

# PHOTOFACT<sup>®</sup> with

# CIRCUITRACE<sup>®</sup>

For Supplier Address See PHOTOFACT Index

## CLEANING

## LUBRICATING

## HEAD DEMAGNETIZING

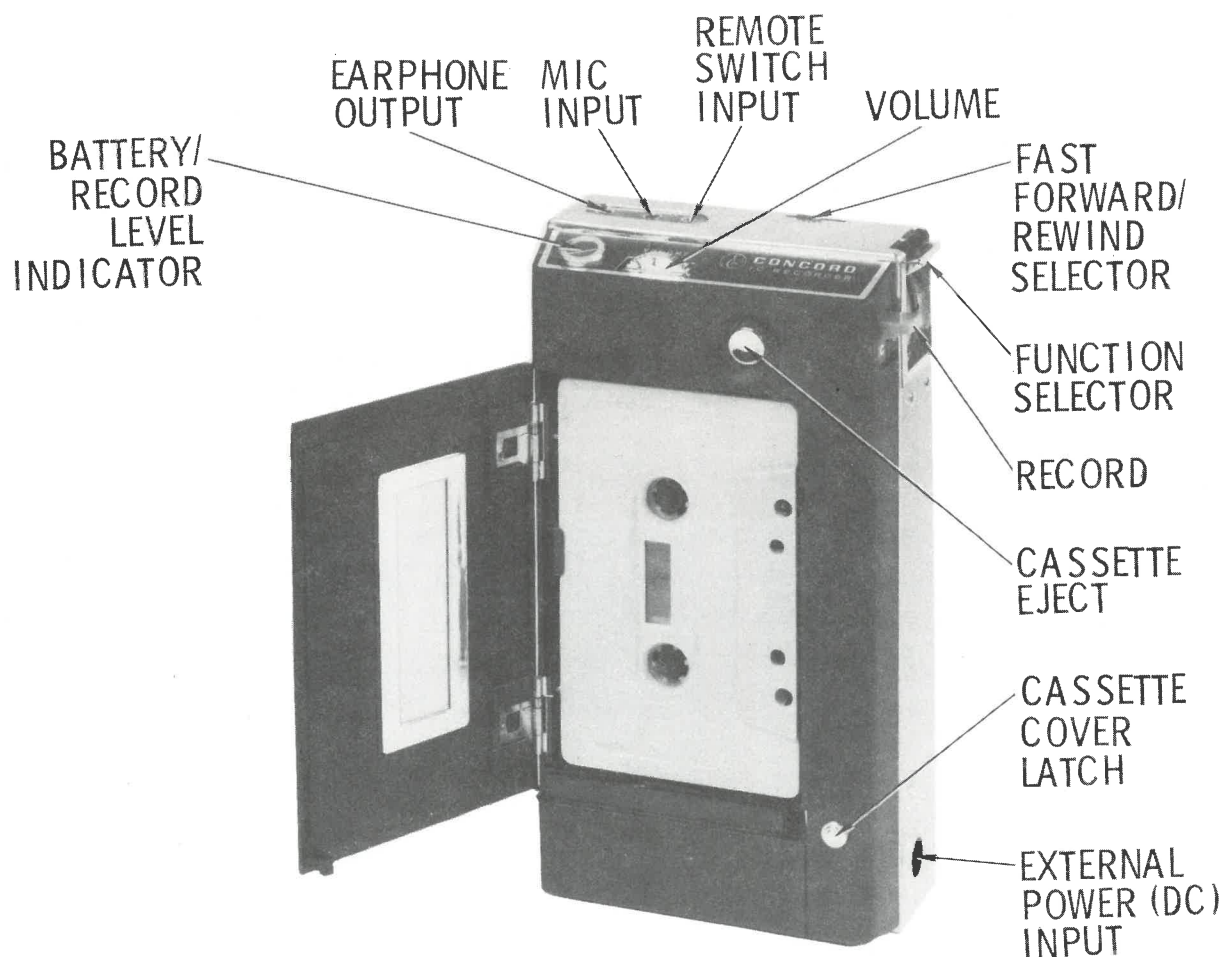
Refer to "General Servicing Information" on page 4.

### Concord Model F-101

This unit is a two-track monaural recorder having a speed of 1-7/8 ips. Automatic recording level is provided.

Jacks are provided for microphone, earphone, external power, and remote operation.

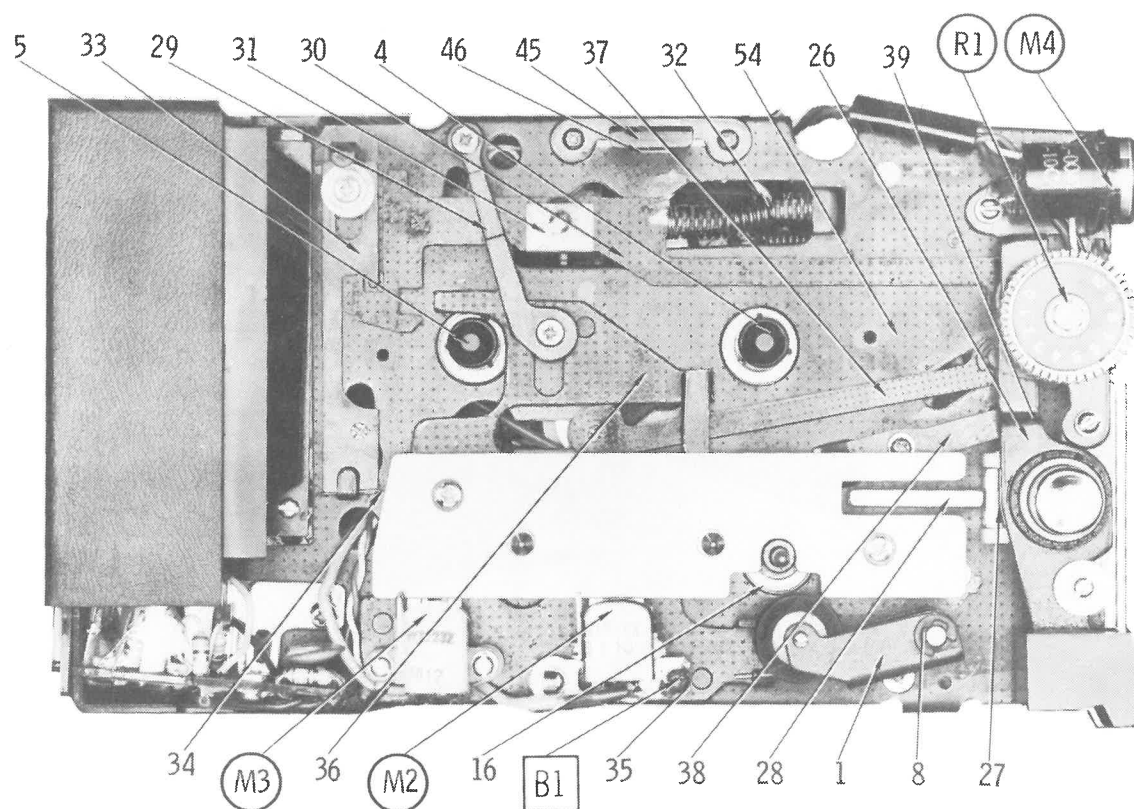
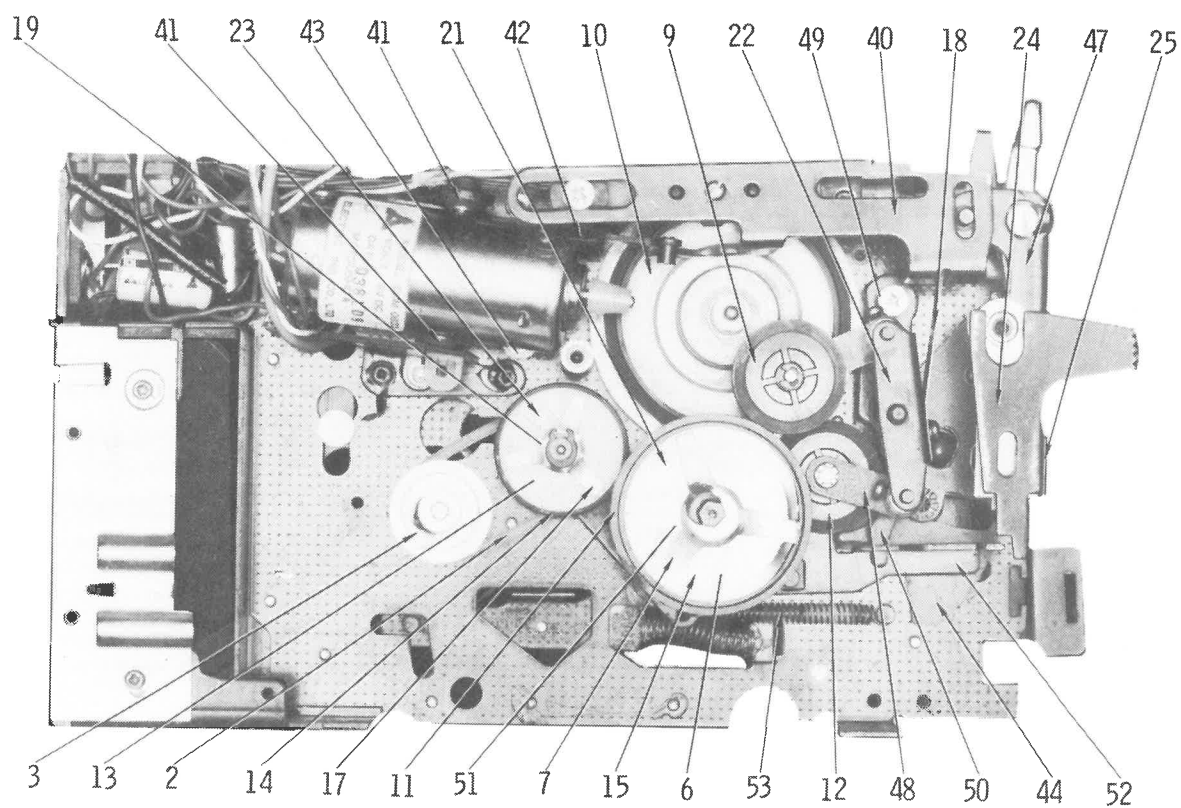
A power source of four, 1-1/2 volt "AA" cells is required.

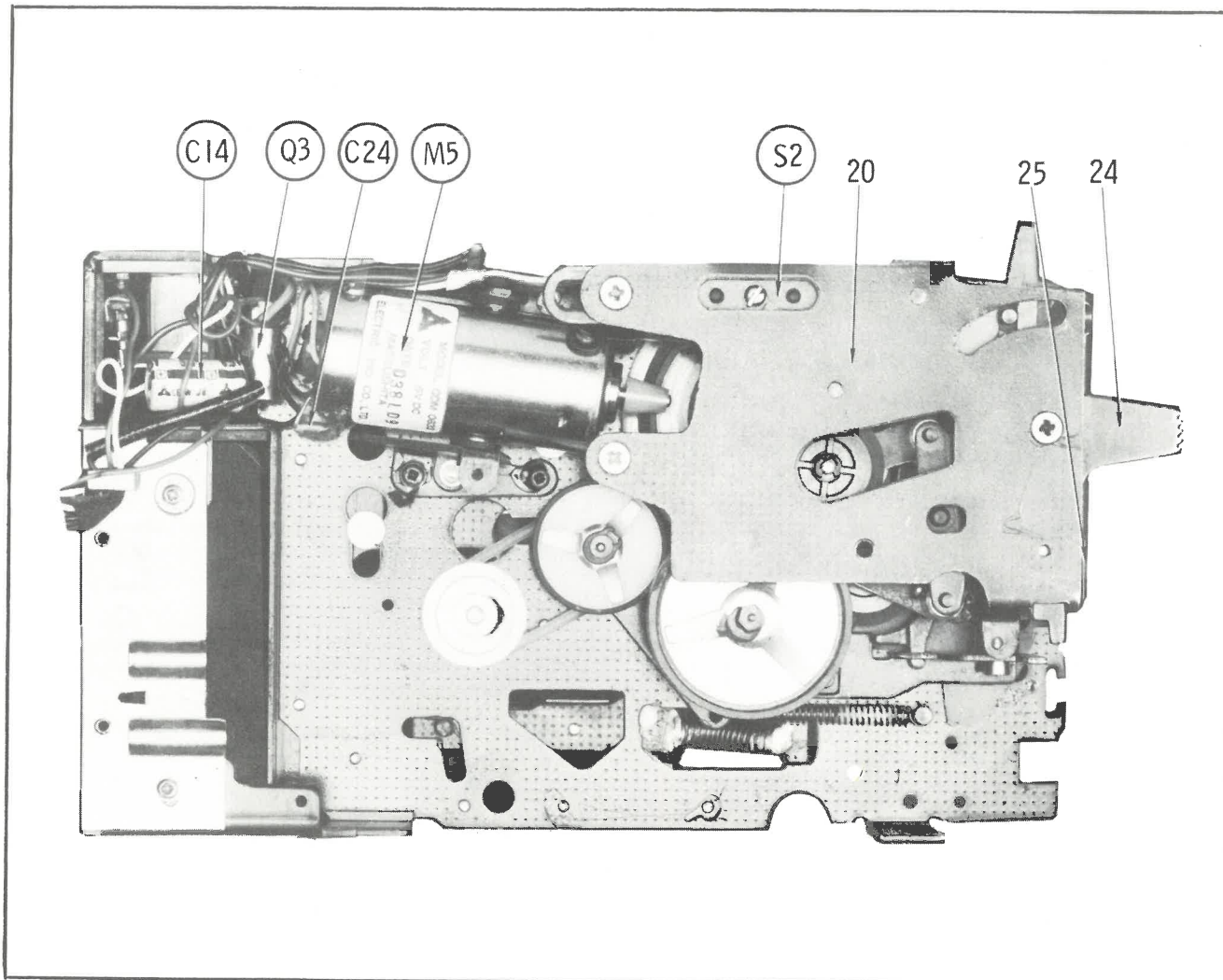


CONCORD MODEL F-101

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

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CONCORD MODEL F-101

## OPERATING INSTRUCTIONS

### Record

Move Function Selector to Stop and insert a cassette, closed side first. Tabs on closed side must be intact.

Connect the microphone, move the switch on the microphone to On, and push and hold Record button while moving Function Selector to Play.

The unit will automatically maintain the correct recording level.

### Play

Insert a cassette, move Function Selector to Play, and adjust the volume.

### Monitor

To monitor the source while recording, connect an earphone to Earphone Output jack.

## DISASSEMBLY

Remove three Phillips screws from each side of cabinet and two Phillips screws from battery compartment holding metal trim around cabinet, and remove trim by sliding trim off the battery end of the unit.

Remove bottom cover held by a Phillips screw.

Remove two, black Phillips screws from cassette well and remove top cover.

## SEQUENCE OF OPERATION

### Play

Pressing the Function Selector to Play pivots Lever (47), locked by Spring (38) and Ball (39), to move Actuator (40). Actuator (40) releases Lever (42) to allow Spring (43) to pivot Motor (M5), pressing the motor cam against Flywheel (10). Actuator (40) also actuates Switch (S2) and moves Spring (18). Spring (18) pivots Assembly (22) to press Idler (9) against Flywheel (10) and Pulley (11).

The motor -- through Flywheel (10), Idler (9), Pulley (11), Clutch (6), and Plate (15) -- drives Spindle (4).

Lever (47) also pulls Lever (37), pivoted by a slot in Plate (54), causing Lever (37) to slide Assembly (36). Assembly (36) moves the heads forward and allows Spring (8) to press Roller (1) against the capstan.

### Record

The Record sequence is the same as "Play." However, the Record button is also depressed, if the cassette has moved Assembly (33), to pivot Lever (26) which pulls Lever (30) to move Spring (31) into the slot on Switch (S1). Lever (30) also locks onto Assembly (36). Assembly (36) slides forward (refer to "Play" sequence), pivoting Lever (30) to cause Spring (31) to actuate Switch (S1).

### Fast Forward

After moving Lever (24) to Fast Forward to block

Lever (52), moving the Function Selector to Fast Wind pivots Lever (47), locked by Spring (38) and Ball (39), to move Actuator (40). Actuator (40) releases Lever (42) to allow Spring (43) to pivot Motor (M5), pressing the motor cam against Flywheel (10). Actuator (40) also actuates Switch (S2) and moves Spring (18). Spring (18) pivots Assembly (22) to move Lever (48), pressing Idler (12) against Flywheel (10) and Pulley (11).

The motor -- through Flywheel (10), Idler (12), Pulley (11), Clutch (6), and Plate (15) -- drives Spindle (4).

### Rewind

After moving Lever (24) to Rewind to release Lever (52), moving the Function Selector to Fast Wind pivots Lever (47), locked by Spring (38) and Ball (39), to move Actuator (40). Actuator (40) releases Lever (42) to allow Spring (43) to pivot Motor (M5), pressing the motor cam against Flywheel (10). Actuator (40) also actuates Switch (S2).

Lever (47) also releases Plate (55) to release Lever (52), moved by Spring (53), to press Idler (14) against Flywheel (10).

The motor -- through Flywheel (10), Idler (14), Clutch (13), Pulley (19), Belt (2), and Pulley (3) -- drives Spindle (5).

### Stop

Moving the Function Selector to Stop reverses the sequence for any previously selected function.

## ADJUSTMENTS

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

1. All voltage measurements referred to in this chart are made at a tape speed of 1-7/8 ips with an audio VTVM having a flat response to 100KC.
2. All torque measurements are made at a tape speed of 1-7/8 ips with a spring scale applied to a point 1 inch from spindle 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	Nominal value 1/2 oz. Controlled by condition of Idler (9) and Clutch (6).
Fast Forward Take-up Torque	Nominal value 3/4 oz. Controlled by condition of Idler (12) and Clutch (6).
Rewind Torque	Nominal value 3/4 oz. Controlled by condition of Idler (14), Belt (2), and Clutch (13).
Pressure Roller Pressure	Nominal value 10 oz. Controlled by tension of Spring (8).
Record/Play Head Azimuth	Connect an AC VTVM across speaker, play an azimuth-test tape, and adjust B1 for maximum output.
Erase Current	Nominal value 155 ma (11.2V rms) in erase head. No adjustment provided.
Record Bias	Nominal value 5.8V rms (1.55 ma) across record section of record/play head. No adjustment provided.

## ADJUSTMENTS (Continued)

ADJUST	REMARKS
ARL Operation	Select record mode and disable bias oscillator by disconnecting wire at point $\diamond B$ . Apply a 1,000-cycle tone at .0015V rms to mic input. Adjust volume control for .018V rms across the record section of the record/play head. The record/battery level indicator should indicate "normal maximum" recording level. Increasing the input level 10db should increase the voltage across the record section of the record/play head 6db.
Battery Level Indicator Calibration	Connect unit to a 4.3 VDC power supply and select play mode. Record/battery level indicator should indicate at the deviding line on the meter scale.
RF Trap Adjustment	Adjust L2 for MINIMUM RF at point $\diamond A$ .
Motor Speed Adjustment	Play a speed-test cassette, follow instructions with cassette, and adjust R2 for proper response.

## TROUBLE CHART

IMPORTANT: Before consulting this chart, refer to "General Servicing Information" on page 4.

SYMPTOM	REMARKS
Take-up erratic or inoperative in Play or Record.	Spindle (4) dirty, worn, or binding. Clutch (6) dirty or worn. Pulley (11) dirty or binding. Idler (9), dirty, worn, or binding.
Take-up erratic or inoperative in Fast Forward.	Spindle (4) dirty, worn, or binding. Clutch (6) dirty or worn. Idler (12) dirty, worn, or binding. Lever (48) broken or binding. Flywheel (10) binding.
Rewind erratic or inoperative.	Spindle (5) dirty, worn, or binding. Idler (14) dirty or binding. Clutch (13) dirty or worn. Belt (2) dirty, worn, or broken. Spring (53) broken or missing. Plate (44) binding.
Spindle does not stop immediately when stop function is selected.	Assembly (22) binding. Spring (18) bent.
Capstan does not rotate.	Flywheel (10) dirty or binding. Spring (43) bent or broken. Motor (M5) defective or not supplied with power.
Tape rides up and down between capstan and pressure roller.	Capstan bent. Roller (1) worn. Excessive take-up torque.
Wow or Flutter.	Roller (1) dirty or worn. Bearing (16) binding. Cassette defective. Motor defective. Excessive take-up torque.
Sound is weak or distorted.	Record/play head dirty, misadjusted, or defective. Amplifier defective. Bias oscillator defective. Cassette defective.
Erase weak or inoperative.	Erase head dirty or defective. Insufficient erase current.

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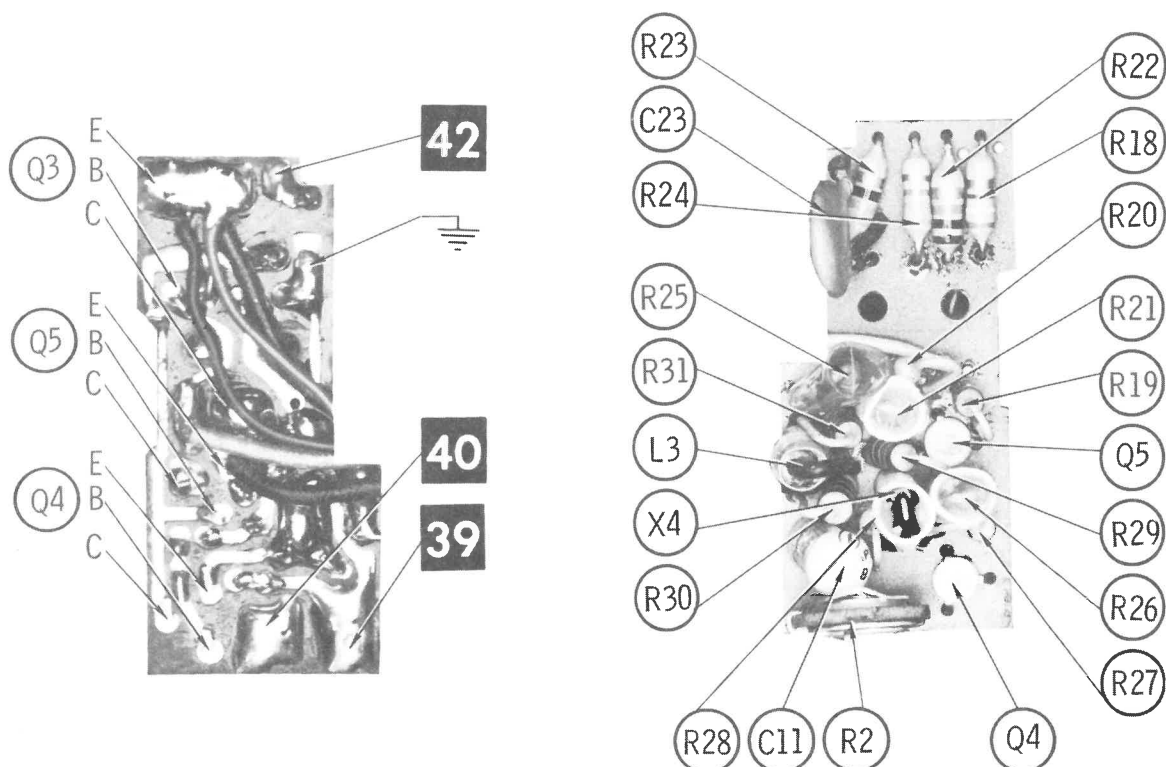
# MECHANICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	QXL-0206	Pressure Roller	28	QML-1572 (4)	Cassette Eject Lever
2	QDB-0095	Rewind Belt	29	QMR-1099	Head Plate Stop Lever
3	QDP-1233	Supply Spindle Pulley	30	QXM-0028	Record Switch Lever
4	QXP-0217	Take-up Spindle	31	QBP-1166 (5)	Record Switch Spring
5	QXP-0216	Supply Spindle	32	QBC-1105	Record Lever Spring
6	QBJ-3059 (1)	Take-up Felt Clutch	33	QXH-0036	Record Lock Assembly
7	QBC-1109	Take-up Clutch Spring	34	QBN-1067	Record Lock Spring
8	QBN-1066	Pressure Roller Spring	35	QBC-1103	Head Azimuth Adjust Spring
9	QXP-0212 (2)	Take-up Idler	36	QXK-0023	Head Plate Assembly
10	QDW-1026	Flywheel	37	QXM-0029	Head Plate Actuator Lever
11	(1)	Take-up Clutch Pulley	38	QBP-1159	Function Selector Lock Spring
12	QXP-0212 (2)	Fast Forward Idler	39	QDK-1008	Lock Spring Ball Bearing
13	QBJ-3062 (3)	Rewind Felt Clutch	40	QXM-0047	Slide Switch Actuator
14	QDP-1241 (3)	Rewind Idler	41	QBG-1170	Motor Rubber Cushion (2 used)
15	QMF-1275	Take-up Clutch Plate	42	QXH-0035	Motor Pivot Lever
16	(6)	Capstan Bearing	43	QBP-1161	Motor Pivot Spring
17	QBC-1108 (3)	Rewind Clutch Spring	44	(6)	Rewind Lock Plate
18	QBP-1164 (2)	Idler Lever Spring	45	QMA-1268	Cassette Hook
19	QDP-1230 (3)	Rewind Pulley	46	QBP-1163	Cassette Pressure Spring
20		Function Selector Plate	47	QXL-0243	Function Selector Lever
21	QXP-0215	Take-up Clutch Assembly	48	QXL-0202 (2)	Fast Forward Idler Lever
22	QXL-0207	Idler Lever Assembly	49	QBC-1102	Idler Plate Spring
23	QXP-0214	Rewind Idler Assembly	50	QXH-0038	Idler Plate
24	QML-1656	Fast Forward/Rewind Lever	51	QXL-0209	Retaining Collar
25	QBP-1186	Fast Forward/Rewind Lever Spring	52	QXL-0205	Rewind Lever
26	QXL-0244	Record Button Lever	53	QBT-1323	Rewind Lever Spring
27	QXB-0053	Cassette Eject Assembly	54		Base Plate

(1) Part of Assembly (21).  
(2) Part of Assembly (22).

(3) Part of Assembly (23).  
(4) Part of Assembly (27).

(5) Part of Lever (30).  
(6) Part of Plate (54).



A Howard W. Sams CIRCUITRACE® Photo

## PARTS LIST AND DESCRIPTION

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

### TRANSISTORS

ITEM No.	TYPE No.	FUNCTION	REPLACEMENT DATA					
			MFGR. PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MOTOROLA PART No.	RCA PART No.	SYLVANIA PART No.
Q1	2SD178	Output		GE-8	TR-10	HEP641	SK3010	ECG 103A
Q2	2SB178	Output		GE-2	TR-14	HEP254	SK3004	ECG 102A
Q3	2SB324	Speed Regulator		GE-2	TR-14	HEP254	SK3004	ECG 158
Q4	2SC183	Speed Regulator		GE-20	TR-22	HEP56	SK3020	ECG 108
Q5	2SC183	Speed Regulator		GE-20	TR-22	HEP56	SK3020	ECG 108

### INTEGRATED CIRCUITS

ITEM No.	FUNCTION	MFGR. PART No.	REMARKS
IC1	Preamplifier	EHD-AA010G (1)	
IC2	ARL Amp	EHD-PC013 (1)	
IC3	AF Amplifier	EHD-AA011 (1)	
IC4	AF Amplifier	EHD-AP012 (1)	
IC5	Bias Oscillator	EHD-GA014 (1)	

(1) A single IC Unit may not be available. Complete Printed Circuit Board may have to be replaced. Refer to "Miscellaneous".

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### POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MFGR. PART OR TYPE No.	REPLACEMENT DATA				NOTES
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	RCA PART No.	SYLVANIA PART No.	
X1	0A90	1N60	1N60	1N60	ECG 109	
X3	0A90	1N60	1N60	1N60	ECG 109	
X4	0A90	1N60	1N60	1N60	ECG 109	

### ELECTROLYTIC CAPACITORS

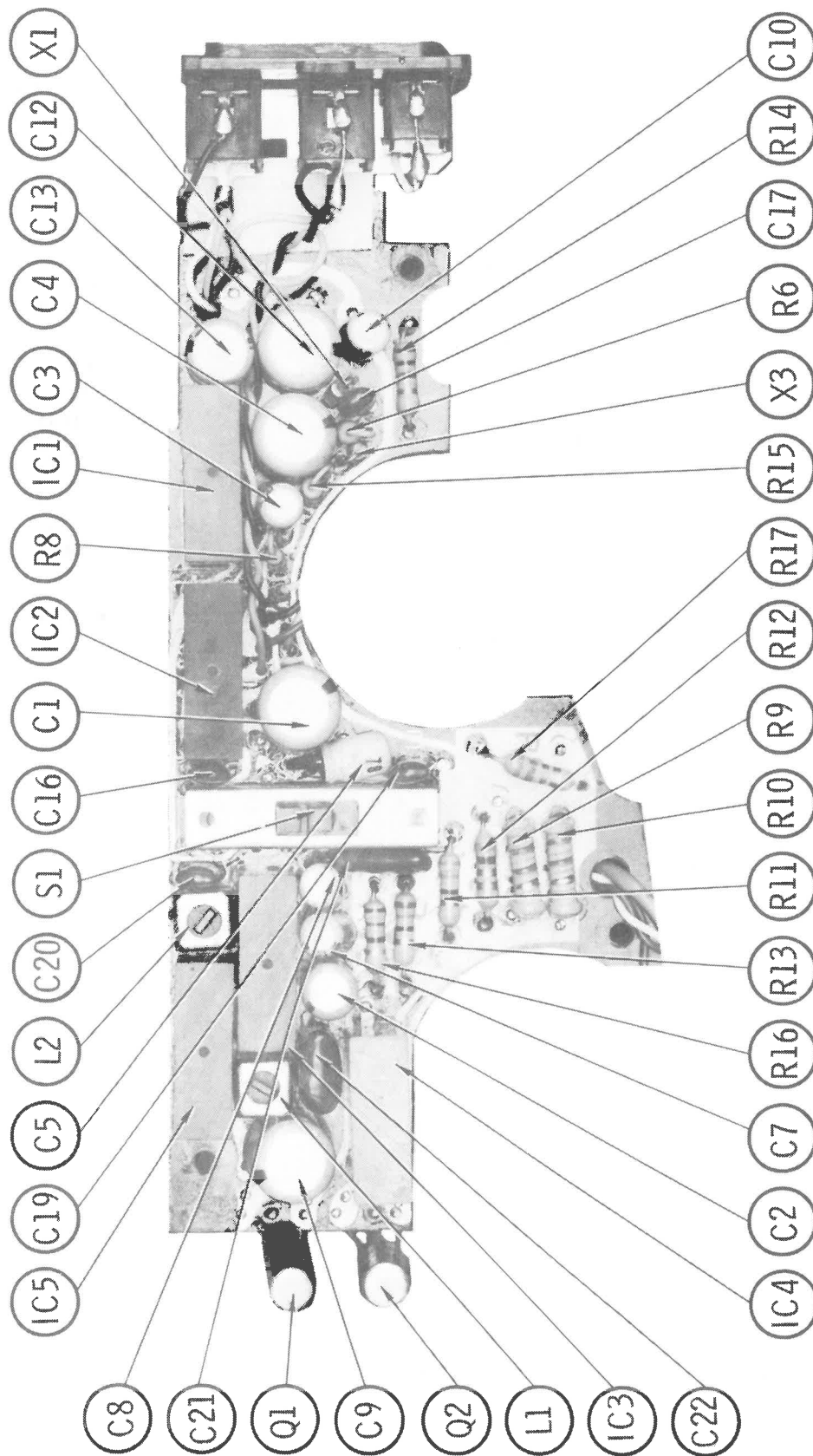
ITEM No.	RATING	REPLACEMENT DATA						
		PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	200 6V	ECE-A6V200T						
C2	100 6V	ECE-A6V100T	MCD-170	EP6-100	PC1-100	MT1-1		TE-1200
C3	1 25V	ECE-A25V1	MCD-10					
C4	200 6V	ECE-A6V200T						
C5	10 10V	ECE-A6V10K	MCD-70	EP15-10	PC10-50	MT1-5		TE-1128
C7	10 10V	ECE-A6V10K	MCD-70	EP15-10	PC10-50	MT1-5		TE-1128
C8	10 10V	ECE-A6V10K	MCD-70	EP15-10	PC10-50	MT1-5		TE-1128
C9	200 6V	ECE-A6V200T						
C10	10 10V	ECE-A6V10K	MCD-70	EP15-10	PC10-50	MT1-5		TE-1128
C11	1 25V	ECE-A25V1	MCD-10		PC1-100	MT1-1		TE-1200
C12	200 6V	ECE-A6V200T						
C13	47 6.3V	ECE-A6V47H	MCD-130	EP6-50	PC50-16	MT1-15		TE-1100
C14	100 6.3V	ECE-A6V100T	MCD-170	EP6-100				

(CONTINUED ON PAGE 33)









## 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.
C16	.01	50V	TTP-01	CK-103	MGP01	CCD-103	TA110	TG-S10
C17	.001	50V	GPD X5F102K	DM-102	GP1000	CCD-102	SM210	2SS-D10
C18	.001	50V	GPD X5F102K	DM-102	GP1000	CCD-102	SM210	2SS-D10
C19	.0015	50V	GPD X5F152K	DD-152		CCD-152	GP215	10TS-D15
C20	.0047	50V	TTP-005	CK-502	MGP005	CCD-502	TA250	TG-D50
C21	.022	50V	TTP-02	CK-203	MGP02	CCD-203	TA120	TG-S20
C22	.082	50V						225P82391
C23	.2	12V						
C24	.1	12V						
C25	.001		TTP-1	CK-104			TA010	TG-P10
C26	.001		GPD X5F102K	DM-102	GP1000	CCD-102	SM210	2SS-D10
			GPD X5F102K	DM-102	GP1000	CCD-102	SM210	2SS-D10

### CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST- ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.
R1	Volume	5000	EVJ-A2AT 12A53	B16-114 (1)			
R2	Bias	5000		TSV-5K (2) or T-5000 (2)		X201R502B (2)	MTC53L1 (2)

(1) Use original knob. (2) Cut off one of the end terminals and bend to fit "PC" board.

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA			
		PART No.	MEISSNER PART No.	MILLER PART No.	WORKMAN PART No.
L1	Bias Oscillator	ELT-7S909			
L2	30KC Trap	ELQ-7S910			
L3	RF Choke				
L4	Hash Choke				

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PM 8 ohms	EAS-65P93S		

### BATTERIES

ITEM No.	VOLTAGE	MFGR. PART No.	REPLACEMENT DATA		NOTES
			EVEREADY	MALLORY	
M1	6V Total		1015 or E91 or E9	M15R or MN1500 or ZM9	4 Required

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## PARTS LIST AND DESCRIPTION (CONTINUED)

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

### TAPE HEADS

ITEM No.	MEASURED			PART No.	NORTRONICS PART No.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
M2	43mh Tapped @ 11.5mh	5.8V rms (1) (1.55ma)	29KC	WY-027X		Cassette 2-Track Monaural Record/Play
M3	.32mh	11.2V rms (155ma)	29KC	WY-223Z		Cassette 2-Track Monaural Erase

(1) Taken across record section of head.

### MICROPHONE

ITEM No.	REPLACEMENT DATA			REMARKS
	MFGR. PART No.	RCA REPLACEMENT	RCA STEP UP REPLACEMENT	
	WM-2203H	HK-118		

### MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M4	Meter	QSL-0041	Record/Battery Level
M5	Motor	QDM-0633	Tape Transport
S1	Switch	QSS-1046	Record/Play
S2	Switch		Power
	Printed Circuit Board	QEM-1059	Complete Assembly

### CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Case, Shell	QYB-0164	Lever, Function	QGO-1059
Case, End Panel	QYK-0028	Knob, Volume	QGT-3115
Case, Bottom Section	QYC-0088	Button, Record	QGO-1060
Case, Side Panels	QGK-1365	Button, Cassette Eject	QGO-4033
Cover, Battery Compartment	QYF-0046		

### ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
Earphone	EAE-1QA	

### WIRING DATA

General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
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)

## GENERAL SERVICING INFORMATION

The following information applies to all recorders in this volume, and should be followed before any adjustments are made or trouble diagnosis is attempted. Any exceptions or additions will be found in the detailed servicing procedures for each recorder.

### POWER SOURCES

Many recorders require full supply voltage for proper operation. Be sure the supply voltage is maintained at the rated value *under load* while making adjustments.

### CLEANING

All head faces should be cleaned with head cleaner or methyl alcohol to remove dust and accumulated oxide. (An applicator may be fashioned from absorbent cotton.) Do not use a screwdriver or any metallic object near the head faces.

**CAUTION:** *Avoid getting head cleaner on any plastic surface.*

Clean the capstan, pressure roller, pressure pads and all tape guides with alcohol using a soft lint-free cloth. Also use alcohol to remove oil and grease from drive belts, idler wheels, brake drums and shoes, and all other driving surfaces.

### LUBRICATING

Clean all surfaces before lubricating. Apply a few drops of #20 machine oil to all bearings and rotating bushings. Apply a thin film of light nonhardening grease to all sliding surfaces and detent rollers. Always wipe excess oil or grease from parts that have been lubricated.

**CAUTION:** *Oil and grease must be kept off all driving surfaces as well as any parts which may transfer oil or grease to them.*

### DEMAGNETIZING

Record-Play heads require demagnetizing at regular intervals to maintain high-frequency response, dynamic range, and low distortion. (Follow instructions included with the demagnetizing unit.) After demagnetizing the heads, keep all screwdrivers and other metallic objects away from the head faces. Tape guides may also require occasional demagnetizing.

**IMPORTANT:** *Be sure to demagnetize the heads after making resistance measurements in the head circuits.*