a series of diagnostic tests. Encompassing the audio range of frequencies, the instrument is calibrated in terms of Hearing Loss above and below the normal threshold of hearing. Exemplifying a modern technique is the Electro-Encephalograph by means of which cerebral disorders may be identified by the brain specialist even when undetected in clinical investigation. Head electrodes pick up minute potentials from the scalp and these are amplified and displayed in the form of char-



A machine shop foreman devotes part of his time to apprentices' training

acteristic waveforms on a paper chart. This instrument is often in the news especially during murder trials when the mental condition of the accused is open to doubt.

Yet another electro-medical equipment measures and controls the dosage applied in X-ray Therapy.

X-RAY UNITS

The value of X-ray diagnosis and therapy in combating ill-health requires no emphasis, and it will be appreciated that to cater for modern radiological practice, an extended range of units must be produced. It is the object of the Company to maintain in this branch of electronics the same recognition as it has earned in its other activities and to progress to the full in co-operation with

other members of the Group, the continued development of a vital science.

The foregoing paragraphs will, it is hoped, outline the scope and character of the Company's ramifications. In so brief a fashion it is, of course, impossible to present an intimate picture: the finished product, in almost every case, is of a highly technical nature and can only be fully described in scientific terms. Nevertheless, sufficient may have been said to indicate that there exists in Marconi Instruments Ltd. an organisation which, unrivalled in its particular field, has been developed to fill a national need: to provide the very best in electronics for our home industries, now independent of imported types and, in the process, to set a fine British standard of instrumentation throughout the world.