

# NOTICE DU ROCK-OLA PRINCESS 1493

## ROCK-OLA presents the Princess

**all purpose  
stereophonic  
monaural compact  
console phonograph**



a totally new concept in *Compact* design

MODEL 1493 *100 Selections*



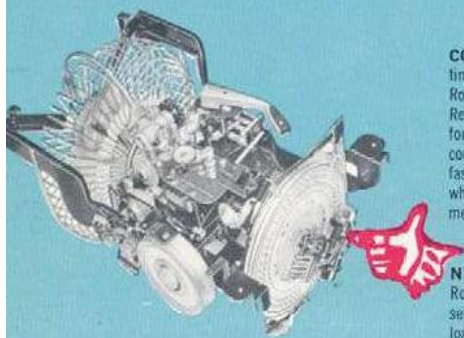
a symphony of high style . . . a rhapsody of ma



look to **ROCK-OLA**  
for advanced products for profits



**33 $\frac{1}{3}$ —45 RPM MECH-O-MATIC INTERMIX PLAY.** Dual-speed Rock-Ola Built turntable permits complete intermix of 33 $\frac{1}{3}$  and 45 RPM records in any sequence in any bank of records. No matter the speed or whether it's stereo or monaural records, they can all be played on the PRINCESS, the one truly flexible phonograph. Only the PRINCESS gives complete protection for all future location needs. (Optional Equipment)



**COMPACT MECHANISM.** Now for the first time in the history of Coin-Operated phonographs, Rock-Ola has produced an entirely new Compact Revolving-Record Magazine designed specifically for use in a small phonograph. The NEW Rock-Ola compact mechanism has fewer moving parts for faster cycling and maximum ease of servicing, while preserving the traditional Rock-Ola Revolving mechanism design and operating dependability.

**NEW SIMPLIFIED SELECTOR.** Another new Rock-Ola exclusive: is the simplified coil-less selector. Selections are achieved through spring-loaded, self cleaning selection levers activated by two motor driven revolving carriages. The elimination of electro-magnetic coils reduces service calls and assures increased dependability for greater operating profits.

**FEATHER-TOUCH TONE ARM PLUG-IN CARTRIDGE SNAP-IN STYLUS.** Longer record wear and better performance are now possible.

The Princess incorporates a new, stylish, feather-weight tone arm containing a specially designed Astatic high compliance stereo cartridge with a snap-in DIAMOND stylus. The famous Rock-Ola serviceability is again shown in the cartridge which merely plugs-in with no wires or connections to loosen or solder. These features are just another proof of Rock-Ola's economy of operation developed through years of on "Location Testing."



## TRI-FONIC FLEXIBILITY

Only from a Rock-Ola Phonograph with its "Tri-Fonic" Flexibility do you get three phonographs in one.

The Rock-Ola built dual-channel amplifier with its "Tri-Fonic" switch permits instant conversion from monaural to stereo or reinforced stereo at the flip-of-a-switch.

There is no need for costly conversion parts.

Only stereo extension speakers are needed. Rock-Ola's three position "Tri-Fonic" switch offers these three sound choices:



**MONAURAL SOUND POSITION ON THE TRI-FONIC SWITCH DELIVERS** All the sound thru the two built-in main unit speakers. One heavy duty 12" speaker and a wide dispersion high compression driver horn which are skillfully matched for the finest of high fidelity music in any location.



**STEREOPHONIC SOUND POSITION ON THE TRI-FONIC SWITCH** Delivers all sound power to the two separate stereo extension speakers. Eliminating the main unit speakers, this allows the phonograph to be placed in a profitable heavy traffic area while the speakers are placed for best stereo reproduction.



**REINFORCED STEREO SOUND POSITION on the TRI-FONIC SWITCH DELIVERS** the true stereo music to the extension speakers and also supplies monaural music to the main unit speakers. This combined woofer and tweeter speaker arrangement fully compensates for any acoustic deficiencies and provides smooth, aural-balanced, stereophonic sound even in extra large or odd shaped locations.



**« REVERBA-SOUND ».** New CUSTOMER PLEASING SOUND « REVERBA-SOUND » The Sound of the Future . . . Today . . . is available on the PRINCESS COMPACT PHONOGRAPH. (Optional Equipment) ROCK-OLA'S « REVERBA-SOUND » Reverberation Unit produces concert hall realism from recorded music in all locations regardless of size or configuration through an electronically integrated acoustical delay line system. Rock-Ola's « REVERBA-SOUND » fills every corner of the location with deep, rich, melodic tones for true living-presence "wall to wall" music.

compact • flexible • profitable • versatile



gnificant color . . . a new experience in music

# the ROCK-OLA Princess



**The Princess**—Compact—Versatile—Daring High Styling coupled with the World Famous ROCK-OLA Tradition of excellence in engineering, unexcelled dependability and quality convinces you at a glance that here is truly the World's Finest All Purpose Stereophonic—Monaural Compact Console Phonograph.

**The Princess** is truly a rhapsody of color . . . a symphony of high style with the sound of the future . . . today.

Maximum earnings and complete location satisfaction are assured.

STORES  
TAVERNS  
SODA FOUNTAINS  
INDUSTRIAL  
RESTAURANTS  
SIDEWALK CAFES  
BOWLING ALLEYS



another  
**ROCK-OLA**  
feature!

**Personalization!**



**COMPACT NEW DESIGN  
FOR GREATER FLEXIBILITY  
SAVES ON SPACE...  
AND ON SERVICE**

**PRINCESS SPECIFICATIONS MODEL 1493**

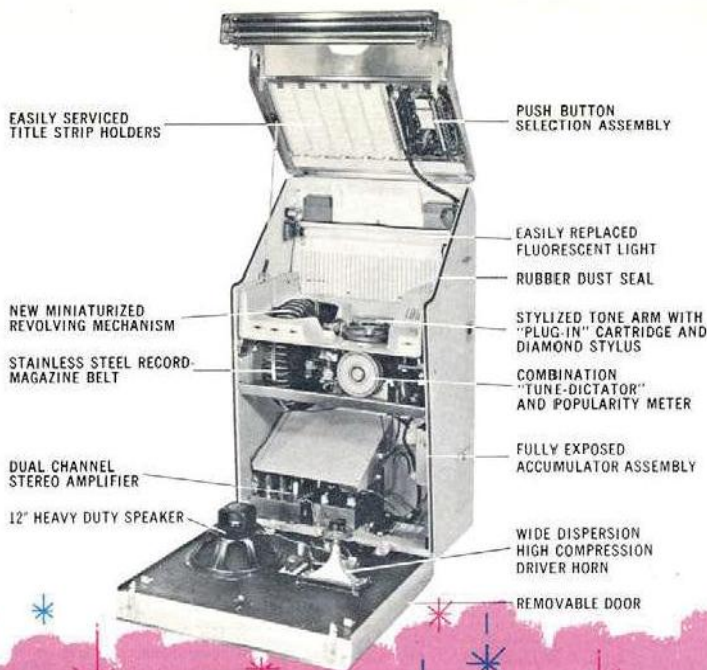
<b>CABINET</b>	<b>CRATED</b>	<b>WEIGHT</b>
Width 29 1/4"	Width 33"	(Uncrated) 205 lbs.
Depth 21 1/4"	Depth 25"	(Crated domestic) 245 lbs.
Height 48 1/4"	Height 51"	(Crated export) 245 lbs.

Cabinet finish: Purple and White.  
Coin Equipment: Single Entry, Four Coin—nickels-dimes-quarters-halves-U.S. Coins. 50¢ a standard feature. Also credit accumulator.

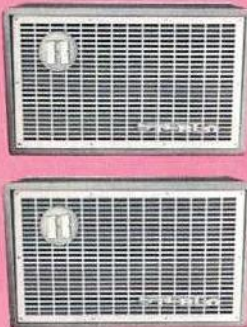
Record Changer Mechanism: 50 (100 selections).  
7" Records, 45 RPM. 3 3/4" 45 RPM Mech-O-Matic intermix play (optional equipment).

Record Popularity Indicator a Standard Feature.  
Tube Complement: (4)—6973, (1)—12AX7, (2)—6CY7, (2)—12AU7, Automatic Volume Compensator a Standard Feature.

Rock-Ola Manufacturing Corporation whose policy is one of continuous improvement reserves the right to change designs, specifications, price and equipment at any time without notice or incurring obligation.



**ROCK-OLA PROFIT PROVED ACCESSORIES**



**ROCK-OLA DE LUXE "STEREO-TWINS"**

Model 1622-P "Stereo Twins" perfectly match the acoustic qualities of the Princess. Each speaker enclosure houses a 12" heavy duty bass speaker and a wide dispersion driver horn, line matching transformer and tap switch for sound level control.

Cabinet 12 1/2" deep, 27" wide and 16 1/2" high.



**ROCK-OLA "Stereo-Twins Jr."**

Model 1623-P Extension speakers matched to the acoustic qualities of the Princess has an 8" P.M. speaker with line matching transformer and tap switch for sound level control. Can be used separately as a monaural remote speaker or in pairs for Stereo.



**Model 1950 Remote Volume Control Unit**

This simple, five wire accessory controls volume for monaural and stereophonic play including all extension and main unit speakers. Finger-Tip Cancel Button permits "Cancelling Out" any tune when desired. Sixty foot cable permits quick installations anywhere.



**ROCK-OLA (((REVERBA-SOUND))) KIT.**

A sure fire customer pleaser and play stimulator for greater profits Rock-Ola (((Reverba-Sound))) Kit Model 1972 may be added at any time to the Model 1493 Princess Compact.

**MODEL 1554 100 SELECTION WALL BOX and the MODEL 1745 RECEIVER UNIT.**

These two Rock-Ola accessories are matched companions to the PRINCESS COMPACT phonograph. Any location equipped with these two new Rock-Ola accessories will have the ultimate in this type of remote equipment.



**MOUNTAIN DISTRIBUTORS**

3630 Downing

Denver 5, Colorado

Phone: AC 2-8518

**ROCK-OLA**

**MANUFACTURING CORPORATION**  
800 NORTH KEDZIE AVENUE  
CHICAGO 51, ILLINOIS



# ROCK-OLA

Manufacturing Corporation

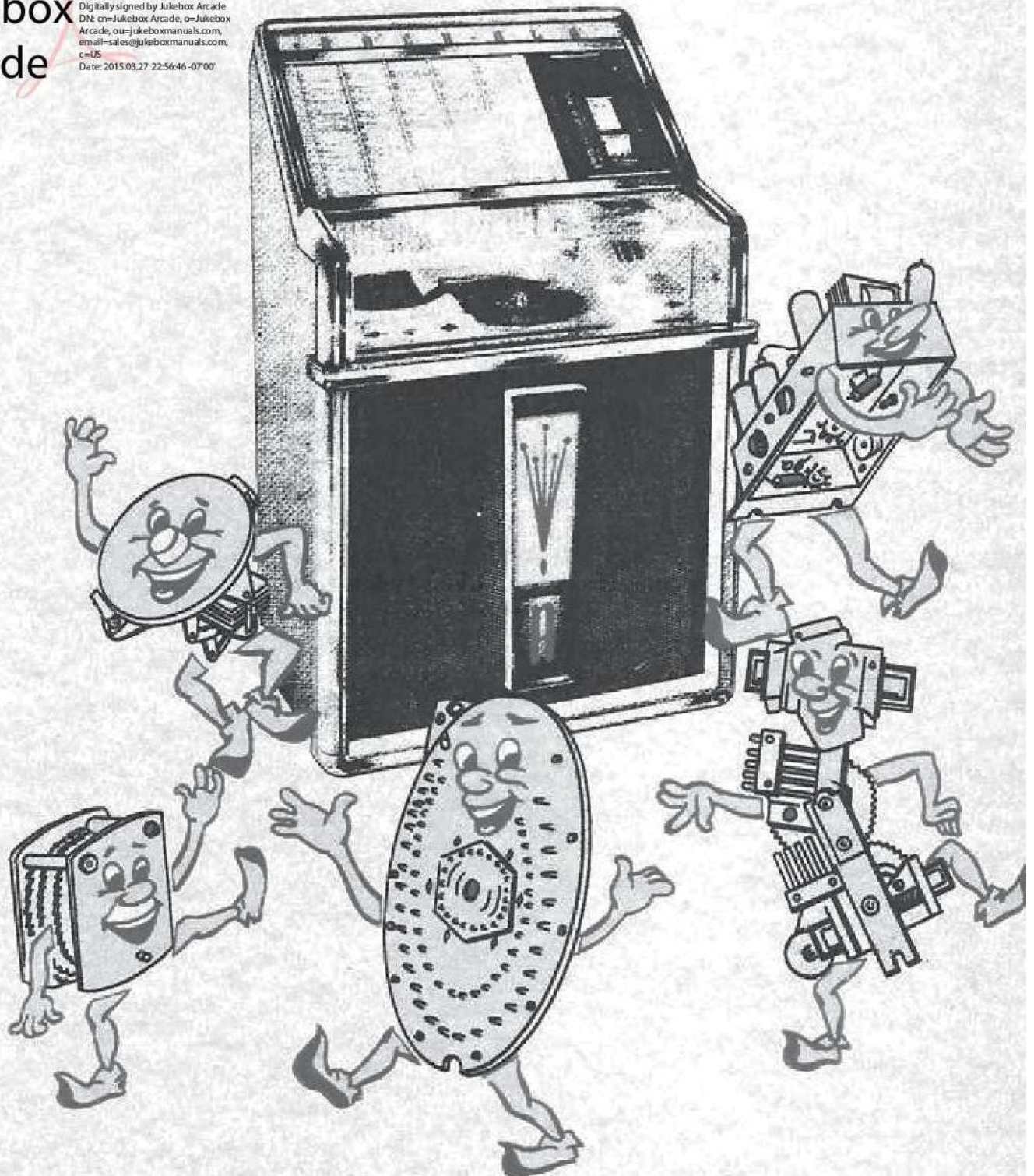
## INSTRUCTION MANUAL AND PARTS LIST

MODEL 1493

100 SELECTIONS

Jukebox  
Arcade

Digitally signed by Jukebox Arcade  
DN: cn=Jukebox Arcade, o=Jukebox  
Arcade, ou=jukeboxmanuals.com,  
email=sales@jukeboxmanuals.com,  
c=US  
Date: 2015.03.27 22:56:46 -0700





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### LUBRICATION CHART

ROCK-OLA MODEL 1484

#### CODE:

- — 1 DROP HIGH GRADE LIGHT MACHINE OIL EVERY 3 MONTHS
- ⊕ — LIGHT FILM AERO GRADE LUBRIPLATE EVERY 3 MONTHS (ROCK-OLA #ST-9126)
- × — DO NOT OIL OR GREASE

#### CAUTION NOTES:

1. DO NOT DROP OIL ON AMPLIFIER
2. DO NOT OIL SELECTOR UNIT
3. DO NOT DRIP OIL ON RECORDS



# ROCK-OLA PRINCESS

Modèle n° 1493 de 1962

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## CHRONOLOGIE DES SEQUENCES DE SELECTION D'UN DISQUE

Les phases du **WRITE-IN** consistent à  
placer un picot de sélection en position  
**PLAY.**

### 3 étapes principales:

- Mise du jukebox en position « **SELECT** » (crédit disponible).
- Choix d'une sélection au clavier (1 lettre de A à K et 1 chiffre de 0 à 9).
- Mémorisation de la sélection (write-in → picot de sélection en position **PLAY**).



## Séquence N° 1 / WRITE-IN: présence de crédit

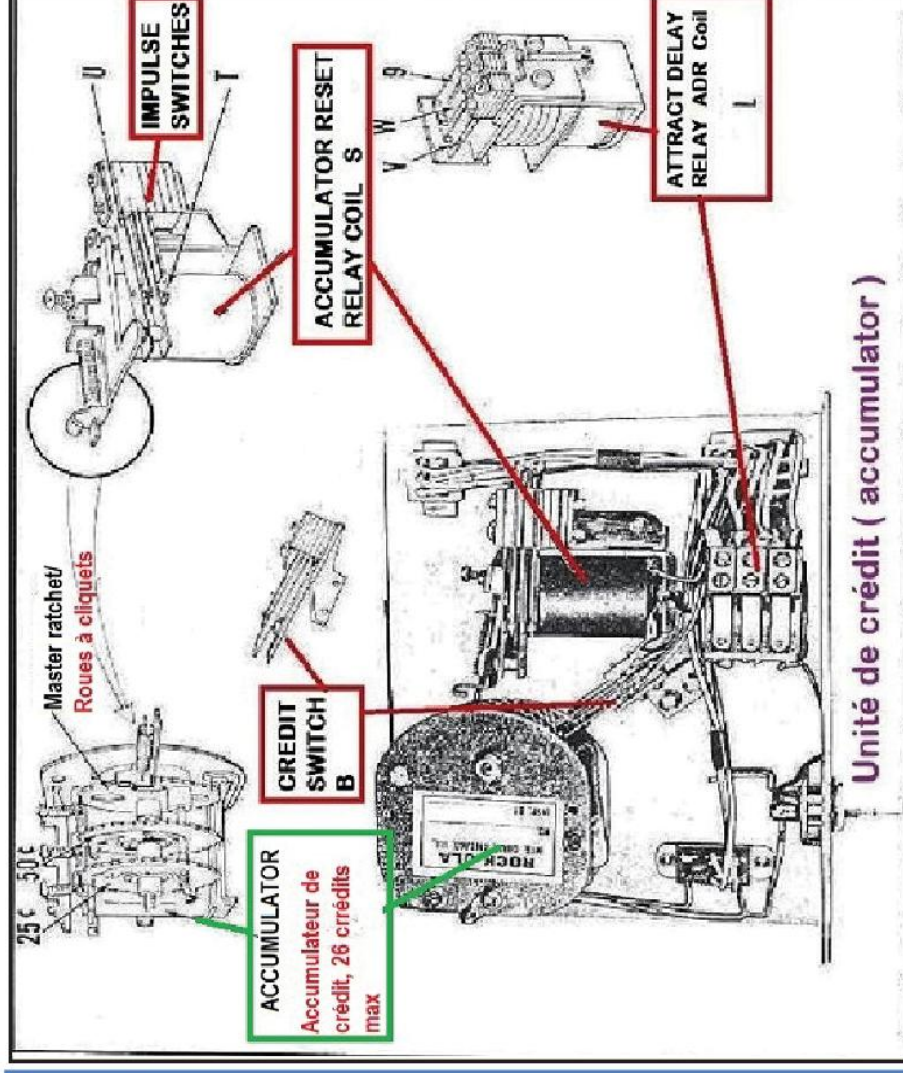
A l'introduction de la pièce de monnaie dans le monnayeur, le contact **COIN SWITCH A** se ferme et alimente dans l'**unité de crédit**, une des 3 bobines (**End coil** pour notre exemple) incrémentant l'**accumulator** par le **système à cliquets** (**master ratchet**). Cet **accumulator** mémorise le crédit jusqu'à un maximum de **26 unités**.

La présence de crédit provoque la fermeture du contact **TRAVAIL credit switch B** qui alimente la bobine du **relais de maintien C (lock-bar solenoid)** des touches de sélection.

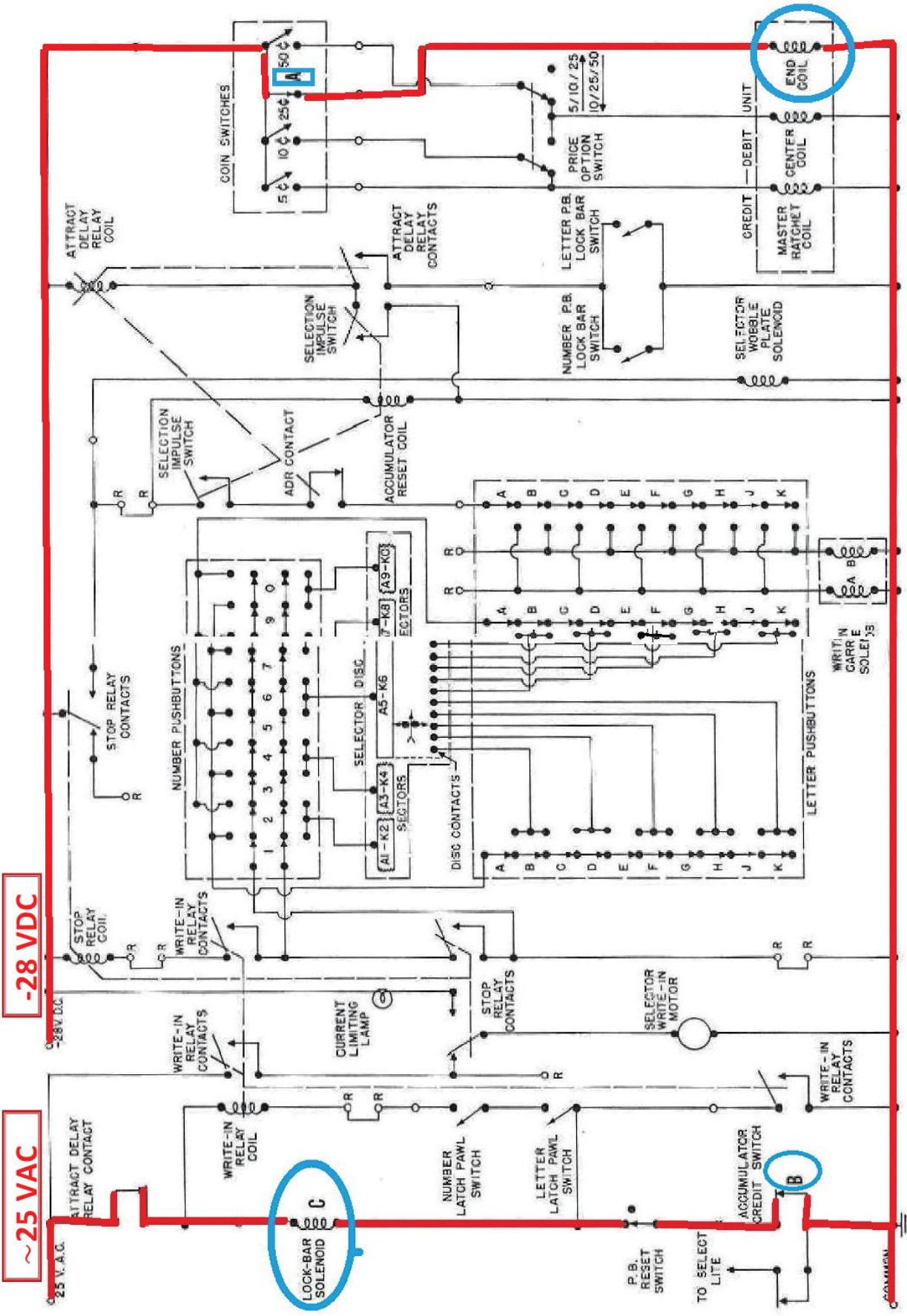
**Attention** : 2 alimentations différentes:

-Courant alternatif **25 VAC**

-Courant continu **-28 VDC**









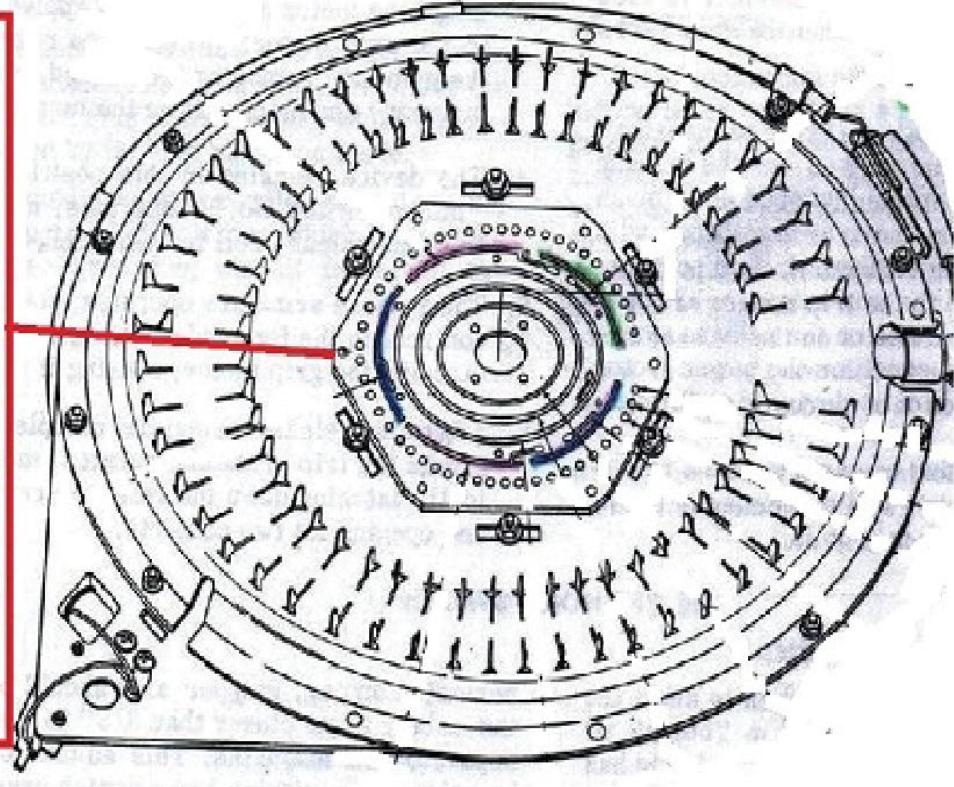
**Séquence N° 2 / WRITE-IN: la bobine du WRITE-IN Relay K est alimentée.**

**Exemple avec la sélection J – 5 :**

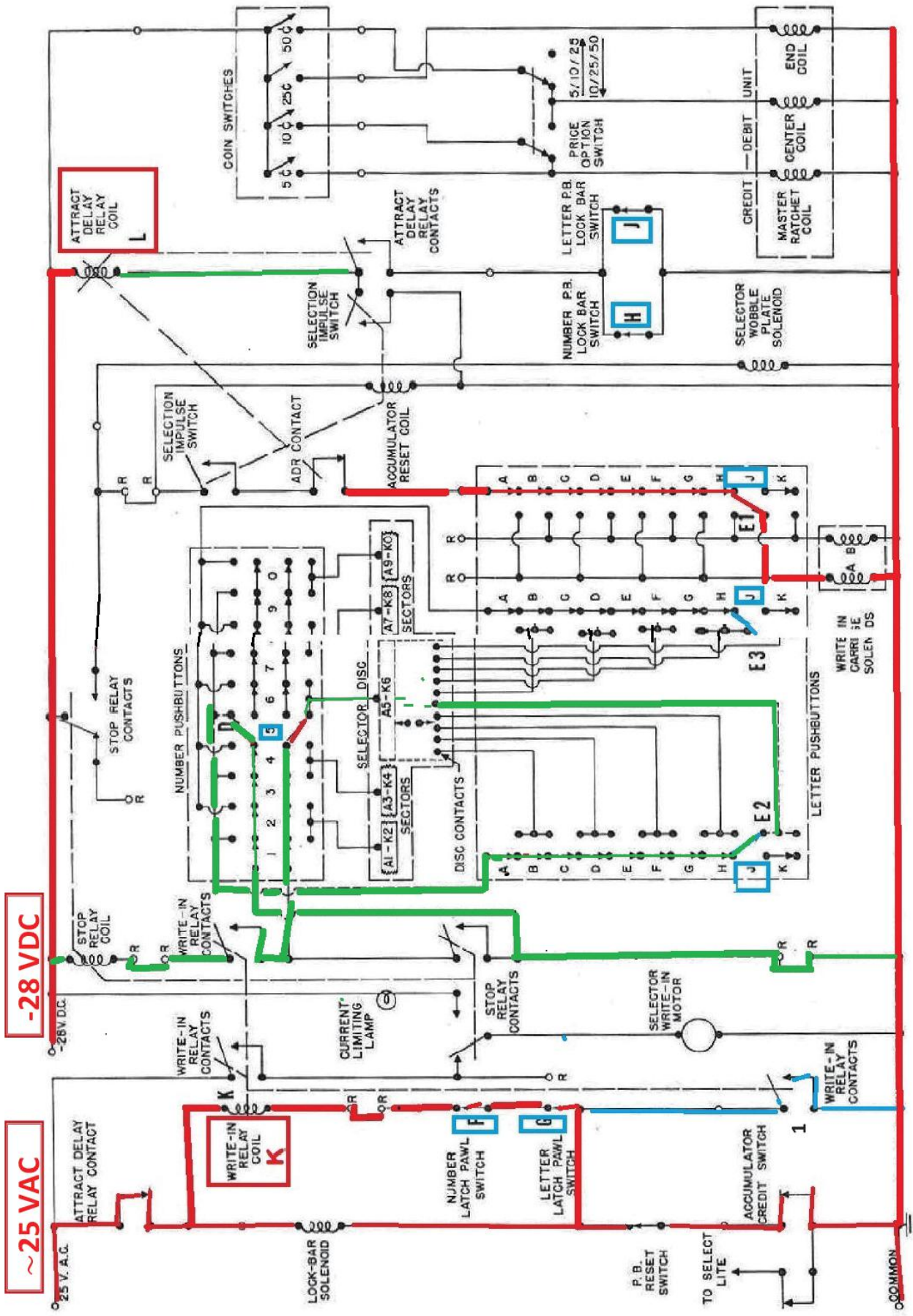
L'enclenchement des touches de sélection J et 5 actionne la barre de verrouillage, ce qui opère les contacts F, G, H et J du clavier.

- 1/-Les contacts F et G opèrent le write-in relay K qui s'auto-entretient par son contact 1 (symbolisé en bleu sur le schéma ci-après).
- 2/-Les contacts H et J préparent le circuit du ATTRACT DELAY RELAY L (ADR).
- 3a/-Les contacts de la touche J (en E1, E2, E3) et ceux de la touche 5 (en D), sont en position pour sélectionner le picot du Selector INNER printed circuit Disc.
- 3b/-Le contact de la touche J en E1 (chaîne n°1, la plus proche des touches) prépare l'alimentation de la bobine A du Write-in du charriot (sélection impaire / face A). En rouge sur le schéma.
- 3c/- Le contact de la touche J en E2 (chaîne n°2, au milieu), et celui du bouton du chiffre 5 en D préparent le circuit vers le selector disc bloc A5-K6. En vert sur le schéma.
- 3d/- Le contact de la touche J en E3 (chaîne n°3) n'a pas d'action dans cette séquence.

**Selector INNER Printed circuit disc**









### Séquence N° 3 / WRITE-IN: le moteur du write-in démarre le charriot qui commence le scan.

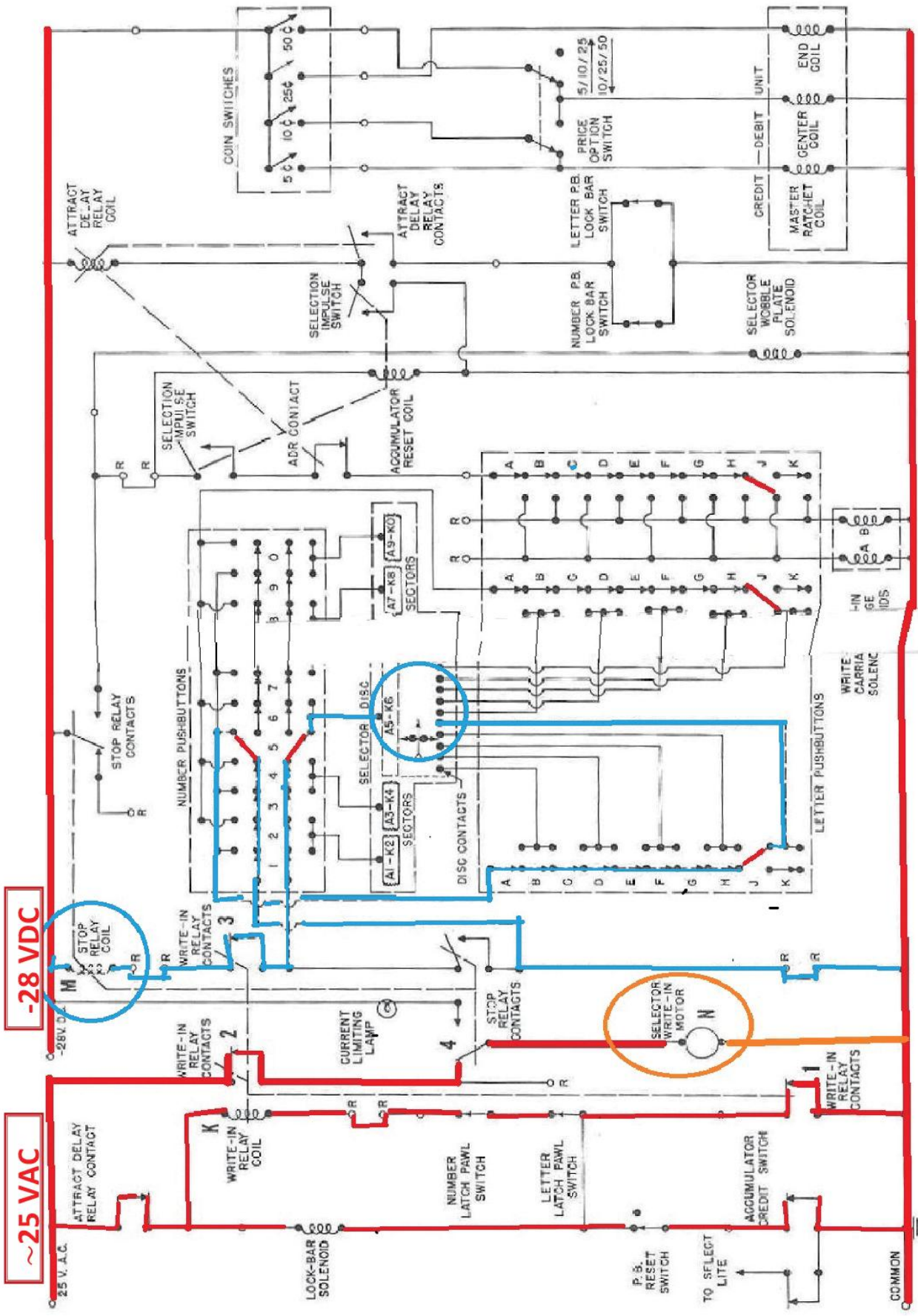
Le **write-in relay K** étant opéré ferme ses **3 contacts TRAVAIL** en 1,2 et 3 :

-Le **contact en 1** assure le maintien du write-in relay.

-Le **contact en 2** ferme le circuit du **selector write-in motor N** qui démarre (le contact 4 du stop relay étant au repos). Le **Inner carriage** commence sa rotation et par ses balais (lamelles cuivre) va détecter la sélection enregistrée **J 5**.

-Le **contact en 3** avec **les contacts des touches J et 5** ferment le circuit du **stop relay M**. Ce relais opérera quand le charriot détectera la sélection enregistrée **J 5** (circuit alimenté par du courant **continu -28 VDC**, symbolisé en **bleu sur le schéma**).





-28 VDC

~25 VAC



### Séquence N° 4 / WRITE-IN: le charriot rotatif détecte la sélection enregistrée puis s'arrête.

Le charriot (**inner carriage**) par ses balais ayant détecté la sélection en **O** et **P**, opère le **stop relay** .

Ce relais ferme ses 3 **contacts** : **2 REPOS- TRAVAIL** en 5 et 7 et **1 TRAVAIL** en 6. :

-Le **contact** en 5 transfère le circuit du **selector write-in motor** sur celui de la lampe limitant le courant moteur (**current limiting lamp**) ; le moteur s'arrête, stoppant la rotation du charriot.

-Le **contact** en 6 permet l'auto-maintient du **stop relay M** venant ainsi suppléer le circuit via les contacts des touches **J** et **5** sélectionnées.

-Le rôle du **contact** en 7 est décrit dans la séquence N° 5 suivante.







## Séquence N° 5 / WRITE-IN: le selector lever (picot de sélection) passe en position « PLAY »

1/-Le contact TRAVAINL du stop relay en 7 opère l' accumulator reset relay S de l'unité de crédit et le selector wobble relay R, en bleu sur le schéma.

2/Dans l'unité de crédit, l'accumulator reset relay provoque la fermeture des 2 contacts selection impulse switches en T et U. Le crédit est décrémenté d'une unité.

-le contact en T et celui de la touche J en E1 alimentent la bobine du write-in A du charriot (write-in carriage solenoid) ; sélection impaire. En vert sur le schéma.

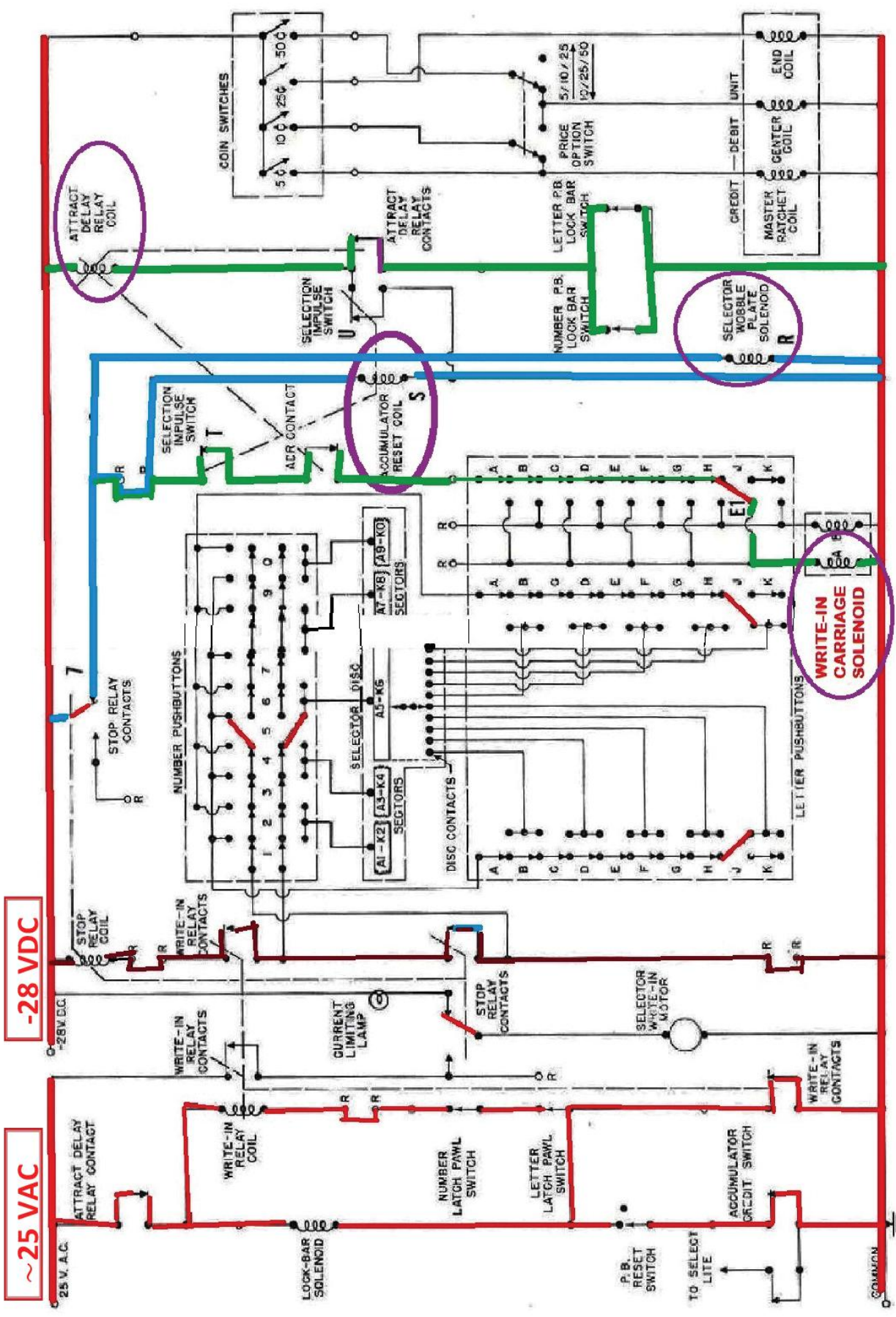
-L'excitation de la bobine du write-in vient frapper le picot de sélection qui est en face de la bobine (selector lever) qui passe en position « PLAY ».

Le déplacement de ce picot de sélection en position « play » actionne avec l'aide du wobble relay, le wobble plate switch, contact qui lancera le cycle de la prise de disque ; cycle développé dans le document à l'URL :

<https://jukeboxsologne.pagesperso-orange.fr/TUTO/2-08-Sequences%20Rockola%201484-1493.pdf>

-La fonction du contact en U est décrite dans la séquence N°6.





**-28 VDC**

**~25 VAC**

## Séquence N° 6 / WRITE-IN: Fin de la 1<sup>ère</sup> sélection.

- 1/-Dans l'unité de crédit, la fermeture du **contact travail** en **U** du **selection Impulse swirch** opère le **attract delay relay (ADR)** qui ouvre ses **2 contacts** en **V** et **W**.
- Le **contact** en **W** ouvre le circuit du **write-in carriage relay** qui retombe.
- Le **contact** en **V** ouvre le circuit du **lock-bar solenoid** (relais de verrouillage des touches du clavier) qui retombe et relâche les 2 touches **J** et **5** correspondant à la sélection choisie.
- Les touches des chiffres et des lettres étant au repos provoquent l'ouverture des contacts **F, G, H** et **J**. Ces contacts sont commandés mécaniquement par la tringlerie des 2 réglettes des boutons-poussoirs suivant leur position.
- les contacts **H** et **J** ouverts font retomber le **accumulator delay relay ADR**
- Dans le même temps, le **write-in relay** retombe également avec l'ouverture de ce contact **ADR** en **V**.

**Tous les relais étant au repos, le jukebox est prêt pour une nouvelle sélection si du crédit est toujours disponible.**

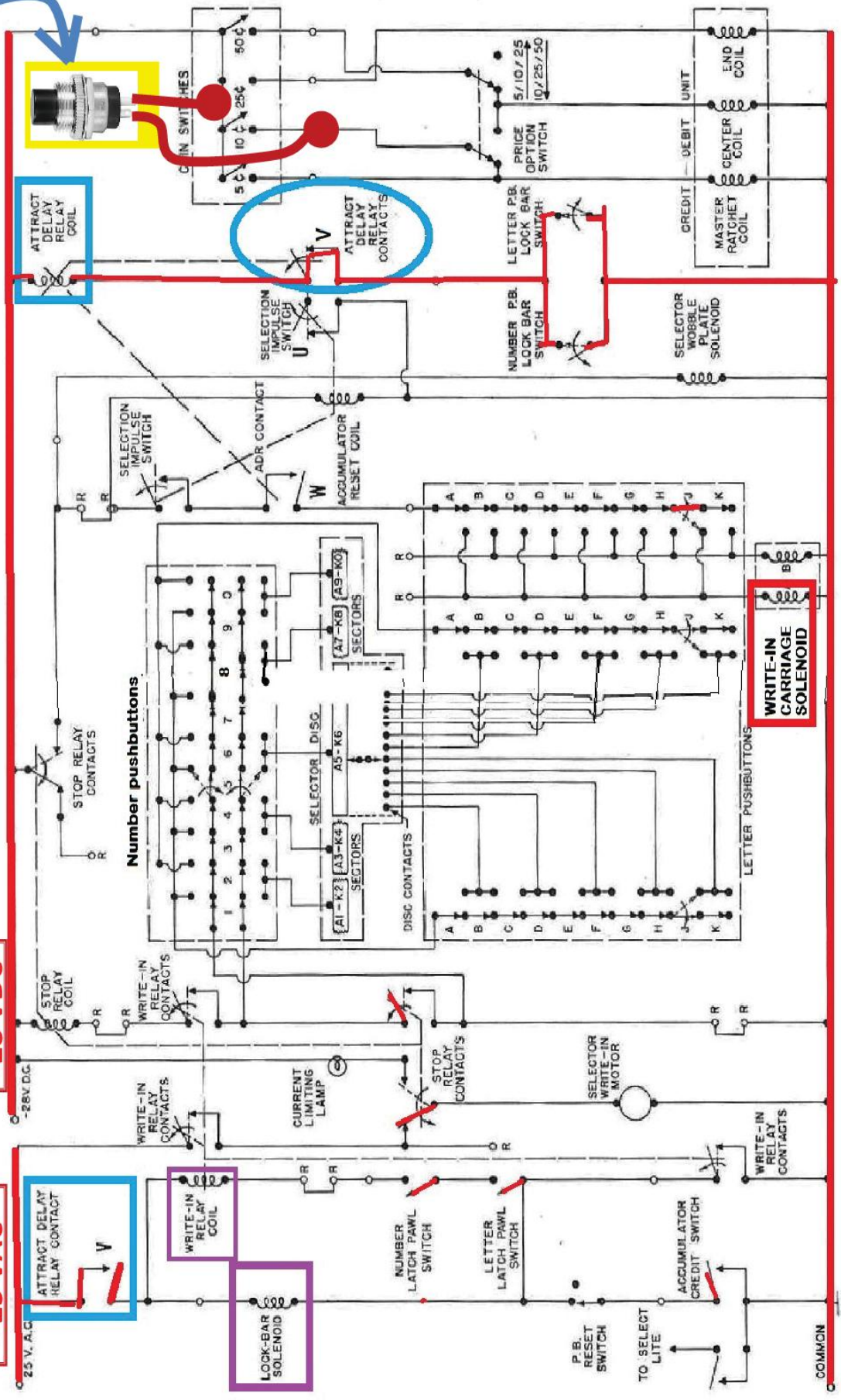
**Branchement d'un bouton-poussoir FREE PLAY** : voir les connexions sur le schéma, en parallèle sur l'un des contacts en sortie de monnayeur suivant le nombre de sélections désiré par impulsion sur le bouton-poussoir.



Free Play

-28 VDC

~25 VAC



**Phases électriques  
de la  
gestion du disque**

\*\*\*\*\*

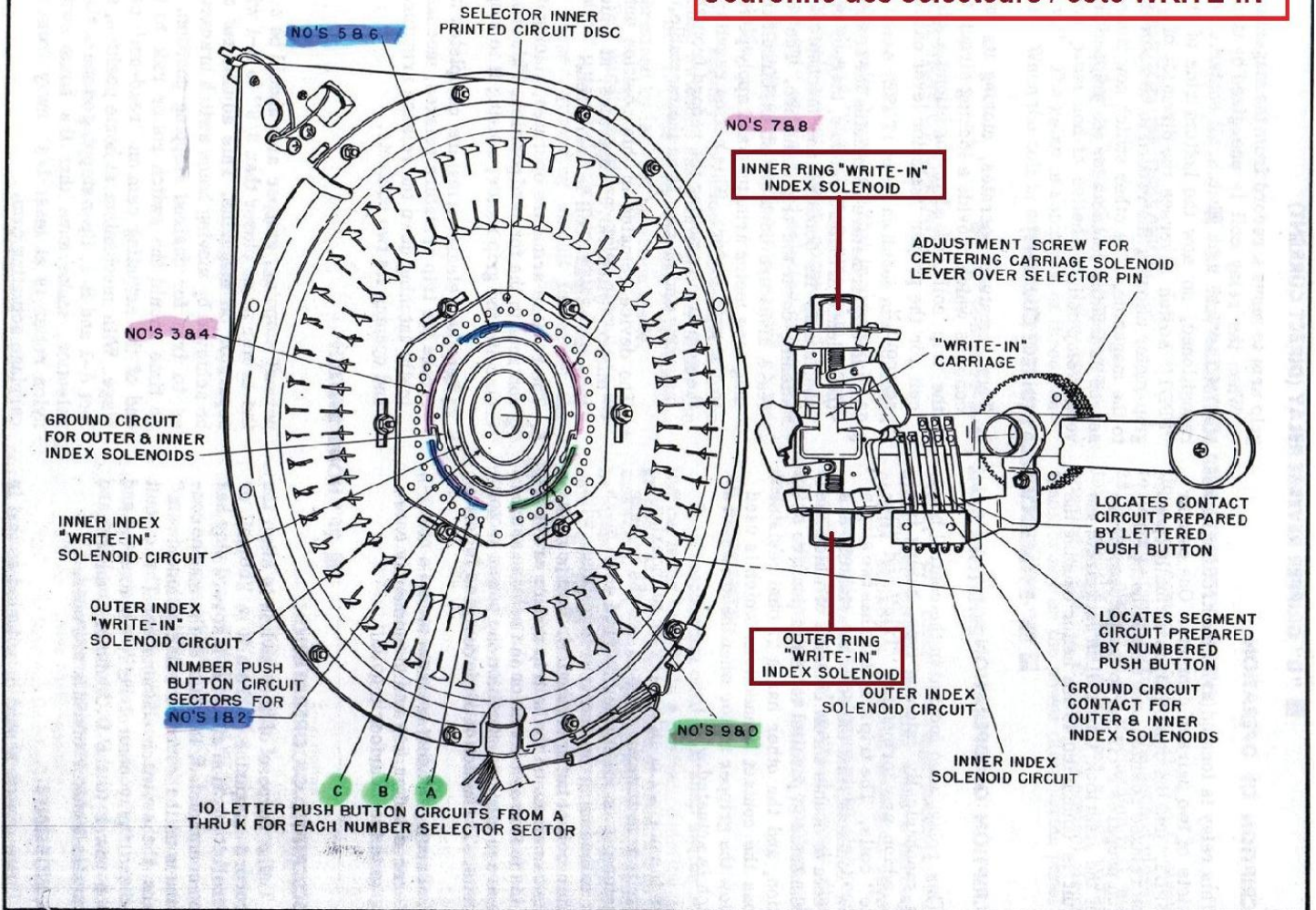
**Repos – play – repos**

\*\*\*\*\*

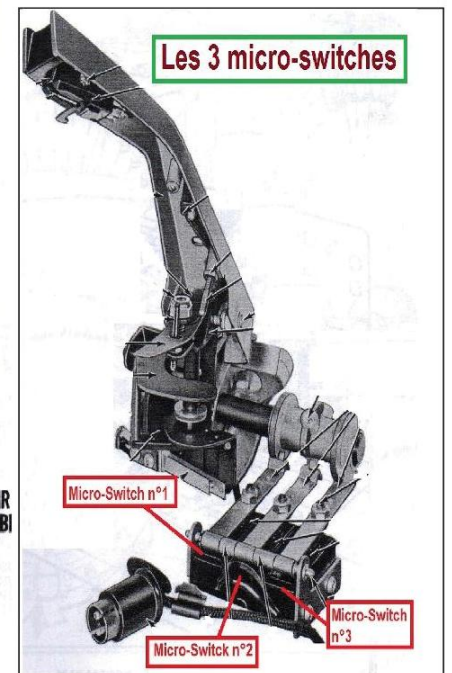
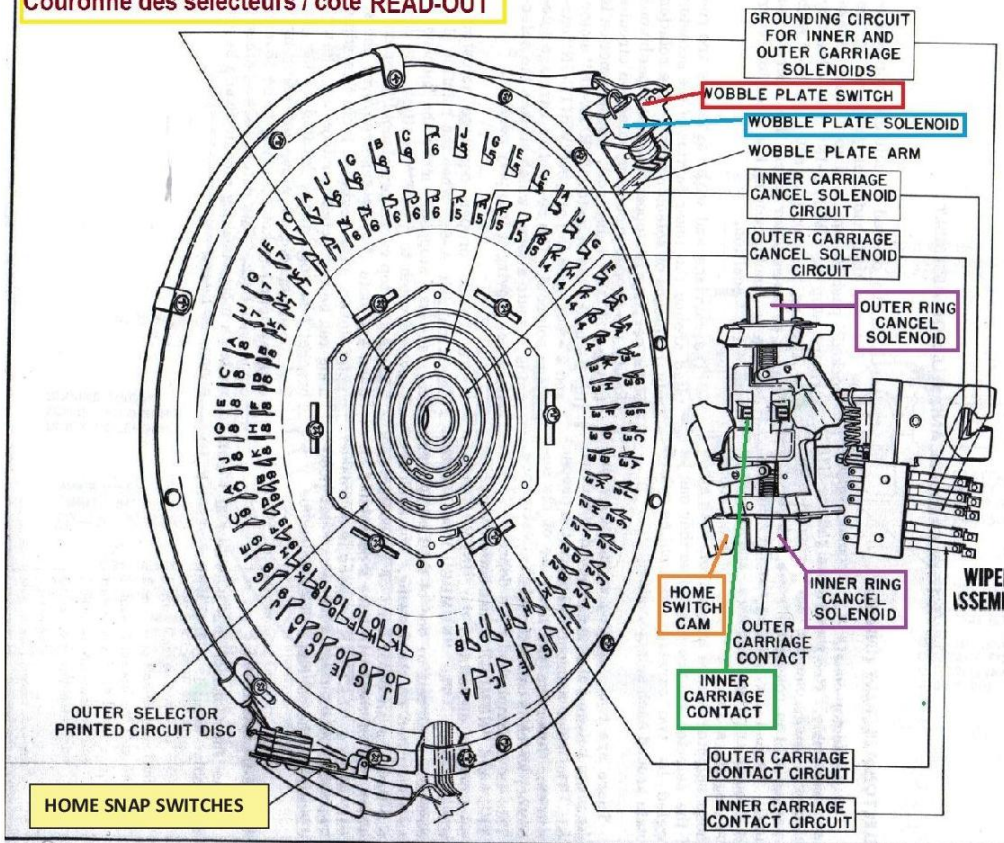
**Au moins un picot de sélection est en  
position PLAY (Write-in ok)**



## Couronne des sélecteurs / côté WRITE-IN

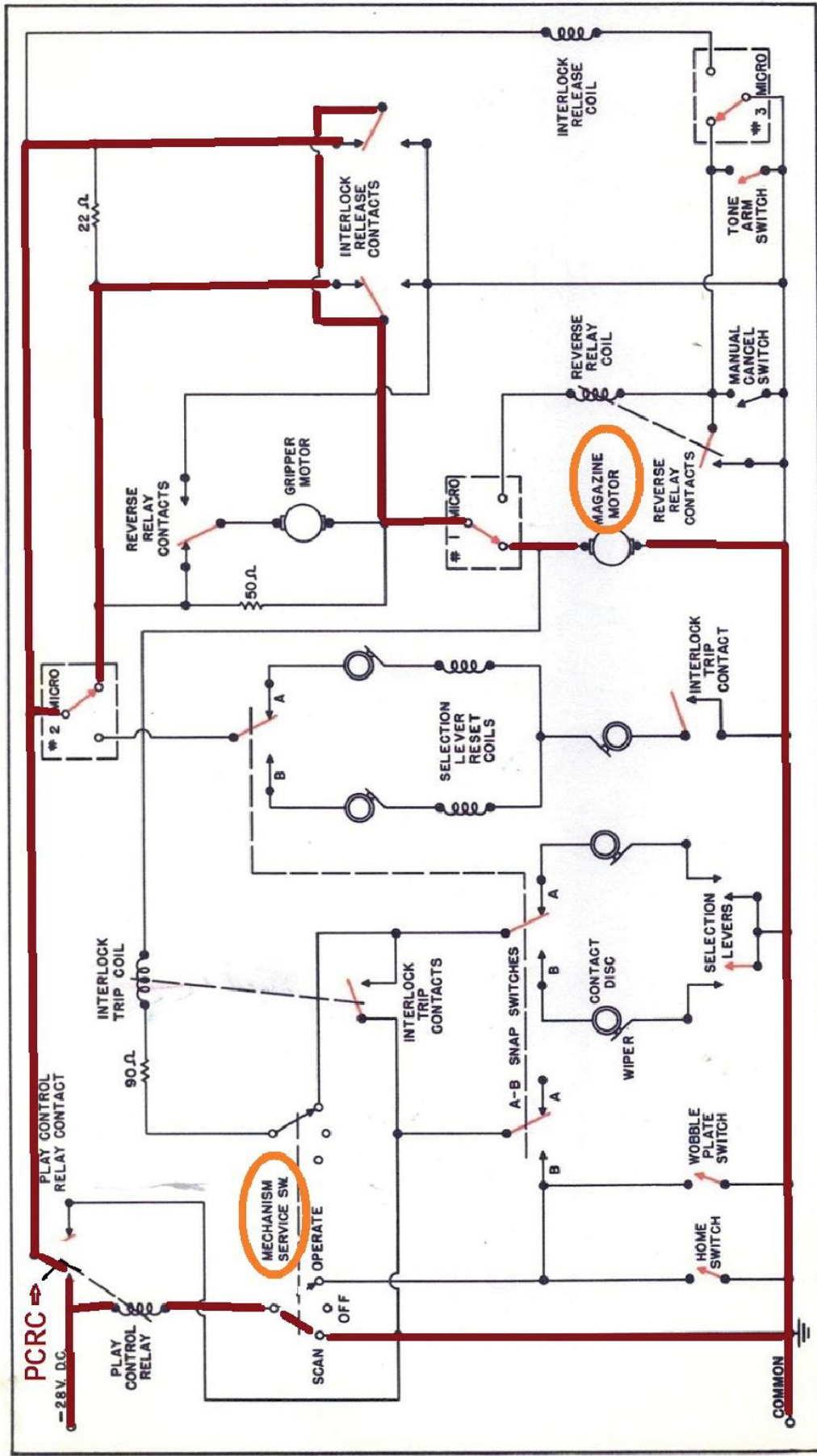


## Couronne des sélecteurs / côté READ-OUT



Vue permettant de localiser les équipements électriques principaux impliqués dans les séquences de fonctionnement



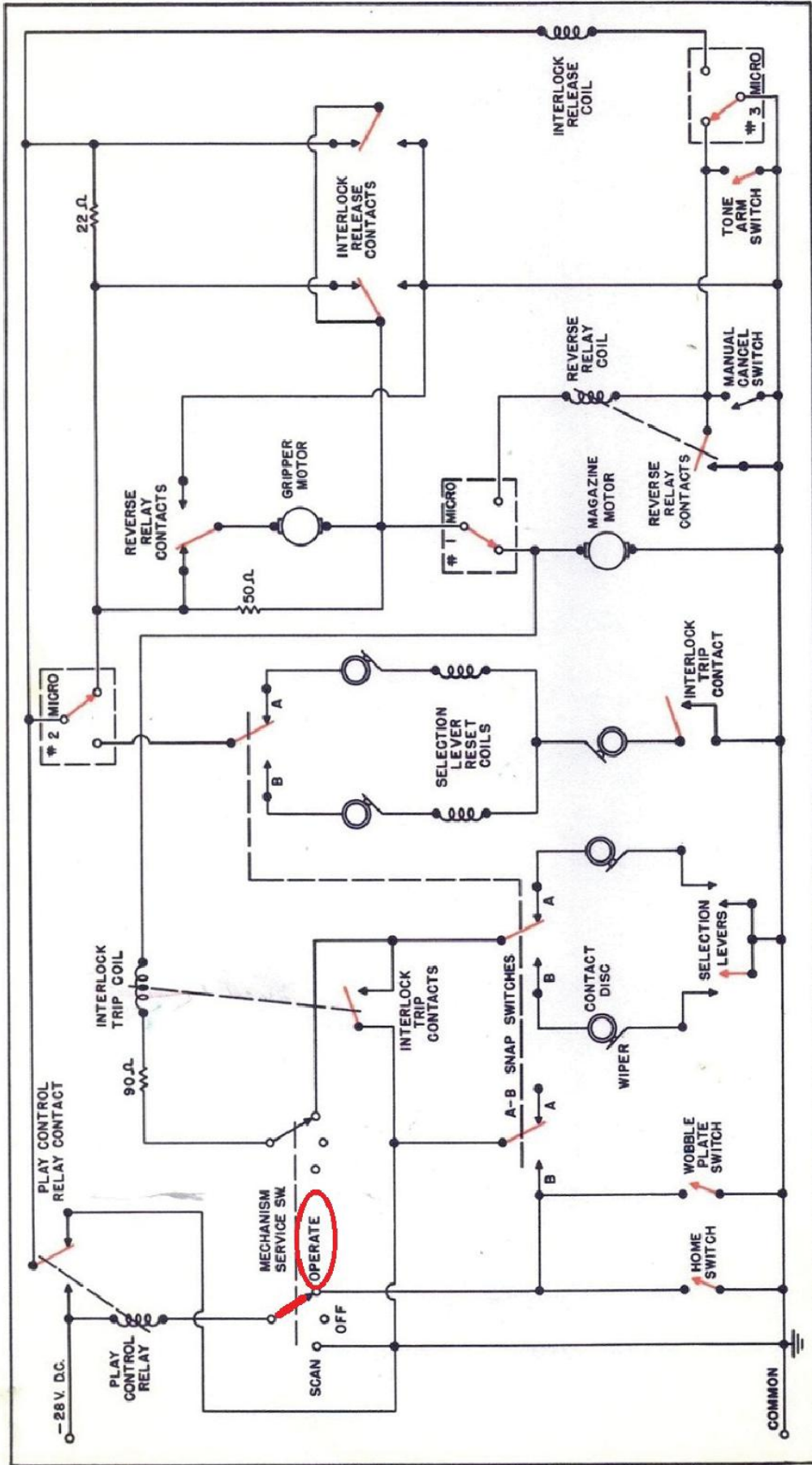


**Commande manuelle du panier à disques ( record magazine)**

Positionner le « MANUAL SERVICE SWITCH » sur « SCAN » : le Play Control Relay opère et par son contact PCRC alimente le circuit du Magazine motor (moteur du panier à disques) en -28 VDC → le panier démarre sa rotation. Etat permettant le chargement et/ou changement des disques.

En fin d'intervention, remettre le SERVICE SWITCH en position « OPE » (position en service).

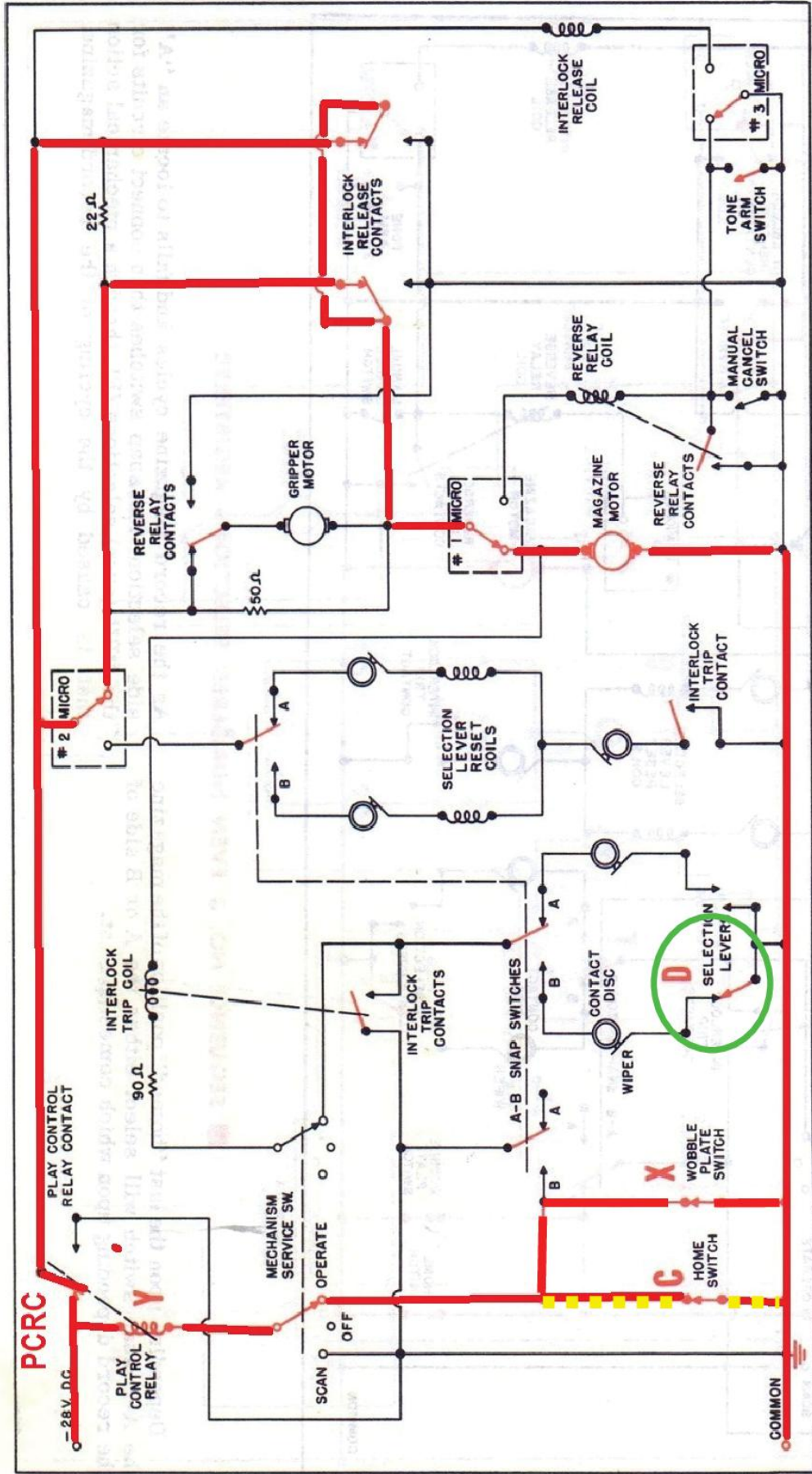




**Séquence n° 1 : Jukebox en position « OPE » (prêt pour une sélection)**

Power ON, pas de sélection enregistrée, Manual Service Switch en position « OPE ».

La pince de prise de disque en position REPOS (sur le panier à disques).

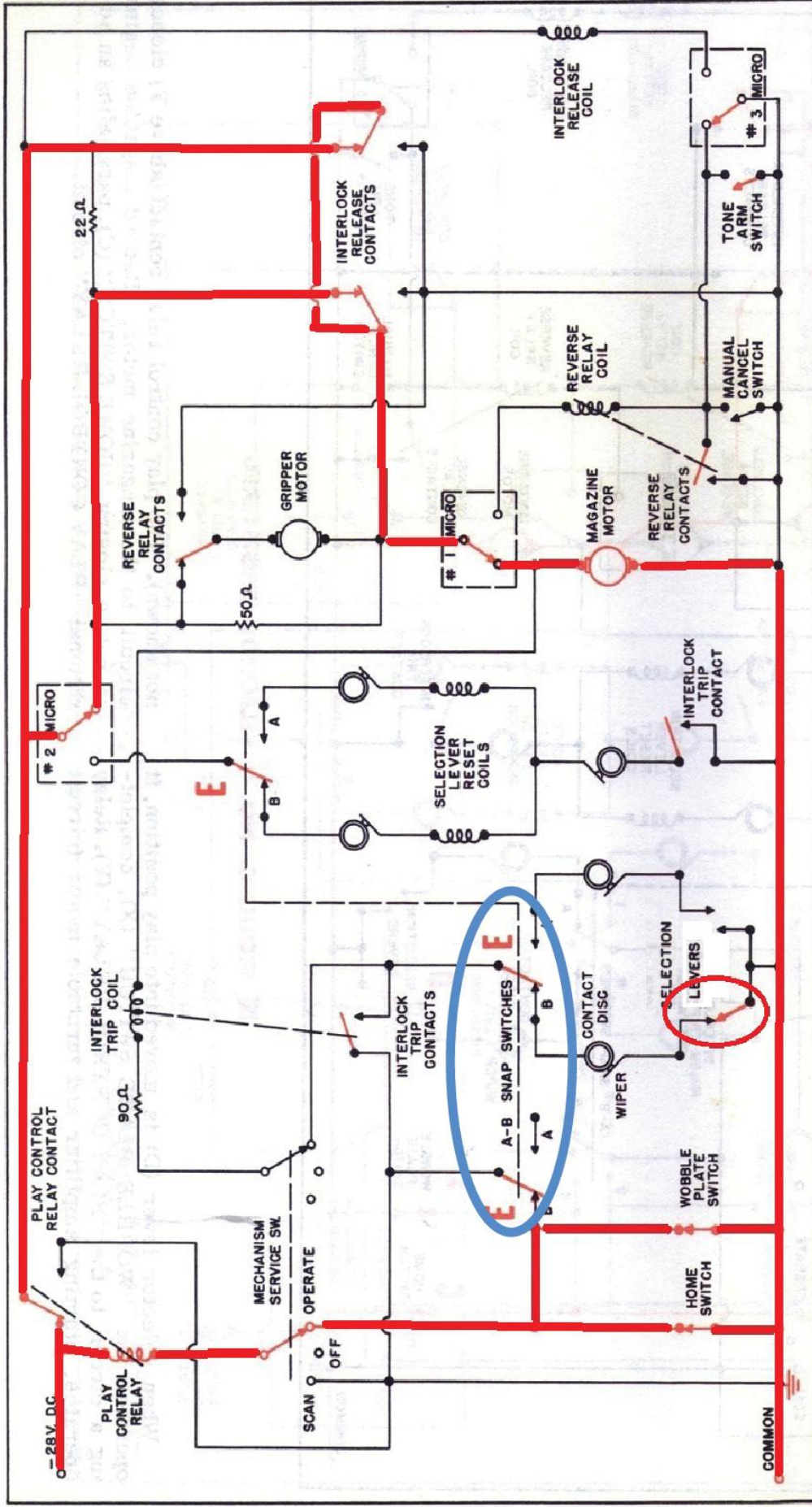


**Séquence n° 2 : Sélection enregistrée (contact D du picot de sélection fermé)**

L'enregistrement de la sélection se matérialise par le **picot de sélection D** (selector lever D) qui se déplace en position PLAY ; il ferme le **contact X** du wobble, opérant le **play control** relay Y. Ce dernier démarre l'ampli et le Turntable (platine de lecture) Circuit non représenté ici.

Le **contact PCRC** du Play Control Relay commute le **-28 VDC** et démarre le moteur du panier à disques (magazine motor) ce qui ferme le **contact Home Switch C**, et qui sécurise le maintien du Play Control Relay Y.

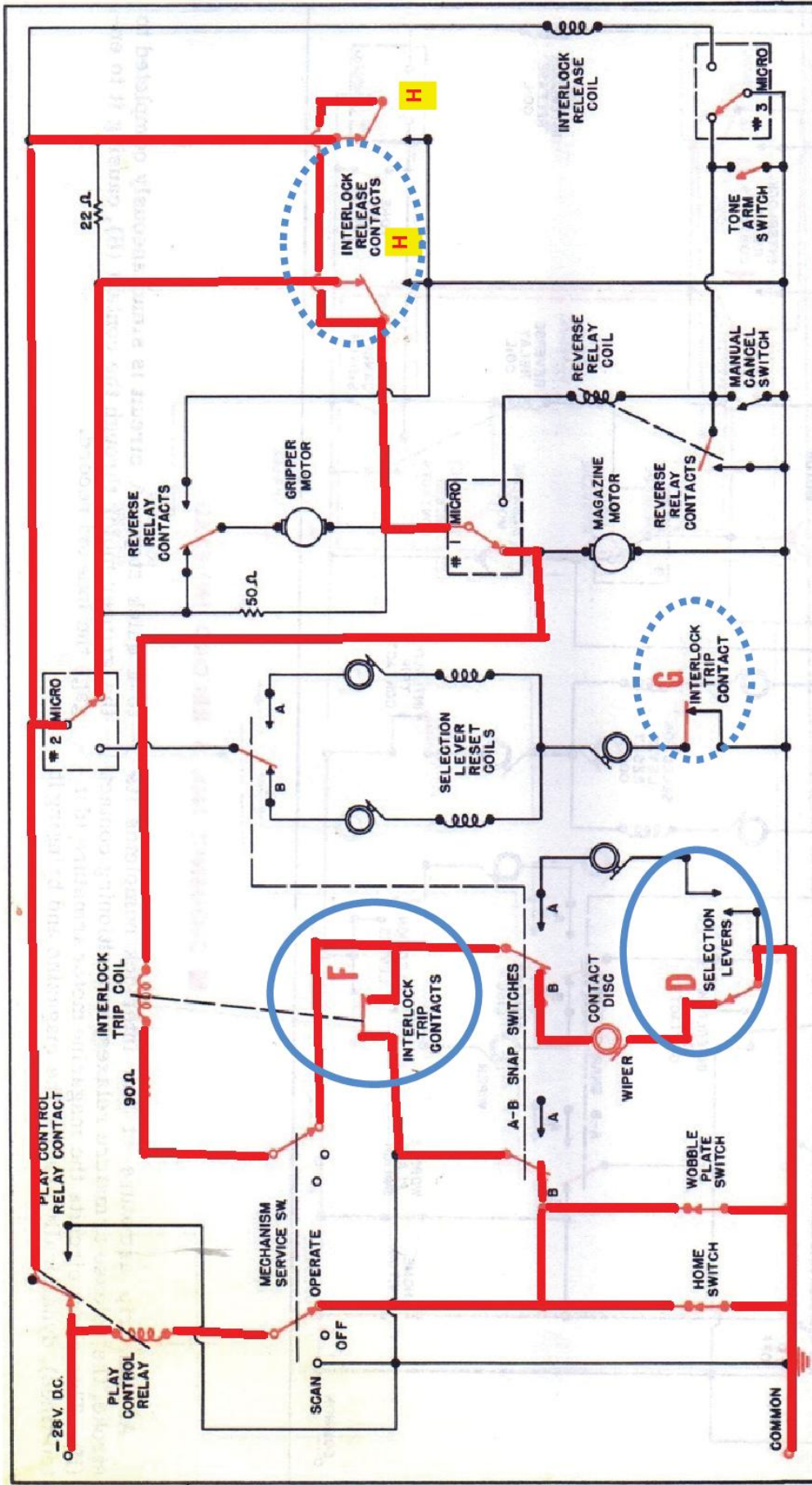




**Séquence n° 3 : sélection paire (even) enregistrée (face B du disque).**

L'ordre de prise de disques est conditionné par la position des **SNAP SWITCHES E**. Depuis la position REPOS, les faces A seront d'abord jouées, puis après un tour complet du panier à disques, ce seront les faces B.

Ces **SNAP SWITCHES E** contacts **A** et **B** sont commandés mécaniquement lors de la rotation du panier à disques.

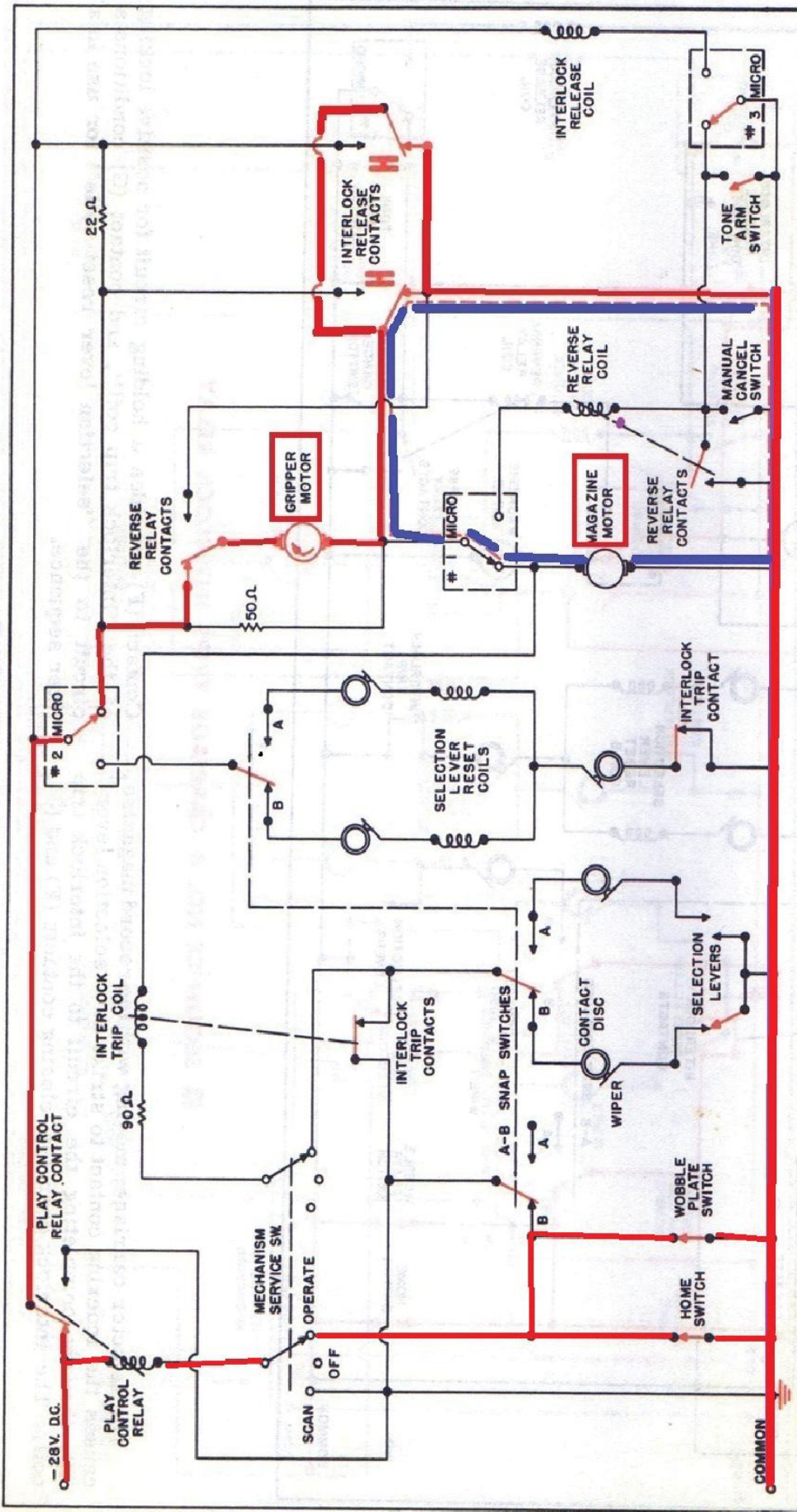


**Sequence n° 4 : Le chariot détecte le picot de sélection en position PLAY.**

Le chariot de la couronne des picots de sélection se déplace, entraîné par le panier à disques. Le picot de sélection (selecteur lever) en position PLAY est détecté au passage du chariot, générant la fermeture du contact D. Ce contact D opère l'interlock Trip Relay qui ferme ses contacts F et G.

Le contact F assure le maintien de l'interlock Relay. Le contact G prépare le circuit de reset (RAZ) du picot de sélection. Les contacts H préparent l'arrêt du moteur du panier à disques.

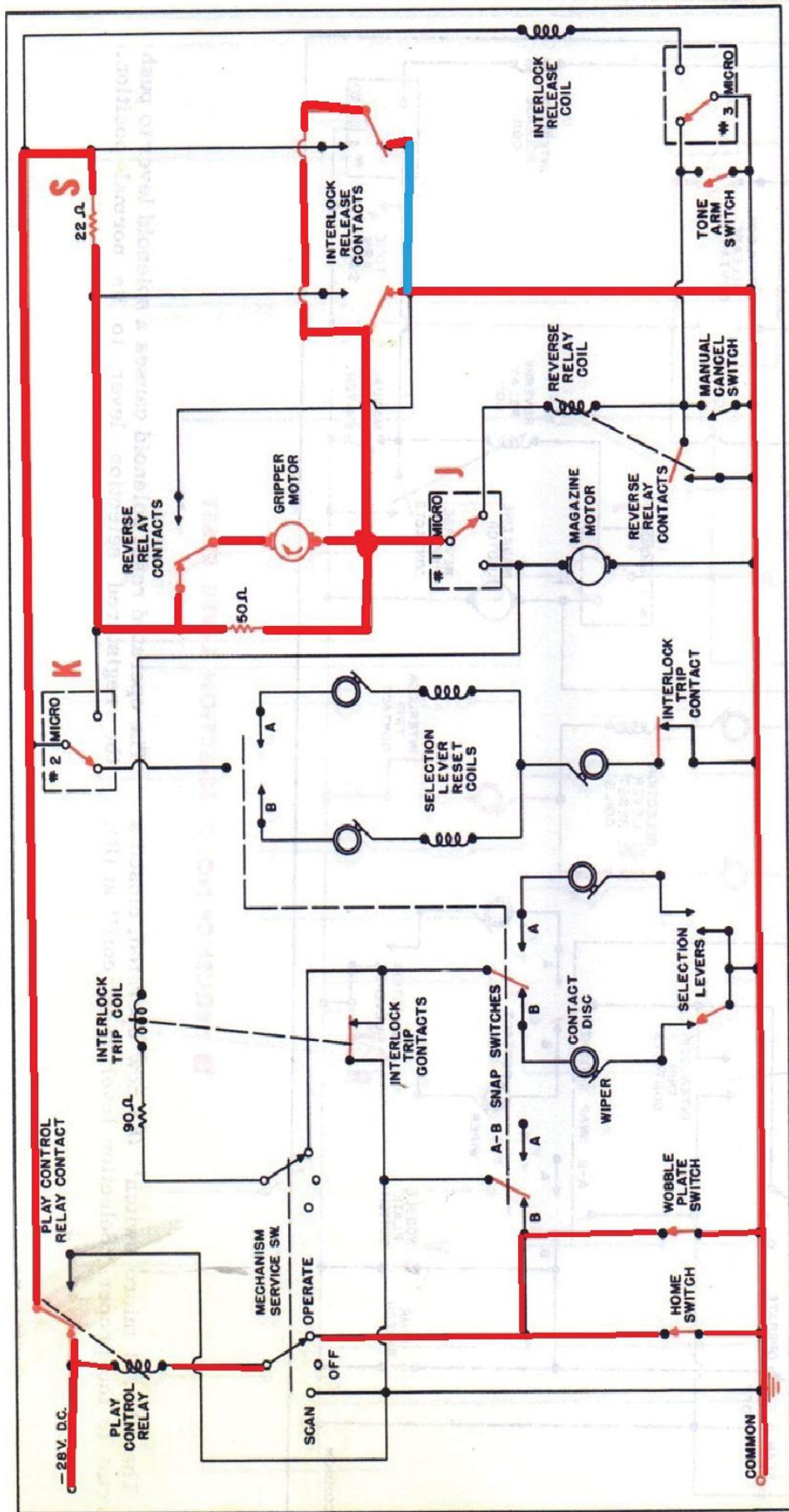




**Séquence n° 5 : transfert du disque sélectionné sur la platine de lecture (Turntable) :**

L'un des contacts H de l'Interlock Relay court-circuite le magazine motor qui s'arrête instantanément (présence du 0 Volt aux 2 bornes du moteur). Circuit matérialisé de couleur bleue.

Simultanément, les 2 contacts H de l'Interlock Relay alimente le GRIPPER MOTOR (moteur de la pince à disques) qui transfère le disque sélectionné du panier sur le Turntable (platine de lecture). Circuit matérialisé en rouge.

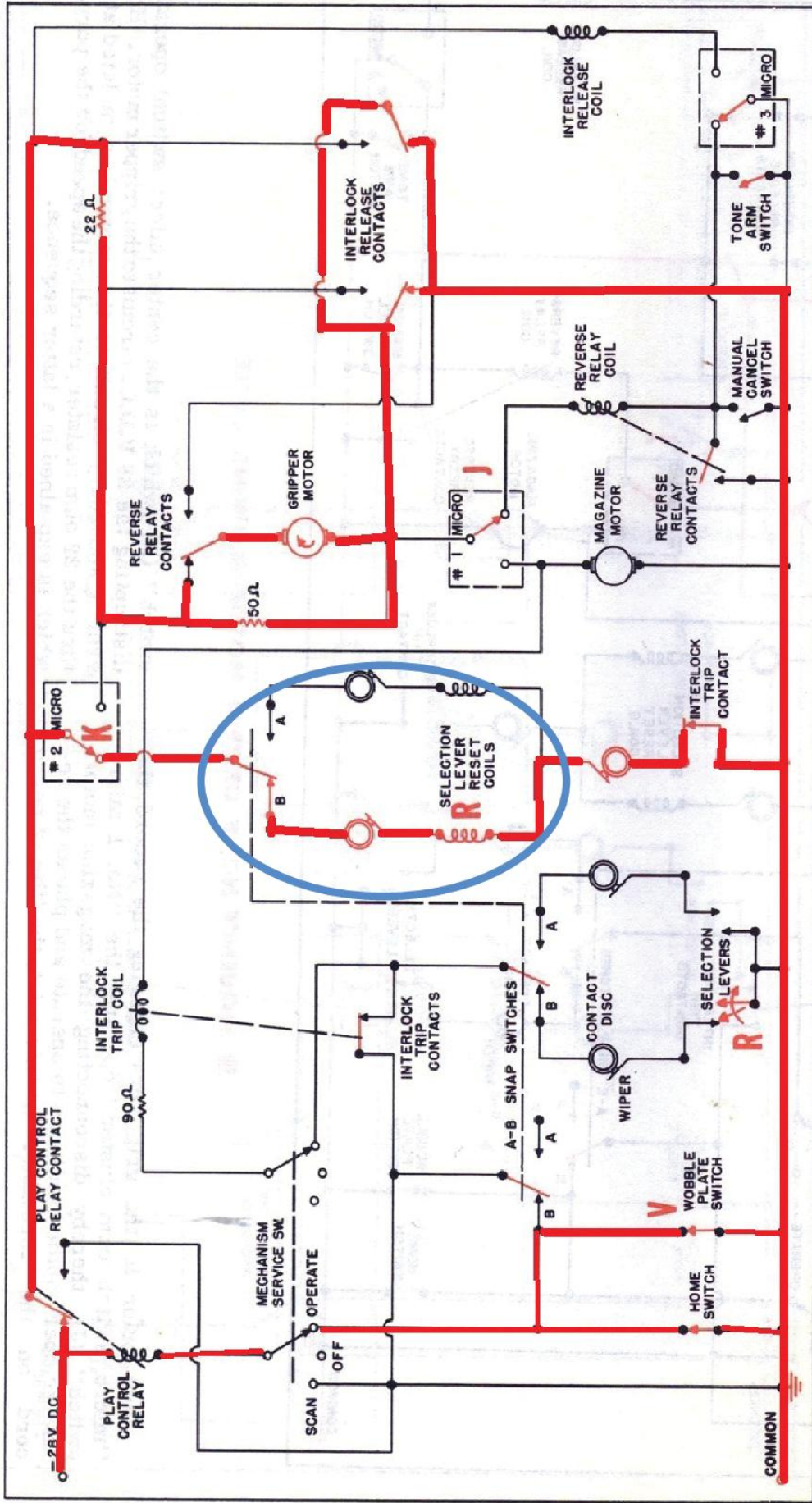


**Séquence n° 6 : Le Gripper Motor ralentit en fin de cycle de la pose du disque sur la platine de lecture.**

La rotation du Gripper Motor actionnant l'arbre à cames, le micro-switch N° 1 (en J) coupe l'alimentation du Magazine Motor.. Le Gripper Motor continue et place le disque sur la platine de lecture..

Dans le même temps le micro-switch N°2 (en K) déconnecte le -28 VDC du Gripper Motor. Cependant un second circuit (en S) à travers une résistance de 22 ohms permet toujours d'alimenter le gripper motor mais ce dernier tourne moins vite (intensité limitée) afin de finir en douceur le cycle, et notamment le déplacement du bras de lecture sur le disque.

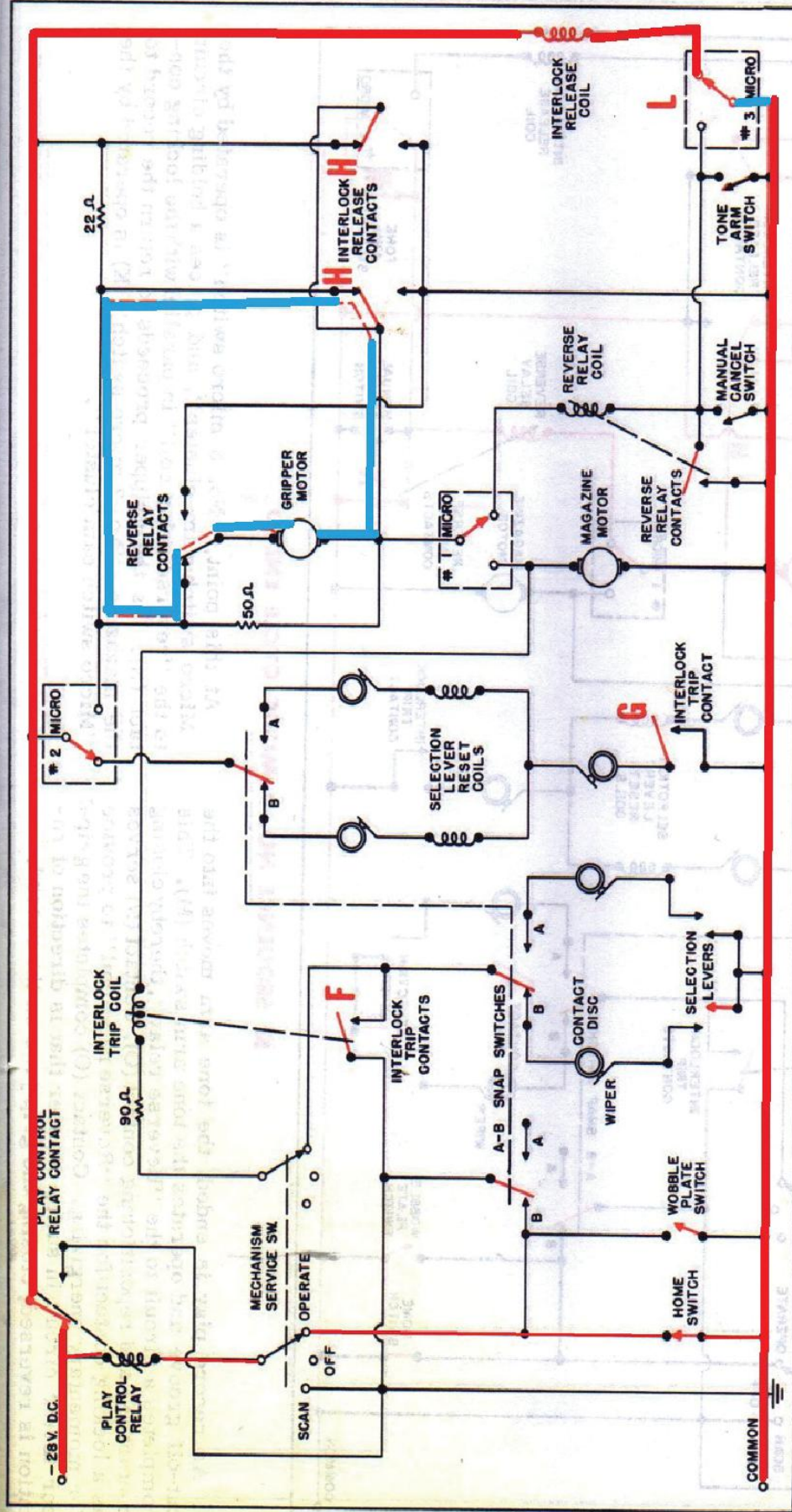




**Séquence n° 7 : Remise à zéro du picot de sélection (Selection lever).**

Le micro-switch N°2 déjà opéré dans la séquence précédente (en K), ferme le circuit sur la bobine de sélection (face B des disques suivant notre exemple d'une sélection paire) → le picot de sélection est repoussé et remis dans sa position d'origine au repos.



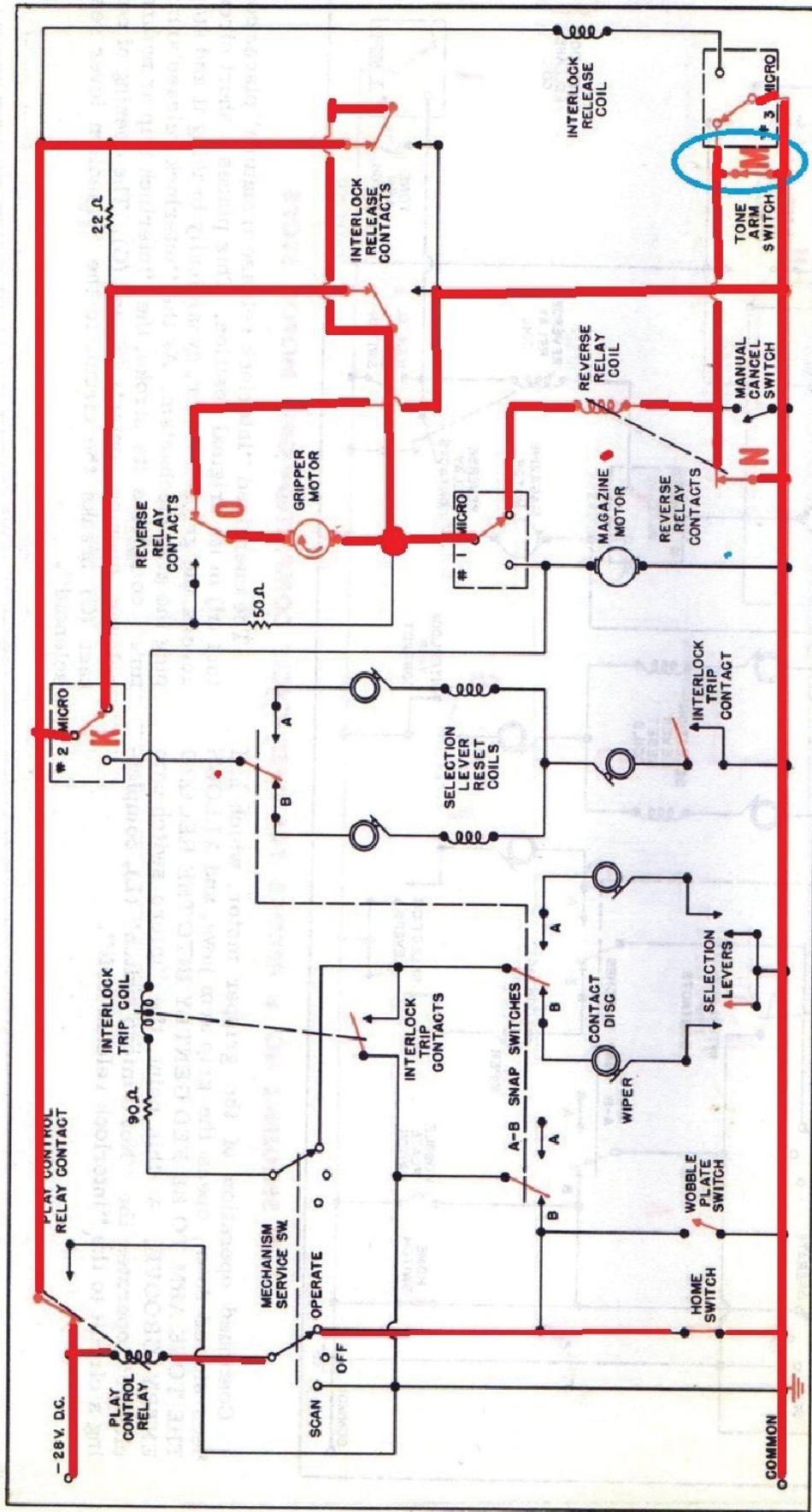


**Séquence n° 8 : Le Gripper Motor stoppe, disque en position PLAY**

A ce stade le **grripper motor** tournant doucement amène le bras de lecture sur le disque et par l'arbre à cames, actionne le **micro-switch N°3** (en L) qui alimente le circuit de l'**interlock release Relay**. Les contacts **H** de l'interlock release Relay court-circuitent le **grripper motor** qui s'arrête (**circuit matérialisé de couleur bleue sur le schéma**).

L'attraction de l'**interlock release Relay** agit sur les contacts de l'**interlock trip relay** mécaniquement, ce qui ouvre les contacts **F** et **G** l'ouverture du contact **G** coupe l'alimentation de la bobine de RAZ des picots de sélection (**selection lever reset coil**) qui revient en position REPOS. **JUKEBOX en position PLAY**.



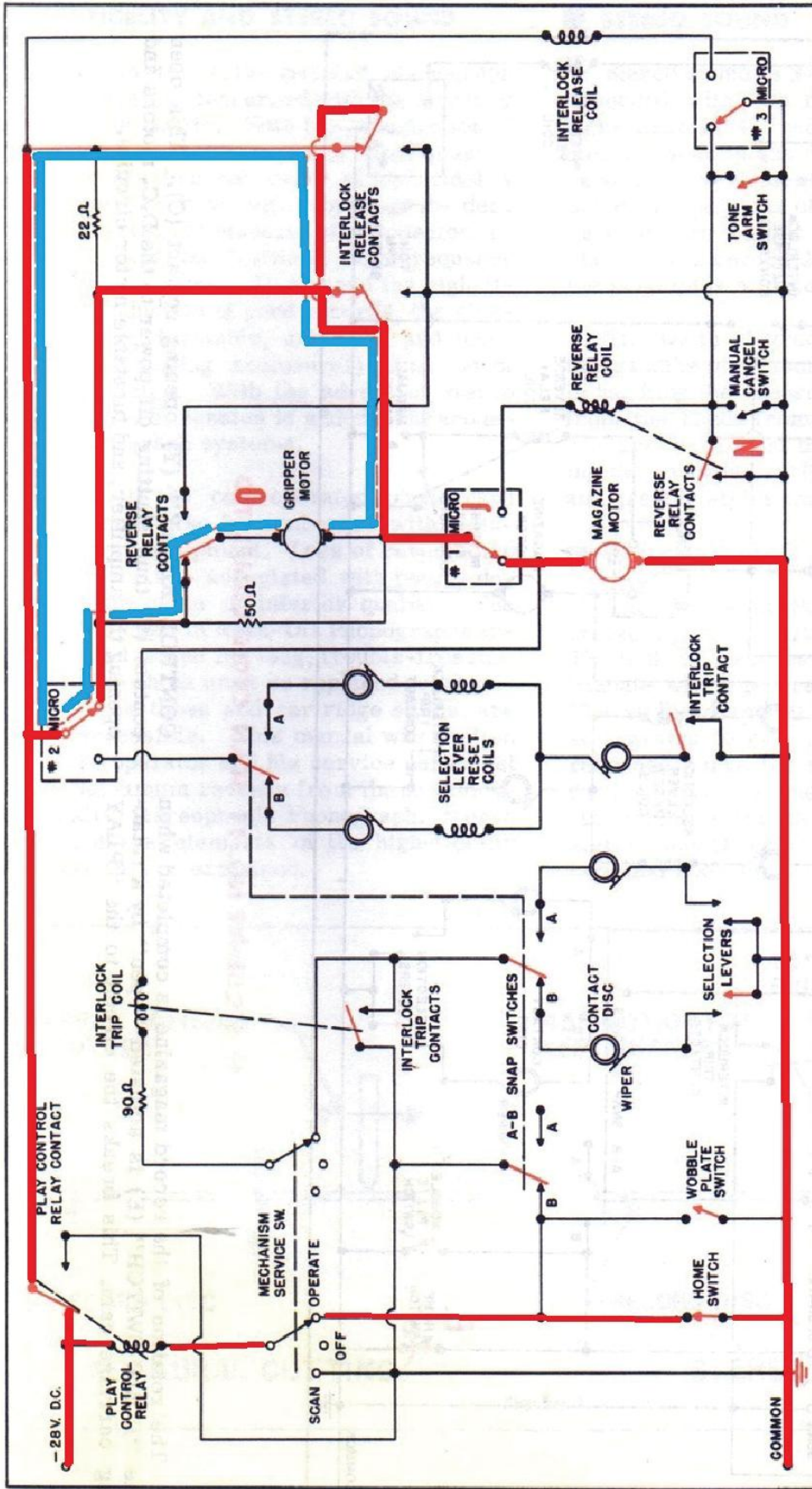


**Séquence n° 9 : Fin de lecture du disque, le Gripper Motor retire le disque de la platine (Turntable)**

En fin de lecture du disque, le **bras de lecture** (tonearm) vient actionner le **contact M** (tonearm switch) qui se ferme. Une pression sur le **bouton poussoir REJET** (Manual Cancel Switch) aurait le même effet c'est-à-dire d'opérer le **Reverse Relay** (les contacts de ce relais inverseront les potentiels aux bornes du Gripper Motor qui tournant dans le sens inverse retournera le disque dans le panier). Ce **reverse relay** s'auto-entretient par son **contact N** et par son **contact O** alimente le **Gripper Motor**.

Le **Gripper Motor** démarre entraînant l'arbre à cames qui actionne **1°** le **micro-switch N°3** qui maintient opérer le **reverse relay** car le bras de lecture quittant la platine ouvre le **Tonearm contact M**, et **2°** le **micro-switch N°2** en K, qui sécurise l'alimentation du **gripper motor**.

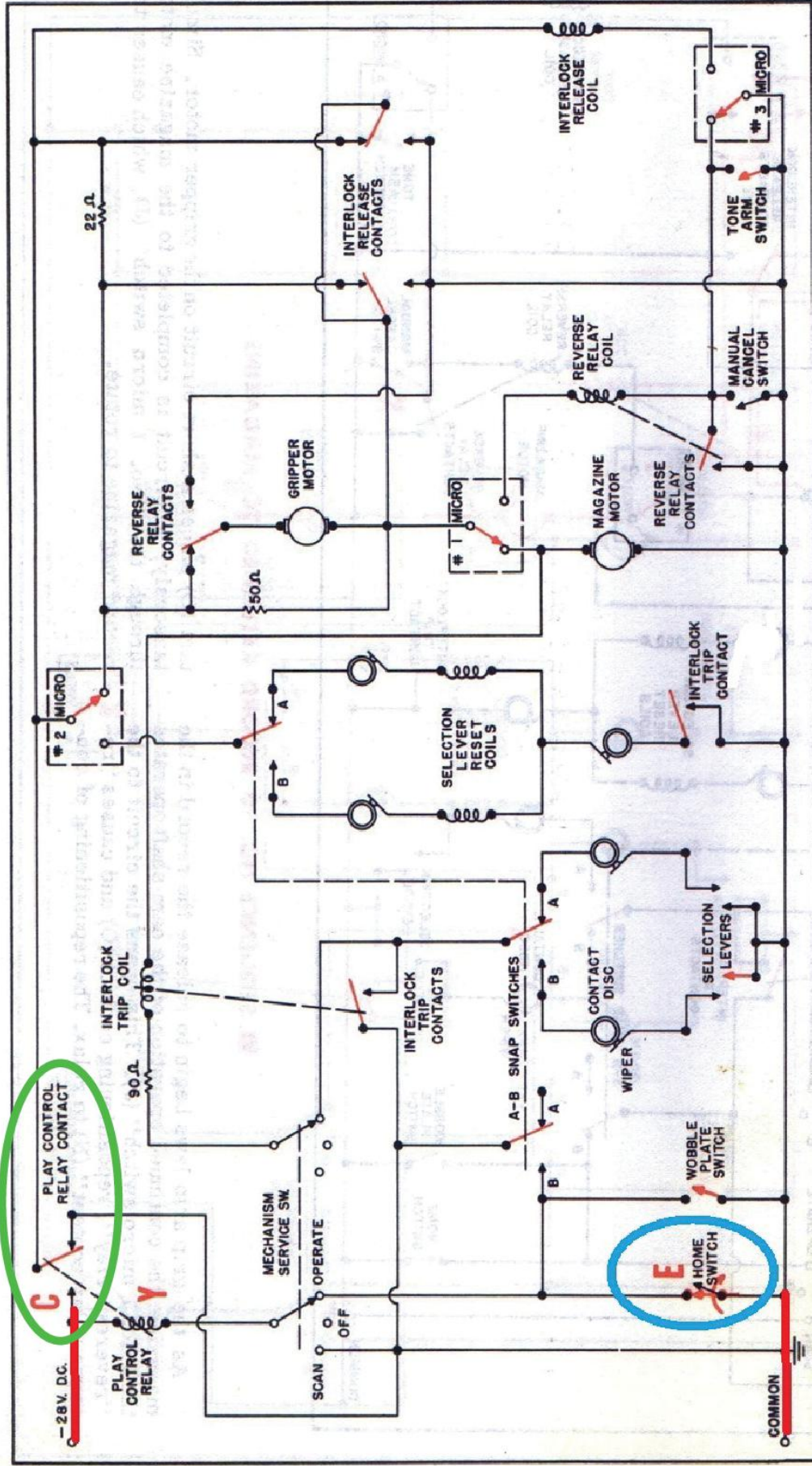




**Séquence n° 10 : Retour du disque dans le panier à disques (Record magazine).**

Quand le **gripper motor** commence à reposer le disque dans le panier, l'arbre à cames actionne en fin de course le **micro-switch N°1** (en J) faisant ainsi retomber le **Reverse Relay**, ce qui a pour effet d'ouvrir son **contact N** et de provoquer par son autre **contact O**, le court-circuit du **gripper motor** qui s'arrête (**circuit matérialisé de couleur bleue**). Simultanément, le nouvel état du **micro-switch N°1** et du **reverse relay** ferment le circuit du **magazine motor** qui va continuer sa rotation (**READ OUT**).





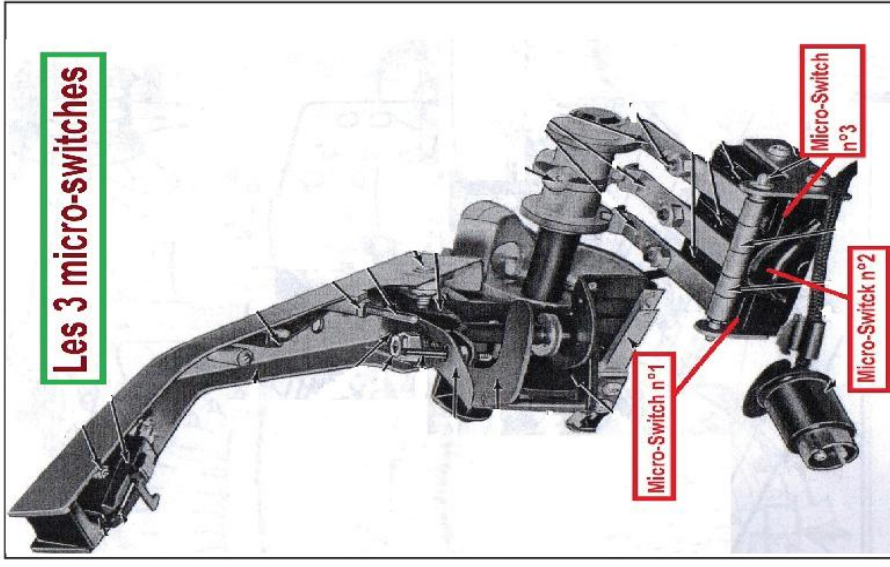
**Sequence n° 11 : Plus aucune sélection enregistrée, fin du cycle. Jukebox en attente d'une prochaine sélection.**

Si pas d'autre sélection enregistrée, en fin de rotation du magazine motor, la came du chariot ouvre le Home switch coupant l'alimentation du Play control relay Y.

Le contact C du Play control relay coupe le -28VDC de l'ensemble du mécanisme. Par ailleurs l'alimentation de l'ampli et du moteur de la platine est aussi coupée (Circuit non représenté ici).

**Le jukebox est prêt pour une nouvelle sélection.**

## Les 3 micro-switches



ETAT FONCTIONNEL DU JUKEBOX	MICRO-SWITCH N° 1	MICRO-SWITCH N° 2	MICRO-SWITCH N° 3
Repos : Pince du Gripper Motor posée au-dessus du panier à disques			
Disque en cours de transfert entre le panier et la platine de lecture			
Disque en position PLAY			

**ETAT DES 3 MICRO-SWITCHES EN FONCTION DE LA POSITION DU GRIPPER MOTOR (moteur de la pince à disques).**

Ces micro-switches sont actionnés par l'arbre à cames solidaire des mouvements du gripper motor.



## ■ ROCK-OLA MODEL 1493 AMPLIFIER

### ■ HIGH-FIDELITY AND STEREO SOUND

People in the coin-operated phonograph business must be concerned with the listening tastes of the public. With the introduction of microgroove records made of vinyl plastic, the public has become aware of high-fidelity sound; these records will reproduce the deep bass of organs, the staccato of percussion instruments, and the brilliant, high-frequency overtones of violins. To achieve the high-fidelity reproduction of good records, the pick-up cartridge, turntable, amplifier and loudspeakers (including enclosures) must be of advanced design. With the advent of stereo sound, a third dimension is added to the acoustics of phonograph systems.

People in the coin-operated phonograph business must also be concerned with reliability of their equipment. Loss of revenue and service costs are associated with poorly designed components of inferior quality. The components used in Rock-Ola Phonographs are designed and tested for long, trouble-free life. Those parts which must be replaced occasionally, such as tubes and cartridge stylus, are readily accessible. This manual was written to help the operator and his service personnel achieve maximum revenue from the new Rock-Ola "Wall" Stereophonic Phonograph. Stereo sound and the elements of the high-fidelity audio system are explained.

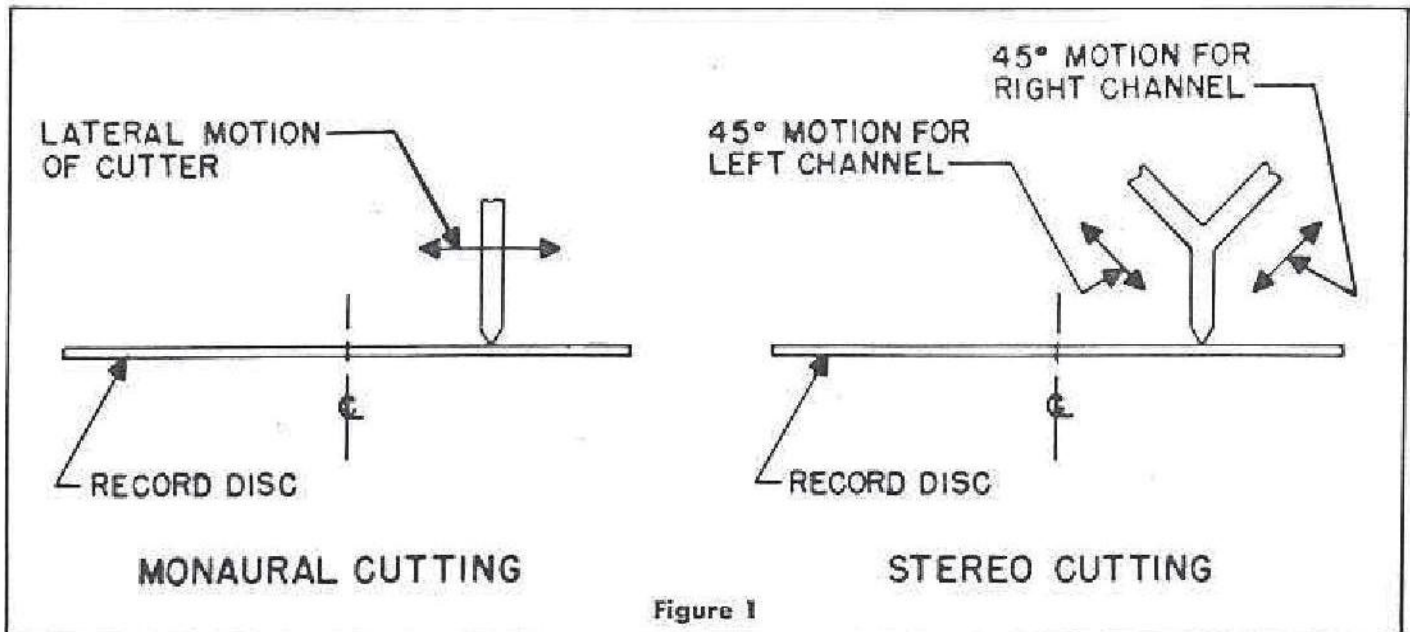
### ■ STEREO SOUND

Stereo sound is 3-dimensional sound. It is recorded with two microphones, two amplifiers, and a 45/45° record cutter which cuts two sound tracks in one record groove. Monaural records are lateral cut; the cutter stylus moves in the plane of the record disk. Stereo records are cut at 45 degree angles to the plane of the record disk. Figure 1 illustrates the principles of record cutting.

The width of groove in a record is a few thousandths of an inch; the importance of care in handling the record to prevent dust or acids from the hands from accumulating is evident. Further, care must be taken to avoid scratching the recorded surface as it results in noise and greater stylus wear.

### ■ THE CARTRIDGE AND STEREO AMPLIFIER

The Rock-Ola Stereophonic Phonographs utilize a pick-up cartridge of advanced design. The pick-up consists of two wafers of barium-titanate which generate a voltage when flexed. The stylus diameter is .0008 inch and tracks at 6 grams force. Figure 2 is the frequency response curve for the cartridge. This particular cartridge, due to its four terminal output arrangement, is suitable for use for all stereo model phonographs with the proper terminal hook-up.



## RESPONSE FROM RIAA CHARACTERISTIC TEST RECORD

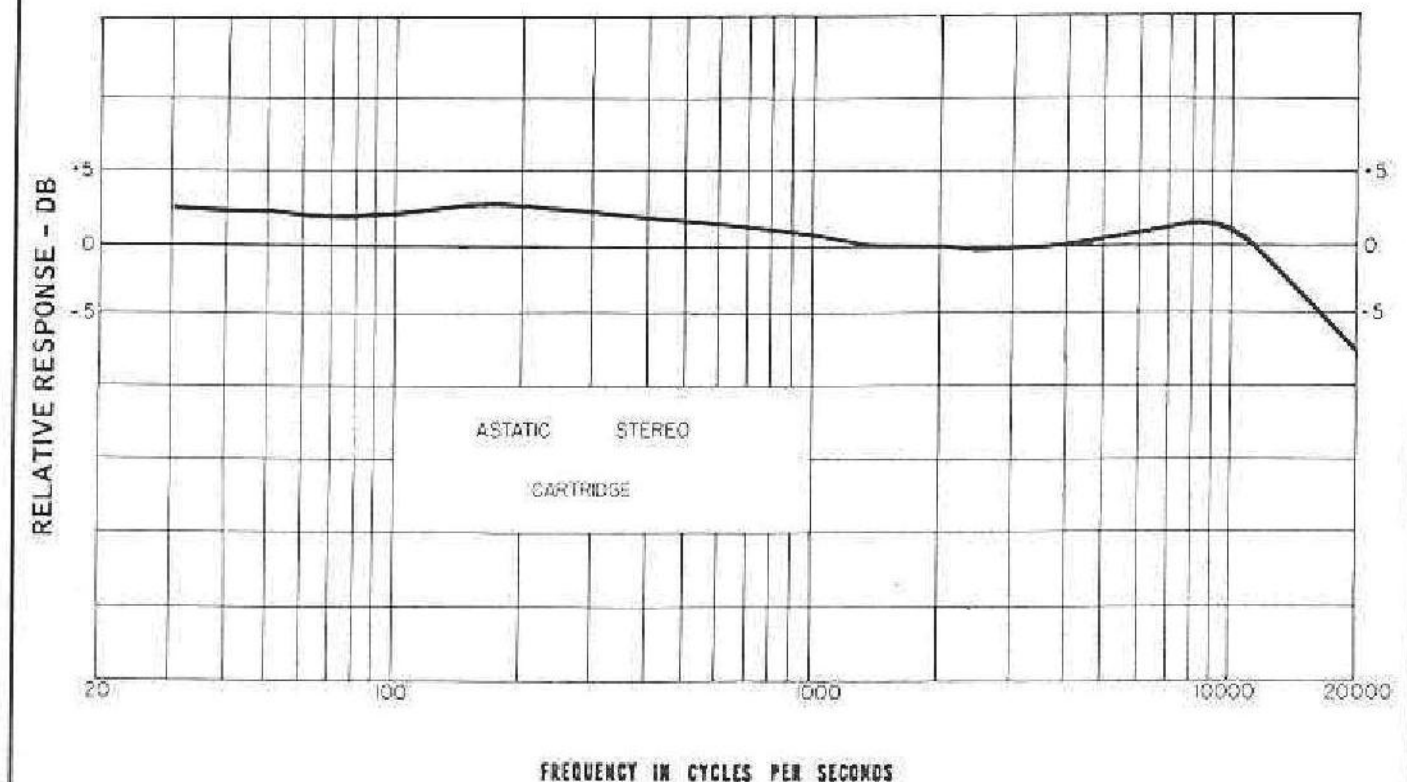


Figure 2.

### ■ THE TURNTABLE

The record is rotated at 45 RPM on a turntable weighing 1 pound and 2 ounces, which is supported by a steel ball pressed in a bronze bushing. The mass of the turntable, associated

with a high-quality, 4-pole motor results in uniform speed, and in negligible vertical rumble, important for clean stereophonic reproduction.

### ■ THE STEREO AMPLIFIERS

The Rock-Ola Stereophonic Phonograph has a two channel amplifier, for the left and right signal channels from the stereo cartridge. These two amplifiers are mounted on a single chassis, with operating controls for both channels ganged to maintain balanced output (equal gain) and tone range from the two channels.

Page 55 is a functional diagram of the two amplifiers.

Note that each channel signal from the stereo cartridge is amplified by one triode of a 12AU7 twin triode. Each signal is then fed to a voltage amplifier section of a 6CY7 and a cathode follower arrangement of the 6CY7.



The low impedance cathode follower permits use of a volume control up to a hundred feet from the phonograph without excessive hum or other extraneous pick-up. The cathode followers also drive thermistor controlled AVC feed-back loops to the voltage amplifier sections of the 6CY7. The thermistors for each

channel are matched-pairs to preserve channel balance. As will be noted on the accompanying AVC input-output characteristic, Figure 3, the dynamic range of the recorded music is preserved, but the average level of the output for different records is kept within an optimum range by this circuitry.

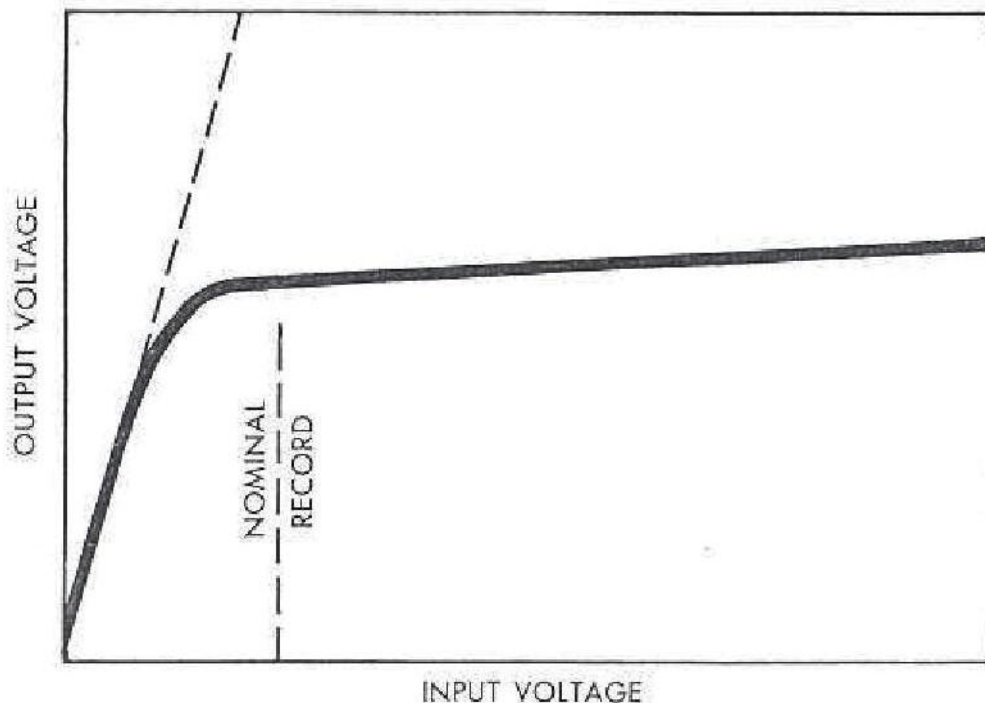


Figure 3.

Because of manufacturing tolerances of tubes, resistors, capacitors, and the thermistors, the overall gain from the input of the 6CY7 to the output from the volume control will vary between left channel and the right channel. It is necessary to balance these left and right signals with a 100 K ohm balance potentiometer.

The bass and treble controls are close tolerance potentiometers and capacitors, and are ganged for ease of setting and to preserve the balance between channels. A 12AX7 is used as a voltage amplifier and a 12AU7 as a phase splitter to drive push-pull 6973 power amplifiers. Negative feed-back from the secondary to the output transformer to the 12AX7 cathode help to reduce distortion.

Each amplifier channel is capable of providing 20 watts output or 40 watts total from both.

Each stereo amplifier chassis is provided with a muting relay and associated muting socket. The muting circuitry blocks both ampli-

fiers during all cycles but the music cycle of operation.

Filament power and 150 volts AC power are provided from the power distribution panel. A voltage doubler circuit utilizes silicon rectifiers and a total of 400 microfarads of electrolytic capacitors; this circuit is protected by a one-ampere "slo-blo" fuse.

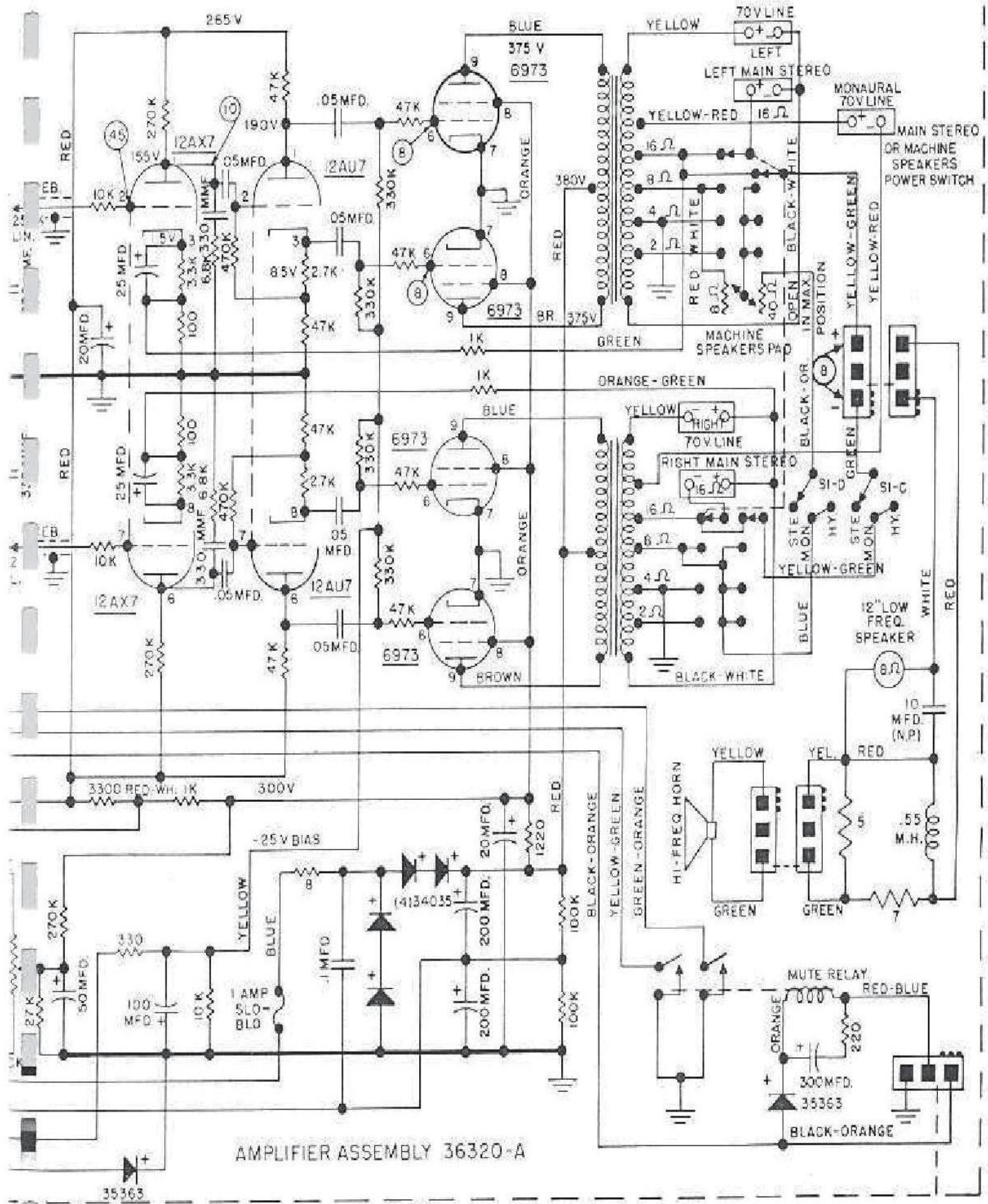
Each output transformer has its multi-tapped secondary connected to a terminal strip for 16 ohm stereo speakers, 70 volt line transformer speaker cabinets, and to a receptacle for the machine speakers. Tap switches are provided to match the impedance of the speaker or to adjust the load distribution. The 70 volt terminals are provided for speakers to be installed over 150 feet from the amplifier. A complete explanation of the various operating modes appears on pages 58, 59 and 60.

If a remote volume control and cancel switch is desired under the bar, the Model 1950 Stereo Remote Control may be installed in place of the control on top of the phonograph.









## ■ SERVICING AND ADJUSTING OF AMPLIFIERS

Figure 5 is a complete schematic of the stereo amplifiers. All DC voltages and AC voltages for 0.18 volts input are shown on the schematic for ease of servicing and adjustment.

It has been estimated that 90 percent of the troubles occurring with phonograph audio systems may be corrected in the field. A large proportion of the troubles will be with tubes.

All other components should give a long, trouble-free life. If a filter capacitor should short, the one-ampere "slo-blo" fuse will blow. Other "solid shorts" will blow this fuse and it will be necessary to locate the short through inspection and voltage checks.

The volume, treble and base controls may be set to suit the location acoustics.

If audio system troubles cannot be corrected in the field, the amplifier should be checked in a shop with a DC VTVM, AC VTVM, audio generator and cathode-ray oscilloscope.

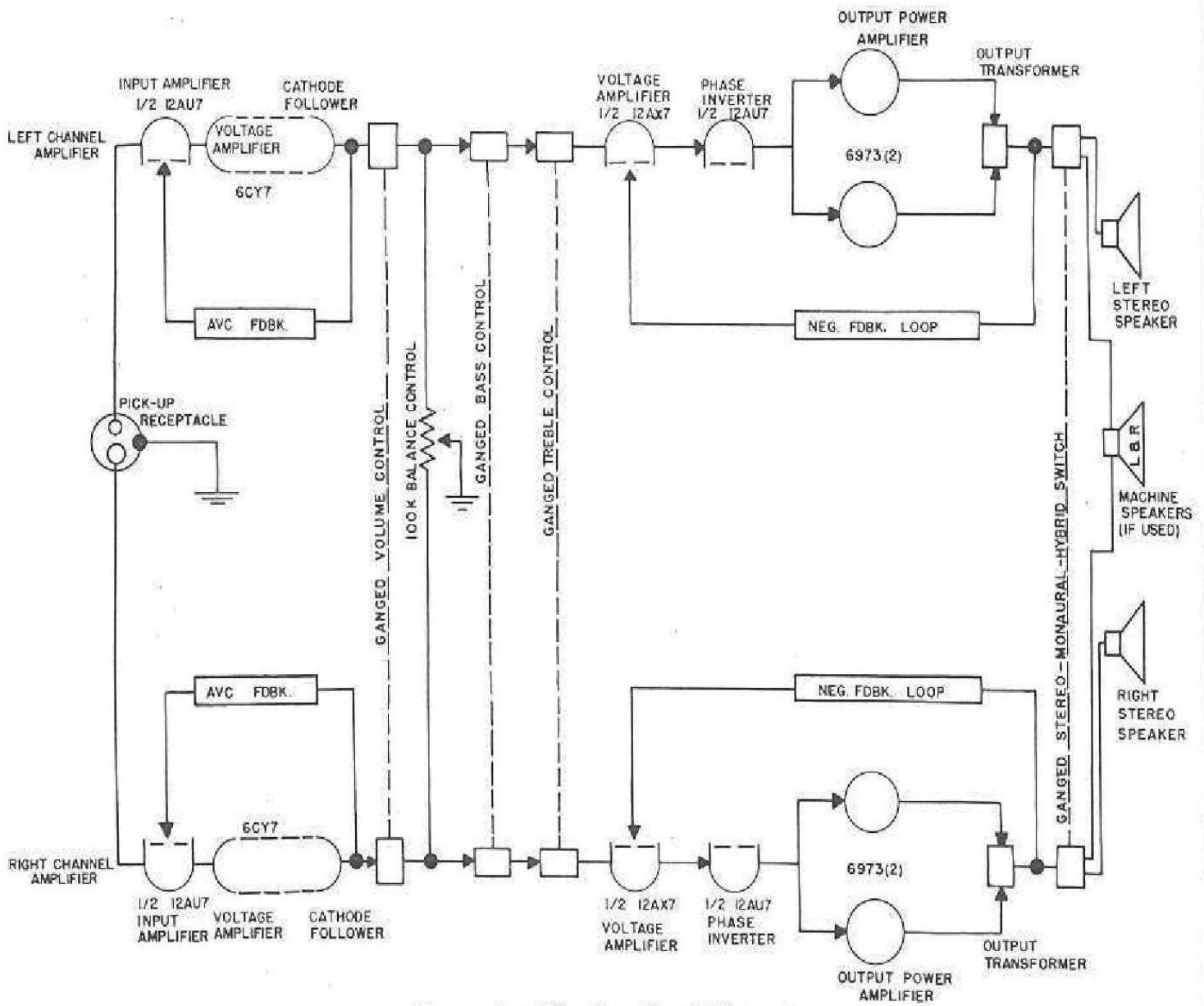
To adjust the balance control, turn the volume control and the treble and base controls to maximum, the power switch to 25 watt position

and the Stereo-Monaural-Hybrid switch to Stereo, AVC switch to ON. Using the RMC test record, or any equivalent having stereo modulation of 5.5 cm/sec. at 1000 cps. Although, it is recommended that a test record with the proper recording level be used for adjustments, thereby including the pick-up cartridge variations, an audio generator signal of 0.18 volts may be substituted if desired. Adjust the balance control to provide 8 volts across each of the 16 ohm output terminals, loaded, not to ground. Use the Main Stereo output terminals for this purpose.

When the balance is achieved, the lock nut on the control should be tightened. In similar fashion the AC voltages (shown in circles) at different points in the amplifier may be checked. A cathode ray oscilloscope should be connected to the 16 ohm output leads to check the linearity of each channel.

The operating points of the various stages are determined by the DC voltages and the cathode and load resistors associated with the stage. Distortion, incorrect gain, and other troubles may be isolated through stage by stage measurements of the DC voltages on tubes with a DC VTVM.





Stereo Amplifier Functional Diagram

## ■ THE STEREO LOUDSPEAKER SYSTEM

Cocktail lounges, neighborhood taverns, restaurants, and other public places vary greatly in size, layout of equipment and decor. It is evident to Rock-Ola engineers that the most important consideration in the application of stereo sound to locations is flexibility and ease of loudspeaker placement.

In most locations there is a "best place" for the eye-appealing phonograph, but this "best place" may not be the ideal place for stereo sound. Further, the sound from a phonograph cabinet can only be matched or acoustically balanced with sound from a similar cabinet on the floor.

A second floor cabinet takes up valuable floor space even when it can be properly placed. Booths and other location furniture usually preclude the use of a second floor cabinet.

These problems led Rock-Ola engineers to design two separate loudspeaker cabinets for

acoustic balance of the two sound channels and for flexibility of placement in widely varying locations. This has the further advantage that full stereo sound can be had in several different rooms since the speakers are independent of the machine.

The acoustic characteristics of locations vary according to the following:

1. Size
2. Shape (length, width and height of ceiling)
3. Materials (rugs and drapes "deaden" a room)

Obviously, with the many variables involved, only a stereo sound system with complete flexibility in both phonograph and loudspeaker placement can satisfy all locations. The Rock-Ola Stereophonic Phonograph has been designed for such flexibility and for acoustic balance.

## ■ INSTALLATION OF ROCK-OLA STEREO SOUND

The placement of the two stereo loudspeakers should be preceded by consideration of the principles of stereo recording and reproduction. When a "live" orchestra is playing, the sound has three dimensions; some of the instruments are on the left, others on the right, and some are in the back or have "depth". This sound "field" may be recorded

with two microphones separated a certain distance apart. To reproduce the sound "field" it is necessary to separate the two loudspeakers. Figure 6 illustrates the desired method of separation. The wide dispersion angle of the Rock-Ola stereo loudspeakers provide maximum sound coverage in the location.

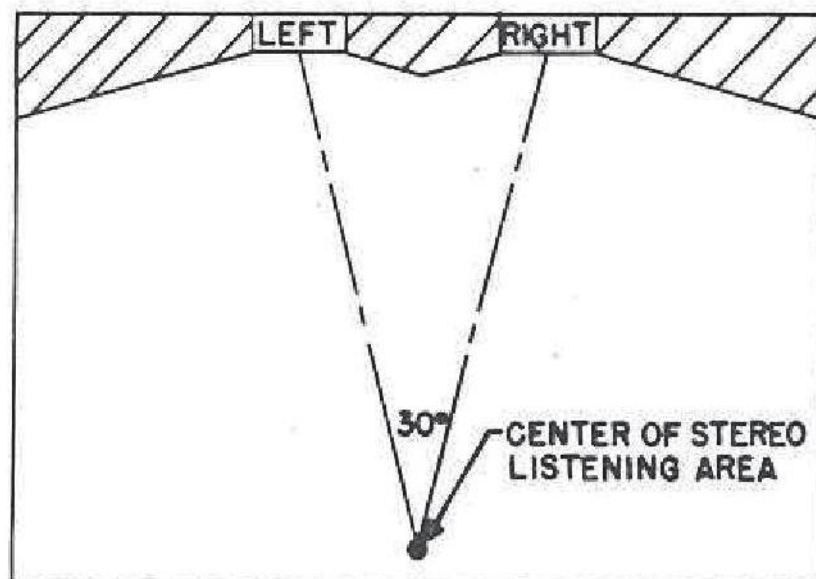
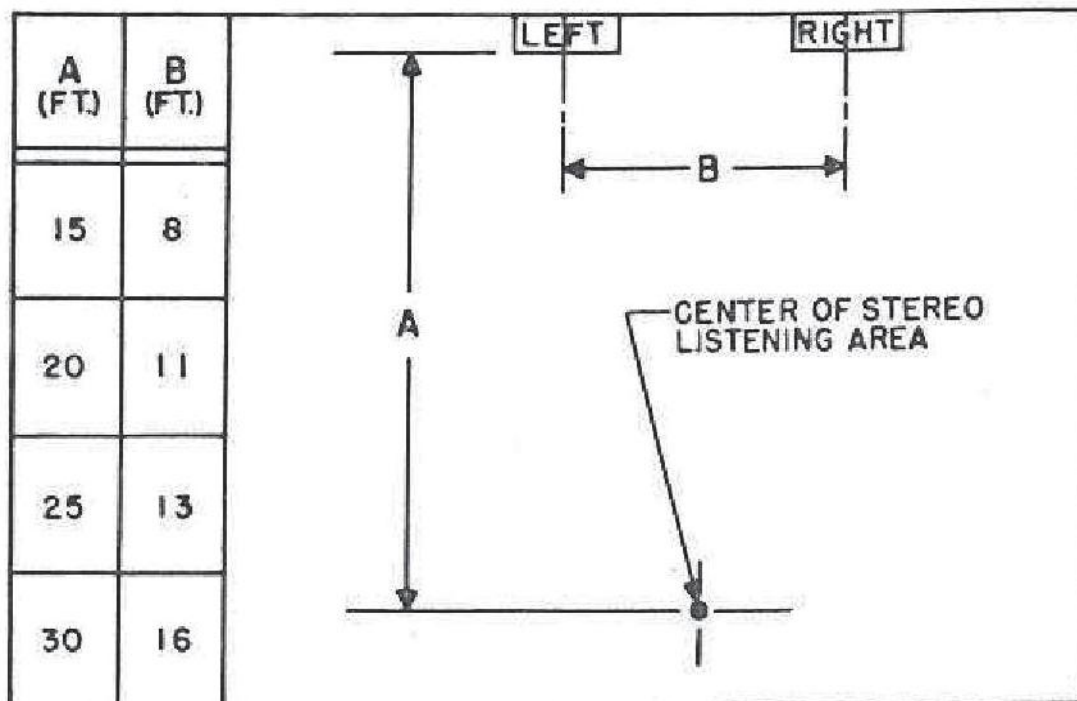


Figure 6.



In general, the loudspeakers should be separated 8 feet or more and placed on the same wall; the included angle between the center of the stereo listening area and the two loud-

speakers should be about 30 degrees. The following table will serve as a guide for determining the separation of loudspeakers for any listening area.



Examples will serve to illustrate application of the principles for stereo loudspeaker placement. A square room, 40 feet x 40 feet, often will have most of its customers on one side.

The speakers may be placed on the wall next to the area of least customer concentration. The distance from this wall to the center of the listening area is about 25 feet; from the table it is determined that the speakers should be separated 13 feet for the best stereo effect over the greatest listening area.

Very large rooms, odd-shaped rooms, and other locations will require several sets of stereo loudspeakers. Placement should be determined as the result of experimentation for best stereo sound.

If the speakers are farther than 150 feet from the phonograph, they should be connected

to the 70 volt speaker terminals on the amplifier and 70 volt line to speaker transformer obtained for the stereo speaker cabinets. The output from each amplifier output transformer must be connected to the corresponding right and left loudspeaker cabinets. Ordinary rubber-covered lamp cable may be used, with a continuity check to determine that the conductor to be soldered to the plus terminal on the cabinet is also connected to the plus terminal in the amplifier. This will assure proper phasing of the speakers.

Each stereo speaker cabinet contains a 12-inch woofer, crossover network, and a compression-driver-horn-tweeter. The hanger brackets for the cabinets have been reversed to facilitate packaging for shipment. It is necessary to remove their screws with a Phillips screwdriver to properly place the brackets for hanging the cabinets on walls.

## ■ STEREO OPERATION

1. Set "Stereo-Monaural-Hybrid" switch in Stereo position. This disconnects the machine speakers and the "machine speakers pad" and alters the amplifier frequency response for use with wall type speakers.
2. Connect speaker sets or combinations thereof as shown in table below. The left and right indicated on the amplifier refer to left and right as seen from the listening area and have no relation to the phonograph. Proper phasing of the speakers is made by means of plus (+) and minus (-) markings

on all amplifier output terminals and by similar markings on all RMC stereo wall speakers. Connect (+) terminals on the amplifier to (+) terminals on the speakers, and the (-) amplifier terminals to (-) speaker terminals. Always use the terminals on the boards; do not attempt to use chassis ground as the (-) terminal and do not tie the minus (-) terminals of the two channels together; they are not common. The same applies to the left and right plus (+) terminals.

(See Schematic for details.)

Number and Type Speakers Used	Connect Speakers as Indicated	Main Stereo or Machine Speakers Power Switch Position
One Pair 16 ohm Stereo Speakers	Left and Right Main Stereo (16 ohm) Output Terminals	25 Watt
Two Pair 16 ohm Stereo Speakers	Left and Right Main Stereo (16 ohm) Output Terminals	12 Watt
Three or Four Pair 16 ohm Stereo Speakers	Left and Right Main Stereo (16 ohm) Output Terminals	8 Watt
One Pair 16 ohm Stereo Speakers	Left and Right Main Stereo (16 ohm) Terminals	Adjust for desired volume balance between 16 ohm Speakers and 70 volt Speakers. Add the wattages shown on the switch positions of all 70 volt Speakers to that shown on machine Speakers Power Switch. The total must not exceed 25 Watts. NEVER USE THE 25 WATT POSITION WHEN USING more than 1 set of Stereo Speakers.
and one or more pair of 70 volt Stereo Speakers.	Left and Right 70 volt Line Terminals	



## ■ MONAURAL OPERATION

1. Set "Stereo-Monaural-Hybrid" switch on Monaural position. \*(See Note 1 below)
2. Rotate the "Machine Speakers Pad" to the MAXIMUM (full clockwise) position. The construction of this control is such that at MAXIMUM setting, the shunt leg of the pad is open-circuited. Failure to follow this instruction will result in an undesirable loss occurring in the pad thereby reducing the power available to the speakers.
3. Connect auxiliary speakers as shown in table. Never tie the left and right plus (+) or minus (-) terminals together; they are not common and must be kept separate; likewise do not ground any terminals to chassis ground. (See Schematic for details.)

Number and type of Speakers Used	Connect Speakers as Indicated	Main Stereo or Machine Speakers Power Switch Position
Machine Only (No additional speakers)		25 Watt
Machine and one or more 70 Volt Speakers. (See Note 2 below.)	Connect Speakers to 70 Volt Monaural line terminals.	Adjust for desired volume balance between machine and 70 Volt speakers. Add wattages shown on the switch position of all 70 Volt speakers to that of Machine Speaker Power Switch. The total must not exceed 25 watts. Never use the 25 watt position when using extra speakers.

\*NOTE 1: In certain instances where the machine is operated ONLY at low volume levels and more bass response is desired, the "Stereo-Monaural-Hybrid" switch may be set in the hybrid position. This affords some additional bass boost. DO NOT use at high volume levels.

NOTE 2: It is possible to use 16 ohm stereo speakers as extensions up to 150

feet from the machine, but this type of operation is not recommended as no volume level adjustments may be made other than the main volume control on the machine. Preferred installation requires the use of the 70 volt speaker cabinets as each contains a switch for level adjustment independent of the "Machine Speakers Pad".

## ■ HYBRID OPERATION

1. Set "Stereo-Monaural-Hybrid" switch to Hybrid position. This mode of operation is intended for simultaneous playing of the machine speakers and one or more pairs of stereo speakers in the same room. For best results the stereo speakers should flank the phonograph; the left channel stereo speakers being to the left of the phonograph and the right channel speakers being to the right. With this arrangement the left and right stereo outputs are provided by the stereo speakers and the phonograph speakers reproduce the lateral information from both channels. This means the phonograph speakers reproduce the "body of the music", and do not reproduce the "Stereo Portion", which is the function of the wall speakers.
2. Connect the main stereo and auxiliary speakers (if used) as shown in table and set the various controls as indicated. Do not tie the left and right plus (+) and minus (-) terminals together; they are not common and must be kept separate; likewise do not ground any terminals to chassis ground. (See Schematic for details.) Be sure that all plus (+) and minus (-) amplifier terminals go to the corresponding (+) and (-) terminals on all RMC stereo speakers; failure to observe this will result in out-of-phase condition between the machine and the flanking stereo speakers. For speakers of other manufacturers, the positive (+) terminal is that which will cause the speaker cone to move outward upon application of a small positive potential.

(Use 1.5 volt flashlight battery)

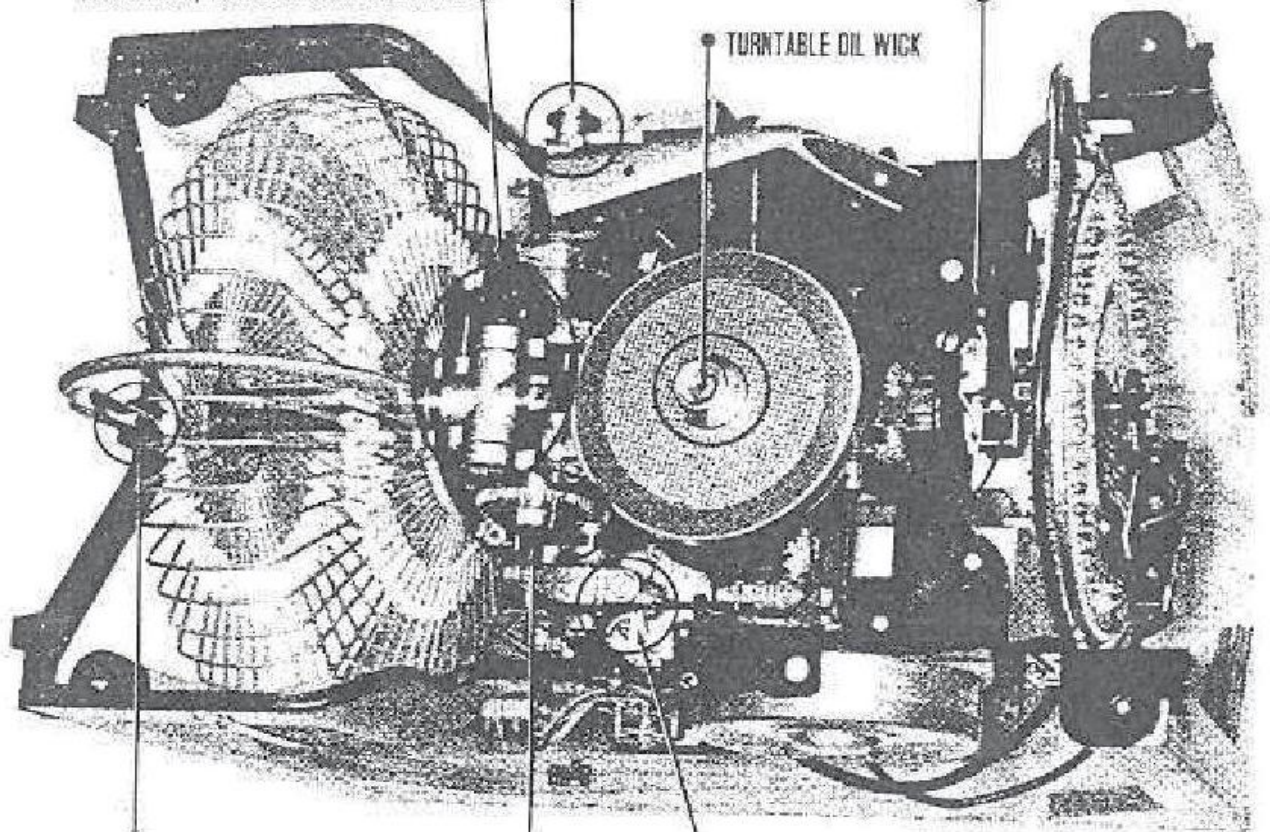
Number and type of Speakers Used	Connect Speakers to Terminal Boards as Indicated	Main Stereo or Machine Speakers Power Switch Position	Machine Speakers Pad Adjustment
Machine plus 1 pair 16 ohm Stereo Speakers in same room.	Left and right main Stereo (16 ohm) output Terminals	12 Watt	Adjust for desired balance between machine and 2 Flanking Stereo Speakers.
Machine plus 2 pair 16 ohm Stereo Speakers in same room.	Left and right main Stereo (16 ohm) output Terminals	8 Watt	Adjust for desired balance between machine and 4 Flanking Stereo Speakers.
Machine plus 1 pair 16 ohm Stereo Speakers in same room.	Left and right main stereo (16 ohm) output Terminals	Use either 8 or 4 watt position-which ever results in desired balance between rooms. Do not use 12 or 25 watt setting.	Adjust for desired balance between machine and 2 Flanking Stereo Speakers.
plus one or more pair 70 volt speakers in other room.	Left and right 70 volt output Terminals		



WEARING SURFACES ON GRIPPER MECHANISM, TURNOVER CAM AND GEARS

MICRO CAM AND LEVERS

DRIVE GEARS



TURNTABLE OIL WICK

MAIN SHAFT BEARING REAR (3 DROPS)

GRIPPER DRIVE GEARS

GRIPPER MOTOR (2 PLACES)

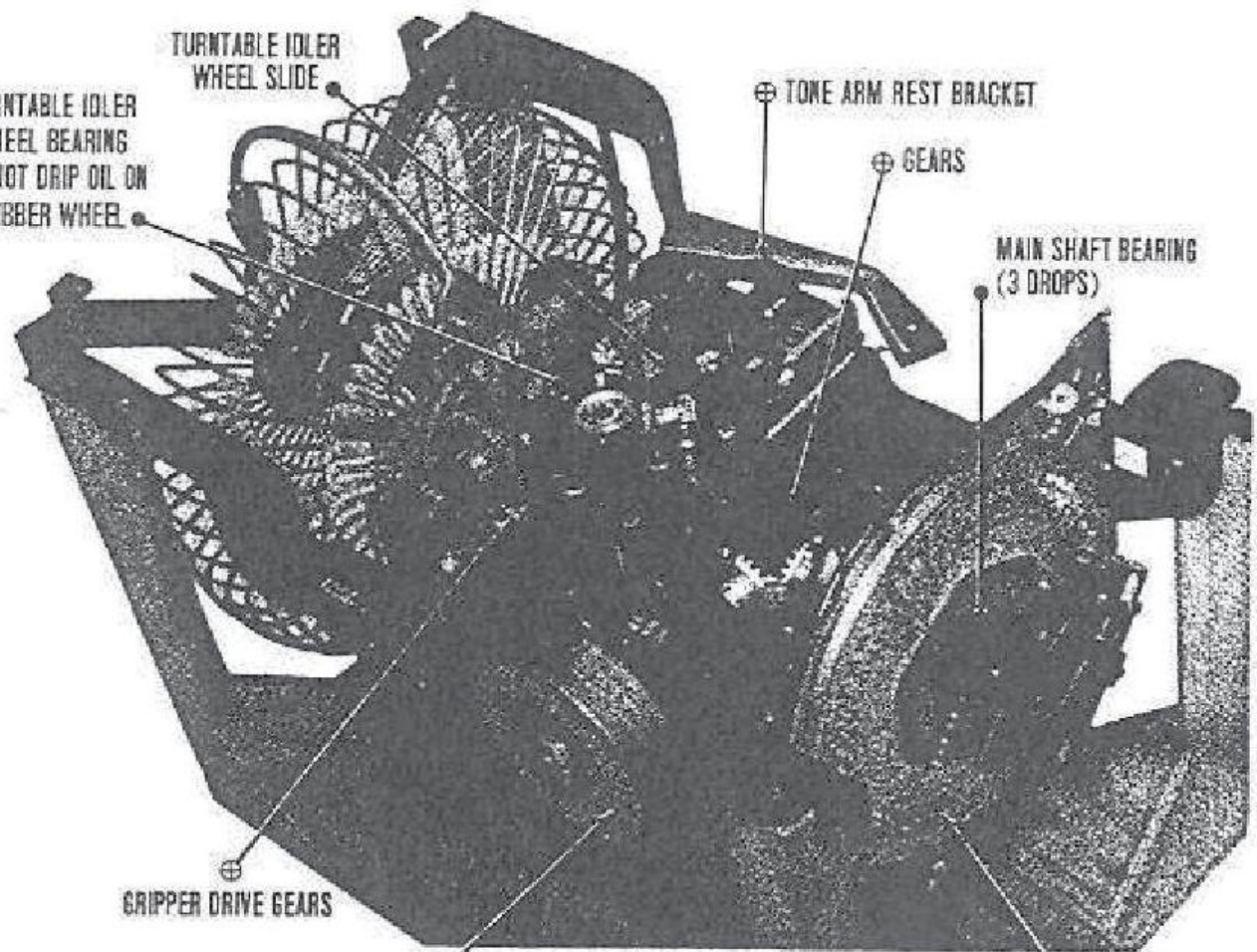
TURNTABLE IDLER WHEEL SLIDE

TURNTABLE IDLER WHEEL BEARING DO NOT DRIP OIL ON RUBBER WHEEL

⊕ TONE ARM REST BRACKET

⊕ GEARS

MAIN SHAFT BEARING (3 DROPS)



⊕ GRIPPER DRIVE GEARS

× DO NOT OIL COUNTER INDICATOR FINGERS

× SELECTOR LEVERS

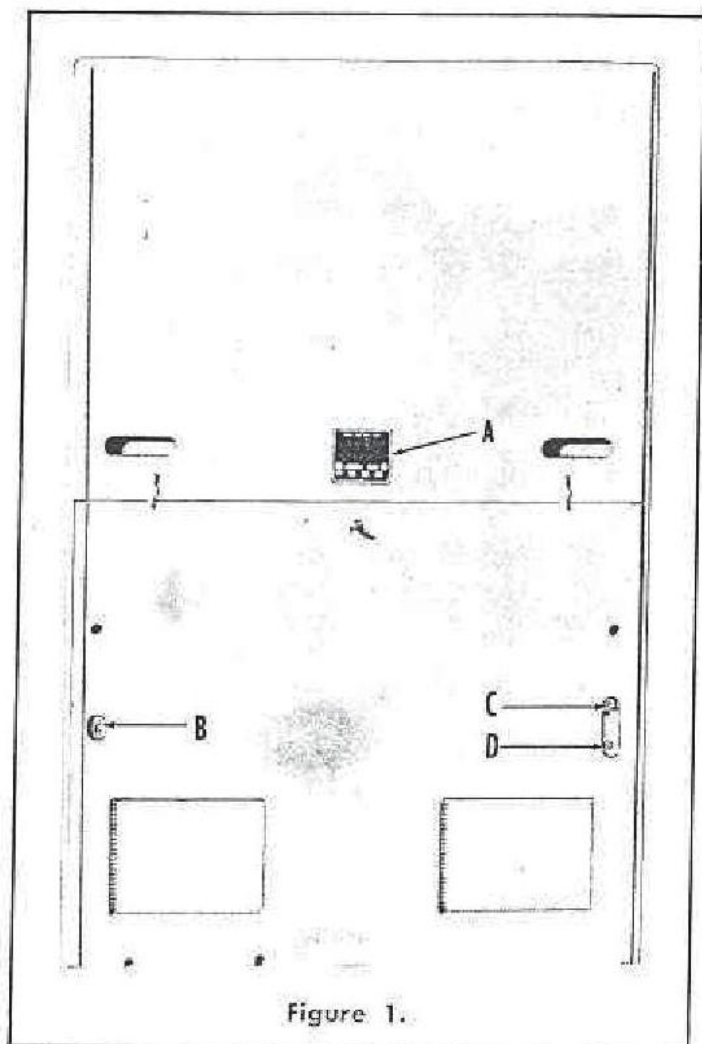


Figure 1.

### 117 V. LINE CORD

Check your location's power line outlet before plugging in the phonograph. The outlet should meet the requirements stamped on the serial plate (A-Fig. 1) affixed to the rear of the phonograph cabinet.

### POWER AND LIGHT SWITCH

The master line switch (B-Fig. 1) is located on the rear of the cabinet.

Up position - ON  
Down position - OFF

This switch controls all the power to the mechanism, amplifier, and lights. Credits will not accumulate if coins are inserted when the master line switch is "OFF".

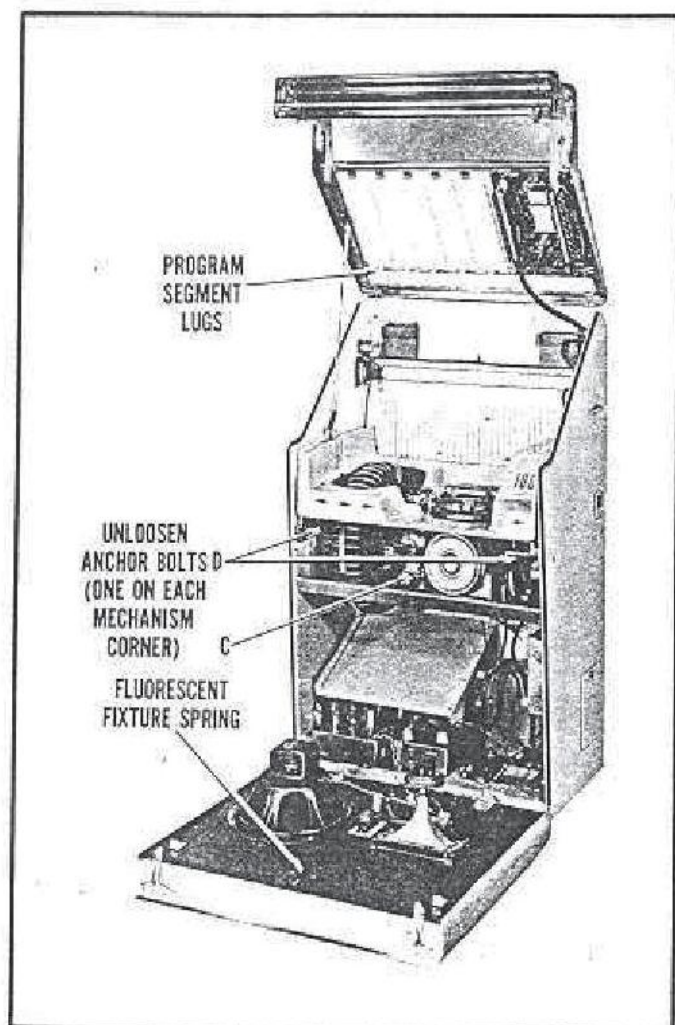
### REJECT SWITCH

The reject switch (C-Fig. 1) is located on the rear of the cabinet. To reject a record that is playing, depress this button momentarily.

### VOLUME CONTROL

Volume is adjusted with the slotted shaft (D-Fig. 1) located directly below the reject switch. Use the key supplied or a small screwdriver.





### ■ MECHANISM ANCHOR BOLTS

The four anchor bolts (D-Fig.2) must be unscrewed to about 3/8" below their chassis seats before operating the phonograph. However, these bolts must be tightened whenever the phonograph is to be transported.

### ■ SERVICE SCAN SWITCH

The service scan switch (C-Fig.2) may be used at any time to stop the mechanism at any point of its operation. When servicing is complete, though, the switch must be left in the "operate" position or the mechanism will not function.

Moving the service scan switch left to the "scan" position causes the magazine to rotate. Releasing the switch will stop the magazine in any position convenient for insertion or removal of records.

### ■ MAGAZINE—INSERTION OF RECORDS

As already stated, the magazine can be caused to rotate without interruption by holding the scan switch to the left; however, the gripper arm must be in the standby position (arm over the magazine) for the scanning to take place.

The process of loading the magazine involves scanning a short distance, inserting several records, scanning again, inserting more records, etc.. Care must be taken, of course, to assure that the record locations match the title strip programming.

### ■ INSERTION OF TITLE STRIPS

Open the dome and lift out the program segments by pulling on the segment lugs. Each flat program segment is held in place by a wire spring.

Insert title strips into the program segments, and clip the segments back into place.

NOTE: Programming may be categorized. If categories are desired for Hits Tunes, Westerns, etc.

### ■ LIGHTING

One 20 watt fluorescent tube supplies lighting for the upper cabinet section. This fluorescent tube is exposed when the cabinet dome is raised. The starter and ballast are mounted to the left of the tube.

Door lighting is supplied by a 15 watt fluorescent. The starter and ballast are mounted between the two speakers at the rear of the front door.

### ■ REPLACEMENT OF FLUORESCENT TUBES

Front door fluorescent: Raise dome and pull door latches forward. Allow the door to tilt. A fluorescent fixture spring latch can be seen. Hold the fluorescent fixture and depress downward on the fixture spring. This releases the hinged fixture and fluorescent tube is fully accessible.

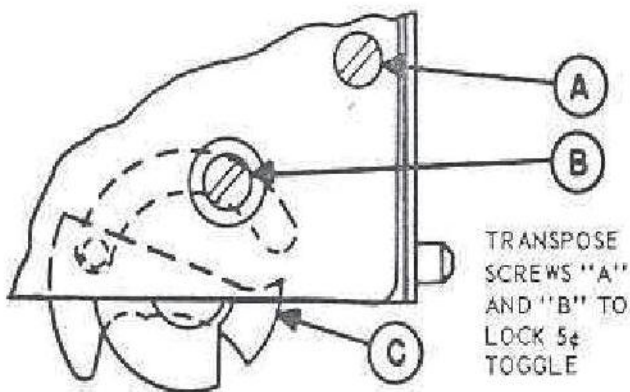
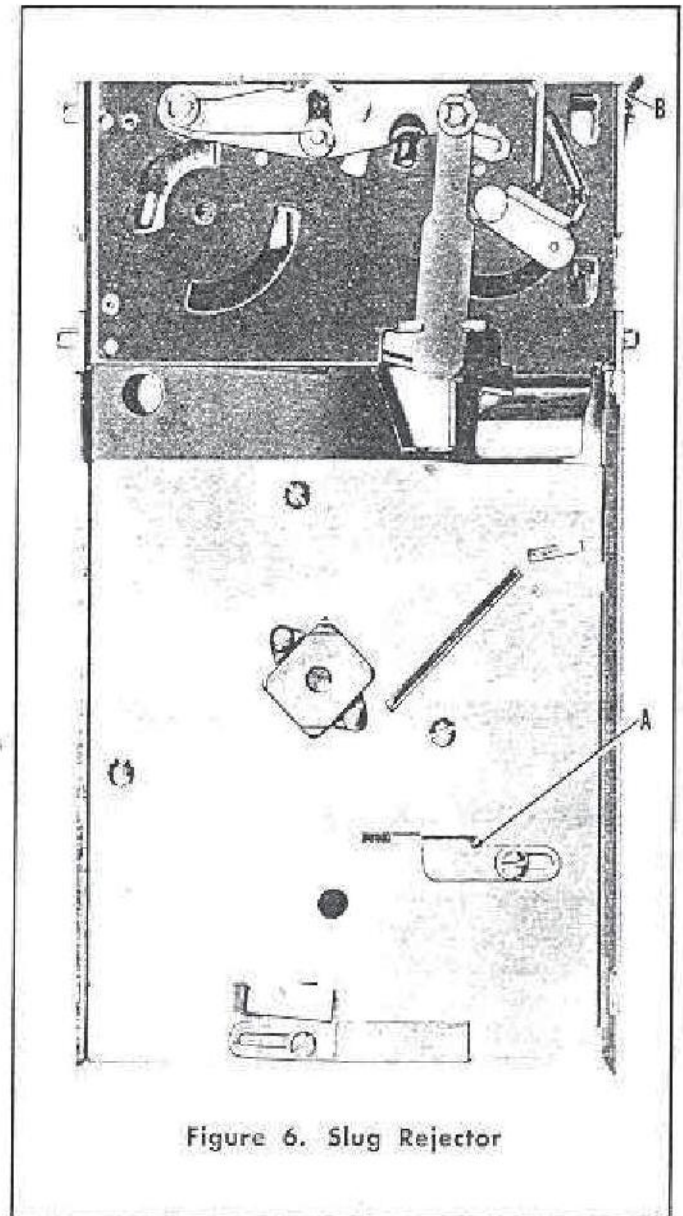
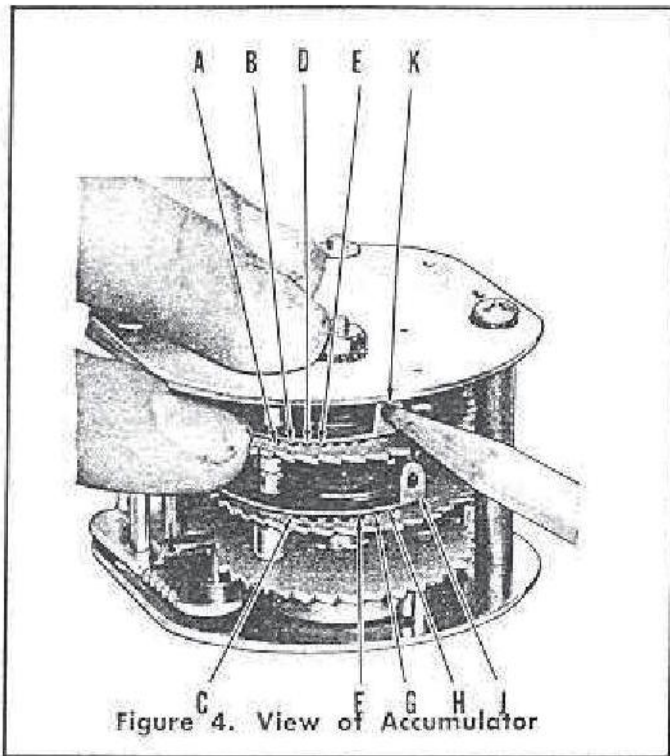


Figure 5. Double 5¢ Toggle (on Slug Rejector)



## ■ COIN CONVERSION INSTRUCTIONS

NOTE: MODEL 1493 IS PRE-SET AT THE FACTORY FOR "ONE PLAY FOR 2 NICKELS OR ONE DIME, THREE

PLAYS FOR A QUARTER, AND SEVEN PLAYS FOR A HALF-DOLLAR."

### ■ ACCUMULATOR AND SLUG REJECTOR ADJUSTMENTS:

1. "1 PLAY FOR 2 NICKELS OR ONE DIME, 3 (OR 4) PLAYS FOR A QUARTER, AND 8 (9 OR 10) PLAYS FOR A HALF-DOLLAR."
  - A. The upper ratchet on the accumulator, is the "quarter ratchet". If 4 plays for a quarter are desired, insert a pointed tool into the ear of the wafer (K-Fig. 4) on the upper ratchet, and lift slightly raising the wafer pin from the 3 play hold (A-Fig. 4). Keep the ratchet wheel from rotating and move the wafer until the pin drops into the 4 play hole (B-Fig. 4).
  - B. The center ratchet is the "half-dollar ratchet". Insert a pointed tool into the ear of the wafer (J-Fig. 4) on the center ratchet, and lift slightly raising the pin from the 7 play hole. Keep the ratchet from rotating and move the wafer until the pin drops into the 8 play hole (F-Fig. 4), or the 9 or 10 play holes (G, H-Fig. 4).
  - C. Leave the pricing switch, on the accumulator, in the 10¢-25¢ & 50¢ position.
  - D. Replace the pricing tab with one to match the chosen pricing combinations.
2. "1 PLAY FOR 2 NICKELS OR ONE DIME, AND 3 (OR 4) PLAYS FOR A QUARTER."
  - A. Remove complete slug rejector unit. (Move the lever on the front of the main slug rejector housing, and lift the rejector up.)
  - B. Bend the spring (B-Fig. 6) outward and lift out the top 50¢ rejector unit; then take out the lower unit exposing the inside of the housing, which is part of the 50¢ rejector. Loosen the screw at A in figure 6, move the lever all the way to the left, and retighten the screw. This will cause 50¢ coins to be rejected.
  - C. Return both slug rejectors units to their housing, and return this complete rejector to the main housing on the phonograph cabinet.
  - D. Leave the center ratchet, on the accumulator, as it is. But if 4 plays for a quarter are wanted, move the upper ratchet wafer pin to the 4 play hole. (See Section 1.A. above.)
  - E. Leave the pricing switch in the 10¢-25¢ & 50¢ position.
  - F. Replace the pricing tab with one to match the chosen pricing combinations.
3. "1 PLAY FOR A NICKEL, 2 PLAYS FOR A DIME, AND 5 PLAYS (OR 6) FOR A QUARTER".
  - A. Remove the complete slug rejector unit from the phonograph, and adapt it to reject 50¢ coins. (See sections 2A, and 2B above.)
  - B. Figure 5 shows the lower right hand corner of the 5¢ - 10¢ - 25¢ rejector. Place the toggle (C-Fig. 5) as shown, and then switch the positions of the two screws (A, B-Fig. 5) so that the longer screw goes into the hole at B. This permits each nickel to register 1 play.
  - C. Return the complete slug rejector unit to the main housing on the phonograph cabinet.
  - D. Move the pricing switch to the 5¢ - 10¢ - 25¢ position. This converts the center ratchet from a "half-dollar ratchet" to a "dime ratchet".
  - E. Insert a pointed tool into the ear of the wafer on the center ratchet and lift slightly. Keep the ratchet from moving, and move the wafer until the pin drops into the 2 play hole (C-Fig. 4). In the same manner, move the wafer pin on the upper ratchet to the 5 (or 6) play hole (D, E-Fig. 4).
  - F. Replace the pricing tab with one to match the chosen pricing combinations.



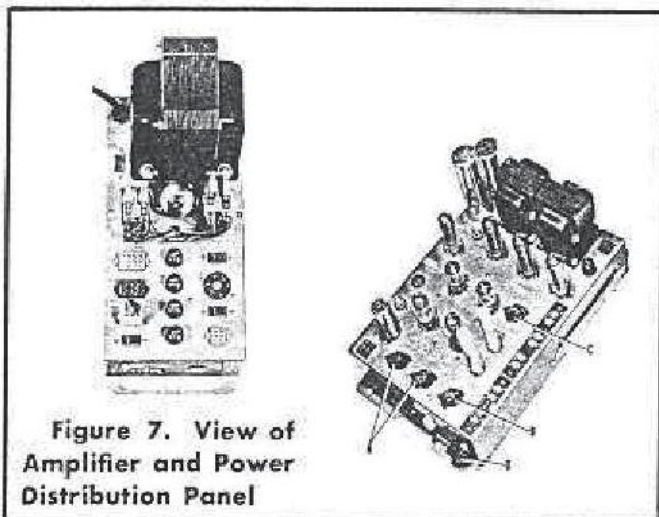


Figure 7. View of Amplifier and Power Distribution Panel

## ■ AMPLIFIER

The amplifier in this machine is a dual purpose Stereophonic - Monaural amplifier. It may be used monaurally through the machine speakers and remote speakers, or stereophonically through a set, or sets, of stereo speakers.

1. Check the tubes, make sure they are tight in their sockets.

CAUTION: Tubes should never be removed when the phonograph is on.

2. There are several controls on the amplifier, some of which require explanation.

A. The "Bass" and "Treble" controls are quite ordinary, and should be set to give the desired type of sound.

B. The "Stereo-Monaural-Hybrid" switch (A-Fig.7) directs the amplifier output in the following ways:

STEREO position: This position disconnects the machine speakers and directs the output to the two stereo channels only.

MONAURAL position: This position combines the two stereo channels into one and directs this output to the machine speakers and/or remote speakers.

## ■ PHONOGRAPH CYCLE OF OPERATION

The phonograph cycle begins with the dropping of a coin which accumulates plays on the master ratchet wheel in the accumulator assembly. This allows a credit switch to close a circuit to the push button "LOCKING SOL-ENOID". Its purpose is to keep the depressed "NUMBER" and "LETTER" push buttons in

HYBRID position: This position directs the stereo output into the two stereo channels, and also combines these channels into one channel to feed the machine speakers.

- C. "Main Stereo Or Machine Speakers Power Switch": This switch controls the distribution of power, and serves to match impedances, between the machine speakers, stereo speakers, and remote speakers. If only the machine speakers are to be used, this switch should be in the "25W" position.

A complete description of this switch, and its uses with stereo and remote speakers, is contained in the service manual section. Refer to the service manual before installing stereo or remote speakers.

- D. "Machine Speakers Pad": This control serves as a separate volume control for the machine speakers. However, two volume controls are undesirable when a machine is used monaurally without remote speakers. For this reason the "Machine Speakers Pad" is not connected when the "Power Switch" is in the "25W" position. Refer to the service manual for a complete description of the uses for this control.

## ■ POWER PANEL

The power panel supplies power to the entire phonograph. Before placing the phonograph into operation, make certain that all plugs are firmly in their sockets.

### SERVICE NOTE:

Operation of the Selector is controlled by a Write-in Relay, Stop Relay and a Current Limiting Lamp. These are located on top side of the Power Panel and protected by a cover. The Play Control Relay and Rectifier are located on the underneath side.

locked position during the sequence which will register a selection on the selector.

The selector consists of a circular slotted disc assembly. From these slots radiate 100 selector levers, one for each record side, arranged in two concentric rows of 50 levers



each. Levers for playing the "A" side of the record are the outer row, and the inner row registers the "B" side of the record. These selector levers extend from both sides of the selector and are pivoted so they can be toggled by two carriage assemblies which rotate around each selector side.

Adjacent to, and fastened to each carriage rotating arm is a bifurcated "WIPER ASSEMBLY" which is in contact with a printed circuit disc. The first selection sequence is referred to as the "WRITE-IN" sequence. The "locked" push buttons actuate switches allowing the "INNER" carriage and wiper assembly to rotate. The function of this wiper assembly is to locate selection circuits on the printed circuit disc that were prepared by the push buttons, and to brake the rotation of the carriage. Simultaneously, the circuit to the "LOCKBAR" solenoid is then opened releasing the locked push buttons, a credit is removed from the master ratchet and the associated blade switches that are actuated momentarily, energize the proper carriage solenoid.

The solenoid operates an arm which strikes a selector lever in its path, raising the opposite end, and in the path of the "OUTER" carriage. The movement of the lever allows a "WOBBLE PLATE" micro switch to close a circuit to the "PLAY CONTROL" relay in the power distribution panel, which turns on the turntable motor, amplifier and magazine motor.

Standby position of the record magazine always remains in a "home" or "zero" position. From this position, the magazine motor will always start the record magazine and selector arm in the counter-clockwise direction. This sequence of operation is referred to as the "READ-OUT" sequence.

Rotation of the magazine continues until a contact on the bottom of the carriage assembly strikes the selected lever in its path. This action closes a circuit to the "INTERLOCK RELAY TRIP COIL" thereby repositioning its associated contact, which will perform two functions simultaneously. It will create a short circuit on the magazine armature which will dynamically brake the motor causing the magazine to stop, and secondly, a circuit is closed to the gripper motor. This revolves the cam shaft and causes the jaws of the gripper arm to grasp the record and proceeds to place it on the turntable.

During the rotation of the magazine a mechanical action took place that determined the proper positioning of the record gripper for either the "A" or "B" side of the record.

On the extreme end and to the right of the tone arm, the rotating cam operates the last micro switch, referred to as "NO. 1 MICRO". This disconnects the magazine motor armature.

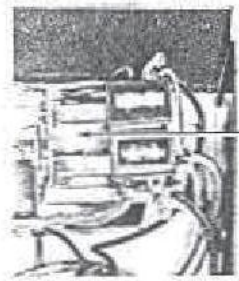
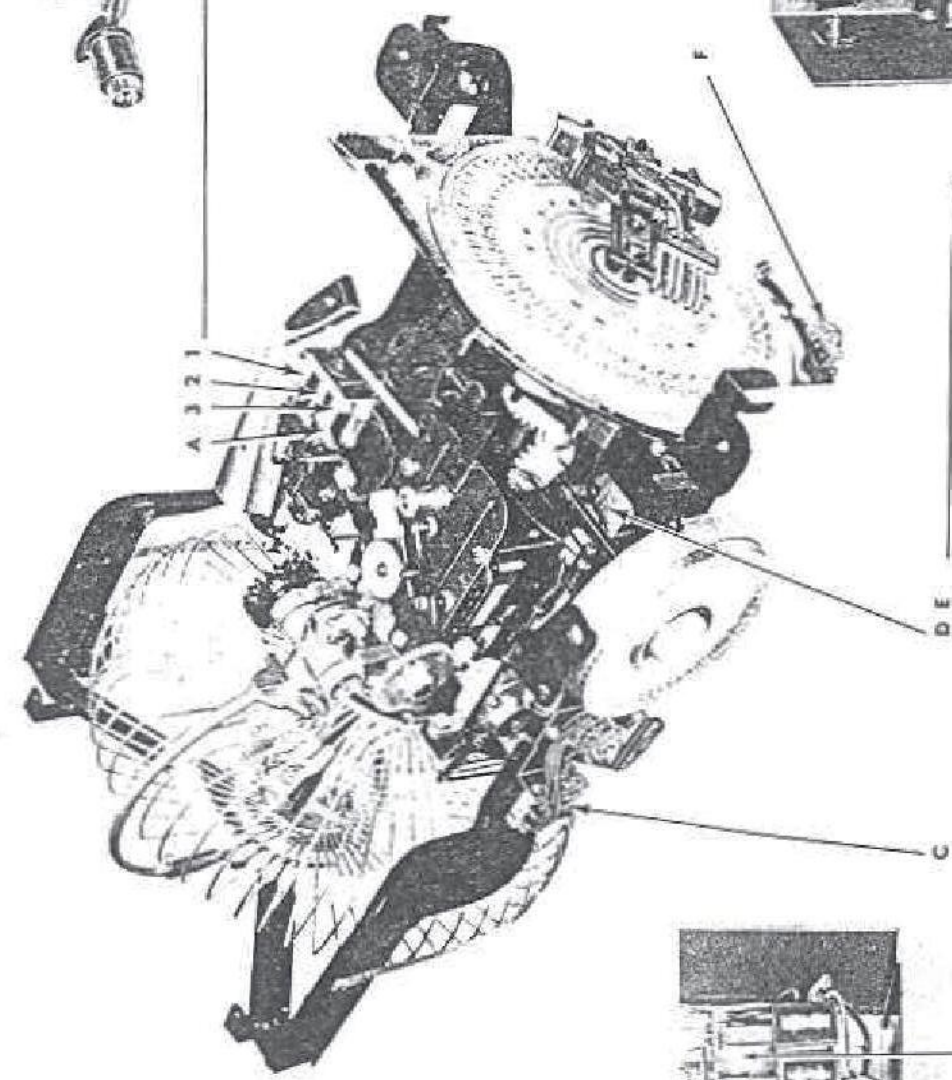
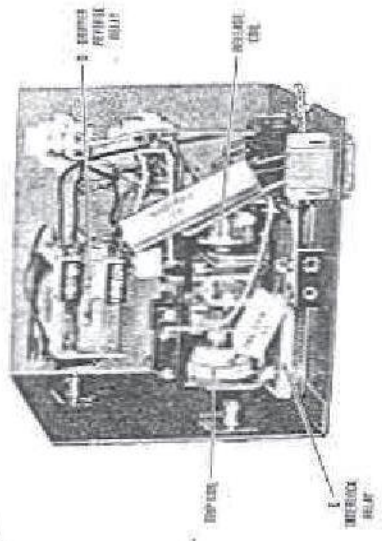
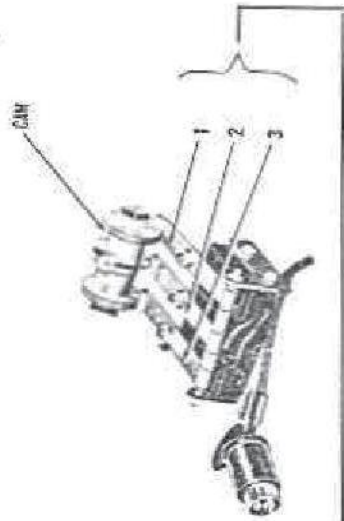
Then, the center or "NO. 2 MICRO" switch lever falls into the groove of the cam. This micro switch closes a circuit to the proper "SELECTOR LEVER RESET SOLENOID" located on the top of the carriage assembly and causes the solenoid lever to strike the selector lever, resetting it to its normal position. The solenoid continues to be energized until "NO. 3 MICRO" switch lever falls into the cam groove. This action opens the circuit to the energized solenoid, thus releasing the solenoid lever. In addition, the grip motor circuit is interrupted and a circuit to the "INTERLOCK RELAY RELEASE COIL" is completed. This releases the interlock relay to its original position, and places a short circuit across the grip motor armature, which causes it to stop.

During the above actions, the tone arm cam has placed the tone arm on the record, and the phonograph has reached the music cycle.

When the tone arm reaches the record cut-off groove, the tone arm switch closes the circuit to the "REVERSE RELAY COIL". The reverse relay contacts close the grip motor circuit in such a manner that its direction of rotation is reversed and consequently the grip jaws engage the record and the arm returns the record to the magazine.

As the grip jaws release the record, "NO. 1 MICRO" switch lever again is operated to its original position. This action disrupts the grip motor circuit allowing it to stop and starts the magazine motor. The record magazine continues to operate even though additional selections may not be registered and continues to do so until the selector "HOME" snap switch disrupts the "PLAY CONTROL" relay circuit (providing no additional selections are registered) allowing the contacts to open. This makes the magazine motor, turntable motor and amplifier inoperative. With all the circuits now open, the record magazine is again in "home" or "zero" position which completes the mechanism cycle.





**B**  
PLAY CONTROL RELAY



## ■ NO. 1 MICRO SWITCH

### DESCRIPTION OF OPERATION

This is a "SPDT" micro switch. When the mechanism is in the home position the No. 1 micro switch lever is positioned in the cam groove. After the record magazine indexes and the grip arm begins to remove a record from the magazine, the switch disconnects the magazine motor armature, and prepares a secondary circuit to the gripper reverse relay.

### CAM ADJUSTMENT

With the phonograph in "standby" position,

(grip arm over record magazine) move the "service scan switch" to "OFF" position. Rotate the knurled end of the grip motor clockwise, until a "jam" occurs. In this position, the No. 1 micro switch lever must remain seated on the bottom of the cam groove, favoring the back drop-off. IF THE MICRO LEVER CAMS OUT, THIS WILL CREATE AN OPEN CIRCUIT TO THE MAGAZINE MOTOR, PREVENTING THE MECHANISM FROM OPERATING.

To adjust, loosen the two cam allen set screws, and rotate the cam for proper positioning.

## ■ NO. 2 MICRO SWITCH

### DESCRIPTION OF OPERATION

This is a "SPDT" switch. The functions of this switch when actuated, allows a second-

ary resistor circuit to retard current flow to the gripper motor, allowing the tone arm to be eased gently to the record entry groove. Also to close a circuit to the proper carriage "selector lever reset solenoid".

## ■ NO. 3 MICRO SWITCH

### DESCRIPTION OF OPERATION

This is a "SPDT" switch. Prior to the completion of the first half cycle of gripper cam shaft, the micro switch lever falls into the cam groove, closing a circuit to the "inlock release coil." This allows all contacts on the interlock assembly to return to their normal position. The above action short circuits and dynamically brakes the gripper motor and also, allows the mute switch coil to operate so that the music cycle can begin. Current remains on the interlock release coil throughout the music cycle. On the return cycle, the "micro"

lever is moved to the outer portion of the cam. This completes a secondary circuit to the "reverse relay" which prevents the relay from unlocking in the event main power fails momentarily, line plug is accidentally pulled from outlet, etc.

When the lever rests in the cam groove, a slight "click" should be heard in the center of the drop off portion of the cam as the lever is moved manually. This lever has a set screw and lock nut arrangement for adjustment purposes. This adjustment prevails for the three micro switches.

## ■ A TONE ARM SWITCH

When the tone arm has reached the record cut-off groove, the tone arm switch is actuated, completing the circuit to the grip motor

through the gripper reverse relay contacts. See Page 21 for Tone Arm Adjustment.

## ■ "B" PLAY CONTROL RELAY (DIRECT CURRENT)

### DESCRIPTION OF OPERATION

This relay is located in the power distribution panel and is called the "play control relay." The relay is composed of three contacts. When the coil is energized by a selec-

tion, one contact closes a 117 V.A.C. circuit to the turntable motor. The second closes a 28 V.D.C. circuit to the mechanism D.C. motors, and the third completes a high voltage winding of 235 V.A.C. from the control circuit transformer on the power distribution panel to the amplifier.

## ■ "C" A-B (odd-even) SNAP SWITCHES

### DESCRIPTION OF OPERATION

These (SPDT) snap switches are operated mechanically by an arm that is actuated by an "outer" and "inner" magazine cam groove. Electrical circuits must correspond to the "read-out" carriage and selector, in the manner the gripper arm places a record on the turntable.

In "standby" position, the ganged section of snap switches ready circuits for either the "A" or "B" side of the record, which is predetermined by the last selection made.

The middle section readies circuits to the "outer" printed circuit disc, which determines the proper grounding circuit for either the

"outer" or "inner" carriage contact. This allows for proper indexing when a carriage contact strikes a selected selection lever.

The section on the extreme right, also ready circuits to the "outer" printed circuit disc, which will energize the proper carriage solenoid.

### ADJUSTMENTS

Scan mechanism until A-B snap switch actuating lever travels in a downward motion and gripper arm is over center of blank space on magazine. At this point A-B snap switch should be adjusted so that contacts are just snapped to relaxed position.



## ■ "D" GRIPPER REVERSE RELAY (DIRECT CURRENT)

### DESCRIPTION OF OPERATION

This relay is located in the control box and consists of two pairs of contacts. One pair is a "SPDT" and the other pair is normally open. In the relaxed position, one side of the "SPDT" switch prepares a circuit to the grip motor, so when the interlock trip coil is energized, the circuit is completed to the motor causing the

grip arm to move a record from the magazine.

When the relay coil is energized by tripping of the tone arm switch, all contacts are repositioned, so now the bottom side of the "SPDT" switch reverses the direction of the grip motor allowing the record to be returned to the magazine. The other switch now closed serves as locking contacts for the gripper reverse relay coil.

## ■ "E" INTERLOCK RELAY (DIRECT CURRENT)

### DESCRIPTION OF OPERATION

This relay, also located in the control box is a mechanically latching type, having two coils which are termed the "Trip" and "Release" coils. The trip armature has two single throw contacts, and the release armature has two sets of double throw contacts of which one is connected in parallel to insure positive operation, and the other has a 22 ohm resistor across the contact connections which is used to slow the gripper motor when the No. 2 micro switch is actuated.

In the normal position, (Prior to Indexing), the trip armature is relaxed and the release armature is mechanically latched down by an arm extending from the trip armature: with neither coil being energized. In this position, the two contacts on the trip armature are open and the forward contacts on the release armature are closed and condition the power motor circuits. The action of the device is as follows:

1. Carriage Indexing contacts strike a registered selector key and momentarily energize the interlock trip coil.

2. Trip armature operates, closing its two contacts which provide a locking circuit to the trip coil and also conditions a circuit for the proper "selector lever cancel solenoid."
3. As the trip armature completes its stroke, the release armature relaxes, thereby repositioning its contacts and mechanically latching down the trip armature. The release armature contacts short-circuit the magazine motor armature and apply power to the grip motor. This action results in the grip arm removing the record from the magazine and placing it on the turntable.
4. The device remains in this position until "micro switch No. 3" operates, at which time the release coil is energized.
5. The release armature operates, placing its contacts in the forward position. This short circuits the grip motor, causing it to stop.
6. After the release armature completes its stroke the trip armature relaxes, mechanically latching down the release armature, and opening its two contacts.

## ■ "F" HOME SWITCH

### DESCRIPTION OF OPERATION

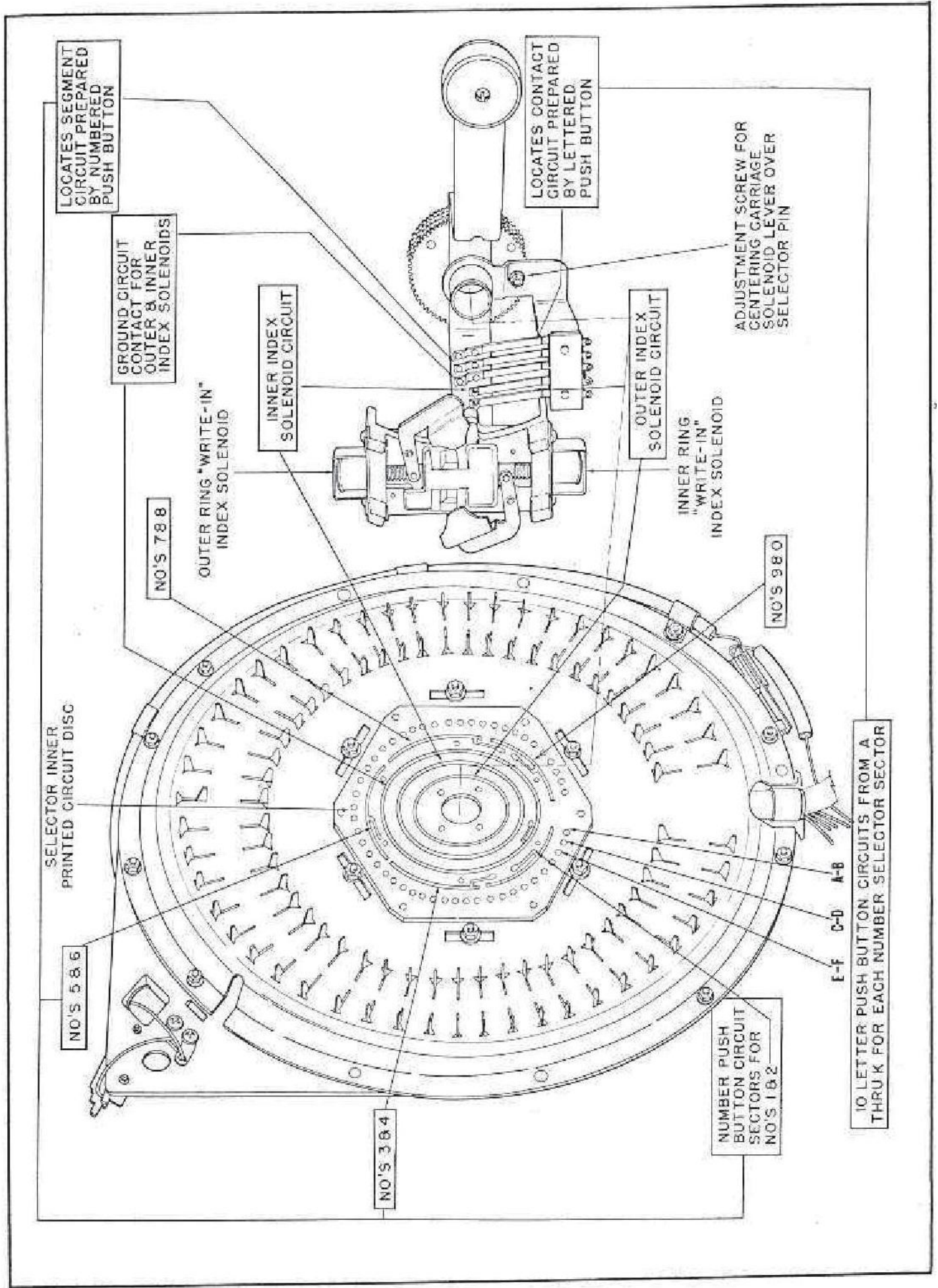
The purpose of this switch is to allow the record magazine to return to a "home" or "zero" position after the last record play has been completed. Rotation of the magazine continues until the "outer carriage solenoid cam" snaps the switch contacts open. The circuit to the "play control relay" is disrupted and the power to the D.C. motors, amplifier and turntable motor circuits are opened.

### ADJUSTMENTS

Home switch should be adjusted so that in

normal stopping, gripper arm should be over the center or no closer than 3/8" to A-1 wire separator on magazine. This adjustment can be achieved by moving home switch bracket so as to trip for desired stopping position. At no time should the switch roller ride to the end of the actuating cam on "read-out" carriage. With mechanism at home position, select A-1 and B-1. Upon stopping on one of these selection, make sure that the home switch nylon roller is at least 1/4" away from the carriage actuating cam.





LOCATES SEGMENT CIRCUIT PREPARED BY NUMBERED PUSH BUTTON

LOCATES CONTACT CIRCUIT PREPARED BY LETTERED PUSH BUTTON

GROUND CIRCUIT CONTACT FOR OUTER & INNER INDEX SOLENOIDS

INNER INDEX SOLENOID CIRCUIT

OUTER INDEX SOLENOID CIRCUIT

ADJUSTMENT SCREW FOR CENTERING CARRIAGE SOLENOID LEVER OVER SELECTOR PIN

NO'S 788

OUTER RING "WRITE-IN" INDEX SOLENOID

INNER RING "WRITE-IN" INDEX SOLENOID

NO'S 980

SELECTOR INNER PRINTED CIRCUIT DISC

NO'S 586

NO'S 384

NUMBER PUSH BUTTON CIRCUIT SECTORS FOR NO'S 182

10 LETTER PUSH BUTTON CIRCUITS FROM A THRU K FOR EACH NUMBER SELECTOR SECTOR

E-F C-D A-B



## ■ WRITE-IN CARRIAGE AND SELECTOR ASSEMBLY

### SELECTOR ASSEMBLY (INNER)

The selector consists of a circular slotted disc assembly. From these slots radiate 100 selector levers, one for each record side, arranged in two concentric rows of 50 levers each. Levers for playing the "A" side of the record are the outer row, and the inner row registers the "B" side of the record. These selector levers extend from both sides of the selector and are pivoted so they can be toggled by two carriage assemblies which rotate around each selector side.

There are two selection sequences which take place before the proper record is selected. The first sequence registers the proper selector lever on the inner side of the selector, which is called the WRITE-IN sequence. This is accomplished by a depressed "LETTER" and "NUMBER" push button, which connect proper circuits to the "INNER" printed circuit disc. The "NUMBER" push button connects a circuit to one of the five sectors, as illustrated on the drawing. For each sector there is an outer ring of 10 contacts, of which one of them will have a completed circuit when a "LETTER" button is depressed. The inner contact rings serve to relay proper circuits to the carriage index solenoids.

### WRITE-IN CARRIAGE

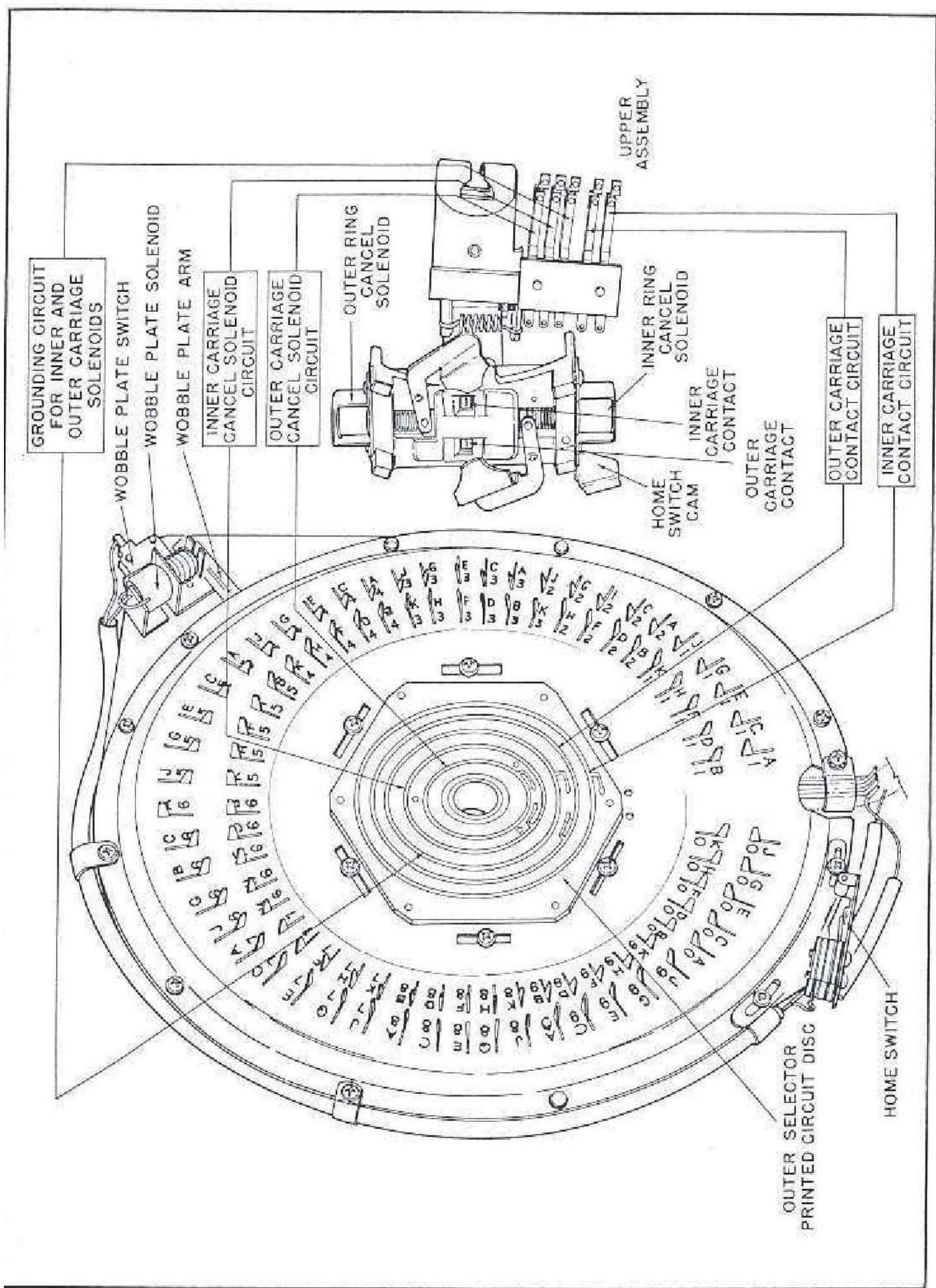
The functions of this carriage and wiper assembly are: 1 - the wiper assembly to

search on the printed circuit disc for selection circuits that had been prepared by the "locked" push buttons, and upon locating these circuits, stop the "WRITE-IN" motor; thereby 2 - Aligning the carriage solenoid lever with respect to the selector lever. 3 - Operate the carriage solenoid, moving the selection lever into "play" position.

The carriage and wiper assembly are rotated around the inner portion of the selector unit by means of selector arms. The rotation of the carriage is stopped when the wiper blades locate the proper grounding selection circuits to the "STOP" relay coil, whose function is to: 1 - brake the selector "WRITE-IN" motor, and 2 - energize the proper "WRITE-IN" carriage solenoid. The respective carriage solenoids actuate a lever which strikes the selector lever moving it into play position.

To check proper carriage adjustment, select number A-6. When the rotation of the carriage has stopped, move the mechanism service switch to "OFF" position. By hand, actuate the top carriage solenoid lever downward and note if it is centered over the selector lever. Any deviation from this adjustment can be corrected by unloosening the wiper bracket hex head screw located on the gear. The bracket hole is elongated allowing the entire wiper bracket assembly to be advanced or moved back. This determines whether the write-in motor braking circuit should be made sooner or later.







## ■ READ-OUT CARRIAGE ASSEMBLY AND SELECTOR ASSEMBLY

### SELECTOR ASSEMBLY (OUTER)

In the internal part of the selector is a "WOBBLE PLATE" assembly. On the drawing, an arm can be seen extending outward and attached to a "WOBBLE PLATE" solenoid. Whenever a selection lever is actuated, it allows this assembly to shift. Its movement is also aided by the "WOBBLE PLATE" solenoid which is energized when the "INNER" carriage is indexed. Above the extreme end of the wobble plate arm is a "WOBBLE PLATE" switch which is operated whenever the wobble plate is allowed to move. The operation of this switch completes a circuit to the "PLAY CONTROL" relay, (located in the power distribution panel) which turns on the turntable motor, amplifier and magazine motor.

### READ-OUT CARRIAGE ASSEMBLY

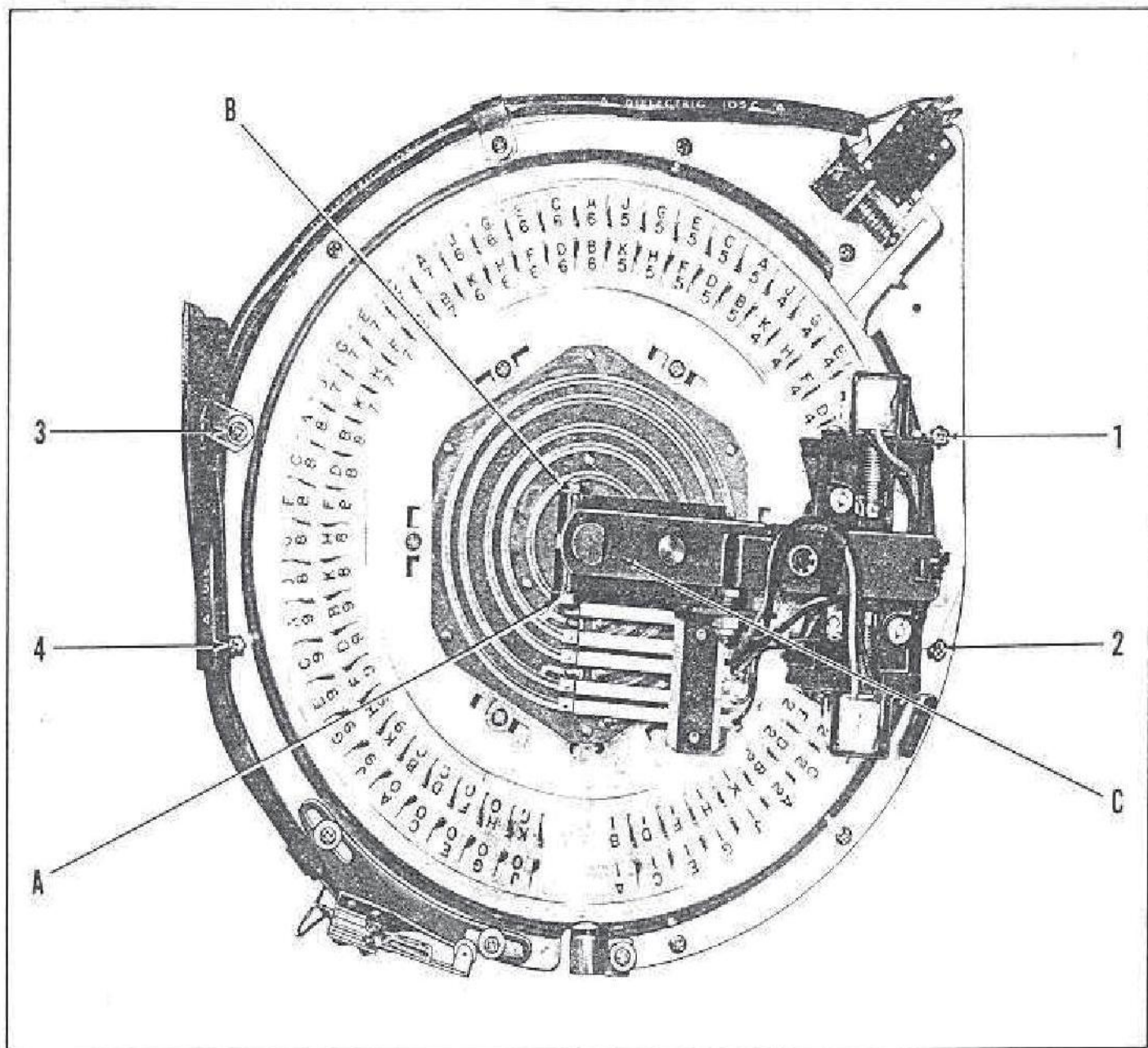
Standby position of the record magazine always remains in a "zero" or "home" position. The operation of the magazine motor rotates the record magazine in a counterclockwise direction. To the record magazine shaft, is attached a "READ-OUT" carriage and wiper assembly that rotates around the outer

side of the selector. The functions of this carriage are: 1 - to search for a selector lever in "play" position, and upon locating the lever, stop the record magazine; thereby 2 - Aligning or "indexing" the proper record with respect to the gripper arm. 3 - Return the selector lever to normal position in the selector unit.

The rotation of the carriage is stopped when the proper carriage contact is grounded by a selector lever in "play" position. The wiper assembly transfers circuit changes for either the "A" or "B" side of the record, to the respective cancel solenoid plungers that operate when the "No. 2 micro switch" drops into the cam.

The "HOME" switch when operated at the proper cycle, by the carriage "home switch cam", will open the circuit to the play control relay, making the turntable motor and amplifier inoperative. With all the circuits now open, the record magazine is again in "home" or "zero" position which completes the cycle.

ADJUSTMENT FOR THIS SWITCH IS EXPLAINED IN THE SECTION "DESCRIPTION OF OPERATION."



### ■ REMOVAL OF SELECTOR

Loosen and remove nut (A) and carriage bolt (B). Remove carriage (C) from shaft. Disconnect the 21 prong Jones plug at the other end of the selector cable, and the green amp-

lok that plugs into the control box. Unloosen and remove the 4 screws that secure the selector to the mechanism frame; lower and remove selector.



## ■ CARRIAGE ADJUSTMENTS

### WRITE-IN CARRIAGE

When the "WRITE-IN" carriage is indexed, the "OUTER" or "INNER" ring solenoid lever operates. This lever strikes a selector lever in its path, and moves it into play position. The solenoid lever must be centered over the selector lever when this operation takes place.

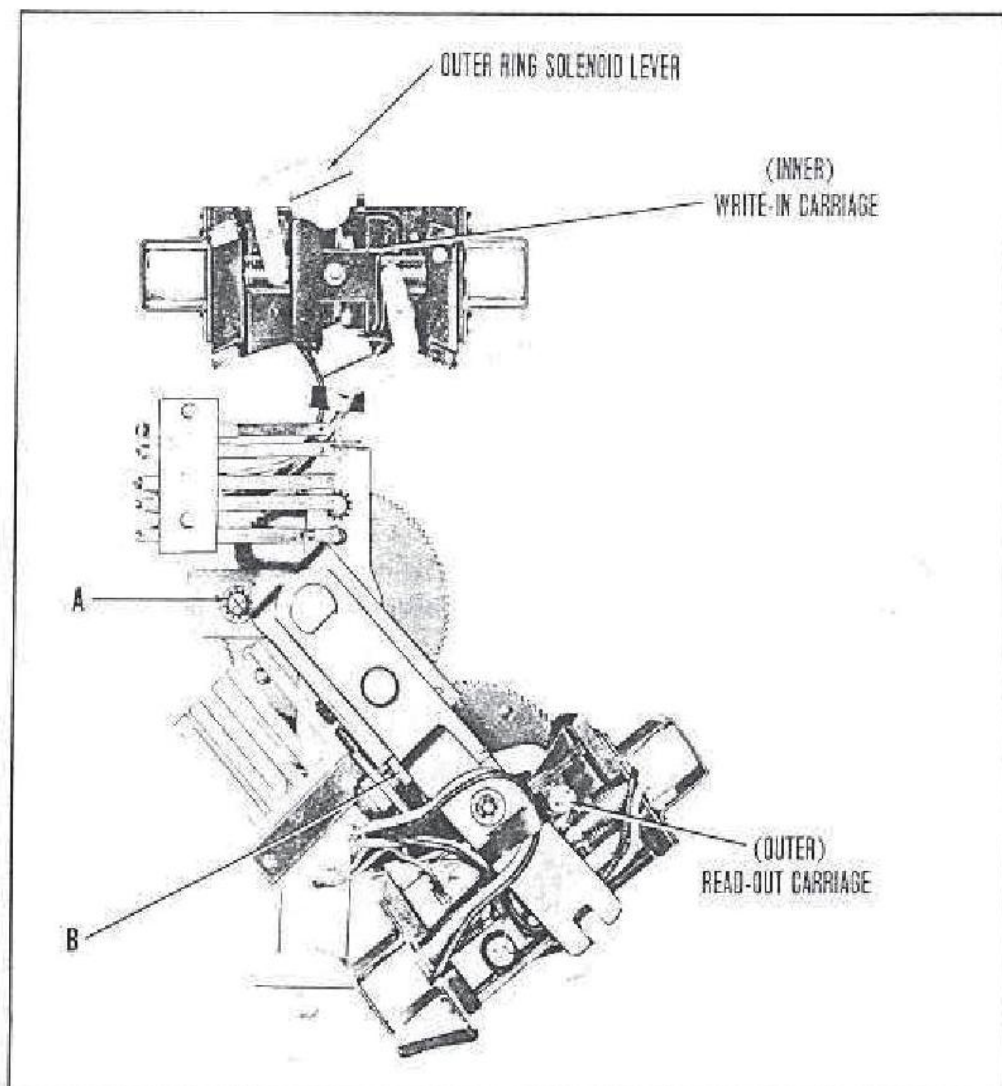
To check for proper adjustment, select A-6, and allow the inner carriage to index. Move the mechanism scan switch to "OFF" position. Toggle the selector lever that had been moved to "play" position, back to its original position. By hand, move the "OUTER RING SOLENOID" lever downward, and note if the solenoid lever is centered over the selector lever. If this is not the case, unloosen screw (A), and move the wiper assembly bracket "UP" or "DOWN" which is determined by whether the carriage should index sooner or later.

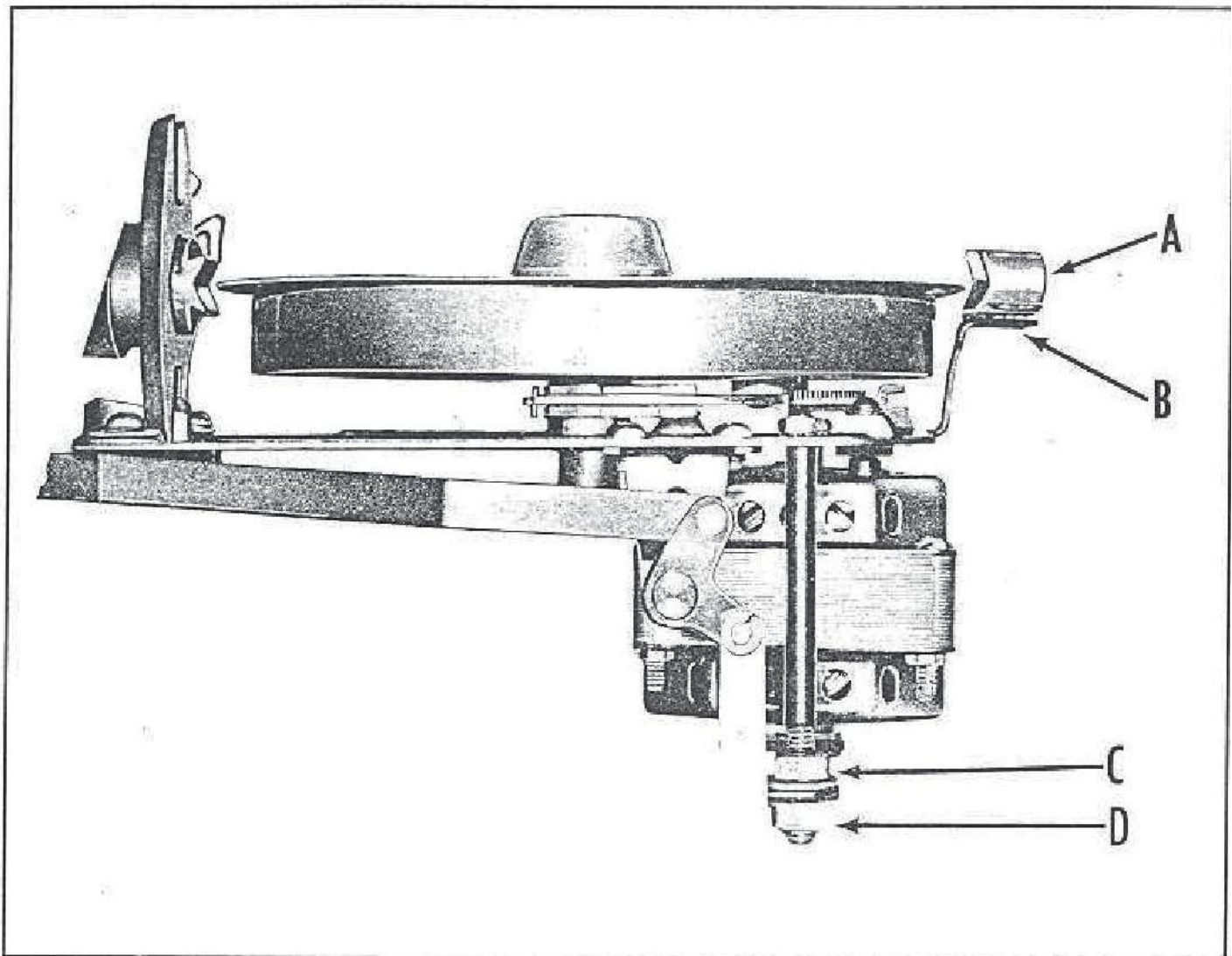
### READ-OUT CARRIAGE

This carriage when indexed, allows the gripper arm to place a record on the turntable. In returning the record back to the magazine, it must be well centered between the two record separators.

To check proper carriage adjustment, select A-1 and allow record to be placed on the turntable. Cancel the record and just before it enters the spacing between the two record separators, shut the power with the "ON" and "OFF" scan switch. Observe if the record is entering the magazine well centered.

If the record is not in perfect alignment, the entire carriage must be shifted in the direction the adjustment is necessary. This is done by adjustment screw (B). Recheck alignment for records C-1 and E-1.





## ■ TURNTABLE HEIGHT AND CENTERING

### TURNTABLE HEIGHT

The height of the turntable is predetermined when the turntable mounting plate is positioned and fastened by two mounting screws to the gripper housing casting. Then, before tightening the hex lock nuts (C & D) make sure that the mounting plate is perfectly level.

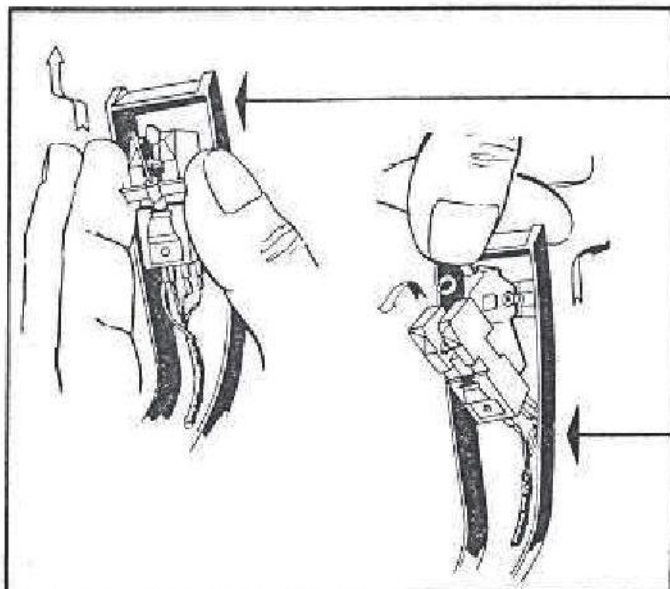
Allow the gripper arm (A) to place a record on the turntable. In this playing position, the record edge must be either slightly below or even with the "V" or center line of the outer gripper arm. If condition needs correction, the gripper arm stop (B) can be adjusted by bending the stop up or down for proper alignment. In making the necessary correction, make sure there is at least 1/8 inch up and down play between gripper arm and gripper stop (A & B). If this condition does not exist,

it means that the turntable mounting plate is not level.

### TURNTABLE CENTERING

To center a record over the turntable center locator, allow the gripper arm to lift a record from the record magazine. Before the record is placed on the turntable, move the mechanism service switch to "OFF" position. By rotating the gripper motor armature manually, lower the record to the turntable, and carefully observe the relationship of the turntable center locator to the center hole of the record. If adjustment is necessary, unloosen the two mounting screws and the two hex nuts (D), and shift the turntable plate in the direction necessary for perfect alignment. Then tighten the screws and nuts carefully so that the mounting plate does not shift out of position.





### ■ REMOVAL OF STYLUS FROM CARTRIDGE

Raise tone arm. Grasp the stylus handles and pull upward. The stylus will snap out from under a flat spring that holds it firmly in position.

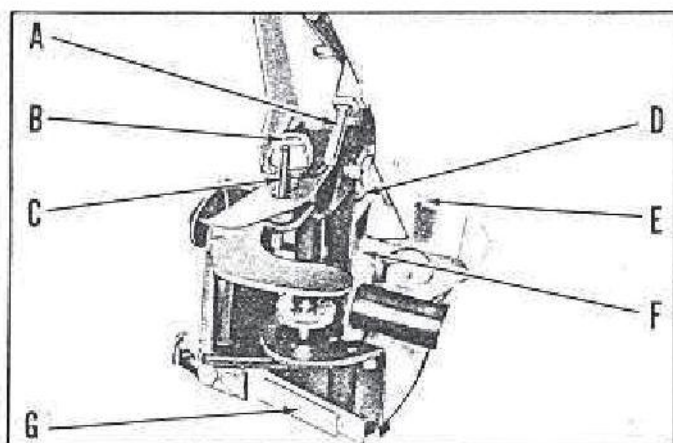
In re-assembling reverse the procedure making sure that stylus shaft is seated in the saddle.

### ■ REMOVAL OF CARTRIDGE FROM TONE ARM

Remove stylus from cartridge. Depress "cartridge holder clip" which allows cartridge to snap out.

To re-assemble, insert the rear end of the cartridge locator into the bracket slot and snap into position.

### ■ TONE ARM ADJUSTMENTS



The "Set Down" position of the needle on a record is  $\frac{3}{32}$  inch from the edge of the record. To obtain this position, cycle the mechanism until the tone arm needle is above the record. At this point move the mechanism service switch to "OFF" position. Rotate the knurled end of the gripper motor armature manually until the needle almost makes contact with the record. Hold the inside cam plate stop in (E) against inside of tone arm cam (F). Loosen screw at (D) and move tone arm so that needle rests  $\frac{3}{32}$  inch from edge of record. Then carefully tighten screw (D).

The record "Cut-Off" position is  $2\text{-}\frac{1}{32}$  inches from the outer edge of the record to-

ward the center. Move the tone arm slowly to this cut-off position and make certain that at that point, tone arm switch (G) makes contact. To make any adjustments simply readjust blade switches.

The needle pressure on the record is six grams. When adjusting for needle pressure, turn adjusting screw (B) accessible through the top of the tone arm, "counter clockwise" to reduce needle pressure. Needle pressure readings must be taken at the point of contact of the needle on the record.

The tone arm height must be adjusted so that the body of the pick up just touches the rubber ring on the turntable. Loosen nut which locks adjustment screw (C). Turn screw "out" to increase height and "in" to decrease the height of the needle with respect to the rubber ring on the turntable.

There should be at least  $\frac{3}{16}$  inch to  $\frac{1}{4}$  inch clearance between the tone arm needle and the bow of the gripper arm as the tone arm passes over the gripper arm to "Set Down" position on the record. Adjustment screw (A) can be turned "in" to decrease the clearance and "out" to increase the clearance between the gripper arm and the needle. Select even numbered record before making adjustments.

### ■ ACCUMULATOR ASSEMBLY AND THE FUNCTION OF THE WRITE-IN RELAY, STOP RELAY, AND CURRENT LIMITING LAMP

The accumulator assembly is designed to accumulate any number of credits up to 26 plays maximum. After a coin strikes one of

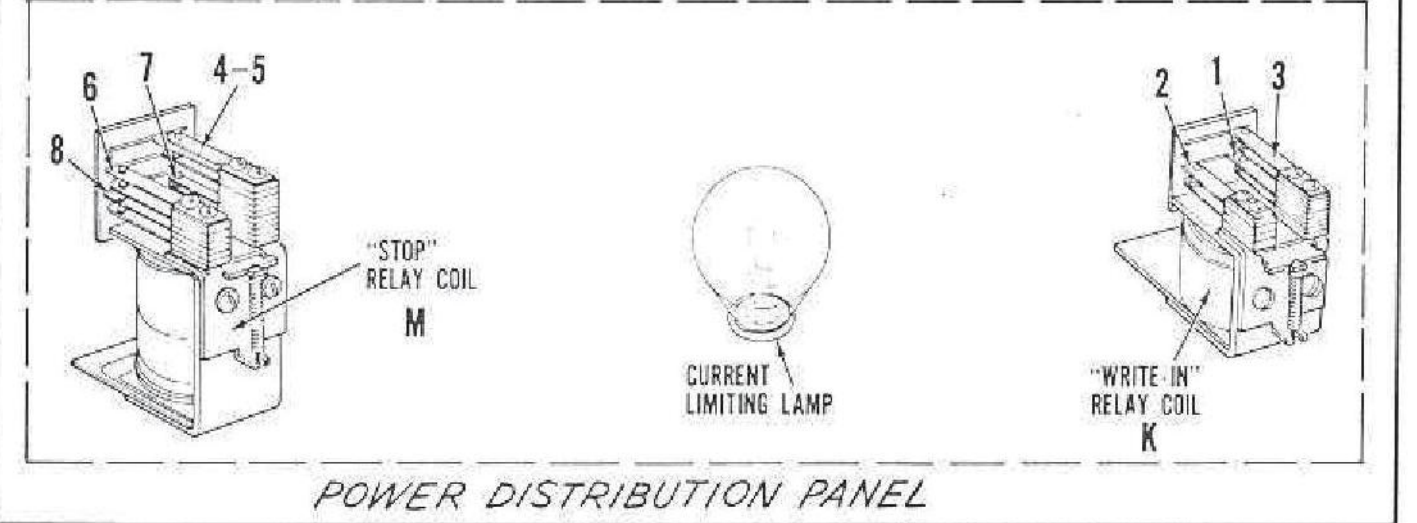
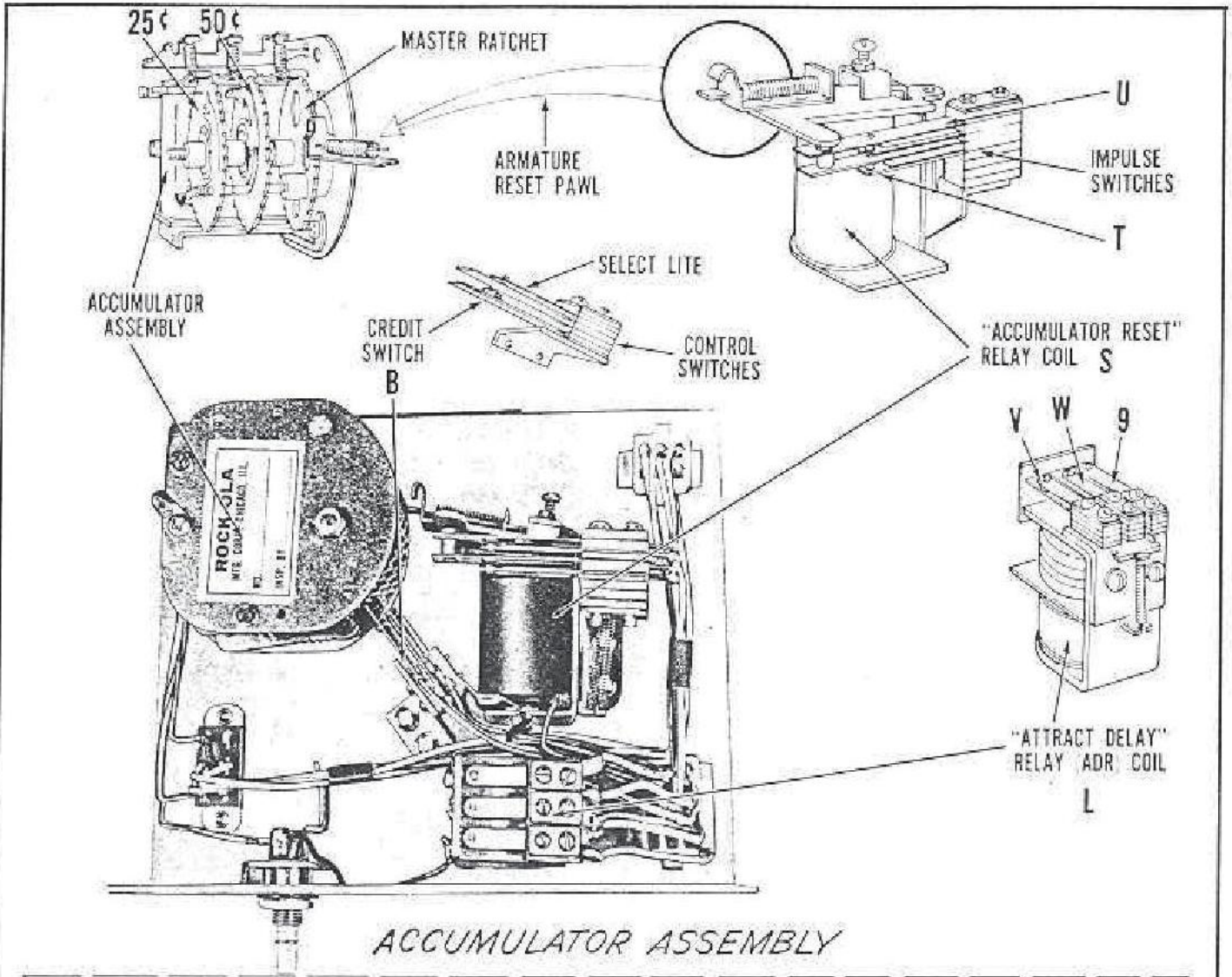
the four coin switches located below the slug rejector, a D.C. circuit is completed to the proper electro magnet. During the short



period the electro remains energized, the corresponding armature ratchet detent and the ratchet escapement armature are drawn to the pole-piece of the electric magnet. The corresponding ratchet detent locks the hub and ratchet assembly, and releases the escape-

ment armature stud.

This sequence is repeated for every coin dropped. The circuit is such that both the 5¢ and 10¢ coin switch operate the master ratchet. The 50¢ switch operates the center ratchet





and the 25¢ coin switch operates the outer ratchet. The stud which is staked to the master ratchet extends through the center and outer ratchet discs. It will be noted that the openings in these two ratchets are adjustable. These openings determine the amount of plays that can be accumulated on the master ratchet wheel. Various incentive coin combinations can be made by making the necessary adjustments. (See page 7 for instructions.) The price option switch merely accommodates a proper circuit for the usage of a 50¢ coin.

The accumulator in conjunction with two relays and a current limiting lamp, mounted on top side of the power supply assembly, namely; the Write-In relay and Stop relay, function in the first selection sequence to register a selection on the phonograph selector. The sequence of operation is as follows:

(THE NUMBERS AND LETTERS ON THE PICTORIAL DIAGRAMS INDICATE RELAYS AND CONTACTS THAT CORRESPOND TO THE PROCEEDING SEQUENCE DIAGRAMS FOUND ON PAGE 26.)

In "standby" position the accumulator CREDIT SWITCH (B) is held open by a stud that is riveted to the MASTER RATCHET wheel. Rotation of the ratchet allows the switch to close completing a circuit to a pushbutton LOCK-BAR solenoid (C). (See page 24) The pushbuttons in "locked" position close a pair of NUMBER and LETTER switches, namely, LATCH PAWL switches (F) and (G), and LOCK-BAR switches (H) and (J). (See page 24) The LOCK-BAR switches are preparatory circuits for the ATTRACT DELAY RELAY (L) and the LATCH PAWL switches operate the WRITE-IN relay coil (K).

### ■ WRITE-IN RELAY COIL

The WRITE-IN relay contacts (1) (2) and (3) when transfer do the following;

(1). Closes a 25 V.A.C. circuit to the selector WRITE-IN MOTOR thru normally closed contact (4) on the STOP relay coil, allowing the motor to run.

(2). Self locking contact for the WRITE-IN relay coil.

(3). Connects a standby circuit to the STOP relay coil.

The selector WRITE-IN MOTOR rotates a carriage and wiper assembly around the inner side of the selector. Eventually the wiper

contacts will locate circuits on the printed circuit disc prepared by the locked pushbuttons. This action allows the STOP relay coil to operate which brakes the operation of the WRITE-IN MOTOR thru a CURRENT LIMITING LAMP circuit.

### ■ STOP RELAY COIL

The STOP relay contacts (4 & 5) (6) (7) and (8), when transfer complete the following circuits.

(4 & 5). These are SPDT contacts. The contacts now repositioned, opens contact (4) and closes contact (5). Open contact (4) disconnects the 25 V.A.C. circuit to the WRITE-IN MOTOR, however closed contact (5) now connects the motor circuit thru a CURRENT LIMITING LAMP to a 25 V.D.C. source causing the motor to brake.

(6). Is a self locking contact for the STOP relay coil

(7). These are also SPDT contacts. The normally closed contact is used with receiver operation only. Normally open contact now closed operates the ACCUMULATOR RESET COIL (S) and WOBBLE PLATE SOLENOID (R). (See page 16)

(8). Used with receiver operation only.

### ■ ACCUMULATOR RESET COIL

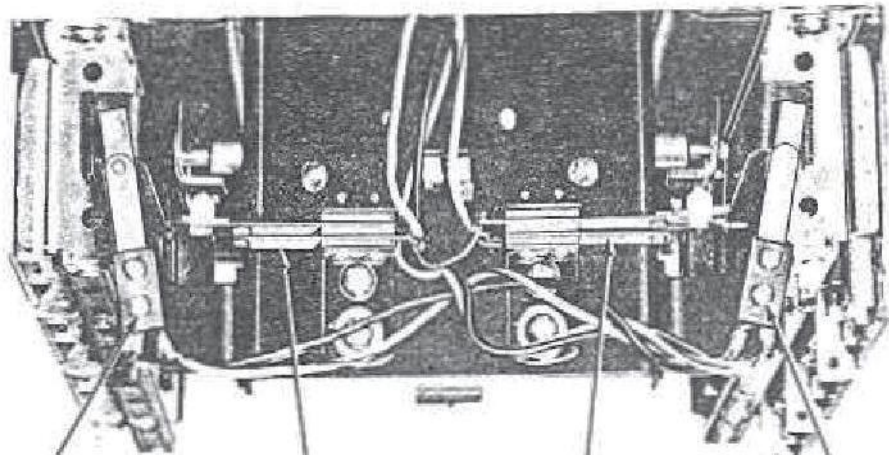
Since contact (7) operated the ACCUMULATOR RESET COIL, the armature closed a ganged section of two IMPULSE SWITCHES (T) and (U). Switch (T) closes a circuit to the proper WRITE-IN CARRIAGE solenoid energizing it, and switch (U) operates the ADR relay. Simultaneously, the armature reset pawl engages a tooth on the master ratchet and moves it back one tooth, canceling one credit.

### ■ ATTRACT-DELAY-RELAY (ADR)

Contacts (V) and (W) are normally closed. The energized ADR relay opens these contacts disrupting the circuit to the WRITE-IN CARRIAGE solenoid thru contact (W). Contact (V) opens circuits to the pushbutton LOCK-BAR solenoid and ACCUMULATOR RESET COIL. This action returns circuits to "standby" position providing of course there are no plays registered on the accumulator master ratchet. If all selections are not completed the pushbutton LOCK-BAR solenoid will remain closed.

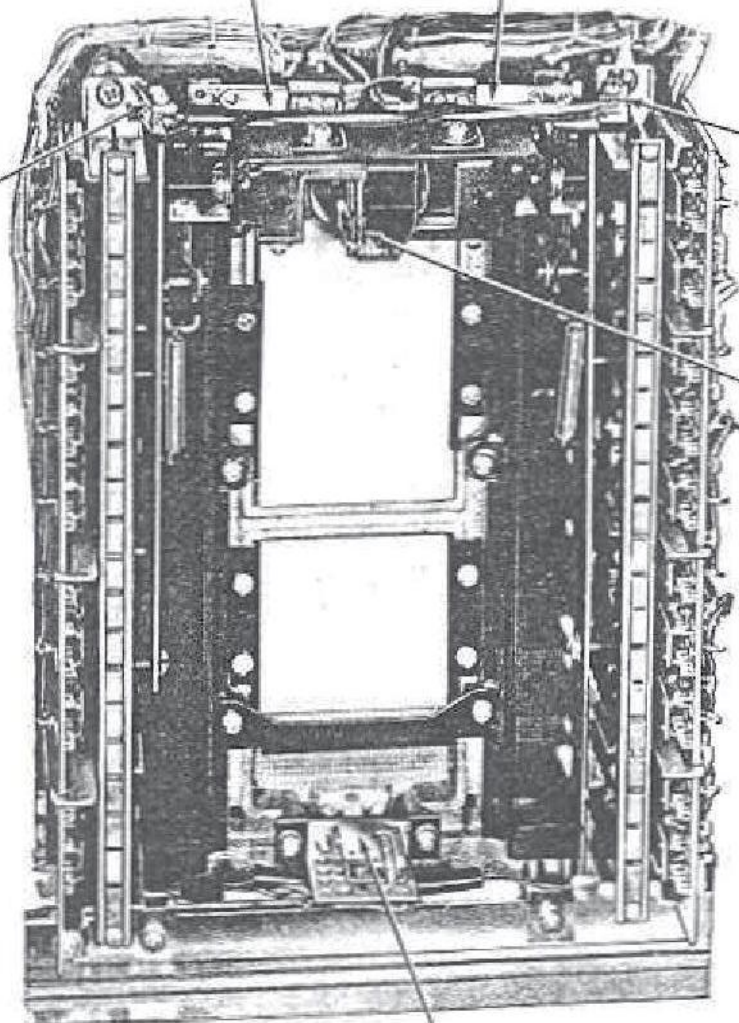
Contact (9) serves as a self locking contact for the ADR relay coil.





"NUMBER" LATCH  
PAWL SWITCH

"LETTER" LATCH  
PAWL SWITCH



"NUMBER" LOCK  
BAR SWITCH

"LETTER" LOCK  
BAR SWITCH

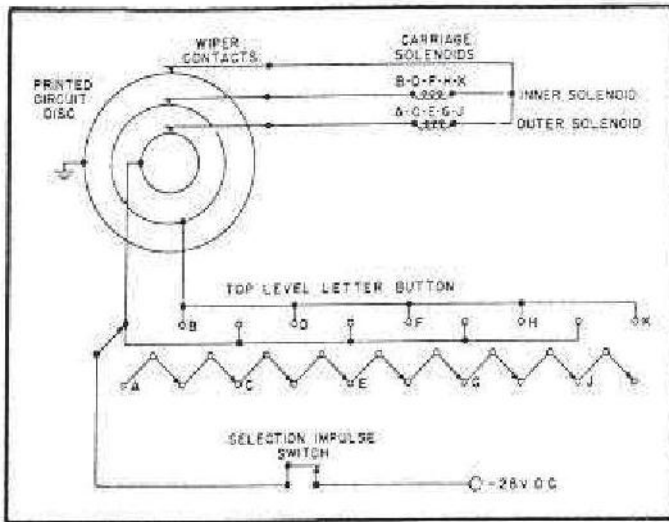
LOCK BAR  
SOLENOID

PUSH BUTTON RESET SWITCH



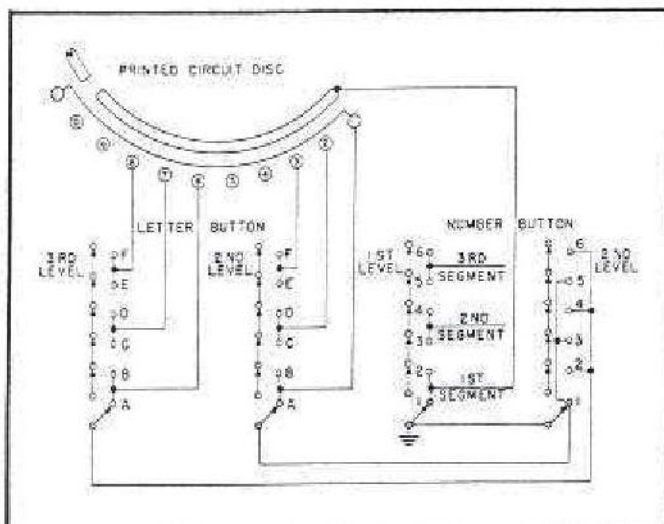
## ■ PUSHBUTTON SWITCH ASSEMBLY

### ■ DESCRIPTION OF OPERATION



The function of the "pushbutton assembly" is to connect proper selector circuits to the "inner" printed circuit disc, in the first selection sequence. When the carriage is indexed, the selector lever registered will correspond to the "letter" and "number" pushbutton depressed.

The "letter" pushbutton assembly consists of three levels of switches. The top level operates the proper "write-in" carriage solenoid when the accumulator "selection impulse switch" operates. Letters A-C-E-G and J, energize the solenoid which actuate the "outer" ring of selection levers. Letters B-D-F-H and K energize the "inner" carriage solenoid and actuate the bottom ring of selection levers.



The second level switches (circuitwise) are connected in pairs. A and B connect circuits to the first contact, concentric to each one of the five selector disc sectors on the "inner" printed circuit disc assembly. C and D, to the second contact in each sector, and so on. In this sequence the middle lever connects circuits to only the first five contacts in each sector.

The third level switches are also connected in pairs, however, A and B connect circuits to the sixth contact, C and D to the seventh contact, and so on, for the balance of contacts in each sector.

The purpose of the "letter" pushbuttons therefore, is to energize the proper carriage solenoid, and to ready circuits to two contacts for each selector disc sector.

The next step is to eliminate circuits that do not correspond to the selection made, and that is the function of the "number" pushbutton assembly. This "number" switch consists of two levels. The top level readies circuits to one of the five sectors on the printed circuit disc, predetermined by a depressed "number" pushbutton. Here again, circuitwise, No. 1 and No. 2 are connected together and ready circuits to the first sector, No. 3 and No. 4, second sector, etc.

The bottom level serve as grounding circuits thru the "middle" or "bottom" section of the "letter" pushbuttons to a particular contact determined by the "number" pushbutton depressed. No.'s. 1-3-5-7 and 9, ready circuits for the first five contacts, for each sector and No.'s. 2-4-6 8-0, ready circuits for the last five contacts for each sector.

### Example: Selection A-1 made

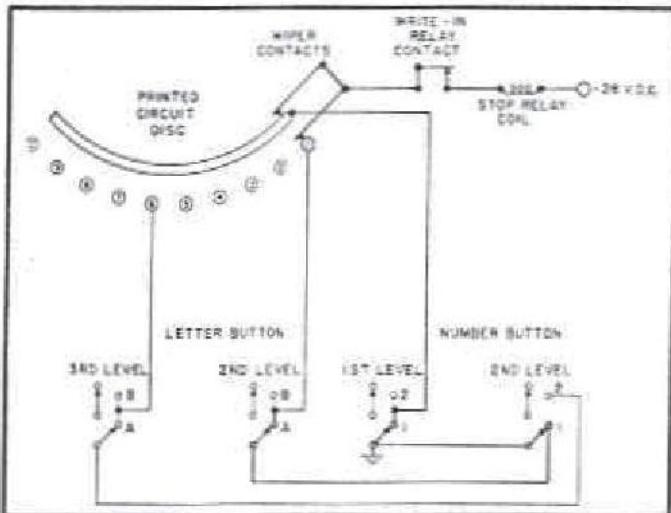
"A" BUTTON WHEN DEPRESSED DOES:

1. TOP LEVEL CONNECTS A CIRCUIT TO THE OUTER RING INDEX CARRIAGE SOLENOID.
2. SECOND LEVEL CONNECTS CIRCUITS TO THE 1ST CONTACT IN EACH SELECTOR SECTOR.
3. THIRD LEVEL CONNECTS CIRCUITS TO THE 6TH CONTACT IN EACH SELECTOR SECTOR.



**NO. 1 BUTTON WHEN DEPRESSED DOES:**

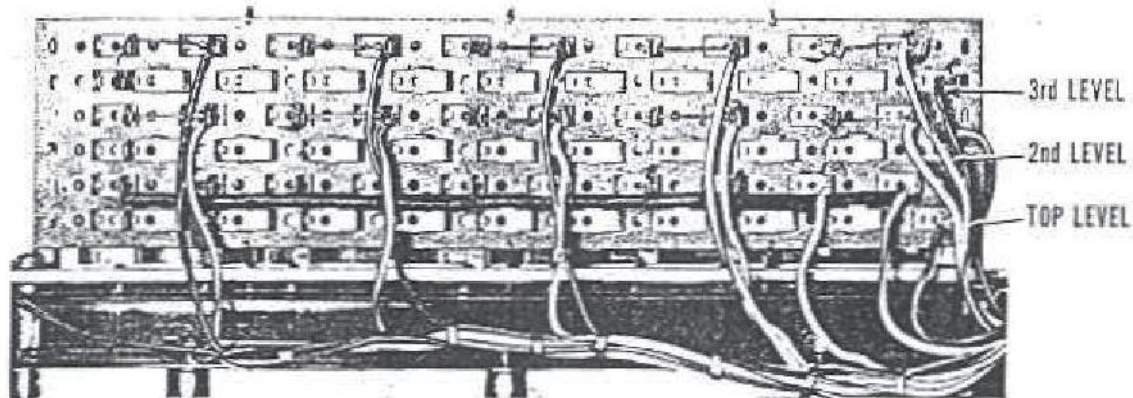
1. TOP LEVEL CONNECTS A CIRCUIT TO THE 1ST SELECTOR SECTOR.
2. BOTTOM LEVEL CONNECTS A GROUNDING CIRCUIT THRU THE BOTTOM SECTION OF THE "LETTER" PUSHBUTTON TO THE 1ST CONTACT OF THE 1ST SELECTOR SECTOR.



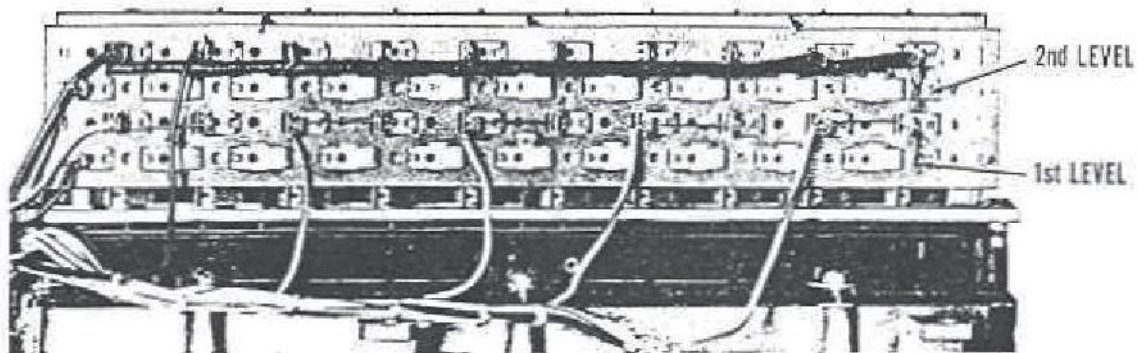
The carriage and wiper assembly now scanning, eventually locate these prepared circuits, and upon contact will index. This action operates a "stop relay coil" (discussed under "WRITE-IN UNIT") which will operate the "outer" carriage solenoid thru a circuit that had been prepared by the top level "letter" pushbutton.

The "lock-bar" solenoid operates when any coins are registered on the master ratchet allowing the accumulator credit switch to close. This keeps the depressed pushbuttons in locked position during the first selection sequence. Each locked pushbutton close a pair of switches. The "number" and "letter" latch pawl switches complete a circuit to the "write-in" relay coil which allows the selector "write-in" motor to operate. The "number" and "letter" lockbar switches readies circuits to the ADR (attract delay relay) coil, which when operated will release the locked buttons.

The reset switch is used only in the event a wrong pushbutton had been depressed. This opens the circuit to the lockbar solenoid allowing the button to be released.



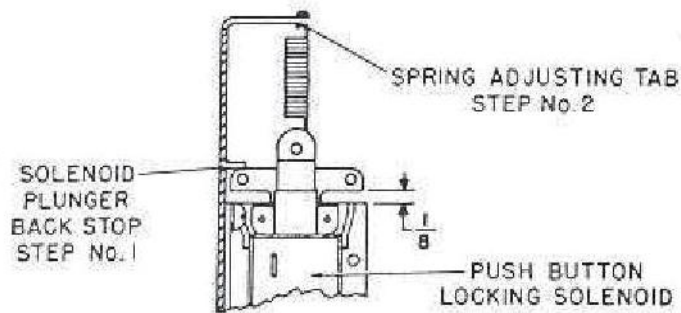
**LETTER PUSH BUTTON SWITCH**



**NUMBER PUSH BUTTON SWITCH**

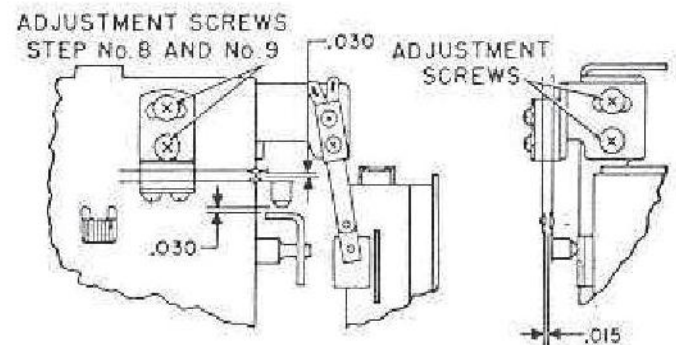


**MODEL 1493 PUSH BUTTON PANEL ADJUSTMENTS  
DO IN SEQUENCE**



5. With the solenoid released, actuate the number push button lock bar fully from the P.B. switch end and adjust the clearance between key switch lock and chrome lock pin by bending left hand lock lever until a 1/64 clearance is obtained.

6. Repeat Spec. #5 with letter push button switch.



7. With the solenoid and all push button released, adjust the number and letter lock bar blade switches so that the bumper rests on the lock bar extension bracket and the blade switch air gaps are .015".

8. With the solenoid released, actuate the number push button lock bar fully from the P.B. switch end and adjust the blade switch operated by the key switch lock until a clearance of .030" exists between nylon bumper and the key switch lock; tighten adjusting screws and check switch for .030" air gap.

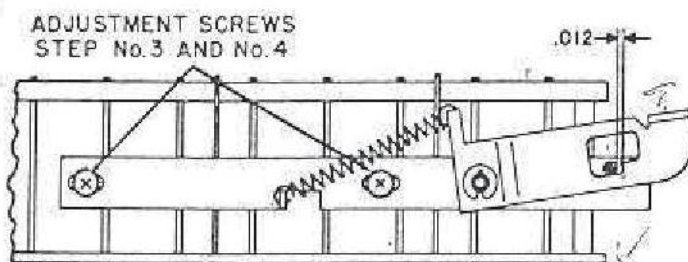
9. Repeat Spec. #8 for letter push button switch.

**IMPORTANT**

If the above procedure has been improperly followed and subsequent adjustment is required, then whatever step is corrected must be followed by all subsequent steps.

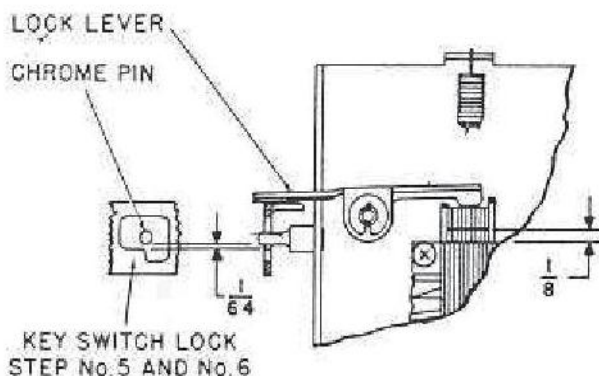
1. Adjust relaxed solenoid air gap to 1/8" by bending solenoid plunger back stop.

2. With solenoid energized at 90 volt line, adjust solenoid return spring force by bending spring adjusting tab until solenoid seats rapidly and without buzz and chatter. Turn power off and on rapidly 6-8 times as a check. With solenoid released, the force required to start solenoid plunger down shall be not less than 200 grams.



3. With an energized solenoid and number one push button pressed in fully, adjust the lock bar extension bracket for .012 overtravel between the key switch lock lever and the chrome lock pin. Check all number push buttons for overtravel.

4. Repeat Spec. #3 using the letter push button side. Depress A push buttons.



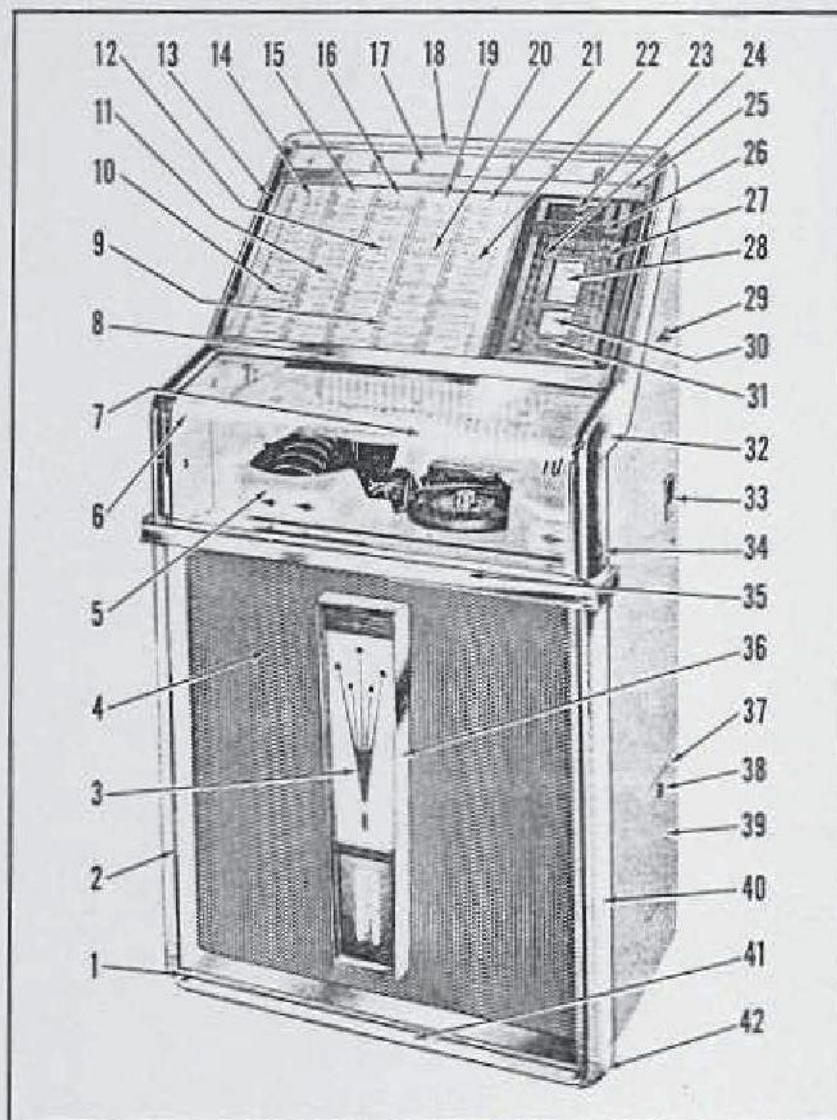
**PARTS LIST  
SECTION**

**FOR**

**MODEL 1493-100 Selection**

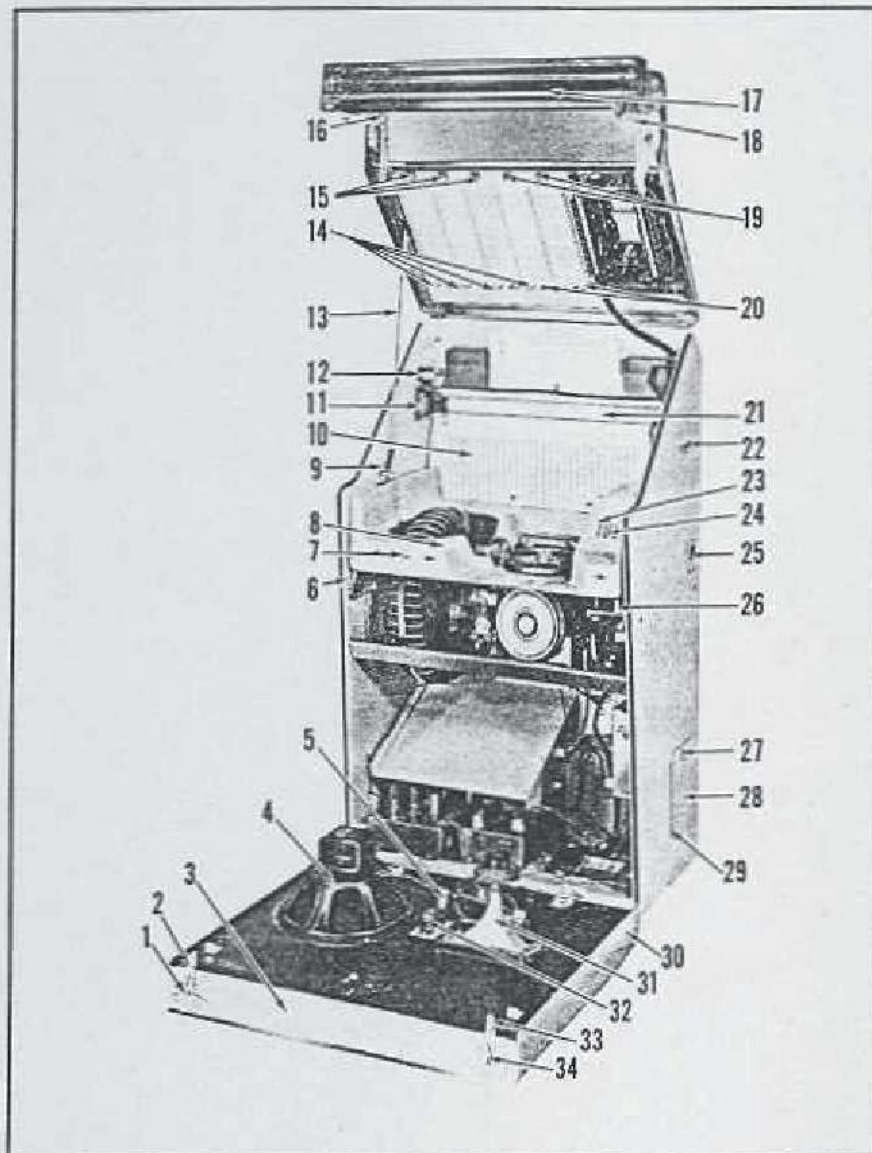
**PHONOGRAPH**





■ CABINET AND RELATED PARTS (FRONT VIEW)

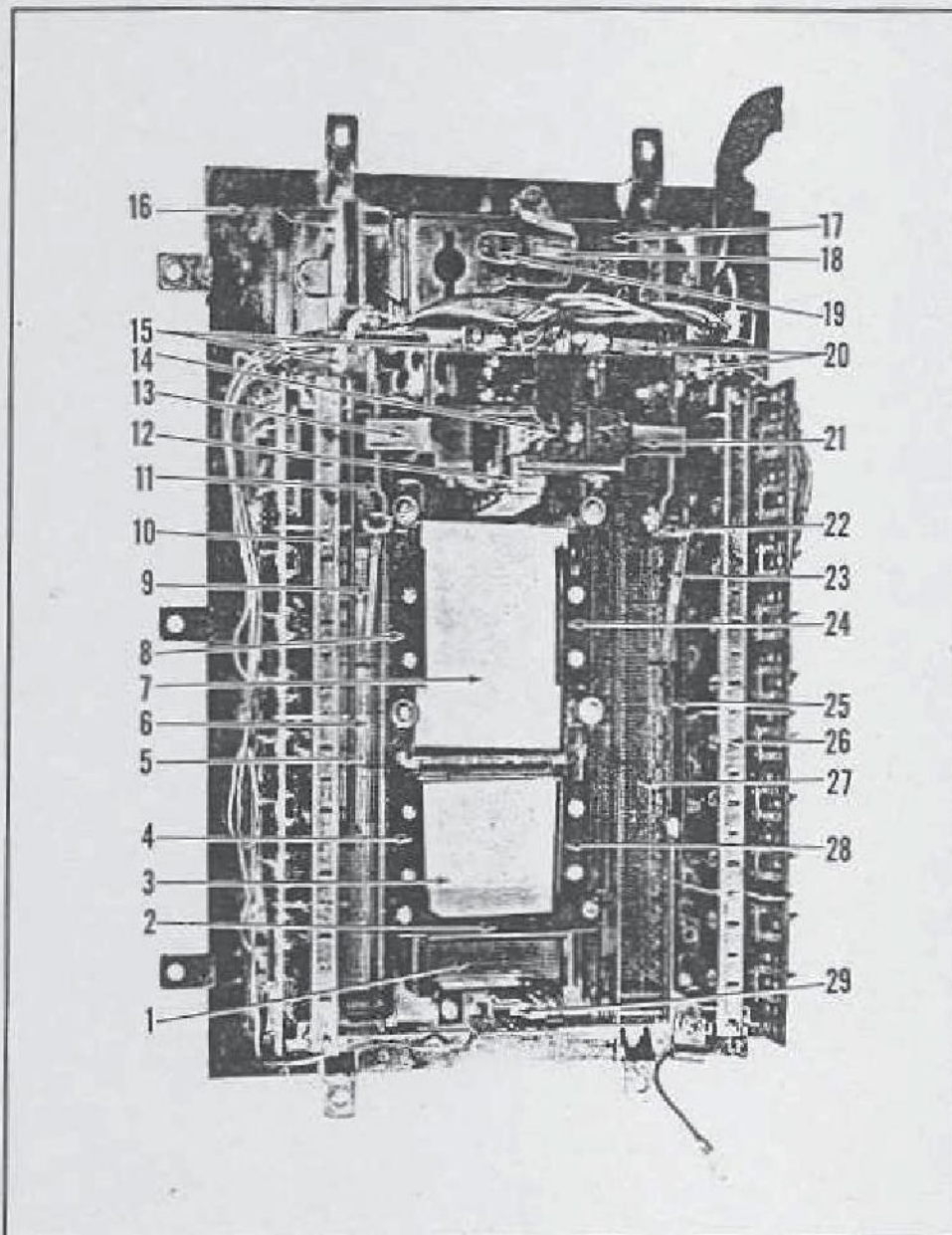
ITEM	Part No.	Description	Item	Part No.	Description
1	35716	Door Bottom Corner Casting (L.H.)	22	34545	Program Segment (A9-K0)
2	35712	Door Extrusion (L.H.)	23	34538	Select Window
3	35704	Grille Ornament Insert	24	34529	Push Button (Specify Letter)
4	35863	Grille	25	35708	Program Extrusion - Upper
5	36051-A	Mechanism Dress Cap Assembly	26	34481-1	Key Switch Casting
6	35721	Inner Plastic Trim (L.H.)	27	34529	Push Button (Specify Number)
7	35719	Dome Glass	28	34534-2	Pricing Glass (1-3-7)
8	35709	Program Extrusion - Lower	29	32551	Coin Return
9	35718	Program Glass	30	34539-2	Instruction Glass
10	34541	Program Segment (A1-K2)	31	34528-1	Reset Button
11	34542	Program Segment (A3-K4)	32	35993-A	Dome Side Casting & Hinge Assembly (R.H.)
12	34543	Program Segment (A5-K6)	33	31965-3	Coin Return Cup
13	35994-A	Dome Side Casting & Hinge Assembly (L.H.)	34	ST-7410	Lock and Key
14	34576-1	Category Card (Hit Tunes)	35	35710	Dome Extrusion - Bottom
15	34577-1	Category Card (Rhythm & Blues)	36	35700	Grille Ornament Casting
16	34578-1	Category Card (Favorites)	37	32355-4	Cash Door Frame
17	35777	Rockola Glass	38	ST-7379	Lock & Key w/ST-7407 Latch
18	35707	Dome Extrusion - Top	39	32880-4A	Cash Door Assembly
19	34579-1	Category Card (Country & Western)	40	35711	Door Extrusion (R.H.)
20	34544	Program Segment (A7-K8)	41	35713	Door Extrusion - Bottom
21	34580-1	Category Card (Varieties)	42	35715	Door Bottom Corner Casting (R.H.)



■ CABINET AND RELATED PARTS (INSIDE VIEW)

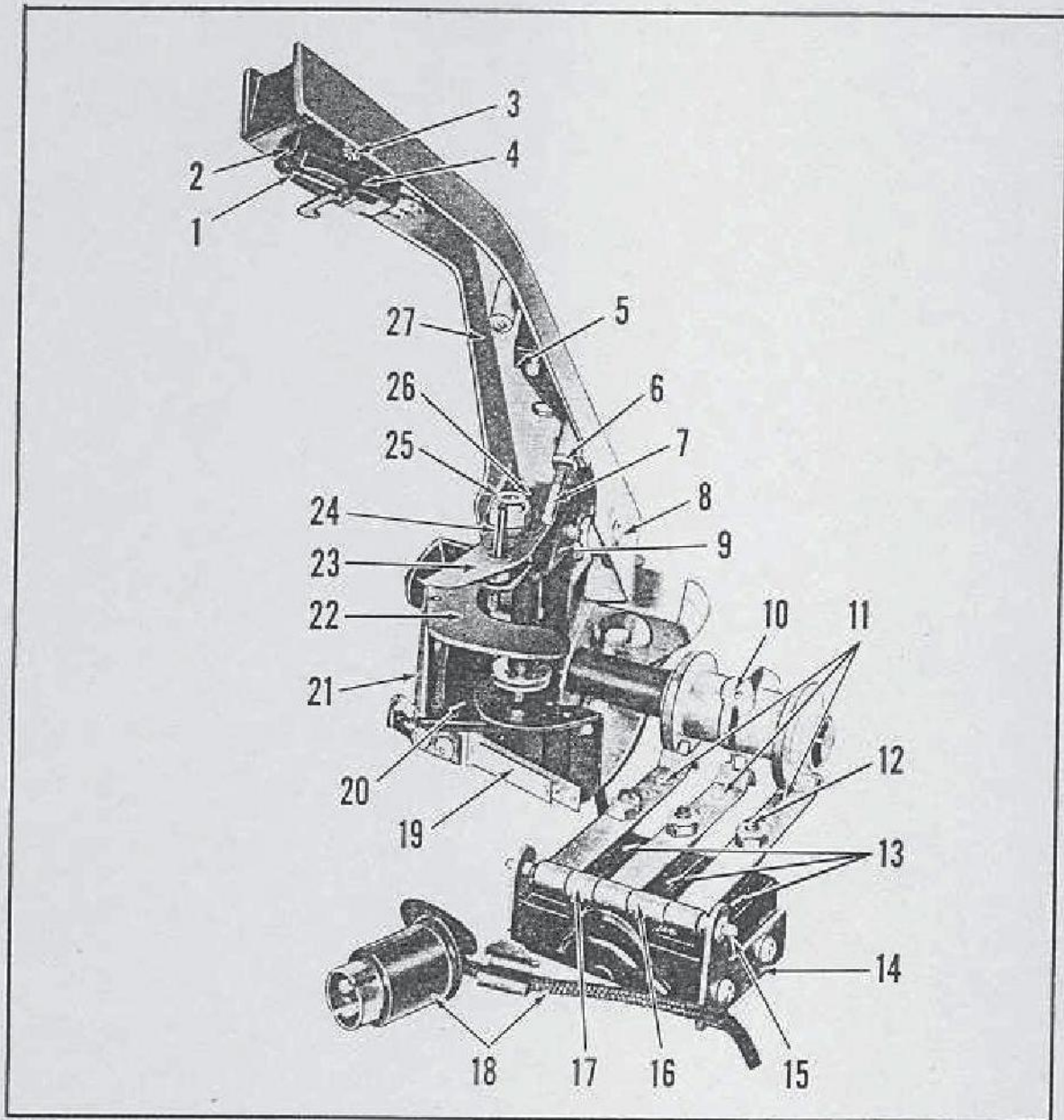
Item	Part No.	Description	Item	Part No.	Description
1	35737	Door Latch Spring (L.H.)	18	35722	Inner Plastic Trim (R.H.)
2	35742	Door Latch (L.H.)	19	34499	Program Retaining Spring
3	35714	Door Extrusion - Top	20	34697	Program Holding Spring
4	35985	12" Speaker	21	36121	20 Watt Fluorescent Tube
5	11556	Fluorescent Light Starter	22	32551	Coin Return
6	35744	Door Lock Bracket (L.H.)	23	34848	One Logo
7	35058	Dress Cap Ornament	24	34849	Zero Logo
8	35061-A	Mechanism Dress Cap Assembly	25	35536-A	Coin Return Cup Assembly
9	34693-A	Dome Latching Bracket Assembly	26	35743	Door Lock Bracket (R.H.)
10	36135	Back Rail Trim	27	ST-7379	Cash Door Lock W/ST-7407 Latch
11	17693	Ballast	28	32354-4	Cash Door (only)
12	11556	Fluorescent Light Starter	29	32355-4	Cash Door Frame
13	35754	Dome Latching Bar	30	35711	Door Extrusion (R.H.)
14	34697	Program Holding Spring	31	36180	Hi-Frequency Horn
15	34499	Program Retaining Spring	32	17693	Ballast
16	35721	Inner Plastic Trim (L.H.)	33	35741	Door Latch (R.H.)
17	35997-A	Lock Arm and Shaft Assembly	34	35736	Door Latch Spring (R.H.)





■ No. 35846-A PUSH BUTTON SWITCH ASSEMBLY

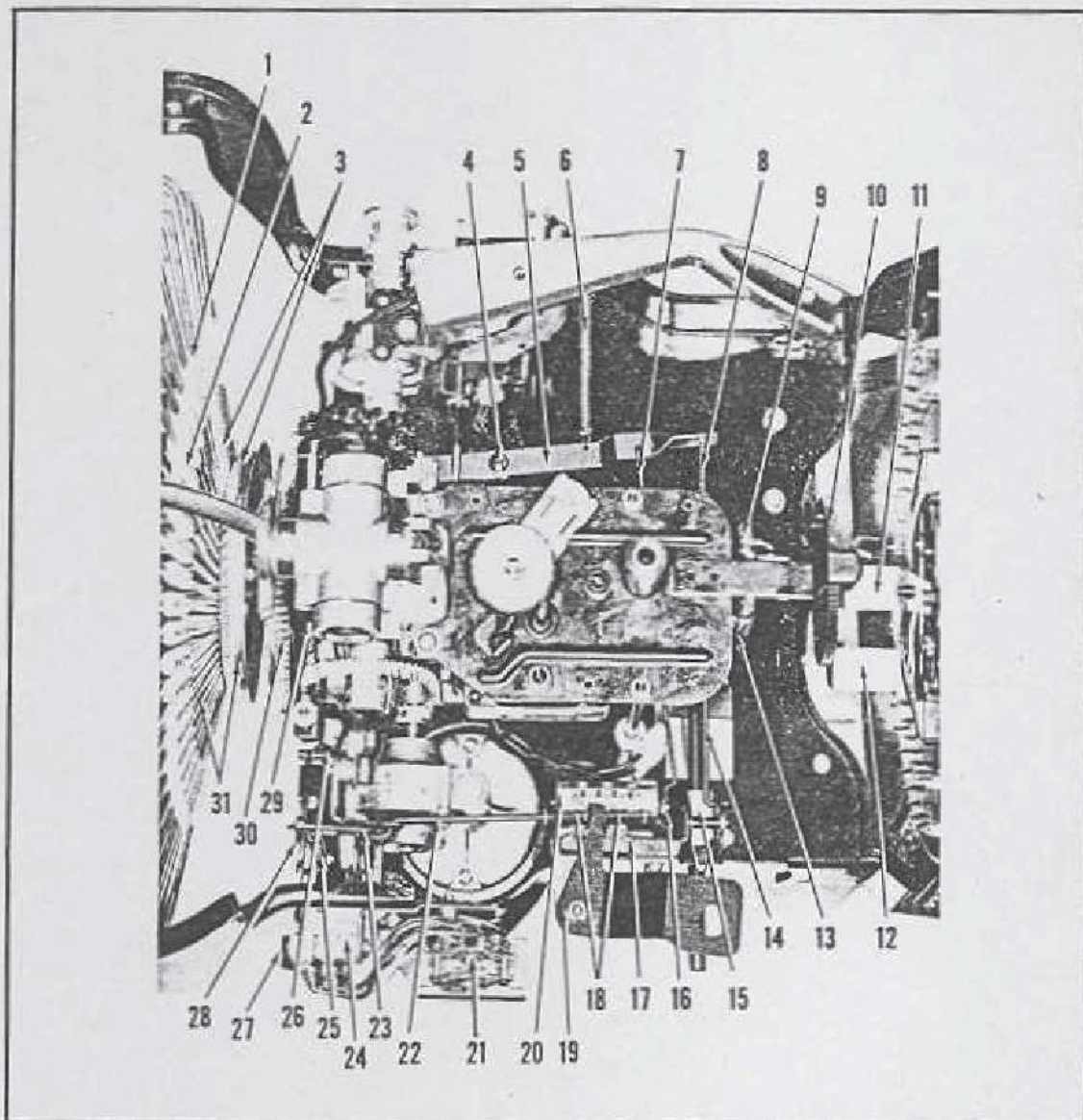
Item	Part No.	Description	Item	Part No.	Description
1	34528-1	Reset Button	16	34481-1	Key Switch Casting
2	34588	Button Stop	17	34490	Select Light Housing
3	34975	Instruction Glass Background	18	35107	Bayonet Socket
4	34524	Glass Holder (R.H.)	19	ST-3046	No. 44 Bulb
5	34278-A	Slide Bar Assembly (R.H.)	20	35359	Blade Switch
6	34493-1	Plastic Shield	21	34520	Lock Lever
7	34976	Pricing Glass Background	22	34513	Key Switch Lock (L.H.)
8	34524	Glass Holder (R.H.)	23	19216	Tension Spring
9	19216	Tension Spring	24	34525	Glass Holder (L.H.)
10	34816-A	Push Button Switch Assy. (R.H.)	25	34279-A	Slide Bar Assembly (L.H.)
11	34512	Key Switch Lock (R.H.)	26	34817-A	Push Button Switch Assy. (L.H.)
12	34599-A	Solenoid Assembly	27	34493-1	Plastic Shield
13	34520	Lock Lever	28	34525	Glass Holder (L.H.)
14	34702	Solenoid Spring	29	34592	Reset Switch
15	35359	Blade Switch			



### ■ TONE ARM AND RELATED PARTS

Item	Part No.	Description	Item	Part No.	Description
1	35227	Stylus	15	34416	Micro Lever Pivot Stud
2	34995	Cartridge Holding Clip	16	34417	Spacer (long)
3	ST-4519	4-40 x 3/16 Screw	17	15083	Spacer (short)
4	35122	Pickup Cartridge	18	34536	Dual Input Cable
5	ST-1387	Speed Clip	19	17771	Tone Arm Switch
6	ST-423	5-40 Hex Nut	20	34613-A	Tone Arm Bracket Assembly
7	34369	Tone Arm Rest Pin	21	34444	Lifter Lever Spring
8	ST-2294	Allen Set Screw—Cone Point	22	35156-A	Lifter Lever and Pin Assembly
9	34349	Tone Arm Pivot Plate	23	34360	Tone Arm Spring
10	34316	Micro Safety Cam	24	35040	Tone Arm Rest Pin
11	30132-A	Micro Switch Lever Assembly	25	ST-2297	Bristol Head Set Screw
12	ST-2288	Bristol Head Set Screw	26	34619-A	Pivot Bracket Assembly
13	33706	Micro Switch (D.C. Rated)	27	35189-A	Tone Arm and Diamond Assembly
14	19951	Mounting Plate			

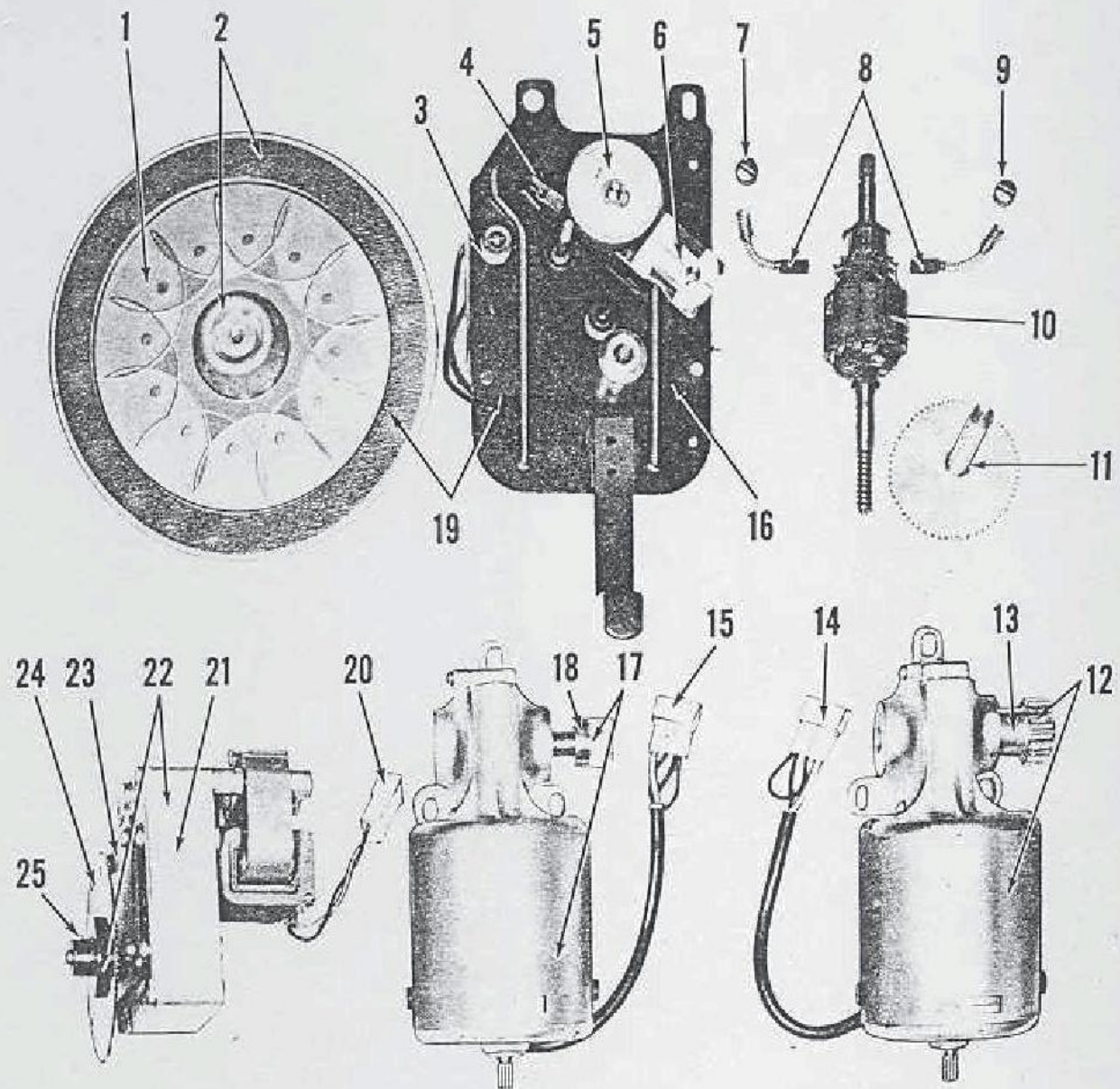




■ MECHANISM AND RELATED PARTS

Item	Part No.	Description	Item	Part No.	Description
1	34601-A	Magazine Assembly (Complete)	17	34674-A	Slide Mounting Bracket Assembly
2	34464	Magazine Decal	18	34446	Spring-Rocker Arm Rod
3	34376-A	Magazine Segment Assembly	19	34357	Slide-Popularity Counter
4	34427	Pawl Guide Stud	20	35322	Mechanical Counter
5	34391	Pawl Lever Pivot Arm	21	30368	Service Scan Switch
6	34445	Pawl Lever Return Spring	22	34406	Counter Slide Push Rod
7	34394	Counter Push Rod	23	34356	Bell Crank
8	34446	Spring-Rocker Arm Rod	24	34593	Odd-Even Snap Switch
9	34306	Bevel Gear	25	34466	Spring-Rocker Arm Rod
10	34632-A	Selector Gear Assembly	26	34398	Connecting Rod-Gripper Linkage
11	34350	Carriage Write-In Arm	27	34666-A	Gripper Linkage and Dog Assembly
12	34636-A	Wiper Assembly	28	34407	Bell Crank Push Rod
13	34662-A	Counter Shaft and Gear Assembly	29	34317	Odd-Even Alternating Dog
14	34401	Rocker Arm Push Rod	30	34603-A	Drive Gear and Main Shaft Assembly
15	34675-A	Rocker Arm and Pawl Assembly	31	34602-A	Magazine Segment Assembly
16	35323	Spring Lever			

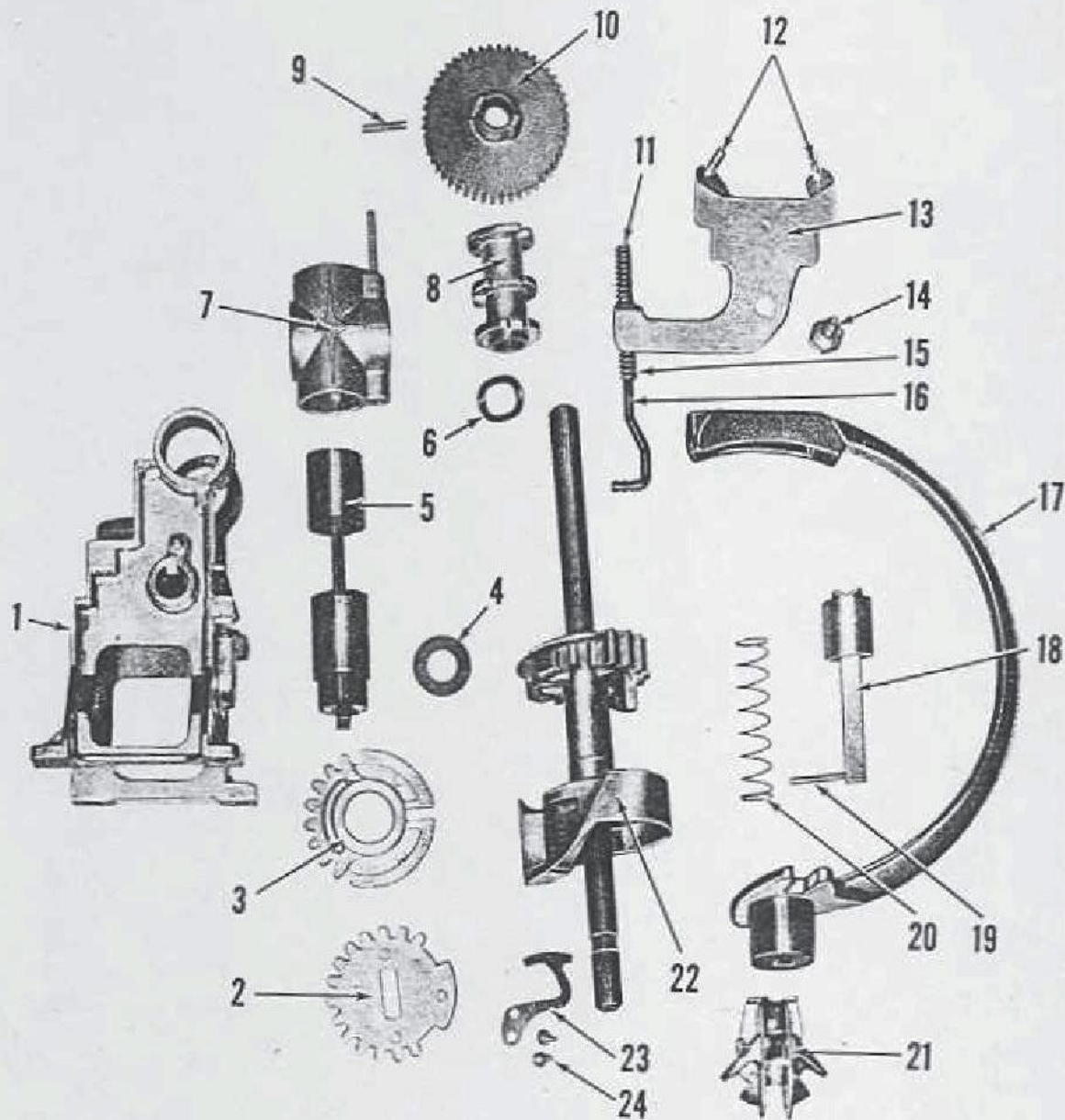




■ MOTORS AND RELATED PARTS

Item	Part No.	Description	Item	Part No.	Description
1	35061	Turntable Cover Plate	14	33636	Amp Lok Cap - 3 Circuit
2	35442	Turntable Complete (Less Motor)	15	33636	Amp Lok Cap - 3 Circuit
3	18849	Rubber Grommet	16	34333	Turntable Motor and Mounting Plate
4	30788	Idler Tension Spring	17	34672-A	Gripper Motor and Gear Assembly
5	30789	Idler Wheel Assembly	18	34309	Gripper Motor Gear
6	19950	Spring Plate Assembly	19	34678-A	Turntable Motor and Turntable Assembly
7	31494	Motor Brush Cap Screw	20	35121	Amp Lok Cap - 3 Circuit
8	31493	Motor Brush	21	34594	Write-In Motor
9	31494	Motor Brush Cap Screw	22	34750-A	Write-In Motor Assembly (Complete)
10	31189	Armature Assembly (P.M.)	23	34393	Motor Mounting Bracket
11	19694	Nylon Gear and Shaft	24	34680-A	Selector Gear Assembly
12	34668-A	Magazine Motor and Gear Assembly	25	ST-531	Spiral Pin
13	34308	Magazine Pinion Gear			

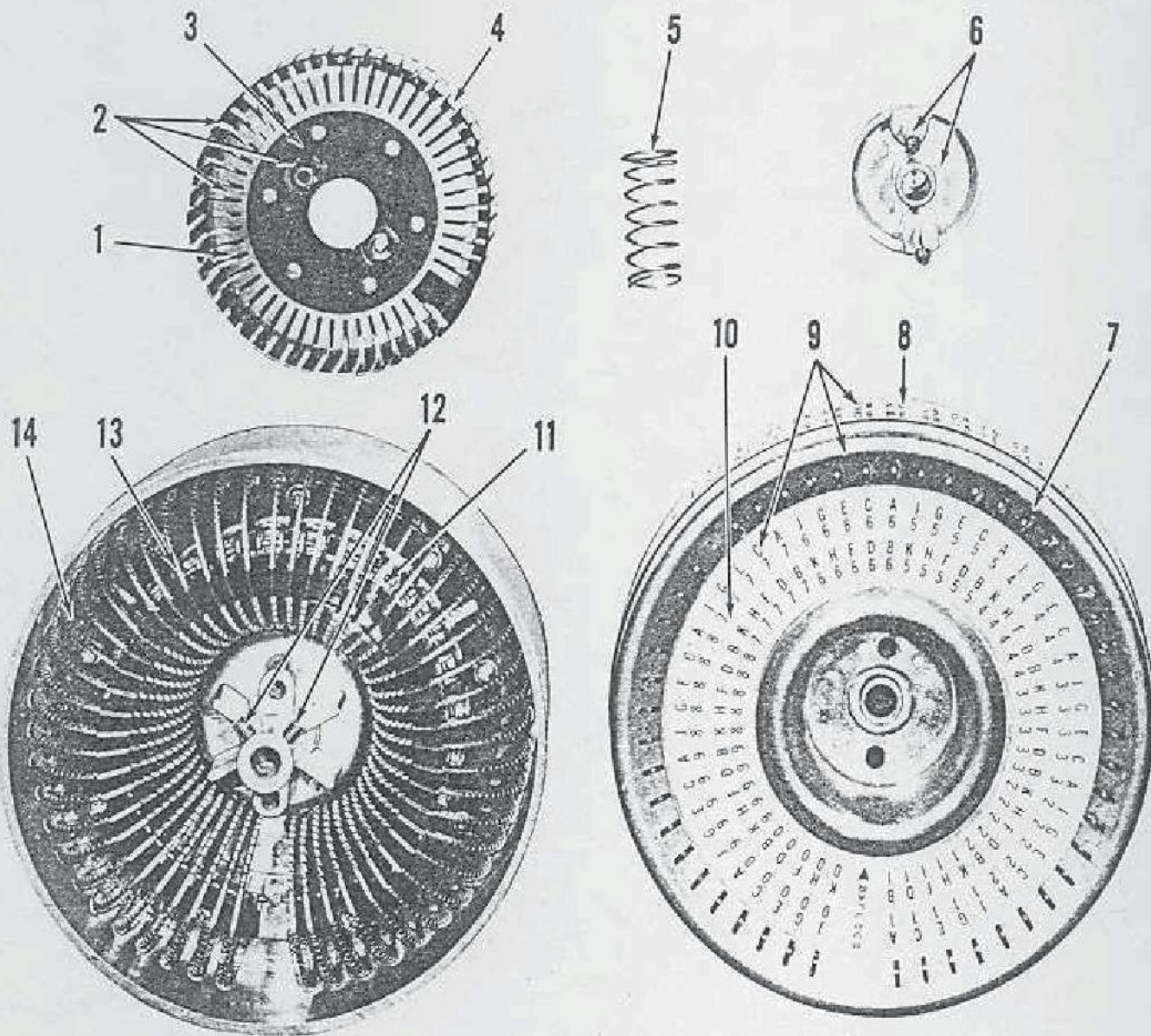




■ NO. 34610-A GRIPPER UNIT ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	34305	Gripper Housing	13	34609-A	Reversing Bracket Assembly
2	34311	Gripper Release Gear	14	34422	Shoulder Screw
3	34312	Gripper Turnover Gear	15	34864	Connecting Rod Spring
4	34929	Thrust Washer	16	34398	Gripper Connecting Rod
5	34399	Trunnion Shaft	17	34322	Gripper Arm
6	ST-4828	Spring Washer	18	34314	Inner Gripper
7	34604	Gripper Spider Assembly	19	ST-534	Spirol Pin
8	34316	Micro Safety Cam	20	34441	Gripper Spring
9	ST-519	Spirol Pin	21	34323	Gripper Arm Reversing Cam
10	34310	Gripper Shaft Gear	22	34608-A	Drive Shaft Assembly
11	34447	Connecting Rod Spring	23	17524	Tone Arm Cam Keeper Spring
12	34420	Reversing Bracket Pin	24	ST-6348	6-32 x 1/4 R.H. Machine Screw

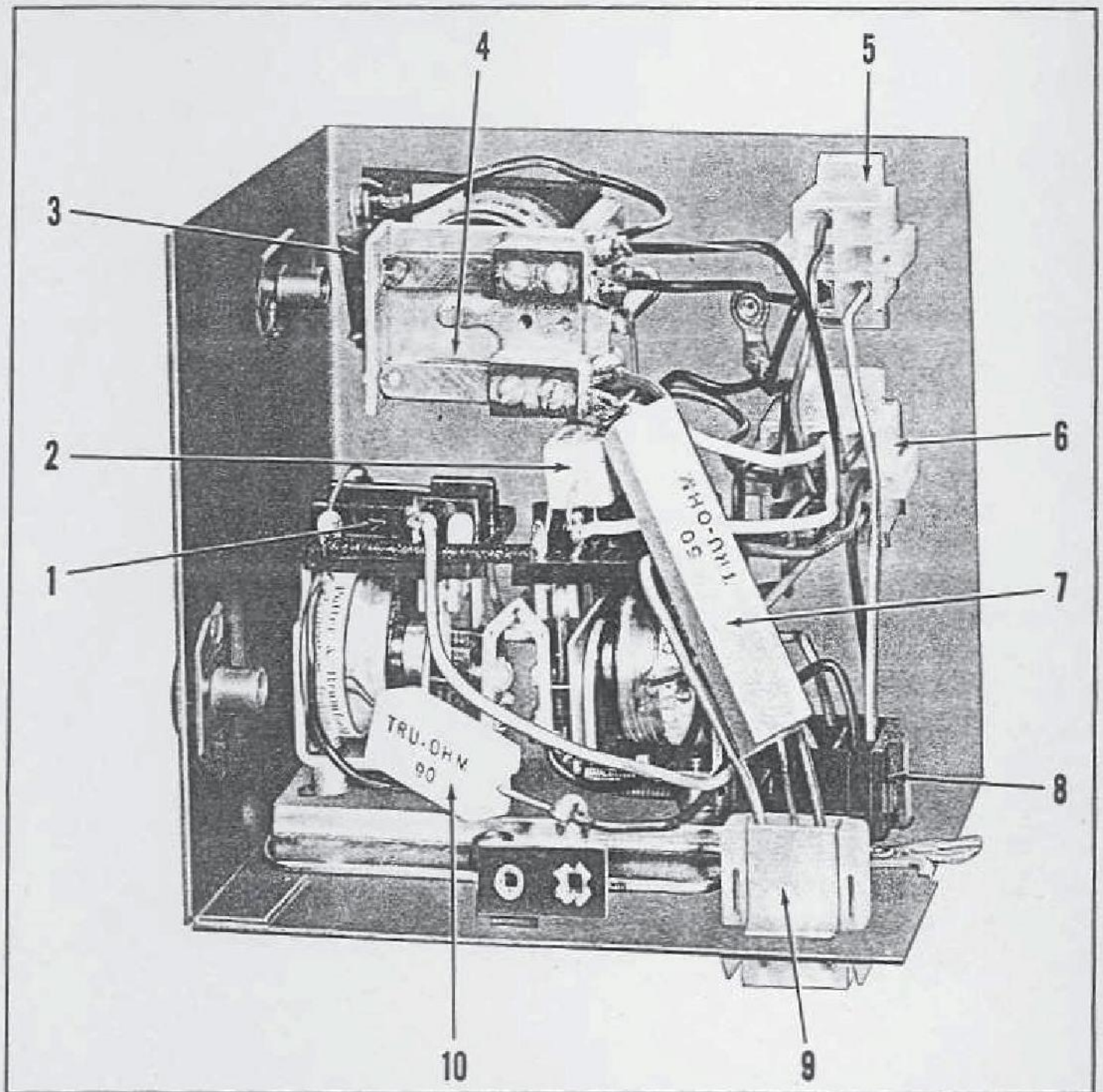




■ NO. 34645-A POPULARITY COUNTER ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	34325	Comb	9	34870-A	Counter Casting and Decal Assembly
2	34643-A	Reset Ring Assembly	10	34467	Counter Decal
3	34389	Comb Retainer	11	34424	Counter
4	34326	Reset Ring	12	ST-2253	Allen Set Screw
5	34442	Reset Button Spring	13	34324	Counter Indicator
6	34644-A	Reset Button Assembly	14	34443	Indicator Spring
7	34319	Counter Casting (only)			
8	34465	Counter Index Tab			

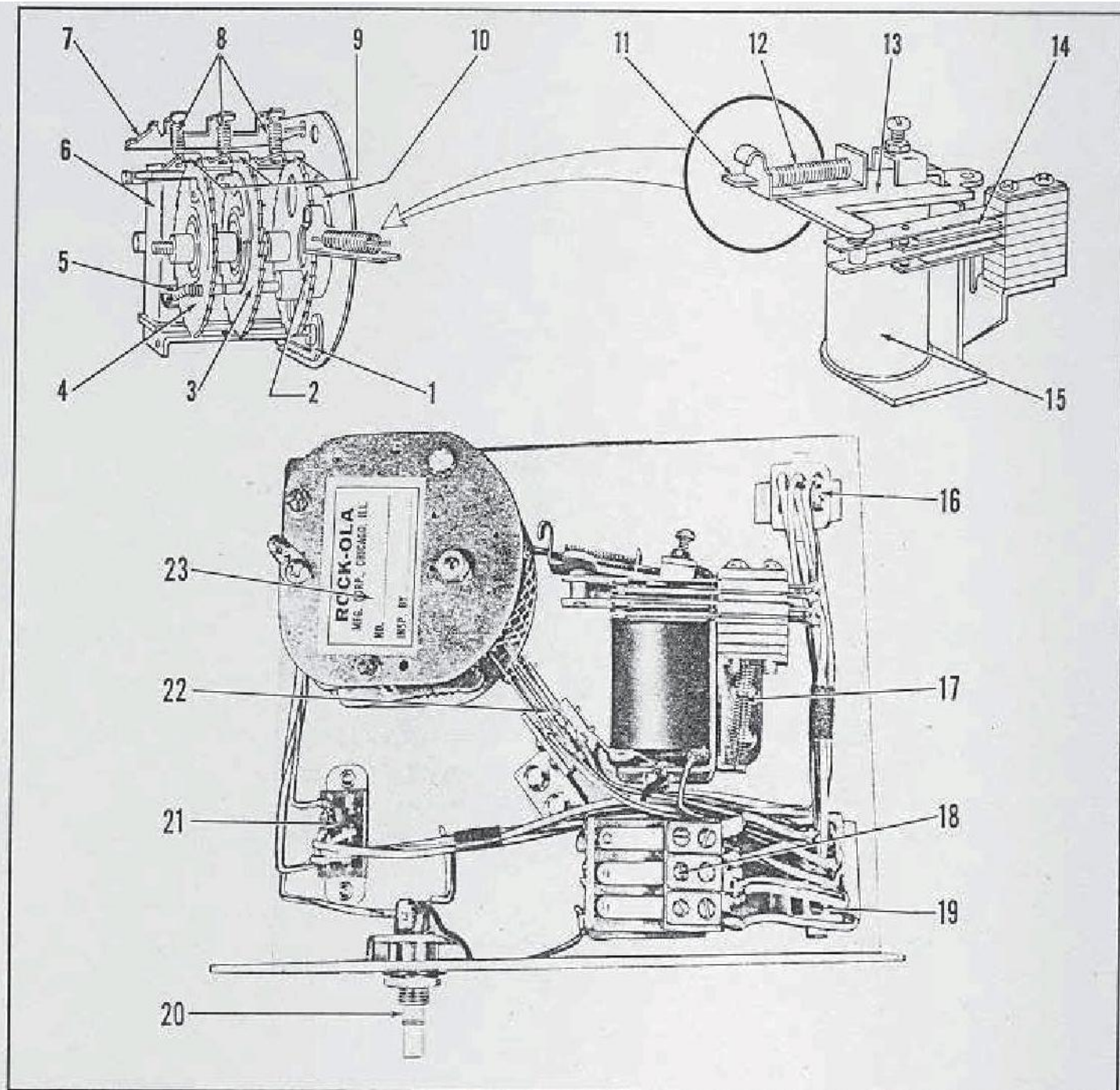




■ NO. 34640-A CONTROL BOX ASSEMBLY

Item	Part No.	Description
1	34552	Interlock Relay
2	35128	22 Ohm 5 Watt Resistor
3	34871	680 Ohm 5 Watt Resistor
4	35114	Gripper Reverse Relay
5	33637	Amp Lok Plug-6 Circuit White
6	33643	Amp Lok Plug-9 Circuit
7	34554	50 Ohm 10 Watt Resistor
8	33638	Amp Lok Plug-6 Circuit Red
9	33635	Amp Lok Plug-3 Circuit
10	34553	90 Ohm 5 Watt Resistor

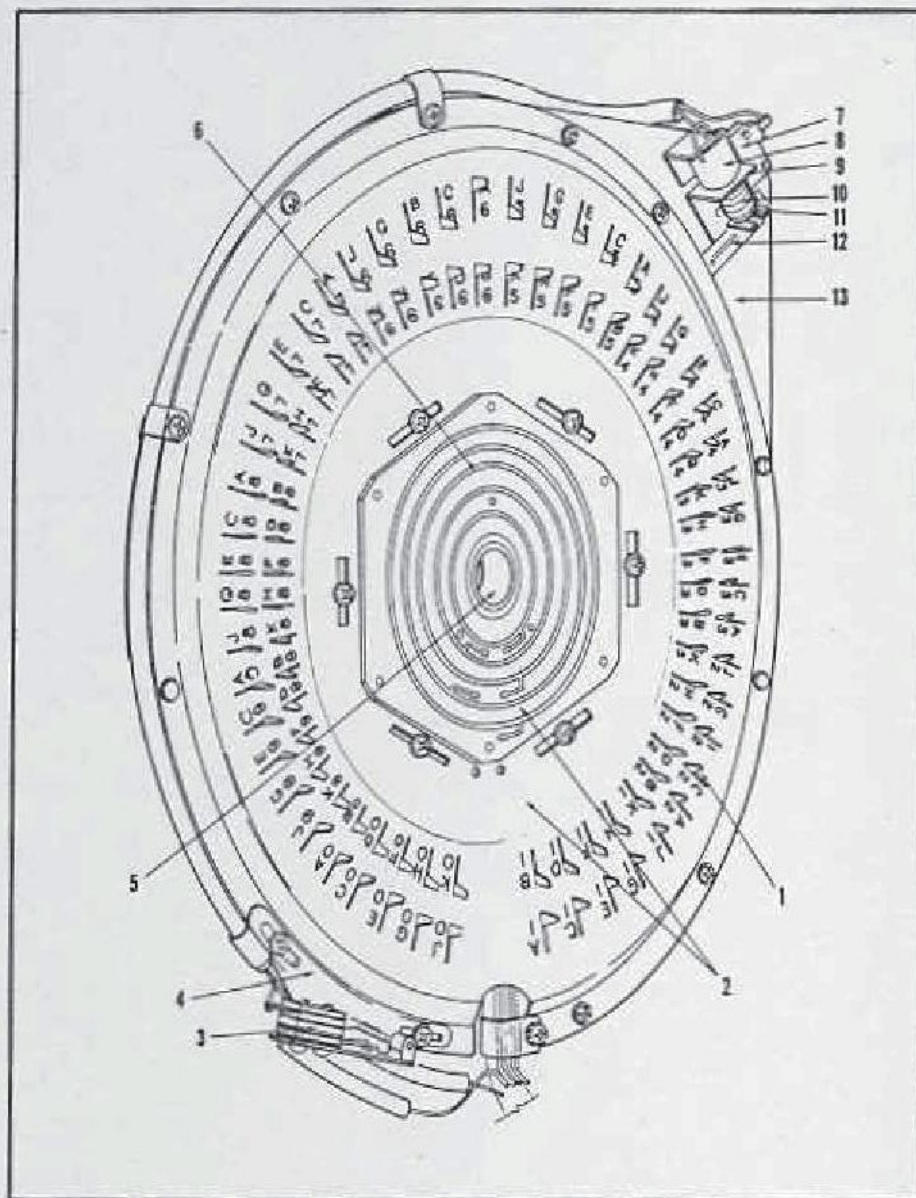




■ No. 35865-A ACCUMULATOR ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	34228-A	Ratchet Escapement Armature Assembly	12	14028	Compression Spring
2	14693-A	Ratchet and Hub Assembly	13	34229-A	Reset Armature Riveting Assembly
3	31258-A	Ratchet & Hub Assembly (3-25¢)	14	34719	Switch-Selection Impulse
4	31214-A	Ratchet & Hub Assembly (7-50¢)	15	14030	Coil - Reset
5	10901	Tension Spring	16	33637	Amp Lok Plug - 6 Circuit White
6	14011	Coil - Electromagnet	17	19216	Tension Spring
7	14567	Spring Anchor	18	35138	Attract Delay Relay (ADR)
8	14570	Tension Spring	19	35129	Amp Lok Plug - 12 Circuit
9	14014	Armature - Ratchet Detent	20	15159	Momentary Push Switch
10	14007	Clock Spring	21	31192	Slide Switch (D.P.D.T.)
11	17982	Pawl - Reset	22	34000	Control Switch
			23	31200-A	Accumulator Assembly





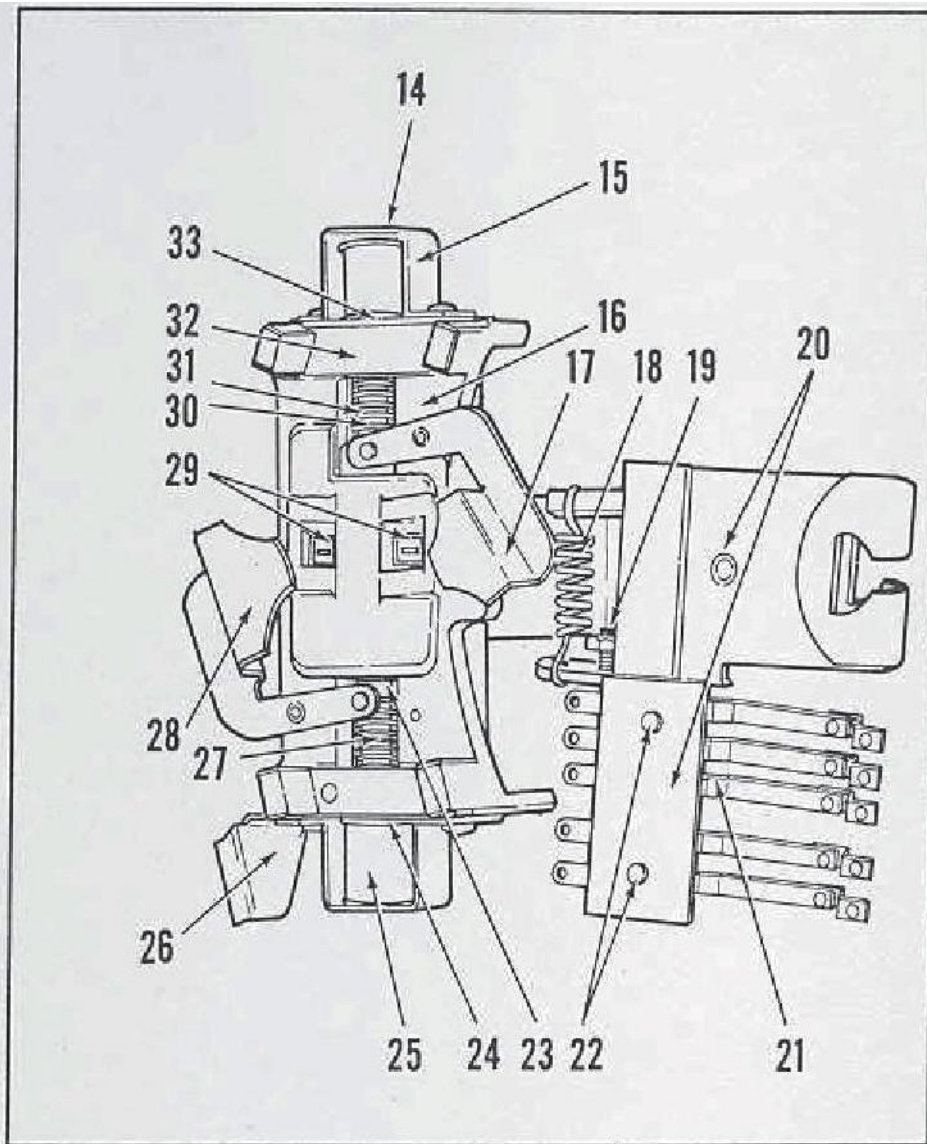
■ NO. 34650-A SELECTOR ASSEMBLY (Read-Out)

Item	Part No.	Description	Item	Part No.	Description
1	34334	Selector Lever	7	34555	Wobble Plate Switch
2	34655-A	Selector Cover Read Out Assembly	8	34556	Solenoid Coil
3	34569	Home Snap Switch	9	34448	Solenoid Bracket
4	34377-1	Home Switch Bracket	10	34559	Return Spring
5	34411	Selector Bearing	11	34449	Coil Plunger
6	34657-A	Read Out Contact Riveting Assembly	12	34341	Wobble Plate
			13	34653-A	Selector Center Plate Assembly

■ ADDITIONAL SELECTOR PARTS (Not Shown)

Part No.	Description	Part No.	Description
34437	Selector Lever Spring	34429	Selector Lever Shaft - Long
34825	21 Contact Plug and Shell	SB-281	Knife Disconnect
33642	Amp Lok Cap-6 Circuit-Green	34891	Home Snap Switch Guard Bracket
34428	Selector Lever Shaft - Short	34433	Wobble Plate Stud





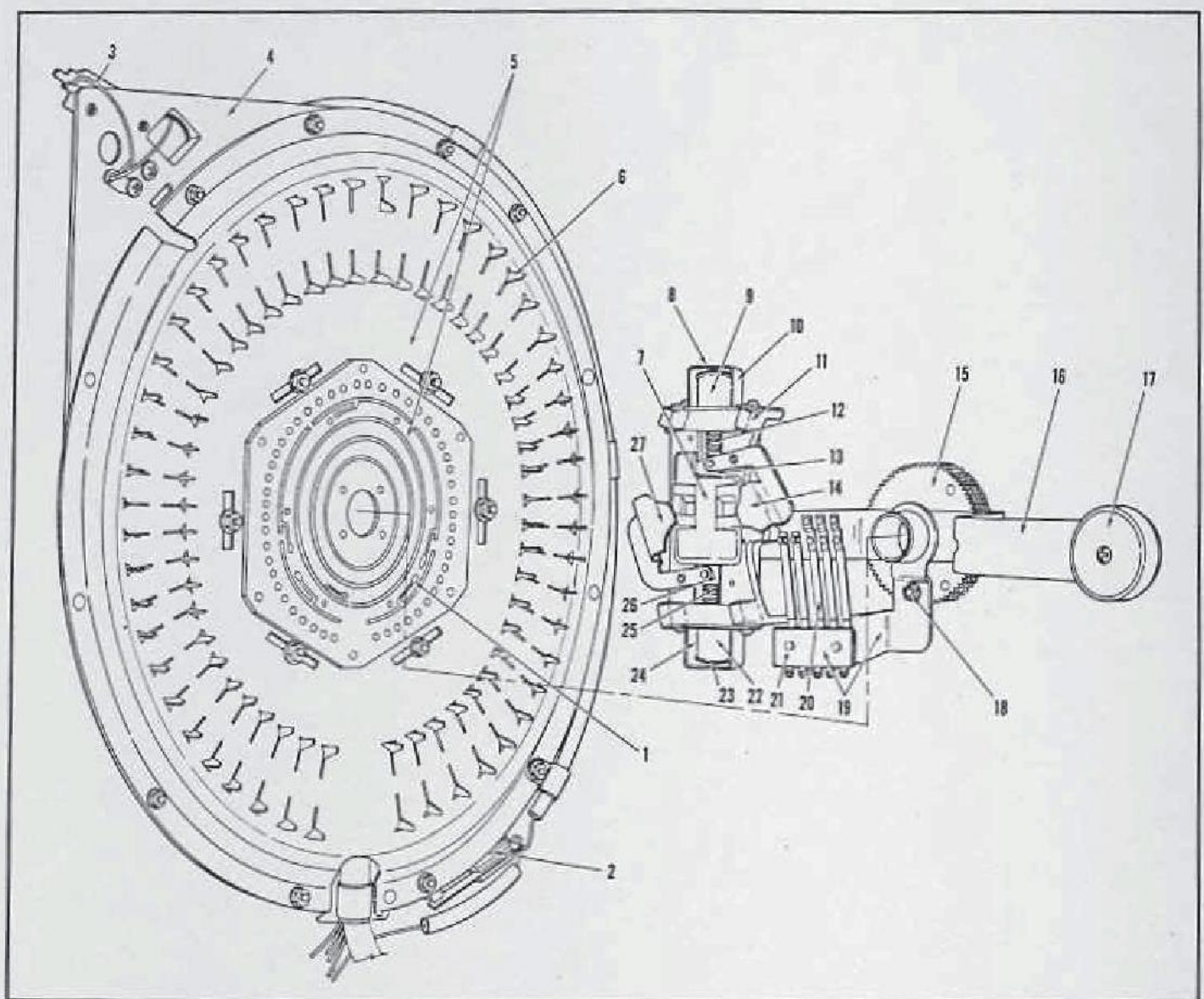
■ NO. 34625-A READ-OUT CARRIAGE ASSEMBLY (COMPLETE)

Item	Part No.	Description	Item	Part No.	Description
14	34557	Carriage Coil	24	ST-4856	Spring Washer
15	34626-A	Coil Housing Bracket Assembly	25	34557	Carriage Coil
16	34364	Carriage Housing	26	34384-1	Home Switch Cam and Coil Pad
17	34623-A	Inside Lever and Pin Assembly	27	34472	Plunger Return Spring
18	34471	Read-Out Tension Spring	28	34624-A	Outside Lever and Pin Assembly
19	ST-2521	Hex Head Machine Screw	29	17946-A	Contact Assembly
20	34627-A	Read-Out Arm Riveting Assembly	30	34622-A	Coil Plunger and Pin Assembly
21	32301	Wiper Unit	31	34472	Plunger Return Spring
22	ST-4956	Tubular Rivet	32	34920-A	Read-Out Carriage Assembly (Onl
23	34622-A	Coil Plunger and Pin Assembly	33	ST-4856	Spring Washer

■ ADDITIONAL CARRIAGE PARTS (Not Shown)

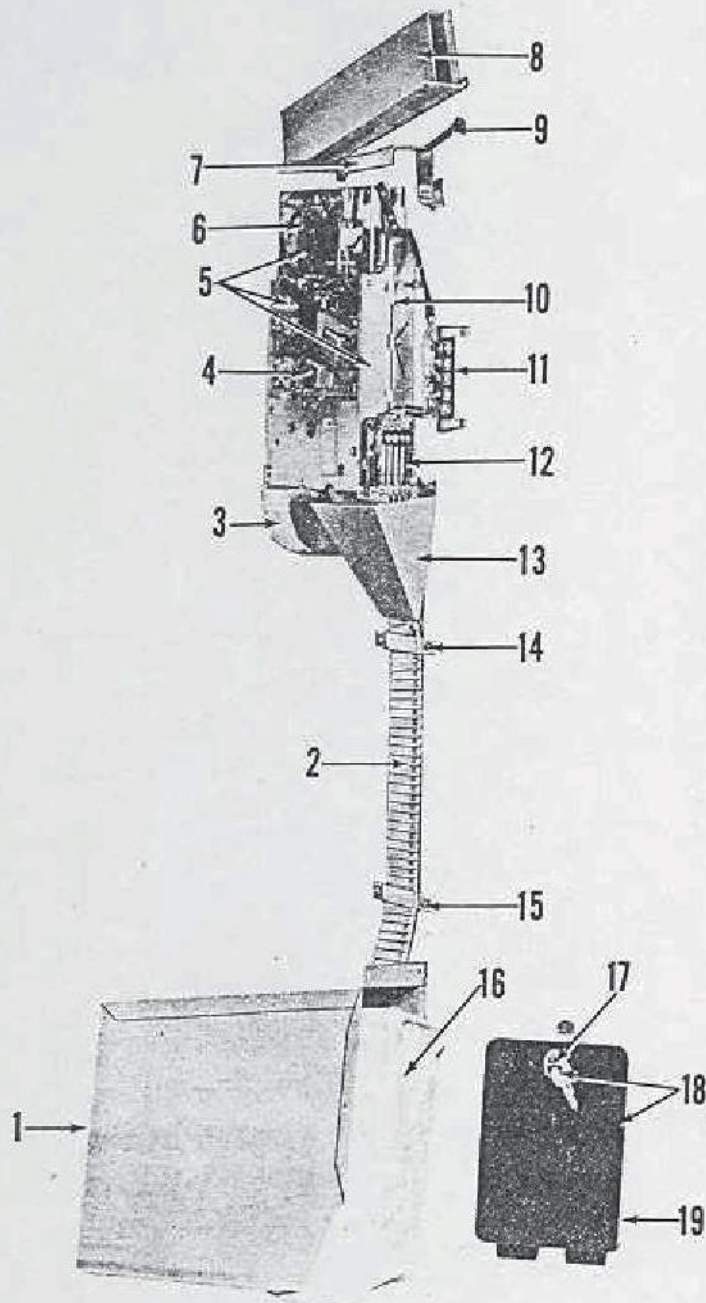
Part No.	Description	Part No.	Description
34473	Carriage Pressure Spring	ST-9247	Truarc Self Locking Ring
34382	Contact Retainer		





■ SELECTOR AND WRITE-IN CARRIAGE

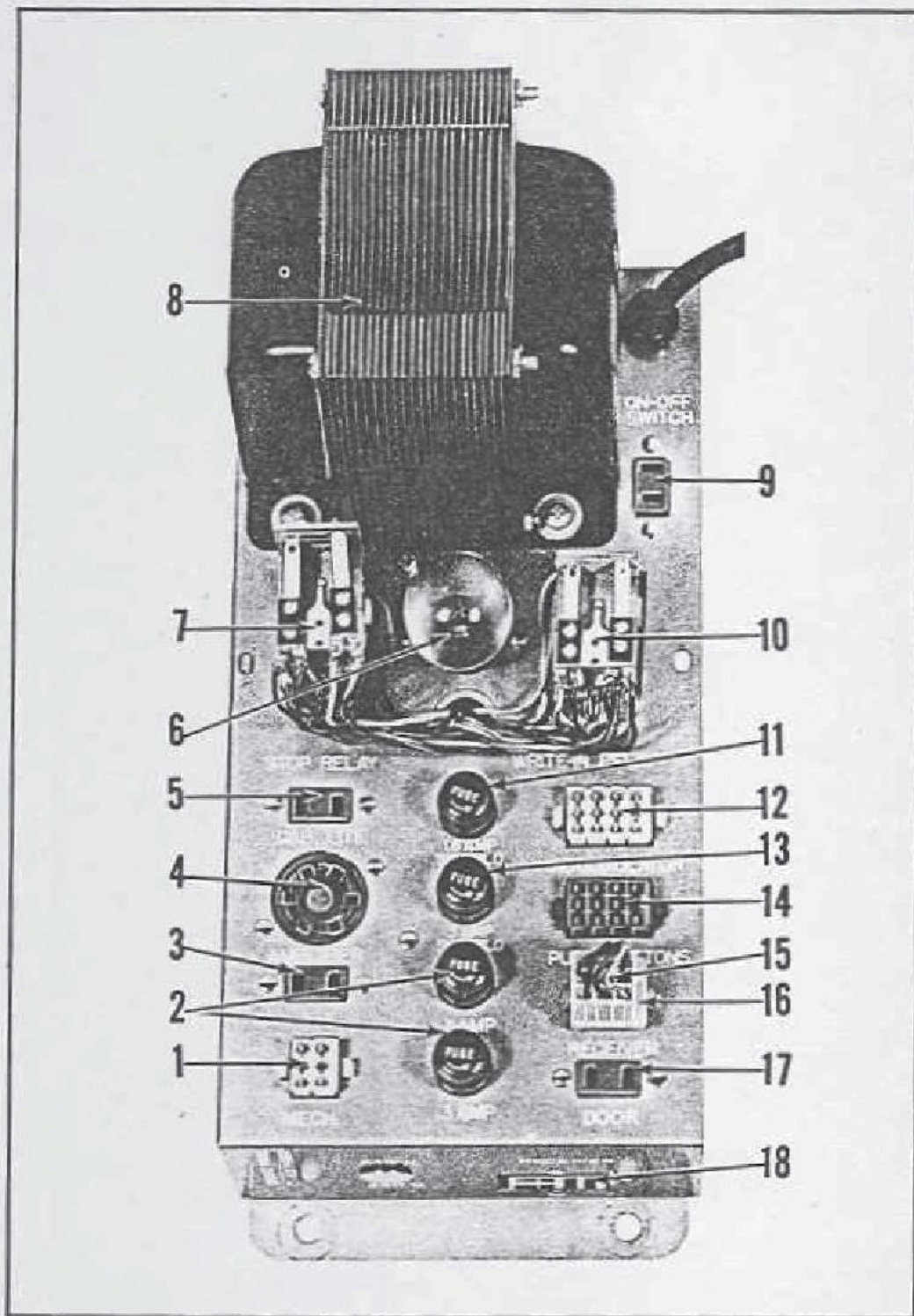
Item	Part No.	Description	Item	Part No.	Description
1	34646-A	Write-In Printed Circuit Assembly	15	34633-A	Selector Gear Assembly
2	34569	Home Snap Switch	16	34350	Write-In Carriage Arm
3	34555	Wobble Plate Switch	17	34779	Counter Balance Weight
4	34338	Selector Center	18	ST-1596	10-32 x 3/8 Hex Head Screw
5	34649-A	Write-In Cover and Wiring Assembly	19	34636-A	Wiper Assembly
6	34334	Selector Lever	20	34392	Write-In Wiper Unit
7	34925-A	Write-In Carriage Assembly	21	ST-4956	Tubular Rivet
8	ST-4856	Spring Washer	22	34557	Carriage Coil
9	34557	Carriage Coil	23	ST-4856	Spring Washer
10	34626-A	Coil Housing Bracket Assembly	24	34626-A	Coil Housing Bracket Assembly
11	34364	Carriage Housing	25	34472	Armature Return Spring
12	34472	Armature Return Spring	26	34622-A	Coil Armature and Pin Assembly
13	34622-A	Coil Armature and Pin Assembly	27	34624-A	Outside Lever and Pin Assembly
14	34623-A	Inside Lever and Pin Assembly			



### ■ SLUG REJECTOR AND RELATED PARTS

Item	Part No.	Description	Item	Part No.	Description
1	35873	Cash Box Housing	11	32113	5 Lug Terminal Strip
2	35726	Flexible Coin Chute	12	14860	Coin Switch
3	31965-3	Coin Return Cup	13	34733-A	Lower Coin Chute Assembly
4	31317	5¢ - 10¢ - 25¢ Slug Rejector	14	35750	Coin Chute Clamp
5	33347	Slug Rejector Unit - Complete	15	35750	Coin Chute Clamp
6	31318	50¢ Slug Rejector	16	32343	Cash Bag
7	35749	Coin Return Lever	17	ST-7379	Lock and Key W/ST-7407 Latch
8	35701	Coin Chute	18	32880-4A	Cash Door Assembly
9	32609	Coin Return Spring	19	32354-4	Cash Door (only)
10	33018-A	Slug Rejector Housing Assembly			

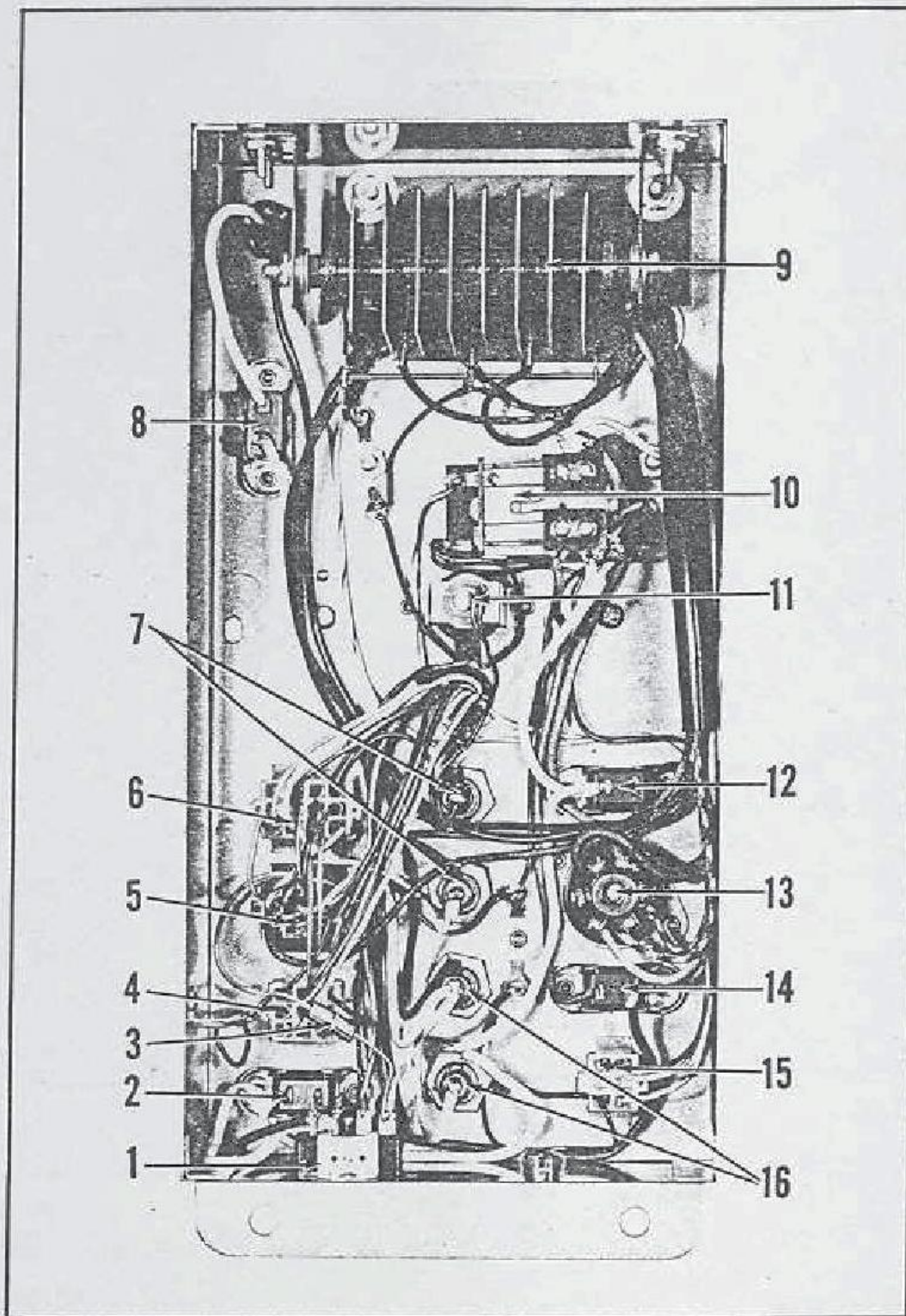




■ NO. 35885-A POWER DISTRIBUTION ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	33637	Amp Lok Plug - 6 Circuit - White	10	35901	Write in Relay
2	ST-4333	3 Amp Fuse	11	ST-4321	1.6 Amp Slo-Blo Fuse
3	19272	Miniature Socket	12	35129	Amp Lok Plug - 12 Circuit - White
4	18414	6 Prong Socket	13	ST-3090	3 Amp Slo-Blo Fuse
5	19272	Miniature Socket	14	35929	Amp Lok Plug - 12 Circuit - Red
6	ST-4338	#309 - G.E. Lamp	15	35955-A	Amp Lok Cap Assembly - 9 Circuit
7	34739	Stop Relay	16	33643	Amp Lok Plug - 9 Circuit - White
8	35953-A	Power Transformer Assembly	17	19272	Miniature Socket
9	19272	Miniature Socket	18	35928	8 Contact Socket

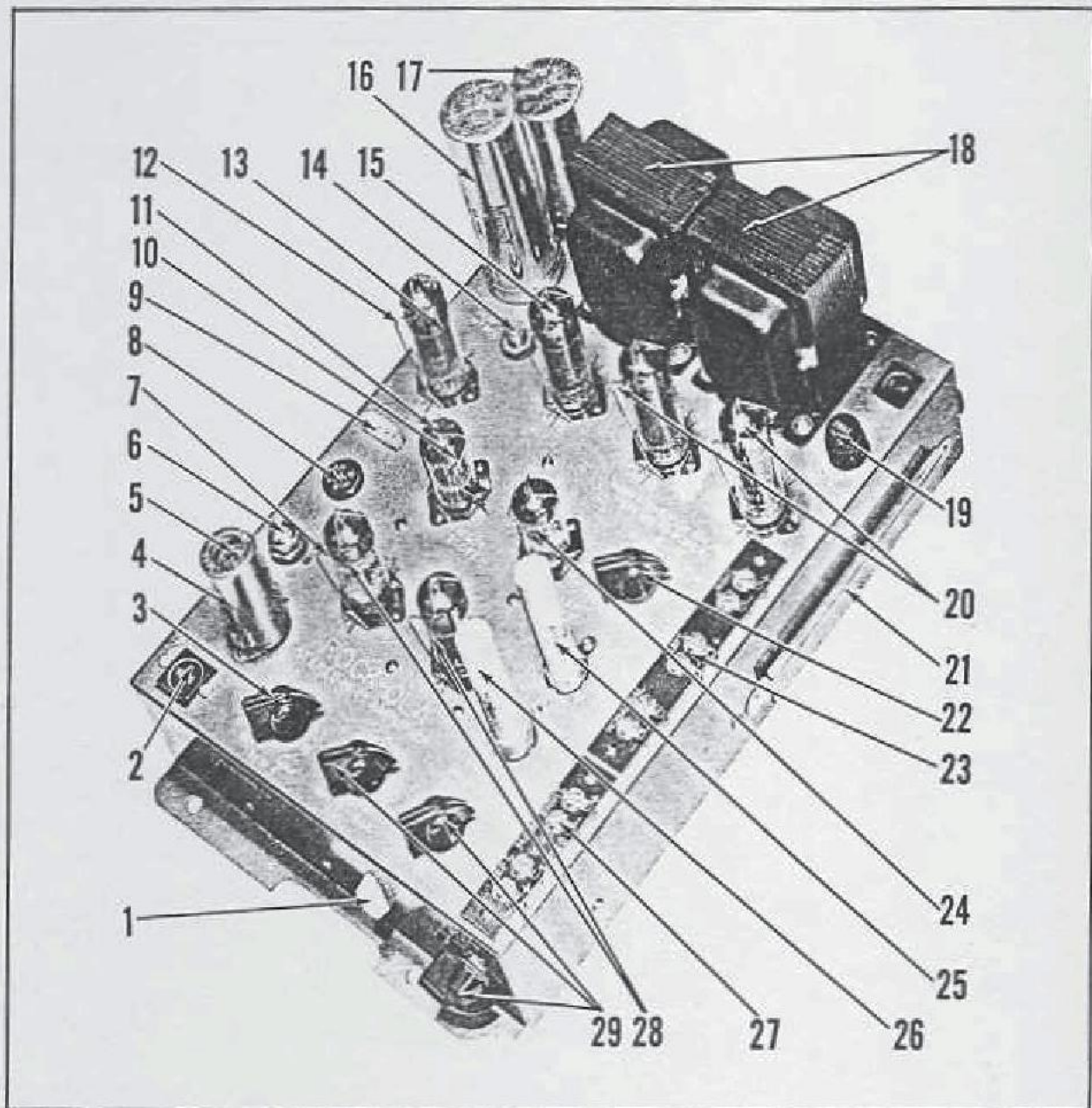




■ NO. 35885-A POWER DISTRIBUTION ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	35928	8 Contact Socket	9	35302	Power Rectifier
2	19272	Miniature Socket	10	34792	Play Relay
3	35328	1500 OHM 1 Watt Resistor	11	34749	Lamp Socket
4	33643	Amp Lok Plug - 9 Circuit - White	12	19272	Miniature Socket
5	35929	Amp Lok Plug - 12 Circuit - Red	13	18414	6 Prong Socket
6	35129	Amp Lok Plug - 12 Circuit - White	14	19272	Miniature Socket
7	11555	Fuse Holder	15	33637	Amp Lok Plug - 6 Circuit - White
8	19272	Miniature Socket	16	11555	Fuse Holder

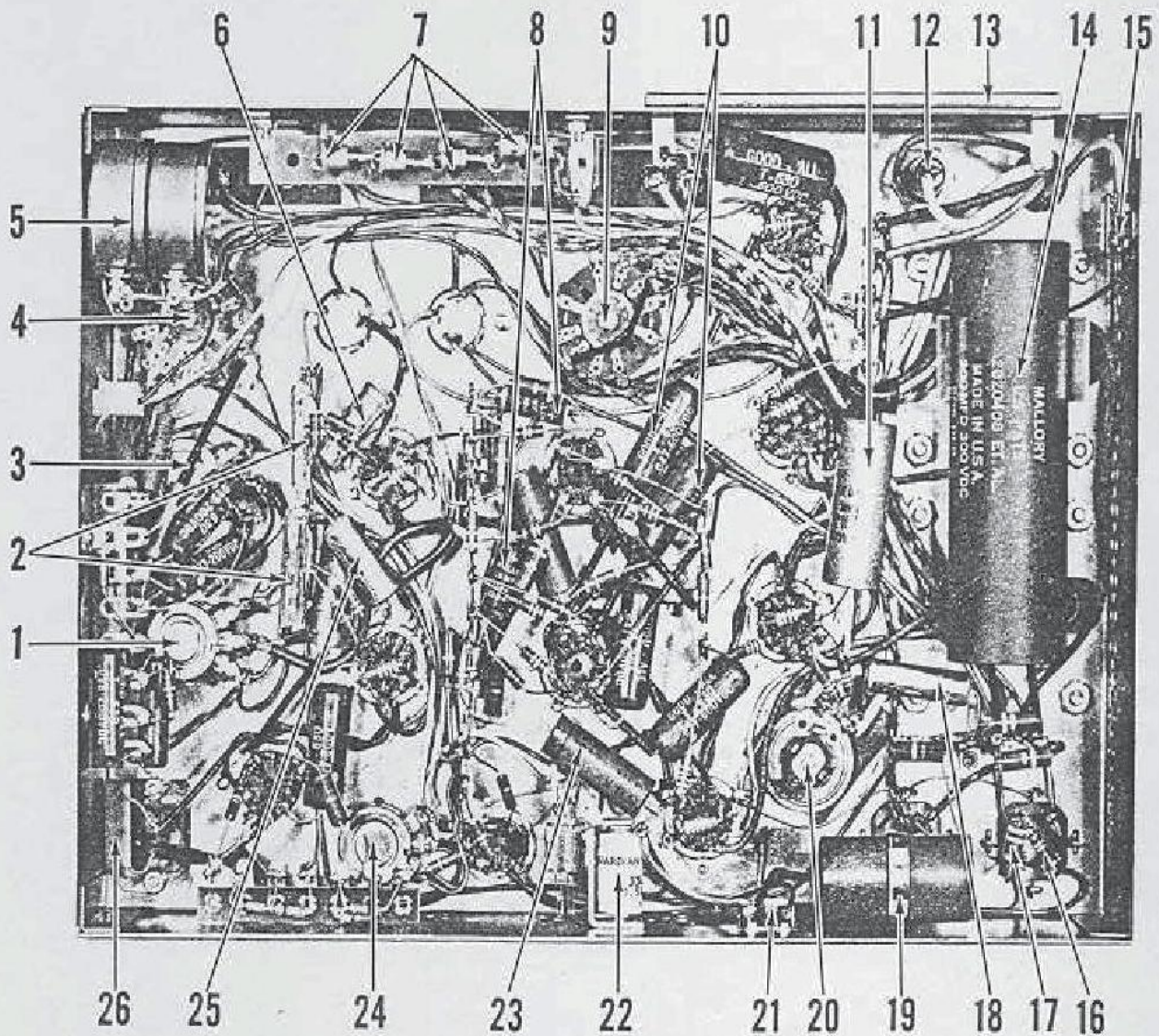




■ No. 36320-A AMPLIFIER ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	35126	Amp Lok Plug - 3 Circuit	16	32824	Grounded Can Doubler Capacitor
2	33199	Dual Input Socket	17	30316	Filter Capacitor - 4 Section
3	11578	Pointer Knob	18	35354	Output Transformer
4	33207	Tube Shield	19	ST-4332	1 Amp Slo-Blo Fuse
5	35365	12 AU7/ECC82 Tube	20	33229	6973 Tube
6	33245	Balance Control	21	34032	8 Ohm Candohm Resistor
7	33752	Tube Clamp Spring - Medium	22	11578	Pointer Knob
8	18634	6 Prong Miniature Socket	23	35348	Remote Speaker Terminal Strip
9	35126	Amp Lok Plug - 3 Circuit	24	32852	12AX7 Tube
10	35365	12AU7/ECC82 Tube	25	35342	2200 Ohm 25 Watt Standee Resistor
11	33751	Tube Clamp Spring - Short	26	34069	7800 Ohm 25 Watt Standee Resistor
12	33753	Tube Clamp Spring - Long	27	34031	Main Stereo Speaker Terminal Strip
13	33229	6973 Tube	28	32498	6CY7 Tube
14	32489	Hum Control	29	11578	Pointer Knob
15	33229	6973 Tube			

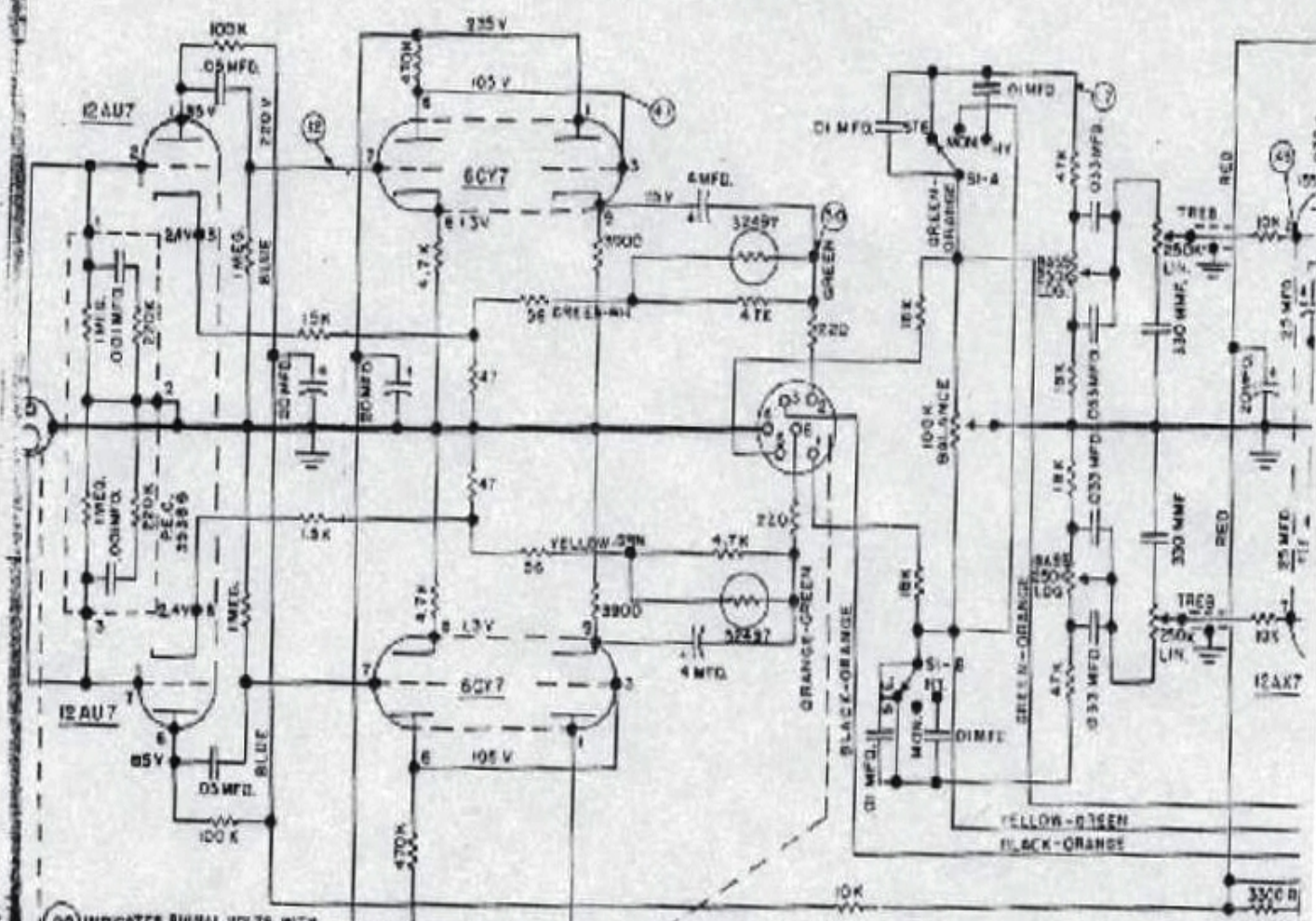




■ No. 36320-A AMPLIFIER ASSEMBLY

Item	Part No.	Description	Item	Part No.	Description
1	35413	Treble Control	14	32825	Insulated Can Doubler Capacitor
2	34225	Thermistor	15	35363	Rectifier
3	35341	Bass Control	16	15184	10,000 Ohm 1/2 Watt Resistor
4	35352	3 Position 4 Circuit Switch	17	31197	3300 Ohm 1 Watt Resistor
5	34047	L Pad Control	18	35387	50 Mfd. 50 V.D.C. Capacitor
6	35388	4 Mfd. 250 V.D.C. Capacitor	19	35879	300 Mfd. 50 V.D.C. Capacitor
7	34035	Rectifier	20	32489	Hum Control
8	35390	25 Mfd. 15 V.D.C. Capacitor	21	35363	Rectifier
9	35351	4 Position 4 Circuit Switch	22	33263	Muting Relay
10	35371	.047 Mfd. 600 V.D.C. Capacitor	23	35371	.047 Mfd. 600 V.D.C. Capacitor
11	35389	100 Mfd. 50 V.D.C. Capacitor	24	33245	Balance Control
12	11555	Fuse Holder	25	35388	4 Mfd. 250 V.D.C. Capacitor
13	34032	8 Ohm Candohm Resistor	26	35386	Dual Input P.E.C.





(00) INDICATES SIGNAL VOLTS WITH  
 18 VOLTS 1000 CPS INPUT MAX VOLUME AND TONE CONTROLS  
 MAIN SPEAKER POWER SWITCH IN 25 WATT POSITION AND TWO  
 18 OHM LOADS CONNECTED TO LEFT AND RIGHT MAIN STEREO  
 OUTPUT. ALL OTHER VOLTAGES SHOWN ARE D.C.

