



# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

**TRADE NAME:** Tandberg Models 62X, 64X

**SUPPLIER:** For Current Address, See Annual Index

**TYPE SET:** 3-Speed, 4-Track Recorder (Model 64X)  
3-Speed, 2-Track Recorder (Model 62X)

**POWER SUPPLY:** 110 - 120 Volts AC, 60 Cycles

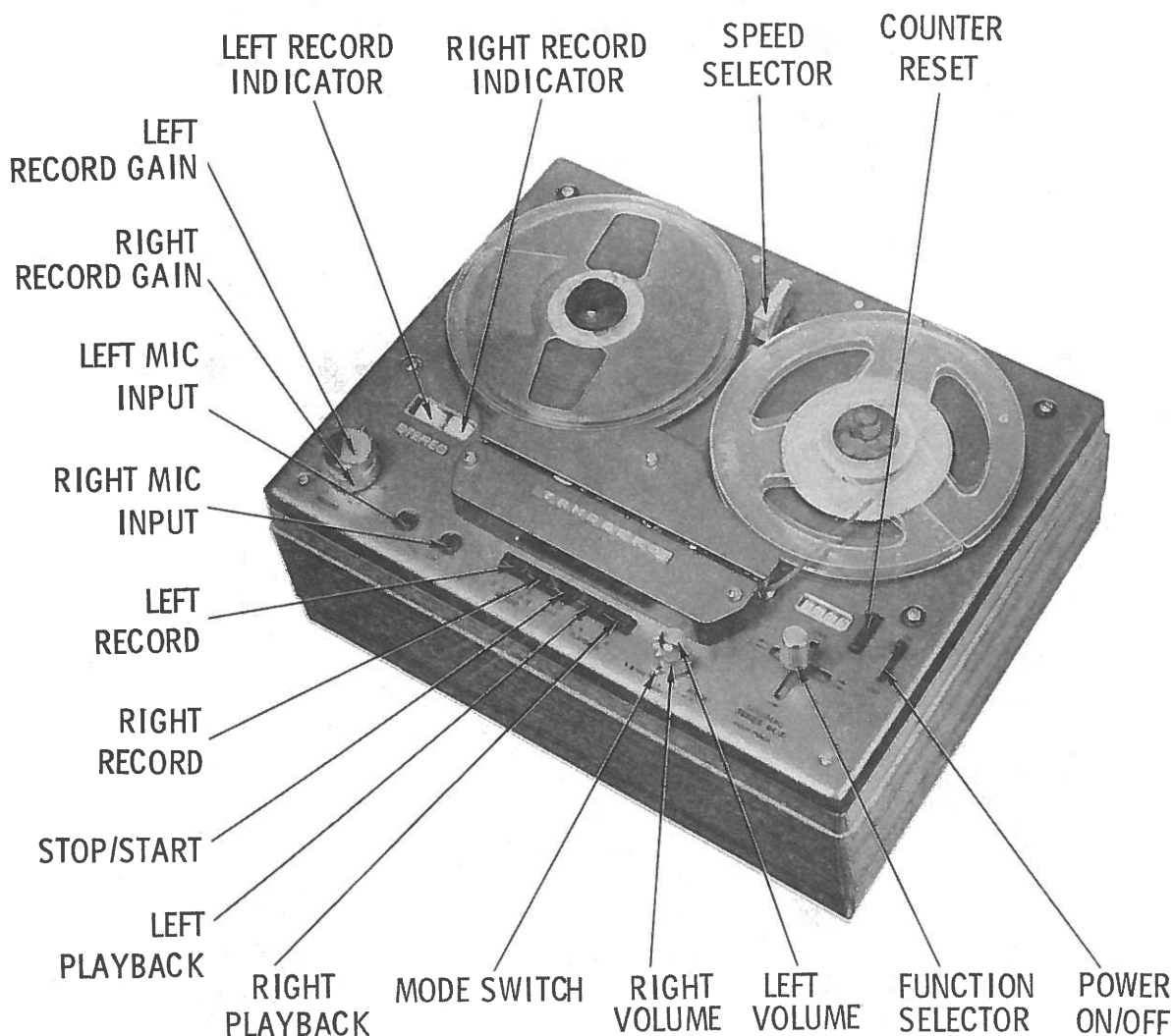
**RATING:** 80 Watts, .75 Amp. @ 117 VAC  
(Record with Motor)  
76 Watts, .71 Amp. @ 117 VAC  
(Play with Motor)

These units are monaural/stereo recorders having three speeds: 1 7/8, 3 3/4, and 7 1/2 ips. An external amplifier/speaker system is required for playback. Model 64X is a four-track recorder and Model 62X is a two-track recorder.

Sound-On-Sound and Sound-With-Sound recordings can be made.

Jacks are provided for both low- and high-level inputs, microphone inputs, cathode-follower outputs, remote, and center-channel output.

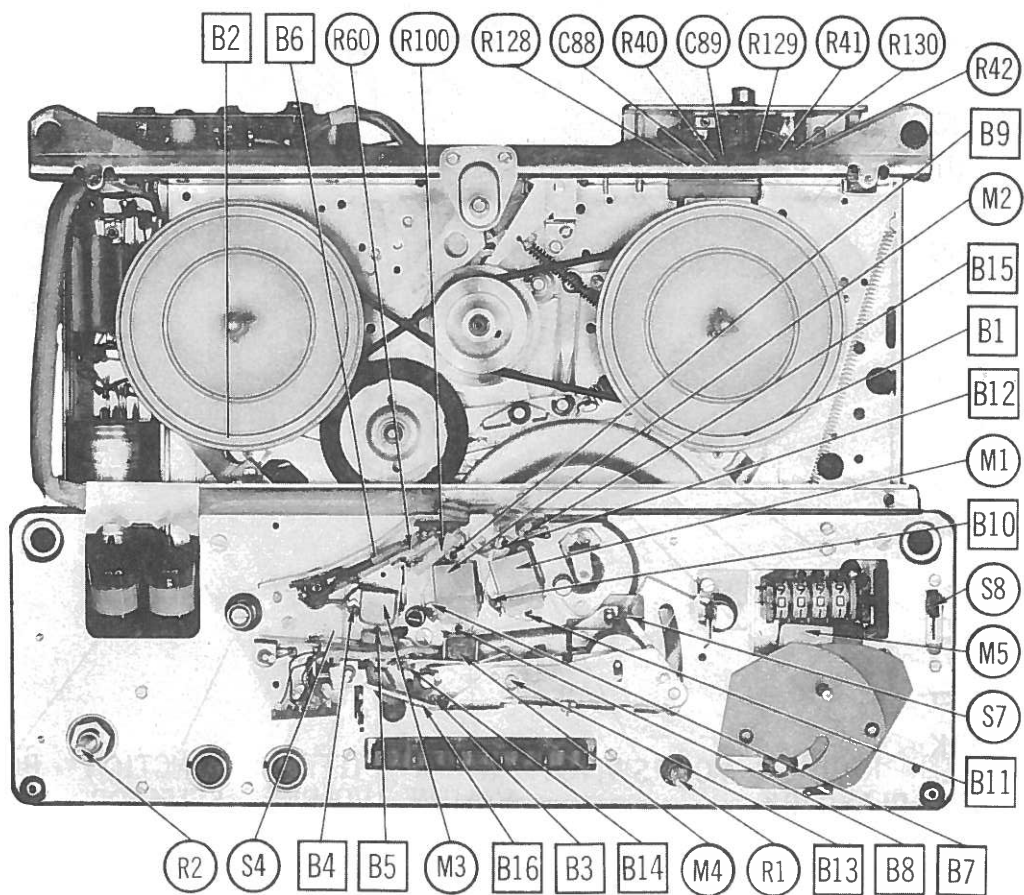
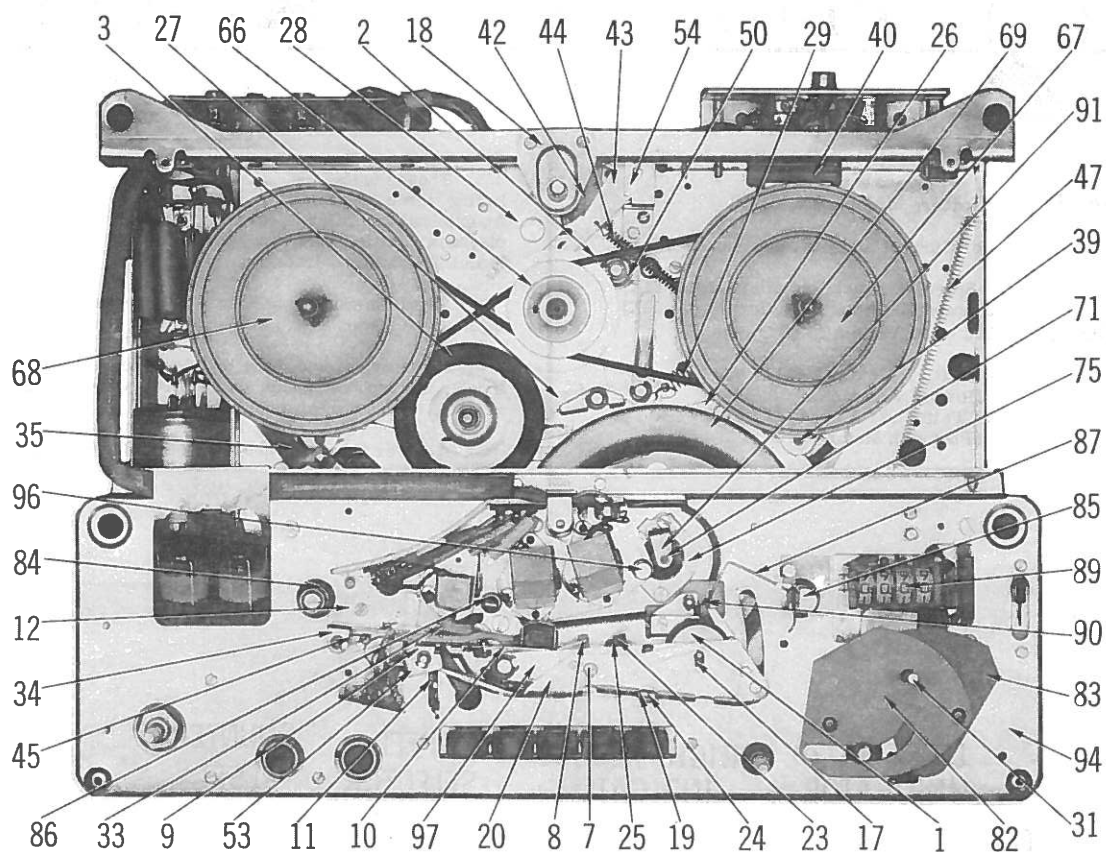
A power source of 110-120 volts AC, 60 cycles is required.

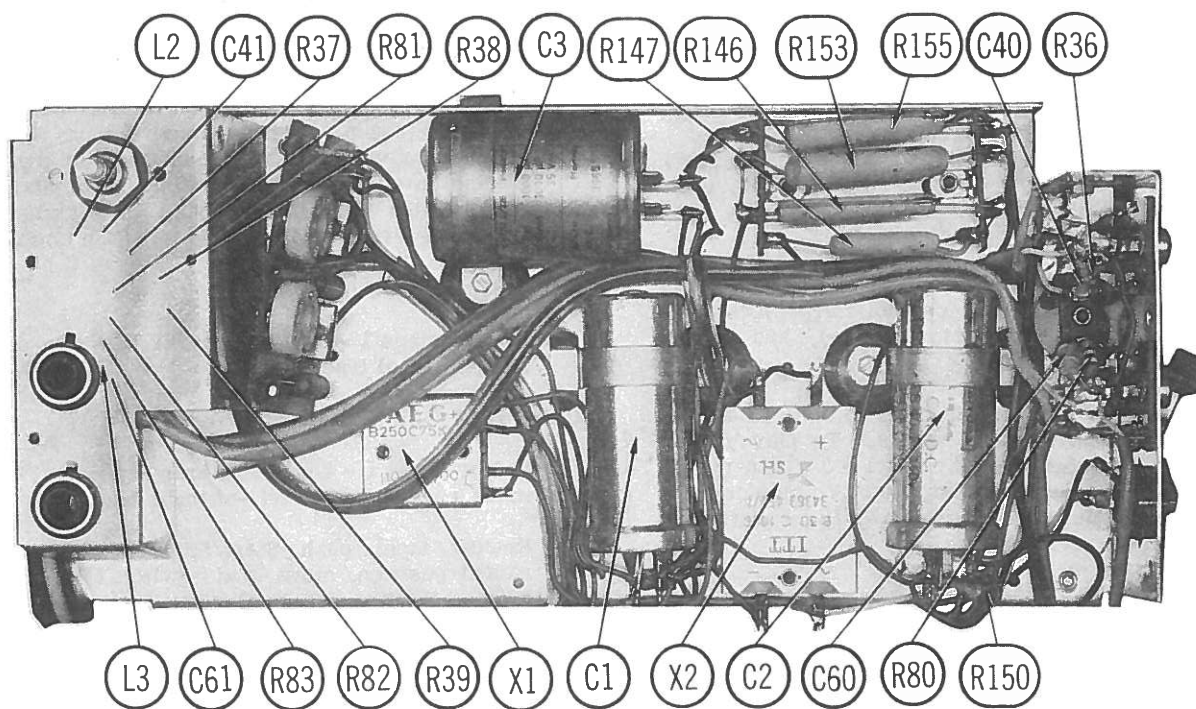
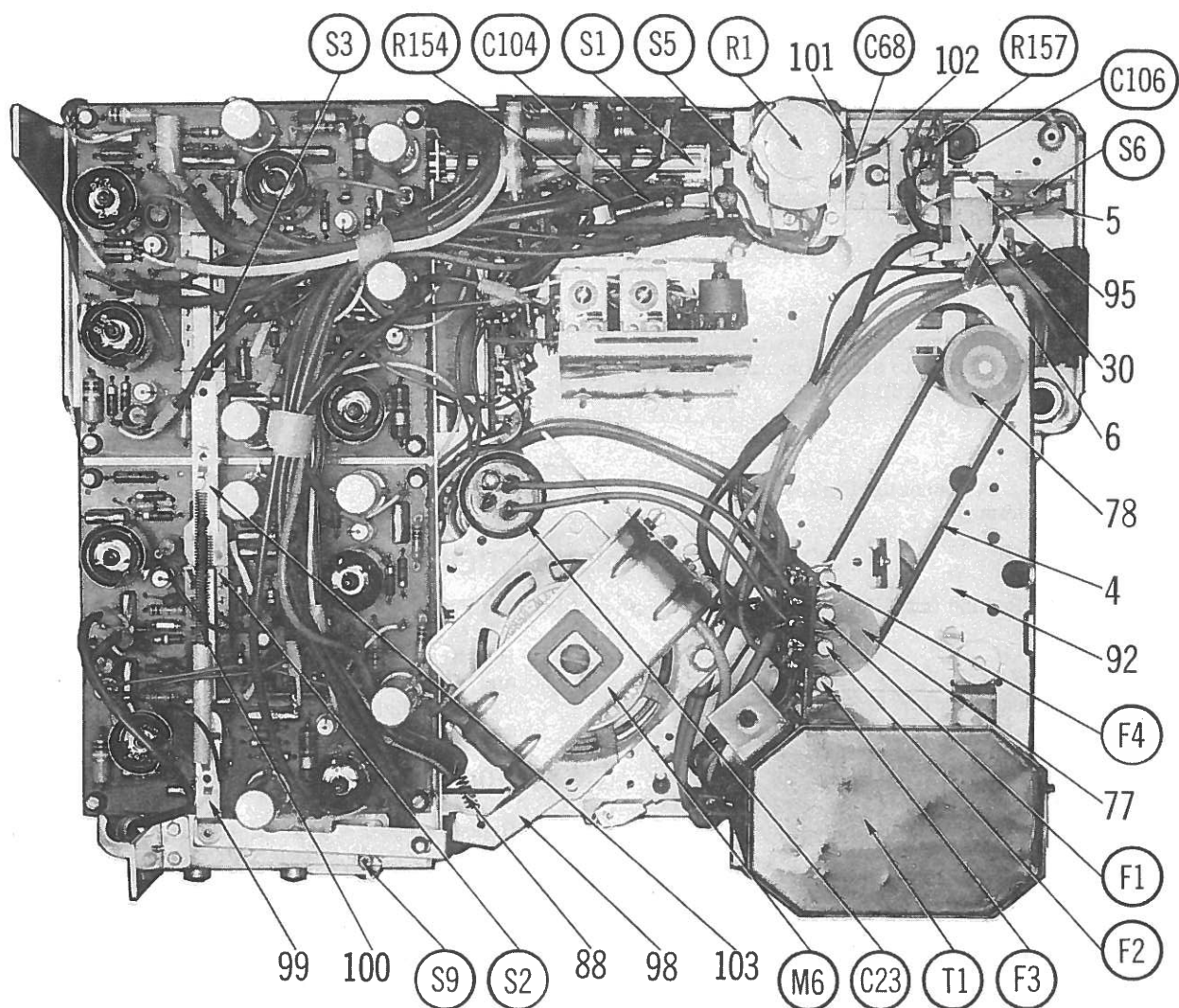


TANDBERG MODELS 62X, 64X

**HOWARD W. SAMS & CO., INC.** Indianapolis, Indiana 46206

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## FUNCTION OF SPECIFIC CONTROLS, JACKS & INDICATORS

### Foot Control Jack

For the connection of a remote-operated foot switch used to stop and start tape motion.

### Line Jack

For use with DIN connector to couple playback preamps. to high-level inputs of a second unit for copying tape. (150mv, 10K impedance).

### Center Channel Jack

For use with low-impedance monaural headphones to monitor or to listen to simultaneous playback of both channels. (1V with 200Ω load).

### Radio Jack

For use with DIN connector for low-level input. (100K, 200mv maximum).

### Right and Left High-Level Input Jacks

For high-level input for monaural or stereo recording. (430K, 3V maximum).

### Right and Left FM Stereo Input Jacks

For inputs from FM Stereo tuner with Internal MPX filter.

### Right and Left Cathode Follower Outputs

For connection of Playback preamp. to external power amp. (1.5V, 2000Ω impedance).

### Right and Left Mic Inputs

For recording from microphones. (5meg, 50mv maximum signal).

## OPERATING INSTRUCTIONS

Play/Record (→) Rewind (⇐) Fast Forward (⇒)

### Monaural Recording

1. Move Function Selector to Free, thread tape, turn on unit, move Mode Switch to Norm, and push Start/Stop button to the raised position.
2. Sources may be connected to any inputs, but plugging a source into a mic jack disconnects all other inputs for that channel.
3. Press Left Record button while moving Function Selector to (→), adjust Left Record Level control for sources connected to left inputs, and adjust Right Record Gain control for sources connected to right inputs.
4. Press Start/Stop button and record on left-channel tracks. To record on right-channel tracks, repeat steps 1 - 4 with Right Record button depressed instead of Left Record button.

### Monaural Play

1. Move Function Selector to Free, thread tape, turn on unit, move Mode Switch to Norm, push Start/Stop button to the raised position, and press Left Playback button.
2. Connect a left-channel output to a power amp., advance Left Volume control fully clockwise, move Function Selector to (→), and press Start/Stop button.
3. Set power amplifier controls to desired levels and play left-channel tracks. To play right-channel tracks, repeat steps 1 - 3 with a right-channel output connected, Right Volume control advanced fully clockwise, and Right Playback button depressed.

### Stereo Recording

1. Repeat steps 1 - 4 of "Monaural Recording" with sources connected to left and right inputs and both Left and Right Record buttons depressed.

### Stereo Play

1. Repeat steps 1 - 3 of "Monaural Play" with left and right outputs connected to a power amp., Left and Right Volume controls fully clockwise, and Left and Right Playback buttons depressed.

### Sound-On-Sound Recording

1. Repeat steps 1 - 4 of "Monaural Recording" and make a recording on left-channel tracks.
2. Rewind tape, push Start/Stop button to the raised position, move Mode Switch to S on S, adjust Left Volume control fully clockwise, and press Left Playback button.
3. Connect a microphone to a Left Mic. Input, press Right Record button while moving Function Selector to (→) and set recording level for microphone with Left Record Gain control and Right Record Indicator.
4. Press Start/Stop button, monitor left-channel recording from a right-channel output. Left-channel information is transferred to right-channel track and new information is simultaneously added with microphone. Set Transfer recording level with Right Record Gain control.

### Sound-On-Sound Play

1. Repeat steps 1 - 3 of "Monaural Play" to play right-channel tracks.

### Sound-With-Sound Recording

1. Follow steps 1 - 4 of "Monaural Recording" and make a recording on left-channel tracks.
2. Rewind tape, push Start/Stop button to the raised position, move Mode Switch to S on S, connect headphones to Center Channel Output Jack, and connect microphone to Right Mic. Input.
3. Press Left Playback button, press Right Record

button while moving Function Selector to (→) and set microphone recording level with Right Record Gain control.

4. Press Start/Stop button, listen to left-channel information while recording new information on right channel, and adjust Right and Left Volume controls for desired monitoring level.

### Sound-With-Sound Play

1. Follow procedure outlined under "Stereo Play".

### A-Test Monitor

Advance appropriate volume control, move Mode Switch to A-B Test, and connect outputs to power amp.

### B-Test Monitor

Repeat "A-Test Monitor" with appropriate play-back buttons depressed.

## DISASSEMBLY

1. Remove four screws from rubber mounts, invert unit, and lift case from unit.
2. Remove seven knobs and remove head covers held by three thumbscrews.
3. Remove two screws holding head cover brackets.
4. Remove four Phillips screws holding deck cover and remove deck cover.

## SEQUENCE OF OPERATION

### Play

Moving the Function Selector to Play (→) tilts Lever and Pivot Ball (31), followed by cover plates, actuating motor switch and pulling Bar (26). Bar (26) lifts Lever (39), depressing Lever (40) and lowering Disc (57) to decrease pressure on Sheet (59) and Turntable (67). Bar (26) also pivots Lever (35), releasing the brake, and pivots Lever (38), lowering Disc (58) and Sheet (60) from Turntable (68).

Lever and Pivot Ball (31) pivots Eccentric (48), pushing Arm (50) to move Brake (105) from Flywheel (69) and also to release Arm (28). Holder (27), pulled by Spring (29) and laterally located by Arm (104), moves Wheel (3) against Pulley (66) and Flywheel (69). The motor, through Pulley (66), Belt (2), Disc (57), and Sheet (59), drives Turntable (67), and also, through Pulley (66) and Wheel (3), drives Flywheel (69) to rotate Capstan (93). Turntable (67), through Pulley (77), Belt (4), and Pulley (78), drives Counter (89).

Eccentric (48) pivots and locks Bracket (97) to move Roller (1) against Capstan (93) and actuates the muting switch. Bracket (97) allows Lever (20) to release Bracket (53), allowing Arm (34), pushed by Spring (45), to move Felt (33). Bracket (97) also pushes Spring (10), pivoting Bracket (9) to move Head (M4).

### Record

Record is the same as "Play" except Arm (50) pivots Arm (102) to lock the Record buttons.

### Fast Forward

Moving Function Selector to Fast Forward (⇒)

tilts Lever and Pivot Ball (31), actuating motor switch and sliding Bar (26) to lift Lever (35) and release the brake. Bar (26) also pivots Lever (38), lowering Disc (58) and Sheet (60) from Turntable (68). The motor, through Pulley (66), Belt (2), Disc (57), and Sheet (59), drives Turntable (67).

### Rewind

Moving Function Selector to Rewind (⇐) tilts Lever and Pivot Ball (31), actuating motor switch and sliding Bar (26) to lift Lever (35) and release the brake. Bar (26) also pivots Lever (39), pivoting Lever (40) and lowering Disc (57) and Sheet (59) from Turntable (67). The motor, through Pulley (66), Belt (2), Disc (58), and Sheet (60), drives Turntable (68).

### Free

Moving the Function Selector to Free tilts Lever and Pivot Ball (31), pivoting Bar (26) to lift Lever (35) and release the brake and pivoting Lever (38) to lower Disc (58) and Sheet (60) from Turntable (68). Bar (26) also pivots Lever (39), pivoting Lever (40) and lowering Disc (57) and Sheet (59) from Turntable (67).

### Pause (From Play Position)

Pressing the Start/Stop button actuates Solenoid (K1), pivoting Lever (11) to pivot Lever (20). Lever (20) moves Roller (1), pivoting Assembly (23) to move Brake (25).

### Stop

Moving the Function Selector to Stop reverses the action of any other position.

## 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"> <li>1. Lever (39) adjustment (B1) incorrect.</li> <li>2. Sheet (59) dirty.</li> <li>3. Turntable (67) dirty or binding.</li> <li>4. Disc (57) binding or defective.</li> <li>5. Belt (2) dirty, worn, or defective.</li> <li>6. Lever (38) adjustment (B2) incorrect.</li> <li>7. Shaft (31) not operating motor switch.</li> </ol>
Take-up reel revolves rapidly in Play or Record.	<ol style="list-style-type: none"> <li>1. Lever (39) adjustment (B1) incorrect.</li> </ol>
Supply reel does not revolve in Rewind.	<ol style="list-style-type: none"> <li>1. Lever (38) adjustment (B2) incorrect.</li> <li>2. Lever (35) defective.</li> <li>3. Sheet (60) dirty.</li> <li>4. Turntable (68) binding or dirty.</li> <li>5. Lever (39) adjustment (B1) incorrect.</li> <li>6. Lever and Pivot Ball (31) not operating motor switch.</li> </ol>
Supply reel spills tape in forward positions.	<ol style="list-style-type: none"> <li>1. Disc (62) dirty or defective.</li> </ol>
Reels do not stop immediately when Stop button is pressed.	<ol style="list-style-type: none"> <li>1. Lever (35) defective.</li> <li>2. Lever (38) adjustment (B2) incorrect.</li> <li>3. Lever (39) adjustment (B1) incorrect.</li> <li>4. Belt (2) dirty or worn.</li> </ol>
Capstan does not rotate in Play or Record.	<ol style="list-style-type: none"> <li>1. Wheel (3) worn or dirty.</li> <li>2. Flywheel (69) dirty or binding.</li> <li>3. Motor defective.</li> <li>4. Lever and Pivot Ball (31) not operating motor switch.</li> <li>5. Transfer Wheel (3) position incorrect.</li> </ol>
Tape rides up and down between capstan and pressure roller.	<ol style="list-style-type: none"> <li>1. Capstan (93) position incorrect.</li> </ol>
Wow or Flutter.	<ol style="list-style-type: none"> <li>1. Wheel (3) worn or dirty.</li> <li>2. Flywheel (69) binding.</li> <li>3. Bearings (70) defective.</li> <li>4. Felt (33) worn.</li> <li>5. Pressure Roller (1) dirty, worn, or binding.</li> <li>6. Transfer Wheel (3) position incorrect.</li> </ol>
Sound is weak or distorted.	<ol style="list-style-type: none"> <li>1. Felt (33) worn.</li> <li>2. Record Head (M2), Play Head (M1), and Bias Head (M4) dirty, defective, or misaligned.</li> <li>3. Amplifiers defective or misaligned.</li> <li>4. Bias adjustments incorrect.</li> </ol>
Erase weak or inoperative.	<ol style="list-style-type: none"> <li>1. Felt (33) worn.</li> <li>2. Erase Head (M3) dirty or defective.</li> </ol>

**CLEANING**

**LUBRICATING**

**HEAD DEMAGNETIZING**

Refer to "General Servicing Information" on Page 4.



## ADJUSTMENTS

Note: Perform all adjustments in the order listed.

**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/Fast Forward Take-up Torque.	Nominal value 1 1/2 ounces in play position and 5 1/2 ounces in fast-forward position. Controlled by tension of Springs (46) and (64) and position of Levers (39) and (40). Adjust Screw, B1, until Lever (39) clears Lever (40) by .002 to .005 inch in fast-forward position. Disc (57) should clear Turntable (67) by .005 to .04 inch in Free and/or rewind position. Lever (39) should not contact lugs on Disc (57) in play position.
Rewind Torque	Nominal value 5 1/2 ounces in rewind position. Torque controlled by tension of Spring (63). Adjust B2 until Disc (58) clears Turntable (68) by .005 to .010 inch in play and/or Free position with a loaded 7-inch reel on supply turntable.
Supply Reel Drag	Nominal value 1/4 ounce in play position with a fully loaded 7-inch reel. Controlled by reel weight and tension of Springs (65).
Take-up Reel Drag	Dependent on reel weight.
Pressure Roller Pressure	Nominal value 2 1/2 pounds. Controlled by tension of Spring (19).
Pressure Roller Tilt	Rotate Latch (24) until pressure roller completely covers the tape in play position.
Supply Braking Torque	Nominal value 9 ounces measured counterclockwise in stop position. Controlled by tension of Spring (37) and condition of pad on Lever (35).
Take-up Braking Torque	Nominal value 6 ounces measured clockwise in stop position. Controlled by condition of felt on Turntable (67) and the reversing action caused by Belt (2).
Stop/Start	In stop position, Roller (1) should clear capstan by .005 inch. Controlled by angle of bend of Lever (20) at B16. Tape Brake Block (25) should clear tape by .010 inch in play. Controlled by B3.
Pressure Pad Pressure	Nominal value 2 1/2 ounces. Controlled by tension of Spring (33).
Motor Pulley Height	Rib between belt grooves should be .002 inch below center lines of Discs (57) and (58) in stop position.
Capstan Position	Move upper Latch (75) until capstan is perpendicular to Disc Plate (94).
Speed Transfer Wheel Position	Move Bracket (18) until Wheel (3) is parallel to Flywheel (69). Wheel (3) should be .004 inch below rim of Pulley (66) in 3 3/4 ips position.
Flywheel Brake Pressure	Nominal value 12 ounces. Controlled by tension of Spring (47).
End Stop Switch	Spring (87) should contact only half of tape surface. Switch should be actuated as Spring (87) passes into Guide (85). Adjust by bending Spring (87) and Bracket (90).
Equalization Micro-Switch Position	Position bracket for Switch (S9) so that switch is actuated only in the 1 7/8 ips position.

TANDBERG MODELS 62X, 64X

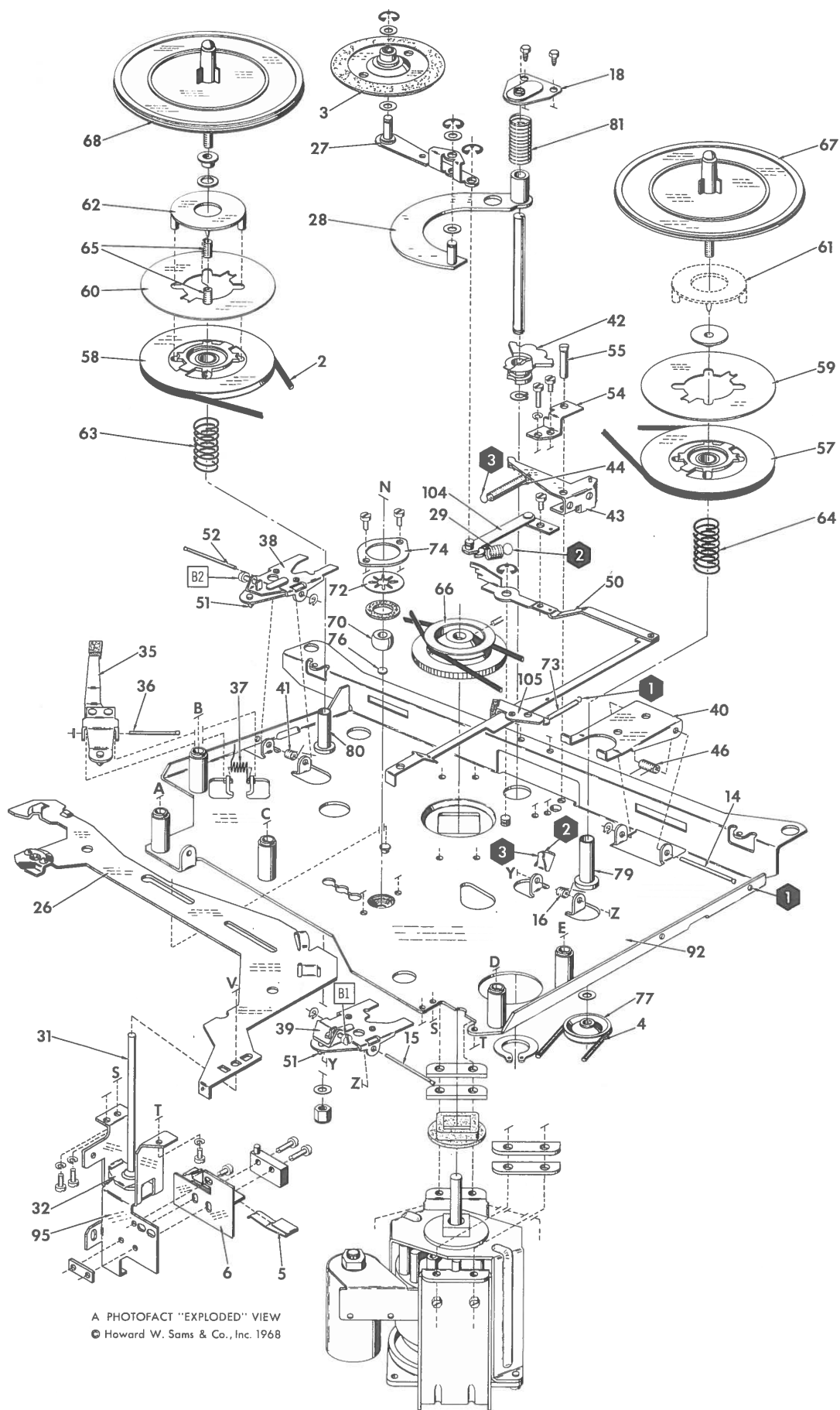
## ADJUSTMENTS (Continued)

ADJUST	REMARKS
Turntable Alignment	Tape should track in center of Guides (84) and (85) and should wind on center of reels without touching edges of reels. Alignment should not be necessary unless the turntable support sleeves have been bent. Should alignment be required, information, Tandberg Special Tools 1 through 6, and height shim washers, Tandberg Number M306-7, are available from Tandberg.
Head Plate Height	Adjust B15 until tape runs in center of Guide (96) during play.
Tape Guide Height	Adjust Guide (86) until tape tracks in center during play.
Bias Oscillator Frequency	Set R9 and R11 to the 1 o'clock position, set R10 and R12 to the 11 o'clock position. Select 7 1/2 ips speed and stereo record. Monitor oscillator frequency across bias head and adjust C98 for 85.5KC. Select monaural record, left channel, and adjust L4 for 85.5KC across bias head. Select monaural record, right channel, and readjust and compromise L4 for MINIMUM deviation from 85.5KC in all three record modes. Deviation should be less than 2KC.
Bias Current	Connect a 10 $\Omega$ resistor in series with low side of each section of Bias head and ground. Connect AC VTVM across each resistor and adjust C101 for maximum on upper section and C103 for maximum on lower section.
Head Zenith	Front and rear of each azimuth plate on heads should be of equal distance from Plate (12).
Play head Height	Adjust B10, B11, and B12 equally until top of upper pole is even with top of properly threaded tape.
Play Head Azimuth	Play an azimuth test tape and adjust B10 for maximum output across Cathode Follower output.
Play Head Lateral Alignment	Play an azimuth test tape, monitor outputs, and move Felt (33) away from erase head. Output should not drop more than 3 db. Rotate head azimuth plate laterally to adjust.
Record Head Height	Remove Bias Head by loosening B14, sliding head to left, and then, lifting up and to the right. Adjust B7, B8, and B9 equally until top of upper pole piece is .0025 inch above top edge of tape in motion. Replace Bias Head centered horizontally on Record Head.
Record Head Azimuth	With tape on unit, prepare to record on left channel. Apply a 10KC tone to Left Mic Input, set unit for B-Test monitor, and connect a VTVM across Left Cathode Follower Output. Adjust Left Volume Control for maximum and set Left Record Level. Adjust B7 for maximum output.
Record Head Lateral Alignment	With same conditions as in "Record Head Azimuth", lift Felt (33) from Erase Head. If output drops more than 3 db, correct by laterally rotating record head azimuth plate.
Bias Head Height	Connect AC VTVM across record head, set unit to stereo record, turn volumes to MINIMUM. Adjust B13 for maximum.
Bias Head Horizontal Position	Prepare unit as in "Record Head Azimuth", record a 1000-cycle tone, move Bias Head to extreme left by loosening B14 slightly. Move Bias Head to right for maximum indication and tighten B14. Adjust R9 and R11 for maximum left- and right-channel outputs.
Erase Head Height	Adjust B4, B5, and B6 equally until top of upper pole piece is .010 inch above top of tape.
Erase Head Azimuth	Adjust B4 until head is perpendicular to lateral tape motion.
Erase Head Lateral	Rotate erase head azimuth plate until head is perpendicular to head pad.

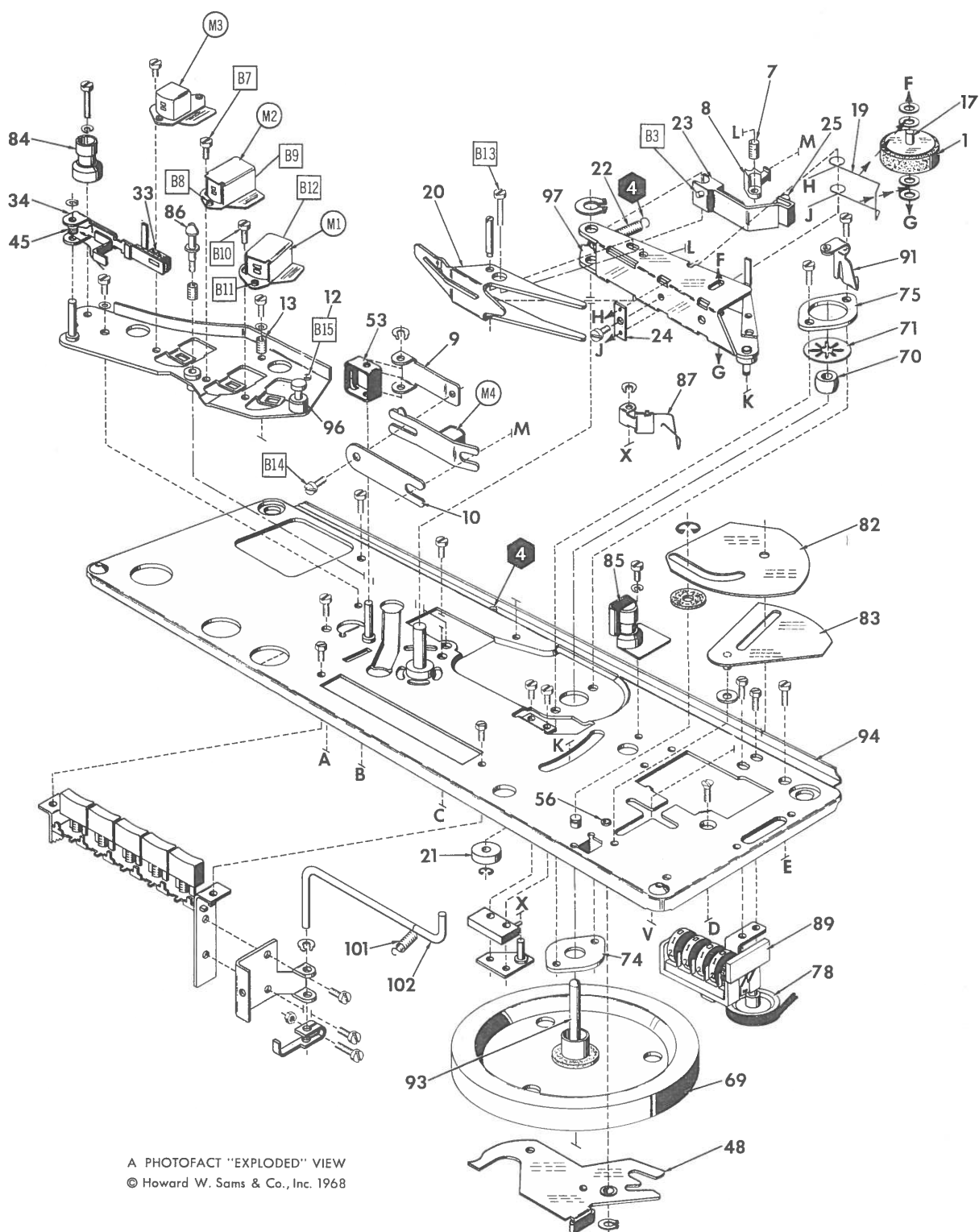


## ADJUSTMENTS (Continued)

ADJUST	REMARKS
Amplifier Distortion and Record Indicator Alignment	<p>Connect a VTVM to each Cathode Follower Output Jack and apply a 400-cycle tone to each High-Level Input. Set recorder for stereo recording and A-Test Monitor at 7 1/2 ips, using high-quality recording tape. Advance Record Levels for a 1.5V indication with Right and Left Volume controls at maximum.</p> <p>Replace left-channel VTVM with a distortion meter, depress Left Playback button and adjust R4 for 3% distortion. Move distortion meter to right channel, depress Right Playback button and adjust R7 for 3% distortion. Adjust R5 (left channel) and R8 (right channel) until beam indicators just close.</p> <p>Reconnect VTVM's and set recorder for stereo record in B-Test monitor. Adjust R3 (left channel) and R6 (right channel) for 1.5V. Release Left and Right Playback buttons. Reading should still be 1.5V.</p>
Total Frequency Response	<p>Set unit for stereo record, B-Test monitor at 7 1/2 ips. Use a high-quality tape that has been run 5 - 10 times at normal speed. Connect VTVM to each output, apply 400-cycle tone to high-level inputs, set Record Level for maximum recording level, and reduce generator output 30 db.</p> <p>Sweep generator between 30 and 20,000 cps. Frequency response should not vary more than <math>\pm 2</math>db. Adjust R9 (left channel) and R11 (right channel) to correct high-frequency response.</p> <p>Reduce speed to 1 7/8 ips and sweep generator between 40 and 9,000 cps. Response should not vary more than <math>\pm 2</math>db. Adjust R10 (left channel) and R12 (right channel) to correct high-frequency response.</p> <p>If frequency response is not within tolerance, check record and playback amplifiers separately.</p>
Playback Frequency Response	<p>Insert a 100<math>\Omega</math> resistor in series between ground and upper section (left channel) of play head. Connect generator across resistor. Set recorder for left-channel monaural playback at 7 1/2 ips and connect VTVM to Left Cathode Follower Output Jack. Set signal generator to 400 cps and adjust generator output for .002V on VTVM. Consider this point as "0" db level. Response should be +12 db at 50 cps, +10db at 100 cps, -2 db at 500 cps, -8 db at 1000 cps, -11 db at 2000 cps, -16 db at 5000 cps, -16db at 10,000 cps, -14 db at 15,000 cps, and -15db at 20,000 cps. Tolerance is <math>\pm 2</math> db.</p> <p>Repeat process for right channel. The difference between channels should be <math>\pm 3</math>db at any frequency.</p>
Record Frequency Response	<p>Insert a 1000<math>\Omega</math> resistor in series with upper section of record head. Set recorder for left-channel monaural record at 7 1/2 ips. Connect VTVM across resistor. Apply 400-cycle tone to Left High-Level Input. Set generator output 30db below maximum recording level. Consider reading on VTVM as the "0"db level. Response should be +2db at 50 cps, 0db between 100 cps and 500 cps, +1 db at 1000 cps, +2 db at 2000 cps, +5 db at 5000 cps, +8 db at 10,000 cps, +10db at 15,000 cps, and +12db at 20,000 cps. Tolerance is <math>\pm 2</math> db at any frequency. Repeat process for right channel. The tolerance between channels should not be more than 3db.</p>
Multiplex Filter Alignment	<p>Set recorder for stereo recording A-Test monitor. Advance Left and Right Volume Controls to maximum. Apply 19KC signal to Multiplex Inputs. Set Record Levels for maximum recording level. Connect a VTVM to outputs. Adjust L2 (left channel) and L3 (right channel) for MINIMUM indication.</p>



A PHOTOFACT "EXPLODED" VIEW  
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A PHOTOFAC "EXPLODED" VIEW  
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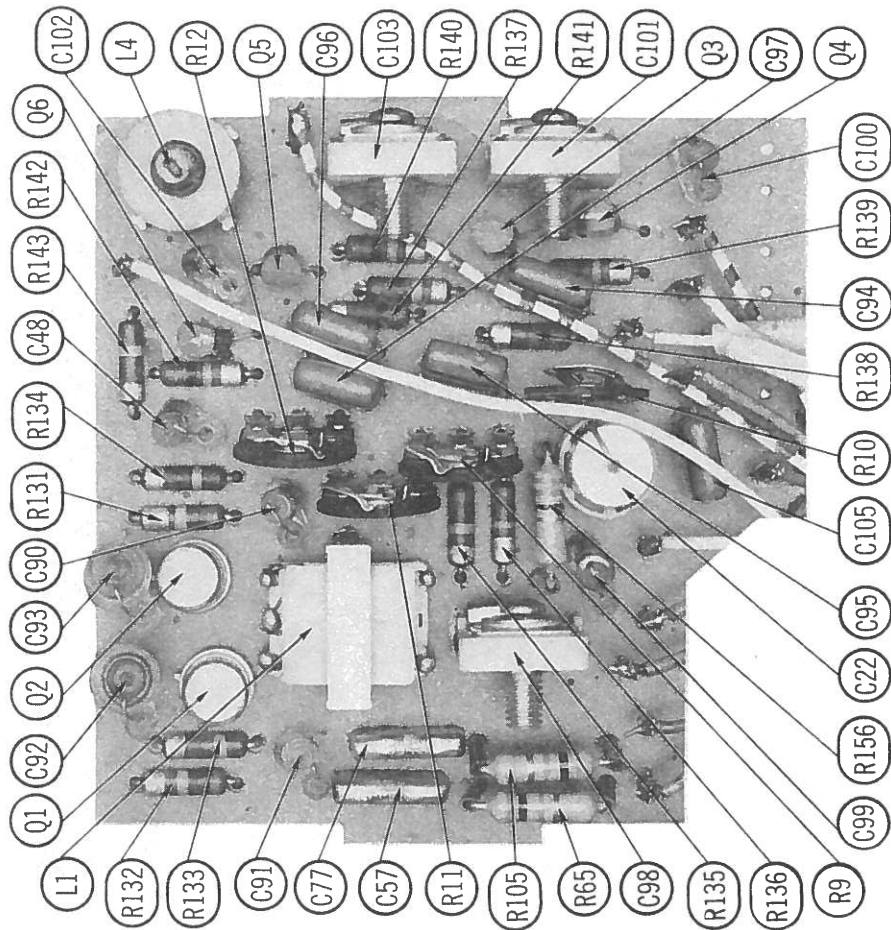
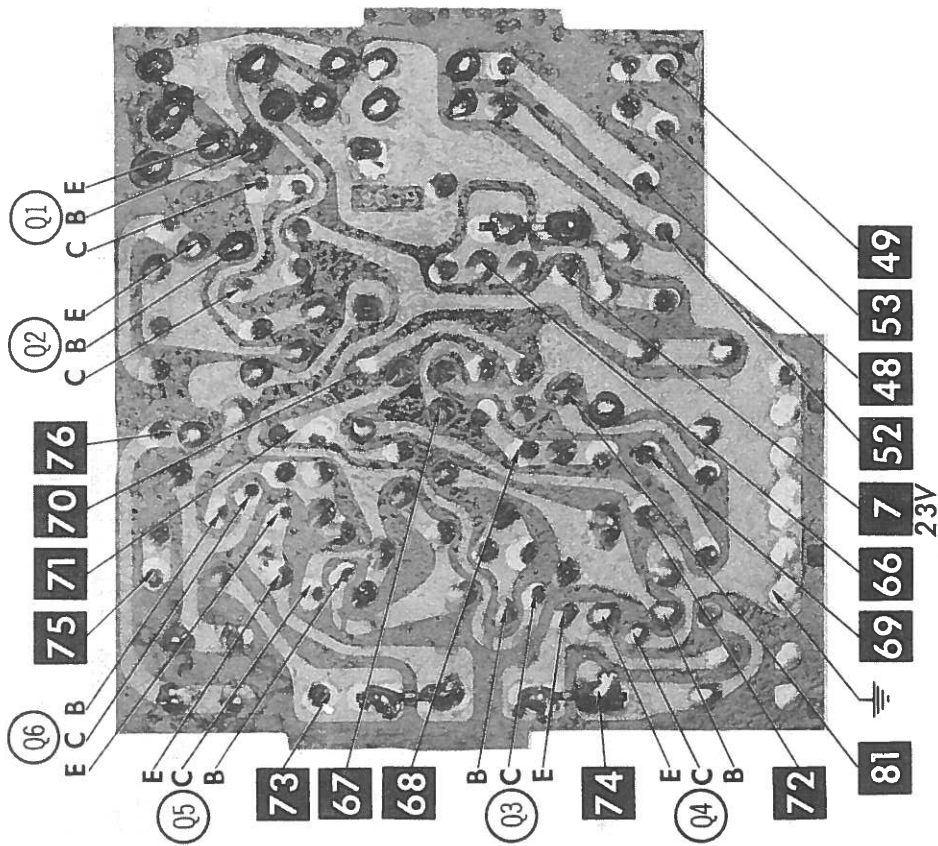
NOTE: Include Model and Serial Number when ordering parts.

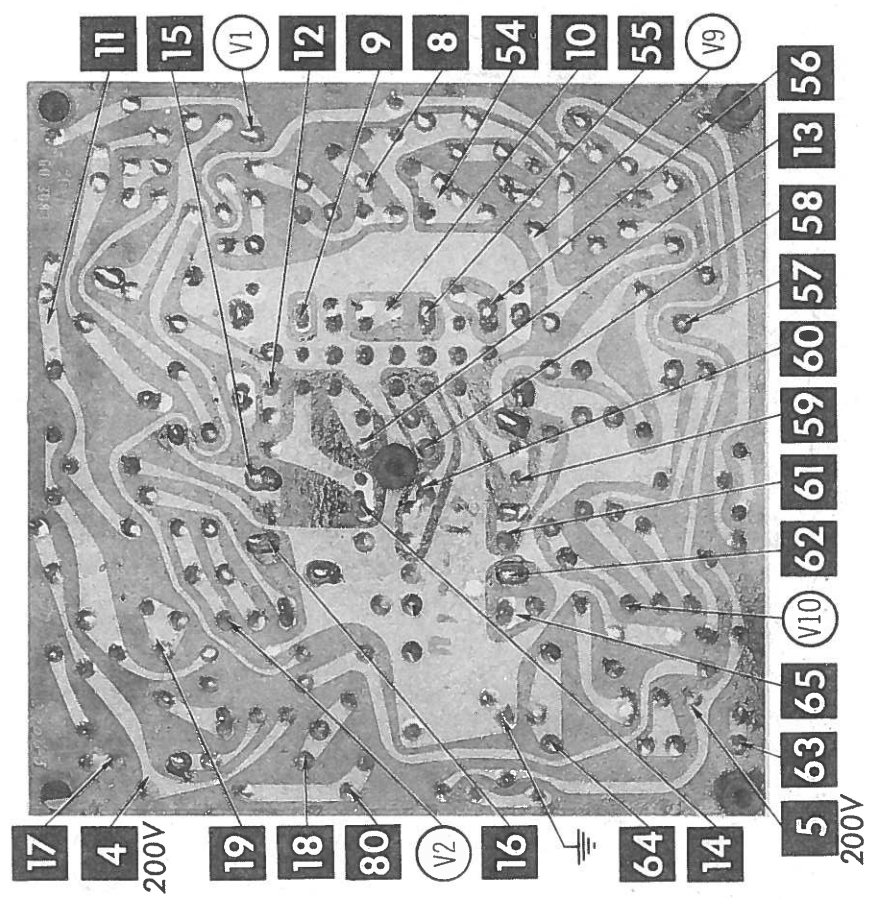
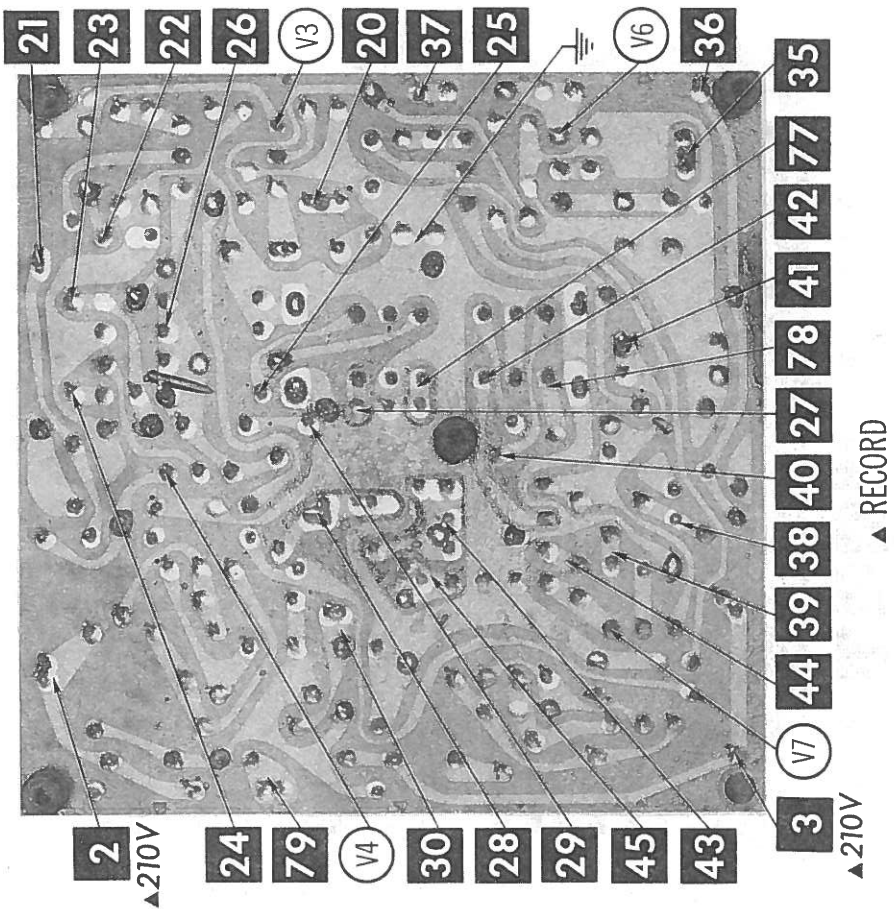
## MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	51.1-6C	Pressure Wheel (Pressure Roller)	51	59.32-6C ②	Clutch Lever Buttons (2 used)
2	62.2-6C	Rubber Drive Belt	52	59.15-6C ②	Supply Clutch Lever Shaft
3	53.1-6C	Speed Transfer Wheel	53	59.26-6C	Transfer Bracket
4	69.3-6C	Revolution Counter Belt	54	59.23-6C	Cam Disc Arm Shaft Bracket
5	33.6-6C	Microswitch Plate Spring	55	59.24-6C ②	Disc Arm Shaft
6	33.7-1-6C	Microswitch Actuator Lever	56	59.2-6C ②	Eccentric Segment Shaft
7		Bias Head Height Spring	57	61.1-2-6C ②	Take-up Friction Disc
8		Bias Head Height Sleeve	58	61.2-1-6C ②	Supply Friction Disc
9		Bias Head Bracket	59	61.6-6C ②	Take-up Mylar Sheet
10		Bias Head Pressure Spring	60	61.7-6C ②	Supply Mylar Sheet
11	51.8-6C ①	Start/Stop Lever	61	61.8-6C ②	Take-up Mylar Sheet Fixing Ring (Not used in all versions)
12	15.4-6C	Head Carrier Plate	62	61.9-6C ②	Tape Tight Disc
13		Head Carrier Azimuth Spring	63	61.4-6C ②	Supply Turntable Spring
14	59.13-6C ②	Take-up Turntable Lower Clutch Lever Shaft	64	61.3-6C ②	Take-up Turntable Spring
15	59.11-6C ②	Take-up Turntable Upper Clutch Lever Shaft	65	61.11-6C	Tape Tight Disc Spring (2 used)
16	59.12-6C ②	Take-up Turntable Upper Clutch Lever Spring	66	③	Motor Pulley
17	51.2-6C	Pressure Wheel Shaft	67	65.1-6C	Take-up Turntable
18	79.11-6C	Speed Selector Bracket	68	65.2-6C	Supply Turntable
19	51.4-6C	Pressure Wheel Spring	69	66.1-6C	Flywheel
20	51.5-6C	Pressure Wheel Lever	70	66.3-6C ②	Flywheel Bearing Bushing
21	51.9-6C ②	Pressure Wheel Bracket Roller	71	66.4-6C	Upper Flywheel Bearing Spring
22	51.12-6C ②	Pressure Wheel Bracket Spring	72	66.5-6C ②	Lower Flywheel Bearing Spring
23	51.13-1-6C	Tape Brake Assembly (complete)	73	66.9-6C ②	Flywheel Brake Spring
24	51.7-6C	Equalization Latch	74	66.7-6C	Flywheel Bearing Latch (center)
25	51.15-6C	Tape Brake Block	75	66.8-6C	Flywheel Bearing Latch (top & bottom)
26	52.1-6C	Trip Bar	76	66.12-6C ②	Thrust Washer
27	53.2-6C	Transfer Wheel Holder	77	69.1-6C	Revolution Counter Pulley (turntable)
28	53.3-6C	Transfer Wheel Arm	78	69.2-1-6C	Revolution Counter Pulley (counter)
29	53.5-6C	Transfer Wheel Holder Spring	79	72.1-6C ②	Take-up Turntable Housing Flange
30	54.1-1-6C ①	Operating Lever Assembly (Includes Ref. Nos. 31, 32, 95)	80	72.2-6C ②	Supply Turntable Housing Flange
31	54.2-6C	Operating Lever and Pivot Ball	81	79.13-6C ②	Speed Selector Spring
32	54.11-6C ②	Operating Lever Clip	82	79.18-6C	Cover Plate 1
33	59.27-6C	Spring, with Felt	83	79.19-6C	Cover Plate 2
34	59.4-6C	Pressure Pad Arm	84	79.1-6C	Left Tape Guide
35	59.28-6C	Supply Brake Lever (Complete)	85	79.4-6C	Right Tape Guide
36	59.29-6C ②	Supply Brake Lever Shaft	86	79.3-6C	Adjustable Tape Guide
37	59.31-6C ②	Supply Brake Lever Spring	87	79.32-6C	End Stop Actuating Spring
38	59.9-6C ②	Supply Turntable Clutch Lever	88	39.13-6C ①	Equalization Switch Spring
39	59.7-6C	Take-up Turntable Upper Clutch Lever	89	79.14-6C	Revolution Counter
40	59.8-6C	Take-up Turntable Lower Clutch Lever	90	79.33-6C	End Stop Spring Bracket
41	59.16-6C ②	Supply Turntable Clutch Lever Spring	91	66.13-6C	Thrust Spring Assembly
42	59.17-6C	Cam Disc	92	71.1-6C	Deck Plate
43	59.18-6C	Cam Disc Arm	93	66.2-6C ②	Capstan
44	59.19-6C	Cam Disc Arm Extension Spring	94	71.2-6C	Head Deck Plate
45	59.6-6C	Pressure Pad Arm Spring	95	54.14-6C	Operating Lever Bracket
46	59.14-6C ②	Take-up Turntable Clutch Lever Spring	96	79.2-6C	Head Carrier Plate Tape Guide
47	52.2-6C	Lifting Arm Spring	97	51.14-6C	Pressure Wheel Bracket
48	59.1-6C ②	Eccentric Segment	98	39.14-6C ①	Equalization Switch Arm
49	51.3-6C ① ②	Pressure Wheel Bracket Ass'y. (Includes Ref. Nos. 1, 17, 19, 24 & 97)	99	39.16-6C ①	Equalization Arm Joint Plate
50	59.25-6C	Transfer Lifting Arm	100	39.13-6C ①	Equalization Switch Spring
			101	39.3-6C ①	Rewind Lock Arm Spring
			102	39.2-6C ①	Record Lock Arm
			103	39.17-6C	Joint Plate
			104	53.7-6C	Parallel Arm
			105	66.9-6C	Flywheel Brake

① Not shown on Exploded View. ② Not shown on Photos.

③ When ordering Motor or Motor Pulley, include Motor Manufacturer (Engel or Papst) and line frequency (50 or 60 cycles)

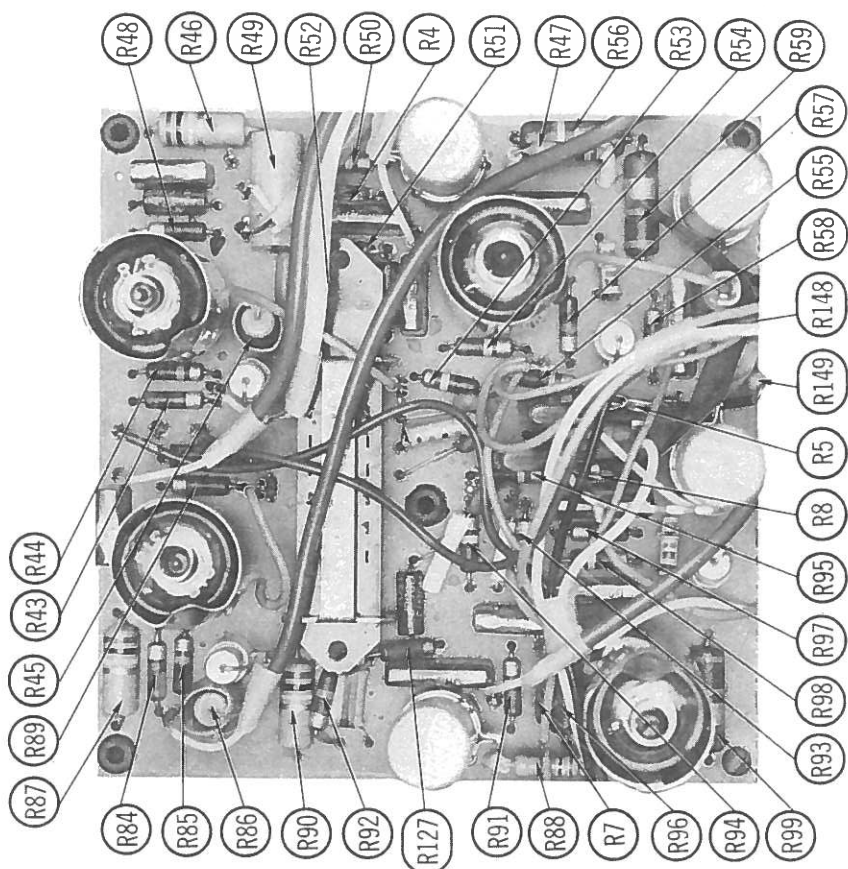
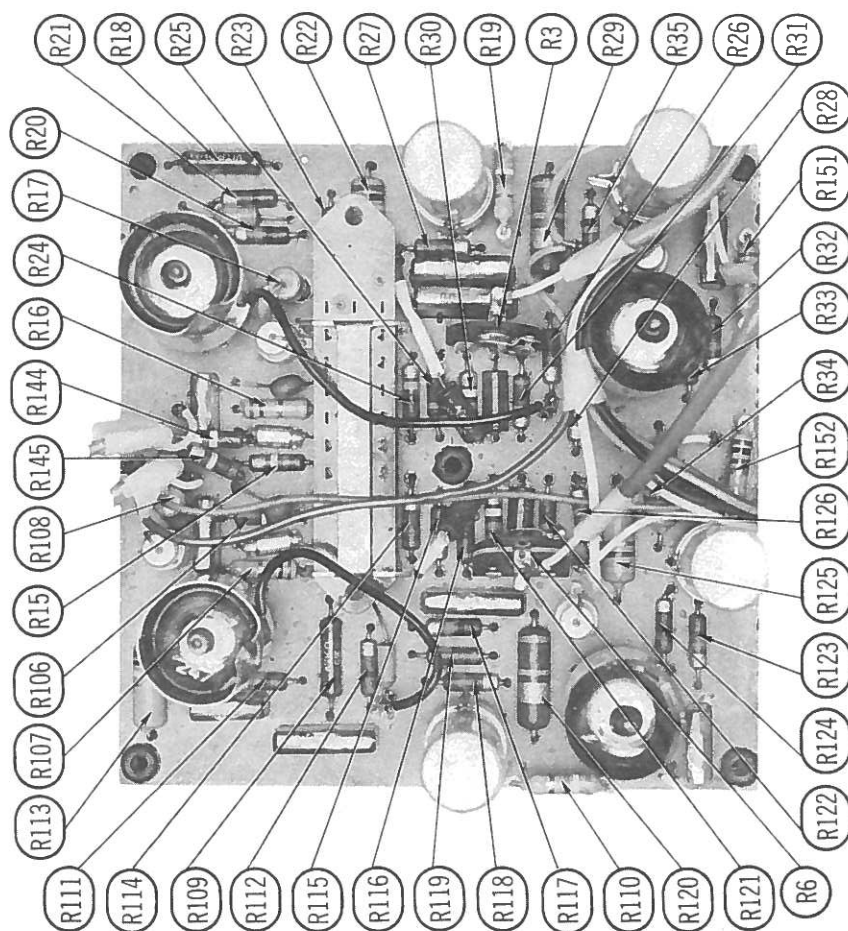


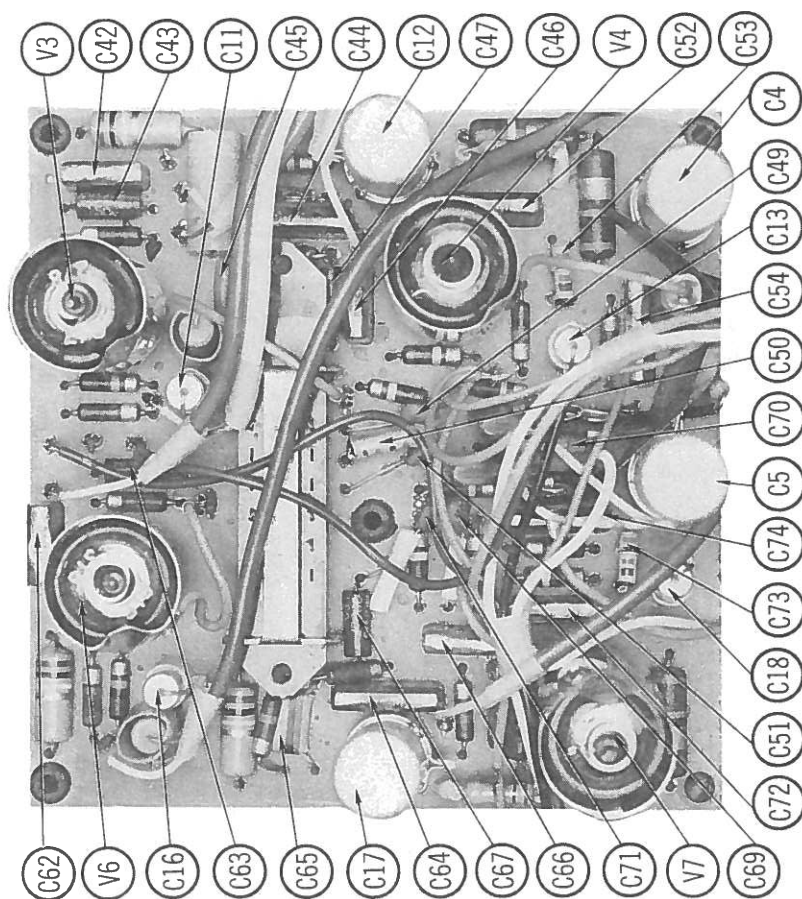
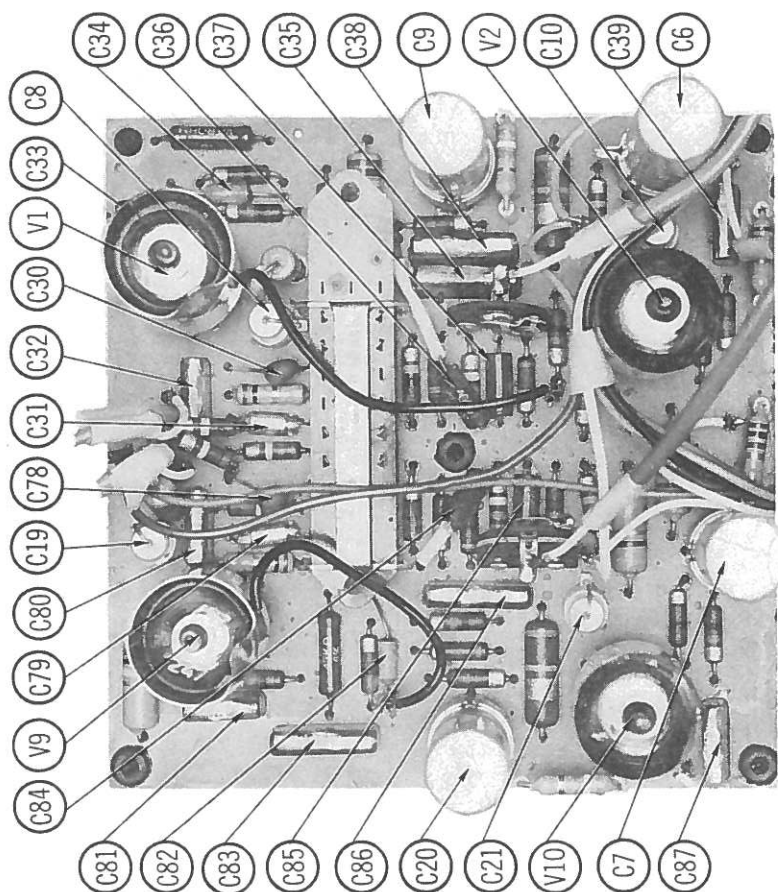


ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

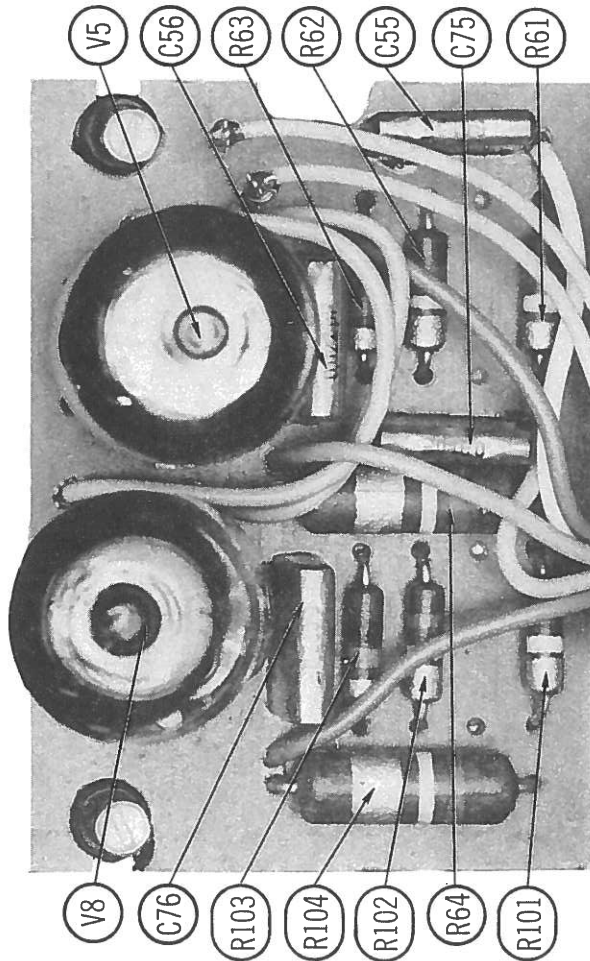
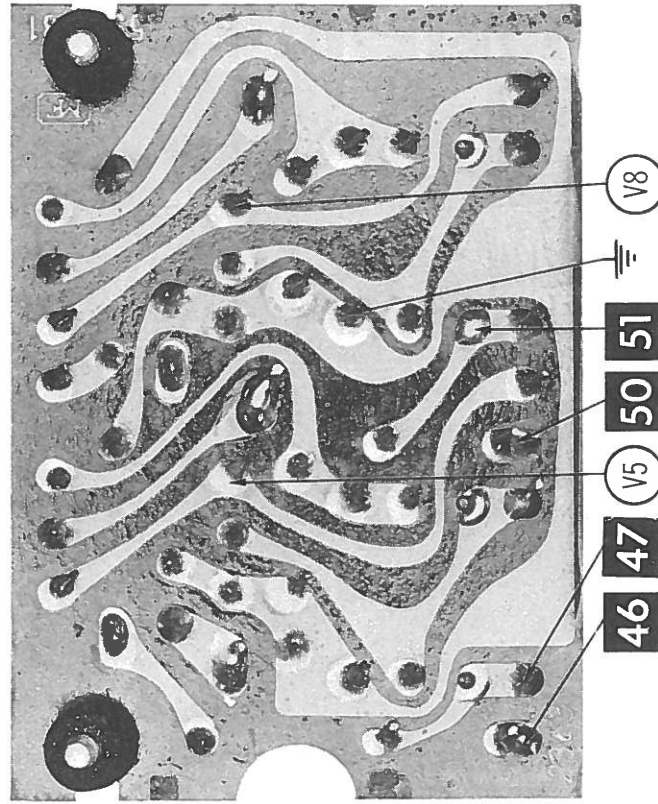
A Howard W. Sams CIRCUITRACE® Photo

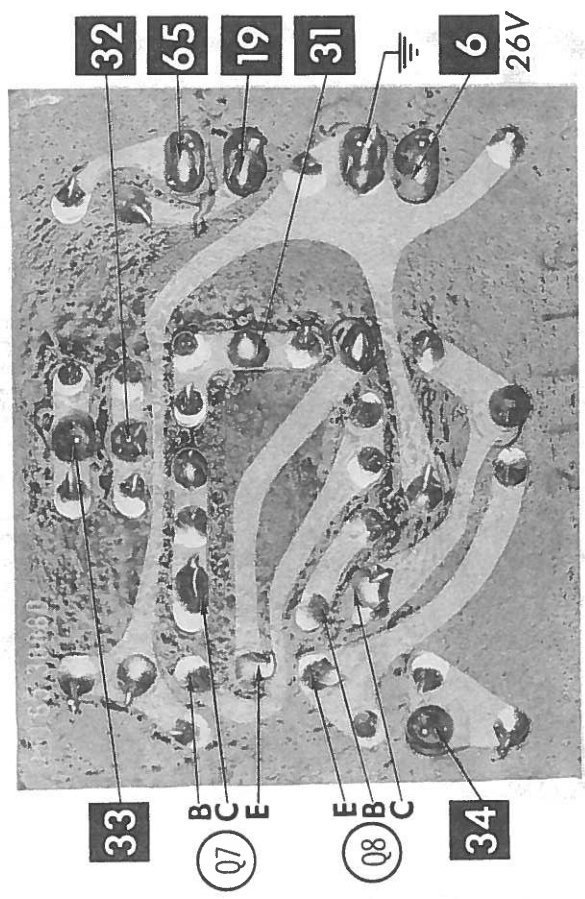
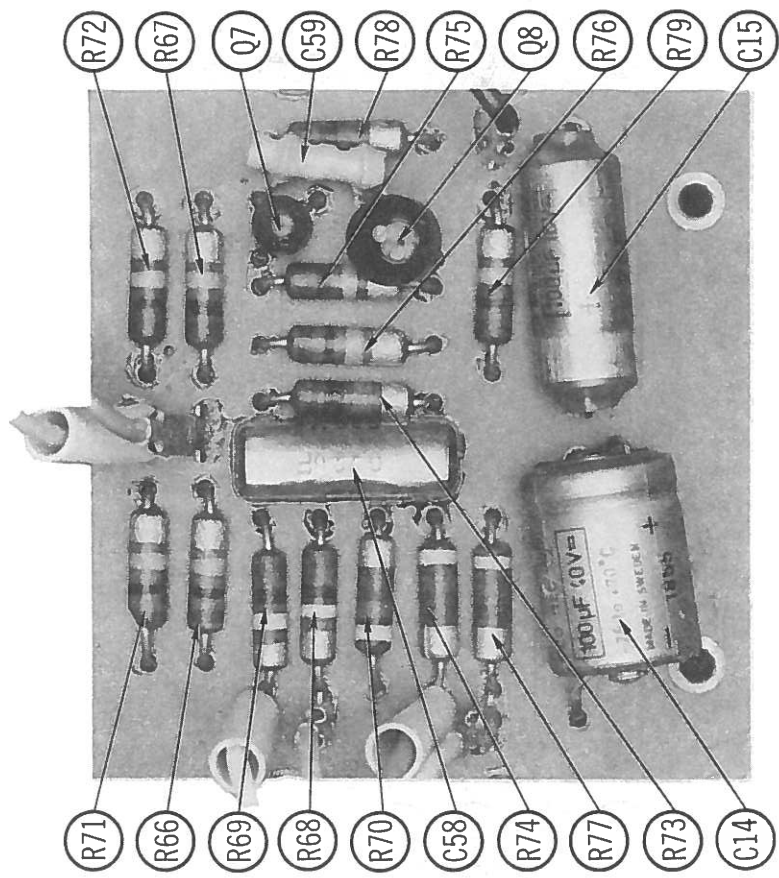






ARROWS INDICATING TUBE LOCATIONS ARE  
POINTING TO PIN 1 UNLESS OTHERWISE INDICATED





A Howard W. Sams CIRCUITRACE® Photo

# PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

## WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Power Cord .....	8524 (Stranded) Available in 12 Colors
Power Cord (Interlock Type) .....	Use BELDEN No. 17108 (Plastic) or 17128 (Rubber) - 6 Ft.
Low-Loss Shielded Lead (Interconnecting) .....	17109 (Plastic) or 17129 (Rubber) - 9 Ft.
Phono Pick-up Arm Cable .....	Use BELDEN No. 8874 (Rubber) or 8896 (Plastic)
	Use BELDEN No. 8401 or 8421
	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	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Play Preamp., Left	ECC83/12AX7/7025	V6	Record Preamp., Right	ECC83/12AX7/7025						
V2	Play AF Amp./Cathode	ECC82/12AU7	V7	Record Amp., Right	ECC81/12AT7						
V3	Followers, Left		V8	Record Indicator, Right	EAM86						
V4	Record Preamp., Left	ECC83/12AX7/7025	V9	Play Preamp., Right	ECC83/12AX7/7025						
V5	Record Amp., Left	ECC81/12AT7	V10	Play AF Amp./Cathode	ECC82/12AU7						
	Record Indicator, Left	EAM86		Followers, Right							

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	RCA PART No.	
Q1	U2848-1	Bias Oscillator	DS-66	GE-10	TR-21	SK-3020	NPN
Q2	U2848-1	Bias Oscillator	DS-66	GE-10	TR-21	SK-3020	NPN
Q3	2N3705	Bias Amp.	DS-66	GE-10	TR-22	SK-3020	NPN
Q4	2N3702	Bias Amp.			TR-19	SK-3025	PNP
Q5	2N3705	Bias Amp.	DS-66	GE-10	TR-22	SK-3020	NPN
Q6	2N3702	Bias Amp.			TR-19	SK-3025	PNP
Q7	SE4001	AF Amp.	DS-66	GE-10	TR-22	SK-3020	NPN
Q8	SE6001	AF Amp.	DS-66	GE-10	TR-21	SK-3020	NPN

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS & DIODES		RECTIFIERS	
			GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	RCA PART No.	SARKES TARZIAN PART No.
X1	.025ADC	B250C75K41	GE-504A ①	18DB6A	SK-3017A ① or SK-3032 ①	S-5959-2
X2	.06ADC	B30C1000	GE-504A ①	18DB4A	SK-3016 ① or SK-3031 ①	S-5959-1

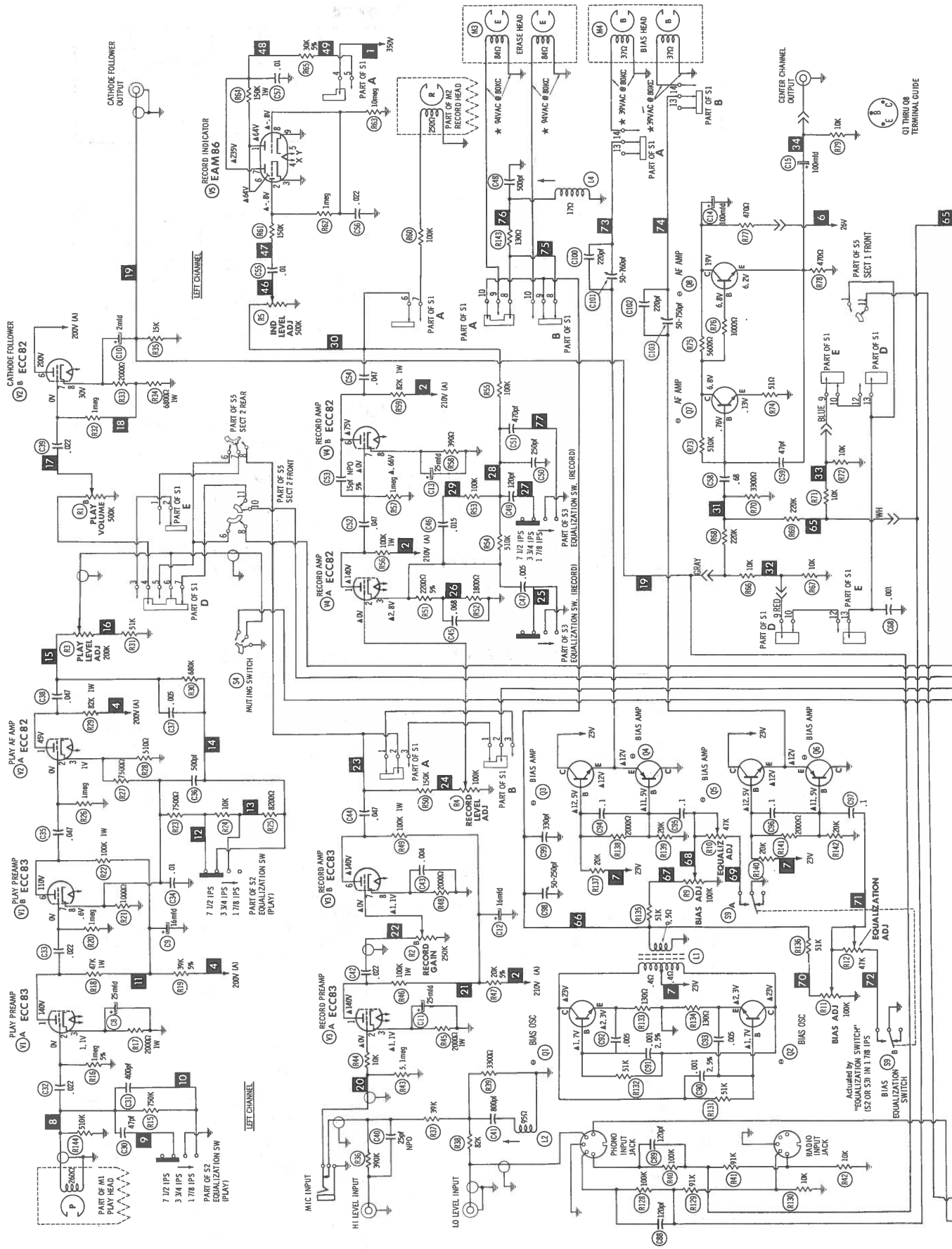
① Four Required

## ELECTROLYTIC CAPACITORS

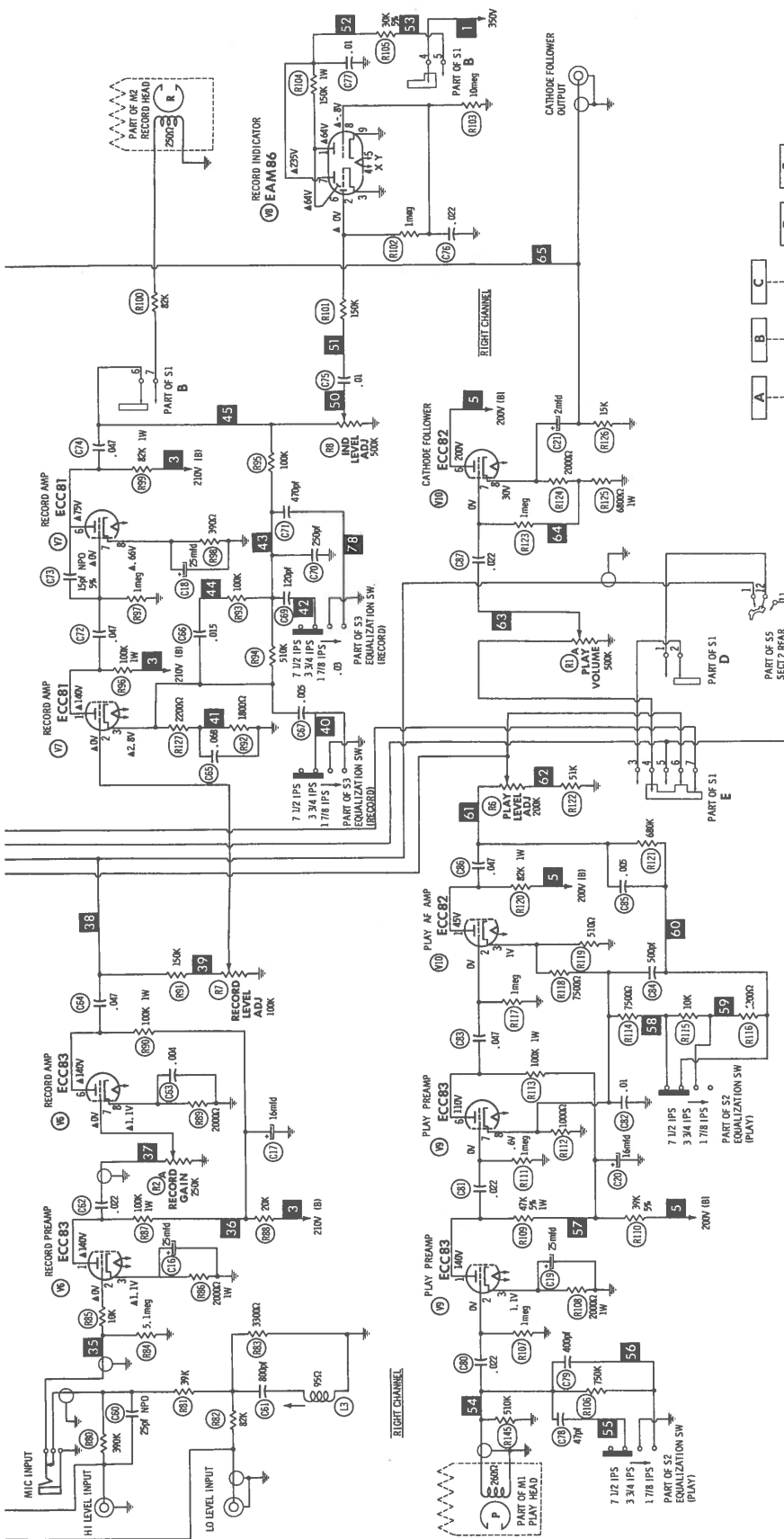
ITEM No.	RATING	REPLACEMENT DATA						
		TANDBERG PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	SPRAGUE PART No.
C1A	40 350V		AFH3-28-30		CCO225	XC3-28.1	FP330.7A	TVL-3639.8
B	10 350V							
C	20 350V							
C2A	40 350V		AFH3-28-30		CCO225	XC3-28.1	FP330.7A	TVL-3639.8
B	20 350V							
C	10 350V							
C3A	1000 35V						WP201.5A	TVL-2250
B	1000 35V							
C4	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C5	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C6	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C7	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C8	25 15V		CRE462A		NLW25-15	MT1-10	MTA25D20	TE-1157.1
C9	16 350V		PRS1640	EA15-25	BR16-350	QTI-8	TC64A	TE-1157.1
C10	2 100V		CRE901A		NLW2-100	MT1-2	TT100X2	TE-1401
C11	25 15V		CRE462A	EA15-25	NLW25-15	MT1-10	MTA25D20	TE-1157.1
C12	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C13	25 15V		CRE462A	EA15-25	NLW25-15	MT1-10	MTA25D20	TE-1157.1
C14	100 40V		PRS1360	EA50-100	BR100-50	QTI-23	TC3051A	TL-1309
C15	100 16V		CRE623A	EA30-100	NLW100-25	MT1-20	MTA100F35	TL-1162
C16	25 15V		CRE462A	EA15-25	NLW25-15	MT1-10	MTA25D20	TE-1157.1
C17	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C18	25 15V		CRE462A	EA15-25	NLW25-15	MT1-10	MTA25D20	TE-1157.1
C19	25 15V		CRE462A	EA15-25	NLW25-15	MT1-10	MTA25D20	TE-1157.1
C20	16 350V		PRS1640		BR16-350	QTI-8	TC64A	TVA-1607
C21	2 100V		CRE901A		NLW2-100	MT1-2	TT100X2	TE-1401
C22	80 25V		CRE620A	EA30-100	NLW75-25	MT1-20	MTA80F50	TE-1210
C23A	1.5 350VAC							
B	.1 350VAC							

(CONTINUED ON PAGE 130)









### RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	15K	1M	200K	50	80	147K	1M	100K	60
V2	ECC82	150K	1M	50K	80	70	190K	1M	800K	90
V3	ECC81	127K	49K	200K	80	80	127K	80	200K	60
V4	ECC81	127K	49K	200K	80	70	190K	1M	900K	90
V5	EAM86	4180K	11M	80	20	4180K	4180K	10M	80	80
V6	ECC82	127K	49K	200K	80	80	127K	80	200K	60
V7	ECC81	127K	49K	200K	80	70	190K	1M	900K	90
V8	EAM86	4180K	11M	80	20	4180K	4180K	10M	80	80
V9	ECC83	15K	1M	200K	50	80	147K	1M	100K	60
V10	ECC82	150K	1M	50K	80	70	190K	1M	800K	90

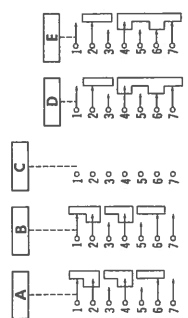
\* MEASURED IN "RECORD" POSITION  
 † MEASURED FROM OUTPUT OF M1  
 ‡ MEASURED IN "RECORD" POSITION  
 § MEASURED IN "RECORD" POSITION

Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

- 1. Voltage measurements taken with vacuum tube voltmeter.
- 2. All components are to be measured from common ground.
- 3. Measured values are from bottom pin or terminal to common ground.
- 4. All terminals assigned to terminals may not be found on the unit.
- 5. Supply voltage maintained at rated value for voltage readings.
- 6. Resistance measurements not given because of the wide variation in internal resistance of transistors.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCULAR

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TOP

BOTTOM

SHOWN WITH  
 DEPRESSOR 1 AND 2  
 A. RECORD 1  
 B. RECORD 2  
 C. PLAYBACK 1  
 D. PLAYBACK 2  
 E. PLAYBACK 3

MODE SWITCH  
 SEQUENCE  
 1. RECORD  
 2. PLAYBACK  
 3. ON 5

SHOWN IN NORM  
 POSITION

REFER TO PAGE 131 FOR POWER SUPPLY

TANDBERG MODELS 62X, 64X

# PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

## 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.
C30	47		DI-47	DD-470	JBZ601YP470K	CCD-470	GP447	10TS-Q47
C31	400		ADM-15-391	CPR-390J	CD15F390J500	DM-15-391	SX339	MS-339
C32	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C33	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C34	.01 250V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-103	PVC611	6PS-S10
C35	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C36	500 600V		DI-500	DD-501	JBZ601YP501K	CCD-501	GP350	10TS-T50
C37	.005 150V		DI-5000	DD-502	JBZ601YP502K	CCD-502	GP250	10TS-D50
C38	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C39	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C40	25 N750		N750-DI 25	DTN-25				10TCU-Q25
C41	800		ADM-20-821		CD19F821J500	DM-19-821	SX382	MS-382
C42	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C43	.004 150V		DI-4000	DD-402		CCD-402	GP240	10TS-D40
C44	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C45	.068		DBE4S68		DMF4S68	4DP-3-683	PVC6168	4PS-S68
C46	.015 400V	(.022) †	DBE4S15		DMF4S15	4DP-1-153	PVC6115	4PS-S15
C47	.005 150V		DI-5000	DD-502	JBZ601YP502K	CCD-502	GP250	10TS-D50
C48	500 160V		ADM-15-501			DM-16-501		MS-35
C49	120	(180) †	DI-120	DD-121	JBZ601YP121K	CCD-121	GP312	10TS-T12
C50	250		DI-250	DD-251		CCD-251	GP325	10TS-T25
C51	470	(820) †	DI-470	DD-471	JBZ601YP471K	CCD-471	GP347	10TS-T47
C52	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C53	15		DI-15	DD-150		CCD-150	GP415	10TS-Q15
C54	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C55	.01 400V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-103	PVC611	6PS-S10
C56	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C57	.01 400V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-103	PVC611	6PS-S10
C58	.68 100V		V1612P68		WMF1P68	1DP-5-684	PVC1068	2WF-P68
C59	47		DI-47	DD-470	JBZ601YP470K	CCD-470	GP447	10TS-Q47
C60	25 N750		N750-DI 25	DTN-25				10TCU-Q25
C61	800		ADM-20-821		CD19F821J500	DM-19-821	SX382	MS-382
C62	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C63	.004 150V		DI-4000	DD-402		CCD-402	GP240	10TS-D40
C64	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C65	.068		DBE4S68		DMF4S68	4DP-3-683	PVC6168	4PS-S68
C66	.015 400V	(.022) †	DBE4S15		DMF4S15	4DP-1-153	PVC6115	4PS-S15
C67	.005 150V		DI-5000	DD-502	JBZ601YP502K	CCD-502	GP250	10TS-D50
C68	.001 250V		DBE6D1	CPR-1000J	DMF6D1	6DP-1-102	PVC621	6PS-D12
C69	120	(180) †	DI-120	DD-121	JBZ601YP121K	CCD-121	GP312	10TS-T12
C70	250		DI-250	DD-251		CCD-251	GP325	10TS-T25
C71	470	(820) †	DI-470	DD-471	JBZ601YP471K	CCD-471	GP347	10TS-T47
C72	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C73	15		DI-15	DD-150		CCD-150	GP415	10TS-Q15
C74	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C75	.01 400V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-103	PVC611	6PS-S10
C76	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C77	.01 400V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-1-3	PVC611	6PS-S10
C78	47		DI-47	DD-470	JBZ601YP470K	CCD-470	GP447	10TS-Q47
C79	400		ADM-15-391	CPR-390J	CD15F390J500	DM-15-391	SX339	MS-339
C80	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C81	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C82	.01 250V		DBE6S1	CPR-10000J	DMF6S1	6DP-1-103	PVC611	6PS-S10
C83	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C84	500 600V		DI-500	DD-501	JBZ601YP501K	CCD-501	GP350	10TS-T50
C85	.005 150V		DI-5000	DD-502	JBZ601YP502K	CCD-502	GP250	10TS-D50
C86	.047 400V		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47
C87	.022 400V		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22
C88	120		ADM-15-121	CPR-120J	CD15F121J500	DM-15-121	SX312	MS-312
C89	120		ADM-15-121	CPR-120J	CD15F121J500	DM-15-121	SX312	MS-312
C90	.001 2.5% 160V			CPR-1000J	CD19F102J500	DM-19-102J	SX210	MS-210
C91	.001 2.5% 160V			CPR-1000J	CD19F102J500	DM-19-102J	SX210	MS-210
C92	.005 10% 125V		ADM-20-502	CPR-5000J		DM-19-502	SX250	MS-25
C93	.005 10% 125V		ADM-20-502	CPR-5000J		DM-19-502	SX250	MS-25
C94	.1mfd		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C95	.1mfd		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C96	.1mfd		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C97	.1mfd		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C98	50-250							
C99	330	(300) †	ADM-15-331	CPR-330J	CD15F331J500	DM-15-331	SX333	MS-333
C100	220 2.5% 160V	(500) †	ADM-15-221	CPR-220J	CD15F221J500	DM-15-221	SX322	MS-322
C101	50-750							
C102	220 2.5% 160V	(500) †	ADM-15-221	CPR-220J	CD15F221J500	DM-15-221	SX322	MS-322
C103	50-750							
C104	.1mfd 400V		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C105	.1mfd		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10
C106	.1mfd 400V		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10

† Alternate Value.

## CONTROLS

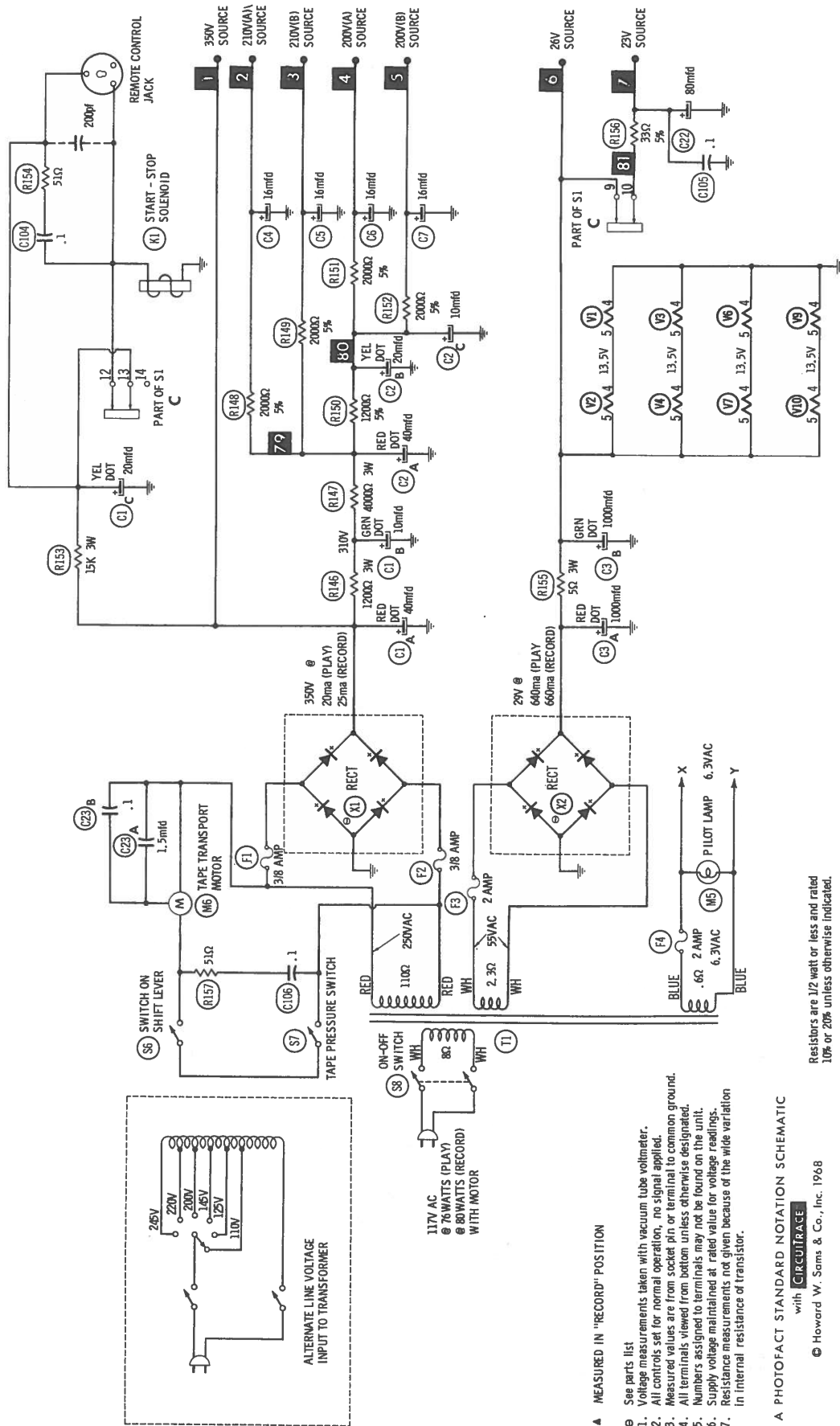
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESIST-ANCE	REPLACEMENT DATA				
			TANDBERG PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1A	Play Volume, Right	500K					
B	Play Volume, Left	500K					
R2A	Record Gain, Right	250K					
B	Record Gain, Left	250K					
R3	Play Level, Adjust	200K		T-250K		X201R254B	MTC184L1
R4	Record Level, Adj.	100K		TH-100K ①		X201R104B	MTC151L
R5	Indicator Level Adj.	500K		T-500K		X201R504B	MTC551L
R6	Play Level Adjust	200K		T-250K		X201R254B	MTC184L1
R7	Record Level Adjust	100K		TH-100K ①		X201R104B	MTC151L
R8	Indicator Level Adj.	500K		T-500K		X201R504B	MTC551L
R9	Bias Adjust	100K		TH-100K ①		X201R104B	MTC151L
R10	Equalization Adjust	47K		T-50K		X201R503B	MTC541L
R11	Bias Adjust	100K		TH-100K ①		X201R104B	MTC151L
R12	Equalization Adjust	47K		T-50K		X201R503B	MTC541L

① Modify terminals to fit "PC" board.

(CONTINUED ON PAGE 132)

NOTE: DEMAGNETIZE HEADS AFTER SERVICING RECORDER



TANDBERG MODELS 62X, 64X

- ▲ MEASURED IN "RECORD" POSITION
- See parts list
1. Voltage measurements taken with vacuum tube voltmeter.
  2. All controls set for normal operation, no signal applied.
  3. Measured values are from socket pin or terminal to common ground.
  4. All terminals viewed from bottom unless otherwise designated.
  5. Numbers assigned to terminals may not be found on the unit.
  6. Supply voltage maintained at rated value for voltage readings.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
with **CIRCUITRACE**

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Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.

POWER SUPPLY

## PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

### RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	TANDBERG PART No.			IRC PART No.	WORKMAN PART No.	TANDBERG PART No.
R146	1200Ω, 3W	PW5-1200	5W-SQ 1.25K		R153	15K, 3W			
R147	4000Ω, 2W	PW5-4000	5W-SQ-4K		R155	5Ω, 3W	PW5-5	5W-SQ 5	

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA			
		TANDBERG PART No.	MEISSNER PART No.	MILLER PART No.	WORKMAN PART No.
L1	Bias Oscillator				
L2	19KC Trap				
L3	19KC Trap				
L4	Dummy Coil				

### TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
				TANDBERG	MERIT	STANCOR	THORDARSON	TRIAD	
	PRI.	SEC. 1	SEC. 2	PART No.	PART No.	PART No.	PART No.	PART No.	
T1	117VAC @ .75A	250VAC @ .66A DC	55VAC @ .025A DC						
	SEC. 3 6.3VAC @ .88A	SEC. 4	SEC. 5						

### FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	3AG, 2A, 125V, S/B			MDX 2	3823-4	313002		
F2	3AG, 3/8A, 250V			AGC 3/8		312.375		
F3	3AG, 3/8A, 250V			AGC 3/8		312.375		
F4	3AG, 2A, 125V, S/B			MDX 2		313002		

### TAPE HEADS

ITEM NO.	MEASURED			TANDBERG PART NO.	NORTRONICS PART NO.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
M1	595mh			17H	1000 & QK-82	4-Track Stereo Play ①
M2	250mh			44H	2000 & QK-82	2-Track Stereo Play ②
					1005 & QK-82 & 1/32" Shim	4-Track Stereo Record ①
M3	11mh	94V rms	80KC	41H	2005 & QK-82 & 1/32" Shim	2-Track Stereo Record ②
					8704 & QK-82	4-Track Stereo Erase ①
M4	4.2mh	39V rms	80KC	42H	8301 & QK-82	2-Track Stereo Erase ②
						4-Track Stereo Crossfield Bias ①
						2-Track Stereo Crossfield Bias ②

① Model 64X

② Model 62X

### MISCELLANEOUS

ITEM No.	PART NAME	TANDBERG PART No.	NOTES
K1	Solenoid		Start/Stop
M5	Pilot Lamp		6.3VAC @ .88 Amp.
M6	Motor		Tape Transport
S1	Switch	6615	Start-Stop, Record/Play
S2	Switch	5015	Equalization (Play)
S3	Switch	5016	Equalization (Record)
S4	Switch	5157	Muting
S5	Switch	11004	Sound-On-Sound
S6	Switch		Motor
S7	Switch		Tape Pressure (Micro)
S8	Switch		Power On/Off
S9	Switch		Bias Equalization (Micro)

### CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)