

APRIL 1966

TAPE

RECORDING MAGAZINE



IN THIS ISSUE

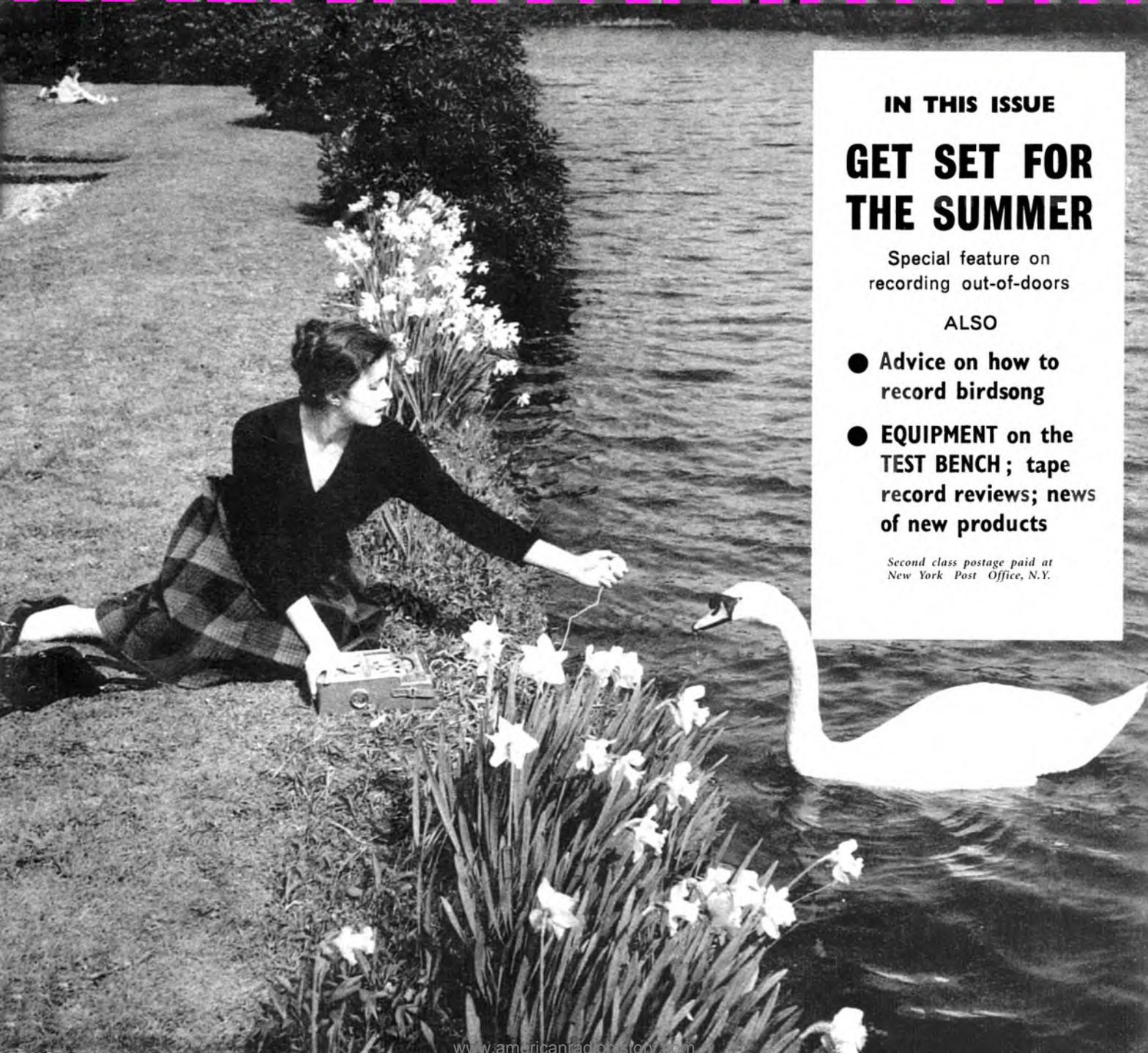
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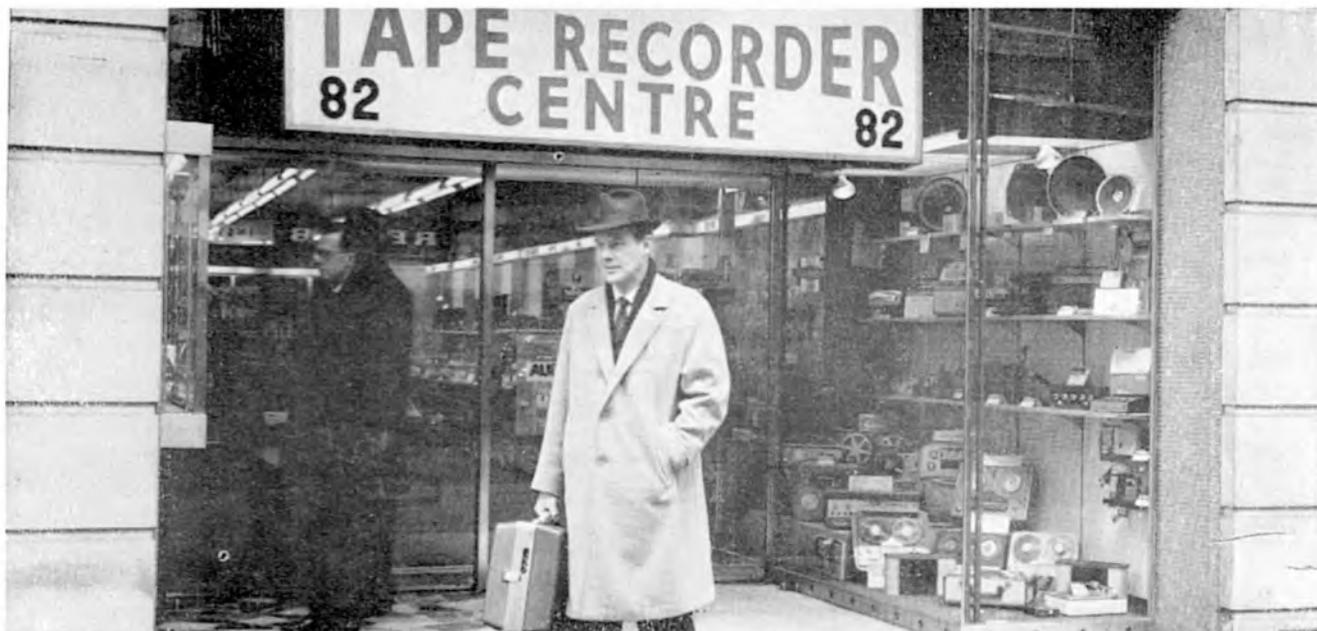
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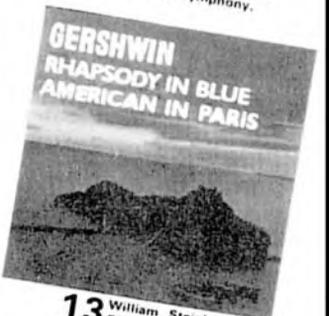
1 John Hollingsworth conducts the Sinfonia of London in a thrilling performance of the famous ballet music.



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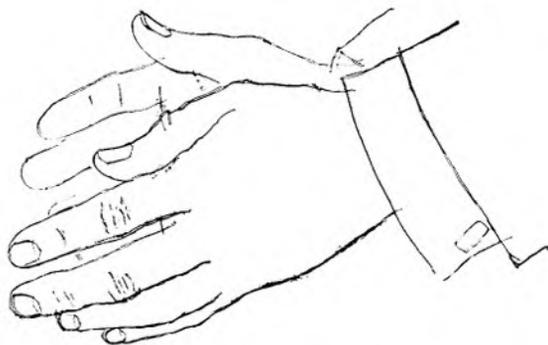


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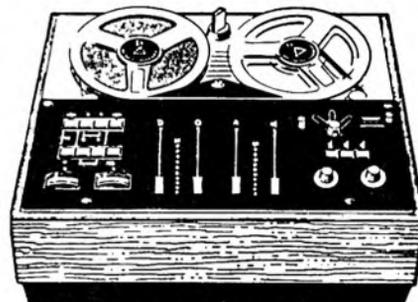
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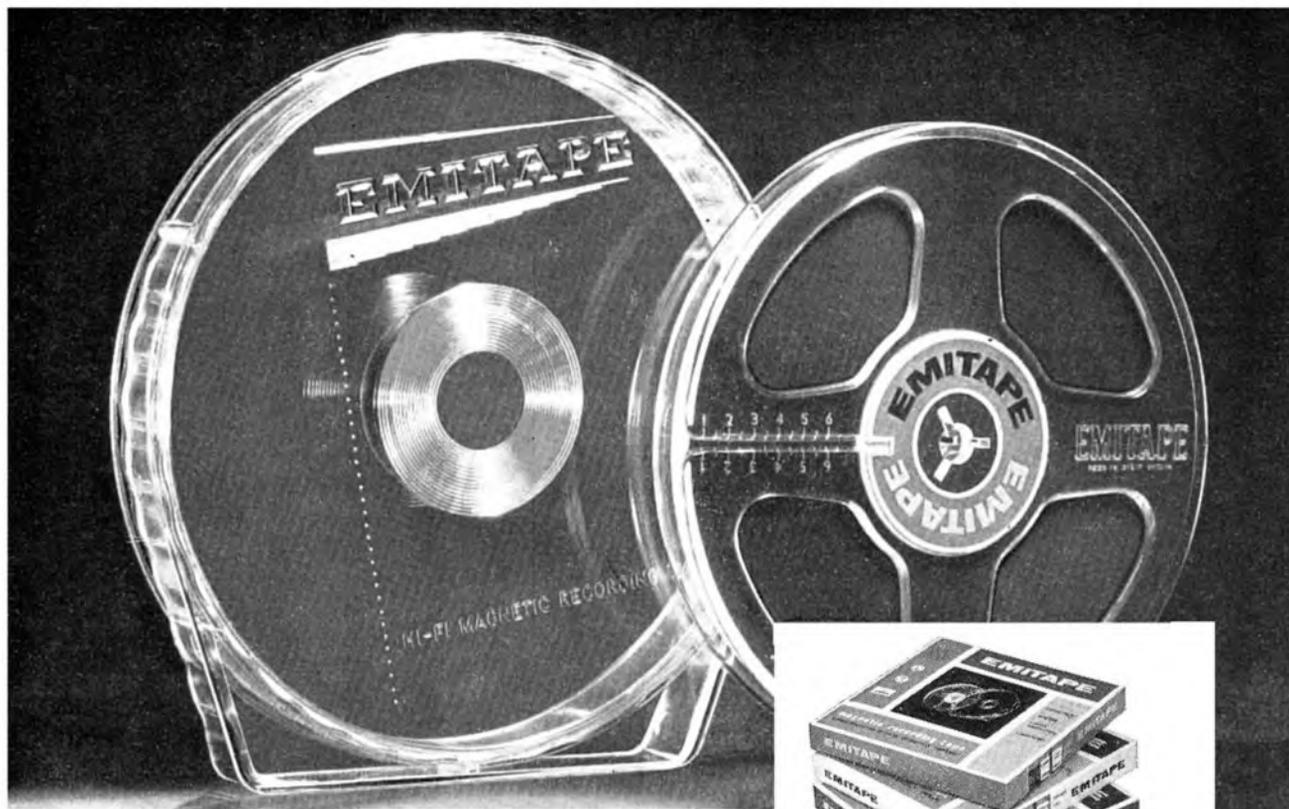


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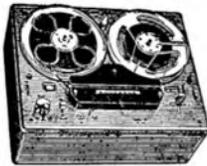


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TAPE

RECORDING
MAGAZINE

Vol. 10

No. 4

April 1966

IN THIS ISSUE

Tape trends and tape talk 120

By the Editor

Get set for the summer 121

H. Burrell Hadden

Recording the sounds of nature 123

Richard Margoschis

The New Decks 126

Magnavox 363

Cross Talk 129

By Audios

Glossary of tape terms 130

Harry Mack

Popular music on tape 135

Don Wedge

Jazz on tape 135

Mike J. Gale

New Products 136

Tape Bookshop 138

News from the clubs 139

Tape Exchanges 139

Advertisement Inquiries Service 141

COVER PHOTOGRAPH: Summer is almost upon us once again and soon the parks and gardens will be providing scenes such as that depicted on our cover this month. Advice on preparing for those outdoor recording sessions is given in a special feature on page 121 of this issue. Oh, and anticipating those letters, the tape recorder with our charming cover girl is the Steelman Transitate, an American-manufactured recorder that is not available in this country.

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Back numbers, if still in print, are available at 2s. 6d. per copy.

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EDITORIAL

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119

Tape trends and tape talk

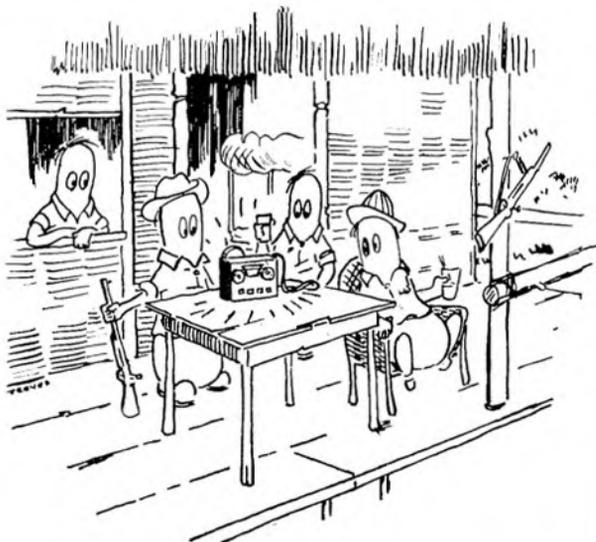
By the Editor

THE GRUNDIG SCHOOLS Contest, which I was very happy to help to judge last month, has opened a rich mine of recording material. The Contest attracted 139 entries, which is probably the most spectacular achievement of any tape recording contest organised anywhere. More than a quarter of these tapes survived the preliminary "sifting" process and came before the final judging session. This is an indication of the average quality of the entries.

The largest entry—65 tapes—came from junior schools and this section produced the overall winner of the Contest. The children of Boucher C. of E. School, Grange Road, London, S.E.1—average age 9½—produced a splendid play based on the Guy Fawkes story, full of atmosphere, delightful colloquial speech smoothly and confidently delivered, and a zestful involvement in the story which demonstrated the value of the recorder as a tool in education.

This school will hold the silver Grundig Challenge Cup for the coming year—there is to be another contest during 1966—and also collects a Grundig TK 18L recorder and accessories. The winning tapes in the sections for infants and seniors also collect a TK 18L. The winning infants' tape was submitted by Baillieston School, in Lanarkshire; it recorded the performance of a simple play and the subsequent class discussion of how it turned out, and how it might have been improved.

LAUGH WITH JEEVES



"And this recording is of a man-eating lion preparing to spr . . ."

The best of the senior tapes came from a 13½-year-old class in Wallsend-on-Tyne and was a dramatic presentation of the Biblical story of Christ stilling the storm. It contained good sound effects, effective narrative and a superb build-up of excited sound during the storm sequence.

* * *

TALKING OF CONTESTS, last year's International event in London is reported in the latest issue of the Swiss Sound-Hunters' magazine in racy style by Jean-Claude Gigon, who was one of the judges. I particularly enjoyed this assessment of the British character:

"When, at the beginning of a session, the jurors—the Latins in particular—announced that they did not have all the script translations, the reply was simply: 'Gentlemen, it is time to break for tea.' For the Swiss there was one moment of total discouragement. We inquired if all the Swiss entries had arrived safely, with the translations? After searching for an hour in the office, one of the organisers had not found it but assured me: 'If the tapes are in England, then we will find them before tomorrow.' Then I had the proof of British phlegm!"

One other experience of the Swiss delegates who came to England was not so happy, although it is cheerfully recounted. When it came to immigration control at Dover, it was: "English first, in the saloon; Commonwealth citizens on the fore-deck; foreigners, down the corridor."

Nothing makes me so angry as the way we receive visitors to this country when they first encounter us at our ports; when one thinks of the reception the English get when they go, for example, to Switzerland, it is a sad reflection upon this country.

* * *

THE FEDERATION OF British Tape Recording Clubs is more vigorously active than for a long time past, but I gather that this is the new pattern which the officers are resolved to sustain. Latest evidence of the new drive is the well-produced catalogue of the Federation's "Sound Archives."

This lists all the tapes which affiliated clubs and associate members may have copied free, provided they pay for the tape required. Non-members may also secure copies, provided they pay in addition five shillings per hour of recorded programme to cover copying and packing costs.

Most of the winning tapes in the British Amateur Tape Recording Contest since 1957 and in the International Recording Contest since 1962 are now available.

* * *

LATEST FROM JAPAN: Shiba, the country's biggest radio and TV firm, is selling a domestic video recorder operating at 60 ips with standard quarter-inch tape for only a little more than £100. By the time it is exported to America (or Britain?) the price is expected to rise to about £175. Still the cheapest in sight.

* * *

LATEST FROM THE U.S.A.: The big boom is in cassette machines for use in cars. Chrysler Motors and the Goodrich Tire and Rubber Company are the latest giants to move in on this market. In a few years, according to one prophet, you'll be able to buy a cassette of taped music at your filling station when you stop for petrol.

H. BURRELL HADDEN advises on preparations to be made for recording out-of-doors, describing the alternative types of suitable equipment available and some important pre-recording session service checks. His advice will help you to:—

Get set for the summer

IN the Spring a young man's fancy lightly turns to thoughts of. . . . But in these spring-like days as I write these notes it is not our amatory inclinations that I am concerned with, but rather the amateur type, amateur recording to be exact. For it is now, whilst there is still time, that we should all be making preparations for the great adventure of recording sounds out-of-doors during the summer months ahead.

For those who have never before tried recording sounds on location there is a whole new world waiting, just for the asking, with, as well, a whole new series of challenges to be met if good results are to be achieved.

I can hear somebody asking: "What sort of things can I record outside?"; well apart from the rather obvious sounds of nature, a number of suggestions come to mind, for amateur recordists. The sounds of the traffic in the town centre, the church bells and clocks, interviews with prominent personalities from town officials to the newspaper man on the corner; all these can be woven into a composite picture of the place in which we live. Or more simply we could tackle a report on a single event; the annual carnival or the village church fete. A more ambitious project would be a sound record of a summer holiday, giving glimpses of all that happened from the moment the front door bangs as we leave, to the key turning in the lock at the moment of return.

Having made up our minds to get out-of-doors this summer, we shall have to consider the equipment required. The answer to this question is "exactly the same as we always need to make any recording"—a tape recorder, a microphone and a reel of tape. No more, no less. Of course it would be a lot easier if our equipment was small, lightweight, and battery-operated, but this need not deter us from our intent at all. An ordinary mains-operated recorder can be made to do valuable service in the open air.

There are two main ways in which this is possible. Firstly, by the simple expedient of either running a long mains lead from the nearest supply point to the machine or, more safely, by using long leads from the microphone, keeping the machine near to

the mains power point. If you do run a long lead to the mains, and the machine will be literally on the ground outside, or you will be handling it in such a position, then it is most necessary that the equipment is properly earthed, or else you may not live to tell the tale. This is, of course, equally important if a mains machine is being used anywhere where it is possible to touch it or anything connected to it, and that includes the microphone, whilst standing on the open ground. If a long microphone lead is to be used, then the microphone must be of the low impedance type, long leads with high impedance microphones can cause serious high frequency attenuation, and spoil the result completely.

We need not be deterred either by the absence of an available mains power supply since for a quite modest sum of money it is possible to buy our own. So long as we have a car, or a fairly good sized car battery, a converter can be used to change the 12 volts of this to the 240 volts AC supply we need. Converters are mainly of two kinds, rotary and vibratory, although there are now some that depend on semi-conductors. Of the two easily available, the rotary one is probably the most satisfactory, although it is also the most bulky and the most expensive. The vibratory one can, however, work very well. The main snag is that the regulation, that is the drop in output voltage with increase of load, is not very good. But so long as the rating of the equipment is big enough, and we do not exceed the loading (preferably under-run it) then this trouble should not be too serious.

Of course the best way to make recordings in the open air is to use a battery portable model. There are now many of these to choose from, having a variety of facilities available, and with a wide price range. Which one to buy? Since we want to make the best recordings for our money, the thing to look for is a machine with no frills, no extra gadgets, and then to pay as much as can be afforded, since by this method the best possible quality should result. As far as tape speeds are concerned, I myself would always prefer a machine that would run at $7\frac{1}{2}$ ips, since this makes the final editing that much easier. A tape at this speed is also much more likely to be accepted by a broadcasting organisation, should it be good enough: and who knows, any of us may one day be in the position of being the only reporter to record some world shattering event! I shall be describing

the various available models in the next issue of *TAPE*.

About microphones. The most suitable type to use out of doors is a moving coil pressure type, since this will almost always be of low impedance, and will be the least affected by wind and handling noise. In spite of this, it is still well worth while investing in a good windshield. The use of a stocking or a silk handkerchief as a windshield has saved many a recording that would otherwise have been impossible, but any such device as this is by its very nature, rather haphazard, and can cause undesirable effects on the frequency response. Good windshields are usually rather expensive, but since the advent of foam plastic cheaper versions are becoming available. In either case, the money expended is well repaid by the improvement in performance. If we are going to record the sounds of nature, particularly bird song, then a parabolic reflector is a worth while addition to the kit of equipment (Richard Margoschis goes into greater detail on page 123).

Recording out-of-doors presents new problems, mainly due to wind and background noise. A golden rule is always to try to get out of the wind. A shop doorway can give a very useful reduction, for example, or you can shelter the microphone using your own body. The high background noise in a busy street can often be lessened by going into a nearby side street, particularly if it is narrow. If speech is to be recorded in conditions of high noise, the microphone should be placed very close to the mouth, and the speaker encouraged to talk normally, and not shout. If the recorder gain control is then adjusted for normal recording level, a clear record of the speech will be achieved. Later it may be advantageous to use, if funds permit, a small transistorised mixer and a second microphone to put back sufficient of the background to achieve the required balance.

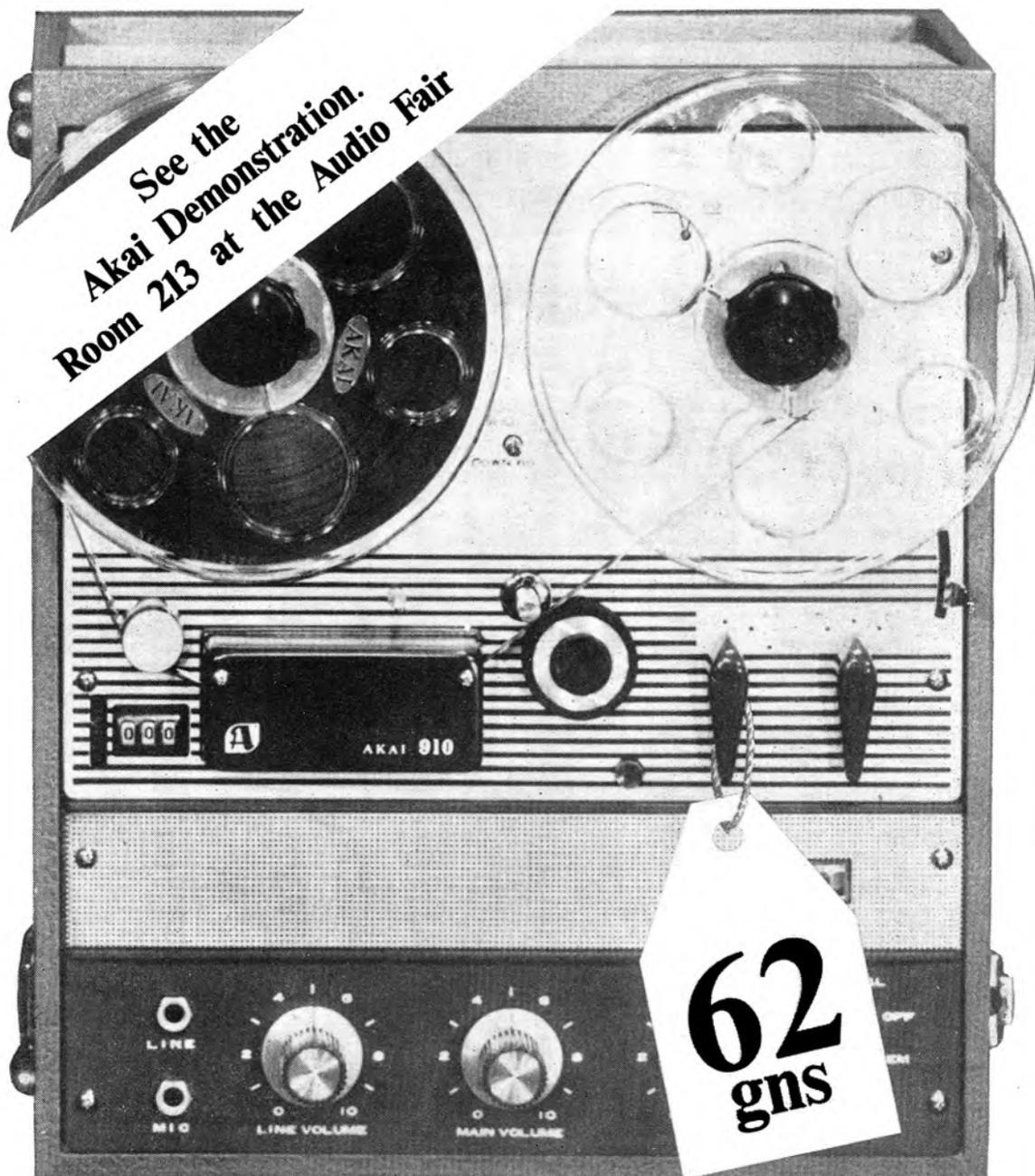
Much of the advice given so far has been concentrated on those enthusiasts who will be purchasing new equipment. For those already in possession of the equipment required there are a number of points to consider before embarking on a location recording session. Apart from the more obvious precautions regarding battery supplies and a check list for ticking off the necessary equipment as available, cleanliness of equipment is vital.

The tape heads and guides should be carefully cleaned with a soft cloth to remove all traces of the brown deposit of tape coating which accumulate in these areas. Normally a dry cloth will remove these, but in obstinate cases the cloth can be slightly moistened with carbon tetrachloride. This should not be overdone, however, or more harm than good can result. There are cleaners currently available, such as the Bib Instrument cleaner (4s. 6d. a bottle), specifically designed for use on tape recorders.

The heads themselves may have become magnetised during use, and it is advisable to de-magnetise them using one of the available de-fluxers.

The cleaning process should include the removal of dust and fluff that will have collected on the bearings of the moving parts, but in this case *no* solvent should be used, or the oil in the bearings will be removed. Normally no oiling is necessary as the bearings are amply lubricated when the machine is made; but be guided by the manufacturers advice on this, some machines do occasionally need oiling in the capstan bearing.

(Continued on page 133)



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Recording the sounds of nature

By R. A. MARGOSCHIS

HAVING described the most suitable tape recorder (February issue) and the construction of a parabolic reflector (March issue) we can now turn to actual work in the field recording bird-song. During extensive tours of the Welsh mountains equipped with my Fi-Cord 1A battery portable and home-built reflector I have found little discomfort rigged as described last month.

Constantly alert for suitable recording material, I find the most difficult problem is directing the reflector as nearly as possible on to the sound source. This can be done by sight or listening. I normally use a combination of the two; monitoring with the ear-phone I move the reflector to get the strongest signal, this often being assisted by vision. I do not like using a sighting tube because it necessitates holding the reflector in an awkward position near the eye, and a touch of the nose on the back of the reflector can be recorded! I find that the angle of acceptance is generally sufficient to allow satisfactory visual alignment without use of any special sighting arrangement. Quite often I cannot see the bird which is singing and then I rely entirely on listening. Some can be pinpointed exactly and others are difficult. This depends on the directional properties of the reflector to that particular frequency, as I mentioned earlier.

Frequently a bird will start to call unexpectedly and the first note or two are missed. This can be difficult if it ruins a phrase of the song but often a spot can be found to make a cut. For this reason I always allow the tape to run for a few seconds after the song has ceased, I am then sure of having a bit of the right background to splice in at the start if necessary and practicable.

Earlier on I said that a reflector would be of little use in recording sounds which are of a low frequency, in such cases it is necessary to use an open microphone. The naturalist will have a great advantage in knowing from where the call is likely to be made and can place the microphone accordingly, but he also has to know something of the recordist's skill in placing the microphone from a point of view of picking up the sound and being shielded from the wind. There is no doubt that when working with

an open microphone it is necessary to be much more selective of weather conditions than when using a reflector.

I have had the pleasure of seeing Vic Lewis, another well-known bird recordist, at work. He uses only open microphones and sometimes places as many as half a dozen very near to points where he has observed that birds are in the habit of singing. When he sees his bird close enough to a microphone he inserts the appropriate plug and hopes that his customer will oblige with a song, and when I saw him at work a great tit was recorded within ten minutes of the microphone being placed in the chosen spot. To do that sort of thing you have got to be an experienced ornithologist as well as a recordist.

From my own experience recording in open country it is only on rare occasions that I need take no notice of the wind, but I have gradually learned ways and means of reducing its effect. Most obvious, of course, is the simple expedient of turning your back to the wind, but at times this can necessitate a considerable manoeuvre to get on the right side of the sound source. Bushes, scrub and stone walls offer suitable protection, then when I get in position I find that I am picking up the sound of the wind in the trees in front of me! However, one has to make the best of circumstances and hope that a future recording of the same species can be made under more favourable conditions.

As soon as possible after getting my recordings home I sort out the ones that are good enough to keep. If I get an odd minute or two out of a day's expedition I think I am pretty lucky. The ones that are kept are spooled up with a coloured leader spliced to the start of each recording. This leader, carrying a reference number for indexing purposes, details the species, the place, date and time of recording and the equipment used, together with any other relevant data.

There is, finally, the question of replaying the recordings obtained. It is a common fault for birdsong to be replayed at too high a level, and here the results of some experiments which I have carried out might be of interest. As a public health inspector, and being concerned with environmental hygiene I often have to deal with complaints about offensive noises. Recently, when using a sound level meter for just such a purpose I

had the idea of putting this instrument to another use.

On a still evening I found a quiet spot and set up the sound meter alongside the parabolic reflector. In a tree about 25 yards away was a song thrush, singing contentedly and beautifully. As I recorded his song I noted the level of the signal reaching the microphone as indicated on the dial of the sound meter. I was surprised to find that the level of the notes ranged from 65 to 75 decibels, with the average at about 70 dB. Later a similar test on a sparrow gave 53 dB at fifteen yards.

Traffic noise in a street can range between 70 and 80 dB, showing how powerful the song of a thrush can be.

On my return home I replayed the tape and set the volume control to produce in the room what I thought to be the level at which I had heard the bird singing. The sound meter, placed ten feet from the loudspeaker, indicated replay at 85 to 90 dB. When I asked my wife to do likewise she set it at 80 to 85 dB. A further nine persons carried out the same test, and whilst it must be noted that they had not heard the original the results were surprising. The lowest setting, by an elderly lady, was 75-80 dB, fairly close to the actual, whilst the highest was 95-100 dB. The fact that this latter test concerned a person suffering hay fever may have had an effect. The average was 84-89 dB.

Appreciating that the acoustics of the room and reflections from walls and ceiling would all have their effect upon the sound meter reading it does indicate that the majority of people try to produce too high a level. This seems to be supported by the fact that when five of the eleven people were asked to set a recording of a brass band to the level at which they would listen, the range was from 70-80 dB, with an average of 73 dB—considerably lower than the average for the setting of the bird song! It seems that they attempted to get as much noise out of the bird as a brass band. In fact, the ten-watt amplifier was more than enough to reproduce the bird at the correct level in the garden.

There was no doubt that when the bird song was replayed in the room to produce 70 dB on the sound meter it sounded very much better and, into the bargain, certain unwanted low-level noises on the tape disappeared. So watch the level at which you replay your recordings.

The approach to the subject will be dictated to a great extent by your previous experience and knowledge and also by your desires and inclinations. I have always enjoyed the open spaces, but although having lived in the country all my life only in the last few years have I realised how little is my knowledge of wild life.

Walking along lanes, over mountains and moors or along the coast, my recording gear is always with me and as soon as I hear an interesting sound I make an effort to record it. In this way my wife and I have added a lot to our enjoyment and from it has emerged a pattern involving deft team work.

We have found this team work of great advantage because of our difficulty sometimes in identifying what we are recording. It works quite simply. As soon as an interesting bit of bird song, or any other noise for that matter, is heard, I start recording while my wife tries to identify the source, using binoculars. Having secured an initial recording, if I am lucky, I then try to get a better one if the bird is still about. Finally my wife will turn to the microphone and identify the bird or describe some distinguishing features. This provides a very use-

(Continued on page 129)

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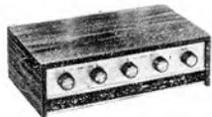
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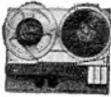


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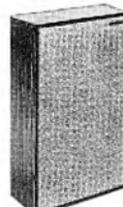
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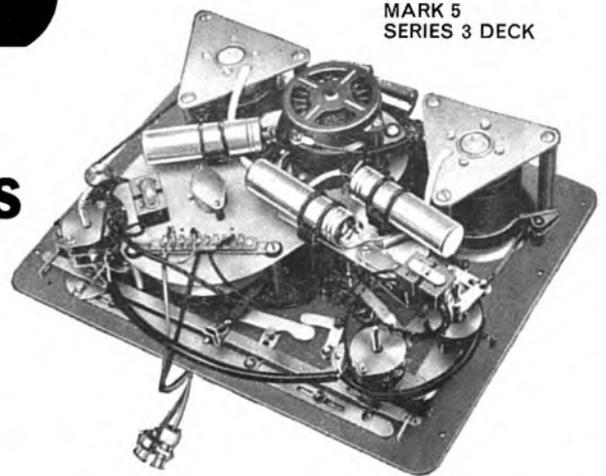
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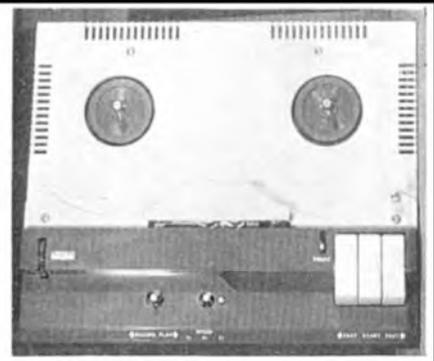
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THE MAGNAVOX STUDIOMATIC



OFFICIALLY, this deck is called the Magnavox 363 Tape Transporter, but with the reflected light of its predecessor's success upon it, the signs are that the trade and the public will plump for the less portentous term "Studiomatic." Whether it will equal the record of the earlier "Studio" deck and meet with as wide acclaim remains to be seen: a preliminary period of inspection and use offers encouragement.

The deck has been designed with the equipment maker very much in mind. The mechanical layout makes for easy integration and there is plenty of room for additional controls to be fitted to the main chassis. Examples of what can be done to incorporate the Studiomatic in an individual tape recorder are to be seen in the Elizabethan LZ102 and the Truvox Series 40, two of the first machines to use it.

This deck is in no way a development of the Studio, but is a completely new design with several interesting features. Complete specifications are given elsewhere at the end of this article.

My brief is to give a descriptive analysis

of the deck, not a technical review, and we shall not therefore waste space in discussing wow and flutter tests, etc. We are concerned, however, with the ease of operation, and the efficiency of the Studiomatic, from the user's point of view. Let me say at the outset that in every respect it made a good impression.

Of particular interest is the novel switching system. This consists of a three-key "rocker" action as quiet and light to the touch as some upper-income machines which use featherweight controls backed by an intricate electrical assembly of relays and solenoids. This is a real achievement, and a detailed description of the key and lever action will be given later.

First, however, to discuss the main features of the Studiomatic deck. A single four-pole induction motor is used. This unit is fully screened. A stepped capstan transmits the drive to intermediate wheels for the separate functions, and thence to fly-wheel, clutch drum or spool carrier. The only belt used is for the tape position indicator, coupled to the feed spool carrier. A ramp and spring assembly provides three speed selection, positioning the capstan idler wheel to the appropriate step on the motor pulley. Fig. 1 shows the deck with covers removed and Fig. 2 gives a closer detail of the motor pulley and idler wheels.

A simple device is used for locking the ramp as the appropriate speed is selected;

the idler wheel bracket is spring-loaded and its upper face has a large, loose washer on its spindle. As the selector spindle is rotated, the washer clicks into place on the correct step of the ramp, and when "Record" or "Play" is selected a fork lever coupled to the centre key locks a lug attached to the spindle bracket, preventing speed change while running. Fig. 3 shows the underside of the capstan idler bracket, and the washer can be seen clearly in the $3\frac{1}{2}$ ips position, while Fig. 4 reveals the locking device. Both the speed change and "Record" interlock spindles are extended sufficiently beneath the deck for switch wafers to be fitted, enabling equalisation and amplifier mode switching to be carried out by the deck operation, which is normal modern practice.

The three control keys are mounted on a central bar and each operates a control lever via a slide plate. The far end of each control lever sits in a slot at the upper right corner of the deck, and each lever couples to its appropriate selector system for the various functions, via a moving plate. Depressing the key pivots a vertical metal plate whose lower end moves in a slot in the chassis. This limits the key movement. A jaw cut-out near the top of this plate, of a slightly different shape for each key, contains a locking bar, common to all three keys. Because of the different shapes of the three cut-outs, selection of any function causes the locking bar to sit in a position which prevents either of the other two keys from moving. The positive action of each key is obtained by a hairpin type spring being fitted to the side of each vertical plate. While requiring no great pressure to select a function or neutralise the keys, this action is quite definite, yet succeeds in being very quiet.

At the other end of this leverage system, the swivel plate operates both the motor switch and the brakes. The short rod at the end of each straight lever slides in a slot in the main deck and also in an angled slot in the swivel plate, thus imparting a common action to the latter for the depression of any key. A "pull-on" motor switch is used and some adjustment of the setting position is provided by its mounting. One end of the switch is fixed and the other free to pivot slightly when the retaining screws are slackened. These screws are revealed when the rewind idler is removed.

The same action of the plate pivots a hinged lever which holds off the right-hand brake against the pull of its spring, and, via a metal rod, pivots the left-brake away from the feed spool drum, also against spring action. Adjustment of the brakes is by setting the lever pivots, which are secured by set screws (see Fig. 5 and Fig. 3). The correct procedure is to depress the "Start" key with power disconnected, slacken the set screws, and check clearances. These are: 0.036 inches (left-hand) and 0.064 inches (right-

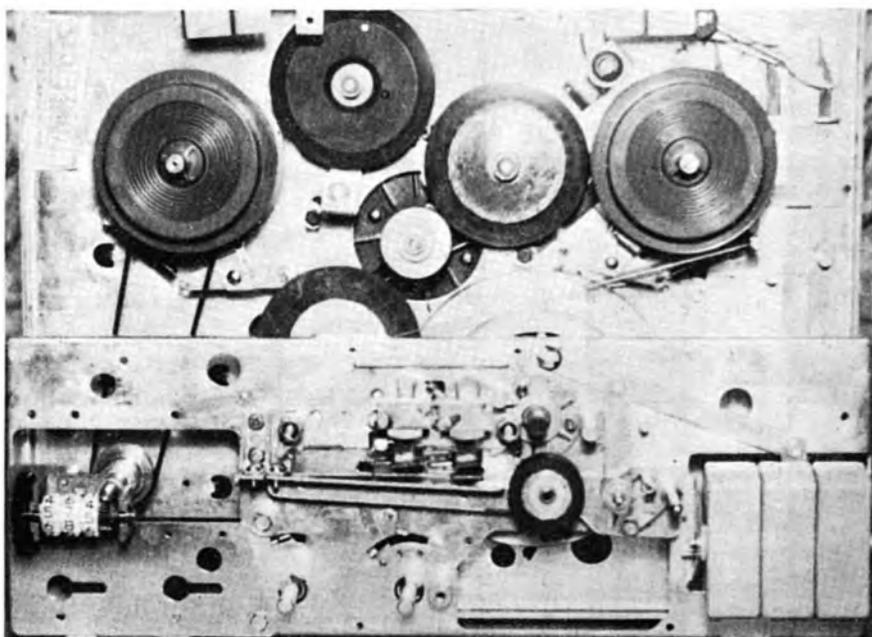


Fig. 1. View of the deck with top covers removed

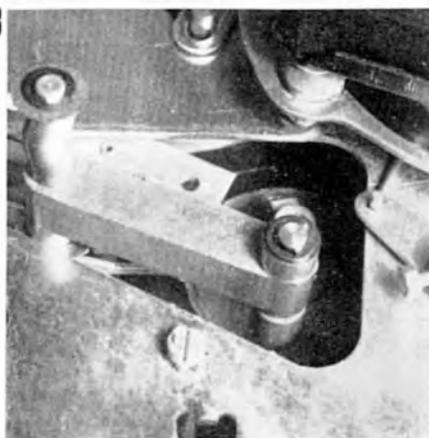
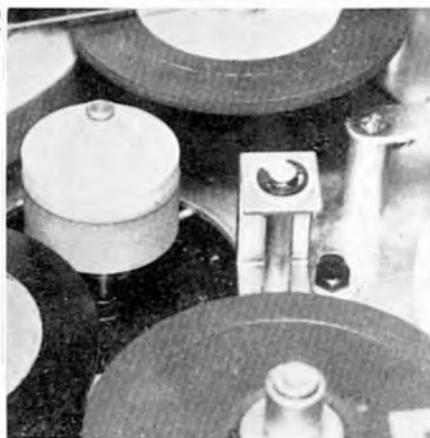
hand) between brake pad and spool carrier. Then turn right-hand operating arm clockwise until pin on the brake actuator arm is contacted, tighten set screws, rotate left-hand operating arm anti-clockwise until there is no further play in the linkage, and tighten the screws. When spool carriers are lifted, each brake pad should advance with the pull of its spring to a position beyond normal contact. Note that the brake assembly has a retainer which limits upward movement of the carrier, as indicated in Fig. 6, and it is necessary to hold the brakes "off" by hand when removing and replacing spool carriers.

An auxiliary brake engages the flywheel, and is coupled by a leverage system to the capstan idler bracket. The hold-on spring of the latter can be seen beneath the pointer in Fig. 6. A linkage system between the "Start" key and a hold-off rod has a brake pad coupled to it, and depression of the key both releases the idler, allowing it to engage the motor pulley and flywheel, and disengages the flywheel brake. The only other refinement to be noted is the positioning of the right-hand auxiliary brake pad, which must impart a slight retaining pressure to the clutch drum during "Fast Rewind," to prevent tape snatch, and spillage. This part is coupled to the lever system of the right-hand main brake, and is held on by a pin on the long lever actuated by the function key. Return is by a shared action of the hairpin spring which is used for the take-up clutch lever system. These parts are visible in Fig. 6, and the pins on the upper faces of the "Start" and "Fast Wind" levers can be seen clearly in Fig. 1, although the pin of the "Rewind" lever is just hidden by the transverse upper deck plate on which the head channel, pinch wheel bracket, etc., are mounted.

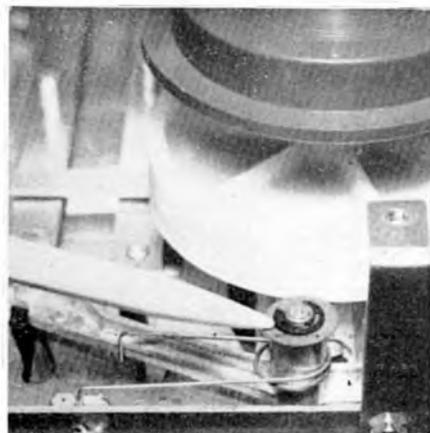
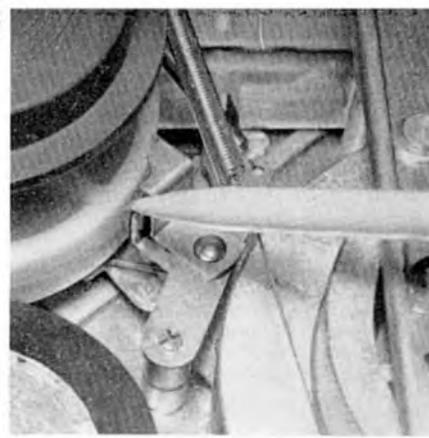
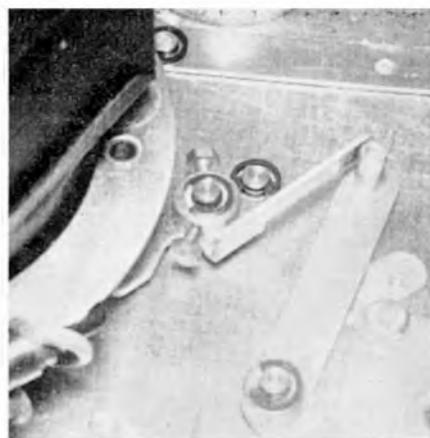
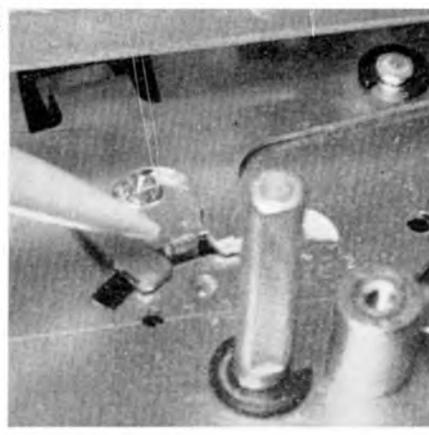
Simplicity of design is indeed the feature of this deck most worthy of mention. An economy of lever and spring movement with no "fiddly bits" can give points to a number of more expensive tape decks, and should certainly remove the "after-sales-service" bogey which has exercised correspondents and contributors in past issues of *TAPE Recording Magazine*. As evidence of the designer's ingenuity, take a look at the clutch and fast wind lever and idler system.

When the "Start" key is depressed, the centre lever moves forward and its vertical pin, seen to the left of Fig. 7, moves the end of a bracket which is pivoted at a point very near the right-hand spindle, and whose inner end links with a slotted lever that carries the take-up idler into a position between the motor capstan and the lower portion of the clutch drum, as in Fig. 8. Friction is transmitted via a felt washer between the two sections of the clutch drum, the lower being free to move while the upper is coupled directly to the spool carrier. But when "Fast Wind" is selected, the same idler is used to transmit the motor drive to the upper section of the clutch drum by the simple expedient of raising it slightly. This is effected by the ramped lever seen in Figs. 7 and 8. The idler is mounted on a spring-loaded vertical rod, and the impeller lever is actuated by a raised lug at the end of the main control lever, visible by the pointer in Fig. 7. The tip of the pointer indicates the pivot post of this impeller lever and shows also the hairpin spring used to neutralise the action.

On the deck sent to this reviewer there was a tendency for the idler to slip into a position between the two sections of the clutch drum when neutralised, especially if the control keys are operated with the power removed. But a slight modification, the



2 Motor pulley and idler wheel arrangement.
 3 View of capstan idler wheel bracket from beneath deck, showing ramp and selector washer, slide post and compression spring.
 4 Speed change selector and interlock jaws, shown in 3½ ips position. A similar jaw arrangement is used for record interlock.
 5 Brake setting is effected by pivoting of brackets, clamped by set screws (see also Fig. 9).
 6 Detail of right-hand brake, showing also the spool carrier retainer flange and the brake and idler wheel tension springs.
 7 View of right-hand spool assembly, showing actuating levers, pin and pivoted angle lever with hairpin spring used to raise idler wheel for fast wind.
 8 Lower section of clutch pulley is free, engaged by idler. Selection of fast wind raises the idler on ramp and spring-loaded post shown in picture, engaging idler with upper section of clutch pulley, directly coupled to spool carriers.



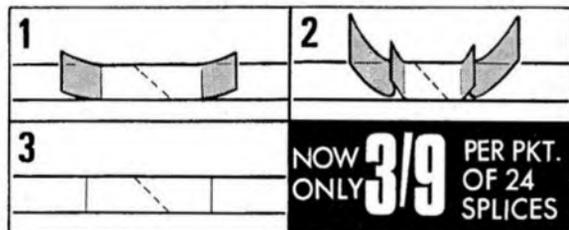
(Continued on page 133)

All photographs by R. V. Hill

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CROSS

TALK

By Audios

IN the February edition of "Cross-talk" I asked readers to send details of their experiences when recording weddings promising to analyse and publish the collective results. This investigation was intended to form some picture of the general attitude of the clergy and the public to a proposal that a recording should be taken of a wedding ceremony. In his innocence yours truly thought he would compile a neat table of statistics to show at a glance the percentages of refusals, acceptances, etc. Thanks to a very generous reader response it would need a computer to work out all the figures and to assess the various shades of opinion expressed!

To all those who wrote, my heart-felt thanks. To those who offered the loan of satirical recordings and to those who recounted amusing stories of their experiences, my very special thanks. I'm doing my best to reply personally to all my correspondents.

The letters received covered so many actual weddings under so many different religious denominations that it would be quite impossible to accurately summarise the results. However, we can generalise, and when we do the answers are very, very encouraging. The experience of Mr. and Mrs. Copinger of Kilmarnock is typical. This enterprising couple have recorded fifty or sixty weddings during the past three years. I don't blame them for losing count with such a score to their credit. Out of that number how many refusals have they met? Just two. Only two clergymen out of fifty or sixty refused to allow the recording to be taken.

In February I suggested that the clergy needed educating in the value to the bride and groom of a recording of this most important event in their lives. Obviously I did them an injustice and I am delighted to offer them my apologies. According to my figures there is about a 95 per cent acceptance rate in answer to the question, "May I record a wedding in your church?"

But having received permission to record the job must be carried out with tact and with every regard to the solemnity of the occasion. Your letters were full of tips on how to conceal microphones discreetly behind floral decorations and stern advice to get the equipment—and the operator(s)—out of sight in the vestry if at all possible.

Never be afraid to ask for permission to record a wedding; you're almost certain to

get it but if you don't it's just bad luck—try again somewhere else.

Always make yourself unobtrusive in the church. Use low impedance microphones on long cables and keep out of the way yourself.

Explain your proposals and requirements to the priest in charge—some will even help you run out your cables.

In return show every regard and consideration to the church and the couple about to be married.

Lastly, as the blame for *not* recording more weddings cannot be laid at the door of the clergy it can only be our fault. And by "our" I mean those enthusiasts who have not yet attempted work of this kind. As I said before, the results of this little survey are very, very encouraging. Why not try?

AS a little light relief I've been experimenting in the sound effects department. Effects men are, I believe, born rather than made—and the best of them often turn out, perversely, to be women. My wife can produce the most ferociously realistic lion's roar I've ever heard. I'd love to play it back in the lion house at the zoo and watch the great beasts cower away in terror. . . .

In spite of studying Alan Edward Beeby's excellent little handbook on the subject I'm just no good at it. Take marching men, for instance. Simple. Just shake a few dried peas in an empty seven-inch tape box and the regiment will be on the move. If anyone wants to buy a recording of three-legged gnomes tip-toeing across the grass I can lay my hands on one very quickly.*

How time flies. That fantastic annual jamboree the Audio Fair is almost on us once again. I wonder that no enterprising manufacturer has yet thought of the idea of giving away free anti-headache pills . . .

As you wander through the rooms of the Hotel Russell do spare a thought for these people who have gone to the considerable trouble and expense of putting their equipment on display. In theory they make money out of it, but in fact they could probably make as much without showing. You can take a lot of the weight off the feet of the man on the stand by showing appreciation and courtesy, which is all they can either hope for or get.

OF all the so-called "personalities" of television Patrick Campbell must have made a greater impact than almost any other. Viewers will argue furiously about the contentious intellectuals, but they have a warm and very real regard for Mr. Campbell. Surely this is because his personality is genuinely sincere and the impediment in his speech, far from being a handicap, serves to arouse immediate sympathy in the audience. His relaxed style is an object lesson for all who face the microphone.

In pure sound we, thank goodness, do not have the added tensions of batteries of arc lamps and cameras to face. But you may be quite sure that your own personality can shine through on tape without the need for any visual image.

Some people are shy about recording because they feel they haven't the "right"

* see page 138

voice; a regional accent, perhaps, or even a stutter. The day of the BBC accent has gone for ever. There's a right voice for you, and it's your own voice. Don't worry in the slightest if you don't like it yourself; everyone thinks they sound awful. Your own voice is the one sound source always readily available for recording. Why not use it more? And if you imagine you have a built-in disadvantage just think for a moment about dear old Patrick Campbell and then have a go. By the way, his book, "Rough Husbandry" comes very high on my list of "best books not about tape recording."

ACCORDING to a press report, an American Company is now in business recording messages for its customers heirs. For a single dollar the message is recorded, stored for one hundred years and then played back to the addressee. I would be a customer but for one snag. I can't quite work out who will be my heir in 2066.

BIRDSONG RECORDING

(Continued from page 123)

ful source of notes for any future identification and of course is on the tape adjacent to the recording to which it relates.

We have had many rewarding and amusing experiences. In the Welsh mountains, after waiting for over two hours, a whinchat finally perched a few yards away and gave us a couple of minutes non-stop song. In a Cotswold lane one evening we watched, and recorded, two hares having a boxing match. On this occasion we nearly spoilt the recording by laughing as we watched this most amazing and amusing spectacle of these animals standing on their hind legs and boxing each other with their front paws. Then there was the occasion when we thought we had recorded a tree creeper. Though we had in fact seen one on the tree, the recording proved to be an unseen nut-hatch! That was just one of the many times when our contact with experienced ornithologists has put us right.

From what I have said it should not be very difficult for you to deduce that my original approach to recording nature was as a recordist. Put this the other way around and you have a naturalist becoming interested in recording. There is a great difference between the two and a naturalist's original approach would, I am sure, be very different from mine. He would know where and when to go and sit to hear a particular bird or animal and then, perhaps, he would get his controls mixed up like I get my birds mixed up!

Then this naturalist turned recordist will, with practice, no doubt find that operating the equipment will become more absorbing, just as we have found is the case with watching nature. In fact we have noticed our activities changing with experience, and now find ourselves spending as much time sitting about in a locality, where we know there are certain birds, as wandering about. Incidentally, this all goes together very well with caravan touring and we find it very relaxing. Time means little and we should have missed many a recording, or meal, had we been compelled to return to base at a specific time.

THE writer of a glossary, like the compiler of an encyclopædia, is inevitably hag-ridden by the thought of what he might have left out, rather than what he can find to put in. Something of the sort seems to have happened here. This glossary is not an exact alphabetical compilation, but my leap from HYS- to INC- at the end of the last article has caused a couple of yelps of protest. "What about impedance?" asks G.C. of Cardiff.

What indeed—for this term is one of the most vexing examples of technical doubletalk the tape recording enthusiast has to endure. In particular, the practice of saying "high impedance" or "low impedance" in a specification cannot be too heavily criticised. Who is for joining the Mack campaign for more precise spec. details? Makers beware, you're being hounded.

* * *

IMPEDANCE. Resistance to alternating current. Correctly defined as the combination of resistance and reactance, the latter being the opposition to a change in current, due to the presence of inductance and capacitance in a circuit. Measurement is made in ohms. Although it is not necessary to remember the mathematical details, it is useful to consider that the reactance due to inductance increases with frequency and the reactance of a capacitor decreases with applied frequency.

SERVICE BUREAU

A glossary of tape terms—part 3

BY HARRY MACK

In practical terms, a condenser (capacitance), shunted across a circuit, will offer less impedance to higher frequencies than to lower frequencies, and thus bypass more and more treble as its value is increased. A combination of inductance and capacitance can offer a relatively high impedance to a particular frequency. The circuit can then be "tuned" to this resonant frequency. Practical examples in tape recording are peaking coils and filters and the oscillator coil with its associated capacitors illustrated in Fig. 2 of the article in the December issue.

The term for impedance is **Z**. The important impedances we need to know in tape recording are the Input and Output impedances, and, in special circumstances,

the head impedances. Typical Input impedances are shown in Fig. 1. Output impedances will be dealt with later, as will the problem of matching, in which the calculation of impedances plays a vital part, for correct energy transfer.

Head impedances were dealt with in the appropriate section of the last article, but precise values were not given. Head impedances are normally specified at particular frequencies, the most usual quoted figure being the impedance of a Record/Playback head at 10,000 cps, a value of 50 K ohms being typical. Heads may be wound in such a way that they can be connected to give high or medium impedance matching, with a smaller recording current being required for the high impedance mode, and with an

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appropriate signal level available from a fully modulated tape being played back. Typical figures: at 50,000 cps, 70 K or 17.5 K ohms, with recording current 30-100 and 60-200 microamps.

Erase heads require more power and are generally of a lower impedance. An example might be 150-200 ohms, at the bias frequency. As the head is mainly inductive, an alternative specification may be 1.5 millihenries for a half-track and as much as 75 mH for a quarter-track erase head, requiring an erase voltage of 45 volts (A.C.) for the lower inductance and a third of this for the higher inductance head.

INCHES PER SECOND. Tape speed specification. Also abbreviated to ips, i/s, or in/sec. Speeds are standardised at 30 ips and successive halved fractions of this figure. The two higher speeds, 30 ips and 15 ips are more usual for professional recording. The three speeds used for most domestic machines are $7\frac{1}{2}$, $3\frac{1}{2}$ and $1\frac{1}{2}$ ips, with $3\frac{1}{2}$ ips the most popular general purpose speed, at which many pre-recorded tapes are made. A lower speed of 15/16 ips is used on many small portables and dictating machines.

Improved manufacturing techniques and better materials have made good reproduction possible at slower speeds, but in general the high frequency response is improved by using a higher speed, other conditions being unaltered. The two lower speeds are more suitable for speech recording, where a restricted frequency response can be tolerated.

INPUT. The point to which the signal source is applied. Inputs to a tape recorder

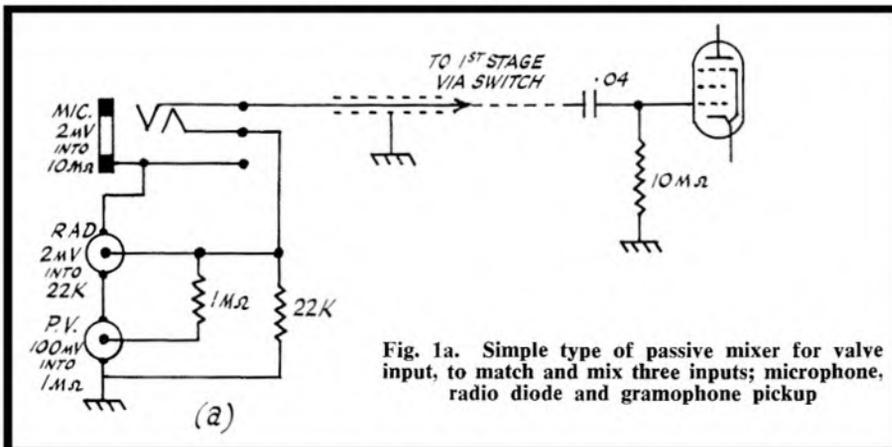


Fig. 1a. Simple type of passive mixer for valve input, to match and mix three inputs; microphone, radio diode and gramophone pickup

may be typically: Microphone, Pick-up, Radio Diode, with or without mixing facilities. Each input has its appropriate level of signal required for full modulation, and the input impedance must be matched. (See *Input Impedance*.) Input levels from typical sources would be as follows: Crystal microphone: 1.5 to five millivolts into one megohm upwards; Dynamic microphone: less than one mV into 30 to 200 ohms; Ceramic or crystal pickup: 100 to 200 mV into two Meg upwards; Dynamic (variable reluctance) pick-up: one to ten mV into 50,000 ohms; and Diode: 50 to 100 mV into 100,000 ohms.

These are only typical figures, and reference should always be made to maker's specifications when matching. (See also *Sensitivity*.)

INPUT IMPEDANCE. From the above it is obvious that sources vary widely not only in the level of signal they apply to the input circuit but also in the impedance into

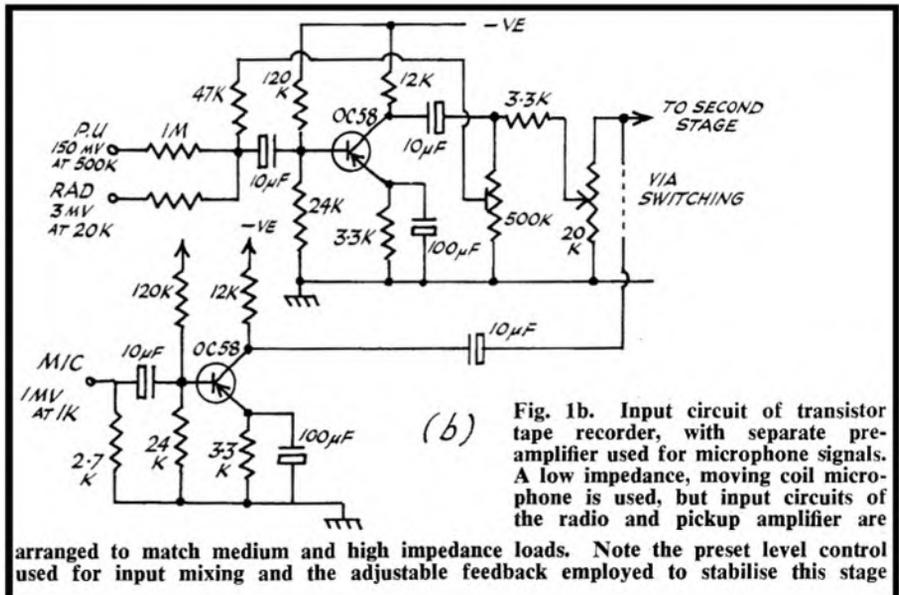


Fig. 1b. Input circuit of transistor tape recorder, with separate pre-amplifier used for microphone signals. A low impedance, moving coil microphone is used, but input circuits of the radio and pickup amplifier are

arranged to match medium and high impedance loads. Note the preset level control used for input mixing and the adjustable feedback employed to stabilise this stage

which they must be matched for maximum transfer of energy.

As impedance is an AC quantity, loss of energy due to a mismatch will not be constant at all frequencies. For example, a crystal microphone fed into an input circuit with too low an impedance loses bass response. A high impedance input with too long a connecting lead loses high frequency (treble) response due to lead capacitance.

Actual speed, when loaded, may be less than this, as the design allows for "slippage." Rotor speed can never reach the speed of the revolving field, as the rotor bars must cut the flux of the stator field, and the difference between rotor speed and synchronous speed is called the "slip" of the motor. This is also affected by the friction of the system—the mechanical load.

Various methods are used to start the motor and cause the flux-cutting necessary to keep the rotor moving. Usual method is "capacitor-start," a series capacitor causing the necessary phase shift in the field winding; cheaper types use the shaded-pole principle. (See also *Motors*.)

INTERMEDIATE WHEEL. A free-running pulley interposed between the drive source and the driven member, as between motor and flywheel, or flywheel and clutch pulley. (N.B. The size of an intermediate wheel has no effect on the ratio between the two other rotating parts, and thus does not affect the speed.)

IRON OXIDE. The active coating on the recording tape, which is magnetised by the varying field applied by the recording head, retains the magnetic "pattern" and when replayed, sets up corresponding electrical currents in the playback head. A tape may be homogenous, in which case the magnetic material is embedded in the base material, or otherwise impregnates it; or non-homogenous, where the oxide is bonded to the base material by a coating or plating process. (See also *Tape*.)

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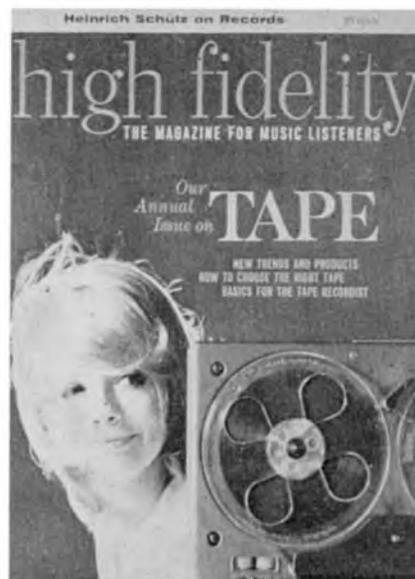
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THE MAGNAVOX STUDIOMATIC

(Continued from page 127)

addition of a small spring to assist return of the pivoted lever, easily circumvents this, and has, in fact, been fitted to production models. In practice, I found that switching to "Fast Rewind" temporarily was sufficient to release the idler from its trapped position.

The same idler is employed for "Fast Rewind" by the rod of the main lever pushing the swivel bracket in an anti-clockwise direction. This moves the idler into contact with the motor pulley and the free idler seen at top left in Fig. 1. The latter is in contact with the lower section of the left-hand spool assembly, coupled directly to the spool carrier, and resting on a felt pad on the spindle base. Only a small movement of this idler is needed, and there is a tendency for it to remain in contact with its drum. In operation, however, there is quite sufficient clearance and the direction of rotation is enough to throw the idler clear when the "Start" or "Fast Wind" function is selected. Again, an example of economy of design.

In each case, the spool carrier is mounted on a spindle whose lower end is supported by a triangular plate, spring-loaded by three screws beneath the main deck, as shown in Fig. 9. Height adjustment is thus possible, and a fine adjustment for free-running can be made by careful setting of the support screws. Also clearly shown in this photograph are the brake and motor switch levers, and the ends of the control levers in their slots. The transverse lever at the bottom of the picture is attached to a rod on the lower side of the "Start" lever, and hinged just out of the photograph, this is the actuating lever for the capstan idler wheel assembly, discussed in detail above.

Pinch wheel and pressure pad arrangements in various machines differ between the brute force technique and the compensated, adjustable balance method, usually operated by solenoid action. In the Studiomatic, a

compromise was obtained by using a lever hinged at its inner end but impelled by the rocker action of the "Start" key at its outer end. This lever is coupled to a short strut which directly operates the interlock jaws shown in Fig. 4, and indirectly applies pressure to the pinch bracket, via the screw and slide plate indicated in Fig. 10. As this screw carries the bracket forward, the hairpin spring attached to the post of the bracket at the right of the picture takes over and gives a final snap action. The same spring provides the neutralising action when the screw moves in the other direction. Thus, by partial operation of the "Start" key, a very sensitive pause action can be obtained, quite apart from the direct action possible by movement of the post, which is extended to protrude through the top cover for this purpose.

This assembly, as well as the head mountings and the top of the retracted pressure pad bracket can be seen in Fig. 11, where the pointer indicates the adjustable guide. A similar adjustment is employed for the left-hand guide, both of which are faced with highly polished brass. The leaf-spring bracket on which the felt pressure pads are mounted is also brass, each pad having its individual sub-bracket, and being self-adjusting. The main plate on which the pad brackets are mounted is pivoted to rock back when the deck is neutralised, thus giving plenty of space for tape loading—a point that is certainly worthy of praise.

The lower section of this plate is butted by a lug at the front edge of the interlock lever, and the "on" position is effected by yet another hairpin spring, fitted vertically just to the left of the erase head pad, its top leg just visible at the left of Fig. 11. The whole pinch bracket is mounted at its left-hand end in a flexible plastic hinge, thus assisting the snap action for positive engagement without the aid of such devices as solenoids or balanced springs. Simplicity again.

A special bracket with three pressure pads is available from the makers and space has been left, as in earlier designs, for the fitting of a third head. Azimuth adjustment is by the mounting screws clearly seen in Fig. 11 adjacent to the heads and a "rocker" action is used, i.e., movement of one screw of a head mounting should be followed by a compensating movement of its companion.

Considerable space has been taken to describe and illustrate this deck—for one reason the reviewer believes to be valid: we are going to see more and more of the Studiomatic as time goes on, and now is the time to get to know this simple and efficient mechanism.

MANUFACTURER'S SPECIFICATION

Speeds: $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{1}{2}$ ips.

Tracks: Two or four, as required.

Motor: Single, four-pole induction type, fully screened.

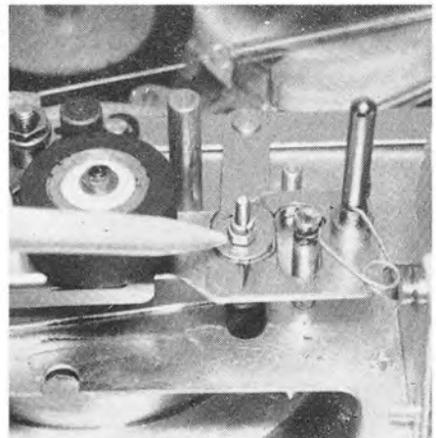
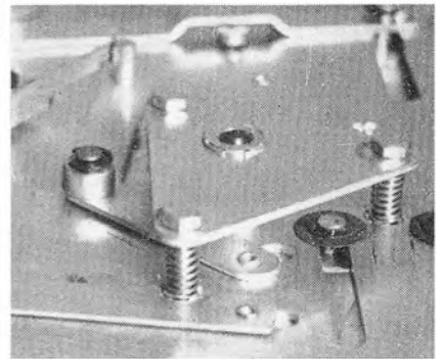
Operating consumption: Twenty watts at 230 volts, 50 c/s AC.

Rewind Time: 120-150 seconds for seven-inch spool of 1,200 ft. (standard-play).

Playing Time: 120, 60 or 30 minutes per track, using standard-play tape (1,200 ft.) on seven-inch reel.

Wow and Flutter: 0.15 per cent at $7\frac{1}{2}$ ips; 0.25 per cent at $3\frac{3}{4}$ ips (no figure quoted for $1\frac{1}{2}$ ips).

Dimensions: $13\frac{1}{2}$ x 11 x $5\frac{1}{2}$ inches (depth below mounting board).



9 View of spool height adjustment plate, showing also the brake arm and ends of control levers in their slides.

10 Pinch wheel bracket assembly.

11 Head assembly, showing also tape guide, flywheel capstan and pinchwheel. See text for details of operation.

Weight: 10 lb.

Tape Heads: half-track Record, Bradmatic C1; half-track Erase, Bradmatic CE1; quarter-track Record, Marriot X/RPS/17 HI; or Marriot X/RSP/18 LI; or Acos TR4/500 HI; or Acos TR4/120 LI; or Bogen UK207; quarter-track Erase, Marriot X/ES/11; or Acos TE1-3; or Bogen UL218.

Price: £14 19s. 6d.

Manufacturers: Magnavox Electronics Co. Limited, Alfred's Way, By-Pass Road, Barking, Essex.

Getting set for summer

(Continued from page 121)

Apart from the machine, all plugs should be cleaned and again CTC is very useful for this. If the plugs are standard Post Office jack types, a light cleaning with one of the wadding types of metal cleaner is permissible. Check all connections to plugs, since with a lot of use these can become frayed and cause serious trouble at the most inopportune times. Any suspect connections should be remade, or worn leads completely replaced.

Tapes should also be checked and splices (if any) re-examined for strength. If it is not possible to use virgin tapes, previously recorded tapes should be bulk-erased, or run through on a machine set to "record" with the gain controls at minimum. This is particularly necessary if the previous programme included any over-modulated passages that one run past the erase head would not obliterate.

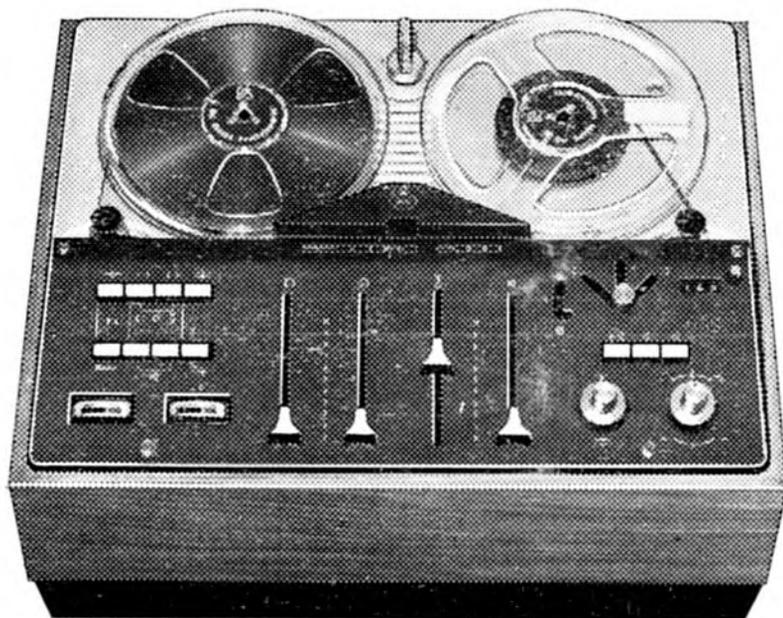
Regular maintenance of tape recorders is a must anyway, but specific checks before a recording session will prevent many frustrating moments in the field.

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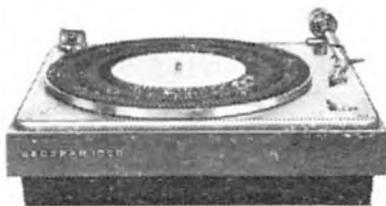
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Power output is 2 x 8 watts, distortion at 5 watts less 1%. FREQUENCY RESPONSE: $7\frac{1}{2}$ in./sec.: 30-20,000 c/s (± 2 dB: 40-16,000 c/s); $3\frac{3}{4}$ in./sec.: $1\frac{7}{8}$ in./sec.: 50-8,000 c/s (± 2 dB: 50-6,000 c/s). Price 119 Gns.

Also available to the same specification is Model 2000T which has two speakers built into the lid of the portable carrying case. Price: 123 Gns.



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Tape records reviewed

The finest POPULAR record by the Beatles



By Don
Wedge

RUBBER SOUL. The Beatles. Parlophone (TA-PMC 1267), 3½ ips, mono, 35s.

Pop adventurers—that's the Beatles today. Knowing that whatever they do is going to sell in massive quantities they can experiment to their hearts' content. This confidence leads to exciting records.

This album, probably their finest, is noticeable for its range. It's full of innovating sound colours *Michelle* is beautiful if corny. *You Won't See Me* is one of those melodies that you find yourself humming long after you first heard it.

Nowhere Man is a brilliant pop social comment. It attacks the empty-headedness in all of us.

If nothing else, this track shows that there is a lot more to the Beatles than mop hair. Long may they continue making such records.

* * *

PRETTY EYES. Peggy Lee orchestra conducted by Billy May. WRC (TT 484), 3½ ips, mono, 29s. 6d.

"Pretty Eyes" is one of the songs Peggy Lee features on the old Capitol record reissued by WRC. It's a gem.

The whole album is a joy of Peggy Lee's restrained cool singing of a collection of worthy songs.

Her choice has been for rarely heard compositions which become her.

Billy May's usual strident accompaniment is missing; his subdued arrangements complement Peggy Lee perfectly.

* * *

ADAM FAITH with accompaniment directed by John Barry. WRC (TT 486), 3½ ips, mono, 29s. 6d.

Adam Faith had something. This record was made in the days of his climb to fame and benefits enormously from the multi-talented John Barry (whose rise coincided).

Listen for a singer and you may shudder with embarrassment for Faith's efforts. But listen rather deeper and the fervour he injects overcomes all.

This is far better material and performance than his present-day output, mature though he may have become. *If I Had A Hammer* (done as "... had a dollar") is most moving and the highlight of the record.

* * *

DREAMY. Sarah Vaughan with accompaniment by Jimmy Jones. WRC (TT 440), 3½ ips, mono, 29s. 6d.

Credit for this outstanding record—exceptionally good even by Sarah Vaughan standards—is due to arranger Jimmy Jones.

His backing is so subdued that it's more noticeable for its absence than its presence! Which is fine. Sarah Vaughan doesn't need any window-dressing.

Dreamy (the Erroll Garner tune) provides the album title, but apart from *Stormy Weather*, the songs are pleasantly unfamiliar.

BRIEFLY

The major companies have such an enormous output of long playing records now (there are more disc LPs issued than singles) that obviously they can pick and choose the cream for tape releases.

The overall standard is high and the range of tape releases is wide enough to appeal to most tastes.

The quantity of releases is so great that comment must be restricted on most of them. May I offer these points on recent 3½ ips, mono tape releases?

A country music album without a composition by Hank Williams is unusual. But it detracts not at all from **The Best of Slim Whitman—Vol. 2** (Liberty, TA-LBY 3060, 35s.)—and it's not as though Whitman filled the sixteen-title album with his own compositions. His light tenor is not for me, but many people like it and enjoy its subdued vocal effect.

Ella Fitzgerald—I dig. **Ella Swings Lightly** (WRC, TT 483, 29s. 6d.) features her with a small accompanying orchestra in a delightful selection of not too frequently heard songs. The stand-outs are *720 In the Books* and *Little Jazz*. The mood is aptly summarised in the title.

Mulligan and a classic collection

JAZZ



By Mike
J. Gale

GERRY MULLIGAN MEETS JOHNNY HODGES. Personnel: Gerry Mulligan, bar; Johnny Hodges, alt; Claude Williamson, pno; Buddy Clark, bass; Mel Lewis, dms. WRC (TT 494), 3½ ips, mono, 29s. 6d.

Norman Granz has, of course, played a fantastic part in the jazz world and it was his idea to get Mulligan to team up with major contemporary jazzmen in a series which I hope will go on for a long time. This collection is classic: both men apparently prepared for it with their own ideas and were determined to make the most of them. They could have been at odds but, in fact, no item required more than three takes at the most. The results are dynamic.

Ideas grow to maturity as both men galvanise each other's creative impulses supported by a highly talented team of sidemen: Williamson is exceptionally fluent and sensitive throughout. Highly rated.

Items are: *Bunny, What's the Rush, Back Beat, What It's All About, 18 Carrots For Rabbit and Shady Side.*

The tapes reviewed this month are issued by the following companies:

"Liberty" and "Parlophone": E.M.I. E.M.I. Records Ltd., 20, Manchester Square, London, W.1.
"W.R.C.": World Record Club, Box 11, Parkbridge House, The Little Green, Richmond, Surrey.

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(SEE PAGE 111)

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NEW PRODUCTS

**THREE MODELS
BY
FERGUSON**

THREE new recorders are announced by Ferguson who have introduced two four-track two-speed models, and a half-track single-speed machine.

First of the new models is the 3222 a four-track two-speed recorder operating at 3½ and 1½ ips. With accommodation for 5½-inch spools, it provides a playing time of 45 minutes per track using standard-play tape (850 ft.) at 3½ ips; rewind being accomplished within 2½ minutes.

The frequency response is quoted as 60-10,000 cps at 3½ ips, 60-6,000 cps at 1½ ips. Wow and flutter is given as better than 0.2 per cent and 0.3 per cent respectively, and signal-to-noise ratio at 40 dB unweighted.

Incorporating its own tape deck, manufactured by the Thorn group, the 3222 (illustrated right) incorporates a wide range of features including facilities for superimposition, parallel track playback, automatic tape end stop, safety erase lock, remote pause control, tape inching, straight-through amplification, and combined tone control. Other features include push-button controls, three digit rev. counter with zero reset button, and neon record level indicator.

Inputs are provided for microphone (1.5mV/10 M ohms), radio (1.5mV/68 K ohms) and pick-up (75mV/3.3 M ohms). Outputs are for loudspeaker or headphones (3 ohms), and radio/amplifier (500mV/22K ohms). The built-in 7 x 3½ inches loudspeaker handles the power output of three watts.

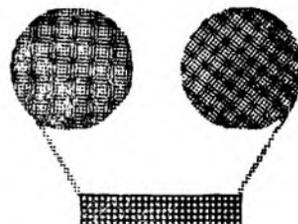
The dimensions are 14½ x 12½ x 7 inches and it weighs 19 lb. Housed in a teak cabinet with black polypropylene lid, the 3222 costs



35 guineas. An identical model, the 3218, housed in a leathercloth covered cabinet, costs 34 guineas. This can be used to replay stereo programmes used in conjunction with the SA101 stereo amplifier unit.

Third new model is the 3220, incorporating a single speed of 3½ ips, and operating on the half-track system. This also will accommodate 5½-inch spools. The quoted frequency response is 60-10,000 cps, wow and flutter is given as better than 0.2 per cent RMS, and the signal-to-noise ratio as 40 dB unweighted.

Among the features of the 3220, illustrated above, are facilities for tape inching, piano-key controls, interlocked record button, pause control, tone control, neon record



level indicator, and three-digit rev. counter with zero reset button.

It features a built-in 7 x 3½-inch loudspeaker handling the power output of three watts. Inputs and outputs are as for the 3222 above.

The dimensions are 14 x 12½ x 6½ inches, and it weighs 18 lb. The price is 25 guineas.

Ferguson Radio Division, Thorn Electrical Industries Ltd., Upper St. Martins Lane, London, W.C.2.

**NEW MICROPHONE
FROM
RESLOSOUND**

AN improved cardioid "pencil" dynamic microphone, Model CPD, is announced by Reslosound. The new microphone, illustrated below, is a lightweight tapered cylindrical case incorporating a miniature dynamic insert having a ribbed plastic diaphragm to which is attached a lightweight self-supporting voice coil.

The CPD is suitable for high quality music recording and replay purposes and can also be used for loud close-speaking and singing if bass attenuation is provided in the associated amplifier unit.

Three alternative impedance models are available. CPDL, single impedance (30-50 ohms), CPDM, dual impedance (250 and 600 ohms), and CPDH, dual impedance (30-50 ohms and Hi-Z, 40,000 ohms). Fitted with an on-off switch, the various models are supplied with six yards of flexible screened cable and connecting plugs and a set of accessories for universal stand mounting. Our illustration shows the CPD mounted on an MS175 "boom" arm and MS100 floor stand.



The quoted frequency response is 50-17,000 cps -2 dB and the polar response is uni-directional, partially suppressed at the rear. Rear pick-up is rated as -10 to 20 dB over the range 200-15,000 cps.

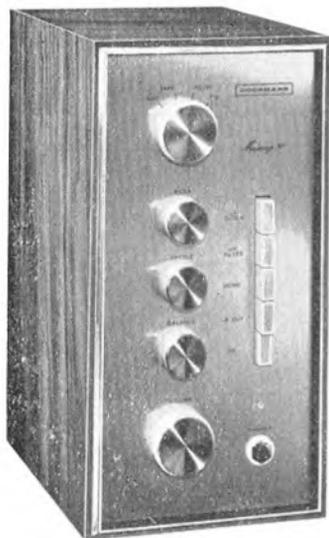
Finished in fine grain black shrivel enamelled tubular case with head and front cap matt "silver," the CPD measures 8½ inches overall with a maximum diameter of 1½ inches. The CPDL costs £15, the CPDM and H models cost £16, and the CPD/NSL low impedance model without on-off switch costs £14.

Reslosound Ltd., Reslo Works, Spring Gardens, London Road, Romford, Essex.

GOODMANS ANNOUNCE HI-FI AMPLIFIER UNIT

THEIR entry into the hi-fi amplifier field is announced by Goodmans Industries who have introduced the MaxAmp, a solid state stereo amplifier with integrated control unit.

The MaxAmp, illustrated below, has a rated power output of fifteen watts per channel, and uses silicon transistors throughout. Measuring 10½ x 5½ x 7½ inches, it is



housed in a polished wood cabinet no larger than the well-known Maxim speakers. The list price is £49 10s., and delivery will commence on April 1. Further details are available from the manufacturers.

Goodmans Industries Ltd., Axiom Works, Lancelot Road, Wembley, Middlesex.

PHILIPS INTRODUCE NEW TAPE CASSETTE

A CONTINUOUS tape cassette has been introduced by Philips Electrical. The new unit is designed for use with standard tape recorders employing the usual reel-to-reel tape transport system.

It accommodates 195 ft. of tape providing an initial playing time of twenty minutes at

1½ ips. Manufactured in off-white plastic, the cassette, Philips CE10, costs £3 10s.

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

MORE MAGNETIC TAPE FROM AMERICA

DENHAM & MORLEY LTD. announce the new range of ERA (Extended Range Audio) magnetic recording tapes manufactured by C.B.S. International in America.

The new tapes are available as follows:
Standard-play (1½ mil Acetate base): Three-inch reel (150ft.) 6s. 6d.; five-inch (600ft.) 21s.; 5½-inch (900ft.) 28s.; seven-inch (1200ft.) 33s.

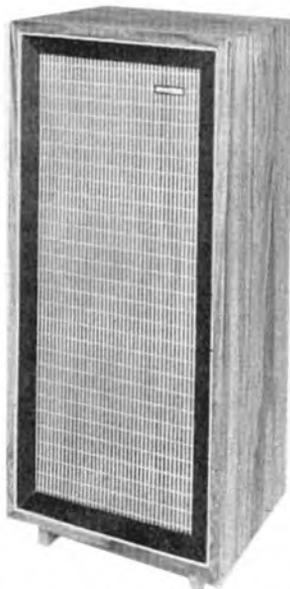
Double-play (½ mil Mylar base): Three-inch (300ft.) 12s. 6d.; five-inch (1200ft.) 36s.; 5½-inch (1800ft.) 50s.; seven-inch (2400ft.) 68s.

Triple-play tape is available only on a seven-inch reel (3600ft.) selling at five guineas.

Denham & Morley Limited, 173-5, Cleveland Street, London, W.1.

LOUDSPEAKER UNIT BY DECCA

A NEW Kelly loudspeaker system is announced by Decca Special Products who have introduced the Kelly Kardiod. The new unit, illustrated below, incorporates a new twelve-inch bass speaker—the Decca Kelly DK1—and the Kelly ribbon loudspeaker Mark II, which has a single moving



part—an aluminium ribbon just one-twentieth the thickness of the average human hair.

Retailing at 47 guineas, the enclosure is finished in teak and measures 36 x 16½ x 13 inches.

Decca Radio & Television, Ingate Place, Queenstown Road, London, S.W.8.

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News from the Clubs

CORNWALL

A plea for members in the Penryn district of Cornwall is made by the secretary of the Cornish society who points out his club virtually exists in name alone.

His newsletter also refers to the increasing difficulty experienced explaining the club's desire to provide a service for local hospitals rather than requesting assistance for a recording to be made. Tape in the south-west seems to be still "almost 'black magic'" reports a despairing secretary, with the "hundreds" of machines sold locally seemingly disappearing into thin air.

Secretary: G. B. Reed, 5, Trekeen Road, Penryn, Cornwall.

COVENTRY

A change of secretary is announced following the AGM of the Coventry society. Relieving Roy Reynolds is Mr. C. Stanley. Other changes included the retirement of Stan Day from the chair. The new chairman is Ken Preston.

Secretary: C. Stanley, 333, Holyhead Road, Coventry, Warwickshire.

DARTFORD

At the request of Mr. Stanley Atkins, Borough Librarian, members of the Dartford society spent an evening recording antique musical instruments in the local museum. Among the instruments recorded was a Polyphon, a cross between a gramophone and a musical box, which uses metal discs incorporating spikes which strike a metal comb as it revolves. A copy of the tape made is to be kept in the Library archives and will also be used in the club's programmes for the blind and hospitalised.

Shortly after this visit the members were out again this time to visit Miss Daphne Oram's Oast house recording studio at Wrotham. Miss Oram demonstrated her electronic music recording equipment.

Secretary: E. H. Foreman, 117, Westgate Road, Dartford, Kent.

DONCASTER

Comparative strangers to this column are the members of the Doncaster tape club who break their silence to announce their sponsorship of the third AGM of the Federation of Yorkshire tape clubs. The meeting was to be held at the club's headquarters at the beginning of March.

Scheduled for the evening's entertainment was a manufacturer's demonstration, a recording session and a tape and cine show.

Secretary: C. K. Young, 28, Chelmsford Drive, Doncaster, Yorkshire.

IPSWICH

Visits by manufacturers have been the main feature of the recent meetings of the Ipswich society. At consecutive meetings the members received talks and enjoyed demonstrations from Mastertape (Magnetics) Ltd., the World Record Club Ltd., S. G. Brown, Ltd., Truvox Ltd., and Wharfedale Wireless Works.

At the first of the series, Mr. G. C. Balmain of Mastertape presented a lecture on "fault-finding in tape

recorders," describing methods of tracing and dealing with both electrical and mechanical problems.

He was followed by Mr. A. C. Griffiths of W.R.C. who, in conjunction with local dealers Hi-Fi Centre (Ipswich) Ltd., provided a programme of current and future mono and stereo tape records. Mr. Griffiths also described the production of his company's repertoire and mentioned the different types of recording level meters in use.

October 7 saw members being entertained with a lecture by Messrs. Pickburn and Ibbotson, Sales Manager and Chief Engineer of S. G. Brown Ltd., who traced developments in the field of microphone and receivers since 1908. One of the most intriguing items demonstrated was a microphone designed to be held in the teeth like a pipe, with the head inside the mouth. The Ipswich newsletter omits to relate the applications of this particular instrument. Also seen and examined were micro-miniature microphones similar to those used in the Mercury and Gemini space capsules.

The club's Trafalgar Day meeting included a Musical Challenge programme with members presenting their favourite musical programmes. A fortnight later Mr. K. C. Smith of Truvox made a return visit to demonstrate the latest range and talk on the design and development of Truvox recorders.

Their November 18 meeting included a live recording session when members made mono and stereo recordings of music played by the Vairoos Beat Group from Woodbridge. Some publicity from this particular meeting was gained for the club when a photograph showing them at work was published in the local paper.

For the first of their December meetings members welcomed Mr. W. A. Jamieson of Wharfedale who lectured on the development of loudspeaker equipment. A wide range of loudspeakers were demonstrated including some in use at the beginning of the century. Also presented was a stereo recording made in 1933. The following meeting featured a film show presented by member David Lockwood.

Secretary: Mrs. Diane Wilding, 4, Meadowvale Close, Ipswich, Suffolk.

LEICESTER

The seventh anniversary of their formation was celebrated by members of the Leicester tape club at one of the December meetings, when the guest of honour was Mr. T. A. Walden, Director of Leicester Museums.

During the evening plans were made for the 1966 meetings which will now take place on the 2nd and 4th Thursdays in each month at Leicester Museum. Among the programmes already arranged is a monthly series devoted to tape recording techniques and accessories for the benefit of new members.

One of the first of the season's meetings was an evening compiled for the benefit of the new members, listening to highlights of the club's history. Among the items heard were recordings of villagers singing local folk songs, brass bands, antique musical instruments—like the Dartford members they have also recorded a Polyphon—and a barrel organ. At a later meeting members took along their own recorders and each presented a ten-minute talk on its design and use.

Members are currently active arranging to man a stand at the "Leisure 1966" exhibition to be held at the Granby Halls from April 20-23, the proceeds for which are being given to the Lord Mayor's appeal for the county's Medical Centre. Other recent activities have included the recording of church music and massed school choirs for distribution to the City's Old Peoples Welfare Centres.

Secretary: P. Warrington, 20, Langham Drive, Narborough Leicestershire.

LONDON

Post-war recordings made on a wire recorder were among the items heard during the February meeting of the London tape club. Presenting them were Walter Buchanan, joint producer with Mike Avel of the British Amateur Tape Recording Contest's "Tape of the Year" for 1962 and 1963. "Buck" also talked about and demonstrated his 20-year-old home-constructed wire recorder. His recorded feature had been made using a variety of microphones in order to demonstrate their relative performances.

Another part of the programme for the evening included a film with taped sound track produced by Mike Avel. Members congratulated the Triumph Owner's Club Film Unit for an amusing film which was based on the 007 epics.

The Londoners' January meeting saw two newcomers in attendance for the club's recording session for their magazine programme "Air Space" Jim Dale brought along his recording equipment and the club's Camera Club H.Q. was transformed into a "studio" for the night.

Prepared for their March meeting is a "creative recording" session with members being invited to take along examples of their own work.

Secretary: David Campbell, 46, Aberdare Gardens, London, N.W.6.

MIDDLETON

A change of secretary also for the Middleton club with Mr. T. Brown replacing John Witts who assumes the post of publicity secretary. During the AGM, during which the changeover was announced, members discussed the British Amateur Tape Recording Contest and the possibility of including some of the unsuccessful entries in the club's tape magazine "Playback".

If anyone would care to send his tape to the secretary, the club would be pleased to circulate them in their audio journal.

Secretary: T. Brown, 67, Sherbourne Road, Middleton, Manchester.

STEREO INTERNATIONAL

A change of U.K. representative and a reduction in the annual subscription is announced by Stereo International, a world-wide tape exchange organisation with special interests towards stereo recording.

Complete reorganisation is also claimed for the society which provides, among its many attractions, four-track tape records at special discount prices.

The new U.K. representative is John Shuttleworth who has assumed temporary command from Roy Huddleston. The new fees for U.K. members is 30 shillings.

U.K. Representative: John Shuttleworth, 33, Grove Park Road, Mottingham, London, S.E.1.

WORLDWIDE TAPETALK

Consideration of its reorganisation as a marriage bureau for the Worldwide Tapetalk tape exchange club is anticipated with the announcement of the third marriage between members who first made contact via the club.

Janet Hallam of Birmingham established a tape contact with Gunther Rabbell of West Berlin soon after joining WWTT in 1963. Tapes flew back and forth culminating in Gunther's visit to England in autumn of 1964 to meet Janet. They married in December and have now returned to Germany to start their life together.

The latest issue of their monthly newsletter "Sound Advice" announces the introduction of a special section devoted to the interests of teenage recording enthusiasts. Paul Bailey of Melton Mowbray will be in charge of this department and he writes his first "Teen Tape Talk" in the winter issue. The sixteen-page booklet contains a variety of features including

"Tape Tips." Among this month's tips was the suggestion to cut a small piece of fine sponge rubber and insert it between the flanges on a spool to prevent tape spillage during storing. This was from member Paul Brierley of Bolton, Lancashire, who also described his use of a shaving mirror angled above his recorder's magic eye for distant observation.

Secretary: B. Ashfold, 11, Sixth Avenue, Brackendene, Addlestone, Surrey.

TAPE EXCHANGES

TAPE recorder owners who wish to contact others with similar interests, to exchange news and views by tape are invited to fill in and return the form on page 140 giving their name, age, address, special hobby or interest for this free service.

Details given here also include speeds to be used, spool size, name of recorder, and special area to be contacted.

Ashcroft, G. R. S. (35). 4, Wilson Grove, Garston, Liverpool 19, Lancashire. Choirs, organs, bands, bell-ringing, Scouting. 7 1/2, 3 1/2, 15/16 ips. Seven-inch spool. Philips EL3585, EL3301, and Stella ST459, four-track.

Ashfold, Bernard (21). 11, Sixth Avenue, Brackendene, Addlestone, Surrey. 3 1/2, 1 1/2 ips. Seven-inch spool. Cossor CR1604.

Bain, Robert (21). 17, Martin Drive, Rainham, Essex. Modern jazz music. 7 1/2, 3 1/2 ips. Seven-inch spool, Akai M8, four-track stereo.

Bass, Sam (34). 98, Orme Road, Newcastle, Staffordshire. Film sound tracks. 7 1/2, 3 1/2 ips. Seven-inch spool. Ferrograph recorder.

Beardsley, K. (37). 36, Highfield Lane, Newbold, Chesterfield. French language. 3 1/2, 1 1/2 ips. 8 1/2-inch spool. Ferrograph recorder. Native French speaking contacts required.

Beswick, David (35). 63, Ashton Road, Luton, Bedfordshire. Social services for blind and aged. 3 1/2, 1 1/2 ips. Seven-inch spool. Cossor CR1604, four-track.

Bhasin, R. S. (22). 66, College Road, Isleworth, Middlesex. Photography, travel, sleep-learning by tape. 3 1/2, 1 1/2 ips. Seven-inch spool. Grundig TK14 and Civic, four-track.

Blay, Godfrey L. (39). 5, Ashlett Close, Fawley, Southampton. Travel, outdoor life, local history. 7 1/2, 3 1/2, 1 1/2 ips. Seven-inch spool. Baird 101. New Zealand, Australia, USA.

Blundell, Arthur M. (37). 56, Castle Road, London, N.W.1. Philately, country dancing and classical music. 7 1/2, 3 1/2, 1 1/2, 15/16 ips. Seven-inch spool. Philips EL3549, four-track.

Booth, Ronald (36). 15, Keynsham Road, Eitham, London, S.E.9. Electronics, television. 7 1/2, 3 1/2, 1 1/2 ips. Seven-inch spool. Truvox R102 and Stella portable.

Broomfield, Kenneth (44). 8, Southlands Drive, Nunthorpe, Middlesbrough, Yorkshire. Photography, building techniques, local histories, light classical music. 3 1/2 ips. Seven-inch spool. Philips EL3541, Sweden, USA.

Browne, Dave (33). 265, Mays Lane, Barnet, Hertfordshire. Photography, motoring, naturism. 7 1/2, 3 1/2, 1 1/2 ips. Seven-inch spool. Robuk RK44. Female contacts preferred in Home Counties. Letters first please.

Bull, Mrs. Rita (23). 13, Chapel Street, Brynmawr, South Wales. 3 1/2 ips. Five-inch spool. Stella recorder. Overseas only.

Continued on page 140)

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TAPE EXCHANGES

(Continued from page 139)

Cadwell, Charles (47). 50, Churchill Crescent, Farnborough, Hampshire. 7½, 3½, 1½ ips. Philips EL3549, four-track.

Chapman, David J. (30). 22, Gouge Avenue, Northfleet, Kent. Church work, pop and c/w music. 3½, 1½ ips. 5½-inch spool. Grundig TK35.

Charles, Paul (25). 4, Penrith Gardens, Southmead Road, Bristol 7, Gloucestershire. 35mm photography, light and classical music. 15, 7½, 3½, 1½ ips. 8½-inch spool. Brenell Mk 5, Type M, Series 3. Europe.

Childs, R. C. (28). "Electronics," RAF Marham, Kings Lynn, Norfolk. Motoring, all music. 7½, 3½, 1½ ips. Seven-inch spool. Elizabethan LZ507, four-track stereo.

Cowan, Selwyn (37). Braidholm Court, Giffnock, Glasgow, Scotland. Jazz music. 7½, 3½, 1½, 15/16 ips. Seven-inch spool. Stella ST459, four-track. Female contacts in Canada, UK, USA, Sweden, Italy.

Clough, John (49). 264, Rommady Road, London, S.E.27. Photography, cars, Bach. 7½, 3½ ips. 8½-inch spool. Ferrograph 5A/N. USA, England.

Coles, John E. (35). 580, Goldhawk Lane, Cambridge. Shortwave radio, wild animals. 3½ ips. 5½-inch spool. Sound Riviera. Holland, Austria.

Daniels, J. E. (27). 2, Ynys Nedd, Resolven, Neath, Glamorgan, South Wales. 8mm cine photography, tape-to-disc. 7½, 3½ ips. Seven-inch spool. Simon SP5.

Docherty, Jack (22). 63, Underwood Road, Paisley, Scotland. Film music, esp. Max Steiner. 3½ ips. Elizabethan four-track. UK only.

Dowell, Norman (42). 31, Woodstock Avenue, London, W.13. Travel, woodwork, mechanics. 3½ ips. 5½-inch spool. Fidelity TR6, Challenge, Mayfair FT157.

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VACANCY

YOUNG MAN required with some knowledge of tape recorders. Only London applicants please. MAGNEGRAPH, 1, Hanway Place, London, W.1.

Dromey, Brian (27). 14, Stewart Avenue, Narborough, Leicester. Hi-Fi, jazz, pop and r/b music, gardening. 3½, 1½ ips. 5½-inch spool. H.M.V., four-track. Not USA.

Dunkley, R. Brian (38). Top Flat, 80, Herne Hill, London, S.E.24. Round robin tapes. 7½, 3½, 1½ ips. Seven-inch spool. Stella, Civic, Fidelity Playmaster Major recorders.

OVERSEAS READERS

Aubrey, Brian (25). 5, Maraball Street, Elizabeth Grove, South Australia. Matchbox collection, pop, c/w and instrumental music. 7½, 3½, 1½ ips. Seven-inch spool. National 722 and RQ115, Philips EL3517/30 and EL3515.

Bentley, E. George (27). SAC, V4274580, Supp. Sqdn., POL Control, RAF Wilderwrath, BFPO 42. Printing, c/w, jazz, folk and pop music, foreign languages. 7½, 3½, 1½ ips. Seven-inch spool. Grundig TM45, stereo and Telefunken M203, stereo. UK, Spain, Germany, Holland, West Indies, West Africa, Philippines, France.

Brown, Robert (23). 3 AMO, RAF Siglewi, BFPO 51. Historic tapes, traditional folk music. 3½ ips. Seven-inch spool. Philips EL3541, four-track. South America, East and West Africa.

Butler, Leslie (19). 1946509, SAC, RAF Troodos, Cyprus, BFPO 53. Amateur radio, sport, light, folk and pop music. 7½, 3½ ips. Seven-inch spool. General EXB77A, four-track stereo. Female contacts preferred.

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INDEX TO ADVERTISERS

A. Brown & Sons Ltd.	130
Agfa Ltd.	Back cover
Bang & Olufsen U.K. Sales Division	134
Berean Forward Movement	141
Brenell Engineering Co. Ltd.	125
Brockley Trading Co.	130
Commercial Drug & Chemical Co. Cussons & Light Ltd.	130
Daystrom Ltd.	124
Elstone Electronics Ltd.	119
E.M.I. Tape Ltd.	118
Francis of Streatham	138
Global Products	141
Gramplan Reproducers Ltd.	114
Green & Cooper Ltd.	135
High Fidelity Magazine	132
K.J. Enterprises	132
Leda Tapes	141
Lee Electronics	135
Lennard Developments Ltd.	128
Lustraphone Ltd.	141
Magnegraph	135
Massey's Centre of Sound	135
Masterstape (Magnetics) Ltd.	124
Minnesota Mining & Manufacturing Co. Ltd.	116 and 117
NuSound	111 and 136
Psychology Tapes Ltd.	130
Pullin Photographic	120
Recording Machines Ltd. 131 and R.E.W. Earlsfield Ltd.	136
Sheen Tape Recorder Centre Ltd.	136
Sony U.K. Sales Division	143
Standard Telephones & Cables Ltd.	110
Tape Recorder Centre (Halifax)	137
Tel-Lee-Radio	136
The Recorder Co.	114
Tom Molland Ltd.	137
Truvox Ltd.	115
World Record Club Ltd. 112 and 113	113
Worthing Tape Recorder Centre	137

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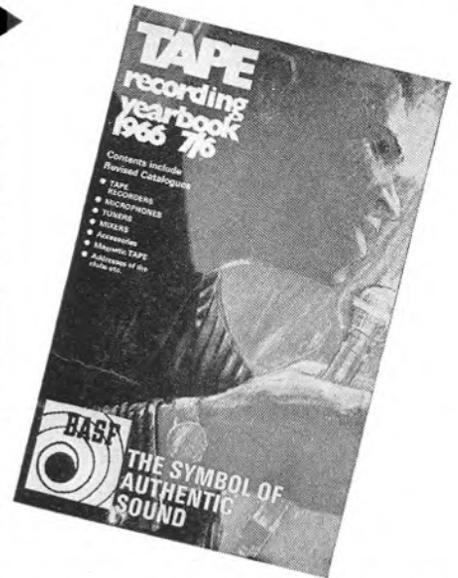
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