

MECHANICAL PARTS LIST (CON'T.)

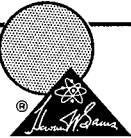
Ref No.	Part No.	Description
106	B3-14268	Arm
107		Hi-Speed Forward Lever
108		Washer
109		Spring
110	A1-14223	Play Key Assembly
111	A1-14224	Record Key Assembly
112	A1-14225	Stop Key Assembly
113	A4-14347	Key Shaft
114	A9-11888	"E" Ring, 3/16" Shaft (2 required)
115	A13-14421	Hi-Speed Idler Spring
116	A9-10960	Speed Nut (2 required)
117	A9-11888	"E" Ring, 3/16" Shaft (2 required)
118	A8-10472	Washer (2 required)
119	A1-14204	Idler Slide Assembly(2 required)
120	B1-14207	Idler Assembly (2 required)
121		Spring Retainer
122		Idler Drive Spring
123	A3-14281	Speed Change Arm (7 1/2 ips)
124	A9-11888	"E" Ring, 3/16" Shaft
125	A9-11888	"E" Ring, 3/16" Shaft
126	A1-14219	Two Speed Knob Assembly
127	A13-12124	Detent Spring
128	A9-10874	Steel Ball
129		Cotterpin
130	A9-12098	Rollpin, 1/16" x 3/8"
131	A4-14323	Two Speed Arm Shaft
132	B1-14209	Hi-Speed Slide and Key Return Lever Assembly
133	A9-11888	"E" Ring, 3/16" Shaft (2 required)
134	TR-7602	Key Return Lever Spring
135	A13-14423	Brake Release Spring
Monaural Half-Track Head Assembly (T-1500, TS-1520, T-1700)		
136	A14-1057	#3-48 x 1/8" Screw (2 required)
137	A13-14320	Head Hold Down Spring
138	A16-14464	Head Insulator
139	C161-1	Play-Record-Erase Head
140	TR-7429	#4-48 Set Screw (Head Adj)
141		"E" Ring (2 required)
142	A1-14218	Record Pressure Pad Assembly

Ref. No.	Part No.	Description
143	TR-7916	Erase Pressure Pad Assembly
144	TR-7818	Pressure Pad, Felt (2 required)
145	TR-7610	Record Pad Spring
	TR-7615	Erase Pad Spring
Stereo Quarter-Track Head Assembly (T-1515-4)		
146	A1-17253	Selector Dial Assembly
147		Screw, Flat Head
148	A-13200	"E" Ring
149		Screw, Filister Head
150	A1-17236	Cover Plate Assembly
151	A1-17234	Cam Shank and Pin Assembly
152	A14-17208	#3-56 Screw
153	A17-17209	#3-56 Bristol Set Screw
154	A9-5805	3/32" Ball
155	A1-17230	Cam Adjustment Lever Assembly
156	A-6501	"E" Ring, 3/32" Shaft
157	A13-17197	Belleville (Spring) Washer (4 required)
158	A4-17211	#4-40 Hex Nut
159	A4-17212	#2-56 Hex Nut
160	A1-17232	Upper and Lower Bushing Plate Assembly
161	A9-17223	1/16" Ball (2 required)
162	A4-17213	#4-40 Hex Nut
163	A13-17196	Conical Spring (2 required)
164	A1-17233	Record Head Mounting Plate Assembly
165	B161-7	Erase Head
166	B161-6	Quarter-Track Record Playback Head
167		Threaded Spacer (2 required)
168	A8-17225	Washer (2 required)
169		Upper Tape Guide (2 required)
170		Middle Tape Guide (2 required)
171		Lower Tape Guide (2 required)
172	A9-13199	"E" Ring (2 required)
173		Record Pad Spring
174	A1-17228	Record Pressure Pad Assembly
175	A1-17229	Erase Pressure Pad Assembly
	A9-17227	Felt Pressure Pad (2 required)
176		Erase Pad Spring

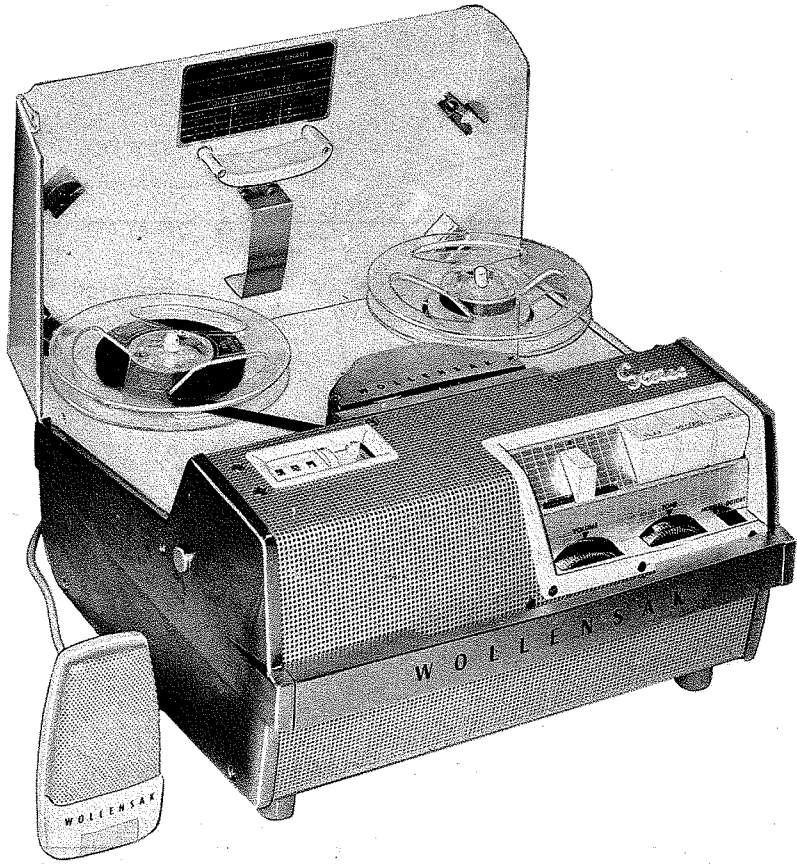
* Takeup Belt, WALSCO Part No. 1410-14
* Pressure Roller, WALSCO Part No. 1427-01
* Idler Assembly, WALSCO Part No. 41-040

FOLDER 15
SET 564

PHOTOFACT® Folder



WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520



GENERAL INFORMATION

Wollensak Models T-1500, T-1515-4, TS-1520 and T-1700 tape recorders have keyboard controls for Play, Record, and Stop. All four models use the same transport mechanism.

Model T-1515-4 has a quarter-track stereo head, while the other three are half-track monaural recorders. Models T-1500 and T-1515-4 are for 115VAC operation only. Model TS-1520 operates on either 115VAC or 220VAC, and Model T-1700 requires 12VDC.

Recordings can be made from a radio, phonograph, or television as well as those made directly from the microphone.

Playing time on Model T-1515-4 using a 7" reel of 1 mil monaural tape recorded on 4 tracks at 3 3/4 ips is 6 hours. A 7" reel of 1 mil stereo tape recorded in 4-track stereo at 7 1/2 ips is 1 1/2 hours. Playing time on Models T-1500, TS-1520, and T-1700 using a 7" reel of 1 mil monaural tape recorded on both tracks at 3 3/4 ips is 3 hours.

Manufactured By:

Wollensak Optical Company
320 East Twenty-First Street
Chicago 16, Illinois

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



The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ475

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WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520

SET 564 FOLDER 15

DATE 1-62

SET 564

FOLDER 15

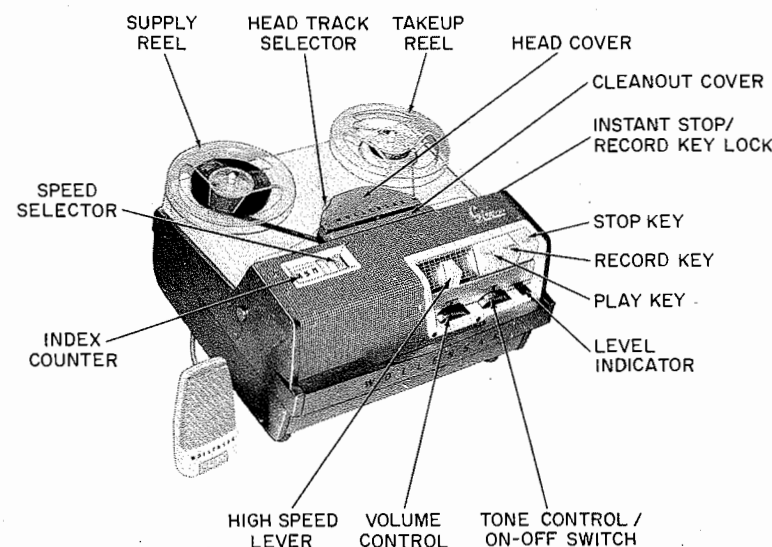


Fig. 1. Tape Recorder Controls-Model T-1515-4 Shown

SPECIFICATIONS

FREQUENCY RESPONSE:

Model T-1515-4 (both channels):
40-17,000 cps \pm 3 db at 7 1/2 ips.
40-10,000 cps \pm 3 db at 3 3/4 ips.
Model T-1500, TS-1520, and T-1700:
40-15000 cps \pm 3 db at 7 1/2 ips.
40-8,000 cps \pm 3 db at 3 3/4 ips.

WOW AND FLUTTER:

Less than 0.3% for both speeds.

SIGNAL-TO-NOISE RATIO:

Greater than 48 db.

TAPE SPEEDS:

7 1/2 and 3 3/4 ips.

TAPE REQUIRED:

Up to 7" reel, "A" wound tape (shiny side out).

PLAYING TIME:

Model T-1515-4:
Monaural - A 7" reel of 1 mil tape recorded on 4 tracks at 3 3/4 ips will play for 6 hours; other tapelengths, thicknesses, and speeds are proportional.
Stereo - A 7" reel of 1 mil tape recorded in 4-track stereo at 7 1/2 ips will play for 1 1/2 hours.

Models T-1500, TS-1520, and T-1700:

A 7" reel of 1 mil tape recorded on both tracks at 3 3/4 ips will play for 3 hours; other tape lengths, thicknesses, and speeds are proportional.

POWER REQUIREMENTS:

Models T-1500 and T-1515-4: 115V, 60 cycles.
Model T-1520: 115V or 220V, 60 cycles.
Model T-1700: 115V, 60 cycles, or 12 VDC.

POWER CONSUMPTION:

100 watts.

LOWER CHANNEL PREAMP OUTPUT SIGNAL

(MODEL T-1515-4):
0.5 to 1.5 volts.

CROSS TALK (MODEL T-1515-4):

-50 db.

SIZE:

Approximately 6 1/2" x 10 1/4" x 11 3/4".

WEIGHT:

Models T-1500 and T-1515-4: 20 pounds.
Model T-1520: 22 pounds.
Model T-1700: 26 pounds.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	A9-14370	Screw, #6-32 x 7/32" (5 required)	50	A3-14270	Key Return Lever
2	A9-14368	Screw, #4-48 x 1/4" (2 required)	51	A4-14341	Key Return Lever Shaft
3	C2-17217	Head Cover Casting (Model T-1515-4)	52	A9-12097	Rollpin, 1/16" x 3/8"
	C2-14259	Head Cover Casting (Models T-1500, TS-1520, T-1700)	53	B3-14262	Take-Up Actuating Lever
4	B2-14255	Clean Out Cover Casting	54	A13-14417	Take-Up Lever Spring
5	C3-14288	Cover Plate	55	A4-14578	Motor Pulley
6	A9-14369	Screw, #6-32 x 7/32" (3 required)	56		Set Screw
7	C2-14257	Odometer Bezel Casting	57	A9-14388	Felt Washer
8	R1-14190	Front Screen Group	58	B1-14206	Slow Idler Assembly
9	A15-14461	Spindle Cap (2 required)	59	A1-14205	Slow Idler Slide Assembly
10	P-1428	Flat Washer (2 required)	60	A13-14418	Slow Speed Idler Spring
11	A1-14211	Rewind Spindle and Tire Assembly (Includes Item 12)	61	P-1428	Washer
12	A30-11094	Spindle Cup Tire (2 required)	62	A9-11888	"E" Ring, 3/16" Shaft
13	A1-14227	Spindle Cup and Hi-Speed Drum Assembly (Includes Item 12)	63	A9-10960	Speed Nut (2 required)
14	A30-14492	Counter Drive Belt	64	A3-14282	Speed Change Arm (3 3/4 ips)
15	A8-14441	Phenol Washer (2 required)	65	A9-11888	"E" Ring, 3/16" Shaft
16	TR-7524	"E" Ring, 1/4" Shaft (2 required)	66		Locknut (2 required)
17	A13-11200	Brake Arm Spring	67		Washer, Large (2 required)
18	A1-14240	Brake Arm Assembly (Left)	68		Spacer Sleeve (2 required)
19	A1-14241	Brake Arm Assembly (Right)	69		Thimble (3 required)
20	A15-14064	Brake Arm Roller (2 required)	70		Grommet (3 required)
21	A13-14415	Brake Roller Leaf Spring (2 required)	71		Washer, Small Steel (2 required)
22		Spacer	72		Washer, Large, Steel (2 required)
23	A3-14321	Brake Release Link (2 required)	73		Hex-head Screw
24		Grip Ring	74		Washer, Steel
25	TR-7524	"E" Ring, 1/4" Shaft (3 required)	75		Washer, Steel
26	B1-14215	Rewind Spindle and Arm Assembly	76	A1-14603	Motor and Plug Assembly, 115V, 60 cycle
27	A1-14191	Rear Slide Cam Assembly	77	TR-7524	"E" Ring, 1/4" Shaft (2 required)
28	A3-14322	Right Scissors Detent Spring	78	TR-7513	Flat Washer, Steel
29	A13-11203	Spring	79	A9-14499	Motor Fan
30	A3-14292	Left Scissors Detent Spring	80		Washer
31	A13-14409	Spring	81	A15-14446	Slow Speed Switch Cam
32	TR-7604	Rewind Spring	82	A9-11888	"E" Ring, 3/16" Shaft
33	A1-14208	Counter Worm Shaft and Bracket Assembly	83	B1-14247	Cam Actuating Stud Lever Assembly
34	A1-14237	Counter Assembly	84		"E" Ring
35	A14-14431	#8-32 x 5/32" Pan Head Screw (2 required)	85	C1-14203	Bottom Mechanism Plate Assembly
36	A15-14397	Counter Worm Gear	86	A14-12187	#8-32 x 1/4" P.H. Screws (3 required)
37	A8-14436	Washer	87	C1-14198	Top Mechanism Plate Assembly
38	TR-7526	Grip Ring, 3/16" Shaft	88	A9-11888	"E" Ring, 3/16" Shaft
39	A8-14481	Washer	89	A13-14424	Pressure Roller Tension Spring
40	A1-14513	Clutch Plate and Felt Assembly	90	A1-14243	Function Switching Arm Assembly
41	TR-7817	Take-Up Clutch Felt	91	A13-14420	Instant Stop Brake Spring
42	TR-7617	Clutch Plate Spring (3 required)	92	A9-11888	"E" Ring, 3/16" Shaft
43	A1-14228	Take-Up Pulley Assembly	93	A15-14451	Function Roller
44	TR-7520	"E" Ring, 1/8" Shaft (3 required)	94	A15-14450	Slide Roller (2 required)
45 *	TR-7809 *	*Take-Up Belt	95	A9-11888	"E" Ring, 3/16" Shaft (2 required)
46	TR-7513	Flat Washer, Steel	96	A3-14272	Instant Stop Brake Arm
47	A1-14193	Flywheel, Capstan, and Hub Assembly	97	A9-11888	"E" Ring, 3/16" Shaft
48	TR-2431	Steel Ball	98	A9-6501	"E" Ring, 3/32" Shaft
49	A9-11888	"E" Ring, 3/16" Shaft (2 required)	99	A15-14450	Slide Roller
			100		Instant Stop Guide Arm
			101	TR-7521	"E" Ring, 5/32" Shaft
			102	TR-7517	Fibre Washer (2 required)
			103 *	A30-14068 *	*Pressure Roller Assembly
			104	A1-14580	Instant Stop Arm and Stud Assembly
			105	TR-7922	Pressure Roller Arm Assembly

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Wollensak PART No.	Miller PART No.	Sencor PART No.	Workman TV PART No.	
L1	Equalization Bias Osc.	A133-8				
L2		A132-10				

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA				NOTES
		Wollensak PART No.	Merit PART No.	Sencor PART No.	Thordorson PART No.	
T1	SEC. 1 PRL 117V @ 180V @ .2A SEC. 2 12.6V @ .010A DC .4A SEC. 3 6.3V @ 1A SEC. 4 SEC. 5	B-130-5A ①				① Alternate Part # B-130-5

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA				NOTES
		Wollensak PART No.	Merit PART No.	Sencor PART No.	Thordorson PART No.	
T2	SEC. 1 PRL 1.2 SEC. 2 1	B-131-0E ①				① Alternate Part # B-131-6

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA				NOTES
		Wollensak PART No.	Merit PART No.	Sencor PART No.	Thordorson PART No.	
T3	PRL 1500Ω CT SEC. 1 6-8Ω SEC. 2 125Ω CT	B-131-5B ①				① Alternate Part # B-131-5

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		Wollensak PART No.	GUAM PART No.	
SP1	SIZE 5 1/4" PM FIELD V. C. IMP. 6-8Ω	C160-7 *	52A128	* Used in Models T-1500, TS-1520, T-1515-4 # Used in Model T-1700

POWER RECTIFIERS

ITEM No.	BATING CURRENT (Measured)	REPLACEMENT DATA			NOTES
		Wollensak PART No.	RCA PART No.	SARKES PART No.	
M1 M2 M3	.050A .050A .010A	A123-5* A123-5* A123-4*	IN1763* IN1763* IN1763*	2F4* 2F4* Model 50 • ①	* Silicon * Selenium ① Use 2 in series

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA			
			Wollensak PART No.	Holder	Holder	BUSS PART No.
M4	3AG	1 1/4A 125V S/B 2/T	A178-1			MDV 1 1/4
	3AG	8A	A176-5 *			

MISCELLANEOUS

ITEM No.	PART NAME	Wollensak PART No.	NOTES
M5	Head	B101-6	Record-Play, Model T-1515-4
M6	Head	B101-1	Record-Play-Erase, Models T-1500, TS-1520, T-1700
M7	Head	B101-37	Erase, Model T-1515-4
M8	Switch	A141-37	Speed Equalization (Leat Type) Model T-1515-4
M9	Switch	A141-32	Speed Equalization (Leat Type) Models T-1500, TS-1520, T-1700
M10	Switch	A141-31	Speaker (Slide Type)
	Motor	A1-14603	Includes Plug Part PA173-19, Models T-1500, TS-1520, T-1515-4
	Motor	C9-17422	Model T-1700

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors
Power Cord	Use BELDEN No. 8524 (Stranded) Available in Ten Colors
Low-Long Shielded Lead (Interconnecting)	Use BELDEN No. 1785-B (6 Ft. Length)
Phone Pick-up Arm Cable	Use BELDEN No. 8401
	Use BELDEN No. 8430 (Two Conductor - Twisted)

Tone Control On-Off Switch

Rotating the tone control a few degrees clockwise turns the recorder "On": power is then applied to the amplifier and the tape transport motor. Turning this control further adjusts the relative strength of bass, middle, and treble frequencies of program material. In "Balanced Tone" position the very high and very low tones are emphasized, the degree of emphasis varying with the volume control setting. This gives a response which follows closely the normal hearing pattern of the human ear. In "Bass" position the highs are subdued and the lows are emphasized. In "Treble" position the higher frequencies are emphasized. "Hi-Fi" position produces a response suitable for use with auxiliary equipment.

The tone control has no effect when a recording is being made.

When the tone control is turned to "Off" position, a tab on the knob trips the transport mechanism, returning it to "Stop" position for storage.

Volume Control

This control regulates the volume during recording and playback. It is also effective in regulating the signal level applied to a separate sound or music system through the Preamp Output jack.

TABLE I

Model	Power Source	Record	Playback
T-1500	115 V, 60 cycles	Half-track Monaural	Half-track Monaural
T-1515-4	115 V, 60 cycles	Quarter-track Monaural	2- and 4-track Stereo Quarter-track Monaural Half-track Monaural
TS-1520	115 V or 220 V, 60 cycles	Half-track Monaural	Half-track Monaural
T-1700	115 V, 60 cycles or 12 VDC	Half-track Monaural	Half-track Monaural

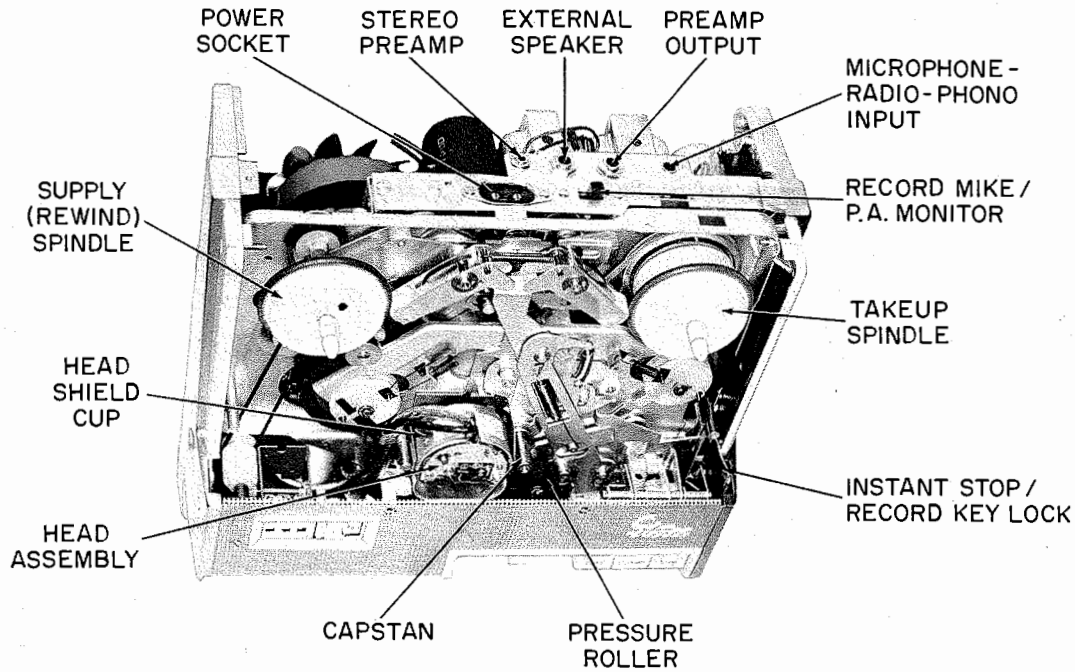


Fig. 2. Rear Panel Connections - Model T-1515-4 Shown.

FUNCTION OF CONTROLS, INDICATORS, SWITCHES, AND JACKS

WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520

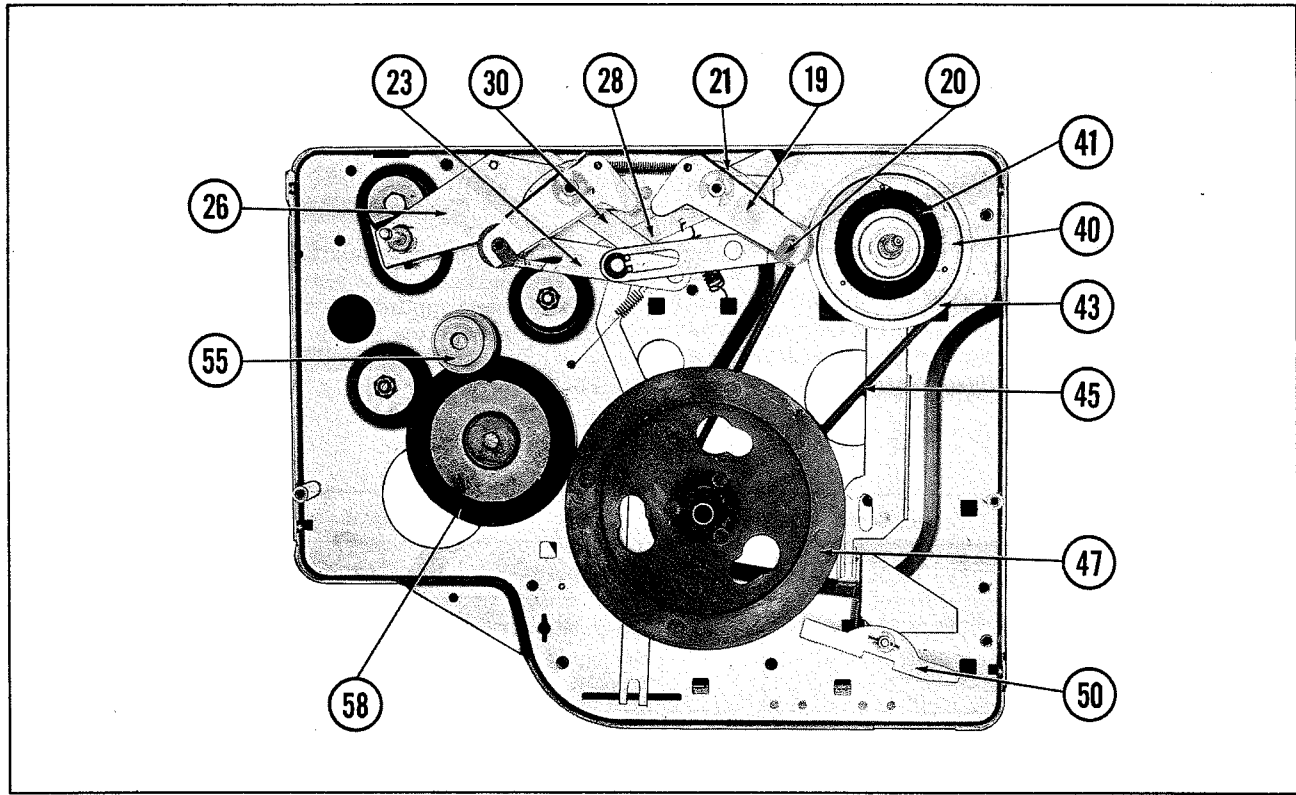


Fig. 4. Top View of Transport Mechanism With Top Mechanism Plate Removed

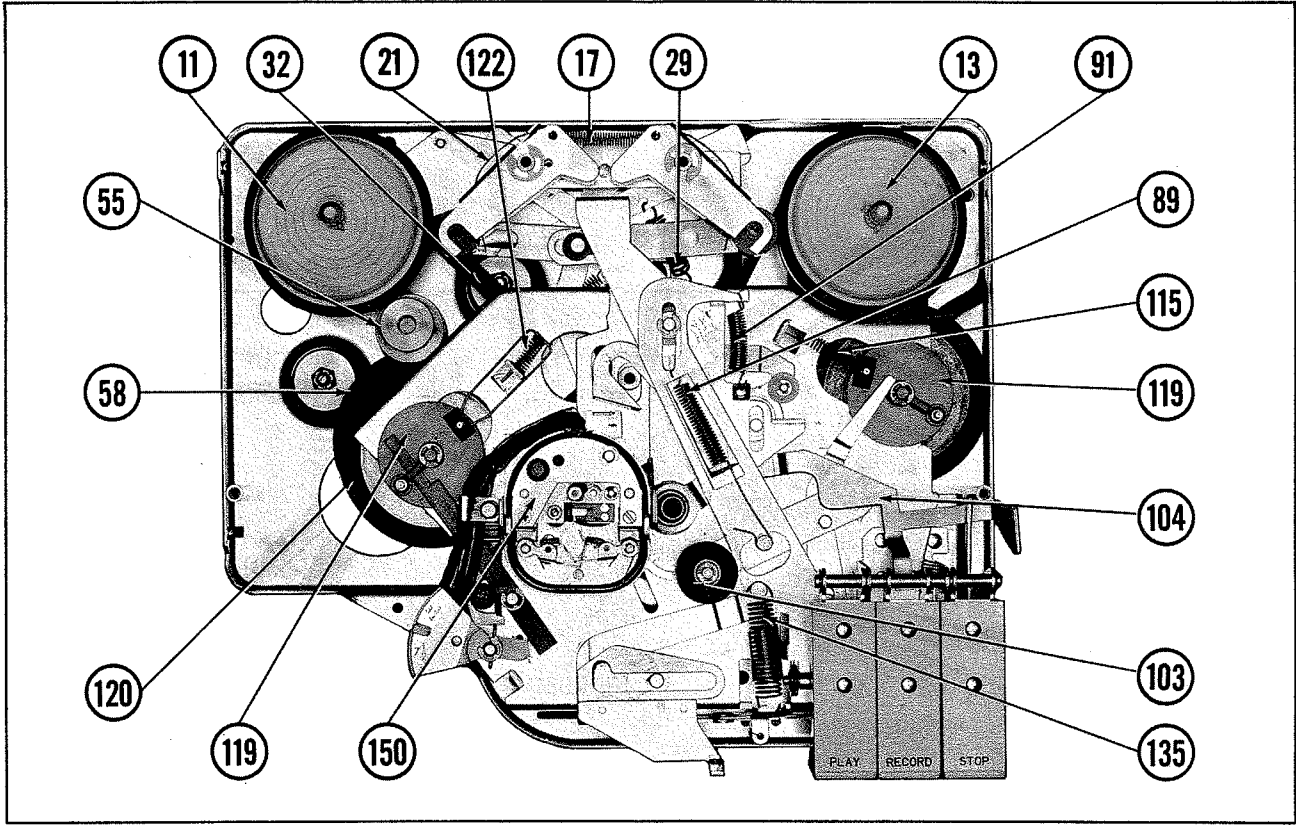


Fig. 3. Top View of Transport Mechanism

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC	RAYTHEON	SYLVANIA	ITEM No.	USE	TYPE
V1	Presampler	Wollensak PART No. A119-19			V4	Bias Oscillator Output	12AB5
V2	AF Amplifier	A119-9			V5	Stereo Preamplifier	7025
V3	Output						

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	Wollensak PART No.	GENERAL ELECTRIC PART No.	CORNELL-DUBILIER PART No.	RAYMOND PART No.	SPRAGUE PART No.
C1	40	A119-19	A0280	XC1-5	XC4-43	TVL-1519
C2A	40	A119-9				TVLS-4608,6*
C3	25					
C4	25					
C5	25					
C6	25					
C7	25					
C8	25					
C9	25					
C10	25					
C11	25					
C12	25					
C13	25					
C14	25					
C15	25					
C16	25					
C17	25					
C18	25					
C19	25					
C20	25					
C21	25					
C22	25					
C23	25					
C24	25					
C25	25					
C26	25					
C27	25					
C28	25					
C29	25					
C30	25					

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

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMICO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.1 100V		P288N-22	DP-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10
C6	.22 100V		P288N-22		CUB2P2	IDP-3-224	GEM-202	2TM-P22
C7	.22 100V		P288N-22		CUB2P2	IDP-3-224	GEM-202	2TM-P22
C8	150	(600)*	DI-150	DD-503	L0T15	CCD-151	B-315	10TS-T15
C9	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C10	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C11	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C12	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C13	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C14	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C15	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C16	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C17	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C18	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C19	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C20	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C21	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C22	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C23	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C24	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C25	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C26	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C27	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C28	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C29	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10
C30	.1 400V		P288N-1	DD-503	CUB4P1	ADP-3-104	GEM-401	4TM-P10

* Used in Models T-1500, TS-1520, T-1700.

Note 1. Used in Model T-1515-4 only.

CONTROLS

ITEM No.	RATING	Wollensak PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200K Tap		BT-47	A47F-200K	Q13-130K	RU254T15*	Volume
B	100K Tap		Not Req.	FS-3	Not Req.	SL3500	

CONTROLS (cont)

ITEM No.	RATING	Wollensak PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R2A	200K		A140-11		RU254T34 †	US-41	Tone
B	Switch						Power Off-On
R3	250K		A140-13				Hum Balance
R4	250K		A140-13				Hum Balance
R5	250K		A140-13				Hum Balance
R6	250K		A140-13				Hum Balance

① Part #A140-17 used in Model T-1700.
② Used in Model T-1515-4 only.
† Use SL3500 Shaft and SL-38 Bushing.
* Use SL3500 Shaft and SL-38 Bushing.

RESISTORS

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

ITEM No.	RATING	Wollensak PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R7	1meg						
R8	22K						
R9	22meg						
R10	10K						
R11	10K						
R12	20K 2W						
R13	10K						
R14	270K						
R15	33K						
R16	10K						
R17	10K						
R18	10meg						
R19	220K 2W						
R20	2.2meg						
R21	100K						
R22	910K						
R23	300K 5%						
R24	680K						
R25	33K						
R26	91K						
R27	180K 5%						

Note 1. Used in Model T-1515-4 only.
Note 2. Models T-1500, TS-1520 use 1800K in this application.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Wollensak PART No.	REPLACEMENT DATA
K1	Function Sw. Comp.	150mmf, 150mmf, 82K, 820K	A177-12	Model T-1515-4
K2	AF Amp. Grid	220mmf, 680mmf, 68K, 220K	A177-8	Models T-1500, TS-1520, T-1700
		200mmf, 250mmf, 250mmf, 250mmf	A177-13	Model T-1515-4
		1000mmf, 1000mmf, 10K, 1K, 33K	A177-6	Models T-1500, TS-1520, T-1700
K3	AF Amp. Plate	27K (2) 200K, 2.2meg	A177-11	Model T-1515-4
		470mmf, 330mmf, 2500mmf, 270K, 270K, 1meg	A177-7	Models T-1500, TS-1520, T-1700
		100mmf, 470mmf, 330mmf, 2500mmf, (2) 270K, 1meg		

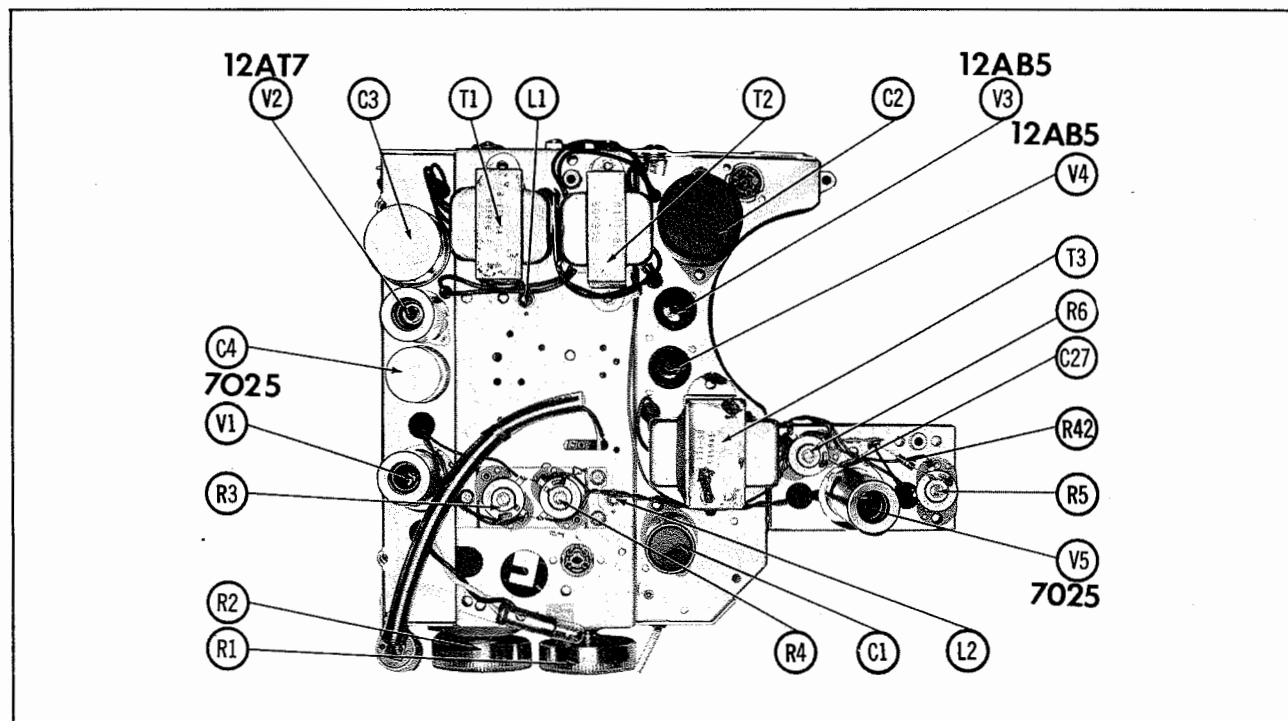


Fig. 20. Top View of Amplifier Chassis.

3. Distorted indicator should begin to glow when 2 volts at 1,000 cycles appears at preamp output jack, if circuit is normal.

Hum In Record or Playback

1. Check all stages for heater to cathode leakage in tubes.
2. Check hum controls, R3, R4, R5 and R6 for proper adjustment (See Hum Balancing Adjustments).
3. Check B+ filter capacitors C1, C2, C3, and C4.
4. Hum on a recorded microphone signal may be due to poorly grounded shield on microphone cable. An extra long microphone cable can also be a source of hum pickup.
5. Be careful to keep recorder away from hum fields such as fluorescent lamps, amplifiers, and transformers.

Weak or No Erase, Records Over Previous Recordings

1. Check for dirt on erase head. Check pressure pads.
2. Check oscillator coil (L2) and oscillator tube (V4). Check erase head continuity.

Microphonic Noises

Microphonic noises usually develop in the first stages of an amplifier where the sensitivity is greatest, but can develop in other stages. Start with the first stage (7025) and try different tubes, selecting the one which is least microphonic.

Dress C7 to clear edges of switch (M9) shield.

Dress V1A grid wire (pin 2) to clear C9. Dress C5 to clear input jack shield.

If microphonic noises are encountered during stereo playback from lower channel (Model T-1515-4 only), check V5.

No Sound, Neon Lamps Flashing With Signal

1. Check speaker and speaker switch. Check function switch clips for contact.
2. Check transformer (T3) for open secondary.
3. Check connecting cables, jacks, or plugs in output circuit. Make sure speaker plug is pushed all the way down.

Excessive Tape Hiss

1. Check for sufficient recording level by comparing to a prerecorded tape.
2. Tape may be worn. Try new tape of good quality.
3. Check V4 and associated voltages. Check bias-erase oscillator coil (L2) and associated components.
4. Check bias current adjustment. See "Electrical Adjustments".
5. Check the automatic demagnetization circuit which operates by shorting C7 (.22 mfd) across the play-record coil at the termination of the Record function. This capacitor resonates the record head to provide a decaying demagnetization transient.

6. Head may be microphonic. Replace head.

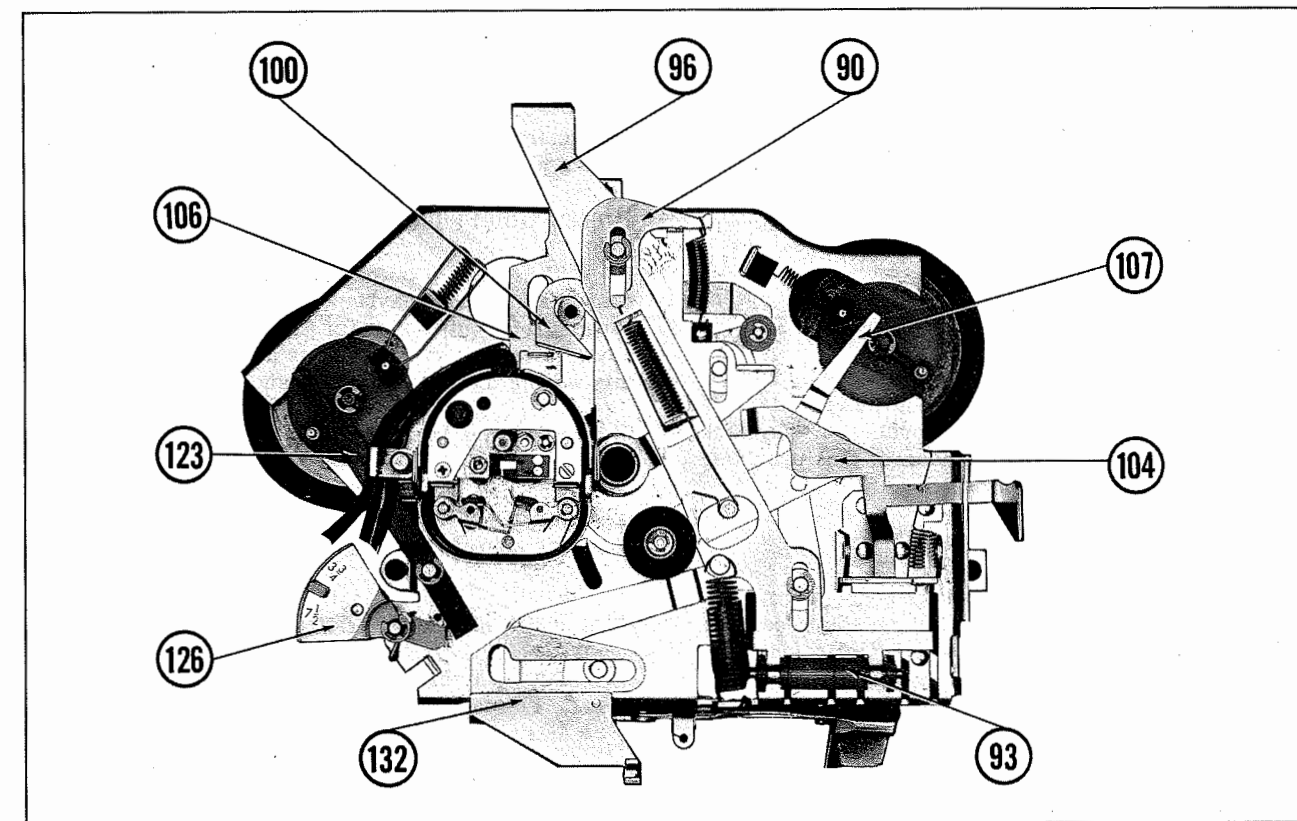


Fig. 5. Top Mechanism Plate.

Function Keys

STOP - Depressing the stop key cancels either the play or the record key. Brakes are applied to the spindles, the tape is held away from the head, and the function switch is put in "Stop" position.

RECORD - The record lock lever must be pulled forward before the record key can be depressed. Then the brakes are released, the tape is held against the head by pressure pads, the pressure roller pushes against the capstan advancing the tape, and the function switch is turned to "Record" position.

PLAY - Depressing the play key causes the same action as the record key except the function switch moves into "Play" position.

High-Speed Lever

Moving the high speed lever to the right causes the tape to advance at a much higher speed than during normal record or playback operation. When the lever is moved to the left, tape is rewound onto the supply reel. The high speed lever can be moved when the recorder is in any function (Play, Record, or Stop) and the play or record keys will be automatically released. When the lever is returned to neutral the recorder is left in the "Stop" position.

Instant Stop & Record Lock Lever

The record lock lever is provided as a safety feature to prevent accidental erasure of pre-recorded

tape. It must be pulled towards the front of the recorder and held there before the record key can be operated. It also serves as an instant stop lever when the tape is in motion during record or playback. When the instant stop lever is pulled towards the front of the recorder the tape drive is disengaged and the tape stops instantly. The recorder returns to its previous operation when the lever is released.

Record Level Indicator

During recording operations the left or "Normal" half of the indicator flashes to indicate a correct volume level and the right or "Distorted" half flashes if the volume setting is too high. If the volume level is preset for recording before the record key is pressed, the tone control should be turned to "Treble". However, after the record key has been pressed the tone control adjustment has no effect. When playing pre-recorded tape ignore the flashing of this indicator.

Record Mike/P.A. - Monitor Switch

This is a slide switch mounted on the rear of the recorder. When the switch is in the "Record Mike" position the speaker does not operate when either the record or stop keys are depressed. This is also true of any speaker which may be connected to the speaker output jack at the time. When the switch is in "P.A. - Monitor" position the speaker is connected so that the recorder can be used as a P.A. system, or so that program material can be monitored as it is being recorded. The switch has no effect when the recorder is in the "Play" mode.

Speed Selector

The speed selector is mounted near the index counter at the left front of the instrument, and determines whether the tape travels at 7 1/2 or 3 3/4 ips. The speed being used appears on the speed selector dial. The recorder does not need to be stopped in order to change speeds. Rapid forward winding can be accelerated by setting the speed selector to 7 1/2 ips.

Index Counter

The index counter can be set to zero by turning the knurled knob toward the rear of the recorder. If the counter is zeroed when recording or playback starts, tape selections can be indexed, thus providing quick and accurate replay or editing.

Input Jack

The input jack can be used to connect a microphone or radio-phono combination to the recorder. The proper input circuit is automatically selected by means of different plug lengths for each application. A short (1") plug is used with the microphone and a longer (1 3/16") plug is used for the radio-phono connection.

External Speaker Jack

An external speaker can be connected to the recorder by means of this jack. The nominal impedance

of the speaker should be 8 ohms, but speakers of impedances ranging from 3.2 to 16 ohms may be used with only a slight loss of power. Accessories such as the TE-401 ear phone or any head phones may be used. The internal speaker of the recorder is disconnected when a plug is inserted into the external speaker jack.

Preamp Output Jack

The preamp output jack is provided for direct connection of the playback signal to a Hi-Fi system, bypassing the output stage of the tape recorder. Where a quarter-track stereo head is used (Model T-1515-4) this will be the upper channel signal.

Stereo Preamp Jack (Model T-1515-4 Only)

The lower channel of a pre-recorded stereo tape is fed out through the stereo preamp jack to an auxiliary amplifier and speaker system.

Head Track Selector (Model T-1515-4 Only)

The quarter-track stereo head on the Model T-1515-4 tape recorder may be used to make either 2- or 4-track monaural recordings. This instrument will play back 2- or 4-track monaural and 2- or 4-track stereo tapes. To function properly, however, the head pole pieces must contact the tape at the proper level. The head track selector moves the head to the correct position when set as indicated in Table II, and the proper side of the tape reel is up.

TABLE II

	Mode of Operation	Track Used	Reel Side Up	Track Selector Dial Setting	Remarks
Record or Playback	Monaural, 2-track	1	Side 1	2 track	See Fig. 6
		2	Side 2	2 track	See Fig. 6
	Monaural, 4-track	1	Side 1	A	See Fig. 7
		2	Side 2	A	See Fig. 7
		3	Side 1	B	See Fig. 8
Playback Only	Stereo, 2-track	4	Side 2	B	See Fig. 8
		1	Side 1	2 track	See Fig. 9
	Stereo, 4-track	1	Side 1	A	See Fig. 10
		2	Side 2	A	See Fig. 10
		2	Side 2	A	See Fig. 10

OPERATING INSTRUCTIONS

Power Supply

Connect the tape recorder to the power source indicated on the back panel of the recorder by using the power cord provided.

Model T-1500	105-120 V, 60 cycles
Model T-1515-4	105-120 V, 60 cycles
Model T-1520	115 V or 220 V, 60 cycles
(See that power switch is in proper position.)	
Model T-1700	115 V, 60 cycles or 12 VDC

Make sure the high speed lever is in the center or neutral position, then turn the recorder on by turning the tone control a few degrees clockwise.

Threading the Tape

Press the stop key. Place a full reel of tape (glossy side out, i.e. "A" wind) on the left spindle. Pull a length of tape off the supply reel and lower it into the threading slot. Attach the end of the tape to the empty take-up reel. Set the index counter to zero for reference.

2. Clutch felt (41) may be worn; replace if necessary.

Tape Squeal or Squeak

Tape squeal or squeak is heard as a high-pitched warbling sound that accompanies recording or playback. It can be noticed in quiet surroundings when listening close to the sound head with the volume turned down. Squeal or squeak can be minimized as follows:

1. Clean head, pressure pads, and tape guides with alcohol.

2. Use a good name-brand tape. Inferior tape with insufficient lubrication may be helped by treating with silicon lubricant.

3. Replace pressure pad felts. Place thin teflon film tape over pads if necessary.

4. Slightly decrease the tension of pressure pad springs (144 and 145, or 173 and 176).

ELECTRICAL TROUBLES

Weak Playback Volume or No High Frequencies

1. Check for faulty silicon rectifiers (M1 and M2) in voltage doubler power supply.

2. Check for open fuse resistors R32 and R33.

3. Check for low B+ to 12AB5 power output tubes.

4. Check for dirty head. Clean head with alcohol.

5. Check pressure pads for weak or improper contact.

6. Wrong type of tape or wind. Dull side of tape should be wound "in" ("A" wind).

7. Check head azimuth adjustment.

8. Check head for wear. If head is worn make compensating adjustment (see High Frequency Equalization Adjustment) or replace if head wear is too great.

9. Check adjustment and condition of L1.

10. If high frequency response is lacking only at 3 3/4 ips, check operation of equalization switch (M7).

Recorder Dead, Pilot Light Off

1. Check fuse (M4). If recorder blows fuses repeatedly, check for B+ shorts; also check type of power source against power requirement listed on nameplate.

2. Check power cord and on-off switch.

No Playback or Record

1. Check tubes and voltages as indicated on schematic diagram. Trouble can be localized by monitoring output at preamp jack: if signal is present here trouble must be in some succeeding stage; if no signal is present trouble may be in preceding stages, or in B+ supply.

2. Check play-record head (Demagnetize head after an ohmmeter is used to check head).

Plays, But Does Not Record, or Records But Does Not Play Back

1. Check amplifier function switch nylon arm adjustment. See if switch arm moves the function

switch all the way back when play key is pressed or all the way forward when the record key is pressed. The switch arm requires adjustment if pushing the switch arm by hand moves the function switch slide slightly more to the rear or front when the play or record keys respectively are pressed. To make adjustment, turn the hexagon nylon cam so that its pin moves the function switch slide as far as possible, both backward and forward when the play and record keys are pressed. To check if adjustment is correct, press the stop key; sight straight down the rear edge of the function switch 7/8" access hole into the amplifier. The rear edge should appear to bisect the small eyelet on the function switch slide.

2. Check for drag or binding on the function switch slide. Switch should not require more than twenty ounces to move back and forth.

3. Check recording source; microphone may be dead, or other source may be faulty.

4. Oscillator tube (V4) may be defective (if so, listener may perceive distortion in playback).

5. Check oscillator coil (L2).

Weak or Distorted Record, Playback of Prerecorded Tape Normal

1. Check oscillator tube (V4).

2. Check input jack for proper contact.

3. Check microphone or other input source for quality of signal. Also check plugs; microphone plug should be a 2-circuit plug with shielded wire connected to tip, shield connected to body. Shaft of plug should be approximately 1" long. High level sources require a 2-circuit plug approximately 1 3/16" long. Failure to push plugs all the way into jack may cause distortion.

4. Check record level indicator lamp. A defective lamp may result in a recording level which is too high or too low.

Record Level Indicator Inoperative or Operation Defective

1. Check for defective lamp.

2. Lamp may glow continuously if there is excessive hum or if the amplifier is oscillating.

WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520

FOLDER 15

MECHANICAL TROUBLES

No Tape Drive In Play or Record

Check for the following possibilities:

1. Tape wound around capstan.
2. Pressure roller tension spring (89) broken or disconnected so that pressure roller (103) is not held against capstan. Connect or replace the spring.
3. Instant stop brake spring (91) broken or disconnected. Brakes will not release and the pull of the capstan may be sufficient to break the tape. Connect or replace the spring.
4. Idler drive spring (122) broken or disconnected. Left high speed idler assembly (120) is not held against motor pulley (55) and flywheel (47). Connect or replace the spring.
5. Slow speed idler spring (60) broken or disconnected and the slow speed idler assembly is not held against motor pulley (55) and flywheel (47). Connect or replace the spring.
6. Motor pulley (55) loose on its shaft. Tighten motor pulley set screw.
7. Grease or oil on high (120) or low speed (58) idler tires.
8. Sticking idler slide (59 or 119).

Take-Up Reel Does Not Turn Although Tape Feeds Past the Capstan

1. Take-up belt (45) broken or off pulley (43). Replace belt or place it back on pulley.

Take-Up Reel Stalls In Playback or Record When Reel is Nearly Full

1. Grease or oil on take-up belt (45) or on take-up clutch felt (41). Clean with alcohol. Replace felt if necessary.

No Fast Forward-Capstan Revolves

1. High speed idler spring (115) broken or disconnected. Idler assembly (120) not held against fly wheel or spindle cup (13). Connect or replace spring.

Fast Forward Stalls With Full Reel

1. Grease or oil on idler assembly tire (120).

No Rewind-Capstan Revolves

1. Rewind spring (32) broken or disconnected. Rewind spindle and tire assembly not held against motor pulley (55). Connect or replace spring.

Tape Overruns or Spills When Functions are Changed

1. Brake arm spring (17) broken or disconnected. Connect or replace spring.

2. Brake roller leaf spring (21) broken or disconnected. Connect or replace spring.

Speed Irregularities (Wow and Flutter)

In general, anything which causes a drag or slipping action other than that occurring during normal operation can cause wow or flutter.

Check for binding in the following:

1. Flywheel bearings. Check by moving right and left idler wheels (120) away from the flywheel and rotate the capstan by hand. A slight drag is normally obtained from take-up belt (45).
2. Pressure roller bearing.
3. All idler and drive wheel bearings.
4. Right and left reel spindles. The brakes should be disengaged or held away before the spindles are turned.
5. Motor bearings. Check by turning shaft by hand.

Check to see that:

1. Supply reel is free to rotate and is not scraping against the top plate.
2. Brakes are completely released.
3. Pressure roller (103) is making good contact with capstan. Pressure roller tension spring (89) should not be too weak or too strong.
4. Capstan and pressure roller are clean.

Check for irregularities in the following:

1. Idler wheel surfaces.
2. Pressure roller (103) surface.
3. Take-up tension. The take-up clutch is designed to slip during normal operation to compensate for the different rate of rotation of a full and an empty reel. Check by holding the right hand spindle while the recorder is in play position. The clutch action should be smooth and non-pulsating. If the surface of the take-up clutch felt (41) is gummy or if the felt is worn, it should be replaced.

Bottom Motor Shaft Pin Rubs on Bottom Ventilating Grill

1. Place washers under motor supports on side rubbing to more nearly center the motor in grille opening when recorder is in normal position.

Insufficient Tape Takeup

1. Increase take up action by adding another washer (46) under take-up pulley assembly.

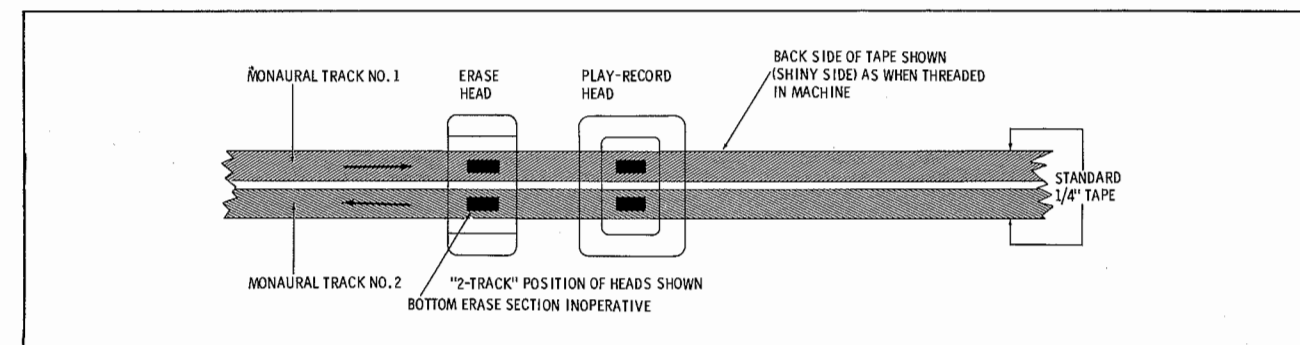


Fig. 6. "2-Track" Position of Heads Shown for Monaural Record or Playback Operations in Model T-1515-4.

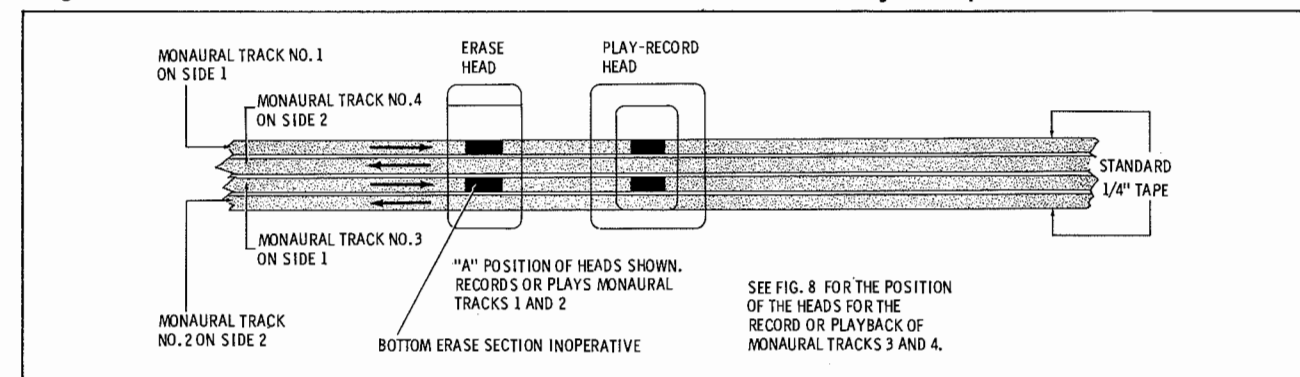


Fig. 7. "A" Position of Heads Shown in Model T-1515-4.

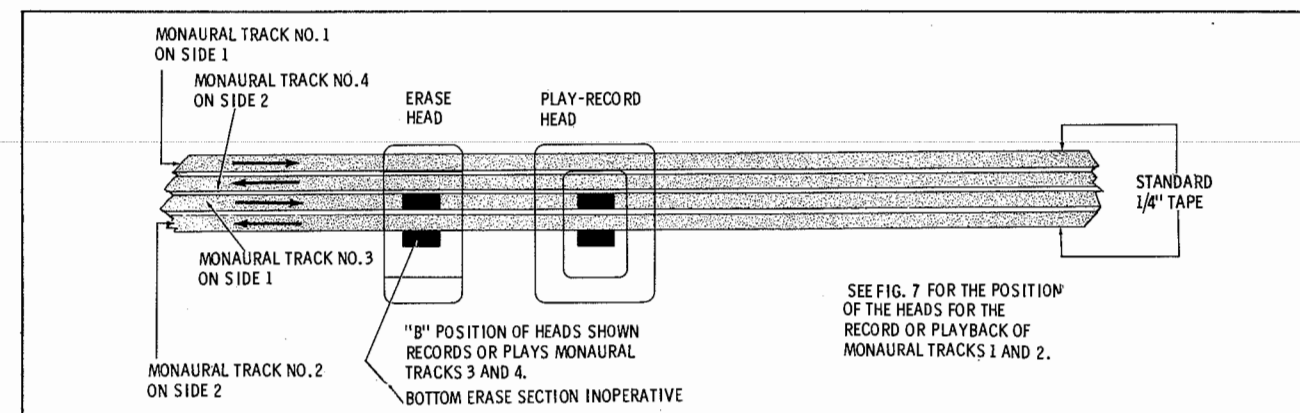


Fig. 8. "B" Position of Heads Shown in Model T-1515-4.

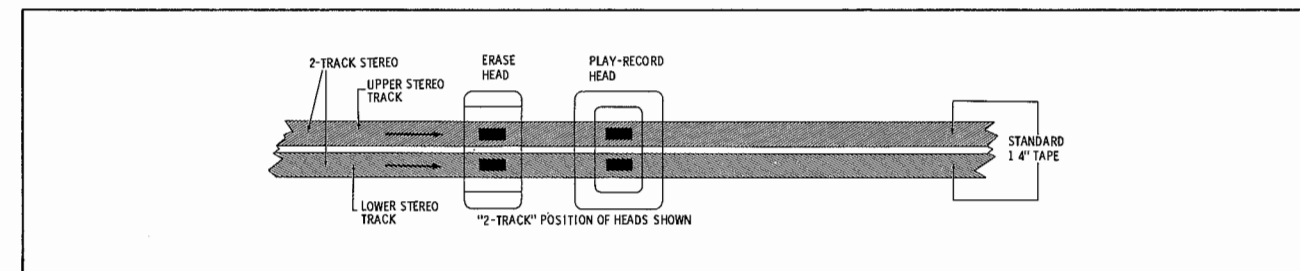


Fig. 9. "2-Track" Position of Heads Shown for Stereo 2-Track Playback in Model T-1515-4.

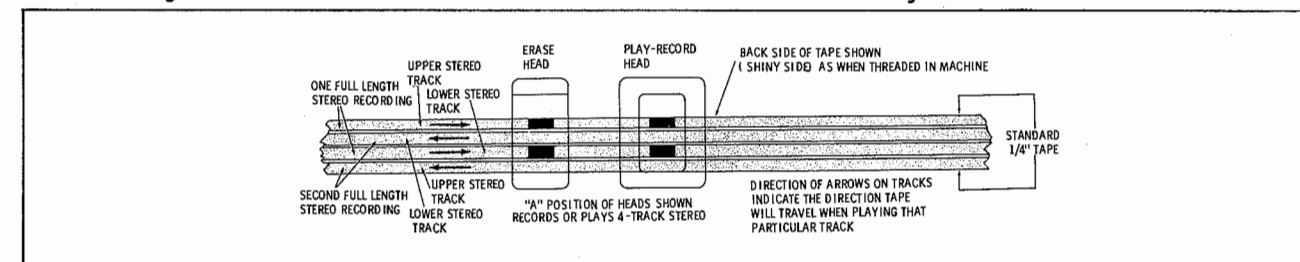


Fig. 10. "A" Position of Heads Shown for 4-Track Playback in Model T-1515-4.

Recording With A Microphone

Insert the microphone plug into the input jack at the rear of the recorder. Set the slide switch to "Record Mike." Select the desired tape speed (7 1/2 or 3 3/4 ips) by means of the speed selector. For Model T-1515-4 only, set track selector to proper position (see Table II).

If it is desired to set the record level before the tape is set in motion, turn the tone control to "Treble" and adjust the volume control until the "Normal" half of the indicator flashes and no flashing occurs at the distorted half.

Pull back the instant stop-record lock lever and press the record key. Release the instant stop lever and recording will be started. When the recording is finished, press the stop key.

The signal can be monitored during recording if the slide switch on the rear panel is set to "P.A.-Monitor". However care should be used to keep the microphone away from the speaker or acoustic feedback may cause squealing. This danger can be avoided if earphones are used instead of the speaker. The earphones should be plugged into the external speaker socket. When the recording is completed the tape can be rewound by moving the high speed lever to the left. Before rewinding the tape additional material may be recorded by turning over the full takeup reel and placing it on the supply spindle. (For Model T-1515-4 only, four tracks may be recorded. See Table II.)

Recording from an External Amplifier

Connect the signal source to the input jack of the tape recorder with an A196-13 Hi-Fi cable, or other similar cable with a long (1 3/16") plug. Proceed the same as when recording with a microphone.

Recordings can be made from external sources such as Phonographs, Radios, TV's or AM-FM tuners. The outputs from these sources are commonly marked "Detector", "Tape", "Recorder Input" or "Pre-Amp Output", and can be connected directly to the Microphone-Phono-Radio input of the recorder. If the external amplifier has a level control for the output jack being used, it should be set so that the recorder volume control will be somewhere near its midrange for proper operation of the level indicator. Tone controls and loudness controls on the external amplifier should be set as nearly as possible to feed a flat output signal to the recorder.

Erasing Tape

Whenever a monaural recording is made, any previously recorded material on the tape is automatically erased before the new material is recorded. Erasing is accomplished only when the recorder is in the "Record" function. A half-track head (Models T-1500, TS-1520, and T-1700) erases one-half of the tape each time it is used; a quarter-track head (Model T-1515-4) erases one-fourth of the tape. To erase without recording new sound, turn the volume control down before pressing the record key.

On Model T-1515-4 only, tape should be erased before recording if the tape will be played on a re-

corder which has a half-track head. This is necessary because the Model T-1515-4 erases and records one-fourth the width of the tape, so there will be both old and new recordings on the half of the tape the second recorder would play. Erasing can be accomplished by running the tape through the Model T-1515-4 recorder four times, or by the use of a bulk tape eraser.

Playing Back a Monaural Recording

Thread the tape, and locate the desired starting point by using the high speed lever. Set speed selector for the speed at which the tape was recorded. Push down the play key, then adjust volume and tone controls to suit. If it is a dual track recording turn over the takeup reel at the end of the first track and put it on the supply spindle. Rethread the tape and play as before.

If it is desired to use an external Hi-Fi system, connect the preamp output jack on the back panel of the recorder to the Hi-Fi input with a shielded cable such as Wollensak A196-13 Hi-Fi cable. Set the recorder's tone control to "Hi-Fi" and adjust the volume until the "Normal" side of the level indicator flashes. Thereafter adjust the volume and tone controls of the external amplifier to suit.

For Model T-1515-4 only, when playing 2-track monaural recordings, set head track selector on "2-track". For 4-track monaural recordings set head track selector on "A" or "B", depending on which track is to be played. See Table II.

Playing Back a Stereo Recording (Model T-1515-4)

Connect the stereo preamp jack to an external amplifier and speaker system, placing the speaker at least seven feet to the right of the tape recorder. If a stereo amplifier is to be used, connect the preamp output jack to the left channel input, and the stereo preamp jack to the right channel input. In this arrangement the output stage and speaker of the tape recorder are not used.

Thread the tape and locate the desired starting point by using the high speed lever. Set speed selector for the speed at which the tape was recorded. For 2-track stereo tapes set head track selector on "2-track"; for 4-track set selector on "A". Push down the play key, then adjust volume and tone controls for proper balance.

For 2-track stereo tapes, rewind tape at the end of the reel to prepare for the next playing. 4-track stereo tapes contain additional program material, so turn the full takeup reel over at the end of the first side and place it on the supply spindle. Leave the head track selector knob set on "A". At the end of the second side this tape will be ready for the next playing without rewinding.

Public Address System

Press the stop key of the recorder and set the slide switch to "P.A.--Monitor". Plug the microphone into the input jack and the external speaker or speakers into the external speaker jack. Keep microphone and speakers separated as far as possible to avoid feedback and howling.

The equalization adjustment has been properly made at the factory and should not require readjustment for at least 500 hours of use. Before any adjustment is made, the heads should be carefully cleaned with alcohol. Make the adjustment in the following manner:

1. Record signals of equal amplitude at 10 kc and 15 kc, well below (-15 db) normal level.
2. Set the tone control for "Hi-Fi" and measure the two signals at the Pre-amp output during playback.
3. Adjust the core of the peaking coil (L1) so that the output at 15 kc is the same as at 10 kc. Use the 10 kc recording as a reference. The threaded shaft of the core is accessible from the tube side of the chassis, near hum control (R3) between transformers (T1) and (T2).

Hum Balancing Adjustment

Two access holes are provided in the recorder's bottom cover (near manufacturer's label) for adjustment of hum controls R3 and R4. The access hole nearest the manufacturer's label provides for the adjustment of R4. The other hole provides for the adjustment of R3. Adjust with a small bladed screwdriver.

Adjust hum controls R3 and R4 as follows:

1. Turn recorder on, allow warmup, and then press play key. Do not use a tape.
2. Turn Volume control to "0" position (minimum). To lower hum, first try reversing the power plug.
3. If hum still exists, adjust R4 for minimum hum.
4. Turn Volume control to the "10" position (maximum) and adjust R3 for minimum hum. If R3 adjusts for minimum hum at one end of its rotation, leave Volume control at maximum and readjust R4 for minimum hum.

The majority of defects, other than wear or breakage, can be traced to dirty surfaces. The play-record and erase heads, capstan, and pressure roller are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts.

CLEANING

This accumulation should be periodically removed since it will cause faint recording and poor playback. Wipe off the above surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen cloth slightly with alcohol.

LUBRICATION

All moving parts in this recorder were permanently lubricated at time of manufacture. Under normal use further lubrication should not be required. In heavy-duty service, the following parts should be lubricated once a year with a drop of #10 motor oil:

1. The top and bottom motor bearings.
2. The top and bottom flywheel (47) bearings.
3. Pressure roller (103) bearing.

Model T-1515-4 has hum balancing controls R5 and R6 which affect the hum level for stereo playback operations from the lower channel of the stereo head. The stereo preamp adjustments have been factory adjusted for minimum hum, but in some cases, a readjustment may be necessary. No access holes are provided in the recorder's bottom cover for adjustment of these controls; therefore, it is necessary to remove the bottom cover.

Adjust R5 and R6 as follows:

1. First, perform hum balancing adjustments for R3 and R4 as specified previously.
2. Press Stop key.
3. Turn up the volume control on the auxiliary amplifier that is connected to the recorder's stereo preamp jack in a typical stereo hook-up.
4. Use a small-bladed screwdriver and adjust R5 and R6 for minimum hum.

Bias Current Adjustment

1. Remove bottom cover from recorder. See "To Remove Mechanism from Case" under "Disassembly Instructions".
2. Unplug 4-prong head plug (M11). Remove 1/2" of insulation from a length of hook-up wire and wrap several turns of the bare wire around pin #2 of the head plug.
3. Reinsert plug into socket being careful not to short the wire to the chassis or another pin on the plug.
4. Connect a VTVM (capable of accurately measuring voltage at 75 kc) between the wire (pin #2) and chassis ground.
5. Operate the recorder in "Record" position.
6. Adjust bias/erase oscillator coil (L2) core for a reading on the VTVM of 40 VAC (Model T-1515-4) or 50 VAC (Models T-1500, TS-1520 and T-1700). See Fig. 13 for location of adjustment.

WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520

FOLDER 15

Replacing Half-Track Sound Head (Models T-1500, TS-1520, and T-1700)

1. After removing head retainer spring (137) lift head and brass alignment plate from head shield cup. Unplug head cable plug.

2. Pry head from brass alignment plate. Note position of location pins.

3. Place the new head over the pins in the aligning plate in the proper location and press into place.

4. Replace alignment plate into head cup. The two brass pivot studs should engage the two holes in the plate. Replace head retainer spring.

5. Align head azimuth as described in electrical adjustments.

ELECTRICAL ADJUSTMENTS

Head Azimuth (Models T-1500, TS-1520, and T-1700)

An alignment tape, which can be obtained from Ampex or the larger radio supply houses, should be used to align the head. The tape should have a full-track recording at a frequency higher than 6,000 cps. While the alignment tape is being played on the recorder adjust alignment screw (140) for maximum output. Cement screw with "Locktite."

If an alignment tape is not available, play a previously recorded tape and adjust alignment screw (140) for maximum treble response. This is the only head adjustment needed on Models T-1500, TS-1520, and T-1700.

Record Head Height (Model T-1515-4)

1. Set head track selector (146) to "A" position. Remove head cover casting (3) and track selector knob.

2. While playing a tape recording place a finger on the roll pin in record pressure pad (174), and pull back pressure pads. Tape should move smoothly past the heads.

3. Using a #2 Bristol wrench, adjust screw (153) through head height adjustment hole so that top of upper head element is exactly even with tape. See Figs. 11 and 18

Erase Head Height (Model T-1515-4)

1. Repeat Steps 1 and 2 under "Record Head Height".

2. Turn erase head mounting nut (158) until the top edge of upper erase element is even with top edge of tape (Refer to Fig. 18).

If there is any doubt about the record and erase head height adjustments, they can best be checked

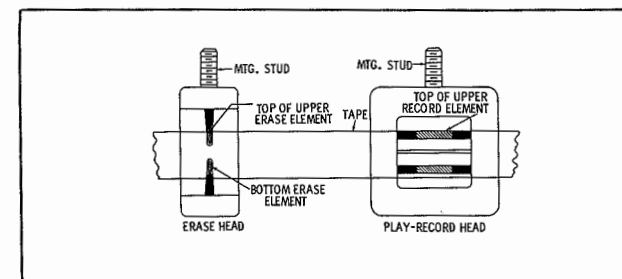


Fig. 18. Head Height Location.

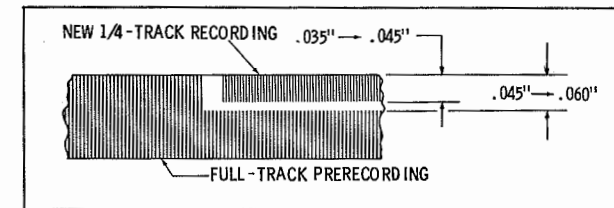


Fig. 19. Magnetic Dispersal Pattern.

with magnetic powder dispersal, such as the Magna-See Kit manufactured by Reeves Soundcraft, Danbury, Connecticut. The procedure is as follows:

1. Set head track selector knob to "A" position.

2. Make a constant tone recording (any frequency) on a previously recorded full or half-track tape.

3. Submerge a small section of the tape as described in the Magna-See Kit instructions. The pattern shown in Fig. 19 should appear. Inexpensive pocket microscopes calibrated in thousandths of an inch can be used to measure the track width.

Record Head Azimuth (Model T-1515-4)

An alignment tape which can be obtained from Ampex or the larger radio supply houses should be used to align the head. This tape should have a full track recording at a frequency higher than 6,000 cps. Adjust head azimuth as follows:

1. Set head track selector in "2 track" position. Remove head cover casting (3) and track selector knob.

2. While playing the alignment tape adjust record head azimuth nut (159) for maximum output.

3. In lieu of the alignment tape, play a commercial prerecorded 2-track tape, and adjust the head for maximum treble response.

4. After adjusting the azimuth, check to see that the head height has not been disturbed. Use "Locktite" cement on the adjusting nuts.

High Frequency Equalization Adjustment

An adjustment is provided in the cathode circuit of V2A (12AT7) to compensate for high frequency losses which accompany long term head wear. This equalization has more effect upon the playback than it has upon the recording process; therefore, the adjustment is made for best results during playback.

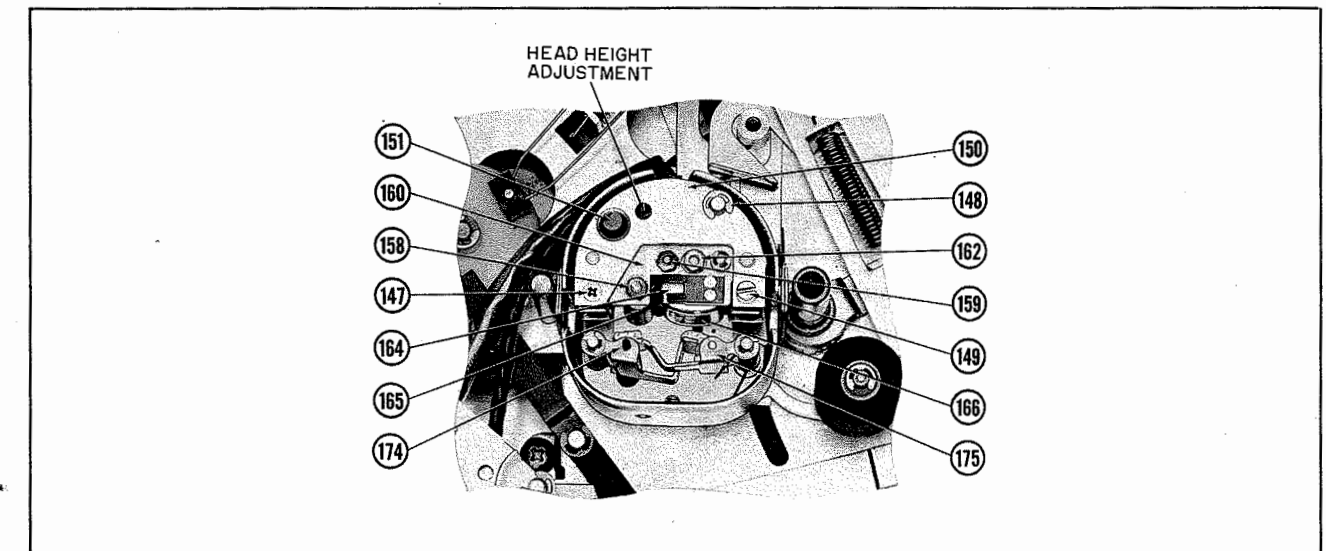


Fig. 11. Top View of Head Assembly.

Splicing and Editing

Tape from a dual track recorder can be edited if only one track has been recorded or if the program on the other track can be sacrificed. Undesirable portions can be cut out, announcements can be inserted between selections, etc. Unused sections of tape can then be spliced together and re-used. Tape should be cut on a diagonal and the ends joined together with splicing tape on the glossy side. Any excess width should be trimmed.

Program material can be edited very precisely

in the following manner:

1. Press "Play" key and stop the tape with the instant stop lever. Turn the reels by hand to locate the word of sound.

2. Remove the head cover and mark the tape at the right hand element in the black slot of the sound head.

3. Remove the tape from the threading slot and cut at the mark.

DISASSEMBLY INSTRUCTIONS

To Remove Mechanism From Case

1. Remove top panel.

A. Remove 5 painted screws holding top panel (3 screws between reel spindles and 1 on each forward corner).

B. Remove 2 chrome-plated screws on top of perforated grill directly in front of head cover.

C. Remove clean out cover bar, by pulling up.

D. Carefully pry up top panel at the rear enough to just clear the reel spindles; pull it back to remove.

2. Remove bottom cover by removing 8 screws: 4 screws in line with, and inside front rubber feet; 2 screws on side panels 1/2" above rear feet (for Model T-1700 only - 1 screw on left side panel 1/2" above rear foot and 1 screw inside right rear foot); 2 screws 1" to the side of the top cover hinges. Remove bottom cover.

3. Remove counter belt from counter pulley.

4. Remove high speed knob by pulling up.

5. Remove the three remaining Phillips head screws from each side panel. Remove side panels. (For TS-1520 and T-1700 disassembly an extra power plug will have to be removed before the left side casting can be removed.

6. Remove speaker plug from amplifier chassis and slide mechanism away from control panel.

To Remove Amplifier From Transport Mechanism

1. Unplug motor plug.

2. Unplug head plug. (Model T-1515-4 only, unplug 2 head plugs).

3. Remove nylon function switcharm from bottom of amplifier by pulling off.

4. Remove four Phillips head screws (3-long, 1-short) from bottom of amplifier chassis holding each corner. Lift amplifier chassis away from tape transport mechanism. In Model T-1515-4 a bracket holding the stereo preamplifier to the mechanism plate will also have to be removed.

To Remove Amplifier Without Complete Disassembly

1. Turn Speed Selector to 7 1/2 ips. Remove bottom cover and right side panel as outlined above.

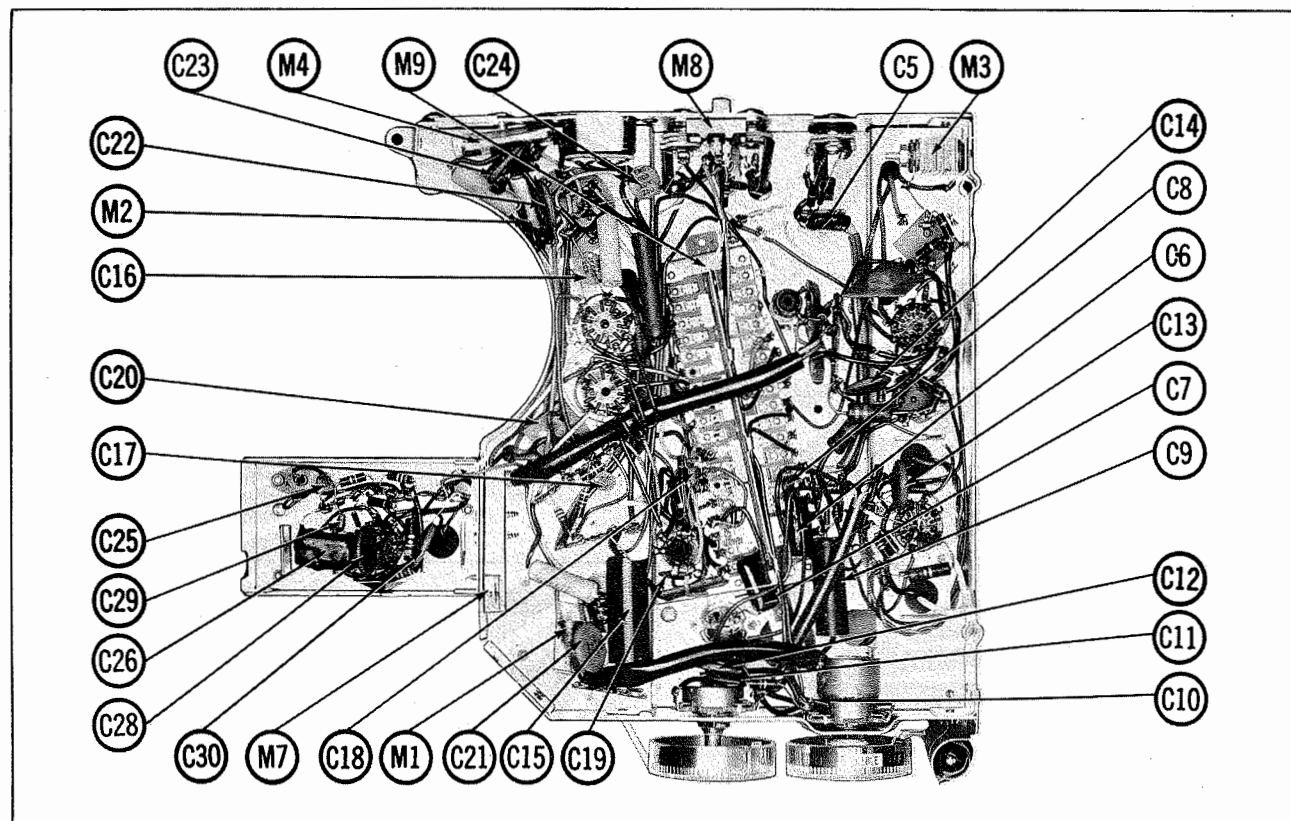


Fig. 12. Bottom View of Amplifier Chassis- Capacitor and Miscellaneous Identification.

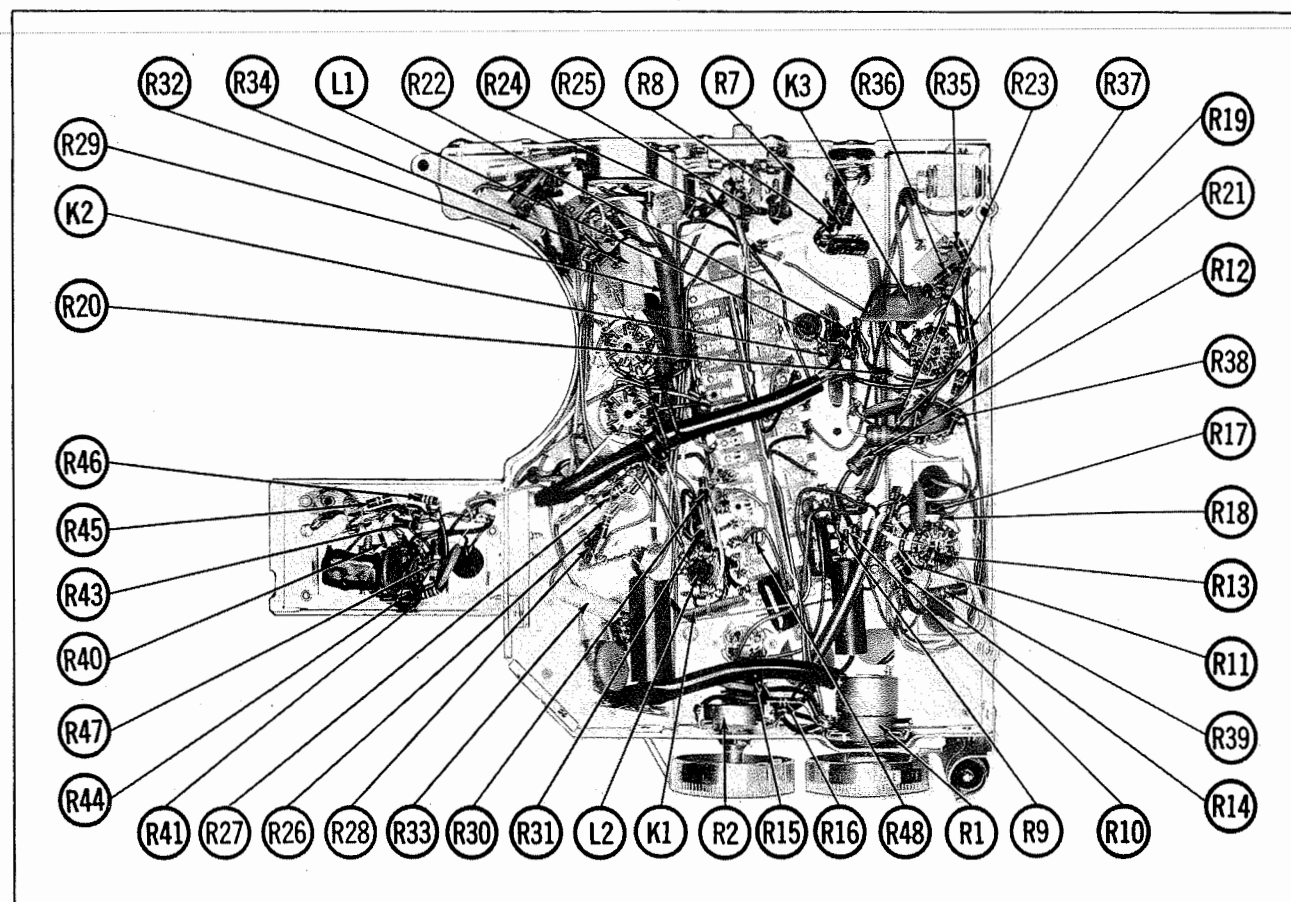


Fig. 13. Bottom View of Amplifier Chassis-Resistor & Inductor Identification

(In Model T-1515-4 both side panels will have to be removed).

2. Pull the nylon function switch arm out of the chassis bottom.

3. Unplug the head plug, motor plug, and speaker plug. In Models T-1520 and T-1700 an extra power plug has to be removed.

PRELIMINARY TESTS - REPAIR PROCEDURE

TEST PROCEDURE -- FAILURE TO PASS ANY OF THESE TESTS INDICATES A FAULT THAT SHOULD BE REMEDIED.

1. Remove head cover casting (3) and pull out cleanout cover casting (4). Clean heads, tape guides, and capstan with alcohol.

2. Press stop key. Place high speed knob in the middle or neutral position. Turn on recorder by rotating tone control.

3. Place reel of tape on rewind (left) spindle, and pull out about 12" of tape. Brakes should be engaged. Pull required on reel should not distort the tape, but there should be a sufficient drag to prevent spilling of tape. Drop tape in threading slot, and attach free end to takeup reel (right). Reel should rotate freely counter-clockwise and drag when rotated clockwise.

4. Press play key; it should latch down. Brakes on both spindles should release. Record pressure pad assembly (142 or 174) and erase pressure pad assembly (143 or 175) should press tape squarely against head (s). Pressure roller (103) should push tape against flywheel-capstan assembly (47) causing tape to move smoothly past the head at speed set on the speed indicator. Takeup reel should wind tape as it passes flywheel-capstan assembly (47). The counter should tally each revolution of the supply reel.

5. Move high speed knob to the right. This movement should release play key. Pressure roller and pressure pads should be released. The tape should move forward at greatly increased velocity.

6. Return high speed knob to the middle or neutral position. Pressure pads and pressure roller should remain disengaged. Brake pressure on spindles should increase smoothly, bringing tape to a stop without spilling.

7. Make a recording with the microphone. Adjust volume control while speaking so that normal indicator flashes and distorted does not.

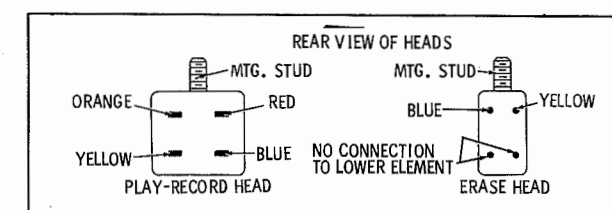


Fig. 17. Head Wire Color Coding.

4. Remove the four Phillips head screws holding the chassis corners to the mechanism.

5. Note the position of the plastic insulator between chassis and mechanism. Lift chassis up and to the right to remove.

NOTE: When reassembling, make sure mechanism is in 7 1/2 ips position and nylon chassis insulator is in place.

8. Move high speed knob to the left. Record key should release and the tape should rewind rapidly.

9. Playback recording. Check volume, tone and overall quality. Pull instant stop arm (104) forward. Tape should stop at once. When arm is released, tape should start instantly without spilling off reels.

10. Rewind tape and re-record over previous recording. All trace of previous recording should be erased on the portion of tape re-used. Check for irregularities in playing speed (wow and flutter).

Replacing Quarter-Track Sound and Erase Head (Model T-1515-4)

Refer to Fig. 11.

1. Remove cover plate (3) and track selector knob (146).

2. Unfasten cover plate assembly (150) by removing two screws (147 and 149) and one "e" ring (148). Lift off cam shank and pin assembly (151) with cover plate assembly (150). Be careful not to lose ball (154) resting on cam adjustment lever (155).

3. Lift out upper and lower bushing plate assembly (160) in which the heads are mounted. If head cables are too tight, slide some slack through the cable clamp or remove clamp.

4. To remove record-playback head, unscrew nut (162) and pry head from mounting plate (164). Disconnect cable from head using long-nosed pliers. Note color coding of leads (Refer to Fig. 17).

5. To remove erase head, unscrew nut (158) and pry head loose from upper bushing plate (160). Disconnect wires from head connecting pins. These wire connections are crimped into the erase head pins, and therefore need to be cut in order to be removed. Note wire color coding as shown in Fig. 17. After wires are cut, strip the insulation from the ends of the wires in readiness for connecting to the replacement head.

6. To replace erase and/or record - playback head reverse foregoing procedure. It is necessary to align the heads when they are replaced. See "Stereo Head Alignment."

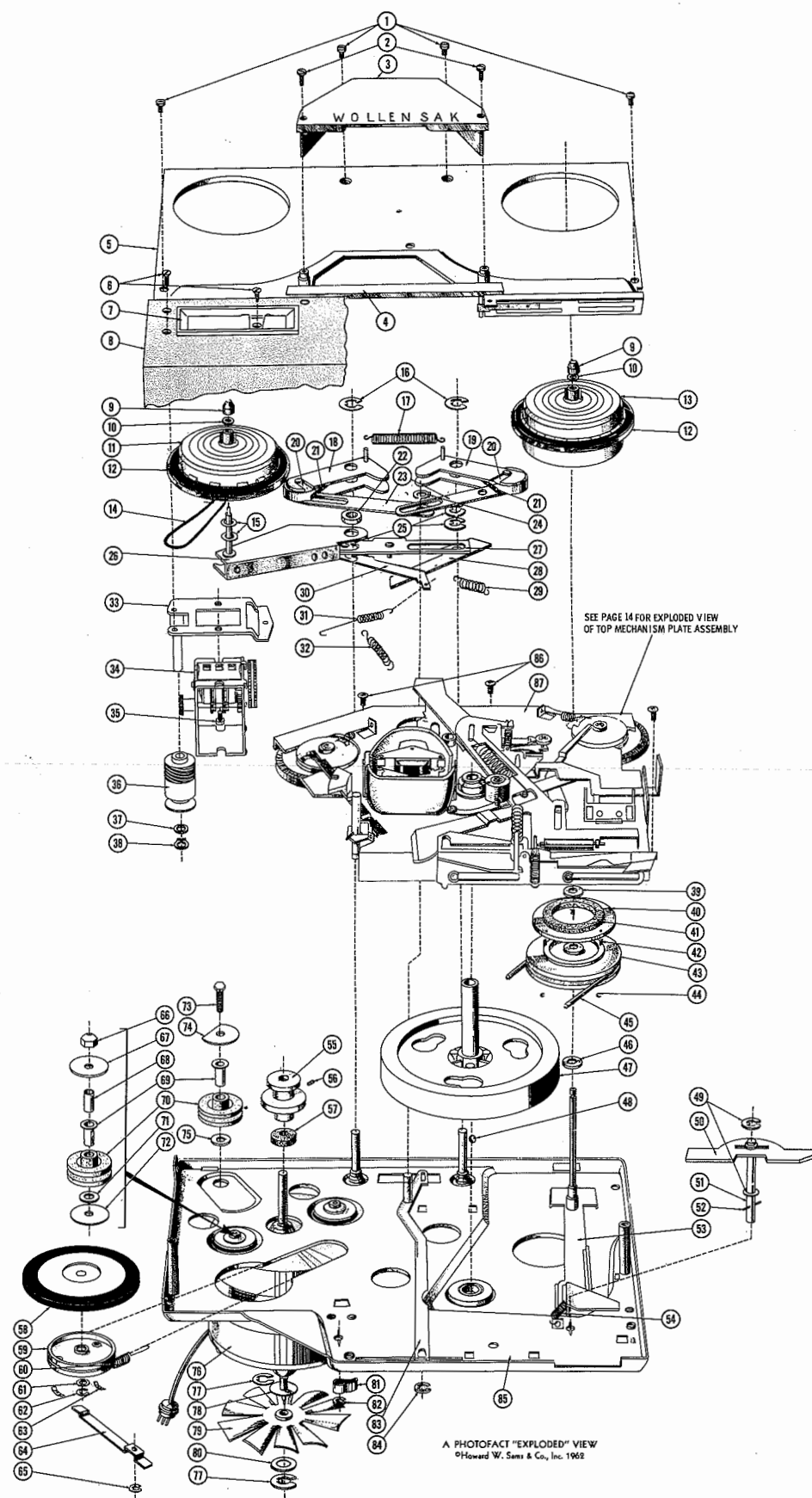


Fig. 15. Exploded View of Transport Mechanism .

WOLLENSAK MODELS
T-1500, T-1515-4, T-1700, TS-1520

FOLDER 15

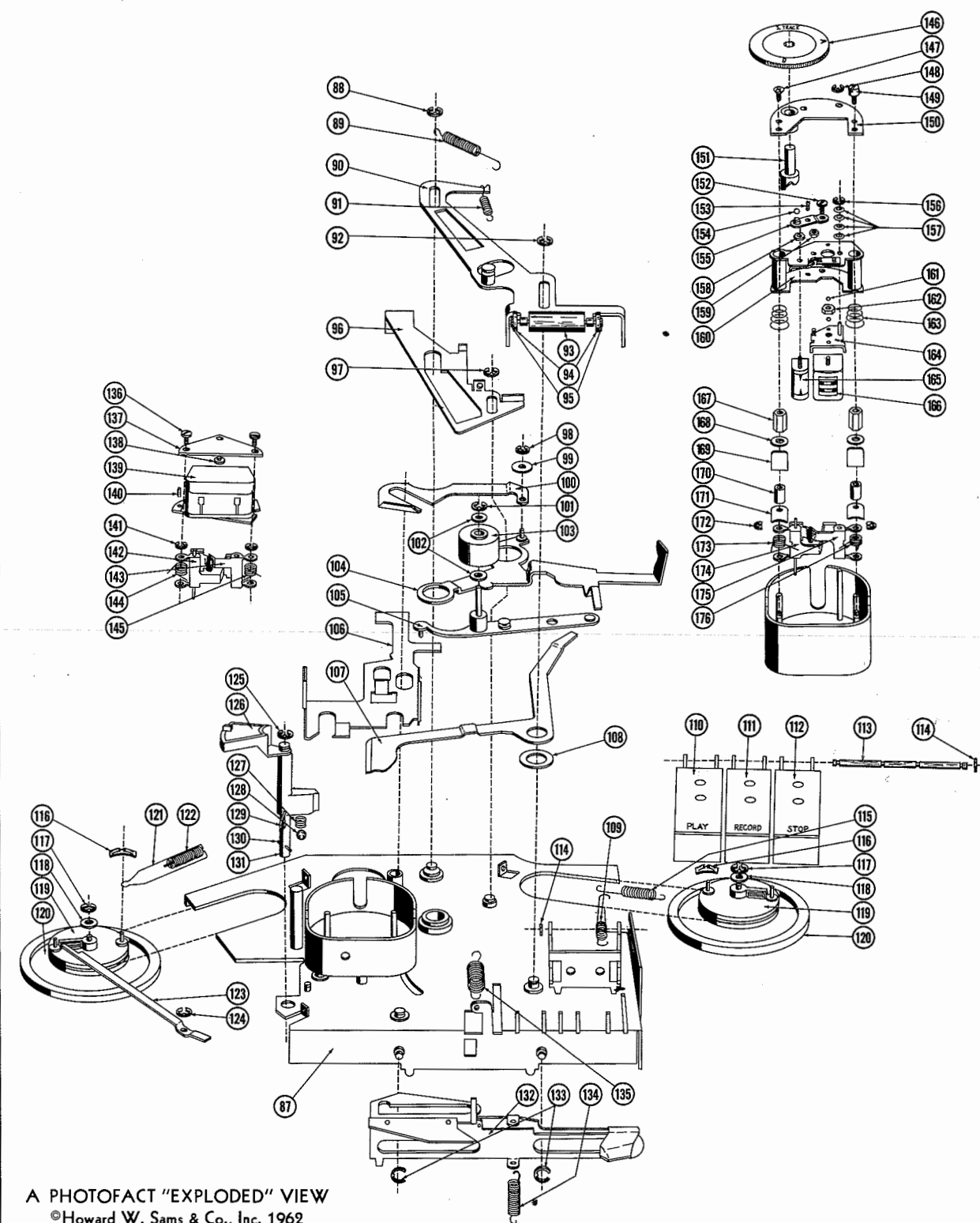
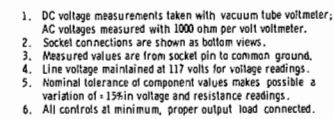


Fig. 16. Exploded View of Top Mechanism Plate.



Ⓢ SEE PARTS LIST FOR ALTERNATE
VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM
NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS										
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	1290K	10meg	10Ω	FIL	FIL	1290K	10meg	0Ω	FIL
V2	12A17	1120K	2.4meg ±15K	910Ω	FIL	FIL	14900Ω	1meg	300Ω	FIL
V3	12AB5	+200Ω	NC	≈ 730Ω	FIL	FIL	NC	≈ 300Ω	NC	≈ 405Ω
V4	12AB5	+210Ω	NC	≈ 500Ω ≈ 10K	FIL	FIL	NC	≈ 300Ω	NC	≈ 1400Ω ≈ 1200Ω
V5	7025	1540K	10meg	10Ω	FIL	FIL	1340K	10meg	0Ω	FIL

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED,
 ■ MEASURED IN "RECORD" POSITION. † MEASURED FROM OUTPUT OF M1.
 ▲ MEASURED FROM B- LINE. ‡ MEASURED FROM OUTPUT OF M3.
 NC NO CONNECTION

11

