

the equipment makers

BRENELL

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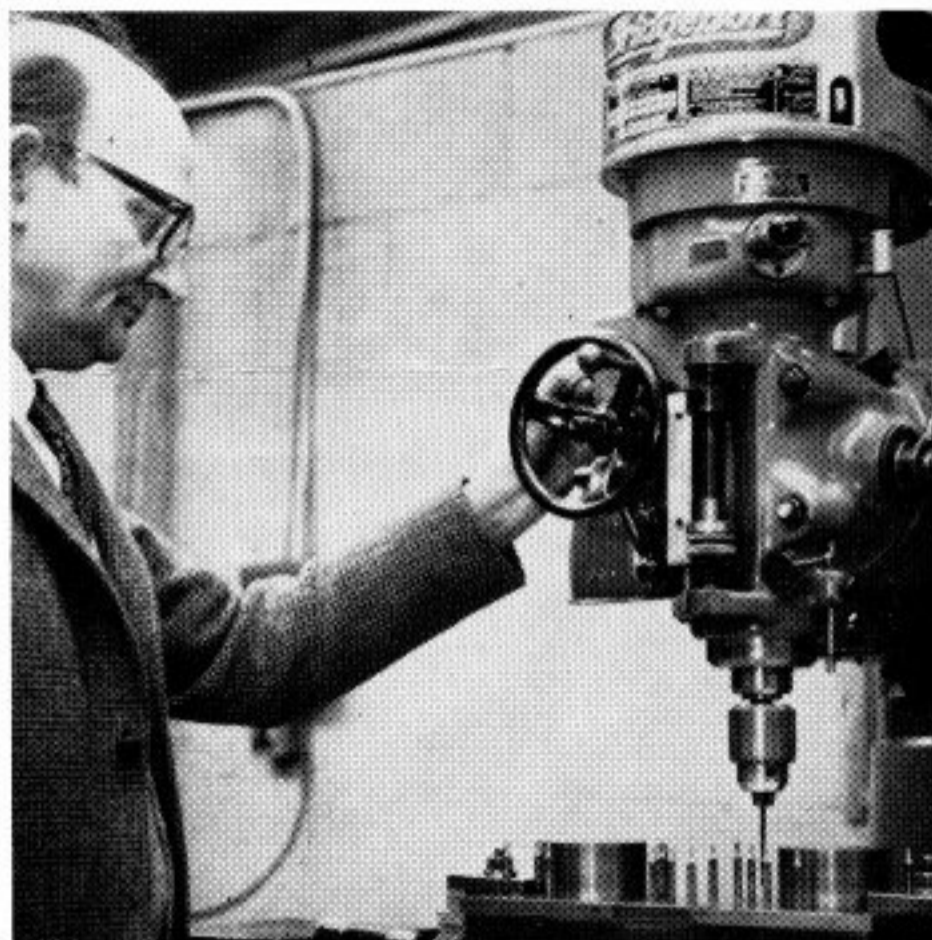
AT THE END of World War 2 millions of servicemen were looking for work in which they could use their new talents. Many of these had jobs to go back to, but this was not the case for Robert Hahn, a Czechoslovakian who had fought with the Royal Air Force and decided Britain had more to offer than his own country. Having a little capital and an engineering background, Robert Hahn pooled his resources with P Glaser, one of his airforce colleagues, to start a small precision engineering works. Called Brenell Engineering, the company undertook a variety of sub-contracting work ranging from relatively simple photographic equipment to telephone answering machines.

The First Tape Recorders

These were pretty advanced machines and prompted the firm's entry into the tape recorder business. Several of Britain's leading radio manufacturers approached Brenell Engineering for a domestic tape recorder design in the early 1950s. The idea was for a 'do-it-yourself' unit, no doubt triggered off by the highly successful television receiver kit which was being made at the time. It might not be appreciated, but the home construction requirement greatly added to the design problems, since the component parts had to be assembled by unskilled hands.

The challenge was met and a kit of parts

Preparation of the special machine tool used for punching the main tape deck assembly



under the trade name 'Soundmaster' proved a great success. It was in fact responsible for introducing many thousands to tape recording—a hobby then in its infancy. The quality of these kits, which were subsequently assembled by Brenell Engineering and sold under the company's own name, can be confirmed by the number still in use by veteran enthusiasts. This machine had a three motor deck arrangement, belt-driven flywheel and was one of the first decks with three speeds—15, 7½ and 3½ i.p.s.

The next major change took place in 1957 when the Mark 4 made its debut. This machine retained the well proven belt-driven flywheel arrangement, but had new motors which greatly improved wow and flutter figures.

Breakthroughs

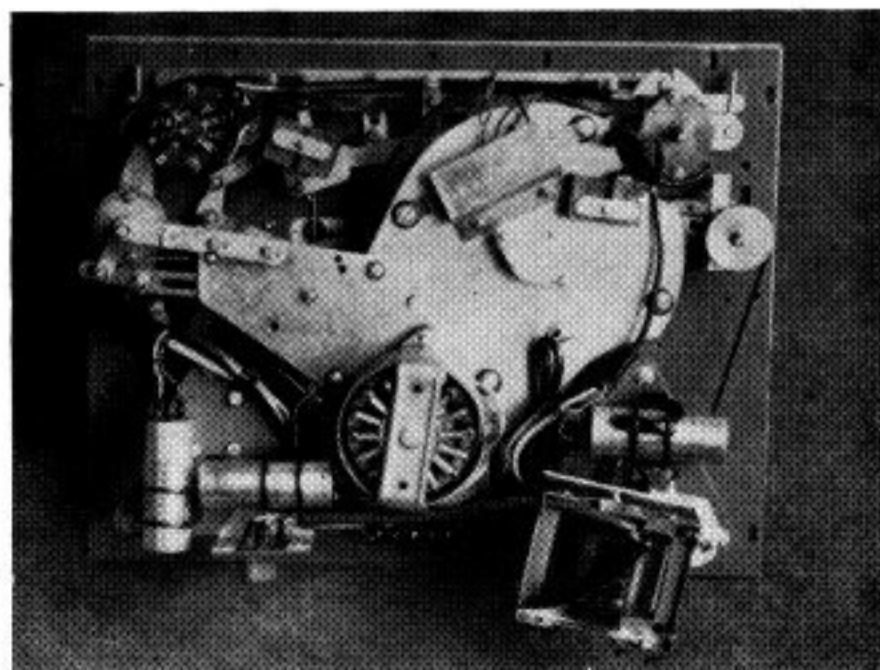
One of the breakthroughs, if it might so be called, happened when the brass flywheel gave way to a heavier aluminium unit which had been carefully cast to distribute most of its mass on to the periphery of the wheel.

Carefully balanced and driven from its widest circumference, wow and flutter figures dropped once again. Improved drive motors have, of course, played an important part in obtaining the present specification which features a wow and flutter figure of better than 0.05 per cent at 15 i.p.s.—a figure considered impossible with this class of machine only a few years ago. Brenell Engineering was the first British company to use the West German Papst hysteresis synchronous outer-rotor capstan motors which are now used by many prominent tape recorder manufacturers.

Many other noteworthy developments have taken place below deck. The braking system has, for example, had to be completely redesigned for the outer-rotor motors. Control facilities are also greatly improved. The latest pause control is, to quote J W Raine, the company's technical development engineer, 'really positive yet so simple it is a wonder we didn't think of it before'. Facilities for fitting up to four heads are still retained. On some machines, solenoid control is featured to meet the needs of the professional worker. Also some machines are available to accommodate 10½-inch spools.

Professional Market

Trying to get something different for the Radio Show several years ago the company exhibited a machine capable of taking the professional-size 10½-inch spools. The response was terrific. Several studios placed orders for the machine which was well below competitors in price and thought an ideal editing machine. The professional recordists were pleasantly surprised with the quality of the Brenell machines. Wow and flutter were remarkably low for this type of machine and it was not long before some studios were using them as work-horses. Hundreds of these machines are now in



Underside view of the Brenell quarter-track, three speed, tape deck unit which incorporates many features including three motors, lockable pause mechanism and back tension control.

service with professional organisations including the B.B.C., foreign broadcasting authorities, film studios, etc. Specials, including a studio model designed for mounting in standard 19-inch racking, are now made to meet the needs of the professional.

Hand-made Units

Every Brenell tape deck and unit is hand-made at the company's North London works. This enables the company to meet virtually every customer requirement. Even non-standard speeds and non-standard tape sizes can be catered for. There is, of course, some degree of standardisation to maintain quality at realistic prices. The tape deck chassis, for example, are punched in one operation. Some 50 holes ranging in size from a fraction of an inch up to nearly 3½ in. are cut through thick aluminium sheet with one stroke of a 45-ton press. The machine tool needed for this operation is made in the company's own machine shop which is responsible for the manufacture of all the specialist tools needed for production.

Another area calling for precision engineering is manufacturing the flywheel. Early flywheels were made of brass, but the rising cost of this material and new technology has seen the introduction of aluminium. This has made it possible to produce a

larger wheel with most of the weight on the periphery and thus obtain even greater stability of drive. The supporting spindles are machined to within one ten thousandth of an inch to ensure that wow and flutter is kept to a minimum.

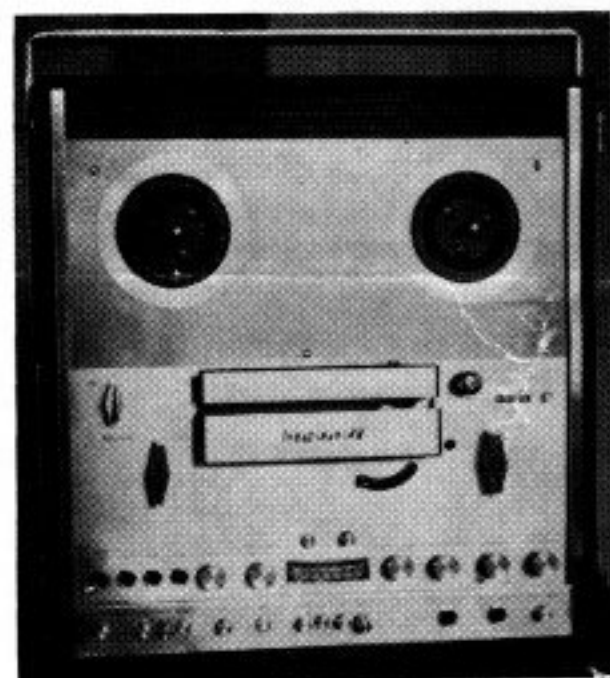
They say the proof of the cooking is in the eating and I must say I was very impressed with a simple demonstration enabling me to listen to tape and disc at a flick of a switch. Personally I could not detect any difference between the two outputs.

The associated electronics can be produced in either semiconductor or valve form. Brenell's maintain while there is still a requirement for valve equipment they should continue to fulfil this need. Transistors were introduced three years ago in the company's monitoring amplifiers and a completely transistored unit made its debut last year.

High Exports

Production is running at about 5,000 units a year and some 90 per cent of these are to fulfil export orders. Brenell machines are in operation throughout the world. Hundreds of machines have been sold to China and almost as many have gone to the African continent. Here they are being used by missionaries and broadcasting authorities for all types of recording. Reliability is one of the main selling points say Brenell. Several

are being used in the Australian outback and others in remote areas of Borneo.



Latest model from Brenell Engineering is the Mark 6 Type M. It features pickup, ceramic and magnetic compensated inputs and a high quality replay amplifier with a 15 watt output. A/B switching facilities are provided to enable the recording to be compared with the original

Wide Applications

At home the machines are being used in a variety of applications. One is that of recording the last minutes of critical patients in intensive-care wards. A little macabre, perhaps, but necessary if we are to make advances in the science of medicine. Another hospital application started five years ago when Brenell was approached by Dr L Knopp on behalf of the British Library of Tape Recordings for Hospital Patients. In this case the problem was of a technical nature, in that the library needed reliable equipment that would accept non-standard tape and operate at non-standard speeds—a requirement laid down to safeguard Authors and Publishers Copyright. Equipment to operate at 2 i.p.s. and accommodate 16mm tape was fully engineered in a matter of months and now treasured by hospital patients, especially those who are temporarily without sight.

Operation of the bed-side machine is very simple. There are only four controls—to stop and start the machine, select tracks and adjust the volume level. Outputs are provided for headsets and 'pillow-phones'. Ancillary equipment includes a large console for transferring materials from standard tapes to the library's 16mm stock. Editing facilities are provided.

Education authorities, cinemas, stores and supermarkets, shipping lines, aircraft constructors, Government departments, recording studios, film manufacturers are but a few of Brenell customers. Every new application is considered a challenge, never to be turned down. Technical advice is always forthcoming and for convenience of tape clubs, the company operates a demonstration room at its headquarters, 231-5 Liverpool Road, London N1.



*Left — the simple yet ultra-reliable unit produced for continuous music applications
Below is the editing console for producing special tapes for The British Library of Tape Recordings for Hospital Patients. These are made on 16mm tapes at a speed of 2 inches per second*

