SEEBURG

SPECTRA PHONOGRAPH

Service Manual

[redacted]

MODEL

LS 1

[redacted]

THE SEEBURG CORPORATION
CHICAGO, ILLINOIS, U.S.A. 60622

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SEEBURG

SELECT-O-MATIC PHONOGRAPH, Model LS1

– SPECIFICATIONS –

POWER REQUIREMENTS ..... 120 volts, 60 Hertz
Phonograph equipped with SSU4
Standby ..... 110 watts, 1.4 amps.
Operating .....190 watts, 2.0 amps.

CABINET LIGHTING
One (1) 30-watt, 36-inch cool white fluorescent lamp with one FS4 starter.

One (1) 19-watt, 30-inch cool white fluorescent lamp with one FS25 starter.

LID KEY NUMBER F-205

ALBUM DISPLAY ..... Type AD2

SELECT-O-MATIC MECHANISM ..... Type 160ST17

TORMAT MEMORY UNIT ..... Type 160TM5

RECORD TYPE ..... 33-1/3 & 45 rpm., 7-inch diameter

RECORD CAPACITY ..... 80 records (160 selections)

PICKUP ..... Convenient Plug-in, High Compliance Mu-Metal Shielded Stereophonic Magnetic Pickup Assembly with two Diamond Stylii.

PHONOGRAPH SPEAKERS
Two 12-inch low frequency
Two 6 X 9-inch (oval) high frequency

CABINET FINISH.... High pressure laminate, wood grain, aluminum and chrome trim, blue anodized aluminum grille.

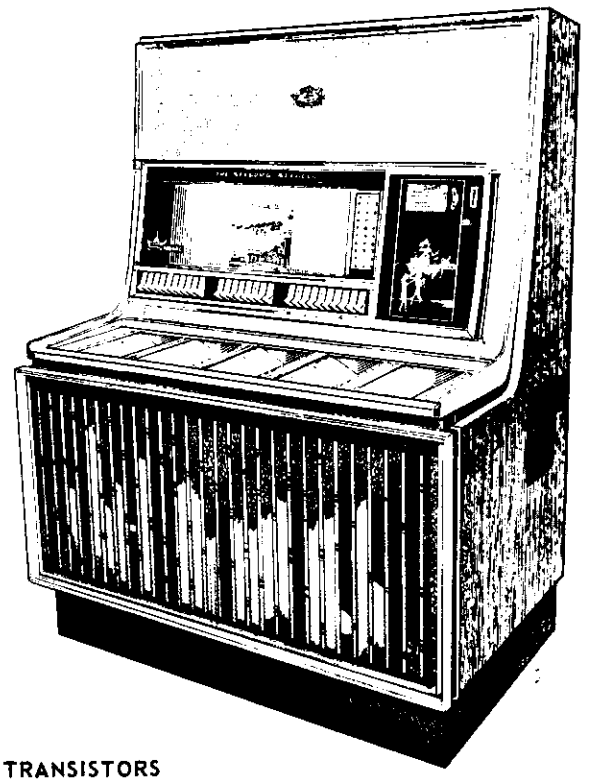
UNIVERSAL DUAL PRICING UNIT ..... Type UDPU6

SOLID STATE STEREO AMPLIFIER ..... Type TSA6

TORMAT ELECTRICAL SELECTOR.... Type TES1613-56

SOLID STATE CONTROL CENTER ..... Type SCC7
(Including the Solid State Auto-Speed Unit, Type SAS1)

FUSES
Solid State Control Center ..... 15 amp. (307556)
Solid State Control Center ..... 1½ amp. Pigtail (317025)
Solid State Control Center ..... 1/8 amp. Pigtail (317026)
Select-O-Matic Mechanism ..... 5 amp. Pigtail (247850)
Select-O-Matic Mechanism.... ½ amp. Slo Blo Pigtail (252464)
Solid State Stereo Amplifier....8/10 amp. Slo Blo (306316)
Solid State Auto Speed ..... 2 amp. Pigtail (317946)
Universal Dual Pricing Unit....1-6/10 amp. Slo Blo (451248)
Power Junction Unit.... 6¼ amp. non-tamp. Slo Blo (307830)
Solid State Stepper Unit.....3.2 amp. Slo Blo (303713)



TRANSISTORS

Solid State Stereo Amplifier

4 - 309412 (PNP)	1 - 309434 (NPN)
2 - 309429 (PNP)	1 - 309435 (PNP)
2 - 309430 (NPN)	10 - 309436 (PNP)
	2 - 309437 (PNP)

Solid State Auto Speed Unit

1 - 309443 (Unijunction) 2 - 309441 (NPN) 1 - 309442 (NPN)

Solid State Stepper Unit

1 - 309424 (PNP) 1 - 309425 (PNP)

SILICON CONTROLLED SWITCH & ZENER DIODE

Solid State Control Center

1 - 309375 (Zener Diode) (27 volt)
1 - 309376 (Zener Diode) (150 volt)
1 - 309472 (Silicon Controlled Switch)

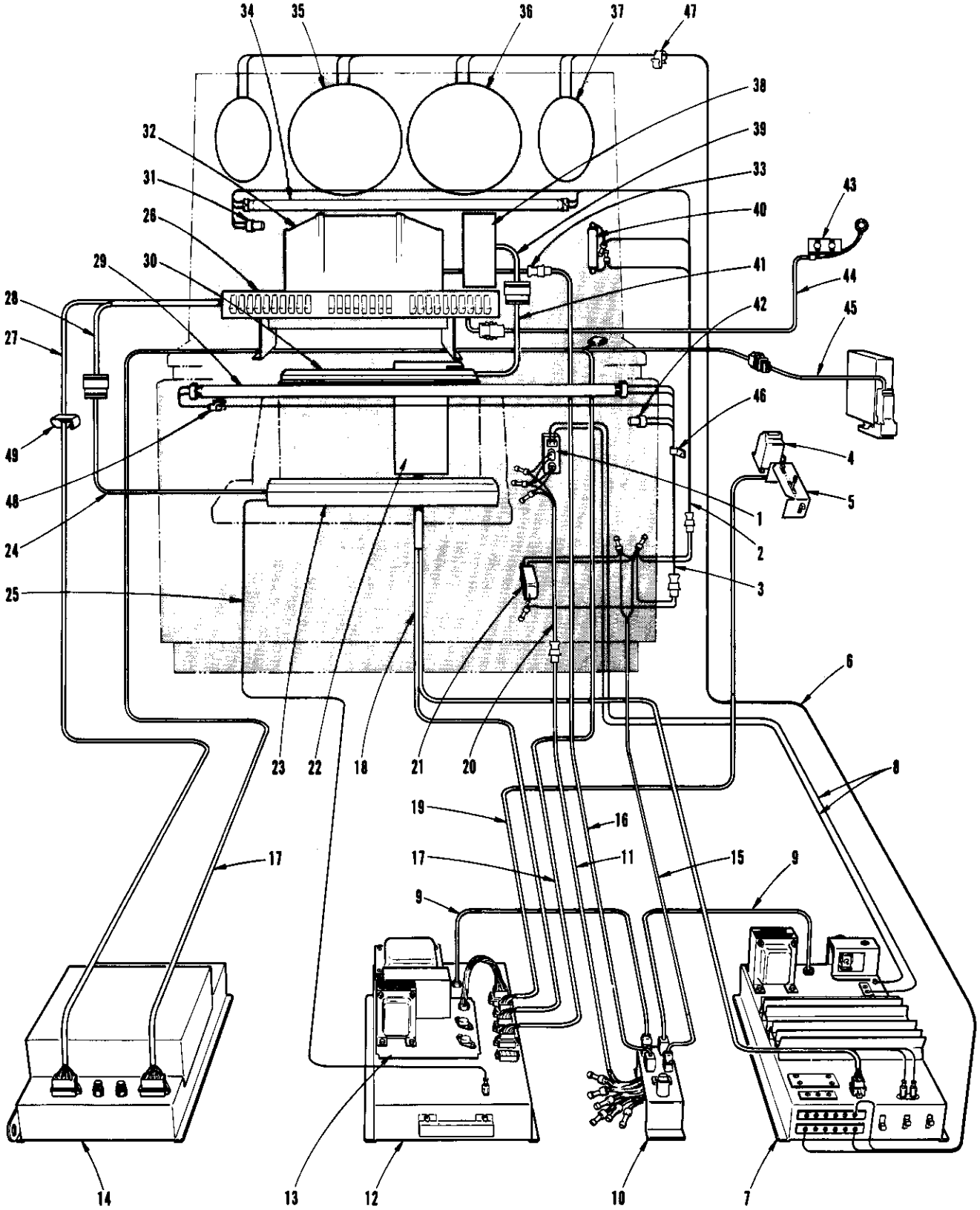
DIMENSIONS & WEIGHTS

Height ..... 56 inches
Width ..... 40-11/32 inches
Depth ..... 27-5/16 inches
Net Weight ..... 415 pounds
Shipping Weight ..... 425 pounds

– SPECIFICATIONS – continued

ACCESSORIES	Part No.
Remote Stereo Speakers, Type TW1-8	512350
Corner Adapter, Type CA1 (for TW1-8)	502881
Remote Stereo Speakers, Type TR1-8	512351
Remote Stereo Speakers, Type RTR1-8	512352
Remote Stereo Speaker, Type EBWC2-12	512392
Stereo Speaker Control, Type S10LT-3	508110
Powered Remote Volume Control, Type PRVC3	509210
Solid State Stepper Unit Kit, Type SSU4K	317970
Auxillary Power Supply Kit, Type RPS8K-56	509056
Stereo Consolettes:	
Type SCH1-4	515550
Type SCH3-4	515551
Recording Income Totalizer Kit, Type RIT54K-56	453449
Remote Recording Income Totalizer, Kit, Type RIT54RK-56	453489
Remote Adapter for Recording Income Totalizer, Type RITRA52-56	453456
Transistorized Microphone Preamplifier System, Type TMPS5-56	302716
Dollar Bill Validator Kit, Type DBV1K2	423324
Dollar Bill Validator Mounting Kit, Type DMK1	423351
Dollar Pre-Select Kit, Type DPK1	509750
Quarter Pre-Select Kit, Type QPK1	509774
"Two Quarters Equal One Half-Dollar" Kit	509790
Alphabet Case Kit, Type RACK1	509088
Display Card (for AD2)	493601, 493602, 493603, 493604, 493605 or 493606

SELECT-O-MATIC PHONOGRAPH, Model LS1



Cabinet Cabling

SELECT-O-MATIC PHONOGRAPH, Model LS1

Parts List for Cabinet Cabling

Item	Part No.	Description
1	317610	Line Cord & Switch Assembly
	961047	8-32 x ¼ Acorn Hex Washer Hd. Self Tap. Sc.
2	493365	Upper Fluorescent Cable Assembly
3	493366	Lower Fluorescent Cable Assembly
4	491256	Counter (60 Hz)
	491257	Counter (50 Hz)
	960697	6-32 x ¼ Hex Washer Hd. Self Tap. Sc.
5	317763	Service Switch Assembly
	960979	8-32 x ¼ Hex Washer Hd. Self Tap. Sc.
6	493417	Speaker Cable Assembly
7	306880	Solid State Stereo Amplifier, Type TSA6
8	317757	Jumper Assembly (Black)
	317758	Jumper Assembly (White)
9	766369	Line Cord (2)
10	317576	Power Junction Unit, Type PJU5
	317595	Receptacle Mounting Bracket
	307828	Receptacle (5)
	307829	Fuse Holder
	303693	Fuse Holder Mounting Clip
	307830	6¼ Amp. Fuse
	960979	8-32 x ¼ Hex Washer Hd. Self Tap. Sc.
11	317604	Cable Assembly
	770390	3 Contact Pin Housing
	941804	Pin
12	317833	Solid State Control Center, Type SCC7
13	317860	Solid State Auto Speed Unit, Type SAS1
14	455151	Universal Dual Pricing Unit, Type UDPU6
15	375460	Line Cord
16	493409	Line Cord & Housing Assembly
	768387	Line Cord
	861328	Socket Housing
	941805	Socket
17	493396	Cabinet Cable Assem. (UDPU6 to SCC7)
	309328	3 Contact Socket Housing (Brown)
	309345	9 Contact Socket Housing (Brown)
	309364	12 Contact Pin Housing (Green)
	309318	15 Contact Pin Housing (Orange)
	941830	Socket
	941829	Pin
18	252968	Cable Assem. (Mech. to SCC7 & TSA6)
19	317824	Cable Assem. (Service Sw. to SCC7)
20	317747	Cable Assembly
	770391	3 Contact Socket Housing
	941805	Socket
	941756	Closed End Connector
21	487435	30 W. Fluorescent Lamp Ballast
	988161	Rubber Grommet
	920935	Flatwasher
	961025	8-32 x ½ Hex Washer Hd. Self Tap. Sc.
22	252031	Select-O-Matic Mechanism, Type 160ST17
23	304904	Tormat Memory Assembly, Type 160TM5
24	304858	Cable Assembly (TM5 to TES)
25	304732	Cable Assembly (TM5 to SCC7)
	252922	Single Prong Plug
26	411900	Tormat Electrical Selector, Type TES1613-56
27	411937	Control Cable Assem. (TES to UDPU6)
28	411935	Matrix Cable Assem. (TES to TM5)
29	404127	30 W. 36 Inch Cool, White Fluorescent Lamp
	309302	Fluorescent Tube Socket
	960401	4-40 x ½ Phillips Pan Hd. Self Tap. Sc.
	600754	Insulator
30	252800	Contact Block Assem., Type CB1
31	405138	Fluorescent Light Starter
	491995	Starter Socket
	913234	6-32 x 3/8 Sems
32	493030	Album Display Unit, Type AD2
33	493053	Cable Assembly (AD2 to SCC7)
34	493233	19 W. 30 Inch Cool, White Fluorescent Lamp
	309302	Fluorescent Tube Socket
	911825	4-40 x 3/8 Phillips Pan H.M.S.
	600754	Insulator
35	493413	12 Inch Speaker
36	493800	12 Inch Speaker
37	493415	6 Inch x 9 Inch Speaker (2)
38	493060	Digital Selection Display, Type DSD1
39	493068	Cable Assembly (DSD1 to CB1)
40	493230	19 W. 60 Hertz, Finger Ballast
	988161	Rubber Grommet
	920935	Flatwasher
	961025	8-32 x ½ Hex Washer Hd. Self Tap. Sc.
41	252809	Cable Assembly (CB1 to DSD1)
42	404253	Fluorescent Light Starter
	491995	Starter Socket
43	411883	Credit Lamp Bracket Assembly
	493706	Lamp Socket Assembly
	507522	No. 19 Lamp (3)
44	493705	Cable Assembly
	769869	Pin Housing
	941829	Pin
45	421356	Coin Sw. & Cable Assem. (Coin Sw. to Cab. Cable)
46	492618	Cable Strap
	951393	Staple
47	410705	Cable Clamp
48	620284	Cable Speed Clip
49	620282	Adhesive Cable Clip

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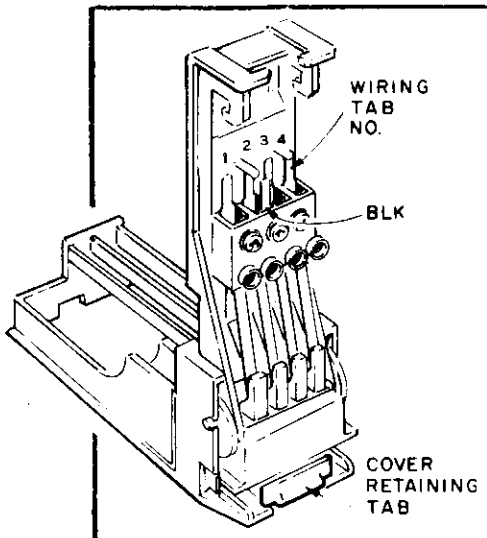
COIN SWITCHES

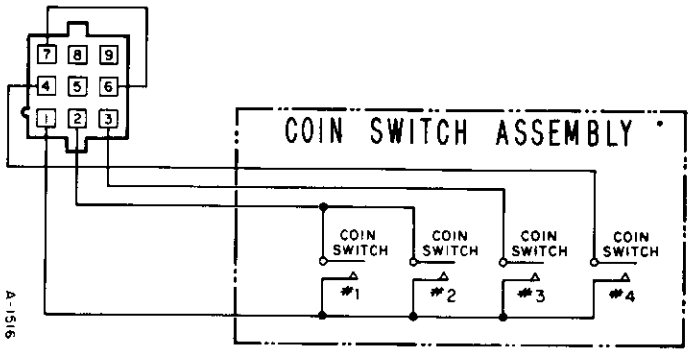


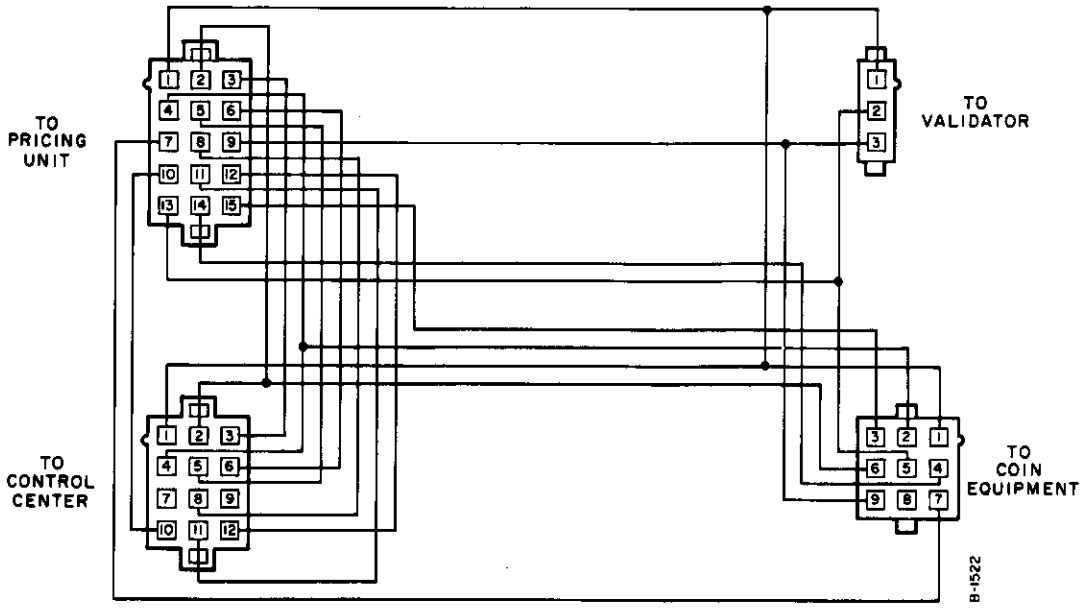
CAUTION !

Coin Switch wiring MUST be changed whenever a slug rejector of a different part number is used.

Depress tab at bottom of cover and pull off cover. Change wiring tabs (see chart). No switch adjustments are necessary.

REJECTOR NO.	SWITCH TABS 1	2	3	4
421205 Coin Acceptors	nickel GRN	quarter RED	dime YEL	half BLU
421206 Natl. Rejectors	nickel GRN	dime YEL	quarter RED	half BLU





Cabinet Credit System Cable.

- OPERATION -

1. INTRODUCTION

a. General

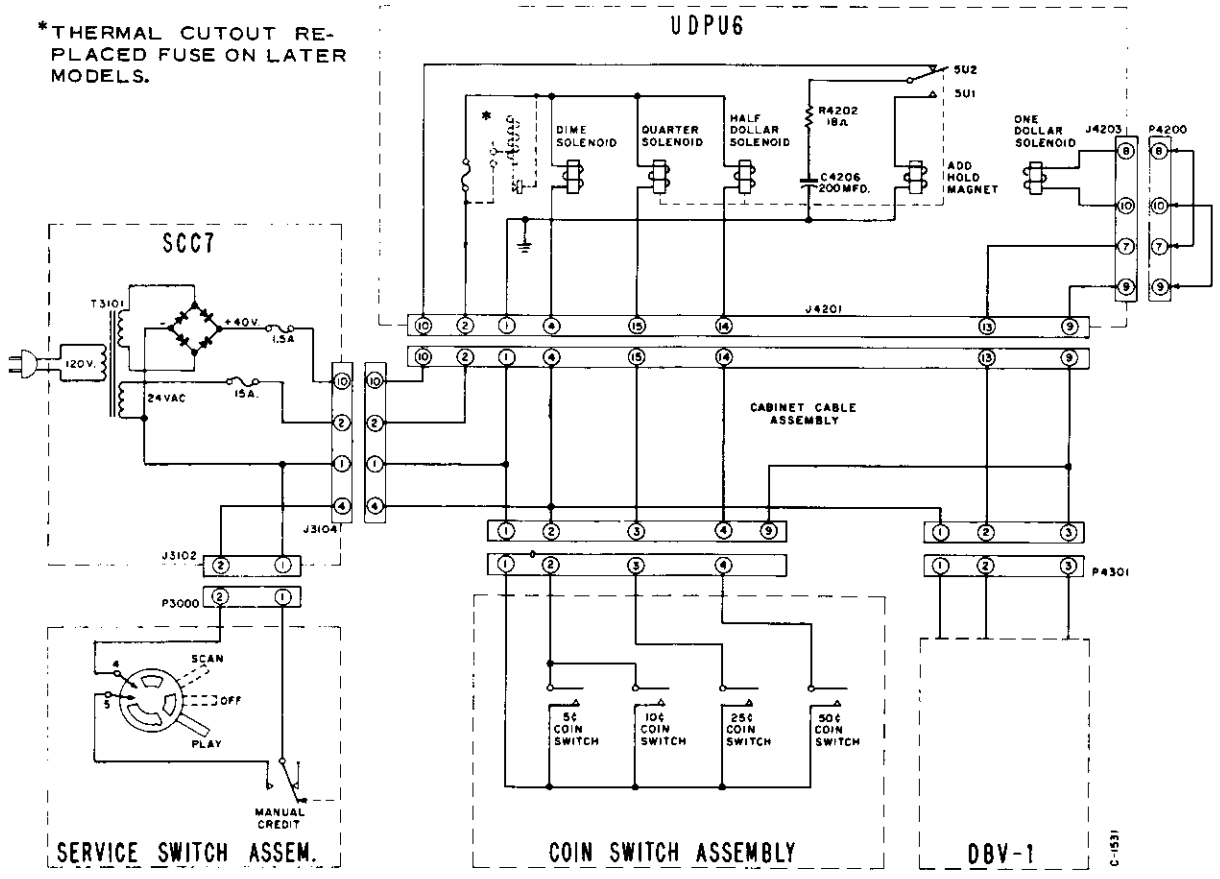
This section consists of simplified diagrams of each of the phonograph's main functions, a wiring diagram of the cabinet fluorescent lamps and schematic diagrams of the Power Junction Unit and the Service Switch Assembly. Each of the simplified diagrams is accompanied by a detailed description of the function.

b. Normal Customer Play

A customer desiring to play a specific record selection must first deposit the appropriate amount of money as specified in the pricing window. On phonographs equipped with a recording income totalizer, a thank you lamp will flash as each coin is accepted. When a sufficient amount of money is deposited to permit the selection of a single recording, a "singles" credit lamp lights. This lamp illuminates instructions informing the customer that he may make a "singles" selection. If enough money is deposited to permit the selection of an "album" recording, an "album" credit lamp also lights. This lamp illuminates instructions informing the customer that he may make an "album" selection.

A selection is made by depressing one letter button and one number button. As soon as the second button is pressed, the carriage begins scanning. At the same time the pricing unit subtracts the appropriate number of credits for the selection. If only enough money was deposited to play that selection, the credit lamp circuit is also opened.

When the carriage arrives at the selected record, it stops, transfers the record to the spindle and then



NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

Figure 1. Simplified Credit System Add Circuit.

plays the record. After the record has finished playing it is returned to the magazine. The carriage then resumes scanning. When the carriage reaches its original starting point for the second time, the carriage stops. This completes one cycle of operation.

2. CREDIT SYSTEM ADD CIRCUIT

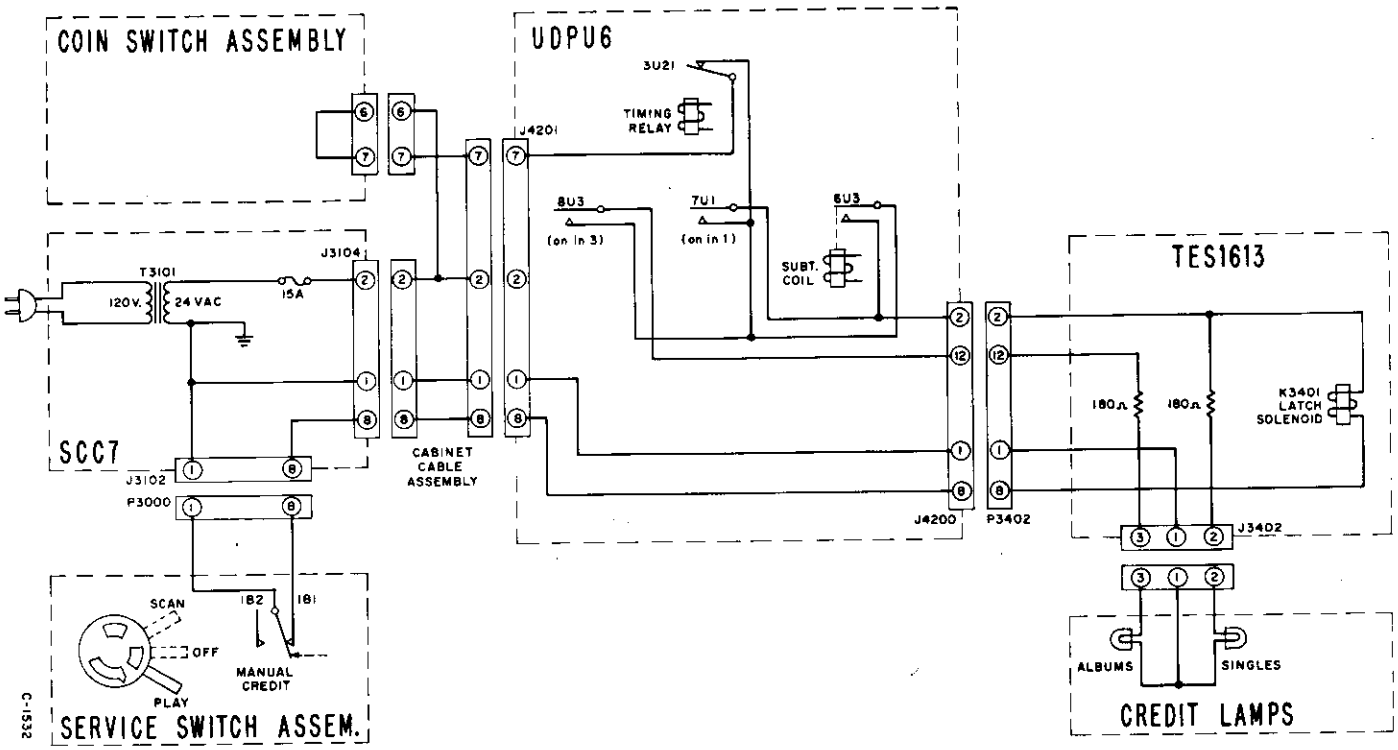
Refer to Figure 1. When a coin is deposited in the phonograph, the weight of the coin closes the appropriate coin switch. The coin switch in turn, completes the circuit to the appropriate solenoid. If either the quarter or half dollar solenoid is energized, the 5U1 contacts of the add-hold magnet will be mechanically closed. Closing the 5U1 contacts permits capacitor C4206 to discharge through the add-hold magnet, holding it energized for approximately 80 milliseconds. The add-hold magnet in turn, mechanically holds the quarter or half dollar solenoid in the energized position. This is done to allow enough time for the credit ratchet wheel to rotate its required distance.

The serviceman may add credits by holding the service switch lever in the SCAN position and then momentarily operating the credit switch. Each time the credit switch is operated, a circuit is completed to the dime solenoid.

3. LATCH SOLENOID AND CREDIT LAMP CIRCUIT

When 10¢ credit is established in the phonograph, the latch bar solenoid is energized to mechanically operate the latch bar in the electrical selector. This permits the selection buttons to be held in the depressed position, for the proper length of time, when a selection is made. Also, when 10¢ credit is established, the single credit lamp is lighted to illuminate the "Select Any Single" credit lamp. When 25¢ credit is established, the album credit lamp is lighted to illuminate the "Select Any Album" credit lamp.

When the coin solenoids are operated as described in paragraph 2, the credit ratchet wheel rotates and closes the credit switch contacts. If enough credit for a single selection is accumulated the one-credit switch contacts 7U1 close completing a circuit to the latch solenoid and the single credit lamp. Refer to Figure 2. The complete circuit is as follows: From the 24-volt a.c. source in the Solid State Control Center through the 15 ampere fuse, the cabinet cable assembly, the coin switch assembly, the 3U21 contacts, the 7U1 contacts, pin 2 of J4200 and P3402 to both the latch solenoid and the single credit lamp. The other side of the credit lamp is connected to ground. The latch solenoid is connected to ground through the 1B1 contacts of the manual credit switch.

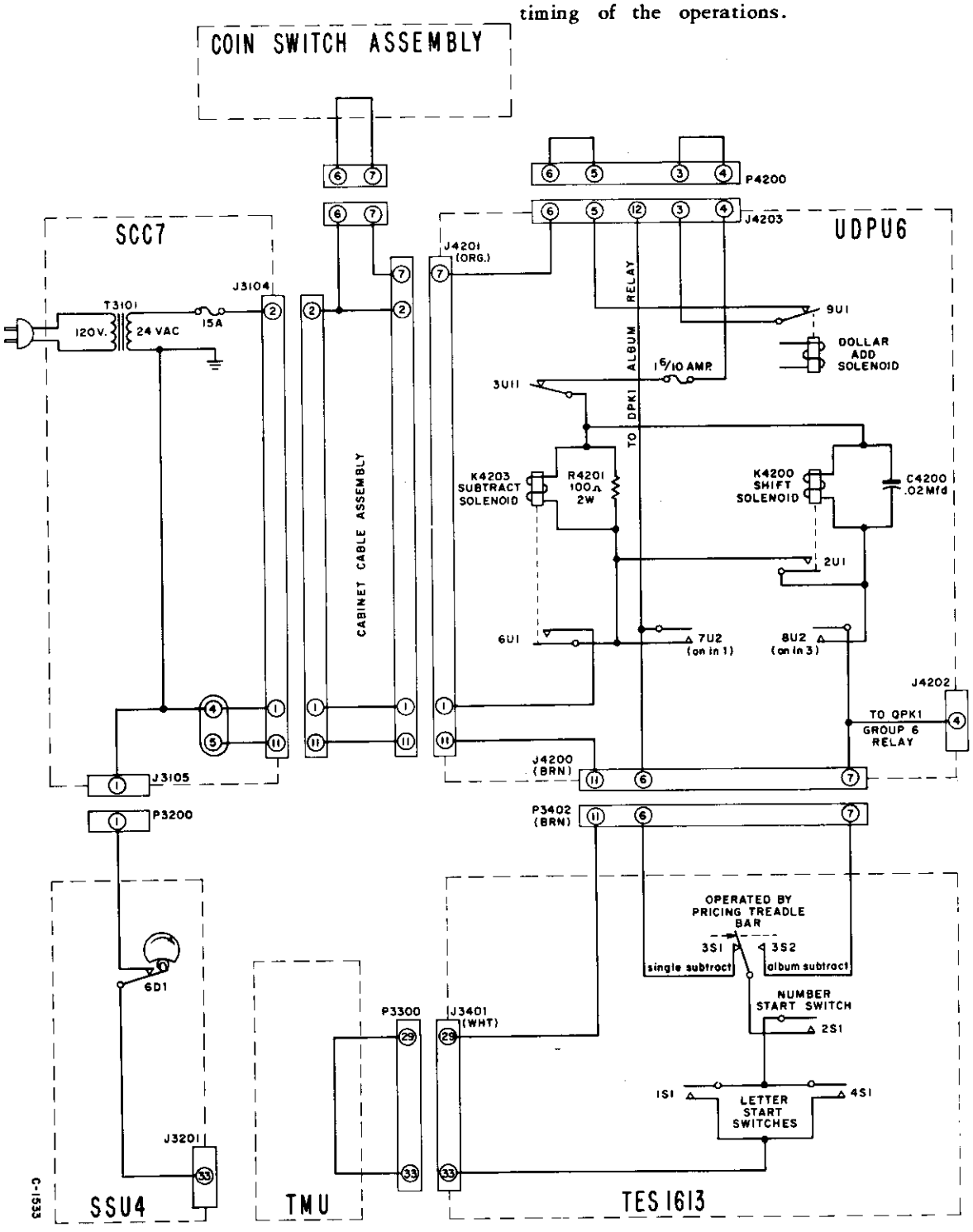


NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

Figure 2. Simplified Latch Solenoid and Credit Lamp Circuit.

4. SUBTRACT CIRCUIT

After credit has been established and the desired selector buttons pressed, the phonograph must perform several functions. These are (1) mechanically subtract the appropriate number of credits from the credit ratchet wheel, (2) start the scan operation, (3) trigger the write-in pulse, (4) impulse the selection counter and (5) energize the timing relay. These functions are accomplished by energizing the subtract solenoid as described in the following paragraphs. Refer to Figure 3. Since these operations must occur in a given sequence, the timing relay is energized by the subtract solenoid to insure proper timing of the operations.



NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

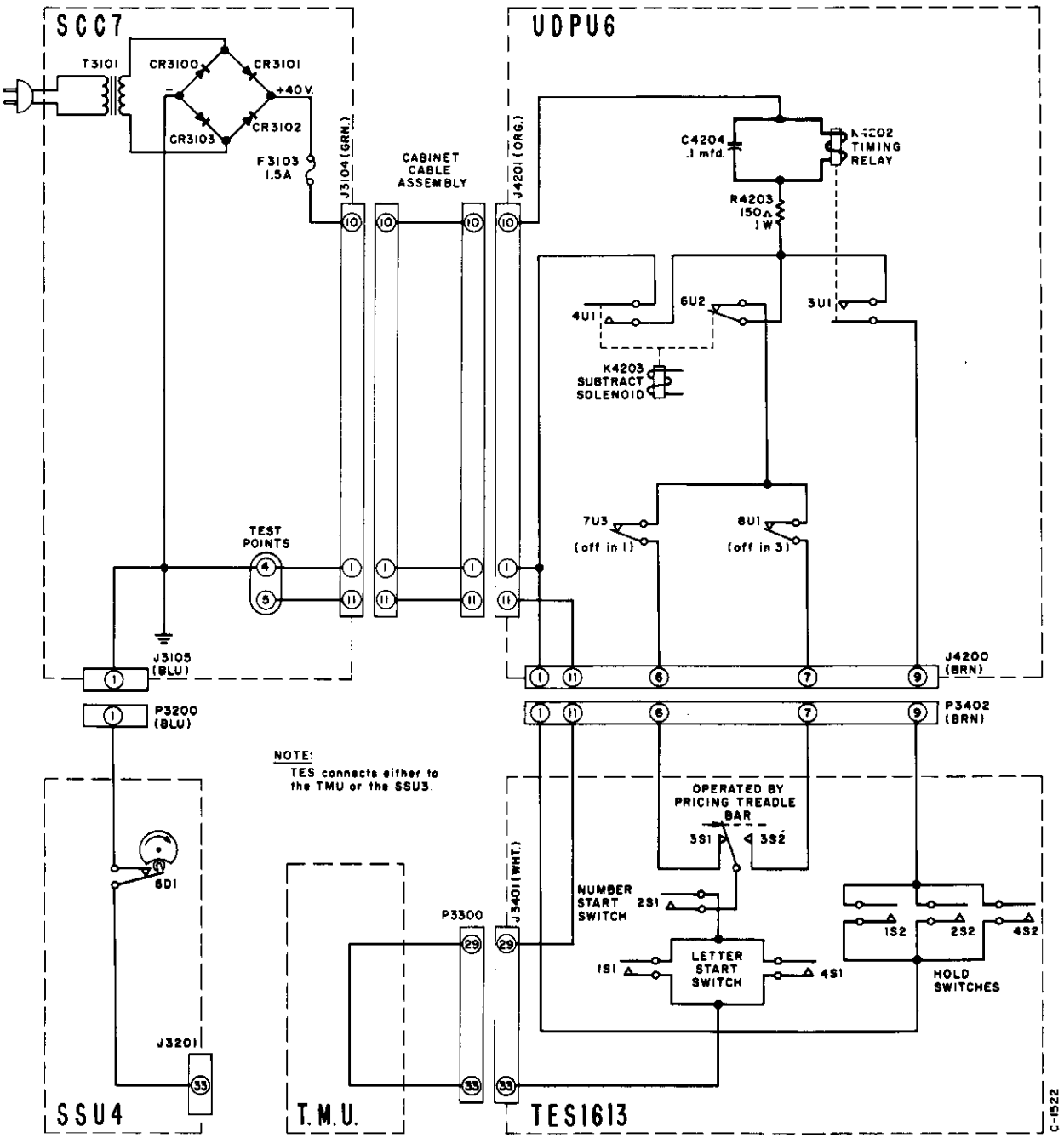
Figure 3. Simplified Single and Album Subtract Circuit.

a. Single Subtract Circuit

Assume credit has been established for a single selection and a selection has been made, i.e., a letter button and a number button are pressed in. A circuit to the subtract solenoid is completed from the 24-volt a.c. source in the SCC7, through the coin switch assembly into the UDPU6, through jumper plug P4200 and the 9U1 contacts, through the fuse and the 3U11 contacts to the subtract solenoid. From the subtract solenoid, a ground path is completed through the 7U2 contacts which are now closed, the 3S1 contacts, the 2S1 contacts which are closed and either the 1S1 or 4S1 contacts depending on the selection made.

b. Album Subtract Circuit

When an album selection is made, the shift solenoid must be operated before the subtract solenoid. Assume credit has been established for an album selection and an album selection has been made, i.e., a letter button and a number button are pressed in. A



NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

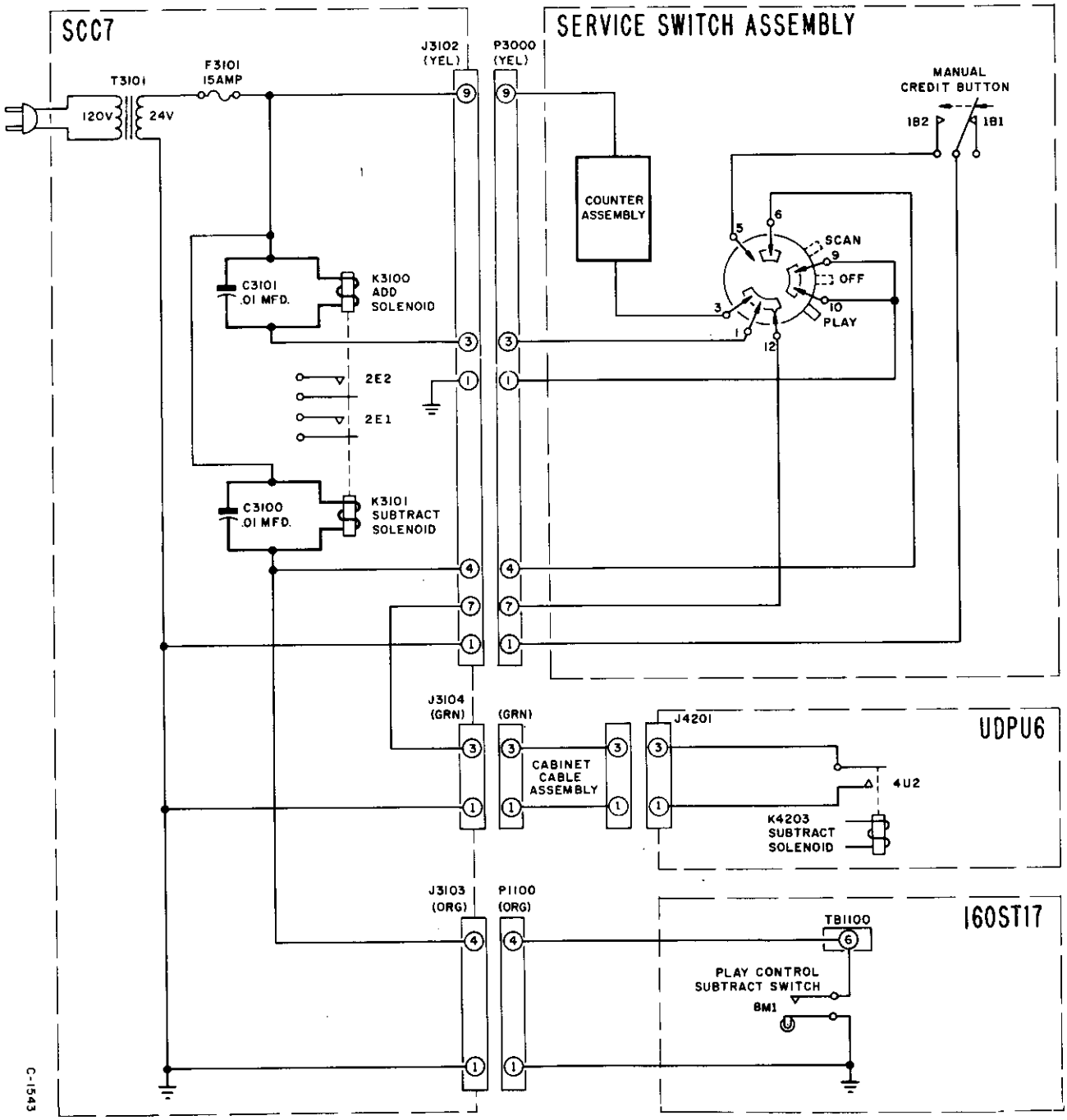
Figure 4. Simplified Timing Relay Circuit.

circuit to the shift solenoid is completed from the 24-volt supply in the SCC7, through the coin switch assembly, into the UDPU6, through the jumper plug P4200 and the 9U1 contacts, through the fuse and the 3U11 contacts to the shift solenoid and the subtract solenoid. The subtract solenoid will not energize because the 3S1 contacts in the ground side of the subtract solenoid have been opened by operation of the pricing treadle bar. A ground circuit to the shift solenoid is completed through the 8U2 contacts which are now closed, the 3S2 contacts, the 2S1 contacts and either the 1S1 or 4S1 contacts depending on the selection made.

When the shift solenoid energizes, it closes the 2U1 contacts which complete a ground circuit to the subtract solenoid energizing it. The shift solenoid also alters the approach of the subtract pawl so it is in a position to subtract enough credits for an album selection.

c. Timing Relay Circuit

The timing relay controls the sequence of events by de-energizing the subtract, shift and latch solenoids at the appropriate time. The timing relay also serves to protect the customer or the phonograph if (1) selections are attempted with insufficient credit or while



NOTE: All contacts shown with mechanism at REST POSITION.

Figure 5. Simplified Play Control and Counter Assembly Circuit.

coins are being deposited or (2) the customer fails to release the selector keys after making a selection.

The timing relay is energized after the subtract solenoid has energized. Refer to Figure 4. The +40 d.c. source in the SCC7 is connected directly to the timing relay via pin 10 of J4201. A ground path is completed through R4203, contacts 4U1 and pin 1 of J4201 and J3104.

When the timing relay energizes, it closes the 3U1 contacts which complete an alternate ground path holding itself energized through the letter and number hold switches (1S2, 2S2, 4S2). The timing relay then remains energized as long as any letter or number button is held down.

d. Play Control and Counter Circuits

The play control assembly controls the number of times the carriage is allowed to scan back and forth on the mechanism base. The counter assembly counts the number of selections made on the phonograph and is connected in parallel with the add solenoid of the play control assembly. Refer to Figure 5. The add solenoid of the play control assembly receives its voltage from the 24-volt a.c. supply in the SCC7. The ground side of the add solenoid is connected to pin 1 of the service switch via pin 3 of J3102 and P3000. The counter assembly receives its voltage from the same source via pin 9 of J3102 and P3000. Its ground side is connected to pin 3 of the service switch. Both pin 1 and pin 3 are connected to pin 12 which is connected to ground via the 4U2 contacts of the subtract solenoid in the UDPU6.

When a selection is made, the subtract solenoid in the UDPU6 is energized closing the 4U2 contacts. This energizes the add solenoid in the play control assembly and the counter assembly. Each time the add solenoid is energized, it mechanically closes a step switch which completes a circuit to the mechanism motor causing the carriage to begin scanning. This switch can only be opened by pulsing the subtract solenoid in the SCC7 twice.

The subtract solenoid may be energized automatically through a play control subtract switch in the 160ST17 or manually by using the manual credit switch on the service switch assembly. The play control subtract switch is mounted on the front of the carriage assembly and moves with it. Each time the carriage assembly nears the right side of the mechanism base, a roller on the play control subtract switch meets with a stationary ramp mounted on the mechanism base. As the carriage assembly moves nearer the right end of the base, the roller moves up the ramp and closes the 8M1 contacts which complete a circuit to the play control subtract solenoid. The ramp is positioned so the carriage will reverse direction before the 8M1 contacts are allowed to open. Since it takes two pulses of the subtract solenoid to open the motor circuit, the carriage must scan back and forth twice.

The subtract solenoid may be energized manually by placing the service switch lever in the OFF position and operating the manual credit button twice. Each time the credit button is operated, a ground circuit to the subtract solenoid is completed. This circuit is from the ground side of the subtract solenoid, through pin 4 of J3102 and P3000 to pin 6 of the service switch. When the service switch lever is in the OFF position, pins 5 and 6 are shorted together. Pin 5 is connected to ground via the 1B2 contacts of the manual credit button and pin 1 of P3000 and J3102.

5. SELECTION SYSTEM

a. General

This selection system uses toroidal shaped magnetic cores (toroids) of magnesium ferrite as the storage elements. There are one hundred and sixty cores - one for each record side - arranged in an electrical matrix and housed in the Tormat Memory Unit. This unit, the electrical selector, the mechanism control circuits, a contact plunger block on the mechanism carriage and the associated electronic circuits comprise the selection system.

The toroids are arranged in the memory unit in two rows of eighty each. They are spaced so there is one toroid in each row at each magazine record space. Each toroid has four wires threaded through it; two are part of the selection input circuit (write-in), one is part of the output circuit (readout) and one is part of a sensing circuit. Refer to Figure 6.

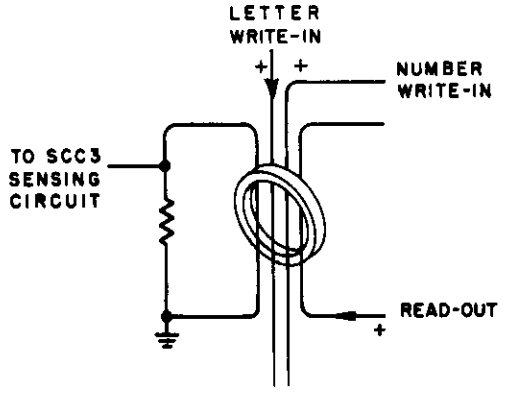


Figure 6. Simplified Toroid Circuit.

The writein circuits terminate in a 36-pin plug, the readout circuits terminate in 80 rivets on the bottom of the memory unit and the sensing circuit terminates in a single prong connector which plugs into the trip circuit on the Solid State Control Center.

Each toroid has two normal states of magnetization in which the residual magnetic flux is in either the clockwise or counterclockwise direction. One of these states is called zero or no-selection; the other is the selected state. If undisturbed by a magnetic field, they will retain, idefinitely, either state.

b. Write-in Circuit

The current pulse and the resultant magnetic field that passes through a toroid must exceed a critical density or strength before the toroid changes state. A magnetic field less than the critical value has no significant effect on the toroid. This behavior makes it possible to arrange the toroids in a matrix that greatly simplifies the writein circuits and writein switching.

Figure 7 shows the matrix, circuits and switches associated with the writein operation. The circles at the points of intersection of the letter and number circuits represent the toroids. Any toroid may be identified in reference to the selection numbering system of the phonograph by using the letter and number circuits that intersect in that toroid. (Example: Toroid B2 is at the intersection of circuits B and 2).

In Figure 7, selection B2 is shown operated. It can be seen that when the trigger switch is closed, a pulse of current is fed through all the toroids in the number 2 row. From the number 2 row, the pulse enters the letter circuit and, since the B switch is closed, through all the toroids in the B row. One toroid, B2, has then been pulsed by a magnetic field twice as strong as any other toroid.

The current pulse is regulated in the Solid State Control Center so the current through a single wire does not produce a magnetic field that exceeds the critical strength required to select a toroid. This means that even though a writein pulse is fed through a toroid, the toroid will not be selected unless two circuits are completed through it.

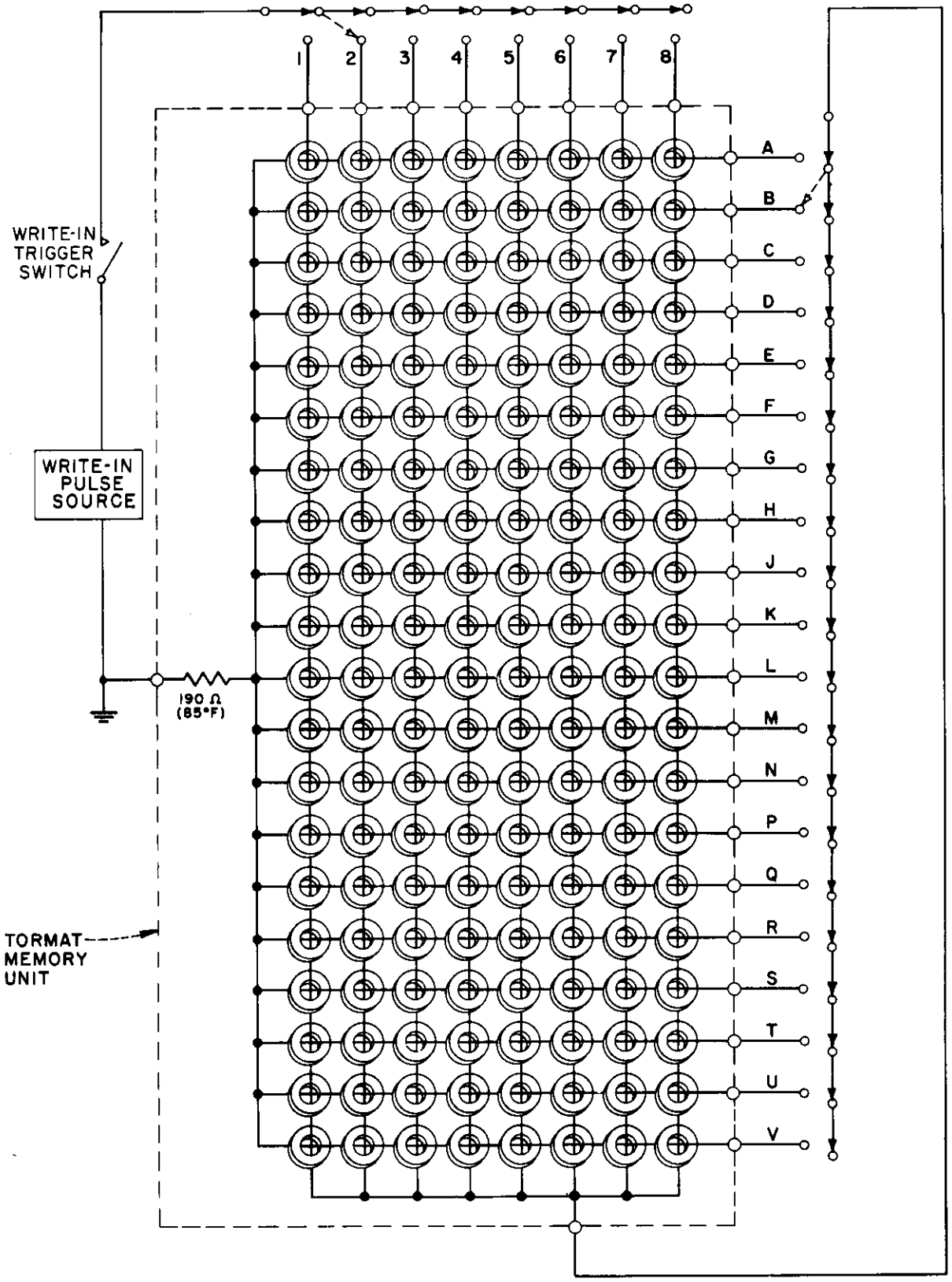
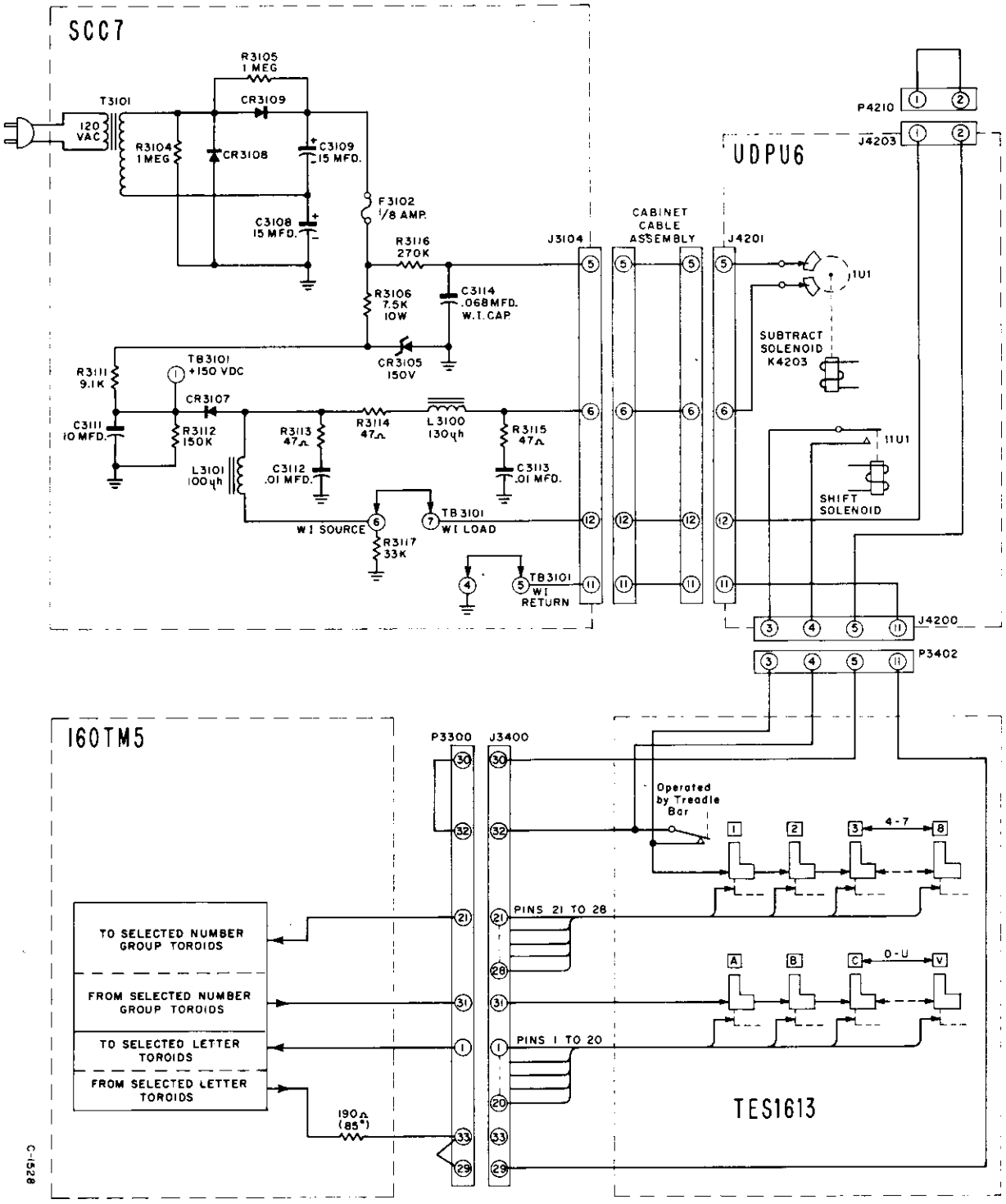


Figure 7. Simplified Memory Unit Diagram.

Figure 8 shows the writein circuit that is used to generate the electrical pulse that "selects" a toroid. The 1U1 contact of the subtract solenoid in the UDPU6 is the trigger switch that provides a discharge path for the writein capacitor, C3114. The letter and number switches direct the pulse to the appropriate toroid.



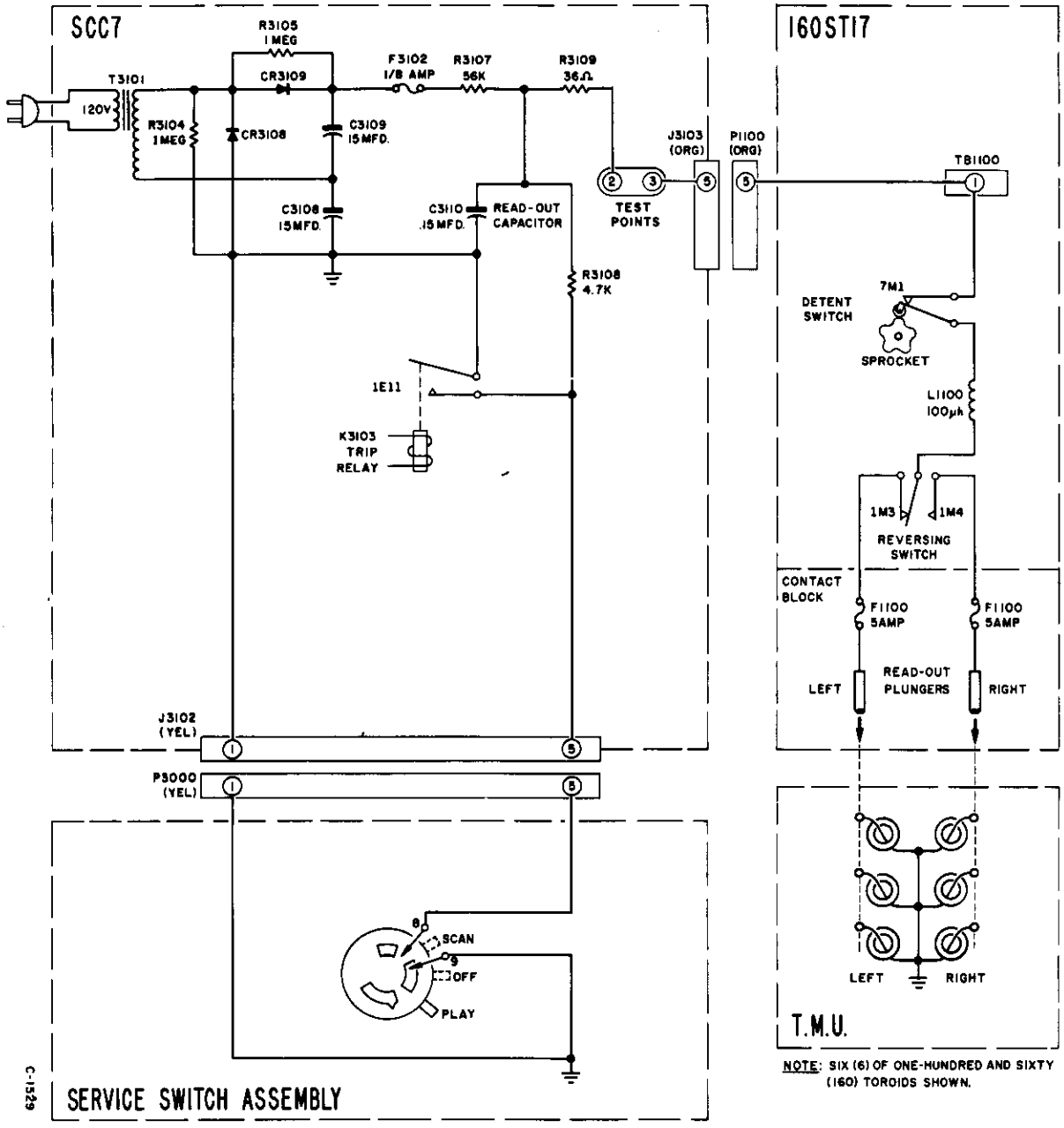
NOTE: All contacts shown with ZERO CREDITS on the phonograph and the mechanism at REST POSITION.

Figure 8. Simplified Writein Circuit.

c. Readout Circuit

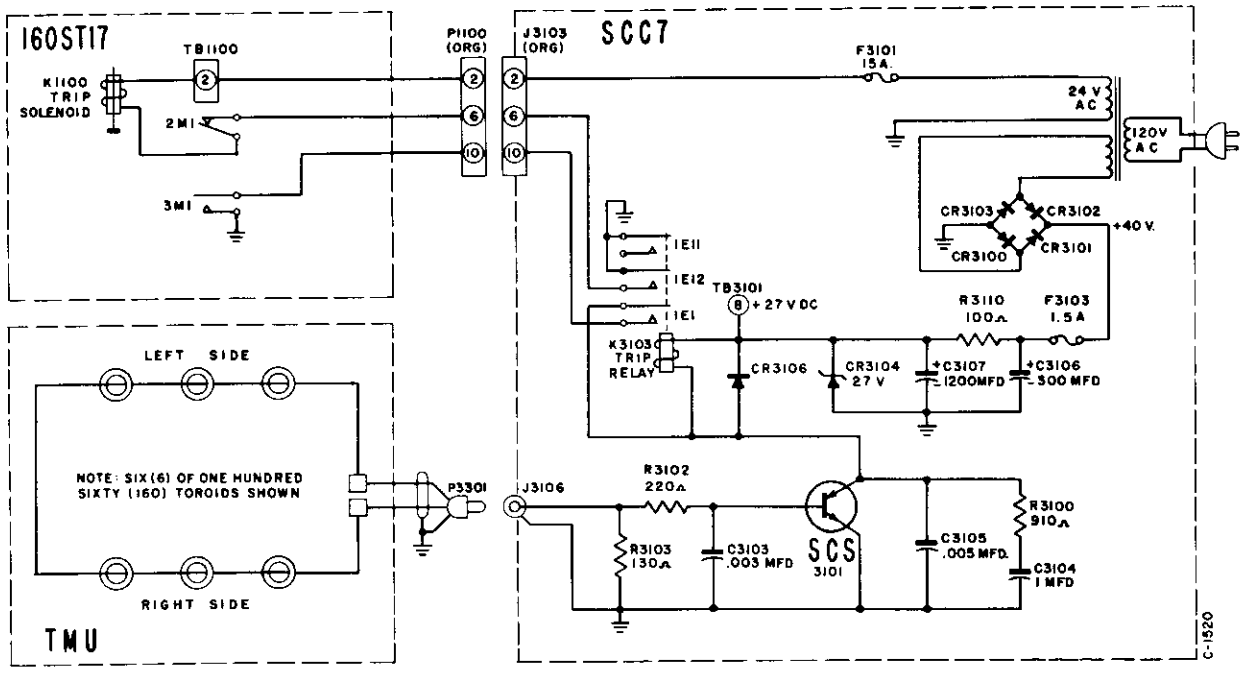
When the selection information that has been written into a memory unit toroid is to be used for control of the mechanism, a pulse of current is passed through another wire that is threaded through the toroid. Refer to Figure 9. This current is of the opposite phase with respect to the writein current and produces a magnetic field that restores the toroid to the zero state. This process is called "readout" and the associated circuit is the readout circuit. The term is used and applies whether the state of the toroid is or is not changed. If a toroid is in the zero state, no change will occur when the current is passed through the circuit.

As the carriage scans, the readout circuit tests each toroid in sequence to determine if its corresponding record side has been selected. The operation is physically correlated with the record sides because the mechanism trip operation occurs at the moment of readout of a selected toroid. Physical correlation is accomplished through the



NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

Figure 9. Simplified Readout Circuit.



NOTE: All contacts shown with the mechanism in REST POSITION.

Figure 10. Simplified Sensing and Trip Relay Circuit.

use of a contact plunger block on the carriage assembly and the readout circuit contacts on the bottom of the Tormat Memory Unit.

d. Sensing and Trip Relay Circuit

The sensing circuit consists of a loop of wire threaded through the toroids in the Tormat Memory Unit and terminated at the trip circuit in the SSC7. Refer to Figure 10. If a toroid is in the selected state when a readout pulse is passed through it, the toroid changes state. This change is detected in the sense loop as a 3-volt pulse which is fed directly to the trip circuit in the SCC7 (J3106). The 3-volt pulse causes silicon controlled switch SCS3100 to begin conducting. This causes the trip relay to energize closing a pair of contacts that complete a circuit to the trip solenoid in the 160ST17.

e. Trip Solenoid Circuit

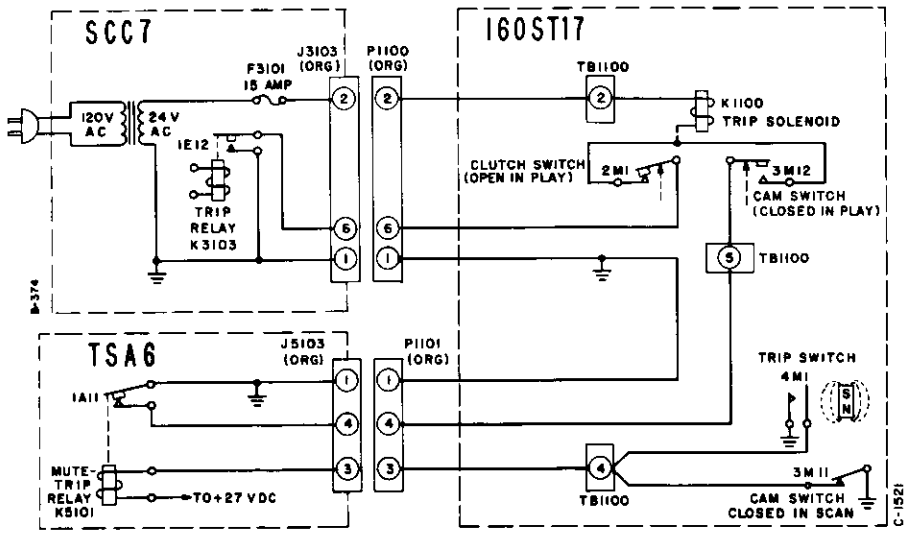
The trip solenoid, if energized during a scan cycle, causes the mechanism to detent and play a selection. Refer to Figure 11. This circuit is completed through the 2M1 contacts of the clutch switch and 1E12 contacts of the trip relay. The clutch switch operates immediately opening the 2M1 contacts and de-energizing the trip solenoid.

At the end of play, the 4M1 contacts of the trip switch complete a path to the mute-trip relay in the TSA6. When the mute-trip relay energizes, a circuit is completed to the trip solenoid through the 3M12 contacts of the cam switch. Energizing the trip solenoid causes the clutch switch to operate which results in the mechanism returning to the scan cycle.

f. Mechanism Motor Power Circuit

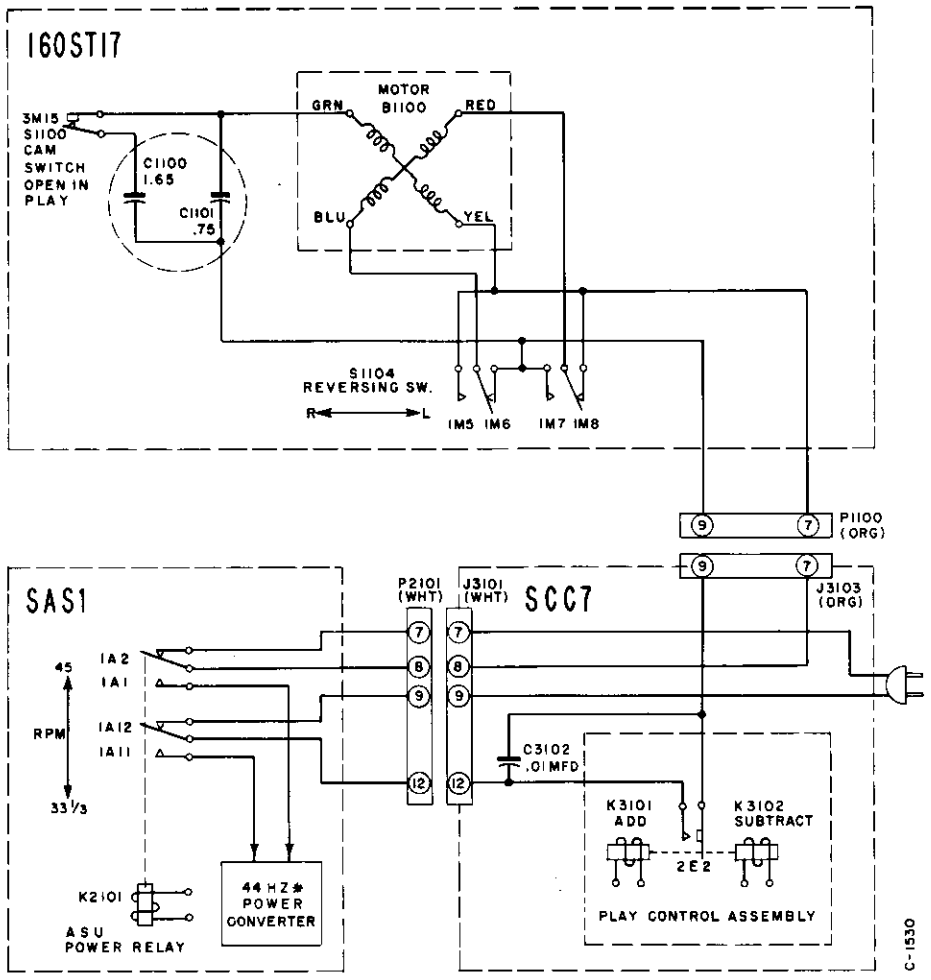
This circuit provides 120 volts a.c. at 60 Hertz to the play motor for both scan and 45 rpm. record play and 95 volts a.c. at 44 Hertz to the play motor for 33-1/3 rpm. record play.

Refer to Figure 12. During the scan operation and 45 rpm. record play, the line voltage is applied directly to the play motor via the 2E2 contacts of the play control assembly and contacts 1A2 and 1A12 of the power relay. When a 33-1/3 rpm. record is placed on the turntable, the power relay in the SAS1 is energized. The circuit between the play motor and the line voltage is then opened and a circuit from the 44 Hertz power converter to the play motor is completed.



NOTE: All contacts shown with ZERO CREDIT on phonograph and mechanism at REST POSITION.

Figure 11. Simplified Trip Solenoid Circuit.



NOTE: ALL CONTACTS SHOWN WITH ZERO CREDIT ON PHONOGRAPH & MECHANISM AT REST POSITION.
* HZ (HERTZ) DESIGNATION REPLACES ~ (CYCLES PER SECOND) DESIGNATION. 1 HZ = 1 ~.

Figure 12. Mechanism Motor Power Circuit.

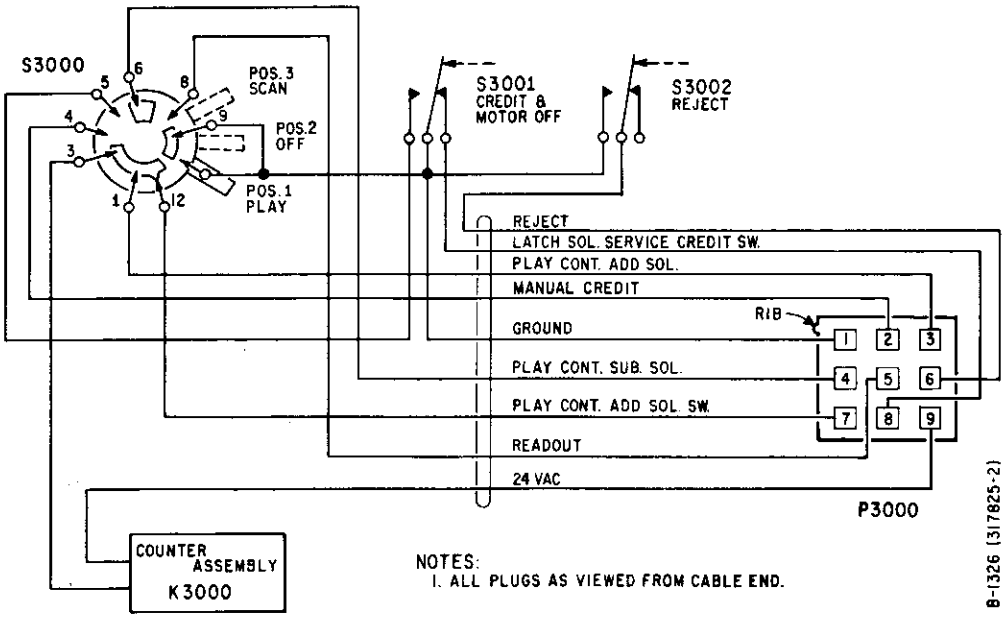


Figure 13. Service Switch Assembly.

6. ACCESSORIES

a. Quarter Pre-Select Kit Model QPK1

The Quarter Pre-select Kit consists of 3 relays, (see Figure 14) with their associated wiring. It is designed for easy mounting in the space provided in the UDPU6. The Switch Panel, (see Figure 15) is mounted on the cabinet lid. With this kit installed, the customer is given the opportunity to deposit one quarter and select three record sides by pressing only one button. If the phonograph is adjusted to play two tunes for a quarter, use of the Quarter Pre-select will give the customer a bonus of one selection. The two groups of records available are A6, C6 and E6 or A7, C7 and E7. See Figures 16 and 17 for simplified diagrams.

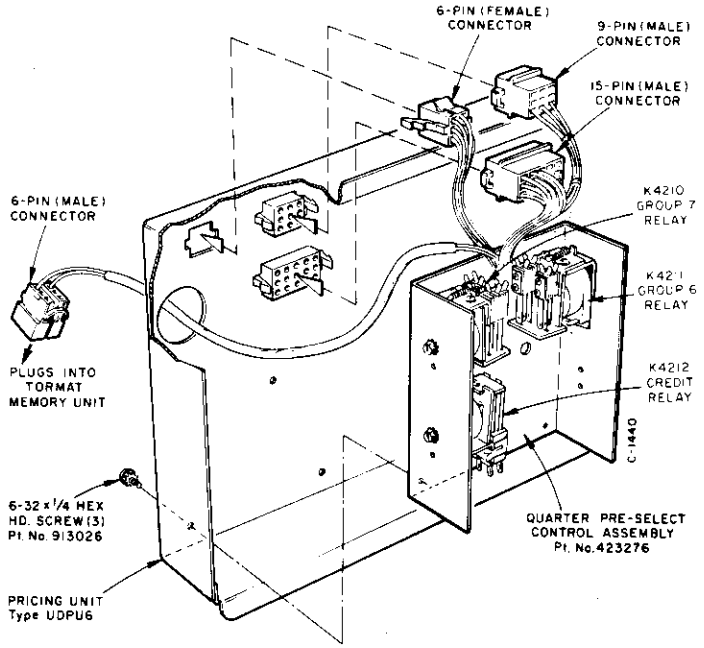


Figure 14. Relay Assembly.

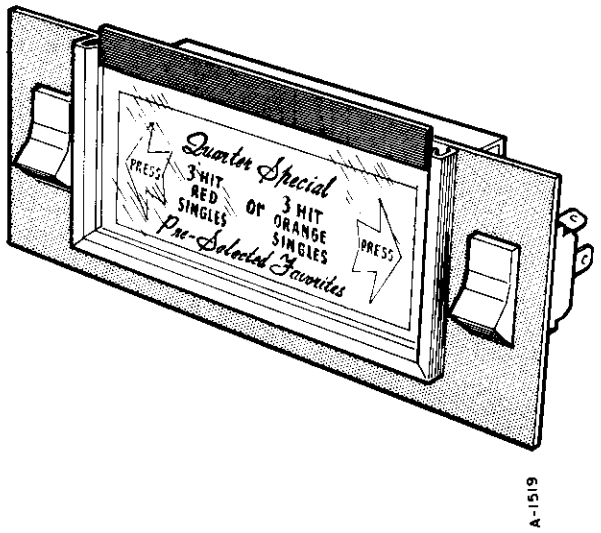


Figure 15. Switch Assembly.

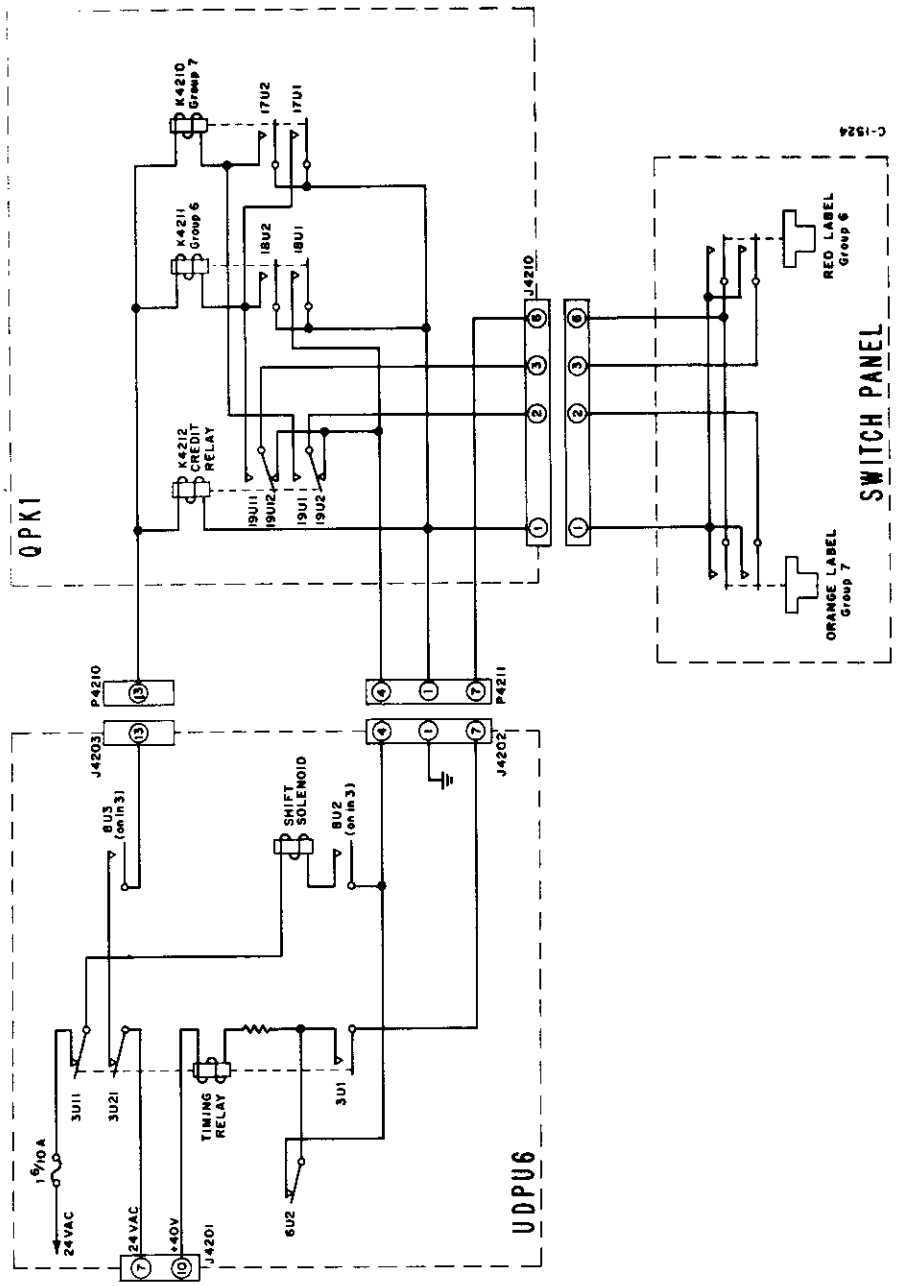


Figure 16. Simplified Quarter Pre-select Control.

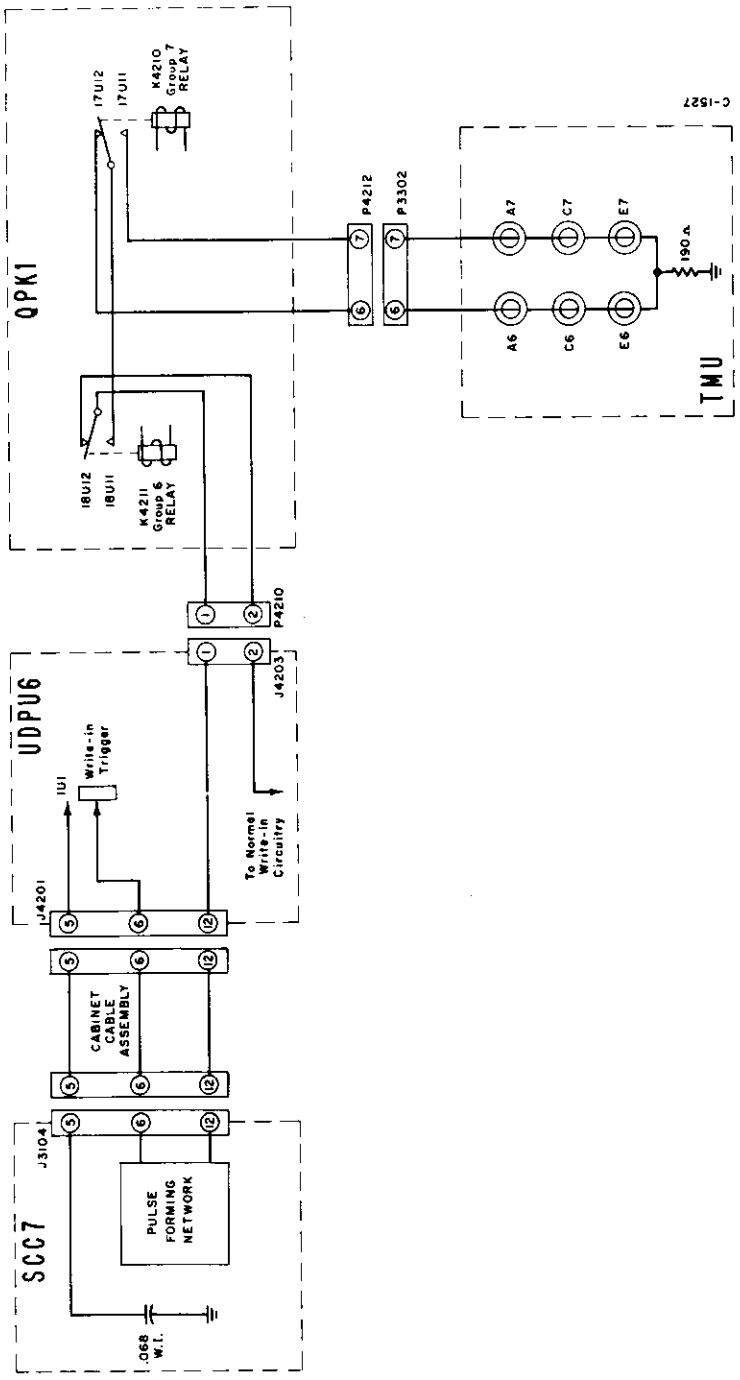


Figure 17. Simplified Quarter Pre-select Write In.

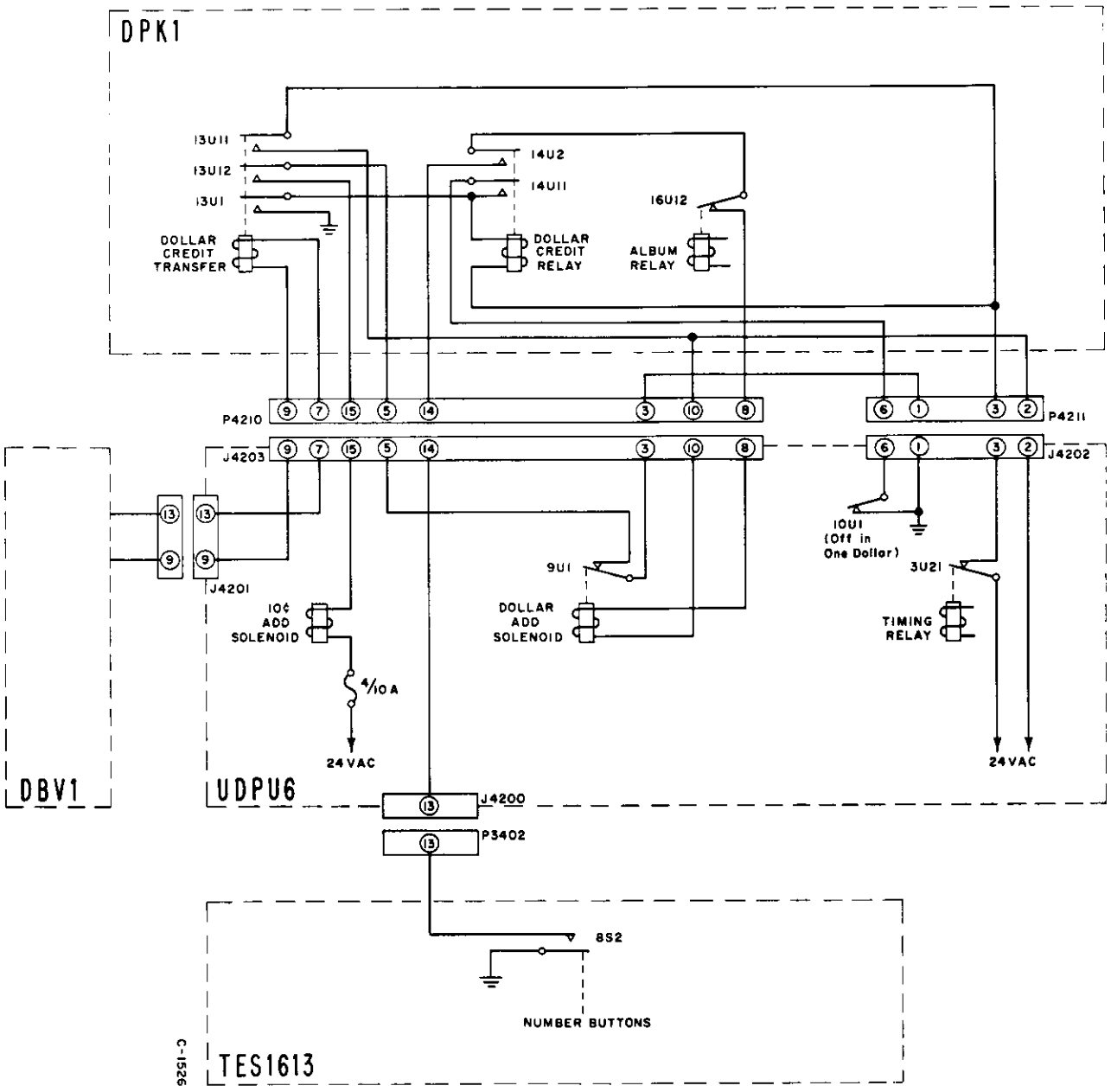


Figure 18. Addition of Dollar Credit When Using DPK1.

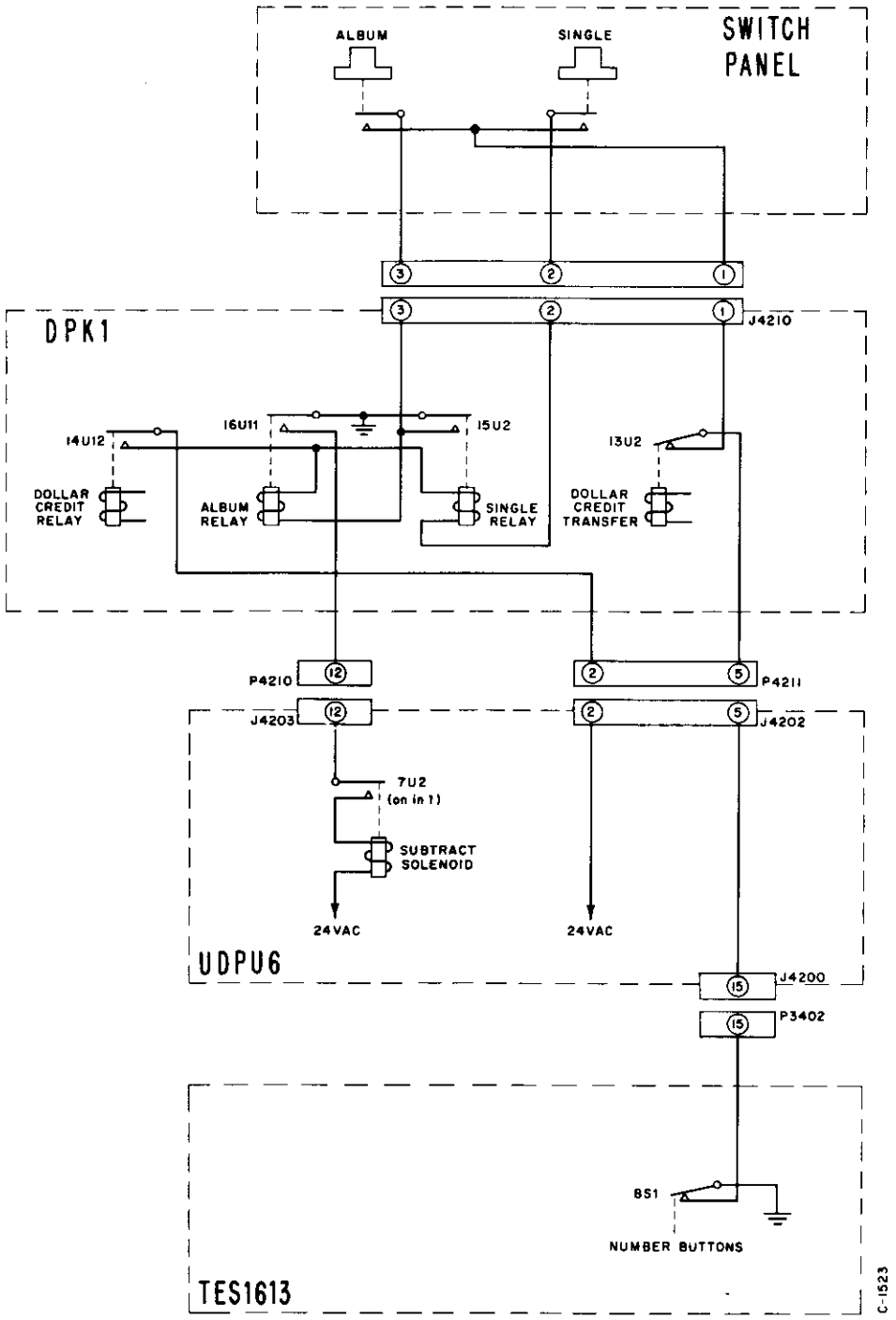
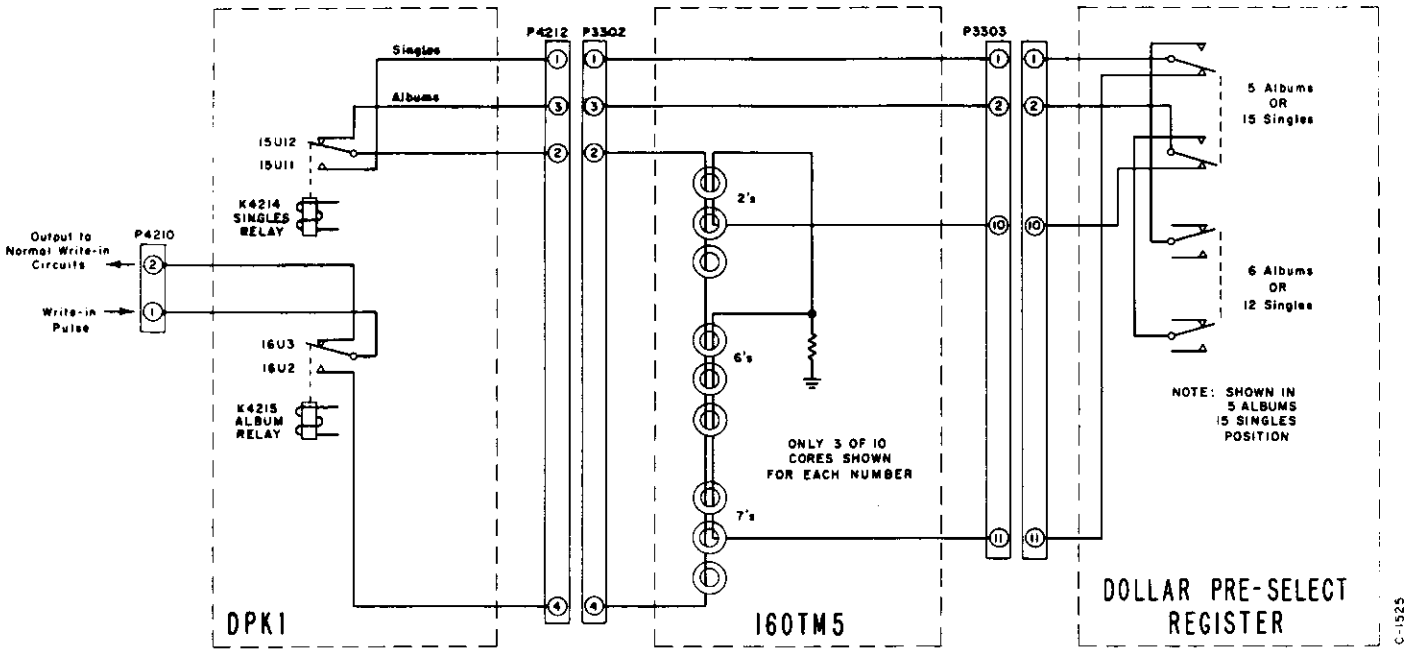


Figure 19. Simplified Dollar Pre-select Selection Control Circuits.



NOTE:

1. PRE-SELECT PLAYS ONLY LEFT SIDES OF RECORDS.
2. PRE-SELECT OF ALBUMS ENERGIZES ONLY THE ALBUM RELAY.
3. PRE-SELECT OF SINGLES ENERGIZES BOTH THE SINGLES AND THE ALBUM RELAY.
4. PRE-SELECT REGISTER SETTINGS –

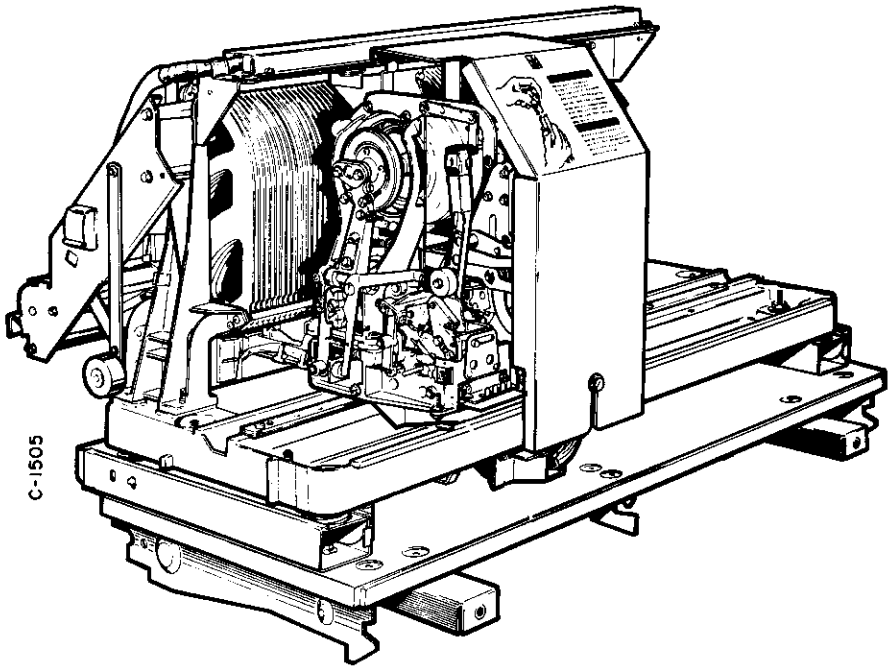
   5 OR 15 – PLAYS FIRST 5 2'S OR 6'S AND FIRST FIVE 7'S.
   6 OR 12 – PLAYS FIRST 6 2'S OR 6'S AND FIRST TWO 7'S.
   6 OR 18 – PLAYS FIRST 6 2'S OR 6'S AND FIRST EIGHT 7'S.
   7 OR 14 – PLAYS FIRST 7 2'S OR 6'S AND FIRST FOUR 7'S.
   8 OR 16 – PLAYS FIRST 8 2'S OR 6'S AND FIRST SIX 7'S.

Figure 20. Simplified Dollar Pre-select Write In Circuit.

b. Dollar Pre-select Kit Model DPK1

The Dollar Pre-select Kit, consisting of 4 relays and a switch panel, features multiple selection of single or album records. This kit may be used only when a Dollar Bill Validator is installed.

SELECT-O-MATIC MECHANISM, Type 160ST17 for Model LS1



The Select-O-Matic Mechanism, Type 160ST17, is used in the LS1 Model Select-O-Matic Phonographs. The adjustments and service information are given on the following pages and are indexed below.

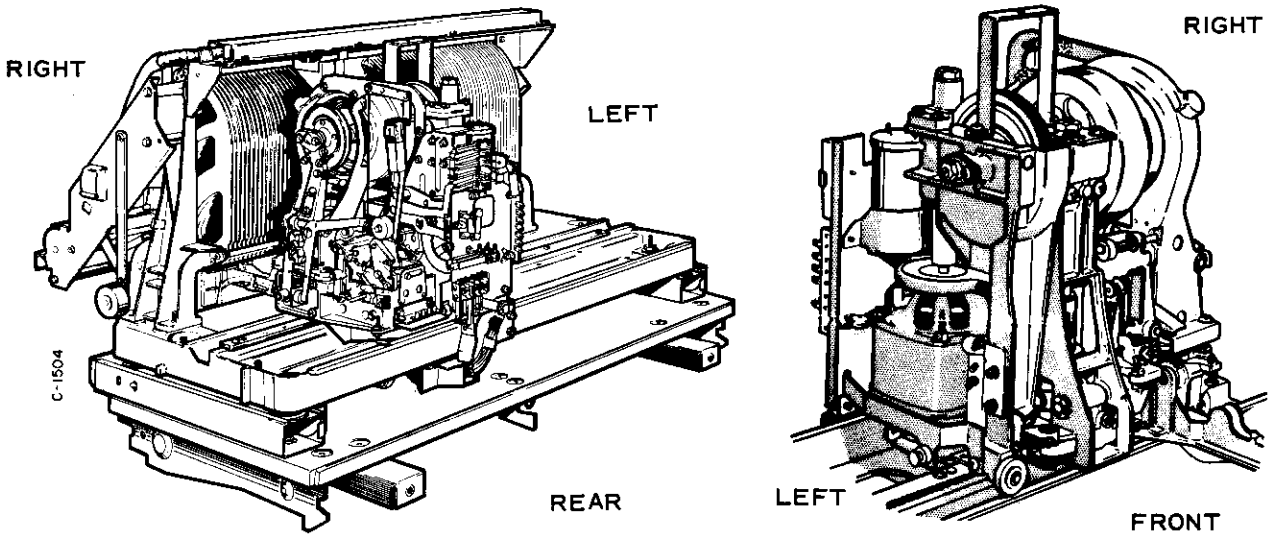
– INDEX FOR SECTION 20 - 22 –

SELECT–O–MATIC MECHANISM ADJUSTMENTS

– PREFACE –

The adjustments for the 33-1/3 - 45 rpm. Select-O-Matic Mechanism 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 phonograph and is played with counterclockwise rotation of the mechanism flywheel. Left side of a record is defined as viewed from the front of the phonograph and is played with clockwise rotation of the flywheel. Counterclockwise and clockwise rotation of the flywheel are defined as viewed from the right 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.

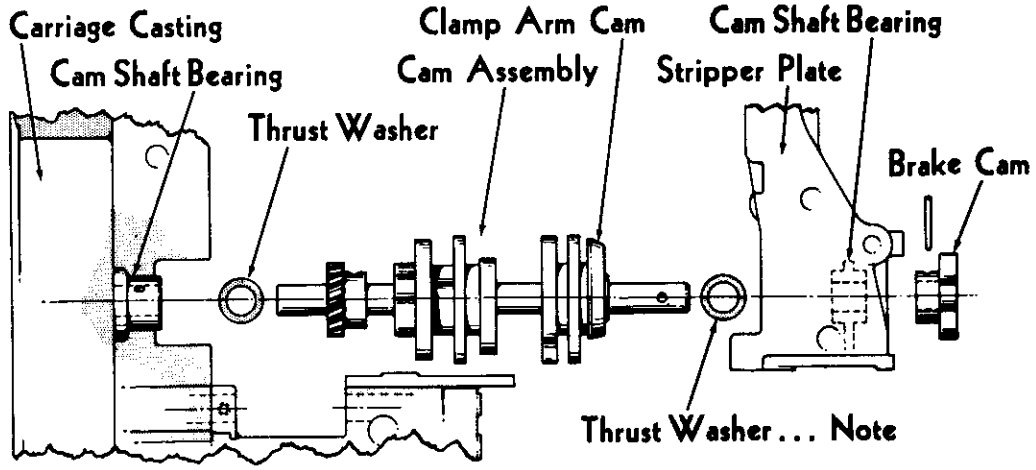
TRANSFER – in which the record is transferred from the magazine to the playing position or from the playing position to the magazine.

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

The 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.

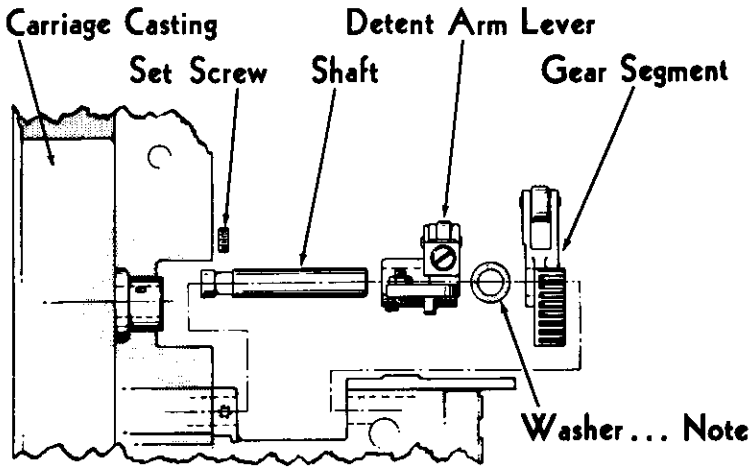
SELECT–O–MATIC MECHANISM ADJUSTMENTS

INSTALLATION OF CAM ASSEMBLY, DETENT ARM AND GEAR SEGMENT



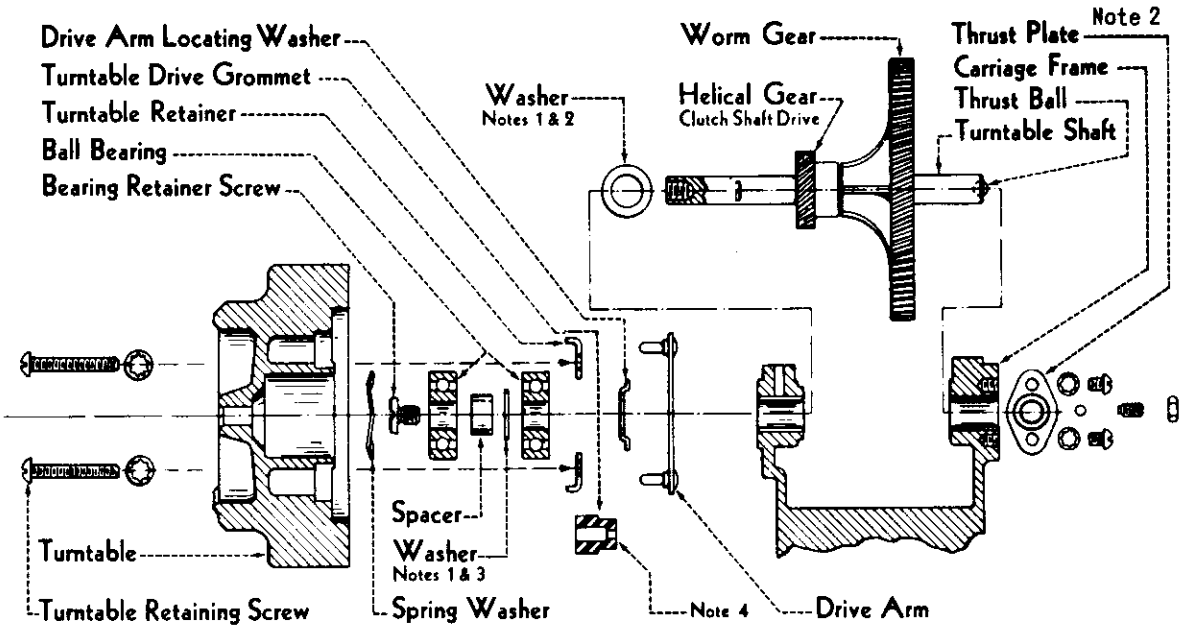
NOTE:
Washers, Part No. 922603 (.020"), 922600 (.005"), 922601 (.010"), 922602 (.015") should be selected and installed between the Clamp Arm Cam and the Thrust Washer so the end play of the Cam Assembly is .003" to .010".

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".

TURNTABLE, SHAFT AND GEAR INSTALLATION



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

Note 2: . . . . . *Install Washer No. 922272 between Clutch Shaft Drive Gear and left Turntable Shaft Bearing and adjust thrust plate screw for .003 to .007 end play.*

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: . . . . *Install rubber Drive Grommets with small diameter end toward the Drive Arm.*

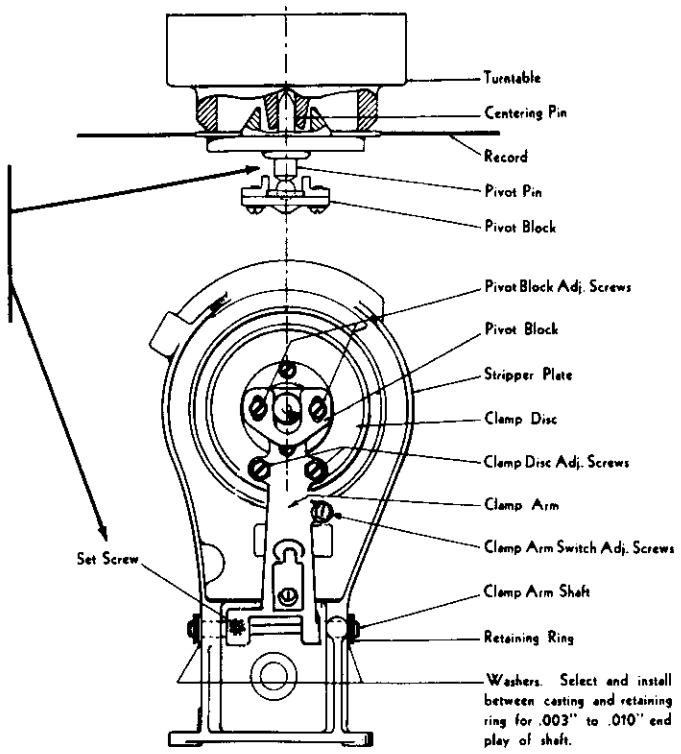
Lubrication: *The Gears should have a light coating of Seeburg Special Purpose Oil, Part No. 53014. Do not use more oil than will adhere to the Gears. The felt wick in the Thrust Screw for the Turntable Worm (which meshes with the Worm Gear) must be placed in the hole in the screw so it is in contact with the Thrust Ball. The wick should be saturated with Seeburg Special Purpose Oil.*

SELECT–O–MATIC MECHANISM ADJUSTMENTS

INSTALLATION OF CLAMP AND TRANSFER ARMS

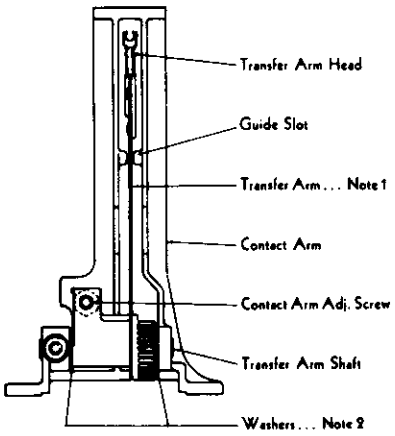
With the Set Screw loose and a Record clamped on the Turntable, adjust the horizontal position of the Clamp Arm so the Center Line through the Pivot Pin forms a right angle with the Clamp Disc and Record.

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

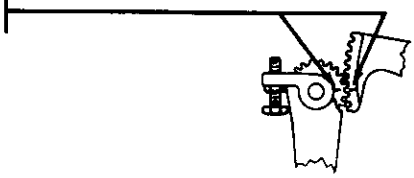


Note 1: Transfer Arm should be straight and should form a right angle with the Transfer Arm Shaft.

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.



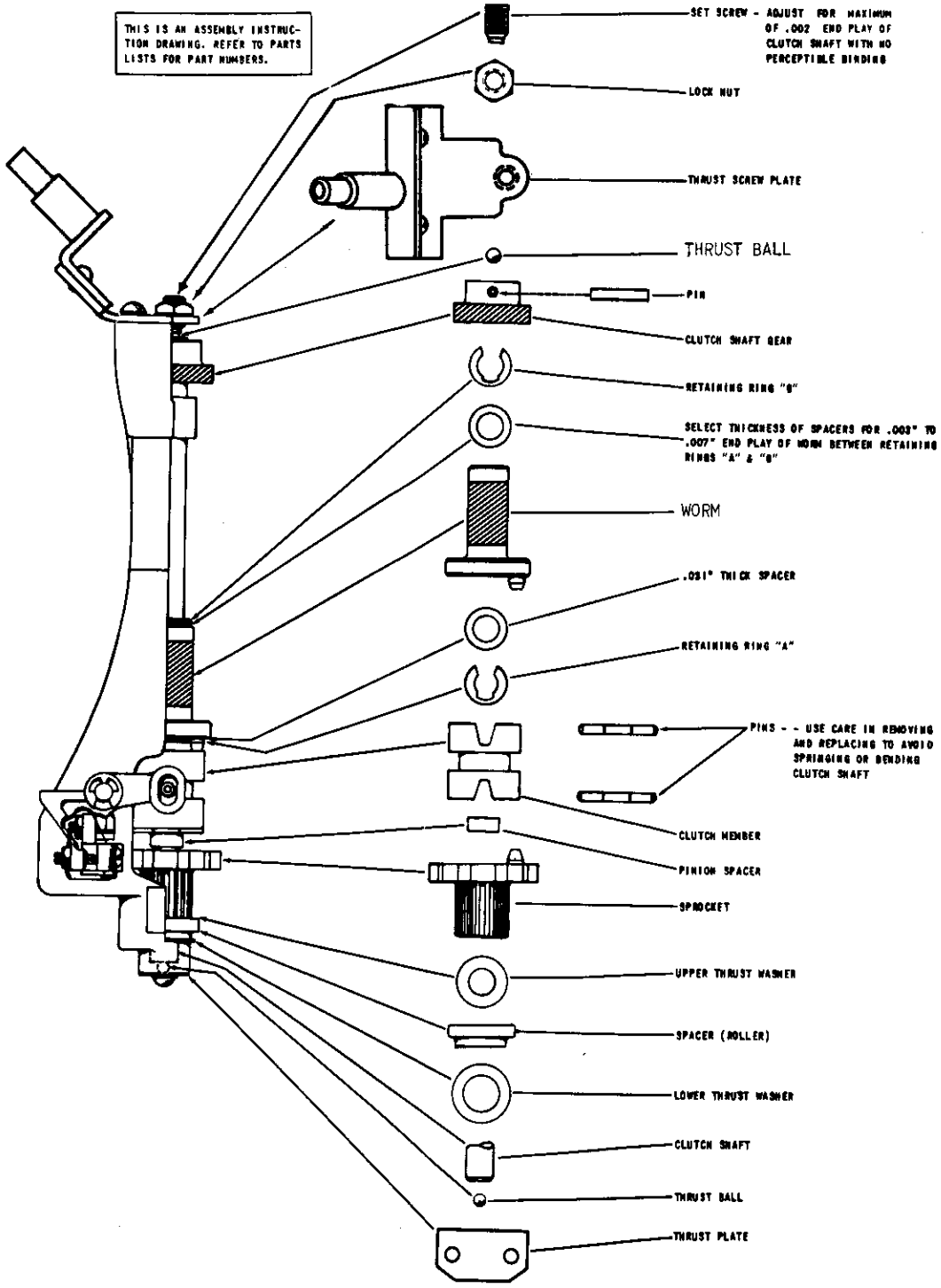
Note 3: When installing assembly on carriage, mechanism and Transfer Arm should be in SCAN position with reference marks aligned as shown.



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

SELECT–O–MATIC MECHANISM ADJUSTMENTS

CLUTCH & HOUSING ASSEMBLY INSTRUCTIONS

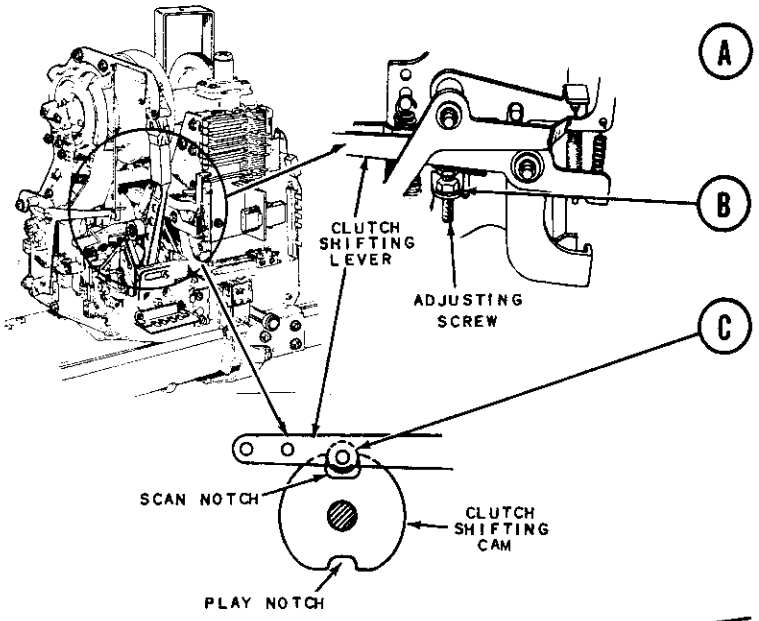


BE SURE CLUTCH WORM AND CAM SHAFT DRIVE GEAR ARE CORRECTLY MESHED BEFORE TIGHTENING CLUTCH ASSEMBLY MOUNTING SCREWS.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"CLUTCH 1" -- CLUTCH LIFTING ADJUSTMENT

This adjustment controls the amount of vertical clutch travel and results in full engagement of the Clutch with the Worm Pin in TRANSFER position and with the Sprocket Pin in SCAN position.

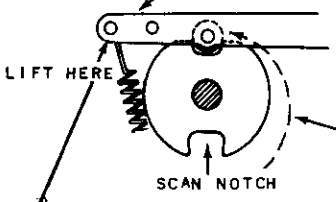


(A) Scan Carriage to front of A1 - B1 record space. Leave it in SCAN position.

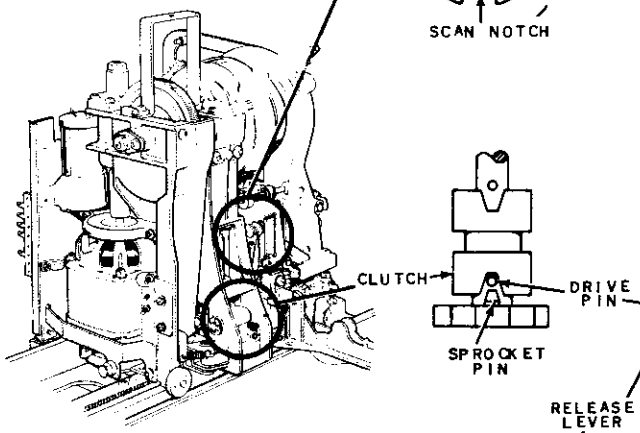
(B) Loosen lock nut and turn Adjusting Screw down to limit.

(C) Check Clutch Shifting Lever Roller position. The Roller should be in the SCAN Notch.

If the Roller is not in the SCAN Notch, turn the motor shaft until the Roller enters fully into the notch. If the Roller enters the PLAY Notch, it may be necessary to manually lift the Clutch Shifting Lever and - - - - - - - - - -

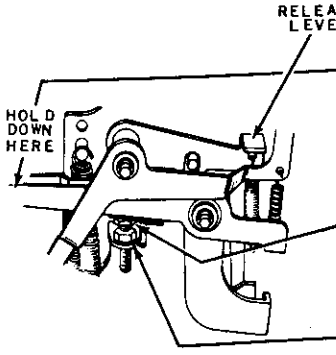


turn the motor shaft until the Roller is on the high part of its cam. When the Roller is on the high part of the cam, release the Lever but continue turning the motor shaft until the Roller fully enters the SCAN Notch.



(D) Check Trip Mechanism position. The Trip Mechanism should be latched with Release Lever down to limit.

(E) Check Clutch position. Clutch should be all the way down against Drive Pin and engaged with Sprocket Pin.



(F) While manually holding Clutch Shifting Lever down - - - - - - - - - - - - -

turn Adjusting Screw UP until screw head just touches Clutch Shifting Lever.

(G) Tighten Lock Nut.

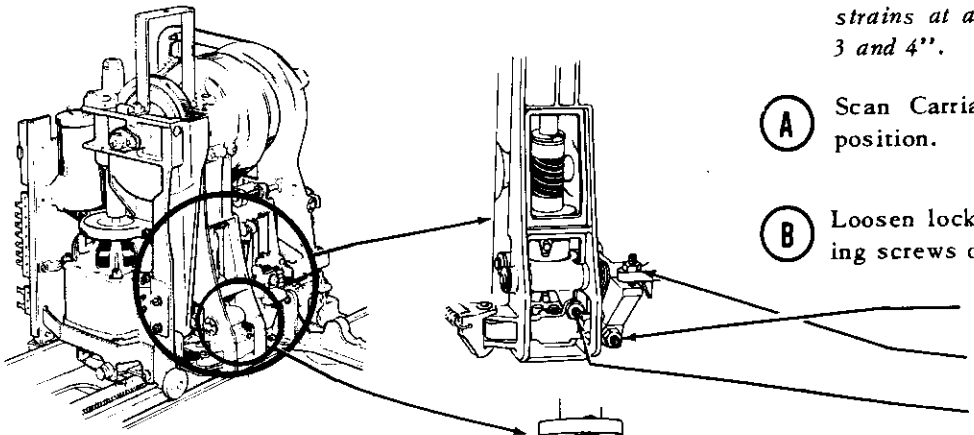
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 inch 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 readjusted. "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".



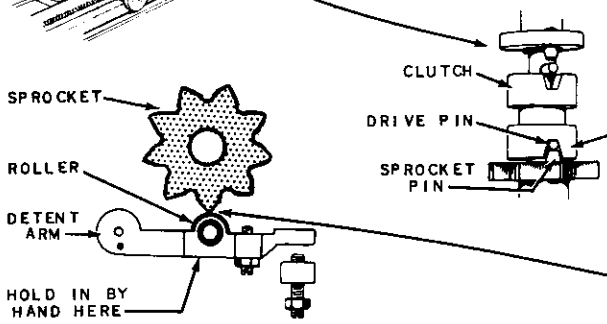
(A) Scan Carriage to left end beyond A1 position.

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

"Clutch 2"

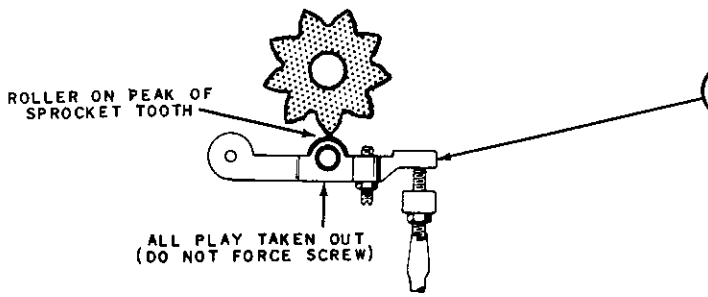
"Clutch 3"

"Clutch 4"

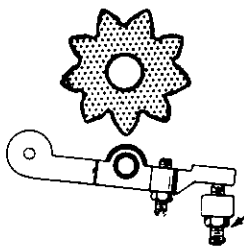


(C) Mechanism should still be in SCAN position, beyond A1 with Clutch all the way down (against lower Drive Pin) and engaged with Sprocket Pin.

(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.)



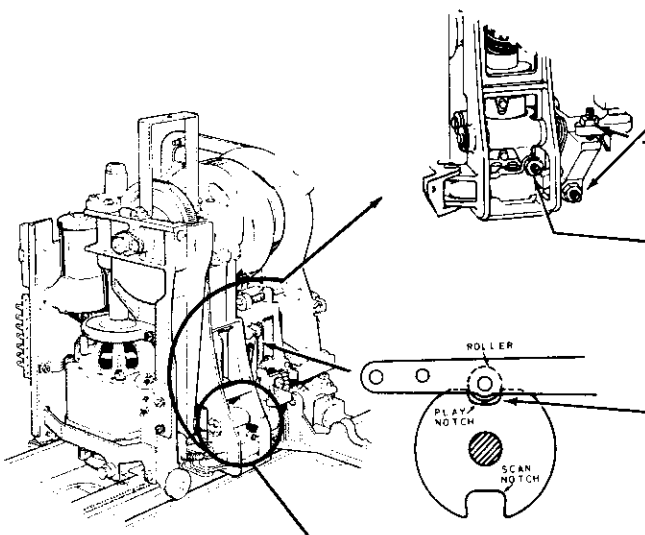
(F) Now, back out, the screw 2 turns and tighten the lock nut. This establishes correct clearance.

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

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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.



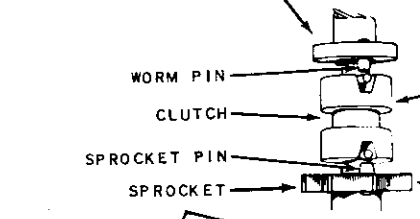
NOTE: "Clutch 2" adjustment should be correct before making this adjustment.

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

"Clutch 3"
"Clutch 4"

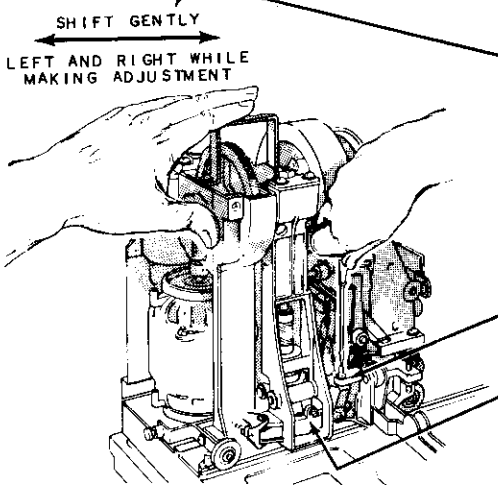
(B) Place Mechanism in A1 PLAY position. Be sure mechanism is fully in PLAY position.

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.

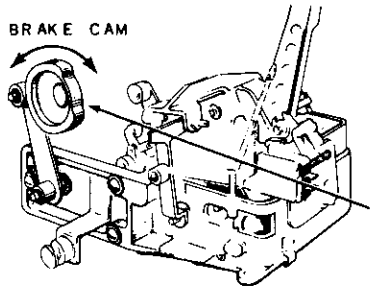


(C) While gently shifting Carriage to Left and Right by hand, - - - - - - - - - -

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 and check Reverse Relay Latching adjustment.



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.

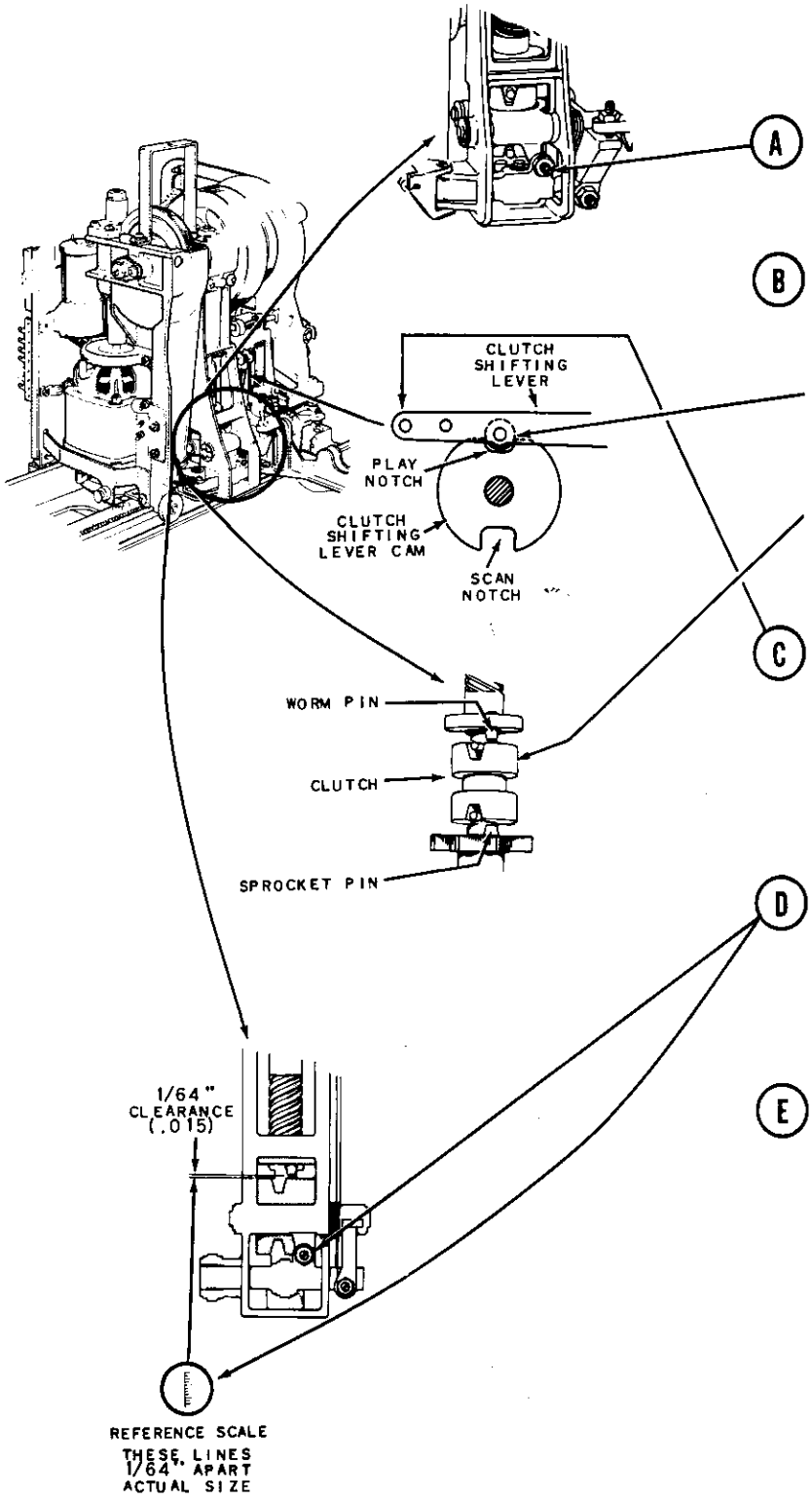
Turning the screw down too far will set up severe strains in the levers and will cause the Cam Assembly to bind when entering PLAY position. When adjustment is completed, check for freedom of action of Cam Assembly by turning Brake Cam by hand in both directions. Cam should have a slight amount of rotational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

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"CLUTCH 4" – CLUTCH PLAY POSITION ADJUSTMENT

This adjustment establishes the playing position of the Clutch. This results in 1/64 inch 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 A1 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 inch (.015) clearance between the bottom of the Worm Pin and the top of the Clutch.

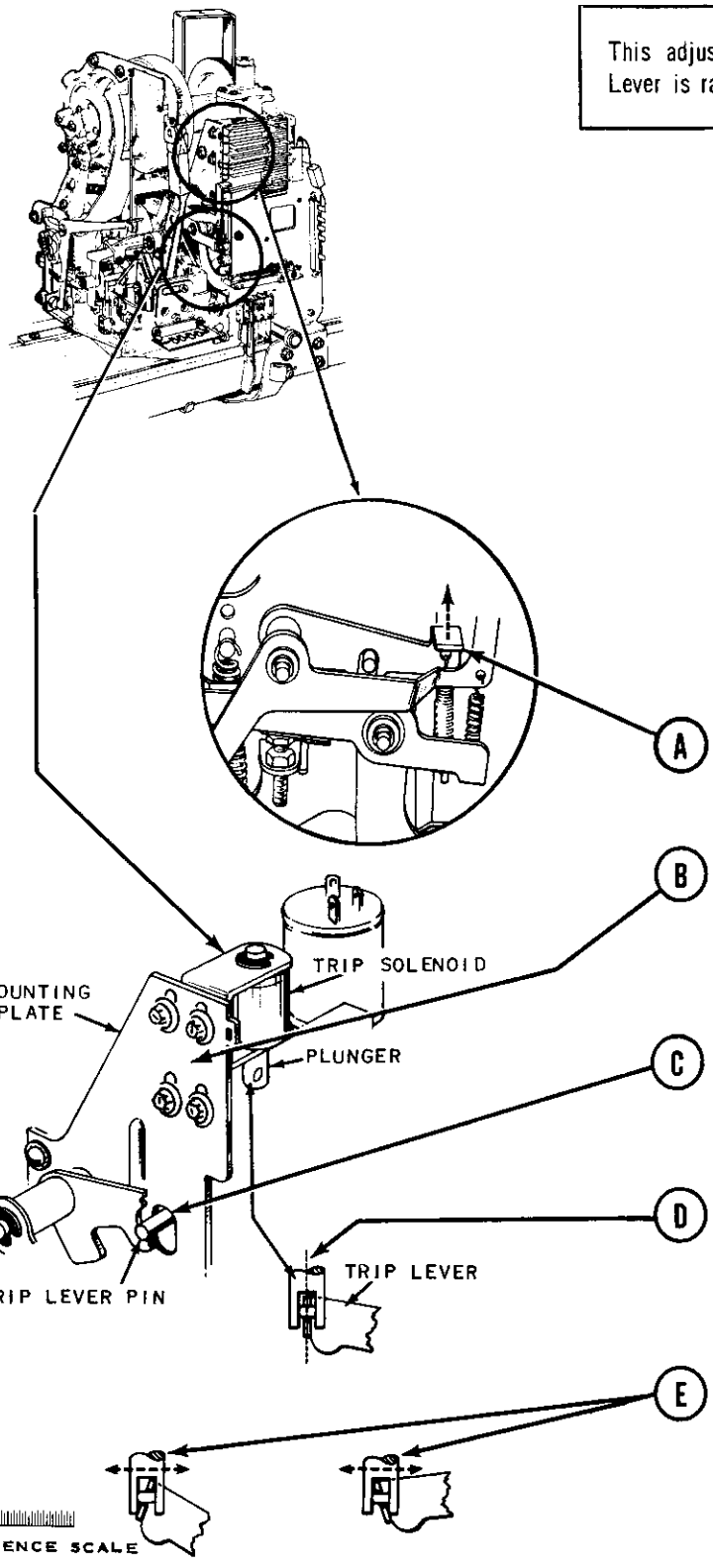
(E) Tighten Lock Nut.

NOTE: Clutch should drop freely, (to 1/64 inch 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.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"TRIP SOLENOID" – 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 - - - - - - - -

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 inch when the Solenoid Plunger is in the fully raised position.

C

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.

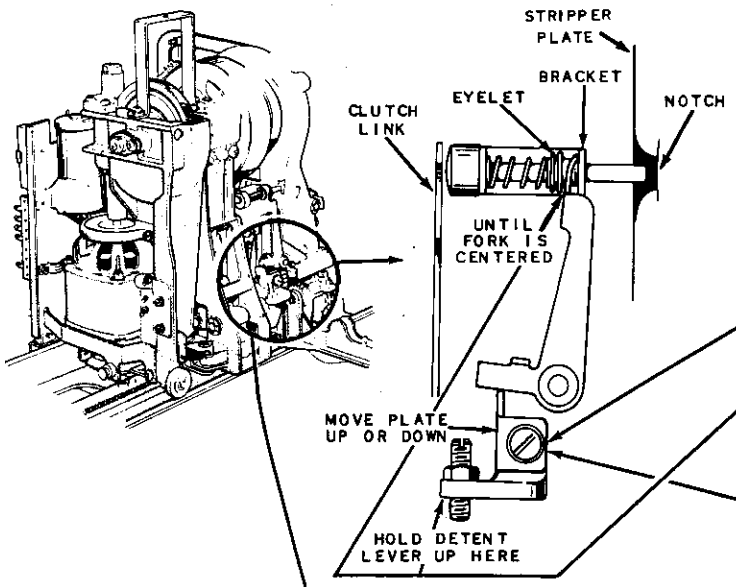
The upper and lower brackets holding the Solenoid should be square with the coil.

SELECT-O-MATIC MECHANISM ADJUSTMENTS Page 13

"SAFETY LEVER" – SAFETY LEVER POSITION

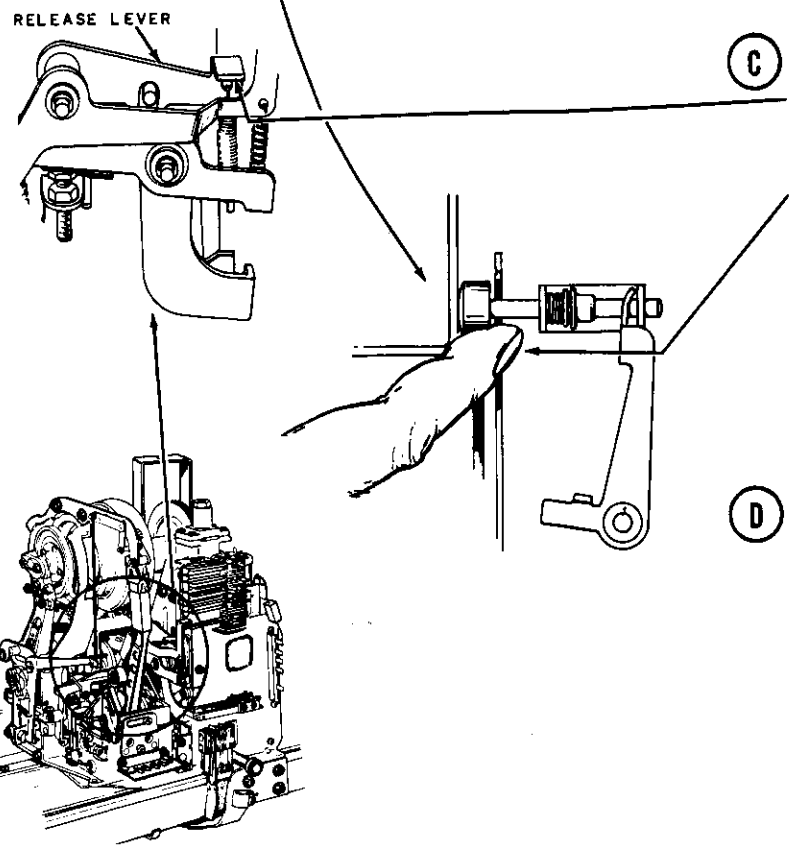
This adjustment establishes the correct position of the Safety Lever and results in proper travel of the Safety Plunger when the mechanism is entering PLAY or SCAN position.

(A) Scan Carriage to right end beyond A1 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,

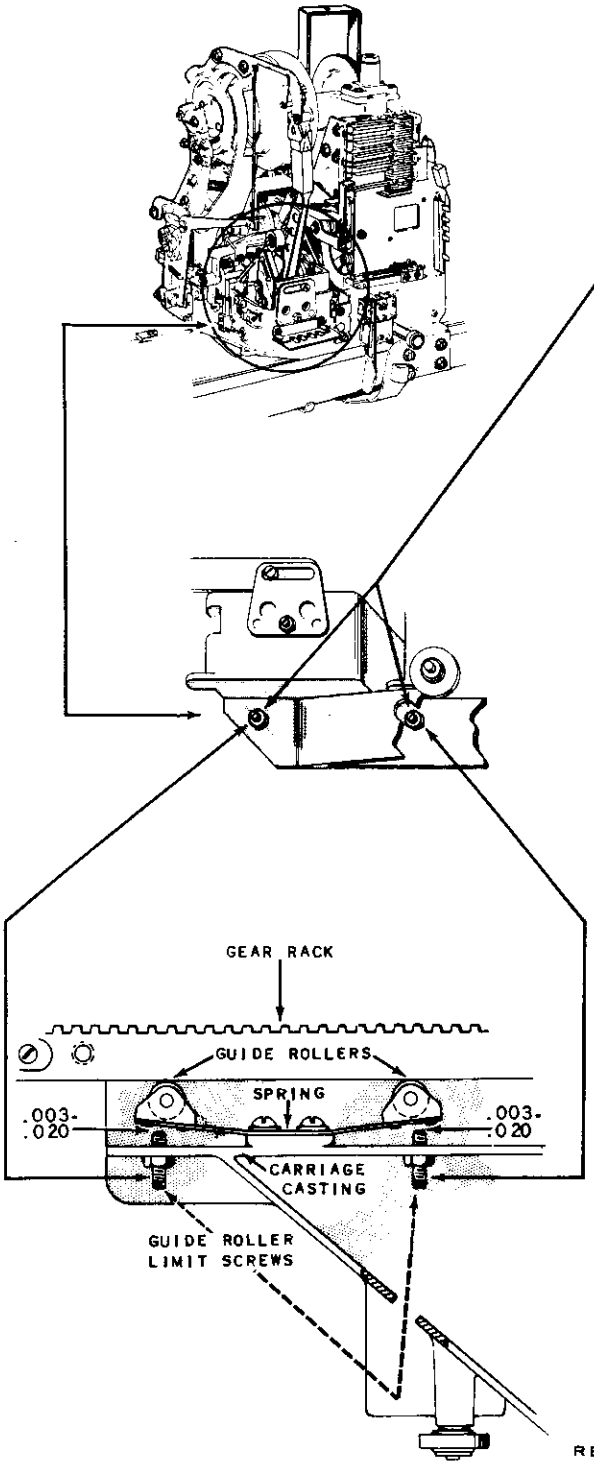
1. Trip the mechanism by manually lifting the Release Lever.
2. Pull Plunger all the way over to the left (as shown) and release slowly to right. Plunger should return freely without binds.

(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.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"GUIDE ROLLERS" – 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 ½ 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 ¼ turn if necessary to avoid binding.

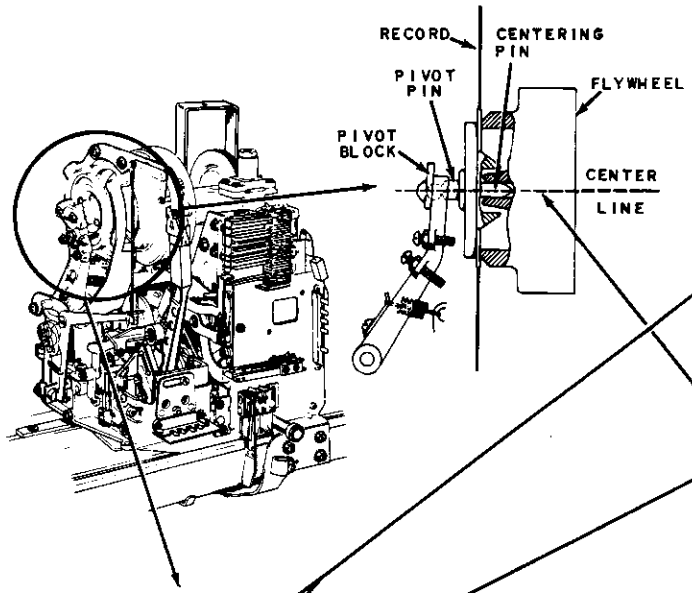
D To check Guide Roller Spring pressure, push left side of Carriage toward the rear and release slowly. Repeat with right side of Carriage. Spring pressure on each side should be great enough to fully reset the Carriage to its normal forward positions.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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.

NOTE: The horizontal position of the clamp arm MUST BE CORRECT before making this adjustment.



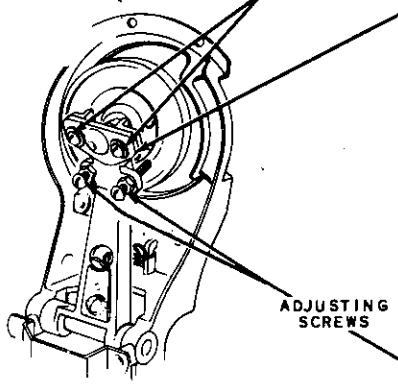
(A) Place mechanism in PLAY position with a 45 rpm. record clamped on the Flywheel.

(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 inch below the center line of the Flywheel Shaft, and tighten screws.

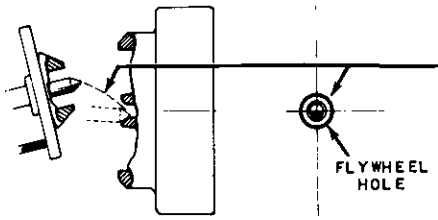
"CLAMP ARM 2" – CENTERING PIN POSITION

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 - - - - - - - - - -

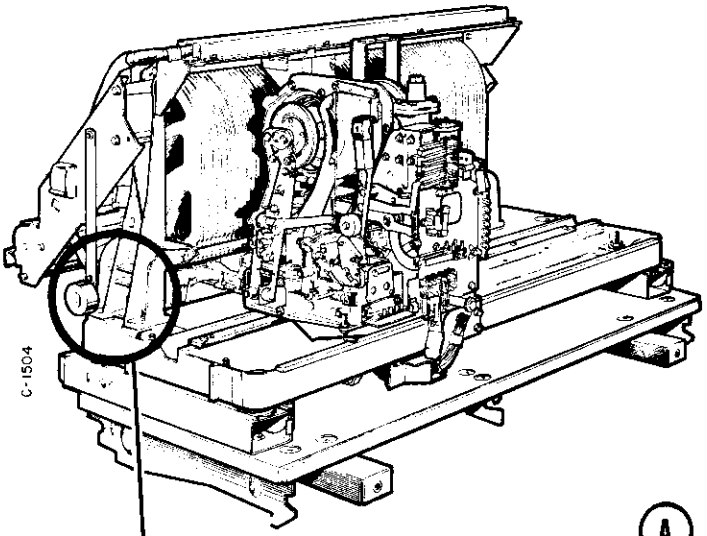


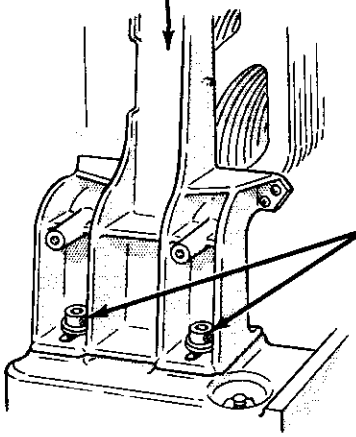
(B) Tip of Centering Pin enters flywheel hole as shown.

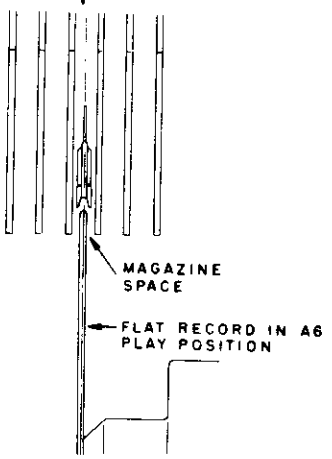
(C) Tighten Lock Nuts.

SELECT-O-MATIC MECHANISM ADJUSTMENT
"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.

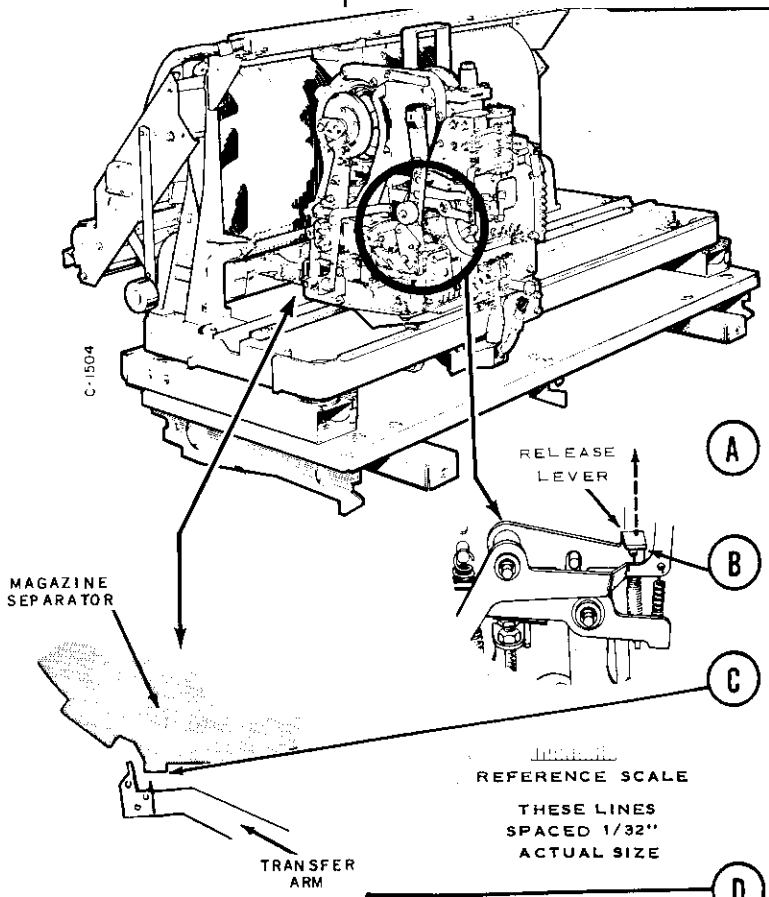
(D) Tighten cap screws. (Be sure the screws are tight.)

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

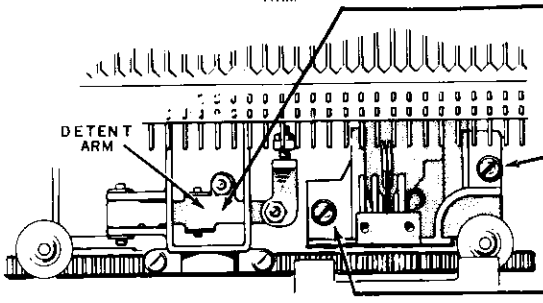
"Transfer Arm 1"
"Contact Plunger Block 1 and 2"
"Tormat Memory Unit Position"
"Selection Playing Indicator"

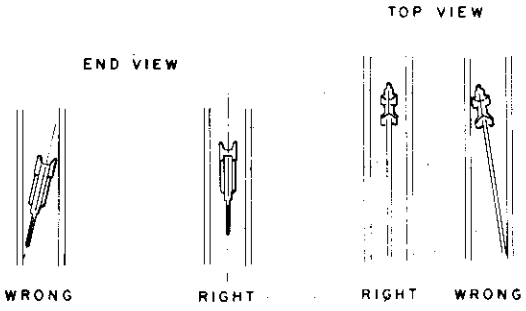
"TRANSFER ARM 1" – ALIGNMENT TO MAGAZINE

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.



FRONT 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 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.

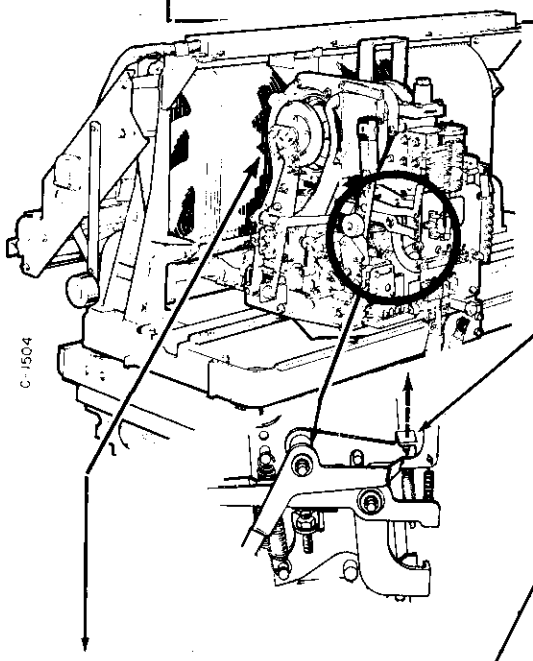
G When the Transfer Arm enters the space, the Transfer Arm Head should be parallel to the Magazine Separators as shown. Straighten Arm if necessary to correct Transfer Arm Head alignment.

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

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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.



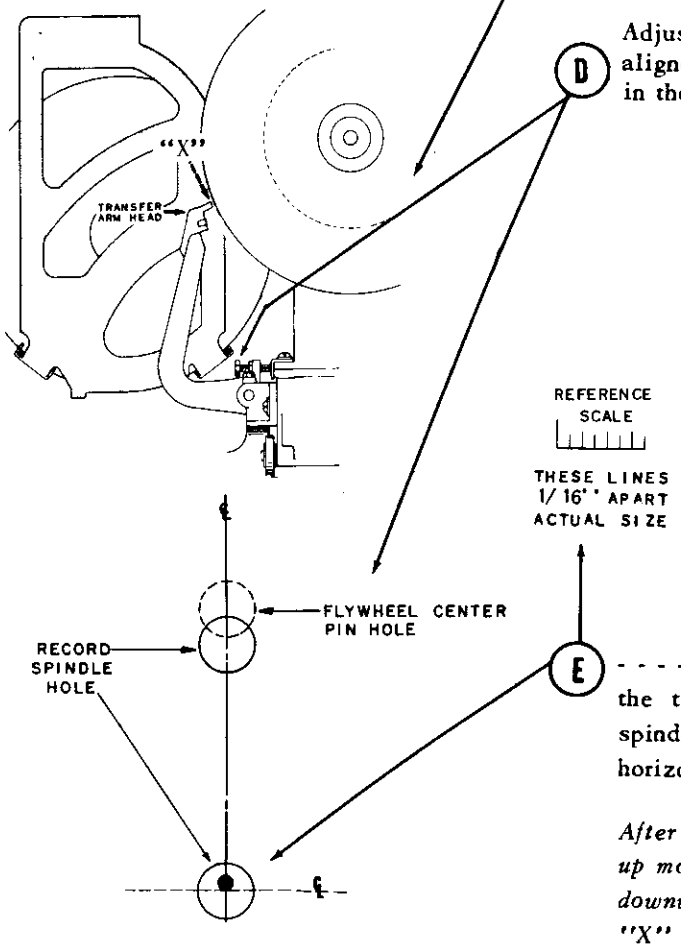
NOTE: CLAMP ARM 1 & 2 ADJUSTMENTS MUST BE CORRECT BEFORE MAKING THIS ADJUSTMENT.

A Scan the carriage to the Right, stopping it *one position to the RIGHT of V8* so the Transfer Arm will come up outside the magazine.

B Trip the mechanism by manually lifting the Release Lever.

C Place a normal* size record 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.

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



E - - - - - 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 and the pick-up moves to the record, the Transfer Arm moves downward so there is about 1/4" clearance at "X" in play position.

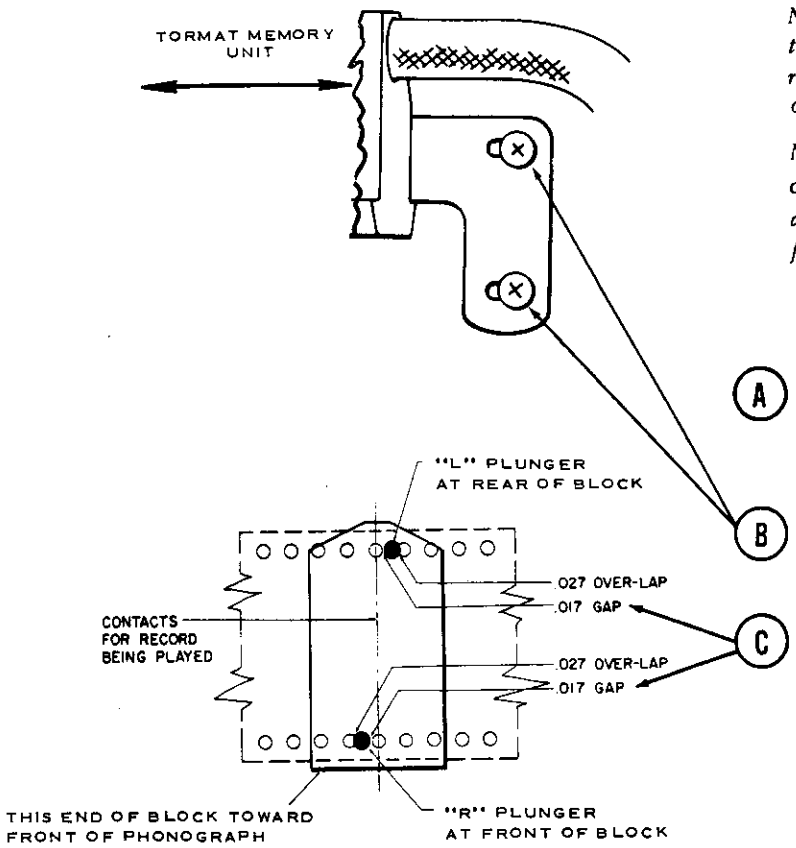
*DIAMETER OF A NORMAL SIZE RECORD IS 6 - 7/8" ± 1/32".

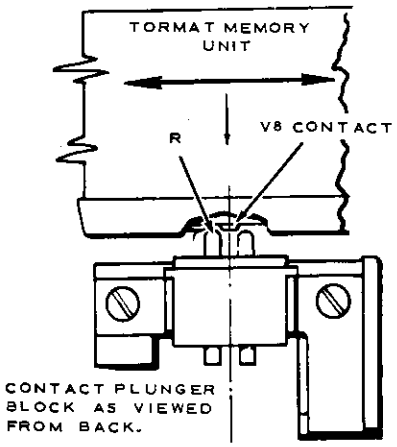
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 V8 and mounting it on the magazine with rear plunger just touching contact rivet for adjacent selection (to the left of the contact for V8).





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 left and right of the contacts associated with the record being "played". The contacts and plungers will be separated by approximately 1/64" (0.017) as shown and the gap should be the same for each.

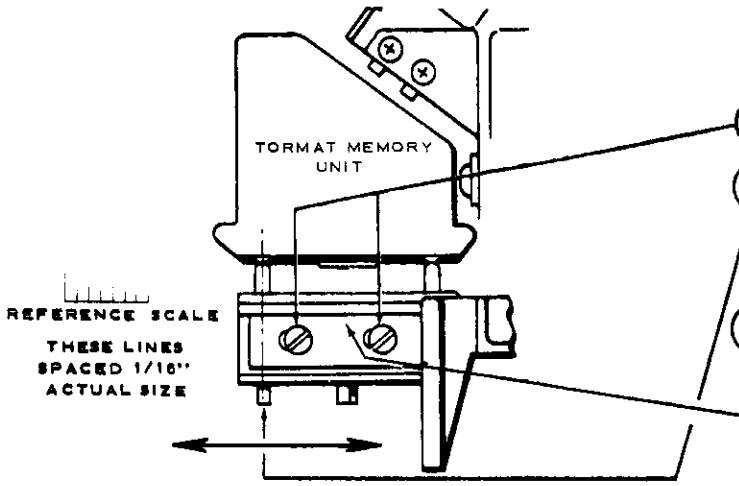
Place mechanism in PLAY position at the end record spaces of the magazine, then check the positions of the plungers relative to the Memory Unit contacts. The gaps between the plungers and the end contacts should be approximately 0.017" as in C (above) and should be equal. Exactly equal separation at 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.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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.



(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.

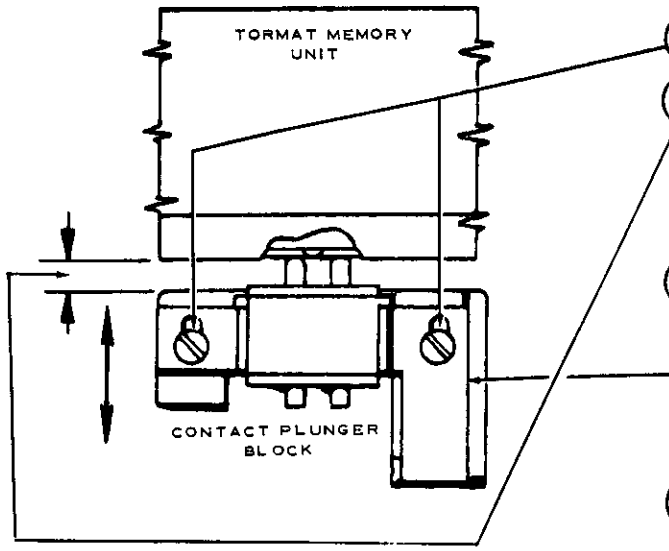
NOTE: Edge of bracket must be against flange on casting during adjustment and tightening of screws.

(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 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 inch from the surface of the Tormat Memory Unit.

(D) Securely tighten adjusting screws.

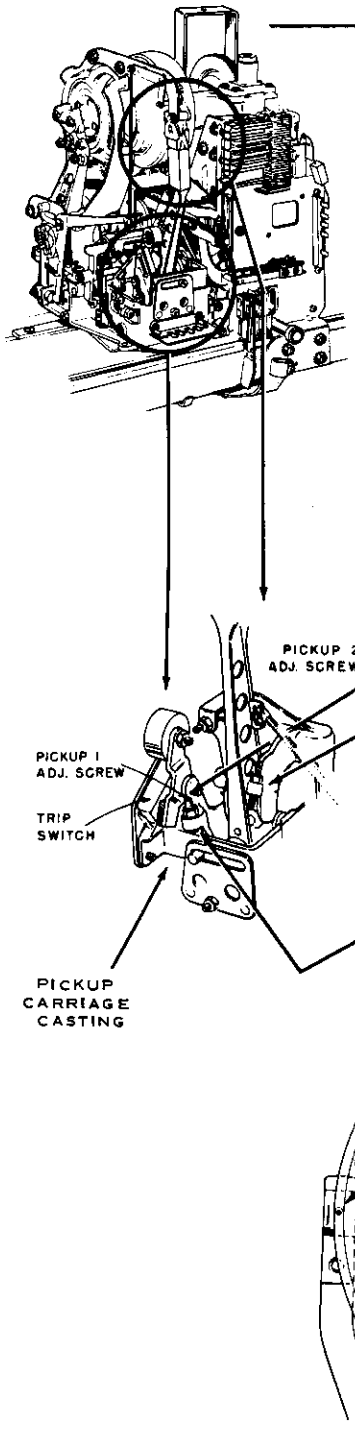
NOTE: Edge of bracket must be against flange on casting during adjustment and tightening of screws.

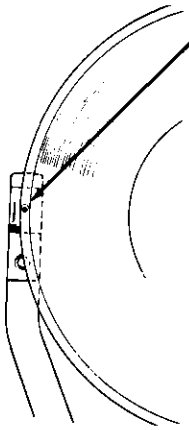
(E) Check adjustment at the end record positions of the magazine.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 Right side of a normal* record (preferably a transparent type) and place the record and the mechanism in Right 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 Left side of the same record and check for proper needle landing at the beginning of Left Side PLAY.

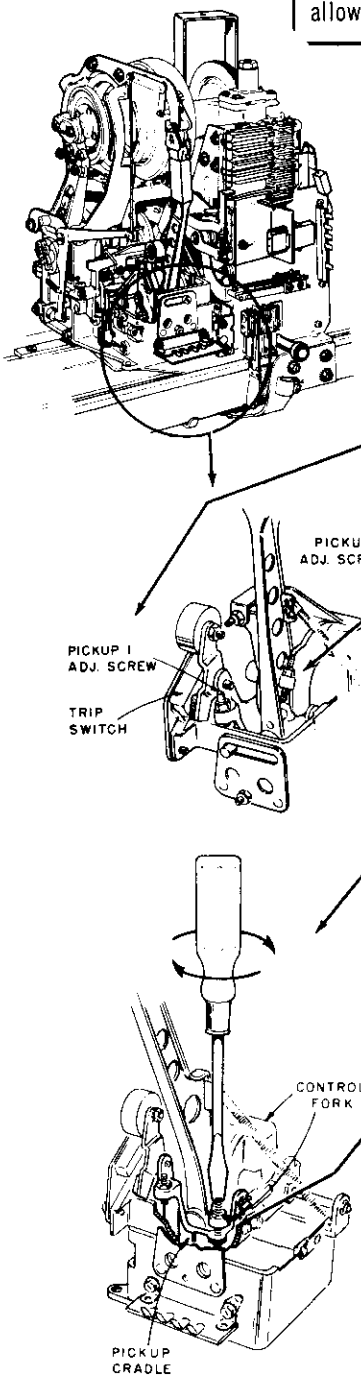
(G) After this adjustment had been made, adjust "Pickup 2" as shown on the following page.

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

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 Right 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 ¼ 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).

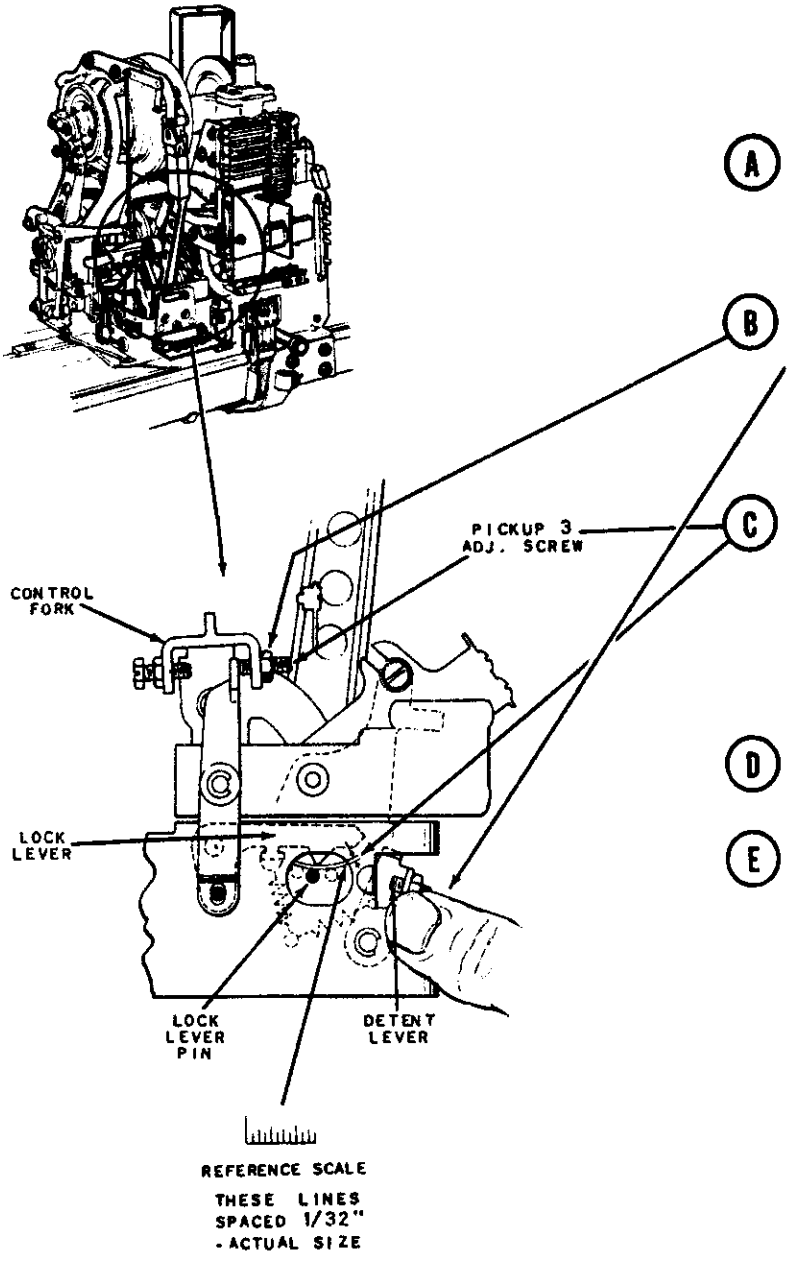
F Place mechanism in Left side PLAY position then return it to SCAN with Pickup Arm on Left Side. Check for equivalent up and down play of Control Fork with Pickup Arm on Left side.

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.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"PICKUP 3" – PICKUP RELEASE ADJUSTMENT

This adjustment establishes 1/32 inch 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 Right 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 inch when the Pin is moved past the Lever.

(D) Tighten Lock Nut.

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

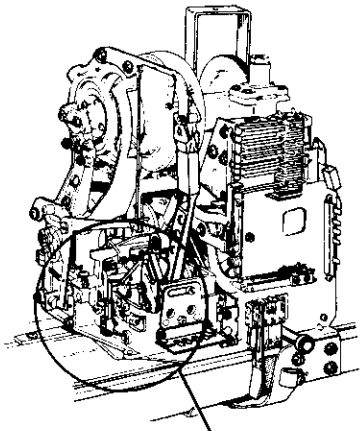
If clearance is not approximately the same in both Right and Left side PLAY positions, check Lock Lever Pin alignment. Straighten Pin, if necessary.

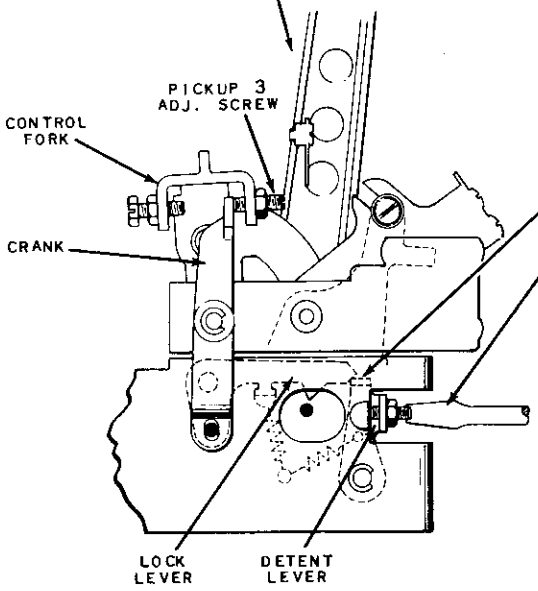
NOTE: This adjustment should be followed by "Pickup 4" adjustment.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 Left 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.

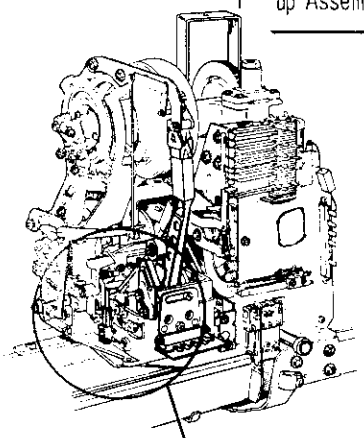
(C) Tighten Lock Nut.

(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.

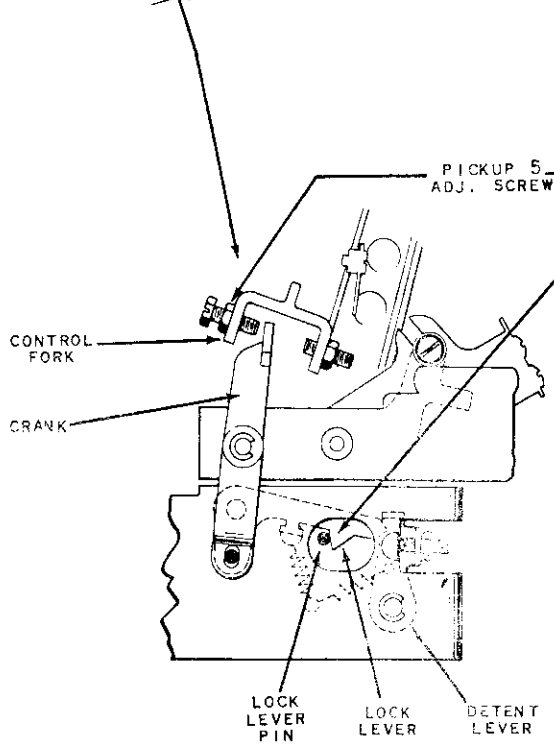
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"PICKUP 5" – PICKUP LOCKING ADJUSTMENT

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



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



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

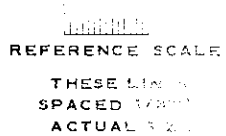
Ⓑ Lock Lever should be engaged with Lock Lever Pin. Pull Detent Lever out of way, if necessary, to allow Lock Lever to drop against pin.

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

Ⓓ Tighten Lock Nut.

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

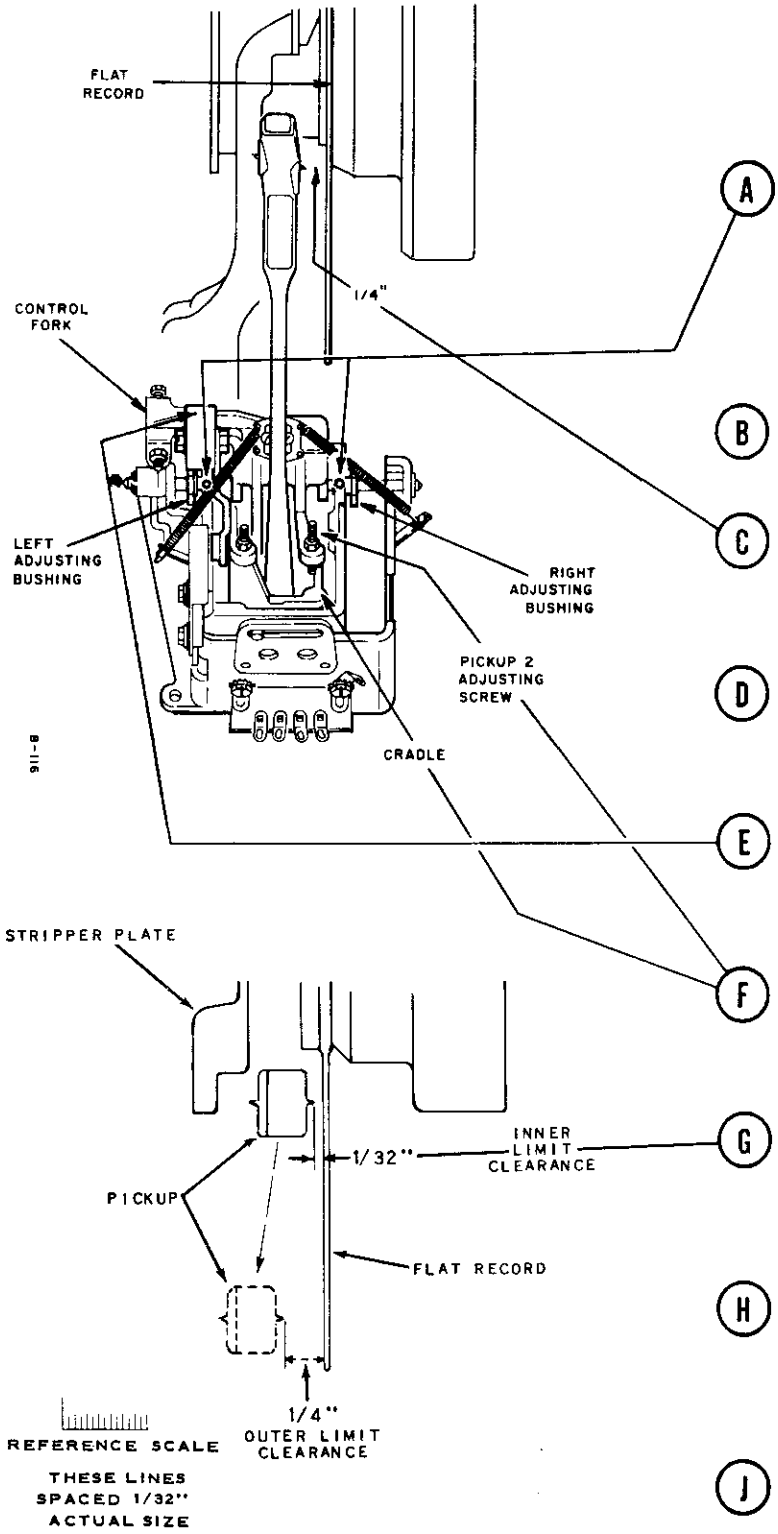
Ⓕ Check resetting action - - by returning mechanism to Left side SCAN position. Lock Lever should be returned to Lock position against Pin and clearance between screw tip and Crank should be 1/32 inch.



SELECT-O-MATIC MECHANISM ADJUSTMENTS

"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 Right 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 ¼ inch clearance between record and needle.

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

(E) Hold Pickup in this position by pressing forward lightly on cradle counterweight.

(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 inch from the record.

(H)

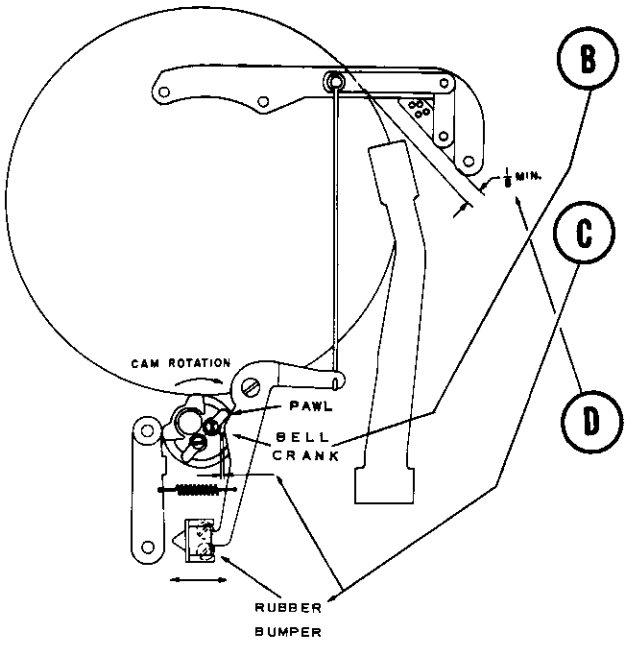
Repeat above for Left side PLAY position using Right Adjusting Bushing to make adjustment.

(J) Tighten both set screws.

SELECT–O–MATIC MECHANISM ADJUSTMENTS

"PICKUP 8" – BRUSH ADJUSTMENTS

This adjustment positions the brush for correct operation and clearance.



A With mechanism in SCAN position, manually operate the release lever to trip.

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

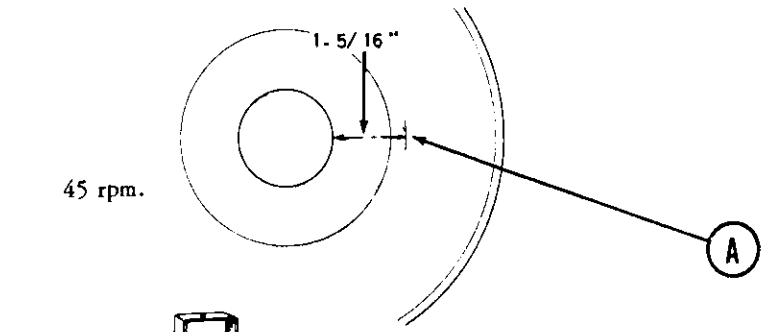
C Position rubber bumper so that (as cam rotates in direction shown) bell crank does not touch hub of pawl. 1/64 inch maximum clearance allowable.

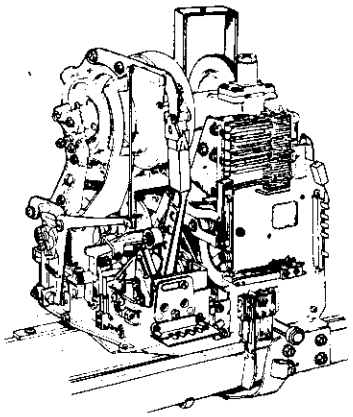
D With rubber bumpers adjusted, as in **C** and with record in PLAY position, clearance between brush blade and record must be not less than 1/8 inch.

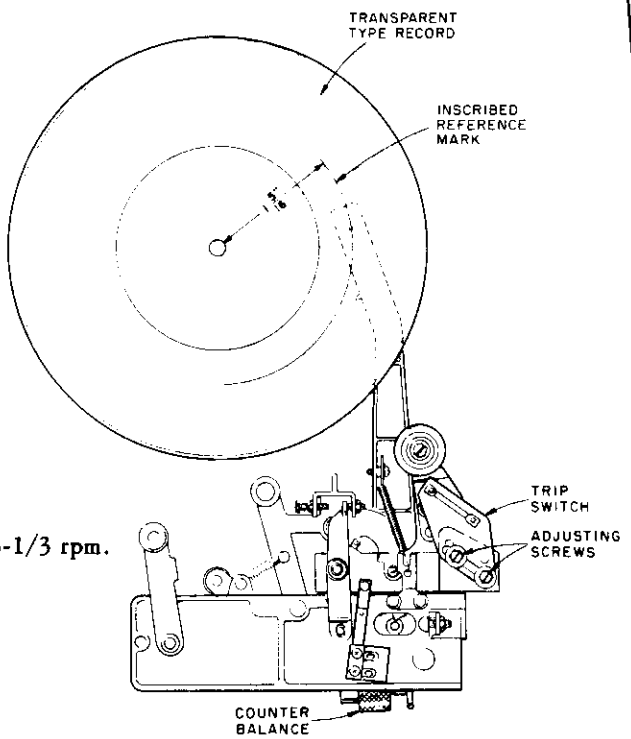
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"PICKUP 10" – "RECORD CUT-OFF" (Trip Switch 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 inch from the edge of the hole in the record.







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 Left side PLAY position with inscribed record clamped on flywheel. Turn on power.

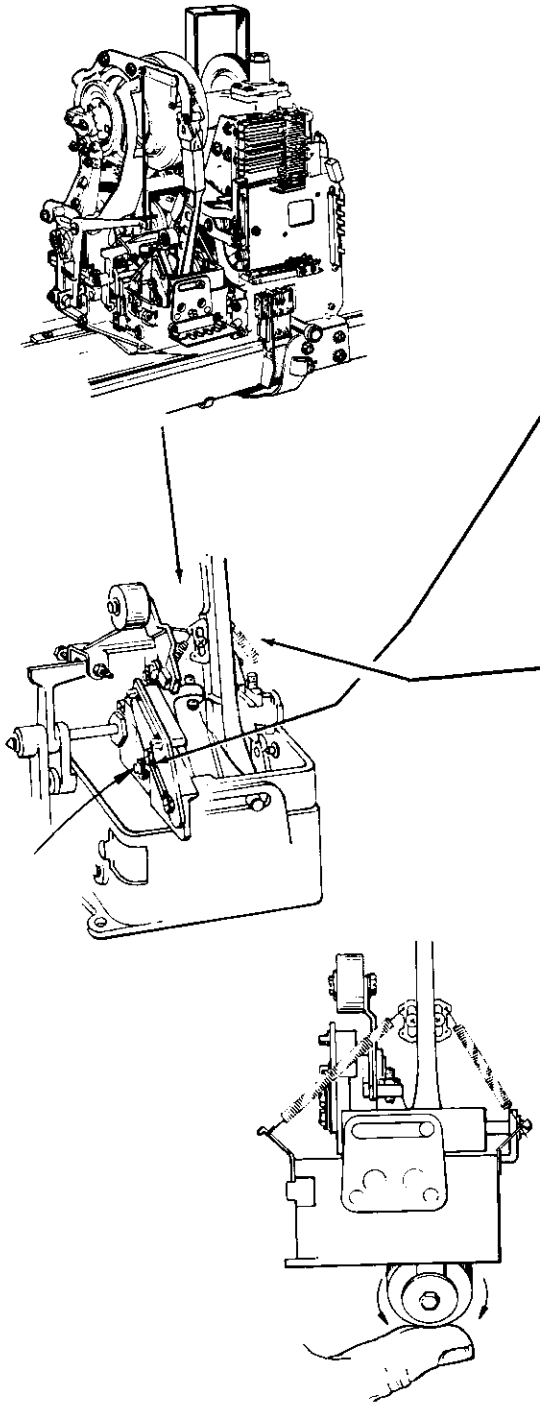
C Loosen screw and position Trip Switch so it will operate when needle reaches inscribed mark.

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 is changed be sure to readjust and check "Pickup 11".

"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.

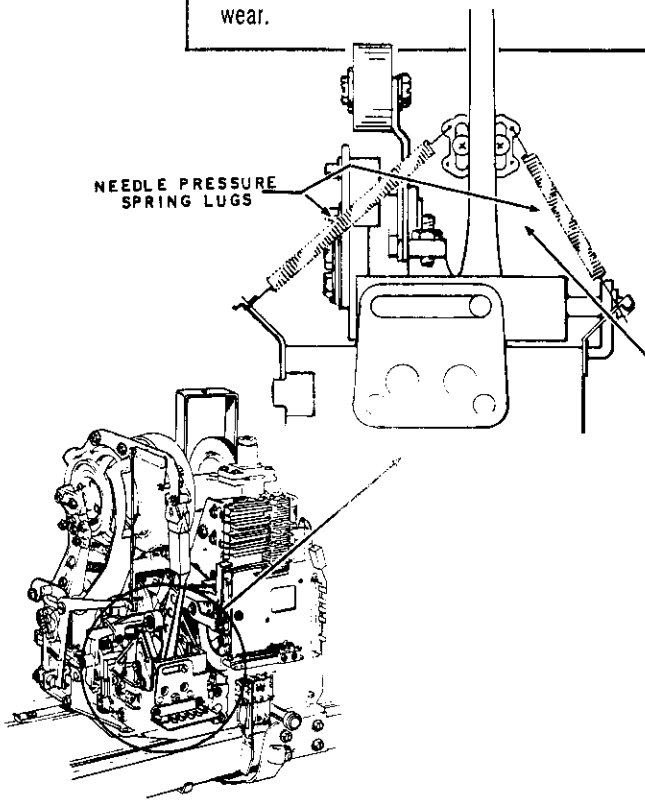
Check the balance by holding the pick-up 1/8 inch to 1/4 inch from the record, releasing carefully, and observing the DIRECTION in which it moves. Ignore the slow movement toward or away from the record surface. There should be no *in or out* movement (toward or away from the record center). In or out 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.

SELECT–O–MATIC MECHANISM ADJUSTMENTS

"PICKUP 13" – NEEDLE PRESSURE ADJUSTMENTS

This adjustment establishes the needle pressure at 2½ to 3 grams for either Right or Left sides. Correct pressures result in proper tracking and in a minimum of needle and record wear.



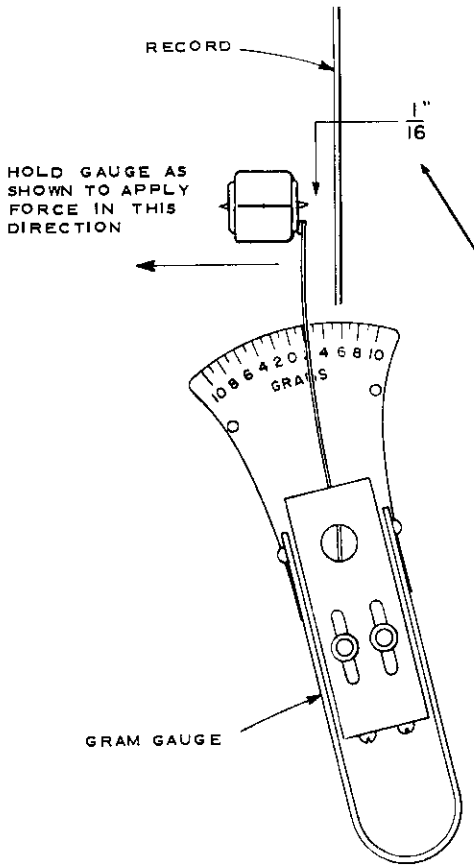
(A) Place mechanism in Right side PLAY position with a flat record clamped on the Flywheel.

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

(C) Adjust position of Pressure Spring Lug on Left side of Pickup Arm so that needle pressure is 2½ to 3 grams.

(D) Repeat same procedure on Left side PLAY position by adjusting the pressure Spring Lug on Right side of the Pickup Arm for 2½ to 3 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 and lift the pickup so that needle is about ¼ inch from the record.

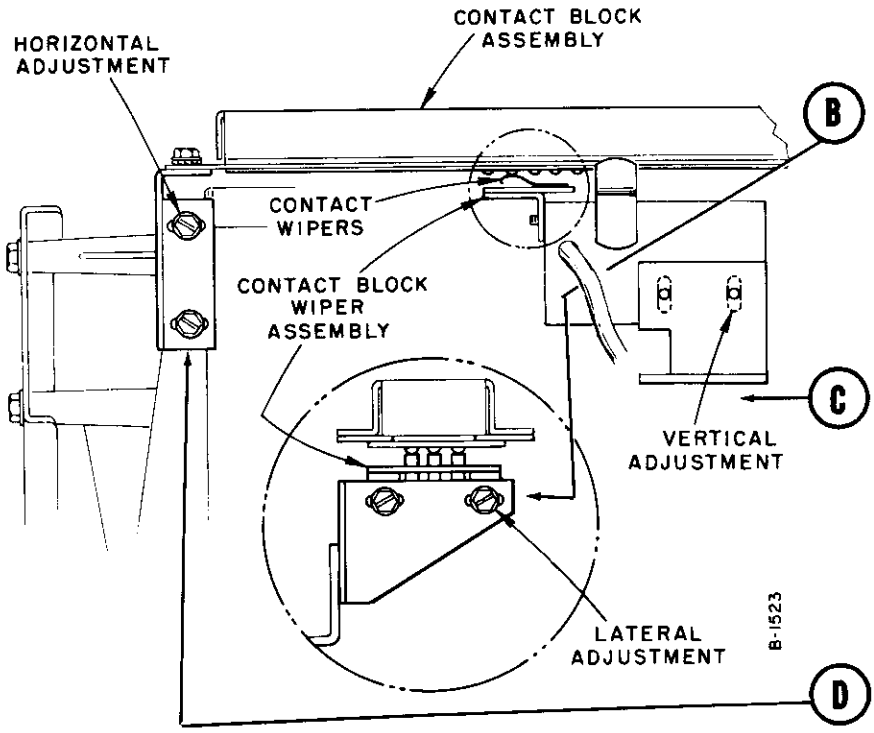
(2) Slowly relax the force of the gauge against the Pickup so the needle moves toward the record.

(3) Stop the inward movement when the needle is about 1/16 inch from the record and read indicated pressure on gauge. Pressure should be between 2½ and 3 grams.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

"SELECTION PLAYING INDICATOR"

These adjustments align the Selection Playing Indicator System for proper indication.



A Place the mechanism in record playing position for record A5 and stop motor by operating the service switch.

B Loosen the screws for the lateral adjustment of the Contact Block Wiper Assembly. Adjust the Contact Block Wiper Assembly so that each wiper is centered under a row of contacts on the contact block. Tighten the screws.

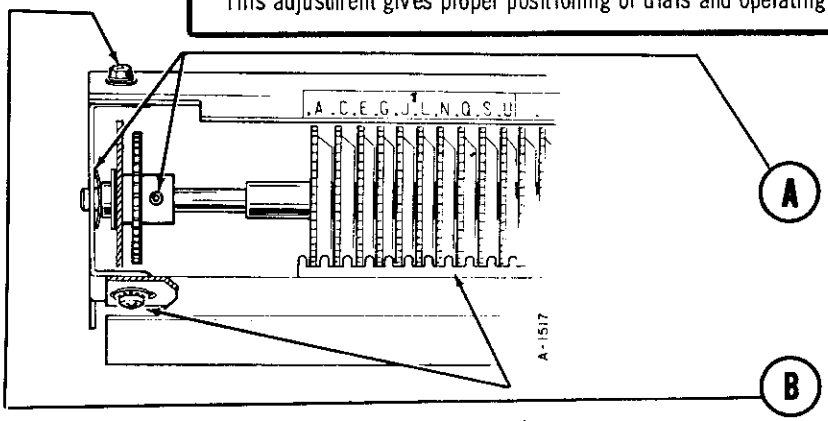
C Loosen the screws for vertical adjustment. Adjust the Contact Block Wiper Assembly for 1/8 inch clearance between the top of the Contact Block Wiper Assembly and the bottom of the contact block. Tighten the screws.

D Loosen the screws for horizontal adjustment. Adjust the contact block so that the wipers are centered under the contacts causing A5 to light on the Selection Playing Indicator.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

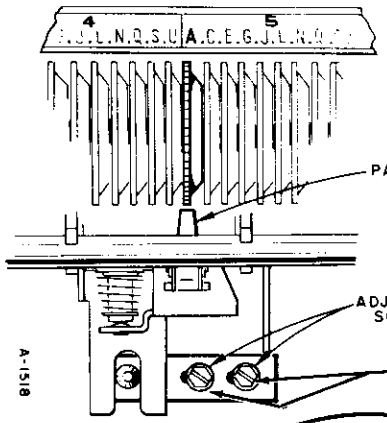
"POPULARITY METER" – DIAL ADJUSTMENT

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



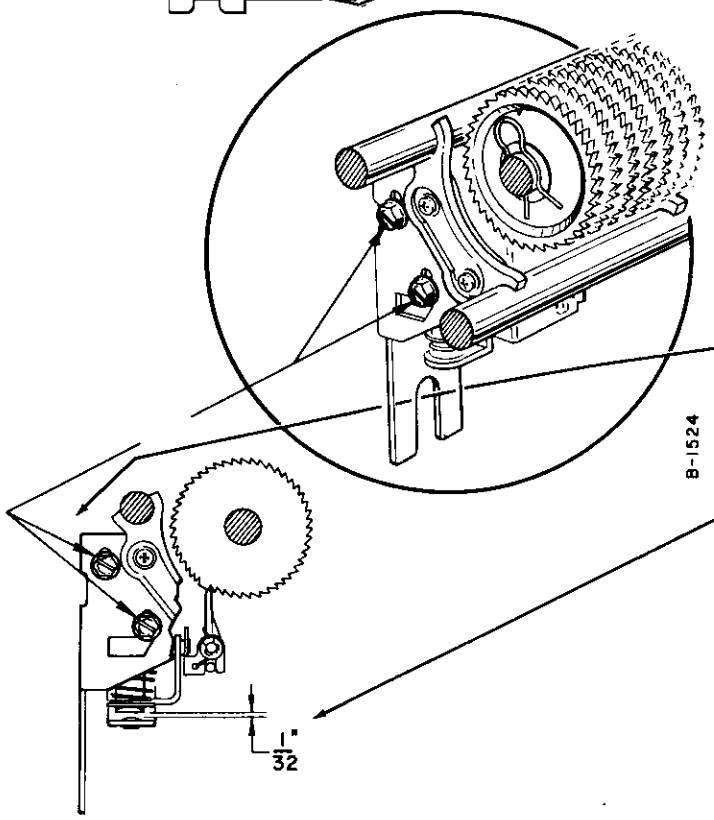
A Position ratchet wheel on dial and shaft assembly so that spring washer is compressed and wheel is centered on pawl. Tighten set screws.

B Loosen the two (2) screws holding the indicator strip and adjust so that the dot on label A1 lines up with the A1 dial.



C 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.

D With the mechanism in play position at A5, adjust actuator assembly laterally to have centerline of pawl in line with centerline of full width of tooth of A5 dial.



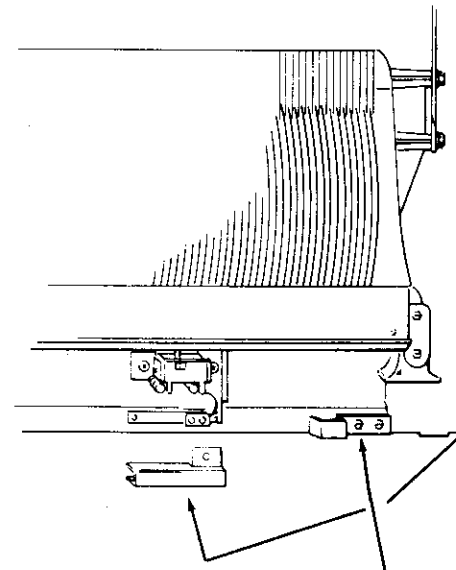
E Loosen the two screws holding solenoid frame.

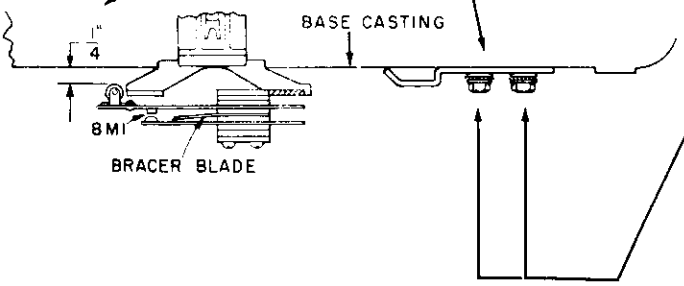
F Hold the solenoid plunger in the energized position and position the assembly so that there remains a minimum of 1/32 inch clearance between the top of the plunger and the actuator. Tighten screws.

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.

(B) 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 cap of switch "8M1" 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 "8M1". Tighten screws.

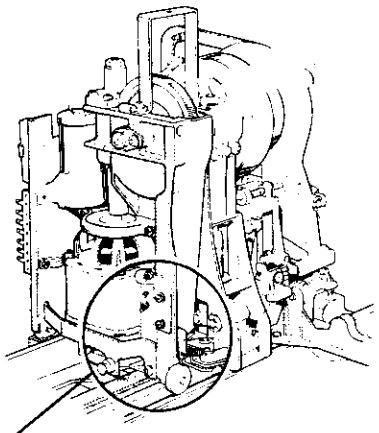
REFERENCE SCALE

THESE LINES SPACED 1/32" ACTUAL SIZE

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.

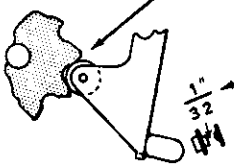
SELECT-O-MATIC MECHANISM ADJUSTMENTS

"DETENT SWITCH" - CONTACT GAP AND PRESSURE ADJUSTMENT



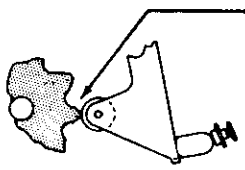
(A) Remove cover from switch stack.

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



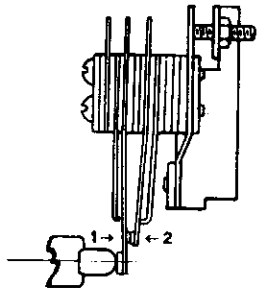
(C) Form bracer blades for 1/32 inch contact gap between blades 1 and 2. Maintain a bracer blade follow of at least .015" for each bracer blade.

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.



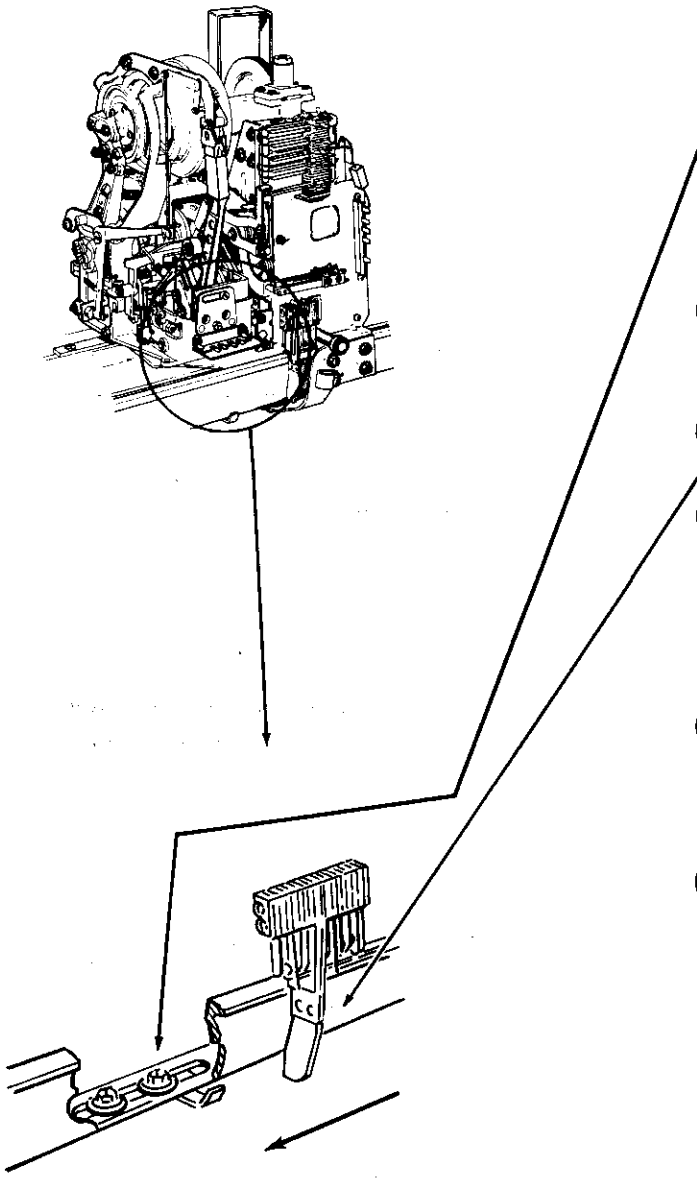
SWITCH ACTUATOR

(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

"REVERSING SWITCH 1" – SWITCH BRACKETS

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



REFERENCE SCALE
THESE LINES SPACED 1/16" ACTUAL SIZE

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

(B) Select V8 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) Move the reversing switch lever so it is toward the right as shown.

(E) Return mechanism to SCAN and turn the motor shaft manually until the mechanism has moved 5/16 inch to the RIGHT of the reference mark made on the base.

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

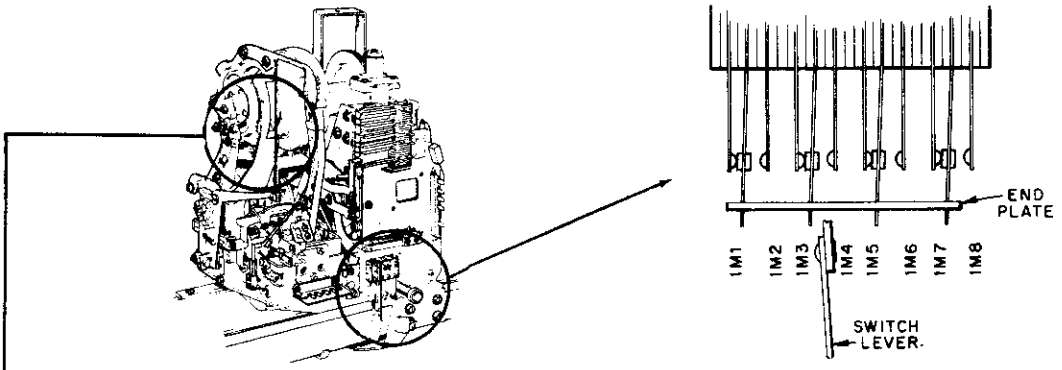
(G) Scan the carriage out of the way to the left, being careful not to move the Bracket, and tighten the bracket holding screws.

(H) Adjust the LEFT Reversing Switch Bracket so the Switch operates when the carriage is 5/16 inch to the LEFT of the record position at the left hand end of the magazine.

See "Reversing Switch 2" for contact gap adjustment.

SELECT-O-MATIC MECHANISM ADJUSTMENTS

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



CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS *
1M1	1/32 inch clearance when switch lever is to left.	Connects Indicator Lights for indicating right sides of records.
1M2	1/32 inch clearance when switch lever is to right.	Connects Indicator Lights for indicating left sides of records.
1M3	1/32 inch gap at instant 1M4, 1M6 and 1M8 just open.	Connects L contact of Contact Plunger Block for Right Side Selections.
1M4	1/32 inch gap at instant 1M3, 1M5 and 1M7 just open.	Connects R contact of Contact Plunger Block for Left Side Selections.
1M5 & 1M7	1/32 inch gap at instant 1M4, 1M6 and 1M8 just open.	These contacts closed so motor turns for SCANNING to LEFT and for PLAYING RIGHT SIDES.
1M6 & 1M8	1/32 inch gap at instant 1M3, 1M5 and 1M7 just open.	These contacts closed so motor turns for SCANNING to RIGHT and for PLAYING LEFT SIDES.

*see schematic diagram for circuit details.

– ADJUSTMENT PROCEDURE –

CAUTION: TURN OFF POWER! 117 volts is present on contacts 1M5, 1M6, 1M7 and 1M8.

A. Move the switch lever to the right.

B. Adjust contacts 1M1 for a gap of 1/32 inch.

C. Push the bakelite end plate slowly to the right. At the instant contacts 1M4, 1M6 and 1M8 just break, 1M3, 1M5 and 1M7 must have a gap of 1/32 inch.

D. Move the switch lever to the left.

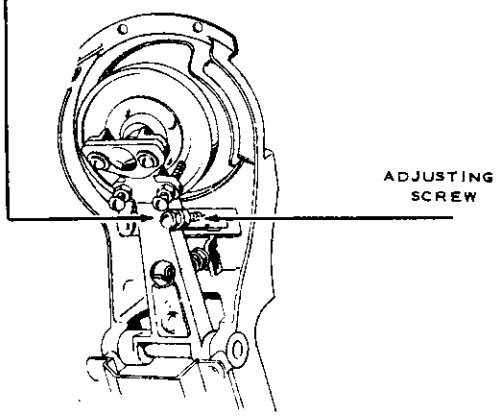
E. Adjust contacts 1M2 for a gap of 1/32 inch.

F. Push the bakelite end plate slowly to the left. At the instant contacts 1M3, 1M5 and 1M7 just break, 1M4, 1M6 and 1M8 must have a gap of 1/32 inch.

ALL CONTACTS MUST HAVE A PRESSURE OF 25 GRAMS (1 OZ.) MINIMUM 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.



CLAMP ARM SWITCH (SHOWN IN PLAY POSITION) WITH 45 RPM. RECORD CLAMPED.

"6M1" contact has 1/32 inch 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.) MINIMUM PRESSURE WHEN CLOSED.

REFERENCE SCALE

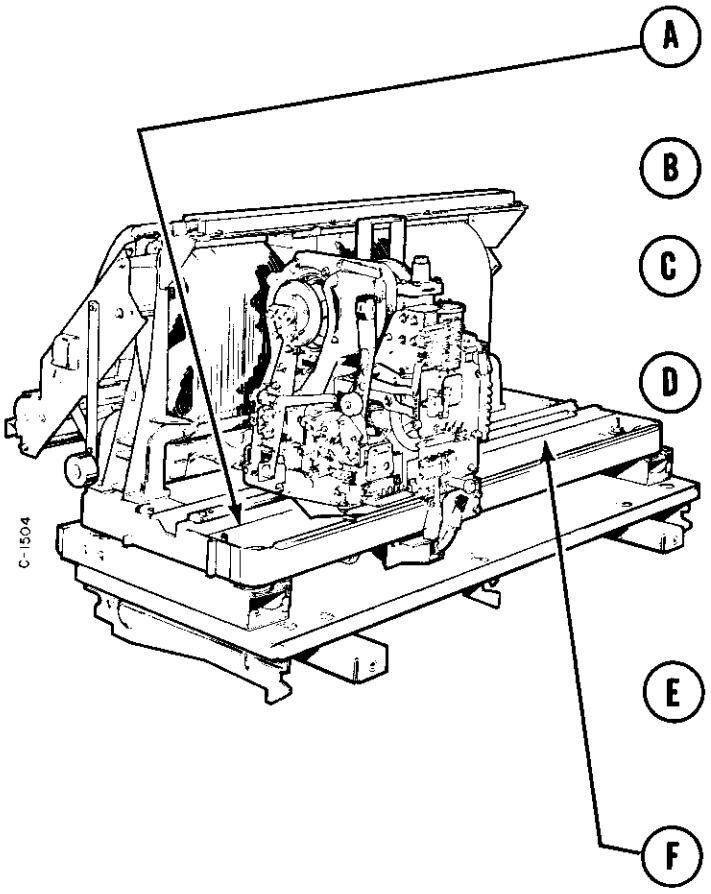
THESE LINES SPACED 1/32" ACTUAL SIZE

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.



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

Select record V8 and turn off power when selection is playing.

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

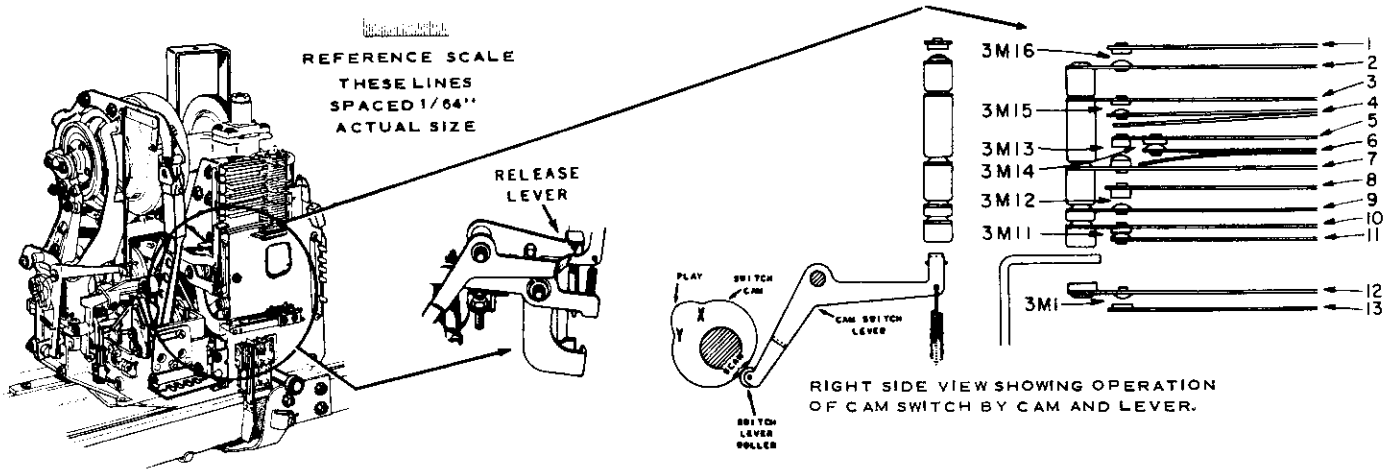
Return mechanism to Scan and turn motor shaft manually until the mechanism has moved 3/8 inch to the Right of the reference mark made on the base. (This point is 1/16 inch past the position at which the reversing switch should operate). The carriage will push the bumper to the correct position.

Scan the carriage out of the way to the left being careful not to move the bracket, and tighten the bracket holding screws.

Using the procedure above, adjust the right bumper by using the selection playing position at the left hand end of the magazine for references and move the bumper 3/8 inch to the right.

SELECT–O–MATIC MECHANISM ADJUSTMENTS

"CAM SWITCH" – – CONTACT GAP AND PRESSURE ADJUSTMENTS



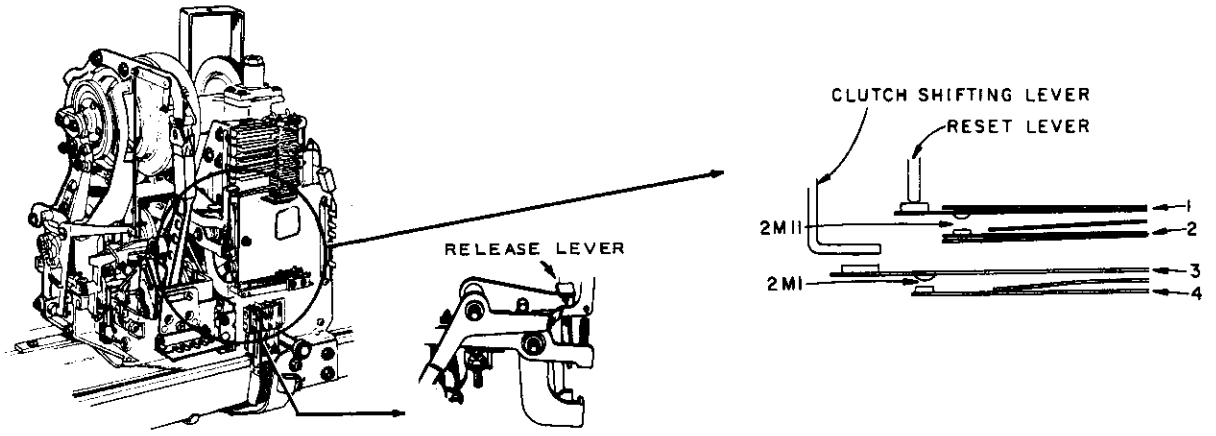
CONTACTS	CONTACT GAP	CONTACT FUNCTIONS
3M11	1/64 inch gap in play position. Closed during SCAN and part of transfer cycle.	Part of mute circuit. Maintains muting action of both channels of amplifier, during SCAN and part of transfer operation.
3M15	3/64 inch gap in PLAY position. Closed in TRANSFER and SCAN.	Adds 1.65 mfd. condenser to motor circuit during TRANSFER and SCAN.
3M14	1/64 inch gap in PLAY position. Closed in SCAN position.	Part of popularity meter solenoid circuit. Just before the mechanism enters PLAY position the 3M13 and 3M14 contacts "Make and Break" controlling the pulse to the popularity meter solenoid.
3M13	1/32 inch gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	
3M12	1/32 inch 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.
3M16	1/32 inch gap in SCAN. Closed only in PLAY.	In series with clamp arm switch, it completes power relay circuit in Auto-Speed Unit (if used).
3MI	1/32 inch gap in PLAY position. Closed in SCAN position.	In holding circuit of trip relay.

– 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 10 against switch lever. (35 grams pressure).
   - B. Bias blade 9 against blade 10.
   - C. Bias blade 7 against blade 9 and adjust blade 8 for 1/32 inch gap at 3M12 contacts.
   - D. Bias blade 3 down so fiber lift touches blade 7 with 3M15 contacts closed (35 grams pressure). 3M12 contacts should still have 1/32 inch gap.
   - E. With 3M14 contacts closed (35 grams pressure) adjust for 1/32 inch gap in 3M13 contacts.
   - F. Adjust blade 12 so fiber lift just touches Switch Lever.
   - G. Adjust blade 13 for 1/32 inch gap in 3M1 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 11 for 1/64 inch gap in 3M11 contacts.
   - B. Adjust blade 4 for 3/64 inch gap in 3M15 contacts.
   - C. Adjust blade 6 for 1/64 inch in 3M14 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 inch gap in 3M13 contacts with 3M14 closed (35 grams pressure).
   - B. Check to see that blade 10 bears against Switch Lever.
   - C. Check for 1/32 inch gap in 3M12 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 1/32 inch gap between 3M16 contacts.
   - C. Adjust blade 13 for 40 grams pressure.

SELECT–O–MATIC MECHANISM ADJUSTMENTS

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



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

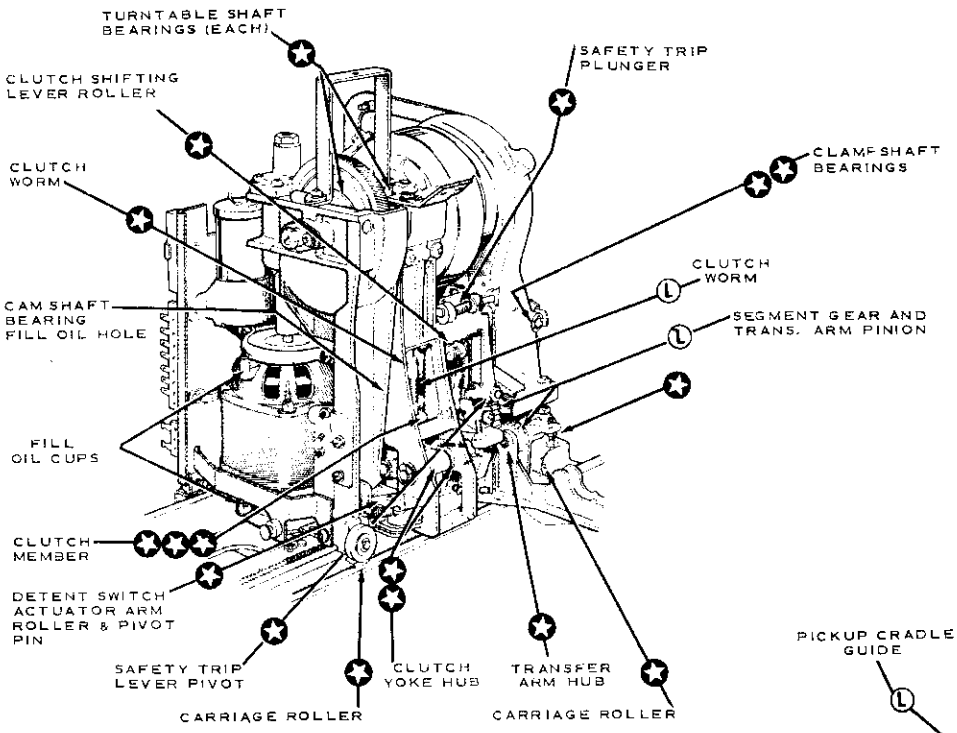
CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS
2M11	3/64 inch gap when mechanism trips. Closed in SCAN and PLAY positions.	Part of Popularity Meter Solenoid Circuit. Allows operation of Solenoid when mechanism is transferring into PLAY position but prevents "Extra" operation when mechanism is transferring out of PLAY position. Also opens ground return of Auto-Speed Unit Power Control Relay Circuit.
2MI	1/64 inch gap in PLAY position. Closed during Transfer and SCAN.	Part of Trip Solenoid Circuit, opens circuit when mechanism trips from SCAN position.

– 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 inch of Reset Lever.
   B. Bias blade 2 against bracer blade and adjust blade 2 for 1/16 inch gap between 2M11 contacts.
3. Turn motor shaft manually until mechanism is in PLAY Position.
   A. Bias blade 3 so its fibre lift bears against Clutch Shifting Lever with 35 grams pressure.
   B. Bias blade 4 against its bracer blade and adjust bracer blade for 1/64 inch gap between 2M1 contacts.

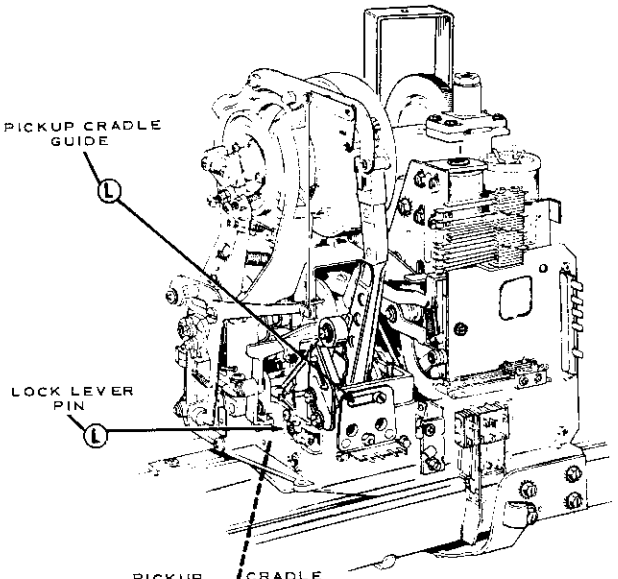
SEEBURG
LUBRICATION CHART

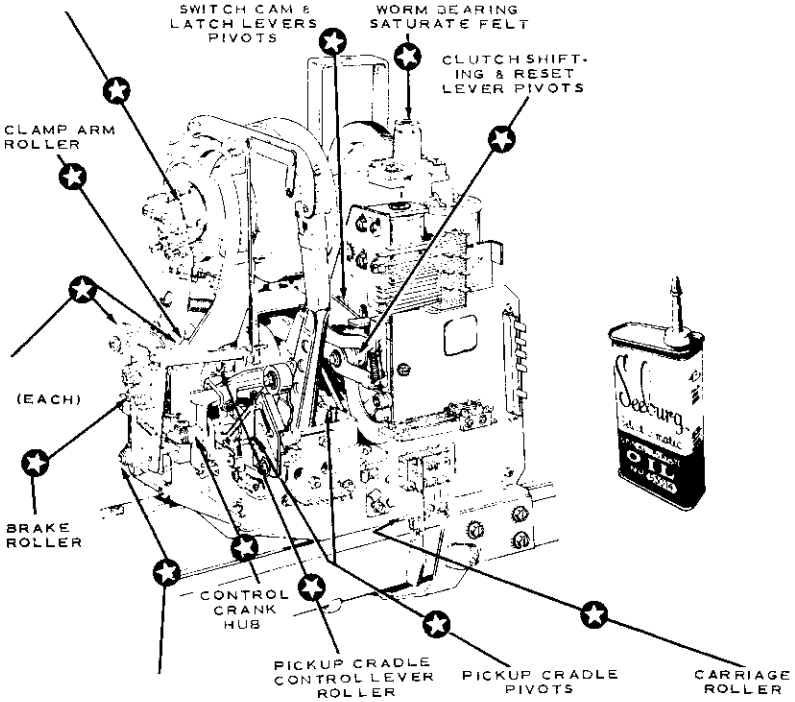


OIL ALL ROLLER PIVOT BEARINGS – 1 OR 2 DROPS

USE AERO LUBRIPLATE** SPARINGLY EVERY SIX MONTHS . . . . . .

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

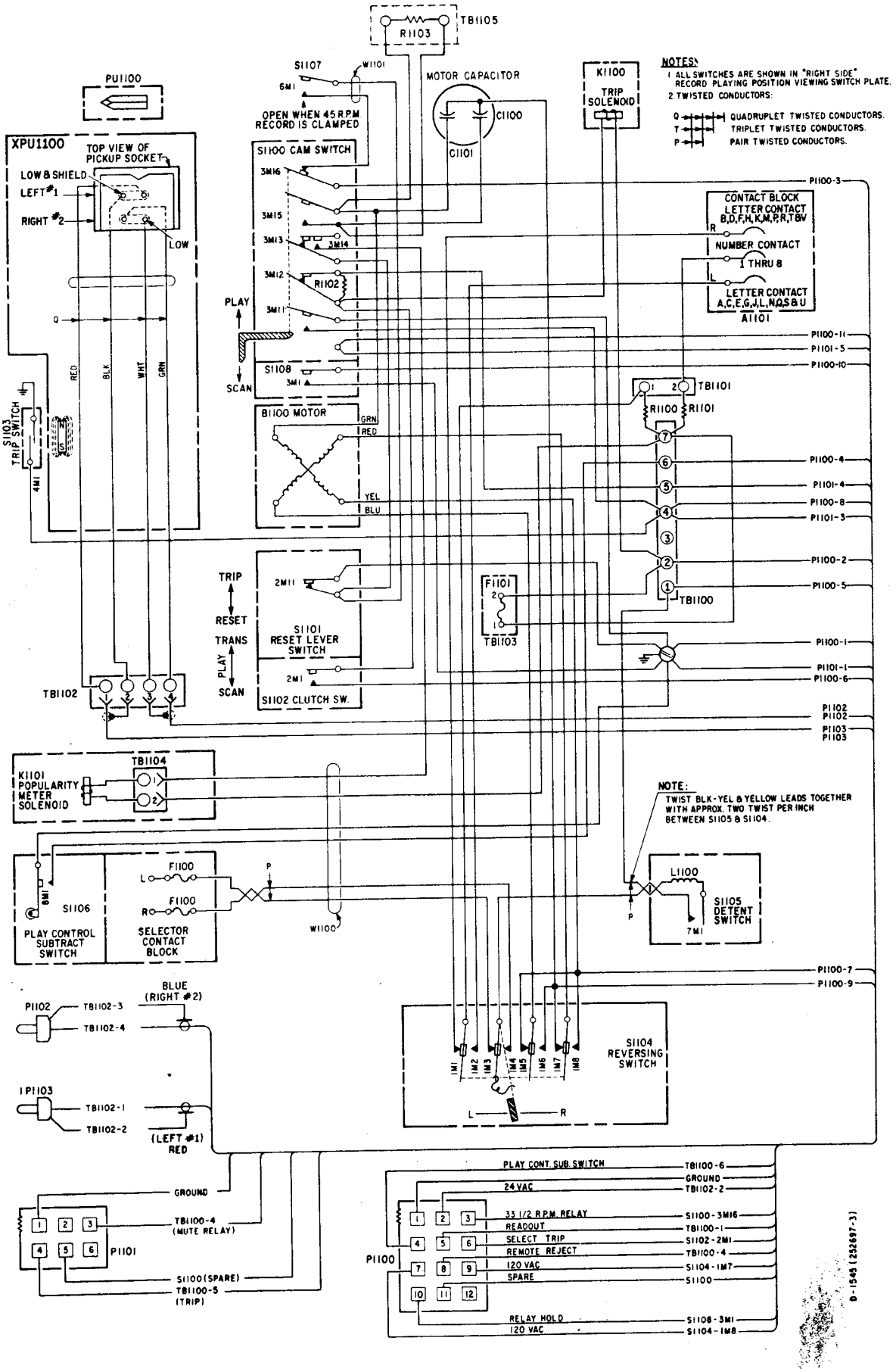




*SEEBURG SPECIAL PURPOSE OIL NO. 53014 MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

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

SELECT-O-MATIC MECHANISM, Type 160ST17 and 160ST17-5



SELECT-O-MATIC MECHANISM, Type 160ST17 and 160ST17-5

Item	Part No.	Description
A1100	252684	Contact Block Assembly
A1101	252722	Contact Block Riveted Assembly
B1100	252413	Motor
C1100	86321	1.65 Mfd. Motor Capacitor
C1101	86321	.75 Mfd. Motor Capacitor
F1100	247850	5 Amp. Fuse
F1101	252464	½ Amp. Fuse
K1100	245578	Trip Solenoid
K1101	252673	Solenoid Staked Frame Assembly
L1100	303702	100 Micro Henry Choke
P1100	309354	12 Pin Cap Housing
P1101	309352	6 Pin Cap Housing
P1102	252922	Plug
P1103	252922	Plug
PU1100	253718	Magnetic Pickup
R1100	81248	190 Ohm 5 W. ±5%
R1101	81248	190 Ohm 5 W. ± 5%
R1102	82704	1500 Ohm 1 W. ±10%
R1103	81292	5000 Ohm, 10 W ±10%, Wire Wound
S1000	252926	Cam Switch
S1101	252927	Clutch & Reset Lever Switch
S1102	252927	Clutch & Reset Lever Switch
S1103	253725	Trip Switch & Housing Assembly
S1104	247834	Reversing Switch
S1105	249235	Detent Switch
S1106	248127	Play Control Subtract Switch
S1107	249506	Clamp Arm Switch
S1108	252947	Relay Hold Switch
TB1100	249764	Terminal Strip
TB1101	450979	Terminal Strip
TB1102	249765	Terminal Strip
TB1103	450979	Terminal Strip
TB1104	410717	Terminal Strip
TB1105	252827	Terminal Strip
W1100	252969	Control Cable
W1101	252970	Internal Cable
XPU1100	253751	Pickup Cartridge Socket Assembly

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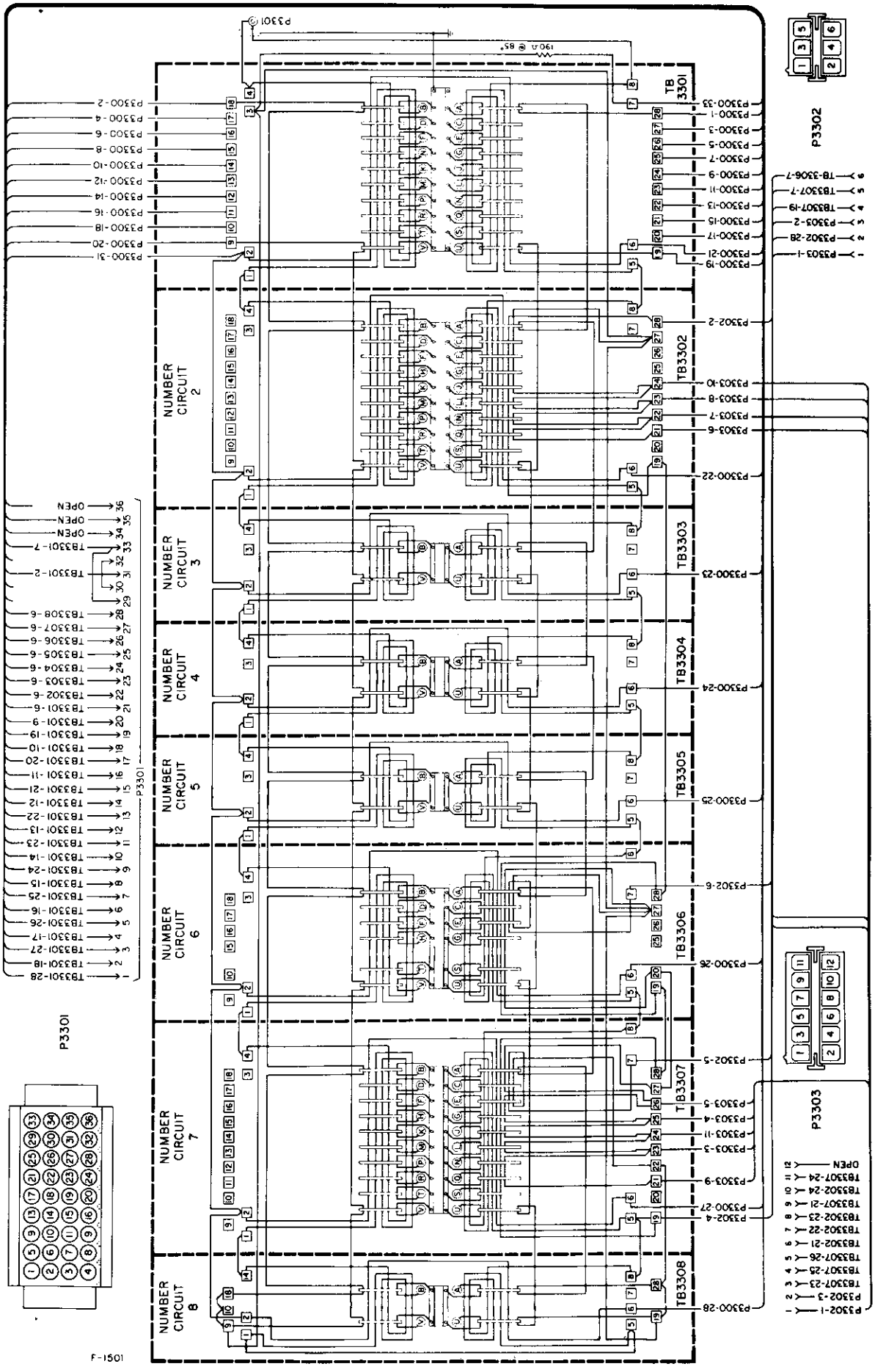
SELECT-O-MATIC MECHANISM, Type 160ST17 and 160ST17-5



Wiring Diagram for Tormat Memory Unit, Type 160TM5.

TORMAT ELECTRICAL SELECTOR, Type TES1613-56

1. GENERAL

The Tormat Electrical Selector, Type TES1613-56 is part of the phonograph selection system. The principal functions of the selector 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 begins the operational sequence of the system. These functions are performed when two of the selection switches are operated by pressing a letter key and a number key.

The principal parts of the selector include three selection switch assemblies, a latch bar solenoid, three start and hold switches and pricing switches.

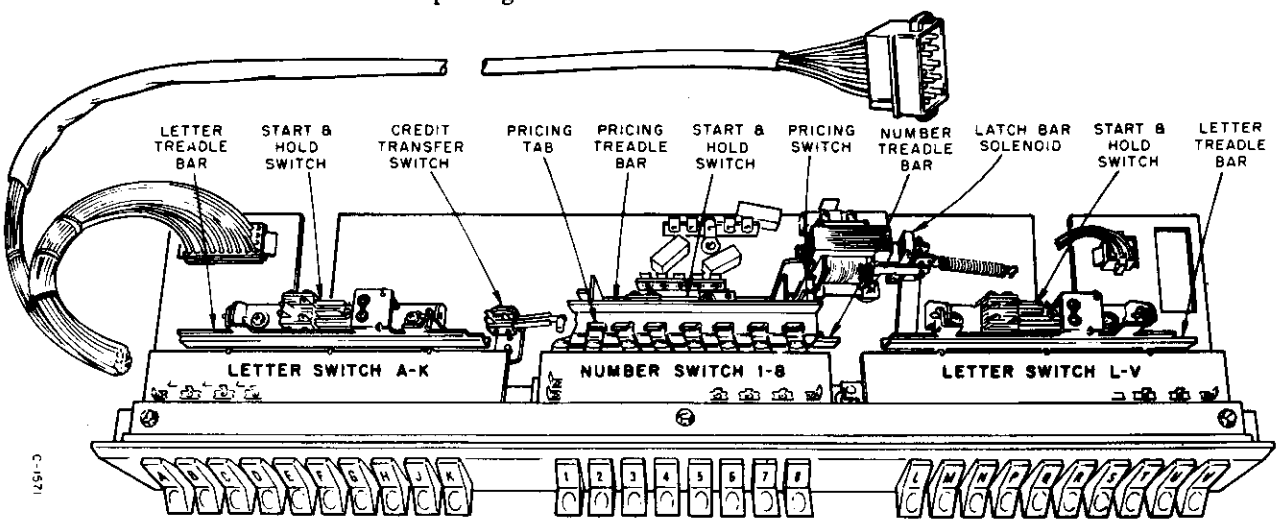


Figure 1. Parts Location Detail.

2. PRICE SETTINGS

The Tormat Electrical Selector may be adjusted so that any number group may be priced for singles or albums. The adjustment is made by moving the pricing tab. If all tabs are positioned so the formed end of the tab is furthest from the latch bar solenoid, all selections will be priced for singles. If the pricing tab located behind the number 1 key is repositioned so the formed end is towards the latch bar solenoid then all selections using the number 1 key (A1, B1, C1, etc.) will be priced for albums.

After positioning the desired tabs for albums, press the associated number keys and watch the pricing treadle bar move. The number keys priced for singles should not move the pricing treadle bar.

3. REMOVAL OF SELECTOR

The entire unit may be removed for service by pulling out the connecting plugs and removing the four nuts that hold the selector to its mounting brackets. When replacing the selector in the cabinet it should be fastened securely. Position the selector so that it fits properly into the opening in the phonograph lid.

4. 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 the solenoid plunger and the latch bars. (see your Seeburg distributor for oil and lubriplate).

5. ADJUSTMENTS

a. Spring Tensions

(1) Pricing Treadle Bar Spring

To move the pricing treadle bar from its normal rest position should require a force of 1¾ to 2¼ ounces. If the force required to move the bar is more than 2¼ ounces, check for binds at the pivot points. If the force required to move the bar is less than 1¾ ounces, replace the spring.

(2) Number and Letter Treadle Bar Springs

To move the number or letter treadle bars from their normal rest position should require a force of 4½ to 5½ ounces. If the force required to move a bar is more than 5½ ounces, check for binds at the pivot points. If the force required to move a bar is less than 4½ ounces, replace the associated spring.

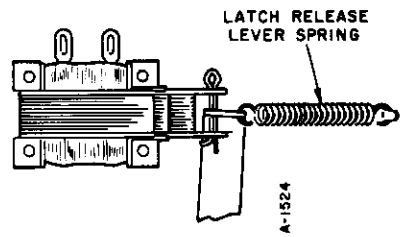


Figure 2.
Latch Release Lever Spring Detail.

(3) Latch Release Lever Spring
Refer to Figure 2. Restrain the movement of the the number release lever. The force required to start movement of the solenoid armature should be 5 to 7 ounces. If the force required to move the armature is more than 7 ounces , check for binds in the solenoid. If the force required to move the armature is less than 5 ounces, replace the spring.

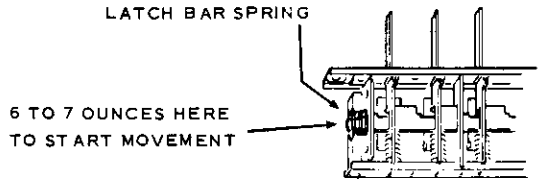


Figure 3. Latch Bar Spring Detail.

(4) Latch Bar Spring
Refer to Figure 3. The force required to start movement of the latch bar should be 6 to 7 ounces. If more than 7 ounces of force is required, check for binds in the switch assembly. If less than 6 ounces of force is required, replace the spring.

b. 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.

Refer to Figure 4. Loosen the two latch lever adjusting screws holding the latch release lever bracket and position the bracket so the tips of the latch bar hooks extend 1/64 inch through the openings in the selector switch shafts. If the bracket is too far to the right, the selector keys

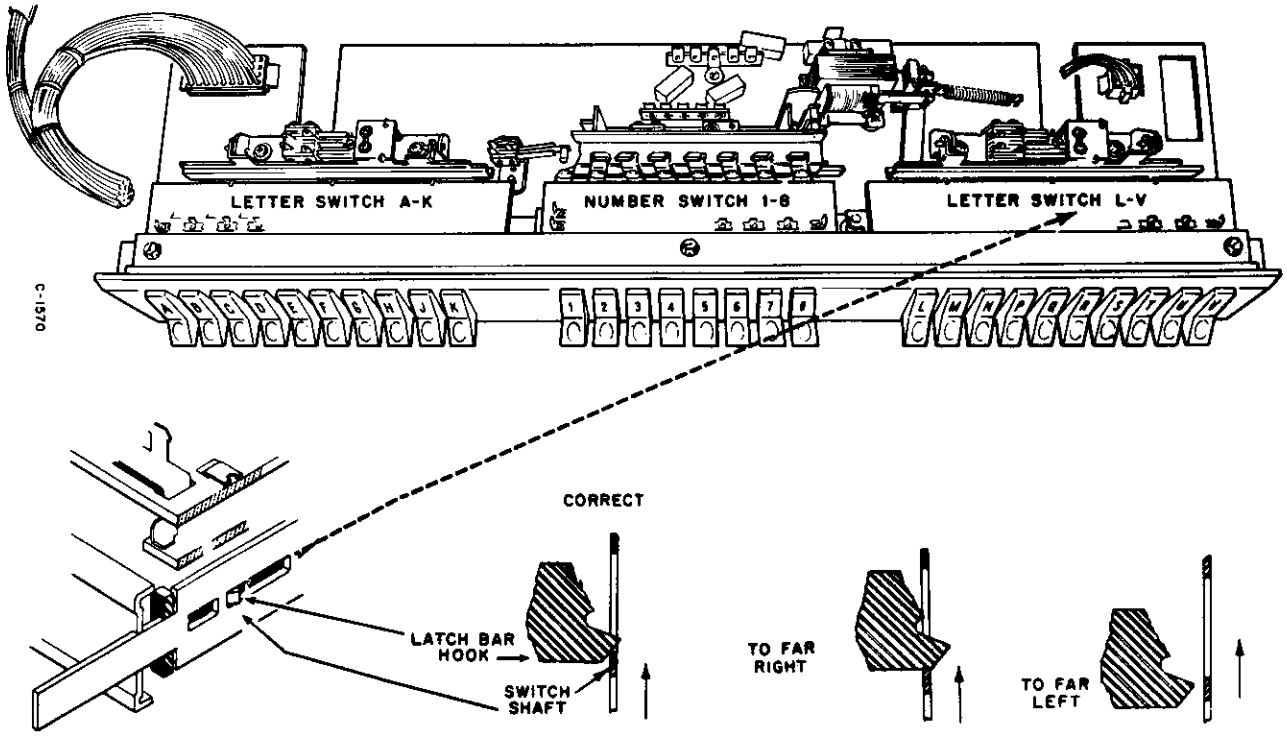


Figure 4. Letter Switch L - V Adjustment Detail.

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. After the bracket has been correctly positioned, securely tighten the bracket holding screws.

c. 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 the preceeding paragraph. The adjusting screws are accessible through a hole in the bottom of the selector frame.

NOTE:

Before making this adjustment, the following conditions must be met:

(1) The L - V letter switch adjustment must be correct.

(2) The latch bar solenoid must be in the energized position.

(3) All linkage and bars must be free to move without binding.

(4) There should be a gap between the release lever and the end of the latch bar solenoid plunger rod.

Refer to Figure 5. Loosen the two adjusting screws 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 hooks extend 1/64 inch through the openings in the selector switch shafts. Securely tighten the adjusting screws. Check this adjustment by pressing a lettered switch in the A-K group and one in the L-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 left, 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.

d. Number Switch

The 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 the letter switch adjustments must be correct.

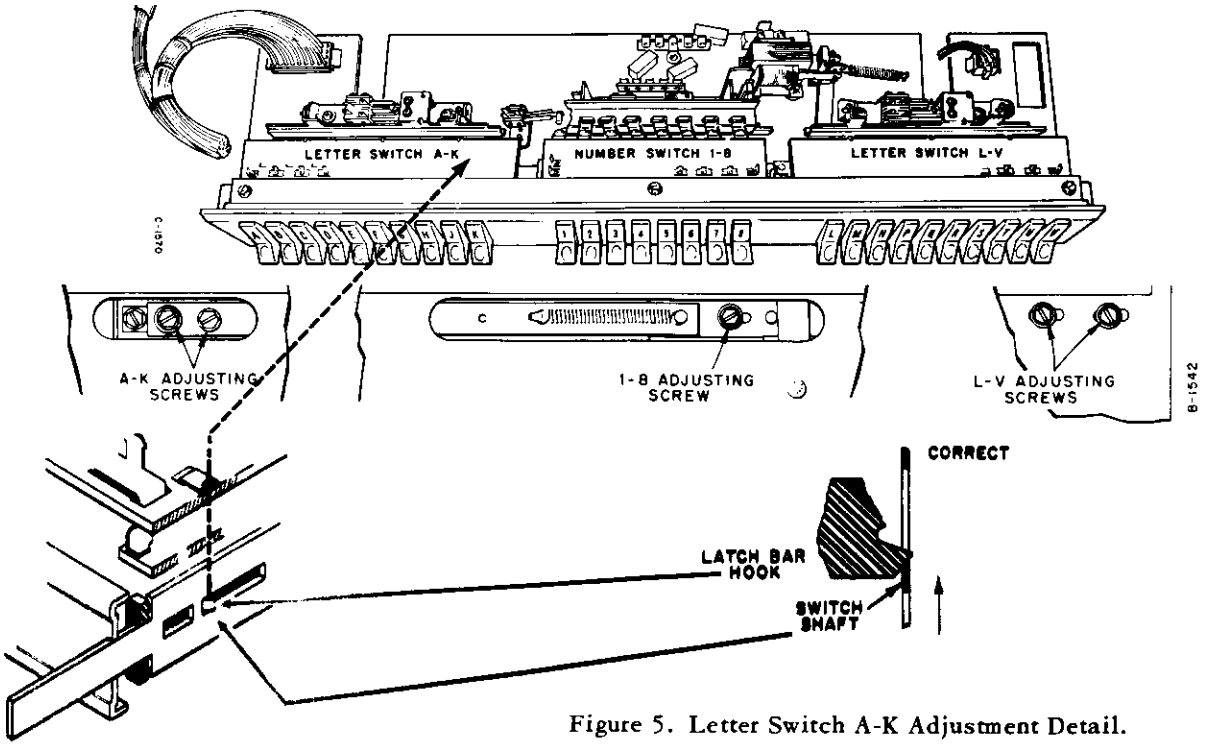
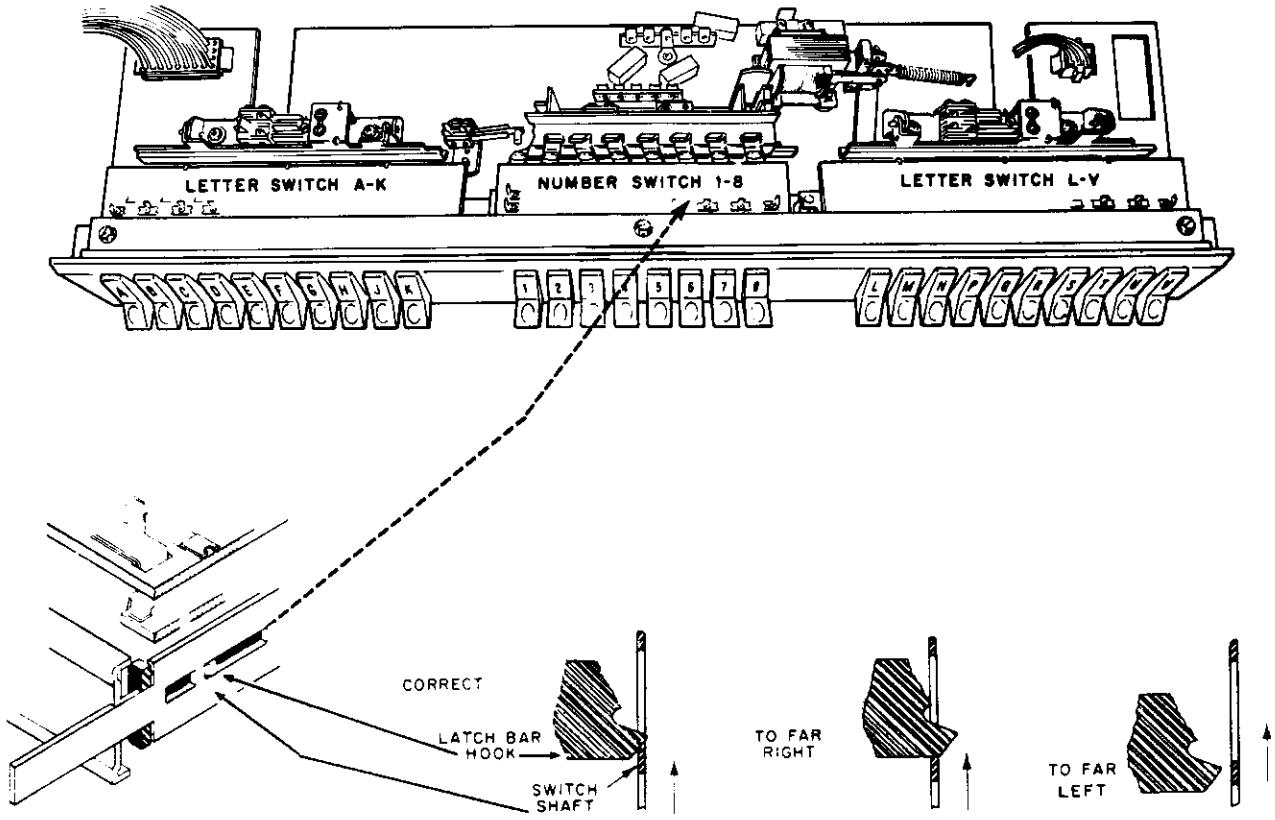


Figure 5. Letter Switch A-K Adjustment Detail.



C-1570

Figure 6. Number Switch Adjustment Detail.

Refer to Figure 6. Loosen the adjusting screw that holds the number latch lever to the letter latch lever. Position the number latch lever so that the tips of the latch bar hooks of the number selector switches extend 1/64 inch through the openings in the selector switch shafts. 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. When the correct position for the latch lever has been established, tighten the adjusting screw.

e. Treadle Bar

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.

Refer to Figure 7. With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate after loosening the treadle bar bracket screws so there is 13/64 inch

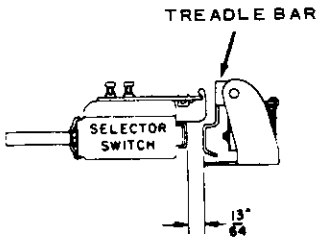


Figure 7. Treadle Bar Adjustment Detail.

(0.203 inch) separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (0.204 inch) or No. 7 (0.201 inch) or a 13/64 inch twist drill for a spacing gauge.

f. Start and Hold Switches

The timing 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.*

Refer to Figure 8. Loosen the bracket holding screws and position the switches so the start switch contacts close when the selector switches have approximately 1/32 inch more travel before latching by the latch bars.

TORMAT ELECTRICAL SELECTOR, Type 1613-56

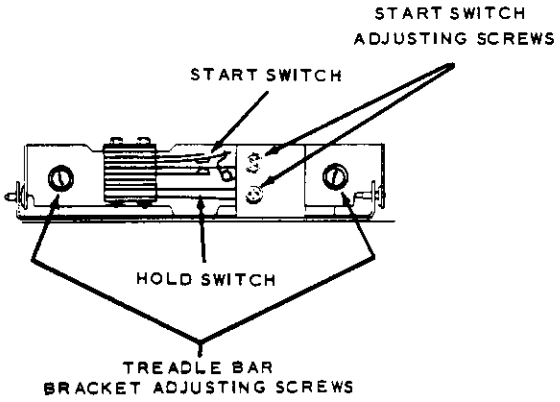


Figure 8.
Start and Hold Switch Adjustment Detail.

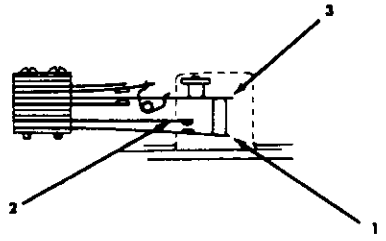


Figure 9.
Start and Hold Switch - Blade Numbering Detail.

Refer to Figure 9. With all selector switches released:

(1) Adjust blade No. 1 so its fiber lift bears against blade No. 3 with a force of approximately 2 ounces.

(2) Adjust blade No. 2 for 1/64 inch to 1/32 inch contact gap.

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

Check operation by operating the selector switch and noting that the hold switch closes before the start switch closes and opens before the start switch opens.

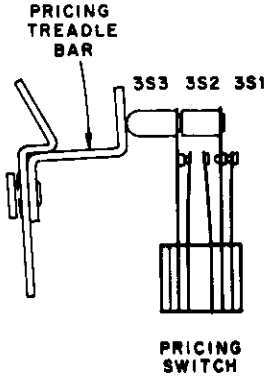


Figure 10.
Pricing Switch Adjustment Detail.

g. Pricing Switch

With no selector switches operated, set up minimum contact gaps as shown in Figure 10.

With a pricing tab set for "album play", operate the number selector switch and check for the following conditions:

(1) The 3S3 contacts open.

(2) The 3S1 contacts open after the 3S3 contacts open.

(3) The 3S2 contacts, normally open with a 1/32 inch minimum gap, close.

The switching of all contacts should take place before the number start switch closes.

h. Credit Transfer Switch

NOTE:
These contacts are used only when preselect kits are added to the UDPU6 Pricing Unit.

Operate any number selector switch and assure that the 8S1 contacts open before the 8S2 contacts close.

SOLID STATE STEREO AMPLIFIER, Type TSA6

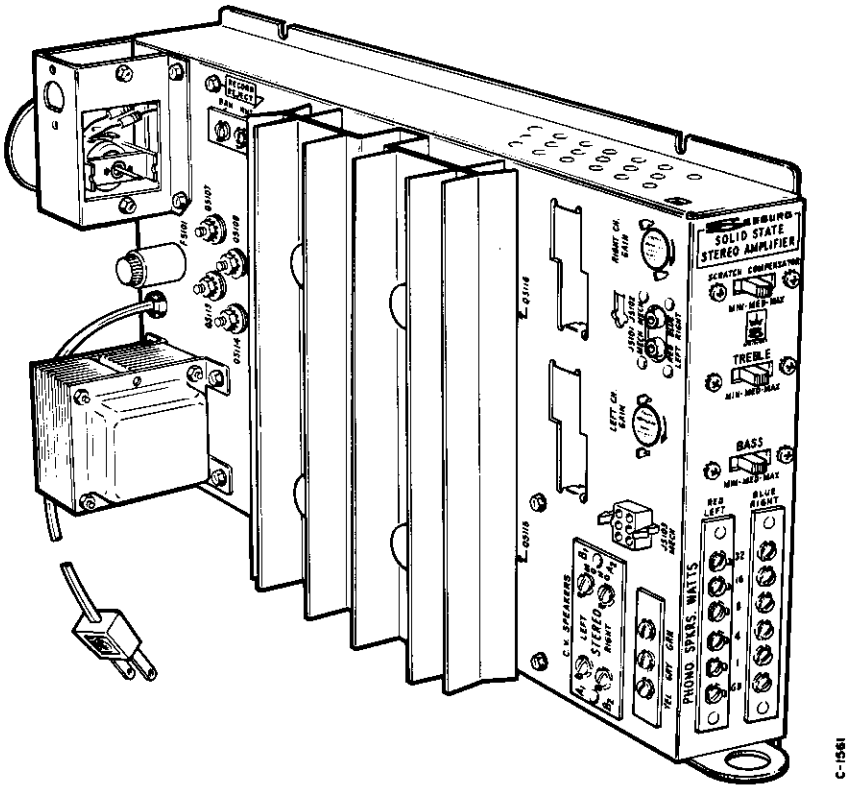


Figure 1. Solid State Stereo Amplifier, Type TSA6.

1. GENERAL

The Solid State Stereo Amplifier, Type TSA6, is a fully transistorized, dual channel, low distortion, high fidelity amplifier with a power output of 32 watts per channel. A special feature of this amplifier is the speaker overload protection circuit. This circuit continually monitors the output current. If the output current increases to a level that may damage the amplifier, the speaker overload protection circuit cuts off the input to the amplifier.

The amplifier also contains circuits for treble, bass and record scratch compensation. These controls enable the output to be varied to fit the customers need.

2. CIRCUIT DESCRIPTION

For purposes of discussion, the audio signal will be traced only through the right channel. Refer to the Schematic Diagram.

a. Preamplifier

The preamplifier circuit consists of four transistor stages, Q5101, Q5102, Q5103 and Q5104. Transistors Q5101 and Q5102 are part of a preamplifier with an equalization network that provides RIAA record compensation. Audio signals from the pickup cartridge are coupled to the base of Q5101 where they are amplified and coupled to the base of Q5102. Part of the output of Q5102 is fed back to the emitter of Q5101.

A low frequency coupling network R5102 and L5101 is connected from the collector of a similar circuit in the left channel. Undesirable low frequency signals are then coupled together in an out of phase condition effectively cancelling them out.

The remaining output from Q5102 is capacitively coupled to the base of voltage ampli-

fier Q5103. Transistors Q5103 and Q5104 are connected in a Darlington configuration which is characterized by a high input impedance and a low output impedance. The output of Q5104 is then coupled to the AVC circuit, the TREBLE, BASS and VOLUME controls and the predriver stage.

b. AVC Circuit

A sampling of the output of Q5104 is coupled through C5105 to the base of Q5105. The output from the collector of Q5105 is rectified by diode CR5106 creating a d.c. voltage. This voltage varies with the average amplitude of the signal voltage applied to Q5105. This varying d.c. voltage is directly coupled to the center of dual diode CR5105. If a large signal voltage is coupled to Q5105, then a large d.c. signal is coupled to diodes CR5104 and CR5105. This large signal forward biases the diodes effectively decreasing their resistance. As the resistance decreases, more of the signal voltage at the base of Q5103 is shunted to ground effectively decreasing the input signal to Q5103.

c. Treble, Bass, Volume and Gain Set Controls

The TREBLE and BASS controls are in parallel with the output from Q5104. The TREBLE control varies the amount of high frequencies fed through the VOLUME control to the predriver stage, Q5106. The BASS control varies the amount of low frequencies fed to Q5106. The VOLUME control varies the amount of drive to the base of Q5106. The individual Gain Set Controls compensate for gain differences of the voltage amplifier and/or power amplifier. It is also used to balance the system.

d. Predriver, Driver and Power Amplifier Stages

The output from the VOLUME control is capacitively coupled to the base of predriver stage Q5106. The output of Q5106 feeds the bases of driver stages Q5107 and Q5108. Power amplifier stages Q5109 and Q5110 are operated in a complimentary symmetry configuration which produces the power required to drive the output transformer, T5102.

e. Short Circuit Protection Circuit

This circuit prevents amplifier damage due to short circuits, overloads or incorrect connections in the speaker system. If a condition occurs in the speaker system that may result in damage to the amplifier, the short circuit protection circuit biases the input transistors into cut-off.

Refer to Schematic Diagram. The output current is monitored by measuring the voltage across emitter resistor R5128. As the current through R5128 increases, capacitor C5122 charges in the polarity shown. For any particular time period the potential reached is only a fraction of the potential at the emitter resistor due to the time constant determined by DELAY TIME potentiometer R5143A and the voltage divider consisting of R5136 and R5137. If the current through R5128 increases enough, capacitor C5122 will charge to a potential that results in the conduction of Q5111. When Q5111 conducts its collector current forward biases Q5112 causing Q5112 to conduct. Due to feedback between the transistors, both Q5111 and Q5112 saturate and become independent of C5122.

When Q5112 saturates, the potention on the collector rises from −20 volts to near zero. This change in potential is coupled through R5130 to the forward bias CR5102, thereby reducing the collector voltage of Q5101 in the Pre-Amplifier to practically zero. This cuts off the first stage of the Pre-Amplifier preventing any further signal from passing through the amplifier. Since the power amplifier stages are operating near class B, no input results in very little current flow.

f. Mute Relay

The mute relay (K5101) is used to quiet the amplifier before record transfer takes place to avoid unpleasant noise in the output. The relay is energized whenever the trip switch in the Select-O-Matic Mechanism is closed. A holding circuit for the mute relay is completed through contacts 3M11 of the cam switch in the mechanism. These contacts are closed when the mechanism is in the transfer or scan position.

When the mute relay is energized, contacts 1A11 close completing a circuit to the trip solenoid in the mechanism. Contacts 1A1 and 1A21 close to mute the amplifier. Contacts 1A1 ground the audio signal from the top of the right channel volume control. Contacts 1A21 ground the audio signal from the top of the left channel volume control.

When contacts 1A12 open, the ground circuit to dual diode CR5106 is opened. This allows capacitors C5120 and C5121 to charge in the direction indicated which results in diodes CR5104 and CR5105 being forward biased. Forward biasing diode CR5104 and CR5105 grounds the input signal to the base of the amplifier stage (Q5103) through C5103. When the mute relay is de-energized and contacts 1A12 close, capacitor C5121 discharges slowly through R5132. This results in a slow unmuting of the amplifier rather than a sharp return to music.

3. ADJUSTMENTS AND MAINTENANCE

a. Short Circuit Protection Circuit Adjustment

The dual DELAY TIME potentiometer is used to adjust the short circuit protection circuit. This control is preset at the factory and normally does not require further adjustment. If however, adjustment does become necessary, a pulse test record, Seeburg Part No. 25144 is required. This 7 inch 45 rpm. record includes verbal instructions for adjusting the DELAY TIME potentiometer.

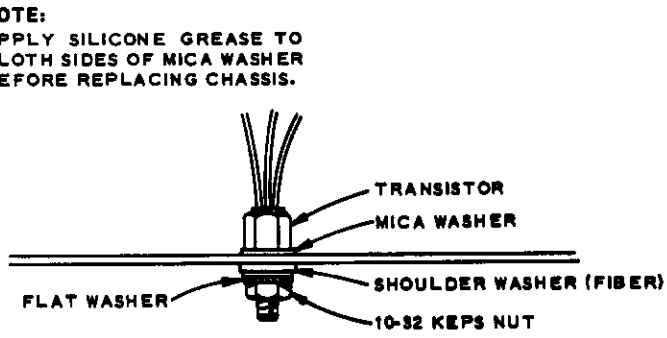


Figure 2.

b. Driver Transistor Replacement

If the driver transistors, Q5107, Q5108, Q5113 or Q5114, need to be replaced, they must be mounted as shown in Figure 2. Be sure both sides of the mica washer are coated with silicone grease.

c. Bias Adjustment for Output Transistors

The bias adjustment potentiometer located in the corner of each voltage amplifier printed circuit board is used to properly adjust bias on the output transistors. This adjustment should not be touched unless components in the Predriver, Driver or Output Stages are changed. For proper adjustment of bias see Note No. 9 on the schematic diagram.

SOLID STATE STEREO AMPLIFIER, Type TSA6

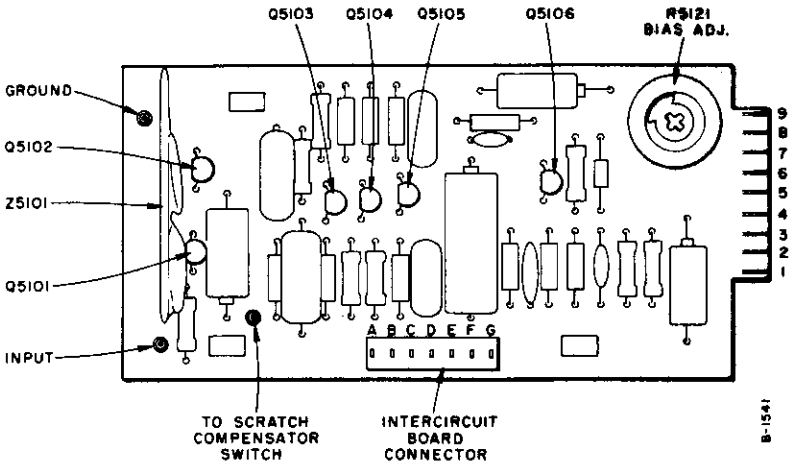


Figure 3. Voltage Amplifier Control Circuit Board.

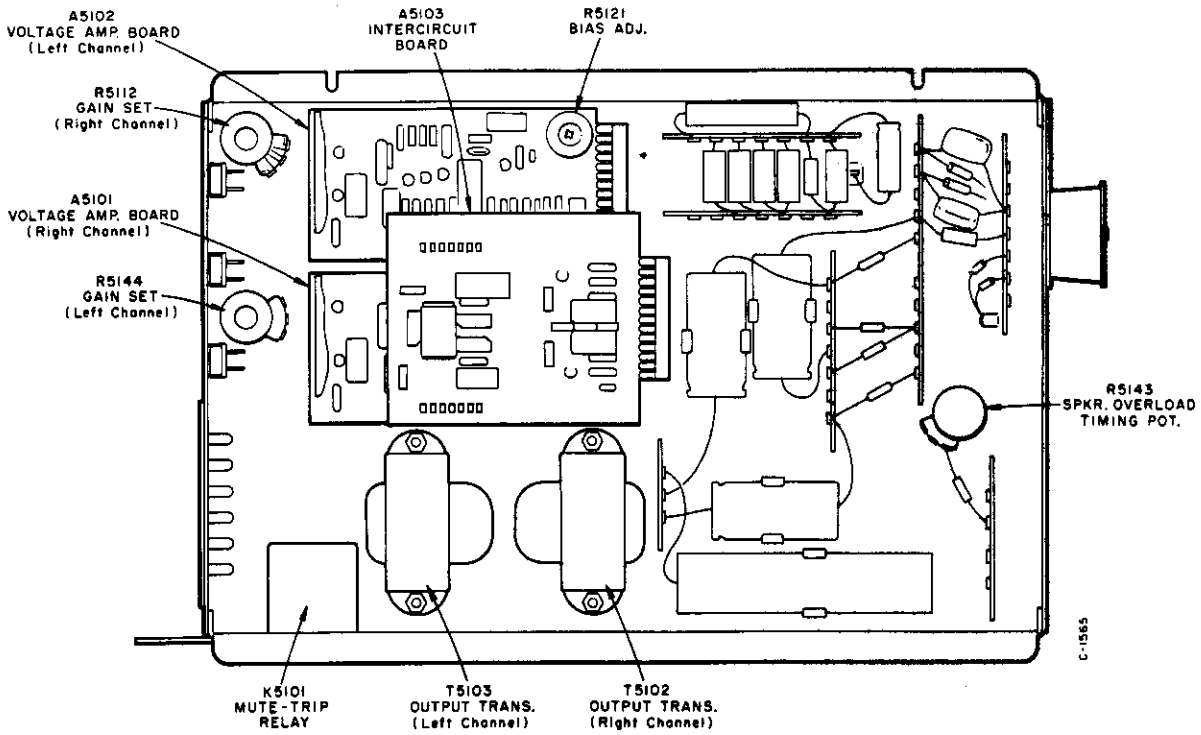


Figure 4. Parts Location Detail - Bottom View.

SOLID STATE STEREO AMPLIFIER, Type TSA6

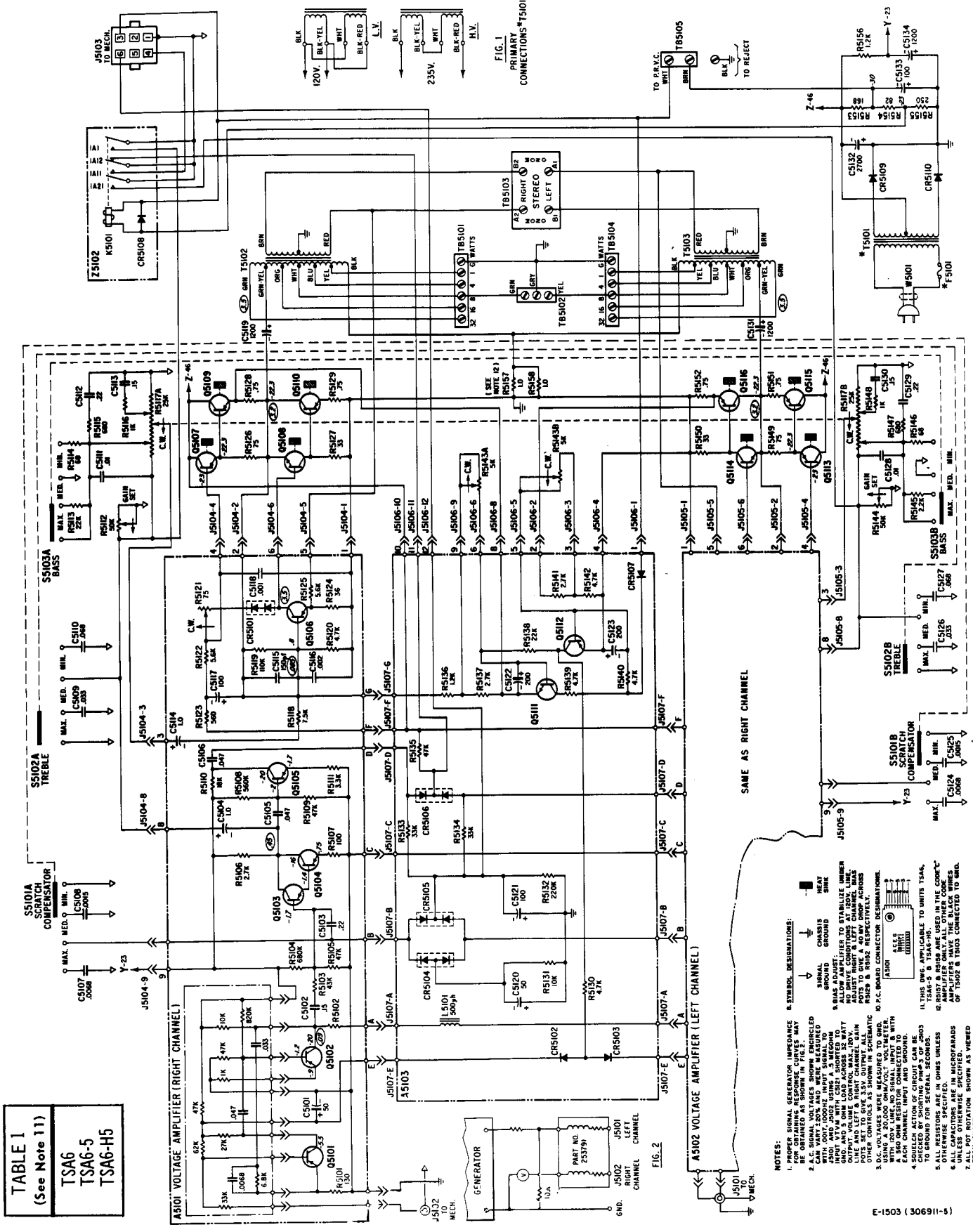


TABLE 1 (See Note 11)
TSA6 TSA6-5 TSA6-H5

PARTS LIST on Reverse Side

Item	Part No.	Description
A5101	306895	Voltage Amplifier Board
A5102	306895	Voltage Amplifier Board
A5103	306901	Inter Circuit Board
C5101	87703	50 Mfd. 12 V. Lytic
C5102	86303	.15 Mfd. 50 V. Mylar
C5103	86331	.22 Mfd. 50 V. Mylar
C5104	87754	1.0 Mfd. 35 V. Tantalum
C5105	86327	.047 Mfd. 50 V. Mylar
C5106	86327	.047 Mfd. 50 V. Mylar
C5107	86332	.0068 Mfd. 50 V. Mylar
C5108	86240	.0015 Mfd. Ceramic
C5109	86336	.033 Mfd. 50 V. Mylar
C5110	86351	.068 Mfd. 50 V. Mylar
C5111	86313	.01 Mfd. Ceramic
C5112	86331	.22 Mfd. 50 V. Mylar
C5113	86303	.15 Mfd. 50 V. Mylar
C5114	87754	1.0 Mfd. 35 V. Tantalum
C5115	86243	150 Pf. Ceramic
C5116	86255	.002 Mfd. Ceramic
C5117	87700	100 Mfd. 35 V. Lytic
C5118	86309	.001 Mfd. Ceramic
C5119	87726	1200 Mfd. 35 V. Lytic
C5120	87696	50 Mfd. 6 V. Lytic
C5121	87724	100 Mfd. 12 V. Lytic
C5122	87744	200 Mfd. 6 V. Lytic
C5123	87744	200 Mfd. 6 V. Lytic
C5124	86332	.0068 Mfd. 50 V. Mylar
C5125	86240	.0015 Mfd. Ceramic
C5126	86336	.033 Mfd. 50 V. Mylar
C5127	86351	.068 Mfd. 50 V. Mylar
C5128	86313	.01 Mfd. Ceramic
C5129	86331	.22 Mfd. 50 V. Mylar
C5130	86303	.15 Mfd. 50 V. Mylar
C5131	87726	1200 Mfd. 35 V. Lytic
C5132	87748	2700 Mfd. 50 V. Lytic
C5133	87700	100 Mfd. 35 V. Lytic
C5134	87726	1200 Mfd. 35 V. Lytic
CR5101	309478	Silicon Stabistor
CR5102	309373	Silicon Diode 100 Piv
CR5103	309373	Silicon Diode 100 Piv
CR5104	309398	Dual Selenium Diode
CR5105	309397	Dual Selenium Diode
CR5106	309440	Dual Selenium Diode
CR5107	309373	Silicon Diode 100 Piv
CR5108	309384	Silicon Diode 170 Piv (Part of Z5102)
CR5109	309477	Silicon Rectifier 200 Piv
CR5110	309477	Silicon Rectifier 200 Piv
*F5101	306316	8/10 Amp. Slo Blo Fuse
*F5101	306369	5/10 Amp. Slo Blo Fuse (H5 Model)
J5101	306916	Input Socket
J5102	306916	Input Socket
J5103	309355	Part of Cable Assembly
J5104	309307	9 Position Edge Connector
J5105	309307	9 Position Edge Connector
J5106	309308	12 Position Edge Connector
J5107	941851	Part of P.C. Board Assembly
J5108	941851	Part of P.C. Board Assembly
K5101	306914	Mute Trip Relay (Part of Z5102)
L5101	306792	500 Micro Henry Inductor
Q5101	309436	PNP Transistor
Q5102	309436	PNP Transistor
Q5103	309436	PNP Transistor
Q5104	309436	PNP Transistor
Q5105	309436	PNP Transistor
Q5106	309437	PNP Transistor
Q5107	309429	PNP Transistor
Q5108	309430	NPN Transistor
Q5109	309412	PNP Transistor
Q5110	309412	PNP Transistor
Q5111	309434	NPN Transistor
Q5112	309435	PNP Transistor
Q5113	309429	PNP Transistor
Q5114	309430	NPN Transistor
Q5115	309412	PNP Power Transistor
Q5116	309412	PNP Power Transistor
R5101	82655	130 Ohm ½ W. 5%
R5102	82423	820 Ohm ½ W. 10%
R5103	82678	43,000 Ohm ½ W. 5%
R5104	82458	680,000 Ohm ½ W. 10%
R5105	82676	47,000 Ohm ½ W. 5%
R5106	82429	2,700 Ohm ½ W. 10%
R5107	82618	100 Ohm ½ W. 5%
R5108	82457	560,000 Ohm ½ W. 10%
R5109	82444	47,000 Ohm ½ W. 10%
R5110	82439	18,000 Ohm ½ W. 10%
R5111	82624	3,300 Ohm ½ W. 5%
R5112	306319	50,000 Ohm Gain Set
R5113	82428	2,200 Ohm ½ W. 10%
R5114	82410	68 Ohm ½ W. 10%
R5115	82422	680 Ohm ½ W. 10%
R5116	82424	1,000 Ohm ½ W. 10%
R5117A	306318	25,000 Ohm Volume Control
R5117B	306318	25,000 Ohm Volume Control
R5118	82631	7,500 Ohm ½W. 5%
R5119	82779	110,000 Ohm ½ W. 5%
R5120	82627	4,700 Ohm ½ W. 5%
R5121	306915	75 Ohm Bias Adjustment
R5122	82629	5,600 Ohm ½ W. 5%
R5123	82421	560 Ohm ½ W. 10%
R5124	82993	36 Ohm ½ W. 5%
R5125	82433	5,600 Ohm ½ W. 10%
R5126	82649	75 Ohm ½ W. 5%
R5127	82406	33 Ohm ½ W. 10%
R5128	81284	0.75 Ohm W.W. 5 W. 5%
R5129	81284	0.75 Ohm W.W. 5 W. 5%
R5130	82432	4,700 Ohm ½ W. 10%
R5131	82436	10,000 Ohm ½ W. 10%
R5132	82452	220,000 Ohm ½ W. 10%
R5133	82442	33,000 Ohm ½ W. 10%
R5134	82442	33,000 Ohm ½ W. 10%
R5135	82444	47,000 Ohm ½ W. 10%
R5136	82425	1,200 Ohm ½ W. 10%
R5137	82429	2,700 Ohm ½ W. 10%
R5138	82440	22,000 Ohm ½ W. 10%
R5139	82432	4,700 Ohm ½ W. 10%
R5140	82432	4,700 Ohm ½ W. 10%
R5141	82429	2,700 Ohm ½ W. 10%
R5142	82432	4,700 Ohm ½ W. 10%
R5143A	306804	5,000 Ohm S.O.S. Timing
R5143B	306804	5,000 Ohm S.O.S. Timing
R5144	306319	50,000 Ohm Gain Set
R5145	82428	2,200 Ohm ½ W. 10%
R5146	82410	68 Ohm ½ W. 10%
R5147	82422	680 Ohm ½ W. 10%
R5148	82424	1,000 Ohm ½ W. 10%
R5149	82649	75 Ohm ½ W. 5%
R5150	82406	33 Ohm ½ W. 10%
R5151	81284	0.75 Ohm W.W. 5 W. 5%
R5152	81284	0.75 Ohm W.W. 5 W. 5%
R5153	81243	168 Ohm W.W. 10 W. 10%
R5154	81237	82 Ohm W.W. 2 W. 10%
R5155	81201	250 Ohm W.W. 5 W. 10%
R5156	81282	1200 Ohm W.W. 2 W. 10%
R5157	81220	1 Ohm W.W. 5 W. 10%
R5158	81220	1 Ohm W.W. 5 W. 10%
S5101A	306329	Scratch Compensator
S5101B	306329	Scratch Compensator
S5102A	306329	Treble
S5102B	306329	Treble
S5103A	306329	Bass
S5103B	306329	Bass
*T5101	306793	Power Transformer for 120 V. 60 Hz.
*T5101	306840	Power Transformer for –5 and –H5 Models
T5102	306893	Output Transformer
T5103	306893	Output Transformer
TB5101	306304	6 Lug Terminal Board
TB5102	305831	3 Lug Terminal Board
TB5103	306338	4 Lug Terminal Board
TB5104	306304	6 Lug Terminal Board
TB5105	307650	2 Lug Terminal Board
W5101	766369	Line Cord & Plug Assembly
Z5101	306900	Pre Amplifier Network (For Alt. 306930)
Z5102	306914	Mute Trip Relay Assembly
Z5101	306930	Pre Amplifier Network (Alt. for 306900)

PRINTED CIRCUIT BOARD LEGEND

Amp. Code Letter	A5101 & A5102 Identification No.	A5103 Identification No.	T5102 & T5103 Identification No.
A	306895	306901	306893 - 3
B	306895 306895 - 3	306901 - 1	306893 - 3
C	306895 - 4	306901 - 1	306893 - 1
D	306895 - 4	306901 - 1	306893 - 3

SOLID STATE CONTROL CENTER, Type SCC7

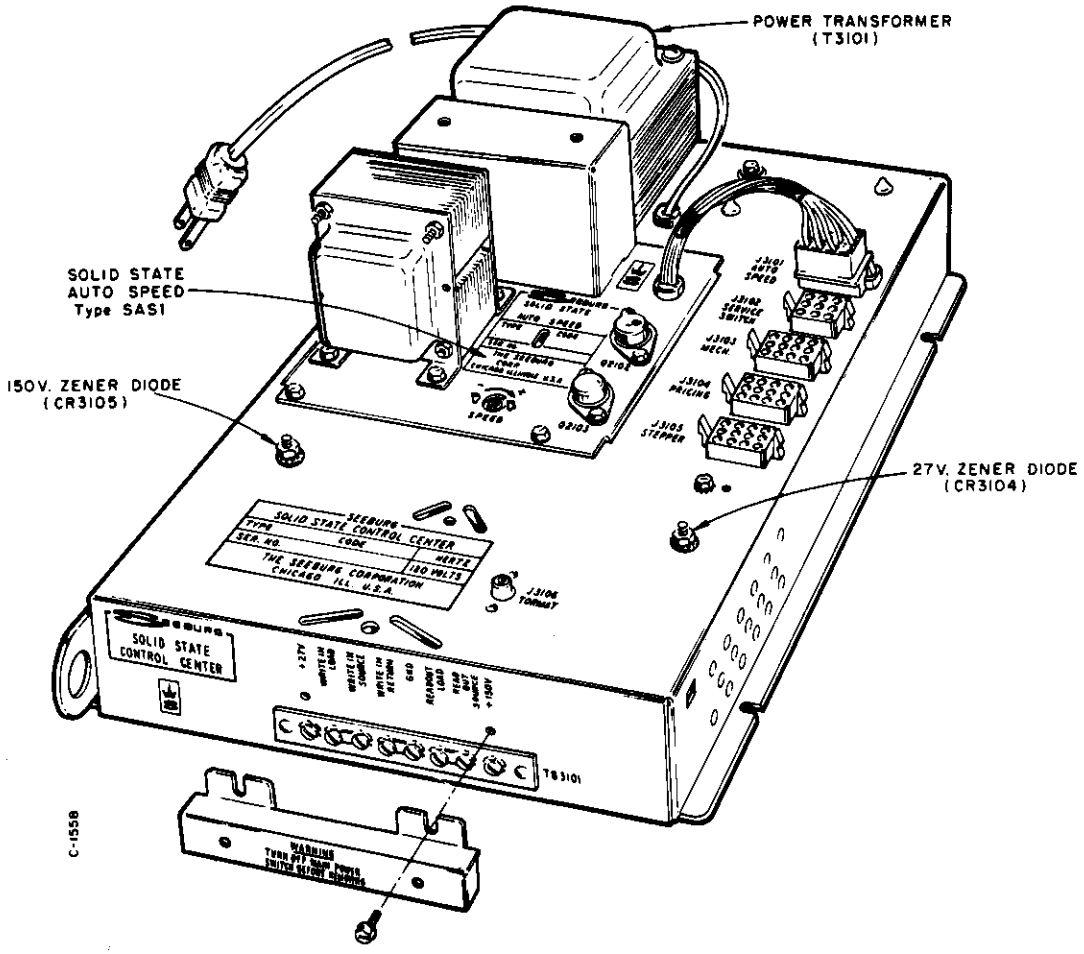


Figure 1. Solid State Control Center, Type SCC7.

GENERAL

The Solid State Control Center is a power distribution center and a junction unit for control circuits of the complete phonograph. The control center includes a power supply, a play control assembly, write-in, read-out and sensing circuits. The power supply converts 120 volts a.c. into the various voltages needed to operate the individual chassis. The play control assembly starts the scanning operation of the mechanism carriage and then stops the carriage after two complete cycles. The write-in circuit provides the necessary current for making a selection. The read-out and sensing circuits provide the necessary voltage for stopping the mechanism at the selected record during a scan operation.

All connections between the SCC7 and other units within the phonograph cabinet are made with plugs that are keyed by color and/or number of contacts so they cannot be incorrectly connected.

ADJUSTMENTS

a. Trip Relay Contacts (refer to Figure 2)

1. Adjust the armature as required to obtain a 1/16 inch clearance between the armature and the armature back stop when the relay is energized.

2. Form the short blades as required to obtain a contact gap of 0.020 inch.

SOLID STATE CONTROL CENTER, Type SCC7

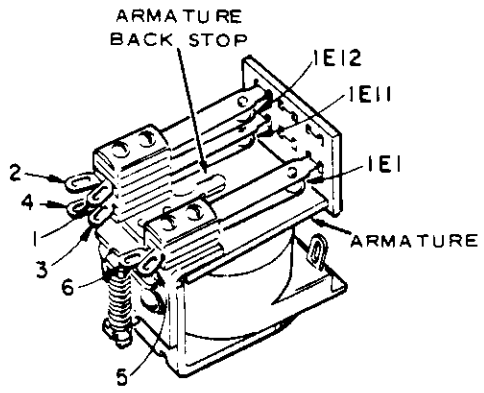


Figure 2. Trip Relay Detail.

3. Check for a one ounce contact force on each pair of contacts. If there is less than one ounce of force, replace the blades.

b. Play Control Switch Contacts

1. Unplug the Type SCC7 Solid State Control Center from the power junction box.
2. Press and release the add solenoid plunger. (Refer to Figure 3 for the location of the solenoid).
3. Press and release the subtract solenoid plunger.
4. Press and hold the subtract solenoid plunger.
5. Adjust the two long blades so they are just touching the tip of the ratchet wheel. Refer to Figure 4.
6. Release the subtract solenoid plunger.
7. Adjust the short blades for 0.020 and 0.030 inch contact gap.

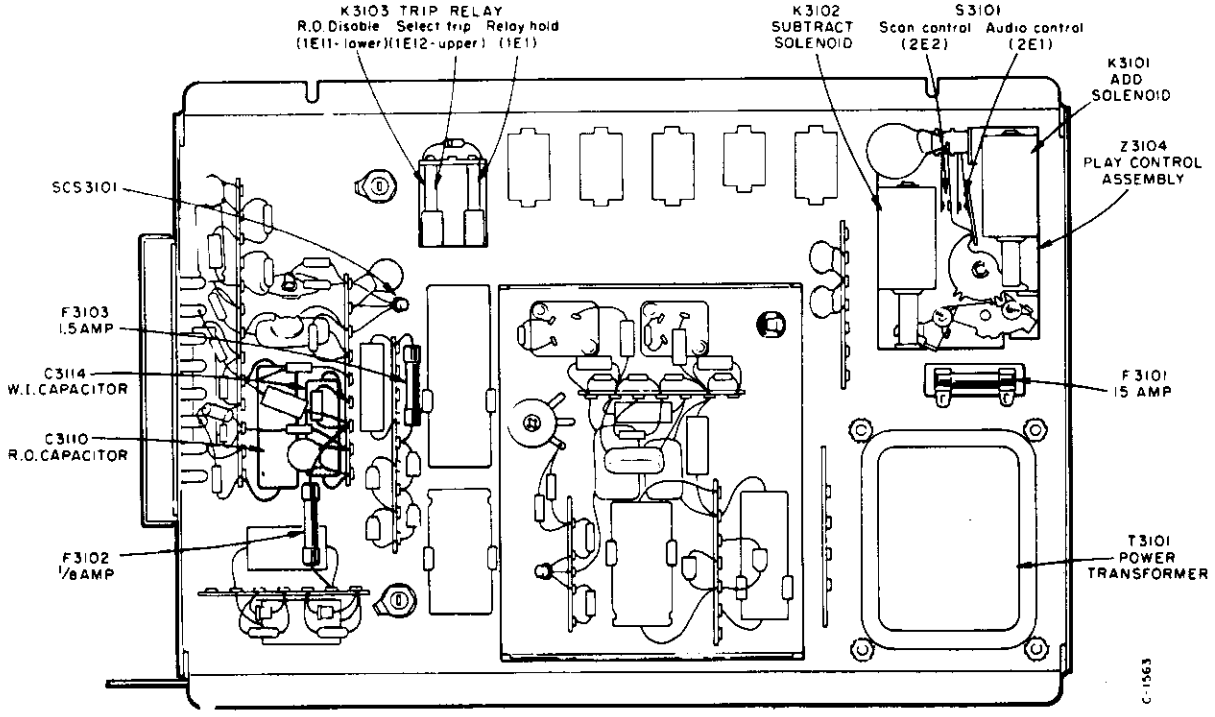


Figure 3. Parts Location Detail Bottom View.

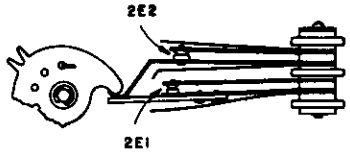
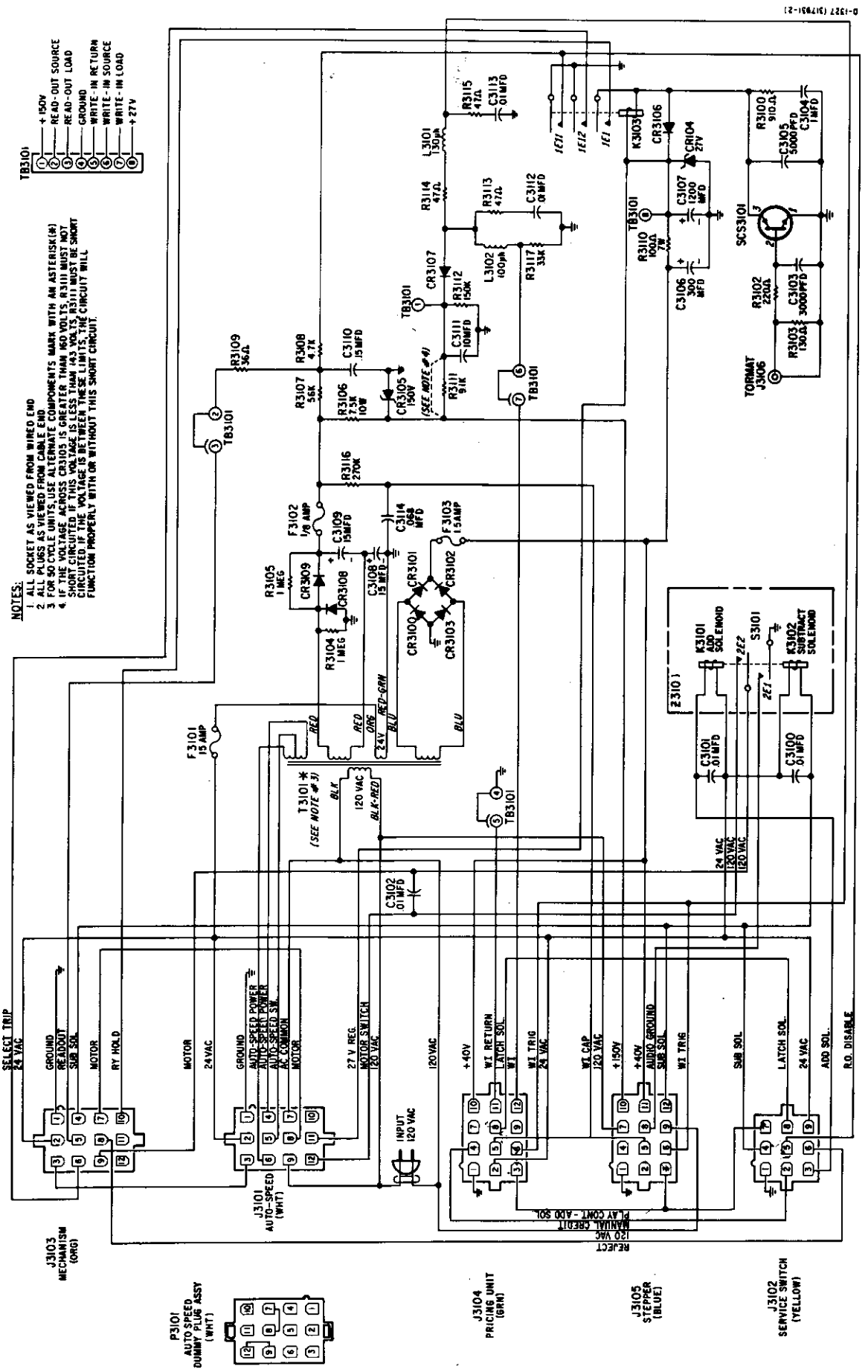


Figure 4. Play Control Switch Detail.

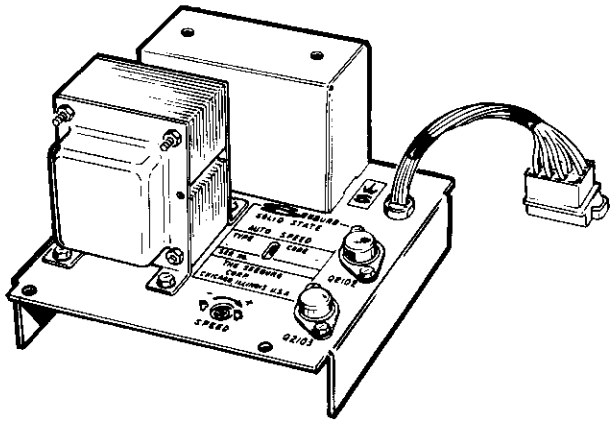
SOLID STATE CONTROL CENTER, Type SCC7



Item	Part No.	Description
C3100	86313	.01 Mfd. 500 V. Ceramic
C3101	86313	.01 Mfd. 500 V. Ceramic
C3102	86317	.01 Mfd. 1400 V. Ceramic
C3103	86278	3000 Pfd. 500 V. Ceramic
C3104	86352	1 Mfd. 200 V. Mylar
C3105	86250	5,000 Pfd. 500 V. Ceramic
C3106	87611	300 Mfd. 50 V. Lytic
C3107	87726	1200 Mfd. 35 V. Lytic
C3108	87749	15 Mfd. 250 V. Lytic
C3109	87749	15 Mfd. 250 V. Lytic
C3110	86296	.15 Mfd. 600 V. Molded Paper
C3111	87734	10 Mfd. 200 V. Lytic
C3112	86313	.01 Mfd. 500 V. Ceramic
C3113	86313	.01 Mfd. 500 V. Ceramic
C3114	86295	.068 Mfd. 600 V. Molded Paper
CR3100	309476	Silicon Diode 100 V.
CR3101	309476	Silicon Diode 100 V.
CR3102	309476	Silicon Diode 100 V.
CR3103	309476	Silicon Diode 100 V.
CR3104	309375	Zener Diode 27 V. 10 W. 10%
CR3105	309376	Zener Diode 150 V. 10 W. 10%
CR3106	309384	Silicon Diode 170 V.
CR3107	309384	Silicon Diode 170 V.
CR3108	309372	Silicon Diode 600 V.
CR3109	309372	Silicon Diode 600 V.
F3101	307556	15 Amp. Fuse
F3102	317026	1/8 Amp. Fuse
F3103	317025	1½ Amp. Fuse
J3101	710315	12-Contact Socket
J3102	710531	9-Contact Socket
J3103	309343	12-Contact Socket
J3104	309361	12-Contact Socket
J3105	309360	12-Contact Socket
K3101	303482	Add Solenoid
K3102	303484	Subtract Solenoid
K3103	317024	Relay
L3101	303603	130 Micro Henry Choke 5%
L3102	303702	100 Micro Henry Choke 5%
P3101	317957	Auto Speed Dummy Plug Assem.
R3100	82661	910 Ohm ½ W. 5%
R3102	82658	220 Ohm ½ W. 5%
R3103	82655	130 Ohm ½ W. 5%
R3104	82460	1 Megohm ½ W. 10%
R3105	82460	1 Megohm ½ W. 10%
R3106	81261	7500 Ohm W.W. 10 W. 10%
R3107	82837	56,000 Ohm 2 W. 10%
R3108	82432	4,700 Ohm ½ W. 10%
R3109	308971	36 Ohm ½ W. 5%
R3110	81173	100 Ohm W.W. 7 W. 10%
R3111	82633	9,100 Ohm. ½ W. 5%
R3112	82698	150,000 Ohm ½ W. 5%
R3113	82617	47 Ohm ½ W. 5%
R3114	82617	47 Ohm ½ W. 5%
R3115	82617	47 Ohm ½ W. 5%
R3116	82998	270,000 Ohm 1 W. 10%
R3117	82442	33,000 Ohm ½ W. 10%
S3101	303481	Play Control Switch
SCS3101	309472	Silicon Control Switch
T3101	317924	Power Transformer 60 Hertz
*T3101	317925	Power Transformer 50 Hertz
W3101	766363	Line Cord & Plug Assembly
Z3101	303464	Play Control Assembly

* For 50 Hertz Units, use alternate components marked with an asterisk.

SOLID STATE AUTO SPEED UNIT, Type SAS1



1. GENERAL

The Solid State Auto Speed Unit, Type SAS1 provides 44 cycles, 95 volts square wave output to the Select-O-Matic Mechanism Motor when 33-1/3 rpm. records are played. The Auto Speed Unit consists of a unijunction oscillator with a speed control, an emitter follower type buffer stage, a free running inverter and a power relay. Power for the Auto Speed Unit is supplied by the Solid State Control Center to which it is connected.

2. OPERATION

a. Switching Circuit

When a 33-1/3 rpm. record is transferred to play position, the clamp arm switch (6M1) closes to provide a ground path from the reset lever switch (2M11) which is closed, through the cam switch (3M16), which is also closed, to pin 3 of plug P1100, through the Solid State Control Center to pin 3 of the Auto Speed plug P2101. This causes the power relay K2101 to energize.

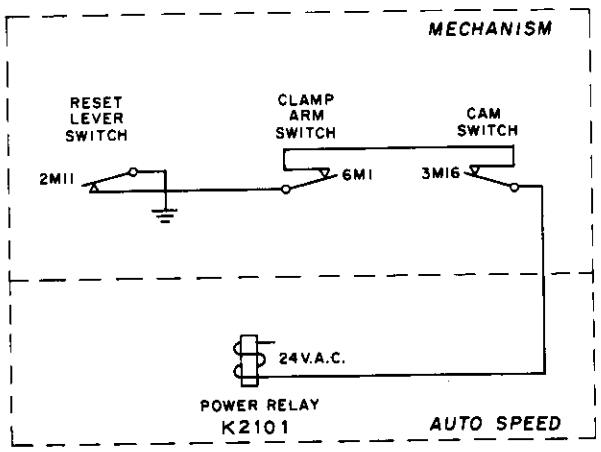


Figure 1. Simplified Switching Circuits.

Energizing the power relay, switches the mechanism motor from the 120 V, 60 cycle line to the 95 V, 44 cycle output of the Auto Speed.

b. Oscillating Circuit

The unijunction oscillator produces positive pulses at a repetition rate of 89 pulses per second. This rate can be changed by adjusting the speed control (R2102). This changes the charge time of C2101. The output of the unijunction oscillator is used to drive free running inverter at the desired frequency of 44.5 cycles. The output is a square wave.

3. Adjustments

a. Frequency

The desired frequency for a turntable speed of 33-1/3 rpm. is approximately 44.5 cycles and is checked by using a strobe disc on the turntable. For 60 cycle operation, the part number of the strobe disc to be used is 508487. For 50 cycle operation, the part number of the strobe disc to be used is 508478.

The adjustment is made as follows:

1. Replace a record with the appropriate auto speed strobe disc. The light source frequency must conform to the frequency indicated on the strobe disc.
2. Press the appropriate number and letter button which selects the strobe disc on to the mechanism turntable.
3. Carefully prop the pickup arm out of the way.
4. Allow the unit to run approximately three minutes.
5. Set the motor speed to 33-1/3 rpm. by adjusting the SPEED control on the auto-speed unit so that the inner and outer bands on the strobe disc move in opposite directions.
6. Remove the strobe disc and replace the record.

SOLID STATE AUTO SPEED UNIT, Type SAS1

b. Power Control Relay (Refer to Figure 2)

1. Adjust the armature as required to obtain a 1/16 inch clearance between the armature and the armature back stop when the relay is energized.

2. Form the short blades so they move 1/64 inch when they make and break.

3. Form the short blades as required so there is a 1/32 inch contact gap on contact pairs 1A2 and 1A12 when 1A11, 1A1 and 1A3 are just opening. Check by manually releasing relay from the energized position.

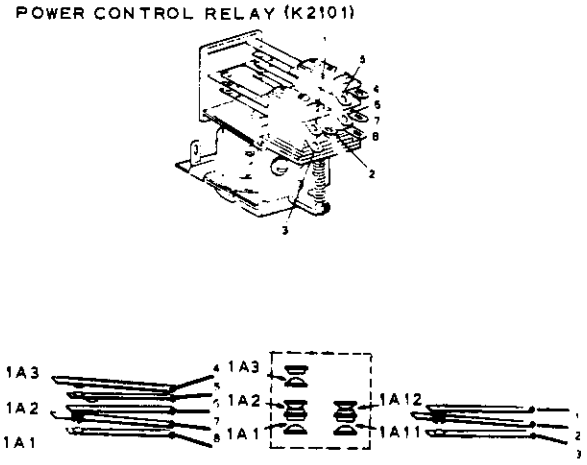
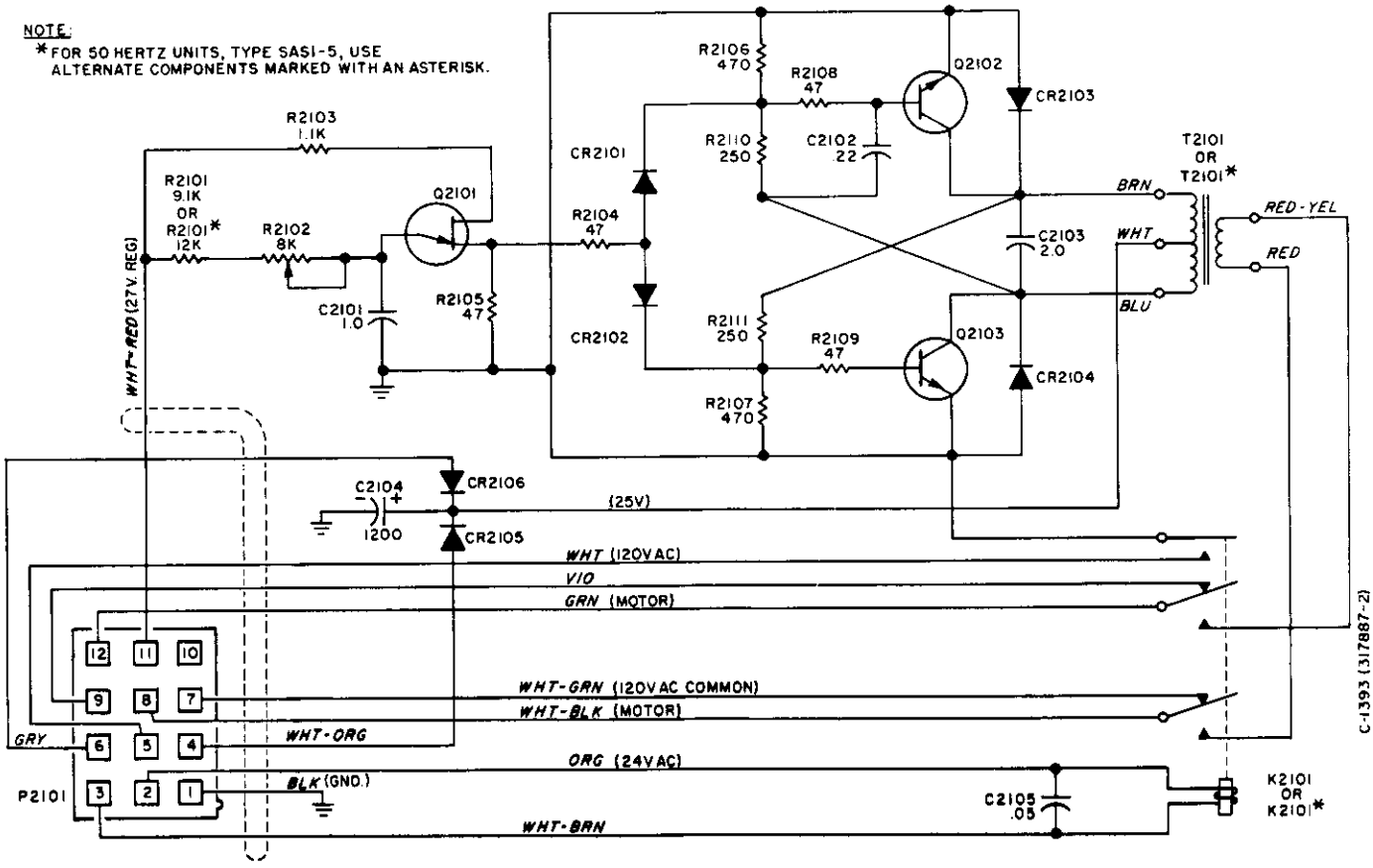


Figure 2. Power Control Relay Adjustment Detail.

SOLID STATE AUTO SPEED UNIT, Type SAS1



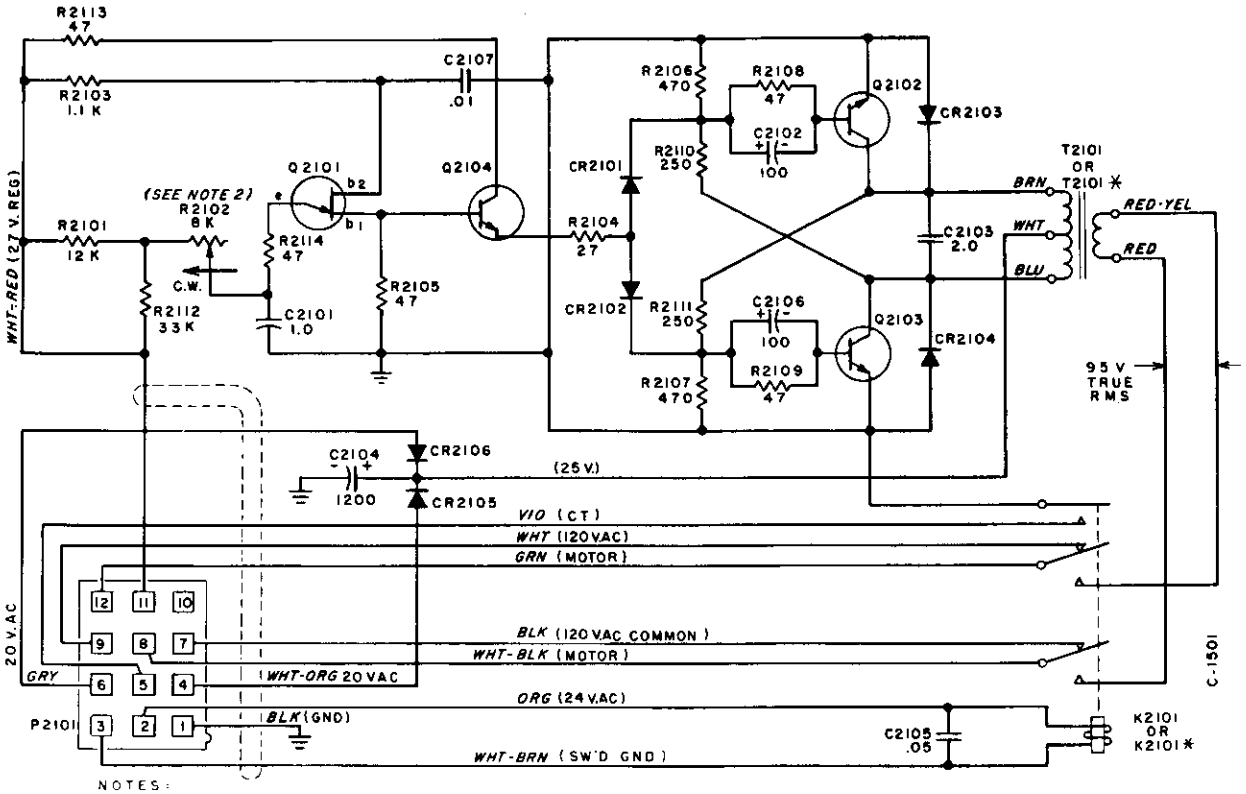
– CODE A –

Item	Part No.	Description
C2101	86352	1.0 Mfd. 200 V. Mylar
C2102	86331	0.22 Mfd. 50 V. Mylar
C2103	86349	2.0 Mfd. 200 V. Mylar
C2104	87726	1200 Mfd. 35 V. Lytic
C2105	86235	0.05 Mfd. 200 V. Paper
CR2101	309384	Silicon Diode 170 V.
CR2102	309384	Silicon Diode 170 V.
CR2103	309384	Silicon Diode 170 V.
CR2104	309384	Silicon Diode 170 V.
CR2105	309476	Silicon Diode 100 V.
CR2106	309476	Silicon Diode 100 V.
P2101	710316	Cap Housing
K2101	317877	Power Relay
*K2101	317878	Power Relay

Item	Part No.	Description
Q2101	309428	Unijunction Transistor
Q2102	309441	NPN Power Transistor
Q2103	309441	NPN Power Transistor
R2101	82633	9100 Ohm ½ W. 5%
*R2101	82635	12,000 Ohm ½ W. 5%
R2102	317881	8000 Ohm Potentiometer
R2103	82162	1100 Ohm ½ W. 5%
R2104	82408	47 Ohm ½ W. 10%
R2105	82408	47 Ohm ½ W. 10%
R2106	81288	470 Ohm W.W. 2 W. 10%
R2107	81288	470 Ohm W.W. 2 W. 10%
R2108	81236	47 Ohm W.W. 2 W. 10%
R2109	81236	47 Ohm W.W. 2 W. 10%
R2110	81201	250 Ohm W.W. 5 W. 10%
R2111	81201	250 Ohm W.W. 5 W. 10%
T2101	317874	Output Transformer
*T2101	317875	Output Transformer

* 50 Hertz

SOLID STATE AUTO SPEED UNIT, Type SAS1



NOTES:
1. * FOR 50 HERTZ UNITS, TYPE SAS1-5, USE ALTERNATE COMPONENTS MARKED WITH AN ASTERISK. 2. WHEN THE SPEED CONTROL R2102 IS ROTATED FROM MIN. TO MAX. POSITION (FULL CLOCKWISE AS VIEWED FROM TOP OF CHASSIS), THE INVERTER OUTPUT FREQUENCY MEASURED AT THE SECONDARY WINDING OF T2101 MUST CONTINUALLY INCREASE. IF IT DOES NOT, REMOVE R2112 FROM CIRCUIT.

– CODE B –

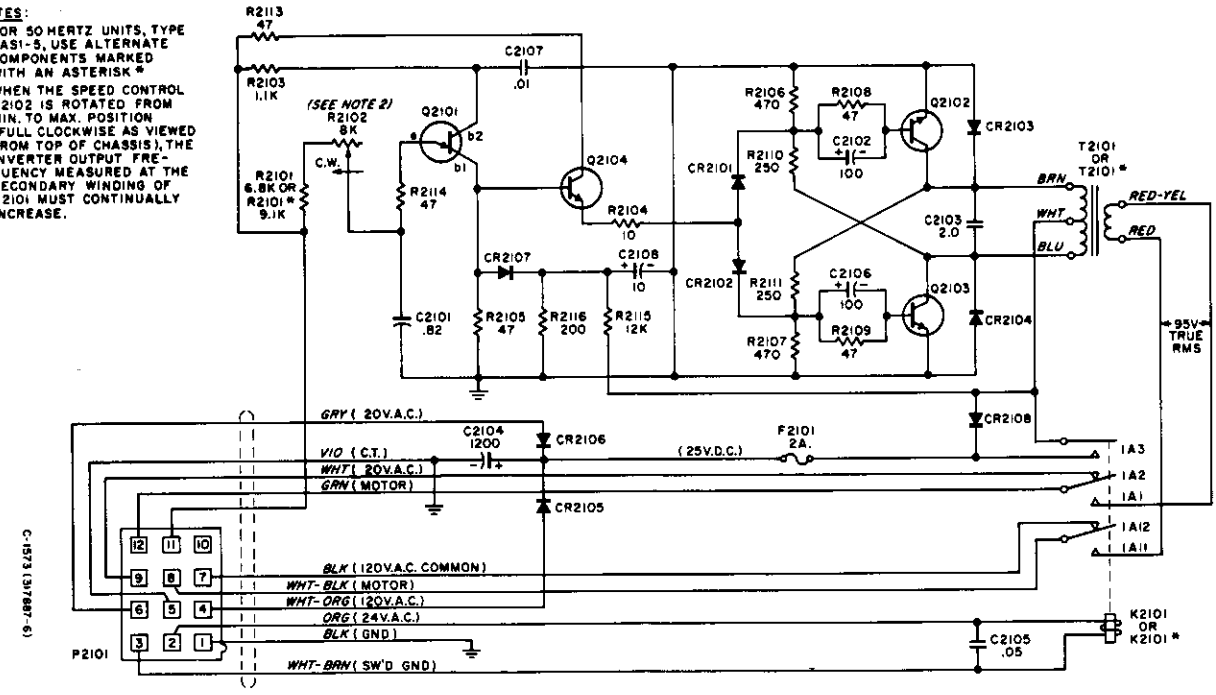
Item	Part No.	Description
C2101	86352	0.82 Mfd. 50 V. Mylar
C2102	87752	100 Mfd. 10 V. Lytic
C2103	86349	2.0 Mfd. 200 V. Mylar
C2104	87726	1200 Mfd. 35 V. Lytic
C2105	86235	0.05 Mfd. 200 V. Paper
C2106	87752	100 Mfd. 10 V. Lytic
C2107	86313	0.01 Mfd. 500 V. Ceramic
CR2101	309384	Silicon Diode 170 V.
CR2102	309384	Silicon Diode 170 V.
CR2103	309384	Silicon Diode 170 V.
CR2104	309384	Silicon Diode 170 V.
CR2105	309476	Silicon Diode 100 V.
CR2106	309476	Silicon Diode 100 V.
K2101	317877	Power Relay (6 Hz.)
P2101	710316	Cap Housing
Q2101	309428	Unijunction Transistor
Q2102	309441	NPN Power Transistor
Q2103	309441	NPN Power Transistor
Q2104	309442	NPN Transistor

Item	Part No.	Description
R2101	82437	6800 Ohm ½ W. 5%
R2102	317881	8000 Ohm Potentiometer
R2103	82162	1100 Ohm ½ W. 5%
R2104	82405	10 Ohm ½ W. 10%
R2105	82408	47 Ohm ½ W. 10%
R2106	81288	470 Ohm W.W. 2 W. 10%
R2107	81288	470 Ohm W.W. 2 W. 10%
R2108	81236	47 Ohm W.W. 2 W. 10%
R2109	81236	47 Ohm W.W. 2 W. 10%
R2110	81201	250 Ohm W.W. 5 W. 10%
R2111	81201	250 Ohm W.W. 5 W. 10%
R2112	82442	33K Ohm ½ W. 10%
R2113	82408	47 Ohm ½ W. 10%
R2114	82408	47 Ohm ½ W. 10%
T2101	317874	Output Transformer (60 Hz.)
* K2101	317878	Power Relay (50 Hz.)
* R2101	82633	9100 Ohm ½ W. 5%
* T2101	317875	Output Transformer (50 Hz.)

* **Used on Type SAS1-5 only.**

SOLID STATE AUTO SPEED UNIT, Type SAS1

NOTES:
1. FOR 50 HERTZ UNITS, TYPE SAS1-5, USE ALTERNATE COMPONENTS MARKED WITH AN ASTERISK *
2. WHEN THE SPEED CONTROL R2102 IS ROTATED FROM MIN. TO MAX. POSITION (FULL CLOCKWISE AS VIEWED FROM TOP OF CHASSIS), THE INVERTER OUTPUT FREQUENCY MEASURED AT THE SECONDARY WINDING OF T2101 MUST CONTINUALLY INCREASE.



– CODE C AND D –

Item	Part No.	Description
C2101	86364	0.82 Mfd. 50 V. Mylar
C2102	87752	100 Mfd. 10 V. Lytic
C2103	86349	2.0 Mfd. 200 V. Mylar
C2104	87726	1200 Mfd. 35 V. Lytic
C2105	86235	0.05 Mfd. 200 V. Paper
C2106	87752	100 Mfd. 10 V. Lytic
C2107	86313	0.01 Mfd. 500 V. Ceramic
C2108	87697	10 Mfd. 6 V. Lytic
CR2101	309384	Silicon Diode 170 V.
CR2102	309384	Silicon Diode 170 V.
CR2103	309384	Silicon Diode 170 V.
CR2104	309384	Silicon Diode 170 V.
CR2105	309476	Silicon Diode 100 V.
CR2106	309476	Silicon Diode 100 V.
CR2107	309384	Silicon Diode 170 V.
CR2108	309476	Silicon Diode 100 V.
F2101	317946	2 Amp. Fuse
K2101	317877	Power Relay (6 Hz.)
P2101	710316	Cap Housing
Q2101	309443	Unijunction Transistor
Q2102	309441	NPN Power Transistor
Q2103	309441	NPN Power Transistor
Q2104	309442	NPN Transistor

Item	Part No.	Description
R2101	82630	6800 Ohm ½ W. 5%
R2102	317881	8000 Ohm Potentiometer
R2103	82162	1100 Ohm ½ W. 5%
R2104	82400	10 Ohm ½ W. 10%
R2105	82408	47 Ohm ½ W. 10%
R2106	81288	470 Ohm W.W. 2 W. 10%
R2107	81288	470 Ohm W.W. 2 W. 10%
R2108	81236	47 Ohm W.W. 2 W. 10%
R2109	81236	47 Ohm W.W. 2 W. 10%
R2110	81201	250 Ohm W.W. 5 W. 10%
R2111	81201	250 Ohm W.W. 5 W. 10%
R2113	82408	47 Ohm ½ W. 10%
R2114	82408	47 Ohm ½ W. 10%
R2115	81293	1200 Ohm W.W. 2 W. 5%
R2116	82994	200 Ohm ½ W. 5%
T2101	317874	Output Transformer (60 Hz.)
* K2101	317878	Power Relay (50 Hz.)
* R2101	82633	9100 Ohm ½ W. 5%
* T2101	317875	Output Transformer (50 Hz)

* Used on Type SAS1-5 only.

UNIVERSAL DUAL PRICING UNIT, Type UDPU6

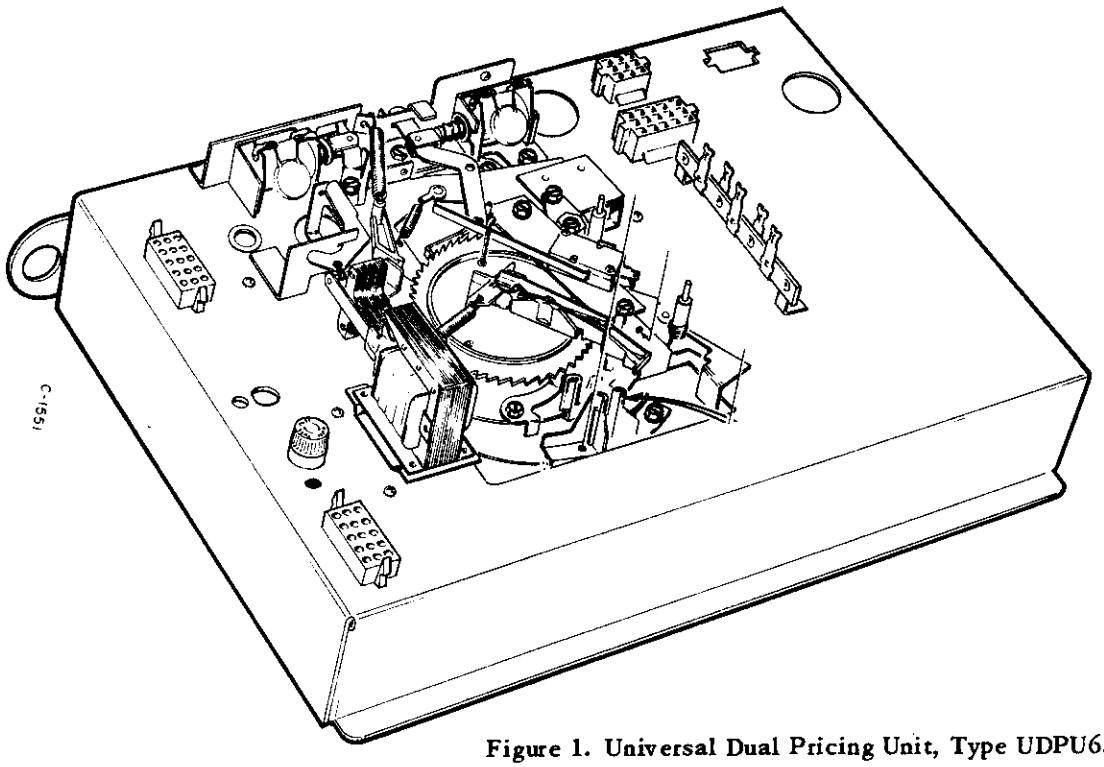


Figure 1. Universal Dual Pricing Unit, Type UDPU6.

1. DESCRIPTION

The Universal Dual Pricing Unit, Type UDPU6, is for use with the Coin-Operated Phonograph when selections are sold for two basic prices. However, the unit may be used as a single pricing unit if so desired. The function of this unit is to store credits for coins deposited, cancel the credit as it is used for selections, control the selection system write-in current pulse, and to start the scanning operation of the mechanism. The unit consists of three add solenoids, one shift solenoid, one subtract solenoid, two fuses (or one fuse and a circuit breaker), an add hold magnet, a timing relay and the switches that control the various circuits. Power for the unit is obtained from the Solid State Control Center.

2. OPERATION

a. General

The basic component of the pricing unit is the spring loaded credit ratchet wheel. It is a molded ratchet with each tooth representing a credit. With the spring fully charged and the credit ratchet wheel held in position by a detent lever, there is no credit established. When a coin is deposited, a solenoid is momentarily energized disengaging the detent lever from the credit wheel allowing the wheel to rotate. The number of teeth the ratchet wheel rotates is determined by an add arm that engages the ratchet wheel before the detent lever is disengaged.

When a selection is made, a subtract solenoid is energized which drives the credit ratchet wheel back toward the zero credit position.

3. ADJUSTMENTS

a. Full Credit Stop Bracket

Refer to Figure 2. With the credit ratchet wheel resting against the full credit stop bracket, adjust the bracket so there is .003 to .008 inch clearance between the tip of the detent lever and the face of tooth number 31.

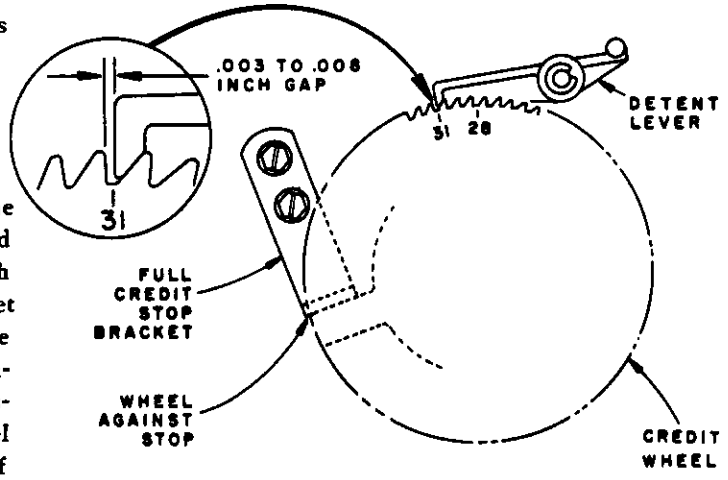


Figure 2. Full Credit Stop Bracket Adjustment Detail.

UNIVERSAL DUAL PRICING UNIT, Type UDPU6

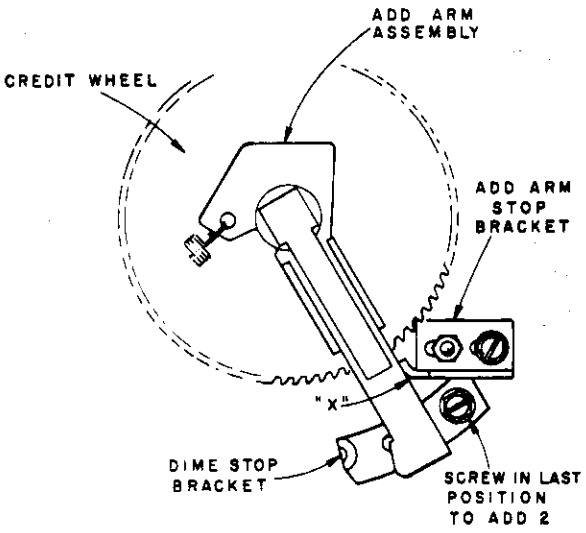


Figure 3. Add Arm Stop Bracket Adjustment Detail.

b. Add Arm Stop Bracket, refer to Figure 3.

1. Position the dime stop bracket so that the screw is in the first hole in the bracket. The pointer on the stop bracket should indicate 2 on its markings. This will provide an add 1 function.
2. Loosen the screws on the add arm stop bracket and slide it as far as possible towards the add arm.
3. Tighten the screws.
4. Press down on the add arm as it rests against the add arm stop bracket and see that it engages the teeth of the credit ratchet wheel smoothly. This may require a slight readjustment of the add arm stop bracket.
5. Energize and release the dime solenoid manually and see that the credit wheel advances one tooth. If not, repeat this step.

c. Dime, Quarter and Half Dollar Solenoids

Refer to Figure 4. Position the solenoids so when the coil plunger is fully seated there is .015 to .030 inch clearance between the detent lever and the tips of the teeth in the credit wheel. If this clearance cannot be reached by adjusting the solenoids, refer to paragraph e.

d. Hold Magnet

Refer to Figure 5. Adjust the position of the hold magnet so the magnet plate is just touching the pole piece of the hold magnet when the quarter solenoid plunger is bottomed.

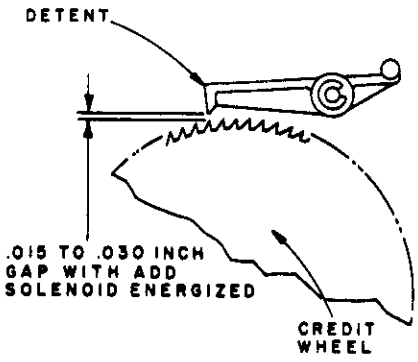


Figure 4. Solenoid Adjustment Detail.

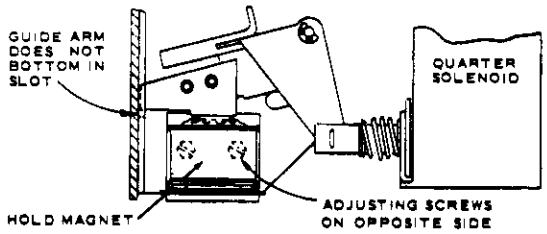


Figure 5. Hold Magnet Adjustment Detail.

e. Detent Release Lever

Refer to Figure 6. When the dime, quarter and half dollar solenoids are operated, the detent lever should clear the tips of the teeth on the credit ratchet wheel by .015 to .030 inch. Adjust the detent release lever as required to obtain this measurement.

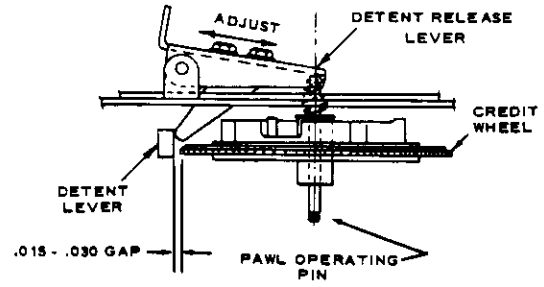


Figure 6. Detent Release Lever Adjustment Detail.

f. Credit Ratchet Wheel Zero Position

Refer to Figure 7. Adjust the zero stop so there is .015 to .080 inch gap between the tip of the detent lever and the face of the first tooth. Check that the subtract solenoid bottoms before the credit ratchet wheel drives the switch lever nose against the zero stop when removing the last three credits.

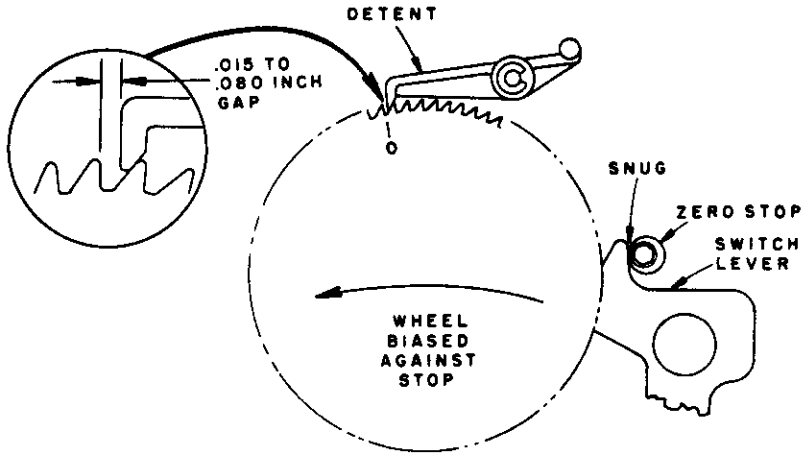


Figure 7.
Credit Ratchet Wheel Zero Position Adjustment Detail.

g. Cancel Adjustments

1. Refer to Figure 8. Adjust the subtract solenoid and the shift solenoid bracket so that the subtract pawl enters the teeth in the credit ratchet wheel without striking either side and subtracts one credit when the subtract solenoid is energized.

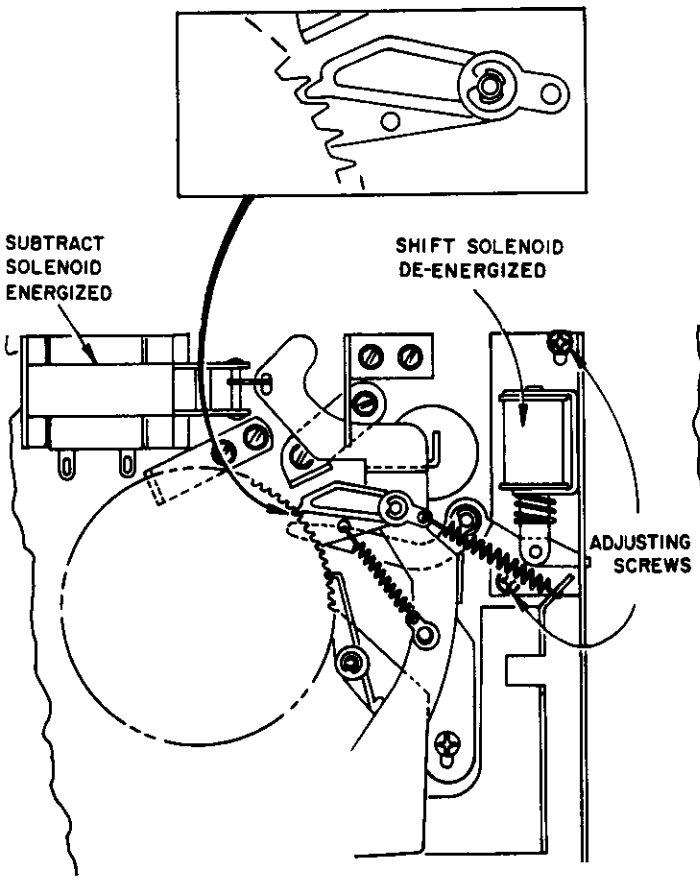


Figure 8. Subtract Solenoid Adjustment Detail.

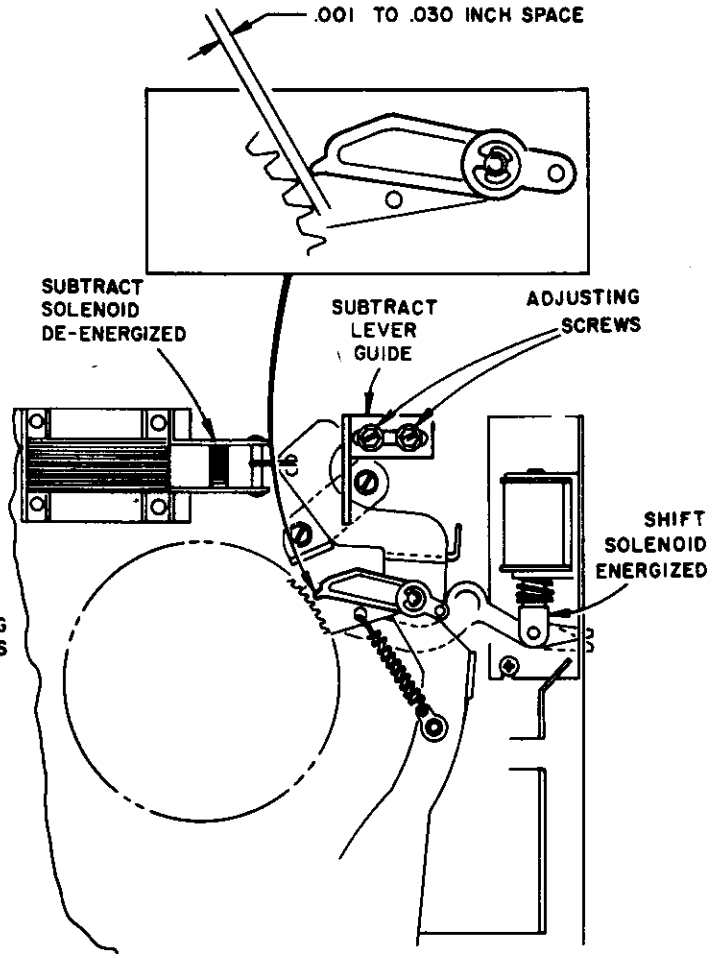


Figure 9. Subtract Lever Guide Adjustment Detail.

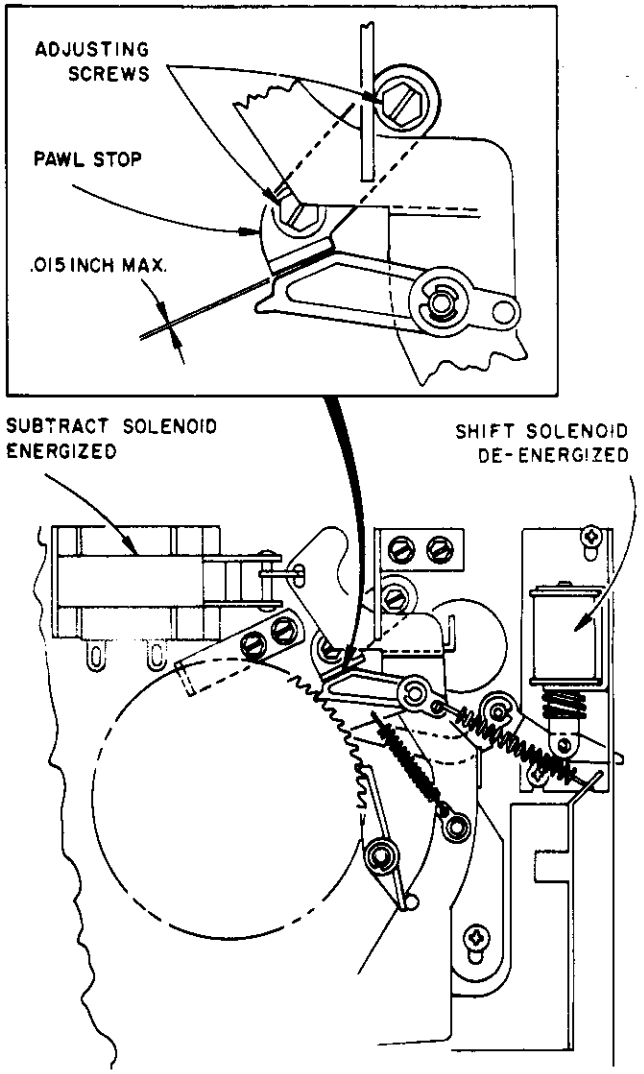


Figure 10. Pawl Stop Adjustment Detail.

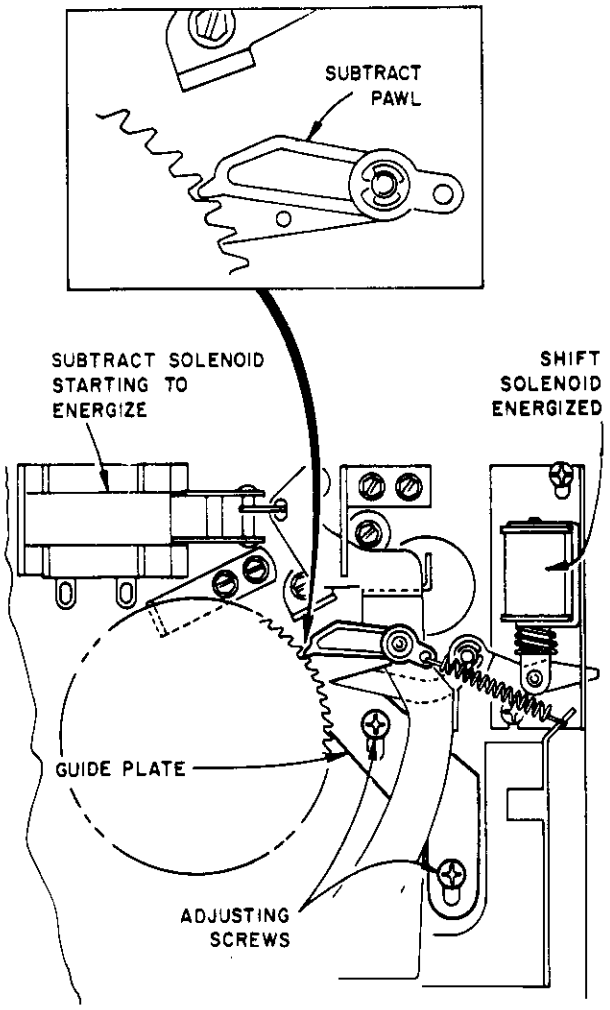


Figure 11. Guide Plate Adjustment Detail.

2. Refer to Figure 9. With the shift solenoid energized and the subtract solenoid de-energized, adjust the subtract lever guide so the subtract pawl clears the credit ratchet wheel by .001 to .030 inch.

3. Refer to Figure 10. Adjust the pawl stop so that when the subtract solenoid plunger is seated firmly on its pole piece, the subtract pawl is not tight against the pawl stop (.015 inch maximum). Check this adjustment by seating the solenoid plunger and manually driving the ratchet wheel in the subtract direction. There must be a slight movement of the subtract pawl. The pawl stop position can be shifted slightly to permit this free play.

4. Recheck the entry of the subtract pawl in at least three positions of the wheel. Check at the low credit end, the mid-position and at the high credit end.

5. Refer to Figure 11. With the shift solenoid seated adjust the guide plate to allow the subtract pawl to enter the teeth in the credit ratchet wheel without striking either side and to subtract three credits. Make certain that with the shift solenoid plunger seated, the shift lever is held far enough away from the subtract pawl so that it cannot touch at any point during the subtract stroke. See Figure 12.

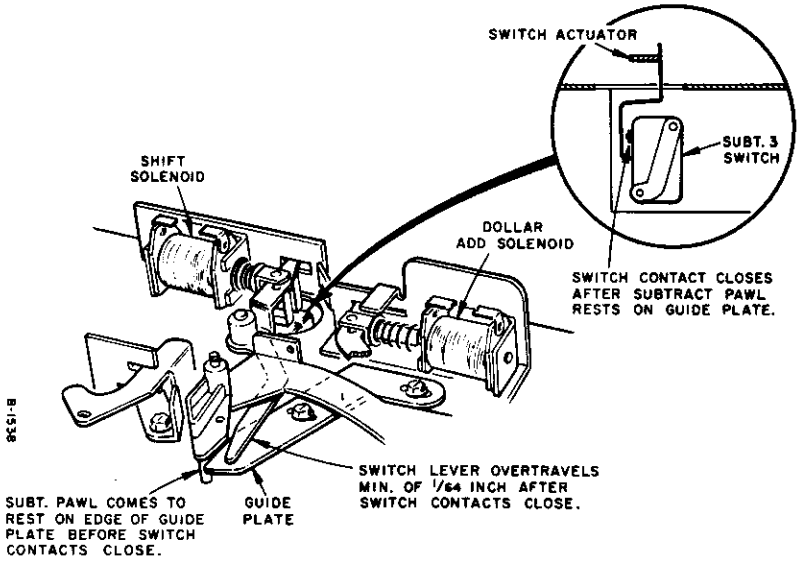


Figure 12. Subtract 3 Switch Adjustment Detail.

h. Subtract 3 Switch Adjustments

Refer to Figure 12. Adjust the position of the subtract 3 switch so that when the shift solenoid is energized, the switch contacts close (listen for click) after the subtract pawl has come to rest against the edge of the guide plate but before the shift solenoid bottoms. There must be 1/64 inch minimum overtravel of the end of the switch lever after switch operation. Upon the return stroke of the shift solenoid, the subtract 3 switch contacts must open by the time the shift lever comes within 1/32 inch of bottoming in its slot in the shift coil and switch bracket.

i. Write-in Trigger Switch Adjustment

Refer to Figure 13. Adjust the terminal board so that the contact on the left is just about to make when the cancel arm is moved down far enough so the subtract pawl engages the credit wheel.

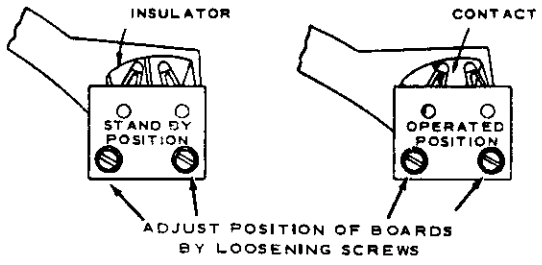


Figure 13.

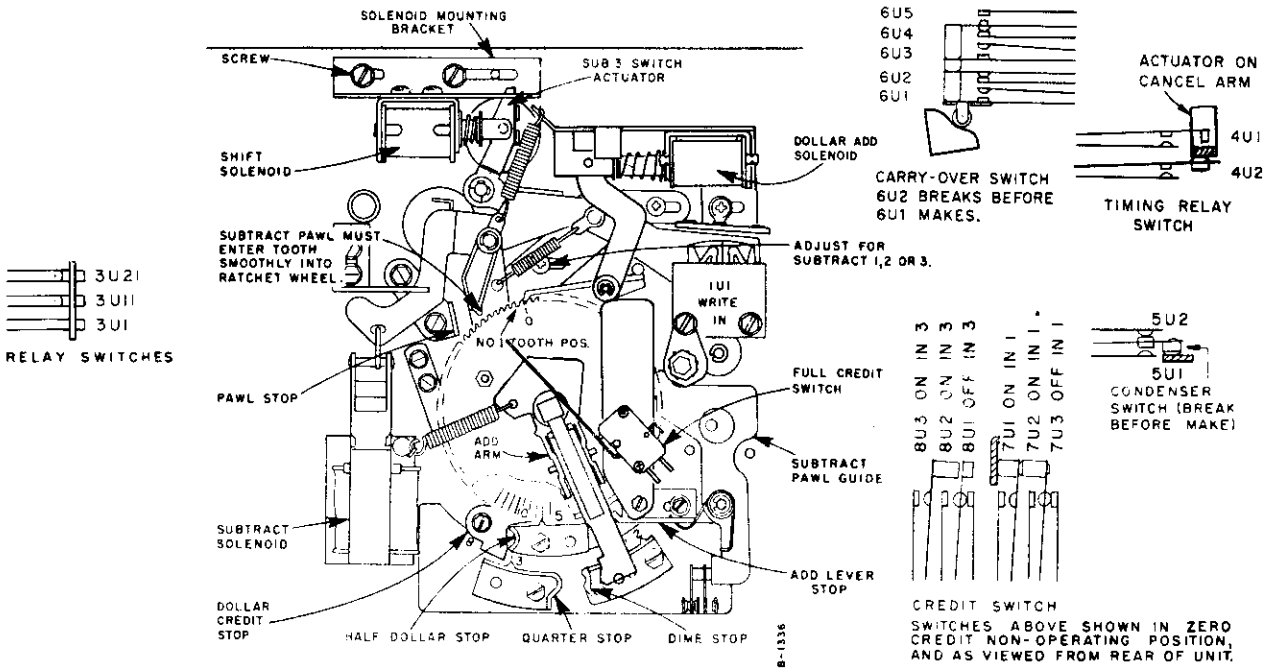
Write-In Trigger Switch Adjustment Detail.

j. Album Write-in Switch Adjustment

Adjust the position of the album write-in switch so that its contacts close before the subtract 3 switch contacts close.

Page 6

UNIVERSAL DUAL PRICING UNIT, Type UDPU6



CONTACT FUNCTION CHART

CONTACT	NORMAL POSITION	FUNCTION
1U1	OPEN	Write-In Trigger
2U1	OPEN	Energizes Subtract Coil on Album Select
3U1	OPEN	Timing Relay Hold
3U11	CLOSED	De-energizes Subtract and Shift Coils
3U21	CLOSED	De-energizes Latch Solenoid
4U1	OPEN	Energizes Timing Relay
4U2	OPEN	Energizes Scan Control Add
5U1	OPEN	Add Hold Magnet Capacitor Switch
5U2	CLOSED	
6U1	OPEN	Subtract Coil Carry Over
6U2	CLOSED	Timing Relay Reset Circuit
6U3	OPEN	Latch Solenoid Hold
6U4	CLOSED	Quarter Add To Bonus Assembly
6U5	OPEN	Reset Bonus Assembly with Selection
7U1	OPEN	Energizes Latch Solenoid with 1 or more Credits
7U2	OPEN	Enables Subtract Coil to Energize (Closed with 1 or more Credits)
7U3	CLOSED	Timing Relay Reset Circuit (Open with 1 or more Credits)
8U1	CLOSED	Timing Relay Reset Circuit (Open with 3 or more Credits)
8U2	OPEN	Enables Shift Coil to Energize (Closed with 3 or more Credits)
8U3	OPEN	Album Credit Lamp (Closed with 3 or more Credits)
9U1	CLOSED	Disables Subtract Circuit during Dollar Add
9U2	OPEN	Dollar Add Hold Circuit when using DPK1
10U1	CLOSED	Holding Circuit for DPK1, One Dollar Credit Coil
11U1	OPEN	Completes Path for Write-In Pulse during Album Selection
12U1	OPEN	Resets Two Quarter Bonus Circuit

ISSUE 2

Universal Dual Price Setting Adjustments.

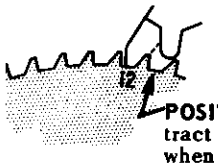
SUBTRACT PAWL GUIDE PLATE

Adjust with shift solenoid held energized.

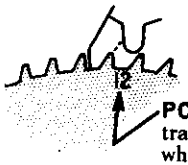
A. Advance Credit Wheel so detent lever is engaged with tooth No. 6.

B. Loosen two screws on subtract pawl guide plate.

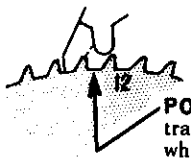
C. Position the subtract pawl guide plate for:



POSITION NO. 3; so the subtract pawl enters tooth No. 11 when subtract solenoid operates.

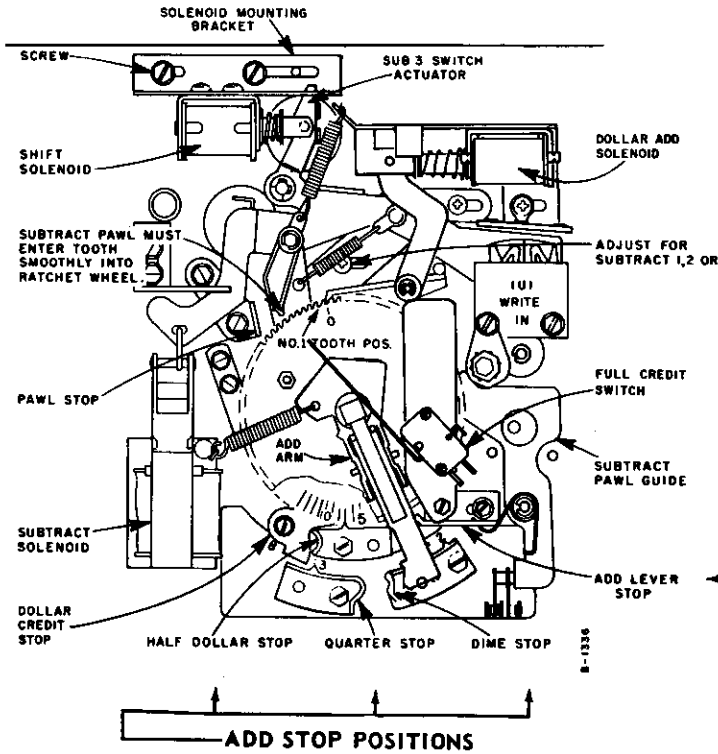


POSITION NO. 2; so the subtract pawl enters tooth No. 12 when subtract solenoid operates.



POSITION NO. 1; so the subtract pawl enters tooth No. 13 when subtract solenoid operates.

D. Tighten screws on guide plate.



ADD STOP POSITIONS

Credits for coins are determined by positioning stops.

A. Remove screw from stop.

B. Shift stop to desired position using pointer on stop as indicator.

C. Replace and tighten screw.

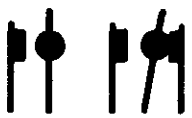
ADD LEVER STOP BRACKET

POSITION 1; loosen screws and position stop bracket so that arm assembly is held 1 tooth back from stop position on dime stop. Check that add arm engages teeth of wheel smoothly.

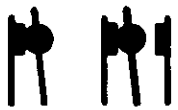
POSITION 2; loosen screws and position stop bracket so that arm assembly is held 2 teeth back from stop position on dime stop. Check that add arm engages teeth of wheel smoothly.

CREDIT SWITCH SETTINGS

Make certain singles credit switch operates as shown below after making price settings.

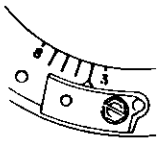
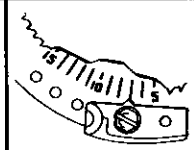
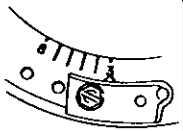
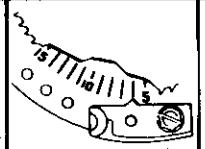


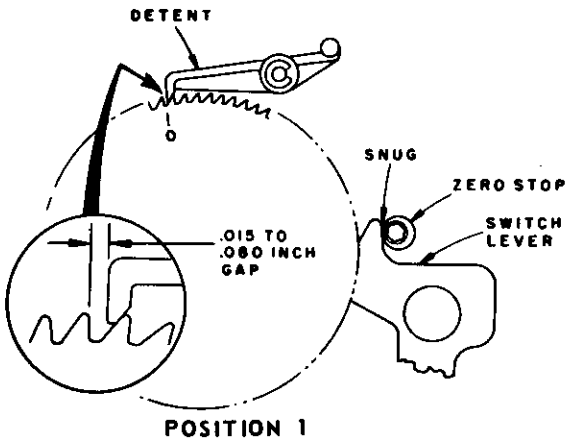
AT "0" CREDIT



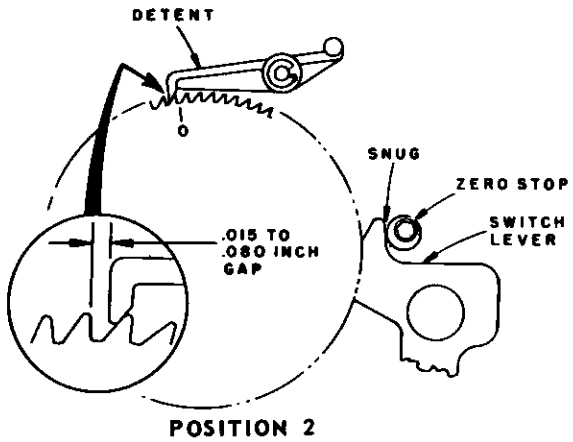
AT "1" CREDIT

Universal Dual Price Setting Adjustments. (continued)

Part No.	PRICING WINDOW	ADD STOP POSITIONS			ADD LEVER STOP BRACKET	PAWL GUIDE PLATE	ZERO STOP	SLUG REJECTOR
		DIME	QUARTER	HALF DOLLAR				
493196	DEPOSIT COINS UP TO ONE DOLLAR TOTAL **SINGLES:** TEN CENTS . . . . . 1 SELECTION QUARTER . . . . . 3 SELECTIONS HALF DOLLAR . . . . 6 SELECTIONS **ALBUMS:** QUARTER . . . . . PER ALBUM SIDE HALF DOLLAR . . . 2 ALBUM SIDES	 IN POSITION 2	 IN POSITION 4	 IN POSITION 7	POSITION 1 (forward)	POSITION 3	POSITION 1	Flipper not anchored.
493197	DEPOSIT QUARTERS AND HALF DOLLARS ONLY **SINGLES:** QUARTER . . . . . 2 SELECTIONS HALF DOLLAR . . . . 5 SELECTIONS **ALBUMS:** QUARTER . . . . . PER ALBUM SIDE HALF DOLLAR . . . 2 SIDES PLUS 1 SINGLE	NOT USED	 IN POSITION 3	 IN POSITION 6	POSITION 1 (forward)	POSITION 2	POSITION 2	Set for rejecting nickels and dimes



POSITION 1



POSITION 2

ZERO STOP POSITIONING

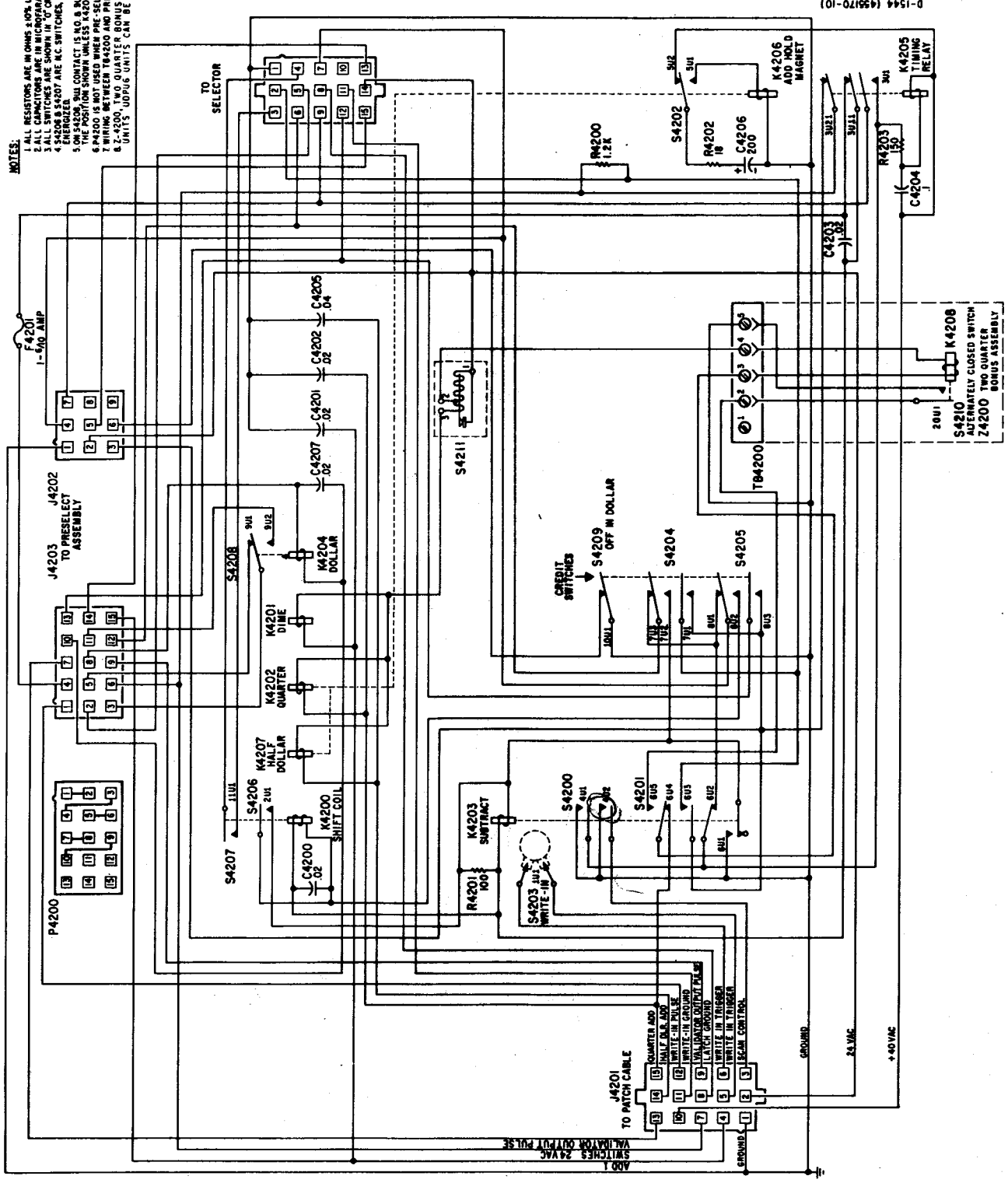
A. Loosen the screw on the ZERO STOP.

B. Turn the ZERO STOP as required until snug against the switch lever for:

POSITION NO. 1; so the long radius on the ZERO STOP is facing away from the Credit Wheel. The Detent should enter tooth No. 0 with .015 to .080 clearance. Tighten the screw. Make certain single credit switch is adjusted as shown above.

POSITION NO. 2; so the long radius on the ZERO STOP is facing toward the Credit Wheel. The Detent should enter tooth No. 1 with .015 to .080 clearance. Tighten the screw. Make certain single credit switch is adjusted as shown above.

UNIVERSAL DUAL PRICING UNIT, Type UDPU6



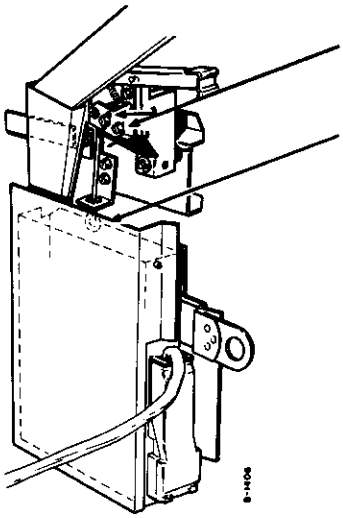
UNIVERSAL DUAL PRICING UNIT, Type UDPU6 & UDPU6-5

Item	Part No.	Description
C4200	86259	0.02 Mfd. Ceramic Capacitor
C4201	86259	0.02 Mfd. Ceramic Capacitor
C4202	86259	0.02 Mfd. Ceramic Capacitor
C4203	86259	0.02 Mfd. Ceramic Capacitor
C4204	86142	0.1 Mfd. 200 V. Capacitor
C4205	86258	0.04 Mfd. Ceramic Capacitor
C4206	87753	200 Mfd. 50 V. Electrolytic
C4207	86259	0.02 Mfd. Ceramic Capacitor
F4200	515290	4/10 Amp. Slo Blo Fuse
F4201	451248	1-6/10 Amp. Slo Blo Fuse
†F4202	515290	4/10 Amp. Slo Blo Fuse (Part of Z4200)
J 4200	309312	15 Contact Brown Socket Housing
J 4201	309317	15 Contact Orange Socket Housing
J 4202	769870	9 Contact White Socket Housing
J 4203	309325	15 Contact White Socket Housing
K4200	455023	Solenoid Assembly
*K4200	455024	Solenoid Assembly
K4201	451068	Solenoid Assembly (Dime)
*K4201	451265	Solenoid Assembly (Dime)
K4202	451068	Solenoid Assembly (Quarter)
*K4202	451265	Solenoid Assembly (Quarter)
K4203	451330	Subtract Solenoid Assembly
K4204	455284	Solenoid Assembly (Dollar)
K4205	451228	Timing Relay
K4206	455263	Time Delay Magnet Assembly
K4207	451218	Solenoid Assembly (Half Dollar)
K4208	451068	Solenoid Assembly (Part of Z4200)
*K4208	451265	Solenoid Assembly (Part of Z4200)
P4200	309324	15 Contact White Pin Housing
R4200	82707	Resistor 1.2K Ohm
R4201	82838	Resistor 100 Ohm
R4202	82403	Resistor 18 Ohm
R4203	82868	Resistor 150 Ohm
S 4200	455199	Timing Relay Switch
S 4201	455184	Carry-Over Switch
S 4202	451141	Condenser Switch
S 4203	451098	Write-In Switch
S 4204	451362	1 Credit Switch
S 4205	451363	3 Credit Switch
S 4206	455026	Switch (Sub 3)
S 4207	455026	Switch (Album WJ)
S 4208	455178	Switch (Dollar Carry Over)
S 4209	455305	Switch (Dollar Credit Sensor)
S 4210	453014	Switch (Alternator Reset) (Part of Z4200)
† S4211	455394	Thermal Cutout
TB4200	455351	Terminal Strip
Z4200	455350	Two Quarter Bonus Assembly

* 50 Hertz

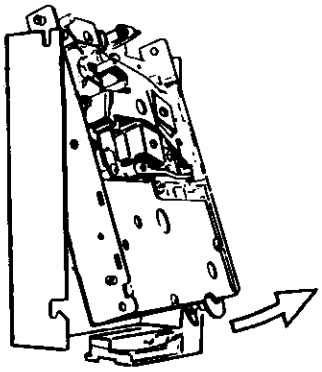
† Thermal Cutout replaces Fuse on later models.

COIN EQUIPMENT



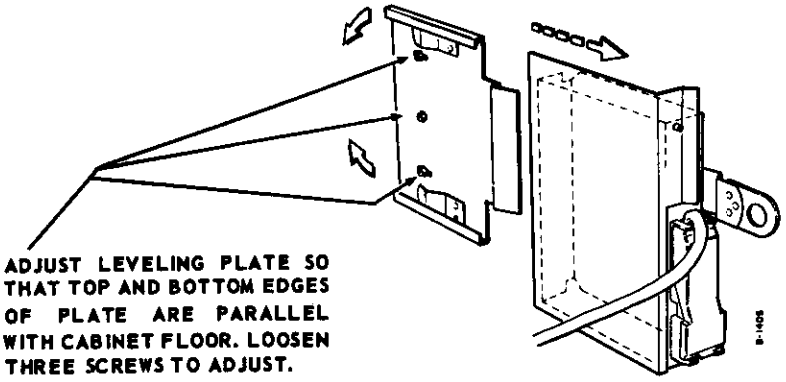
LOOSEN TWO SCREWS ON ADJUSTMENT PLATE.

ADJUST SO THAT HOOK CLEARS COIN RETURN LEVER ON SLUG REJECTOR BY 1/32" TO 3/32" WHEN CABINET LID IS CLOSED. TIGHTEN SCREWS.



SLUG REJECTOR AND FRAME ASSEMBLY MAY BE LIFTED UP AND OFF FOR EXAMINATION OR SERVICE.

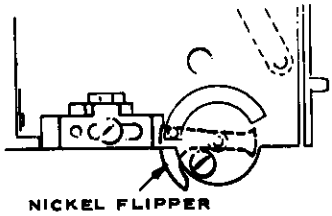
TO REMOVE SLUG REJECTOR FROM ITS FRAME LIFT UP AND SWING OUT.



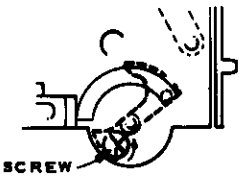
ADJUST LEVELING PLATE SO THAT TOP AND BOTTOM EDGES OF PLATE ARE PARALLEL WITH CABINET FLOOR. LOOSEN THREE SCREWS TO ADJUST.

NICKEL FLIPPER NOT ANCHORED: To operate properly in this equipment Slug Rejectors equipped with nickel flippers MUST be set up for two nickel operation, if not already set in this manner. First remove slug rejector from its frame.

COIN ACCEPTORS, INC.

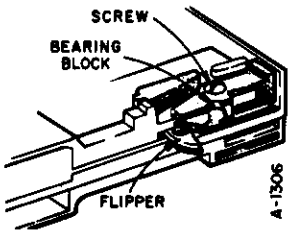


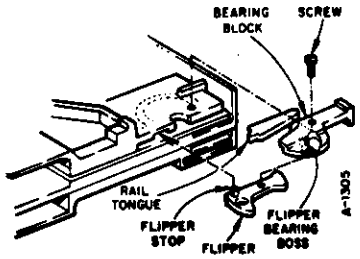
NICKEL FLIPPER IN ONE NICKEL POSITION



FOR TWO NICKEL POSITION BACK OUT SCREW UNTIL FLIPPER CLEARS END OF SCREW

NATIONAL REJECTORS, INC.

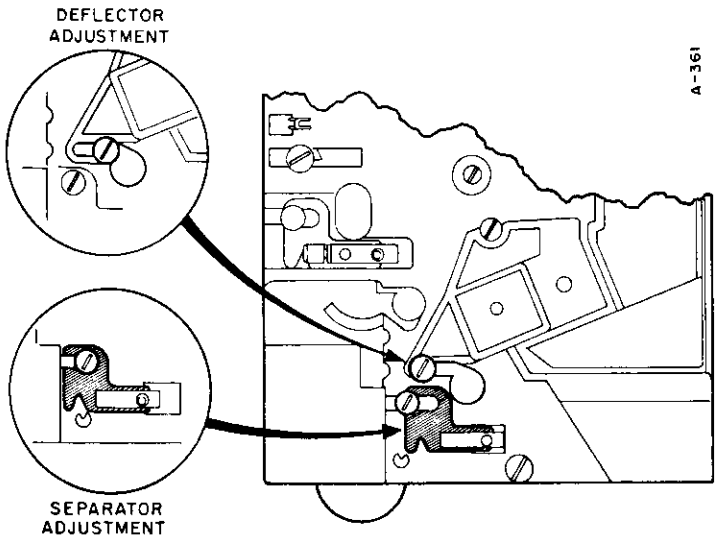




TO CHANGE FROM ONE NICKEL TO TWO NICKEL OPERATION:

1. Remove screw and swing bearing block down and out.
2. With flipper stop upward place bearing boss of bearing block into small hole of flipper.
3. Hold both pieces together and insert nickel flipper stop into nickel exit. Set rail tongue in place and swing bearing block into place.
4. Replace screw.

COIN EQUIPMENT

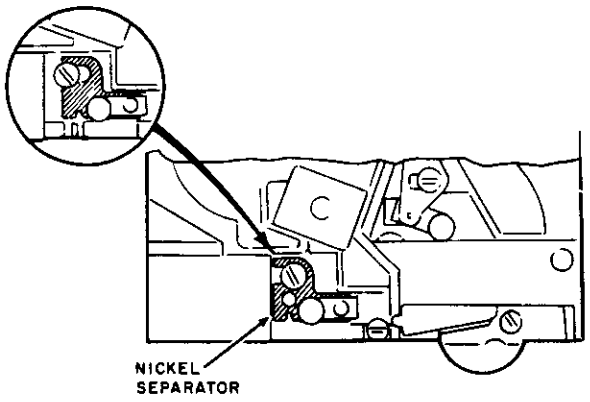


NOTE:
THE DETAILS OF THE NATIONAL REJECTORS AND COIN ACCEPTORS PARTS ARE SLIGHTLY DIFFERENT. THE ADJUSTMENTS HOWEVER, ARE THE SAME FOR DIME BLOCKING.

FOR DIME BLOCKING MAKE THE FOLLOWING ADJUSTMENTS:

1. Loosen the dime deflector screw.
2. Move the dime deflector to the extreme right.
3. Tighten the screw.
4. Loosen the dime separator screw.
5. Move the dime separator to the extreme left.
6. Tighten the screw.

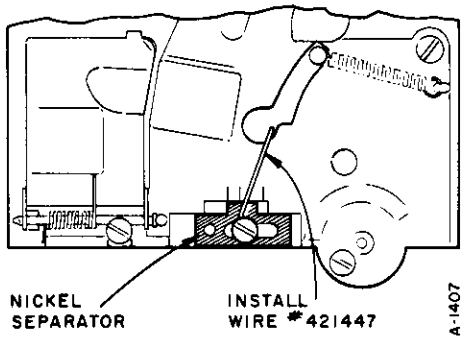
DIME BLOCKING (NATIONAL REJECTORS & COIN ACCEPTORS)



FOR NICKEL BLOCKING MAKE THE FOLLOWING ADJUSTMENT:

1. Loosen the nickel separator screw.
2. Move the nickel separator to the extreme right.
3. Tighten the screw.

NICKEL BLOCKING (NATIONAL REJECTORS)



NICKEL BLOCKING (COIN ACCEPTORS)

FOR NICKEL BLOCKING MAKE THE FOLLOWING ADJUSTMENT:

1. Loosen the nickel separator screw.
2. Install wire (Part No. 421447) under the screw. (other end fits into a slot as shown)
3. MAKE SURE THAT STEP IN WIPER BLADE CLEARS WIRE.
4. Move nickel separator to extreme right.
5. Tighten the screw.
6. Re-check step 3.

RECORDING INCOME TOTALIZER, Type RIT54-56

GENERAL

The Seeburg Type RIT54-56 and RIT54R-56 Recording Income Totalizers are electromechanical counting devices used to total money deposited in the phonograph console and associated consolettes. Type RIT54R-56 is used on phonographs equipped with or without consolettes. Type RIT54-56 is used only on phonographs not equipped with consolettes.

A window is provided in the income totalizer so the total amount of money recorded on the counter may be viewed. Manually operated printing facilities are also provided for printing this total on a form furnished with the totalizer.

A lamp connected to the totalizer illuminates a THANK YOU window when a deposit is made. The shortest period of lighting is for dimes and the longest for a dollar.

Basically, the counter assembly consists of four add solenoids (dime, quarter, half-dollar and dollar), a counter motor, a main shaft assembly and a counter. A coin or dollar bill causes the appropriate add solenoid to energize. This, in turn, allows a spring loaded ratchet wheel in the main shaft assembly to rotate an amount corresponding to the value of the money. When the spring loaded ratchet wheel rotates, it closes a circuit to the counter motor. The counter motor drives a gear which rewinds the spring and simultaneously advances the counter. When the spring is fully wound, the circuit to the counter motor is opened.

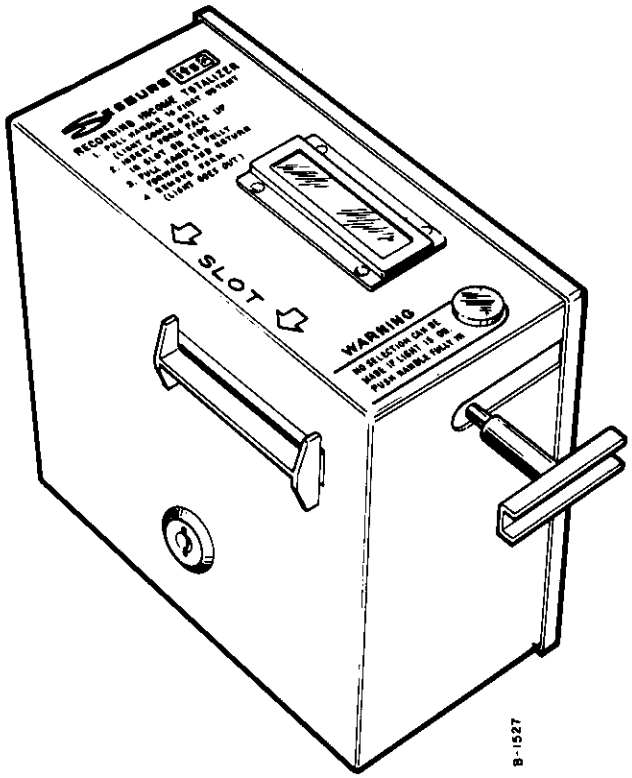


Figure 1.
Recording Income Totalizer, Type RIT54-56.

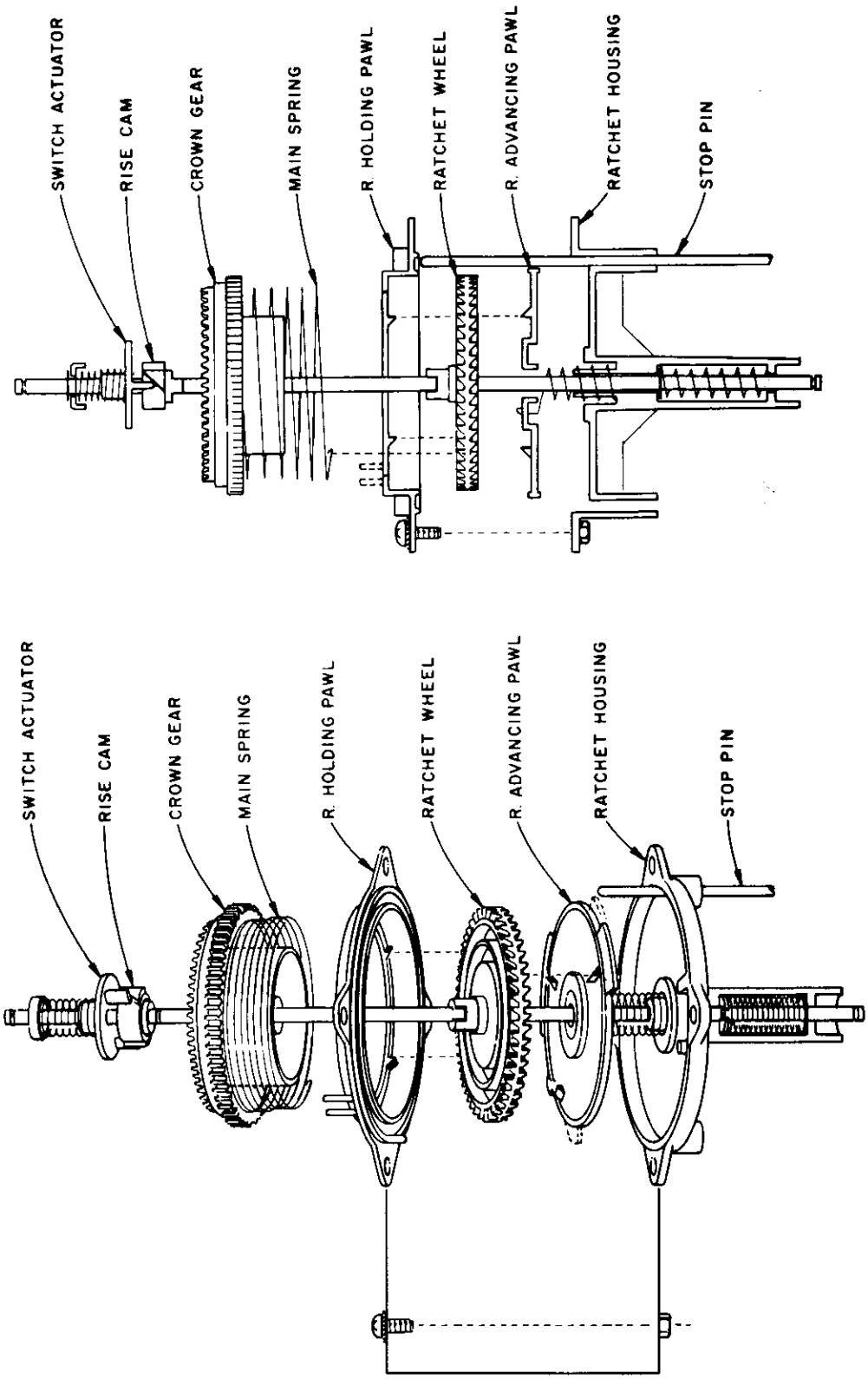


Figure 2. Main Shaft Assembly.

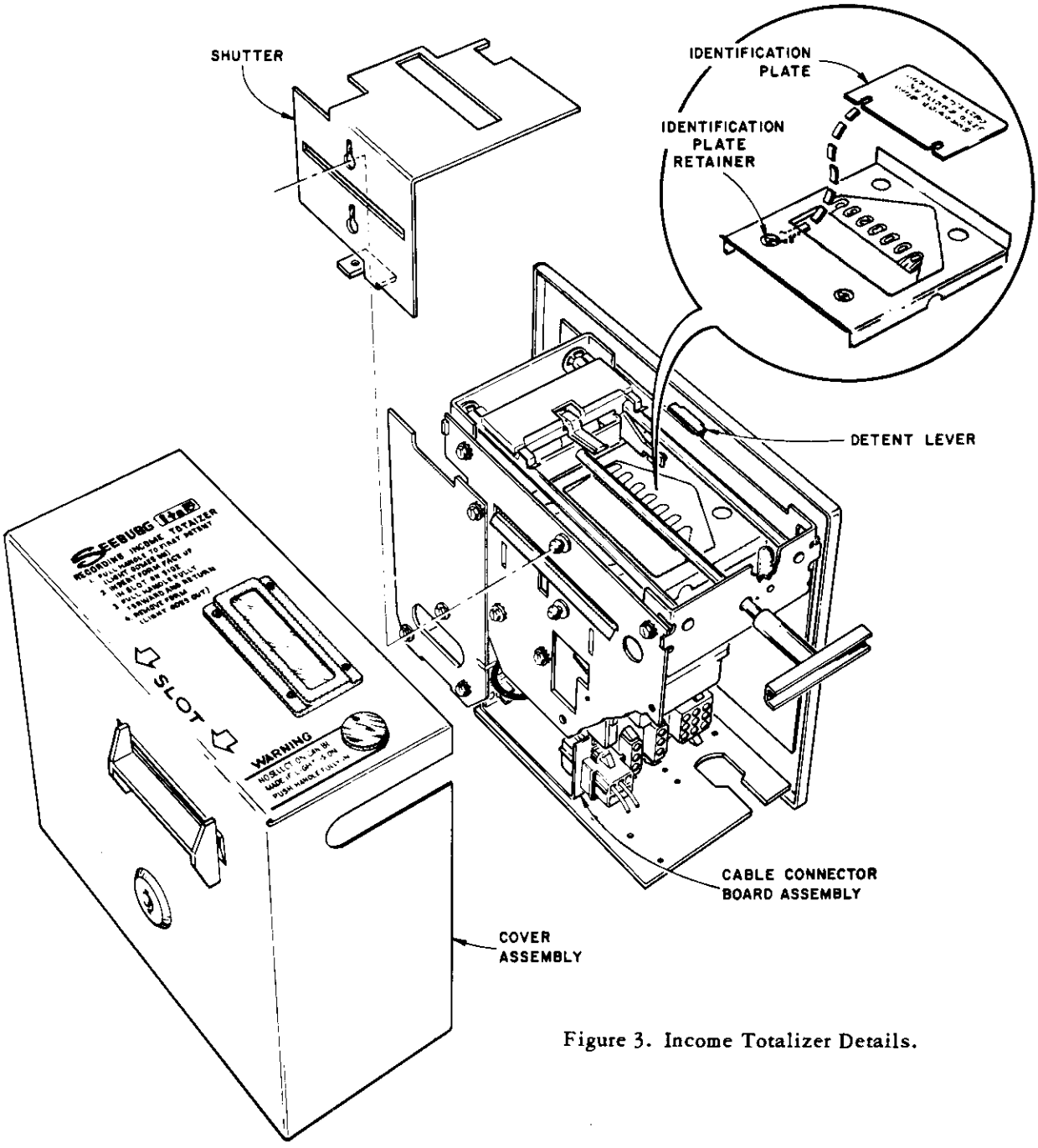


Figure 3. Income Totalizer Details.

REMOVAL OR INSERTION OF IDENTIFICATION PLATE

a. Using the key furnished with the totalizer, unlock and remove the cover. Refer to Figure 3.

b. Lift the shutter straight up, tilt it slightly forward and remove it from the totalizer.

c. Remove the identification plate or insert it securely in place as shown in the inset of Figure 3.

d. Raise the detent lever and replace the shutter. Lower the detent lever.

e. Replace the cover on the totalizer and lock it. Be sure the handle is in the PLAY position and the warning light is out.

ADJUSTMENTS

a. Disabling Switch

Refer to Figure 4. Remove the income totalizer cover. With the shutter riding free on the shutter switch and the handle all the way back, lift the shutter up. The warning lamp should light after the shutter has moved more than 1/16 inch and less than 3/32 inch.

After the lamp lights, lower the shutter until the lamp goes out. The distance the shutter is lowered should be more than 1/32 inch but less than 1/16 inch.

b. Add Motor Switch

Refer to Figure 5. Remove power from the unit. Operate any one of the add solenoids manually. The add motor switch contacts should close. Rewind the counter drive gear counterclockwise until the actuator begins to rise. The switch contacts should open when the actuator is approximately half-way up.

c. Credit Transfer Switches

Refer to Figure 6. There should be a contact gap of 1/16 to 1/8 inch on all switches and a 5/16 to 3/8 inch clearance between the switch and the base of the solenoid assembly.

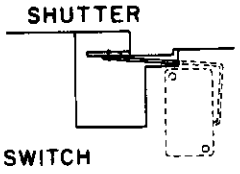


Figure 4. Disabling Switch Detail.

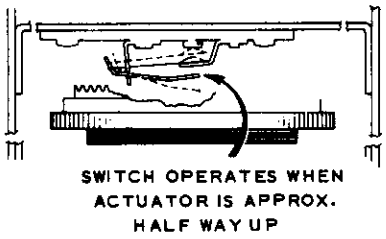


Figure 5. Add Motor Switch Detail.

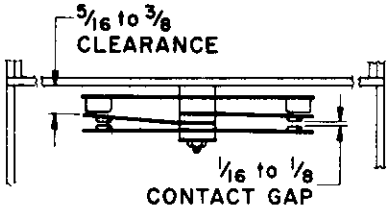
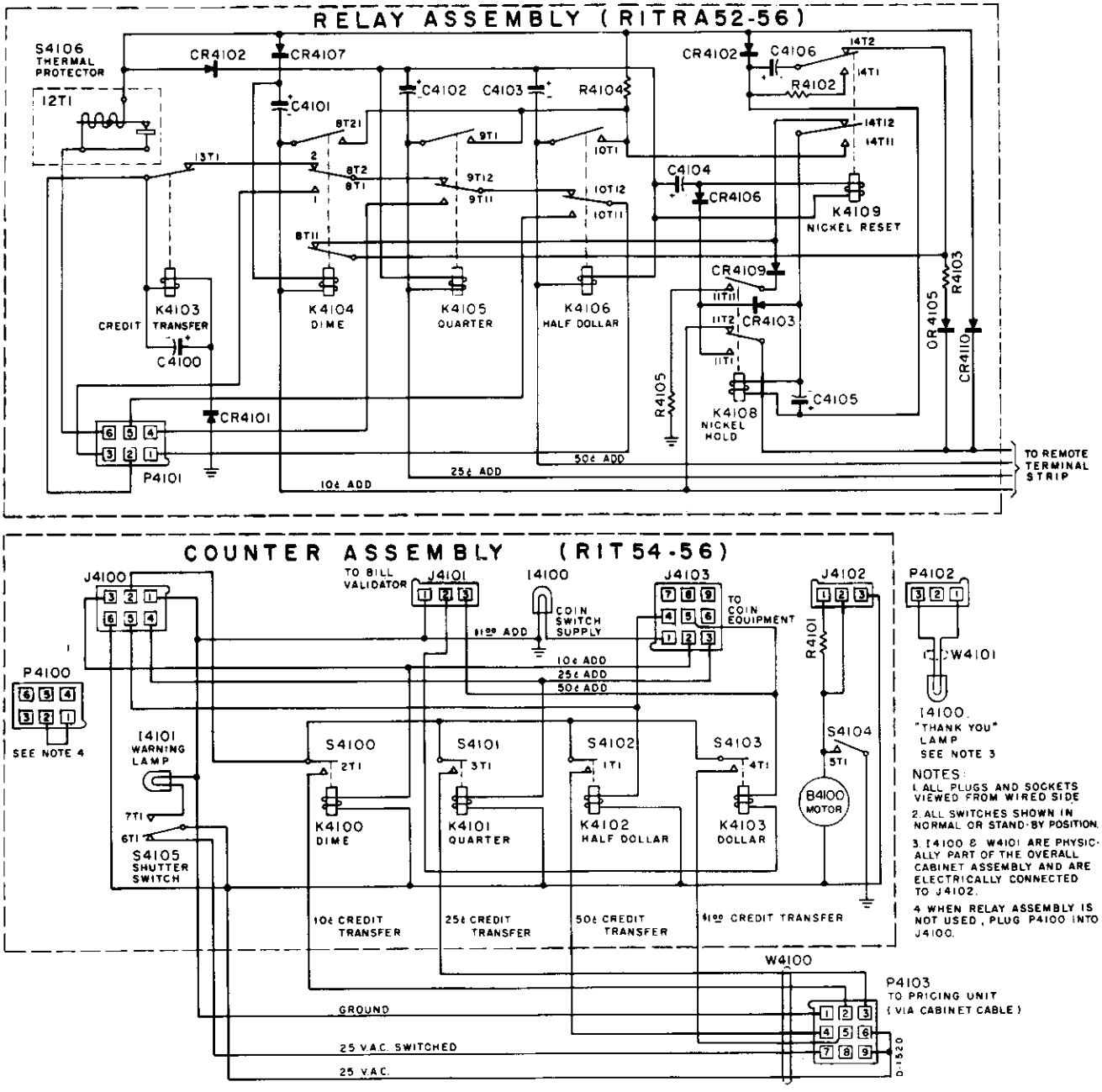


Figure 6. Credit Transfer Switch Detail.

RECORDING INCOME TOTALIZER, Type RIT54-56



PARTS LIST On Reverse Side

Schematic Diagram.

RECORDING INCOME TOTALIZER, Type RIT54-56

Parts List

Item	Part No.	Description
B4100	453080	Motor
C4100	87743	10 Mfd. Electrolytic Condenser
C4101, C4102, C4103, C4104	87741	100 Mfd. Electrolytic Condenser
C4105	87703	50 Mfd. Electrolytic Condenser
C4106	87742	250 Mfd. Electrolytic Condenser
CR4101 thru CR4109	309374	Rectifier
CR4110	309476	Rectifier
I 4100	507522	Lamp
I 4101	133722	Lamp
I 4102	452386	No. 93 Lamp
J 4100	769868	6 Contact Socket Housing
J 4101	309328	3 Contact Brown Socket Housing
J 4102	861328	3 Contact Socket Housing
J 4103	309345	9 Contact Brown Socket Housing
K4100	453545	10¢ Solenoid Coil
K4101	453546	25¢ Solenoid Coil
K4102	453547	50¢ Solenoid Coil
K4103	453548	$1.00 Solenoid Coil
K4104	453682	Relay
K4105, K4106	453736	Relay
K4107	453740	Relay
K4108, K4109	453736	Relay
P4100, P4101	769869	6 Contact Pin Housing
P4102	770390	3 Contact Pin Housing
P4103	309341	9 Contact Brown Pin Housing
R4101	81232	Resistor, 180 Ohms, 5 W.
R4102, R4103	82400	Resistor, 10 Ohms, ½ W.
R4104	81283	Resistor, 15 Ohms, 10 W.
R4105	81275	Resistor, 120 Ohms, 2 W.
S4100, S4101, S4102, S4103	453104	Switch Assembly
S4104	452526	Switch
S4105	452562	Switch
S4106	453618	Thermal Cut Out
W4100	453783	Cable Assembly
W4101	453775	Totalizer Aux. Light Cable Assembly

SOLID STATE STEPPER UNIT, Type SSU4

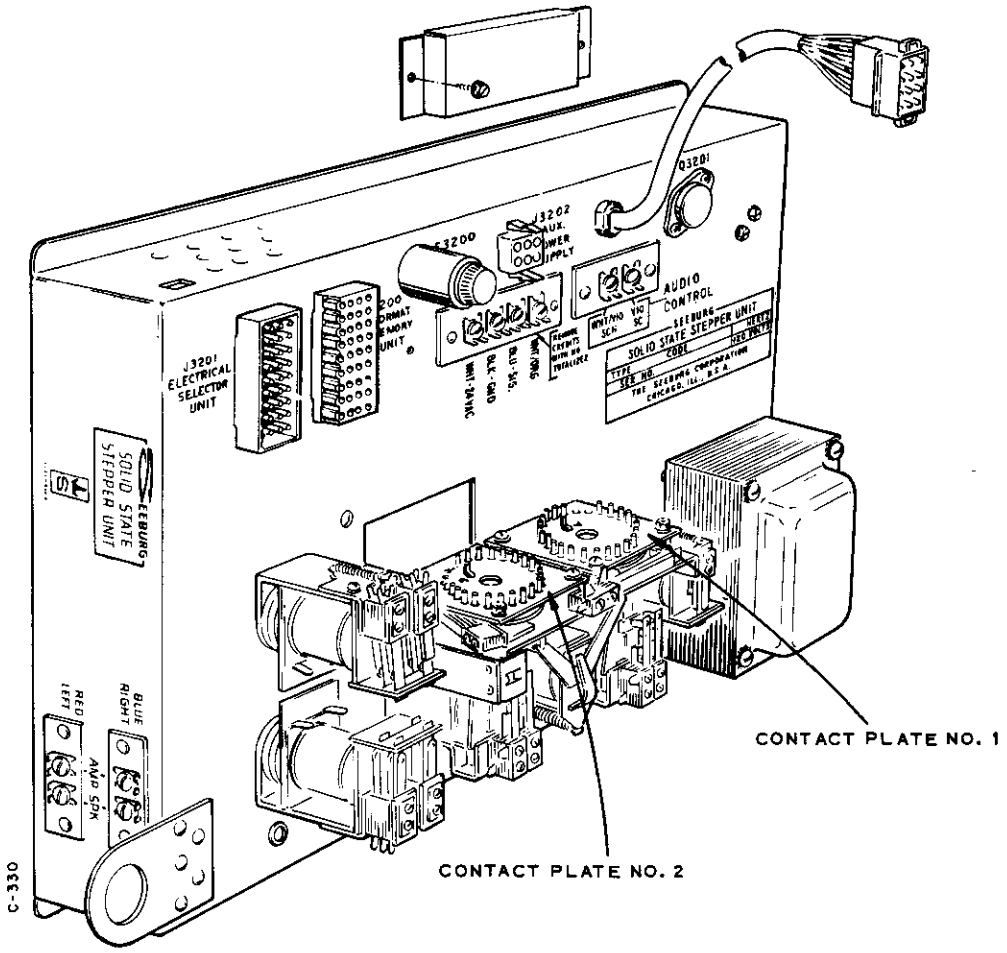


Figure 1. Solid State Stepper Unit, Type SSU4.

INTRODUCTION

This stepper unit is used when any Seeburg Consolette or Wall-O-Matic is used with a Seeburg Coin Operated Phonograph. The purpose of the stepper unit is to establish a path between the write-in circuit in the Solid State Control Center and the selected toroid when a remote selection is made. This is accomplished by initiating two groups of ground pulses at the consolette corresponding to a particular toroid. The ground pulses are approximately 40 milliseconds in duration with 40 milliseconds between pulses. There is approximately 200 milliseconds between the first and second group of pulses. The first group of pulses is used to step Contact Plate Number 1 which provides the proper number circuit to the Tormat Memory Unit. The second group of pulse steps, Contact Plate Number 2 which provides the proper letter circuit to the Tormat Memory Unit and then initiates the write-in pulse.

In addition. the stepper unit includes a circuit to provide audio to the phonograph speakers only when selections are made at the phonograph.

ADJUSTMENTS

a. Ratchet Return Spring

The return spring tension for step switch No. 2 will be correct if the spring is wound three full turns when the switch is in the rest position.

The return spring tension for the step switch No. 1 will be correct if the spring is wound two full turns when the switch is in the rest position.

b. Step Relay Magnet Position

Adjust the step relay magnet vertically so the ratchet wheel tooth will over-ride the end of the release dog 0.010 inch to 0.020 inch when the armature is seated, Figures 2 and 3.

With the pawl against the upper edge of the pawl guide opening, the clearance between the ratchet teeth and the pawl should not be less than 0.005 inch.

c. Pawl Guide and Return Spring

Adjust the pawl guides so the pawls will strike the bottom of the ratchet teeth when the pawl engages the ratchet, Figure 4. The adjustment must be made so there will be a 0.004 inch to 0.010 inch gap between the pawl and the guide at the bottom of the stroke, Figure 5.

The pawl return spring tension should require 10 to 15 grams (½ oz.) force to start the pawl from the side of the guide. Measure this force at the spring with the pawl in the rest position.

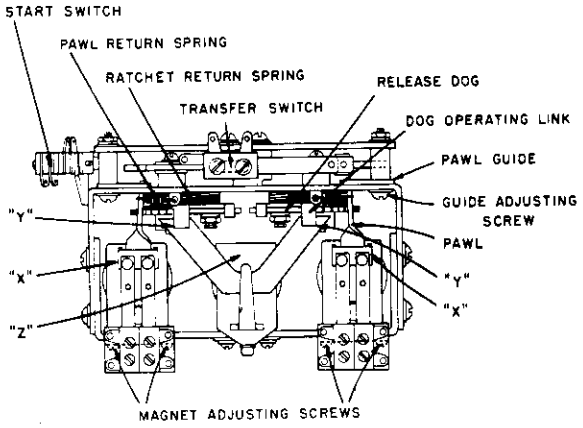


Figure 2. Stepper Detail.

Figure 3. Release Dog Over-Travel Detail.

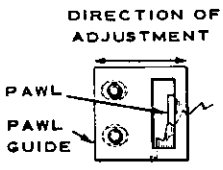


Figure 4. Pawl Guide Detail.

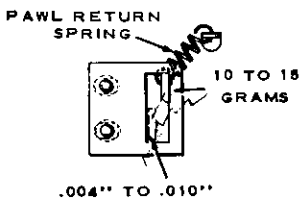


Figure 5. Pawl Return Spring Detail.

d. Step Magnet Tail Springs

The tail spring force, measured at the front of the bridge on the step magnet armature ("X", Figure 2) should be 50 to 75 grams (1¾ to 2½ oz.) to just close the switch contacts (when the contacts are correctly adjusted).

e. Contact Plate Switch Blades

The switch blades should have 10 to 35 grams force against the contacts. The force will be approximately correct if the blades are formed so their tips extend 5/32 inch above the contact assembly when the plates are removed, Figure 6.

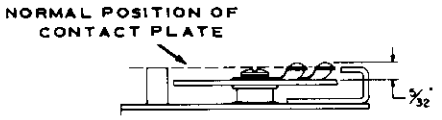


Figure 6. Contact Plate Switch Detail.

f. Contact Plate Position

Each contact plate should be positioned so the outer blade of the step switch is approximately centered on the lowest contact (on the contact plate) when the stud on the side of the ratchet wheel is against the stop on the stepper frame and so the blade is approximately centered on each successive contact as it is advanced, step by step, through its full movement. The mounting holes at the corners of the contact plates are slotted to permit this adjustment.

g. Reset Magnet Position

Adjust the reset magnet vertically so the release dogs engage the ratchet teeth with the armature extension clearing the dimples ("Y", Figure 2) on the dog operating links 1/64 inch when the magnet is energized.

The armature travel must be sufficient to permit the release dogs to clear the ratchet teeth 0.010 inch minimum when the magnet is not energized, Figure 7.

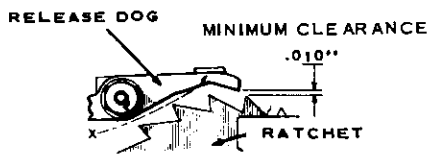


Figure 7. Release Dog Clearance Detail.

The tabs on the release dog operating links which engage the dogs and couple them to the reset magnet reset magnet should not bind tightly but should not permit more than 0.005 inch free travel between the dogs and the links.

h. Reset Magnet Tail Spring

The force applied to the end of the reset magnet armature ("Z", Figure 2) to start it from the rest position should be 100 to 140 grams (3½ to 5 oz.).

i. Release Dog Springs

An upward force of 15 to 25 grams (½ to ¾ oz.) applied at the dimple on the release dog operating links ("Y", Figure 2) should start the dogs from seated position. This force will be approximately correct if the springs are wound ½ to ¾ turn.

J. Transfer Switch Position

Adjust the position of the switch on the mounting bracket so the roller is in the notch of the contactor assembly disc and the first operation of one step magnet causes no change of the roller blade, see Figure 8. The second operation of the step magnet should raise the roller to the outer diameter of the disc. The flanges of the roller should not drag on the disc and the roller bracket should not strike the switch contact plate.

1. With the step switch in the rest position so the roller is in the notch of the contactor disc, adjust the lower blade for ½ to ¾ oz.
2. Adjust contact 8D1 gap 1/64 inch.
3. Adjust contact 8D2 force 1 oz.

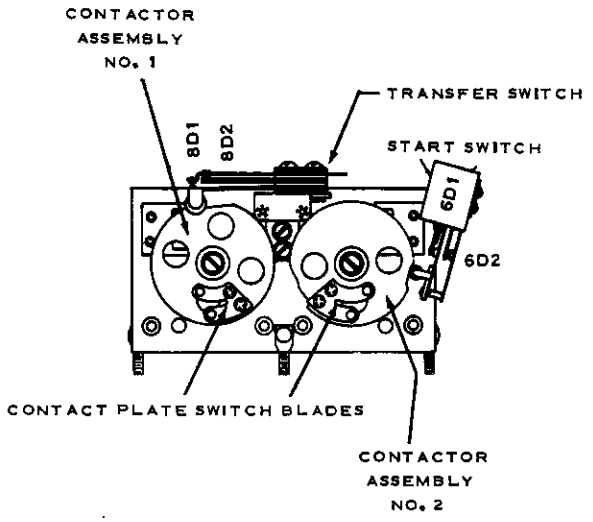


Figure 8. Transfer Switch Detail.

4. The second operation of the step magnet should result in closing contact 8D1 with 1oz. force and opening contact 8D2 1/64 inch to 1/32 inch gap.

k. Lubrication

Lubricate with a drop of Seeburg No. 53014 Special Purpose Oil:

1. Pawl Pivots and sliding surfaces of the pawls on the step relay armatures.
2. Pawl guides at area of contact with pawls.
3. Step switch shaft bearings.
4. Roller on roller blade of transfer switch.
5. Relay hinges.

SOLID STATE STEPPER UNIT, Type SSU4

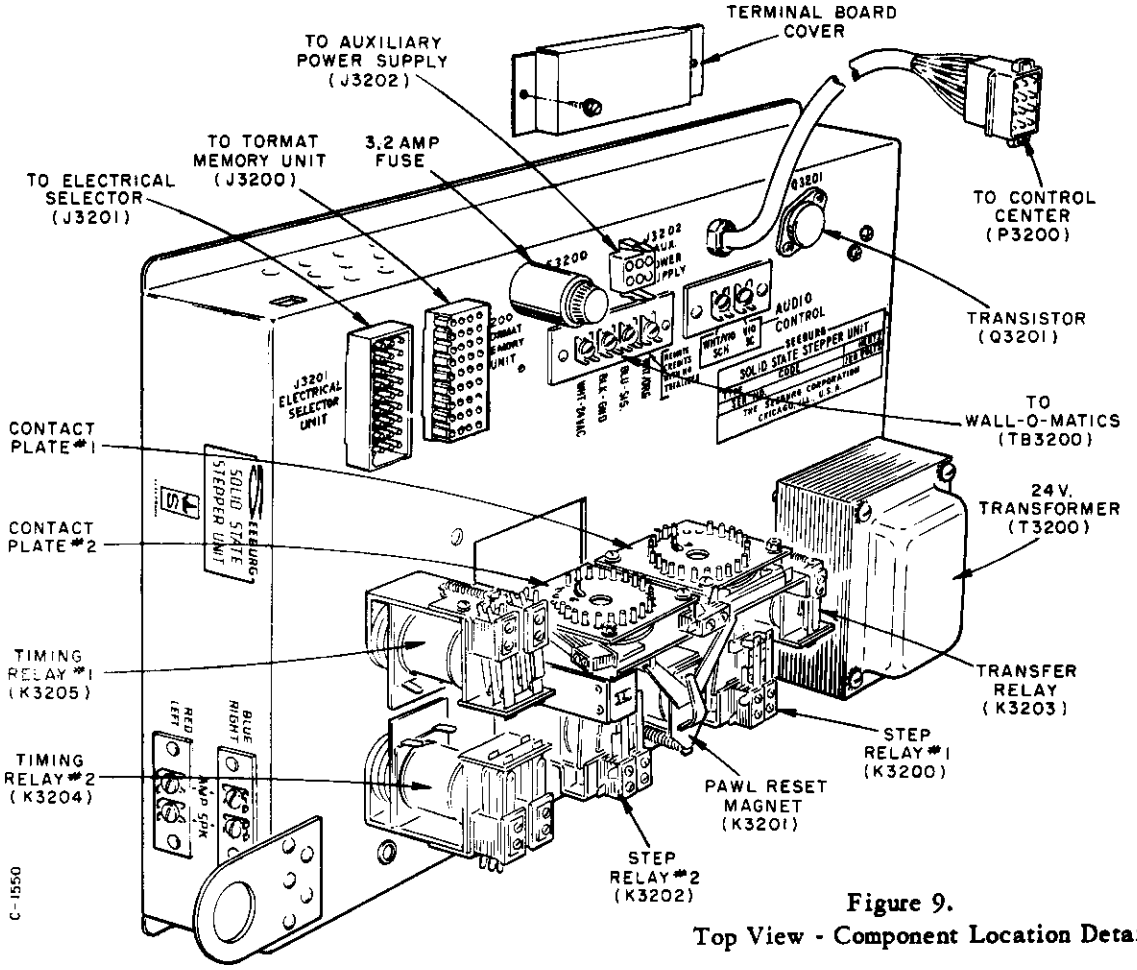


Figure 9.
Top View - Component Location Detail.

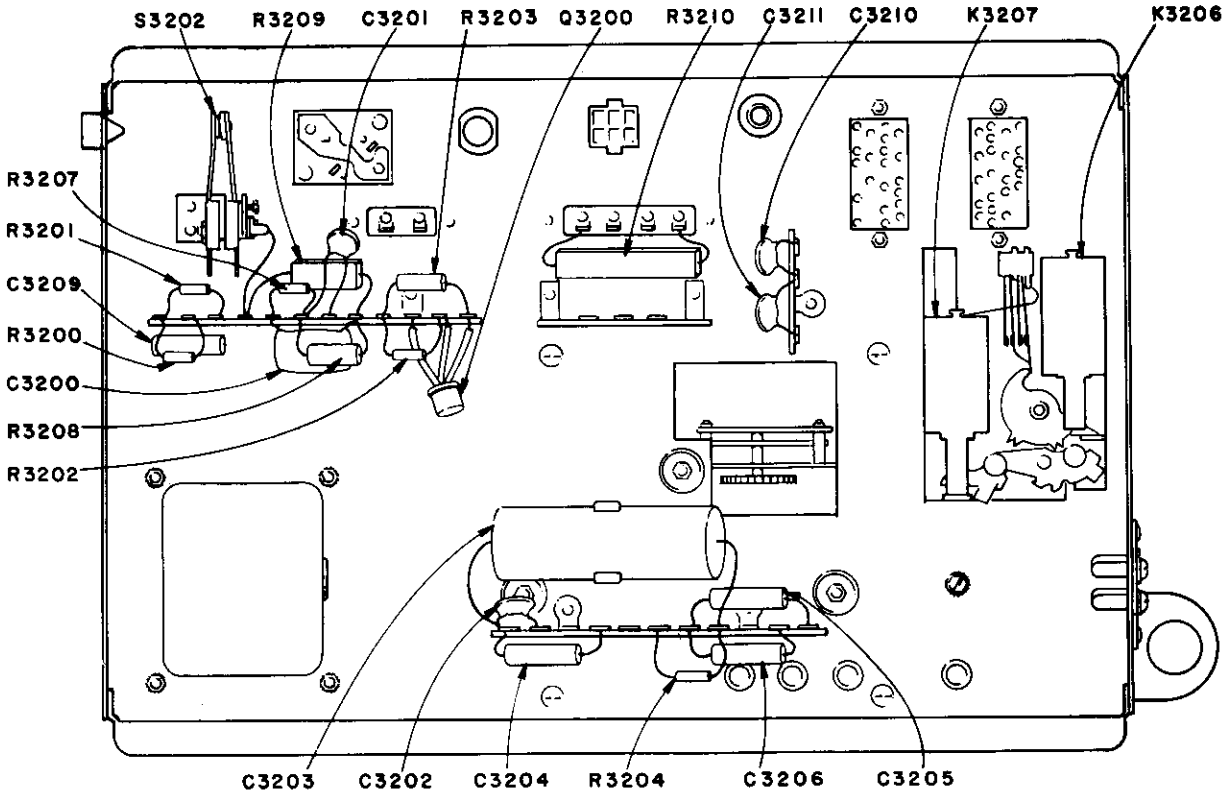
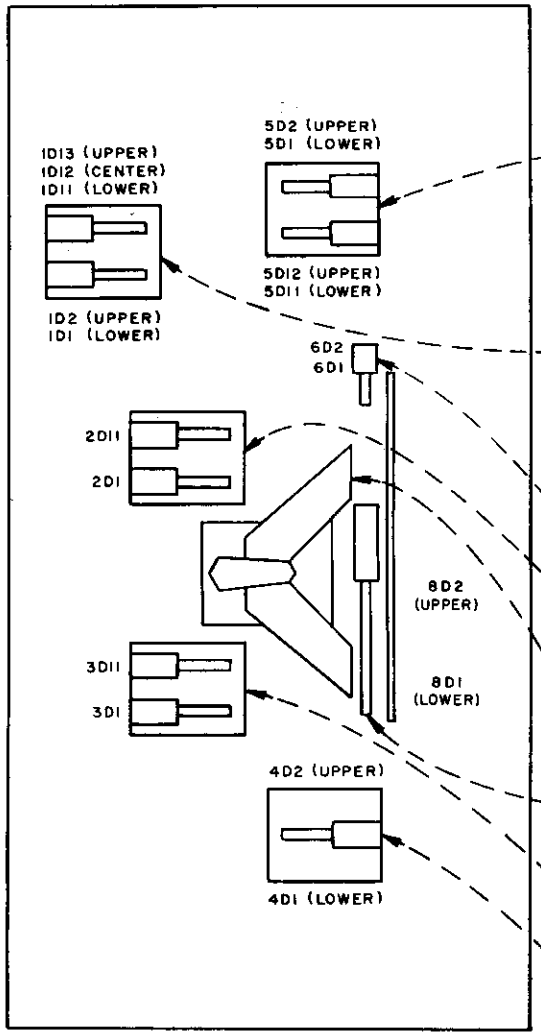
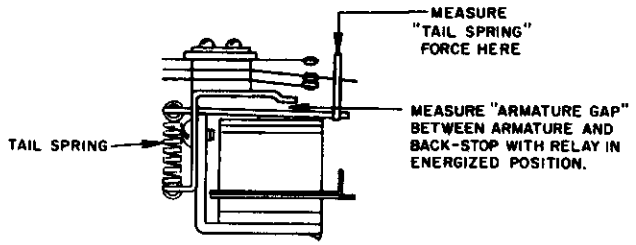


Figure 10. Bottom View - Component Location Detail.



ITEM	OPERATED BY	ARMATURE GAP	CONTACT	CONTACT FUNCTION	GAP	FORCE OUNCES	NORMAL POSITION
TIMING RELAY NO.1 *	CONTACT 2D11	3/32	5D12	WRITE-IN TRIGGER	1/64	1	CLOSED
			5D2	ENERGIZES TIMING RELAY NO. 2	1/64	1	OPEN
			5D11	DIRECTS ALL PULSES TO STEP RELAY 2 AFTER IST PULSE OF SECOND PULSE SERIES	1/64	1	OPEN
			5D1	ENERGIZES RESET MAGNET WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
TIMING RELAY NO.2 *	CONTACT 5D2	3/32	1D13	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	3/4	CLOSED
			1D12	SWITCHES IN STEPPER WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
			1D11	WRITE-IN TRIGGER	1/32	1	OPEN
			1D2	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	3/4	CLOSED
			1D1	ENERGIZES PLAY CONTROL ADD SOLENOID	1/64	1	OPEN
START SWITCH	CAM ON STEP RELAY 2		6D1	OPENS ELECTRIC SELECTOR START CIRCUIT	1/64	1 1/4	CLOSED
			6D2	DIRECTS IST PULSE OF SECOND PULSE SERIES TO STEP RELAY 2	1/64	1 1/4	CLOSED
STEP RELAY 2 ‡	Q3201 THRU CONTACTS 4D2 8D1, 6D2 & 2D1 FOR IST STEP; THROUGH 4D2, 8D1 & 5D11 FOR SUBSEQUENT STEPS.	SEE ADJUSTMENT TEXT	2D1	CARRY-OVER FOR W ON IST PULSE TO STEP RELAY 2	1/64	1	OPEN
			2D11	ENERGIZES TIMING RELAY NO.1 WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
RESET MAGNET †	CONTACTS 3D11 OR 5D1	SEE ADJUSTMENT TEXT					
TRANSFER SWITCH	CAM ON STEP RELAY 1		8D2	DIRECTS IST AND EARLY PART OF 2ND PULSE OF FIRST PULSE SERIES TO STEP RELAY 1	1/64	3/4	CLOSED
			8D1	DIRECTS END OF 2ND PULSE AND ALL SUBSEQUENT PULSES TO TRANSFER RELAY CONTACTS 4D1 OR 4D2.	1/64	1	OPEN
STEP RELAY 1 ‡	Q3201- THRU CONTACTS 8D1 OR 8D2 AND 4D1.	SEE ADJUSTMENT TEXT	3D1	ENERGIZES TRANSFER RELAY WHILE STEP RELAY 1 OPERATES	1/64	1	OPEN
			3D11	ENERGIZES RESET MAGNET WHILE STEP RELAY 1 OPERATES	1/64	1	OPEN
TRANSFER RELAY *	CONTACT 3D1	3/64	4D2	Q3201 PULSES TO STEP RELAY 2	1/32	1	CLOSED
			4D1	Q3201 PULSES TO STEP RELAY 1	1/32	1	OPEN



TAIL SPRING FORCES

TIMING RELAY NO. 1 1-1/4 OZ
TIMING RELAY NO. 2 1-1/2 OZ
TRANSFER RELAY 1-2/3 OZ

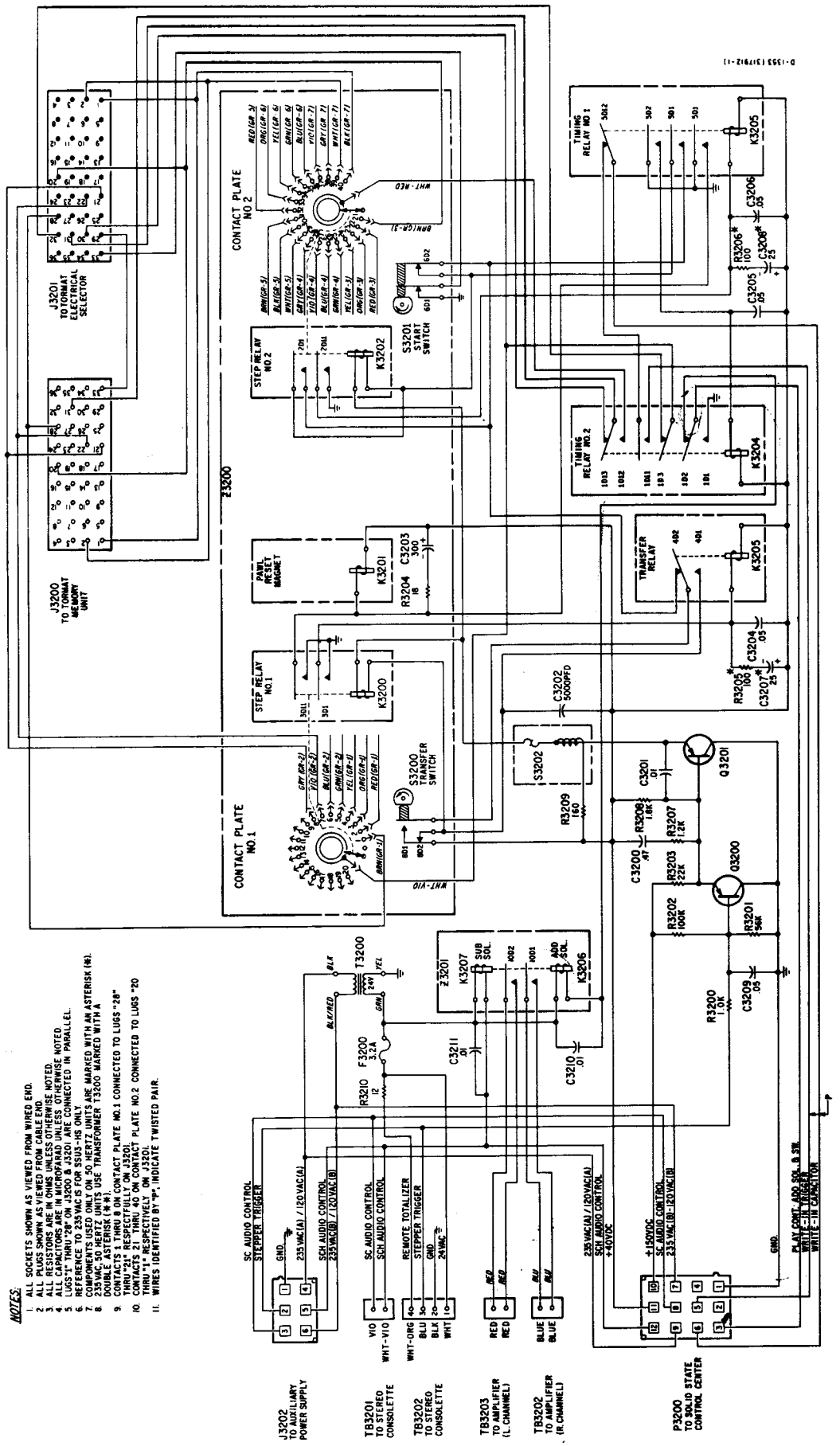
D.C. COIL RESISTANCE

* ——— 500 OHMS
† ——— 235 OHMS
‡ ——— 52 OHMS

Relay Adjustments

Page 6

SOLID STATE STEPPER UNIT, Type SSU4



Item	Part No.	Description
C3200	86329	0.47 Mfd. 50 V. Mylar
C3201	86313	0.01 Mfd. 500 V. Ceramic
C3202	86250	5000 Pfd. 500 V. Ceramic
C3203	87611	300 Mfd. 50 V. Lytic
C3204	86235	0.05 Mfd. 200 V. Molded Paper
C3205	86235	0.05 Mfd. 200 V. Molded Paper
C3206	86235	0.05 Mfd. 200 V. Molded Paper
*C3207	87571	25 Mfd. 50 V. Lytic
*C3208	87571	25 Mfd. 50 V. Lytic
C3209	86235	0.05 Mfd. 200 V. Molded Paper
C3210	86313	0.01 Mfd. 500 V. Ceramic
C3211	86313	0.01 Mfd. 500 V. Ceramic
F3200	303713	3.2 Amp. Fuse
J 3200	309316	Contact Socket Housing
J 3201	309314	Contact Socket Housing
J 3202	769868	6 Circuit Connector
K3200	317070	Step Relay No. 1
K3201	307464	Pawl Reset Magnet
K3202	317072	Step Relay No. 2
K3203	303074	Transfer Relay
K3204	317682	Timing Relay No. 2
K3205	307732	Timing Relay No. 1
K3206	303482	Add Solenoid
K3207	303484	Subtract Solenoid
P3200	309362	12-Circuit Connector
Q3200	309424	Milliwatt Transistor
Q3201	309425	Power Transistor
R3200	82424	1000 Ohm ½ W. 10%
R3201	82445	56,000 Ohm ½ W. 10%
R3202	82448	100,000 Ohm ½ W. 10%
R3203	82757	22,000 Ohm 1 W. 10%
R3204	82403	18 Ohm ½ W. 10%
*R3205	82412	100 Ohm ½ W. 10%
*R3206	82412	100 Ohm ½ W. 10%
R3207	82425	1200 Ohm ½ W. 10%
R3208	82876	1800 Ohm 2 W. 10%
R3209	81269	160 Ohm 5 W.-Wire Wound 5%
R3210	81241	12 Ohm 10 W.-Wire Wound 10%
S 3200	303547	Transfer Switch
S 3201	303794	Start Switch
S 3202	317698	Circuit Breaker
T3200	307074	24 V. Transformer
**T3200	307774	24 V. Transformer
TB3200	452147	Terminal Board Assembly
TB3201	307650	2 Lug Terminal Board
TB3202	307650	2 Lug Terminal Board
TB3203	307650	2 Lug Terminal Board
Z3200	317703	Stepper Assembly
Z3201	303464	Play Control Assembly

* Components used only on 50 Hertz Units
** 235 VAC, 50 Hertz Units use transformer T3200

REMOTE POWER SUPPLY KIT, Type RPS8K-56 – Part No. 509056

DESCRIPTION

The Seeburg Type RPS8K-56 Remote Power Supply Kit is for the purpose of installing a Type RPS8-56 Remote Power Supply Unit in the Model LS1 Select-O-Matic Phonograph.

The Seeburg Type RPS8-56 Remote Power Supply is an auxiliary unit capable of supplying power for up to six Seeburg Stereo Consolettes. It is to be used to supplement power available from the stepper unit in the LS1 Model Phonograph whenever more than six Consolettes or Wall-O-Matics are to be powered.

NOTE:
This RPS8-56 Remote Power Supply may be used as a direct replacement for the previous model, Type RPS7-56.

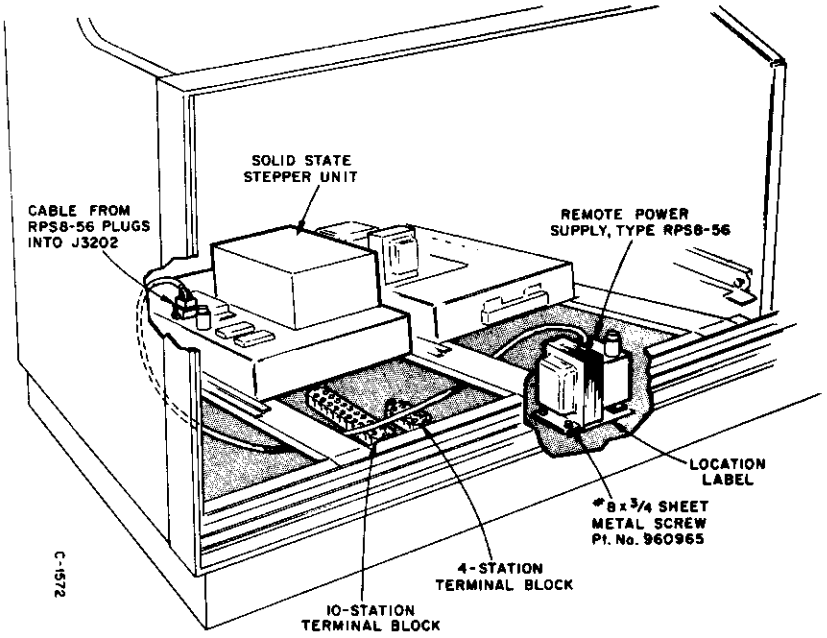


Figure 1. Power Supply Installation.

INSTALLATION

1. Install the power supply at the location labeled in the phonograph cabinet using the three mounting screws provided (see Figure 1).

2. Insert the six pin plug from the power supply into the six contact socket on the stepper unit in the phonograph.

3. Connect the white, black and blue wires of the 10 conductor cable, from the Consolettes being added, to the color coded terminal board on the RPS8-56. Connect the violet wire to the SCH terminal when SCH Model Consolettes are used, or to the SC terminal when SC Model Consolettes are used.

NOTE:
Both SC and SCH Model Consolettes may be used in any combination to make six, as long as separate cables are run for the SC and SCH Models. Make sure the two VIO wires for the SC and SCH Models are kept separate. The other wires may be connected together.

Connect the balance of wires from the 10-conductor cable to the 10-station terminal block in the phonograph cabinet (see *Figure 2*) and to the 4-station terminal block if a remote totalizer is used (see *Figure 3*).

If an additional circuit is required, another auxiliary power supply unit may be connected in cascade as shown in *Figure 4*. The six pin plug of the added power supply is connected to the six contact socket of the first power supply. Another 10-conductor cable must be run from the additional consolettes, and is to be wired the same as for the first power supply.

Stereo Consolettes should be connected to provide equalized distribution of load on the circuits. For example, if nine consolettes are used, connect four on one circuit and five on another, rather than six on one circuit and three on another.

CAUTION:
DO NOT CONNECT MORE THAN SIX CONSOLETTES TO ANY ONE POWER SUPPLY CIRCUIT.

REMOTE POWER SUPPLY KIT, Type RPS8K-56

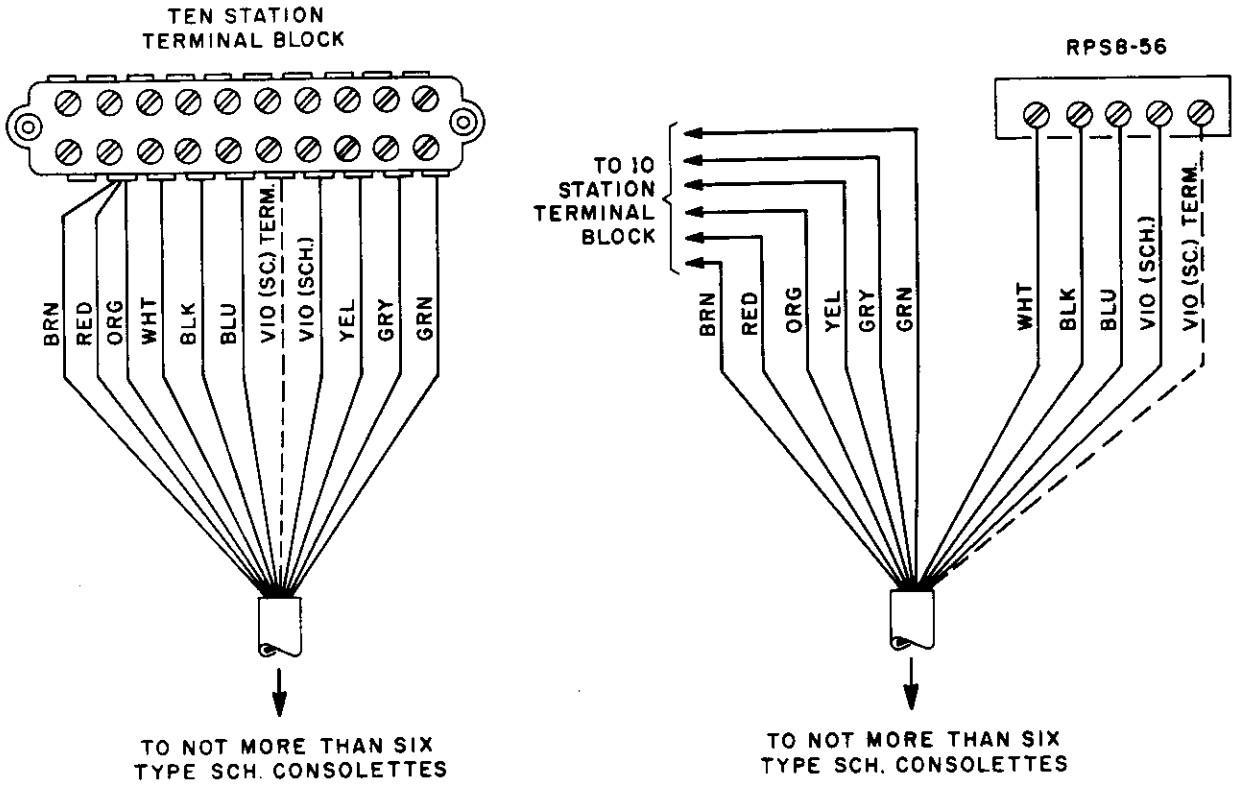


Figure 2. Cable Connections with No Income Totalizer.

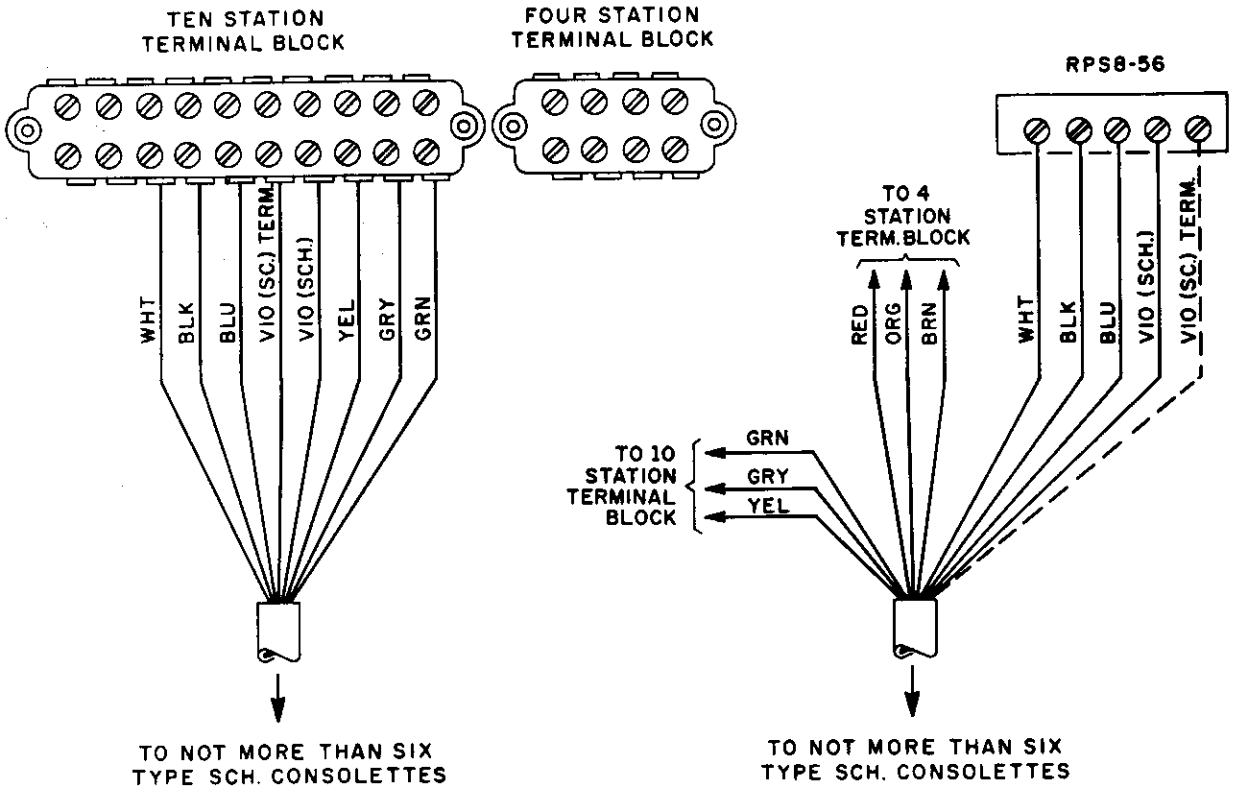


Figure 3. Cable Connections with Income Totalizer.

REMOTE POWER SUPPLY KIT, Type RPS8K-56

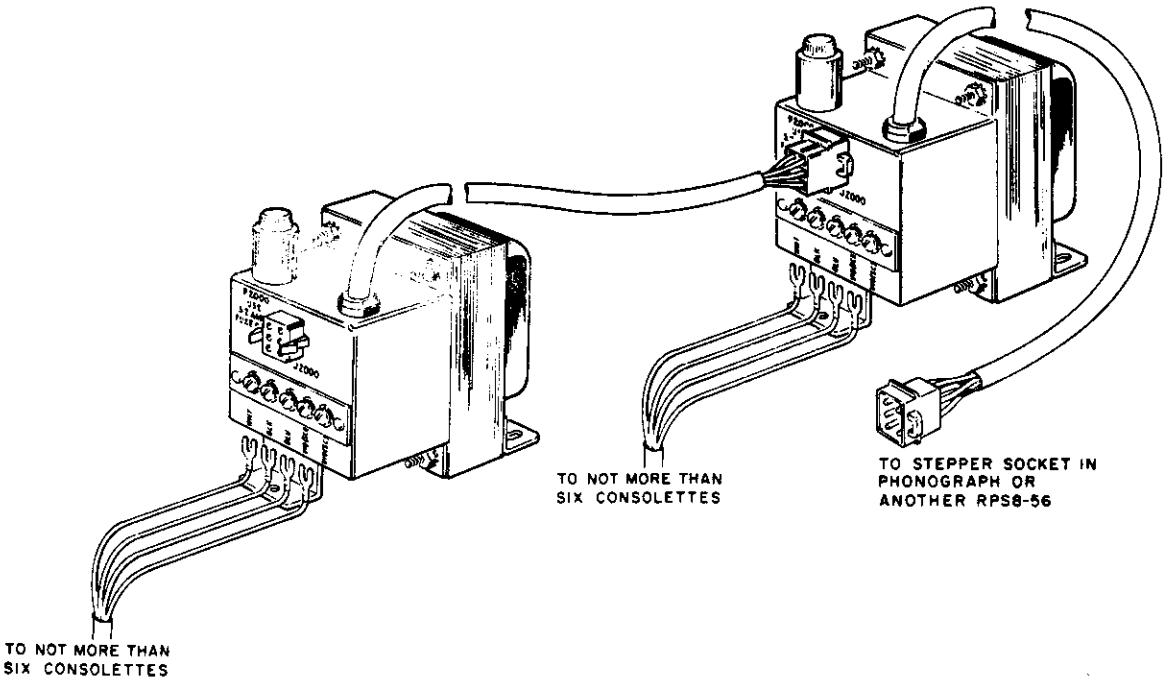


Figure 4. Power Supplies in Cascade.

NOTE:

Not more than 3 Power Supplies should be added to a phonograph for a total of 24 Stereo Consolettes (maximum) per phonograph.

All wiring shown pertains to Model LS1 Phonographs with a Type SSU4 Solid State Stepper Unit. The Type RPS8-56 Power Supply may also be used with Model APFEA, PFEAU and SS160 Phonographs. Wiring is the same for these models with the exception that audio control circuits for SCH Model Consolettes will not function unless minor revisions are made in the Solid State Control Center. Consult Part Number 515397, Installation Instructions for Model "SCH" Consolettes for details.

The schematic of the RPS8-56 Power Supply is shown in Figure 5.

– PARTS LIST –

Part No.	Description
305954	Type RPS8-56 Remote Power Supply
507503	10-Wire Cable (purchase separately)
305662	5-Lug Terminal Board (TB2000)
305656	Power Socket & Wire Assembly
769868	6-Contact Socket (J2000)
941830	Socket (3 used)
941793	Socket (3 used)
303712	Fuse Holder
303963	Fuse Holder Clip
303713	Fuse, Type GMQ 3-2/10 (F2000)
305966	Power Transformer (T2000)
602828	Strain Relief Bushing
† 305655	Power Plug & Cable Assembly (see note below)
769869	6-Contact Plug (P2000)
941829	Pin (3 used)
941804	Pin (3 used)
940592	Spade Solder Lugs
960965	No. 8 x ¾ Mounting Screw

† Includes 769869, 941829 and 941804.

REMOTE POWER SUPPLY KIT, Type RPS8K-56

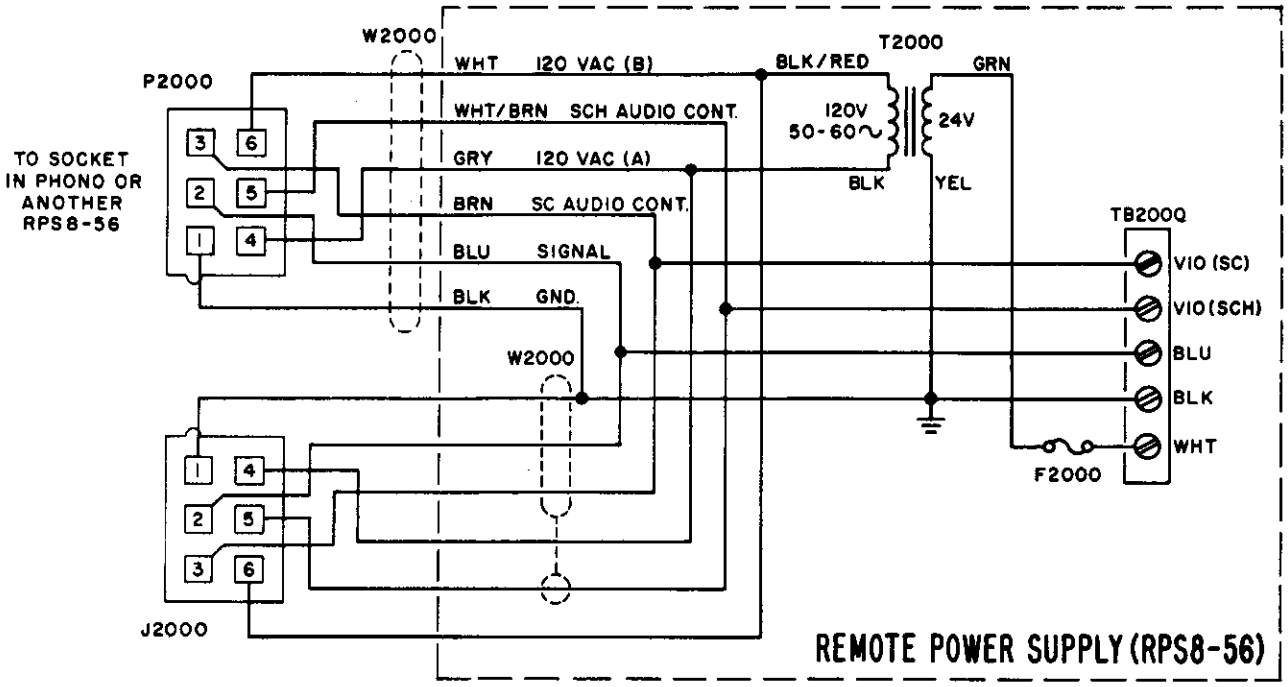


Figure 5. Schematic Diagram of RPS8-56.

POWERED REMOTE VOLUME CONTROL, Type PRVC3

The Powered Remote Volume Control is an accessory which may be used with Seeburg phonographs to remotely control the volume and to cancel selections. It consists of a volume control drive motor and control unit which are interconnected by means of a five-wire cable (not included). Any reasonable length of cable may be used without introducing losses or having any effect on the sound. 100 to 150 foot cable length is practical. The cable, Part No. 508712, is available from your Seeburg Distributor in any length required.

NOTE:
Existing remote volume control cable installations may be used by removing the plug and the remote volume control unit.

CAUTION:
Do NOT use shields as conductors.

A slip clutch drive permits volume adjustment at the phonograph independently of the remote volume control.

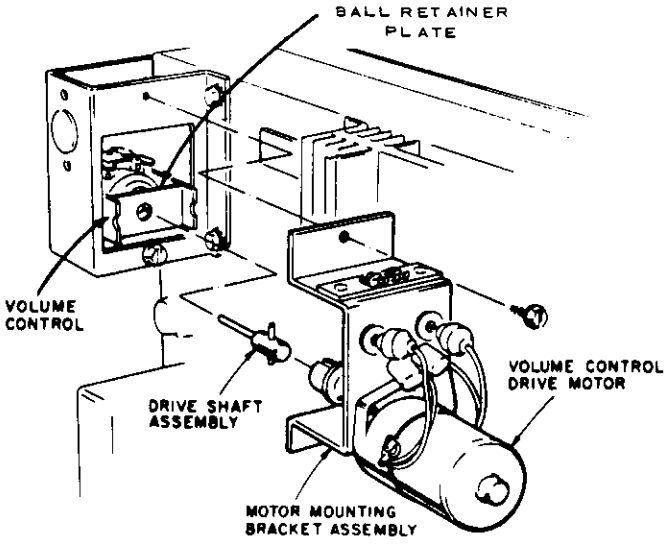


Figure 1. Drive Motor and Bracket Installation.

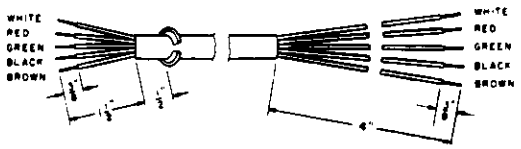


Figure 2. Cable Preparation.

INSTALLATION INSTRUCTIONS

1. Determine location for the Remote Volume Control and best routing for the cable, keeping in mind appearance and possibility of physical damage to the cable as well as convenience of control.
2. On the amplifier, remove the top screw and loosen the bottom screw on the front of the volume control bracket, see Figure 1.
3. Remove pin in volume control by depressing ball retainer plate and insert the Drive Shaft Assembly until it bottoms.
4. Align the drive pin of the Drive Shaft with the slot in the Drive Motor Coupling.
5. Install the Drive Motor and Bracket Assembly into place by sliding the slotted end of the Motor Mounting Bracket over the bottom screw on volume control bracket. Replace the top screw and tighten the bottom screw.
6. Strip and trim phonograph end of 5-wire cable as shown in Figure 2. Connect cable to drive motor, ground screw, and to the 2-screw terminal board on the amplifier, see Figure 4.
7. Remove the plate covering the hole in the back of the phonograph and feed the 5-wire cable through the hole.
8. Fasten the cable to the inside wall of the cabinet with a clamp, allowing enough slack cable in the cabinet to avoid strain on cable or connections.
9. Lay the cable from the cabinet to the Remote Volume Control, passing the cable loosely over pipes and through necessary holes in walls and floors.
10. Remove the center screw from the PRVC3 and remove bottom plate.
11. Lift out the Terminal Panel in the PRVC3 and connect the 5-wire cable to the screw terminals, Figures 4 and 5. Exercise caution so as not to crack panel.
12. Place Terminal Panel in position and apply strain relief clamp to cable.
13. Insert Terminal Panel Insulator, as shown in Figure 3.
14. If control unit is to be set on counter top, insert rubber feet into Bottom Plate and assemble to unit with the 6-32 x 1-3/16 screw.
15. If the control unit is to be permanently attached, fasten the bottom plate to a shelf or counter with the No. 6 sheet metal screws.

POWERED REMOTE VOLUME CONTROL, Type PRVC3

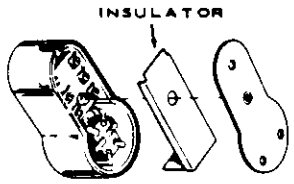


Figure 3. Terminal Panel Insulator.

Assemble the control unit to the bottom plate with the 6-32 x 1-3/16 screw.

16. Fasten the cable securely, starting at the control with a clamp adjacent to the control box. Take up excess cable as it is fastened.

17. When the cable is installed, leave enough slack to permit moving the phonograph from the wall for maintenance and cleaning.

REMOVAL OF DRIVE MOTOR

When the volume control drive motor and drive shaft are to be removed, it is essential that the ball retainer plate on the volume control be pressed down before extracting the Drive Shaft.

CAUTION:

Failure to do this may damage the volume control.

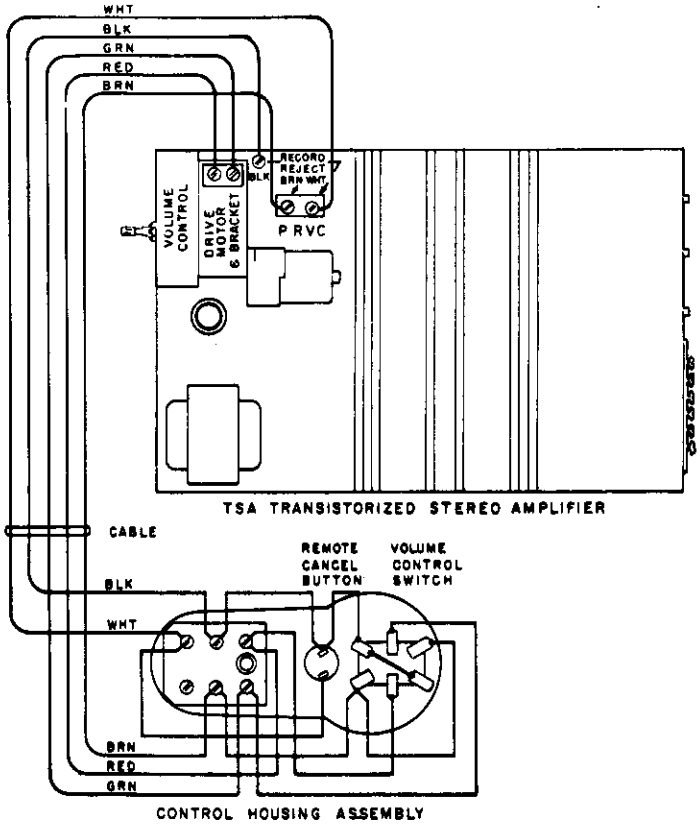


Figure 4. Wiring Diagram.

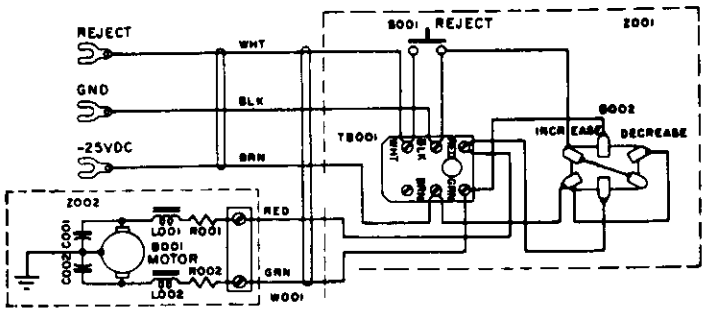
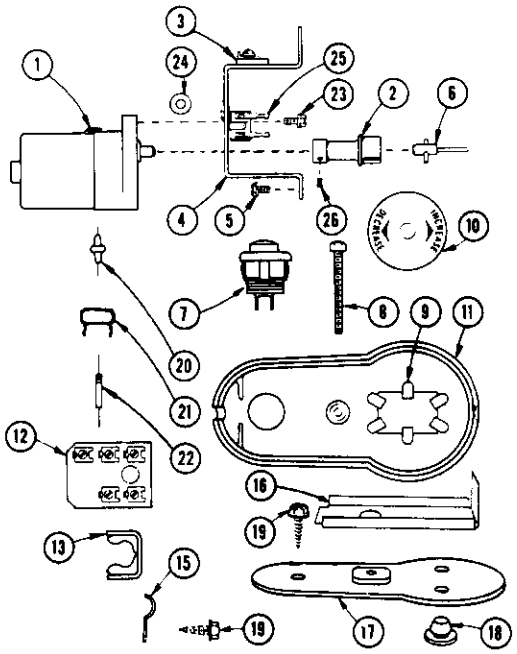


Figure 5. Schematic Diagram.

PARTS LIST



Item	Part No.	Description
–	509210	Type PRVC3 Powered Remote Volume Control
1	509220	Volume Control Drive Motor (Barber-Coleman)
2	508914	Coupling
3	508913	Terminal Panel
4	508928	Motor Mtg. Bracket Assembly
5	960698	6-32 x ¼ Hex Washer H. Self Tap Screw
6	508916	Drive Shaft Assembly
7	306864	Selection Cancel Button
8	913675	6-32 x 1-3/16 Phillips Fil. H.M.S.
9	508897	Switch
10	508899	Switch Plate
11	508896	Control Housing
12	508901	Terminal Panel
13	503182	Strain Relief
15	402098	Cable Clamp
16	508904	Terminal Panel Insulator
17	503882	Button Plate Assembly
18	503183	Rubber Foot
19	960688	No. 6 x ¼ Hex Washer H. Sheet Metal Screw
20	508923	Choke
21	86343	0.022 Mfd. Mylar Condenser, 200 V. 20%
22	82407	39 Ohm Resistor
23	960697	6-32 x ¼ Hex Washer H. Self Tap Screw
24	988161	Grommet
25	410717	Terminal Strip
26	918301	6-32 x 1/8 Socket H. Cup Pt. Set Screw

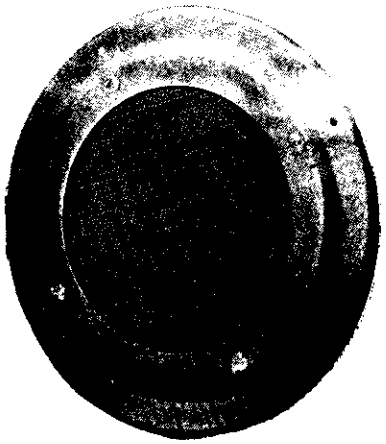
SEEBURG

TWIN STEREO RECESSED SPEAKER, TYPE TR1-8

SPECIFICATIONS

Size ..... 8 inch
Type ..... Constant Voltage
Power Rating ..... 16 watts (each)
(Taps at 16, 8, 4 and 1 watt)
Net Weight ..... 10 pounds (2 speakers)
Shipping Weight ..... 13 pounds (2 speakers)

The Type TR1-8 speakers are specifically designed to be used in pairs for recessed wall and ceiling installations.



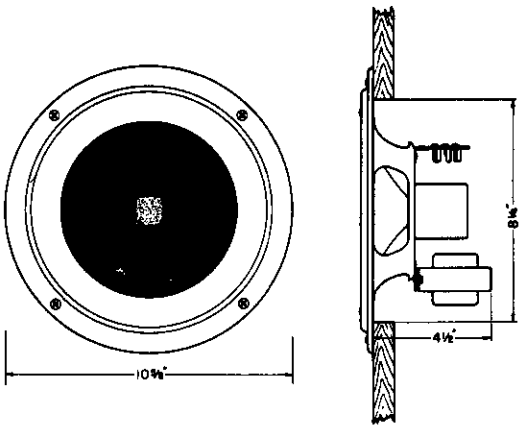


Figure 2.

INSTALLATION

The speakers may be installed directly in a wall or ceiling as follows:

1. THE MINIMUM DEPTH REQUIRED FOR RECESSING THIS SPEAKER IS 4½ INCHES FROM THE SURFACE OF THE WALL OR CEILING. However, sufficient additional clearance should be available to prevent any interference. Locate the exact position in which the speaker is to be mounted. Make certain no stud will interfere with mounting of the speaker by tapping the surface or drilling a series of very fine holes.
2. Scribe an 8¼ inch diameter circle.
3. Cut out with a compass saw.
4. The speaker, with its attached grille, is now ready to be fastened in place after wiring.
5. The volume of the space in back of the speaker should be as large as possible. The back of the speaker should not be enclosed or "boxed" in. For optimum performance, the minimum air space in back of the speaker should not be less than 6 cubic feet.

Use Mounting Rings, Part Number 502931, available from your Seeburg Distributor, when installing the speakers in a plaster or composition wall or ceiling.

1. Follow the instructions outlined in previous step 1.
2. Mark midpoints on the ring. They must coincide with a plumb line *(Figure 3a)* to insure vertical alignment of the installed wall speaker. A similar center-line mark should be used for orientation in ceiling installations.
3. Scribe a 9-inch diameter circle about the center mark and cut out the wall or ceiling along the circle.
4. Fasten the mounting ring as shown in *Figure 3b.*
5. The speaker, with its attached grille, is now fastened in place *(Figure 3c)* after wiring.

Installations of speakers in new construction require the use of Plaster Rings, Part Number 502932, available from your Seeburg Distributor.

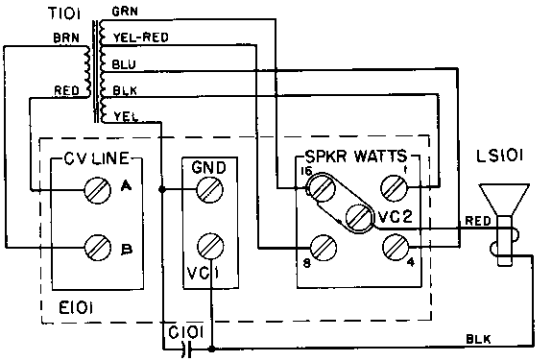
1. Apply previous step 1.
2. Nail 2 by 2's in place and install Plaster Ring as shown in *Figure 4* after lath has been applied.

3. After plastering is completed, install the speaker *(Figure 5)*.

The speaker and grille assembly can be removed for adjustment or service without disturbing the Mounting Ring or Plaster Ring. All that is necessary is the removal of four screws on the outer edge of the speaker grill.

SPEAKER WIRING

Connection to the speaker is made at the terminal board located at the top of the cabinet. The CV line output terminals of the amplifier are connected by means of suitable speaker cable. To select the desired power output move the SPEAKER WATTS link to the proper terminal. Refer to the Stereo Phonograph Installation Manual for placement and connections of complete speaker system.



PARTS LIST

Part No.	Part Name
512371	Speaker Grille Assembly
502842	Speaker
502848	Transformer (T101)
502919	Terminal Panel (E101)
87671	Condenser (C101)

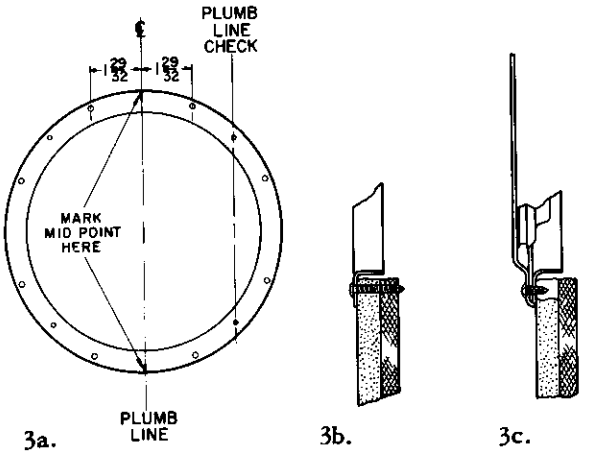


Figure 3.

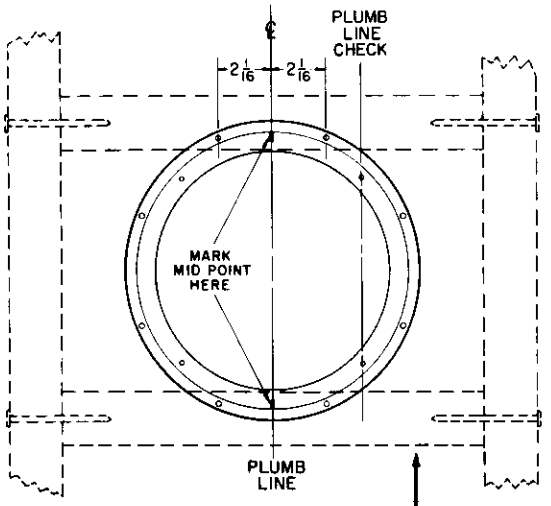


Figure 4.

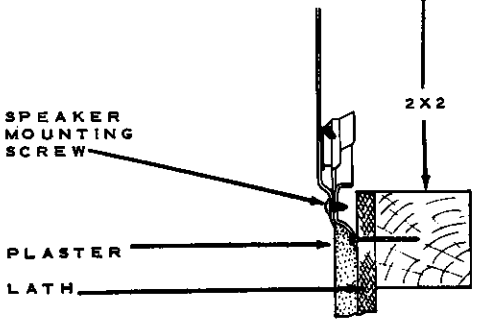


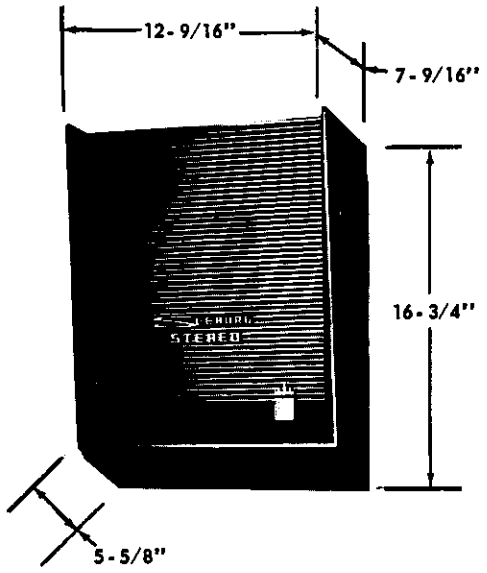
Figure 5.

TWIN STEREOPHONIC SPEAKERS, Type TW1-8 and TC1-8

SPECIFICATIONS

Size ..... 8 inch
Type ..... Constant Voltage
Power Rating ..... 16 watts (each)
(Taps at 16, 8, 4 and 1 watts)
Net Weight ..... 17 Pounds (2 speakers)
Shipping Weight ..... 22 Pounds (2 speakers)

The Seeburg Twin Stereophonic Speakers are specifically designed to be used in pairs. The TW1-8 speaker illustrated above is intended for wall installation. The TC1-8 is for corner mounting. The wall type TW1-8 may be converted for corner mounting with the Type "CA1" Corner Adapter.



INSTALLATION

Locate the speaker mounting holes as shown in *Figure 2*. Use a plumb line or level to insure vertical alignment. Allow a minimum of 2" beyond the 1-7/8" dimension to provide ceiling clearance. Screw in the No. 8 wood screws (provided) allowing about 1/2 inch clearance between the heads and the wall. Place the cabinet into position and, allowing the screw heads to enter the slots in the back, move the cabinet downward until the screw shanks are wedged in the slots.

Connection to the speaker is made at the terminal board located at the top of the cabinet. The CV line output terminals of the amplifier are connected by means of suitable speaker cable. To select the desired power output, move the SPEAKER WATTS link to the proper terminal. Refer to the Stereo Phonograph Installation Manual for placement and connections of complete speaker system.

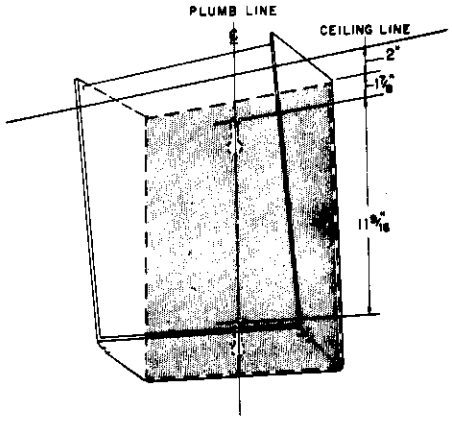


Figure 2. Speaker Mounting.

PARTS LIST

PART NO.	PART NAME
502832	SPEAKER HOUSING
502848	TRANSFORMER (T101)
502850	TERMINAL PANEL (E101)
87671	CONDENSER (C101)
502842	8 INCH SPEAKER
502851	SPEAKER HOUSING BACK ASSEMBLY (TW1-8 ONLY)
502872	SIDE RAIL (TC1-8 ONLY)
502874	END PLATE ASSEMBLY (TC1-8 ONLY)
502877	CHANNEL (TC1-8 ONLY)
502726	MOUNTING BRACKET (TC1-8 ONLY)
502855	MOUNTING SCREW KIT (TC1-8 ONLY)