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APRIL, 1960

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- (1) To act as a central organisation for enthusiasts wishing to Tapespond throughout the world.
- (2) To assist in every way possible the advancement and enjoyment of Tape Recording and its many facets.
- (3) To act as a liaison link between Manufacturers, Dealers and enthusiasts.
- (4) To advise and answer member's queries.
- (5) To keep readers abreast of the times with new ideas and equipment in the fields of Tape Recording, Hi-Fi, Stereo and Recordings.

AMATEUR TAPE RECORDING

amateur TAPE RECORDING

Incorporating Practical Tape Recording and The Recordist

Vol. I

APRIL, 1960

No. 9

THE OFFICIAL MAGAZINE OF
THE BRITISH RECORDING CLUB
INCORPORATING
THE BRITISH TAPE RECORDING SOCIETY

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SUMMER SOUNDS

SPRING is here—and with it lambs, daffodils and the promise of Summer. For the tape recorder it often means being put away in a dark cupboard until next Autumn.

Why should we think that because the days are longer and there is more to do out of doors in the Spring and Summer, there is less for the tape recorder to do?

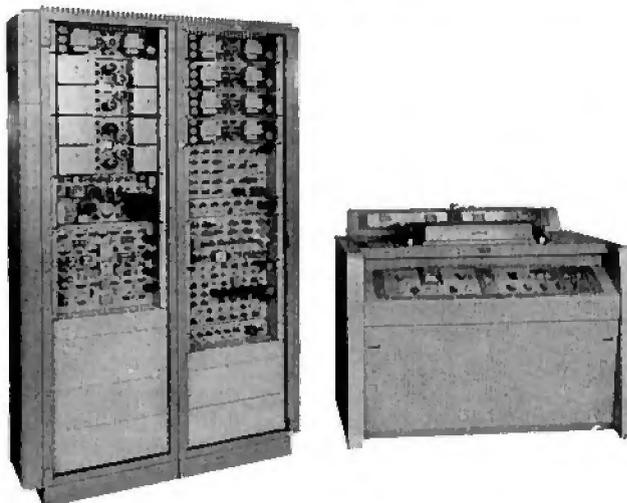
After all a recorder is the ideal means of capturing and retaining all the sounds that please us. Is the Summer a silent time of the year then? Close your eyes and try to remember sounds of years gone by—it's a safe bet that most of them will be "Summer sounds."

Tape can make hobbies and pastimes so much more interesting—caravanning, sailing, cycling, motor racing, cricket, golf, even fishing, are all shared activities and unless we talk about them they lose a lot of their enjoyment. There's no better way of preserving those tall stories than on tape!

Tape can bring real pleasure and happiness to people. The Summer is the time for that first visit to the hospital for the club's Hospital Recording Service.

Summer is a great time for fêtes, flower shows and all sorts of other occasions when we all feel we should do something to help, but can't quite see how. Why not let the recorder work for you by making announcements, encouraging people to come and buy and providing a background of entertaining sounds.

A Video Tape Recorder with its attendant equipment used by Associated Rediffusion at their Wembley Studios (see page 24)



Every school has its sports day but how many of these dramatic and exciting events are recorded for posterity except through silver cups and faded photographs? Bring them to life through recorded commentaries; "clips" spliced into the tape-spondence will prove that we really do have outstanding children!

Let's put the Summer of 1960 on tape!

BAD PENNY NEWS

Nowadays tape recorders turn up everywhere. We have recently seen them referred to in "Garden News," "Drapery and Fashion Weekly," "Baptist Times," "Catholic Times" and "The Lady." The reasons for their mention were respectively: a gardener wishing to tapespond with other gardeners in any part of the world; the introduction of tape-recorded soft background music in Richard shops; a taped lecture on "The Office and Duties of Baptist Deacon"; a taped reassurance to an 80-year-old traveller from the son she was travelling across the world to join (this also appeared in a Canadian newspaper, "Medicine Hat News"!); and lastly, a reference to our own Hospital and Blind Services and the "Tape Bank" of recording tape donated for the use of these voluntary services.

TRAIL POINT

For the benefit of new readers, the Tape Bank Target is to lay a trail of tape (figuratively) from Land's End to John O' Groats, hence our regular appeals for half-crown donations. Our first main objective along the trail, Penzance, remains



'Ancock's 'appy with his TK 20! Famous TV and radio personality, Tony Hancock finds his Grundig tape recorder invaluable in learning the latest scripts for his frequent appearances.

elusive, despite the many kind contributors, to whom we give our sincere thanks. Our trail has now passed Boleigh, Newbridge and Lamorna Cove, and has arrived at Lower Drift.

AUDIO FAIR PRE-ECHO

The British Recording Club has a stand at this year's Audio Fair, to be held at the Russell Hotel on 21st-24th April. The staff of the magazine and the club are all looking forward to meeting many friends, members and readers at STAND 67.

We hear that Recording Devices Ltd. will be exhibiting the Mannequin Export, which replaces the Mannequin, and has a higher grade loudspeaker in a restyled cabinet, making the machine even smaller and lighter. Further changes are also in the wind.

Grundig will be showing their full range of equipment, including the Grundig Channel Reproducer type CR.1, a small column-type loudspeaker enclosure with self-contained built-in amplifier, specially designed for use with their TK 55 recorder.

Wellington Acoustic Laboratories will be introducing the WALTRAK, a new pocket audio oscillator, so look out for this on Stand 66.

C. T. Chapman (Reproducers) Ltd. will have on show their complete range of high fidelity equipment, including for the first time, the FM 90 Switched V.H.F. F.M. Feeder and the S6BS/FM Tuner.

SOUND SEEKERS SPOT

Joe W. Green, of 97 Newport Road, Middlesbrough, Yorks, seeks information on a composer named Michael William Balfe, who was born in 1802 and died in 1870. He composed twenty-nine

operas, of which the best known is "The Bohemian Girl," and twenty-seven songs. Can anyone locate any records or music? Joe has searched the North of England, with no luck, except for three songs from "The Bohemian Girl," sung by Gwen Catley, Count John McCormack and Gigli. One of Joe's tape pals in America, Jerry Lipman, of San Francisco, who also collects Balfe's works, is still without many of them after ten years' hunting.

Joe continues: "I picked up a twelve-inch Zonophone disc record, costing me 4d. off a ragcart, of the opera "The Bohemian Girl." I think it must be the first record Zonophone made. It weighs nearly 25 ounces. Is it the only one in existence, I wonder?"

"I hear that in America they are buying all the cylinder records (Edison Bell type) and transcribing them on to L.P.s. Maybe Balfe's works will reappear on these."

While you are looking, dear reader, make a note of any old or unusual records you possess and send us a postcard about them. Who knows? You may own a record of no interest to you, but worth a couple of L.P.s to a collector.

"THE MAGIC TAPE"

This is the title of the unique film being featured by B.A.S.F. at the London Audio Fair. It will undoubtedly be a star attraction, as it has already won a number of awards, including First Prize at the 1959 Berlin Festival of Industrial Documentary Films (it is a documentary, not an advertising film), three special awards for best production, best camera work, and best commentary, and an Oscar at the 1959 Rouen International Festival of Industrial Documentaries.

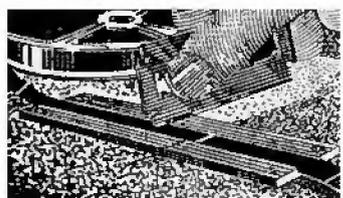
It is a sound film in colour and black and white, approximately 25 minutes in length, and opens with some historic recordings dating back to 1898!

★ DUE TO A PRINTING ERROR THE ARTICLE ON PAGE 54 CONCLUDES ON PAGE 51 ★



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Alan Lovell (Hospital Broadcasts Secretary) receives some of the tapes kindly donated by Messrs. Grundig (Gt. Britain) Ltd. for the Tape Bank

INTER-TAPE NOTEBOOK

The Directory has been centralised in the magazine this month, so that those who like to keep a separate file of taperspondents can do so easily by detaching this section.

A point we would like to stress is that if you

B.R.C. COMPETITION

The British Recording Club are pleased to announce the winners of the "historical" competition published in the February edition.

The winning entries were sent in by:

MR. PETER HOLLOWAY, of 29 Fishery Road, Hemel Hempstead, who submitted a humorous taped interview with William Shakespeare;

MR. K. G. TOMES, of 41 Barnwood Road, Gloucester, told the story of the "Tay Bridge Disaster," complete with sound effects; and

RICHARD COLLINSON, of 30 Ridler Road, Forty Hill, Enfield, Middlesex, with a tape description of Henry VIII.

In the opinion of the judge, only three entries were of a high enough standard to merit awards. Each winner has been forwarded a five-inch spool of recording tape, and the remaining prizes have been donated to the Tape Bank.

name has been listed in the Directory, you should try to reply to everyone contacting you, even if it is only a postcard saying "Sorry, fully taped." There is nothing so disheartening as writing to prospective taperspondents and never receiving a reply, so please don't forget this.

One of our correspondents says that he thinks the ages of everyone listed in the Directory should be shown, as people usually like to contact others of their own age. At present we only give the ages of those under 21, so do you agree with our correspondent, tapists?



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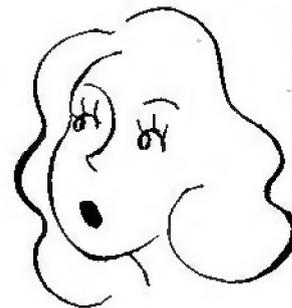
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What is...?

A Bias Oscillator and Erase Head

By FREDERICKS



IN THE first article of this series that appeared in the November, 1959 issue (Volume 1, No. 4), it was stated:—

“Because of the recording characteristics of the recording tape and record heads, a bias oscillator is required.”

In all tape recorders a high frequency current is used to improve the signal-to-noise ratio, reduce harmonic distortion and bias the tape so that the best portion of the characteristic curve is utilised.

Let us now examine those terms.

Signal-to-noise ratio is an expression which is used by engineers to designate how much background noise is present when compared to the actual signal level of the item which we are recording. The expression signal-to-noise ratio can also be applied to any type of amplifying device or reproducer. When one is talking about signal-to-noise ratio, obviously some term must be used which would indicate to the engineer or even to the layman, the quantity or amount of signal-to-noise ratio and for this purpose we use the decibel. In the electronics dictionary by Cooke and Markus, published by McGraw Hill Book Co., a decibel is defined as follows:—

DECIBEL.—A unit used for expressing the magnitude in signal level or a change in sound level.

One decibel is the amount that the pressure of a pure sound wave must be changed in order for the change to be just barely detectable by the average human ear. To simplify the expression a decibel is a unit which is used by Engineers to indicate loss or gain in amplifying devices.

Now let us return once again to our discussion of the high frequency current which is used to improve the signal-to-noise ratio on recording tapes when recording.

Generally the ratio is the difference between the signal level and the noise level. For example, a signal-to-noise ratio of—60 decibels would be considered excellent for a home tape recorder. This means that the noise within the tape recorder is 60 decibels below the level of the recorded signal. In other words, at room volume, when playing back the tape recorder, the noise would be very low and the majority of listeners would not hear this very low level of recorded noise.

Now let us deal with the question of harmonic distortion. What is the meaning of this expression we often hear used by engineers? “*Harmonic distortion is the result of distortion in the amplifier.*” In the last article you will recall that certain classes of amplifier cause distortion and this distortion was shown in the

article as a flattening of the output to input curve. Figure 1A shows an undistorted signal and Figure 1B shows a distorted signal.

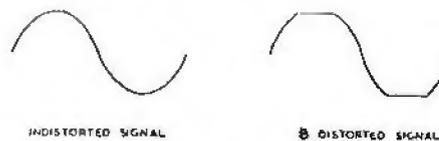


FIG. 1.

This flattening of the peaks of the signal results in harmonic distortion which, as we explained previously, is a most undesirable effect and must be reduced as much as possible.

The magnetic characteristics of recording tape can be compared to the plate current grid voltage curve of a valve; as the reader will readily see, if he reads last month's article. From this article it will be recalled that the upper and lower ends of the curve were non-linear whilst the middle of the curve was almost a straight line. Figure 2 shows a typical magnetic characteristic curve for recording tape and this is known as a hysteresis loop.

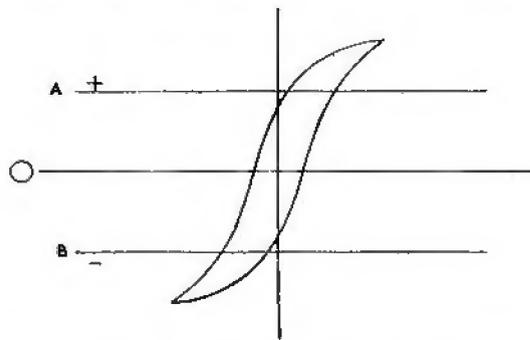


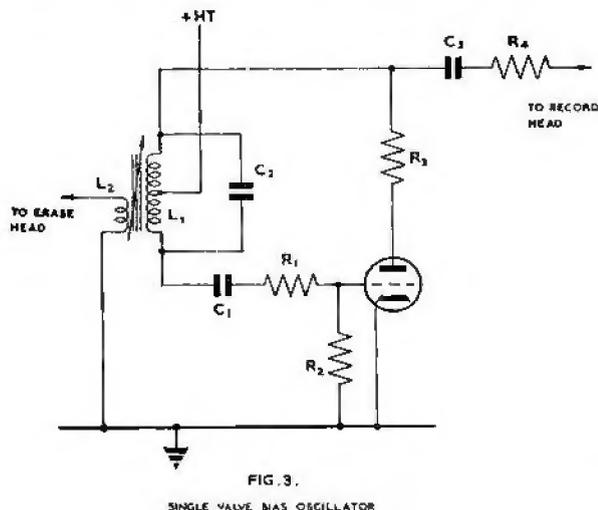
FIG. 2 TYPICAL HYSTERESIS LOOP FOR RECORDING TAPE

If we use the part of the curve between line A and line B, the record and playback response when actually recording and reproducing will be linear and minimum distortion will result. The high frequency bias which we apply to the recording tape to obtain the optimum result can be compared to the bias voltage on the control grid of a Class A amplifying valve. In other words, we try to use the straight part of the curve which is free from distortion. The frequency used for the purpose of biasing the tape is usually between 50,000 to 100,000 c.p.s. and it is completely outside

the audio frequency range (i.e., it cannot be heard as the pitch is too high) which, if you remember from previous articles is roughly 50 c.p.s. to 15,000 c.p.s. The bias frequency is carefully selected by the Tape Recorder Design Engineer to prevent what is known as best frequencies appearing in the loudspeaker of the tape recorder when reproducing from recorded tape. Just a word about best frequencies. A best frequency is the result of two frequencies combining together to give new frequencies. For example, a 1000 cycle signal and a 200 cycle signal will combine to give new frequencies of 1200 c.p.s. (the sum) and 800 c.p.s. (the difference), between the two frequencies. Expressed arithmetically $1000 \text{ plus } 200 = 1200 \text{ c.p.s.}$, and $1000 \text{ minus } 200 = 800 \text{ c.p.s.}$ Now let us consider what is a bias oscillator and how does it work.

A bias oscillator is a device which operates at a frequency well above the highest frequency that can be heard by the human ear. The oscillator consists of one or two valves depending on how much bias current is required. One valve will give a small bias current, two valves will give a larger bias current.

Figure 3 illustrates a single valve bias oscillator circuit.



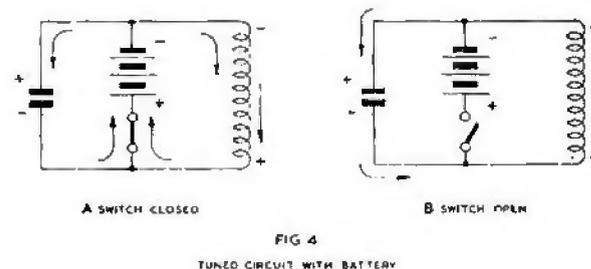
If you study the circuit for a few minutes you will see that the bias oscillator is basically an amplifier with the anode load resistance replaced by a tuned circuit and that a portion of the signal from the anode circuit of the valve is fed back to the control grid of the valve. Let us now consider how the circuit operates.

R.2 is the control grid resistor and is used to match the impedance of the control grid. Resistor R.3 is used to drop the anode voltage to the proper value and to match the anode impedance to the record head impedance. Resistor R.4 is used to control the bias current to the record head. Resistor R.1 and Capacitor C.1 control the amount of feedback to the control grid circuit. Capacitor C.3 prevents the H.T., that is the high tension voltage which is applied to the anode

of the valve, from flowing through the record playback head. Coil L.1 and Capacitor C.2 form a tuned circuit that determines the frequency of the oscillations. Coil L.2 is used to obtain voltage from Coil L.1, the oscillator, to provide erase current for the erase head. The coil has a metallic core which is used to tune the tuned circuit L.1 and C.2.

When we apply a high tension voltage (H.T.) to the anode of the valve, current starts to flow through the coil L.1 and voltage is developed in this coil. Part of this voltage is fed to the Resistor R.1 and Capacitor C.1 and is then fed to the control grid, resulting in a negative voltage being applied to the grid of the valve. When the voltage is sufficiently negative it causes the valve to stop conductive current. This results in a voltage of opposite polarity being developed in the coil L.1 which in turn causes a positive voltage to appear on the control grid, resulting in maximum current flow through the valve, and this sequence continually repeats. To explain fully the purpose or action of coil L.1 we shall now consider the tuned circuit C.2 and L.1.

Let us take a coil and a capacitor (condenser) and connect a battery as shown in Figure 4, with a switch connected in series with the battery.



Now close the switch, see Figure 4A, and the capacitor will charge to the voltage of the battery and current will flow through the coil and will result in a voltage being developed across the coil. Now open the switch and the capacitor will discharge through the coil—see Figure 4B. Figure 4A shows the current flow when the switch is closed; the top of the coil becomes negative and the bottom positive. Figure 4B shows the current flow when the switch is opened and the capacitor discharges through the coil. From this simple experiment of opening and closing the switch you will notice that the current has reversed its polarity, the size of the capacitor and the impedance of the coil determines the frequency of the oscillatory circuit. In other words the value of these two components C.2 and L.1 will tell the valve at what frequency it must oscillate. Therefore, it will be seen that in the oscillator circuit we use the valve to replace the switch.

When a higher bias current is required, that is a larger bias current, we use the two valve circuit and frequently these valves are connected in push pull. Last month's article dealt with push pull amplifiers and it would be useful at this juncture if the reader were to refer to it.

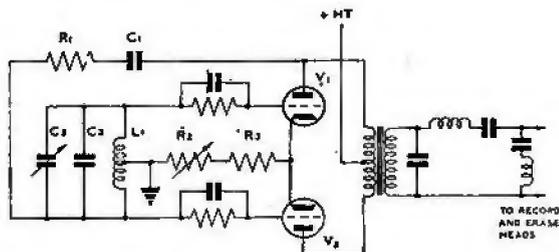


FIG. 5.
TYPICAL PUSH PULL BIAS OSCILLATOR

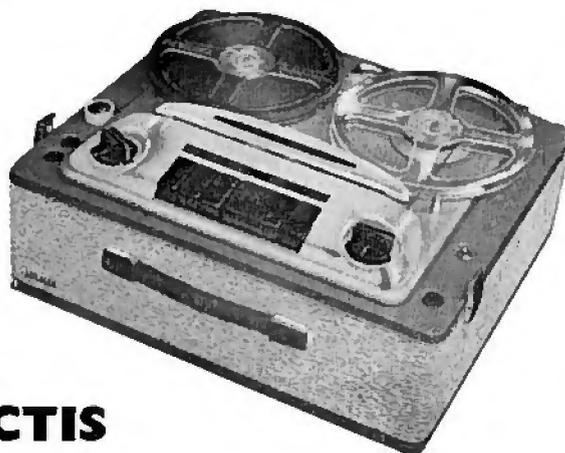
Figure 5 shows a typical push pull bias oscillator circuit. Resistor R.1 and Capacitor C.1 are the components used in the feed back network. Coil L.1 in conjunction with Capacitor C.2 and C.3 form a tuned circuit. It will be seen that C.3 is variable (a variable condenser) and the position at which this variable condenser is set adjusts the frequency of the oscillator circuit. Each control grid has a resistor and capacitor to develop grid bias and to match the impedance of the circuit. Resistors R.2 and R.3 control the current flow through the valves and since they are not bypassed or shunted by a Capacitor R.2 also provides a fine feedback control. The anode circuit has a transformer to match the impedance of the record and erase heads. A filter network of capacitors and coils in the output side of the transformer is used to prevent undesirable frequencies from appearing in the output of the oscillatory circuit.

The tuned circuit operates in a similar manner to that

described in Figure 4. Now let us consider how the complete circuit operates—see Figure 5. A signal is fed back from the anode of V.1 to the control grid of valve V.2. When V.1 is operating, a positive voltage is applied to the control grid of Valve V.2. This causes V.2 to switch on (conduct) and a current will flow through the valve. At the same time a current will also flow through Resistors R.2 and R.3 and this causes the control grid of Valve V.1 to become negative and cuts off (switches off) the flow of current through V.1. As no current is now flowing through this valve the feedback voltage is removed from the control grid of V.2 which becomes negative, cutting off the current flow. This eliminates current flowing through Resistors R.2 and R.3. Valve V.1 then starts to conduct again and the cycle is repeated. To simplify the whole statement, V.1 and V.2 operate alternately and this state of affairs continues whilst the circuit is alive. It will be noticed that the output transformer is centre tapped and, as previously explained, the entire oscillatory circuit provides a high frequency bias voltage to the record and erase heads which are fitted to all tape recorders. The bias oscillator supplies the required bias current to the record head through a resistor of a suitable value to give the best results and the same statement applies to the erase head. In the single valve bias oscillator an extra winding on the Coil L.1—see Figure 3—is used to match impedances by a transformer action. However, in the two valve bias oscillator erase current is taken from the same output as the bias current for the record head. As we do not require bias for the playback head when we are using our tape recorders for playing

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back, the bias oscillator is automatically switched off by the playback switch.

We use the erase head for two purposes. Firstly to erase any signal which has been previously recorded on the tape which, as most readers know, takes quite a long time, and secondly, to enable us to record on to a used tape without bothering to erase what has been previously recorded on to that particular tape, which, of course, saves a considerable amount of time. The construction of the erase head is the same as the construction of the playback head and the reader is recommended to study the November 1959 issue, Vol. 1, No. 4, which deals fully with this subject. The erase head consists of a ring core with two coils and two or three gaps as shown in Figure 6A and 6B but almost all erase heads are of the three gap type.

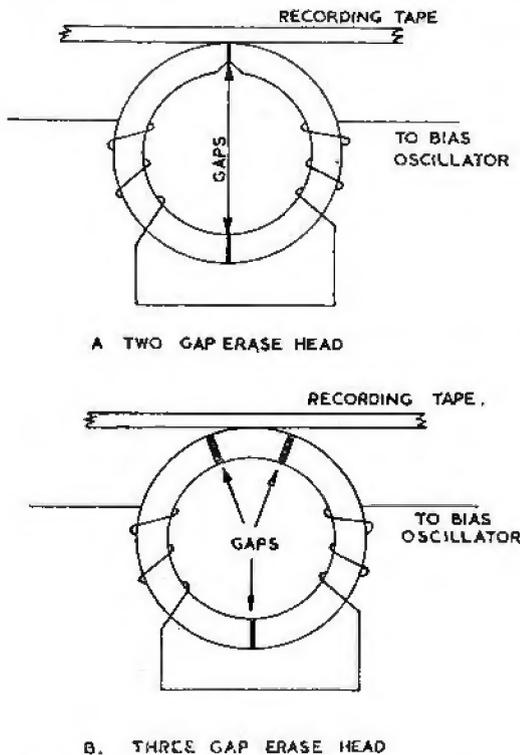


FIG. 6. TYPICAL ERASE HEADS.

The erase head gaps are wider than the record playback head to ensure complete erasure of previously recorded tapes. A variable capacitor is normally placed in series with the erase head, its purpose being to tune the erase head circuit to the frequency of the bias oscillator to obtain the optimum results and at the same time to match the two impedances.

In commercial recorders, that is tape recorders which are used in large studios, etc., the erase heads are eliminated and a method known as bulk erasure is used. The erasing equipment consists of a large electro magnet which is mounted in a suitable container and has a non-magnetic top fitted to it. A spindle is located on this non-magnetic top so that the reel of tape can be placed on to this spindle and rotated over the pole pieces of the electro-magnet. The coil of the electro-magnet is usually connected to the A.C.

mains supply and results in a more completely erased tape than is normally achievable on an ordinary domestic tape recorder and another advantage, of course, is that this method is much quicker. Figure 7 shows a typical bulk erase circuit.

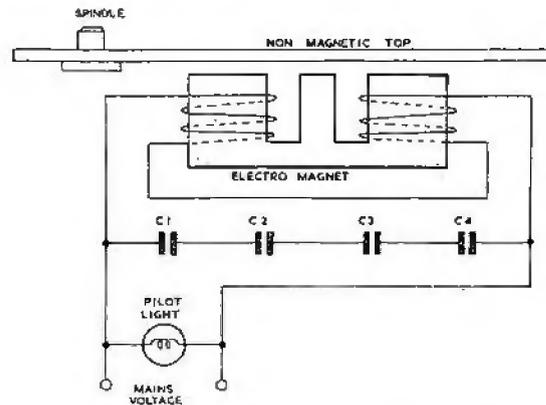


FIG. 7. TYPICAL BULK ERASE CIRCUIT.

The capacitors C.1 to 4 are used to filter noise from the mains and prevent it from being recorded on to the recording tape. A pilot lamp is used to show when the unit is operating. The reel of tape which has to be erased is placed on the spindle and slowly rotated through several complete revolutions which completely erases the tape, from which it will be seen that this is an easy and fast method of erasing.

Most tape recorders are limited by space and since the signal voltage required by the record head is small compared to the signal available from the tape recorder amplifier, the output amplifier valve is used as the bias oscillator during recording and as an audio amplifier during playback, and this alternative use is achieved quite simply by fitting contacts to the various switches on the Record, Playback, and other controls which are fitted to the normal tape recorder.

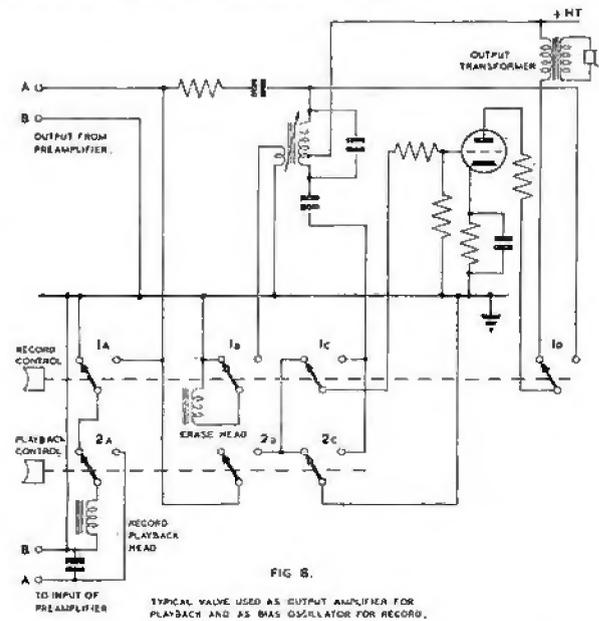


Figure 8 shows one method of using the output amplifier valve for this double duty. Both controls are shown in the off position; when the playback control is operated the various sections of the switch move to the right position and achieve the following functions.

Section 2a connects the playback head to the input of the pre-amplifier; Section 2c shorts to earth the bias oscillator tuned circuit to prevent possible interference, and Section 2b connects the output from the pre-amplifier to the control grid of the output amplifying valve. We now have the output valve working as an audio amplifier. Let us now return the playback control to the off position and operate the record control. When the record control is operated, the four sections of the switch move to the right position. Section 1a connects the record head to the output of the pre-amplifier and bias oscillator; Section 1c completes the feedback circuit from the anode tuned circuit to the control grid, Section 1d connects the tuned circuit to the anode of the valve and disconnects the output transformer, and Section 1b connects the erase head to the erase current winding of the tuned circuit coil. Note that for all operations, except recording, the erase head is shorted to prevent possible erasure of a recorded tape.

So far in this series we have discussed magnetic tape—recording and playback heads, microphones, pre-amplifiers, compensating circuits, power amplifiers, bias oscillators and erase heads. Future articles will cover disc recordings, pick-ups, radio tuners, radio jacks, aerials, loudspeakers and dividing networks.

Fredericks, the authors, would welcome postcards from readers with suggestions for a further series on audio frequency devices. Why not a series entitled "What you want to know?" Perhaps you will be kind enough to tell us! We are already planning a "Make it yourself" series.



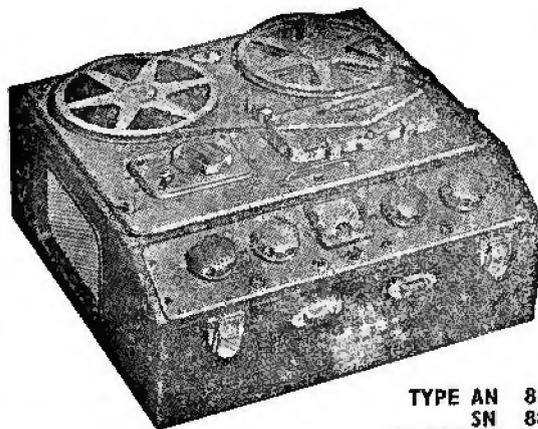
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Technical English

Since February, Mr. Karl Eisele

recorder he made it possible to check his own pronunciation at home and to compare it to that of the American and of his German teacher of English again and again. "Perhaps one takes the learning of a foreign language more seriously when one gets older. I think that the method of teaching adopted is very efficient and has much to offer to each participant who is able to make use of it!"

Control by means of the recorder

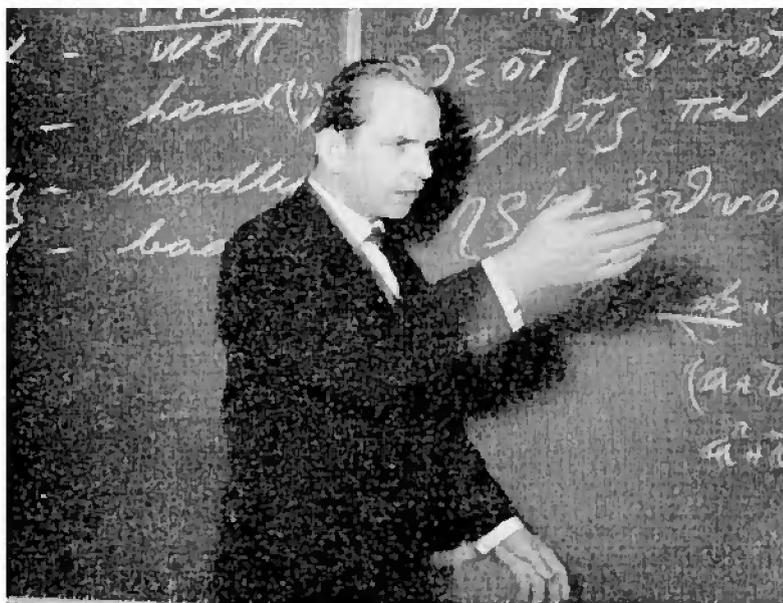
On average each class consists of seven students and is taught in accordance with the latest, well proved methods. Except for ex-



The centrally placed microphone ensures that all members of the group can be heard equally well on the tape recording.

Voluntary classes after working hours

Encouraged by the reaction produced by the introduction of these courses, voluntary language classes were offered to any employee interested within four weeks of the commencement of the above facility against a monthly fee of DM 2.50, as part of the Company's social services. The result of an announcement on the notice board was surprising: more than fifty applied for English, French, even Latin and Greek, partly no doubt to be able to supervise the home work of their children. A further course in mathematics will be provided also.



Language instructor Hans Georg Peterhurs has no grounds for complaint in respect of attention or industry of his pupils. Concentrated effort in small groups and the application of the most modern teaching methods and of the Philips tape recorder EL 3316-G contribute considerably to the success of the courses.

has been a participant, and twice weekly he has an hour's instruction in a class of four students of English. His work demands a continual study of American and English technical literature.

Before joining the language classes he had a year's private tuition from an American, and with the aid of his own tape

planations of points of grammar, instruction is given in the foreign language concerned; apart from text books a tape recorder is used during the lessons as a teaching aid for the control of the pronunciation. Furthermore, each student has two exercise books for his home work, which he uses alternately.



The tape recorder has proved to be a most valuable teaching aid. After the lesson each participant can check his own pronunciation very accurately.



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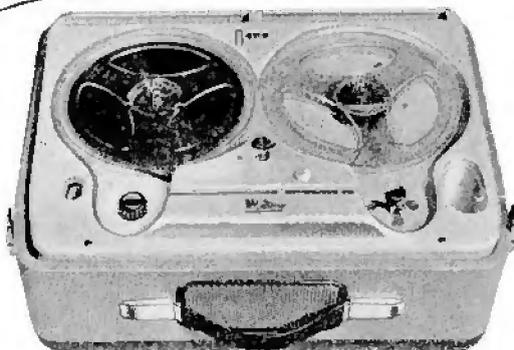
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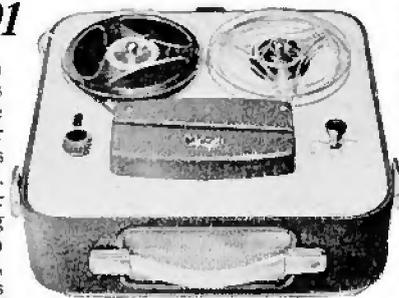
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Arthur Grumiaux

by L. G. H. Tabak

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Arthur Grumiaux at the grand piano, playing a sonata by Mozart. The tape recorder silently "takes down" the piano score.

After pressing the button Arthur Grumiaux listens to the piano introduction of the sonata for violin and piano.



Technology and the arts are more closely related than many of us are inclined to believe. Technology supplies the means and afterwards it is the artist's technique of using those means that brings them to life. Celebrated musicians owe their fame not only to their exceptional talent and their aptitude to play the instrument they have chosen, but also to their complete control of that instrument.

Obviously, the violin is one of the instruments that call for an almost perfect technique. It requires years of concentrated study; continuous attention has to be paid to the way the fingers are used and the way the bow is held. Endless care has to be given to those and other elements before at last the artist can make his first appearance before the public. But even after the musician has reached that stage, even when he has that ripeness of talent that enables his music to be pervaded by true inspiration—even then his technique remains his best ally. Day after day the bond between him and his instrument has to be cultivated and strengthened—during the study of new works, to prepare new performances, but above all in order to maintain his technique at a high level. For only when the musician's technique approaches perfection will his art be able to soar to the highest peaks.

Of course, all this also applies to a man like Arthur Grumiaux, the Belgian musician who is reckoned among the greatest violinists of our day. When he is not touring Europe to give stage performances, his days are filled with exercising on the violin and mental training. On such days, in the studio of his house at St. Genesius-Rode, near Brussels, the sound is heard of his Stradivarius, which is called "General Dupont"—a name the instrument owes to the man who owned it in Napoleon's days and who played an important role in the "Spanish adventure." General Dupont, who managed to escape unhurt, was made responsible for the military defeat and was condemned to spend the rest of his life in prison. There he sought consolation from a more peaceful companion—his Stradivarius.

Arthur Grumiaux is interested in technique, but also in technology. It is not as if tape recorders were his private hobby, but he knows and appreciates the facilities such an instrument offers during the study of duets. His performances of Mozart's violin-sonatas, together with the Rumanian pianist, Clara Haskil, and of compositions by Debussy, Lekeu and



The bow touches the strings of the Stradivarius in a duet between Grumiaux and Grumiaux.

Schubert, together with Riccardo Castagnone, the Italian pianist, have become widely known. For the study of such music Grumiaux uses a tape recorder. Being an excellent pianist himself—as a boy he made his first appearance before the public playing the violin first and the piano afterwards in the same programme—he first plays the piano score, recording it on the tape. Then, accompanied by his own music, Grumiaux plays the violin score on his Stradivarius. Thus, preparing his stage performances, Grumiaux avails himself of the advantages of an instrument that plays an equally important part in the manufacture of the gramophone records which carry his fame towards the ends of the world.

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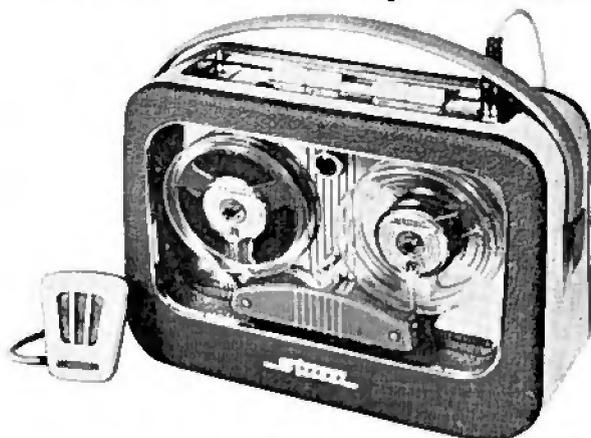


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Born under Taurus!

I AM informed that horoscopes on records are now available. One side of the record is taken up with observations on the future, whilst the other has suitable music. So, after hearing promises of final if delayed fortune, you turn the record over and play yourself the Overture to the Crown Jewels, or, perhaps, "We're in the Money". I suppose that all the records contain a fairly rosy picture of the future, whether one is born under Capricorn or Taurus. Even so, it might be cheaper to swap tapes with a fortune teller with a real crystal ball. I used to read my own horoscope in a large number of journals, then I would decide what, on average, my luck would be like for that day. Alas, in vain have I waited for superiors to give me new responsibilities, for sudden journeys and important letters. Needless to say, I still glance at the printed promises occasionally, but the thought of having an audible horoscope does not enthuse me to any great extent. If I'm going to be rich, I would sooner it take me by surprise. And how I dislike looking out for those tall dark men!

Running out of tape!

MOST OF the people that send me tapes seem to forget that the acetate is a-running out. Suddenly, in the

middle of the sentence the leader-tape signifies it is time to turn the tape over—or wait for the next one! I have decided that I will support that tape manufacturer who inserts some non-erasable "pips" on the tape, when there is only about 50 feet left.

Then I will be spared the repeated beginnings of side two—"Now where was I?" Frequently, the severed sentence is forgotten, and I often wonder how it was meant to end. One other remark from this angry young man. Have you noticed how many folk say at the beginning of the second side, "Well, here we are on side two!"—with the same amount of surprise as the stage Cinderella gasps when the Fairy Godmother appears. Personally, I always start side two with something original, like "Once more unto the breach, dear mon!" (a fine sentence written by Mr. William Shakespeare).

In the Cause of Recording

TALKING OF Fairy Godmothers reminds me that I am still waiting for mine to drop a transistorised tape recorder in my lap. A young friend of mine, Graham, tells me that he recently bought such an instrument. He was asked to record a recital of bell-ringing in a local country church, and a suitable evening was settled. The Clerk of the Weather had also selected

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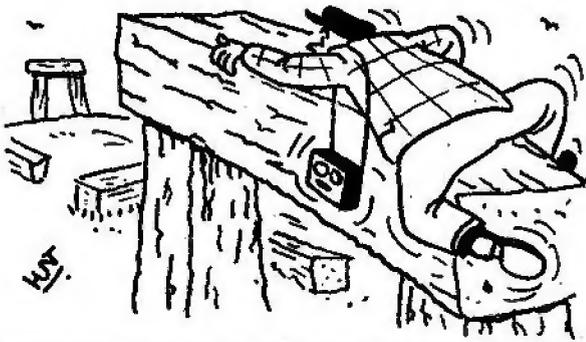


this date to drop a goodly amount of snow over the fields of England, accompanied by a breeze that was, to say the least, stiff. Anyway, Graham stationed himself in the middle of a field a short distance away from the Church and switched on the machine. The snow continued to fall with some enthusiasm, whilst the church bells rang. Eventually, Graham, resembling a snowman built by children in a hurry, trudged away. He says that the recording came out well. It seems a pity that there wasn't someone around with a cine camera; such an act of determination should itself have been recorded. I'm wondering if the chattering of Graham's teeth was recorded. I would like to hear of any similar acts. I did hear once of a man

being swung from a crane high over a building site. He wore a special harness, and used his portable recorder to make a progress report of the work going on below. Dear me—what will these foremen do next?

Back to them History books!

AN AMERICAN friend of mine professed an interest in various English legends on a recent tape sent to me, and enquired if I knew anything about Stonehenge. Not wishing to display my "abyssmal ignorance" (as my old maths. master used to put it!), I immediately visited the local library. After all, some Americans may believe that every Englishman is well aware of our "traditions"; I thought I might display a wide knowledge about Stonehenge rather nonchalantly. However, I discovered that quite a lot of books—and

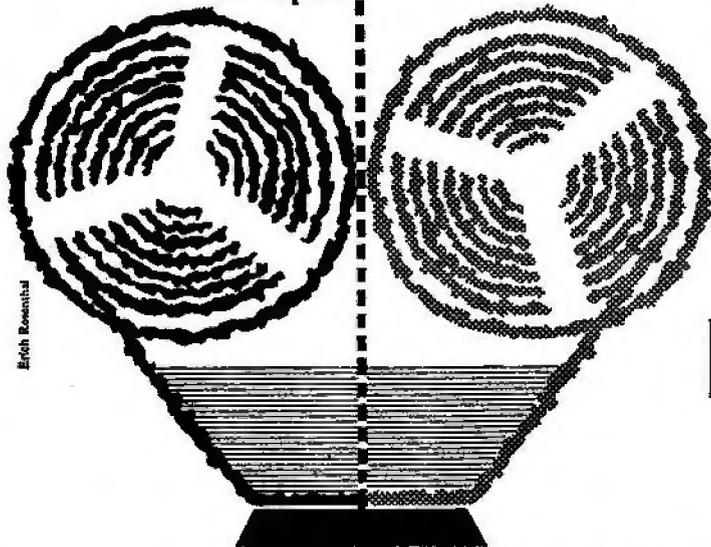


theories—are in existence about those rugged rocks in Wiltshire. I now share my American friend's interest in them. For instance, did you know that one legend says that the stones were originally erected in Ireland, from whence they were transported magically by Merlin, that gentleman who appears in the tales of King Arthur? I also understand that Stonehenge was presented to the nation in 1918 by a gentleman who bought it at an auction sale for £6,600. Surprising what can be bought at auctions, of course . . . Theories about Stonehenge include one which credits its construction to the Druids, another which suggests that it was a "college for Druids" and one which says that it was erected by the Phoenicians when they inhabited England after the Flood. After doing so much research for my friend in Illinois, I have just sent to him the recent publication of Her Majesty's Stationery Office on the subject, to wit, "Stonehenge and Avebury" (3/-)—a well illustrated and informative guide written by Mr. R. J. C. Atkinson, the Professor of Archaeology at University College, Cardiff. If your tape pal is interested in archaeology or British history, get him a copy of this booklet. But read it yourself first!!! In the meantime, I am going to read some more books. Another tape pal has just asked me how they figure the height of towns above sea level. By the time I've finished, I may even be ready for my G.C.E. examination!

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I HAVE to journey around the country more than somewhat in my job; I cover mile after mile of railway

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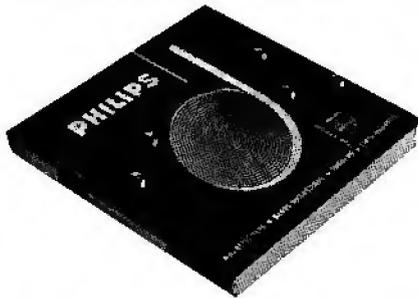
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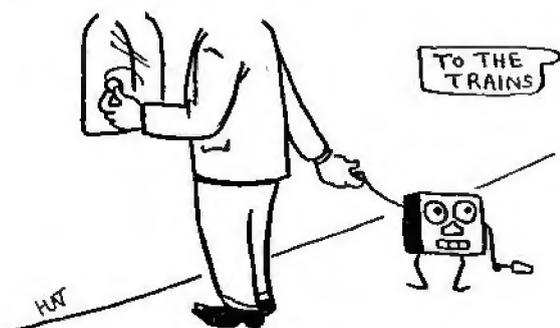
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tracks peering either out of the window or into the depths of my newspaper. My fellow travellers are usually as reserved as I am. I have been giving some thought to ways in which conversations can be started in such circumstances. There are many opening gambits, the weather being the most common. The only trouble about a conversation starting about the weather is that it rarely leads anywhere else. After all it is rather difficult to move a conversation about the weather to a discussion on the international situation. Sometimes, one's fellow traveller launches into a commentary on the football match he saw last week; this can be a very depressing experience to someone who, like me, has very little knowledge of sport (except blow football, marbles and chess). When I get me that portable transistorised tape recorder, I will prepare a tape for railway journeys. Just when



BOGEN TAPE HEADS

4 TRACK STEREO

TWO TRACK STEREO & MONO

Bogen Tape Heads are found in fine recording equipment all over the world. They are made by Bogen of West Germany, who specialise exclusively in the manufacture of magnetic heads to extraordinarily high standards of design and performance. Many new and original techniques are used in their production, the results of which are instantly apparent in use. Particular attention is drawn to Bogen 4-track heads for stereo and other multi-channel requirements. These are supplied in sets for record/replay and erase. Two-track stereo and mono heads are also available.

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that man in the corner is about to slumber, I will switch on.

"Good day, sir," the tape recorder will boom. "It may interest you to know that this handsome, bespectacled young man is interested in conversing on a wide range of topics, including diet and nutrition, flying saucers, literature, the arts, the social sciences and contemporary events. What, for instance, do you think of the impending American election?"

I have a feeling that my fellow travellers will leave the compartment hurriedly at the first available opportunity, alas! Still, it may be worth trying. Better than reading the same newspaper three times over, or watching the trees and the railings flash by, don't you think?

As Good as Grand Opry!

WHAT SEEMS to me to be an excellent example of contemporary music—in a traditional, romantic style—is that of "West Side Story", composed by Leonard Bernstein. Certainly, the more I hear it, the more am I impressed by it. I hereby recommend a certain 45 r.p.m. extended-play record on which Don McKay and Marlys Watters sing the four best known sequences from the show, namely, "Tonight," "Maria," "One hand, one heart," and "I feel pretty." The record (7 EG 8429) is, for me, a wonderful souvenir of the show; I would be pleased to hear if you agree. As a matter of fact, I found myself singing "I feel pretty" quietly at the office. One of the typists heard me. "I don't think that 'pretty' is quite the right word for you, Mr. Lazell," she said. She's right, of course.

Inventions Department

MY TAPE recording commitments seem to increase every week, and I am now thinking up a way in which I can listen to a tape and reply to it at the same time. Any ideas?

Entertainments Department

FINAL THOUGHT for the month—I did a nice bit of social research at a morning children's cinema show recently. This is good material for discussion on tape. In any case, it seems to me that these children's cinema shows



—usually held on Saturday mornings, and to which adults can enter—are often better value for money than the adult programmes. Sometimes you can see a vintage Will Hay or George Formby film (as well as a cartoon and serial). Ah, well, I never did grow up . . . !

DON'T CUT THE TOP OFF



A tape recorder is only as good as its microphone.
If you cut a top note off in the mike, you can't
blame the recorder if the note isn't there.
If there's distortion at the start, there'll be
a din in the end. Give your recorder a fair chance.
Give it a balanced, wide-frequency input. Give it
a good microphone. Give it an Acos microphone.

USE AN ACOS MICROPHONE



MIC 39

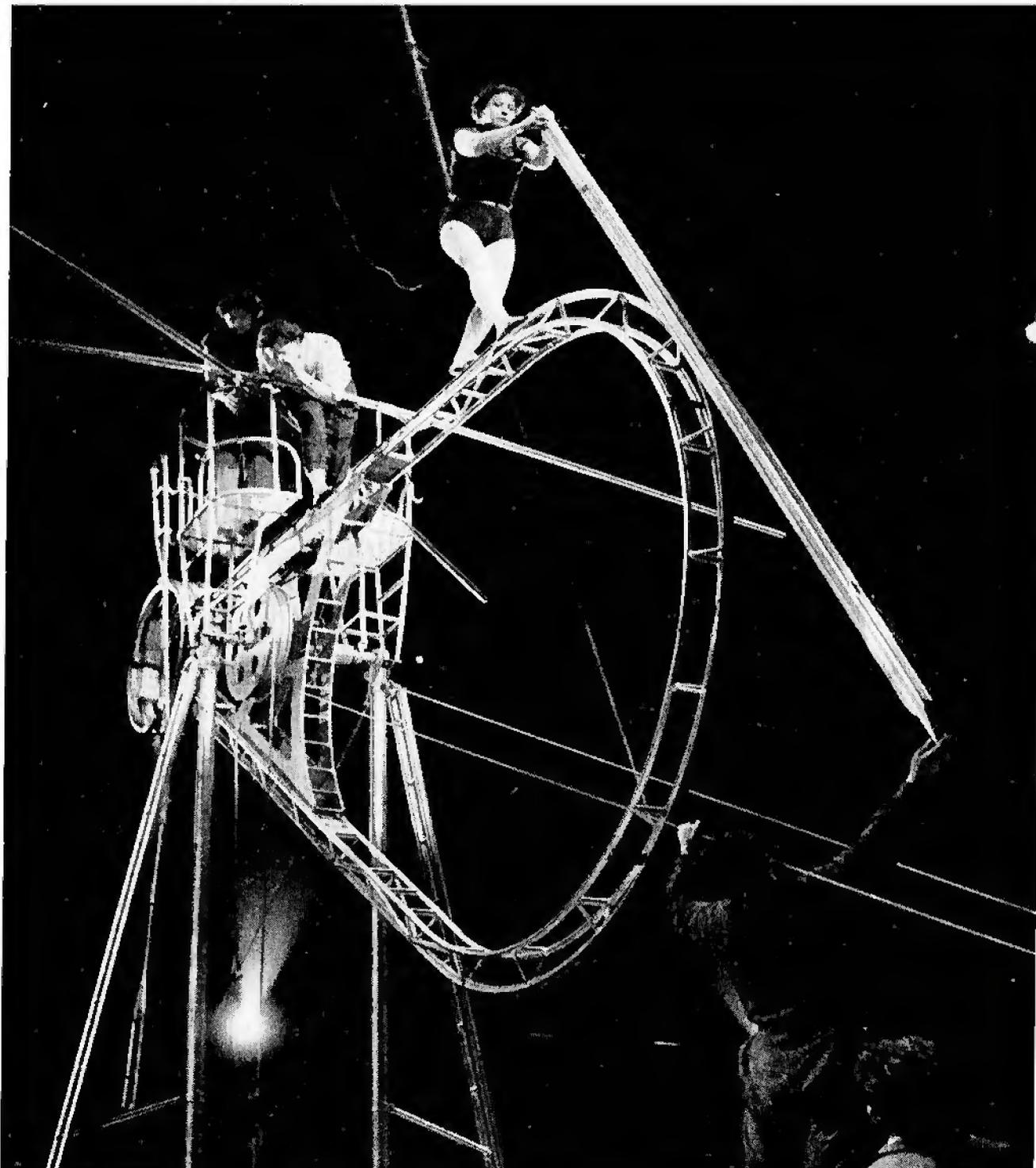
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AT THE CIRCUS

JOE WALDORF

This fine study of circus life was photographed by Joe Waldorf who recently held an exhibition of his photographs at Kodak Ltd., Kingsway, London, W.C.2.

Waldorf photographs life as he sees it and this picture shows members of a circus act preparing for the opening night.

In the article opposite, Laurence Mallory describes how the atmosphere of the circus can be captured on tape—to build up a sound picture as dynamic as life itself.

AT THE CIRCUS

by Laurence Mallory.

FOR EXCITEMENT, colour, suspense and speed, the circus provides one of the best places to make a recording. To capture the atmosphere is a test of one's ability both as a commentator and recordist.

A year or two ago I spent a week with a circus, one of the larger ones that come to town every year. Firstly I contacted the publicity manager and told him what I would like to do. I wanted to photograph and make a sound record of the performers both in and out of the ring and so build up a picture of circus life. Once he was assured that I would *not* be in the way, he readily agreed.

Each morning I wandered round the caravans, talking with the performers, attendants and technicians. In a circus like anywhere else in the entertainment world most of the work goes on behind-the-scenes. Like an iceberg, only a small part shows. The public see only the polish and glitter, not the endless hours of hard work that make it all possible.

The lion tamer was a Swede, the aerial act Austrian, while one of the most startling acts came from sunny Spain. I spent two nights watching the performance very carefully, mentally making notes about the acts. Then, and only then, was I ready to record and photograph the circus.

One of the most interesting viewpoints is to stand at the ring entrance. This spot serves a two-fold purpose. One can see everything that is happening in the ring and at the same time the next act as it waits its turn to perform. Then during the quick changes there is no better place to see the clowns and animals. But, and this is very important, one must be almost like the invisible man. The time schedule of the show has no place for a novice who gets in the way.

Sound effects from the ring entrance are excellent. The band is directly overhead, somewhat muffled, but not too loud and overpowering. The ring master stands near to you, and the jingling of the horse trappings a few feet away can be easily recorded and make an excellent "atmosphere" sound effect.

Announcements over the speaker system are easy to pick up to provide the introduction to the acts. Now that with this background of sound effects, ready made, and at our disposal, what about the most important part of the recording, the actual commentary? For example, how do we capture the suspense as the audience holds its breath at a particularly daring act seventy feet above the sawdust ring?

At such moments, a voice hushed with tension, yet perfectly audible, is often the most effective.

"A roll on the drums and into the ring comes a young man. He is dressed in white tights." Cut off the commentary to record the ringmaster's announcement.

"Now he climbs the rope ladder, the eyes of the audience and the unwinking beams of the spot lights follow him as higher and higher he climbs to be almost lost beneath the spread of the big top canvas." The commentary must enable the listener to form an accurate picture in his mind's eye. And it must be

smooth and calm. While the audience sit on the edge of their seats and the tension mounts all around you, as commentator, you have to be calm and any excitement in your voice must be there only for effect. If you readily become excited your speech will speed up and become incoherent. So take it easy. This is one of the marks of a good commentary.

"He starts to walk along the high wire, now only a slender steel rope and a pole for balance being between him and death seventy feet below."

You may think that the word death is overdramatic. But, to the actual watchers this thought must be in all their minds. The risk is part of the act. Who wants to see someone on a wire two feet above the ground? Not the same thing is it?

For some acts, get information from the artists beforehand. I always remember the final act of the show that year. Two Spaniards, man and wife, were shot out of a cannon. They flew through the air to land in a net at the far side of the ring.

I discovered that in the split second as they actually left the mouth of the gun, they blacked out. At this point it was practically impossible to see them. The eye only became aware of the figures when they were in mid-air.

"Now, as the two figures slide into the muzzle of the gun, a silence falls on this audience. Soon we shall see them shot from the cannon."

A roll on the drums is recorded.

"Any minute now and the cannon will be fired." Then follows the sound of the explosion. Don't let it fade away. Cut in with the commentary—staccato—"The figures hurtle through the air. They fall. Now they land safely in the net. Once again they have risked their lives for the public." A brief comment on the performers' black-out is now appropriate.

The circus has so many different acts that it is impossible to talk about each one. Select one or two and touch on their acts and feelings through interviews. If you meet circus people as I did during that week, you'll understand their way of life. Eventually it will get into your blood and your record will be thrilling and dynamic.

Many of us might not be fortunate enough to be able to spend a whole week at the circus. But go and see several performances. Don't try to do everything at the first one. Spend the first evening watching the show, enjoying it, and noting the various turns.

When one is recording, photographing, or just reporting, one hasn't time to watch the show. After the first two nights I found that I was far too busy to enjoy the acts. My main concern was to come away with successful recordings and pictures.

Whatever is your choice, do try and get the atmosphere across in your commentary. While sounds are descriptive, they don't tell the tale by a long shot. It is up to you to somehow paint a visual picture with words.

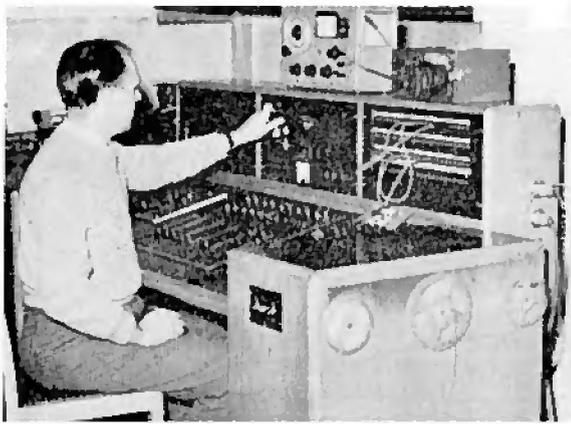
Good luck and good hunting with your recorder.

MAGNETIC TAPE

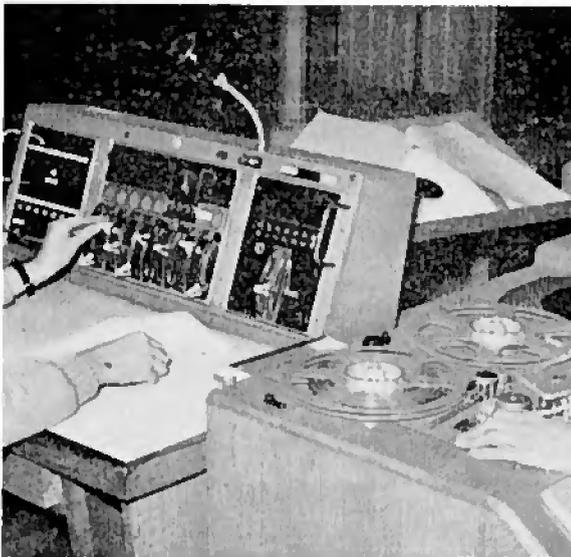
IN TELEVISION PRODUCTION

With acknowledgment to Associated Rediffusion

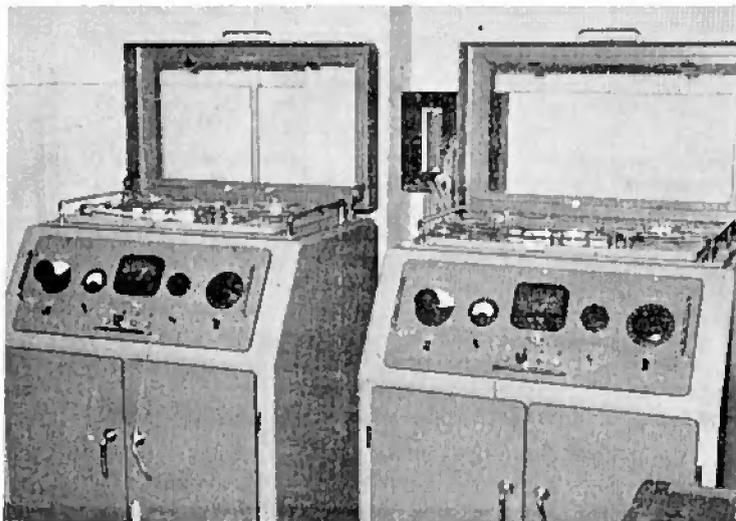
By **BILL SUTTON**



Westrex Sound Mixer.
Bill Sutton at the *Westrex Mixer* installed in the *Sound Transcription Unit*.



The *TR90* tape recorder in use in the *Sound Control Room*. The white leader can easily be seen and the machine is ready to insert a tape recording into the programme sound at a moment's notice. Left, The hands of Bill Sutton; right, The hands of John Coombs.



E.M.I. type TR90 Tape Recorders. These machines have been built into a specially designed cabinet for use in *A-R studios*. The control panel on the front of the machine has also been built to *A-R specification*.

IN broadcasting as a whole magnetic tape is primarily used for the recording—and subsequent reproduction—of complete programmes; programmes which would not be possible or which would be inconvenient to broadcast live at a scheduled time. The final tape is usually—but not always—the final end product, the programme as broadcast. In television, however, the exact opposite maintains; the final tape is not the end product and in the great majority of programmes contributes only a small but important part to the final programme sound. There are, of course, certain exceptions to this statement. For example, in Associated-Rediffusion's spectacular "Summersong" programmes the fullest use was made of pre-recording techniques. The final tape, with the exception of a videotape insert in one programme and a live insert in the other, carried the whole of the programme sound as heard by viewers and the hitherto unheard of decision to cue the entire visual programme to this pre-recorded sound tape was made.

"Summersong," as many readers may remember, consisted of different song and dance items from many parts of the country as far apart as Scotland and Stonehenge and produced engineering problems the scope of which had never before been attempted by any other contractor. The programme sound had to be fed to each contributor and relayed by loud-speaker to the artists so that they could mime and dance in perfect synchronisation with the music, which in each item originated from London. The programme was a great success and would have been extremely difficult, if not impossible, without the use of magnetic tape.

The Christmas schools programme "The Nativity" was another good example of pre-recording techniques. This programme told the story of the Two E.M.I. TR 90 tape machines were used to reproduce Nativity in narration, choral and instrumental music. duce the two final tape recordings; one tape carried the narration, the other carried the whole of the music. The machines were started and stopped on cues as marked in the script or on cues from the Director.

In this case each insert on each tape had to be clearly marked with white leader tape in order that the operator knew exactly where an item began or finished. The white leader, about 12in. long, was spliced into the tape and the joint was made only a fraction of an inch from the actual start of the modulated portion of the tape. The length of the white leader was made no more than 12in. because

MAGNETIC TAPE IN TELEVISION PRODUCTION

With acknowledgment to Associated Rediffusion

By **BILL SUTTON**

in practice this has been found to be the optimum length permitting the tape machine to be stopped and started without any spooling-on or movement of the tape in between each band. In any case there is usually no time to spare on constant "setting-up" of inserts.

The biggest use of magnetic tape in television sound is for "dropping-in" to the programme the various complex sounds which cannot originate live from the studio floor. These include signature tunes, opening and closing music, musical bridges, background music, sound effects—especially continuous background noises lasting for long periods; for example: seawash, traffic, railway noises lasting sometimes throughout an entire scene in a play. These long duration sound effects are usually reproduced on a separate machine, leaving the main tape reproducer free to deal with the shorter duration sounds. A popular use of pre-recording is to enable an actor's "thoughts" to be heard by the viewer, or Superintendent Lockhart's narration in "No Hiding Place" when we see the famous policeman at the scene of the crime. Sometimes voices are required to sound sinister, grotesque, "different," and this can only be achieved by electronic alteration or distortion of the original pre-recorded sound. Of course, this could possibly be done "live," but it is much more convenient, safe, and certain of perfect results if the voice is pre-recorded.

It follows that the final tape for use in the production of a play, for example, consists of several separate recordings. In fact, there can be as many as a hundred such separate "bands" and each one has to be carefully marked with a white leader upon which an identifying symbol or title can be written. An enormous amount of work goes into the preparation of these tapes and they are ideally prepared well in advance. The Director of the programme, the sound supervisor and his gramophone effects operator go through the script together and very carefully list every single sound which does not or cannot originate from the studio floor during transmission. The sound effects, which are already on disc in the Sound Effects Library, are left on disc unless the effects operator finds it more convenient to transfer them to his composite tape. Other special sound effects—unusual ones or complicated sounds not normally available from the library—are recorded either on location or in the studio or manufactured by dubbing and mixing existing sounds. Narration is recorded in a small studio used exclusively for this purpose, and is electronically altered if necessary in



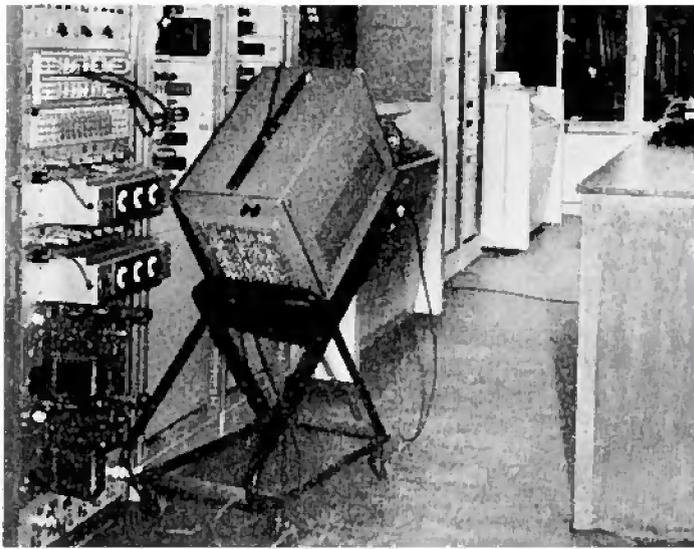
The white leader is inserted into the final programme tape to separate each band of sound effects or music.



The machine in the foreground has been set up to reproduce an endless loop of tape. This facility can also be used to provide "flutter-echo."



E.M.I. type L2 Midget Tape Recorder. A number of these machines are in current use by A-R for recording sound effects, etc.



the recording studio. Music is selected from the range of mood music records available from the record library and copied to the composite tape, if necessary, or the music is specially recorded, for certain productions, by an orchestra in the studio. The final tape is finally checked and the leaders inserted between each sound and is complete from opening music to closing music with the exception of the various sounds which are added from disc reproducers.

Having considered how the final composite tape is made up, let us now find out how the bands of sound which are on the composite tape are prepared. Every sound obviously has to be recorded from a live source in the first place and a very convenient tape recorder which is used by A-R for this purpose is the E.M.I. L2 battery-operated midget portable recorder. Assuming, for the purposes of discussion, that the sound of a motor-car interior starting, pulling away through gears and constant running, then stopping, is required. The sequence of sounds is recorded on the L2 several times, perhaps from various microphone positions in the car. The tape is then replayed on the larger tape reproducer back at base, carefully listened to and timed. It may be found that several takes are no good because of poor initial microphone positioning resulting, say, in a bad balance between gear box noise and exhaust noise, or extraneous noises may be present. The best takes are noted and are again played carefully, using any tone correction necessary (it is usually found advantageous to remove a certain amount of bass to minimise the "boomy" quality which is often present). It may be found that the beginning of one take and the end of another are the best and so these must somehow be joined together, the unwanted parts of the recording being discarded. Unfortunately, however, it is not always possible to *cut* one sound into another—the change in quality might be too obvious. In this case it is better to "dub-edit," that is to make use of three tape recorders in the following way.



Above—Videotape recording equipment.

Left —The Ampex Videotape recording machine. Console.

Below—Editing Videotape. Jack Valencia, of A-R's Videotape Department, prepares to make a cut in a Videotape Recording.



The first selected take of the motor car effect is replayed on one machine and the second selected take is replayed on the second. As it has been decided that the beginning of the first take and the end of the second take are the desired sounds, the first take is replayed up to the rejected part and just before this point is reached the second take is started at a point just following the rejected part. The two tapes are for a short while running together, the first faded up, the second faded out. Before the bad part of the first tape is heard a smooth cross-fade is made from tape 1 to tape 2 and this ensures a smooth almost unnoticeable, join of the two sounds. Tape machine No. 3 is used, of course, to record the blending of the two sounds. This process sounds rather complicated but in actual practice is relatively simple and swift to achieve and is a very common process. Any short extraneous noises, clicks, bangs, etc., can be cut out without detection and the sound effect is complete. In this way sounds are mixed together and really composite sounds can be obtained which would be extremely difficult to produce "live" in the studio by mixing several sound effects records—even if a large number of turntables

were available. Remote tape recorders are often used for providing electronic "flutter" echo effects. To get the sound quality of a public address announcement, say, in a play, a slow "flutter" is necessary. Simply, the pre-recorded announcement is reproduced from the studio tape machine and is fed to the remote tape recorder operating at $7\frac{1}{2}$ i.p.s. The output of its replay head is taken back to the studio and is mixed with the original recorded announcement. It will, of course, be delayed due to the difference in distance between the recording head and reproducing head of the remote recorder, and this will give the "bouncing" effect common to large public address installations. This system is also used to give the "flutter echo" effect much used by record companies.

There are other uses, of course, for magnetic tape; chiefly for editing purposes. Record programmes like "Cool for Cats" are always prepared in advance. In order that eleven or twelve records can be played in the time allocated for the programme, several cuts have to be made to shorten each record. This must be very carefully done so that the record will not be spoiled by making the cuts too obvious. A verse or chorus or a musical break is often easy to remove unnoticed by the listener and, far from having a detrimental effect on the record, often improves it from a programme point of view as a whole by removing what may be rather dull portions, the final result being a smoother, faster programme.

Finally, even when a tape is no longer useful for recording because it contained too many joins and leaders, it is spooled on to the floor to make a huge tangled heap and then can be used to produce the sounds of rustling grass, fire, and, by various electronic techniques, all manner of sounds too numerous to mention!

VIDEOTAPE RECORDING

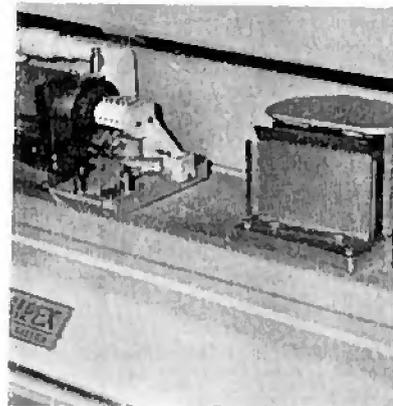
The greatest step forward that magnetic tape has taken in several years is undoubtedly its development for use in recording television pictures simultaneously with the programme sound on the same magnetic tape. This development opens the way to a whole new field of operational techniques and will surely have as much impact on television as ordinary tape had on sound radio. It is only in the last decade that theory, technique and materials have developed to the stage where taped television has become a practical possibility.

The equipment used by A-R is manufactured by the Ampex Corporation of America and has been modified to British standards by Rank-Cintel Ltd. The first order for this equipment was placed by A-R over four years ago and it was first used to record an insert to "This Week" on June 30th, 1958. Since then the Videotape recording section, under the supervision of Mr. J. Runkel, has been expanding rapidly and today is one of the most important departments in the Company.

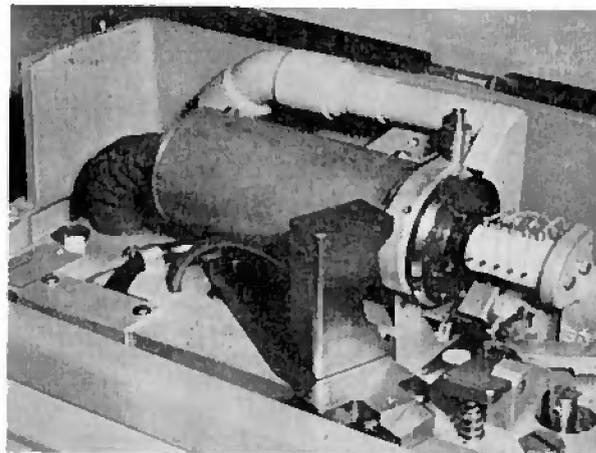
What are the advantages of the Videotape recorder? It promises the viewer an even more rapid and comprehensive programme coverage than he already enjoys. It enables each hour of programme time to be planned for maximum audience viewing. For example, when an event of national importance takes place at 5 p.m., it can be taped and relayed later at



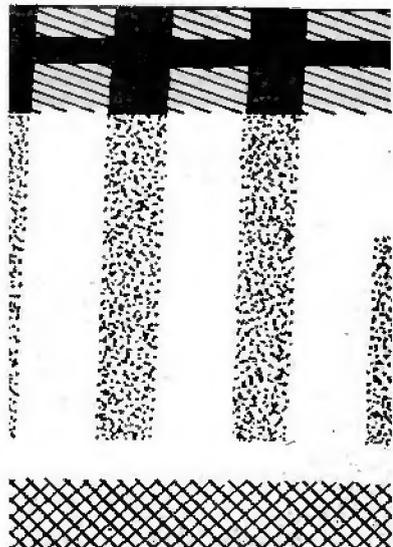
Above — Editing Videotape. Here the varying magnetic impulses on the tape are being "developed" by passing the tape through a carbonyl iron solution. The finely divided iron particles arrange themselves in distinctive patterns and the editing pulses are clearly revealed.



Right — Ampex Videotape recording machine. Tape transport mechanism.



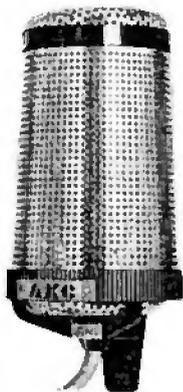
Above — Ampex Videotape recording machine. Video head assembly.



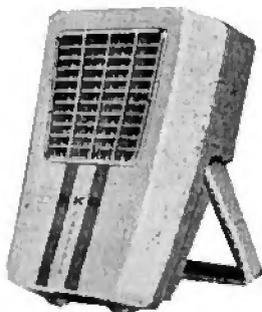
Right — A typical view of signal pattern showing audio track at top, Video pattern running vertically across tape, and cue track superimposed on control track at bottom.

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ANNOUNCEMENT

The Audio Reproduction Centre wishes to inform members of the British Recording Club of changes in the terms and conditions of the facilities of the Gramophone Record Library previously announced in the January edition of "Amateur Tape Recording" (page 46).

As from April the scheme will apply in the following manner:

1. Second-hand gramophone records will continue to be accepted and credited against the future hire of records only, and such accumulated credit *cannot* be used for the purchase of equipment.
2. Any make of record will be accepted but such makes are restricted to 12in. and 10in. L.P.s only. Credit for 7in. E.P.s has now been discontinued.
3. Credit values have also been modified to conform with the general reduction in the price of new discs, and are as follows:
12in. L.P.s, 15/- each; 10in. L.P.s, 10/- each.

All members of the B.R.C. are requested to note these changes when using the Record Library.

a suitable time to reach a larger and more representative audience. It simplifies networking problems by allowing a programme contractor to tape a programme from the network for retransmission at an individually more suitable time. It enables programmes which it would not normally be possible to televise live because of difficulties encountered by some artistes to be available at the desired time to be taped at a time suitable to all. In fact, taped television enables studios, cameras and equipment to be so utilised that more live programmes can be produced.

Other important advantages are its relative cheapness. The same reel of Videotape can be used over and over, recordings can be played back immediately, test programmes can be recorded at relatively low cost, it can easily be adapted to record in colour should this ever become necessary. A programme recorded in London can be immediately flown to, say, the Scottish contractor and broadcast on their local network only a few hours after it was recorded. The Videotape recordings cost less than 1/10th as much as the same programme recorded on 35mm. film.

How does it work? There were three basic problems which had to be solved in designing the practical magnetic tape recorder for recording television pictures.

1. High speed, or head-to-tape velocity was required to record the high frequency components of the video signal—exceeding 3 mc/s.
2. Adequate playing time using reels of reasonable size was necessary.
3. A means had to be found whereby the entire video signal from direct current to the high frequency of 4 mc/s could be recorded and reproduced. This was done by using a frequency-modulation system, the details of which are somewhat beyond the scope of this article.

In the B.B.C.'s "VERA" machine the first requirement was met by designing a tape transport mechanism capable of accurately running the tape at a speed of about 200 i.p.s. This obviously used an enormous amount of tape for a half-hour programme and the tape had to be accommodated on very large reels. The system proved unwieldy and from what I personally saw of the results far from satisfactory.

The Ampex recorder solves the first two problems by using four heads mounted at the outer circumference of a rotating disc with their gaps parallel to the disc axis, and the vision signal is then recorded vertically rather than horizontally on the 2in. wide tape. In the head assembly, each head is spaced with microscopic precision at 90° from the next on the disc. With a disc diameter of about 2in and a rotational rate of 15,000 r.p.m. the relative head-to-tape velocity is about 1,580 inches per second, or 90 m.p.h.! The tape transport mechanism operates at about 15 i.p.s. and, using thin tape, approximately 64 minutes of recording are obtained on a 12in. diameter reel of tape.

The recorded tape has four separate synchronised magnetic tracks. The first is the series of transverse video tracks; the second is the sound track carrying the programme sound and occupies a position at the

top of the tape; the third is the control track which comprises a record of the alternating currents which fed the rotating head motor during that recording, and the fourth is a cueing track to aid operators in the production of programmes. Also on the third, control, track is an edit pulse used as a reference point in editing and splicing.

During recording the sound track is wiped clean by a conventional erase head for maximum signal-to-noise ratio.

The tape transport mechanism used is similar to that used on conventional professional tape recorders; the tape moves from left to right round an idler, then by the rotating video head assembly, which also contains the stationary control track head. The tape then goes on to two stationary stacks of heads—the first consists of the erase head and underneath the cue track record/replay head. The second contains the audio record/replay head at the upper edge of the tape. The tape then passes between a drive capstan and its pressure idler, contacts a take-up tension arm and finally is wound on to the take-up reel, on the right. Very complicated circuitry is provided to translate the control and synchronisation pulses recorded on the tape in order to ensure absolute synchronisation of the picture when the tape is reproduced.

Experience with the recorder has shown that it is possible to make duplicate tapes from an original. They are made in exactly the same way as a copy of a sound recording is made, and first-generation copies of a Videotape recording are not obviously any worse than the original.

Editing and splicing can be carried out provided that the tape is cut in the correct place. The latter part of the vertical synchronising signal represents a blanking time between television fields. The editing pulse on the control track marks where this blanking time appears, and if the tape is cut on this blanking period there will be no frame-roll on the screen when the tape is played back. These editing pulses cannot be seen on the tape until they are made visible by "developing" them with a special solution containing carbonyl iron. The iron particles adhere to the tape according to the magnetic pattern made by the recording and the editing pulses are clearly revealed. The carbonyl iron particles wipe off easily when the splice has been made.

CONCLUSION

The magnetic tape recorder has undoubtedly made possible hitherto unconceived strides towards presenting new and exciting television productions. From a purely audio point of view quality and originality of complex sounds impossible without the use of tape have in themselves provided ideas for programmes. Some programmes are more dependent upon sound than others and, indeed, many programmes are not possible at all without the support of complex sound sequences very painstakingly produced by editing, dubbing and copying of many tape-recorded sound sources. With the present development of tapes and equipment who knows what will be possible in the future, what technical achievements through the use of magnetic tape will contribute to your pleasure and entertainment!

PHOTOGRAPHIC COVERS FOR RECORDING TAPE BOXES

by KEITH E. MASON

MY TAPE collection, and probably yours too, used to present rather a drab face to the world compared with the slick, glossy covers of the long playing records with which it shares lodgings. Now, however, it can more than hold its own after being given a photographic face lift.

The covers reproduced here are good examples of what can be done to improve the appearance of a tape box. To produce the covers a montage must first be made. I made mine by mounting lettering cut from magazines on to suitable photographs. The design is a matter of personal taste but a study of a few record covers will prove fruitful. Notice how the title is short and how it is carefully positioned in relation to the rest of the cover. The pictorial matter is kept simple and yet it is designed to catch the eye. In making the montage for tape covers we must therefore use an eye-catching photograph and carefully spaced lettering to produce a well balanced effect.

The lettering used should be either black on a white background or white on a black background. Sometimes both types may be used as in the "Jazz in Hi-Fi" cover. Coloured lettering should be avoided, unless one has a good knowledge of photographic

emulsions and can visualise the tone in which it will be rendered on a black and white photographic print. The artistic tape enthusiast may prefer to make his



own lettering and this can be done on the surface of the photographic print using black Indian ink. The montage should not be smaller than the box on

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to which the final print is to be mounted otherwise there may be a loss of quality. Any white spots on the photograph should be spotted out using black

watercolour or one of the special dyes supplied for this purpose.

The next stage is to re-photograph the montage. The keen photographer will carry this out with his own



equipment and he will find a great deal of information on the subject in "All about copying," published by the Focal Press at two shillings. A photographic dealer will also undertake the copying work and his charge will be about three shillings.

From the new negative a print is made of a suitable size for mounting on to the tape box. A dealer will also make this print for you but be sure that you specify the EXACT size of the print when placing the order, otherwise misunderstandings may arise. A special size print will be charged at the rate for the next highest standard size, e.g., a 5 inch by 5 inch print will be charged as a 6½ inch by 8½ inch print. The choice of a glossy or lustre finish print is again a matter of personal taste.

Mounting the print on the box is best done with one of the new impact adhesives. The back of the print is coated with a thin layer of the substance, taking care not to allow any to find its way on to the emulsion side. The tape box is coated in the same way and both coatings are allowed to dry. When both coatings are dry, place the print on the side of the box and smooth down with a soft cloth until it is firmly fixed in position.

Your tapes, together with mine, can now compete on equal terms with the lavish productions of the record companies on the shelves of their storage cabinet.



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Model	Gns.
Philips 3515	32
Sagatone	38
Elizabethan Princess	39
Simon Minstrelle	39
Perth Saja	45
Wyndor Victor	45
Elektron	47½
Magnafon	49
Spectone Ex Tape	49
H.M.V.	£50
Grundig TK10	52
Telefunken 75 with mic	56
Perth Saja De Luxe	56
Brenell 3 Star	58
Veritone	58
Mobile	58
Ficord	59
Grundig TK25*	62
Telefunken Deck*	63
Korting Stereo*	68
Telefunken 4 track with Mic	68
Souxi Mag-Nette	69
Brenell MKV with Mic	69
Grundig TK30*	72
Brenell M.V. with meter, Mic	74
Elektron Stereo*	77
Telefunken 8SKL*	79
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The Royal Opera Arcade lies behind Her Majesty's Theatre in the Haymarket (one minute from Piccadilly Circus or Trafalgar Square).



Alec Lovett, Treasurer of Rugby Society (right), presents a cheque to Alec Alexander for the Tape Bank Trail. Also shown left: Ken Peters, and extreme left: Terry Nurse.



Members of the Bournemouth Club: left to right W. Rawlins (Chairman), L. Lawson, Mr. & Mrs W. J. Meads, Mrs. L. Lawson, A. Cadorath, D. Williams (foreground). In the centre is a recorder constructed by Mr. Rawlins. Front: Headley R. Jones, Secretary of the Bournemouth Club.

CLUB PICTORIAL

Photographs by
ALBERT GREENWAY

Henry B. Hopfinger demonstrating his Telefunken 85 KL to members of 'The Coventry Tape Recording Club' in his hand he holding that £19.10.0d. Microphone.

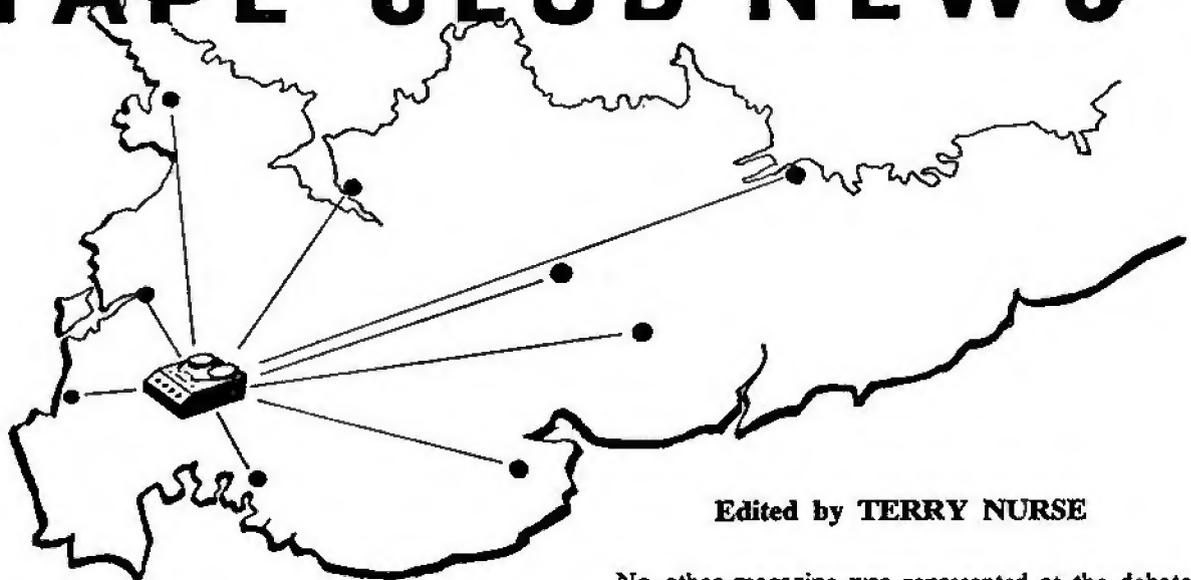


Two members of the Reading Cine and Tape Recording Society on 'location' at Reading. Mr. T. H. Pettit is filming with his Bolex 8 mm. camera whilst D. M. Noyes is recording stereo effects to be used with the film on a Reflectograph Stereo Recorder.

Producer D. Reynolds on left of Photograph checking the script with members of 'The Coventry Tape Recording Club' before recording, on The Telefunken 85 KL.



TAPE CLUB NEWS



Edited by **TERRY NURSE**

ANNOUNCEMENT

Will Club Secretaries continue to send news to :—
TERRY NURSE,
 161 Stuart's Road,
 Birmingham 33,
 not later than the 26th of the month. Send plenty
 of news in because *THIS IS YOUR JOURNAL*.
 Interesting photographs are also invited.

**EXCITING CLIMAX OF STAR
 RECORDING COURSE**

On Thursday, February 11th, the most ambitious event ever sponsored by a local tape club—the R.A.T.R.S. Star Recording Course—culminated in a Grand Debate on tape recording and tape club organisation.

"Amateur Tape Recording" delegates, Ken Peters (Assistant Editor), Terry Nurse (Club News Editor) and Alec Alexander (B.R.C. Secretary) took part, as well as representatives from a number of Midland clubs.

Treasurer Alec Lovett presented a donation on behalf of R.A.T.R.S. to "The Tape Bank Trail." Later in the evening Ken explained the significance of the trail to those present.

The B.R.C. Secretary was invited to present gold-embossed diplomas to students who had attended the full six-week course.

Alec then recounted the stories behind the examples played of tapes recorded for the B.R.C. Hospital Broadcasting Service, Blind Service and Educational Division. These were, respectively, the "Sound Edition" of "A.T.R."; a musical hospital broadcast; and a tape showing how recorders are being used as an aid to today's education.

No other magazine was represented at the debate, and we feel all the more proud therefore to have played an active part.

At the previous session, "A.T.R." columnist David Lazell had given a talk about "The Humour in Tape Recording." Some of his witticisms had stuck in the minds of many students. He was quoted more than once during the debate, providing everyone with a good chuckle.

One thing arising from the debate, of particular note, was the way in which recorders are all too often purchased for their novelty value, or as a means of "keeping up with the Joneses." It was felt that clubs should counteract this sterile approach by promoting the creative aspects of the hobby. More practical work—such as outside documentary recording—was urged.

The course has undoubtedly provided those who took it with a solid foundation of knowledge, on which to build their future recording activities. Congratulations to the co-organisers, **Mike Brown** and **Vera Tilecock**.

CEMENT MIXER



Warwick and Leamington's meeting had a strong stereophonic flavour. But the pre-recorded stereo tapes had to compete with the spasmodic chattering of a road drill, which apparently was smashing the ground floor of the Town Hall where the meeting was held.

Mr. Willis entertained with his satire on the radio programme "Down Your Way." His version had the title "Up Your Street."

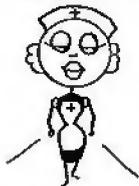
Members then turned to creative exercise and volunteers acted in an excerpt from "She Stoops to Conquer."

There has been what Club Official G. Harris

describes as a "general tape machine shuffle" amongst members during the last two months. Philips recorders would appear to be very popular — eight members have recorders of that make.

The Society has begun another season of competition tape making. The first of these, which was announced during the meeting, calls for a five-minute "music-concrete" experiment. One member turned round to another and whispered with dismay, "But I can't do anything like that. I haven't got a concrete mixer!"

STORY OF A HOSPITAL SERVICE



Originally contemplated as a minor Service of the Middlesbrough Club, the Hospital Service has since grown to considerable proportions. The Service, which started early in 1959, at first offered to provide equipment and an operator for a tape message scheme to and from patients and

relatives. Later on they turned their attention to producing entertainment programmes, and they succeeded in gaining admittance to a small room in one hospital where up to twenty patients could congregate, and hear the tapes played back over a member's machine.

This scheme operated for about five months, during which time the members gained experience, and technical quality improved.

Then the service was joined by Derek Trubshaw, a live-wire producer, who has since led it from strength to strength. Programmes are now relayed

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through the internal radio system to patients at a local hospital, and ultimately the club hopes to have a programme on the relay system serving all hospitals in the locality.

This story of just one hospital service provides a typical example of what many clubs are undertaking as a service to the less fortunate. May they continue to enjoy the voluntary support which enables them to carry on this wonderful work.

FROM CARBON MIKES TO "RIBBONETTES"



Ever tried playing a gramophone record with a bent pin instead of a needle! Perhaps not, but to expect to make good recordings with a bad microphone is no less foolish. Luckily good mikes are plentiful, as members of the West Wales Club discovered when they were visited by Mr. Pontzen, of Lustraphone. He provided an enlightening evening telling the story of the microphone industry from the time of the first carbon mike.

The instrument which gained top vote from members was the "Ribbonette." One member who since purchased this model, has made an excellent recording of Haydn's "Creation" performed by the University College of Wales Choral Union and Symphony Orchestra. This is just one of the numerous bodies that have requested the services of the club.

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INQUISITION



The Kettering Club's fortnightly meeting included a "Brains Trust" with Mr. D. Scotney (Radio and TV Engineer), Maurice White (Sales Chief of a local retailers), J. S. G. Potter (Treasurer) on the hot seats, and Chairman P. Labert refereeing. Nineteen members attended.

The club is interested in exchanging tapes with a similar club abroad. Any club interested is invited to contact Secretary A. M. Webb, 93 Regent Street, Kettering, Northants.

EMI THROW LIGHT ON SHRINKING I.P.S.

Representatives from the largest tape manufacturers in Britain (E.M.I., of course) recently gave a very interesting and instructive talk to the Reading Ciné and Tape Recording Society on the history and development of magnetic tape.

The Emitape men were able to give the history of tape from 1888, and some of the vast improvements made in manufacturing control can be judged from the statement that "the response from a half-track recording at a speed of 7½ i.p.s. today is no less than that from a full-track recording at 30 i.p.s. in 1948."

Members' questions were answered, and the open discussion proved of great benefit to all.

Plans for future meetings of this club include a pre-recorded tape evening and a "dem" of portable recorders.

ON TOP ONLY

When Bournemouth Club member J. Lawson heard a conversation between two teenage girls on the upper deck of a bus, he thought it would amuse other members. Luckily (like our own Jan Phillips) he always carries a portable recorder with him, so he was able to take down the "victims'" comments

without their being aware of it. And, indeed, the tape did amuse members, who heard it at the very next meeting.

Another tape played was one of Mr. Cadorth's two daughters giving poetry readings. This wound up (appropriate expression for a spool of tape!) with a set of "schoolboy howlers." When the laughter had fizzled out, Mr. D. Williams let off a banger, a recording of a firework display!

HEADS TOGETHER

The committee of the Swindon Club have got their heads together and between them have thought up a really lively programme for the coming season. The club has been fortunate in gaining permission to record some local talented amateurs. Members of this club are invited to tell the committee just what they want at their meetings. The committee will then try to bring the suggestions about. Don't be bashful!

IT'S HIS 46th

A combined sixth and seventh edition of Grantham Club's "Sound" magazine has made its appearance. The reason for the merging of the two numbers is that the Editor, Geoff Harris, has been ill. Mr. Harris does a splendid job with the magazine, which is distributed each month to other clubs, the local and tape recording press, to local dealers, and to about 80 other people.

Three meetings are described in this "bumper number." At the first, members tried their hands at making sound effects, one being the sound of a motor-car skidding and finally crashing into a solid object. The screeching of tyres was made with a piece of plastic scraping on the clubroom window. The engine noise was supplied by three members who made weird but lifelike sounds with their throats. The tinkling of breaking glass was made with the aid of a box of nuts and bolts!

At the second meeting, the club had access to an oscilloscope and signal generator. Both these instruments were used to find the frequency response of recorders, amplifiers, etc. The test also sorted out those members with "sharp ears." Everyone could hear 15 kc/s, but only a few could hear the 16 kc/s note.

The third meeting was devoted to Mr. Parrington's "Walter dem." This, by the way, was his 46th visit to a tape recorder club! You've still got 16 more to do, J.F.P.

LET'S MAKE A RECORDER

At the Sheffield Club's A.G.M., held in the Empire Hotel, the committee were re-elected en bloc for a further year. Chairman W. N. Anderson urged the Society to become even more active in 1960. He proposed that the club construct a recorder from scratch, as well as make outside recordings and visit hospitals.

Difficulty is still being experienced with finding a new clubroom, but despite this it was decided to revert temporarily to fortnightly meetings at a reduced subscription.

A list of events for future meetings was compiled. This includes play production, equipment "dems," outside documentary raffles and competitions, including the very popular "Five minutes or else" penalty game.

ALL AT SEA



There has been a "complete reorganisation" of the North Lincs Club, and the following have taken office: H. Fitzpatrick (President), N. James (Chairman), G. Leighton (Treasurer), N. Margaron (Secretary).

The changes were made at the A.G.M. held on February 2nd. After the official business was complete, those present heard a recording which three members had made of the landing of the catch from the Grimsby trawler *Alsey*, which had just returned from the "White Sea" fishing grounds. They were able to interview a member of the crew.

At the February 16th meeting, members had to guess the identity of famous voices. The winner was able to identify 18 voices out of a total 24. This competition proved to be very amusing and more are to be run on similar lines.

The meeting finished with a recording by Mr. James of his interview with a survivor of the ill-fated *Lusitania*.

CLARION EXPERIMENTS

Everything went with a swing at the last meeting of the Wakefield Club. Mr. Wood demonstrated his Stereo Ferrograph, and most people seemed to have brought recorders or recorded items along.

A library was started, and a number of books and periodicals will be available on loan to members. "Legacies" of suitable books would be greatly appreciated.

The Secretary, Ivan Chidwick, recently carried out some experiments with the Clarion Transitaape. The measured Mic. input is 450 ohms, not 200 ohms as stated by the manufacturers, reports Mr. Chidwick. With a good microphone of the moving coil type (Gramplan D.P.2 or 4) very good results can be obtained.

In one instance ordinary twin flex was used from mic. to recorder, unscreened, over a distance of 30 yards, with excellent results!

Clarion owners may like to experiment along these lines.

PRE-SPEECH TEST



At Coventry the resignation has been accepted with regret of Mr. Malcolm Simmons due to personal reasons. President Malcolm had been one of the founders of the club two years ago.

The newly formed programme sub-committee was introduced. Consisting of Henry Hopfinger, Peter Warden, and Howard Freer, its job will be to plan future meetings.

At the following meeting, the club welcomed a number of prospective members who came along to judge the results of playing a pre-recorded tape on various recorders. Seven members brought along their machines for this experiment, ranging from a Stereo Reflectograph to a Boosey and Hawke.

The difference between the smaller models and the larger ones was, of course, very noticeable, largely due to the size of the loudspeakers incorporated.

IS THAT MAGAZINE LOADED?

The Swindon Club recently heard an interesting talk by Mr. H. B. Diver, who has built his own tape recorder. He explained to members in simple layman's terms exactly how the recorder had been constructed.

Another lecturer, Mr. E. W. Mortimer, head of the Research Establishment at the Garrard concern, demonstrated their new tape deck, which incorporates drop-in-place "tape magazine" loading.

Although the club now has 20 members, only two of these are female, and a plea comes to us for "more of the fairer sex" to join the club. Any ladies interested in tape are very very welcome.

PUT AND TAKE

The recently formed Friern Barnet Club has gained a new member (male), but has lost another (female). Joyce Brown, a founder-officer, has had to resign due to pressure of work. The new member, although away on business at the moment, will soon be playing an active part in the club as he intends to rally members into entering the 1960 International Tape Competition.

"B" TRAC GOES MOBILE



With a meeting every week, the committee of the Birmingham Audio Club have a heavy task organising fresh and lively activities to keep the members happy. Fortunately, they are very much on their toes. An innovation of personal interest to me has been the forming of an outside broadcast section. "B" TRAC goes mobile, and all

members with portable or lug-able recorders will be able to take part in this venture. I hope to join in myself with my own Clarion. No doubt Dennis Osborne, of the Family Circle Club, will also be joining the party with his Fi-Cord. In fact, there will be quite a gathering of past secretaries!

By hook or by crook something new always turns up. This time it's by crook, by Alan Crook, in fact, who has formed a Tape Drama Group. The club is now rehearsing "The Dear Departed," a one-act play, produced and adapted for tapecasting by Mr. Crook. Alan is at present experimenting with sound effects for his play, and he says that "considerable ingenuity" will be called for if realistic effects are to be obtained.

The Hospital Section, directed by Barry Stephens and Molly Rickard, is about to extend its services, and will now take in patients of Summerfield House. Already three programmes for Heath Lane patients have been presented. Dennis Brown and Reg Smith make a tour of the wards and in "Down Your Ward" style, gather requests from each of the patients.

One of the club's members, "Tape Express" Editor Albert Greenway (who is, of course, also Visual Editor of this supplement, has been in hospital himself during the last month. No sooner was he discharged than this staunch supporter of tape recording was back at work turning out the seventh edition of what has gained the reputation of being the finest "local club" magazine, "Tape Express." This journal, which sometimes runs to some 12 or more pages, contains a hive of information every month.

members with portable or lug-able recorders will be able to take part in this venture. I hope to join in myself with my own Clarion. No doubt Dennis Osborne, of the Family Circle Club, will also be joining the party with his Fi-Cord. In fact, there will be quite a gathering of past secretaries!

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The Club suggests that in all instances it is advisable to first contact a prospective tapespondent by letter on the following lines:—

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I own a X machine and use X" spools playing at X i.p.s.
My interests are as follows:—*

Yours sincerely,

For ease of reading, particulars of Tapespondents are printed in the following order—name, occupation, address, interests, taste in music, type of machine and area of Tapesponding.

SCHOOLS DIVISION

Mrs. Francesk Seddon, **Pinkwell Junior School**, Pinkwell Lane, Hayes, Middlesex. 450 pupils, 8-11 years. Recorders used: Truvox, Grundig. Tape speeds: 3½ and 7½ i.p.s. Size of spools: 7in. and 5in. They wish to contact Commonwealth schools and others interested.

Mr. D. N. Atkinson, B.C., **Ashford County Grammar**, Church Road, Ashford, Middlesex. 750 pupils, 11-18 years. Recorder used: Spectone Mk. IV. Tape speeds, 3½, 7½ and 15 i.p.s. Size of spools: 7in.

Mr. J. W. Bartrop, **Rochford County Primary School**, Ashingdon Road, Rochford, Essex. 406 pupils, 7-11 years. Recorders used: Clarke and Smith STR/4, Ferrograph 4A. Tape speeds: 3½ and 7½ i.p.s. Size of spools: Up to 8½in. They wish to contact Canada, Australia, Norway and Ghana.

Mr. L. I. Daw, **The Grammar School**, Kibworth Beauchamp, Leicestershire. 500 boys and girls, 11-19 years. Recorder used: Telefunken 85 KL. Tape speeds: 3½ and 7½ i.p.s. Size of spools: Up to 7in. They wish to contact France, preferably provincial of about the same size.

Mr. C. J. B. Clark, School Librarian, **Twynham C.S. School**, Stourbank Road, Christchurch, Hants. Recorder used: Grundig TK 30. Tape speeds: 3½ and 7½ i.p.s. Size of spools: 7in.

The Reverend Edwin S. Towill, **Dunfermline High School** (Divinity Department), Dunfermline, Fife. 1,500 pupils, 12-19 years. Recorders used: Elizabethan Princess, etc. Tape speeds: 1½, 3½ and 7½ i.p.s. Size of spools: 7in. They wish to contact anywhere on any school interests, particularly reli-

gious education, but including sport, music, general discussion, etc.

Mr. J. J. Egglshaw, **Johnston Grammar Technical School**, Durham City. 750 boys, 11-18 years. Recorders used: Collaro Mk. 3, Grundig TK 5. Tape speeds: 3½, 7½ and 15 i.p.s. Size of spools: 7in. They wish to contact France, Germany, U.S.A. and Australia.

GEORGE PATRICK, Field Secretary, Social Service, 138 8th Street E., Cornwall (The Seaway City), Ontario, Canada. General and good music, chiefly classical, particularly seldom-heard music. Wollensak T 1500, 3½, 7½ i.p.s., up to 7in. spools. Any.

NORMAN O. JONES, Accountant, Bank Chambers, 8 Church Street, St. Helens, Lancs. Travel, photography, weight training, sport, general, camping. Classical or light (no extremes). Clarion Transi-tape, 3½ i.p.s., 3in. spools. Any.

GORDON MAXWELL SHEARER, Composer, Process Cameraman, 171 Prince Street, Peterborough, Ontario, Canada. Many and general, Salvation Army soldier. Bible study and recording with emphasis and an effective contact with the blind, lonely or handicapped. 35 mm. and process photography, short-wave radio, aviation. Classical, gospel or sacred, folk. Ampro 758, dual speed, anything up to 7in. inc. 3½ and 7½ i.p.s. Anywhere, but particularly overseas from Canada. English language only unless someone is like myself, trying to learn German. (A rank beginner!) Salvation Army soldiers or officers particularly welcome, from anywhere.

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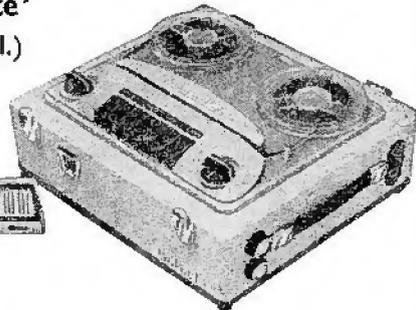


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STARTING CLUBS

ACTON, W.3

Mrs. Hilda Wiseman wishes to form a club in this area. She can be contacted on any evening after 7 p.m. at 8 Woodhurst Road, Acton, London, W.3.

HEREFORD

James Pegg, of 43 Wordsworth Road, Hereford, tells us that so far his efforts to form a club have been unsuccessful. His proposal to the local ciné club that a tape section be formed was outvoted. Mr. Pegg, a member of the British Recording Club, intends to try again, and invites prospective members to contact him.

OLDHAM

Local interest in the Oldham area is becoming more pronounced, says B. S. Craig, of 126 Main Road, Oldham, Lancs., but so far attempts to establish a club have been unsuccessful. Mr. Craig feels sure the club will emerge in this early part of 1960.

BLACKBURN

David Birtwistle, of 11 Pilkington Street, Blackburn, Lancs., has just formed a club in the Blackburn area, and will be happy to furnish details to all interested.

EASTBOURNE

Miss D. Harris is forming a club for tape enthusiasts in the Eastbourne area. Interested recordists should write to Miss Harris at 12 Victoria Mansions, Terminus Road, Eastbourne, Sussex.

CLUB REQUESTS

Don Dietz, of 1571 Pauline Drive, Sunnyvale, California, U.S.A., would like to hear from anyone possessing tape recordings of merry-go-round or carousel band organs available for purchase.

Mr. Frank Randle, programme organiser (Barnsley Tape Recorder Club), 301 Pontefract Road, Lundwood, Barnsley, Yorks, will be interested to hear from other club secretaries who prepare a request programme and any other members who would like to offer ideas. He is anxious to obtain tape recordings of pre-1930 hits.

J. Eric Wells, 41 Dudley Avenue, Kenton, Harrow, Middlesex (Harrow Tape Recording Club), says the club welcomes new members with or without equipment, and adds that tuition is given.

Dr. Frank H. Marz, 94 Downton Avenue, Streat-ham Hill, London, S.W.2, offers "FRAMAR" easy teaching language methods on tape, so if you are going abroad this summer, why not drop Dr. Marz a line for details?

Mr. T. W. Legg, of Flat 3, 80 Alcester Road, Moseley, Birmingham, is very keen to tapespond with a French tapist. Can any French club member or contact please assist?

Mr. J. McBride, Senior Staff Photographer of the Scarborough and District Newspapers Ltd., kindly offers to help any member interested in free lance photo journalism with advice on the best markets and the best selling types of stories and pictures, including ciné for T.V. work. His address is 10 Hatterboard Drive, Scarborough, Yorkshire.

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We haven't yet been very successful in the more remote parts of Siberia or in Indo-China, but we keep on trying and no doubt we shall get there yet! (Please refrain from commenting!)

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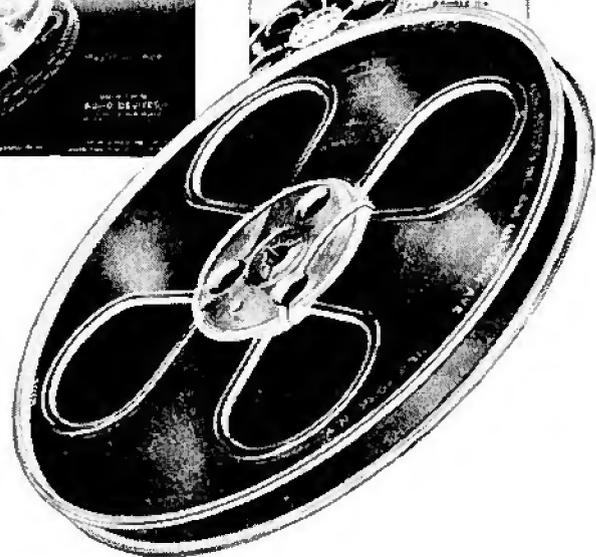
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TAPE TALK the monthly summary of queries by post

Dear Sir,



ANSWERS TO TECHNICAL QUERIES

The Panel of technical advisers of A.T.R. have been overwhelmed with letters and we apologise for any delay which may occur in replying. We feel sure that readers will appreciate that in a large number of instances it is necessary for the panel to acquire particular equipment in order to answer queries accurately and this of course takes time. Finally we would mention that due to the volume of correspondence we must now restrict this service to members of the B.R. Club and affiliated clubs only.

Mr. R. SAWYER, of 12 Glebe Crescent, Kenton, Middlesex, asks:

I have recently purchased a Bush 7 transistor portable radio. As this model has no extension speaker sockets I fitted one myself by connecting two wires to the loudspeaker of the radio. When I started to

record on tape all I could get was a very bad fluctuation of sound.

Would this be due to the radio having transistors in place of valves, and if so is there any way in which a successful recording can be made, from this type of radio, without the use of a microphone? My recorder is a Perth Saja Twin-de-luxe.

ANSWER.—So far as your present arrangements go we can only suggest you have a loose or dirty connection.

The practice of recording from the loudspeaker terminals is not a very good one. The impedance of the loudspeaker is usually 3 to 15 ohms; the input impedance of your recorder is of the order of 1 million ohms. Distortion can be caused by such a mismatch.

When recording from any radio it is far better to use some high impedance point to feed your tape recorder. On some recorders there is a high impedance output socket fitted. This is usually labelled "High Z O/p" or "Diode O/P."

Any radio can be fitted with such an output socket, but it is best left to a proper radio mechanic. This is especially true in the case of transistors as one slip can ruin every transistor in the set.

Mr. R. CLAYTON, of Liverpool, has two queries to be answered:

I own a Telefunken KL 85 tape recorder and a Cossor Model 580 Stereophonic record player. Is it possible to use the Heathkit F.M. Tuner Model F.M.T.4U (3/2/0d) for recording direct without a microphone, thereby replacing the amplifier unit with the amplifier of the tape recorder?

I would like to record direct without microphone from my record player without the risk of the high tension current passing from the record player to the recorder. Would you please tell me how to carry out the necessary alterations to the record player and whether it is necessary to use a screened lead.

ANSWER.—The answer to the first part of your question is "Yes." You can plug the Heathkit tuner straight into the "gram" input sockets on your tape recorder. The answer to the second part of your question is quite easy. From the points where the leads from your record player needle join the record player amplifier, solder a piece of screened lead. Bring the other end of the screened lead to a suitable socket mounted on the record



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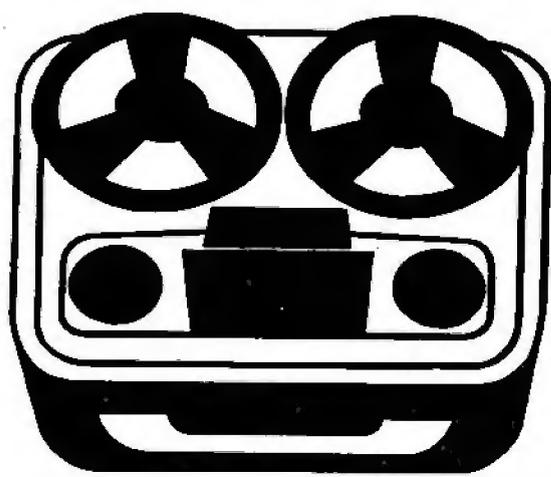
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player. We suggest a coaxial or Post Office-type jack socket as being suitable for this purpose.

Another piece of screened lead fitted at one end with a plug to match the chosen socket, and at the other end with a Telefunken tape recorder jack plug to connect the two instruments together completes the modification. The tape recorder end of the lead is plugged into the "gram" input socket.

By using this method the record can be monitored on the record player loudspeaker while it is being recorded. When playing back a recording on the tape recorder the record player amplifier and loudspeakers can be utilised by plugging the tape recorder end of the inter-connecting lead into the tape recorder's "monitor" socket.

Mr. F. MARMENT, of Port Talbot, writes:

I own a Philips A.G.8109 tape recorder, which has given good service for the past two years. The only facility lacking is the ability to superimpose on to an already recorded tape.

Can I fit a switch (push-button type) to either open circuit the erase head or bridge it with a resistance? If this method is not advisable, can you please give an alternative suggestion?

ANSWER.—You can fit a switch to switch off your erase head quite cheaply. Unfortunately, I doubt whether it would be of the "push-button" type. A more suitable switch would be the "Belling Lee" double-pole changeover switch. This has six contacts arranged as three pairs. The leads from the erase oscillator to the erase head must be cut. The ends from the oscillator should then be soldered to the centre pair of the contacts. The leads from the head should be soldered to one of the two remaining pairs of contacts and a resistor of suitable value soldered across the remaining pair.

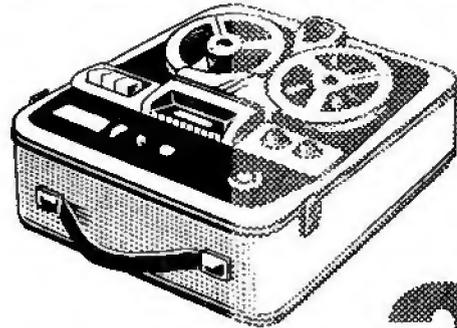
The reason for the resistor is to absorb the power from the oscillator when the head is out of circuit. The value of the resistor should correspond to the impedance of the erase frequency. This is best found out from the manufacturers.

Lastly, try to keep the switch and its leads away from such things as motors, transformers and mains leads.



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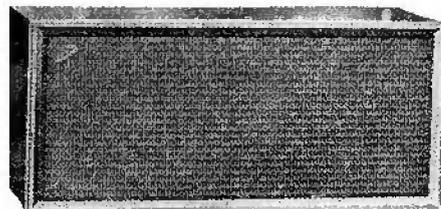
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"The Recorder Henderson! Throw me the Recorder"

PETER HOLLOWAY, of Hemel Hempstead, Hertfordshire, writes:

I have an Elizabethan Princess tape recorder and sometimes I feel a desire to switch out the internal loudspeaker of the recorder whilst playing back through either the extension speaker or external amplifier.

On examination I note there is quite an amount of cable to the loudspeaker, so I wondered if I could let a switch in this cable and drill the cabinet to take same.

ANSWER.—You can fit a switch as you suggest in one lead to the internal speaker, but make sure the lead is one to the speech coil and not to the output transformer on the output valve side, i.e. the primary.

The leads to the speech coil usually go straight into the speaker from two solder tags on the frame. It does not matter which one you break with the switch. Any small single-pole on/off switch will do the job.

K. FIELDS, of Golcar, Huddersfield, says: I am interested in a portable tape recorder in the £25 region, and the Clarion appears to be about the only machine in this price range.

How does this compare with the Geloso Mk. IV deck? I don't expect much from any small speaker, but my H.F.T.3 (Mullard) amplifier is available for

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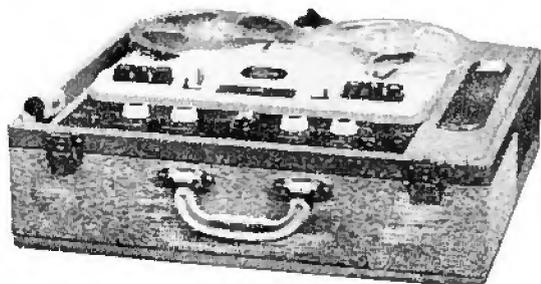
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home reproduction into a 12in. speaker and gives very good results with the Collaro heads.

ANSWER.—These small transistor recorders cannot compare with a more expensive machine using valves, and are not particularly suitable for music even when used with an external amplifier.

There is little to choose between any of them, the only favourable point being that the recording speeds are linear so that the tapes can be played back on a better machine.

Tapes made on a non-linear speed machine such as the Grundig Cub are unsuitable for replay on another machine.

P. KEEPIN, of Sydenham, London, has a number of points to raise:

I own a Grundig T.K.8 and a Cossor radiogram Model No. 529 with triple speakers.

The first snag is that the radiogram speakers do not seem able to cope with even half of the volume supplied even at normal listening level; the bass notes cause a thumping sound and the treble vibrates. I have checked the cabinet for loose fittings and fret but apart from the baffle board being rather thin, there is nothing to account for it.

Is a thicker board the answer?

The second question links with the first. When playing my T.K.8 back through the gram, sometimes with only the speakers used and other times using the amplifier, the thumping and vibration is even worse than using the gram on its own. I appreciate the T.R. and the gram speakers are not balanced, but is there another reason?

Regarding the Grundig, I have two or three dif-

ferent types of screened cable to record from the gram and the signal strength varies with each cable.

I also record direct from the pick-up base. The result is quite good except that I am unable to control the tone. Do you recommend this method and can you offer any suggestion?

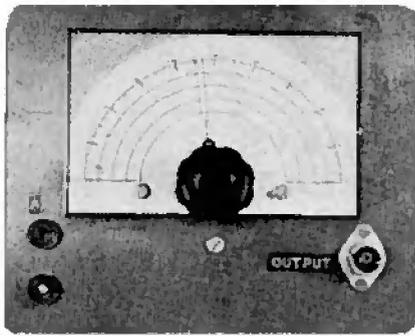
I wish to make a pair of column speakers and would like to know the correct size they should be in relation to the speakers fitted; also the type of speakers required to match the T.R.8 and the gram, or should I make a column speaker to match each machine, and what size speakers should I fit?

ANSWERS—

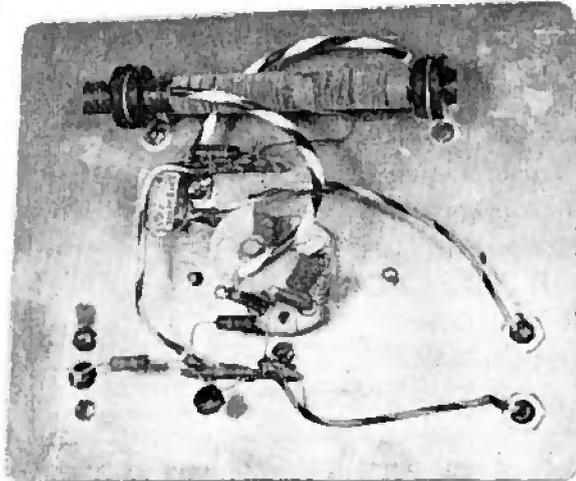
1. You may be grossly overloading the loud-speaker and likewise probably overloading the amplifier stages of the radiogram when using its internal speaker or amplifier. You should be able to take the recorder signals from a high impedance output and feed direct to the gram amplifier at low level. The Cossor radiogram may not be suitable for this purpose.
2. Your problem with the cables is difficult to answer as you do not state what type of cables they are or how long.
3. To obtain proper tone control when recording direct from the pick-up would mean inserting a passive tone control network between the pick-up and the recorder or using a special pre-amplifier which has very little gain but incorporates the necessary tone control system.
4. With regard to the design of column speakers, our advice is to consult the maker of the loud-speaker you intend to use. Both Wharfedale and Goodmans will supply literature on request.

CONSTRUCTING ACCESSORIES FOR YOUR OWN TAPE RECORDING

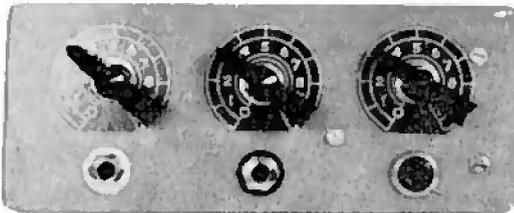
by F. C. Judd, A.Inst.E.



Front view of Diode Radio Receiver.

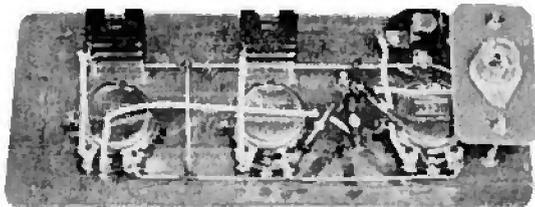


Rear view of Diode Radio Receiver.



Front view of Simple three channel mixer.

View of single mixer.



DIODE TUNER AND 3 CHANNEL MIXER

HERE ARE TWO new items for constructing on the kitchen table and which call for little in the way of technical knowledge and tools. Both are useful items and together with the simple microphone pre-amplifier described in the last article, may be used in conjunction with each other. For example, the microphone pre-amplifier may be plugged into one channel of the signal mixer unit, the diode radio tuner in the other, leaving a spare channel for a gramophone input or a high impedance microphone pre-amplifier to be described later. Alternatively two low impedance microphone pre-amplifiers may be used with the mixer leaving the third channel spare for radio or gramophone. The mixer is not suitable for microphones by themselves as there is some insertion loss; this means some loss of gain which is inherent in this type of mixer. That is why a pre-amplifier is necessary for microphones.

The diode radio tuner is a handy device and will receive the Home and Light programmes almost anywhere in the London area. It will be suitable for Regional station reception up to about 25 miles from the transmitter providing a reasonably good aerial and earth connection is used. The tuner uses a small ferrite rod as the basis of an efficient tuned circuit which has been designed to give the best possible station separation without losing sensitivity.

Constructional Details for the Diode Tuner

The unit may be assembled on a metal panel but take care that the tuning capacitor is insulated from the panel. The type of capacitor used in the prototype is mounted on ceramic and can be obtained from most radio component dealers. Alternatively a wood or paxolin panel may be used in which case a non-insulated type capacitor may be used, but note that the co-axial output socket body must be connected to the common earth line as shown in Fig. 2.

The tuning coil is wound on a Mullard Ferroxcube rod type FX.1482 and requires first a winding (L1) of 80 turns of 30 or 32 s.w.g. D.S.C. wire, the end of which is brought out to form a "tap" but continues on to the next section of the coil consisting of 40 turns of the same wire. The ferrite rod is mounted by means of two rubber grommets (internal diameter $\frac{1}{8}$ in.) slipped over each end of the rod. A short length of 18 or 16 s.w.g. wire is wrapped about two-thirds way round the groove in the grommets and secures the assembly by soldering the ends of these wires to the solder tags on the panel (see Fig. 2). These securing wires must not form a complete loop round the grommet and should be long enough to hold the coil about $\frac{1}{4}$ in. above the panel. Details for drilling the front panel are given in Fig. 1 and the assembly and wiring can be completed from Fig. 2 and the photographs. The aerial and earth sockets are insulated types and the tag strips are three way with one earthed tag.

CONSTRUCTING ACCESSORIES FOR YOUR OWN TAPE RECORDING

by F. C. Judd, A.Inst.E.

The crystal diode is a Mullard type OA70 although equivalent types by other makers may be used. The length of aerial required will depend on the location, but averagely 25 to 30 ft. of wire should bring in the local broadcast station(s). For example in the London area a wire round a picture should be ample. If the aerial is too long the selectivity of the receiver will be spoiled and two stations will be heard together. In this case shorten the aerial until just sufficient separation is obtained.

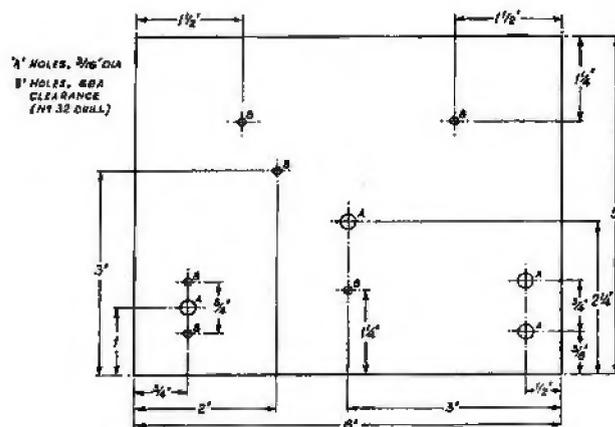
The output from the receiver should be sufficient to load the radio or pick-up input of most recorders, but if a little more gain is required a microphone input may be used instead. Connection to the recorder must in either case be made via a screened lead, co-axial plug on one end for the receiver and a plug suitable for the recorder on the other.

A Simple Three Channel Mixer

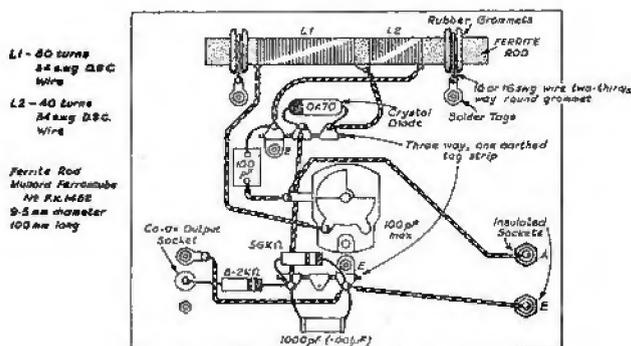
This is primarily intended for high level signals such as from a radio, pick-up or pre-amplified microphone signal. It is in fact, the most basic of mixing circuits and does have an insertion loss of its own which is approximately 10 to 12 dB. This prevents a high impedance microphone being used directly into the mixer as the loss would be too great. However, a simple valve, pre-amplifier for high impedance microphones will be given in a later article and the design will be suitable for use with this mixer. Owners of low impedance ribbon or moving coil microphones may use the transistor pre-amplifier recently described. Construction is as simple as the mixer and consists of 3 gain controls, 3 fixed resistors, 3 input jacks and a co-axial output socket which is mounted on a small panel attached to the back of the main panel. Dial transfers will enhance the finish and permit accurate settings of the controls which may be small pointer type knobs. The gain controls must be logarithmic type potentiometers and any good quality make such as Morganite, Dubilier, Plessey, etc. will do. The three jacks should be self-shorting, insulated types. All the components are mounted on the metal panel (brass, aluminium, mild steel) for which drilling details and dimensions are given in Fig. 3.

Wiring is simple and a pictorial guide is given as Fig. 4. A three-way (one earthed) tag strip is used to carry the common connection of the three series resistors which are standard $\frac{1}{4}$ watt 20 per cent types 220 k.ohms. Make sure that the gain control metal covers are earthed and for this purpose practically all shielded controls are fitted with a separate earthing tag.

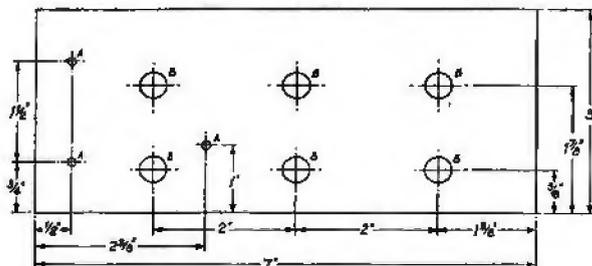
The theoretical circuits of both the diode receiver and the mixer are given in Fig. 5 and 6 respectively. All components should be readily available from radio component dealers; the receiver transfer tuning dial can be obtained from Data Publications Limited, 59, Maida Vale, London, W.9, and the gain control dials from Rotech Electronics, 152, Maybank Road, London, E.18.



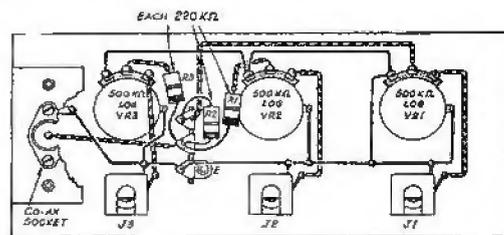
PANEL DETAILS FOR DIODE RECEIVER Fig. 1



PICTORIAL WIRING DIAGRAM OF THE DIODE RECEIVER Fig. 2

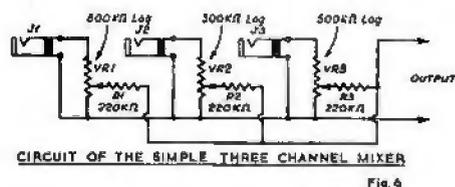
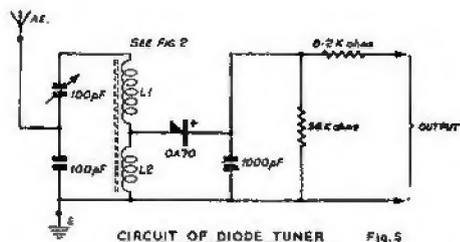


PANEL DETAILS OF SIMPLE THREE CHANNEL MIXER Fig. 3



PICTORIAL WIRING DIAGRAM OF THE SIMPLE THREE CHANNEL MIXER Fig. 4

The next article will contain details of a power supply suitable for driving a microphone mixer or pre-amplifier.



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SWITCH ON — THAT'S THE SPIRIT !

By Lorna Gulston.

THERE IS, of course, not the slightest reason why it should thrill you to know, but I think I ought to tell you just the same—I am *not* psychic. The only species of spectre which whisks my hackles on to their hind legs is H.M. Inspector of Taxes, of whose existence I have evil and irrefutable proof because I received a communication from him today, through the "medium" of the Post Office, which reveals a condition of such nasty, suspicious covetousness over my pitiful little income that it is clear that I, single-handed, have been saddled with the travail of laying the National Debt! Fundamentally, I'm a downright sceptic about Luck and Horoscopes and crossed knives and Friday the 13th and diaphanous white Things loping round tombstones, and I'll keep on walking under ladders until somebody drops a paint-pot on my head. I hold no brief for spirits which announce their advent with anything other than a homely "pop," and I went sour on my perfidious Sagittarius ever since the Saturday it swore that I should have "Exciting and Profitable News Concerning Finance," and as I flung the paper from me, crowing exultantly and dreaming of stereo, the postman rang to deliver a husky bill for repair of the TK5 six months before!

You will see, therefore, that I was a bleak sort of prospect for occult pranks, and when my friends suggested that we speed the waning hours of the Old Year with a table-turning session I laughed like a drain. You know the kind of thing—the 26 letters of the alphabet, the words "yes" and "No" and numbers from 1 to 10, written on pieces of paper and laid in a circle on a polished surface, with a glass tumbler turned upside-down in the middle so that as many as intend to participate can lay their fingers on the rim of the base, the idea being that, when asked questions, the glass flits from letter to letter spelling out answers. I'd heard about this but never seen it done, and my theory was that some cad always pushed. However, I was quite eager to give it a try, if only to see who was the one with the unscrupulous finger, so the alphabet, etc., was duly scattered, a very ordinary, harmless tumbler was up-ended on the table, and, scorning the mumbo-jumbo of darkness and dedicated deathly 'ush, we sat down to await developments in the full glare of the electric light with the TV rollicking away and a sturdy fire prancing in the grate.

There were five of us engaged on the operation. My friend Betty, her sister Dorothy, her brother-in-law Derrick, and myself, were dispersed in chairs round a small table, with fingertips touching the glass, and the fifth member of the team crouched in the corner going round in circles. This was NOT a form of incantation, or the result of over-indulgence in the worldlier brand of spirits, but happened to be normal procedure, since our colleague was, in fact, a Gramdeck working on the turntable of a record player, for the purpose of blinding any innocent unsuspecting Visitation with Science.

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"I'm afraid I've scared it off," I said.

"Oh no—it takes time to warm up. It'll come, you'll see," Dorothy assured me, and just at that moment (when an old man in Peru may well have been scratching his left ear) the tumbler glided across the table and took up a measured circling motion.

"We're off," observed Derrick, and indeed we were, as the tumbler pirouetted like Margot Fonteyn in "Swan Lake."

I don't mind admitting that I was a little bit shaken. Try as I would, I couldn't for the life of me *see* anybody cheating, and a glass *couldn't* propel itself along without any human persuasion—of *course* it couldn't! My reaction was akin to that of the dogmatic old gentleman who, faced with his first giraffe, exploded "Preposterous, by Gad! There's no such animal!" However, we were obviously tuned in on remote control, or something, since there was our inanimate piece of kitchen equipment doing an eerie Charleston, so the conversation began, and it was all very odd.

Our "guide" professed to be one Bill Cartwright, an erstwhile Viking who had expired in 2 BC at the age of 64 and who was at present resident on a planet known as "Ram". We felt that there was an anachronism somewhere, and "Cartwright" sounded a most un-Viking-like name, but our correspondent explained that he'd been on the Viking Advance Party (presumably complete with the time-honoured "knife, fork, spoon, plate and mug") and that later he'd become a naturalised Briton, and our combined Ancient History inclining to the threadbare on the far side of 1066 And All That, we didn't dare contradict him.

After the usual frivolous questions ("Am I going to win the Pools?") we graduated to meaty, intellectual exchanges, and even learned, with mixed feelings, where we were to spend Eternity. Dorothy and Derrick were bound for the galaxy Orion, Betty and I for Ram (to join Bill!), and a few other people of varying degrees of virtue about whom we enquired were destined respectively for Pluto and two mysterious planets entitled "Goth" and "Heren". Incidentally, if any knowledgeable amateur astronomer has ever heard of Ram, Goth or Heren I'd be interested to learn that they do in fact exist.

Now this was all very well, and delightfully Jules Verne, but so far the patient Gramdeck had been a sleeping partner, and since it was to be the *pièce de resistance* we decided it was time to make use of its services. But first—happy task!—we had to take

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traditional leave of the Old Year, and as Derrick went out to undertake the uncorking he said whimsically

"We'll be back with you in a little while, Bill. Have a drink yourself, on us, while you're waiting."

The strange, nonsensical thing was that the tumbler went empty and dead, as if something had seeped out of it, but for the next few minutes we were engrossed with glasses which were alive and full, though we *did* remember to invite Bill to join in "Auld Lang Syne." At ten past twelve, when 1960 had shed its shell and was cheeping feebly, we got down to business again.

"Are you there, Bill?" asked Betty.

For a moment there was no response, then the glass began to move, in a fumbling, erratic fashion, towards the "Yes", paused, made its way back to the centre of the table, and orbited lopsidedly.

"Did you have a drink?" I ventured, and again it headed for the "Yes", with more determination than accuracy.

"Are you DRUNK, Bill?" grinned Derrick, and, bless his honest Viking heart, back went our astral friend to "Yes". At this we all roared delightedly, and the glass began to circle faster, faster, until it was swooping round in a positive frenzy of indignation so that our fingers could scarcely keep pace with it. Poor Bill—we had to beg his pardon very humbly before he simmered down and re-opened diplomatic negotiations. We asked him a few easy questions until his head cleared, then we resolved to venture on our Great Experiment.

"Bill," wheedled Derrick, "Could you speak to us

directly, not just through the glass?"

This apparently was child's play, as Bill hit the "Yes" at a gallop.

"Could you record on tape so that we could play it back and HEAR you?" Derrick pursued.

The glass spelt out "Only 1."

This took us aback and brought the thing down to an uncomfortable personal level.

"Which one?" murmured Dorothy.

It was a tense moment, like the dénouement scene in the final chapter of a "whodunit," as the Inspector, lighting a cigarette to prolong the suspense, says evenly (Inspector's voices *never* break into an excited squeak of triumph) "Ladies and gentlemen, one of the people in this room is the murderer . . ." Mildly panic-stricken, I wondered if my Ulster Irish left me wide open to "feyness," but Bill had no doubts on this score either. *Betty*, to her consternation, was Teacher's Pet!

"Yes, but if only I can hear you, how shall I ever get the others to believe me?" she protested plaintively.

Bill gyrated in enigmatic unhelpfulness, indicating that that was Betty's headache, not his.

"Will you record *now*?" enquired Derrick.

Yes, Bill would. Offered a choice of microphone or radio he was perplexed—after all, the Vikings hadn't even been around when Henry the Eighth invented polygamy (or was it Casanova?), so poor Bill could be forgiven for thinking that wow and flutter was another name for a naughty night with the nordic nymphs in the Palais de Danes. He finally took a

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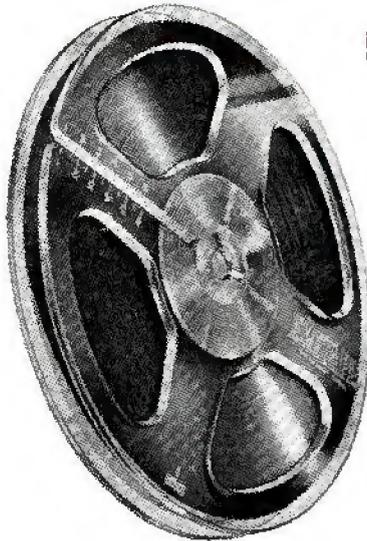
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Jan has her birthday sign pointed out to her by Commander Fanning. For those unfamiliar with the Zodiac it is Aquarius.

BEHIND THE SCENES AT THE LONDON PLANETARIUM

Tape viewed
by
JAN PHILLIPS



Dick Bendall "rectifies" Jan's knowledge on the Control Room equipment.

One of the three E.M.I. machines used in the Control Room.



It was opened on 19th March, 1958, in the presence of the Duke of Edinburgh—the first commercial planetarium in the world. Many famous people have since been there: Prince Charles, the Duchess of Kent, Sir Laurence Olivier, Mrs. Pundit, Salvador Dali—and Jan Phillips. The last, knowing least, learnt most, for I must admit that I did not really know what to expect as I approached the London Planetarium, London's latest entertainment, situated next door to Madame Tussaud's Exhibition. All I knew was that it had been built on the site of the Madame Tussaud's Cinema, destroyed by a British bomb in the last war (the bomb was captured by the Germans at Dunkirk).

I entered the very modern foyer with its angled windows and signs of the Zodiac, set in the mosaic floor, and could almost imagine myself in a flying saucer. The staircase leading up to the auditorium has a huge mirrored wall, fronted by a glorious floral display. The auditorium itself was circular in shape with a huge dome soaring over our heads for a ceiling. All round ran the skyline of a great city, thrown into sharp silhouette by concealed lighting. Familiar buildings caught my eye—the Houses of Parliament, St. Paul's, Tower Bridge, the Albert Hall. . . . We were indeed standing in the middle of London.

As I glanced around, the bulk of a strange machine dominated the whole room. Straddled on two lattice supports in the centre of the auditorium, it looked like some two-headed monster from outer

Action stations on deck as music is fed to the auditorium.

space, brooding with latent power, waiting to leap into action. Lt. Commander A. E. Fanning, M.B.E., D.S.C., E.R.A.S., who was to take the presentation later that evening, took me under his wing, and with almost paternal affection told me something of this machine, the Zeiss Planetarium Projector—a 20th century space and time machine, manufactured by the Carl Zeiss Organisation in Western Germany. It cost £70,000, weighs 2½ tons, is made up of 29,000 parts, and contains more than four miles of electrical wiring. Nearly 200 individual projectors are interconnected and driven by seven electric motors. The calculations to compute the driving gears, which give the incredibly accurate results filled 600 sheets of foolscap.

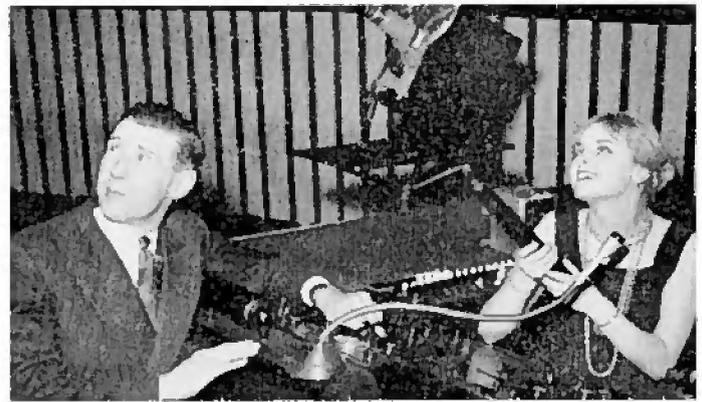
Commander Fanning, who is one of the six narrators employed in the Planetarium, was careful to explain that he and his colleagues are narrators and not lecturers. The Planetarium presentations are devised as pure entertainment. The narrator's role is that of guide, counsellor and friend, bringing the wonder and mystery of the heavens and the excitement of the space age to people who have no knowledge of and, indeed, little interest in astronomy. He took me to the console from which he controls the instrument. To my eyes it looked a confused jumble of levers, knobs and handles (there are in fact more than 75 of them), and they have to be operated in total darkness—but he assured me that once they have been mastered (sounds easy when it is put like that) it is no more difficult than driving a high-powered sports car at night.

As he was explaining some of the other equipment which he controlled from the console, equipment which produced meteor showers, wonderful enlargements of the moon, planets, and a device which reproduced our solar system seen from the remoteness of space, soft music suddenly filled the air, and the audience started to enter to fill the 555 seats.

It was 15 minutes to zero hour, so Commander Fanning took me into the Control Room, the nerve centre of the Planetarium. Banks of switch gear, rectifiers and transformers filled three sides of a fairly large room panelled out in acoustic board. The centre of the room was occupied by the music desk, housing three tape decks, two pre-amplifiers, and four amplifiers supplied by E.M.I. On one side

(continued on page 71)

Jan at the console.



"I shot an arrow in the air . . ."

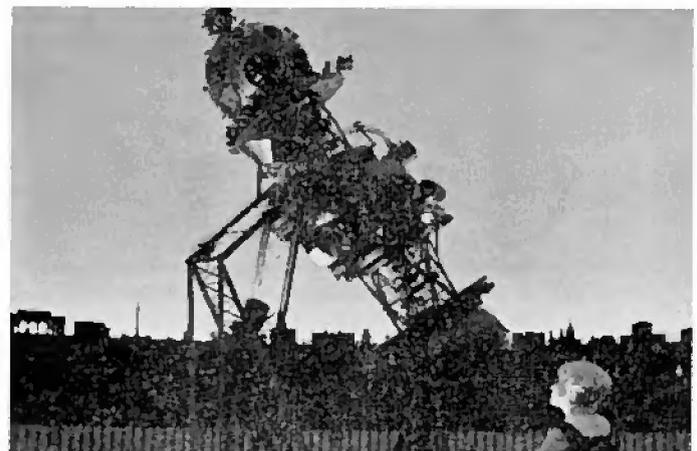


Commander Fanning suggests an alternative method of examining this £70,000 instrument.



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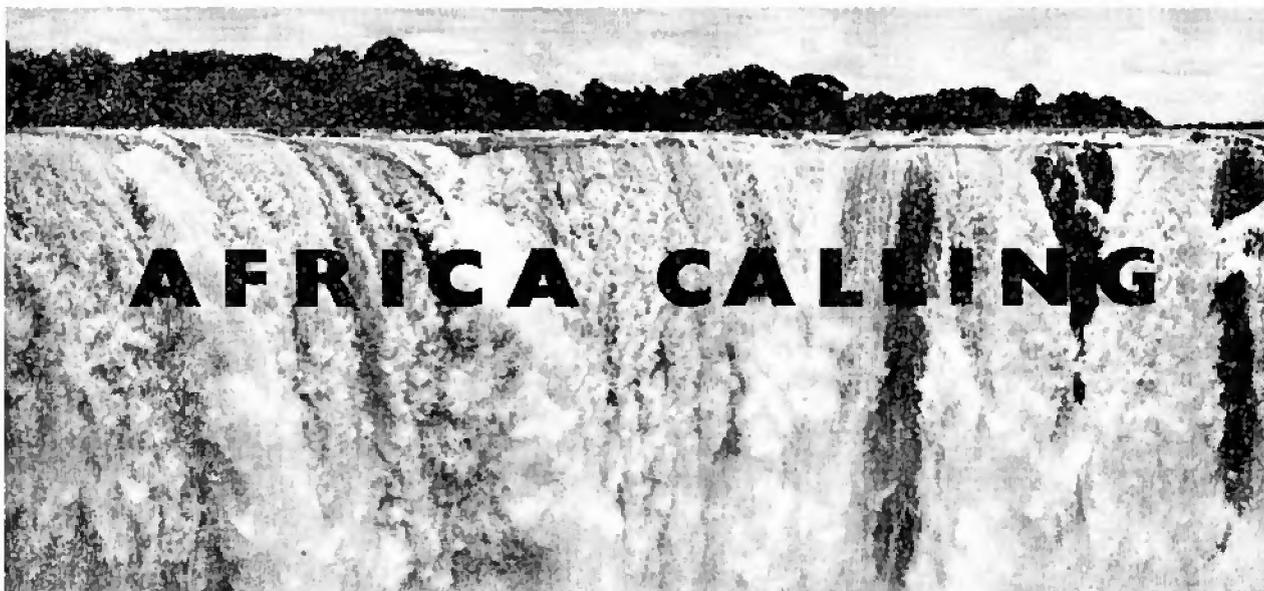
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Bob Rowley reports from Livingstone, Northern Rhodesia.

I HAVE been running my own business (radio and electrical) here in Central Africa for almost two years. Though it is obvious that I am, therefore, a "new dealer," I'm very thankful for that fact because I have come in on what, to my mind, is one of the most interesting and fruitful periods in the industry. I refer to the development, as a public requirement, of tape recording.

Here in Africa we are beginning to realise the greater possibilities as a medium of expression of the tape recorder. Its first effect has been, perhaps, the realisation that tape provides the personal touch that no amount of letter writing can ever give, and I know that many people here in Central Africa, with close links to "home," have graduated from a Christmas "party message" to continuously circulating tape letters of news, views and opinions.



Let me say, here and now, that, in my opinion, the benefits of tapesponding, not so much with relatives, but generally with people throughout the world, are not yet fully appreciated.

For instance, Africa in general, and the Central African Federation in particular, are, and will be, very much in the news these days. If more people were in tape contact with this part of the world, how much less ignorance there would be of the general

situation! I don't mean that politics need to be aired. As an example, I had one tapespondent who said, "I don't suppose you live in mud huts out there, but what *is* life like in Africa?"

It may not be Darkest Africa any more, but there is a sad lack of knowledge about how we live out here, and Africa is not the only place in the world that people need to know more about.

I'm afraid I'm riding one of my "hobby horses," but I do sincerely feel that the more the "man in the street" in one part of the world can learn about his fellow "man" in another part, the sooner a world-wide peace will come. I firmly believe that tape is the answer, and, in my own small way, I'll do all I can to further this ideal.

Three things stand out above all others when one reviews developments in the past two years, although out here, we have not, as yet, reaped all the benefits. They are:

1. The endeavours and success of manufacturers in producing tape recorders at a price range in reach of all, yet without appreciable deterioration in quality.
2. The realisation that the serious tape "amateur" looks for facilities normally only available to the "pro," and the provision by some manufacturers of these facilities, again at reasonable cost.
3. The development of transistors, battery motors, etc., which has enabled us to have completely mobile tape recorders which are no longer toys, but serious instruments. I shall look for even greater advances in this field during this year of 1960.

I should, perhaps, have mentioned the other very important fact, improvement in record and/or playback heads, which has resulted in high performance at lower speeds. It is not so long ago that 15in./sec. was considered the only worthwhile speed for quality recording, yet, in these days, 7½in./sec., and even on some models 3½in./sec. will give comparable results with those early 15in./sec. speeds. Such is the benefit of research and development!

My biggest disappointment?

The inability, lack of interest, take it or leave it attitude of most recorded tape suppliers, who can-

not, or will not, see the revolution that has taken place in the tape field. They will still supply what is, again, to the "man in the street," who is their main customer, a virtually obsolete speed and size: 7½ in./sec. and a 7 in. reel.

It's the old story of supply and demand. When consumer requirements are met, then consumer demand will rise. Simple, isn't it, but how hard it appears to be to bring about.

A problem of ours which, I'm glad to say, has now eased considerably, has been recording tape. In this country, where we have high temperatures and, worse, high humidity, we have, in the past, suffered much through tape stretch, twist, warpage and breakage. Some of the earlier long-playing tapes became almost useless after a few run-throughs, and I have, on a number of occasions, had to discard a tape completely after a storage period, because the warp was so bad as to make it unplayable through the machine (and, be it noted, professional equipment and tape!).

Now, I'm glad to say, there is little or no fault to find in this respect, but there is still a certain amount of "consumer resistance" to long-playing tapes, dating back to those bad old days.

This particularly applies to one consumer field, and one, to my mind, that deserves special attention. It's a growing body, not only out here, where conditions are ideal all the year round, but also in Britain. I refer to the ciné enthusiast, who is now becoming a tape enthusiast too.

The thrill of home movies, complete with effects, commentary, background music and what have you, has become a reality to the 8mm. ciné man, through the medium of the tape recorder and the various sound couplers, synchronisers, and other devices.

This means that tapes have to be able to stand the extra strain of additional drives and devious routes, without stretch, warp or breakage.

I well remember doing a sound track, with a colleague, for an instructional film, on behalf of the local ciné club. In those days our equipment, on the tape side, was rather inadequate, and this film, which only ran for 4½ minutes, was rather loaded with closely timed effects and music. We battled one night from 9 p.m. to 3 a.m. synchronising speech, effects and music into a complete sound track.

Then, to our horror, we discovered that the tape, after running back and forth numerous times across the hot machine, had developed such a warp that it would no longer ride straight between the capstan and drive wheel, but lifted up and out! Hence the loathing of L.P. tape!

Now, however, with improvements in backing, such happenings are unlikely, although our local ciné enthusiasts stick to normal tape to be on the safe side.

Finally, and still in the same field, here's a possible suggestion to manufacturers. There is a need in sound track recording (and in other fields, too) for a second tape recorder for playback purposes only. Output power need not be high, and no recording facilities are necessary. Bearing in mind that a good tape recorder is fairly expensive, making the acquisition of a second model difficult, a playback deck at a cheap price would be a boon.

How about it, manufacturers?

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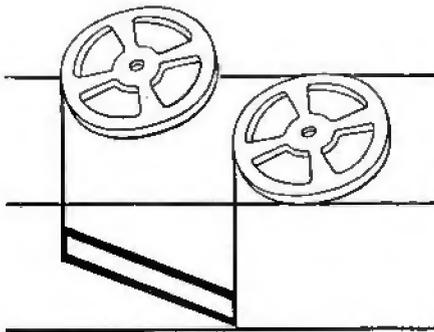
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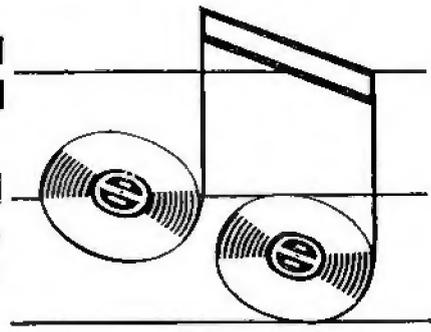
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TAPE and DISC REVIEW



by STANLEY R. WHITE

(DISC)

"KID ORY AND HIS CREOLE JAZZ BAND"

(featuring Red Allen).

H.M.V. CLP 1329 (12 inch LP) Mono.

Kid Ory, Trombone; Henry "Red" Allen, Trumpet; Bob McCracken, Clarinet; Cedric Haywood, Piano; Frank Haggerty, Guitar; Charles Oden, Bass; Alton Redd, Drums and Vocal.

Recorded: Hollywood, July, 1959.

The band heard on this record is almost identical to the one which visited this country on a concert tour last year. The only changes are the addition of Frank Haggerty on Guitar and that Charles Oden replaces Squire Gersh on Bass.

I have happy memories of the Ory band's visit; in particular the wonderful session they played in the De Montfort Hall in Leicester. This band is one of



THE GRAND OLD MAN OF JAZZ STEAMS IN

Kid Ory, who, at 75, is revered by jazz traditionalists as the veteran maestro of the trombone, arrives with his five-year-old daughter Babette at Liverpool Street Station, London, October 14, 1959. He and his Creole Jazz Band have just completed a successful tour of Scandinavia. Kid Ory is renowned for the many jazz greats with whom he has played. They include such household names as King Oliver, Sidney Bechet, George Lewis and Louis Armstrong. He will tour Britain with the band, which includes Bob McCracken, Alton Redd, Cedric Haywood and Squire Gersh.

the few remaining which can still play the real New Orleans style of jazz, and it is hardly any wonder, for the band has its roots in that City of Jazz.

My brother was fortunate enough to tape record an interview with 73-year-old Kid Ory whose memories go back to the early days of jazz and of happenings that have become legend. Ory recalls the time when Buddy Bolden asked him to play Trombone with his band, but his sister stopped him, saying he was too young. Ory tells of the days when the famous King

Oliver played trumpet in his band, and that it was Kid Ory who named Joe Oliver "King".

Those of you who want a permanent reminder of the Ory band's visit cannot do better than buy this record. The drive of Ory's trombone, the solid trumpet solos of Red Allen, and the opportunity to hear again the Clarinet of Bob McCracken, the vocal on "Ain't Misbehavin'" by drummer Alton Redd. Probably the finest moments are without the solos with the band beating it out together, and always with Ory in command. At a gesture from him they sink to a whisper—only to open up again at the command. This is the real jazz, and I doubt if any other band will ever again capture the spirit of the music the way these do. It was born in them. If you are a "Trad. Fan" you must have this.

Titles.

In the Mood; Blues for Jimmy; Ain't Misbehavin'; Honeysuckle Rose; Peoria; I Wish I Could Shimmy Like My Sister Kate; Tishomingo Blues.

(TAPE)

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(TAPE)

"SALUTE TO HARRY JAMES" (Music on Tape). 36 mins.

Stereo	CAS 8127	(7½ i.p.s.)	80/-
Monaural	CA 867	(7½ i.p.s.)	42/-
Monaural	CA 833	(3¾ i.p.s.)	32/-

Trumpet Blues; I've Heard That Song Before; Cherry; Two O'Clock Jump; Sleepy Lagoon; Strictly Instrumental; James Session; I Had The Craziest Dream; Velvet Moon; The Man with a Horn; Music Makers.

(TAPE)

"SALUTE TO ARTIE SHAW" (Music on Tape). 36½ mins.

Stereo	CAS 9127	(7½ i.p.s.)	80/-
Monaural	CA 967	(7½ i.p.s.)	42/-
Monaural	CA 933	(3¾ i.p.s.)	32/-

Begin the Beguine ; Dancing in the Dark ; Cross your Heart ; When the Quail come back to San Quentin ; Temptation ; S'Wonderful ; Stardust ; Frenesi ; Summit Ridge Drive ; Moonglow ; Nightmare.

The Brussels International Big Band is featured on the three "Salute" series tapes above. I dealt with one of this "Music On Tape" series last month, "Salute to Tommy Dorsey." In each case the band uses arrangements which are associated with the bandleader concerned, but it would be wrong to say that they manage to re-create the original sound each time. One can hardly expect a new Benny Goodman to emerge on Clarinet, or a new Trumpet stylist like Harry James. Yet in spite of the comparisons which will almost certainly be made by people who have followed these different bands, these recordings stand up to the test extremely well. I don't suppose it was intended to copy the original, but merely put on record a pleasant reminder of it, and this has been done. The playing of the band is as smooth as silk, with the solo instrumental work far above the average. I only wish I could give you the names of the individual musicians concerned, but unfortunately this information is not available to me.

The size of the band varies according to the required sound ; the small groups of Goodman and Shaw are represented, a string section is also added for some of the Artie Shaw arrangements (as on his original recordings); and the "lush" sound of the Harry James orchestra is presented with the saxes and lovely solo Trumpet work. In spite of what I have already said, I'm half convinced that Harry James himself must have supplied the trumpet solo a couple of times, although I realise this really isn't so.

up microphone techniques, equally good whether monaural or stereo, with a rich clean reproduction.

Tapes are supplied in the "Music on Tape" smart black boxes with the titles inside the lid. Available through your dealer or direct from "Music on Tape," 6 Laurence Pountney Hill, London, E.C.4. The company also work in close co-operation with D.G.C. Ltd., of 41 High Street, Camberley, Surrey, who deal with the distribution of "Music On Tape" products.

(DISC)

"ME AND THE MOON". Brunswick OE 9472.
No. 1. BING CROSBY.
Me and the Moon ; Sail Along Silv'ry Moon ; The Moon was Yellow ; Moon of Manakoora.

"ME AND THE MOON". Brunswick OE 9473.
No. 2. BING CROSBY.
The Moon and the Willow Tree ; When the Moon Comes Over Madison Square ; Pale Moon ; Got the Moon in my Pocket.

The Bing Crosby songs on these two extended-play records date back many years, the reproduction quality is not all that good, and yet I know a lot of people will buy them. Especially the first one, which contains a recording that has been a rare "collectors' item" for years, "The Moon Was Yellow." It was issued here in 1934, but the pressings were faulty due to a damaged master copy, and the record was withdrawn without ever being put into the catalogues.

After all these years, the number has been placed in the catalogues for the first time, and what is more, the opening bars of the record are still marred by the original distortion—but this is a collectors' item, and I am proud to add it to my collection. Bing sings pleasantly on all the numbers, in his earlier voice of course, and if you enjoy Der Bingle, then you can't go wrong with these.

(DISC)

"NEW ORLEANS" (Do you know what it means to miss).

"A CLOSER WALK" (Just a Closer Walk with Thee).

Pete Fountain. Clarinet Solo with Rhythm accompaniment. Coral. 45-Q 72389.

It is not often that I bother to review single pop releases here. However, there will be exceptions and this is the first. Pete Fountain is one of the younger musicians who hail from the City of Jazz, New Orleans. I presume that the idea for releasing this record of him playing solo clarinet, is to cash in on the current popularity of Clarinet items in the hit parade. Both numbers are extremely well played by Fountain with a very warm tone ; at times not unlike the pre-war Benny Goodman. "New Orleans" is a good melody, but the side containing the best Clarinet work is "A Closer Walk;" this number is, of course, the famous "Just a Closer Walk with Thee" which has been recorded by almost every jazz band of the past

(continued on page 70)

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CLUBMAN PROFILE . . .

The Man behind the
"MIKE"

P. A. DUGGAN

It was some eight weeks after my enforced "semi-retirement" due to a version of a complaint that has become very popular in recent years, namely, a slipped disc, that I first obtained a tape recorder—that was three years ago practically to the month.

I had overworked myself decorating, etc., following moving into new accommodation, and found that on New Year's Eve I realised all was not well with my back. So it can be imagined what my wife Betty's disappointment must have been when I told her that my doctor had forbidden me to attend



a New Year's Eve dance—but to rest up and see a specialist!

Well, one thing led to another and eventually I ended up being made more or less immobile by the encumbrance of a plaster cast running from hip to neck.

I found that as time dragged by, with my wife out all day running a hairdressing business, that

the days were becoming increasingly boring; I read until I was nearly cross-eyed, I watched television until I knew every commercial by heart, and I used to listen to the wind whistle in an eerie sort of way round our chimneys. I used to imagine I could make up tunes out of the notes it used to pitch.

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fine!*

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It was then that a friend of mine said, "Why don't you buy yourself a tape recorder?" That's it, I thought, just the thing to keep me amused; I could record all those commercials all on one tape—then burn it! But a serious thought did come to mind. How about recording all my old records on tape—they were becoming increasingly worn each time I played them, so why not put them all on tape and preserve them?

And that is what set me on the road to tape recording. If it hadn't been for my original Grundig TK 5 during those 5½ months' enforced confinement to the confines of my flat, I think I'd have blown a gasket!

However, since those days I have made many varied recordings of radio and television programmes, outdoor sounds, dance bands and my own periodic "music sessions" at home. Some 2½ years ago my late father-in-law decided he would follow suit and bought a Grundig TK 820 Specialist, and he said that I should have one also, as the TK 5 was no match for his! So, by various means, I said goodbye to my first recorder and came home one day the very proud possessor of a Specialist.

My first introduction to taping was through him. He went away a couple of years ago to his bungalow out along the North Wales coast for a holiday, and one evening while Betty and I were having our evening meal, the idea occurred to me to record a message in the kitchen over our meal in the form of a running commentary on what we were having to eat; the sound of clanking pans, the gas jets blazing on the cooker, tea being poured out,

knives and forks clattering on plates, water being run into the sink to wash up the dirty dishes, and all the ancillary sounds that go to make up the preparation and demolition of an evening meal; all, I might add, to the accompaniment of the 6 o'clock news, The Archers and Radio Newsreel! The only thing that wasn't recorded was the smell of the meal!

This was duly dispatched and caused quite a stir on playback. Here at last was a way of sending a much more intimate message than the mere application of pen to paper; and so it went on, every time the family was temporarily parted due to holidays, tapes were used to exchange messages.

From these humble beginnings I joined the British Recording Club immediately after I had purchased my first copy of the magazine. The idea of taping with unknown people appealed to me immensely.

The excitement became intense when a couple of days after my announcement first appeared in the directory, my first tapespondent's letter arrived by the morning post. I read it and reread it, and then, during the rest of the day, whilst at the office, I wondered whether I should in fact go through with it. The thought of filling up a tape of a half-hour duration filled me with horror. I'd never be able to talk to someone of whom I knew nothing, barring what information I could glean from that letter. Anyway, I said to myself what should I do—write out my first tape in the form of a speech? No—that would sound too artificial. But what about all those embarrassing pauses when I became stuck for words—well,

there is always the temporary stop button!—and so it was. My first message was duly dispatched, complete with innumerable pause blips, and er-er-r-r-m's, volume changes due to erasures and corrections. That, I thought, will surely mark the end of the acquaintance before it started!—but no. Practically by return of post came the reply, also containing numerous pause blips, and er-er-r-r-m's, volume changes due to erasures, and corrections!

Immediately my confidence knew no bounds. We are all human and can make mistakes, and, anyway, come to think of it—the message *would* sound much more natural if there was a continuous run through without pauses, even though there were breaks in the conversation. One could always use background music of some description or have the budgerigar chattering away in his cage, and so it has been ever since then.

Following my purchase of the Specialist I have gradually—as money would allow—built up my equipment, namely in the form of a W.B. Corner Reflex speaker enclosure, having an HF 1016 speaker and tweeter, a Verdik 10-watt amplifier and associated pre-amp, a Jason V.H.F. tuner and RC 54 turntable for records

I can now boast over a half a dozen very interesting contacts in various parts of the country and Commonwealth and although of late my activities have been somewhat curtailed due to a technical hitch in my equipment, I can now thankfully say that I am back "on the air" and look forward to, with grateful thanks to the B.R.C., many more happy hours taping with friends all over the world.

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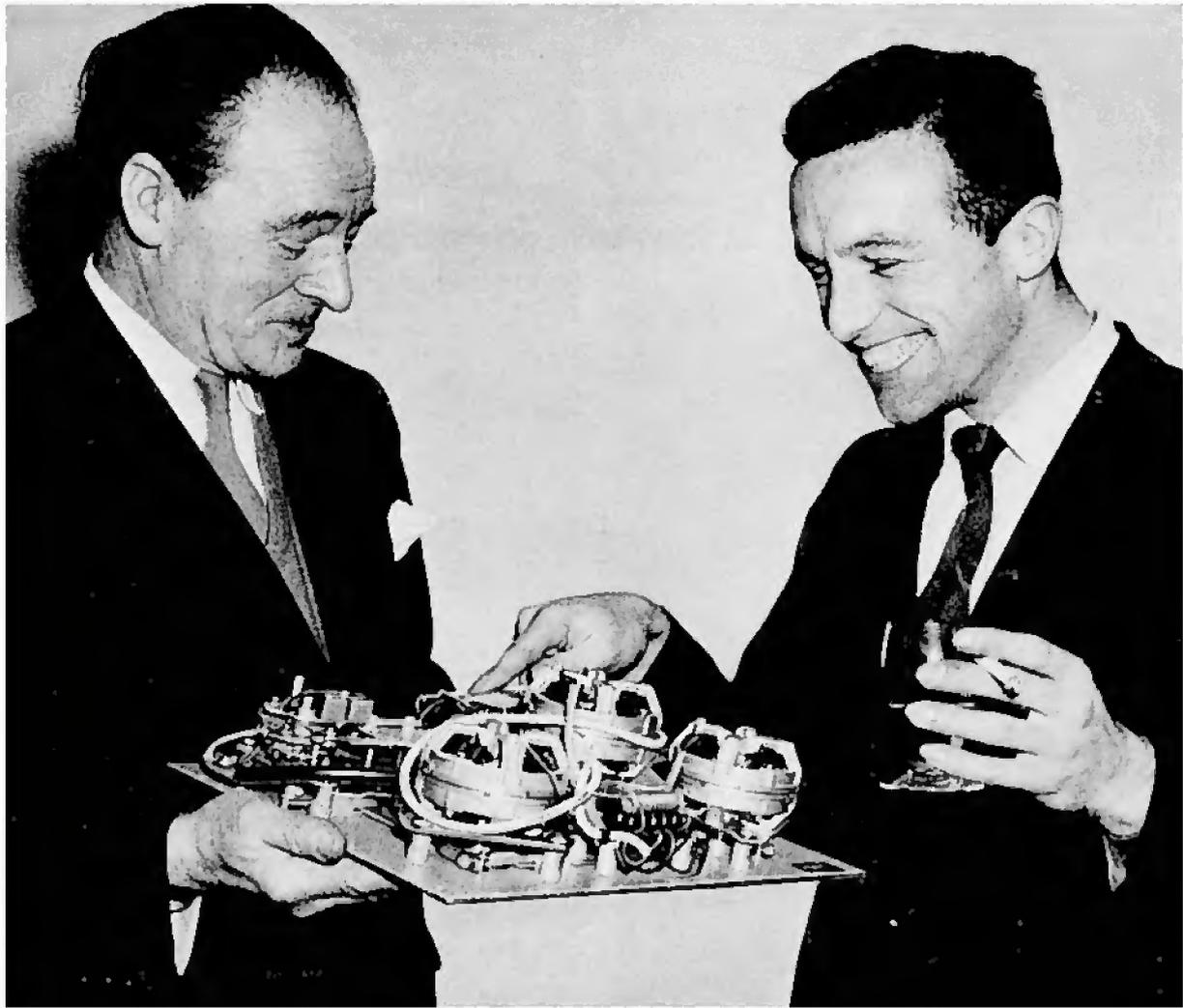
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A winner awarded



a winner!

Mr. J. S. Harper, 82 Shaftesbury Avenue, W.1 (on right), winner of the second prize (Class B) in the Tape Recorder "New Music" Competition, receives his prize—a Brenell Mk. 5 Deck. Presented by the editor of Hi-Fi News.

The Brenell Mk. 5 Deck

In the field of tape recording the remarkable Brenell Mk. 5 Deck must also be judged a winner! Its high outstanding performance and versatile application make it not only the deck of today but the deck of the future. 4 recording speeds: $1\frac{1}{2}$, $3\frac{1}{4}$, $7\frac{1}{2}$ and 15 i.p.s. Permits use of $8\frac{1}{4}$ in. reels (3,600 ft. of D.P. tape at $1\frac{1}{2}$ i.p.s. plays over 12 hours). Three independent motors (B.T.M.). Special foolproof interlocking controls. Instant stop without spillage. Pause control. Digital rev. counter. Fast rewind (1,200 ft. in 45 secs.). Provision for extra heads. Price 28 gns.

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WHO'S WHO

AND WHAT IS MANUFACTURED

An A-Z of manufacturers and their equipment



Above — Special Orders Department.

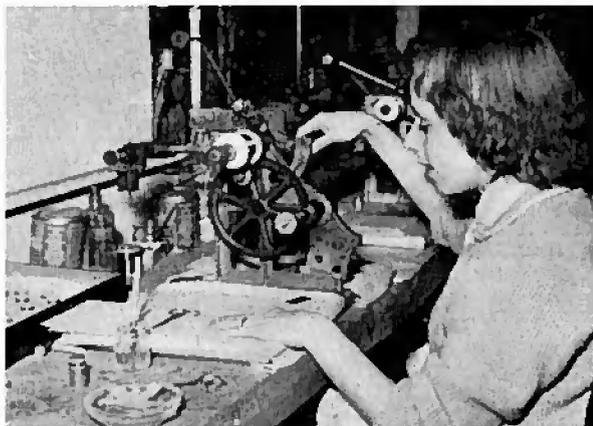


Lustraphone microphones find their way into almost undreamt of applications. Here a

Wire almost too thin to see is here wound on to formers for making dynamic (or moving coil)

noise cancelling model such as air pilots would use, is being demonstrated to our "A.T.R." reporter.

microphones. The work calls for great precision and must be exact to within precise limits.



MAKING MIKES AT LUSTRAPHONE

Lustraphone's factory, or to give it its correct title, The St. George's Works, is situated in the heart of London. It is an appropriate name and site for a British firm whose products are British in design, materials and manufacture.

Lustraphone are, of course, most famed to recordists for the microphones they make, but many other products are included in the Lustraphone range, microphone booms and stand equipment, transistor audio frequency amplifiers, transistorised portable public address systems, transistor power amplifiers, mixer units, programme selector units, hand microtelephones, transistorised inter-com. systems, etc.

However, for this visit we decided to concentrate our attention on the production of the Lustraphone microphones. Our guide was Lustraphone's eminent expert on microphones, Mr. G. R. Pontzen, who will already be known personally to many recordists whose Clubs he has visited to give talks on the A to Z of microphones. Our first stop was at one of the shops assembling microphones, and here Mr. Pontzen explained the sequence of events involved in the manufacture of Lustraphone's moving coil mikes. We were impressed by the skill which has gone into the design of this model to ensure that it is shock-proof. Even if one is dropped on to the floor, the diaphragm will stay perfectly centred in its housing.

One of the main stages in the production of a moving coil microphone is the winding of the actual moving coil. This coil is self-supporting, and the machinery required to produce it was designed and made by Lustraphone themselves.

The length of the coil is critical and it is manufactured out of wire being fed manually on to a collapsible recessed former which also controls the overall width. The purpose of using a collapsible former is to ensure that after the wire coil has been coated with an adhesive it can be withdrawn from the winding jig without damage. But before it is removed the coil is heated to accelerate the drying time of the adhesive which holds the wire together. This heating is effected with an electric element encased in a sleeve fitted on to a handle placed over the coil whilst it is still mounted on to the collapsible former.

The diaphragm for this type of microphone is made from 0.001 inch thick soft aluminium strip and the complex shape, on manufacture, necessitates a close tolerance compound press tool to form and blank this precisely designed component which is extremely sensitive to the slightest vibration. Again, as with the coil-winding machinery, Lustraphone found that they had to make all the tools required in their own tool room.

The diaphragm, having been pressed out in the machine shop, comes up to the microphone construction shop where it is reinforced with a mounting ring. In the next stage, the coil is cemented on to the diaphragm.

A parallel process to the coil winding and mounting is the assembly of the magnet. This consists of a centre pole with concentric pole pieces assembly which is located by means of a centering ring and cannot therefore go

out of centre. The centering ring goes over the pole piece and is secured and held in position by a recess in the top plate. This is followed by various acoustic adjustments designed to eliminate resonances which would otherwise set up below the diaphragm. For this purpose, a certain amount of pressure relief has to be afforded. This is controlled by a combination of small apertures and resistive damping, and also by spring pressure. A further stage of the assembly is connecting the transformer to the base.

We then moved to the second production line where the units are fixed to the mounting system and again automatically centred and held in position by the front shield. The tolerances are so close that the several test processes which follow merely confirm that the moving coil is dead centre.

RIBBON MICROPHONES

The next section we visited was engaged on the production of ribbon microphones. The V.R.53 Studio Microphone, the small Ribbonette V.R.64, etc.

The V.R.64 is produced in low and high impedance versions, which only differ outwardly by the cable used; twin screened cable for the low impedance and coaxial for the high impedance microphones due to the lower capacity of the latter.

One of the major features of the V.R.53 Studio ribbon microphone is the twin magnet assembly which allows very slim pole pieces to be used, giving a uniform configuration of the magnetic field between the two pole pieces. It is completely symmetrical back and front in respect of the gap between the pole pieces. One of the reasons for the excellent high frequency response of this mike is the slimmness of the pole pieces, and another that the back to front path around the ribbon is very short. The soft iron bar used in this assembly is milled to give it the correct profile, and it is then cadmium finished.

Here it is worth pointing out that all internal steel components are cadmium plated and that this plating process overcomes any problems of humidity regardless of the geographical area in which Lustraphone mikes are employed.

The range of materials used in the manufacture of the outer cases of Lustraphone mikes includes die-cast materials and thermo-plastics. The die cast housings are usually completed in either the crackle paint or hammer finish. But where thermo-plastics are used there is no need to give a colour finish as the colour is inherent in the materials and can be changed to customers' specifications.

"STEREOMIC"

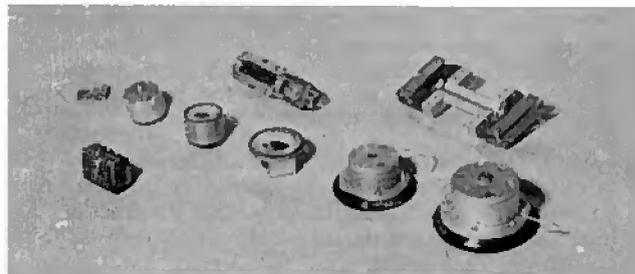
Of all the microphones produced by Lustraphone, ranging as they do from the miniature lapel and noise cancelling models to the "Studio" and public address types, our favourite is the Model V.R.65 "Stereomic" dual ribbon velocity microphone. This is a combined stereo-ribbon microphone. The microphone unit consists of two identical ribbon velocity microphones mounted vertically in line. The top half of the unit which contains one of the microphones is so arranged that it can be continuously rotated through an angle of approximately 100° from the "in-line" position. This is designed to enable the optimum setting for any contingencies of stereophonic transmission to be achieved, but also permits other uses. For instance, if one is making monophonic recordings, there is provision for connecting the two microphones in series. By adjusting the top one, these can be made practically omni-directional, actually producing four lobes instead of the normal two (back and front) for a ribbon mike. The phasing switch can be thrown into anti-phase so that the two voltages across the pair of ribbons cancel out, and then only close speech

(continued on page 71)



Left — Slim, elegant and highly professional, that's the Lustraphone LFV159 dynamic microphone on a base. Ever noticed how frequently you see this mike in use on T.V.?

Right — The new Lustraphone LD/66 popularly priced moving coil mike shown here on a base for table use, P.A. work, etc.



Above — A cross-section of Lustraphone sub-assemblies. From left to right — Front — Miniature three-stage transistor pre-amplifier.

Middle row — VE63 noise cancelling electro magnetic insert, VC52 moving coil noise cancelling insert, D159 moving coil insert, D156 moving coil insert, C151 moving coil insert, and last a C48 moving coil insert.

Back row — VR64 ribbon insert and VR53 ribbon insert. All inserts being in skeleton form without protective shields in order to show the construction.

Right — With every hole punched in the foil, one more diaphragm is on its way to be fitted into a Lustraphone dynamic microphone.



A Home-View

of the

FI-CORD

By F. C. JUDD, A.Inst.E.

If it were only a case of recommendation, this month's Home-View could be written in exactly one dozen words, because in presenting the Fi-Cord, I could simply say: "I own one, it is an excellent recorder and therefore highly commendable."

The Fi-Cord is a fully transistorized portable, of miniature yet sound construction measuring only 9½ in. x 5 in. x 2½ in., and weighing only 4½ lb. You can carry it about with the same ease as a camera and collect those "snapshots in sound" in the train, in the plane, at the seaside, in the town, in the country, anywhere, any time.

It is powered from batteries, which can be re-charged overnight to full capacity and from which continuous 1½ to 2 hours record/playback time is available at 7½ i.p.s. The Fi-Cord has two speeds, the higher one being suitable for fidelity recording of music and special sounds, the lower speed of 1½ i.p.s. being more suitable for speech, thus making it ideal as a dictating machine or for recording business conferences, etc.

Being so small it is unobtrusive and when carried vertically on the non-slip shoulder strap provided can be operated directly from a single switch on the microphone. The moment your sound is available, you press the switch and the sound is captured! For this reason it is an ideal recorder for interviews, and I believe certain well-known broadcasting organisations use them for this purpose, because the Fi-Cord is capable of exceptionally good quality reproduction, especially at 7½ i.p.s.

I feel it is only fair to say that it is not a cheap recorder, but then, cheap recorders don't always give a good performance, neither do they have all the special facilities of the Fi-Cord, which is beautifully finished with a black stove enamelled deck and chromed fittings, all neatly contained in a very attractive case. The tape spools are 3 in. diameter and filled with L.P. tape, allow nine minutes' recording per track at 7½ i.p.s. and 36 minutes at 1½ i.p.s.

The rest of the technical data is as follows:—

The frequency response for 7½ i.p.s. is given in the makers' specification as 50-12,000 c.p.s. ± 3 dB from the tape and 50-10,000 c.p.s. ± 3 dB via the input socket through the tape and then from tape to output socket. They are also honest enough to quote that the slow speed of 1½ i.p.s. is more suitable for speech only. Recording times I have mentioned but let me make it quite clear that the Fi-Cord is not



the sort of machine to use for "pop record" dubbing, for instance. I think the makers will agree with me on this point, for I would recommend it as a first class portable for making short, but very good quality recordings.

It is powered by four 2-volt accumulators which are completely sealed and require no attention except re-charging by means of the special charger unit that goes with the recorder. The motor, which runs quietly, is operated at 3 volts and although no motor-driven tape re-wind facility is available, the tape can be re-wound for a recording check with a small hand key. Recording sense is standard half track and the speeds are linear so that tapes can be played back on another machine.

An output socket is provided for matching the Fi-Cord directly into an external amplifier and provision is made for direct monitoring through headphones whilst recording. The microphone, as supplied with the recorder, is a dynamic type, with an impedance of approximately 1,000 ohms, and whilst this is quite good for general sound recording and speech, the keen recordist is advised to use a better type of microphone for fidelity reproduction.

PERFORMANCE

For the technician and the very discriminate enthusiast here is a brief account of the performance tests. A frequency response check revealed that the makers' claim is fully justified. Noise level is extremely low and hum is, of course, non-existent. At 7½ i.p.s. wow is almost imperceptible and only just noticeable from continuous tones at 1½ i.p.s.

The various mechanical functions of the recorder, e.g., tape spooling, tape position indicator and so on, all perform excellently and last, but not least, there is a tiny magic eye record level indicator that, together with the major controls, is placed outside the case for convenience of operation when the lid of the recorder is closed.

The Fi-Cord is British-made throughout and is manufactured by Erskine Laboratories Limited, for distribution by Fi-Cord Limited, 40a Dover Street, W.1. The price, including batteries, battery charger, microphone, tape and tape spools is 59 guineas. If you are looking for a precision-made portable machine for fidelity recording, then seriously consider this one. Need I say more!

THE NEW REFLECTOGRAPH MODEL A

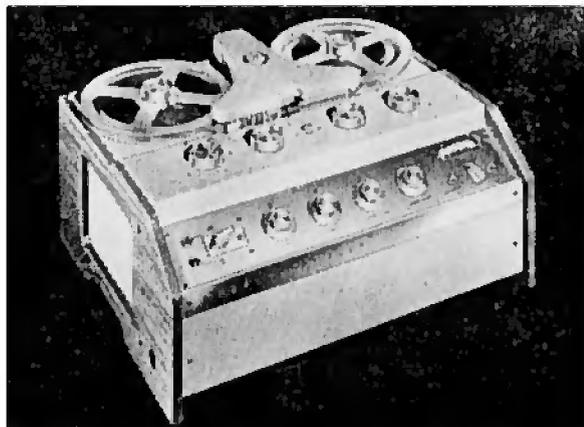
THIS MODEL A is the first of the new series of Reflectograph Tape Recorders incorporating the new and novel Multimusic deck.

Reliability, consistency in operation and utmost flexibility are claimed by the manufacturers who state that this instrument is in the professional class but is extremely simple to operate.

Novel features of this instrument include a pleasing two-tone grey/blue appearance and a complete absence of cabinet. Instead, the Reflectograph Model A is supplied with detachable wooden sides, the front and back of the actual deck and amplifier constituting the other two sides. When the recorder is built into furniture these sides may be removed completely.

In the Reflectograph Model A, the new Multimusic deck which incorporates a rigid cast aluminium frame construction technique is utilised as a single channel recording and playback instrument being provided with three heads on the left hand side of the Capstan. There are no belts or interwheels to wear and with the heavy duty, direct drive, synchronous capstan motor an instant start or stop may be achieved.

An automatic stop is provided which automatically



Reflectograph Model A, incorporating the new Multimusic Deck.

switches off the equipment at the end of the tape, being actuated by the metal foil strip now spliced into most brands of recording tape. However, Multimusic Ltd., can provide self-adhesive metal "Zipp" strips measuring only $\frac{1}{4}$ in. long which may be affixed to any recording tape and which will stop the equipment at the point where they are placed.

Total "wow" and "flutter" is said to be better than 0.2% R.M.S.

Open access is provided to the heads for ease of editing and as standard, the deck is supplied for use at 7 $\frac{1}{2}$ and 3 $\frac{1}{2}$ i.p.s. and with reels up to 8 $\frac{1}{4}$ ins. diameter. Fast wind forward and back, which is guaranteed will not stretch or break even the thinnest tape, is entirely electrically controlled by a single knob and 1,200 feet of tape can be wound in either direction in 45 seconds.

The separate record and playback amplifiers in a matching grey and satin aluminium finish, with

specially designed and calibrated skirted knobs, to overcome parallex effect, incorporates two-tone controls (with boost and cut), separate record and play back gain controls, an entirely new "slimline" edgewise reading, record level meter calibrated in colour, and a Tape/Input switch for comparing any input signal with the signal recorded on the tape.

The frequency response at 7 $\frac{1}{2}$ i.p.s. is \pm 2dB from 40—10,000 cycles (—4 at 14,000 cycles).

At 3 $\frac{1}{2}$ i.p.s. the frequency response is \pm 2dB from 40—7,500 cycles.

The signal-to-noise ratio is approximately —50dB (unweighted including hum).

Features of the instrument panel are a record/playback switch automatically illuminating red and green indicator lamps respectively.

Weight is approximately 50 lbs.

The price of the Reflectograph Model A with half-track erase, record and playback heads, one way operation and self-contained three watt amplifier calibrated to C.C.I.R. characteristics is 95 guineas.

NEW PRODUCTION LINE FOR ACOS MIC 40 MICROPHONES

COSMOCORD LTD. have installed a new production line at their Waltham Cross factory for the assembly of the well-known Acos Mic 40 microphone. This new assembly set-up is proving an enormous boon towards increased productivity.

Following detailed method study of the assembly of the Mic 40, the assembly line has been completely

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- **SIGNAL TO NOISE RATIO**—Better than 55dB, unweighted.
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re-designed. The new line is based on the most advanced principles of works organization and ergonomics, so as to achieve ideal positioning of all materials, components and instruments vis-a-vis the



operators. The results so far achieved show that nine operators now produce 6,000 Mic 40 microphones per week, compared with fourteen operators previously turning out 5,000. The outstandingly successful measures of this pilot line are now being applied to the whole of Mic 40 production and similar processes will shortly be introduced for other Acos products.

Tape & Disc Review continued from page 62

decade. The only thing which makes it distinctive from other recordings is the treatment given to it as a clarinet solo. Personally, I like the record very much, for Pete Fountain is a fine musician; the reproduction quality is also very good, and I imagine this disc will sell quite well. It would be ideal "Juke Box" material I imagine, for sophisticated locations of course, and I can imagine it being popular in many homes.

CLUB AFFILIATION TO THE B.R.C.

"A.T.R. Magazine" extend a cordial welcome to the clubs listed below, who have recently become affiliated to the British Recording Club. The secretaries of these clubs will be delighted to forward details of their activities to local residents who are interested.

Mrs. J. M. Tasker, Hon. Secretary, Staffordshire Tape Recording Society, 7 Creswell Grove, Stafford, Staffs.

K. E. Trenerry, Hon. Secretary, Swindon Tape Recording Club, 9 Corby Avenue, Swindon, Wilts.

A. Asworth, Programme Organiser, Rochdale and District Ciné Society, 551 Bury Road, Rochdale, Lancs.

A. C. Ings, Hon. Secretary, Clacton Tape Recording Society, 18 Coopers Lane, Clacton-on-Sea, Essex.

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TELEFUNKEN 76 ...	£59.10. 0
WALTER DE-LUXE ...	£29.17. 6
AVON ...	£24.19. 6
FIDELITY ARGYLL ...	£27.10. 0
GRUNDIG CUB ...	£24.19. 6
SECOND-HAND CLARION ...	£23.10. 0
GRUNDIG MEMORETTE ...	£51. 0. 0
MOBILE II ...	£52.10. 0

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MICROPHONES including CADENZA and GRAMPION
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Write, quoting model interested in

stood an E.M.I. TR51 tape recorder and on the other a unit housing a Garrard 301 transcription desk, together with an E.M.I. Angel pick-up.

I was surprised at the wide range of music used. While the auditorium was filling bright cheerful music from the Mantovani, Chacksfield and Stapleton Orchestras filled the auditorium to get the audience in the mood to be entertained and to settle them into their strange surroundings. Each of the six different presentations was, however, backed with the appropriate mood music, music chosen carefully to suit the flow and character of the narration. Programme tapes were prepared with great care. Two decks were used, switching from one to the other on a verbal cue to suit each section. General narration music ranged through Brahms, Beethoven, Sibelius, Vaughan Williams, and Samuel Barber. Where appropriate, sound effects are also incorporated. I learned, too, that not only is the London Planetarium the only commercially run planetarium in the world — but it also the only one in which music is blended into the presentation.

By now the auditorium had filled and I slipped into the seat which had been reserved for me near the console. As I waited for the presentation to start, I remembered some of the other fascinating facts with which the two enthusiasts had amazed me. The dome, which is 67 feet in diameter and looks so solid, is in point of fact a wire mesh. Made of aluminium sheeting it is perforated with 20,000,000 holes nearly $\frac{1}{16}$ in. in diameter—it has to be for acoustical reasons. The dome is accurate over the whole surface to within $\frac{1}{16}$ in.—the greatest degree of tolerance Zeiss would permit the architect. The music loudspeakers were concealed behind the dome in the 8ft. air space. The dome under which I was sitting was the innermost of a series—the last, of course, being the copper dome seen from Marylebone Road—a necessary precaution for sound insulation to damp down air-borne noise from the busy streets outside. The air we were breathing was changed eight times every hour—to keep the atmosphere free from dust so that light beams projected from the instruments could not be seen. I should think that this must make it the healthiest place in London. Perhaps, too, as a foretaste of space travel, the air pressure inside the Planetarium was two pounds per square inch higher than that outside.

Commander Fanning slipped silently and unabtrusively into the control console, his quiet, pleasant voice bade us welcome and set the scene. The music swelled, the lights began to fade. First the moon and then the planets appeared against the darkening dome, which took on the colours of sunset and as the opening theme of Sir Arnold Bax's "Tintagel" reached its climax thousands of stars burst from out the gathering darkness of night. Night had fallen in the London Planetarium, and I had started my first journey into space.

registers. In fact it is functioning as a noise cancelling mike when arranged like this. Being a ribbon mike, however, bass cut would be required when using it at this close proximity.

NOISE CANCELLING MICROPHONES

In connection with the V.C.52 noise cancelling microphone, we found the process involved in the manufacture of the cage (the metal cap at the top of stick microphones) to be of particular interest.

First of all it is blanked and deep drawn and then transferred to an indexed piercing jig which presses out the windows individually. The function of the cage on assembly is to retain the mesh covering which protects the internal mechanism of the microphone. The mesh itself is also deep formed. An important feature of the mesh is that its fine quality (200 mesh to the inch) has a water-shedding characteristic.

THE LUSTRAPHONE SCRAPBOOK

We were allowed to peep into the Lustraphone Scrapbook and saw photographs and cuttings collected from the World's Press revealing the thousand and one people and places using Lustraphone equipment. The Queen Mother, President Eisenhower, Kruschev and Mao Tse Tung immediately caught the eye. The many other world personalities shown therein using Lustraphone mikes demonstrated most forcibly that the quality of British goods is appreciated throughout the world.

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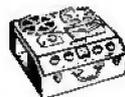
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