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RECORDERS**

Special feature ^{pages} 13-23

TAPE

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AND HI-FI MAGAZINE

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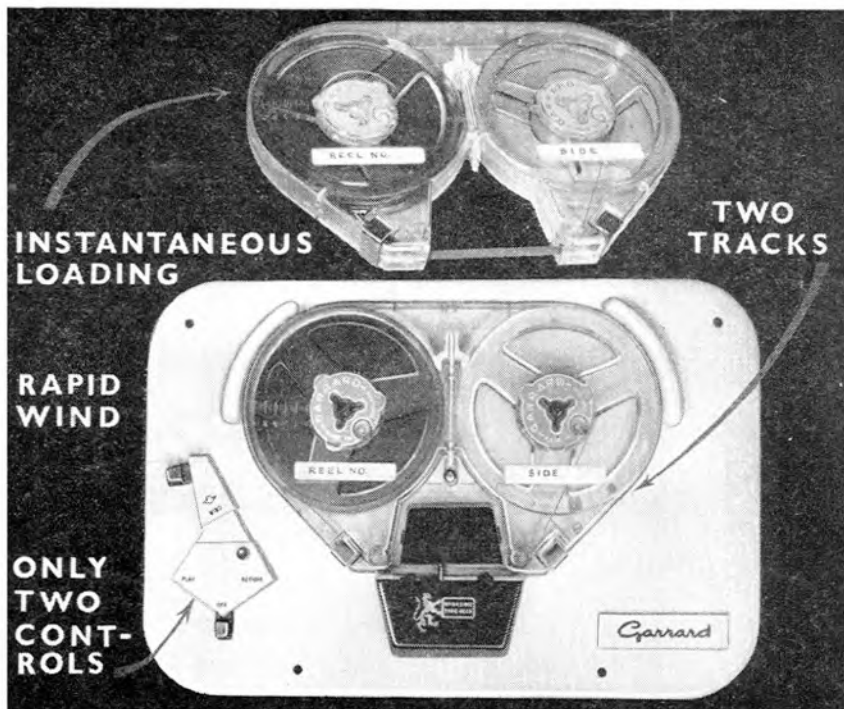
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The Saba Tape Recorder is made at Villingen in the Black Forest. It is a two-speed— $7\frac{1}{2}$ and $3\frac{3}{4}$ i.p.s., twin track, two way machine built to professional standards. When recording it reverses automatically and stops at the end of track II; when playing back it reverses until stopped. It takes 7 inch reels, giving over 4 hours playing time at $3\frac{3}{4}$ i.p.s. The record-replay heads measure 0.00016 ins., which with careful attention to circuitry give frequency responses of 40 to 20,000 c.p.s. at $7\frac{1}{2}$ and 40 to 16,000 at $3\frac{3}{4}$ i.p.s., all ± 3 dB, at a signal-to-noise ratio better than -40 dB unweighted, including hum. This means that, at normal room volume, a recording of the average f.m. broadcast combined wow and flutter is less than 0.4% at the slower speed, and cannot be detected even on sustained piano type motor is silent in operation, The Saba will fast wind 1,800 ft. in either direction in under 3 minutes with even and drum-tight spooling. Braking is instantaneous, even on fast wind, without spill or strain. The (ECL82) will deliver $3\frac{1}{2}$ watts without audible distortion into two separate inputs for low-impedance elliptical speakers 7×4 ins. which may be left permanently connected; there is a knob to choose the one required. There are outputs to an external amplifier, to the output stage of a radio and to an external speaker. The internal speakers can monitor; there is an erase cut-out button. Clicks on the tape are attenuated. Control is entirely by relays, actuated by illuminated buttons; no pressure pads are used. The Saba which is housed in a two-tone brown case will give many years of that contentment born of the conviction that one has the best. It costs 79 guineas without microphone. Write for multi-coloured fully descriptive brochure to Dept. SS5, Selmer, 114 Charing Cross Road, London, W.C.2.



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Listen Before You Leap



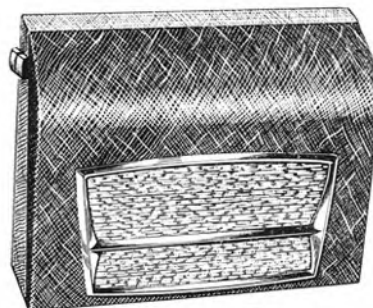
THOSE of us who know little about decibels and flat frequency responses might not raise our eyebrows at the facts and figures describing the much-talked-about new WyndSOR "Victor" portable. Those who are genned up to translating the specification into words and music are not surprised that the "Victor" sounds better than some tape recorders nearly twice the price. But make no mistake if you are about to plunge: the WyndSOR "Victor" is a quality-all-the-way portable, so beautifully designed and executed as to bring professional-sounding recordings within the reach of the most non-technically-minded amongst us.

Mark these following features and ask yourself how does WyndSOR do it at the price.

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 - 7½ i.p.s.—50 to 15,000 c.p.s. better than ±3 dB.
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- * finger-tip controls closely grouped.
- * mixing facilities for mic and gram/radio inputs.
- * additional output with automatic speaker cut-out.
- * facility for use as an amplifier.
- * three independent 4-pole motors.
- * unique styling in two-tone grey with gilt fittings.
- * twin tracks * pause control * tone control.
- * guarantee: 12 months (valves 90 days) and the name of WyndSOR.

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If history is anything to go by, widely publicising the "Victor" would overwhelm the WyndSOR factory. WyndSOR policy is never to sacrifice quality for quantity and the fact is that there were never enough of the "Victor's" predecessor, the "Viscount," to satisfy the demand. So now is the time for all good enthusiasts to inquire at WyndSOR dealers or to send postcards (clean variety still preferred) to the modestly proud makers for the names of nearest stockists. There is nothing more annoying than hearing a WyndSOR just after buying an ordinary tape recorder.



the WyndSOR "VICTOR" complete with crystal microphone, 1,200 feet of tape, and spare jackplug, is only 45 guineas.

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'phone : SW1 4977

ELEKTRON 4-TRACK RECORDERS

● Important announcement

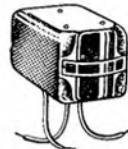
TSL, exclusive trade distributors for this superb four-track stereo/mono recorder, announce that due to exceptionally large overseas orders the manufacturers have been able to effect a substantial reduction in the price of Elektron Model 9S/4K. This finely designed instrument with multi-channel input facilities, superimpose, monitor and pause features, etc., provides for every possible requirement for stereo and mono recording and playback, and has all the features of the most expensive instruments, including true high-fidelity quality to make it the lowest-priced quality recorder in its class.

62 gns.

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Add below any models you are particularly interested in:

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MODELS:

R20 62 GNS. with magic eye recorder indicator.
R30 66 GNS. with meter record level indicator.
R40 70 GNS. as R30 but with push/pull sound.

TECHNICAL SPECIFICATION

The R40. $1\frac{7}{8}$ ips 70—4,500± 3dBs. $3\frac{1}{2}$ ips 60—9,000± 3dBs. $7\frac{1}{2}$ ips 50—15,000± 3dBs. 15 ips 40—20,000± 3dBs. (signal noise ratio at $7\frac{1}{2}$ ips—47dBs.). Separate record amplifier. Push-pull bias erase oscillator for low tape hiss. Separate bass and treble controls± 15dBs at 14 kc/s—15dBs at 40 c/s. Supplied complete with Acos 39/1 microphone. Radio Record lead and 1,200' PVC Tape.

FURTHER FACTS:

It is not generally known that the Tape Deck mechanism is virtually re-built in the REPS machines. It is standard procedure to remove all rubber wheels—i.e., re-wind, idle and pinch—and re-grind them to a closer tolerance. Also the Capstan is skimmed to less than ± 0.0001". This has resulted in a very low "wow" factor, especially at $3\frac{1}{2}$ ips which has led to the logical introduction of $1\frac{7}{8}$ ips in place of the 15 ips. The principal cause of "flutter" is due to the eccentricity of the three-step pulleys which control the tape speed. This eccentricity occurs when the pulley is locked to the motor shaft and is due to the off-setting action of the fixing screws. This difficulty has been overcome by manufacturing pulleys over-size and machining to the correct diameter when fitted to the motor shaft. By this method a total variation of less than 0.0001" has been achieved at $1\frac{7}{8}$ ips. Initial measurement indicate total "flutter" content at $1\frac{7}{8}$ ips to be of a lower order than previously associated with $3\frac{1}{2}$ ips.

D. W. Aldous of 'GRAMOPHONE RECORD REVIEW' writes in March issue:—

"The overall performance of this Repls R30 recorder, coupled with its reliability and simplicity of operation, not to mention an attractive styling, must give it a wide appeal to tape recordists seeking an all-British machine of unusual quality."

Please send me without obligation full details of your range of Tape Recorders. I am particularly interested in

Model R.....

Mr.

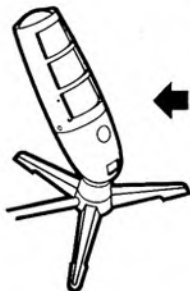
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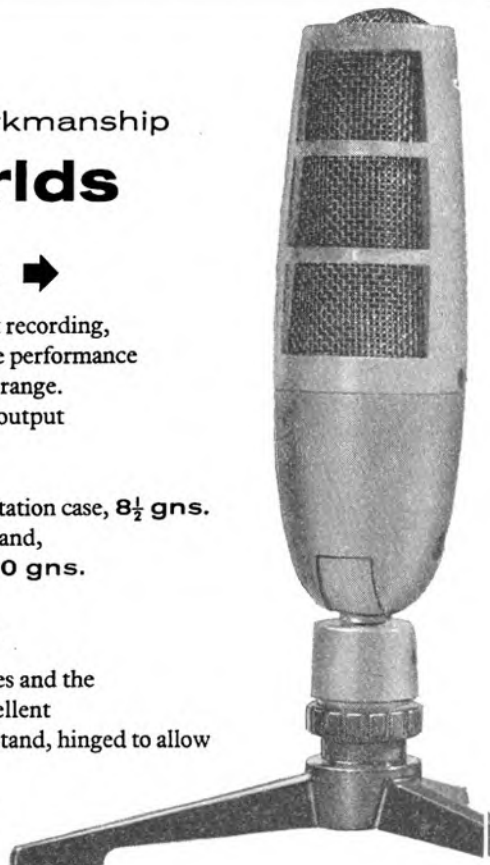


← *Cadenza Crystal* MICROPHONE

Top crystal performance, robust and handy, these qualities and the low price make this an ideal second microphone or an excellent partner to any tape recorder. Complete with tripod desk stand, hinged to allow adjustment of microphone head angle, **3½ gns.**

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IN THIS ISSUE

We take the view . . . 10
The World of Tape 11
News Digest
BATTERY PORTABLES 13
A special summer feature
Technique of recording interviews 14
S. M. Wheatley
A 1001 uses for a portable recorder 16
Mains pack for the Grundig Cub 18
Build-it-yourself article
Survey of portables in use 22
A monitor for tape copying 24
Cecil H. L. Andrew
Stereo Notes 24
Douglas Gardner
How to read a circuit diagram 26
Charles Langton
Report from Rose Bruford 28
Sound Effects 29
Alan Edward Beeby
Equipment under Test 31
New Products 33
Letters to the Editor 34
News from the clubs 35

We take the view . . .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

NEVER a dull moment! Always something new to record. Now it is the first Soviet space-ship, which has been orbiting the earth since May 15. I wonder how many enthusiasts were up before dawn on the first morning to tune in to its signals.

Angus McKenzie, of Olympic Sound Studios, tells me that *he* was and I am indebted to him for the details that follow.

To hear the space-ship at its best the receiver should be adjusted to get the American station W.W.V., which sends out pips every second for receiver alignment purposes. This is the frequency of the rocket transmitter.

If your receiver has a beat frequency oscillator, an interesting experiment is possible. The dial should be set to receive on a frequency of 20.00 megacycles (approximately 15 metres).

After the space-ship passes the horizon, pips should soon be heard on this frequency. A note should be made of the frequency of the pip when it is beating with the oscillator. It will be found that—because the speed of the space-ship causes the so-called Doppler Effect—the frequency of beat note will change. The difference between the two frequencies (i.e. that first heard and that last heard) will give some idea of the speed of the rocket and, by trigonometry, the height above the earth can be calculated.

Only a powerful receiver will be able to pick up the signals for more than three minutes as the space-ship passes over head.

Angus McKenzie has suggested a competition, in which we are happy to cooperate. Olympic Sound Studios will give a prize of four boxes of recording tape for the best recording by a reader of the sound of the space-ship (with or without beat frequency oscillator). Send entries direct to the Studios at Carton Street, London, W.1. Judging will be by a panel of engineers at the Studios, and their decision will be final.

C.I.M.E.S.

THE Ninth International Recording Contest—CIMES 1960—and the annual congress of the International Federation of Sound Hunters are to take place in Holland between October 28 and November 1. The FICS congress will meet in Amsterdam, the Contest judging will take place in the studios of Radio Hilversum, and the visitors will also go to Eindhoven as guests of Philips.

Britain will be represented by the Federation of British Tape Recording Clubs and the best entries in the British Amateur Tape Recording Contest will, of course, go forward to Hilversum for judging.

Our Dutch friends promise a most

attractive programme and I am looking forward to a very interesting five days there in the autumn.

developments in the use of tape recorders in the next few years," he told shareholders.

Success story

THERE are many romantic success stories to be told in the world of hi-fi and tape recording. An outstanding one is that of Dr. D. M. McDonald, the Chairman of Birmingham Sound Reproducers Ltd.

Back in the 'thirties he was an employee of a big firm in the electronics field. He decided to take the plunge and to start up on his own. The energy and diligence he put into his venture were astounding. He wanted to make equipment that would have medical uses; so he set to and took a medical degree.

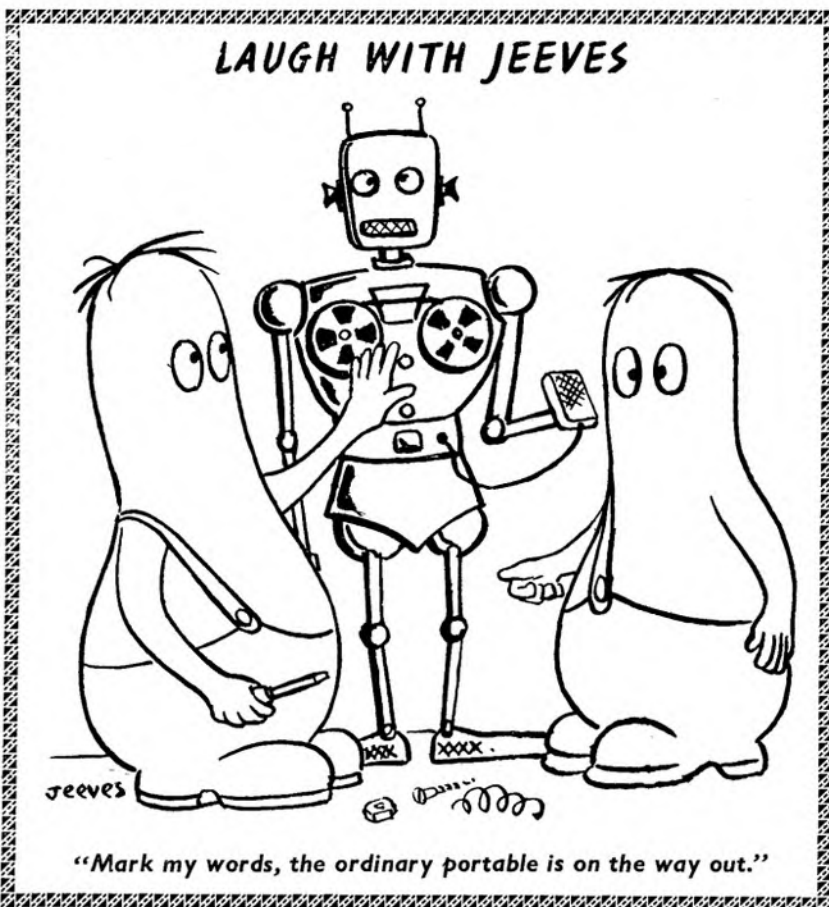
B.S.R. Ltd. is now 24 years old. At its annual meeting the other day, Dr. McDonald reported a net profit, after tax, of over £800,000, and production running at a record level. "The reception given to our tape deck has been beyond expectations and we anticipate large

Glamour

HAVE you met the Garrard Girl? If not, you will make her acquaintance on page 28 of this issue. Readers in South Wales and the West of England may already have seen her on commercial TV there; she will make her debut shortly in other parts of the country.

It seems still to be true that nothing sells a product so effectively as a pretty girl. I take it we were all captivated by the Elizabethan Girl, in colour, in our last issue? Do you smile back, too, at the beautiful brunette in the Spectone adverts? Or wink at the charmers who recommend the Simon? And what did Jayne Mansfield do for you when she appeared in the H.M.V. adverts with recorder and mic?

The glamour parade is growing daily. As Jimmy Edwards would say, Whacko!



BLIND LIBRARY SWITCHES TO TAPE AT COST OF £95,000

THE Foundation for the Blind in New Zealand expects to spend £95,000 converting its talking book system from gramophone records to tapes. "The Foundation has raised £30,000," said the director, Mr. E. W. Christiansen, "and we have to find the balance within the next five years."

The new machines will cost £25, and each recording cassette £8. New Zealand has ordered 1,000 machines and 5,000 cassettes. The change-over is expected to begin early next year.

Up to date there's only one of these machines in New Zealand—at the Blind Foundation in Auckland—which is being used for demonstrations.

New Zealand, Britain, Canada and Australia are combining in the scheme, which one member of the Foundation described as "the biggest thing since Braille."

A London factory will produce the master tapes. "But once the tapes are in general use here," said Mr. Christiansen, "we hope to produce some of our own."

These will be from books by local authors."

Encased in steel cassettes, the tapes have a life expectancy of 20 years.

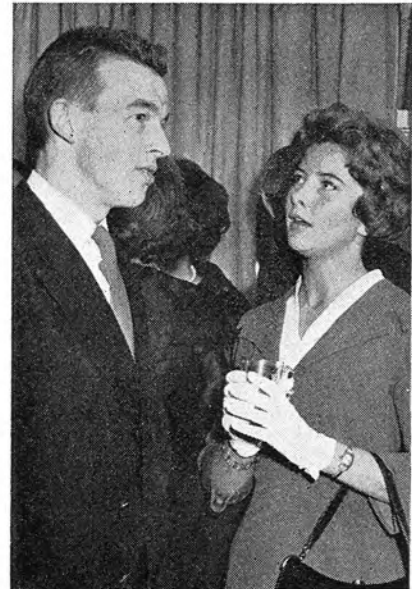
The new machines are easier to handle than gramophones. They can be stopped in the middle of a track, and they have attachments for earphones.

A book the size of "Gone With The Wind" at present fills 60 records. Now it will be fitted into one cassette, taking 20 hours reading.

"The greatest advantage in the change-over," went on Mr. Christiansen, "is that we will be able to meet the demand for popular books. We only had two copies of 'The Cruel Sea' and the waiting list was so long that, theoretically, some had to wait 13 years."

"Now, from a master tape I can take as many copies as are required and, when the demand has fallen, scrub the tape clean and use it again."

"Once these tapes are in general use, the work of the Post Office, which provides a free delivery service, will be reduced by about 50 per cent," he concluded.



"Absolutely invaluable" is the way June Thorburn described her tape recorder to Fred Chandler of Tape Recording Fortnightly, seen with her above at a recent cocktail party.

"I use it a great deal," she said, "especially to perfect any particularly difficult dialect called for in my scripts. For general purposes, when learning lines, I also find it an asset. I record my part, then sit back and listen. From the notes made during playback—I am a stern critic—I re-record until perfectly satisfied."

She uses a Grundig TK8.

June's latest film, The 3 Worlds of Gulliver, is to be released by Columbia Pictures next Christmas.

Equipment to meet a world demand for religious tapes

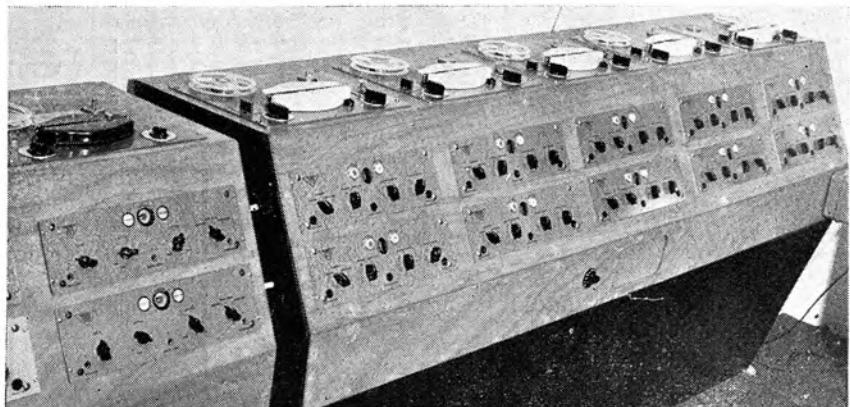
THE growing demand all over the world for pre-recorded tapes of religious talks, broadcasts and services presents a problem to the recording engineer when it comes to combining quality of recording with speed of production.

This problem has been met by one of the world-wide religious organisations by the use of the equipment shown in this photograph.

Two consoles, each comprising five Brenell decks and ten amplifiers were designed and made by Messrs. Benfell Ltd. of Blackpool. The consoles are coupled by a multi-plug for A.C. power and screened leads terminated at both ends coupled through the audio feeds, each console having jack sockets at both ends. The inbuilt speakers can be switched to any of the ten amplifiers to sample recordings.

Service to any amplifier or deck is carried out by simply unplugging the defective unit for repair, while leaving the other units temporarily continuing production at a slightly reduced level.

All the power packs are linked by their own shortened mains lead, leaving one mains lead to reach a suitable power point which, when switched, controls all the equipment. Amplifier and decks can be individually rendered safe by the removal of the fuse in the power pack.



Part of the equipment specially designed to copy tapes for religious purposes

All the power packs are primarily designed for recording only.

A minor modification was carried out by wiring all the motors to a common cut-out switch, seen on the right of the picture; this allows all the amplifiers to remain heated, and enables the decks to be started and stopped together. It will be realised that, having set all the decks to record position beforehand (when loading with tape), all the brakes will be

released and, on pushing the start button, all the decks will start in unison.

Recordings are mono, but optimum production is obtained by using stereo facilities and recording the second track backwards.

Recording is at double speed.

The master recordings are made at 7½ ips and are played back at 15 ips on a stereo master recorder. This signal is recorded at 7½ ips, giving a final product of 3½ ips.



Only with **FI-CORD** can you have it both
ways—really HI-FI and really portable

Don't be misled by the compact size. The **FI-CORD** is a high fidelity instrument of advanced scientific design—assuring true-to-life recordings.

Frequency 50-12,000 c.p.s. \pm 3db. Tape speeds $7\frac{1}{2}$ i.p.s. and $1\frac{1}{4}$ i.p.s. Twin track record/playback, using standard $3\frac{1}{4}$ " spools.

Wherever you go, you can take your **FI-CORD** with you, it is ideal for adding

the realism of sound to movie films.

The **FI-CORD** weighs only $4\frac{1}{2}$ lbs., measures $9\frac{1}{2}$ " x 5" x $2\frac{1}{4}$ ", operates in any position (lid open or shut) and requires no power point. It runs on 4 batteries, rechargeable from the automatic charger supplied.

Built-in speaker. Full playback volume. Extension speaker socket. Dynamic microphone with stop/start switch.

*CATCH IT—
AND KEEP IT—WITH*

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Microphone, Tape,
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BATTERY PORTABLE TAPE RECORDERS

A TAPE RECORDING & HI-FI
MAGAZINE SPECIAL SURVEY



The most important single current trend in tape recording is the rapidly growing popularity of battery-operated portable machines. The situation has been transformed since we published our first survey on battery models in these pages three years ago.

At that time the cheapest available battery tape recorder cost over £80, and it was one of only two then available. We had to fill out our survey with details of a machine which had become obsolete, plus two office dictation models.

Now there is a wide and exciting range to choose from, as the details on pages 22 and 23 of this survey will show. There are popular models costing well under £30, there are a number of high-performance machines between £40 and £75, and there are some superb professional-quality recorders at higher prices.

Today everyone is catered for: every pocket and every use.

Far-sighted executives have quickly devised many uses for the battery portable in professional, commercial and industrial life. At the other extreme, many teenagers are taking to tape recording, for the first time, with a battery portable. Between, there is a growing company of keen tape-users who are using the new light-weights as auxiliaries to their mains machines.

The "reader quiz" recently conducted by this magazine revealed that almost one-fifth of our readers now

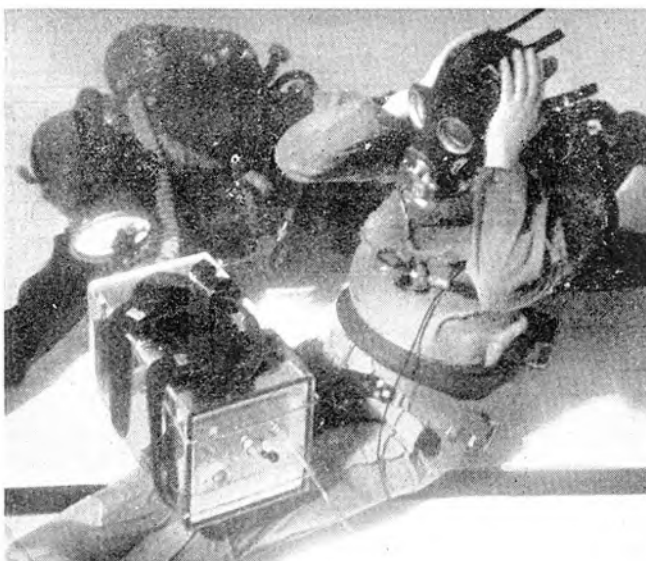
own a battery portable recorder. Among them, a quarter have a battery machine only; the other three-quarters have mains and battery models.

Many of the battery portables can, of course, be adapted by simple add-on units to be operated from the mains. Recognising that many enthusiasts are now thinking in these terms, we include in this issue an explanation of how you can "do-it-yourself" with one of the most popular portables.

We are able to announce, too, an entirely new machine with which the change-over from mains to battery operation simply involves the flick of a switch. This is a significant development and is likely to set a pattern for other recorders.

With the spread of these portables, tape recording horizons are extended to embrace any imaginable type of recording activity. Informal outdoor parties (such as that illustrated above with a Clarion Transita), rail journeys and boat trips, lazy days on the beach, bird-song and bands, outdoor ceremonies and local dialects, gossip in the pub and foreign travel: these are but a few of the sounds which are now much more easily obtainable by anyone.

There are new techniques to be learned if the greater opportunities are to be used properly. So we introduce the summer season with this survey and, in future issues, we shall provide regular and full cover of the battery portable field.



The author with the E.M.I. L2, in a protective case on his lap, seen during an underwater exercise

Battery portable recorders have been used by the BBC since 1952. In charge of training in their use has been S. M. Wheatley; he might almost be called the "King of the Midgets". In this article he calls upon his vast experience to suggest basic technique for the amateur.

IN the development of most modern pastimes there has usually been a slow growth of interests by a few enthusiasts, with leading manufacturers and commercial interests reluctantly catering for their needs. Cycling, motoring, motor-cycling, photography, radio, hi-fi, tape recording, and now the very latest phase, the development of battery-operated "midget" tape recorders for the mass of tape recording "fans."

With probably nearly a million owners of mains-driven tape recorders in this country wondering how to expand their hobby, it is pleasant for those of us "in the know" to offer our experiences and advice. When asked to do an article for this special number, I felt I could well do so since I have been organising the B.B.C.'s service of midget tape recorders for some years.

Naturally we started in a small way, back in 1952. It was an experiment to supplement the service performed by mobile recording teams. Mobile recording on disc gave way to tape recording, but the gear was large and heavy and the car-size batteries even bulkier, so that when an early American "toy" recorder appeared, operated by dry cells, the B.B.C. tried out a new method of gathering programme material.

A few selected producers of feature writers were taught how to operate these recorders. They then went forth independent of cars and heavy equipment. The results were sufficiently encouraging to justify ordering a British-made machine, and by the end

of 1953 a small service was established, with myself in charge.

From small beginnings the service has grown year by year. Mainly relying on what is described as the "famous L2," we now operate nearly 200, instead of the original six. Other broadcasting organisations have followed the lead, so that battery-operated midget tape recorders are in use all over the world.

INSTRUCTION

It was quite clear in the early days that if this new service was to be a success, two conditions were essential. First, the programme personnel should be given enough instruction to enable them to become confident in the use of the recorder when far away from the engineers on whom they had relied so much previously; second, there were limits to what these small recorders could be expected to do and, despite careful servicing, occasional failures must be accepted.

To date, we have trained about 1,500 people, men and women, in the use of the L2 in London alone; the proportion of men is roughly 70 per cent. Many of these users have moved on to overseas, television, or other jobs in and out of broadcasting, but there is a hard core of about 400 who are on the active list.

Now, what do we tell them about the technique of operating battery recorders? As I've trained the vast majority personally, I can say with some authority what they should know. Briefly, it is how to

Mr. Wheatley will write further articles on portable recorder technique in future issues of "Tape Recording Fortnightly."

operate the recorder, how to check and test it for satisfactory working, and the basic microphone technique to employ.

Naturally, I have to find out what kind of recording they aim to do: is it a straight interview, or a descriptive piece, does it involve sound effects, or are there any special hazards likely to arise, or climatic conditions involved?

When you realise that L2's have been employed in the air, in planes and gliders, on trains and footplates, down "Wookey Holes" and under water, for pony treks and attached to a parachutist, it is clear that a careful assessment of the user's ambition is important. Mind you, there's a lot of very ordinary everyday sort of work, too.

I put myself in the potential user's position, and try to make it as realistic as my office and the adjacent corridors allow. "One man in his time plays many parts" is very true so far as I am concerned with midget recorder trainees—and very interesting it has made my job.

Quite a number of my trainees have had experience in front of microphones, either broadcasting or recording, but many come to it with journalistic experience, or are specialists in some field; but all are new to the responsibility of handling technical gear. Therefore, I first explain that the recording is limited in duration by the battery supply; secondly, that the length of time on one reel is restricted by the size, the speed and the fact that for B.B.C. use single track recording is essential.

The battery supply consists of 1.5 V dry cells in a cassette. The main consumption is due to the motor which drives the recorder. This requires about 400 m/a, so I have to explain that continuous use is not a good idea and if they want to do reel after reel, the poor battery will soon feel its effect, and the speed will fall off, with disastrous results when heard in the studio. On a five inch reel at the speed adopted, namely 7½ inches per second, 15 minutes duration is possible. That is as long a run as is good for the battery, which has earned

THIS IS THE ADVICE THEY GIVE AT THE B.B.C.

a rest by then. About one hour of use can be obtained from the battery of 1.5 V cells.

On the L2, a means of checking the "goodness" of the battery is provided by the meter. This meter is mainly used to check the programme volume applied to the tape by the sounds picked up by the microphone.

This introduces the microphone, a most important first link in the chain. A good quality moving-coil "mic" can't be bettered for the kind of job done in the field. The better the mic, the more costly, as a rule and usually the bigger.

This is a nice point, because there is the psychological effect of presenting a microphone to someone in the street or to the eye-witness who has a news story to tell, or to the old gentleman who is remembering what exactly Lloyd George did say in the 1908 Election. Anything more calculated to make them dry up than this "thing" a foot or so away is not yet invented. Television makes a microphone quite familiar to millions, but its effect on the individual is still intimidating; so—the less obtrusive the better.

METHOD

Remember, the function of the mic is to "overhear" an interesting story or discussion and to transmit it to the tape. Don't poke it too close, or try to chase each voice, if several are involved. Ideally, the best results are obtained when the mic faces the speaker; then there is maximum volume and frequency response to make the quality real.

But a slight compromise is permissible if a more informal attitude is adopted. Give the other person about 60 per cent share in the mic, stand facing your interviewee, hold your mic at arm's length, with your elbow tucked into your side or on your hip (it's less tiring). When you turn to engage another person, automatically the mic will follow. If the movement means turning from extreme right to left, a quiet unobtrusive change of mic from right hand to left brings the mic to the new voice.

There is one other point on principle to be applied to this interviewing technique. Always try to engage your interviewees with your full attention by facing them over the mic and ask them to look towards you in a similar manner. The advantages are two-fold. One is that you can take their points, as they make them, with your own expression, a smile or nod, a frown or a raising of eyebrows, reflecting your interpretation or reaction to what they are saying. This stimulates their own confidence in what they are telling you and how it is being received. Most important, this expression will reduce the temptation to chip in with the "I see," "yes," and "really." These interjections are a bugbear to the tape editor and can become pernicious bad habits. It's a matter of self-discipline and the earlier it is imposed, the better.

Then there is the person who won't look toward the mic (or you). He gazes at the roof opposite, or stares into space, or at the toe of his shoe. Don't let him get away with it if at all possible. He will be badly "off mic" for one thing, and his speech will lack animation.

Another golden rule to observe yourself, and to encourage in others by instruction or by your own example, is to keep the voice up in volume and in pitch. My experience tells me that many people in conversation allow themselves to "go quiet" soon after starting a conversation: down goes the volume and, usually, much of the expression. The speech soon attains a flat and dull character, tedious to listen to and disastrous for the recording.

PERFECTION

So don't forget! Voice up in volume and pitch. A conscious effort when framing a new question, turning to a new speaker or changing the subject matter will soon become a good habit in this interviewing technique. You may think this is too much a counsel of perfection. It is, indeed, and if you do have to do interviews with passers-by on topical or perhaps contentious matters you will



The battery portable is ideal for on-the-spot interviewing and mobile commentating. Here BBC commentator Raymond Baxter is seen at work with an L2

(By courtesy of E.M.I. Sales & Service Ltd.)

soon find that some are good, some bad, and an occasional outstanding "natural" will reward you.

But there are other things which will frustrate your best endeavours. Background sounds, traffic noise, well-meant but misplaced help—"I've put you in a nice large empty room" sort of thing. I remember once doing something, for Women's Hour, connected with shoes. The showroom was in the West End and was downstairs. Continuously, overhead, came the tip-tap, tip-tapping of many heels across the pavement deadlights. In any other programme it would have been irritating; in this one it was quite effective.

One of the greatest benefits of the portable recorder is that the *real* atmosphere can be captured, but by the same token unfavourable acoustic conditions have to be tolerated. Reverberation, or echo, due to reflection of the sounds from walls, floors, or table tops, cause lack of clarity, particularly of voices. This will be more noticeable in sparsely furnished rooms, and it will be more pronounced with male voices, because of the much lower frequency content than is present in the voices of women or children. It is useful to have a Bass Cut which will reduce the lower frequencies in such conditions; about 10dB at 100 cycles clears it up wonderfully.

Generally, you can be sure that the microphone "hears" all that you hear and in public places, therefore, some background has to be accepted. When, however, it is necessary to record where a great deal of background is inevitable,

(Continued on page 38)

MONEY BOX TO MAGIC BOX

An enthusiast who is about to buy his first battery recorder savours the pleasures of anticipation and plans to find

A THOUSAND AND ONE USES FOR A PORTABLE

I'VE been saving up. I stopped smoking and started counting my coppers. I fixed my eye on one of those new transistorised battery portable tape recorders. I already had a mains model, but I discovered some of the limitations that can only be overcome by owning a second recorder.

I can do so much more with two machines and, if my second is a battery portable, one that records anywhere, independent of plugs and mains supplies, just think of all the new and wonderful "live" sounds that can be added to my collection and so increase my pleasure a hundred-fold.

These battery models are real "magic boxes."

Listening to people talking is one of my favourite pastimes—everybody has at least one subject they like talking about—and with my new recorder I hope to get out and about interviewing people. Some of the older ones live in cottages without electricity, and so my battery recorder will be ideal for use when getting them to tell me about life as lived in the old days.

In return for their trouble, I can repay them by going along to local sports events and other activities which interest them and recording the happenings to play back for them. Similarly, I can record weddings and other church services for the benefit of the bedridden and those who cannot attend through sickness or distance.

By
F. J. G.
HODGE

Fairs fascinate me and at least twice a year one comes to the local waste lot and "camps" there for a week or so. Next time it comes I'll be there, complete with recorder, ready to capture the noise of the hurdy-gurdy, the shouts of the barkers, the shrieks and cries of the girls on the roundabouts and dodgems, the speil of the speilers. All the raucous, strident and "vulgar" fun of the fair sounds will be mine on tape. I will interview some of the fairground folk—their conversation should be both interesting and colourful.

A friend of mine runs a jazz club and I have a standing invitation to go along and tape the proceedings whenever I feel like doing so. With my new recorder I might get around to it, knowing that I am free from the worries of plugs and mains points. I can foresee some difficulties when I do these recordings, but half the fun of "live" recording is overcoming difficulties.

With my portable I'll be able to move freely among the cash customers and get them to tell me about their interest in jazz. I'll also be able to describe the atmosphere and the dress and style of the habitués. In fact I'll have me quite a ball, as they say!



Where pleasanter to tape-record than on a beach in the Bahamas? When the popular Michael Miles TV programme, "Take your pick," wanted to send a prizewinner on a treasure hunt in the West Indies recently, the director, Miss Audrey Starrett, flew out to make the preliminary arrangements.

She took a Stuzzi Magnette along with her, to act as secretary and reporter. But she came back, too, with some wonderful sound recordings to remind her of one of her most enjoyable assignments.

I'm fortunate in living not too far away from a large airport, so I am looking forward to taking my recorder there and taping the hustle and bustle of planes and of people coming and going. Flight announcements for use in future documentary features, jet planes taking off and landing, all the hundred and one sounds of a busy airport can be captured.

Whit-week in Manchester is the time for religious processions—on Monday and Friday mornings the city centre is closed to traffic as the bands and banners take over. This year I hope to be "on location" to record the happenings, together with the bands, to send away to my friends in other parts.

Another annual event in Manchester is the Highland Games, complete with pipes and drums. It's the skirl of the pipes that I'll be recording there, together with any other sounds that help to make the day.

There's music in the parks at weekends, children singing songs as they play in the streets, fun at parties, laughs at the local, adding sounds to movies, holiday times, a thousand and one uses for a battery portable. That's why I'm patting my pockets on the way to the shop, and saying "Look, no cigarettes, no matches, no finger nails."

HE TAPED A KREMLIN GUIDE

THE value of a battery portable on a trip abroad has never been demonstrated more thoroughly than by Mr. Winston Sheppard, a businessman who visited Russia recently.

His special interest is agriculture and while in the U.S.S.R. he had many discussions with their experts, all of which he recorded.

But, in off-duty hours, he obtained fascinating recordings for his private enjoyment: a Russian church service, the descriptions by the guide who showed him around the Kremlin, talks with students at Moscow University. Mr.

Sheppard also brought back colour slides, to complete his record of the trip.

In Leningrad he found that the assistant pastor at a church he visited had worked in Britain two years ago, and spoke English perfectly. He acted as interpreter, so that Mr. Sheppard could record a message from the pastor addressed to the Church of England. A number of churches in this country have already heard the tape.

Mr. Sheppard's recordings, which were made on a Stuzzi Magnette, are of exceptionally good technical quality.

PLANNING A HOLIDAY?

Take your recorder this year

PLANNING a holiday? Living room floor littered with brochures full of flattering photos of faraway places? Include a battery portable tape recorder in your plans and record on-the-spot sounds and impressions of your holiday haunts. Nowadays, with a number of medium priced transistorised models on the market, "on location" recording is within the reach of most.

It's a good idea to prepare a programme of what, where and when to record.

A start can be made by "mocking up" the departure of your holiday train. Go along to your local station and record the Tannoy announcement of your holiday train's departure. Do this a week or two before your date of leaving and, while on the station, record some "atmosphere" noises—doors slamming, porters shouting, trains letting off steam, or diesels tooting.

If you are flying, go along to the airport and record the flight departure.

If you are sailing, go along to the docks and record ships hooting and similar "shippy" sounds.



On the actual day of departure, and when you are settled in your seat with your luggage stowed away, bring your recorder out and tape the *clickety-clack* of the train, the *whoosh* and whistle as it goes through tunnels, the noise as other trains pass.

These activities should serve to break the ice with your fellow passengers; they will probably be watching the proceeding with interest. Now's the time to get them talking. If any of them have spent their holidays at the place you are off to, they will be able to tell you some of the interesting things to see and do there. Record their comments and later on, when you do and see these things for yourself, record your own impressions and then compare them.

During your holiday you will probably go on an excursion or two. Record a running commentary of the countryside through which you travel. Describe the places you visit. If there is a guide conducting the trip, record his talks. Record any sounds that are "peculiar" to the place.

A description of places of interest in the town where you are holidaying can be made. Take the recorder along to the beach and record a Punch and Judy show. Go to the fun-fair and record the patter of the sideshow barkers. You will probably find a thousand and one things to put on tape during your stay.

Before your holiday ends, go along to the local station and repeat the "mock up" of the departure of your holiday train—this time homeward bound.

If you are lucky, there may be a "character" staying in your hotel, or someone who is "interesting" and really worth listening to. Record their conversations, having first obtained their permission, of course, and, if you make any particular friends, they can record messages for you before they leave.

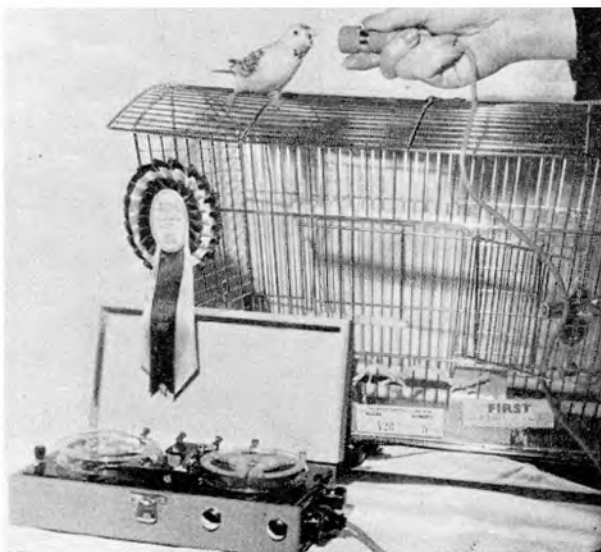
Like all good things, your holiday will come to an end and you will have to start packing and thinking of the journey home. Don't pack your recorder away, though, as you can use it on your homeward journey. You can talk to others who have just spent their holidays at the same place and record their views and impressions, the things they saw and did, the places they visited that you didn't.

When you finally arrive home you should have yards of tape full of interesting material. During the winter months you can edit these tapes and put your picture-in-sound into some sort of order. The final result should be a kaleidoscope of sound memories of your happy holiday. If you take a camera along as well, you will be able to link sound and vision, but that's another story. . . .

Bon voyage, and happy holiday.

F. J. G. H.

Taping birds — and taking wing



Perhaps they ought to re-name it the "Fly-Cord." All things that take to the air—whether budgerigars or intrepid aviators—have been put on tape with the Fi-Cord battery portable. You can bring the recorder to the bird (left), or you can fly it into the air, as shown on the right, where it is seen strapped to Bob Danvers-Walker doing one of his "Wired-for-Sound" programmes in the BBC *Roundabout* series.



A 6v MAINS PACK for the GRUNDIG CUB

A do-it-yourself article

THE Grundig "Cub" transistor battery-operated tape recorder uses four 1.5v leakproof batteries and a 3v No. 8 battery, all fitted internally, and wired in series. The 6v across the four 1.5v cells supplies the motor, which is governor and transistor controlled. Motor circuit current consumption is 200 m/a average. The whole 9v across all cells supplies the 120 m/w transistor amplifier, which draws 15 m/a. The motor consumption means that only 12 hours playing/recording/rewind time is available from one set of batteries.

Grundig, thoughtfully, provided an external 6v input socket to take their J.12 co-axial plug, through which a 6v accumulator or other external D.C. supply may be connected. Note that the centre pin of the J.12 plug must be negative and the outer co-axial ring positive.

For home recording/playback/rewind it is advisable to use this facility, since it conserves the internal 6v batteries and keeps them fresh for portable recording. The resulting circuit in the recorder is as shown in fig. 1.

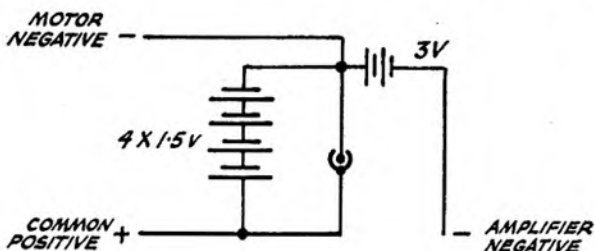


Fig. 1

Now even the external 6v accumulator won't last for ever and will eventually need re-charging. But why re-charge anything? I thought about this and so started, gingerly, toying with a heater transformer, rectifier and an electrolytic reservoir capacitor, together with a 50 ohm potentiometer in series with the negative line (fig. 2).

This is all you need. For the "Cub" a choke and filtering capacitor are superfluous, since no hum and constant D.C. are already achieved.

Before proceeding with the construction, you must note the following: since the motor is governed by a centrifugal switch which controls the voltage regulator transistor (OC 602), if the motor P.D. of 4½ volts (which the regulator

must maintain) is allowed to rise outside certain limits, excessive loading of the OC 602 and centrifugal switch will result.

If the battery voltage is too low, the motor will run slow. But if the input voltage does not exceed 6½v the regulator and centrifugal switch operate normally and keep the motor input volts at 4½v. Beyond this, excessive loading occurs. It will shorten the motor and regulator life and may even blow the circuit if above 9-10v.

The final circuit uses a 1,000 mfd 6v capacitor and a 10 ohm potentiometer. Test the circuit with a voltmeter and trim to about 5½ volts with the 10 ohm wire-wound pot. This will give trouble-free running at constant speed with good wind-up to speed time.

You may try 6v, 5½v, etc., with a voltmeter wired across the 6v contacts (of the 4 x 1.5v cells), and note voltage flicker. It should be gentle and regular at 5½v. Leave the 4 x 1.5v cells out for the first test. Run through the test again with the cells all in, and again set to rewind. Note the gentle regulation and reduced flicker amplitude.

The batteries do this. Overnight you may leave the pack on at full voltage, the J.12 plug in, and the recorder off. Leak-proof batteries re-charge very well, and so the morning brings with it a fresh set of internal batteries for portable recording.

You should allow the charge to settle in for a time; never leave the J.12 in with the pack off for long periods.

Components are all available from: Radio Supply Co., 29/31, Moorfield Road, Leeds 12. They are: Heater Trans-Pri, 230v A.C./Sec, 6.3v 1.5a, 5s. 9d. Full Wave Bridge Rectifier, 6/12v 1a, 3s. 11d.; 1,000 mfd 6v Electrolytic, 3s.; 10 ohm wire-wound pot.—1a Case, switch, etc.

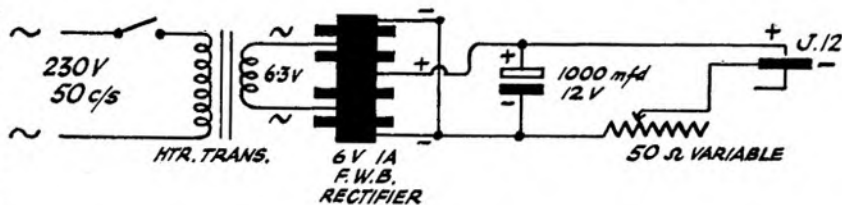


Fig. 2



The Grundig Cub in delightful company and pleasant surroundings

You may try using a choke; lamp—0.5 ohm L.T. type—6s. 6d., although I find it unnecessary and a little too costly.

Improvisation and experimentation are now up to you. I find that the basic unit (really a 4v charger) works very well.

C. PARKER.

OUR TECHNICAL ADVISORY EDITOR adds: If a small amount of hum remains, a smoothing choke (mentioned in the article) may be connected in series with the 10 ohm variable resistor, and a further 1,000 mfd 6 volt electrolytic connected across the output.

The following comment on this article is offered by the Chief Engineer of Grundig (Great Britain) Ltd.:

There is no doubt that this system will work. It is, of course, not difficult to provide a small external power supply in order to drive the "Cub" motor.

The author does, however, rely rather heavily on the four 1.5 volt cells and he even recommends that they are being re-charged by the power supply which he describes. It is not disputed that leak-proof cells (as any others) can, up to a certain degree, be re-charged. Any such charging is, however, never 100 per cent and there will come a time when the batteries develop a zinc oxide which may

(Continued on page 38)

**NOW!
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**MODEL
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Transistors power the Clarion tape recorder without mains supply, without flex. You can record any sound, any time, *anywhere* . . . on the beach, out at sea, up a mountain, in a car.

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For ciné enthusiasts, too, the Clarion is a godsend. Now you can bring that sound back alive. Sound captured on tape at the same time as your camera is capturing the picture.

- Weighs only 5 lbs. No bigger, no heavier than a handbag!
- Runs 50 hours on four small U.2 torch batteries!
- Records 44 minutes on standard tape at 3 $\frac{3}{4}$ ips — you can play back the tapes either on the Clarion or on any standard tape recorder. The Clarion is the only machine at anything like the price with this facility.
- Can be used as a straight-through amplifier

ONLY 25 GNS

including microphone and 360' of tape

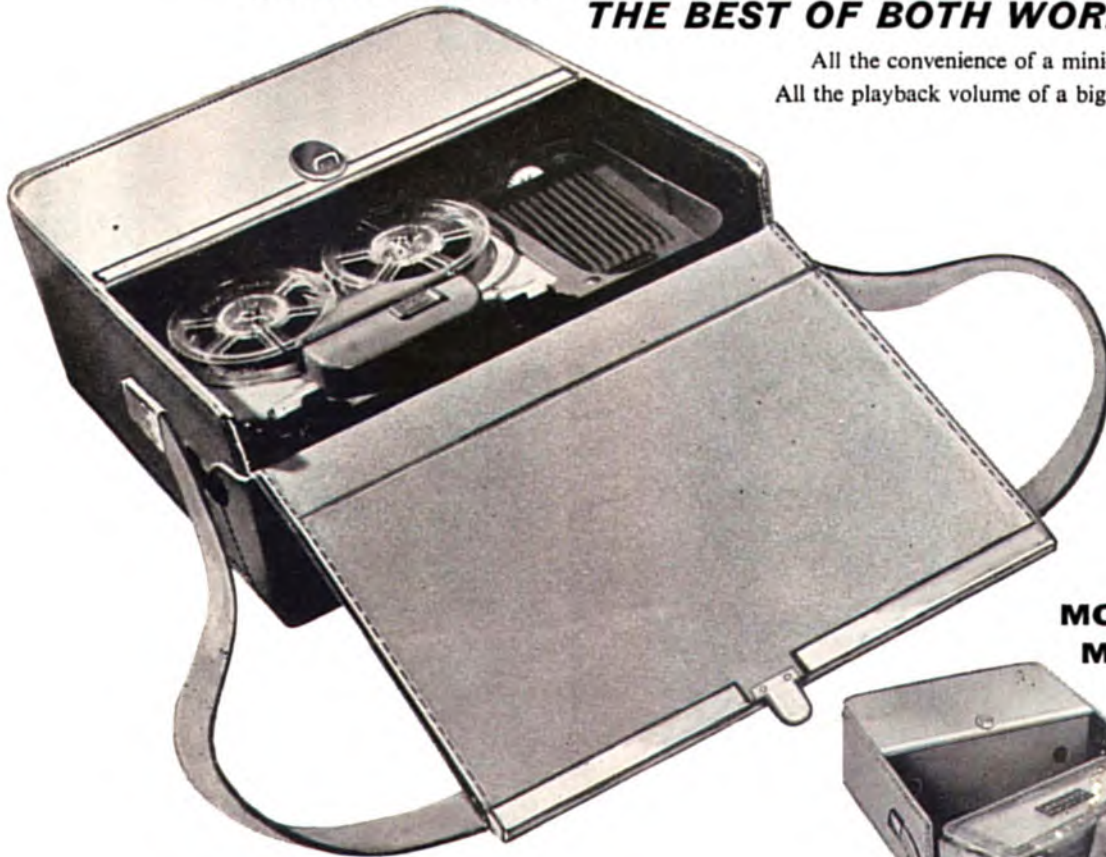
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MODEL MARK II

THE BEST OF BOTH WORLDS!

All the convenience of a mini-portable
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MODEL MARK III



CLARION TWINSET

Here, for the first time, is a model having all the facilities of both mains and transistorised recorders. For the Clarion can be taken out of the Twinset and used on its own for recording and normal playback. Then for the special plus of room-filling tone and volume on playback, it is simply replaced in the Twinset case, the lead connected to the larger amplifier and speaker and, suddenly, the reproduction is tremendous — equal, in fact, to a good mains tape recorder! Yet being transistorised throughout, even the Clarion Twinset is completely independent of mains supply and can be played anywhere, any time.

- Fully transistorised amplifier with over $\frac{1}{2}$ watt push-pull transformerless output.
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- 12 volt power supply provided by ordinary U.2 torch batteries.
- Case finished in magnificent sand tan simulated pigskin with polished brass trimming.

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TWINSET (conversion set only)

**NOW YOU CAN ADD MAINS-QUALITY
PLAYBACK FACILITIES TO YOUR CLARION
with this new completely transistorised amplifier**

For present Clarion owners who wish to take advantage of group listening facilities, the Twinset (case, amplifier and speaker) are available as a separate unit.

The Clarion Twinset case is finished in magnificent sand tan simulated pigskin with polished brass trimming. The carrying strap can be extended for use as a shoulder strap. Performance figures are, of course, the same as for the full Clarion Twinset

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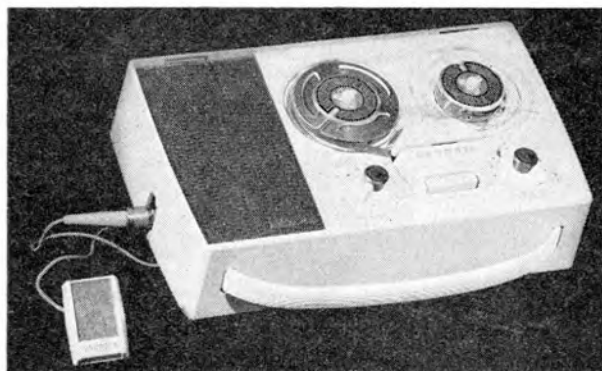
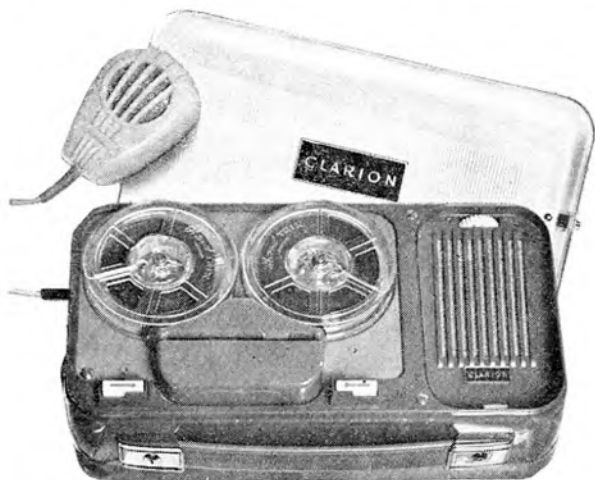
NAME _____

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TRG 1

BATTERY PORTABLES :

Now the range is wide and exciting



THE cheapest available battery recorder is the **Clarion**, which costs only 25 guineas, including microphone. It weighs five pounds, measures $9\frac{1}{2} \times 5 \times 3\frac{3}{8}$ in., and runs on four ordinary torch batteries, which provide 50 hours' operation.

It runs at a governed speed of $3\frac{1}{4}$ ips and takes $3\frac{1}{2}$ in. spools, which means a total playing time of 44 minutes with LP tape. A small speaker is built in. A "Twinset" amplifier is available at eight guineas to boost the reproduction.

The **Grundig Cub** costs 26 guineas, with microphone and tape. It is elegantly styled, measures $11 \times 6\frac{1}{4} \times 3\frac{1}{2}$ in., and weighs $5\frac{1}{2}$ lb.

It, too, uses four torch batteries. It takes 3 in. spools, and has a small speaker included. The speed is not capstan-governed; it averages $3\frac{1}{4}$ ips, but varies slightly according to the point on the tape.

There are two versions of the **Minivox**. A $1\frac{1}{8}$ ips model sells at £37 10s. and the new Model C, which has an additional speed of $3\frac{1}{4}$ ips and a rather better performance, costs 41 guineas, with microphone.

These machines weigh 9 lb. and measure $10 \times 9 \times 5$ in. They accommodate 3 in. spools, so that, using LP tape at $1\frac{1}{8}$ ips, there is a full hour of recording time. There is a built-in speaker.

The **Walter** is only just off the production line and, at 47 guineas, is an extremely interesting machine, for, as well as the three Ever-Ready PP 9 batteries used to drive the machine, it can also be driven directly from the mains supply—200-250 v. A.C., 50 cycles.

A single speed, $3\frac{1}{4}$ ips, is provided, and with a maximum spool size of $5\frac{1}{2}$ in., 64 minutes play per track is available using long-play tape. The 7×4 in. loudspeaker gives 2 watts undistorted output; it weighs approximately 20 lb. with batteries; and measures $17 \times 15\frac{1}{2} \times 5\frac{1}{2}$ in. Full details are given on page 33.

The **Steelman Transitaape** is an attractive portable of American origin which sells at 55 guineas. It measures $9\frac{1}{2} \times 6\frac{1}{2} \times 2\frac{3}{4}$ in. and weighs $6\frac{1}{2}$ lb. (without batteries). It takes 3 in. spools and operates at $1\frac{1}{8}$ and $3\frac{1}{4}$ ips. There is a built-in 4 in. speaker. An accessory is available to enable the use of mains supply.

The **Fi-Cord**, at 59 guineas, is now established as one of the most popular and adaptable portables sold here. It weighs only

The two cheapest battery portables available are illustrated left above.

At the top is the Clarion Transitaape, at 25 guineas. Below it is the Grundig Cub, at 26 guineas.

On the left is the professional E.M.I. L2/TA, which costs £124.

The machine on the right is the two-speed Steelman Transitaape, first introduced here from the United States and priced at 55 guineas.



BATTERY PORTABLES:

Now the range is wide and exciting

4½ lb. and measures 9½ x 5 x 2½ in. It records at standard speeds of 7½ and 1½ ips.

An automatic charger is supplied to recharge the four 2 v. accumulator batteries from normal AC supplies of 110-240 v. It takes 3½ in. spools and has a built-in speaker. The Fi-Cord can also be supplied with a Grampian DP4/M microphone, at 66 guineas.

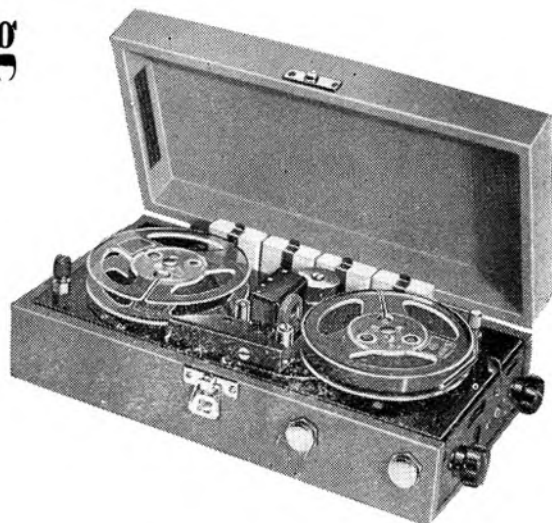
Next are two machines selling at 69 guineas, including microphone. One is the **Stuzzi Magnette**, weighing 8 lb., measuring 11 x 8 x 4½ in., and powered by four torch batteries, giving 30 hours' use. This machine takes 4 in. reels, operates at 3½ ips and 1½ ips, and so gives up to two hours' operation.

It has a rev. counter, magic-eye, fast running facilities, push-button controls and a built-in speaker.

The other 69 guineas recorder is the **Butoba MT4**, measuring 12 x 9½ x 6 in., and weighing 12 lb. It accommodates 5 in. reels and operates at 3½ and 1½ ips. It is powered by eight U2s, but a mains converter is available as an extra. The microphone also costs an extra five guineas.

In the professional class, there is the **E.M.I. L.2/TA**, which is built for operation at 7½ ips. It measures 14½ x 8 x 6½ in. and weighs 17½ lb. The price is £124. Delivery is expected in August.

Also available here is the superb **Nagra** portable, which measures 12½ x 8½ x 4½ in., weighs 16½ lb. and takes 5 in. reels with cover closed, or 7 in. when it is open. The basic single-speed model costs £186, but a three-speed model is available at £270. Quality is claimed to be up to highest broadcasting and cinema standards.



A selection of two-speed portables in the medium-price range.

On the left is the new **Minivox Model C**, at 41 guineas, one of the few all-British machines. Below it is the **Butoba MT4**, 69 guineas.

On the right, from top to bottom, the **Fi-Cord**, priced at 59 guineas, the **Stuzzi Magnette**, 69 gns., and the **Walter**, 47 guineas.



A MONITOR FOR

TAPE COPYING



By Cecil H. L. Andrew

Never rely on common sense

MANY of the problems that arise when people are planning stereo installations are a result of loose thinking or an imperfect grasp of the nature of stereophonic reproduction. Not everything is yet known about stereo sound, and I do not blame anyone for not having all the theories at his finger-tips; but I do advise readers, whenever they are puzzled about a point concerning their own set-ups, to check-up on first principles and see how they affect the problem.

This train of thought emerges after considering one or two recent queries.

A reader in Ireland, writing about his plans for future stereo development, mentioned that he has an existing 3-speaker assembly with a very good top response. He does not expect to spend so much on the second speaker assembly and asked me to confirm that it would be better to keep the speaker with good top response on the left "where the percussion is usually situated."

The trouble with this suggestion is that it is based on the not uncommon assumption that stereo is pumped out and heard in two

Stereo Notes

By D. W. GARDNER

halves more or less independent of each other. All kinds of errors can arise from such assumptions—including the comfortable belief that the sound from a poor speaker on the right will stay on the right even if it does lack top frequencies.

By refusing to allow our thoughts to fly over the barriers of simple, scientific stereo fact we should avoid potentially disastrous ideas like this contemplation of the use of speakers unmatched at high frequencies. We should probably remember that our hearing system tells us where a sound is coming from not just because of the existence of a soundwave "line of communication" between a certain point and ourselves but because of an examination of all the evidence reaching the brain from both ears.

We should also probably remember that the low frequencies provide little of the directional evidence and the high frequencies a great deal of directional evi-

dence. We should conclude from all this that if we have one speaker with a good top response and a second one, on the other side, with poor top response then the result would be that practically *all* the sound would seem to come from the speaker with the good top response.

To rub this in, it is tempting to imagine that if a lot of sound is *in fact* coming out of the speaker on the right (certainly in the bass and middle frequencies, if not in the top register) then we can (as our common sense tells us) be certain to hear them and know where they are coming from.

Unfortunately common sense lets us down completely and, in such circumstances, our brains inform us that all of the sound is coming from the left. The answer is to be sure that your speakers have the same top frequency response.

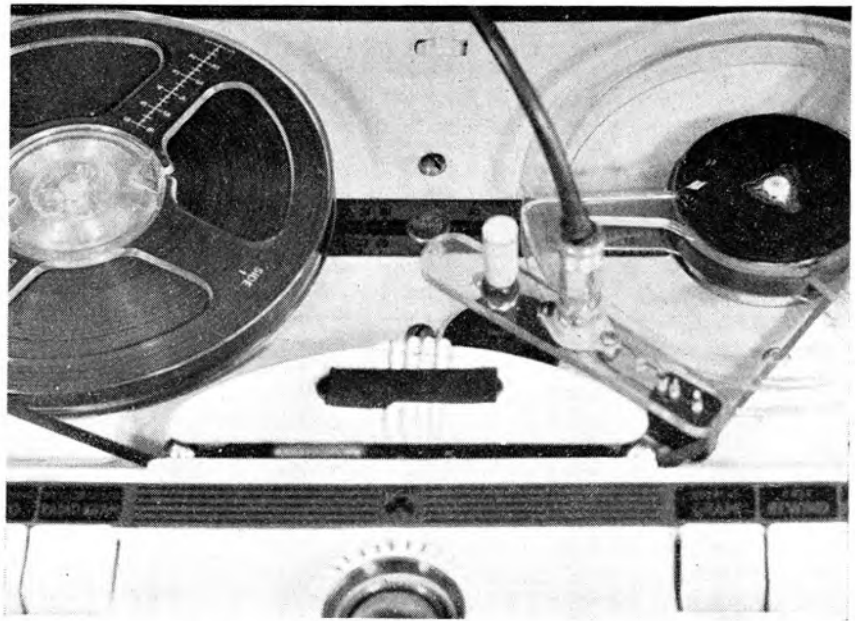
Many readers will already be conditioned to this particular stereo fact of life, but the lesson should be constantly applied at all levels. Never rely on common sense to give you the answer. Study the elementary underlying theory of stereophonic reproduction and work out the answer with the aid of this theory. Ignore the theory and your stereo will vanish out of the window.

The author describes a simple arrangement to provide monitoring facilities for those whose machines lack it. It will save you a great deal of time if you have tapes to copy.

READERS may have the need at times to make copies from an original recording and will wish they had some means of expediting this tedious process. In some cases, copying at double speed is a great help; but it does not overcome the necessity of playing back the copy at normal speed to check it. This is essential, in order to be sure that all the original matter has been copied, and without imperfections.

Some recorders, of course, have monitoring facilities, so that the signal can be checked on the second tape as it takes the copy. Many models, however, and particularly the older ones, have no such facility and it is for the owners of such machines that this article is written.

The monitor here described will save half the time in copying, as it enables one to listen to the actual copy a few seconds after it is made. The photograph shows a recorder fitted with the device which has proved very satisfactory in performance.



The apparatus consists of an extra-play-back head of a small, compact, narrow type, attached to a strip of Perspex or Bakelite, about three-sixteenths of an inch thick. A co-axial socket is fitted in the centre of this strip, and is connected to the head.

At the other end of the plastic strip a slot is cut, so as to enable the whole device to be slid forward or backward on the top of the recorder, to provide adjustment of the head against the tape.

The head should be positioned as near to a tape guide as possible. You can avoid any tampering with the recorder if you support the strip of plastic by a screwed rod attached to a substantial rubber suction pad. These pads can be purchased with a threaded bush moulded into the rubber. Use of such a pad allows the apparatus

to be positioned on any part of the deck.

I have found that the sound-head and its supporting strip are quite rigid, especially if a small "distance piece" is attached or stuck underneath the head to ensure that, when resting on the deck, the head-gap is on the correct part of the tape.

Two nuts can be used on the screw pillar to adjust the height of the plastic strip. Additional stability may result if the strip is given a slight tilt forward.

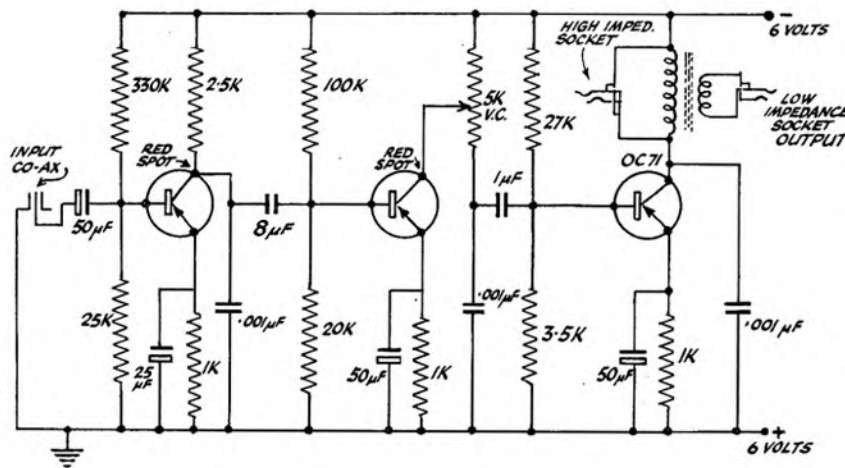
No pressure pad should be necessary, as the tape will be held at tension across the head.

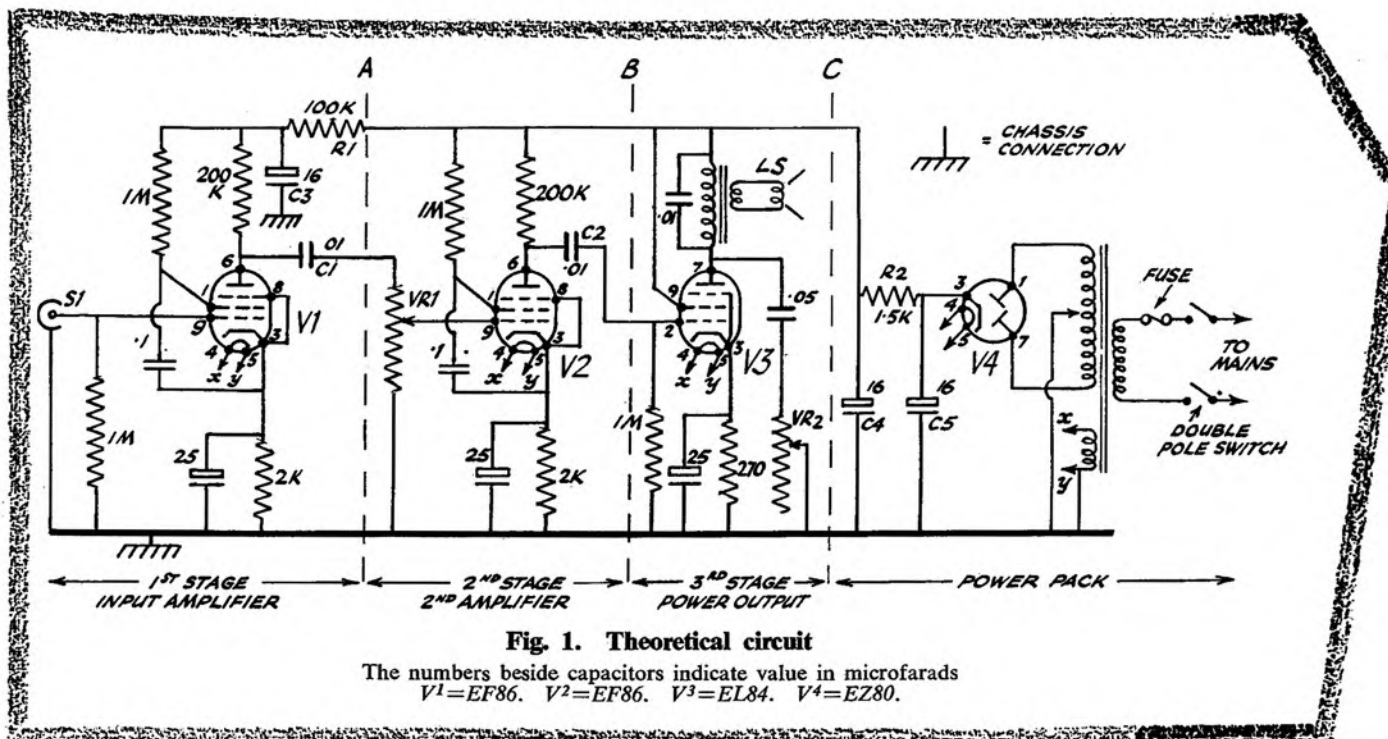
If you have a recorder with sufficient space between the capstan and the last guide pillar for a play-back head, then it may be better to fix the monitoring head permanently, of course.

The head is connected by co-axial lead to a transistor amplifier, which, in the photograph, is seen contained in an adapted aluminium box. This amplifier has two plug sockets, for headphones or stethophones, one at high impedance and the other at low impedance, as can be seen in the accompanying circuit diagram of the transistors.

The diagram is only suggestive of the one which I have in use at present, and I have no doubt that it may lend itself to improvement.

Time saved in copying will more than compensate for the little time needed to construct this simple apparatus.





THE circuit diagram of a tape recorder, high fidelity amplifier, tuner unit, or any other electronic device often appears to the beginner as a complicated, meaningless maze of lines and squiggles. Even when reference is made to a list of theoretical symbols, interpreting the diagram may still be an overwhelming task unless certain rules are followed, rules which every electronic engineer obeys either consciously or subconsciously.

The most important fact when reading even the most complex of diagrams is that it is made up of a number of smaller circuits or *stages* fitted together. Each stage is relatively simple, and when reading the diagram it is essential to pick out one stage at a time and concentrate on this section only. Never try to take in the whole circuit at once, as this will only result in an overwhelming confusion.

When we talk about a stage, we usually mean one valve or transistor, and associated components. Each valve on the diagram, therefore, is a landmark placed in the middle of each stage, and it offers an immediate starting point of study. In certain cases, such as a push-pull output stage, two valves are used in the one stage. To quote another case, the frequency changer stage in a tuner unit may be sub-divided into two other stages, the *mixer* and the *oscillator*.

HOW TO READ A CIRCUIT DIAGRAM

CHARLES LANGTON

A.M.Brit. I.R.E., A.M.Inst. E.

**Our Technical
Advisory Editor**

If the reader can follow the basic circuits of a few simple stages, he will soon be able to analyse a complete circuit diagram into those simple elements.

If the identity of the circuit diagram is known, it will be a good deal easier to sort out than if an unnamed diagram is being studied; in such a case it will first be necessary to deduce the function of the device. In this case, the argument for analysing the circuit stage by stage carries even greater force, for only in this way is it possible to fit the pieces together to produce the over-all function.

Readers who are primarily concerned with tape recorders and audio equipment will only need to concentrate on three basic stages. These are AF amplifiers, power packs, and oscillators. The most complicated of tape recorder and high fidelity circuits are made up of combinations of these three elements, and, with some practice, a working understanding of any circuit can quickly be obtained.

Consider the amplifier circuit at fig. 1. Although four valves are shown, only three are used in the amplifier, the fourth being the HT rectifier valve in the power pack. Such a cir-

cuit is classed, therefore, as a three-valve amplifier, and, although simplified in some ways, is quite practical and workable, and suitable for amplifying the voltage from a microphone or pick-up to loudspeaker level.

The valves are recognisable by their circular enclosures, and are numbered V^1 , V^2 , V^3 , and V^4 . At first glance, this diagram may look rather formidable, but notice how it can be broken into four distinct sections by the dotted lines A, B, and C. Each section is a complete stage in itself, as described at the bottom of the diagram.

Before going on to focus attention on each stage in turn, one or two general rules need to be mentioned.

First, it is normal practice for the signal to pass through the circuit from left to right. In the case we are considering, the microphone signal enters

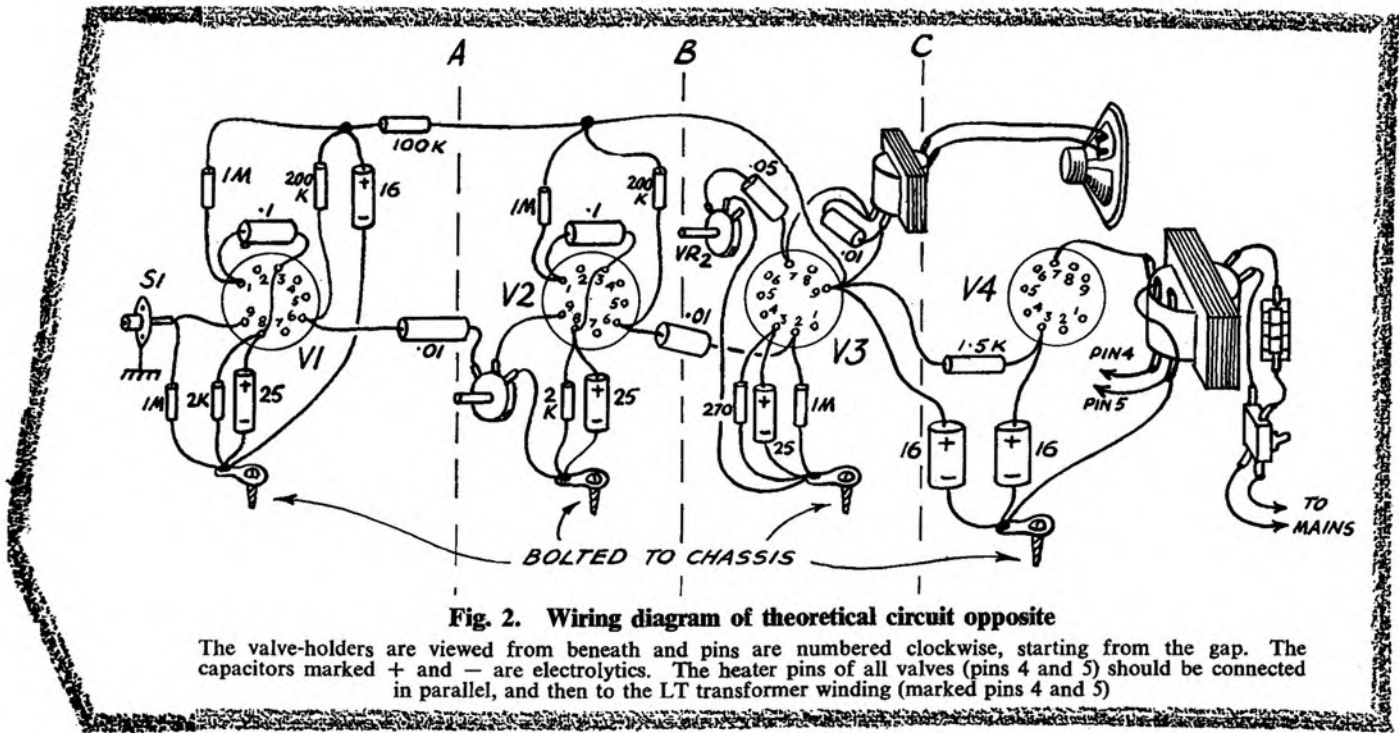


Fig. 2. Wiring diagram of theoretical circuit opposite

The valve-holders are viewed from beneath and pins are numbered clockwise, starting from the gap. The capacitors marked + and - are electrolytics. The heater pins of all valves (pins 4 and 5) should be connected in parallel, and then to the LT transformer winding (marked pins 4 and 5)

HOW TO READ A CIRCUIT DIAGRAM

A simple guide for the intelligent layman

the amplifier via the coaxial socket S¹, is amplified by V¹, V², and V³ in turn, and passed out of the loudspeaker. The input and output stages can usually, therefore, be picked out at a glance.

The power pack is usually on the extreme right, although sometimes it may be drawn below the main amplifier.

It is customary for the highest voltage points (HT positive) to be at the top of the diagram. The chassis is the thick line at the bottom. In

certain cases, voltages more negative than the chassis potential are employed, and such supplies are drawn beneath the chassis line.

For clarity, the wiring should be drawn in the form of vertical or horizontal lines, and joints between wires indicated as in fig. 3. Fig. 4 shows two wires crossing, but not in contact.

Now to tackle the main circuit of fig. 1. The first two stages are *voltage amplifiers*, their purpose being to magnify the tiny microphone voltage until it is large enough to drive the grid of the *power output* stage. The output from this stage is coupled to the loudspeaker by means of the step down output transformer.

Notice how these stages resemble each other, as they are all amplifiers.

The microphone is plugged into the coaxial socket S¹ and the tiny voltage applied to the control grid (pin 9) of V¹. An amplified signal appears at the anode of V¹, to be passed through the coupling capacitor C¹ into the next stage via the volume control VR¹ (variable resistor). Adjustment of this control determines the signal voltage to be applied to the control grid of V², for further amplification. A comparatively large voltage emerges from the anode of V², to be coupled by C² on to the grid of the power amplifier V³.

The large anode current of V³ passes through the primary winding of the output transformer, thereby inducing a voltage into the secondary winding, which, in turn, causes speech currents to flow through the speech coil of the loudspeaker, resulting in vibrations of the cone.

The anodes of each valve have to be connected to HT positive, and this is done through a high value resistor in the case of the voltage amplifiers, and the transformer primary in the output stage. As the first stage is more sensitive to hum and other disturb-

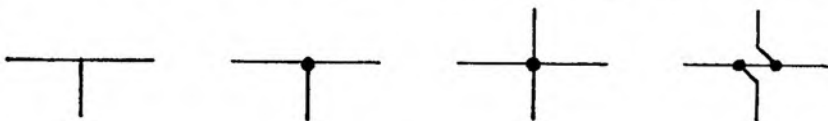


Fig. 3. Circuit junctions



Fig. 4. Crossover

(Continued on page 28)

HOW TO READ A CIRCUIT DIAGRAM

Continued from page 27)

ances which may be present in the HT supply, extra smoothing is provided for this stage by R^1 and C^3 .

Similarly, the screen-grids of each of the valves must also be connected to HT. The power valve requires the full voltage on its screen (pin 9), while a lower voltage is more suitable for V^1 and V^2 . Resistors of one megohm are used, therefore, to supply the screens of V^1 and V^2 (pin 1). The screens are *decoupled* (that is, connected to cathode as far as the AF signal is concerned) by means of 0.1 mf capacitors.

The cathode of each valve (pin 3) is connected to chassis through the correct value of *bias* resistor, as recommended by the valve manufacturer. This resistor also has to be effectively short-circuited as far as AF voltages are concerned, by means of a large capacitor, at least 25 mf.

The power pack is supplied from the AC mains, a transformer stepping up the voltage to about 700. This HT winding is centre tapped, the tapping being connected to chassis. Thus, in effect, each anode of the rectifier valve is supplied with half the full voltage, that is 350 volts.

The rectified output is taken from the common cathodes (pin 3) and the ripple or hum removed by the smoothing resistor and capacitors, R^2 , C^4 , and C^5 . The voltage at the junction of R^2 and C^4 is almost pure DC of about 275 volts, and is suitable for supplying the amplifier with HT. A smaller winding is added to the transformer to supply 6.3 volts to the valve heaters, which should all be connected in parallel. This last point is often taken for granted and frequently the heater circuits are not even shown on the circuit diagram.

B.B.C. "Sound" Programme

A magazine for radio and recording enthusiasts

Tape and Cine

Thinking in terms of sound-track for the start of filming: another special number for recording and film enthusiasts with Peter Handford, Freddie Francis and Desmond Roe

3 p.m. Sunday, June 5, with a repeat at 6.40 p.m. Monday, June 13

THE WORLD OF TAPE

A NEWS ROUND-UP



The Garrard Girl
(See "We take the View" page 10)

MAGAZINE DIGEST

In this column we draw attention to items published elsewhere which may be of particular interest to readers.

Tape Recording (American): *Signal-to-noise ratio*—an explanatory article. Dr. Lovingsone, *I presume*, a script for home fun.

Hi-Fi News: *The Nature of Sound*, second in the series explaining hi-fi.

Hi-Fi Stereo Review (American): *Saga of a folksong hunter*. Alan Lomax writes of his experiences in this field.

Revue de Son (France): *Recording along the Congo*. C. Huchin writes of his expeditions to record the pygmies. Also an article on the assembly of amplifiers and pre-amps, with circuit diagrams and response curves.

All issues are dated May.

TIME SAVED

VAUXHALL MOTORS Parts Dept. at Dunstable have installed a tape recorder to assist main dealers who want to place an urgent order outside normal working hours. By dialling a specified number the dealer hears a pre-recorded message inviting him to state his requirements.

The machine records his needs and when the staff return to duty the recordings are played back and appropriate action taken.

"TALKIE-WALKIE"

A SET of "talking traffic lights" has been installed near a home for the blind at Nuremberg, West Germany. Working in conjunction with the lights is a recording apparatus which tells pedestrians alternatively: "Please wait" and "Please cross."

Documentaries, Studio dramatics, Electronic effects—

ROSE BRUFORD
COLLEGE COURSE

THE Rose Bruford Training College has already started to make plans for its fourth national tape recording course next Easter. Although, of course, full details are not yet available, this course promises to offer even more variety than its predecessors.

Fifty-eight persons attended the most recent of these courses, held during April, and they covered a wide field of tape activities.

After the three days of instruction and exercises in the basic techniques of tape recording, members of the course had two days of programme exercises, with the choice of one or two days on outside recordings, drama productions, and electronic effects.

Two BBC producers, Richard Burwood and Jack Singleton, looked after the outside recording groups, who had to choose a subject and provide a ten-minute item. There were four or five persons per group, each group with at least one portable battery machine.

They soon learnt how much time has to be spent listening to and selecting from their recordings, and how adept they had to become in handling recorders, mixers, tape and editing blocks.

The best results were a most charming tape essay on children at leisure; an exciting inquiry into some local burglaries; an item entitled "The Freedom of Woolwich" which began on the free ferry and ended in a new corporation building; a sound picture of the London Planetarium; and a visit to a Saturday morning film club for children.

Quite the most popular item at the final playback was called "Spring Comes to Lamorbey Park." The group made a brilliant satire of themselves, producing a feature tape which began with the narrator standing in the middle of the lake.

The day on studio drama production was devised by the Course Organiser, Geoffrey Hodson, and based on his normal work at the College. Scripts had been chosen to illustrate a number of production problems, and each group had experience under studio conditions, and doing the whole job in a single room.

The producers were guided by two tutors with professional and amateur experience. Desmond Briscoe, now head of the BBC's Radiophonic Workshop, worked in the Drama Department for many years, and Graham Jones has had considerable experience of producing tape programmes in schools.

Apart from the careful organisation and expert tuition, a big factor in the success of these tape courses is the generosity of the many manufacturers who are glad to have their equipment and tape used on them. On this last course nearly £2,500 worth of equipment was used.

Sound Effects

ALAN EDWARD BEEBY, who has had long experience in devising and recording sound effects, continues his regular column of advice.

If there is an effect you want, and which is causing difficulty, write to him for guidance.

AN ECHO-TO-VOICE EXPERIMENT. Let's look back at the article which appeared in the January 13 issue, when we dealt with the subject of echo-effects. It described a method of adding artificial reverberation to *sounds*, as distinct from speech, and consisted of "stretching" the original echo-signal by recording the initial sound at double speed.

The method which I have devised of adding an echo to *speech* employs the same principle of speed-variation, though in a more complicated form. There are two ways of working the effect: firstly, by the "rough" method, and secondly, by applying the same idea in a more advanced way.

Take the first method. Two recorders are needed, with identical twin speeds, and one microphone. The passage of speech to which the echo is to be added must first be recorded on machine A. This is then set to play back the item at *double speed*.

The second recorder, machine B, is set to *record* at double speed. Start both machines simultaneously: A to play back, and B to record.

When the operation is completed, switch machine B back to normal speed and listen to the result.

By recording a double-speeded voice at double speed and then dropping it to normal on playback, no change will have taken place. But the microphone will also have picked up room-echo which when played back at half the original speed will have been "stretched" to twice its normal length. Hence, the echo.

This sounds rather complicated, but it's really quite simple. It is merely that the *voice* did not "suffer" from the switch to half-speed, but the *room-echo* did!

Now for the second method. You will probably have noticed that, although the echo was quite satisfactory, there was some slight loss of quality or distinctness in the speech itself, due to the signal having been received at second-hand, as it were.

Method number two compensates for this by feeding a direct "clean" version of the signal from machine A to machine B via a mixer (see diagram).

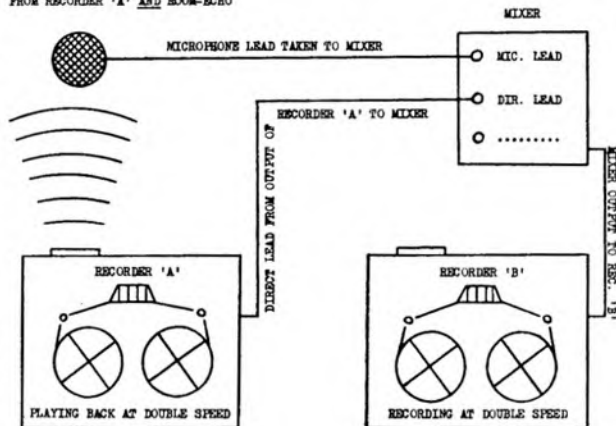
I am now going to repeat the instructions, which are very nearly the same as those given for method number one.

Two identical, twin-speed recorders are required, as before, one microphone and a mixer. Again, the speech to which the echo is to be added must first be recorded on machine A and then set to play back the item at double speed.

The output socket of this machine is connected to the mixer, to which the microphone lead is taken also. The mixer is then fed into the input socket of machine B which is, again, recording at double speed.

Let's have a final check before we begin operating. Recorder A is playing the speech back at double speed and feeding a twin version of the signal by microphone and direct lead, via the mixer, to recorder B, which is also recording at double speed. Got it?

MICROPHONE PICKING UP DOUBLE-SPEEDED SPEECH PLAYBACK FROM RECORDER 'A' AND ROOM-ECHO



You'll probably need, as I did, one or two trial runs before you are able to hit upon a satisfactory balance between the two signals at the mixer stage. Conditions and equipment vary, of course, but I found that the best rule to follow is not to allow the direct signal to dominate the microphone signal too much. Remember that the direct signal's job is solely to *compensate* for any loss of quality in the microphone signal, so just give it enough gain to do that and no more. Bad judgment here means that the two signals, although synchronised, will sound foreign to each other.

Incidentally, it will improve the "naturalness" of the echo if the original speech is recorded in surroundings which have a slight *existing* echo. If recorded in "perfect" studio conditions, you'll find that each word will have a sharp "edge" to it which, ending just before the echo occurs, makes the whole thing sound false and mocked-up.

Having obtained the echo, we must now apply the item in the correct way.

The nature of the echo itself will be decided by the reverberation-time and how long it lasts. For instance, if you are fortunate enough to be able to work with two machines having all four speeds, then the reverberation-time is capable of being greatly increased by using an initial recording-speed of $1\frac{1}{2}$ ips and a combined re-recording and playback-speed of 15 ips in the effect-producing stage.

Perhaps I can best advise on this by suggesting the following table of speed combinations for certain "location" effects:—

LOCATION	RECORDING AND RE-RECORDING PLAYBACK SPEED
1. Large rooms, halls, empty passages, etc. ...	$1\frac{1}{2}$ & $3\frac{1}{2}$ or $3\frac{1}{2}$ & $7\frac{1}{2}$ or $7\frac{1}{2}$ & 15 ips.
2. Churches, tunnels, vaults, etc. ...	$1\frac{1}{8}$ & $7\frac{1}{2}$ or $3\frac{1}{2}$ & 15 ips.
3. Caves, mountains, canyons, etc. (Outdoor) ...	$1\frac{1}{8}$ & 15 ips.

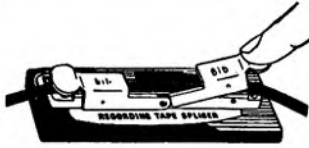
Think of it this way: Slight echo=Original speed plus one; Medium echo=Original speed plus two; Prolonged echo=Original speed plus three.

Try it, anyway, and I'd be pleased to know the results of your efforts. Maybe some of you have other ideas in this direction; if so, drop me a line and tell me about them.

Meanwhile, I have to say goodbye until a *month* from today. In the next issue, my wife Shirley will be taking over. I did try to reason with the Editor, but he wouldn't listen. All he said was: "Oh, don't talk rubbish! I think it's a charming idea; it'll make a nice change."

Famous last words. . . .!

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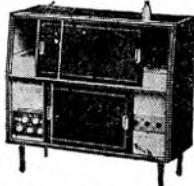
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Equipment Under Test

THE WALTRAK POCKET OSCILLATOR

By C. T. HEINLEIN

THE Waltrak is a pocket audio oscillator which, according to its manufacturers, "is invaluable to the serviceman and the keen amateur, and is the most effective way of tracing the faults in a dead circuit."

The unit, with its nine volt battery, is housed in a strong metal case, and employs a single transistor audio oscillator whose output amplitude may be preset by means of a slider resistor fitted internally.

The three output sockets on one end of the unit are marked 1.0v, .1v, and .01v, each having its own 400 volt blocking capacitor to enable the unit to be used when D.C. is present at the test point, the first two providing output voltages of 2.5 volts and .25 volts which fall to the stated values when the test leads are terminated with a resistance of 30,000 ohms.

A graph is provided with the instrument showing the output voltage with various termination resistances, and in fact it would be feasible to calibrate a suitable variable resistor to enable reasonably accurate voltages to be obtained.

The output is stated to be a sine wave having a frequency of 1,000 cps and when measured this was found to be accurate, the actual frequency being 1,060 cps. The harmonic content was not measured, but was clearly visible on an oscilloscope, which means that it must be at least 5 per cent, the output voltage being accurately set by the makers to 1 volt when terminated with 30,000 ohms. When the output voltage was reduced 2 dB to .8 volts by means of the internal slider resistor, the distortion disappeared.

The battery life should be well in excess of one hundred hours since the consumption is a mere .65 mA and in fact, when used only intermittently, it is probable that the actual life will be the shelf life of the cells themselves.

The unit is constructed of a stove enamelled rectangular steel tube with

two end caps, one of which is removable to gain access to the Ever Ready PP7 battery. The other end cap carries the control sockets and a paxolin chassis on which are neatly mounted the various components, apart from the On/Off slide switch which is carried on the side of the unit.

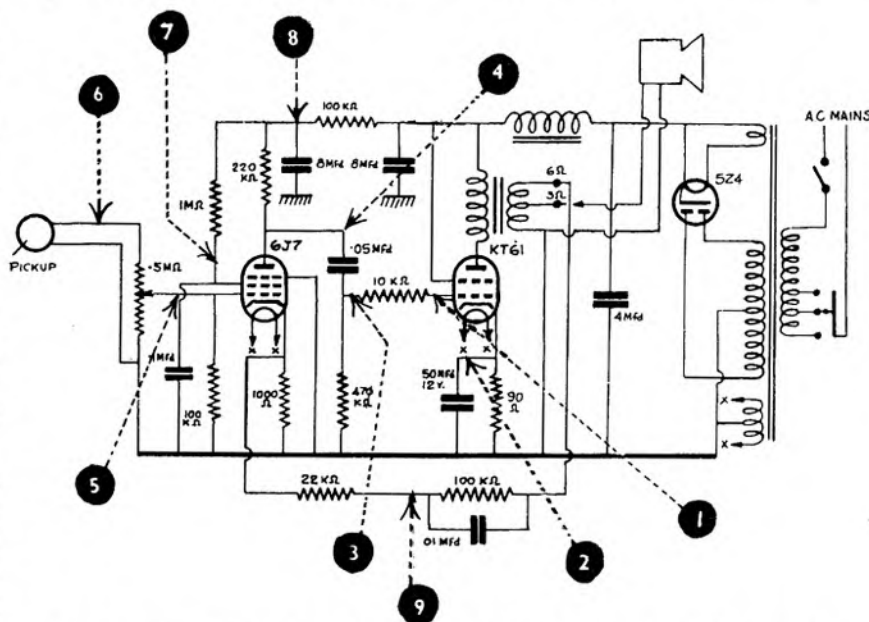
Overall dimension are $6\frac{1}{8} \times 2 \times 2$ in., and the weight is 17½ oz., apart from the 2 ft. long test leads—figures which mean that the unit may be carried conveniently in the pocket if one does not value one's clothes too highly.

In use the oscillator will provide a convenient signal for application to any point in all normal types of audio amplifier circuits: thus the 1 volt out-

put may be used to provide a signal to the grid of the output stage, and one may then use the lower outputs for testing the earlier stages until a point is reached where an output signal is absent and a fault indicated thereby.

The instruction leaflet, which bears the graph previously mentioned, also shows a simple valve amplifier circuit (see below) with various suggested test points indicated thereon, the fault diagnosis being indicated by the side of each point. The oscillator is of course equally suitable for testing transistor circuits, it being capable of supplying about 40 μ A R.M.S. into a low impedance, which is adequate for providing an audible signal from the later stages of a transistor amplifier.

Anyone requiring a single frequency audio source will find the Waltrak is a useful and reliable instrument.



1. Using 1v. output, signal indicates . . . O.K. No signal indicates . . . dud valve, or faulty output transformer, or faulty speaker.
2. No signal indicates O.K. Signal indicates open circuit coupling.
3. No signal indicates open circuit, grid decoupling resistance. Signal indicates second stage O.K., fault in previous stage.
4. Signal indicates O.K. No signal indicates open circuit, anode to grid coupling condenser.
5. Signal indicates O.K. No signal indicates dud valve, or associated components, i.e.: anode resistor, valve holder, cathode resistor, or no H.T. or L.T.
6. Signal indicates O.K. No signal . . . suspect pick-up.
7. Signal indicates fault in decoupling circuit. No signal indicates O.K.
8. Signal indicates fault in decoupling condenser. No signal indicates O.K.
9. Signal indicates O.K. No signal indicates fault, i.e.: shorted decoupling in feedback network

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MURPHY MAKE TAPE DEBUT

MURPHY RADIO LTD., recently announced their entry into the tape field with a domestic recorder, the TR1. This is a compact machine, 13 x 10 x 7 inches, using the single-speed, 3½ ips, Garrard magazine-loading deck, see illustration.

Playing time for double-play tape is given as 35 minutes per track, and the rewind stated as 45 seconds.

The usual controls, one for play/off/record, and the other for fast rewind, on the deck, are accompanied by a volume control and an on/off tone control knob on the front panel. To the left of the volume switch are two inputs for microphone (2 M ohms), and for radio connection (100 K ohms).

On the right of the tone control is the magic eye recording level indicator.

Other facilities include extension speaker socket, and a 7 x 4 inch elliptical loudspeaker. Consumption is estimated at 45 watts.

An internal spring clip in the completely detachable lid provides storage for the Acos 40 microphone when not in use. The weight is 21 lb.

Designed for AC mains 200-250v, 50 cycles, the TR1 retails at £29 18s. 6d.

Murphy Radio Ltd., Welwyn Garden City, Hertfordshire.

FIRST BRITISH MAINS AND BATTERY RECORDER

WALTER INSTRUMENTS have entered the portable tape recorder market with the first self-contained mains or battery powered transistorised tape recorder.

Incorporating the Walter Mk IV deck, with a modified joystick control, and a single tape-speed of 3½ ips, the new

machine accommodates 5½ inch spools providing 64 minutes playing time per track using long play tape.

The quoted frequency response is 50—9,000 cps ±3dB (amplifier only, 40—15,000 ±1dB). Wow and flutter is given as less than .2 per cent, and the signal-to-noise ratio is better than -40dB. Two watts undistorted output is provided through the 7 x 4 inches, high flux permanent magnet loudspeaker.

An impressive list of facilities includes magic-eye recording level indicator, rev. digital counter, safety erase button, superimposition, monitoring, tone control, mixing, and a pause control. A Walter high efficiency record/playback head with fully screened micro-gap, and a separate erase head are fitted. Inputs are provided for microphone and radio/gram, and sockets are fitted for extension loudspeaker or external amplifier. The brakes fitted are mechanical, automatic and non-adjustable.

Power is supplied through three Ever-Ready PP9 batteries and seven Mullard transistors are included in the circuit. Mains supply is 200-250v AC, 50 cycles, or to special order, 110-115v AC 40-60 cycles.

Dimensions of the Mk IV are 17 x 15½ x 5½ inches, and the weight without batteries (approx. 3 lb.) is 19½ lb.

A Walter crystal microphone is supplied with the machine, and a carrying handle attached allowing operation during any manoeuvre. The price is 47 guineas.

Walter Instruments Ltd., Morden, Surrey.

New Products

MINIATURE JACK PLUG

RENDAR INSTRUMENTS LTD., a subsidiary of the Ferragraph Company, have recently completed the development of miniature jack plugs, jack sockets and cable connectors.

The tiny dimensions of these instruments can easily be seen when it is pointed out that the jack plug has a diameter of only ¼ in., and a length of 1½ ins. It is completely shielded, and only one soldered joint is required for assembly.

The outer braided screen of the cable makes contact with the plug cover when held by the clamping device. In spite of its small size, exceptionally strong connection is made between the cable and the plug, and considerable force is needed to break this connection.

The jack socket is supplied with both insulating and metal washers. Its construction enables either of these washers to be used in direct contact with the surface upon which it is affixed, according to the effect desired.

Rendar Instruments Limited, Burgess Hill, Sussex.

CORRECTION

The price of the SL 142 R recording lead for the Grundig Cub, is 8s. 6d., not 18s. as incorrectly stated in our last issue.

The new recorder by Balmoral Electronics Ltd. is the TH20, not the TM20. This printers' error in the May 18 issue may have caused some confusion with the TM20, the Grundig tape deck.

Chitnis announce professional machines

TWO PROFESSIONAL machines, introduced into this country by Chitnis Electronics Ltd., are the Chitnis-Vollmer deck (on the left in our photograph) and the Chitnis-Vollmer Studio recorder.

The deck, official title CV120, is designed to accommodate six heads; has a continuously variable tape speed from 0.6 to 15 ips; a socket for a strobe device and designed for use with Bogen heads. Its price is 75 guineas.

The studio recorder is a two-track stereo reproduction unit with an interchangeable head carrier allowing conversion into a two- or four-track monaural, or a four-track stereo unit. A number of other combinations are also possible on this highly professional machine which costs £700.

Chitnis Electronics Limited, 1, Long Acre, London, W.C.2.



Letters to the Editor

Unauthorised recording

YOUR correspondent, Mr. Reginald Williams, is, I feel, being more than a little unreasonable in expecting professional singers to allow their performances to be recorded.

Quite apart from the question of Equity and gramophone record contracts, both strong and valid reasons to prohibit unofficial recordings (and which Mr. Williams himself mentions), there is the position of the artist himself.

A professional singer sings for his bread and butter. It is, in fact, his livelihood. He is presumably employed by the amateur society because of his superior professional quality, and the fact that the society is unable to fill the role from within its own ranks.

He contracts to give so many performances, and is paid for so many performances. Is not Mr. Williams, therefore, being a little unfair in expecting him to give extra for, presumably, no increase in fee? No one would expect a professional painter to give free prints of his paintings.

Despite the plea that playback would only be for home consumption, recordings can, remember, be used again and again. For every honest person there are always charlatans and, if the professional artist once gave *carte blanche* for unauthorised recordings of his performances, in time there would come into being a fine selection of recordings for which neither the artist, nor the commercial gramophone record company (and it is their bread and butter, too!) would be in receipt of royalties.

However pleasant it may be to record the professional (and I do not deny that—I am a keen amateur recordist myself), let's be fair about it and not expect the professional artist to give free and gratis performances for the increased enjoyment of somebody else's hobby.

NORMAN PAUL.

Muswell Hill, N.10.

WITH reference to your Editorial Opinion about recording Royalty, and the letter from Reg Williams, why do you not make it quite clear to all that making a recording of anyone or any-

thing at any time without *prior* knowledge and permission is in most cases obviously illegal and in all other cases quite morally wrong, insupportable in Common Law and, if persisted in, likely to lead to a lot of onerous control and licensing of the ownership and use of private recording apparatus?

All owners should learn the correct legal procedure for obtaining written recording permission or licence *well in advance of the event or occurrence*; where contracts permit. This is rarely refused in the entertainment field, but quite properly always refused by prominent personages, because unscrupulous editing of tape can make them appear to say the most improper things.

There is no genuine need to make such recordings at all, because authorised transcripts of formal speeches are usually readily available by other means. Private or semi-private speech and any professional utterance, performance or work is strictly copyright and if a recording is wanted it should be bought and paid for under contract in the proper lawful manner.

J. H. SPIBY.

University Recording Co., Cambridge.

The Editor comments: I cannot believe that many readers will accept the whole of Mr. Spiby's argument. I will leave Mr. Williams to answer for himself, but I should like to deal with the suggestion that there is an objection to amateur recordings of "formal speeches" by "prominent personages," because of the danger of unscrupulous editing.

Does Mr. Spiby recognise what an unscrupulous photographer might fake with the negatives of a snapshot of a "prominent personage"? And, if he does, would he argue that the danger justifies a ban on all amateur photography when such a person appears on a formal occasion?

As for availability of "authorised transcripts," this very fact means a ban on amateurs offers no additional protection against the unscrupulous. They can re-record a radio version of a formal speech, and use that!

MUSICAL PERFORMANCES

IN your last issue you gave the playing time of "The Mastersingers" as 10½ minutes. I assume that this refers to the Prelude to Act 1. I recently attended a performance of this opera at Covent Garden—it started at 6 p.m. and did not end until 11.30 p.m.

Perhaps you may be interested in some other times of musical performances.

ORFF—*Der Mond*, 70 minutes; *Die Kluge*, 95 minutes.

BEETHOVEN—*Missa Solemnis*, 73 minutes.

MENDELSSOHN—*Symphony No. 5*, 29 minutes.

PUCCINI—*La Boheme*, 98 minutes.

VERDI—*Masked Ball*, 118 minutes.

STRAUSS—*Capriccio*, 132 minutes.

BRITTEN—*Peter Grimes*, 140 minutes.

WAGNER—*Das Rheingold*, 144 minutes.

VERDI—*Aida*, 134 minutes.

SHOSTAKOVITCH—*Symphony No. 11*, 58 minutes.

MENDELSSOHN—*Octet in E*, 29 minutes.

WALTON—*Belshazzar's Feast*, 34 minutes.

SIBELIUS—*Symphony No. 5*, 29 minutes.

En Saga, 17 minutes.

DVORAK—*Cello Concerto*, 38 minutes.

TCHAIKOVSKY—*Romeo and Juliet*, 24 minutes.

BEETHOVEN—*Capriccio Italien*, 15 minutes.

BEETHOVEN—*Leonora No. 3 Overture*, 14 minutes.

Coriolanus Overture, 8 minutes.

P. S. GENALLIC.

Holland Park, W.11.

Hi-Fi
HARRY
by rich



"I know you're very proud of that Wyndor Gold Medal, Harry—but must you wear it every time we go out?"

CONTEST CORNER

HOW is your entry for the 1960 British Amateur Tape Recording Contest coming along? Now is the time when editing should be well in hand. There is exactly a month left. The closing date for entries is July 1.

All tapes should be sent to the Contest at 7, Tudor Street, London, E.C.4, with the official entry form, fully completed.

Prizes will be presented at a special ceremony at the Radio Show at Earls Court on Saturday, August 27. You have the chance to win many valuable awards: the Emitape Cup for the "Tape of the Year," the Grundig Challenge Cup for the best entry in the Schools Section, the Wyndor Gold Medal for the best technical performance, cash prizes totalling 70 guineas awarded by *Tape Recording Fortnightly*, and many certificates of merit.

The best entries will automatically be sent on to compete in the International Contest in Holland in October, when there will be many other valuable prizes.

Winners in the British Contest will be guests at a Savoy Hotel luncheon arranged by E.M.I. Sales and Services Ltd., later at the Radio Show, and at a *Tape Recording Fortnightly* party, and they or their entries may be featured in TV and radio programmes.

Don't miss this opportunity. Get your tapes finished now, and make sure you post them in time.

News from the Clubs

Edited by

FRED CHANDLER

THE Federation of British Tape Recording Clubs, with a committee represented by members of localised clubs, recently issued a statement outlining the work done on behalf of these clubs. Apart from the leading part played in helping to form, and ensuring the success of existing clubs, they also represent Great Britain as a member of F.I.C.S., the organising body of the annual International Tape Recording Contest.

On June 11, a reception and tape-recording "conference" will take place, preceded by a purely business meeting of the Federation's member-clubs. Secretary Alan Stableford asks me to point out that non-member club representatives are most welcome to come along to the Hotel Russell, Russell Square, W.C.1, at 11 a.m. to meet the people who represent them, and perhaps iron out any difficulties they may have.

In his role as Chairman, he had some bitter news for members of the London club at their April 4 meeting. His Vortexion recorder had been removed from his car. Expressing regret at this news, members remarked they only hoped the culprit would use it as ably as Alan has done in the past. If anyone happens across this recorder, serial number 3309/30, please contact this magazine or the London club.

The round-robin tape exchange was the first item on their agenda, and after listening to Terry Devereux's introduction to the latest edition, members dubbed it on to the original tape, and proceeded to record the second part.

A demonstration of the Veritone Venus followed. This was given by new member Norman Simpson. Secretary H. E. Saunders was so impressed by the demonstration he has earmarked the Venus as his next purchase. A South African visitor, Miss Irene Pye, then introduced her Steelman Transitaape. Members look forward to hearing from Miss Pye when she returns to Tanganyika.

Another of the members' favourite pastimes, a coach outing, is planned for June 12. They have booked a 41-seater coach for a day at Southend where they will hunt sound pictures. The competition spirit, so much a part of their normal proceedings, will be represented with the award of a prize for the best recording.

A tape received from the Nottingham club, describing their formation, was

played at the inaugural meeting of the Ware and District club, held recently at 12, High Street, Ware, the home of Mrs. A. R. Campbell. One of the first decisions of members is that the club should meet monthly at members' homes. Officials elected are: Secretary, Mr. J. Smith; Assistant Secretary, Mrs. J. Wakeley; Treasurer, Mr. A. R. Campbell; and Publicity Officer, Mr. B. Sapsford.

Derek Harker and J. W. Harris were re-elected Secretary and Treasurer at the recent A.G.M. of the Catford club. Members also decided that meetings are to be held every Friday in future, with alternative meetings on an informal basis.

A publicity campaign is being organised, and Mr. Harker would be pleased to hear from anyone interested. His address is 62, Barmeston Road, Catford, S.E.6.

Mike Brown, Secretary of the Rugby club, and Bill Tilcock again recently visited the Granada Theatre, this time to spend ten minutes backstage with Jon Partwee. The interview they recorded was heard at their May 5 meeting, when the interviewers told members of the actor's keen interest in tape recording.

At the same meeting, members greeted Mr. Wells, Sales Manager of Cosmocord Ltd., who provided an interesting lecture on the use of crystal in the Acos microphones. Also present was Mr. Adams of the Technical Staff. He delighted members with a full account of the manufacture of his firm's products. To round off the evening, a stereo demonstration was provided, which included tapes made using the Acos stereo microphone.

A brief report on the tape recording course organised by this club earlier this year is now available from the Secretary at 219, Clifton Road, Rugby.

Members of the Reading tape and cine club recently held their annual competition for the *Bournes Cup*, a silver cup presented by a member three years ago.

After watching the entries, and awarding the cup, the evening resolved into a general discussion. One of the points made was that the cine enthusiast is now finding it increasingly necessary to have at least a basic knowledge of tape recording. Many of the members spend more hours producing the sound for their films than titling and editing them. Among the machines used for sound synchronisation are the Grundig TK55 and Korting stereo recorders.

Microphone demonstrations, tape editing displays and instruction on dubbing with two recorders are examples of the recent activities of the West Herts Society. At their latest meeting, April 6, members experimented with the "Chipmunks" effect.

Mr. J. D. Grainger is preparing the second programme of recorded material for the Blind Clubs in Watford and Rickmansworth, and as part of their plan to broadcast the club's existence and per-

haps gain new members, Secretary Peter Holloway recently gave a lecture on clubs in general to the Moorland Women's Club.

One of the newest members of the West Middlesex club presented a film of his son's wedding with tape commentary at the April 14 meeting. The sound was provided on an Elpico-Collaro decked machine, from original recordings made by Fred Gazeley and Dave Thorpe. I understand that these members now almost qualify as aerial acrobats. They perched high on the top of swaying ladders to record the ceremony.

David Lloyd and Phillip Pratt produced a technical evening for the meeting on April 28. In orbit were a Solartron scope, an advance signal generator and a specially-built transistorised amplifier with several faults built-in so that they could be switched in and out of circuit to display the effects on the scope screen.

The following meeting, May 12, saw Secretary H. E. Saunders demonstrating his recently-acquired Butoba MT4, the transistorised battery and mains operated recorder.

Their next meeting will be on June 9, when Mr. Frank Parrington of Walter Instruments Ltd, will demonstrate the new Walter battery/mains portable.

The recent A.G.M. of the Walthamstow society led to a reshuffle of club officials. Former Secretary John Wells was elected Chairman and his vacated post has been filled by K. J. Perks, 9, Third Avenue, Walthamstow, E.17. Mr. L. T. Chanter was elected Assistant Secretary, J. D. Dawson, Treasurer, and M. R. Dudley, Publicity Officer.

Using a Simon SP 4, Don Couper recently made recordings of the final judging of the local music and drama festival. This now seems the time when this type of activity is most prominent, and a good opportunity for the documentary enthusiasts to get cracking. Encouraged by their previous experiences, members have made arrangements for the society to have a decorated van in a forthcoming carnival parade. From their vantage point in the procession, and from points along the route, recorded commentaries of the festivities will be made using mains and portable machines. These will be edited into a feature for playback to the local hospitals. During the carnival week, members will also provide a "record your voice" stand at a garden fête.

Another club concentrating on an outside activities programme is the Plymouth Sound Association. On April 29, members entertained over 100 mothers at the Virginia House Theatre. Secretary John Baker interviewed members of his audience and Terence Healy entertained them with his accordion. The entire programme was recorded by Michael Smith on his Verdik.

Since presenting the show, the society have received requests from other local organisations for a repeat performance. There is a possibility it may be used as an attraction for holiday-makers in the Plymouth Hoe Marquee.

Ipswich club meetings are now being held fortnightly. Divided into two groups, one section will meet in the Art Gallery Committee rooms as before, the remainder will meet in the King's Arms Hotel, Thoroughfare.

(Continued on page 37)

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IF YOU HAVE SURPLUS EQUIPMENT YOU WISH TO SELL, OR IF YOU WANT TO BUY ITEMS SECOND-HAND, YOU WILL GET RESULTS BY USING OUR CLASSIFIED COLUMNS. TO PROVE THE POINT, WE ARE OFFERING READERS A SPECIAL RATE UNTIL SEPTEMBER 1st NEXT—2s. 6d. FOR UP TO TWENTY WORDS IF YOU USE THE FORM BELOW

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JOHN HASSELL RECORDINGS. Tape/Discs. All Speeds, CCIR Studio, 21, Nassau Road, London, S.W.13. Riverside 7150.

Gramdeck Wanted—Complete, full outfit, first-class condition essential, £10 offered. Write 62, Beacontree Avenue, E.17. Phone (mornings) Larkwood 3792.

Tape to Disc—All Speeds. Rendezvous Records, 19, Blackfriars Street, Manchester 3. Leaflet on request.

Tape Recorders, players, radios, etc. (modern) wanted for cash. Callers or particulars Cook's Store, 159 & 187, Praed Street, W.2 (opposite Paddington Station). Tel.: PAD 6464.

TAPE TO DISC—ALL SPEEDS; s.a.e. for leaflet. **OMEGA RECORDING COMPANY,** 112, Sunnybank Road, Potters Bar, Middx. Tel.: 6428 evenings.

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Tape Recorder repairs, all makes; also trade servicing—Telefunken service agents. Tape Recorder Centre (Halifax), 17, Rawson Street, Halifax. 66832.

Solid mahogany enclosure, has Goodman's Axiom 300, Trebax 100, crossover, 15 ohm 15-watt. Apertures for third stage blanked off. £30 o.n.o. S.A.E. details. C. Leyden, 2, Garnett Villas, Otley, Yorkshire. Phone 2278.

FOR SALE—H.M.V. DSR1 Recorder. Owner changing to stereo. £40 or near offer. Birmingham area. Box 362.

Grundig TK20, new, in carton, guarantee card, complete, mike, tape, cost £54 12s., accept 35 gns. Wanted Grundig TK830, mint condition, reasonable price. H. Middleton, 55, High Rd., Balby, Doncaster.

Ferrograph 4S/N with Stereo-ad Unit. Condition as new. £95. Box 361.

WYNDSOR VISCOUNT. Brand new condition, hardly used. £40. Ring Hirstle, Fleet Street 3244, weekdays, between 10 and 5.

Wanted Hire—Battery Recorder, three weeks September, good music recording essential. Sherrard, 37, Victoria Road, Capel, Folkestone. Tel.: 3917 (weekdays).

Mullard Five Ten Amplifier, horn loaded speaker, £35 complete. Shakespeare, 100, Rutland Road, W. Bridgeford, Nottingham.

Premier VHF Tuner, large amplifier, 10 watts, premier pre-amp power pack. Give-away price, £12 the lot. Terrific volume. Hurry! Wright, 60, Queensdale Road, London, W.11.

Wanted—V.H.F. Tuner Unit, about £10. No dealers! Mr. Alker, 35, Sevenoaks Avenue, Urmston, Manchester.

Wanted—F.M. Tuner for use with Telefunken KL35, must be in good condition but cheap. Recorder input 5mv, 15mv, 50mv. D. Howle, 71, High Street, Talke Pits, Stoke-on-Trent, Staffs.

Gramdeck, complete, microphone, new, November, perfect. Student leaving for home soon. £11. S. H. Chow, 6, Wiloughby Road, London, N.W.3. Ham 4740, after 6 p.m.

Fane "Quartet" (4-unit) Reproducer, figd. walnut, mint condition, fully guaranteed, wonderful quality. £30 carr. paid. Also "Sterophoner," tested. Only £3 10s. Box 360.

Grundig "Cub" Transistor Portable Recorder, six months old. £18. Immaculate. Trial against cash. Noble, 42c, Church Street, Berwick-on-Tweed.

Brenell MK4 Deck only, overhauled by makers, new belts, capstan motor, new recording head, but needs facing. £10. Evenings. D. Henry, 42, Laundry Road, London, W.6.

Widow wishes dispose Ferrograph "66," superb condition, two years old. Nearest £60. Phone Kingston 0160.

Exchange 5-inch Mains Recorder for Grundig Mixer and Valradio DC/AC Converter. Write Secretary, Barnsley Tape Recorder Club, Y.M.C.A., Barnsley, Yorkshire.

Gramdeck, complete, good condition. £8. Armstrong Control Unit MK11, £4 10s. J. Payne, 2, Thorpe Crescent, London, E.17.

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Stuzzi Tricorder, latest model, little used, full mixing and superimposing with moving coil microphone. £55. Going stereo. J. Edgell, 2, Thorndyke Avenue, Derby. Tel.: 71631.

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Motex K10 Tape Deck, £9 o.n.o. Gramdeck, complete, £8 o.n.o. Both new condition. Box 363.

Telefunken KL75K, 3½-1½ ips, 1959, portable, perfect, with Walter mike and tape. Worth £54. Bargain £32, or exchange Fi-cord. D. Powell, 31, Crossvale Road, Huyton, nr. Liverpool.

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Grundig Stenorette, complete, E.M.I. desk mike, remote facilities stop-start, record repeat, new condition. Cost £50. Bargain £22. Full guarantee. H. Middleton, 55, High Road, Balby, Doncaster.

Körting Stereo MK 128, two T.S.L. microphones, new, unboxed. £59. Elliott, 25, Lemsford Road, St. Albans, Herts. St. Albans 57410.

News from the Clubs

(Continued from page 35)

Tapes are being exchanged with the Bristol club, and a tape has also been received from Cathedral Sound, organisers of the chain service for the blind.

Club President John Clover, who attended the Rose Bruford Tape Course, recently gave a talk on his experiences. Other recent activities included an interview with the Everley Brothers backstage at a local theatre.

Another of their monthly demonstrations was held at the April 14 meeting of the Grantham club. A local dealer, who specialises in Telefunken equipment, took along a 75K-15, an 85KL, an M23, and a radiogram. The M23, with built-in five channel mixer and nine-inch reel accommodation, really impressed members. An invitation by the dealer to visit his showrooms was eagerly accepted by the members present.

The Audio Fair will be remembered for a long time by the members who travelled to London during the last weekend in April. Rex Pearson, equipped with a newly-imported portable recorder, had difficulty persuading the manufacturers of that particular model that he had not "borrowed" it from their demonstration room, and Vic Bingham had a hectic ten minutes with a policeman convincing him that "the car belonged to his friend," and that he was "only collecting matches from it." It is reported that a third member, when asked his opinion of the Fair, replied "it

was marvellous, I have never had so many free cigarettes in my life." He admitted the sounds were good, too.

Secretary Mr. L. Gilbey has moved to Northampton, and Mr. Pearson has offered to fill the post until the A.G.M. in the summer. His address is 45, Swinegate, Grantham.

The latest meeting of the Leeds and District club in their new headquarters at the British Legion Club, centred around two recorder demonstrations by Mr. T. Dowling.

First machine to be seen was a Philips, followed by one of the few portables owned by members, the Stuzzi Magnette.

After an extensive examination of the recorders, the evening resolved into a re-hearing of the tape received from the Brighton club.

Two items members are looking forward to are a 35mm slide show with tape commentary, to be presented by Treasurer Mr. Scarboro, and an evening listening to recordings of broadcasts made by ex-chairman Mr. J. W. Williams for the B.B.C.'s *North Countryman* series.

The York tape Society recently held its first exhibition and demonstration.

Held in conjunction with Messrs. Cussans & Lights at their showrooms in King's Square, the exhibition sought to make the club known to enthusiasts in the area. Monaural and stereophonic demonstrations were provided, and members of the club were on hand to answer technical queries. *Forthcoming meeting details are on page 38.*

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Index to Advertisers

	page
A. L. Stamford Ltd.	30
Challen Instruments Ltd. ... Front cover	
Deroy Sound Service	37
E.M.I. Sales and Service Ltd.	2
Fi-Cord Ltd.	12
Francis of Streatham	39
Garrard Engineering and Manufacturing Co. Ltd.	3
G.B.C. Electronics Ltd. 19, 20 and 21	
Henri Selmer Ltd.	4
Howard Photographic	7
Jewkes & Co. Ltd.	37
Lustraphone Ltd.	6
Magnegraph	37
Metro-Sound Manufacturing Co. Ltd.	39
Multicore Solders Ltd.	30
Psycho-Tape Institute	39
Rapid Recording Service	37
Record Sales Ltd.	30
Rendezvous Records	37
Reps (Tape Recorders) Ltd.	8
R-E-S (Coventry) Ltd.	37
R.E.W. Earlsfield Ltd.	30
Simon Equipment Ltd.	8
Tape Recorder Centre Ltd.	40
Tape Recorder Service Co.	4
Technical Suppliers Ltd.	6
The Recorder Co.	6
Wyndor Recording Co. Ltd.	5

FORTHCOMING MEETINGS

ACTON: Every Friday at 8, Woodhurst Road, Acton, W.3.

BIRMINGHAM: Every Monday at the White Horse Cellars, Constitution Hill.

BLACKPOOL: Every Wednesday at 173, Church Street.

BOURNEMOUTH: Alternate Tuesdays at the Civil Defence Centre, Holdenhurst Road. (Next: June 14.)

BRIGHTON: Every Tuesday at Fairlight School, Pevensey Road.

CHESTERFIELD: Every 3rd Monday at the Yellow Lion Inn, Saltergate. (June 13.)

COVENTRY: Alternate Thursdays at Rotherham's Social Club. (June 9.)

CRAWLEY: 1st and 3rd Mondays in month at Southgate Community Centre.

EDINBURGH: 1st Tuesday and 3rd Sunday at 23, Fettes Row, Edinburgh 3.

GRIMSBY: Alternate Tuesdays at the RAFA Club, Abbey Drive West, Abbey Road. (June 7.)

GRANTHAM: Weekly. 1st week, Wednesday; 2nd, Monday; 3rd Thursday; 4th Friday at Grantham Technical College, Avenue Road.

ILFORD: Alternate Thursdays at the RAFA Rooms, Cranbrook Road (June 2), and immediately on Fridays at the Pioneer Market Committee Rooms, Ilford Lane. (June 10.)

IPSWICH: 1st Saturday at the Art Gallery Committee Rooms, High Street.

LEEDS: Every Thursday at the British Legion Club, Albion Street, Leeds 1.

KEIGHLEY: Alternate Wednesdays at the South Street Sunday School Rooms (June 15.)

KETERING: Alternate Wednesdays at the Rising Sun, Silver Street. (June 8.)

LONDON: 2nd Thursday at the Abbey Community Centre, Marsham Street, S.W.1.

LUTON: 2nd and 4th Tuesdays at 17, Dunstable Road.

MANCHESTER: Every Saturday, 6 p.m., at 20, Naylor Street, Hulme, Manchester 15.

NORTHAMPTON: Every Tuesday at 36, Spring Gardens.

NOTTINGHAM: Alternate Thursdays at the Co-operative Educational Centre, Broad Street. (June 9.)

WARWICK: Alternate Wednesdays in Room 18 of the Royal Leamington Spa Town Hall. (June 8.)

WEST MIDDLESEX: 2nd Thursday at the Co-operative Hall, Station Road, Hampton, and 4th Thursday at St. George's Hall, Lancaster Road, Southall Broadway.

WEST WALES: 1st and 3rd Thursdays at the Club Room, New Street, Aberystwyth.

WEYMOUTH: Alternate Wednesdays at the Waverley Hotel, Abbotbury Road. (June 15.)

WINCHESTER: Every Friday at The Ship Inn.

YORK: Every Thursday at 25, Broadway Grove, York.

Unless otherwise stated, meetings start between 7 and 8 p.m.

Is your club included in this list? If not, send details on a postcard. The list will appear in future as space permits.

The BBC and portable recorders

(Continued from page 15)

such as traffic, factories, shipyards or, say, a football match, there are two remedies: to use a "lip" microphone, as the B.B.C. does, or to improvise.

The "lip" mic is expensive and requires an equaliser to correct the amount of Bass recorded, particularly as the mic is held quite near the mouth. It is rather unlikely that non-professionals will have such a mic, so this is how to make the best of the one you have.

The background, noisy or raucous as it may be, can be reduced to a reasonable level by turning down the recorder volume control. The microphone must then be held quite close to the lips, a bit on the side, so that you do not actually "spit" your words into it. The secret of success then is to discipline yourself not to shout against the noise which assails your ears all the time in such surroundings. It is natural to raise your voice, but if you do your voice will be overloud, distorted and generally unpleasant to listen to afterwards.

Try it; don't forget, reduce background, close technique with the mic, and quiet, rather confidential speaking. Although you may scarcely be able to hear yourself speaking for noise, the mic will "hear" you and a very reasonable recording should be on the tape. No one expects studio quality in such conditions; indeed once a recording made in a helicopter was criticised for not having enough background to make it "real."

I hope this article will help. Most of the B.B.C. midget recordings have been done on L2 machines, at 15 ips and, in recent years, 7½ ips. Extended field trials with Fi-cord recorders are being made now, also with some very high-grade

transistorised all-battery jobs, but these last are engineer-attended.

The field for battery-operated recorders is tremendous, for everyone, of course, soon realises how restricted is his hobby when tied by a mains lead to the home or garden. Converters help, but add still more to weight and inconvenience.

When manufacturers wake up to the big market awaiting well-designed and reliable machines, preferably using 7½ or 3½ ips, the scope and excitement of recording "sounds" will flourish as the camera trade has done, especially since high-grade small cameras have become so plentiful.

A 6v mains pack for the Grundig Cub

(Continued from page 18)

ultimately lead to the destruction of certain parts of the machine, if the batteries are not removed previously.

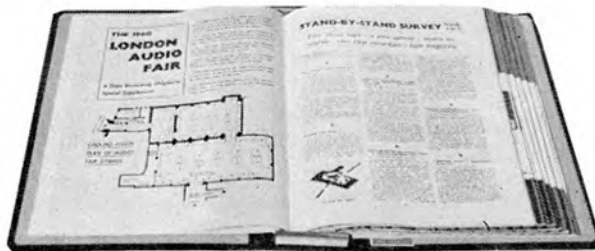
On the whole, it is not necessary to use batteries as smoothing components, and the arrangement should work with the internal batteries removed.

In the article all the attention is drawn to the 1.5 volt cells, not to the 3 volt battery which, together with the four 1.5 volt cells, feeds the amplifier. This could easily detract the users' attention from this component and, if the 3 volt battery has become exhausted, again damage might be caused by zinc oxides being deposited on certain components of the recorder.

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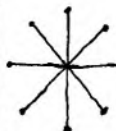
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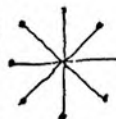
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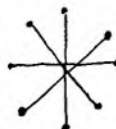
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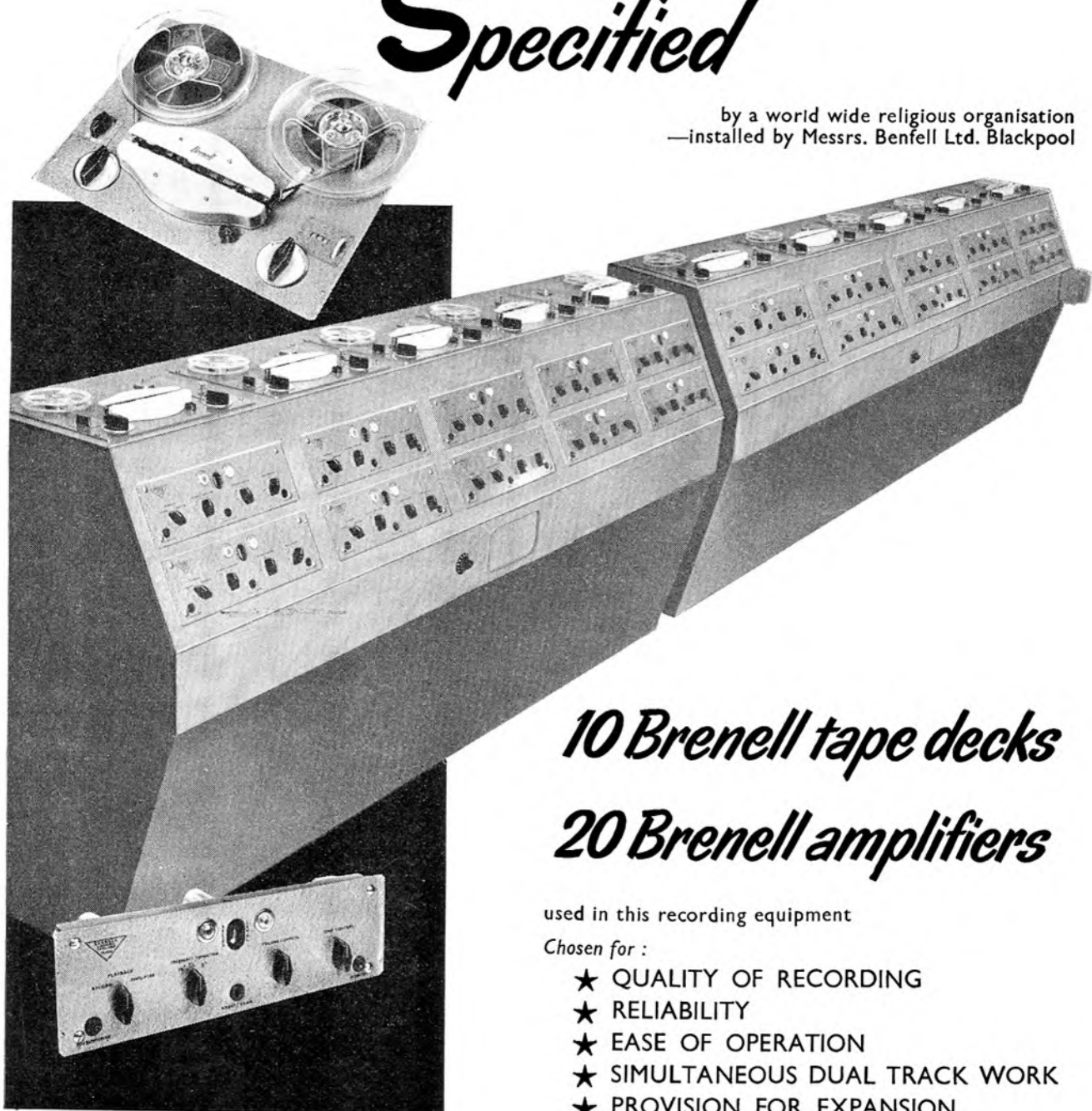
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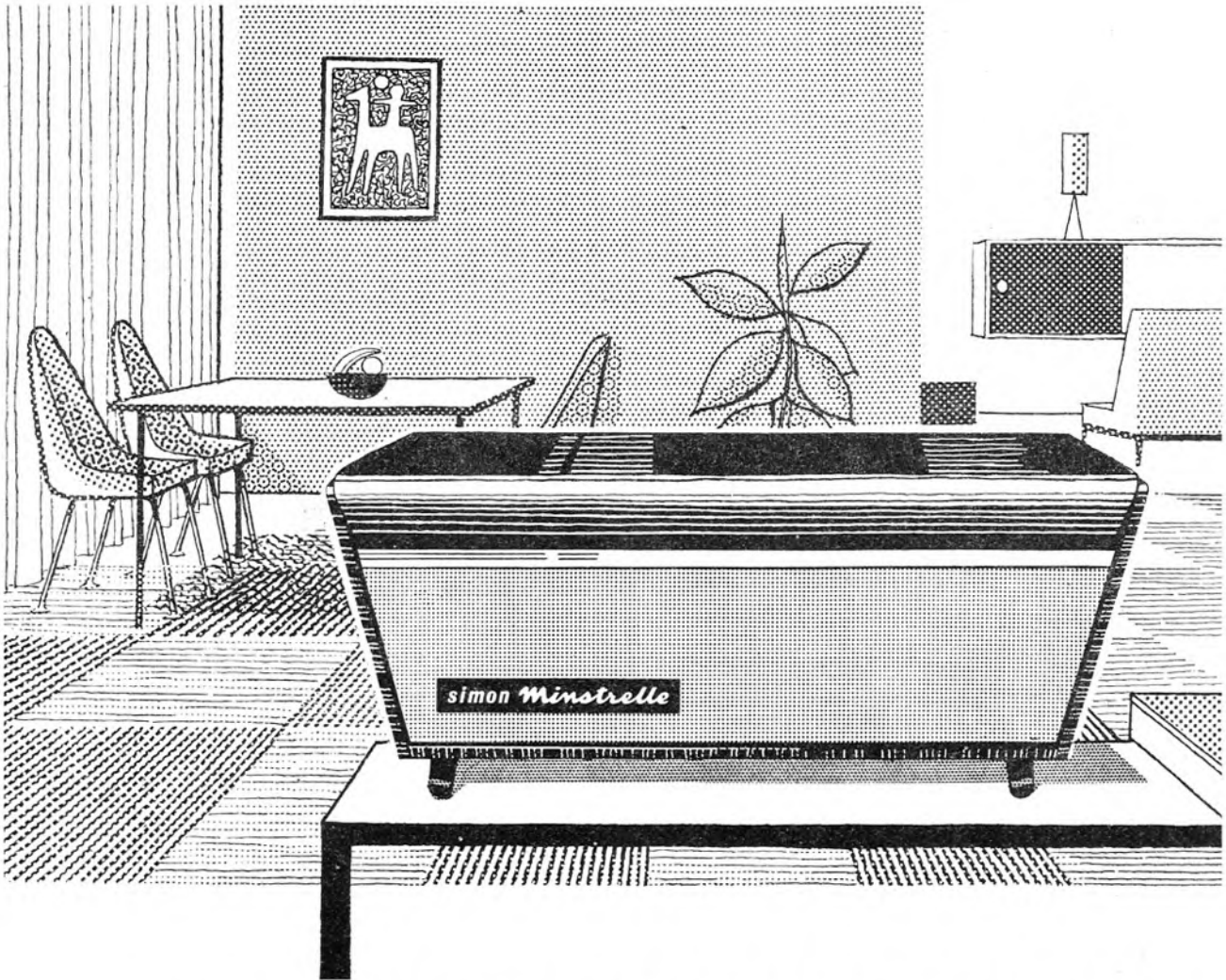
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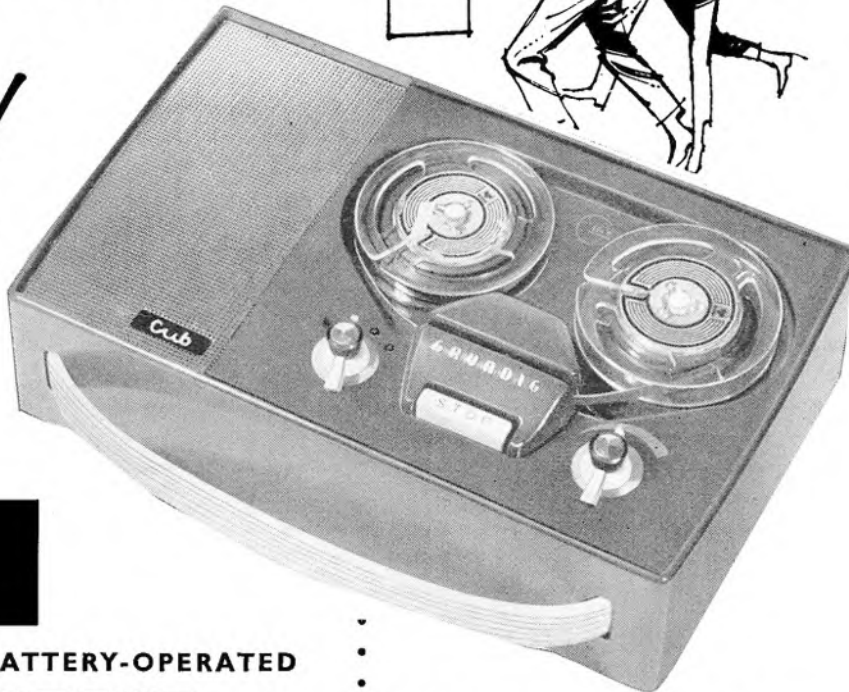
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FURTHER FACTS :

It is not generally known that the Tape Deck mechanism is virtually re-built in the REPS machines. It is standard procedure to remove all rubber wheels—i.e., re-wind, idle and pinch—and re-grind them to a closer tolerance. Also the Capstan is skimmed to less than ± 0.0001". This has resulted in a very low "wow" factor, especially at 3 1/2 ips which has led to the logical introduction of 1 7/8 ips in place of the 15 ips. The principal cause of "flutter" is due to the eccentricity of the three-step pulleys which control the tape speed. This eccentricity occurs when the pulley is locked to the motor shaft and is due to the off-setting action of the fixing screws. This difficulty has been overcome by manufacturing pulleys over-size and machining to the correct diameter when fitted to the motor shaft. By this method a total variation of less than 0.0001" has been achieved at 1 7/8 ips. Initial measurement indicate total "flutter" content at 1 7/8 ips to be of a lower order than previously associated with 3 1/2 ips.

D. W. Aldous of 'GRAMOPHONE RECORD REVIEW' writes in March issue:—

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Vol. 4 No. 12 15th June 1960

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IN THIS ISSUE

We take the View . . . 12

The World of Tape 13

News Digest

Composing music with a recorder 14

Rupert L. Tams

Contest Corner 14

TAPE AND CINE 17

A special feature

Perforated tape 21

Equipment under Test 23

Letters to the Editor 24

Sound effect troubles 25

Shirley Margaret Beeby

Stereo Notes 26

Douglas Gardner

Ultrasonic biasing 26

An explanatory article

New Products 29

News from the Clubs 31

We take the view . . .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

THE first Annual Congress of British Tape Recording Clubs was held last weekend in London. It will be fully reported in our next issue, but it can be said now that this new event in the tape recording calendar has served a most useful purpose and it is to be hoped that it will become a regular annual function.

About a score of clubs, with a very good geographical cover of the country, were represented at the Congress. So were the manufacturers, the BBC and the specialist Press. The idea of group discussions on the future of amateur tape recording was an excellent one.

And it proved to be a most suitable moment to raise a debate on the proper function and conduct of tape recording clubs. How far should they cater for the hobby of their members, in just such ways as other similar specialist clubs, educating members, keeping them informed, encouraging their creative talents? How far should they divert their principal energy into social service activities, such as hospital and blind magazines-on-tape?

This is a debate in which each side is able to deploy some powerful arguments. It makes a very well worth-while investigation.

The Federation of British Tape Recording Clubs, the annual meeting of which followed the Congress, has performed another useful service by producing a standard identity card.

This is a simple document certifying that the holder is "a fully accredited member of an affiliated tape recording club," and is, in effect, vouched for by the Federation. As portable recorders are increasingly used for reporting purposes, a card of this kind will prove very useful.

New fashion in memoirs

AMERICA'S soldier-statesman, George C. Marshall, who died recently, may have set an important new fashion with his memoirs. He refused to write them—but he tape-recorded his views and information about events in what is estimated to total a quarter-of-a-million words, or roughly 40 hours' playing time.

The recordings are being kept, with 155,000 documents, some original and some microfilmed, at the Virginia Military Institute, Lexington, where General Marshall was educated.

When others come to write his story,

they will be able to listen to it in his own words. President Truman once called Marshall "the greatest living American." When he gave up soldiering after the war and turned statesman, he originated the famous "Marshall Plan" which saved much of Europe from economic ruin.

elapse yet before a picture of future developments becomes clear.

The report says that a stereo system is clearly feasible as an engineering proposition, but poses serious economic problems.

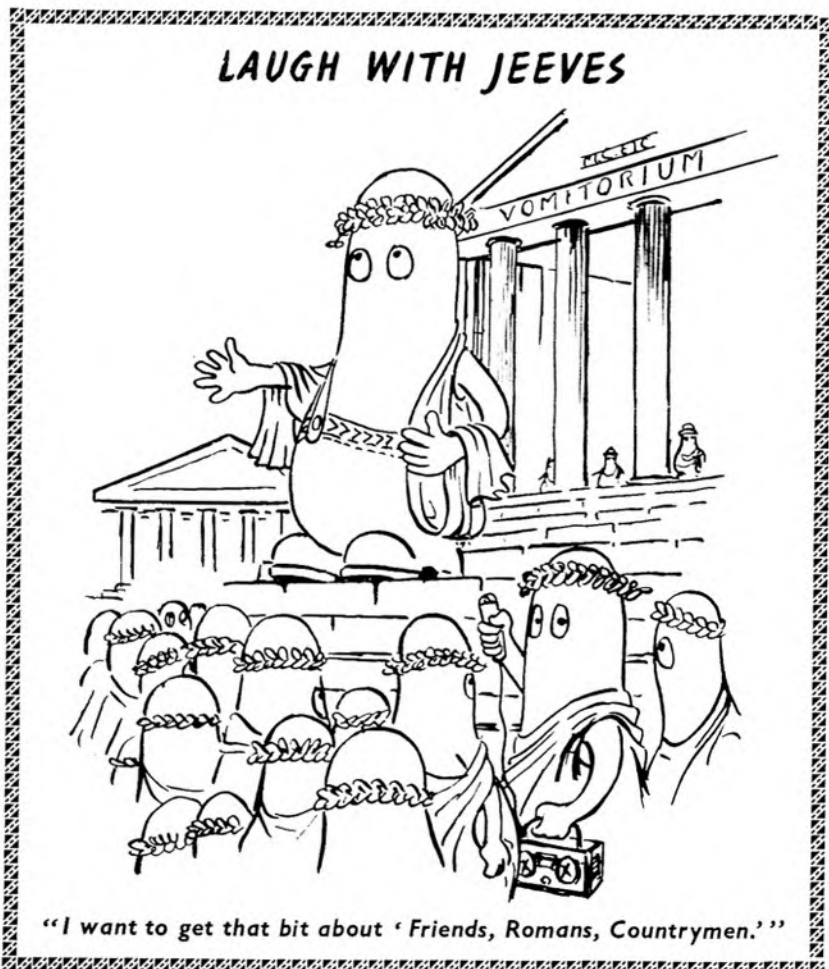
If a lot of money has to be spent, it must be justified by a public demand for stereo. In estimating how many people are ready to equip themselves with the necessary receivers or adaptors, it must be considered what proportion of BBC programmes will benefit substantially from stereo presentation.

That, in turn, necessitates a lot of experiment with various types of programme in order to study effects.

My information is that it is this kind of investigation which is now going ahead at the BBC, but that there is still a good deal to be done before a complete overall picture has been built up.

Stereo radio— one day

THE BBC Engineering Division has recently issued a report on the latest position regarding stereophonic broadcasting, but it reveals little that is new. The most disappointing thing in it is the conclusion that some time must



A NEWS SERVICE FOR THE BLIND

A BLIND woman, Mrs. M. Rands (left), accompanied by her guide, voices her appreciation of the "talking newspaper" produced weekly for local Blind Clubs at Ilford, Essex, by Mr. Walter Gillings. As well as giving a news commentary on local affairs, "What Goes On Here" presents sound pictures of the activities of Ilford Blind Welfare Association and goodwill messages from prominent citizens.



THE WORLD OF TAPE

FOR several weeks negotiations have been proceeding between Grundig (Great Britain) Limited and Grundig Radio-Werke GmbH of Germany, and the Ministry of Commerce in Northern Ireland, in connection with a plan for the formation of a new Company in Northern Ireland to manufacture electronic apparatus.

If these negotiations are successful it is hoped that production will commence this year on a fairly substantial scale, the goods being distributed in Great Britain and certain Commonwealth countries by Grundig (Great Britain) Limited, and in other parts of the world by Grundig Radio Verkaufs GmbH.

Negotiations are proceeding favourably, but no final agreement has yet been reached.

THE Council of Industrial Design announce the recent inclusion in their "Design Index"—the catalogue of the best-designed products of British craftsmanship—of a number of stereo units.

One is the Ferrograph Series 4 tape recorder. Others include four amplifiers from Scientific and Technical Developments Ltd., a control unit from the Lowther Manufacturing Co., a Burne-Jones speaker, the Decca FFSS stereo pick-up and a Garrard transcription motor.

THE row about a Salford councillor's attempt to record Council proceedings has been taken to the Minister of Local Government for arbitration.

Councillor Gerald Joplin, who was ordered by the Mayor of Salford to remove his portable recorder from the Council chamber, has appealed to the Minister to give a ruling.

TO cut out harsh background machinery noises and to help his cows relax while being milked, a Warwickshire farmer has installed taped background music in his milking parlour.

3M COMPANY BUYS RADIO NETWORK

NEW YORK—

THE Minnesota Mining and Manufacturing Company has bought one of America's biggest radio networks—the Mutual Broadcasting System, one of its biggest clients!

Though the price was not revealed, it was reported to be more than \$1,250,000 (£450,000).

Mutual is not involved in television. Unlike its main competitors, NBC, CBC and ABC, the network has never given up its sole interests in broadcasting. It controls radio stations right across the United States.

Minnesota Mining bought Mutual after being offered a minority share-holding originally. They countered with a bid for control which was accepted by the owner, real estate tycoon Albert G. McCarthy.

The company's research and promotional facilities were understood to have figured prominently in the attraction to Minnesota Mining, which is best known for its Scotch brand magnetic tape.

There is considerable speculation in trade circles they may take advantage of the extra development facilities to make a competitive move into the tape cartridge field.



British hi-fi goes to Germany

ONE of the highlights of the British Electronic Centre's exhibition at the Hanover Trade Fair was a visit by Sir Christopher Steele, the British Ambassador to the German Federal Republic. Sir Christopher spent a considerable time inspecting each exhibit, taking a keen interest in the technical features and merits of the products on view. In the photograph above he is seen visiting the Cosmocord stand.

The participation of the Group at the Fair is a combined effort of ten British Manufacturers. The joint exhibit gives an impressive survey of British electronic advances, right in the heart of the Inner Six market.

IN BRIEF

MIAMI—

AN enterprising stereo and hi-fi equipment dealer here has arranged with the local telephone company to allocate him a number which can be dialled as S-T-E-R-E-O!

The firm, Apex Television and Radio Corporation, calls it the "easiest number in the world to remember." The number is used in all advertisements and has been found particularly useful in building repeat sales from previously served customers.

BOSTON—

THE Radio Shack Corporation has developed what is claimed to be the lowest priced dual-track, two-speed tape machine in America. It has 3½ and 7½ ips playing speeds, records, erases, plays back, re-winds and is fitted with three external sockets, yet sells for under \$50 (about £18).

COMPOSING MUSIC WITH A RECORDER

THE particular difficulty in tape composition is that music everywhere in the world is only recognised as such if it is based on so-called "scales" which are derived from the sequence of naturally-occurring harmonics heard in most noises, whether wind, sea, waterfalls, thunderstorms or even atom bomb explosions.

Whether the scale is Aeolian, twelve-tone or twenty-three-tone, rules have gradually come to be accepted for using it, to prevent any confusion with noise. If they are ignored, the very basis of the musical system is destroyed.

To demonstrate how a musical scale system can easily become noise if not used within its conventions, a simple experiment can be done with your tape recorder.

By wedging the forte pedal of a piano down with a screwdriver, so that the dampers are off the strings, it is possible to set all the strings (tuned in Western European twelve-note scale

If you are interested in the structure of music, there are fascinating experiments you can perform with a piano and a tape recorder—and you may create a genuine work of art. The author of this article describes the experiments he has made.

we know so well) resonating by passing the thumbnail across them glissando.

This chord, of the lower thirty or forty black and white notes of the instrument, is recorded at maximum level. The result is an awe-inspiring noise like a mountain avalanche in full blast. But if it is recorded backwards, including the glissando, we hear what is apparently noise magically resolve itself into the familiar chromatic scale.

I and my collaborating composer, Mr. A. Forbes, soon decided that to rely on assembling chance sounds,

devised and recorded in various ways, may give good music concrete, but is too near to actual noise to be good music.

So that we should not trespass against the philosophy behind music, we decided to use as our sound source a "noise-producer" specially designed for making sounds that fit into already existing tradition—the pianoforte. With its enormous range of frequency, covering more of the audio range than any other instrument except the organ, it is much easier to handle than, say, electro-acoustic filters and frequency changers.

THE CONTEST — JUDGES WILL INCLUDE EX-CHIEF OF B.B.C.

Lt.-Gen. Sir Ian Jacob, K.B.E., C.B., Director-General of the B.B.C. until the end of last year, and Eric Robinson, star of show business, will be among the judges of the 1960 British Amateur Tape Recording Contest.

Sir Ian Jacob, after a distinguished military career, was for many years a dominating figure in the world of broadcasting. He was Controller of the B.B.C. European Services in 1946, Director of Overseas Services the following year, and Director-General from 1952-59. He is now a director of Electric and Musical Industries Ltd.

Eric Robinson, Television Conductor since 1947, has been with the BBC since 1931, when he joined their Theatre Orchestra. Following his wartime service with the "British Band of A.E.F.," he was offered his present post, and since then has conducted over 1,600 television productions from Grand Opera to Variety. He was awarded the Television Society's Silver Medal for outstanding artistic achievement in 1952, and acclaimed the *News Chronicle's* National Poll Musical Personality in 1956 and 1957.

The names of other distinguished judges will be announced shortly.

There is news, too, of another two major awards in the Contest.

Messrs. Cosmocord have decided to give an Acos Cup for competition annually. It will be awarded to the best entry submitted in either the Compositions or Music or Speech sections, and the technical quality of the recordings, including

and Acos offer another cup

microphone technique, will be taken into consideration. The Acos Cup, like the other similar trophies in the Contest, will be held for one year and will then pass to the next winner, but a small replica will also be awarded annually for retention by successful entrants.

The Federation of British Tape Recording Clubs is giving the second award—for the winning tape in the Club section.

The prize, presented by John Amphlett, Federation Chairman for the past two years, is a wooden plaque, 10½ x 14 in., with metal tabs, on which will be engraved the name of the winning club, surrounding the central motif, see page 33.

There is now only a fortnight to complete your tapes and to despatch them. They must be received by July 1. The address is British Amateur Tape Recording Contest, 7 Tudor Street, London, E.C.4.

The other awards include the Emitape Cup for the "Tape of the Year," the Grundig Challenge Cup for the winner of the Schools Section, and the Wyndor Gold Medal for the best technical performance.

Tape Recording and Hi-Fi Magazine, the sponsors of the Contest, will award ten guineas to the winner of each of the seven sections. Certificates will also be awarded to winners and runners-up.

In addition, the best entries will be automatically forwarded to the International Contest in Holland, where they will compete for other substantial prizes, including cash, in the autumn.

Judging in the British Contest will take place during July. The results will be announced and the prizes presented at a special ceremony at the Radio Show at Earls Court on Saturday, August 27.

COMPOSING MUSIC WITH A RECORDER

We were very pleased to find that Monsieur Henri, in his often-broadcast "Concerto des Ambiguities," used the pianoforte as his sound source.

By slowing down or speeding up the tape it is possible to change the pitch of the recorded sequence. In order to retain the scale system, we limited any such transformation to octave modulation, that is, we increased or decreased tape speed to twice or half values, multiplying frequency successively by two or dividing it by two, as required.

Using two tape recorders, we did a further experiment. A simple tune on the common chord *doh-me-soh-doh*, like "Oranges and Lemons," was recorded, using the lowest octave of the piano. This was raised in pitch an octave by replaying at twice tape speed and, while accompanied by the original tune on the piano, recorded.

This record was similarly raised an octave, and again recorded with the original piano notes. The final record contained the tune and all the octaves to the limits of audio frequency superimposed on it. Our recorders did indeed cover this.

Out of tune

The results were disappointingly unpleasant, perhaps because of a phenomenon known to acousticians as the "Comma of Pythagoras."

Whether the out-of-tune quality was caused by the beats of an harmonic in the note timbre becoming more obtrusive on multiplying the frequency, or whether the normally negligible speed differences between our two recorders was magnified each time we doubled the frequency we did not ascertain; but we decided to limit the technique of octave doubling to two octaves, which is quite enough up-or-down addition to the range of the pianoforte and enabled us to keep in tune.

In practice, modulation of one octave proved the most useful, and was perfectly in tune, even when both tape recorders were involved in changing its pitch. We had a range of pitch of $1\frac{1}{2}$, $3\frac{1}{2}$, $7\frac{1}{2}$ and 15 ips—enough to rocket anything out of audio range without much trouble, as regards playing back and forth from one record to the other.

Another aspect of music forced itself on our attention; the question of time length of notes, and of metre in relation to rhythm.

If we speed up the tape to play in a higher octave, the notes are reproduced proportionally faster and their duration is, inversely, shortened. So, on playing a figure to be recorded, one has to have a very clear idea of what it will sound like after its tape transformation, and

By
RUPERT L. TAMS

one changes the pitch and time as required for recording.

The metre is so bound up with the tune (perhaps I dare call it "melody") that a change of accent from say $3/8$ time to $3/4$ time—allowing for doubling of note length and envisaging a tape-speed change to twice as fast for superimposition on a $3/8$ accompaniment already on another tape—is artistically very debatable, particularly if the theme has appeared before in $3/8$ metre.

On superimposing several lines of music ("parts," we call them in the trade), we have to know for each of them:—

- (a) which ones are already on which tape,
- (b) which one is being recorded on which tape,
- (c) what tape speed is to be used to record it,
- (d) what speed of replay will be required for the tape from which it is being recorded or, if the source is an instrument,
- (e) what alteration in pitch of the source is required,
- (f) what change of note length is needed,
- (g) what change of metrical accent is thought best.

Ideally, change of dynamic expression should also be included.

We were soon reduced to hysteria, attempting to remember all these aspects, and so we decided to chart them.

Five columns ruled on a large sheet of paper sufficed for identification notes and the first four items. The pianist—myself—was optimistically hoping to cope with the pianistic source changes needed, as each part was superimposed.

From arduous experience, I would advise that the last three items should be written out and placed on the music stand; otherwise the pianist does not know what he has done wrong until the sequence is completed.

Ordinary musical notation, to guide one in playing the things, is also very helpful. We then, on our first trial, found the disadvantages of this too rigid format, which did far more than merely hamper creativity.

What we had planned in detail proved extremely difficult to accomplish. The complex sequences for which we struggled, when produced, seemed far less effective than others, done en route to the final result, made more or less by the machine itself.

It was as though the tape recorder had taken charge. We were evidently not yet masters of our medium, because it took two hours' work to make thirty seconds'

final result, and the latter did not please us much at the end.

Both my fellow composer and I are what are loosely referred to as "scientists," but, on this occasion, we had to drop our philosophy and, like a sculptor, bash away until we had the feel of the material.

So we listened to bits as they were made, and wrote out our design sheet as we went along.

One of the major technical difficulties, as is not surprising, is that of superimposing. To achieve a balance of parts all of the right amplitude is tricky. The only helpful suggestion I can pass on is that the theme which is to be most prominent should be recorded last, on top of the other strands of music.

On our design sheet, an entire column of information on where to find which accompanying parts would have been valuable—and an electronic computer scanner to pick out any required length of tape by code would have aided us!

We spent most of our time winding back, searching for particular sequences needed, playing them to be sure they were the ones required, winding them back, and then superimposing or recording them. Resulting from about twenty-hours application, and some wear and tear to two tape recorders, we had an oeuvre about five minutes. It has some positive artistic qualities, but lacks unity when compared with, say, Mozart's "Eine kleine Nachtmusik."

Gave machine its head

The most successful *morceau* we made by largely ignoring metre, synchronism and note length from the tape recorder viewpoint and giving the machine its head. Like Frankenstein's monster, Mr. Melmoth, it works better on its own.

Some Polynesian and South American music has no distinct metre, but only many contrasting rhythms, so our trial on these lines had precedent. The polytonality ensuing is quite pleasant, although Palestrina might not have approved.

This work required considerable editing and a word about this may be in place.

After some experience of splicing ciné film, it was two years before I even considered cutting and splicing the polyvinyl tape of my recorder. But the simplicity of a backed tape splice is a joy after the horrors of cellulose in the dark. A tape splicer giving, through exact geometry, a perfectly soundless joint every time costs so little that to wrestle with sticky tape and scissors is to spoil the ship. . . .

Regarding stereophony, those of us who have heard the orchestral compositions by Englebrect, stereo-broadcast from Radio Paris, will agree with Mr. Bryan Whitton, who suggested in an article in *Tape Recording Magazine* some time ago, that an additional dimension has possibilities. My colleague and I will try this when we have learned to handle monaural, monophonic stuff, and by then there will be, undoubtedly, a fourth dimension!

IT'LL BE ON EVERYBODY'S LIPS!

* LIP SYNC INSERTS

using perforated tape



A new conception in tape recorders.

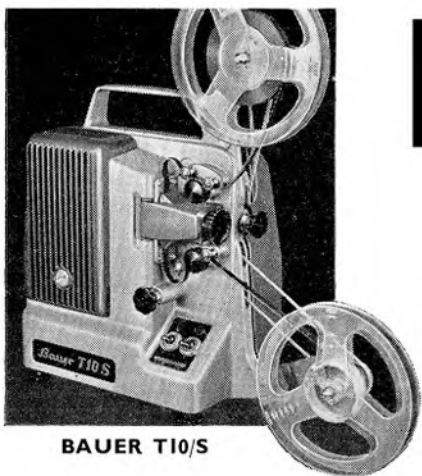
The unique remote control of the Cinecorder, together with perforated tape, will enable many cine enthusiasts to try lip sync for the first time. While the other novel and comprehensive facilities will greatly simplify the compiling of complex sound tracks.

AVAILABLE EARLY AUTUMN

Cinecorder

Pat Pending

HGM electronics limited



BAUER T10/S

The new Bauer T10/S is designed to give the finest possible performance at a reasonable price. In addition to a host of interesting innovations the T10/S offers two very important features to amateur cine enthusiasts—namely, extreme quietness of operation and a brilliant, high efficiency optical system. Another useful feature is the provision of electrical synchronisation for use with a Bauer Sound Coupler and tape recorder, giving accurate sound matching. The whole projector is finished in an attractive two-tone grey, has adjustable rubber covered feet and 6 ft. power cable.



Bauer T10/S (Inc. lamp) £45

BAUER

*The world's finest
cine equipment*

BAUER SOUND COUPLER

The showing of one's own sound film can easily be achieved with a Bauer T10/S projector, a tape recorder and a Bauer Sound-Coupler.

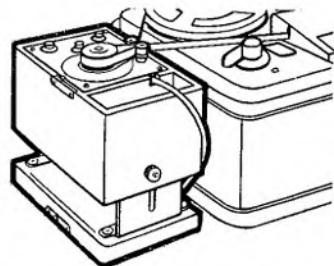
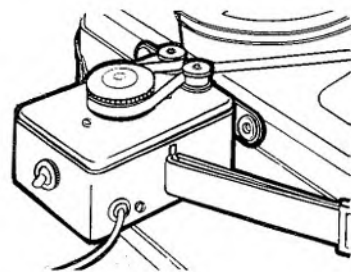
Projector and tape recorder are synchronised by the coupler and can be automatically switched on and off through the tape. Speed of tape in relation to the projector may be varied to compensate for corrections made on the recording.

MODEL K

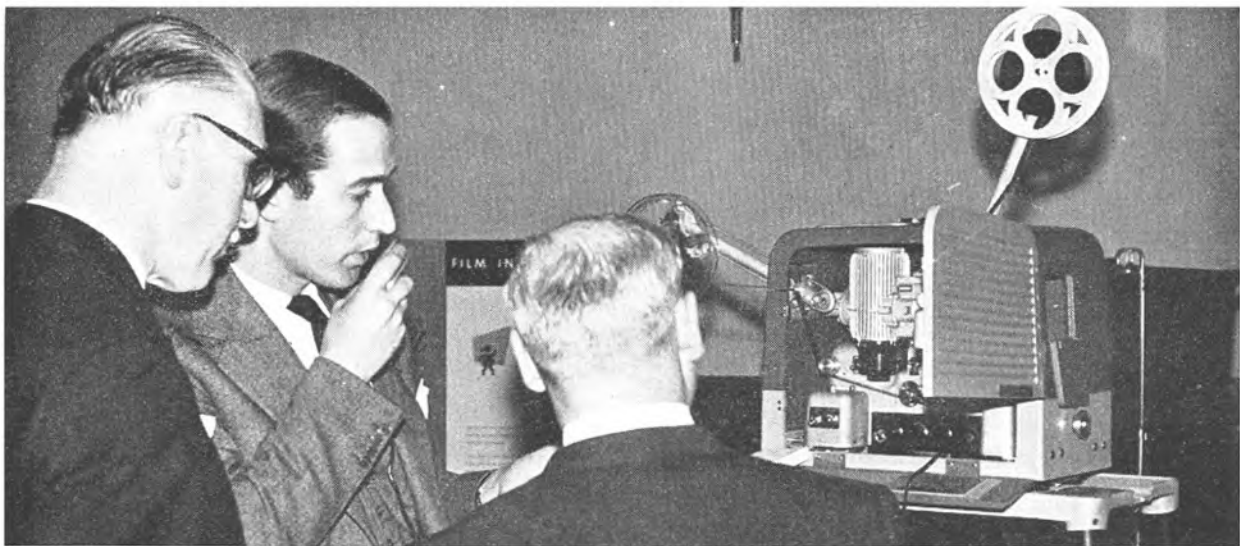
A simple and compact model having straps for attachment to recorder. Fitted with an on/off remote control projector switch, and 10 ft. cable, enabling the source of sound to be placed near the projection screen. For tape recorders of 3½ i.p.s. running speed. **£8 10 0**

MODEL N

De luxe model, with remote control projector switch, split switch roller for automatic on/off switching of the projector by means of the magnetic tape and reduce and increase projector speed buttons. Fitted compartment for its 10 ft. cable. For use on tape recorders of 3½ or 7½ i.p.s. running speed. **£27 10 0**



Sole Wholesale Distributors: **NEVILLE BROWN & COMPANY LIMITED, LONDON, W.I.**



In the photograph above a commentary is being "striped" magnetically on to a film as it runs through a Bell and Howell model 640 projector. This is a 16 mm model which has proved popular in industry, education and advertising, and it is beyond the purses of most amateurs.

Rank Precision Industries Ltd. have just produced a booklet, however, that will be of interest to many who cannot hope to possess such expensive equipment. Bell and Howell 640 Recording Techniques is being supplied to all who buy the projector, but is available to others at 7s. 6d. a copy from 37-41, Mortimer Street, London, W.1.

It is a glossy, well-illustrated, 48-page production containing a great deal of information about adding sound tracks to cine film. Although the advice is directed at the model 640, most of it will have a general interest.

As an example, this guidance is offered about recording level:

"In the interest of low background noise, the recording level should be as high as possible, but not so high as to cause noticeable overloading. Some people may argue that a small volume range will produce an inartistic recording, lacking 'light and shade,' but they fail to take into account the fact that under practical conditions of showing, projector, audience and other noises generally preclude a wide volume range, at least in the case of speech.

"Background music and effects which do not play an important part in conveying information can be recorded at a lower level in accordance with the dramatic effects which it is desired to create. . . .

"As in the live theatre, whispers must be contrived by changing the voice's character rather than by reducing its loudness

"Music and speech should play back at similar level of loudness. Having set the volume control at the beginning of a film to suit the 'title music,' it is most annoying—but unfortunately not uncommon—to find that the speech which follows is much too quiet. Relative loudness should be judged by listening."

LINK YOUR TAPE RECORDING TO CINE

*It's getting
easier
every day*

It's getting more common. This summer you will see it more frequently than ever before—the enthusiast with a battery portable tape recorder over one shoulder and a cine-camera in the hand. Cine has had a good start over outdoor recording and the result was an early movement from cine to embrace tape, regarding it as a useful auxiliary. Now the reverse movement is under way—sound recording enthusiasts are recognising that their documentary and creative activities can be filled out and given additional interest if cine shots are made as well.

In this special supplement—a natural follow-up to that on battery portable recorders in the last issue—we concentrate on the latest methods of synchronising sound and picture. It is now a simple and not necessarily expensive business.

We print, too, news of an entirely new type of tape recorder, using perforated tape and incorporating a series of unique facilities which will make a special appeal to those who want to combine tape and cine.

WHY NOT SOUND and PICTURE?

JOHN ALDRED, our movie-making expert, offers advice to those who are making sound and cine' records this summer

USING a tape recorder for adding a sound track to home movies is not a new idea, and the equipment available today for coupling a recorder and projector together to produce a synchronised track follows a definite pattern.

The most popular method is to extend the tape path round a device called a Loop Synchroniser, which will automatically control the projector speed to maintain synchronism. This is achieved by the tape passing round a swinging roller, to which is attached the slider of a variable resistance in the projector motor circuit.

Two manufacturers have so far produced machines with a Loop Synchroniser built-in, the German Noris Synchroner 100, which sells at £55, and the Austrian Eumig P8m, at £45.

The Eumig P8m is the latest version of this now well-established machine, and it has facilities for reverse running and showing still pictures. These are useful when editing but not, of course, when running synchronised to a recorder. A tape speed of $3\frac{1}{2}$ ips is required to control the projector at 16 frames per second, and quite an accurate sync. can be obtained using p.v.c. standard tape.

The Noris Synchroner 100 is a fairly new projector, built on similar lines to the Eumig and providing the same facilities. It has push-button controls for switching on and off and the loop synchroniser is built at the back of the projector on a horizontal plane. This makes it extremely simple to line up with the recorder tape path and, since it will accept tape speeds of $3\frac{1}{2}$ ips or $7\frac{1}{2}$ ips, through an interchangeable capstan, this is the projector to buy if you prefer the higher speed.

There is also a punch in the film gate, operated by a standard camera cable release, for marking the cutting point during editing. The degree of synchronism obtainable is within three seconds for every 15 minutes running time: quite accurate enough for the majority of purposes.

Quality — and quietness

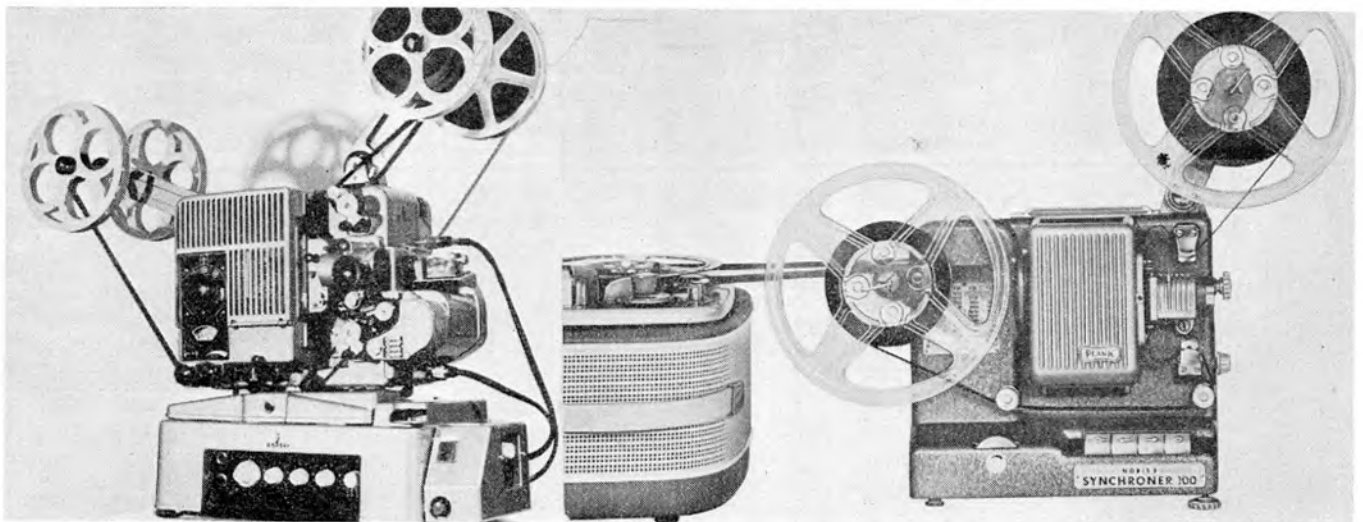
Another good buy is the Zeiss Movilux 8a projector, selling at £52 19s. 6d. This is the quietest projector I have encountered and it is a compact, quality machine. The mechanism runs extremely sweetly and is, therefore, ideal for use near a live microphone. The Sound Coupler, as it is called, fits on top of the projector like a penthouse and is sold as an accessory for £9 12s. 6d. Tape

speed is restricted to $3\frac{1}{2}$ ips, but the whole projector is such an attractive one that it warrants inspection.

Zeiss are still manufacturing their Moviphon tape recorder, which is mechanically driven by the Movilux 8b projector. This outfit was originally reviewed in *Tape Recording Magazine* and takes 5-in. reels of $\frac{1}{2}$ -in. tape. A small transistor amplifier is built-in to record two half tracks at a tape speed of $3\frac{1}{2}$ ips. With the addition of a power amplifier, these two tracks can be played back either singly or together, enabling quite a complicated track to be constructed. The Movilux 8b projector can also be used with an ordinary type of loop synchroniser.

Other projectors for which Synchronisers are available include the Bolex M8R, Bauer T10/S, and Nizo Cinemator. These all require leads between projector and recorder and, with the exception of the Bauer, a mechanical coupling as well.

A device for indicating sync. without automatically compensating for it, called the Synchrodek, sells for £12 17s. 6d. It can be used with any tape recorder and variable speed projector and consists of a box containing a set of differential gears with a large clock-type dial and pointer. One end of the gear train is driven by a capstan in the tape path and the other end by a flexible coupling from the projector. Loss of synchronism is shown on the dial, which is calibrated in frames, and



Professional and domestic—the Siemens 2000 (left) is equipped for running separate picture and magnetic sound films and for re-recording on to a final combined striped print; and the Noris Synchroner 100 (right) is an 8 mm. projector with a built-in synchroniser and costing £55 or £59, according to lens

WHY NOT SOUND and PICTURE?



The Synchronode can be used with any recorder and variable-speed projector to indicate synchronism. It is here seen linking a Telefunken recorder and a Bell and Howard projector

the projector speed must be adjusted manually to keep the pointer at zero. Special adaptors are available for fitting the flexible shaft on to the majority of projectors, and full instructions are supplied with each Synchronodek.

The alternative medium to $\frac{1}{4}$ -in. tape is, of course, Sound Stripe. This is a magnetic coating applied to the film after editing has been completed and it can be used for all three film gauges: 8mm, 9.5mm and 16mm. Special recording projectors are normally used and they are inclined to be a trifle expensive, especially in the 16mm gauge. Stripe attachments have made their appearance in the past, but they are usually restricted to recording on film and cannot be used for $\frac{1}{4}$ -in. tape as well. The exception is the Peterson attachment for 8mm, which has extra spool arms for use with tape only.

There is really little in 16mm between the Peterson (57 gns.) and the Bell and Howell 640, at £366, which is a complete recording projector. We are now almost in the professional class and it is here that we can find some really first rate equipment.

If you come up on the pools!

Typical is the Debrie D.16, which is a standard 16mm sound projector with a separate magnetic recording amplifier which gives excellent results. The recordings made can be monitored through a separate monitor head and playback amplifier two frames after the recording head. Amplifiers up to 25 watts Audio can be fitted into the base of the projector for large-scale film shows.

Another interesting professional machine is the Siemens 2000, which is a complete 16mm double film projector for running separate picture and magnetic sound. It is essential for editing purposes to have sound and picture on separate reels of film, as on a normal combined film the sound is spaced 28 frames ahead of its corresponding picture frame. Since both the Debrie and the Siemens cost between £400 and £600, perhaps we had better think of something more economical!

There is a choice of two 8mm recording projectors, the Elite made in Norway, and the Circesound made in Italy (the latter is fully reviewed on page 23). Both cost well over £100, but there is news of a new British model which will soon be available below this figure.

Then there is the Bolex Sonoriser, a stripe attachment for £90 which can be used in conjunction with most 8mm projectors, although it has been specifically

designed for the Bolex M8R. The Sonoriser contains a neat superimposing device, operated by a push button on the microphone base. This operates a relay which gradually restores the recording bias and so produces a fade down of the original track.

So far I have described only equipment suitable for adding and synchronising a sound track after the picture has been photographed and edited. Recording direct sound at the time of shooting the picture is an idea which will appeal to most readers. The limiting factor here is choosing a system which will maintain synchronism during the film editing process, and, quite frankly, there is little in the way of equipment that the amateur can afford which will do this.

Theoretically, there would be no problem if the actual camera film were to carry a magnetic stripe and a small recording amplifier fitted inside the camera case. This has, in fact, been achieved in the U.S.A. by the Fairchild Camera Corporation, which has recently put on the market an 8mm camera with a printed-circuit transistor amplifier built in. A companion projector is available and a special pre-stripped colour film, but there are no facilities for accurate editing or for re-recording and adding further sounds to complete the track.

John Aldred contributes regularly to "Tape Recording Fortnightly" on latest developments on the photographic front which are of direct interest to tape recording enthusiasts.

Brighter news for 16mm users

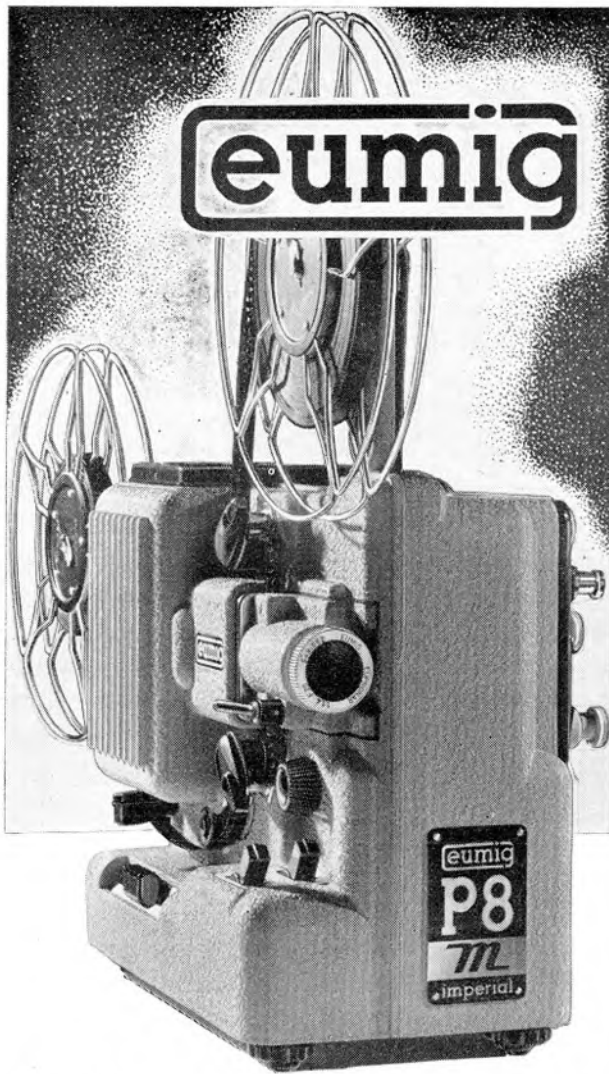
For 16mm users, the news is slightly brighter. An add-on magnetic sound head has just been announced by Magnasync, called the Nomad. This is a completely self-contained transistorised recording system which is attached to the camera tripod. Most makes of 16mm cameras can be mounted on top and interlocked through a flexible cable. The Nomad is driven by the spring camera motor and its capacity of 100 ft. matches that of most spool loading cameras. A motor can be fitted for long runs, if required.

Whether we shall see something of a similar nature manufactured in this country remains to be seen.

In an effort to make use of a domestic tape recorder for shooting sync sound, $\frac{1}{4}$ -in. tape on a Mylar base can now be purchased already perforated with 16mm sprocket holes. The idea is to provide some visible means of synchronising tape and film during editing, but at present no equipment is available which can handle perforated tape and a cine camera at the same time.

Home constructors can, no doubt, get down to the task of making a small add-on recorder driven by the camera itself, and supplies of perforated tape for experimenters may be obtained from Zonal Film Facilities Ltd., The Tower, Hammersmith, W.6. But be prepared to pay more than for ordinary tape.

So, to sum up, it is really only feasible to add sound to an already edited film. If you want to go ahead and try for direct sound, lip synchronised dialogue, and the rest, you will have to improvise or make your own equipment until some enterprising manufacturer comes along with something practical at a price that most of us can afford.



The world-famous EUMIG P8M Imperial 8mm. cine projector is the ideal instrument for combining tape recorded sound with your own home movies. Perfect synchronization is assured by the built-in coupling system. (3½ i.p.s.).

To the smooth, silent, running, brilliant screen illumination and exceptional reliability of EUMIG projectors are added the following new features:

- PRE-CENTRED 12v/100w. lamp.
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AND NOW IT'S PERFORATED TAPE . . .

and "a new conception"
in recorders that will
interest many other than
the cine enthusiasts



A general view of the Cinecorder, showing deck and controls and the detachable lid containing the speaker

AN entirely new type of tape recorder, using perforated tape, will appear on the market this summer. Known as the K.G.M. Cinecorder it is specially designed for users interested in adding sound to cine, but it will be of equal interest to those who want to make elaborate feature programme tapes. The price will be about £50.

The Cinecorder type A is intended primarily for owners of Eumig Imperial 8mm cine projectors, but may be used with certain other makes of constant-speed or controlled-speed projectors. A synchronising unit to connect the Cinecorder to a variety of standard cine projectors is under development.

Many novel items have been added to the usual tape recorder facilities:

A separate capstan tape position indicator gives a time measurement of tape length in seconds.

A tape lift lever by which the tape may be lifted away from the magnetic heads—this enables sound to be inserted or faded in or out to any volume level without any possibility of "clicks" or other noises being recorded, since all the electrical controls can be pre-set.

A "Varitrack" tape control permit-

ting "multi-track" recording, which is claimed to be a considerable advance over the usual superimposing method, since any errors can be rectified without affecting earlier recordings and high frequencies of the first recordings are not attenuated.

A fully-controllable bias control, with a maximum level sufficient for erasure, provides means of adding fades, erasing "spot" errors, and for superimposing where this is applicable.

Switched inputs on each of two mixing channels, allowing the volume levels to be pre-set and the sound "keyed in" instantaneously. Alternatively, inputs may be rapidly selected without having to fumble for cable plugs.

The Cinecorder uses the BSR TD2 tapedeck, providing a speed of 3½ ips and accommodating 5½ in. reels.

There are push-button controls and separate bass and treble tone controls, with boost and cut. The control knobs and markings are in white, for use in dim illumination. A 24 feet cable and switch enables remote control of tape start and stop.

The amplifier output is rated at 3½ watts. Monitoring facilities are provided.

A 15 ohm loudspeaker is mounted in the detachable lid of the Cinecorder.

The most notable departure from standard tape recording practice is the use of perforated tape, so that 100 per cent synchronisation between tape and film is possible.

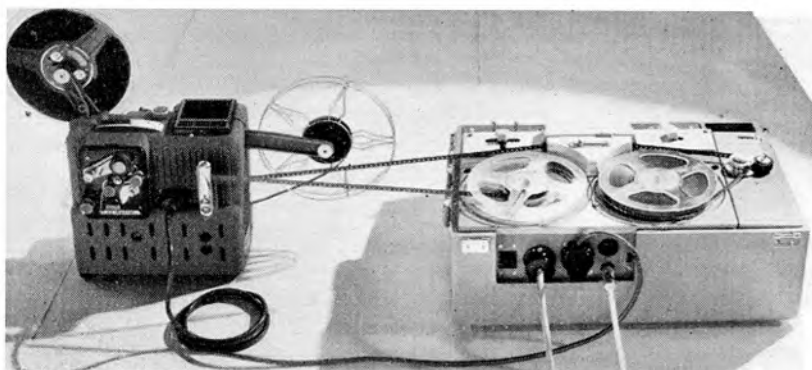
For cine purposes, a number of other special facilities are provided.

A double-circuit mains switch is fitted for both the tape recorder motor and the projector, so that they can be started simultaneously. A strobe disc on the capstan of the tape position indicator enables variable speed cine projectors to be set at a constant synchronised speed.

The second channel input has sufficient amplification for microphone close-talking, so that special announcements or commentary may be made during tape playback. The MIC 2 input can be arranged to have bass boost so that recordings can be made directly from another tape-deck (i.e. no amplifier is needed).

Arrangements have been made with Zonal Film Facilities Ltd. for the manufacture of perforated tape.

The Cinecorder is manufactured by K.G.M. Electronics Ltd., Bardolph Road, Richmond, Surrey, and has been designed by their Chief Development Engineer, Mr. Desmond Roe, B.Sc.



The tape recorder linked with the cine projector

B.B.C. "Sound" Programme

A magazine for radio and recording enthusiasts

Copyright

A barrister talks about some of the points raised by listeners

Teaching Tape

The Teacher: I. W. Jarman,
the pupil: Angela Jeffries

3 p.m. Sunday, June 19, with a repeat at 6.40 p.m. Monday, June 27

New! New!! New!!!

THE Synchrodek, an entirely new cine accessory, is designed to give exact synchronism between any tape recorder and any variable speed projector.

This it does with unfailing accuracy and extreme simplicity.

The following range of projectors can be instantly fitted with a screw-in flexible shaft adaptor. No other modification to projector or recorder is required.

G. B. & Howell	613, 635
Bolex	G3, G816, M8R
Circe	Nilus, Astro, Super Comet
Eumig	P.26
Kodak	All variable speed models
Pathe	Gem
Specto	All 8mm Models

Many other variable speed projectors can have adaptors specially fitted.

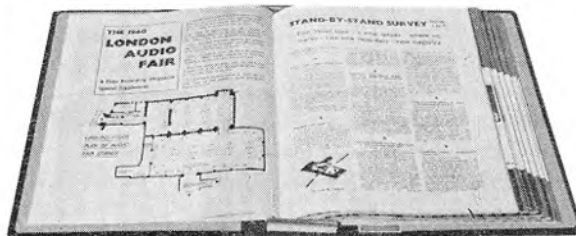
Write for full price and modification list and leaflet to:—

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Grundig TK20	52
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Brenell 3-Star	58
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Mobile	58
Ficord	59
Grundig TK25*	62
Telefunken Deck*	63
Korting Stereo*	68
Telefunken 4-track with mic.	68
Stuzzi-Magnette	69
Brenell MKV with mic.	69
Grundig TK30*	72
Brenell MV with meter, mic.	74
Elektron Stereo*	77
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Harting Stereo*	86
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* Excluding Microphone.



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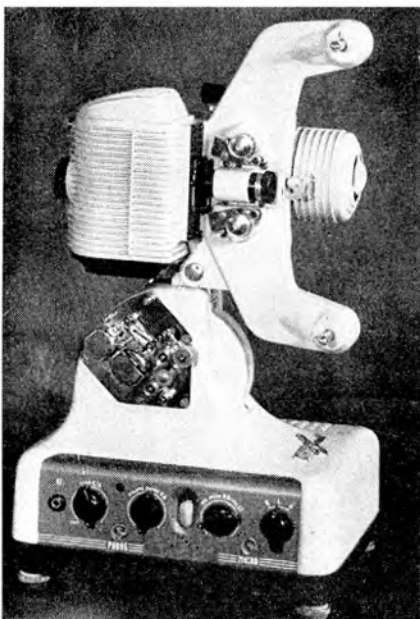
READ the all-in-one Tape Recorder Book. 12s. 6d. Packed with information.

TELEFUNKEN DA CAPO RADIO, 39 gns. Call and hear this fine instrument.

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Equipment Under Test

THE CIRSESOUND RECORDING PROJECTOR

FOR those who seek perfection in the recording and reproduction of 8mm Sound Stripe, the new Cirsesound recording projector provides the answer. It is not to be confused with the earlier Cometson projector, which it supersedes. Made in Italy, the Cirsesound consists of a projector with induction motor drive geared for 16 or 24 frames per second, and a sound head driven with a separate motor.

The speed of the sound head is variable and can be accurately matched to the projector speed. In this way, all wow and flutter caused by film weave and sprocket modulation from the projector mechanism on the "pull-through" type of sound head has been eliminated from recordings.

Naturally a speed of 24 frames gives the better sound quality, but 16 frames is quite acceptable.

PROJECTOR

The projector itself is well made and has an all-gear drive from the motor. The large sprockets contain 16 teeth, and consequently engage several frames of film at once.

Illumination is by a Philips 8v. 50w. lamp and there is a still picture device which can be used when showing films not threaded over the sound head.

Framing is of the optical type which shifts the claw position relative to the aperture plate. There is a fast motor rewind and the maximum spool size is 400 ft.

SOUND HEAD

This is driven by a separate induction motor, bearing against the side of the large diameter flywheel. The speed of this drive is made variable by sliding the whole motor towards or away from the centre of the flywheel.

The film path is easy to load, but one has to remember to lower the pressure pads on to the erase and record heads, and bring the pressure roller against the capstan or sound drum to provide the friction drive.

By

JOHN ALDRED

The projector switch starts the sound head motor and the flywheel speed is adjusted until a tension roller takes up an optimum position. The interval between picture and sound is then approximately 54 frames.

AMPLIFIER

This is of conventional design and uses standard valves, giving an output of 2½ watts. Two double triodes are used for recording, and the bias oscillator pentode is converted to a power output stage for playing back.

A half wave rectifier supplies H.T. and the whole amplifier is completely hum free.

The mixing of two separate inputs is possible, also superimposition. The amplifier can be used in a straight-through condition for playing music or adding a live commentary to silent films.

All controls are conveniently located on a front panel, together with input and speaker sockets.

When recording, a monitoring circuit is available by inserting a special long plug into the speaker socket. This enables a pair of high impedance phones to be

used at a fixed sound level, there being no separate monitor volume control.

A high impedance crystal microphone is supplied, but if a ribbon or moving coil is contemplated a matching transformer must be used. The 8 in. loudspeaker is by Philips, and is housed in an attractive wooden cabinet, which also serves as the projector carrying case. Thirty-three feet of speaker cable is supplied.

REMARKS

The amplifier is very quiet in operation and gives good fidelity. It deserves the use of a better microphone than the one supplied. The superimpose device can only be switched ON or OFF. There can be no gradual fading of the previous recording when adding the second.

With a little practice, excellent recordings can be made on the Cirsesound, equalling those obtained from the average domestic tape recorder.

A well-illustrated instruction book clearly enumerates all working parts and the threading-up process is clearly shown. The speed adjustment of the sound head is not at all difficult, and the projector will then run through a whole reel of film without further attention, leaving you entirely free to concentrate on the actual recording.

SPECIFICATION

Mains supply: 110v.-240v. A.C.
Power: 140 watts.
Projector lamp: 8v. 50w. (Philips).
Film capacity: 400 ft.
Amplifier inputs: Microphone, 1mV./5 Mohms; Gramophone, 1V./250 Kohms.
Outputs: Speaker, 2½ watts/5 ohms; Headphones, 1V./4000 ohms.
Valve line-up: ECC83, ECC82, EM81, EL41.
Frequency response: 16 fps, 100-4,000 cycles; 24 fps, 80-60,000 cycles.
Signal-noise ratio: 53 dB.
Bias oscillator: 35,000 cycles.
Overall weight: 37½ lb.
Dimensions of case: 10 x 12 x 20 in.
Price: £169 10s.
Headphones and two-way mixer are available as extras.

Agents: D.W. Cine Equipments Ltd., 14-18, Ham Yard, Piccadilly, London, W.1.

THE WORLD OF TAPE

Brass band rehearses on tape

EXTENSIVE use of tape recording is made by the C.W.S. (Manchester) Band, winners of this year's North West Area Brass Band Championship.

Mr. Alex Mortimer, the band's musical director, makes a tape recording of the proceedings during each rehearsal so that any mistakes the band may make are not overlooked between one rehearsal and the next.

He plays the tape over to himself constantly between rehearsals and makes extensive notes of any errors that need straightening out, things that could be improved upon, parts that seem to be causing some difficulty, and then he tells the bandsmen how to go about correcting them.

The members of the band are no strangers to tape recording as they fre-

quently attend the BBC Manchester studios to record the programmes broadcast on Saturday afternoons in the Light programme. They have also just had an LP record and an EP record issued under the Philips label.

B.R.E.M.A. elect committee

AT the AGM of the Audio Manufacturers' Group of the British Radio Equipment Manufacturers' Association, on Tuesday, May 10, the following firms were elected members of the management committee: A.E.I. Sound Equipment Ltd., Beam-Echo Ltd., E. K. Cole Ltd., Clarke & Smith Mfg. Co. Ltd., Electric Audio Reproducers Ltd., Gramophone Company Ltd., Grampian Reproducers Ltd., Jason Motor & Electronic Co., Lowther Manufacturing Co., Trix Electrical Co. Ltd.

At a subsequent meeting of the management committee, Major J. F. E. Clarke, of Clarke & Smith Manufacturing Co. Ltd., was re-elected chairman. Mr. D. M. Chave, Lowther Manufacturing Co., was elected vice-chairman in succession to Mr. D. A. Lyons, Trix Electrical Co. Ltd.

Hi-Fi HARRY by rich



"We call the white one
Wow, and the black one
Flutter."

Letters to the Editor

Tape speeds

I HAVE been a reader of *Tape Recording Magazine* since it first appeared and have watched it become more interesting as the years go by. The 18th May issue had more than usual of direct interest to me, but I must remark on two articles that seem to me to be rather a waste of space and almost an insult to one's intelligence.

These are the articles by Pat Copinger and Stanley Jepson on measuring tape speed. If one is going to check the speed of one's recorder, it's so obvious that one should do so by timing a measured length of tape that it hardly needs a page and a half of instructions on how to carry out such a "complicated" procedure.

And Stanley Jepson goes on to confuse things with his very roundabout method of making copies of tapes at speeds not on the recorder. Assuming, as he does, that two machines are available, they need have only two speeds (one on each) to cover the complete range required.

For example, taking the two most common speeds, $3\frac{1}{2}$ and $7\frac{1}{2}$ ips, both of which he has on his two recorders, tapes at $1\frac{1}{2}$ and 15 ips can both be recorded and played back with only one copying process necessary.

For $1\frac{1}{2}$ ips, the tape is recorded at $3\frac{1}{2}$ ips then transferred to the other recorder and dubbed from $7\frac{1}{2}$ to $3\frac{1}{2}$. Result $1\frac{1}{2}$, with only one copying involved, and consequently less distortion and loss (pro-

vided the heads on both recorders are accurately aligned, as they should be).

For 15 ips the reverse procedure can be adopted. Record at $7\frac{1}{2}$, then dub from $3\frac{1}{2}$ to $7\frac{1}{2}$. For playback of 15, dub from $7\frac{1}{2}$ to $3\frac{1}{2}$ and play at $7\frac{1}{2}$. For playback of $1\frac{1}{2}$ dub from $3\frac{1}{2}$ to $7\frac{1}{2}$ and playback at $3\frac{1}{2}$. This is much simpler, takes less time and gives better results.

Really, though, the problem seldom arises, as hardly any amateur uses 15 ips even if he has it on his recorder (except out of curiosity), and most tape correspondence, for which this is mainly intended, is recorded at $3\frac{1}{2}$ ips.

The reason why Stanley Jepson's method is so longwinded is because he will insist, for some odd reason, on recording and playing back all his tapes at $7\frac{1}{2}$ ips. For message tapes, there is nothing to be gained by this, unless you are recording high quality music. Most tape correspondence, as I said, is carried out at $3\frac{1}{2}$ ips for obvious reasons of economy, and is perfectly satisfactory at this speed.

DONALD JEATER.

Weymouth.

Recording on film

I AM an apprentice projectionist and a purchaser of your magazine since the first issue. I am a tape recorder enthusiast and I have managed to save and purchase a Ferrograph 4A. I enjoy reading over the various electronic circuits that appear each week in your

magazine and they are also helpful to me in my work with the amplifier in the cinema.

You may be interested in a little experiment I tried the other week. We received in the projection room a copy of a film in which the leader of one of the prints was clear film, with a magnetic sound track on it. I cut this track off, for about 14 feet or so, and threaded it through the record head of my Ferrograph. I then plugged in my VHF radio and set the recorder going. On trying it at playback, I found I had recorded the music of the VHF and it came through very well.

I thought it quite an interesting discovery that professional film magnetic track will take a home recording on a domestic machine so easily.

FERGUSON MEEK.

Edinburgh.

ADVICE WANTED

WE are repeatedly being asked by Fi-Cord users to advise them where they can obtain a parabolic reflector to use with their Fi-Cord recorders. We, ourselves, have been unable to discover any manufacturer of reflectors and would be interested to learn from any of your readers whether they are able to recommend a manufacturer of a portable reflector suitable for use with the Fi-Cord.

RALPH E. GOUGH,
General Manager.

Fi-Cord Ltd.,
40a, Dover Street, London, W.1.

Alan Edward Beeby's regular articles on sound effects are one of our most popular features. We thought readers might like to know something about our contributor. So we asked his wife (seen right) to send us a biographical sketch. The article she has written raises a most interesting and important question:



Are all sound-effects men slightly mad?

By
SHIRLEY MARGARET BEEBY

WHEN he learned of my intention to contribute this article, my husband opposed the idea on three counts: I couldn't write, I knew nothing whatever about sound-effects, and the article would deal such a crippling blow to circulation that, within a month, the Editor would find himself subjected to the necessity of selling matches at the corner of Tudor Street!

Nevertheless, in my view, monopoly, be it of the family or field variety, is not a very healthy thing and, on that principle, I turned a deaf ear to the Expert's objections.

I say "Expert" although I sometimes find it difficult to reconcile the term with the oft-seen sight of the Expert surrounded by a welter of broken glass and debris, giving forth the most uncomplimentary language, because the thing doesn't sound right!

Disillusionment set in with me somewhat earlier than with most wives, I imagine. Precisely twenty-four hours after the ceremony, some of the gold began to roll off my rolled-gold wedding ring (figuratively speaking, of course!).

I found him in the kitchen. His tape recorder was in action on the floor, while he had hold of one end of my brand-new 20-guinea cabinet and was bouncing it up and down, shaking holy murder out of its contents. Most of this was crockery and, judging from the hell-raising clatter from within, it was now in the immediate process of making me the proud owner of a 365-piece dinner service!

Then he looked up and noticed me. Lowering the cabinet to the ground, he switched off the recorder, grinned rather sheepishly and waved a tired hand in the direction of the machine.

"Done it!" he exclaimed, "A bit over-modulated but it'll do."

My voice was thick with apprehension. "Done . . . done what?" I asked nervously.

He was searching in his pockets for something. "Er . . . wagon-noises," he answered, and wandered into the sitting room. Then he called over his shoulder:

"Be a sport and clear a bit of the mess up in the cabinet."

"Is . . . is anything broken?" I quavered.

"Dunno, a few cups fell over, I think, that's all." And he was gone.

Perhaps the kindest thing one can say about sound-effect men is that they are all slightly mad! Listen to this. A few weeks ago, he went out and bought a length of rusty iron chain from a blacksmith to use for an effect. Shortly afterwards, he lost it. First, he said I'd had it. Then he said the dog had hidden it somewhere.

Two days later, I found it. *Laying on a pile of clean laundry in the linen cupboard!* When I confronted him with it, he said: "Oh yes, glad you've found it, I've been looking for that!" Like I say, *slightly mad!*

I have now grown accustomed to answering the door to total strangers bearing parcels of the weirdest kind.

These are usually accompanied by the message: "Alan said this would be useful for one of his sound-effects, so I've brought it up for him."

Odd pieces of metal, lengths of tubular steel, broken panes of glass and even, on one occasion, a huge slab of wet, mud-encrusted concrete!

His passion for collecting unusual sound-effects nearly got him killed a short time ago. A fellow-maniac had told him about a centuries-old tunnel let into the wall of a disused well, which was supposed to have rather uncanny acoustic properties. Of course Alan had to investigate, and duly set off one evening with his recorder, promising to be home by 10 o'clock.

By 11.15 he still hadn't arrived and I was having all sorts of horrible visions, ranging from street fights and road accidents to seductive-looking blondes!

Ten minutes later he walked in. You never saw such a sight! His face was bruised, his hands were grazed, and his coat was torn. His trousers were caked with mud and clay and he'd lost his tie.

Apparently, he'd crawled along this narrow tunnel with a microphone, in an attempt to record the famous echo. In fact, he went in a bit too far, causing the microphone to part company with the recorder. Hearing his colleagues yelling for him to come out, he found he hadn't enough room to turn round and had to wriggle out backwards. Then, emerging into the well itself, he lost his footing, and only after some frenzied and furious scrambling and clawing at the rotting brickwork was he able to regain a foothold and pull himself to safety by means of the hook ladder.

Of his ruined clothing and injured person, he said nothing. His main concern was that he'd lost his S3 Extension (whatever that was) and had to be almost forcibly prevented from returning the next day to repeat the experiment!

His constant companion is a black, sleek, powerfully-built dog named Tess. Tess is a seasoned recording artist in her own right, and between them they have brought the recording of "dog" effects to a fine art.

She will answer the words "On guard!" with a fierce growl; "Cats!" brings forth a frantic barking; while "Cry!" can usually be relied upon to produce both a dismal howling and an early visit from an indignant R.S.P.C.A. Inspector.

At the moment, he's in the throes of fitting-up his new recording studio, which is situated at the top/rear of our house, and for the past few days there's been a constant stream of his cronies wandering in and out at all hours to admire the place.

This, needless to say, has rapidly depleted my already dwindling stocks of biscuits, coffee and energy. (I wonder what his last servant died of!)

As a person, he's a walking paradox. He doesn't drink, but he smokes like a factory chimney. He knows tape recording from A to Z, yet it was I who taught him the correct way to use a soldering iron. He eats like a horse but is as thin as a rake. He's quick-tempered, with an almost brutal intolerance of anything which he regards as stupid or useless, but he has three weaknesses: old people, animals and children.

Oh, yes . . . and Sound-Effects!

THE NEED FOR ULTRASONIC BIASING

GLANCING through the technical specifications of modern tape recorders, one sometimes notices a reference to the "bias frequency," generally with a value somewhere between 40 Kc/s and 100 Kc/s. To the non-technical owner of a recorder, this reference may not mean very much, but he would undoubtedly sit up and take notice if he heard a tape which had been recorded on a machine which used no bias.

For those who build their own recording machines, the provision of bias facilities is probably the least straightforward problem encountered, since it involves the construction of an oscillator to provide just the appropriate amount of current.

I have known of several who, proceeding in the construction of their respective recorders, were extremely vague in their ideas as to why biasing is necessary, although they appeared to be *au fait* with regard to the rest of the system. With a view to dispelling the mystery which surrounds the process of biasing, I intend to show the

nature of, and the need for, biasing, and some of the ways in which it can be applied.

It is necessary to study, for the moment, the graph shown in Fig. 1. It simply shows how the magnetism retained in a piece of magnetic material varies with the application of a magnetising force, which could be

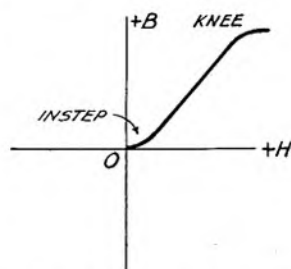


Fig. 1.—Magnetisation curve of magnetic material

an electric current passing through a coil wrapped around the material.

As the current is switched on, the material, which, for purposes of argument, we will assume to be a piece of iron, becomes slightly magnetised. As we slowly increase the current, the magnetism in the iron slowly increases, until suddenly, the rate of increase of magnetism becomes greater, producing an "instep" in the curve.

The graph now becomes straight until a value of magnetism is reached, which cannot be exceeded, not even by increasing the current further. This is the saturation point, and the curve flattens off here, producing a "knee."

Now a curve similar to this one can be drawn for the magnetic tape upon which we record. Let us assume that we have a tape system, consisting of a means of driving the tape at a con-

Developing personal "taste"

"THIS is the speaker for me. Last year I thought very little of it, but I like it better now than any of the others."

The man who said this was a salesman in a high-fidelity retail organisation. His experience is obviously abnormal, but it does underline a factor which is often ignored—the factor of developing personal "taste" in speakers.

I should like to see some statistics of changing taste among people who are exposed to a wide variety of equipment—ignoring technicians who spend most of their time listening for specific features regardless of musical effect.

I think the common tendency would show itself to be towards greater appreciation of what is genuinely the most faithful reproduction—with special reference to absence of distortion. Certain forms of artificial "richness" that can beguile one at first, eventually cloy, leaving the more neutral and more faithful reproducers holding the field.

The thing that it is most important to bear in mind, however, is that the best reproduction—and the reproduction that

Stereo Notes

By D. W. GARDNER

you are probably going to like best in the end—is not necessarily that which seems to be the best at the outset. You may come round to it only after many hours of "exposure."

This applies with as much force to stereo as to mono—perhaps more. The greater clarity of stereo can temporarily unsettle the judgment of many people. What is more, I should hate to buy one speaker on the strength of a short introduction, and I should hate even more to buy two in this way.

Good advice would be to take every opportunity that arises of listening to speakers with a high reputation—even if you find yourself reacting against them at the outset.

Long concerts of the type of music you like best can leave you highly contented or vaguely dissatisfied according to the subconscious effect of the reproduction. Listening fatigue is one of the possible disadvantages of the poorer speakers. You may not be able to detect anything wrong on a straight comparison, but the end product after an hour or more would be a serious reduction of enjoyment.

There is another form of deprivation that is even more difficult to realise, although it is extremely important to those who are really enthusiastic about music, and that is the sabotage that occurs through a response that is not substantially flat.

The intentions of a composer, coupled with the interpretation of a supreme artist, produce a web of sound that is magnificent rather than mediocre because of the finest of inflections and the most minutely calculated arrangement of "weight." If a pair of speakers impart their own tonal emphasis and weight variation then the original pattern is lost—although at any one phrase it might be impossible to observe a fault.

Systematic listening through speakers that do not change the original balance bring the reward, month after month, of a higher standard of musical experience—the undebased standards achieved by soloist and orchestra.

Every music lover knows that the difference between the world's greatest pianist and one who is simply a brilliant technician is largely a matter of a difference in "touch" that is often too slight to be detected consciously. Loudspeakers for stereo should be judged on their capacity to deal faithfully with such differences.

If your tape recorder lacked proper bias facilities, you would not be very happy about its performance. This article explains the nature and function of biasing

**By B. E.
WILKINSON**

stant speed, a record head, fed by an amplifier, and a microphone.

While we do not speak into the microphone, the amplifier is quiescent, and there is no magnetising force developed by the record head. These conditions are represented by the origin of the curve shown in Fig. 2.

As sound waves fall upon the diaphragm of the microphone, the amplifier becomes active and applies a similar electrical force to the record head. This is shown as a single cycle of sine wave. By a geometric projection on to the curve, we are able to show the shape of the recorded signal. It has, as can be clearly seen, lost its

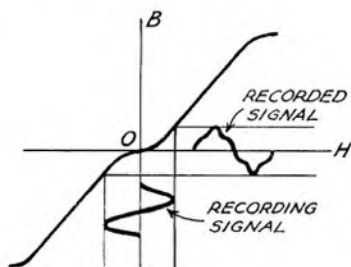


Fig. 2.—Magnetisation curve of recording tape, showing distortion through application of signal to origin

original shape and does not, therefore, represent fully the original signal.

The kinks in the recorded waveform give rise to distortion at playback, which is heard as "woolliness" which completely ruins music and speech. The reason for the distortion is the presence of the "instep" in the curve, and, while the signal is applied about the curved portion, distortion will be present. Bias is necessary to move the point of signal application along the magnetising force axis (horizontal) until it can operate on a linear part.

This implies the use of a magnetising force on the tape before the signal is applied. In Fig 3 we see the sine wave signal superimposed upon a steady magnetising force which has moved the application point under a

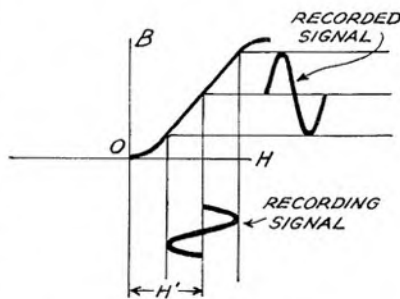


Fig. 3.—Effect of applying steady magnetising force to tape during recording

straight portion. The recorded signal is seen to contain no distortion.

It springs to mind immediately that a direct current through the record head windings would provide the necessary magnetising force upon which the signal can be superimposed. Indeed, this is one method of bias which can be used and is known as D.C. bias. The amount of magnetic oxide on the tape is small, so that not very much current is required to provide bias in this way.

There are, however, disadvantages which do not make this method fully satisfactory. In the first place, it is not wise to pass D.C. through the head windings. The current is probably insufficient to heat up the windings, but constant application could eventually magnetise the head. Secondly, a steady magnetising force, as produced by a direct current, would result in the magnetic particles on the tape being magnetised in a definite direction, which would give rise at playback to noise.

Another version, using the same principle, allows the tape to pass a permanent magnet before the recording head. Again, noise is present during playback, and, should the magnet come too near the head, there is a risk that the latter may become magnetised. Now this kind of bias is considered to be satisfactory in limited applications of tape recording, mainly for small portable dictating machines not intended for music. Since the

storing of information in the form of speech is all that is required, the low signal to noise ratio is acceptable.

The most satisfactory form of bias is ultrasonic, or high frequency, in nature. To understand fully how this system works we must study Fig. 4.

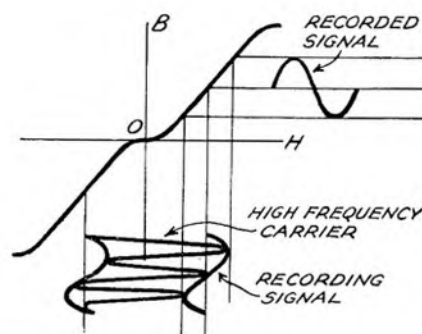


Fig. 4.—Mixing of recording signal with high-frequency carrier

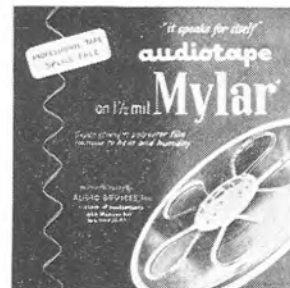
Again, we have a magnetisation curve, and instead of applying a steady magnetic potential to the tape in order to apply the signal to a linear portion, a high frequency alternating current is applied. The frequency is not important, except that it must be supersonic (so that it cannot be heard), and the amplitude is such that when the signal to be recorded is mixed with it, it is projected to a straight part of the curve.

The high frequency bias does more than merely provide the correct point of signal application. As they pass the head the magnetic particles are subjected to diminishing magnetising forces of alternate phase. This means that, apart from those which represent the actual signal, the particles are left in an unmagnetised and randomised form, which eliminates background noise. The oscillatory force also assists the particles to follow the signal current much in the same way as a heavy tap on a barometer overcomes the friction in the system sufficiently for the needle to be deflected by the prevailing small atmospheric force.

Sensational success of audiotape

TRADE MARK

Tape Recording experts and enthusiasts all over the country are changing to AUDIOTAPE for its flawless perfection of sound reproduction over the entire audio range and its *consistent, uniform quality* from reel to reel.



Available on all standard reel sizes, there are eight different types to meet every recording requirement. AUDIOTAPE, manufactured in the U.S.A., by Audio Devices Inc., gives you the truest sound your recording equipment can produce—try AUDIOTAPE . . . it speaks for itself.



Sensational C-SLOT REEL!

All 5" and 7" reels of AUDIOTAPE are supplied on the exclusive C-Slot Reel—the fastest-threading tape reel ever developed. The tape end, dropped into a slot in the hub, anchors itself automatically at the first turn of the reel.



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TELEFUNKEN INCREASE THEIR RANGE OF RECORDERS

New Products

WELMEC CORPORATION have added two machines to their Magnetophon range, the M24 and the M77.

The first is a small studio recorder, 20 x 16 x 10½ inches, weighing approximately 57 lb. Two speeds are provided, 7½ and 3½ ips. Maximum spool size is 8½ inches, allowing 180 minutes playing time per track with DP tape at the slower speed. Rewind time for this tape is given as within 2½ minutes.

Frequency response is quoted as 20-17,000 cps at 7½ ips and 20-14,000 cps at 3½ ips. Wow and flutter is given as less than 0.15 per cent at 7½ ips, less than 0.25 per cent at 3½ ips, and the signal-to-noise ratio as better than -50dB.

Facilities provided include monitoring, automatic tape-end stop, remote control, pause control, recording level indicator, separate record/playback amplifiers, digital rev. counter, and an interchangeable head assembly.

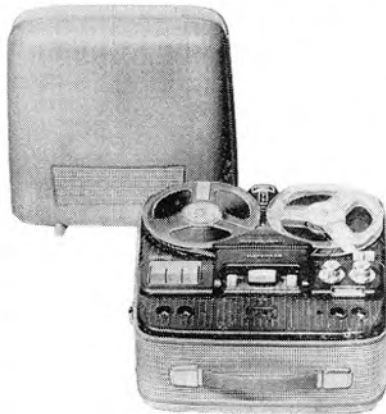
The price ranges from 159 guineas for a chassis model without power stage, M24C, to 192 guineas for the M24KL portable design with 6-watt push-pull power stage and four loudspeakers.

Their second machine, the M77 is a four-track stereo recorder with two speeds, 3½ and 1½ ips. Frequency response is quoted as 40-16,000 cps at the higher speed, and 40-9,000 cps at 1½ ips. Playing time with a 5½-inch spool of DP tape at 1½ ips, is 12 hours 40 minutes for monaural operation.

Facilities include automatic tape-end stop, digital rev. counter, recording level indicator, fast rewind, two 2.5-watt power stages, separate selection of both channels, and external loudspeaker sockets. Allowance is made for monitoring track one whilst recording on track two, and vice versa.

Power consumption is approximately 50 watts, and it is operated on a mains supply of 110-240 v AC, 50 cycles.

This machine is produced in two ver-



THE M77 (top) AND M24

sions. The Table Model 77T, with output stage only, measures 12 x 9 x 5½ inches. The portable model, 77K, with output stage and loudspeakers is 12½ x 12½ x 8 inches. Both models are encased in the new plastic material, Styron.

The price is not yet announced, as the recorder will not be available until next month.

Welmec Corporation Limited, 147/18, Strand, London, W.C.2.

New name in pre-recorded tape field

A new name in the pre-recorded tape field is Bi-Tapes Limited, a recording company formed in London at the beginning of June.

The new company is particularly interested in the more popular type of music and their initial issue includes Latin American, Rock 'n' Roll, Jazz and Mood music.

Artists appearing on the Bi-Tape label are Lis Welch, Mike McKenzie, Ian Daniel, Ed Bones and Mike Dalton.

The tapes will be produced mainly for monaural playback, at 3½ ips on a five-inch reel, although a stereo version of one of the tapes, a duet by Lis Welch and Mike McKenzie, is available.

Their first eight tapes will be reviewed in our pages shortly.

Tapes Limited, 78, Upper Berkeley Street, W.1.

More tape from "Scotch Boy"



The new Scotch Brand 3-inch reel, the *One-Five Special*, which provides 15 minutes playing time from its 150 feet of tape at 3½ ips. Ready for instant mailing in its own specially designed box, the tape costs 5s. 3d.

The 3M Company have also increased their range of No. 200 Double Play Tensilized Polyester Tape, with the introduction of a new 5½ inch reel with 1,700 feet of tape, selling at 57s. 6d.

WALTRAK

The Waltrak pocket oscillator, reviewed in the June 1 issue, is manufactured by Wellington Ascoustics Laboratories Ltd., of Allways, Kings Lane, Wrecclesham, Farnham, Surrey, and retails at £6 10s.



The new Gainsborough three-speed recorder, 1½, 3½ and 7½ ips, which was fully described in our May 4 issue

IN BRIEF

E.A.P. (TAPE RECORDERS) LTD., manufacturers of the Elizabethan range of tape recorders, announce that the trading title of the company has been changed to Elizabethan (Tape Recorders) Ltd. The management, address and telephone remain as before.

* * *

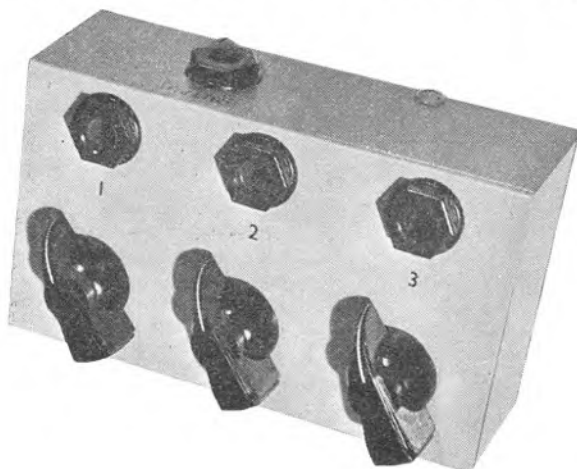
WITH EFFECT from May 6, the prices of Stella tape recorders, models ST 450 and ST 451, are decontrolled.

Stella Radio & Television Co. Ltd., 121-123, Shaftesbury Avenue, London, W.C.2.

* * *

TO give wider service facilities to their customers, Grundig (Great Britain) Limited are extending the period of guarantee for their tape recorders from six months to one year. This becomes effective on the 1st July, 1960, but will include all registered guarantees on or after the 1st January, 1960.

Are you getting the most out of your recorder?



A TAPE RECORDER IS A VERY FLEXIBLE MACHINE; ITS FACILITIES CAN BE GREATLY EXTENDED, AND ITS USES INCREASED, WITH PROPER ACCESSORIES. DEKTRON SPECIALISE IN THE PRODUCTION OF INEXPENSIVE ITEMS WHICH WILL DOUBLE YOUR TAPE RECORDING INTEREST AND ABILITY.

2 THE MIXER-FADER

With this mixer-fader you can blend together three separate input sources to produce a single recording. Items can be faded in or out in professional style. Skilful use of this instrument can save you hours of tedious editing work, too. This is the smallest mixer-fader on the market (it will slip into your pocket)—and the cheapest and most efficient. The price is 39s. 6d.

3 THE MONITOR

It is of great assistance to know exactly what you are recording on a tape. This transistorised unit gives you full monitoring facilities. Used in conjunction with the mixer-fader, it acts as a pre-amplifier and gives you the essential basis of a home recording studio. The price is five guineas.

1 THE TELECON PICK-UP

This is a very simple, but highly efficient, instrument that enables you to record both ends of a telephone conversation and—if you wish—to amplify and broadcast it simultaneously to listeners in the room. It is of great value for family and business purposes. The pick-up is simply laid on a desk or table beside the 'phone and plugged into the recorder. The price is only 27s. 6d.



DEKTRON, 2 Westbourne Road, Weymouth, Dorset

Telephone : Weymouth 1987

News from the Clubs

AS we go to press on this issue the recording conference arranged by the **National Federation of Tape Recording Clubs** is only a few days away. A report of the proceedings on June 11 will be given in our next issue, meanwhile it appears some interesting points are likely to be raised in the Russell Hotel, especially regarding closer co-operation between, and the enrolment of, new clubs.

The formation of new clubs is now reaching a new high. There will always be the setbacks normally associated with new organisations, but from the evidence, the tape enthusiasts seem capable of cutting free the "deadwood," and gradually they build their clubs into solid groups.

Three clubs which have met with a great deal of success lead me into the reports for this fortnight.

Seven members were present at the second meeting of the **Ware and District** club, held on May 23. Discussion on the plans for the future started the proceedings and suggestions made included tape exchanges, visits to other clubs, and a hospital tape service.

Three recorders had been taken along by members and these were subjected to speed tests. Mr. Saul, the technical genius of the club, demonstrated a Collaro Studio deck, and put forward proposals for building a battery recorder for club use.

Seven persons also at the May 2 meeting of the newly-formed **Dover** club. Their first decision was to double the meeting dates. In future members will meet on alternate Mondays at the "Rose and Crown," London Road.

Their meeting, a fortnight later, was spent on location at "The Warren," a local wood noted for its nightingales. Equipped with a Grundig Cub, members spent the evening collecting recordings of this elusive bird. Later in the evening, playback of the recordings, on a Grundig TK35, revealed a satisfactory evening's work, with, in addition to the nightingale's songs, recordings of trains steaming along the nearby coast, and of a black-bird. One lesson learnt from the evening's activities is that members found 9.30 p.m., the time the recording session finished, too early to record the nightingale with any marked degree of success.

A stereo recording of sound effects was heard at their May 30 meeting. This was presented by the Chairman, Snay Rumsby.

The **Staffordshire** club is now holding its meetings at "The Grapes," Bridge Street, where the landlord allows free use of a room. Meetings are still held on alternate Tuesdays; next on June 21. Membership has now risen to thirty.

Edited by

FRED CHANDLER

Recent meetings included a joint meeting with the local Cine Society, when a number of films with tape commentary were shown and discussed, and a dance held last month to raise funds.

Malcolm Wilding, Secretary of the **Ipswich** club, repeated the success of members who recently recorded the Everley Brothers in the dressing-room at a local theatre. He went backstage of the Gaumont Theatre last month to record an interview with Cliff Richard, who is himself interested in tape recording.

National Federation Secretary, Alan Stableford, and Mr. Keith Plumridge, Librarian of the Crawley College for Further Education, were the judges of a "Music on Tape" competition held at the May 2 meeting of the **Crawley** club. Both judges expressed delight at the high standard of the entries, and Alan pointed out the number of entries, there were 26, must be a record for club competitions.

Winners in the various sections were Tony Wales, with a recording of a Chinese violinist; Mrs. Archer, with a bird-song tape; Mr. F. Woods and Mr. F. Whittingham, with a musical piece and a piano-accordion recording.

Plans are being made to organise a similar competition, with a wider range

of subjects, that would be thrown open to local cultural organisations.

Full coverage in the form of documentaries and club publicity was given by the club at the Crawley Carnival held during Whitsun.

The May 8 meeting of the **Chesterfield** Society commenced with the playback of a tape received from the Nottingham club. This was followed by a demonstration of a battery portable recorder presented by Harry Marshall. Later in the evening members attempted to record a play-reading session, reading alternatively from two separate plays.

The following meeting, June 13, was scheduled to include an interlude of five-minute tapes from each member, and the playback of a tape received from New York.

A committee meeting of the **Nottingham** club, held on May 9, brought out a number of ideas to speed correspondence between members. One was that each member should give the Secretary a few stamped addressed envelopes, thus cutting out a great deal of laborious work when posting the newsletters to members. It was also suggested that a "sign-in" sheet should be available at every meeting and to members lax in attendance should be sent a tape encouraging regular attendance.

At their May 26 meeting, Keith Fricker gave a talk entitled "Tapespondence with a difference," which dealt with his tape exchanges to Bill Kemp of Chesterfield. The following evening, members visited the demonstration rooms of a local dealer.

Members of the **West Herts** Society also went out-and-about during a recent meeting.

Three members, equipped with a Fi-Cord, and another three with a Minivox, went separate ways in an attempt to get various sounds as listed by

(Continued on page 33)



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(Continued from page 31)

John Grainger, whilst he and Jack Hill stayed "home" to produce the same sounds with the material available in the club rooms. On the playback of tapes equal points were awarded, the outdoor crews just beating "indoors" by half a point.

The "cuckoo" contest tapes were then played, and Dennis Millard and new member Norman Parker awarded most points to Peter Holloway, who kept the tape he had donated as a prize. The evening concluded with a discussion on the National Contest.

Mr. Stan Freeman, of Messrs. Watford Suppliers, provided a demonstration of recorder and accessories at the May 4 meeting. On show were a transistorised radio that can be connected to a recorder, and an E.M.I. TR51. This machine, which is considered portable in some circles, was compared with the battery portables more familiar to the amateur enthusiasts. Further discussions on the National Contest, and arrangements for recording the Whit Monday Watford Carnival, rounded off an interesting evening.

Another competition was set in which members are to record six subjects that could be described as "Old and New." An example given was the steam train and a diesel.

Dennis Millard is preparing a tape to be sent to a lady missionary in Pakistan. The tape will include messages from her parents and members of a local Fellowship Club, and an edited version of an evening church service.

Armed Forces Day, May 14, was duly observed by the U.S. Air Force at Bovingdon Air Base. Six members of the club were in attendance and, with help from the U.S.A.F. and the R.A.F., were able to obtain some fascinating recordings. Jack Hill and Jack King visited the control tower to record two-way conversations with jet pilots taking part in the fly-past; Pete Walmsley roamed the tarmac and collected the sounds of the aircraft warming-up prior to take-off; and Pete Holloway wandered into the hangars with a portable recorder to collect impressions of the static displays. A servicemen's skiffle group provided an entertaining climax to the day's activities.

Mr. Frank Parrington, of Walter Instruments Ltd., presented another of his demonstrations at the May 24 meeting of the Brighton club. At the previous meeting, Secretary Ralph Vivian won a spool of tape, the prize for the most original tape depicting a journey into outer space.

At the request of a local dramatic group, members recorded a stage performance of their latest play. After editing, the tapes were dubbed and a number of copies presented to the members of the cast.

The West Wales club held a meeting at their Club Room at New Street, Aberystwyth on May 18 when they enjoyed a demonstration of the latest Grundig equipment given by Mr. M. H. Eatly, Area Manager of Messrs. Grundig (Great Britain) Ltd. The attendance exceeded all expectation.

Mr. Eatly gave a short history of the machines, but main interest lay in hearing (for the majority, for the first time) the new Stereophonic TK 60 Tape

Recorder. He also demonstrated the monaural TK 35. Afterwards, Mr. Eatly invited questions, and these came at him from all directions and were ably and satisfactorily dealt with. The Club have invited Mr. Eatly to come back again when his firm have any new products on the market and he has very kindly agreed to do so.

Principal event of the April 28 meeting of the Coventry club was a talk given by Mr. L. W. Saunders, of E.M.I., who spoke on the manufacture of Emitape. One point made clear during the lecture was that recent criticism of "print-through" on DP tape was not altogether justified, and no undue concern should be noted.



One of the prizes for the winner of the club section of the National Contest, this plaque is presented by John Amphlett, retiring Chairman of the National Federation of Tape Recording Clubs

Members of this club also paid a visit to the Audio Fair. Henry Hopfinger and Mac Thompson brought back sheafs of manufacturers' literature for club consumption.

Six members of the Warwick and Leamington club had been invited along for the E.M.I. lecture. One took home a 3-in. reel of LP tape—won in the raffle—thereby partly revenging the Coventry members' luck during the visit to Warwick on March 16. Continuing the now popular exchange visits between these two clubs, Coventry members were invited to Warwick for their May 25 meeting which included a special demonstration of portable battery recorders.

Another recent visit was to the Women's League of the Unitarian Church where Peter Warden gave a talk on the formation and growth of the tape club.

The club has booked the Herbert Art Gallery for the evening of June 23, when, with the co-operation of Welmeac Corporation Ltd., the Telefunken importers, they will present a demonstration of hi-fi.

A visit to the B.B.C. Midland Region Studios has been requested by some new members. If arrangements are completed this will be their third visit.

Peter Warden and his wife Kathleen went to Hastings a short while ago, and during a visit to a church found the vicar to be a recording enthusiast. "You just cannot get away from it," Peter states. Kathleen was approached by a market research investigator. She found her comments on a washing powder were being recorded, and, for services rendered, received ten shillings.

Club fame continues to spread. Latest evidence of this is that the chairman has been asked to write an article on his club for the Nuffield Organisation house journal.

The May 18 meeting of the South-West London club opened with a discussion on a future programme, when it was decided to produce a documentary on the River Thames.

Mr. John James then read a letter from his American tape contact, and the ten members present recorded a reply giving their views on topics of current interest. This was followed by a demonstration of four popular microphones presented by Secretary Denys Killick. A demonstration of the Tandberg stereo recorder was arranged for their June 1 meeting. The Secretary's address is 6, Disraeli Gardens, Fawe Park Road, London, S.W.15.

A tape received from the Middlesbrough Society and heard at the May 19 meeting of the Leeds club, received a tremendous reception from the Leeds members. Terence Quigley said members were highly impressed at the quality of the tape and his club would have to excel themselves to attain the same standard in their reply tape.

As if to press ahead with this statement, a lecture and demonstration on script-writing and microphone technique was presented by Mr. J. W. Williams. He illustrated his talk with extracts from the scripts he has used for his BBC documentary programmes.

A local businessman, Mr. O. Underwood, entertained members of the Rugby club at their May 19 meeting with a film show. The first film shown, entitled "Shakespeare's Avon," was a colour film which travelled from the source of the river to the spot where it joins the Severn. With a delightful and jaunty musical background, it formed a relaxing item. The mood changed for the second film, which contained breath-taking shots of motor-cycle and motor-car racing.

During the evening, four new members joined, taking the membership to fifty. Their target of 52 was expected to be passed before the AGM held on June 2.

A pageant organised recently by a local Girl Guides Association required aircraft effects. Members of the club, called in to assist, made arrangements to visit the airport at Birmingham, and earmarked a Telefunken mains machine, and a Stuzzi Magnette to collect the desired sounds.

After listening to a demonstration of musique concrete at one of their recent meetings, members of the Ilford club heard that Secretary Jeff Langley is to devise a competition for this type of recording.

The demonstration that enthralled members won first prize in a competition for its producer F. C. Judd. Lasting only two minutes, it took him four days to compile from bits and pieces of tape on which he had recorded various sounds at differing speeds.



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Index to Advertisers

	page
Audio Devices Ltd.	28
Brenell Engineering Co. Ltd.	4
Coghlan and Robinson Ltd.	34
Deroy Sound Service	34
Dektron	30
Dickinsons of Pall Mall Ltd.	22
Elizabethan (Tape Recorders) Ltd.	2
F. A. Hughes & Co. Ltd. ... Front cover	
Gopalco Ltd.	6
Grundig (Great Britain) Ltd.	9
Howard Photographic	35
Johnsons of Hendon Ltd.	20
KGM Electronics Ltd.	16
Lee Electronics	34
Magnegraph	34
Modern Techniques	35
Murphy Radio Ltd.	8
Neville Brown & Co. Ltd.	16
Olympic Sound Studios	34
Psycho-Tape Institute	6
Rapid Recording Service	34
R. B. Tapes Co. Ltd.	8
Reps (Tape Recorders) Ltd.	10
Shinns Ltd.	34
Simon Equipment Ltd.	7
Sunderland Sound Services	34
Synchro Sound Instruments	22
Tape Recorders (Bournemouth) Ltd.	34
Tape Recorders (Electronics) Ltd.	5
Tape Recorder Centre Ltd.	36
Tape Recorder Service Co.	10
The Gramophone Co.	3
The Recorder Co.	6
Zonal Film Facilities	20

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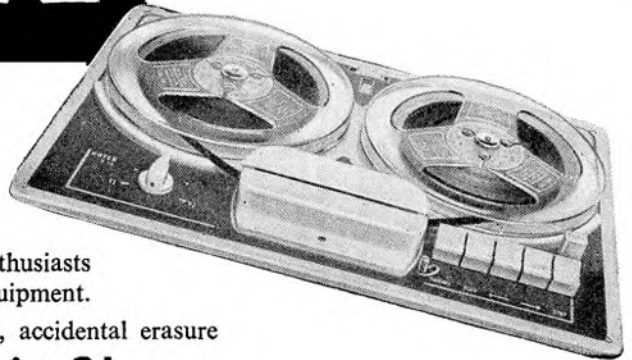
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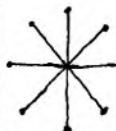
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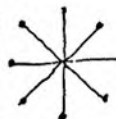
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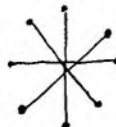
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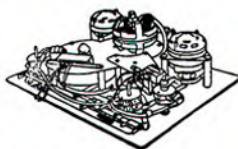
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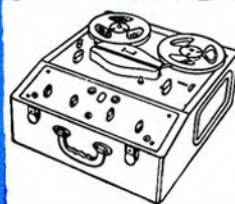
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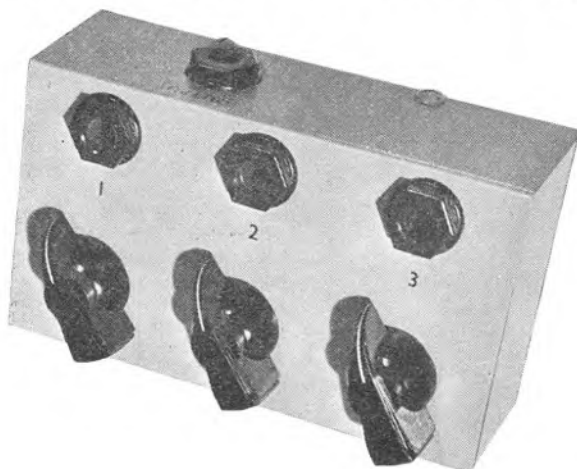
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IN THIS ISSUE

We take the view . . . 8

The World of Tape 9 A News Digest

Use your Imagination 10 Bertram Russell

To Russia with a Recorder 10 The Editor

Contest Corner 12

Recorders as aids to staff training 12 H. Charles

Tape Recording Congress report 14

Tape in the schools 16

Stereo Notes 18 Douglas Gardner

Sound Effects 19 Alan Edward Beeby

A.T.R.F. Transistor Radio Tuner 20 Build-it-yourself article

Equipment under Test 22

New Products 22

Letters to the Editor 24

News from the Clubs 25

We take the view . . .

A DIGEST OF NEWS, COMMENT AND EDITORIAL OPINION

QUITE a lot of discussion seems to be taking place quietly behind the scenes about the future of audio exhibitions in this country.

The organisation of the Audio Hall at the Radio Show and of Northern Audio Fair is under way. And exhibitors have analysed carefully the results of their participation in the last London Audio Fair, which was generally regarded as the most successful so far. There were 34,000 visitors in four days.

But the need now seems to be for something pitched about mid-way between the Audio Fair and the Radio Show.

Space in hotels is severely limited. The rule has been that all firms, big and small, shall have similar facilities. But if some of the leading firms were given scope to put on the displays of which they are capable, the event would attain a new stature.

As a part of the same exercise, more of the public would be attracted. It is a strong point that the Audio Fair now draws the well-informed and the enthusiast. But it is desirable to have a leavening of newcomers; the Audio Fair should play a vital role in extending the circle of knowledgeable people by drawing in those whose interest may yet be casual.

This, of course, involves more space. Yet the big exhibition hall does not provide a ready answer. There have got to be effective private demonstration rooms and it would be uneconomic to have to build them specially each time.

If the organisers planned well ahead, however, say for five years, might it not be possible to arrange for sound-proofed sectional rooms which could be dismantled and stored between exhibitions?

We do not underestimate the difficulties, and we admire the business-like way in which problems have been tackled in the past, but the evidence is mounting that bold new thinking is now called for.

Talking books

THE "talking book" is clearly going to fill an important role in the future. It began, of course, with the blind. It was extended for the teaching of languages. Now it is being applied to juvenile literature.

But the frontiers have nowhere been touched and we may anticipate big developments in this field before long.

I have before me as I write the latest five titles produced by the Talking Book

Company Ltd., in association with the publishing house of Methuen. Each is a well-produced booklet of twelve or sixteen pages, illustrated in colour, bound into a stout card cover with an attractive glossy finish. Inside the cover is a seven-inch 33½ rpm long-play disc.

The value of these talking books is superbly illustrated by that entitled "Bird Song," by Ludwig Koch. On the record are Koch's recordings of sparrows, the carrion crow, the rook, the raven, the starling, the blackbird and the thrush.

He introduces each song himself, while in the book he has written about them under accurate colour illustrations provided by Richard Taylor. It is undoubtedly true that there has never before been such an effective introduction to ornithology for young people.

The other new titles are: "The Story of Jesus," read by John Betjeman; "Instruments of the Orchestra," by Percy M. Young; "Windy Old Weather," sea shanties by Bob Roberts; and

"Kissin's nae sin," Scottish love ballads by Isabel Sutherland and Jimmie MacGregor. These talking books cost 8s. 6d. each.

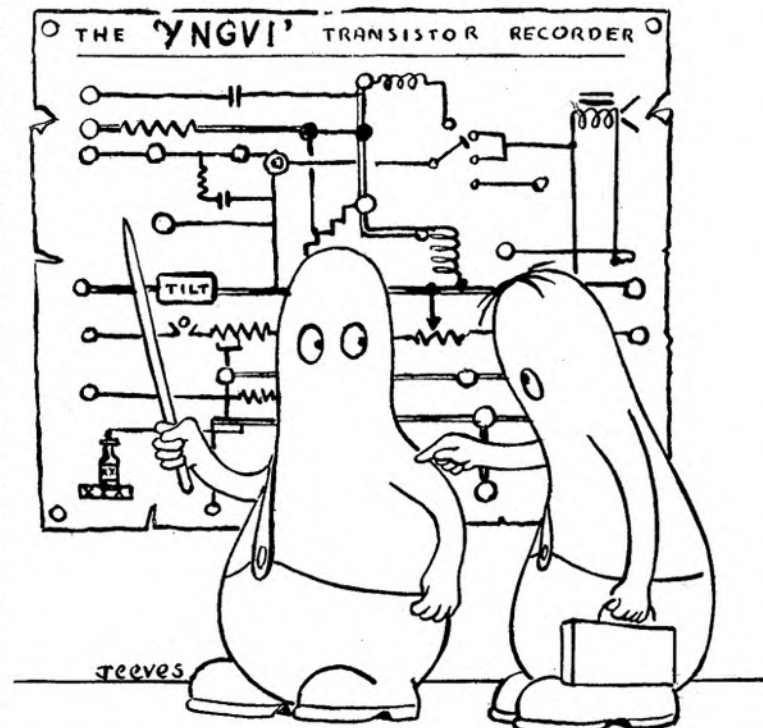
Sumptuous

SPEAKING of fine books, I must refer to "Hi-Fi Journey with Lasky's." This is, in fact, a catalogue of tape and hi-fi equipment—but you would never guess it when you see the glossy colour cover and delight in the sumptuous production.

It is one of the most comprehensive illustrated guides to what is available on the market that has ever been produced. It includes a great deal of technical information and will prove of considerable value as a reference book.

It costs 3s. 6d. if you buy it at one of Lasky's shops, or 4s. by post. I do not propose to draw attention to trade catalogues as a regular thing, but this one is quite exceptional.

LAUGH WITH JEEVES



"Can you tell me where I change for the Inner Circle line?"

SCHOOL DOES GOOD TURN WITH TAPE

A "GREETINGS on tape" service has been inaugurated by a group of boys and girls at St. Christopher's School, Letchworth, Herts, for patients in local hospitals, making it possible for the patients to record messages and send them to relatives who live too far away to visit. The hospital management committee has accepted the scheme and patients may now send messages of up to ten minutes in length for just the cost of posting the tapes.

The same recorder, bought by selling scrap metal and woollens, also provides a book-reading service for blind people. Provided they possess a tape recorder, they can ask the recording unit to read a book passage on to a tape which may then be played back at the blind person's leisure. It is hoped later on to extend this service to the production of a periodic magazine in which interesting events will be recorded.

and tape helps deaf children

SOUNDS crazy! . . . but tape recorders are definitely being used in schools for deaf children in Scotland today.

Heads of education authorities and other organisations, always on the lookout for new methods which can be used for aiding handicapped children, have been giving this medium a great deal of thought for some time and results up to date are encouraging.

In Gateside School, Paisley, the staff have adapted themselves to this new technique and have produced some excellent results.

Samples of the pupil's speech are recorded. About half of the children can, with amplified sound, hear the play-back of their own voices and defects of articulation, accent, rhythm, pitch and other faults are pointed out. Then, with skill and great patience, the staff give the pupils practice in improving their performance.

The teacher, by listening to a recording, gets a better over-all impression of the intelligibility and naturalness of a child's speech.

Deviations from the normal stand out, and so help the staff to concentrate their efforts on removing these.

The recorder is also used as an amplifier and will be used more when a loop system is installed.

Still very much in the experimental stage, the authorities hope to build up a collection of recorded tunes to illustrate rhythms for walking, skipping, running and other practises for rhythmic exercises. And with all the skill and ingenuity of their staffs at their disposal, the authorities feel confident of finding other uses for the recorder in the near future

THE WORLD OF TAPE • A NEWS ROUND-UP



TELEVISION personality. Al Koran, used his Grundig Cub tape recorder in a novel manner recently. On the Monday before Derby Day he recorded his forecast of the winner, and the tape was carefully locked away. It was brought out again on Derby night in Al's own show and thousands of viewers heard the playback. Al had not only successfully predicted the winner but the second and third as well.



Mrs. Clara Coles of Smethwick, Staffs., receiving from Mr. Michael Miles a Wyndor Victor recorder, won on the final programme of the Associated Rediffusion television quiz "Take Your Pick"

Contest entry may help solve traffic problem

ONE of the entries in the 1960 British Amateur Tape Recording Contest may well be turned to another use and perhaps finally assist in solving a traffic problem in Mitcham, Surrey. To gain authentic material for an entry in the reportage section, two Mitcham 17-year-olds, John Burnett of Tamworth Lane, and John Morgan of Brenley Close took their "mobile recording studio"—a car battery, generator, tape recorder and microphone, mounted on a bicycle trailer—to the nearby Eastfields level crossing.

The crossing is the scene of long queues of traffic during busy periods and motorists interviewed by the two youths expressed strong views that something should be done about the hindrance which had kept some of them waiting up to twenty minutes.

For a number of years the crossing has been the subject of controversy and a local residents' association has repeatedly asked for it to be widened. To provide some first-hand evidence of what the motorists who actually use it feel, John Burnett says that he and his friend have been thinking of sending a copy of their recording to the Town Hall.

Stuzzi display

A PUBLIC demonstration of Recording Devices Ltd. Stuzzi recorders at the Welbeck Hotel, Nottingham, drew over 200 people. Mr. K. Short demonstrated the Magette and the Tricorder, using the latter to give part of the lecture unaided, in conjunction with slides and a projector. He also answered 45 minutes of questions. The display was organised by Nottingham Tape Recorders Ltd.

Auditioned on tape

A JAZZ band in Leicester recently signed up by a band agency in Manchester may have started a new fashion in auditioning technique.

The Clayton Jones Jazz Band was anxious to get engagements in the North of England, but neither they nor the principals of the Dixon Orr Agency in Manchester could find a mutually convenient time or place for an audition. The difficulty was overcome when a tape recording enthusiast in Leicester agreed to "sit in" on a session at the Jazz Club where they play and record the proceedings.

The tape was then sent to Manchester and after playing it through the Dixon Orr Agency agreed to represent the band.

USE YOUR IMAGINATION

urges Bertram Russell

YOU will not get maximum value for your recorder unless you use it imaginatively. Let me give an example. Most people use their machine to correspond with a friend. Experience has shown me that such correspondence is frequently stilted and too much an imitation of a normal letter, rather than a full use of the facilities of self-expression and communication offered by the recorder.

I have turned my own taped correspondence into something more alive and interesting. On the first letter, I got my wife to chat with me, bearing in mind that the microphone was eaves-dropping on behalf of the friends to whom the "letter" was being dispatched. Then we drew our two girls into the conversation, so that what we actually recorded was a family conversation-piece designed to cover the appropriate news and views for the friends to whom the "letter" was being sent.

As a 300 ft. reel of tape allowed us, at 3½ ips, some fifteen minutes per side, our conversation-piece was completed on one side. Then, applying a little more imagination, I got my family to hunt out a group of their favourite poems which we proceeded to record, with appropriate comments, on the other side of the tape.

We were delighted, when we received the tape back, to find that our friends had adopted the same technique. We were able to judge how effective the idea had been, and it was a great improvement on the direct letter style.

One cannot use the recording of poems continually, without exhausting interest, but I recollected that our friends were particularly fond of the small copse in which my home is situated. So I decided, with the second letter, to give them a sound picture of our garden and the copse—we had a nightingale and cuckoo performing at the time.

Most parents owning a tape recorder put it into use when their child has a birthday party, for the young guests are usually anxious to hear their own voices. But they usually restrict this use to the trying out of voices; by applying a little imagination in advance, I recently made fuller use of my machine on my daughter's birthday.

I got from her a list of the children who were to be her guests—some four-

teen of them. Then I recorded a twenty-minute short story on my machine, introducing the names of all the guests into the narrative. During the party I switched on the machine and told them that every time their name was mentioned in the story they were to put up their hand or else score a point for a forfeit. This proved to be the most popular event at the party.

Turning to a different field, I was discussing with a headmaster the uses to which a recorder can be put in school. We listed speech training, poetry reading, puppetry, geographical and historical "documentaries," dramatics, training in singing, and so on. Thinking later of this discussion, I decided that many of the school activities could be modified for home recording. As an example, the history "documentary" became a "Family History"; it was soon obvious that this could be a recording in which the various branches of the family could be invited to record, particularly grandparents, who invariably have a fund of family anecdotes. Blended into the narrative would be sound recordings of the hobbies and activities of various members of the family, even such oddities as the peculiar whistle of guinea-pigs owned by nephews or nieces!

A further use of the recorder was found by my elder girl, who took advantage of it to revise her language studies. That set me an example. I wished to revise my study of a textbook on psychology, and I did so by reviewing a chapter and making notes on it. These notes I then dictated on to tape and, during the remaining days of the week, I played them back at least twice a day. The following week I dealt with the next chapter, and so on until I had revised the entire book. I found that this method helped considerably in fixing essential data in the mind.

There have been articles in *Tape Recording Magazine* on the use of recorders with puppets, but some fellow recording enthusiasts, Aileen and Bill Hall, who present the "Petroma Puppets" in Sussex, are developing this use to a high degree. I recently had the pleasure of hearing one of their recorded scripts; announcements, complete dialogue, incidental music, sound effects, and final announcements were all recorded, so that attention could be almost exclusively concentrated on manipulation of the puppets.

These few brief pointers will, I hope, have been sufficient to show how a new world of interest and enthusiasm may be opened up—by applying a little imagination to one's routine recording activities.

The Editor recently made a 4,500 miles round tour of Europe—with a tape recorder. Here he relates some of his experiences during the time he spent in the U.S.S.R.

SOVIET RUSSIA is this year beginning a new drive to attract tourists from the West, and there is consequently greater interest today than ever before in the recording possibilities of the country. As a part of that drive for visitors, a new through train from the Hook of Holland to Moscow was recently inaugurated and, as a journalist with a personal enthusiasm for railway matters, I was invited to travel on the opening run.

I took a Fi-Cord recorder, Gram-pian microphone, and seven reels of long-play tape. I returned with about one-and-a-half hours of first-class recorded material with which it should be possible, when I have the time, to construct a feature programme on tape of up to two hours' duration, allowing for the linking narrative.

All the recordings were made at 7½ ips and, with few exceptions, on one track only, to facilitate editing.

I started from London with some slight apprehensions. Cameras and tape recorders figured recently in a big spy row centred on Moscow. Over the last three years I have been trying consistently to obtain basic information about tape recording progress in the Soviet Union—without success; I concluded that domestic tape recording was probably unknown there. Hence, the sight of an ordinary individual operating a recorder in public places might cause a stir.

Let me say immediately, therefore, that I encountered no difficulties of any kind. My tape recorder attracted no undue attention, either in Russia or at the various customs posts which I passed. I wandered freely about Moscow and Leningrad taking recordings wherever I chose. Very little interest was shown; certainly no one tried to stop me.

I recorded on railway stations, in



To Russia with a recorder

Red Square, in the Kremlin Museum, in the streets, and in shops.

When I was directly recording individuals I always made a point of informing them in advance that I would like to do so, and obtaining their permission. In this way, as I toured the two big cities, I was able to record all the interesting passages from the Intourist guide's descriptions, with the result that I have brought back much information which I would otherwise have forgotten.

On the way to Moscow, I was able to obtain some superb railway sounds. From Brest, on the Polish-Russian frontier, to Moscow is a 700-mile journey across vast open farmlands. The steam locomotive that hauled the train was twice the size of anything ever seen in Britain. And its whistle was a long, low, husky moan, full of the lonely, echoing sadness of the wide open spaces. No sound will ever recapture for me more quickly or surely the rare quality of my journey than that locomotive whistle, of which I have a number of first-class recordings.

Naturally I recorded a number of station announcements—that with which the journey began at the Hook of Holland and that with which the return trip began in Moscow. On the way there, I left the train at Minsk and strolled among thronging crowds along the platform in the afternoon sunshine. I secured a fine "atmosphere" recording of the chatter of those crowds, with the station announcer in the background.

During the train journey, Russian

music was broadcast through the train, each compartment of which was fitted with its own midget loudspeaker. Incidentally, this music was provided from a tape recorder operated by one of the train conductors, and this appeared to be a standard feature on Soviet trains.

I made several recordings of this broadcast music and it should serve well, alternating with the rattle of train wheels, to provide continuity in my final, edited programme.

In Moscow and Leningrad, apart from the guides' commentaries and some individual interviews, I endeavoured to get a number of representative sounds of the two cities. An obvious one in the capital was the sound of the clock in the Kremlin tower.

In Leningrad, at noon each day, a cannon gives a tremendous boom from the walls of the Peter and Paul fortress.

While I was in Russia, I was naturally anxious to investigate how far tape recording has caught the public interest there. Soviet science and technology can be taken to be well up to Western standards in its use of tape, but my impression is that its domestic use is only just beginning, and on a small scale.

Shop display and marketing techniques in Russia bear no comparison with Western practice and it is difficult, during a short visit, to discover how widely recorders are on sale. In a big store in Leningrad, however, I found three machines displayed in the radio and music department.

One was an orthodox two-speed tape recorder priced at 1,600 roubles. One was a combined radio receiver and tape recorder, at 1,800 roubles. The third was a combined tape recorder and disc player, at 1,850 roubles. All appeared to be orthodox in design and robust in construction, but the styling was not up to the best Western standards.

It is not easy to try to express these prices in our own terms. The official rate of exchange is only 11 roubles to the £ sterling, but tourists are offered a special rate of 28 to the £. Even that figure, however, may be artificial when we try to compare Soviet and British prices. A better guide could well be the black market rate. In Red Square late one night I was approached by a tout offering me 60 roubles to the £.

I have no doubt, on the evidence I saw on a short visit, that living standards and consumer demands in Russia are now rising very rapidly indeed. It is fair to anticipate, therefore, that the domestic tape revolution, now that it has begun there, will gather momentum quickly.

The general climate there, too, seems to favour increased contact with the West. It seems to me possible, therefore, that those few enthusiasts who have tried unsuccessfully in the past to establish tape contact with Russians may soon find it possible.

When that happens, you will be able to collect the sounds of the Kremlin clock and the Leningrad cannon without the 4,500-mile train journey which I made last month.

The 1960 British Amateur Tape Recording Contest

The judges are ready

The closing date for entries in the 1960 British Amateur Tape Recording Contest is next Friday, July 1. If you have not already sent off your tapes, do so immediately. The address is 7, Tudor Street, London, E.C.4.

The most distinguished panel of judges ever assembled for the Contest has now been formed.

As announced in our last issue, it includes Sir Ian Jacob, K.B.E., C.B., former Director-General of the B.B.C., and Eric Robinson, the popular music and TV star.

We are delighted to announce this week that Miss Josephine Douglas, another TV star and a popular judge in each of the previous British Contests, has agreed to join the panel again.

The fourth judge will be Robert Milne-Tite, Education Correspondent of the *News Chronicle*, whose specialist knowledge will be of particular value in considering the entries in the Schools Section of the Contest.



This year the Federation of British Tape Recording Clubs is officially associated with the organisation of the Contest, and four leading members will assist the Editor of *Tape Recording Fortnightly* in the preliminary hearing of all the tapes submitted.

A record number of entries is certain this year and judging will go on throughout July. Early in August the distinguished judges will hold a final session in London, at which the awards will be decided.

Prize-winners will be informed at least a fortnight before the official gathering in London on Saturday, August 27, when the awards will be presented.

They will also be invited to the Emitape Luncheon at the Savoy Hotel on that day.



Details of the allocation of prizes between the various categories of the Contest will be published later.

The prize list to date includes the following:—

The Emitape Cup, for The Tape of the Year.

The Grundig Cup, for the best entry in the Schools Section.

The Acos Cup, for the best entry in the "Compositions" or "Music or Speech" sections.

The Federation of British Tape Recording Clubs Plaque for the best entry in the "Clubs" section, presented by John Amphlett.

Seventy guineas in cash, plus many certificates, awarded by *Tape Recording Fortnightly*.

A tape recorder awarded by Chitnis Recorders.

Details of other prizes will be given later.

TAPE RECORDING AS AN AID TO STAFF TRAINING

IN the training of personnel, such as telephonists, sales representatives, lecturers and demonstrators, whose everyday work involves talking to members of the public, the tape recorder can play an invaluable part in making the trainee aware of the importance of the spoken word.

I believe it is true to say that nobody ever hears oneself as others hear them. When your voice is heard by other people, the sound emerges from your mouth and is transmitted by sound waves through the air to their ears. Your own voice is audible to you mainly through bone conduction, so that you do not hear your true voice.

In my opinion, it is desirable for all people who have dealings with the public to know what their own voice sounds like to others and, furthermore, to hear for themselves their powers of expression, tone of voice, and whether or not they are grammatically correct. To that end, I use a high-quality tape recorder.

The Recorder

With regard to the recorder itself, I must confess I have little technical knowledge, but I have, with a certain amount of experience and help from other people, developed a technique of dealing satisfactorily with the trainee.

It takes a lot of courage to hear yourself as others hear you! My experience of getting people to record their utterances for the first time is that they don't want to hear themselves as they really are. The average person tends to put on an act. He feels that his voice will not be as good as he would like it to be, and he would sooner try to imitate somebody else than speak naturally. For that reason, I always give the group a recording session unexpectedly.

At a few moments' notice I tell them that they are going to have a recording session, and that the object of the exercise is for them to hear them-

TAPE RECORDING AS AN AID TO STAFF TRAINING

The training and education officer of a large industrial undertaking describes in this article how he uses recording techniques in his work.

BY H. CHARLES

selves as they really are. I usually begin the session by recording my own voice and playing it back to them, and asking them if it really sounds like me.

They always agree that it does, and I am able to make the very necessary point that the recorder gives accurate reproduction.

Then I tell them that in a few minutes time I shall expect them to come up to the microphone one at a time and talk for a minute or so about anything they like, right "off the cuff." This sounds a little bit hard on them, and I suppose it is. But, on the other hand, I have found from experience that if I tell them in advance, they will probably "mug up" some prose or poetry that they can repeat at the recording session in their best party voices. That is not what I want, because they would not be hearing themselves as they really are. I won't allow them to read, either; it must be spontaneous talking.

Non-Recognition

When the recordings are played back, very seldom do the trainees recognise their own voices, and very seldom do they like what they hear. It is quite a salutary business: hearing oneself for the first time.

I find that most people are aghast at the sound of their own voices. If they have an accent that they don't like, they generally pull faces, and then I have to comfort them by pointing out that the world is full of all sorts of

odd-looking people, and it would be a dull place if everybody was tall, handsome and a fine specimen of humanity.

Similarly with voices. If everyone had a voice like a professional announcer, how uninteresting life would become. Let us have all the different accents and a variety of voices. After all the voice is just as much part of one as is the physical make-up: the colour of the eyes, colour of the hair, the way one walks, and so on. There is frequently a strong family resemblance in the voice, just as there are physical likenesses.

Embarrassing

I regard it as essential that the trainee should know when recording equipment is being used. In my opinion it is entirely unfair to record people without their knowledge. It can be very embarrassing to hear what one has been saying in an unguarded moment.

After the initial recording session, when the trainees have got used to recording their voices, I then ask them to listen again with the object of criticising what they have said and how they said it. The trainees can easily detect for themselves such things as grammatical errors, misuse of words, repetition of such phrases as "you know" and "I mean," and over-frequent use of the conjunctions "um" and "er."

They begin to enjoy this self-

analysis, and after a time they look forward to hearing themselves again, although they never quite get used to the sound of their own voices. They are told that later in the course recording equipment will be used quite a lot, and the sooner they become reconciled to the sound of their own utterances the better. Generally, the trainees make a conscious effort to correct their mistakes, and it is surprising how quickly they improve.

For trainees who are to become lecturers or demonstrators, advice has to be given on how to produce the voice for an audience, with or without the aid of various types of microphone. With such jobs, a certain amount of histrionic ability has to be developed, for I doubt whether any successful public speaker is always entirely natural, it usually being necessary for him to "put on an act" in order to project his personality to the audience. For such trainees, I use a slightly different follow-up, after the initial surprise recording.

Preparation

They are told to prepare a speech, but are warned that they will not be allowed to read it. The speeches are recorded and played back, and the trainee is encouraged to be his own critic. It is surprising how ruthlessly they criticise themselves. Additional constructive criticism and guidance is given by the group's instructor and for this purpose, extracts from the recordings are selected to emphasise the points.

The method I have outlined above of making trainees aware of the importance of the spoken word, by encouraging them to become interested in their own voices, has proved to be effective, especially in cases where people are rather nervous and tend to resent outside criticism. The result of all this is that trainees and instructor work together in harmony, and usually everybody thoroughly enjoys what could easily be an irksome part of the training course.

BRITAIN'S FIRST TAPE RECORDING CONGRESS

The first annual Congress of British Tape Recording Clubs was held in London this month, proved to be an immediate success, and laid a pattern for what is certain to become a new and very important regular event in the British tape recording calendar.

About two dozen clubs associated themselves with this initial venture. They were represented by over 50 members, who gathered at the Russell Hotel, London, for a full Saturday's programme.

The main activity of the day was a series of discussion groups, which examined problems of recording activity, and then reported back to the full Congress.

A panel of experts attended to answer questions and to hear proposals submitted from the discussion groups.

The four groups were as follows:—

"Future developments in tape recording equipment," led by Mr. Roger Aslin;

"The Tape Recording Press," led by Mr. F. Westcott;

A wide-ranging debate

Questions raised in the discussion ranged over a very wide field: *What is a good tape recording? Should clubs concentrate on humanitarian and social service work? What is the attitude of the BBC to amateur recordings? Should manufacturers provide more facilities and less "trim"?* And the experts did their best to reply, with members of the Congress joining in freely with their own views.



THE discussion group on equipment evidently felt that too big a proportion of manufacturers' efforts go into "trim" and decoration. It asked why recorders could not be marketed with "rather more attention to the works," and mentioned specifically the value of a variable bias control for use with different makes of magnetic tape and a variable speed control.

Alan Stableford, in a forthright contribution, thought the tape recorder was now going through a "juke-box phase."

Mr. Spring gave a reasoned reply, pointing out that manufacturers must strike a balance between many conflicting claims. For example, overseas sales must be taken into account, and customers abroad do not always share British tastes. He felt, too, that many laymen demanded simplicity in operation; even a level meter might frighten off some of them.

He suggested, also, that the "trim" that brightens up many recorders on the

market does not represent any significant element in the total cost of a machine.

The equipment group later "came back" with a suggestion that machines were often sold with cheap microphones that could not match the potentialities of the recorder. Why not skip the microphone and devote its cost to fitting a transformer, so that a high quality ribbon microphone could be used?

Discussion of this point produced some interesting information. One manufacturer, it seems, has reported that many of his customers only use their microphones for a few weeks after buying a recorder. After that they only record from the radio, or use their recorders for replay purposes. Yet at the same time they insist on buying a machine "complete with mic."

Mr. Spring explained the possibilities of extension leads. Another speaker warned that some ribbon microphones do not give better quality than crystal microphones and that the fitting of a transformer in place of supply of a crystal microphone would not, therefore, necessarily produce better recordings—unless the enthusiast was prepared to spend more money.



DISCUSSION also took place on the absence of CCIR standard characteristic for 3½ ips speed. Mr. Spring explained that there is now a British standard for this speed and he thought we could look forward to one for 1½ ips before long.

He pointed out that the German stan-



Mr. F. Westcott, the new Chairman of the Federation of British Tape Recording Clubs (left), chatting with Mrs. Marguerite Cutforth, producer of the BBC "Sound" programme, and Mr. L. G. Dive, of BBC Engineering Information



The group which discussed "Future developments in tape recording equipment." Mr. Ken Blake, at the far end of the table (left) presided

NATION-WIDE SUPPORT

THE first Congress of British Clubs was supported by organisations in London, Glasgow, Birmingham, Coventry, Plymouth, Reading, Doncaster, Rugby, Grantham, Ipswich, Luton, Keighley, Warwick and Leamington, Weymouth, Stevenage, Crawley, Catford, Ilford, Walthamstow, West Middlesex, West Essex, West Herts, and the Caledonia and E.T.E.S.S.A. tape recording societies.

There was thus a good turnout of delegates representing the whole area of Britain.

Mr. Alan Stableford, presiding, was at pains to remove any misapprehension that may still exist in clubs about the nature of the Federation. Any club, he explained, may affiliate to the Federation, whatever other affiliations it may have.

The purpose of a Congress, open to member and non-member clubs of the Federation, was to emphasise this fact and to give those not yet affiliated an opportunity to learn something of the Federation's activities.

"One thing we hope to do by this Congress is to increase the membership of the Federation," he said. "Although we have done a great deal of work on behalf of amateur tape recording clubs during the two years of our existence, less than a quarter of the clubs in Great Britain are members of the Federation.

"One of the objects of the Congress, then, is to give delegates from non-member clubs an insight into the work of the Federation.

BRITAIN'S FIRST TAPE RECORDING CONGRESS

"Amateur tape recording and the B.B.C.," led by Mr. R. Topham; and

"The function of tape recording clubs," led by Mr. Ken Blake.

Mr. Alan Stableford, Secretary of the Federation of British Tape Recording Clubs, who had been mainly responsible for organising the Congress, presided.

The panel of experts included Mrs. Marguerite Cutforth, producer of the B.B.C. Network Three "Sound" programme; Mr. L. G. Dive, of the B.B.C. Engineering Information; Mr. H. Spring, Chief Engineer, Grundig (Great Britain) Ltd.; Miss Brenda Marriott, Publicity Department, Grundig (Great Britain) Ltd.; and representatives of the tape recording press, including the Editor of *Tape Recording Fortnightly*.

After a reception in the morning, the Congress assembled early after lunch to get down to business. The discussions continued longer than had been anticipated, so great was the interest shown.

In the evening, the annual general meeting of the Federation of British Tape Recording Clubs was held.



Alan Stableford, Federation Secretary (right), puts a point to Mr. H. Spring and Miss Brenda Marriott, of Grundig (Great Britain) Ltd.



The group which discussed the tape recording press. Behind them can be seen those discussing "Amateur tape recording and the BBC"

standard for 3½ ips only goes up to 8,000 cycles and the CCIR standard for 7½ ips only goes to 10,000 cycles, and he suggested that revisions would be desirable.



THE group which discussed the function of clubs raised a stimulating subject—should their be concentration on providing hospital and blind services and on other similar "social service" work?

Mr. Stableford offered his own personal view that there was now too much emphasis in this direction in some quarters. "Very admirable in its way and an excellent way for owners of recorders to use their machines—but the energies of a club can easily be dissipated," he summed up.

"Tape recording clubs are clubs for the purpose of encouraging high quality recording—for producing works of art. Anything else should be secondary to that."

Mr. Peter Rigg strongly challenged this view. Humanitarian efforts should be encouraged, he said, adding the

thought that it also meant good publicity for clubs.

Mr. Dive offered a personal suggestion that clubs might organise such activities using the Council for Social Service that exists in each county as a focal point.



THE BBC representatives gave reassuring replies when they were questioned about the attitude of the Corporation to amateur recording enthusiasts. Mrs. Cutforth said a great deal of material included in programmes was contributed by amateurs, in the sense that they were not recording engineers.

Amateurs had shown that they did not need official encouragement to submit recordings. But she made clear that their offerings will be welcomed.

Mr. Dive was able to offer some en-

couragement to clubs who would like to see professionals at work at the BBC.



THERE was—not surprisingly—not agreement on what constitutes a good tape recording. Mrs. Cutforth said that, in general, the BBC pays the greatest attention to technical quality, and that the "Sound" programme concentrates on advice on how to achieve it. But Mr. Dive added the thought that the quality of a recording had to be judged against the function which it was intended to fulfil. There are certain circumstances, he insisted, in which quality will be of lesser importance.

Perhaps John Borwick best summed up the problem when he commented: "A good recording is any one which I wish I had made myself. A very good recording is one of which I would like to have a copy for myself."



Facsimile of the new identity card issued by the Federation of British Tape Recording Clubs for the use of club members and individual enthusiasts



FEDERATION OF BRITISH TAPE RECORDING CLUBS

The holder of this card is a fully accredited member of an affiliated Tape Recording Club. The Committee of the Federation would appreciate any assistance which you might be able to give.

Date.....

Secretary

The Federation maintains a central Register of all persons to whom an Introduction Card is issued. All enquiries concerning this card should be addressed to:

The Secretary,
Federation of British
Tape Recording Clubs,

Serial No.....
This card is issued for the use of the person named below and is not transferable.

Name of holder.....

Address.....

Name of Affiliated Organisation.....

Sig. of Sec. of Affil. Organisation

Signature of holder

SPECIMEN

"DO IT YOURSELF" electronics kit

ELECTRONICS is traditionally a rather difficult branch of science to master, as anybody who recalls his schooldays will remember. In an attempt to make things easier for the future student of electronics, two companies have combined to produce a "do it yourself" constructional kit enabling pupils to assemble for themselves a large number of experiments and demonstrations illustrating many of the fundamental principles associated with this study.

The two companies are Clarke and Smith Manufacturing Company Ltd., known for their tape recorders, and Griffin and George Ltd., who have a century-and-a-third experience in educational scientific requirements.

The Mechtronics apparatus, as it is called, has one feature which deprives it of much of the hard work associated with the assembly of electrical components and avoids the need for manual and technical skill in the user. Soldered joints are eliminated and circuits are screwed or clipped together on a peg-board layout.

The complete set, type 97-100, contains valves, transistors, a photo-electric device, transformer, relay loudspeaker, circuit board, neon tube, crystal diode, potentiometers, bulbs, holders, switch parts, special connectors, wires, valve holders, resistors, capacitors and other standard components.

The revised syllabus for the General Certificate of Education at ordinary and advanced levels is covered by the set which can be used for both qualitative and quantitative work by individual pupils or groups. It also gives wide scope for experimentation by the enthusiast on his own.

Mains supply is not required and power is supplied from 4½ volt and 120 volt batteries.

A variety of qualitative experiments can be carried out, ranging from the simple rigging up of a bulb, battery and single pole on/off switch to the construction of a transistor morse oscillator.

Beauty Prize

ONE of the events in the famous London Soho Fair is an Anglo-French Beauty Contest for which one of the prizes is a Wyndson Victor Tape Recorder. The contest is open to beautiful girls between 18 and 20 and will take place between July 9 and 15.



Students at one of the tape recording courses organised by Mr. Geoffrey Hodson at the Rose Bruford College

EDITED BY GEOFFREY HODSON

EVERY month we hear of Education Authorities sanctioning the purchase of more tape recorders for use in schools, and one major Authority recently asked some of its senior officers to listen to about twenty machines, one after the other, to decide their suitability for educational purposes. But the Authorities themselves are still wanting more and more information about how their teachers can use the machines once they have got them.

In my previous article I told of Kenneth Methold's book, *Broadcasting with Children*, published by the University of London Press. This time I am going to write about a smaller booklet which has been published by the National Committee for Visual Aids in Education, consisting of articles which appeared in the Committee's journal *Visual Education*. It is called *The Tape Recorder in the Classroom*, and the author is no stranger to this magazine because John Weston has produced the best Schools tape in the British Amateur Tape Recording Contest for the last two years. Indeed, his second tape, a most lively and imaginative piece of work, went on to cover itself with glory in the European Contest.

At first reading I enjoyed this booklet enormously. Mr. Weston is very knowledgeable and has a sense of humour which bubbles its way to the surface at the most unlikely times. His technical section is one of the best I have seen. As a Primary school teacher, Mr. Weston is at home with charts and diagrams, and he uses them to great advantage to explain the various technical details of tape, the recorder, the microphone, and the operation of equipment. This is excellent and fills a definite need.

The second section of the booklet describes various teaching techniques, which the author lists as passive and active. The passive ideas involve the production of pre-recorded tapes for use in the classroom as aural aids. The active ideas consist of brief suggestions for the use of the tape recorder in different types of lessons.

It is to this part of the booklet that most teachers will turn for guidance, and it is a pity that John Weston has chosen to be brief. Indeed, only about eleven of the 38 pages of actual text strictly speaking justify the title *The Tape Recorder in the Classroom*. One couldn't agree more that knowledge of the machinery involved and technical operations is important, but the title leads one to expect more about classroom procedures than actually materialises.

Still, for only half a crown this is a very useful companion to Kenneth Methold's book, and you should certainly buy both if this subject interests you.

But a final point about John Weston's book, and a controversial one. In a chapter called "Creative Tape Recording," he outlines his method of taping extempore drama. As he implies, the technique is more analogous with filmmaking, as opposed to copying established broadcasting methods. It is obviously the method he used to such good effect when he produced his prize-winning mock-travel documentary.

I played this tape to a group of teachers and training college tutors. All expressed enjoyment but some were concerned because the teacher was so very obviously in the foreground, both as leading actor, producer and, particularly, editor. They posed the bald questions, "How much should the teacher appear on the tape?" and "Even if the finished result is less satisfying as a piece of entertainment, is it not more important that the children should participate more actively?"

In this chapter Mr. Weston says: "It will be seen that there is going to be a fair amount of pattern work with the director's voice, at least in the early stages, rather prominent. No matter; record the lot. It may be very useful later."

An Illustration Tape can be bought for 37s. 6d. with the booklet and the first track consists of 43 short items showing uses of the tape recorder in various educational situations. Most of the excerpts illustrate passive uses of tape in school, but one showed Mr. Weston's method of taking a reading lesson with



TAPE IN THE SCHOOLS

backward children. The quote at the beginning of this paragraph came to life, and struck rather chill to the hearts of the drama teachers present because the method seemed to be concerned with the externals of interpretation.

One sees dangers in using these methods, particularly with a teacher who has a strong personality and some dramatic ability. And the use of the tape recorder in these conditions could mean that a teacher, in fact, was working off some latent acting and production talent rather than putting the interests of the children first.

These were some of the thoughts that occurred to my audience, and it was a pity that John Weston couldn't have been with us to join in the discussion.

* * *

AN INTERESTING CONTRAST of accents can be heard in the tape exchanges between **Our Lady's Primary School, Leeds**, and **Whiteleigh Junior School, Plymouth, Devon**. Besides giving a sound picture of everyday life in each school, the tapes are also used for exchanging local recipes. The Yorkshire children have been introduced to the intricacies of making a *pasty*, and they have told the Devon children how to make Yorkshire pudding and *parkin*.

The school's equipment consists of an Elizabethan Essex, with Cadenza ribbon microphone. This has now been supplemented by a new 4 A/N Ferrograph, belonging to the Deputy Head, Mr. H. R. Rundell.

Recent activities have included a play-writing competition, and the recording of a short religious playlet. A "slide-tape," consisting of coloured transparencies, each with its own recorded commentary, is now being prepared for a school in Capetown, South Africa.

* * *

WISHING TO EXTEND its Schools' Tape Recording Network, another Yorkshire school sent a letter to the Editor of the *Kingston Daily Gleaner*, Jamaica, inviting local schools in Kingston and district to reply.

Imagine the delight at **Waterloo School, Pudsey**, when the first reply that reached them from the West Indies was from *Waterloo School, Harry Watch, Jamaica*.

Letters have already been exchanged and a tape from Pudsey is nearing completion. Later it is planned to send an audio-visual tape showing all that goes on in Waterloo School and around Pudsey.

A TEXTBOOK FOR TEACHERS—EXCHANGING LOCAL RECIPES—A NAMESAKE IN JAMAICA—A MAORI TAPE—NEW ZEALAND-U.S. LINK

THE HEAD TEACHER of **Gloucester Infants School, Peckham, London**, recently received a very interesting tape from an all-age Maori school at Rotorua, near the Bay of Plenty, in the Northern Island of New Zealand. The tape was written and produced by the older boys and girls, and consists of unaccompanied native songs of various types, followed by some rock 'n' roll—Maori style—with guitar accompaniment.

The Maori is a music lover and the children are no exception; their emotions are expressed through their music. They are an independent race of people also, full of confidence, and resent interference. Once they have a working knowledge of say, a tape recorder, they insist on producing and recording entirely on their own. Any interference, and they will have nothing further to do with the recording.

The Peckham school has made a tape to send back to Rotorua, mainly featuring the Infant School Assembly. "This has been quite deliberate," writes Paddy Randle, "because New Zealand schools do not hold a daily school religious service. We followed on with various infant classes, including the Nursery class singing various school songs they had learned. We finished with two rock 'n' roll numbers by five-year-olds. The tape concludes with personal messages to

the Head Teacher, his wife, and the Maori children."

* * *

FINALLY, THERE IS NEWS from New Zealand itself, from a teacher, Murray J. Spiers, now on his way to Canada. At the **Ellerolie District School, Auckland** they have a Vortexion recorder with Lustraphone ribbon microphone. There is also an intercommunication sound system by Philips. Much of the work recorded by classes is fed into this system and other classrooms tune in to the programmes which prove very popular. Such things as local news bulletins, original stories, poems and playlets are recorded without help from the class teacher.

Mr. Spiers' own class of eleven and twelve year olds have made many contacts overseas in England and the U.S.A. Their tapes have given word pictures of the school and local area, the city of Auckland, and much information about New Zealand. A short while ago a set of colour slides and matching commentary on tape was sent to Sibley Junior High School, in West St. Paul, Minnesota. It was enjoyed not only by one particular class but by several of the social studies groups. The replies to the New Zealand tapes have all been most interesting, and the children are keen to follow information and put items of interest from these tapes on to a bulletin board map.

PROJECT FOR EDUCATIONAL TAPE RECORDING LIBRARY

PLANS have just been announced for the formation of the British Educational Tape Recording Library, the purpose of which will be to encourage widespread use of tape recording as an educational medium in schools throughout Great Britain.

The Minister of Education, Sir David Eccles, has been notified, and the organisers plan to badger at top level to give publicity to the possibilities of tape in education.

A non-profit making organisation, the Library will use "master" copies of specialised tape record-

ings of an educational nature, from which any member school in the country will be able to borrow a copy for a specified period. If the Minister can be persuaded to lend a financial start to the project, the pupils themselves will be invited to contribute to the upkeep of it at the rate of either 6d. or 1s. per child per year.

Anybody interested should contact A. E. Beeby, 88, Clare Street, Northampton, and he will forward details as soon as bulk letters and forms are received from the printers.

WE MUST MAKE A STAND FOR QUALITY

PROGRESS in stereo depends a great deal on the efforts of people on both sides of the fence (the manufacturing side and the consuming side) who are dedicated to true stereo as distinct from sound spreading.

True stereo is at present quite hard to achieve, although in due course it will all be relatively simple; but if too many makers and buyers trim their ambitions to match the blurred semi-stereo effects that we are inclined to get in less than ideal conditions, instead of remaining faithful to the first-class stereo that can be obtained

full positional fidelity as a vital ingredient of stereo. Settling permanently for anything else makes a mockery of the two-channel technique.

We still hear discussions on stereo based on the assumption that the objective is a large, solid block of sound, just as if music consisted simply of one continuous note or chord. It ought to be unnecessary to remind people that music actually comprises a constant succession of different notes, coming as a rule from different points. Our objective is to reproduce this pattern, not to broaden each note so that each one seems to come from everywhere.

It is useful to bear this in mind when we are studying systems that take a two-

Stereo Notes By D. W. GARDNER

when all is well, then the whole business could easily go into reverse.

For, once we allow our standards to go down, the opportunists will step in and say: "Come and listen to this. Here is a lovely spread of sound which you must agree is pretty well indistinguishable from the reproduction they are getting down the road from their stereo system. And the amazing thing about this equipment is that it is all done on one channel! Why pay for two channels when..."

And we shall be back where we started.

It will help if everyone who has the highest standards at heart will join in the work of driving home to the muddled majority the fact that, today, *high-fidelity means tonal fidelity coupled with positional fidelity.*

You cannot buy positional fidelity in the simple, positive way that you can buy tonal fidelity, but what you can do is refuse to buy equipment that offers you no hope of ever achieving positional fidelity.

The stereo buyer today—especially those without a great deal of money to spend—must acquire equipment partly for the present and partly for the future. He must accept the fact that, to begin with, he is likely to get results that fluctuate between true stereo and simple sound-spreading, but he must still keep his sights high in the certainty that true stereo all the time is possible.

One reason for the variable results is the need for working out correct speaker placing and other room conditions. Other reasons include discrepancies and occasional failures in the recording studios.

What is important, however, is that music lovers, and all who seek good reproduction should continue to regard

channel source and invoke the aid of wall reflections and similar devices to achieve breadth.

We have two ears, and their use in comprehending the spatial pattern of a performance is a proper part of our musical enjoyment. Pre-digestion of the separate, distinct sounds (either in a narrow or a broad beam), is a confusing and retrograde process.

Spreading is useful if we know that a mixture of sounds is inevitable—as it is in monophonic reproduction—but it is against the interests of stereophonic fidelity.

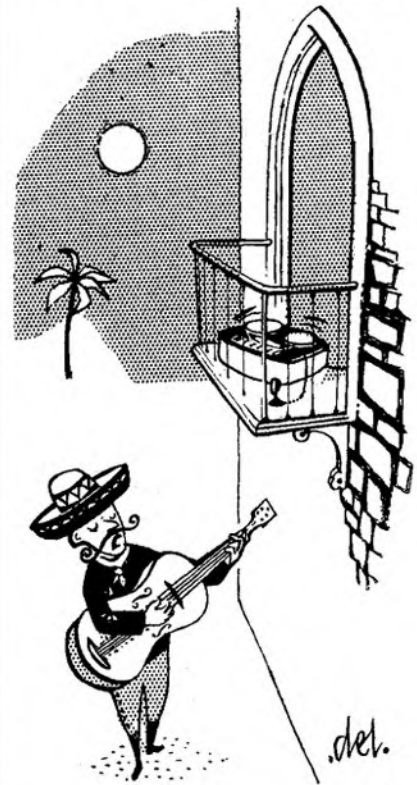
These basic facts of music and musical reproduction may be well known to some readers, but they are so essential to progress at the present time—and so frequently forgotten—that they need to be stressed unremittingly.

* * *

It is perfectly in accord with the above, of course, to permit a distribution of the bass notes below the point where directional information is imparted, because these notes spread themselves in the concert hall or wherever else you hear them. Home reproduction can benefit from this peculiarity if it is well exploited, and we should be on the watch for the right ideas in this field. The main potential advantage is that one large speaker cabinet and two very small ones can do the work of two large cabinets; and the main difficulty is that of separating the bass from the treble satisfactorily.

Sound Sales have recently introduced an interesting variation of their Tri-channel system, whereby the separation is performed at the control unit stage, three main amplifiers being used, one for the bass and one each for the treble units. Reports suggest that this system does hold the stereo together. And in case you should wince at the idea of three amplifiers, remember that each one contributes to the total power output.

TAPE TITTER



Playing times

THE lists of playing times of popular classical works are already more than contradicting each other. It is accepted that times will vary according to the performance and conductor, and one reader has found his time is double that of a figure published earlier.

It concerns Mozart's Symphony No. 33. One reader estimated it as running for 17 minutes, and now we hear of a performance being drawn out to 30 minutes.

Here for the record are some more. Further times will be published as received.

Tchaikovsky

Symphonies: No. 1, 30 minutes; No. 6, 45 minutes.

Schubert

Symphonies: No. 6, 30 minutes; No. 8, 25 minutes (an extension of 3 minutes).

Haydn

Symphony No. 88, 25 minutes.

Rachmaninov

Piano Concerto No. 2, 32 minutes.

Strauss, Johann

Overture, Die Fledermaus, 10 minutes. *Perpetuum Mobile,* 4 minutes. *Thunder and Lightning Polka,* 3 minutes.

Strauss, Richard

Der Rosenkavalier Waltz, 4½ minutes. *Waltz from Intermezzo,* 4½ minutes. *Oboe Concerto,* 23 minutes.

Sound Effects

ALAN EDWARD BEEBY, who has had long experience in devising and recording sound effects, continues his regular column of advice.

If there is an effect you want, and which is causing difficulty, write to him for guidance.

SOME years ago, when I used to help out back-stage at our local theatre, I struck up an acquaintance with an old fellow known to everyone as Joss. Joss was a sound-effect man of the Old School, and a complete master of his craft. The things he could do with a table full of the most unlikely-looking rubbish was nobody's business!

For instance: one of his inventions was a flat steel disc (which he made himself) covered with scratched-in "doodles." By playing this on an ordinary gramophone, in front of a microphone he was able to reproduce an amazingly accurate imitation of different types of "crowd" noises.

I picked up quite a number of hints and wrinkles while working with Joss, and some of these have been adapted for use with a tape recorder and featured in these articles of mine over the past few months.

Joss was at his best with "sustained" effects: an avalanche, carriage-wheels, machinery, train effects, and so on. I want to describe one or two of his methods and then compare them with the more technical and up-to-date use of the continuous tape loop.

The mainstay of Joss's equipment was the "cascade" machine shown in the diagram. Made from thin plywood, it was simply a six-sided box mounted on two side supports and turned by a handle. One of the six panels around the edge was hinged in the form of a lid to enable various items to be placed inside the machine to produce the required noise when the handle was turned.

The machine itself is quite easy to construct, although you'll find that hardboard will give a better result than plywood for the casing. It's also best not to run the axle straight through the centre as this obstructs the free tumbling of the contents during operation. Fit a separate short axle on either side, one to the back support and the other to act as a shaft for the handle at the front.

The microphone needs to be quite close to the machine to obtain the best effect, so fit a piece of foam-rubber to the baseboard and rest it on that. The following chart will give some idea of the types of "fillings" to use:—

Carriage-wheels: fine pebbles or handful of "flint" grit.

Avalanches, earthquakes: as above with two tennis balls.

Houses collapsing, etc.: thin scraps of metal, glass and tennis balls.

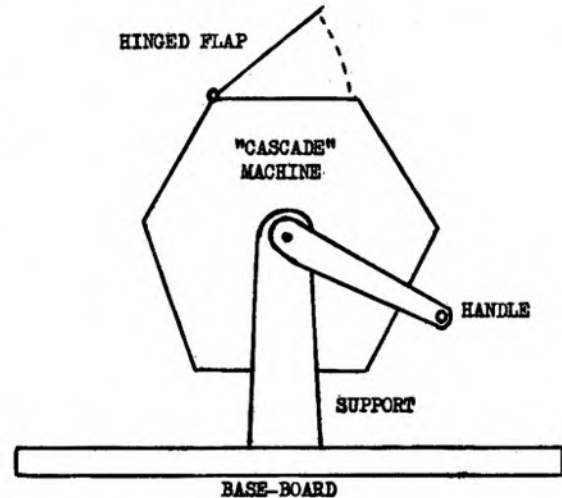
Machinery (various): one tennis or billiard ball, marble or similar.

Another machine on the same principle of operation is the "wind" machine. This time, the box is circular in shape, having a succession of spars made of wood-dowelling around the edge, projecting slightly above rim-level. A long piece of canvas, the same width as the spars, is fixed to the baseboard on one side, brought over the machine, and attached to the baseboard again on the other. A spring on either end of the canvas ensures an even tension.

When the handle is turned, the wooden spars brush continuously against the canvas strip, producing a howling noise. The pitch of the sound is determined by the speed with which the handle is rotated. A slow motion gives a soft, whining note, and a fast action will take the sound up to screaming pitch.

This apparatus is, of course, mainly intended for stage use, but I have heard it applied quite successfully to the recording medium.

The third version of the machine is the "Train" item, and



is used to imitate the sound heard from within a train when travelling. Again, the box is circular in shape but this time with a flat edge surface. At two points on this surface it has a strip of one inch half-round wood beading running from edge to edge. An ordinary roller-skate (metal-wheeled) is held against the side and the handle is turned. As the wheels pass over the beading in double-two time, the familiar "clickety-clack" of train wheels is reproduced.

So much for Joss and his equipment. Now let's examine the use of the continuous tape loop for these same effects, together with some easier ways of achieving them. The secret of success in the employment of the tape loop lies in careful editing. Note also that the longer you are able to make your loop, the easier the job becomes, as any noticeable "repeats" do not occur so frequently as with a shorter version. I usually run the loop through the sound channel, round the left-hand feed spool, across the bench to a glass jam jar about four feet away (the tape passing round the neck), and back to the sound channel.

"Crowd" effects are fairly simple, provided you are careful not to include any isolated shouts that might interrupt the flow of the effect and cause a "sound pattern." Carriage wheels can be imitated by combined hand-pressing and rolling a billiard ball round the lid of a box containing a thin layer of sugar. Horses hooves, if desired, may be added in the normal way with coconut shells, the rhythm of the hoof-beats being preserved at the loop join.

The same thing applies to the "travelling train" effect, whether the sound is mocked-up or recorded "live" (see February 24 issue). Here again, the rhythm of the sound must be carefully maintained in the editing stage.

In tape loop versions of "machinery" sounds, the need for exact editing is reduced where a number of machines are supposed to be operating at once. Try recording the ticking together of, say, four clocks and playing back at half speed. A small glass jar tapped with a pencil at the same time will add that distinctive "metallic" quality to the effect, while a slight echo will improve things still further by blurring the repeated sound. This is known as "feathering."

The "wind" effect can be made vocally (see November 4, 1959, issue). In this case, the loop join must carry an exact matching of the pitch of the sound on each side.

In the next issue, we shall be taking a look at ghost noises and other weird effects.

Read any good spooks lately. . . ?



"Oh, Harry, speaking of hum suppression . . ."

MAGAZINE DIGEST

In this column we draw attention to items published elsewhere which may be of particular interest to readers.

Hi-Fi News: Stereophonic Broadcasting: Part one in a discussion of various multiplex systems. The basic principles of sound reproduction.

Amateur Tape Recording: The latest article in the *What is . . . ?* series which deals with H.T. supplies to electronic circuits.

High Fidelity (American): Towards Stereo Compatibility: What are the prospects for a record which would play normally through an ordinary hi-fi system and stereophonically through a stereo arrangement?

The Tape Recorder: Teaching Tape: The first in a series written for the newcomer to the tape recorder.

Journal of the B.S.R.A. (May)—Loudspeakers, by Stanley Kelly; **Multichannel Sound Systems,** by Dr. D. M. Leakey.

Revue du Son—Impressions of the International Festival of Sound.

All issues are dated June unless otherwise stated.

Baby Taping

SECRETARY of the Ilford and District Tape Recording Society, Jeff Langley, began creating a tape album on his son almost at birth, for soon after the six pound twelve ounces baby was born his father recorded some of his first cries, by taking a battery recorder down to the maternity home. Jeff plans a complete record of his son's growth, as a supplement to the more normal photograph album, and he has already included recordings from some members of the hospital nursing staff and the doctor responsible for his son's delivery.

A T.R.F. TRANSISTOR RADIO TUNER

VERY few T.R.F. transistor circuits have been developed, despite the fact that fairly efficient R.F. transistors are at present available and not too expensive. Such types as the Mullard OC44, OC45 and the Ediswan XA102 will operate as oscillators up to 2 or 3 Mc/s and, with a suitable neutralising arrangement, become quite efficient R.F. amplifiers.

Most of the diode-type radio tuners, for which many alternative circuits have been published, are unselective unless exceptionally high Q inductors are used and they have low voltage output, which necessitates using the microphone socket on the tape recorder, with resultant high noise level and the possibility of receiving two stations at once—particularly in the London area.

A T.R.F. (tuned radio frequency) tuner has the advantage of higher gain and, with careful design considerable selectivity. The tuner described in this article was able to receive Luxembourg 208 in the London area from an aerial only three feet long. While such a performance cannot be guaranteed for everyone

who decides to build one (mainly because of local conditions) the tuner will give sufficient output to load the radio or pick-up input on most tape recorders and is selective enough to separate high-powered broadcast stations such as that at Brookmans Park. At greater distances from BBC transmitters, quite a number of the stronger Continental stations should be receivable on a very short aerial.

Those who own a recorder with a "through" amplifier system (loudspeaker monitoring while recording) will find the tuner useful, as the system could be used as a standby radio receiver. The tuner was also tested with a Mullard 510 amplifier and provided enough output fully to load the amplifier.

THE CIRCUIT

Transistors for high frequency operation cannot, like triode valves, be used without neutralising as they will oscillate, due to both internal and external feedback, which must be cancelled out if the transistor is to function efficiently as an r.f. amplifier. The components R3 and C3 are provided for this purpose, but, by careful adjustment of C3, a small amount

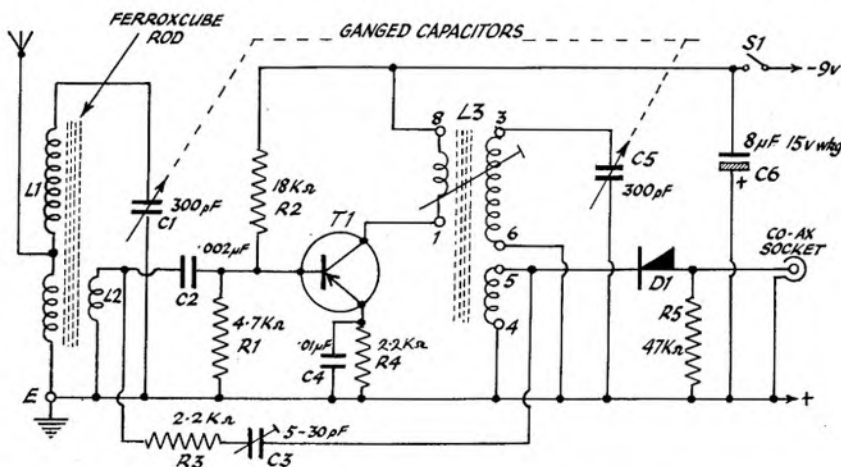


Fig. 1.—T.R.F. Transistor Tuner

T1 is either an Ediswan XA102 or Mullard OC44, D1 a Mullard OA79, L3 a Denco Maxi Q coil (Range 1 (green) plug in) and the battery an Ever Ready 9V bias type

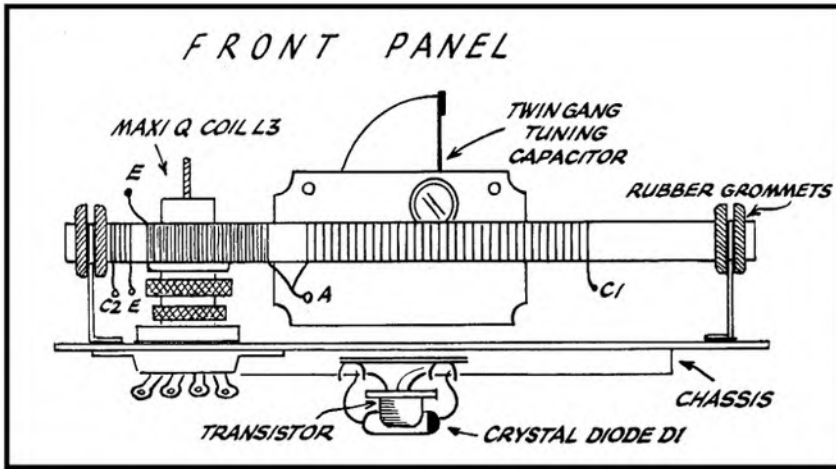


Fig. 2.—Suggested layout for the tuner

of positive feedback can be allowed in order to increase the gain through the transistor. If the value of C3 is set too high, however, the transistor will oscillate and loud whistles will occur on stations.

The circuit diagram of Fig. 1 is the complete tuner, while Fig. 4 shows an alternative output arrangement for those who have only a microphone input socket on the recorder. The attenuation network (R5 and the 27K.ohm resistor) will drop the output to a few milli-volts, at least sufficient to prevent overloading.

The aerial tuning coil L1 and the coupling L2 are both wound on a Mullard Ferroxcube rod No. FX.1162. Do not use cheap-grade ferrite rod, such as that offered by many radio component dealers. The main coil L1 is wound with small spaces between turns, so that the coil occupies about 2½ inches of the rod, as shown in Fig. 4. The end of this winding is brought out to form a tapping point for the aerial and then continues as a close-wound coil of 36 turns. The coupling winding consists of six turns only and is wound in the same direction on the others. This low impedance winding is necessary to match the low input impedance of the transistor.

The rod should be mounted at the back of the chassis, at least one inch above it, and is held by rubber grommets on each end of the rod. The grommets can be fitted into small brackets secured to the chassis (see Fig. 4).

The tuning coil L3 is a Denco Maxi Q coil plug-in type which fits into a standard octal valve base. The numbers against the coil shown in the circuit diagram Fig. 1 correspond with the pin numbers of the octal base. The coil may be obtained from Denco Limited, 357/9, Old Road, Clacton-on-Sea, Essex, and is range 1 (green) medium-wave coil with h.f. coupling and reaction winding. The recommended diode detector is a Mullard OA79 crystal type, although such types as the G.E.C. GEX34 or Ediswan CG12E can be used. The alternative output circuit has already been mentioned (see Fig. 3).

While no hard and fast rules need be given for layout (see Fig. 2), it is important to arrange the components so as to keep the leads from the aerial coil, the tuning coil, and the transistor,

reasonably short and to mount the tuning coil well back on the chassis, away from the ferrite rod. A midget type 0.0003uF (300 pfd) twin gang tuning capacitor can be obtained from most radio component dealers, or Denco Limited, and a transfer type tuning scale from Data Publications Limited, 69, Maida Vale, London, W.9.

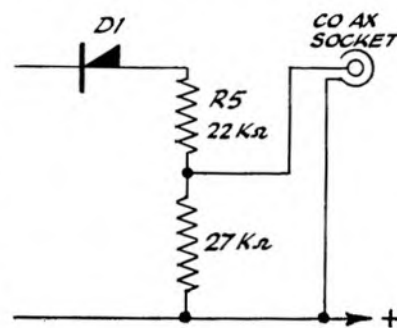


Fig. 3.—Alternative output circuit for lower signal level

These dials are supplied with various other smaller types and lettering and are called "Panel Signs." When the set is finally assembled, carefully check the wiring; wrong connections or polarity of voltage to the transistor can destroy it.

The tuner requires only a very short aerial of three or four feet and a local BBC station should be receivable without any other adjustment. A strong whistle on the signal, however, indicates

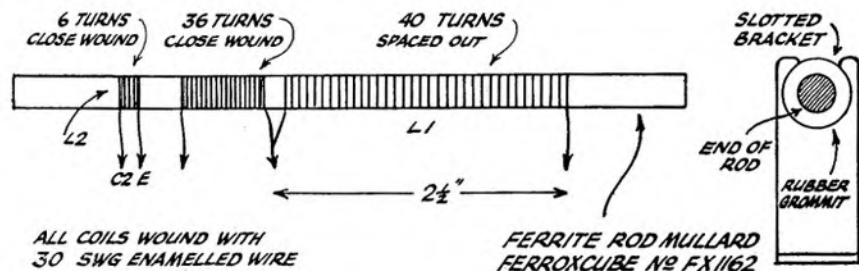


Fig. 4.—Details of aerial coil

An inexpensive circuit which can be used as a standby radio receiver for those who own a recorder with a "through" amplifier system

by

WILLIAM DOBBS

that the transistor is self-oscillating; if this occurs, the pre-set neutralising capacitor C3 must be unscrewed (reduced in capacity) until no whistle is audible. The tuning slug of L3 should now be adjusted in conjunction with the main tuning capacitor until a station (preferably a nearby one) is received at maximum strength. If, during this process, oscillation starts again, unscrew the neutralising capacitor a little more until it stops. Now try for a fairly weak station, and repeat the process of adjusting the L3 tuning slug in conjunction with the tuning capacitor until maximum signal strength is obtained. If adjustment of C3 will not stop self oscillation it may be necessary to reverse L3 coil connections Nos. 4 and 5.

The output co-axial socket may be connected, via a screened lead, directly to the radio input of the recorder and a local BBC station should produce sufficient signal for full recording level, e.g. closing of magic eye or other recording level indicator.

While every endeavour has been made to ensure a worthwhile performance from this tuner, it should be remembered that local conditions may prevent good reception. For example, in the North London area where the tuner was tested, the Brookmans Park transmitters were receivable at good strength on the ferrite rod coil only, no aerial attached; in areas more remote from transmitters, careful adjustment of C3 to produce as much feedback as possible without oscillation may help bring in an otherwise weak signal.

One final word: be extremely careful not to short-circuit the base potential divider, junction of R1 4.7K.ohm to earth. Even if done accidentally and for only a fraction of a second, the transistor will be destroyed. Price for experience—one new transistor.

Equipment Under Test

AKG Moving Coil Headphones

THE Viennese firm of Akustische-Kino-Geräte GmbH has long been famous for its production of high-grade professional microphones, and more recently for less expensive, but still high-quality, microphones for the domestic user.

In the early days of radio, the most common means of converting electrical energy into sound was the old-fashioned moving iron headphones, which, because of their large size, gained the affectionate name of "cans." Looking at these modern counterparts to those early headphones, one could not possibly apply such a heavy-sounding name to them. The A.K.G. phones are very light in weight (only 80 gms, or just under 3 ozs.), and they are extremely graceful in appearance.

The two capsules, which are very small, are mounted on a headband consisting of two chromium-plated wire springs, and they can slide along these to suit all sizes of head. The capsules themselves are small moving-coil units with a plastic diaphragm specially designed for the highest possible fidelity of reproduction. Each capsule is less than an inch in diameter and is fitted with a transparent plastic shell designed for a good acoustic matching to the ear. The shell is removable for cleaning.

Connection to the capsules is by an ingenious contact disc, and various sets of leads complete with these discs can be obtained from the manufacturers. The standard equipment is connected for monophonic reproduction and provided with a single lead 1.5 metres long, with bare ends. Alternative leads can be provided with either banana plugs or a miniature jack plug. Stereophonic leads are also available, and it is a matter of a few minutes to change from one set of leads to another. No soldering is necessary.

The maker's specification, in part, is reproduced for those interested:

Frequency range: 30 to 20,000 Hz.

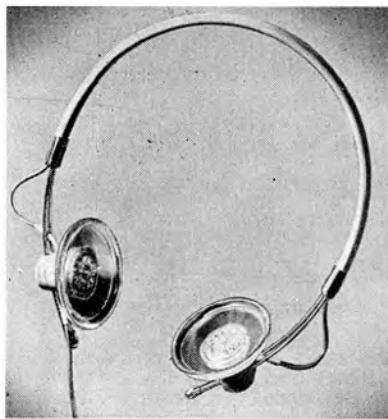
Impedance: monaural, 800 ohms; stereo, 2 of 400 ohms.

Maximum load: monaural, 20 milliwatts (equals 4 volts on 800 ohms); stereo, 2 of 10 milliwatts (equals 2 volts on 400 ohms on each system).

Level requirements for normal monitoring purposes: monaural, 0.5 volts; stereo, 2 of 0.25 volts.

Weight: K50, 80g net.

Special types and a stereo cord pair, AS50, will be delivered at extra cost if specified.



The use of "monaural" in the maker's specification is surely unfortunate, since both earpieces are in use. Surely "monophonic" would have been more appropriate?

No indication is given as to the relative levels to be expected throughout the frequency range. On a listening test at constant input, frequencies from 30 cps to over 18,000 cps were clearly audible. The top limit was the limit of the author's hearing, and it seemed highly probable that the maker's specification was conservative.

Accurate measurements on earphones are extremely difficult, and require the use of the "standard ear," a device producing an "average" cavity to stimulate the human ear cavity. Even then, the measurements are apt to be misleading.

In this case, a listening test to a constant level tone was employed. Some slight resonances were observed, but they may well have been as much due to the reviewer's ears as to the phones themselves. Slight coloration was audible when listening to music, but this was not nearly so serious as that normally associated with the older types of headphones.

Some loss of level at low frequencies was evident, although the bass was undoubtedly present. I understand from the manufacturers that this is a fault which has been remedied in the production model, the phones actually reviewed being a prototype pair.

The power requirement of the headphones is very modest, less than one milliwatt being perfectly adequate. The impedance of the phones, a nominal 800 ohms for the monophonic pair, or 400 ohms each side for the stereo pair, make them suitable for listening across a low impedance loudspeaker circuit without upsetting the matching to the loudspeaker.

These headphones are extremely comfortable to wear, and their performance is first-class. As one might expect, such features are not bought cheaply, but at £8 4s. 6d. these headphones are among the best one can buy in the world.

H. BURRELL-HADDEN

FEATURES OF THE NEW UHER RANGE

APART from a variety of applications as a dictating machine the Uher Universal has three speeds, including the ultra low 15/16 ips and a quoted frequency response of 40-16,000 cps at 3½ ips. Signal-to-noise ratio is given at 45 dB and wow and flutter—0.3 per cent. Mentioned briefly among the new Uher range in our March 9 issue, the Universal costs £82 19s. and features fully automatic repetition of playback including stopping, rewind, stopping and re-starting.

A remote control dictating microphone enables the user to reverse the tape at will with a single control and both starting and stopping of the tape are delay-free. Printed circuits are used and there are inputs for microphone, radio/record player, extra loudspeaker and earphones. The model operates at between 110-240 volts AC, 50 cps, and there is provision for converting to 60 cps power input.

The intermediate tape speed is 1½ ips, and the maximum reel diameter is 5 in. The unit weighs 17 lb.



The Universal

Moving to the other extreme of the Uher range the Stereo 111 occupies the high-spot and costs £108 3s. A four-track system is offered, and trick effects are possible by playing back No. 1 track and simultaneously recording on No. 2. Tape speeds are 1½, 3½, and 7½ ips, and a frequency response of 40 to 20,000 cps is claimed for the latter speed.

The signal-to-noise ratio is given as over 45 dB and wow and flutter as 0.1 per cent at 7½ ips, when measured in view of aural perception. With an output of 5 watts used monaurally, the Stereo Record 111 will operate on voltages between 110 and 240 volts and has a power consumption of approximately 70 watts. The unit weighs 31 lb. and measures 16½ x 15½ x 7½ in.

Valves used are: 2 x EF 86, 3 x ECC 83, 2 x EL 95, ECC 82, EMM 801, 2 x B30C2, B30C600, B250C100.

Other Uher models are: the 500, £51 9s.; the 502, £61 19s.; the 720, £78 15s.; the 730, £99 15s.; and the 750 stereo, £99 15s.

Tedex (London) Ltd., 2/4, Great Eastern Street, London, E.C.2.



The Grundig TK 24

New Products

GRUNDIG ANNOUNCE FIRST FOUR-TRACK *Six hours' playing time*

THE FIRST 4-track tape recorder to be introduced by Grundig (Great Britain) Limited is just announced. Known as the TK 24, it is a single speed machine operating at 3½ ips, with a quoted frequency response of 60—12,000 cps.

Six hours playing time is available on the 1,800 ft. of extra-long-play tape supplied.

The tape is supplied in a special tape magazine which protects it and acts as a tape stand for easy storage.

A track selector, placed at the back of the deck between the two spools, gives a selection of Tracks 1 and 2 or 3 and 4 and is fitted with a third position (marked "D") which allows simultaneous reproduction of Tracks 1 and 3 or 2 and 4 and the monophonic reproduction of stereophonic tape recorded at 3½ ips.

The moving coil microphone of entirely new design supplied with the machine, is a sensitive omni-directional instrument.

A Monitor Amplifier available for use with the TK 24, enables the user to listen through headphones to the playback on Track 3 or 4, thus ensuring perfect synchronisation.

The TK 24 is contained in a pale grey case and has nickel-plated fittings.

The price, including the GDM 12 microphone, tape and the TCD 2 tape magazine, spare spool, diode lead, and a tape cleaning felt, is 62 guineas.

If bought separately the microphone is £7 7s., the tape and tape magazine, £3 2s. 6d. and the Monitor Amplifier, Type M.A.1., 4½ guineas.

Grundig (Great Britain) Ltd., Newlands Park, Sydenham, London, S.E.26.

Philips restyle the Family four-track for mass market

The new Philips Family recorder, Model EL 3541, has been restyled and sells at £35 14s. The four tracks give up to eight hours recording if double play tape is used and features include magic eye recording level indicator, programme indicator with zero reset, superimposing facilities, headphone monitoring and mixing of microphone

with a 4-in. speaker and there are inputs for microphone and radiogram. There are outputs to a radio, hi-fi amplifier, headphones and external speaker. A stereo socket is also provided, although replaying is only available with additional equipment.

Valves used are: EF 86, ECC 83, ECL 82, EM 84, and EZ 80.

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



The completely restyled Philips Family tape recorder (Model EL 3541) costing £35 14s.

with gramophone or radio inputs. The unit is supplied with a 5-inch reel of long-play tape, crystal microphone and spare take-up spool.

Weighing 18 lb., it measures 6½ x 13½ x 11½ in. Rewind time for 1,200 ft. of tape is 2 minutes, and a 7-in. spool can be accommodated when the lid is removed. The output is given as 2½ watts, and a frequency response of 40-14,000 cps at the single 3½ ips speed is claimed. A signal-to-noise ratio of better than 40 dB is quoted with less than 0.3 per cent wow and flutter. The recorder is equipped

PRICE REDUCED

PENCO PRODUCTS have reduced the price of their transistorised pre-amplifier mixer unit, MIX/3, from 19 gns. to 15 gns.

Penco Products, 36 Coniston Road, Kings Langley, Herts.

More news of new products is printed on page 24



Grundig's Monitor Amplifier M.A. 1

Letters to the Editor

Have you an idea, a complaint, or a bouquet to hand out? Write to us about it. Letters not for publication should be clearly marked.

RECORDING PROFESSIONALS

"Let us learn to live together"

WHAT a suspicious pair your two correspondents, Mr. Norman Paul and Mr. J. H. Spiby, are. Why are they so obsessed with "the evil that men do." One writes of "charlatans" and the other of "unscrupulous editing." Let us get back to the normal, honest, amateur tape recordist. Let me deal with Mr. Paul first.

Of course "a professional singer sings for his bread and butter" and should be paid for what he undertakes; but the fact that a recording might be taken simultaneously with his performance does not cause him any extra work or time. If he should be asked to sing for a special recording session, that is a different matter and he should then expect to be paid for it.

If an amateur society pays an artist anything from 30 to 100 guineas for a performance he (or she) is not "doing too badly," and I repeat that he is very shortsighted indeed if he will not allow an amateur tape-recordist—*approved by the conductor or society concerned*—to record the performance.

I said "an amateur recordist *approved by the conductor or society concerned*," and here I turn to Mr. Spiby. How many tape recordists would have the audacity to walk into a society's concert and place a microphone in position without having obtained "prior permission"? If such people exist, I hold no brief for

them. I speak for the amateur, who, having had permission of the conductor or society members concerned, is *then* refused permission by an artist. An artist engaged for a performance should remember, having accepted an engagement by a Society, that he is then a paid servant of the Society for the duration of the performance and is under "conductor's orders."

What gives Mr. Paul the idea that professional artists are so indispensable to a first-class performance of a musical work? I would remind him (and any professionals who may have this belief) that many amateur societies could, and often do, find first-class artists within their ranks who, in many cases, equal a visiting professional both in musical ability and artistic integrity.

Mr. Spiby believes that "there is no genuine need to make . . . recordings" of formal speeches, as they are available "by other means." Of course there isn't.

There is no need for an amateur photographer to take photographs of famous places and people, as there are plenty of picture postcards and press photographs available; but who would deny the amateur the thrill and joy of doing the job himself?

The world is full of useful discoveries and inventions, from atomic energy to a pocket-knife, which may be turned to evil means. It is no use Mr. Spiby talk-

ing of the necessity of "onerous controls" and "Licensing of ownership and use of private apparatus" because of the possible misuse they might be put to. The amateur tape recorder is here to stay; it is one of the most useful and valuable inventions of the last decade and the sooner professional artists (and Mr. Spiby) learn to live with it the better for everyone.

Finally, let me show that not all professional singers are of the same mind regarding amateur recording. Since writing my original letter I can report an incident at a performance of a well-known oratorio which I was asked to record. At the afternoon rehearsal, I took several test recordings to decide microphone positions. After the rehearsal, I was trying these out and, having made my decision, I stopped the recorder in the middle of a bass aria.

A voice behind me said: "Oh! I would have liked to have heard that through." It was the soloist himself—a well-known bass—and, having pointed out to me the passage he wanted to hear, I ran the tape back and let him hear it as he wished, to check-up on a vocal technical point for his own satisfaction. At the end of the evening's performance he made a point of thanking me again and said he would like to hear the final recording sometime.

He was, evidently, one of the professionals who are willing to allow amateur recordists to help them. Would that all professionals were like that.

REGINALD WILLIAMS.

Chester.

NEW PRODUCTS (continued from page 23)

PETO SCOTT ENTER THE FIELD

ANOTHER addition to the ranks of inexpensive recorders is the Peto Scott Fanfare 60 which costs £24 3s. Housed in a wooden cabinet covered in vynair and vynide in red and grey, measuring 14½ x 12½ x 6½ in., the Fanfare 60 is supplied with tape, a spare spool and an Acos stand microphone.

A BSR twin-track tape deck is fitted and there is a four-stage amplifier with magic eye recording indicator. The output is rated 2½ watts through a 7-in. elliptical speaker. A covered storage compartment conceals microphone and mains lead when not in use and there are input sockets for microphone and radio and also an extension speaker socket. A tone control is fitted.

Peto Scott, Electrical Instruments Ltd., Weybridge Trading Estate, Surrey



TESTING SPEEDS

I READ with interest the articles on tape speeds in your May 18 issue and I would like to suggest some additional ideas, using two recorders with speeds of 1½ ips and 15 ips.

A recording can be made at 1½ ips and replayed at 15 ips. If it is then dubbed on to a tape running at 1½ ips, it can be multiplied by eight again—and so on, until we should be able to produce such a rise in pitch as to make the recording inaudible.

Perhaps recordings of bats could be made and the reverse procedure applied to them: i.e., record at 15 ips and replay at 1½ ips, so lowering the pitch to make the bats' signals audible. Notes might also be extended to last minutes, thus allowing analysis of the various harmonies.

I must point out that I have not personally tried these experiments. It is pure theory on my part. I would be interested to hear from anybody who has.

A. SULMAN.

Slough, Bucks.

News from the Clubs

MIDSUMMER, the time of year when a large number of clubs are holding their Annual General Meetings; the time when mistakes, problems and activities of the past twelve months are learned from and improved upon.

A number of clubs are pursuing the publicity aspect and I start the club reports for this issue with news of strangers to this column, while following the general trend, are making themselves known and welcome in the surrounding district.

Members of the **Ulster** club responded eagerly to an invitation from the Belfast Chamber of Commerce to record a commentary of the Lord Mayor's Show held on May 21.

Their first task was to cover "strategic" points along the route and they established a mobile recording unit using a car and a rotary converter supplying power to a Vortexion recorder.

Other teams of commentators with a variety of recorders were stationed along the 1½-mile processional route.

Altogether over 7,000 feet of tape was used on the commentaries and V.I.P. interviews, which presented the second great problem, the editing.

This was carried out by Cecil Jordan and William Scott who condensed the whole on to one track of a 7 in. reel of DP tape at 7½ ips, providing approximately one hour's playing time.

Other recent activities include the final rehearsal of a short play for tape, produced by Gerry McLean, and the continuation of the hospital request service. In this, six programmes a month are broadcast to local hospitals and old people's welfare homes.

Outside recording teams have also been formed. A keen rivalry exists between teams for the most original recording—one team is seeking a haunted house in which to spend the night and record any "unusual" sounds.

London members have also been experimenting with a play. At their May 12 meeting Terry Devereaux produced a script he had written, and, after the members had studied it for ten minutes, the half-hour recording session started. Roger Aslin produced and directed, Alan Pierce was recording engineer, operating Frank McManus' Brenell Mk. V recorder. At the meeting a fortnight later, Norman Simpson used his Veritone to play back a tape of guitar music produced by blind member Bob Trotman.

During the same evening Mike Rowden presented a tape showing the advantages of using a Grampian microphone with a Fi-Cord recorder.

The **Plymouth Sound Association** have received three bookings to present their

Edited by

FRED CHANDLER

Meet Yourself show at the Plymouth Hoe marquee as an added attraction for summer visitors to the city. Following an earlier request, the Plymouth Entertainments' Manager confirmed the show for June 21 and 22, and August 10.

A highlight of one of their recent meetings, June 1, was the hearing of William Cardews' humorous documentary tape entitled "Anatomical Observations." Similar in production to Kenneth Miller's contest winning tape, the programme consisted of sounds to be heard within the human body and a comedy dialogue on the working of the brain.

Afterwards, John Baker used his Elizabethan Escort to record hand-bell ringing as performed by the Plymouth Chimsters. The bell-ringers were so impressed by the reproduction they asked for an EP disc to be cut.

At the next meeting of the club, July 13, John Baker will present the evening's entertainment with a talk on programme construction. A fortnight later Reg Roper will play back recordings he has made using the Gramdeck turntable recorder.

Only half-an-hour before the start of the **Rugby** club's A.G.M. on June 2, two new members were enrolled and the target of 52, set last year, was reached. In his opening speech, the President, John Bannister, praised the work of the committee and members in reaching their goal, and straightaway set a new target of 75 for 1961.

Secretary Mike Brown, then reported on the success of the tape course held earlier this year, and announced a similar course for the coming autumn.

Before the reports from the various specialised groups were heard, members discussed the club's affiliation to the National Federation. The meeting reached no decision on this point and the question was postponed until after a delegation had attended the Federation's AGM.

Nine members visited the Warwick and Leamington club on May 25, for the special demonstration of portable recorders.

The May 12 meeting of the **West Middlesex** club revolved around a demonstration of the Butoba portable recorder presented by Secretary H. E. Saunders. Those present expressed great interest in this instrument and were impressed by its performance.

A tape from Pat Copinger was heard at the following meeting on May 26, their second AGM. Views aired during the evening provided a stimulating discussion on the year's activities. The retiring

officials were re-elected and a separate programme committee composed of three ordinary members was elected. This, it was felt, will encourage a livelier interest by all members and would speed up their programmes.

Financially the club is in very good shape, having some £33 in hand. This amount is to be used to buy equipment. The difficulty of finding satisfactory club rooms has not yet been solved, and the suggestion that weekly meetings should be held has been shelved pending the easing of this situation. A suggestion that Sunday morning meetings are started was discussed and the programme committee is to discuss ways and means.

Their next meeting will be held at St. George's Hall, Lancaster Road, on June 23.

The main item on the agenda for the May 4 meeting of the **Stevenage Tape and Radio** club was a demonstration of the Minirose portable recorder. The demonstration was preceded by a discussion on the club's publicity display for Stevenage day organised by the local Rotary club on June 11. The club is sharing a stand with the Cine Society.

The evening of May 4 produced another three members and swelled the total membership, since their formation four months ago, to 23.

Members have formed a link with the **Crawley & Sussex** club and exchange regular tapes. A recent tape sent to the Crawley members contained a documentary of Stevenage New Town's growth and history. This was produced by a local school-master, Mr. Neville-Wood.

The Secretary of the club is Mr. L. V. McGregor, 42, Marymead Drive, Stevenage, Herts, and meetings are held on the first Wednesday in each month at The Tenants' Meeting Rooms, Willows Link, Marymead.

An average of twelve to fourteen members has been obtained at the meetings of the newly-formed **Harrow** club. During the initial meetings of the club, members provided demonstrations of their individual recorders and this proved to be a fairly widespread selection.

Temporary officials elected are: Chairman, Dick Burrill, Secretary, Mrs. Toni Fisher, of 5, Gloucester Road, North Harrow, Middlesex. Meetings are held at the Labour Hall, Wealdstone, Middlesex, every Thursday.

A new club is to be formed in **Dartford**, Kent. Mr. E. H. Foreman has the audition and would like local enthusiasts to contact him at 117, Westgate Road, Dartford, Kent.

Len Hart is in the process of organising a club in the **Rickmansworth** area. He can be contacted at 2, The Greenery, Rickmansworth, Herts.

Eastbourne enthusiasts will be pleased to hear of the recent formation of a club in their area. The organiser is Miss Dorothy C. Harris, 12, Victoria Mansions, Terminus Road, Eastbourne, Sussex.

July 1 is the date when the **Wyncho** Youth Theatre Company propose to alter its name and constitution. On that date, the **Phoenix Drama and Tape Recording Society** will come into being. The Secretary, Mr. A. C. C. Smith, 73, King's Road, Windsor, Berks, welcomes anyone interested to write to him for details.

(More Club News on page 27)

SPECIAL OFFER—

If you have surplus equipment you wish to sell, or if you want to buy items second-hand, you will get results by using our classified columns. To prove the point, we are offering readers a special rate until September 1st next—2s. 6d. for up to twenty words if you use the form below.

Classified advertisements

Trade, ninepence per word (minimum 10s.); box numbers, one shilling extra. Payment with copy. Copy should be sent to Advertisement Department, "Tape Recording Magazine," 1, Crane Court, Fleet Street, London, E.C.4.

Swop. Lettera 22 typewriter, as new, offered in exchange for Clarion Portable. Urgently required. Dukes, Prospect Farm, Folly Lane, Hereford.

Philips EL 3527 Recorder, Mic. Extra smoothing, just over one year old, mint condition, £30. Crome, 13, Peartree Hill, Salfords, Redhill. Horley 966.

For sale. Teletron Tapejak, nearly new, £4 5s. o.n.o. Three radio stations on tape recorder. D. Hewson, 24, Elmete Avenue, Leeds 8.

Grundig Stereophonic Radiogram with built-in TM 60/U tapedeck in walnut cabinet. Cost £265 late 1959, as new 200 guineas o.n.o. Box 368.

Clarion Transistor Portable Recorder, five months old, immaculate, £19. Tel. Daventry 405. Meek, 26, Park Leys, Daventry, Northants.

For sale. Philips 3-speed recorder. New 62 gns. Just over year old, excellent condition, £44. Edinburgh area. Box 367.

Clarion Transistape, under guarantee, £16. 10 watt Hi-Fi Amplifier and Pre-amp, £10. Roe, 55, Abbey View Road, Sheffield 8.

TAPE TO DISC—ALL SPEEDS; s.a.e. for leaflet. OMEGA RECORDING COMPANY, 112, Sunnybank Road, Potters Bar, Middx. Tel.: 6428 evenings.

Tape to Disc—All Speeds. Rendezvous Records. 19, Blackfriars Street, Manchester 3. Leaflet on request.

TAPE RECORDERS. Large selection of used models, most as new with Three Month Guarantee. Part exchanges with Cameras, Binoculars, Radios, etc. Good quality Recording Tape at competitive prices. Cooks Store, 159 & 187, Praed Street, W.2 (both opposite Paddington Station). PAD 6464.

FRIENDLY FOLK ASSOCIATION, 87, Terrace, Torquay. Leading International Correspondence Hobby Club since 1943. Now included, facilities for Tapesponding. Details free.

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JOHN HASSELL RECORDINGS. Tape/Discs. All Speeds. CCIR Studio, 21, Nassau Road, London, S.W.13. Riverside 7150.

Tape Amplifier Mullard Design, 3 watt output 3 speed equalisation, complete with power pack and mike, £10 o.n.o. New condition. Box 369.

Stuzzi Magnette Battery Portable. Two speed, mike, spare tape, ever-ready case, 12 months old, perfect condition, £50 o.n.o., evenings. M. P. Nash, "Langthorne", Grange Road, Billericay, Essex.

Ferrograph 4A/M—Reslosound mic. RBL/TM—both 14 months old—also tapes. £85. C. Kirk, 30, Midcroft, Ruislip, Middlesex.

Grundig TK 20, complete, mike, tape, condition as new. Cost £54 12s., accept £35. Burt, 6, Brockley Cross, London, S.E.4. Tideway 6718.

Ferrograph 2/AN with Reslo mike and transformer. Little used. What offers? 6, Chalcot Crescent, PRI 4911. Seen by appointment.

W.A.L. Booster pre-amplifiers, the transistorised WAL GAINS, for tape heads (Gramdeck, Fi-Cord, Ferrograph, etc.), Mics (Reslo, etc.), p.u.s (Garrard, Ortofon, etc., Decca ffs, etc.). Many applications including Mixing. Mono Wal Gain £5, Stereo £7 10s. The new WALTRAK, pocket audio oscillator with 1,000 cps signal, transistorised. Ideal for circuit checking £6 10s. The WAL BULK TAPE ERASER "cleans" reels of tape in 30 secs. £7 18s. 6d. Ask your dealer or send to us for full Technical literature. Wellington Acoustic Laboratories Ltd., TRCDG Dept, Farnham, Surrey.

For Sale—Elizabethan Escort Recorder, bought 1959, Huddersfield area. Offers to Box No. 370.

Mullard Pre-amp and 3-3 Main. Six switched inputs, record facilities, power supply for tuner, £10 10s. 58, Bennerley Road, London, S.W.11.

Spectone Hi-Fi Amplifier 10W. preamp, has tape facilities, new condition, £14. Gramdeck, complete with mic, £9. W. J. Tomlinson, 62, Beacontree Avenue, E.17.

For sale—Grundig Mixer and condenser mic, £15. Write 6, Uxbridge Road, Hampton, Middlesex.

Ferrograph 88 (stereo, record and playback), perfect condition, £65 o.n.o. Harting H.M.8 four-track, still under guarantee, £75 o.n.o. Box 371.

Sound 777 15/7½/3¼ Collaro Deck Mic. R/lead, new valves, overall. Complete with £15 worth of tape. Cash only £20. E. Horne, 53, Londesborough Road, London, N.16.

Ferrograph 3/AN £55. Simon SP/2 £35. TSL FM Tuner £10. Complete aerial and cable. Buyer collects, Durham area. Box No. 373.

Balmoral TH9, factory new, unused, guarantee. Motek K10 Deck, list price 45 gns., will accept 35 gns. Box 372.

Bargain—Perfect condition Telefunken K.L.65 Tape Recorder, complete with dynamic mic and tapes. Cost over £70, selling for £35. F. Lewis, 3, Willow Road, Blaby, Leicestershire.

Wanted on tape—sounds of the Manx Electric Railway. Top prices paid. L. H. Goddard, 30, Stone Lane, Worthing, Sussex.

TAPE RECORDER need repairing? Let Britain's leading Tape Recorder Repair Specialists do this for you at an economical price. Essex Tape Recorder Centres, 2, Maryland Point Station, Stratford, London, E.15. Maryland 5879.

Veriton Venus—Only six hours use—Plus mike, tape, spare jack, £55 o.n.o. Owner going stereo. Burten-Shaw, 5 Billing Street, London, S.W.10.

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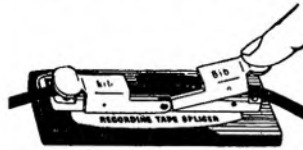
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(Continued from page 25)

The National Federation has received a request for an English tape contact from Herr Horst Pommer, Essen-Kupferdreh, Hinsbecker Loeh 34, Germany. He suggests this would be a good opportunity to learn German, but the initial tapes would be in English.

Another request from that part of the world is passed via the Coventry club. Eighteen-year-old Karl Heinz Scherer, Kaiserstrasse 43, Pirmasens, Germany, would like to have a German-speaking tape contact in this country. His hobbies are reading, collecting stamps and radio.

A few enthusiasts have formed a tape group in Bedford. Although having no formal organisation, committee or subscription, the group will perform the normal functions of a club and has already exchanged tapes with the Manchester and Brighton clubs.

The Secretary is W. Summerfield-Turner, 131, London Road, Bedford.

Details of a club already formed comes from Yorkshire, where Mr. G. F. Clegg is the Secretary of the three-month-old Northallerton club. Meetings are held on the first and third Wednesday of each month. Secretary's address is 5, Friarage Mount, Northallerton.

A club has been formed in Gloucestershire under the name **The Cotswold Tape Recording Society**. About thirty members hold meetings fortnightly on alternate Mondays and Fridays in the club-room of the Cheltenham Science Fiction Circle, 130, London Road, Cheltenham.

The Secretary is Kenneth G. Jones, 41, Bamwood Road, Gloucester.

Another recently formed group is **The Authentic Circle**, concerned mainly with tape exchanges. Nine members keep in regular contact by tape and meet at roughly ten-week intervals. Their next meeting is on July 17 at the Bata shoe Store, High Street, Sheerness, when a demonstration of tape slicing and editing will be given. The Secretary is Mr. C. D. Bushnell, 19, Harps Avenue, Minster-in-Sheppey, Kent.

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Index to Advertisers

	page
Brenell Engineering Co. Ltd. Front cover	
Dektron	3
Deroy Sound Service	27
Dixon's Tape Recorders	4
Francis of Streatham	6
Howard Photographic	5
Jewkes and Co. Ltd.	27
Lustraphone Ltd.	4
Magnegraph	27
Multicore Solders Ltd.	27
Nusound Recording Co.	27
Psycho-Tape Institute	5
Rapid Recording Service	27
The Recorder Co.	5
REPS (Tape Recorders) Ltd.	6
R.E.S. (Coventry) Ltd.	27
Tape Recorder Centre	2
Tape Recorder Service Co.	4

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