

KNIGHT
MODEL KN4035 (35DU805)

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GENERAL INFORMATION

The Knight Model KN4035 is a two-speed, dual-track tape recorder. The transport holds any size reels up to seven inches.

Recordings can be made from a radio, TV receiver, phonograph, tuner, or directly from a microphone.

The transport operates at two speeds; 3 3/4 and 7 1/2 ips.

Connect the tape recorder to a power source supplying 105-120 volts, 60 cycles, AC only.

Supplied By:

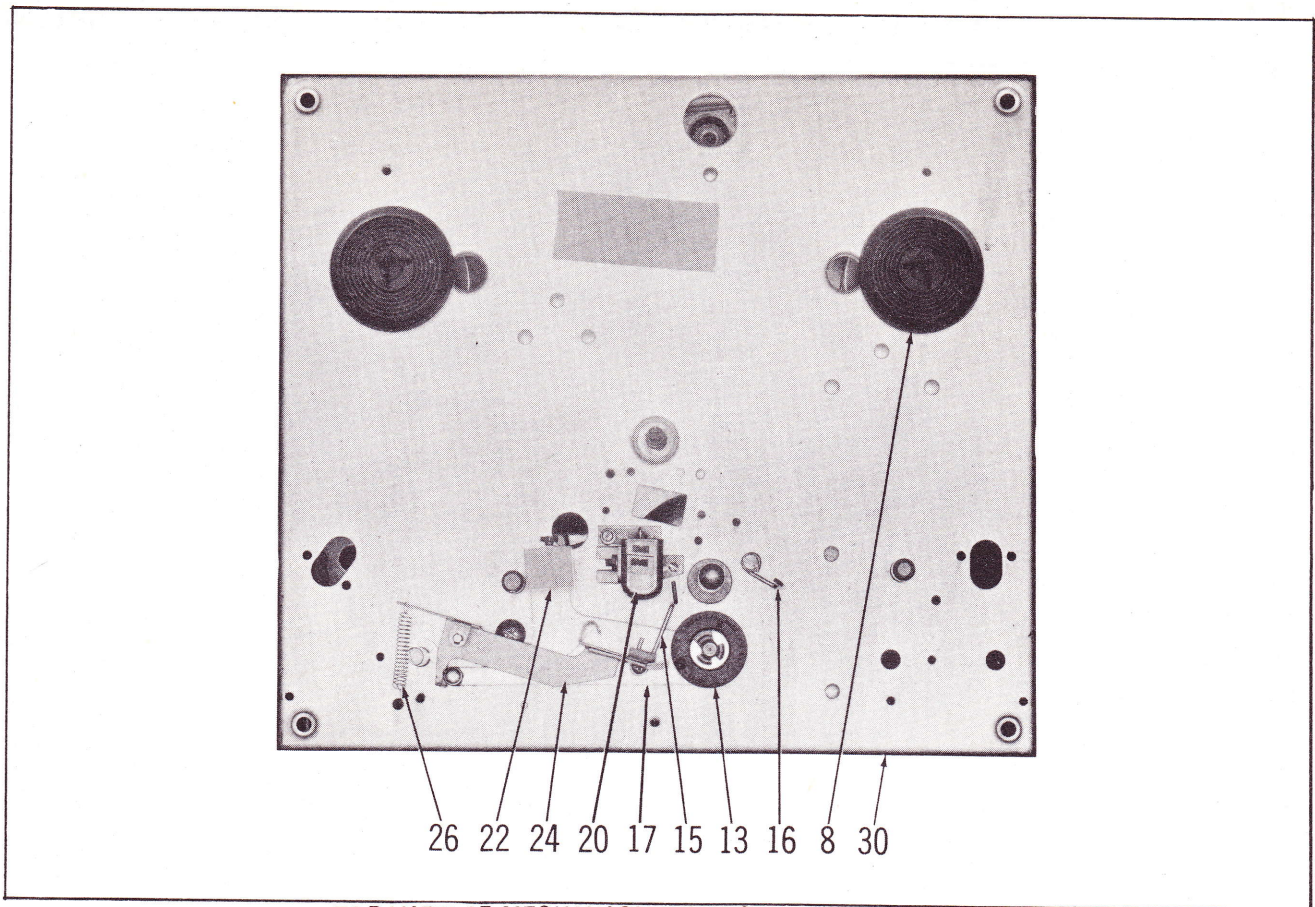
Allied Radio
100 North Western Avenue
Chicago, Illinois

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

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TOP VIEW OF MECHANISM WITH COVERS REMOVED

FUNCTION OF CONTROLS

Off-Volume

Turns the power off or on and varies the playback volume and recording level.

Function Control

Selects the various modes of operation, Play, Idle (Stop), and Record.

Record Button

When depressed, sets the amplifier and transport in the Record mode.

Wind-Rewind Control

Rotate clockwise to rewind the tape and counter-clockwise to wind in the forward direction. Function control must be in Idle position before Wind-Rewind control can be operated.

Speed Change

Changes transport speed to $3 \frac{3}{4}$ or $7 \frac{1}{2}$ ips. Change speeds when the Function control is in the Idle position only.

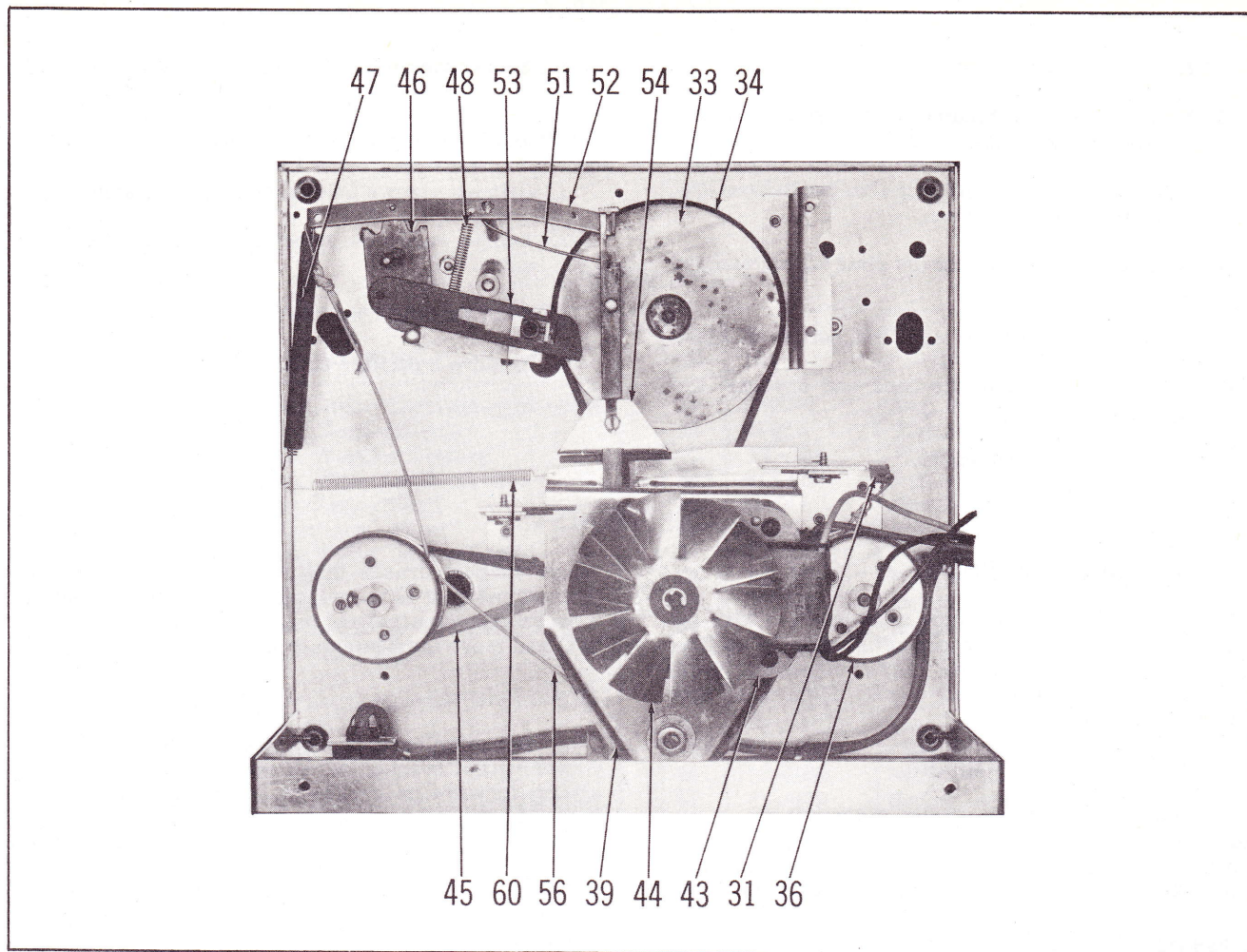
OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the supply spindle.
2. Place an empty reel of the same size on the take-up spindle.
3. Unwind about 18 inches of tape from the supply reel and place the tape through the head slot, making sure that the shiny side faces the front of the recorder.
4. Insert the end of the tape into one of the radial slots in the hub of the take-up reel. Rotate the take-up reel several times to secure the tape and take up any slack.

To Make a Recording

1. Insert the microphone plug into the "Mic" jack on the top of the recorder.
2. Thread the tape as described under "Threading the Tape."
3. Set the Speed Change control to the desired speed.
4. Press down on the Record button and at the same time, move the Function control to the Record position.



BOTTOM VIEW OF MECHANISM

NOTE: To record from a radio, phonograph, tuner, or TV receiver, follow the same procedure as described above, keeping the volume of recorder at a normal level.

6. To stop movement of the tape, turn the Function control to the Idle position.

To Wind or Rewind Tape

Check to see that the Function control is in the Idle position. To wind the tape onto the take-up reel, turn the Wind-Rewind control to the Wind position and hold. To rewind the tape back onto the supply reel, turn the control to the Rewind position and hold. Releasing the knob will automatically stop the tape movement.

To Play Back a Recording

1. Thread the tape.
2. Turn the Function control to the Play position.
3. Adjust the Volume control to the desired listening level.

To Erase a Recording

In the Record mode of operation, any recording on the tape will be automatically erased before the new recording is made. Should it be desired to erase

a recording without recording new material on the tape, follow the normal recording procedure with the Volume control at minimum.

Dual-Track Recording

This recorder is designed to record and play back one-half the tape width at a time; thereby, resulting in two-track recording. After one side of the tape is completed, remove the full reel from the take-up spindle and place it on the supply spindle and the empty reel on the take-up spindle. Rethread the tape and continue recording. The tape is played back in the same manner.

To Edit and Splice Tape

NOTE: Since it is impossible to edit and splice one track without affecting the other track, recordings to be edited should be limited to one track recordings only.

1. The tape may be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements may be inserted between selections. Unused portions of the tape can be spliced together for reuse.
2. Cut the tape at a diagonal. Join the ends using a commercial splicing tape only. Trim away excess splicing tape.

DISASSEMBLY

1. Remove control knobs.
2. Remove screws holding front escutcheon (6). Remove front escutcheon.
3. Remove screws holding rear escutcheon (5). Remove rear escutcheon.
4. Remove screws from dress plate (7) and remove dress plate.
5. Remove screws from sides and bottom of case.
6. Slide recorder chassis back and unsolder the speaker leads.
7. Lift recorder from case.

8. To reassemble, reverse the foregoing procedure.

To Remove Amplifier from Transport.

1. Remove screws holding chassis to transport.
2. Loosen screw on selector lever and slide from shaft.
3. Slide bushing from on-off-volume shaft.
4. Remove amplifier chassis from transport.

ADJUSTMENTS

Record-Playback Head Height

The top edge of the tape must be even with the top edge of the pole piece of the head. To adjust, loosen the two head mounting nuts and raise or lower the head to meet above requirement. Tighten the nuts and recheck adjustment.

Record-Playback Head Azimuth

Using an alignment tape, adjust the azimuth adjustment screw until the maximum high-frequency output is obtained. After the azimuth adjustment is completed, recheck the record-playback head height.

Erase Head Height

Erase head (22) should be adjusted so that the

erase magnet erases only the top half of the tape. This adjustment is to be made in the Record position. Loosen the set screw in the rear of the erase head (22) and move the head up or down as necessary.

Brake Release

Brake release bracket (54) can be adjusted by loosening the bracket screw and moving the bracket either forward or backward. When bracket (54) is moved to the rear, wind-rewind lever assembly (50) contacts brake release bracket (54) causing brake cord to have a greater amount of slack. To tighten the brake cord, move the bracket toward the front of the unit. Repeat adjustment until proper braking action is obtained.

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Incomplete or no erase.	1. Erase head set screw loose.	1. See "Erase Head Height" adjustment.
No drive in Play or Record.	1. Drive belt (34) broken. 2. Pressure roller tension spring (48) broken or disconnected. 3. Take-up drive belt (42) broken. 4. Defective drive motor (43). 5. Flywheel shaft binding.	1. Replace drive belt (34). 2. Connect or replace spring (48). 3. Replace take-up drive belt (42). 4. Replace motor (43). 5. Clean Flywheel bearings and apply a thin film of oil to shaft.
No Rewind.	1. Rewind belt (45) broken. 2. Oil on rewind belt (45).	1. Replace belt (45). 2. Clean or replace belt (45).
Wow or flutter.	1. Motor pulley, pressure roller (13), or capstan dirty.	1. Clean oil and dirt from parts with alcohol and a soft cotton cloth.
Function control works too freely.	1. Tension springs (47 or 48) disconnected or broken.	1. Connect or replace tension springs (47 or 48).
Little or no brake action.	1. Misadjusted brake cord (56). 2. Brake cord (56) broken. 3. Loosen pulley on spindle shaft.	1. See "Brake Release" under Adjustment. 2. Replace brake cord (56). 3. Tighten set screw on pulley.

CLEANING

The pressure roller (13), capstan sleeve (10), record-playback head (20), erase head (22), and tape guides should be cleaned occasionally to remove the tape residue which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean the parts.

LUBRICATION

All rotating parts are provided with oilite type bearings and need no lubrication for a long period of time. When the recorder is disassembled for service, clean all bearings and apply a thin film of oil on the bearings. Apply a thin coating of grease on all slide levers and detent rollers.

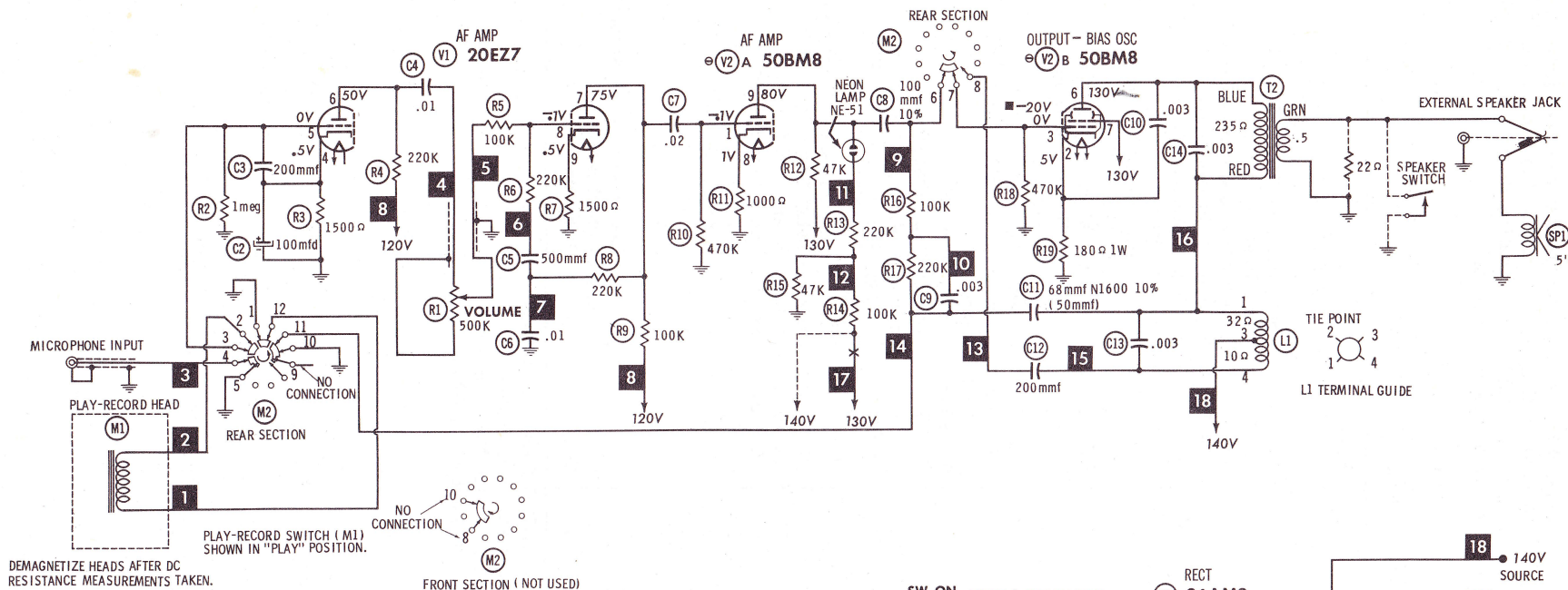
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Screw, Rear Escutcheon Mounting	31	960070	Stop Bracket, Rewind
2	TK-251	Knob, Wind-Rewind	32	960071	Stop Bracket, Wind
3	460026	Knob, Volume Control	33	TF-304	Flywheel & Capstan Assembly
4	TA-1984	Knob, Function Control	34*	TO-171*	* Belt, Flywheel Drive
5	TE-279	Escutcheon, Rear	35	120017	Pulley, Spindle Belt
6	TA-1985	Escutcheon, Front	36		Pulley, Brake
7	TP-1603	Dress Plate, Motor Board	37	TP-849	Sub-Plate, Motor Board
8	460012	Spindle	38	TB-234	Bearing, Motor Pivot
9		Washer	39	960065	Bracket, Motor Mounting
10	TA-1037	Capstan Sleeve Assembly	40		Bracket, Brake Rod Guide
11		Retaining Ring	41	TM-274	Motor Shock Mounts
12		"E" Ring	42*	TB-998*	*Belt, Take-up
13*	TR-1846*	* Pressure Roller	43	TA-1988	Drive Motor with Pulley
14		Washer	44	TF-337-1	Fan
15	TT-7121	Guide, Tape	45*	TB-999*	*Belt, Rewind
16	TG-435	Guide, Tape	46	TA-1003	Switch Cam Assembly
17	TA-1986	Pressure Roller Plate Assembly	47	TS-1682	Spring, Switch Detent Lever
18		Screw, Azimuth Adjustment	48	360011	Spring, Pressure Roller Plate Lever
19	360012	Spring, Record Head	49	TL-349	Cam Lever, Pressure Roller Plate
20	TH-494	Record-Playback Head	50	TA-1015	Wind-Rewind Lever Assembly
21	TB-2028	Bracket, Record-Playback Head Mounting	51	360009	Spring, Brake Rod Return
22	TA-1967	Erase Magnet Assembly	52	TA-1004	Switch Detent Lever Assembly
23	360018	Spring, Erase Magnet Return	53	TS-1625	Slide, Interlock
24	TA-1987	Bracket, Pressure Pad Assembly	54	TB-858	Bracket, Brake Release
25		Retaining Ring	55	360010	Spring, Brake
26	360015	Spring, Pressure Pad Tension	56	TB-1004	Brake Cord
27	TB-1026	Pivot, Pressure Pad Bracket	57		Spring
28		"E" Ring	58		Lever, Record-Playback Actuating
29	TT-657	Guide, Tape	59	TA-1031	Interlock Shaft Assembly
30	960059	Motor Board	60	360016	Spring, Take-up

- * Pressure Roller, WALSCO Part No. 1482-04
- * Drive Belt, WALSCO Part No. 1410-14
- * Take-Up Belt, WALSCO Part No. 1409-10
- * Rewind Belt, WALSCO Part No. 1409-04

MODEL KN4035 (35DU805) KNIGHT

FOLDER 8



DEMAGNETIZE HEADS AFTER DC RESISTANCE MEASUREMENTS TAKEN.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	20EZ7	30 Ω	0 Ω	15 Ω	1500 Ω	1 meg 700 Ω	† 235K	† 115K	100K	1500 Ω
V2	50BM8	470K	180 Ω	470K 200K	100 Ω	30 Ω	† 487 Ω	† 1220 Ω	1000 Ω	† 48K
V3	36AM3	NC	NC	130 Ω	100 Ω	50 Ω	115 Ω	†		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
 ■ TAKEN IN "RECORD" POSITION.
 † MEASURED FROM PIN 7 OF V3
 ‡ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

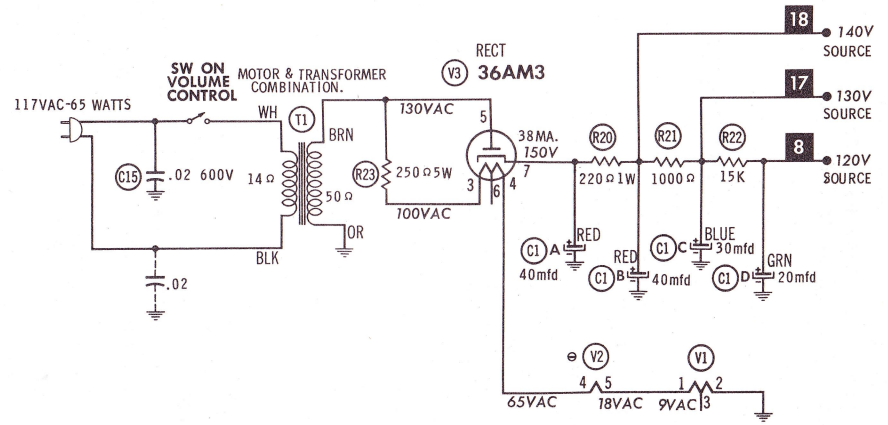
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

- DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
- Socket connections are shown as bottom views.
- Measured values are from socket pin to common ground.
- Line voltage maintained at 117 volts for voltage readings.
- Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
- All controls at minimum, proper output load connected.

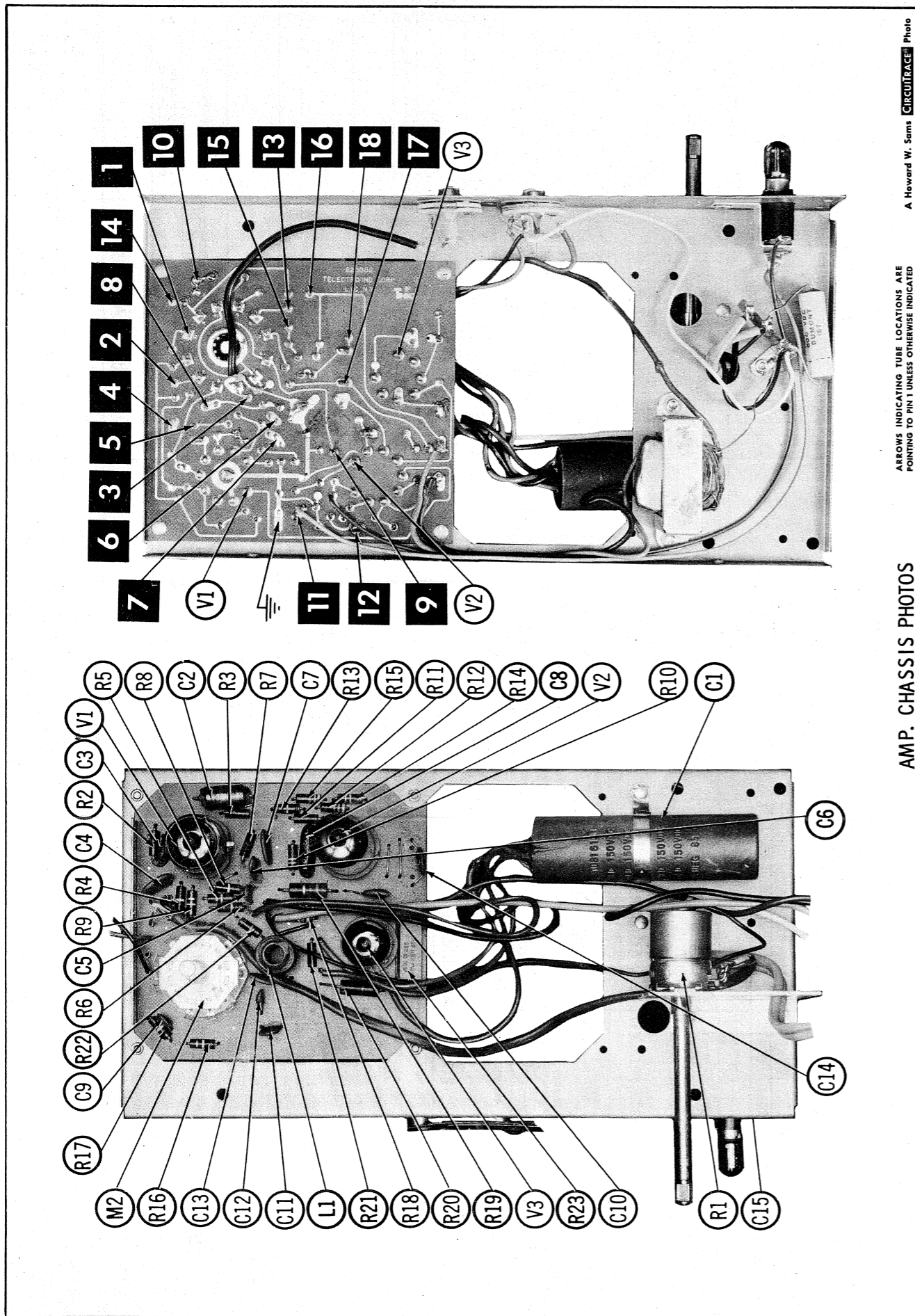
A PHOTOFAC STANDARD NOTATION SCHEMATIC with **CIRCUITRACE**

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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



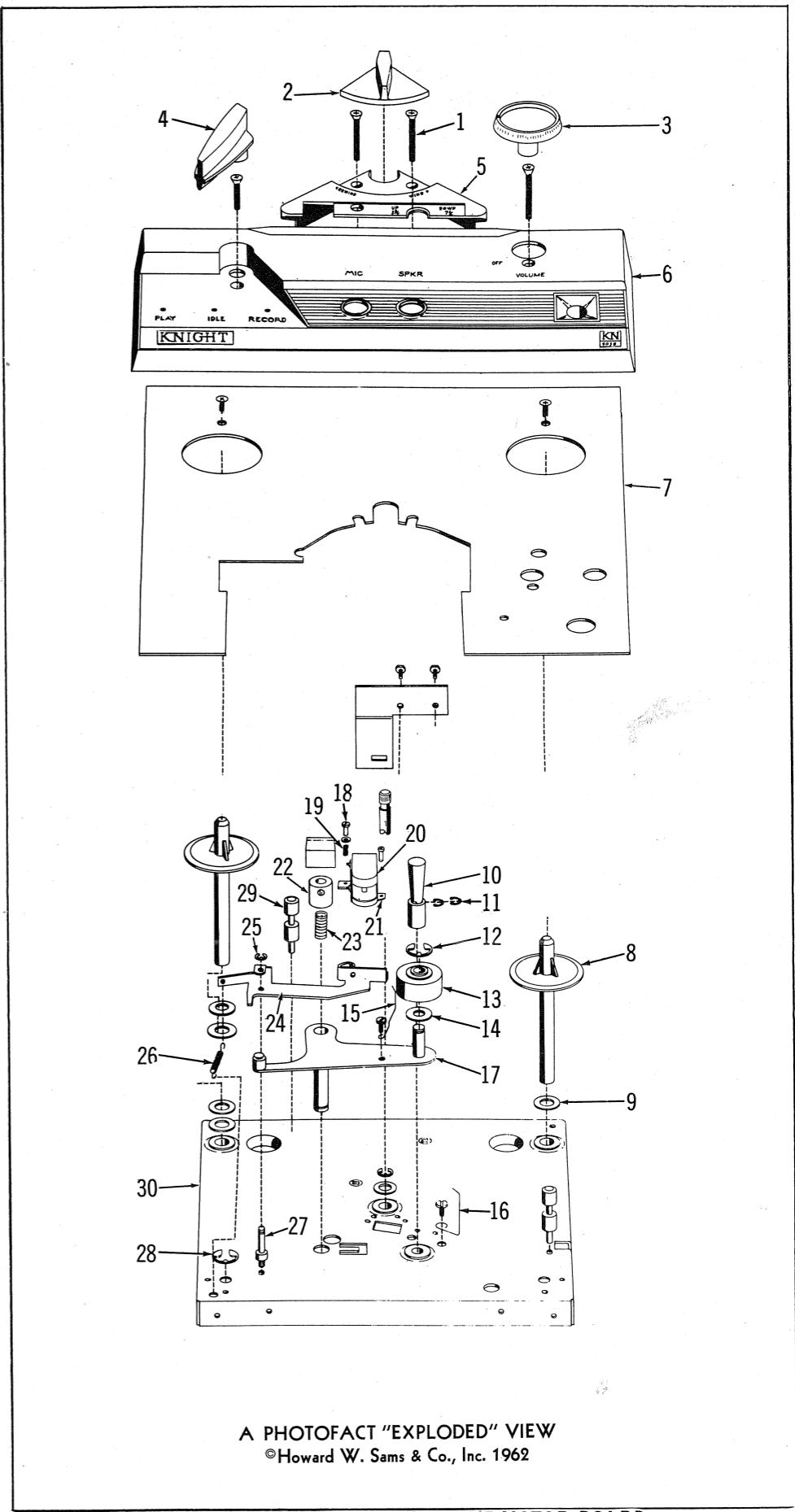
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A Howard W. Sams **CIRCUITRACE** Photo

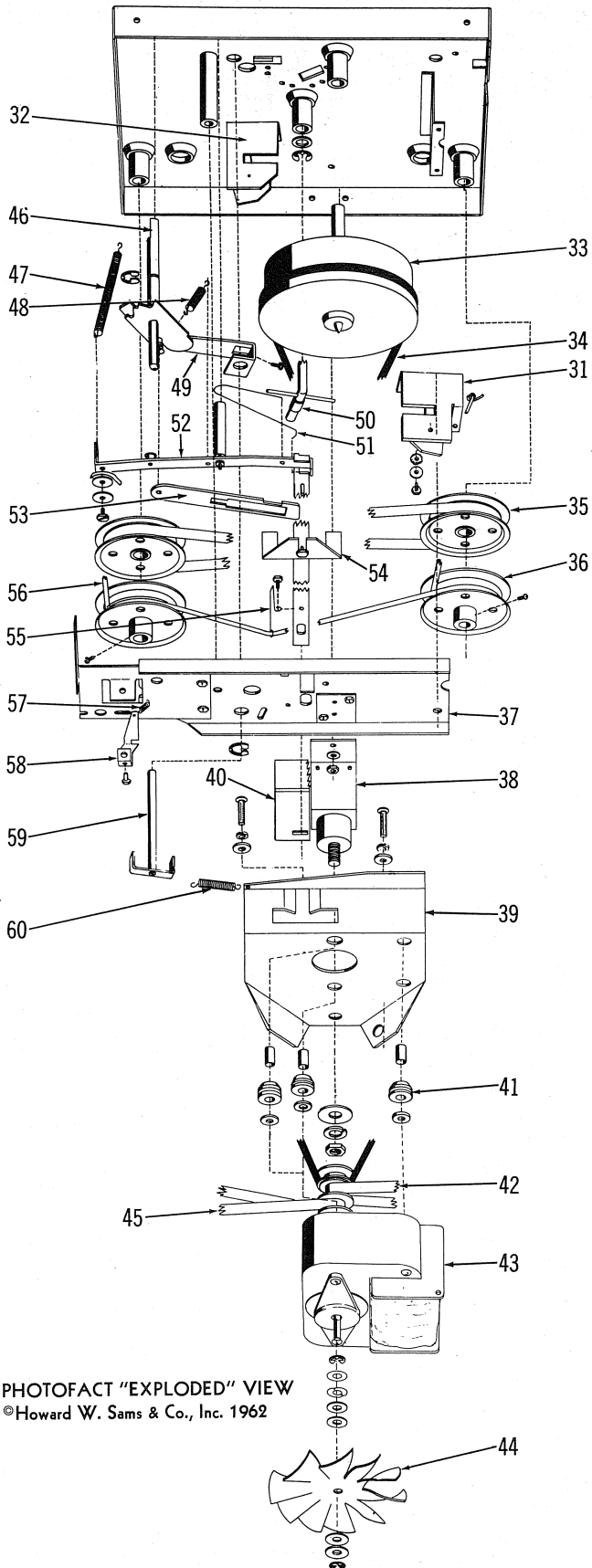
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

AMP. CHASSIS PHOTOS



A PHOTOFAC "EXPLODED" VIEW
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EXPLODED VIEW OF PARTS ABOVE MOTOR BOARD



A PHOTOFAC "EXPLODED" VIEW
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EXPLODED VIEW OF PARTS BELOW MOTOR BOARD

AMP PARTS LIST AND DESCRIPTIONS

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			RAYTHEON			SYLVANIA		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	20E27	V3	Rectifier	36AM3						
V2	AF Amplifier-Output-Bias Osc.	50BM8 (UCL82)*									

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA								
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	40	150	TC-1192	PRS3625 PRSI470	BBRT43215 BR40-150	QT3-8 QT1-9	TCT3105 TC48	TDLT-3 TD-40-150	TVAS-4545*		
B	40	150									
C	30	150									
D	20	150									
C2	100	3								PTT13	NLW100-3

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED 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.		
C3	200	(50) †	DI-200	DD-201	LI0T2	CCD-201	GP320	10TS-T20		
C4	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10		
C5	500		DI-500	DD-501	BYA10T5	CCD-501	B-350	10TS-T50		
C6	200		DI-200	DD-201	LI0T2	CCD-201	GP320	10TS-T20		
C7	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10		
C8	.02 300V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20		
C9	100 10%		DI-100	DD-101	LI0T1	CCD-101	GP310	10TS-T10		
C10	.003		DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30		
C11	68 N1600 10%									
C12	200									
C13	.003			DI-200	DD-201	LI0T2	CCD-201	GP320	10TS-T20	
C14	.003			DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30	
C14	.003			DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30	
C15	.02 600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate Value.

CONTROLS

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

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1	Volume & Switch	500K	560001	AB-60, KR-1, AK-11	A47-500-Z/ KSS-5, SWE-12	Q13-133, AQ5, 76-1	UA55A, SL3500, US-41

RESISTORS

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

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	REMARKS			IRC PART No.	WORKMAN PART No.	REMARKS
R2	1meg				R13	220K			
R3	1500Ω				R14	100K			
R4	220K				R15	47K			
R5	100K				R16	100K			
R6	220K				R17	220K			
R7	1500Ω				R18	470K			
R8	220K				R19	180Ω 1W			
R9	100K				R20	220Ω 1W			
R10	470K				R21	1000Ω			
R11	1000Ω				R22	15K			
R12	47K				R23	250Ω 5W	PW5-250	5W-SQ-250	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		KNIGHT PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman PART No.	
L1	Bias Osc.	TC-2463					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	KNIGHT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	KNIGHT PART No.	QUAM PART No.	

TAPE HEAD

ITEM NO.	MEASURED			KNIGHT PART NO.	NORTRONICS PART NO.	DESCRIPTION
	INDUCTANCE	BIAS/ERASE VOLTS (RMS)	BIAS FREQ.			
M1	945MH	34 Volts	52KC	10L17-104	3050 * KQ-20 †	* 2 Track Monaural Head † Mounting Kit for Head

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M2	Switch		Play-Record (Rotary Wafer Type)