SEEBURG 201-161-101

Tome 1

Seeburg 201

Service Manual Tome 1

LEGEND Tome 1

Pages

LEGEND Tome 2

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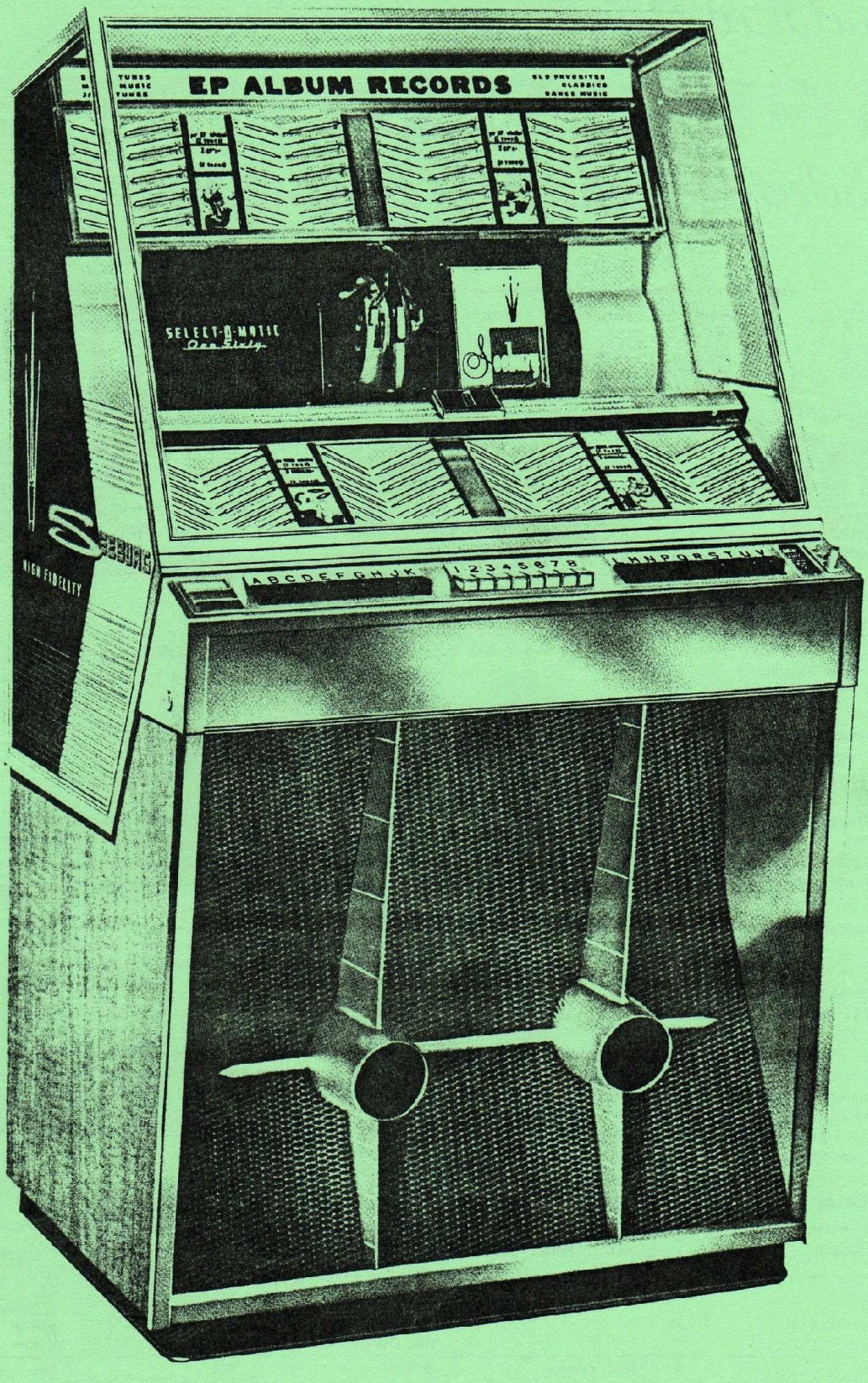
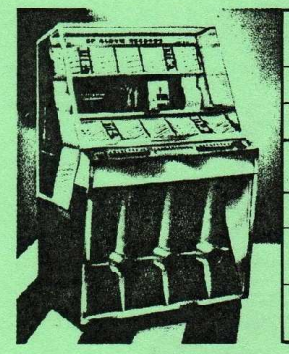


MODEL 161 of 1958 160 Selections

detailed general

SPECIFICATIONS

Select-O-Matic 200 • Select-O-Matic 160



Model	Height	Width	Depth	Weight (Net)	Weight (Shipping)
200	56½"	34⅞"	27"	374 Lbs.	458 Lbs.
160	55¾"	30½"	26½"	330 Lbs.	401 Lbs.

	Cabinet Lighting	Cabinet Finish	Record Capacity
200	Two 25-watt 33-inch Cool white fluorescents	Silver Fox	100 Records—200 Selections
160	Two 25-watt 28-inch Cool white fluorescents	Sliced Walnut	80 Records—160 Selections

Watts (Standby)—125 • Current (Standby)—1.6 Amp. • Watts (Operating)—260 • Current (Operating)—2.7 Amps. • Line Voltage—117 • Line Frequency—60.

Record Speed—45 RPM

Remote Control—Using any number of S-3WA, D-3WA or HD-3WA, whichever is applicable.

Selector—Instantaneous Electrical.

Selection Storage—Tormat Memory System, with no moving parts.

Electronics—Highly accessible hinged rear door houses all electronic equipment.

Music Reproducing System—Wide Range High Fidelity.

"Selection Now Playing" Indicator—New full-view magnifier type.

Cash Box Capacity— (with nickels, dimes and quarters) over $200.00.

TITLE DISPLAY: Dual panel display provides complete flexibility for dual pricing or single pricing.

SPEAKER SYSTEM: (Select-O-Matic 200) Full range, high fidelity music. Special dividing network feeds low frequencies to two 12-inch low frequency speakers, and middle and high-range frequencies to two 8-inch wide-range speakers. The two 8-inch speakers are enclosed in a separate acoustical chamber to reduce intermodulation distortion and to provide wide angle coverage. (Select-O-Matic 160) Two wide-range 12-inch speakers with high frequency and reinforced by a high frequency 8-inch speaker.

AUDIO SYSTEM

Pickup—Seeburg High Fidelity magnetic (5 grams stylus force).

Pre-Amplifier—Transistorized (no tubes).

Amplifier—Seeburg High Fidelity push-pull.

Tone Controls—1 Bass Control (4 positions).

Volume Control—Bass compensated.

Automatic Volume Compensator—Used on all Select-O-Matic 200's and 160's.

Remote Speakers—Up to 24 watts output.

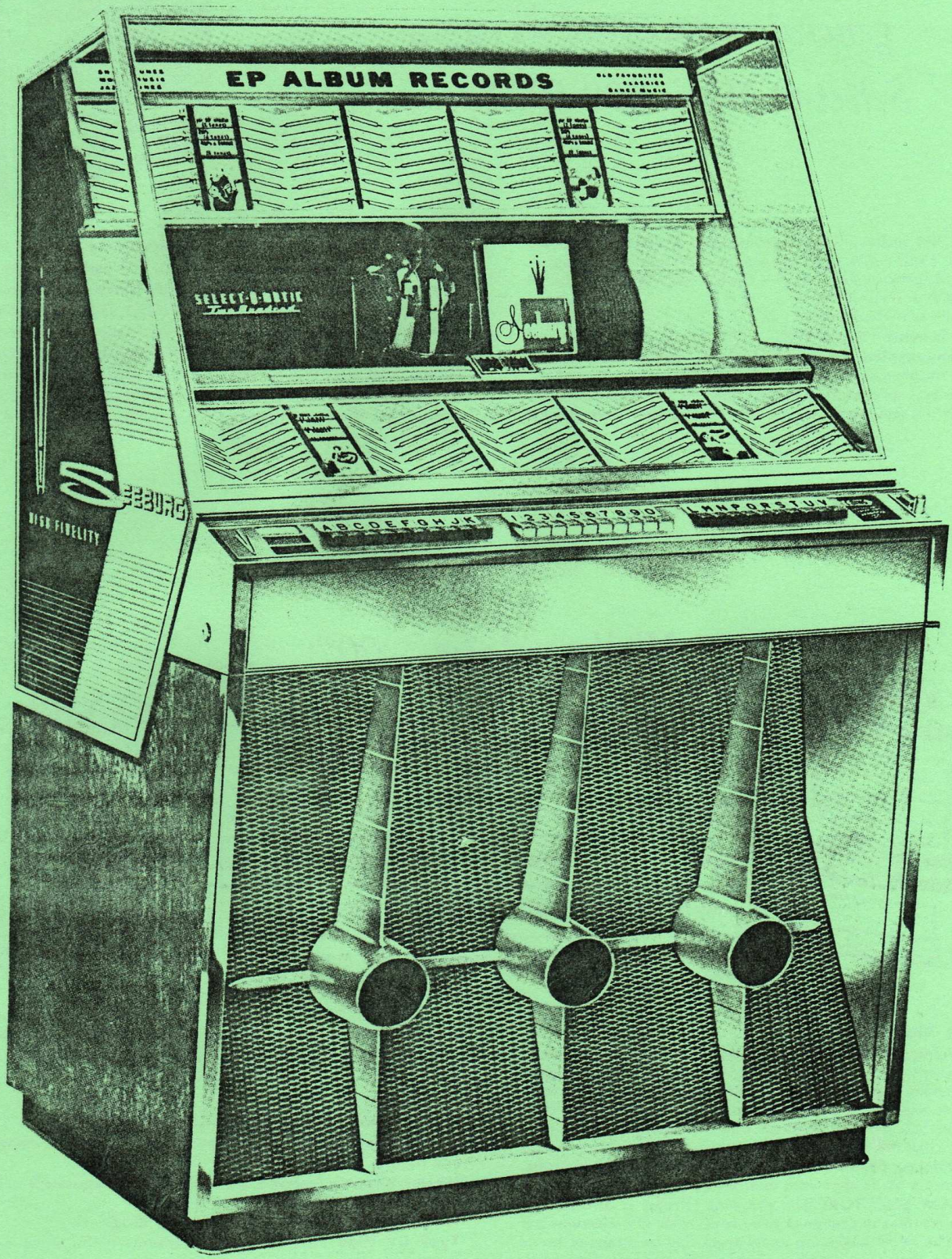
Audio Performance—40 CPS to 13 KC ±5 DB. Rumble rejection filter for frequencies below 40 CPS and an adjustable noise suppression filter for reducing undesirable high frequency noise. There are two tone controls, one for the bass and the other for simultaneously equalizing and controlling the high frequency range, making it possible to obtain an acoustically flat output from records made to new recording standards (AES, NARTB, New Orthophonic).

SELECTION SYSTEM: All selections made from either the phonograph or from a Wall-O-Matic at a remote point are stored in the "Tormat Memory Unit," which has no moving parts. The new Seeburg Electronics door has built into it a power supply unit which provides for up to six Wall-O-Matics without an additional power supply. Additional power supplies (Type PS6-1Z) may be added as required to accommodate almost any number of Wall-O-Matics.

STANDARD CREDIT AND PRICING SYSTEMS

MODEL	CREDIT SYSTEM	COINS	PRICING	
			Singles	EP's
201DH 161DH HD-3WA WOM *D-3WA	Dual Pricing	Nickels Dimes Quarters Half Dollars	10c 3/quarter 7/Half	15c 2/Quarter 4/Half (+ one single)
201D 161D *D-3WA WOM	Dual Pricing	Nickels Dimes Quarters	10c 3/Quarter	15c 2/Quarter
201SH 161SH (HD-3WA or D-3WA WOM may be used)	Single Pricing	Nickels Dimes Quarters Half Dollars	10c 3/Quarter 7/Half	—
201S 161S S-3WA (or D-3WA WOM may be used)	Single Pricing	Nickels Dimes Quarters	10c 3/Quarter	—

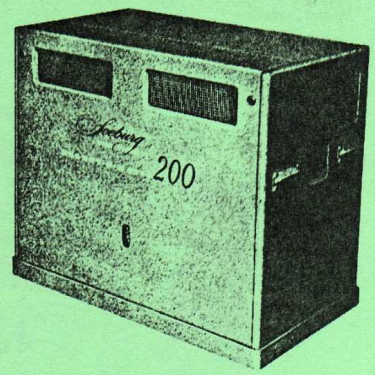
*These models will not accept half dollars.



MODEL 201 of 1958 200 Selections

general SPECIFICATIONS

Select-O-Matic 200 RC Special



Height—28½ inches • Width—36 inches • Depth—25½ inches • Weight (Net)—235 Lbs. (Approx.) • Weight (Shipping)—285 Lbs. (Approx.) • Volts—117 • Cycles—60 • Watts (Standby)—225 without Wall-O-Matics.

Cabinet Finish—Multicolor.

Monitor Speaker—5 inch P.M.

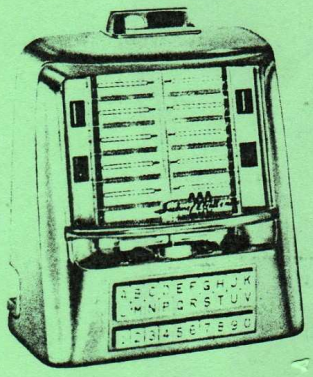
Bass Compensated Remote Volume Control— (with 60 feet of cable) supplied as standard equipment.

The general specifications for the Seeburg Electronic door are essentially the same as for the Select-O-Matic 200 Phonographs.

SELECTION SYSTEM: The selections are stored in the Tormat Memory Unit which has no moving parts. The Seeburg Electronic door has built into it a power supply unit which provides for the use of up to six Wall-O-Matics, Types V-3WA, D-3WA or S-3WA. An additional power supply, Type PS6-1Z, is supplied as standard equipment. This provides power for an additional 6 Wall-O-Matics. Thus, a total of 12 Wall-O-Matics may be used with the Seeburg RC Special without any other additional equipment. Space is provided for three additional power supplies, Type PS6-1Z.

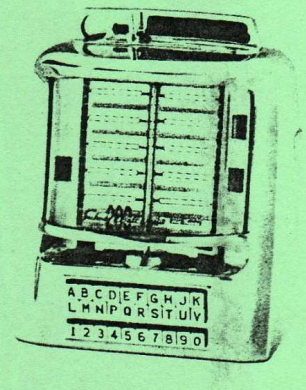
general SPECIFICATIONS

Wall-O-Matic "200"



Model	Height	Width	Depth	Weight (Net)	Weight (Shipping)
HD-3WA	14⅞"	12¼"	8⅛"	37 Lbs.	41 Lbs.
D-3WA	14⅞"	12¼"	7¼"	31½ Lbs.	35½ Lbs.
S-3WA	14⅞"	12¼"	7¼"	29½ Lbs.	33½ Lbs.

Watts—15 • Amps. (Standby) .45—(Operating) 3.0 • Finish—Polished Chrome.



PRICING SYSTEM:

Dual Pricing System: Half dollars, quarters, dimes and nickels will be accepted. Quarters, dimes and nickels are accumulative in mixed denominations, and credits are stored up to $1.00 total.

It is not required to make selections after depositing each coin, except for half dollars, in which case selections must be made after each half dollar deposited.

Single Pricing System: Accepts nickels, dimes and quarters. Selections are made after each quarter, dime or two nickels.

PROGRAM SELECTOR: The program selector is divided into five classifications in groups of two panels each (20 selections per panel). The panel pages are easily accessible by means of levers for viewing the entire program. Total number of selections available—200. The numbers of selections can be changed to 160 by locking two panel pages with bracket provided (Seeburg part #506166).

ACCESSORIES:

Wall-O-Matics—Types S-3WA, D-3WA or HD-3WA.

Transistorized Microphone Preamplifier for remote operation and paging, Type TMPA-1.

Master Remote Volume Control (bass compensated)—Type MRVC3.

Wall-O-Matic Power Supply—Type PS6-1Z

Type CV High Fidelity Remote Speakers—for every application.

THE SEEBURG CORPORATION
1500 North Dayton Street • Chicago 22, Illinois

SEEBURG

SELECT-O-MATIC

MODELS 101, 161 AND 201

This manual is made up of pages selected from a universal manual that covers all Seeburg Units. The original page numbering system has been retained for convenience in reference.

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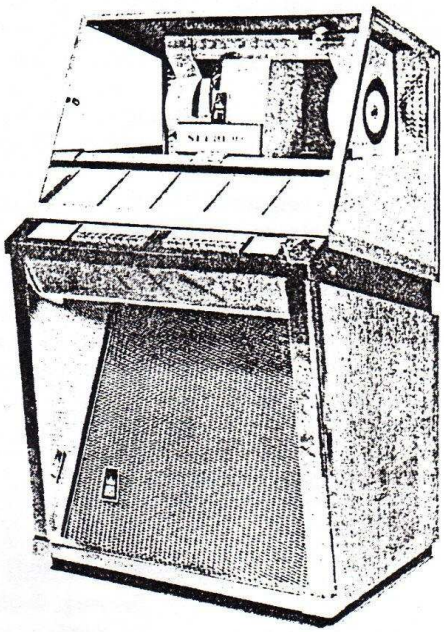
SEEBURG

SELECT-O-MATIC "100"
MODEL 101



The Select-O-Matic "100", Model 101 is a coin-operated phonograph using the Seeburg Select-O-Matic Mechanism for selective playing of either or both sides of fifty 45 r.p.m., 7-inch records. Choice of any of the one hundred selections may be made at the phonograph with the Tormat Electrical Selector or by remote control with 100 selection, 3-wire Wall-O-Matics. A program holder using standard size title strips displays the entire hundred selections and may be removed in sections of 20 titles.

The program title strips are back-lighted by a 25-watt fluorescent lamp which also illuminates the mechanism, speaker grille and the electrical selector escutcheons.

The lid glass through which the mechanism may be seen is hinged and opens for changing records and title strips. A Service Switch, a Credit Switch, a Popularity Meter and a Selection Counter are accessible with the lid open. The Service Switch and Credit Switch are used to operate the mechanism when servicing the phonograph. The Popularity Meter, which is part of the mechanism, indicates the number of times (up to 40) each record is played. The Selection Counter, which is part of the Tormat Electrical Selector, totals the number of selections made with the electrical selector and with remote control Wall-O-Matics.

Coins are deposited in a single entry coin chute and pass through a 5, 10, 25 cent slug rejector to the coin switches. The coin switches are connected for one play for a nickel, two plays for a dime or six plays for a quarter. The coins are stored in a canvas bag which has a capacity of approximately one-hundred-fifty dollars. The bag is removed through a small door at the lower right side of the cabinet.

A Seeburg Magnetic Pickup with one-fifth ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt high fidelity audio amplifier connects to three permanent magnet type speakers. Two of these are 12-inch low frequency speakers; one is an 8-inch high and middle range speaker. A terminal strip is provided for connection of Constant Voltage High Fidelity Type Remote Speakers. The audio amplifier incorporates a transistorized preamplifier stage. An automatic volume compensator provides uniform volume level and

avoids "blasting" due to "loud" records. A single volume control is used to adjust the volume of sound from the phonograph speakers and the remote speakers. Provision has been made for plug-in connection of a remote volume control that may be up to a hundred feet from the Select-O-Matic without introducing hum or causing distortion.

A Selection Receiver supplies power for remote control Wall-O-Matics and incorporates the switches and relays for operation by remote control as well as from the Electrical Selector. It has sockets for convenient plug-in connections for the mechanism, cabinet lighting and control units. A terminal strip provides connections for Wall-O-Matics.

The selection receiver and the audio amplifier are mounted vertically on the rear door of the cabinet. The door is hinged on the side and can be swung out to permit access to coin equipment in the cabinet and to tubes, tone controls, plugs etc. A cover plate on the rear of the door can be removed by unscrewing two screws on its outer left hand edge and sliding the plate forward and out. This exposes the interior wiring of the selection receiver and amplifier for test during normal operation.

A selection cancel switch, effective only when a record is playing, is operated by a push button on the back of the rear door. A remote cancel switch may be connected to terminals on the selection receiver where a switching link is located to permit either the remote cancel switch, the included switch or both to be used.

SPECIFICATIONS

Power Requirements:

117 volts A. C., 60 cycles
Standby (without Wall-O-Matics) – 95 watts
Operating (without Wall-O-Matics) – 220 watts

Cabinet Lighting:

1 - 25-watt, 28-inch, Cool White Fluorescent (FS25 starter)

Cabinet Key Number ..... F 313

Select-O-Matic Mechanism ..... Type 145ST3

Tormat Memory Assembly ..... Type 100TM3

Record Capacity ..... 50 records (100 selections)

Record Type ..... 45 rpm
7-inch diameter, 1.5-inch center hole

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

2 – 12" PM (Low Frequency)
1 – 8" PM (High Frequency)

Finish ..... Blonde Cherry

Coin Equipment 5-, 10-, 25-cent
Single Entry Slug Rejector
Single Pricing Unit ..... Type SPU1

Audio Amplifier ..... Type HFMA-2

7-tube High Fidelity, Constant Voltage Type with Automatic Volume Compensation transistor pre-amplifier stage.

Audio Power Output:

To Phonograph Speakers (adjustable) - 1 to 25 watts
To Remote Speakers ..... 24 watts max.
Maximum total to Phonograph Speaker & Remote Speakers ..... 25 watts

Tormat Electrical Selector ..... Type TES102

Tormat Selection Receiver ..... Type TSR6

Remote Control:

Seeburg, 3-wire "Wall-O-Matic"
Nominal operating voltage 25
Power Source ..... Tormat Selection Receiver or Auxiliary Power Supply Type PS6-1Z
Maximum number of Wall-O-Matics powered by Tormat Selection Receiver 6
Maximum number of Wall-O-Matics powered by each added auxiliary power supply 6

Remote Speakers: ..... High Fidelity Types:

HFCV1-12	12" Recessed Type
HFCV2-8	8" Wall Cabinet
HFCV3-8	8" Corner Cabinet

Transistor ..... Type 2N109

Tubes:

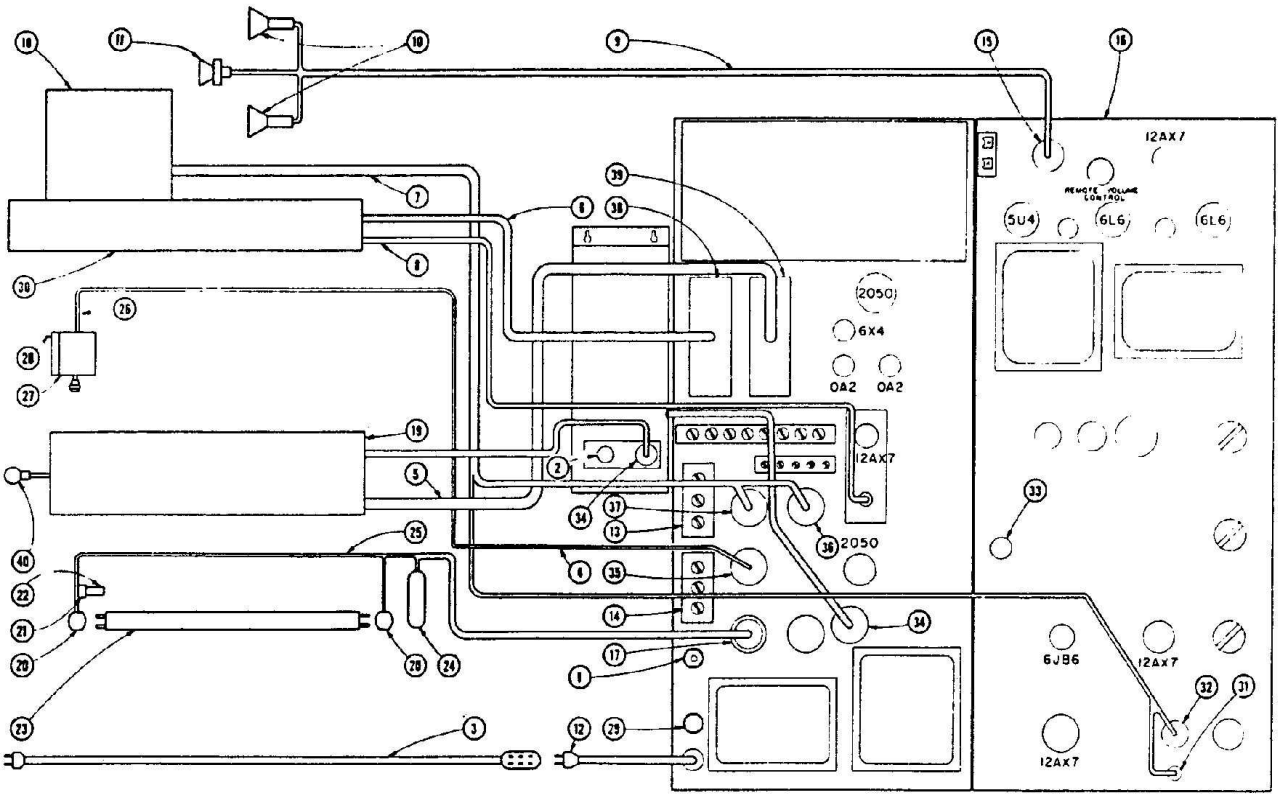
2 – 6L6GB	1 – 5U4G-GB
1 – 6X4	2 – 2050
2 – OA2	3 – 12AX7
1 – 6BJ6	

Fuses:

1 – 5 amp. Type MTH
1 – 2 amp. Type MDL
1 – 3.2 amp. Type N 3-2/10
1 – 5 amp. Pig-Tail Fuse, Type GJV (used on Select-O-Matic Mechanism)

DIMENSIONS.

Height ..... 53-1/4 Inches
Width ..... 30-1/2 Inches
Depth ..... 26 Inches
Net Weight ..... 274 Pounds
Shipping Weight ..... 341 Pounds
Record Weight:
50 Records, approx. 3 Pounds



Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	303697	Fuse
2	401897	Coin Switch & Cable Assembly
	401898	Cable & Plug Assembly
	401900	Coin Switch
3	402152	Line Cord & Outlet Assembly
4	410862	Electrical Selector Control Cable
5	411864	Matrix Cable Assembly
6	304729	Tormat Cable Assembly
7	249931	Mechanism Control Cable
8	304722	Tormat Electronic Input Cable Assembly
9	480368	Speaker Cable Assembly
10	408340	Speaker
11	409350	Speaker
12	303985	Line Cord
13	305447	Terminal Board Assembly
14	305309	Terminal Board
15	200241	Plug
16	309231	Door Assembly
17	10895	Plug
18	249004	Select-O-Matic Mechanism
19	410760	Tormat Electrical Selector
20	407352	Lamp Socket
21	407353	Starter Socket
22	405138	Starter
23	409084	Fluorescent Lamp
24	407365	Ballast
25	409239	Program Light Cable Assembly
26	409241	Service Switch & Cable Assembly
27	409240	Service Switch Assembly
28	408389	Manual Credit Switch
29	602411	Fuse
30	304701	Tormat Memory Assembly
31	246957	Plug
32	250938	Plug
33	303087	Fuse
34	410708	Plug
35	408258	Plug
36	250942	Plug Assembly
37	65319	Plug Assembly
38	304657	Plug Assembly
39	410573	Socket Assembly
40	410843	Credit Light Cable Assembly

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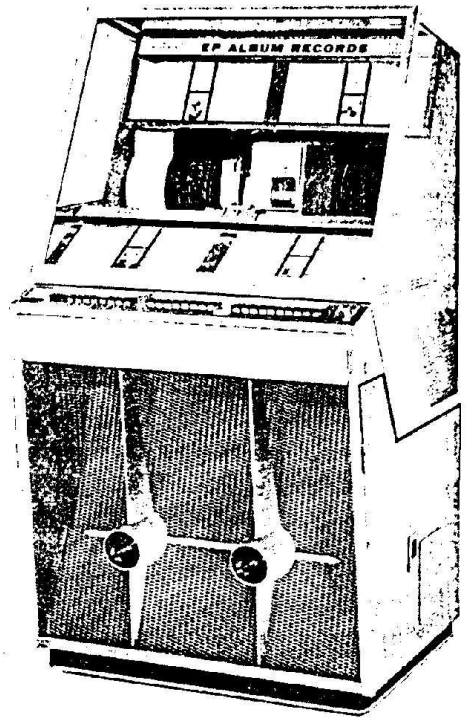
SEEBURG

SELECT-O-MATIC "160"

MODEL 161



The Select-O-Matic "160", Models 161S, 161SH, 161D and 161DH are coin operated phonographs using the Seeburg Select-O-Matic Mechanism for selective playing of either or both sides of 80 45 r.p.m., 7-inch records. Choice of any of the one hundred sixty selections may be made of the phonograph with the Tormat Electrical Selector or by remote control with 3-wire Wall-O-Matics.

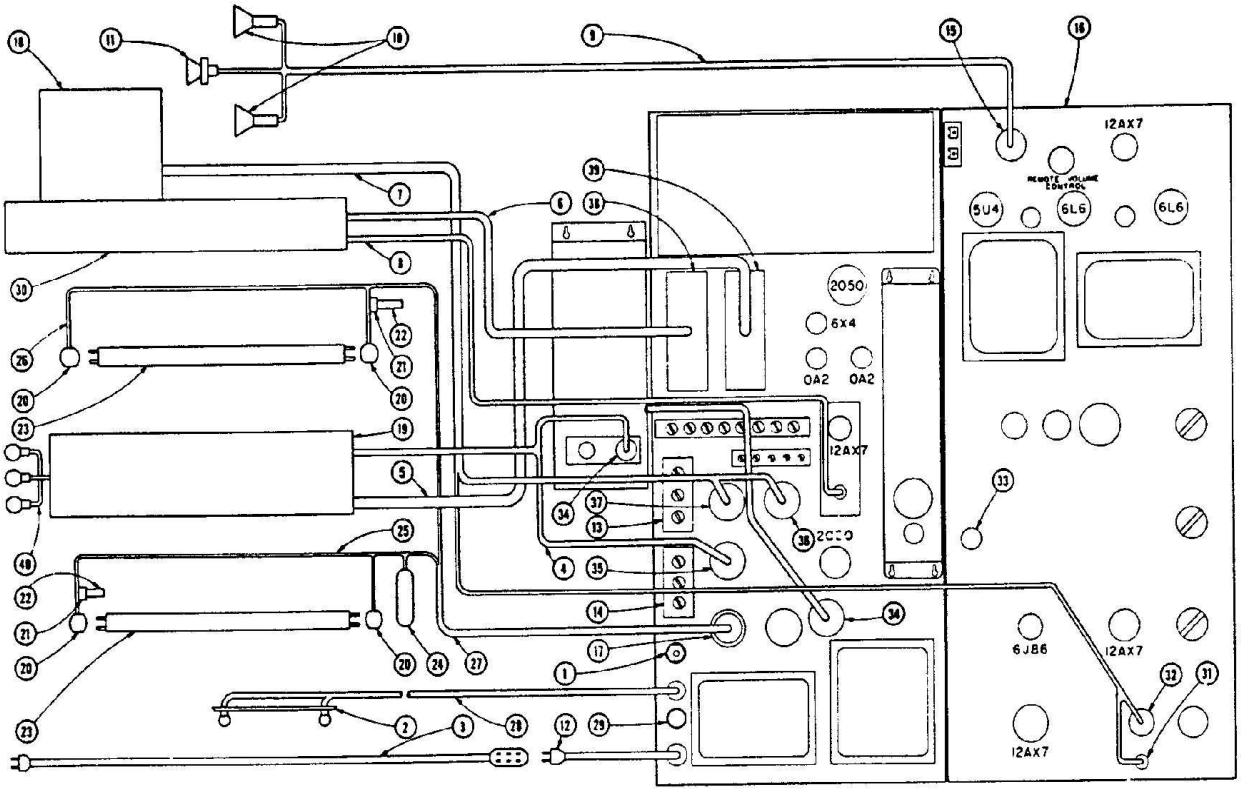
The four models differ only in their pricing and credit systems and their coin acceptance. Models 161S and 161SH have a single pricing system with which record selection is made after coin deposit and all selections are priced at the same value. Model 161S is equipped with a slug rejector which accepts nickels, dimes and quarters; Model 161SH is equipped with a slug rejector which accepts nickels, dimes, quarters and half-dollars. Models 161D and 161DH have a dual pricing system with which credits are accumulative and selections may be "sold" at either of two values. Model 161D is equipped with a slug rejector which accepts nickels, dimes and quarters; Model 161DH is equipped with a slug rejector which accepts nickels, dimes, quarters and half-dollars. Each coin deposited adds credit "units" in an add-and-subtract credit switch that is part of the dual pricing system. A Half Dollar Unit in the Model 161DH permits a choice of premium credit combinations when half dollar coins are used. Glass information panels at the side of the coin entry are lighted to indicate when there is enough accumulated credit for a selection or when additional coins are needed for selection.

The titles for the entire program of two hundred record sides are displayed on standard size dual title strips and are exposed for viewing in two back-lighted title strip frames. They are back-lighted by the fluorescent lamps that illuminate the mechanism, selection keys and the speaker grille.

The lid glass through which the mechanism and the record program are viewed is hinged and opens for changing records and title strips. With the lid open, access may be had to a Service Switch, a Manual Credit Switch, Popularity Meter and a Selection Counter. The Service and Credit Switches are for control of the mechanism when servicing the instrument.

The Popularity Meter is part of the mechanism and indicates the number of times (up to 40) each record has been played. The Selection Counter is part of the Credit System and totals the number of selections made. The counter total includes selections made through the remote control Wall-O-Matics as well as those made at the instrument.

A Seeburg Magnetic Pickup with one-fifth ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt high fidelity audio amplifier connects to three permanent magnet type speakers. Two of these are 12-inch low frequency speakers; one is an 8-inch high and middle range speaker. A terminal strip is provided for connection of Constant Voltage High Fidelity Type Remote Speakers. The audio amplifier incorporates a transistorized preamplifier stage. An automatic volume compensator provides uniform volume level and avoids "blasting" due to "loud" records. A single volume control is used to adjust the volume of sound from the phonograph speakers and the remote speakers. Provision has been made for plug-in connection of a remote volume control that may be up to a hundred feet from the Select-O-Matic without introducing hum or causing distortion.



Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	303697	Fuse
2	480359	Grille Ornament Rail & Socket Assembly
3	402152	Line Cord & Outlet Assembly
4	411101	Electrical Selector Control Cable
5	411099	Matrix Cable Assembly
6	304786	Tormat Cable Assembly
7	249931	Mechanism Control Cable
8	304725	Tormat Electronic Input Cable
9	480368	Speaker Cable Assembly
10	408340	Speaker
11	409350	Speaker
12	303985	Line Cord
13	305447	Terminal Board Assembly
14	305309	Terminal Board
15	200241	Plug
16	309231	Door Assembly
17	10895	Plug
18	248210	Select-O-Matic Mechanism
19	411001	Tormat Electrical Selector
20	407352	Lamp Socket
21	407353	Starter Socket
22	405138	Starter
23	405084	Fluorescent Lamp
24	409947	Ballast
25	480722	Lower Program Light Cable Assembly
26	480724	Upper Program Light Cable Assembly
27	480767	Plug Assembly
28	480456	Grille Light Cable & Plug Assembly
29	602411	Fuse
30	304900	Tormat Memory Assembly
31	246957	Plug
32	250938	Plug
33	303087	Fuse
34	410708	Plug
35	408258	Plug
36	250942	Plug Assembly
37	65319	Plug Assembly
38	304657	Plug Assembly
39	410573	Socket Assembly
40	411102	Credit Light Cable Assembly

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SEEBURG

SELECT-O-MATIC "200"
MODEL 201

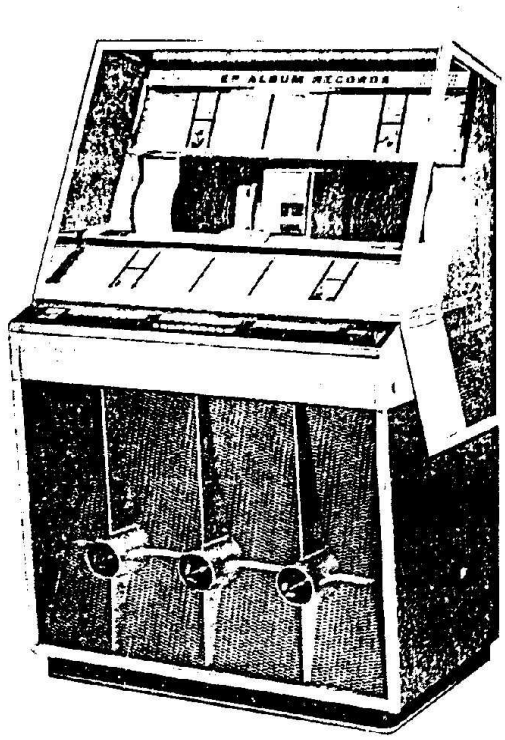
The Select-O-Matic "200", Models 201S, 201SH, 201D and 201DH are coin operated phonographs using the Seeburg Select-O-Matic Mechanism for selective playing of either or both sides of 100 45 r.p.m., 7-inch records. Choice of any of the two hundred selections may be made of the phonograph with the Tormat Electrical Selector or by remote control with 200-selection, 3-wire Wall-O-Matics.

The four models differ only in their pricing and credit systems and their coin acceptance. Models 201S and 201SH have a single pricing system with which record selection is made after coin deposit and all selections are priced at the same value. Model 201S is equipped with a slug rejector which accepts nickels, dimes and quarters; Model 201SH is equipped with a slug rejector which accepts nickels, dimes, quarters and half-dollars. Models 201D and 201DH have a dual pricing system with which credits are accumulative and selections may be "sold" at either of two values. Model 201D is equipped with a slug rejector which accepts nickels, dimes and quarters; Model 201DH is equipped with a slug rejector which accepts nickels, dimes, quarters and half-dollars. Each coin deposited adds credit "units" in an add-and-subtract credit switch that is part of the dual pricing system. A Half Dollar Unit in the Model 201DH permits a choice of premium credit combinations when half dollar coins are used. Glass information panels at the side of the coin entry of all models are lighted to indicate when there is enough accumulated credit for a selection or when additional coins are needed for selection.

The titles for the entire program of two hundred record sides are displayed on standard size dual title strips and are exposed for viewing in two back-lighted title strip frames. They are back-lighted by the fluorescent lamps that illuminate the mechanism, selection keys and the speaker grille.

The lid glass through which the mechanism and the record program are viewed is hinged and opens for changing records and title strips. With the lid open, access may be had to a Service Switch, a Manual Credit Switch, Popularity Meter and a Selection Counter. The Service and Credit Switches are for control of the mechanism when servicing the instrument.

The Popularity Meter is part of the mechanism and indicates the number of times (up to 40) each record has been played. The Selection Counter is part of the Credit System and totals the number of selections made. The counter total includes selections made through the remote control Wall-O-Matics as well as those made at the instrument.



A Seeburg Magnetic Pickup with one-fifth ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt high fidelity audio system connects to four permanent magnet type speakers. Two of these are 12-inch low frequency speakers; two are 8-inch high and middle range speakers. A terminal strip is provided for connection of Constant Voltage High Fidelity Type Remote Speakers. The audio amplifier incorporates a transistorized preamplifier stage. An automatic volume compensator provides uniform volume level and avoids "blasting" due to "loud" records. A single volume control is used to adjust the volume of sound from the phonograph speakers and the remote speakers. Provision has been made for plug-in connection of a remote volume control that may be up to a hundred feet from the Select-O-Matic without introducing hum or causing distortion.

A Selection Receiver supplies power for remote control Wall-O-Matics and incorporates the switches and relays for operation by remote control as well as from the Electrical Selector. It has sockets for convenient plug-in connections for the mechanism, cabinet lighting and control units. A terminal strip provides connections for Wall-O-Matics.

The selection receiver and the audio amplifier are mounted vertically on the rear door of the cabinet. The door is hinged on the side and can be swung out to permit access to coin equipment in the cabinet and to tubes, tone controls, plugs etc. A cover plate on the rear of the door can be removed by unscrewing two screws on its outer left hand edge and sliding the plate forward and out. This exposes the interior wiring of the selection receiver and amplifier for test during normal operation.

A selection cancel switch, effective only when a record is playing, is operated by a push button on the back of the rear door. A remote cancel switch may be connected to terminals on the selection receiver where a switching link is located to permit either the remote cancel switch, the included switch or both to be used.

SPECIFICATIONS

Power Requirements:

117 volts A. C., 60 cycles
Standby (without Wall-O-Matics) – 125 watts
Operating (without Wall-O-Matics) – 260 watts

Cabinet Lighting:

Upper Cabinet Lamp – 25-watt, 33-inch, Cool White Fluorescent (FS25 starter)
Lower Cabinet Lamp – Same as above

Cabinet Key Number: ..... F 313

Select-O-Matic Mechanism ..... Type 245ST7

Tormat Memory Assembly ..... Type 200TM3

Record Capacity ..... 100 records (200 selections)

Record Type .....45 rpm
7-inch diameter, 1.5-inch center hole

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

2 – 12" permanent magnet (low frequency)
2 – 8" permanent magnet (high frequency)
Cross Over Network ..... Type CN600-1

Finish ..... Silver Fox

Coin Equipment: 5-, 10-, 25-cent
Single Entry Rejector with Models 201S and 201D

5-, 10-, 25-, 50-cent Single Entry Rejector with Model 201SH and 201DH

Model	Pricing Unit	Coins Accepted
201S	SPU1	5- 10- 25-
201SH	SPU1H	5- 10- 25- 50-
201D	DPU1	5- 10- 25-
201DH	DPU1 & HDU1	5- 10- 25- 50-

Amplifier..... Type HFMA-2

7-tube High Fidelity, Constant Voltage Type with Automatic Volume Compensation and transistor preamplifier stage.

Audio Power Output:

To Phonograph Speakers (adjustable)-1 to 25 watts
To Remote Speakers ..... 24 watts max.
Maximum Total to Phonograph Speakers & Remote Speakers ..... 25 watts

Tormat Electrical Selector ..... Type TES221

Tormat Selection Receiver ..... Type TSR6

Remote Control:

Seeburg, 3-wire "Wall-O-Matic"
Nominal operating voltage 25
Power Source ..... Tormat Selection Receiver or Auxiliary Power Supply Type PS6-1Z
Maximum number of Wall-O-Matics powered by Tormat Selection Receiver 6
Maximum number of Wall-O-Matics powered by each added auxiliary power supply 6

Remote Speakers; .....High Fidelity Types:

HFCV1-12 12" Recessed Type
HFCV2-8 8" Wall Cabinet
HFCV3-8 8" Corner Cabinet

Transistor ..... Type 2N109

Tubes:

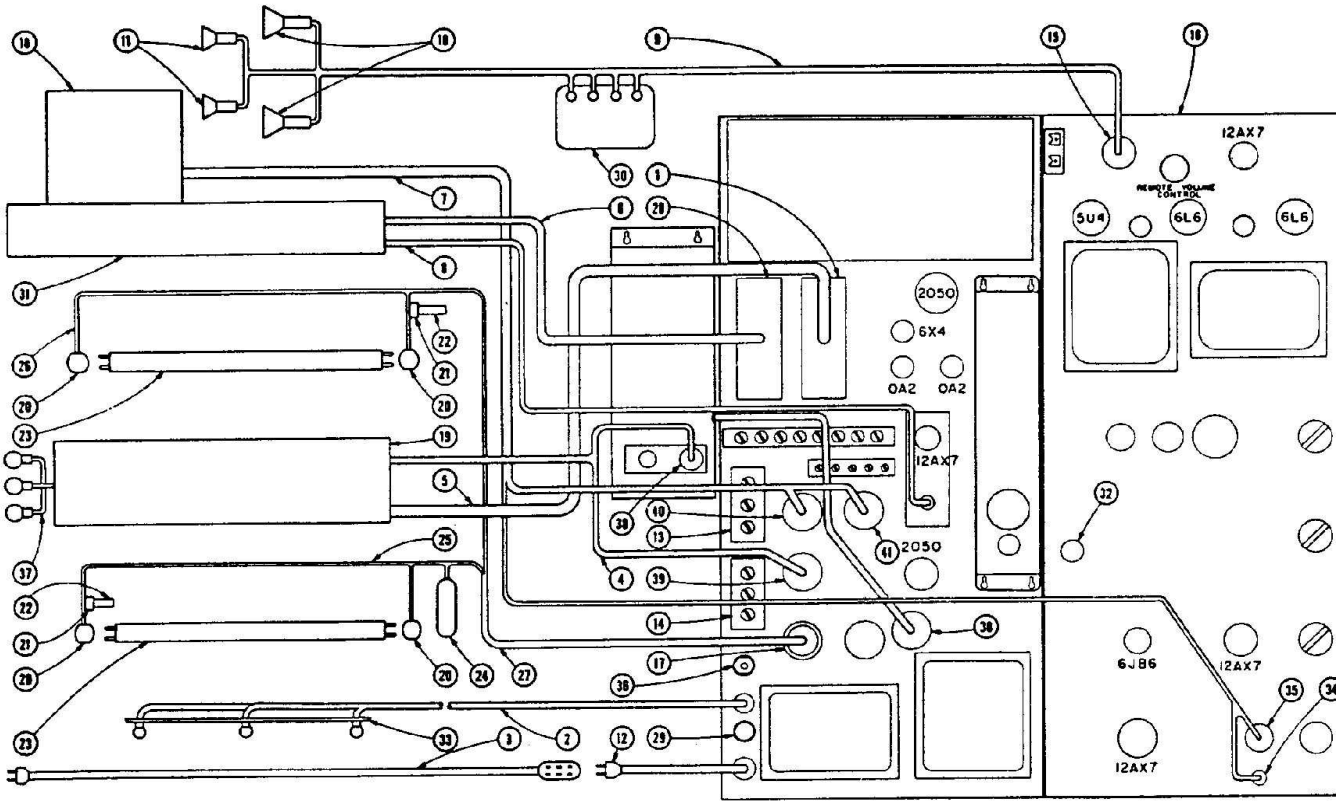
2 – 6L6GB	1 – 5U4G-GB
3 – 12AX7	2 – 2050
1 – 6BJ6	1 – 6X4
2 – OA2	

Fuses:

1 – 5 amp. Type MTH
1 – 2 amp. Type MDL
1 – 3.2 amp. Type N3-2/10
1 – 5 amp. Pig-Tail Fuse, Type GJV (used on Select-O-Matic Mechanism)

DIMENSIONS

Height .....56-1/2 Inches
Width ..... 34-7/8 Inches
Depth .....27 Inches
Net Weight ..... 374 Pounds
Shipping Weight ..... 458 Pounds
Record Weight:
100 Records, Approx. .....6 Pounds

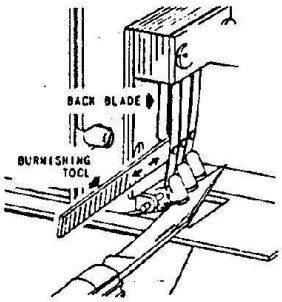


Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	410573	Socket Assembly
2	480456	Grille Light Cable & Plug Assembly
3	402152	Line Cord & Outlet Assembly
4	411101	Electrical Selector Control Cable
5	411099	Matrix Cable Assembly
6	304786	Tormat Cable Assembly
7	249931	Mechanism Control Cable
8	304725	Tormat Electronic Input Cable
9	480726	Speaker Cable Assembly
10	408315	Speaker
11	408818	Speaker
12	303985	Line Cord
13	305447	Terminal Board Assembly
14	305309	Terminal Board
15	200241	Plug
16	309231	Door Assembly
17	10895	Plug
18	248400	Select-O-Matic Mechanism
19	411003	Tormat Electrical Selector
20	407352	Lamp Socket
21	407353	Starter Socket
22	405138	Starter
23	405084	Fluorescent Lamp
24	409947	Ballast
25	480722	Lower Program Light Cable Assembly
26	480724	Upper Program Light Cable Assembly
27	480767	Plug Assembly
28	304657	Plug Assembly
29	602411	Fuse
30	503600	Speaker Crossover Network
31	304751	Tormat Memory Assembly
32	303087	Fuse
33	409705	Grille Ornament Rail & Socket Assembly
34	246957	Plug
35	250938	Plug
36	303697	Fuse
37	411102	Credit Light Cable Assembly
38	410708	Plug
39	408258	Plug
40	65319	Plug Assembly
41	250942	Plug Assembly

COIN SWITCHES



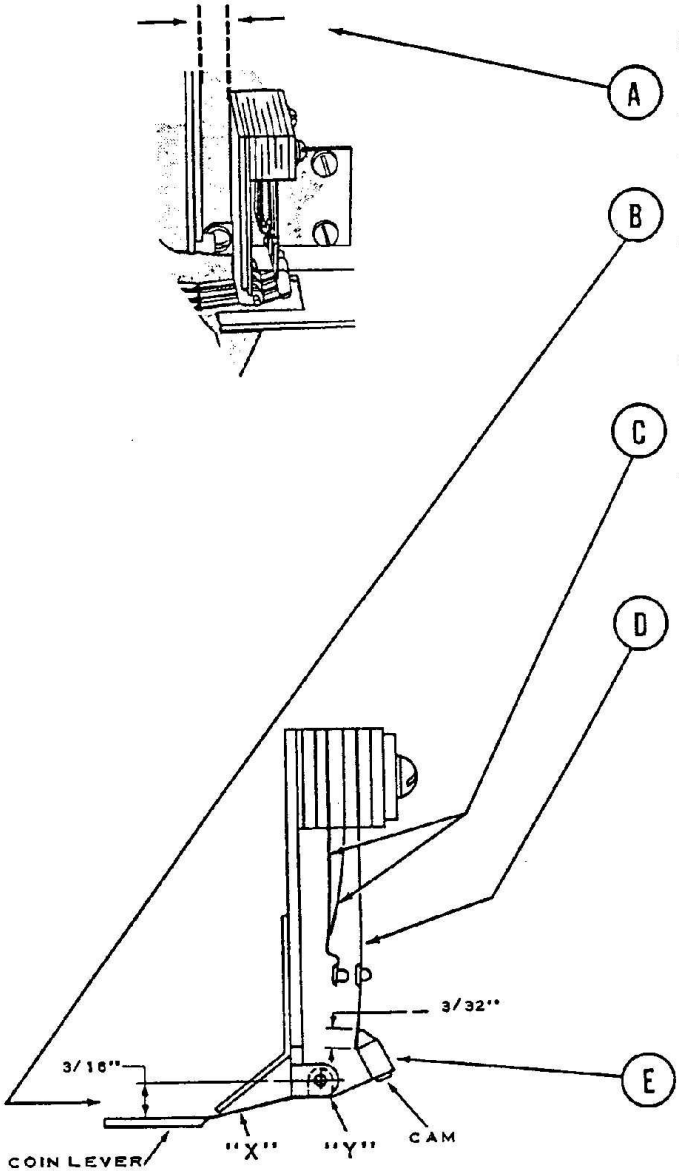
CLEANING

Clean the switch contacts carefully with carbon tetrachloride using a No. 2 camel hair brush.

Burnish by inserting a burnishing tool between the contacts, raising the switch lever with a knife blade as shown. *Never use a file or sandpaper for contact cleaning.*

COIN LEVER ALIGNMENT

The coin switch levers should be parallel and centered with the openings of their respective coin exits in the slug rejector. Lateral play of the lever should be taken into account when checking the position of the switch levers.



SWITCH ADJUSTMENT

A. Adjust the coin switch mounting so the bracket is vertical and parallel with the vertical edge of the slug rejector frame.

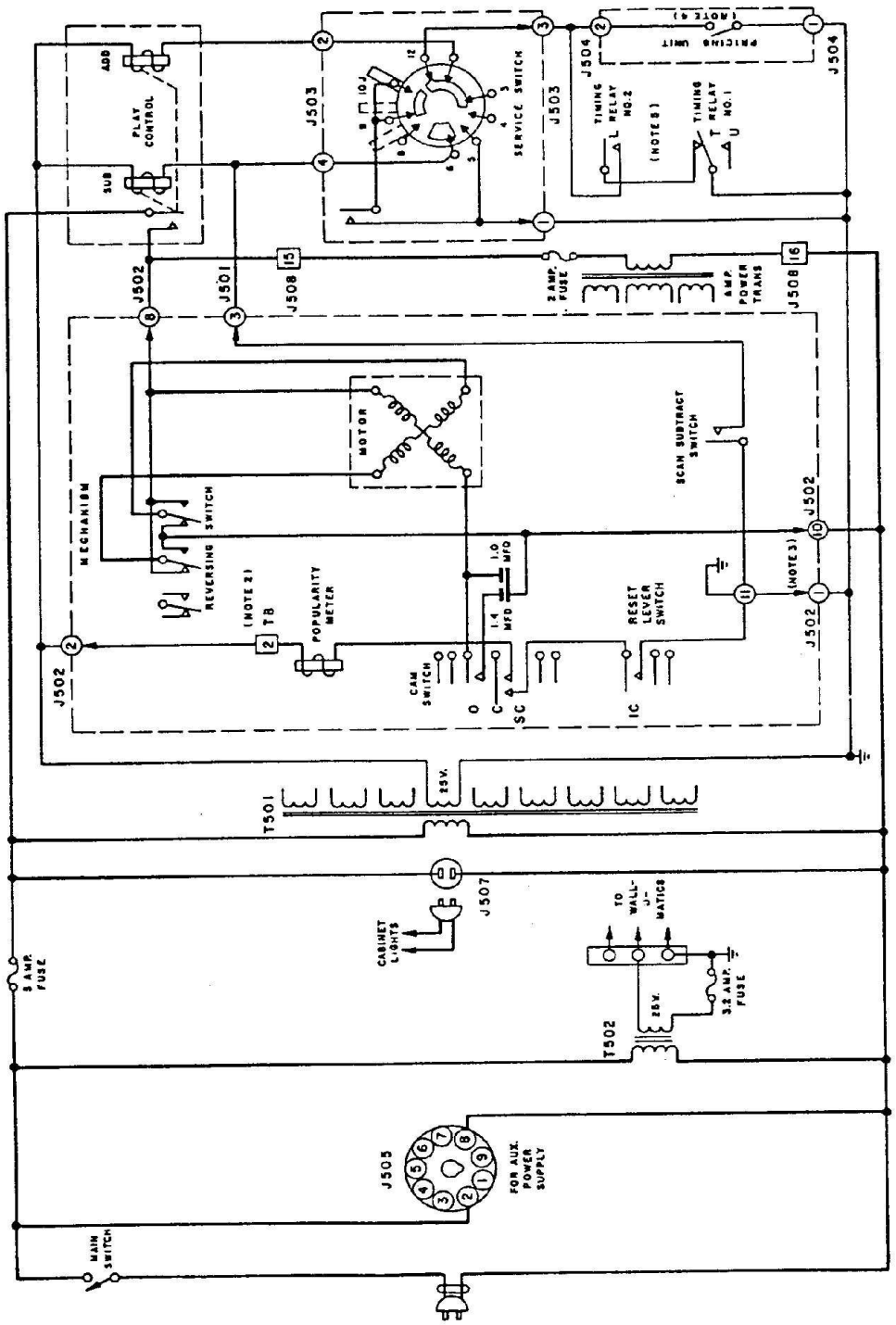
B. Adjust the coin levers so they are parallel with the bottom edge of the rejector and are bearing against the bracket at "X". The ends of the levers should be approximately 3/16" below the level of the lever pivot, "Y".

C. Adjust short blade and bracer for 1/32" to 3/64" contact gap (all switches) with short blade bearing against tip of bracer at approximately 2 to 3 grams (measured at contact point).

D. Adjust the long blade so it bears against the cam, as measured at the switch contact:

Nickel switch	– 10 to 14 grams
Nickel switch (with flipper equipped slug rejector)	– 5 to 7 grams
Dime switch	– 5 to 7 grams
Quarter switch	– 12 to 16 grams
Half Dollar switch (not shown)	– 12 to 16 grams

E. Adjust the switch actuating cams to be tilted as shown and overlap the switch blade approximately 3/32".



1. (2) THIS SYMBOL INDICATES A SOCKET IN THE SELECTION RECEIVER. NUMERAL IN CIRCLE IS CONTACT OR TERMINAL NUMBER. ARROW INDICATES MATING PLUG TERMINAL.

2. [2] THIS SYMBOL INDICATES A TERMINAL OF THE TERMINAL STRIP ON MECHANISM CARRIAGE. NUMERAL IN BOX IS TERMINAL NUMBER. TERMINAL NUMBERING BEGINS WITH 1 AT BOTTOM OF STRIP.

3. CARRIAGE GROUND CONNECTION BELOW TERMINAL STRIP.

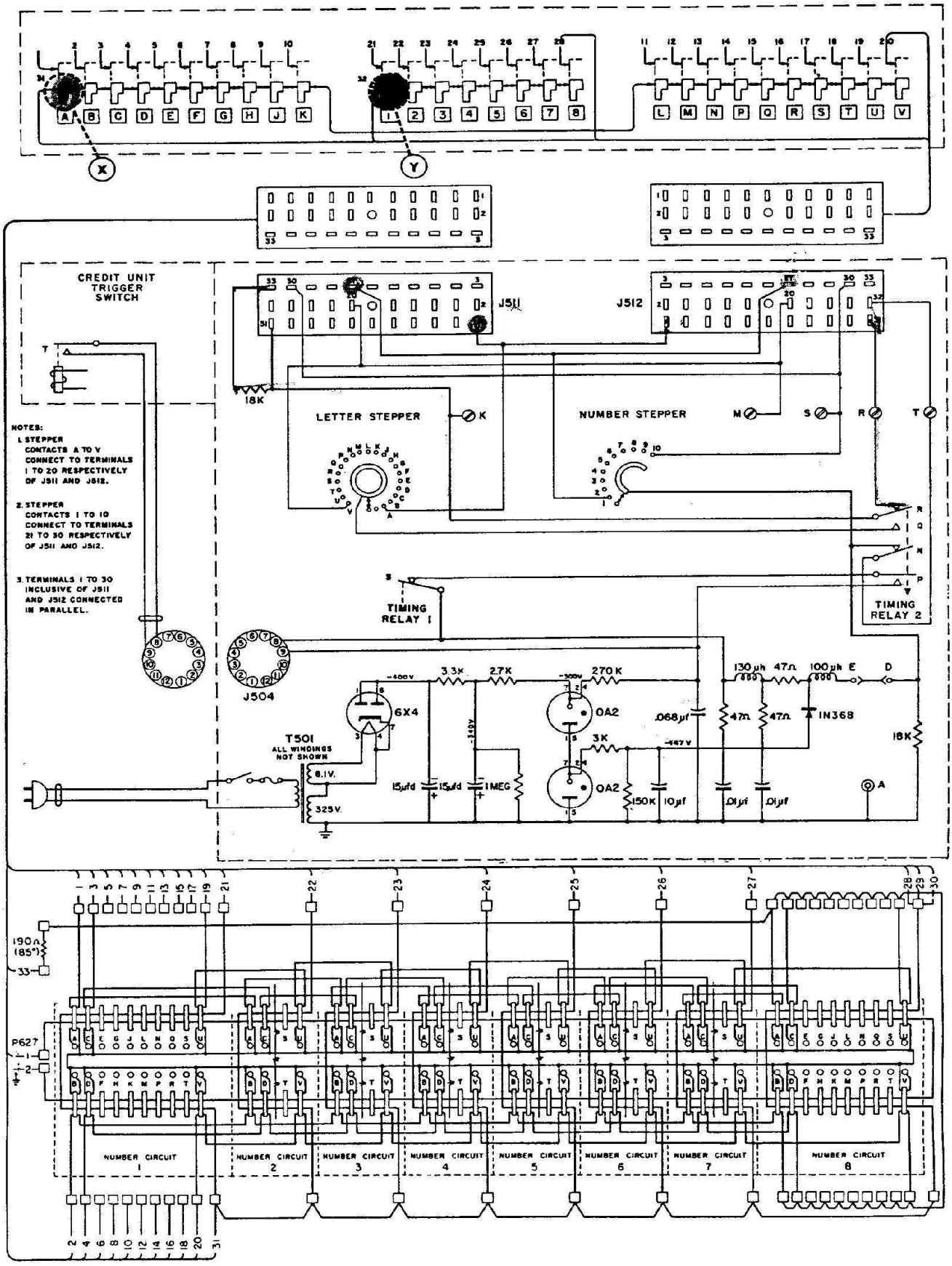
4. CIRCUIT MOMENTARILY CLOSED WHEN SELECTION IS MADE AT ELECTRICAL SELECTOR.

5. CIRCUIT MOMENTARILY CLOSED THROUGH L AND T WHEN SELECTION IS MADE BY REMOTE OPERATION.

Simplified Schematic Diagram — Power & Control Wiring

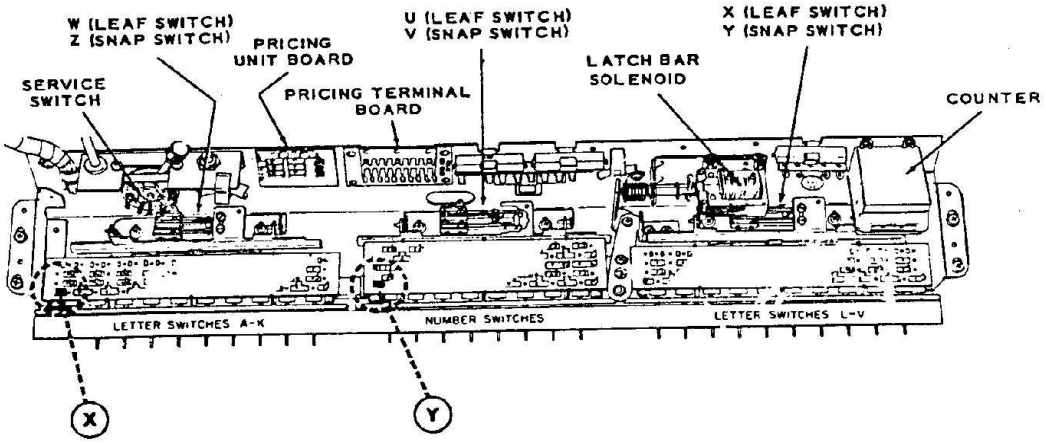
SELECT-O-MATIC "160", MODEL 161

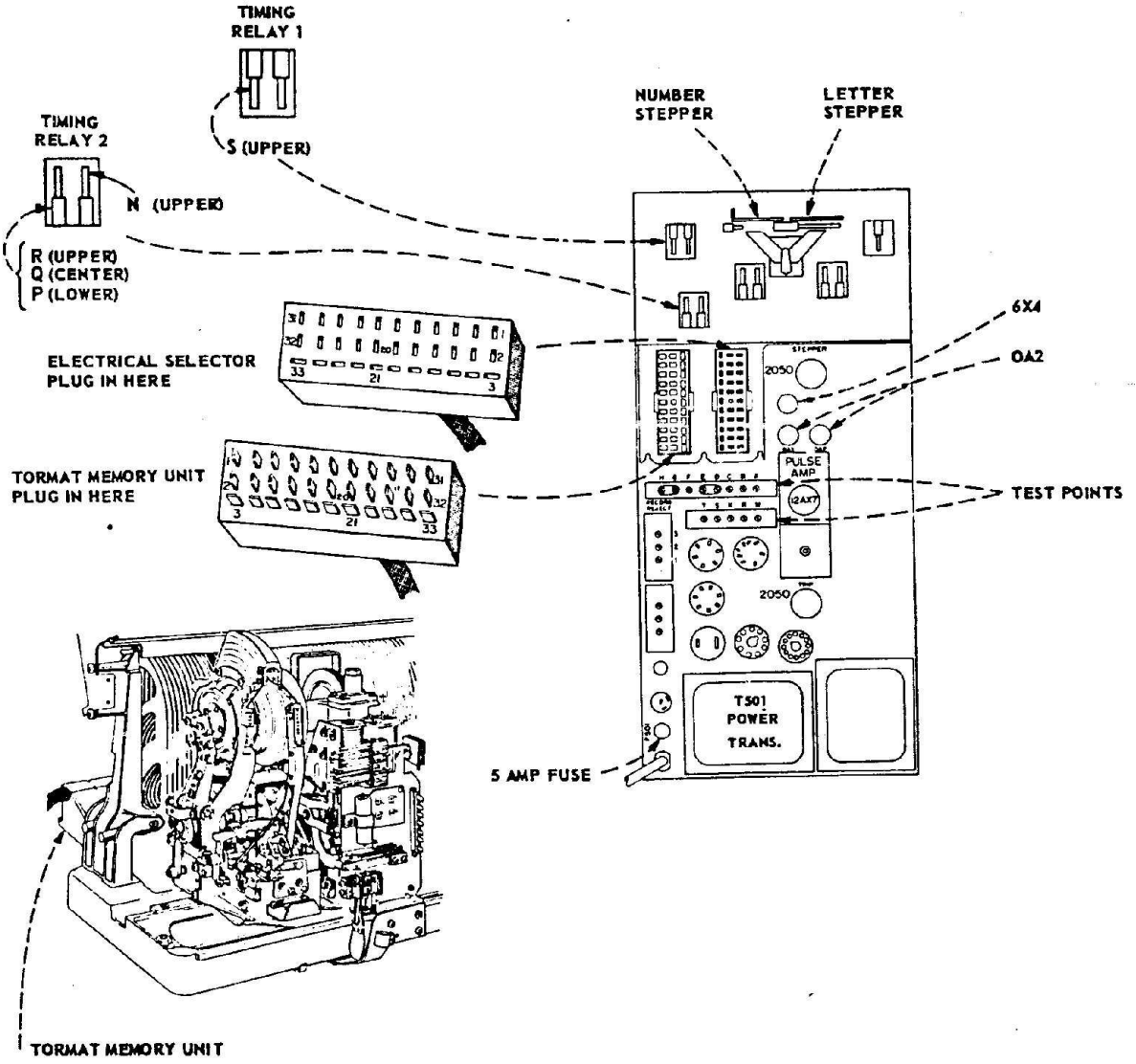
WRITE-IN CIRCUITS



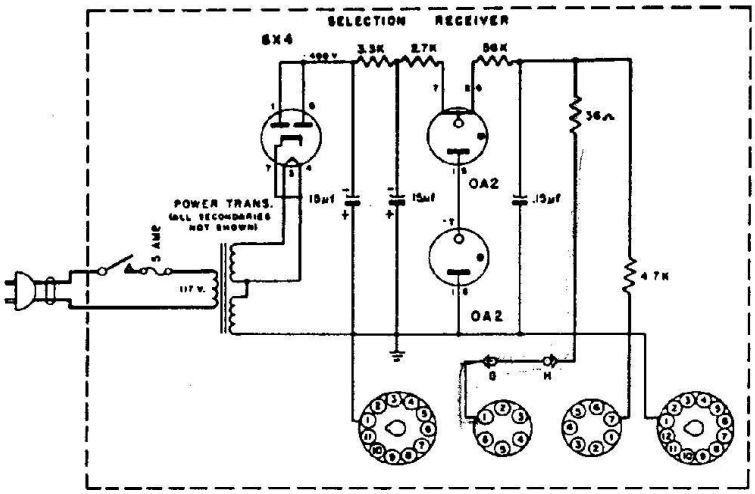
1341

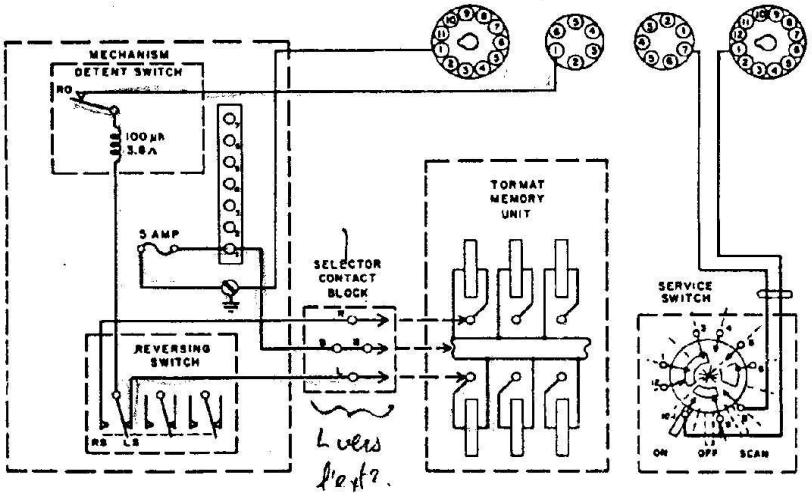
WRITE-IN CIRCUIT COMPONENTS

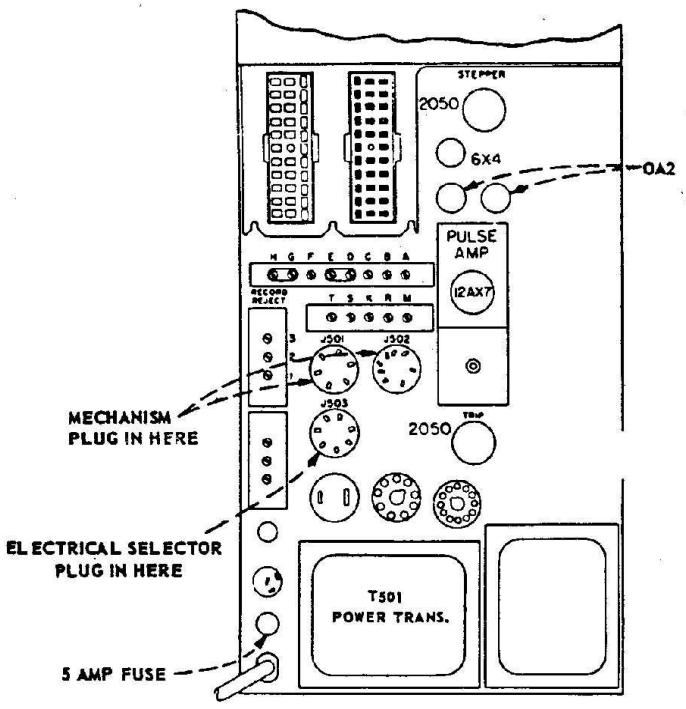


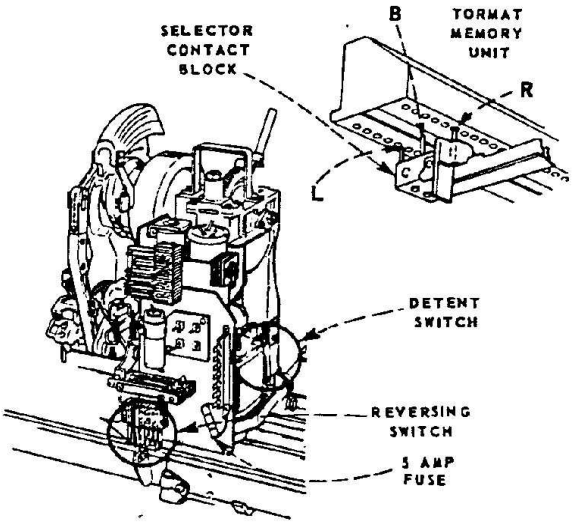


READ-OUT CIRCUIT



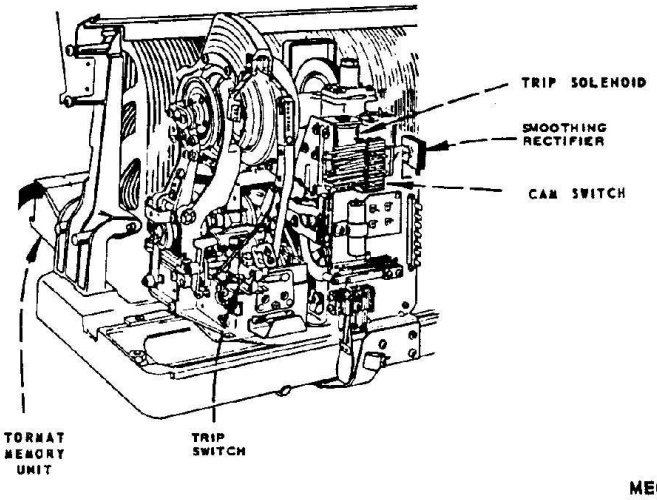


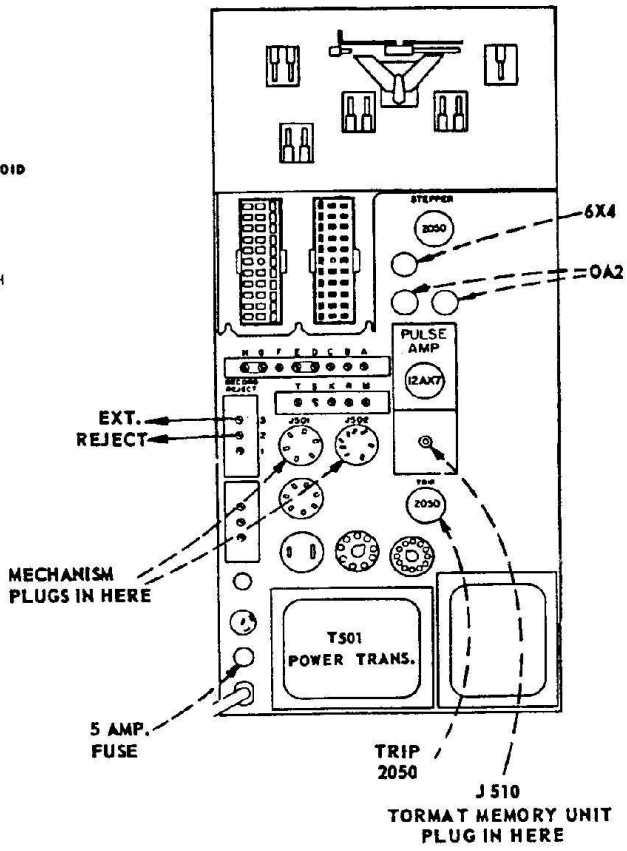


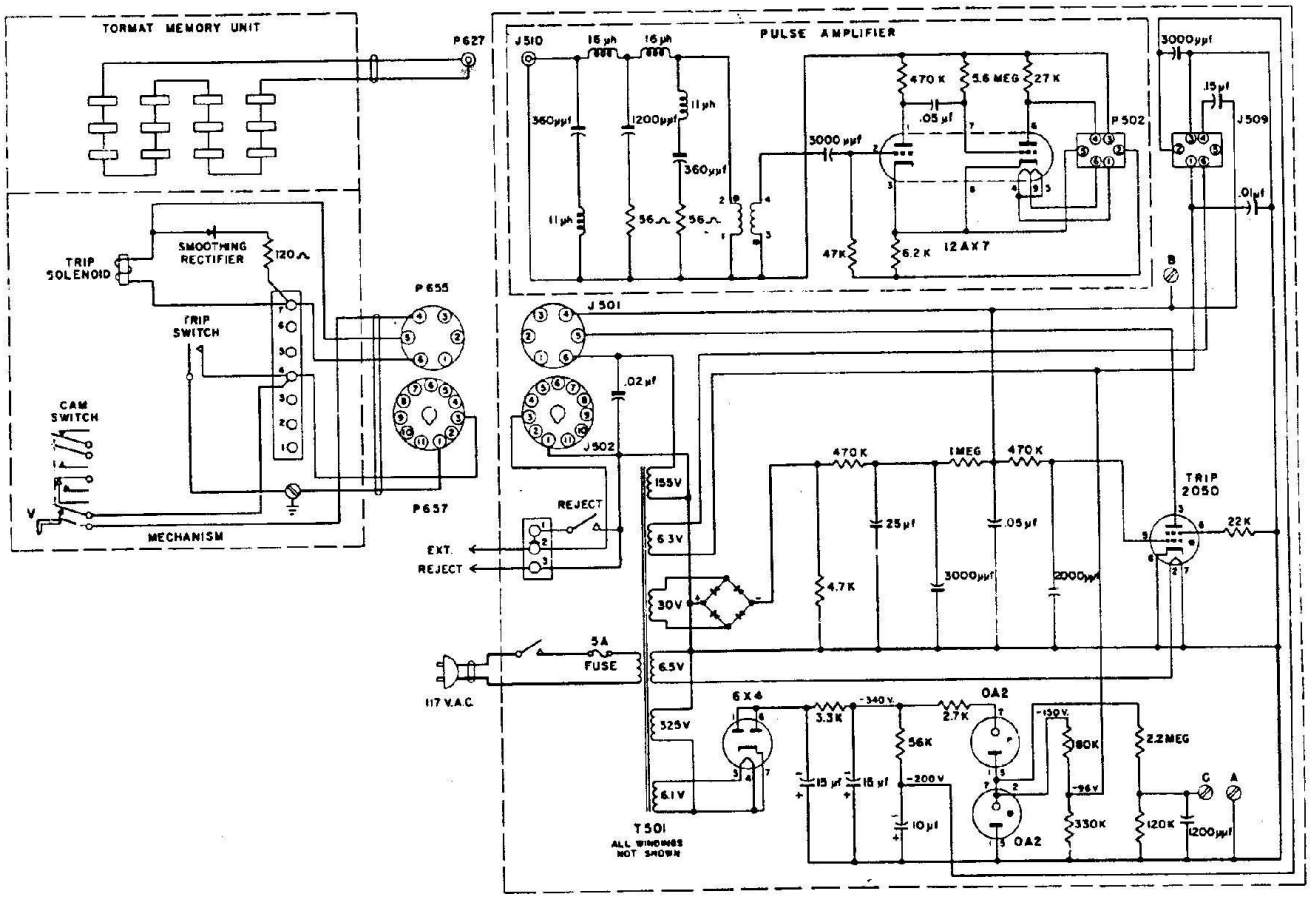


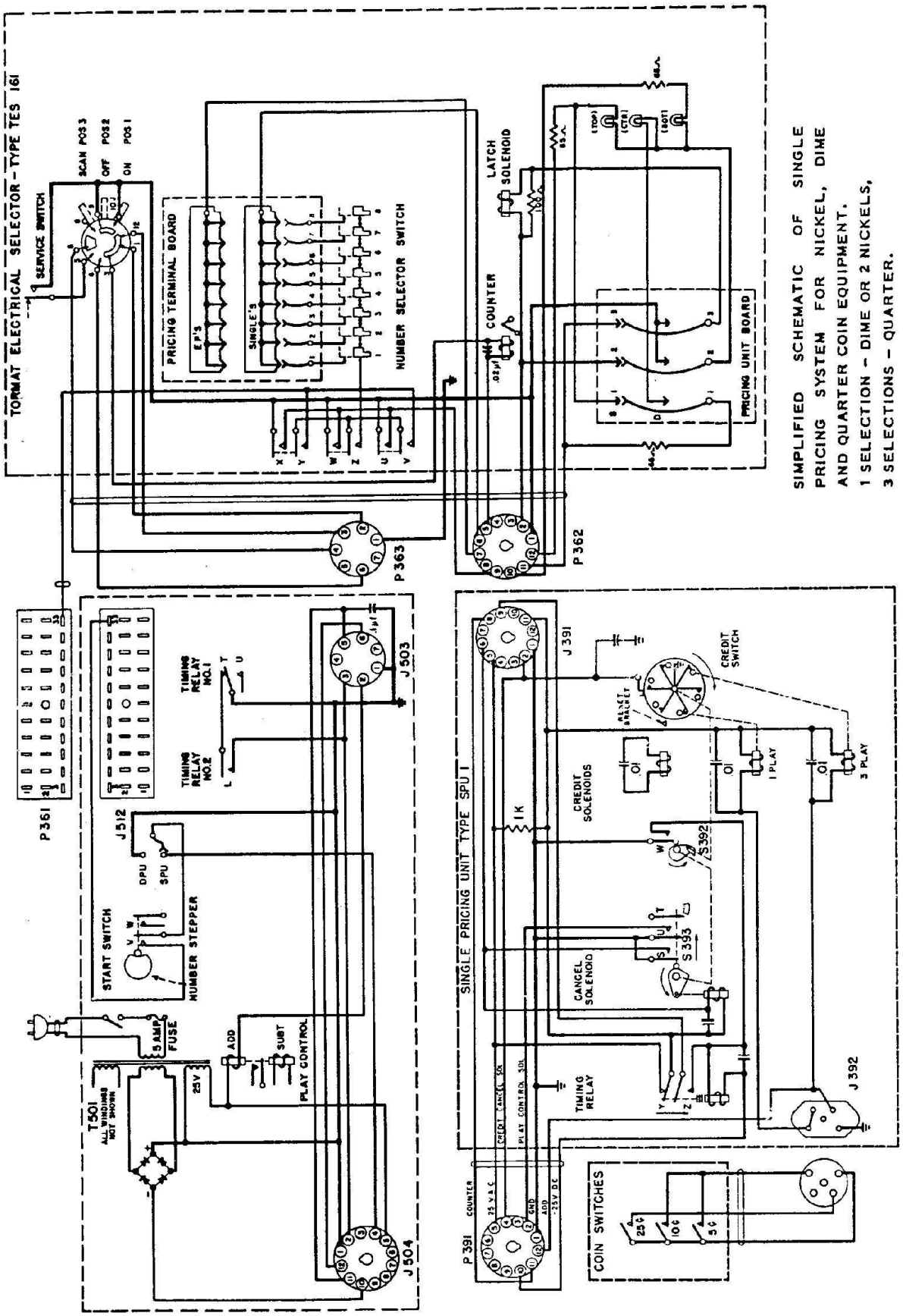
1343

TRIP & SENSING CIRCUITS





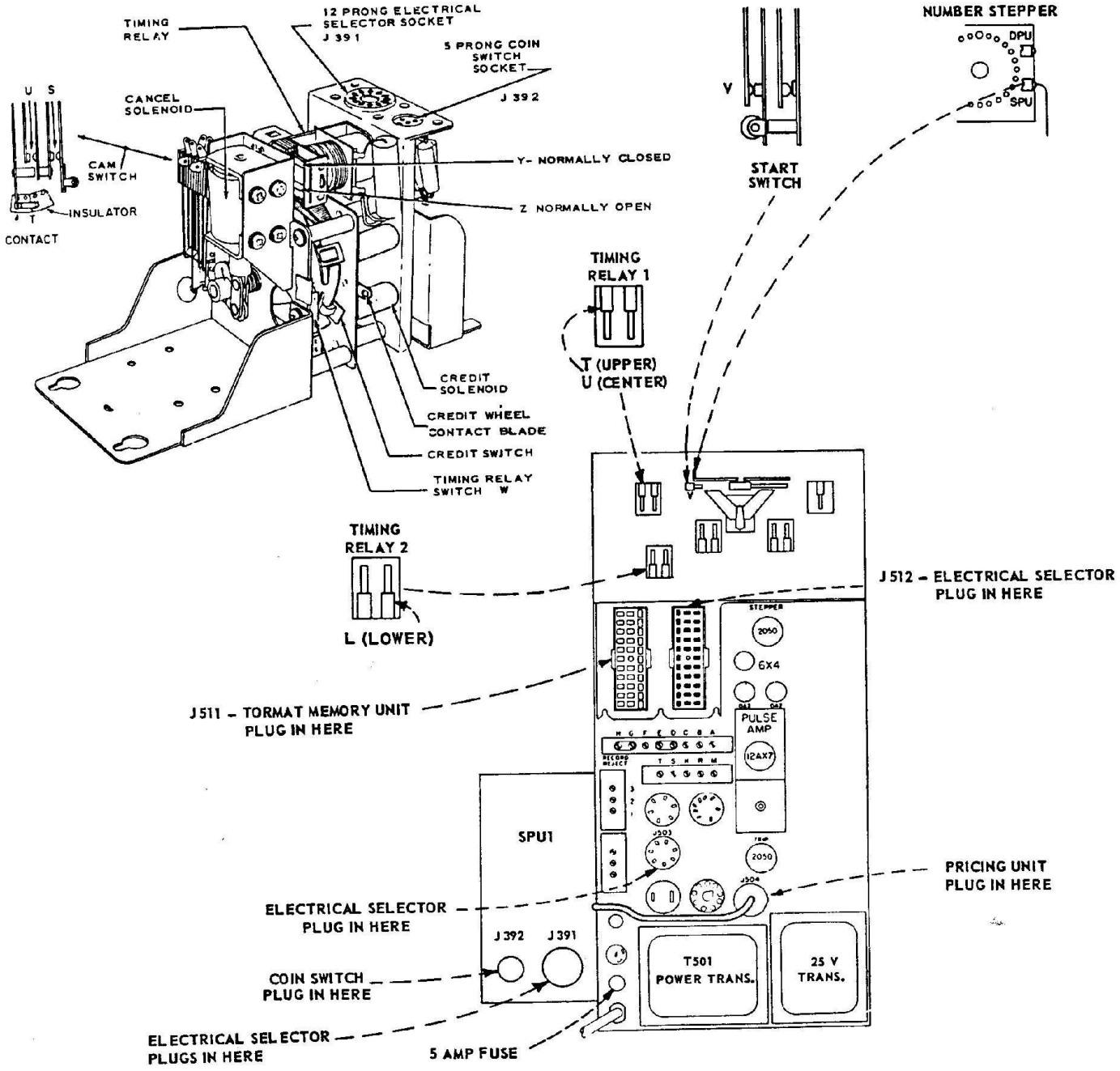


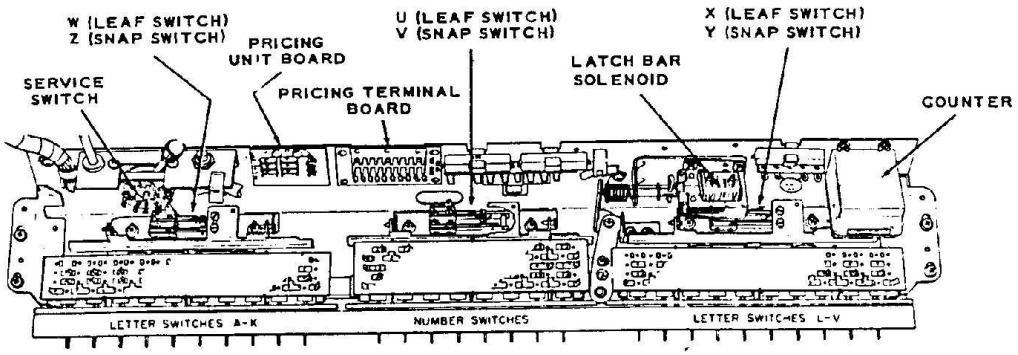


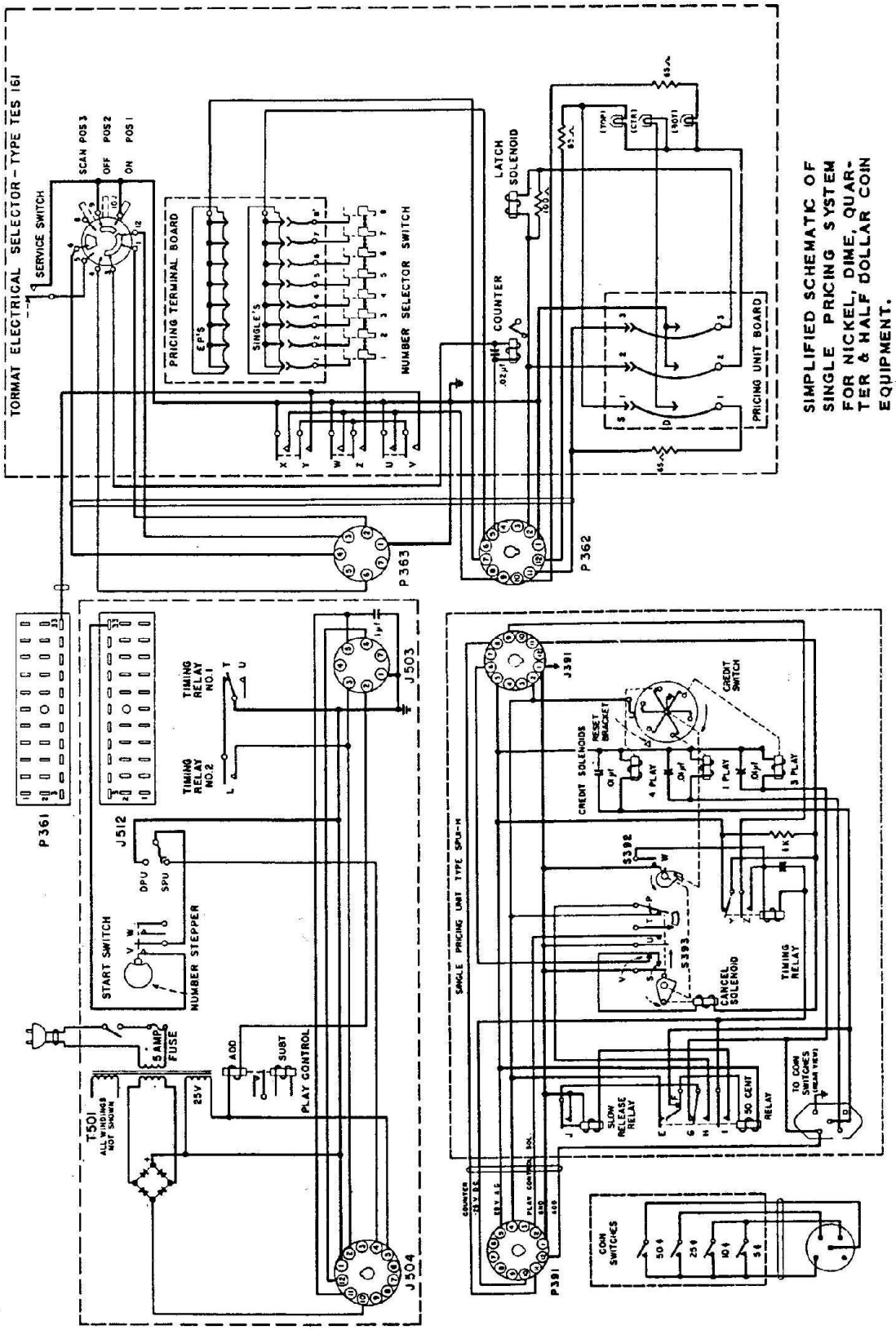
SIMPLIFIED SCHEMATIC OF SINGLE PRICING SYSTEM FOR NICKEL, DIME AND QUARTER COIN EQUIPMENT.
1 SELECTION - DIME OR 2 NICKELS,
3 SELECTIONS - QUARTER.

1345

CREDIT SYSTEM





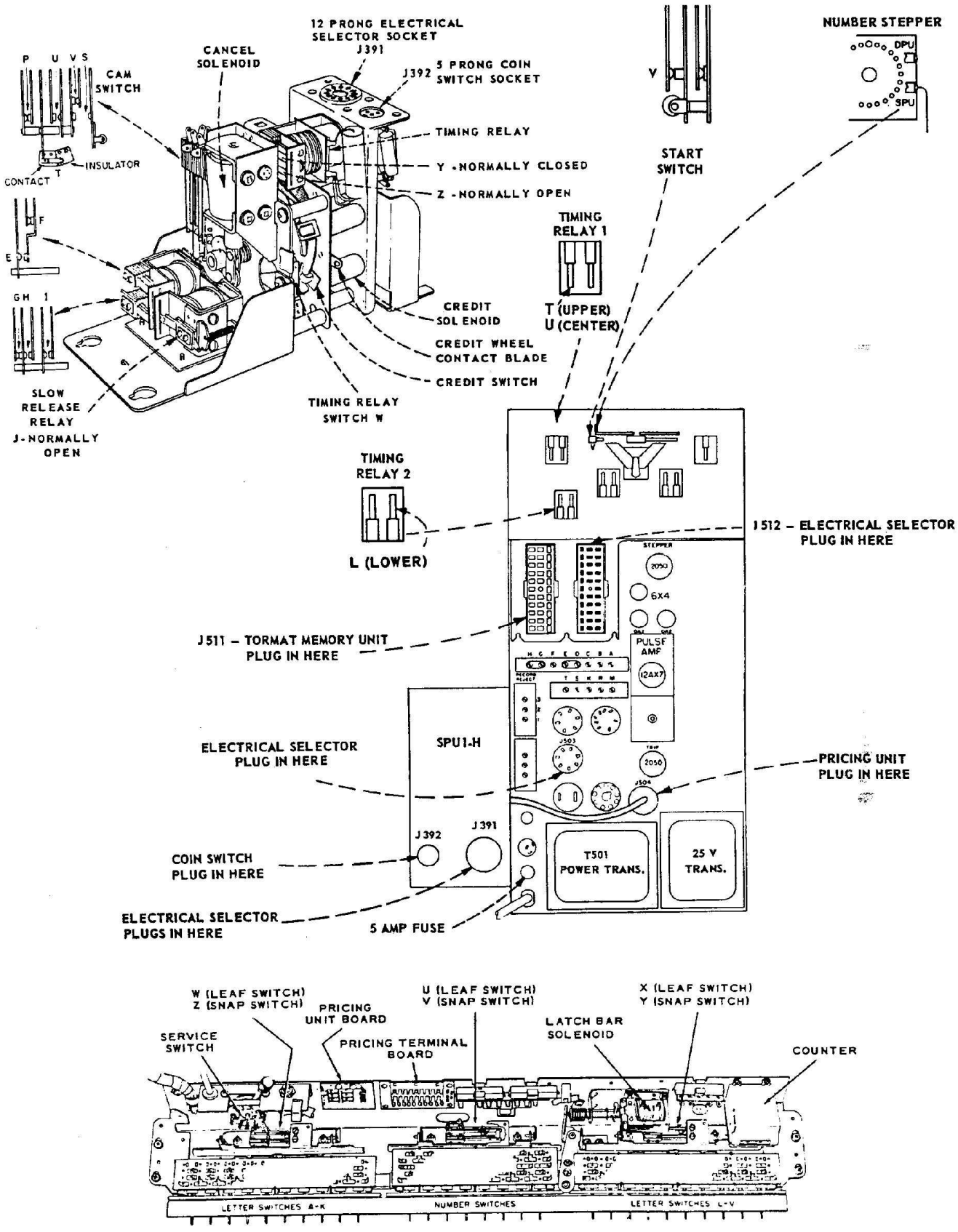


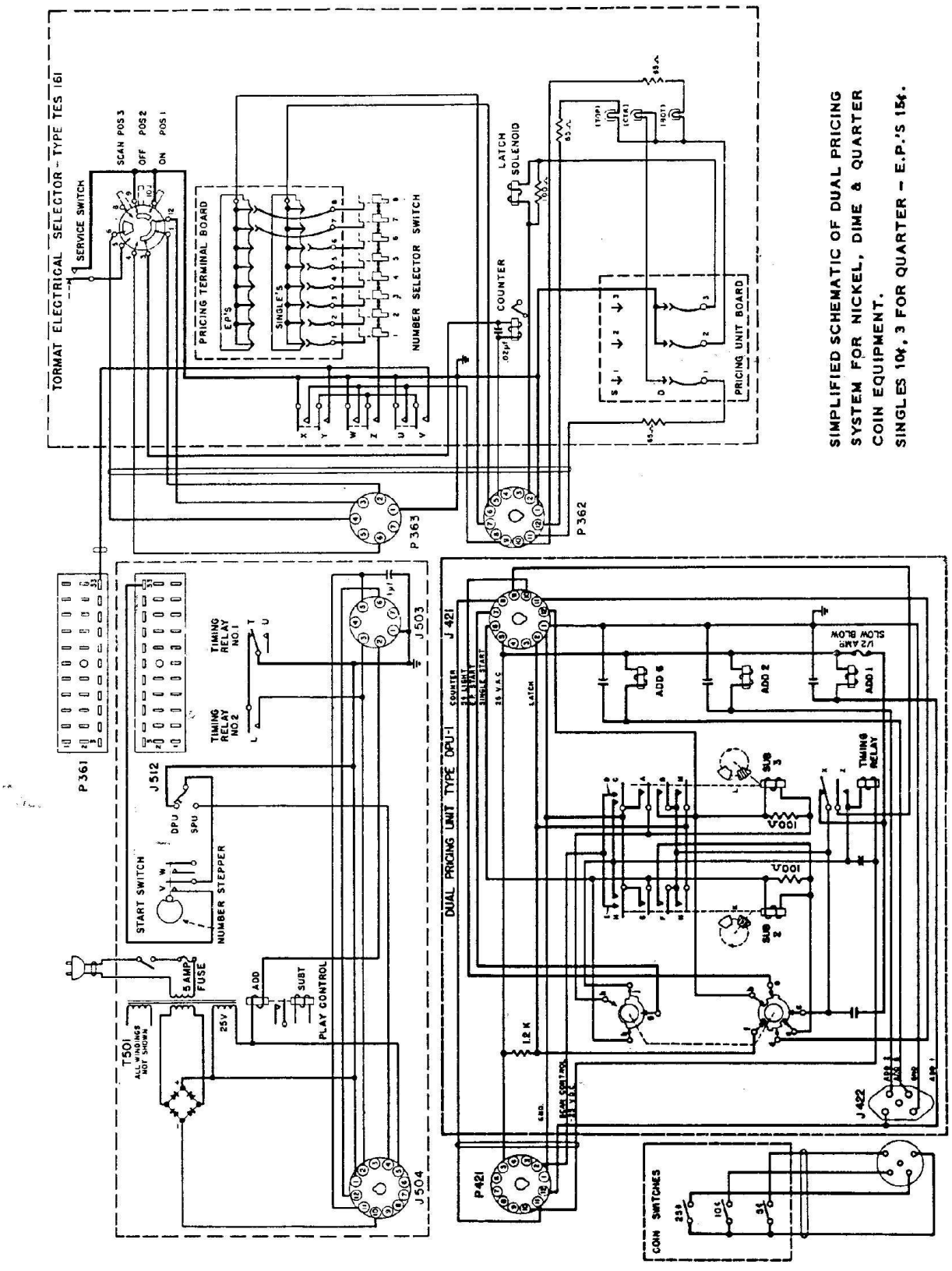
SIMPLIFIED SCHEMATIC OF SINGLE PRICING SYSTEM FOR NICKEL, DIME, QUARTER & HALF DOLLAR COIN EQUIPMENT.

1 SELECTION - DIME OR 2 NICKELS,
3 SELECTIONS - QUARTER,
7 SELECTIONS - HALF DOLLAR.

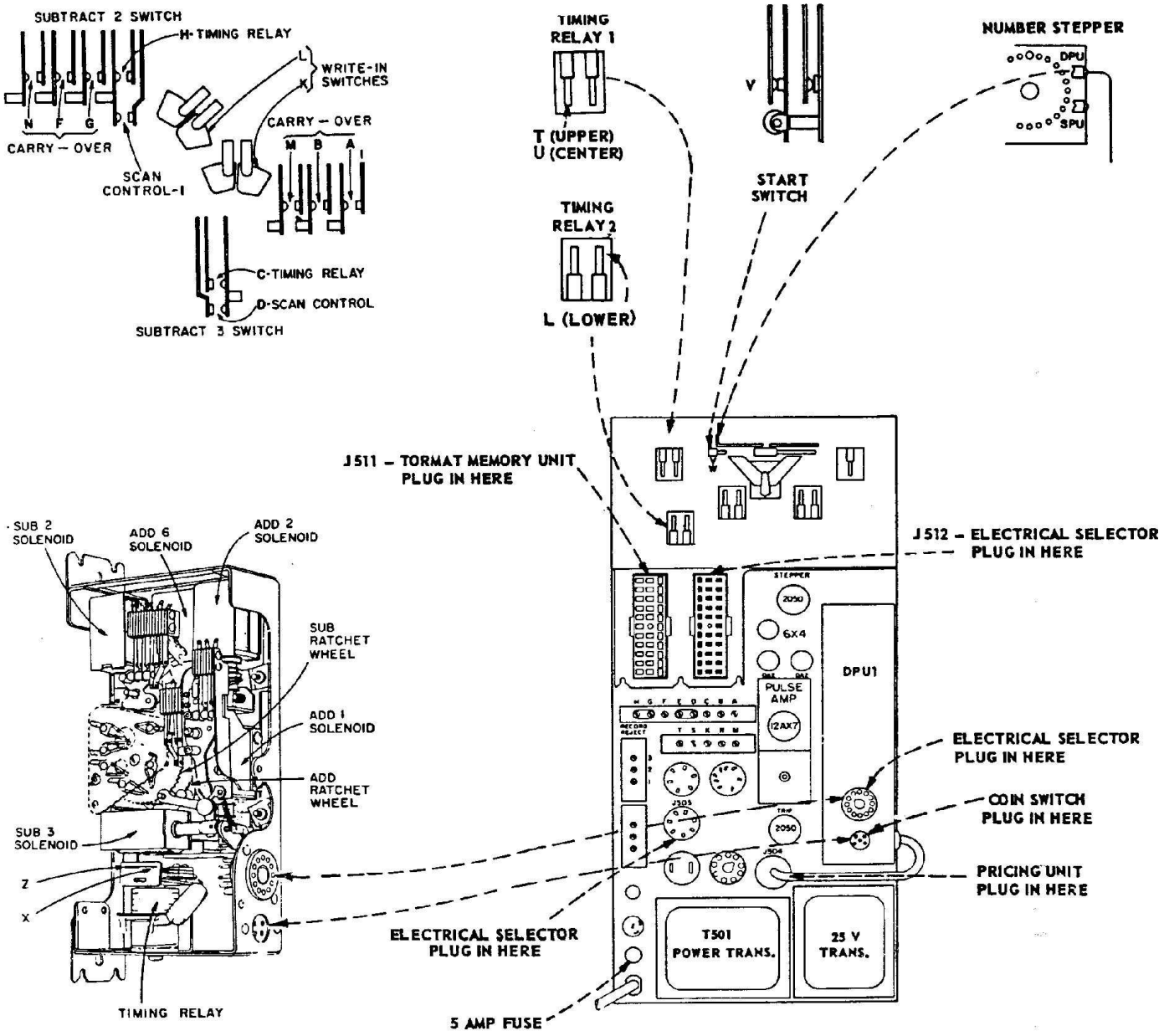
1347

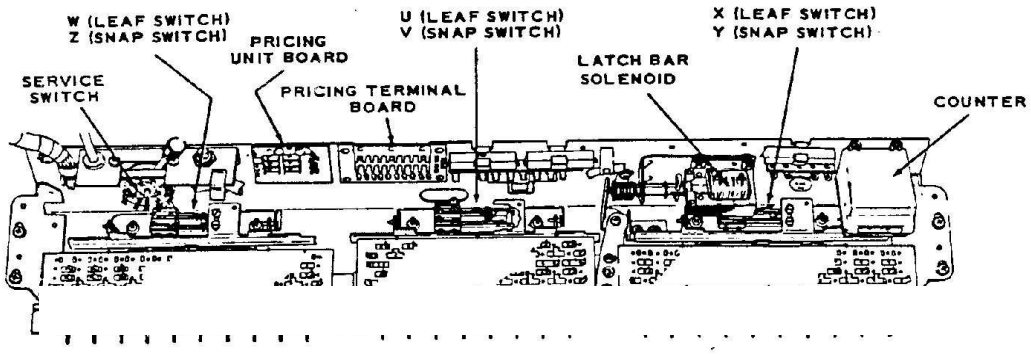
CREDIT SYSTEM




TORMAT ELECTRICAL SELECTOR - TYPE TES 161
SERVICE SWITCH
SCAN POS 3
OFF POS 2
ON POS 1
PRICING TERMINAL BOARD
EP'S
SINGLE'S
NUMBER SELECTOR SWITCH
LATCH SOLENOID
COUNTER
PRICING UNIT BOARD
P362
P363
P361
J503
J504
J512
TIMING RELAY NO.1
TIMING RELAY NO.2
START SWITCH
NUMBER STEPPER
5 AMP FUSE
T501
ALL WINDINGS NOT SHOWN
ADD
SUBT
PLAY CONTROL
DUAL PRICING UNIT TYPE DPU-1
J 421
P421
J422
12 K
COIN SWITCHES
SIMPLIFIED SCHEMATIC OF DUAL PRICING SYSTEM FOR NICKEL, DIME & QUARTER COIN EQUIPMENT.
SINGLES 10¢, 3 FOR QUARTER - E.P.'S 15¢.

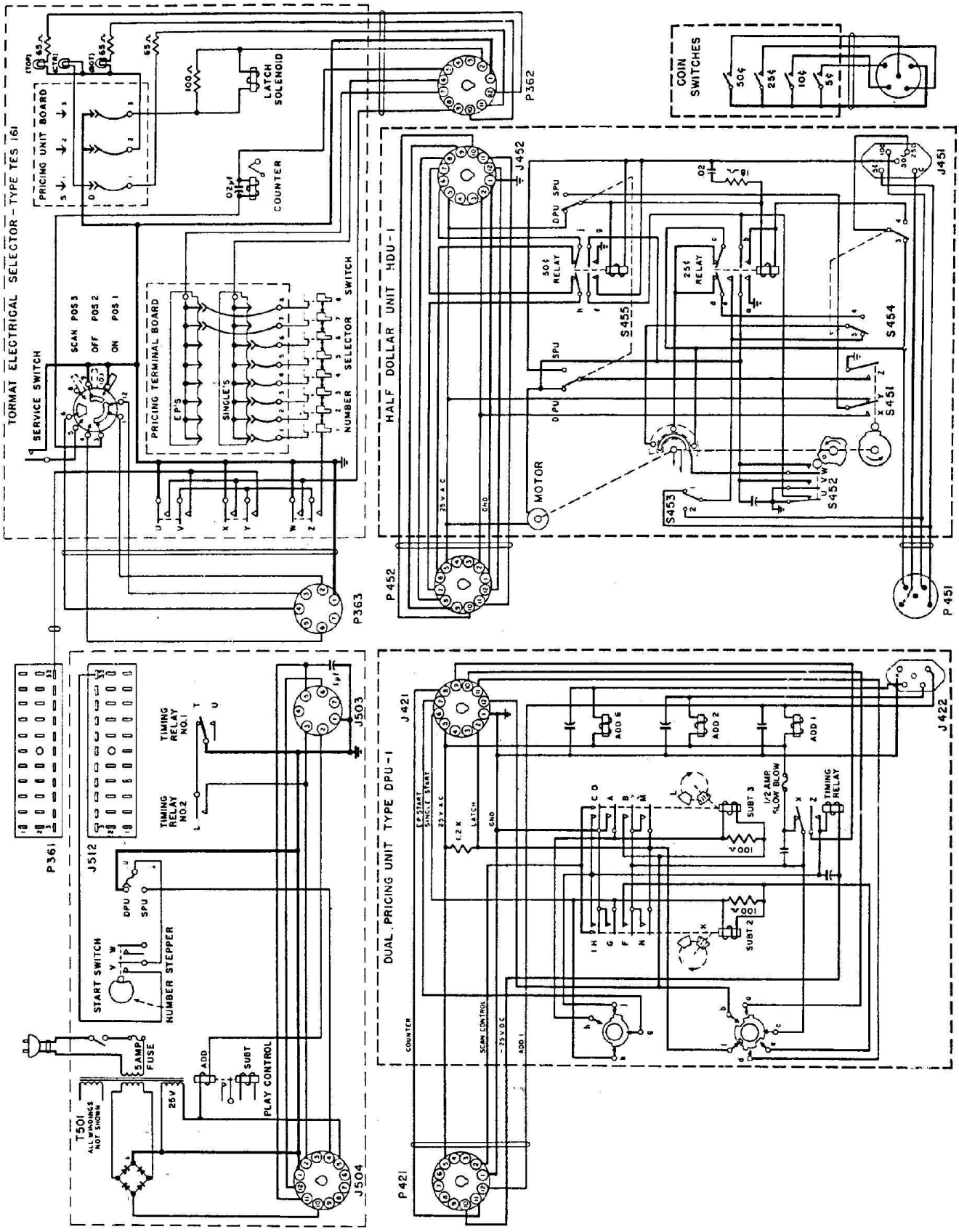
CREDIT SYSTEM





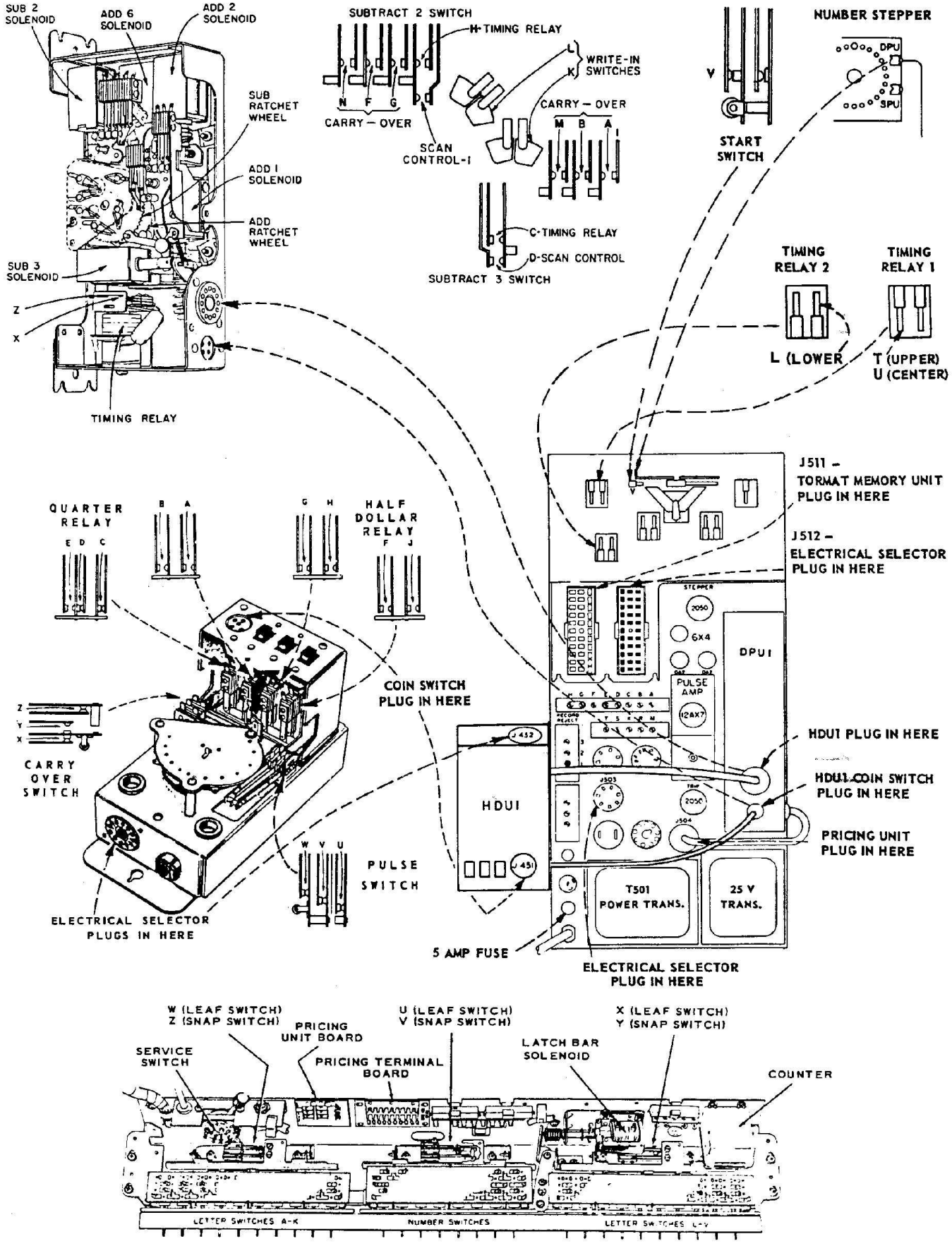
SELECT-O-MATIC "160", MODEL 161DH

SIMPLIFIED SCHEMATIC OF DUAL PRICING SYSTEM FOR NICKEL, DIME, QUARTER & HALF DOLLAR COIN EQUIPMENT.
SINGLES 10¢, 3 FOR QUARTER, 7 FOR HALF DOLLAR, E.P.'S 15¢, 2 FOR QUARTER, 4 E.P.'S PLUS 1 SINGLE FOR HALF DOLLAR.



1351

CREDIT SYSTEM



SEEBURG
SELECT-O-MATIC MECHANISM

TYPE 145ST3 for MODEL 101

TYPE 160ST1 for MODEL 161

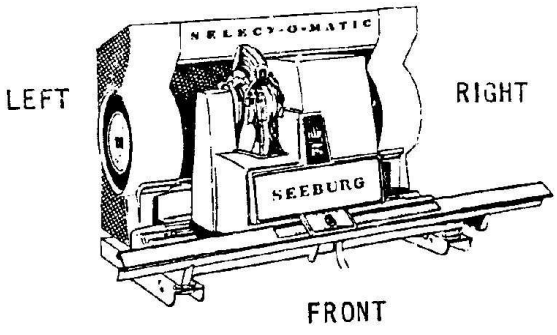
TYPE 245ST7 for MODEL 201

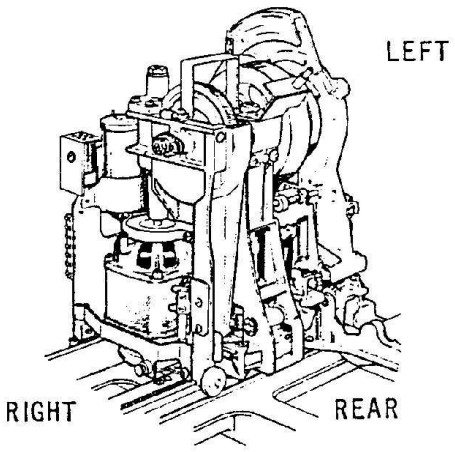
- ADJUSTMENT INDEX -

PREFACE

The adjustments for the 45 r.p.m. Select-O-Matic Mechanisms are given on the following pages. Each adjustment is associated with a step-by-step procedure which, if followed, will result in correct adjustment and normal operation. These individual adjustments may be made in any sequence but they are, in some instances, dependent on or affected by others. Because of this, they are arranged in a sequence which may be followed from page to page if a completely misadjusted mechanism is to be placed in operating condition. If an individual adjustment is to be checked or made, careful attention should be given to notes indicating dependent adjustments.

Reference is made in these adjustment outlines to the FRONT, REAR, LEFT and RIGHT of the mechanism in order to locate adjusting screws and various mechanical parts. Unless otherwise specified, these are defined as viewed from the front of the cabinet. Reference is also made to right side and left side playing of a record. Right side of a record is defined as viewed from the front of the complete instrument and is played with counter-clockwise rotation of the mechanism flywheel. Left side of a record is defined as viewed from the front of the instrument and is played with clockwise rotation of the flywheel. Counter-clockwise and clockwise rotation of the flywheel are defined as viewed from the left side of the mechanism. These references are used whether the mechanism is in or out of the cabinet.





The operation cycle of the mechanism follows a definite sequence in playing a record. This sequence includes the following:

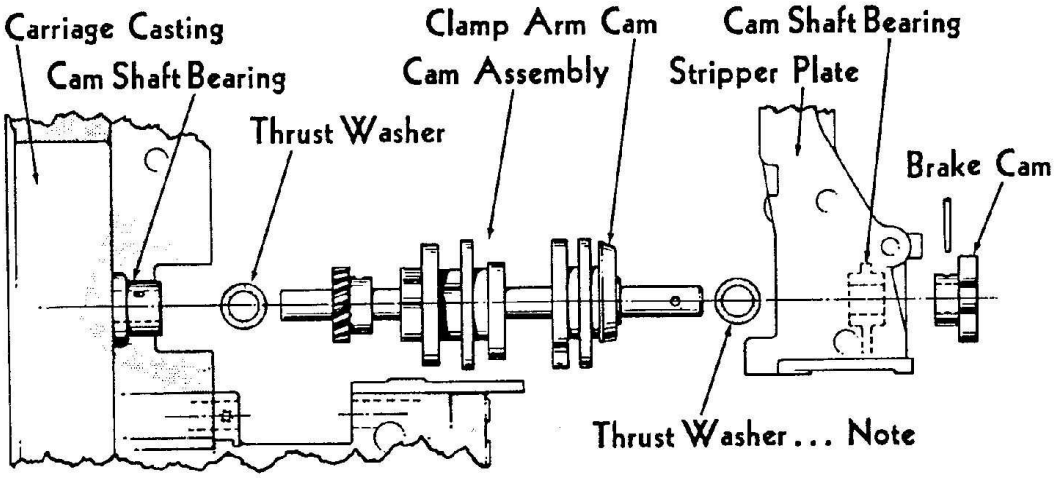
SCAN – in which the carriage assembly travels from side to side on the mechanism base.

TRANSFER – in which the record is transferred from the magazine to the playing position or from the playing position to the magazine.

PLAYING – in which the record is clamped to the turntable and is played.

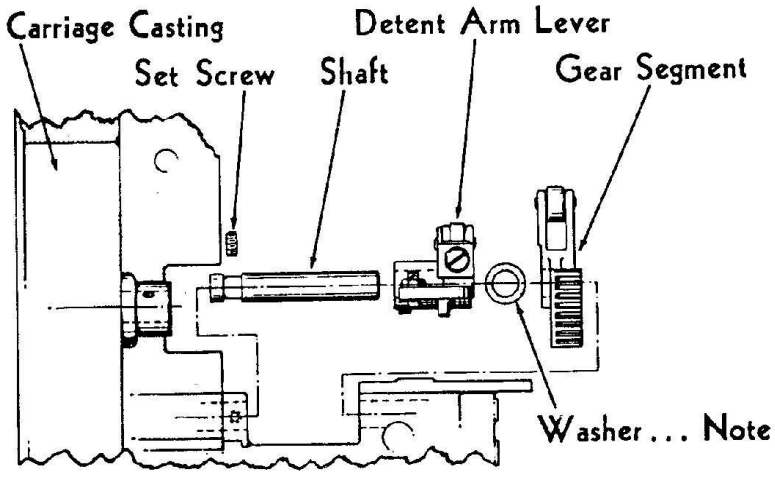
These terms SCAN - TRANSFER - PLAYING are also used to describe the position of the clutch, cams and levers of the carriage assembly whether or not the motor is in operation.

INSTALLATION of CAM ASSEMBLY, DETENT ARM & GEAR SEGMENT



Note: Washers, Part No. 922603 (.020"), 922600 (.005"), 922601 (.010"), 922602 (.015") should be selected and installed between the Clamp Arm Cam and the Thrust Washer so the end play of the Cam Assembly is .003" to .010".

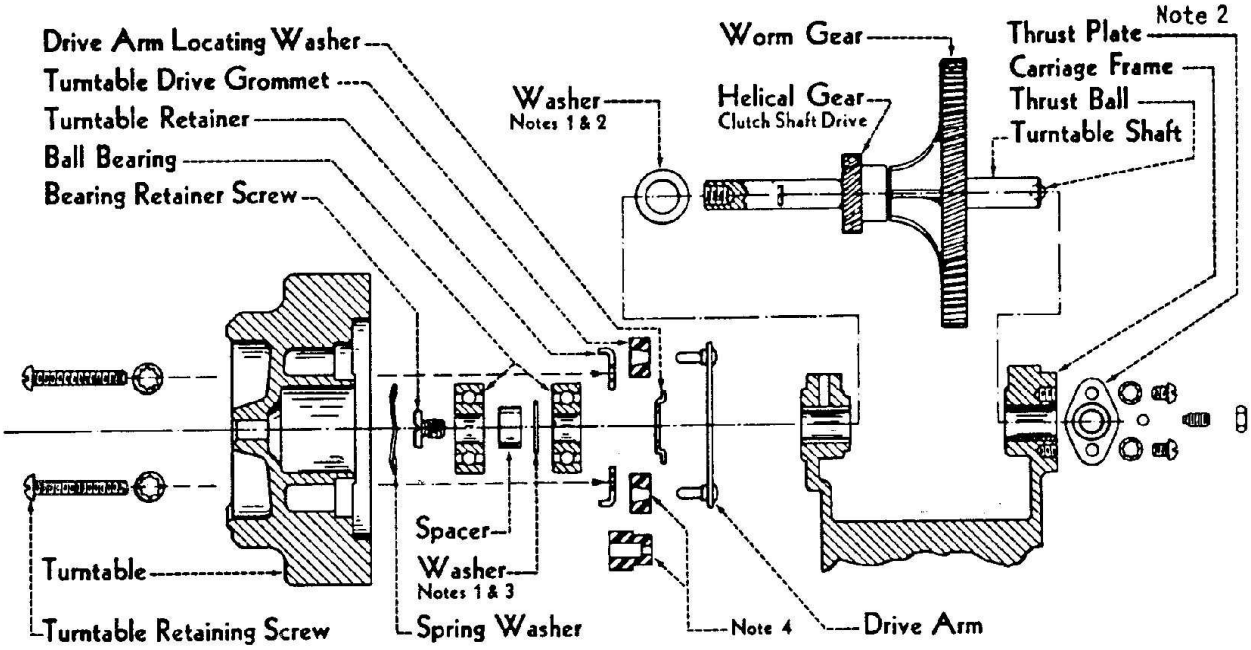
After the proper washers have been installed, the cam assembly should be checked by manual rotation, a full turn in either direction without evidence of binds.



Note: Washers, Part No. 922170 (.015"), 922165 (.010"), 922160 (.005") should be selected and installed between the Detent Arm Lever and the Gear Segment so the end play is .003" to .010".

SELECT-O-MATIC MECHANISM ADJUSTMENTS

TURNTABLE, SHAFT, and GEAR INSTALLATION



Note 1: ..... Washer Part No. 922270 - .005" thick
" " " 922271 - .010" "
" " " 922272 - .015" "

Note 2:..... Select Washers and install between Clutch Shaft Drive Gear and left Turntable Shaft Bearing so end play of Turntable Shaft is .003" to .007". When thrust plate has screw for adjusting end play of shaft, use one No. 922272 washer and adjust for .003" to .007" end play with screw.

Note 3:..... Select Washers and install between Spacer and Ball Bearing so end play of Turntable on the Shaft is a maximum of .015". To check this, hold Turntable Shaft firmly against the Thrust Plate, by pressing against the Worm Gear, and move the Turntable to the right in a direction parallel to the Turntable Shaft. The Spring Washer must always take out the end play by returning the Turntable to the left when released.

Note 4:..... Turntable Drive Grommet with tapered center hole is to be installed with small end of tapered hole toward the Drive Arm. When assembled correctly, the part number, which is molded on the end with the large end of the center hole, will not be visible.

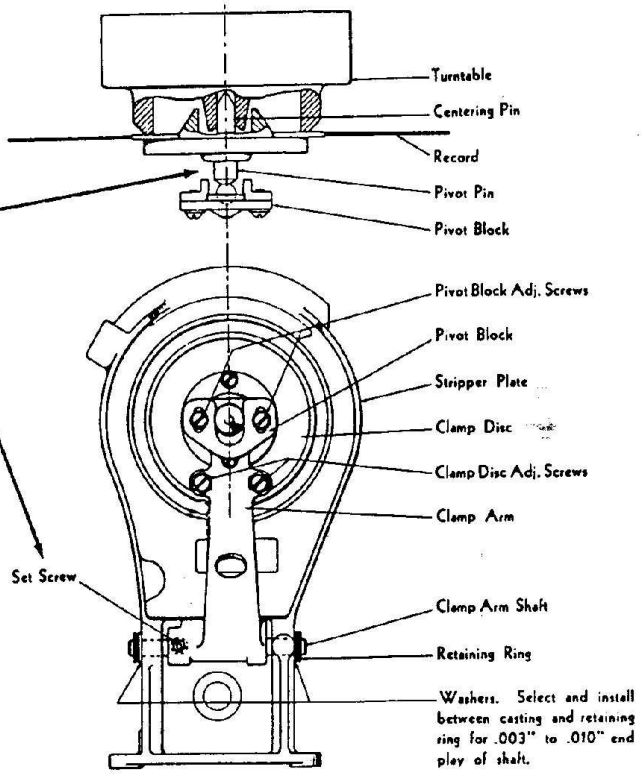
Drive Grommets with "step" should be installed with the small diameter end toward the Drive Arm.

Lubrication: The Gears should have a light coating of Stanodrip #29 (Standard Oil Co) oil. Do not use more oil than will adhere to the Gears. The felt wick in the Thrust Screw for the Turntable Worm (which meshes with the Worm Gear) must be placed in the hole in the screw so it is in contact with the Thrust Ball. The wick should be saturated with Stanodrip #29 oil.

INSTALLATION of CLAMP & TRANSFER ARMS

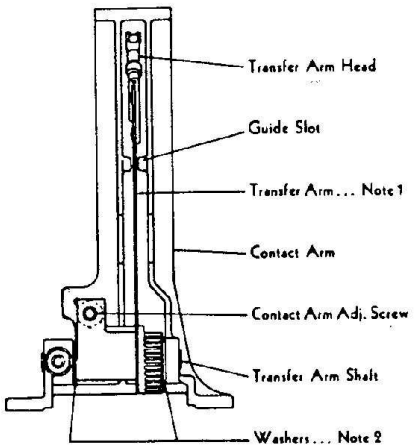
With the Set Screw loose and a Record clamped on the Turntable, adjust the horizontal position of the Clamp Arm so the Center Line through the Pivot Pin forms a right angle with the Clamp Disc and Record.

When installation is complete, readjust Clamp Arm. Refer to Clamp Arm Adjustments.

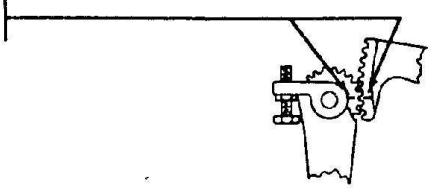


Note 1: Transfer Arm should be straight and should form a right angle with the Transfer Arm Shaft.

Note 2: Washers, Part No. 921551 (.015"), 921550 (.010"), 921552 (.020"), 921553 (.031") should be selected and placed at both ends of the Transfer Arm hub so the Arm falls in the center of the Guide Slot in the Contact Arm and so the end play of the Arm is .003" to .007". There must be at least one washer at each end of the hub.



Note 3: When installing assembly on carriage, mechanism and Transfer Arm should be in SCAN position with reference marks aligned as shown.



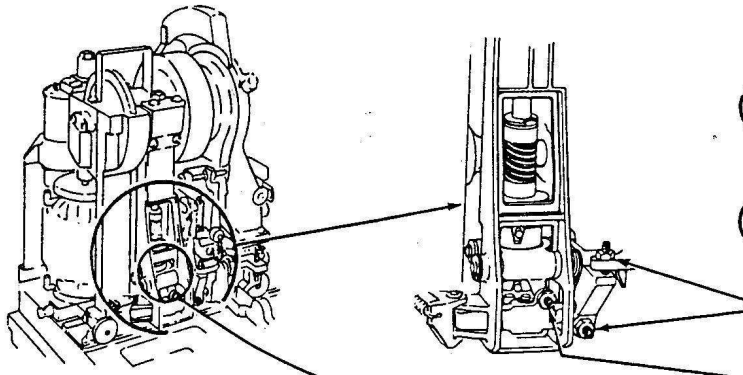
When installation is complete, readjust Transfer Arm. Refer to Transfer Arm Adjustments.

"CLUTCH 2" - - SPROCKET CLEARANCE AND DETENTING ADJUSTMENT

This adjustment establishes correct clearance between the Detent Roller and the Sprocket Teeth when the mechanism is Scanning. It results in clearance between roller and Sprocket Teeth which allows 1/16" movement at end of the Detent Arm.

NOTE 1: - "Clutch 1" adjustment should be correct before making this adjustment.

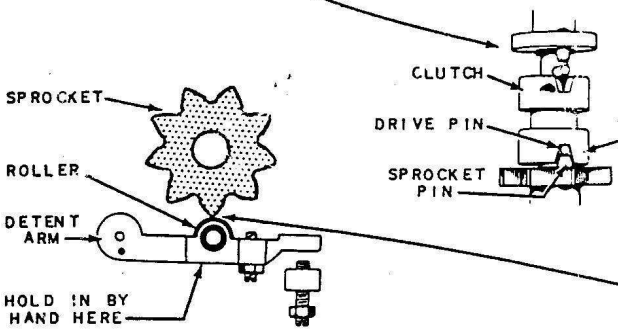
NOTE 2: - If "Clutch 2" adjustment is changed in any way, "Clutch 3 and 4" should be re-adjusted. "Clutch 2, 3 and 4" are related to an extent that a change of "Clutch 2" can cause damaging strains at adjusting screws for "Clutch 3 and 4".



(A) Scan Carriage to right end beyond *V0 (V8 or K0) position.

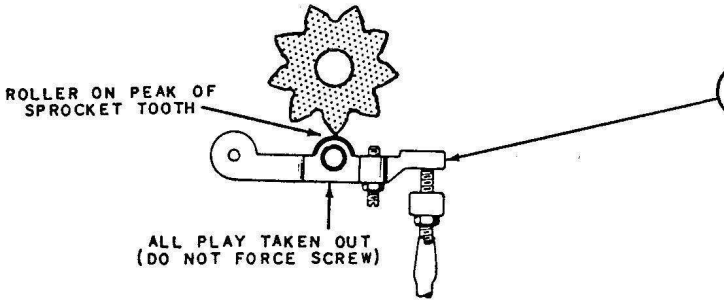
(B) Loosen lock nuts and turn these adjusting screws out to the limit;

"Clutch 2"
"Clutch 3"
"Clutch 4"

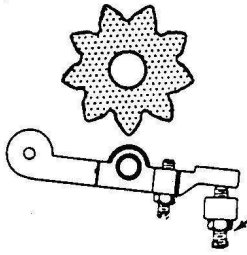


(C) Mechanism should still be in SCAN position, beyond *V0 (V8 or K0) with Clutch all the way down (against lower Drive Pin) and engaged with Sprocket Pin.

(D) Hold Detent Arm in lightly by hand and turn motor shaft until Detent Arm Roller reaches peak of a Sprocket Tooth.



(E) With Detent Roller lined up with peak of Sprocket Tooth, turn adjusting screw in carefully, a little at a time, until there is no "in and out" play between Detent Arm Roller and peak of Sprocket Tooth. (This is the starting point for correct adjustment.)



(F) Now, back out, the screw 2 turns and tighten the lock nut. This establishes correct clearance.

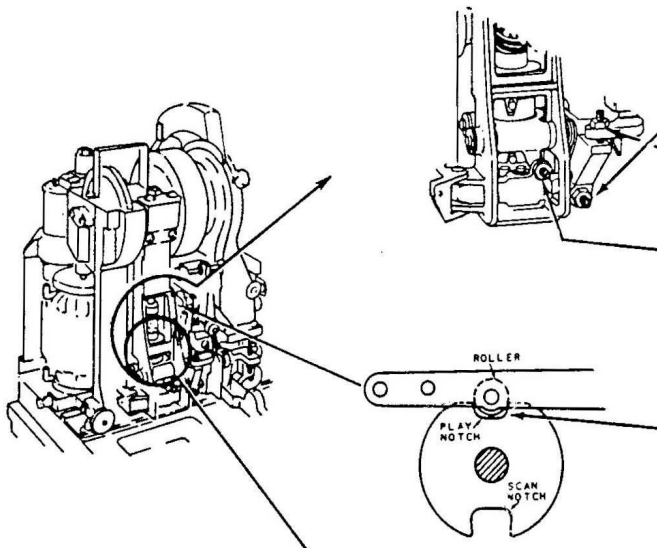
(G) After this adjustment has been made, adjust "Clutch 3 and 4" as shown on following pages.

* V0 for 200 Selection Mechanisms
V8 for 160 Selection Mechanisms
K0 for 100 Selection Mechanisms

2435

"CLUTCH 3" - - DETENT LOCKING ADJUSTMENT

This adjustment insures proper locking of the carriage while a record is playing. The adjustment takes out all rotational motion of the sprocket resulting in a minimum of lateral play in the carriage.



NOTE: - "Clutch 2" adjustment should be correct before making this adjustment.

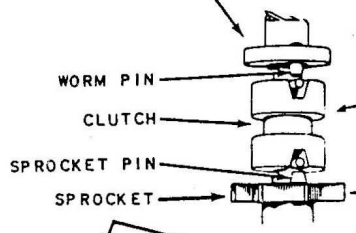
(A) Loosen Lock Nuts and turn these adjusting screws out to the limit:

"Clutch 3"

"Clutch 4"

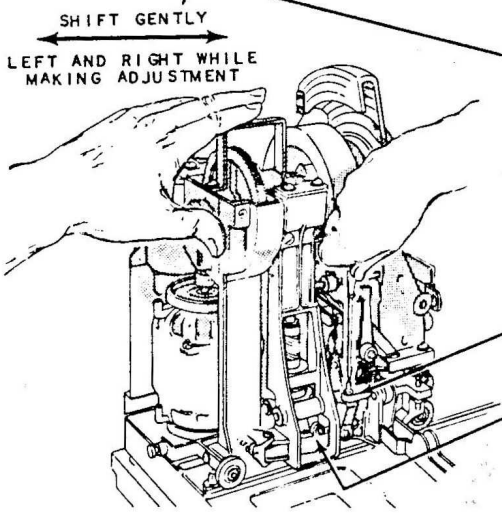
(B) Place Mechanism in *V0 (V8 or K0) PLAY position. Be sure mechanism is fully in PLAY position.

Clutch Shifting Lever Roller should be down in PLAY Notch, - - - and - - -



Clutch should be somewhere below the Worm Pin and above the Sprocket Pin.

Note side play in Carriage and rotational motion in Sprocket when Carriage is shifted to left and right by hand. This is due to "Clutch 3" screw being out too far.

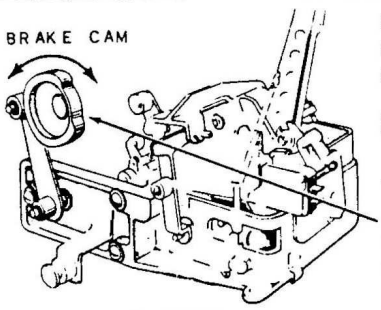


(C) While gently shifting Carriage to Left and Right by hand, - - -

turn "Clutch 3" adjusting screw carefully downward - - -

until all rotational motion is just taken out of Sprocket. Tighten "Clutch 3" Lock Nut.

(D) After this adjustment has been made, adjust "Clutch 4" as shown on the following page.



CAUTION: - Note that when adjustment is completed there is no more rotational motion in Sprocket but Carriage still has a slight amount of side play. This is a normal condition due to required gear clearances.

Do not force adjusting screw.

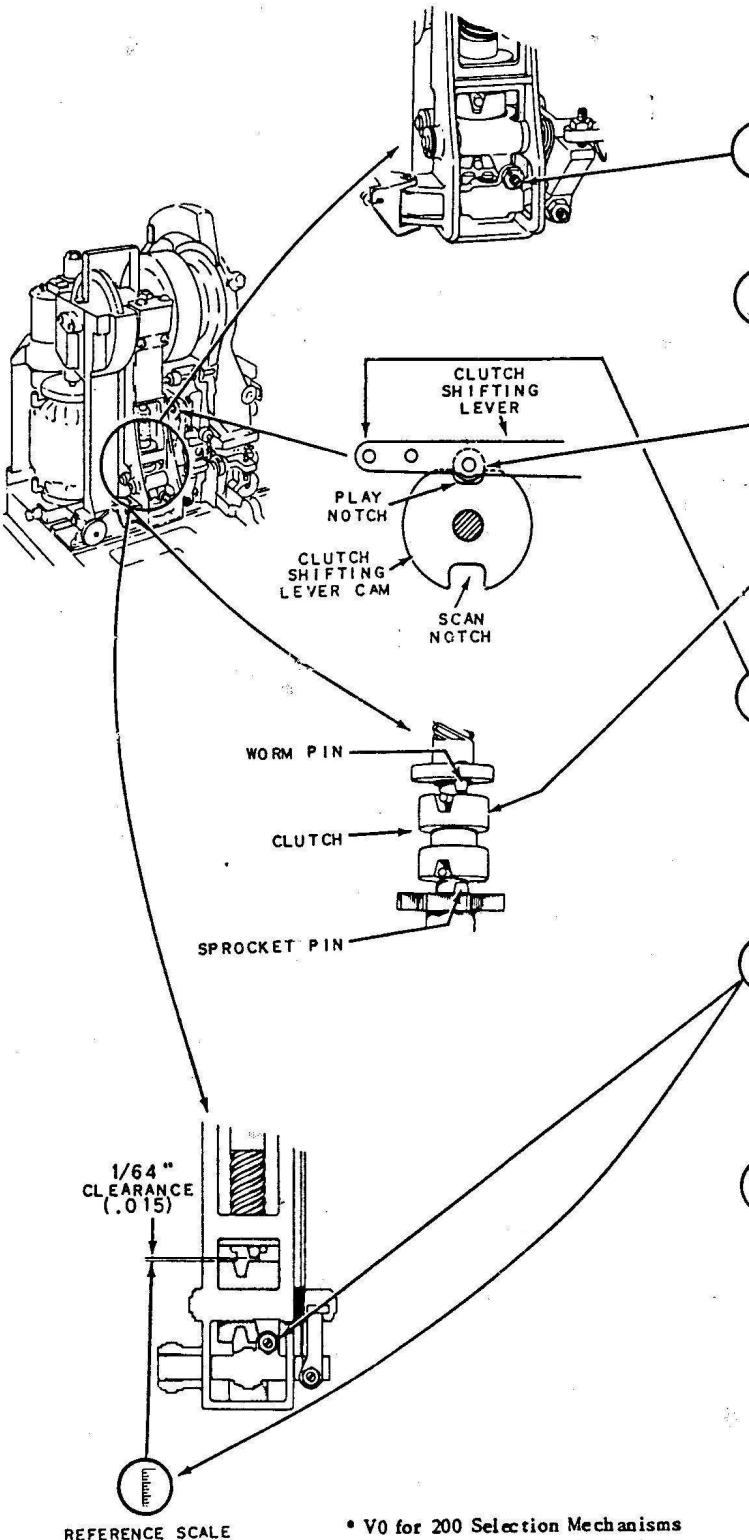
Turning the screw down too far will setup severe strains in the levers and will cause the Cam Assembly to bind when entering PLAY position. When adjustment is completed, check for freedom of action of Cam Assembly by turning Brake Cam by hand in both directions. Cam should have a slight amount of rotational play.

* V0 for 200 Selection Mechanisms
V8 for 160 Selection Mechanisms
K0 for 100 Selection Mechanisms

"CLUTCH 4" - - CLUTCH PLAY POSITION ADJUSTMENT

This adjustment establishes the playing position of the Clutch. This results in 1/64" clearance between the Clutch and the Worm Pin in PLAY position.

NOTE: - Before making this adjustment "Clutch 2 and 3" should be correct.



(A) "Clutch 4" adjusting screw should be turned out to the limit.

(B) Place mechanism in *V0 (V8 or K0) PLAY position. Be sure mechanism is fully in PLAY position.

Clutch Shifting Lever Roller should be down in PLAY notch, - - - and - - -

Clutch should be below the Worm Pin and above the Sprocket Pin.

(C) Press downward on end of Clutch Shifting Lever. (This insures that the Clutch has moved to its farthest downward travel before making the adjustment.)

(D) Turn adjusting screw inward until there is 1/64" (.015) clearance between the bottom of the Worm Pin and the top of the Clutch.

(E) Tighten Lock Nut.

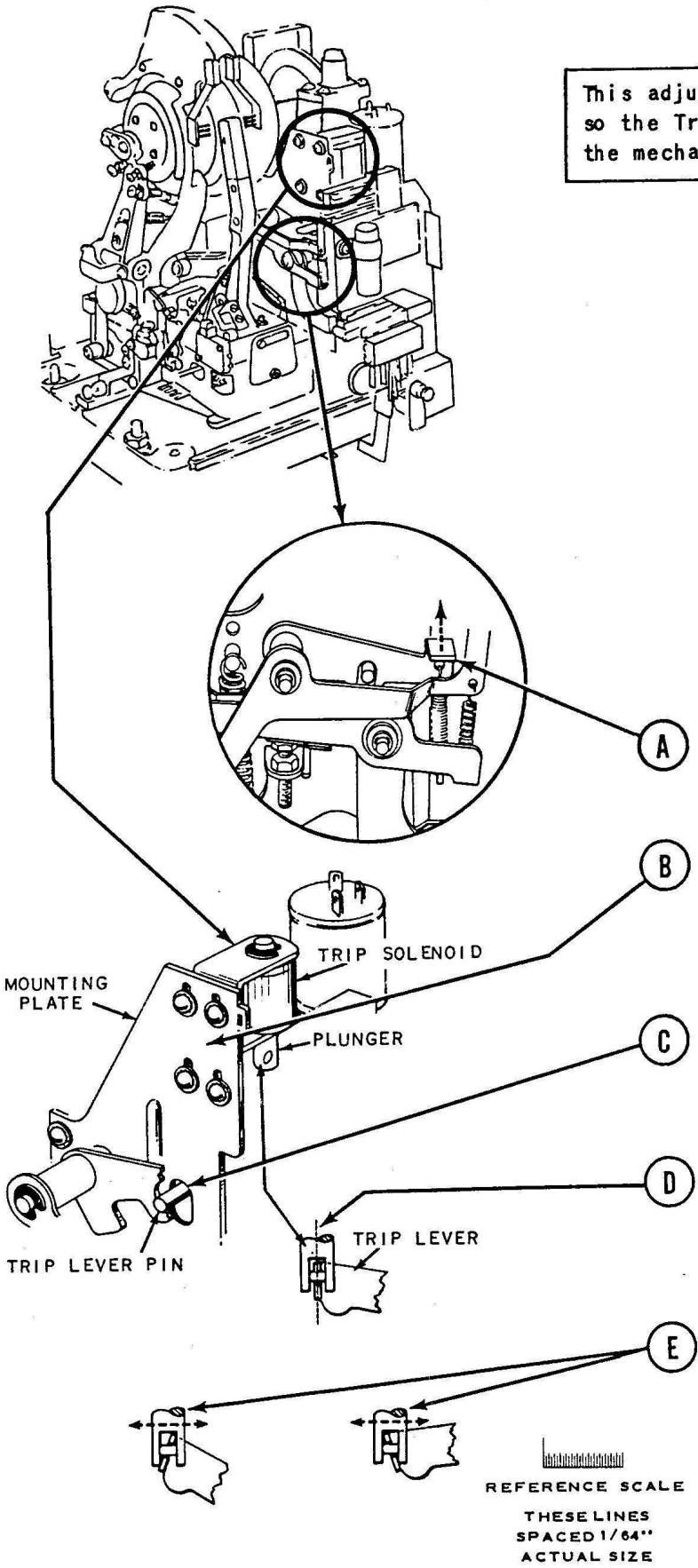
NOTE: - Clutch should drop freely, (to 1/64" clearance) every time mechanism enters PLAY position. If Clutch does not drop freely into full PLAY position it may hit Worm Pin as it rotates. This can be caused by "Clutch 3" being too tight or by binds in the Clutch and the Clutch Shifting Lever.

* V0 for 200 Selection Mechanisms
V8 for 160 Selection Mechanisms
K0 for 100 Selection Mechanisms

2437

"TRIP SOLENOID I" - - TRIP SOLENOID POSITION

This adjustment positions the Trip Solenoid so the Trip Lever is raised enough to cause the mechanism to "trip".



A Trip the mechanism by manually lifting the Release Lever.

B Loosen four screws holding Trip Solenoid Brackets and - - -

C adjust the vertical position of the Solenoid so the Trip Lever Pin clears the upper edge of the Mounting Plate Hole not less than 1/64" when the Solenoid Plunger is in the fully raised position.

D Adjust the horizontal position of the Solenoid so the forked end of the Trip Lever, when vertical, is centered in the plunger slot.

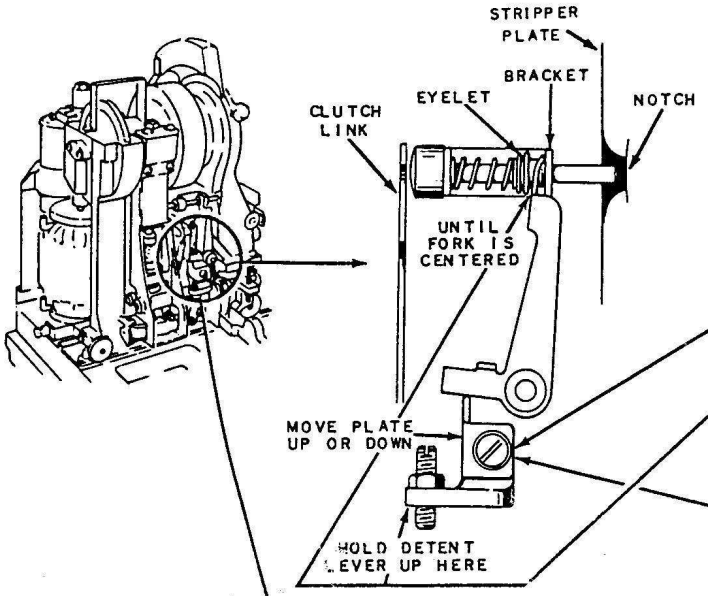
E To avoid binds the Plunger must have horizontal play when the Trip Lever is in either extreme up or down position.

The upper and lower brackets holding the Solenoid should be square with the coil.

"SAFETY LEVER I" - - SAFETY LEVER POSITION

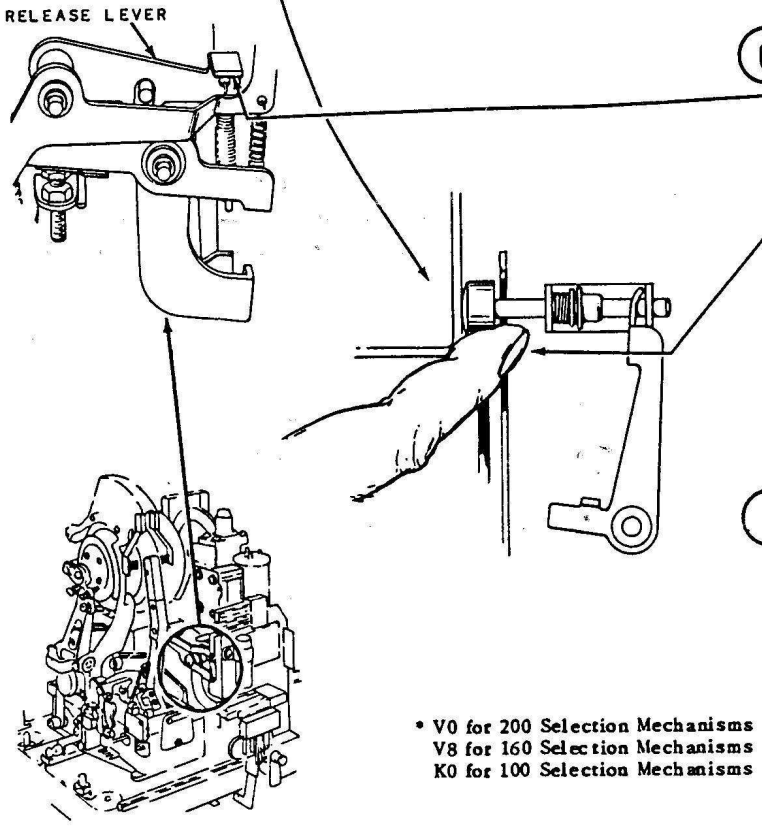
This adjustment establishes the correct position of the Safety Lever and results in proper travel of the Safety Plunger when the mechanism is entering PLAY or SCAN position.

(A) Scan Carriage to right end beyond *V0 (V8 or K0) and turn off power.



(B) To adjust Safety Lever, - - -

1. Mechanism should still be in SCAN position.
2. Loosen screw.
3. While holding Detent Arm Lever up by hand, move Adjustment Plate up or down until top forked end of Safety Lever is approximately centered between eyelet and bracket.
4. Tighten screw.



(C) To check Safety Assembly for binds,

1. Trip the mechanism by manually lifting the Release Lever.
2. Pull Plunger all the way over to the left (as shown) and release slowly to right. Plunger should return freely without binds.

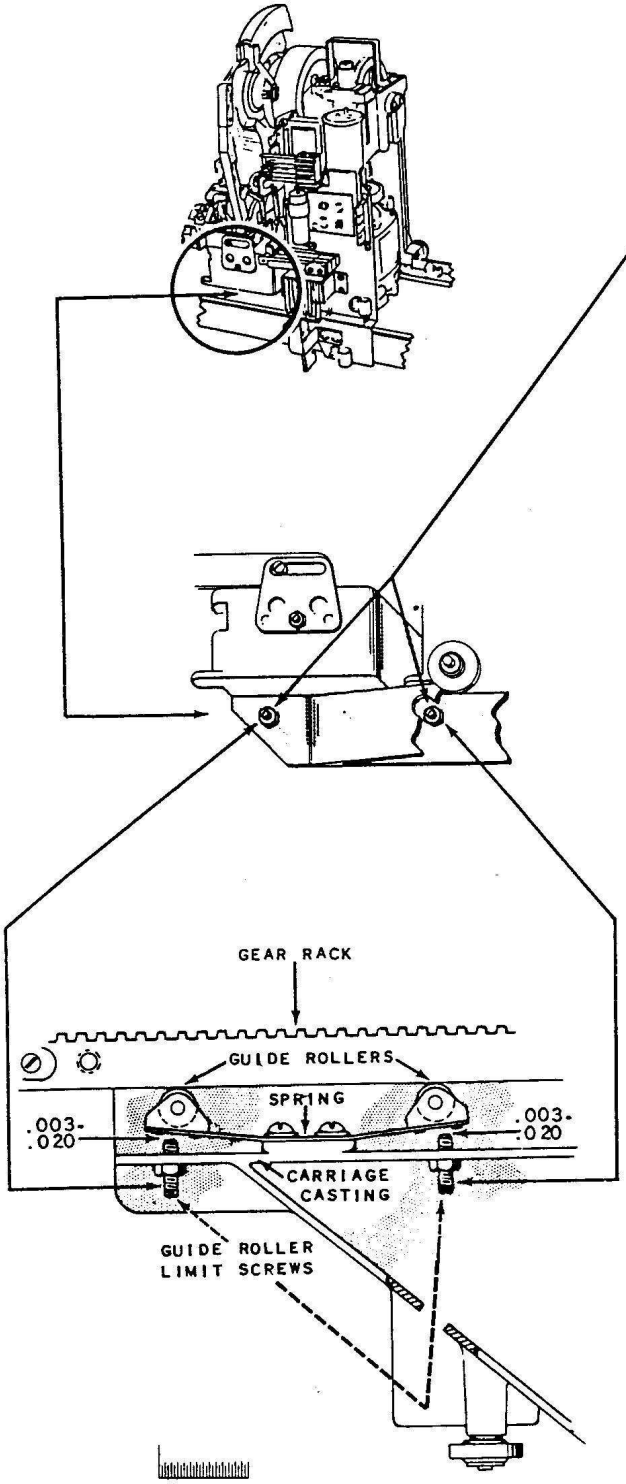
(D) To test for correct safety operation, - - hold the edge of a thin record across the Stripper Plate Notch and run mechanism slowly through SCAN. Hook on Clutch link should catch on large end of Plunger and record should be returned to PLAY position.

* V0 for 200 Selection Mechanisms
V8 for 160 Selection Mechanisms
K0 for 100 Selection Mechanisms

2439

"GUIDE ROLLERS I" - - CARRIAGE GUIDE ROLLER ADJUSTMENTS

This adjustment limits the front to back play of the Carriage.



(A) Front and back play of Carriage on rack should be limited to .003 to .020 by position of Guide Roller Limit Screws.

(B) To adjust Guide Roller Limit Screws - - -

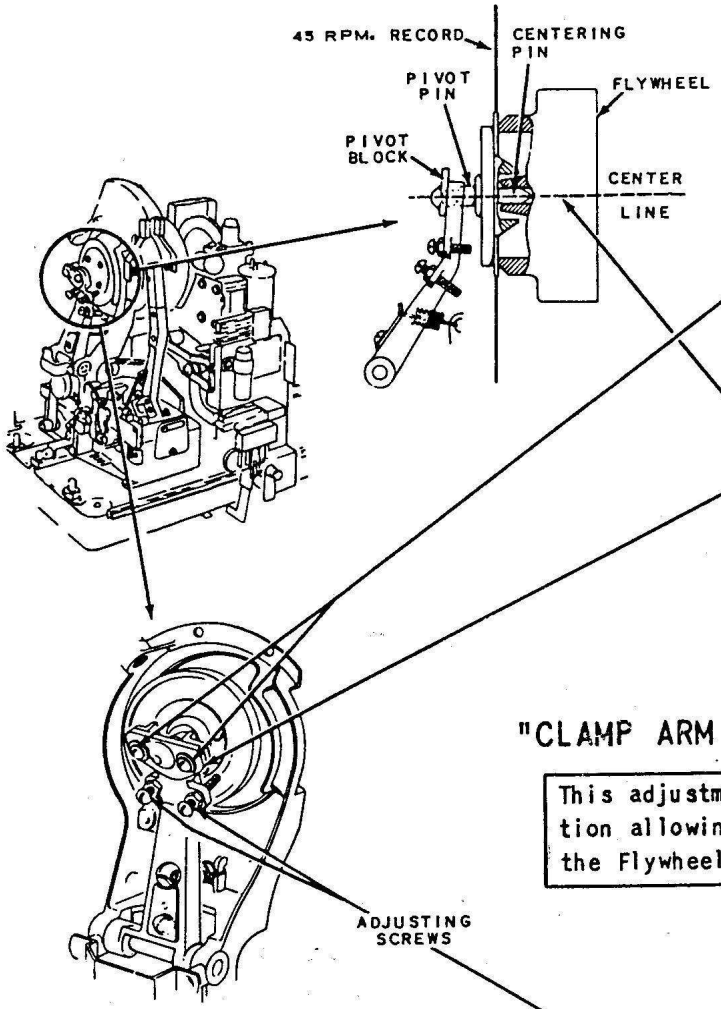
1. Loosen Lock Nuts.
2. Carefully turn screws in, all the way, until all front and back play of Carriage is taken out. (DO NOT FORCE SCREWS)
3. When all front and back play is taken out, back out each screw 1/2 turn. (This will result in approximately .015 clearance.)
4. Tighten Lock Nuts.

(C) Check for play along the entire Gear Rack. Back out each screw an additional 1/4 turn if necessary to avoid binding.

(D) To check Guide Roller Spring pressure, - push left side of Carriage toward the rear and release slowly. Repeat with right side of Carriage. Spring pressure on each side should be great enough to fully reset the Carriage to its normal forward positions.

"CLAMP ARM 1" - - PIVOT PIN ALIGNMENT

This adjustment establishes proper alignment of the Pivot Pin with the Centering Pin and the hole in the Flywheel Shaft.



(A) Place mechanism in PLAY position with a record clamped on the Flywheel.

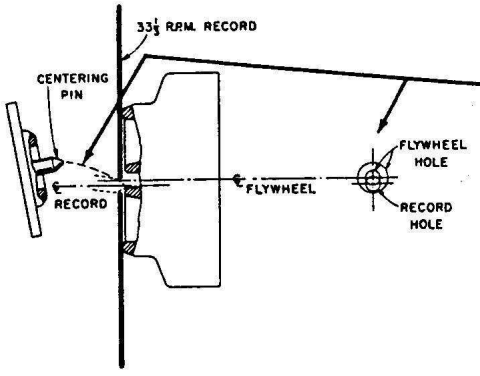
(B) Loosen Pivot Block Screws.

(C) Move Pivot Block, up or down, until center line of Pivot Pin is in line with or 1/32" below the center line of the Flywheel Shaft, and tighten screws.

"CLAMP ARM 2" - - CENTERING PIN POSITION

This adjustment establishes the Centering Pin position allowing it to enter freely into the hole of the Flywheel Shaft when a record is being clamped.

NOTE: - "Clamp Arm 1" and transfer arm adjustments should be correct before making this adjustment.



(A) Loosen lock nuts and adjust both screws as required so - - -

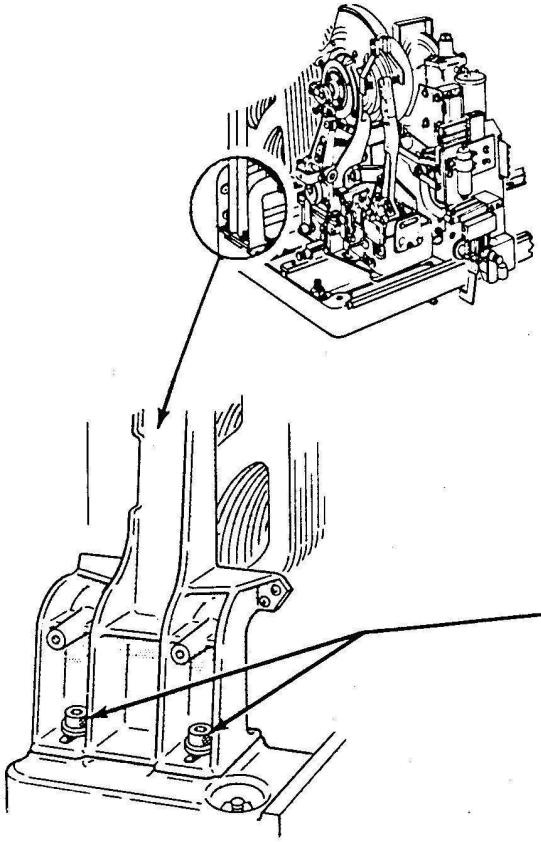
(B) Tip of Centering Pin enters record hole as shown.

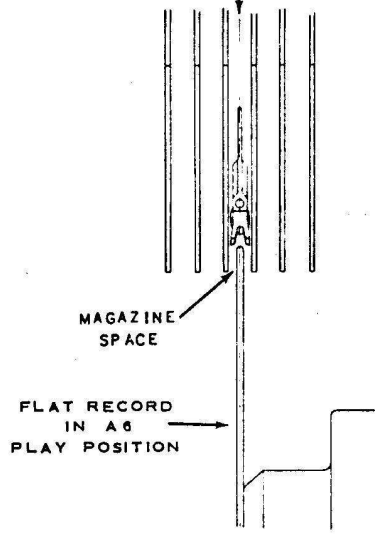
(C) Tighten Lock Nuts.

2441

"MAGAZINE - - HORIZONTAL POSITION"

This adjustment establishes the horizontal Magazine position so that when a record is in Play position it is approximately centered with its magazine space.





(A) Place a FLAT record in PLAY position near the center of the magazine. (Be sure the record is FLAT – not warped, not dished.)

(B) Loosen the cap screws holding both ends of the Magazine to the Base.

(C) Shift the entire Magazine to Left or Right until the record is in the center of the Magazine Space.

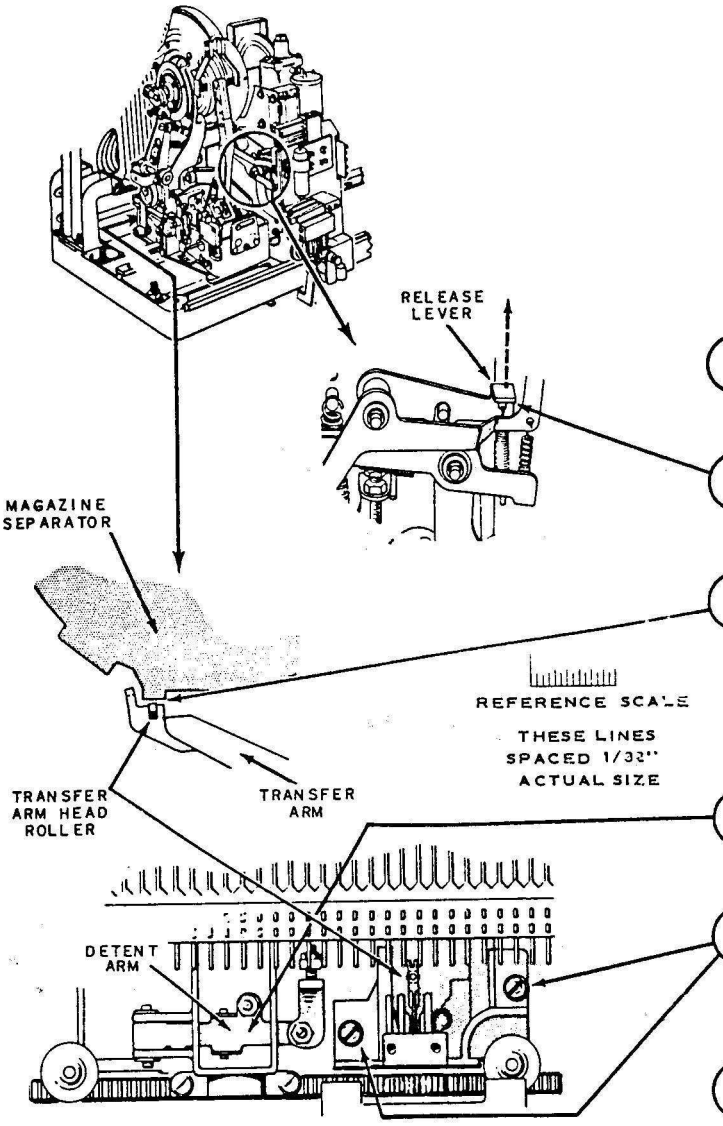
(D) Tighten cap screws. (Be sure the screws are tight.)

NOTE: - If the Magazine position is changed be sure to check

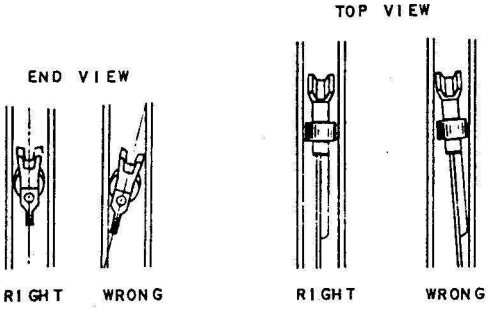
"Transfer Arm 1"
"Contact Plunger Block 1 & 2"
"Tormat Memory Unit Position"
"Selection Playing Indicator"

"TRANSFER ARM I" - - ALIGNMENT TO MAGAZINE

This adjustment establishes the lateral position of the Transfer Arm so the Transfer Arm Head will be centered in the magazine space when a record is transferred.



REAR VIEW WITH TORMAT MEMORY UNIT REMOVED



NOTE: The Magazine horizontal position adjustment should be correct before making this adjustment.

The Tormat Memory Unit should be removed for convenience in making this adjustment. This can be done by removing its four mounting screws.

(A) Scan the mechanism to a position near the center of the magazine and turn off power.

(B) Trip the mechanism by manually lifting the Release Lever.

(C) Turn motor shaft until Roller in Transfer Arm Head is approximately 1/32" below the projections on the lower edges of the Magazine Separators.

(D) Push in on Detent Arm to take out Carriage Side Play.

(E) Loosen two screws holding Contact Arm Casting to Carriage Casting and - - -

(F) Shift Contact Arm Casting to left or right until Transfer Arm Head is centered in the space. Tighten screws.

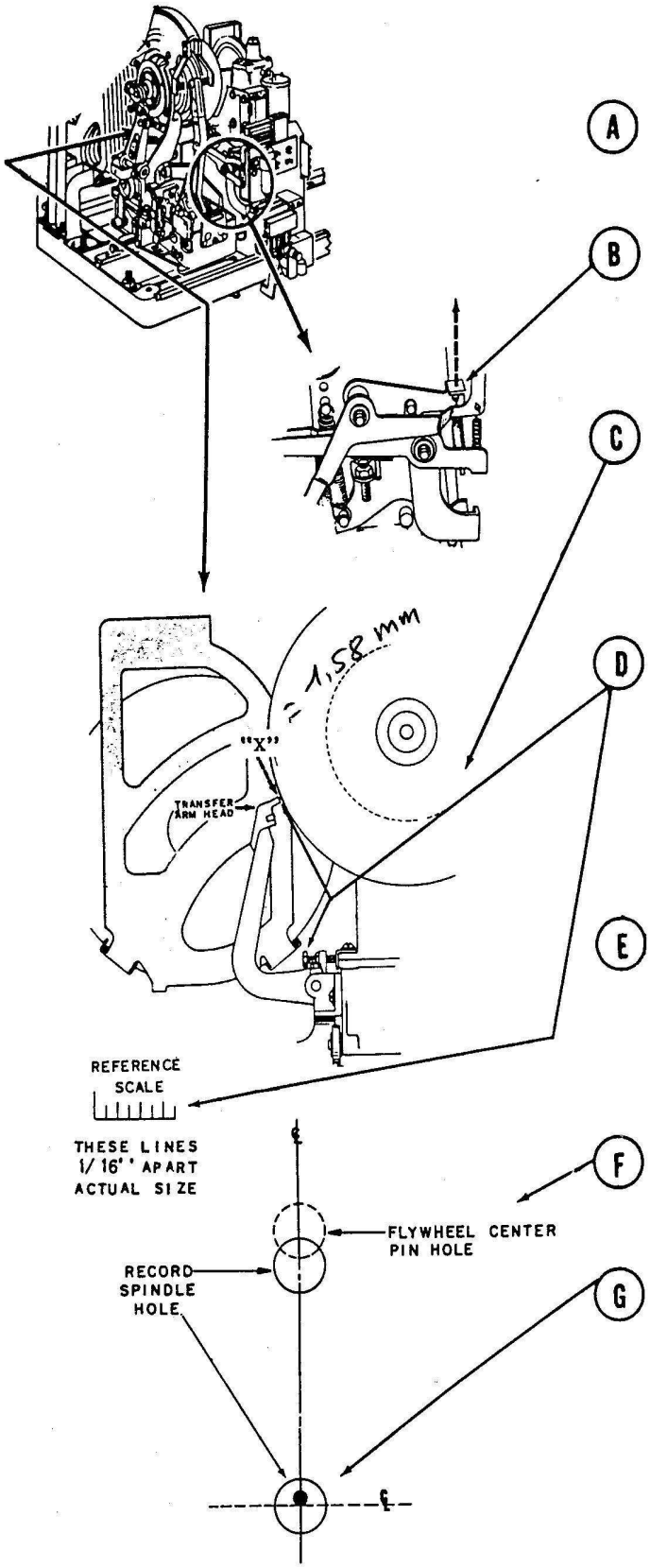
(G) When the Transfer Arm enters the space, the Transfer Arm Head should be parallel to the Magazine Separators as shown. Straighten Arm if necessary to correct Transfer Arm Head alignment.

NOTE: -After making this adjustment be sure to check and adjust - "Contact Plunger Block 1 & 2" and "Tormat Memory Unit Position."

2443

"TRANSFER ARM 2" – – PLAY POSITION CLEARANCE

This adjustment establishes the travel of the Transfer Arm so that records will be properly clamped to the Flywheel by the Clamp Arm.



NOTE: CLAMP ARM 1 & 2 ADJUSTMENTS MUST BE CORRECT BEFORE MAKING THIS ADJUSTMENT..

A. Scan the carriage to the Left, stopping it *one position to the LEFT of A1* so the Transfer Arm will come up outside the magazine.

B. Trip the mechanism by manually lifting the Release Lever.

For mechanisms designed for playing 45 rpm. records only (clamp arm lifts record from transfer arm head).

C. Place a normal size *45 rpm. record in position on the Transfer Arm Head. Turn motor shaft until record is brought up and clamped in PLAY position. (Transfer Arm and record should come up just outside of the Magazine one position to the left of A1.)

D. Adjust screw for 1/16" clearance between edge of record and tips of the Transfer Arm Head at "X".

For mechanisms designed to play intermixed 45 and 33-1/3 rpm. records. (Transfer arm moves away from record after clamp arm clamps it.)

E. Place a normal size *33-1/3 rpm. record (with 5/16" spindle hole) in position on the Transfer Arm head and turn motor shaft until record is at its maximum raised position. This will be at a point where the Clamp Arm just starts moving toward the record.

F. Adjust screw so record spindle hole is exactly aligned, vertically, with the centering pin hole in the fly wheel and - - - - - -

G. - - - - - - -the record ramp should be positioned so the tip of the centering pin enters the record spindle hole in line with or 1/32" above the horizontal center line of the record hole.

After the record has been clamped, the Transfer Arm moves downward so there is about ¼" clearance at "X" in play position.

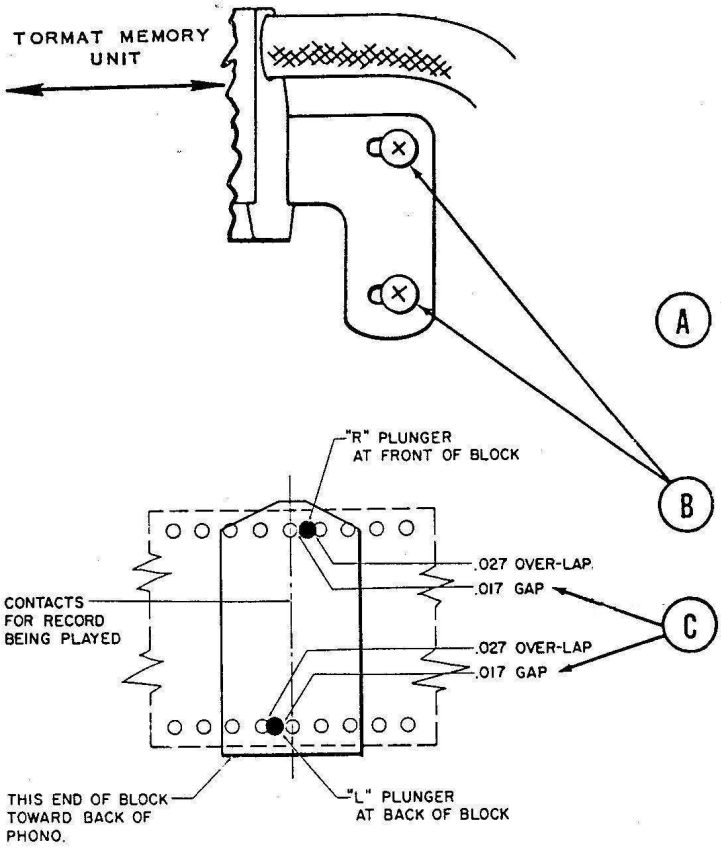
*DIAMETER OF A NORMAL SIZE 45 RPM. RECORD IS 6-7/8" ± 1/32"

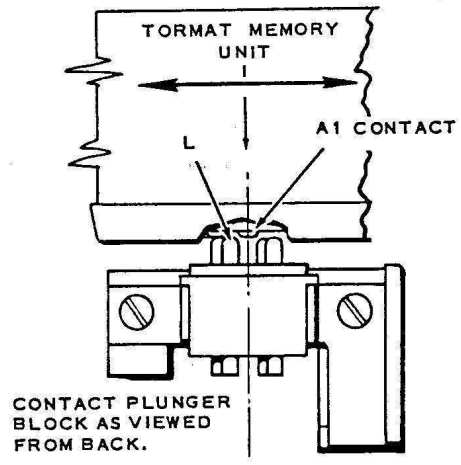
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"TORMAT MEMORY UNIT POSITION"

This adjustment positions the Tormat Memory Unit so the contact plungers and Tormat contacts will be correctly aligned for tripping the mechanism at the selected record.

NOTE: If for any reason the Tormat Memory Unit is removed from the mechanism the Contact Plunger Block adjustments must be checked and, if necessary, corrected before making the Tormat adjustment. This may be done with a preliminary lateral adjustment of the unit by placing the mechanism at A1 and mounting it on the magazine with rear plunger just touching contact rivet for adjacent selection (to the left of the contact for A1).





NOTE 1: The Tormat Memory Unit and the Contact Plunger Block positions are related so each must be checked if any one is changed.

NOTE 2: Check "Clutch 3" for minimum carriage side play also check "Magazine" and "Transfer Arm 1" adjustments before making this adjustment.

(A) Place the mechanism in PLAY position at a record space near the center of the magazine and turn off power.

(B) Loosen the two mounting screws at each end of the Memory Unit.

(C) Adjust the lateral position of the Unit so the R and L contact plungers are, respectively, to the right and left of the contacts associated with the record being "played". The contacts and plungers will be separated by approximately 1/64" (.017) as shown and the gap should be the same for each.

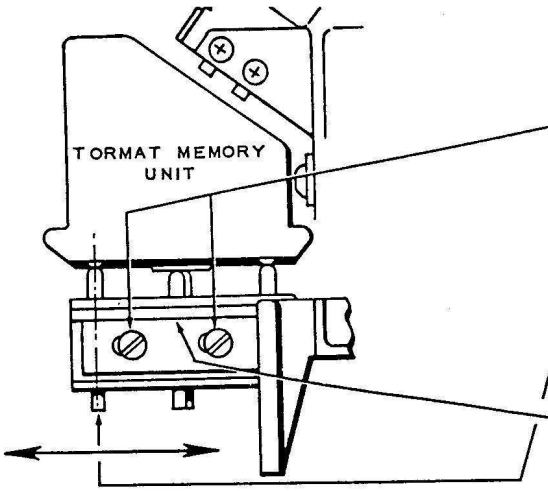
Place mechanism in PLAY position at the end record spaces of the magazine, then check the positions of the plungers relative to the Memory Unit contacts. The gaps between the plungers and the end contacts should be approximately .017" as in C (above) and should be equal. Exactly equal separation at both end positions is not necessary but if it is not equal, shift the Memory Unit, as required, so variation of gap is equally divided at each end of the magazine.

2445

"CONTACT PLUNGER BLOCK 1" - - HORIZONTAL POSITION

This adjustment positions the Contact Plunger Block horizontally (front to back) and determines proper alignment of the contact plunger and the Tormat contact rivets.

NOTE : The Tormat Memory Unit and the Contact Plunger Block positions are related so each must be checked if any one is changed.



REFERENCE SCALE

THESE LINES SPACED 1/16" ACTUAL SIZE

(A) Place the mechanism in Play position near the center of the record magazine and turn off power.

(B) Loosen adjustment screws.

(C) Adjust contact plunger block in horizontal direction as indicated so that the contact plunger is exactly centered on the contact rivet of the Tormat Unit.

(D) Securely tighten adjusting screws.

NOTE: Edge of bracket must be against flange on casting during adjustment and tightening of screws.

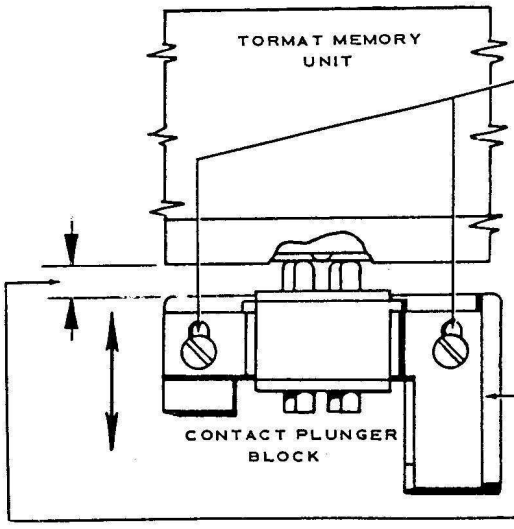
(E) Check adjustment at the end record positions of the magazine.

"CONTACT PLUNGER BLOCK 2" - - VERTICAL POSITION

This adjustment positions the Contact Plunger Block vertically to assure proper contact pressure and movement of the plungers.

NOTE : The Tormat Memory Unit and the Contact Plunger Block positions are related so each must be checked if any one is changed.

(A) Place the mechanism at in Play position near the center of the record magazine and turn off power.



(B) Loosen adjustment screws.

(C) Adjust Contact Plunger Block in vertical direction so that the top surface of the contact plunger bearing plate is ¼" from the surface of the Tormat Memory Unit.

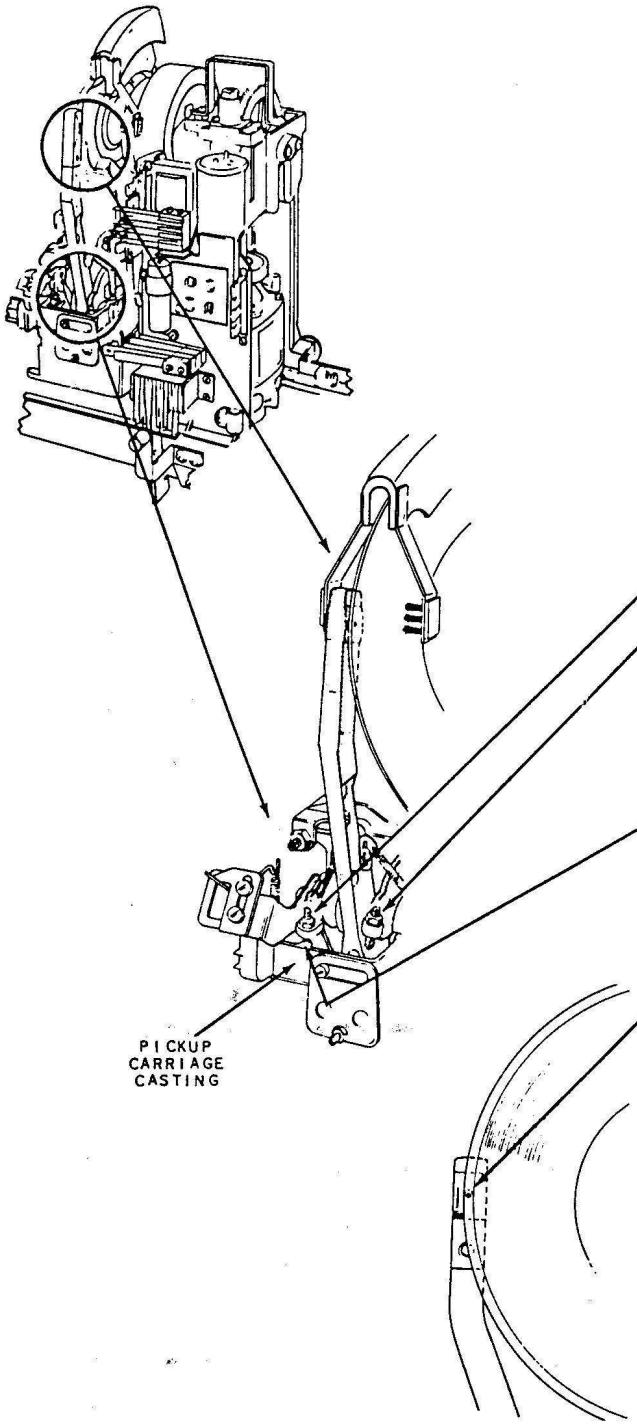
(D) Securely tighten adjusting screws.

NOTE: Edge of bracket must be against flange on casting during adjustment and tightening of screws.

(E) Check adjustment at the end record positions of the magazine.

"PICKUP 1" - - NEEDLE LANDING ADJUSTMENT

This adjustment establishes the point of landing of the needle on the record at the beginning of Play. It should be made so the needle lands half way between the edge of the record and the first playing groove.



(A) Select the Left side of a normal* record (preferably a transparent type) and place the record and the mechanism in Left Side PLAY position.

(B) Loosen Lock Nuts on - - - "Pickup 1" and - - - "Pickup 2". Turn Adjusting Screw out to limit. (" Pickup 2" Adjusting Screw is loosened to avoid possibility of binds in the levers when the mechanism is later returned to SCAN.)

(C) Hold Adjusting Screw down against casting and adjust so - - -

(D) - - needle is halfway between outer edge of record and the playing grooves. (If transparent type record is used, point where needle touches can be seen through the record.)

(E) Tighten "Pickup 1" Lock Nut.

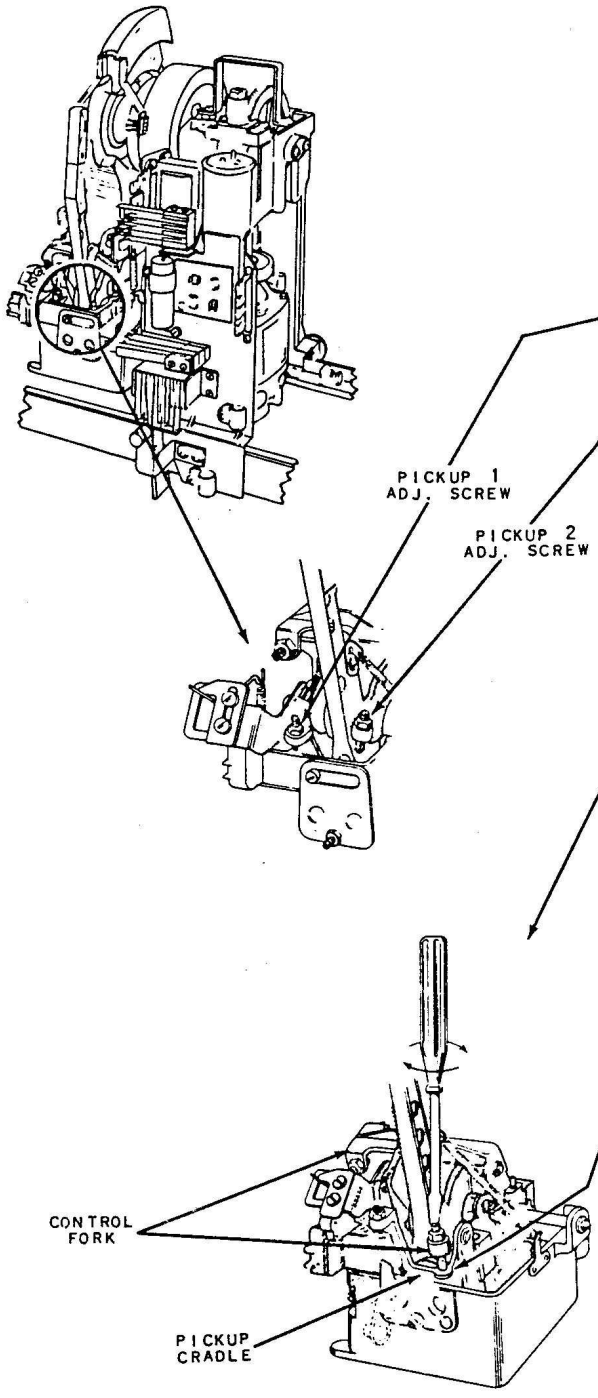
(F) Select the Right side of the same record and check for proper needle landing at the beginning of Right Side PLAY.

(G) After this adjustment had been made, adjust "Pickup 2" as shown on the following page.

*Normal diameter for 45 R.P.M. records is 6-7/8 ± 1/32.

PICKUP 2 - - PICKUP RETURN ADJUSTMENT

This adjustment results in proper return of the Pickup Arm to SCAN position and allows enough play between the Cradle and the Adjusting Screw to avoid binds.



NOTE: - "Pickup 1" adjustment should be correct before making this adjustment.

(A) Place mechanism in SCAN position with Pickup Arm on Left Side. "Pickup 1" Adjusting Screw should be against the casting.

(B) Loosen Lock Nut and turn "Pickup 2" Adjusting Screw out to limit.

(C) Insert screw driver in screw slot. Push straight down on screw with screw driver, then release. Note clearance between screw and cradle and note the up and down play in the Control Fork.

(D) While gently pushing down and releasing the screw with screw driver, turn screw down carefully, a little at a time, until all the up and down play is just taken out.

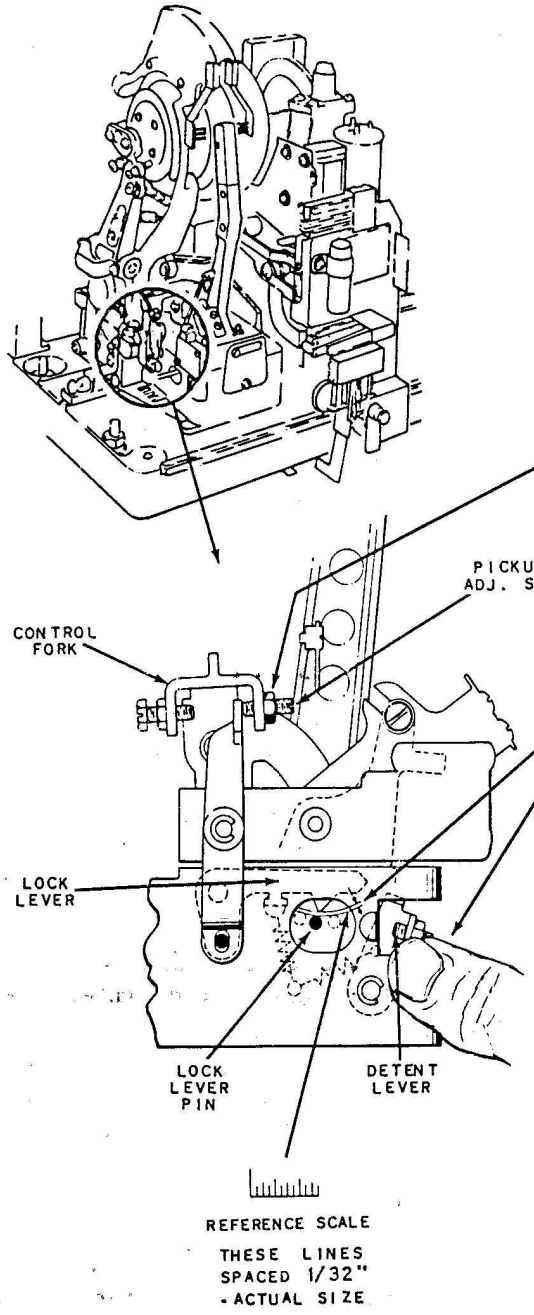
(E) Back out screw 1/4 turn from the above position and tighten Lock Nut. (This allows a small amount of clearance under the screw and a slight amount of up and down play in the Control Fork.)

(F) Place mechanism in Right side PLAY position then return it to SCAN with Pickup Arm on Right Side. Check for equivalent up and down play of Control Fork with Pickup Arm on Right side.

CAUTION: If "Pickup 2" Adjusting Screw is down too far (no up and down play in Control Fork) it may place a bind on the Levers and interfere with proper Pickup shifting action. A check for proper shifting of Pickup can be made by alternately selecting and playing several Right and Left sides of records. Each time Pickup shifts it should move smoothly all the way over to its Right or Left position.

"PICKUP 3" - - PICKUP RELEASE ADJUSTMENT

This adjustment establishes 1/32" clearance between the path of the Lock Lever Pin and the lower projection of the Lock Lever when the mechanism is in PLAY position.



(A) Place mechanism in Left Side PLAY position.

(B) Loosen Lock Nut - - and while holding Detent Lever away from the Lock Lever, - - -

(C) adjust screw so that the lower projection of the Lock Lever and the Lock Lever Pin clear by 1/32" when the Pin is moved past the Lever.

(D) Tighten Lock Nut.

(E) Place mechanism in Right side PLAY position. While holding Detent Lever away from Lock Lever, move Pickup Arm in along record and again check for required 1/32" clearance.

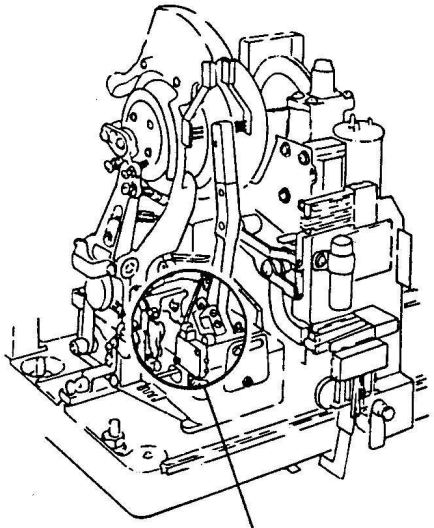
If clearance is not approximately the same in both Right and Left side PLAY positions, check Lock Lever Pin alignment. Straighten Pin, if necessary.

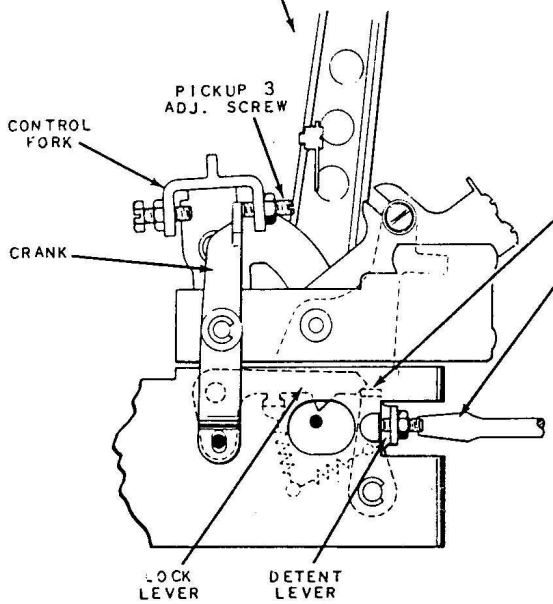
NOTE: - This adjustment should be followed by "Pickup 4" adjustment.

2449

"PICKUP 4" - - DETENT LEVER ADJUSTMENT

This adjustment establishes the Detent Lever position so that it just touches the lower slope of the end of the Lock Lever when the mechanism is in PLAY position.





NOTE: - "Pickup 3" adjustment should be correct before making this adjustment.

(A) Place mechanism in Right side PLAY position.

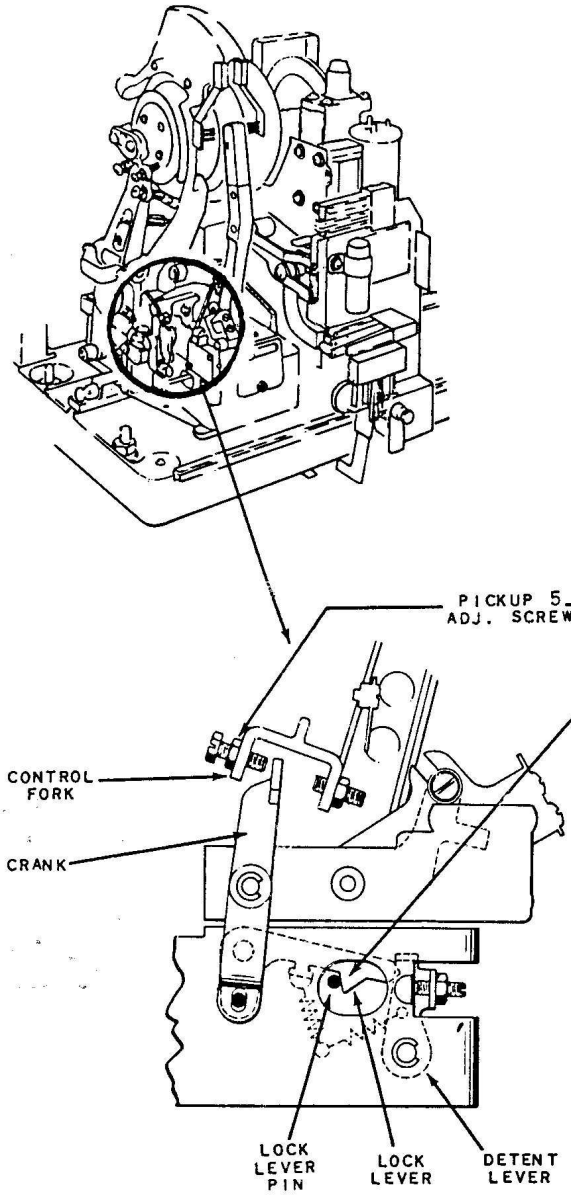
(B) Loosen Lock Nut and adjust the screw until Detent Lever just touches lower slope of Lock Lever, as shown. *The Detent Lever should meet the Lock Lever approximately half way along the lower slope. If the edge of the Detent Lever is above or below the lower slope of the Lock Lever, check "Pickup 3" adjustment.*

(C) Tighten Lock Nut.

(D) To check - - manually pull top of Control Fork away from Crank. The Detent Lever should hold the Lock Lever and the Crank from moving.

"PICKUP 5" - - PICKUP LOCKING ADJUSTMENT

This adjustment establishes 1/32" clearance between the tip of "Pickup 5" adjusting screw and the upper end of the Crank to insure correct locking of the Pickup Assembly in SCAN position.



REFERENCE SCALE

THESE LINES
SPACED 1/32"
ACTUAL SIZE

NOTE: - "Pickup 4" adjustment should be correct before making this adjustment.

(A) Place mechanism in SCAN position with Pickup Arm and Cradle fully reset on Left side.

(B) Lock Lever should be engaged with Lock Lever Pin. Pull Detent Lever out of way, if necessary, to allow Lock Lever to drop against pin.

(C) Loosen Lock Nut and adjust screw so that clearance between the Crank and the tip of the screw is 1/32'' to 1/16''. Note reference scale.

(D) Tighten Lock Nut.

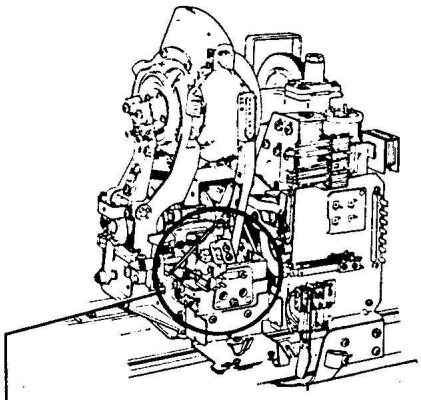
(E) Check adjusting screw clearance by selecting Right side of a record. Screw tip should not touch Crank while shifting.

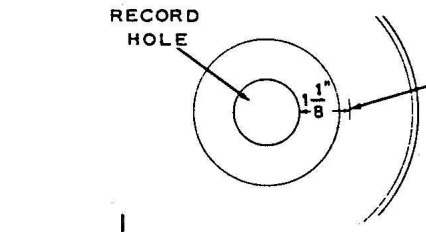
(F) Check resetting action - - by returning mechanism to Right side SCAN position. Lock Lever should be returned to Lock position against Pin and clearance between screw tip and Crank should be 1/32".

2451

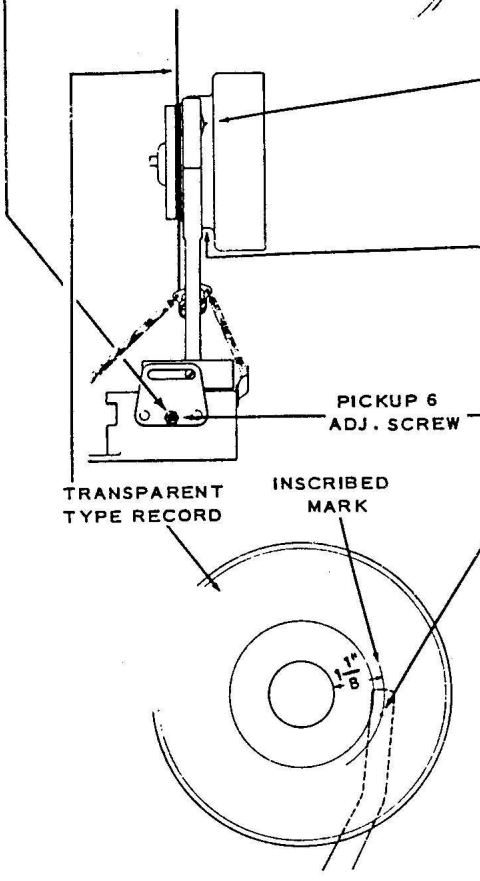
"PICKUP 6" - - PICKUP ARM STOP

This adjustment limits the inward travel of the Pickup Arm so the Pickup Cartridge cannot move in far enough to hit the Flywheel.





(A) Inscribe a mark on a record 1-1/8" away from the edge of hole. Use a transparent type record if available.



(B) Place mechanism in Right side PLAY position with inscribed record on Flywheel. Turn off power.

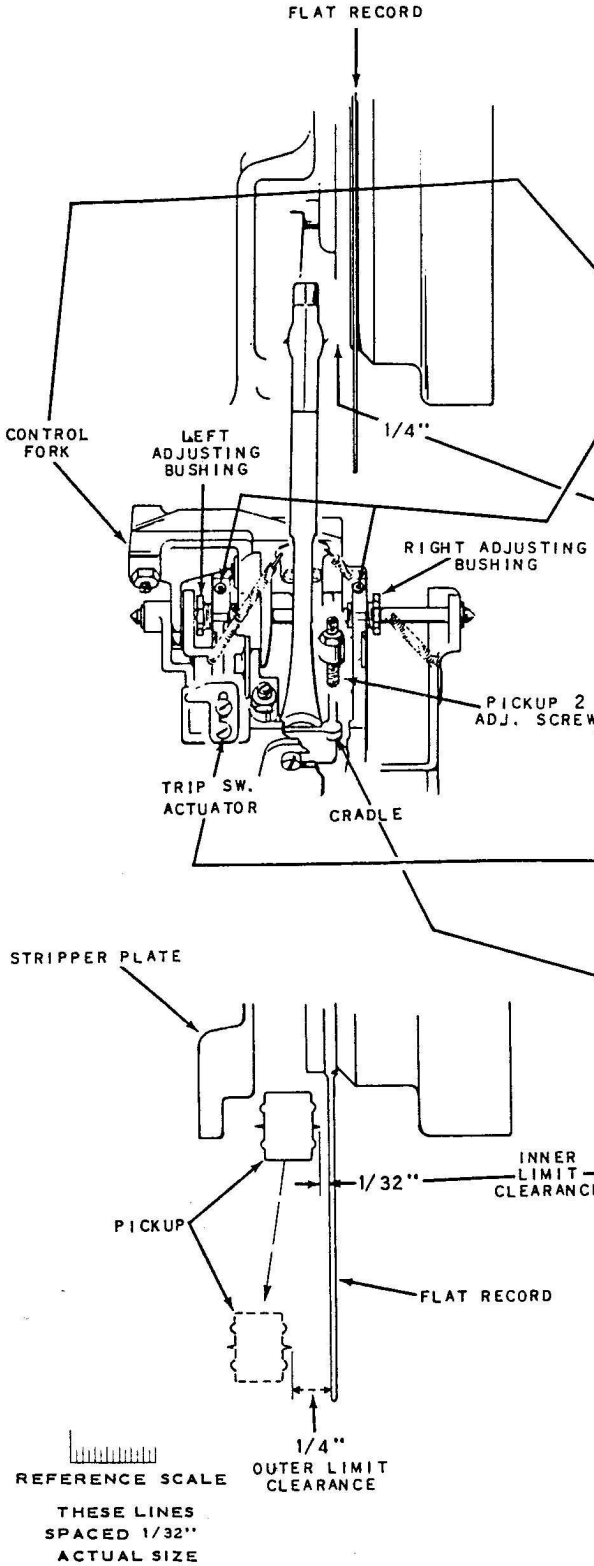
(C) Move Pickup Arm in as far as possible toward Flywheel.

(D) Loosen Lock Nut and adjust screw so that needle cannot move in toward Flywheel any farther than the inscribed mark, as shown.

(E) Tighten Lock Nut.

"PICKUP 7" - - PICKUP LIFTING ADJUSTMENTS

This adjustment establishes correct Pickup lifting action and clearance between the needle and record when the Pickup is lifted and returned to its rest position.



NOTE: - "Pickup 6" adjustment should be correct before making this adjustment.

(A) Place mechanism in Left side PLAY position with a flat record clamped on Flywheel. Turn off power and loosen both socket head set screws holding Adjusting Bushings.

(B) Pull Control Fork forward to the limit of its travel and - - -

(C) adjust Left Adjusting Bushing for 1/4" clearance between record and needle.

(D) Release Control Fork and move Pick-up toward center of Flywheel to limit of its travel.

(E) Hold Pickup in this position by pressing inward lightly on Trip Switch Actuator.

(F) Pull Control Fork down lightly until "Pickup 2" adjusting screw just touches Cradle.

(G) In this position of the Pickup Arm and Control Fork the needle should be a minimum of 1/32" from the record.

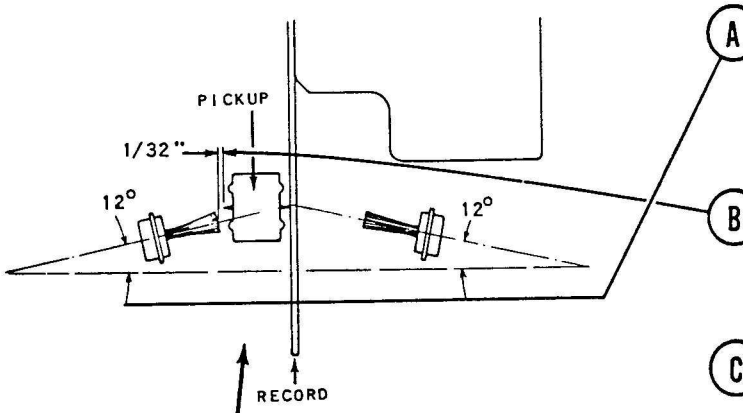
(H) Repeat above for Right side PLAY position using Right Adjusting Bushing to make adjustment.

(J) Tighten both set screws.

2453

"PICKUP 8" - - BRUSH POSITION ADJUSTMENTS

This adjustment establishes 1/32" clearance between the outer needle and the Brush while a record is being played.



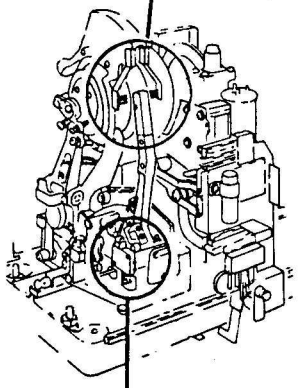
(A) The Brush Mounting Brackets are set so the bristles "point" approximately 12 degrees toward record center.

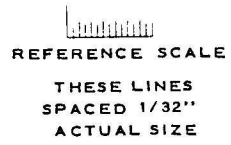
(B) The Brackets should be formed so the outer needle clears the brush by 1/32" while a record is played.

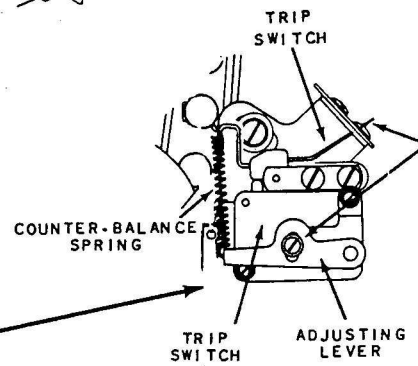
(C) Check for correct clearance on both Right and Left sides.

"PICKUP 9" - - TRIP SWITCH PRESSURE ADJUSTMENT

This adjustment establishes the pressure required to operate the Trip Switch at 1 to 2 grams as measured at the end of the Trip Lever.





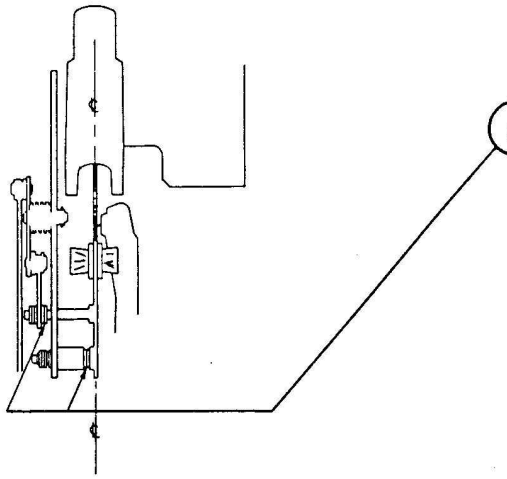


(A) Loosen screw and adjust Counter-balance Spring by moving Adjusting Lever up or down.

Pressure required to trip the Switch should be 1 to 2 grams as measured with a gram scale at this point.

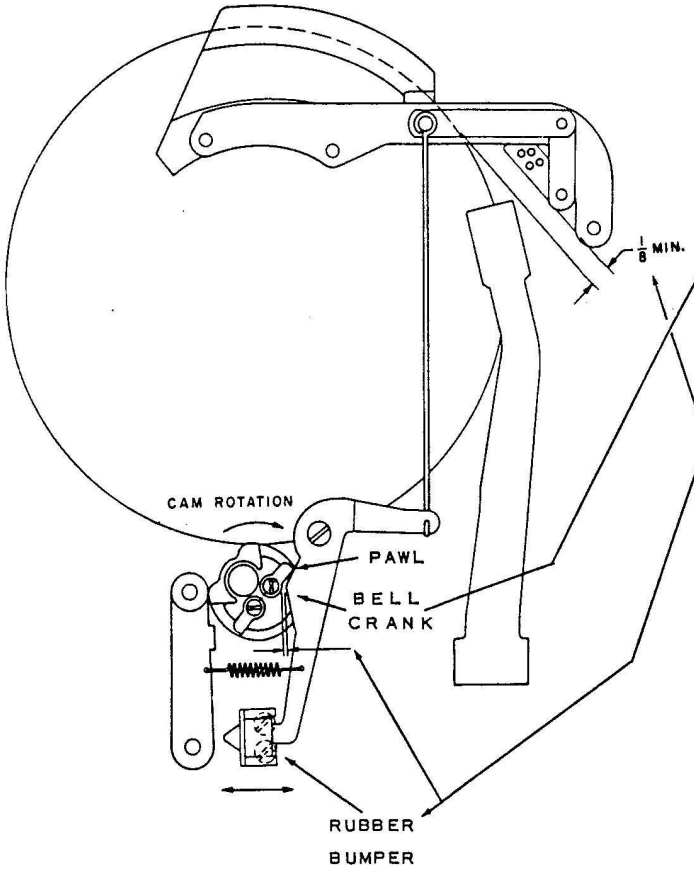
"PICKUP 8" - - BRUSH ADJUSTMENTS (Stereo Pickup)

This adjustment positions the brush for correct operation and clearance.



(A) Place mechanism in PLAY position. Use washer (Part No. 920600) as required to center blade with record. Quantity of washers should be equal on both studs.

(B) With mechanism in SCAN position, manually operate the release lever to trip.



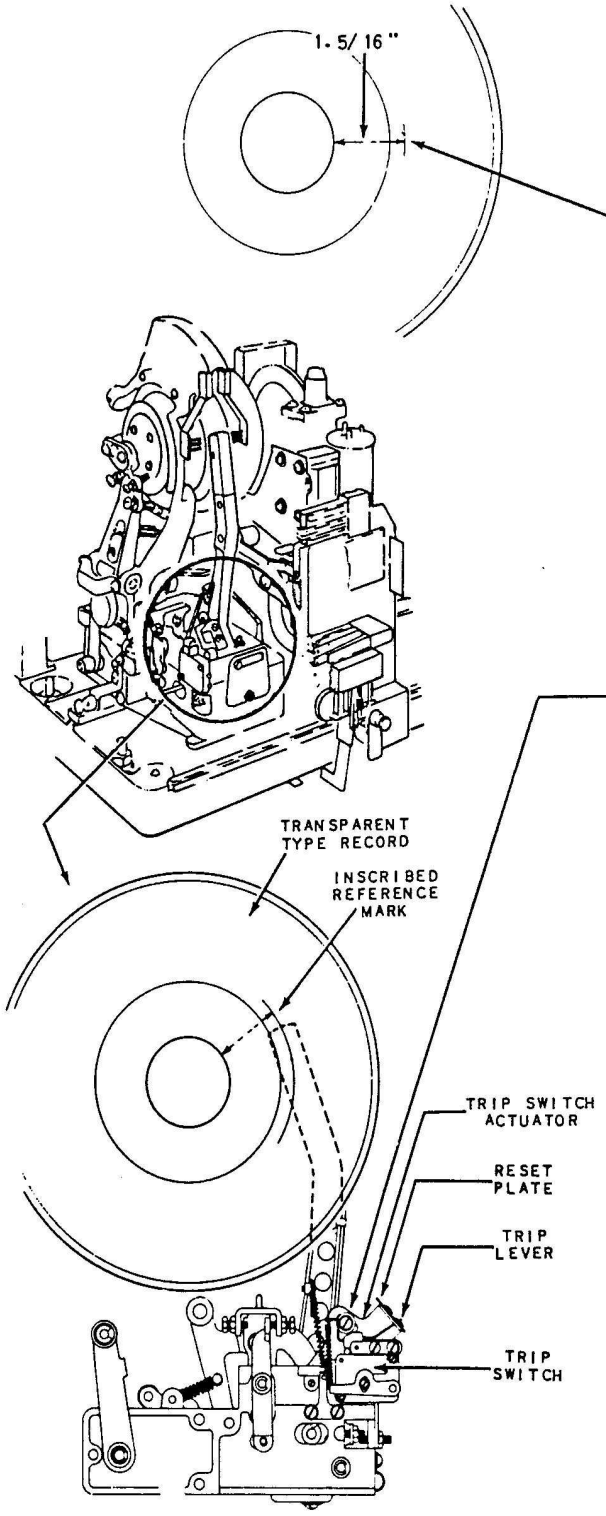
(C) Turn motor coupling manually so pawl on brake cam is rotated clockwise until adjacent to lobe on bell crank as shown.

(D) Position rubber bumper so that (as cam rotates in direction shown) bell crank does not touch hub of pawl. 1/64" maximum clearance allowable.

(E) With rubber bumpers adjusted, as in (D) and with record in PLAY position, clearance between brush blade and record must be not less than 1/8".

"PICKUP 10" - - "RECORD CUT-OFF" (TRIP SWITCH ACTUATOR ADJUSTMENT)

This adjustment establishes the "Record Cut-off" position and results in tripping of the mechanism when the needle has reached a point 1-5/16" from the edge of the hole in the record.



NOTE: - "Pickup 9" adjustment should be correct before making this adjustment.

(A) Inscribe a line on a record 1-5/16" away from edge of hole as shown. (Use a transparent type record if available.)

(B) Place mechanism in Right side PLAY position with inscribed record clamped on Flywheel. Turn off power.

(C) Loosen screw and position Trip Switch Actuator so that Trip Switch will operate when needle reaches inscribed mark.

(DO NOT BEND TRIP LEVER TO MAKE ADJUSTMENT.)

(D) Tighten screw and check for normal operation by playing several Left and Right sides of records.

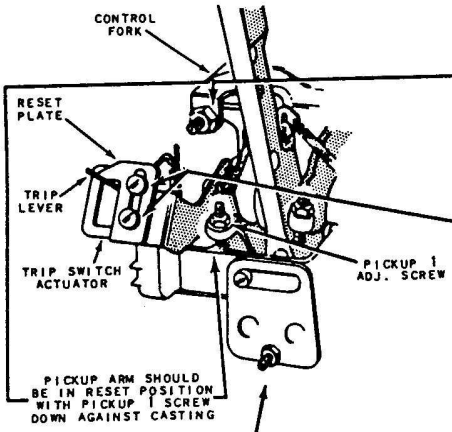
NOTE: - If the position of the Trip Switch actuator is changed be sure to readjust and check "Pickup 11".

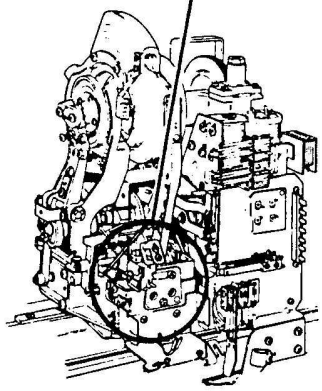
2455

"PICKUP 11" - - TRIP SWITCH RESET ADJUSTMENT

This adjustment results in proper resetting of the Trip Switch when the Pickup Arm returns to its rest position.

NOTE: – "Pickup 9 and 10" adjustments should be correct before making this adjustment.





(A) Place mechanism in PLAY position and pull Control Fork down until Pickup Arm is in its reset position.

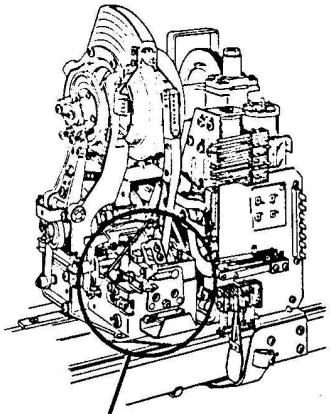
(B) In this position loosen screws and adjust Reset Plate so Trip Switch is fully reset.

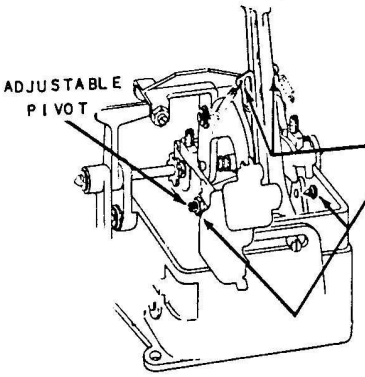
When adjusted correctly the Trip Switch should be reset but the Trip Lever should not apply any upward pressure against the reset plate.

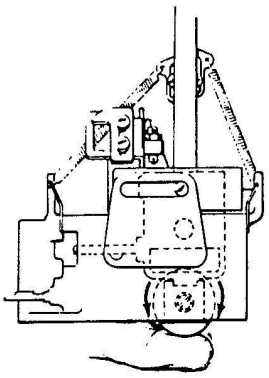
(C) Check by releasing Control Fork. Needle should land properly on record without "Booster" action from Trip Lever.

"PICKUP 12" - - PICKUP BALANCE ADJUSTMENT

This Adjustment results in proper balancing of the Pickup Arm and Cradle Assembly and assures maximum record and needle life.







NOTE: Before making this adjustment:

1. Check Cradle Pivots for binds. There should be no play but the Arm and Cradle should move freely on the Pivots.
2. Check Pickup lead to be sure it hangs freely below Cradle and does not touch the carriage or at any place along the base casting.

(A) Place mechanism in PLAY position with a record clamped on Flywheel and turn off power.

(B) Remove both Needle Pressure Springs.

(C) Adjust the position of the pickup arm counter-weight so the arm is "in balance" at the record cut-off groove and at a point 1" in from the outer edge of the record.

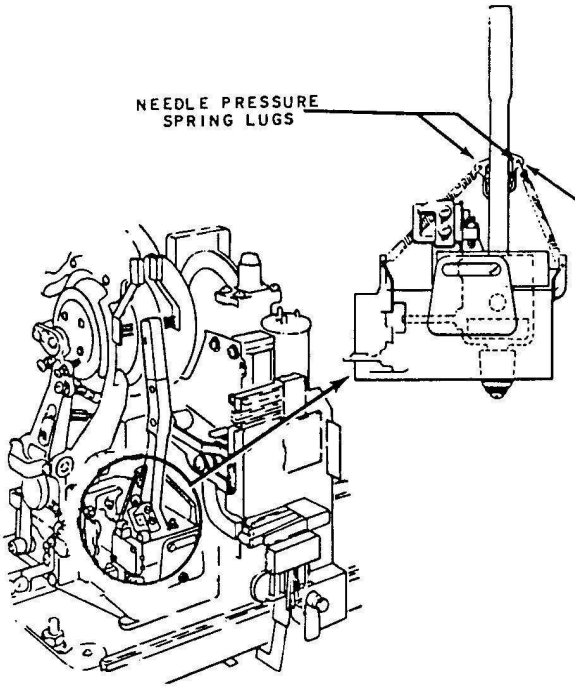
Check the balance by holding the pickup 1/8" to 1/4" from the record, releasing carefully, and observing the DIRECTION in which it moves. Ignore the slow movement toward or away from the record surface. There should be no in or out movement (toward or away from the record center). In or out movement indicates that the pickup arm is not "in balance" at the point of check and requires adjustment of the counter-weight position.

(D) Replace needle pressure springs and check "Pickup 13" Adjustment.

2457

"PICKUP 13" - - NEEDLE PRESSURE ADJUSTMENTS

This adjustment establishes the needle pressure at 5 to 6½ grams* for either Right or Left sides. Correct pressures result in proper tracking and in a minimum of needle and record wear.

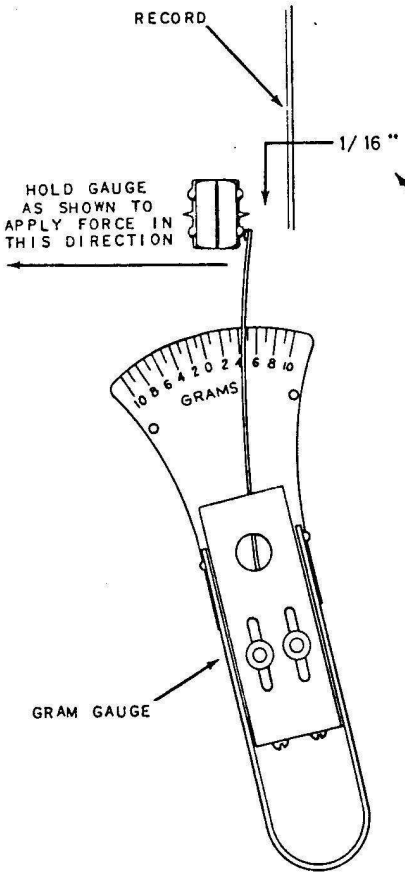


(A) Place mechanism in Left side PLAY position with a flat record clamped on the Flywheel.

(B) Turn off power so record is not turning.

(C) Adjust position of Pressure Spring Lug on Right side of Pickup Arm so that needle pressure is 5 to 6½ grams.*

(D) Repeat same procedure on Right side PLAY position by adjusting the Pressure Spring Lug on Left side of the Pickup Arm for 5 to 6½ grams * needle pressure.



NOTE: - For accurate adjustment needle pressure should be measured with a gram gauge as follows:

1. Place the tip of the gauge spring against the Pickup case at the "Bump" next to the needle tip and lift the Pickup so the needle is about 1/4" from the record.

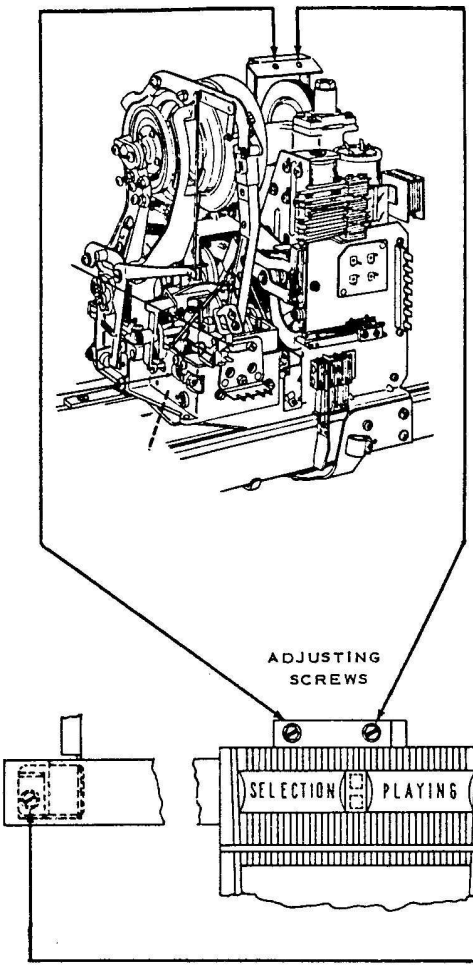
2. Slowly relax the force of the gauge against the Pickup so the needle moves toward the record.

3. Stop the inward movement when the needle is about 1/16" from the record and read indicated pressure on gauge. Pressure should be between 5 and 6½ grams. *

* Stylus Force should be 4½ to 5½ grams with stereo pickup, Part No. 249730.

"SELECTION PLAYING INDICATOR"

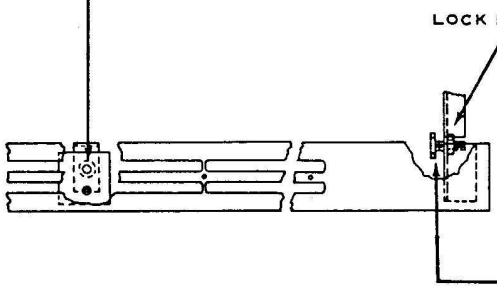
This adjustment aligns the Selection Playing Indicator with mechanism playing position.



A Loosen adjusting screws and laterally position indicator, bracket and shutter assembly so that indicator escutcheon lines up with carriage cover plate escutcheon. Tighten screws.

B Loosen adjusting screws (one on each end of the indicator channel) and with the mechanism in *B5 (or †F2) record playing position, adjust the channel so that the selection number is in the center of the bottom viewing window. Tighten screws.

C With the indicator shutter shifted to the left and the mechanism in *B1 (or † A2) record playing position, loosen the retaining screw and adjust stop angle so *B1 (or † A2) is clearly visible.

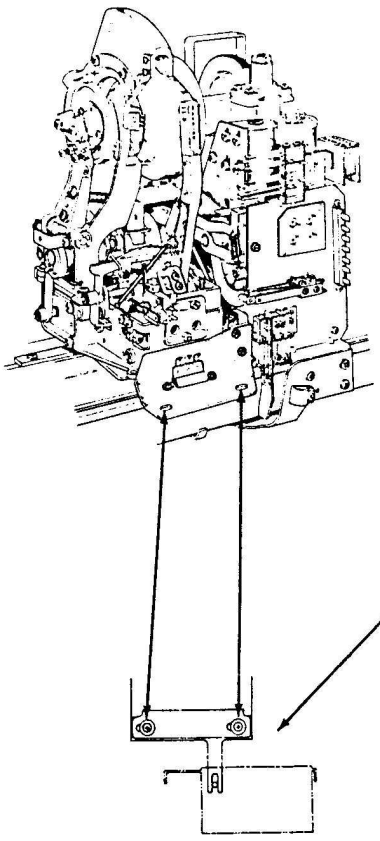


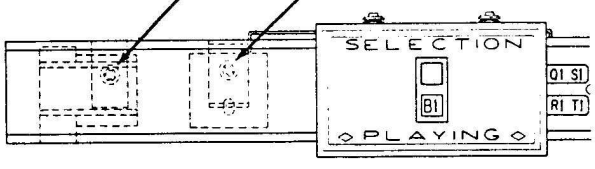
D With the indicator shifted to the right and the mechanism in *U8 (or † K9) record playing position, adjust the actuator screw so that *U8 (or † K9) is is clearly visible. Tighten lock nut.

*160 SELECTION MECHANISM
†100 SELECTION MECHANISM

"SELECTION PLAYING INDICATOR"

This adjustment aligns the Selection Playing Indicator with mechanism playing position.





(A) Loosen adjusting screws (one on either end of the indicator channel) and position channel so that it is centrally located with respect to the mechanism base. Tighten screws.

(B) With the mechanism in *B6 (or †F2) record playing position, adjust the indicator, bracket and shutter assembly so that "F2" is in the center of the bottom viewing window of the indicator escutcheon.

(C) With the indicator shutter shifted to the left and the mechanism in *B1 (or †A2) record playing position, loosen the retaining screw and adjust the stop angle so *B1 (or †A2) is clearly visible.

(D) Repeat adjustment (C) with mechanism in play position for the record at the right end of the magazine for right hand shutter positioning.

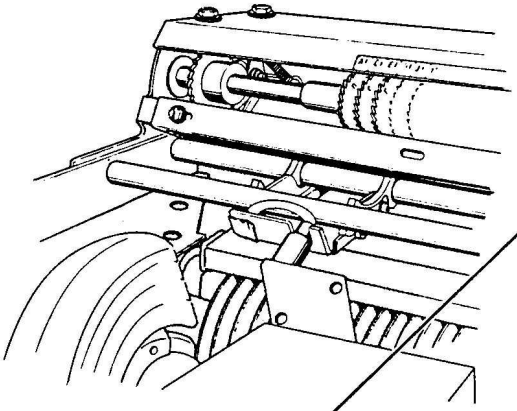
* 200 and 160 Selection Mechanisms

† 100 Selection Mechanism

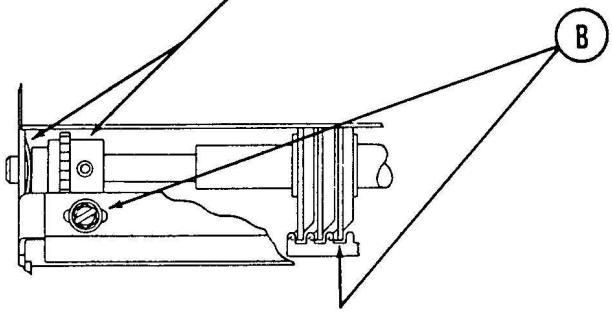
2459

"POPULARITY METER" – DIAL ADJUSTMENT

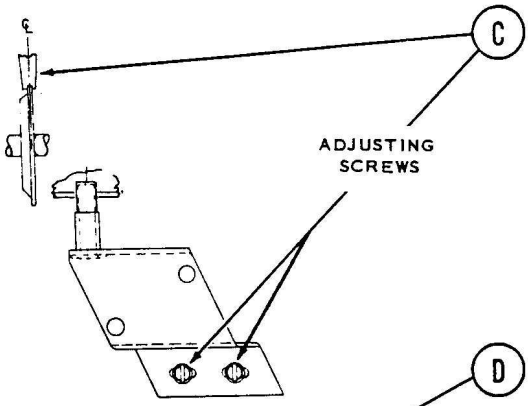
This adjustment gives proper positioning of dials and operating Solenoid Assembly.



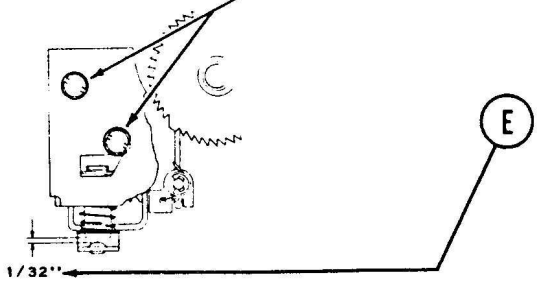
A Position ratchet wheel on dial and shaft assembly so that spring washer is compressed and wheel is centered on pawl. Tighten set screws.



B Loosen screws on each end of dial stop strip and adjust so that the dials are exactly centered in the notches in the dial stop. Tighten screws.



C With the mechanism in play position at A1, adjust actuator assembly laterally to have centerline of pawl in line with centerline of full width of tooth of A1 dial.



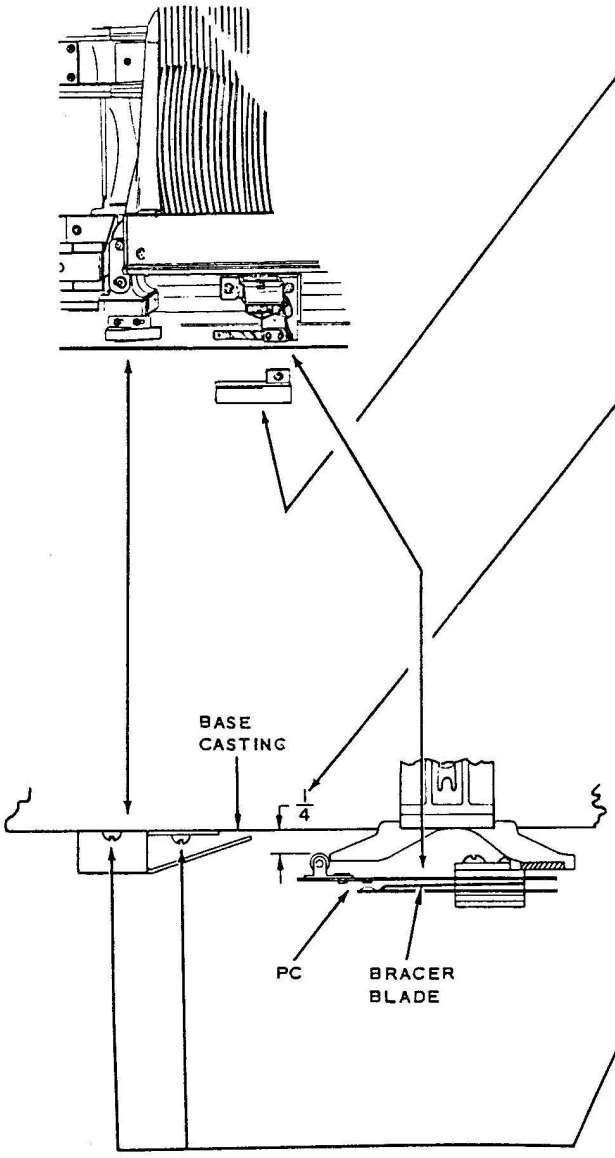
D Loosen the two screws holding solenoid frame.

E Hold the solenoid plunger in the energized position and position the assembly so that their remains 1/32 clearance between the top of the plunger and the actuator. Tighten screws.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"PLAY CONTROL SUBTRACT SWITCH"

This adjustment positions the switch actuator and determines contact gap and pressure.



(A) Remove switch cover.

Position mechanism carriage so that switch roller is clear of actuator bracket.

(C) Adjust blade with roller so that the roller is ¼ inch away from base casting.

(D) Adjust bracer blade so that it bears against its associated contact blade with a minimum of 1½ ounce force.

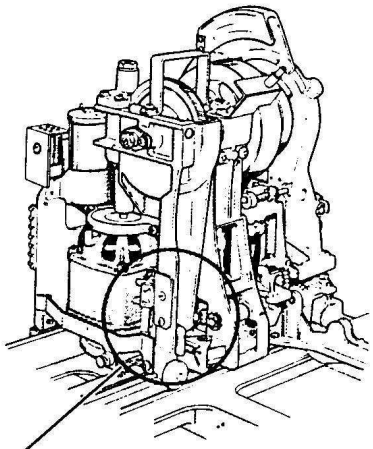
(E) Adjust contact gap of switch "PC" to be 1/32 of an inch.

(F) Position mechanism carriage in play position for the record at the right end of the magazine. Loosen switch actuator retaining screws and position subtract switch actuator so that its sloping ramp just touches the roller on switch "PC". Tighten screws.

NOTE: – When switch cover is replaced, make certain that switch blades and roller bracket do not touch cover and that cover does not strike switch actuator as mechanism is scanning.

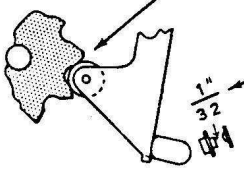
2461

"DETENT SWITCH" – CONTACT GAP AND PRESSURE ADJUSTMENT

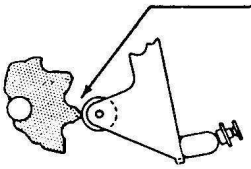


(A) Remove cover from switch stack.

(B) Place phonograph service switch in "OFF" position and turn motor coupling manually until actuator roller is engaged as shown.

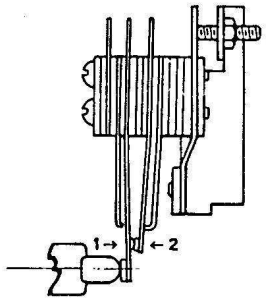


(C) Form bracer blades for a 1/32" contact gap between blades 1 and 2. Maintain a bracer blade follow of at least .015" for each bracer blade. *NOTE: Do not bend contact blades in making this adjustment; bend only the bracer blades.*



(D) Turn motor coupling so that actuator roller is on peak of sprocket tooth.

(E) Position Detent Switch on its mounting bracket so its actuator arm engages the center of the nylon fibre lift on the detent switch blade.



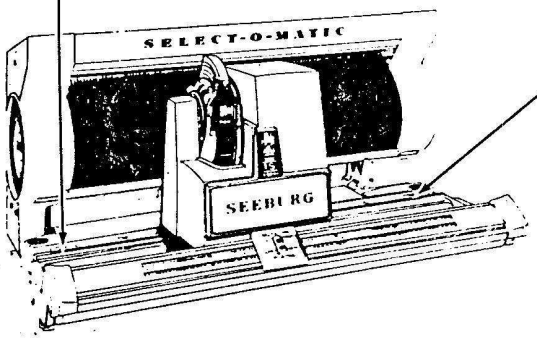
(F) Loosen hex nut on adjusting screw and turn the screw clockwise until switch contacts are open. Back off screw until contacts are just closed. Complete adjustment by continuing to turn the screw counter-clockwise 1 turn exactly. Tighten hex nut without turning screw. Contact pressure should now be 2 ounces minimum.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"RUBBER BUMPERS"

This adjustment positions the rubber bumpers so the lateral carriage movement is limited to avoid damaging of the reversing switch and contact plunger block.

NOTE : The Reversing Switch Bracket Adjustment MUST BE CORRECT before making this adjustment.



(A) Loosen screw holding bumper and move bracket as far as it will go toward the center of the base.

(B) Select *B1 or †A2 and turn off power when selection is playing.

(C) Make a reference mark on the base casting to indicate the record position of the carriage.

(D) Return mechanism to Scan and turn motor shaft manually until the mechanism has moved 3/8" to the Left of the reference mark made on the base. (This point is 1/16" past the position at which the reversing switch should operate.)

(E) Scan the carriage out of the way to the right being careful not to move the bracket, and tighten the bracket holding screws.

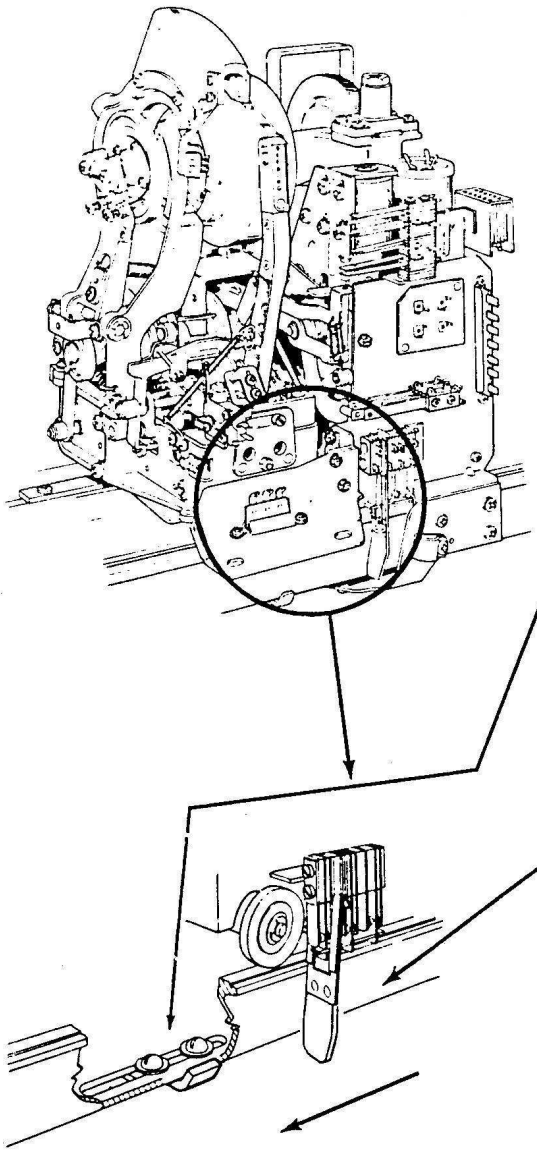
(F) Using the procedure above, adjust the right bumper by using the selection playing position at the right hand end of the magazine for references and move the bumper 5/16" to the right.

* 200 or 160 Selection Mechanisms
† 100 Selection Mechanisms

2463

"REVERSING SWITCH 1" - - SWITCH BRACKETS

This adjustment positions the Reversing Switch Brackets so the Switch operates when the carriage is 5/16" past the end record positions.



REFERENCE SCALE

THESE LINES SPACED 1/16" ACTUAL SIZE

(A) Loosen screws holding left Reversing Switch Bracket and move Bracket all the way to the left.

(B) Select *B1 or †A2 and turn off power when selection is playing.

(C) Make a reference mark on the base casting to indicate the record position of the carriage.

(D) Return mechanism to SCAN and turn the motor shaft manually until the mechanism has moved 5/16" to the LEFT of the reference mark made on the base

Reversing Switch Lever should still be to the left.

(E) Move the Bracket slowly and carefully to the right until it is at the point where the reversing switch operates.

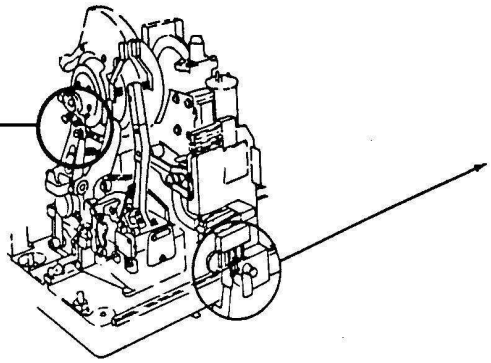
(F) Scan the carriage out of the way to the right, being careful not to move the Bracket, and tighten the bracket holding screws.

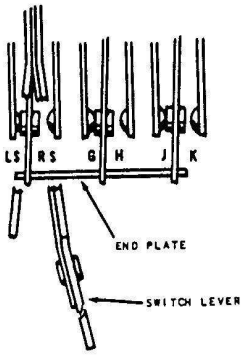
(G) Adjust the RIGHT Reversing Switch Bracket so the Switch operates when the carriage is 5/16" to the RIGHT of the record position at the right hand end of the magazine.

See "Reversing Switch 2" for contact gap adjustment.

* 200 or 160 Selection Mechanisms
† 100 Selection Mechanisms

"REVERSING SWITCH 2" -- CONTACT GAP & PRESSURE ADJUSTMENTS





CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
L S	1/32" clearance when Switch Lever is to Left.	Connects L contact of Contact Plunger Block for Left Side Selections.
R S	1/32" clearance when Switch Lever is to Right.	Connects R contact of Contact Plunger Block for Right Side Selections.
G & J	1/32" gaps at instant H and K Just Open.	These contacts closed so motor turns for SCANNING to RIGHT and for PLAYING LEFT SIDES.
H & K	1/32" gaps at instant G and J Just Open.	These contacts closed so motor turns for SCANNING to LEFT and for PLAYING RIGHT SIDES.

*See Schematic Diagram for Circuit.

ADJUSTMENT PROCEDURE

CAUTION: TURN OFF POWER!: 117 volts on G-H and J-K contacts.

A. Move Switch Lever to Left.

B. Adjust LS for 1/32" gaps.

C. Push bakelite End Plate slowly to Left. At instant H and K just break, G and J must have 1/32" gaps.

D. Move Switch Lever to Right.

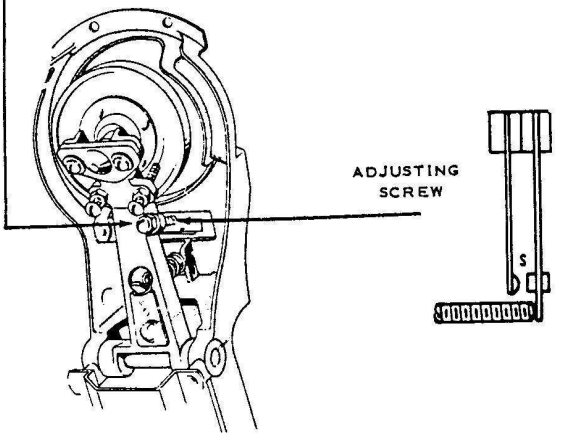
E. Adjust RS for 1/32" gaps.

F. Push bakelite End Plate slowly to Right. At instant G and J just break, H and K must have 1/32" gaps.

ALL CONTACTS MUST HAVE 25 GRAMS (1 OZ) MINIUMUM PRESSURE WHEN CLOSED.

"CLAMP ARM SWITCH" -- CONTACT GAP & BLADE PRESSURE ADJUSTMENT

This switch controls power relay in the Auto-Speed Unit when intermixed 33-1/3 and 45 rpm. records are played.



ADJUSTMENTS

"S" contact has 1/32" gap in play position with standard 45 RPM. record clamped on turntable and is closed in SCAN position and when 33-1/3 RPM. record is being played.

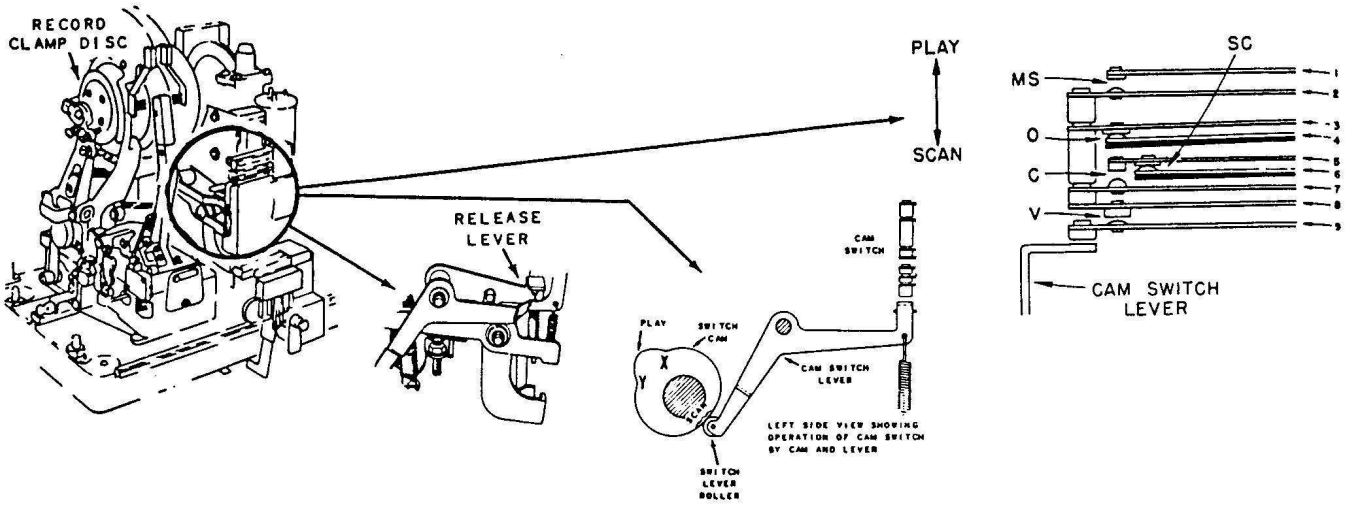
CONTACT MUST HAVE 25 GRAMS (1 OZ) MINIUMUM PRESSURE WHEN CLOSED.

REFERENCE SCALE

THESE LINES SPACED 1/32" ACTUAL SIZE

2465

"CAM SWITCH"– CONTACT GAP AND PRESSURE ADJUSTMENTS



CONTACTS	CONTACT GAP	CONTACT FUNCTIONS
MS	1/16" gap in SCAN position. Starts to close when pickup approaches ecord. Closed in PLAY position.	Squelch circuit for use with Automatic Volume Compensator.
1,2 mm O	3/64" gap in PLAY position. Closed in TRANSFER and SCAN.	Adds 1.4 mfd condenser to motor circuit during TRANSFER and SCAN.
SC	1/64" gap in PLAY position. Closed in SCAN position.	Part of popularity meter solenoid circuit. Just before the mechanism enters Play position the C and SC contacts "Make and Break" controlling the pulse to the popularity meter solenoid.
C	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	
V	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	Trip Solenoid Circuit. Completes all circuits which can operate Trip Solenoid in PLAY position.

ADJUSTMENT PROCEDURE

1 Place mechanism in Scan Position and TURN OFF POWER.

2 Trip mechanism by lifting Release Lever and manually turn motor shaft until record Clamp Disc first engages the Turntable. (This places cam so Switch Lever Roller is at position X.)

- A Bias blade 9 down tight against Switch Lever. (1½ oz pressure).
- B Bias blade 7 against blade 8 and adjust for 1/32" gap in V Contacts.
- C Bias blade 3 down so fiber lift touches blade 7 with O Contacts closed. (1½ oz. pressure). V Contacts should still have 1/32" gap.
- D With SC Contacts closed (1½ oz. pressure) adjust for 1/32" gap in C Contacts.

3 Turn motor shaft until mechanism is fully in PLAY position. (This places cam so Switch Lever Roller is on Play position "Peak).

- A Adjust blade 4 for 3/64" gap in O Contacts.
- B Adjust blade 6 for 1/64" gap in SC Contacts.

4 Trip mechanism by lifting Release Lever and manually turn motor shaft until Clamp Disc begins movement away from Turntable. (This places cam so Switch Lever Roller is at position Y).

- A Check for 1/32" gap in C Contacts with SC closed. (1½ oz. pressure).
- B Check to see that blade 9 bears against Switch Lever.
- C Check for 1/32" gap in V Contacts.

5 Trip and operate mechanism until it is in SCAN position.

- A Adjust blade 2 so fibre lift bears lightly against blade 3.
- B Adjust blade 1 for 1/16" gap between MS contacts.

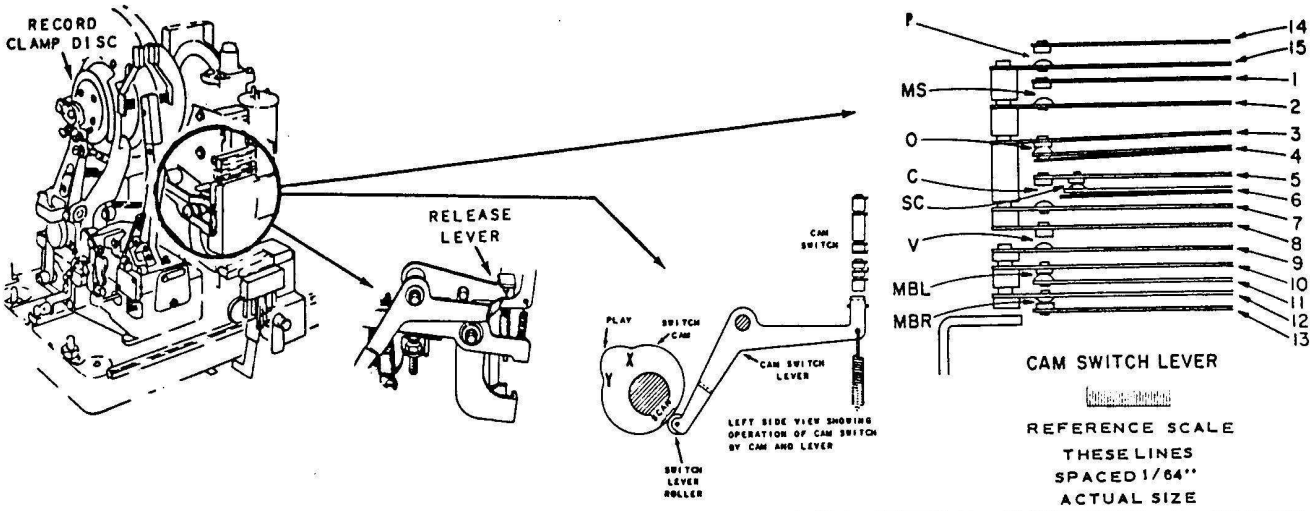
REFERENCE SCALE

THESE LINES SPACED 1/64" ACTUAL SIZE

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"CAM SWITCH" - CONTACT GAP AND PRESSURE ADJUSTMENTS

(For Mechanism Having Stereo Pickup)



CONTACTS	CONTACT GAP	CONTACT FUNCTIONS
MBL MBR	1/64" gap in play position. Closed during SCAN and part of transfer cycle.	Part of mute circuit. Maintains muting action of both channels of amplifier, during SCAN and part of transfer operation.
MS	1/64" gap in SCAN position. Starts to close when pick-up approaches record. Closed in PLAY position.	Squelch circuit for use with Automatic Volume Compensator.
O	3/64" gap in PLAY position. Closed in TRANSFER and SCAN.	Adds 1.4 mfd. condenser to motor circuit during TRANSFER and SCAN.
SC	1/64" gap in PLAY position. Closed in SCAN position.	Part of popularity meter solenoid circuit. Just before the mechanism enters PLAY position the C and SC contacts "Make and Break" controlling the pulse to the popularity meter solenoid.
C	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	
V	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	Trip Solenoid Circuit. Completes all circuits which can operate Trip Solenoid in PLAY position.
P	1/32" gap in SCAN. Closed only in PLAY.	In series with clamp arm switch, it completes power relay circuit in Auto-Speed Unit.

ADJUSTMENT PROCEDURE

1. Place mechanism in Scan Position and TURN OFF POWER.

2. Trip mechanism by lifting release Lever and manually turn motor shaft until record Clamp Disc first engages the Turntable. (This places cam so Switch Lever Roller is at position X)
   - A. Bias Fiber lift of blade 12 against switch lever. (1½ ounce pressure)
   - B. Bias Fiber lift of blade 10 against blade 12.
   - C. Bias blade 9 against blade 10.
   - D. Bias blade 7 against blade 8 and adjust for 1/32" gap at V contacts.
   - E. Bias blade 3 down so fiber lift touches blade 7 with 0 contacts closed (1½ ounce pressure). V contacts should still have 1/32" gap.
   - F. With SC contacts closed (1½ ounce pressure) adjust for 1/32" gap in C contacts.

3. Turn motor shaft until mechanism is full in PLAY position (this places cam so switch Lever Roller is on PLAY position peak).
   - A. Adjust blade 13 for 1/64" gap in MBR contacts.
   - B. Adjust blade 11 for 1/64" gap in MBL contacts.
   - C. Adjust blade 4 for 3/64" gap in 0 contacts.
   - D. Adjust blade 6 for 1/64" in SC contacts.

4. Trip mechanism by lifting Release Lever and manually turn motor shaft until clamp disc begins movement away from turntable. (This places cam so Switch Lever Roller is at position Y)
   - A. Check for 1/32" gap in C contacts with SC closed (1½ ounce pressure).
   - B. Check to see that blade 12 bears against Switch Lever.
   - C. Check for 1/32" gap in V contacts.

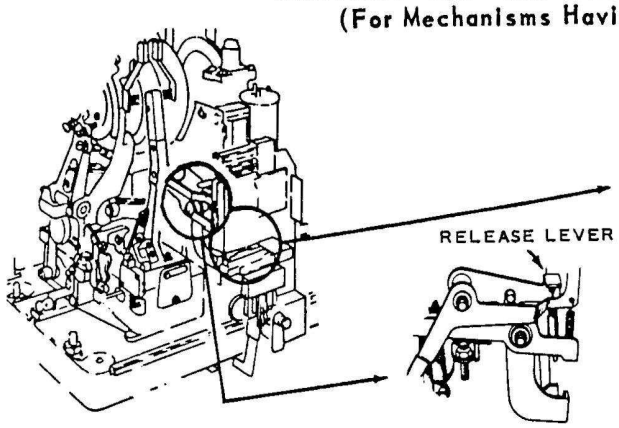
5. Trip and operate mechanism until it is in SCAN position.
   - A. Adjust blade 2 so fiber lift bears lightly against blade 3.
   - B. Adjust blade 1 for 1/64" gap between MS contacts.
   - C. Adjust blade 15 so its lift bears against blade 2.
   - D. Adjust blade 14 so there is 1/32" gap between P contacts.

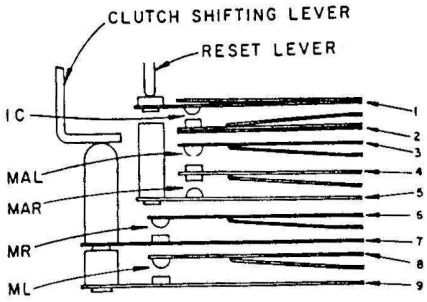
6. Trip and operate mechanism until it is in PLAY position observing that MS contacts must close before MBL and MBR contacts open.

2466A

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"CLUTCH and RESET LEVER SWITCHES" CONTACT GAP and PRESSURE ADJUSTMENT (For Mechanisms Having Stereo Pickup)





NOTE: "Clutch 1" to "4" Mechanical Adjustments must be correct before adjusting these switches.

CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS
I C	3/64" gap when mechanism trips. Closed in SCAN and PLAY positions.	Part of Popularity Meter Solenoid Circuit. Allows operation of Solenoid when mechanism is transferring into PLAY position but prevents "Extra" operation when mechanism is transferring out of PLAY position.
M A L M A R	1/64" gap in PLAY position. Closed in Tripped position.	Part of Mute Circuit. Mutes both channels in Amplifier at end of record at instant Trip Solenoid is operated.
M L M R	1/64" gap in PLAY position. Closed during Transfer cycles.	Part of Mute Circuit. Maintains Muting action during entire Transfer cycle.

ADJUSTMENT PROCEDURE

REFERENCE SCALE
THESE LINES SPACED 1/64" ACTUAL SIZE

1 Place mechanism in SCAN position and TURN OFF POWER.

2 Trip by manually lifting Release Lever. While mechanism is in this position:

A Bias blade 1 to within 1/16" of Reset Lever.

B Bias blade 5 so its fibre lift is against blade 1.

C Bias blade 2 against bracer blade and adjust blade 2 for 1/16" gap between IC contacts.

3 Reset mechanism by pressing down on Release Lever.

A Bias blade 4 against bracer blade and adjust blade 4 for 1/64" gap between MAR contacts.

B Bias blade 3 against bracer blade and adjust blade 3 for 1/64" gap between MAL contacts.

4 Trip mechanism by lifting Release Lever and turn motor shaft manually until mechanism is in PLAY Position

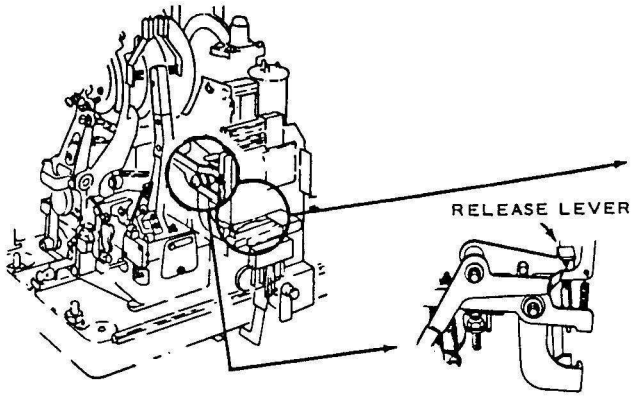
A Bias blade 7 so its fibre lift bears against Clutch Shifting Lever with 7 ounce pressure.

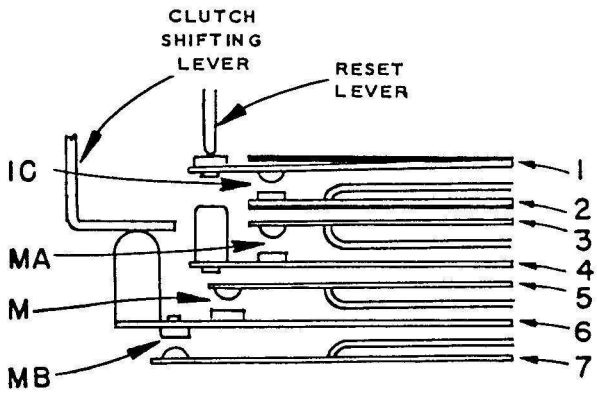
B Bias blade 6 against its bracer blade and adjust bracer blade for 1/64" gap between MR contacts.

C Bias fiber lift of blade 9 against fiber lift of blade 7.

D Bias blade 8 against bracer blade for 1/64" gap between ML contacts.

"CLUTCH & RESET LEVER SWITCHES" CONTACT GAP & PRESSURE ADJUSTMENT





NOTE: "Clutch 1" to "4" Mechanical Adjustments must be correct before adjusting these switches.

CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
IC	1/16" gap when mechanism trips. Closed in SCAN and PLAY positions.	Part of Popularity Meter Solenoid Circuit. Allows operation of solenoid when mechanism is transferring into PLAY position but prevents "Extra" operation when mechanism is transferring out of PLAY position.
MA	1/64" gap in PLAY position. Closed in Tripped position.	Part of Mute Circuit. Mutes Amplifier at end of record at instant Trip Solenoid is operated.
M	1/64" gap in PLAY position. Closed during Transfer cycles.	Part of Mute Circuit. Maintains Muting action during entire Transfer cycle.
MB	1/64" gap in PLAY position. Closed in SCAN position.	Part of Mute Circuit. Maintains muting in SCAN position.

*See Schematic Diagrams for Circuit.

REFERENCE SCALE
THESE LINES SPACED 1/64" ACTUAL SIZE

ADJUSTMENT PROCEDURE

1 Place mechanism in Scan Position and TURN OFF POWER.

2 Trip by manually lifting Release Lever . While mechanism is in this position:

- A Bias blade 1 to within 1/16" of Reset Lever.
- B Bias blade 4 so its fibre lift is against blade 1.
- C Bias blade 3 against bracer blade 2 and adjust blade 2 for 1/16" gap between IC Contacts.

3 Reset mechanism by pressing down on Release Lever.

- A Bias blade 3 against bracer blade 4 and adjust blade 4 for 1/64" gap between MA Contacts.

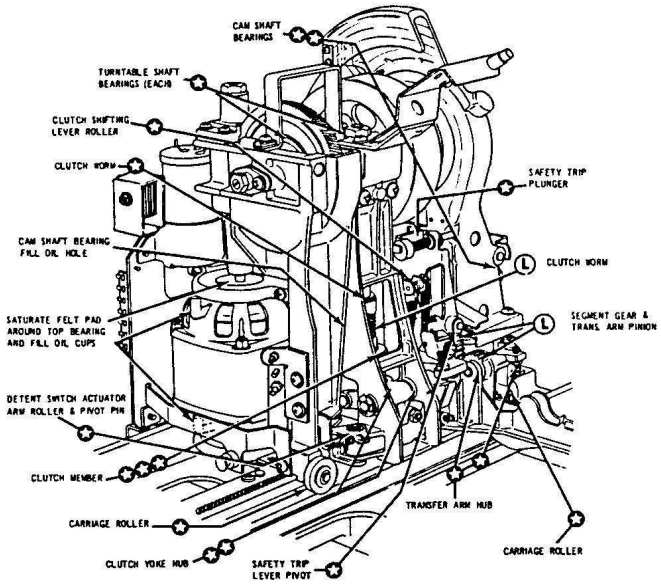
4 Trip mechanism by lifting Release Lever and turn motor shaft manually until mechanism is in Play Position.

- A Bias blade 6 so its fibre lift bears against Clutch Shifting Lever with 7 oz. pressure.
- B Bias blade 5 against its bracer blade and adjust bracer blade for 1/64" gap between M Contacts.
- C Bias blade 7 against its bracer blade and adjust bracer blade for 1/64" gap between MB Contacts.

2467

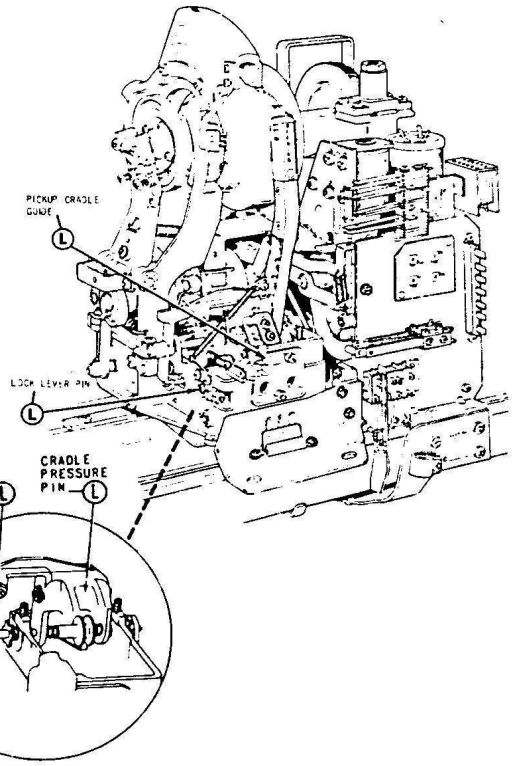
LUBRICATION CHART

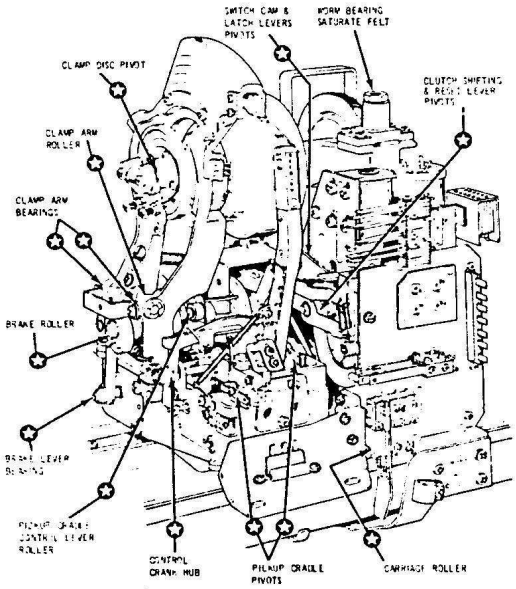
OIL ALL ROLLER PIVOT BEARINGS – 1 OR 2 DROPS



USE AERO LUBRIPLATE** SPARINGLY EVERY (L) SIX MONTHS . . .

USE SEEBURG SPECIAL PURPOSE OIL* EVERY SIX MONTHS IN AMOUNT SHOWN . . . 1 DROP FOR EACH



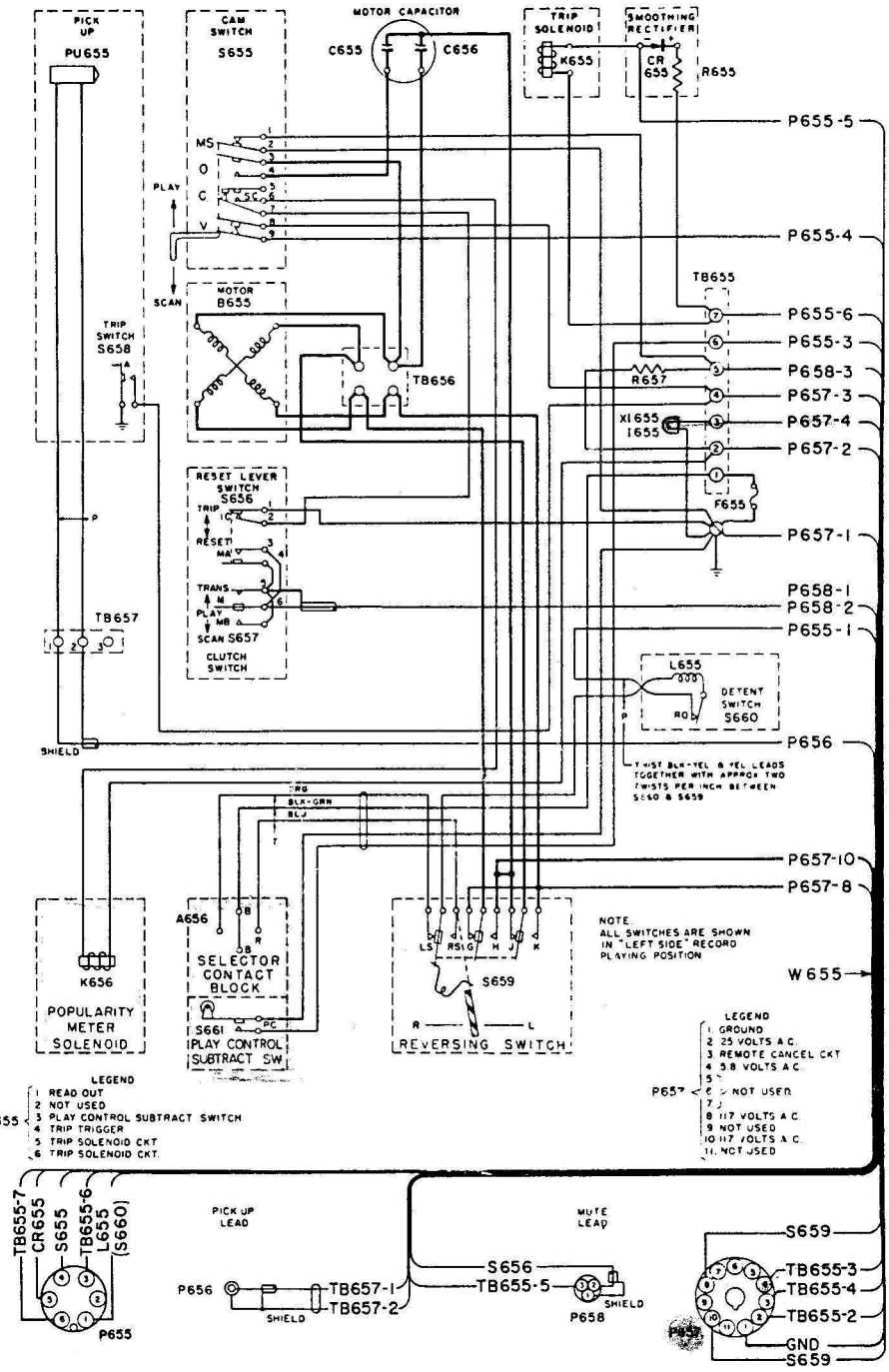


* SEEBURG SPECIAL PURPOSE OIL NO. 53014 MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

** AERO LUBRIPLATE MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

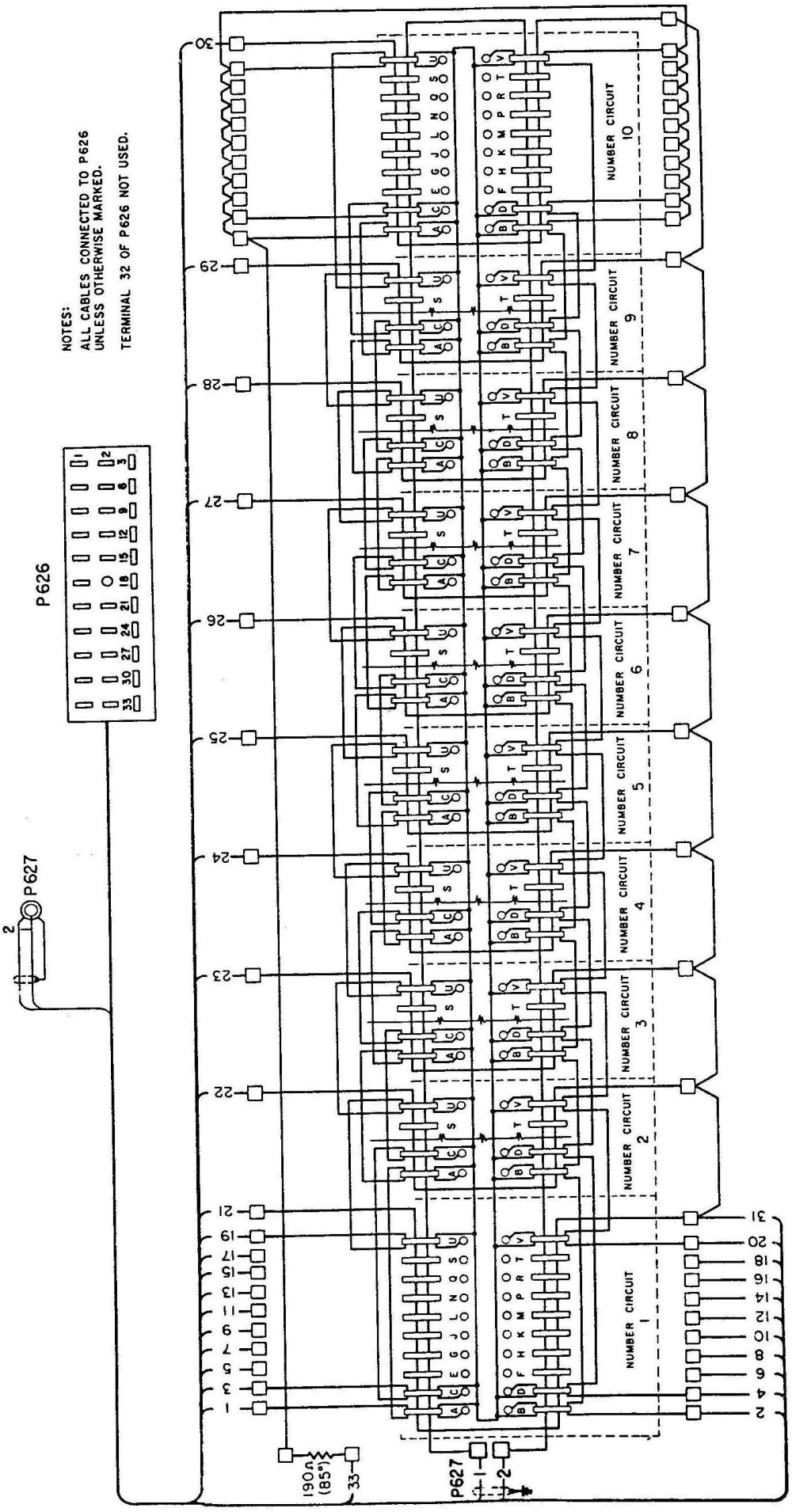
PARTS LIST

ITEM	PART NO.	PART NAME
A656	249148	Contact Block Assembly
B655	250251	Motor Assembly
C655 } C656 }	86772	{1.4 Med. / 1.0 Med.} Motor Capacitor
CR655	247843	Selenium Rectifier
F655	247850	Fuse, 5 Amp.
I 655	249198	Indicator Lamp
K655	247510	Trip Solenoid
K656	249122	Popularity Meter Solenoid
L655	303702	Choke, 100 μ Henry
P655	65319	Six Prong Plug
P656	246957	Single Prong Plug
P657	250942	11 Prong Plug Assembly
P658	250938	3 Prong Plug Assembly
PU655	246796	Magnetic Pickup
R657	82752	2,200 Ohm, 1 W., ± 10% Resistor
R655	82413	120 Ohm, ½ W., ± 10% Resistor
S655	249912	Cam Switch
S656 } S657 }	249913	{Reset Lever Switch / Clutch Switch}
S658	245816	Trip Switch
S659	247846	Reversing Switch Assem.
S660	249235	Detent Switch
S661	248127	Play Control Subtract Switch
TB655	305113	Terminal Strip
TB656	245909	Motor Terminal Strip
TB657	245755	Terminal Strip
XI655	249193	Lamp Socket Assembly
W655	249931	Control Cable

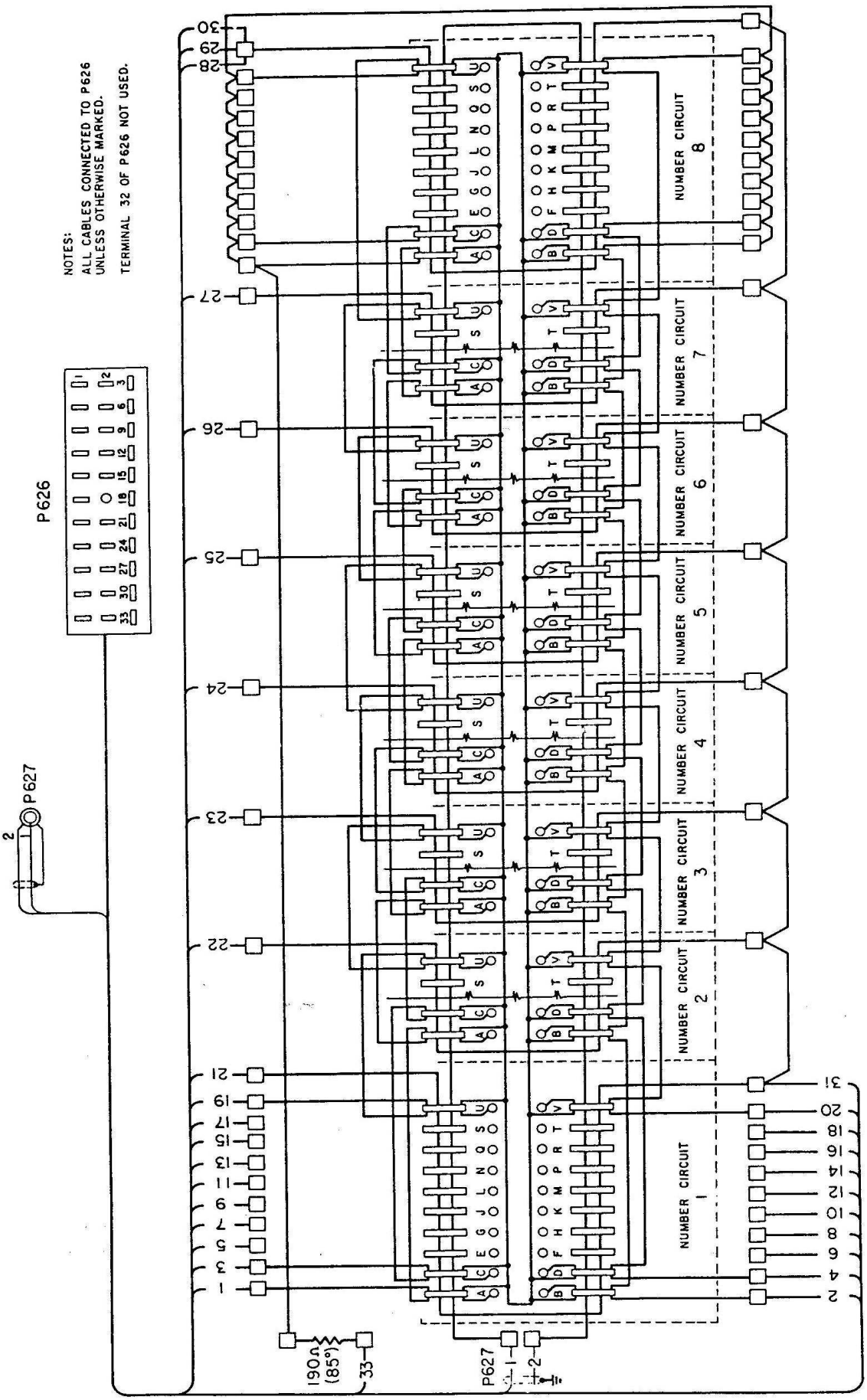


Mechanism Schematic

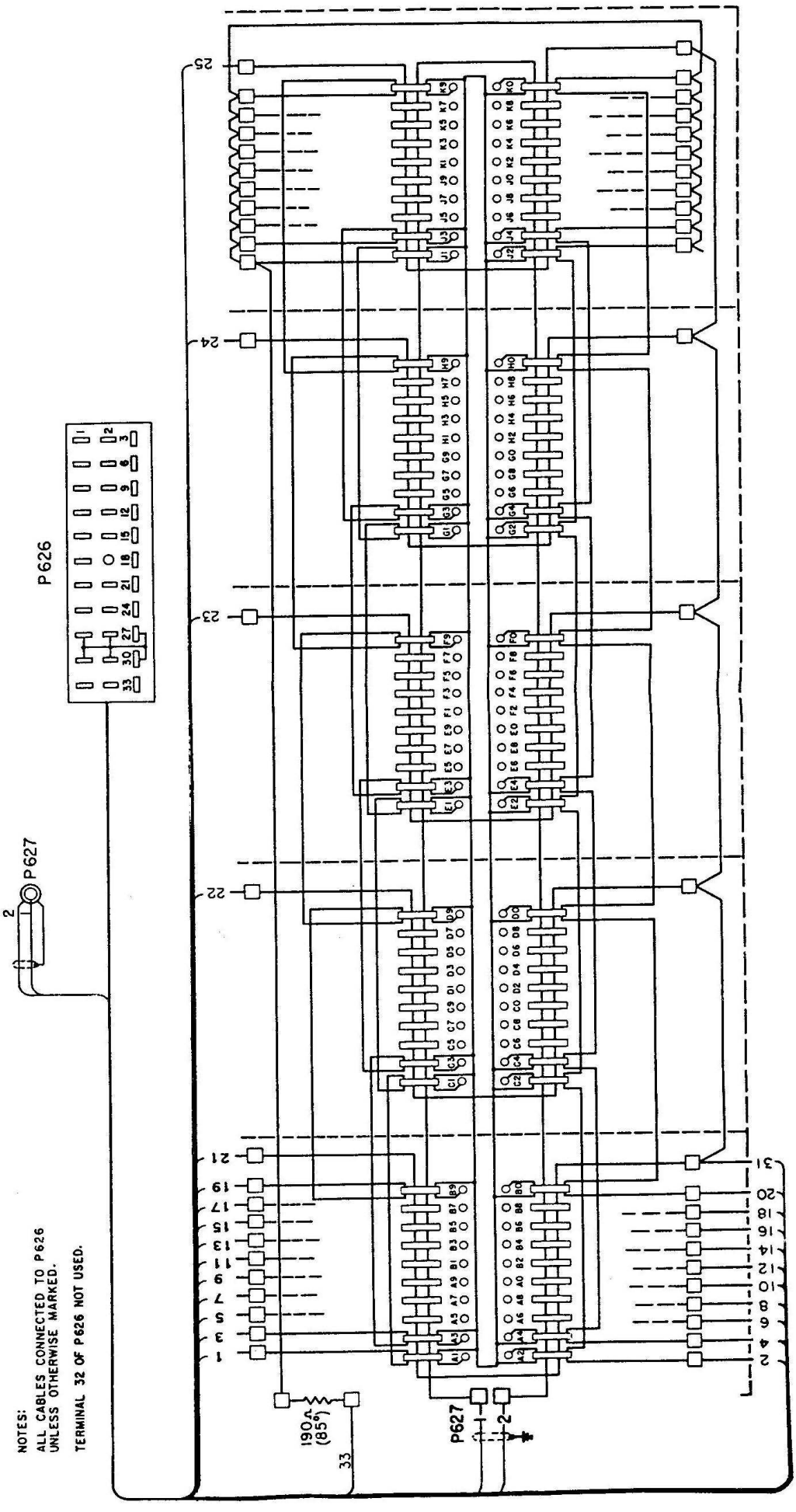
2469



WIRING DIAGRAM - TORMAT MEMORY UNIT, TYPE 200TMU



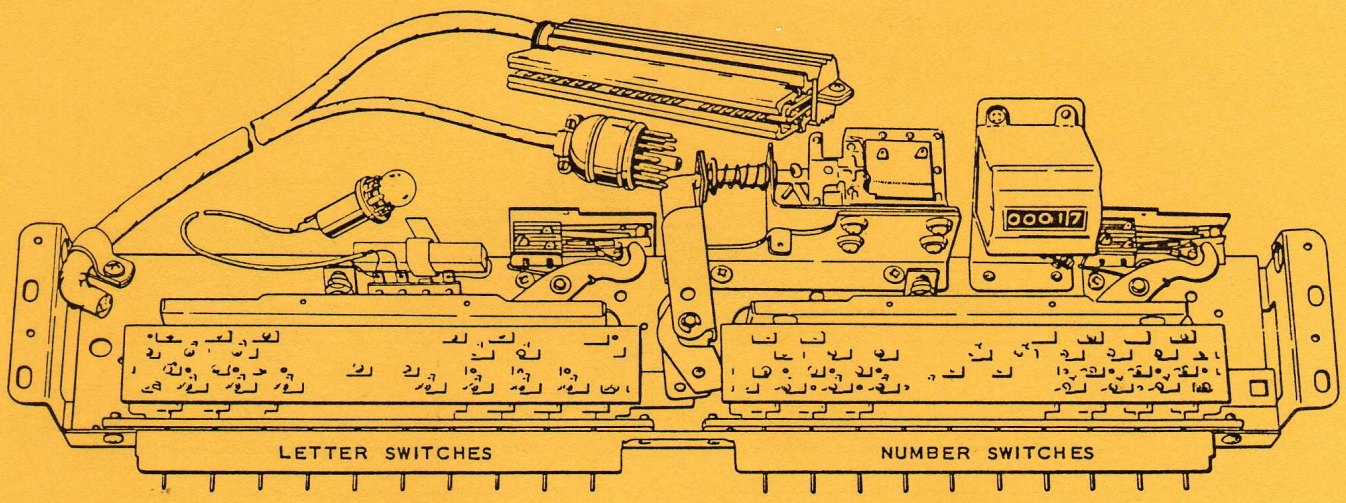
WIRING DIAGRAM - TORMAT MEMORY UNIT, TYPE 160TMU



WIRING DIAGRAM - TORMAT MEMORY UNIT, TYPE 100TMU

SEEBURG

TORMAT ELECTRICAL SELECTOR
TYPE TES101



The Tormat Electrical Selector, Type TES 101 is a part of the Seeburg Tormat Selection System and Credit System which includes the Tormat Memory Unit on the Select-O-Matic Mechanism, the Tormat Electronic Unit and Remote Control Unit. It is designed for use with the Select-O-Matic "100", Model L-100 and is operated from a selector key panel having a row of ten lettered keys and a row of ten numbered keys. Its principal functions are to connect a letter and a number circuit of the Tormat Memory Unit into a selection write-in circuit and to complete a circuit that initiates the operational sequence of the system. These functions are performed when two of the selection switches are operated by pressing a lettered selector key and a numbered key.

The component parts of the Selector are assembled on a steel frame and are protected by a steel cover. All electrical connections to the associated Tormat Memory Unit and to the other parts of the system are made with a 12-contact plug and a 36-contact plug.

The principal component parts of the Selector include, in addition to the two selection switch assemblies, a latch bar operating solenoid, a credit indicating light and two switch groups each of which has two pairs of contacts. There is also a counter which totals the number of selections made in the remote control Wall-O-Matics as well as those made with the Electrical Selector.

The Credit indicating (SELECT) light connects to a credit circuit through the Credit & Cancel Unit and is lighted whan a credit switch is closed. It indicates, when lighted, that a selection can be made.

The Letter and Number selector switch assemblies are identical and interchangeable. They each incorporate a latch bar and ten selection switches for connecting the current supply to the desired selection circuits. The latch bar function is to hold a selection switch (and selector key) in the pressed-in position when a selection is being made and to release it when the selection sequence is completed. The bars in both switch assemblies are controlled through levers, by the latch bar solenoid.

The linkage between the latch bar solenoid and the latch bars is spring biased so the bars are in a position that permits free in-and-out movement of the selection switches when the solenoid is not energized. When the solenoid is energized, the bars move to a position in which they will hold a pressed-in switch. The solenoid is energized when a credit switch in the Credit Unit is closed.

The shafts or stems of the selector switches extend through the switch frame. They operate a treadle bar when a selector key is pressed and the treadle bar, in turn, operates a switch group consisting of a spring-leaf switch and a snap-action, over-center switch. One of the two

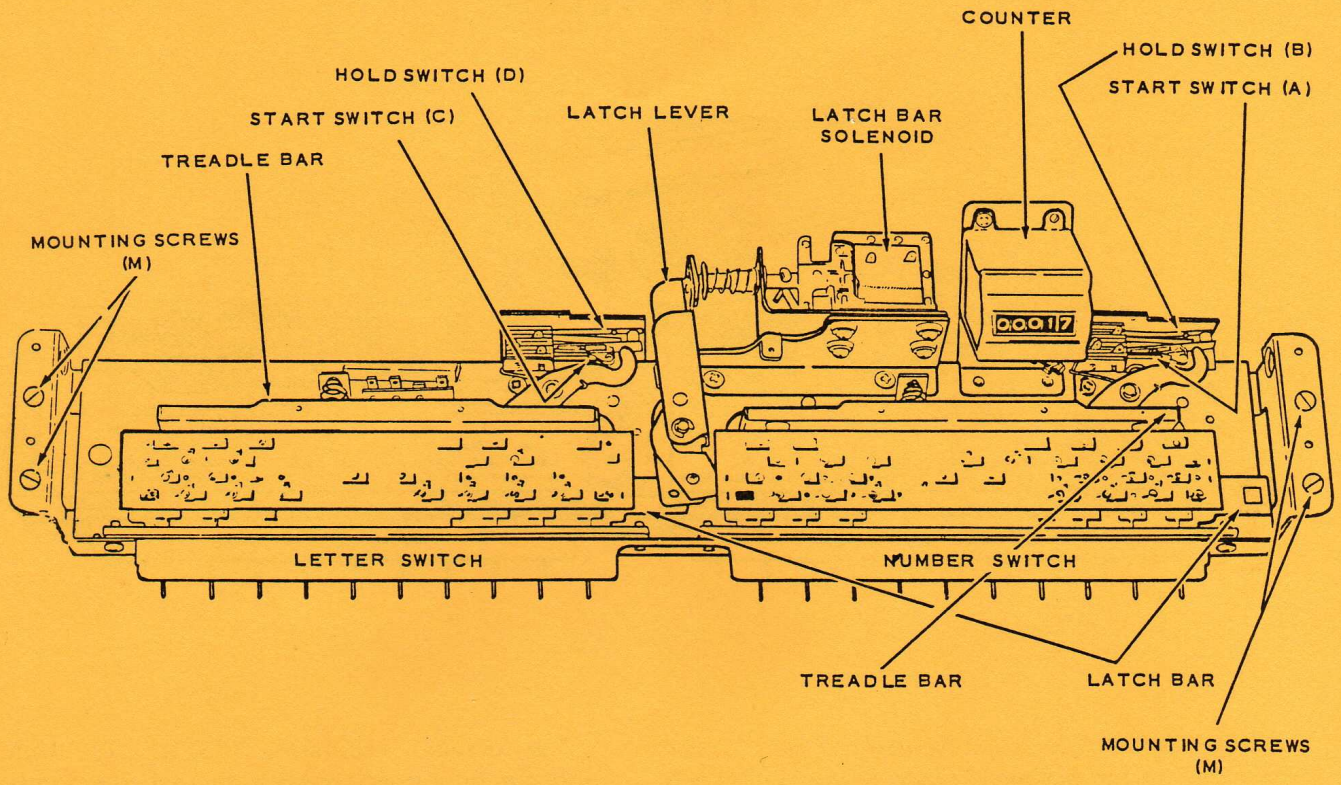


Figure 2.

switch groups is associated with the numbered switches and operates when any numbered selector key is pressed. The other operates when any lettered key is pressed.

The two spring-leaf switches in the two switch groups are parallel connected and are part of a timing relay holding circuit that is completed through interlocking contacts on the relay when any one of the thirty selector keys is pressed. These switches are the Hold Switches, contacts B and D.

The snap-action switches are the Starting Switches, contacts A and C. They are series connected and, together, are part of a circuit that includes a Cancel or Subtract Solenoid in the Credit Unit. When a letter key and a number key are pressed, the starting switches complete the circuit to the solenoid which, when energized, closes switch contacts that control the power to the Tormat Memory Unit, the selection counter and the timing relay. They also close, momentarily, the circuit for a play control add solenoid that, in turn, controls, through a play control switch, the power to the phonograph amplifier and the mechanism motor.

REMOVAL OF SELECTOR

All adjustments of the mechanical linkage, all switch adjustments and all circuits of the Selector are accessible for inspection and service without removing it from the cabinet. The entire unit may, however, be removed by pulling out the two connecting plugs at the end of the cable and taking out three screws that are at the back edge of the selector frame. These screws are identified at (M) in *Figure 2.*

When replacing the Selector in the cabinet it should be fastened securely with the mounting screws. It should be positioned so there is a little clearance between the ends of the selection switch shafts and the back of the selector keys. If it is too far toward the keys the selection switches may not return far enough to the released position to open the timing relay circuit.

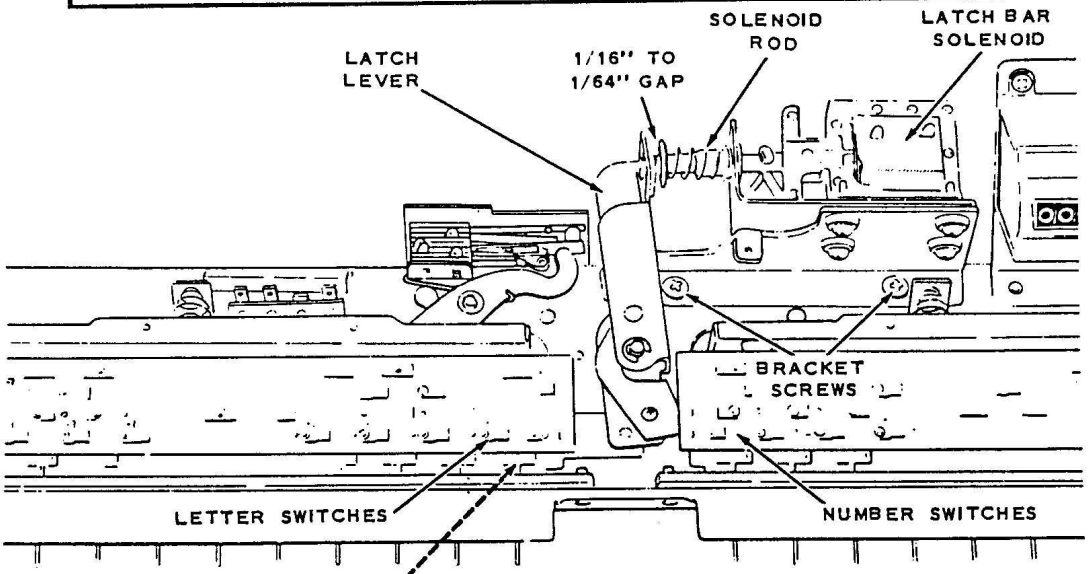
LUBRICATION

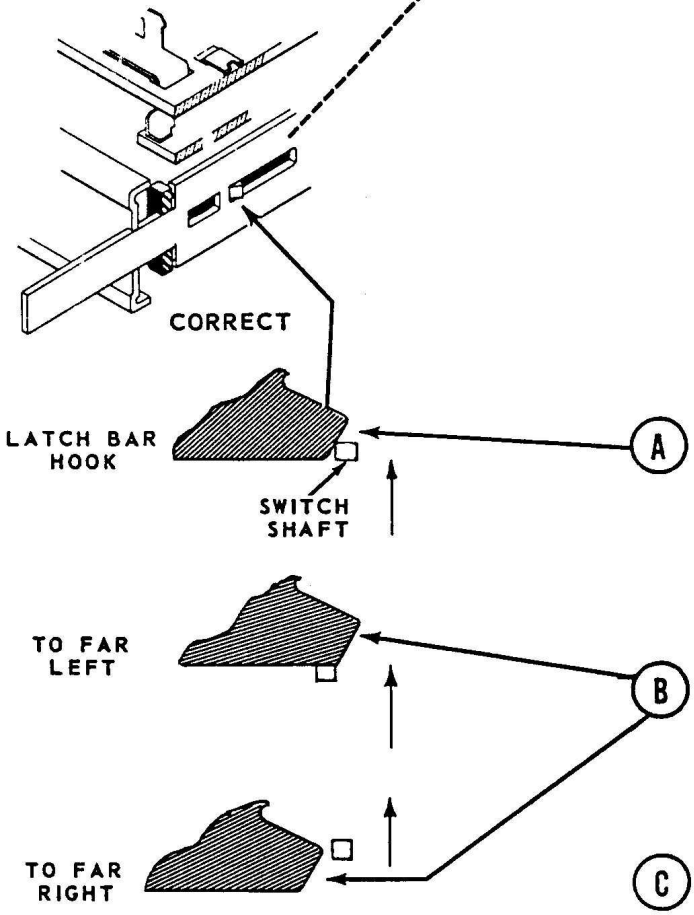
Oil all pivots with one drop of Seeburg No. 53014 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly at the ends of the latch bars and at the point of contact of the latch bar solenoid plunger with the latch lever. *(Aero Lubriplate and No. 53014 Oil is available from your Seeburg Distributor.)*

TORMAT ELECTRICAL SELECTOR, TYPE TES101

ADJUSTMENT NO. 1 – LETTER SWITCH

This adjustment positions the latch bar in the LETTER selector switch so that when credits are established, the selector switches will latch in the pressed-in position but permit change of selection by operating another switch.





NOTE: When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a 1/64" to 1/16" gap between the latch lever and the solenoid rod.

(A) Loosen the two bracket screws holding the Latch Bar Solenoid Bracket and position the Solenoid so the shaft of a letter selector switch, when pressed in will engage the latch bar at the mid-point of the sloping edge of the latch bar hook.

(B) If the Latch Bar Solenoid is too far to the right, the selector keys will be locked. If the Solenoid is too far to the left, the selector keys will not latch or the latching will be erratic.

(C) After the correct position of the Latch Bar Solenoid has been made, the bracket holding screws must be securely tightened.

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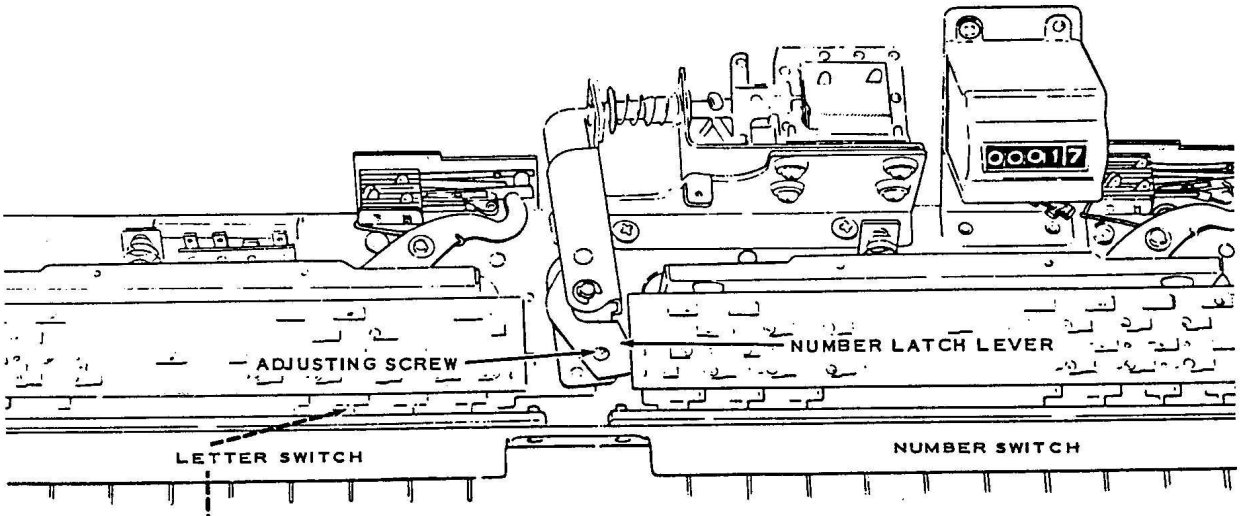
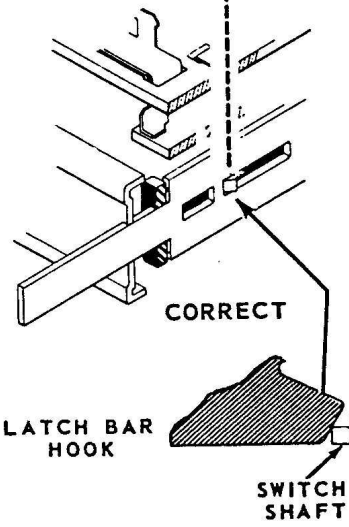
TORMAT ELECTRICAL SELECTOR, TYPE TES101

ADJUSTMENT NO. 2 – NUMBER SWITCH

This adjustment positions the latch bar of the NUMBER SWITCH so the selector switches will operate in the same manner provided for the lettered switches in Adjustment No. 1.

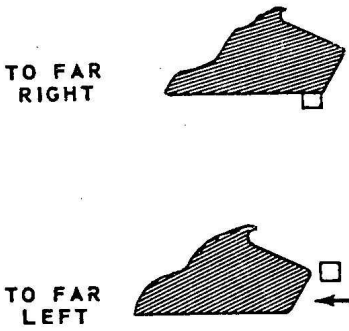


NOTE: Before making this adjustment, the Letter Switch adjustment must be correct, the latch bar solenoid must be in the energized position, the latch bars must be free to move without binding and there should be 1/64" to 1/16" gap between the latch lever and the solenoid rod.



(A) Loosen the screw in the latch lever that is between the Number and Letter Switches and, holding the latch bar at the right of the Number Switch, position it so the lettered switch shafts (L to V), when pressed in, engage the latch bar at the mid-point of the latch bar hook.

(B) Move the Number Latch Lever against the latch bar and securely tighten the adjusting screw.

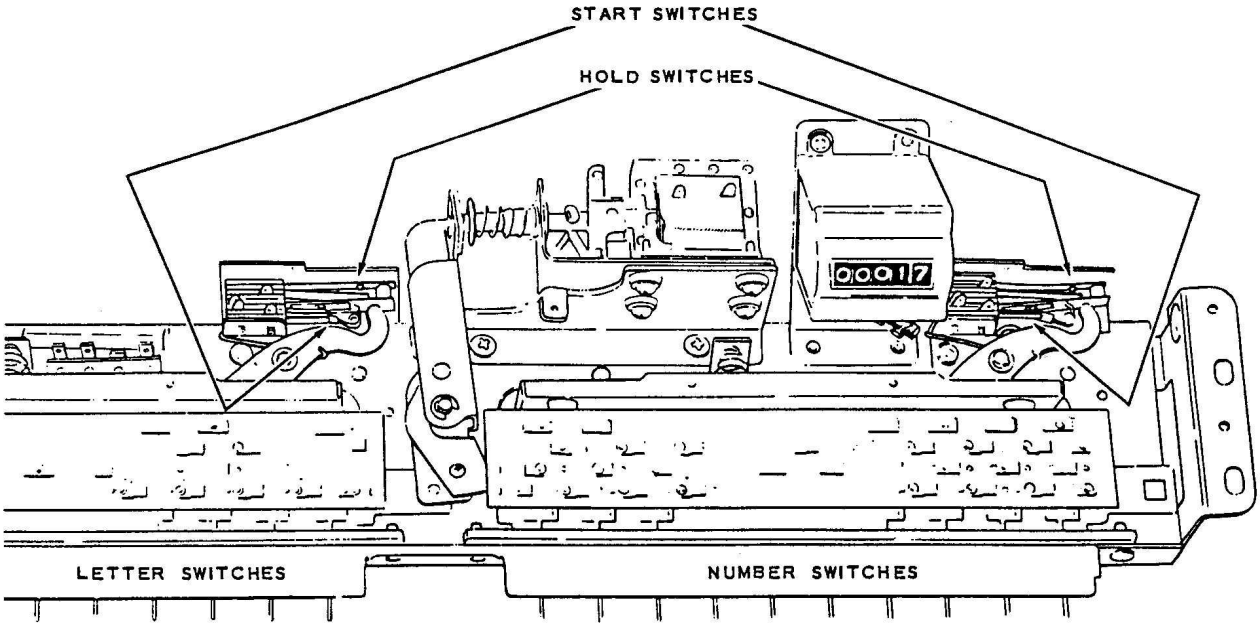


(C) Check this adjustment by pressing a number and letter selector switch while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. The lettered and the numbered switches should release at the same time. If the number latch lever is too far to the right, the number switch will release before the lettered switch; if the number latch lever is too far to the left, the number switch will release after the letter switch.

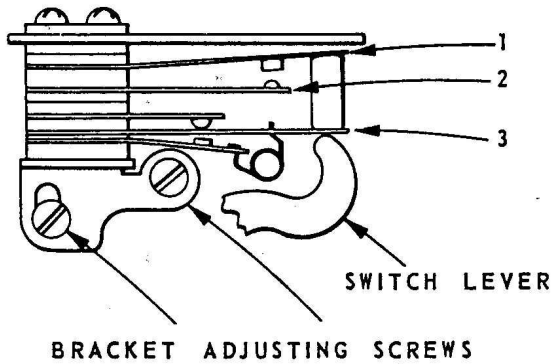
ELECTRICAL SELECTOR, TYPE TES101

HOLD SWITCH AND START SWITCH ADJUSTMENT

The Hold Switches are open 1/32" in the at-rest position and close when an associated selection switch shaft is pressed in.
The Starting Switches are open in the at-rest position and close when an associated letter or number switch is pressed to almost the fully operated position.



NOTE: Before making switch adjustments, each treadle bar and lock plate should be checked for free and smooth operation. There should be some end-play on both. The treadle bars, when slowly released by the selection switches, should have complete return to the at-rest position with their rubber bumpers against the selector switch frames.



The timing of operation of the snap action Start Switches is adjusted by positioning the brackets for the entire switch assembly. DO NOT ADJUST BY BENDING THE SNAP ACTION SWITCH BLADES.

A. Loosen the bracket holding screws and position the switches so the Start Switch contacts close when the selector switches have approximately 1/16" more travel before latching by latch bars.

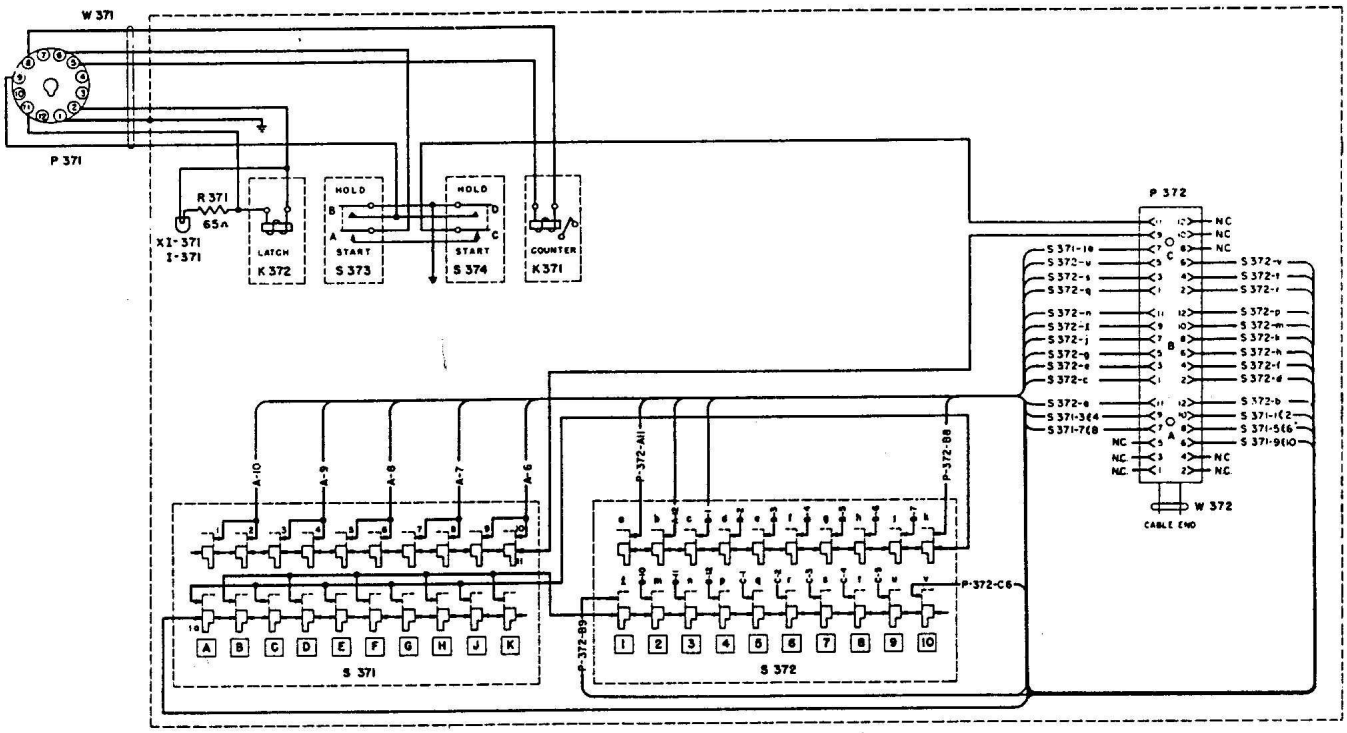
With all selector switches released and the treadle bar bumpers against the selector switches –

B. Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).

C. Adjust Blade No. 2 for 1/32" contact gap.

D. Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness (1/64") when contacts close.

E. Check operation: Hold Switch must close before Start Switch closes and open after Start Switch opens.



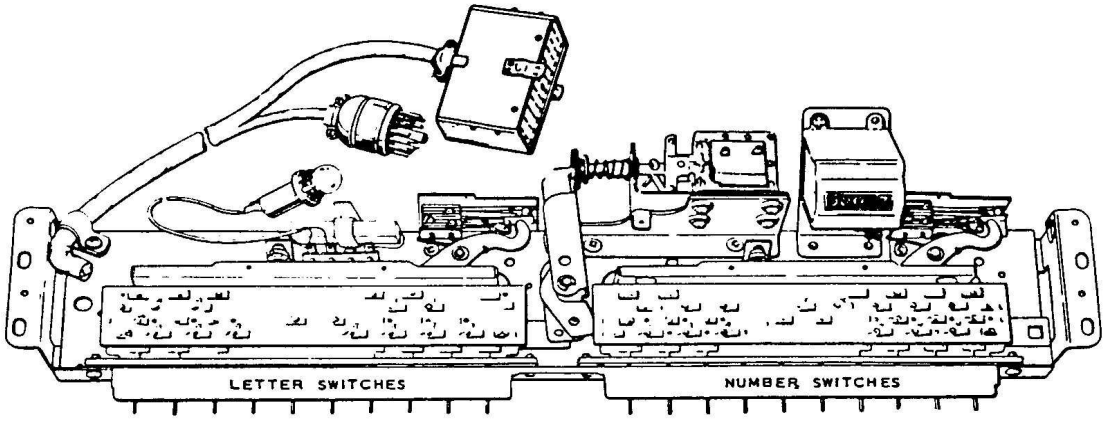
Schematic Diagram

PARTS LIST

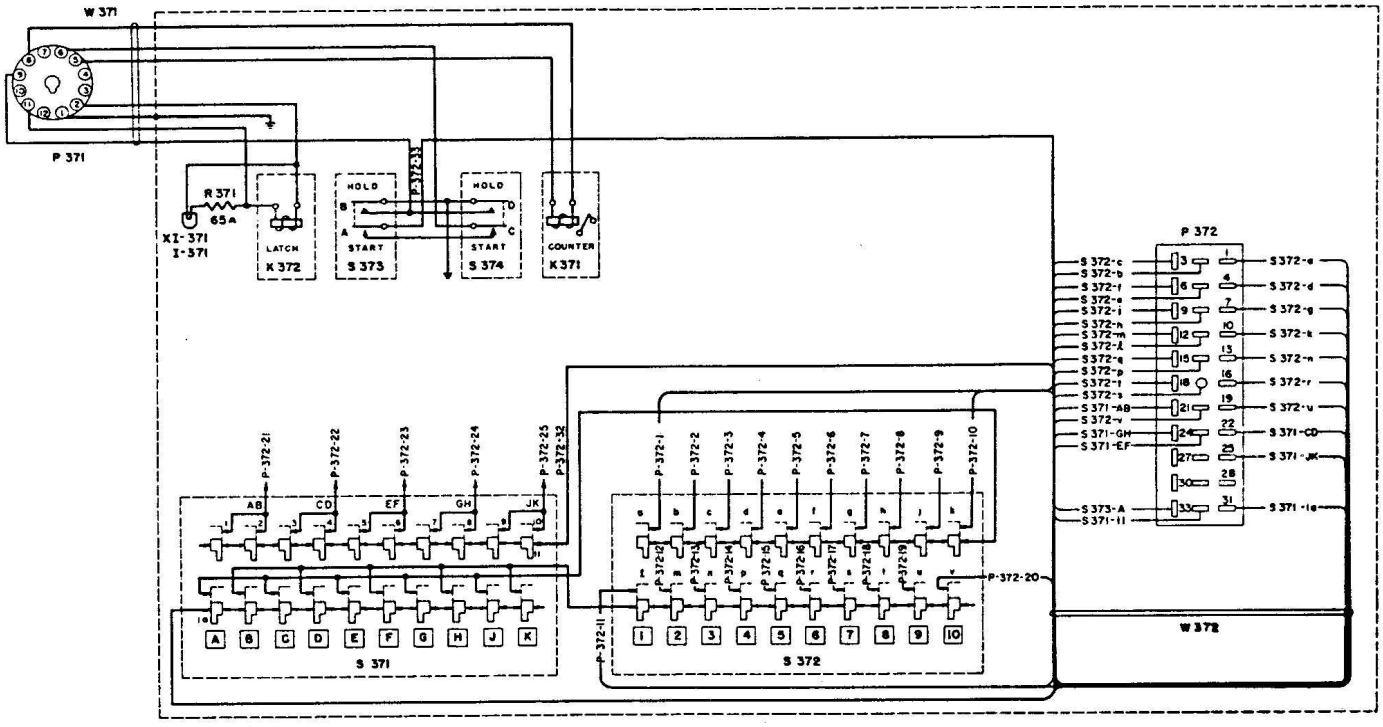
Item	Part No.	Part Name
XI-371	410823	Lamp Socket Assembly
I-371	505173	Lamp No. 55
J 371	410836	Connector Board
K 371	410903	Counter
K 372	410821	Solenoid (Latch)
P 371	410707	Plug Assembly (12 Prong)
P 372	604094	Socket Assembly
R 371	81178	Resistor Wire Wound 65 Ohms
S 371	410806	Selector Switch Assembly
S 372	410806	Selector Switch Assembly
S 373	410818	Leaf Switch Assembly
S 374	410818	Leaf Switch Assembly
W 371	410824	Plug & Cable Assembly
W 372	410844	Plug & Cable Assembly

SEEBURG

TORMAT ELECTRICAL SELECTOR
TYPE TES102



The Tormat Electrical Selector, Type TES102, is the same as the Type TES101 except that a 33-prong plug is used for selection circuit connections. All service data beginning on Page 3107 applying to the Type TES101 applies to the Type TES102 except the symbols on the diagram. The diagram for the Type TES102 is given below.



Schematic Diagram

PARTS LIST

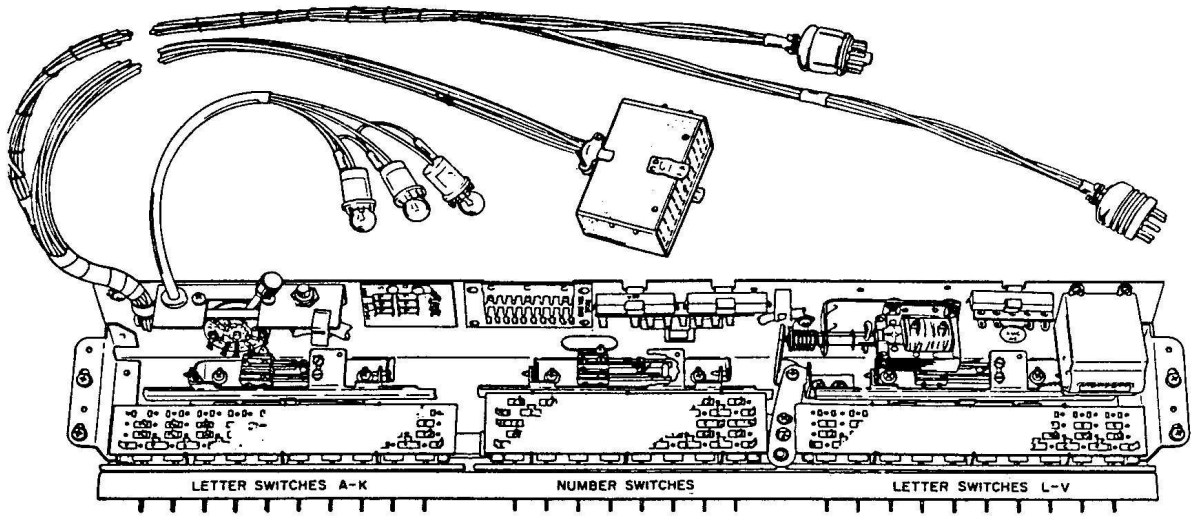
Item	Part No.	Part Name
XI 371	410823	LAMP SOCKET ASSEMBLY
I 371	505173	LAMP NO. 55
K 371	411082	COUNTER
K 372	410821	SOLENOID (LATCH)
P 371	410708	PLUG ASSEMBLY (12 PRONG)
P 372	410573	SOCKET ASSEMBLY
R 371	81178	RESISTOR WIRE WOUND 65 OHMS

Item	Part No.	Part Name
S 371	410806	SELECTOR SWITCH ASSEMBLY
S 372	410806	SELECTOR SWITCH ASSEMBLY
S 373	410818	LEAF SWITCH ASSEMBLY
S 374	410818	LEAF SWITCH ASSEMBLY
W 371	410862	PLUG & CABLE ASSEMBLY (CONTROL)
W 372	410864	PLUG & CABLE ASSEMBLY (MATRIX)

SEEBURG

TORMAT ELECTRICAL SELECTOR

TYPE TES161 and TES221



The Tormat Electrical Selectors, Types TES161 and TES221, are part of the Seeburg Tormat Selection System and Credit System which includes the Tormat Memory Unit on the Select-O-Matic Mechanism and the Tormat Selection Receiver. They are designed for use with the Select-O-Matic Models 161 and 201 respectively. The two types differ only in their Number Selection Switches and the connections made to terminals in the 33-contact plugs with which selection circuits are connected to the complete selection system. All adjustments and service data on the following pages applies to both types.

The principal functions of the Selector is to connect a letter and a number circuit of the Tormat Memory Unit into a selection write-in circuit and to complete a circuit that initiates the operational sequence of the system. These functions are performed when two of the selection switches are operated by pressing a lettered selector key and a numbered key.

The component parts of the Selector are assembled on a steel frame and are protected by a steel cover. All electrical connections to the associated Tormat Memory Unit and to the Selection Receiver are made with a 12-contact plug, a 7-contact plug, and a 33-contact plug that connect to sockets in the units with which it is associated.

The principal component parts of the Selector include the service switch, three selection switch assemblies, a latch bar operating solenoid, three credit indicating lights, a selection pricing terminal board, a pricing unit board and three switch groups each of which has two pairs of contacts. There is also a counter which totals the number of selections made with remote control Wall-O-Matics as well as those made with the Electrical Selector.

The credit indicating lights are extended on their connecting leads so they illuminate the selection and credit information windows that are in the cabinet frame casting at the right of the selector key panel. They are 6-volt lamps operated at 25 volts through resistors and connect to an add and subtract credit switch that is part of the Selection Pricing Unit in the phonograph. A different light is turned on to indicate when selections can be made in accordance with the selections pricing unit being used.

The three selection switches in the Type TES221 Selector each incorporate a latch bar and ten selector switches. These switch assemblies are not interchangeable. The two associated with the lettered keys and circuits are identical in contact arrangement and dimensions but their latch bars are not the same. The switch assembly associated with the numbered keys and circuits differs from the

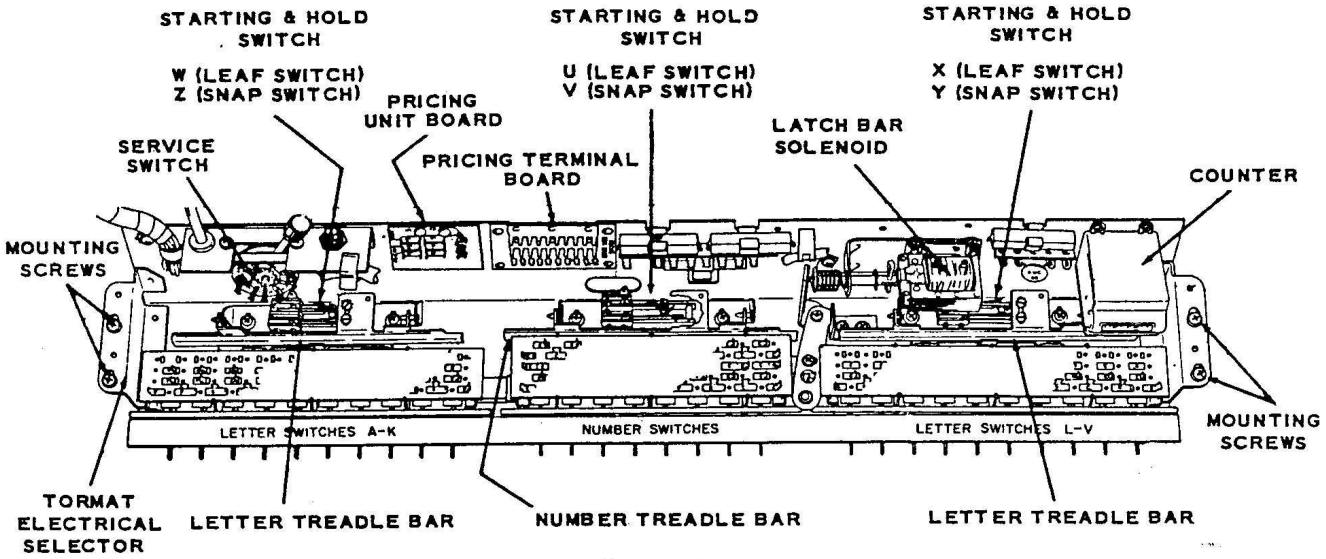


Figure 2.

"letter switches" in that it includes contacts and circuits for starting the operation sequence as well as control of circuits of the Tormat Memory Unit.

The A-K and L-V Letter Selection Switches in the Type TES161 are, respectively, the same as the A-K and L-V used in the Type TES221. The Number Selection Switch in the Type TES161 has eight individual selector switches instead of ten as in the Type TES221.

The latch bar function is to hold a selection switch (and selector key) in the pressed-in position when a selection is being made and to release it when the selection operation sequence is completed. The bars in the two letter switch assemblies are coupled end-to-end so they operate as a single continuous bar. The latch bar of the number switch is independent of the letter switches but the bars in both letter and number switches are linked to and controlled by the latch bar solenoid. The linkage between the solenoid and the bars is spring biased so the bar position permits free in and out movement of the selection switches when the solenoid is not energized. When the solenoid is energized, the bars move to a position in which they will hold a pressed-in switch in the operated position however, the bars are designed so a latched-in switch will be released if another switch in same number or letter switch group is pressed in. The solenoid is energized when credits are set up in the phonograph Pricing Unit.

The shafts or stems of the selector switches extend through the switch frame. They operate a treadle bar when a selector key is pressed and the treadle bar, in turn, operates a switch group consisting of a spring-leaf switch and a snap-action, over-center switch. One of the three switch groups is associated with each of the three selection switches and operates when a selector key is pressed. The three spring-leaf switches in the two switch groups are parallel connected and are part of a timing relay holding circuit that is completed through interlocking contacts on the relay when any one of the selector keys is pressed. These switches are the Hold Switches, contacts U, X and W.

The snap-action switches are the Starting Switches, contacts V, Y and Z. The Y and Z contacts are operated by the Letter Selection switches and are parallel connected so one or the other closes whenever a Letter selector key is pressed. The Z contact is closed by pressing any Number selector key and is in series with the parallel-connected Y and Z contacts. These contacts are part of a circuit that includes a Subtract Solenoid in a Dual Pricing Unit or, with a Single Pricing Unit, a Cancel Solenoid. When a letter key and a number key are pressed, the starting switches complete the circuit to the solenoid which, when energized, closes switch contacts that control the power to the Tormat Memory Unit, the selection counter and the timing relay. They also close, momentarily, the circuit for a play control add solenoid that, in turn, controls, through a play control unit, the power to the phonograph amplifier and the mechanism motor.

The pricing terminal board consists of two

ten-point terminal strips and ten flexible leads. One end of each of the leads connects to the start switches through one of the ten numbered selector switches and has at its other end a push-on terminal for easy and simple connection to either of the two terminal strips marked "EP" and "Singles". By choice of terminal strip connection any group of twenty record selections can be "sold" for either two prices when a Dual Pricing Unit is in use. If a Single Pricing Unit is being used, the leads are connected to the "Singles" strip.

The credit light and "starting" circuits of the selection system are not the same for Dual and Single Pricing Units. These circuits are terminated at the pricing unit board and are connected to suit the Pricing Unit with which the phonograph is equipped.

REMOVAL OF SELECTOR

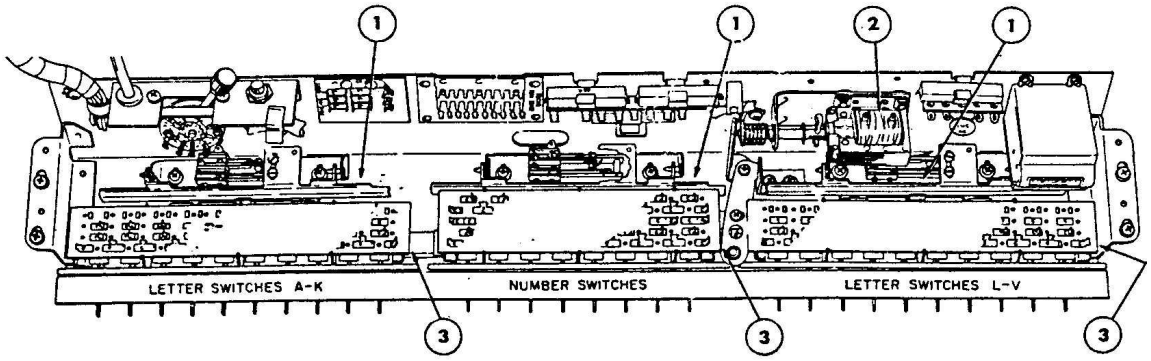
All adjustments of the mechanical linkage except Adjustment No. 2, all switch adjustments and all circuits of the Selector are accessible for inspection and service without removing it from the cabinet. The entire unit may, be removed for any service and for Adjustment No. 2 by pulling out the connecting plugs at the ends of the cable and taking out the screws that are back of the selector key panel at each end of the Selector frame.

When replacing the Selector in the cabinet it should be fastened securely with the mounting screws. It should be positioned so there is a minimum of clearance between the ends of the selection switch shafts and the back of the selector keys. If, however, it is too far toward the keys the selection switches may not return far enough to the released position to open the timing relay circuit that is operated by the Hold Switches. If it is too far from the keys, the keys will be loose and may settle.

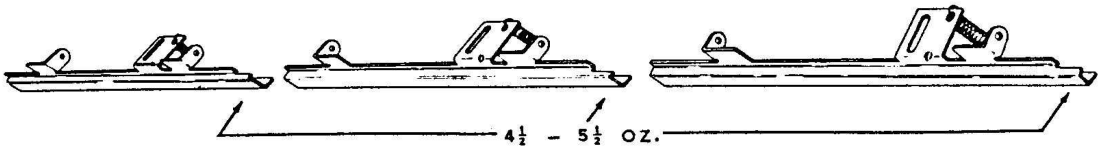
LUBRICATION

Oil all pivots with one drop of Seeburg No. 53014 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly on the surfaces of the latch levers where they bear on solenoid plunger and the latch bars. *(Aero Lubriplate and No. 53014 Oil is available from your Seeburg Distributor.)*

SPRING ADJUSTMENTS

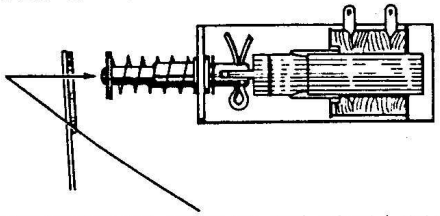


(1) TREADLE BAR SPRINGS



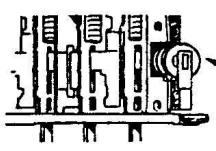
FORCE TO MOVE TREADLE BARS FROM NORMAL REST POSITION(AGAINST RUBBER STOPS).

(2) LATCH RELEASE LEVER SPRING



RESTRAIN MOVEMENT OF NUMBER RELEASE LEVER – FORCE TO START MOVEMENT OF SOLENOID ARMATURE IS THEN 5 TO 7 OZ.

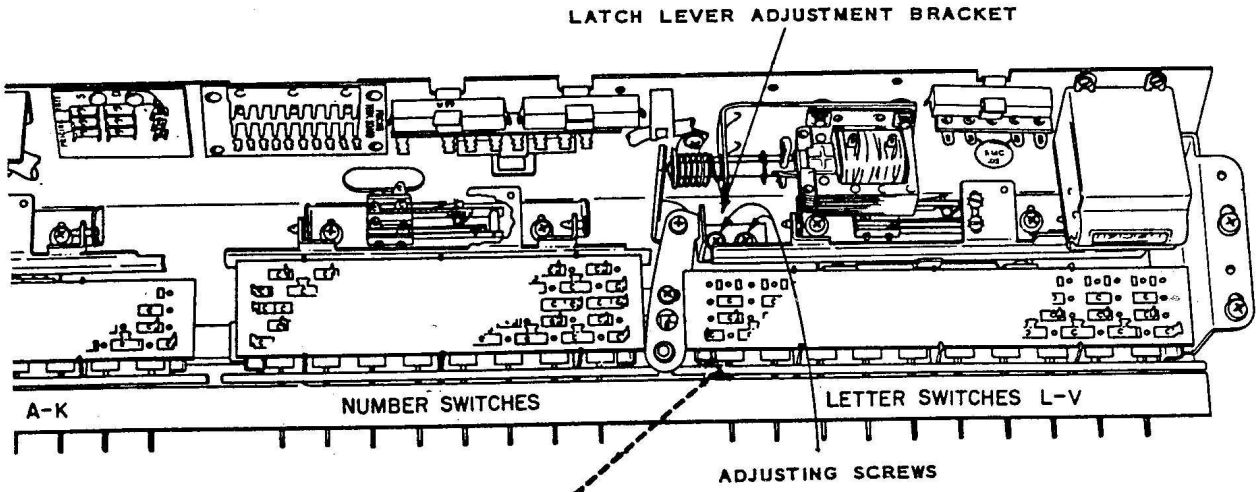
(3) LATCH BAR SPRING

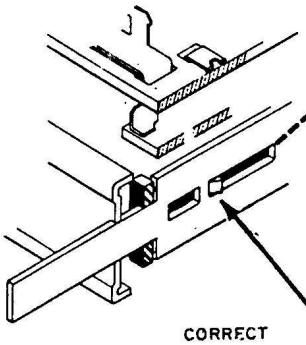


6 TO 7 OUNCES HERE TO START MOVEMENT.

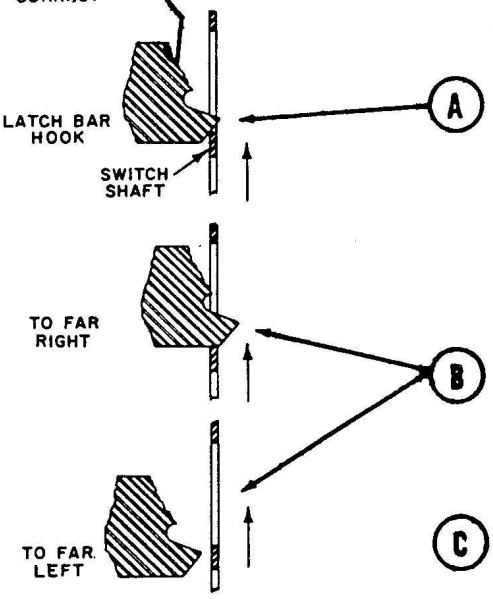
ADJUSTMENT NO. 1 – LETTER SWITCH L-V

This adjustment positions the latch bar in the L-V LETTER selector switch so that when credits are established, the selector switches will latch in the pressed-in position but permit change of selection by operating another switch in the L-V group.





NOTE: When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a gap between the latch release lever and the end of the latch bar solenoid plunger rod.



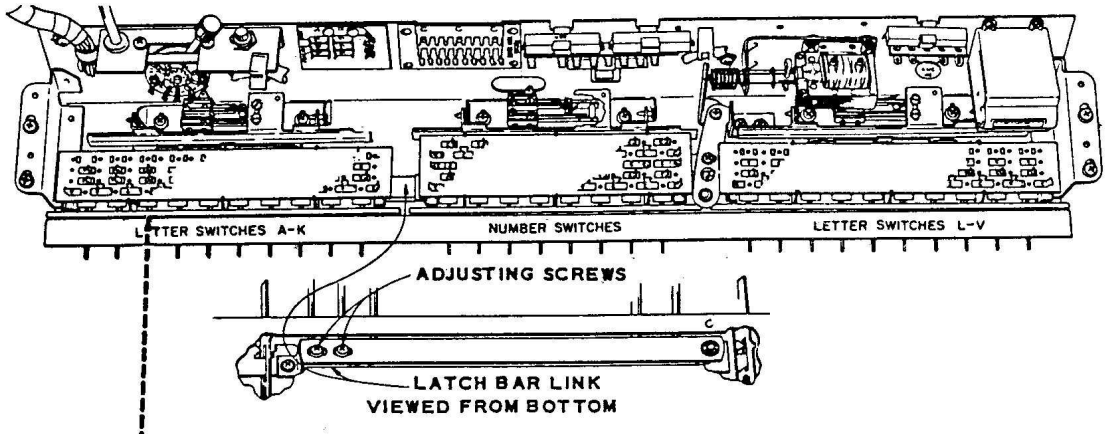
A Loosen the two screws holding the latch lever adjustment bracket and position the bracket so the tips of the latch bar hooks extend 1/64" through the openings in the selector switch shafts. The bars and shafts may be seen through openings in the bottom of the Selector frame.

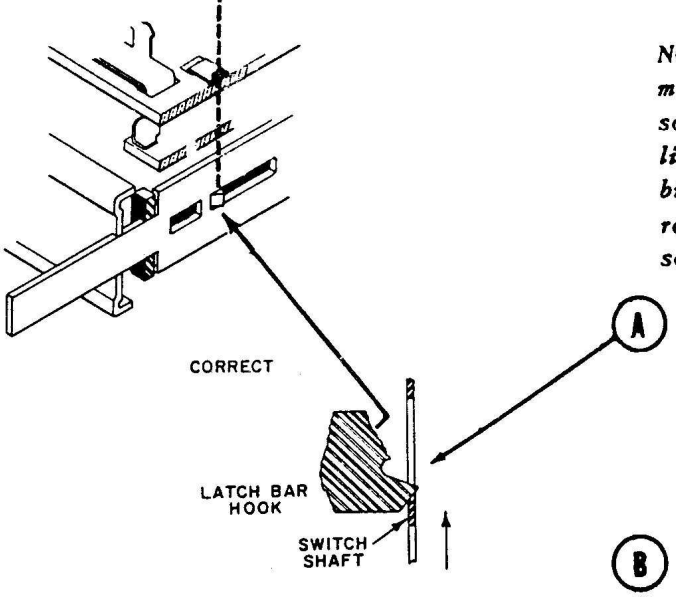
B If the bracket is too far to the right, the selector keys will be locked out. If the bracket is too far to the left, the selector keys will not latch or the latching will be erratic.

C After the correct position of the bracket has been made, the bracket holding screws must be securely tightened.

ADJUSTMENT NO. 2 – LETTER SWITCH A-K

This adjustment positions the latch bar of the A-K LETTER SWITCH so these lettered selector switches will operate in the same manner provided for the L-V LETTER SWITCH in Adjustment No. 1. The adjusting link is accessible through a hole in the bottom of the Selector frame.





NOTE: Before making this adjustment, Adjustment No. 1 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a gap between the release lever and the end of the latch bar solenoid plunger rod.

(A) Loosen the screw in the latch bar link between the A-K and the L-V letter switches and position the A-K switch latch bar so the tips of the latch bar locks extend 1/64" through the openings in the selector switch shafts.

(B) Securely tighten the adjusting screw.

(C) Check this adjustment by pressing a lettered switch in the A to K group and one in the L to V group while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. Both lettered switches should release at the same time. If the A-K latch bar is too far to the lift, the switch in the A-K group will release first; if the A-K latch bar is too far to the right, the switch in the L-V group will release first.

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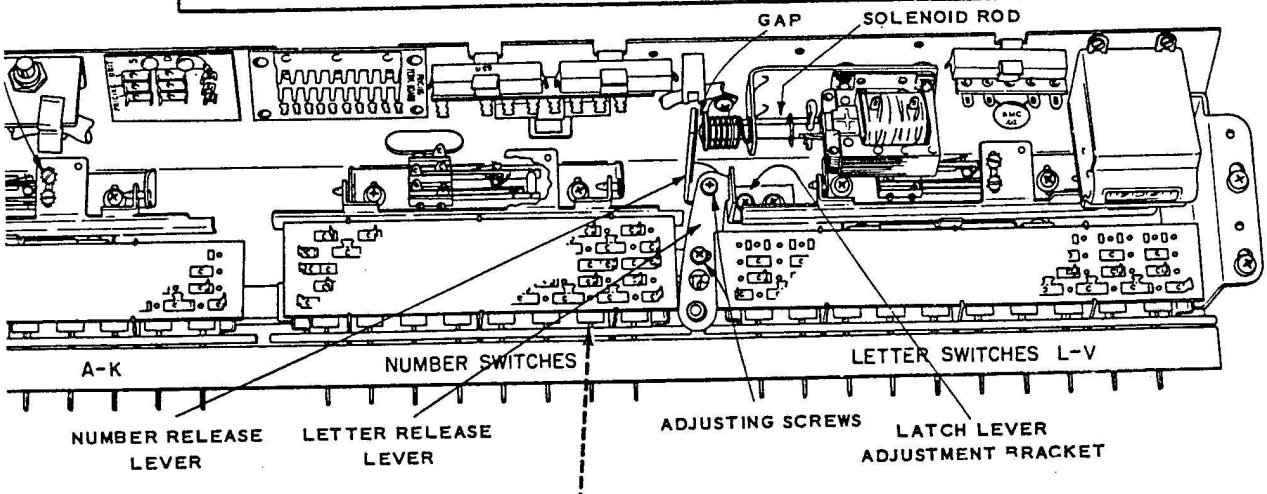
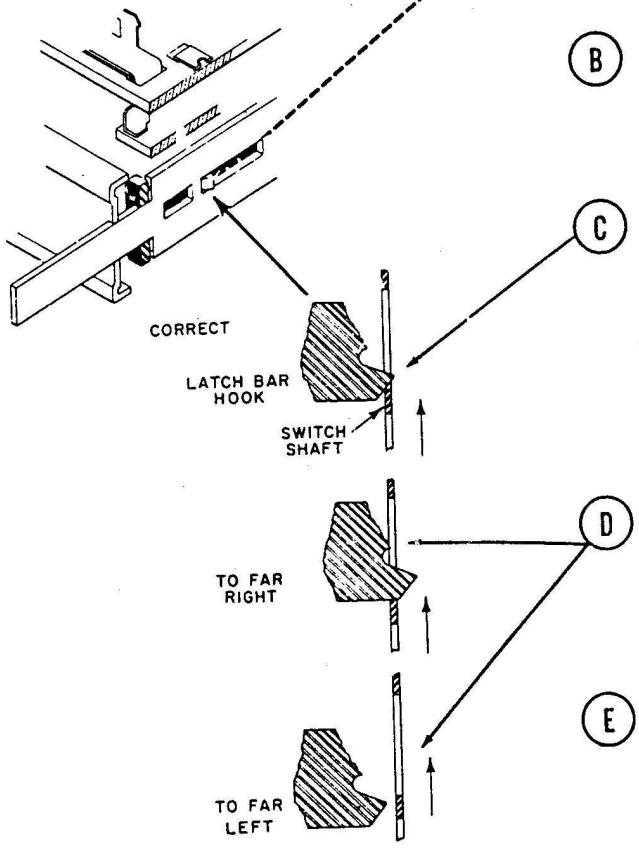
ADJUSTMENT NO. 3 – NUMBER SWITCH

This adjustment positions the latch bar in the NUMBER selector switch so that when credits are established, the numbered selector switches will latch in the pressed-in position but permit change of selection by operating another numbered switch.



NOTE: When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and adjustments No. 1 and No. 2 must be correct.



(A) The two screws that hold the number latch lever to the letter latch lever should be loosened just enough to permit the levers to be shifted.

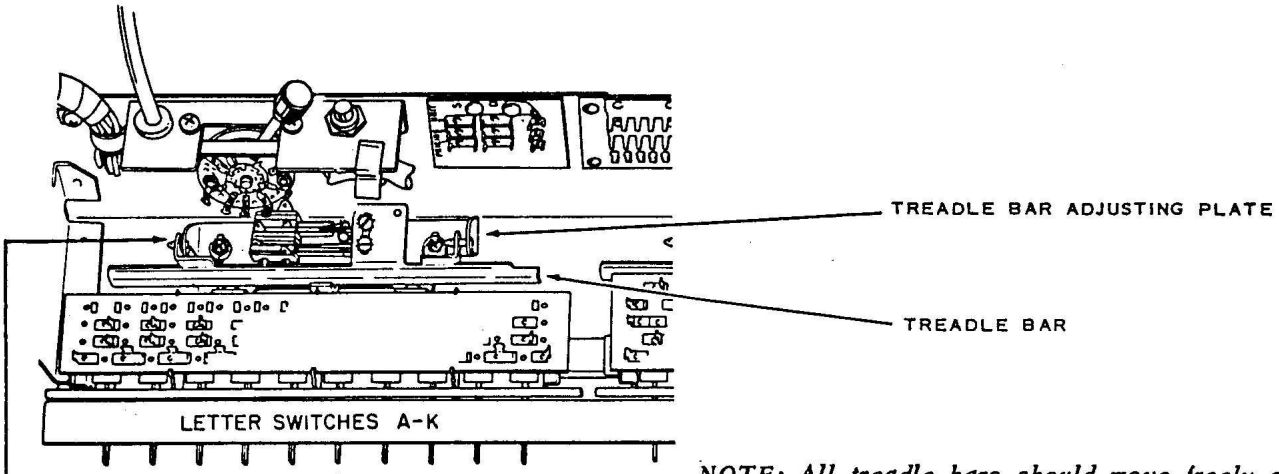
(B) Insert and hold in place a shim 1/64" to 1/16" thick (a single thickness of match book cover) between the letter latch lever and the tip of the latch bar solenoid rod.

(C) While holding the letter latch lever against the latch lever adjustment bracket and the number latch lever against the shim and the solenoid rod, position the number latch lever so the tips of the latch bar hooks of the NUMBER selector switches extend 1/64" through the openings in the selector switch shafts.

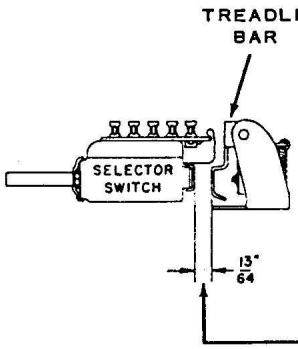
(D) If the forward end of the number latch lever is too far to the right, the selector keys will be locked out. If the lever is too far to the left, the selector keys will not latch or the latching will be erratic.

(E) When the correct position for the latch lever has been established, the two screws that hold the letter and number levers together should be securely tightened and the shim removed.

TREADLE BAR AND SWITCH ADJUSTMENTS

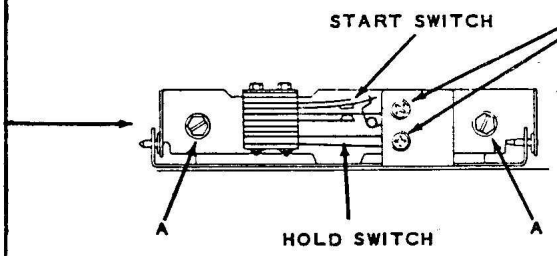


NOTE: All treadle bars should move freely on their pivots to rest against the rubber bumpers and should have a small amount of end play.



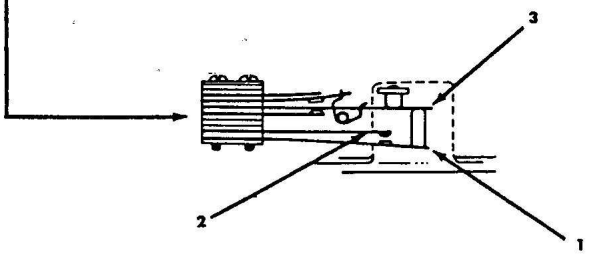
(A) With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate (Screws A) so there is 13/64" (.203") separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (.204") or No. 7 (.201") or a 13/64" twist drill for a spacing gage.

The timing of operation of the snap action Start Switches is adjusted by positioning the brackets for the entire switch assembly. DO NOT ADJUST BY BENDING THE SNAP ACTION SWITCH BLADES.



(B) Loosen the bracket holding screws, B, and position the switches so the Start Switch contacts close when the selector switches have approximately 1/32" more travel before latching by latch bars.

With all selector switches released:



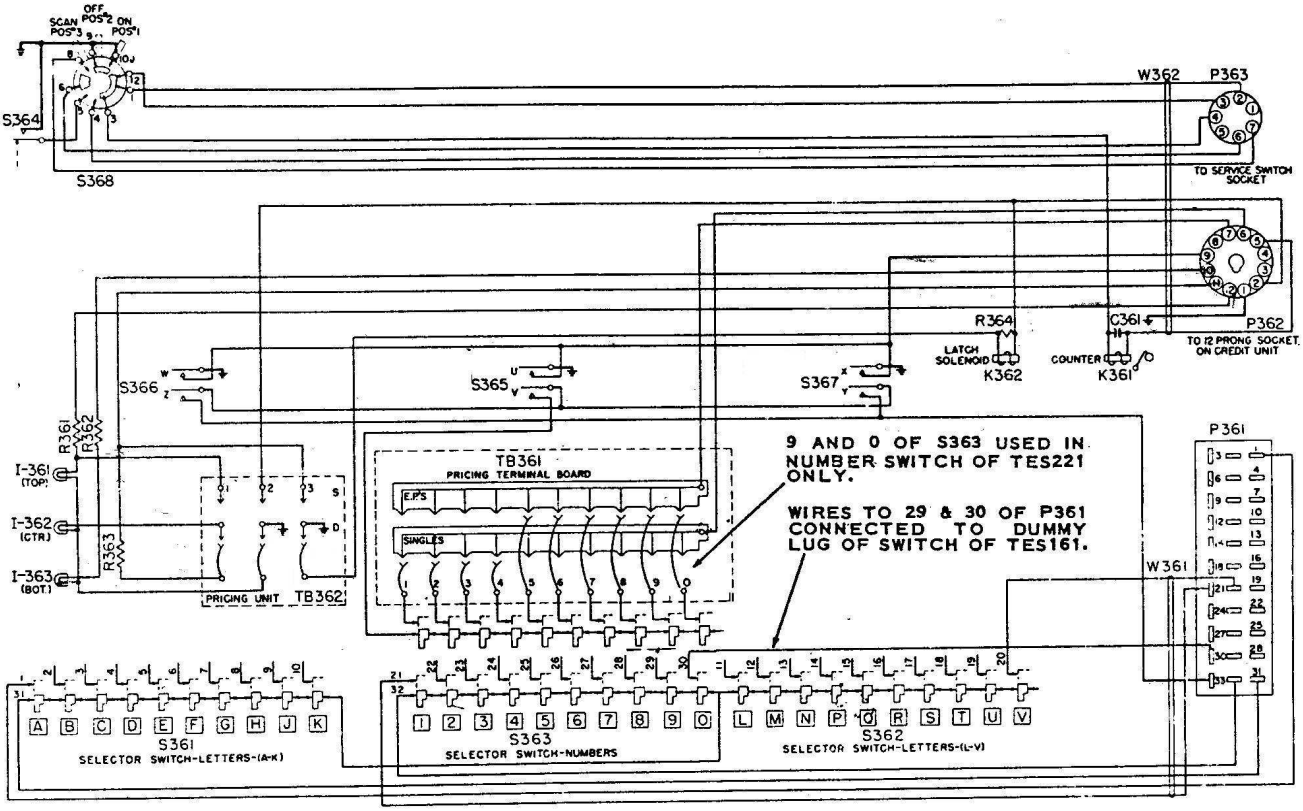
(C) Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).

(D) Adjust Blade No. 2 for 1/64" to 1/32" contact gap.

(E) Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness (1/64") when contacts close.

(F) Check operation: Hold Switch must close before Start Switch closes and open after Start Switch opens.

TORMAT ELECTRICAL SELECTOR, TYPE TES161 and TES221



Schematic Diagram

PARTS LIST

Item	Part No.	Part Name
C361	86259	.02 Ceramic Condenser
I361	410823	Credit Lamp Socket Assembly
I362	410823	Credit Lamp Socket Assembly
I363	410823	Credit Lamp Socket Assembly
	505173	Panel Lamp No. 55
K361	411082	Counter Assembly
K362	410684	Latch Solenoid
P361	410573	Socket Assembly
P362	410708	Plug, 12 Prong
P363	408258	Plug, 7 Prong
R361	81178	Resistor 65 Ohm 10 W.
R362	81178	Resistor 65 Ohm 10 W.
R363	81178	Resistor 65 Ohm 10 W.
R364	81183	Resistor 100 Ohm 10 W.

Item	Part No.	Part Name
S361	411066	Selector Switch (A-K)
S362	411067	Selector Switch (L-V)
S363	411155	Selector Switch (Number) (TES221)
S363	411068	Selector Switch (Number) (TES161)
S364	410486	Credit Switch
S365	411073	Snap Switch
S366	411073	Snap Switch
S367	411073	Snap Switch
S368	411136	Service Switch
T361	411134	Pricing Term. Bd. Assembly
TB362	410938	Pricing Unit Term. Board Assembly
W361	411099	Matrix Cable
W362	411101	Control Cable

SEEBURG

HIGH FIDELITY MASTER AMPLIFIER, Type HFMA2

The High Fidelity Master Amplifier, Type HFMA2 is a low distortion, wide frequency range, constant voltage type. It has a transistor preamplifier stage followed by seven tubes, two of which are 6L6's in a push-pull output stage to supply 25 watts of audio power for operation of the Select-O-Matic speaker and remote speakers.

The output of the low impedance magnetic pickup of the Select-O-Matic mechanism is connected through a single-contact socket to the transistor preamplifier, a 2N109. The 2N109 is followed by a 12AX7(V101) dual triode. The first section (A) of the 12AX7 provides additional amplification, the second section (B) is used as an AVC amplifier. A Treble Range control circuit utilizes the first section (A) of another 12AX7(V103) as an amplifier. Section (B) of this 12AX7 is a cathode follower for low impedance input to bass and volume control circuits. The output from the volume control is amplified by the first section (A) of a third 12AX7(V104), the second (B), section of which is a phase inverter that drives the 6L6 output tubes.

An automatic volume compensator is incorporated in this amplifier. It compensates for the variation in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. A 6BJ6 is used as a compensation control. Use of AVC is optional and may be suspended by removal of the 6BJ6 tube.

A selenium rectifier, CR101 serves a dual purpose. It rectifies the output of the AVC amplifier (V101, Section B) for variable grid bias for the 6BJ6 control tube. It also rectifies 25 volts supplied from the control circuits of the Select-O-Matic Mechanism for squelch operation. The squelch voltage from the mechanism is applied only when a record is not being played.

Use is made of inverse feedback to obtain output regulation necessary for constant voltage operation and to insure a minimum of distortion and hum. The inverse feedback is supplied from a secondary of the output transformer to the cathode circuit of the amplifier section of the 12AX7 (V104).

The output transformer has two secondaries. One of these is for the Select-O-Matic speakers and is tapped for switch control of the power to the speakers. The other is for remote speakers and has taps to a terminal strip to accommodate High Fidelity Remote Speakers.

The terminal strip shown in *Figure 3* provides connections for high impedance remote speakers.

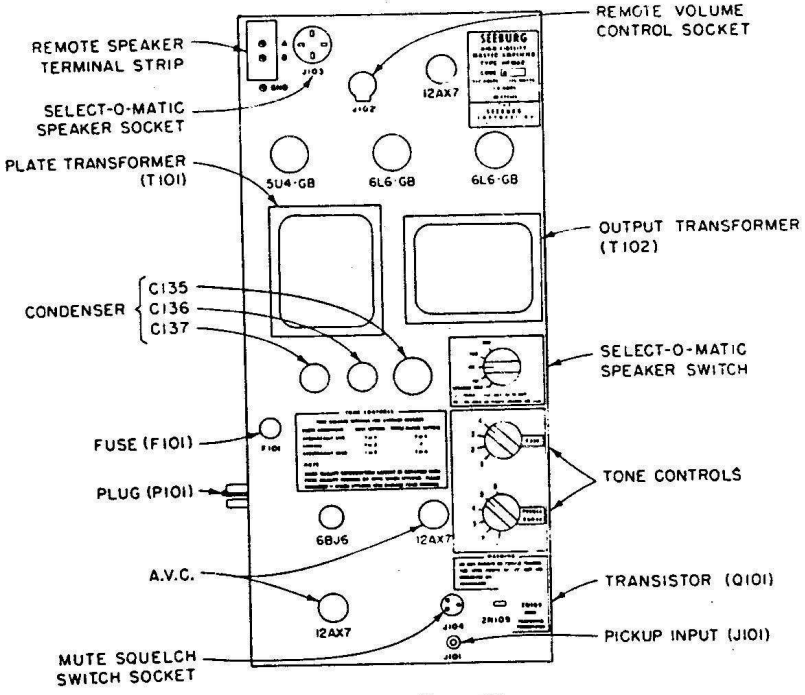


Figure 1. Top View

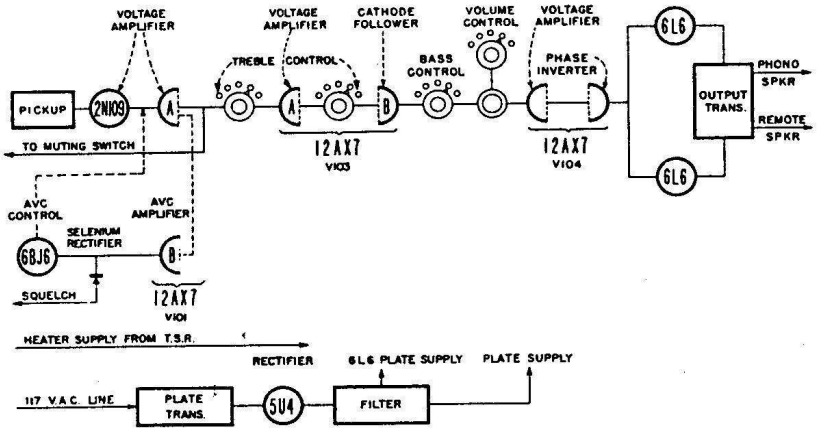


Figure 2. Block Diagram

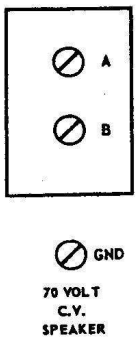


Figure 3. Terminal Strip

The high impedance output terminates at A and B and is for 70-volt Constant Voltage Speakers. The GND terminal is provided for grounding of shielded speaker lines.

The total amplifier output power of 25 watts can be divided between the Select-O-Matic speakers and remote speakers with the proportions of volume conveniently adjusted by use of the Select-O-Matic Speaker Switch located at the upper end of the amplifier and shown in *Figure 4.* The switch is set to provide the desired balance of volume between the Select-O-Matic speakers and the remote speakers but the total power (in watts) of all the speakers in use must not exceed 25. The load (in watts) should also not be lower than 25% of the total, (6 watts).

If the total watts of the remote speakers and the Select-O-Matic cabinet speakers exceed 25 watts, an external Seeburg Power Amplifier, may be used to supply part of the load.

IF NO REMOTE SPEAKERS ARE USED, THE SPEAKER SWITCH MUST BE SET AT THE 20 WATT POSITION.

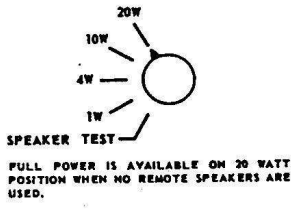


Figure 4. Speaker Switch

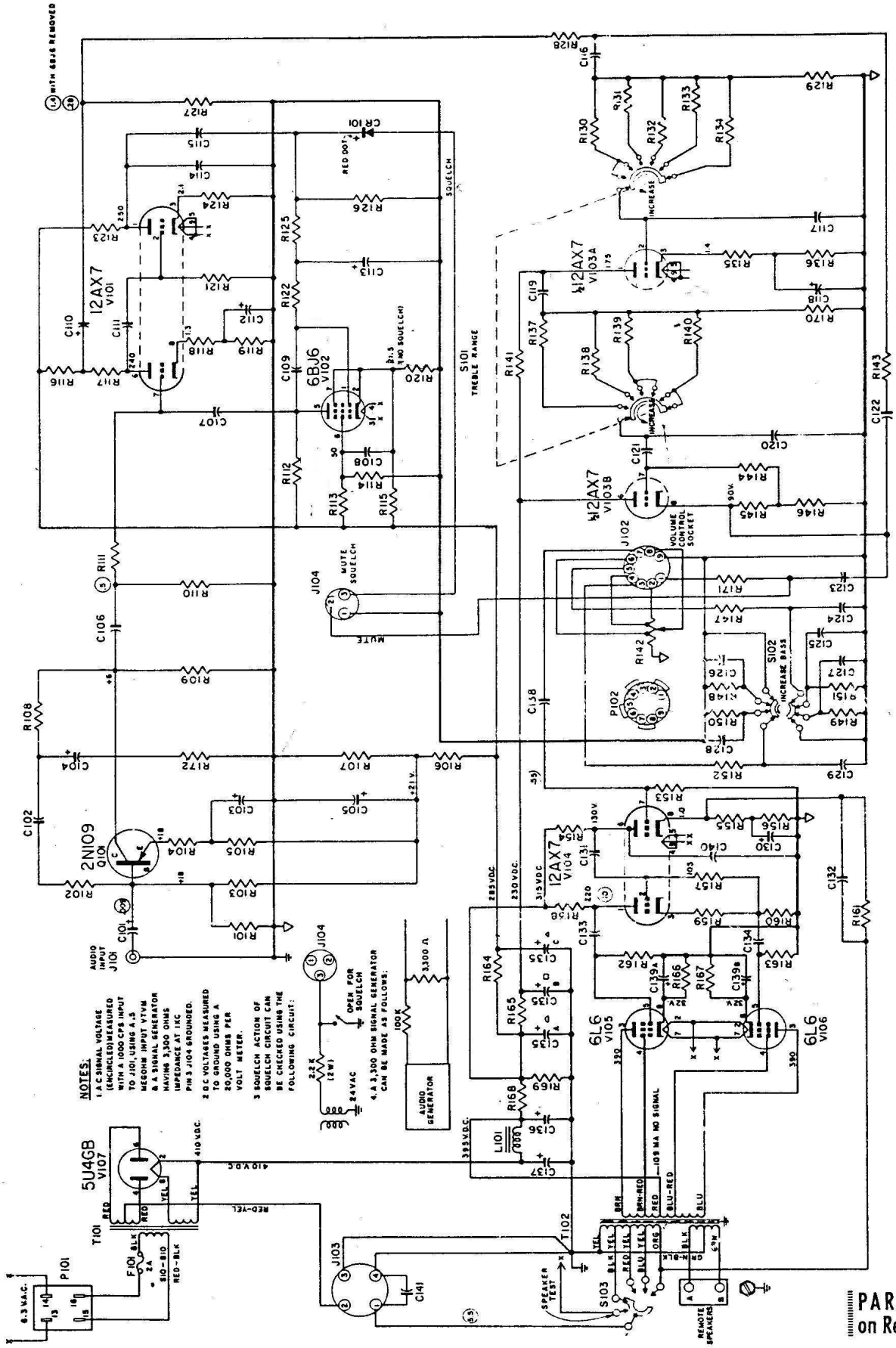
The Select-O-Matic speaker switch has a test position. With the switch in test position, the speakers are connected to one side of the 6 volt tube heater circuit for a hum test at approximately 3 volts.

The volume control adjusts the level of sound from the Select-O-Matic speaker and the remote speakers. It is located on the amplifier so it is accessible at the back of the cabinet. Connections for the control are made through a socket and dummy plug on the amplifier chassis. A remote volume control may be used by replacing the dummy plug with the 9-prong plug of a remote volume control, Type MRVC-3. The remote volume control cable may be up to one hundred feet in length without introducing hum, distortion or loss of volume.

Heater current for the amplifier tubes is supplied at 6.3 volts from the Selection Receiver. Plate current for the tubes is from an included plate supply transformer and 5U4GB rectifier. The plate supply transformer primary is protected by a fuse located on the amplifier chassis.

The Bass and Treble Range controls are four & six position switches respectively. The position of the controls when an amplifier is in normal use is determined by the records being reproduced, the room size and other acoustical conditions. "Flat" response of the amplifier is had with the Bass control at 1 and the Treble Range control at 4 but with average conditions and typical records, very realistic reproduction is obtained by setting the bass at 2 and the treble at 3.

HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA2



PARTS LIST on Reverse Side

4063

HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA2

PARTS LIST

Item	Part No.	Part Name
C101	87651	8 Mfd. 50 V. Lytic
C102	86213	.005 Mfd. ±10% 400 V. Paper
C103	87660	20 Mfd. 30 V. Lytic
C104	86247	.0068 Mfd. ±10% 200 V. Paper
C105	87651	8 Mfd. 50 V. Lytic
C106	87235	.05 Mfd. 200 V. Paper
C107	86300	.22 Mfd. ±20% 400 V. Paper
C108	86140	.05 Mfd. $^{+30}_{-10}$% 400V. Paper
C109	86212	.01 Mfd. ±10% 400 V. Paper
C110	86140	.05 Mfd. $^{+30}_{-10}$% 400 V. Paper
C111	86213	.005 Mfd. ±10% 400 V. Paper
C112	87659	50 Mfd. 6 V. Lytic
C113	86246	1.0 Mfd. ±10% 200 V. Paper
C114	86270	680 Mmfd. ±10% 500 V. Ceramic
C115	86212	.01 Mfd. ±10% 400 V. Paper
C116	86207	.001 Mfd. ±10% 200 V. Paper
C117	86268	470Mmfd. ±10% 500 V. Ceramic
C118	87659	50 Mfd. 6 V. Lytic
C119	86213	.005 Mfd. ±10% 400 V. Paper
C120	86243	150 Mmfd. ±10% 500 V. Ceramic
C121	86213	.005 Mfd. ±10% 400 V. Paper
C122	86159	.01 Mfd. ±10% 200 V. Paper
C123	86297	.5 Mfd. ±10% 200 V. Paper
C124	86248	.15 Mfd. ±10% 200 V. Paper
C125	86248	.15 Mfd. ±10% 200 V. Paper
C126	86248	.15 Mfd. ±10% 200 V. Paper
C127	86248	.15 Mfd. ±10% 200 V. Paper
C128	86248	.15 Mfd. ±10% 200 V. Paper
C129	86248	.15 Mfd. ±10% 200 V. Paper
C130	87659	50 Mfd. 6 V. Lytic
C131	86140	.05 Mfd. $^{+30}_{-10}$% 400 V. Paper
C132	86243	150 Mmfd. ±10% 500 V. Ceramic
C133	86146	.05 Mfd. $^{+30}_{-10}$% 600 V. Paper
C134	86146	.05 Mfd. $^{+30}_{-10}$% 600 V. Paper
C135a, C135b, C135c	87658	40 Mfd. 400 V. Lytic / 40 Mfd. 400 V. Lytic / 30 Mfd. 350 V. Lytic
C136	87596	40 Mfd. 450 V. Lytic
C137	87596	40 Mfd. 450 V. Lytic
C138	86159	.01 Mfd. 200 V. Paper
C139a, C139b	87664	30 Mfd. 50 V. Lytic / 30 Mfd. 50 V. Lytic
C140	86241	33 Mmfd. 500 V. Ceramic
C141	86313	.01 Mfd. 500 V. Ceramic
CR101	309115	Selenium Diode
F101	303087	2 Amp Slo-Blo Fuse
J101	300152	P. U. Socket
J102	84305	Remote Volume
J103	305206	Speaker Socket
J104	12034	Mute Squelch
L101	305446	Choke 1.5 HVS
P101	300087	Input Socket
P102	305316	Remote Volume Dummy Plug
Q101	308950	2N109
R101	82616	220K 5% ½ W.
R102	82989	39K 5% ½ W.
R103	82639	22K 5% ½ W.
R104	82518	100 5% ½ W.
R105	82624	3.3K 5% ½ W.
R106	82850	82K 5% 2 W.
R107	82632	8.2K 5% ½ W.
R108	82989	39K 5% ½ W.
R109	82637	15K 5% ½ W.
R110	82456	470K 10% ½ W.
R111	82698	150K 5% ½ W.
R112	82450	150K 10% ½ W.
R113	82454	330K 10% ½ W.
R114	82447	82K 10% ½ W.
R115	82847	68K 5% 2 W.

Item	Part No.	Part Name
R116	82632	8.2K 5% ½ W.
R117	82640	27K 5% ½ W.
R118	82418	330 10% ½ W.
R119	82422	680 10% ½ W.
R120	82610	6.2K 5% ½ W.
R121	82460	1.0 Meg. 10% ½ W.
R122	82470	6.8 Meg. 10% ½ W.
R123	82793	68K 5% ½ W.
R124	82629	5.6K 5% ½ W.
R125	82466	3.3 Meg. 10% ½ W.
R126	82472	10.0 Meg. 10% ½ W.
R127	82449	120K 10% ½ W.
R128	82666	100K 5% ½ W.
R129	82667	470K 10% ½ W.
R130	82442	33K 10% ½ W.
R131	82448	100K 10% ½ W.
R132	82609	300K 5% ½ W.
R133	82457	560K 10% ½ W.
R134	82460	1 Meg. 10% ½ W.
R135	82798	360 5% ½ W.
R136	82425	1.2K 10% ½ W.
R137	82609	300K 5% ½ W.
R138	82457	560K 10% ½ W.
R139	82459	820K 10% ½ W.
R140	82460	1 Meg. 10% ½ W.
R141	82695	56K 5% ½ W.
R142	309195	Volume Control
R143	82691	200K 5% ½ W.
R144	82464	2.2 Meg. 10% ½ W.
R145	82421	560 10% ½ W.
R146	82446	68K 10% ½ W.
R147	82425	1.2K 10% ½ W.
R148	82426	1.5K 10% ½ W.
R149	82424	1.0K 10% ½ W.
R150	82631	7.5K 5% ½ W.
R151	82430	3.3K 10% ½ W.
R152	82425	1.2K 10% ½ W.
R153	82456	470K 10% ½ W.
R154	82667	470K 5% ½ W.
R155	82659	330 5% ½ W.
R156	82433	5.6K 10% ½ W.
R157	82457	560K 10% ½ W.
R158	82789	390K 5% ½ W.
R159	82433	5.6K 10% ½ W.
R160	82789	390K 5% ½ W.
R161	82627	4.7K 5% ½ W.
R162	82453	270K 10% ½ W.
R163	82453	270K 10% ½ W.
R164	82701	2.7K 10% 1 W.
R165	82443	39K 10% ½ W.
R166	81197	600 5% 5 W.
R167	81197	600 5% 5 W.
R168	81198	3000 10% 10W.
R169	81199	25,000 10% 10 W.
R170	82451	180K 10% ½ W.
R171	82418	330 10% ½ W.
R172	82436	10K 10% ½ W.
S101	305541	Treble-Range Switch
S102	305330	Bass Switch
S103	305543	Speaker Switch
T101	305430	Power Transformer
T102	305560	Output Transformer
V101	308120	12AX7 Tube
V102	308603	6BJ6 Tube
V103	308120	12AX7 Tube
V104	308120	12AX7 Tube
V105	308640	6L6 Tube
V106	308640	6L6 Tube
V107	308506	5U4 Tube