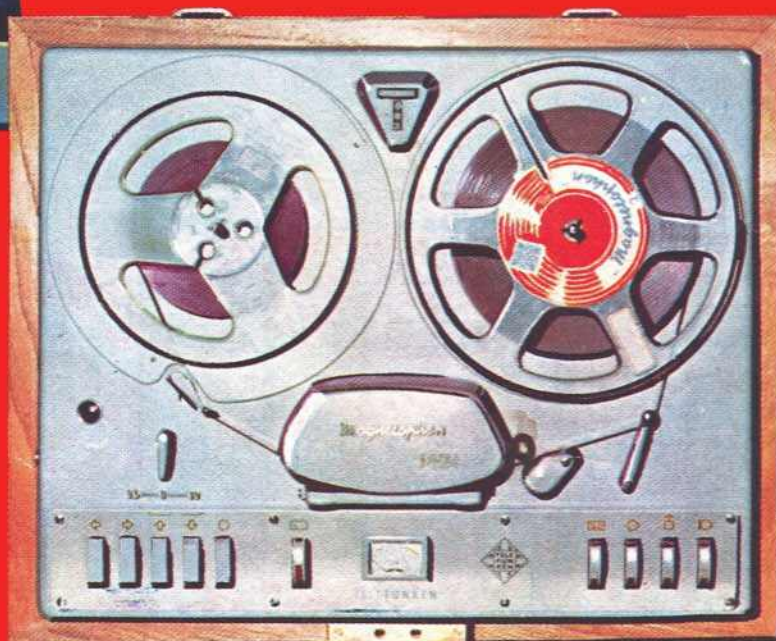


**AMATEUR**

# TAPE RECORDING

VOL. 6 No. 2 SEPTEMBER 1964 PRICE 2/-



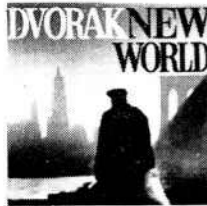
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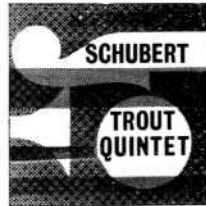
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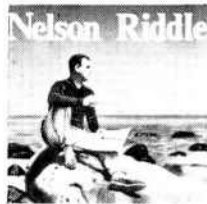
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**83** Devy Erlsh gives dazzling performance of Mendelssohn's Violin Concerto, plus Kreisler Memories. Ernest Bour conducts Sudwestfunk Orchestra.



**71** The smooth sound of the Nelson Riddle Orchestra in Touch of Your Lips, Body and Soul, The Tender Touch, As you Desire Me—11 favourites in all.



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**58** The fabulous dynamic Duke Ellington himself in eight great numbers including Stomping at the Savoy, In the Mood and Honeysuckle Rose.



**31** Rimsky-Korsakov: Scheherazade. Sir Eugene Goossens conducts the LSO in a breathtaking performance of this rich and exotic masterpiece. Also in stereo.



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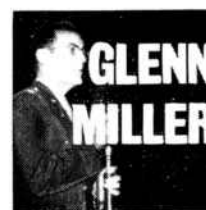
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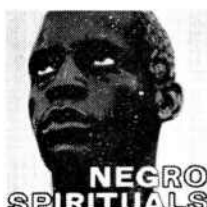
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**59** The silken voice of Nat King Cole in Walkin', Because You're Mine, You'll Never Grow Old, Baby Won't You Say You Love Me and 8 more.



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**42** Jericho, Swing Low, Shadrak... 12 of the best loved Negro Spirituals movingly sung by George Browne, Isabelle Lucas and Linden Singers. Also in stereo.



**54** Tchaikovsky's last and greatest symphony, is here given a splendidly moving rendering by the Sinfonia di London conducted by Muir Mathieson. Also in stereo.



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**40** Superb singing by Bruna Rizzoli and Giuseppe Savio with the chorus of the Teatro Nuovo di Milano and orchestra conducted by Napoleone Annovazzi.



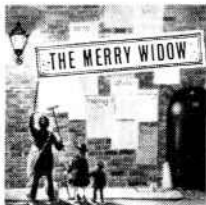
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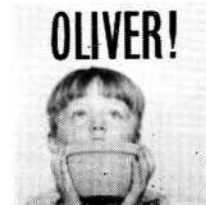
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**56** All the magic of old Vienna! Starring Jacqueline Delman, John Larsen, Linden Singers and Sinfonia di London conducted by John Hollingsworth. Also in stereo.



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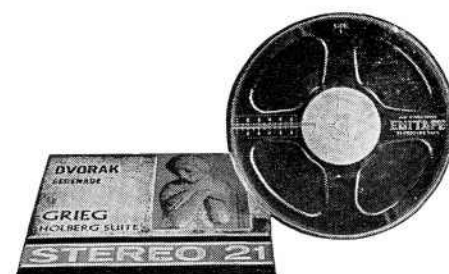
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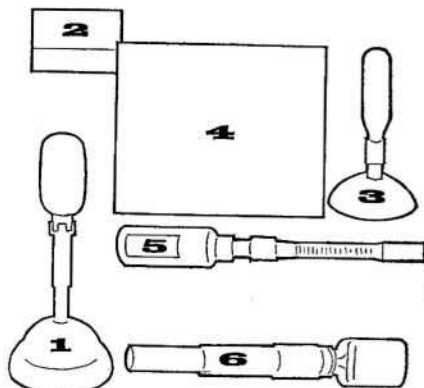
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Editor : F. C. Judd, A.Inst.E.

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### ON THE COVER



1. Shure 55S Cardioid Mic.
2. The Grampian "Mike 3" mixer.
3. The Lustraphone VR 64 ribbon mic.
4. The Telefunken M24 Studio tape recorder.
5. Sound-film ribbon mic.
6. Reslo ribbon mic.

Vol. 6, No. 2

September, 1964

# THE DISAPPEARING PROGRAMME

IT is with regret that we learn the B.B.C. programme "Sound" (network 3) is to come off the air. The last programme will have gone out on August 2nd with the repeat, if any, about a fortnight later and in which A.T.R. Editor F. C. Judd, with other members of the programme team, took part.

"Sound," which is a magazine programme for all tape recording, radio and hi-fi enthusiasts is to make way for continuous music programmes. We suspect this to be the outcome of a demand for more programmes of popular music on the Light Programme to offset the non-stop "pop" records churned out by coastal pirate radio stations. Undoubtedly there is a demand for non-stop music of one kind or another and it seems that the British Post Office, who control the issue of licences for broadcasting are taking a short-sighted view of this situation. Authorised commercial broadcasting would obviate the necessity for business groups to operate transmitters without licences. The already increasing amount of pirate broadcasting can only endanger the operation of existing radio services in any case. A.T.R. welcomes opinions from readers, NOT on the subject of pirate broadcasting, but as to whether or not the "Sound" programme, which is for your particular interest, should be reprieved. Remember we nearly lost it about a year ago and only because of popular demand was it allowed to continue. The enthusiastic programme team, under the direction of Richard Keen the producer, had planned a whole new series of major interest. Are we to let "Sound" disappear, perhaps this time for good?

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# THE MODERN MICROPHONE

**F. C. JUDD, A.Inst.E., SURVEYS THE MICROPHONE WORLD**



**T**HERE are basically three kinds of microphones in use today, the crystal microphone, the least expensive of all, the dynamic or moving coil type and the velocity or ribbon type. There are combinations of these, principally the dynamic and ribbon types, which provide specific characteristics. All the many different types and makes available, except possibly the very cheapest, are capable of a high standard of performance. For example a crystal microphone costing in the region of £3 to £4 has a fairly wide and level frequency response and is probably the most popular of all the microphones used for tape recording. The more discriminate enthusiast may use a dynamic or ribbon microphone, the prices of which vary quite considerably, but which are capable of that extra smoothness in response and overall quality.

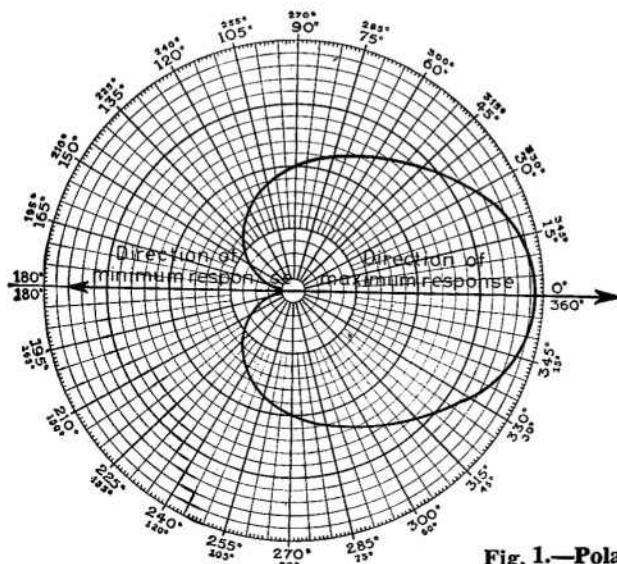
Some of the characteristics of microphones are common to each other, frequency response, sensitivity, impedance for instance, but there is one important characteristic that should always be considered when

buying a microphone. This is the *polar response* or the *directivity*. This simply means the sensitivity of the microphone in different directions around it. An omnidirectional instrument is one which responds with equal sensitivity in all directions around it. Most crystal and dynamic microphones have this kind of directivity. Then we have the cardioid microphone, so called because the sensitivity or polar response curve is heart shaped as in Fig. 1.

The cardioid microphone is most sensitive in the forward and side directions and least sensitive to the rear. This can be used to great advantage in the recording, to eliminate unwanted sound or to reduce sound from a given direction, or to accentuate sound from a given direction. Cardioid microphones are frequently used in public address work to reduce sound pick up from the rear which is normally facing the audience.

The ribbon or velocity microphone normally has a polar response which looks like a figure of eight as shown in Fig. 2. Here the sensitivity is greatest to both the front and the rear and lowest to the sides. This microphone has a 'cosine' polar response, sometimes referred to as bi-directional. (Not to be confused with co-axial stereo microphones). Again the peculiar pattern can be put to use to accentuate or eliminate wanted or unwanted sound respectively. It is greatly favoured for music recording and ribbon microphones generally have a wider and smoother frequency response.

By now some expert reader will have decided that I have forgotten the condenser microphone. This has been deliberately segregated as it is a microphone that is not much used by tape recording enthusiasts, although at one time the Grundig Company used to issue a condenser microphone with their recorders. The modern condenser microphone is now more widely used in the studio and for broadcasting, and high grade instruments of this type are extremely expensive. Moreover they require special amplifiers and have to be energised with a D.C. voltage. However, a tape recording enthusiast



**Fig. 1.—Polar Response of a 'Cardioid' Microphone.**



who can afford a good condenser microphone can at least say he has the best. Perhaps it should be mentioned that at least one firm, the Nu-Sound Recording Company, are able to supply a condenser microphone kit (see directory of microphones).

### FREQUENCY RESPONSE AND IMPEDANCE

The frequency response and general sensitivity of any microphone depends somewhat on cost and application. Usually the cheaper the microphone the narrower the frequency response, although some crystal microphones for instance have a fairly wide response, but these may not necessarily be even over the entire range. The next most important characteristic to consider is the impedance of a microphone. Many tape recorders nowadays have microphone input impedances of around 200 ohms and consequently there are many microphones

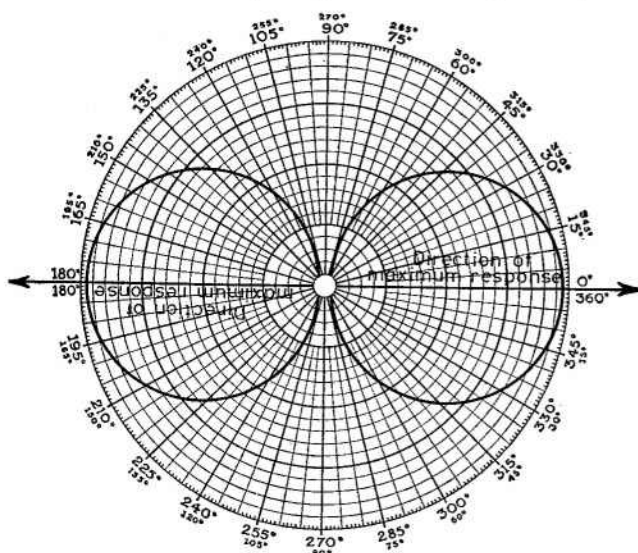


Fig. 2.—Polar Response of a Ribbon Microphone.

to choose from with this impedance. When you purchase a new microphone, make sure you know the input impedance at the microphone socket(s) of your tape recorder or mixer. It does not follow that a microphone of that impedance must be purchased. One could use a low impedance microphone (30 to 50 ohms) with a suitable matching transformer giving a 30 to 50 ohm transfer to 200 ohms or if the impedance of the microphone socket is high a 200 ohm microphone could be used with a 200 ohm to high transformer. Crystal microphones which have a very high impedance by the way, cannot be matched into a lower impedance with a transformer. A special impedance matching amplifier would be required.

It is sometimes advantageous to use low impedance microphones since they can be used with long cables. If high impedance microphones are used with long cables there is a risk of frequency and sensitivity loss as well as hum pick up.

In addition to all the microphones listed in the directory it would be as well if I now select a few representa-



Fig. 3.—The Acos Mic 60 Crystal Microphone.

tive types that are popular with tape recording enthusiasts. These will be taken in alphabetical order and accordingly begin with ACOS. The Acos Mic.39 and Mic.60 are now available as ceramic types as well as crystal. Ceramic microphones are not so greatly affected by temperature and are probably more suitable for tropical use. The Mic.60 crystal mic shown in Fig: 3 has a smooth and wide frequency response and will match directly into any high impedance microphone socket on a tape recorder. If you are looking for a compact 'lapel' microphone not too expensive, the Mic 55 ceramic type shown in Fig: 4 should fill the bill. This is a low impedance microphone and will work satisfactorily with portable recorders, having input impedances around 1,000 ohms.

The A.K.G. range is as extensive as any could be and there is a wide range of types to choose from. The D9C shown in Fig: 5 is an excellent dynamic microphone with omnidirectional polar response and has alternative high or low impedance output. The frequency response is smooth over the range 80-12,000 c/s and therefore

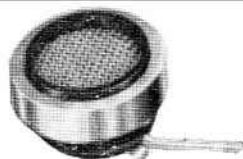


Fig. 4.—The Acos Mic 55 Crystal lapel microphone

particularly suitable for tape recorders operating at slow speeds where maintenance of frequency response is important. The A.K.G. range also includes some really high quality microphones, such as the popular D19C. This is a table stand microphone (detachable stand for hand use) with a smooth flat response from 40-16,000 c/s. It has adjustment for close talking or singing and a cardioid polar response. A highly suitable microphone for tape recording under difficult acoustic conditions.

Another manufacturer with an extensive range is the BEYER COMPANY whose microphones are distributed in the U.K. by Fi-Cord International. Those seeking a high quality studio microphone will be interested in the M.69 moving coil directional microphone (cardioid) which has a frequency response 50-16,000 c/s. and is shown in Fig. 6. Output impedance is 200 ohms but special matching transformers are available to suit another input impedance. The Beyer M.160 is also a high quality instrument and has a double ribbon element (Fig. 7). It is intended for studio use and costs £45-14-5 for the 50K.ohm model or £45-7-8 for the 200 ohm model. Frequency response is 50-18,000 c/s. and it has a cardioid polar response. There are of course other Beyer microphones at lower prices such as the M52R, the M50 and M55 which has a table stand.

GRAMPIAN is a name as well known as the type number of one of their own microphones, namely the DP4. This microphone is popular with all tape recordists but few may know that it is now available with three different impedances, low 25 ohms, medium 600 ohms, and high 50K.ohms. There is also a DP2 moving coil available with the same range of impedance matching. Grampian also produce two high grade ribbon microphones known as the GR1 and GR2 which are available with different impedance outputs as above (Fig. 8). The GR1 and GR 2 are similar and have a frequency response which is flat from 40 to 15,000 c/s.

A microphone reflector is a must for all outdoor recordists and the Grampian is about the only one at present available (Fig. 10). I recently carried out a check on the polar pattern and gain of this reflector using a pulsed signal of 3,000 c/s. and two different microphones. The relative gain for an ordinary crystal microphone and a Grampian DP4 and the respective polar patterns are shown in Fig. 11. This shows quite clearly the great advantage of a microphone reflector and its ability to practically eliminate unwanted sound from other directions and to build up the wanted sound without the attendant noise of high gain microphone amplifiers.

GRUNDIG have a range of microphones essentially for Grundig tape recorders but some of these like the GM12 and GDM121 have alternative impedances of 200 and 50K.ohms (high).

The GDSM202 stereo microphone may also be of interest since this too has an alternative output impedance, 200 ohms or 50K.ohms. It is a moving coil microphone or rather two microphones with a cosine or figure-of-eight polar response. The two microphones are placed one above the other co-axially and this is of course the ideal system for stereo recording. The microphones can also be rotated to increase or decrease the angle between them. Grundig also make a stereo mixer etc., without wires. Miniature FM transmitters are used for this which operate on frequencies specially allocated under licence by the G.P.O. The system is used extensively by theatres and film studios etc., but is rather beyond the reach of the average tape recording enthusiast.

However, LUSTRAPHONE have a range of microphones that cater for domestic recording as well as studio use. Of these the Ribbonette VR64 and the Studio VR53 are probably the most popular. The Ribbonette will provide that extra quality at low cost for it is a high quality ribbon instrument available with

Fig. 5. — The A.K.G D9C Omnidirectional microphone.



Fig. 6.—The BEYER M 69 moving coil cardioid microphone.



Fig. 7.—The BEYER M160 Double ribbon cardioid microphone.





different output impedances. The Studio VR53 caters for those with professional standards in mind for it is a microphone often used for studio work. Lustraphone also do a full range of microphone stands and many other accessories as well as a transistorized mixer. Their catalogue is well worth writing for.

**PHILIPS ELECTRICAL** need little introduction either, for they are also world famous for sound recording equipment. Their range of microphones covers domestic as well as professional recording and public address. From the tape recording accessories catalogue I have



**Fig. 8.—The GRAMPIAN GR1(2) Ribbon microphone.**

taken the EL3755 cardioid moving coil microphone as representative of the better quality types for home recording. It has a frequency response from 150 to 10,000 c/s, and is suitable for all tape recorders with a low impedance (500 ohms) microphone input. The Philips EL3784 stereo microphone is also one with low impedance output and a wide frequency range. The two microphones are co-axially aligned which makes for the best stereo effect. Owners of Philips tape recorders will be especially interested in the tape recorder accessories catalogue which is available on request.

**RESLOSOUND** microphones are all high grade types but most popular with the enthusiasts who set out to achieve quality approaching the professional standard.

September, 1964

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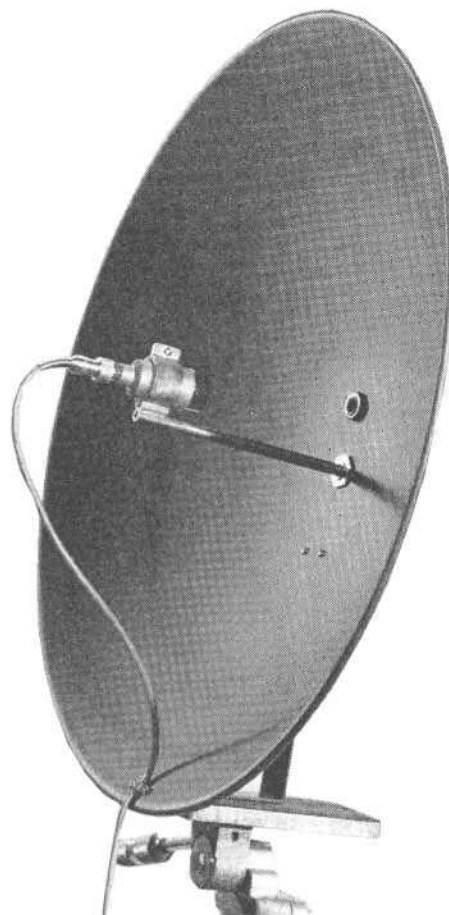
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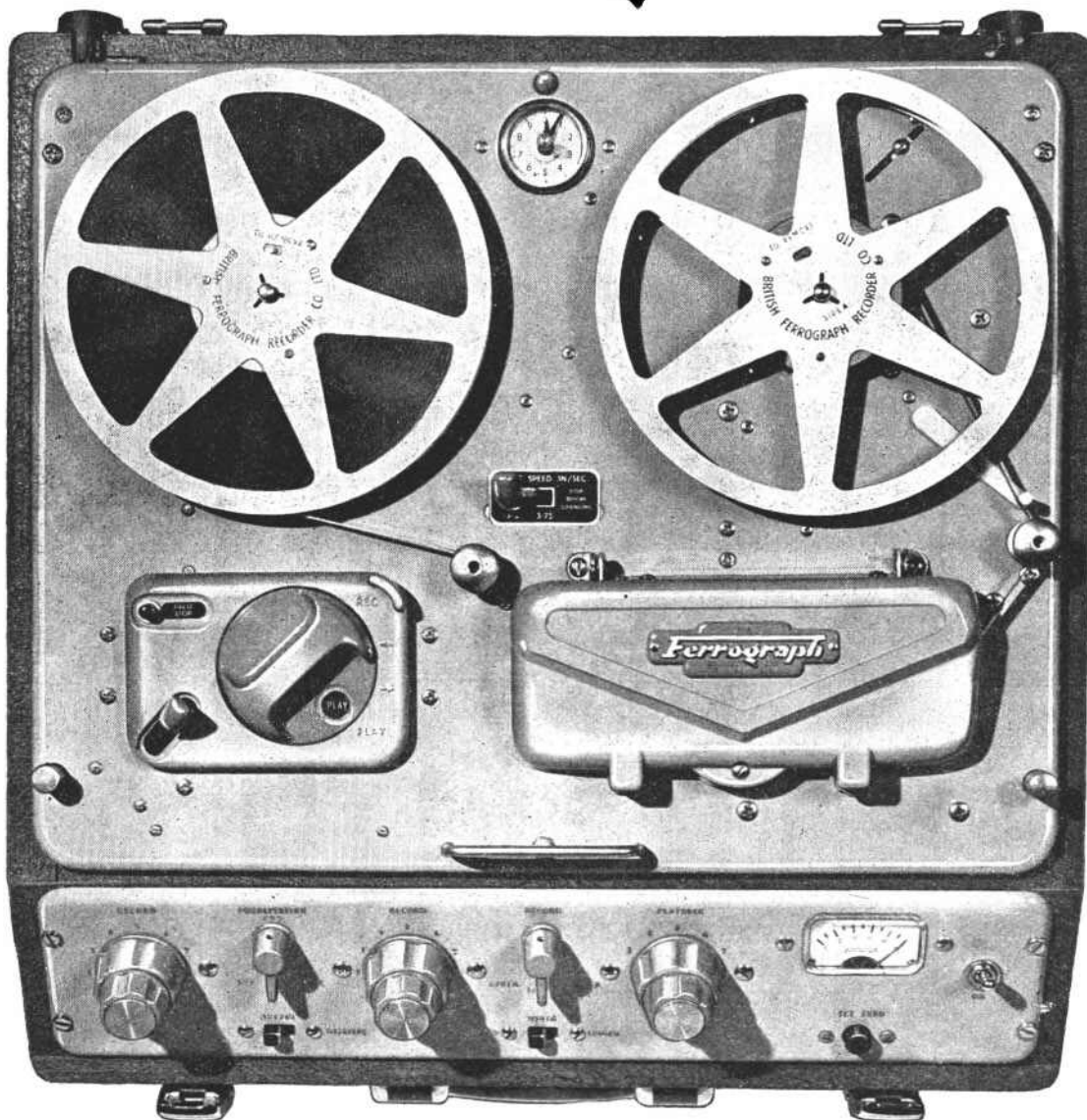
**Fig. 10.—The GRAMPIAN microphone reflector with  
a DP6 mic.**

Reslo microphones are used quite extensively in studios but perhaps those used most frequently by the keen amateur are the miniature ribbon types RBT and RBTS. These two microphones are similar and the RBTS is shown in Fig. 9. Another representative Reslo microphone is the ribbon pencil type PD which has a smooth response between 50 and 15,000 c/s. It is an omnidirectional microphone available with impedances of 35-50, 250, 600 and 40,000 ohms (high). It is shown in Fig. 12 and is suitable for stand mounting. With a plastic stand holder this high grade microphone costs only 10 guineas. The Reslo RBT costs £10 2s. 0d., but this price varies slightly as others according to the impedance required.

**TELEFUNKEN** microphones for domestic tape recording are essentially for Telefunken tape recorders. The D19C however, at £19 10s. 0d., is a first grade microphone that warrants mention for it is a directional dynamic type that comes complete with table stand. It has an impedance of 200 ohms and a balanced output to match the microphone input circuit of the Telefunken M24 recorder. The TD7 is an inexpensive microphone that will operate with most makes of tape recorder for



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(Monophonic/Stereophonic)

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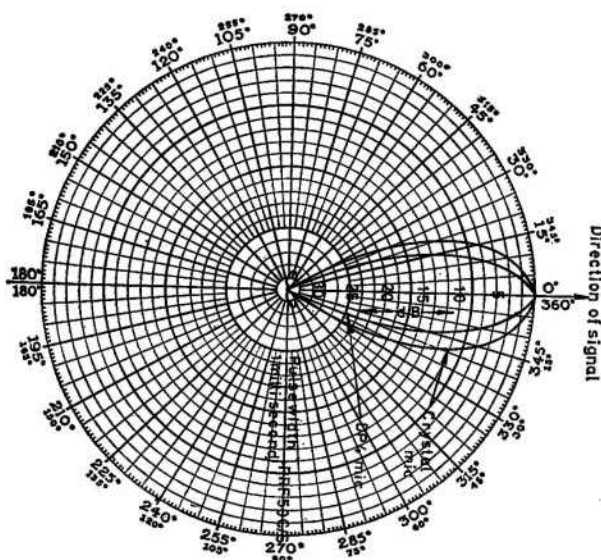
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AT.15

Fig. 11.—Polar pattern and gain with a Grampian microphone reflector.



it is a dual impedance type—200 ohms and high—and is priced at only £2 10s. 0d. This is a new model specially marketed for domestic tape recording.

The TANNOY range is better known to public address engineers but they now have some new models which have been specially developed for high quality sound recording. Among these are the Slendalyne models which include moving coil, ribbon types, with

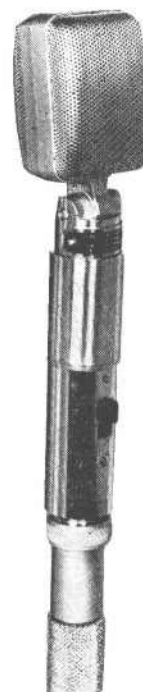


Fig. 9.—The Reslosound Type RBTS miniature ribbon microphone.

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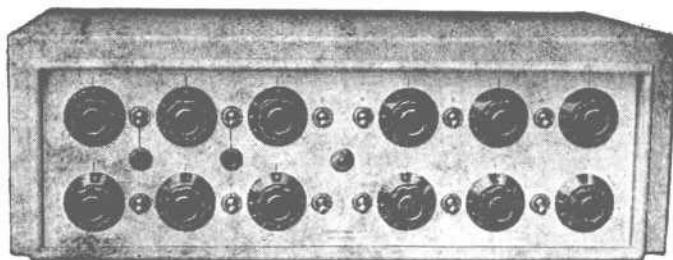
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# **—Vortexion**

## **quality equipment**

The 12-way electronic mixer has facilities for mixing 12 balanced line microphones. Each of the 12 lines has its own potted mumetal shielded microphone transformer and input valve, each control is hermetically sealed. Muting switches are normally fitted on each channel and the unit is fed from its own mumetal shielded mains transformer and metal rectifier.



**12-WAY ELECTRONIC MIXER**

### **FOUR-WAY ELECTRONIC MIXER**

This unit provides for 4 independent channels electronically mixed without "spurious break through", microphony hum and background noise have been reduced to a minimum by careful selection of components. The standard 15-50 ohm shielded transformers on each input are arranged for balanced line, and have screened primaries to prevent H.F. transfer when used on long lines.

The standard 5 valve unit only consumes 18.5 watts, H.T. is provided by a selenium rectifier fed by low loss, low field, transformer in screening box. The ventilated case gives negligible temperature rise with this low consumption, assuring continuance of low noise figures.

20,000 ohms is the standard output impedance, but the noise pick-up on the output lines is equivalent to approximately 2,000 ohms due to the large amount of negative feedback used.

For any output impedance between 20,000 ohms and infinity half a volt output is available. Special models can be supplied for 600 ohms at equivalent voltage by an additional transformer or 1 milliwatt 600 ohms by additional transformer and valve.

The white engraved front panel permits of temporary pencil notes being made, and these may be easily erased when required. The standard input is balanced line by means of 3 point jack sockets at the front, but alternative 3 point connectors may be obtained to order at the rear.

|  |         |
|--|---------|
| Mixer for 200-250V A.C. Mains ...  | £40 8 6 |
| Extra for 600 ohm output model ...   | £1 18 6 |
| Extra for 600 ohm 1 milliwatt output ...   | £3 0 6  |
| Size 18½in. wide × 11½in. front to back (excluding plugs) × 6½in. high. Weight 22lb. |         |

### **THREE WAY MIXER & peak programme meter, for recording and large sound installations, etc.**

This is similar in dimension to the 4-Way Mixer, but has an output meter indicating transient peaks by means of a valve voltmeter with a 1 second time constant in its grid circuit.

The meter is calibrated in db, zero db being 1 milliwatt-600 ohm (.775V.) and markings are provided for +10db and -26db. A switch is provided for checking the calibration. A valve is used for stabilising the gain of this unit.

The output is 1 milliwatt on 600 ohms for zero level, up to +12db maximum. An internal switch connects the output for balance, unbalance, or float. This output is given for an input of 40 microvolts on 15 ohm.

An additional input marked "Ext. Mxr." will accept the output of the 4-Way Mixer converting the unit into a 7-Way controlled unit. This input will also accept the output of a crystal pick-up, but no control of volume is available.

The standard input is balanced line by means of 3 point jack sockets at rear, but alternative 2 point connectors may be obtained to order at the front or rear as desired.

The 8 valves and selenium rectifier draw a total of 25 watts.

P.P.M. for 200-250V. A.C. Mains ... Price on application.

Size 18½in. wide × 11½in. front to back (excluding plugs) × 6½in. high. Weight. 23 lb.

10/15 watt Amplifier with built-in mixers.

30/50 watt Amplifier with built-in mixers.

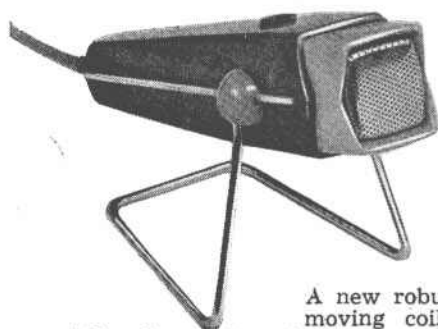
2 × 5-way stereo mixers with outputs for echo chambers, etc.

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## TD300 TELEFUNKEN

Specially designed for the new Telefunken Magnetophon 300 portable. A high quality moving coil dynamic microphones with cardioid characteristics, 60 - 14,000 c.p.s. response, a built-in level meter and music/voice switch. Always choose Telefunken microphones... they put the best into any tape recorder. See the wide range at your dealer, including the D11C Dynamic Directional Microphone 8 gns., the D19C Dynamic Directional Wide Response Microphone £19 10s and the D66 Stereo Microphone 12 gns.

★ Only one thing can improve the quality of a Telefunken microphone: a Telefunken mixer! Have you seen one yet? There is an 85/- monaural twin-channel unit that integrates with the majority of Telefunken tape recorders. Then there is the £17 Trick-Mixer 77 for models 77 and 97, and of course, the fabulous Reverberation mixer for top professional results... echo and all manner of mixing effects... for £45. Mix your sound with Telefunken. It sounds better that way.



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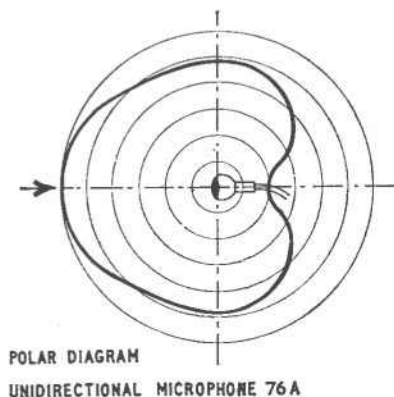


Fig. 12.—The RESLO type-PD pencil ribbon microphone.

cardioid and cosine polar responses. Prices are not yet available but the specifications show these microphones to be in the high grade range. Each is available with a choice of three different output impedances — 30-50 ohms, 600 ohms and high.

Last but not least are the **TRIX** microphones. These too have high grade types of sound recording. The G7871/D is a moving coil type at £7 15s. 0d., and very suitable for amateur work as is also the G7823 ribbon microphone at £9 12s. 6d., if you are looking for something a little more pretentious. Those who seek something of really top grade at a lower than usual price might favour the unidirectional (cardioid) dynamic microphone model M76A. This retails at £19 15s. 0d., and the actual polar response is shown in Fig. 13. It has a frequency of 100-15,000 c/s and a low output impedance.

Fig. 13—  
Polar  
response  
of the  
**TRIX**  
type 76A  
microphone



## A. Lester-Rands answers some of the questions on microphone mixers.

**A**SIDE from microphone stands, matching transformers, cables and plugs, etc., all of which are mentioned in the ATR directory this month there is that very worthwhile accessory the microphone mixer. These are still something of a mystery to many tape recording enthusiasts, perhaps more so to the newcomer. What does a mixer do, what advantages does it have, is it a costly device and can I use one with my tape recorder? A few of the questions most people ask about the microphone mixer.

Its true function lies in its name for it will mix the signals from one, two or more microphones together with music from a radio or disc record or another tape recorder. A properly designed mixer also functions as a pre-amplifier to the microphone signals and the output is usually high enough for direct connection to a high level signal input socket on the tape recorder itself, i.e.,

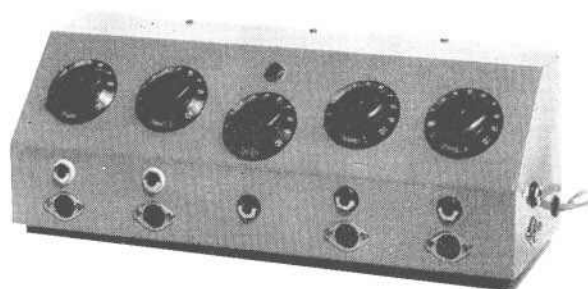


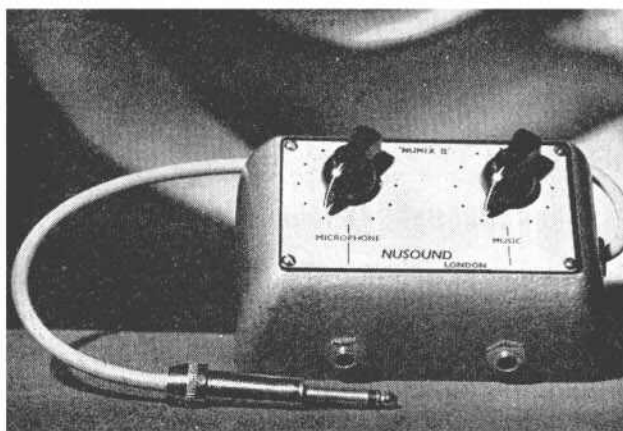
Fig. 2 The Esimix Major. 4 Channel Mixer for mains operation.

# MICROPHONE MIXERS

the socket usually marked *radio* or *gram* and on high grade recorders often marked 'line' or '600 ohms'. A mixer with its own pre-amplifiers for the microphones will also have a power supply, mains for a valve mixer, batteries for a transistorised mixer. These are usually incorporated within the instrument.

A mixer has many advantages for the more serious recording amateur for it allows two or three microphones or other signal sources to be faded in or out independently, as well as actual mixing with the gain or volume control set to any pre-determined level. Some recorders do of course have a built-in dual mixing arrangement for one microphone and a high level signal such as that from a radio tuner, and which is adequate

Fig. 1. The NuMix Mk. 2 resistive mixer for mic. and radio.



for simple mixing of speech and music. The three or four channel mixer extends this facility very considerably but does of course mean an extra, though very worthwhile, outlay. The majority of mixers at present available do however, operate satisfactorily with all tape recorders, although there may be a few cases where impedance matching and/or lack of a suitable socket into which to feed the mixer, may present some difficulty. Your dealer or tape recorder or mixer manufacturer will advise. Otherwise, write to A.T.R.

Now let's take a look at a few of the mixers now available. First there are the NuMix units of which the Mk.1 is a special resistive mixer for use with Ferrograph tape recorders. This allows full mixing of one microphone and a radio or gramophone pick-up. The NuMix Mk.2 is a two channel resistive mixer that can be used with the microphone socket of any tape recorder and which will mix a microphone and one other signal such as from a radio, or tape recorder, etc. This is shown in Fig. 1, but it must be emphasised that it does not incorporate a microphone pre-amplifier as do the more usual types of mixer mentioned in this article. The NuMix Mk.3 however, is a transistorised mixer for two microphone and/or other signal sources and can be used with a high level (radio or gram) socket on a tape recorder since it has an output of approximately 400 milli-volts. Microphone inputs are for 30 to 600 ohms microphones.

The Heathfield series 2 Audio Mixer is also distributed by NuSound Recording Co., Ltd., the makers of the NuMix units. This is a new mixer of robust design and available with three microphone inputs and one high level input (high impedance) or with similar inputs at low impedance. It has a built in power supply for



mains operation and a cathode follower output. There are of course many other features about this mixer that make it desirable and details of these can be obtained from the NuSound Recording Co., Ltd.,

The Esimix range also embraces various models of high quality mixers as for instance the Esimix Major shown in Fig. 2. This is self powered (mains supply) and is available with two microphone and two high level inputs or four microphone inputs. It has a master fader and provision for monitoring. The Esimix Minor is of similar design available with two microphones and two high level inputs or four microphone inputs. It has no master fader or monitoring socket and requires an external supply such as the Esimix power unit. These mixers have cathode follower outputs and can be used with long cables to the tape recorder. Details from Esisolder Iron Co., Ltd., (addresses of manufacturers mentioned in this article will be found in the directory in this issue).

Fi-Cord owners will by now be familiar with the Fi-Cord mixer designed for use with the Fi-Cord 202 but which can be used with other portable machines. This is a two microphone and one line (high level signal) mixer which employs transistors and is powered from an internal battery. A report on this was recently published in A.T.R. Details from Fi-Cord International Limited.

Another transistor mixer of merit is the Grampian 'Mike 3' model also transistorized and available for

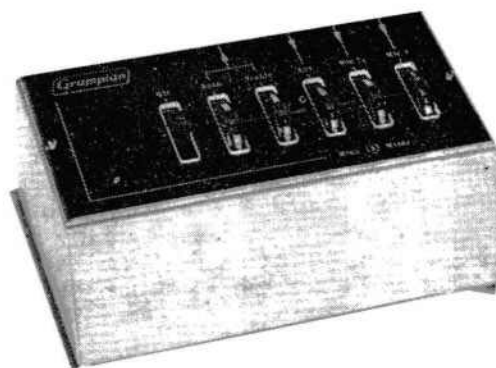
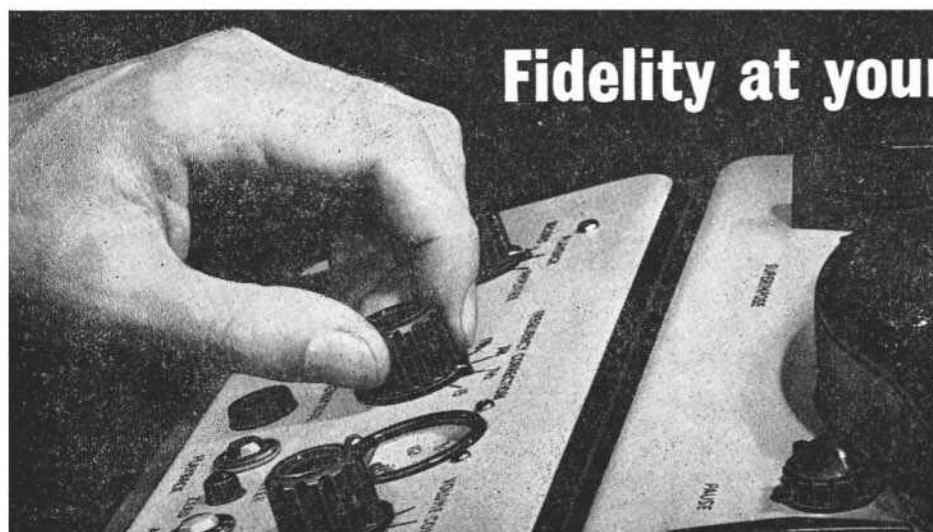


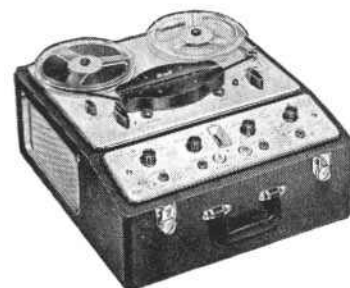
Fig. 3 The Grampian 'Mike 3' 4-channel transistorized mixer.

different microphone impedances. It will take two microphones and one high level signal. This mixer was also reviewed recently in A.T.R. and is completely portable since it is powered by an internal battery. It is shown in Fig. 3 and is manufactured by Grampian Reproducers Limited, who will send full details on request.

Yet another transistor mixer is the Lustraphone MU577/4 which is also portable because of its internal battery supply. The MU577/4 is available with the



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For full details of the complete range of mono and stereo models write to the sole manufacturer:—



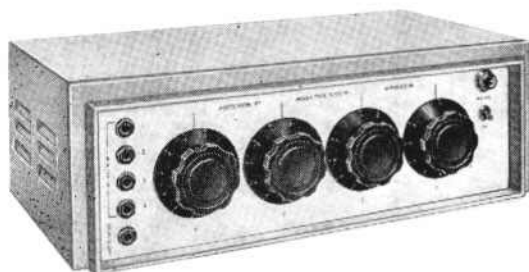
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GD814



**Fig. 4 The Vortexion Studio Mixer with 4 inputs for microphones.**

following input and output arrangements:— 4 low impedance inputs and high impedance output; 4 low impedance inputs and low impedance out; 4 low impedance inputs and line impedance output. Frequency response 50 to 15,000 c/s. This mixer also operates with the Lustraphone Radiomic system. Details from Lustraphone Limited.

The Vortexion mixers, which are high grade studio units and naturally fairly expensive, should also be included. First there is the type 4/15/M which has four mixing inputs and is shown in Fig. 4. It is a mains operated unit with a high standard of performance. There are other Vortexion mixers of course but in view of the high cost and special application of the instruments interested readers are advised to write to Vortexion Limited for specifications and prices etc.

This short survey of microphone mixers is intended to show only representative types. There are others listed in the microphone and accessories directory.

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# MICROPHONE DIRECTORY

A.T.R. presents this up to-date directory of microphones, mixers, and other accessories

| Make   | Type    | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price   |
|--|---------|----------------|--------------------------|------------------|---------|
| Acos Mic.39  | Crystal | Omni           | 80-1,000 ± 3dB           | 200 or 50,000    | £7 10 0 |
| Acos Mic.39/1  | Crystal | Omni           | 30-12,000                | high             | £3 3 0  |
| Acos Mic.40  | Crystal | Omni           | 30-7,000                 | high             | £1 15 0 |
| Acos Mic.44  | Crystal | Stereo         | 50-12,000                | high             | £6 6 0  |
| Acos Mic.45  | Ceramic | Omni           | 30-8,000                 | high             | —       |
| Acos Mic.45  | Crystal | Omni           | 30-8,000                 | high             | £2 0 0  |
| Acos Mic.55  | Crystal | Omni           | 30-10,000                | high             | £2 2 0  |
| (Inpel mic)<br>(available as ceramic or magnetic mic.) |         |                |                          |                  |         |
| Acos Mic.60  | Crystal | Omni           | 30-10,000                | high             | £2 2 0  |
| (stick mic)<br>(available as ceramic or magnetic mic.) |         |                |                          |                  |         |
| Manufacturers : Cosmord Ltd., Waltham Cross, Herts.    |         |                |                          |                  |         |

|                   |             |          |           |           |         |
|-------------------|-------------|----------|-----------|-----------|---------|
| Electrovoice 649B | Moving coil | Omni     | 70-10,000 | 50 to 250 | £24 0 0 |
| Electrovoice 655E | Moving coil | Omni     | 40-20,000 | 50-250    | £45 0 0 |
| Electrovoice 666  | Moving coil | Cardioid | 40-14,000 | 50-250    | £55 0 0 |

Manufacturers : K.E.F. Electronics Ltd., Tovli, Maldstone, Kent.

|  |           |                 |           |               |          |
|--|-----------|-----------------|-----------|---------------|----------|
| A.K.G. D.7A  | Dynamic   | Omni            | 80-11,000 | 200 or 80,000 | £4 4 0   |
| A.K.G. D.9C  | Dynamic   | Omni            | 80-12,000 | 200 or 50,000 | £4 14 6  |
| A.K.G. D.11C   | Dynamic   | Cardioid        | 80-12,000 | 200 or 50,000 | £6 0 0   |
| A.K.G. D.12  | Dynamic   | Cardioid        | 40-15,000 | 200 or 60     | £28 0 0  |
| A.K.G. D.17  | Dynamic   | Cardioid (P.A.) | 50-14,000 | 200 or 60     | £21 0 0  |
| A.K.G. D.19  | Dynamic   | Cardioid        | 40-16,000 | 200 or 60     | £17 10 0 |
| A.K.G. D.24B   | Dynamic   | Cardioid        | 30-16,000 | 200 or 60     | £55 0 0  |
| (The price of these microphones varies according to grading) |           |                 |           |               |          |
| A.K.G. D.20B   | Dynamic   | Cardioid        | 30-16,000 | 200 or 60     | £49 15 0 |
| A.K.G. D.58  | Dynamic   | Anti-noise      | 70-12,000 | 200 or 60     | £10 10 0 |
| A.K.G. D.77A   | Dynamic   | Stereo          | 80-13,000 | 200 or 60     | £13 0 0  |
| A.K.G. C.60  | Condenser | Cardioid        | 30-18,000 | 400           | £84 0 0  |
| A.K.G. DK.7A   | Dynamic   | Mic. capsule    | 80-11,000 | 200           | £2 10 0  |

Manufacturers : Politechna (London) Ltd., 3 Percy Street, London, W.1.

|             |                |           |            |            |          |
|-------------|----------------|-----------|------------|------------|----------|
| Beyer M.23  | Dynamic M/C    | Cardioid  | —          | 200        | £9 15 3  |
| Beyer M.26  | Dynamic M/C    | Omni      | —          | 200        | £14 0 0  |
| Beyer M.41  | Dynamic M/C    | Cardioid  | 70-12,000  | 200        | £11 18 3 |
| Beyer M.42  | Dynamic M/C    | Omni      | 100-14,000 | 200        | £7 15 6  |
| Beyer M.50  | Dynamic M/C    | Omni      | 60-13,000  | 200 or 50K | £4 7 3   |
| Beyer M.51  | Dynamic M/C    | Omni      | 100-9,000  | 200 or 50K | £4 10 9  |
| Beyer M.55  | Dynamic M/C    | Omni      | —          | 200        | £5 8 1   |
| Beyer M.57  | Dynamic M/C    | Hand mic. | —          | 200        | £9 14 2  |
| Beyer M.61  | Dynamic M/C    | Cardioid  | 70-12,000  | 37 or 200  | £15 15 0 |
| Beyer M.62  | Dynamic M/C    | Cardioid  | —          | 200        | £6 16 0  |
| Beyer M.64  | Dynamic M/C    | Cardioid  | 70-12,000  | 200 or 50K | £13 0 0  |
| Beyer M.69  | Dynamic M/C    | Cardioid  | —          | 200        | £24 13 0 |
| Beyer M.88  | Dynamic M/C    | Cardioid  | —          | 200        | £44 11 8 |
| Beyer M.100 | Dynamic M/C    | Omni      | —          | 37 and 200 | £44 5 0  |
| Beyer M.119 | Dynamic M/C    | Omni      | 50-16,000  | 27 and 200 | £15 15 0 |
| Beyer M.130 | Dynamic ribbon | Co-line   | 40-18,000  | 200        | £45 3 0  |
| Beyer M.160 | Ribbon         | Cardioid  | —          | 200        | £45 8 0  |

Manufacturers : Gramplan Reproducers Ltd., Hanworth Trading Estate, Feltham, Middlesex.

| Make         | Type        | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price    |
|--------------|-------------|----------------|--------------------------|------------------|----------|
| Beyer M.219  | Dynamic M/C | Omni           | —                        | 200              | £16 10 1 |
| Beyer M.260  | Ribbon      | Cardioid       | 50-18,000                | 200 or 50K       | £21 5 0  |
| Beyer M.52TR | Moving coil | Omni           | —                        | high             | £5 3 10  |
| Beyer M.62TR | Moving coil | Cardioid       | —                        | high             | £7 5 4   |
| Beyer M.44   | P.A. mic.   | Cardioid       | 300-14,000               | 200              | —        |

There are various other Beyer microphones as well as alternatives to those listed above i.e., with different impedances. Details available on application.

U.K. Distributors : Fi-Cord International Ltd., 40A Dover Street, London, W.1.

|                   |             |          |           |           |         |
|-------------------|-------------|----------|-----------|-----------|---------|
| Electrovoice 649B | Moving coil | Omni     | 70-10,000 | 50 to 250 | £24 0 0 |
| Electrovoice 655E | Moving coil | Omni     | 40-20,000 | 50-250    | £45 0 0 |
| Electrovoice 666  | Moving coil | Cardioid | 40-14,000 | 50-250    | £55 0 0 |

Manufacturers : K.E.F. Electronics Ltd., Tovli, Maldstone, Kent.

|              |             |      |           |        |         |
|--------------|-------------|------|-----------|--------|---------|
| Elipico 1110 | Crystal     | Omni | 40-12,000 | high   | £5 12 6 |
| Elipico M.51 | Crystal     | Omni | 40-12,000 | high   | £3 7 6  |
| Elipico M.66 | Moving coil | Omni | 50-14,000 | low 30 | £9 9 0  |

(also available with stands)

U.K. Distributors : Lee Products Ltd., 10-18 Clifton Street, London, E.C.2.

|               |             |         |           |              |         |
|---------------|-------------|---------|-----------|--------------|---------|
| Film Ind.M.7  | Moving coil | Omni    | 60-9,000  | 20           | £7 15 0 |
| Film Ind.M.8  | Ribbon      | Co-line | 50-12,000 | up to 57,000 | £8 15 0 |
| Film Ind.M.8A | Ribbon      | Co-line | 50-12,000 | up to 57,000 | £8 0 0  |
| Film Ind.M.9  | Ribbon      | Co-line | 50-12,000 | up to 57,000 | £6 12 6 |

Manufacturers : Film Industries Ltd., 90 Belsize Lane, London, N.W.3.

|                  |           |          |            |                    |         |
|------------------|-----------|----------|------------|--------------------|---------|
| Gramplan DP.2    | P.A. mic. | —        | —          | 15                 | £6 10 0 |
| Gramplan DP.2/M  | P.A. mic. | —        | —          | 600                | £7 10 0 |
| Gramplan DP.2/H  | P.A. mic. | —        | —          | high 50K           | £8 0 0  |
| Gramplan DP.4/L  | Dynamic   | Omni     | 50-15,000  | 20                 | £8 0 0  |
| Gramplan DP.4/X  | Dynamic   | Omni     | 50-15,000  | 200                | £9 0 0  |
| Gramplan DP.4/M  | Dynamic   | Omni     | 50-15,000  | 600                | £9 0 0  |
| Gramplan DP.4/H  | Dynamic   | Omni     | 50-15,000  | 50,000             | £9 0 0  |
| Gramplan DP.6/L  | Dynamic   | Omni     | 200-15,000 | 25                 | £8 0 0  |
| Gramplan DP.6/X  | Dynamic   | Omni     | 200-15,000 | 200                | £9 0 0  |
| Gramplan DP.6/M  | Dynamic   | Omni     | 200-15,000 | 600                | £9 0 0  |
| Gramplan DP.6/H  | Dynamic   | Omni     | 200-15,000 | 50,000             | £9 0 0  |
| Gramplan GR1 & 2 | Ribbon    | Cardioid | 40-15,000  | 20,200,600 and 50K | £10 5 0 |

(various stands and mountings available)

Manufacturers : Gramplan Reproducers Ltd., Hanworth Trading Estate, Feltham, Middlesex.



# MICROPHONE DIRECTORY Cont.

| Make        | Type           | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price               |
|-------------|----------------|----------------|--------------------------|------------------|---------------------|
| Reslo MPD   | Pencil dynamic | Omni           | 50-15,000                | 30-50            | See previous column |
| Reslo VMC.2 | P.A. mic.      | —              | 100-15,000               | 15               | various             |
| Reslo THM.1 | Telecom mic.   | —              | —                        | —                | —                   |

Manufacturers : Reslo Sound Ltd., 24 Upper Brook Street, London, W.1.

|            |          |          |           |             |          |
|------------|----------|----------|-----------|-------------|----------|
| Shure 245  | Ceramic  | Cardioid | 50-7,000  | high        | £11 13 4 |
| Shure 545  | Dynamic  | Cardioid | 50-15,000 | 50 and high | £28 6 8  |
| Shure 540S | Dynamic  | Omni     | 60-10,000 | 50 and high | £16 13 4 |
| Shure 430F | Magnetic | Omni     | 60-10,000 | 30 and high | £13 0 0  |
| Shure 555  | Dynamic  | Cardioid | 50-15,000 | various     | £27 13 4 |

Distributors : Shure Electronics Ltd., 84 Blackfriars Road, London, S.E.1.

|               |         |         |           |              |         |
|---------------|---------|---------|-----------|--------------|---------|
| Simon Cadenza | Ribbon  | Co-sine | 30-14,000 | low and high | £8 15 0 |
| Simon Cadenza | Crystal | Omni    | 30-8,000  | high         | £3 13 6 |

Manufacturers : Simon Equipment Ltd., 46 George Street, London, W.1.

|             |             |          |           |    |          |
|-------------|-------------|----------|-----------|----|----------|
| S.T.C. 4021 | Moving coil | Omni     | 30-15,000 | 30 | £24 0 0  |
| S.T.C. 4033 | Composite   | Cardioid | 30-10,000 | 30 | £54 0 0  |
| S.T.C. 4015 | Moving coil | Cardioid | 60-10,000 | 30 | £22 10 0 |
| S.T.C. 4113 | Ribbon      | Cardioid | 60-12,000 | 30 | £11 11 0 |

There are many other S.T.C. microphones but they are mostly high grade studio types.

Prices and details on application.

Manufacturers : Standard Telephones & Cables Ltd., Electro-magnetic Division, Harlow, Essex.

|                   |         |      |   |             |         |
|-------------------|---------|------|---|-------------|---------|
| Stern-Clyne DM303 | Dynamic | Omni | — | high        | £5 5 0  |
| Stern-Clyne BM3   | Crystal | Omni | — | high        | £1 19 6 |
| Stern-Clyne DX29  | Dynamic | Omni | — | high        | £2 19 6 |
| Stern-Clyne DM301 | Dynamic | Omni | — | high        | £4 19 6 |
| Stern-Clyne DM304 | Dynamic | Omni | — | high or low | £4 9 6  |
| Stern-Clyne DM107 | Dynamic | Omni | — | high        | £3 9 6  |
| Stern-Clyne CM30  | Crystal | Omni | — | high        | £1 19 6 |

Manufacturers : Stern Clyne Ltd., 23 Tottenham Court Road, London, W.1. and branches.

|                   |                 |          |           |             |                       |
|-------------------|-----------------|----------|-----------|-------------|-----------------------|
| Tannoy MC/420/8   | Moving coil     | Omni     | 100-6,000 | 600         | Prices on application |
| Tannoy MR/435/S   | Velocity        | —        | 50-7,000  | 600         |                       |
| Tannoy MC/440/S   | Moving coil     | Omni     | 30-12,000 | 600         |                       |
| Tannoy MR425/S    | Velocity        | Co-sine  | 60-7,000  | 600         |                       |
| Tannoy Slendalyne | Ribbon          | Cardioid | 50-13,000 | 30,600 high |                       |
| Tannoy Slendalyne | Moving coil     | Omni     | 30-17,000 | 30,600 high |                       |
| Tannoy Slendalyne | Velocity ribbon | Co-sine  | 40-12,000 | 30,600 high |                       |

Manufacturers : Tannoy Ltd., Norwood Road, London, S.E.27.

|             |             |             |           |    |          |
|-------------|-------------|-------------|-----------|----|----------|
| Trix G.7871 | Moving coil | Omni        | 50-8,000  | 30 | £7 15 0  |
| Trix G.7823 | Ribbon      | —           | 50-12,000 | 30 | £9 12 6  |
| Trix G.7809 | Moving coil | Hand mic.   | —         | —  | £6 15 0  |
| Trix M.88   | Dynamic     | Pencil mic. | —         | —  | £26 10 0 |
| Trix M.76A  | Dynamic     | Cardioid    | —         | —  | £19 15 0 |
| Trix G.7852 | Dynamic     | Pencil mic. | —         | —  | £9 5 0   |
| Trix G.7854 | —           | Pencil mic. | 50-11,000 | 30 | £7 7 0   |

Manufacturers : Ultra Electronics Ltd., Brunel Road, London, W.3.

| Make            | Type        | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price    |
|-----------------|-------------|----------------|--------------------------|------------------|----------|
| Grundig GDM.12  | Moving coil | Omni           | 100-11,000               | 200 and 55       | £7 7 0   |
| Grundig GDM.18  | Moving coil | Omni           | 100-11,000               | 200 and 55       | £7 7 0   |
| Grundig GDM.202 | Moving coil | Stereo         | 80-15,000                | 200 and 55       | £14 14 0 |
| Grundig GDM.121 | Moving coil | Omni           | 50-16,000                | 200 and 40       | £22 1 0  |
| Grundig GDM.125 | Ribbon      | Cardioid       | 50-15,000                | 200 and high     | £24 3 0  |
| Grundig GDM.300 | Moving coil | Omni           | 150-11,000               | 4,000            | £4 4 0   |

Manufacturers : Grundig (G.B.) Ltd., Newlands Park, Sydenham, London, S.E.26.

|                     |             |         |            |              |          |
|---------------------|-------------|---------|------------|--------------|----------|
| Lustraphone D.159BS | Moving coil | —       | 150-14,000 | low-600-high | £11 11 0 |
| Lustraphone LP.62   | Dynamic     | —       | —          | 30 and 1,000 | £3 7 6   |
| Lustraphone LV.59   | Moving coil | —       | 150-14,000 | low-600-high | £8 18 6  |
| Lustraphone LD.66   | Moving coil | —       | 70-12,000  | low-600-high | £4 2 6   |
| Lustraphone LD.61   | Moving coil | —       | 70-12,000  | low-600-high | £3 7 6   |
| Lustraphone LX.65   | Crystal     | —       | 30-8,000   | high         | £2 10 0  |
| Lustraphone C.48    | Moving coil | —       | 56-8,000   | 20           | £6 6 0   |
| Lustraphone C.51    | Moving coil | —       | 50-8,000   | low-600-high | £7 17 6  |
| Lustraphone VR.64   | Ribbon      | —       | —          | low-600-high | £12 12 0 |
| Lustraphone VR.70   | Ribbon      | —       | 50-14,000  | low-600-high | £15 15 0 |
| Lustraphone VR.70L  | Ribbon      | Co-sine | 50-14,000  | —            | £31 10 0 |
| Lustraphone VR.65   | Ribbon      | Stereo  | 50-13,000  | —            | £9 19 6  |
| Lustraphone VR.53   | Ribbon      | —       | —          | low-600-high | £15 15 0 |
| Lustraphone VR.65NS | Ribbon      | Stereo  | 50-13,000  | —            | £8 18 6  |
| Lustraphone TH59-SB | Moving coil | —       | 150-14,000 | —            | £9 19 6  |

Manufacturers : Lustraphone Ltd., St. George's Works, Regents Park Road, London, N.W.1.

|                    |             |                |   |             |         |
|--------------------|-------------|----------------|---|-------------|---------|
| Philips ET.1045    | Moving coil | Omni           | — | 50          | £13 0 0 |
| Philips EL.6014/00 | Moving coil | (with trans.)  | — | 500 and 25K | £8 0 0  |
| Philips EL.6014/01 | Moving coil | (w/out trans.) | — | 500 and 25K | £6 0 0  |
| Philips EL.6021    | Moving coil | Omni           | — | high        | £14 0 0 |
| Philips EL.6031/50 | Moving coil | Cardioid       | — | 500 and 25K | £17 0 0 |
| Philips EL.6022    | Moving coil | Cardioid       | — | 60          | £18 0 0 |
| Philips EL.6040/03 | Moving coil | Omni           | — | high        | £25 0 0 |
| Philips EL.6061/02 | Dynamic     | Noise          | — | 500         | £7 15 0 |
| Philips EL.6121    | Moving coil | cancelling     | — | 50 and 10K  | £12 0 0 |

Manufacturers : Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

|                    |             |          |            |      |                       |
|--------------------|-------------|----------|------------|------|-----------------------|
| Philips EL.3753/00 | Crystal     | Omni     | 150-10,000 | high | Prices on application |
| Philips EL.3755    | Moving coil | Cardioid | 500        | 500  |                       |
| Philips EL.3784    | Moving coil | Stereo   | 500        | 500  |                       |
| Philips EL.3782/00 | Moving coil | Cardioid | 150-10,000 | 500  |                       |
| Philips EL.3756/00 | Moving coil | Omni     | 150-10,000 | 500  |                       |

Manufacturers : Philips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

|            |               |          |            |              |                                 |
|------------|---------------|----------|------------|--------------|---------------------------------|
| Reslo RBT  | Ribbon        | Co-sine  | 30-16,000  | low-600-high | All these prices on application |
| Reslo CR2  | Ribbon        | Cardioid | 60-16,000  | low-600-high |                                 |
| Reslo PR   | Pencil ribbon | —        | 50-16,000  | various      |                                 |
| Reslo RL1  | —             | Cardioid | 100-16,000 | various      |                                 |
| Reslo SR.1 | Ribbon        | Co-sine  | 30-20,000  | various      |                                 |
| Reslo VRT  | Ribbon        | —        | 30-16,000  | various      |                                 |
| Reslo PD   | Dynamic       | Omni     | 50-15,000  | various      |                                 |

Manufacturers : Ultra Electronics Ltd., Brunel Road, London, W.3.



**TRY IT  
YOURSELF,  
THERE IS  
NOTHING  
LIKE D 12**

Because the D 12 dynamic directional microphone with cardioid characteristic has no tendency for developing feedback when loudspeakers are located near the microphone. And if you want more brilliance, fuller bass, crystal clear transparency and higher volume ask for the D 12. Excellent sensitivity and magnetic shielding. Frequency response 40—50,000 cps, 18 db front to back ratio. Price: £34.0.0.

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Amalgamated Wireless (Australasia) Ltd., Sydney, Wellington — Connoisseur Records Ltd., Dublin — Caldwell A-B Equipment Co. Ltd., Toronto 5. — International Aeradio (East Africa) Ltd., Nairobi — David Pollock (Pty) Ltd., Johannesburg — A. Rajab & A. Silsilah, P.O. Box 203, Jeddah — Soundrite Ltd., Singapore, Penang, Kuala Lumpur — The China Engineers Ltd., Hong Kong.

# MICROPHONE DIRECTORY Cont.

| Make                 | Type | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price    |
|----------------------|------|----------------|--------------------------|------------------|----------|
| Telefunken TD7       | —    | —              | —                        | 200 and high     | £2 10 0  |
| Telefunken D11C      | —    | —              | 80-12,000                | 200 and high     | £2 8 0   |
| Telefunken D66       | —    | Stereo         | 80-15,000                | 200              | £12 12 0 |
| Telefunken D19C      | —    | —              | 40-16,000                | 200 and high     | £19 10 0 |
| Telefunken D19/BK200 | —    | —              | 40-16,000                | 200              | —        |

Distribution: Welmes Corp. Ltd., 27 Chancery Lane, London, W.C.2.

## SPECIAL MICROPHONES

Nu-Sound Microkit 2 — Condenser microphone kit with amplifier. Omnidirectional. Output 400 ohms. Frequency response 20-20,000 c/s. Price 28 guineas.

Distribution: Nu-Sound Recording Co. Ltd., 93 Mortimer Street, London, W.1.

Lustraphone Radio Mic. System — Special microphone F.M. transmitting and receiving equipment for operation on frequencies allocated by the G.P.O. for stage, film studio and other special uses. Details and prices on application.

Manufacturers: Lustraphone Ltd., St. George's Works, Regents Park Road, London, N.W.1.

## MICROPHONE ACCESSORIES

### MICROPHONE MIXERS

| Make   | Type                          | Mic. Channels | High Level Channels | Power     | Price    |
|--------|-------------------------------|---------------|---------------------|-----------|----------|
| Esimix | Major 1                       | 2             | 2                   | Internal  | £19 19 0 |
| Esimix | Major 2                       | 4             | —                   | Internal  | £21 0 0  |
| Esimix | Minor 1                       | 2             | 2                   | External  | £12 12 0 |
| Esimix | Minor 2                       | 4             | —                   | External  | £13 13 0 |
| Esimix | Power Supply for Minor mixers | —             | —                   | 230-250v. | £3 13 6  |

Manufacturers: Esisolder Iron Co. Ltd., 98 Dominion Road, Worthing, Sussex

| Fi-Cord | TM. 11 | 2 | 1 | Int. battery | on application |
|---------|--------|---|---|--------------|----------------|
|---------|--------|---|---|--------------|----------------|

|          |          |             |   |           |          |
|----------|----------|-------------|---|-----------|----------|
| Gramplan | Mike 3/L | 2 (25 ohm)  | 1 | batteries | £21 10 0 |
| Gramplan | Mike 3   | 2 (400 ohm) | 1 | batteries | £19 10 0 |
| Gramplan | Mike 3/H | 2 (50K ohm) | 1 | batteries | £21 10 0 |

|         |            |                             |           |          |
|---------|------------|-----------------------------|-----------|----------|
| Grundig | Stereo 608 | Mic. and radio each channel | batteries | £18 18 0 |
|---------|------------|-----------------------------|-----------|----------|

|            |   |          |   |            |       |
|------------|---|----------|---|------------|-------|
| Heathfield | — | 3 (high) | 1 | mains int. | 27gu. |
| Heathfield | — | 3 (low)  | 1 | mains int. | 34gu. |

Distributors: Nu-Sound Recording Co., 93 Mortimer Street, London, W.1.

| Make        | Type     | Polar Response                                      | Frequency Response (c/s)           | Impedance (ohms) | Price                |
|-------------|----------|---|------------------------------------|------------------|----------------------|
| Lustraphone | MU577/4  | 4   | available various input impedances | batteries        | price on application |
| Nusound     | Nunmix 1 | Mic/radio mixer for Ferrograph recorders            | —                                  | —                | £4 7 6               |
| Nusound     | Nunmix 2 | Mic/radio mixer                                     | —                                  | —                | £6 10 0              |
| Nusound     | Nunmix 3 | 2-Channel: mic or radio transistor/battery operated | —                                  | —                | £9 6 6               |

Manufacturers: Nu-Sound Recording Co., 93 Mortimer Street, London

|                     |   |   |                    |       |                |
|---------------------|---|---|--------------------|-------|----------------|
| Phillips EL3962/02  | — | 2 | connector box only | —     | on application |
| Phillips ET.1042/10 | — | 4 | connector box only | mains | £35 0 0        |

| Tannoy Control Unit | DUC/10 | Single microphone fader | on application |
|---------------------|--------|-------------------------|----------------|
|---------------------|--------|-------------------------|----------------|

|            |      |              |                           |         |
|------------|------|--------------|---------------------------|---------|
| Telefunken | 77   | Special unit | Telefunken recorders only | £17 0 0 |
| Telefunken | Mono | Special unit | Telefunken recorders only | £4 5 0  |

|      |         |   |   |       |          |
|------|---------|---|---|-------|----------|
| Trix | EM.33   | 2 | 1 | mains | £43 0 0  |
| Trix | EM.33/M | 3 | 1 | mains | £44 10 0 |
| Trix | EM.63   | 5 | 1 | mains | £60 0 0  |

### PRE-AMPLIFIERS

| Make and Type       | Use   | Price          |
|---------------------|---|----------------|
| Trix EM.22          | Mic. pre-amplifier — mains                  | £8 17 6        |
| Resound GB.1        | Mic. pre-amplifier — transistor             | £7 0 0         |
| Resound             | Mic. pre-amplifier with line transformer    | £11 0 0        |
| Phillips EL3774/00  | Stereo pre-amplifier                        | on application |
| Phillips EL.3787/00 | Stereo pre-amplifier                        | on application |
| Grundig MA2         | Monitor amplifier for headphones            | £4 14 6        |
| Boyer P.75          | Microphone pre-amplifier — battery operated | £25 5 9        |

### WINDSHIELDS

|              |   |   |
|--------------|---|---|
| A.K.G. W.17  | For C39A, C30A and C60 A.K.G. microphones | Prices and other details on application |
| A.K.G. W.24  | For D19C, D24B A.K.G. microphones         |   |
| A.K.G. W.25A | For D25B A.K.G. microphones               |   |
| A.K.G. W.28  | For C38A A.K.G. microphones               |   |
| A.K.G. W.43  | For C38A A.K.G. microphones               |   |

Note: Dimensions of these windshields, some of which may be suitable for other makes of microphone, can be obtained from Politechna Ltd., 3 Percy Street, London, W.1.

—Continued on Page 48



# Truvox

present  
a transistorised  
Stereo  
amplifier

Hot on the heels of the outstandingly successful series 90 recorders comes another new pace-setter from Truvox. An amplifier. A completely new amplifier. A fully *compatible* amplifier—the TSA 100.

The TSA 100 is a complete, integrated, transistorised, stereo amplifier designed and built for extremely high performance. Perfect compatibility does away with all matching problems; the TSA 100 can be used successfully with any disc, tape or tuner equipment on the market. The fascia panel is simple and elegant and all sockets are fitted at the rear. The TSA 100 makes a handsome free-standing unit as it is housed in an attractively-finished afrormosia plinth. Alternatively it can be built-in. The TSA 100 is readily available at all good audio dealers.

|                                   |   |                          |
|-----------------------------------|---|--------------------------|
| <b>Semi conductor complement:</b> | 20 transistors, 4 diodes  |                          |
| <b>Inputs:</b>                    | P.U.1 — 50 mV at 100K   | R.I.A.A. characteristics |
|                                   | P.U.2 — 3.5 mV at 50K   | " "                      |
|                                   | Tape — 150 mV at 100K   | flat "                   |
|                                   | Tuner — 50 mV at 100K   | " "                      |
|                                   | Aux. — 50 mV at 100K  | " "                      |
| <b>Tone Controls:</b>             | Bass—plus or minus 15db at 50 cps.  |                          |
|                                   | Treble .. .. 15db at 14 kcs.  |                          |
| <b>Frequency response:</b>        | Plus or minus 1db from 15 cps — 30 kcs at 1 watt  |                          |
|                                   | .. .. 1db .. 20 cps — 20 kcs at 10 watts  |                          |
| <b>Power output:</b>              | 10 watts per channel across 15 ohms.  |                          |
|                                   | 12 " " " " 8 "  |                          |
|                                   | 15 " " " " 4 "  |                          |
| <b>Filters:</b>                   | Scratch filter —10db at 12 kcs commencing at 6 kcs  |                          |
|                                   | Rumble filter —14db at 20 cps commencing at 70 cps  |                          |
| <b>Crosstalk:</b>                 | —50db at 1 kcs.   |                          |
| <b>Tape out:</b>                  | 200mV   |                          |
| <b>Hum noise:</b>                 | P.U.1. and P.U.2. —55db, tape, tuner and auxiliary —60db  |                          |
| <b>Power required:</b>            | 100—250V A.C. 40—60 cps 45 watt max.  |                          |
| <b>Dimensions:</b>                | 16" wide x 6½" deep x 5½" high  |                          |
| <b>Other facilities:</b>          | stereo/mono function switch, tape/source monitor switch, balance control, stereo headphone output socket. |                          |

## The Truvox Stereo TSA 100 Amplifier 49 GNS



For full information about this amplifier and the Truvox Tape System please write: **TRUVOX LTD · NEASDEN LANE · LONDON NW 10**

# BUILDING A STUDIO

**Part two of the series by Ken Thompson, of the Millom and District Tape Recording Club, describing stage by stage how the members built their studio.**

**I**T TOOK Roy and Derek, with Manfred's occasional help, twelve weeks to panel the roof — remembering of course that we only had one 2½ hour session per week.

The height made it quite a balancing feat, despite the obvious value of the centre beam. It was possible for a tall member to stand on this, and just reach the apex of the roof with the flat of his hand. Both the two centre bays were reached in this way. The remainder required a 12 foot ladder either against the wall, roof, or beam. Each roof panel comprised one box slit open, with the flaps removed. The folds were of course laid at right angles to the roof timbers to maintain strength. Each panel was cut to overlap the timbers by approximately one inch, and one box opened right up stretched from one horizontal down to the next. To save felt nails, each panel was overlapped with the next, and the two pinned together. The same method was applied to the walls.

It was a filthy job, for with each hammer blow, plaster would fall in all directions, and the floor was soon almost as bad as ever. Meanwhile, Phil and I began the tedious task of framing the two end walls, and the lower half of the timbered wall. The tedium arose from the use of old wood which had to be stripped into 1" x 1½" laths. Cheap as it was, we simply could not afford to buy it when free issue was available.

The laths were cut into 9' 6" lengths, and fixed with 2½" nails to the joists at the top, and to the floorboards at the bottom. On the timbered wall, they were nailed at the top to the overhanging beam. These verticals were not spaced evenly, but simply arranged to fit the various widths of cardboard available.

Stuart was faced with the most difficult problem of all. Framing the back wall! The unbroken area was so

large that it was necessary to break it into sections. This required longer timber than we could scrounge, and we were compelled to invest 14/- in 6' x 13' slate laths from a local builder. A horizontal rail was firmly fixed to the wall at eaves height, and then the entire face framed with vertical laths at approximately 30" intervals.

Each club night, we reached the Plough with minutes to spare, for one drink, and a 20' minute discussion on progress, and future work. No fixed plan was laid at the beginning, and it wasn't until work was well under way that the exact situation and dimensions of the control room was finalised.

This allowed for a partition wall sealing off one end of the room, with a short dividing wall, making a 4 ft. square microphone booth, and a 9 ft. 6 ins. x 4 ft. control room. Each had a door and a window facing the main club room with a small window in the dividing wall.

Under Stuart's direction the partition framework was erected, using all old timber. The main frame height was 6 ft. 6 ins. and comprised of discarded bed frames, a length of rough 3 ins. x 2 ins., and sundry bits and pieces. No screws were used except to give added strength to the window, which was very heavy. It was an old sash type, with the two sections cleaned, and nailed together to produce a double glazed effect. A 3 ins. x 2 ins. timber was nailed to the floor, four inch nails being driven in at an angle. The only two joints used were on the verticals holding the window. They were cut to let in the crosspiece on which it rested. All the rest were simply hammered together with four inch nails, driven at an angle for extra strength. More slate laths were now purchased (another 12/6d.) and these were cut to size, with the ends to 45 degrees. They were nailed from the top beam of the wall, angled back to reach the rafters, spaced one to each rafter. With these in position the whole edifice became so rigid that we were able to span a plank from the big centre beam to the partition wall, for work on the roof.

Panelling the walls with cardboard sheets was easy after the fight with the roof. For this we used cartons from washing machines, TV sets, and corn flakes. They were stripped down flat in the same way as the roof boxes, folds running horizontally to the vertically laid laths. As far as possible the side panels only were utilised. They were overlapped on all four sides, and fastened with felt nails.

The dividing and partition walls were much more difficult. We were agreed that as far as possible, they should be soundproof. Cardboard was fitted both sides, and wood wool sandwiched between them. Once more we were scrounging. For two weeks, wood wool was the scarcest commodity in Millom, then in two days we were knee deep in the stuff. Where it all came from

I'll never know — But one thing's sure, it tickles when you get down your vest! The outside of the frame was covered first, then inside, the lowest panel being pinned from the bottom to half its height. Packing was stuffed into the gap, then packed to the top, held by a gentle pressure on the cardboard, until the pinning was complete.

The short partition wall was treated in the same way, and a pair of small windows were nailed together and built in. Small windows are not plentiful so I asked the boys to look for some in good time. Serves me right. Did you ever try to get rid of a yard full of windows in off beat sizes? The dividing wall was completed without any real trouble, although the short partition was a bit tricky at the top.

There was one job however, which did cause difficulty. From the very beginning, we had been saving egg trays for the obvious reason, and now they had to be fixed to the roof. Roy, Derek and Phil, spent five weeks experimenting with various pastes and glues. They finally

settled for Evostick. It was expensive, but cheaper materials simply would not hold, and it was not possible to nail them. Evostick is an impact adhesive, not strictly intended for this type of work, but it was thick enough to remain on the surface of the absorbent egg trays, an important requirement. As work progressed, so technique improved. From sticking up one at a time, they developed the method of glueing together sets of trays in correct lengths, and setting them up as one strip. They used Polycel for this part of the work, it was cheaper and quite strong enough, if the lengths were left to dry for several days before use. To avoid holding them to the roof by hand, a most ingenious network of wooden bracing was devised. They soared from any convenient point, chair, stepladder or table, and were at times the subject of a good deal of very unchristian language.

Next month I hope to give some details of the circuitry and power supplies, which by now were beginning to take theoretical shape in our minds.

---

The cheery Millom Tape Club members ready for mopping up operations after their work on building their own studio.







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# TAPE AND TRANSPARENCIES

**Bob Danvers-Walker invites A.T.R. readers to begin a new hobby by combining photography with recording to result in tape and colour slides —**

**S**OUND and picture on tape and transparencies come together to form an exciting hobby for amateur photographers and tape recording fans alike. Because of the extensive travelling undertaken every year as a travel broadcaster and writer, **BOB DANVERS-WALKER** is now building a library of colour transparencies to go with his tapes. In this **AMATEUR TAPE RECORDING** report he describes some of his experiences and illustrates with photos a recent visit to Finland where he travelled over 1,500 miles by car in eleven days gathering "copy." His inseparable companions on this mission, as on all his assignments abroad, were his **Fi-Cord 202** tape recorder and an **Alpha 35 mm.** Reflex camera with a **Kern-Macro-Switar 1 : 1 8/50** lens. (Ed:)

I am no stranger to Finland. I have travelled with infinite pleasure the length and breadth of this, the world's second most northerly country — on both occasions at Midsummer — and found more sunshine there than I have in many southern latitudes. That's mainly due of course to the fact that there is virtually no night at that season. Photographer **Brian Shule** who came with me gave me the benefit of his professional wisdom on more intricate details of aperture setting which frequently relieved me to concentrate on the accompanying sound. In terms of sound Finland is to me the hiss of steam from water dashed onto the red hot stones of a Sauna bath: it is the engine throb of wood-burning passenger steamers plying the peaceful **Saimaa Lakes**: it is the charm of zither-like music played on a **Kantele**, Finland's national instrument, and the sound of birds singing during the short twilight when, in the northernmost regions, the sun never travels below the red horizon at "midnight" during Midsummer. Think of these things also in terms of colour pictures and visualise the effect of a tape playing back the relevant sounds as a slide projector throws the images onto a screen.

While the refinements of stop-frame projection, complete with recorded impulse signal automatically



**Fig. 1. Crouched in the forepeak of the powerful Hydrofoil at Lahti which at full speed skims its way over Lake Vesijarvi at 50 m.p.h., its bow rising up on skis.**

activating the movement of transparencies, may be beyond the reach of the amateur, it is relatively easy to make up a sound track to match the order of pictures loaded in the magazine. With each picture or series of shots having a relevant track on tape, the operator simply matches the speed of picture projection to the accompanying sound track. Recorded "atmosphere" from the place where the picture was taken, played back simultaneously, has an amazing effect of bringing the scene to life. Its natural for one to describe the shots as they come onto the screen, so why not think about recording a commentary and, where possible, backing the narrative with "natural sound" dubbed behind the voice.

To screen your holiday shots in dead silence is about the same as watching TV with the sound turned off. But, just for the record, the picture taking is easier than the sound taping. Let me give you a short illustration of what I mean. Being a great lover of Sauna I remember the difficulties I had the first time I recorded inside one of these baths where the temperature gets up to, and frequently exceeds, the boiling point of water (212° F.). Describing the scene inside, I had previously

agreed with my Finnish friends on a signal from me to dash a dipper of water onto the stones on the top of the stove. This immediately converts the pleasant dry heat to a water-saturated or humid temperature which, though cooler, is not comfortable to linger in. To encourage perspiration and stimulate circulation the body is then gently beaten with whisks made from freshly gathered birch leaves. This was to be accompanied by general sounds of approval and squeals of delight as the invisible steam from the wood-burning stove stung their bodies.

Ten minutes in the Sauna had made the microphone so hot that I had to wrap it in a towel to make it bearable to hold. In fact that was possibly the severest test I have ever given a Fi-Cord Ia or the Grampian microphone. The sudden change from dry to humid heat on the tape itself was reflected when I played it back. But when we came out of the Sauna into the cool night air for a plunge into the lake the sudden switch must have caused every part of my recorder to revolt in protest. Belt drive, bearings, recorder head . . . the lot were affected.

The next morning it was nearly back to normal but the motor was somewhat noisy. I have since recorded a Sauna bath with my Fi-Cord 202 and Beyer microphone with no ill effects.

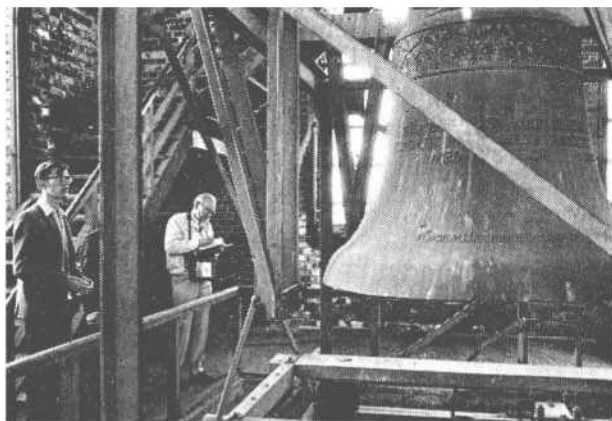
Consider the photographs the Editor is using to illustrate this article. For each of these occasions I have a tape and a picture. The performers in the Pyynikki Theatre are heard and seen again: the more static pic-



**Fig. 2. Martti Pokela, Finland's finest Kantele player, records folk music for Bob Danvers-Walker.**

ture of the bells in the belfry of the Kallio Church are given another projection: the unique music of the Kantele will be heard for the first time.

Even if you have no 35 mm. camera, why not start yourself off on this fascinating hobby by buying half a dozen stock transparencies of places and occasions (dance groups seen on holidays abroad, the Ceremony



**Fig. 3. Inspecting the 7 ton bass bell in the tower of the Kallio Church, Helsinki. Every Sunday morning a composition by Sibelius is rung by the peal of seven bells.**

of Trooping the Colour, animals in Regents Park Zoo or aircraft at London Airport) and record tapes to match them. Instead of borrowing a slide projector you'll probably end up by buying one. Once you get the "bug" you'll find a new interest for your tape recorder.

---

**Bob Danvers-Walker will be back in the November issue, bringing you more details of his travels with a tape recorder.**

---

**Fig. 4. Recording a pastoral musical play from the World's first revolving auditorium at the Pyynikki open air Theatre, Tampere. Seating a thousand, the audience is revolved within the natural amphitheatre with the scenes set around its circumference.**



# TAPE AND TRANSISTORS

*Part five in the series by Gordon J. King*

NOW that we have acquired a basic understanding of transistors, how they work, how transistorized audio circuits look and operate and the things to avoid when making and testing units in which transistors are used, we can turn our attention more to the application and construction of transistorized units. We will do this essentially from the aspect of tape recording and replay, filling in the gaps of our basic theoretical knowledge on the way.

## STEREO TO MONO MIXER

At this stage, a description of a transistorized tape unit built by the author for a specific purpose would not be amiss. The requirement was for a device which would respond to and mix at low level the simultaneous signals on two tracks of a stereo tape recording so that the "full blooded" mono signal (the combination of the two stereo signals) could be monitored and reproduced as required.

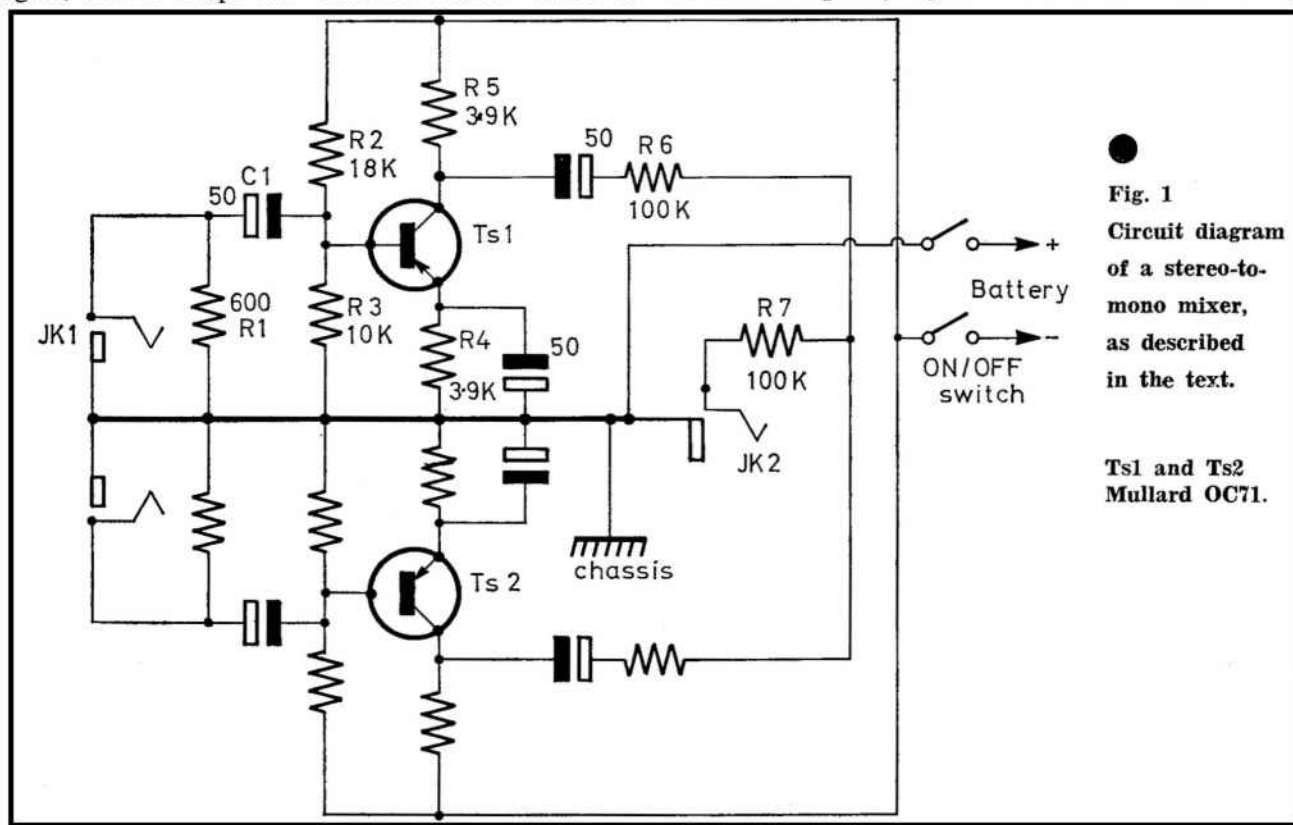
In addition, the low level signals from the stereo tape recorder on replay were at 600 ohms impedance and it was required for the "mono" output signal to be at high impedance.

It was decided to employ two transistors, one for the right-hand stereo signal and the other for the left-hand signal, and to adopt the "common emitter" mode of

connection. That is, the signal going in at the base and coming out at the collector, with the emitter "earthed" so that it is common to both other electrodes. It will be recalled that Fig. 1 in the June, 1964 issue depicts a circuit of this kind, and in the same issue it is shown that the low to medium input impedance is transformed to medium to high impedance at the output (that is, at the collector).

Fig. 1 (in this article) shows the complete circuit of the device. The two transistor circuits, Ts1 and Ts2, are identical both in terms of wiring and component values. Thus, from the operational aspect we need consider only one channel. Let us take the right-hand channel (the top circuit) on which the components have been numbered.

The signal is applied to the base from the input jack Jk1 and across the 600-ohm load resistor, via the coupling/isolating capacitor C1. Note here that the 600-ohm resistor is selected to match the source impedance and that a 50  $\mu$ F electrolytic capacitor is employed to couple in the signal circuit. Such a high value capacitor is required to maintain a good bass response, since the associated impedances of this circuit are relatively low. If an ordinary 0.1  $\mu$ F capacitor were used much of the lower frequency signal would be attenuated owing





to the reactance of the capacitor at those frequencies being equal to or greater than the base circuit impedance. A potential-divider effect would thus occur, and only a fraction of the low-frequency input signal would appear in the base circuit.

## REACTANCE AND IMPEDANCE

Reactance is the term used to describe the *apparent resistance* to alternating current (i.e., audio signal) given by a capacitor or inductor. The reactance of a capacitor decreases both with increase in capacitance value and with increase in frequency. With an inductor, the reactance decreases with decrease in inductance value and with increase in frequency.

Impedance is the term used to describe the same "apparent resistance" to alternating current in a circuit composed of both reactance and true or "ohmic" resistance. In practice, there is really no such thing as 100 per cent reactance, for even the very best capacitor or inductor has a degree of loss resistance which may have to be taken into account in calculations. In some cases, however, the reactive component may predominate over the resistive component, and the reactance only then be considered.

Where either capacitance or inductance is present in an audio circuit, this can be looked upon as a resistance of a value dependent upon the *frequency* of the signal. As ordinary resistance holds its inherent value over the audio spectrum, an RC or RL combination can appear as a variable potential-divider from one end of the spectrum to the other, and attenuate or "lift" signal depending upon the circuit make-up. This, in fact, is the principle upon which tone control and correction circuits are based. We shall see more of this important effect in later articles in this series.

*Both reactance and impedance are measured in ohms, the same as true resistance.*

The bases of the transistors in Fig. 1 are held at a small negative potential relative to the emitters by the potential-divider comprising R2 and R3, the values being chosen to give the correct forward current in the emitter/base junction, as explained in previous articles.

R4 is the emitter resistance whose purpose is to "stabilise" the transistor and to prevent "thermal runaway". It will be recalled that any tendency for increase in collector current produces an increase in volts drop across the emitter resistor, the result of which decreases the forward emitter/base current (by pulling back the negative base-to-emitter voltage) and thus reduces the collector current and counters the runaway effect.

## SIGNAL BYPASS

To avoid the signal itself from being attenuated due to the development of signal voltage across the emitter resistor, R3 is bypassed by C2. This, again, needs to be of high value so that the low frequencies are bypassed as well as the treble, and a 50  $\mu$ F electrolytic capacitor is used, the same as the coupler C1.

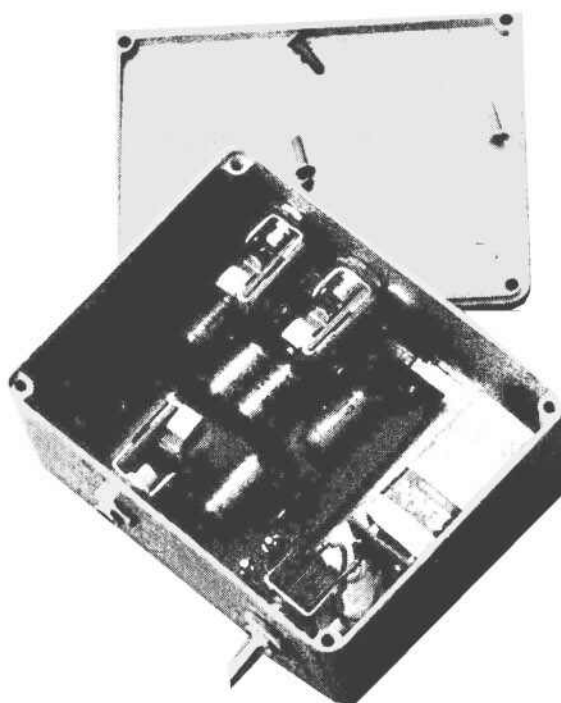


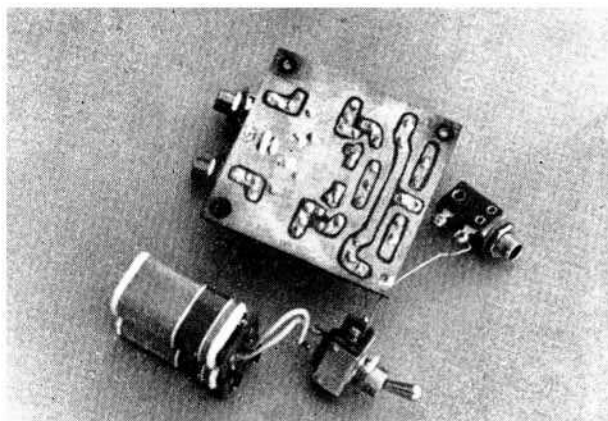
Fig. 2.—The unit is built into a small die-cast box, as shown.

In all circuits employing electrolytic capacitors, the polarity should always be carefully considered. The voltage, for instance across R4 is negative at the emitter relative to the chassis line, while that at the base is also negative with respect to the chassis line, and the electrolytics should be connected accordingly, as shown in Fig. 1.

The signal voltage is developed across the collector load resistor R5, and since a lot of gain was not needed for the device a relatively low value resistor was employed. The signal is coupled to a common output circuit (that is, along with the signal from Ts2) through C3 (another electrolytic—note polarity) and R6, and the correct impedance output is given by feeding the signal to the output jack Jk2 through R7, this being the resistor which carries both the right-hand and left-hand signals.

## CONSTRUCTION

For the application described, a ganged gain control was not needed, for the level of the signals applied to the transistors could be controlled from the tape recorder itself (the replay gain controls) bearing in mind that the signals are obtained from the "monitor" output



**Fig. 3.—The underside of the printed circuit board, showing on/off switch, output jack and battery.**

socket. It was thus decided to arrange the circuit so that it could be accommodated, along with a battery for powering, in a small die-cast box (Eddystone No. 8). The circuit itself was designed in the form of a printed circuit board to fit snugly inside the box with the battery and on/off switch.

The internal appearance of the unit is depicted in Fig. 2, while the bottom of the board, the output jack (Jk2),

the on/off switch and the batteries are shown in Fig. 3. Care should be taken when wiring and connecting the batteries in any transistorized equipment to ensure that the polarity is correct (that is, negative of the battery to to the collector circuits with PNP transistors), for reversal of the power supply polarity will almost certainly result in immediate failure of the transistor.

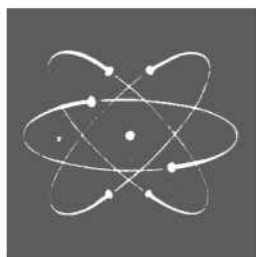
While the device described in this article may not be just the thing that every enthusiast needs right away, it does, at least, reveal how transistors are being used in tape equipment and amplifiers and how small, battery-powered units can easily be built by the enthusiast.

The current drawn by the transistors is extremely small, so an ordinary type of transistor battery will usually provide several months of use before it needs replacing. Such equipment is thus inexpensive to run and also very safe to use.

Battery powering has two great attributes, these being portability and freedom from mains hum, the latter, it may be recalled, is often a problem when mains-powered units are added to audio equipment and tape recorders.

Subsequent articles in this series will look at "eyelet board" and printed circuit construction in more detail, and hints and tips on how the enthusiast can actually make his own printed board will also be given. Transistors and printed circuit boards go very much together, as we shall see . . .

*To be Continued.*



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# SOUND SCENE

*Right up-to-the-minute news and views  
on the latest products in the audio world*

## SLIDE PROJECTORS

**I**N addition to the manufacturers listed in our Tape and Slide Survey last month, there is also the Pullin Optical Co. Ltd., of Ellis House, Aintree Road, Perivale, Greenford, Middlesex, who are U.K. distributors for the PAXIMAT slide projectors. There are six different types available, some of which are fully automatic and can be operated from a tape recorder.

## NEW BOOKS

*Tape Recording and Hi-Fi* by Frederick Oughton has just been published, price 5s. A compact little book full of illustrations and practical information on tape recording, loudspeakers, microphones, amplifiers, tuners and record playing. It is up-to-date and informative and in addition to the major subjects as above, contains many hints on the use of tape, record collecting, setting up your own studio and stereo. Published by Collins Nutshell Books.

Writers of books on the combined subject of tape recording and high fidelity sound cannot seem to get away from the title *Tape Recording and Hi-Fi*. The second book with this title is by Douglas Brown, well known as the compere of the B.B.C. Sound programme. Price also 5s. and again a very practical book without mathematics and written in clear non-technical style. In fact the author sets out in the very first paragraph to make it quite clear that his book is not written for "boffins". The book has a nice personal approach and takes the reader in easy stages from the introduction right through tape recording, buying the right equipment, how it works, recording indoors and outdoors, editing tape, tape and photography. In fact the accent on tape recording with enough on hi-fi to make it really worthwhile. Published by Arco Publications Ltd.

## TABLE LAMP LOUDSPEAKER (Fig. 1)

A revolutionary high fidelity speaker which radiates sound from the lamp shade and base of a normal looking table lamp has just been introduced by Acoustics Associates Inc. of Los Angeles, California.

The new *Omnisonic Lamp-Speaker* may replace the conventional box type home speakers, according to this American electro-acoustics company, because it combines the dual functions of an attractively styled table lamp and a high quality hi-fi speaker.

The lamp-speaker radiates sound uniformly from the entire surface of the lampshade in a 360 degree pattern throughout the listening area, eliminating dead spots produced by most other hi-fi speakers. The electrostatic speaker, including the fabric shade cover, is less than  $\frac{1}{4}$ " thick, the thinnest speaker yet developed. The

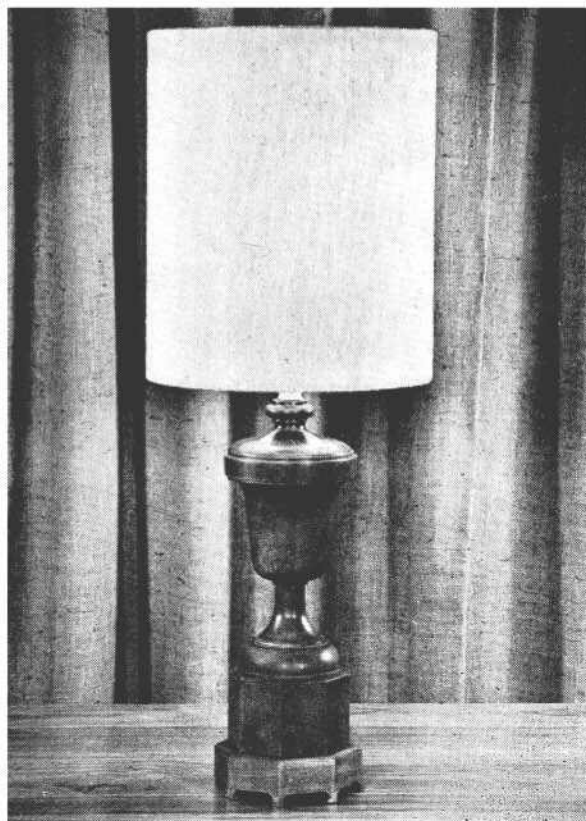
low frequency speaker is housed in the base of the stand, and the overall frequency range is from below 40 c/s, to well over 25,000 cps. Further information from Acoustics Electronics Inc., 5331, West 104th Street, Los Angeles, California, U.S.A.

(From A.T.R.'s U.S.A. correspondent, Sol Tabacnick.)

## TAPEHEAD CLEANING TOOL

Designed for cleaning tape heads, capstan and tape guides, etc., without cleaning fluid, this non-magnetic cleaning tool has a non-abrasive scraper at one end and a polishing pad at the other. Complete with instructions, price 5s. from Global Products, 13 Stanley Street, Rothwell, Northamptonshire.

**Fig. 1:** This handsome hand-turned Grecian Urn, finished in beautiful walnut, is one of Acoustica's series 100 Omnisonic lamp-speakers. Delivering flawless sound in a 360° pattern, this revolutionary electrostatic speaker is available in a variety of styles and finishes.





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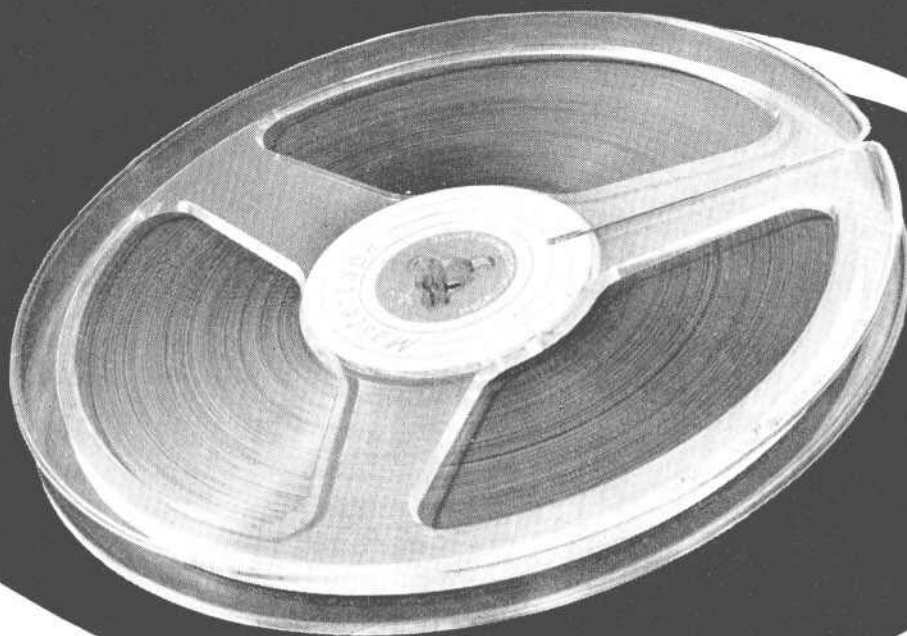
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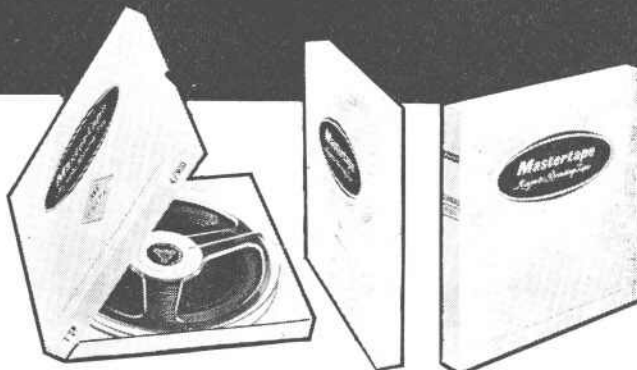
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# TAPE RECORDING SIMPLIFIED

*Ken Smith continues with part two of this series dealing  
this month with the tape deck*

## THE TAPE TRANSPORT

Last month I made a general introduction to tape recording and in this article will deal entirely with the tape transport mechanism, or as it is generally known, the tape deck. Unlike the gramophone transcription unit, numerous functions are necessary, the most important being as follows (see also Fig. 1):—

1. Rapid rewinding of tape.
2. Rapid forward winding of the tape.
3. Transporting the tape at one or more tape speeds.
4. The temporary stop.
5. The braking system.
6. The tape position indicator.
7. The interlocking system.

Individually these functions appear simple but in fact some are quite complex because they must work in conjunction with others. Let us now look at them in detail.

**Fast Winding.** Winding in both directions can be considered as one function because the requirements are exactly similar. Assuming we have a reel of 7" diameter containing 1200' of tape which has already been recorded on both tracks and we require to play a recording half way along the first track. The full reel is placed on the left side of the machine and the tape loaded on to the take up reel. By pressing the appropriate button the tape will now wind rapidly onto the right hand spool and at the same time the tape position indicator (counter or clock dial) will rotate, giving an indication by number of the passage of the tape. It is usual to make a note of the number showing the commencement of any recording and when this number is reached another button or key is pressed to stop the tape.

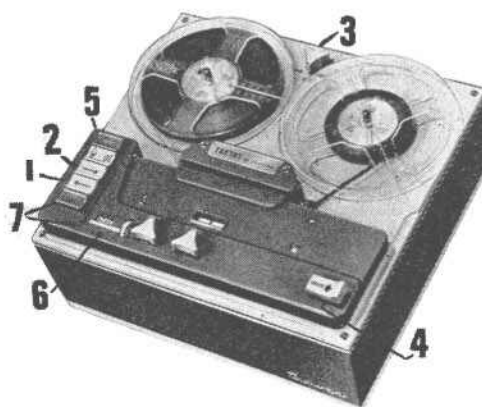
It will be appreciated that although modern tapes are quite strong they will not tolerate misuse so the deck mechanism must ensure that the tape is wound rapidly and yet carefully to avoid snagging or snatching. Magnetic tape will resist stretching to a remarkable degree but any sharp edges or corners on the tape guides which

lead it through the mechanism would immediately damage it.

**Playing or Recording.** The deck mechanism operates in exactly the same way regardless of whether a tape is being played or a recording is being made. The tape is pulled through at a steady speed, the actual speed being determined by a speed selector. It is this part of the mechanism, which is considered to be the most important, the utmost care is necessary in design and manufacture because even the smallest variation in speed is noticeable to the listener. In domestic machines to-day the tape speeds most commonly used are  $7\frac{1}{2}$ ,  $3\frac{3}{4}$  and  $1\frac{7}{8}$  i.p.s. although some machines include a speed of 15 i.p.s. and others one of 15/16 i.p.s. It will be seen that in all cases each speed is a multiple or sub-multiple of the next. The tape is drawn through the machine by a capstan and free running pinch wheel or roller (see Fig. 2). In some machines the capstan is in fact the shaft of an electric motor, in others it has a large flywheel attached to it which is driven by an intermediate rubber wheel in contact with the motor spindle. Sometimes the capstan is coupled to the motor by a rubber driving belt.

(continued overleaf)

Fig. 1. Function controls on a Truvox tape deck.



## TAPE RECORDING SIMPLIFIED (continued)

Whichever method is used there must be the minimum of speed variation.

Tape transport mechanisms vary quite considerably between one make and another. In some designs one motor is used, usually of substantial proportions, and the motor spindle serves as the capstan. In single motor-machines the spools are usually driven by a rubber belt from the motor and as the speed of tape take-up spool steadily decreases as the spool fills with tape, a slipping clutch system is incorporated to allow for this. In some designs two motors are used and in others three. In the latter case one motor serves to drive the capstan spindle and flywheel and the other two are each connected directly to the left and right spool carriers for the purpose of fast winding in either direction.

**Braking System.** The braking system must bring the tape to a halt regardless of the operation being carried out and because of this it is coupled to other parts of the mechanism. With most braking systems the motors are switched off and friction brakes are applied to the two reel carriers to ensure that they also stop rapidly and smoothly without applying undue strain to the tape. The pinch roller is also moved away from the capstan.

**Temporary Stop or Pause Control.** During the process of making a recording, or sometimes whilst a tape is being played, it will be necessary to stop the tape temporarily leaving the mechanism in a standby condition. The temporary stop control releases the pinch roller and although the capstan continues to rotate the tape is held still by pressure pads.

**The Interlock System.** It will be seen from the foregoing remarks that in view of the complex nature of

Fig. 2. Mechanism layout on a modern tapedeck.

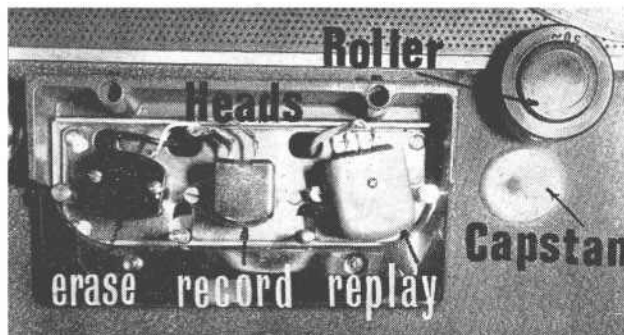
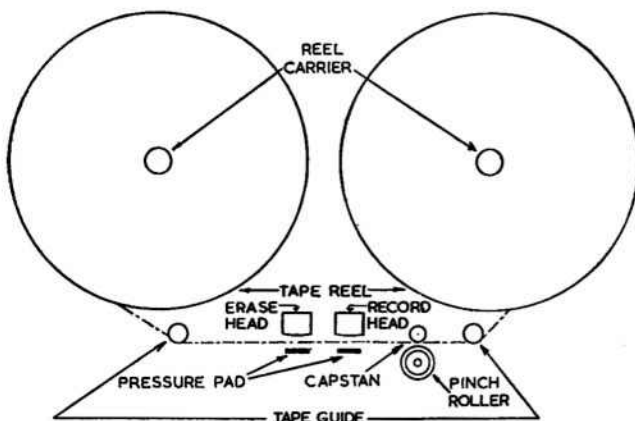


Fig. 3. Head assembly on a modern tape recorder with separate re-play and record heads.

the functions possible with a tape recorder, a considerable amount of thought must be applied to the design of the various control keys or switches to ensure that the operator cannot carry out one function whilst another is in progress. If during the re-winding process for instance, the re-play function could be operated, the tape would be stopped suddenly under tremendous tension and would probably break. The inter-locking system ensures that when one function has been selected no other can be made to operate until the stop button has been pressed and the tape brought to a standstill before another function or speed, etc., is selected.

**The Tape Heads.** These are usually mounted in the centre of the machine towards the front and between the two tape spools and the method of mounting is extremely critical. Tape guides must always be considered in conjunction with the heads because it is essential that the tape should not wander vertically whilst passing through. Domestic machines usually have two heads, one erase and one combined record/replay head although there are some machines with separate record and playback heads (see Fig. 3). At this stage it is sufficient to say that each head has a microscopic vertical gap which must lie exactly at right angles or in azimuth alignment with the tape. When playing or recording the tape must be in intimate contact with the heads, the most common method of ensuring this being pressure pads which come into position when the play button is pressed

---

*Next month Ken Smith  
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1

# THE TAPE DIRECTORY

Particulars of Tapespondents are given in the following order:— name, age, occupation, address; special interests, taste in music; type of machine, spool sizes, speeds; area of taping required.

## BEDFORDSHIRE

**BRUCE S. McMURDIE**, 35, Dye Machine Operator, 14 Belmont Road, Luton, Bedfordshire. Spiritual tape club (no fees). Butoba MT 5 portable twin-track, Robuk RK 3, three speeds, 1½, 3½. Anywhere.

## BERKSHIRE

**NEVILLE FORREST**, 20, cashier, 1 Glen Cottages, City Road, Tilehurst, Reading, Berkshire. Audio, electronics, photography; pop and a little light classical and jazz. Truvox PD 86 4-track stereo, up to 7 in., 1½, 3½, 7½. Anywhere English speaking.

## CAMBRIDGESHIRE

**T. RUDDERHAM**, 25, 10 Mayfield Close, Ely, Cambridgeshire. Amateur television, Modern jazz, guitars, playing the guitar, Daphne Oram type sound effects; any but pop. Elizabethan 400, 5½ in., 3½. Any age, either sex, anywhere.

## CHESHIRE

**KEITH TULLOCH**, 20, Salesman, Hilltop, 2 Manor Road, Irby, Heswell, Wirral, Cheshire. Writing, reading S.F., tape, Goonery, subtle humour; trad jazz, classical, swing, pops. Philips EL 3549 4-track, 7 in., 15/16, 1½, 3½, 7½. Holland, Germany, Norway, Switzerland, U.S.A. Only English spoken.

**MALCOLM WALLER**, 24, Composer, 16 Moorside Road, Heaton Moor, Stockport, Cheshire. Cine, S.W.L., travel, drawing, reading; popular, trad jazz, some classical. Philips EL 3541, 7 in., 3½. U.K., America, New Zealand. English speaking, female or male, 21-25.

## CORNWALL

**HUGH D. COLTON**, 17, G.P.O. Engineer, 62 Warfeton Crescent, Saltash, Cornwall. Cycle racing, touring; some pop, folk and a little classical. Spectone 2-track, 7 in., 3½, 7½, 15. Western Europe (not Germany). Some French and Italian spoken.

## DORSET

**AUDREY & TED SOUTER**, 35, Motor mechanic, 10 Albert Terrace, Portland, Dorset. Cars, 35 mm photography, any interesting subject; pop, light classical, trad and mod. jazz. Grundig TK 5, 5½ in., 3½. Norway, Sweden, Denmark.

**A. J. EBBINGTON**, 37, Engineer, 185 Tentelow Lane, Southall, Middx. Philately, photography, history; very general. Telefunken Magnetophon 96 4-track, 7 in., 1½, 3½, 7½. British Commonwealth.

**LEONARD ERNEST INGRAM**, 19, Warehouse manager, 19 Churchill Avenue, Hillingdon, Middx. Hi-fi, motorcycling, fishing, photography; Rhythm & Blues. C & W., Pops, light classical. Robuk RK 3 7 in., 1½, 3½, 7½. America or Canada.

## HAMPSHIRE

**PHILIP CAREY**, 14, schoolboy, 74 Kennedy Road, Maybush, Southampton, Hampshire. Fishing, cycling, woodwork, watching T.V.; pop. Elizabethan LZ30, 7 in., 1½, 3½, 7½. English speaking, especially U.S.A., N. Zealand, Australia.

## H.M. FORCES

**BOB REGAN**, 31, soldier, 48 Command Workshop, R.E.M.E., BFPO 53. Chit chat sound effects; popular. Philips EL 3585, EL 3534 and EL 3515 (RK 14), Grundig TK 25, up to 7 ins, 1½, 3½. Anywhere.

An ATR service to promote friendships through tape correspondence

## KENT

**BILL BAZLEY**, (ex-R.N.), 41, Guitarist (dance), 8 Andrew Manor, Britton St., Gillingham, Kent. Composing multi-track recording, sailing; Paul Ingemann, Sheenhuis, Atkins, anything light, not teenbeat. Tuvox stereo P.D. 87, 7 in., 1½, 3½, 7½. Anyone—Anywhere English speaking, including musicians.

## LANCASHIRE

**GEORGE CHARLES BACKHOUSE**, 59, builders foreman, 103 Keswick Road, Blackpool, Lancashire. Cinematography, gardening, do-it-yourself, stamp collecting; light operetta, some pop, not jazz. Grundig TK 35, Ferrograph 6 A.N., 3, 5 and 7 in., 1½, 3½, 7½. Anywhere, no need to write first.

**ROBERT TULLOCH**, 52, gardener, The Coach House, 'Bali Hai', Backburn Road, Wheelton, Near Chorley, Lancashire. Radio, 35 mm colour slides, motoring, outdoor recording; country and western, organ, hi-fi and stereo, Scottish. Philips (two) 4-track stereo, 7 in., 15/16, 1½, 3½, 7½. Anywhere, especially Scotland, America, Australia and New Zealand. Don't write, just tape, I guarantee to return all tapes.

**S. G. HOLTUN**, 37, G.P.O. Postman-driver, 53 Cobden Road, Sevenoaks, Kent. The late Jimmie Rodgers, blue yodler; American country-western and folk. REPS R.10/2 Elizabethan twin-track, 7 in., 1½, 3½, 7½. Anywhere English speaking.

## LONDON

**SIDNEY JOHN BETTERIDGE**, 38, Labourer, 16 Lorne Gardens, London, W.16. Tape-sponding, photography; anything. Robuk RK3, 3 in., up to 7 in., 1½, 3½, 7½. English speaking anywhere, all tapes welcome, male or female.

**KEN GAMBLE**, 26, Photographer, 24 Gresley Road, Highgate, London, N.19. Travel photographer, theatre, films; classical and jazz. Philips EL 3586 and Philips EL 3549 4-track, 7 in., 15/16, 1½, 3½, 7½. Anywhere English speaking.

**GEORGE W. TAYLOR**, 25, Tool and Cutter Grinder and **DAVID TREADWELL**, 22, Welder, 61 Whitworth Road, South Norwood, London, S.E. 25. Girls, money, hi-fi, trick recording; pops, light classical, electronic. Vortexion CBL/S stereo, 8½ in., 2-track 3½, 7½, special mono stereo, 2-track, 8½ in., 3½, 7½. Girls anywhere English speaking, all tapes answered.

**ALEC WASHBOURNE**, 36, London Transport Bus Inspector, 38 Upper Walthamstow Road, Walthamstow, London, E.17. Boys clubs, amateur dramatics, camping, photography, films and shows; all music and pop. U.K., U.S.A., Australia, male contacts only.

**JOHN WASHBOURNE**, 16, junior salesman, 38 Upper Walthamstow Road, Walthamstow, London, E.17. Camping, photography, cinema, amateur dramatics, travel; pops. U.K., U.S.A., Australia, Teenage male contacts only.

**DAVID WOODS**, 25, Representative, 31 Evering Road, London, N.16. Hi-fi, Electronics; all kinds. Gnome 2-track, 7 in., 1½, 3½, 7½. Australia, New Zealand, U.S.A., South Africa.

## NOTTINGHAMSHIRE

**JOHN G. SIMONS**, 26, Toolmaker, 14 Paul Avenue, Mansfield, Notts. S.W. Radio, Esperanto, gardening, Trad jazz. Philips 4-track, 7 in., 3½. Anywhere.

## STAFFORDSHIRE

**ARTHUR BLOOR**, 43, Wine Merchant, Flat 12, Friarscourt, Friarswood Road, Newcastle, Staffordshire. Photography, tapes, travel; all kinds. Grundig TK60, 7 in. and smaller, 1½, 3½.

## SURREY

**PHILIP BALLARD**, 20, Reps Control clerk, 220 Kingston Road, New Malden, Surrey. Photography, radio, tape recording; trad and modern jazz.

## SUSSEX

**P. FOSTER**, 24, Civil servant, 36 Bankside, West Dene, Brighton, Sussex. Photography, physical culture, cycling, reading, stereo; travel, ships; all kinds. Revox F 36, 2-track, 9½ in., 3½, 7½. Anywhere.

**EDWIN THOMAS ARTHUR NEWMAN**, 54, Electrical chassis tester, 59 Queen's Park Rise, Brighton, Sussex. Television, radio, recorders, repair work, 8 mm and 16 mm cine; good piano, vocal, violin, ifield, good musical. B.S.R., 7 in., 1½, 3½, 7½. Canada, Australia.

## WARWICKSHIRE

**R. RUSSELL**, 20, 6 Blythwood Road, Tyseley, Birmingham 11, Warwickshire. Photography, travel, sport; pop. Robuk RK4, up to 7 in., 1½, 3½, 7½. Preferably from U.S.A., anywhere.

**MISS MARGARET DEVIES**, 42, Clerk, 309 Ansty Road, Coventry, Warwick. Music, photography, travel; all. Sobel Festival, 5½ in., 3½. All.

## YORKSHIRE

**JOHN GARY BROCKBANK**, 25, Engineer, 37 Western Road, Skipton, Yorks. Body building; interior decoration, family interests, sport, tape recording; light pop, C & W., no jazz. Fidelity Playmaster, 4-track, 5½ in., 3½. U.S.A., Africa, Scandinavian countries, Australia, Spain, English speaking countries.

**STANLEY H. COX**, 34, G.P.O. Night telephonist, 67 Eiford Grove, Harehills, Leeds 8, Yorks. Hi-fi, taping, books, films, records; everything but jazz. Philips EL 3585, Grundig TK 20, Sony 521 Stereo, 7 in., 1½, 3½, 7½. Anywhere.

**EDWARD HELME**, 18, Trainee manager, 17 Eden Crescent, Burley, Leeds 4, Yorks. Listening to pop music, films; pop. Elizabethan popular, Avon, 5½ in., 3½. Anywhere English speaking.

**RAYMOND MOHAMED**, 19, Concrete batcher, BK 246 Bramall Lane, Sheffield 2, Yorks. Taping people, sounds; pop, light opera. Grundig TK 14, 5½ in., 3½. U.K., Europe, N. and S. America.

**TONY DANCE & VIVIEN LONGDEN**, 18 & 16, Apprentice electrician and student, 44 Gordon Street, The Fall, East Ardsley, nr. Wakefield, Yorks. Tape recording; light classical and pops. Philips EL 3549 and 3585, 7 in., 15/16, 1½, 3½, 7½. Anywhere, male or female, English or French speaking.

**DAVID A. GODDARD**, 18, Trainee Buyer, 64 Roxholme Grove, Leeds 7, Yorkshire. Sound recording, photography; pop, orchestral. Philips EL 3538A, 7 in., 1½, 3½, 7½. U.K. only of same age.

**ALAN L. OLDROYD**, 30, Brush Maker, 472 Kirkstall Road, Leeds 4, Yorkshire. Radio, Theatre, sport; general chatter; any kind except opera. Elizabethan IZ 29, 4-track, up to 7 in., 1½, 3½, 7½. Anywhere English speaking, male or female.

## CHANNEL ISLES

**ROY G. CRICK**, 16, Student, 32 David Place, St. Helier, Jersey, Channel Isles. Cinema, general; pop, folk, country and western, not classical. Spectone 161 2-track, 7 in., 3½, 7½, 15. Anywhere.

## KENYA

**THEOBALD MATHEWS FERNANDES**, 26, Accounts asst. clerk, c/o B.P. Shell Petroleum Co. Ltd., P.O. Box 9810, Mombasa, Kenya. Dancing, swimming; dancing and pops. Philips stereo 4 track, 5" and 7", 3½ and 7½. Anywhere.

# TWO NEW

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Tape speed :  $3\frac{1}{2}$ "  
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Output : L.S. 2.5 watts at 3 ohms.  
Spool capacity :  $5\frac{1}{2}$ "  
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Superimpose switch.  
Control panel : Printed aluminium with a chromium hood and control knobs.  
Cabinet : A new styled cabinet made of formed plywood covered in charcoal grey PVC material, giving a most attractive appearance.  
Cabinet Dimensions: 15"  $\times$  13 $\frac{1}{2}$ "  $\times$  7"  
Total weight of machine : 18 $\frac{1}{2}$  lb.

### Brief specification : 707 II and 707 IV

Tracks : 707 II — Two ; 707 IV — Four.  
Tape speeds : 7 $\frac{1}{2}$ ", 3 $\frac{1}{2}$ ", 1 $\frac{1}{2}$ ".  
Spool capacity : 7".  
Frequency response : 7 $\frac{1}{2}$ " 40 cycles to 15k/cs  $\pm 3$ dB.  
Output : L.S. 3.5 watts at 3 ohms.  
Loud Speaker : 8"  $\times$  5" elliptical 10K lines.  
Monitor through speaker on record.  
Cabinet : A new style cabinet made of formed plywood covered in charcoal grey PVC material, giving a most attractive appearance.  
Cabinet Dimensions: 16 $\frac{1}{2}$ "  $\times$  14 $\frac{1}{2}$ "  $\times$  8 $\frac{1}{2}$ "  
Total weight of machine : 22 lb.  
707 IV : Track change switch.  
Double play switch : (this combines two tracks together for trick recordings or to replay stereo tapes as mono.)  
707 II : Superimpose switch.

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ATR/4/64

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### SABRE 11

#### TWO TRACK



**23 GNS**

Complete with microphone, 600 ft. tape, recording lead., etc.



**707-11 Two Track 29 GNS**  
**707-1V Four Track 32 GNS**

Complete with microphone, recording lead, plug and 1,800 ft. tape with the 707 IV ; 1,200 ft. tape with 707 II

# THE STUZZI DISC-CORDER



The smart Tape Recorder

## Three machines in one

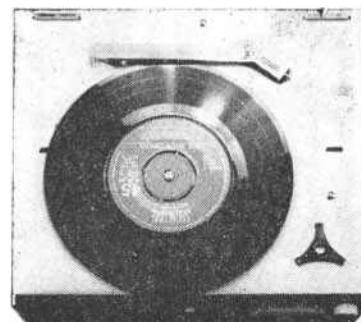
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John Courtney Reviews . . .

# THE STUZZI DISCORDER

**A**LTHOUGH the Stuzzi Discorder is not the first tape recorder-cum-record player it is probably the first machine that operates as tape recorder, record player and radio set. Novelty? Well this depends on how one expects to use a combination recorder of this kind and what performance it will give bearing in mind that it is the equivalent of three units which purchased separately would be quite expensive anyway.

The Stuzzi Discorder is not a hi-fi instrument but it does provide a quality of reproduction equal to its separate counterparts, viz.: transistor radio, portable tape recorder, portable record player. It has most of the usual facilities of a small portable tape recorder and a single tape speed of  $1\frac{7}{8}$  i.p.s. It will accommodate  $4\frac{1}{2}$ " spools, so with L.P. or D.P. tape a long playing time is available. Frequency response is 60 to 8,000 c/s., and the output power is 400mW. Recording is half track on standard  $\frac{1}{4}$ " wide tape and the Discorder can be operated entirely from internal batteries. The tape drive is by means of a special high frequency motor.

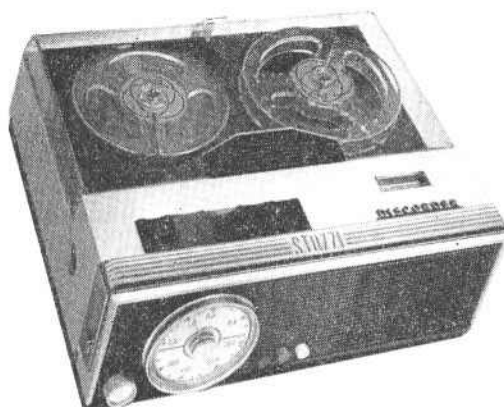
Other features on the tape recording side are fast forward and reverse rewind, record level meter which also indicates the state of the internal batteries, input sockets for microphone, radio or pick up (external) and output sockets for headphones and external loudspeaker. The Discorder can be used in conjunction with an external power supply with incorporated extension loudspeaker which is available as an accessory (type DLN 122).

The radio is a transistorised superhet with built in aerial and equal in sensitivity and performance to any good class of transistor radio. The radio can be run entirely separately from the tape recorder or record player and is quite economical to run, current consumption from the battery being only 40mA. The radio was run for approximately eight hours daily over a period of three weeks after which the batteries were still in good shape and would probably go on for several more weeks at the same rate of usage.

The record playing side, which is tucked away on the underside of the recorder, gives a fair performance and will accommodate 45 r.p.m. discs. The pick-up can be switched into the recorder and records copied on to tape. The radio can also be switched directly to the recorder and radio programmes copied whilst listening. No microphone is supplied with the Discorder but the Stuzzi type DM5 is recommended. Also available as accessories are the Stuzzi M51 and D11 microphones, extension cables, telephone adaptor, headphone monitoring sets, a car battery adaptor and a choice of plastic or leather carrying cases.

## PERFORMANCE

As I said at the beginning of this review, the Dis-



corder is three separate units in one and the performance of each is in keeping with the price. Let's take the tape recording side first. Considering the speed of  $1\frac{7}{8}$  i.p.s. the performance is remarkably good and a radio programme recorded on tape is comparable with the original. Speed fluctuation (wow) becomes noticeable towards the end of a spool of tape but otherwise I have no other criticism of the mechanical or electrical performance on tape, in fact with a good microphone the Discorder will make a recording equal to some of the more expensive portables.

The radio performance I commented upon earlier but should add that second channel rejection is very good and stations such as Luxembourg and Caroline can be received quite well on the built in aerial. Reproduction from the record player is also comparable with that from tape or the radio and whilst not in the hi-fi class it is sufficient for, shall we say, casual listening.

Perhaps the Discorder is a little expensive for the average teenager although it would undoubtedly completely satisfy their insatiable need for radios and record players plus in this case, a tape recorder as well. Bearing in mind however, that one is getting "three for the price of two" the Discorder is a good buy and a really handy all-in-one piece of equipment that would be in constant demand by all members of the family. The Stuzzi Discorder retails at 59 guineas but is supplied without tape or microphone. There is one special feature that the makers asked me to mention and that is the tape spools can be locked on, thus allowing the recorder to operate at any angle.

U.K. Distributors are Recording Devices Limited, 44, Southern Row, Kensington, London, W.10., to whom requests for leaflets, etc., should be addressed.

*A zany idea? Well what would you think if . . .*

# The Year Was 2000!

**T**HE Year Was 2,000!—At least it was for five of us during two evenings of actual recording. When it was suggested that one of the subjects for the Club's competition should be of a newscast in the year 2,000 A.D., eyes boggled, mouths dripped and one could almost hear the mental recording heads screaming with space rockets and asteroids, clanging against the metal hulks.

"That!" George had said, "is just what the other three groups will do, but we shall be different." The club is split into four competitive groups each consisting of about five members. A 'different' fifteen minute tape containing the amenity to transport an audience into the future requires, for its foundation, a conference backed script, a mound of sound affects and a hive of prolific minds in no order of preference.

We had the necessary enthusiasm. For a start, there was the hovercraft port and, as George's wife put it to me, after we had looked into middle distance for half an hour, "You wrote the script, you go get the hovercraft".



"I'm looking for an ominous buzz, constable."

Actually I went to a supermarket, purely to get the sounds of a supermarket for another section in the same tape, but with the usual mistrust of the microphone, I walked away with the background noise of a hovercraft, which just goes to add to the advertisements that tell us that we can get anything from a supermarket. There was this girl inside a bank pounding the keys on one of those electronic typewriter cum adding machines. On playback it sounded like a supermarket.

Of course there was the hovercraft itself and we all assembled with our donated tapes that contained vacuum cleaners, whistling kettles, assorted lip blowing noises and variable speeded up motor sounds. The idea was that we each made a recording of the required sound affects and the best of the bunch was to be picked for the main programme. This we did and with each donation we shook our heads . . . In cases like this a vacuum cleaner sounds just like a vacuum cleaner and so on. We finally commissioned, purely out of accident, the live recording of a hair drier. No one could quite remember how a hair drier came to be used during this pregnant period, but there it was. So with one battery portable singing out with the sounds of the supermarket, the hair drier humming behind the left ear of one live voice and I, recently drafted into the corps of hovercraft pilots, conducting the orchestra, the sounds of 2,000 A.D. came into being.

An ominous buzz, a signal denoting take off time, was required to 'echo through the Port'. I am convinced that everyone regards the person with a tape recorder as something not of this world and so it was that I, without any delusions, recorded a public telephone booth. The instrument off its hook growls with an ominous buzz. (I wonder if the G.P.O. have the copyright on this!)

We needed the sounds of a talking robot and the voice of a Portable Multi Lingual Interpretation Computer Unit (See issue dated March 4th, 1999 for the eezitofolla doityourself diagram). My own subscribed effort was purposely faulty, metallic recorded voice, toneless and dragged with an echo in a foul accoustics rigged room on a machine, because of its age, of variable speeds. The idea was that the 'live' character should speak in a foreign tongue (Russian in this case) and the interpretation tape should be played back through a speaker as far from the microphone as possible. It was a marvellous success so far as I was concerned. I under-

stood every word of the final product, but no one else did. It was a lesson in mistakes. So that the words could be heard on the end tape, the interpretation had to be spoken clearly, faultlessly and slowly into a good microphone and at the speed of  $7\frac{1}{2}$  i.p.s. This was then played back on maximum treble through an open 3 inch speaker. It wasn't high fidelity, but what robot speaks that fluently?

For the purpose of history, a diesel engine was required and it was a particularly cold afternoon that I chose to get it. Whilst I waited on the station I was pestered by a being, sent by one of the competitive groups I'll be bound, who asked five thousand times if I was there to catch a train. Politely I replied, "Yes I am—in a manner of speaking" to which I was informed that I was standing on the wrong platform. Yes, I did show him my recorder, but he was one of these poor souls who did not understand and said so continually. For an hour there was no train and when one did arrive (Make a note to check the time tables in the future) it was a steam hissing contraption. Another eighteen minutes went by and then—forty three thousand trains came through all at the same time. I eventually acquired a diesel engine and when I played back 'they' swore blind that it was a steam train, an express at that, and that I must have put the microphone in its funnel.

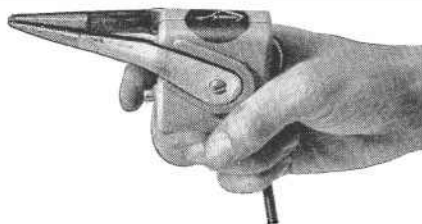
Take a tip; when making a feature tape—and why not, they are interesting both to the makers and the listeners—get your sound effects before you do the script. Do it the other way only if you don't mind leav-



ing all the last minute panics until the very last minute and staying up until the early hours of the morning.

I don't mind, myself. It's people like neighbours, mothers and wives who do all the complaining.

## Professional Performance



### Head De-magnetiser

De-magnetises tape heads quickly and simply. Also for pin-point erasing on striped film and tape recordings—removes local unwanted noises

without detriment. Has nylon-cushioned twin probes with a concentrated demagnetising field in the  $1/8$ " gap between the arms. Pistol grip. A.C. mains. Professionally designed for professional recording engineers. £2.10.0.



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Erases both sides of a 7" tape reel in 30 seconds and positively removes even the very low frequency portions of

a recording. Use the WAL Tape Eraser, the only way to ensure an absolutely clean tape—quicker and better. Mains operated. Also erases sound from 16 mm. film, 10" aluminium reels. Professionally designed for professional recording engineers. £6.18.6.



### Pre-amplifiers

WAL pre-amps are made for every purpose. Fully transistorised, battery-operated, give high gain, completely hum-free. Laboratory built and fully tested. Professionally designed for

professional recording engineers. Ask for details of WAL-GAIN Mono £5.10.0. STEREO WAL-GAIN £7.10.0. and the superb WAL HI-GAIN with built-in switched equalisation for monitoring, dubbing etc. etc. £7.16.0.

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really NEW in  
tape recording:*

# CARTRIDGE LOADING

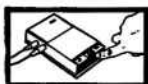
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**PHILIPS BATTERY POCKET  
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Remote control switch on microphone starts and stops recorder—detaches from microphone for separate use.



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# BAFFLING DECISIONS

## Two surprising setbacks for recording enthusiasts

**S**INCE writing last month's club news, I have been greatly disappointed, and I must confess, rather baffled, by two items of news.

The first is the ending of the B.B.C. programme "Sound"—the only programme catering for enthusiasts such as ourselves. Personally, I think the decision to scrap this programme shows an amazing lack of concern for interested opinion. Thousands of keen recordists throughout the country are to be deprived of the one opportunity of studying their subject in its own medium. By now, the department concerned with this closure will no doubt have received numbers of complaints, and I trust that the clubs will not be tardy in registering their disapproval. Only if enough voices are raised in indignation will the B.B.C. wake up to the fact that this programme forms an irreplaceable link in the pursuit of sound recording.

Broadcasts were the subject of another baffling decision, this time by the Post Master General, when Mr. Roy Mason, M.P. for Barnsley, protested against the atrociously high charges for land lines to voluntary hospital broadcasting associations. In reply, Mr. Bevins stated that when land line charges were reviewed in 1961, the question of concessions for broadcasting associations was thoroughly gone into and "we were reluctantly forced to the conclusion that we could not give any concessions . . . and to make a concession to any one section, however deserving, would, in effect, subsidise them at the expense of other telephone users."

What? Does he really expect us to believe this, when the telephone authority admits that they expect to make a profit of £36,000,000 next year.

### CLUB OF THE MONTH

Turning now to more pleasing news, **Walthamstow & District T.R.S.** have planned some new moves which will be very heartening to local non-sighted folk. The first edition of their new magazine for the blind was distributed recently, and local reaction was overwhelming. The local Foresters Vespa Scooter Club readily accepted the invitation to help in delivering tapes, which included a special feature that other clubs might find it worthwhile to emulate. Called "Notice Board" it lists from information gleaned from local transport and amenities authorities, details of changes, alterations, obstructions, road works etc., that are an added hazard to the blind. Furthermore, agreement has been obtained from many of the local multiple stores, supermarkets and shops to appoint a "shop guide" for the general assistance of blind people wishing to make purchases.

### NEW MAGAZINE

A new magazine, this time of the printed variety, has just been introduced by **Thornton Heath T.R.C.** Entitled "Contact" the magazine is a bound, duplicated production, and the first issue was written, stencils cut, run off, bound, and the first copy delivered inside three hours. Wow!

The club has been keeping up a regular tape correspondence with the Tape Club aboard H.M.S. Hartland Point for almost a year now. The ship was undergoing a refit in Singapore when the exchanges started, and she is now based on Hong Kong. At 16,000 miles to Singapore and 20,000 miles return to Hong Kong, the club estimates that the tape—an Agfa triple play—has travelled some 110,000 miles by post to date, and will clock up another 20,000 miles when it next returns to the club.

Co-operation between the club and dealers, industry and other clubs is fast growing, with plenty of visits and demonstrations, and of course, the regular club contests.

### HOSPITAL PIONEERS?

I have had many replies from clubs all over the country about the pioneers among the T.R. clubs in this country. One of these comes from **Radio Barnsley**, who although not the first club (formed February 1958), believe that they are the first hospital broadcasting organisation in the country. Their first broadcast was in September 1958, and to celebrate the start of the seventh season of hospital broadcasts, a 12-hour stint is planned to take place this month. Consisting of 12 live broadcasts (including news and sports bulletins) and 17 pre-recorded items, the programme is scheduled to run from 9 a.m. to 9 p.m.

As mentioned above, the first blow to Radio Barnsley in the fight to reduce land line charges for these services has come. Club members there are as baffled as I am by Mr. Bevins' refusal to grant concessions to organisations such as theirs. However, their M.P. Mr. Mason has asked the club to provide evidence that there is a demand for such a reduction. A.T.R. has already found its way into Mr. Mason's hands, and if there are any clubs in Britain who feel that they would start hospital broadcasts, or extend present ones, if only the land line charges were reduced, would they please write to **John Fisher, The Secretary, Radio Barnsley, Y.M.C.A., Barnsley, Yorks.** The evidence so gathered, if sufficiently impressive, might well affect any further decisions the P.M.G. may make on this matter, so do speak up for yourselves! And if you can pass the word around to other organisations who might be interested, so much the better.

### WEST COUNTRY PIONEERS?

Another reply concerning pioneers came from the newly formed **West Cornwall Tape Recorder Club** at Penryn. Although perhaps one of the youngest clubs, they feel themselves pioneers in the sense that they are not aware of any other similar club in the county (Sorry to disillusion you folks, but my records show three), but pioneers or not, the folk at Penryn are really working hard to make things shipshape for their first official meeting on the 4th of this month. Meanwhile they are giving prospective members something to aim for by setting a tape contest. Already, keen-to-get-started members have been recording live brass bands, choirs, etc., and have found local organisations only too willing to help, and even arranging special programmes for the enthusiasts to record.

### KEEPING OUT THE TRAINS

For some months now, members of **I.V.A.S.** have been busily building their own studio in the garden of one of their colleagues. Work has progressed satisfactorily, and although the studio is not quite complete, some trial recordings have already been made within its walls. One snag is the local electric train route, which runs parallel with the garden about 100 yards away from the studio. The sound of the electric trains has been completely eliminated, but not so the low frequency noises of the diesel locos, although these have been much reduced. However, it is hoped that the girls will help solve this problem, for they have the job of attending to the interior decorations. The fitting of heavy curtains and carpets should make quite a difference.

Meanwhile outdoor recording sessions have not been overlooked, and members are being conned into buying portable machines. The possibilities of making or buying a parabolic reflector for the club are also being looked into.

### CARILLON CHIMES

Members of the **Doncaster and District T.R. Club** have, for their hospital

### TOP TEN FOR SEPTEMBER

- 1 — Walthamstow
- 2 — Thornton Heath
- 3 — Barnsley
- 4 — I.V.A.S.
- 5 — Doncaster
- 6 — West Cornwall
- 7 — I.T.A.C.
- 8 — Millom
- 9 — Hinckley
- 10 — Lincoln

broadcasting service, recorded Church bells from every church in the area. The last, and probably most important, of these Sunday morning outings was to nearby Tickhill parish church, where there is a carillon which plays for 20 minutes, and four times every Sunday it plays a different selection. This meant a long days work for a Sunday, but in a very worthwhile cause.

Another outdoor event for a very worthwhile cause was the local Donkey Derby organised by members of the Doncaster Lions Club. I must mention that this club is one formed from all the big business men in the town, and every year they raise about £2,000 for charity, about £200 of which comes from the Donkey Derby. For this, Doncaster club members rigged up the P.A. system and gave commentaries on the races. Later the winning jockeys and personalities were interviewed, including some young winners of the children's races, and genuine professional jockeys, such as Joe Sime. In return, the Doncaster Lions are to equip the local hospital with a new amplifier and radio system, with headphones for every bed, so that the patients may all enjoy the T.R. clubs' hospital broadcasts.

#### PROGRAMME ANALYSIS

An interesting analysis of their programmes for 1963 has been sent to me by Ilford Tape Recording Club, which should make fascinating reading for other clubs. Of the total number of meetings during the year 40 per cent were devoted to club projects, and a further 28 per cent were spent on "members' recordings." Instructional programmes took up 19 per cent of club evenings, and manufacturers' talks and demonstrations 9 per cent, compared with 1962's total of 19 per cent. The remaining 4 per cent went on club quizzes. Which makes me wonder how other clubs divide their time. Do you set out to provide a given percentage of a particular item, or do you just plan for individual programmes, and work out the proportions later on, if at all?

#### TRAGEDY FOR MILLOM

As you are no doubt following in current issues of A.T.R., the Millom club members really banded together to produce the grand studio they now enjoy for club meetings. Just before the final inauguration of the new premises, the club held its A.G.M., when appropriate new rules for members were introduced. These included a limitation of membership to 20, and the banning of smoking

on club premises for fire insurance purposes.

But the meeting was tinged with sorrow when members received the sad news that their good friend and fellow member George Lamb had passed away that very day. Fellow member Phil Darke writes: "George was extremely popular, and one of the stalwarts of our club. It is perhaps ironic that he should have watched and helped so much with the construction of our clubroom only to see, but never have the opportunity of benefiting from it."

Club life has continued, however, and since the inauguration party many very successful recordings have been completed.

#### LESSONS TO BE LEARNED

Hinckley Club members are discovering that there is more purpose in making recordings that just for taping's sake. For instance, when they recorded, in conjunction with the local photographic society, the annual Carnival, it was decided that the final film and sound track will be a great help to the Carnival committee for next year. From it, the committee can see just where the organisation and procession routes can be improved, and I understand that many long winter evenings will be spent studying the tape club's efforts and learning from them.

Another lesson well learned by the Hinckley club's committee, is that of keeping the younger members happy, particularly the female ones. For this reason, two of the club's young lady members have been selected as interviewers at the local Mecca Ballroom, where they have the opportunity of doing

useful club work and meeting their favourite pop stars at the same time.

#### CLUB CARAVAN

I was very pleased to hear from the two organisers of the new Lincoln Tape Recording Club, that the notice, albeit very short, in these columns recently, really brought attention to the club, even from as far afield as Scotland. A Scotsman wanted a recording of the bells of Lincoln Cathedral for a friend of his who had previously lived in Lincoln, and club members took great pride in executing their first outside commission.

It is hoped to start a hospital broadcasting service in Lincoln shortly, but the club's first task is to convert a caravan into a club studio. This somewhat unusual conversion will doubtless need much patience and not a little ingenuity, but I'm sure the project will give the new club a real incentive for enthusiasm.

#### NEW INTERNATIONAL CLUB

Doubtless many of you will have heard of the Nor-Tape Club for tape-spondence, which of late seems to have broken up. One or two members, feeling that they hadn't had their money's worth of taping, started up a new club open to all, but with free membership to those who had been current members of Nor-Tape when it apparently disintegrated. Called the International Tape Recording Club, this new organisation is now well under way in the States, and a British branch was inaugurated on July 11th. U.K. rep. is Brian Lowe, of 43 Laburnum Walk, Hornchurch, Essex.

#### CHANGE OF ADDRESS

The new Secretary of the Dundee T.R. Club is Mr. Charles Aitken, 32 Muirfield Crescent, Dundee, Angus.

- Members of the Boston Soundhunters inspecting Lustraphone microphones at a recent meeting. Chairman Ken Healey (left).



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Tape/Disc/Tape transfer, editing, duplicating. If quality and durability matter (especially with LPs from your precious tapes), consult Britain's oldest transfer service. Records published for schools, Musical Societies (tax free); excellent fund raisers. Sound News, 10 Clifford Street, London, W.1.

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"Somerset" 10 and 30 watt output transformer. Transformer Equipment Limited, Railway Place, London, S.W.19.

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Quite certainly the October ATR will be pounced upon by hi-fi enthusiasts. It will contain articles, circuits, reviews, etc., for both the beginner and the hi-fi addict. Also the first of a series of free-to-enter competitions with a fascinating range of hi-fi equipment as prizes. So don't miss ATR in October. Fill in the form on page 52 now!

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# MICROPHONE DIRECTORY Cont.

Continued from page 21

| Make                             | Type                                       | Polar Response                                   | Frequency Response (c/s) | Impedance (ohms) | Price | Make   | Type               | Polar Response | Frequency Response (c/s) | Impedance (ohms) | Price |
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| MICROPHONE MATCHING TRANSFORMERS |  |  |                          |                  |       |        |                    |                |                          |                  |       |
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| A.K.G.                           | U1   | 50-200 ohms                                      | high                     |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U50  | For K50 or K51 stereo headphones only, 4:1 ratio |                          |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U203                                       | 200 ohms   | high (with cable)        |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U204                                       | 200 ohms   | high (chassis mounting)  |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U207 & U209                                | ratio 30:1                                       | chassis mounting         |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U212                                       | 200 ohms   | high (with cable)        |                  |       |        |                    |                |                          |                  |       |
| A.K.G.                           | U400                                       | 200 ohms   | high (stereo only)       |                  |       |        |                    |                |                          |                  |       |
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## STUDIO MIXERS

| Make      | Type                               | Microphone Channels | High Level Channels                     | Power | Price                |
|-----------|------------------------------------|---------------------|---|-------|----------------------|
| Vortexion | Four-way                           | 4                   | —                                       | mains | £40 8 6              |
| Vortexion | Three-way                          | 3                   | With prog. level meter                  | mains | price on application |
| Vortexion | Twelve-way                         | 12                  | —                                       | mains | do.                  |
| Vortexion | Mixer amplifier 10/15 watts output | 2                   | 1 gram, 1 tape (bass & treble controls) | mains | £49 0 0              |

## ATR SOUND CONTEST

With only eight weeks left till the closing date of the ATR 1964 Sound Contest, those of you who have not yet completed your entries had better get a move on! In reminding you of the rules (below) we would draw your attention to Rule 7, which is a new one, and also to the Room Number to which entries should be sent.

1. Any subject suitable for sound recording may be used.
2. Recordings may be stereo or mono, at speeds of 3½ or 7½ i.p.s.
3. Duration of recording not to exceed five minutes.
4. No copyright material from radio, pre-recorded tapes or discs may be used.
5. Tapes entered must be properly spooled on not larger than 7-in. spools, and preferably with leaders at each end....
6. Closing date for entries is 1st NOVEMBER, 1964.
7. No tapes may be entered that have been entered in any previous competition whatsoever.

Entries will be judged on quality, editing and continuity, as well as on actual content, and the decision of the judges will be final. Send your entry to "ATR Sound Contest," Room 538, Ulster Chambers, 168 Regent Street, London, W.1. Remember to include your own name and address, the title of your recording, and the speed at which it was made.

Beyer TR48-BV-35604 For DT.48 microphones only

|  |       |
|--|-------|
| £4 17 6                                    |       |
| Type G7/LH                                 | 15/30 |
| Type G7/LM                                 | 15/30 |
| Type G7/MH                                 | 600   |
| Type G7/HM                                 | high  |
| (available without cable and mu-metal box) |       |

|                   |                |      |         |
|-------------------|----------------|------|---------|
| Reslosound MT.101 | 30.50 ohms     | high | £2 12 6 |
| Reslosound MT.102 | 600 ohms       | high | £2 18 6 |
| Reslosound LTU.1  | Line 30.50 ohm | high | £4 4 0  |

## MICROPHONE STANDS AND FITTINGS

Most microphone manufacturers make and supply stands and flexible mountings, etc., for their microphones. A.K.G., for example, have a unique range of flexible shafts, adaptors for microphones and stands, cable reels, carrying cases, plugs, sockets, elastic suspensions, etc. These items are too numerous to list in detail in this directory, but we include the names of manufacturers with a note of the kind of accessories they can supply:—

|                                    |   |
|------------------------------------|---|
| A.K.G. (Politechna London Ltd).    | Stands, adaptors, flexible and other microphone mountings. Thread adaptors, microphone booms, windshields, etc. |
| Beyer (Fi-Cord International Ltd.) | Floor stands, boom arms, goose-neck flexibles, thread adaptors, special cables, etc.                            |
| Gramplan Reproducurs Ltd.          | Parabolic microphone reflectors, microphone stands, cables, plugs, etc.   |
| Grundig (G.B.) Ltd.                | Plugs, sockets (DIN), cables and adaptors.  |
| Lustraphone Ltd.                   | Microphone stands, booms, flexible mountings, adaptors, etc.  |





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| GRUNDIG TK 6                   | 67/6 |
| GRUNDIG TK 8 with pocket       | 63/- |
| GRUNDIG TK 14, 23 & 18         | 59/6 |
| GRUNDIG TK 20 with pocket      | 52/6 |
| GRUNDIG TK 24 with pocket      | 55/- |
| GRUNDIG TK 25 with pocket      | 55/- |
| GRUNDIG TK 30 with pocket      | 60/- |
| GRUNDIG TK 35 with pocket      | 63/- |
| GRUNDIG TK 40 & 41             | 66/- |
| GRUNDIG TK 46 with pocket      | 82/- |
| GRUNDIG TK 60 no pocket        | 75/- |
| TELEFUNKEN 85 with pocket      | 65/- |
| TELEFUNKEN 75/15 & 76K         |      |
| with pocket                    | 55/- |
| TELEFUNKEN 95 & 96 with pocket | 69/6 |
| PHILIPS 8108 with pocket       | 57/6 |
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| PHILIPS EL3538 with pocket     | 63/- |
| PHILIPS EL3542 with pocket     | 63/- |
| PHILIPS EL3536 with pocket     | 70/- |
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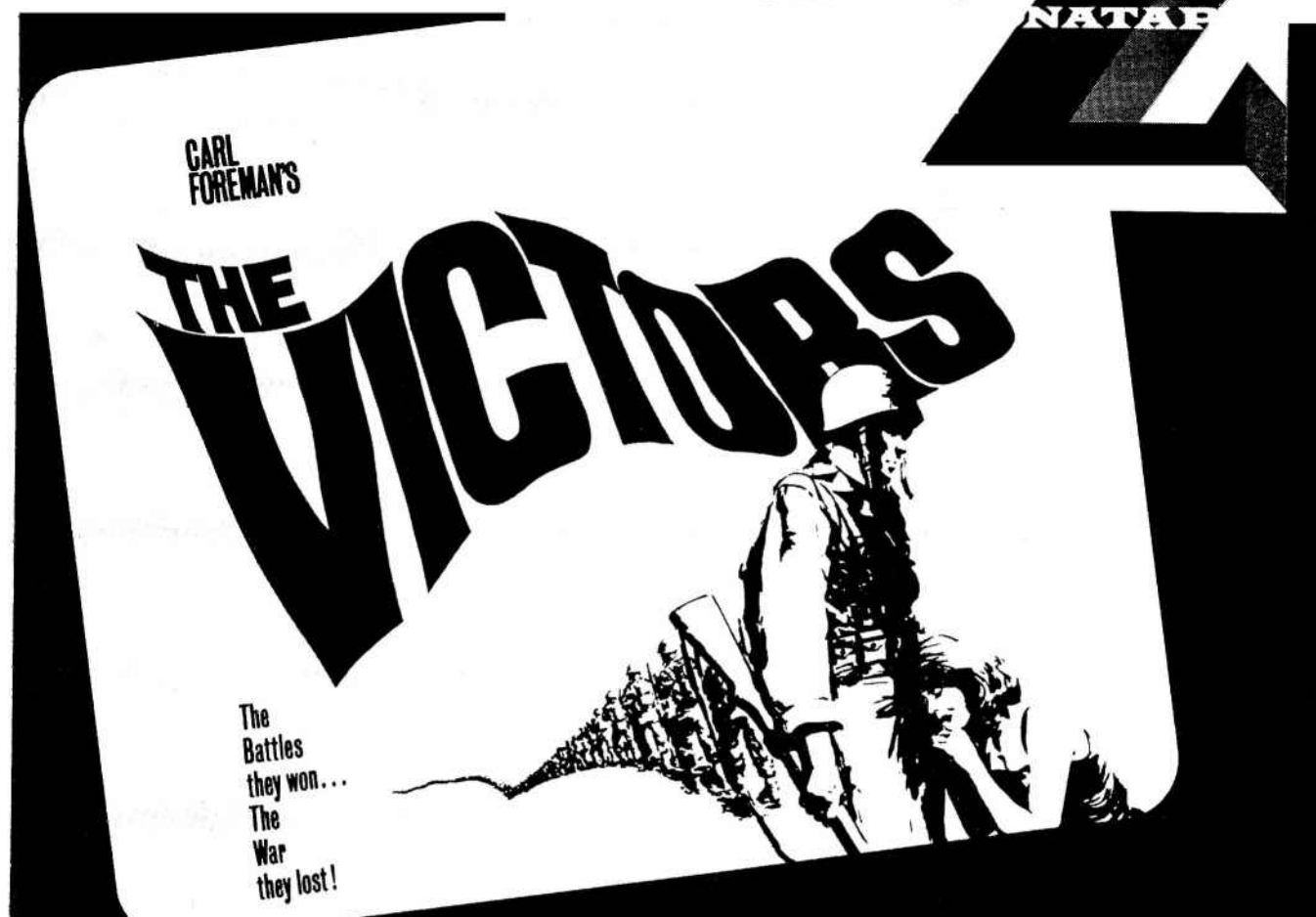
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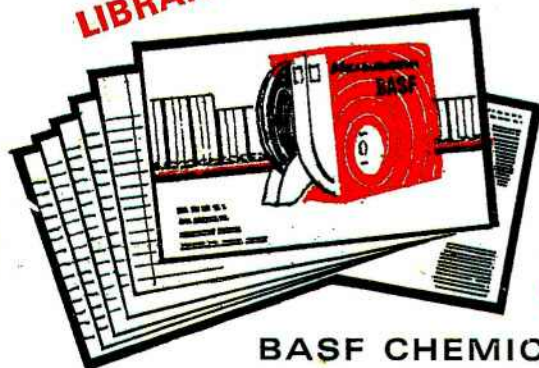
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