

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	714-A-276	Spindle Cap	26		Drive Mechanism Bracket
2	711-A-422	Reel Support	27	964-A-163	Wind Drive Wheel
3	824-A-10	Record Lock Button	28	964-B-59	Clutch Plate Assembly
4		Rear Trim Cover	29	871-A-32	Clutch Backing Felt
5	711-A-495	Lock Button Retainer	30	711-A-476	Spindle Plate
6	824-A-9	Function Control Knob	31		Motor Mounting Bracket
7	765-D-17	Front Trim Cover	32	714-338	Take-up Spindle
8		Top Panel	33		Flywheel & Capstan Assembly
9		Rear Trim Cover Mtg. Bracket	34		Pressure Roller Actuating Lever
10		Amplifier Control Knobs	35	616-A-16	Idler Washer
11	964-A-116	Pressure Roller	36	711-A-438	Idler Engagement Spring
12	964-B-1	Record Head	37	712-A-41	Idler Lift Spring
13	871-A-30	Pressure Pad	38	714-A-291	Idler Spacer
14	964-B-2	Erase Head	39	717-B-11	Motor Fan
15		Mechanism Plate	40		Idler Actuating Spring
16	712-A-43	Clutch Compression Spring	41	619-A-22	Hair Pin Clip
17	714-339	Feed Reel Spindle	42	619-A-20	"E" Ring
18	964-A-130	Idler Wheel	43	851-A-8	Rubber Bumper
19		Motor	44	619-A-21	1/8" Retaining Ring
20	711-A-476	Rewind Drive Plate	45	616-A-720-9	Steel Washer, 5/16 x 5/8 x .010
21	964-A-163	Rewind Drive Wheel	46		Steel Washer, 1/4 x 1/2 x .010
22		Drive Shaft	47	616-A-714-9	Steel Washer, 5/16 x 7/16 x .010
23	711-A-429	Connecting Arm Assembly	48	712-A-12	Actuator Control Spring
24	854-A-17	Drive Belt	49		Speed Change Lever
25	764-A-27	Drive Pulley	50		Pressure Roller Actuating Spring

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	5879	Pre-Amp.	R5		Resistor 33K@1/2 W.
V2	12AX7	AF Amp.	R6		Resistor 2.7K@1/2 W.
V3	6AQ5	Bias Osc. -Output	R7		Resistor 2.2Meg @1/2 W.
V4	6X4	Rectifier	R8		Resistor 470K@1/2 W.
C1A		Elect. Cap. , 30MFD@350V.	R9		Resistor 82K@1/2 W.
C1B		Elect. Cap. , 10MFD@350V.	R10		Resistor 2.7K@1/2 W.
C1C		Elect. Cap. , 10MFD@350V.	R11		Resistor 270K@1/2 W.
C1D		Elect. Cap. , 25MFD@25V.	R12		Resistor 220K@1/2 W.
C2		Elect. Cap. , 25MFD@25V.	R13		Resistor 1.5K@1/2 W.
C3		Cap. , Ceramic, 250MMF, 10%	R14		Resistor 1 Meg@1/2 W.
C4		Cap. , Molded Paper, .05MFD@400V.	R15		Resistor 100K@1/2 W.
C5		Cap. , Ceramic, 10,000MMF, 20%	R16		Resistor 220K@1/2 W.
C6		Cap. , Ceramic, 250MMF, 20%	R17		Resistor 270K@1/2 W.
C7		Cap. , Ceramic, 250MMF, 10%	R18		Resistor 22K@1/2 W.
C8		Cap. , Ceramic, 5000MMF, 20%	R19		Resistor 100K@1/2 W.
C9		Cap. , Ceramic, 10,000MMF, 20%	R20		Resistor 270K@1 W.
C10		Cap. , Molded Paper, .05MFD@400V.	R21		Resistor 270K@1/2 W. (Note-R21 Selected To Give Correct Neon Lamp(NE51) Operation. Range 270K to 390K
C11		Cap. , Ceramic, 1000MMF, 20%	R22		Resistor 100K@1/2 W.
C12		Cap. , Ceramic, 3000MMF, 20%	R23		Resistor 820K@1/2 W.
C13		Cap. , Ceramic, 250MMF, 10%	R24		Resistor 6.8K@1 W.
C14		Cap. , Ceramic, 10000MMF, 20%	R25		Resistor 22K@1/2 W.
C15		Cap. , Ceramic, 500MMF, 20%	R26		Resistor 150K@1/2 W.
C16		Cap. , Ceramic, 250MMF, 10%	L1	311-13	Bias Osc. Coil
C17		Cap. , Ceramic, 3000 MMF	T1	352-28	Power Transformer
C18		Cap. , Ceramic, 3000MMF, 20%	T2	342-12	Output Transformer
R1		Vol. Cont. 500K	M1	534A3	Slide Switch
R2		Tone Cont. And Sw. Assy. 500K	M2		Neon Lamp NE51
R3		Resistor 33K@1/2 W.	SP1		Speaker
R4		Resistor 1 Meg@1/2 W.			

PHOTOFACT* Folder



PENTRON
MODEL CT-1

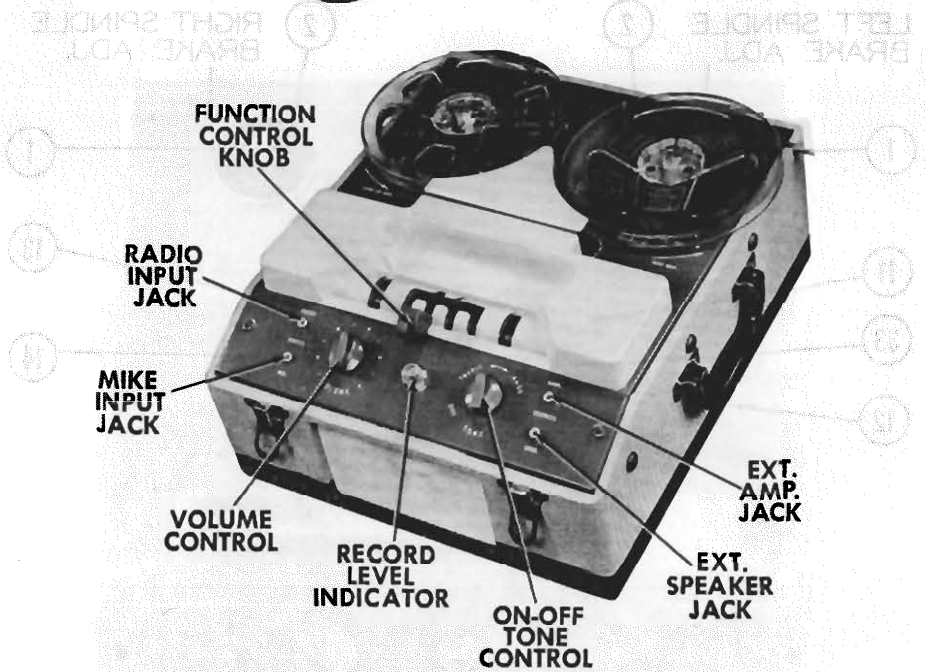


Figure 1
GENERAL INFORMATION

The Pentron Model CT-1 Tape Recorder features a Monomatic* control which controls all mechanical functions of the recorder. They are as follows: Wind, Play (either 3 3/4 or 7 1/2 ips.), Rewind, Neutral, and Record (either 3 3/4 or 7 1/2 ips.).

This recorder is of the dual track type, permitting two separate tracks of material to be recorded and played back on a reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker or an external speaker may be used through use of the "Spkr". Output Jack. The output of the recorder may be fed into an external amplifier, radio, TV receiver, or public address system, by use of the "Ampl." Output Jack.

Model CT-1 has two tape speeds, 7 1/2" and 3 3/4" per second. Using both tracks of the tape, the recording time is as follows:

SIZE REEL	3 3/4" SPEED	7 1/2" SPEED
5"	1 hour	1/2 hour
7"	2 hours	1 hour

This recorder is designed to operate on 60 cycle, 110-120 volts, AC supply only.

CAUTION: Before connecting recorder to line supply be absolutely certain that it agrees with the above specifications.

*A Registered Tradename of the Pentron Corporation.

Manufactured by:

The Pentron Corporation
777 South Tripp Avenue
Chicago 24, Illinois

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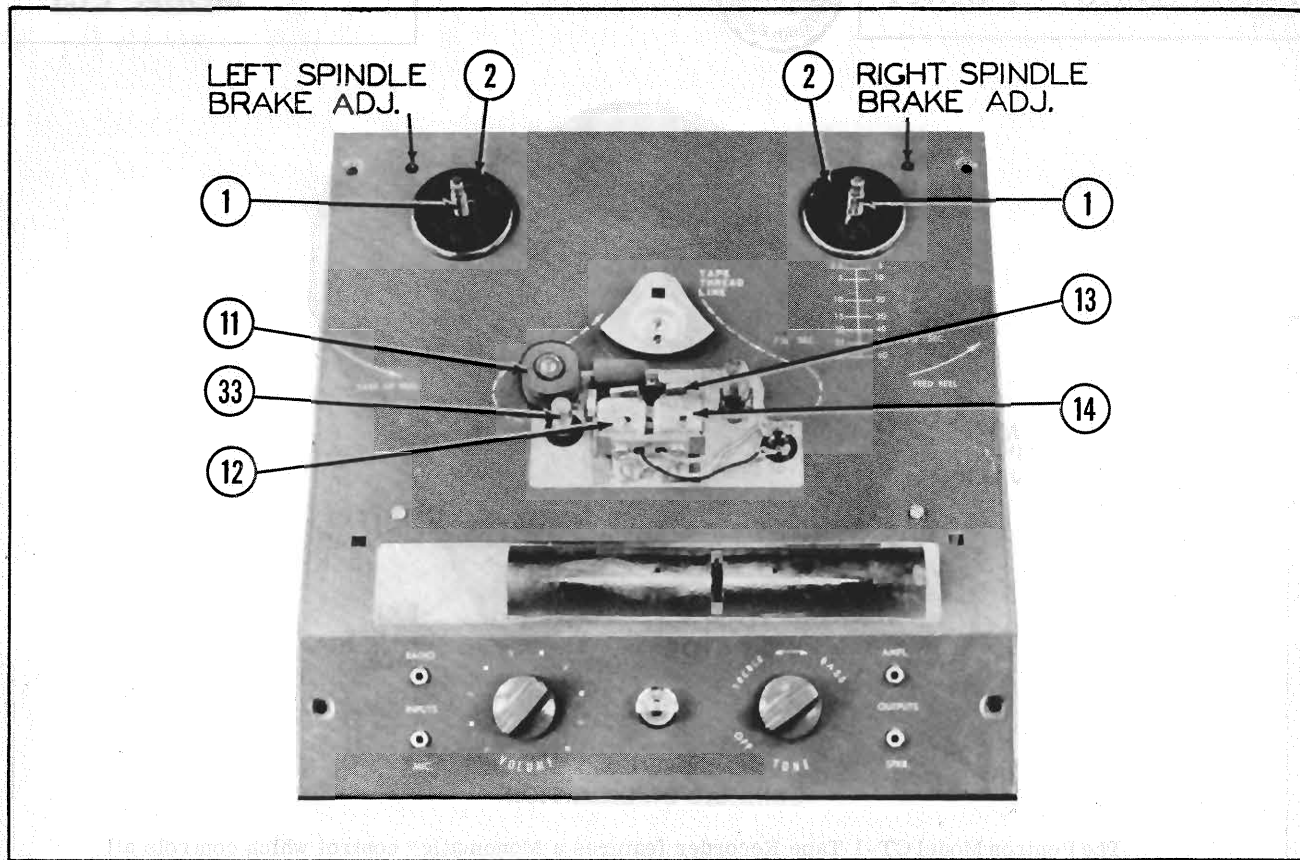


Figure 2

FUNCTIONS OF THE MONOMATIC CONTROL

Wind Position-

When in this position you may skip forward at high speed to any given spot on the tape.

Rewind Position-

Shifting the control knob to the Rewind position enables you to rewind tape at high speed to any given spot or to the end of the reel.

Play Position-

Shifting the control knob into the appropriate 7 1/2 or 3 3/4 "Play" slot sets the amplifier and tape transport mechanism for the playback function.

Record Position-

Depressing the red record lock button and shifting the control knob into the desired 7 1/2 or 3 3/4 "Record" slot sets the amplifier and tape transport mechanism for the record operation.

Neutral Position-

Placing the control knob in any one of its vertical positions places the mechanism in a neutral position which stops all movement of the tape.

OPERATING INSTRUCTIONS

Preparing The Pentron For Recording-

1. With the On-Off-Tone Control in the "Off" po-

sition, insert the AC power cord plug into a convenient wall receptacle of the proper rating.

2. Place an empty reel on the left hand reel support (2) making sure that the small protruding metal finger on the reel support fits into one of the slots at the center of the plastic reel.

3. Place a reel of Type "A" wound tape (dull coated side facing inward) on the right hand reel support so that the tape will feed off the reel as shown in Fig. 3. The tape should then be pulled off the reel with sufficient slack to permit placement into the tape slot. When this is done the coated (dull) side of the tape should be facing toward the front of the machine. The tape, after threading through the slot, should be

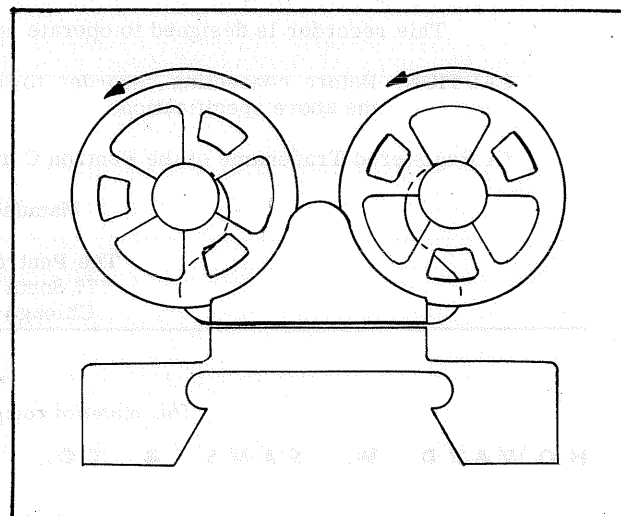
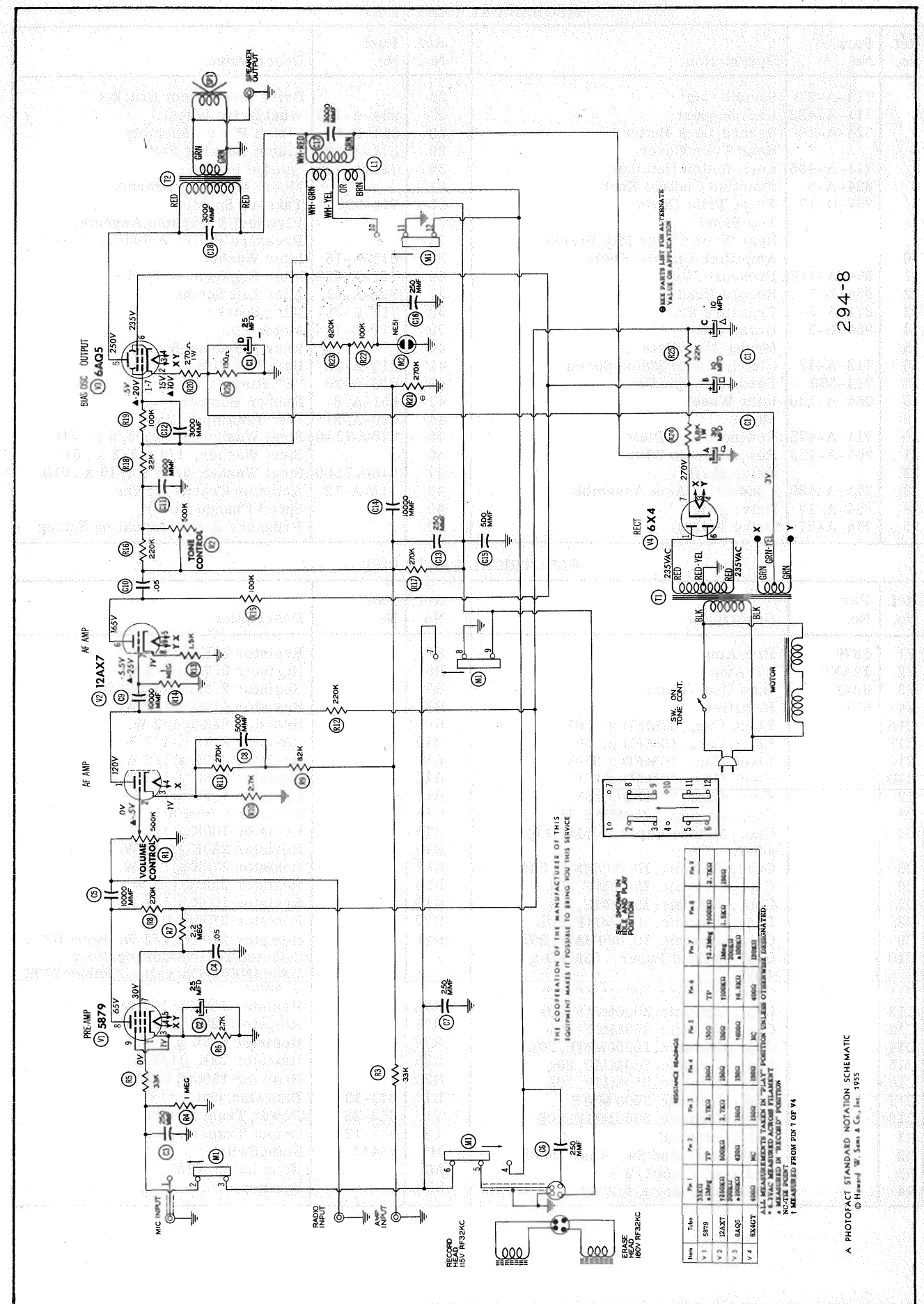


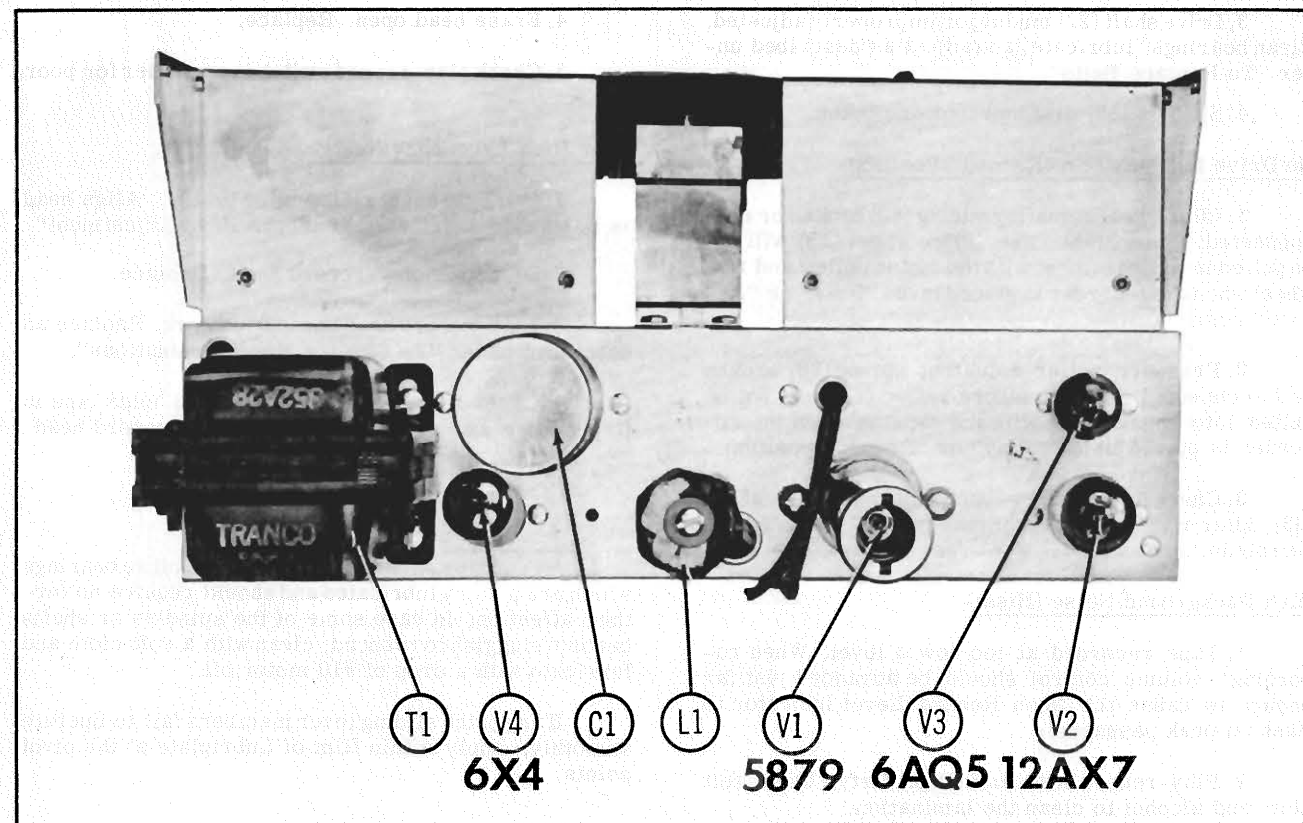
Figure 3



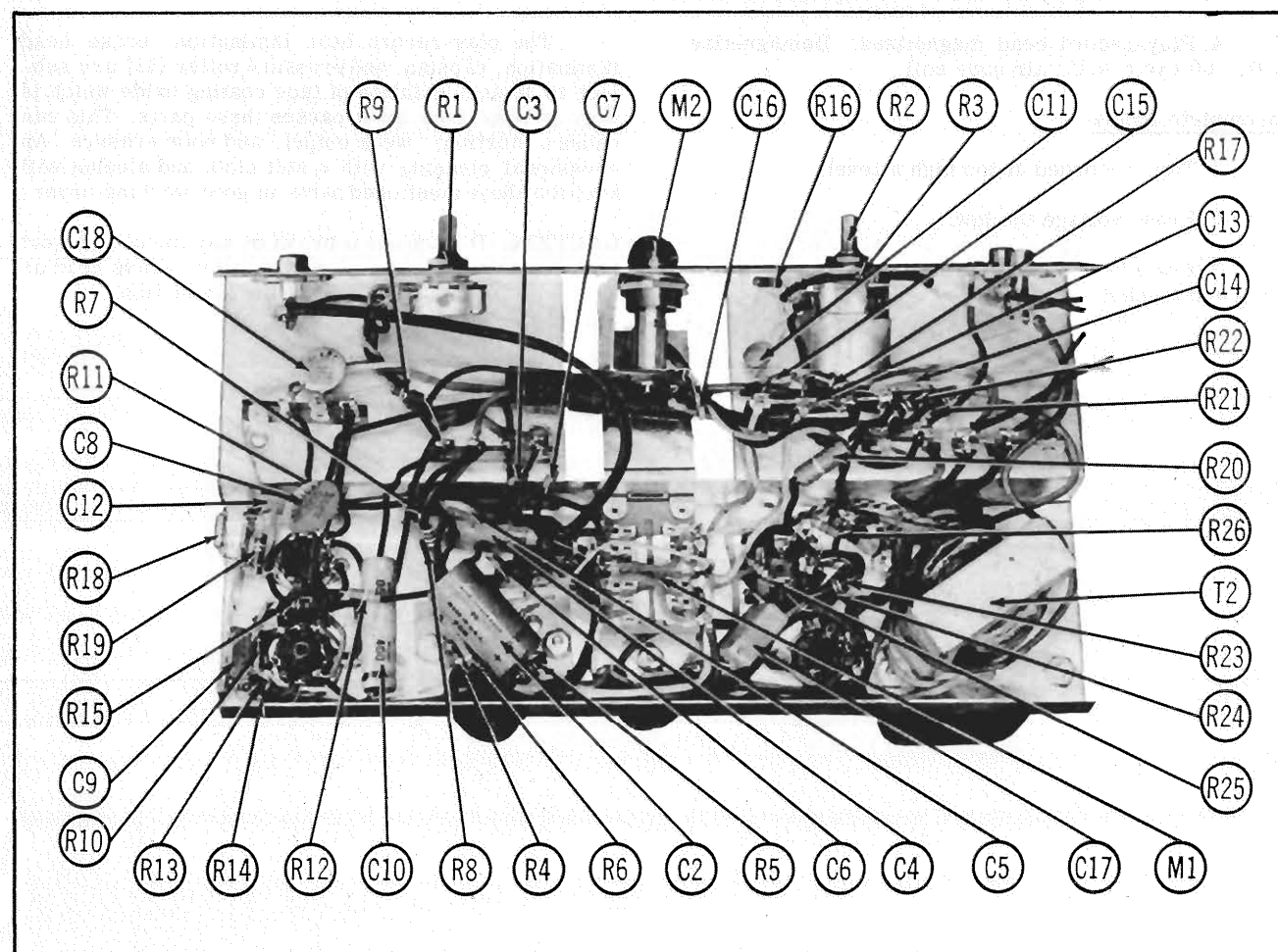
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PENTRON
MODEL CT-1

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TOP VIEW OF AMPLIFIER



BOTTOM VIEW OF AMPLIFIER

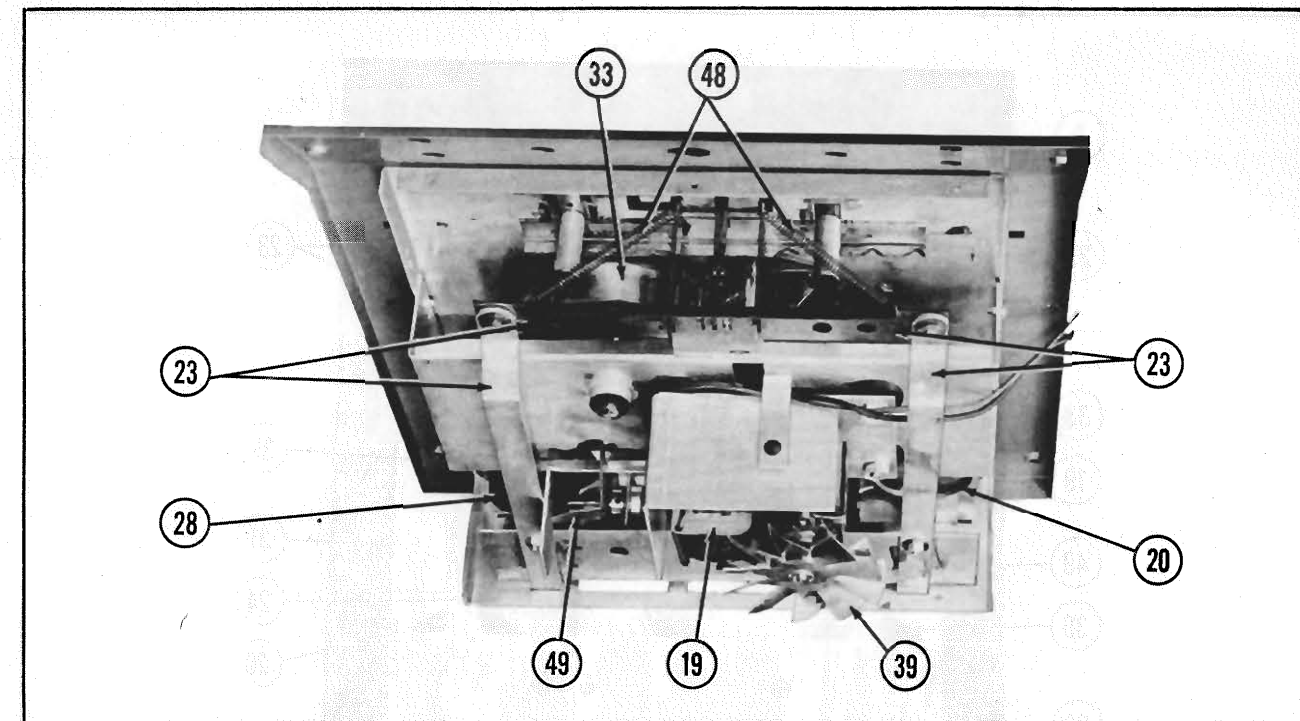


Figure 4

wound around the hub of the take-up reel in a counter-clockwise direction.

4. Turn the On-Off-Tone Control clockwise until a click is heard. This supplies power to the entire recorder.

To Record From Microphone-

NOTE: Erasing of recorded material takes place automatically when new material is recorded, therefore, no special step is necessary to erase old recordings before new recordings are made.

1. Insert the microphone plug into the "Mic." Input Jack.

2. Slide the Monomatic control to the desired speed position and shift into record while simultaneously pressing the red record lock button.

3. While talking into the microphone, adjust the "Volume" Control until the loudest portions of the signal just cause the record level indicator to flash.

To Record From Radio, TV Receiver Or Phonograph-

1. Using any standard interconnecting cable (such as the Pentron accessory cord X310), fasten the two clips to the radio, TV receiver, or phonograph speaker terminals and insert the plug into the "Radio" Input Jack on the recorder.

2. Turn recorder on and select the proper record position (3 3/4 or 7 1/2 ips.). Proceed with the recording as described under "To Record From Microphone".

Dual Track Recording-

1. This recorder is designed so that each reel of

tape holds two full length recordings, one on each half of the dull side of the tape.

2. After the first track has been recorded, a second recording can be made on the same tape by removing the reels from the recorder (do not rewind), turning them over, then placing the full reel on the right-hand spindle and the empty reel on the left-hand spindle.

3. Thread the tape and proceed with the recording as previously described.

4. After the second track has been recorded, the first track is ready to be played without rewinding, by changing reels as described in step No. 2.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track 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, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

To Monitor While Recording-

By plugging a set of earphones into the "Ampl." Output Jack the recording may be monitored. In an emergency your microphone will serve as an earphone if plugged into this same jack. Continued use of the microphone in this fashion is not recommended since permanent damage may result.

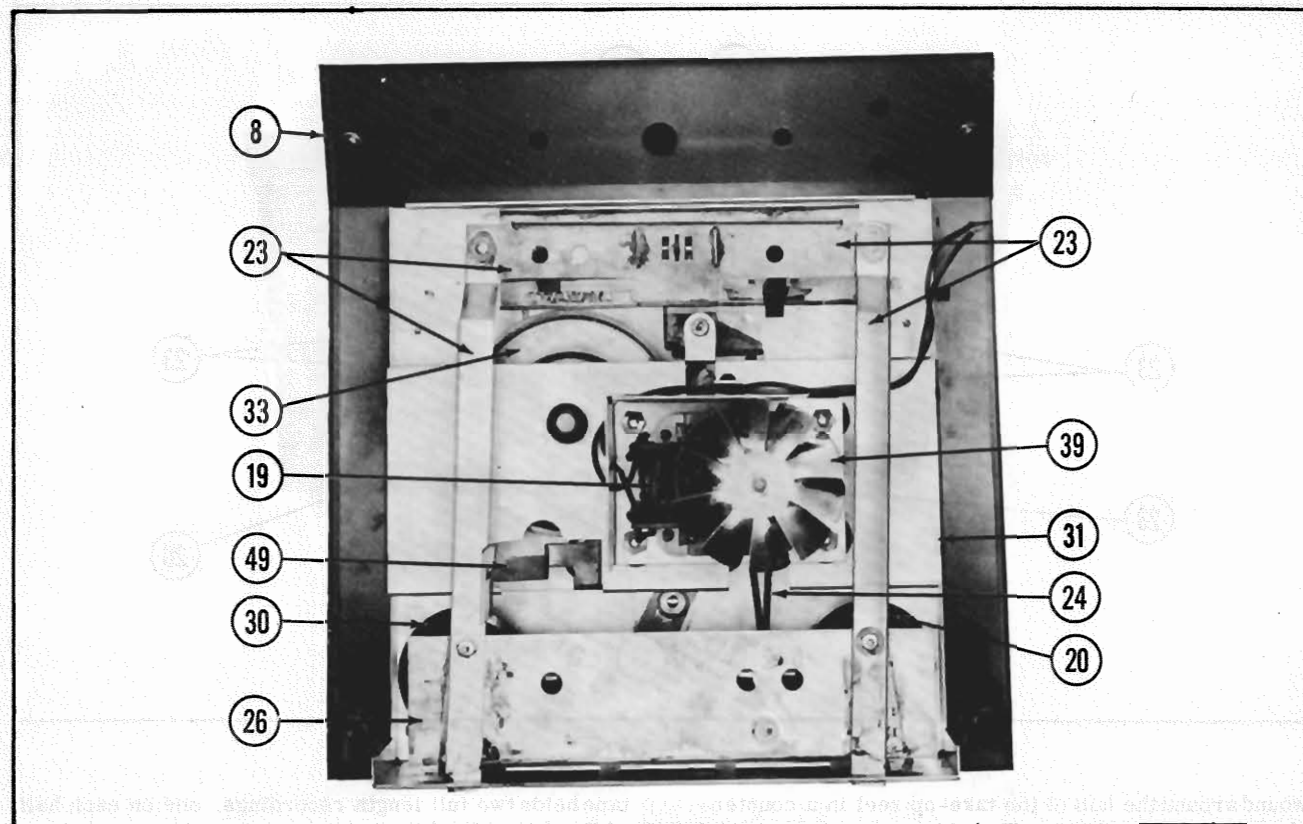


Figure 5

To Use Wind And Rewind-

Shift the Monomatic control knob into the appropriate slot marked "Wind" (fast forward) or "Rewind" (fast reverse). Shifting the control knob to "Rewind" position enables you to rewind tape at high speed to any given spot or to the end of the reel. Shifting to the "Wind" position enables you to skip forward at high speed to any given spot.

To Playback Recordings-

1. Shift the Monomatic control into the appropriate 7 1/2 or 3 3/4 play position.

2. Adjust "Volume" and "Tone" controls for desired listening level.

To Use "Spkr." Output Jack-

This output is used when a speaker in addition to the one in the unit is desired. Simply plug the external speaker into this output.

To Use "Ampl." Output Jack-

This is a high impedance output used to feed the output of the recorder into an external amplifier, radio or TV receiver, or public address system.

To Use Recorder As P. A. System-

By plugging the microphone into the "Radio" Input Jack the CT-1 may be used as a public address system. For more volume or controlled sound placement an external speaker may be plugged into the external speaker jack.

ADJUSTMENTS

To Adjust The Brakes-

1. Slide the Monomatic control knob to its extreme left neutral position. Insert a 5/64" Allen Hex. Key through hole in top panel near left spindle and into the socket of the brake adjustment screw.

2. Adjust brake by turning screw, (clockwise rotation will increase brake pressure) so that only the slightest contact can be felt when rotating the left spindle.

3. Remove wrench and place control knob in the "Rewind" position. The left spindle must now be completely free. If any braking at all can be felt in this position, the brakes are adjusted too tightly.

4. Slide the control knob to the extreme right neutral position. Insert a 5/64" Allen Hex. Key through hole in top panel near right spindle and into the socket of the brake adjustment screw.

5. Adjust brake on right spindle the same way as on left side.

6. Remove Allen Key and place control knob in "Fast Forward" position. The right spindle must now be completely free or brake is adjusted too tightly.

Play-Record Head Adjustment-

It is very important that Play-Record Head (12) be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result.

3. Drive shaft (22) binding or improperly adjusted. Clean bearings, lubricate, and adjust as described under "To Replace Belts".

4. Springs (50) disconnected or broken.

No Drive In "Play" or "Record" Position-

1. Idler wheel actuating spring (40) broken or disconnected. If this is the case, idler wheel (18) will not be pulled into engagement with the motor pulley and flywheel when the recorder is placed in the "Play" or "Record" position.

2. Pressure roller actuating spring (50) broken or disconnected. If so, pressure roller (11) will not be pulled into engagement with the capstan when the recorder is placed in the "Play" or "Record" position.

3. Check for oil on pressure roller (11), flywheel (33), idler wheel (18), and motor pulley. Clean with a petroleum solvent.

High Background Noise (Hiss)-

1. Tape recorded at too low a level. When recording, volume control should be advanced just far enough to cause the Neon Record Level Indicator to flash on peak passages.

2. Play-record head lamination dirty. Use a soft cloth and alcohol to clean the lamination.

3. Defective play-record head. Replace.

4. Play-record head magnetized. Demagnetize with a 60 cycle A. C. air core coil.

Incomplete Erase-

1. Tape recorded at too high a level.

2. Erase voltage too low.

3. Erase head lamination dirty. Clean with a soft cloth and alcohol.

4. Erase head open. Replace.

5. Check play-record switch in amplifier for poor contact.

Poor High Frequency Response-

1. Head gap not at right angles to tape. Align head as described under "Play-Record Head Adjustment".

2. Defective play-record head. Replace.

3. Play-record head lamination worn. Replace as described under "To Replace Head Laminations".

4. Check to see that pressure pad holds tape in firm but not excessive contact with play-record head.

LUBRICATION

All rotating parts are provided with oilite bearings which are factory lubricated and should require no further attention. In case some of the spindles or shafts become sluggish to respond, clean with a soft cloth and lubricate with a drop of #10 motor oil.

If any of the sliding lever members fail to operate smoothly, apply a thin film of Lubriplate at the pivot points.

CLEANING

The play-record head lamination, erase head lamination, capstan, and pressure roller (11) are subject to an accumulation of tape coating oxide which is worn off the tape as it passes these parts. This can cause distortion, weak output, and poor erasure. An occasional cleaning with a soft cloth and alcohol will keep the above mentioned parts in good working order.

CAUTION: Do not use a brush or any metallic object when cleaning the record or erase head as this could damage the laminations.

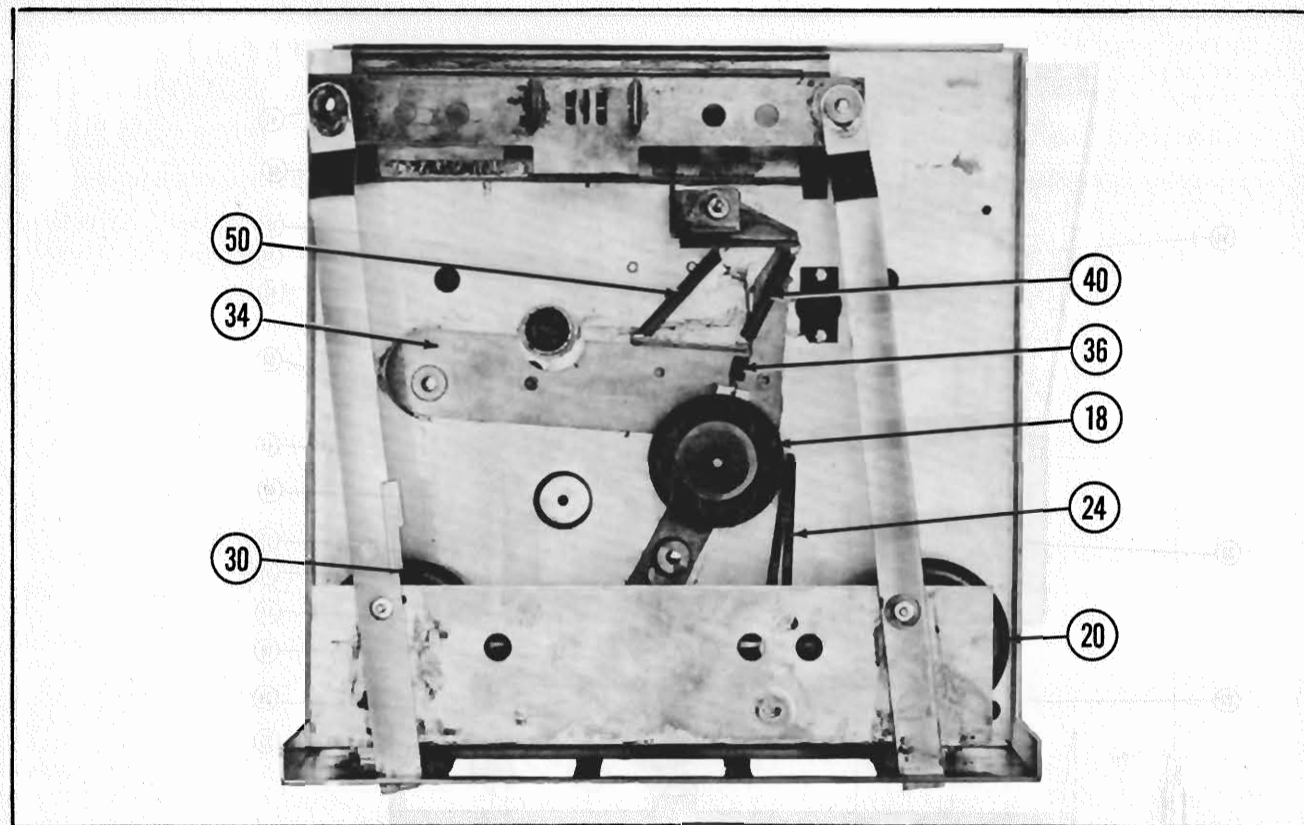


Figure 8

plate (30), felt washer (29), clutch plate (28), and spring (16).

(b) Tighten spindle plate set screw after adjusting the spindle for free movement without excessive end play.

(c) Put clutch plate (28) and spring (16) in place and add washer and two clutch adjustment nuts. Adjust clutch for very light engagement (nuts should be at low end of shaft and tightened against each other).

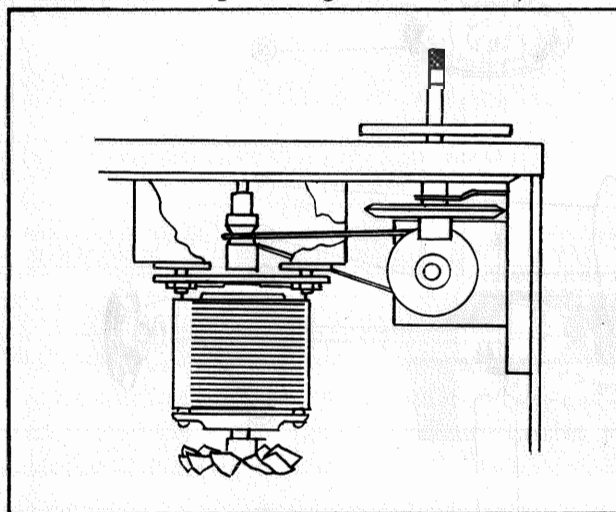


Figure 9

TROUBLES

Speed Variation or "Wow"

1. Check for oil on all driving surfaces. If any of

the rubber drive wheels have oil on their surfaces clean with a petroleum solvent, not carbon tetrachloride.

2. Take-up clutch improperly adjusted. Adjust as described under "To Replace Belts".

3. Check all rollers and shafts for binding. If parts bind, clean bearings and lubricate with a good light oil.

Won't Take Up Tape Properly-

1. Set screw loose in clutch plate (30). Tighten screw and adjust clutch as described under "To Replace Belts".

2. Belt (24) slipping. Clean motor pulley, drive pulley (25), and belt (24).

3. Belt (24) loose or broken. Replace belt as described under "To Replace Belts".

Fast Forward Won't Function Properly-

1. Check rubber drive wheel (27) for oil on driving surface. If this condition exists clean drive wheel (27) and clutch plate (30) with a petroleum solvent.

2. Check feed reel spindle (17) and take-up spindle (32) for binding. Clean and lubricate if necessary.

3. Springs (50) disconnected or broken.

Rewind Won't Function Properly-

1. Check rubber drive wheel (21) for oil on drive surface. Clean drive wheel (21) and rewind drive plate (20) with a petroleum solvent.

2. Check feed reel spindle (17) and take-up spindle (32) for binding. Clean and lubricate if necessary.

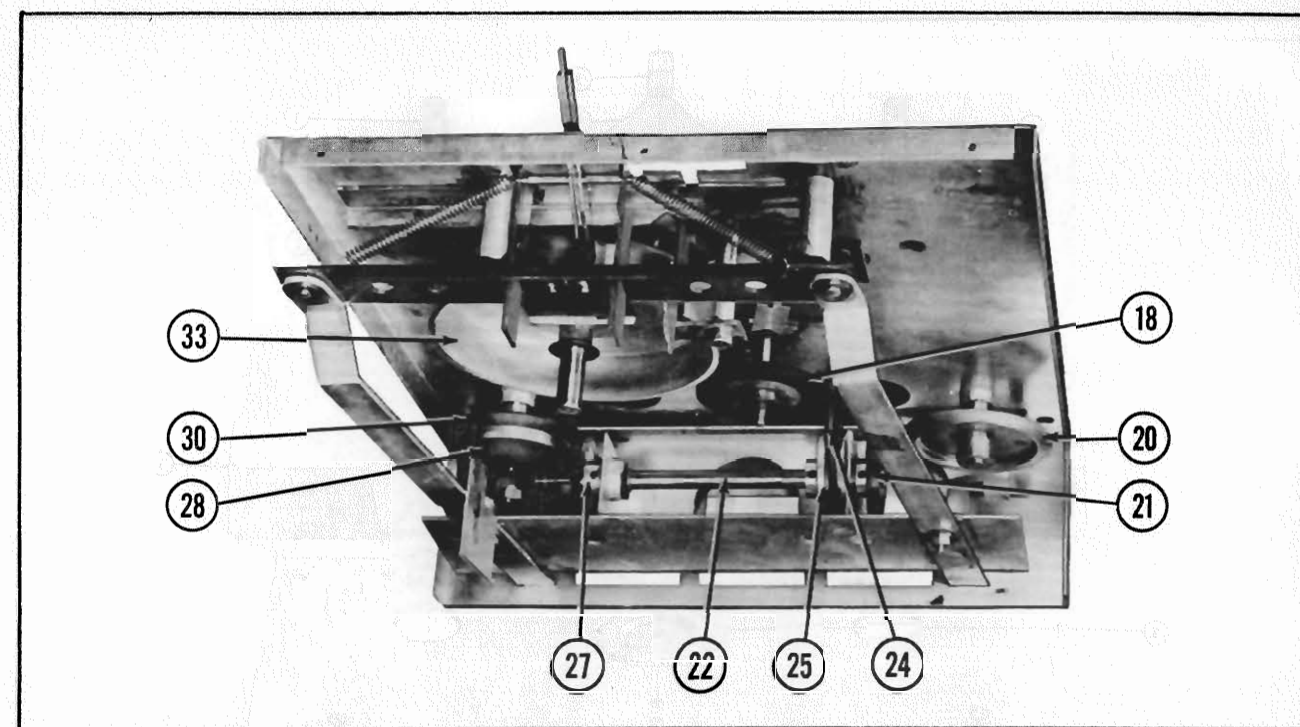


Figure 6

CAUTION: The head was adjusted and sealed in place at time of manufacture and further adjustment should not be necessary unless the head becomes faulty and replacement is required. There are two adjustments to be made, they are as follows:

1. One is the head height. This should be adjusted so that the top edge of the tape lines up evenly with the top edge of the record head lamination. Adjustment can be made by loosening screw (point "B" on exploded view) and slightly raising or lowering play-record head (12).

2. The second adjustment is made by turning head so that the air gap in the head lamination is at right angles to direction of tape travel. This assures maximum output and frequency response. Adjustment is best accomplished with the aid of a pre-recorded, constant 3000 cycle tape. Place the pre-recorded tape on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. While playing the 3000 cycle tape, loosen screw (point "B" on exploded view) and rock the head from side to side and notice the variation in the output voltage at the voice coil. Tighten the head in the position of highest output. After the adjustment is made make certain that the head was not moved up or down.

Erase Head Adjustment-

1. Erase head (14) should be adjusted so that the top edge of the tape lines up evenly with the top edge of the erase head lamination. Adjustment can be made by loosening screw (point "A" on exploded view) and slightly raising or lowering erase head (14).

PARTS REPLACEMENT

To Replace Head Laminations-

Worn out or damaged head laminations can be replaced without disturbing the play-record and erase

head adjustments. On record head (12), remove lamination by prying out with a screw driver. Press in new lamination with fingers until it bottoms on yoke. Erase head lamination can be replaced in the same manner. It is important to replace laminations with steel section uppermost.

To Replace Belts-

1. With control knob in "Rewind" position, remove clutch adjustment nuts on lower end of the take-up spindle (left side) and lower the clutch plate (28) exposing the spindle hub (30).

2. Loosen the spindle plate set screw and remove spindle and plate.

3. With control knob in "Wind" position, loosen the set screw in the hub of rubber drive wheel (21). Remove drive wheel (21). Slide drive shaft (22) to the left until clear of the right hand drive shaft bearing.

4. Place new belt over drive shaft and replace shaft in bearing. Make sure thrust washer between drive pulley (25) and bearing is in place.

5. Replace thrust washer and rubber drive wheel (21), adjusting the thrust for free rotation of shaft without excessive end play. Excessive end play may cause noisy operation.

6. Place belt into groove of drive pulley (25). Insert a suitable tool through the motor support plate from the right front towards the rear and grasp belt (24). Pull belt with a 90° twist over the motor pulley. Belt should lead from the top of the drive pulley to the right side of the motor as in Fig. 9.

7. Replace take-up spindle and clutch as follows:

(a) Replace spindle (32) with "E" ring and thrust washer through top of spindle bearing and placing its parts in the following order: Thrust washer, spindle

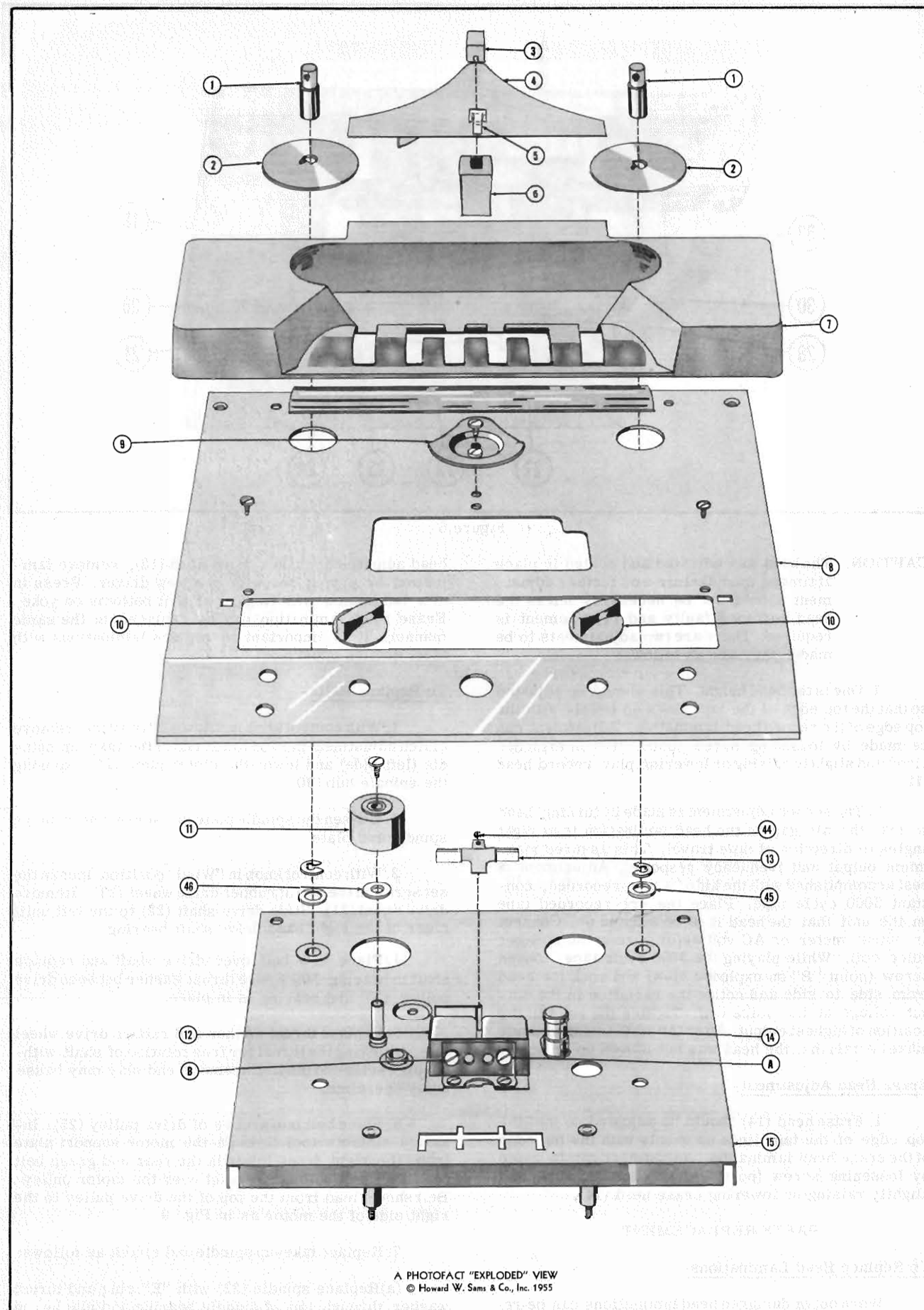


Figure 7A. Exploded View Of Parts Above Baseplate.

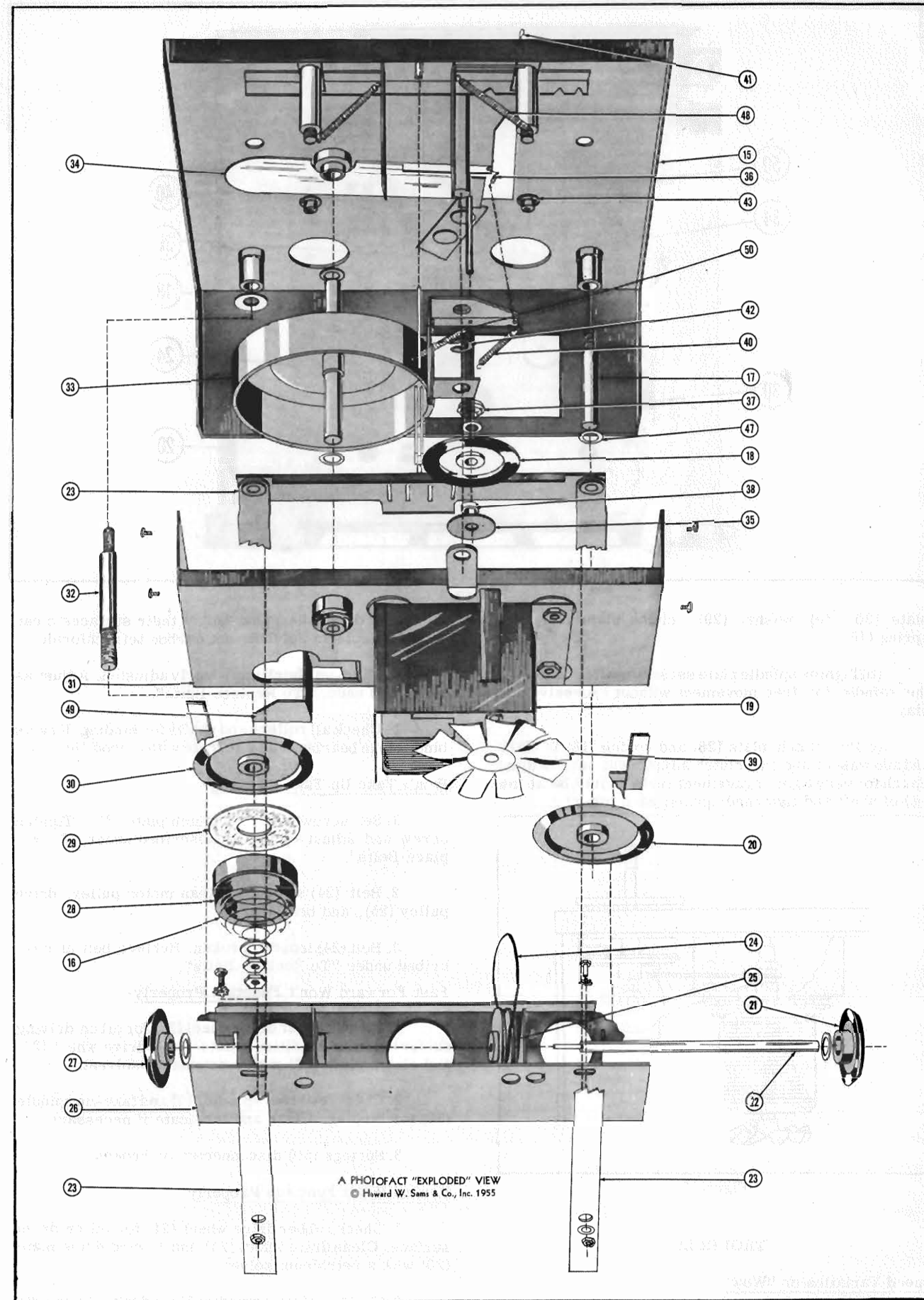


Figure 7B. Exploded View Of Parts Below Baseplate.