SEEBURG V-VL 200

Service Manual & Parts List

LEGEND

Pages

The Popularity Meter is part of the mechanism and indicates the number of times (up to 40) each record has been played. The Selection Counters are part of the Dual Credit System and total, separately, the number of selections made at the 10-cent and the 15-cent rate (or 5-cent and 10-cent rate). The counter totals include selections made through the remote control Wall-O-Matics as well as those made at the instrument.

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

A Selection Receiver supplies power for remote control Wall-O-Matics and incorporates the switches and relays for operation from remote points as well as from the Electrical Selector. It is equipped with convenient sockets for plug-in connections of the mechanism, cabinet lighting, amplifier, and control circuits.

The Selection Receiver and the Amplifier are mounted in a vertical position on the inside of the cabinet rear door. The door may be opened for access to the tubes and fuses or it may be fully removed. The units are fastened over an opening which is covered by a plate. The plate, which is held in place with wing nuts, may be removed to expose the tube socket and plug connections and the interior wiring of the units for test during normal operation.

A selection cancel switch, effective only when a record is playing, is operated by a small, inconspicuous button on the back near the left side of the cabinet. A remote cancel switch or button may be substituted by plug-in connection to the selection receiver.

SPECIFICATIONS

Power Requirements:

117 volts A.C., 60 cycles
Standby (without Wall-O-Matics) - 147 watts
Operating (without Wall-O-Matics) - 325 watts

Cabinet Lighting:

Upper Cabinet Lamp — 25-watt, 33-inch, Daylight Fluorescent (FS25 starter.)
Lower Cabinet Lamp — (Same as above.)
Program Selector Drum Lamp — 20-watt, 24-inch Daylight Fluorescent (FS25 starter.)

Cabinet Key Number F-314

Mechanism .....Type 245ST1-L6 (V-200)
Type 245ST3-L6 (VL-200)

Tormat Memory Assembly..... Type 200TM1-L6

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

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

Pickup .....Seeburg High Fidelity Magnetic

Phonograph Speakers:

2-12" permanent magnet (low frequency)
2-8" permanent magnet (high frequency)

Cross Over Network Type.....CN600-1

Finish..Gray Olive Burl Plastic Veneer & Rose Maroon Lacquer (V-200)
Gray Teakwood Plastic Veneer & Coral Lacquer (VL-200)

Credit System:

Coin Equipment.....5-, 10-, 25-cent Single Entry Slug Rejector
Dual Credit Unit.... Type DCU1-L6 or DCU5-L6 (V-200)
Type DCU1L-L6 or DCU5L-L6 (VL-200)

Amplifier.....Type HFMA1-L6
8-tube, High Fidelity, Constant Voltage Type with Automatic Volume Compensation

Audio Power Output:
To Phonograph Speakers (adjustable)..... 1 to 20 watts
To Remote Speakers..... 24 watts max.
Maximum total to Phonograph Speakers & Remote Speakers.....25 watts

Tormat Electrical Selector.....Type TES1-L6

Tormat Selection Receiver. Type TSR1-L6 (V-200)
Type TSR3-L6 (VL-200)

Remote Control:

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

Remote Speakers: ..... High Fidelity Types

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

Tubes:

1 - 5879	1 - 6SN7GTB
1 - 6SK7/6SK7GT	1 - 6SL7-GT
2 - 12AX7	2 - 6L6G/6L6
1 - 5U4G-GB	1 - 6X4
4 - 2D21 (V-200 only)	1 - OA2 (V-200)
2 - CA2 (VL-200)	2 - 2050 (VL-200)

Fuses:

1 - 5 Amp. 3 AG	1 - 5 Amp. Pig-Tail Fuse, Type 6JV
1 - 2 Amp. 3 AG	
1 - 3 Amp. Fustat (V-200)	
1 - 3.2 Amp. Fusetron Type N 3-2/10 (VL-200)	

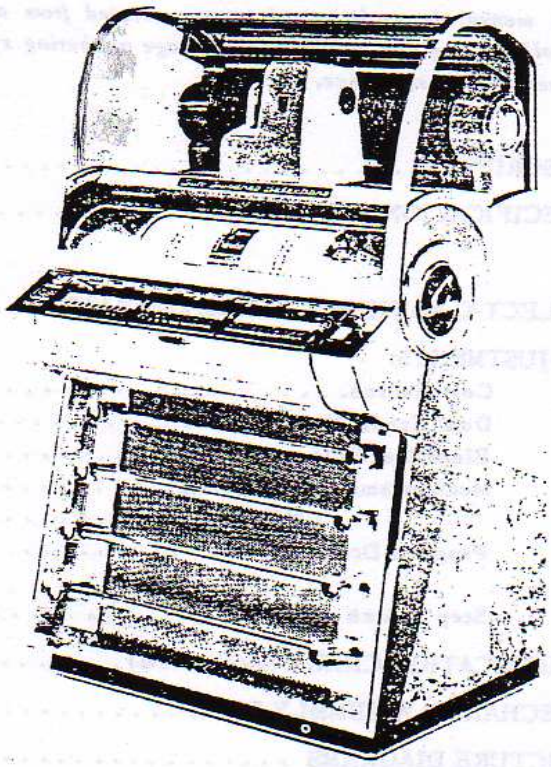
DIMENSIONS:

Height.....58¾ Inches
Width.....36¾ Inches
Depth.....27¾ Inches
Net Weight.....416 Pounds
Shipping Weight..... 498 Pounds

Record Weight,
100 Records, approx..... 6 Pounds

Seeburg SELECT-O-MATIC HIGH FIDELITY 200

MODEL V-200 – VL200



The Select-O-Matic "200", Model V-200 and Model VL-200 are coin-operated phonographs having a dual selection pricing system and using the Seeburg Select-O-Matic Mechanism for selective playing of either or both sides of one hundred 45 r.p.m., 7-inch records. The Model V-200 and Model VL-200 differ in cabinet finish and trim, the color of some of the exposed mechanism parts, the type of selection receiver and dual credit unit. The letter N or D following the model number designates the selection pricing specification. Choice of any of the two hundred record sides to be played is made at the instrument with an Electrical Selector or by remote control with 200-selection, 3-wire Wall-O-Matics. The Memory Unit of the Seeburg Tormat Memory System is a part of the mechanism. It "remembers" the selections and controls the mechanism accordingly.

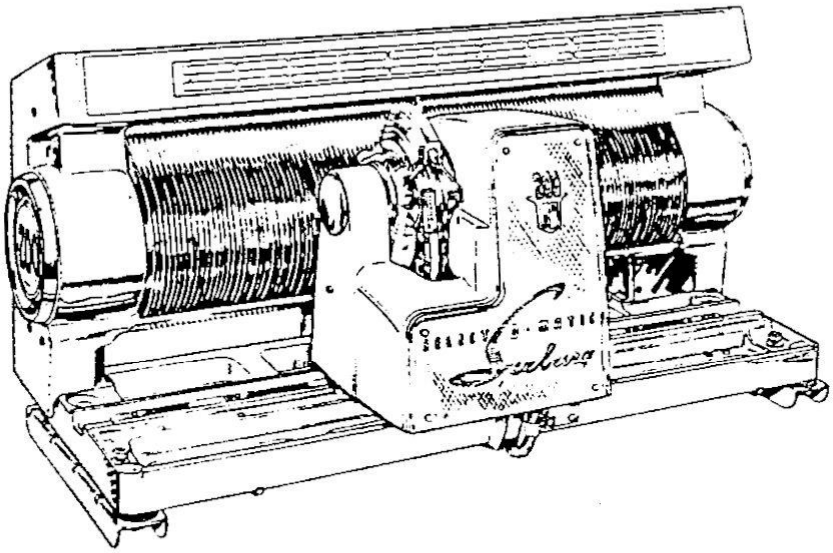
The titles for the entire two hundred record sides are displayed on standard size dual title strips. The strips are arranged in a cylindrical program holder that exposes them to view as five back-lighted panels of forty selections each. The program holder is motor driven and controlled by five selector switches. Each switch and program panel is associated with a musical classification ('Hit Tunes", '"Rhythm and Blues", etc.) so, when a switch is pressed, the program panel is brought into view that shows the titles for the type of music desired.

Coins are deposited in a single entry coin chute. They pass through a 5-, 10-, 25-cent slug rejector and the coin switches to a canvas bag which has a capacity of approximately one-hundred fifty dollars. Each nickel, dime and quarter adds, respectively, one, two and six credit "units" in an add-and-subtract credit switch that has capacity for twenty-four credits and is part of the dual selection system. Selection pricing panels in the Electrical Selector and the "200" Wall-O-Matics permit pricing of tunes so that either of two values of credits are cancelled when a record is selected. Two credits (10 cents) or three credits (15 cents) are subtracted from the credits totaled in the system credit switch when a Type DCU1-L6 (V200-D) or a Type DCU1L-L6 (VL-200-D) Dual Credit Unit is used. One credit (5 cents) or two credits (10 cents) are subtracted when a Type DCU5-L6 (V-200-N) or Type DCU5L-L6 (VL-200-N) Dual Credit Unit is used. Glass information panels at the side of the coin entry are lighted to indicate when additional coins are needed for selection or when there is enough accumulated credit for a 10-cent (or 15-cent) selection.

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

Seeburg

SELECT-O-MATIC "200" MECHANISM



The Select-O-Matic "200" Mechanism is designed for automatic selective playing of any of the selections in a program of 100 45 r.p.m., 7" diameter records with 1½" center hole. The mechanism will play either side or both sides of the records.

There are two fundamental parts of the Mechanism – a magazine, and a carriage assembly. The magazine holds the records. The carriage assembly plays the desired program selections by progressively withdrawing the records, playing them, and restoring them to their original position in the magazine.

The record magazine holds the records in a vertical position in openings or spaces that are .224" wide (center to center). It is filled from the front of the instrument by merely placing the records in the spaces. The spaces are numbered A1 to V0 for convenience in indexing the selections. There are 10 groups with 20 selections in each numbered group. To avoid confusion with the figure "1", the letter "I" is not used.

The carriage assembly moves, or scans from side to side of the instrument on a track parallel to, and in front of, the records. The scanning operation of the carriage commences as soon as a selection is made and will continue until the carriage has moved to a position in front of a record that is to be played. The carriage stops scanning when it comes to the position for playing the selected record and transfers the record from the magazine to the playing position on the carriage. The carriage transfers the record (when it has finished playing) to its original position in the magazine and scans to the next selected record, or, if no other record has been selected, will come to a stop.

SEQUENCE OF PLAYING

The carriage assembly changes direction of scanning only at the ends of the magazine, and the scanning operation is interrupted for playing only when the carriage is scanning toward the selected side of the record. The sequence of playing selections will, then, be established by their position in the magazine and the starting position and direction of scanning of the carriage. Selections of the left sides of records will be played as the carriage progresses from the left side of the magazine – right sides as the carriage scans from the right side. If both sides of a record are selected, one side will be played then the carriage will scan to the end of the magazine, reverse direction, and return to the record for playing the remaining side.

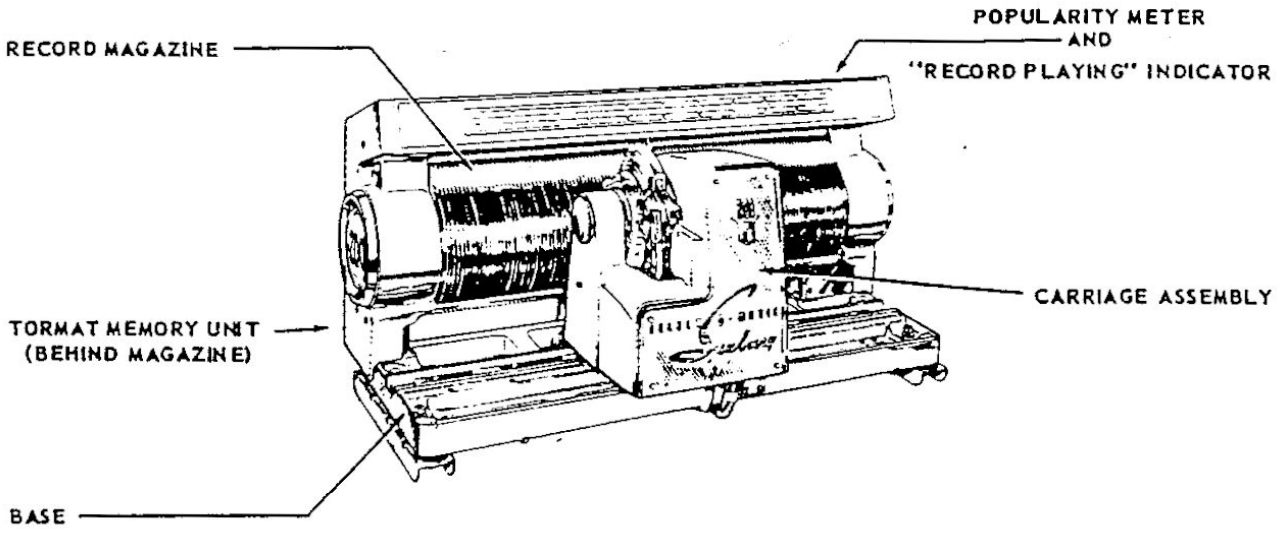


Figure 2.

SELECTION OF RECORDS

The mechanism is controlled for playing selected records by the Tormat Memory Unit on the back of the mechanism and a movable Contact Plunger Block that is attached to the carriage assembly. There are two-hundred toroidal shaped magnetic cores in the Memory Unit – one for each record side – arranged in two rows of one-hundred each. When a selection

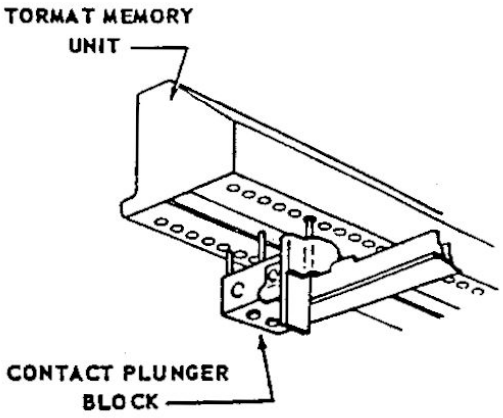


Figure 3.

is made with the Electrical Selector, or by remote control, a pulse of current is passed through the magnetic core corresponding to the selection. The current pulse changes the magnetic state of the core from zero (not selected) to selected.

The switching operation that controls the selection pulse for the Memory Unit also closes a circuit to a scan control solenoid. The solenoid, which is only momentarily energized, closes a circuit that starts the scanning operation of the carriage assembly.

As the carriage scans, the contact plunger block moves with it. The block has on it contacts that progressively connect with a circuit through each core in the Memory Unit. During the interval of contact, a current pulse is passed through the core. When the pulse passes through a core that is in the selected state, a signal is generated in an output circuit of the Unit. This output signal controls current to a trip solenoid that, when operated while the carriage is scanning, causes the carriage to stop and be accurately detented at the selected record.

When the carriage is detented, the transfer arm rolls the selected record from the magazine, up a ramp to the turntable. After the record has been brought to the turntable, the clamp arm lifts it from the ramp and clamps it, properly centered, in the playing position. Because the turntable is rotating, the record will start to turn as soon as it is clamped. When the clamping operation is completed, the pickup stylus is set on the record and is released so the stylus will follow the record grooves. The mechanism is then in the record-playing position.

When the record has finished playing the pickup will have moved the arm to a position which causes it to operate a trip switch. The

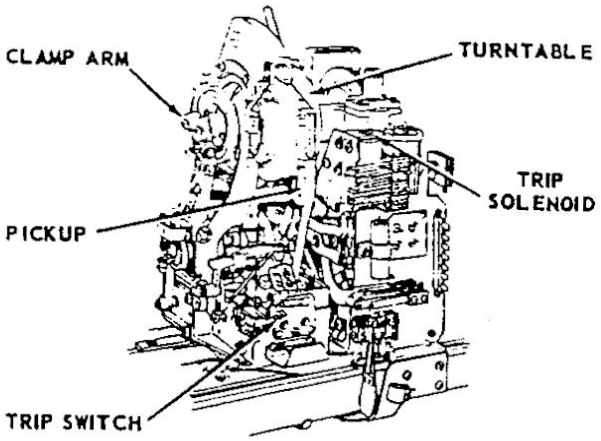


Figure 4.

switch, in turn, closes a circuit to the trip solenoid. This is the same trip solenoid which operated to detent the carriage and initiate the transfer of the record to the playing position. This second operation of the solenoid, occurring at the moment of record trip-off, starts the operation in which the record is transferred from the playing position back to the magazine. In this operation the above cycle is reversed – the pickup is lifted from the record; the clamp arm is withdrawn so the record is released; the transfer arm lowers the record to the magazine. When the record has been fully returned, the carriage again scans or, if no other record has been selected, it comes to a stop.

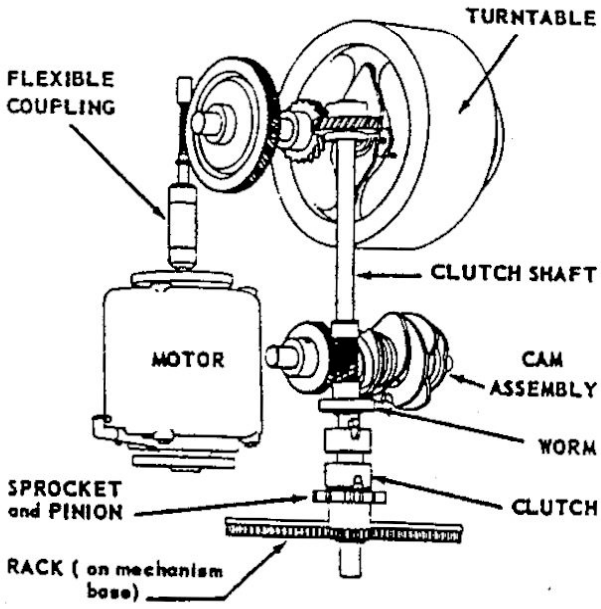


Figure 5.

SCAN – TRANSFER

All the operations of the mechanism – scan, transfer and playing – are powered by a motor through gears to the record turntable and, through a clutch, to a cam assembly or a sprocket assembly. These parts are shown in their relative positions in Figure 5. It can be seen that the turntable and the clutch shaft will turn whenever the motor is running. The clutch member is loosely fitted on the clutch shaft and can be moved vertically. One or both the drive pins shown in the enlarged view of the clutch, Figure 6, will be engaged in the notches of the

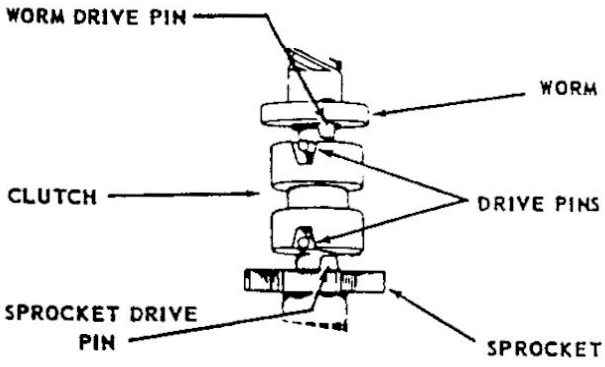


Figure 6.

clutch at all times so the clutch, although free to move up and down, will be turning with the shaft whenever the motor is in operation. In the scan operation of the mechanism, the clutch is lowered and is engaged with the pin on the upper end of the sprocket. In the transfer operation, the clutch is raised and is engaged with the pin on the lower end of the clutch worm. In the play position, the clutch is held between the sprocket and worm pins so that only the turntable is being driven by the motor.

When the rotating clutch is lowered so it is engaged with the sprocket, the pinion (which is part of the sprocket) is also turning. The pinion is meshed with a gear rack which is fastened to the mechanism base and extends the length of the magazine. As the pinion turns, it drives the carriage in the movement referred to as "scanning". The direction of scanning is determined by the direction of rotation of the pinion and is changed by reversing the motor. The motor rotation is changed by a reversing switch that is mounted on the carriage and actuated by "stops" at each end of the base.

When the clutch is raised and engaged with the clutch worm, the cam assembly rotates and, in turning, operates the parts of the carriage that are associated with the record transferring operation. During the transition of the carriage from the scan to the play position, the cam assembly turns one-half revolution. It makes another one-half turn during the change back to the scan position. Its direction of rotation is determined by the direction of rotation of the motor and is the same during both transfer operations so it makes one complete revolution for each record playing cycle.

The cam assembly, although a single unit, has eight individual cam faces each of which has a definite function in the transfer operations. The contour of each of the cams is symmetrical about an axis through its scan and play positions so the sequence and timing of the carriage operations are the same for either rotation direction of the motor.

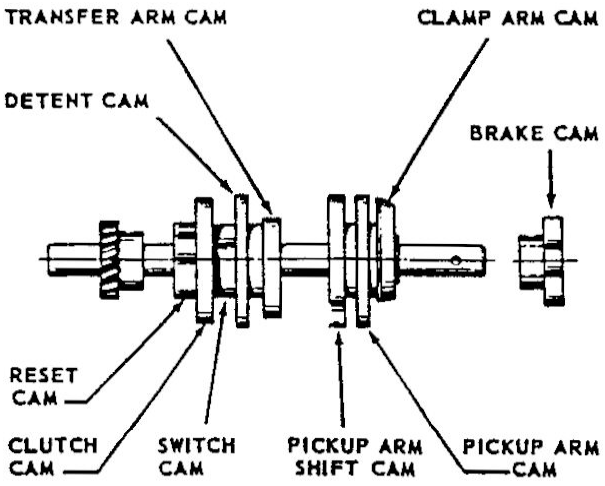


Figure 7.

Figure 7 shows the cam assembly and identifies the different cams. The reset and clutch cams operate in conjunction with a trip mechanism as a part of the clutch control. It is the trip mechanism and the levers associated with it which move the clutch to the scan, transfer and play positions. The third cam – the switch cam – operates a cam switch which, in turn, operates mechanism control circuits. The detent cam operates through a series of levers to hold the carriage at a selected record position (magazine record space) and maintains alignment of the turntable with the magazine while the record is played and also while it is being transferred. The pickup shift cam moves the pickup for left or right side playing of a record. The movement of the pickup arm to and away from the record and to the normal starting position is performed through levers by the pickup arm cam. The clamp arm cam, operating the clamp arm, holds the record in playing position on the turntable. The cam at the right – the brake cam – is not a part of the cam assembly although it is attached to the cam shaft. It stretches and releases a "brake spring" and has a profile designed so the spring equalizes the forces required from the motor at different positions of the cam assembly thereby assuring smooth operation of the mechanism during transfer of the record.

CLUTCH OPERATION

The clutch is shifted by two springs and a series of levers that are parts of the trip mechanism assembly shown in Figure 8. It is linked

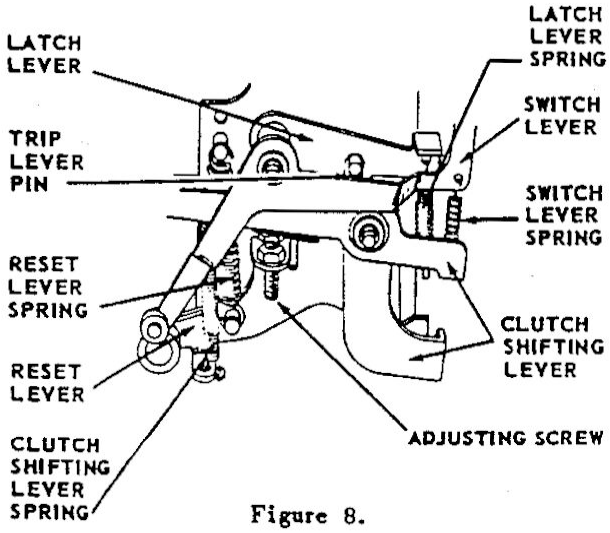


Figure 8.

to the clutch shifting lever and is lifted to the transfer position by the reset lever spring. The force of this spring is applied, upward, to the clutch shifting lever, through the reset lever and the adjusting screw that is in the reset lever.

When the mechanism is scanning or playing a record, the reset lever is held down by the latch lever and the spring is in its charged condition. When the trip solenoid is momentarily energized, it pulls the trip lever pin upward against the latch lever. When the pin hits the latch lever, the reset lever is released and the spring pulls the clutch upward so it engages the pin in the clutch worm.

During the ensuing record transfer operation and cam rotation, the reset cam moves the reset lever to its original latched position and the spring is again charged. This resetting of the trip mechanism begins as soon as the cam assembly starts to turn and is fully completed when approximately one-half the transfer operation is completed.

When the reset lever is returning to the reset position it can no longer hold the clutch shifting lever in the raised position. The clutch would then be lowered until it is no longer engaged with the clutch worm and the transfer operation would cease soon after it is begun. This is prevented by the clutch cam and the roller that is a part of the clutch shifting lever.

The clutch cam is the second from the left in Figure 7. The roller is between the two side frame members of the clutch shifting lever and is above the cam assembly. The roller must be in the "scan notch" of the cam, as in Figure 9a, to permit the clutch to engage the sprocket. The roller, in this position, holds the cam assembly so it cannot turn from the scan position.

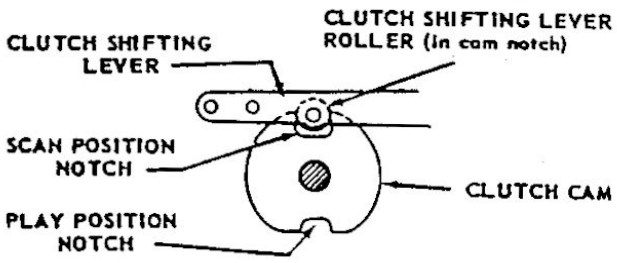


Figure 9a.

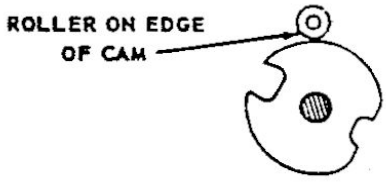


Figure 9b.

When the clutch rises to the transfer position, the clutch shifting lever roller lifts out of the notch. The transfer operation commences as soon as the clutch engages the pin on the clutch worm and, as the cam turns, the roller rides it as in Figure 9b. As long as the roller is on the outer edge of the cam it will hold the lever (and the clutch) in the transfer position.

As the transfer operation progresses, the reset cam, pushing on the reset lever, recharges the reset lever spring and, at the same time, charges the clutch shifting lever spring. This spring pulls downward on the clutch shifting lever so its roller is held firmly against the clutch cam.

In the continuing transfer operation, "play position notch" of the clutch cam is brought under the roller and the roller is pulled down, by the clutch shifting lever spring, into the notch. As the roller enters the notch the clutch also moves down and disengages from the clutch worm so the cam assembly stops turning. The downward movement of the clutch is limited by a mechanism adjustment so it cannot engage the sprocket.

When the clutch shifting lever roller has entered the cam notch, the cam assembly will have rotated one-half turn from its scan position and will be in its "play position", the carriage will be firmly detented at the selected record position, the record will have been transferred to the turntable and been clamped there, the pickup will be on the record and released so it can follow the record grooves and only the turntable is being driven by the motor. This is the "play position" of the mechanism.

CARRIAGE DETENTING

It is necessary to firmly detent and hold the carriage assembly at the selected record position while the record is being transferred to the turntable, played, then returned to the magazine. This is done by engaging a detent roller between two teeth of the sprocket that is at the lower end of the clutch shaft. The roller is supported on the detent arm and is engaged with the sprocket by the lower end of the clutch yoke lever. These parts are shown in Figure 10. *(Page 2124)*

Initial detenting occurs when the trip solenoid is energized and the clutch moves from the scan position to the transfer position. The upward movement of the clutch shifting lever lifts the clutch link and clutch spring, Figure 11, and the clutch yoke lever. The yoke lever pivots, bringing the detent adjusting screw against the detent arm so the detent roller engages the sprocket.

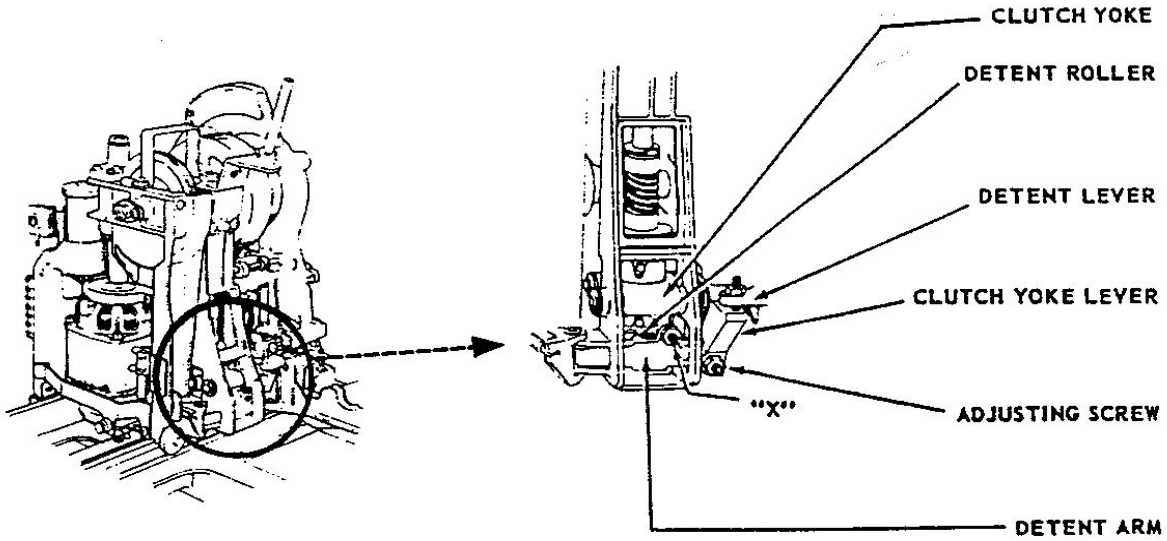


Figure 10.

When the play position of the carriage is attained, the clutch shifting lever drops to disengage the clutch from the clutch worm. Its downward movement relieves the detenting force it applies to the clutch yoke lever but, before the release occurs, the yoke lever will be locked in the detenting position by the detent lever shown in Figure 12.

The detent lever is operated by the detent cam. These are shown in their scan position in Figure 12. As the cam turns from the scan position to the play position, the detent lever is driven downward so the adjusting screw at its end is against the flat horizontal part of the clutch yoke lever effectively locking the detent roller in position.

At the conclusion of playing a record, the trip solenoid again is operated so the clutch moves upward to the transfer position and again the clutch shifting lever supplies detenting force to the clutch yoke lever. In the ensuing rotation of the cam assembly to the scan position the detent lever is raised from the yoke lever so the detenting force is again supplied only from the clutch shifting lever. When the scan position is attained, the clutch drops and the detent roller is retracted from the sprocket so the carriage is free to scan.

Another function of the detent arm and the operations associated with it is retention of the clutch in its correct playing position while a record is playing. The adjusting screw in the detent arm, indicated at "X" in Figure 10, will move toward the clutch when the sprocket is detented and will be held firmly in position by

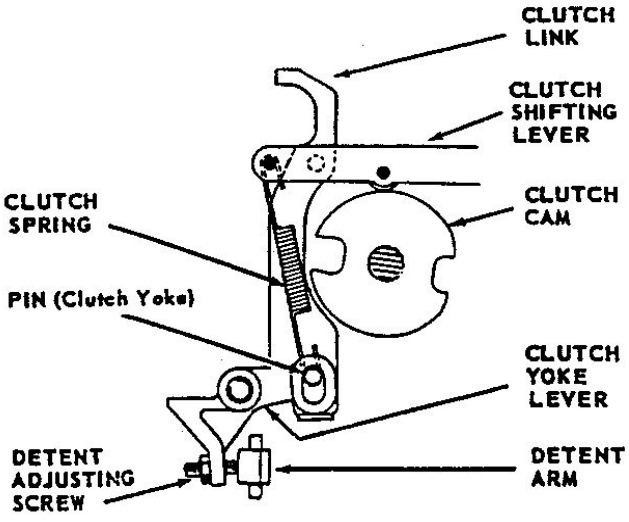


Figure 11.

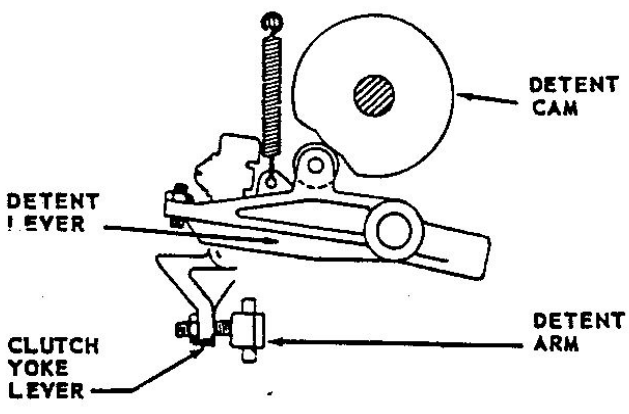


Figure 12.

the locking action of the detent cam and lever at the time the carriage cycles into the play position. When the play position is attained, the clutch disengages but its downward travel is limited by the clutch yoke bearing against the adjusting screw. The length of clutch travel from the transfer position to play position is held to a minimum so the remaining available movement (from play to scan position) will afford the greatest possible displacement of the clutch shifting lever. By maintaining maximum movement of the clutch shifting lever between the scan and play positions, a control switch it operates will be less critical in adjustment and positive contact functioning will be assured.

The transfer arm is controlled by the gear segment and cam shown in Figure 13. The segment pivots on the shaft at A; the arm pivots at B. The gear segment spring biases the roller against the cam and lifts the head of the arm in an arc toward the turntable as the cam rotates from the scan to the play position. In the scan position the arm is below the record magazine. As it starts moving into the magazine, the roller in the head engages the lower projections of adjacent separators so the arm centers in the record space.

As the arm moves upward, the record is rolled onto and up the ramp until the upward

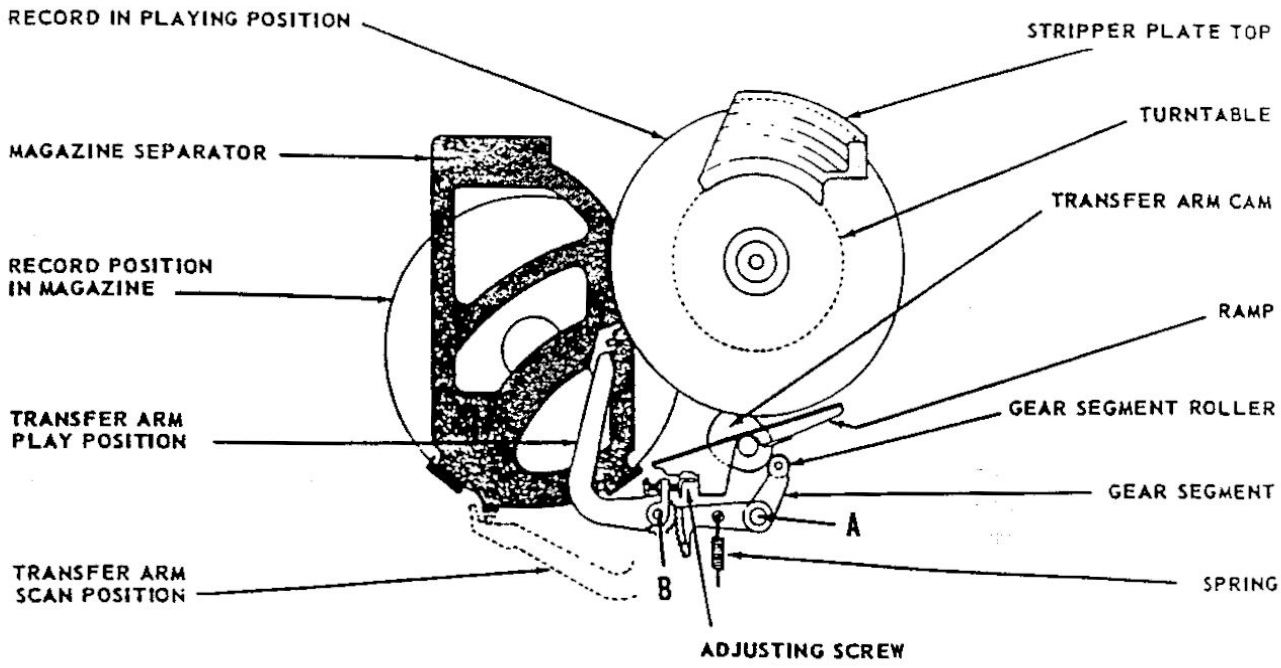


Figure 13.

RECORD HANDLING

Record handling from the magazine to the playing position on the turntable and return to the magazine is performed by the transfer arm and the clamp arm. The record is rolled by the transfer arm from the magazine, upward on the ramp, to a position beside the turntable. After the record has been brought up to the turntable, the clamp arm centers it and clamps it in the playing position. At trip-off, when playing is concluded, the cam assembly rotation retracts the clamp arm to release the record and the transfer arm then lowers it to its original position in the magazine.

movement is arrested by the adjustment screw coming in contact with the stop plate. In this position, the record is cradled in the forked head of the transfer arm and the ramp and is slightly below its centered clamped position.

As soon as the transfer arm and record are in the raised position, the clamp arm, Figure 14 moves toward the turntable and the cone and centering pin on the clamp disc pass through the record center hole. As the centering pin enters the hole in the turntable, the disc is aligned parallel with the turntable and the cone lifts the record so it no longer is touching either the ramp or the transfer arm.

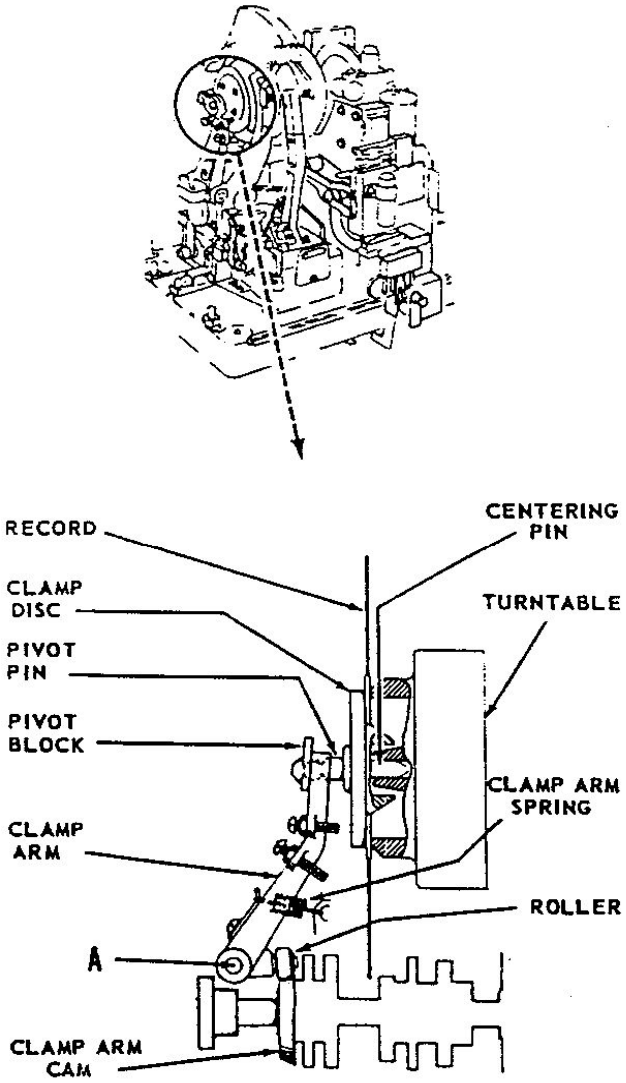


Figure 14.

The clamp arm movement is controlled by the clamp arm cam. The arm pivots at A and is pulled toward the turntable by the clamp arm spring as the roller follows the cam during rotation from the scan to the play position. In the clamping position, the disc rotates with the record and turntable, with the ball on the pivot pin and the pivot block as a bearing.

It will be noted that both the transfer arm and the clamp arm move to their play positions by spring force. If either is obstructed by any abnormal conditions, there are no damaging strains set up. It will be noted, too, that the record is "captive" in that it does not fully leave its magazine space for playing and cannot move past possible clamping position due to the stripper plate top. Lateral random movement of the record, before and after clamping, is prevented by the turntable and the stripper plate.

At trip-off, when the record is to be returned to the magazine, the cam assembly turns to the scan position. The clamp arm is first retracted from the turntable and the stripper plate "strips" the record from the disc cone so it drops to its former cradled position on the ramp and the transfer arm head. The transfer arm then lowers it to its stored position in the magazine space.

SAFETY PLUNGER

If a record is badly warped so it rubs on the magazine separators or for any other reason fails to return fully to its stored position in the magazine, the carriage will not scan to cause possible damage to the records or mechanism. The safety plunger, Figure 15, must move

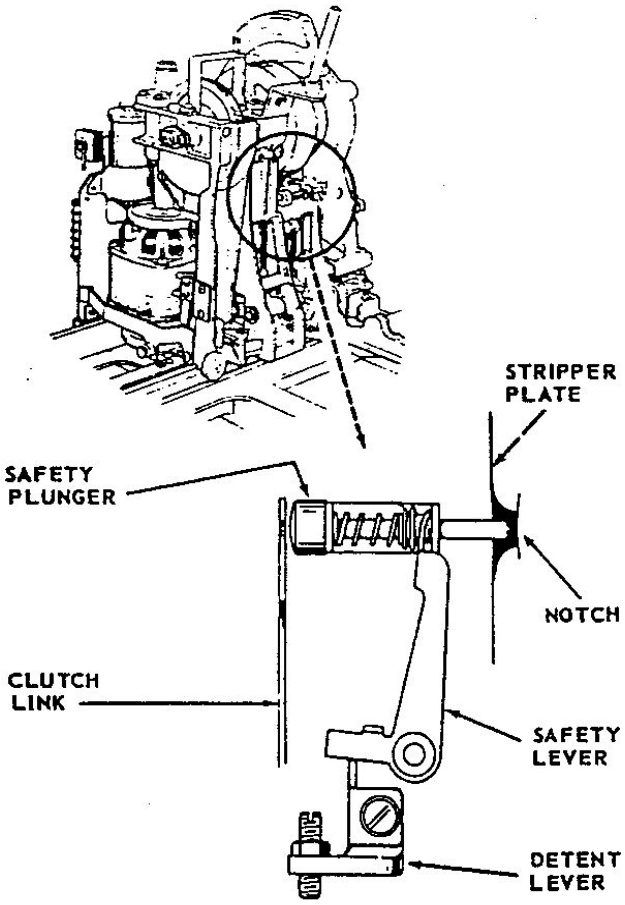
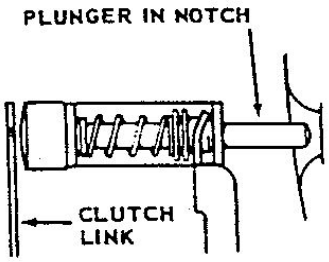
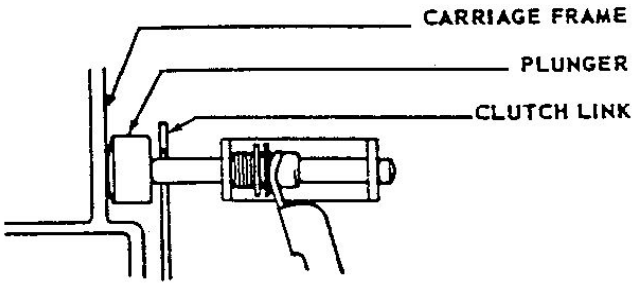


Figure 15.

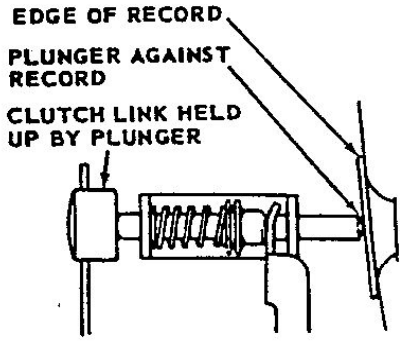
to its normal scan position, Figure 16A, before the carriage can start the scanning operation by engaging the sprocket. In this position the small diameter end of the plunger is in a notch in the stripper plate and the hook at the top of the clutch link (see Figure 11) has moved down past the large end of the plunger to permit the clutch to drop into its scan position.



(A) Normal Scan Position



(B) Play Position



(C) Record Not Returned To Magazine

Figure 16.

In the play position the plunger has been moved by the detent lever and the safety lever so its large end is against the clutch frame as shown in Figure 16B. In this plunger position the hook on the clutch link can move downward far enough to permit the clutch to move to the play position.

If a record is not returned to the magazine, it will block the path of the safety plunger from its scan position as shown in Figure 16C and the hook on the clutch link will rest on the large end of the plunger. With the link held up by the plunger, it cannot drop far enough for release of sprocket detenting or engagement of the clutch and sprocket for carriage scanning.

PICKUP

A pickup with two stylus assemblies plays both sides of the records and is part of a pickup arm system that is moved to the record side that is to be played. The pickup is a magnetic type with replaceable styluses and operates with stylus pressure on the record of 4½ to 5½ grams.

The stylus tips are mounted in hollow tube: that pivot, laterally, in plastic armature assem blies. The armature assemblies wedge into th pickup cartridge so the movement of eith stylus varies the flux density of the magneti field through a single coil. The coil terminate at two connecting pins in a bakelite block base and has a d. c. resistance of 1600 to 19 ohms. The nominal pickup output for 10 c. p. s. at amplitude of 6 cm/sec is 25 m. when connected to a 47,000 ohm load.

PICKUP ARM SYSTEM

The pickup arm position and operation controlled by two cams. One of these, pickup cam, places the stylus on the rec releases the arm so the stylus can follow playing grooves, lifts the pickup from the re at conclusion of playing, returns the arm to at-rest position and locks it there, ready fo next playing cycle. The other, the shift positions the arm to the left or right o record to be played for, respectively, l right side playing.

The movement of the arm as the p moves to and from the record and as it f the irregularities of a warped record has axis, at the lower end of the arm, a d system shown in Figure 17A. The arm pi a thin film of viscous oil that is betwe bore of the arm and the stator. The stator name implies, does not turn – it is held between two centering screws in the shown in Figure 18.

The stylus pressure against the record and the arm movement toward the record is obtained from the pressure springs, Figure 17B. When the right side of a record is played, the arm is positioned at the right as shown and the spring at the left provides the stylus pressure. When the left side is played, the arm is positioned to the left of the record so the spring at the right provides the pressure.

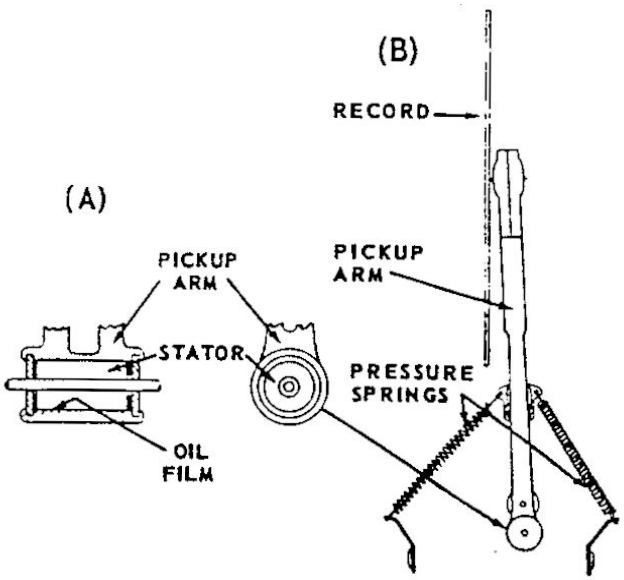


Figure 17.

The axis of lateral movement of the pickup arm (movement parallel to the record surface) is through the pickup cradle at the pivot sockets, Figure 18. The pivots are hardened steel points in the cradle frame, Figure 19. The pivot at the right is fixed; the one at the left is moveable so it can be adjusted for free movement of the cradle with neither binding nor undue looseness.

The lateral movement is limited in both directions. The limit of pickup travel toward the edge of the records is controlled by the adjusting screw A, Figure 20, and is established at the point at which the stylus lands on the record at the start of play. The screw is in a projection of the pickup cradle and moves downward in an arc until it stops against the cradle frame. The movement of the pickup toward the record center is controlled by the screw, B. It projects through the frame casting at a point below the axis of movement so it acts as a stop for the swing of the cradle.

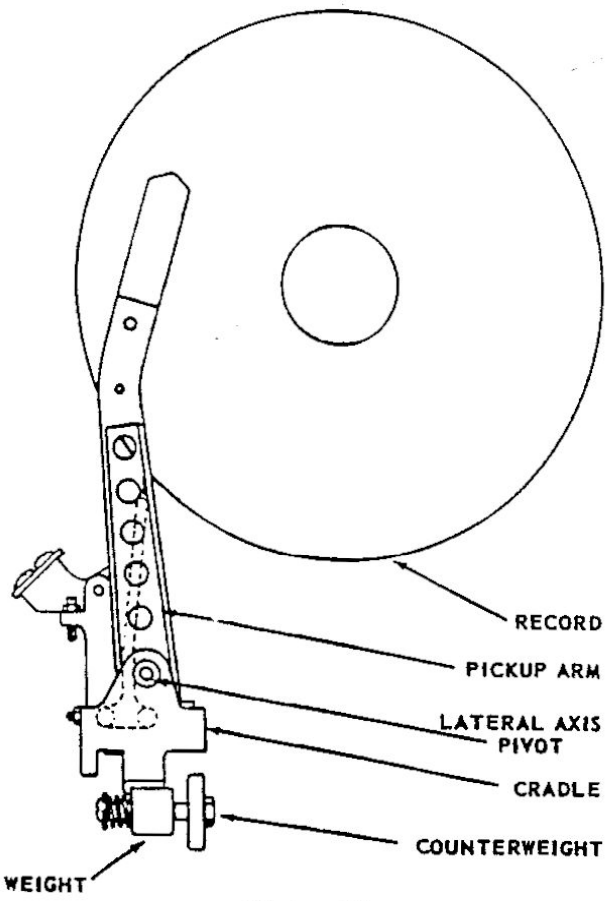


Figure 18.

The arm and cradle, as a unit, are statically balanced by a weight and counterweight that are attached to the bottom of the cradle, Figure 18. The weight is fixed in its position but the counterweight is moveable and is adjusted for correct lateral balance.

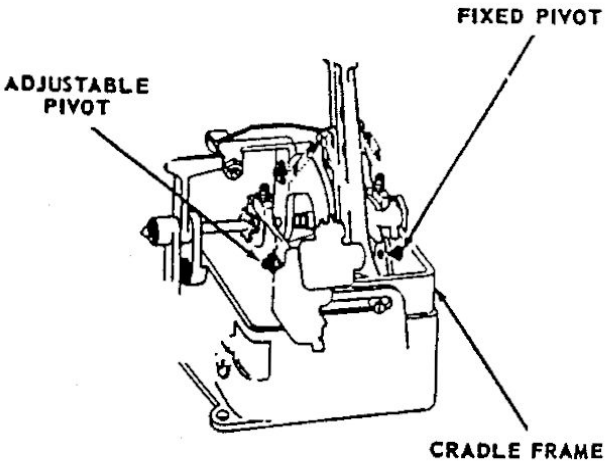


Figure 19.

In addition to balancing for static conditions, provision is made to counteract the lateral forces developed dynamically by friction between the stylus tip and the record. This is done by anchoring the lower ends of the stylus pressure springs at a point that is off-set from the lateral axis of the arm so the spring that is in tension opposes the dynamic force as well as holds the stylus in the record groove.

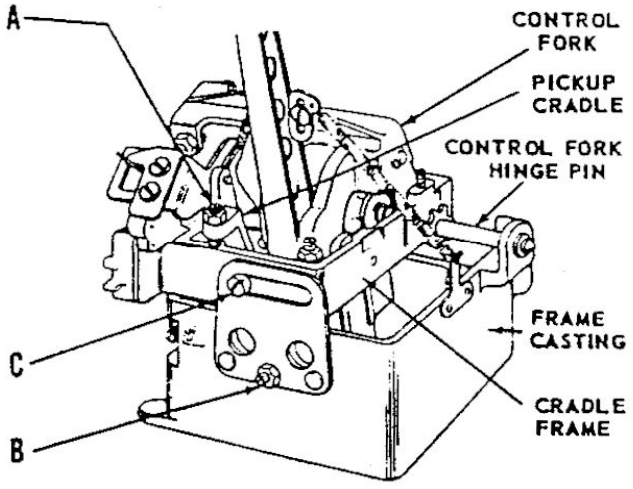


Figure 20.

PICKUP ARM SHIFT

The cradle frame in which the pickup arm and cradle are held is mounted in the frame casting, Figure 20. It is supported on the control fork hinge pin and the screw, C, the head of which rests in the slotted plate at the front of the casting. The assembly is moved, as a whole, to the left or right, by the pickup shift cam operating through the drive crank, cradle actuator lever, and shift collar, Figure 21.

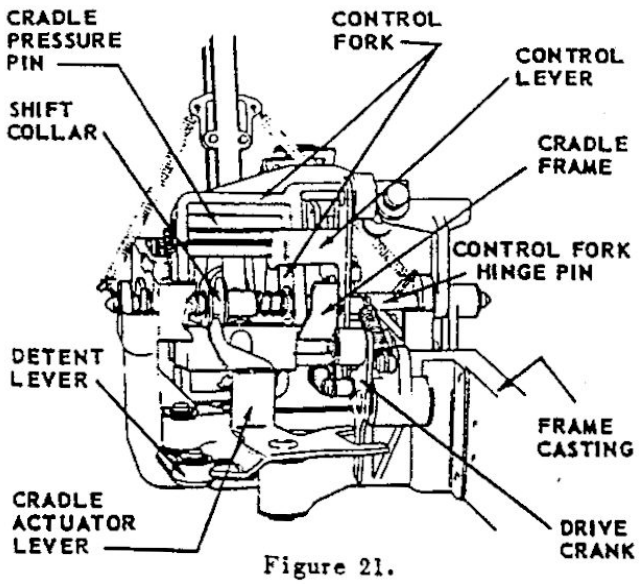


Figure 21.

In the assembly shifting operation, the shift cam rotation direction determines the position of the drive crank. The crank, if it changes position, operates the cradle actuator lever which, in turn, slides the shift collar on the control fork hinge pin. The collar is between two compression springs and the control fork so, when it moves, the control fork and the cradle frame, together, slide with it along the pin until the frame comes to a stop against projections that are at the back of the frame casting.

The movement imparted to the cradle actuator lever by the drive crank is supplemented by the detent lever, Figure 21. In conjunction with the actuator lever, it performs an over-center action that moves the shift collar farther than the stops on the frame casting will permit the cradle frame to move. This over-travel of the collar is absorbed by the compression springs and assures full positioning of the pickup arm to the left or right side playing position. It also holds continuous but controlled force against the control fork and the cradle frame to eliminate possibility of vibration of the assembly.

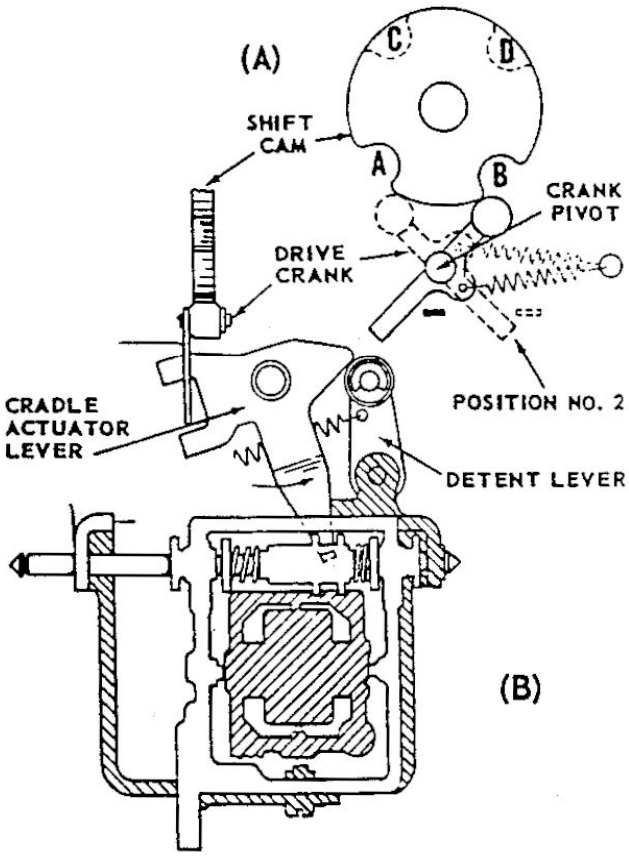


Figure 22.

The drive crank changes position and move the pickup arm only if the record side next to b

played is opposite that of the record side last played. Figure 22A explains this operation and shows the shift cam and the drive crank in their relative scan positions after the left side of a record has been played. In this view, the cam and crank are shown in their relative positions as though viewed from the clamp arm side of the carriage assembly.

If, on the next play, the right side of a record is to be played, the cam will turn clockwise in the record transfer operation. After a few degrees of cam rotation the roller on the drive crank will fall into the notch, B. As the cam continues to turn, the notch, B, will move to its play position at C with the roller following it until the crank is at position 2. When the crank is in this position, the pickup arm and the levers are positioned as shown in Figure 22B.

If, on the next play, the left side of a record is to be played, the cam will turn counterclockwise from the position shown in Figure 22A and the notch, A, will pass the roller of the drive crank. The roller is momentarily in the notch but there will be no change of position of the crank relative to the cam and the pickup arm position remains unchanged.

PICKUP ARM OPERATION

The pickup arm operations at the beginning and end of record play are performed by the control fork. The fork is actuated by the pickup cam and the control lever and is shown in its play position in Figure 23. In this position, the control lever spring holds the control lever roller in the cam notch and the control fork,

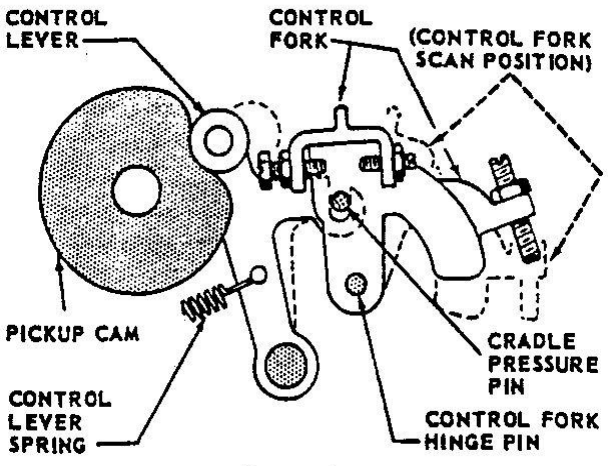


Figure 23.

through coupling with the lever at the cradle pressure pin, is in its play position. As the cam rotates from its play position, the roller on the control lever moves to the longer cam radius and the control fork pivots on the hinge pin to its scan position. While moving from play to scan position, the pickup is lifted from the record, the arm and cradle are then moved to and locked in their scan position. While moving to the play position, the fork lowers the pickup to the record, then releases the arm and cradle so the stylus can follow the record grooves.

The pickup is moved to and from the record surface by the forked downward extension that gives the control fork its name. In the scan position, one or the other of these extensions bears against a roller, that is in the pickup arm above its pivot axis in the cradle, and holds the pickup away from the record. Figure 24 shows the fork and pickup arm with the fork in a position approximately half way between scan and play and with the pickup arm at the right side of a record. In this illustration the

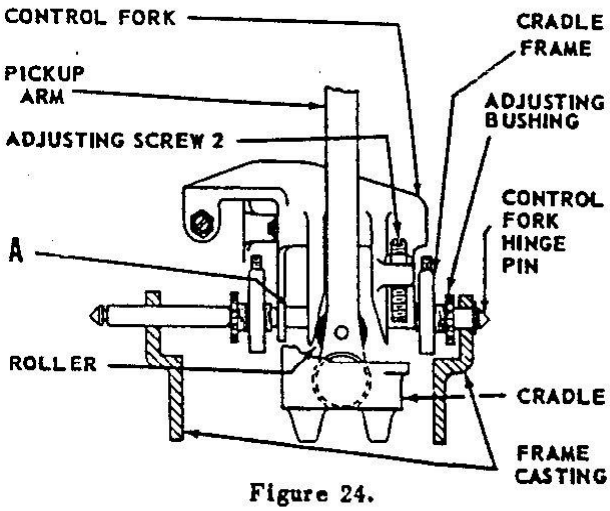


Figure 24.

fork extension at the left is against the roller in the arm and, if it is moved downward to the scan position, it will press against the roller and move the pickup away from the record. If the fork is moved upward to the play position from the position shown, it will fully clear the roller and the pickup arm will be released so the stylus will rest on the record.

Negligible force for lateral movement is imparted to the pickup arm by the lifting operation because the point of contact of the roller and the control fork is on the lateral axis of the system.

If the pickup arm is in position for right side playing and the left side of a record is to be played, it will be shifted as discussed in Pickup Shift. The shift collar and compression spring (Figure 21) will push against the control fork at A, Figure 24, and the fork will move to the left on the hinge pin, until bearing against the left adjusting bushing, it shifts the arm, cradle and cradle frame to the left in the frame casting. As the fork moves from the right to the left side of the cradle frame, the fork extension at the left moves away from the pickup arm roller and the one at the right moves against it. The arm then tilts to the left for pickup clearance with the left side of the record.

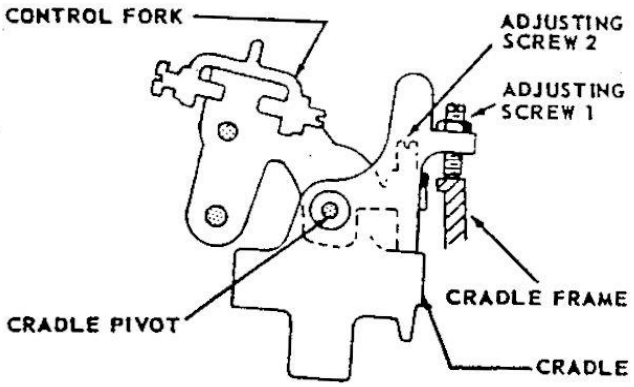


Figure 25.

Return of the pickup and cradle from the released, record playing position to the scan position occurs when the adjusting screw 2 in the control fork, Figures 24 and 25, presses downward on the forward edge of the cradle. The pickup moves with the arm to a position that places the stylus where, without lateral movement, it can move to its starting point on a record at the start of the next play. This position is established by the adjusting screw 1, Figure 25, and adjustment for movement to that position is made with screw 2.

The pickup arm is locked in the scan position and released for playing by the lock lever, Figure 26. The lever pivots at A when the upper end of the control crank is moved by the No. 3 or No. 5 adjusting screws. In the play position, shown in Figure 26, the horizontal part of the lock lever is raised and is held in position by contact with the detent lever at B. The lock lever pin which extends from the cradle can move freely beneath the pointed projection on the lock lever so the pickup arm and cradle are free to swing on the cradle pivots.

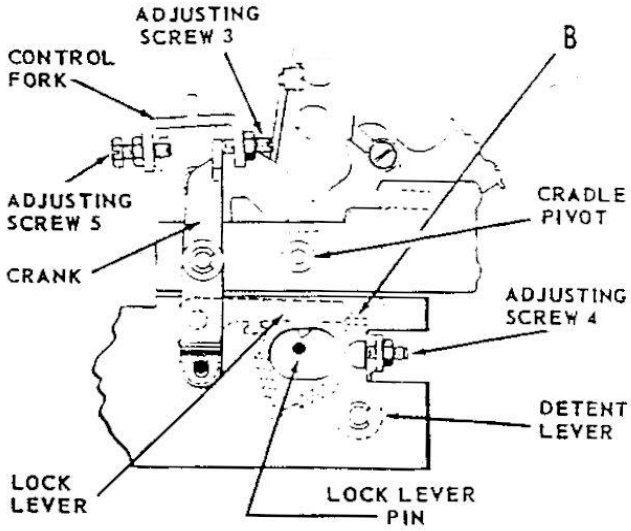


Figure 26.

When the control fork moves to the scan position, the cradle and pickup arm are first moved to their scan position and the lock lever pin is positioned back of the point on the lock lever. When the fork has moved almost fully to its scan position, the No. 5 adjusting screw, presses against the control crank and drives the lock lever downward, past the detent lever, to the scan position shown in Figure 27. The lock lever, in the lowered position, securely holds the lock lever pin (and the pickup arm) in the scan position and is again detented by the detent lever. The force or pressure of detenting is controlled by the tension of the spring that holds the lever toward the lock lever but the No. 4 adjusting screw, in contact with the frame casting, limits the detent lever movement and determines the point of contact of the two levers.

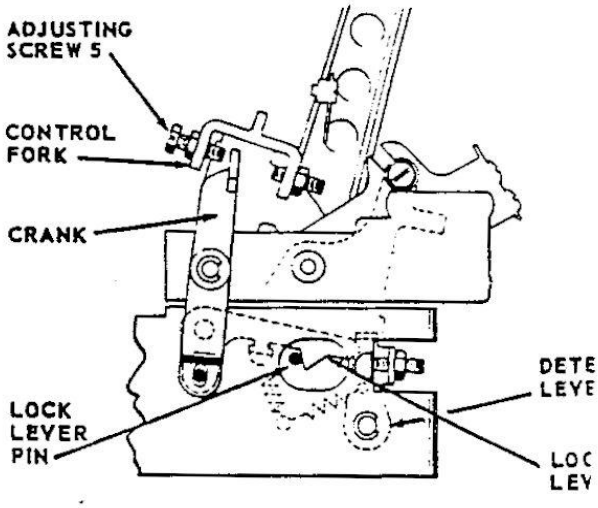


Figure 27.

The pickup arm remains locked in the scan position until, in the next record playing cycle, the control fork has moved almost fully to its play position and the pickup stylus has been placed on the record. The No. 3 adjusting screw then presses against the control crank and lifts the lock lever past the detent lever, to the position shown in Figure 26, so the pickup is released for playing.

MOTOR

All phases of operation of the carriage assembly – scanning, transfer of the record to and from the turntable, and playing – are accomplished with a single motor that is mounted on the carriage assembly. It is a 117-volt A.C., split phase capacitor type of approximately 1/100 h.p. The normal motor speed for record playing at 45 r.p.m. is 1745 r.p.m. During scanning and when a record is being transferred, more torque is required of the motor and is provided for in these operations by connecting additional capacitance across the permanently connected capacitor. This is done with the "O" contacts of the cam switch that are closed except when the carriage is in the play position.

The change in direction of scanning and of the turntable for playing the left or right sides of the records requires a change in direction of rotation of the motor. This change is made with the reversing switch that is on the carriage and operated by "stops" at each end of the base.

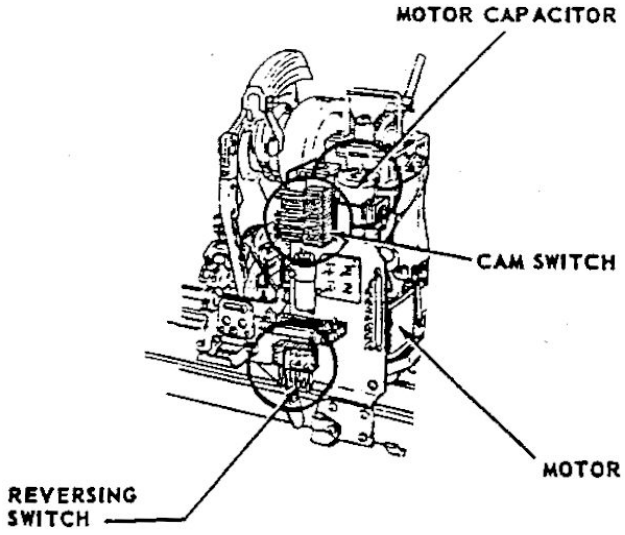


Figure 28.

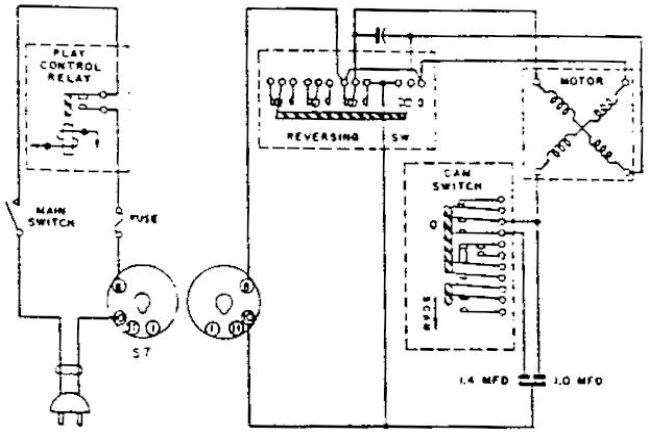


Figure 29.

The direction of rotation is determined by the motor connections and must be such that the carriage will scan to the right when the operating lever of the reversing switch is deflected to the right.

Power for the motor is supplied from the selection receiver in the complete phonograph through the cable to the mechanism and is controlled by the play control relay that is in the receiver.

SELECTION SYSTEM

The Tormat Memory System is a selection system in which magnetic cores of magnesium ferrite are the basic elements for control of the mechanism so selected records will be played. Two hundred cores – one for each record side and each one not much larger than the head of a pin – are arranged in an electrical matrix that stores or "remembers" the selection information that is fed into it when selections are made at the phonograph with the Electrical Selector or by remote control with a Wall-O-Matic. The cores are toroidal shaped and are known as toroids in their application in the selection system. It is from this name, *Toroid*, together with the *matrix* arrangement and the "remembering" function that the "Tormat Memory System" name has been derived.

The toroid matrix is assembled in the Tormat Memory Unit that is mounted on the back of the mechanism. This Unit, the Electrical Selector, the mechanism control circuits, a contact plunger block on the mechanism carriage, and the electronic circuits in the Selection Receiver comprise the selection system.

The toroids are arranged in the Memory Unit in two rows of one-hundred each and spaced so there are two of them at each magazine record space. They are mounted in molded bakelite blocks and are held in position by a locking plate and the internal circuit wiring. The wiring terminates at solder lugs in the Unit that serve as junctions for the multiconductor cable to the 33-pin and single conductor plugs that connect to the Selection Receiver. Some of the internal circuits terminate at the contact rivets and the continuous contact bar that are on the bottom of the Unit. Contact with the rivets and the bar is made with the contact plunger block that moves with the carriage in the scanning operation of the mechanism. The Memory Unit and contact block are shown in *Figure 30.*

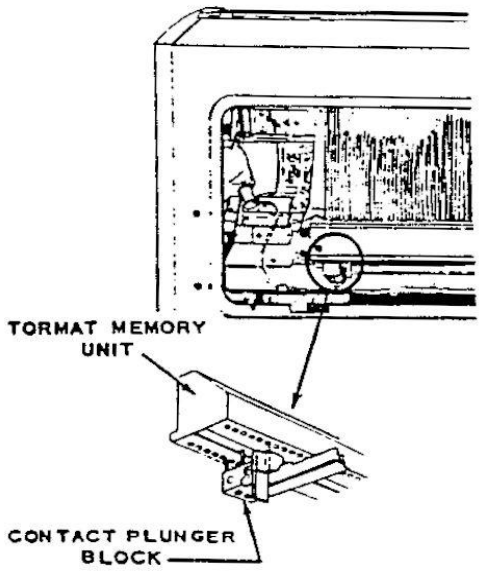


Figure 30.

Each toroid has two normal states of magnetization in which the residual magnetic flux is in either clockwise or counter-clockwise 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, indefinitely, either state.

When a selection is made, a pulse of current is passed through wires threaded through the appropriate toroid. The resultant magnetic field changes the magnetization from the zero – not selected – state to the selected state. The process of changing a toroid to the selected state is called "write-in". The circuits associated with it are the "write-in circuits".

If a write-in pulse is passed through the circuit of a toroid that is in the selected state, no change of magnetization takes place – the toroid only continues to be in the selected state.

When the selection information that has been written into the Memory Unit is to be used for control of the mechanism, a pulse of current is passed through another wire that is threaded through the toroid. This current is of opposite phase with respect to the write-in current and produces a magnetic field that can restore the toroid magnetization to the zero state. This operation is called "read-out" and the associated circuit is the "read-out circuit". The term is used and applies whether the state of the toroid is or is not changed although a change of magnetization state takes place if the toroid is in the zero state at the time the current is passed through the circuit.

Wire of a third circuit is threaded through the toroid. This is the output loop of the Tormat Memory Unit and is part of what is known as the sensing circuit of the system. The load connects to a filter and pulse transformer in the sensing circuit where one side is grounded. This load of filter and transformer is represented as a resistor in *Figure 31.* A voltage is

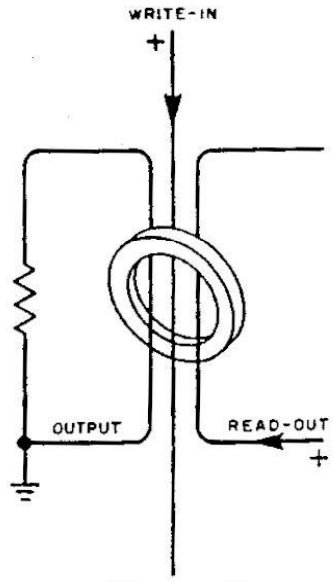


Figure 31.

duced in the loop and appears across each time a current pulse is passed either the write-in or read-out circuit threads the toroid. The direction of the and read-out currents in these circuits indicated in *Figure 31.* The voltage across the load will be positive

to ground) when the write-in circuit is pulsed, negative when the read-out circuit is pulsed. If the output pulse is negative and if it has sufficient amplitude, it operates the sensing circuit of the system so the trip solenoid of the mechanism will be energized and begin a record playing cycle.

The operating conditions in the Memory System are such that the change of magnetization state of a toroid is very rapid. The voltage appearing across the output loop load due to this rapid change is several times greater than the voltage that is developed when no change of state occurs. This has no significance in the write-in operation, for the output pulse is positive whether or not the toroid changes state and does not affect the sensing circuit. It is important, however, in the read-out operation because the sensing circuit is designed to operate (the trip solenoid) only if the voltage developed in the loop is the result of a toroid change from the selected to the zero state.

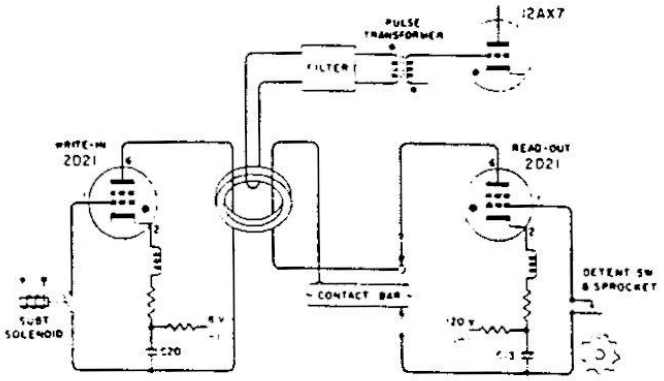


Figure 32.

Figure 32 shows the basic circuits of the Tormat Memory System in simplified form. The current pulses for write-in and read-out are supplied by discharge of capacitors through Type 2D21 thyratrons. The condenser charging current is supplied from a voltage regulated power supply in the Selection Receiver. The write-in 2D21 is fired when selection is made. It is triggered by grounding its grid through contacts operated by either of the two subtract solenoids that are in the Dual Credit Unit or by contacts of the timing relays in the Step Switch Assembly. The read-out 2D21 is fired at each magazine record space by a switch that is operated by the mechanism clutch sprocket. The output loop is connected to the 12AX7 tube in the pulse amplifier through the filter and pulse transformer previously discussed.

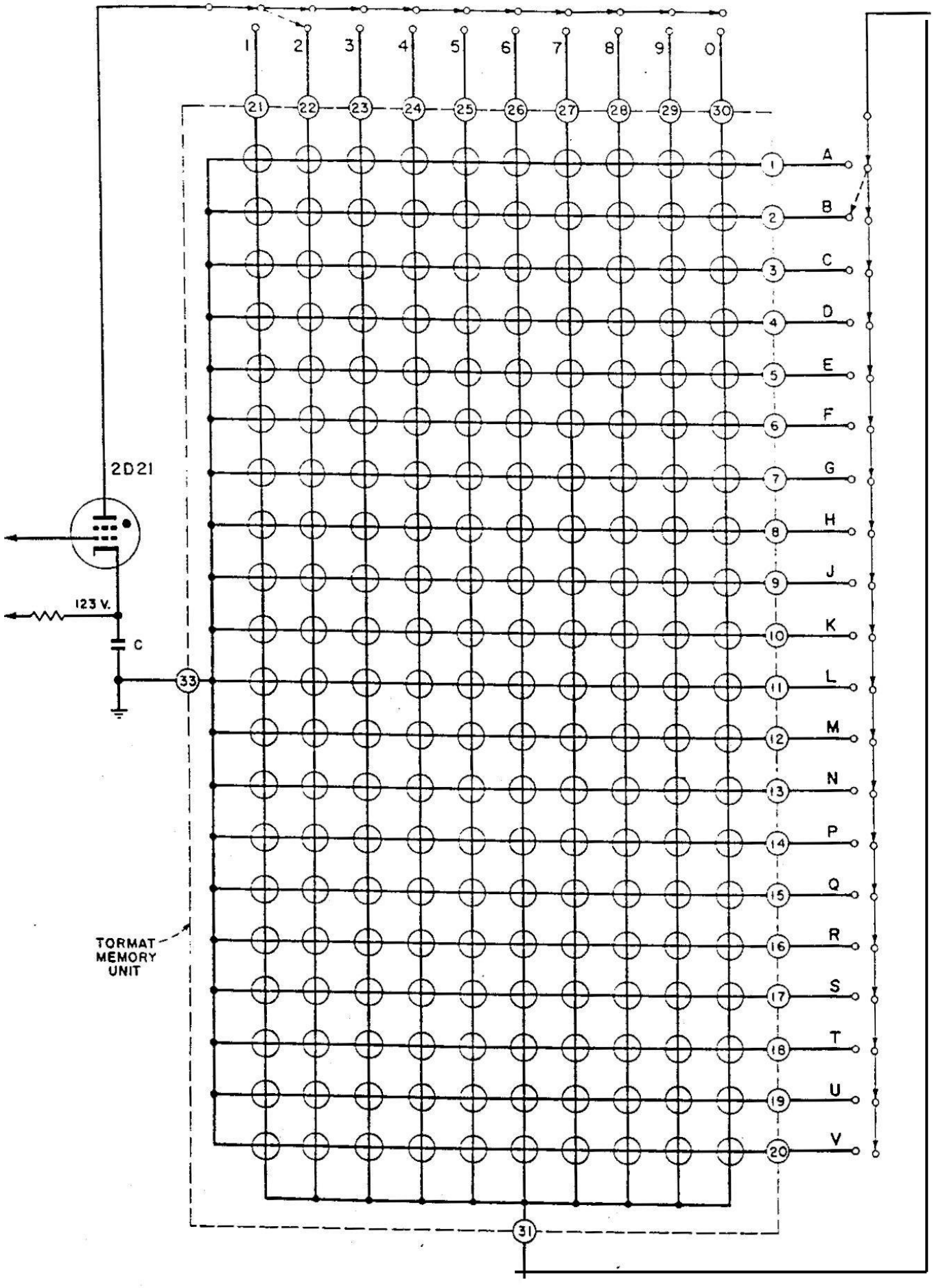
WRITE-IN CIRCUIT

The magnetic field that changes a toroid from zero to select or from select to zero must exceed a critical density or strength before it becomes effective. A field with strength less than the critical value has no significant effect. Because the field is the result of a current pulse through a circuit threaded through the toroid, no change of state occurs unless the current exceeds a critical value. This behavior, which is due to a characteristic of the material of which the toroids are made, makes it possible to arrange them in a matrix that greatly simplifies the write-in circuits and write-in switching. Instead of two hundred write-in circuits and switches there are thirty.

The diagram, *Figure 33*, shows the 10-by-20 (=200) matrix, the thirty circuits and the switches associated with the write-in operation. The circuits are identified with letters and numbers that correspond to those used for the Tormat Memory Unit circuits. 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.) The matrix circuits and switches are shown associated with the write-in 2D21 tube.

Any toroid in the matrix can be set to the select state by using the two write-in circuits that intersect at the chosen toroid and energizing them with a write-in current that is one half the value that, in a single wire, will cause the change. The circuit wires thread the toroids once only and are arranged so their half-current fields have the same polarity at the intersection toroid. The two fields, together, are strong enough to set the toroid to the selected state. The other toroids that are threaded by the circuits being used remain unchanged because the half-current fields to which they are subjected have less than the critical strength required to affect them.

The write-in "half-current" value and its duration is controlled by the capacity of the write-in condenser, the voltage to which the condenser is charged and by the resistors and other components in the circuit. The polarity of the magnetic fields at the intersection toroid is established by the internal wiring of the Memory Unit and the circuit arrangement in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33
31
TORMAT
MEMORY
UNIT

Figure 33.

reference to the Selection Receiver and Electrical Selector. These factors must be recognized in studying circuit operation and in any considerations involving service.

Figure 34 shows the write-in circuits of the electrical selector, the Memory Unit and the Selection Receiver and identifies the circuit components in reference to the phonograph assemblies. The Memory Unit is simplified by showing only nine toroids in order to more clearly indicate the circuit sequence in relation to the toroids and the connectors.

The numeral in the small circles on the dotted lines surrounding the Electrical Selector and the Memory Unit are the pin numbers of the selection receiver sockets into which these units are plugged. The sockets, J15 and J14 respectively, are identified similarly in the complete Selection Receiver diagram and on the Receiver chassis. In the Memory Unit, the common connections for the lettered circuits is through terminal 33, the common connections for the numbered circuits is 31. The lettered circuits A through V are through, respectively, pins 1 through 20 for both the Memory Unit and the electrical selector. The numbered circuits, 1 through 9 and 0, are through, respectively, 21 through 30 in both the Unit and the selector.

The timing relay and release magnet switches are part of the step switch in the Selection Receiver. They are shown, in *Figure 34* in their normal position in which the step switch is not being operated by a Wall-O-Matic. The switches isolate the electrical selector write-in circuit when remote control is being used for selection.

The OA2 voltage regulator tube holds the write-in power supply at 150 volts. The positive (+) side of this supply is grounded. The 150 volts are distributed by the voltage divider so the write-in condenser C20 is charged to 123 volts (nominal) and there is a 27-volt negative bias on the 2D21 grid. When selection is made, a write-in triggering switch in the Dual Credit Unit is closed or contacts S and P in the step switch assembly timing relays are closed so the grid is grounded through an R-C network. The write-in condenser is then discharged through the tube and the selected write-in circuits of the Tormat Memory Unit.

READ-OUT CIRCUIT

It is necessary to read-out each toroid to determine if its corresponding record side has been selected and the operation must be correlated with the record sides because the mechanism trip operation occurs at the moment of read-out of a selected toroid. This is done by the physical arrangement of the toroids and their individual read-out circuit contacts in two rows. One row is for left record sides, the other for right sides. The read-out current is applied to each toroid in turn in the appropriate row through the contacts in the contact plunger block that moves with the mechanism carriage as it scans.

Each toroid has an individual read-out circuit in the Memory Unit. It consists of a single loop of wire through the toroid. The wire is connected at one end to the contact bar that extends the length of the Unit. The other end is connected to a contact rivet. The contacts for toroids for left record sides are in a row on one side of the bar, contacts for right side toroids are in the row on the other side of the bar. This arrangement is shown in *Figure 30* and is represented in the read-out circuit diagram, *Figure 35*.

The read-out contacts are spaced, center-to-center, the same as the record spaces in the mechanism. The Memory Unit is positioned on the mechanism so the L and R contacts make connection with the read-out contacts for the toroid that corresponds to the record position the carriage is passing. For example, the circuit is through the toroid for record side A5 or B5 as the carriage is passing the A5-B5 record position.

The circuit is shown in *Figure 35*. The read-out current is supplied by discharging the read-out condenser, C13, through the 2D21 thyratron. The circuit is through the LS contacts of the reversing switch and L (and B) of the plunger block when the carriage is scanning to the right, through RS, R and B when the carriage is scanning to the left. The condenser is charged by regulated d. c. from the same 6X4 and OA2 that supplies power for the write-in operation. A voltage dividing network different from the one for write-in is used for the read-out. It proportions the 150 volts across the OA2 for 118 volts on the read-out condenser and 32 volts bias for the 2D21 grid.

The tube is fired by the detent switch, contact RO, *Figure 35*, that is on the mechanism carriage. This switch closes and grounds the 2D21 grid during the time the L and R contacts are on the individual read-out contacts. The switch is operated by the sprocket with which

SELECT-O-MATIC "200" MECHANISM

WRITE-IN CIRCUITS

WITH THYRATRON PULSE SWITCHING

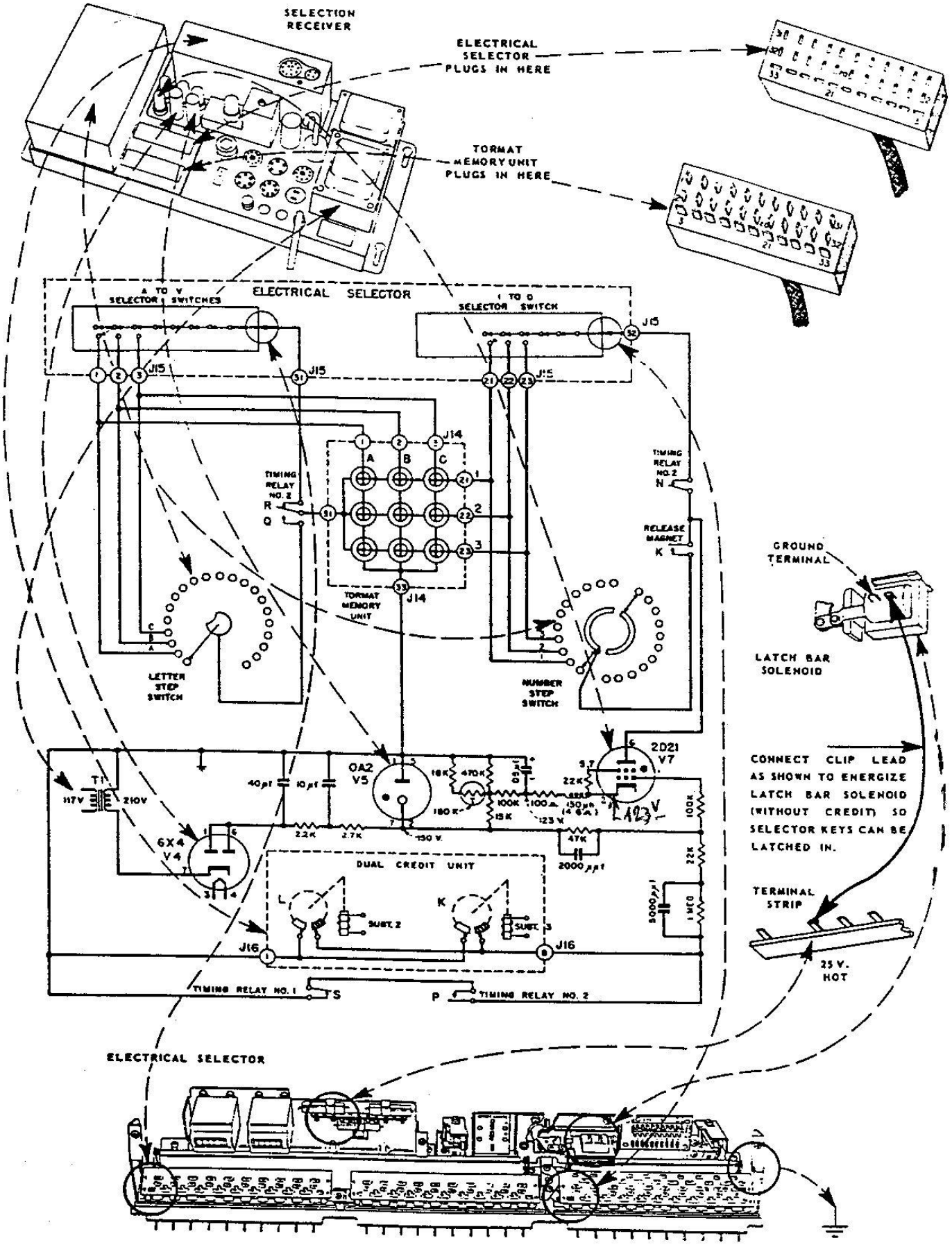


Figure 34.

the carriage is detented at a record position. There is a sprocket lobe for each record space so the read-out operation is synchronized with the carriage position and occurs at each record space as the carriage scans.

Toroids that are in the zero state are not affected by the read-out current. Those that have been selected will have their magnetization reversed. The change to zero induces a voltage in the output loop in the Memory Unit. The sensing circuit in the selection receiver responds to this output signal so the trip solenoid of the mechanism is energized. Operation of the solenoid while the carriage is scanning starts a record playing cycle and the record side played will correspond to the toroid that was in the selected state.

The amplitude and duration of the read-out current pulse is important and is established by the capacity of the read-out condenser, C13, the voltage to which the condenser is charged and the other parts constituting the circuit. As with the write-in circuit, these factors and the direction of current flow in the circuit must be recognized when studying circuit operation and when there is any problem of service due to abnormal conditions.

The bias shift toward zero that fires the 2D21 tube is caused by closing the RO contacts and occurs because an appreciable time interval is required to charge the condensers in the grid network. As these condensers charge, the grid-to-cathode voltage becomes negative and, because the tube plate current dropped to zero when the read-out condenser discharged, the grid again takes control to keep the tube blocked. The read-out condenser recharges but the plate current will remain cut-off until the RO contacts open and again close and the interval they are open must be long enough to permit the grid circuit condensers to discharge through the resistors across which they are connected. Because the contacts do not open until after the carriage scans from a playing position, there will be no read-out operation until the carriage has moved to the next record space (at which point the RO contacts are again closed). This control of bias and read-out pulse permits a record to be reselected anytime after the carriage has been stopped by a read-out operation but the record will not be repeated until after the carriage has scanned and can play other selections that may have been made.

Figure 35 shows the phonograph service switch associated with the read-out circuit. In the normal, motor-on position of the switch it has no function. In the motor-off or scan positions it discharges the read-out condenser C13 so that, while scanning the carriage with the switch or by manual operation of the motor, the trip solenoid will not be operated and selected toroids will not be reset to zero. The condenser C1 is for suppression of transients picked up by the read-out circuit wires in the cable to the service switch. This condenser has no appreciable effect on the read-out current for it represents less than three per cent of the total read-out capacitance and because the read-out peak current is determined by the voltage to which the condenser is charged rather than the condenser capacity.

SENSING AND TRIP CIRCUITS

The sensing and trip circuits are shown in *Figure 36*. The diagram has been simplified by representing the Memory Unit with only nine toroids and with an output loop threading once only through each toroid. In the true Memory Unit the loop is threaded three times through all of the two hundred toroids. It connects to the pulse amplifier in the selection receiver through a shielded pair of conductors that are in the cable connecting to the Unit. Connection is made to the amplifier with a plug.

The pulse amplifier is plug-in for convenience in design and manufacture. It is held in position by its plug and a tie-down screw. In it are a low pass filter, a pulse transformer and the 12AX7 amplifier tube with its associated circuit components. The filter is required to prevent relay and switching transients from reaching the amplifier grid. The transformer has a voltage step-up ratio of approximately 1 to 15. Plate supply for the 12AX7 is from the 6X4 rectifier at approximately 200 volts. This is the same rectifier-power supply that furnishes the write-in and read-out currents for the toroids.

In the normal, no-signal condition, the second section of the 12AX7 is conducting, the first section is cut off. There is approximately 14 volts negative bias on the pin-2 grid. * The output pulse (from the Memory Unit)

* A wire in the pulse amplifier connects the 12AX7 cathodes to pin 5 of the plug that connects the amplifier to the selection receiver. This connection is not shown in Figure 36 but may be traced in the full diagram of the selection receiver. It is for test purposes and checking bias voltage and is accessible at the socket (J 17) at the back of the selection receiver chassis.

SELECT-O-MATIC "200" MECHANISM
READ-OUT CIRCUITS
WITH THYRATRON PULSE SWITCHING

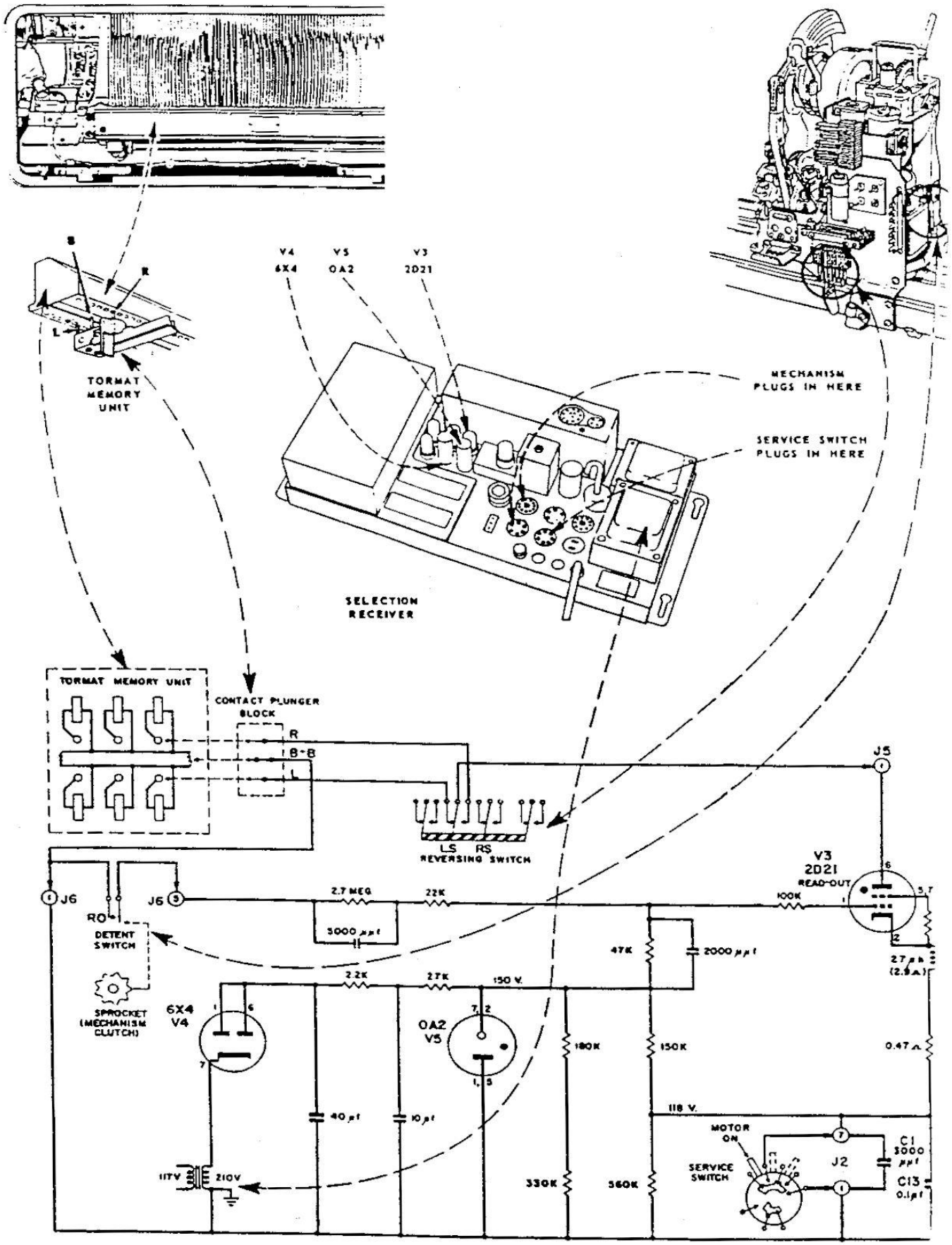


Figure 35.

that results when a selected toroid is reset to zero is negative and has a duration of about one micro-second. It is inverted and stepped up by the pulse transformer and drives the grid of the first tube section so plate current flows. As soon as the grid is driven enough to start plate current, a switching process occurs that cuts off the plate current of the second section and causes zero-bias plate current through the first section. When the switching process is finished, the coupling condenser between the plate pin 1 and grid pin 7 starts to charge and the grid voltage of the second tube moves toward a value that permits plate current to flow. When plate current starts, the tubes again switch and return to their original condition with the first section cut off. The off-on cycle of the tubes results in a positive pulse at the plate of the second section that is of approximately 80 milli-seconds duration with amplitude of 60 volts. This "stretching" of the one micro-second pulse to 80 milli-seconds is necessary to assure firing the 2D21 trip thyratron during three or more cycles of the alternating voltage of the trip solenoid circuit.

The output of the pulse amplifier is coupled to the 2D21 grid through condenser C7 but is effective in firing the tube only when the carriage is scanning and the W contacts are closed. If the W contacts are open, a pulse through C7 is dissipated in the two 2.2 megohm resistors that are shunted by the contacts.

Plate current for the trip 2D21 and operation of the trip solenoid is from the 155-volt secondary of the main transformer for the selection receiver. Bias for the 2D21 grid is obtained from the selenium rectifier and filter that supplies low-voltage d. c. for operation of relays in the step switch assembly and the Dual Credit Unit.

The rectifier shunted across the trip solenoid acts as a filter to smooth operation of the solenoid and minimize buzz. It permits current to flow through the coil during the negative half-cycles of the supply voltage and prevents high amplitude voltage peaks across the coil.

A second operation of the trip solenoid in the record playing cycle occurs when the record is to be returned to the magazine. It is initiated by removing the bias of the trip 2D21 by grounding it through contact V in the cam switch and either the trip switch, the clamp arm switch or the reject switch. Contact V isolates the trip, clamp arm and reject switches until, in normal mechanism operation, they are open or required to close to start the record-return operation. The contact closes at about the time the pickup is placed on a record that has been transferred to the playing position and reopens immediately after the start of transfer of the record to the magazine.

The trip switch is operated by the pickup arm. It controls the normal trip operation at the conclusion of record playing. It closes when the pickup has moved to the cut-off radius on the record and remains closed until the pickup arm is reset to its scan position. Unnecessarily prolonged operation of the trip solenoid is avoided by opening the circuit at contact V.

The S and P contacts of the clamp arm switch are adjusted to be open when a normal record is clamped to the turntable. If the clamping is incomplete or if no record is on the turntable, the S or P contact, respectively, will remain closed so the trip solenoid is energized when contact V closes.

The reject switch is normally in a position where it can be manually operated if, for any reason, a record in the playing position (or transferring to the playing position) is to be returned to the magazine before completion of playing and normal trip-off. There is no control over the time the reject switch is closed but the V contact opens the circuit to the trip solenoid.

DIRECT PULSE SWITCHING

The Type 2D21 thyratrons for control of the write-in and read-out current pulses are replaced by more direct switching in a later circuit development. These circuits, shown in *Figures 37 and 38*, replace the equivalent earlier circuits shown in *Figures 34 and 35*, however, the amplitude and shape of the pulses to the Memory Unit for write-in and read-out operation remain the same and the principle of operation is unchanged.

The write-in current pulse is supplied by the energy stored in the .068 condenser that is connected, through a 120K resistor, across the two OA2 voltage regulator tubes shown in *Figure 37*. The condenser is charged to 300 volts by the drop across these two regulator tubes.

When a selection is made, a write-in switch in the Dual Credit Unit (contacts K and L) or the series switches in the Step Switch (contacts S and P on the timing relays) is momentarily closed. The .068 condenser then discharges

SELECT-O-MATIC "200" MECHANISM

TRIP AND SENSING CIRCUITS

ASSOCIATED WITH THYRATRON PULSE SWITCHING CIRCUITS

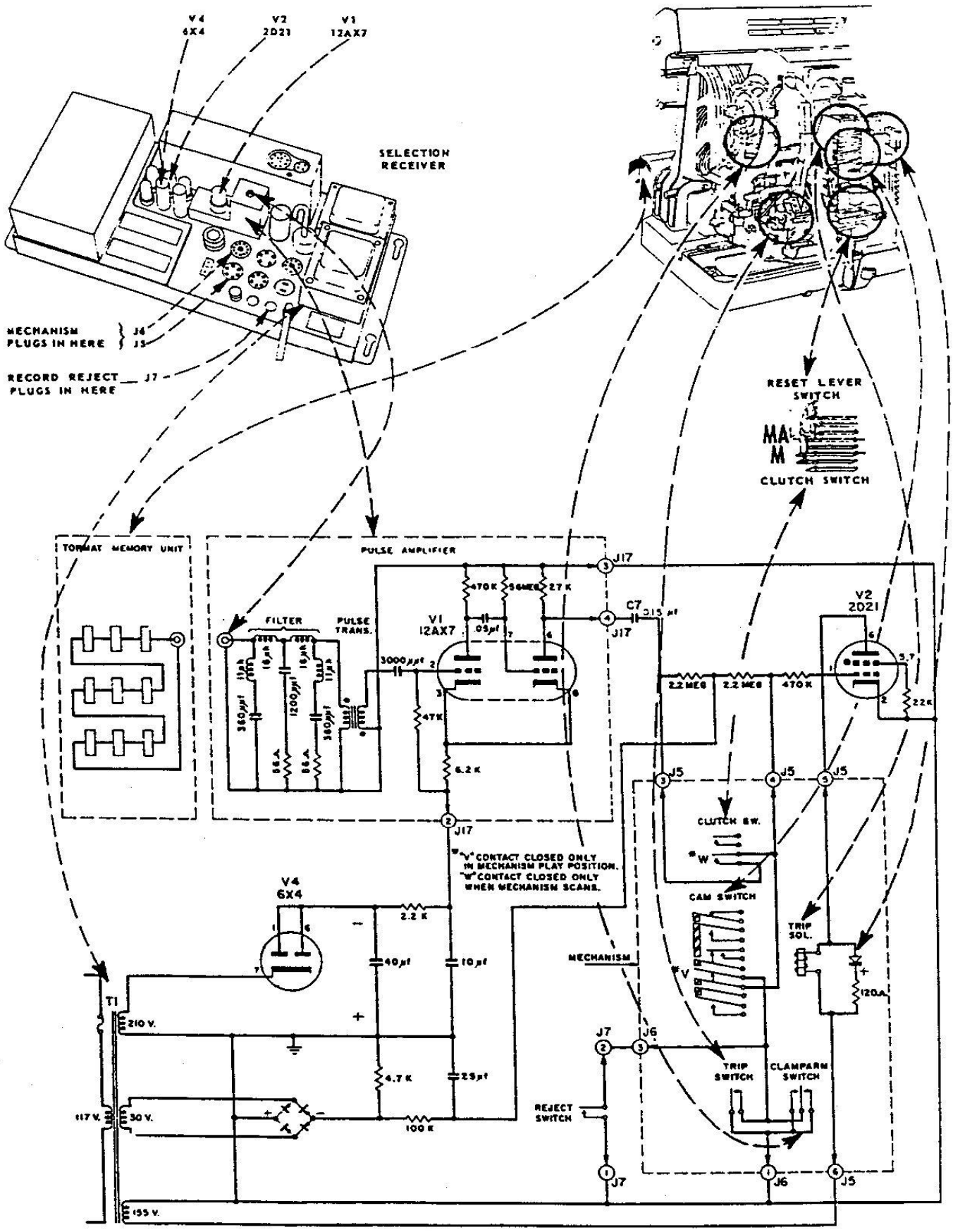


Figure 36.

through the chokes and resistors and the write-in circuits of the Memory Unit that have been connected by the selection switches in the Electrical Selector or by the Step Switches.

The amplitude of the write-in pulse is limited to the required "half-current" value by the chokes and resistors and by the clipping action of the 1N368 diode and the reference voltage applied to the 10 mfd condenser that is connected to ground across the OA2 tube V5. The 10 mfd condenser is charged to approximately 147 volts. When the write-in pulse voltage rises to this value, current flows through the diode from the condenser and prevents further increase in pulse amplitude. The circuit design is such that there is no variation in write-in pulse peak amplitude due to transient switching sputter or voltage supply variations at any line voltage at which the OA2 regulator tubes are functioning.

The 4.7K resistors shown connected to ground from contacts N and R of the timing relays are for transient pulse suppression. They prevent accumulation of electrical charges on the external write-in circuit wiring due to reverse resistance leakage of the diode.

R32 is a temperature compensating resistor having a positive coefficient. Its resistance is approximately 190 ohms at 93° F. The resistor is inductive (approximately 80 microhenrys) and its reactance as well as its resistive value is utilized in amplitude control of the write-in pulse.

The 130 and 27 microhenry chokes, the 47-ohm resistors, the .01 condenser and R32 are for pulse amplitude and shaping control.

The 1.0 ohm resistor is in the circuit for test purposes in manufacture but is otherwise non-functional due to its relatively small value.

The terminals marked A, E and D are service test points on a terminal strip on the Selection Receiver. The 22K resistor and terminal F are also for service tests and have no function in normal circuit operation.

The read-out current pulse is supplied from the .15 mfd condenser that is connected through the 100K resistor across the 300-volt regulated supply. (The OA2 tubes, 6X4 rectifier, transformer and filter are common to both write-in and read-out circuits. They are repeated in the diagrams only for completeness of circuit presentation). The condenser discharges through the read-out circuit of the Memory Unit when the Detent Switch, contact RO, closes. The pulse peak amplitude and shape are controlled by the values of the circuit components and the charge in the .15 mfd condenser. The read-out pulses are independent of supply voltage variations and will be consistently uniform in peak amplitude and shape at any supply line voltage at which the OA2 regulator tubes are functioning.

The 1.0 ohm series resistor has the same purpose in the read-out circuit that is served by the 1.0 ohm resistor in the write-in circuit. It is for manufacturing test purposes and is not functional in normal operation due to its small size in relation to the other components in the circuit.

The segment on the service switch disables the read-out circuit by shorting the .15 mfd condenser when the mechanism carriage is being scanned by operation of the switch. The trip solenoid, then, is not operated by selections that may be set up in the Memory Unit and any selected toroids will not be reset to the zero state.

The 3000 mmf condenser shown connected to the service switch and in parallel with the 0.15 mfd condenser is for suppression of transient pulses picked up by the circuit wires in the cable to the service switch. It has no appreciable effect on the read-out pulse because its capacity is quite small relative to the .15 mfd condenser.

The terminals marked G and H are service test points. Terminals A and F and the 22K resistor connecting F to ground are the same terminals shown in the write-in circuit diagram and are shown in this read-out circuit only for completeness of the diagram.

The trip and sensing circuit associated with the read-out and write-in circuits that are controlled by direct pulse switching is shown in *Figure* 39. Basically, it is the same as the circuit associated with the 2D21 tubes and shown in *Figure* 36. A type 2050 thyratron replaces the type 2D21 used in the earlier circuit. The W-contact in the mechanism clutch switch is shorted out by a connection between terminals 3 and 4 of socket J5 and the associated network of resistors in the grid circuit of the thyratron, V2, has been eliminated.

The terminals marked A, B and C are service test points. Test point A is the same one referred to in the discussion of the write-in and read-out circuits and is repeated here for the sake of completeness of diagram. Test point B gives convenient access to the grid circuit of the 2050 for testing by grounding. Test point C is for connection to a network that provides a test "pulse" that simulates the output pulse from the Memory Unit when a selected core is read out. The operation of the trip circuit can be checked with the pulse by momentarily connecting C to the input of the pulse amplifier. The characteristics of the simulated pulse are independent of line voltage within limits of any value at which the OA2 regulator tubes are functioning.

The 6X4 rectifier, the OA2 regulator tubes and the other parts of the power supply shown in this diagram are the same as those shown in the write-in and read-out diagrams. They are repeated here in order to show a complete circuit.

SELECT-O-MATIC "200" MECHANISM

WRITE-IN CIRCUITS
WITH DIRECT PULSE SWITCHING

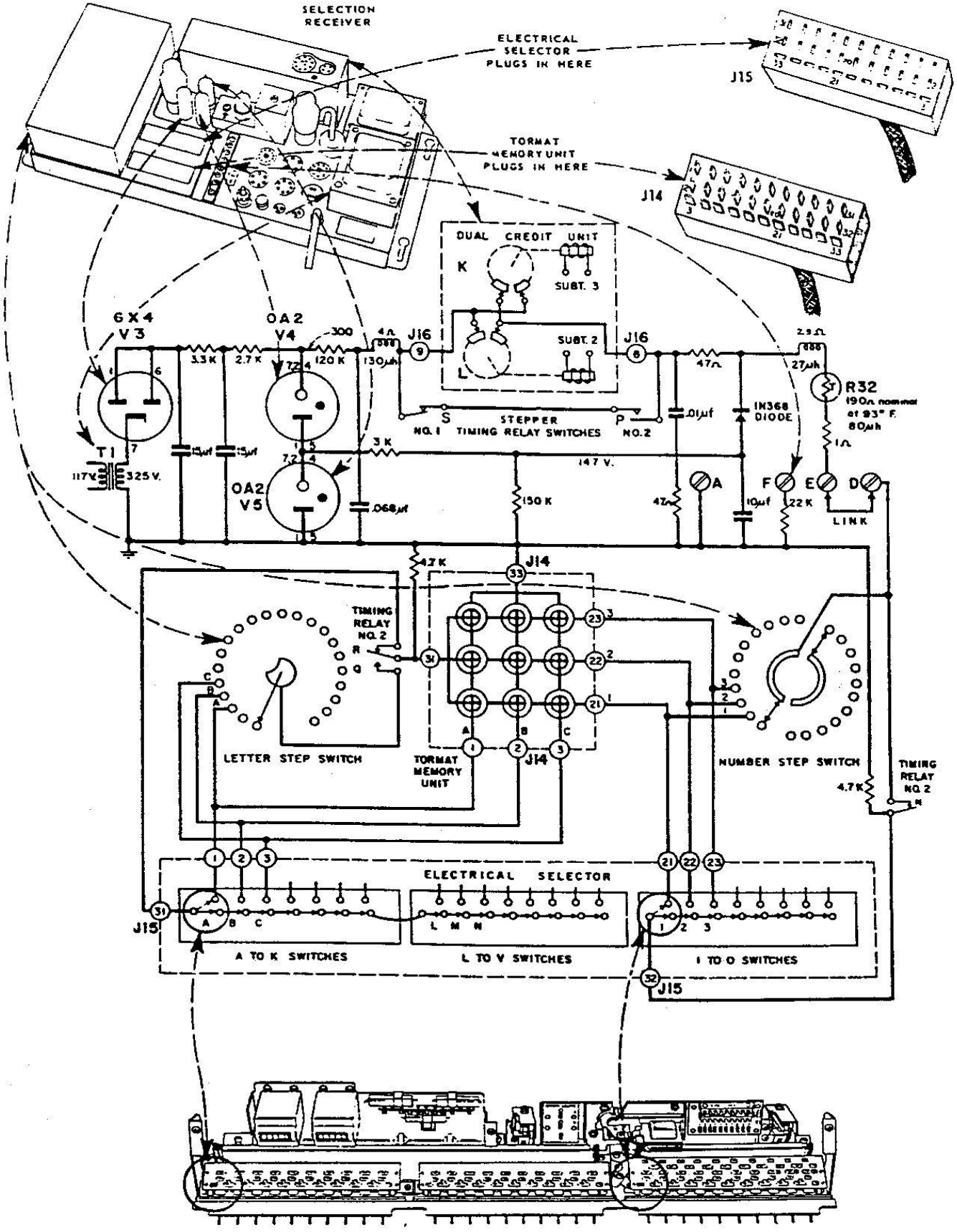


Figure 37.

SELECT-O-MATIC "200" MECHANISM

READ-OUT CIRCUITS

WITH DIRECT PULSE SWITCHING

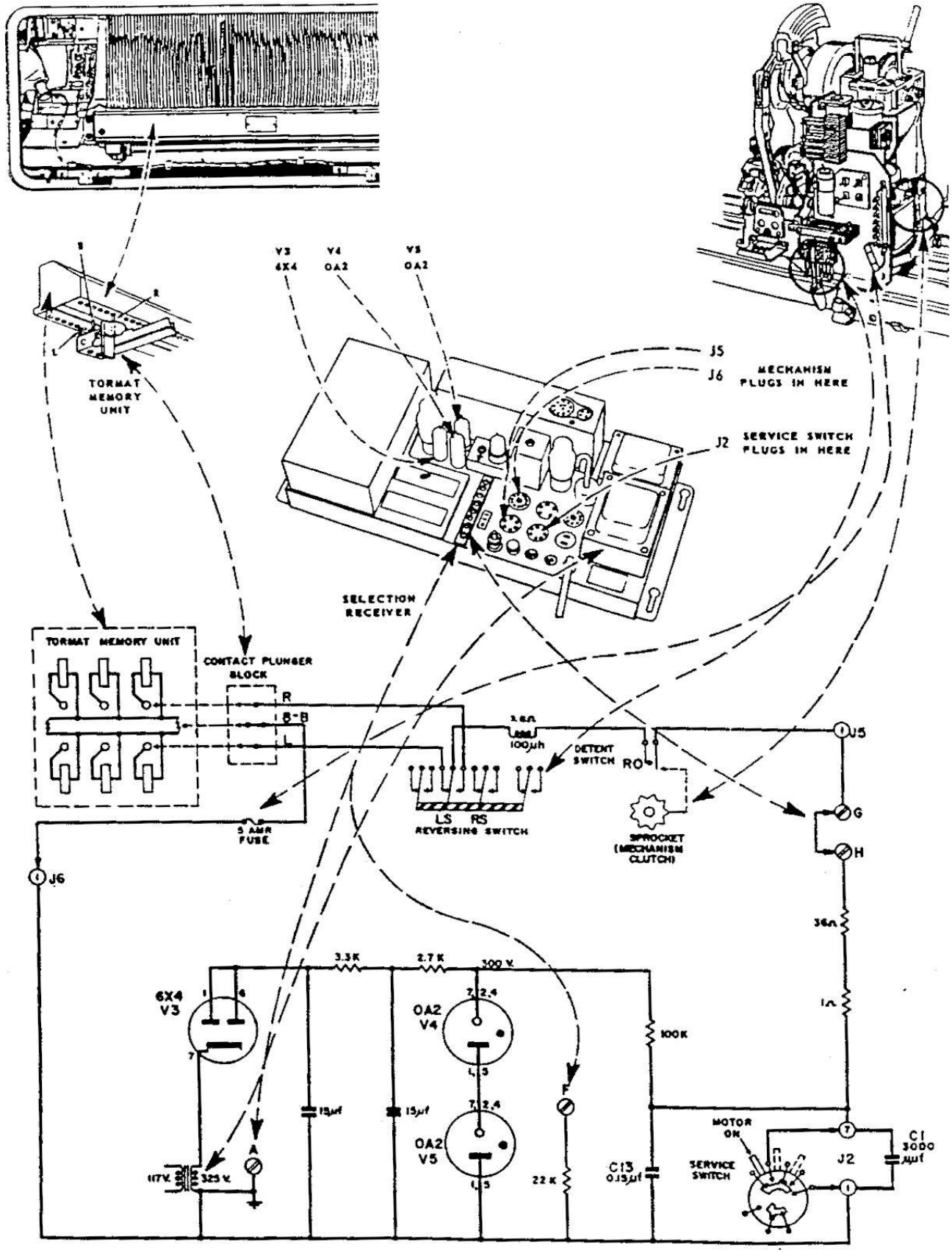


Figure 38.

SELECT-O-MATIC "200" MECHANISM

TRIP AND SENSING CIRCUITS

ASSOCIATED WITH DIRECT PULSE SWITCHING CIRCUITS

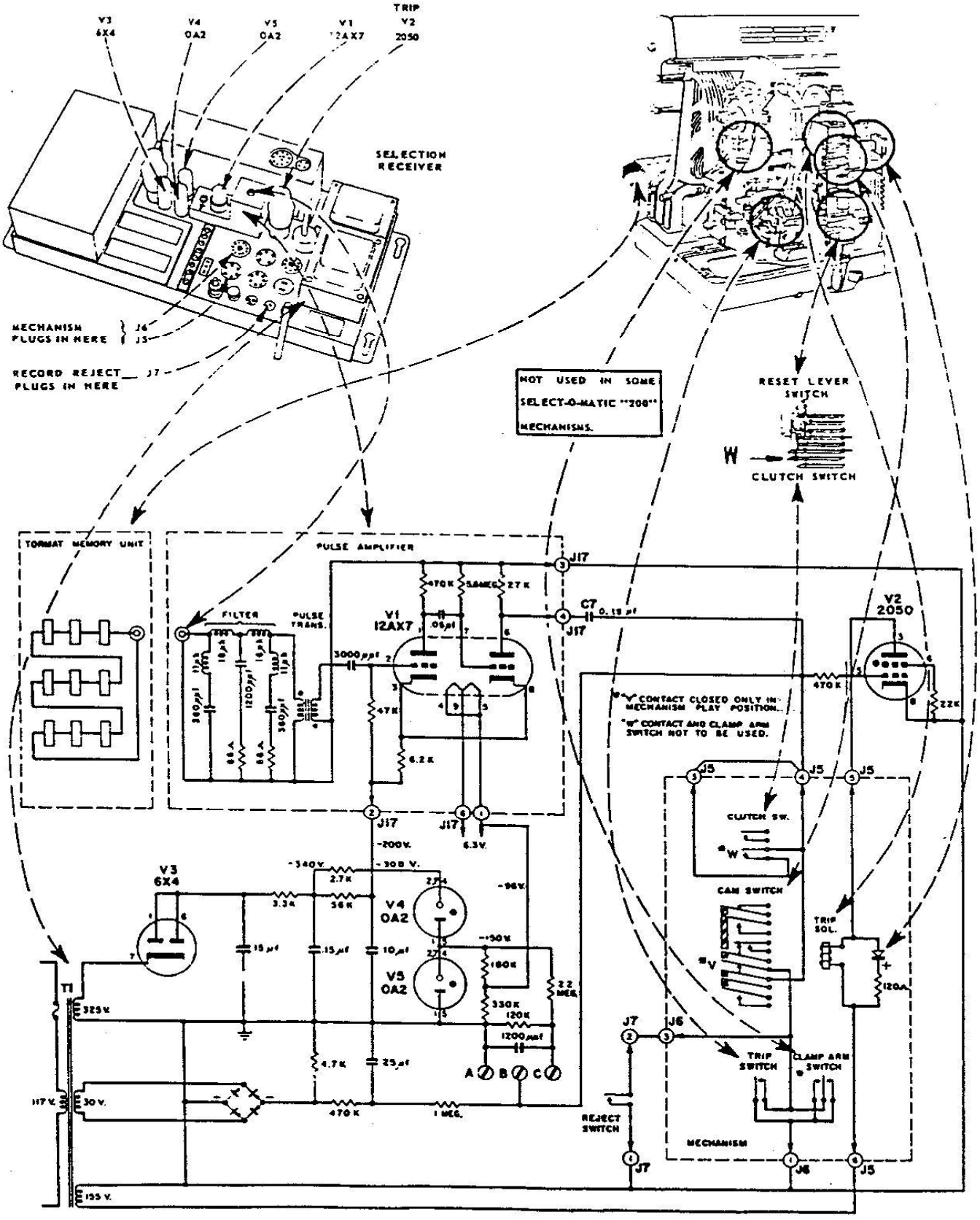


Figure 39.

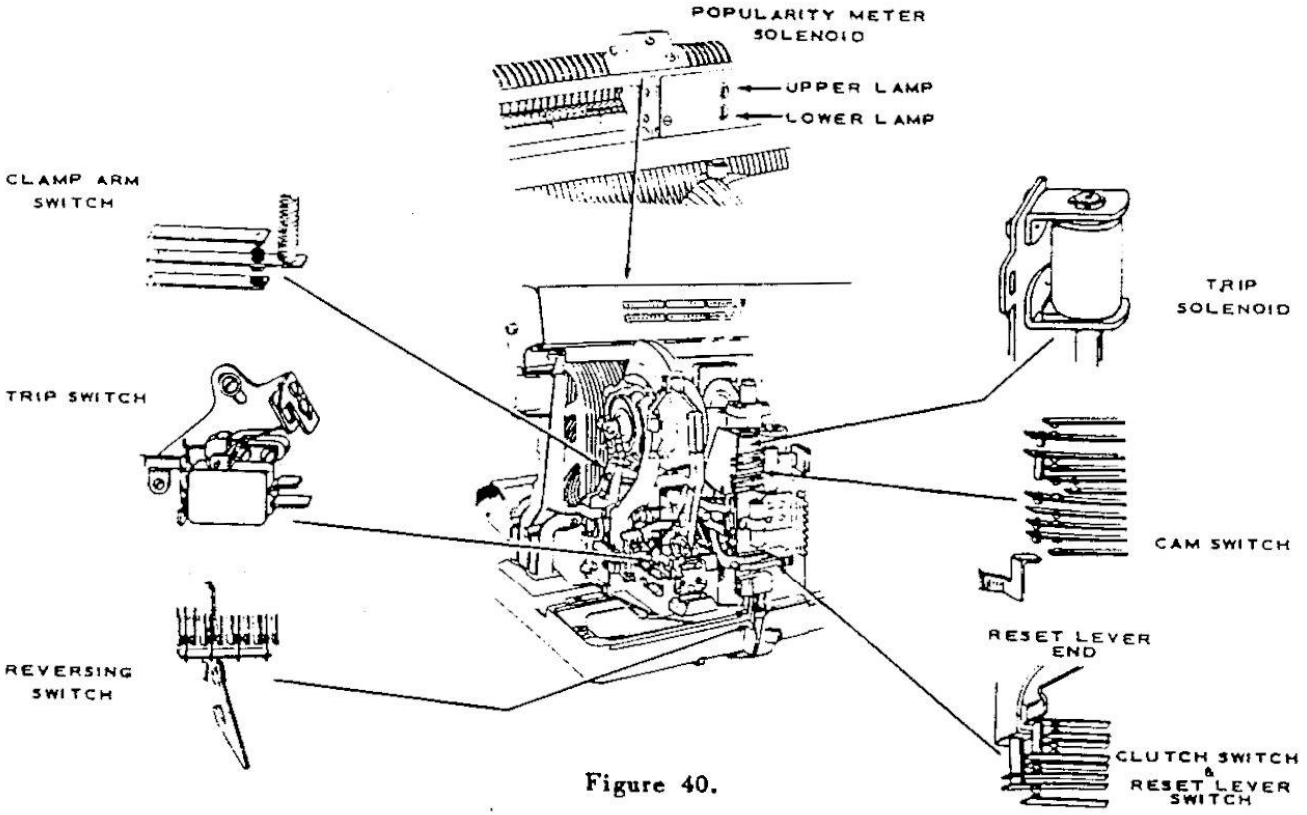


Figure 40.

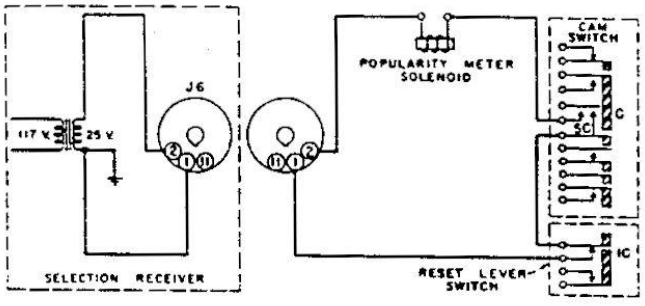


Figure 41.

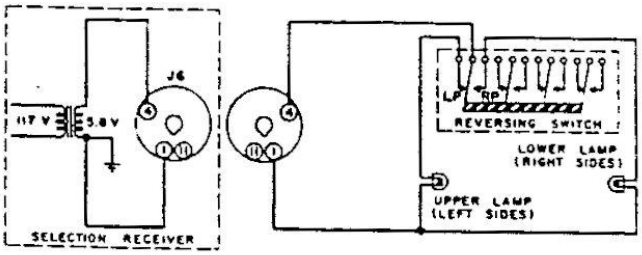


Figure 42.

SCAN CONTROL and PLAY CONTROL RELAY

The scan control functions in conjunction with the play control relay to turn on the mechanism motor and phonograph amplifier when selections are made and to turn off the power when the records have been played. It is located beneath the base casting at the right-hand end of the mechanism and consists of a pair of normally open contacts that are coupled to a solenoid through a ratchet. The contacts close when the ratchet is moved by momentarily energizing the solenoid and are again open when the carriage assembly, operating escapement pawls, resets the ratchet by scanning until it has moved, twice, to the right-hand end of the base.

The solenoid operates whenever a selection is made with the electrical selector at the phonograph or by remote control through the step-switch assembly in the selection receiver. It may also be operated from the phonograph service switch. The contacts complete a circuit that energizes the coil of the play control relay at 25 volts, A. C. The relay, when energized, turns on the 117-volt power to the motor (and phonograph amplifier.)

POPULARITY METER

The popularity meter indicates the number of times (up to forty) each record has been played. It is operated by a 25-volt solenoid with power supplied from the selection receiver. The circuit, shown in *Figure 41*, is closed if the IC

contacts in the reset lever switch are closed when the C and SC contacts in the cam switch are closed.

The C and SC contacts are make-and-break. They are closed momentarily at about the time the pickup is placed on the record in the transfer-to-play operation and again immediately after the start of transfer of the record to the magazine. They operate by force that is applied to them through the blades of the V contacts so they do not close until after the V contacts have closed. The IC contacts are operated by the reset lever and are closed when the trip mechanism is in the reset position.

The trip mechanism is released at the beginning of a record transfer operation and reset when the operation is approximately half completed. The circuit, then, is complete at the IC contacts at the time the C and SC contacts close during the transfer-to-play operation but it is open at the IC contacts when the C and SC contacts close during the transfer of the record to the magazine. There is, then, only one solenoid operation in each record playing cycle and it occurs at the time the record is brought to the playing position.

The solenoid does not operate if no record is in the magazine space at which the record transfer operation takes place or if a record fails to center correctly on the turntable. If either of these conditions prevail, the grid of the trip 2D21 thyratron will be grounded through the clamp arm switch at the time the V contact of the cam switch closes. Because the V contact closes before the popularity meter solenoid circuit can be completed at the C and SC contacts, the trip solenoid will operate so the reset lever will be released and open the IC contacts. In this sequence in which no record is played, there is no play recorded by the meter.

If the reject switch is held closed during transfer of a record to the playing position, the same conditions will prevail – the trip circuit will be completed when the V contact closes and the popularity meter will not operate.

RECORD PLAYING INDICATOR

The record playing indicator illuminates one selection number on a plastic strip to identify the record at which the carriage is detented for playing. It has two 6-volt lamps that are lighted through the LP and RP contacts of the mechanism reversing switch with power supplied from the selection receiver. The circuit is shown in *Figure 42.*

MUTING CIRCUIT

There is the possibility of objectionable noise output from the phonograph sound system arising from mechanism operation when a record is not being played. This is overcome by grounding the amplifier signal circuit except when the carriage is in the play position. In order to be assured of positive grounding during all phases of mechanism operation, three pairs of contacts on different switches are in parallel. These are the MB contacts in the cam switch, the MA contacts in the reset lever switch and the M contacts in the clutch switch. Because this circuit is in the signal path of the sound system, it is shielded and has its grounded side isolated from the mechanism to avoid hum from ground currents between units. Connection of the muting switches to the amplifier is made through a three-pin plug and socket.

SQUELCH CIRCUIT
(Automatic Volume Compensation)

The amplifier associated with this mechanism has an automatic volume compensation circuit that maintains nearly constant the average volume of sound from the phonograph regardless of the difference in "loudness" of the records played. This circuit employs a "squelch circuit" that is connected to the amplifier through the same plug and socket used for the muting circuit connections. The switch, contact MS in the cam switch, is closed only in the carriage play position. When the switch is open, the amplifier gain is reduced (squelched). When the switch closes, it grounds a point of the volume controlling circuit so the gain of the amplifier is restored to normal. These changes in amplifier gain and resultant volume changes are not abrupt; they require four to eight seconds to reach their final values.

SUMMARY—OPERATION SEQUENCE

A complete control and record playing cycle of the Select-O-Matic mechanism begins when, with the carriage at stand-by, ready to start scanning, a record is selected. It ends when the carriage scans to the stand-by position at the right-hand end of the base after playing the selected record. Between the start and finish

here is a fixed pattern of operation that is iven below. If this pattern or sequence is oupled with the operating information of the receding, it will be helpful in mechanism study nd a valuable aid in determining cause for ossible abnormal operation.

1. Selection made.
2. Scan control solenoid closes scan switch contacts.
3. Play control relay energized.
4. Motor and amplifier turn on.
5. Carriage scans.
6. Read-out pulse resets toroid of selected record.
7. Trip solenoid energized.
8. (a) Clutch shifted from engagement with sprocket.
   (b) Sprocket engaged by detent roller.
   (c) Carriage scanning ceases.
9. Clutch engages clutch worm.
10. Cam assembly rotates from scan position.
11. Safety trip plunger moves to play position.
12. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.
13. Sprocket detent is locked by detent lever.
14. Transfer arm and record start upward movement.
15. Reset of trip mechanism commences.
16. Pickup arm shifts (if it is to be shifted).
17. IC contacts close.
18. Reset of trip mechanism completed.
19. Transfer arm completes travel to play position.
20. Clamp arm centers and clamps record.
21. Pickup stylus placed on record.
22. V contact in cam switch closes.
23. C contact in cam switch closes.
24. Popularity meter operates.
25. SC contact in cam switch opens.
26. O contact in cam switch opens.
27. Pickup arm is released.
28. (a) Clutch disengages from clutch worm and moves to play position.
    (b) Sprocket detent force from clutch shifting lever is released.
    (c) Cam rotation ceases.

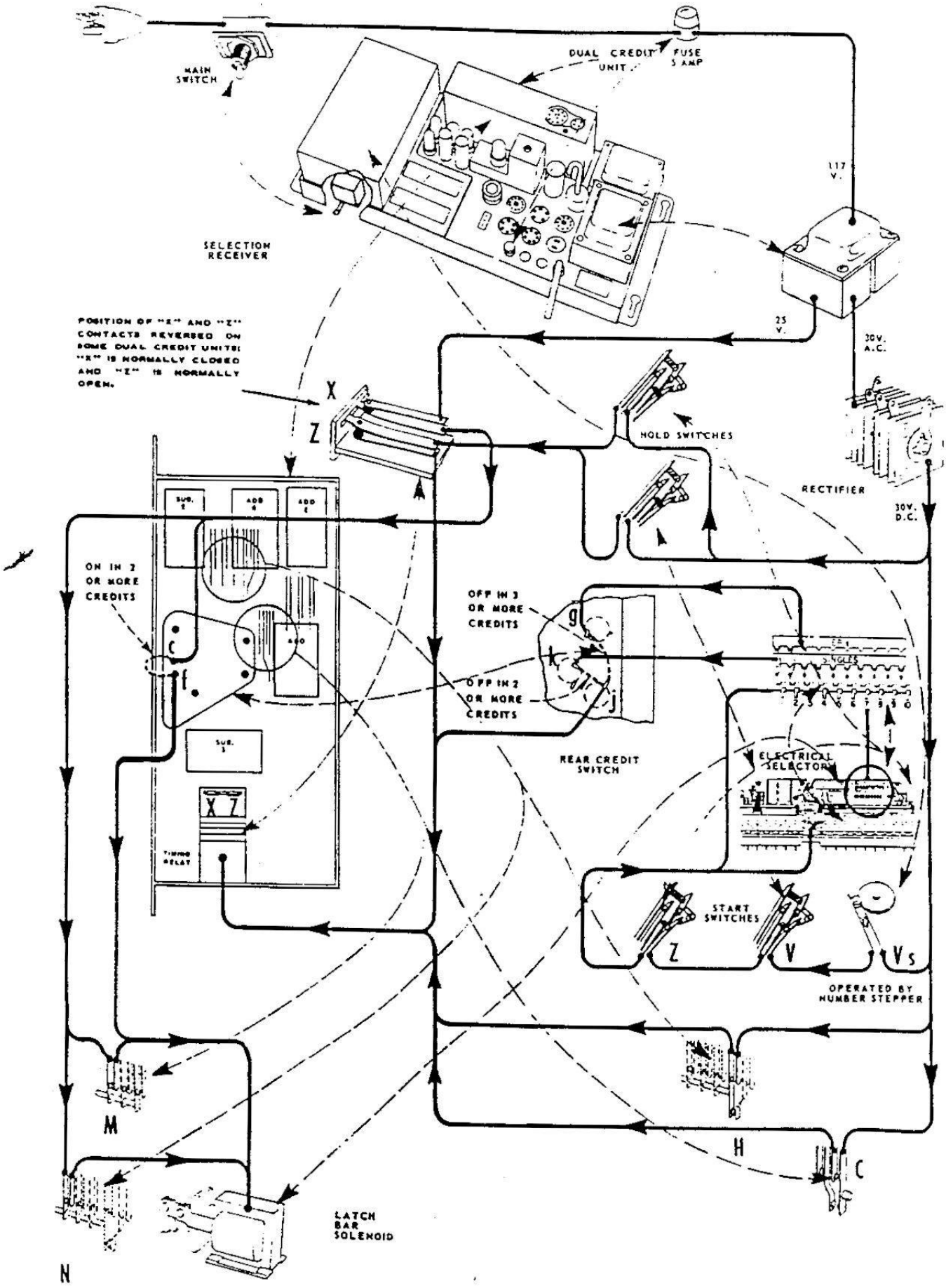
RECORD IS NOW PLAYING

29. Pickup follows record grooves to trip-off.
30. Trip switch closes.
31. Trip solenoid energized.
32. (a) Clutch shifts from play position.
    (b) Sprocket detent force applied by clutch shifting lever.
    (c) IC contact in reset lever switch opens.
33. Clutch engages clutch worm.
34. Cam assembly rotates from play position.
35. O contact in cam switch closes.
36. V contact in cam switch opens.
37. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.
38. Pickup is lifted from record.
39. Reset of trip mechanism commences.
40. Pickup arm resets to scan position.
41. Clamp arm releases record.
42. Reset of trip mechanism completed.
43. Transfer arm and record start downward travel.
44. Detent lock by detent lever is relieved.
45. Safety plunger moves to scan position.
46. Transfer arm completes travel to scan position.
47. Clutch shifting lever roller moves down into scan notch of clutch cam.
48. Clutch moves down from transfer position.
49. (a) Clutch engages sprocket.
    (b) Sprocket detent released.
    (c) Cam rotation ceases.
50. Carriage scans to next selection or, if no other selection has been made, it scans until the scan control ratchet release pawls have been operated twice (since selection was made).
51. Scan control switch opens.
52. Play control relay turns off power to motor and amplifier.
53. Carriage stops, in scan position, at right-hand end of mechanism base.

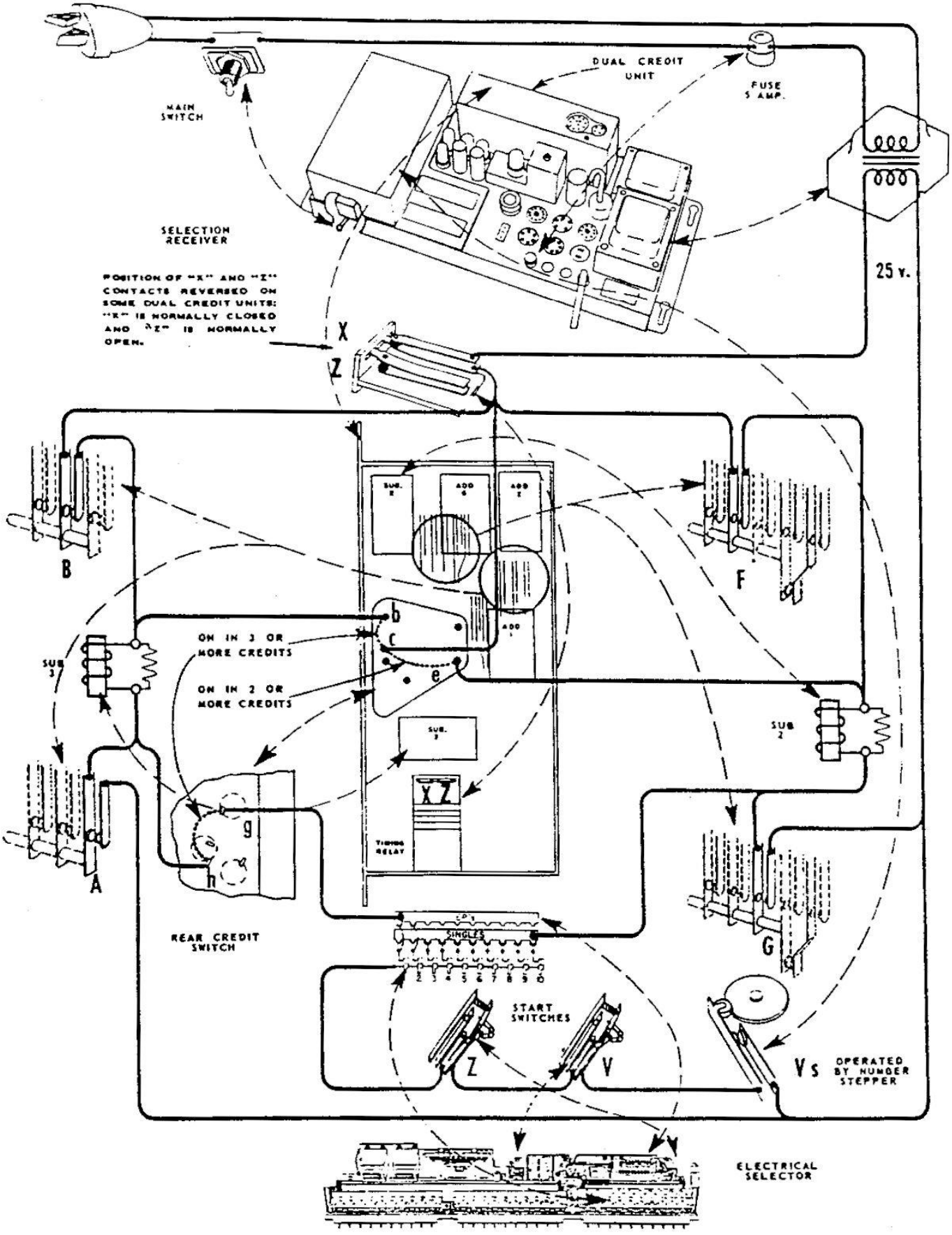
TIMING RELAY & LATCH BAR SOLENOIDS - Picture Diagram

Select-o-matic "200" – V-200

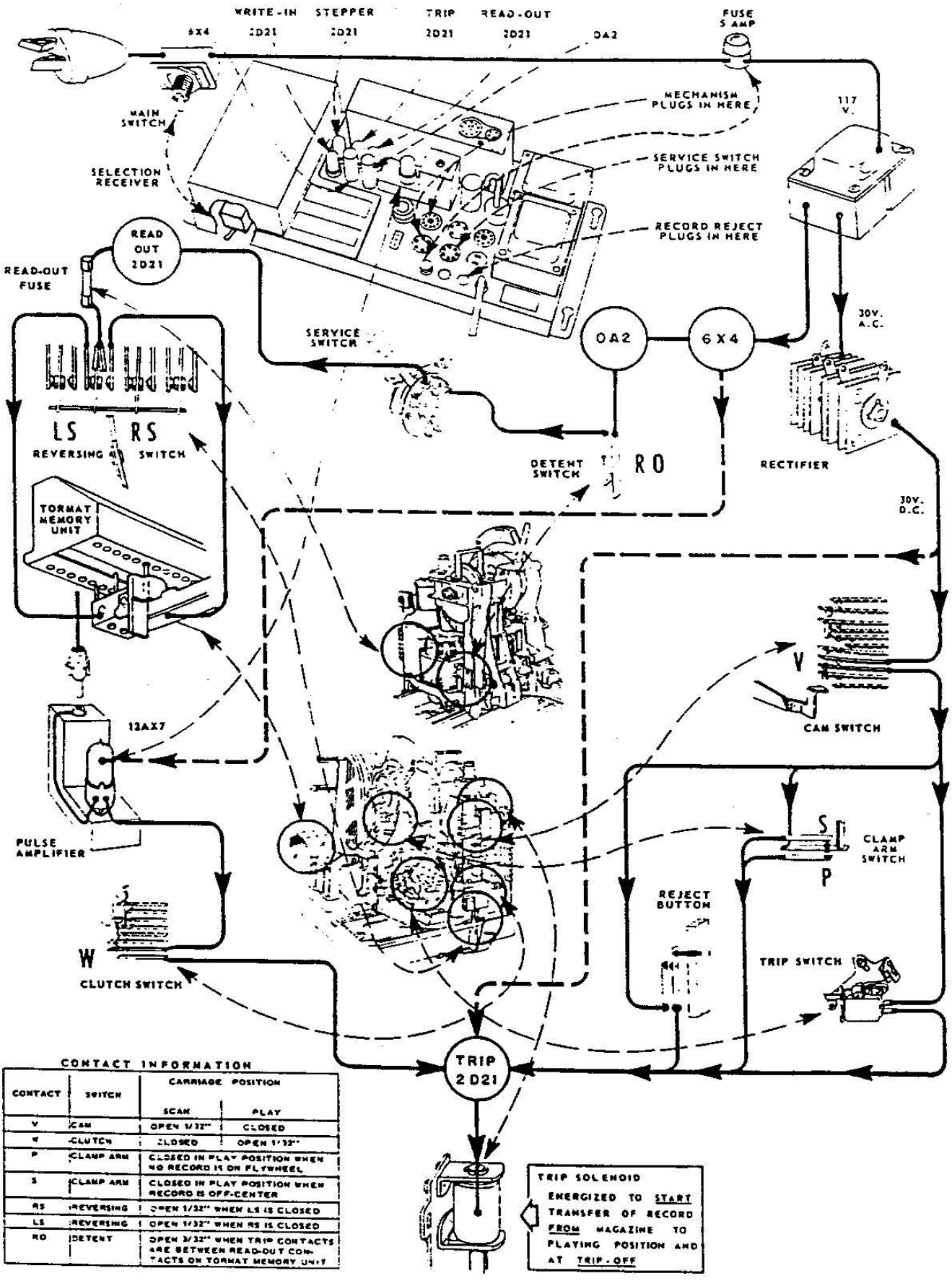
(NOT A SCHEMATIC OR WIRING DIAGRAM)



SUBTRACT SOLENOIDS - Picture Diagram
Select-o-matic "200" – V-200



TRIP SOLENOID - Picture Diagram
Select-o-matic "200" – V-200
(NOT A SCHEMATIC OR WIRING DIAGRAM)

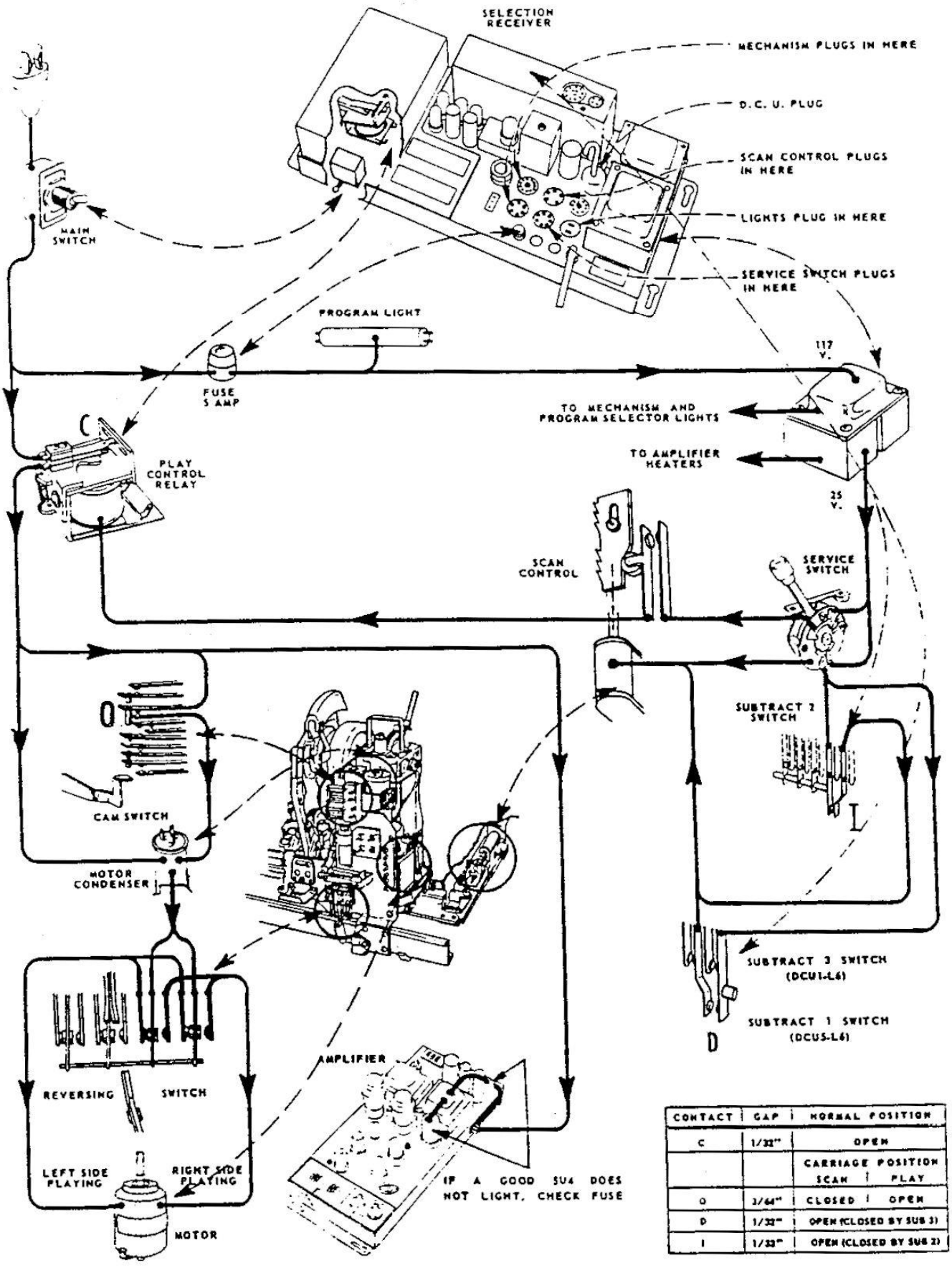


CONTACT INFORMATION

CONTACT	SWITCH	CARRIAGE POSITION	
		SCAN	PLAY
V	CAM	OPEN 1/32"	CLOSED
W	CLUTCH	CLOSED	OPEN 1/32"
P	CLAMP ARM	CLOSED IN PLAY POSITION WHEN NO RECORD IS ON FLYWHEEL	
S	CLAMP ARM	CLOSED IN PLAY POSITION WHEN RECORD IS OFF-CENTER	
RS	REVERSING	OPEN 1/32" WHEN LS IS CLOSED	
LS	REVERSING	OPEN 1/32" WHEN RS IS CLOSED	
RO	DETENT	OPEN 3/32" WHEN TRIP CONTACTS ARE BETWEEN READ-OUT CONTACTS ON FORMAT MEMORY UNIT	

TRIP SOLENOID
ENERGIZED TO START TRANSFER OF RECORD FROM MAGAZINE TO PLAYING POSITION AND AT TRIP-OFF

MOTOR & AMPLIFIER - Picture Diagram
Select-o-matic "200" – V-200
(NOT A SCHEMATIC OR WIRING DIAGRAM)

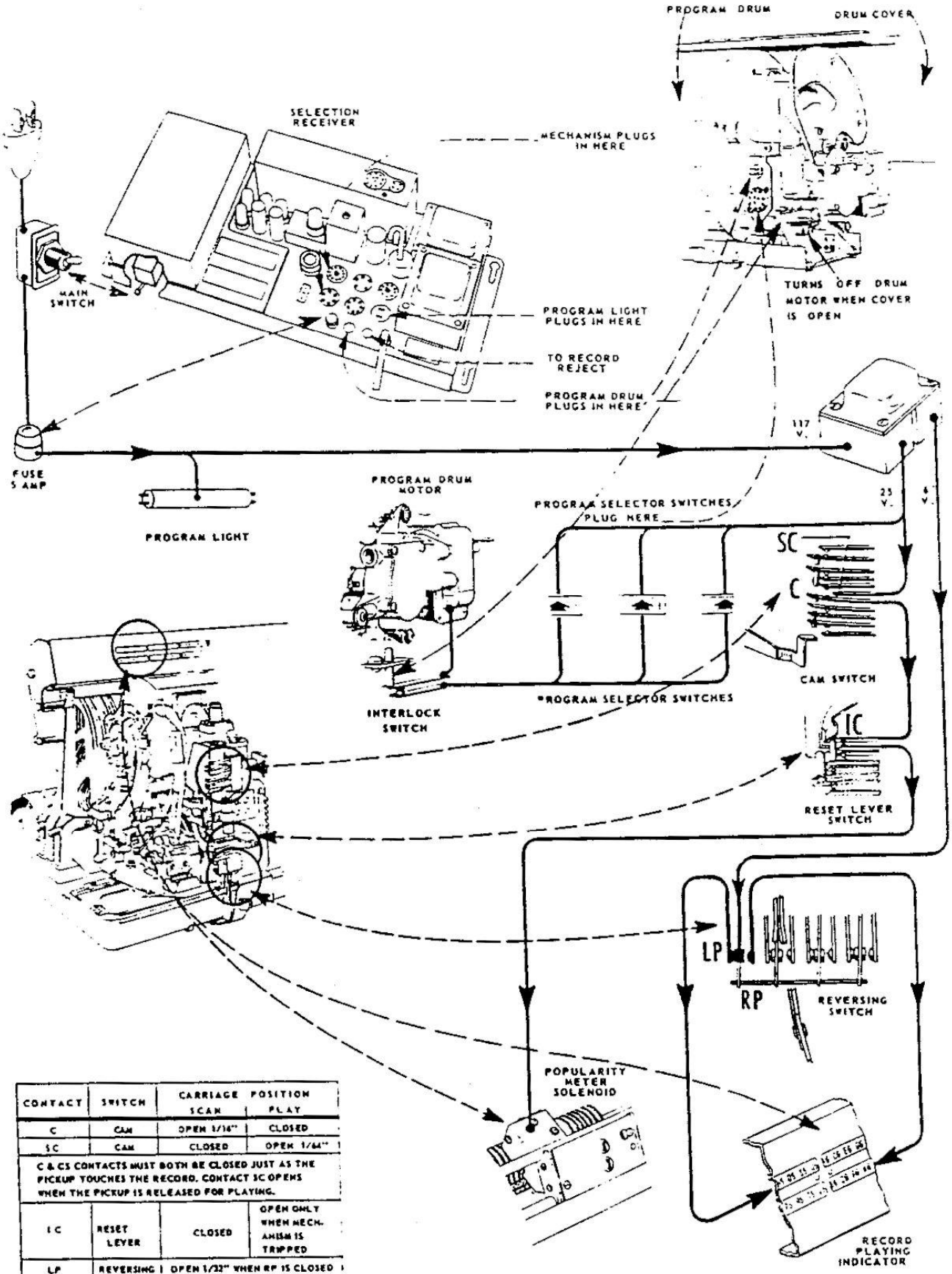


CONTACT	GAP	NORMAL POSITION
C	1/32"	OPEN
		CARRIAGE POSITION: SCAN / PLAY
O	3/64"	CLOSED / OPEN
D	1/32"	OPEN (CLOSED BY SUB 3)
I	1/32"	OPEN (CLOSED BY SUB 2)

POPULARITY METER & PROGRAM DRUM - Picture Diagram

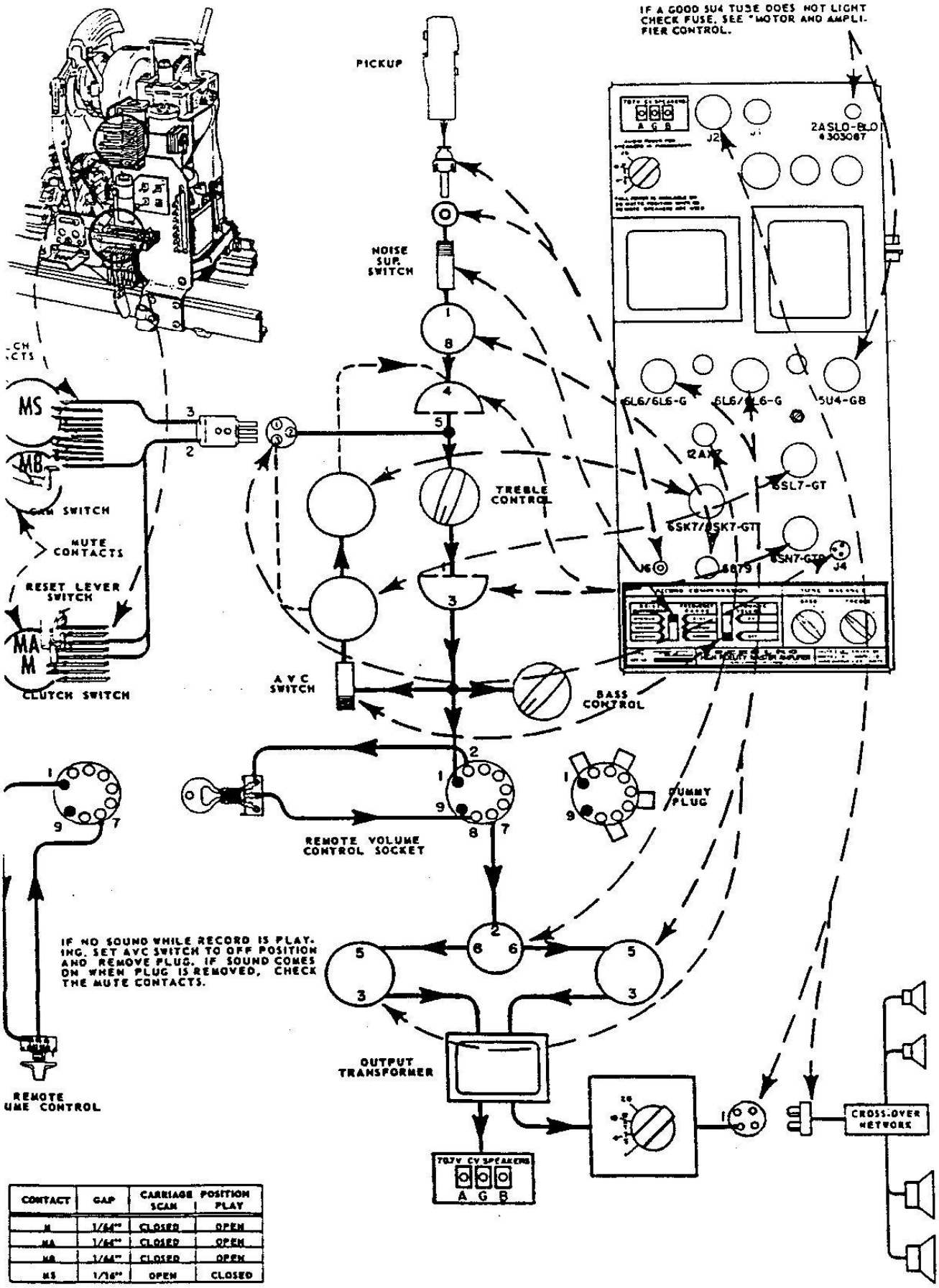
Select-o-matic "200" – V-200

(NOT A SCHEMATIC OR WIRING DIAGRAM)



CONTACT	SWITCH	CARRIAGE POSITION SCAN	PLAY
C	CAM	OPEN 1/16"	CLOSED
SC	CAM	CLOSED	OPEN 1/64"
C & CS CONTACTS MUST BOTH BE CLOSED JUST AS THE PICKUP TOUCHES THE RECORD. CONTACT SC OPENS WHEN THE PICKUP IS RELEASED FOR PLAYING.			
IC	RESET LEVER	CLOSED	OPEN ONLY WHEN MECHANISM IS TRIPPED
LP	REVERSING	OPEN 1/32" WHEN RP IS CLOSED	
RP	REVERSING	OPEN 1/32" WHEN LP IS CLOSED	

AMPLIFIER & SOUND - Picture Diagram
Select-o-matic "200" – V-200
(NOT A SCHEMATIC OR WIRING DIAGRAM)



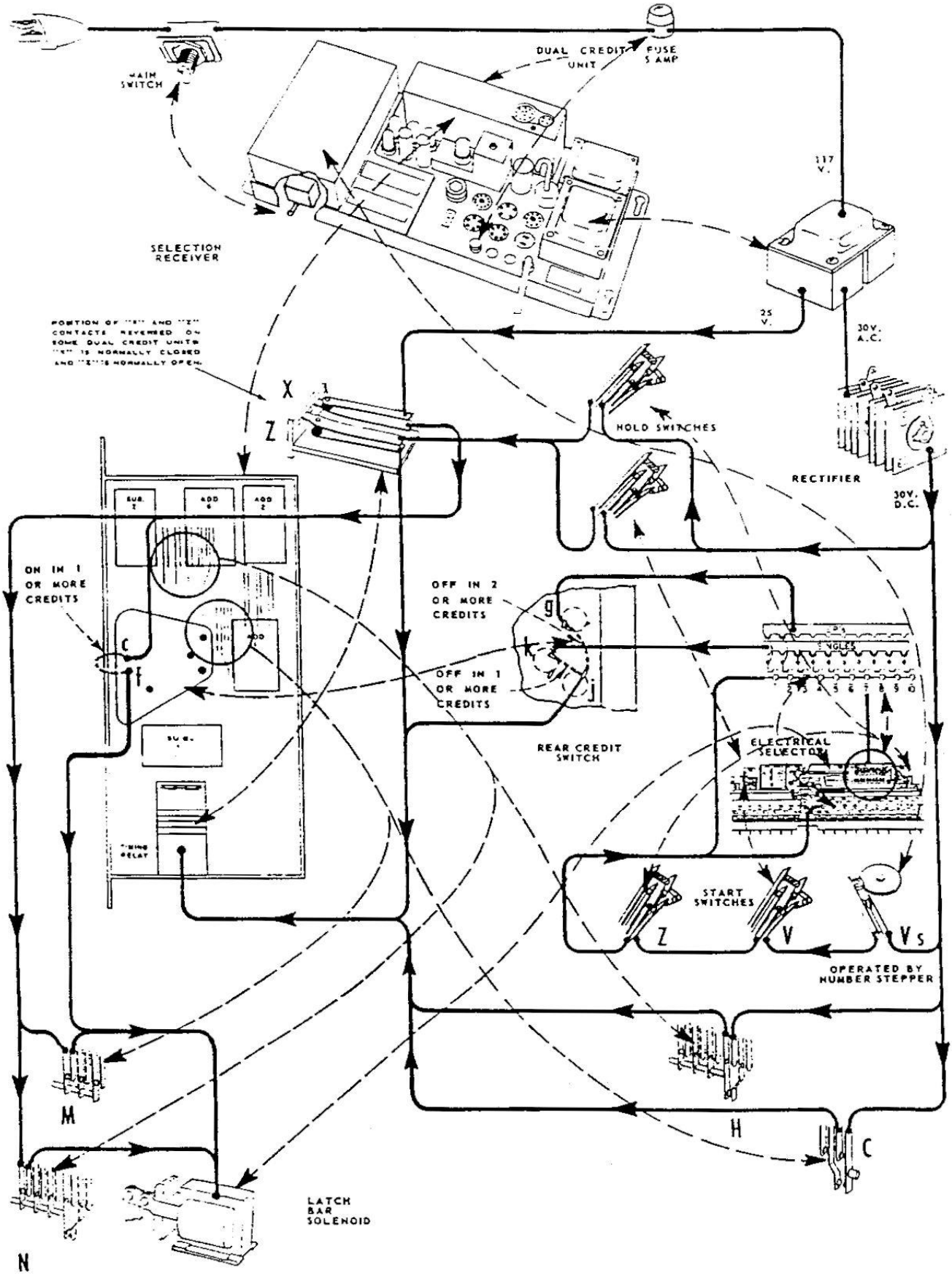
CONTACT	GAP	CARRIAGE SCAN	POSITION PLAY
M	1/64"	CLOSED	OPEN
MA	1/64"	CLOSED	OPEN
MB	1/64"	CLOSED	OPEN
MS	1/16"	OPEN	CLOSED

TIMING RELAY & LATCH BAR SOLENOIDS - Picture Diagram

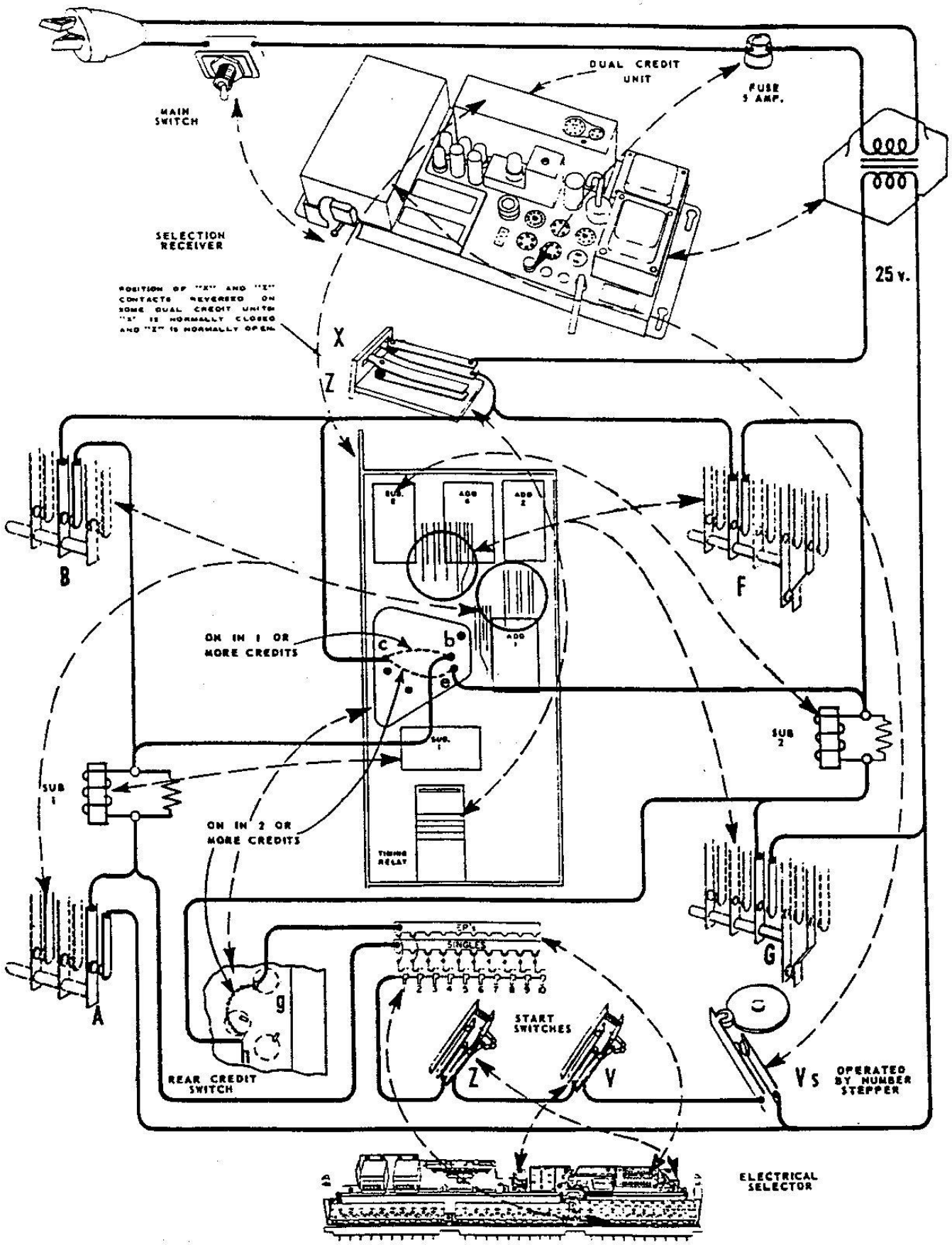
Select-o-matic "200" – V-200-N

(NOT A SCHEMATIC OR WIRING DIAGRAM)

AS USED WITH DUAL CREDIT UNIT TYPE DCU5-L6



SUBTRACT SOLENOIDS - Picture Diagram
Select-o-matic "200" – V-200-N
AS USED WITH DUAL CREDIT UNIT TYPE DCUS-L6

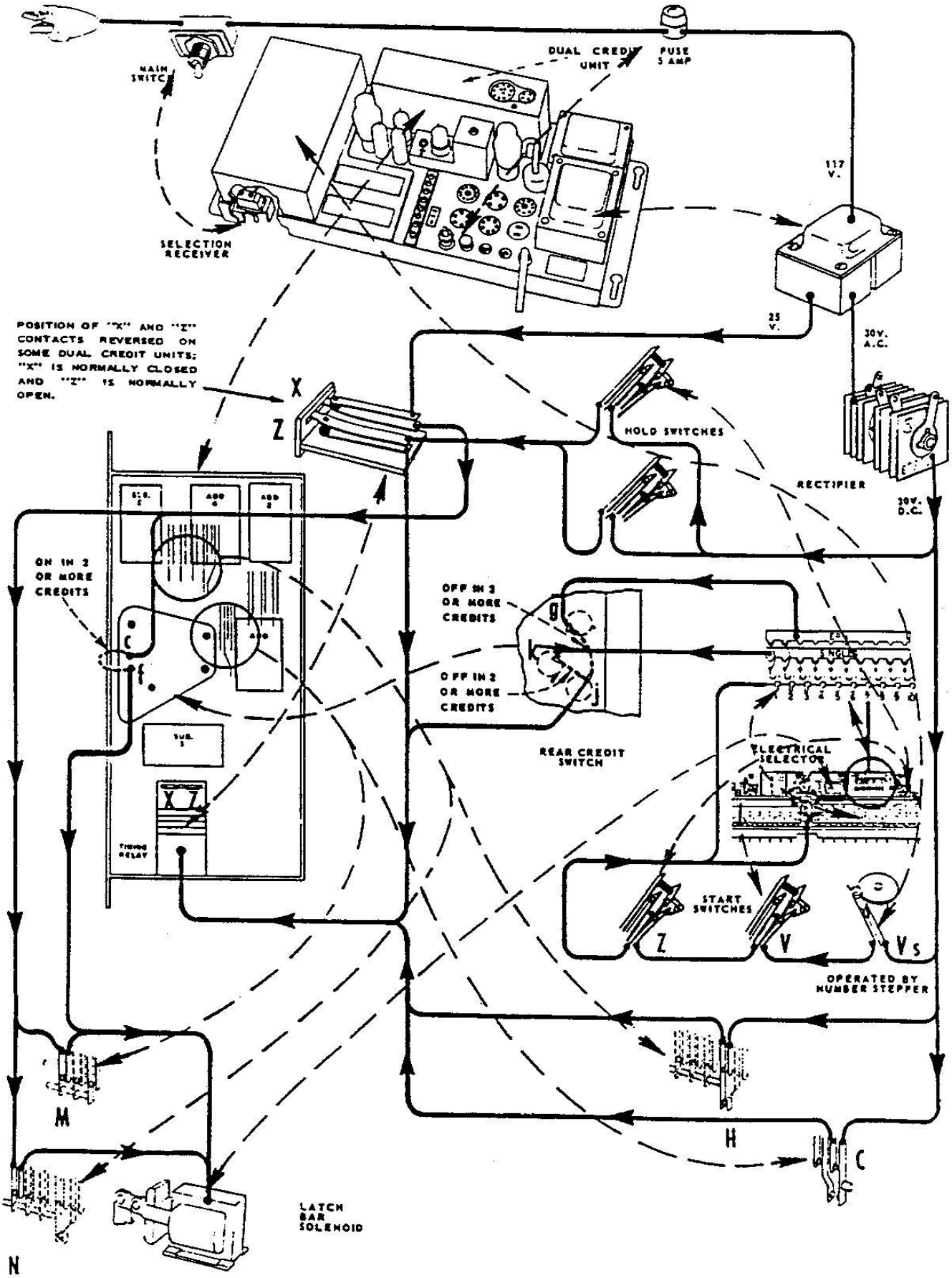


TIMING RELAY & LATCH BAR SOLENOIDS - Picture Diagram

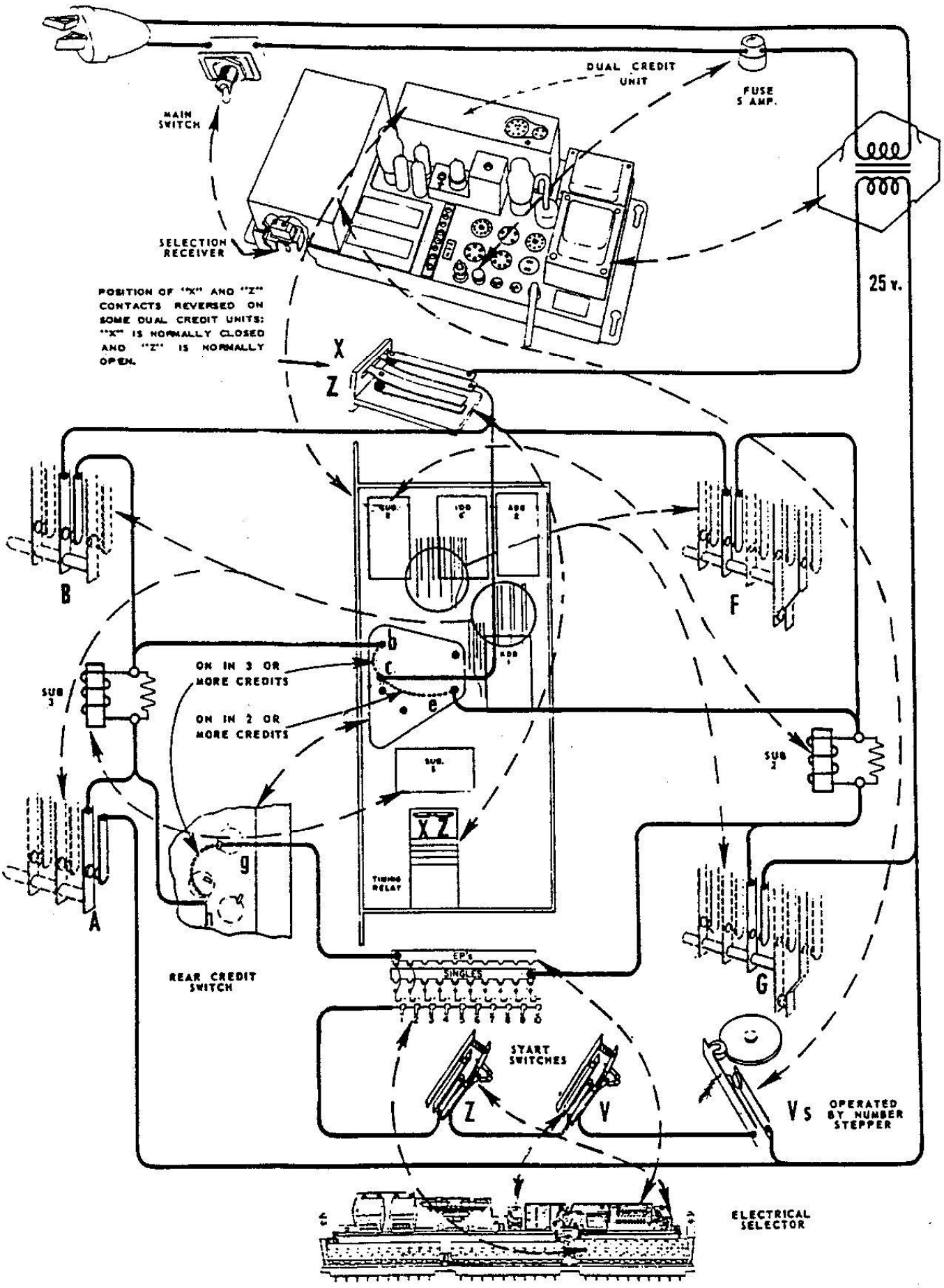
Select-o-matic "200" – VL-200-D

(NOT A SCHEMATIC OR WIRING DIAGRAM)

AS USED WITH DUAL CREDIT UNIT TYPE DCU 1L-L6



SUBTRACT SOLENOIDS - Picture Diagram
Select-o-matic "200" – VL-200-D
AS USED WITH DUAL CREDIT UNIT TYPE DCU1L-L6

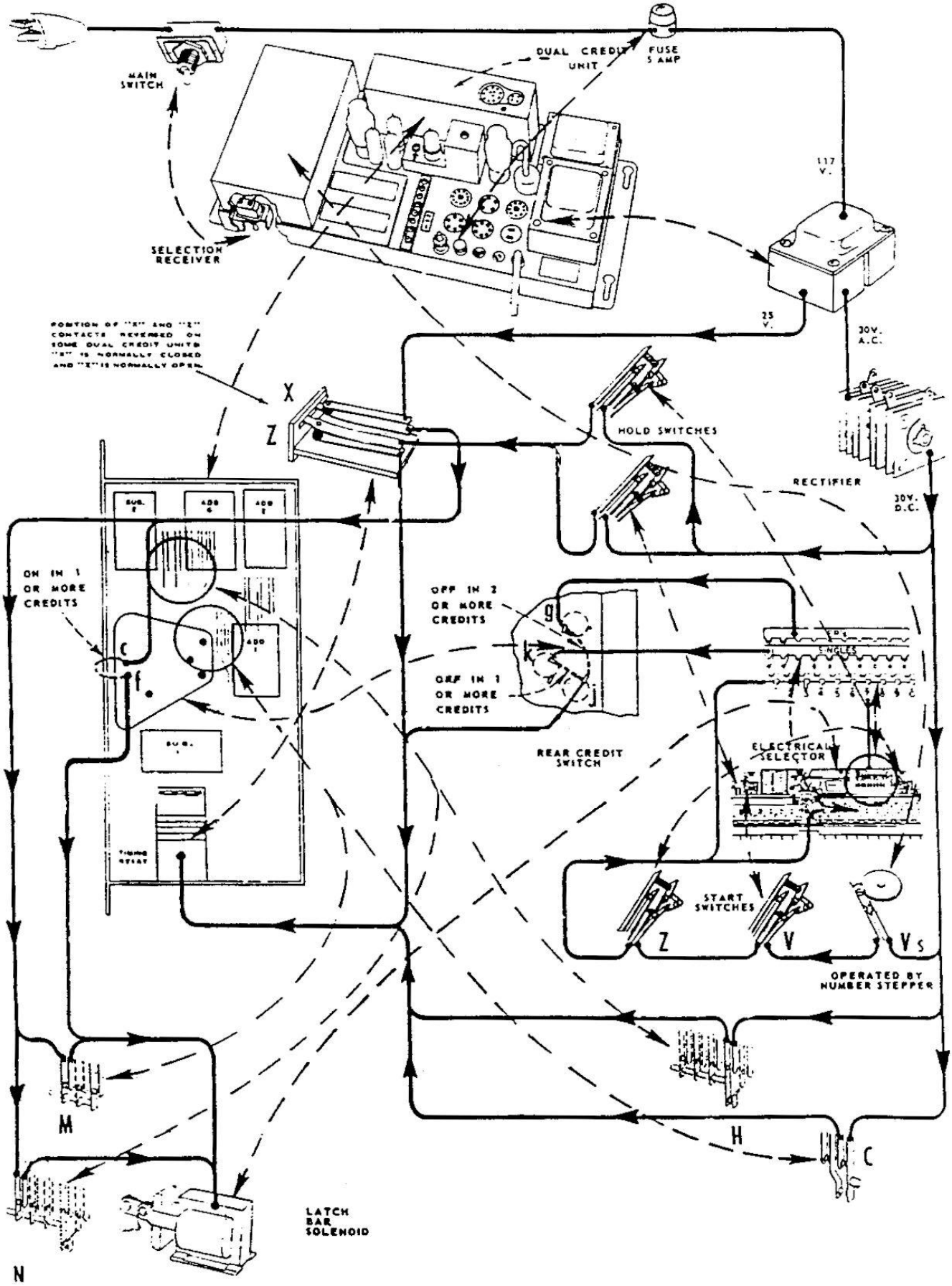


TIMING RELAY & LATCH BAR SOLENOIDS - Picture Diagram

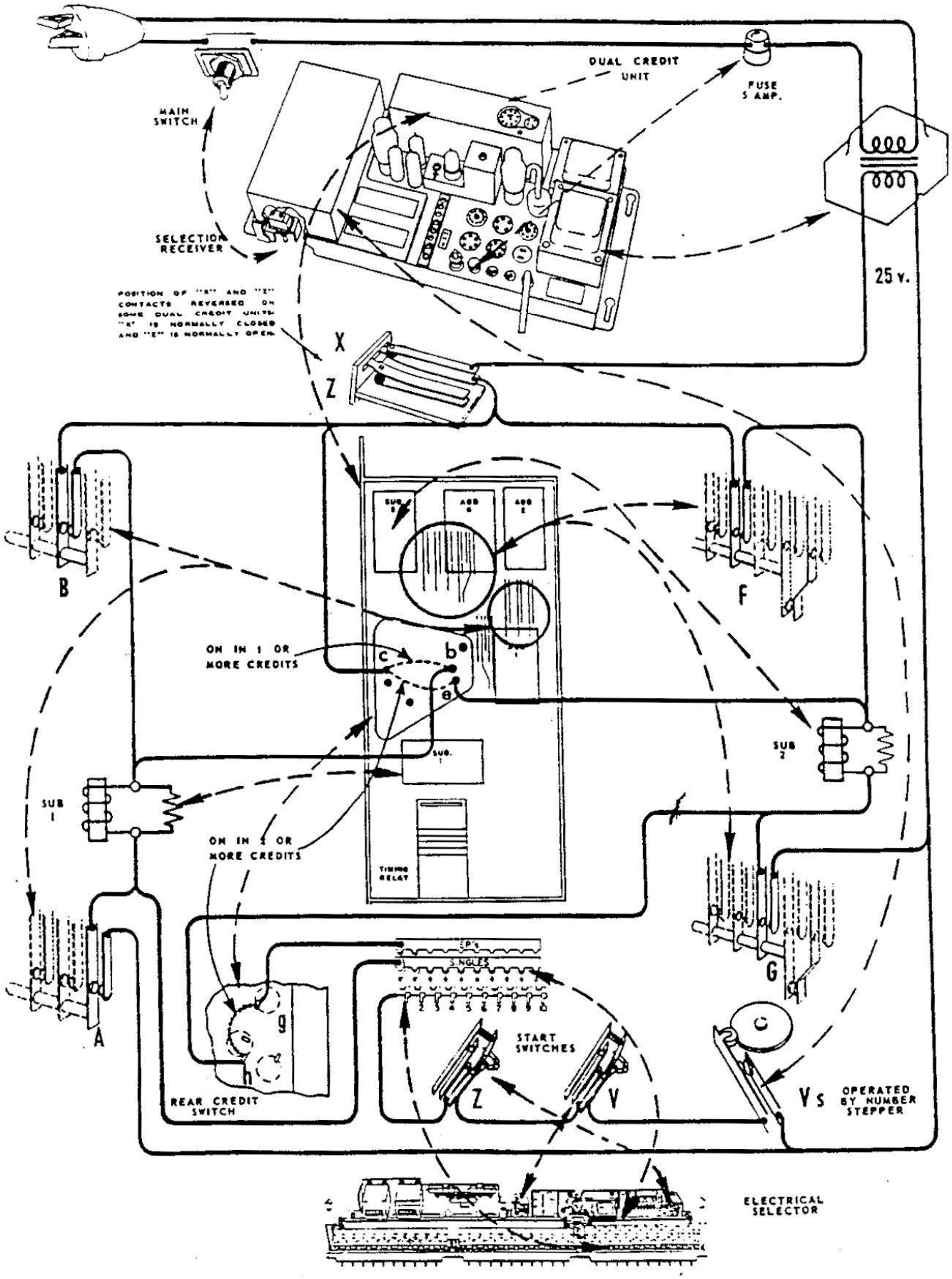
Select-o-matic "200" – VL-200-N

(NOT A SCHEMATIC OR WIRING DIAGRAM)

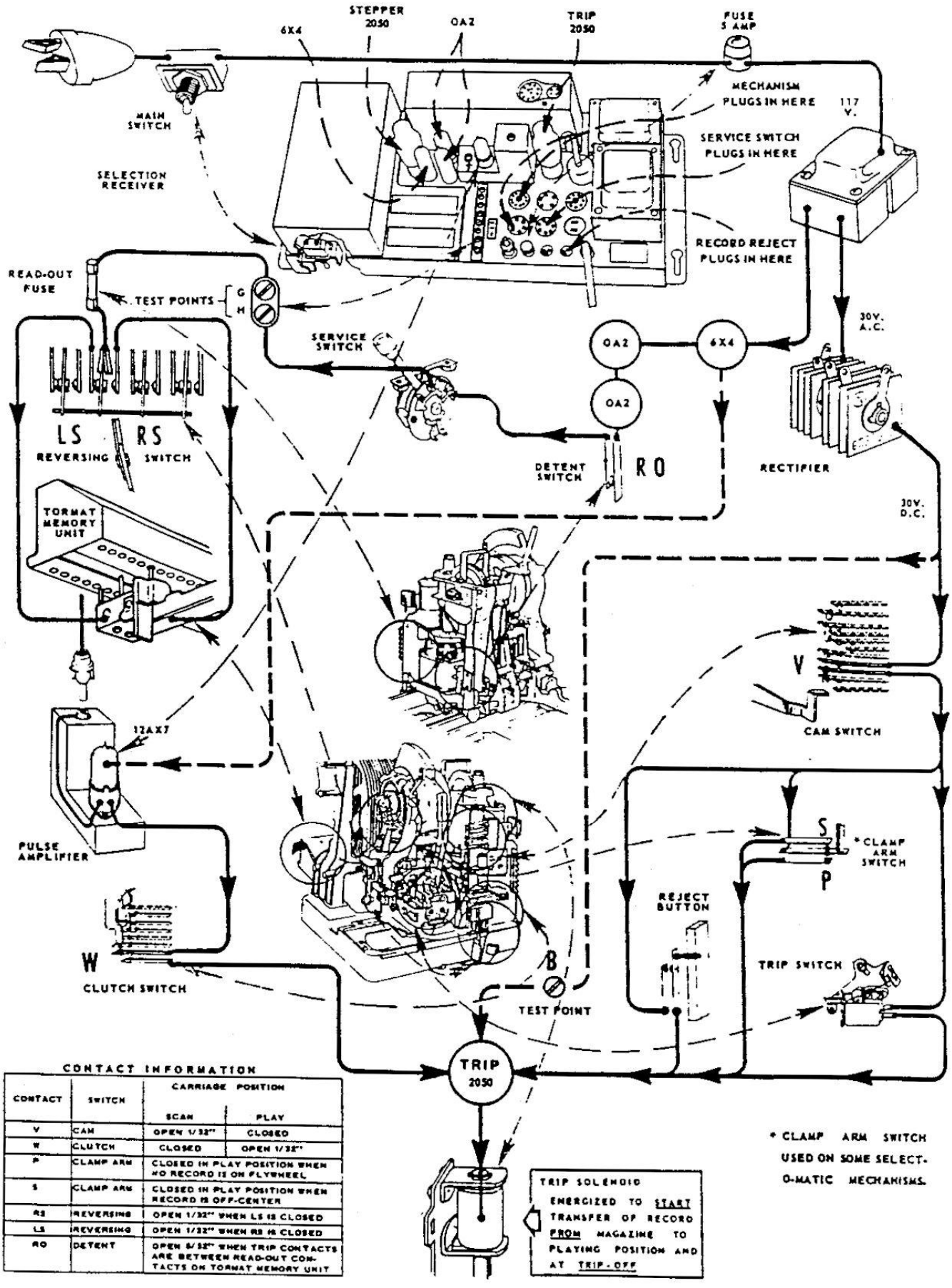
AS USED WITH DUAL CREDIT UNIT TYPE DCU5L-L6



SUBTRACT SOLENOIDS - Picture Diagram
Select-o-matic "200" – VL-200-N
AS USED WITH DUAL CREDIT UNIT TYPE DCU5L-L6



TRIP SOLENOID - Picture Diagram
Select-o-matic "200" – VL-200-D & VL-200-N
(NOT A SCHEMATIC OR WIRING DIAGRAM)



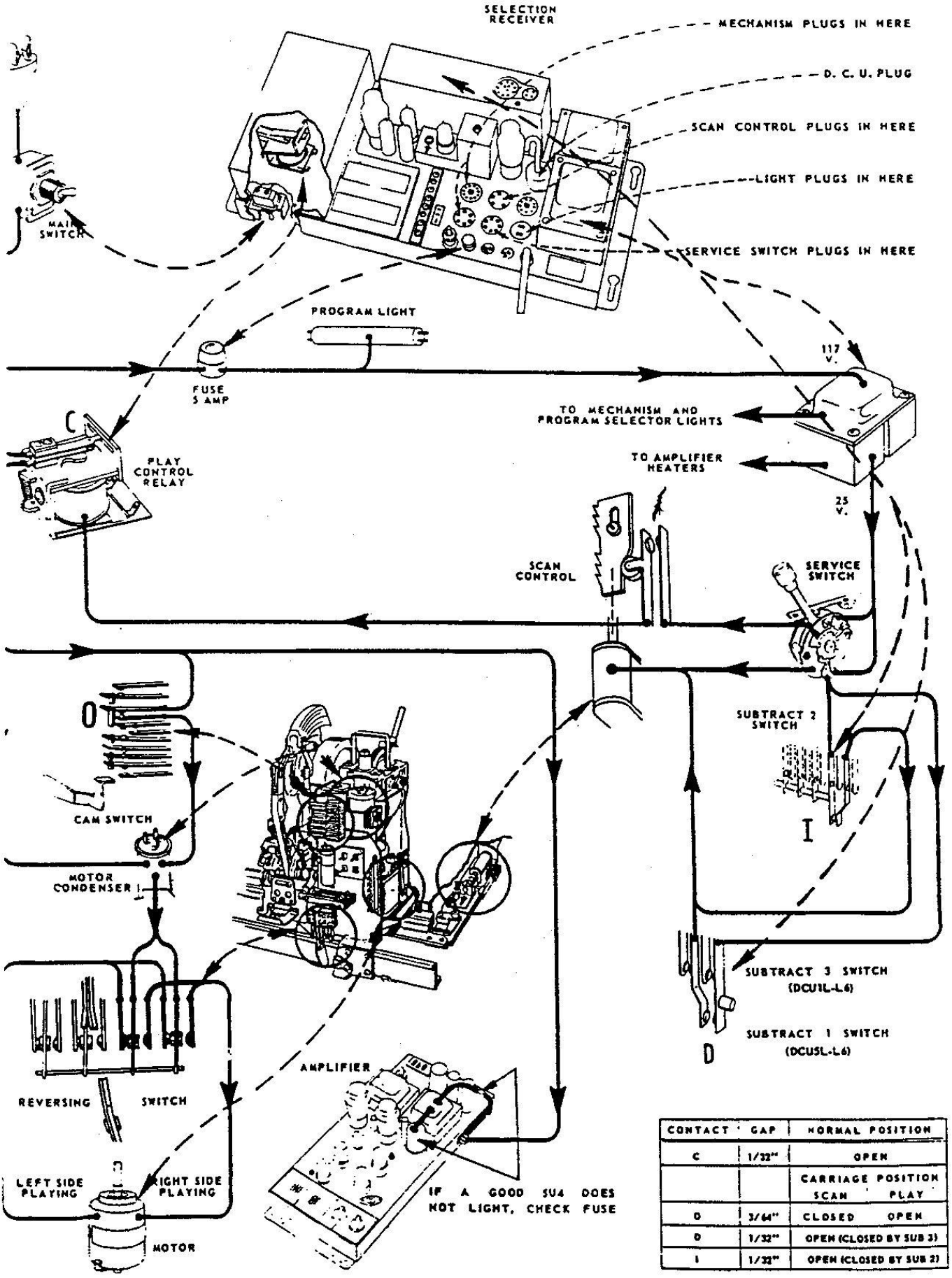
CONTACT INFORMATION

CONTACT	SWITCH	CARRIAGE POSITION	
		SCAN	PLAY
V	CAM	OPEN 1/32"	CLOSED
W	CLUTCH	CLOSED	OPEN 1/32"
P	CLAMP ARM	CLOSED IN PLAY POSITION WHEN NO RECORD IS ON FLYWHEEL	
S	CLAMP ARM	CLOSED IN PLAY POSITION WHEN RECORD IS OFF-CENTER	
RS	REVERSING	OPEN 1/32" WHEN LS IS CLOSED	
LS	REVERSING	OPEN 1/32" WHEN RS IS CLOSED	
RO	DETENT	OPEN 5/32" WHEN TRIP CONTACTS ARE BETWEEN READ-OUT CONTACTS ON TORMAT MEMORY UNIT	

TRIP SOLENOID ENERGIZED TO START TRANSFER OF RECORD FROM MAGAZINE TO PLAYING POSITION AND AT TRIP-OFF

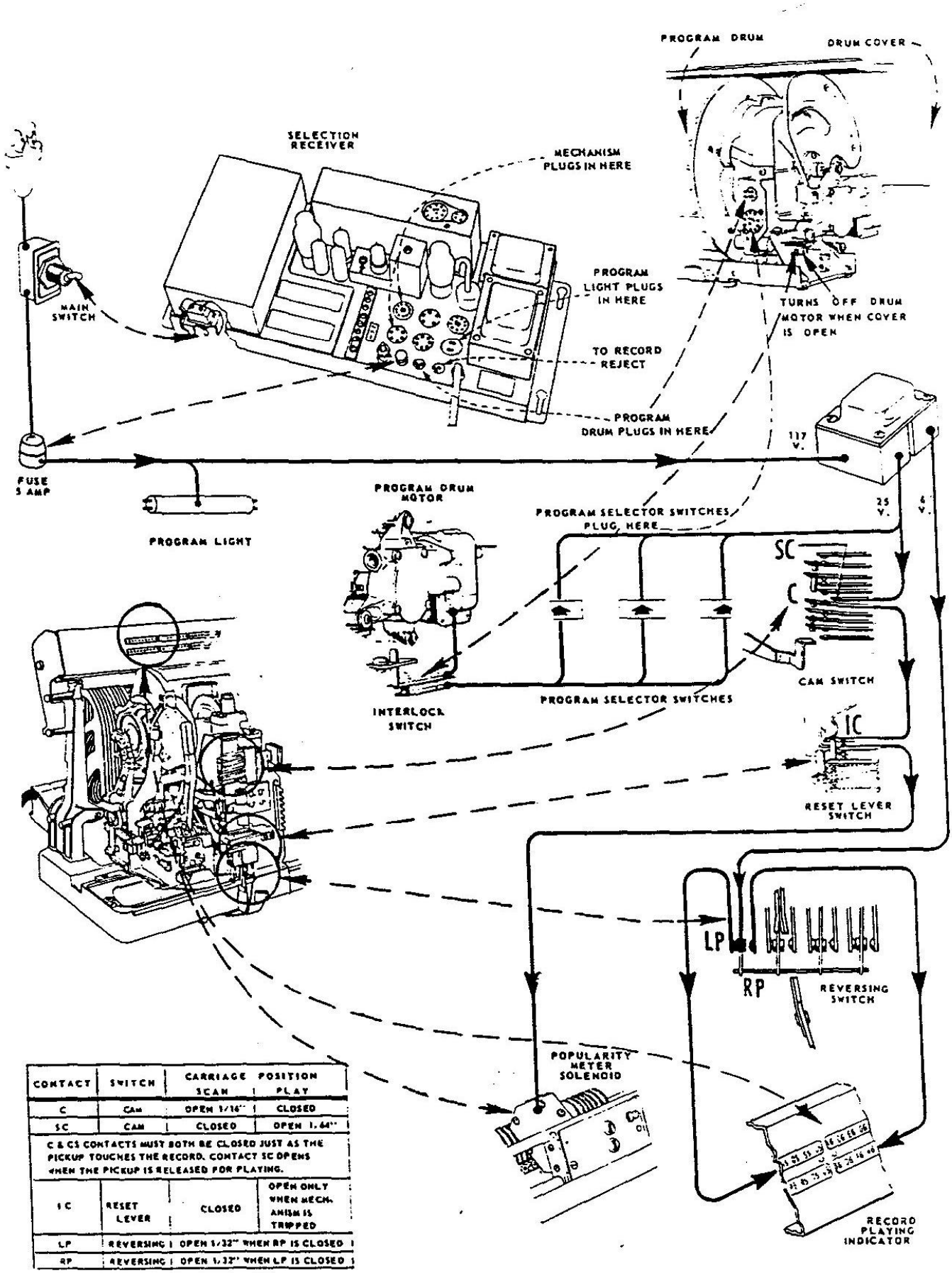
* CLAMP ARM SWITCH USED ON SOME SELECT-O-MATIC MECHANISMS.

MOTOR & AMPLIFIER - Picture Diagram
Select-o-matic "200" – VL-200-D & VL-200-N
(NOT A SCHEMATIC OR WIRING DIAGRAM)



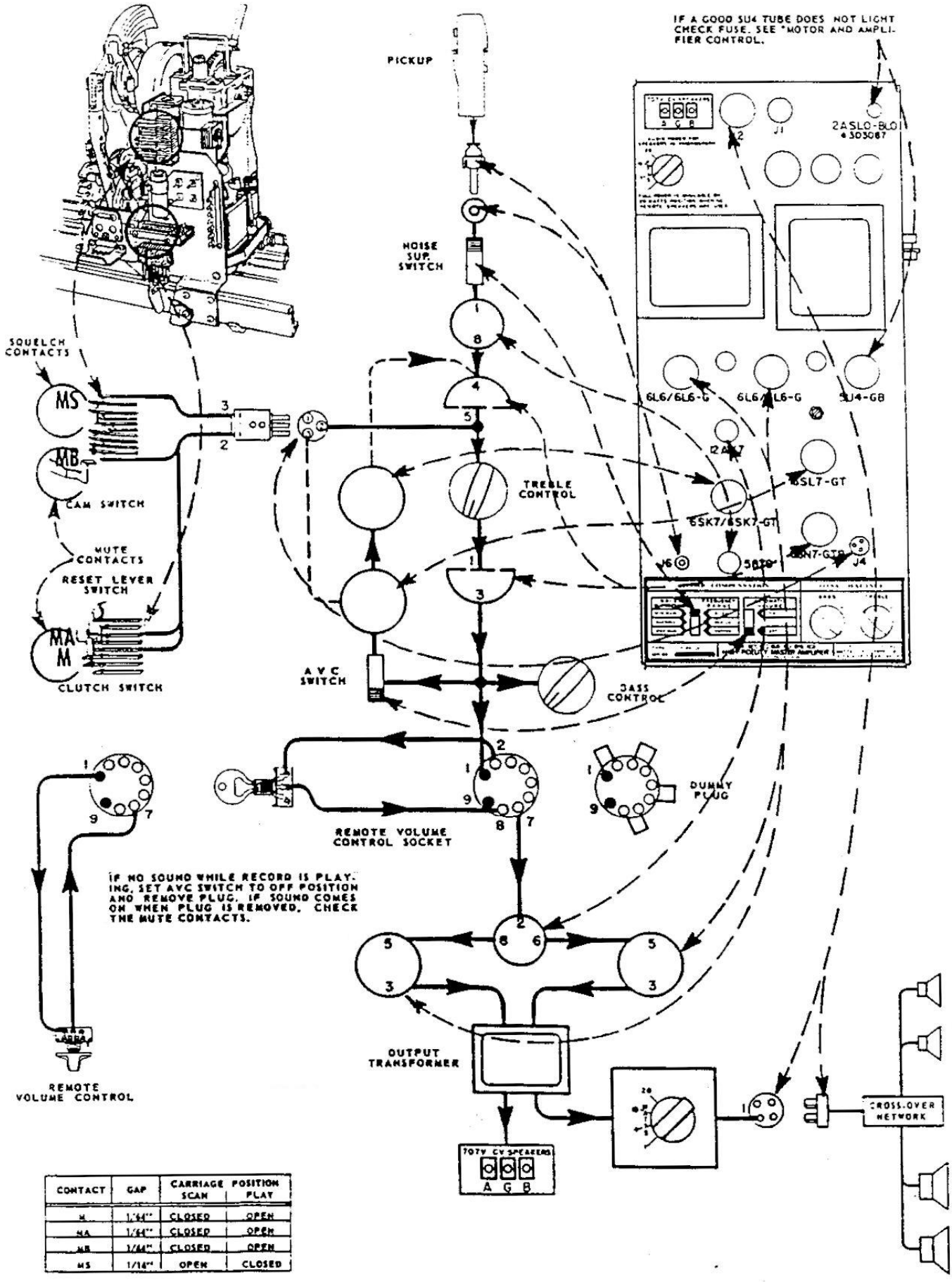
CONTACT	GAP	NORMAL POSITION
C	1/32"	OPEN
		CARRIAGE POSITION: SCAN / PLAY
D	3/64"	CLOSED / OPEN
D	1/32"	OPEN (CLOSED BY SUB 3)
I	1/32"	OPEN (CLOSED BY SUB 2)

POPULARITY METER & PROGRAM DRUM - Picture Diagram
Select-o-matic "200" – VL-200-D & VL-200-N
(NOT A SCHEMATIC OR WIRING DIAGRAM)



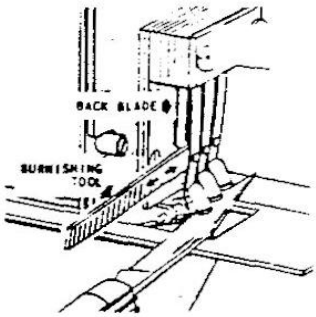
CONTACT	SWITCH	CARRIAGE POSITION SCAN	PLAY
C	CAM	OPEN 1/16"	CLOSED
SC	CAM	CLOSED	OPEN 1.64"
C & CS CONTACTS MUST BOTH BE CLOSED JUST AS THE PICKUP TOUCHES THE RECORD. CONTACT SC OPENS WHEN THE PICKUP IS RELEASED FOR PLAYING.			
IC	RESET LEVER	CLOSED	OPEN ONLY WHEN MECHANISM IS TRIPPED
LP	REVERSING	OPEN 1/32" WHEN RP IS CLOSED	
RP	REVERSING	OPEN 1/32" WHEN LP IS CLOSED	

AMPLIFIER & SOUND - Picture Diagram
Select-o-matic "200" – VL-200-D & VL-200-N
(NOT A SCHEMATIC OR WIRING DIAGRAM)



CONTACT	GAP	CARRIAGE POSITION SCAN	PLAY
M	1/64"	CLOSED	OPEN
MA	1/64"	CLOSED	OPEN
MB	1/64"	CLOSED	OPEN
MS	1/16"	OPEN	CLOSED

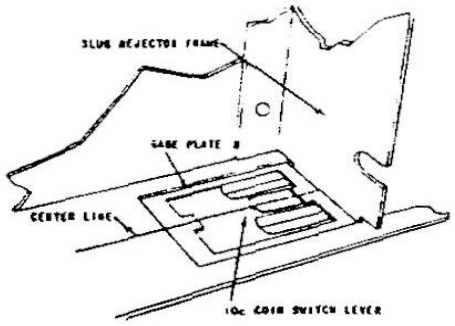
COIN SWITCHES



CLEANING

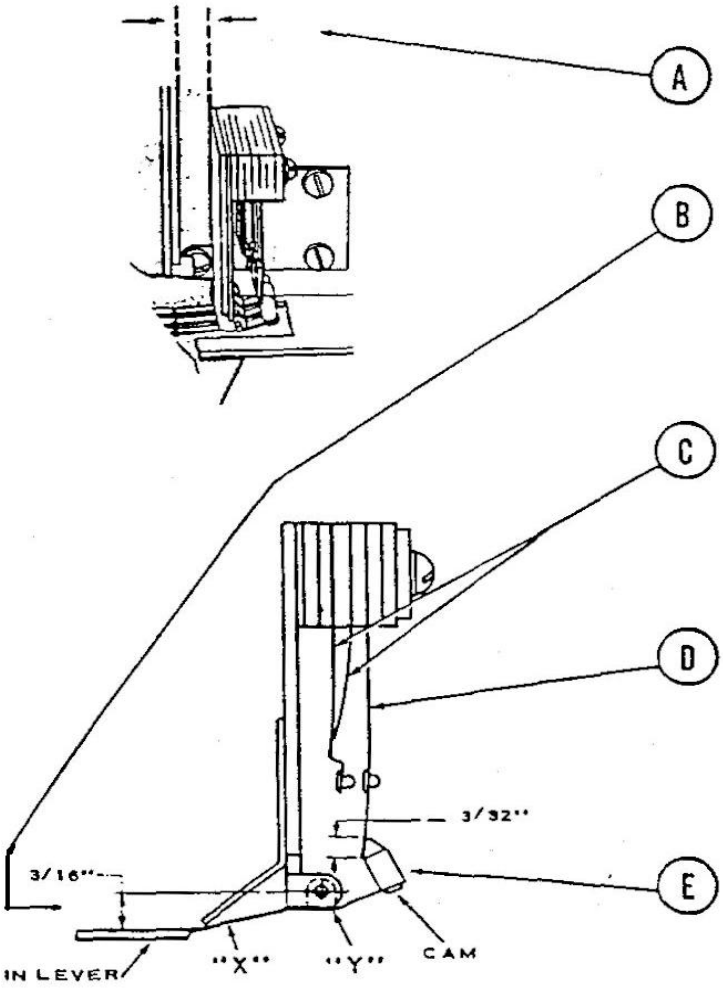
Clean the switch contacts carefully with carbon tetrachloride using a No. 2 camel hair brush.

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



COIN LEVER ALIGNMENT

The coin switch levers should be parallel with the opening in the gage plate and the center lever (10¢) should center on the projection of the gage as shown. Lateral play of the lever should be taken into account when checking the position of the 10¢ switch lever.



SWITCH ADJUSTMENT

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

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

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

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

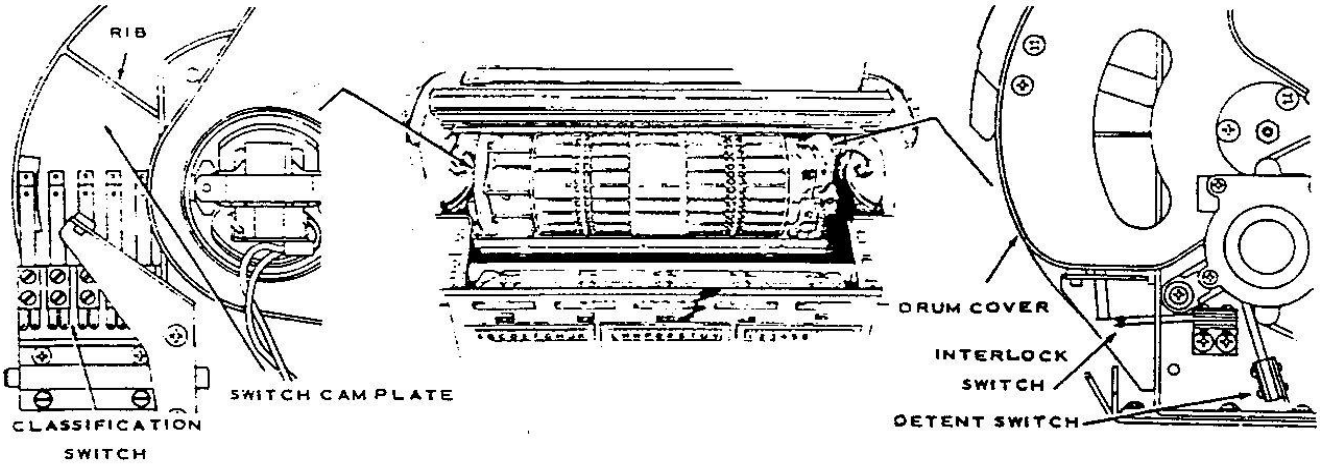
Nickel switch (front) – 10 to 14 grams

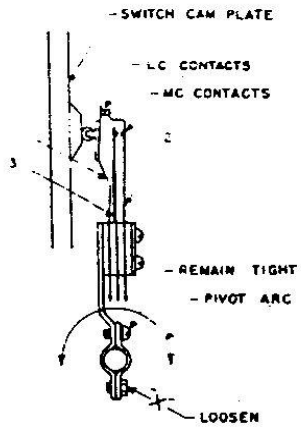
Dime switch (middle) – 5 to 7 grams

Quarter switch (back) – 12 to 16 grams

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

PROGRAM DRUM SWITCH ADJUSTMENTS





CLASSIFICATION SWITCH

A. Detent drum so outermost cam on switch cam plate is under switch roller.

B. Loosen hex head screws, "X", at bottom of switch mounting plate just enough to permit pivoting of mounting plate and switches.

C. Pivot the mounting plate so the MC contacts of the switch on the cam have a 1/32" gap and tighten hex head screws.

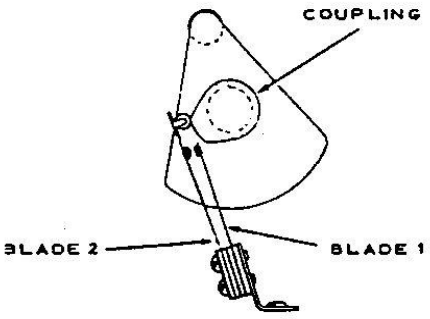
D. Turn the drum, manually, so rib on cam plate is under roller of switch blade 1.

E. Adjust blade 1 so roller clears rib approximately 1/32".

F. Adjust blade 2 so LC contacts have 3/64" to 1/16" gap.

G. Recheck MC contacts with roller again on cam, and if necessary, adjust blade 3 for 1/32" gap.

H. Using steps 5 through 7, adjust remaining four switches. When switches are correctly adjusted, the clearance between the ribs on the cam plate and the rollers of all switches will be approximately 1/32".



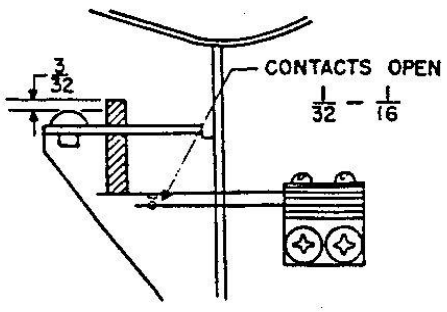
DETENT SWITCH

A. Detent drum so roller is on cam lobe of the coupling.

B. Adjust blade 1 for 1/32" contact gap.

C. Rotate coupling (operate motor) so cam lobe is facing *away* from roller of blade 2.

D. Adjust blade 2 so there is 1/64" to 1/32" clearance between the roller and the coupling.



INTERLOCK SWITCH

A. With drum cover lifted for access to title strips, button on upper blade of switch should project approximately 3/32" above the bumper and contact gap should be 1/16".

LUBRICATION

Seeburg Select-O-Matic oil to be applied to roller pins, studs, lever pivots, and motor oil holes in each bearing cap.

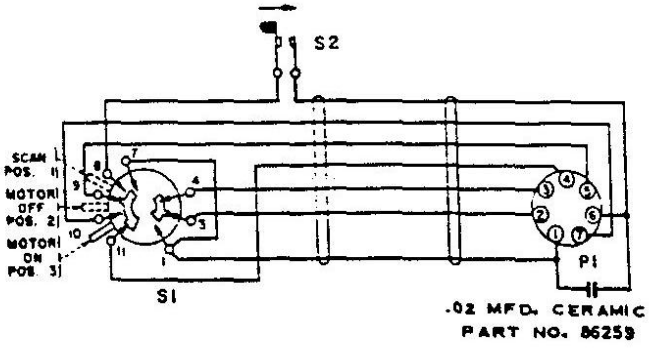


Figure 33. Schematic Diagram - Service Switch (S1) & Service Credit Switch (S2)

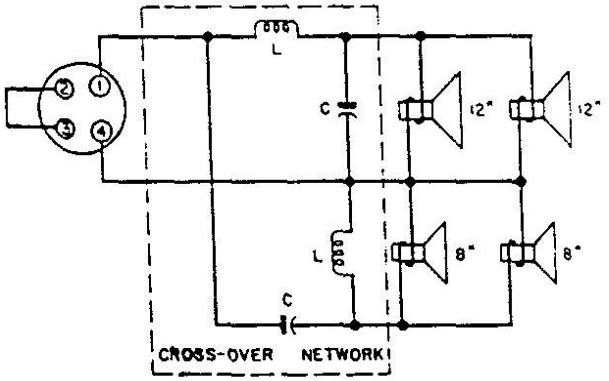


Figure 34. Schematic Diagram Speaker Circuit

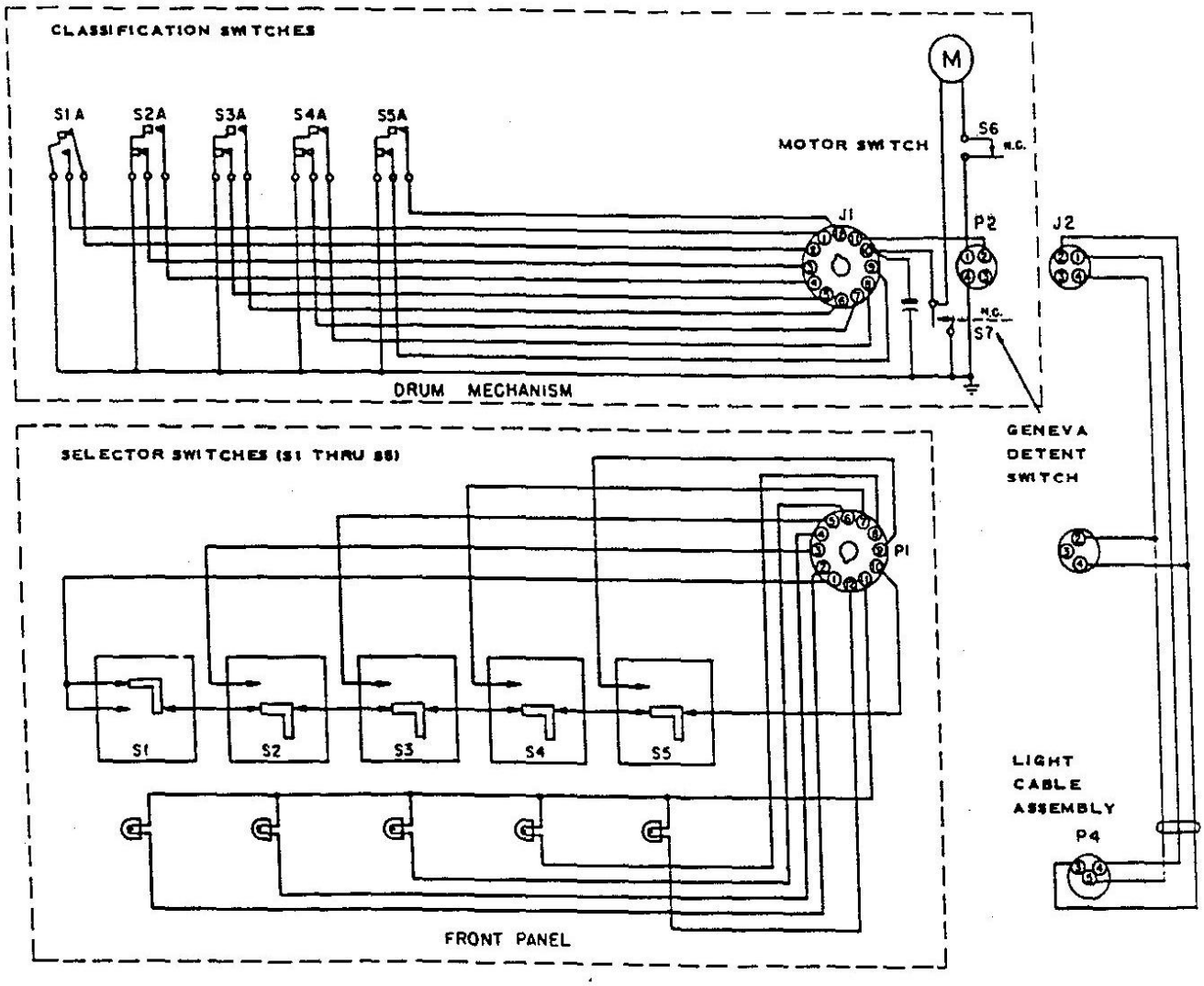


Figure 35. Program Drum Schematic

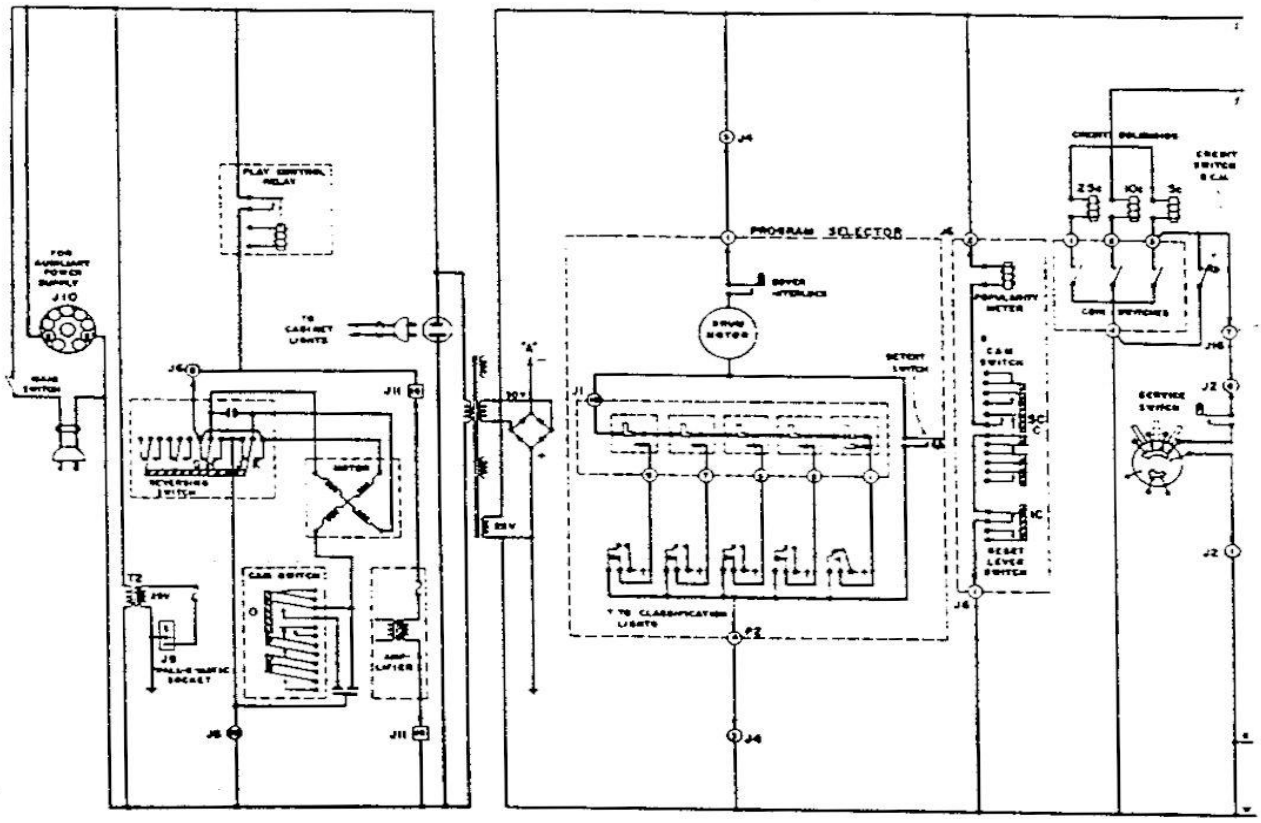


Figure 36a. Simplified Schematic Diagram — Power and Control Wiring (Part 1)

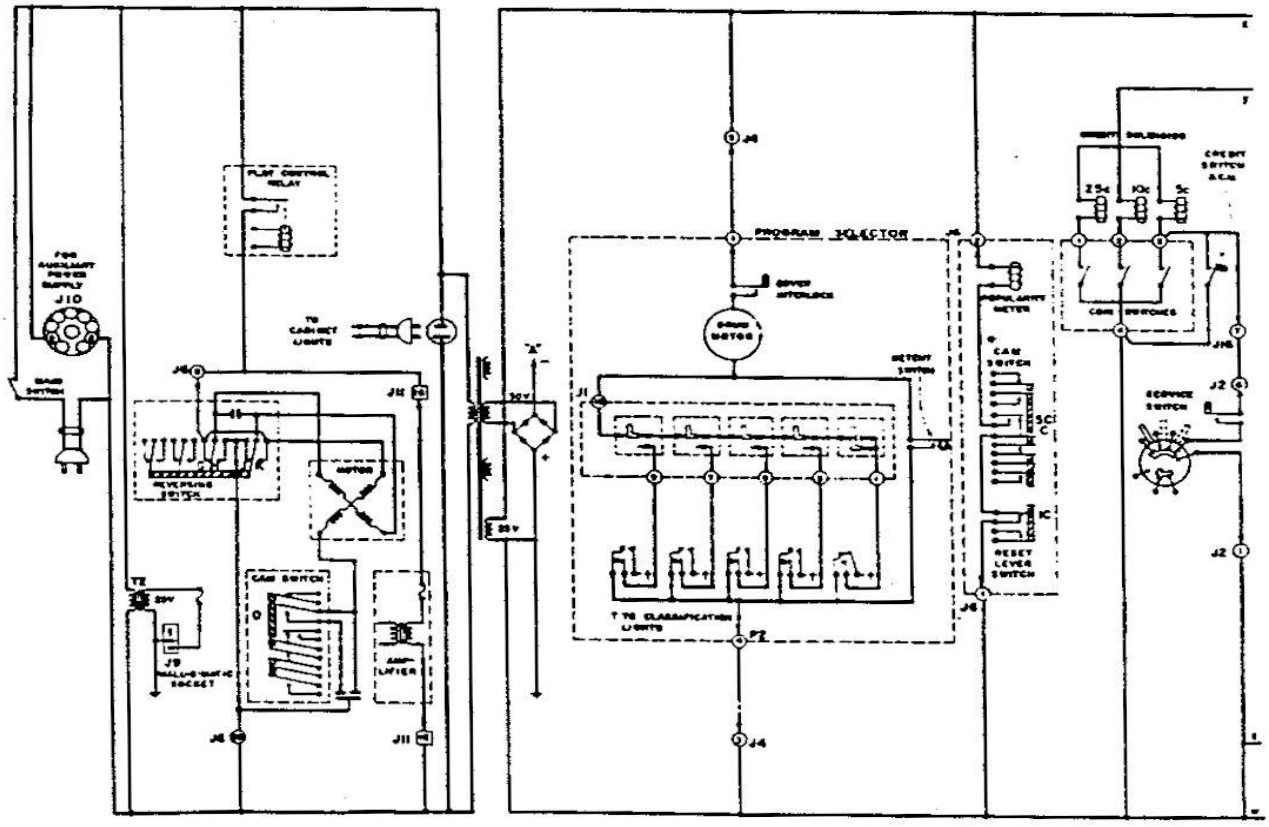


Figure 36a. Simplified Schematic Diagram — Power and Control Wiring (Part 1)

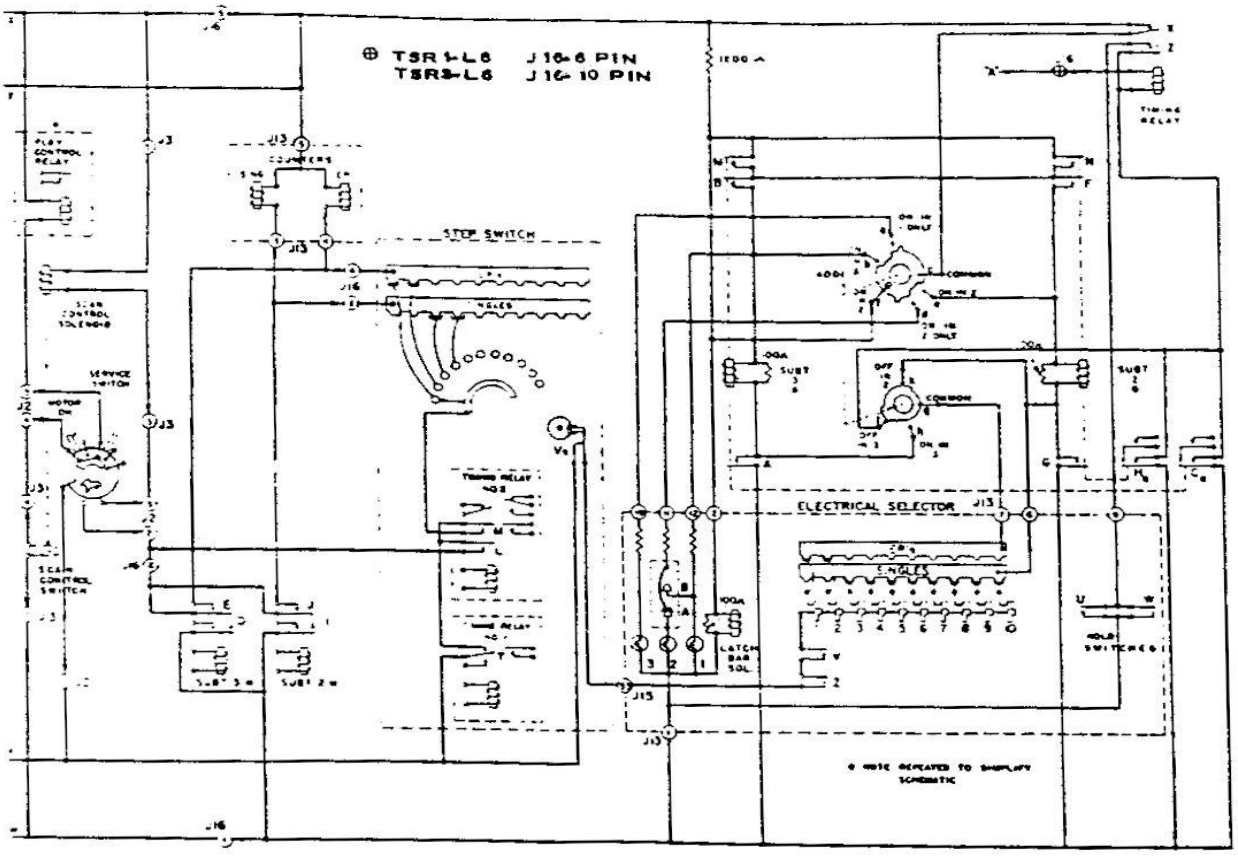


Figure 36b. Simplified Schematic Diagram – Power & Control Wiring (Part 2) With DCU1-L6 in TSR1-L6 and DCU IL-L6 in TSR3-L6

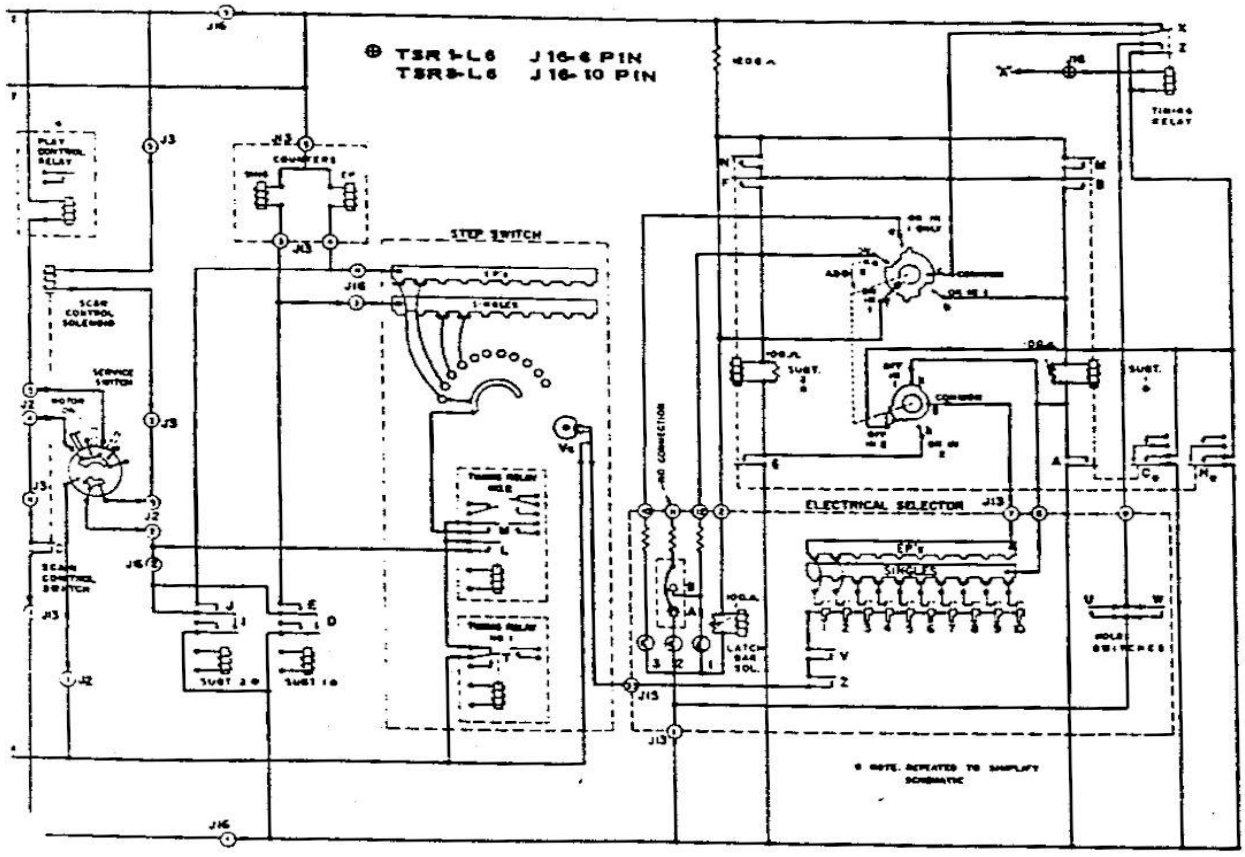


Figure 36c. Simplified Schematic Diagram – Power & Control Wiring (Part 2) With DCU5-L6 in TSR1-L6 and DCU IL-L6 in TSR3-L6

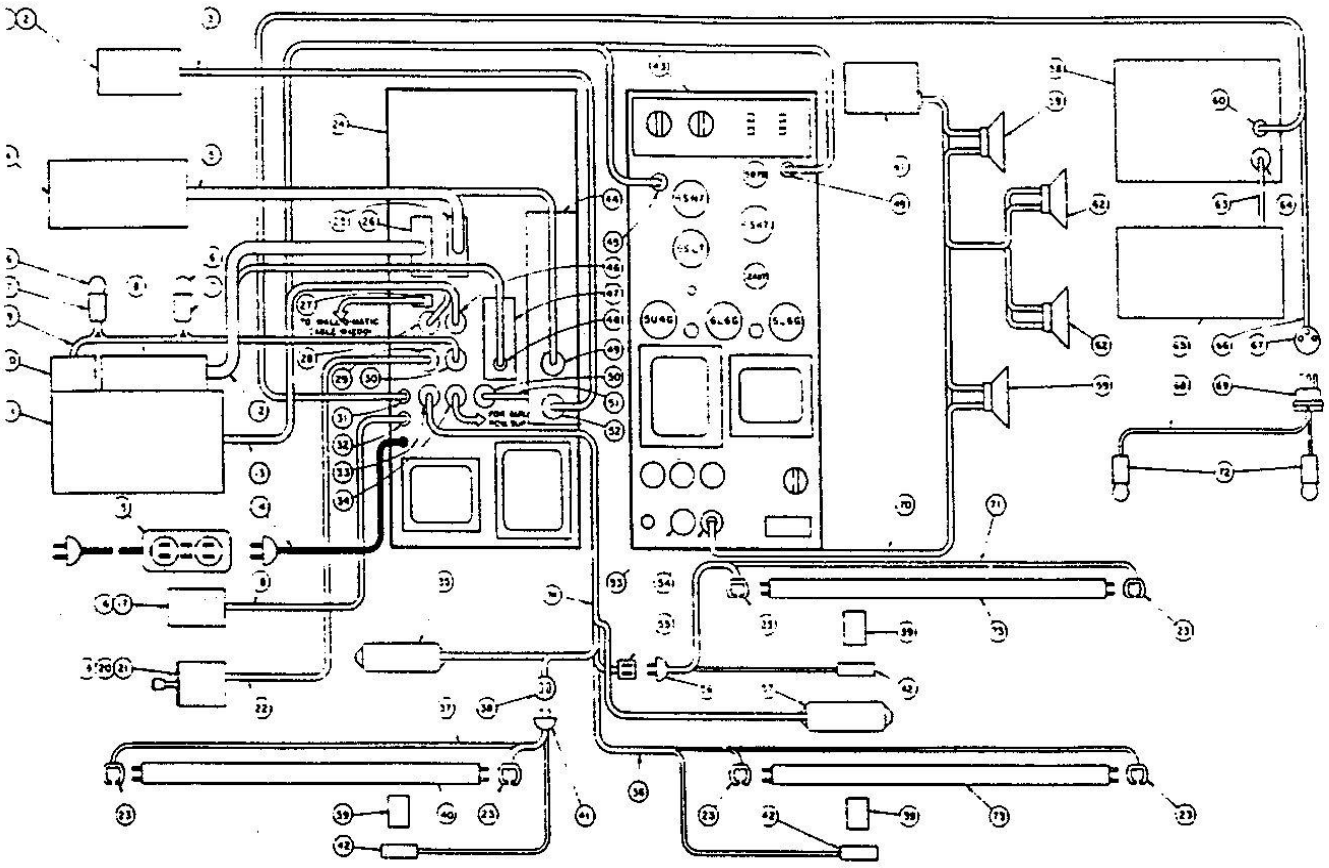
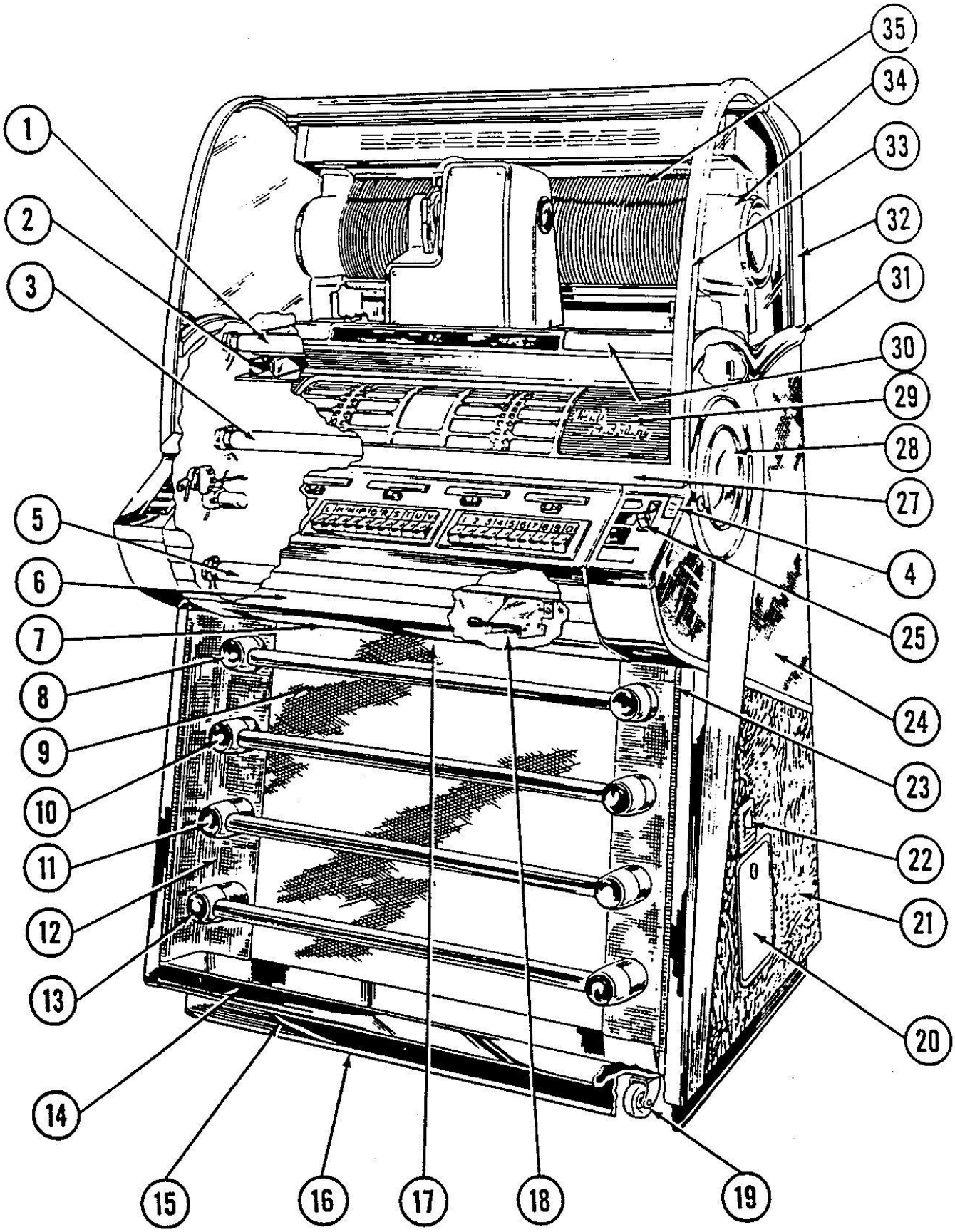


Figure 37. Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	401820	COIN SWITCH
2	401822	COIN SWITCH & CABLE ASSEM.
3	401761	COIN SWITCH CABLE & PLUG ASSEM.
4	410330	TORMAT ELECTRICAL SELECTOR (TES1-L6)
5	410721	CONTROL CABLE & PLUG ASSEM.
	410720	MATRIX CABLE & PLUG ASSEM.
6	247307	LAMP NO.63, FROSTED
7	247049	LAMP SOCKET ASSEM. (END BELL)
8	304600	TORMAT MEMORY ASSEM. (200 TM1)
9	247085	SCAN CONTROL CABLE & PLUG ASSEM.
10	247051	SCAN CONTROL ASSEM.
11	247000	MECHANISM, TYPE 245ST1-L6 (V-200)
	247460	MECHANISM, TYPE 245ST3-L6 (VL-200)
12	304655	TORMAT MEMORY CABLE ASSEM.
13	247820	CONTROL CABLE ASSEM.
14	303571	LINE CORD ASSEM.
15	402152	LINE CORD & OUTLET ASSEM.
16	408247	RECORD REJECT SWITCH ASSEM.
17	403065	RECORD REJECT SWITCH
18	408248	RECORD REJECT SWITCH CABLE ASSEM.
19	408275	SERVICE SWITCH ASSEM.
20	408171	SERVICE SWITCH
21	408389	MANUAL CREDIT SWITCH
22	408230	SERVICE SWITCH CABLE & PLUG ASSEM.
23	407352	FLUORESCENT LAMP SOCKET
24	303500	TORMAT SELECTION RECEIVER TYPE TSR1-L6 (V-200)
	303494	TORMAT SELECTION RECEIVER TYPE TSR3-L6 (VL-200)
25	410573	33 PRONG SOCKET ASSEMBLY
26	304657	33 PRONG PLUG ASSEMBLY
27	12015	3 PRONG PLUG
28	65319	6 PRONG PLUG
29	521117	7 PRONG PLUG ASSEMBLY
30	F200241	5 PRONG PLUG
31	408253	3 PRONG PLUG
32	601170	2 PRONG PLUG
33	10695	2 PRONG PLUG (A.C.)
34	12004	9 PRONG PLUG
35	408243	FLUORESCENT LAMP BALLAST (20 WATT)
36	408246	FLUORESCENT LAMP CABLE ASSEM.
37	201160	PROGRAM LIGHT CABLE ASSEM.
38	F7842	A. C. RECEPTACLE
39	405138	FLUORESCENT LAMP STARTER (25 WATT)

Item	Part No.	Part Name
40	406367	FLUORESCENT LAMP (20 WATT DAYLIGHT)
41	600748	2 PRONG PLUG - A. C.
42	407353	FLUORESCENT STARTER SOCKET
43	305272	HIGH FIDELITY MASTER AMPLIFIER (HFMA1- L6)
44	450000	DUAL CREDIT UNIT, DCU1-L6 (V-200-D)
	450002	DUAL CREDIT UNIT, DCU5-L6 (V-200-N)
	450500	DUAL CREDIT UNIT, DCU1L-L6 (VL-200-D)
	450502	DUAL CREDIT UNIT, DCU5L-L6 (VL-200-N)
45	250936	3 PRONG PLUG
46	250942	11 PRONG PLUG
47	303590	PULSE AMPLIFIER
48	246957	SINGLE PRONG PLUG
49	410707	12 PRONG PLUG ASSEMBLY
50	12028	8 PRONG PLUG (V-200)
	410707	12 PRONG PLUG (VL-200)
51	450245	DCU CABLE & PLUG ASSEM. (V-200)
	450560	DCU CABLE & PLUG ASSEM. (VL-200)
52	401521	4 PRONG PLUG
53	305316	DUMMY PLUG
54	F3150	4 PRONG PLUG
55	408368	A. C. RECEPTACLE
56	408272	2 PRONG PLUG - A. C.
57	408241	FLUORESCENT LAMP BALLAST (DUAL 25 WATT)
58	201000	CLASSIFICATION SELECTOR DRUM ASSEM. (PDA1- L6)
59	406307 / 406305	8" SPEAKER (V-200)
	406618	8" SPEAKER (VL-200)
60	406250	4 PRONG SOCKET (CABLE)
61	503600	CROSSOVER NETWORK (CN600-1)
62	406315 / 406317	12" SPEAKER
63	408153	SELECTOR PANEL CABLE ASSEM.
64	408155	12 PRONG PLUG
65	408120	SELECTOR PANEL ASSEM.
66	408234	LIGHT CABLE ASSEM.
67	408463	3 PRONG SOCKET (CABLE)
68	408244	SIDE LIGHT CABLE ASSEM.
69	408462	3 PRONG PLUG
70	408253	SPEAKER CABLE ASSEM.
71	408158	LIGHT SHIELD CABLE ASSEM.
72	408232	LIGHT SOCKET
	402180	LAMP NO. 81, FROSTED
73	405136	FLUORESCENT LAMP (25 WATT DAYLIGHT)
74	408271	FLUORESCENT LAMP & BALLAST ASSEM.

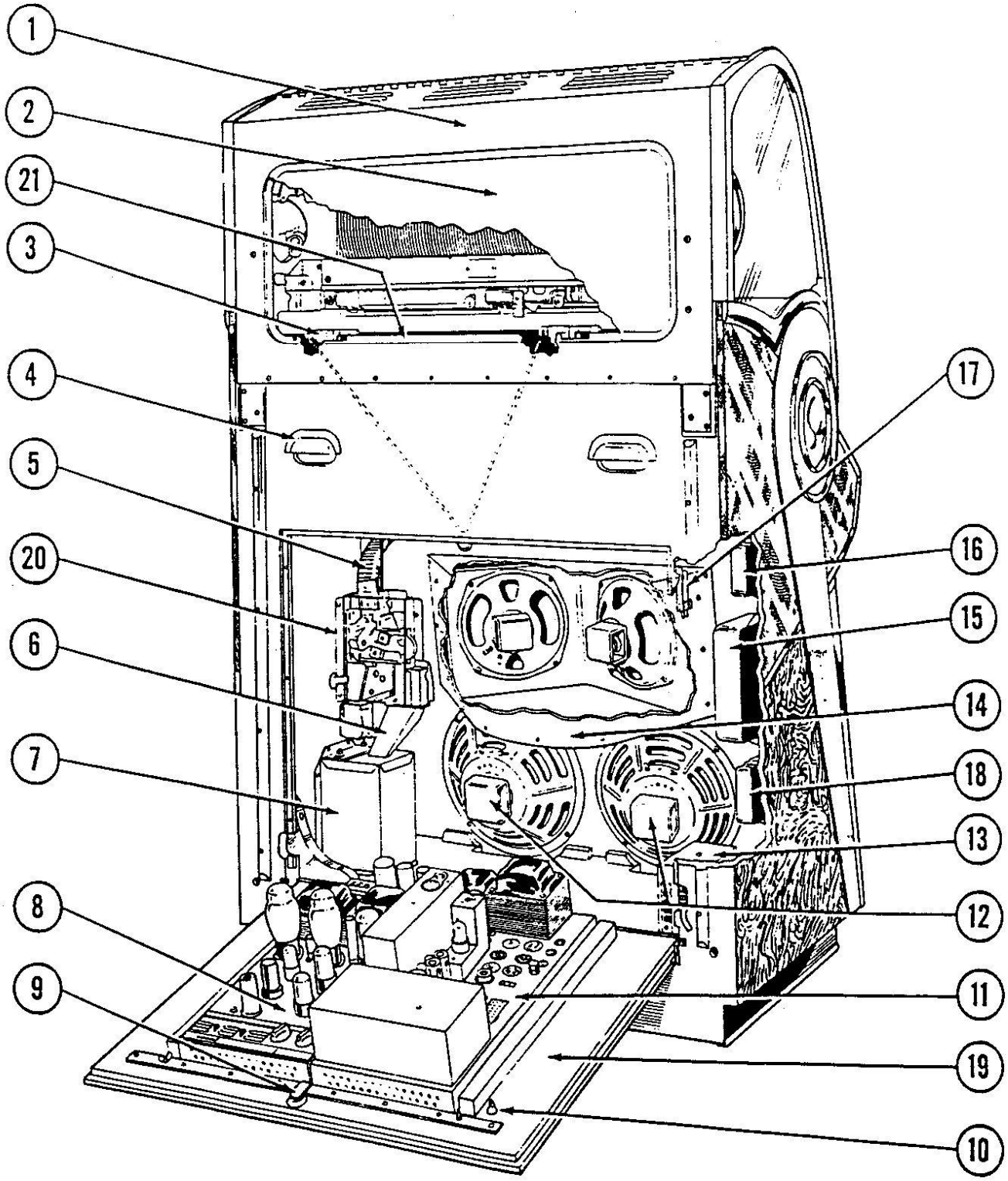


Front View — Cabinet Assembly

SELECT-O-MATIC "200", MODEL V-200, VL-200

PARTS LIST

Item	Part No. V-200	Part No. VL-200	Part Name
1	405136	405136	Fluorescent Lamp (25 W. Daylight)
&	407352	407352	Lamp Socket
5	405138	405138	Lamp Starter
2	408477	408477	Mechanism Mounting Channel
3	406367	406367	Fluorescent Lamp (20 W. Daylight)
	407352	407352	Lamp Socket
	405138	405138	Lamp Starter
4	408071	408071	Corner Casting, R. H.
	408072	408072	Corner Casting, L. H.
	408073	408073	Lower Corner Casting, R. H.
	408074	408074	Lower Corner Casting, L. H.
	408435	408764	Instruction Window
	408514	408514	Instruction Window Retainer
	905301	905301	Speed Nut
	408486	408529	Coin Instruction Plate
	408400	408419	Coin Window (Upper)
	408506	408506	Coin Window Diffuser Screen
	408404	408404	Coin Window (Upper)
	408420	408420	Coin Window (Lower)
	408089	408089	Gasket
	408084	408084	Select Light Window Frame
	406032	406032	Coin Drop Slot
6	408122	408122	Selector Panel Casting
	408123	408123	Lower Selector Panel Casting
7	408070	408070	Lower Center Casting
8	408333	408578	Grille Ornament Spacer No. 1
9	408459	408526	Grille Scrim Cloth
	408091	408091	Grille Screen
10	408334	408578	Grille Ornament Spacer No. 2
11	408335	408579	Grille Ornament Spacer No. 3
12	408092	408760	Grille Side Trim, R. H.
	408093	408761	Grille Side Trim, L. H.
13	408336	408580	Grille Ornament Spacer No. 4
	408085	408085	Grille Ornaments
	408460	408460	Upper Grille Bar (2-used)
	408117	408117	Lower Grille Bar Assembly (2-used)
14	408094	408094	Kick Plate
	408510	408510	Kick Plate Retainer
15	408197		Base Cover
		53125	Plastic Tape
16	408198	408198	Base Trim
17	408193	408765	Front Diffuser Screen
18	408275	408275	Service Switch Assembly
	408171	408171	Service Switch
19	405773	405773	Casters
	405774	405774	Caster Socket
20	408065	408748	Cash Box Door Frame
	408066	408749	Cash Box Door Assembly
	408067	408750	Cash Box Door
	406340	406340	Cash Box Lock Assembly
21	408050		Cabinet Only
			Gray Olive Burl - R. H.
			Gray Olive Burl - L. H.
		408740	Cabinet Only
		408807	Gray Teakwood Plastic, R. H.
		408808	Gray Teakwood Plastic, L. H.
	408100	408745	Side Trim, L. H. (Rear)
22	408068	408751	Slug Receptacle Assembly
23	408081	408081	Lower Side Casting, R. H.
	408082	408082	Lower Side Casting, L. H.
24	408097	408742	Side Trim, R. H. (Front)
	408099	408744	Side Trim, R. H. (Rear)
	408098	408743	Side Trim, L. H. (Front)
	408101	408101	Rear Side Trim Retainer, R. H.
	408102	408102	Rear Side Trim Retainer, L. H.
25	401817	401817	Scavenger Wire & Plunger Assembly
26	408496		Coin Instruction Decal
		408529	Coin Instruction Plate
27	408175	408175	Cabinet Lid Frame (Bottom)
	408178	408178	Lid Catch, R. H.
	408179	408179	Lid Catch, L. H.
	914254	914254	8/32 x 5/16 P. Truss H. M. Screw
	408390	408390	Lid Support Bracket Assembly
	408111	408111	Lid Hinge
	913192		6/32 x 3/8 P.F.H.M. Screw
		960754	6/32 x 3/8 P. F. H. S. T. Screw
	53413	53413	Adhesive Coating Sponge Rubber
	408180	408180	Lid Glass Retainer
	960711	960711	6/32 x ¼ Phillips T. H. S. T. Screw
	960728		6/32 x 5/16 Phillips F. H. S. T. Screw
		960754	6/32 x 3/8 P.F.H.S.T. Screw
	53409	53409	Adhesive Coated Sponge Rubber
	408491	408491	Cabinet Lid Light Seal
28	408345	408769	R. H. Side Bezel Assembly
	408346	408770	L. H. Side Bezel Assembly
	408187	408187	Side Bezel Gasket R. & L. H.
	408185	408771	Cabinet Side Window
	408184	408776	Side Window Retainer R. & L. H.
	408297	408772	R. H. Lid Lock Assembly
	408298	408773	L. H. Lid Lock Assembly
	408244	408244	Side Light Cable Assembly
	408232	408232	Light Socket Assembly
	408482	408482	3 Prong Plug
29	201147	201147	Drum Cover & Hinge Plate Assembly
	201183		Drum Cover & Trim Assembly
	201100	201100	Drum Cover
30	408164	408778	Light Shield Assembly
	408169	408780	Light Shield Window
	408170	408170	Window Retainer
	408457	408457	Upper Window Retainer
	905302	905302	Speed Nut
	408588	408588	Pricing Information Window (Singles)
	408589	408589	Pricing Information Window (E.P.'s)
	408170	408170	Window Retainer (4)
	53401	53401	Adhesive Coated Sponge Rubber
	903100	903100	Speed Nut
	408489	408824	Light Shield Window Diffuser
31	408077	408077	Side Glass Clamp, R. H.
	408078	408078	Side Glass Clamp, L. H.
	408079	408079	Interior Side Glass Clamp R. H.
	408080	408080	Interior Side Glass Clamp, L. H.
32	408075	408075	Upper Side Casting, R. H.
	408076	408076	Upper Side Casting, L. H.
	408191	408191	Upper Side Glass Clamp, R. H.
	408192	408192	Upper Side Glass Clamp, L. H.
33	408176	408176	Cabinet Lid Frame Side, R. H.
	408177	408177	Cabinet Lid Frame Side, L. H.
	914753		8/32 x 7/8 P.F.H.M. Screw
		914668	8/32 x 3/4 P.R.H.M. Screw
34	408181	408181	Side Glass, R. H. & L. H.
	408119	408575	Side Glass Channel Upper
35	408172	408172	Cabinet Lid Assembly
	408173	408173	Cabinet Lid (Glass)
	408174	408174	Cabinet Lid Frame, Top
	408576	408576	Side Glass Channel Lower



Rear View — Cabinet Assembly

PARTS LIST on Reverse Side

PARTS LIST

Item	Part No.	Part Name
1	408103	Back Panel Welded Assembly (V-200)
	408775	Back Panel Welded Assembly (VL-200)
	915471	Sems 10-32 x 3/8 Self-Tap. Screw (4 used) (V-200)
	961175	Sems 10-32 x 3/8 Self-Tap. Screw (4 used) (VL-200)
	915373	Sems 10-32 x 5/8 Self-Tap. Screw (4 used) (V-200)
	961172	Sems 10-32 x 5/8 Self-Tap. Screw (4 used) (VL-200)
	915578	Sems 10-32 x ½ Phillips R. H. M. S. (2 used)
	971171	No. 8 x 5/8 Phillips R. H. Sheet Metal Screw (8 used) (V-200)
	960959	No. 8 x 5/8 Phillips R. H. Sheet Metal Screw (8 used) (VL-200)
2	408112	Access Panel Assembly (V-200)
	408783	Access Panel Assembly (VL-200)
3	408205	Access Panel Latch Assembly
	408327	Access Panel Release Cable
	408494	Panel Latch Cover
4	408069	Cabinet Handle (V-200)
	408754	Cabinet Handle (VL-200)
5	401816	Coin Chute
6	401811	Lower Coin Chute Welded Assembly
7	407193	Cash Box Assembly
8	305272	HFMA1-L6 Amplifier
9	408290	Rear Door Lock Assembly
10	404320	Tee Nut
	404321	Eye Bolt
	404672	Chain Assembly (Not Shown)
	404673	Snap (Not Shown)
11	303500	TSR1-L6 Tormat Selection Receiver (V-200)
	303494	TSR3-L6 Tormat Selection Receiver (VL-200)
12	408315	12" Speaker (Jensen)
	408317	12" Speaker (Utah)
13	503600	Crossover Network CN600-1
14	408063	8" Speaker Compartment Cover (V-200)
	408815	8" Speaker Compartment Cover (VL-200)
	408307	8" Speaker (Jensen)
	408305	8" Speaker (Utah) (V-200)
	408818	8" Speaker (Utah) (VL-200)
	408263	Speaker Cable Assembly
15	408241	Fluorescent Lamp Ballast (Dual 25 Watt)
16	408243	Fluorescent Lamp Ballast (20 Watt)
17	408247	Record Reject Switch Assembly
	402065	Record Reject Switch
	408248	Record Reject Switch Cable Assembly
	402064	Record Reject Pin
18	402152	Line Cord & Outlet Assembly
19	408052	Back Door Assembly (Complete) (V-200)
	408746	Back Door Assembly (Complete) (VL-200)
	408053	Back Door Sub Assembly (Lower) (V-200)
	408747	Back Door Sub Assembly (Lower) (VL-200)
	408385	Lower Rear Door Cover Plate Assembly (V-200)
	408781	Lower Rear Door Cover Plate Assembly (VL-200)
	903300	3/16 - 24 Wing Nut (3 used)
20	401805	Slug Rejector Mounting Bracket & Frame Assembly
	401822	Coin Switch & Cable Assembly
	401820	Coin Switch
	401521	Plug (4 prong)
	401253	Coin Switch Cover
	401255	Slug Rejector Mounting Stud (4 used)
	401373	Slug Rejector (V-200)
	401387	Slug Rejector (VL-200)
21	407251	Cable Bushing (Black) (Not Shown)

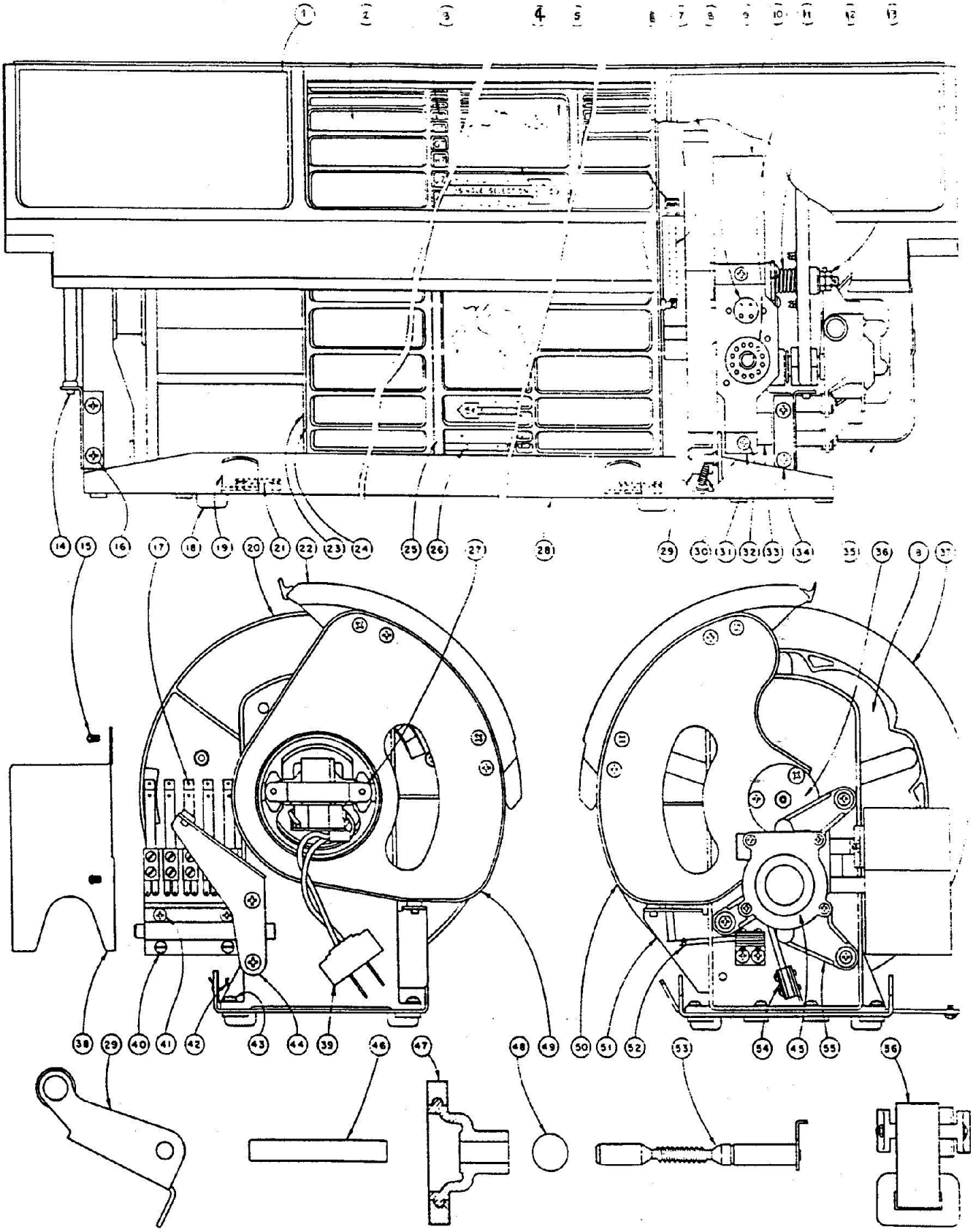


Figure 40. Program Drum Assembly

PARTS LIST

Item	Part No.	Part Name
1	201270	Trim Material (V-200)
2	407354	Duplex Title Strip
	407381	EP Title Strip
3	201090	Selection Number Strip (A2-K2)
	201091	Selection Number Strip (A4-K4)
	201092	Selection Number Strip (A6-K6)
	201093	Selection Number Strip (A8-K8)
	201094	Selection Number Strip (A0-K0)
	201095	Selection Number Strip (L2-V2)
	201096	Selection Number Strip (L4-V4)
	201097	Selection Number Strip (L6-V6)
	201098	Selection Number Strip (L8-V8)
	201099	Selection Number Strip (L0-V0)
4	201247	Coin Instruction Window, R. H. (10-25)
	201248	Coin Instruction Window, L. H. (10-25)
5	201190	Classification Window (Hit Tunes)
	201191	Classification Window (Rhythm & Blues)
	201192	Classification Window (Folk & Western)
	201193	Classification Window (All-Time Favorites)
	201194	Classification Window (Waltzes & Classics)
6	201113	Drum Detent Lever Assembly
7	201117	Drum Detent Spring
8	201068	Geneva Wheel Assembly
	*201356	Geneva Wheel Assembly
		(Old No. 201068)
9	408158	4 Prong Plug
10	201029	Bracket-Bearing & Stud Assembly
	*201358	Bracket-Bearing & Stud Assembly
		(Old No. 201029)
11	201275	12 Prong Socket
12	201105	Drum Cover Spring
13	902360	Hex Nut No. 10-32
14	201155	Rubber Bumper
15	914043	No. 8-32 x 3/16 Phillips Truss H. M. S.
16	914253	Sems Fastener No. 8-32 x 5/16
	920840	Flat Washer
17	201125	Switch Assembly
	400597	Tension Plate
	912470	No. 5-40 x 7/16 R. H. M. S.
18	201155	Bumper
19	201017	Latch Bar & Stud Assembly
20	201023	Switch Cam Plate
	201072	Drum Lock Sleeve
	201073	Lock Sleeve Spring
21	201027	Latch Bar Spring
22	201100	Drum Cover
	201268	Moulding Strip
23	201077	Drum Lock Plate
24	201078	Selection Drum Assembly, L. H.
25	201107	Center Drum Assembly
26	201247	Coin Instruction Window, R. H. (10-25)
	201248	Coin Instruction Window, L. H. (10-25)
	201224	Coin Instruction Window, R. H. (15-25)
	201225	Coin Instruction Window, L. H. (15-25)
27	201140	Drum Lamp Holder Assembly
	407352	Lamp Socket
	911883	No. 4-40 x 7/16 Phillips R. H. M. S.
	407353	Starter Socket
	911773	No. 4-40 x 5/16 Phillips Fil. H. M. S.
	911883	No. 4-40 x 7/16 Phillips Fil. H. M. S.
	127085	Cable Clamp
	920630	Flat Washer
	925171	1204 Lock Washer
	900580	No. 4-40 Hex Nut
	600754	Insulator
	201150	Wire Clamp
	406367	Fluorescent Lamp, 20 Watt Daylight
	405138	Lamp Starter, 25 Watt
28	201311	Base Assembly
	914145	Sems Fastener No. 8-32 x ¼
29	201038	Geneva Detent Lever Assembly
30	201042	Geneva Detent Spring
31	201181	Socket Mounting Bracket
32	914044	Sems Fastener No. 8-32 x 3/16
33	95232	.5 mfd. Tub. Condenser 200 v. 10%
34	914253	Sems Fastener No. 8-32 x 5/16
	920840	Flat Washer
35	201062	Motor Shield Assembly
	915471	Sems Fastener No. 10-32 x 3/8
	921162	Flat Washer
36	201101	Hinge Plate Bearing
	914372	Sems Fastener No. 8-32 x 3/8
37	201109	End Plate & Stud Assembly
38	201126	Switch Cover
39	600748	A. C. Plug
40	914190	Sems Fastener No. 8-32 x ¼
41	914044	Sems Fastener No. 8-32 x 3/16
42	201058	Cable Clamp
43	915500	Sems Fastener No. 10-32 x 3/8
44	201179	Drum Cover Rest Bracket, Rear
	920840	Flat Washer
	914253	Sems Fastener No. 8-32 x 5/16
45	201174	Cover
	201173	Gasket
	913046	No. 6-32 x 5/16 Phillips R. H. M. S.
46	201169	Worm Gear Shaft
47	201170	Worm Gear
48	201052	Closure Disc
49	201149	Hinge Plate L. H.
	920840	Flat Washer
	901660	Hex Nut No. 8-32
	914372	Sems Fastener No. 8-32 x 3/8
	961016	No. 8-32 x 3/8 Phillips Truss HD.S.T.S.
50	201148	Hinge Plate R. H.
	920840	Flat Washer
	901660	Hex Nut No. 8-32
	914372	Sems Fastener No. 8-32 x 3/8
	961016	No. 8-32 x 3/8 Phillips Truss HD.S.T.S.
51	201121	Drum Cover Rest Bracket R. H.
52	201134	Motor Switch
	400597	Tension Plate
	126427	Switch Bracket
	912470	No. 5-40 x 7/16 R. H. M. S.
	914253	Sems Fastener No. 8-32 x 5/16
53	201165	Worm & Coupling Assembly
	201065	Coupling Member
54	201118	Geneva Detent Switch
	400597	Tension Plate
	201119	Geneva Detent Switch Bracket
	912470	No. 5-40 x 7/16 R. H. M. S.
	914145	Sems Fastener No. 8-32 x ¼
55	201163	Housing & Bearing Assembly
	201054	Grommet
	901130	6-32 Hex Nut (5/16 A. F. x 7/64) Steel Cad.
	925342	1206 Lock Washer Steel Cad
	920935	Flat Washer
	201067	Grommet Spacer
	914580	No. 8-32 x 5/8 Phillips R. H. M. S.
56	201175	Drum Drive Motor
	913751	6-32 x 1½ Phillips B. H. M. S. Steel Cad
	925342	1206 Lock Washer Steel Cad
	201255	Motor Rotor, Bearing & Coupling Assembly
	201063	Coupling Member (Driver)
	201064	Coupling Member Driven

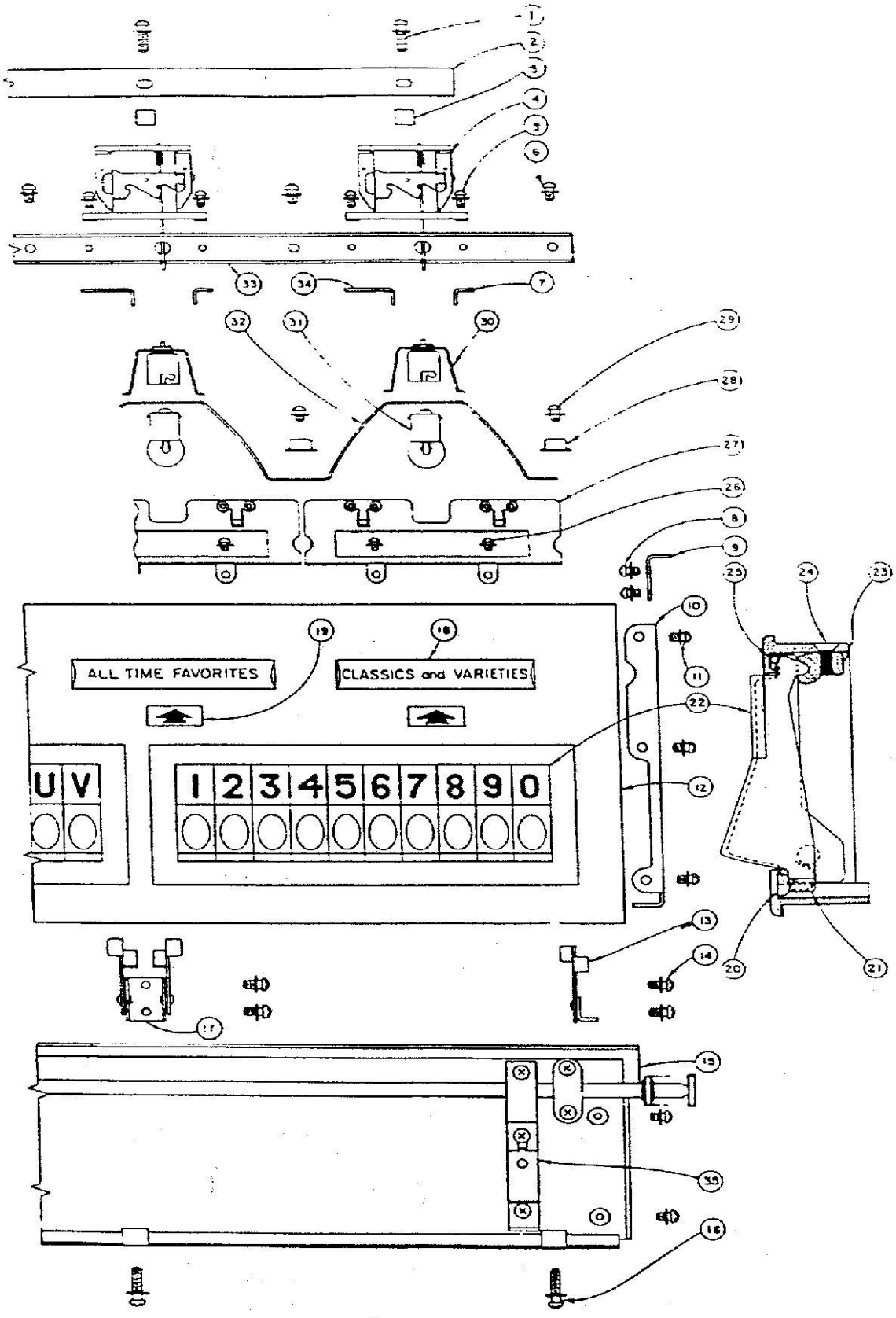
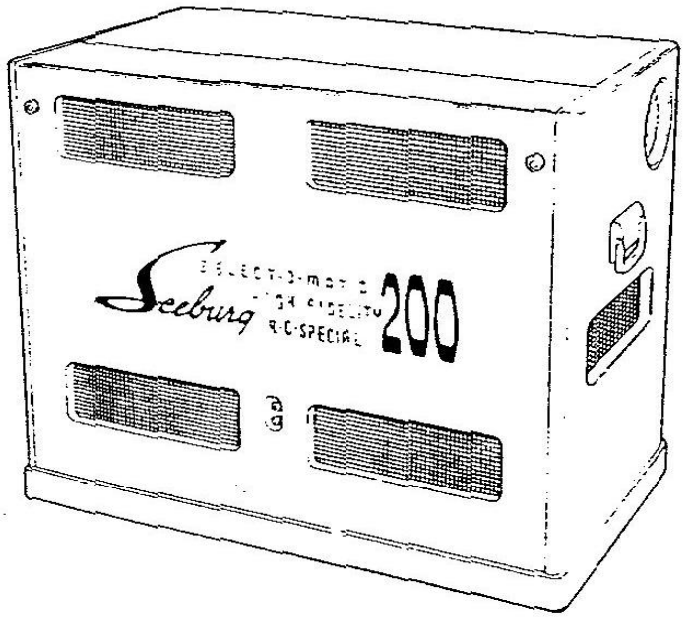


Figure 41. Electrical Selector Panel

PARTS LIST

Item	Part No.	Part Name
1	914582	Sems
2	408130	Switch Tie Strap
3	408129	Spacer (Switch)
4	408128	Selector Switch
5	912965	Sems
6	914116	Sems
7	408132	Button Stop Bracket (Short)
8	915351	Sems
9	408058	Selector Panel Stop Bracket
10	408124	End Plate – R. H.
	408125	End Plate – L. H.
11	915416	Sems
12	408122	Selector Panel (Casting)
13	408140	Latch Assembly – R. H.
	408141	Latch Assembly – L. H.
14	914332	Sems
15	408123	Lower Selector Panel
16	915724	Sems
17	408146	Latch Assembly Center
18	408210	Classification Strip - (Hit Tunes)
	408211	Classification Strip - (Rhythm & Blues) (V-200)
	408796	Classification Strip - (Rhythm & Blues) (VL-200)
	408212	Classification Strip - (Folk & Western) (V-200)
	408797	Classification Strip - (Folk & Western) (VL-200)
	408213	Classification Strip - (All Time Favorites) (V-200)
	408795	Classification Strip - (All Time Favorites) (VL-200)
	408214	Classification Strip - (Classics & Varieties) (V-200)
	408798	Classification Strip - (Classics & Varieties) (VL-200)
19	408127	Selector Switch Button
20	410226	Selector Key Stop
21	410225	Spring Clip
22	410630	Selector Key Panel Assembly (A - K) (V-200)
	410633	Selector Key Panel Assembly (A - K) (VL-200)
	410610	Keys A - K (Set of 10) (V-200)
	410613	Keys A - K (Set of 10) (VL-200)
	410631	Selector Key Panel Assembly (L - V) (V-200)
	410634	Selector Key Panel Assembly (L - V) (VL-200)
	410611	Keys L - V (Set of 10) (V-200)
	410614	Keys L - V (Set of 10) (VL-200)
	410632	Selector Key Panel Assembly (1 - 0) (V-200)
	410635	Selector Key Panel Assembly (1 - 0) (VL-200)
	410012	Keys 1 - 0 (Set of 10) (V-200)
	410615	Keys 1 - 0 (Set of 10) (VL-200)
	410353	Selector Key Separator
	410638	Selector Key Panel Casting
23	410223	Bearing Strip
24	913097	Machine Screw
25	410336	Spring
26	914143	Sems
27	408135	Lens Holder Assembly
	408134	Classification Lens
28	407146	Cup Washer
29	914144	Sems
30	F7814	Lamp Socket
31	402180	(F7817) – No. 81 Lamp
32	408138	Reflector
33	408133	Switch Mounting Channel
34	408131	Button Stop Bracket (Long)
35	408151	Support Bracket & Spring Assembly (End)
	408152	Support Bracket & Spring Assembly (Center)

SEEBURG SELECT-O-MATIC "200"
MODEL HV-200, HVL-200



The Select-O-Matic "200" R. C. Special, Model HV200 and HVL-200 are for use in "hide-away" installations where the available space does not permit the use of a standard coin-operated model. The Model HV-200 and HVL-200 differ only in the color of the mechanisms and in the type of selection receiver. They use the Seeburg Select-O-Matic "200" Mechanism for selective playing of either or both sides of one hundred 45 r.p.m., 7-inch records with 1½ inch center hole. Choice of any of the two hundred selections is made by remote control with the 200-selection, 3-wire Wall-O-Matics. Sound is distributed to the areas to be served by means of High Fidelity remote speakers connected to the High Fidelity Master Amplifier in the R. C. Special.

The cabinet is of wood, finished in multi-color sandel brown and is divided into two compartments. One compartment contains the Select-O-Matic "200" Mechanism, the other is used for the electronic equipment. A door on the front provides access to the mechanism and electronic equipment for record changing and service. Switches, which operate when the front door is opened, turn on service lights for illumination of the mechanism and connect a monitor speaker for checking record and amplifier operation. A three position service switch is located in the upper right hand corner of the electronics compartment. When the switch lever is set in the vertical (center) position, the power is off, and the mechanism will not operate even though selections are "set up" on the Tormat Memory Unit. When the switch lever is moved to the right against the spring return, it causes the mechanism to scan the carriage; in this position it will scan past and bypass selections set up on the Tormat Memory Unit. The service switch must be set towards the left for normal operation.

A Seeburg Magnetic Pickup assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A High Fidelity 25-watt amplifier connects to the monitor speaker and to remote speakers. The amplifier incorporates an automatic volume compensator to provide uniform volume level and avoid "blasting" due to "loud" records. A noise suppression circuit is also provided to control the frequency range of the amplifier providing the most satisfactory reproduction consistent with conditions of records to be played. The volume of the sound from the High Fidelity remote speakers is controlled by means of a volume control which can be installed at any conveniently accessible place. The volume control is mounted in a small plastic case which includes a push button for cancelling a playing selection.

The Tormat Selection Receiver incorporates the switches and relays for remote selection operation as well as the control circuits of the mechanism and provides power for up to six

Wall-O-Matics. An Auxiliary Power Supply unit (furnished as standard equipment) provides power for operation of up to six additional Wall-O-Matics. The Selection Receiver and the furnished Power Supply Unit will, then, furnish power for up to twelve Wall-O-Matics. More than twelve Wall-O-Matics may be used by the addition of more auxiliary power supplies – one for each additional six Wall-O-Matics. The Selection Receiver is equipped with sockets for convenient plug-in connections for the mechanism, cabinet lights, amplifier, and control circuits.

A Popularity Meter is included in the mechanism for determining the number of times the different records have been played.

The Tormat Selection Receiver and the Amplifier are mounted on rails in the bottom of the hideaway cabinet in a horizontal position and can be removed for inspection or servicing by pulling forward, lifting and resting the units on edge on top of the rails.

SPECIFICATIONS

Power Requirements:
117 volts, A. C., 60 cycle
Standby (without Wall-O-Matics).....71 watts
Operating (without Wall-O-Matics).....225 watts
For each V-3WA Wall-O-Matic, add to standby power requirements.....15 watts

Cabinet Key Number.....F314

Mechanism.....Type 245ST2-L6 (HV-200)
Type 245ST4-L6 (HVL-200)

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

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

Pickup.....Seeburg High Fidelity Magnetic

Monitor Speaker .....5" p. m.

Amplifier: Type HFMA1-L6
8-tube, High Fidelity Constant Voltage Type with Automatic Volume Compensator.
Audio Power Output (at full volume).....
.....25 watts, max.

Selection Receiver.....Type TSR2-L6 (HV-200)
Type TSR4-L6 (HVL-200)

Remote Speakers:
Seeburg High Fidelity Type

Volume Control:
(Remote) Type MRVC-2

Remote Control:
Type....Seeburg, 3-wire "Wall-O-Matic" "200"
Nominal operating voltage.....25
Power source for Wall-O-Matics-Tormat Selection Receiver and One Power Supply (Standard Equipment) Type PS6-1Z)
Receiver and Power Supply.....(Type PS6-1Z)
Maximum number of Wall-O-Matics operated from Selection Receiver.....6
Maximum number of Wall-O-Matics operated from Power Supply.....6

Tubes:
1 – 5879
1 – 6SN7GTB
1 – 6SK7/6SK76T
1 – 6SL7-GT
1 – 12AX7
2 – 6L6GT/6L6
1 – 5U4G-GB
4 – 2D21 (TSR2-L6)
1 – OA2 (TSR2-L6)
2 – OA2 (TSR4-L6)
1 – 6X4
2 – 2050 (TSR4-L6)

Fuses:
1 – 5 amp. 3AG
1 – 2 amp. 3AG
1 – 3 amp. Fustat (TSR2-L6)
1 – 3.2 amp. N 3 2/10 (TSR4-L6)
5 – amp. (Pig Tail Type 6JV)
1 – 3 amp. Fustat (PS6-1Z)

Dimensions:
Height.....30¼ Inches
Width.....36 Inches
Depth (front to back).....20½ Inches
Net Weight.....220 Pounds
Shipping Weight .....277 Pounds

SELECT-O-MATIC "200"
R.C. SPECIAL, MODEL HV-200
INSTALLATION AND OPERATION

The Select-O-Matic "200" Hide-Away Model HV-200 is similar in most operational respects to Model V-200. The installation and operation data for the Model V-200, manual pages 1247 to 1261 applies except where reference is made to cabinet features, the electrical selector and phonograph speaker connections. A typical speaker installation is shown below.

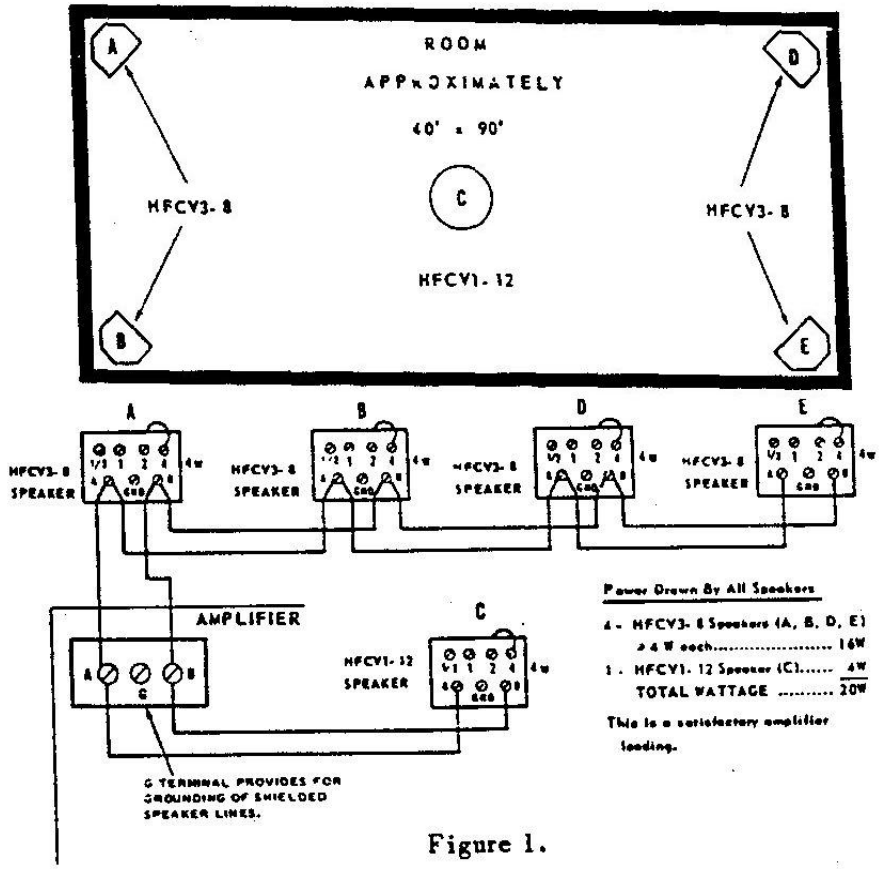


Figure 1.

ADDITIONAL PARTS LIST

Part No.	Part Name	Part No.	Part Name
407262	Caster, Rubber Tread Wheel	408414	Mechanism Mounting Channel
407261	Caster, Steel Wheel	408615	Lock Strike Plate
408607	Cabinet Handle	408616	Door Assembly
408609	Compartment Shield	408610	Vent Screen (Door)
408610	Vent Screen (Side)	408673	Shield
408611	Floor Screen	408290	Door Lock Assembly
408612	Screen (Back)	408620	Guide Channel (Electronic), R.H.
404819	Speaker Grille Screen	408621	Guide Channel (Electronic), L.H.
408118	Mechanism Mounting Channel	408622	Guide Channel (Power Supply)

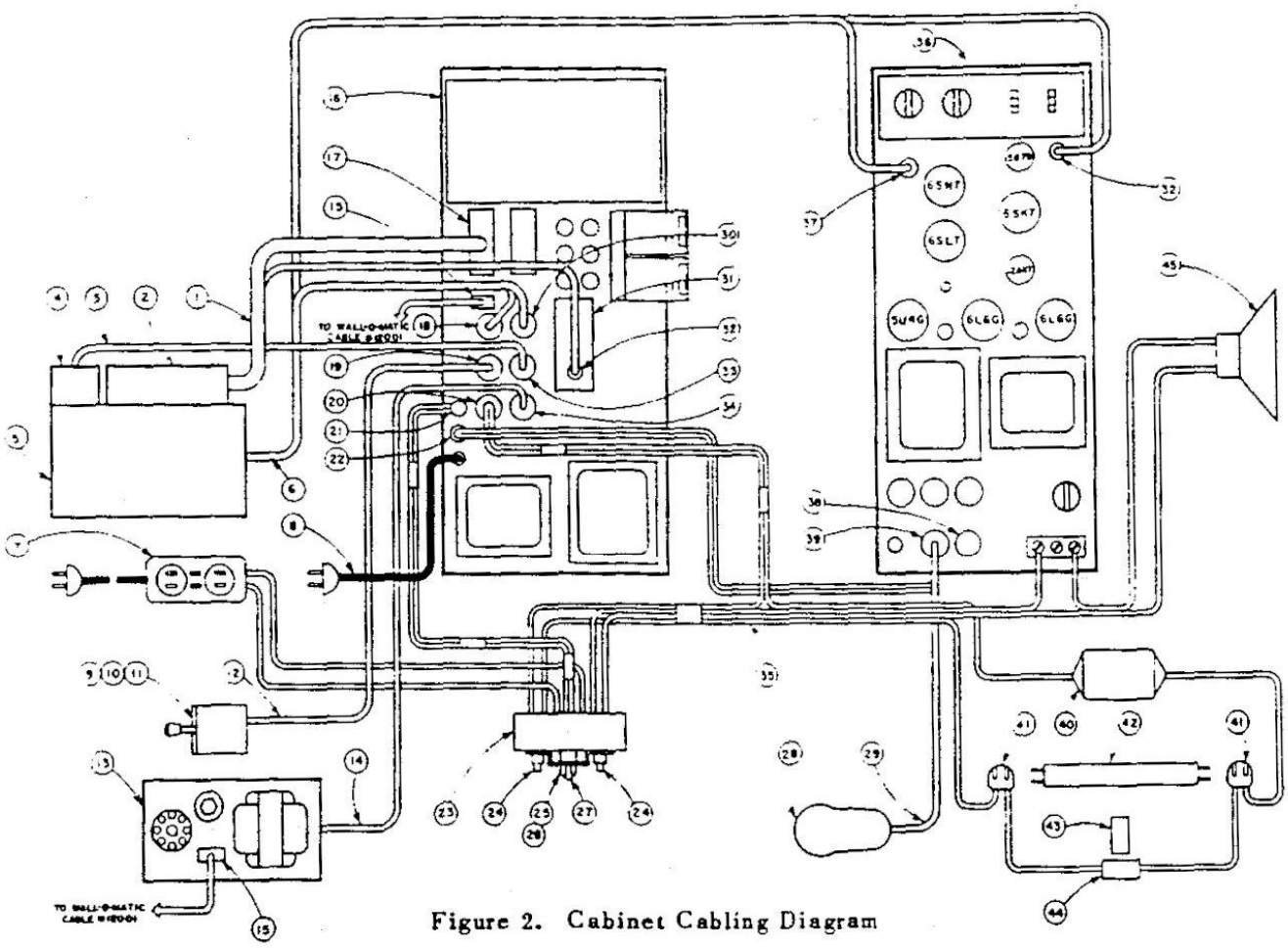


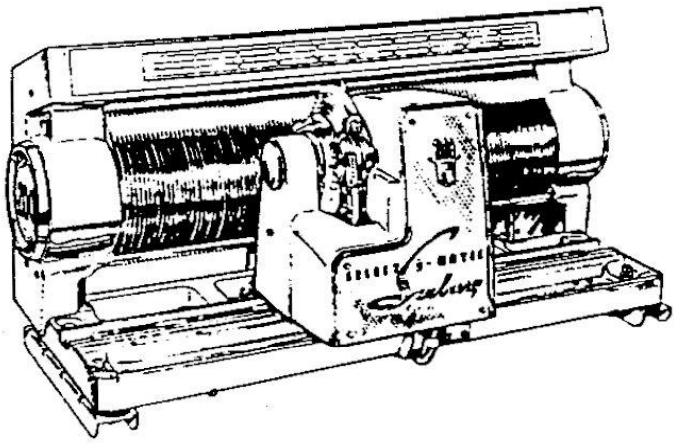
Figure 2. Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	304655	Tormat Memory Cable Assembly
2	304600	Tormat Memory Assembly (200TM1)
3	247102	Scan Control Cable & Plug Assembly
4	247092	Scan Control Assembly
5	247003	Select- O- Matic Mechanism (245ST2- L6)
6	247820	Control Cable Assembly
7	408648	Line Cord & Outlet Assembly
8	303572	Line Cord Assembly
9	408632	Service Switch Assembly
10	408171	Service Switch
11	600023	Manual Trip Switch
12	408649	Service Switch Cable & Plug Assembly
13	60485	Auxiliary Power Supply (PS6- 1Z)
14	14219	Power Cable & Plug Assembly
15	12015	3 Prong Plug
16	303502	Tormat Selection Receiver, TSR2- L6
17	304657	33 Prong Plug
18	65319	6 Prong Plug
19	52117	7 Prong Plug
20	10895	2 Prong Plug (AC)
21	408253	3 Prong Plug
22	601170	2 Prong Plug
23	408681	Power & Interlock Switch & Cable Assembly
24	600024	Interlock Switch (Normally Open)
25	408676	Pilot Light & Cable Assembly
26	602336	Socket & Jewel Assembly
27	303112	Toggle Switch (Power Switch)
28	503180	Master Remote Volume Control (MRVC- 2)
29	503189	Plug & Cable Assembly
30	250942	11 Prong Plug
31	303590	Pulse Amplifier
32	246957	Single Prong Plug
33	F-200241	5 Prong Plug
34	12004	9 Prong Plug
35	408682	Cable Assembly
36	305270	High Fidelity Master Amplifier (HFMA1- L6)
37	250938	3 Prong Plug
38	305223	4 Prong Plug (Dummy Plug)
39	305322	9 Prong Plug
40	408243	Fluorescent Lamp Ballast (20 Watt)
41	408628	Fluorescent Lamp Socket
42	408652	Fluorescent Lamp (15 Watt- Cool White)
43	405138	Lamp Starter (25 Watt)
44	407353	Starter Socket
45	405346	Speaker (Monitor Speaker)

Seeburg

SELECT-O-MATIC "200" MECHANISM
TYPE 245ST1-L6



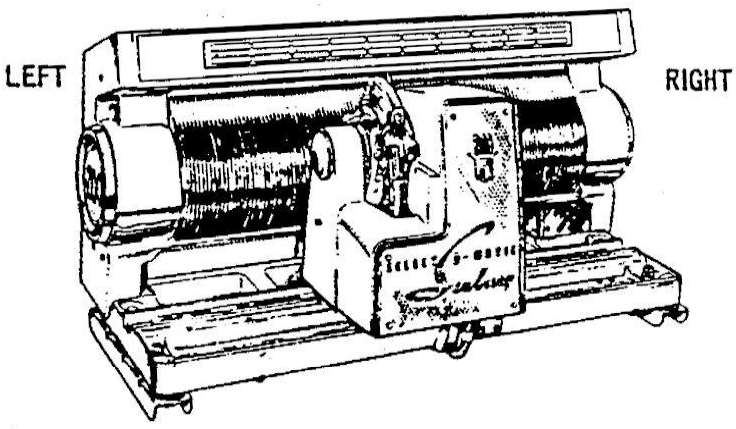
The Select-O-Matic "200" Mechanism, Type 245ST1-L6 is designed for use with 45 r.p.m., 7-inch records in the Select-O-Matic "200" Model V-200 in association with the Seeburg Tormat Memory System for selection.

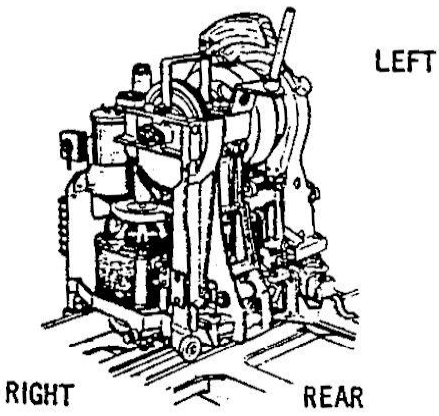
– ADJUSTMENT INDEX –

ADJUSTMENT PREFACE

The adjustments for the 45 r.p.m. Select-O-Matic "200" Mechanism, Type 245ST1-L6. are given on the following pages. Each adjustment is associated with a step-by-step procedure which, if followed, will result in correct adjusment and normal operation. These individual adjustments may be made in any sequence but they are, in some instances, dependent on or affected by others. Because of this, they are arranged in a sequence which may be followed from page to page if a completely misadjusted mechanism is to be placed in operating condition. If an individual adjustment is to be checked or made, careful attention should be given to notes indicating dependent adjustments.

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





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

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

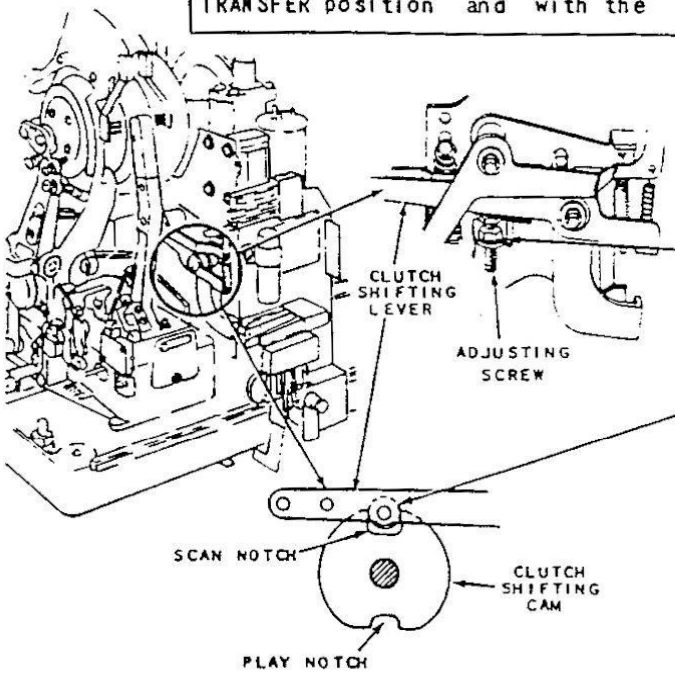
TRANSFER - - in which the record is transferred from the magazine to the playing position or from the playing position to the magazine.

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

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

"CLUTCH I" - - 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

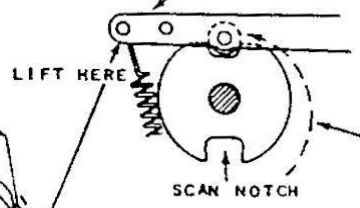


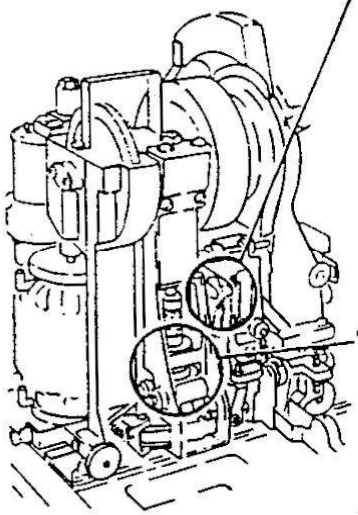
(A) Scan Carriage to front of U0-V0 record space. Leave it in SCAN position.

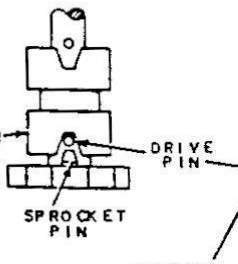
(B) Loosen lock nut and turn Adjusting Screw down to limit.

(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.



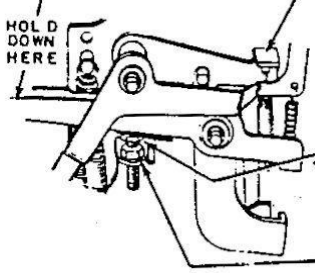




(D) Check Trip Mechanism position. The Trip Mechanism should be latched with Release Lever down to limit.

(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.

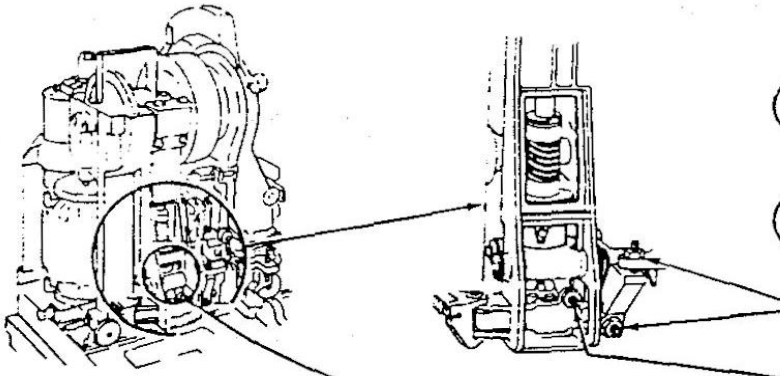
2307

"CLUTCH 2" - - SPROCKET CLEARANCE AND DETENTING ADJUSTMENT

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

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

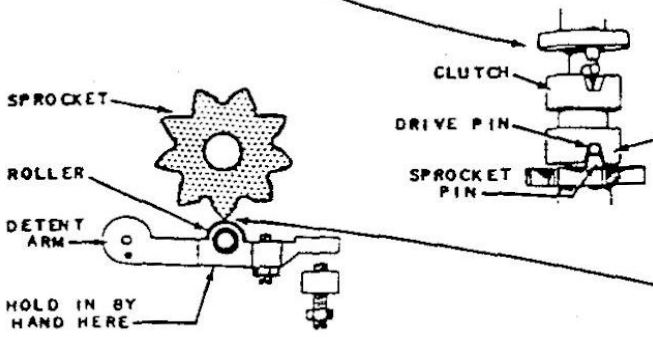
NOTE 2: - If "Clutch 2" adjustment is changed in any way, "Clutch 3 and 4" should be re-adjusted. "Clutch 2, 3 and 4" are related to an extent that a change of "Clutch 2" can cause damaging strains at adjusting screws for "Clutch 3 and 4".



(A) Scan Carriage to right end beyond V 0 position.

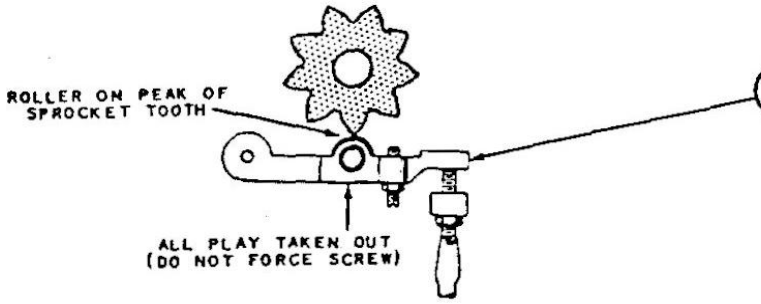
(B) Loosen lock nuts and turn these adjusting screws out to the limit;

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

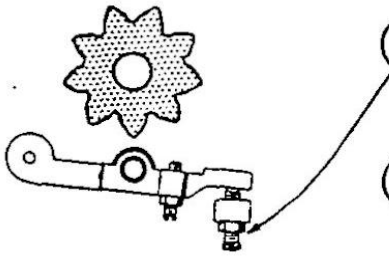


(C) Mechanism should still be in SCAN position, beyond V 0, with Clutch all the way down (against lower Drive Pin) and engaged with Sprocket Pin.

(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.)



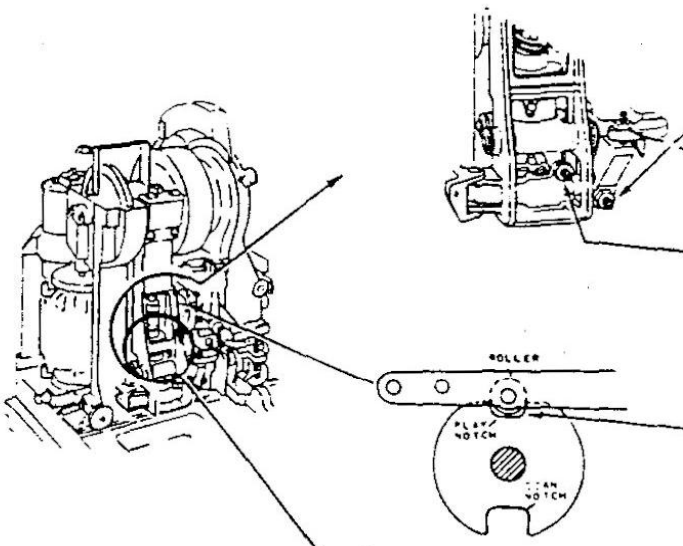
(F) Now, back out, the screw 2 turns and tighten the lock nut. This establishes correct clearance.

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

2308

"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.

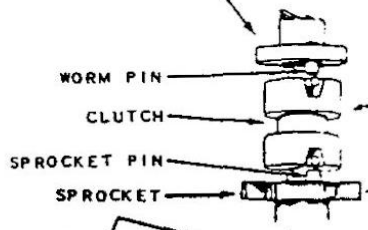
(A) Loosen Lock Nuts and turn these adjusting screws out to the limit:

"Clutch 3"

"Clutch 4"

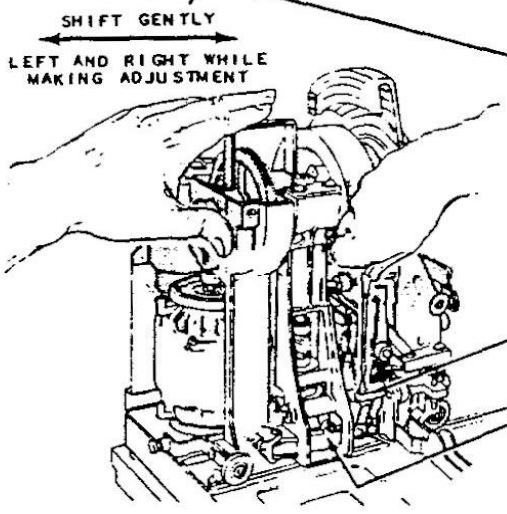
(B) Place mechanism in VO PLAY position. Be sure mechanism is fully in PLAY position.

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



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

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

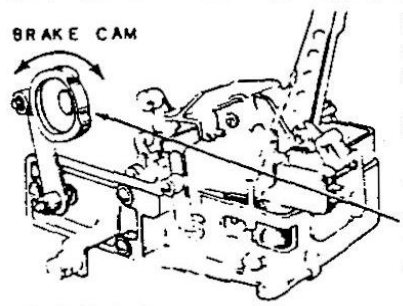


(C) While gently shifting Carriage to Left and Right by hand, - - -

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

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

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



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

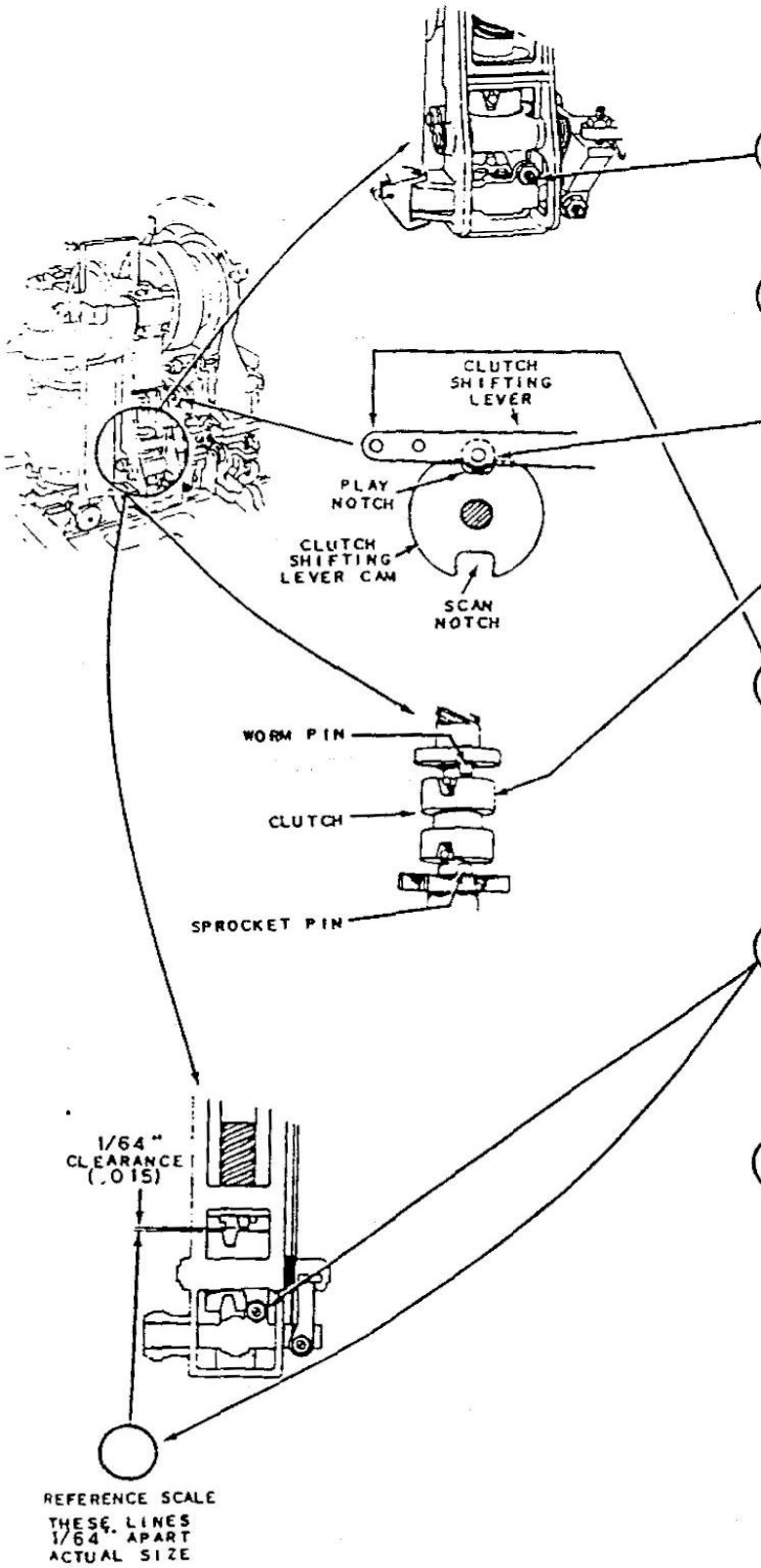
Do not force adjusting screw.

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

"CLUTCH 4" - - CLUTCH PLAY POSITION ADJUSTMENT

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

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



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

(B) Place mechanism in V0 PLAY position. Be sure mechanism is fully in PLAY position.

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

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

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

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

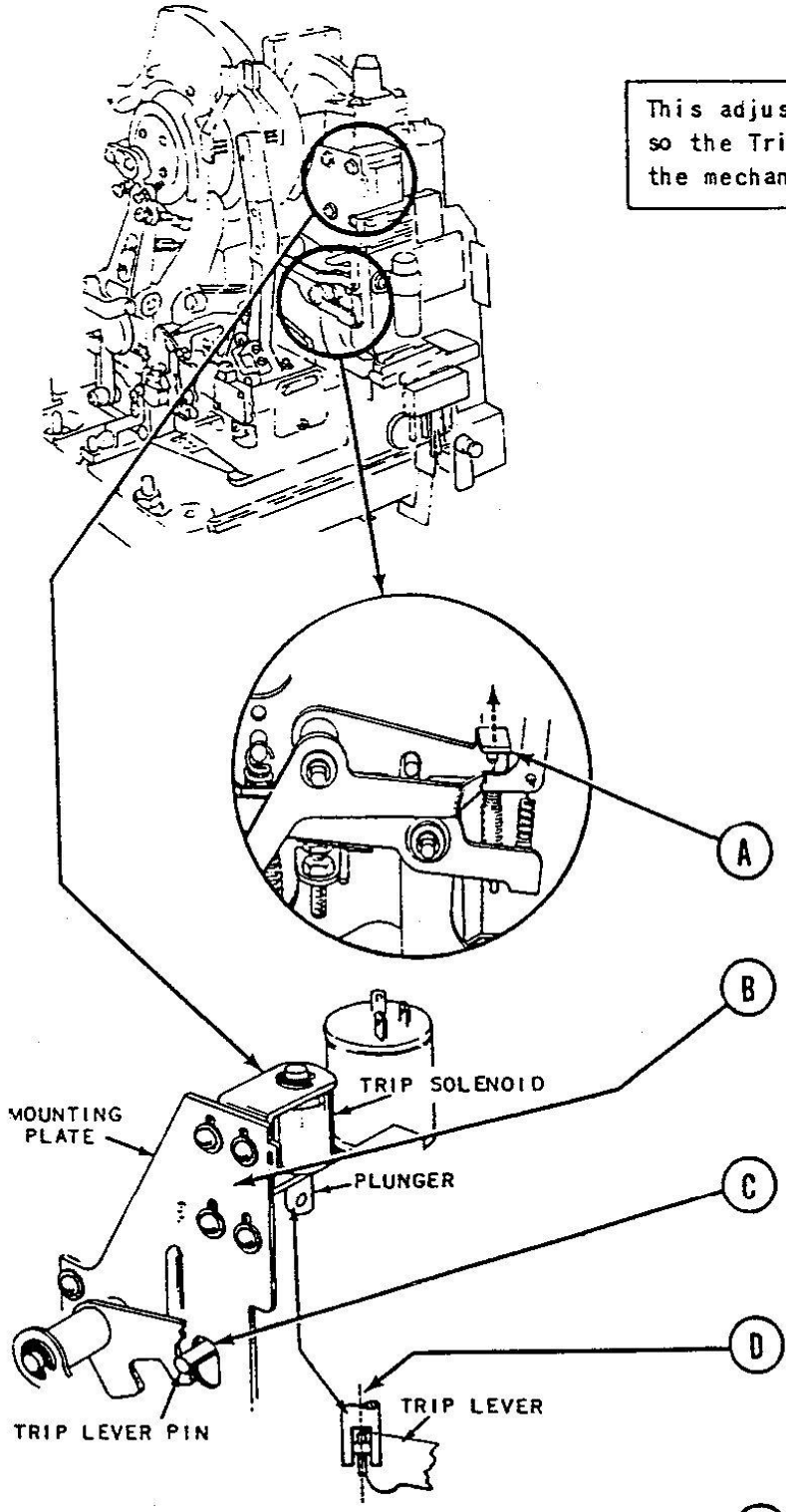
(E) Tighten Lock Nut.

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

2310

"TRIP SOLENOID I" - - TRIP SOLENOID POSITION

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



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

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

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

(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.

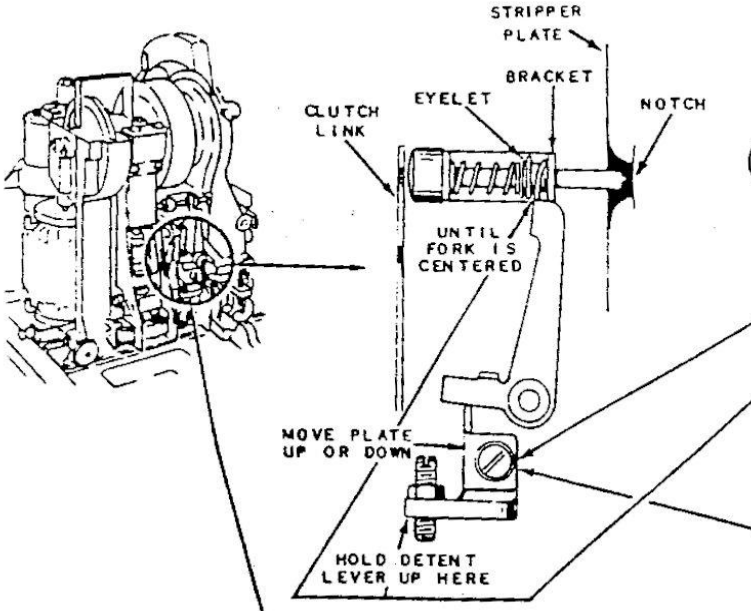
(E) To avoid binds the Plunger must have horizontal play when the Trip Lever is in either extreme up or down position.

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

"SAFETY LEVER 1" - - SAFETY LEVER POSITION

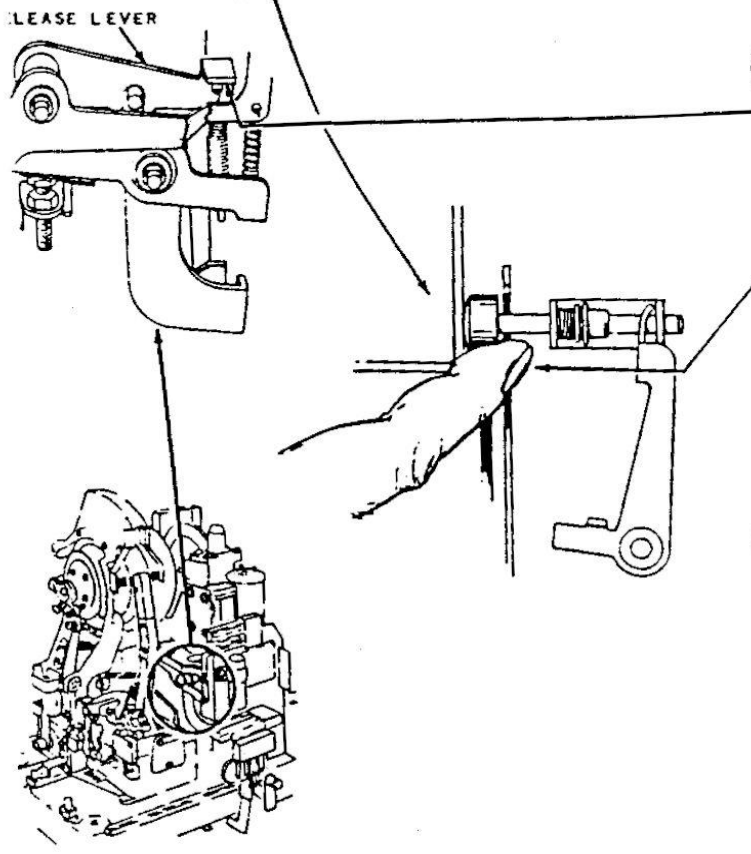
This adjustment establishes the correct position of the Safety Lever and results in proper travel of the Safety Plunger when the mechanism is entering PLAY or SCAN position.

(A) Scan Carriage to right end beyond V0 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,

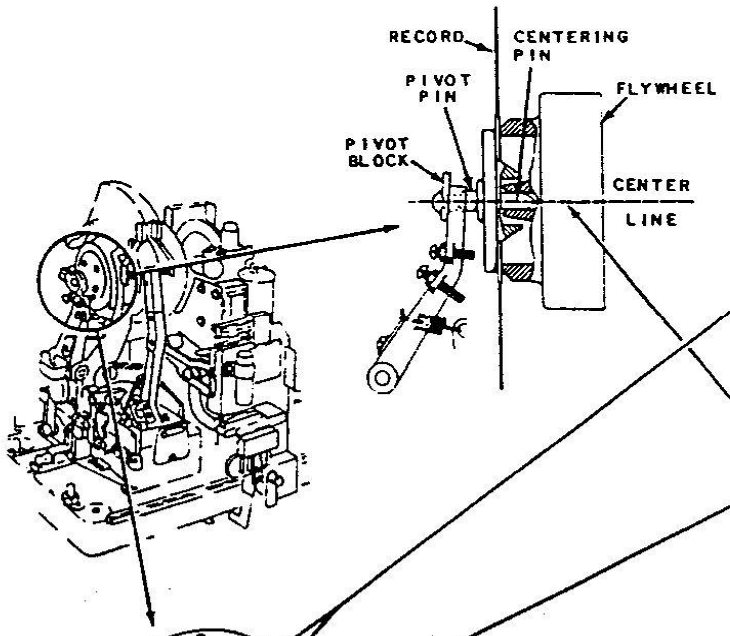
1. Trip the mechanism by manually lifting the Release Lever.
2. Pull Plunger all the way over to the left (as shown) and release slowly to right. Plunger should return freely without binds.

(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.

2312

"CLAMP ARM 1" - - PIVOT PIN ALIGNMENT

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



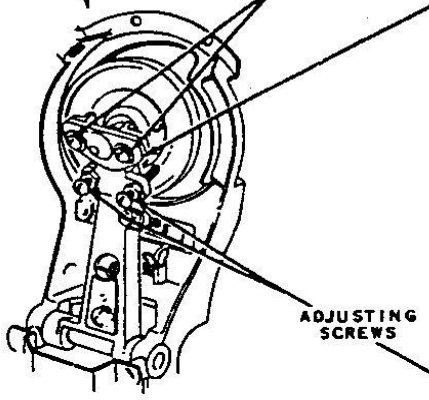
(A) Place mechanism in PLAY position with a record clamped on the Flywheel.

(B) Loosen Pivot Block Screws.

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

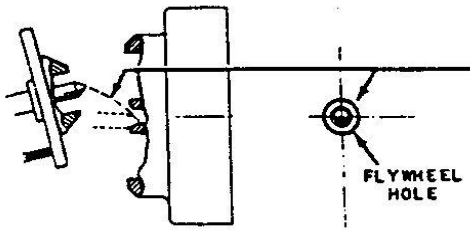
"CLAMP ARM 2" - - CENTERING PIN POSITION

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" adjustment should be correct before making this adjustment.

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

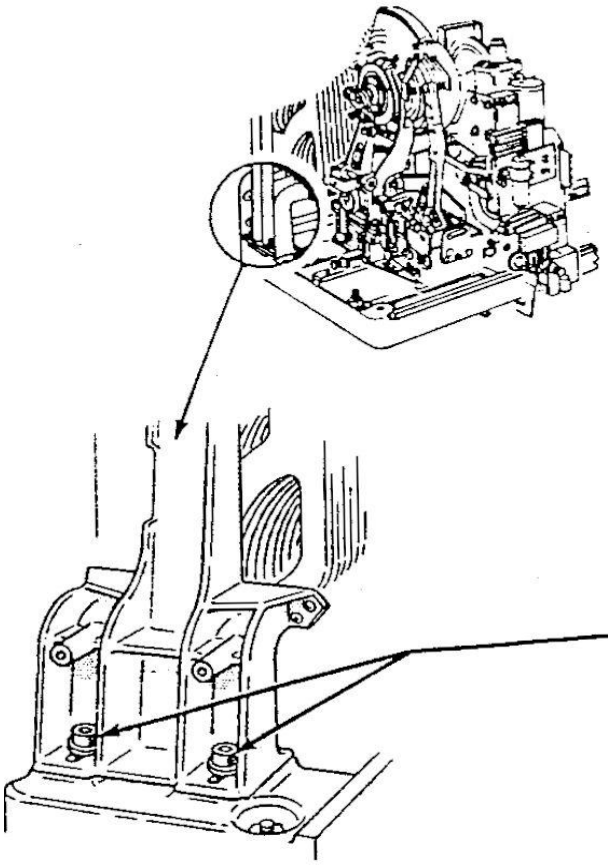


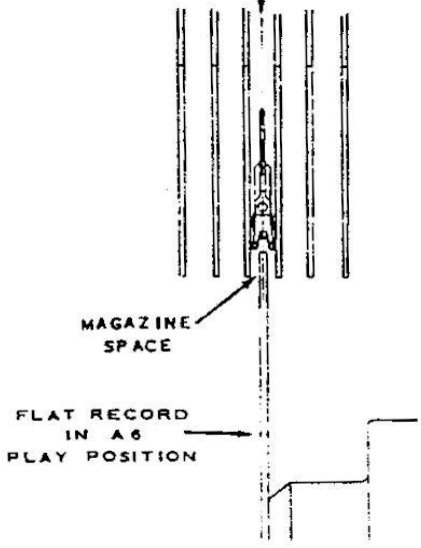
(B) Tip of Centering Pin enters Flywheel hole as shown.

(C) Tighten Lock Nuts.

"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 A6 PLAY position. (Be sure the record is FLAT - not warped, not dished.)

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

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

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

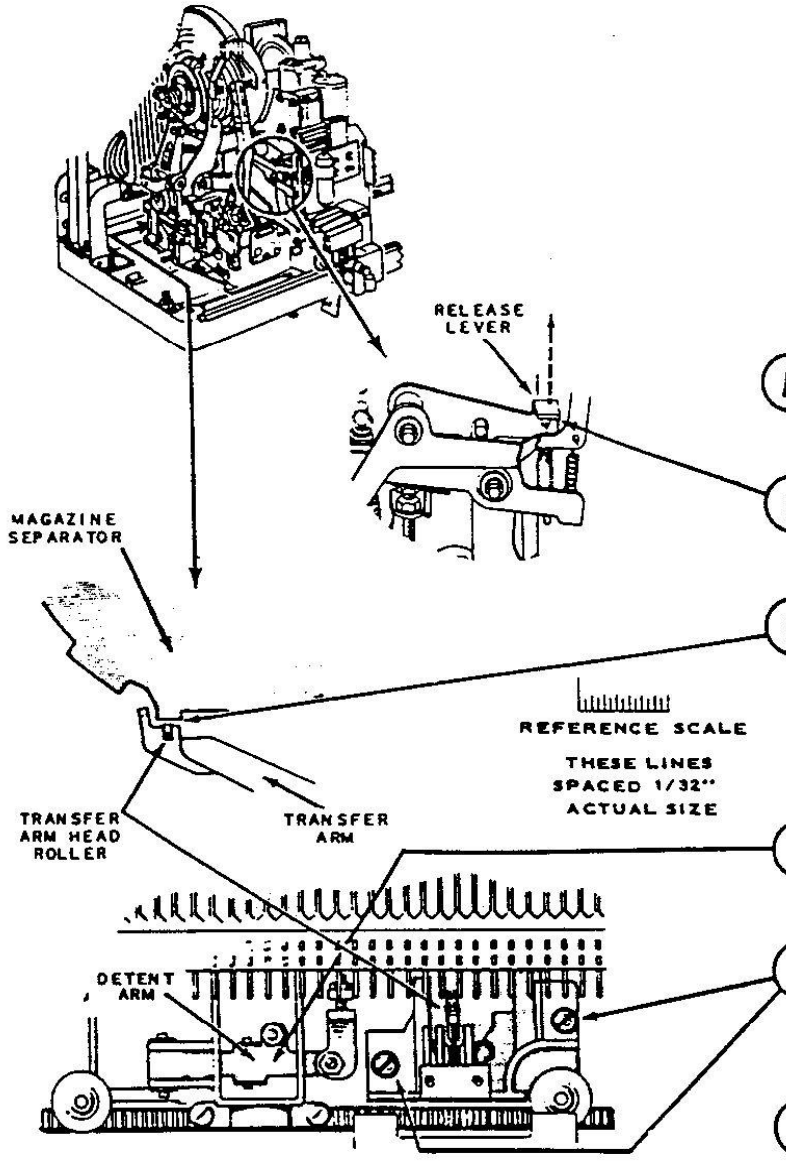
NOTE: - If the Magazine position is changed be sure to check

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

2314

"TRANSFER ARM I" - - ALIGNMENT TO MAGAZINE

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



REAR VIEW WITH TORMAT MEMORY UNIT REMOVED

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

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

(A) Scan the mechanism to A6 position and turn off power.

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

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

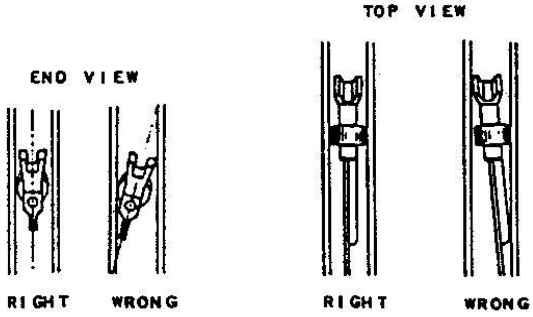
(D) Push in on Detent Arm to take out Carriage Side Play.

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

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

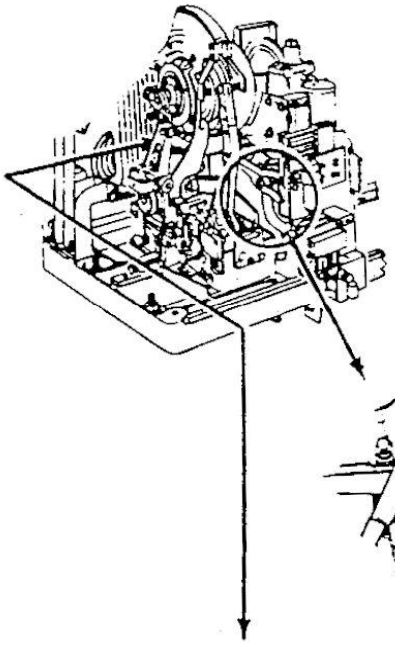
(G) When the Transfer Arm enters the space, the Transfer Arm Head should be parallel to the Magazine Separators as shown. Straighten Arm if necessary to correct Transfer Arm Head alignment.

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

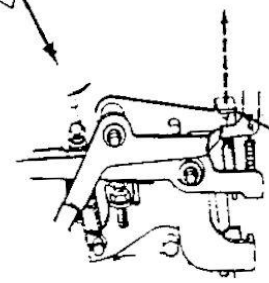


"TRANSFER ARM 2" - - PLAY POSITION CLEARANCE

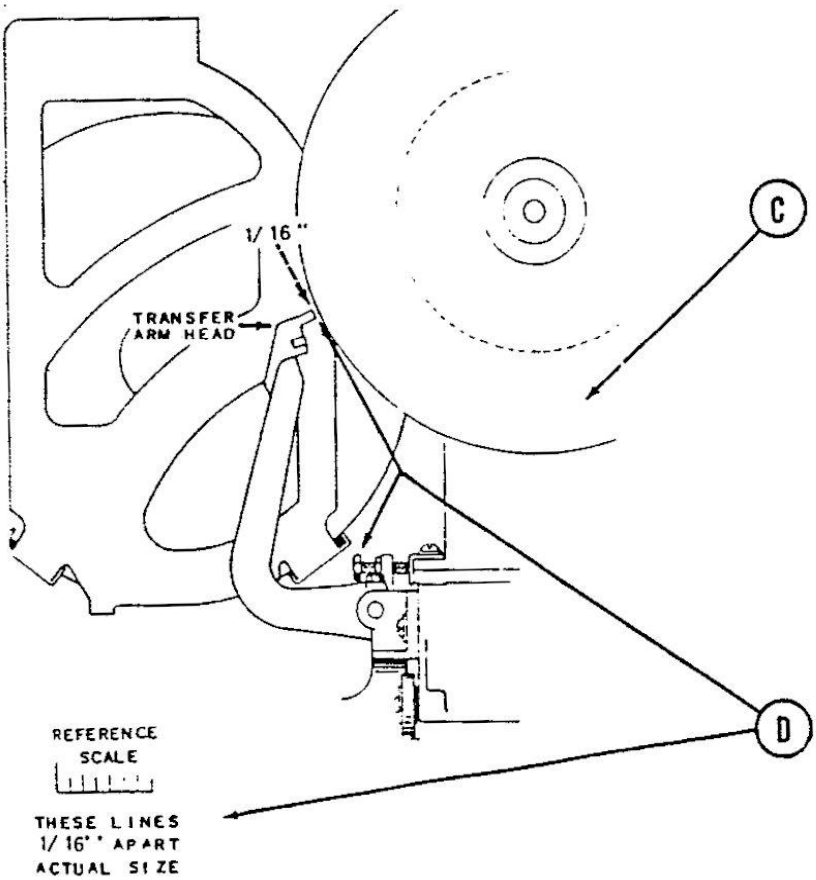
This adjustment establishes the upper limit of travel of the Transfer Arm so that records will be brougnt up high enough to be properly clampeo to the Flywheel by the Clamp Arm.



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



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



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

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

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

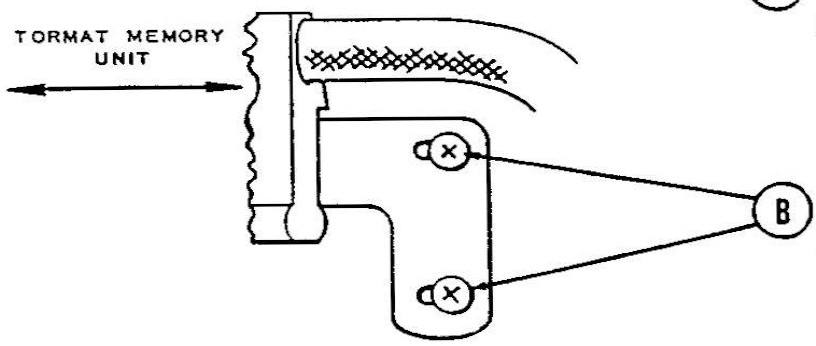
2316

"TORMAT MEMORY UNIT POSITION"

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

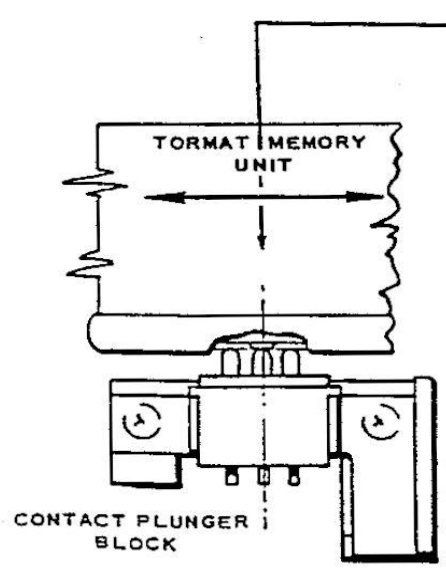
NOTE: If for any reason the Tormat Memory Unit is removed from the mechanism the Contact Plunger Block adjustments must be checked and, if necessary, corrected before making the Tormat adjustment. This may be done with a preliminary lateral adjustment of the unit by placing the mechanism at A1 and mounting it on the magazine with front and rear plungers approximately centered on the contact rivets for selections A1 and B1.

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



(A) Place the mechanism at A6 play position and turn off power.

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



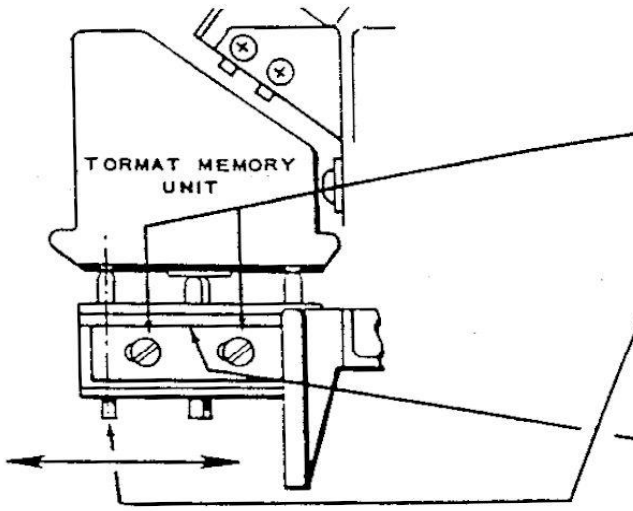
(C) Adjust the lateral position of the Unit so the contact plunger is exactly centered on the A6 contact rivet on the Tormat Unit.

(D) Securely tighten the mounting screws.

"CONTACT PLUNGER BLOCK 1" -- HORIZONTAL POSITION

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

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



REFERENCE SCALE

THESE LINES SPACED 1/16" ACTUAL SIZE

(A) Place the mechanism at A6 Play position 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.

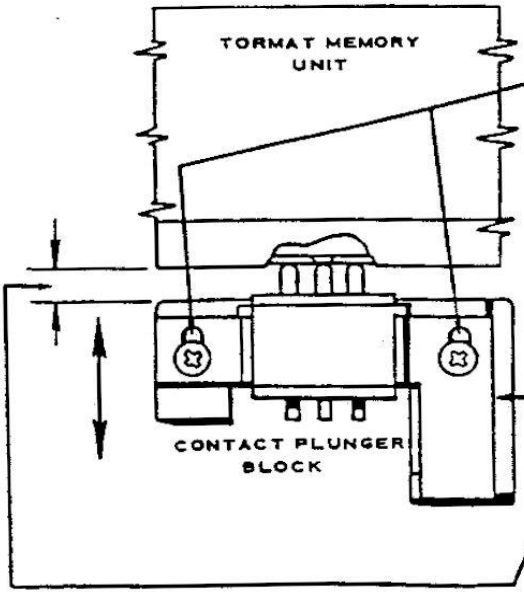
(E) Check adjustment at A1 and U0 record positions.

"CONTACT PLUNGER BLOCK 2" -- VERTICAL POSITION

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

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

(A) Place the mechanism at A6 Play position and turn off power.



(B) Loosen adjustment screws.

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

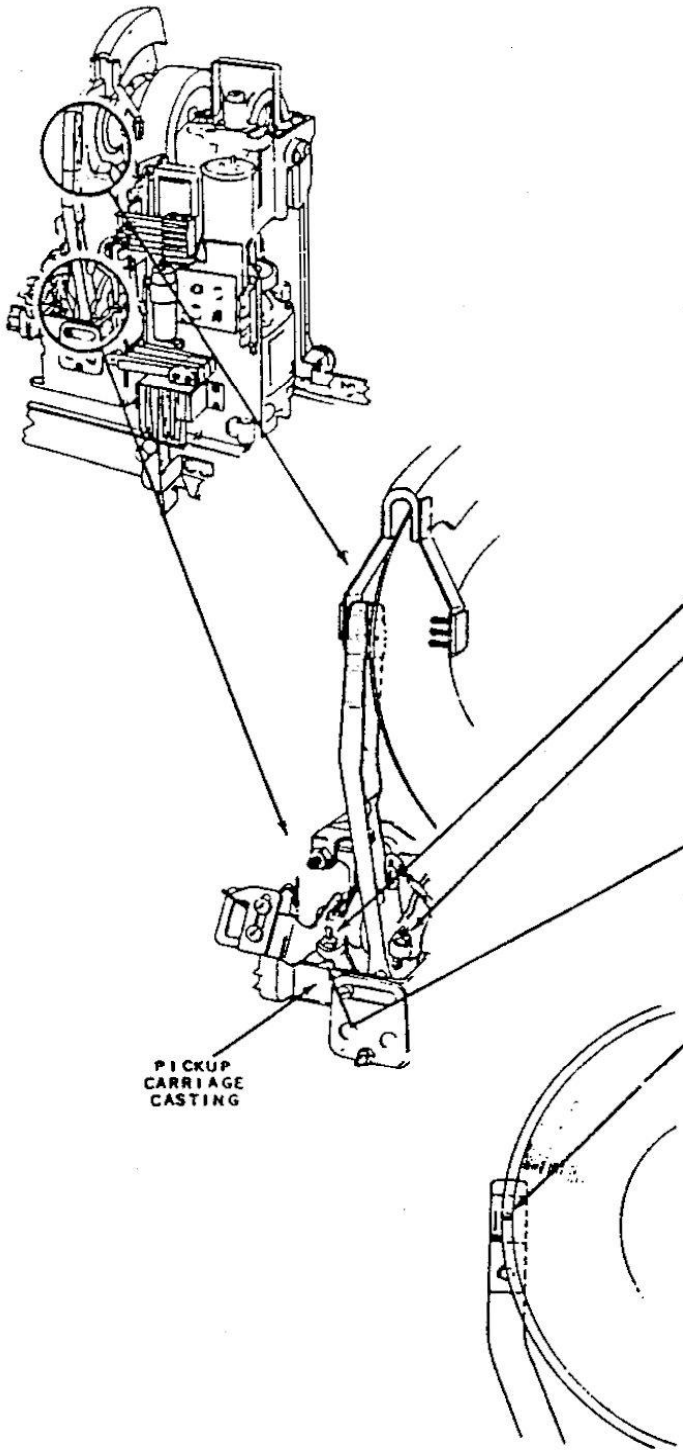
(D) Securely tighten adjusting screws.

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

(E) Check adjustment at A1 and U0 positions.

"PICKUP 1" - - NEEDLE LANDING ADJUSTMENT

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



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

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

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

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

(E) Tighten "Pickup 1" Lock Nut.

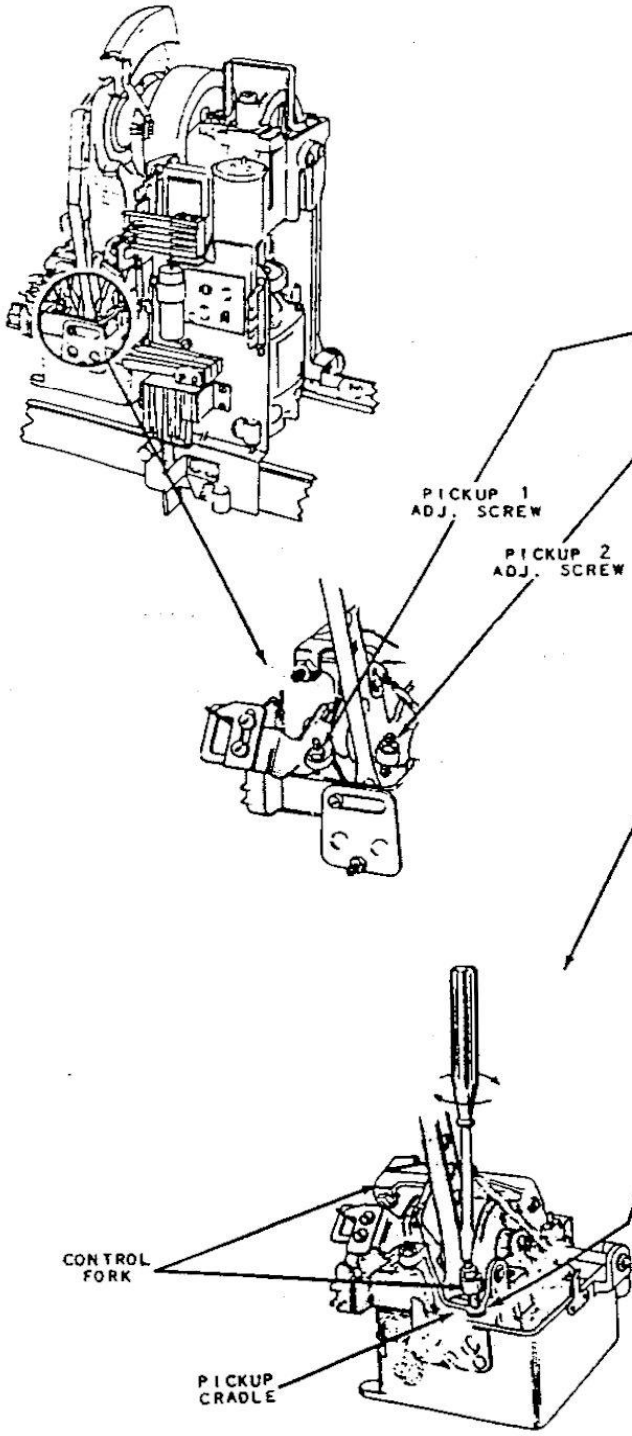
(F) Select the Right side of the same record and check for proper needle landing at the beginning of Right Side PLAY.

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

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

PICKUP 2 - - PICKUP RETURN ADJUSTMENT

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



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

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

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

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

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

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

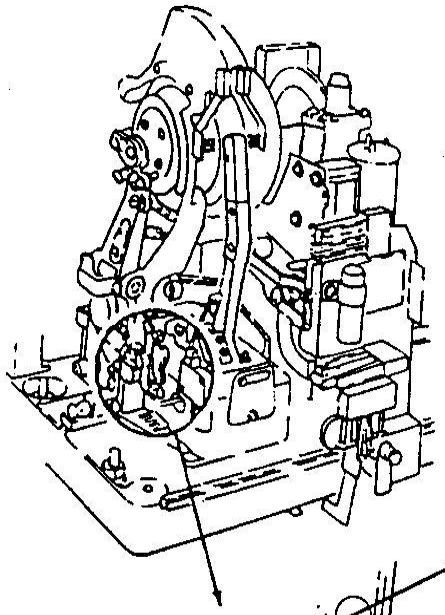
(F) Place mechanism in Right side PLAY position then return it to SCAN with Pickup Arm on Right Side. Check for equivalent up and down play of Control Fork with Pickup Arm on Right side.

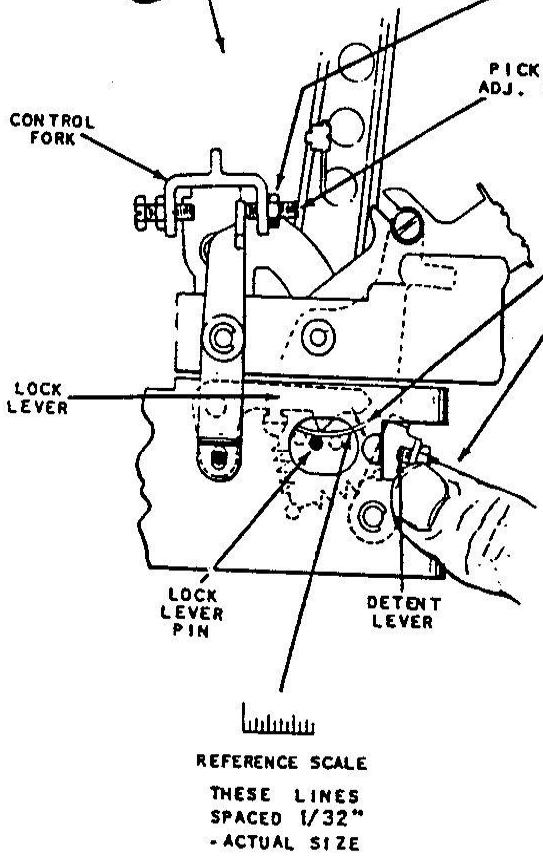
CAUTION: If "Pickup 2" Adjusting Screw is down too far (no up and down play in Control Fork) it may place a bind on the Levers and interfere with proper Pickup shifting action. A check for proper shifting of Pickup can be made by alternately selecting and playing several Right and Left sides of records.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

2320

"PICKUP 3" - - PICKUP RELEASE ADJUSTMENT

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





REFERENCE SCALE
THESE LINES
SPACED 1/32"
- ACTUAL SIZE

(A) Place mechanism in Left Side PLAY position.

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

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

(D) Tighten Lock Nut.

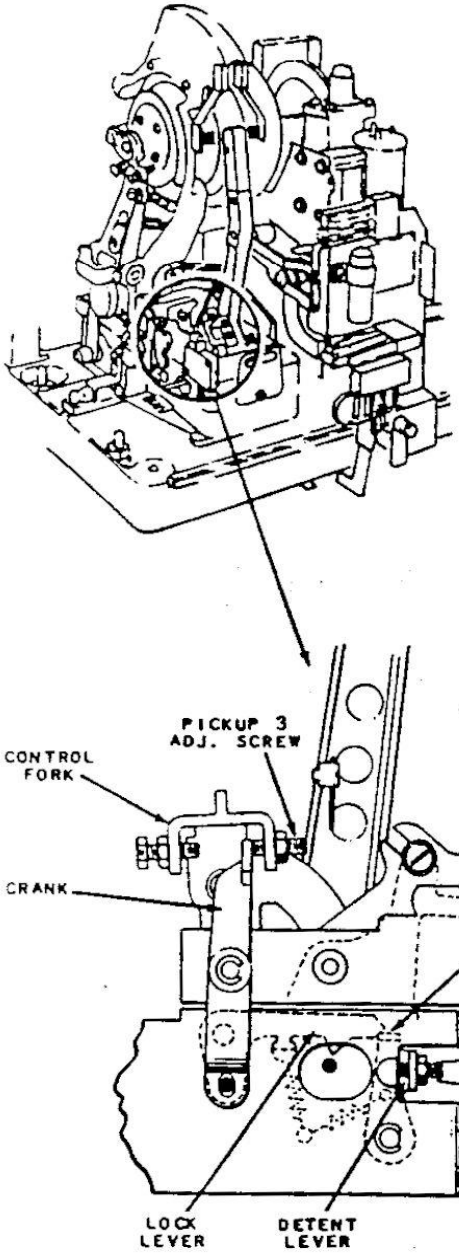
(E) Place mechanism in Right side PLAY position. While holding Detent Lever away from Lock Lever, move Pickup Arm in along record and again check for required 1/32" clearance.

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

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

"PICKUP 4" - - DETENT LEVER ADJUSTMENT

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



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

(A) Place mechanism in Right side PLAY position.

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

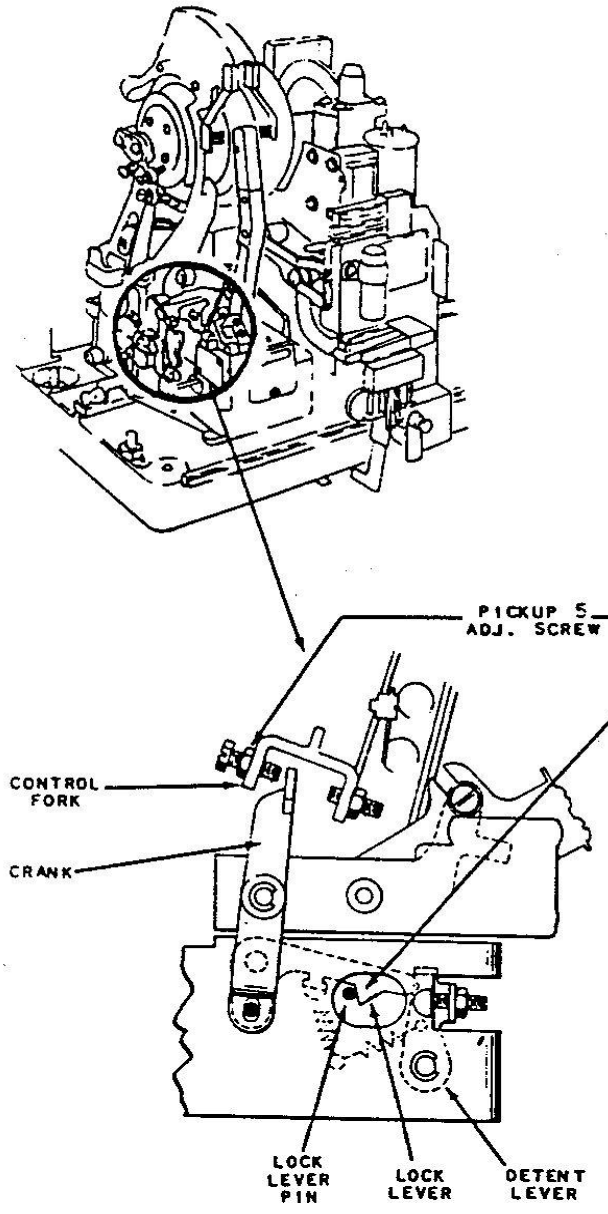
(C) Tighten Lock Nut.

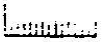
(D) To check - - manually pull top of Control Fork away from Crank. The Detent Lever should hold the Lock Lever and the Crank from moving.

2322

"PICKUP 5" - - PICKUP LOCKING ADJUSTMENT

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





REFERENCE SCALE

THESE LINES SPACED 1/32" ACTUAL SIZE

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

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

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

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

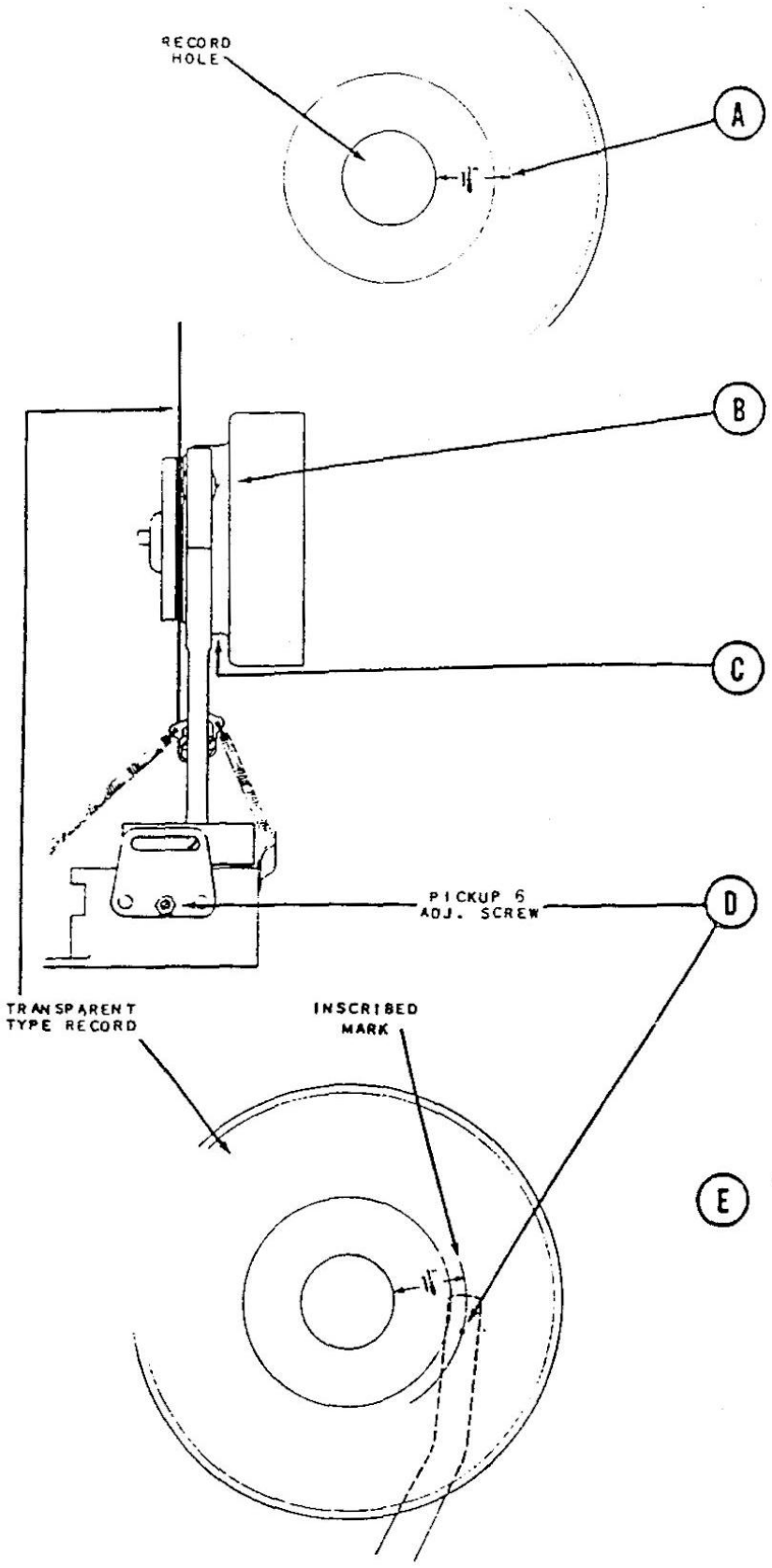
(D) Tighten Lock Nut.

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

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

"PICKUP 6" - - PICKUP ARM STOP

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



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

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

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

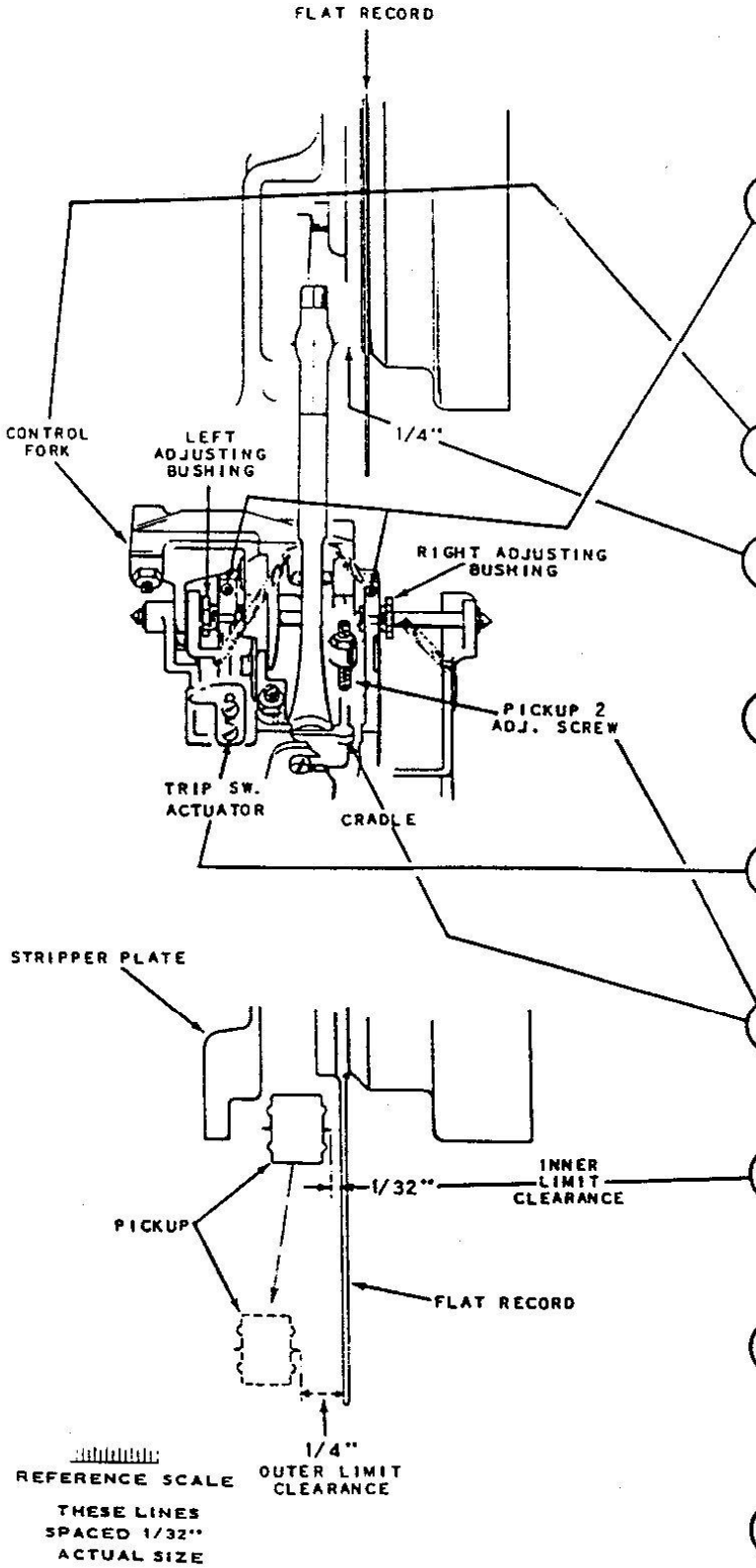
(D) Loosen Lock Nut and adjust screw so that needle cannot move in toward Flywheel any farther than the inscribed mark, as shown.

(E) Tighten Lock Nut.

2324

"PICKUP 7" - - PICKUP LIFTING ADJUSTMENTS

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



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

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

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

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

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

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

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

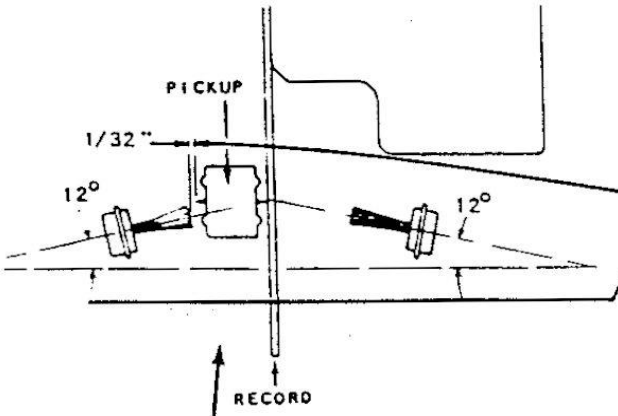
(G) In this position of the Pickup Arm and Control Fork the needle should be a minimum of 1/32" from the record.

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

(J) Tighten both set screws.

"PICKUP 8" - - BRUSH POSITION ADJUSTMENTS

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



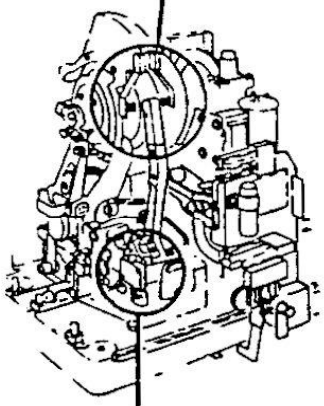
(A) The Brush Mounting Brackets are set so the bristles "point" approximately 12 degrees toward record center.

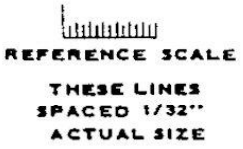
(B) The Brackets should be formed so the outer needle clears the brush by 1/32" while a record is played.

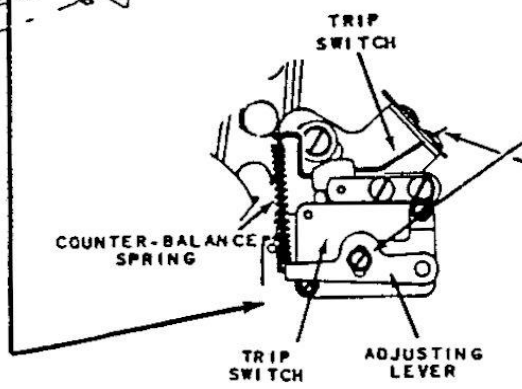
(C) Check for correct clearance on both Right and Left sides.

"PICKUP 9" - - TRIP SWITCH PRESSURE ADJUSTMENT

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







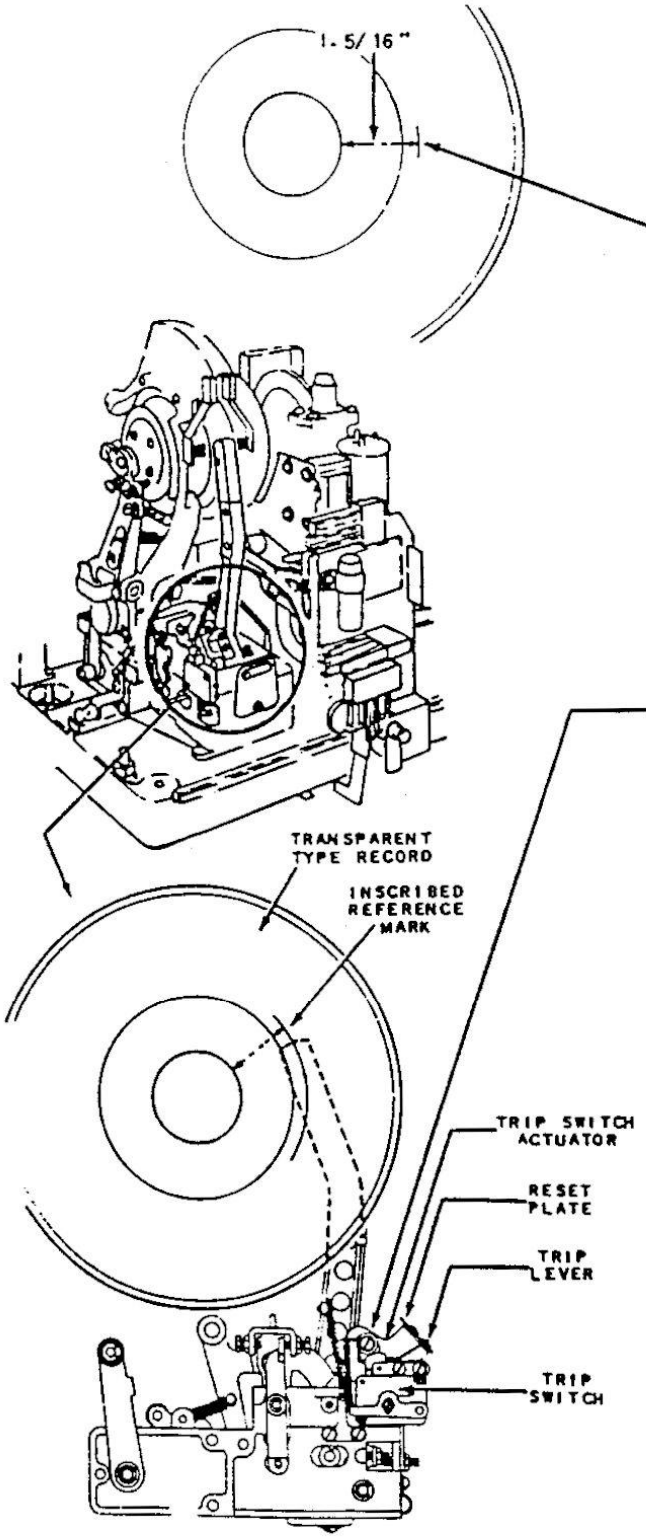
(A) Loosen screw and adjust Counter-balance Spring by moving Adjusting Lever up or down.

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

2326

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

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



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

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

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

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

(DO NOT BEND TRIP LEVER TO MAKE ADJUSTMENT.)

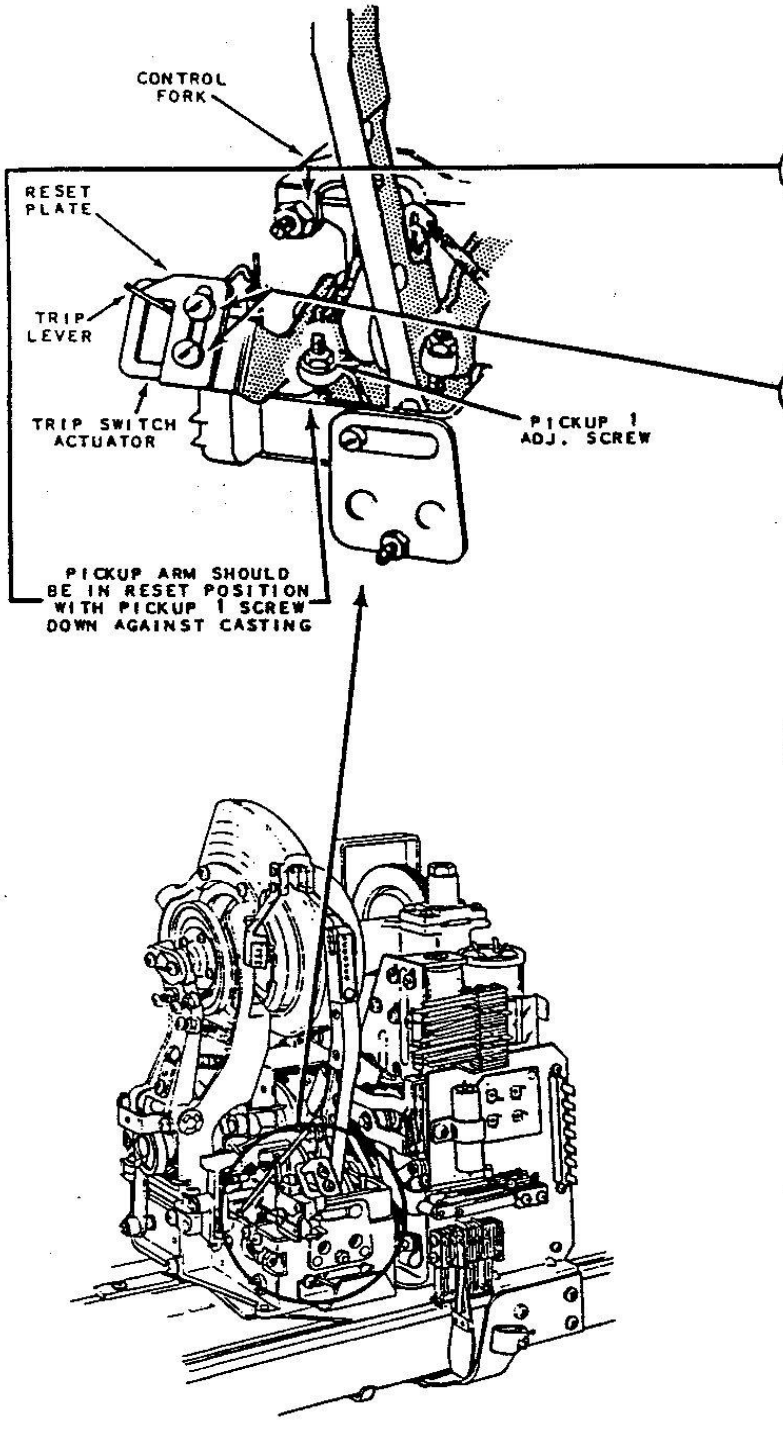
(D) Tighten screw and check for normal operation by playing several Left and Right sides of records.

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

"PICKUP 11" - - TRIP SWITCH RESET ADJUSTMENT

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

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



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

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

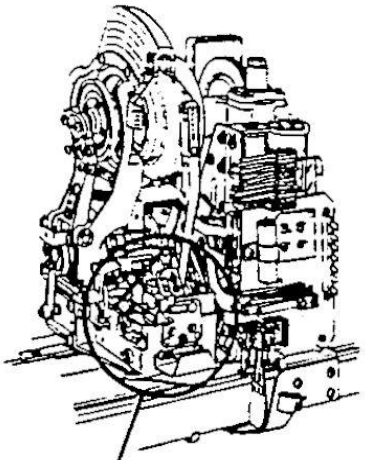
When adjusted correctly the Trip Switch should be reset but the Trip Lever should not apply any upward pressure against the reset plate.

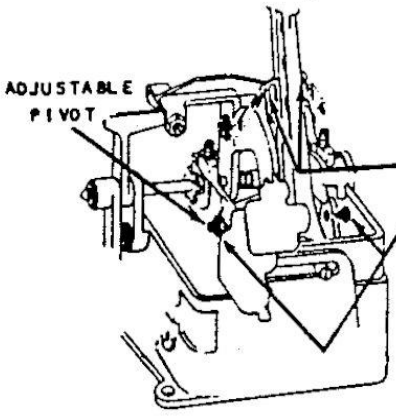
(C) Check by releasing Control Fork. Needle should land properly on record without "Booster" action from Trip Lever.

2328

"PICKUP 12" - - PICKUP BALANCE ADJUSTMENT

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





NOTE: Before making this adjustment:

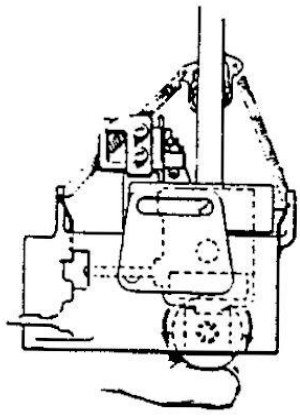
1. Check Cradle Pivots for binds. There should be no play but the Arm and Cradle should move freely on the Pivots.
2. Check Pickup lead to be sure it hangs freely below Cradle and does not touch the carriage or at any place along the base casting.

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

(B) Remove both Needle Pressure Springs.

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

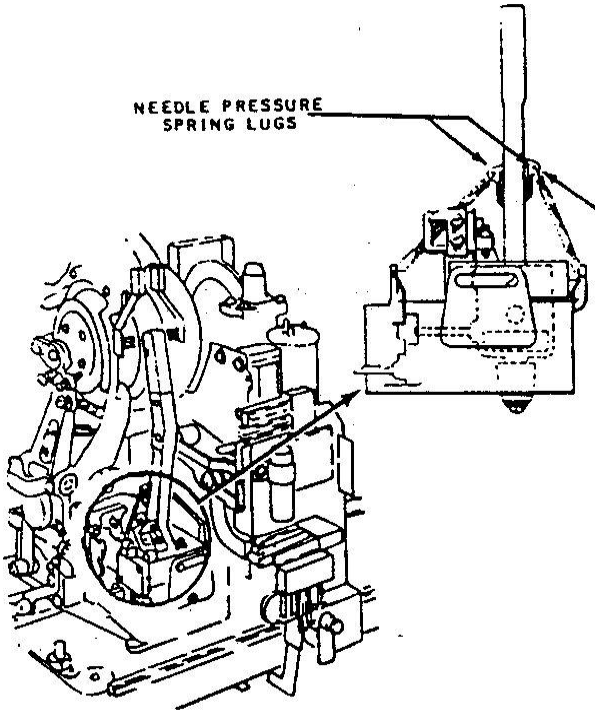
Check the balance by holding the pickup 1/8" to 1/4" from the record, releasing carefully, and observing the DIRECTION in which it moves. Ignore the slow movement toward or away from the record surface. There should be no in or out movement (toward or away from the record center). In or out movement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



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

"PICKUP 13" - - NEEDLE PRESSURE ADJUSTMENTS

This adjustment establishes the needle pressure at 4½ to 5½ grams for either Right or Left sides. Correct pressures result in proper tracking and in a minimum of needle and record wear.

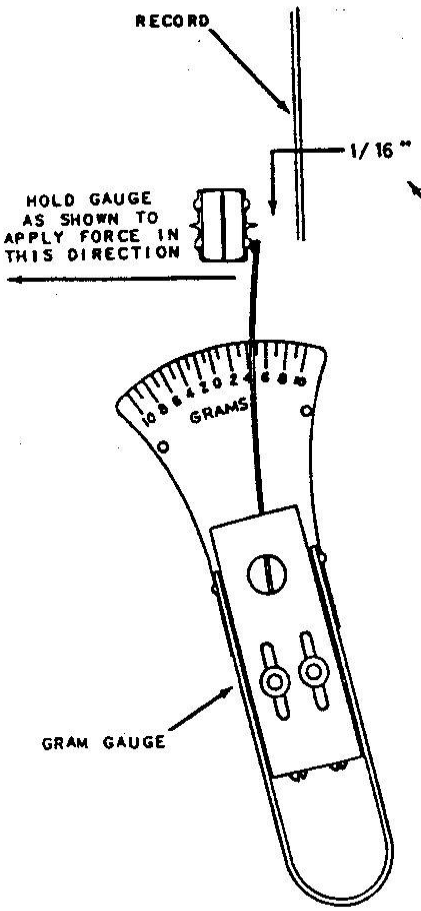


(A) Place mechanism in Left side PLAY position with a flat record clamped on the Flywheel.

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

(C) Adjust position of Pressure Spring Lug on Right side of Pickup Arm so that needle pressure is 4½ to 5½ grams.

(D) Repeat same procedure on Right side PLAY position by adjusting the Pressure Spring Lug on Left side of the Pickup Arm for 4½ to 5½ grams needle pressure.



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

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

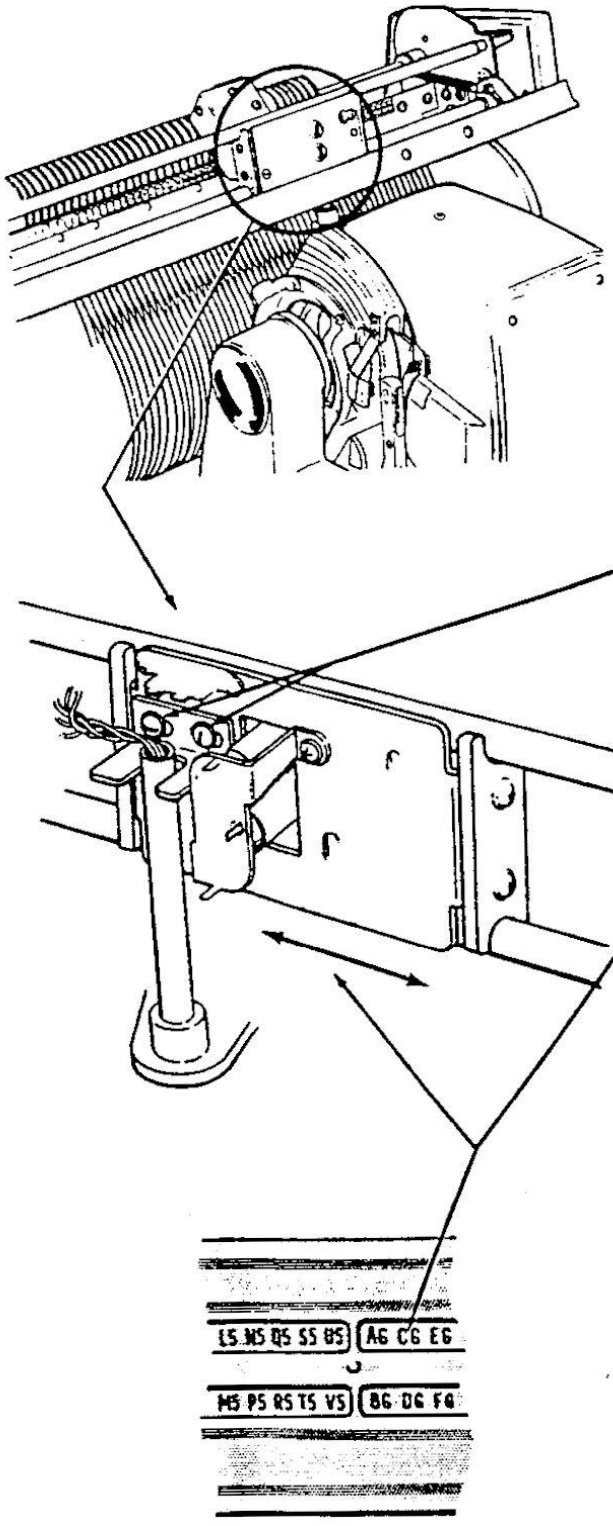
(2) Slowly relax the force of the gauge against the Pickup so the needle moves toward the record.

(3) Stop the inward movement when the needle is about 1/16" from the record and read indicated pressure on gauge. Pressure should be between 4½ and 5½ grams.

"SELECTION PLAYING INDICATOR"

This adjustment aligns the Selection Playing Indicator Light with the numbers on the Plastic Number Strip.

NOTE: The Selection Playing Indicator adjustment and the Popularity Meter – Dial Adjustments are related so each must be checked if either one is changed.



(A) Place mechanism in C6 play position.

(B) Loosen adjusting screws on back of slide.

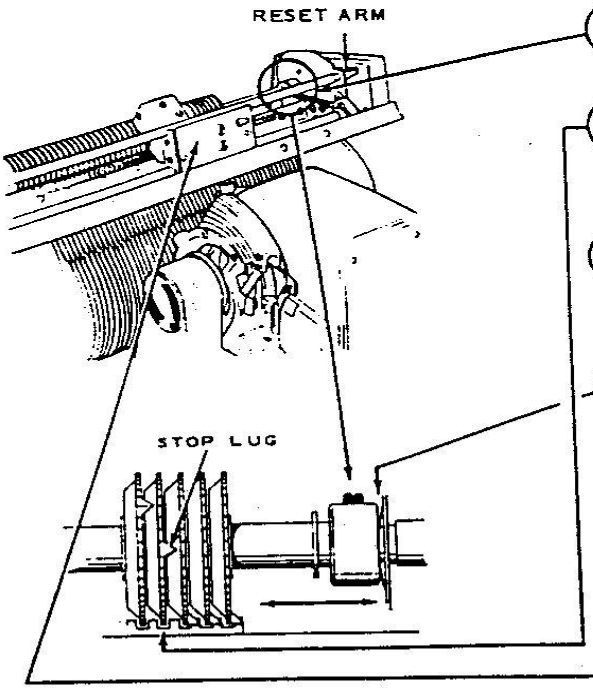
(C) Position assembly horizontally until block of light is centered on C6 of the number strip.

(D) Tighten screws.

"POPULARITY METER" -- DIAL ADJUSTMENT

This adjustment gives proper positioning of dials and operating solenoid assembly.

NOTE: The Popularity Meter – Dial Adjustments and the Selection Playing Indicator adjustment are related so each must be checked if either one is changed.



(A) Loosen set screws in collars at each end of Popularity Meter Shaft.

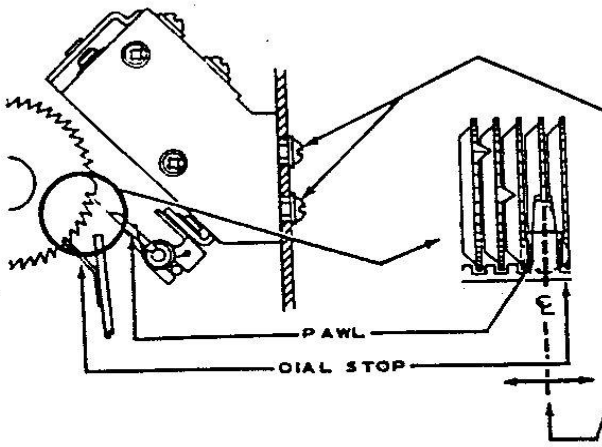
(B) Move complete assembly to a position where the dials are exactly centered in the notches in the dial stop strip.

(C) Position left hand collar to extreme left end of shaft and tighten set screw.

(D) Position right hand collar so the spring washer is completely compressed and tighten set screw.

(E) Place mechanism in C6 play position.

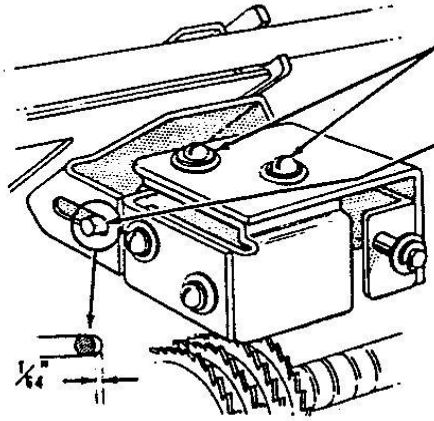
(F) Remove indicator light shield.



(G) Turn C6 dial until it is at zero and the stop lug is firmly against the dial stop strip.

(H) Loosen adjusting screws (that are back of light shield) and position assembly, horizontally, so the tip of the pawl centers on the dial.

(I) Tighten Adjusting screws.



(J) Loosen two screws holding solenoid frame.

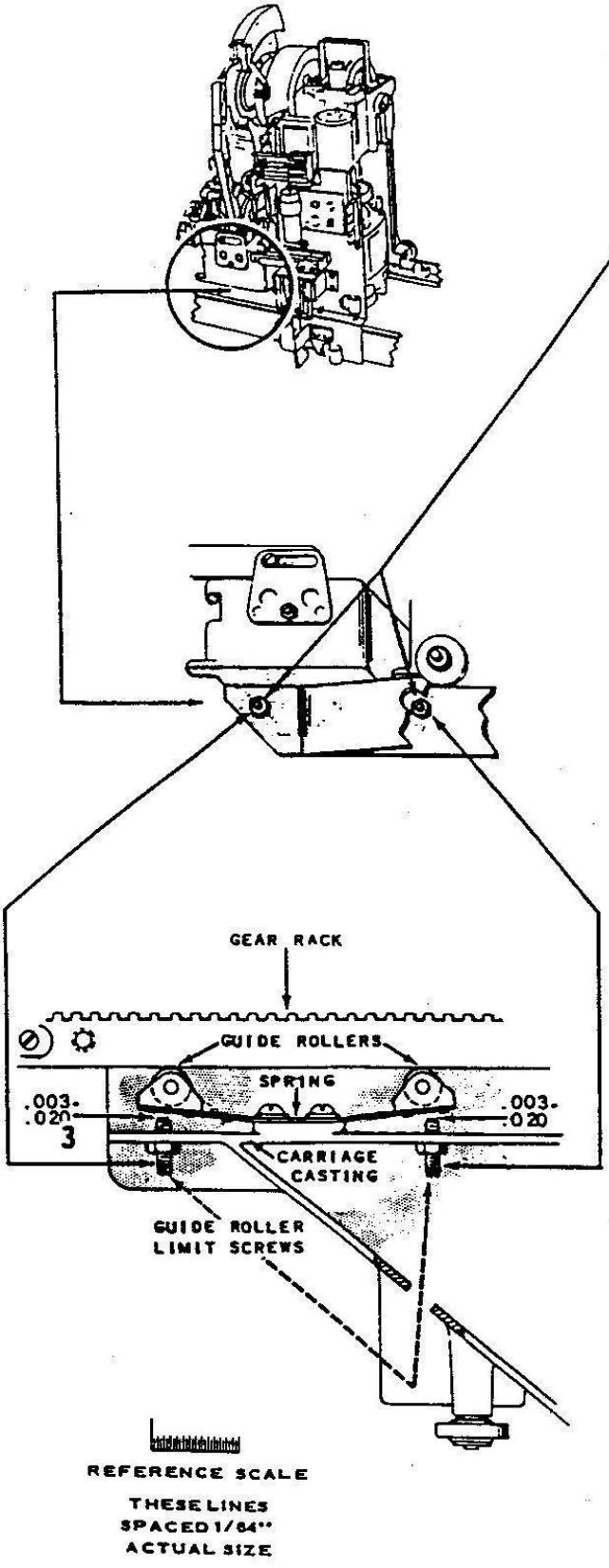
(K) Hold the solenoid plunger in the energized position and position the assembly so there is 1/64'' clearance between the end of the slot in the bracket and the guide pin.

(L) Tighten screws.

2332

"GUIDE ROLLERS 1" - - CARRIAGE GUIDE ROLLER ADJUSTMENTS

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



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

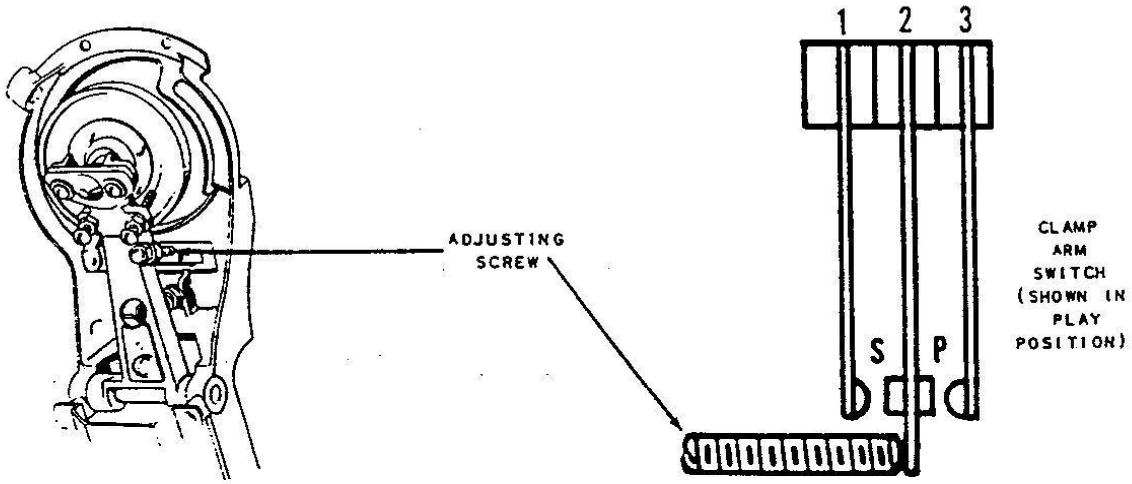
(B) To adjust Guide Roller Limit Screws - - -

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

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

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

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



CONTACTS	CONTACT GAP	CONTACT FUNCTIONS*
P	1/32" gap in PLAY position with normal record clamped on turntable. Closed in PLAY position if there is no record clamped to turntable.	"No-record" reject. Closes circuit to trip solenoid if there is no record on the turntable when mechanism is in play-position.
S	1/32" gap in PLAY position with normal record clamped on turntable. Closed in SCAN position and stays closed in PLAY if record fails to clamp properly.	Closes circuit to trip solenoid if record fails to clamp properly due to undersize hole, off-center position of record, etc.

*See Schematic Diagrams for Circuit.

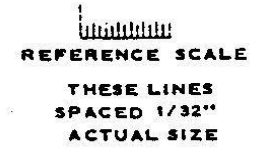
ADJUSTMENT PROCEDURE

A With mechanism in SCAN, bias center blade (#2) tightly against "S" contact.

B With mechanism in PLAY and a normal record clamped on turntable - -

1. Turn adjusting screw until "P" contact just closes lightly, then back it out one turn. Tighten Lock Nut.
2. Adjust blade #1 for 1/32" gap in "S" contacts.

Contacts should have 1 oz. minimum pressure when closed.

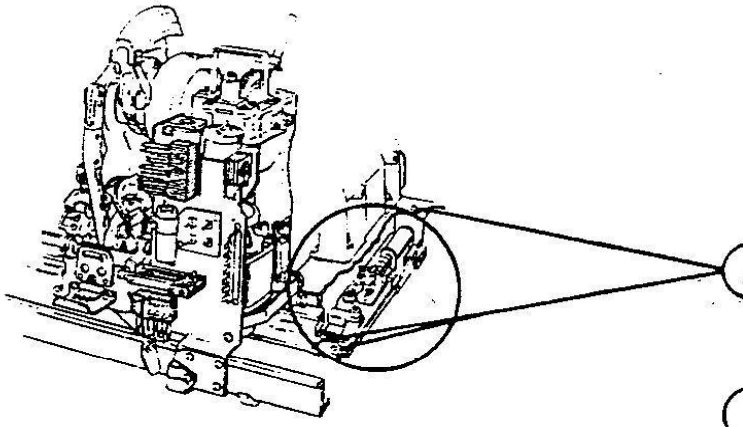


2334

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6

"SCAN CONTROL" - - PAWL ADJUSTMENT

This adjustment controls the clearance between the fibre ratchet teeth and the tip of the operating pawls.



NOTE: Adjustment requires removal of the scan control assembly.

A Remove three mounting screws

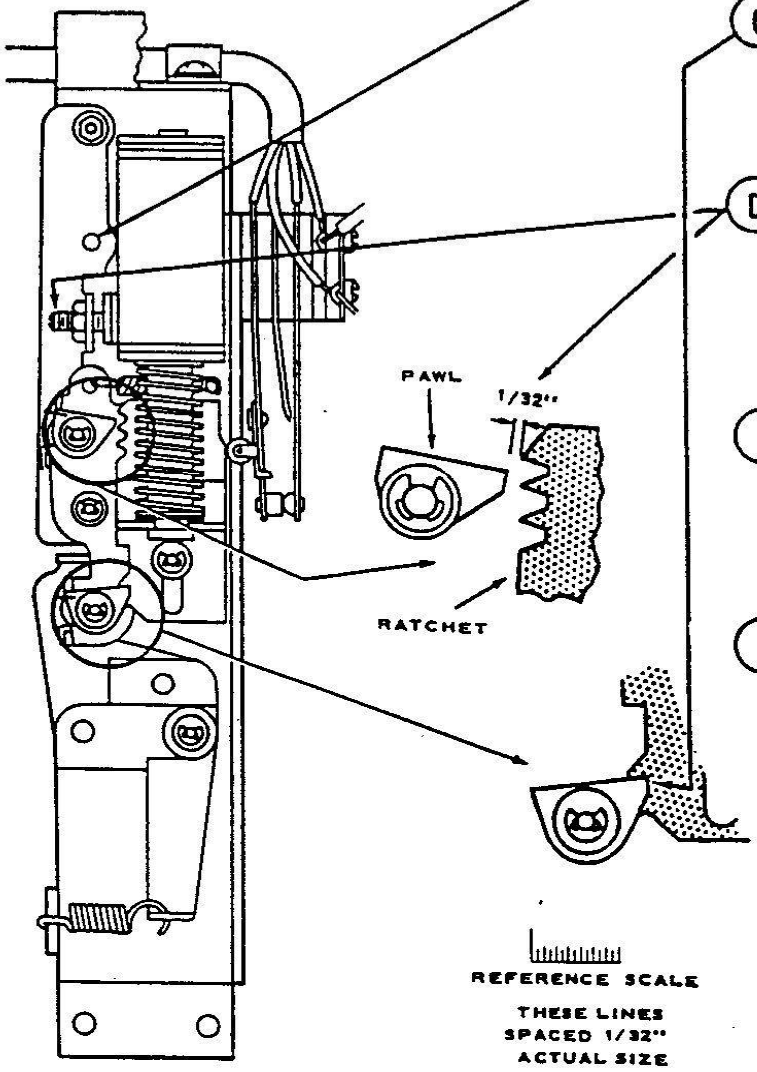
B Loosen adjustment lever locking screw.

C Manually engage pawl in first tooth of ratchet.

D Loosen hex nut and adjust screw for clearance of 1/32" between pawl and ratchet.

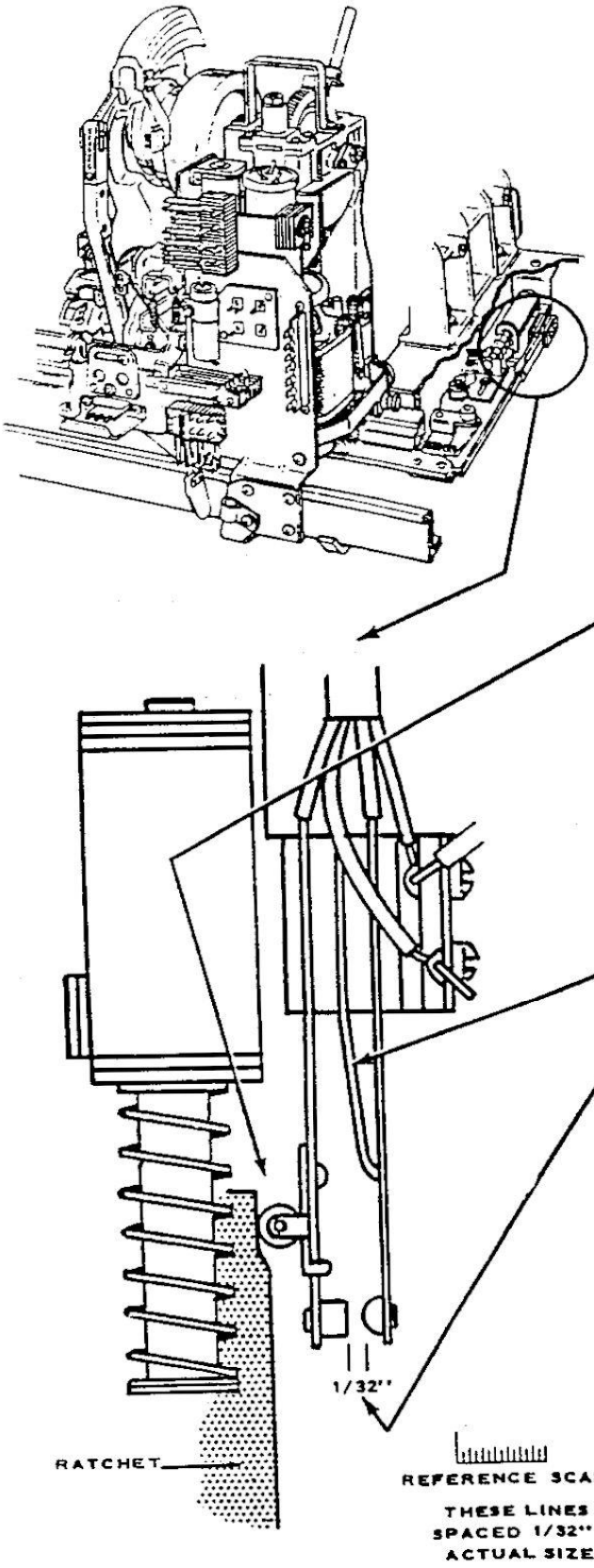
E Tighten adjustment lever locking screw. *(Paragraph B)*

F Back off adjustment screw 2 turns *(Paragraph D)* from solenoid and tighten hex nut.



2335

"SCAN CONTROL SWITCH" -- CONTACT GAP AND PRESSURE ADJUSTMENT



(A) Release ratchet to off position so contacts are open and roller is in position shown.

(B) Form roller blade so roller rests lightly against ratchet fibre.

(C) Form bracer blade for 1/32" contact gap.

(D) Manually actuate solenoid. Contacts should close with approximately 1 ounce pressure.

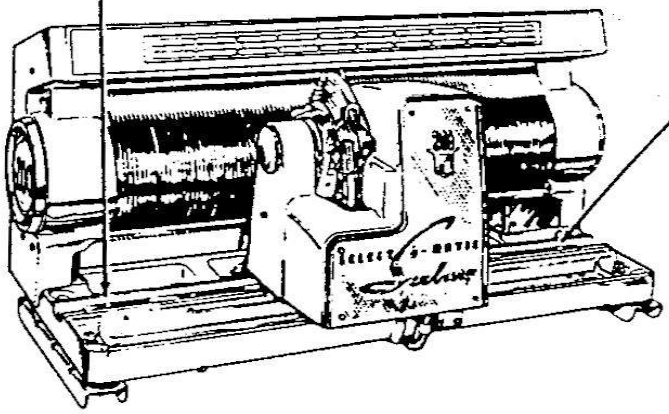
2336

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6

"RUBBER BUMPERS"

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

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



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

(B) Select B1 and turn off power when selection is playing.

(C) Make a reference mark on the base casting to indicate the A1-B1 record position of the carriage.

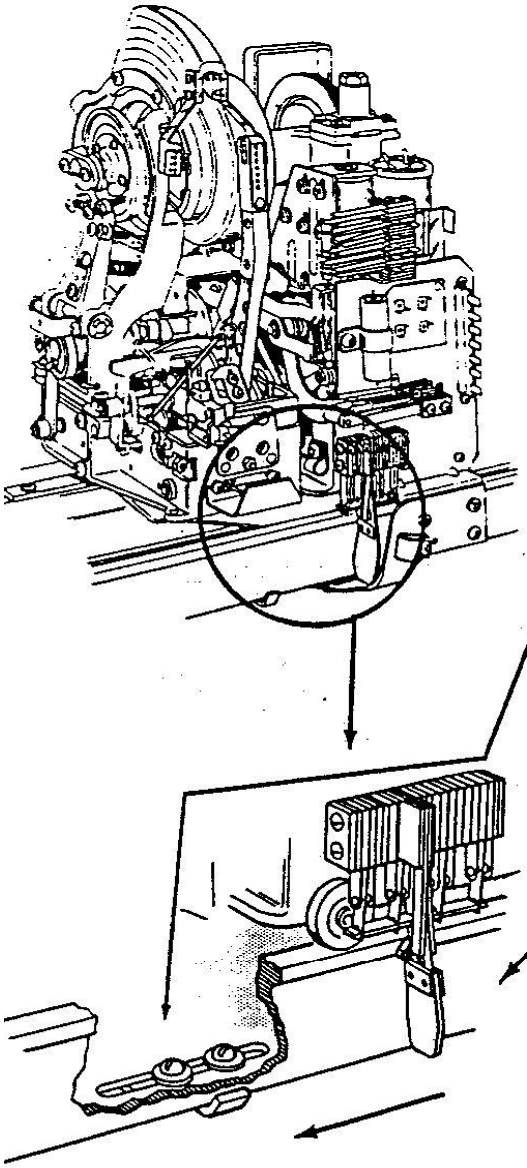
(D) Return mechanism to Scan and turn motor shaft manually until the mechanism has moved 5/16" to the Left of the reference mark made on the base. (It is at this point that the reversing switch should operate.)

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

(F) Using the procedure above, adjust the right bumper by using the V0 selection playing position for references and move the bumper 5/16" to the right.

"REVERSING SWITCH 1" - - SWITCH BRACKETS

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



REFERENCE SCALE

THESE LINES SPACED 1/16" ACTUAL SIZE

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

(B) Select B1 and turn off power when selection is playing.

(C) Make a reference mark on the base casting to indicate the A1-B1 record position of the carriage.

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

Reversing Switch Lever should still be to the left.

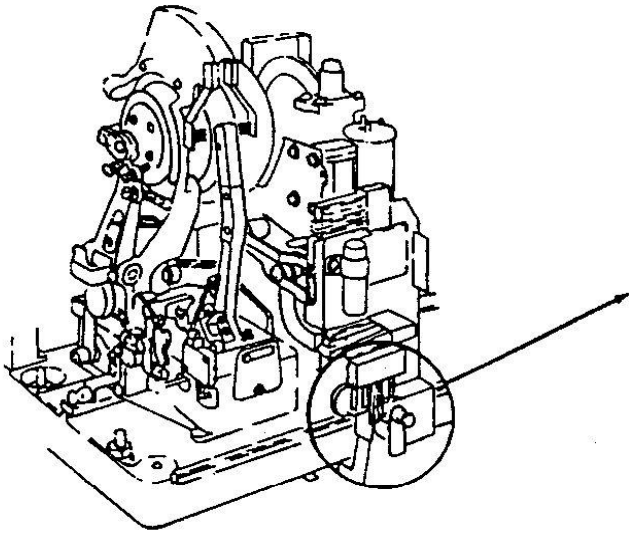
(E) Move the Bracket slowly and carefully to the right until it is at the point where the reversing switch operates.

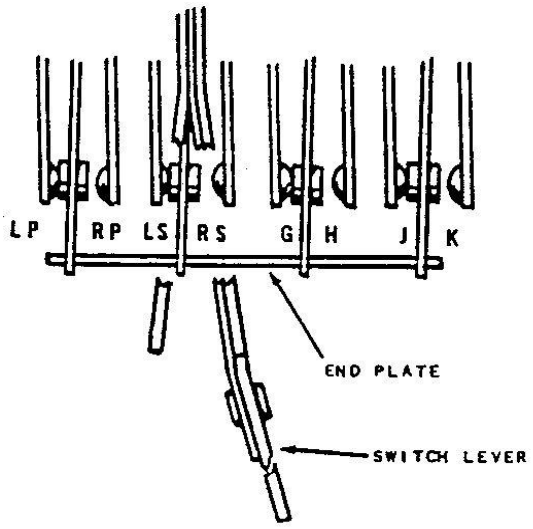
(F) Scan the carriage out of the way to the right, being careful not to move the Bracket, and tighten the bracket holding screws.

(G) Adjust the RIGHT Reversing Switch Bracket so the Switch operates when the carriage is 5/16" to the RIGHT of the U0-V0 record position.

See "Reversing Switch 2" for contact gap adjustment.

REVERSING SWITCH 2" - - CONTACT GAP AND PRESSURE ADJUSTMENTS





CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
L P	1/64" clearance when Switch Lever is to Left.	Connects upper light of Record Playing Indicator (for Records A, C, E, G, etc).
R P	1/64" clearance when Switch Lever is to Right.	Connects lower light of Record Playing Indicator (for Records B, D, F, H, etc).
L S	1/64" clearance when Switch Lever is to Left.	Connects L contact of Contact Plunger Block for Left Side Selections.
R S	1/64" clearance when Switch Lever is to Right.	Connects R contact of Contact Plunger Block for Right Side Selections.
G & J	.020" gaps at instant H and K Just open	These contacts closed so motor turns for SCANNING to RIGHT and for PLAYING LEFT SIDES.
H & K	.020" gaps at instant G and J Just open	These contacts closed so motor turns for SCANNING to LEFT and for PLAYING RIGHT SIDES.

See Schematic Diagrams for Circuit.

REFERENCE SCALE
THESE LINES SPACED 1/64"
ACTUAL SIZE

ADJUSTMENT PROCEDURE

Caution: - Turn Off Power!! 117 volts on G-H and J-K contacts

A Move Switch Lever to Left

B Adjust LP and LS for 1/64" gaps.

C Push bakelite End Plate slowly to Left. At instant H and K just break, G and J must have .020" ge

D Move Switch Lever to Right.

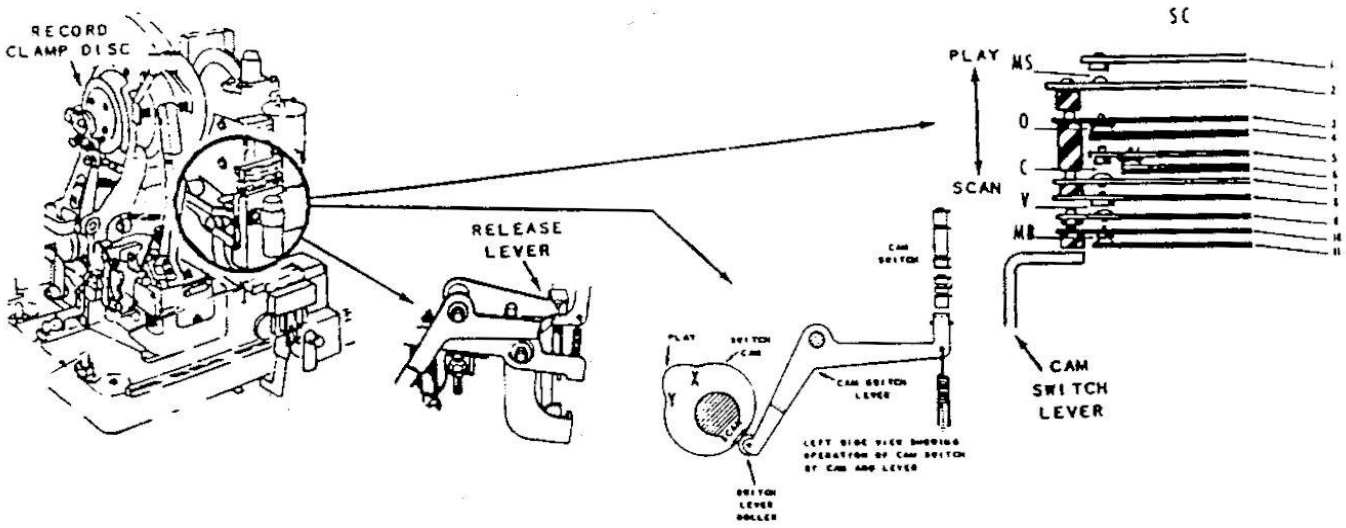
E Adjust RP and RS for 1/64" gaps.

F Push bakelite End Plate slowly to Right. At instant G and J just break, H and K must have .020" g

All contacts must have 35 grams (1-1/4 oz.) minimum pressure when closed.

2339

"CAM SWITCH"– CONTACT GAP AND PRESSURE ADJUSTMENTS



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

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 blades 9 and 10 down tight against Switch Lever with MB closed. (1½ oz. pressure).
- B Bias blade 7 against blade 8 and adjust for 1/32" gap in V Contacts.
- C Bias blade 3 down so fiber lift touches blade 7 with O Contacts closed. (1½ oz. pressure). V Contacts should still have 1/32" gap.
- D With SC Contacts closed (1½ oz. pressure) adjust for 1/32" gap in C Contacts.

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

- A Adjust blade 4 for 3/64" gap in O Contacts.

2340

B Adjust blade 6 for 1/64" gap in SC Contacts.

C Adjust blade 11 for 1/64" gap in MB Contacts.

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

A Check for 1/32" gap in C Contacts with SC closed. (1½ oz. pressure).

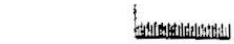
B Check to see that blades 9 and 10 bear against Switch Lever.

C Check for 1/32" gap in V Contacts.

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

A Adjust blade 2 so fibre lift bears lightly against blade 3.

B Adjust blade 1 for 1/16" gap between MS contacts.

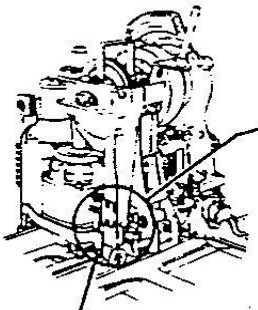


REFERENCE SCALE

THESE LINES SPACED 1/64" ACTUAL SIZE

2341

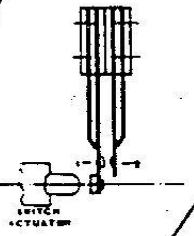
"DETENT SWITCH" – CONTACT GAP AND PRESSURE ADJUSTMENT



SWITCH ADJUSTMENTS FOR ASSEMBLY NO. 247228

A Switch should be positioned on its mounting bracket so the detent switch actuator arm engages the center of the nylon lift on the detent switch blade.

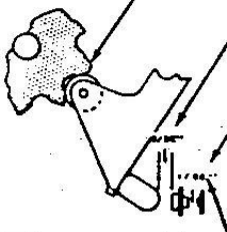
NOTE: Keep switch blades biased against bracer blades during adjustments.



B Place the carriage in the SCAN position and turn the motor coupling manually until the actuator roller is engaged with the sprocket as shown.

C Form blade No. 1 and its bracer blade to give 5/32" contact gap between the actuator and the nylon lift.

D Form blade No. 2 and its bracer blade for 1/32" contact gap.

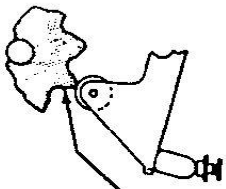


E Move the carriage (by manually turning the motor coupling) so actuator roller is on peak of a sprocket tooth: contact pressure should be 2 ounces minimum.

SWITCH ADJUSTMENTS FOR ASSEMBLY NO. 247384

A Remove metal cover from switch stack and position switch on its mounting bracket so the detent switch actuator arm engages the center of the nylon fibre lift on the detent switch blade.

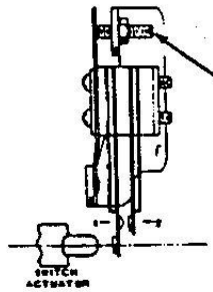
NOTE: Keep switch blades biased against bracer blades during adjustments.



B Same as Step "B" above.

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

NOTE: Do not bend contact blades in making this adjustment; bend only the bracer blades.

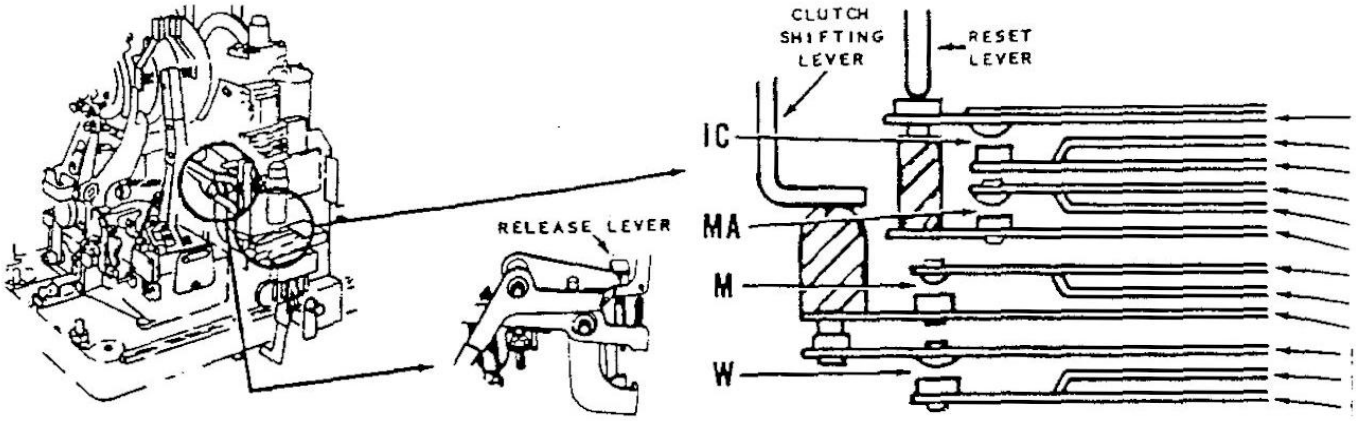


D Move the carriage (by manually turning the motor coupling) so actuator roller is on peak of a sprocket tooth.

E 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 1¾ turns. Tighten hex nut without turning screw. Contact pressure should now be 2 ounces minimum.

2342

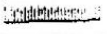
"CLUTCH & RESET LEVER SWITCHES" CONTACT GAP & PRESSURE ADJUSTMENT



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

CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
IC	1/16" gap when mechanism trips. Closed in SCAN and PLAY positions.	Part of Popularity Meter Solenoid Circuit. Allows operation of solenoid when mechanism is transferring into PLAY position but prevents "Extra" operation when mechanism is transferring out of PLAY position.
MA	1/64" gap in PLAY position. Closed in Tripped position.	Part of Mute Circuit. Mutes Amplifier at end of record at instant Trip Solenoi is operated.
M	1/64" gap in PLAY position. Closed during Transfer cycles.	Part of Mute Circuit. Maintains Muting action during entire Transfer cycle.
W	1/32" gap in PLAY position. Closed in SCAN position.	Part of Trip circuit for both Left and Right side selections.

*See Schematic Diagrams for Circuit.



ADJUSTMENT PROCEDURE

1 Place mechanism in Scan Position and TURN OFF POWER.

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

- A Bias blade 1 to within 1/16" of Reset Lever.
- B Bias blade 6 so its fibre lift is against blade 1.
- C Bias blade 9 so its fibre lift is against Clutch Shifting Lever.
- D Bias blade 10 so its fibre lift is against blade 9.
- E Bias blade 3 against bracer blade 2 and adjust blade 2 for 1/16" gap between IC Contact

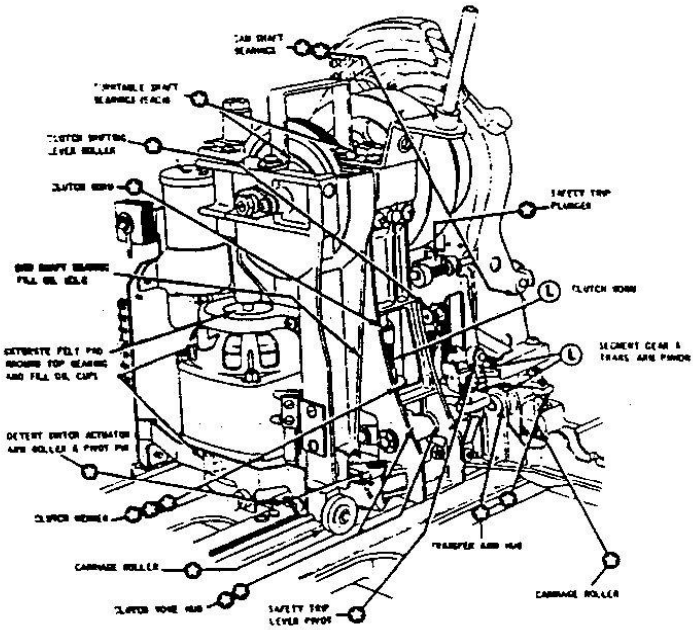
3 Reset mechanism by pressing down on Release Lever.

- A Bias blade 4 against bracer blade 5 and adjust blade 5 for 1/64" gap between MA Contact

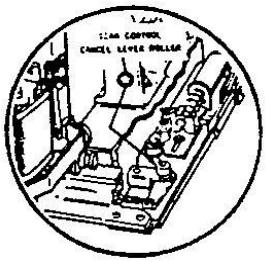
4 Trip mechanism by lifting Release Lever and turn motor shaft manually until mechanism is in Play Position.

- A Bias blade 7 against bracer blade 8 and adjust blade 8 for 1/64" gap between M Contact
- B Bias blade 12 against bracer blade 11 and adjust blade 11 for 1/32" gap between W Contact

LUBRICATION CHART

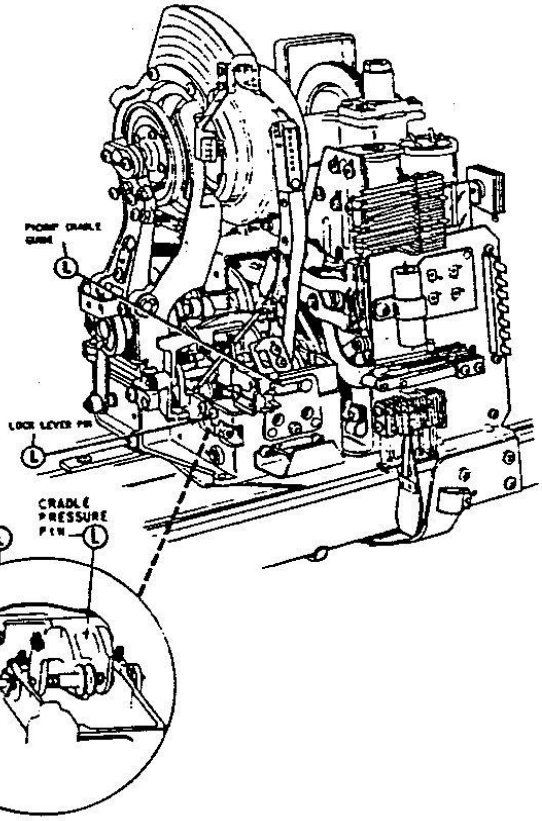


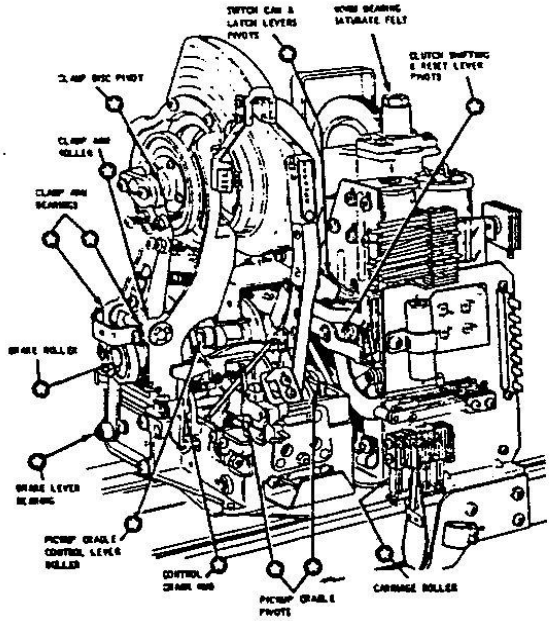
OIL ALL ROLLER PIVOT BEARINGS – 1 OR 2 DROPS



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

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





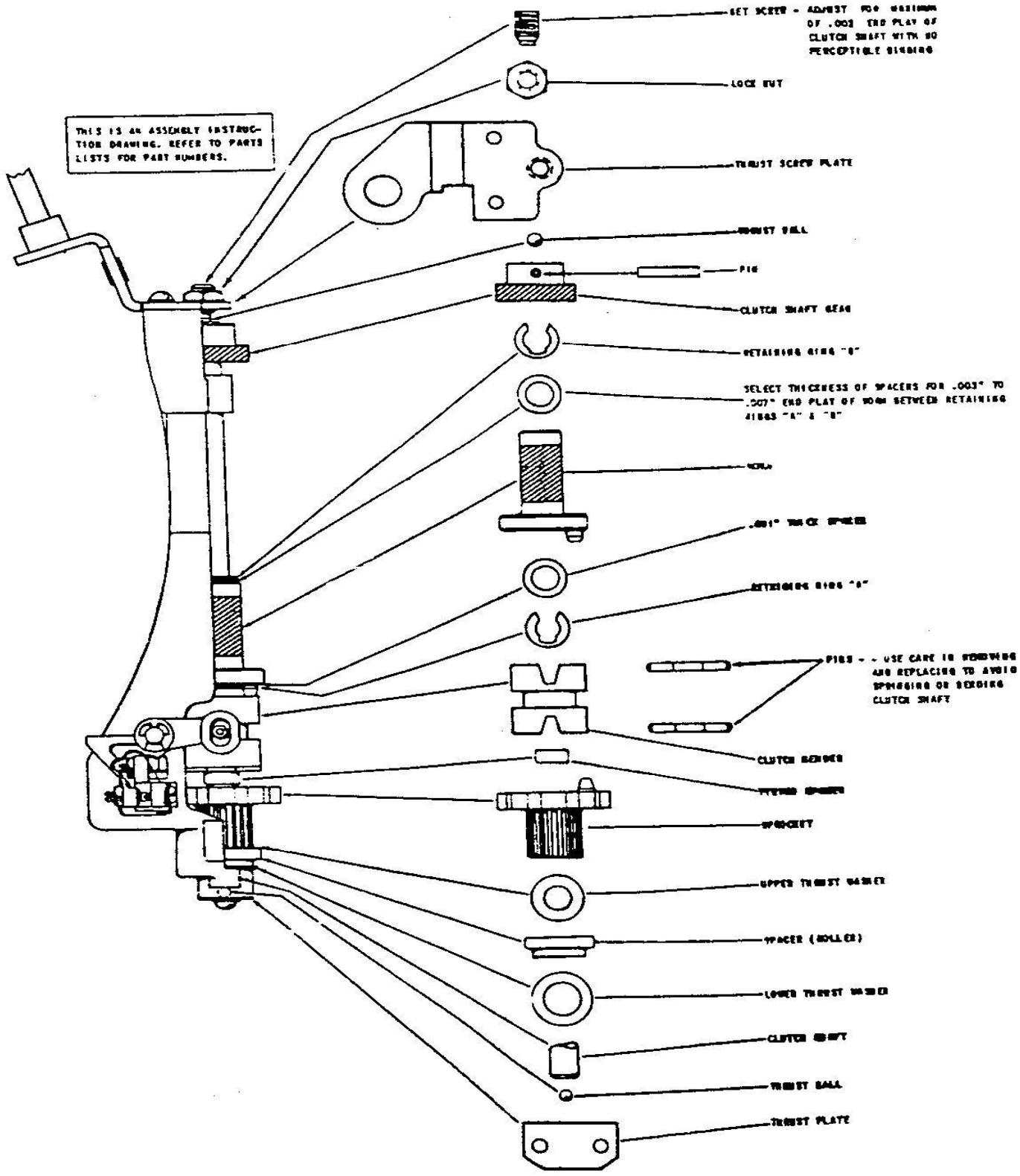
* SEEBURG SPECIAL PURPOSE OIL NO. 53014 MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

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

2344

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6

PART #247600, CLUTCH & HOUSING ASSEMBLY INSTRUCTIONS

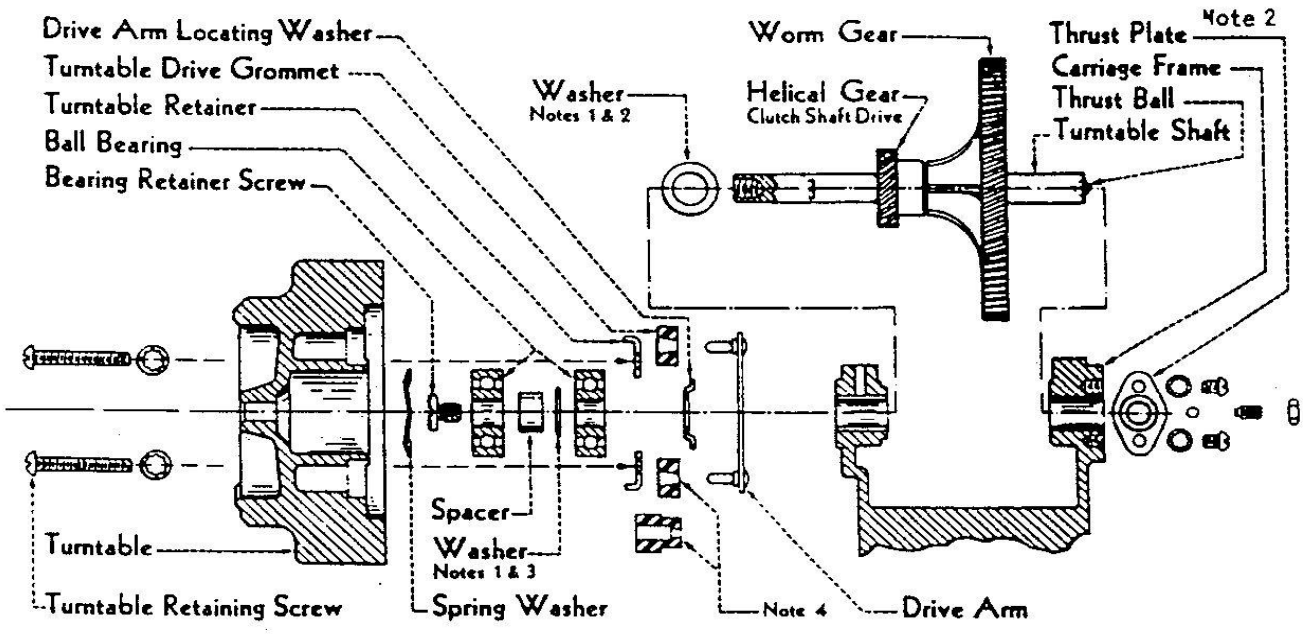


BE SURE CLUTCH WORM AND CAM SHAFT DRIVE GEAR ARE CORRECTLY MESHED BEFORE TIGHTENING CLUTCH ASSEMBLY MOUNTING SCREWS.

2345

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6

TURNTABLE, SHAFT, and GEAR INSTALLATION



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

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

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

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

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

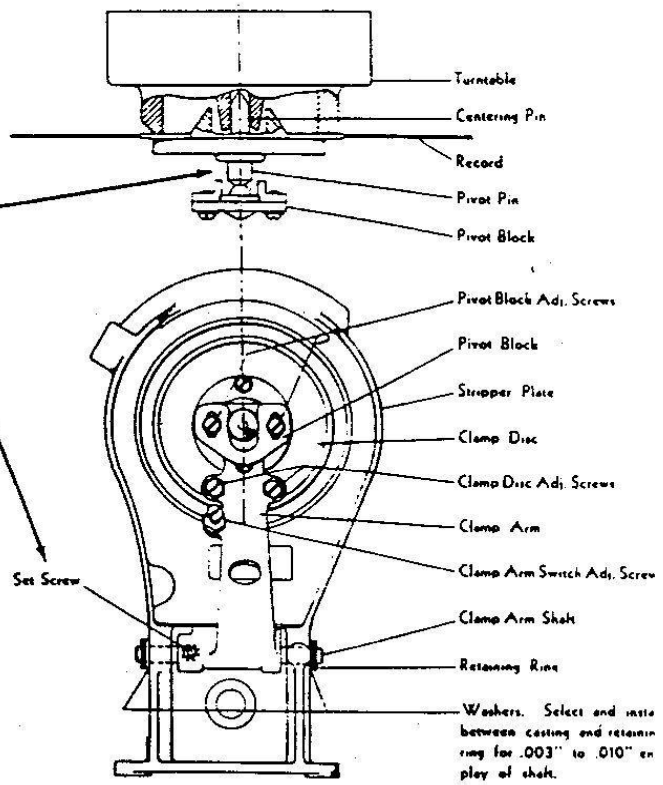
Lubrication: The Gears should have a light coating of Stanodrip #29 (Standard Oil Co) oil. Do not use more oil than will adhere to the Gears. The felt wick in the Thrust Screw for the Turntable Worm (which meshes with the Worm Gear) must be placed in the hole in the screw so it is in contact with the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

2346

INSTALLATION of CLAMP & TRANSFER ARMS

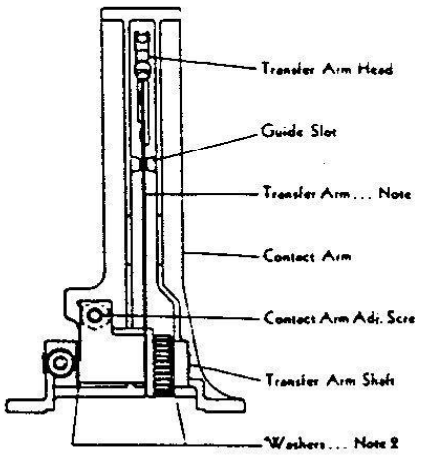
With the Set Screw loose and a Record clamped on the Turntable, adjust the horizontal position of the Clamp Arm so the Center Line through the Pivot Pin forms a right angle with the Clamp Disc and Record.

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

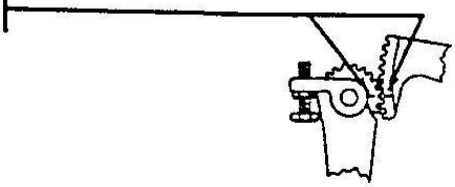


Note 1: Transfer Arm should be straight and should form a right angle with the Transfer Arm Shaft.

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

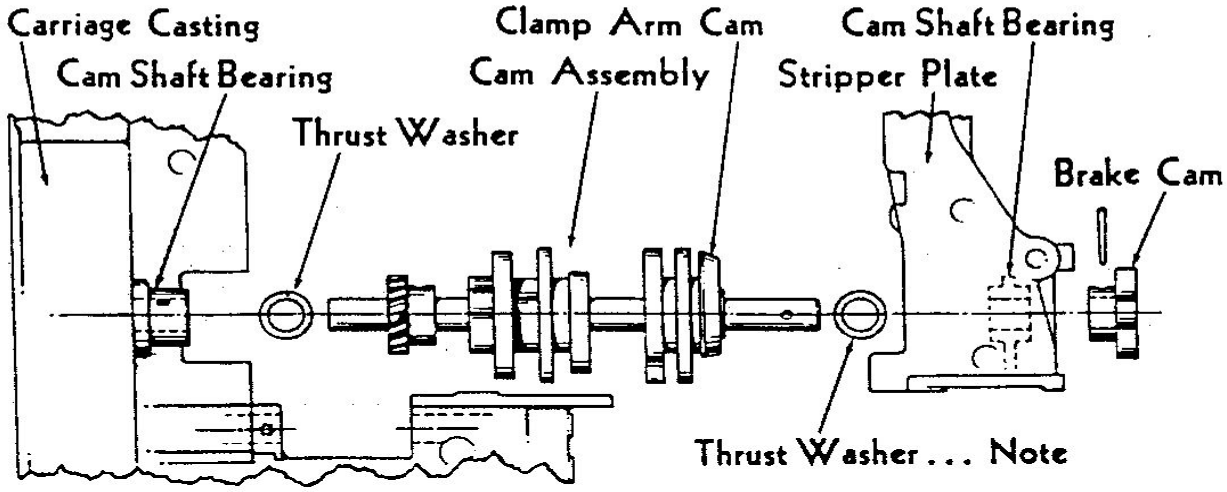


Note 3: When installing assembly on carriage, mechanism and Transfer Arm should be in SCAN position with reference marks aligned as shown.



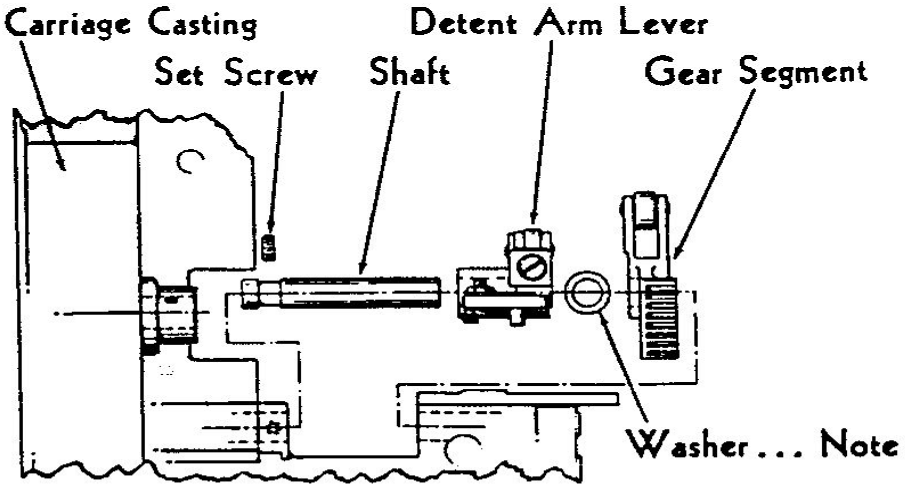
When installation is complete, readjust Transfer Arm. Refer to Transfer Arm Adjustments.

INSTALLATION of CAM ASSEMBLY, DETENT ARM & GEAR SEGMENT



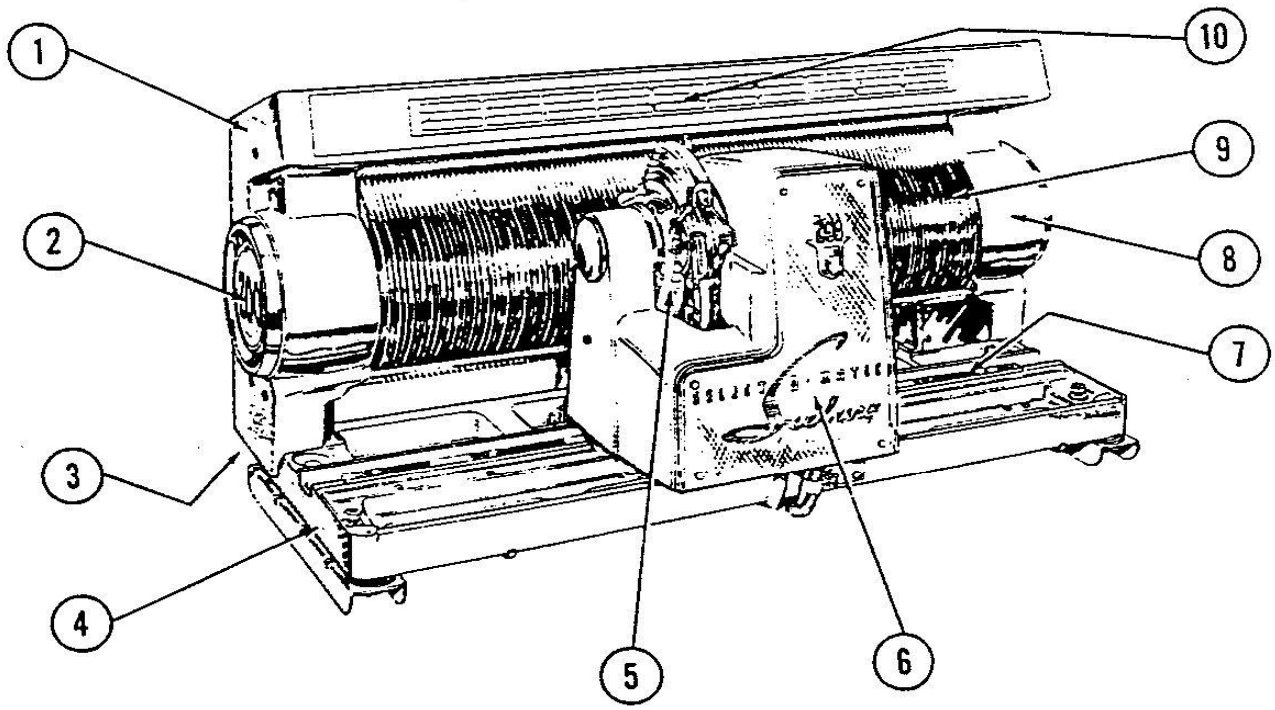
Note: Washers, Part No. 922603 (.020"), 922600 (.005"), 922601 (.010"), 922602 (.015") should be selected and installed between the Clamp Arm Cam and the Thrust Washer so the end play of the Cam Assembly is .003" to .010".

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



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

2348

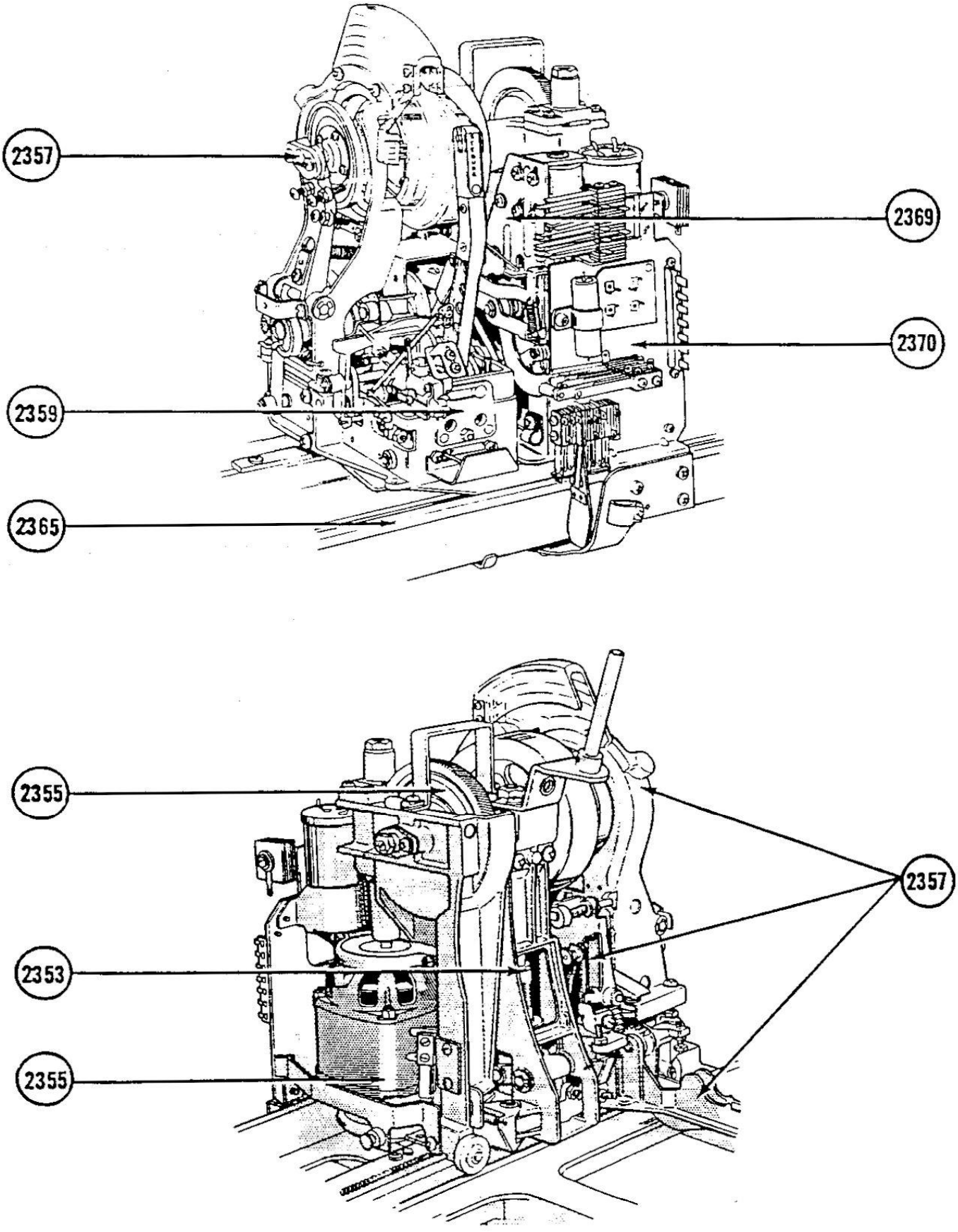


PARTS LIST

Item	Part No.	Part Name
1	247262	Magazine End Cover Assembly, L. H.
	247101	Magazine End Cover, L. H.
	914915	8- 32 x 1½ Phillips Oval H.M.S.
	914863	8- 32 x 1¼ Phillips Oval H.M.S.
	247153	End Cover Bezel Assembly
	903100	Retainer Nut
2	247307	No. 63 Light Bulb - Frosted
	247120	Magazine End Cover Insert
3	304600	Tormat Memory Unit (Page 2367)
4	247015	Base Assembly (Page 2365)
5	247201	Carriage Assembly (Page 2355 to 2358)
6	247264	Carriage Cover Assembly
	247091	Carriage Cover
	247154	Carriage Cover Trim Assembly
	903206	Retainer Nut
	247110	Carriage Cover Escutcheon
	247265	Escutcheon Mounting Screw
	900470	Hex Nut

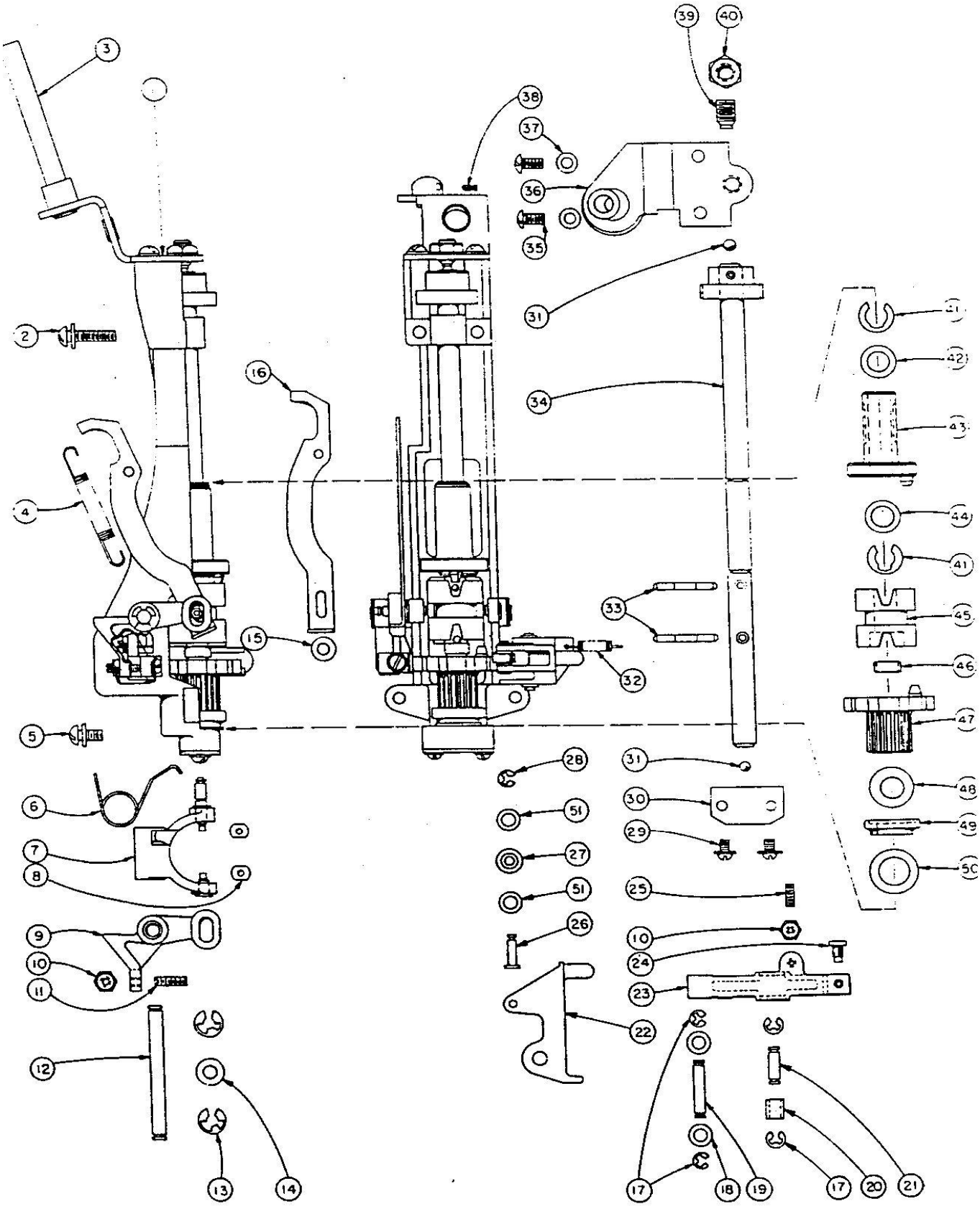
Item	Part No.	Part Name
	914543	8- 32 x ½ Phillips Oval H.M.S.
	246356	Shoulder Screw
7	247092	Scan Control Assembly (Page 2368)
8	247261	Magazine End Cover Assembly, R. H.
	247058	End Cover Mounting Bracket , Lower R.H.
	914808	8- 32 x 1" Phillips Oval H.M.S.
	914863	8- 32 x 1¼" Phillips Oval H.M.S.
	247100	Magazine End Cover, R. H.
	914792	8- 32 x 1" Phillips Flat H.M.S.
	247153	End Cover Bezel Assembly
	903100	Retainer Nut
9	247140	Magazine Filler
	914373	8- 32 x 3/8 Phillips B.M.S.
	913153	Sems
	900810	Nut- Tinnerman
10		Popularity Meter and Indicator Strip Assembly (Page 2361 & 2362) Popularity Meter and Selection Playing Indicator Breakdown (Page 2363 & 2364)

CARRIAGE ASSEMBLY PARTS INDEX
CIRCLED NUMERALS INDICATE PAGE NUMBERS



2352

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6



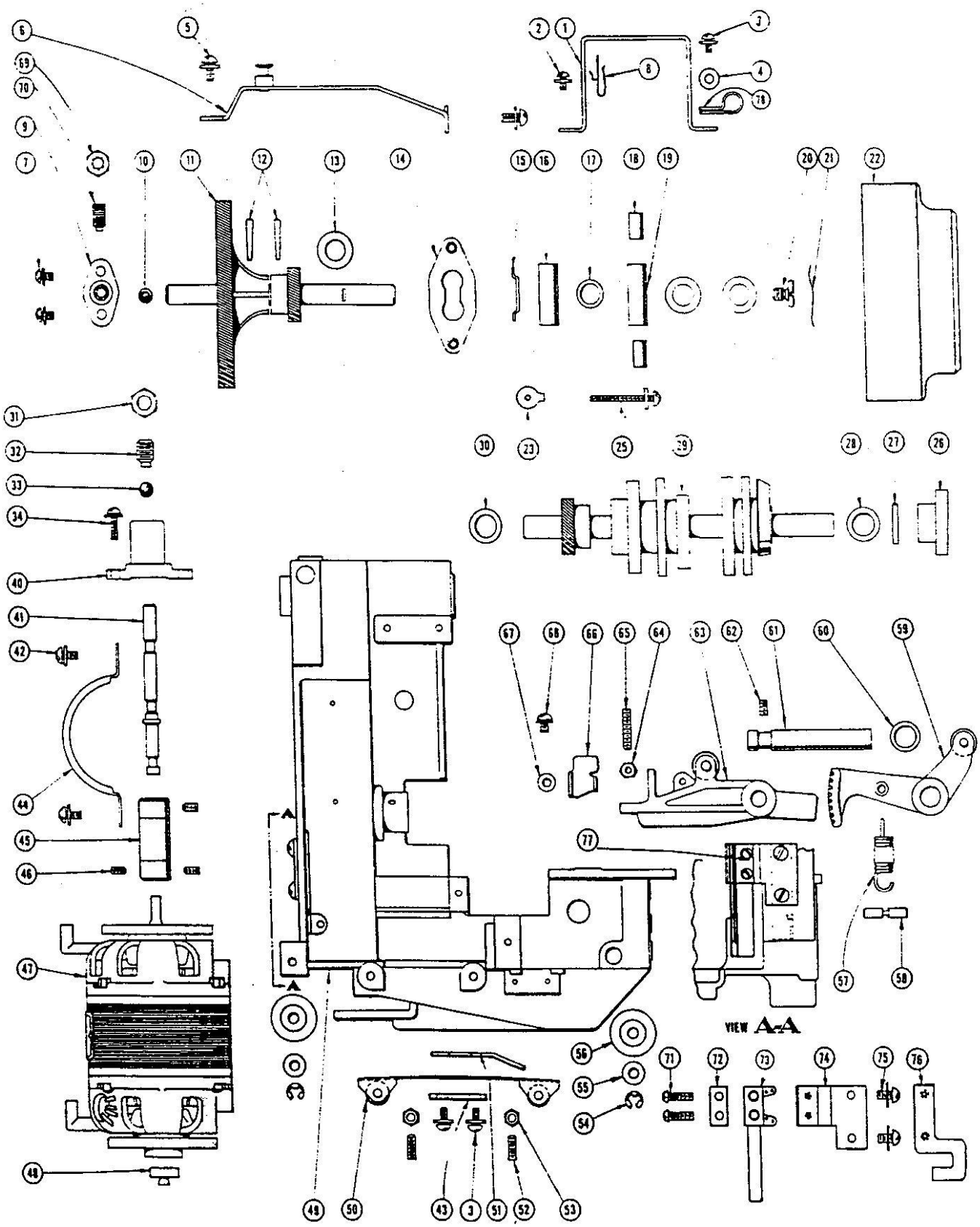
CLUTCH ASSEMBLY – No. 247600

SELECT-O-MATIC "200" MECHANISM, TYPE 245ST1-L6

PARTS LIST for CLUTCH ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	247600	Complete Assembly
	245406	Clutch Housing Assembly
2	915784	10 x 7/8 Sems Fastener
3	247029	Selection Indicator Drive Tube
4	245248	Clutch Spring
5	915548	10-32 x 7/16 Sems Fastener
6	A250141	Detent Arm Retarding Spring
7	245408	Clutch Yoke Assembly
8	A250529	Bearing Block
9	245427	Clutch Yoke Lever
10	901660	8-32 Hexagon Nut
11	918634	8-32 x 5/8 Set Screw
12	A250516	Clutch Yoke Shaft
13	S229220	Snap Washer
14	921551	Spring Steel Flat Washer
15	921065	Flat Washer, Steel
16	245426	Connecting Link
17	RZ31163	Snap Washer
18	921061	Flat Washer
19	247415	Detent Arm Pivot Pin
20	A250518	Detent Arm Roller
21	A250519	Detent Arm Roller Pin
22	247411	Detent Switch Actuator Arm
23	A250506	Clutch Detent Arm
24	246438	Detent Arm Stud
25	918612	8-32 x ½ Set Screw
26	247413	Roller Pivot
27	247414	Roller
28	125448	Retaining Ring
29	914143	8-32 x ¼ Sems Fastener
30	247612	Thrust Plate
31	A250125	Steel Ball
32	247214	Spring
33	A250523	Pin
34	245410	Shaft & Gear Assembly
	245411	Shaft, only
	245412	Gear, only
	952180	Pin
35	915577	10-32 x ½ Phillips R.H.Machine Screw
36	247615	Grommet & Thrust Plate Assembly
37	925492	Lock Washer
38	918552	8-32 x ¼ Set Screw
39	918970	Socket Head Set Screw
40	904403	5/16-24 Hexagon Nut
41	A250507	Snap Washer
42	922175	Spring Steel Flat Washer
	922170	Spring Steel Flat Washer
	922165	Spring Steel Flat Washer
43	245415	Clutch Worm
44	922175	Spring Steel Flat Washer
45	245417	Clutch Member
46	245418	Pinion Spacer
47	247609	Pinion Assembly
48	245421	Upper Thrust Washer
49	245422	Clutch Shaft Spacer
50	245423	Lower Thrust Washer
51	920600	Flat Washer

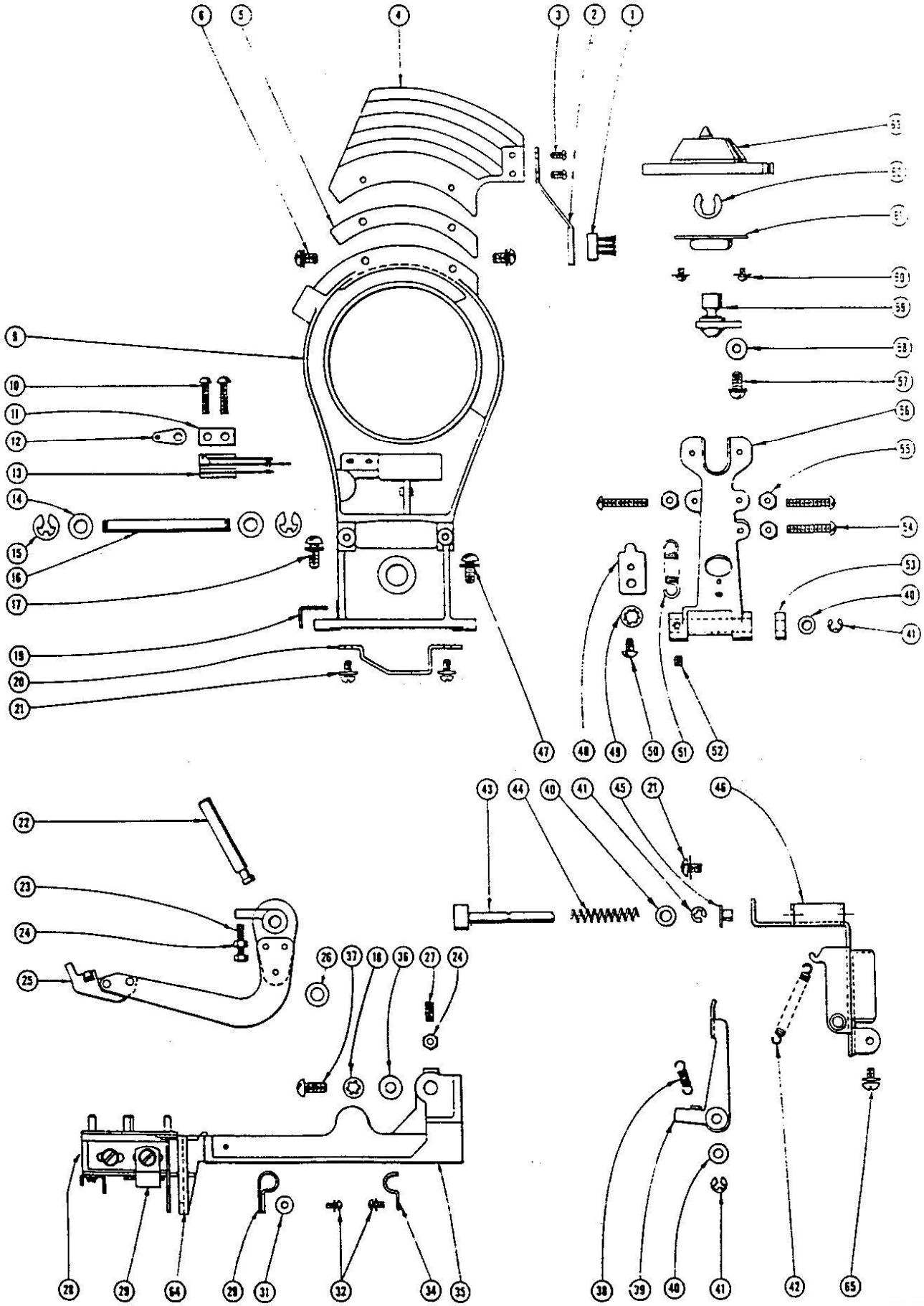


CARRIAGE FRAME ASSEMBLY

PARTS LIST for FRAME ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	246157	Carriage Cover Bracket
2	914110	8-32 x ¼ Ph. Sems Fastener
3	914448	8-32 x 3/8 Sems Fastener (Phillips)
4	920840	Flat Washer
5	914110	8-32 x ¼ Ph. Sems Fastener
6	247038	Guide Stud & Bracket
7	914332	8-32 x 3/8 Sems Fastener (Phillips)
8	201058	Cable Clamp
9	247226	Screw Casting
10	250125	Steel Ball
11	245257	Turntable Shaft & Gear Assembly
	245050	Helical Gear
	245046	Shaft
	245256	Worm Gear
12	951790	Taper Pin, 3/0 x ¾
13	922271	Spring Steel Flat Washer .010 Thick
	922272	Spring Steel Flat Washer .015 Thick
	922270	Spring Steel Flat Washer .005 Thick
14	245467	Drive Arm Assembly
15	245055	Drive Arm Locating Washer
16	245056	Ball Bearing
17	245057	Ball Bearing Spacer
18	245464	Drive Bushing
19	245056	Ball Bearing
20	245058	Bearing Retainer Screw
21	924705	Spring Washer, Steel
22	245060	Turntable
	245464	Turntable Rubber Bushing
23	245479	Turntable Retainer
25	913716	6-32 x 1-3/8 Ph. Sems Fastener
26	245016	Brake Cam
27	952180	Roll Pin, 1/8 Dia. x ¾
28	922600	Spring Steel Flat Washer .005 Thick
	922601	Spring Steel Flat Washer .010 Thick
	922602	Spring Steel Flat Washer .015 Thick
	922603	Spring Steel Flat Washer .020 Thick
29	245062	Cam and Gear Assembly
30	250064	Thrust Washer - Cam Shaft
31	904403	5/16 - 24 Hexagon Nut
32	918971	Set Screw
33	245180	Steel Ball
34	914485	8-32 x ½ Sems Fastener
40	245026	Bearing Bracket Assembly
41	245044	Turntable Shaft Worm
42	914225	8-32 x 5/16 Sems Fastener
43	245299	Spacer Guide Roller Spring
44	250111	Clamp Bracket
45	245083	Motor Coupling Assembly
46	918520	8-32 x 3/16 Socket Head Set Screw
47	250251	Motor - Bodine
	250278	Motor - Westinghouse
48	245086	Motor Support Plug
49	245021	Carriage Frame Assembly
50	245031	Guide Roller and Spring Assembly
51	245965	Leaf Spring
52	918612	8-32 x ½ Set Screw
53	901660	8-32 Hexagon Nut
54	R231163	Snap Washer
55	921061	Spring Steel Flat Washer .015 Thick
56	245082	Carriage Roller
57	245080	Gear Segment Spring
58	245081	Spring Pin
59	245041	Gear Segment Assembly
60	922170	Spring Steel Flat Washer .015 Thick
	922165	Spring Steel Flat Washer .010 Thick
	922160	Spring Steel Flat Washer .005 Thick
61	245043	Shaft
62	918751	10-32 x ¼ Allen Head Set Screw
63	245037	Detent Arm Lever Assembly
64	902360	10-32 Hexagon Nut
65	918830	10-32 x ¾ Set Screw
66	245040	Adjustment Plate
67	920840	Flat Washer Steel .031 Thick
68	914110	8-32 x ¼ Sems Fastener (Phillips)
69	903801	¼ - 20 Hexagon Nut
70	918921	Set Screw
71	912491	5-40 x ½ Phillips R.H.M.S.
72	400597	Tension Washer
73	247229	Detent Switch
74	247213	Detent Switch Bracket
75	913049	6-32 x 5/16 Sems Fastener (Phillips)
76	247230	Spring Anchor Bracket
77	247228	Detent Switch and Bracket Assembly
78	602190	Cable Clamp



CARRIAGE FRAME

PARTS LIST for CARRIAGE FRAME ASSEMBLY

(Preceding Page)

STRIPPER PLATE ASSEMBLY

Item	Part No.	Part Name
1	251684	Brush
2	245295	Brush Holder, R. H.
	245296	Brush Holder, L. H.
3	911645	4 x 3/16 B. H. Machine Screw
4	247027	Stripper Plate Top
5	245135	Stripper Plate Top Shim
6	914225	8-32 x 5/16 Sems Fastener
9	247217	Stripper Plate (Magenta)
	247333	Stripper Plate (Green)
10	912550	5-40 x 5/8 Fil. H. Machine Screw
11	400597	Tension Plate
12	940710	Solder Lug
13	245065	Clamp Arm Switch
14	921550	Flat Washer
15	S229220	Retaining Ring
16	245354	Shaft
17	915578	10-32 x ½ Sems Fastener
19	245134	Transfer Arm Stop
20	246352	Carriage Cover Bracket

Item	Part No.	Part Name
47	915548	10-32 x 7/16 Sems Fastener
48	245070	Clamp Arm Spring Plate
49	925434	1208 Lock Washer
50	961015	8-32 x 3/8 R. H. Thread Cutting Screw
51	245079	Clamp Arm Spring
52	918520	8-32 x 3/16 Set Screw
53	245038	Roller
54	914735	8-32 x 7/8 R. H. Machine Screw
55	901660	8-32 Hexagon Nut
56	247219	Clamp Arm & Pin Assembly (Magenta)
	247335	Clamp Arm & Pin Assembly (Green)
57	914332	8-32 x 3/8 Sems Fastener
58	920902	Flat Washer
59	247221	Pivot Pin & Block Assembly (Magenta)
	247337	Pivot Pin & Block Assembly (Green)
60	911625	4-40 x 3/16 Sems Fastener
61	250235	Clamp Disc Cover
62	250507	Snap Washer
63	245072	Record Clamp Disc. Assembly

CONTACT AND TRANSFER ARM ASSEMBLIES

Item	Part No.	Part Name
22	245109	Transfer Arm Shaft
23	245557	Adjustment Screw
24	901660	8-32 Hexagon Nut
25	245239	Transfer Arm
26	921553	.031" Thick Steel Washer
	921552	.020" Thick Steel Washer
	921551	.015" Thick Steel Washer
	921550	.010" Thick Steel Washer
27	918590	8-32 x 7/16 Set Screw

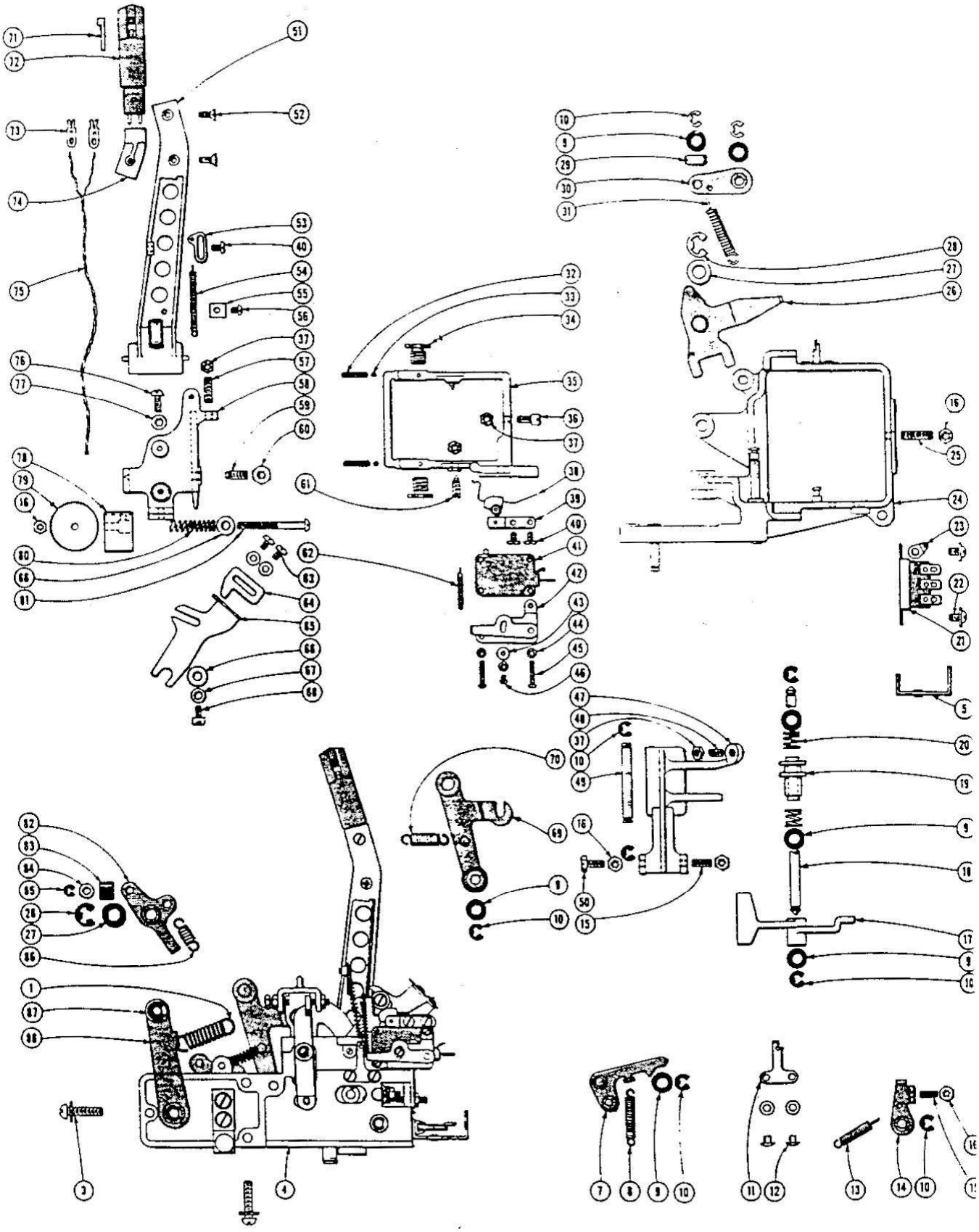
Item	Part No.	Part Name
28	247160	Contact Plunger Block Assembly *
29	602436	Cable Clamp
31	920735	Flat Washer
32	912959	6-32 x ¼ Sems Fastener
34	402098	Cable Clamp
35	245108	Contact Arm
36	921180	Flat Washer
37	915548	10-32 x 7/16 Sems Fastener
64	247168	Contact Block Mounting Bracket

* Refer to Parts Breakdown on Page 2367.

SAFETY TRIP ASSEMBLY

Item	Part No.	Part Name
21	914110	8-32 x ¼ Sems Fastener
38	245103	Safety Trip Lever Spring
39	245094	Lever & Hub Assembly
40	921061	Flat Washer Spring Steel
41	R231163	Snap Washer
42	245102	Detent Arm Spring

Item	Part No.	Part Name
43	245098	Plunger
44	245100	Plunger Spring
45	245101	Eyelet
46	245088	Safety Trip Bracket Assembly
65	914115	8-32 x ¼ Sems Fastener



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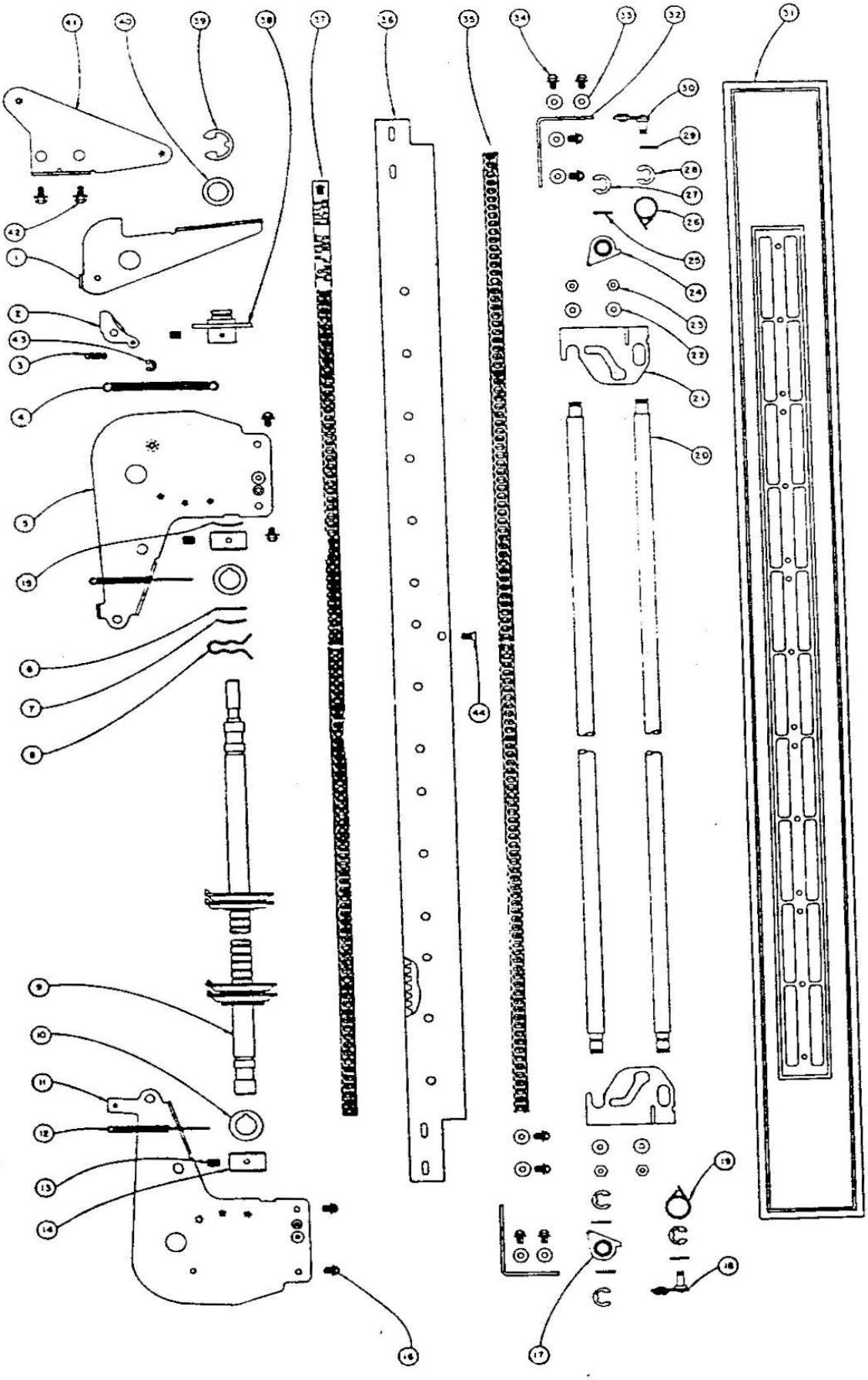
PICKUP ARM FRAME ASSEMBLY

PARTS LIST for PICKUP ARM FRAME ASSEMBLY

(Preceding Page)

PARTS LIST

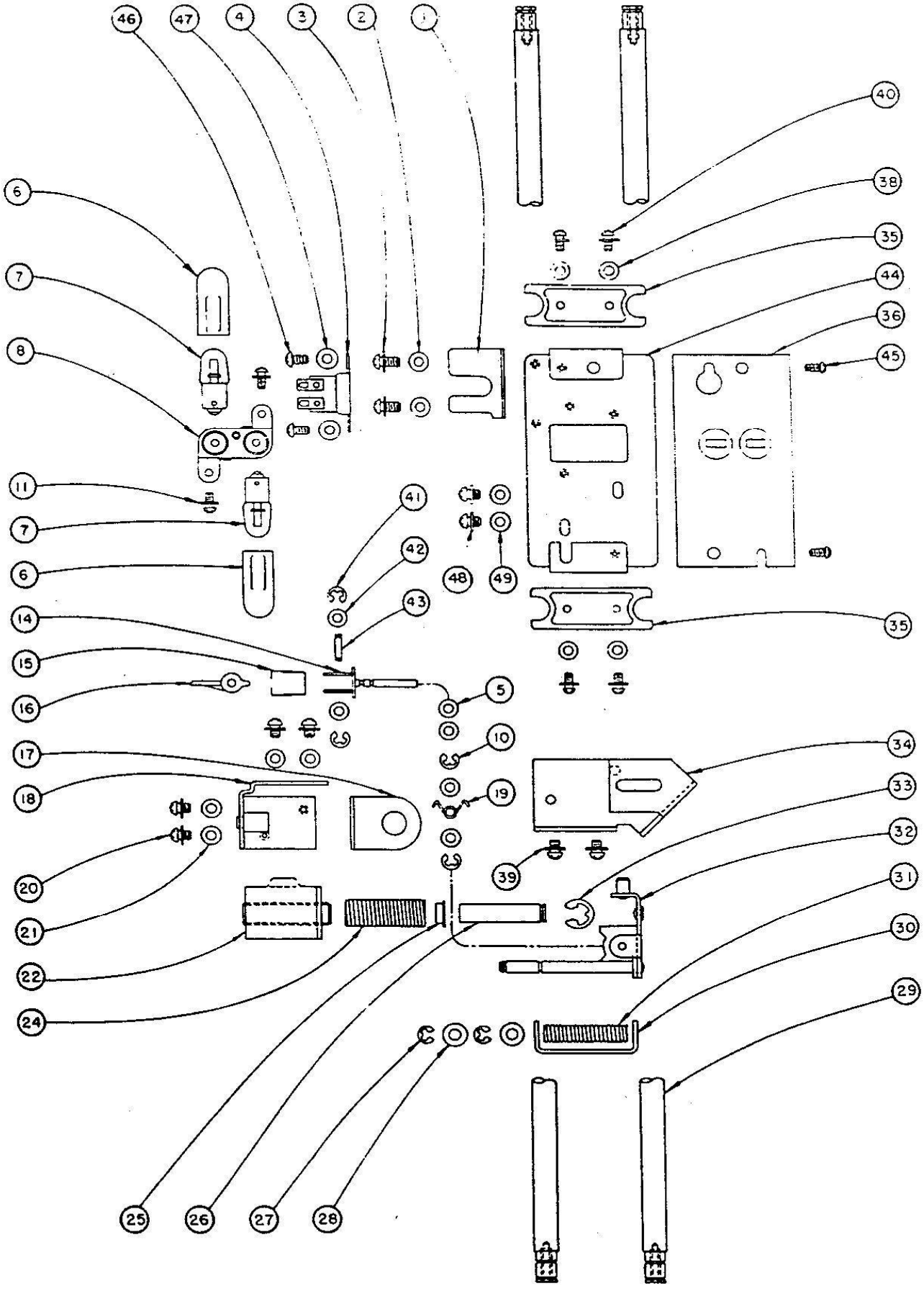
Item	Part No.	Part Name
1	245243	Brake Lever Spring
3	915724	10-32 x ¾ Sems Fastener
4	247700	Pickup Arm & Frame Assembly
5	246784	Terminal Strip Shield
7	245765	Pickup Arm Lock Lever
8	245792	Lock Lever Spring
9	921061	Flat Washer
10	R231163	Retaining Ring
11	245825	Pickup Arm Spring Lug
12	980732	1/8 Diameter - Rivet
	920601	Flat Washer
13	245773	Lock Lever Detent Spring
14	245800	Lock Lever Detent
15	918372	6-32 x 3/8 Slotted Head Set Screw
16	901102	6-32 Hexagon Nut
17	245711	Lock Lever Control Crank
18	245728	Control Fork Hinge Pin
19	245729	Shifting Collar
20	245791	Spring
21	245755	3 Lug Terminal Strip
22	912959	6-32 x ¼ Sems Fastener
23	940755	Solder Lug
24	245753	Pickup Arm Frame Assembly
25	918421	6-32 x 5/8 Set Screw
26	245758	Cradle Actuator Lever
27	921551	Flat Washer
28	S229220	Retaining Ring
29	245740	Detent Roller
30	245763	Detent Lever
31	245764	Detent Lever Spring
32	918210	5-40 x 3/8 Socket Head Set Screw
33	245772	Lock Plug
34	245737	Adjusting Bushing
35	245771	Cradle & Pin Assembly
36	245726	Support Pin
37	901631	8-32 Hexagon Nut
38	245714	Trip Switch Lever
39	245724	Support Lug
40	911644	4-40 x 3/16 Ph. B.H.Machine Screw
41	245816	Trip Switch
42	245818	Adjusting Lever & Plate
43	920360	Flat Washer
44	925072	Lock Washer
45	910615	2-56 x ½ R.H.Machine Screw
46	910408	2-56 x 1/8 R.H.Machine Screw
47	245709	Control Fork
48	918642	8-32 x ¼ Slotted Head Set Screw
49	245732	Cradle Pressure Pin
50	913228	Slotted Hexagon Head Machine Screw
51	247710	Pickup Arm & Roller Assembly (Magenta)
	247722	Pickup Arm & Roller Assembly (Green)
52	911290	4-36 x 5/16 Phil. Flat Head Mach. Screw
(a)	911281	4-36 x 5/16 F.H.Machine Screw
53	245715	Pickup Arm Spring Clip
54	246799	Pickup Arm Spring
55	245823	Wire Retainer
56	911575	4-40 x 1/8 Ph. R.H.Machine Screw
57	918612	8-32 x ½ Slotted Head Set Screw
58	245779	Pickup Arm Cradle & Pin Assembly
59	245805	P.U.Arm Shaft Set Screw
60	902360	10-32 Hexagon Nut
61	245777	Pivot Screw
62	245817	Trip Switch Balance Spring
63	911586	4-40 x 1/8 B.H.Machine Screw
64	245783	Trip Switch Actuator Plate
65	245723	Trip Switch Actuator
66	920661	Flat Washer
67	925343	Lock Washer
68	913020	6-32 x ¼ Socket Head Cap Screw
69	245766	Control Lever & Roller
70	245769	Control Lever Spring
71	246797	Sapphire Armature Only
	246788	Diamond Armature Only
72	246816	Magnetic Pickup with 246797 Armature
	246817	Magnetic Pickup with 246788 Armature
	246796	Magnetic Pickup Only
73	941320	Solder Lugs
74	245713	Pickup Cartridge Socket
75	246734	Pickup Lead
76	913151	6-32 x 3/8 Ph.R.H.Machine Screw
77	925343	Lock Washer
78	246795	Pickup Arm Weight
79	246733	Pickup Arm Counterweight (.273" thick)
80	245821	Lock Spring
81	913685	6-32 x 1-¼ Ph. R.H.Machine Screw
82	245760	Drive Crank
83	245745	Drive Crank Roller
84	920600	Flat Washer
85	125448	Retaining Ring
86	245782	Drive Crank Spring
87	245157	Brake Cam Roller
88	245242	Brake Cam Lever



POPULARITY METER DIAL & SHAFT ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	247245	Reset Lever
2	247246	Reset Pawl
3	245673	Pawl Spring
4	247247	Reset Lever Spring
5	247095	Indicator Bracket & Stud Assembly – R. H.
	247054	Indicator Support Bracket – R. H.
	247097	Stud - Pawl Stop
	247099	Stud - Reset Lever Stop
	247289	Latch Pivot Stud
6	922951	Flat Washer
7	924704	Spring Washer
8	248002	Dial Retainer Spring
9	247235	Popularity Meter Dial & Shaft Assembly
	248001	Dial
	248002	Dial Retainer Spring
	924704	Spring Washer
10	247239	Spring Anchor Washer
11	247096	Indicator Bracket & Stud Assembly – L. H.
	247055	Indicator Support Bracket – L. H.
	247097	Stud - Pawl Stop
	247289	Latch Pivot Stud
12	247256	Indicator Panel Spring
13	918751	No. 10-32 x ¼ Cup Point Socket Head Set Screw
14	247241	Collar
15	924727	Spring Washer
16	913049	Sems
17	247125	Pawl & Bushing Assembly – R. H.
	247127	Pawl - R. H.
	247129	Bushing
18	247293	Latch Assembly – L. H.
	247294	Latch
	247296	Spring Anchor Pin
	247297	Latch Hub
19	247135	Pawl Spring – R. H.
20	247116	Indicator Guide Shaft
21	247117	Indicator Panel Bracket
22	925342	1206 Lock Washer
23	901100	No. 6 - 32 Hex Nut
24	247126	Pawl & Bushing Assembly – L. H.
	247128	Pawl – L. H.
	247129	Bushing
25	921850	Flat Washer
26	247136	Pawl Spring – L. H.
27	301367	Snap Washer
28	125448	Retaining Ring
29	920600	Flat Washer
30	247292	Latch Assembly – R. H.
	247294	Latch
	247295	Spring Anchor Pin – R. H.
	247297	Latch Hub
31	247106	Indicator Panel & Number Strip Assembly
		NUMBER STRIPS
	247039	A1 thru V2
	247040	A3 thru V4
	247041	A5 thru V6
	247042	A7 thru V8
	247043	A7 thru V0
	980334	Rivets
32	247026	Index Strip Mounting Bracket
33	920805	Flat Washer
34	913049	Sems
35	247433	Number Strip (Magazine) (Q6-U0)
36	247286	Index Strip & Stop Assembly
37	247434	Number Strip (Popularity) (Q6-U0)
38	247025	Reset Ratchet
39	245648	Retaining Ring
40	922870	Flat Washer
41	247057	End Cover Mounting Bracket- Upper
42	914332	Sems
43	R-231163	Retaining Ring
44	911704	4- 40 x ¼ Phillips Flat H.M.S.

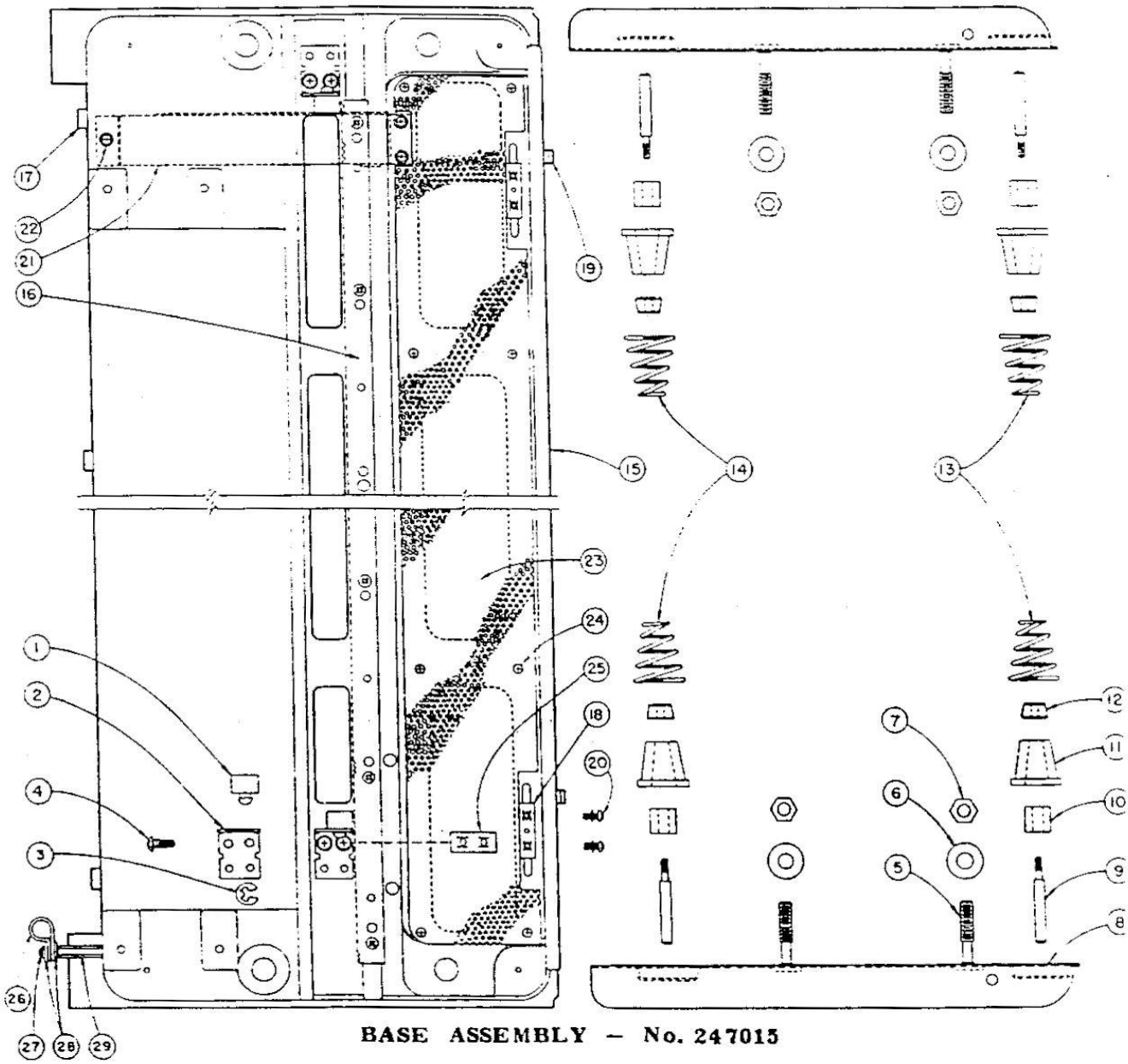


INDICATOR & POPULARITY METER ACTUATOR ASSEMBLY – No. 247170

2363

PARTS LIST

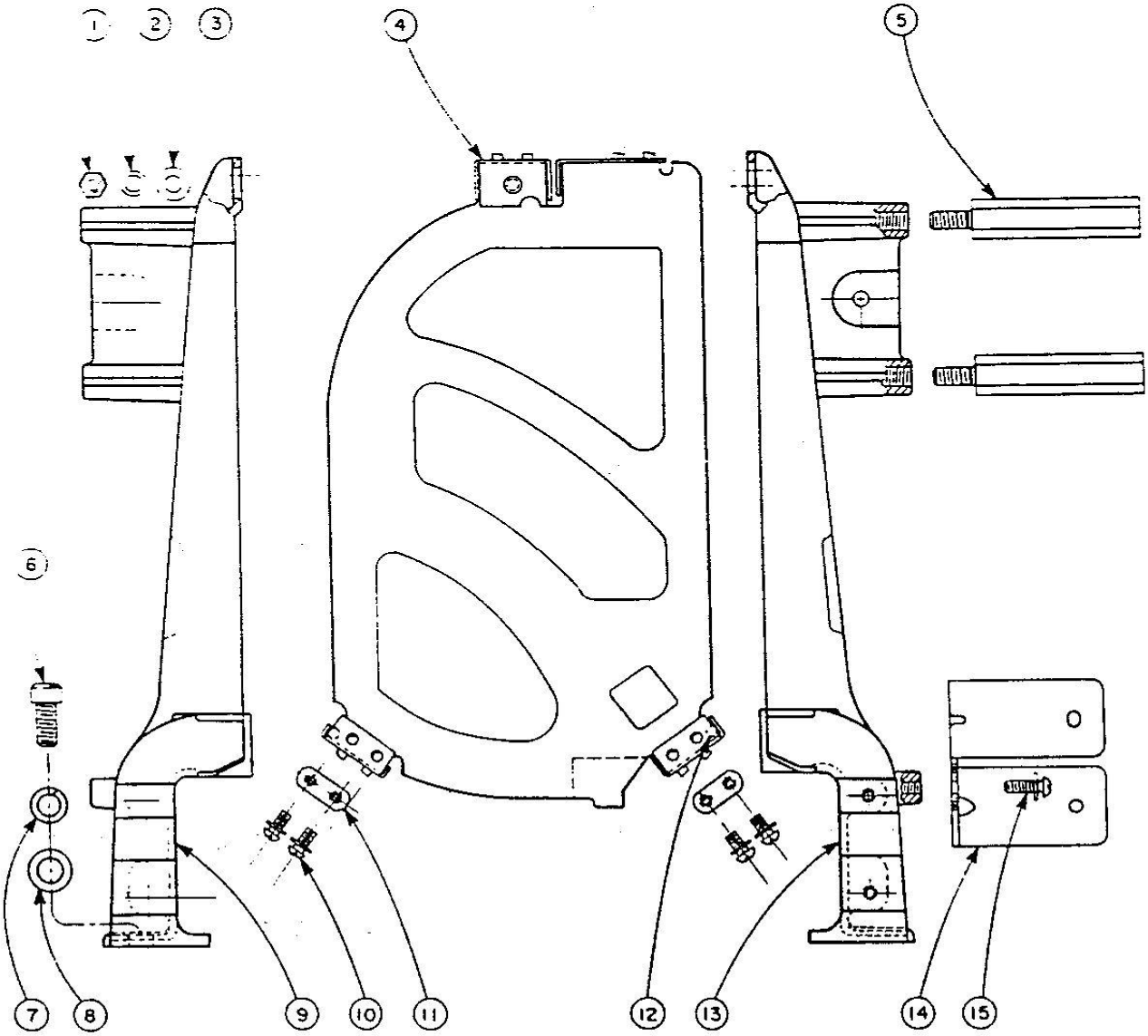
Item	Part No.	Part Name
1	247175	Drive Bracket
2	920805	Flat Washer
3	913049	Sems
4	247287	Terminal Strip
5	920600	Flat Washer
6	247255	Light Shield
7	10192	No. 44 Lamp
8	247174	Light Socket
10	125448	Retainer Ring
11	911692	Sems
14	247185	Pawl Retainer
15	247159	Pawl Spring
16	247158	Pawl
17	247249	Solenoid Bracket
18	247248	Solenoid Bracket Staked Assembly
19	247146	Pawl Centering Spring
20	912959	Sems
21	920805	Flat Washer
22	247251	Solenoid
24	247254	Solenoid Plunger Spring
25	986450	Eyelet
26	247253	Solenoid Plunger
27	R-231163	Snap Washer
28	921061	Flat Washer
29	247116	Indicator Guide Shaft
30	247232	Dial Drive Bearing Bracket
31	247137	Drive Spring
32	247179	Drive Bracket and Stud Assembly
33	125452	Retaining Ring
34	247178	Solenoid Frame
35	247171	Slider
36	247272	Indicator Plate
38	920601	Flat Washer
39	912959	Sems
40	911692	Sems
41	125448	Retainer Ring
42	920600	Flat Washer
43	247147	Pawl Bearing Pin
44	247173	Indicator Frame
45	913067	6-32 x 5/16 Phillips B.H.M.S.
46	911586	4-40 x 1/8" Phillips B.H.M.S.
47	925171	Lock Washer
48	913049	Sems
49	920805	Flat Washer



BASE ASSEMBLY — No. 247015

PARTS LIST

Item	Part No.	Part Name
1	245291	Rubber Bumper
2	247300	Stop Bracket
3	229220	Retaining Ring
4	961121	No. 10 - 3/8" Phillips B. H. Self Tapping Screw
5	916698	Weld Bolt
6	922135	Flat Washer
7	904300	Hex Nut
8	247194	Shock Mounting Channel Assembly
9	247048	Spring Mounting Screw
10	247104	Felt Plug
11	247046	Chassis Mounting Spring Plug
12	245117	Spring Retainer
13	245116	Chassis Mounting Spring
14	245267	Chassis Mounting Spring (Rear)
15	247114	Base Casting Assembly
	247008	Base
	247012	Gear Rack Assembly
	250052	Dowl Pins
16	247012	Gear Rack Assembly
17	247149	Cable Clamp
18	901559	Twin Speed Nut
19	247301	Reversing Switch Stop
20	914332	Sems Fastener
21	247051	Scan Control Assembly
22	914222	Sems Fastener
23	247133	Base Cover Plate (Front)
24	960998	8-32 x 5/16 Phillips B.H. Self Tapping Screw
25	902395	Twin Speed Nut
26	602377	Clamp
27	914332	Sems
28	920935	Flat Washer
29	247045	Spacer Stud

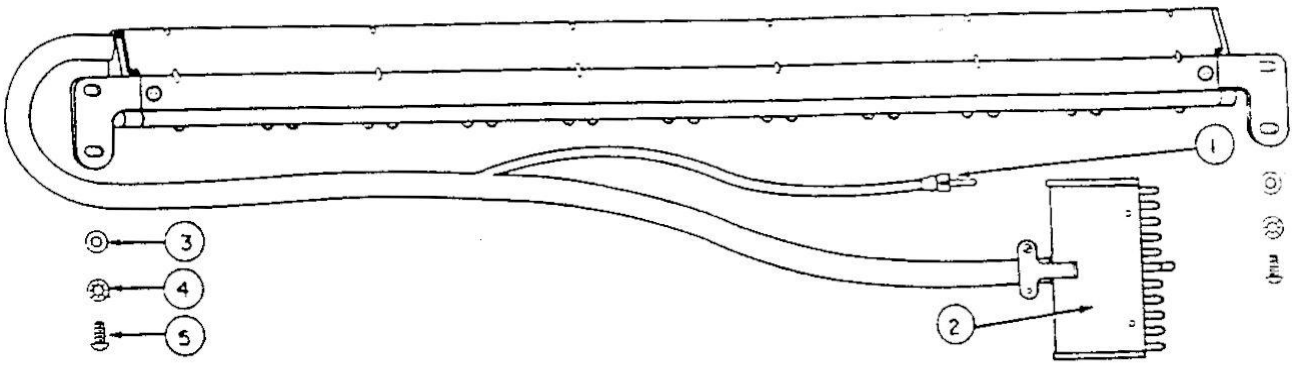


MAGAZINE ASSEMBLY — No. 247420

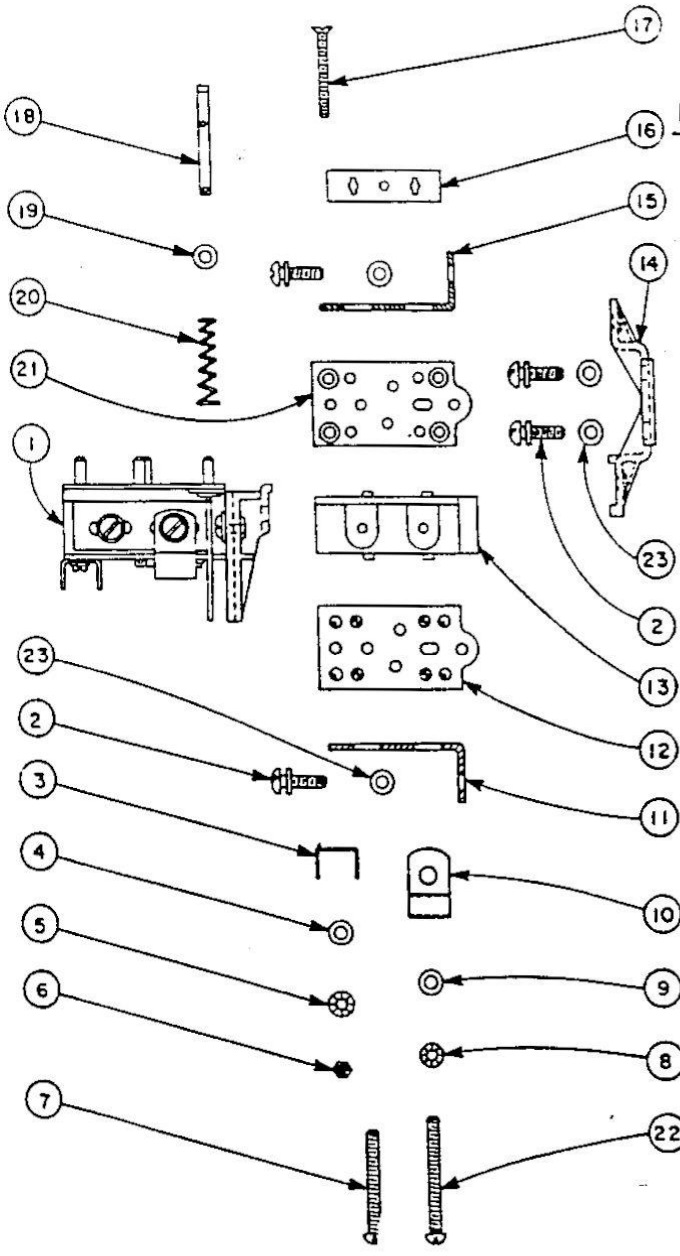
PARTS LIST

Item	Part No.	Part Name
1	902360	Hex Nut
2	925492	Kantlink Washer
3	921180	Flat Washer
4	247426	Separator & Channel Assembly
5	247056	Extension Stud
6	916430	¼- 20 x 9/16 Socket Head Cap Screw
7	925583	¼ Kantlink Lock Washer
8	921555	Flat Washer
9	247431	Magazine Support Bracket, L. H.
10	913049	Sems
11	245313	Tapping Plate
12	247428	Record Cushion
13	247430	Magazine Support Bracket, R. H.
14	247059	End Cover Mounting Bracket, Lower L. H.
15	914485	Sems

2366



TORMAT MEMORY UNIT, TYPE 200TM1
No. 304600

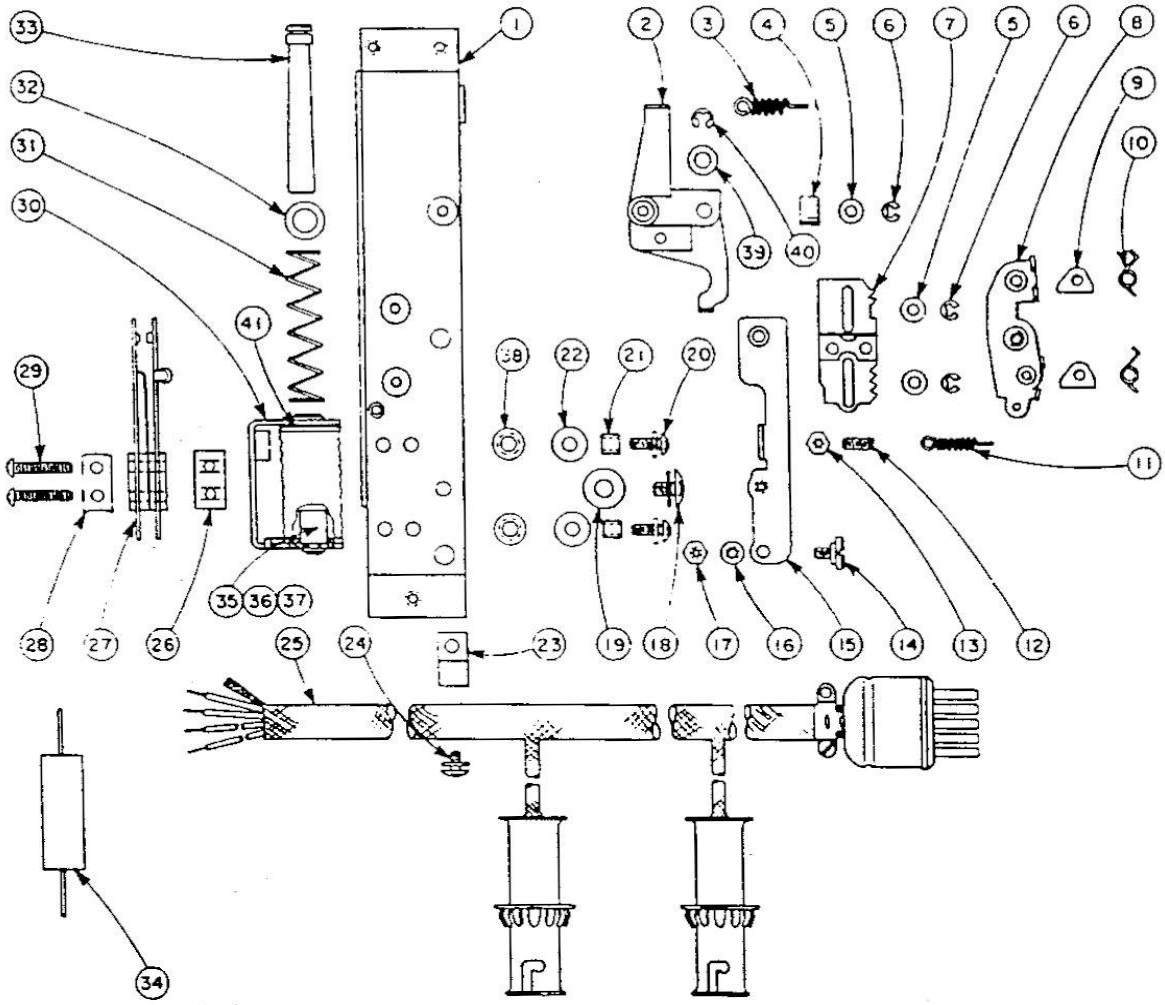


TORMAT MEMORY UNIT
PARTS LIST

Item	Part No.	Part Name
1	246957	Single Prong Plug
2	304657	33 Prong Plug Assembly
3	921180	Flat Washer
4	925492	Lock Washer
5	915545	10-32 x 7/16 Phillips R.H.M.S.

CONTACT PLUNGER BLOCK — No. 247160
PARTS LIST

Item	Part No.	Part Name
1	247160	Contact Plunger Block Assembly
2	913049	Sems
3	940410	Solder Lug
4	920601	Flat Washer
5	925171	Lock Washer
6	900550	4-40 Hex Nut
7	913715	6-32 x 1 - 3/8 Phillips R.H.M.S.
8	925342	Lock Washer
9	920805	Flat Washer
10	602436	Cable Clamp
11	247166	Contact Block Adjustment Bracket, L.H.
12	247165	Contact Plunger Bearing Plate, Bottom
13	247163	Contact Plunger Block
14	247168	Contact Block Mounting Bracket
15	247167	Contact Block Adjustment Bracket, R.H.
16	900811	Dual Nut Tinnerman
17	912125	4-40 x 1" Phillips Flat H.M.S.
18	247161	Contact Plunger
19	920600	Flat Washer
20	247162	Contact Plunger Spring
21	247164	Contact Plunger Bearing Plate-Top
22	913742	6-32 x 1½" Phillips R.H.M.S.
23	920805	Flat Washer

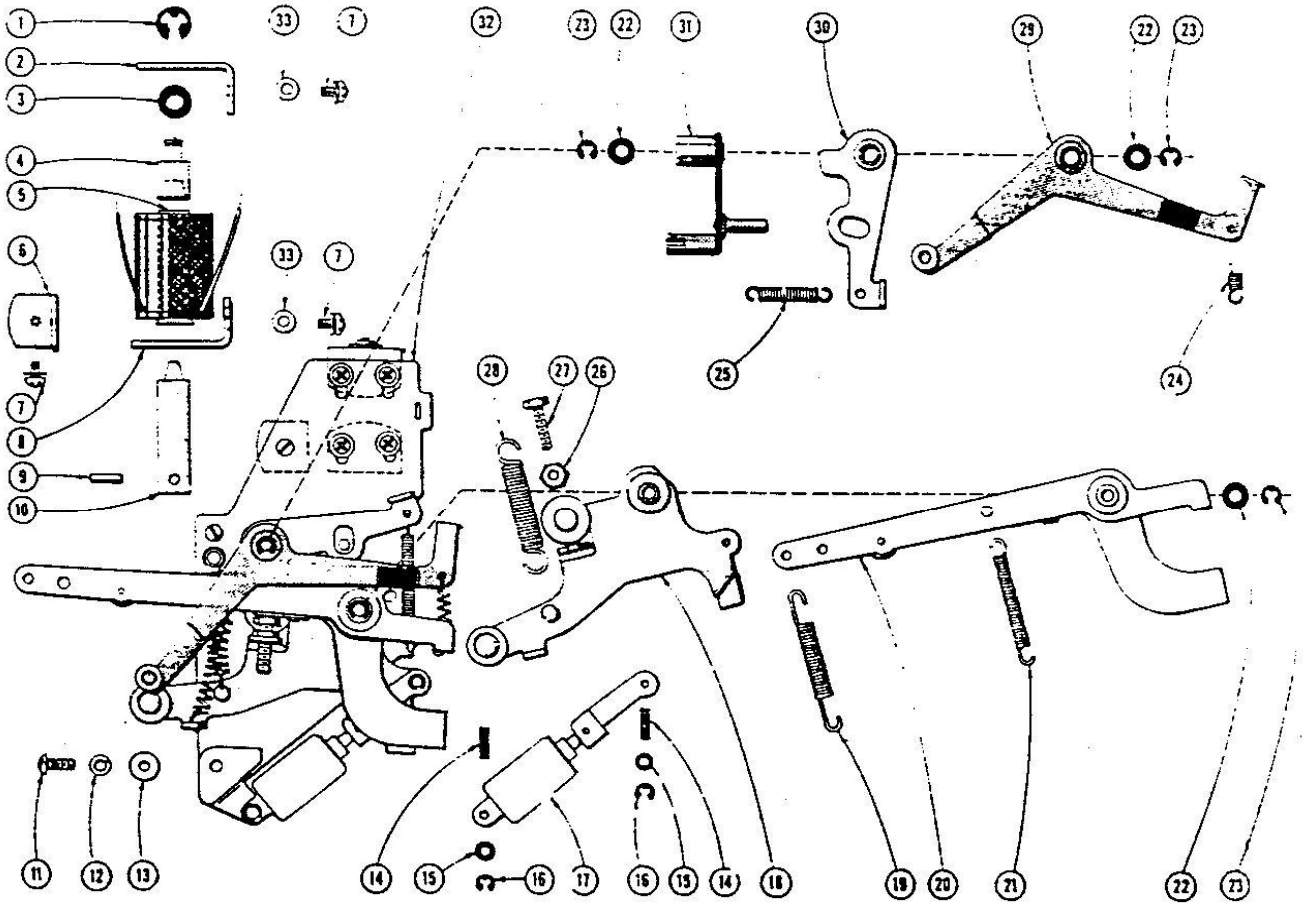


SCAN CONTROL – No. 247051

PARTS LIST

Item	Part No.	Part Name
1	247060	Mounting Plate Assembly
2	247275	Cancel Lever Welded Assembly
3	247069	Spring (Cancel Lever)
4	247068	Roller
5	920600	Flat Washer
6	125448	Retaining Ring
7	247077	Ratchet Assembly
8	247278	Pawl Lever Staked Assembly
9	247075	Pawl
10	247074	Pawl Spring
11	247076	Spring (Pawl Lever)
12	918372	6-32 x 3/8 Oval Point, Slotted Head, Set Screw
13	901100	6-32 Hex Nut
14	247088	Shoulder Screw
15	247277	Adjustment Lever & Stud Assembly
16	925343	1206 Lock Washer
17	901100	6-32 Hex Nut
18	914145	Sems
19	920935	Flat Washer
20	913175	Sems
21	247131	Spacer
22	920651	Flat Washer
23	F-402098	Cable Clamp
24	914047	Sems
25	247085	Cable Assembly
	247086	Cable
	F-200241	5 Prong Plug
	247049	Lamp Socket
26	900526	Speed Nut
27	247080	Switch (Scan Control)
28	400597	Tension Washer
29	960331	No. 4 x ¼ Type "Z" Phillips Pan Head Sheet Metal Screw
30	247141	Solenoid & Bracket Assembly
	247288	Solenoid
	247132	Solenoid Bracket
31	247084	Plunger Spring
32	921750	Flat Washer
33	247083	Plunger
34	86142	.1 Mfd. Molded Paper Capacitor, 200 Volt
35	247306	Plunger Stop Assembly
36	920973	Washer
37	R-231163	Retaining Ring
38	988192	Grommet
39	921061	Flat Washer
40	R-231163	Retaining Ring
41	924726	Spring Washer

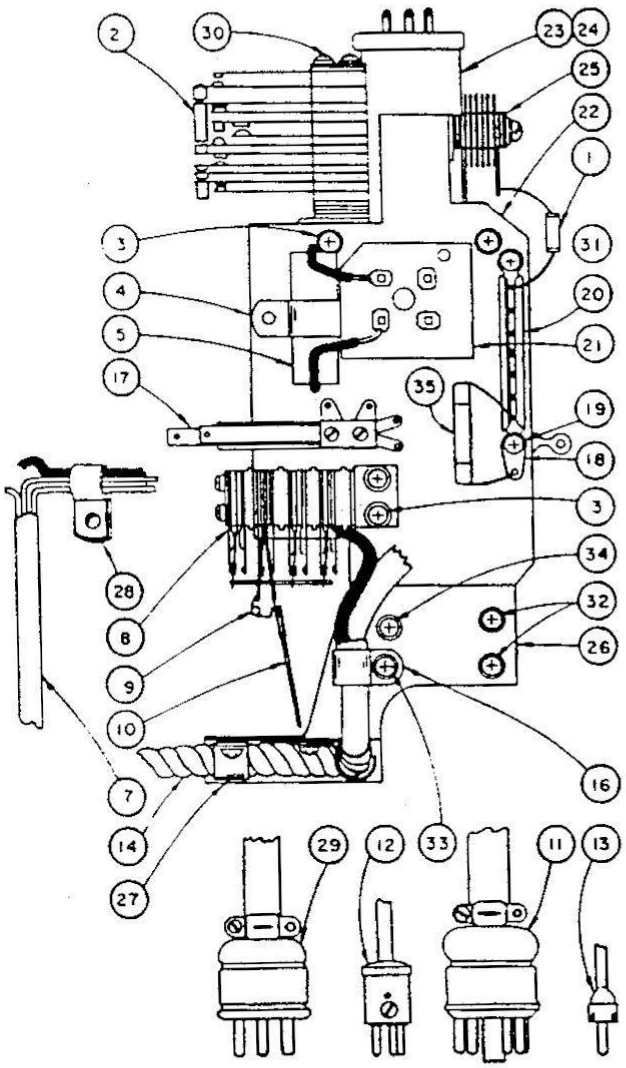
2368



No. 245520 TRIP MECHANISM ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	S229220	Retaining Ring
2	245575	Solenoid Bracket - Top
3	400602	Rubber Washer
4	245576	Plug Assembly
5	247510	Solenoid
6	245582	Trip Plate Support Bracket
7	914143	8-32 x 1/4 Sems Fastener
8	245579	Solenoid Bracket - Bottom
9	952250	5/32 x 7/16 Roll Pin
10	245581	Plunge
11	914320	8-32 x 3/8 Ph. R.H. Machine Screw
12	925401	No. 8 Lock Washer
13	921015	Flat Washer
14	245523	Dash Pot Pivot Pin
15	920600	Flat Washer
16	125448	Retaining Ring
17	245595	Dash Pot Assembly
18	245588	Reset Lever & Roller Assembly
19	245248	Clutch Spring
20	245525	Clutch Shifting Lever Assembly
21	245573	Clutch Shifting Lever Spring
22	921061	Flat Washer
23	R231163	Snap Washer
24	247214	Switch Lever Spring
25	245552	Latch Lever Spring
26	901660	8-32 Hexagon Nut
27	245557	Adjustment Screw
28	245550	Reset Lever Spring
29	245539	Switch Lever Assembly
30	245593	Latch Lever Assembly
31	245545	Trip Lever Assembly
32	245583	Mounting Plate
33	920910	Flat Washer



SWITCH PLATE ASSEMBLY – No. 247830

PARTS LIST

Item	Part No.	Part Name
1	82413	120 Ohm Resistor ½ W. ± 10%
2	247815	Cam Switch
3	912852	Sems
4	245960	Plastic Clamp
5	86174	.1 Mfd. 600 V. Tub. Condenser
7	247823	Internal Cable
8	247834	Reversing Switch Assembly
9	245948	Spring
10	247833	Actuator Blade Assembly
	247847	Center Contact Blade
	245947	Bakelite Tie Strip
11	250942	11 Prong Plug
12	250938	3 Prong Plug
13	246957	Single Prong Plug
14	247820	Cable Assembly with Plugs
	277821	Control Cable Only
	247841	Cable Covering
16	602377	Cable Clamp
17	247840	Clutch and Reset Lever Switch
	912755	5- 40 x 1½ Phillips R.H.M.S.
	400597	Tension Washer
18	940630	Solder Lug
19	912920	6- 32 x ¼ Phillips R.H.M.S.
	901102	6- 32 Hex Nut
	940650	Solder Lug
20	305113	Terminal Strip
21	245909	Terminal Board
22	247835	Switch Plate Riveted Assembly consisting of Items 21 & 22
23	86172	Motor Condenser
24	245917	Condenser Strap
25	247843	Selenium Rectifier
	920840	Flat Washer
	913564	Sems
26	247837	Cable Support Bracket
27	247109	Cable Clamp
28	602377	Cable Clamp
29	65319	Six Prong Plug
30	912781	5- 40 x 1- 7/8" Phillips R.H.M.S.
	400597	Tension Washer
31	912845	6- 32 x 3/16 Phillips R.H.M.S.
	925343	Lock Washer
32	914047	Sems
33	920840	Flat Washer
	914253	Sems
34	914370	Sems
	914185	8- 32 x ¼ Allen Socket Head Cap Screw
	914545	8- 32 x ½ Allen Socket Head Cap Screw
	925434	No. 1208 Lock Washer
	920840	Flat Washer
35	247850	5 Amp. Pig-Tail Fuse, Type GJV

2370

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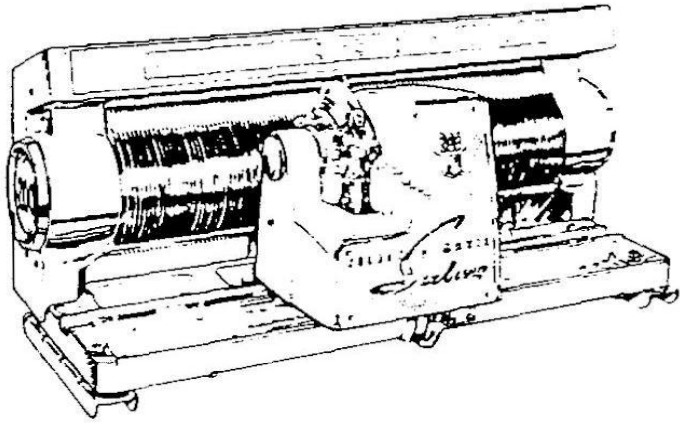
SELECT-O-MATIC "200" MECHANISM
TYPE 245ST3-L6



The Select-O-Matic "200" Mechanism, Type 245ST3-L6 is designed for use with 45 r.p.m., 7-inch records in the Select-O-Matic "200" Model VL-200. It is the same as the Type 245ST1-L6 Mechanism used in the Model V-200 except the color of some of the exposed parts and trim, the switch plate assembly shown on Page 2370 and the carriage read-out circuit wiring.

Except for color and for the switch plate assembly, the parts for the 245ST1-L6 and 245ST3-L6 are identical and interchangeable. A reference for parts having different numbers due to the color difference and the switch plate assembly are on Page 2374. Service data (except wiring diagram) and adjustments are the same for the two mechanisms and are indexed below.

– ADJUSTMENT INDEX –

PARTS LIST

The parts for the Type 245ST3-L6 Mechanism and the Type 245ST1-L6 Mechanism are interchangeable and the same in all respects except in the color of some of the visible items and certain parts associated with the mechanism wiring. The parts that have a different color or specification have a part number differing from the numbers shown on Pages 2351 to 2370. The part numbers below must be used when 245ST3-L6 parts are ordered.

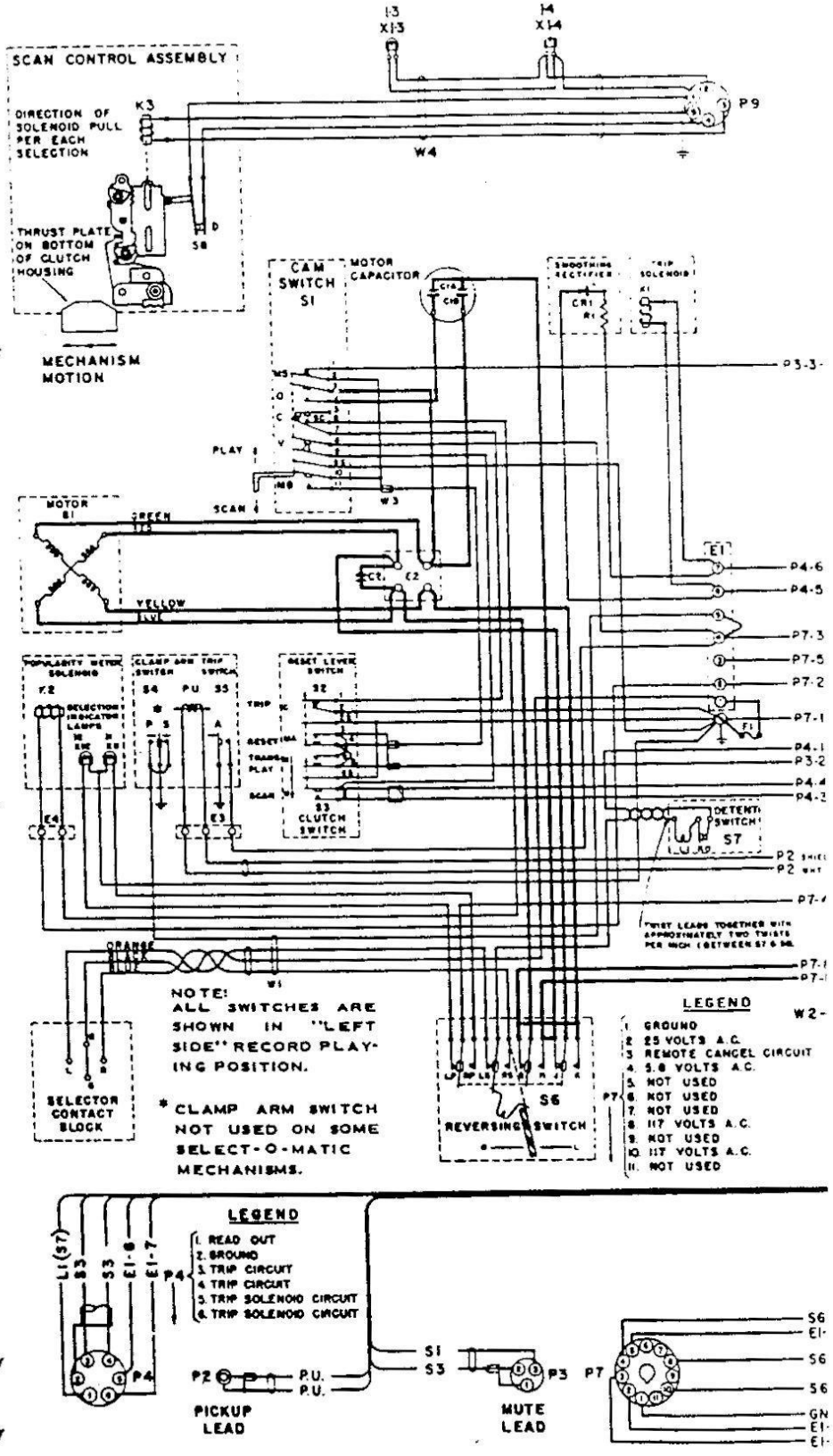
REFERENCE PARTS LIST

PAGE	ITEM	PART NO.	PART NAME
2351	1	247484	Magazine End Cover Assembly, L. H.
	1	247486	Magazine End Cover, L. H.
	1	247488	End Cover Bezel Assembly
	1	903101	Retainer Nut
	2	247487	Magazine End Cover Insert
	4	247461	Base Assembly (Page 2365)
	5	247361	Carriage Assembly (Page 2355 to 2358)
	6	247490	Carriage Cover Assembly
	6	247491	Carriage Cover
	6	247493	Carriage Cover Trim Assembly
	6	247494	Carriage Cover Escutcheon
	6	914681	8-32 x ¾ Phillips Truss H.M.S.
	7	247051	Scan Control Assembly (Page 2368)
	8	247483	Magazine End Cover Assembly, R. H.
	8	247485	Magazine End Cover, R. H.
	8	247488	End Cover Bezel Assembly
	8	903101	Retainer Nut
2356	71	912645	5-40 x 15/16 Phillips R. H. M. S.
	73	247388	Detent Switch
	74	247386	Detent Switch Bracket
	77	247384	Detent Switch & Bracket Assembly
		247389	Detent Switch Cover
2358	4	247464	Stripper Plate Top
	9	247367	Stripper Plate (Dark Gray)
	56	247366	Clamp Arm & Pin Assembly (Dark Gray)
	59	247368	Pivot Pin & Block Assembly (Dark Gray)
2360	4	247702	Pickup Arm & Frame Assembly
	51	247732	Pickup Arm & Roller Assembly (Dark Gray)
2362	31	247468	Indicator Panel & Number Strip Assembly
			NUMBER STRIPS
	31	247471	A1 thru V2
	31	247472	A3 thru V4
	31	247473	A5 thru V6
	31	247474	A7 thru V8
	31	247455	A7 thru V0
	31	980330	Rivets
	35	247480	Number Strip (Magazine) (Q6-U0)
	36	247477	Index Strip & Stop Assembly
	37	247481	Number Strip (Popularity) (Q6-U0)
2365		247461	Base Assembly
	15	247462	Base
	23	247463	Base Cover Plate (Front)
2370		247828	Switch Plate Assembly

SCHEMATIC DIAGRAM

PARTS LIST

ITEM	PART NO.	PART NAME
B1	250251	Motor Assembly
C1a, C1b	86772	1.4 Mfd. Motor; 1.0 Mfd. Capacitor
C2	86174	.1 Mfd. 600 V. Tub. Capacitor
C3	86142	.1 Mfd., 200 V. Capacitor
CR1	306220	Selenium Rectifier
E1	305113	Terminal Strip
E2	245909	Motor Terminal Strip
E3	245755	Terminal Strip
E4	245287	Terminal Strip
F1	247850	Fuse-5 Amp.
I 1	10192	No. 44 Lamp
I 2	10192	No. 44 Lamp
I 3	402180	No. 81 Lamp
I 4	402180	No. 81 Lamp
K1	247510	Trip Solenoid
K2	247251	Popularity Meter Solenoid
K3	247288	Scan Control Assembly Solenoid
L1	303702	Choke, 100 Micro-Henry
P2	246957	Single Prong Plug
P3	250938	Three Prong Plug
P4	65319	Six Prong Plug
P7	250942	Eleven Prong Plug
P9	200241	5 Prong Plug
PU	246796	Magnetic Pickup
R1	82413	120 Ohm, ½ W., ± 10% Resistor
S1	247815	Cam Switch
S2, S3	247840	Reset Lever Switch; Clutch Switch
S4	245065	Clamp Arm Switch
S5	245816	Trip Switch
S6	247834	Reversing Switch Assembly
S7	247388	Detent Switch
S8	247080	Scan Control Switch
X11, X12	247174	Lamp Socket Assembly (Dual)
X13, X14	247049	Lamp Socket Assembly



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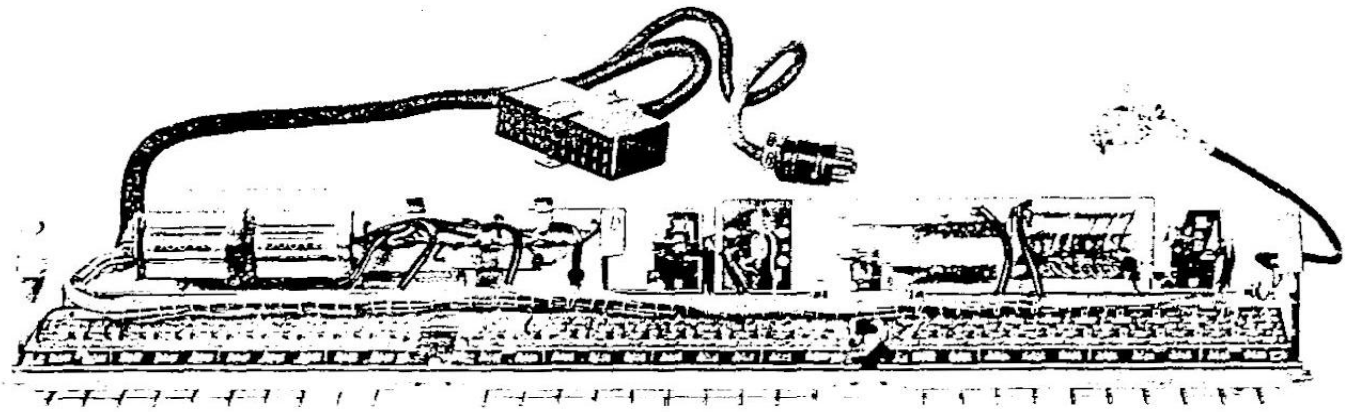
TORMAT ELECTRICAL SELECTOR
TES1-L6



The Tormat Electrical Selector, Type TES1-L6, is an assembly with three in-line selector switch assemblies of ten switches each. It is designed for use with the Select-O-Matic "200" Model V-200 and is operated from a selector key panel having a row of twenty lettered keys and a row of ten numbered keys. The selector panel is not a part of the Tormat Electrical Selector but is part of the phonograph cabinet assembly.

The Selector is a part of the Seeburg Tormat Selection Memory System and Dual Credit System which includes the Tormat Memory Unit on the Select-O-Matic Mechanism and the Tormat Selection Receiver. Its principal functions are to connect a letter and a number circuit of the Tormat Memory Unit into a selection write-in circuit and to complete a circuit that initiates the operational sequence of the system. These functions are performed when two of the selection switches are operated by pressing a lettered selector key and a numbered key. The keys may be operated in either sequence – first a numbered key, then a lettered key or a lettered key followed by a numbered key.

The component parts of the Selector are assembled on a steel frame and are protected by a steel cover. The complete Selector may be easily removed from the cabinet; however, all switch contacts and adjustments are accessible without doing so. All electrical connections to the associated Tormat Memory Unit and to the Selectio Receiver are made with a 12-prong plug and a 33-prong plug that connect to sockets in the Receiver.

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

The credit indicating lights are extended on their connecting leads so they illuminate the selection and credit information windows that are in the cabinet frame casting at the right of the selector key panel. They are 6-volt lamps operated at 25 volts through resistors and connect to an add-and-subtract credit switch that is part of the Dual Credit Unit in the selection receiver. One of the lights is turned on only when the credit switch is in one-credit position. A different light is turned on only when there are two credit units available for selection and the third light is lighted when there are three or more credit units available for selection. The credit window light switchboard identified in *Figure 2* may be arranged to change this one-two-three pattern so the first light indicates when only one credit unit is set up, the second light referred to does not operate at any time and the third light is turned on when two or more credit units are available.

3087

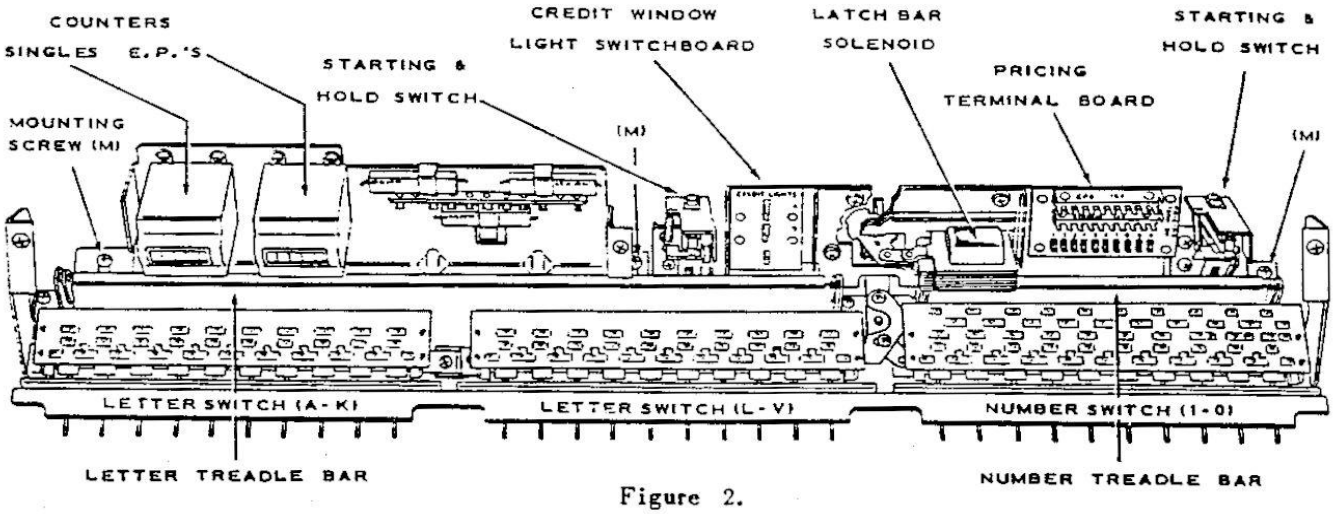


Figure 2.

The three selection switches each incorporate a latch bar and ten selector switches. These switch assemblies are not interchangeable. The two associated with the lettered keys and circuits are identical in contact arrangement and dimension but their latch bars are not the same. The switch assembly associated with the numbered keys and circuits differs from the "letter switches" in that it includes contacts and circuits for starting the operation sequence as well as control of circuits of the Tormat Memory Unit

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

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

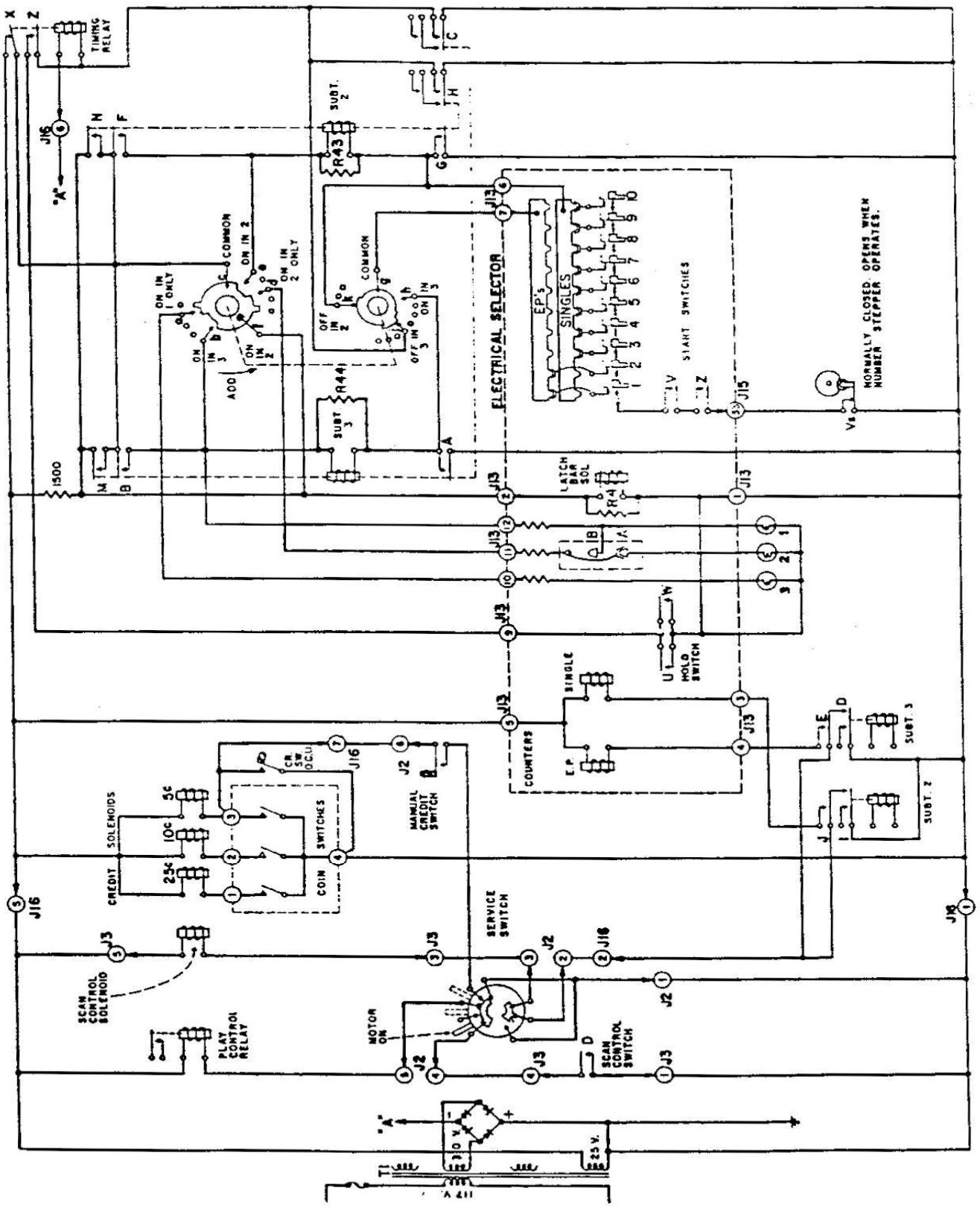
The two spring-leaf switches in the two switch groups are parallel connected and are part of a timing relay holding circuit that is completed through interlocking contacts on the relay when any one of the thirty selector keys is pressed. These switches are the Hold Switches, contacts U and W.

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

There are two subtract solenoids in the Dual Credit Unit. One, when energized, moves the add-and-subtract credit switch two credit units toward the no-credit or zero position. The other solenoid subtracts three credit units when energized. The connections that are pre-set at the selection pricing terminal board in the Selector determines which subtract solenoid will be energized when selection is made.

The pricing terminal board consists of two ten-point terminal strips and ten flexible leads. One end of each of the leads connects to the start switches through one of the ten numbered selector switches and has at its other end a

TORMAT ELECTRICAL SELECTOR, TYPE TES1-L6



push-on terminal for easy and simple connection to either of the two terminal strips. One terminal strip is marked "EP" and connects to the subtract-3 solenoid; the other strip, marked, "Singles", connects to the subtract-2 solenoid. Then a selection is made by pressing a letter and a number key, the subtract-2 solenoid will operate and two credit units subtracted if the lead associated with the selected number switch is connected to the "Singles" terminal strip. There will be three credit units subtracted by the subtract-3 solenoid if the lead is connected to the "EP" strip. By choice of terminal strip connection any group of twenty record selections can be "sold" for either two or three credit units.

The 1500 ohm resistor shown adjacent to to contact M of the subtract-3 switch group in *Figure 3* passes a charging current of low value through the latch bar solenoid so residual magnetism will not hold the solenoid plunger in the energized position when the full-current circuit to the solenoid is opened.

The 100 ohm resistor connected across the latch bar solenoid coil minimizes contact arcing.

The circuits of the Selector are shown in the schematic, *Figure 5*. *Figure 3* shows these circuits in simplified form and in association with other parts of the system.

REMOVAL OF SELECTOR

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

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

LUBRICATION

Oil all pivots with one drop of Seeburg No. 53014 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly as indicated in *Figure 4*. *(Aero Lubriplate and No. 53014 Oil is available from your Seeburg Distributor.)*

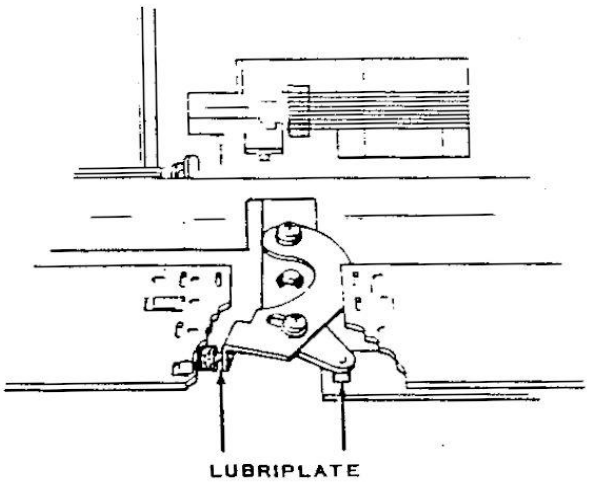


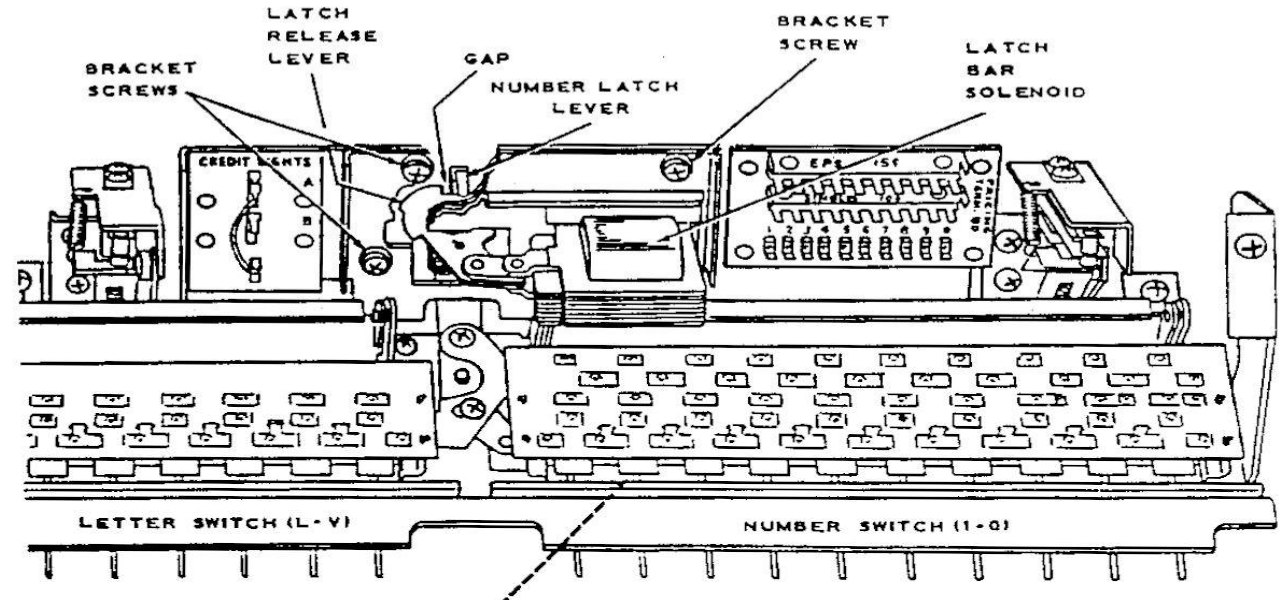
Figure 4.

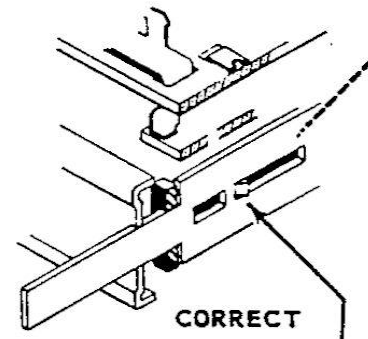
SELECTOR KEYS

The individual selector keys pivot, at the upper end, on a projection in the key frame. They may be removed by swinging inward at the bottom after loosening the key bearing strip. The upper end of the keys are prevented from rattling by spring clips that extend under adjacent keys. The clips will be loose and can fall from place if two adjacent keys are removed from the frame.

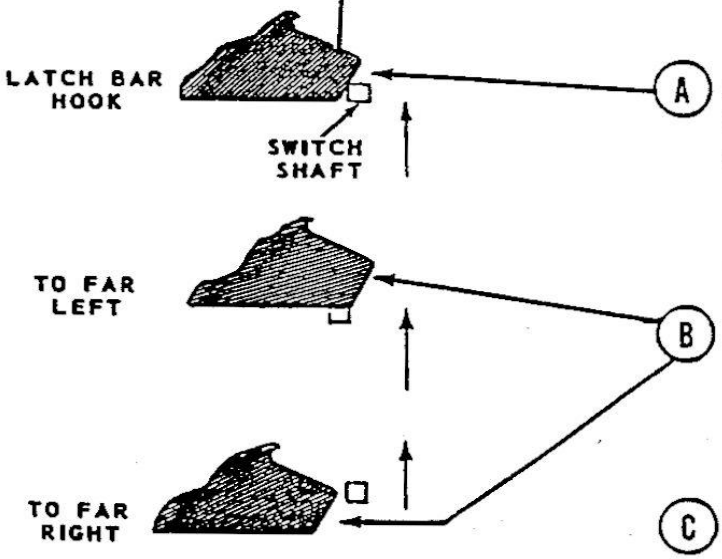
ADJUSTMENT NO. 1 – NUMBER SWITCH

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





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



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

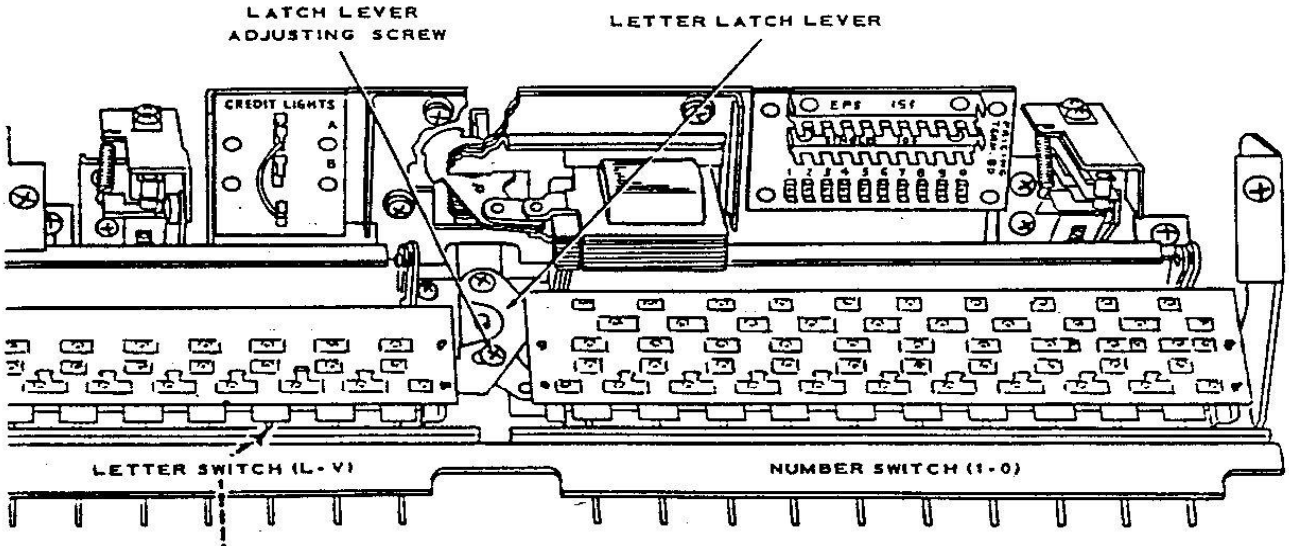
(B) If the Latch Bar Solenoid is too far to the left, the selector keys will be locked. If the Solenoid is too far to the right, the selector keys will not latch or the latching will be erratic.

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

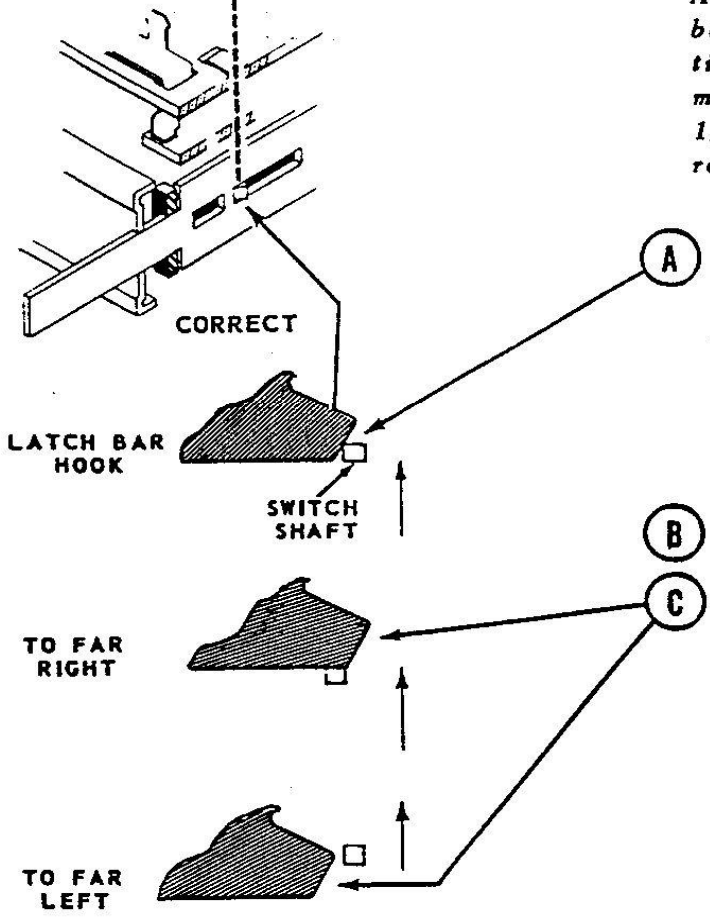
3091

ADJUSTMENT NO. 2 – LETTER SWITCH L-V

This adjustment positions the latch bar of the L-V LETTER SWITCH so the lettered selector switches will operate in the same manner provided for the numbered switches in Adjustment No. 1.



NOTE: Before making this adjustment, Adjustment No. 1 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be 1/64" to 1/16" gap between the latch release lever and the number latch lever.



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

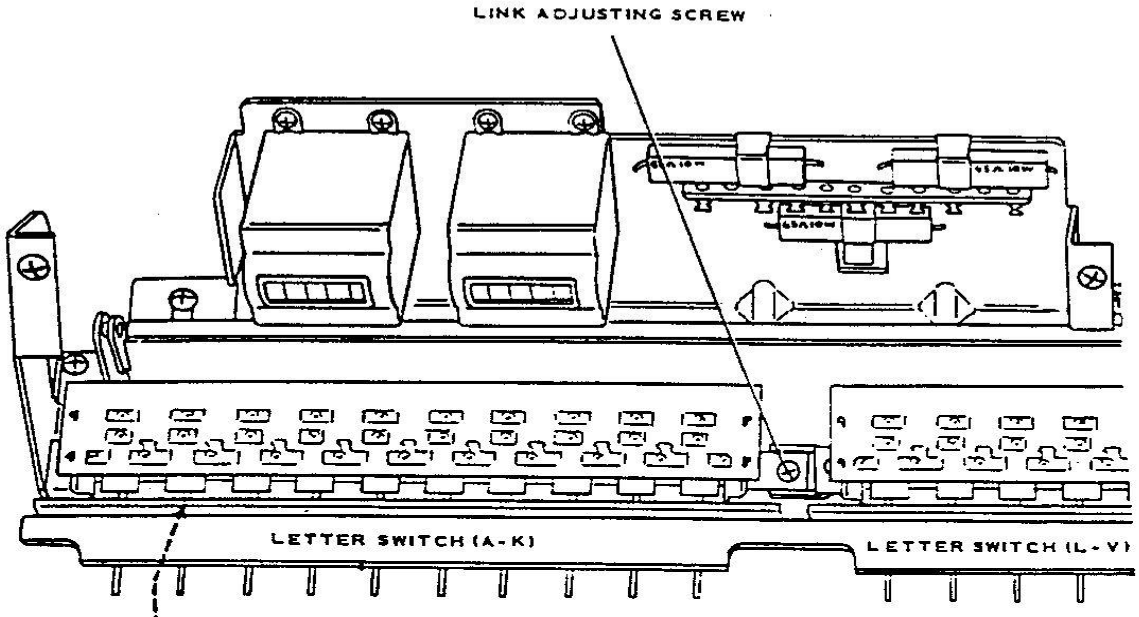
(B) Securely tighten the adjusting screw.

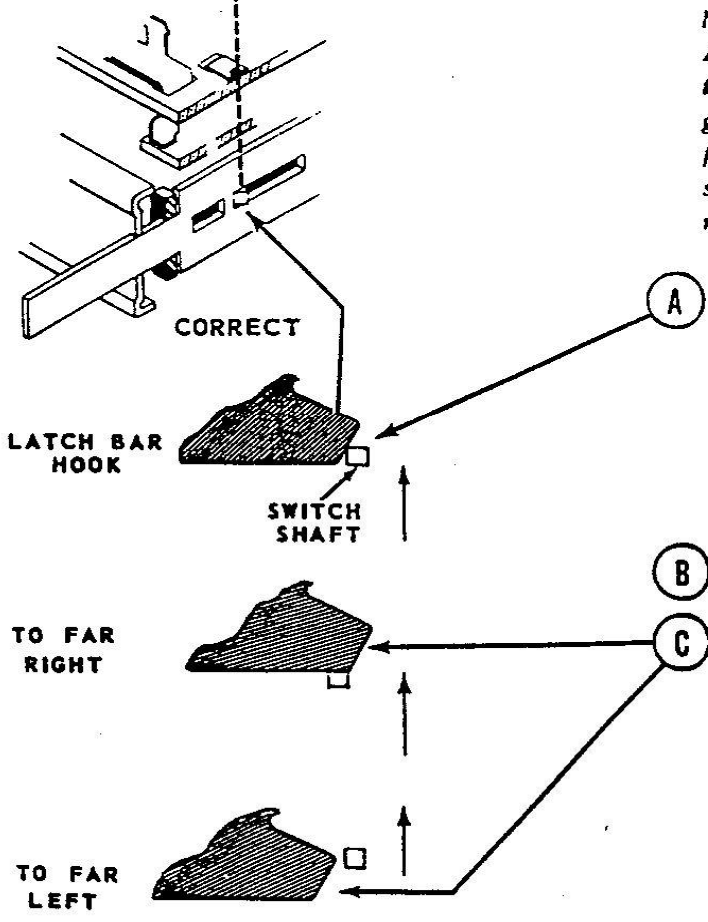
(C) Check this adjustment by pressing a number and letter (L to V) selector switch while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. The lettered and the numbered switches should release at the same time. If the letter latch lever is too far to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

TORMAT ELECTRICAL SELECTOR, TYPE TES1-L6

ADJUSTMENT NO. 3 – LETTER SWITCH A-K

This adjustment positions the latch bar of the A-K LETTER SWITCH so these lettered selector switches will operate in the same manner provided for the L-V LETTER SWITCH in Adjustment No. 2.





NOTE: Before making this adjustment, Adjustments No. 1 and 2 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be 1/64" to 1/16" gap between the release lever and the number latch lever.

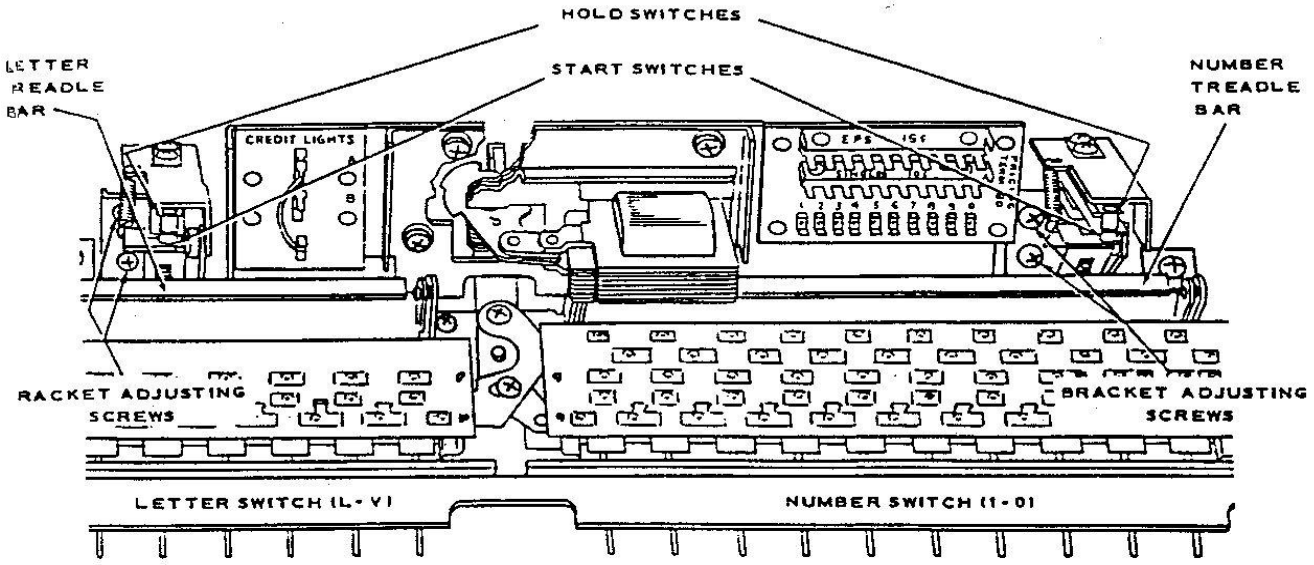
(A) Loosen the screw in the latch bar link between the A-K and the L-V letter switches and position the A-K switch latch bar so the A to K switch shafts, when pressed in, engage the latch bar at the mid-point of the latch bar hook.

(B) Securely tighten the adjusting screw.

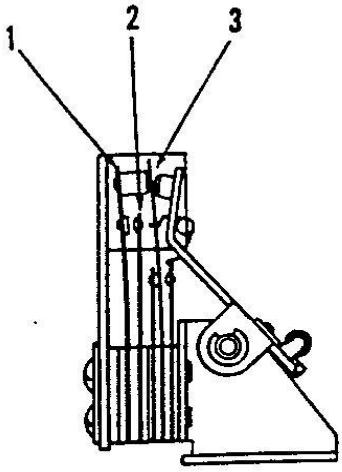
(C) Check this adjustment by pressing a lettered switch in the A to K group and one in the L to V group while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. Both lettered switches should release at the same time. If the A-K latch bar is too far to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

TORMAT ELECTRICAL SELECTOR, TYPE TESI-L6

START AND HOLD SWITCH ADJUSTMENT



NOTE: Check treadle bar operation before making adjustments. Rubber bumpers in bars should rest against selector switch frame when no selector key is pressed in.



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

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

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

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

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

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

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

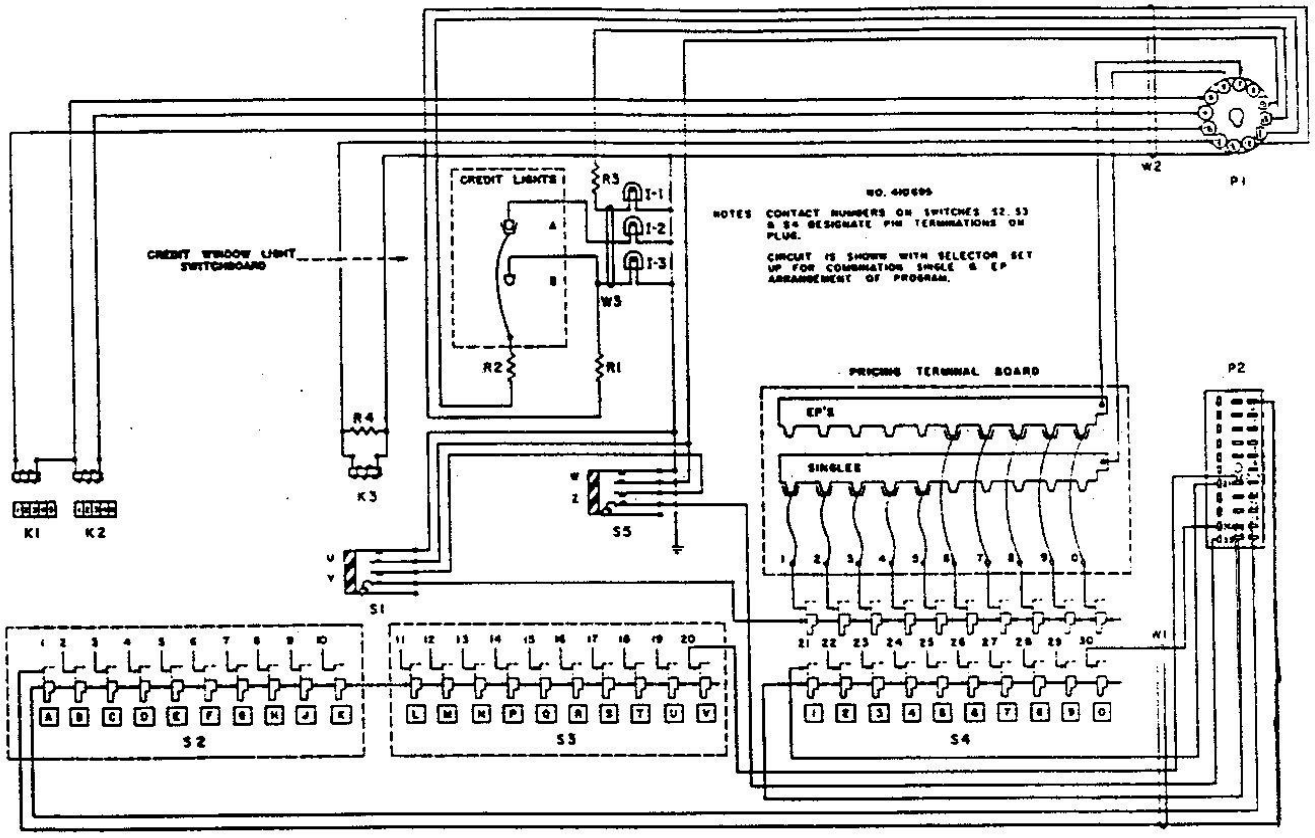
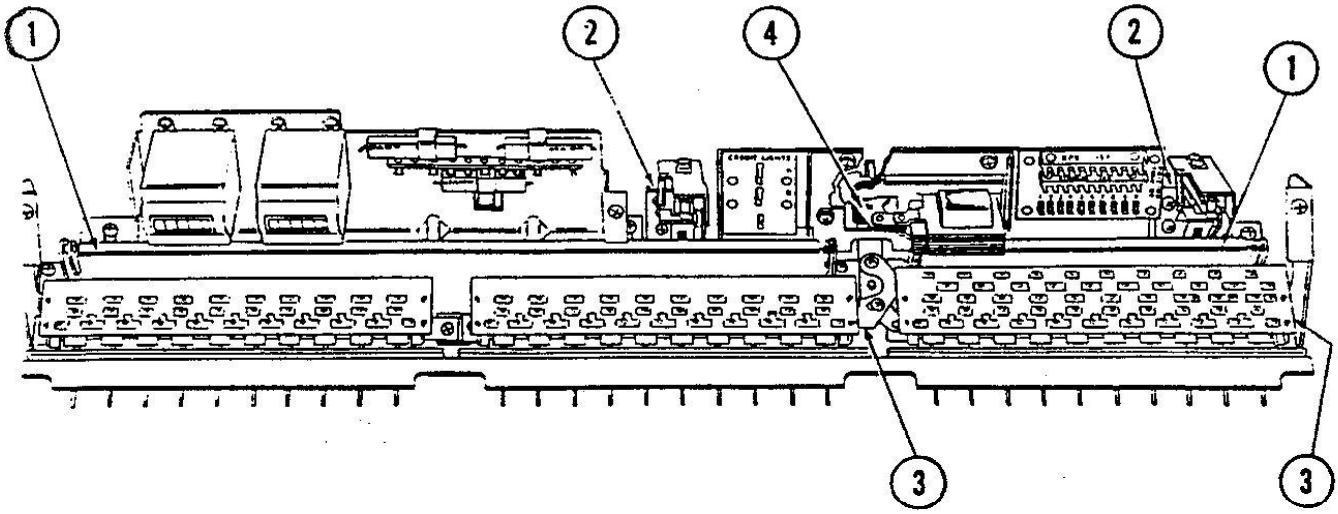


Figure 5.

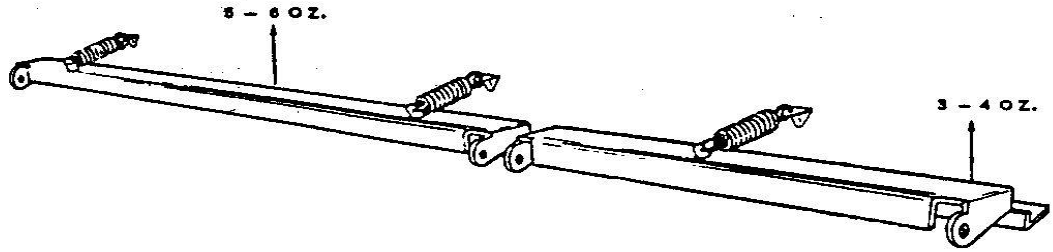
PARTS LIST

Item	Part No.	Part Name
I-1, I-2, I-3	505173	Credit Lamp No. 55
K1	410593	Counter Assembly (Singles)
K2	410594	Counter Assembly (E.P.'s)
K3	410684	Latch Solenoid
P1	410707	12 Prong Octal Plug Assembly
P2	410573	33 Prong Plug Assembly y
R1, R2, R3	81178	Resistor, 65 Ohm, 10 Watt W.W.
R4	81183	Resistor, 100 Ohm, 10 Watt W.W.
S1	410650	Snap Switch & Actuator Bracket Assembly
S2	410616	Selector Switch (A- K)
S3	410617	Selector Switch (L- V)
S4	410618	Selector Switch (Number)
S5	410650	Snap Switch & Actuator Bracket Assembly
W1	410718	Matrix Cable
W2	410719	Control Cable
W3	410606	Credit Light Cable
	410716	Credit Window Light Switchboard Wired Assembly
	410706	Pricing Terminal Board Wired Assembly

SPRING ADJUSTMENTS

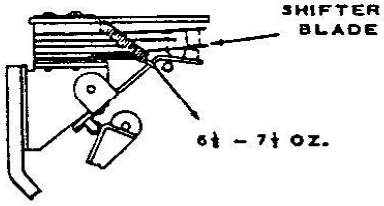


1 TREADLE BAR SPRINGS



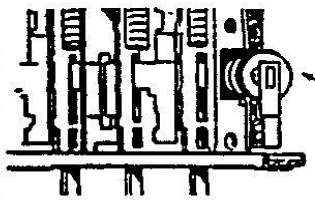
RETURN THE TREADLE BARS TO NORMAL REST POSITION AGAINST SELECTION SWITCHES.

2 ACTUATOR LEVER SPRING



HOLD SHIFTER BLADE – MEASURE FORCE AS INDICATED BY ARROW.

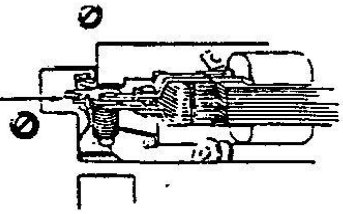
3 LATCH BAR SPRING



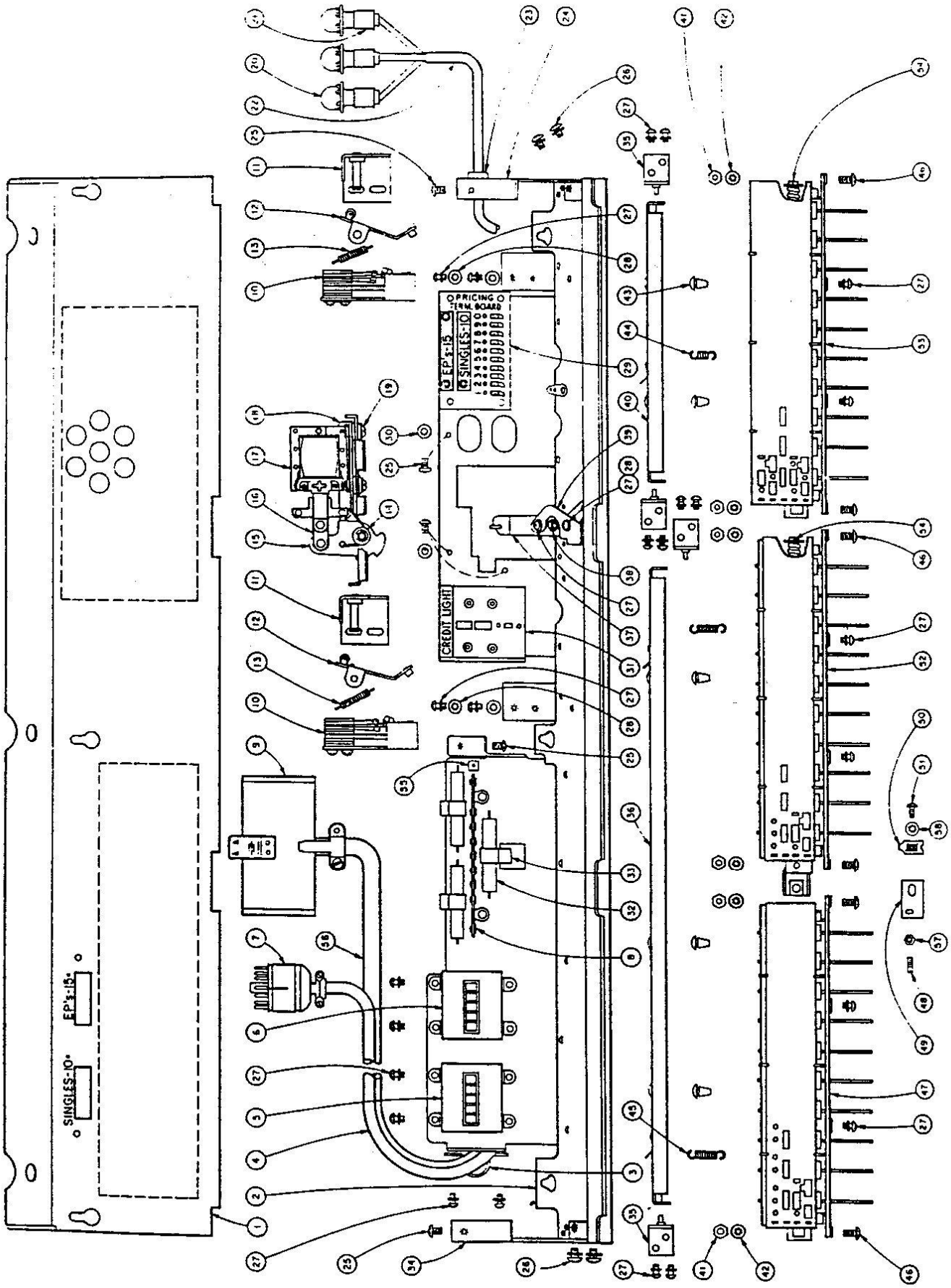
6 TO 7 OUNCES HERE TO START MOVEMENT.

4 LATCH RELEASE LEVER SPRING

RESTRAIN MOVEMENT OF NUMBER LATCH LEVER – FORCE TO START MOVEMENT OF SOLENOID ARMATURE IS THEN 1 LB.



3096


PRICING TRIM BOARD
EP's-15
SINGLES-10
CREDIT LIGHT
EP's-15
SINGLES-10

3097

PARTS LIST

Item	Part No.	Part Name
1	410581	Cover Assembly
	410580	Label (Instruction)
	410582	Label (Adjustment)
	410694	Cover
2	410700	Selector Frame Riveted Assembly
3	410704	Cable Clamp
4	410721	Control Cable & Plug Assembly
	410719	Control Cable Only
5	410593	Counter Assembly (Single)
6	410594	Counter Assembly (EP)
7	410707	12 Prong Plug Assembly
8	410699	Terminal Strip
9	410573	33 Prong Socket Assembly
	410650	Snap Switch & Actuator Bracket Assembly
10	410654	Snap Switch
	410703	Switch Guard
	912631	5-40 x 7/8 Phillips R.H.M.S.
	400597	Tension Plate
11	410651	Actuator Bracket & Pivot Assembly
	301374	Retaining Ring
12	410655	Actuator Lever Assembly
13	410659	Actuator Lever Spring
14	410689	Latch Release Lever Spring
	986450	Eyelet
	410599	Retaining Ring
15	410686	Latch Release Lever Assembly
16	410685	Latch Solenoid Link
	980860	1/8 dia. x 3/8 Rivet
17	410684	Latch Solenoid Assembly
	410683	Latch Solenoid & Release Lever Assembly
18	410680	Latch Release Lever Bracket Assembly
19	913310	6-32 x ½ Phillips B.H.M.S.
	920661	Flat Washer
	988161	Grommet
	400854	Spacer
	900803	Speed Nut
20	505173	No. 55 Panel Light
21	410690	Credit Lamp Socket Assembly
22	410605	Credit Light Cable Assembly
	410606	Cable Only
23	302343	Strain Relief
24	410607	Cover Support Bracket, R. H. Assembly
25	914125	8-32 x ¼ B.H.M.S.
26	914145	Sems Fastener 8-32 x ¼
27	912964	Sems Fastener 6-32 x ¼
28	920661	Flat Washer
29	410706	Pricing Terminal Board Wired Assembly
30	920901	Flat Washer
31	410671	Credit Window Light Terminal Board Assembly
32	81178	Resistor
33	410705	Cable Clamp
34	410642	Cover Support Bracket, L.H.
35	410660	Hinge Assembly
36	410666	Treadle Bar Assembly (Letter)
37	410673	Latch Lever Assembly
38	301374	Retaining Ring
39	410677	Latch Lever
40	410663	Treadle Bar Assembly (Number)
41	901631	8-32 Hex Nut
42	925431	Lock Washer
43	410267	Bumper
44	410600	Treadle Bar Spring, Short
45	410668	Treadle Bar Spring
46	914240	8-32 x 5/16 Phillips B.H.M.S.
47	410616	Selector Switch Assembly (Letter A-K)
48	410647	Latch Bar Stud
49	410649	Latch Bar Link Adjustable
50	900809	Speed Nut
51	980651	No. 6 x 3/8 Phillips Truss Head Sheet Metal Screw
52	410617	Selector Switch Assembly (Letter L-V)
53	410618	Selector Switch Assembly (Number)
54	410349	Latch Bar Spring (Number Switch)
	410621	Latch Bar Spring (Letter Switch)
	400864	Spring Retainer
55	81183	Resistor
56	410720	Matrix Cable & Plug Assembly
	410718	Matrix Cable Only
57	410747	Hex Nut
58	925321	Lock Washer

Seeburg

HIGH FIDELITY MASTER AMPLIFIER,

Type HFMA1-L6

The High Fidelity Master Amplifier, Type HFMA1-L6 is a low distortion, wide frequency range, constant voltage type designed for use in the Select-O-Matic "200". It has eight tubes, two of which are 6L6's in a push-pull output stage to supply 25 watts of audio power for operation of the Select-O-Matic speakers and remote speakers.

The output of the low impedance magnetic pickup of the Select-O-Matic "200" mechanism is connected through a single-contact socket to a 5879 voltage amplifier. The 5879 is followed by a 6SN7 dual triode. The first section of the 6SN7 provides additional amplification, the second section is a cathode follower for low impedance input to bass and volume control circuits. A treble control circuit and connections for a muting switch are between the two 6SN7 sections. The output from the volume control is amplified by the first section of a 12AX7. The second section of the 12AX7 is a phase inverter and drives the 6L6 output tubes.

An automatic volume compensator is incorporated in this amplifier. It compensates for the variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. Use of the feature is optional and is controlled by the AVC switch on the amplifier.

The compensator uses a 6SL7GT and a 6SK7 tube. One half of the 6SL7 is an amplifier; the other half serves as a rectifier. The 6SK7 is the compensation control tube. The position of these tubes in the amplifier as well as the other tubes is shown in the block diagram, Figure 2.

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

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

The volume control adjusts the level of sound from the Select-O-Matic speaker and the remote speakers. It is located on the amplifier so it is accessible at the back of the cabinet. Connections for the control are made through a socket and dummy plug on the amplifier chassis. A remote volume control may be used by replacing the dummy plug with the 9-prong plug of a remote volume control, Type MRVC-2. The remote volume control cable may be up to one hundred feet in length without introducing hum, distortion or loss of volume.

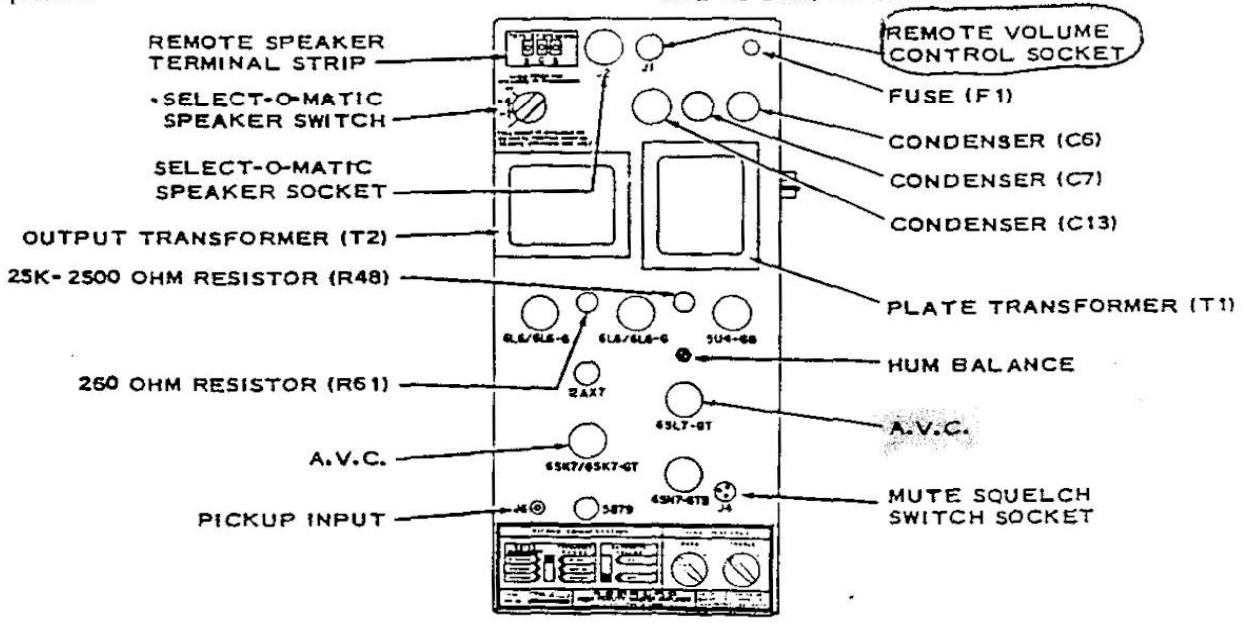


Figure 1. Top View – Master-Remote Amplifier, Type HFMA1-L6

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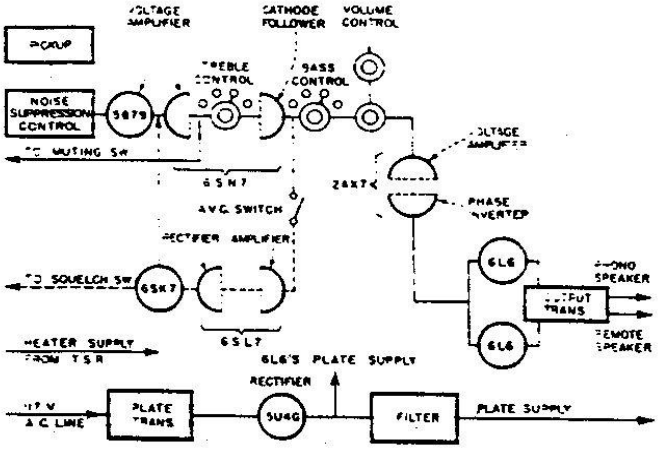


Figure 2. Block Diagram — Type HFMA1-L6

Heater current for the amplifier tubes is supplied at 6.3 volts from the Selection Receiver. Plate current for the tubes is from an included plate supply transformer and 5U4G rectifier. The plate supply transformer primary is protected by a fuse located on the amplifier chassis.

The total amplifier output power of 25 watts can be divided between the Select-O-Matic speakers and remote speakers with the proportions of volume conveniently adjusted by use of the Select-O-Matic Speaker Switch located at the upper end of the amplifier and shown in Figure 3. The switch is set to provide the desired balance of volume between the Select-O-Matic speakers and the remote speakers but the total power (in watts) of all the speakers in use must not exceed 25. The load (in watts) should also not be lower than 25% of the total, (6 watts).

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

The terminal strip shown in Figure 4 provides connections for high impedance remote speakers. The high impedance output terminates at A and B and is for 70-volt Constant Voltage Speakers. The G terminal is provided for grounding of shielded speaker lines.

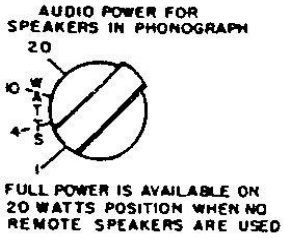


Figure 3.

Speaker Switch

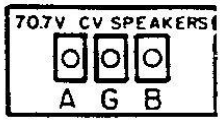


Figure 4.

Terminal Strip

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

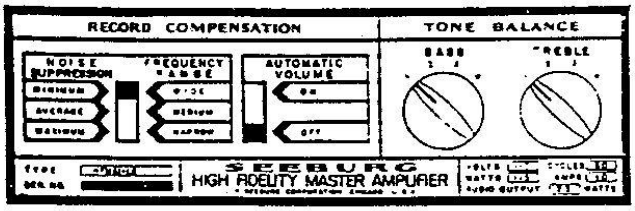
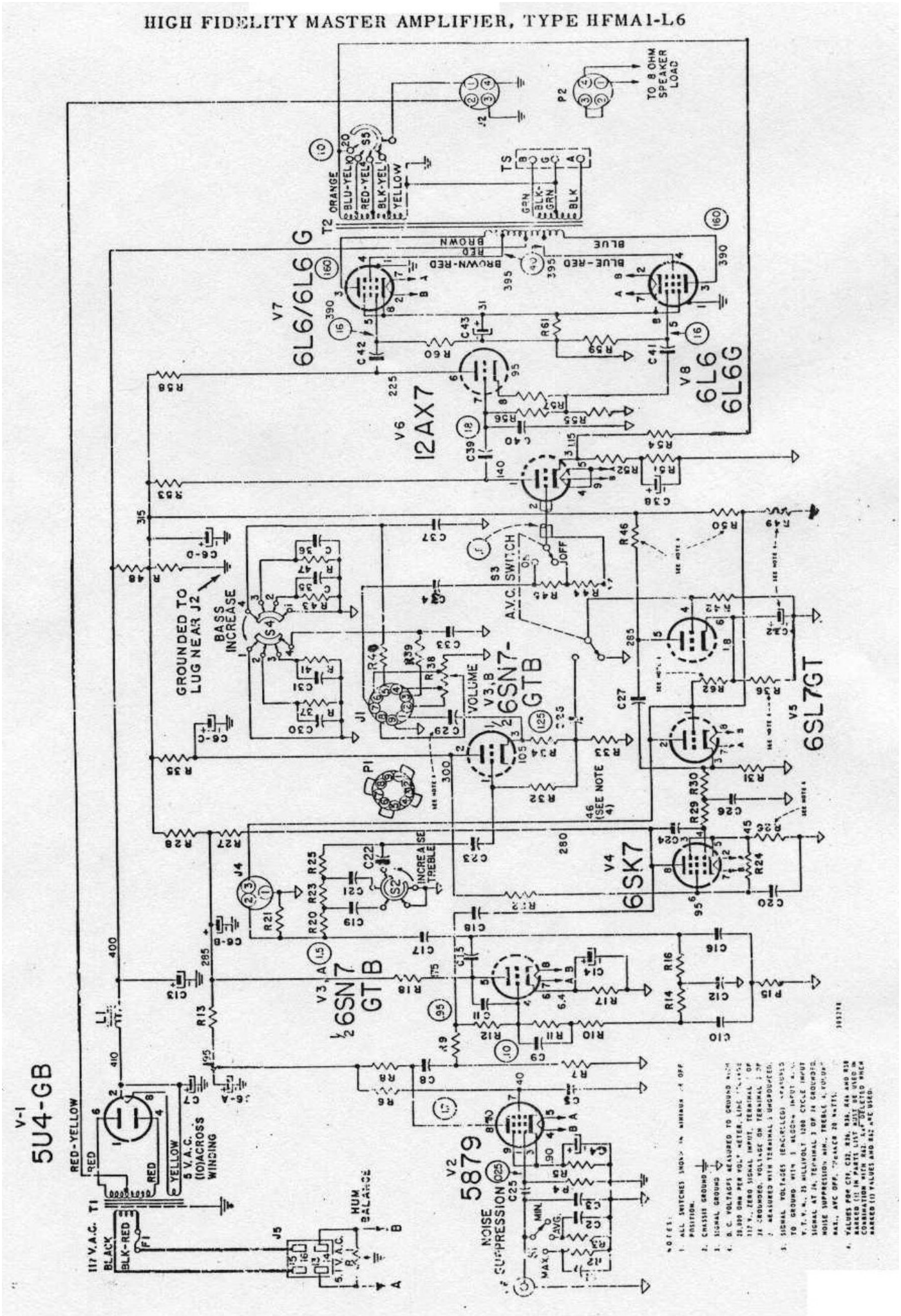


Figure 5. Tone Controls

A three position Noise Suppression Switch controls the frequency range of the amplifier. The switch is set to the position that provides the most satisfactory reproduction-consistent with conditions of records to be played.

The Bass and Treble controls are four-position switches with an indicating escutcheon shown in Figure 5. The position of the controls when an amplifier is in normal use is determined by the records being reproduced, the room size and other acoustical conditions. "Flat" response of the amplifier is had with the bass control at 1 and the treble control at 4 but with average conditions and typical records, very realistic reproduction is obtained by setting the bass at 2 and the treble at 3.


HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA1-L6
V-1
5U4-GB
V7
6L6/6L6 G
V8
6L6
6L6G
V6
12AX7
V3,B
½6SN7-GTB
V3,A
½6SN7 GTB
V4
6SK7
V5
6SL7GT
V2
5879
T1
T2
T3
P1
P2
J1
J2
J3
J4
J5
S1
S2
S3
S4
S5
L1
F1
TO 8 OHM SPEAKER LOAD
117 V.A.C.
BLACK
BLK-RED
RED-YELLOW
RED
YELLOW
5 V.A.C. (10) ACROSS WINDING
HUM BALANCE
NOISE SUPPRESSION
MIN.
MAX.
AVG.
GROUNDED TO LUG NEAR J2
BASS INCREASE
TREBLE INCREASE
VOLUME
A.V.C. SWITCH
ON
OFF
ORANGE
BLU-YEL
RED-YEL
BLK-YEL
YELLOW
BROWN-RED
BLUE-RED
BLK-GRN
GRN
BLK
NOTES:
1. ALL SWITCHES SHOWN IN MINIMUM OR OFF POSITION.
2. CHASSIS GROUND
3. SIGNAL GROUND
4. D.C. VOLTAGES MEASURED TO GROUND WITH 20,000 OHM PER VOLT METER, LINE VOLTAGE OF 117 V., ZERO SIGNAL INPUT, TERMINAL 1 OF J4 GROUNDED, VOLTAGE ON TERMINAL 3 OF J4 MEASURED WITH TERMINAL 3 UNGROUNDED.
5. SIGNAL VOLTAGES (UNCORRECTED) OBTAINED TO GROUND WITH 1 MEGOHM INPUT METER, 117 V. A.C. LINE VOLTAGE, 25 MILLIVOLT 1000 CYCLE INPUT SIGNAL AT J4, TERMINAL 3 OF J4 GROUNDED, NOISE SUPPRESSION MIN., TREBLE & VOLUME MAX., AVC OFF, SPEAKER 20 WATTS.
6. VALUES FOR C17, C22, R24, R34, R44 AND R58 MARKED (1) IN PARTS LIST MUST BE USED IN COMBINATION WITH R42. R49 DELETED WHEN MARKED (1) VALUES ARE R42 ARE USED.

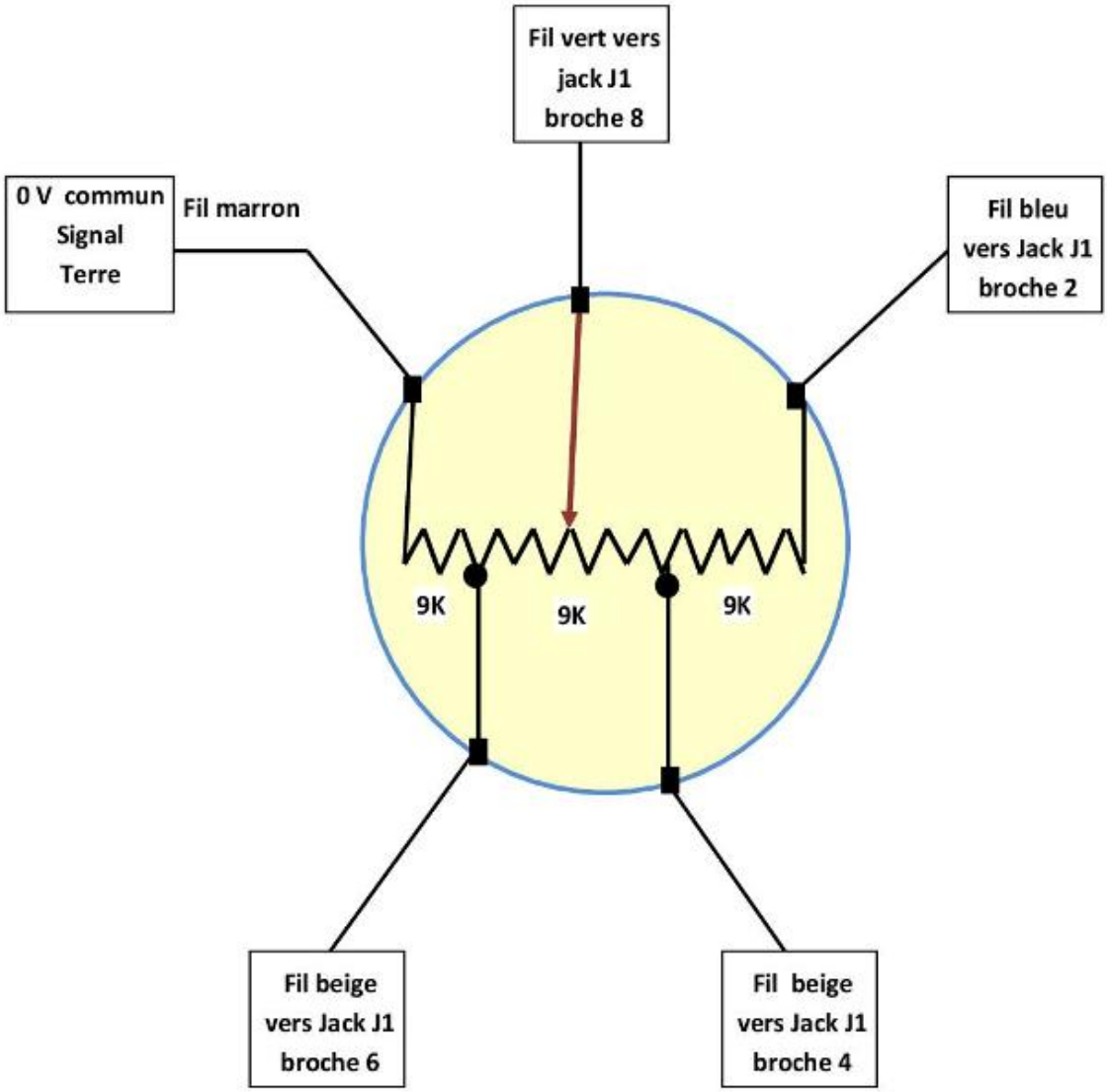
PARTS LIST

Item	Part No.	Part Name
C1	86247	.0068 mfd. 200 V. Paper
C2	86240	1500 mmfd. 500 V. Ceramic
C3	86239	330 mmfd. 500 V. Ceramic
C4	87598	100 mfd. 6 V. Lytic
C5	86237	.15 mfd. 400 V. Paper
C6a	87612	10 mfd. 350 V. Lytic
C6b		20 mfd. 350 V. Lytic
C6c		20 mfd. 400 V. Lytic
C6d		40 mfd. 400 V. Lytic
C7	87596	40 mfd. 450 V. Lytic
C8	86154	.02 mfd. 600 V. Paper
	*86212	.01 mfd. 400 V. Paper
C9	86222	470 mmfd. 1000 V. Ceramic
C10	86213	.005 mfd. 400 V. Paper
C11	86263	22 mmfd. 500 V. Ceramic
	*86242	68 mmfd. 500 V. Ceramic
C12	86212	.01 mfd. 400 V. Paper
C13	87596	40 mfd. 450 V. Lytic
C14	87568	20 mfd. 25 V. Lytic
C15	86146	.05 mfd. 600 V. Paper
C16	86213	.005 mfd. 400 V. Paper
C17	86212	.01 mfd. 400 V. Paper
C18	86140	.05 mfd. 400 V. Paper
C19	86244	680 mmfd. 500 V. Ceramic
C20	86140	.05 mfd. 400 V. Paper
C21	86239	330 mmfd. 500 V. Ceramic
C22	86243	150 mmfd. 500 V. Ceramic
C23	86213	.005 mfd. 400 V. Paper
C24	86212	.01 mfd. 400 V. Paper
C25	86158	.02 mfd. 200 V. Paper
C26	86245	1.0 mfd. 200 V. Paper
C27	86154	.02 mfd. 600 V. Paper
C28	86158	.02 mfd. 200 V. Paper
C29	86246	1.0 mfd. 200 V. Paper
	†86232	.5 mfd. 200 V. Paper
C30	86248	.15 mfd. 200 V. Paper
C31	86248	.15 mfd. 200 V. Paper
C32	87568	20 mfd. 25 V. Lytic
	†87631	100 mfd. 25 V. Lytic
C33	86248	.15 mfd. 200 V. Paper
C34	86235	.05 mfd. 200 V. Paper
	*86158	.02 mfd. 200 V. Paper
C35	86248	.15 mfd. 200 V. Paper
C36	86248	.15 mfd. 200 V. Paper
C37	86248	.15 mfd. 200 V. Paper
C38	87568	20 mfd. 25 V. Lytic
C39	86146	.05 mfd. 600 V. Paper
C40	86241	33 mmfd. 500 V. Ceramic
C41	86146	.05 mfd. 600 V. Paper
C42	86146	.05 mfd. 600 V. Paper
C43	87604	25 mfd. 50 V. Lytic
F1	303087	2A- Slo Blo
J1	84298	Remote Volume Socket
J2	305206	Speaker Socket
J4	12034	Mute Socket
J5	300007	Power Connector
J6	300152	Phono Input
L1	305205	Filter Choke
P1	305316	Dummy Plug Assembly
R1	602846	75 Ohms, W. W. 1 W.
R2	82442	33K 10% ½ W.
R3	82445	56K 10% ½ W.
R4	82452	220 K 10% ½ W.
R5	82424	1000 Ohms 10% ½ W.
R6	82607	750 K 5% ½ W.
R7	82460	1 meg. 10% ½ W.
R8	82791	180K 5% ½ W.
R9	82666	100K 5% ½ W.
R10	82679	820K 5% ½ W.
	* 82665	1 meg. 5 % ½ W.
R11	82665	1 meg. 5% ½ W.
R12	82681	430K 5% ½ W.
R13	82448	100K 10% ½ W.
R14	82458	680K 10% ½ W.
	*82457	560K 10% ½ W.
R15	82791	180K 5% ½ W.
	*82450	150K 10% ½ W.
R16	82458	680K 10% ½ W.
	*82457	560K 10% ½ W.
R17	82429	2700 Ohms 10% ½ W.
R18	82676	47K 5% ½ W.
R20	82442	33K 10% ½ W.
R21	82457	560K 10% ½ W.
R22	82832	47K 5% 2 W.
R23	82446	68K 10% ½ W.
R24	82635	12K 5% ½ W.
R25	82450	150K 10% ½ W.
R26	82634	10K 5% ½ W.
	†82632	8200 Ohms 5% ½ W.
R27	82452	220K 10% ½ W.
R28	82776	8200 Ohms 10% 1 W.
R29	82460	1 meg. 10% ½ W.
R30	82467	3.9 meg. 10% ½ W.
R31	82468	4.7 meg. 10% ½ W.
R32	82456	470K 10% ½ W.
	*82791	180K 10% ½ W.
R33	82820	8200 Ohms 10% 2 W.
R34	82418	330 Ohms 10% ½ W.
R35	82424	1000 Ohms 10% ½ W.
R36	82432	4700 10% ½ W.
	†82640	27K 5% ½ W.
R37	82426	1500 Ohms 10% ½ W.
R38	305193	25K Volume Control
R39	82425	1200 Ohms 10% ½ W.
R40	82425	1200 Ohms 10% ½ W.
R41	82631	7500 Ohms 5% ½ W.
R42	82453	270K 10% ½ W.
R43	82424	1000 Ohms 10% ½ W.
R44	82695	56K 5% ½ W.
R45	82989	39K 5% ½ W.
R46	82456	470K 10% ½ W.
	†82666	100K 5% ½ W.
R47	82430	3.3K 10% ½ W.
R48	81175	25K - 2500 Ohms W. W. 5% 20 W.
R49	82795	36K 5% ½ W.
R50	82616	220K 5% ½ W.
	†82681	430K 5% ½ W.
R51	82433	5600 Ohms 10% ½ W.
R52	82659	330 Ohms 5% ½ W.
R53	82667	470K 5% ½ W.
R54	82610	6200 Ohms 5% ½ W.
R55	82789	390K 5% ½ W.
R56	82457	560K 10% ½ W.
R57	82433	5600 Ohms 10% ½ W.
R58	82789	390K 5% ½ W.
R59	82453	270K 10% ½ W.
R60	82453	270K 10% ½ W.
R61	81145	260 Ohms 5% W. W., 10 W.
R62	†82640	27K 5% ½ W.
S1	305289	Noise Suppression Switch
S2	305312	Treble Switch
S3	305288	AVC Switch
S4	305311	Bass Switch
S5	305290	Speaker Switch
T1	305320	Power Transformer
T2	305304	Output Transformer
TS1	305309	Terminal Strip Remote Speaker
V1	308506	5U4GB
V2	308004	5879
V3	308622	6SN7GTB
V4	308618	6SK7GT
V5	308620	6SL7
V6	308120	12AX7
V7	308612	6L6G
V8	308612	6L6G

* USE ON HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA1-L6J

† USED ABOVE SERIAL NO. 61650 (APPROX.) – [SEE NOTE 6 ON SCHEMATIC DIAGRAM]

Câblage du potentiomètre de volume du V200 avec ampli HFMA 1-L6



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TORMAT SELECTION RECEIVER
TYPE TSR1-L6

The Tormat Selection Receiver, Type TSR1-L6 is the power distribution and control center for operation of the Select-O-Matic mechanism and the Tormat Memory System from the Electrical Selector at the phonograph or by remote control with 200-selection, 3-wire, Wall-O-Matics. Power enters the Receiver through the line cord and main switch and is distributed, at 117 volts or through transformers, to the Electrical Selector, the Select-O-Matic Mechanism, cabinet lighting, program selector, amplifier and the Wall-O-Matics. All connections to the Receiver are made with plugs and connectors of different types and sizes to avoid possibility of incorrect connections.

Included in the Receiver are a Step Switch and Relay Assembly, a Dual Credit Unit and a pulse amplifier unit. The Step Switch and Relay Assembly and a 2D21 thyratron, V6, are for step relay operation for selection from the Wall-O-Matics. The Dual Credit Unit incorporates an accumulative add-and-subtract credit switch for credit and selection control at the phonograph. The pulse amplifier includes a 12AX7 tube, V1, that amplifies the trip signal from the output loop of the Tormat Memory Unit on the Select-O-Matic Mechanism. The pulse from the 12AX7 tube controls a 2D21 thyratron, V2, which in turn passes current for operation of the trip solenoid of the Select-O-Matic mechanism.

A 2D21, V3, operates as a relay to control read-out current pulse for the Tormat Memory Unit. Another 2D21, V7, controls the Tormat write-in pulse. A 6X4 rectifier tube, V4, supplies grounded-positive plate power for the 12AX7 pulse amplifier and, with an OA2 regulator tube, V5, regulated voltage supply for grid bias of V3 and V7. The regulated supply is also used for charging condensers from which are taken power for the write-in and read-out pulses.

A full wave selenium rectifier supplies d.c. at approximately 25 volts for some of the relays of the Step Switch Assembly and a timing relay in the Dual Credit Unit and for grid bias of the 2D21 tubes for the trip solenoid and step relays.

All of the mechanism control circuits, plate and bias supplies and tube heater circuits are supplied from the multiple-secondary transformer, T1.

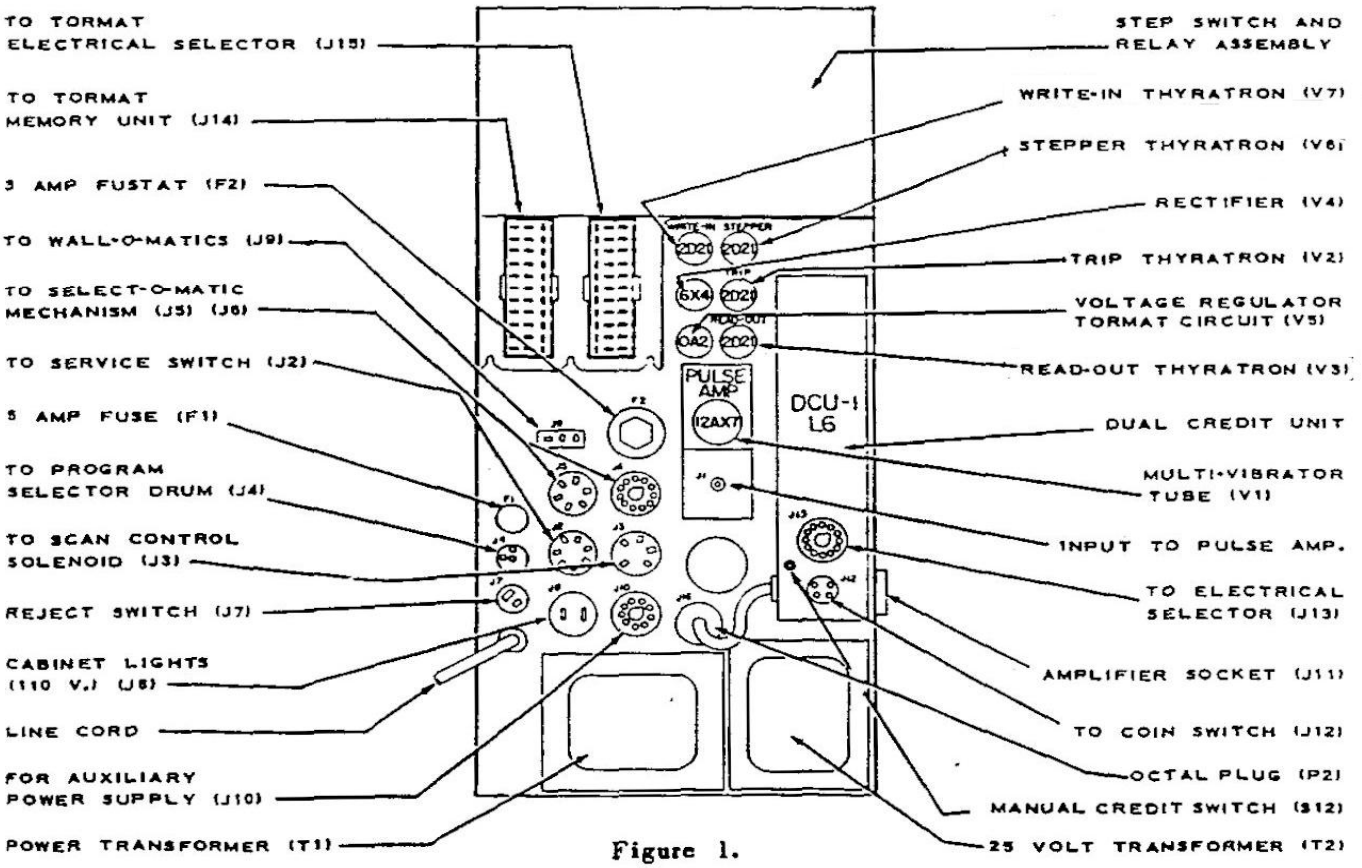

Figure 1.

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The Dual Credit Unit and the pulse amplifier connect to the circuits of the Receiver with plugs and sockets. They may be removed for test or service. Access to the interior wiring of the Receiver is had, while it is operating in normal position, by removing the cover plate on the outside of the rear door of the phonograph. To remove the cover plate, take off the three wing-nuts located inside the door just above the amplifier and selection receiver and loosen the screw at the center of the bottom edge of the plate. After removing the nuts, pull out on the plate so the three bolts are out of the holes in the door and lift up on the plate to disengage it at the lower edge.

The Selection Receiver may be removed from its mounting by removing the cover plate and loosening the four screws holding the flanges of the unit. With the four screws loosened, slide the unit away from the amplifier to disengage the locating pins and amplifier socket connection. It may then be lifted from the mounting frame.

DUAL CREDIT UNIT, TYPE DCU1-L6

The Dual Credit Unit is part of the Tormat Memory System for making selections for coins deposited at the phonograph. It includes three credit solenoids, two subtract solenoids, an add-and-subtract credit switch, a timing relay and two switch groups that are operated by the subtract solenoids. Connections between the Unit and the Selection Receiver are made with an octal plug. Three coin switches in the phonograph connect through a 4-prong socket and a 12-prong socket is for connection to the Electrical Selector.

The credit switch is a rotary, wafer type having two switch sections and two ratchets. The credit solenoids add credits by driving the switch counter-clockwise with pawls that engage the back ratchet when the solenoids are energized. The credit solenoids are energized through the nickel, dime and quarter coin switches (in the phonograph cabinet) and add, respectively, one, two and six credit units. A total of twenty-four credit units may be accumulated.

Operation of either subtract solenoid drives the switch clockwise with pawls that engage the front ratchet. One of the subtract solenoids operates each time a selection is made. The subtract-2 solenoid turns the credit switch two credit units toward the off position. The subtract-3 solenoid turns it three credit units toward off. Whether the subtract-2 or-3 solenoid operates for a particular selection is determined by the arrangement of connections at the pricing terminal board in the Electrical Selector.

The switch contacts A, B, C, D, E, K and M close when the subtract-3 solenoid operates; contracts F, G, H, I, J, L and N are closed by the subtract-2 solenoid. A and B are carry-over contacts for the subtract-3 solenoid and insure a full operating stroke of the solenoid plunger. F and G are carry-over contacts for the subtract-2 solenoid. Closing H or C energizes the timing relay. Closing D or I energizes the scan control solenoid on the Select-O-Matic mechanism. E completes the counter circuit that totals the 3-credit-unit selections; J completes the circuit to the 2-credit-unit counter. M and N are carry-over contacts for the latch bar solenoid in the Electrical Selector.

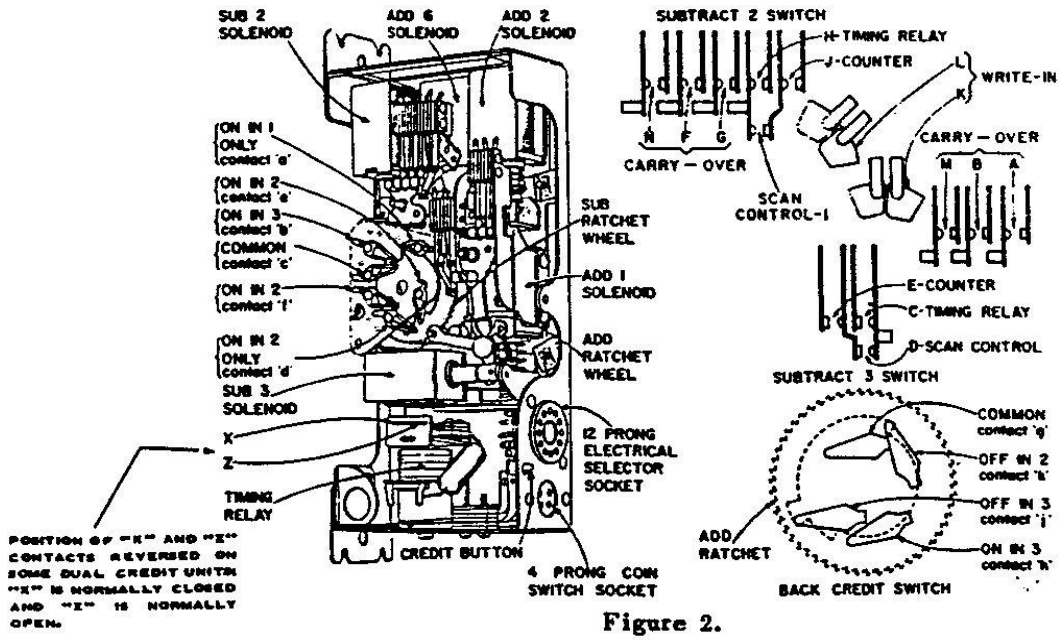

Figure 2.

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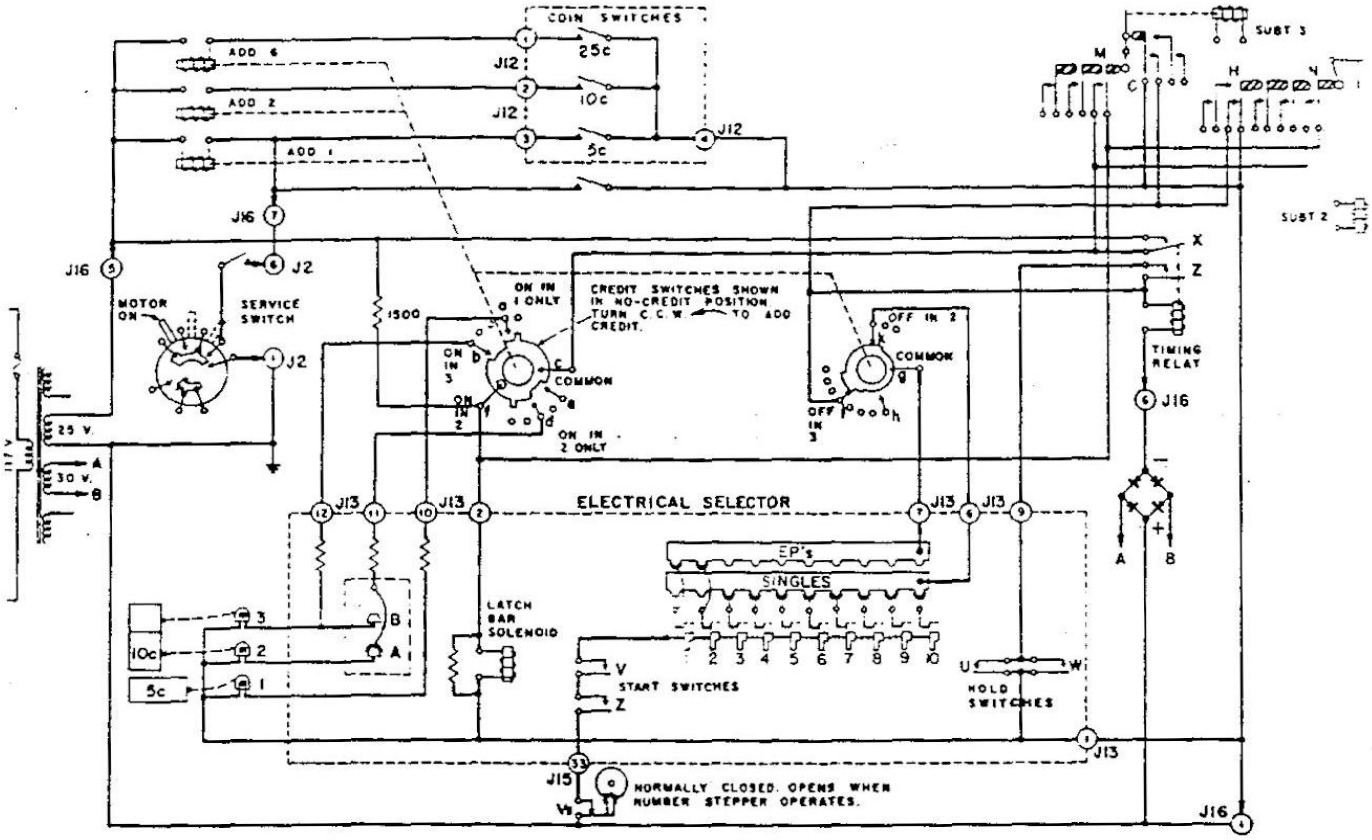


Figure 3.

OPERATION

Figures 3 and 5 diagram the Dual Credit Unit and the Tormat Electrical Selector circuits involved in its operation. Figure 3 shows the circuits associated with credits. Figure 5 shows the subtract (select) circuits. The pricing terminal board in the diagrams is arranged so program selections A1 to V1 and A2 to V2 are "sold" for 15 cents (3 credit units) each. All other selections will be played for 10 cents (2 credit units) each. The credit switch is in the no-credit position.

Referring to Figure 3: Momentary operation of the nickel credit solenoid by closing the nickel coin switch or by a single operation of either manual credit switch will move the credit switch one credit unit and close a circuit to the "5-cent" light through credit switch contacts a and c and contact X of the timing relay. No other circuit conditions are changed. If, in this credit condition, selection is attempted, the timing relay will be energized through k and j (or g and j) of the back section of the credit switch, the number selector switch that is pressed, the start switches (contacts V and Z) and contact Vs in the step switch assembly. The circuit to the credit indicating light will open at contact X. The relay will be energized until both selector keys are released. The timing relay circuit is shown simplified in Figure 4.

If a second nickel is now deposited or a manual credit switch operated again, a second credit unit will be added and the credit switch will be two positions or credit units from the no-credit position. Contact a will now be open so the "5-cent" light is turned off and the "10-cent" light will turn on through d and c of the front credit switch section. The latch bar solenoid in the Electrical Selector will be energized through f and c of the credit switch and X of the timing relay.

If, in this credit condition, a selection is attempted that includes the number 1 or 2 selector key, the timing relay will be energized through g and j of the credit switch, the pressed-in selector switch, the start switches and contact V in the step switch assembly. The circuit to the credit light and the latch bar solenoid will open at relay contact X. The latch bar will release the selector switches

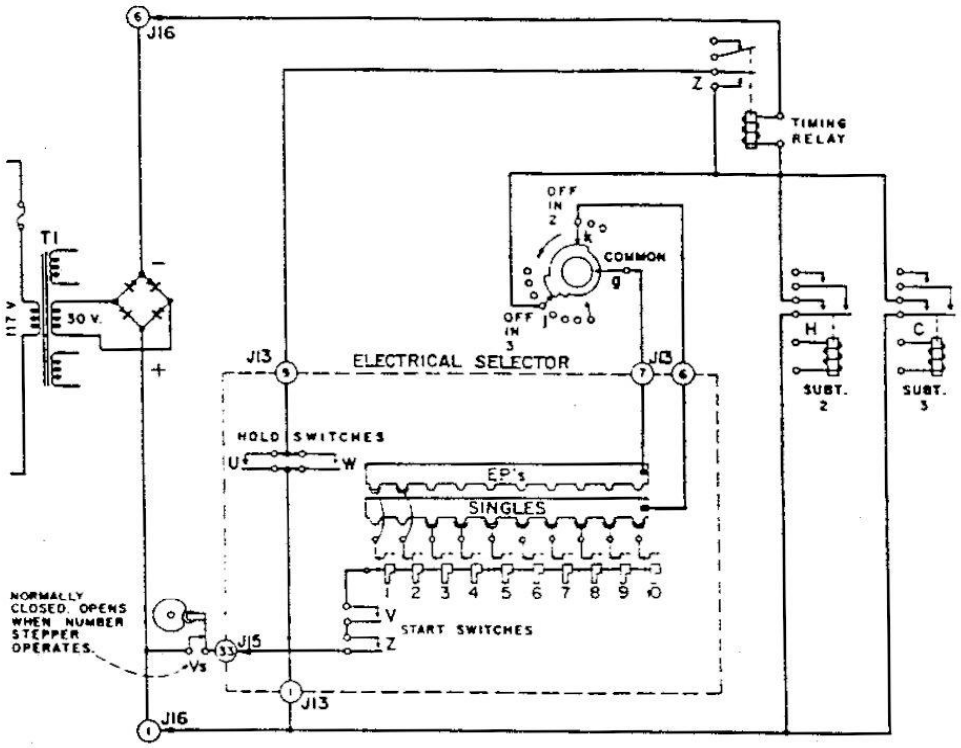


Figure 4.

and open the relay circuit. If either the letter or number selector key is held in, the relay circuit will be maintained through a Hold Switch contacts U and W) in the Selector and timing relay contact Z. The condition and circuit can be traced in Figures 3 or 5.

If a third nickel is deposited, or if either manual credit switch is operated for the third time, the credit switch will advance to the 3-credit-unit position, the latch bar solenoid will remain energized, the "10-cent" light will be turned off and the "15-cent" light will turn on to indicate that ANY selection may be played.

Referring to Figure 5: If, in the 2-credit-unit position of the credit switch, a selection is made that includes any numbered selector switch other than number 1 or 2, the subtract-2 solenoid will be energized and the credit switch will be rotated clockwise to the no-credit position. The circuit is through contact X of the timing relay, c and e of the front section of the credit switch, the solenoid, terminal 6 of the Electrical Selector plug, the "SINGLES" strip of the pricing terminal board, the number selector switch, the start switches and contact Vs in the Step Switch Assembly.

When the solenoid plunger pulls in, contact F shunts e and c of the credit switch so the solenoid circuit is not opened by rotation of the switch to the no-credit position. Contact G connects the solenoid to ground by "shorting out" the selection switch, start switches, and contact Vs. A full stroke of the plunger is assured. The circuit is more readily visualized in the simplified diagram. Figure 6.

Contacts H, I, J, L and N are also closed by this solenoid operation. The scan solenoid is energized through contact I (if the service switch is in the normal "motor on" position). The "SINGLES" selection counter is energized through contact J. Contact L grounds the grid of the write-in 2D21 thyratron so the selected core in the Tormat Memory Unit will be conditioned for selection. The timing relay will be energized through contact H and will open the subtract solenoid circuit at contact X so the solenoid plunger is released to its normal rest position.

Contact N is a carry-over contact for the latch bar solenoid. It shunts contact f (and c) of the credit switch so power to the solenoid will not be interrupted at f as the credit switch is rotated (by the subtract solenoid) from the 2-credit position. The circuit to the latch bar solenoid is opened at contact X when the timing relay is energized. Opening the solenoid circuit releases the selector switches (and keys) so they return to their normal position. If either, or both, selector keys are held in, the timing relay will continue to be energized

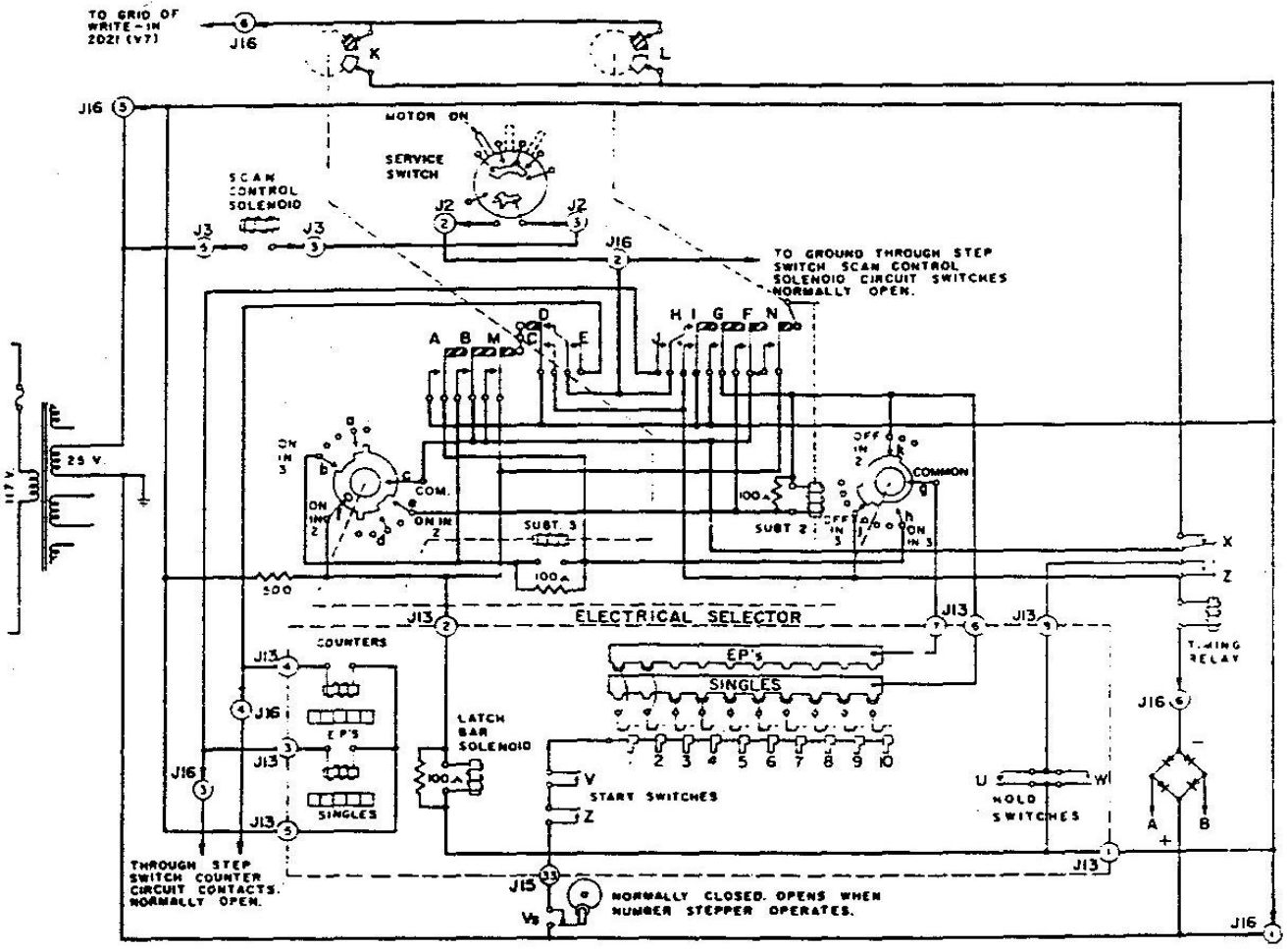


Figure 5.

through the Hold Switches in the electrical selector and contact Z of the relay.

If, when the subtract-2 selection sequence is started, the credit switch is in a position of four or more credit units, the latch bar solenoid circuit still will be complete through the credit switch and contact N is not utilized. N serves only to prevent arcing at f due to interruption of the latch bar solenoid current.

The 1500 ohm resistor shown adjacent to contact X of the timing relay in Figure 3 passes a charging current of low value through the latch bar solenoid so residual magnetism will not hold the solenoid plunger in the energized position when the full-current circuit to the solenoid is opened at contact X.

If, when the subtract-2 selection sequence is started, the credit switch is in a position corresponding to four or more credit units, the latch bar solenoid circuit will still be complete through the credit switch but will be open at the X contact of the timing relay as long as the relay is energized. Opening the solenoid circuit releases the selector switches (and keys) so they return to their normal position. If either, or both, selector keys are held in, the timing relay will continue to be energized through the Hold switches in the Selector and contact Z of the relay.

A total of three or more credit units will position the credit switch so a 3-credit-unit selection can be made. Referring to Figure 5: The subtract-3 solenoid will be energized if a selection is made that makes use of either the number 1 or 2 selection switch. The circuit is through contact X of the timing relay, c and b of the front section of the credit switch, the solenoid, h and g of the back section, terminal 7 of the Electrical Selector plug, the "EP" strip of the pricing terminal board, the number 1 or 2 selector switch, the start switches and contact Vs. The operation involving this solenoid is equivalent to that of the subtract-2 solenoid except that three credit units are subtracted from any existing credit unit total and the "EP" counter will be operated. In the subtract-3 switch group, the carry-over contact B shunts the c and b terminals of the front section of the credit switch to maintain a circuit if the selection is

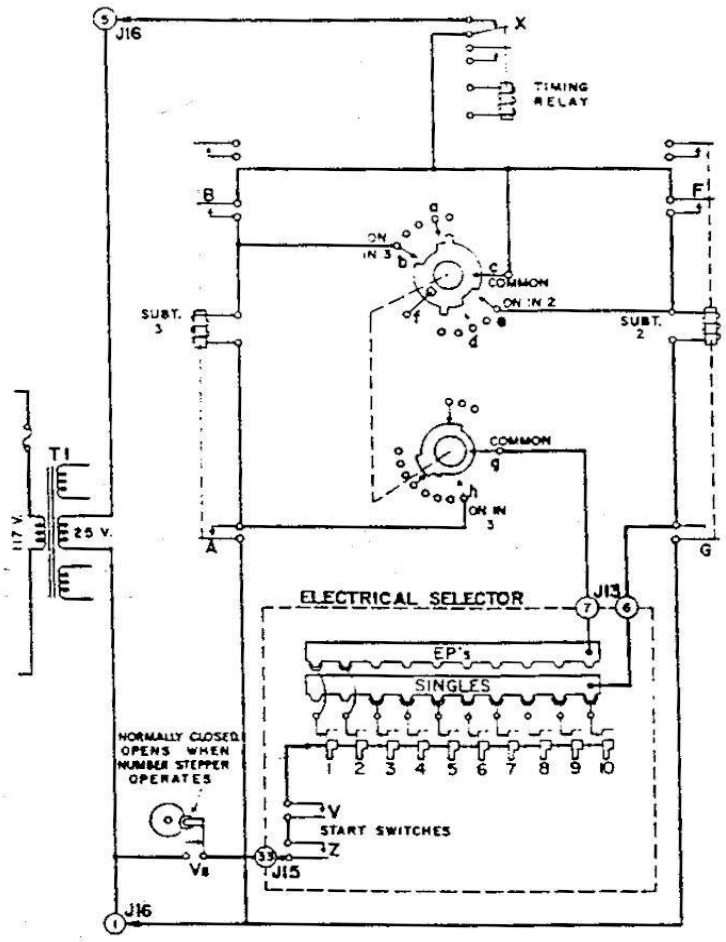


Figure 6.

started with less than six credit units available. Contact A, by connecting the solenoid to ground, serves the same purpose by shunting the back section of the credit switch as well as the selection switch, start switches and contact Vs.

Contact Vs, normally closed and open only when the number stepper of the step switch assembly is operating, disables the Electrical Selector and prevents cross- connecting selection circuits of the Tormat Memory Unit by operating Selector keys while selection is made from a remote control Wall -O- Matic.

The 100 ohm resistors connected across the latch bar and the subtract solenoid coils minimize contact arcing.

STEP SWITCH AND RELAY ASSEMBLY OPERATION

The Step Switch and Relay Assembly is a part of the Seeburg Tormat Memory System. Its functions are to connect a Letter and a Number Circuit of the Tormat Memory Unit into a selection write-in circuit and initiate mechanism operation in accordance with selection made with a Type V-3WA Wall-O-Matic. The assembly consists of two step switches, a reset magnet, a transfer relay, two timing relays, a selection pricing terminal board, and a play control relay. (The play control relay is not directly involved in the operation of the remote control system.)

When a selection is made from a Wall-O-Matic, a rotating switch blade in the Wall-O-Matic causes intermittent grounding of the grid of a 2D21 tube in the selection receiver. The grounding occurs in two series of "pulses". These pulses are of approximately 1/25 second duration with a 1/25 second interval between each successive pulse and with approximately 1/5 second interval between the two series. The number of pulses in each of the two series is determined by which selector buttons are operated at the Wall-O-Matic and will determine, in turn, which write-in circuits in the Tormat Memory Unit will be energized.

Each time the grid of the 2D21 tube is grounded during one of the pulses, the tube passes current through its plate circuit and a step relay coil in that circuit. The relay coil attracts its armature and operates the ratchet of the step switch so the switch is advanced one step. In the normal rest position of the Assembly,

none of the relays are energized, the two step switches are in "zero" position and the coil of the Letter Step Relay is in the plate circuit of the tube through contact A of the transfer switch. When a selection is made, the first pulse of the first series energizes the Letter Step Relay, advances the step switch one contact, and closes contacts G and F. Contact G completes a d.c. circuit to the reset magnet to be energized and engage pawls with the ratchets of both step relays, Contact F completes a d.c. circuit to the transfer relay so it is energized opening contact D and closing contact E. Both the reset magnet and the transfer relay have slow-release timing so they will remain in the energized positions for an appreciable time after the first pulse has ended to permit the step relay armature to return to its normal position with contacts G and F open. Before either relay will drop out, the second pulse of the series operates the armature of the step relay and again the relays are energized. As long as the pulses continue with 1/25 second intervals between them the following condition will prevail: contacts G and F open and close with each pulse from the Wall-O-Matic, the pawls engage with the step switch ratchets, and the transfer relay contact E remains closed. Because the ratchets are engaged by the pawls, the step relay will advance the step switch one step or contact with each pulse.

When the second pulse of the first pulse series advances the step switch a second time, a cam on that switch operates the make-before-break contacts of the transfer switch so the 2D21 tube plate circuit is connected to the Letter Step Relay through contact B of the transfer switch (A is now open) and contact E of the transfer relay. This circuit condition is retained through subsequent steps of the Letter Step Switch.

The 1/5 second interval between the end of the last pulse of the first series and the beginning of the first pulse of the second series causes the Letter Step Relay to open the G and F contacts long enough to allow the transfer relay to drop out but not long enough to allow the reset magnet to disengage the step switch ratchet pawls. Therefore, during this 1/5 second interval when the transfer relay drops out, the step switch remains in the advanced position and the plate circuit of the 2D21 tube is transferred to the Number Step Relay through contact D of the transfer relay. When the first pulse of the second series operates the tube, the Number Step Relay will be energized and contacts J and H will be closed for the duration of the pulse.

Contact H energizes the reset magnet so it maintains its energized position as long as the pulses of the second series operate the Number Step Relay, Contact J closes the d.c. circuit to the No. 1 timing relay. This relay has slow-release timing so it remains in the energized position during the 1/25 second intervals between the pulses forming the second series. When the relay is energized contacts S and T open and contact U closes. Contact U closes the d.c. circuit to the No. 2 timing relay which, in turn, closes contacts M, L, P, and Q and opens contacts N and R.

The conditions prevailing as long as the pulses of the second series continues with 1/25 second interval between them are: advance of the Number Step Switch with each pulse; the reset magnet energized so the Letter Step Switch is in its advance position; the timing relays No. 1 and No. 2 energized.

With the first step of the Number Step Switch, the normally closed contact V is opened by a cam on the switch. This contact, when open, disables the starting circuit of the Electrical Selector system so no selection can be made during the interval the Number Step Relay is being operated by Wall-O-Matic selection.

Contacts P and R of the No. 2 timing relay disable the common return circuits of the Letter and Number Circuits of the Tormat Memory Unit so these circuits cannot be connected to the step switches by operation of the Electrical Selector selection keys while the timing relay is energized (during selection from a Wall-O-Matic). The normally open contact K on the pawl release relay closes at the first step operation of the Letter Step Relay to connect the Step Switch Assembly in the read-in circuit of the Memory Unit.

After the last pulse of the second series has operated the Number Step Relay, contacts J and H remain open and the No. 1 timing relay drops out. When this occurs, contact U opens and S and T close.

When contact U opens, the No. 2 timing relay coil is no longer energized but due to slow-release timing, the relay remains in the energized condition for an interval of approximately 1/20 second. During this interval, the grid of the 2D21 write-in thyratron is grounded through contacts S and P; the write-in circuit to the Tormat Memory Unit is closed through contacts Q and K; the selection counter circuit is completed to ground through the Number Step Switch and contacts M and T; the scan control

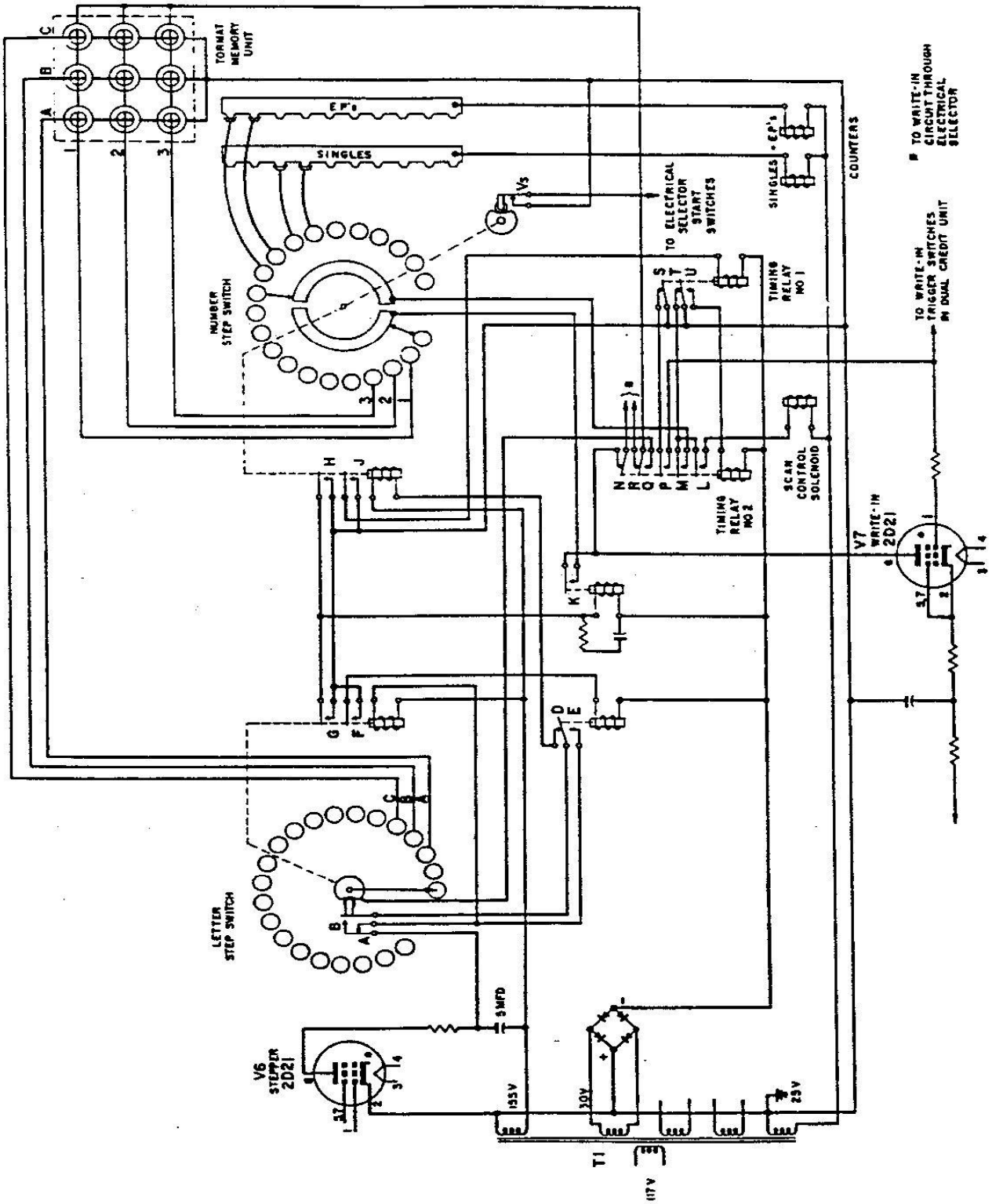

TORMAT MEMORY UNIT
EP's
SINGLES
NUMBER STEP SWITCH
LETTER STEP SWITCH
TO ELECTRICAL SELECTOR START SWITCHES
SINGLES + EP's
COUNTERS
TO WRITE-IN CIRCUIT THROUGH ELECTRICAL SELECTOR
TO WRITE-IN TRIGGER SWITCHES IN DUAL CREDIT UNIT
TIMING RELAY NO 1
TIMING RELAY NO 2
SCAN CONTROL SOLENOID
V5
V6 STEPPER 2D21
V7 WRITE-IN 2D21
K1
T1
.5MFD
135V
105V
25V
117V

Figure 7.

solenoid circuit is completed to ground through contacts L and T. During this interval, then, the 2D21 write-in thyratron is "fired" to energize the write-in circuits of the Memory Unit, that are connected through the step switches; the "Singles" or "EP" selection counter is operated (as determined by the connections pre-set at the pricing terminal board and the Number Circuit selected); the scan control solenoid will be energized so the scan switch is reset for continued operation of the mechanism and phonograph amplifier.

When the No. 2 timing relay releases, these circuits are opened and cleared and the write-in circuits are again conditioned for selection with the Electrical Selector.

The release delay for the pawl reset magnet extends slightly longer than the total time interval required for drop- out of the No. 2 timing relay so the step relay ratchets are released after the timing relay has opened the circuits it controls. When the step switch ratchets are released, the switches return to the "zero" position. Return of the Number Step Switch permits contact Vs to close so the Electrical Selector is no longer disabled.

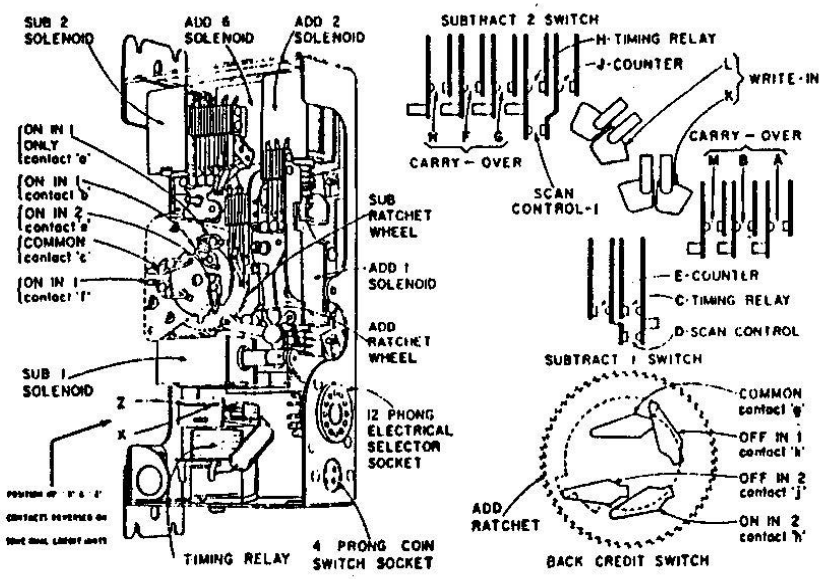
The selection pricing terminal board associated with the Step Switch Assembly provides means for simple connection of the selection counters (in the Electrical Selector) so they will total in accordance with the selection pricing established for the Wall-O-Matics and the Electrical Selector. There is a flexible lead for each of the ten Number Circuits. This lead is connected to either the "EP" terminal strip or the "Singles" terminal strip on the pricing board. If the leads associated with Number Circuit No. 1 and Number Circuit No. 2 are connected to the "EP" terminal strip, all selections in which the No. 1 and No. 2 appear will register in the total shown by the "EP" counter.

The number of steps the Letter Step Switch makes during the first series of pulses determines which one of twenty Letter Circuits of the Tormat Memory Unit will be energized. The number of steps made by the Number Step Switch will determine which one of ten Number Circuits of the Memory Unit will be energized. The selection made, then, will require from two to twenty-one pulses in the first series and from one to ten in the second series with the predetermined interval of approximately 1/5 second between the two series.

It is to be noted that operation of the relays is determined largely by the time interval between pulses, not by the duration of the individual pulses. The individual pulses of a selection series must be of only sufficient duration to insure full operating strokes of the step relay armatures but may be of any duration more than this minimum requirement. The intervals between the pulses must be long enough for the step relay armatures to return to normal position for another stroke but not long enough to permit the transfer relay to release during the first series or the No. 1 timing relay to release during the second series. The interval between the last pulse of the first series and the first pulse of the second series must be timed to permit the transfer relay to release but must not be long enough to allow the release magnet to return to normal position.

Both the pulse length and the intervals between pulses is determined by the design and operation of the Wall-O-Matic. The contacts on the selector plate and the rotating control arm of the Wall-O-Matic are arranged for correct pulsing when the arm operates between the speed limits of 17 to 21 revolutions per minute.

DUAL CREDIT UNIT, TYPE DCU5-L6

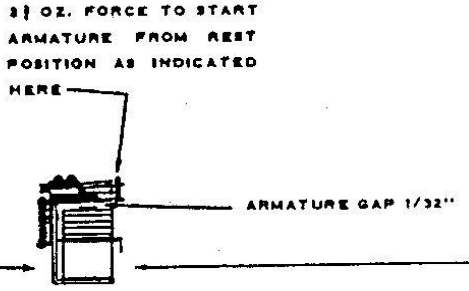


CONTACT	PRESSURE WHEN CLOSED	CONTACT GAP	NORMAL POSITION
A	1 OZ. MIN.	.010 - .015	OPEN
B	1 OZ MIN	.010 - .015	OPEN
C	7/8 OZ. MIN.	.004 - .007	OPEN
D	7/8 OZ. MIN.	.025 - .035	OPEN
E	2/3 OZ. MIN.	.008 - .012	OPEN
F	1 OZ. MIN.	.010 - .015	OPEN
G	1 OZ. MIN.	.010 - .015	OPEN
H	1 OZ MIN.	.008 - .012	OPEN
I	1 OZ. MIN.	.025 - .035	OPEN
J	2/3 OZ. MIN	.010 - .015	OPEN
K	7/8 OZ. MIN AGAINST PLATE	NONE	OPEN
L	7/8 OZ. MIN. AGAINST PLATE	NONE	OPEN
M	2/3 OZ	.008	OPEN
N	2/3 OZ	.008	OPEN
X	1-1 1/2 OZ	1/32"	CLOSED
Z	1-1 1/2 OZ.	1/32"	OPEN

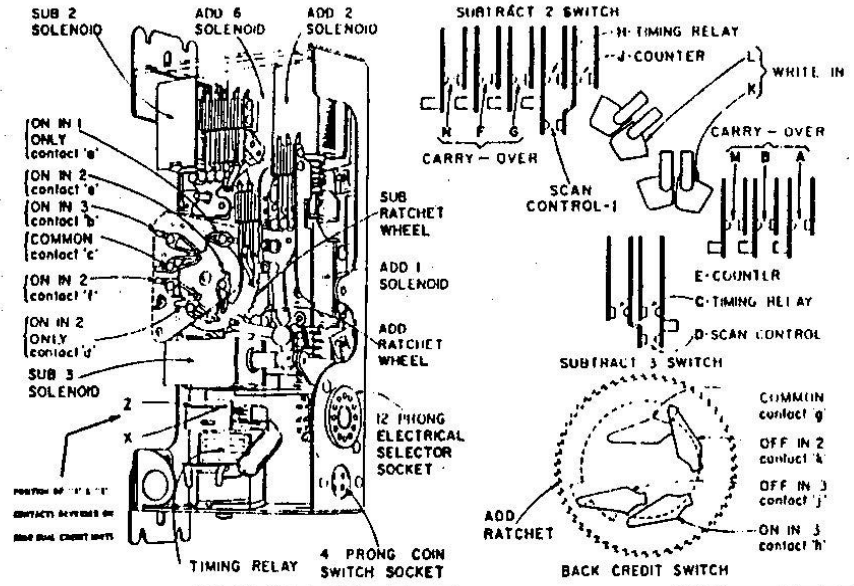
• *Contacts C and H must be closed when respective pawl arm drive pin bottoms in credit wheel tooth.*

CONTACT ADJUSTMENTS

NOTE: Credit switch contacts should have approximately ¼ oz. pressure and will be correct if, WITH THE BAKELITE CONTACT MOUNTING PLATE REMOVED FROM THE UNIT, the blades are formed so their tips are 9/32" to 5/16" from the surface of the plate.



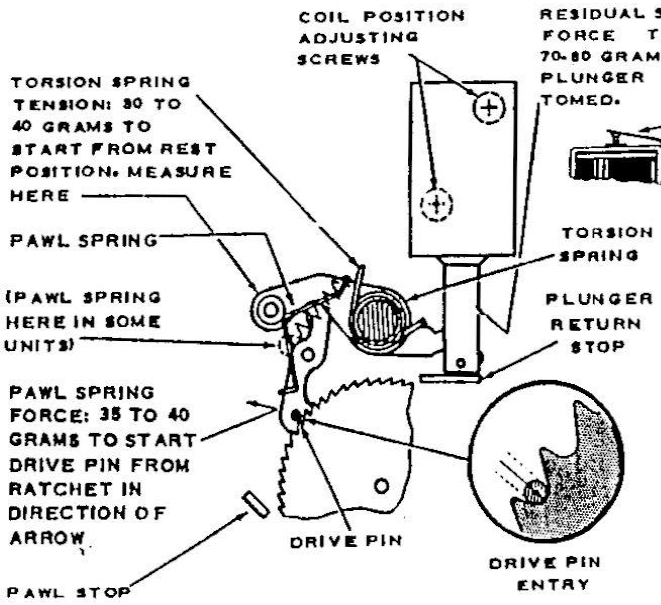
DUAL CREDIT UNIT, TYPE DCU1-L6



CONTACT	PRESSURE WHEN CLOSED	CONTACT GAP	NORMAL POSITION
A	1 OZ. MIN.	.010 - .015	OPEN
B	1 OZ. MIN.	.010 - .015	OPEN
C	7/8 OZ. MIN.	.004 - .007	OPEN
D	7/8 OZ. MIN.	.025 - .035	OPEN
E	2/3 OZ. MIN.	.008 - .012	OPEN
F	1 OZ. MIN.	.010 - .015	OPEN
G	1 OZ. MIN.	.010 - .015	OPEN
H	1 OZ MIN	.008 - .012	OPEN
I	1 OZ. MIN.	.025 - .035	OPEN
J	2/3 OZ MIN	.010 - .015	OPEN
K	7/8 OZ MIN AGAINST PLATE	NONE	OPEN
L	7/8 OZ MIN. AGAINST PLATE	NONE	OPEN
M	2/3 OZ	.008	OPEN
N	2/3 OZ	.008	OPEN
X	1-1 1/2 OZ	1/32"	CLOSED
Z	1-1 1/2 OZ	1/32"	OPEN

• *Contacts C and H must be closed when respective pawl arm drive pin bottoms in credit wheel tooth.*

ADD 6 (25¢) DRIVE ADJUSTMENT



A. With wheel stop against stop pin, adjust stop pin position so ADD 6 drive pin enters ratchet without striking or rubbing the sides of the teeth.

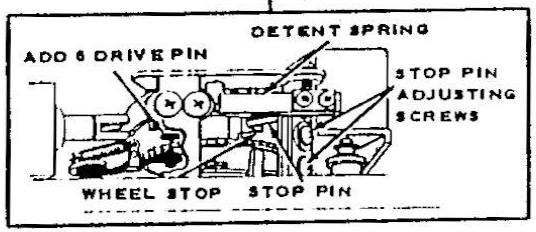
B. Loosen the two screws holding the coil.

C. Operate the plunger manually by applying force at the end of the plunger *(not the levers)* so it is fully seated.

D. Position the coil so the plunger operation will move the wheel six teeth and be fully detented. Tighten screws holding the coil.

E. Adjust pawl stop for minimum play in wheel when plunger is fully seated.

F. Adjust plunger return stop position for clearance between the drive pin and the tips of the ratchet teeth. The tips should pass without rubbing but the clearance must not be more than .010".



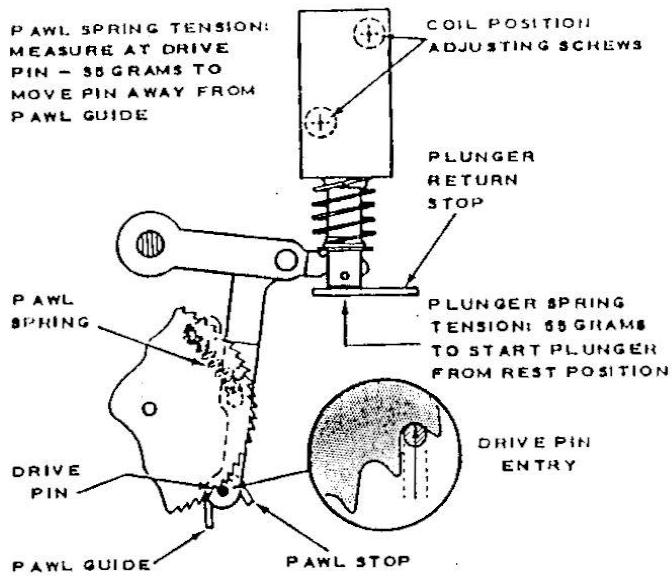
WHEEL STOP AND DETENT ADJUSTMENT

A. With wheel stop against stop pin, adjust stop pin position so ADD 6 drive pin enters ratchet without striking or rubbing the sides of the teeth.

Entry of all drive pins and the detent spring position adjustments are effected by the stop pin position and should be checked if a change is made.

B. Adjust position and force of detent spring so roller is *in full detent* when wheel stop is against stop pin and roller pressure against wheel is 150 to 160 grams (5½ oz.)

ADD 2 (10¢) DRIVE ADJUSTMENT



A. Adjust pawl guide so drive pin enters ratchet without striking or rubbing the sides of the teeth.

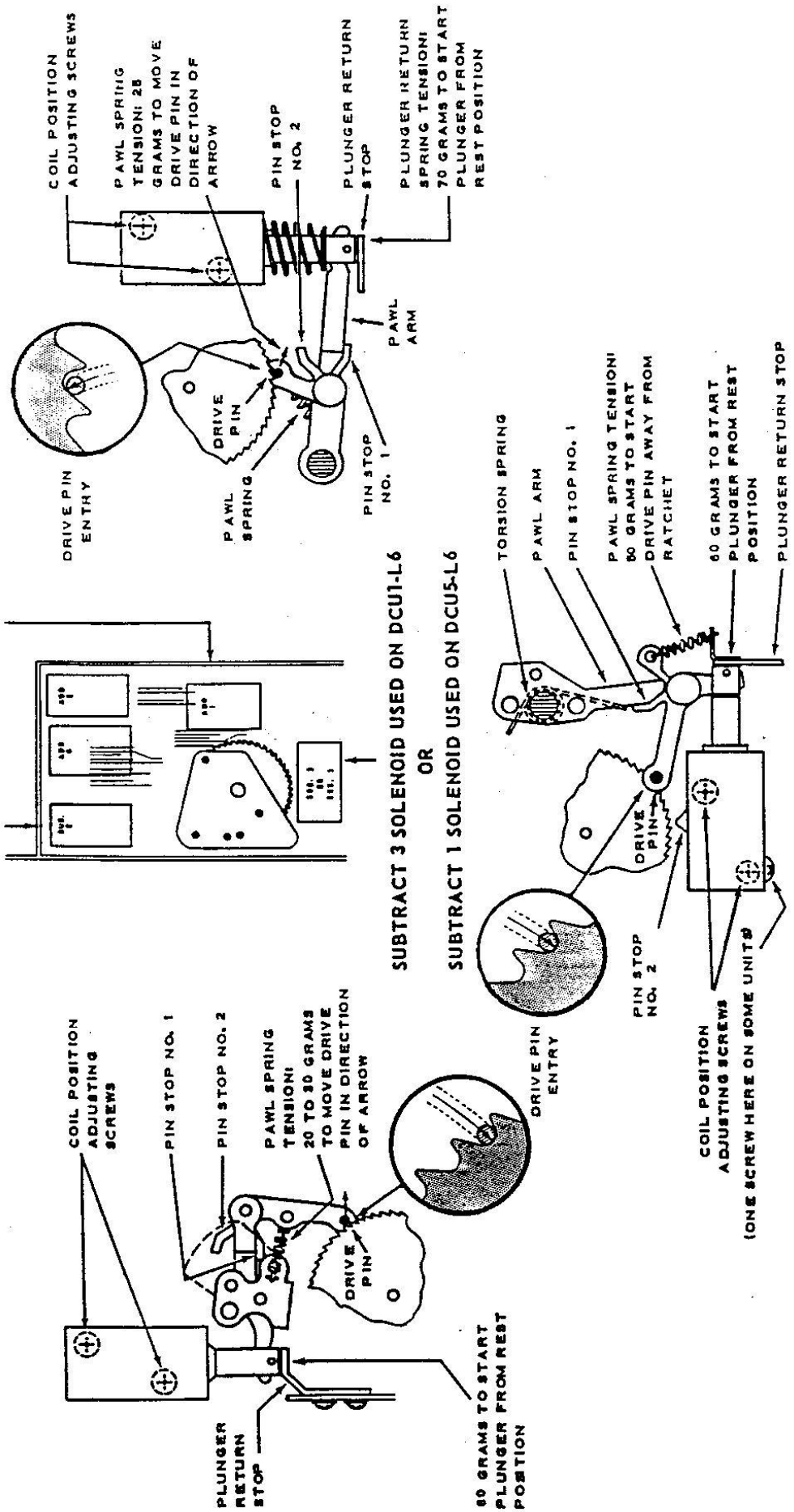
B. Loosen the two screws holding the coil.

C. Operate the plunger manually by applying force at the end of the plunger *(not the levers)* so it is fully seated.

D. Position the coil so the plunger operation will move the wheel two teeth and be fully detented. Tighten screws holding the coil.

E. Adjust pawl stop for minimum play in wheel when plunger is fully seated.

F. Adjust plunger return stop position for clearance between the drive pin and the tips of the ratchet teeth. The tips should pass without rubbing but the clearance must not be more than .010".



5124

SUBTRACT 2; SUBTRACT 3 OR SUBTRACT 1; ADD 1 DRIVE ADJUSTMENTS

A. Adjust pin stop No. 1 so the drive pin enters the ratchet without striking or rubbing the sides of the teeth.

B. Adjust the plunger return stop position for clearance between the drive pin and the tips of the ratchet teeth. The tips should pass without rubbing but the clearance must not be more than .010".

C. Loosen the two screws holding the coil.

D. Operate the plunger manually by applying force at the end of the plunger *(not the levers)* so it is fully seated.

E. Position the coil so the plunger operation will move the wheel the required number of teeth and will be in full detent. Tighten screws holding the coil.

F. Adjust pin stop No. 2 for minimum play in wheel when plunger is fully seated.

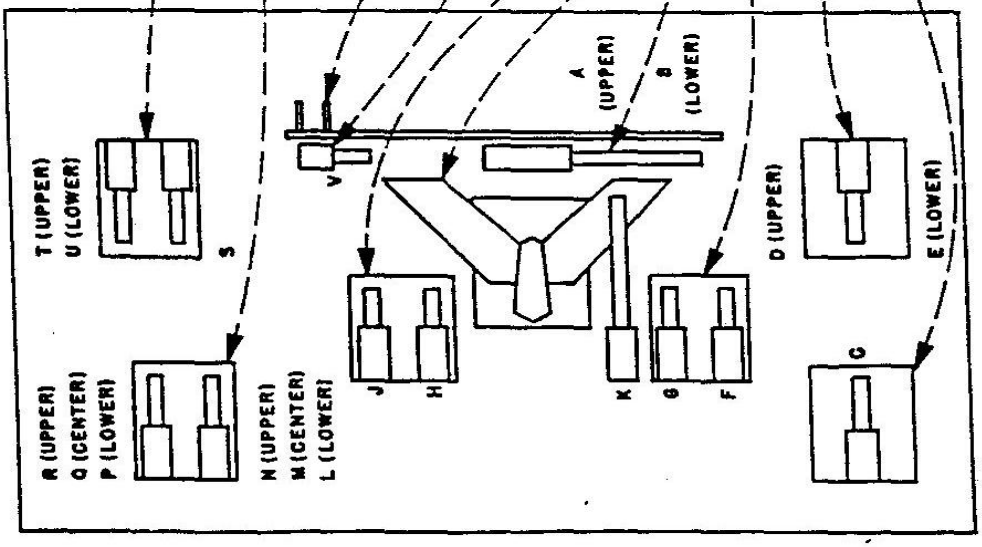
ITEM	OPERATED BY	ARMATURE GAP INCHES	CONTACTS	CONTACT GAP INCHES	CONTACT PRESSURE OUNCES	NORMAL POSITION
TIMING RELAY NO. 1*	CONTACT "J"	1/32	S	1/64	1	CLOSED
			T	1/64	3/4	CLOSED
			U	1/64	1	OPEN
TIMING RELAY NO. 2*	CONTACT "U"	3/64	L	1/64	1	OPEN
			M	1/64	1	OPEN
			N	1/64	3/4	CLOSED
			P	1/32	1	OPEN
			Q	1/64	1	OPEN
			R	1/64	3/4	CLOSED
COUNTER TERMINAL BOARD	EACH TAPER TAB RECEPTACLE CORRESPONDING TO EACH NUMBER IS TO BE PLACED ON THE DESIRED TERMINAL STRIP, EP'S OR SINGLES. BE CERTAIN THAT THE TERMINAL BOARD ON THE FORMAT ELECTRICAL SELECTOR AND EACH TERMINAL BOARD IN ALL THE WALL BOXES ARE CONNECTED IN THE SAME MANNER.					
START SWITCH	CAM ON NUMBER STEP SWITCH		V	1/64	1 1/4	CLOSED
NUMBER STEP MAGNET□	CONTACTS "D" AND "B" AND TUBE V6		H	1/64	1	OPEN
			J	1/64	1	OPEN
RESET MAGNET†	CONTACT "G" OR "H"		K	1/64	1 1/4	OPEN
TRANSFER SWITCH	CAM ON LETTER STEP SWITCH		A	1/64	1	CLOSED
			B	1/64	1	OPEN
LETTER STEP MAGNET□	CONTACTS "A" OR "B" AND "E" AND TUBE V5		F	1/64	1	OPEN
			G	1/64	1	OPEN
TRANSFER RELAY*	CONTACT "F"	5/64	D	1/32	1	CLOSED
			E	1/32	1	OPEN
PLAY CONTROL RELAY△	SCAN CONTROL SWITCH (CONTACT "D") ON SCAN CONTROL ASSEMBLY	3/64	C	1/32	1 1/2	OPEN

D. C. COIL RESISTANCE

- • — 500 OHMS
- □ — 800 OHMS
- † — 325 OHMS
- △ — 40 OHMS

TAIL SPRING FORCES 4 OZ.

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



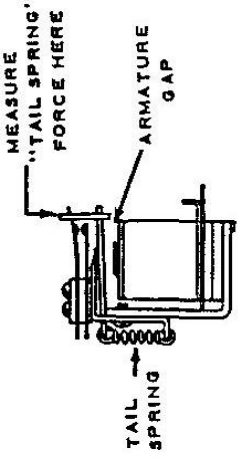


Figure 9. Relay Adjustment

STEP SWITCH ASSEMBLY ADJUSTMENTS

RATCHET AND SWITCH

The ratchets are attached to the switch shafts with pins or set screws. They should be positioned so the outer blades of the switches are 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 assembly frame.

The ratchets should be set on the shafts for a minimum of end play consistent with no binding.

RATCHET RETURN SPRING

The return spring tension for the Letter step switch should require 90 to 115 grams (3-¼ to 4 oz.) tangential force to move the ratchet to the 5th position of the step switch. This force is measured at the point of a ratchet tooth with the switch contact plates removed. It will be approximately correct if the spring is wound one full turn when the switch is in the rest position.

The return spring tension for the Number step switch should require 60 to 75 grams (2 to 2-¼ oz.) tangential force to move the ratchet to the 5th position. The tension will be approximately correct if the spring is wound ¼-turn when the switch is in the rest position.

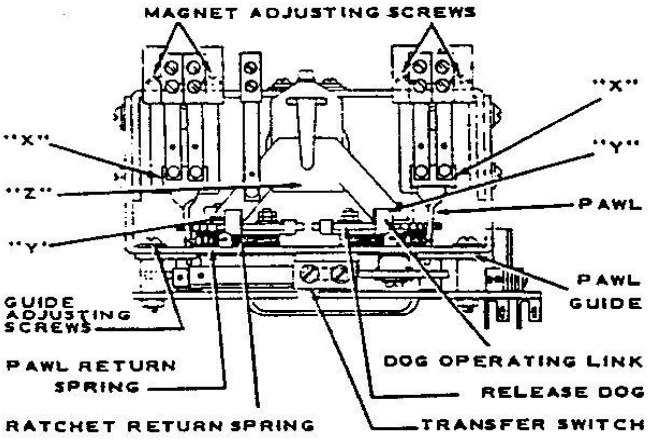


Figure 10.

STEP RELAY MAGNET POSITION

Adjust the step relay magnet vertically so the ratchet wheel tooth will over-ride the end of the release dog .010" to .020" when the armature is seated. *Figure 11.*

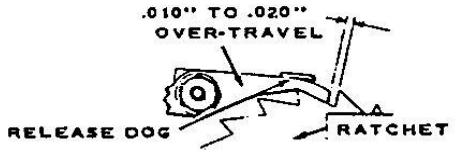


Figure 11.

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..005".

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 12.* The adjustment must be made so there will be a .004" to .010" gap between the pawl and the guide at the bottom of the stroke. *Figure 13.*

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.

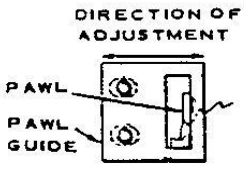


Figure 12.

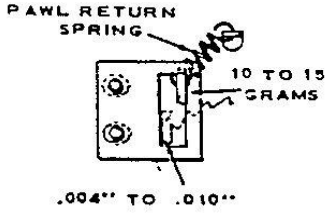


Figure 13.

STEP MAGNET TAIL SPRINGS

The tail spring pressure, measured at the front of the bridge on the step magnet armature ("X", *Figure 10* should be 50 to 75 grams (1-¾ to 2-½ oz.) to just close the switch contacts (when the contacts are correctly adjusted).

CONTACT PLATE SWITCH BLADES

The switch blades should have 10 to 35 grams pressure against the contacts. The pressure will be approximately correct if the blades are formed so their tips extend 5/32" above the contact assembly when the plates are removed. *Figure 14.*

When the contact plates are in position the blades should move freely over the contacts. If the contacts become rough or gummed, they should be cleaned with a clean cloth moistened. slightly, with light oil. *Do not use sandpaper or emery cloth and do not lubricate them with vaseline, grease or oil.*

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 10*) on the dog operating links 1/64" when the magnet is energized. *Figure 14.*

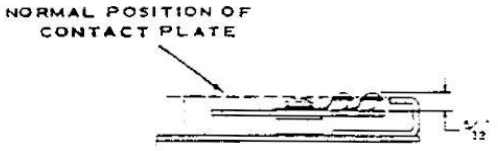


Figure 14.

The armature travel must be sufficient to permit the release dogs to clear the ratchet teeth .010" minimum when the magnet is not energized.

The tabs on the release dog operating links which engage the dogs and couple them to the reset magnet should not bind tightly but should not permit more than .005" free travel between the dogs and the links.

RESET MAGNET TAIL SPRING

The pressure applied to the end of the reset magnet armature ("Z", *Figure 10*) to start it from the rest position should be 100 to 140 grams (3-½ to 5 oz.).

RELEASE DOG SPRINGS

An upward pressure of 15 to 20 grams (½ to ¾ oz.) applied at the dimple on the release dog operating links ("Y", *Figure 10*) should start the dogs from seated position. This pressure will be approximately correct if the springs are wound ½ to ¾ turn.

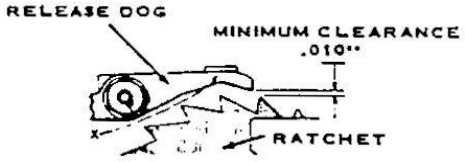


Figure 15.

TRANSFER SWITCH POSITION AND ADJUSTMENT

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 the step magnet causes no change of the roller blade. 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.

(a) 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. pressure of the roller against the disc.

(b) Adjust contact "B" gap 1/64".

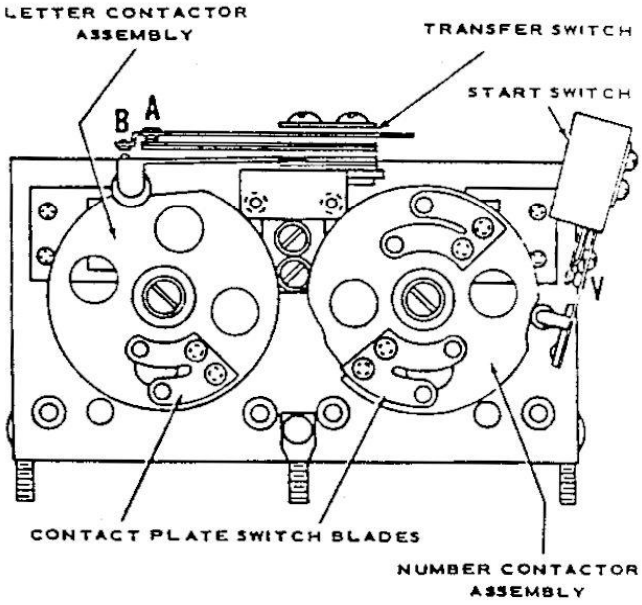


Figure 16.

(c) Adjust contact "A" pressure 1 oz.

(d) The second operation of the step magnet should result in closing contact "B" with 1 oz. pressure and opening contact "A" 1/64" to 1/32" gap.

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.

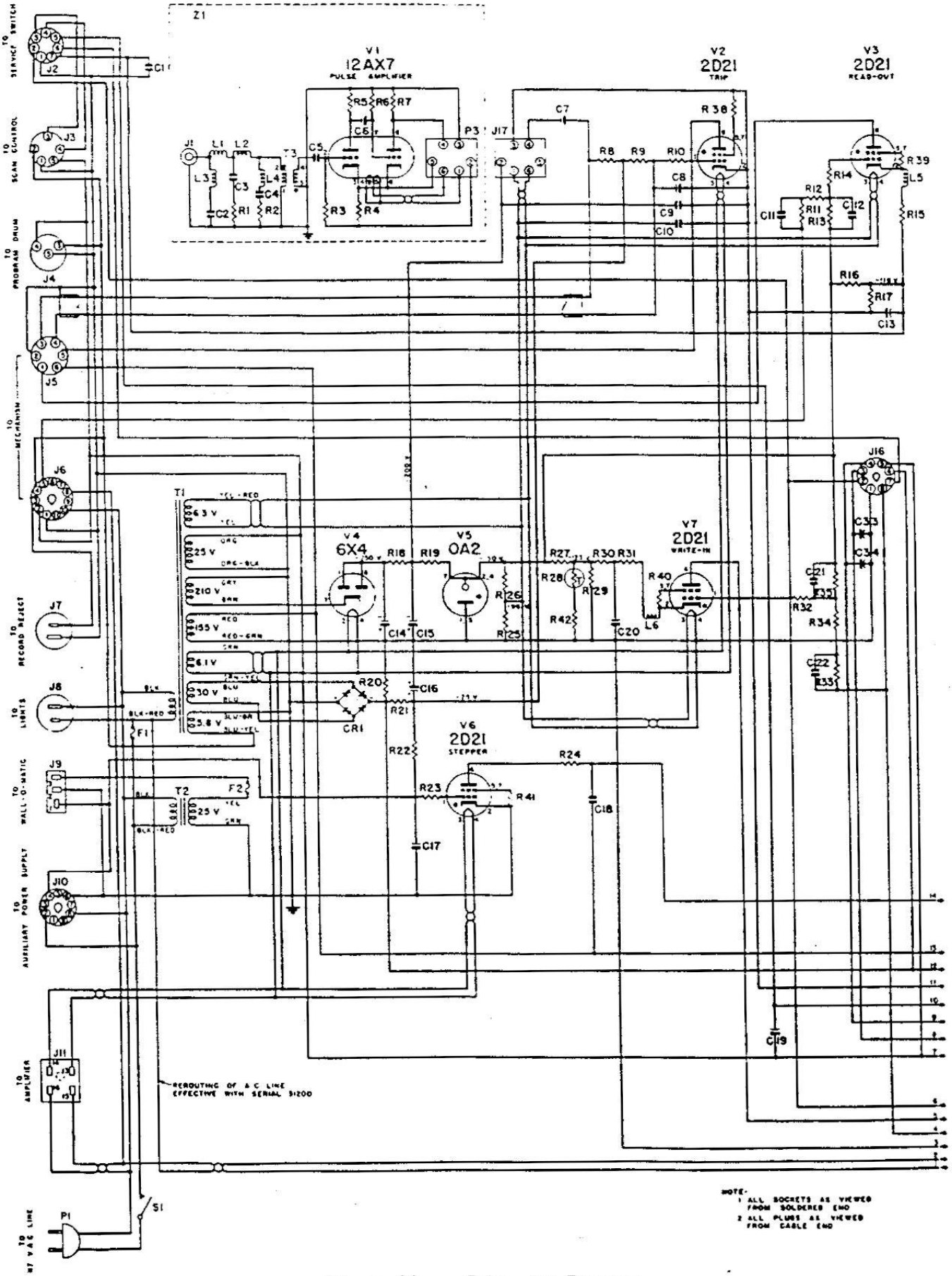


Figure 17. — Schematic Diagram

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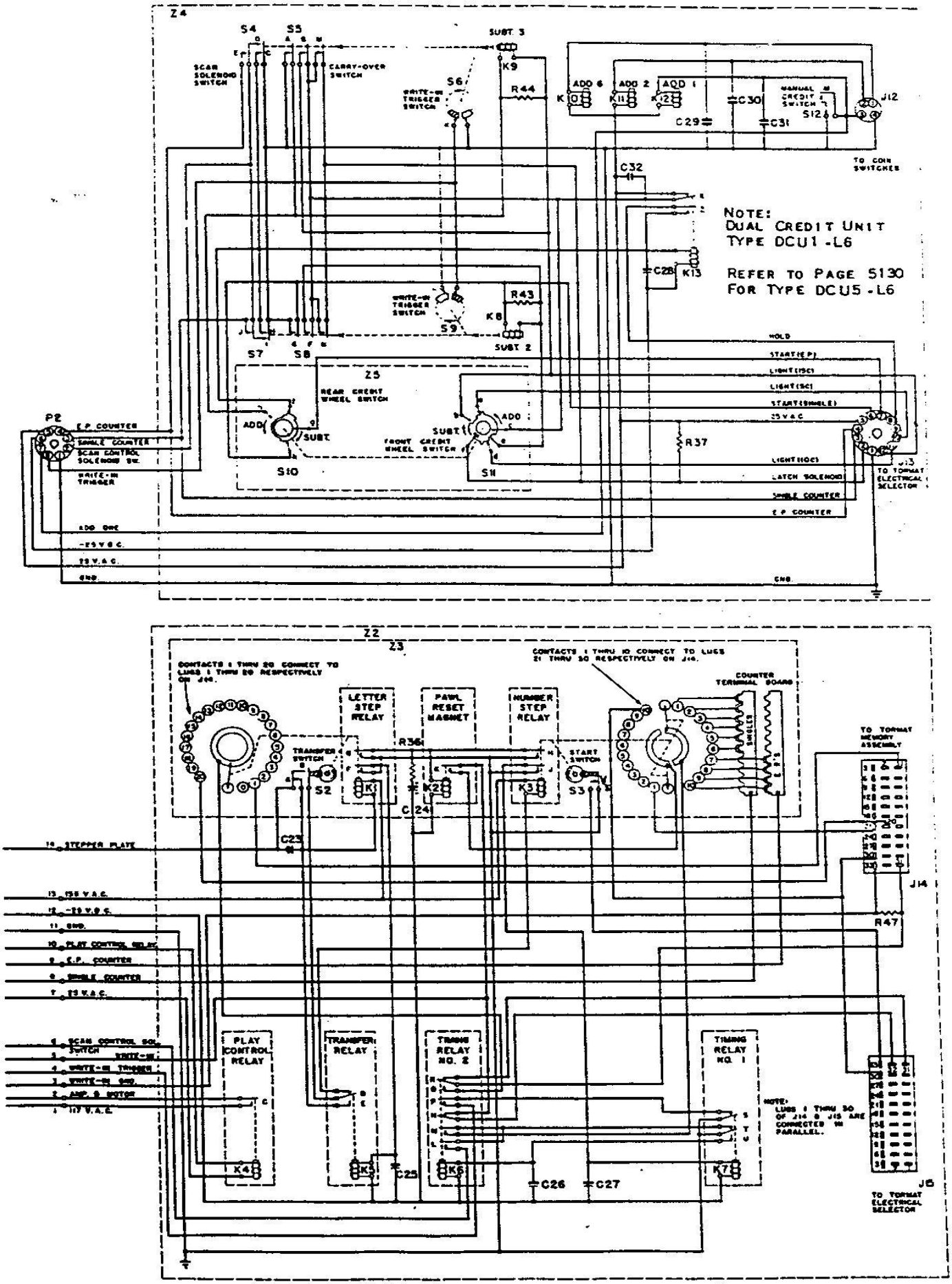
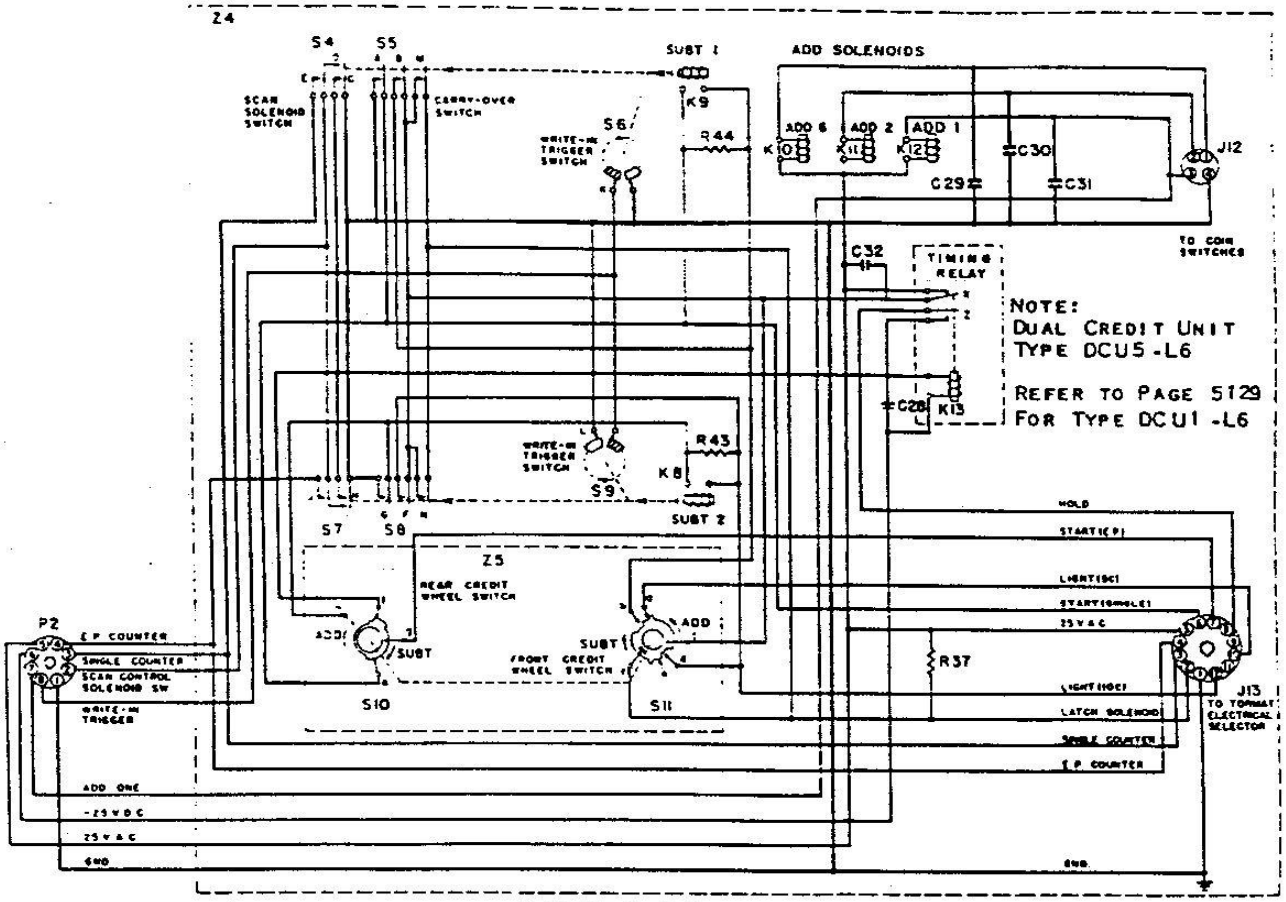


Figure 18. — Schematic Diagram

TORMAT SELECTION RECEIVER, TYPE TSR1-L6



PARTS LIST

(For Figures 17 and 18)

Item	Part No.	Part Name
C1	86251	3000 mmf. 500 V. Ceramic
C2	86253	360 mmf. ± 10% 500 v. Ceramic
C3	86252	1200 mmf. ± 10% 500 v. Ceramic
C4	86253	360 mmf. ± 10% 500 v. Ceramic
C5	86251	3000 mmf. 500 v. Ceramic
C6	86186	.05 mfd. ± 10% 200 v. Paper
C7	86142	.1 mfd. 200 v. Paper
C8	86235	.05 mfd. 200 v. Paper
C9	86251	3000 mmf. 500 v. Ceramic
C10	86251	3000 mmf. 500 v. Ceramic
C11	86254	5000 mmf. ± 10% 500 v. Ceramic
C12	86255	2000 mmf. ± 10% 500 v. Ceramic
C13	86249	.1 mfd. ± 10% 200 v. Paper
C14	87615	40 mfd. 300 v. Lytic
C15	87616	10 mfd. 300 v. Lytic
C16	87571	25 mfd. 50 v. Lytic
C17	86235	.05 mfd. 200 v. Paper
C18	11076	5 mfd. 300 v. Paper
C19	86142	.1 mfd. 200 v. Paper
C20	86186	.05 mfd. ± 10% 200 v. Paper
C21	86255	2000 mmf. ± 10% 500 v. Ceramic
C22	86250	5000 mmf. 1000 v. Ceramic
C23	86250	5000 mmf. 1000 v. Ceramic
C24	87611	300 mfd. 50 v. Lytic
C25	86235	.05 mfd. 200 v. Paper
C26	86235	.05 mfd. 200 v. Paper
C27	86235	.05 mfd. 200 v. Paper
C28	86142	.1 mfd. 200 v. Paper
C29	86258	.04 mfd. 500 V. Ceramic
C30	86259	.02 mfd. 500 v. Ceramic
C31	86258	.04 mfd. 500 v. Ceramic
C32	86259	.02 mfd. 500 v. Ceramic
C33	86142	0.1 mfd. 200 v. Paper
C34	86142	0.1 mfd. 200 v. Paper
CR1	400587	Selenium Rectifier
F1	602411	5 Amp. Fuse, Type 3AG
F2	301205	3 Amp. Fustat fuse
J1	300152	Single Prong Socket
J2	84282	7 Prong Socket
J3	84283	5 Prong Socket
J4	303555	3 Prong Socket (Small)
J5	84223	6 Prong Socket
J6	303253	11 Prong Socket
J7	602839	2 Prong Socket (Small)
J8	11401	2 Prong Socket
J9	12006	3 Prong Socket
J10	84244	9 Prong Socket
J11	301020	4 Prong Socket
J12	84298	4 Prong Socket (Small)
J13	84301	12 Prong Socket
J14	303528	33 Prong Socket
J15	303529	33 Prong Plug
J16	84292	8 Prong Socket
J17	301034	6 Prong Socket (Small)
K1	303545	Letter Step Relay
K2	303541	Pawl Reset Magnet
K3	303546	Number Step Relay
K4	303077	Play Control Relay
K5	303074	Transfer Relay
K6	303589	Timing Relay No. 2
K7	303588	Timing Relay No. 1
K8	450160	Subtract Two (2) Solenoid
K9	*450158	Subtract Three (3) Solenoid
	†450158	Subtract One (1) Solenoid
K10	450162	Add Six (6) Solenoid
K11	450152	Add Two (2) Solenoid
K12	450154	Add One (1) Solenoid
K13	450280	Timing Relay
L1	303602	16 mh Choke ± 5%
L2	303602	16 mh Choke ± 5%
L3	303600	11 mh Choke ± 5%
L4	303600	11 mh Choke ± 5%
L5	303601	27 mh Choke ± 5%
L6	303603	130 mh Choke ± 5%
P1	303571	Line Cord & Plug Assembly
P2	12028	8 Prong Plug
P3	303599	6 Prong Plug
R1	82409	56 Ohm ± 10% ½ W.
R2	82409	56 Ohm ± 10% ½ W.
R3	82444	47,000 Ohm ± 10% ½ W.
R4	82610	6200 Ohm ± 5% ½ W.
R5	82456	470,000 Ohm ± 10% ½ W.
R6	82469	5.6 Megohm ± 10% ½ W.
R7	82640	27,000 Ohm ± 5% ½ W.
R8	82464	2.2 Megohm ± 10% ½ W.
R9	82464	2.2 Megohm ± 10% ½ W.
R10	82456	470,000 Ohm ± 10% ½ W.
R11	82465	2.7 Megohm ± 10% ½ W.
R12	82440	22,000 Ohm ± 10% ½ W.
R13	82444	47,000 Ohm ± 10% ½ W.
R14	82448	100,000 Ohm ± 10% ½ W.
R15	81180	0.47 Ohm ± 5% W.W. ½ W.
R16	82698	150,000 Ohm ± 5% ½ W.
R17	82781	560,000 Ohm ± 5% ½ W.
R18	82805	2200 Ohm ± 10% 2 W.
R19	82836	2700 Ohm ± 10% 2 W.
R20	82432	4700 Ohm ± 10% ½ W.
R21	82448	100,000 Ohm ± 10% ½ W.
R22	82448	100,000 Ohm ± 10% ½ W.
R23	82436	10,000 Ohm ± 10% ½ W.
R24	82716	100 Ohm ± 10% 1 W.
R25	82454	330,000 Ohm ± 10% ½ W.
R26	82451	180,000 Ohm ± 10% ½ W.
R27	82637	15,000 Ohm ± 5% ½ W.
R28	303633	Thermistor
R29	82647	470,000 ± 5% ½ W.
R30	82448	100,000 Ohm ± 10% ½ W.
R31	82618	100 Ohm ± 5% ½ W.
R32	82448	100,000 Ohm ± 10% ½ W.
R33	82460	1.0 Megohm ± 10% ½ W.
R34	82440	22,000 Ohm ± 10% ½ W.
R35	82444	47,000 Ohm ± 10% ½ W.
R36	82403	18 Ohm ± 10% ½ W.
R37	87707	1,200 Ohm ± 10% 1 W.
R38	82440	22,000 Ohm ± 10% ½ W.
R39	82440	22,000 Ohm ± 10% ½ W.
R40	82440	22,000 Ohm ± 10% ½ W.
R41	82440	22,000 Ohm ± 10% ½ W.
R42	82638	18,000 Ohm ± 5% ½ W.
R43	82838	100 Ohm ± 10% 2 W.
R44	82838	100 Ohm ± 10% 2 W.
R47	82432	4700 Ohm ± 10% ½ W.
S1	303112	Toggle Switch S.P.S.T.
S2	303547	Transfer Switch
S3	303625	Start Switch
S4	*450149	Scan Solenoid Switch
	†450210	Scan Solenoid Switch
S5	*450150	Carry-Over Switch
	†450211	Carry-Over Switch
S6	†450255	Contact Assembly
	450105	Contact Segment Assembly — Trigger Switch
S7	450149	Scan Solenoid Switch
S8	450150	Carry-Over Switch
S9	†450272	Contact Assembly
	450132	Contact Segment Assembly — Trigger Switch
S10	*450089	Rear Credit Wheel Switch Assembly
	†450334	Rear Credit Wheel Switch Assembly
S11	*450140	Front Credit Wheel Switch Assembly
	†450342	Front Credit Wheel Switch Assembly
S12	450244	Manual Credit Switch
T1	303567	Power Transformer
T2	303569	25 v. Transformer
T3	303455	Pulse Transformer
	or	
	303457	Pulse Transformer (Alternate)
V1	308120	12AX7 Vacuum Tube
V2	308006	2D21 Thyratron
V3	308006	2D21 Thyratron
V4	308626	6X4 Vacuum Tube
V5	308005	OA2 V. R. Tube
V6	308006	2D21 Thyratron
V7	308006	2D21 Thyratron
Z1	303590	Pulse Amplifier
Z2	303520	Relay & Step Switch Assembly
Z3	303518	Step Switch Assembly
Z4	*450000	Dual Credit Unit
	†450002	Dual Credit Unit
Z5	450078	Credit Wheel Assembly

* Used on Dual Credit Unit, Type DCU1-L6 † Used on Dual Credit Unit, Type DCU5-L6

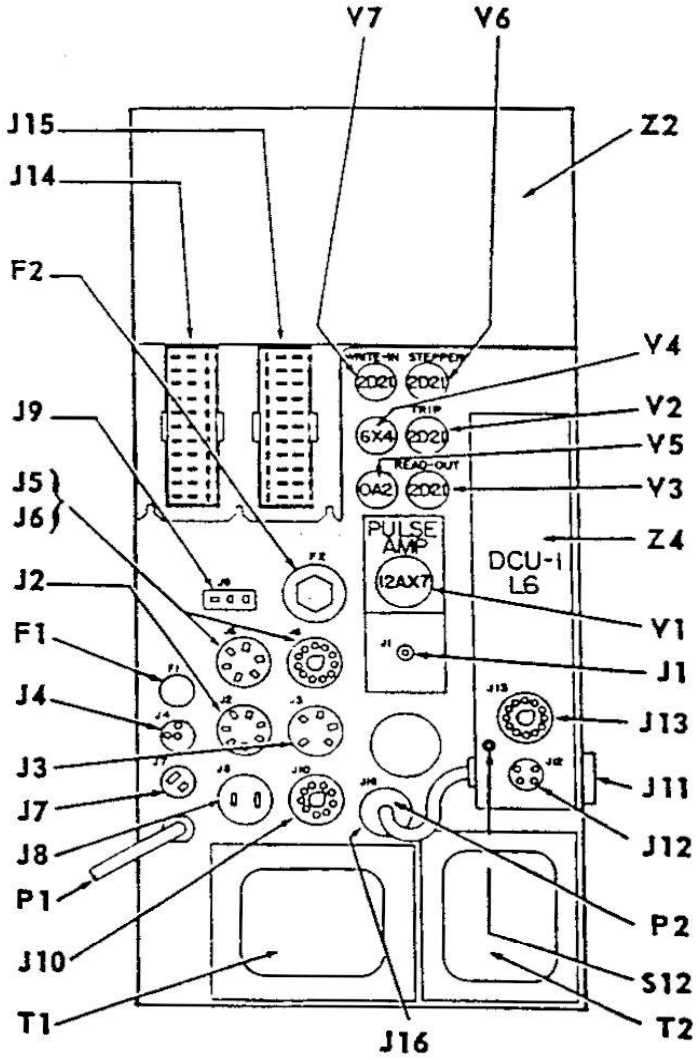


Figure 19.

PARTS LIST

Item	Part No.	Part Name
F1	602411	5 Amp. Fuse, Type 3AG
F2	301205	3 Amp. Fustat Fuse
J1	300152	Single Prong Socket
J2	84282	7 Prong Socket
J3	84283	5 Prong Socket
J4	303555	3 Prong Socket (Small)
J5	84223	6 Prong Socket
J6	303253	11 Prong Socket
J7	602839	2 Prong Socket (Small)
J8	11401	2 Prong Socket
J9	12006	3 Prong Socket
J10	84244	9 Prong Socket
J11	301020	4 Prong Socket
J12	84293	4 Prong Socket (Small)
J13	84301	12 Prong Socket
J14	303528	33 Prong Socket
J15	303529	33 Prong Plug
J16	84292	8 Prong Socket
P1	303571	Line Cord & Plug Assembly
P2	12028	8 Prong Plug
S12	450244	Manual Credit Switch
T1	303567	Power Transformer
T2	303569	25 v. Transformer
V1	308120	12AX7 Vacuum Tube
V2	308006	2D21 Thyratron
V3	308006	2D21 Thyratron
V4	308626	6X4 Vacuum Tube
V5	308005	OA2 V. R. Tube
V6	308006	2D21 Thyratron
V7	308006	2D21 Thyratron
Z2	303520	Relay & Step Switch Assembly
Z4	450000	Dual Credit Unit

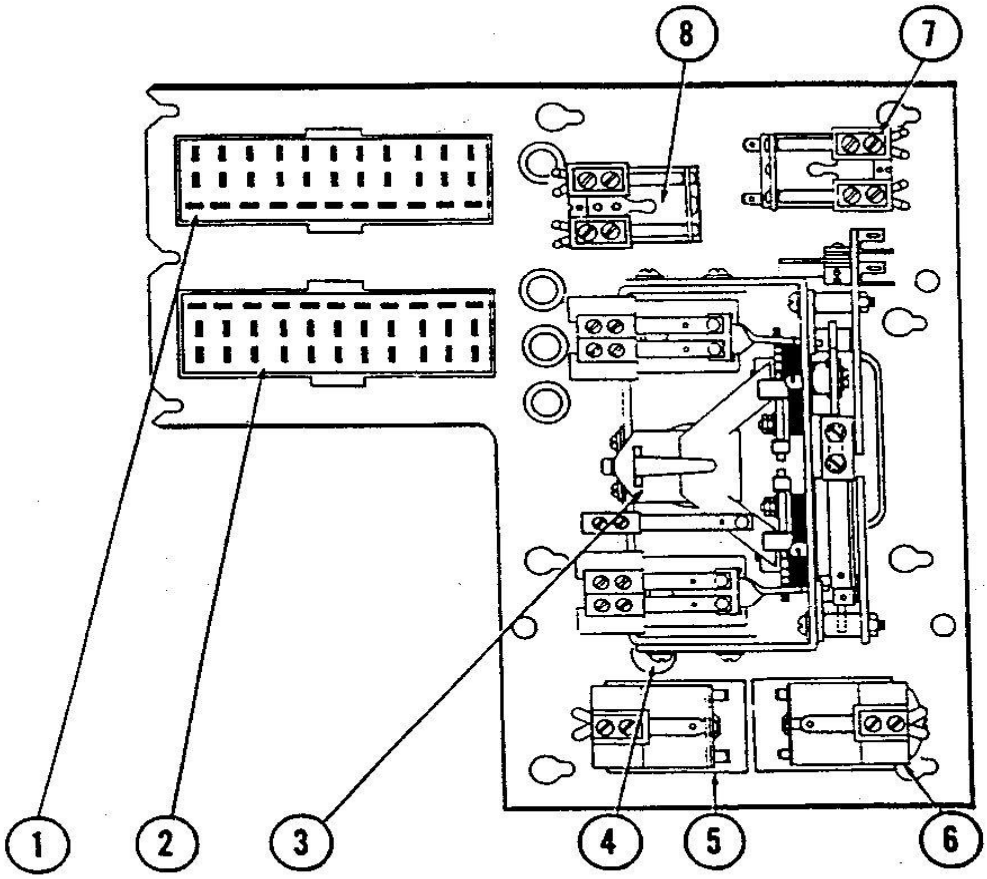


Figure 20. No. 303520 Step Switch & Relay Assembly

PARTS LIST

Item	Part No.	Part Name
1	303528	33 Prong Socket (J14)
2	303529	33 Prong Plug (J15)
3	303510	Step Switch Assembly (Z3)
4	10848	Cup Washer
	988290	Grommet (Rubber)
5	303077	Play Control Relay (K4)
	303128	Coil & Frame Assembly
	303127	Contact Assembly (C)
6	303074	Transfer Relay (K5)
	303130	Coil & Frame Assembly
	303129	Contact Assembly (D & E)
7	303588	Timing Relay No. 1 (K7)
	303617	Coil & Frame Assembly
	303616	Contact Assembly (T & U)
	303615	Contact Assembly (S)
8	303589	Timing Relay No. 2 (K6)
	303620	Coil & Frame Assembly
	303618	Contact Assembly (N, M & L)
	303619	Contact Assembly (R, Q & P)

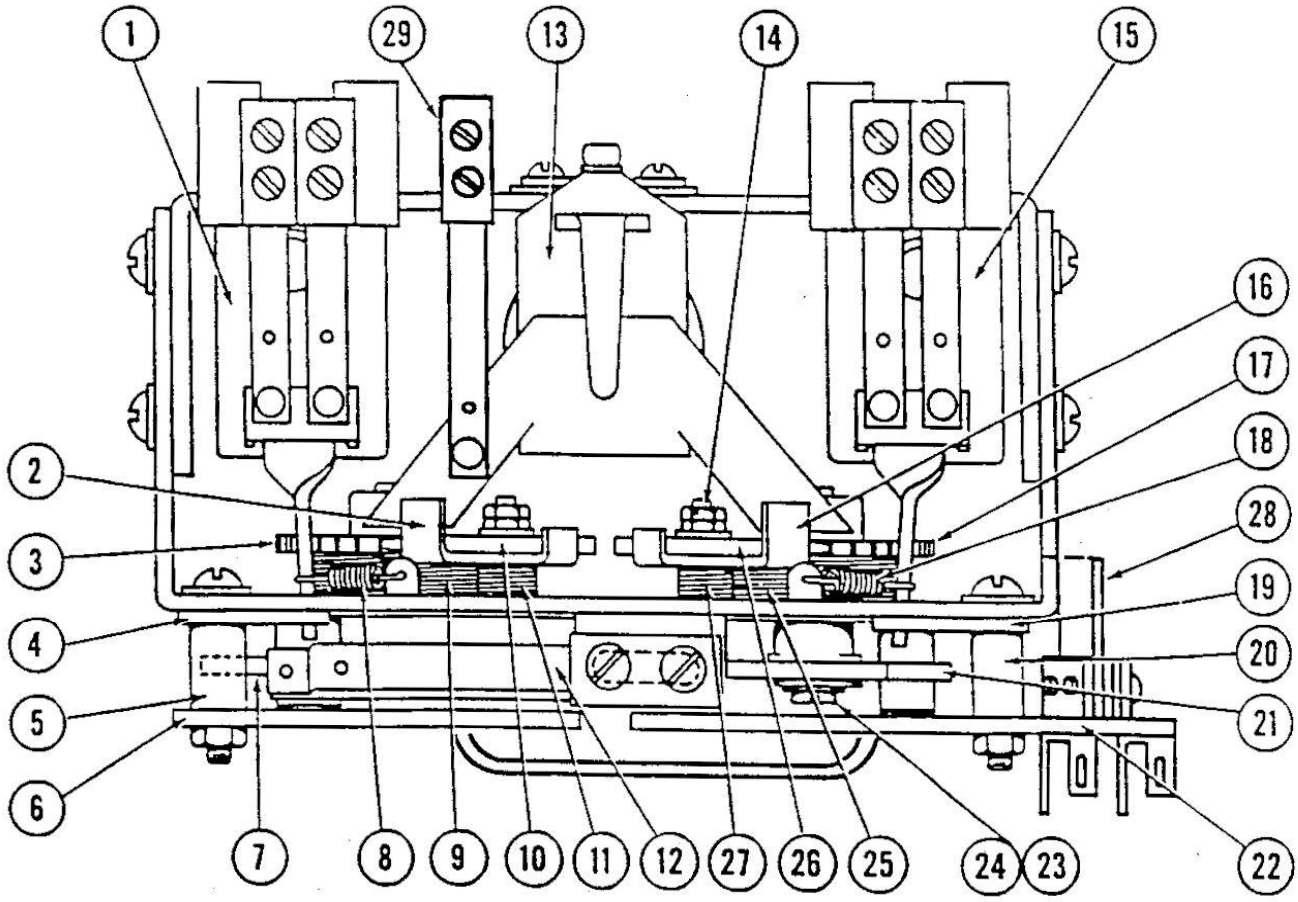


Figure 21. No. 303510 Assembly

PARTS LIST

ITEM	PART NO.	PART NAME
1	303545	LETTER STEPPER RELAY ASSEM. (INCLUDES THE FOLLOWING 6 ITEMS)
	303540	MAGNET & FRAME ASSEMBLY
	303100	ARMATURE ASSEMBLY
	303102	TAIL SPRING
	303192	STEPPER SWITCH ASSEMBLY (CONTACT G & F)
	303191	SWITCH MOUNTING SCREWS (3- 48 X 11/ 32 R.H.M.S.)
	303176	SWITCH MOUNTING BRACKET
2	303177	DOG OPERATING LINK
3	303179	RATCHET AND SHAFT
4	303187	PAWL GATE
5	303188	CONTACT PLATE SPACER
6	303543	CONTACT PLATE
7	303071	CONTACTOR
	303184	CONTACTOR MOUNTING WASHER (NOT SHOWN)
	303183	CONTACTOR MOUNTING SCREW (NOT SHOWN)
8	303106	PAWL RETURN SPRING
9	303104	RETURN SPRING
10	303181	DOG
11	303107	DOG RETURN SPRING
12	303548	TRANSFER SWITCH ASSEMBLY (INCLUDES THE FOLLOWING 4 ITEMS)
	303117	SWITCH MOUNTING BRACKET
	303182	SWITCH MOUNTING SCREWS (5- 40 X 9/ 16 R.H.M.S.)
	303547	TRANSFER SWITCH (CONTACTS A AND B)
	303189	SWITCH RETAINER PLATE
13	303541	PAWL RELEASE MAGNET, COMPLETE
	303103	TAIL SPRING, ONLY
14	303185	2- 56 HEX NUTS
	303186	NO. 2 WASHERS (UNDER NUTS)
15	303546	NUMBER STEPPER RELAY ASSEMBLY (INCLUDES THE FOLLOWING 5 ITEMS)
	303542	MAGNET & FRAME ASSEMBLY
	303101	ARMATURE ASSEMBLY
	303102	TAIL SPRING
	303192	STEPPER SWITCH ASSEMBLY (CONTACT J & H)
	303191	SWITCH MOUNTING SCREWS (3- 48 X 11/ 32)
16	303178	DOG OPERATING LINK
17	303538	RATCHET & SHAFT
18	303106	PAWL RETURN SPRING
19	303187	PAWL GATE
20	303188	CONTACT PLATE SPACER
21	303536	CONTACTOR
22	303544	CONTACT PLATE
23	303184	CONTACTOR MOUNTING WASHER
24	303183	CONTACTOR MOUNTING SCREW
25	303537	RETURN SPRING
26	303181	DOG
27	303108	DOG SPRING
28	303624	START SWITCH ASSEMBLY (INCLUDES THE FOLLOWING 4 ITEMS)
	303626	SWITCH MOUNTING BRACKET
	910940	SWITCH MOUNTING SCREWS (3- 48 X 7/ 16 R.H.M.S.)
	303625	START SWITCH (CONTACT V)
	450259	SWITCH RETAINER PLATE
29	303621	RESET MAGNET SWITCH ASSEMBLY (INCLUDES THE FOLLOWING 3 ITEMS)
	303623	SWITCH MOUNTING BRACKET
	910998	SWITCH MOUNTING SCREWS (3- 48 X 11/ 16 R.H.M.S.)
	303622	RESET SWITCH (CONTACT K)

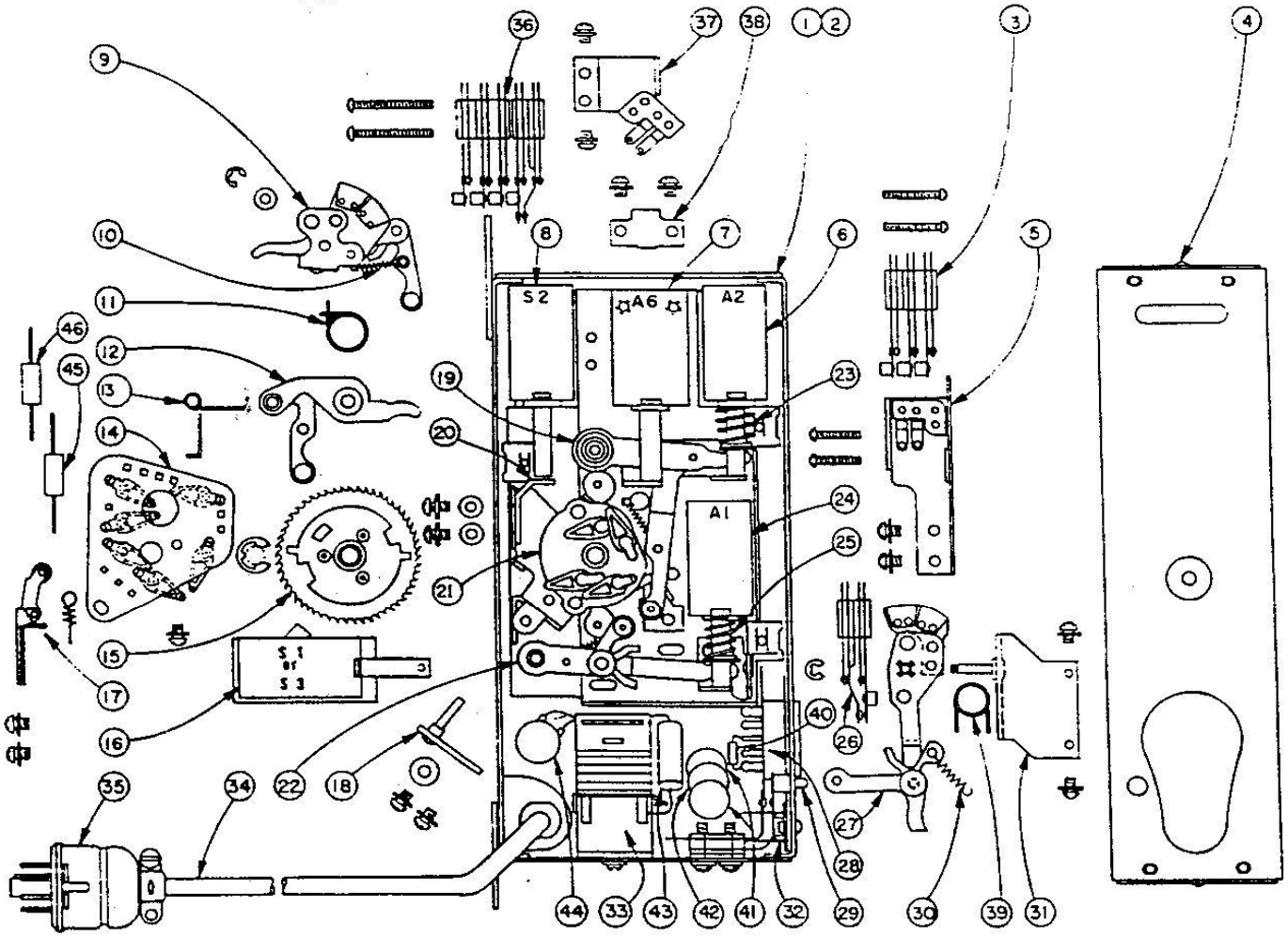


Figure 22. Dual Credit Unit Assemblies

PARTS LIST

Item	Part No.	Part Name
1	*450000	COMPLETE UNIT
	†450002	COMPLETE UNIT
2	450022	MOUNTING PLATE STAKED ASSEMBLY
3	*450150	CARRY-OVER SWITCH
	†450211	CARRY-OVER SWITCH
	450259	TAPPED PLATE
	450260	TENSION PLATE
	910991	3-48 X 5/8 PHILLIPS R.H.M.S.
4	*450247	COVER ASSEMBLY
	†450297	COVER ASSEMBLY
5	*450254	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 3)
	†450344	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 1)
	912882	SEMS
6	450182	COIL & BRACKET ASSEMBLY (ADD 2)
	450075	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
7	450186	CREDIT COIL & BRACKET ASSEMBLY (ADD 6)
	450074	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
8	450180	CANCEL COIL & BRACKET ASSEMBLY (SUB 2)
	450075	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
9	450132	CANCEL ARM ASSEMBLY (SUB 2)
	125448	RETAINING RING
	921112	WASHER
10	450098	SPRING
11	450130	TORSION SPRING
12	450121	CREDIT ARM ASSEMBLY (ADD 6)
13	450131	SPRING - TORSION
14	*450140	CONTACT PLATE ASSEMBLY
	†450342	CONTACT PLATE ASSEMBLY
	912859	SEMS
15	450078	CREDIT WHEEL ASSEMBLY
	125403	RETAINING RING
16	*450188	COIL & BRACKET ASSEMBLY (SUB 3)
	†450336	CANCEL COIL & BRACKET ASSEMBLY (SUB 1)
	912882	SEMS
	*450075	SOLENOID PLUNGER ASSEMBLY
	†450348	SOLENOID PLUNGER ASSEMBLY
17	450465	DETENT ROLLER ASSEMBLY
	450464	DETENT SPRING ONLY
	910821	3-48 X 3/16 PHILLIPS P.H.M.S.
18	450326	STOP PIN PLATE ASSEMBLY
	920739	FLAT WASHER
	912868	SEMS

Item	Part No.	Part Name
19	450111	CREDIT ARM ASSEMBLY (ADD 2)
	450129	SPRING
20	450102	PLUNGER STOP BRACKET (SUB 2)
	912859	SEMS
21	450069	TERMINAL BOARD ASSEMBLY
22	450085	CREDIT ARM ASSEMBLY (ADD 1)
	450096	SPRING
23	450329	SPRING
24	450184	COIL & BRACKET ASSEMBLY (ADD 1)
	450076	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
25	450329	SPRING
26	*450148	SWITCH
	†450210	SWITCH
	450259	TAPPED PLATE
	450260	TENSION PLATE
	911011	3-48 X 2 PHILLIPS R.H.M.S.
27	*450105	CANCEL ARM ASSEMBLY (SUB 3)
	†450339	CANCEL ARM ASSEMBLY
28	54301	12 PRONG SOCKET
29	450244	MANUAL CREDIT SWITCH
	912845	SEMS
	200028	TAPPED PLATE
30	450129	SPRING
31	*450097	PIVOT BRACKET ASSEMBLY
	†450332	PIVOT BRACKET ASSEMBLY
	912882	SEMS
32	54293	4 PRONG SOCKET
33	450260	TIMING RELAY
	914225	SEMS
34	450245	CABLE ASSEMBLY
35	12028	OCTAL PLUG
36	450150	SWITCH (CARRY-OVER)
	450149	SWITCH
	911073	3-48 X 1 1/2 PHILLIPS R.H.M.S.
37	450261	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 2)
	912882	SEMS
38	450318	RESIDUAL SPRING
	912810	6-32 X 1/8 PHILLIPS R.H.M.S.
	450317	RESIDUAL PIN
	925842	FLAT WASHER
39	450281	TORSION SPRING
40	82707	1200 OHM 1 W RESISTOR
41	86259	.02 CERAMIC CONDENSER
42	86258	.04 CERAMIC CONDENSER
43	86142	.1 MFD. 200 V CONDENSER
44	86259	.02 MFD. CERAMIC CONDENSER
45	82836	100 OHM 2 W. RESISTOR

* USED ON TYPE DCU1-L6 † USED ON TYPE DCU5-L6

5134

Seeburg

TORMAT SELECTION RECEIVER
TYPE TSR2-L6

The Tormat Selection Receiver, Type TSR2- L6, is the power distribution and control center of the Select- O- Matic "200" R. C. Special, Model HV- 200 for operation from wired Wall- O- Matics, Type V- 3WA. Power enters the Receiver through the line cord and main switch and is distributed, directly at 117- volts or through transformers, to the Select- O- Matic Mechanism, the cabinet lighting, the amplifier, and the Wall- O- Matics. All connections to the Receiver are made with plugs which are of different types and sizes to avoid possibility of incorrect connections. Included in the Receiver are a Step Switch and Relay Assembly, and a 2D21 tube, for selection of records from Wired Wall- O- Matics.

A 25- volt transformer supplies power for up to six Type V- 3WA Wall- O- Matics. Another transformer, the selection receiver power transformer, has seven output windings for control circuits, and heater current for the tubes in the High Fidelity Master Amplifier.

One of the secondaries of the selection receiver power transformer provides approximately 30- volts, a.c. This 30- volt output is rectified by a full- wave selenium rectifier for 25- volt d.c. supply for some of the relays of the Step Switch and Relay Assembly, and for bias supply for the 2D21 tube. Another secondary provides approximately 150- volts for operating the step switches through the plate circuit of the 2D21 tube.

Operation of Selection Receiver, Type TSR2- L6, is the same as that of the Type TSR1- L6. All service notes, schematic diagrams, and parts lists applying to the Type TSR1- L6 apply to the Type TSR2- L6 except that there is no Dual Credit Unit incorporated for operation of an electrical selector. The space on the chassis of the TSR2-L6 is used for a Selection Counter Assembly, Part No 303656. The parts list for this assembly is given below.

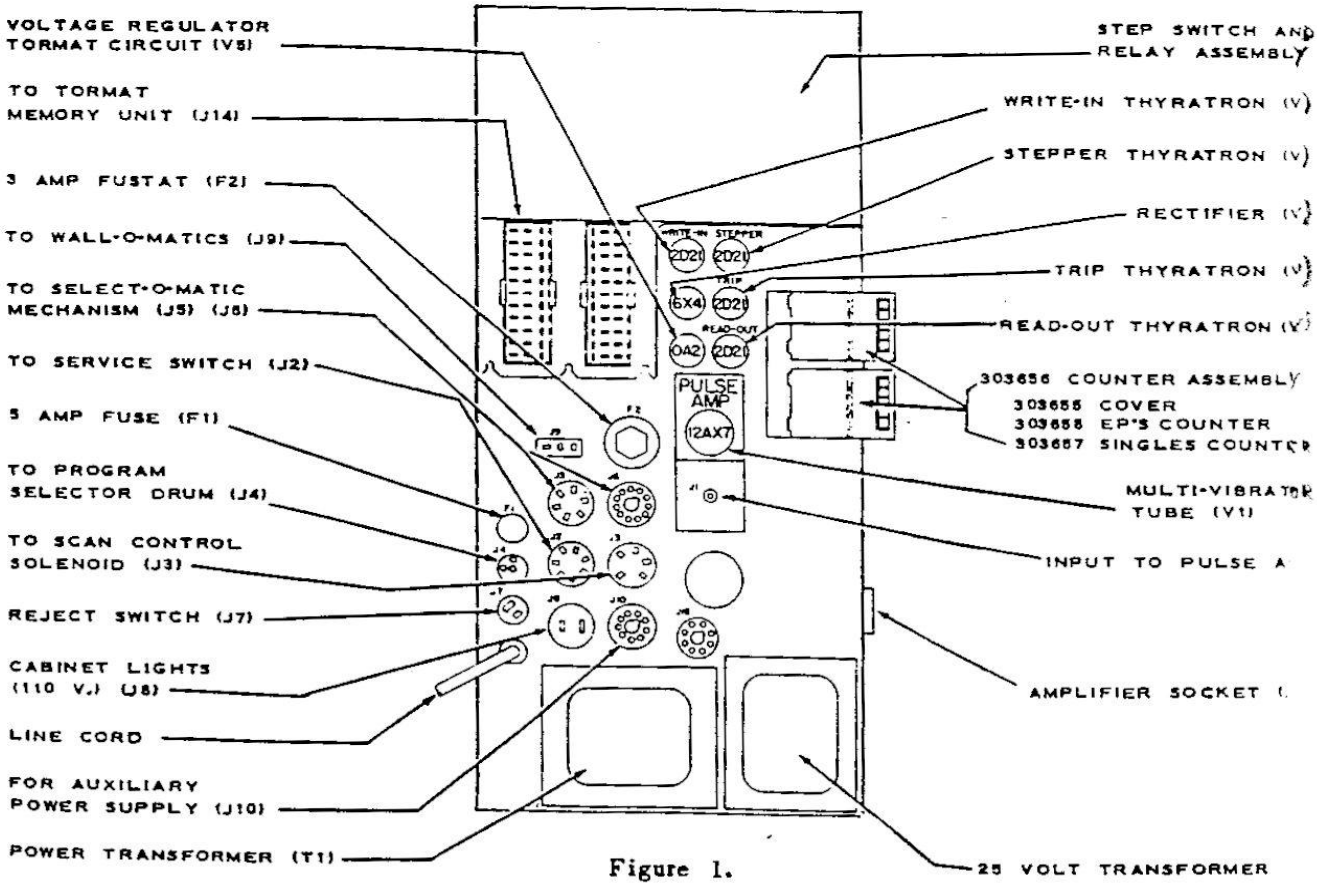


Figure 1.

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TORMAT SELECTION RECEIVER
TYPE TSR3-L6

The Tormat Selection Receiver, Type TSR3-L6 is the power distribution and control center for operation of the Select-O-Matic mechanism and the Tormat Memory System from the Electrical Selector at the phonograph or by remote control with 200-selection, 3-wire, Wall-O-Matics. Power enters the Receiver through the line cord and main switch and is distributed, at 117 volts or through transformers, to the Electrical Selector, the Select-O-Matic Mechanism, cabinet lighting, program selector, amplifier and the Wall-O-Matics. All connections to the Receiver are made with plugs and connectors of different types and sizes to avoid possibility of incorrect connections.

Included in the Receiver are a Step Switch and Relay Assembly, a Dual Credit Unit and a pulse amplifier unit. The Step Switch and Relay Assembly and a 2050 thyratron, V6, are for step relay operation for selection from the Wall-O-Matics. The Dual Credit Unit incorporates an accumulative add-and-subtract credit switch for credit and selection control at the phonograph. The pulse amplifier includes a 12AX7 tube, V1, that amplifies the trip signal from the output loop of the Tormat Memory Unit on the Select-O-Matic Mechanism. The pulse from the 12AX7 tube controls a 2050 thyratron, V2, which in turn passes current for operation of the trip solenoid of the Select-O-Matic mechanism.

A 6X4 rectifier tube, V3, supplies grounded-positive plate power for the 12AX7 pulse amplifier and, with two OA2 regulator tubes, J4 and J5, regulated voltage supply for charging condensers from which are taken power for the write-in and read-out pulses to the Tormat Memory Unit.

A full wave selenium rectifier supplies d. c. at approximately 25 volts for some of the relays of the Step Switch Assembly and a timing relay in the Dual Credit Unit and for grid bias of the 2050 tubes for the trip solenoid and step relays.

All of the mechanism control circuits, plate and bias supplies and tube heater circuits are supplied from the multiple-secondary transformer, T1.

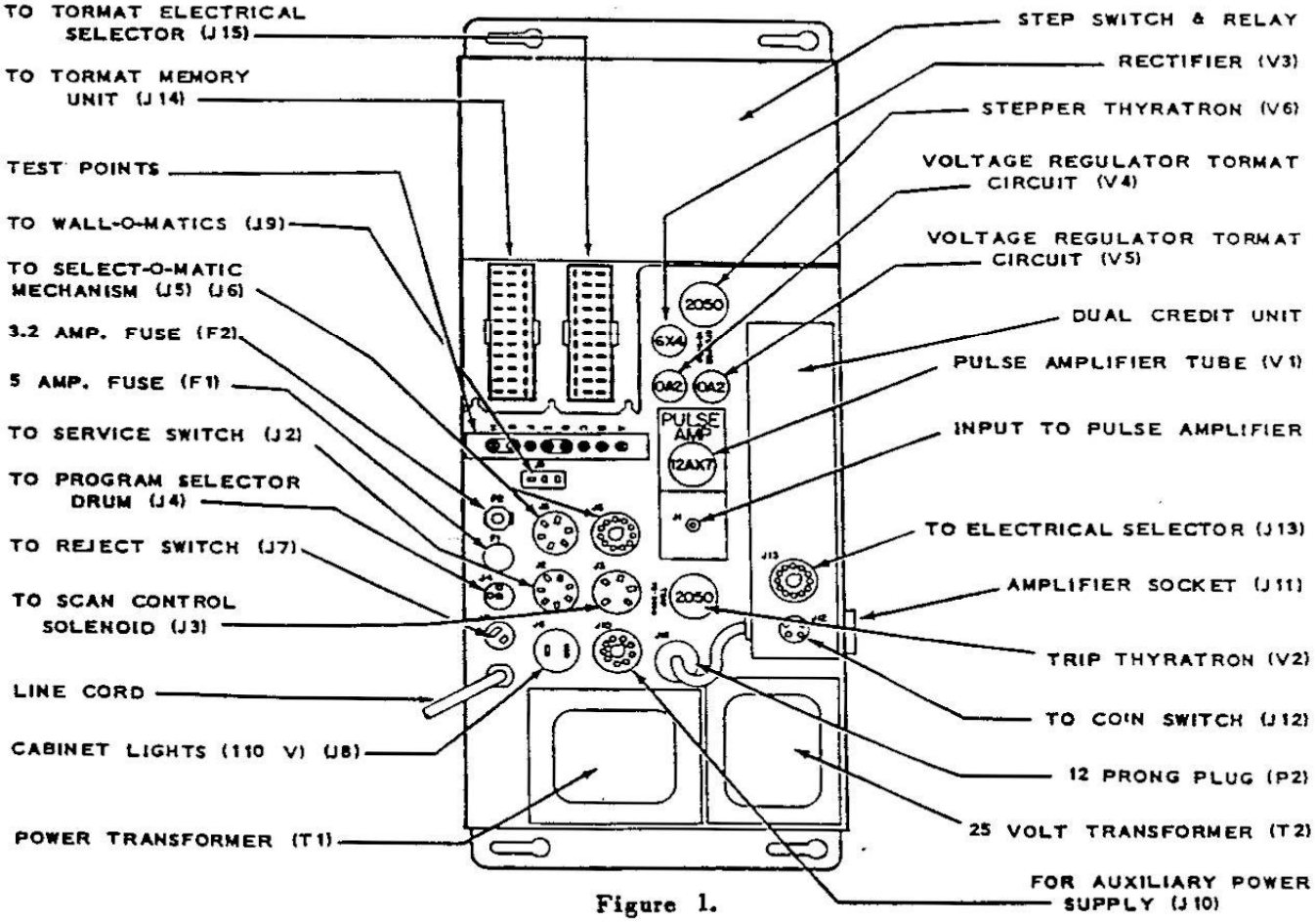


Figure 1.

The Dual Credit Unit and the pulse amplifier connect to the circuits of the Receiver with plugs and sockets. They may be removed for test or service. Access to the interior wiring of the Receiver is had, while it is operating in normal position, by removing the cover plate on the outside of the rear door of the phonograph. To remove the cover plate, take off the three wind-nuts located inside the door just above the amplifier and selection receiver and loosen the screw at the center of the bottom edge of the plate. After removing the nuts, pull out on the plate so the three bolts are out of the holes in the door and lift up on the plate to disengage it at the lower edge.

The Selection Receiver may be removed from its mounting by removing the cover plate and loosening the four screws holding the flanges of the unit. With the four screws loosened, slide the unit away from the amplifier to disengage the locating pins and amplifier socket connection. It may then be lifted from the mounting frame.

DUAL CREDIT UNIT, TYPE DCU1L-L6, TYPE DCU5L-L6

The Dual Credit Units are part of the Tormat Memory System for making selections for coins deposited at the phonograph. The Type DCU1L-L6 is the same, functionally, as the Type DCU1-L6 that is discussed beginning on page 5138. The DCU1-L6 and the DCU1L-L6 differ in respect to the write-in trigger switch connections and in the cable and plug that connects the Unit to the Tormat Selection Receiver. The trigger switches, contacts K and L, in the DCU1L-L6 terminate at pins 8 and 9 of a 12-prong plug (for connection to the Receiver) instead of pins 8 and 1 (ground) as shown in the diagram, *Figure 5*, on page 5117. The 12-prong plug and all DCU1L-L6 wiring are shown in the complete diagram for the Type TSR3-L6 Selection Receiver on page 5140 and 5141.

The Dual Credit Units Type DCU1L-L6 and Type DCU5L-L6 differ in that the latter is designed for use in selection pricing of five cents and ten cents instead of ten cents and fifteen cents as with the DCU1L-L6 (and DCU1-L6). All adjustments of the two types are identical as shown on pages 5122 to 5124. The internal wiring and connections for the DCU5L-L6 is shown on page 5142.

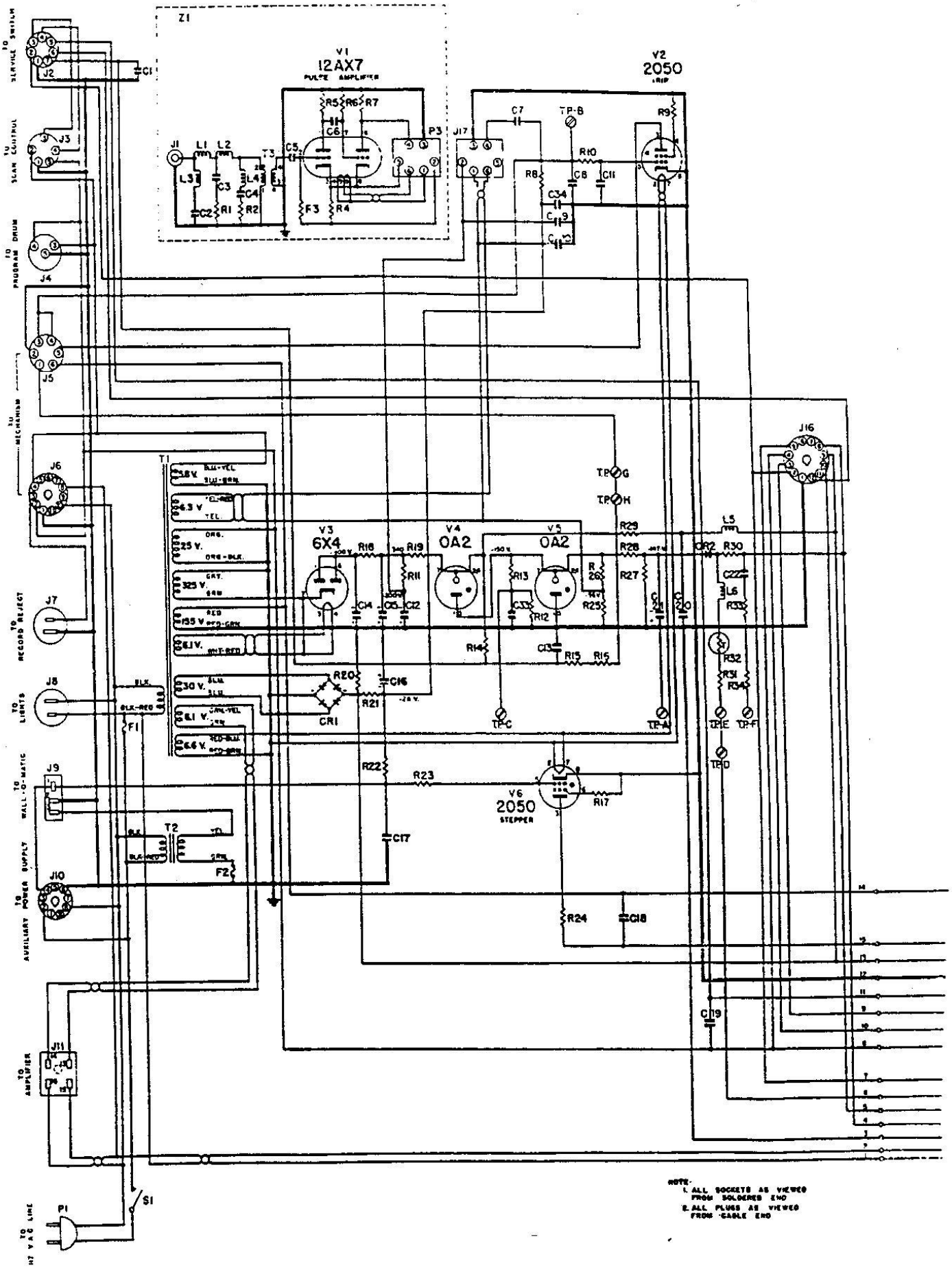
STEP SWITCH AND RELAY ASSEMBLY OPERATION

The Step Switch and Relay Assembly in the Type TSR3-L6 Selection Receiver operates the same as the Assembly in the TSR1-L6 as described beginning on page 5118. In the TSR3-L6, however, the stepper thyratron is a type 2050 instead of a 2D21 as shown at V6 in the diagram, *Figure 7*, page 5120. Also, in the Type TSR3-L6, the S and P contacts of the timing relays operate in a simple switching circuit to control, directly, the write-in current pulse to the Tormat Memory Unit instead of triggering the write-in 2D21, V7, *Figure 7*. (A write-in thyratron is not used in the Type TSR3-L6.) The complete diagram of the Assembly and its connections in the remote control selection system is shown in the Selection Receiver diagram, page 5140 and 5141. All adjustments of the Assembly in the TSR3-L6 are the same as for the TSR1-L6 beginning on page 5126.

PARTS LIST

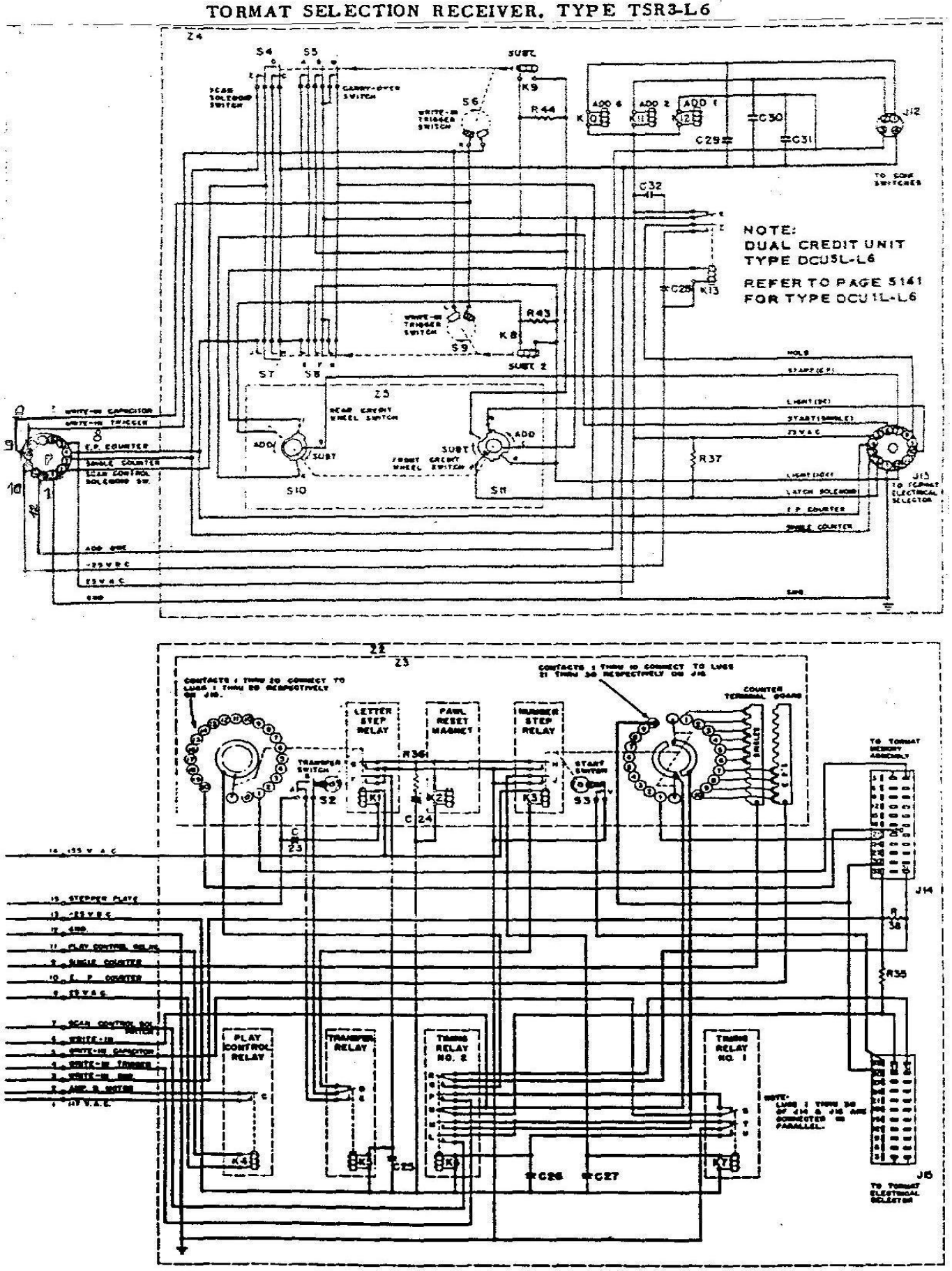
(For Pages 5140 and 5141)

Item	Part No.	Part Name
C1	86251	3000 MMF 500 V. CERAMIC
C2	86253	360 MMF ± 10% 500 V. CERAMIC
C3	86252	1200 MMF ± 10% 500 V. CERAMIC
C4	86253	360 MMF ± 10% 500 V. CERAMIC
C5	86251	3000 MMF 500 V. CERAMIC
C6	86030	.05 MFD ± 10% 400 V. PAPER
C7	86248	.15 MFD ± 10% 200 V. PAPER
C8	86235	.05 MFD 200 V. PAPER
C9	86251	3000 MMF 500 V. CERAMIC
C10	86251	3000 MMF 500 V. CERAMIC
C11	86255	2000 MMF 500 V. CERAMIC
C12	87637	10 MFD 450 V. LYTIC
C13	86236	.15 MFD ± 10% 600 V. PAPER
C14	87635	15 MFD 450 V. LYTIC
C15	87635	15 MFD 450 V. LYTIC
C16	87571	25 MFD 50 V. LYTIC
C17	86235	.05 MFD 200 V. PAPER
C18	11076	5 MFD 300 V. PAPER
C19	86142	.1 MFD 200 V. PAPER
C20	86235	.068 MFD ± 10% 600 V. PAPER
C21	87636	10 MFD 150 V. LYTIC
C22	86212	.01 MFD 400 V. PAPER
C23	86250	5000 MMF 1000 V. CERAMIC
C24	87611	300 MFD 50 V. LYTIC
C25	86235	.05 MFD 200 V. PAPER
C26	86235	.05 MFD 200 V. PAPER
C27	86235	.05 MFD 200 V. PAPER
C28	86142	.1 MFD 200 V. PAPER
C29	86258	.04 MFD 500 V. CERAMIC
C30	86259	.02 MFD 500 V. CERAMIC
C31	86258	.04 MFD 500 V. CERAMIC
C32	86259	.02 MFD 500 V. CERAMIC
C33	86252	1200 MMF ± 10% 500 V. CERAMIC
C34	86251	3000 MMF 500 V. CERAMIC
CR1	400587	SELENIUM RECTIFIER
CR2	303696	IN368 GERMANIUM DIODE
F1	602411	5 AMP. FUSE, TYPE MTH
F2	303697	3.2 AMP. FUSE TYPE MN3-2/10
J1	300152	SINGLE PRONG SOCKET
J2	84282	7 PRONG SOCKET
J3	84283	5 PRONG SOCKET
J4	303555	3 PRONG MIN. SOCKET
J5	84223	6 PRONG SOCKET
J6	303253	11 PRONG SOCKET
J7	602839	2 PRONG SOCKET (Small)
J8	11401	2 PRONG SOCKET
J9	12006	3 PRONG SOCKET
J10	84244	9 PRONG SOCKET
J11	301020	4 PRONG SOCKET
J12	84293	4 PRONG SOCKET (Small)
J13	201275	12 PRONG SOCKET
J14	303528	33 PRONG SOCKET
J15	303529	33 PRONG PLUG
J16	201275	12 PRONG SOCKET
J17	301034	6 PRONG SOCKET (Small)
K1	303545	LETTER STEP RELAY
K2	303541	PAWL RESET MAGNET
K3	303546	NUMBER STEP RELAY
K4	303077	PLAY CONTROL RELAY
K5	303074	TRANSFER RELAY
K6	303589	TIMING RELAY NO. 2
K7	303588	TIMING RELAY NO. 1
K8	450100	SUBTRACT Two (2) SOLENOID
K9	450158	SUBTRACT Three (3) SOLENOID
K10	450162	ADD Six (6) SOLENOID
K11	450152	ADD Two (2) SOLENOID
K12	450154	ADD One (1) SOLENOID
K13	450280	TIMING RELAY
L1	303602	16 mh CHOKE ± 5%
L2	303602	16 mh CHOKE ± 5%
L3	303600	11 mh CHOKE ± 5%
L4	303600	11 mh CHOKE ± 5%
L5	303603	130 mh CHOKE ± 5%
L6	303601	27 mh CHOKE ± 5%
P1	303571	LINE CORD & PLUG ASSEMBLY
P2	410707	12 PRONG PLUG
P3	303599	6 PRONG PLUG
R1	82409	56 OHM ± 10% ½ W.
R2	82409	56 OHM ± 10% ½ W.
R3	82444	47,000 OHM ± 10% ½ W.
R4	82610	6200 OHM ± 5% ½ W.
R5	82456	470,000 OHM ± 10% ½ W.
R6	82469	5.6 MEGOHM ± 10% ½ W.
R7	82640	27,000 OHM ± 5% ½ W.
R8	82460	1.0 MEGOHM ± 10% ½ W.
R9	82440	22,000 OHM ± 10% ½ W.
R10	82456	470,000 OHM ± 10% ½ W.
R11	82695	56,000 OHM ± 5% ½ W.
R12	82449	120,000 OHM ± 10% ½ W.
R13	82464	2.2 MEGOHM ± 10% ½ W.
R14	82815	100,000 OHM ± 10% 2 W.
R15	81189	1.0 OHM ± 5% W.W. ½ W.
R16	82993	36 OHM ± 5% ½ W.
R17	82440	22,000 OHM ± 10% ½ W.
R18	81190	3.300 OHM ± 10% W.W. 5 W.
R19	82836	2,700 OHM ± 10% 2 W.
R20	82432	4,700 OHM ± 10% ½ W.
R21	82456	470,000 OHM ± 10% ½ W.
R22	82448	100,000 OHM ± 10% ½ W.
R23	82436	10,000 OHM ± 10% ½ W.
R24	82716	100 OHM ± 10% 1 W.
R25	82454	330,000 OHM ± 10% ½ W.
R26	82451	180,000 OHM ± 10% ½ W.
R27	82698	150,000 OHM ± 5% ½ W.
R28	82611	3000 OHM ± 5% ½ W.
R29	82992	120,000 OHM ± 10% 1 W.
R30	82617	47 OHM ± 5% ½ W.
R31	81189	1.0 OHM ± 5% W.W. ½ W.
R32	303694	Positive Temp. Coeff. Resistor
R33	82617	47 OHM ± 5% ½ W.
R34	82440	22000 OHM ± 10% ½ W.
R35	82432	4700 OHM ± 10% ½ W.
R36	82403	18 OHM ± 10% ½ W.
R37	82707	1200 OHM ± 10% 1 W.
R38	82432	4700 OHM ± 10% ½ W.
R43	82838	100 OHM ± 10% 2 W.
R44	82838	100 OHM ± 10% 2 W.
S1	303112	TOGGLE SWITCH, S.P.S.T.
S2	303547	TRANSFER SWITCH
S3	303625	START SWITCH
S4	450149	SCAN SOLENOID SWITCH
S5	450150	CARRY-OVER SWITCH
S6	450255	CONTACT ASSEMBLY (Trigger Switch)
	450105	CONTACT SEGMENT Assy. (Trigger Switch)
S7	450149	SCAN SOLENOID SWITCH
S8	450150	CARRY-OVER SWITCH
S9	450272	CONTACT ASSEMBLY (Trigger Switch)
	450132	CONTACT SEGMENT Assy. (Trigger Switch)
S10	450089	Rear Credit Wheel Switch Assembly
S11	450140	Front Credit Wheel Switch Assembly
T1	303680	POWER TRANSFORMER
T2	303569	25 V. TRANSFORMER
T3	303457	PULSE TRANSFORMER
	303455	PULSE TRANSFORMER (Alternate)
V1	308120	12AX7 VACUUM TUBE
V2	308003	2050 THYRATRON
V3	308626	6X4 VACUUM TUBE
V4	308005	OA2 VOLTAGE REG. TUBE
V5	308005	OA2 VOLTAGE REG. TUBE
V6	308003	2050 THYRATRON
Z1	303590	PULSE AMPLIFIER ASSEMBLY
Z2	303520	RELAY STEP SWITCH ASSEMBLY
Z3	303510	STEP SWITCH ASSEMBLY
Z4	450500	DUAL CREDIT UNIT, Type OCU1L-L6
Z5	450078	CREDIT WHEEL ASSEMBLY

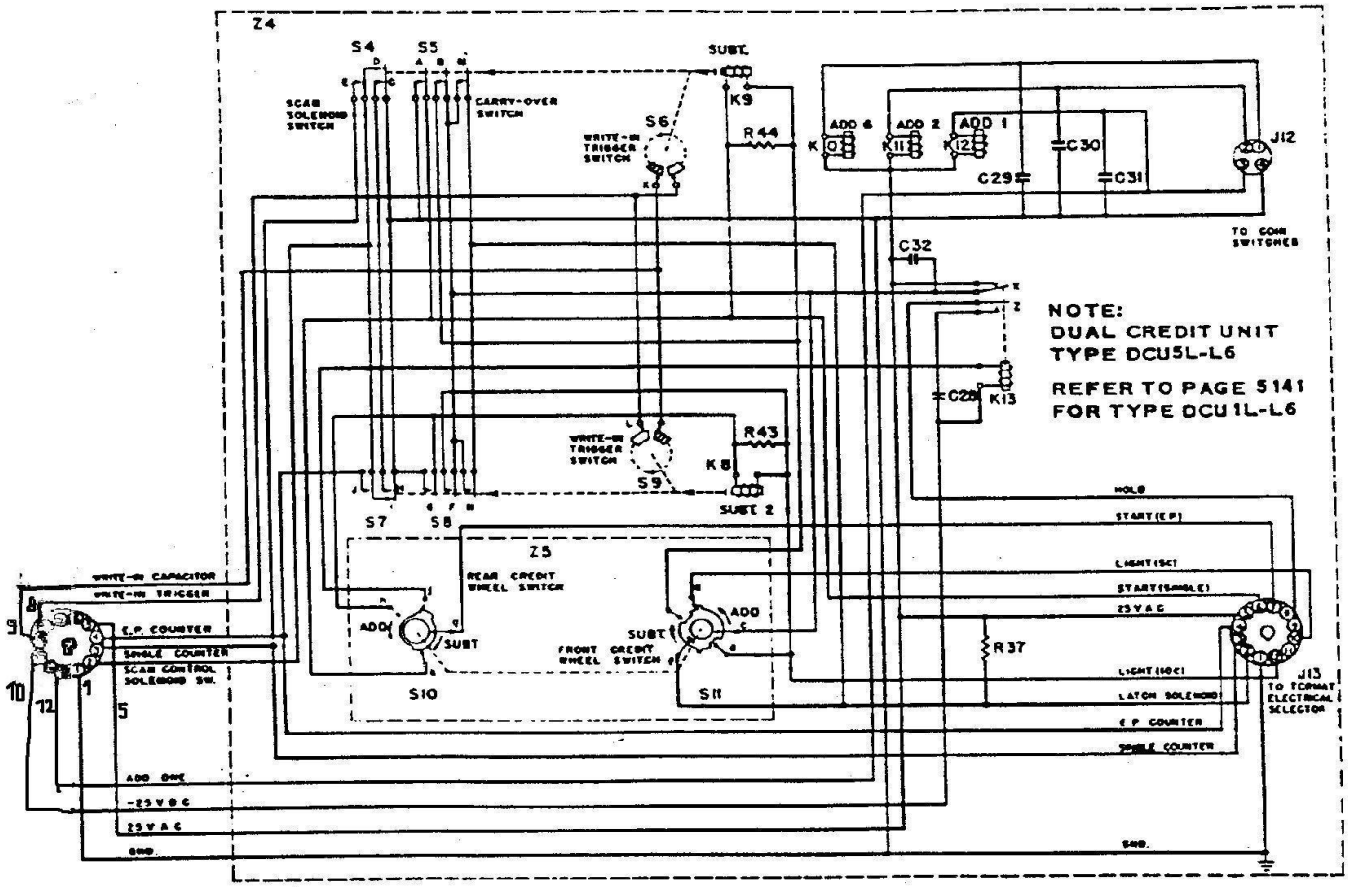


Schematic Diagram

TORMAT SELECTION RECEIVER, TYPE TSR3-L6



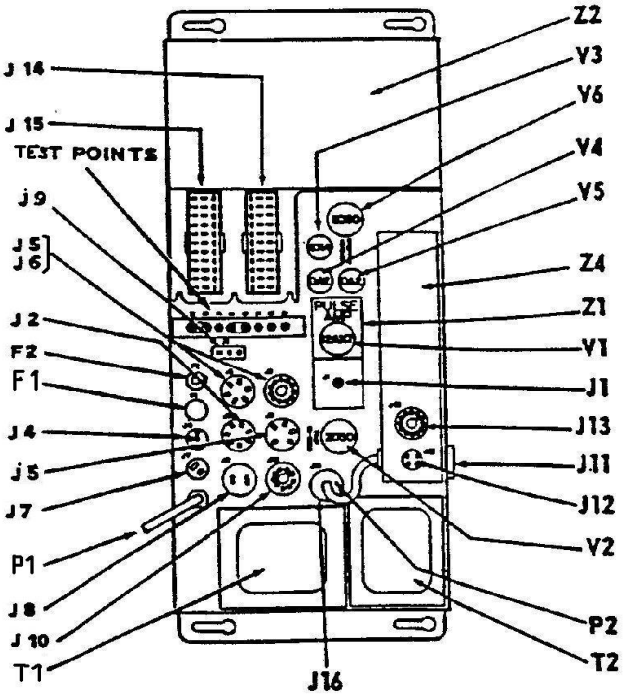
Schematic Diagram



e following parts list supplements that of Page 5139 and itemizes components specifically used the DCU5L-L6.

em	Part No.	Part Name
C8	450160	SUBTRACT TWO (2) SOLENOID
C9	450158	SUBTRACT ONE (1) SOLENOID
S4	450210	SCAN SOLENOID SWITCH
S5	450211	CARRY-OVER SWITCH

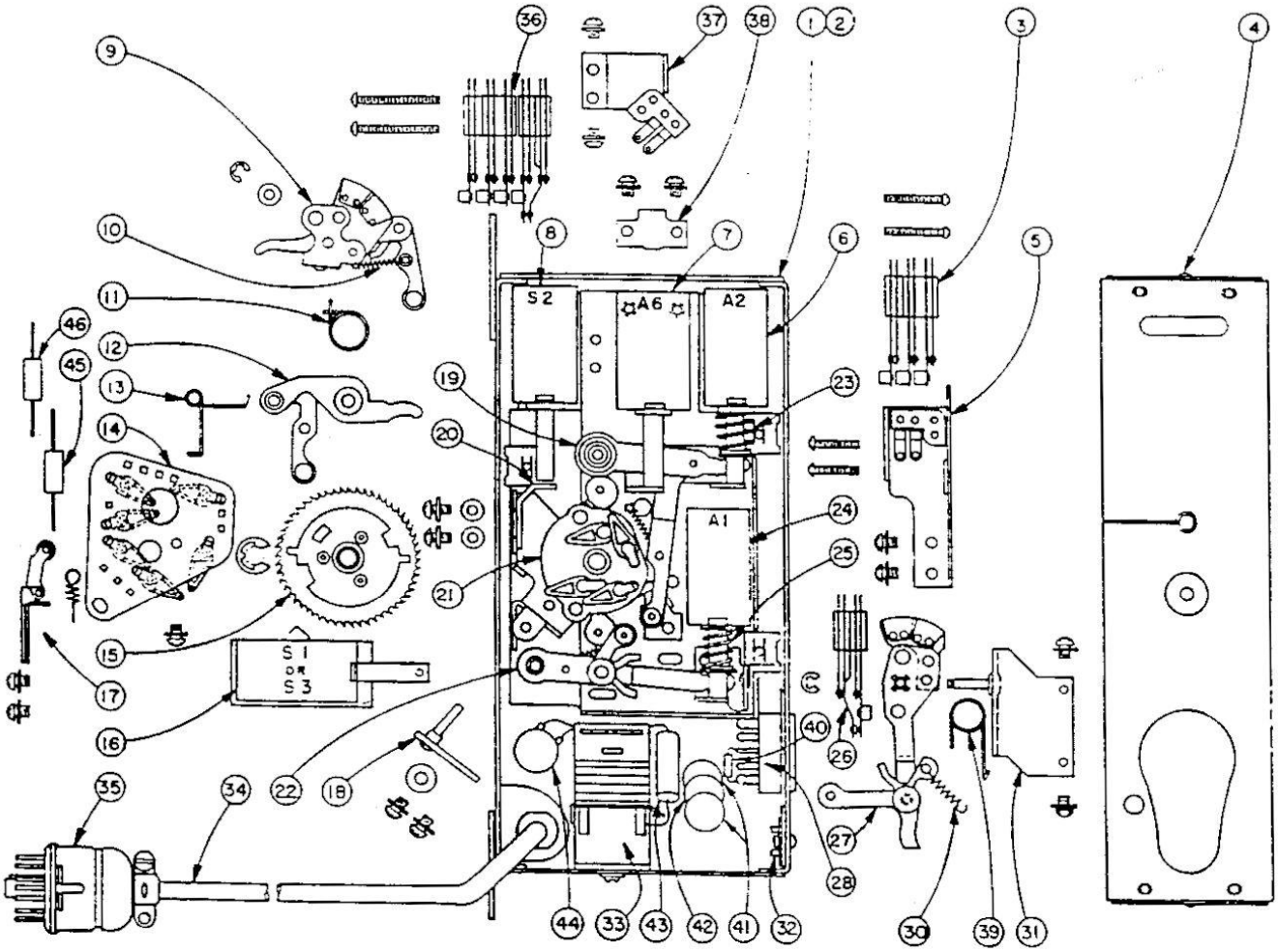
Item	Part No.	Part Name
S6	450255	CONTACT ASSEM. } TRIGGER
	450339	CONTACT SEGMENT ASSEM. } SWITCH
S10	450334	REAR CREDIT WHEEL SWITCH ASSEM.
S11	450342	FRONT CREDIT WHEEL SWITCH ASSEM.
Z4	450502	DUAL CREDIT UNIT, TYPE DCU5L-L6



PARTS LIST

Item	Part No.	Part Name
F1	602411	5 AMP. FUSE, TYPE MTH
F2	303697	3.2 AMP. FUSE TYPE NS-2/10
J 1	300152	SINGLE PRONG SOCKET
J 2	84282	7 PRONG SOCKET
J 3	84283	5 PRONG SOCKET
J 4	303555	3 PRONG MIN. SOCKET
J 5	84223	6 PRONG SOCKET
J 6	303253	11 PRONG SOCKET
J 7	602839	2 PRONG SOCKET (SMALL)
J 8	11401	2 PRONG SOCKET
J 9	12006	3 PRONG SOCKET
J 10	84244	9 PRONG SOCKET
J 11	301020	4 PRONG SOCKET
J 12	84293	4 PRONG SOCKET (SMALL)
J 13	201275	12 PRONG SOCKET
J 14	303528	33 PRONG SOCKET
J 15	303529	33 PRONG PLUG
J 16	201275	12 PRONG SOCKET
P1	303571	LINE CORD & PLUG ASSEMBLY
P2	410707	12 PRONG PLUG
T1	303680	POWER TRANSFORMER
T2	303569	25 V. TRANSFORMER
V1	308120	12AX7 VACUUM TUBE
V2	308003	2050 THYRATRON
V3	308626	6X4 VACUUM TUBE
V4	308005	OA2 VOLTAGE REG. TUBE
V5	308005	OA2 VOLTAGE REG. TUBE
V6	308003	2050 THYRATRON
Z1	303590	PULSE AMPLIFIER ASSEMBLY
Z2	303520	RELAY STEP SWITCH ASSEMBLY
Z4	450500	TYPE DCU1L-L6
	450502	TYPE DCU5L-L6

TORMAT SELECTION RECEIVER, TYPE TSR3-L6



Dual Credit Unit Assemblies

PARTS LIST

Item	Part No.	Part Name
1	*450800	COMPLETE UNIT
	†450802	COMPLETE UNIT
2	450022	MOUNTING PLATE STAKED ASSEMBLY
3	*450180	CARRY-OVER SWITCH
	†450211	CARRY-OVER SWITCH
	450259	TAPPED PLATE
	450260	TENSION PLATE
	910991	3-48 X 5/8 PHILLIPS R.H.M.S.
4	*450247	COVER ASSEMBLY
	†450297	COVER ASSEMBLY
5	*450284	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 3)
	†450844	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 1)
	912882	SEMS
6	450182	COIL & BRACKET ASSEMBLY (ADD 2)
	450075	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
7	450186	CREDIT COIL & BRACKET ASSEMBLY (ADD 6)
	450074	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
8	450190	CANCEL COIL & BRACKET ASSEMBLY (SUB 2)
	450075	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
9	450132	CANCEL ARM ASSEMBLY (SUB 2)
	125448	RETAINING RING
	921112	WASHER
10	450096	SPRING
11	450130	TORSION SPRING
12	450121	CREDIT ARM ASSEMBLY (ADD 6)
13	450131	SPRING - TORSION
14	*450140	CONTACT PLATE ASSEMBLY
	†450342	CONTACT PLATE ASSEMBLY
	912859	SEMS
15	450078	CREDIT WHEEL ASSEMBLY
	125403	RETAINING RING
16	*450188	COIL & BRACKET ASSEMBLY (SUB 3)
	†450336	CANCEL COIL & BRACKET ASSEMBLY (SUB 1)
	912882	SEMS
	*450075	SOLENOID PLUNGER ASSEMBLY
	†450348	SOLENOID PLUNGER ASSEMBLY
17	450468	DETENT ROLLER ASSEMBLY
	450464	DETENT SPRING ONLY
	910921	3-48 X 3/16 PHILLIPS P.H.M.S.
18	450826	STOP PIN PLATE ASSEMBLY
	920739	FLAT WASHER
	912968	SEMS
19	450111	CREDIT ARM ASSEMBLY (ADD 2)
	450129	SPRING
20	450102	PLUNGER STOP BRACKET (SUB 2)
	912859	SEMS
21	450069	TERMINAL BOARD ASSEMBLY
22	450085	CREDIT ARM ASSEMBLY (ADD 1)
	450096	SPRING
23	450329	SPRING
24	450184	COIL & BRACKET ASSEMBLY (ADD 1)
	450078	SOLENOID PLUNGER ASSEMBLY
	912882	SEMS
25	450329	SPRING
26	*450149	SWITCH
	†450210	SWITCH
	450259	TAPPED PLATE
	450260	TENSION PLATE
	911011	3-48 X 1/4 PHILLIPS R.H.M.S.
27	*450105	CANCEL ARM ASSEMBLY (SUB 3)
	†450339	CANCEL ARM ASSEMBLY (SUB 1)
28	84301	12 PRONG SOCKET
30	450129	SPRING
31	*450037	PIVOT BRACKET ASSEMBLY
	†450332	PIVOT BRACKET ASSEMBLY
	912882	SEMS
32	84293	4 PRONG SOCKET
33	450280	TIMING RELAY
	914228	SEMS
34	450860	CABLE ASSEMBLY
35	410707	12 PRONG PLUG ASSEMBLY
36	450180	SWITCH (CARRY-OVER)
	450149	SWITCH
	911073	3-48 X 1 1/4 PHILLIPS R.H.M.S.
37	450261	SWITCH MOUNTING BRACKET ASSEMBLY (SUB 2)
	912882	SEMS
38	450318	RESIDUAL SPRING
	912810	6-32 X 1/8 PHILLIPS R.H.M.S.
	450317	RESIDUAL PIN
	925342	FLAT WASHER
39	450281	TORSION SPRING
40	82707	1200 OHM 1 W RESISTOR
41	86259	.02 CERAMIC CONDENSER
42	86288	.04 CERAMIC CONDENSER
43	86142	.1 MFD. 200 V CONDENSER
44	86259	.02 MFD. CERAMIC CONDENSER
45	82838	100 OHM 2 W. RESISTOR

* USED ON TYPE DCU1L-L6 † USED ON TYPE DCU6L-L6

5143

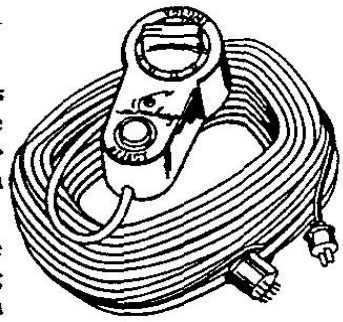
Seeburg

MASTER REMOTE VOLUME CONTROL

Type MRVC-2

INSTALLATION INSTRUCTIONS

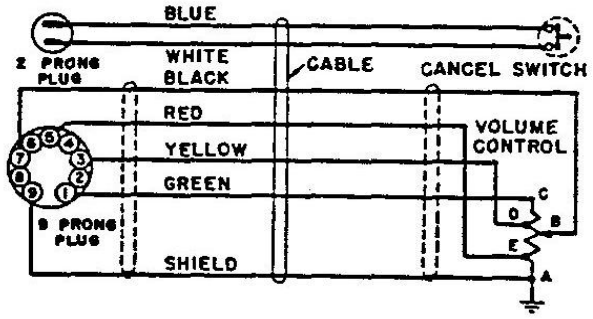
1. Determine location of the Remote Volume Control and best routing for the cable, keeping in mind appearance and possibility of physical damage to the cable as well as convenience of control.
2. Open the back door of the Phonograph. Replace the 9-prong dummy plug in the Amplifier chassis with the 9-prong plug on the cable of the Remote Volume Control.
3. Replace the Selection Cancel plug in the Selection Receiver with the 2-prong plug on the Remote Volume Control cable.
4. Arrange the cable from the plugs so it passes through the notch in the back door.
5. Fasten the cable to the wall of the cabinet with one of the clamps, allowing enough slack cable in the cabinet to avoid strain on the cable or plugs.
6. 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.
7. If the control box is to be permanently attached, remove the bottom plate by unscrewing the center bolt, and fastening with No. 8 wood screws. Then remount control box to the plate.

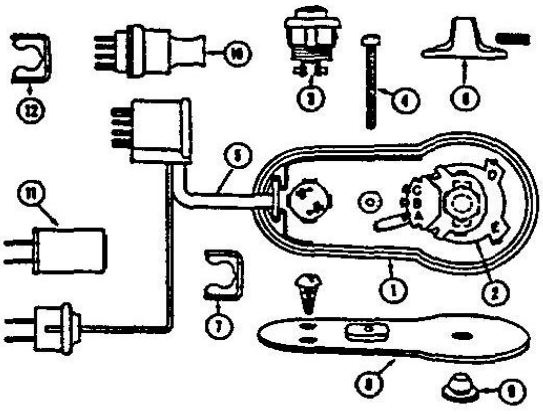


If portable usage is desired, press the three rubber feet supplied into the holes in the bottom plate.

8. Fasten the cable securely, starting at the control with a clamp adjacent to the control box. Take up excess cable as it is fastened.
9. When the cable is installed, excess cable can be coiled or folded in the cabinet. Leave enough slack to permit moving the phonograph from the wall for maintenance and cleaning.
10. If it is necessary to disconnect the Control to pass the cable through holes in walls or floors, prepare it as shown in Figure A and reconnect it according to the diagram. Solder all connections. *Do not use acid core solder or acid solder flux.*

Schematic Diagram





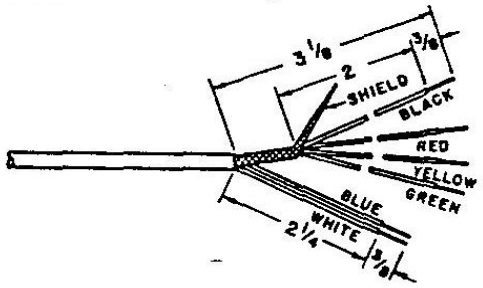


Figure A.

PARTS LIST

Item	Part No.	Part Name
1	503186	Control Box Assembly
	503187	Control Box
2	503185	Volume Control (25K)
	941722	Solder Lug
	925712	Lock Washer
	904801	Nut
3	503199	Selection Cancel Button
4	913675	6-32 x 1-3/16 Ph.H.M.S.
5	503189	Cable Assembly
6	503188	Knob
	918580	Set Screw
7	301146	Strain Relief
8	503192	Bottom Plate Assembly
	402098	Cable Clamp (10)
	971170	No. 8 x 5/8 R. H. Wood Screws (13)
9	503183	Rubber Feet (3)
	503191	Cable Only
10	305322	9-Prong Plug (Replaceable)
11	601170	2-Prong Plug (Replaceable)
12	503182	Strain Relief for 305322

Seeburg

V-200 CONVERSION KIT PART NO. 503860

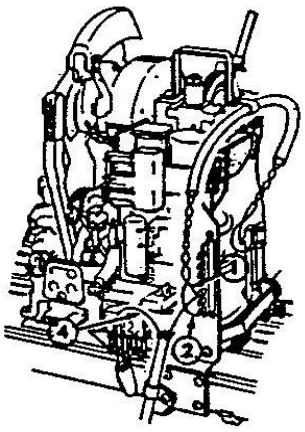
PARTS LIST

QUANTITY	PART NO.	PART NAME
1	303492	SELECTION RECEIVER (LESS TUBES AND DCU)
1	450560	CABLE & PLUG ASSEMBLY
1	303702	CHOKE
1	10062	TERMINAL STRIP (1 LUG)
1	503870	INSTRUCTION SHEET
2		STRANDED PLASTIC COVERED WIRE (BLACK AND YELLOW) ONE 21 INCH AND ONE 15 INCH LENGTH SUPPLIED

CHANGE V-200 AS FOLLOWS:

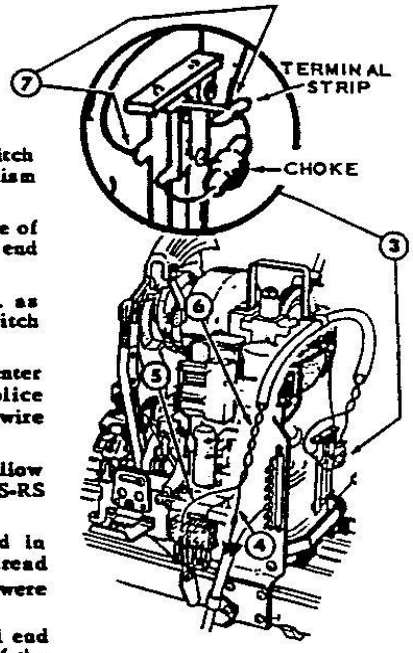
1. Replace existing TSR1-L6 Receiver with No. 303492 (TSR3-L6) Receiver.
2. Remove and discard 2D21 tubes.
3. Transfer 6X4, 12AX7 and OA2 tubes from TSR1-L6 Receiver to TSR3-L6 Receiver.
4. Insert one new OA2 tube and two new 2050 tubes in TSR3-L6 Receiver.
5. Remove Dual Credit Unit from TSR1-L6 Receiver. Change the cable and plug assembly and install modified Unit in TSR3-L6 Receiver.
6. Change read-out circuit on mechanism.

MECHANISM READ-OUT CIRCUIT CHANGES:

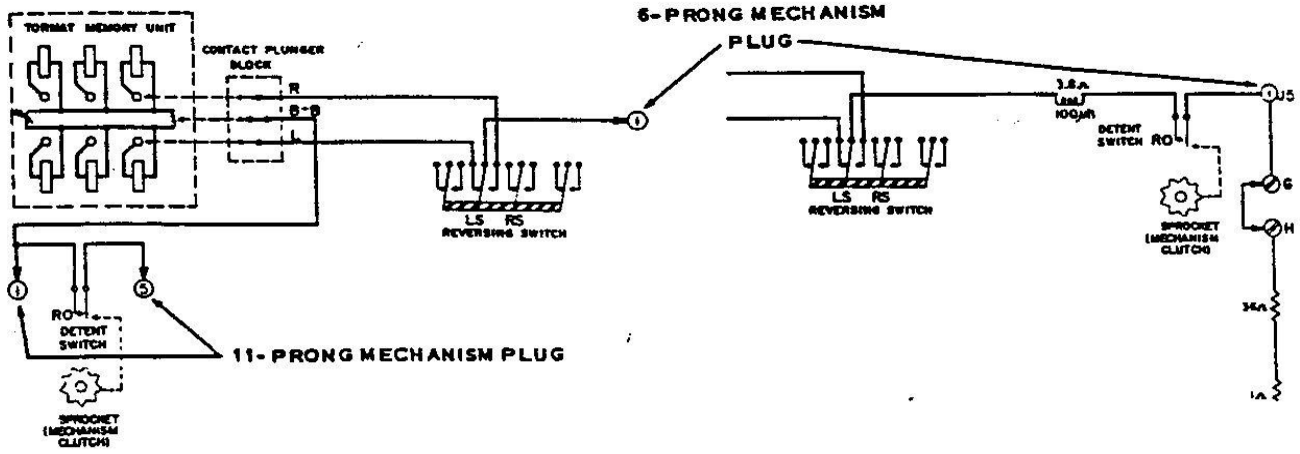


Original

1. Remove wire that connects long blade of Detent Switch to terminal 5 (5th from the top) of the mechanism terminal strip.
2. Remove the black wire that connects the short blade of the Detent Switch to the ground lug via the lower end terminal of the mechanism terminal strip.
3. Install the 303702 CHOKE and 10062 TERMINAL as showing using the top screw on the Detent Switch mounting bracket.
4. Disconnect the mechanism cable wire from the center blade of the reversing switch LS-RS contacts, splice on and tape the 15" length of black-yellow wire supplied in the kit.
5. Connect one end of the 21" length of black-yellow wire to the center blade of the reversing switch LS-RS contacts.
6. Twist together the black-yellow wires described in steps 4 & 5, approx. two twists per inch, and thread through the insulating tubing from which wires were removed in steps 1 and 2.
7. Connect the 21" wire to the choke at the terminal end and connect the 15" to the long blade terminal of the Detent Switch.



Modified



Mechanism 245ST1 - Original Circuit

Modified Circuit

DUAL CREDIT UNIT CONVERSION DCU1-L6 (or DCU5-L6) to DCU1L-L6 (or DCU5L-L6)

DUAL CREDIT UNIT CABLE AND PLUG CHANGE

Remove 8-prong plug and cable and install *450560* cable and 12-prong plug.

DCU1 or DCU5			DCU1L or DCU5L		
8-PRONG PLUG AND CABLE CONNECTIONS			12-PRONG PLUG AND CABLE CONNECTIONS		
CONTACT	NORMAL WIRE COLOR (CHECK COLORS)	CONNECT TO	CONTACT	NORMAL WIRE COLOR	CONNECT TO
1	WHITE	Terminal 4 of J12	1	WHITE	Terminal 4 of J12
2	BLUE	Blade 2 of Subtract 2 Switch	2	BLUE	Blade 2 of Subtract 2 Switch
3	GRAY	Terminal 3 of J13	3	GRAY	Terminal 3 of J13
4	GRAY (or White) RED TRACER	Terminal 4 of J13	4	GRAY RED TRACER	Terminal 4 of J13
5	RED	Terminal 5 of J13	5	RED	Terminal 5 of J13
6	BLACK	Terminal A of Timing Relay (condenser side)	6		NO CONNECTION
7	YELLOW	Terminal 3 of J12	7		NO CONNECTION
8	ORANGE	Terminal 1 of Write-in Switch L	8	ORANGE	Terminal 1 of Write-in Switch L
			9	GREEN	Terminal 2 of Write-in Switch L
			10	BLACK	Terminal A of Timing Relay (condenser side)
			11		NO CONNECTION
			12	YELLOW	Terminal 3 of J12

Remove black wire connecting terminal 2 of write-in switch (K) to blades 4 and 5 of SUBTRACT 2 SWITCH.

Disconnect blue wire connecting to terminal 2 of write-in switch (L) and reconnect to blade 1 of SUBTRACT 3 (or 1) SWITCH. The other end of the blue wire is connected to the ground lug near the timing relay and is not to be changed.