



PHOTOFACE[®] with CIRCUITRACE[®]

TRADE NAME : Grundig Models TK45, TK45U, TM45, TM45U, TM45USA
 SUPPLIER : For Current Address, see Master Index
 TYPE SET : 3-Speed, 4-Track Mono/Stereo Recorder
 POWER SUPPLY : 110 - 120 Volts AC, 60 Cycles
 RATING : 54 Watts, .56 Amp. @ 117VAC (Record)
 48 Watts, .50 Amp. @ 117VAC (Play)

This unit is a four-track stereo recorder having three speeds: 17/8, 33/4 and 7 1/2 ips.

The unit is designed for custom-installation and requires external amplifiers and speakers.

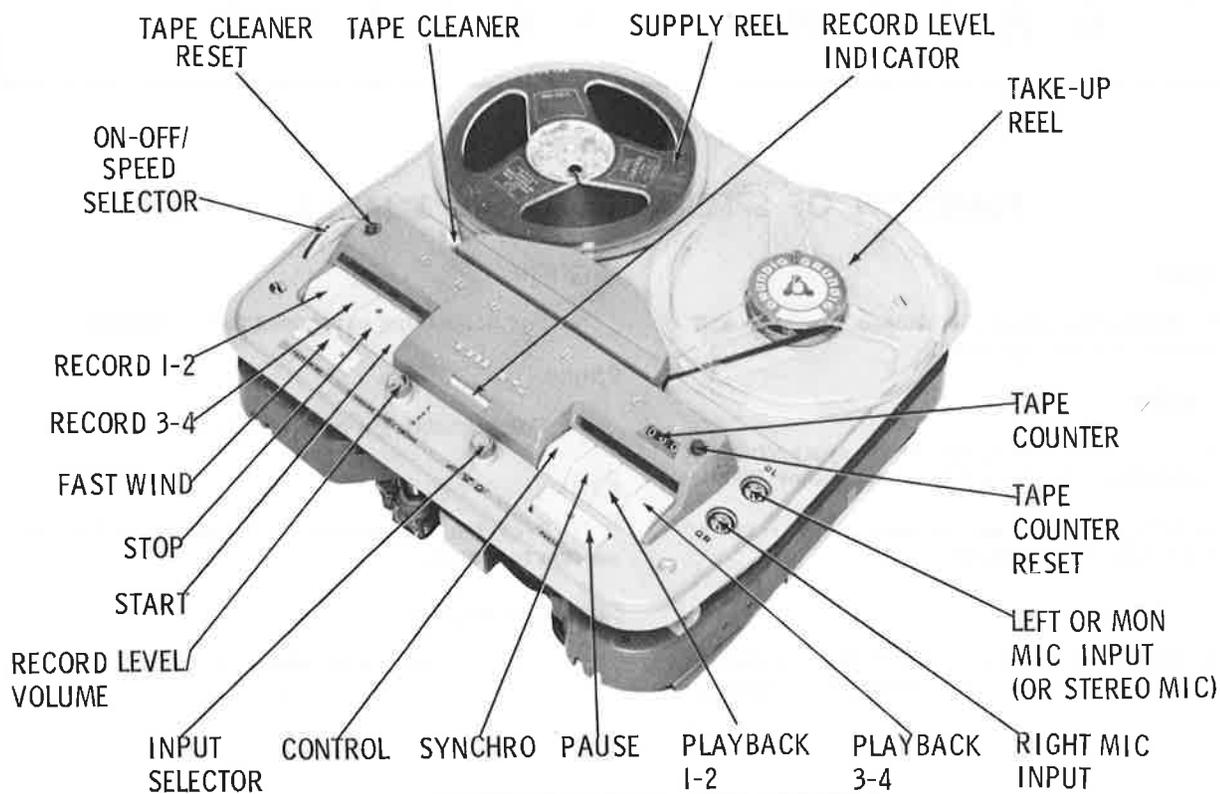
Independent record amplifiers and separate record-play heads permit add-a-track recording and source or tape monitoring.

Tape travel can be stopped automatically if tape with foll leaders is used.

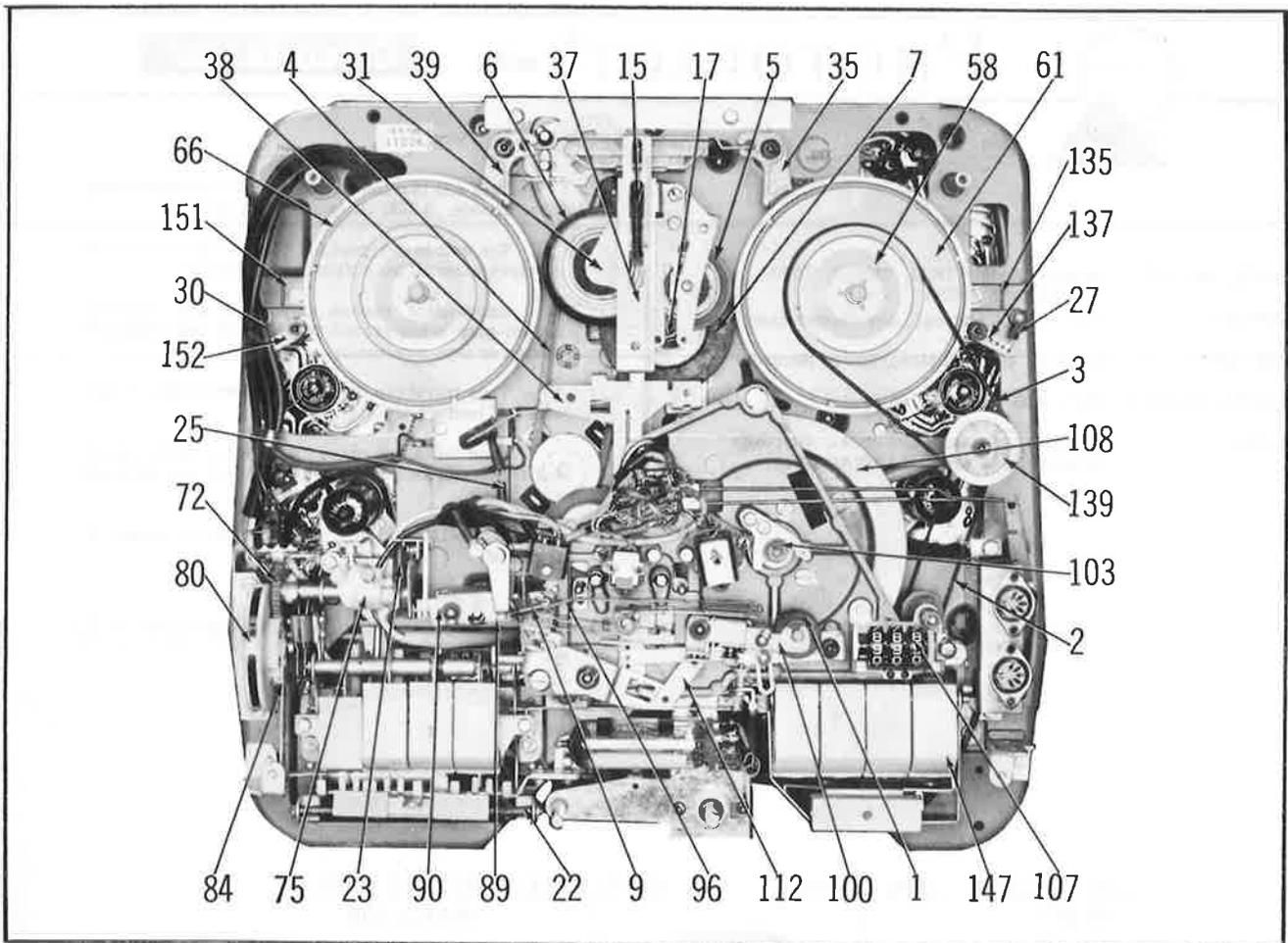
Input jacks are provided for mic, radio, phono and telephone; output jacks for earphone and external amplifiers.

A 110-120 volt AC, 60-cycle power source is required.

GRUNDIG MODELS TK45/U, TM45/U/USA



HOWARD W. SAMs & CO., INC. Indianapolis 6, Indiana



FUNCTION OF SPECIFIC CONTROLS & JACKS

Control Button

For monitoring when the unused playback and control buttons are both pressed.

Synchro Button

For monitoring one track while synchronizing another recording with the original on another track.

The following jacks are located on the rear of the recorder from left to right:

Outputs

For connecting external amplifiers or a stereo mixer accessory for multiple synchronous recordings.

Earphone

For connecting earphones for monitoring.

Phono

For connecting a phonograph or tape recorder.

Radio

Provides both stereo input and output for connection to a radio.

Telephone Adapter

For connecting a telephone adapter.

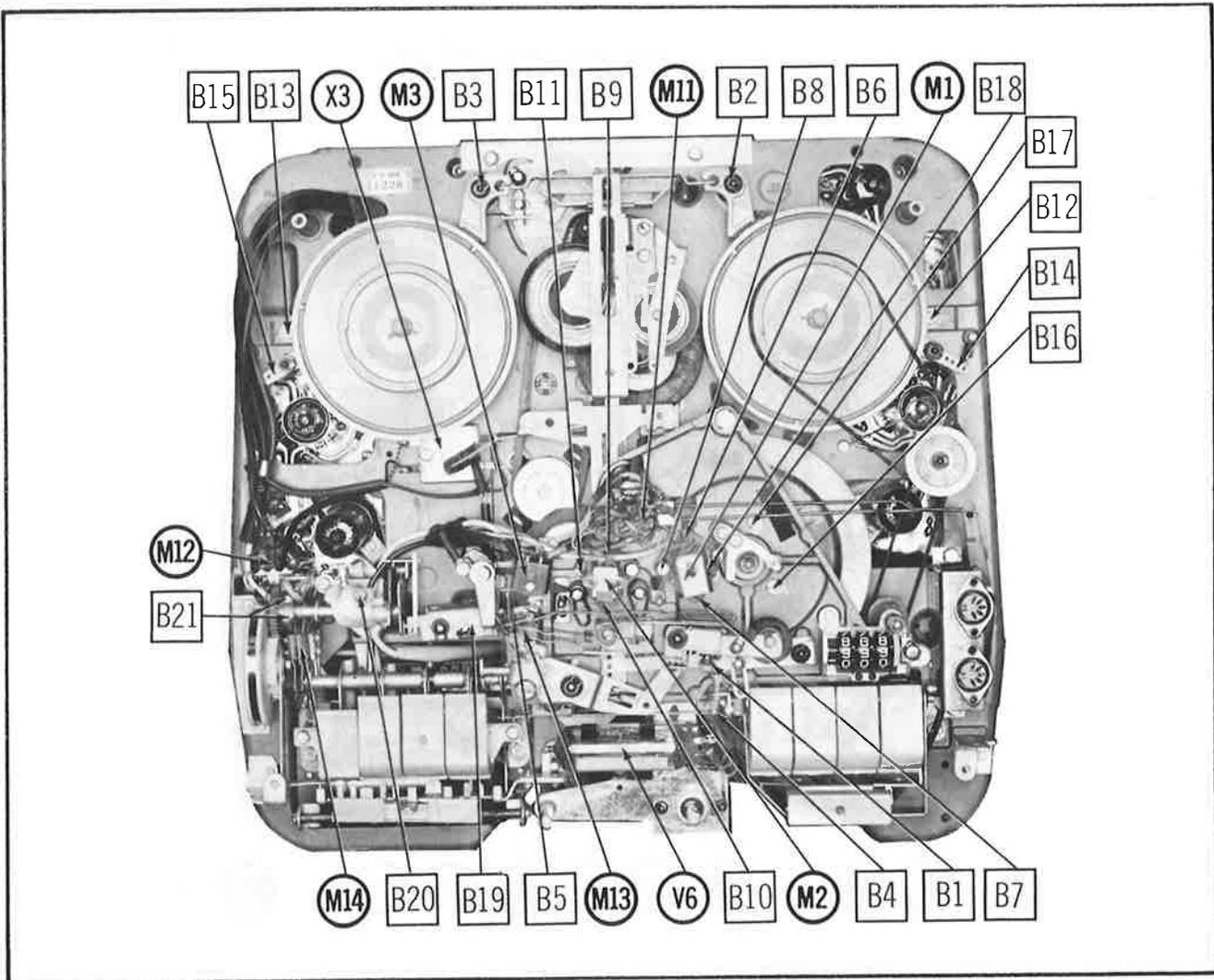
OPERATING INSTRUCTIONS

Source Monitoring While Recording

1. Connect an earphone to the earphone jack, press the Play button not corresponding to the Record button that is pressed and press the Control button.

Tape Monitoring While Recording

1. Connect an earphone to the earphone jack and press the Play button corresponding to the Record button that is pressed.



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Four-Track Monaural Record

1. Thread the tape and connect the sound source.
2. Turn the Input Selector to the appropriate position: counterclockwise for microphone, clockwise for telephone, and the middle position for radio, phono or a second recorder.
3. Press one of the Record buttons and adjust the recording level.
4. Press the Start button and make the recording.
5. After recording track 1, reverse the reels and repeat steps 1 thru 4.
6. After recording track 4, reverse the reels and repeat steps 1 thru 4 except press the opposite Record button.
7. After recording track 3, reverse the reels and repeat steps 1 thru 4 using the same Record button as in step 6.

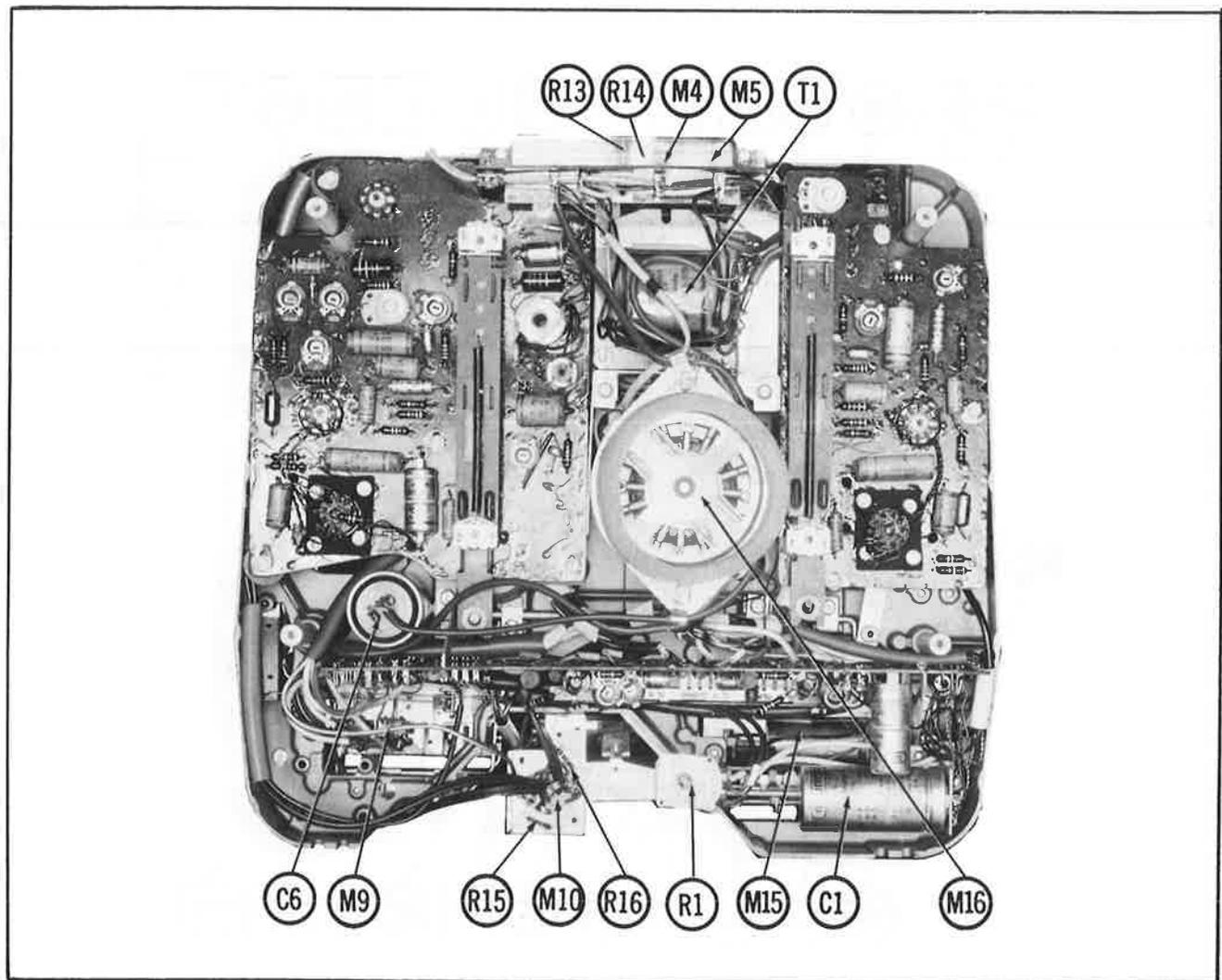
Stereo Record

1. Thread the tape and connect the sound sources.

2. Turn the Input Selector to the appropriate position: counterclockwise for microphones, or middle position for radios, phonos or other recorders.
3. Press both Record buttons and adjust the recording level.
4. Press the Start button and make the recording.
5. Reverse the reels and repeat steps 1 thru 4 for the other side of the tape.

Synchronous Record (Add-A-Track)

1. Make a monaural recording and rewind the tape.
2. Press the Synchro button, and the Play button corresponding to the recorded track.
3. Press the unused Record button and adjust the recording level.
4. Press the Start button. The first recording will be played while making the second recording.
5. Reverse the reels and the remaining two tracks may be recorded in the same manner.



Monaural Play

1. Thread the tape, press the desired Play button and the Start button.
2. Adjust the volume controls as desired.

Stereo or Synchronous (Add-A-Track) Play

1. Thread the tape, press both Play buttons and the Start button.
2. Adjust the volume as desired. The left channel is adjusted after pulling up on the control and the right after pressing it down.

DISASSEMBLY

1. Remove three knobs.
2. Remove four screws holding the deck cover.
3. Remove five screws holding the large printed board and fold out to service.
4. Remove three screws holding the smaller board and fold out to service.

CLEANING

LUBRICATING

HEAD DEMAGNETIZING

Refer to "General Servicing Information" on page 4.

SEQUENCE OF OPERATION

Record Button 1-2

Pressing this button switches the amplifier circuitry to record for Tracks 1 and 4.

Record Button 3-4

Pressing this button switches the amplifier circuitry to record for Tracks 3 and 2.

Stop

Pressing this button releases any button in the left push-button assembly and the Control and Synchro button in the right push-button assembly. Driving Wheel Assembly (8) is released from the motor pulley and Flywheel (109).

If the Start button was pressed, Intermediate Gear Assembly (7) is released from Slipping Clutch (70), Pressure Roller (1) from the capstan, and Pressure Strip Assembly (96) from the heads.

If the mechanism was in Fast Forward, Swinging Gear Assembly (6) is released from Intermediate Gear Assembly (5) which is released from Middle Pressure Half Coupling (66).

If the mechanism was in Fast Rewind, Swinging Gear Assembly (6) is released from Middle Pressure Half Coupling (66).

Start

Pressing the Start button pivots Driving Plate Assembly (111, 112) which pivots Bearing Bracket Assembly (100) moving Pressure Roller (1) against the capstan. Bearing Bracket Assembly (100) pushes Pressure Strip Assembly (96) against the record and play heads. Bearing Bracket Assembly (100) also pulls Switch Lever Assembly (102) toward the heads closing the muting switch and placing the temporary stop lever in operative position. Driving Plate Assembly (111, 112) pushes Slide Assembly (121) backward which in turn pushes Guide Bar (37) backward to release the brakes. Slide Assembly (121) also pushes Slide Assembly (131) backward so Intermediate Gear Assembly (7) will contact Slipping Clutch (70) and Swinging Gear Assembly (6).

Fast Rewind

Pushing Forward-Reverse Slide (54) to the left pulls Wind Operating Bar (129) forward. This pivots Swing Base Assembly (38) releasing the brakes and moving Swinging Gear Assembly (6) into contact with Middle Pressure Half Coupling (66) driving the reel in a reverse direction.

Fast Forward

Pushing Forward-Reverse Slide (54) to the right pushes Wind Operating Bar (129) backward. This pivots Swing Base Assembly (38) releasing the brakes and moving Swinging Gear Assembly (6) into contact with Intermediate Gear Assembly (7) forcing it into contact with Middle Pressure Half Coupling (66) driving it in a forward direction.

Speed Selector

There is an Off position between I and II, and II and III.

In I position (1 7/8 ips) Cam Gear (72) is rotated, positioning the top cutout so the On-Off switch will close. Tape Speed Cam (75) is rotated, moving Switch Lever (76) to actuate the speed equalization switch for 1 7/8 ips. Switch Shaft Assembly (83) rotates, lifting Idler Lifter (93) so Driving Wheel Assembly (8) will engage the small diameter of the motor pulley. In II position (3 3/4 ips) Cam Gear (72) is rotated, positioning the center cutout so the On-Off switch will close. Tape Speed Cam (75) is rotated, moving Switch Lever (76) to actuate the speed equalization switch for 3 3/4 ips. Switch Shaft Assembly (83) rotates, lowering Idler Lifter (93) so Driving Wheel Assembly (8) will engage the middle diameter of the motor pulley.

In III position (7 1/2 ips) Cam Gear (72) is rotated, positioning the bottom cutout so the On-Off switch will close. Tape Speed Cam (75) is rotated, moving Switch Lever (76) to actuate the speed equalization switch for 7 1/2 ips. Switch Shaft Assembly (83) rotates, lowering Idler Lifter (93) so Driving Wheel Assembly (8) will engage the bottom diameter of the motor pulley.

The reverse takes place going from III to I. In each position, Guide Plate (84) pivots Locking Slide (52) so the push buttons will lock when pressed to their full extent.

Temporary Stop

Pressing this button pulls Pressure Roller (1) from the capstan, and Switch Lever Assembly (102) far enough so the muting switch will open. Wire Strap (122) is connected to Switch Lever Assembly (102) and Brake Lever Assembly (124). When Switch Lever Assembly (102) is moved backward, Wire Strap (122) pivots Brake Lever Assembly (124) against Middle Pressure Half Coupling (66) stopping its rotation.

Control Button

Pressing this button connects the Record Head (M2) to the Play Head (M1) for monitoring when the unused Play button is pressed.

Synchro Button

Pressing this button connects the Record Head (M2) to the Play Head (M1) for monitoring synchronous recordings.

Playback 1-2

Pressing this button switches the amplifier circuitry for playback of Tracks 1 and 4.

Playback 3-4

Pressing this button switches the amplifier circuitry for playback of Tracks 3 and 2.

ADJUSTMENTS

IMPORTANT: Before making any adjustments, refer to "General Servicing Information" on page 4.

1. All voltage measurements are made at a tape speed of 7 1/2 ips with an audio VTVM having a flat response to 100KC.
2. All torque measurements are made at a tape speed of 7 1/2 ips with a spring scale applied to a point on an empty tape reel 2 inches from reel center.
3. All pressure measurements are made by using a spring scale to determine that point at which pressure is just removed.

ADJUST	REMARKS
Play Take-up Torque	No adjustment provided. Nominal value 1 ounce.
Fast Forward Take-up Torque	No adjustment provided. Nominal value 6 ounces.
Rewind Torque	No adjustment provided. Nominal value 5 ounces.
Supply Reel Drag	No adjustment provided. Nominal value 1/2 ounce, measured in Forward position.
Take-up Reel Drag	No adjustment provided. Nominal value 1/4 ounce, measured in Rewind.
Pressure Roller Pressure	Adjust B1 for 1 1/2 pounds.
Brake Shoe Pressure	Adjust B2 and B3 for 2 ounces, measured at point of contact in Stop.
Pause Brake Shoe Pressure	Adjust B4 for 3 ounces, measured at point of contact.
Pressure Pad Pressure	Adjust B5 for 1 1/2 ounces, measured at point of contact.
Record Head Height	Thread an alignment tape onto the recorder and adjust B9 and B10 so the top edge of the pole piece is even with the top edge of the tape and perpendicular with the tape.
Record Head Azimuth	Press the Sync button and one of the Record buttons. While making a 10KC recording, adjust B11 for maximum output by monitoring through the Play Head.
Play Head Height	Play a 2-frequency, height test tape and monitor the appropriate output. Adjust B6 and B7 for equal output voltage for each frequency.
Play Head Azimuth	Play an azimuth test tape and monitor the appropriate output. Adjust B8 for maximum output voltage.
Erase Current	No adjustment provided. Nominal current 330ma (11V rms) in each section of the erase head.
Record Bias	Adjust C38 (C39) and R7 (R8) for .15V rms (.84ma) across the upper (lower) section of the record head.
Bias Oscillator	Adjust R9 for 75KC.
Record Level Indicator Calibration.	Remove the bias oscillator tube. Apply a 1000-cycle signal to the channel 1 (2) mic input and adjust the channel 1 (2) volume for .14V rms, measured across the upper (lower) half of the record head. Adjust R10 for the normal peak level on the channel 1 (2) level indicator and adjust R6 for any variations between channels.
Equalization	Set R2 and R3 for 500 ohms across the controls. Set R4 and R5 for 250 ohms across the controls. Set the slugs in L2 and L4 so they protrude approximately 3/16 inch from the coil form.

ADJUSTMENTS (Continued)

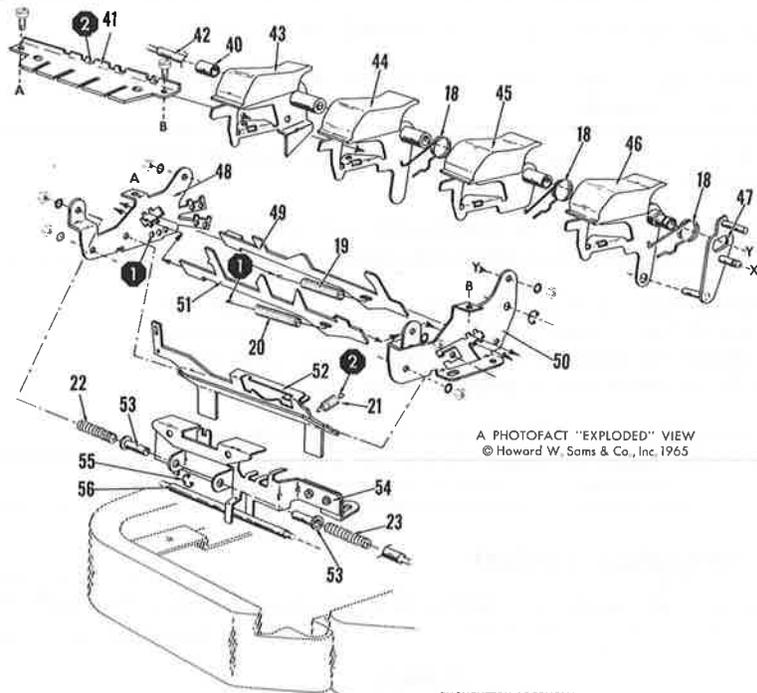
ADJUST	REMARKS
Clutch Height	Adjust B12 and B13 so the tape winds centrally on the reels.
Locking Brakes	Adjust B14 and B15 so the lower clutch halves do not rotate in Fast Forward or Rewind.
Tape Guide Forks	Adjust B16, B17 and B18 so the tape will pass between the forks without touching either fork.
Idler Wheel Height	Loosen the screw in Operating Bracket (90) and adjust B19 so Idler Wheel (8) is centered on one of the steps of the motor pulley.
Tape Speed Cam	Turn the Speed Selector to II. Loosen the set screw B20 and slide the Speed Cam inward until it just touches the mounting bracket. Rotate the Speed Cam while holding it against the bracket until the set screw is perpendicular and tighten B25.
Gear Cam	Turn the Speed Selector to II. Loosen B21 and rotate the Gear Cam so the roller of switch contact set engages the lowest point of the center cam portion and tighten B26.

TROUBLE CHART

IMPORTANT: Before consulting this chart be sure all servicing procedures listed on page 4 have been followed.

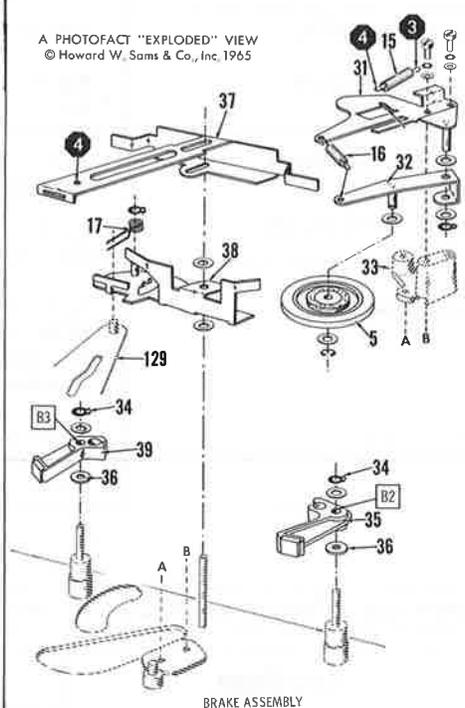
SYMPTOM	REMARKS
Take-up reel revolves erratically, or not at all in Play or Record	<ol style="list-style-type: none"> 1. Drive Belt (4) oily or broken. 2. Driving Wheel Ass'y. (8), clutch (69), or Swinging Gear Ass'y. (6) oily.
Take-up reel does not revolve in Fast Forward.	<ol style="list-style-type: none"> 1. Drive Belt (4) oily or broken. 2. Swinging Gear Ass'y. (6) oily.
Take-up reel revolves rapidly in Play or Record.	<ol style="list-style-type: none"> 1. Insufficient pressure applied between Pressure Roller (1) and capstan.
Supply reel does not revolve in Rewind.	<ol style="list-style-type: none"> 1. Drive Belt (4) oily or broken. 2. Swinging Gear Ass'y. (6) oily.
Supply reel spills tape in forward positions.	<ol style="list-style-type: none"> 1. Tension Spring (30) disconnected or broken. 2. Brake shoe on Supply Brake (152) worn or off.
Take-up reel spills tape in Rewind.	<ol style="list-style-type: none"> 1. Tension Spring (27) disconnected or broken. 2. Brake shoe on Brake Lever Ass'y. (137) worn or off.
Reels do not stop immediately when Stop button is pressed.	<ol style="list-style-type: none"> 1. Shoes on Brake Lever Assemblies (35, 39) worn or off. 2. Tension Spring (15) disconnected or broken. 3. Brakes misadjusted.
Capstan does not rotate in Play or Record.	<ol style="list-style-type: none"> 1. Driving Wheel Ass'y. (8) oily. 2. Tension Spring (25) disconnected or broken.
Tape rides up and down between capstan and pressure roller.	<ol style="list-style-type: none"> 1. Tape Guide Forks (103, 105) misadjusted.
Wow or Flutter.	<ol style="list-style-type: none"> 1. Record Head (M2) or Play Head (M1) misadjusted. 2. Play Head (M1) defective. 3. Pressure Roller (1) worn or dirty. 4. Driving Wheel Ass'y. (8) oily. 5. Flywheel (109) oily. 6. Tension Spring (25) broken or disconnected.
Tapes recorded on the machine are weak or distorted.	<ol style="list-style-type: none"> 1. Record Head (M2) misadjusted. 2. Pressure Roller (1) worn or dirty. 3. Insufficient erase current.
Prerecorded tapes are weak or distorted.	<ol style="list-style-type: none"> 1. Play Head (M1) misadjusted. 2. Pressure Roller (1) worn or dirty.

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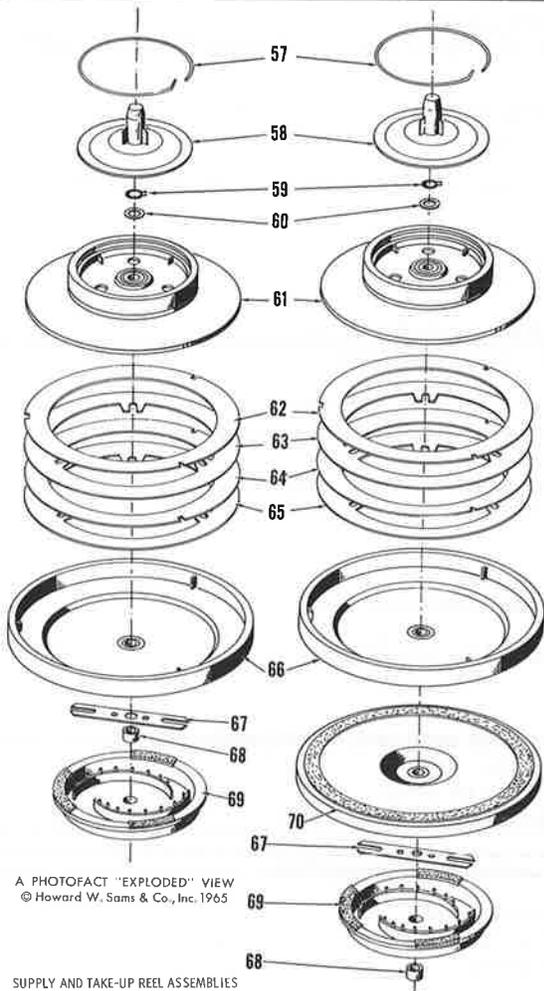
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PUSHBUTTON ASSEMBLY



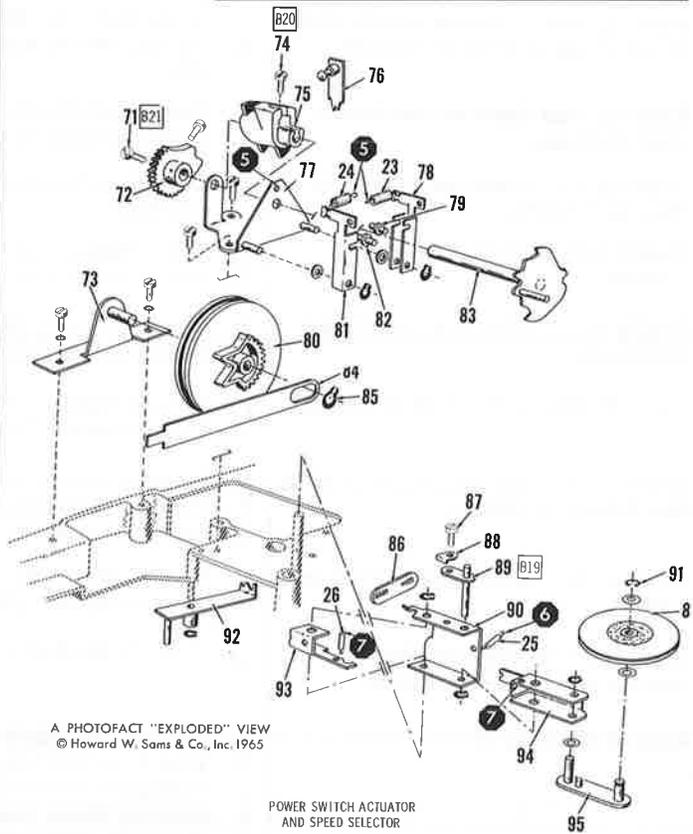
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BRAKE ASSEMBLY



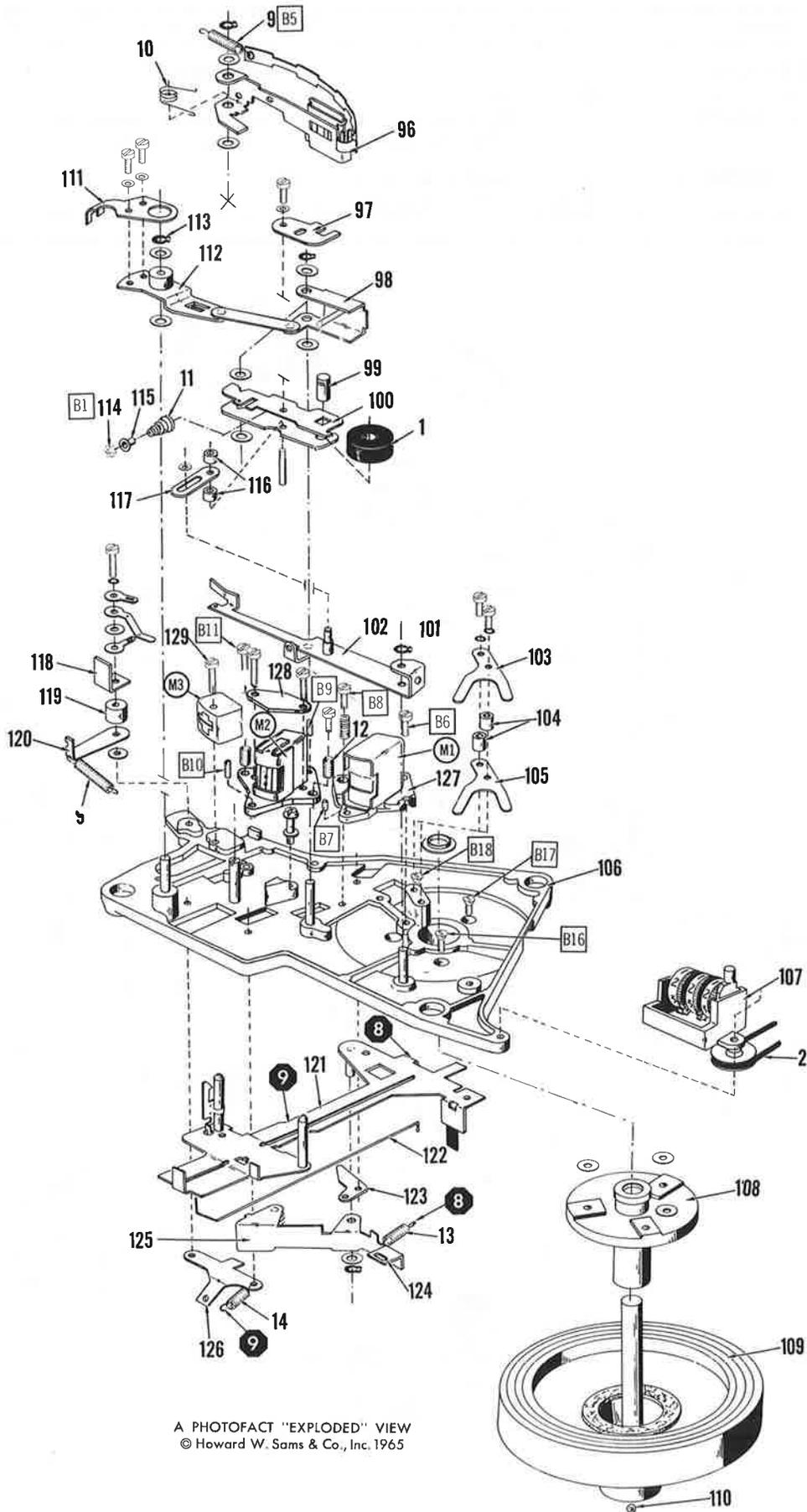
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SUPPLY AND TAKE-UP REEL ASSEMBLIES



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POWER SWITCH ACTUATOR
AND SPEED SELECTOR

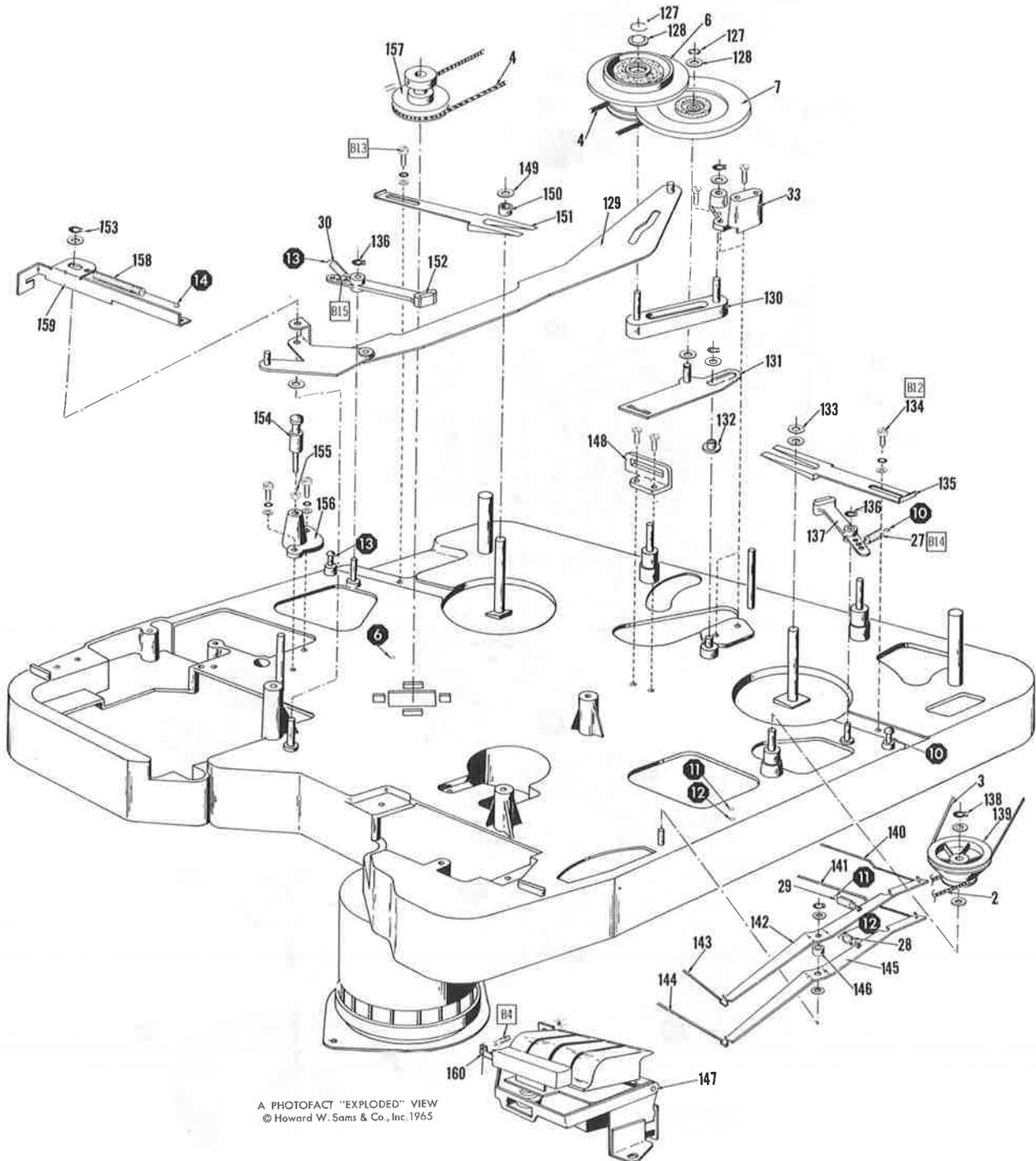


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TROUBLE CHART (Continued)

IMPORTANT: Before consulting this chart be sure all servicing procedures listed on page 4 have been followed.

SYMPTOM	REMARKS
<p>Sound is weak or distorted.</p>	<ol style="list-style-type: none"> 1. Play Head (M1) or Record Head (M2) misadjusted or defective. 2. Tension Spring (9) disconnected or broken.
<p>Erase weak or inoperative.</p>	<ol style="list-style-type: none"> 1. Defective Erase Head (M3). 2. Insufficient erase current.

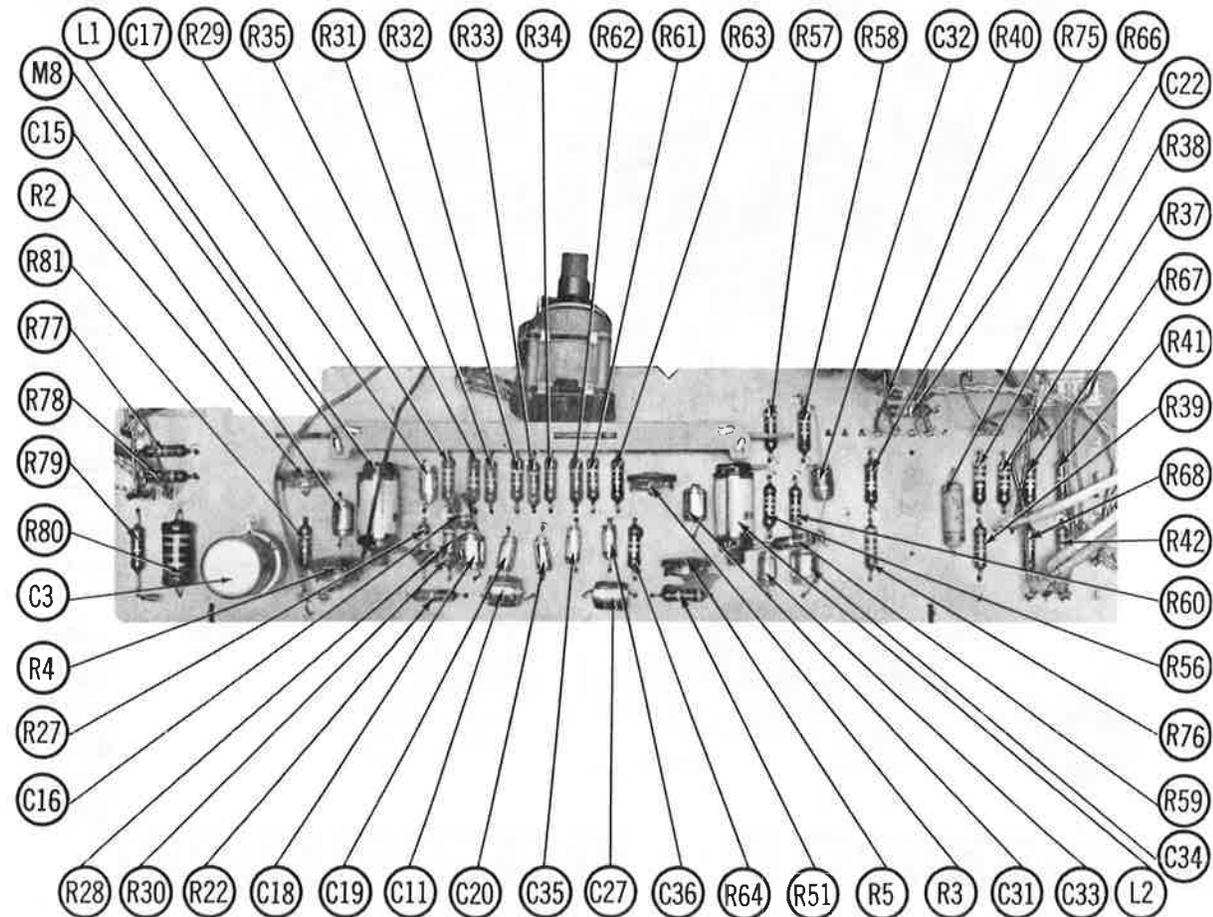
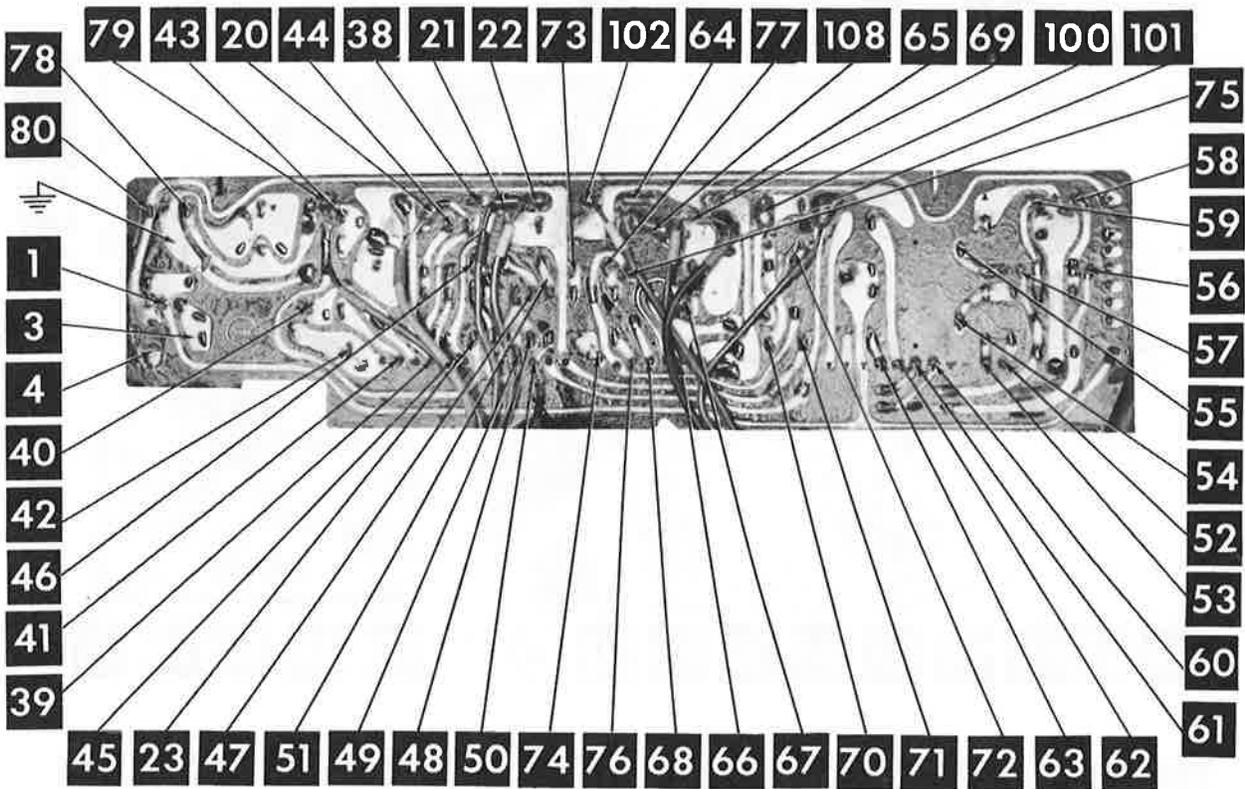


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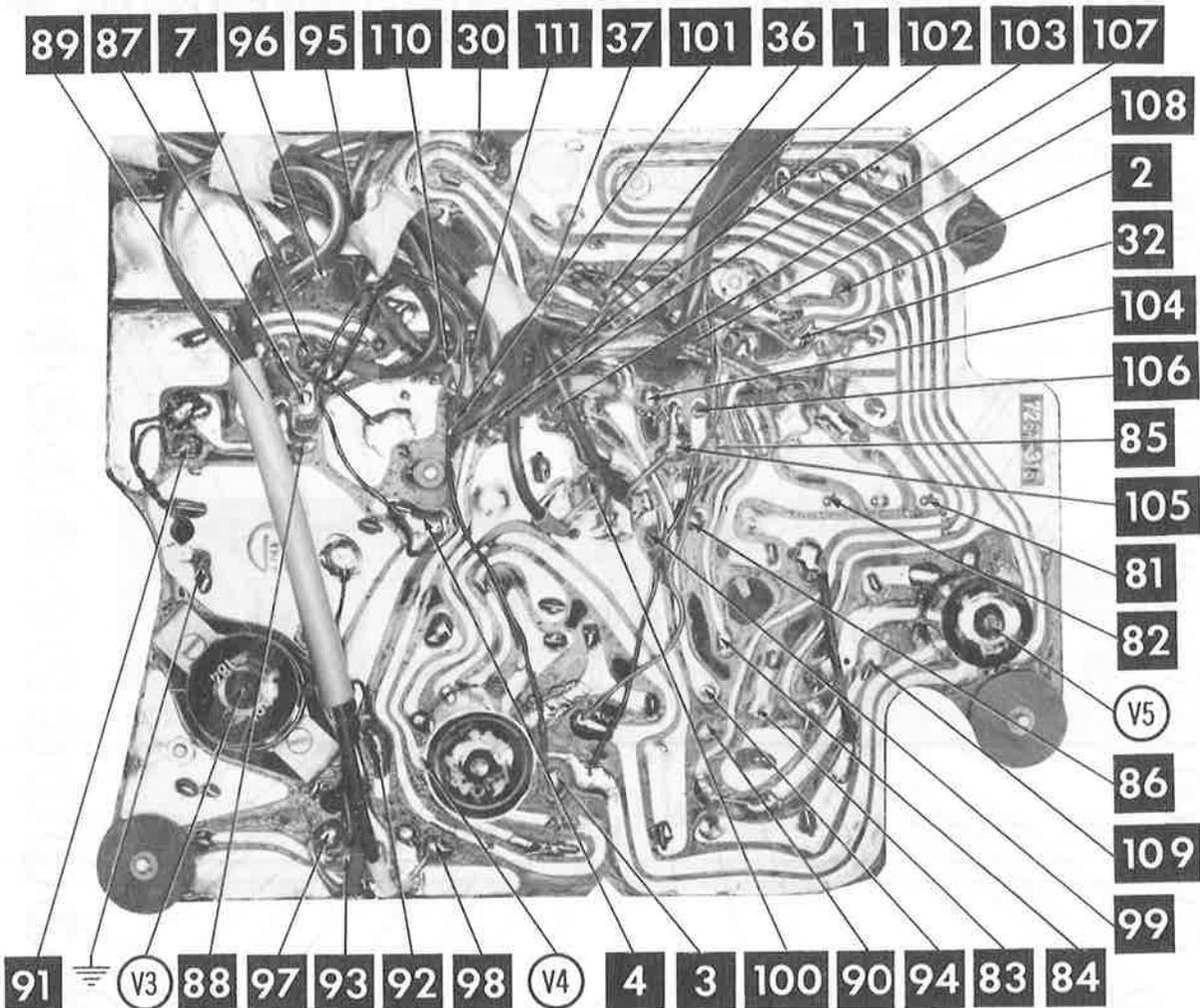
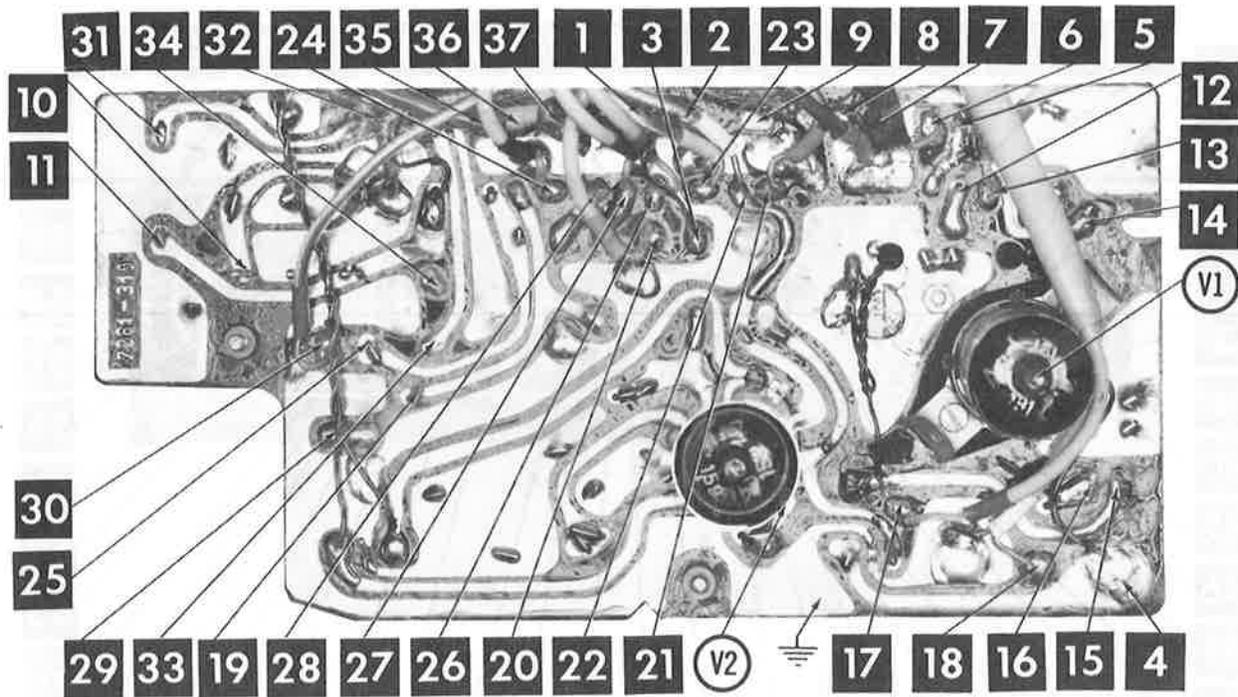
MECHANICAL PARTS LIST

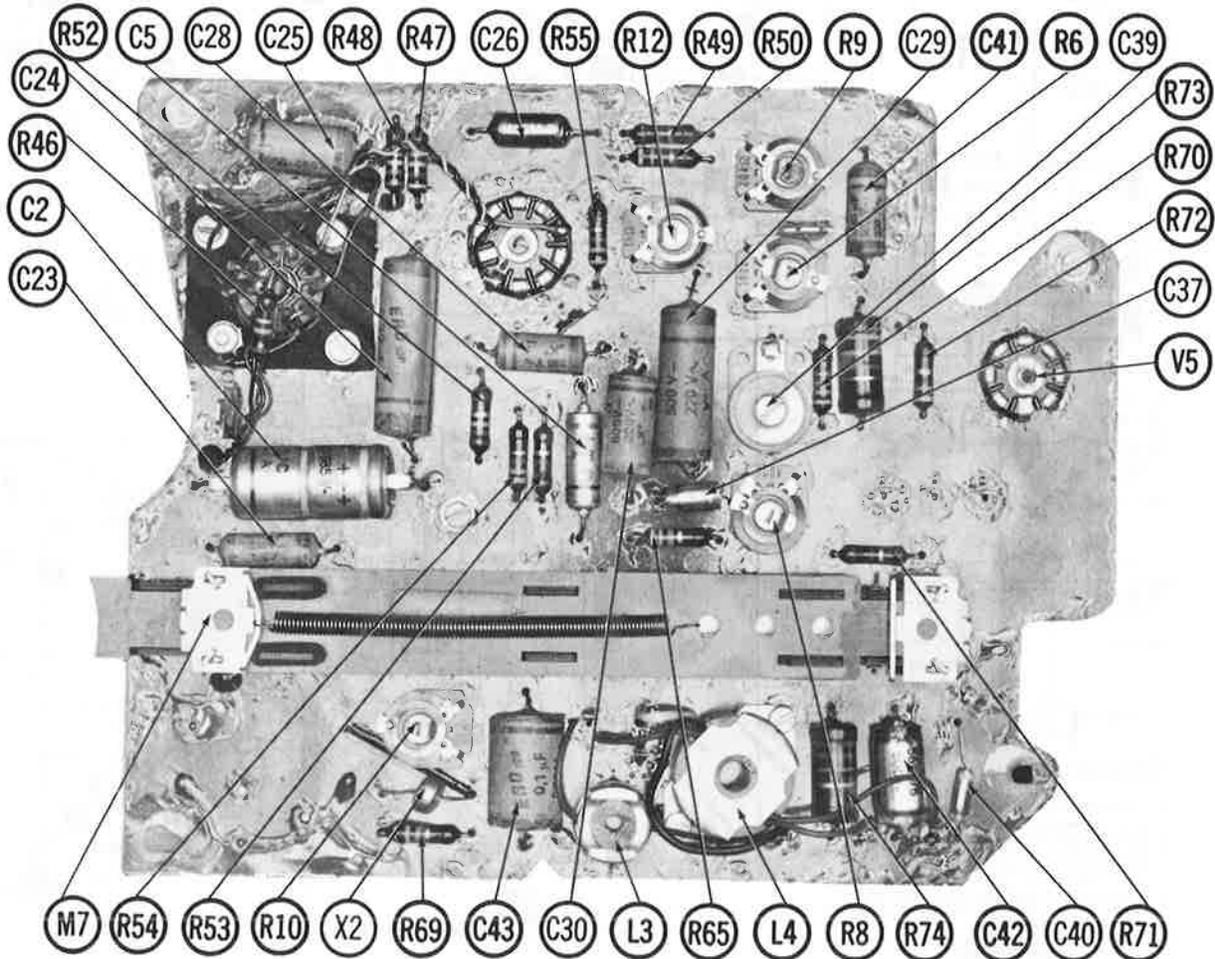
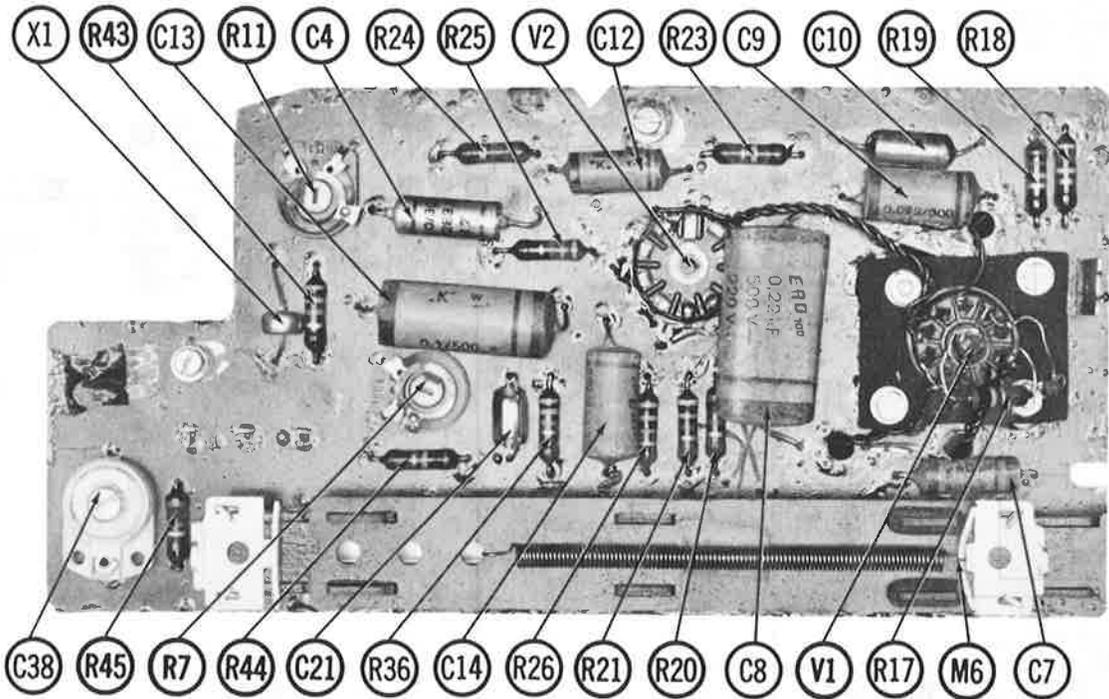
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Pressure Roller	69		Lower Clutch
2*		*Counter Belt, Small	70		Slipping Clutch
3*		*Counter Belt, Large	71		Set Screw
4*		*Drive Belt	72		Cam Gear
5		Intermediate Gear Assembly	73		Bracket
6		Swinging Gear Assembly	74		Speed Cam Locking Screw
7		Intermediate Gear Assembly	75		Tape Speed Cam
8		Driving Wheel Assembly	76		Switch Lever
9		Tension Spring	77		Bearing Bracket Assembly
10		Torsion Spring	78		Position Roller
11		Compression Spring	79		Roller
12		Compression Spring	80		Switch Gear Assembly
13		Tension Spring	81		Locking Flap
14		Tension Spring	82		Roller
15		Tension Spring	83		Switch Shaft Assembly
16		Tension Spring	84		Guide Plate
17		Torsion Spring	85		Grip Ring
18		Torsion Spring	86		Plastic Lever
19		Tension Spring	87		Small Bearing Plate Screw
20		Tension Spring	88		Small Bearing Plate
21		Tension Spring	89		Bracket
22		Compression Spring	90		Bracket
23		Tension Spring	91		"E" Ring
24		Tension Spring	92		Switch Lever
25		Tension Spring	93		Idler Lifter
26		Tension Spring	94		Guide Block.
27		Tension Spring	95		Guide Lever
28		Tension Spring	96		Pressure Strip Assembly
29		Tension Spring	97		Pressure Roller Retainer
30		Tension Spring	98		Pressure Roller Holder Ass'y.
31		Cover Plate Assembly	99		Pressure Roller Shaft
32		Swivel Arm Assembly	100		Bearing Bracket Assembly
33		Mounting Post	101		Grip Ring
34		Grip Ring	102		Switch Lever Assembly
35		Brake Lever Assembly	103		Upper Tape Guide Fork
36		Fiber Washer	104		Spacers
37		Guide Bar	105		Lower Tape Guide Fork
38		Swing Base Assembly	106		Sub-Base Plate
39		Brake Lever Assembly	107		Counter
40		Spacer	108		Flywheel Bearing
41		Push Button Guide	109		Flywheel
42		Push Button Shaft	110		Steel Ball
43		Recording Button 1-2	111		Driving Plate Assembly
44		Recording Button 3-4	112		Part of Ref. 111
45		Stop Button	113		Grip Ring
46		Start Button	114		Hex Nut
47		Pressure Roller Actuator	115		Shoulder Washer
48		End Bracket	116		Spacers
49		Slide	117		Part of Ref. 100
50		End Bracket	118		Upper Tape Guide
51		Slide	119		Tape Guide Spacer
52		Locking Slide	120		Lower Tape Guide
53		Forward-Reverse Slide Bushing	121		Slide Assembly
54		Forward-Reverse Slide	122		Wire Strap
55		"C" Washer	123		Part of Ref. 121
56		Forward-Reverse Slide Guide Shaft	124		Brake Lever Assembly
57		Locking Spring Ring	125		Brake Lining
58		Upper Clutch Spindle	126		Slide Return Bracket
59		Grip Ring	127		"C" Ring
60		Fiber Washer	128		Plastic Retaining Cap
61		Upper Pressure Half Coupling	129		Wind Operating Bar
62		Upper Clutch Disc	130		Eccentric Lever
63		Second Clutch Disc	131		Slide Assembly
64		Third Clutch Disc	132		Shoulder Washer
65		Fourth Clutch Disc	133		Metal Washer
66		Middle Pressure Half Coupling	134		Clutch Wedge Screw
67		Right Hand Spring	135		Clutch Wedge
68		Spacer	136		Grip Ring

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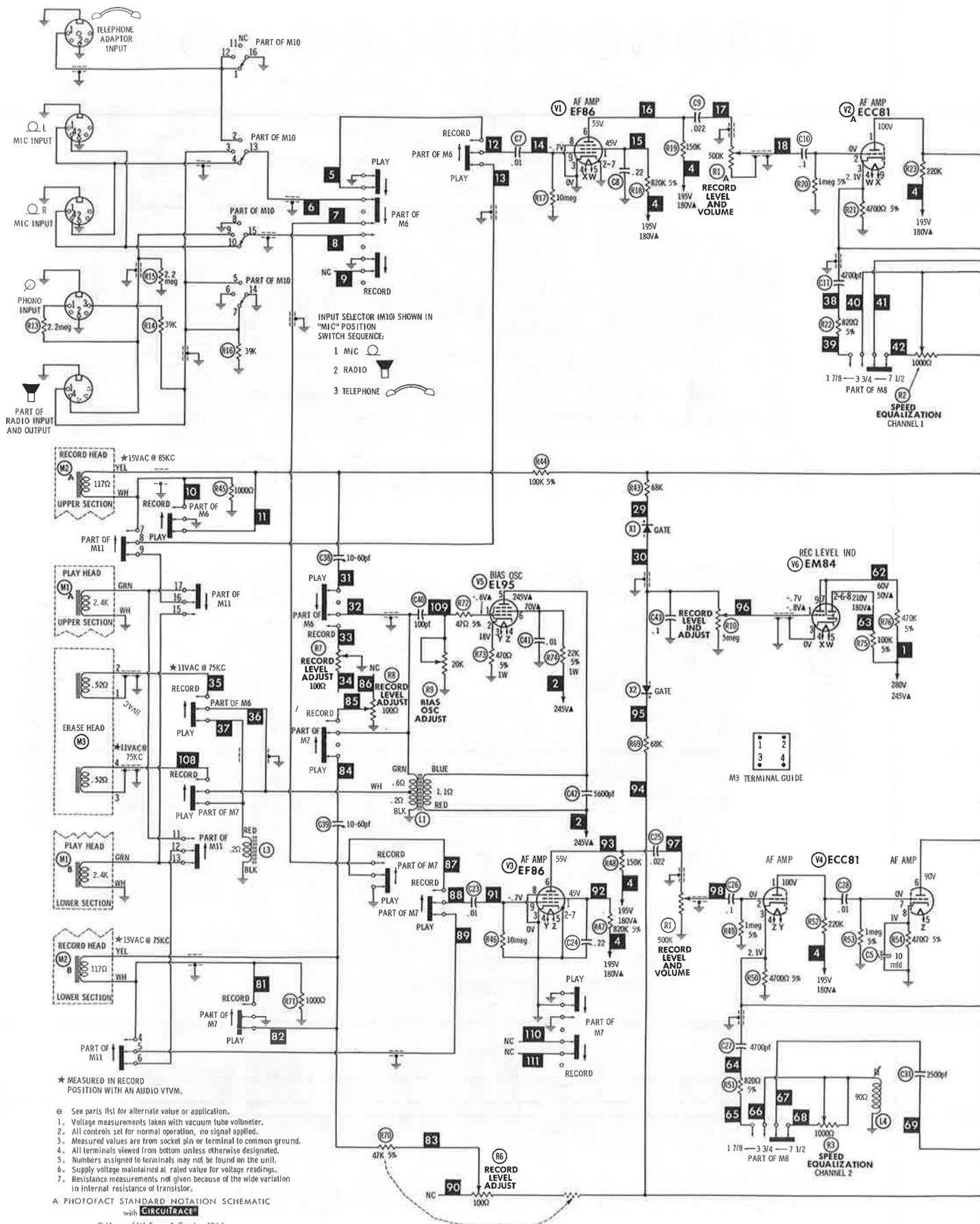


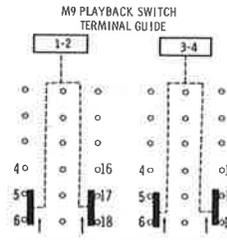
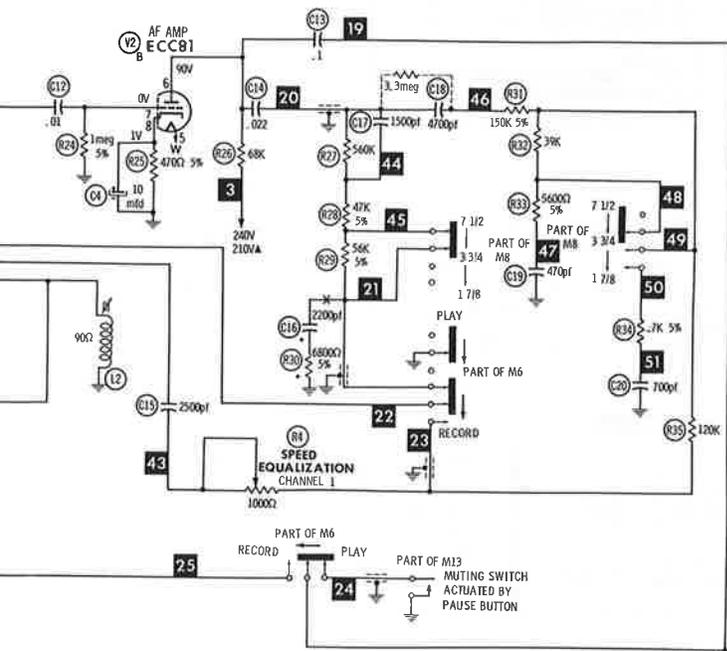
GRUNDIG MODELS TK45/U, TM45/U/USA





NOTE: DEMAGNETIZE HEADS AFTER SERVICING RECORDER



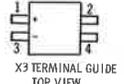
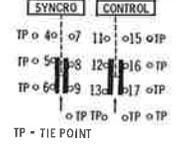


RESISTANCE MEASUREMENTS

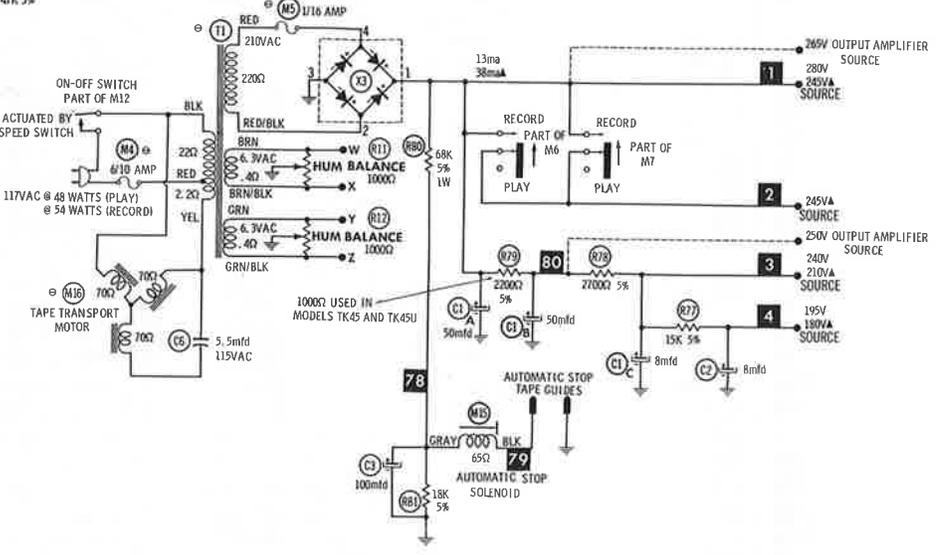
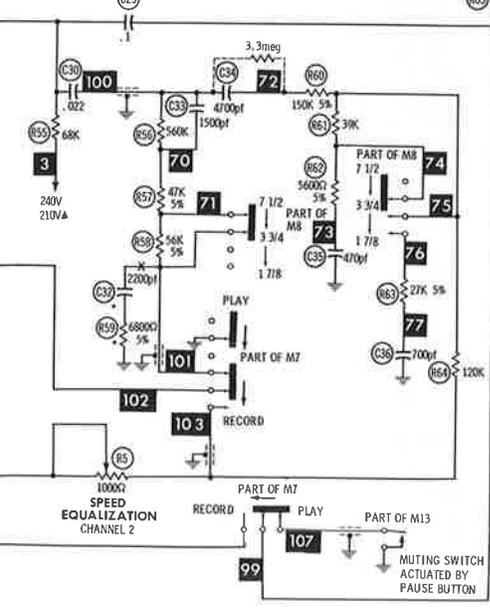
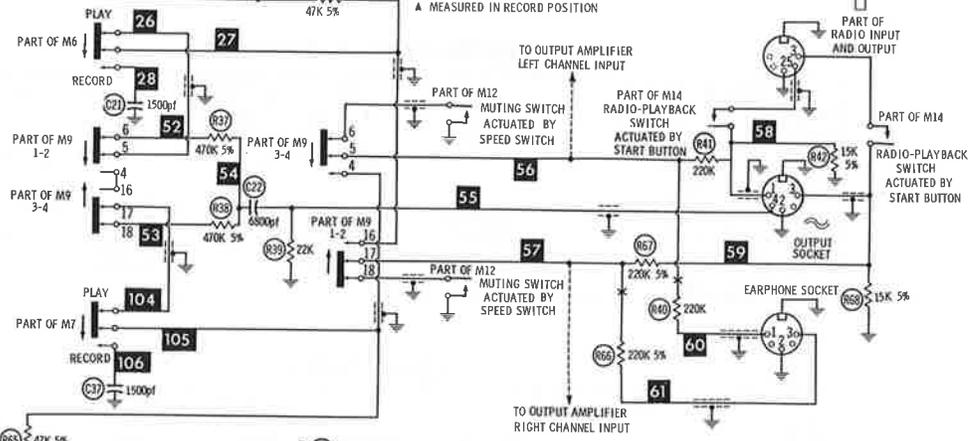
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	840K†	0Ω	0Ω	FIL	FIL	170K†	0Ω	0Ω	10meg
V2	ECC81	240K†	1meg	4700Ω	FIL	FIL	73K†	1meg	470Ω	FIL
V3	EF86	840K†	0Ω	0Ω	FIL	FIL	170K†	0Ω	0Ω	10meg
V4	ECC81	240K†	1meg	4700Ω	FIL	FIL	73K†	1meg	470Ω	FIL
V5	EL95	10K	470Ω	FIL	FIL	1.1ΩΔ†	22KΔ†	NC		
V6	EM84	1.9meg	NC	0Ω	FIL	FIL	100K†	470K†	NC	470K†

ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE NOTED.
 † MEASURED FROM OUTPUT OF X3
 Δ MEASURED IN RECORD POSITION

M11 SYNCHRONIZING AND CONTROL SWITCH TERMINAL GUIDE



* NOT USED IN SOME VERSIONS
 Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.



PARTS LIST AND DESCRIPTION

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Power Cord	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) - 6 Ft. 17109 (Plastic) or 17129 (Rubber) - 9 Ft.
Power Cord (Interlock Type)	Use BELDEN No. 8874 (Rubber) or 8895 (Plastic)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401 or 8421
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor-Unshielded) 8429 (Two Conductor-Shielded) 8419 (Three Conductor-Shielded)

TUBES

♦ AMPEREX ♦		GENERAL ELECTRIC		♦ RCA ♦		♦ SYLVANIA ♦	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V1	AF Amp.	EF86		V4	AF Amp.	ECC81	
V2	AF Amp.	ECC81		V5	Bias Osc.	EL95	
V3	AF Amp.	EF86		V6	Rec. Level Ind.	EM84	

POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.
X1 X2 X3	38ma	M3 M3 B250C75	1N584	FW800 or 1N2096① or 1N2071①	SK-3016① or SK-3017①	F-6① or 60-H①	1N91 1N91

① 4 Required

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		GRUNDIG PART No.	REPLACEMENT DATA				
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	50	385			CC0238	XC3-17.1		
B	50	385						
C	8	385						
C2	8	350		PRS1610	BR8-350	QT1-6	TC61	TVA-1603
C3	100	70		PRS1510	BR100-150	QT1-24	TC493	TVA-1420
C4	10	30		PTT130	NLW10-50	MT1-6	TT50X10	TE-1304
C5	10	30		PTT130	NLW10-50	MT1-6	TT50X10	TE-1304
C6	5.5	150AC						

CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.01 500V		P688N-01	D6-103	PM6S1	6DP-2-103	GEM611	6TM-S10
C8	.22 500V		P688N-22		PM6P22	6DP-5-224	GEM6022	6TM-P22
C9	.022 500V		P688N-022	DD-203	PM6S22	6DP-2-223	GEM6122	6TM-S22
C10	.1 125V		P288N-1		PM2P1	2DP-3-104	GEM401	2TM-P10
C11	4700			CPR-4700J	1R5D47JF	CM-30-E-472	SX247	MS-247
C12	.01 500V		P688N-01	D6-103	PM6S1	6DP-2-103	GEM611	6TM-S10
C13	.1 500V		P688N-1		PM6P1	6DP-4-104	GEM601	6TM-P10
C14	.022 500V		P688N-022	DD-203	PM6S22	6DP-2-223	GEM6122	6TM-S22
C15	2500			CPR-2500J	1R5D25JF	CM-30-E-252	SX225	MS-225
C16	2200			CPR-2200J	1R5D22JF	CM-30-E-222	SX222	MS-222
C17	1500			CPR-1500J	1R5D15JF	CM-30-E-152	SX215	MS-215
C18	4700			CPR-4700J	1R5D47JF	CM-30-E-472	SX247	MS-247
C19	470			CPR-470J	5R5T47JF	CM-20D-471	SX347	MS-347
C20	700			CPR-680J	1R5T68JF	CM-20D-681	SX368	MS-37
C21	1500			CPR-1500J	1R5D15JF	CM-30-E-152	SX215	MS-215
C22	6800 500V		P688N-0068	D6-682	PM6D68	6DP-1-682	GEM6268	6TM-D68
C23	.01 250V		P488N-01	D6-103	PM6S1	4DP-1-103	GEM411	4TM-S10
C24	.22 500V		P688N-22		PM6P22	6DP-5-224	GEM6022	6TM-P22
C25	.022 500V		P688N-022	DD-203	PM6S22	6DP-2-223	GEM6122	6TM-S22
C26	.1 125V		P288N-1		PM2P1	2DP-3-104	GEM401	2TM-P10
C27	4700			CPR-4700J	1R5D47JF	CM-30-E-472	SX247	MS-247
C28	.01 500V		P688N-01	D6-103	PM6S1	6DP-2-103	GEM611	6TM-S10
C29	.1 500V		P688N-1		PM6P1	6DP-4-104	GEM601	6TM-P10
C30	.022 500V		P688N-022	DD-203	PM6S22	6DP-2-223	GEM6122	6TM-S22
C31	2500			CPR-2500J	1R5D25JF	CM-30-E-252	SX225	MS-225
C32	2200			CPR-2200J	1R5D22JF	CM-30-E-222	SX222	MS-222
C33	1500			CPR-1500J	1R5D15JF	CM-30-E-152	SX215	MS-215
C34	4700			CPR-4700J	1R5D47JF	CM-30-E-472	SX247	MS-247
C35	470			CPR-470J	5R5T47JF	CM-20D-471	SX347	MS-347
C36	700			CPR-680J	1R5T68JF	CM-20D-681	SX368	MS-37
C37	1500			CPR-1500J	1R5D15JF	CM-30-E-152	SX215	MS-215
C38	10-80			823-AZ		404		
C39	10-80			823-AZ		404		
C40	100			CPR-100J	5R5T1JF	CM-20C-101	SX310	MS-31
C41	.01 500V		P688N-01	D6-103	PM6S1	6DP-2-103	GEM611	6TM-S10
C42	5800 500V		P488N-01	DF-104	1DR5D56JF	CM-30-E-562	SX256	MS-256
C43	.1 250V		P488N-1	DF-104	PM4P1	4DP-3-104	GEM401	4TM-P10

PARTS LIST AND DESCRIPTION (CONTINUED)

CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				
			GRUNDIG PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A	Record Level/Vol. Channel 1	500K		F2-500K, R2-500K, SU500, CPL-2		B13-133, B13-133, AQ5, QCM *	FA55A, RU55A, CS3500, EB247 ①
B	Record Level/Vol. Channel 2	500K					
R2	Speed Equalization, Channel 1	1000Ω				X201R102B	MTC13L1
R3	Speed Equalization, Channel 2	1000Ω				X201R102B	MTC13L1
R4	Speed Equalization, Channel 1	1000Ω				X201R102B	MTC13L1
R5	Speed Equalization, Channel 2	1000Ω				X201R102B	MTC13L1
R6	Record Level Adjust	100K				U201R104B	MTC15L4
R7	Record Level Adjust, Channel 1	100K				U201R104B	MTC15L4
R8	Record Level Adjust, Channel 2	200K				U201R104B	MTC15L4
R9	Bias Oscillator Adjust	20K				U201R253B	MTC24L4
R10	Record Level Indicator Adjust	5meg					
R11	Hum Balance	1000Ω				U201R102B	MTC13L4
R12	Hum Balance	1000Ω				U201R102B	MTC13L4

① Use portion of original shaft to obtain desired shaft length.

* "SNAPTROL" Equivalent: BU3, CF25, CR20, SS12, SS7A, DC1.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		GRUNDIG PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.
L1	Bias Oscillator	BV9281-079					
L2	Speed Equalization	BV9281-080					
L3	Erase Loading	BV9281-070					
L4	Speed Equalization	BV9281-080					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	GRUNDIG PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
		SEC. 3	SEC. 4						
T1	130V Tap @ 117V @ .25A	210VAC @ 63MA	6.3V @ .7A	BV9005-529 ①					① Part #BV9006-522 used in TK series.
	6.3V @ .7A								

TAPE HEADS

ITEM NO.	MEASURED			GRUNDIG PART NO.	NORTRONICS PART NO.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
M1	2.35H			7489-064	1200 & QK66 ①	4-Track Stereo Play
M2	106MH	15	75KC	7489-062	1203 & QK66 ①	4-Track Stereo Record
M3	.062MH	11	75KC	7489-056/057		4-Track Stereo Erase

① Drill new mounting hole in head shield.

FUSE DEVICES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG S/B	6/10A ①			313.600		MDL 6/10	
M5	3AG S/B	1/16A ②			313.062		MDL 1/16	

① Model TK Series use a 4/10A Fuse.

② Model TK Series use a .16A Fuse.

MISCELLANEOUS

ITEM No.	PART NAME	GRUNDIG PART No.	NOTES
M6	Switch		Record, Left Channel (Slide)
M7	Switch		Record, Right Channel (Slide)
M8	Switch		Equalizer (Slide)
M9	Switch		Play (2 used) Slide Type
M10	Switch		Input Selector (Rotary Wafer)
M11	Switch		Synereo (Slide)
M12	Switch		Off-On-Muting (Leaf)
M13	Switch		Muting (Leaf)
M14	Switch		Radio-Playback (Leaf)
M15	Relay	BV9281-081	Auto Shutoff
M16	Motor	7882-100	Model TM45USA, TM45U
	Motor	7882-102	Models TK45, TK45U

GRUNDIG MODELS TK45/U, TM45/U/USA



PHOTOFACT[®] with

CIRCUITRACE[®]

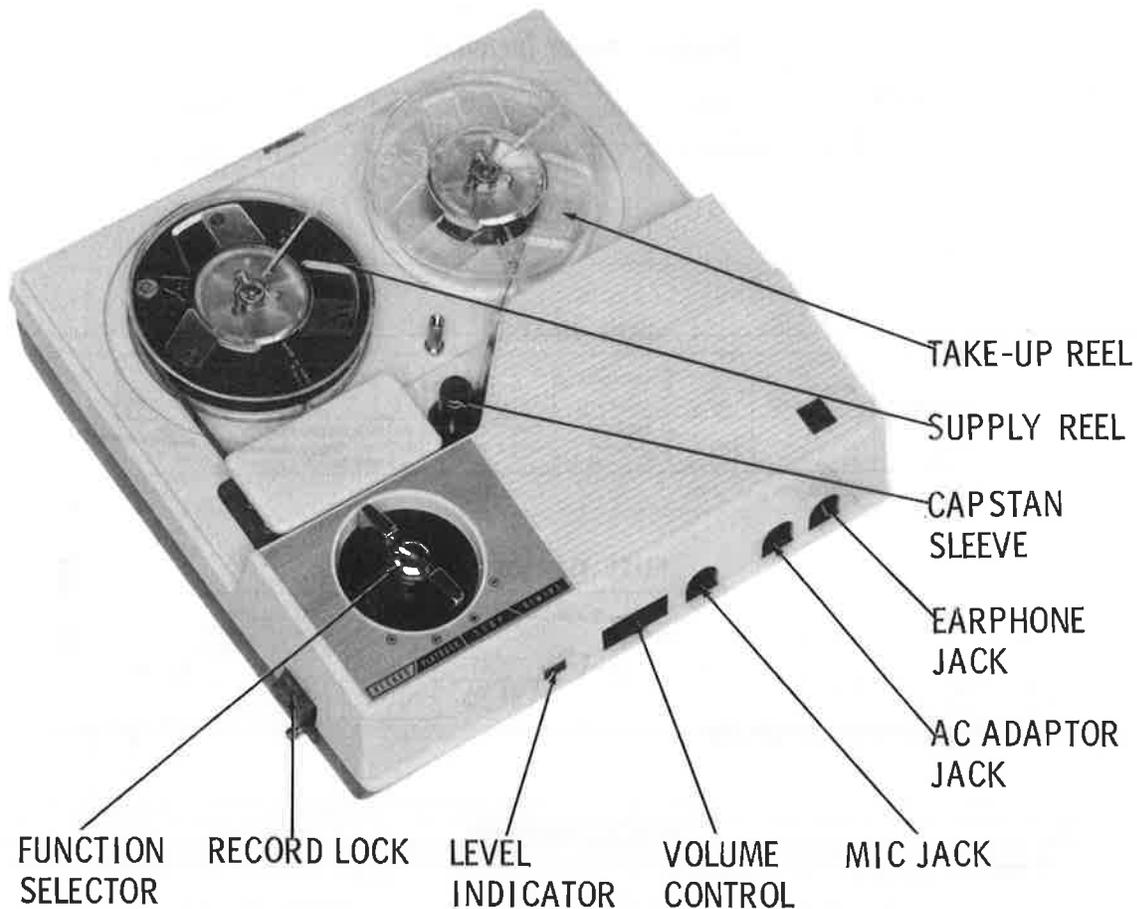
This unit is a two-track monaural recorder having two speeds: 1 7/8 and 3 3/4. The speed is selected by installing or removing the capstan sleeve.

Jacks are provided for connecting a microphone, an earphone and an AC adapter.

Power is supplied by six 1 1/2-volt "D" cells in series.

TRADE NAME : Panasonic Model RQ-101S
SUPPLIER : For Current Address, see Master Index
TYPE SET : 2-Speed, 2-Track Monaural Recorder
POWER SUPPLY : 9 Volts DC
RATING : 90MA @ 9VDC (Record, with Motor)
82MA @ 9VDC (Play, with Motor)
70MA @ 9VDC (Motor Only)

PANASONIC MODEL RQ-101S



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana