

1430

'E R T' SERVICE CHART

GRUNDIG TK40

PORTABLE four track three speed fully press button operated tape recorder with printed circuit amplifier and correction networks. Facilities include superimposition, and playing back tracks 1 and 3, or 2 and 4, in parallel. Fast-wind control permits tape to be "inched" in forward or backward direction.

Tape speeds. 1 $\frac{1}{2}$, 3 $\frac{3}{4}$, 7 $\frac{1}{2}$ ips.

Frequency response. 18kc/s at 7 $\frac{1}{2}$ ips, 15kc/s at 3 $\frac{3}{4}$ ips, 9kc/s at 1 $\frac{1}{2}$ ips.

Output. 2.5W.

Spool capacity. 7in. with lid removed, 5 $\frac{1}{2}$ in. with lid closed.

Voltage ranges. 110, 200, 220, 240V 50c/s AC. Tapping on transformer for conversion to 60c/s.

Consumption. 70W approximately.

Inputs. Microphone 1M5 2mV, diode 40K 6mV, pickup 1M 475mV, telephone adaptor 1K.

Outlets. High impedance 10K, extension speaker 5ohms.

Speaker. 5 $\frac{1}{2}$ x3 $\frac{1}{2}$ ceramic 5ohms.

Playing times per track. 48 min. at 7 $\frac{1}{2}$ ips, 1 hour 36 min. at 3 $\frac{3}{4}$ ips, 3 hours 12 min. at 1 $\frac{1}{2}$ ips. (With 5 $\frac{1}{2}$ in. DP tape as supplied with machine.)

Dimensions. 14 $\frac{1}{2}$ x14 $\frac{1}{2}$ x7 $\frac{1}{2}$ in.

Weight. 27 $\frac{1}{2}$ lb.

Microphone. Grundig GDM18 high impedance moving coil.

Fast-wind times. Forward 3 min. 35 seconds, back 2 min. 36 seconds.

Fuses. Mains 0.7A (110V), 0.3A (200-240V), HF 125mA. All surge resisting.

Valves. EF86, ECC81, EL95 (2), EM87.

Semiconductors. B250, C75, E25, C5.

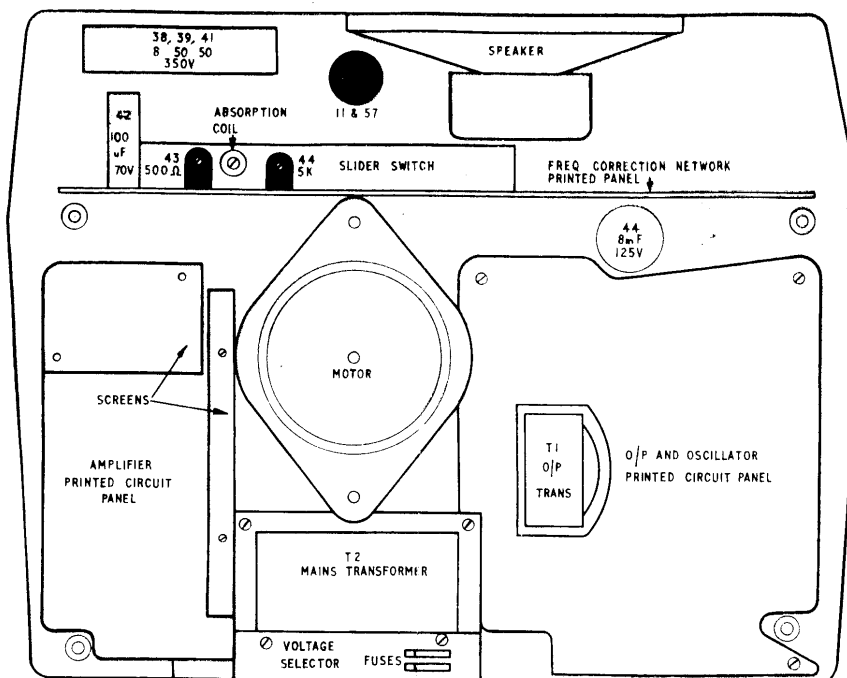
Tape position indicator. Three digit counter with reset button.

Manufacturer. Grundig (Great Britain) Ltd.

Service Department. Newlands Park, Sydenham, London, SE26. Tel.: Sydenham 2211.

DISMANTLING

Access to components. All major components are accessible by removing bottom of case (four screws in rubber feet) and by removing top deck. To remove top deck: Remove fast-wind control (press fit). Remove four control knobs (two grub screws). Remove four screws holding top deck and lift off.



Underside showing layout of principal components

SERVICE NOTES

Replacement of fast-wind drive belt. Remove centre brake operating arm by removing centre spring. Remove righthand clutch idler wheel and fixing bracket (two screws). Remove circlip and washer from righthand idler pulley.

Lift idler pulley and fast-wind pulley together until idler pulley is free. Remove old drive belt and replace, ensuring that new belt is not twisted. Re-assemble in reverse order.

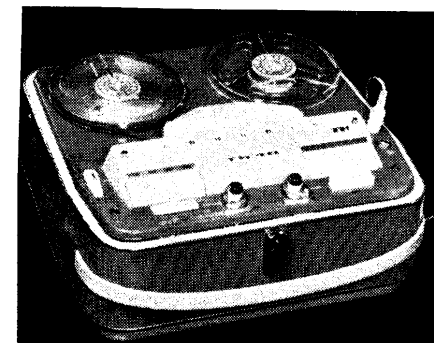
Clutches and brakes. Clutches are double-action friction type requiring only occasional cleaning of friction discs. Remove large clutch ring to release upper clutch spindle. This will expose the grip-ring of upper clutch half. Remove grip-ring and upper clutch half. Friction discs may now be removed for cleaning with soft brush.

Note order of dismantling so that parts are re-assembled correctly. Two paint marks on fixing spigots indicate standard friction setting. Rotating bar clockwise decreases friction and anti-clockwise increases friction.

Brakes. Five braking actions are applied to clutches. Two brake arms acting on lower portions of clutches provide correct back tension for record, playback and fast wind. A second braking force is applied to both clutches when stop button is depressed. This force is applied by the central spring-loaded brake mechanism. Further braking action is applied to periphery of lefthand clutch to prevent tape spill when temporary stop bar is operated.

Circuit diagram. Switches are shown in record position. Voltage readings taken with Avo 8 set to appropriate range. P indicates voltage on playback, R indicates voltage on record.

Variable controls. C1 preset bias tracks 1-2, C2 preset bias tracks 3-4, C3 preset bias cine socket, R1 oscillator amplitude, R11 radio-gram record level, R22 playback volume and microphone/diode record level, R42 preset emphasis 7 $\frac{1}{2}$ ips, R43 preset emphasis 3 $\frac{3}{4}$ ips, R44 preset emphasis 1 $\frac{1}{2}$ ips, R51 magic eye



preset, R57 tone and monitor volume, R71 heater winding humdinger.

Head alignment. Connect valve-voltmeter to high impedance output pins (2 and 3) of diode socket. Play back tape recorded on standard machine with frequency of approximately 6000c/s. Adjust two screws on either side of head, and grub screw at back of head, for maximum output. Tape guides should be set so that pole pieces protrude 0.1mm above top edge of tape.

Head currents and voltages. Correct HF bias varies according to colour of record head, red 0.2mA, white 0.24mA, black 0.27mA. This may be checked using network four on circuit diagram. VVM connected across 100 ohm resistor in chassis return lead to head should indicate 20mV, 24mV or 27mV. Adjustment is by C1 for tracks 1-2 and C2 for tracks 3-4. C3 adjusts HF bias for heads connected externally to cine socket.

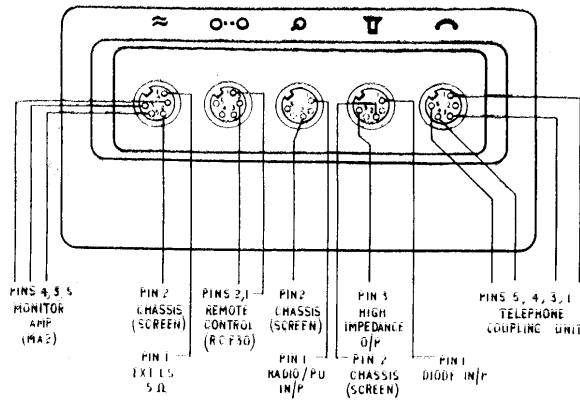
Erase head voltage measured by VVM connected across the head should not be less than 12V. If R1 is adjusted to obtain this it is necessary to re-check record bias.

Frequency response. Feed a signal of 20mV at 1000c/s into diode input. Turn radio/gram level control to zero. Adjust microphone record level control until magic eye just closes. Reduce input by 20dB (10th) and record a range of frequencies covering 60c/s-9kc/s at 1 $\frac{1}{2}$ ips, 60c/s-15kc/s 3 $\frac{3}{4}$ ips, 60c/s-18kc/s 7 $\frac{1}{2}$ ips.

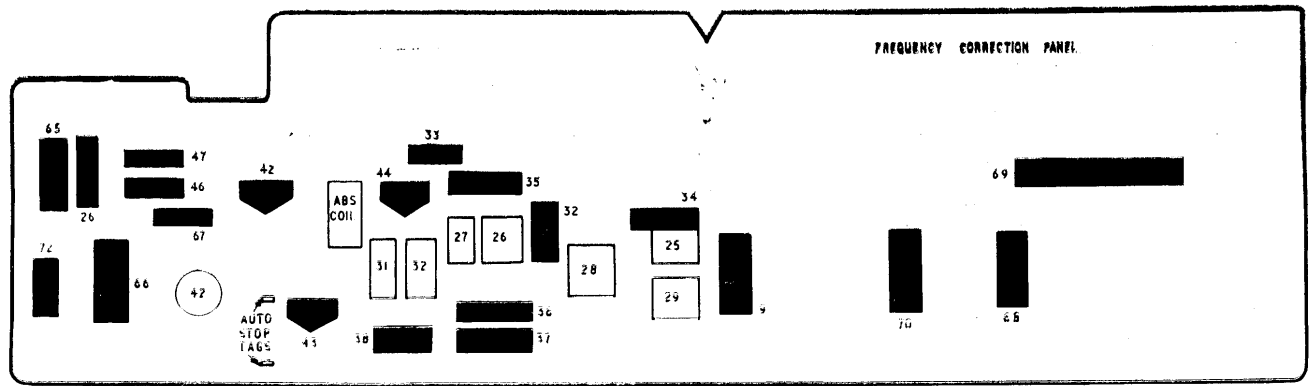
Rewind tape and playback, observing playback level on VVM connected to pins 2 and 3 of diode socket. Levels should not deviate by more than ± 3 dB.

Pressure tape. This ensures magnetic tape makes intimate contact of uniform pressure against large surface of heads. Pressure tape

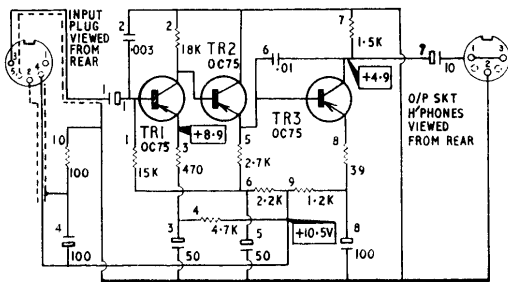
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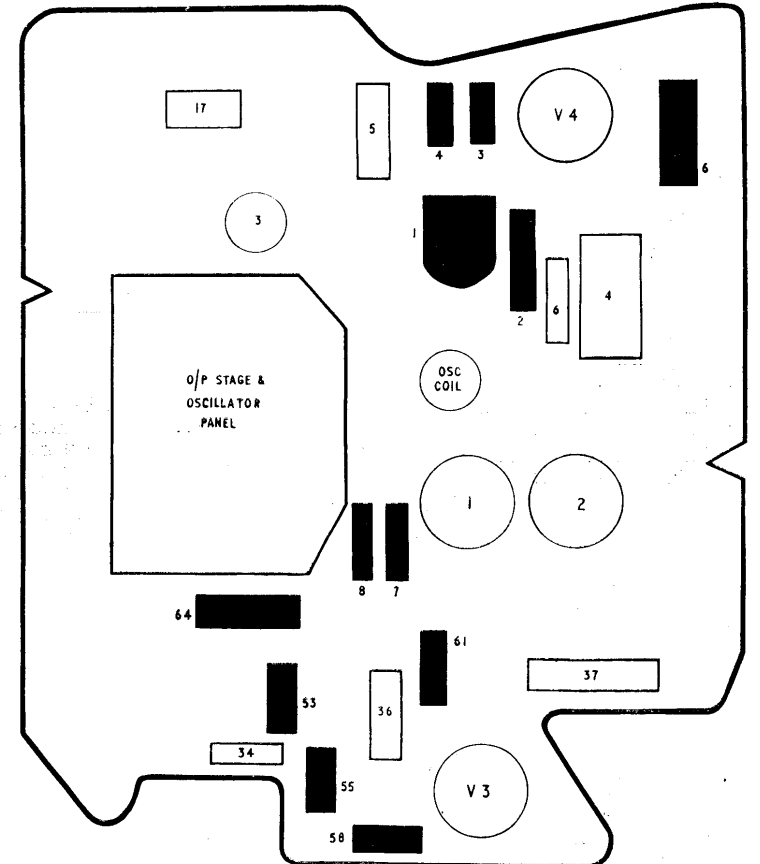
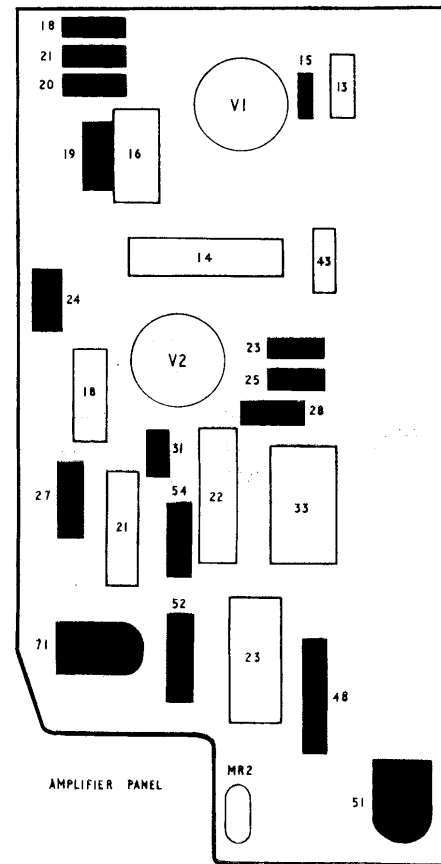
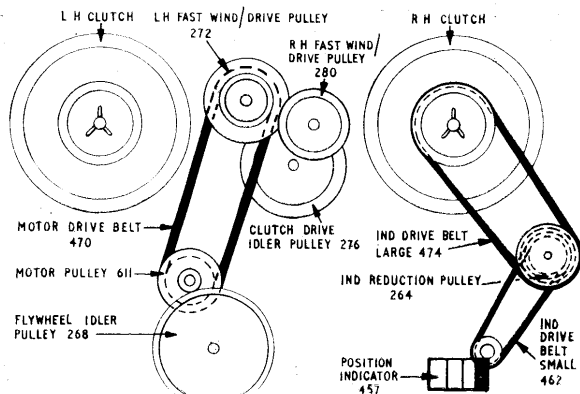
Above, rear panel input/output sockets. Grundig accessories which may be connected are MA2 monitor amplifier, RCF30 remote control, GMU3 mixer, SE3 single head-phone, SL3, SL33 connecting leads

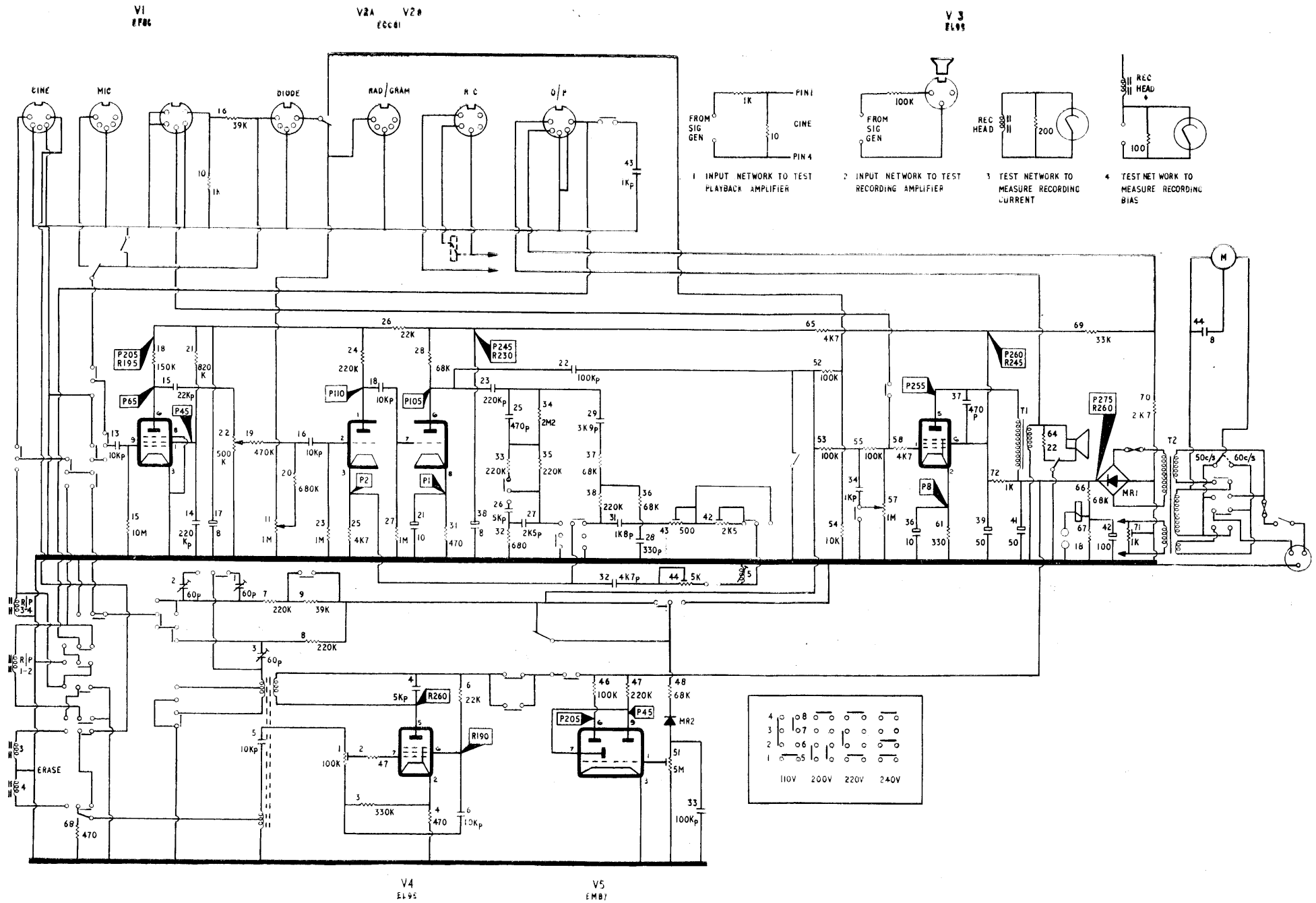


Component layout on printed circuit panels. Above, frequency correction network. Below (left) main pre-amplifier and amplifier, (right) output and oscillator stages



Above, circuit of MA2 monitor amplifier. Transistors may be OC75 or OC604. Below, drive arrangement with maker's part number against each belt and pulley





ensioned and will not normally require adjustment. Clean with soft brush. If damaged it should be replaced. When fitting ensure pressure tape does not foul mu-metal case of head or mu-metal screen in front of head.

Lubrication. All bearings are of self-lubricating sintered type and regular attention is not required. Check need for lubrication after approximately 1000 hours of use. Shell Vitrea Oil No. 2 should be applied sparingly to bearings. Sliders, linkages, press-button units should be lubricated with high viscosity Vaseline grease.

FAULT FINDING (MECHANICAL)

Tape does not move after depressing start key. Check that tape is threaded correctly. Pressure between pressure roller and capstan may be insufficient, should be 24½ oz. See that pressure roller is free on spindle. If not, clean and lubricate sparingly.

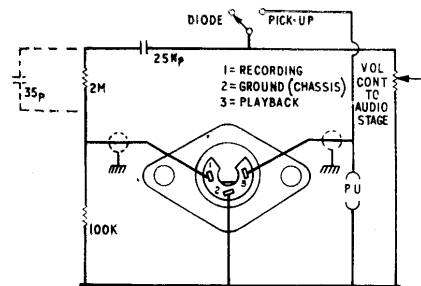
Tape not running at correct speed. Check mains voltage adjustment. Check correct tape pull of approximately 1½ oz. Examine tape to ensure not jamming in guides, makers recommend using only Grundig, Mastertape or BASF tapes on this machine. Make sure spools not rubbing against top deck. Check lefthand clutch not jamming.

Tape runs slow in fast forward or rewind. Check points mentioned in previous paragraph. Examine idler pulleys for oil on contact surfaces. If so, clean with cloth moistened with methylated spirit and dry carefully.

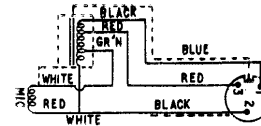
Fast wind-buttons jamming. Check adjustment of locking bracket.

Tape jumping out of guides. Ensure that capstan spindle and pressure roller are free of dirt or oxide deposits. Test adjustment of pressure roller. See that tape is of recommended make, Grundig, Mastertape, or BASF.

Tape moves with no keys depressed. Brakes are not operating and should be cleaned and adjusted.



Circuit for providing diode connection from isolated AC radio to TK40. Value of resistor may be varied to give about 20mV mean programme level to recorder



Circuit and plug connections of GDM18 microphone. Built-in transformer provides output impedances of 200ohms and 55K

Tape scrapes against edge of spool. Check spool is not warped. Check height adjustment of tape guides.

Wow and Flutter. Check that pressure roller has sufficient pressure (24½ oz.). Clean dirt or oxide deposits from pressure roller and capstan spindle. Test with position indicator uncoupled, if OK, fault is due to indicator jamming.

Apply lubricant sparingly to flywheel bearing. Examine idler wheel for flats on bearing surfaces, if so, replace. Check operation and adjustment of clutches and brakes.

FAULT FINDING (ELECTRICAL)

Distorted recording, low volume, no erase. Test V4 EL95 bias oscillator, check oscillator coil, substitute C4 5Kp, check record head.

Cross-talk between channels. Check height adjustment of tape guides. See that pressure tape is correctly fitted, re-adjust if necessary.

High hum level. Test or substitute valves. Check C17, C39, C41 for o/c or low capacity, check adjustment of humdinger R71.

No record level indication. Check and replace if necessary EM87, preset R51, rectifier MR2.

Record level too low. Test V1 EF86, check HT line voltage, if low substitute MR1.

Low playback volume. Clean record head, check record bias correct, test HT line voltage, examine pressure tape for correct fitting, see that tape is recommended make, check output transformer.

No playback. Check that internal speaker is switched on, examine slider switch contacts.

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