The following is a service information sheet from Electrical and Radio Trading dated August 1954.

TRUVOX TAPE DECK

MARK III.

TRUVOX TAPE DECK, Mark III

Prices: Models TR2, TR3, TR4, 22gns. Date released: July 1953.

Tape deck with push-button controlled two-speed three-motor drive system for half-track recording and playback using standard plastic or paper-based tapes on 1,200 ft. reels. Manufactured by Truvox, Ltd., Harrow, Middlesex.

THE Truvox tape deck Mk. III is a self-contained unit assembled on a 16½ by 13in. laminated wood plate and requiring a minimum clearance of 1 7/16in. above and 5in. below.

Three shaded-pole AC induction motors are employed, these being controlled by push-buttons DG and F. Tape is driven at a constant speed of 3¾ or 7½in. per second by means of a capstan fitted to spindle of a heavy die-cast aluminium flywheel P, the latter being friction driven by pulley on shaft of Motor R.

The two tape speeds are obtained by different size capstan heads H, which are of the push-on type and easily interchanged.

During recording or playback, the tape is held in contact with record and erase heads T and S by felt pads on two spring-loaded arms and in contact with driving capstan by pinch roller V. This roller, and a similar one used as a tape guide pulley, are mounted on a pivoted spring loaded arm O, on the underside of the baseplate. The free end of the arm terminates in a control knob which is positioned on top of deck in a locating slot at right-hand side of head assembly plate.

After passing over driving capstan, tape is fed around a guide pulley W, and on to the take-up spool, which is driven by motor K. The free running speed of the take-up motor is in excess of that required to wind on the tape, even at commencement of the spool when maximum speed is needed. The tape is therefore wound on to the take-up spool under tension and loose turns and uneven stacking are avoided.

To rewind tape after recording or playback the control knob C is pulled into the tape release and fast running position. This moves the tape away from driving capstan, pinch wheel, and from faces of record-playback and erase heads and allows it to run free around the two guide pulleys. When appropriate push-button is depressed, motor L is energised and tape is wound at high speed back to stowage spool.

With control knob left in the tape release and fast running position and with fast forward push-button depressed, the tape can be run forward at high speed. In this case, motor K, which drives the take-up spool, is allowed to operate at maximum power, the 700 ohms series dropper resistor, which is employed when on record or playback, being cut out of circuit.

Tape movement is stopped by depressing and holding down the brake push-button E. This disconnects the input mains completely from the deck circuits and connects one side of motors down to chassis or earth. At the same time whichever of the two spool drive motors K and L is idling free is switched, through a IK dropper resistor, to the HT line of amplifier. The DC current that passes produces a DC magnetic field in the motor which brings the armature to a stop quickly and smoothly.

As soon as the tape comes to rest the OFF button A should be pressed. This resets the three selector push-buttons DG and F to their neutral position, and thus disconnects all circuits from the motors, and allows the brake button to be released. Brake button should never be held down longer than necessary without using the OFF button as the DC current drawn from the amplifier HT line is of the order of 150mA.

Tape spools are located on their holders by a single pin and are retained securely by expanding hub locks, these being controlled by milled and slotted screw-nuts on ends of hub shafts. These screw nuts are captive.

The recording-playback head is a high impedance type with a frequency response of 50–10,000c/s. Output voltage is 1 to 3mV. HF bias required is approximately 50V at 45kc/s. Impedance at 10kc/s. is 80K.

Erase head is a high impedance type requiring an energising voltage of approximately 150V with an erasing power of 1.5W.

Input connections are as follows:

1. Mains input—red tags on outer side of switch unit M.
2. HT line of amplifier through a 1K 6W resistor —green tag on inner side of switch unit M.
3. Record-playback feed from amplifier—white tag on centre tag panel N.
4. Erase current feed from amplifier—blue tag on tag panel N.

Speed change. Move control knob to tape release position. Lift off capstan H, and replace with alternative one, making sure that small hole in capstan is over locating pin before capstan is pressed firmly down.

Maintenance. Keep deck free of dust and fluff. Record-playback and erase head faces should be cleaned using a soft-hair brush. Top panel can be cleaned with a damp cloth. All necessary lubrication has been carried out at the factory, and no further oiling should be required. If surfaces of drive capstans become shiny they can be refaced by holding a piece of superfine emery cloth against them whilst rotating.

SERVICING

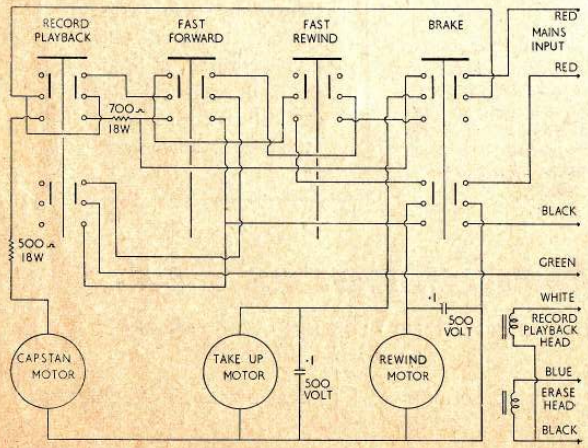
Identification. Advances in the light of research have necessitated several modifications at different times and each change is easily recognisable by certain mechanical features and also by the serial number of the machine.

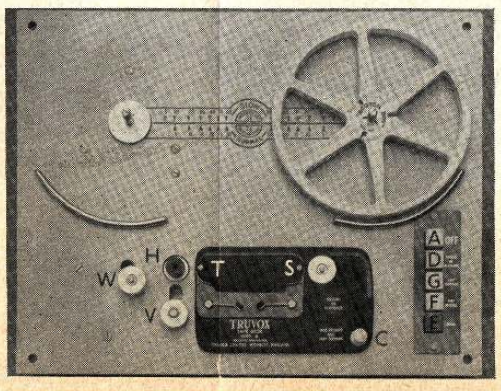
Machines from serial number 1,000 to 1,050 were all experimental models, and will hardly be found in the field. Machines from serial number 1,050 to 1,627 represent first production machines. These can be recognised by the fact that the take-up motor is a BTH type similar to capstan motor, but re-wind motor is Hoover type, i.e., a little longer and grey in colour. Moreover, this motor is supported by two round short pillars which are held to main deck by 4BA screws. From serial No. 1,627 an improved version was made in which the Hoover motor is differently supported, being kept in place by a large circular spinning which secures it rigidly to the panel.

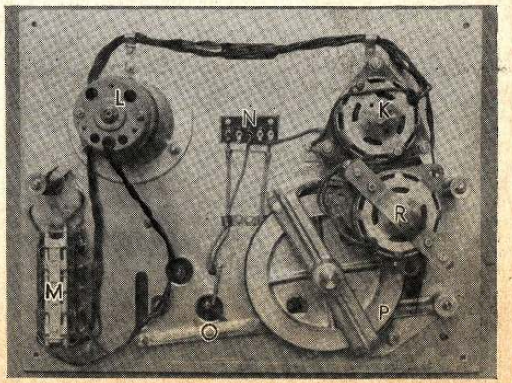
From serial No. 3,000 to 6,000 a different selector switch is utilised. Up to serial No. 3,000 the switch was of a type that permitted the OFF button to be depressed at any time. From serial No. 3,000 onwards, the off button is interlocked with red brake button in such a way that off button can only be depressed when brake button has already been operated and while it is held down. Moreover, the switch is connected with a printed circuit and no longer by wires.

From serial No. 5,000, the Hoover motor is replaced by a BTH motor which means that all three motors are similar in appearance. From serial No. 6,000 onwards hub locks are different in design and consequently the panel has a much larger hole to take them.

Record-playback and erase heads. Heads are of high impedance type and connected to central tag panel N on underside of deck. If a head is suspected, on no account must it be subjected to direct current from a continuity tester or meter, but rather it should be tested on a suitable AC bridge. Faulty or suspected heads should be removed and







The circuit of the tape deck and pictures identifying the parts. The letters superimposed on the photographs are referred to in the text. Wiring associated with the push-button switching is provided by printed circuit technique and is part of the switch unit M

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continued

returned to the factory Service department who will recondition or supply replacements.

After something like 2,000 hours of use, heads require re-conditioning and should be sent to the factory Service department.

At all times heads should be kept clean and free from fluff. Use a soft-hair brush or a soft piece of cloth. On no account should metallic instruments be used to clean out heads as there is a danger of damaging faces or magnetising laminations. If deposits have been formed which are tacky or in some other way difficult to remove, a match stick or special brush may be used to scrape them away.

A magnetised head is recognised by the fact that all recordings made with it suffer from a hissy sort of background noise and this noise is also present on good recordings which have been made on other machines.

When it has been established that a head suffers from this defect it must be de-magnetised.

Removal of head assembly. Remove the two screws securing die-cast head cover and carefully ease off the cover. Unsolder carefully the three head leads from their connecting wires. Finally undo and remove the three bolts fastening head-plate to top of deck. Head assembly can now be withdrawn. When refitting do not forget to place anchor tags of wiper arm springs under the two end fixing nuts.

Hub locks. The two hub locks which are fitted are designed in such a way that they expand when the central screw is screwed down. Hub locks should be upright and spool should not wobble any more than its natural eccentricity. If it is found that a hub lock is bent, then it can be straightened by slipping a tube of correct diameter over hub lock and gently bending it until it is quite straight. This will in no way damage the mechanism. If it becomes necessary to remove the hub lock, then the procedure below should be followed.

For machines up to serial No. 1,627, hub lock simply has to be pulled off and can then be inspected and, if necessary, returned to the factory Service department. It should be noted that right-hand one is different from left-hand one inasmuch as its bore is larger. On later models and up to serial No. 5,000, take-up hub lock is secured with a clip which must first be unscrewed before hub lock can be removed, while the rewind hub lock can still be pulled off.

From serial No. 5,000 onwards both hub locks are secured by clips which must be removed. After serial No. 6,000 clips need only be slackened off, and will come away with hub lock.

Wiper arms. Due to wear or misuse, the wiper arms may either become sticky or the felt pads will no longer enter head guides. It is best to remove each wiper arm assembly and then carefully clean shafts and reset felt pads or, if necessary, obtain and fit new ones. Arm is removed by undoing lock nuts underneath which secure actuating arm to wiper arm. Once the two nuts have been removed the whole spindle can be removed from the top and wiper arm inspected. Bearing bush should be cleaned with a clean piece of rag and likewise the spindle.

When replacing actuating arms underneath, care must be taken to see that they are fitted the right way round. When they have been adjusted and locked in position, they should be set to operate satisfactorily from pins on control lever without fouling it. If the felt pads do not go right home through tape guides then they will not make intimate contact with tape, reproduction may be faint or there will be excessive loss of top or it may even cease altogether.

Capstans. Altogether three different types of capstan have been used. Up to serial number 3,000, metallic rubber-faced capstans were made which operated with a metallic pinch roller pressing the tape against the capstan. Later models were fitted with capstans made from a composition material and these also had metallic pinch rollers. Both the above types are now obsolete and all the latest tape decks are fitted with metallic capstans and rubber-faced pinch rollers holding the tape firmly against the capstan.

Both for the latest type and the previous composition models, strong springs were used to increase the pressure between the pinch roller and the capstan and when new capstans are ordered it should always be stated whether a rubber-faced or composition capstan was previously used.

If a change is made from the rubber-faced capstans to one of the later types, it is then necessary to change this pressure spring and the new type, TR. 242, should be ordered with the new capstans. New capstans come under the Code No. TR. 2008 for the large size and TR. 282 for the small size.

Capstan faults take the form of eccentricity, flats or humps or possibly wear of the central hole and in either case it is best to take no chances and, if there are reasons for suspecting the capstans, replacements should be ordered and these will be of the latest type.

Press-buttons. If buttons are found to stick then loosen the two fixing screws and move switch about to obtain a position where all the buttons operate freely. If this is found to be impossible then locate offending button and file button or nameplate to give free movement.

Control lever. Care must be taken to see that this moves freely over the full length of its travel in either direction, since a sticky arm will give rise to wow and flutter effects.

Flywheel. Removal of flywheel necessitates the removal of whole drive assembly. To do so, unscrew and remove control knob and remove circlips retaining pinch wheel V and guide pulley W on their spindles. Remove drive capstan (pulls off), pinch wheel and guide pulley. Undo and remove the two screws securing drive motor R to its flexible mounting, unhook tensioning spring at side and carefully lay the motor clear of deck to extent of connecting leads. Undo the three nuts on fixing bolts which secure flywheel cradle to underside of deck. Flywheel cradle can now be withdrawn.

Finally, remove circlip retaining control lever in position, remove control lever. Flywheel can now be withdrawn from its shaft. The latter shaft is adjustable up and down inside cradle shaft housing to allow the flywheel to be set to clear motor cooling fan.

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