AMR NO. R-111

SEEBURG

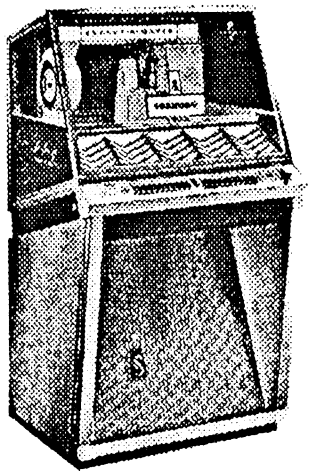
INSTALLATION & OPERATION MANUAL

and

Troubleshooting Guide

For Models

101 - 161 - 201



AMR Publishing
A Divison of Victory Glass Inc.
3260 Ute Avenue Waukee, Iowa 50263
Phone (515) 987-5765 FAX (515) 987-5762
www.victoryglass.com

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

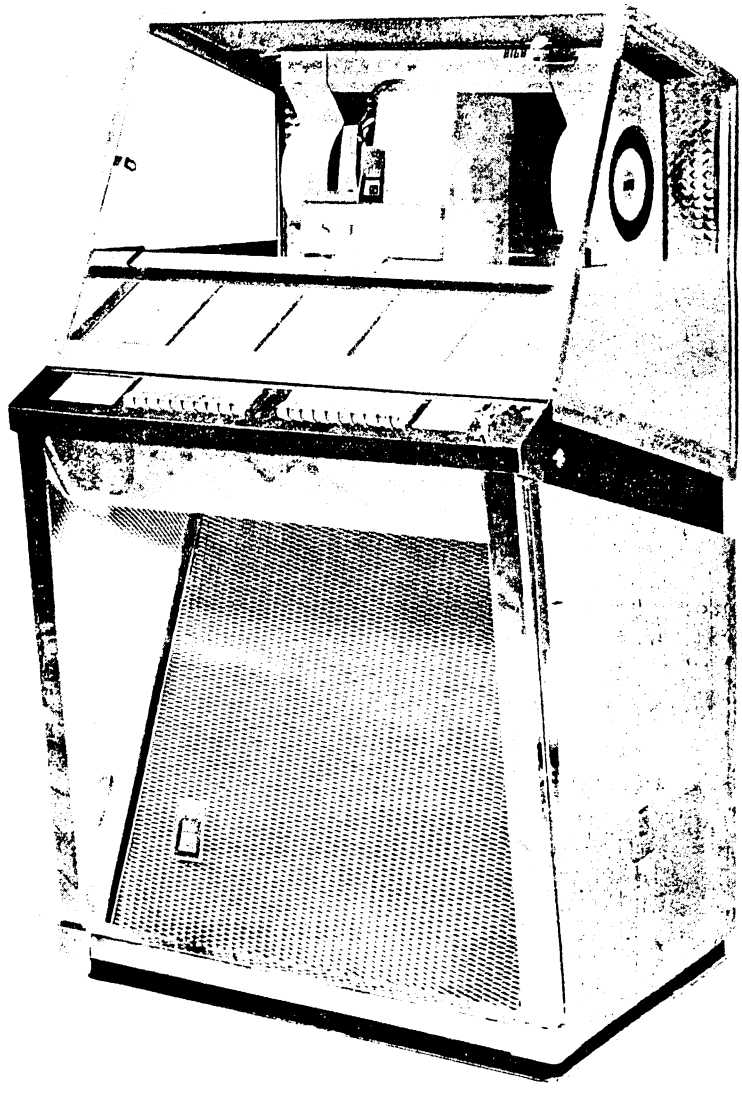
SEEBURG

SELECT-O-MATIC 100

HIGH FIDELITY

INSTALLATION and OPERATION MANUAL

Model 101



THE SEEBURG CORPORATION

PART NO. 476181 (AF) ISSUE 1

SELECT-O-MATIC "100"
MODEL 101

INSTALLATION & OPERATION MANUAL

– Table Of Contents –

SPECIFICATIONS

Power Requirements:

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

Cabinet Lighting:

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

Cabinet Key Number ..... F 313

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

Tormat Memory Assembly ..... Type 100TM3

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

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

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

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

Finish .....Blonde Sliced Cherry

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

Amplifier ..... Type HFMA-2
7-tube, High Fidelity, Constant Voltage Type with Automatic Volume Compensation and transistorized preamplifier stage.

Tormat Electrical Selector ..... Type TES102

Tormat Selection Receiver TSR-6

Remote Control:

Seeburg, 3-wire "Wall-O-Matic"

Remote Control (Continued)

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

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

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

Transistor ..... Type 2N109

Tubes:

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

Fuses:

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

DIMENSIONS

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

Part No. 476181

DAMAGE CAUSED BY SHIPPING

Examine the instrument immediately after unpacking. If any damage is found, notify the transportation representative and get his signature on the transportation bill with notation of damage.

CABINET LID SUPPORT

The cabinet lid support is normally concealed in the upper side glass channel of the phonograph. After lifting the lid, withdraw the lid support as far as it will go and couple as shown in *Figure 2.* The lid support anchor stud fits in the slot of the lid support bracket and locks in place when the weight of the lid bears on it.

To lower the lid, support it with the right hand, disengage the anchor stud with the left hand, fold the lid support and slide it all the way back into its channel; lower the lid. DO NOT ATTEMPT TO MOVE CABINET WITH LID UP.

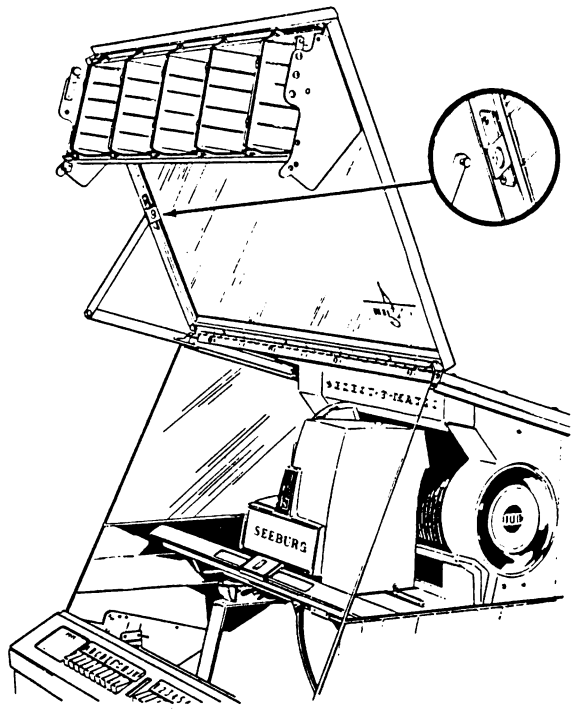


Figure 2.
Cabinet Lid Support

UNBLOCKING

Before placing this phonograph into operation it is necessary to remove or loosen certain shipping hardware used to safeguard the mechansim during transit. Carefully follow instructions on the tags found in several places in the instrument and remove blocks and shipping supports accordingly. *CAUTION: Do not attempt mechanism operation by manually turning the flywheel; this may damage the mechanism. Use the service switch!*

DO NOT PUT PACKING BLOCKS, INSTRUCTION CARDS, OR ANY OTHER MATERIAL ON THE AIR INTAKE SCREEN IN THE FLOOR OF THE CABINET. AS THIS WILL OBSTRUCT VENTILATION AND CAUSE OVERHEATING. SUCH OVERHEATING MAY WARP RECORDS AND SHORTEN THE LIFE OF THE EQUIPMENT.

ELECTRONIC EQUIPMENT

Electronic equipment is mounted on the rear door. The door is hinged on the right side and can be swung out to permit access to coin equipment in the phonograph cabinet and to tubes, tone controls, plugs, etc., on the front of the electronic equipment. The cover plate on the rear of the electronic equipment can be removed by unscrewing four screws (two on the outer left hand edge and two on the back) and sliding the plate forward and out. The electronic equipment may be completely serviced while the phonograph is operating without removing it from the cabinet. The entire door can be removed by extracting all plugs and then lifting up and swinging the bottom of the door out and down. *CAUTION: When reinstalling the door, make certain that the lower hinge pin is positively located in its socket before releasing door.*

TUBES AND PLUGS

This instrument is shipped with tubes and plugs installed. In shipment they may loosen; for this reason, it is well to see that they are all firmly seated in the sockets before inserting the line cord.

VOLTAGE RATING

Before connecting the line cord to a light socket or outlet make certain that the voltage and frequency on the meter box at the location agree with the markings of voltage and frequency on the instrument name plate.

PLACING THE SELECT-O-MATIC "100"

To obtain best performance and long service from this equipment, it should be placed on a firm, reasonably level surface away from excessive moisture and heat.

WARNING: To prevent warping records place phonograph where the records will not at any time be exposed to direct sunlight or any other radiant heat. Do not reduce ventilation by obstructing the vent screens.

A space of at least two inches must be allowed between the back of the cabinet and the wall, so as to assure adequate ventilation.

SERVICE SWITCH OPERATION

A three-position service switch is located on the left side of the phonograph behind the selector button instruction window. When the switch lever is moved to the left, against the spring return, and permitted to return to center position; it will cause the mechanism to scan past and by-pass selections set up on the Tormat Memory Unit and come to rest at the right hand end of the base.

With the mechanism scanning and the service switch in center position, the mechanism may be stopped at any point of travel by pressing the service credit switch twice in succession.

The service switch must be set to the right of center position for Normal Operation of the phonograph.

SERVICE CREDIT SWITCH

At the right side of the service switch box is a push-button which operates the service credit switch. With the service switch held in the "scan" position, a 5¢ credit is obtained when the service credit switch is depressed and a selection may be made after the service switch is returned to "Normal ' position.

LOADING RECORDS

To obtain optimum performance and supply your customer with the best in recorded music it is necessary that only new or nearly new records be used on the HIGH FIDELITY Select-O-Matic. Only standard 7-inch commercial 45 rpm record may be used. Occasionally, records will be found that have an undersize center hole. This is caused, in some cases, by the paper label being pushed into the center hole. If the record center hole is undersize, such a defective record may stick on the record center pin.

Push up the main switch (accessible through hole in rear door) to the "ON" position Scan the mechanism to the right hand end of its base as described in service switch operation.

Starting at the left end of the magazine (A-1, A-3), insert one record in each record space. The left side of all records will be the odd number selections. Thus A-1, A-5, B-7, C-3, D-1, etc., all will be left sides, and A-2, A-6, B-8, C-4, D-2, etc., will be right sides of records.

CAUTION: Do not force records into record spaces! Any normal record will roll very freely into record spaces. A record which is warped badly enough to have any tendency to bind in the magazine space would not be properly played in any automatic mechanism and should not be used.

When the left half of the magazine has been loaded with records, scan the carriage to the left end of the base and load the right half of the magazine. After the magazine has been loaded, set the service switch to the "ON" position. (to the right)

PROGRAM HOLDERS

The complete Program Holder consists of five separate program holder assemblies which are held in place by means of retainer springs. The individual holders may be positioned for servicing, i. e., insertion of title strips or classification headings, as shown in *Figure 3.* This is accomplished by depressing the top of the retainer spring and swinging the holder down. The holder may then be completely removed by unhooking from the program holder frame.

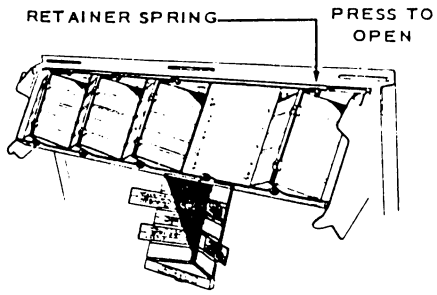


Figure 3.

A complete set of title strips is provided with the phonograph. These can be found in the cash box. Title strips are loaded into the desired slot. The record titles for both sides of a record are to be put on one individual double strip, with the title for the left side on the upper half of the strip. Thus when a record is inserted in the magazine, the selection corresponding to the top title will face left. Spare classification headings are provided and will be found in the cash bag. Classification headings can be changed in the program holder by carefully bowing the heading withdrawing from under the retaining spring, and replacing the classification heading.

POPULARITY METER

A popularity meter is provided behind the magazine cover at the top of the magazine. It is exposed to view by swinging the cover downward, *Figure 4*.. The popularity of each of the 50 records is indicated by an indicator wheel. Each wheel is calibrated from 0 to 40 and accurately shows the number of plays (both sides) the corresponding record has had.

POPULARITY METER RESET

The popularity meter reset lever at the left hand end of the popularity meter assembly is normally latched parallel to the record magazine. To reset the wheels, swing the lever out and pump. This operation partially resets the wheels with each actuation and should be continued until all the wheels indicate zero.

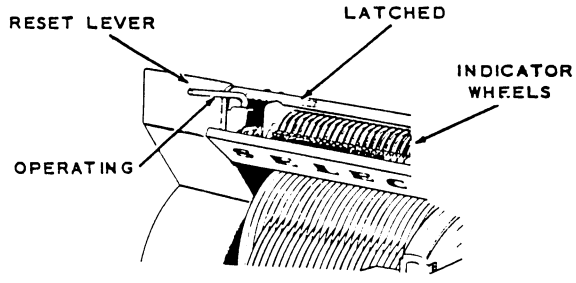


Figure 4. Popularity Meter Reset

SELECTION COUNTER

A selection counter is built into the right side of the electrical selector. This counter totals SELECTIONS made from the Tormat Electrical Selector and Wall-O-Matics. The counter may be read by opening the glass lid and lifting the rubber flap covering the dials.

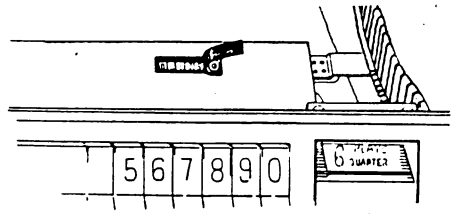


Figure 5 Cabinet Front – Inside View

Although this counter is intended primarily as a selection counter, the approximate total value of coins received in the phonograph and Wall-O-Matic cash boxes may be figured as follows (assuming 6 plays for a quarter):

1. Subtract the present counter reading from the last reading. (The reading taken when the cash boxes were last emptied).
2. From this figure subtract the total number of quarters in all cash boxes (phonograph plus all connected Wall-O-Matics).
3. Multiply by .05 to obtain value in dollars.

EXAMPLE:

Present counter reading	11792
Last counter reading	10680
Difference	1112
Number of quarters	78
	1034
	x .05
Approximate Cash	$51.70

NOTE: The counter may register slightly higher or lower than the actual number of selections, because of the multiple count during simultaneous operation of two or more wall boxes.

AUDIO SYSTEM

The Select-O-Matic Audio System is of the "constant voltage" type: the amplifier output voltage does not change when the speaker load is varied. This means that the volume from any speaker in the system will not change noticeably when other speakers in the system are added or removed. Independent adjustment

of volume at each speaker is possible; connections and speaker cable runs are simplified; and, within limits, impedance matching problems are eliminated.

The audio system delivers High Fidelity Audio power, which can be divided in various proportions between the phonograph and remote speakers. A terminal board is provided on the High Fidelity Master Amplifier for connection of High Fidelity C. V. remote speakers.

AUDIO CONTROLS

The High Fidelity Master Amplifier is equipped with a keyed volume control which is accessible through a hole in the rear door. It is inoperative when a remote volume control is used.

For High Fidelity reproduction of recorded music, the original (live) balance between low frequencies (bass) and high frequencies (treble) must be maintained.

The acoustic (room) conditions in which a phonograph operates greatly affect the tonal balance. A room with plastered walls and ceiling, mirrors, and very little sound absorbing material, such as draperies, carpets, and upholstering, will sound shrill. By contrast, a room containing a large amount of sound absorbing material, such as acoustic tile on the ceiling and walls, draperies, carpets on the floor, and upholstered booths, absorbs high frequencies, and the room will sound "bassy". Such unbalance of bass and treble can be corrected by setting Bass and Treble Range Controls during a simple listening test on location.

The table at the bottom of the page gives approximate settings to serve as a guide. To achieve best results, listen to several records and adjust Bass and Treble-Range Controls to obtain a natural balance, consistant with record quality.

An automatic volume compensator is a unit of the audio system. It compensates for the

LOCATION CONDITIONS	CONDITION OF RECORDS		
	NEW (Good Quality)	FAIR (Average)	POOR (Worn and having High Scratch)
ACOUSTICALLY LIVE . . . . Hard walls, ceiling and floor – little or no upholstery and draperies.	BASS 3-4 TREBLE-RANGE 4-5	BASS 3-4 TREBLE-RANGE 3-4	BASS 2-3 TREBLE-RANGE 1-2
AVERAGE ROOM . . . . Average amount of sound deadening material.	BASS 2-3 TREBLE-RANGE 5	BASS 2-3 TREBLE-RANGE 4	BASS 1-2 TREBLE-RANGE 3
ACOUSTICALLY DEAD . . . . Acoustic tile on ceiling and walls, heavy draperies and carpets, upholstered booths.	BASS 1-2 TREBLE-RANGE 6	BASS 1-2 TREBLE-RANGE 5-6	BASS 1 TREBLE-RANGE 4

Note 1: Room Size: In rooms smaller than average, reduce the treble control by one number. In rooms larger than average, the Treble-Range may be increased by one number if no remote speakers are used.

Noise: The noise encountered in some locations (restaurants, etc.) has a masking effect on music, especially high frequencies. Final setting of tone controls should be made under normal noise conditions with a representative number of people present.

Automatic Vol. Comp. A.V.C., compensates for average loudness variations from record to record.

NOTE: GOOD QUALITY REPRODUCTION CANNOT BE OBTAINED WITH POOR QUALITY RECORDS OR WITH WORN STYLUSES. PLEASE REMEMBER – WORN STYLUSES WILL RUIN YOUR RECORDS.

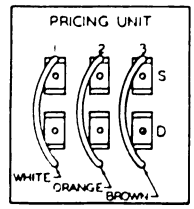
FOR NICKEL, DIME AND QUARTER COIN EQUIPMENT USING SPU1	
1 SELECTION – DIME OR 2 NICKELS 3 SELECTIONS – QUARTER *SET SPU1 FOR DIME PLAY	1 SELECTION 5¢ 2 SELECTIONS DIME 6 SELECTIONS – QUARTER *SET SPU1 FOR NICKEL PLAY

MAKE ANY SELECTION		
	LAMP #1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	MODEL 201S – USE COIN WINDOW – 480901
	LAMP #3 DOES NOT LIGHT	201SH – USE COIN WINDOW – 480903

WHEN USING HALF DOLLAR EQUIPMENT USE AND COIN WINDOW SHOWN ABOVE. } SPU1-H OR SPU1 PLUS HDU1

PRICING UNIT SWITCHBOARD

SPU 1 OR SPU1-H ALL SINGLE PRICE SELECTIONS



* Flipper in slug rejector must be locked out for Nickel Play and operative for Dime Play. Refer to action on SLUG REJECTORS – Page 17.

Figure 5.

"SET-UP" AND OPERATION OF SINGLE PRICING SYSTEMS FOR MODELS 201S & 201SH

The Single Pricing System as applied to the Select-O-Matic "200", Model 201S uses Single Pricing Unit, Type SPU1 and that for Model 201SH uses Type SPU1-H or a combination of Type SPU1 plus Half Dollar Unit, Type HDU1.

Figure 5 constitutes a chart condensing information regarding the capabilities and set-up requirements for the Single Pricing System.

In the event that changes are desired in the phonograph as received, the preparation of the system necessitates:

A. Setting up of the Pricing Unit Switchboard and Credit Window Lights for correct indication of credits, *Figures 6 and 7.*

B. Connecting the Pricing Terminal Board taper tabs all on Singles, *Figure 3.*

C. Placing taper tab connector on Remote Control Stepper Unit on terminal pin marked SPU.

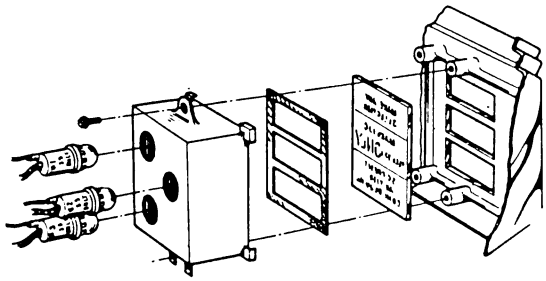


Figure 6. Replacement of Credit Window

PROGRAM HOLDERS

The program holders shown in *Figure 7* are in the positions required for servicing. The holders on the lid of the cabinet can be lowered by releasing the retainer springs and relatched by pressing the springs back into place. The frame containing the holders in the upper part of the cabinet must be raised and latched before the holders can be lowered into the servicing positions. These holders are also latched in place with individual retainer springs. To lower the frame, lift the latch at the left end and press downward. When the frame has been latched in the raised position, the retainer springs supporting the attached holders can also be released. A complete supply of blank title strips is supplied with the cabinet and will be found in the cash bag.

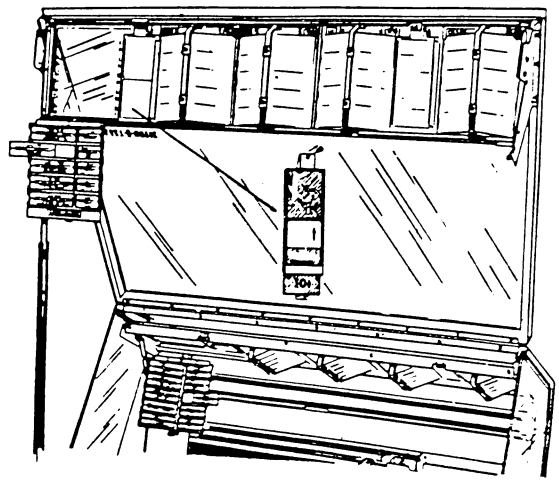


Figure 7.

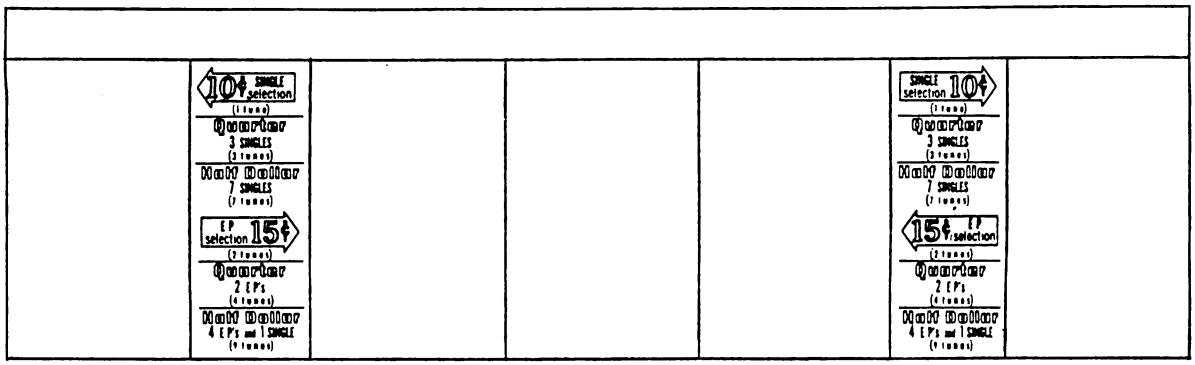
PRICING INFORMATION WINDOWS

The pricing information windows are mounted inside the cabinet of each phonograph on the program holder assemblies as shown in *Figure* 7. At the factory, the windows on the lower program holder assemblies in all models are equipped for programming singles only. This is also true of the windows on the upper program holder assemblies in Models 201S and 201SH. The upper windows on Models 201D and 201DH are equipped only for programming EP's.

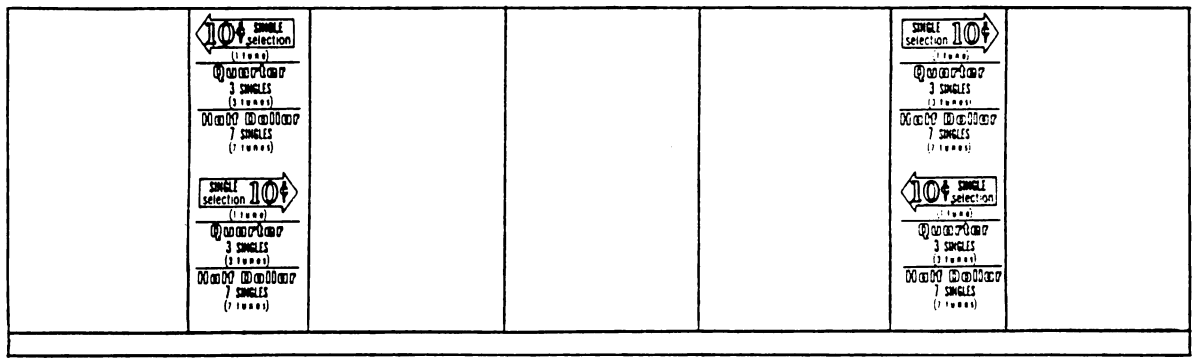
If, following the receipt of the phonograph, it becomes desirable to combine single and extended play programming on either of the program holder assemblies, all of the pricing windows must necessarily be changed to clearly indicate which selections are singles and which selections are extended plays. An example is contained in the chart at the bottom of this page. Also included in the chart are the part numbers of windows denoting various changes which are available only through the Seeburg Distributor.

To gain access to the windows on the lower program holder assembly, simply raise the cabinet lid and rest it securely on the cabinet lid support. The removal of either of the two windows mounted here can be accomplished by removing the screws from the window retainers, as shown in the inset in *Figure* 7, and lifting the windows upward and out. Before removing the windows from the upper program holder assembly, the assembly frame must be lifted and latched in the raised position. The removal of these windows follows the pattern described.

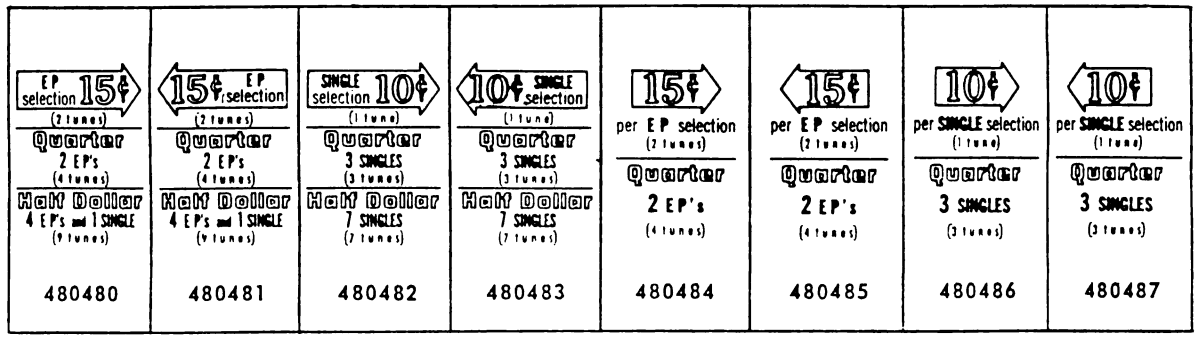
UPPER PROGRAM ASSEMBLY



LOWER PROGRAM ASSEMBLY



PRICING WINDOWS



HIGH FIDELITY CONSTANT VOLTAGE SPEAKER CONTROLS, Types HF25LT-2, 10LT-1 and 10LT-2 (Accessory)

These controls are designed for use with Constant Voltage Speaker lines. It can be used to control the power (in 3 db steps) to one or more High Fidelity Constant Voltage type speakers.

TESTING

After the installation has been completed, all units should be carefully tested to see that they perform properly. Make several selections from the Tormat Electrical Selector and from each Wall-O-Matic and see that the selections made have correctly registered on the Tormat Memory Unit. Check the quality of music, and note that music can be heard at a comfortable volume level in all parts of the service area. See that all cables are dressed into inconspicuous places to present a neat appearance and prevent mechanical damage to them.

GENERAL MAINTENANCE

RECORD CARE

To avoid accumulation of dust and dirt, keep oil off the records. Wipe your hands with a clean cloth before handling records, and always handle records by edge and center hole. Records that show signs of surface dust or dirt should be wiped with a slightly dampened cloth, using a circular motion. Use only water to dampen the cloth – solvents will damage the records. Records not in use should be stored on edge in a cool place. Avoid exposing the records to excessive heat. Records become overheated in a very short time if exposed to direct sunlight or if stored in a closed automobile or truck. Temperature above 120° F. should be avoided. *See instructions on "Placing the Select-O-Matic "100".*

PICKUP STYLUSES

The styluses of the new high fidelity magnetic pickups are permanently mounted in the removable armature assemblies. The extremely low armature mass, high compliance, and low

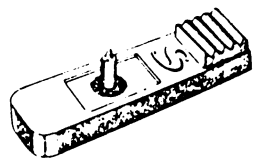


Figure 8. Armature Assembly

stylus force of this quality pickup greatly increases stylus life and record life. The armature assemblies furnished with the Seeburg magnetic pickup are tipped with natural Swiss sapphire which is excelled in hardness and wear resistance only by the diamond. When the armature assemblies are changed, all movable pickup parts are renewed and "new" pickup performance is completely assured. There is no need to replace the pickup; it is permanent because it has no moving parts.

STYLUS REPLACEMENT

In the presence of friction, wear of the stylus starts with the first play and continues until the stylus is replaced. The tone quality is good and distortion remains at a low figure for the first few thousand plays but gradually distortion increases until a disagreeable amount is noticeable.

When only pure vinylite 45 rpm records are used, armature assemblies with sapphire styluses should be changed every four or five thousand plays to maintain good reproduction. If, because of the presence of oil on the records, dust or dirt is permitted to accumulate and remain on the surface, the wear will be more rapid; economical operation will require more frequent armature assembly replacement.

If the Armature Assemblies are not replaced before objectionable distortion sets in, the records may be permanently damaged, and replacing the Styluses will not restore the original tone quality.

Because the cost of a pair of armature assemblies is only a small fraction of the cost of a set of records, it is economically sound to

replace them on a regular schedule rather than on a hit-or miss basis. A schedule can be most easily determined from instrument income. The armature assemblies with sapphire styluses should be changed according to the following table if the records are arranged for approximately equal distribution of play between the right and left sides of the pickup:

Approximate Weekly Gross Receipts:	* Change Both Armature Assemblies Every
$ 25	8 months
$ 50	4 months
$ 75	3 months
$100	2 months
$150	6 weeks

* Maximum stylus life

The table is based on ten cents per selection and three to six thousand plays for each stylus. THE COST OF REPLACING ARMATURE ON THIS SCHEDULE IS LESS THAN ½ OF 1% OF GROSS INCOME.

DIAMOND STYLUSES

With the use of a diamond stylus, many times the above number of plays per replacement is assured. The long run economy more than outweighs the higher purchase price. Armature assemblies with diamond styluses that fit the Seeburg Magnetic Pickup Head are obtainable through your Seeburg Distributor.

TO REPLACE ARMATURE ASSEMBLIES

1. Make a selection to the right of magazine center and left side of a record (Example K5) to position carriage and pickup arm cradle for easiest access to styluses.
2. Remove worn styluses by placing thumb nail against plastic armature assembly just behind raised shoulder. Light pressure in the direction away from the stylus point will cause replaceable assembly to slide free of cartridge slot.
3. Install new armature assembly by laying it FLAT in open end of cartridge slot, and sliding forward in slot until it bottoms. Use thumb nail against plastic raised shoulder in reverse of Step 2 to complete travel when the assembly bottoms.

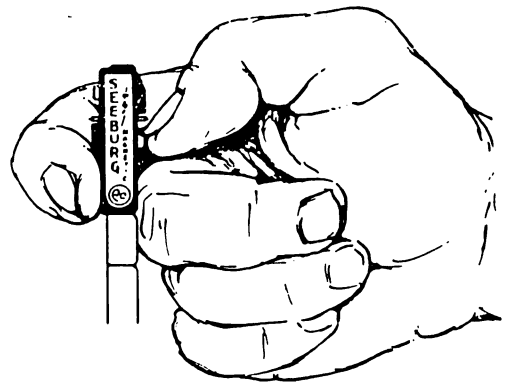


Figure 9. Removing Armature Assembly

In order to retain good quality of reproduction it is necessary to keep the pickup and styluses clean and in good condition.

CAUTION: The pickup and styluses must be handled carefully or the delicate armature suspension may be damaged.

When records are changed, or the equipment is cleaned the stylus well and the stylus brushes should be cleaned by using the small brush furnished for this purpose and mounted on the inside left wall of the cabinet.

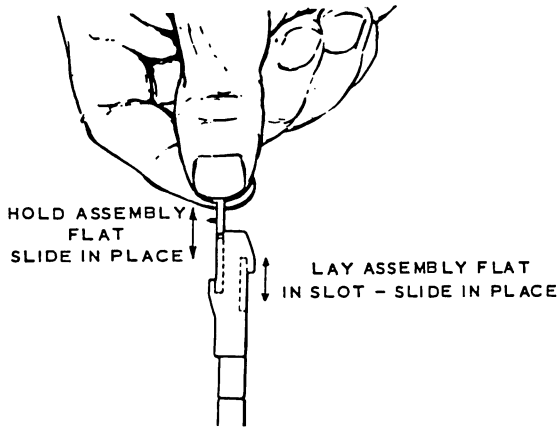


Figure 10. Installing New Armature Assembly

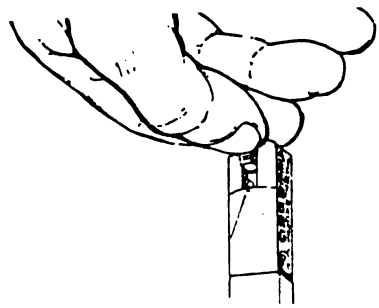


Figure 11. Installing New Armature Assembly

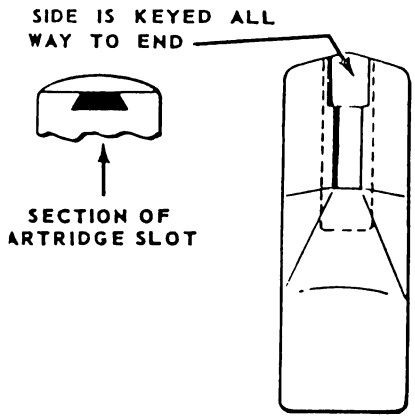


Figure 12.

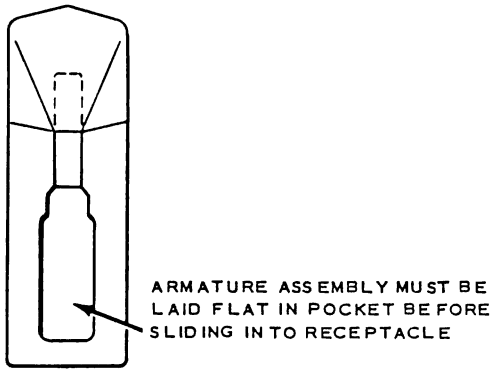


Figure 13.

MECHANISM ACCESS

To expose front of the mechanism for "in the cabinet" servicing:

1. Open lid and select left record side selection (Example A 5) to locate pickup on left side.
2. Cover the pickup cartridge with the plastic protective case.
3. Remove the carriage cover as follows:
   a. Unscrew the two mounting screws: One is on the lower left hand side of the cover; the other is located on top.
   b. Lift up and move forward to remove carriage cover.

REAR ACCESS PANEL

To service rear of mechanism such as adjustment of Tormat Contact Block or clutch mechanism:

1. Open Rear Access Panel above phonograph rear door, *Figure 14*, in the following manner:
   a. Open rear compartment door.
   b. Remove six screws securing access panel to cabinet.
   c. Reach up and pull down on access panel release catch to unlatch.
   d. Swing hinged panel out and up and secure in position as shown by means of the access panel support. (Support is normally snapped onto inside surface of panel)
2. Remove magazine filler by unscrewing (1), (2) and (3) and withdrawing entire section from the front of the record magazine, *Figure 15*.
3. Operate the service switch to position mechanism to the extreme right of its travel thus exposing the serviceable section to view.

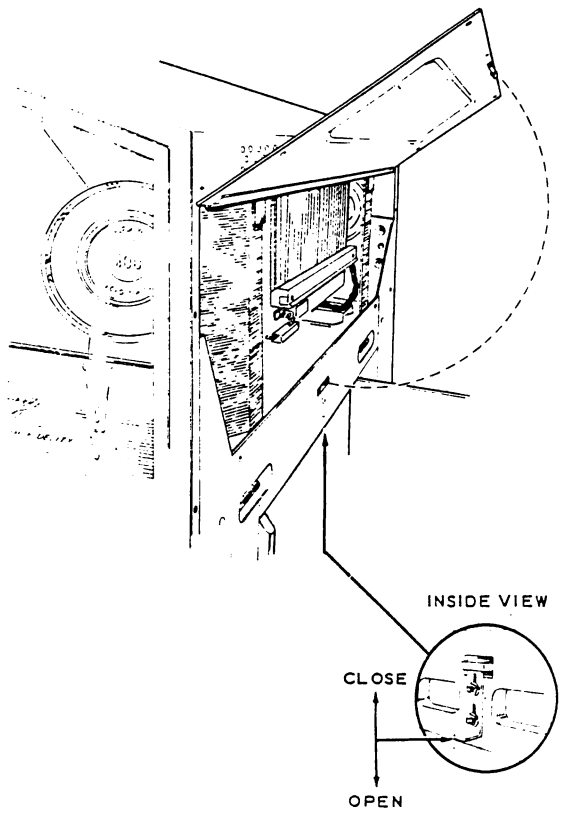


Figure 14. Rear Access Panel

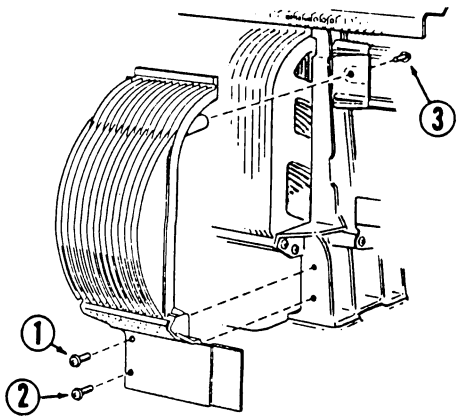


Figure 15.

COMPLETE REMOVAL OF MECHANISM

When it is necessary to remove the mechanism from the cabinet for servicing, proceed as follows:

1. Disconnect Mechanism and Tormat Selector Unit cables from the electronic equipment.

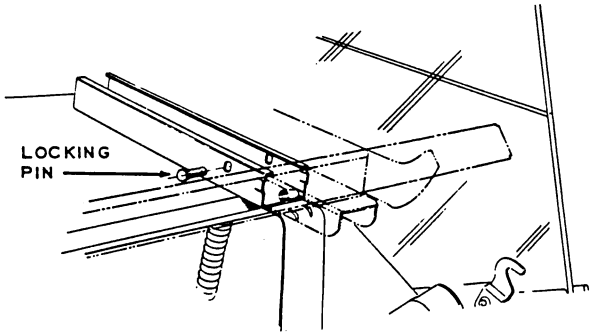


Figure 16.

2. Unlock mechanism frame by prying out and removing locking pins as shown in *Figure 16.*
3. Slide mechanism forward, clear of channel guides and lift out.

LUBRICATION

The mechanism and other mechanical parts should be lubricated periodically. The recommended lubricants are Seeburg Select-O-Matic Oil, *Part No. 53014,* and Aero Lubriplate, *Part No. 53006.*

Seeburg Select-O-Matic Oil is a light machine oil, especially suited to lubrication of small machinery operated normally in the "room temperature" range. It is free of waxy constituents, pours easily at low temperatures, and has exceptional anticorrosive properties.

Follow the complete lubrication instructions given on the lubrication chart in the envelope on the wall of amplifier compartment.

LAMP REPLACEMENT

Cabinet Fluorescent –

To remove the fluorescent lamp, rotate the lamp 90° in either direction and lift out of sockets.

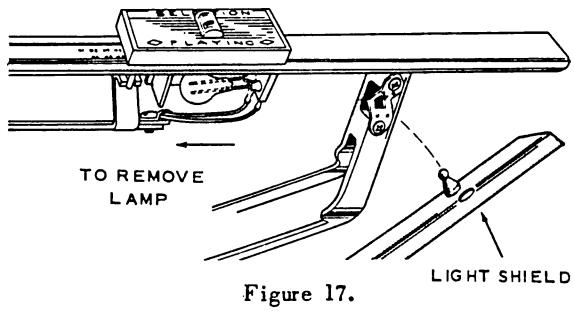


Figure 17.

"Selection – Now – Playing" Lamp –

The lamp illuminating the number strip is a G. E. # 12 which may be replaced by first removing the light shield and then pulling the lamp out to the left of the cabinet as shown in *Figure 17.* Reinstall light shield after lamp replacement.

"Select" Lamp on Key Panel –

Reach behind the key panel casting and pull out socket assembly. The lamp used is a No. 55 bayonet type.

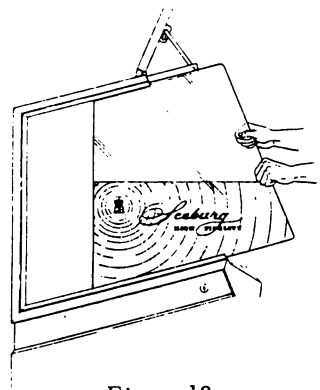
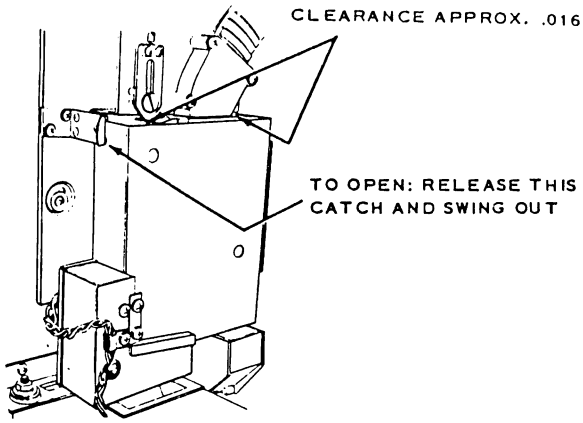
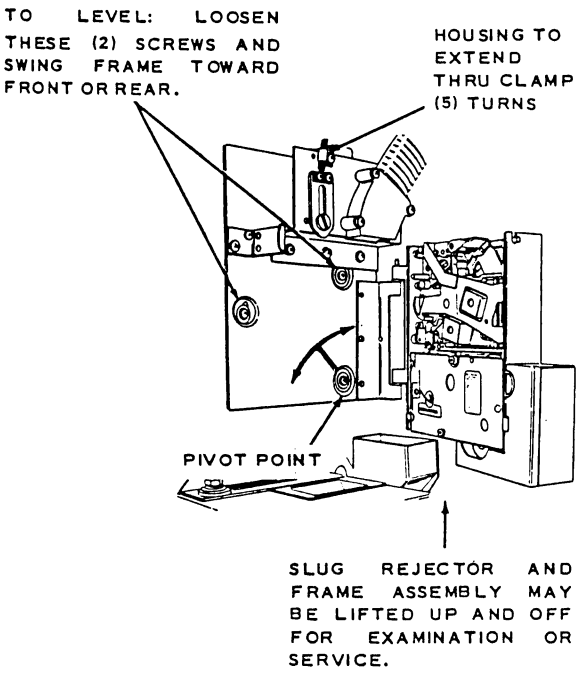


Figure 18.

CABINET SIDE GLASS

The cabinet side glass may be partially pulled out to facilitate cleaning of rear mechanism compartment *(Figure 18)* or completely removed for replacement of damaged glass by sliding out.





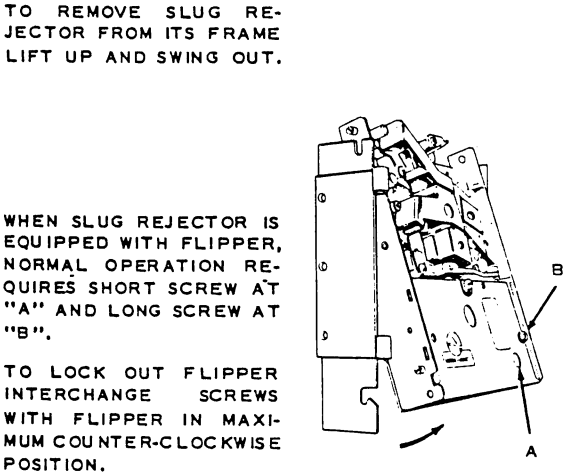


Figure 19.

SLUG REJECTOR

As indicated in *Figure 19*, the coin mechanism may be swung out thus permitting test of the slug rejector and coin equipment without the necessity for opening the cash box.

APPEARANCE

To maintain good appearance of the phonograph, and thus keep customer appeal at its maximum level, the various pieces of glass should be kept clean: lid glass, side glasses, etc.

Use only clear liquid cleaners, as types containing powder can impair reliability of electrical contacts, and cause excessive wear of records, styluses, and mechanism bearings.

Interior trim and all chrome plated parts also should be cleaned occasionally. These parts include Key Panel Frame and plated parts in the mechanism compartment.

PREPARING INSTRUMENT FOR MOVING

1. Put the two 3/8 inch wood shims under the base at the mechanism hold-down bolts.
2. Tighten four mechanism hold-down nuts.
3. Remove all records from magazine.
4. With the pickup arm in left hand side playing position, scan mechanism to a point at selections A-1, A-2.
5. Place protective tube over pickup cartridge and install pickup arm shipping support.
6. Put two fibre pads (a long pad in the rear and a short pad in the front) under the carriage wheels and bolt the carriage to the base by means of two 2 inch long thumb screws, which are to be inserted thru mechanism base.

TO SHIP

If the instrument is to be shipped by way of a transportation company, it should be blocked and crated in the same manner in which it was received from the factory.

SEEBURG

SEEBURG

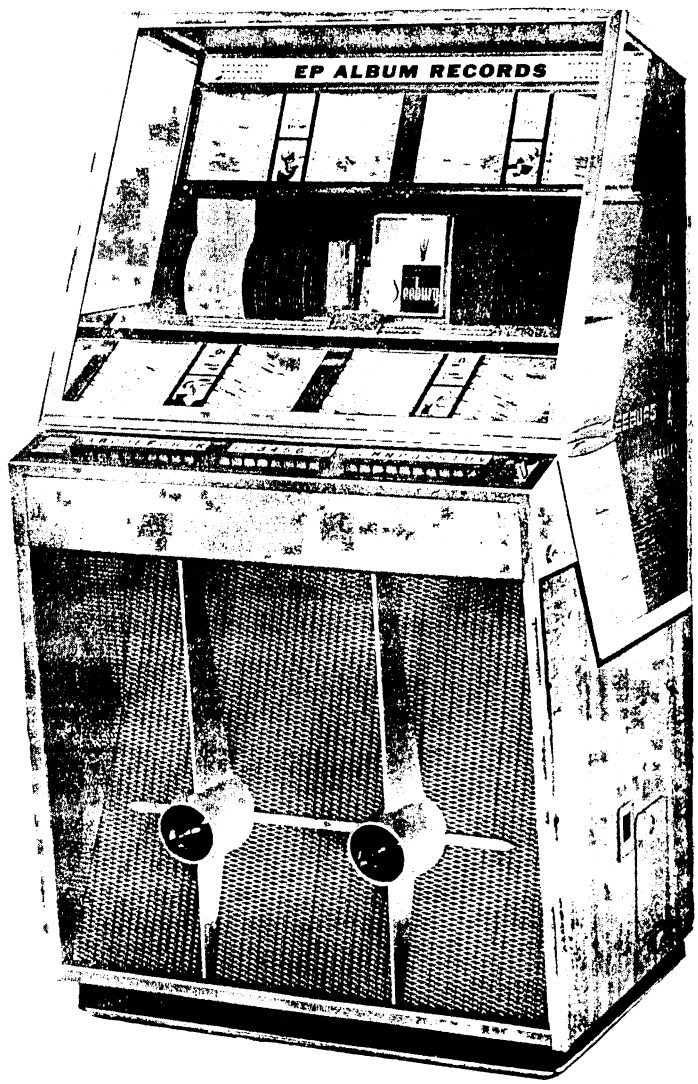
SELECT-O-MATIC **160**

HIGH FIDELITY

INSTALLATION and OPERATION MANUAL

Models

161D
161DH
161S
161SH



THE SEEBURG CORPORATION CHICAGO 22, ILLINOIS, U.S.A.

PART NO. 480304 (AF) *Issue 2*

SELECT-O-MATIC "160"

MODELS 161S, 161D, 161SH and 161DH

INSTALLATION & OPERATION MANUAL

-Table Of Contents-

SPECIFICATIONS

Power Requirements:

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

Cabinet Lighting:

Upper Cabinet Lamp – 25-watt, 28-inch, Cool White Fluorescent (FS25 starter)
Lower Cabinet Lamp – Same as above

Cabinet Key Number: ..... F 313

Select-O-Matic Mechanism ..... Type 160ST1

Tormat Memory Assembly ..... Type 160TM1

Record Capacity ..... 80 records (160 selections)

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

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

2 – 12" permanent magnet (low frequency)
1 – 8" permanent magnet (high frequency)

Finish .....Frosted Blue Walnut

Coin Equipment: 5-, 10-, 25-cent
Single Entry Rejector with Models 161S and 161D

5-, 10-, 25-, 50-cent Single Entry Rejector with Model 161SH and 161DH

Model	Pricing Unit	Coins Accepted
161S	SPU1	5- 10- 25-
161SH	SPU1H	5- 10- 25- 50-
161D	DPU1	5- 10- 25-
161DH	DPU1 & HDU1	5- 10- 25- 50-

Amplifier..... Type HFMA-2
7-tube High Fidelity, Constant Voltage Type with Automatic Volume Compensation and Transistor Preamplifier Stage.

Tormat Electrical Selector ..... Type TES161

Tormat Selection Receiver ..... Type TSR6

Remote Control:

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

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

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

Transistor ..... Type 2N109

Tubes:

2 – 6L6GB
4 – 12AX7
1 – 6BJ6
2 – OA2
1 – 5U4GB
2 – 2050
1 – 6X4

Fuses:

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

DIMENSIONS

Height ..... 55¾ Inches
Width ..... 30½ Inches
Depth ..... 26½ Inches
Net Weight ..... 330 Pounds
Shipping Weight ..... 401 Pounds
Record Weight:
100 Records, Approx. .....4.8 Pounds

INSTALLATION AND OPERATION

DAMAGE CAUSED BY SHIPPING

Examine the instrument immediately after unpacking. If any damage is found, notify the transportation representative and get his signature on the transportation bill with notation of damage.

CABINET LID SUPPORT

The cabinet lid support is located behind the electrical selector panel when the lid is in the closed position. Lift the lid with the right hand. With the left hand, raise the right end of the support. Withdraw the lid support slide until the spring mounted lock pin drops into the slot in the support channel as shown in *Figure 2.* Insert the support stud at the upper end of the slide into the slot shown in the inset in *Figure 2. CAUTION: BE CERTAIN THAT THE SUPPORT STUD IS FULLY ENGAGED IN THE SLOT BEFORE THE LID IS LOWERED. DO NOT MOVE THE CABINET WHILE THE LID IS RESTING ON THE SUPPORT.*

To lower the lid, first raise it slightly and disengage the support stud from the slot. Manually press the spring mounted slide support stud out of its slot in the support channel. Move the slide into the channel and return the support to its original position. When the support has been returned to its original position, complete the lowering of the lid.

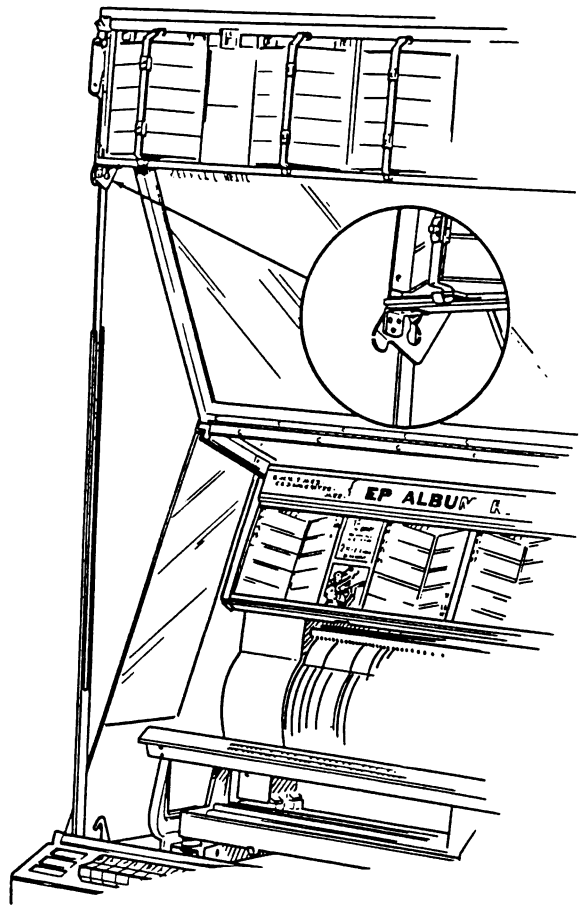


Figure 2.

UNBLOCKING

Before placing this phonograph into operation, it is necessary to remove or loosen certain shipping hardware used to safeguard the mechanism during transit. Carefully follow instructions on the tags found in several places in the instrument and remove blocks and shipping supports accordingly. *CAUTION: Do not attempt mechanism operation by manually turning the flywheel; this may damage the mechanism. Use the service switch!*

DO NOT PUT PACKING BLOCKS, INSTRUCTION CARDS, OR ANY OTHER MATERIAL ON THE AIR INTAKE SCREEN IN THE FLOOR OF THE CABINET. AS THIS WILL OBSTRUCT VENTILATION AND CAUSE OVERHEATING. SUCH OVERHEATING MAY WARP RECORDS AND SHORTEN THE LIFE OF THE EQUIPMENT.

ELECTRONIC EQUIPMENT

Electronic equipment is mounted on the rear door. The door is hinged on the right side and can be swung out to permit access to coin equipment in the phonograph cabinet and to tubes, tone controls, plugs, etc., on the front of the electronic equipment. The cover plate on the rear of the electronic equipment can be removed by unscrewing four screws (two on the outer left hand edge and two on the back) and sliding the plate forward and out. The electronic equipment may be completely serviced while the phonograph is operating without removing it from the cabinet. The entire door can be removed by extracting all plugs and then lifting up and swinging the bottom of the door out and down. *CAUTION: When reinstalling the door, make certain that the lower hinge pin is positively located in its socket before releasing door.*

TUBES AND PLUGS

This instrument is shipped with tubes and plugs installed. In shipment they may loosen; for this reason, it is well to see that they are all firmly seated in the sockets before inserting the line cord.

VOLTAGE RATING

Before connecting the line cord to a light socket or outlet make certain that the voltage and frequency on the meter box at the location agree with the markings of voltage and frequency on the instrument name plate.

PLACING THE SELECT-O-MATIC "160"

To obtain best performance and long service from this equipment, it should be placed on a firm, reasonably level floor away from excessive moisture and heat.

WARNING: To prevent warping records place phonograph where the records will not at any time be exposed to direct sunlight or any other radiant heat. Do not reduce ventilation by obstructing the vent screens.

A space of at least two inches must be allowed between the back of the cabinet and the wall, so as to assure adequate ventilation.

ELECTRICAL SELECTOR PANEL

Mounted behind the electrical selector panel on the tormat electrical selector are the service and manual credit switches plus the pricing unit switchboard and pricing terminal board. *(See Figure 3.)* All four items are located at the left end. The first two are accessible when the cabinet lid is raised. The remaining two can be reached only when the cover, as shown in *Figure 3*, has been removed from the electrical selector. On the right end of the electrical selector, the selection counter is mounted. *(See Figure 9.)*

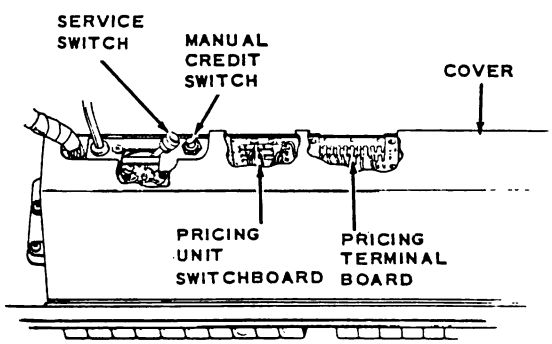


Figure 3.

SERVICE SWITCH OPERATION

A three-position service switch is located as shown in *Figure 3*. When the switch lever is moved to the left, against the spring return, and permitted to return to center position, it will cause the mechanism to scan past and by-pass selections set up on the Tormat Memory Unit and come to rest at the right hand end of the base.

With the mechanism scanning and the service switch in center position, the mechanism may be stopped at any point of travel by pressing the service credit switch twice in succession.

The service switch must be set to the right of center position for Normal Operation of the phonograph.

MANUAL CREDIT SWITCH

At the right side of the service switch box is a push-button which operates the manual credit switch. With the service switch held in the "scan" position, a credit is obtained when the manual credit switch is depressed and a selection may be made after the service switch is returned to "Normal" position. In phonograph models equipped with accumulator type of credit systems – Models 161D & 161DH – each actuation of the manual credit switch will add a 5¢ credit thus providing a choice of a number of selections in any credit combination. In models using single credit systems - Models 161S & 161SH - a 25 cent credit is established when the manual credit switch is actuated.

LOADING RECORDS

To obtain optimum performance and supply your customer with the best in recorded music it is necessary that only new or nearly new

records be used on the Seeburg Select-O-Matic. Only standard 7-inch commercial 45 rpm record may be used. Occasionally, records will be found that have an undersize center hole. This is caused, in some cases, by the paper label being pushed into the center hole. If the record center hole is undersize, such a defective record may stick on the record pin.

Push up the main switch (accessible through hole in rear door) to the "ON" position. Scan the mechanism to the right hand end of its base as described in service switch operation.

Starting at the left end of the magazine (A1, B1), insert one record in each record space. The top row selections on the Indicator Panel refer to the left side of the records and the bottom row to the right side of the records. Thus A1, C1, E1, G1, J1, L1, etc., all will be left sides, and B1, D1, F1, H1, K1, M1, etc., will be right sides of records. *CAUTION: Do not force records into record spaces!* Any normal record will roll very freely into the record spaces. A record which is warped badly enough to have any tendency to bind in the magazine space would not be properly played in any automatic mechanism and should not be used.

When the left half of the magazine has been loaded with records, scan the carriage to the left end of the base and load the right half of the magazine. *(After the magazine has been loaded, set the service switch to the "ON" position to the right of the cabinet).*

"SET-UP" AND OPERATION OF DUAL PRICING SYSTEM for MODELS 161D AND 161DH

The Dual Pricing System as applied to the Select-O-Matic "160", Model 161D uses Dual Credit Unit Type DPU1. For Model 161DH, Dual Pricing Unit Type DPU1 plus Half Dollar Unit Type HDU1 are used. The system is designed to provide "Single" selections for 10¢ and "EP's" for 15¢.

The Dual Pricing System permits the accumulation of credits at the rate of one credit for a nickel, two credits for two nickels or a dime, and three credits for 15 cents. Additional credits can be accumulated up to a maximum of 24 in each programming cycle. Note that a premium is given when quarters are used, since one quarter gives six credits and four quarters will give 24, while it takes 12 dimes or 24 nickels to give 24 credits. Associated Credit Lights, a Pricing Unit Switchboard, and Pricing Terminal Boards (one on the Tormat Electrical Selector and (one on the Tormat Selection Receiver) are effective in setting up the credit system.

Figure 4 constitutes a chart condensing information regarding the capabilities and set-up requirements for the two Pricing Combinations.

In the event that changes are desired in phonograph as received, the preparation of the system necessitates:

A. Setting up of the Pricing Unit Switchboard and Credit Window Lamps for correct indication of credits.

B. Connecting the Pricing Terminal Board taper tabs corresponding to each panel of desired "EP's" and "SINGLES" for associated pricing. The program must be in panels of 20 selections (10) records, each panel being represented by a number button. "Singles" and "EP"' cannot be in the same panel if there is to be a price difference. The pricing terminal board on the Tormat Selection Receiver must be connected to terminal marked DPU. The pricing terminal board on the Tormat Electrical Selector, and the pricing terminal boards in all Wall-O-Matics MUST be connected to match.

With the Pricing Unit Switchboard set to "A", as in pricing combination No. 1, and the Pricing Terminal Boards connected for "SINGLES" and "EP's", the following operational sequence holds true:

1. The deposit of a nickel rotates the credit wheel in the Dual Pricing Unit to the one-credit position and the lower credit window light goes on indicating "5¢ Credit – Another Coin Required". No plays will result when selection buttons are pushed and keys will not latch.

2. Another nickel (or a dime initially) rotates the credit wheel to the two-credit position and the middle credit window light goes on indicating "Make 10¢ Selection Only". Now only "Singles" will play when selection buttons are pushed. If buttons for "EP" selection instead are depressed, they will be unlatched when the second of the two is pushed.

3. Another nickel (or a nickel and a dime initially) rotates the credit wheel to the three-credit position and the upper credit window light goes on indicating "Make Any Selection". Credit window lights remain the same as when on the three-credit position with the deposit of additional coins.

With the Pricing Unit Switchboard set on position "B" and the Pricing Terminal Board tabs all placed on "Singles" as in pricing combination No. 2, the following holds true:

1. The first nickel deposited rotates the credit wheel to the one-credit position and the lower credit window light goes on as before.

2. Another nickel (or a dime initially) rotates the credit wheel to the two-credit position and the upper credit window light goes on indicating "Make Any Selection". The middle credit light remains out at all times with the switchboard in "B" position.

PRICING COMBINATIONS

– 1 –

FOR NICKEL, DIME, AND QUARTER COIN EQUIPMENT USING DPU1

SINGLES 10¢ 3 FOR QUARTER E. P.'s 15¢ 2 FOR QUARTER		
MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
MAKE 10¢ SELECTION ONLY	LAMP # 2	COIN WINDOW FOR MODEL 161D 480250
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

– 2 –

FOR NICKEL, DIME, AND QUARTER COIN EQUIPMENT USING DPU1

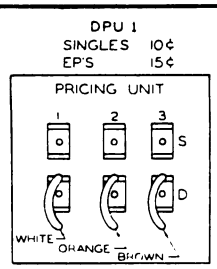
ALL 10¢ SELECTIONS 3 FOR QUARTER		
MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	COIN WINDOW FOR MODEL 161D 480250
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

FOR NICKEL, DIME, QUARTER AND HALF DOLLAR COIN EQUIP. USING DPU1 and HDU1

SINGLES 10¢ 3 for QUARTER 7 for HALF DOLLAR E.P.'s 15¢ {2 for QUARTER {4 EP's + 1 SINGLE for HALF DOLLAR		
MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
10¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 2	COIN WINDOW FOR MODEL 161DH 480254
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

ALL 10¢ SELECTIONS 3 FOR QUARTER 7 FOR HALF DOLLAR		
MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	COIN WINDOW FOR MODEL 161DH 480254
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

PRICING UNIT SWITCHBOARD



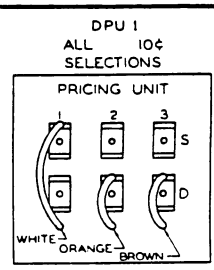


Figure 4.

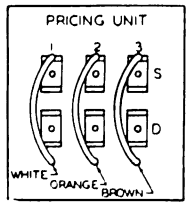
FOR NICKEL, DIME AND QUARTER COIN EQUIPMENT USING SPU1	
1 SELECTION – DIME OR 2 NICKELS 3 SELECTIONS – QUARTER *SET SPU1 FOR DIME PLAY	1 SELECTION 5¢ 2 SELECTIONS DIME 6 SELECTIONS – QUARTER *SET SPU1 FOR NICKEL PLAY

MAKE ANY SELECTION	LAMP #1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	MODEL 161S – USE COIN WINDOW – 480901
	LAMP #3 DOES NOT LIGHT	161SH – USE COIN WINDOW – 480903

WHEN USING HALF DOLLAR EQUIPMENT USE AND COIN WINDOW SHOWN ABOVE. } SPU1-H OR SPU1 PLUS HDU1

PRICING UNIT SWITCHBOARD

SPU 1 OR SPU1-H ALL SINGLE PRICE SELECTIONS



* Flipper in slug rejector must be locked out for Nickel Play and operative for Dime Play. Refer to action on SLUG REJECTORS – Page 17.

Figure 5.

"SET-UP" AND OPERATION OF SINGLE PRICING SYSTEMS FOR MODELS 161S & 161SH

The Single Pricing System as applied to the Select-O-Matic "160", Model 161S uses Single Pricing Unit, Type SPU1 and that for Model 161SH uses Type SPU1-H or a combination of Type SPU1 plus Half Dollar Unit, Type HDU1.

Figure 5 constitutes a chart condensing information regarding the capabilities and set-up requirements for the Single Pricing System.

In the event that changes are desired in the phonograph as received, the preparation of the system necessitates:

A. Setting up of the Pricing Unit Switchboard and Credit Window Lights for correct indication of credits, *Figures 6 and 7.*

B. Connecting the Pricing Terminal Board taper tabs all on Singles, *Figure 3.*

C. Placing taper tab connector on Remote Control Stepper Unit on terminal pin marked SPU.

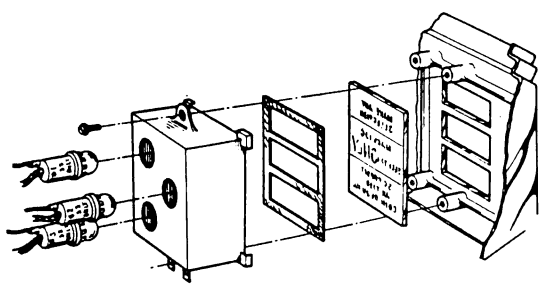


Figure 6. Replacement of Credit Window

PROGRAM HOLDERS

The program holders shown in *Figure 7* are in the positions required for servicing. The holders on the lid of the cabinet can be lowered by releasing the retainer springs and relatched by pressing the springs back into place. The frame containing the holders in the upper part of the cabinet must be raised and latched before the holders can be lowered into the servicing positions. These holders are also latched in place with individual retainer springs. To lower the frame, lift the latch at the left end and press downward. When the frame has been latched in the raised position, the retainer springs supporting the attached holders can also be released. A complete supply of blank title strips is supplied with the cabinet and will be found in the cash bag.

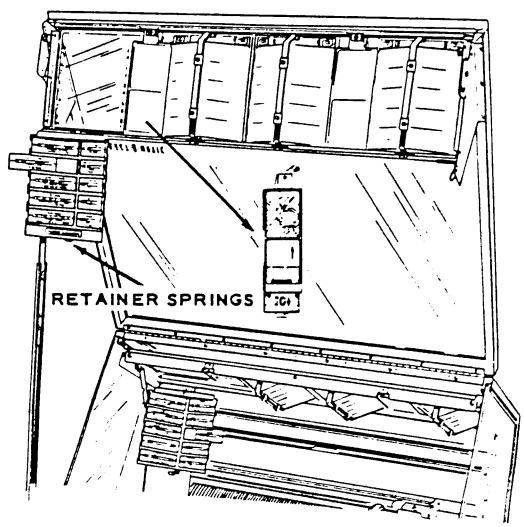


Figure 7.

PRICING INFORMATION WINDOWS

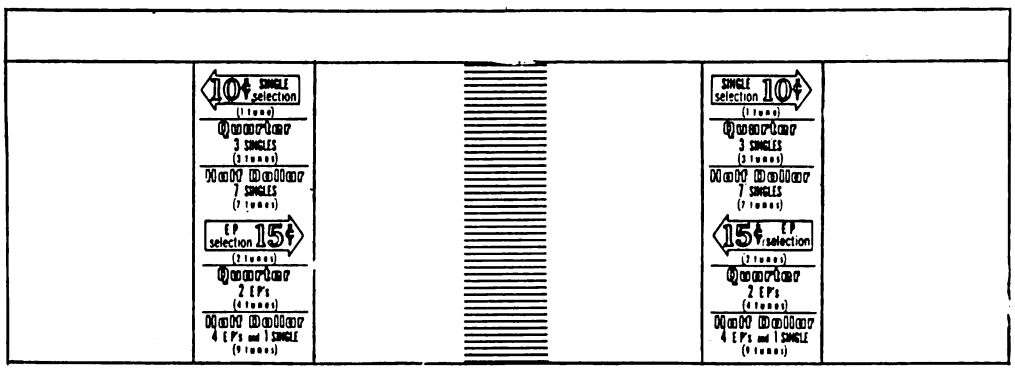
The pricing information windows are mounted inside the cabinet of each phonograph on the program holder assemblies as shown in *Figure* 7. At the factory, the windows on the lower program holder assemblies in all models are equipped for programming singles only. This is also true of the windows on the upper program holder assemblies in Models 161S and 161SH. The upper windows on Models 161D and 161DH are equipped only for programming EP's.

If, following the receipt of the phonograph, it becomes desirable to combine single and extended play programming on either of the program holder assemblies, all of the pricing windows must necessarily be changed to clearly indicate which selections are singles and which selections are extended plays. An example is contained in the chart at the bottom of this page. Also included in the chart are the part numbers of windows denoting various changes which are available only through the Seeburg Distributor.

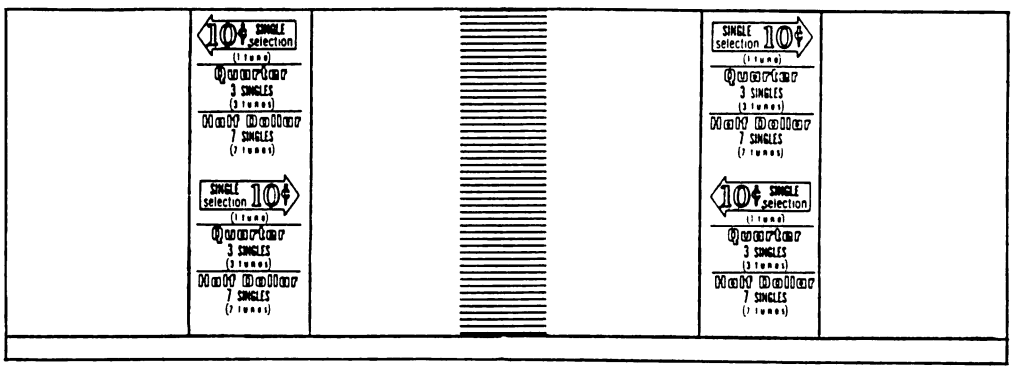
To gain access to the windows on the lower program holder assembly, simply raise the cabinet lid and rest it securely on the cabinet lid support. The removal of either of the two windows mounted here can be accomplished by removing the screws from the window retainers, as shown in the inset in *Figure* 7, and lifting the windows upward and out. Before removing the windows from the upper program holder assembly, the assembly frame must be lifted and latched in the raised position. The removal of these windows follows the pattern described.

Figure 7-A. Example Of "Split Programming".

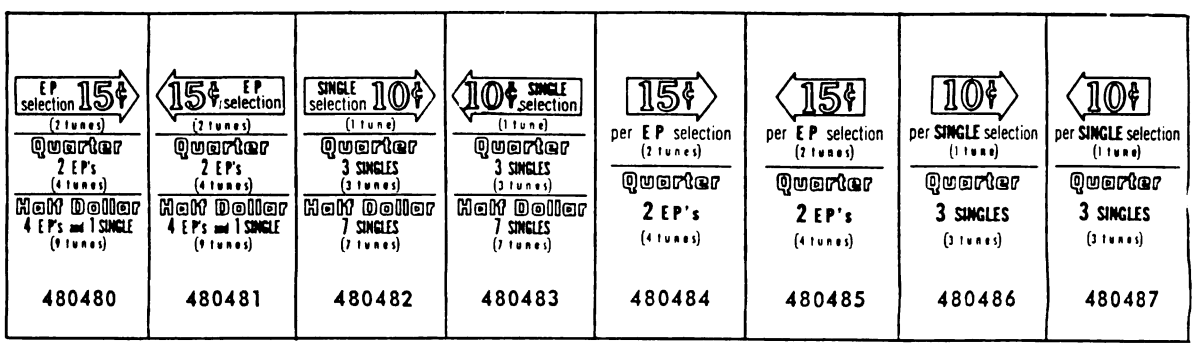
UPPER PROGRAM ASSEMBLY



LOWER PROGRAM ASSEMBLY



PRICING WINDOWS



POPULARITY METER

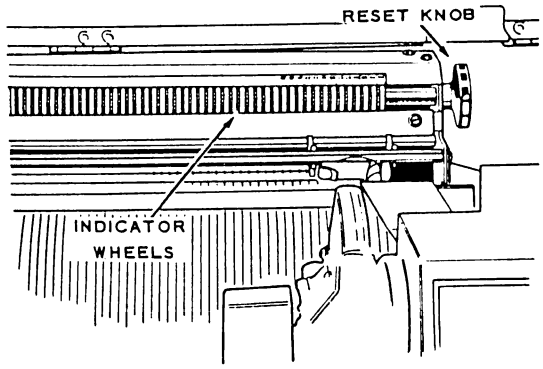


Figure 8.

The popularity meter is located behind the upper cabinet program holders and fluorescent light shield. It can be exposed by latching the program holders in the raised position and lifting the fluorescent light shield *(See Figure 8).* The meter consists of separate indicator wheels, individually calibrated from 0 to 40. The wheels indicate the number of times each record has played.

POPULARITY METER RESET

The popularity meter reset knob is located at the right end of the popularity meter *(See Figure 8).* To reset the indicator wheels, turn the knob in a clockwise direction. Continue turning until all of the wheels indicate zero.

SELECTION COUNTER

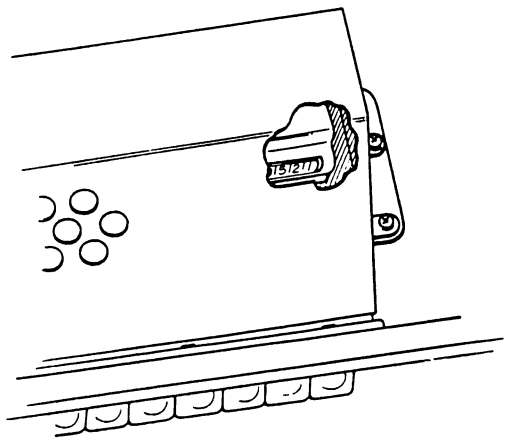


Figure 9.

A selection counter is built into the right side of the tormat electrical selector. The counter totals selections made from the electrical selector in the phonograph and Wall-O-Matics. The counter may be read by opening the glass lid.

AUDIO SYSTEM

The Select-O-Matic Audio System is of the "constant voltage" type: the amplifier output voltage does not change when the speaker load is varied. This means that the volume from any speaker in the system will not change noticeably when other speakers in the system are added or removed. Independent adjustment of volume at each speaker is possible; connections and speaker cable runs are simplified; and, within limits, impedance matching problems are eliminated.

The audio system delivers High Fidelity Audio power, which can be divided in various proportions between the phonograph and remote speakers. A terminal board is provided on the High Fidelity Master Amplifier for connection of high fidelity C. V. remote speakers.

AUDIO CONTROLS

The High Fidelity Master Amplifier is equipped with a keyed volume control which is accessible through a hole in the rear door. It is inoperative when a remote volume control is used.

For High Fidelity reproduction of recorded music, the original (live) balance between low frequencies (bass) and high frequencies (treble) must be maintained.

The acoustic (room) conditions in which a phonograph operates greatly affect the tonal balance. A room with plastered walls and ceiling, mirrors, and very little sound absorbing material, such as draperies, carpets, and upholstering, will sound shrill. By contrast, a room containing a large amount of sound absorbing

material, such as acoustic tile on the ceiling and walls, draperies, carpets on the floor, and upholstered booths, absorbs high frequencies, and the room will sound "bassy". Such unbalance of bass and treble can be corrected by setting bass and treble controls during a simple listening test on location.

The table at the bottom of the page gives approximate settings to serve as a guide. To achieve best results, listen to several records and adjust bass, treble, and Range Controls to obtain a natural balance, consistent with record quality.

An automatic volume compensator is a unit of the audio system. It compensates for the variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. Use of the feature is optional.

The AVC function can be checked or disabled by removing the 6BJ6 tube. This should cause the volume to rise sharply. Reinstallation of the tube should cause the volume to drop to normal as the tube elements warm up.

SELECT-O-MATIC PHONOGRAPH SPEAKERS

A capacitive crossover network divides the audio output of the amplifier and feeds the low frequencies only into the two 12-inch heavy duty "woofers", and the wide range high frequencies to the 8-inch high fidelity speaker.

SPEAKER REQUIREMENTS

Except in small locations, adequate distribution of sound at uniform level thru-out the

LOCATION CONDITIONS	CONDITION OF RECORDS		
	NEW (Good Quality)	FAIR (Average)	POOR (Worn and having High Scratch)
ACOUSTICALLY LIVE . . . . Hard walls, ceiling and floor – little or no upholstery and draperies.	BASS 3-4 TREBLE-RANGE 4-5	BASS 3-4 TREBLE-RANGE 3-4	BASS 2-3 TREBLE-RANGE 1-2
AVERAGE ROOM . . . . Average amount of sound deadening material.	BASS 2-3 TREBLE-RANGE 5	BASS 2-3 TREBLE-RANGE 4	BASS 1-2 TREBLE-RANGE 3
ACOUSTICALLY DEAD . . . . Acoustic tile on ceiling and walls, heavy draperies and carpets, upholstered booths.	BASS 1-2 TREBLE-RANGE 6	BASS 1-2 TREBLE-RANGE 5-6	BASS 1 TREBLE-RANGE 4

Note 1: Room Size: In rooms smaller than average, reduce the Treble-Range by one number. In rooms larger than average, the Treble-Range may be increased by one number if no remote speakers are used.

Noise: The noise encountered in some locations (restaurants, etc.) has a masking effect on music, especially high frequencies. Final setting of tone controls should be made under normal noise conditions with a representative number of people present.

Automatic Vol. Comp. A.V.C., compensates for average loudness variations from record to record.

NOTE: GOOD QUALITY REPRODUCTION CANNOT BE OBTAINED WITH POOR QUALITY RECORDS OR WITH WORN STYLUSES. PLEASE REMEMBER – WORN STYLUSES WILL RUIN YOUR RECORDS.

service area can be obtained only by careful placement of a sufficient number of High Fidelity remote speakers.

REMOTE SPEAKERS

In order to preserve the high quality obtainable from the High Fidelity sound system, when remote speakers are to be used, the following types must be used:

A. Type HFCV1-12 Recessed Speaker (Grill type for wall or ceiling mounting 70-Volt Constant Voltage Type.)

B. Type HFCV2-8 Wall Speaker (Wood Cabinet-wall mounting 70-Volt Constant Voltage Type).

C. Type HFCV3-8 Corner Speaker (Wood Cabinet-ceiling, corner or floor mounting 70-Volt Constant Voltage Type.)

CONNECTION OF HIGH FIDELITY REMOTE SPEAKERS

Constant Voltage Type High Fidelity Speaker Terminals are marked A and B and are connected to matching terminals A and B on the High Fidelity Master Amplifier. The volume level (watts) may be set at each speaker to suit local requirements. A load of 25 watts can be carried by No. 24 wire *(Part No. 502090)* for CV line lengths up to 450 feet. *CAUTION: Do not connect low impedance (8 or 16 obm) speakers to this phonograph.*

SELECT-O-MATIC SPEAKER SWITCH

Set the Select-O-Matic Speaker Switch on the front of the High Fidelity Master Amplifier to the position which gives the best balance between the Select-O-Matic Speakers and the remote speakers with a normal volume control setting. IF NO REMOTE SPEAKERS ARE USED, THE SWITCH MUST BE SET TO 20 WATTS.

The wattage requirements of all speakers combined must not exceed 25 watts. At no time should the total amplifier load be less than six watts or 25% of the rated amplifier load.

NOTE: If the wattage of all speakers (including the Select-O-Matic Speakers) to be connected to the High Fidelity Audio System, exceed 25 watts, a Seeburg power amplifier may be used to supply part of the load. Follow the instructions supplied with the amplifier for connecting speakers.

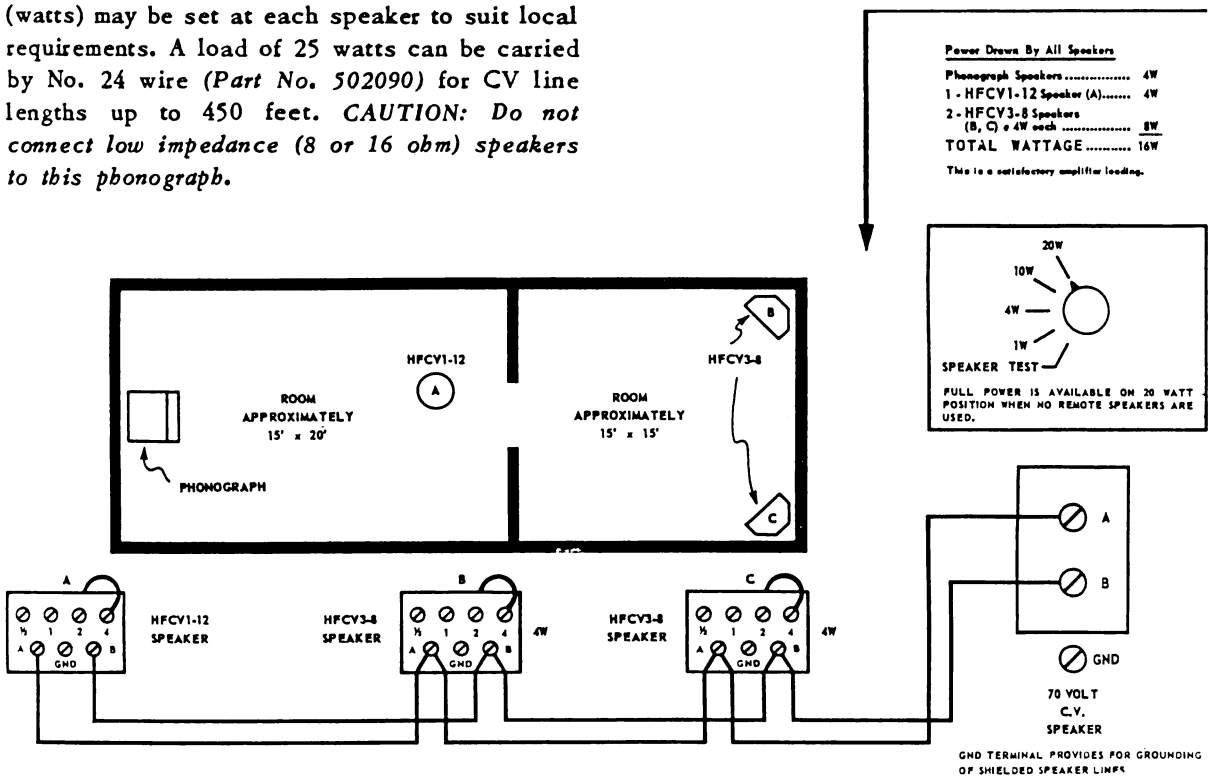


Figure 10.

WALL-O-MATIC
Types D-3WA, HD-3WA and S-3WA

The remote choice of 160 selections is made possible by the Wall-O-Matic which pulses the Tormat Selection Receiver to register selections on the Select-O-Matic "160" Mechanism. A sufficient number of these units should be used and placed to provide convenient selection from all parts of the location.

Wall-O-Matic Type D-3WA is to be used with Select-O-Matic Model 161D for dual pricing systems. Type HD-3WA is used with Model 161DH. Type S-3WA is used with Models 161S and 161SH for single pricing systems.

Power to operate up to six Wall-O-Matics is available from the Wall-O-Matic Power Supply Unit in the Select-O-Matic. When more than six Wall-O-Matics are used, additional power supplies Type PS6-1Z, are required. For each power supply that is added, six additional Wall-O-Matics may be used. The auxiliary power supply unit is to be installed on the cabinet floor in the area indicated. Should additional power supplies be required they may be placed on either side of the first unit.

The wiring of the Wall-O-Matics is facilitated by the use of special cable, Seeburg *Part No. 12015,* which is available in continuous lengths as required. Details of wiring and installing the Wall-O-Matic are included in the instruction folder shipped with each Wall-O-Matic.

Bar Bracket Assembly, Seeburg *Part No. 500200,* is available for rigidly mounting the Wall-O-Matic on bars, counters and tables.

MASTER REMOTE VOLUME CONTROL.
Type MRVC-3 (Accessory)

The Master Remote Volume Control, Type MRVC-3 comes completely wired and ready for use. Although equipped with 60 feet of cable, inherent loss compensation permits as much as 100 feet with no appreciable loss in frequency response. Remove the 9-Prong dummy plug from the High Fidelity Master Amplifier and replace with the corresponding plug on the cable of the MRVC-3. Connect the two spade lugs of the cable to the number 2 and 3 terminals, respectively, of the remote record cancel terminal strip on the Tormat Selection Receiver. If it is desirable to deactivate the phonograph cancel button, open the jumper between terminals 1 and 2.

Dress the cable to the permanent position selected for the control unit.

MICROPHONE PREAMPLIFIER AND MIXER, Type TMPS-56 (Accessory)

The Transistorized Microphone Preamplifier and Mixer Kit, Type TMPS-56, may be used with the Select-O-Matic "160" on any installation requiring the transmission of voice or live music thru the Seeburg Sound Distribution System.

HIGH FIDELITY CONSTANT VOLTAGE SPEAKER CONTROLS, Types HF25LT-2, 10LT-1 AND 10LT-2 (Accessory)

These controls are designed for use with Constant Voltage Speaker lines. It can be used to control the power (in 3 db steps) to one or more High Fidelity Constant Voltage type speakers.

TESTING

After the installation has been completed, all units should be carefully tested to see that they perform properly. Make several selections from the Electrical Selector and from each Wall-O-Matic and see that the selections made have correctly registered on the Tormat Memory Unit. Check the quality of music, and note that music can be heard at a comfortable volume level in all parts of the service area. See that all cables are dressed into inconspicuous places to present a neat appearance and prevent mechanical damage to them.

GENERAL MAINTENANCE

RECORD CARE

To avoid accumulation of dust and dirt, keep oil off the records. Wipe your hands with a clean cloth before handling records, and always handle records by edge and center hole. Records that show signs of surface dust or dirt should be wiped with a slightly dampened cloth, using a circular motion. Use only water to dampen the cloth – solvents will damage the records. Records not in use should be stored on edge in a cool place. Avoid exposing the records to excessive heat. Records become overheated in a very short time if exposed to direct sunlight or if stored in a closed automobile or truck. Temperature above 120° F. should be avoided. *See instructions on "Placing the Select-O-Matic "160".*

PICKUP STYLUSES

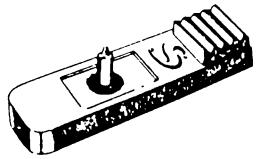


Figure 11. Armature Assembly

The styluses of the high fidelity magnetic pickups are permanently mounted in the removable armature assemblies. See *Figure 11.* The extremely low armature mass, high compliance, and low stylus force of this quality pickup greatly increases stylus life and record life. The armature assemblies furnished with the Seeburg magnetic pickup are tipped with sapphire which is excelled in hardness and wear resistance only by the diamond. When the armature assemblies are changed, all movable pickup parts are renewed and "new" pickup performance is completely assured. There is no need to replace the pickup; it is permanent because it has no moving parts.

STYLUS REPLACEMENT

In the presence of friction, wear of the stylus starts with the first play and continues until the stylus is replaced. The tone quality is good and distortion remains at a low figure for the first few thousand plays but gradually distortion increases until a disagreeable amount is noticed.

When only good vinylite 45 rpm records are used, armature assemblies with sapphire styluses should be changed every four or five thousand plays to maintain good reproduction. If, because of the presence of oil on the records, dust or dirt is permitted to accumulate and remain on the surface, the wear will be more rapid; economical operation will require more frequent armature assembly replacement.

If the Armature Assemblies are not replaced before objectionable distortion sets in, the records may be permanently damaged, and replacing the Styluses will not restore the original tone quality.

Because the cost of a pair of armature assemblies is only a small fraction of the cost of a set of records, it is economically sound to replace them on a regular schedule rather than on a hit-or miss basis. A schedule can be most easily determined from instrument income. The armature assemblies with sapphire styluses should be changed according to the following table if the records are arranged for approximately equal distribution of play between the right and left sides of the pickup:

Approximate Weekly Gross Receipts:	* Change Both Armature Assemblies Every
$25	8 months
$50	4 months
$75	3 months
$100	2 months
$150	6 weeks

* *Maximum stylus life*

The table is based on ten cents per selection and three to six thousand plays for each stylus. THE COST OF REPLACING ARMATURE ON THIS SCHEDULE IS LESS THAN ½ OF 1% OF GROSS INCOME.

DIAMOND STYLUSES

With the use of a diamond stylus, many times the above number of plays per replacement is assured. The long run economy more than outweighs the higher purchase price. Armature assemblies with diamond styluses that fit the Seeburg Magnetic Pickup are obtainable through your Seeburg Distributor.

TO REPLACE ARMATURE ASSEMBLIES

1. Make a selection to the right of magazine center and left side of a record (Example U8) to position carriage and pickup arm cradle for easiest access to styluses.
2. Remove worn styluses by placing thumb nail against plastic armature assembly just behind raised shoulder. Light pressure in the direction away from the stylus point will cause replaceable assembly to slide free of cartridge slot.
3. Install new armature assembly by laying it FLAT in open end of cartridge slot, and sliding forward in slot until it bottoms. Use thumb nail against plastic raised shoulder in reverse of Step 2 to complete travel when the assembly bottoms.

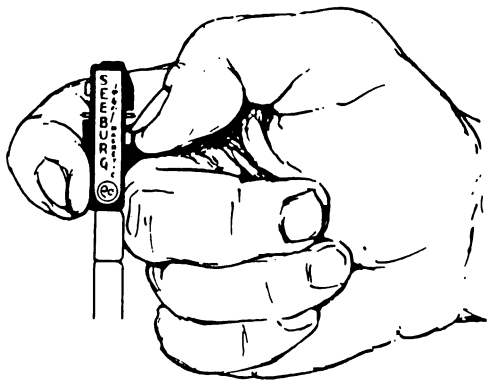


Figure 12. Removing Armature Assembly

In order to retain good quality reproduction, it is necessary to keep the pickup and styluses clean and in good condition.
CAUTION: The pickup and styluses must be handled carefully or the delicate armature suspension may be damaged.

When records are changed, or the equipment is cleaned the stylus well and the stylus brushes should be cleaned by using the small brush furnished for this purpose and mounted on the inside left wall of the cabinet.

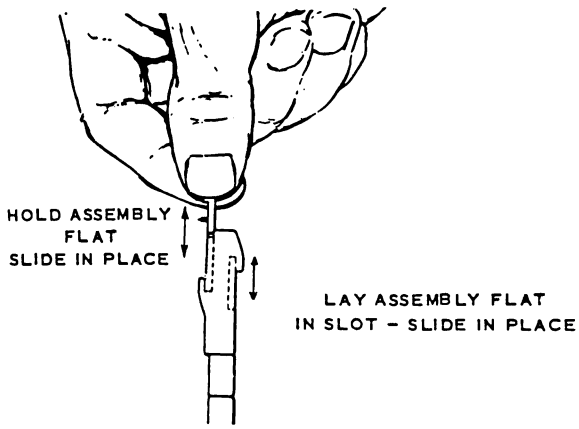


Figure 13. Installing New Armature Assembly

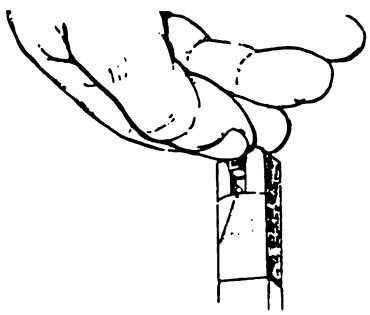


Figure 14. Installing New Armature Assembly

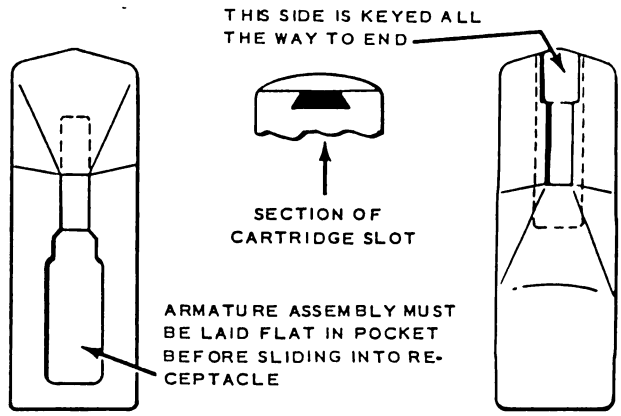


Figure 15. Keyed Fit of Armature Assembly

MECHANISM ACCESS

To expose front of the mechanism for "in the cabinet" servicing:

1. Open lid and select left record side selection (Example A 5) to locate pickup on left side.
2. Cover the pickup cartridge with the plastic protective case.
3. Remove the carriage cover as follows:
   a. Unscrew the two mounting screws: One is on the lower left hand side of the cover; the other is located on top.
   b. Lift up and move forward to remove carriage cover.

REAR ACCESS PANEL

To service rear of mechanism such as adjustment of Tormat Contact Block or clutch mechanism:

1. Open Rear Access Panel above phonograph rear door, *Figure 16*, in the following manner:
   a. Open rear compartment door.
   b. Remove ten screws securing access panel.
   c. Reach up and pull down on access panel release latch.
   d. Swing bottom of panel out and down. Remove from cabinet.

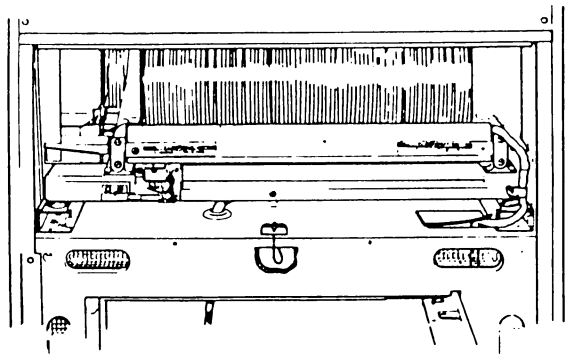


Figure 16.

2. Remove magazine filler by unscrewing (1), (2) and (3) and withdrawing entire section from the front of the record magazine, *Figure 17.*

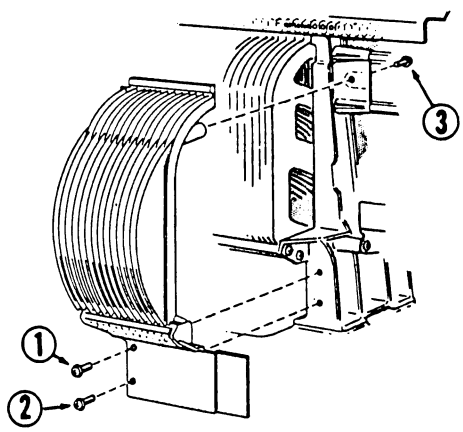


Figure 17.

3. Operate the service switch to position mechanism to the extreme right of its travel thus exposing the serviceable section to view.

COMPLETE REMOVAL OF MECHANISM

When it is necessary to remove the mechanism from the cabinet for servicing, proceed as follows:

1. Disconnect Mechanism and Tormat Selector Unit cables

2. Unlock mechanism frame by prying out and removing locking pins *Figure 19.*

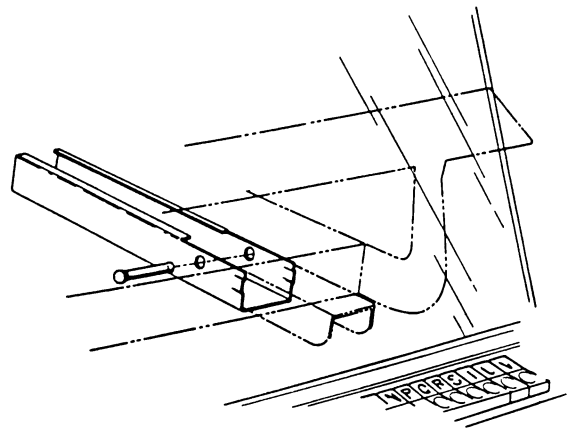


Figure 18.

3. Disconnect power and remove lower fluorescent tube.

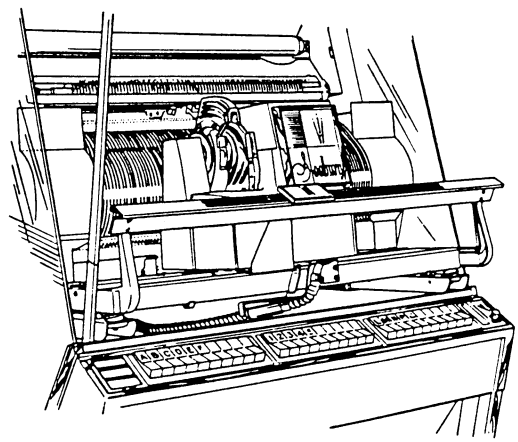


Figure 19.

4. Slide mechanism forward, clear of channel guides and lift out.

LUBRICATION

The mechanism and other mechanical parts should be lubricated periodically. The recommended lubricants are Seeburg Select-O-Matic Oil, *Part No. 53014,* and Aero Lubriplate, *Part No. 53006.*

Seeburg Select-O-Matic Oil is a light machine oil, especially suited for lubrication of small machinery operated normally in the "room temperature" range. It is free of waxy constituents, pours easily at low temperatures, and has exceptional anticorrosive properties.

Follow the complete lubrication instructions given on the lubrication chart in the envelope on the inside wall of the phonograph.

LAMP REPLACEMENT

Upper Cabinet Lamp

The upper cabinet lamp illuminates the upper program holders. It is a 25-watt, 28-inch cool white fluorescent tube which is accessible for replacement when the program holder frame is latched in the raised position *(See Figure 20).*

Lower Cabinet Lamp

This is a 25-watt, 28-inch cool white fluorescent lamp with associated starter. It illuminates the lower program holders and front of the cabinet, and is accessible when the lid is open.

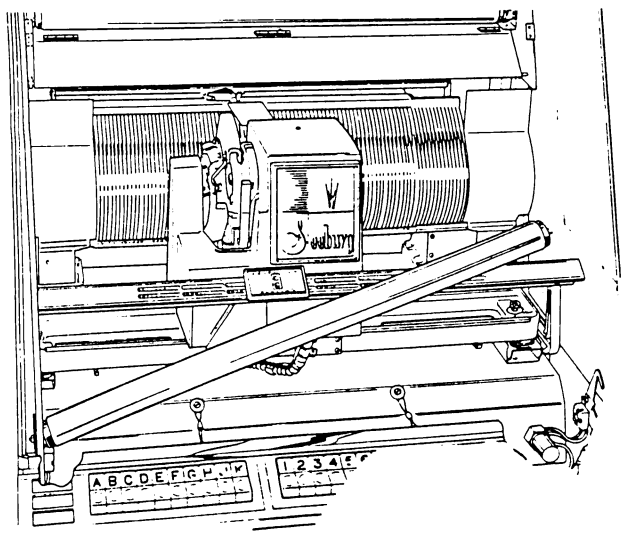


Figure 20.

Credit Lamps

Three credit lamp socket assemblies using No. 55 bulbs are cabled on the right hand side of the Tormat Electrical Selector. The sockets are appropriately labeled for their location in the credit window. WHEN SERVICING MAKE SURE THAT SOCKETS ARE CORRECTLY ORIENTED. Misplacement will falsify credit indications.

Grill Ornament Lamps

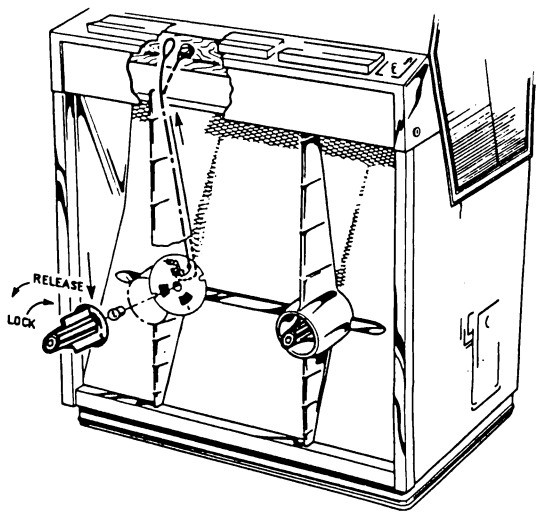


Figure 21.

Two grill ornaments are illuminated by No. 55 lamps which may be replaced as shown in *Figure 21.* Cable-releases are provided which when pulled upward permit removal of the ornament by rotating it counter clockwise and pulling straight out. Lamp sockets are then easily accessible.

APPEARANCE

To maintain good appearance of the phonograph, and thus keep customer appeal at its maximum level, the various pieces of glass should be kept clean: lid glass, side glasses, etc.

Use only clear liquid cleaners, as types containing powder can impair reliability of electrical contacts, and cause excessive wear of records, styluses, and mechanism bearings.

Interior trim and all chrome plated parts also should be cleaned occasionally. These parts include Key Panel Frame and plated parts in the mechanism compartment.

CABINET SIDE GLASS

The cabinet side glass can be removed to facilitate cleaning the rear mechanism compartment *(Figure 22)* or to replace damaged glass.

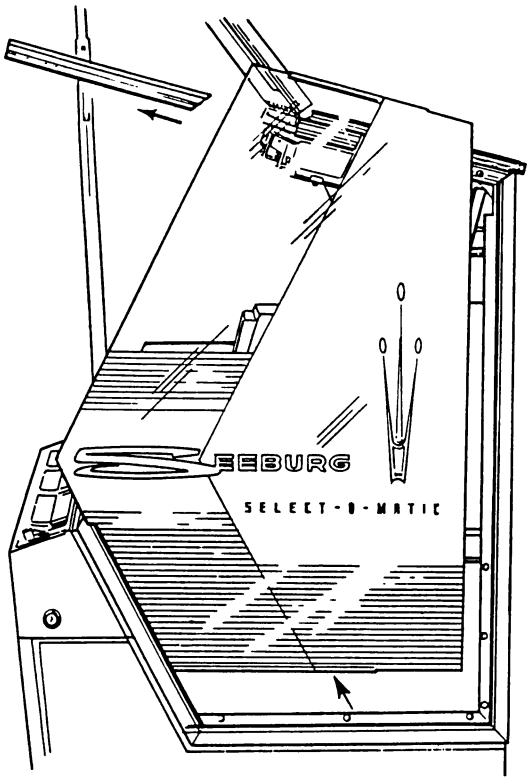


Figure 22.

PREPARING INSTRUMENT FOR MOVING

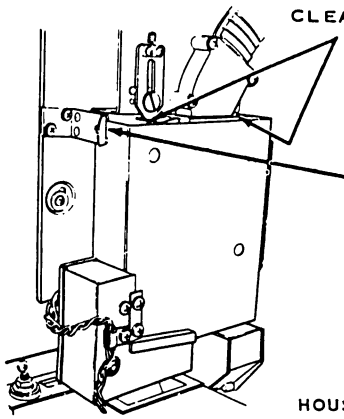
1. Put the two 1/4 inch wood shims under the base at the mechanism hold-down bolts.
2. Tighten four mechanism hold-down nuts.
3. Remove all records from magazine.
4. With the pickup arm in left hand side playing position, scan mechanism to a point at selections A-1, B-2.
5. Place protective tube over pickup cartridge and install pickup arm shipping support.
6. Put two fibre pads (a long pad in the rear and a short pad in the front) under the carriage wheels and bolt the carriage to the base by means of two 4½ inch long thumb screws, which are to be inserted thru mechanism base.

TO SHIP

If the instrument is to be shipped by way of a transportation company, it should be blocked and crated in the same manner in which it was received from the factory.

SLUG REJECTOR

5¢, 10¢, 25¢

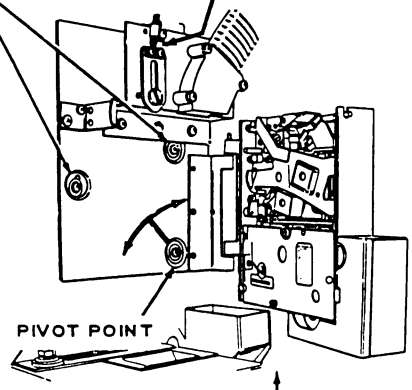


CLEARANCE APPROX. .016

TO OPEN: RELEASE THIS CATCH AND SWING OUT

HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.

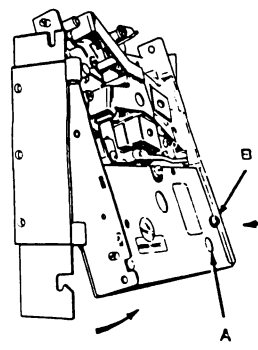
TO LEVEL: LOOSEN THESE (2) SCREWS AND SWING FRAME TOWARD FRONT OR REAR.



PIVOT POINT

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

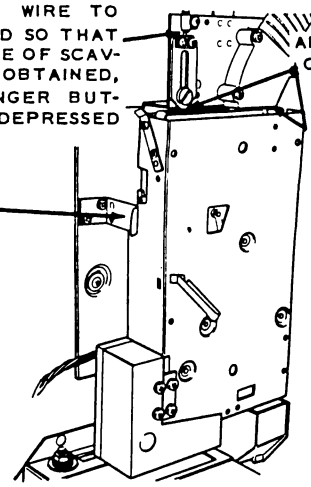
TO REMOVE SLUG REJECTOR FROM ITS FRAME LIFT UP AND SWING OUT.



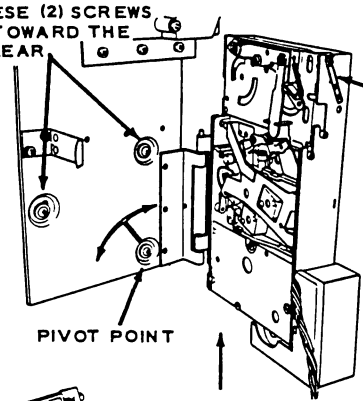
5¢, 10¢, 25¢, 50¢

HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.

APPROX. .016 CLEARANCE

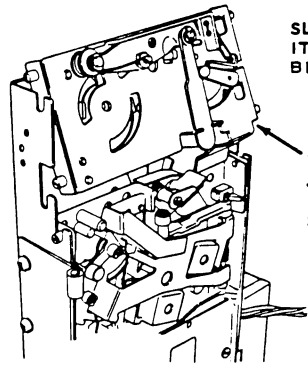


TO LEVEL SLUG REJECTOR: LOOSEN THESE (2) SCREWS AND SWING TOWARD THE FRONT OR REAR



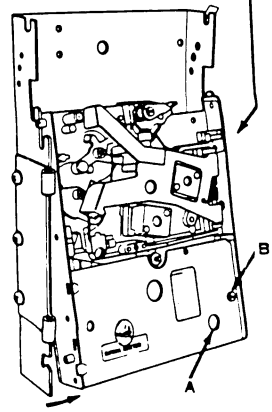
PIVOT POINT

SLUG REJECTOR AND ITS FRAME MAY NOW BE LIFTED UP AND OFF.



TO REMOVE SLUG REJECTOR: RELEASE THIS CATCH THEN LIFT 50¢ SECTION UP AND OUT

NEXT, LIFT 5¢, 10¢ & 25¢ SECTION UP AND SWING OUTWARD



WHEN SLUG REJECTOR IS EQUIPPED WITH FLIPPER, NORMAL OPERATION REQUIRES SHORT SCREW AT "A" AND LONG SCREW AT "B".

TO LOCK OUT FLIPPER INTERCHANGE SCREWS WITH FLIPPER IN MAXIMUM COUNTER-CLOCKWISE POSITION.

Figure 23.

SEEBURG

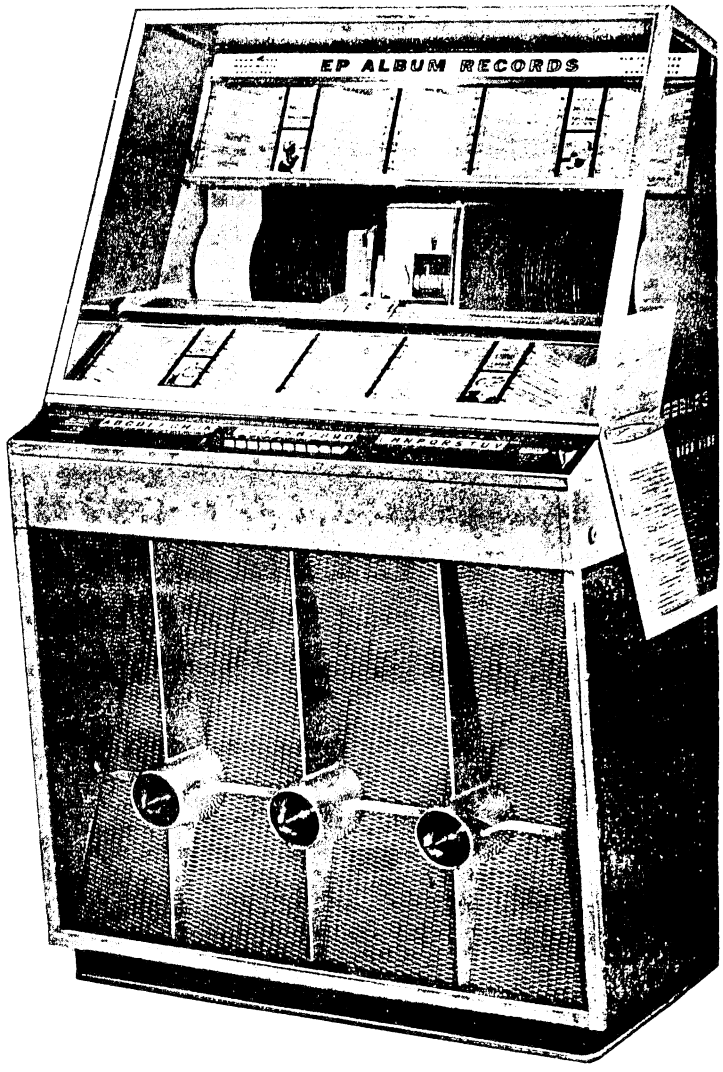
SELECT-O-MATIC 200

HIGH FIDELITY

INSTALLATION and OPERATION MANUAL

Models

201D
201DH
201S
201SH



THE SEEBURG CORPORATION CHICAGO 22, ILLINOIS, U.S.A.

PART NO. 480671 (AF) Issue 1

SELECT-O-MATIC "200"

MODELS 201S, 201D, 201SH and 201DH

INSTALLATION & OPERATION MANUAL

–Table Of Contents–

SPECIFICATIONS

Power Requirements:

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

Cabinet Lighting:

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

Cabinet Key Number: ..... F 313

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

Tormat Memory Assembly ..... Type 200TM3

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

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

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

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

Finish ..... Silver Fox

Coin Equipment 5-, 10-, 25-cent
Single Entry Rejector with Models 201S and 201D
5-, 10-, 25-, 50-cent Single Entry Rejector with Model 201SH and 201DH

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

Amplifier..... Type HFMA-2
7-tube High Fidelity, Constant Voltage Type with Automatic Volume Compensation and transistor preamplifier stage.

Tormat Electrical Selector ..... Type TES221

Tormat Selection Receiver ..... Type TSR6

Remote Control:

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

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

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

Transistor ..... Type 2N109

Tubes:

2 – 6L6GB
3 – 12AX7
1 – 6BJ6
2 – OA2
1 – 5U4GB
2 – 2050
1 – 6X4

Fuses:

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

DIMENSIONS

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

INSTALLATION AND OPERATION

DAMAGE CAUSED BY SHIPPING

Examine the instrument immediately after unpacking. If any damage is found, notify the transportation representative and get his signature on the transportation bill with notation of damage.

CABINET LID SUPPORT

The cabinet lid support is located behind the electrical selector panel when the lid is in the closed position. Lift the lid with the right hand. With the left hand, raise the right end of the support. Withdraw the lid support slide until the spring mounted lock pin drops into the slot in the support channel as shown in *Figure 2.* Insert the support stud at the upper end of the slide into the slot shown in the inset in *Figure 2. CAUTION: BE CERTAIN THAT THE SUPPORT STUD IS FULLY ENGAGED IN THE SLOT BEFORE THE LID IS LOWERED. DO NOT MOVE THE CABINET WHILE THE LID IS RESTING ON THE SUPPORT.*

To lower the lid, first raise it slightly and disengage the support stud from the slot. Manually press the spring mounted slide support stud out of its slot in the support channel. Move the slide into the channel and return the support to its original position. When the support has been returned to its original position, complete the lowering of the lid.

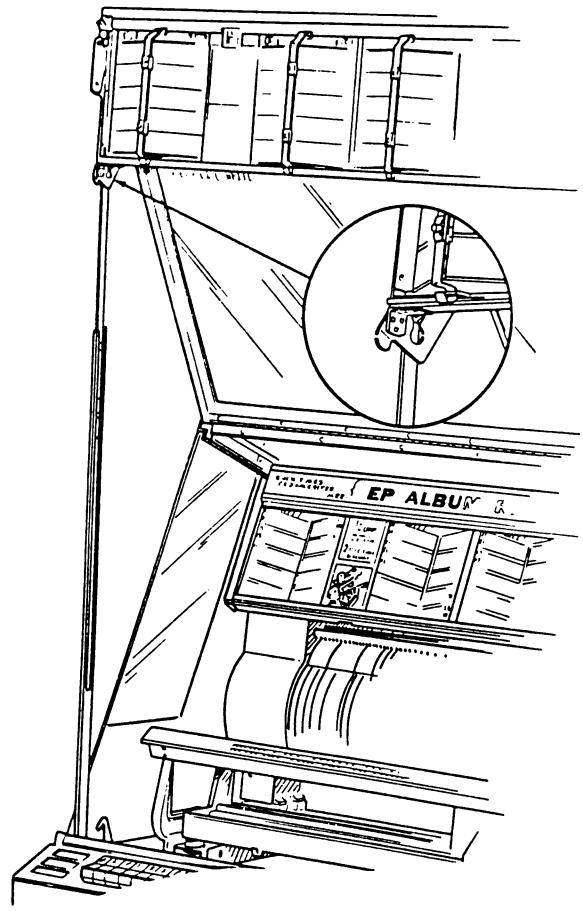


Figure 2.

UNBLOCKING

Before placing this phonograph into operation, it is necessary to remove or loosen certain shipping hardware used to safeguard the mechanism during transit. Carefully follow instructions on the tags found in several places in the instrument and remove blocks and shipping supports accordingly. *CAUTION: Do not attempt mechanism operation by manually turning the flywheel; this may damage the mechanism. Use the service switch!*

DO NOT PUT PACKING BLOCKS, INSTRUCTION CARDS, OR ANY OTHER MATERIAL ON THE AIR INTAKE SCREEN IN THE FLOOR OF THE CABINET. AS THIS WILL OBSTRUCT VENTILATION AND CAUSE OVERHEATING. SUCH OVERHEATING MAY WARP RECORDS AND SHORTEN THE LIFE OF THE EQUIPMENT.

ELECTRONIC EQUIPMENT

Electronic equipment is mounted on the rear door. The door is hinged on the right side and can be swung out to permit access to coin equipment in the phonograph cabinet and to tubes, tone controls, plugs, etc., on the front of the electronic equipment. The cover plate on the rear of the electronic equipment can be removed by unscrewing four screws (two on the outer left hand edge and two on the back) and sliding the plate forward and out. The electronic equipment may be completely serviced while the phonograph is operating without removing it from the cabinet. The entire door can be removed by extracting all plugs and then lifting up and swinging the bottom of the door out and down. *CAUTION: When reinstalling the door, make certain that the lower hinge pin is positively located in its socket before releasing door.*

TUBES AND PLUGS

This instrument is shipped with tubes and plugs installed. In shipment they may loosen; for this reason, it is well to see that they are all firmly seated in the sockets before inserting the line cord.

VOLTAGE RATING

Before connecting the line cord to a light socket or outlet make certain that the voltage and frequency on the meter box at the location agree with the markings of voltage and frequency on the instrument name plate.

PLACING THE SELECT-O-MATIC "200"

To obtain best performance and long service from this equipment, it should be placed on a firm, reasonably level floor away from excessive moisture and heat.

WARNING: To prevent warping records place phonograph where the records will not at any time be exposed to direct sunlight or any other radiant heat. Do not reduce ventilation by obstructing the vent screens.

A space of at least two inches must be allowed between the back of the cabinet and the wall, so as to assure adequate ventilation.

ELECTRICAL SELECTOR PANEL

Mounted behind the electrical selector panel on the tormat electrical selector are the service and manual credit switches plus the pricing unit switchboard and pricing terminal board. *(See Figure 3.)* All four items are located at the left end. The first two are accessible when the cabinet lid is raised The remaining two can be reached only when the cover, as shown in *Figure 3,* has been removed from the electrical selector. On the opposite end of the electrical selector, the selection counter is mounted. *(See Figure 9.)*

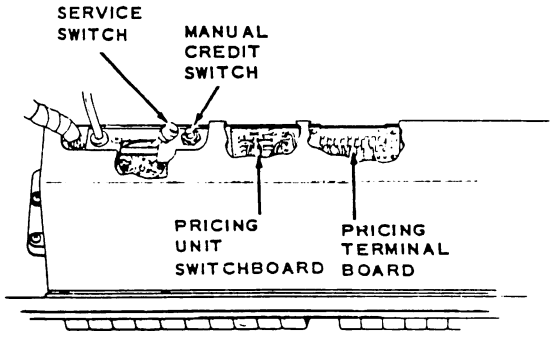


Figure 3.

SERVICE SWITCH OPERATION

A three-position service switch is located as shown in *Figure 3.* When the switch lever is moved to the left, against the spring return, and permitted to return to center position, it will cause the mechanism to scan past and by-pass selections set up on the Tormat Memory Unit and come to rest at the right hand end of the base.

With the mechanism scanning and the service switch in center position, the mechanism may be stopped at any point of travel by pressing the service credit switch twice in succession.

The service switch must be set to the right of center position for Normal Operation of the phonograph.

MANUAL CREDIT SWITCH

At the right side of the service switch box is a push-button which operates the manual credit switch. With the service switch held in the "scan" position, a credit is obtained when the manual credit switch is depressed and a selection may be made after the service switch is returned to "Normal" position. In phonograph models equipped with accumulator type of credit systems – Models 201D & 201DH – each actuation of the manual credit switch will add a 5¢ credit thus providing a choice of a number of selections in any credit combination. In models using single credit systems - Models 201S & 201SH - a 25 cent credit is established when the manual credit switch is actuated.

LOADING RECORDS

To obtain optimum performance and supply your customer with the best in recorded music it is necessary that only new or nearly new

records be used on the Seeburg Select-O-Matic. Only standard 7-inch commercial 45 rpm record may be used. Occasionally, records will be found that have an undersize center hole. This is caused, in some cases, by the paper label being pushed into the center hole. If the record center hole is undersize, such a defective record may stick on the record pin.

Push up the main switch (accessible through hole in rear door) to the "ON" position. Scan the mechanism to the right hand end of its base as described in service switch operation.

Starting at the left end of the magazine (A1, B1), insert one record in each record space. The top row selections on the Indicator Panel refer to the left side of the records and the bottom row to the right side of the records. Thus A1, C1, E1, G1, J1, L1, etc., all will be left sides, and B1, D1, F1, H1, K1, M1, etc., will be right sides of records. *CAUTION: Do not force records into record spaces!* Any normal record will roll very freely into the record spaces. A record which is warped badly enough to have any tendency to bind in the magazine space would not be properly played in any automatic mechanism and should not be used.

When the left half of the magazine has been loaded with records, scan the carriage to the left end of the base and load the right half of the magazine. *(After the magazine has been loaded, set the service switch to the "ON" position to the right of the cabinet).*

"SET-UP" AND OPERATION OF DUAL PRICING SYSTEM for MODELS 201D AND 201DH

The Dual Pricing System as applied to the Select-O-Matic "200", Model 201D uses Dual Credit Unit Type DPU1. For Model 201DH, Dual Pricing Unit Type DPU1 plus Half Dollar Unit Type HDU1 are used. The system is designed to provide "Single" selections for 10¢ and "EP's" for 15¢.

The Dual Pricing System permits the accumulation of credits at the rate of one credit for a nickel, two credits for two nickels or a dime, and three credits for 15 cents. Additional credits can be accumulated up to a maximum of 24 in each programming cycle. Note that a premium is given when quarters are used, since one quarter gives six credits and four quarters will give 24, while it takes 12 dimes or 24 nickels to give 24 credits. Associated Credit Lights, a Pricing Unit Switchboard, and Pricing Terminal Boards (one on the Tormat Electrical Selector and (one on the Tormat Selection Receiver) are effective in setting up the credit system.

Figure 4 constitutes a chart condensing information regarding the capabilities and set-up requirements for the two Pricing Combinations.

In the event that changes are desired in phonograph as received, the preparation of the system necessitates:

A. Setting up of the Pricing Unit Switchboard and Credit Window Lamps for correct indication of credits.

B. Connecting the Pricing Terminal Board taper tabs corresponding to each panel of desired "EP's" and "SINGLES" for associated pricing. The program must be in panels of 20 selections (10) records, each panel being represented by a number button. "Singles" and "EP"' cannot be in the same panel if there is to be a price difference. The pricing terminal board on the Tormat Selection Receiver must be connected to terminal marked DPU. The pricing terminal board on the Tormat Electrical Selector, and the pricing terminal boards in all Wall-O-Matics MUST be connected to match.

With the Pricing Unit Switchboard set to "A", as in pricing combination No. 1, and the Pricing Terminal Boards connected for "SINGLES" and "EP's", the following operational sequence holds true:

1. The deposit of a nickel rotates the credit wheel in the Dual Pricing Unit to the one-credit position and the lower credit window light goes on indicating "5¢ Credit – Another Coin Required". No plays will result when selection buttons are pushed and keys will not latch.

2. Another nickel (or a dime initially) rotates the credit wheel to the two-credit position and the middle credit window light goes on indicating "Make 10¢ Selection Only". Now only "Singles" will play when selection buttons are pushed. If buttons for "EP" selection instead are depressed, they will be unlatched when the second of the two is pushed.

3. Another nickel (or a nickel and a dime initially) rotates the credit wheel to the three-credit position and the upper credit window light goes on indicating "Make Any Selection". Credit window lights remain the same as when on the three-credit position with the deposit of additional coins.

With the Pricing Unit Switchboard set on position "B" and the Pricing Terminal Board tabs all placed on "Singles" as in pricing combination No. 2, the following holds true:

1. The first nickel deposited rotates the credit wheel to the one-credit position and the lower credit window light goes on as before.

2. Another nickel (or a dime initially) rotates the credit wheel to the two-credit position and the upper credit window light goes on indicating "Make Any Selection". The middle credit light remains out at all times with the switchboard in "B" position.

PRICING COMBINATIONS

– 1 –

FOR NICKEL, DIME, AND QUARTER COIN EQUIPMENT USING DPU1

SINGLES 10¢ 3 FOR QUARTER
E. P.'s 15¢ 2 FOR QUARTER

MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
MAKE 10¢ SELECTION ONLY	LAMP # 2	COIN WINDOW FOR MODEL 201D 480902
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

– 2 –

ALL 10¢ SELECTIONS
3 FOR QUARTER

MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	COIN WINDOW FOR MODEL 201D 480902
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

FOR NICKEL, DIME, QUARTER AND HALF DOLLAR COIN EQUIP. USING DPU1 and HDU1

SINGLES 10¢ 3 for QUARTER 7 for HALF DOLLAR
E.P.'s 15¢ {2 for QUARTER / 4 EP's + 1 SINGLE for HALF DOLLAR}

MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
10¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 2	COIN WINDOW FOR MODEL 201DH 480900
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

ALL 10¢ SELECTIONS
3 FOR QUARTER 7 FOR HALF DOLLAR

MAKE ANY SELECTION	LAMP # 1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	COIN WINDOW FOR MODEL 201DH 480900
5¢ CREDIT ANOTHER COIN REQUIRED	LAMP # 3	

PRICING UNIT SWITCHBOARD

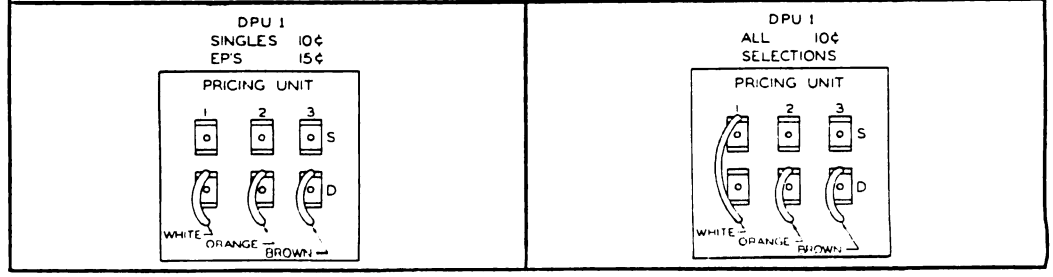


Figure 4.

FOR NICKEL, DIME AND QUARTER COIN EQUIPMENT USING SPU1	
1 SELECTION – DIME OR 2 NICKELS 3 SELECTIONS – QUARTER *SET SPU1 FOR DIME PLAY	1 SELECTION 5¢ 2 SELECTIONS DIME 6 SELECTIONS – QUARTER *SET SPU1 FOR NICKEL PLAY

MAKE ANY SELECTION		
	LAMP #1	USE CREDIT WINDOW 480241
	LAMP #2 DOES NOT LIGHT	MODEL 201S – USE COIN WINDOW – 480901
	LAMP #3 DOES NOT LIGHT	201SH – USE COIN WINDOW – 480903

WHEN USING HALF DOLLAR EQUIPMENT USE AND COIN WINDOW SHOWN ABOVE. } SPU1-H OR SPU1 PLUS HDU1

* Flipper in slug rejector must be locked out for Nickel Play and operative for Dime Play. Refer to action on SLUG REJECTORS – Page 17.

PRICING UNIT SWITCHBOARD

SPU 1 OR SPU1-H ALL SINGLE PRICE SELECTIONS

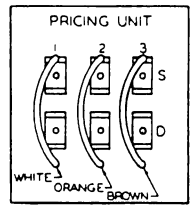


Figure 5.

"SET-UP" AND OPERATION OF SINGLE PRICING SYSTEMS FOR MODELS 201S & 201SH

The Single Pricing System as applied to the Select-O-Matic "200", Model 201S uses Single Pricing Unit, Type SPU1 and that for Model 201SH uses Type SPU1-H or a combination of Type SPU1 plus Half Dollar Unit, Type HDU1.

Figure 5 constitutes a chart condensing information regarding the capabilities and set-up requirements for the Single Pricing System.

In the event that changes are desired in the phonograph as received, the preparation of the system necessitates:

A. Setting up of the Pricing Unit Switchboard and Credit Window Lights for correct indication of credits, *Figures 6 and 7.*

B. Connecting the Pricing Terminal Board taper tabs all on Singles, *Figure 3.*

C. Placing taper tab connector on Remote Control Stepper Unit on terminal pin marked SPU.

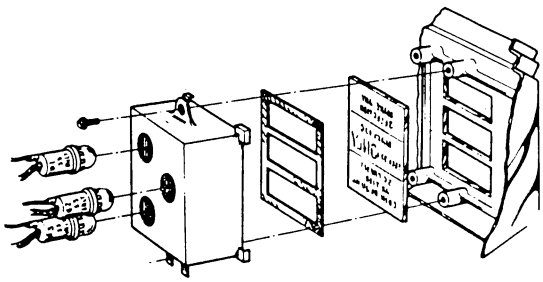


Figure 6. Replacement of Credit Window

PROGRAM HOLDERS

The program holders shown in *Figure 7* are in the positions required for servicing. The holders on the lid of the cabinet can be lowered by releasing the retainer springs and relatched by pressing the springs back into place. The frame containing the holders in the upper part of the cabinet must be raised and latched before the holders can be lowered into the servicing positions. These holders are also latched in place with individual retainer springs. To lower the frame, lift the latch at the left end and press downward. When the frame has been latched in the raised position, the retainer springs supporting the attached holders can also be released. A complete supply of blank title strips is supplied with the cabinet and will be found in the cash bag.

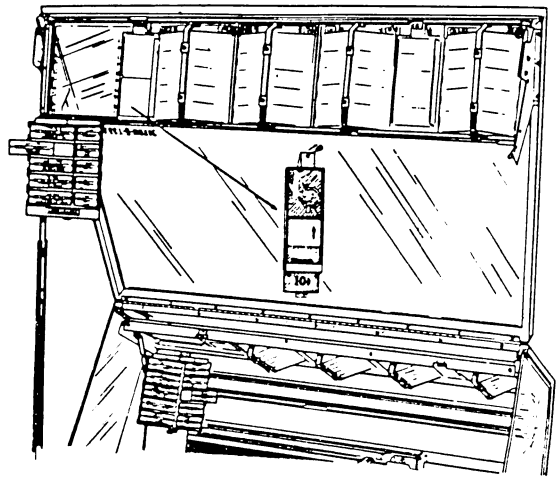


Figure 7.

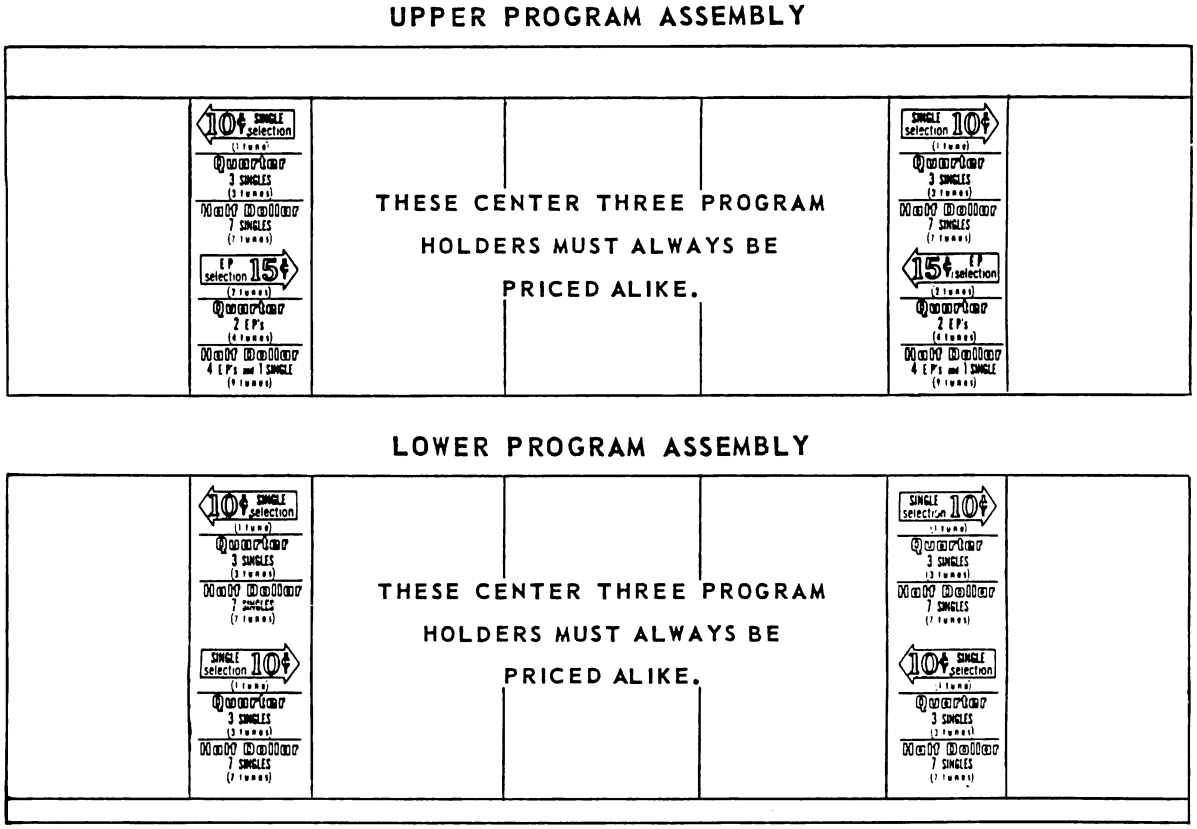
PRICING INFORMATION WINDOWS

The pricing information windows are mounted inside the cabinet of each phonograph on the program holder assemblies as shown in *Figure 7*. At the factory, the windows on the lower program holder assemblies in all models are equipped for programming singles only. This is also true of the windows on the upper program holder assemblies in Models 201S and 201SH. The upper windows on Models 201D and 201DH are equipped only for programming EP's.

If, following the receipt of the phonograph, it becomes desirable to combine single and extended play programming on either of the program holder assemblies, all of the pricing windows must necessarily be changed to clearly indicate which selections are singles and which selections are extended plays. An example is contained in the chart at the bottom of this page. Also included in the chart are the part numbers of windows denoting various changes which are available only through the Seeburg Distributor.

To gain access to the windows on the lower program holder assembly, simply raise the cabinet lid and rest it securely on the cabinet lid support. The removal of either of the two windows mounted here can be accomplished by removing the screws from the window retainers, as shown in the inset in *Figure 7*, and lifting the windows upward and out. Before removing the windows from the upper program holder assembly, the assembly frame must be lifted and latched in the raised position. The removal of these windows follows the pattern described.

Figure 7-A. Example Of "Split Programming".



PRICING WINDOWS

EP selection 15¢ (2 tunes) Quarter 2 EP's (4 tunes) Half Dollar 4 EP's and 1 SINGLE (9 tunes)	15¢ EP selection (2 tunes) Quarter 2 EP's (4 tunes) Half Dollar 4 EP's and 1 SINGLE (9 tunes)	SINGLE selection 10¢ (1 tune) Quarter 3 SINGLES (3 tunes) Half Dollar 7 SINGLES (7 tunes)	10¢ SINGLE selection (1 tune) Quarter 3 SINGLES (3 tunes) Half Dollar 7 SINGLES (7 tunes)	15¢ per EP selection (2 tunes) Quarter 2 EP's (4 tunes)	15¢ per EP selection (2 tunes) Quarter 2 EP's (4 tunes)	10¢ per SINGLE selection (1 tune) Quarter 3 SINGLES (3 tunes)	10¢ per SINGLE selection (1 tune) Quarter 3 SINGLES (3 tunes)
480480	480481	480482	480483	480484	480485	480486	480487

POPULARITY METER

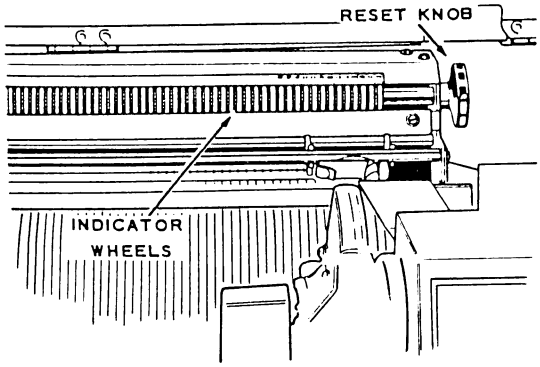


Figure 8.

The popularity meter is located behind the upper cabinet program holders and fluorescent light shield. It can be exposed by latching the program holders in the raised position and lifting the fluorescent light shield *(See Figure 8).* The meter consists of separate indicator wheels, individually calibrated from 0 to 40. The wheels indicate the number of times each record has played.

POPULARITY METER RESET

The popularity meter reset knob is located at the right end of the popularity meter *(See Figure 8).* To reset the indicator wheels, turn the knob in a clockwise direction. Continue turning until all of the wheels indicate zero.

SELECTION COUNTER

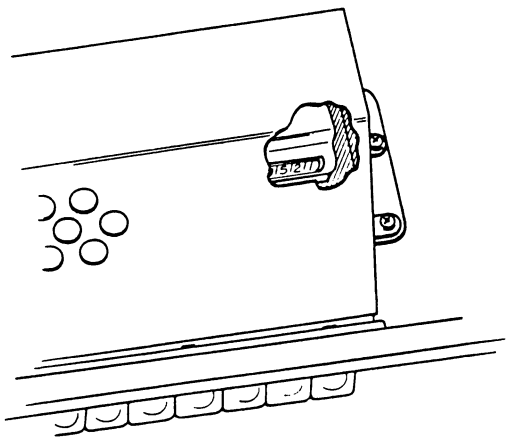


Figure 9.

A selection counter is built into the right side of the tormat electrical selector. The counter totals selections made from the electrical selector in the phonograph and Wall-O-Matics. The counter may be read by opening the glass lid.

AUDIO SYSTEM

The Select-O-Matic Audio System is of the "constant voltage" type: the amplifier output voltage does not change when the speaker load is varied. This means that the volume from any speaker in the system will not change noticeably when other speakers in the system are added or removed. Independent adjustment of volume at each speaker is possible; connections and speaker cable runs are simplified; and, within limits, impedance matching problems are eliminated.

The audio system delivers High Fidelity Audio power, which can be divided in various proportions between the phonograph and remote speakers. A terminal board is provided on the High Fidelity Master Amplifier for connection of high fidelity C. V. remote speakers.

AUDIO CONTROLS

The High Fidelity Master Amplifier is equipped with a keyed volume control which is accessible through a hole in the rear door. It is inoperative when a remote volume control is used.

For High Fidelity reproduction of recorded music, the original (live) balance between low frequencies (bass) and high frequencies (treble) must be maintained.

The acoustic (room) conditions in which a phonograph operates greatly affect the tonal balance. A room with plastered walls and ceiling, mirrors, and very little sound absorbing material, such as draperies, carpets, and upholstering, will sound shrill. By contrast, a room containing a large amount of sound absorbing

material, such as acoustic tile on the ceiling and walls, draperies, carpets on the floor, and upholstered booths, absorbs high frequencies, and the room will sound "bassy". Such unbalance of bass and treble can be corrected by setting bass and treble controls during a simple listening test on location.

The table at the bottom of the page gives approximate settings to serve as a guide. To achieve best results, listen to several records and adjust bass, treble, and Range Controls to obtain a natural balance, consistent with record quality.

An automatic volume compensator is a unit of the audio system. It compensates for the variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. Use of the feature is optional.

The AVC function can be checked or disabled by removing the 6BJ6 tube. This should cause the volume to rise sharply. Reinstallation of the tube should cause the volume to drop to normal as the tube elements warm up.

SELECT-O-MATIC PHONOGRAPH SPEAKERS

A crossover network, Model CN600-1, divides the audio output of the amplifier and feeds the low frequencies only into the two 12 inch heavy duty "woofers", and the wide range high frequencies to the two 8 inch high fidelity speakers. The latter are enclosed in an acoustical chamber designed to prevent intermodulation and provide excellent sound distribution pattern.

SPEAKER REQUIREMENTS

Except in small locations, adequate distribution of sound at uniform level thru-out the

LOCATION CONDITIONS	CONDITION OF RECORDS		
	NEW (Good Quality)	FAIR (Average)	POOR (Worn and having High Scratch)
ACOUSTICALLY LIVE . . . . Hard walls, ceiling and floor – little or no upholstery and draperies.	BASS 3-4 TREBLE- RANGE 4-5	BASS 3-4 TREBLE- RANGE 3-4	BASS 2-3 TREBLE- RANGE 1-2
AVERAGE ROOM . . . . Average amount of sound deadening material.	BASS 2-3 TREBLE- RANGE 5	BASS 2-3 TREBLE- RANGE 4	BASS 1-2 TREBLE- RANGE 3
ACOUSTICALLY DEAD . . . . Acoustic tile on ceiling and walls, heavy draperies and carpets, upholstered booths.	BASS 1-2 TREBLE- RANGE 6	BASS 1-2 TREBLE- RANGE 5-6	BASS 1 TREBLE- RANGE 4

Note 1: Room Size: In rooms smaller than average, reduce the Treble-Range by one number. In rooms larger than average, the Treble-Range may be increased by one number if no remote speakers are used.

Noise: The noise encountered in some locations (restaurants, etc.) has a masking effect on music, especially high frequencies. Final setting of tone controls should be made under normal noise conditions with a representative number of people present.

Automatic Vol. Comp. A.V.C., compensates for average loudness variations from record to record.

NOTE: GOOD QUALITY REPRODUCTION CANNOT BE OBTAINED WITH POOR QUALITY RECORDS OR WITH WORN STYLUSES. PLEASE REMEMBER – WORN STYLUSES WILL RUIN YOUR RECORDS.

service area can be obtained only by careful placement of a sufficient number of High Fidelity remote speakers.

REMOTE SPEAKERS

In order to preserve the high quality obtainable from the High Fidelity sound system, when remote speakers are to be used, the following types must be used:

A. Type HFCV1-12 Recessed Speaker (Grill type for wall or ceiling mounting 70-Volt Constant Voltage Type.)

B. Type HFCV2-8 Wall Speaker (Wood Cabinet-wall mounting 70-Volt Constant Voltage Type).

C. Type HFCV3-8 Corner Speaker (Wood Cabinet-ceiling, corner or floor mounting 70-Volt Constant Voltage Type.)

CONNECTION OF HIGH FIDELITY REMOTE SPEAKERS

Constant Voltage Type High Fidelity Speaker Terminals are marked A and B and are connected to matching terminals A and B on the Tormat Selection Receiver. The volume level (watts) may be set at each speaker to suit local requirements. A load of 25 watts can be carried by No. 24 wire *(Part No. 502090)* for CV line lengths up to 450 feet. *CAUTION: Do not connect low impedance (8 or 16 ohm) speakers to this phonograph.*

SELECT-O-MATIC SPEAKER SWITCH

Set the Select-O-Matic Speaker Switch on the front of the High Fidelity Master Amplifier to the position which gives the best balance between the Select-O-Matic Speakers and the remote speakers with a normal volume control setting. IF NO REMOTE SPEAKERS ARE USED, THE SWITCH MUST BE SET TO 20 WATTS.

The wattage requirements of all speakers combined must not exceed 25 watts. At no time should the total amplifier load be less than six watts or 25% of the rated amplifier load.

NOTE: If the wattage of all speakers (including the Select-O-Matic Speakers) to be connected to the High Fidelity Audio System, exceed 25 watts, a Seeburg power amplifier may be used to supply part of the load. Follow the instructions supplied with the amplifier for connecting speakers.

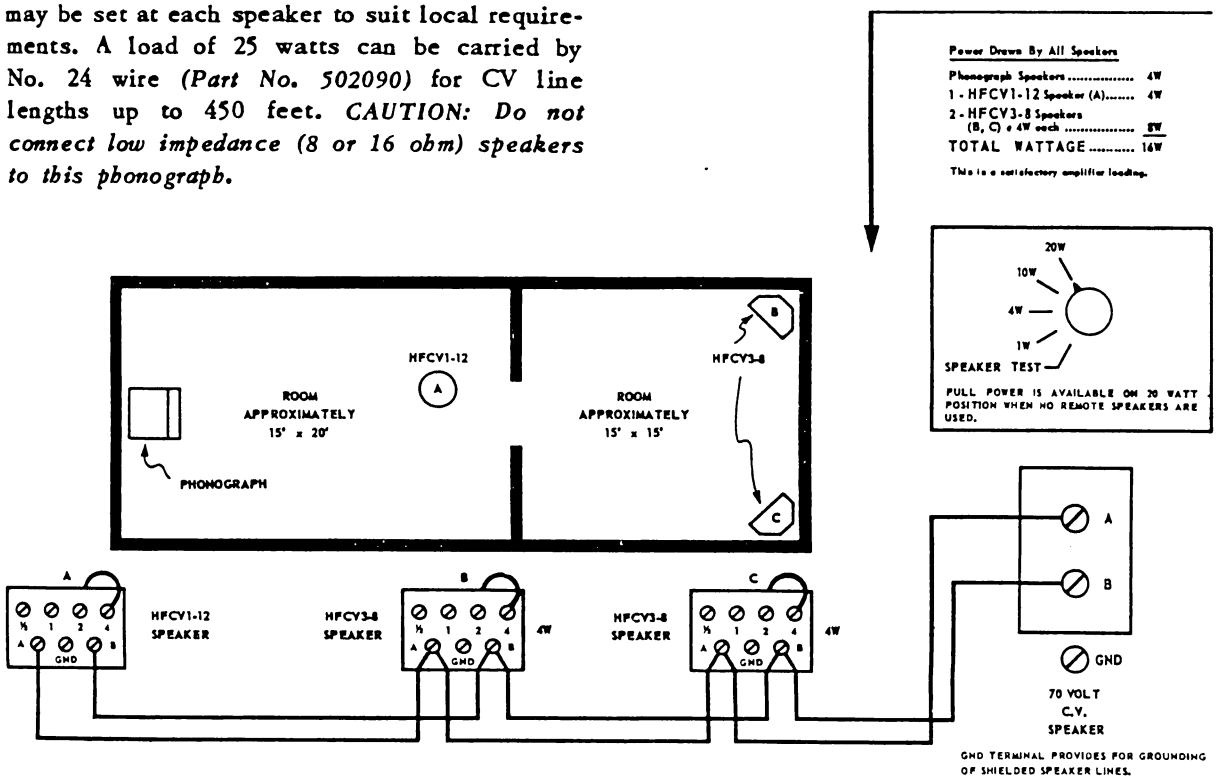


Figure 10.

WALL-O-MATIC
Types D-3WA, HD-3WA and S-3WA

The remote choice of 200 selections is made possible by the Wall-O-Matic which pulses the Tormat Selection Receiver to register selections on the Select-O-Matic "200" Mechanism. A sufficient number of these units should be used and placed to provide convenient selection from all parts of the location.

Wall-O-Matic Type D-3WA is to be used with Select-O-Matic Model 201D for dual pricing systems. Type HD-3WA is used with Model 201DH. Type S-3WA is used with Models 201S and 201SH for single pricing systems.

Power to operate up to six Wall-O-Matics is available from the Wall-O-Matic Power Supply Unit in the Select-O-Matic. When more than six Wall-O-Matics are used, additional power supplies Type PS6-1Z, are required. For each power supply that is added, six additional Wall-O-Matics may be used. The auxiliary power supply unit is to be installed on the cabinet floor in the area indicated. Should additional power supplies be required they may be placed on either side of the first unit.

The wiring of the Wall-O-Matics is facilitated by the use of special cable, Seeburg *Part No. 12015,* which is available in continuous lengths as required. Details of wiring and installing the Wall-O-Matic are included in the instruction folder shipped with each Wall-O-Matic.

Bar Bracket Assembly, Seeburg *Part No. 500200,* is available for rigidly mounting the Wall-O-Matic on bars, counters and tables.

MASTER REMOTE VOLUME CONTROL, Type MRVC-3 (Accessory)

The Master Remote Volume Control, Type MRVC-3 comes completely wired and ready for use. Although equipped with 60 feet of cable, inherent loss compensation permits as much as 100 feet with no appreciable loss in frequency response. Remove the 9-Prong dummy plug from the High Fidelity Master Amplifier and replace with the corresponding plug on the cable of the MRVC-3. Connect the two spade lugs of the cable to the number 2 and 3 terminals, respectively, of the remote record cancel terminal strip on the Tormat Selection Receiver. If it is desireable to deactivate the phonograph cancel button, open the jumper between terminals 1 and 2.

Dress the cable to the permanent position selected for the control unit.

MICROPHONE PREAMPLIFIER AND MIXER, Type TMPS-56 (Accessory)

The Transistorized Microphone Preamplifier and Mixer Kit, Type TMPS-56, may be used with the Select-O-Matic "200" on any installation requiring the transmission of voice or live music thru the Seeburg Sound Distribution System.

HIGH FIDELITY CONSTANT VOLTAGE SPEAKER CONTROLS, Types HF25LT-2, 10LT-1 AND 10LT-2 (Accessory)

These controls are designed for use with Constant Voltage Speaker lines. It can be used to control the power (in 3 db steps) to one or more High Fidelity Constant Voltage type speakers.

TESTING

After the installation has been completed, all units should be carefully tested to see that they perform properly. Make several selections from the Electrical Selector and from each Wall-O-Matic and see that the selections made have correctly registered on the Tormat Memory Unit. Check the quality of music, and note that music can be heard at a comfortable volume level in all parts of the service area. See that all cables are dressed into inconspicuous places to present a neat appearance and prevent mechanical damage to them.

GENERAL MAINTENANCE

RECORD CARE

To avoid accumulation of dust and dirt, keep oil off the records. Wipe your hands with a clean cloth before handling records, and always handle records by edge and center hole. Records that show signs of surface dust or dirt should be wiped with a slightly dampened cloth, using a circular motion. Use only water to dampen the cloth – solvents will damage the records. Records not in use should be stored on edge in a cool place. Avoid exposing the records to excessive heat. Records become overheated in a very short time if exposed to direct sunlight or if stored in a closed automobile or truck. Temperature above 120° F. should be avoided. *See instructions on "Placing the Select-O-Matic "200"."*

PICKUP STYLUSES

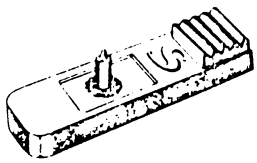


Figure 11. Armature Assembly

The styluses of the high fidelity magnetic pickups are permanently mounted in the removable armature assemblies. See *Figure 11.* The extremely low armature mass, high compliance, and low stylus force of this quality pickup greatly increases stylus life and record life. The armature assemblies furnished with the Seeburg magnetic pickup are tipped with sapphire which is excelled in hardness and wear resistance only by the diamond. When the armature assemblies are changed, all movable pickup parts are renewed and "new" pickup performance is completely assured. There is no need to replace the pickup; it is permanent because it has no moving parts.

STYLUS REPLACEMENT

In the presence of friction, wear of the stylus starts with the first play and continues until the stylus is replaced. The tone quality is good and distortion remains at a low figure for the first few thousand plays but gradually distortion increases until a disagreeable amount is noticed.

When only good vinylite 45 rpm records are used, armature assemblies with sapphire styluses should be changed every four or five thousand plays to maintain good reproduction. If, because of the presence of oil on the records, dust or dirt is permitted to accumulate and remain on the surface, the wear will be more rapid; economical operation will require more frequent armature assembly replacement.

If the Armature Assemblies are not replaced before objectionable distortion sets in, the records may be permanently damaged, and replacing the Styluses will not restore the original tone quality.

Because the cost of a pair of armature assemblies is only a small fraction of the cost of a set of records, it is economically sound to replace them on a regular schedule rather than on a hit-or miss basis. A schedule can be most easily determined from instrument income. The armature assemblies with sapphire styluses should be changed according to the following table if the records are arranged for approximately equal distribution of play between the right and left sides of the pickup:

Approximate Weekly Gross Receipts:	* Change Both Armature Assemblies Every
$25	8 months
$50	4 months
$75	3 months
$100	2 months
$150	6 weeks

* *Maximum stylus life*

The table is based on ten cents per selection and three to six thousand plays for each stylus. THE COST OF REPLACING ARMATURE ON THIS SCHEDULE IS LESS THAN ½ OF 1% OF GROSS INCOME.

DIAMOND STYLUSES

With the use of a diamond stylus, many times the above number of plays per replacement is assured. The long run economy more than outweighs the higher purchase price. Armature assemblies with diamond styluses that fit the Seeburg Magnetic Pickup are obtainable through your Seeburg Distributor.

TO REPLACE ARMATURE ASSEMBLIES

1. Make a selection to the right of magazine center and left side of a record (Example U8) to position carriage and pickup arm cradle for easiest access to styluses.
2. Remove worn styluses by placing thumb nail against plastic armature assembly just behind raised shoulder. Light pressure in the direction away from the stylus point will cause replaceable assembly to slide free of cartridge slot.
3. Install new armature assembly by laying it FLAT in open end of cartridge slot, and sliding forward in slot until it bottoms. Use thumb nail against plastic raised shoulder in reverse of Step 2 to complete travel when the assembly bottoms.

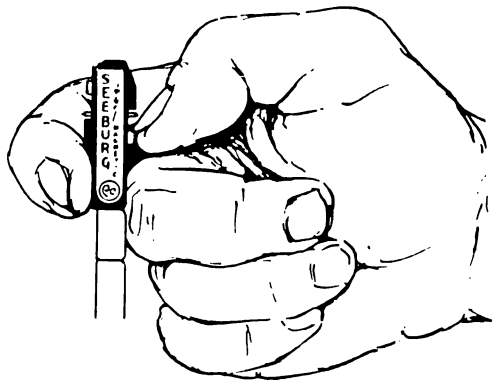


Figure 12. Removing Armature Assembly

In order to retain good quality reproduction, it is necessary to keep the pickup and styluses clean and in good condition.
CAUTION: The pickup and styluses must be handled carefully or the delicate armature suspension may be damaged.

When records are changed, or the equipment is cleaned the stylus well and the stylus brushes should be cleaned by using the small brush furnished for this purpose and mounted on the inside left wall of the cabinet.

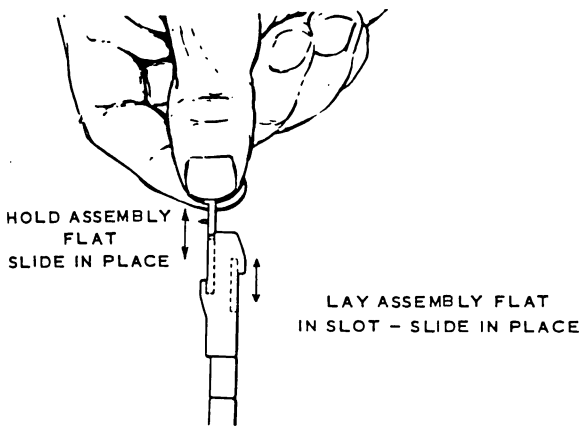


Figure 13. Installing New Armature Assembly

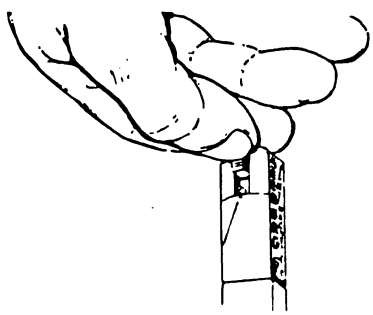


Figure 14. Installing New Armature Assembly

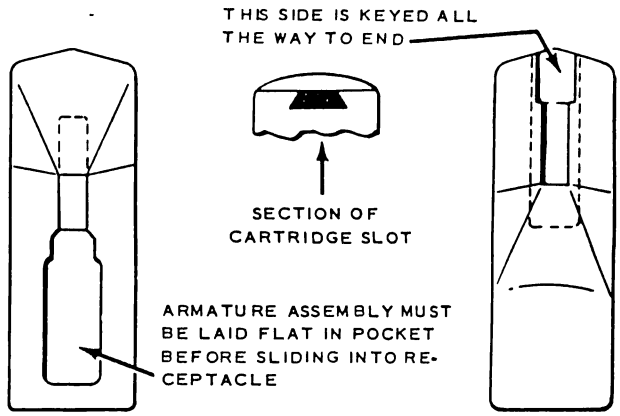


Figure 15. Keyed Fit of Armature Assembly

MECHANISM ACCESS

To expose front of the mechanism for "in the cabinet" servicing:

1. Open lid and select left record side selection (Example A 5) to locate pickup on left side.
2. Cover the pickup cartridge with the plastic protective case.
3. Remove the carriage cover as follows:
   a. Unscrew the two mounting screws: One is on the lower left hand side of the cover; the other is located on top.
   b. Lift up and move forward to remove carriage cover.

REAR ACCESS PANEL

To service rear of mechanism such as adjustment of Tormat Contact Block or clutch mechanism:

1. Open Rear Access Panel above phonograph rear door, *Figure 16*, in the following manner:
   a. Open rear compartment door.
   b. Remove ten screws securing access panel.
   c. Reach up and pull down on access panel release latch.
   d. Swing bottom of panel out and down. Remove from cabinet.

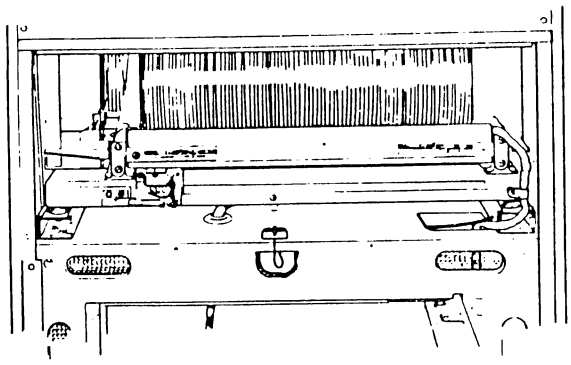


Figure 16.

2. Remove magazine filler by unscrewing (1), (2) and (3) and withdrawing entire section from the front of the record magazine, *Figure 17.*

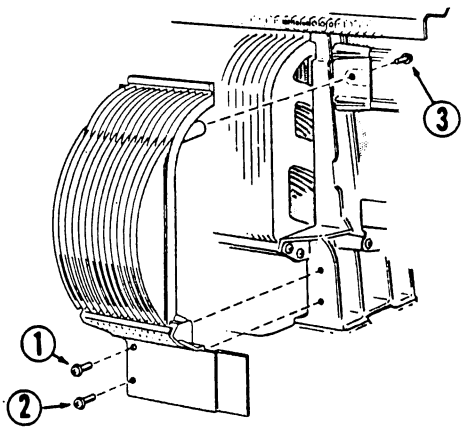


Figure 17.

3. Operate the service switch to position mechanism to the extreme right of its travel thus exposing the serviceable section to view.

COMPLETE REMOVAL OF MECHANISM

When it is necessary to remove the mechanism from the cabinet for servicing, proceed as follows:

1. Disconnect Mechanism and Tormat Selector Unit cables

2. Unlock mechanism frame by prying out and removing locking pins *Figure 19.*

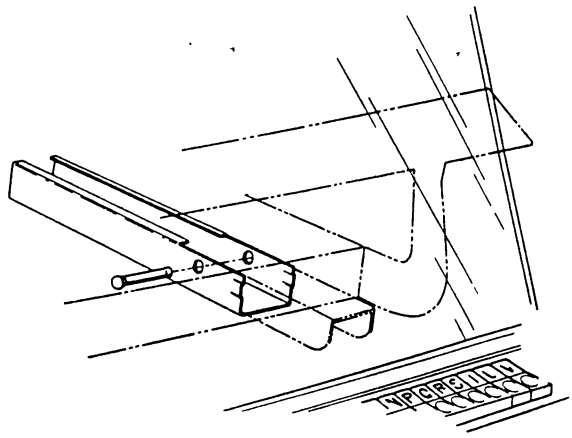


Figure 18.

3. Disconnect power and remove lower fluorescent tube.

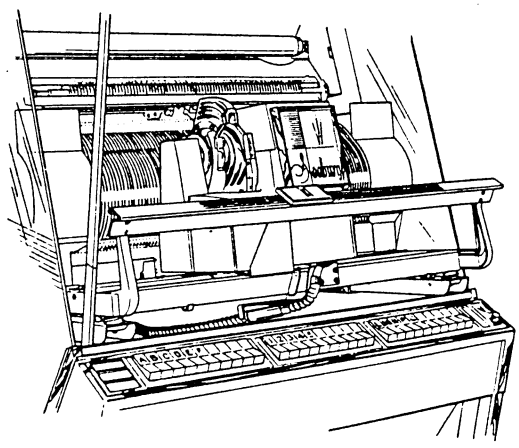


Figure 19.

4. Slide mechanism forward, clear of channel guides and lift out.

LUBRICATION

The mechanism and other mechanical parts should be lubricated periodically. The recommended lubricants are Seeburg Select-O-Matic Oil, *Part No. 53014,* and Aero Lubriplate, *Part No. 53006.*

Seeburg Select-O-Matic Oil is a light machine oil, especially suited for lubrication of small machinery operated normally in the "room temperature" range. It is free of waxy constituents, pours easily at low temperatures, and has exceptional anticorrosive properties.

Follow the complete lubrication instructions given on the lubrication chart in the envelope on the inside wall of the phonograph.

LAMP REPLACEMENT

Upper Cabinet Lamp

The upper cabinet lamp illuminates the upper program holders. It is a 25-watt, 33-inch cool white fluorescent tube which is accessible for replacement when the program holder frame is latched in the raised position *(See Figure 20).*

Lower Cabinet Lamp

This is a 25-watt (33-inch) cool white fluorescent lamp with associated starter. It illuminates the lower program holders and front of the cabinet, and is accessible when the lid is open.

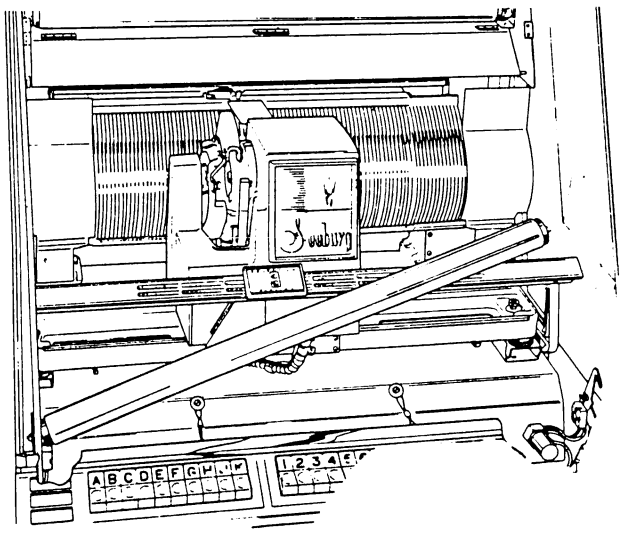


Figure 20.

Credit Lamps

Three credit lamp socket assemblies using No. 55 bulbs are cabled on the right hand side of the Tormat Electrical Selector. The sockets are appropriately labeled for their location in the credit window. WHEN SERVICING MAKE SURE THAT SOCKETS ARE CORRECTLY ORIENTED. Misplacement will falsify credit indications.

Grill Ornament Lamps

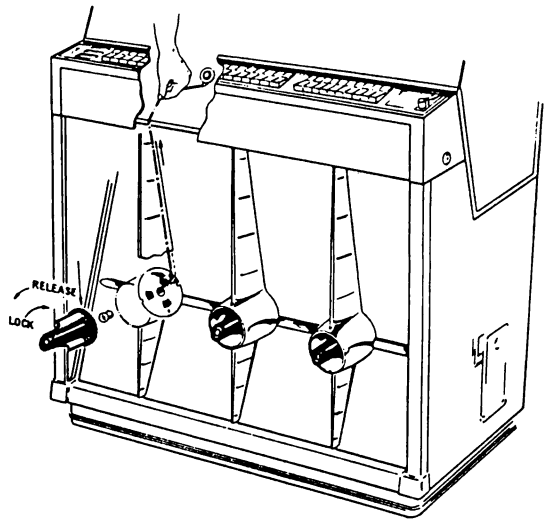


Figure 21.

Three grill ornaments are illuminated by No. 55 lamps which may be replaced as shown in *Figure 21.* Cable releases are provided which when pulled upward permit removal of the ornament by rotating it counter clockwise and pulling straight out. Lamp sockets are then easily accessible.

APPEARANCE

To maintain good appearance of the phonograph, and thus keep customer appeal at its maximum level, the various pieces of glass should be kept clean: lid glass, side glasses, etc.

Use only clear liquid cleaners, as types containing powder can impair reliability of electrical contacts, and cause excessive wear of records, styluses, and mechanism bearings.

Interior trim and all chrome plated parts also should be cleaned occasionally. These parts include Key Panel Frame and plated parts in the mechanism compartment.

CABINET SIDE GLASS

The cabinet side glass can be removed to facilitate cleaning the rear mechanism compartment *(Figure 22)* or to replace damaged glass.

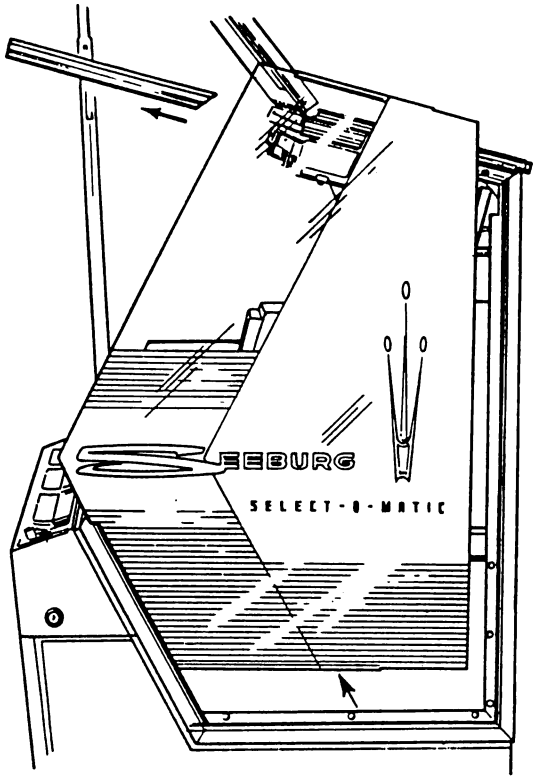


Figure 22.

PREPARING INSTRUMENT FOR MOVING

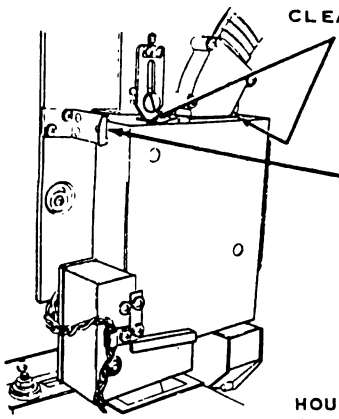
1. Put the two 1/4 inch wood shims under the base at the mechanism hold-down bolts.
2. Tighten four mechanism hold-down nuts.
3. Remove all records from magazine.
4. With the pickup arm in left hand side playing position, scan mechanism to a point at selections A-1, B-2.
5. Place protective tube over pickup cartridge and install pickup arm shipping support.
6. Put two fibre pads (a long pad in the rear and a short pad in the front) under the carriage wheels and bolt the carriage to the base by means of two 4½ inch long thumb screws, which are to be inserted thru mechanism base.

TO SHIP

If the instrument is to be shipped by way of a transportation company, it should be blocked and crated in the same manner in which it was received from the factory.

SLUG REJECTOR

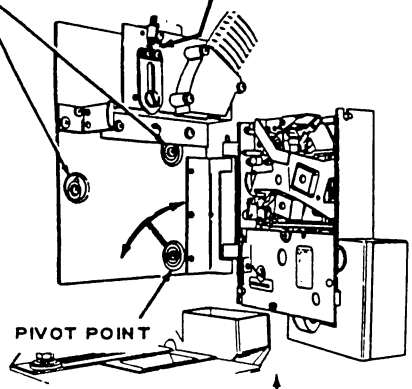
5¢, 10¢, 25¢



TO OPEN: RELEASE THIS CATCH AND SWING OUT

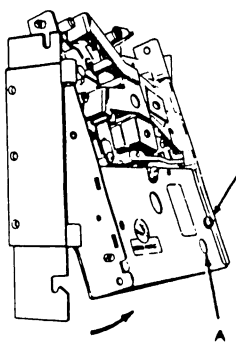
HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.

TO LEVEL: LOOSEN THESE (2) SCREWS AND SWING FRAME TOWARD FRONT OR REAR.



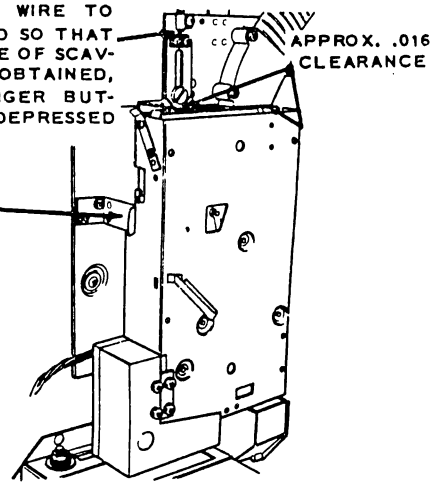
SLUG REJECTOR AND FRAME ASSEMBLY MAY BE LIFTED UP AND OFF FOR EXAMINATION OR SERVICE.

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

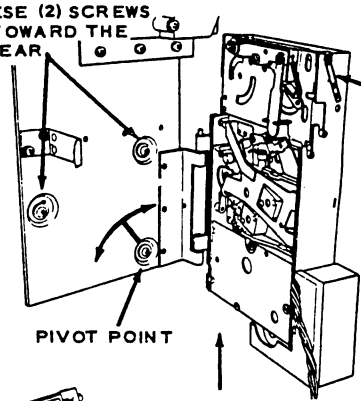


5¢, 10¢, 25¢, 50¢

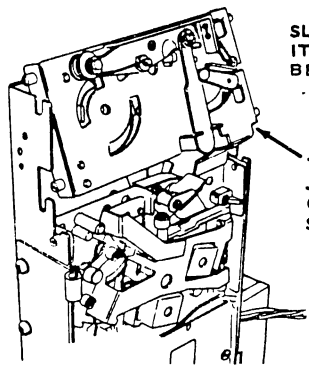
HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.



TO LEVEL SLUG REJECTOR: LOOSEN THESE (2) SCREWS AND SWING TOWARD THE FRONT OR REAR.

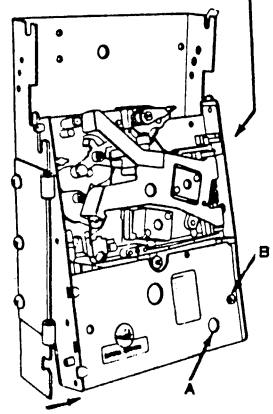


SLUG REJECTOR AND ITS FRAME MAY NOW BE LIFTED UP AND OFF.



TO REMOVE SLUG REJECTOR: RELEASE THIS CATCH THEN LIFT 50¢ SECTION UP AND OUT

NEXT, LIFT 5¢, 10¢ & 25¢ SECTION UP AND SWING OUTWARD

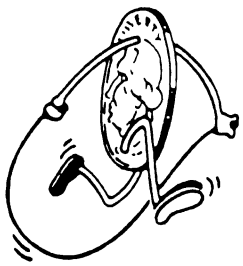


WHEN SLUG REJECTOR IS EQUIPPED WITH FLIPPER, NORMAL OPERATION REQUIRES SHORT SCREW AT "A" AND LONG SCREW AT "B".

TO LOCK OUT FLIPPER INTERCHANGE SCREWS WITH FLIPPER IN MAXIMUM COUNTER-CLOCKWISE POSITION.

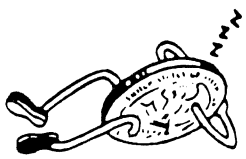
Figure 23.

TROUBLE SHOOTING



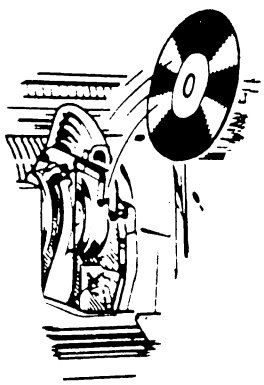
Coins do not work right –

"Credit" lamps do not light when money is deposited.



No Sound –

Poor Sound –



Incorrect record cycling.

Phonograph is dead. (Lights are out – nothing operates)

TROUBLE SHOOTING CHARTS

45 RPM

SELECT-O-MATIC

Models 101-161-201-220-222

INDEX

Trouble Shooting Chart – Coins and Credits 1 - 2 101, 161 and 201 22 and 222

SERVICE CALL	EFFECT	CAUSE	CORRECTION
1. Rejects coins.	Coins sometimes fail to go through to cash box.	(a) Dirt or foreign matter in rejector.	Clean rejector.
		(b) Incorrect adjustments in rejector.	Adjust rejector.
		(c) Bind in scavenger cable keeping rejector gates open.	Remove, straighten, and lubricate scavenger wire.
2. Coins drop through to cash box. Unable to select. "Select" light fails to come on.	Coins occasionally drop through to cash box without establishing credits.	(a) Incorrect alignment of rejector and coin switch levers. Coins drop between levers.	Seat rejector fully into mounting frame. Align switch levers.
		(b) Dirty or incorrectly adjusted coin switches.	Clean and/or adjust coin switches.
	SINGLE PRICING UNIT	(c) Excessive spring pressure or poor contact on one of six credit switches.	Replace U-shaped spring or entire credit switch assembly.
	SINGLE PRICING UNIT	(d) Bind in credit solenoid plunger or gummed plunger.	Remove, clean and polish credit solenoid plungers. Clean solenoid coil sleeve.
	DUAL PRICING UNIT	(e) Bind in credit solenoid linkage or pawl.	Clean and lubricate linkage and pawl.
	DUAL PRICING UNIT	(f) One add solenoid or subtract solenoid pawl hanging on credit wheel.	Check for insufficient overtravel of all solenoids.
	All coins fail to turn on credit light and energize latch bar solenoid.	(g) Coin switch plug not seated in socket.	Replace plug and seat firmly in socket.
		(h) "Y" contacts of timing relay not closing.	Clean and adjust contacts.
		(i) Timing relay continuously energized by partially depressed button or mechanical binds in Electrical Selector keeping Hold Switch closed.	Release button and/or correct cause of bind.
		(j) Timing relay continuously energized by incorrectly adjusted Hold Switch in Electrical Selector.	Adjust switch for 1/32" gap (when buttons are released.)
(Continued)	*(Continued)*		

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 2. Coins drop through to cash box. Unable to select. "Select" light fails to come on.	*(Continued)* All coins fail to turn on credit light and energize latch bar solenoid.	(k) Open circuit wiring or bad solder connection in credit circuit.	Check wiring and connections. See diagram – In Service Manual.
	SINGLE PRICING UNIT	(l) Timing relay continuously energized by "W" contact in pricing unit.	Clear bind in cancel plunger linkage and/or adjust "W" contacts.
	SINGLE PRICING UNIT	(m) Open circuit at wiper contact and collector ring of credit switch assembly.	Clean and adjust contact and collector ring.
	SINGLE PRICING UNIT	(n) Open circuit at ground connection (bearing) of credit switch assembly.	Clean, lubricate bearing with graphite.
	SINGLE PRICING UNIT	(o) Credit switch assembly binds and stops with switches out of line with credit plungers.	Check mechanical adjustments of credit and cancel unit. Check for binds and worn parts.
	DUAL PRICING UNIT	(p) Timing relay continuously energized by "H" or "C" contact in pricing unit.	Adjust contacts.
	DUAL PRICING UNIT	(q) Open circuit through credit wheel in pricing unit.	Adjust wiper contacts.
	DUAL PRICING UNIT	(r) Credit wheel jammed at no credit position.	Locate cause and repair. See service manual for adjustments.
	Only one type of coin fails to establish credits - others work every time.	*See 2 (a), (b), (d), (e) and (k) Above. . . . . .*	
	Only one type of coin fails to establish credits - others work every time.	(s) Open credit solenoid.	Replace solenoid.
	Only one type of coin fails to establish credits - others work every time.	(t) Shorted condenser across credit solenoid.	Replace condenser. See schematic in service manual.
3. Free credits. *(Continued)*	Continuous free credits. Select light stays on. *(Continued)*	(a) Coin hangs on coin switch.	Adjust and check coin switch.
		(b) Coin hangs at bottom of rejector, keeps coin switch closed.	Check coin exits of rejector with new coins. Remove burrs or obstruction causing coins to hang.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 3. Free credits.	*(Continued)* Continuous free credits. Select light stays on.	(c) Coin switch incorrectly adjusted, - contacts stay closed.	Adjust and check contact gaps and pressures.
	SINGLE PRICING UNIT	(d) Credit switch fails to reset.	Adjust reset bracket in credit and cancel unit so it resets all credit switches.
	DUAL PRICING UNIT	(e) Subtract solenoid pawl not engaging credit wheel.	Locate cause and repair. Refer to service manual for adjustment.
	Able to select by pressing number and letter buttons.	(f) Pricing tab in stepper in wrong position.	Set tab to proper position.
4. Too many credits for coins deposited.	SINGLE PRICING UNIT	(a) Reset pawl occasionally fails to engage next ratchet tooth of credit switch assembly.	Adjust cancel solenoid position and pawl arm stop for correct pawl stroke.
		(b) Credit switches jump to ON position when cancel coil operates, - credit switch pressure too light.	Replace U - shaped spring in switch or entire credit switch assembly.
		(c) Credit switch occasionally fails to reset.	Adjust reset bracket in credit and cancel unit so it resets all credit switches.
		(d) Coin switches improperly adjusted. Switches "bounce".	Clean and adjust coin switches. Refer to service manual.
	DUAL PRICING UNIT 25¢ coin occasionally gives seven or more credits.	(e) Incorrect Add 6 Drive adjustments. Credit Wheel driven too far.	Adjust as shown in service manual. Check especially, - Coil Position adjustment and Pawl Stop adjustment.
	10¢ coin occasionally gives three or more credits.	(f) Incorrect Add 2 Drive adjustments. Credit Wheel driven too far.	Adjust as shown in service manual. Check especially, - Coil Position adjustment and Pawl Stop adjustment.
(Continued)	*(Continued)*		

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 4. Too many credits for coins deposited.	*(Continued)* 5¢ coin occasionally gives two or more credits.	(g) Incorrect Add 1 Drive adjustments. Credit Wheel driven too far.	Adjust as shown in service manual. Check especially, - Coil Position adjustment and Pin Stop No. 2 adjustment.
DUAL PRICING UNIT	Add solenoids actually add proper number of credits but Subtract Solenoids occasionally fail to subtract enough credits for selections made.	(h) Incorrect adjustment of Subtract Solenoids or solenoid linkages, or, bind in pawl pivots.	Check Subtract Solenoid adjustments as shown in service manual and adjust as required. Check especially Drive Pin entry, Coil Position, and Pin Stop No. 2 adjustments. Check for binds in pawl pivots.
5. Not enough credits for coin deposited.	SINGLE PRICING UNIT	(a) "Machine gun" action, "S" contact blade vibrates when selection is made taking off additional credits.	Tighten screws holding switch stack. Adjust "S" contact roller blade for pressure against cam and adjust S, T and U contact gaps as shown in service manual.
		(b) Credit switch jumps to OFF position when cancel coil operates. Credit switch pressure too light.	Replace U - shaped spring in switch - or entire credit switch assembly.
DUAL PRICING UNIT	25¢ coin occasionally gives only five (or less) credits.	(c) Incorrect adjustment of Credit Wheel Stop, Detent, or Add 6 Drive.	Check adjustments of Credit Wheel Stop, Detent, and Add 6 Drive. Check especially Detent pressure Pawl Spring pressure, Drive Pin clearance, and Coil position. Make adjustments as required.
		(d) Incorrect adjustment of 25¢ coin switch.	Clean and adjust 25¢ coin switch.
	10¢ coin occasionally gives only one credit.	(e) Incorrect Add 2 Drive adjustment.	Adjust as shown in service manual.
		(f) Incorrect adjustment of 10¢ coin switch.	Clean and adjust 10¢ coin switch.
(Continued)	5¢ coin occasionally fails to establish credit. *(Continued)*	(g) Incorrect Add 1 Drive adjustment.	Adjust as shown in service manual.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 5. Not enough credits for coin deposited. DUAL PRICING UNIT	*(Continued)* 5¢ coin occasionally fails to establish credit.	(h) Incorrect adjustment of 5¢ coin switch.	Clean and adjust 5¢ coin switch.
	Add Solenoids actually add proper number of credits for coins deposited but Subtract Solenoids occasionally take off too many credits when selections are made.	(i) Incorrect adjustment of Subtract Solenoids or solenoid drives.	Check Subtract Solenoid adjustments and correct as required. Check especially Pin Stop No. 2 adjustments and Coil Position adjustments.
6. Occasionally fails to take off all credits. (See also (4h) above) DUAL PRICING UNIT	10¢ credit established then 10¢ selection is made. Occasionally fails to take off both credits, leaves 5¢ credit.	(a) Contacts F and G, in Dual Credit Unit, dirty or incorrectly adjusted.	Clean contacts and adjust.
		(b) Open circuit wiring associated with contacts F and G.	Check solder connections and wiring to contacts F and G.
	15¢ credit established then 15¢ selection is made. Occasionally fails to take off all three credits, - leaves 10¢ or 5¢ worth of credits.	(c) Contacts A and B, in Dual Credit Unit, dirty or incorrectly adjusted.	Clean contacts and adjust.
		(d) Open circuit wiring associated with contacts A and B.	Check solder connections and wiring to contacts A and B.
7. "Machine gun" action. Takes off all credits.	Takes off all credits when a letter and a number are held down at the same time.	(a) "Z" contacts in timing relay fail to make.	Clean and adjust "Z" contacts.
		(b) Defective wiring or solder connection in hold switch circuit.	Check complete hold switch circuit. See schematic in service manual.
8. Credit light does not light. *(Continued)*	Credit system works properly. *(Continued)*	(a) Credit bulb burned out.	Replace bulb.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 8. Credit light does not light.	*(Continued)* Credit system works properly.	(b) Pricing unit tab loose or in wrong position.	Replace tab properly.
		(c) Pricing unit credit light circuit open.	Check credit lamp circuit. See schematic in service manual.
9. Four credits for 50¢ all other coins work OK.	SPU 1-H	(a) Dirty or incorrectly adjusted switches in SPU 1-H.	Clean and adjust switches as shown in service manual.
	HDU and SPU-1	(b) Z contact of HDU-1 dirty or incorrectly adjusted.	Clean and adjust contacts as shown in service manual.
10. 50¢ fails to give any credits, other coins work OK.		(a) 50¢ coin switch dirty or incorrectly adjusted.	Clean and adjust 50¢ coin switch.
	HDU-1	(b) Dirty or incorrectly adjusted switches in HDU-1.	Clean and adjust all switches in HDU-1 as shown in service manual.
11. Free credits HDU-1 installed in phonograph (Also see 3 above).	HDU-1 Motor runs continuously.	(a) "U", "V", or "Z" contacts in HDU-1 fail to open.	Adjust contacts as shown in service manual.
12. Letter and number buttons stick in latched position.	Credit lamp is on.	(a) Stepper stuck in advanced position.	Free stepper. Lubricate and adjust as shown in service manual.
		(b) Stepper pricing unit tab loose or in wrong position.	Replace tab properly.
(Continued)	*(Continued)*	(c) Cancel start circuit open through stepper.	Clean and adjust contacts. See schematic in service manual.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 12. Letter and number buttons stick in latched position.	*(Continued)* Credit lamp is on.	(d) Cancel start circuit open in electric selector.	Check start circuit. See schematic in service manual.
	Credit lamp is off.	(a) Electric selector latch bar solenoid is residual.	Replace latch bar solenoid.
		(b) Electric selector latch bar mechanism binding.	Locate cause and repair.
13. Credit light on. Buttons fail to latch.	Selections can be made if letter and number buttons are pressed at the same time.	(a) Electric selector pricing tab loose or in wrong position.	Replace tab properly.
		(b) Electric selector latch bar mechanism binding.	Locate cause and repair.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
1. All selections "dead".	Carriage scans twice and stops without playing selected records.	Models 101, 161, 201 See Troubleshooting Procedure Pages 165-168 Models 22 and 222 See Troubleshooting Procedure Pages 169-172	
2. Plays all "singles" but occasionally (or always) fails to play "EP's"; (or, plays all "EP's" but fails on "singles").	Carriage plays all "singles" OK but when "EP" selection is made carriage oocasionally (or always) scans twice and stops without stopping to pick up EP selection.	(a) Write-in switch in pricing unit dirty or incorrectly adjusted.	Clean Write-in switches in pricing unit and adjust contact pressure as shown in service manual.
3. One selection fails to play; other 199 selections play OK.	Carriage scans twice and stops without stopping to pick up this selection.	(a) Dirty contact rivet on Tormat Memory Unit.	Use clean cloth and Carbon Tet. to clean contact rivets. DO NOT USE ABRASIVES.
	Stops OK for all other selections and plays them.	(b) Incorrect timing of Detent Switch, or, incorrect alignment of Tormat Memory Unit and Contact Plunger Block. (Sparking occurs on contact block plungers when carriage scans.)	Clean Detent Switch and adjust as shown in service manual. Check Tormat Memory Unit and Contact Plunger Block adjustments as shown in service manual.
		(c) Open read-out loop in Tormat Memory Unit. (Open circuit from contact rivet to contact bar.)	Check with ohmmeter from contact rivet to contact bar. If read-out loop is open, replace Tormat Memory Unit.
4. Plays only left sides of records or, plays only right sides of records.	Carriage does not stop to pick up any selected right sides of records (or vice versa); scans twice and stops. Plays all selected left sides OK.	(a) RS contacts (or LS) on Reversing switch dirty or incorrectly adjusted.	Clean Contacts and adjust.
		(b) Open circuit from RS contacts (or LS) of Reversing Switch to R (or L) contact on Contact Plunger Block. Check for broken pigtail wire on contact block.	Trace circuit and correct as required.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
5. Carriage "occasionally" scans twice and stops without playing any selected records.		(a) Intermittent failure of write-in, read-out, or trip.	If sparking occurs on contact block plungers see 3b above. Repeat each test of 1 above as many times as necessary to locate trouble. (Especially G, H, and J tests)
6. Carriage plays extra selection in letter or number series when a selection is made. EXAMPLE: (Several A selections play when any A selection is made)	Record rejects when selection is made.	(a) "N" or "R" contact of timing relay No. 2 not making good contact in rest position.	Clean and adjust contacts.
		(b) Electric selector or memory unit shorted to ground.	Locate short with ohmmeter and repair. See write in schematic in service manual. (Tests G, H, J, K, and L of 1 above may be used to locate trouble)
		(c) Stepper Plug Not Properly Seated In TSU (Models 22 and 222)	Seat Plug
7. Carriage plays all selections except one number series or one letter series.	Carriage scans twice and stops when defective series is selected.	(a) Electric selector switch or plug connection associated with defective letter or number is open.	Check circuit with ohmmeter and repair. See schematic in service manual.
8. Carriage plays every selection regardless which selection is made.		(a) Memory unit output plug is not properly seated in the pulse amplifier.	Seat plug so outer shell is making good contact.

SEEBURG

TORMAT SELECTION SYSTEM TROUBLESHOOTING PROCEDURE
for
SELECT-O-MATIC MODELS 101, 161 and 201

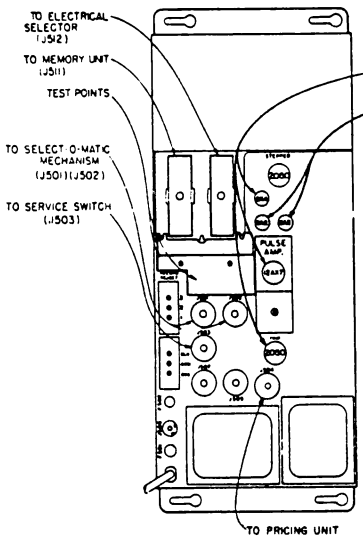
(NOTE) This procedure must be followed carefully without bypassing steps. Each test hinges on having conducted a previous test. This permits the procedure results to dictate the trouble remedy).

TROUBLE: Mechanism scans when selections are made but does not trip on ANY selected record.

TOOLS REQUIRED: 2 jumper wires, a Seeburg Test Lamp and a flashlight battery.

PROCEDURE: Open the back door and inspect the following:

– A TEST –



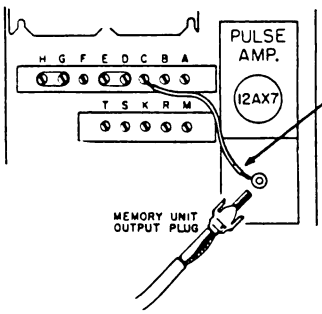
1. Check that all plugs are properly seated.
2. Check that all tubes are lighted.
3. Check for purple glow inside both OA2 tubes. *(no glow can be caused by a weak 6X4 tube)*

IF A LOOSE PLUG OR BAD TUBE IS FOUND AND CORRECTED, CHECK NORMAL OPERATION OF THE PHONOGRAPH.

IF NO TROUBLE IS FOUND, ESTABLISH SEVERAL FREE CREDITS ON THE PHONOGRAPH AND PERFORM B TEST. *(Be sure the service switch is in the play position for all tests)*

(NOTE) After any trouble is located and repaired, remove jumpers, connect links to normal, replace all plugs and check the phonograph for normal operation)

– B TEST –

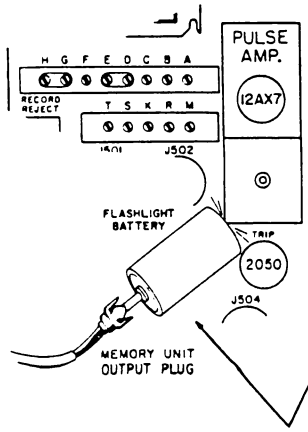


1. Remove cover from the test terminals.
2. Remove the memory unit output plug from the pulse amplifier.
3. Connect one end of a jumper wire to "C", leaving other end free.
4. Make any selection and while mechanism is scanning, momentarily connect the free end of the jumper wire to the input of the pulse amplifier. *(Make connection down inside socket)* Mechanism should immediately trip.

IF MECHANISM TRIPS Reject record, allow mechanism to scan to stop. PERFORM C TEST..

IF MECHANISM DOES NOT TRIP Use M TEST to pinpoint trouble.

– C TEST –

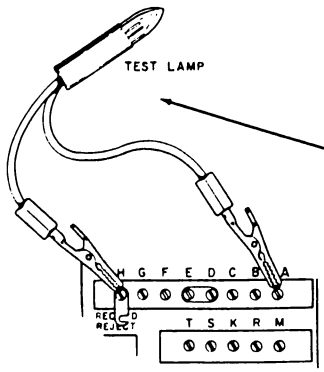


1. Remove jumper wire from "C".
2. Momentarily connect the tip of the memory unit output plug to the tip of a good flashlight battery with the case of the battery held against the corner of the pulse amplifier. *(This is the same as making all selections on the tormat)*
3. Replace memory unit output plug into pulse amplifier.
4. Make any selection. When selection is made, mechanism should immediately trip and play.
5. Reject record and note if next record plays. *(If desired, all records could be played)*

IF MECHANISM TRIPS ON AT LEAST TWO RECORDS Pull out memory unit output plug, reject record, allow mechanism to scan to stop and replace plug. Use G TEST to pinpoint trouble.

IF MECHANISM SCANS OR PLAYS ONLY ONE RECORD Use D TEST to pinpoint trouble.

– D TEST (READ OUT) –



(Be sure service switch is in play position for all tests)

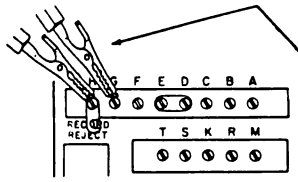
1. Remove mechanism access door on rear of cabinet.
2. Open link between "G & H". *(Turn off power while moving link)*
3. Connect the Seeburg Test Lamp between "H" and "A". Lamp should glow brightly. *(Be sure power is on)*

IF LAMP GLOWS BRIGHTLY PERFORM E TEST

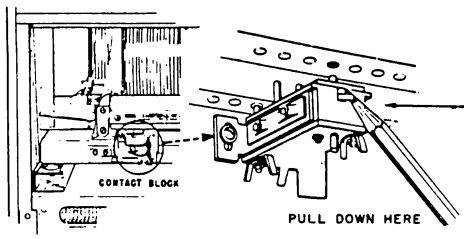
IF LAMP IS DIM OR DOES NOT LIGHT

1. Pull out service switch plug from selection receiver. If lamp now glows brightly, REPLACE OR REPAIR SERVICE SWITCH OR CABLE.

   If lamp does not light after service switch plug is pulled, REPLACE SELECTION RECEIVER. *(Read out circuit is defective)*



– E TEST (READ OUT) –



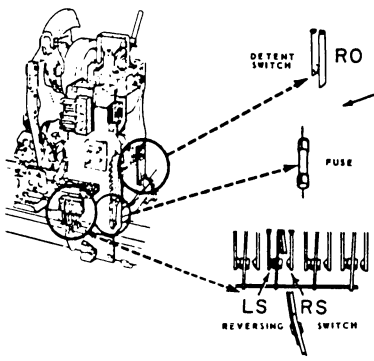
1. Connect the test lamp between "G" and "H".
2. Make any selection. As mechanism scans, lamp should flash at each record space.
3. As mechanism scans back away from A1, pull down on outside plunger of contact block. Lamp should go out while plunger is held down.

IF LAMP CONTINUES TO FLASH WHEN PLUNGER IS PULLED DOWN Check for short to ground in carriage RO circuit.

IF LAMP REMAINS STEADILY ON AS MECHANISM SCANS Check for short to ground from RO contact to plug.

IF LAMP IS DIM OR NOT LIGHTED AS MECHANISM SCANS Check for open fuse, sticky plungers, broken wires in carriage RO circuit.

IF LAMP FLASHES AT EACH RECORD SPACE AND GOES OUT WHILE PLUNGER IS HELD DOWN PERFORM F TEST.

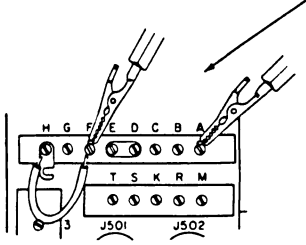


– F TEST (READ OUT) –

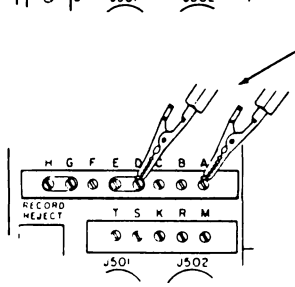
1. With "G" and "H" open, connect test lamp between "F" and "A".
2. Momentarily connect a jumper wire between "H" and "F". Lamp should flash when connection is made.

IF LAMP FLASHES — REPLACE TORMAT MEMORY UNIT (Defective output)

IF LAMP DOES NOT FLASH — REPLACE SELECTION RECEIVER (Defective read out electronics)



– G TEST (WRITE IN) –

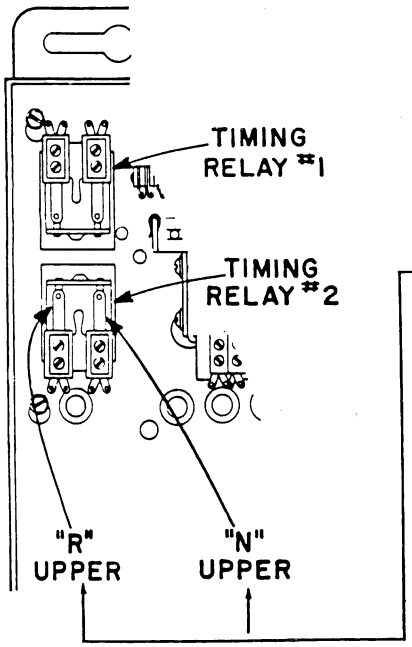


1. Connect a Seeburg Test Lamp between "D" and "A". Lam should not glow. If lamp glows, PERFORM J TEST.
2. While watching lamp, make any selection. Lamp should not flash.

IF LAMP FLASHES — PERFORM H TEST

IF LAMP DOES NOT FLASH — PERFORM J TEST

– H TEST (WRITE IN) –



1. Connect the test lamp between "K" and "A".
2. While watching lamp, make any selection.
   IF LAMP FLASHES — PERFORM TEST #1A BELOW
   IF LAMP DOES NOT FLASH — PERFORM TEST #1C BELOW

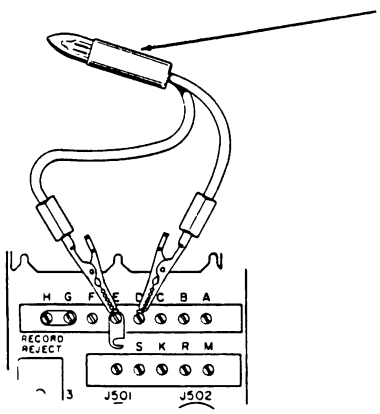
TEST #1A Connect test lamp between "R" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — PERFORM TEST #1B BELOW
IF LAMP DOES NOT FLASH — CLEAN "R" CONTACT-TIMING RELAY #2

TEST #1B Connect test lamp between "M" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES REPLACE TORMAT MEMORY UNIT (Open ground)
IF LAMP DOES NOT FLASH REPLACE ELECTRIC SELECTOR (Open circuit pin #31 or defective starting switch)

TEST #1C Connect test lamp between "S" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — REPLACE TORMAT MEMORY UNIT (Open circuit pin #31)
IF LAMP DOES NOT FLASH — PERFORM TEST #1D BELOW

TEST #1D Connect test lamp between "T" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — REPLACE ELECTRIC SELECTOR (Open circuit pin #32 or defective starting switch)
IF LAMP DOES NOT FLASH CLEAN "N CONTACT – TIMING RELAY #2.

– J TEST (WRITE IN) –



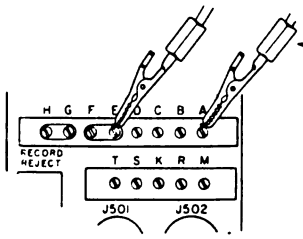
1. Open link between "D" and "E".
2. Connect test lamp between "D" and "E". Lamp should show a dim glow.
3. Pull out pricing unit plug from selection receiver while watching lamp. Lamp brilliance should not change. (Replace pricing unit plug)
   IF LAMP DIMS WHEN PRICING UNIT PLUG IS PULLED
   REPLACE PRICING UNIT (write in contacts shorted)

   IF LAMP REMAINS BRIGHT AFTER PULLING PRICING UNIT – PLUG REPLACE SELECTION RECEIVER (Either shorted diode or shorted "P" contact – timing relay #2)

   IF LAMP DOES NOT LIGHT REPLACE SELECTION RECEIVER (Defective write in electronics)

   IF LAMP GLOWS DIMLY AS IT SHOULD PERFORM K TEST.

– K TEST (WRITE IN) –



1. Connect link between "E" and "F".
2. Connect test lamp between "E" and "A".
3. While watching lamp, make any selection. Lamp should flash.

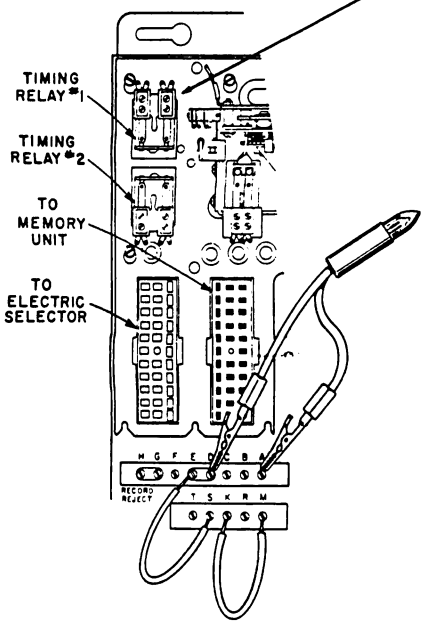
IF LAMP FLASHES PERFORM L TEST

IF LAMP DOES NOT FLASH

1. Press and release timing relay #1 while watching lamp.

IF LAMP FLASHES REPLACE PRICING UNIT (open write in contacts)

IF LAMP DOES NOT FLASH REPLACE SELECTION RECEIVER (Defective write in circuit)



– L TEST (WRITE IN) –

1. Remove electric selector 33 pin plug from selection receiver.
2. Connect link to "D" and "E". (Tighten screws)
3. Connect a jumper wire from "D" to "S".
4. Connect another jumper wire from "K" to "M".
5. Press and release timing relay #1. Mechanism should scan to selection V0 and play it. *****

IF SELECTION V0 PLAYS***** REPLACE ELECTRIC SELECTOR (Shorted to ground)

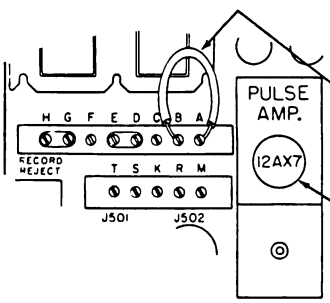
IF NO SELECTION PLAYS

1. Remove memory unit 33 pin plug from selection receiver.
2. With both jumper wires connected as above, connect test lamp between "E" and "A".
3. Press and release timing relay #1.

IF LAMP FLASHES REPLACE MEMORY UNIT (Shorted to ground)

IF LAMP DOES NOT FLASH REPLACE SELECTION RECEIVER (Write in wiring shorted)

*****MODEL 161 SELECTION V8 – MODEL 101 SELECTION K10



– M TEST (TRIP) –

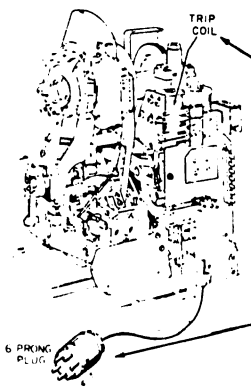
1. Remove jumper wire from "C" and connect to "A".
2. Make any selection. While mechanism is scanning, momentarily connect free end of jumper wire to "B". Mechanism should trip.

IF MECHANISM TRIPS

1. Install new 12AX7 tube in pulse amplifier.
2. Replace memory unit output plug into pulse amplifier and check normal operation of the phonograph.
3. If phonograph does not select, REPLACE SELECTION RECEIVER. (Pulse amplifier or circuit defective)

IF MECHANISM DOES NOT TRIP

1. Install new 2050 tube in selection receiver.
2. Repeat trip test. If mechanism does not now trip, check mechanism trip coil and circuit.



SEEBURG

TORMAT SELECTION SYSTEM TROUBLESHOOTING PROCEDURE for SELECT-O-MATIC MODELS 22 and 222

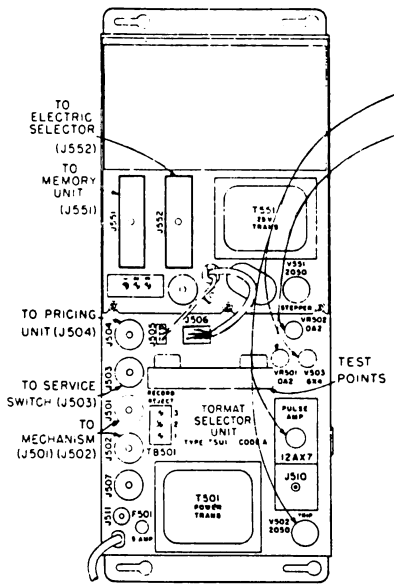
(NOTE) This procedure must be followed carefully without bypassing steps. Each test hinges on having conducted a previous test. This permits the procedure results to dictate the trouble remedy).

TROUBLE: Mechanism scans when selections are made but does not trip on ANY selected record.

TOOLS REQUIRED: 2 jumper wires, a Seeburg Test Lamp and a flashlight battery.

PROCEDURE: Open the back door and inspect the following:

– A TEST –



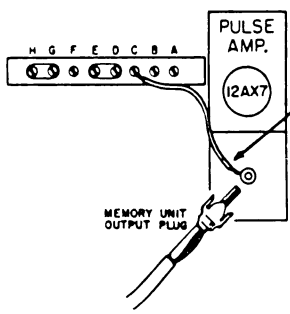
1. Check that all plugs are properly seated.
2. Check that all tubes are lighted.
3. Check for purple glow inside both OA2 tubes. *(no glow can be caused by a weak 6X4 tube)*

   IF A LOOSE PLUG OR BAD TUBE IS FOUND AND CORRECTED, CHECK NORMAL OPERATION OF THE PHONOGRAPH.

   IF NO TROUBLE IS FOUND, ESTABLISH SEVERAL FREE CREDITS ON THE PHONOGRAPH AND PERFORM B TEST. *(Be sure the service switch is in the play position for all tests)*

(NOTE) After any trouble is located and repaired, remove jumpers, connect links to normal, replace all plugs and check the phonograph for normal operation)

– B TEST –

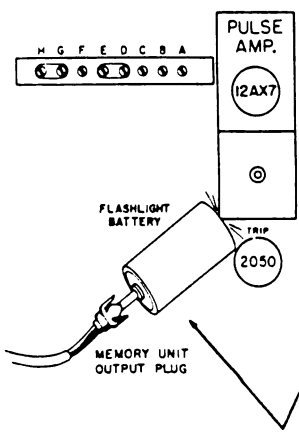


1. Remove cover from the test terminals.
2. Remove the memory unit output plug from the pulse amplifier.
3. Connect one end of a jumper wire to "C", leaving other end free.
4. Make any selection and while mechanism is scanning, momentarily connect the free end of the jumper wire to the input of the pulse amplifier. *(Make connection down inside socket)* Mechanism should immediately trip.

   IF MECHANISM TRIPS Reject record, allow mechanism to scan to stop. PERFORM C TEST..

   IF MECHANISM DOES NOT TRIP Use M TEST to pinpoint trouble.

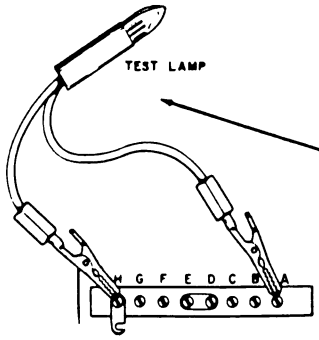
– C TEST –



1. Remove jumper wire from "C".
2. Momentarily connect the tip of the memory unit output plug to the tip of a good flashlight battery with the case of the battery held against the corner of the pulse amplifier. *(This is the same as making all selections on the tormat)*
3. Replace memory unit output plug into pulse amplifier.
4. Make any selection. When selection is made, mechanism should immediately trip and play.
5. Reject record and note if next record plays. *(If desired, all records could be played)*

   IF MECHANISM TRIPS ON AT LEAST TWO RECORDS Pull out memory unit output plug, reject record, allow mechanism to scan to stop and replace plug. Use G TEST to pinpoint trouble.

   IF MECHANISM SCANS OR PLAYS ONLY ONE RECORD Use D TEST to pinpoint trouble.



– D TEST (READ OUT) –

(Be sure service switch is in play position for all tests)

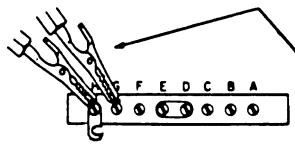
1. Remove mechanism access door on rear of cabinet.
2. Open link between "G & H". *(Turn off power while moving link)*
3. Connect the Seeburg Test Lamp between "H" and "A". Lamp should glow brightly. *(Be sure power is on)*

IF LAMP GLOWS BRIGHTLY PERFORM E TEST

IF LAMP IS DIM OR DOES NOT LIGHT

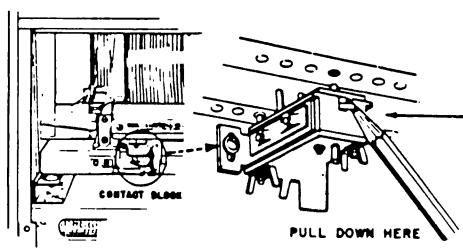
1. Pull out service switch plug from selection unit. If lamp now glows brightly, REPLACE OR REPAIR SERVICE SWITCH OR CABLE.

   If lamp does not light after service switch plug is pulled, REPLACE SELECTION UNIT. *(Read out circuit is defective)*



– E TEST (READ OUT) –

1. Connect the test lamp between "G" and "H".
2. Make any selection. As mechanism scans, lamp should flash at each record space.
3. As mechanism scans back away from A1, pull down on outside plunger of contact block. Lamp should go out while plunger is held down.

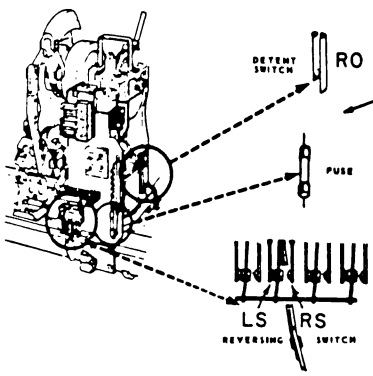


IF LAMP CONTINUES TO FLASH WHEN PLUNGER IS PULLED DOWN Check for short to ground in carriage RO circuit.

IF LAMP REMAINS STEADILY ON AS MECHANISM SCANS Check for short to ground from RO contact to plug.

IF LAMP IS DIM OR NOT LIGHTED AS MECHANISM SCANS Check for open fuse, sticky plungers, broken wires in carriage RO circuit.

IF LAMP FLASHES AT EACH RECORD SPACE AND GOES OUT WHILE PLUNGER IS HELD DOWN PERFORM F TEST.

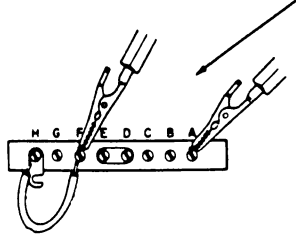


– F TEST (READ OUT) –

1. With "G" and "H" open, connect test lamp between "F" and "A".
2. Momentarily connect a jumper wire between "H" and "F". Lamp should flash when connection is made.

IF LAMP FLASHES — REPLACE TORMAT MEMORY UNIT (Defective output)

IF LAMP DOES NOT FLASH — REPLACE SELECTION UNIT. (Defective read out electronics)

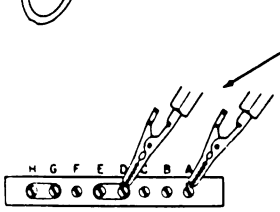


– G TEST (WRITE IN) –

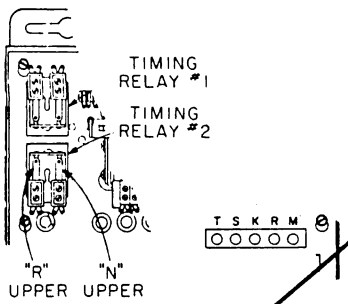
1. Connect a Seeburg Test Lamp between "D" and "A". Lamp should not glow. If lamp glows, PERFORM J TEST.
2. While watching lamp, make any selection. Lamp should not flash.

IF LAMP FLASHES — PERFORM H TEST

IF LAMP DOES NOT FLASH — PERFORM J TEST



– H TEST (WRITE IN) –



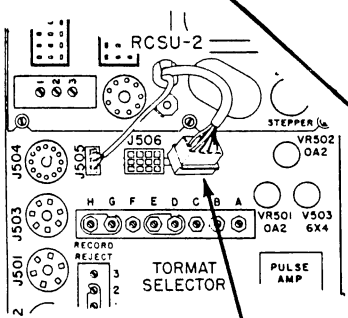
1. Connect the test lamp between "K" and "A".
2. While watching lamp, make any selection.
   IF LAMP FLASHES — PERFORM TEST #1A BELOW
   IF LAMP DOES NOT FLASH — PERFORM TEST #1C BELOW

TEST #1A Connect test lamp between "R" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — PERFORM TEST #1B BELOW
IF LAMP DOES NOT FLASH — CLEAN "R" CONTACT-TIMING RELAY #2

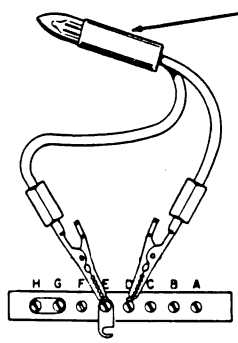
TEST #1B Connect test lamp between "M" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES REPLACE TORMAT MEMORY UNIT (Open ground)
IF LAMP DOES NOT FLASH REPLACE ELECTRIC SELECTOR (Open circuit pin #31 or defective starting switch)

TEST #1C Connect test lamp between "S" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — REPLACE TORMAT MEMORY UNIT (Open circuit pin #31)
IF LAMP DOES NOT FLASH — PERFORM TEST #1D BELOW

TEST #1D Connect test lamp between "T" and "A".
Make any selection while watching lamp.
IF LAMP FLASHES — REPLACE ELECTRIC SELECTOR (Open circuit pin #32 or defective starting switch)
IF LAMP DOES NOT FLASH CLEAN "N CONTACT – TIMING RELAY #2.



– J TEST (WRITE IN) –

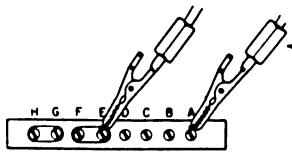


1. Open link between "D" and "E".
2. Connect test lamp between "D" and "E". Lamp should show a dim glow.
3. Pull out pricing unit plug from selection unit while watching lamp. Lamp brilliance should not change. *(Replace pricing unit plug)*
   IF LAMP DIMS WHEN PRICING UNIT PLUG IS PULLED REPLACE PRICING UNIT (write in contacts shorted)

   IF LAMP REMAINS BRIGHT AFTER PULLING PRICING UNIT PLUG
   1. Pull out stepper plug from selection unit. If lamp dims, check for shorted P contact.
   2. If lamp does not dim when stepper plug is pulled, replace selection unit. (Shorted diode)

IF LAMP DOES NOT LIGHT REPLACE SELECTION UNIT (Defective write-in electronics)
IF LAMP GLOWS DIMLY AS IT SHOULD PERFORM K TEST.

– K TEST (WRITE IN) –



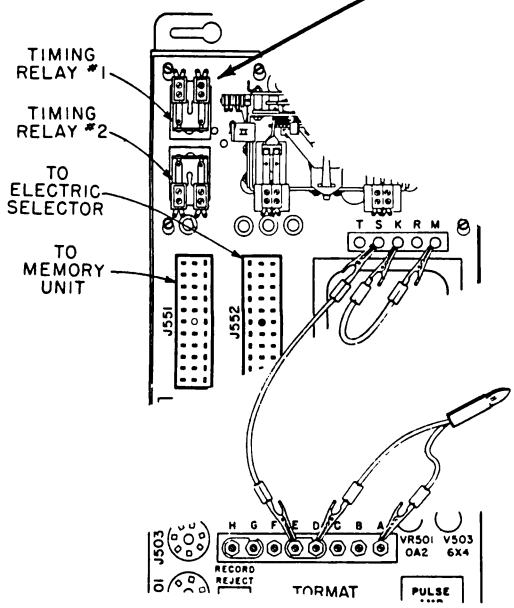
1. Connect link between "E" and "F".
2. Connect test lamp between "E" and "A".
3. While watching lamp, make any selection. Lamp should flash.

IF LAMP FLASHES PERFORM L TEST
IF LAMP DOES NOT FLASH

1. Press and release timing relay #1 while watching lamp.

IF LAMP FLASHES REPLACE PRICING UNIT (open write in contacts)

IF LAMP DOES NOT FLASH REPLACE SELECTION UNIT (Defective write in circuit)



– L TEST (WRITE IN) –

1. Remove electric selector 33 pin plug from RCSU2.
2. Connect link to "D" and "E". (Tighten screws)
3. Connect a jumper wire from "D" to "S".
4. Connect another jumper wire from "K" to "M".
5. Press and release timing relay #1. Mechanism should scan to selection V 8 and play it. *****

IF SELECTION V8 PLAYS***** REPLACE ELECTRIC SELECTOR (Shorted to ground)

IF NO SELECTION PLAYS

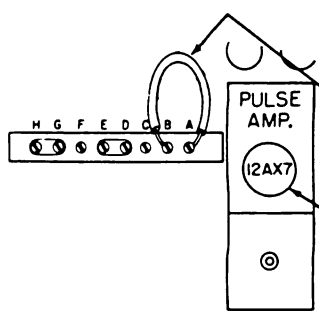
1. Remove memory unit 33 pin plug from selection receiver.
2. With both jumper wires connected as above, connect test lamp between "E" and "A".
3. Press and release timing relay #1.

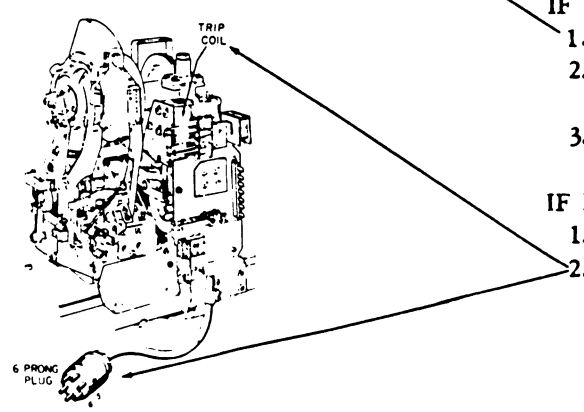
IF LAMP FLASHES REPLACE MEMORY UNIT (Shorted to ground)

IF LAMP DOES NOT FLASH REPLACE SELECTION UNIT (Write in wiring shorted)

***** MODEL 22 SELECTION K10

– M TEST (TRIP) –





1. Remove jumper wire from "C" and connect to "A".
2. Make any selection. While mechanism is scanning, momentarily connect free end of jumper wire to "B". Mechanism should trip.

IF MECHANISM TRIPS

1. Install new 12AX7 tube in pulse amplifier.
2. Replace memory unit output plug into pulse amplifier and check normal operation of the phonograph.
3. If phonograph does not select, REPLACE SELECTION UNIT (Pulse amplifier or circuit defective)

IF MECHANISM DOES NOT TRIP

1. Install new 2050 tube in selection unit.
2. Repeat trip test. If mechanism does not now trip, check mechanism trip coil and circuit.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
1. Motor fails to run.	Play Control Switch is closed but motor does not run.	(a) Play Control Switch contacts not making.	Clean and adjust contacts.
		(b) Reversing Switch contacts not making.	Clean and adjust G, H, J, and K contacts.
		(c) Faulty Reversing Switch.	Repair or replace. Adjust switch and brackets as shown in service manual.
		(d) "O" contacts not making. (Motor runs if started by hand.)	Clean and adjust "O" contacts.
		(e) Defective motor condenser.	Replace condenser.
		(f) Broken motor coupling or loose set screws. (Motor runs but does not drive mechanism.)	Replace coupling or tighten screws as required.
		(g) Bind in motor.	Remove bind and lubricate bearings or replace motor as required.
		(h) Bind in mechanism. Check by carefully turning motor shaft. DO NOT FORCE AND DO NOT TURN FLYWHEEL BY HAND.	Check for foreign matter that may have fallen into mechanism. Check for normal clearances and lubrication of gears, cams, shafts, etc.
		(i) Open motor winding.	Repair or replace motor.
		(j) Open wiring or solder connection in motor circuit.	Check motor circuit and repair. See schematic in service manual.
	Motor fails to run because Play Control does not operate when selections are made.	(k) Service Switch lever in OFF position.	Move to PLAY position.
		(l) Play Control Add Solenoid fails to operate due to failure of D or I contacts in pricing unit.	Clean and adjust D or I contacts in pricing unit.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued)	*(Continued)*		
1. Motor fails to run.	Motor fails to run because Play Control does not operate when selections are made.	(m) Play Control Add Solenoid operates OK but contacts fail to close.	Clean contacts or make correct adjustments.
2. Carriage occasionally (or always) scans *only once* instead of twice when selection is made.	Scans once and stops. Occasionally fails to play all selections made then plays "left over" selections when another selection is made.	(a) Sticking Play Control pawls.	Check pawls for possible binds.
		(b) Scan subtract switch on carriage making poor contact.	Clean and adjust contacts.
3. Carriage scans continuously.	Plays selections OK but never stops scanning.	(a) Play Control contacts staying closed due to incorrect adjustment, or, ratchet sticking.	Adjust contacts. Clean and lubricate ratchet.
		(b) Scan subtract switch on carriage not closing.	Clean and adjust contacts.
		(c) Open circuit from subtract switch to subtract solenoid.	Trace circuit and repair. See schematics in service manual.
4. Fuse blows occasionally during reversal of motor.	Phonograph inoperative.	(a) Reversing switch contacts incorrectly adjusted.	Clean and adjust G, H, J, and K contacts for proper "break before make".
5. "Motor runs slow."	Motor sluggish; slow while scanning and while playing resulting in "poor tone."	(a) Lack of lubrication.	Lubricate motor bearings and mechanism.
		(b) Bind in motor bearings.	Clean and lubricate or replace motor.
		(c) Bind in mechanism.	Lubricate bearings, gears, and clutch assembly. Check end play on flywheel shaft, drive worm, and on clutch shaft.
		(d) Partially shorted motor winding.	Replace motor.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 5. "Motor runs slow."	"Motor slow" while playing but normal while scanning.	(e) "O" contacts in Cam Switch closed in play position.	Adjust contacts.
		(f) Poor clamping of record due to burr or dirt in flywheel hole. (Motor actually runs at normal speed but record turns slowly.)	Remove burr or dirt from flywheel hole to allow normal clamping of records.
6. Motor sluggish or late in reversing.	Motor speed appears normal but is sluggish in reversing. Carriage hits rubber bumpers at ends of base.	(a) "O" contacts in cam switch not closing in scan position.	Clean and adjust contacts.
		(b) Reversing switch operates too late or rubber bumpers incorrectly adjusted.	Adjust Rubber Bumpers and Reversing Switch Brackets.
		(c) Motor starting condenser defective.	Replace condenser.
7. Noisy mechanism.	Whirring noises from general area of motor.	(a) Motor coupling set screws loose and hitting carriage casting.	Tighten set screws.
		(b) Oil cups of motor touching carriage casting.	Turn motor so cups don't touch.
	Whirring or chattering noises while carriage scans.	(c) Excessive end play in drive worm, flywheel shaft, or clutch shaft.	Adjust thrust screws for .002" end play. Avoid binding.
		(d) Selection playing indicator chattering.	Check for loose parts. Clean guides.
	Ticking noises while scanning or playing.	(e) Clutch 1, 2, 3, or 4 adjustments incorrect.	Adjust as shown in service manual.
		(f) Bind in cam shaft bearings prevents clutch from dropping freely into play position.	Clean and lubricate bearings.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
12. Flywheel turns but no action. Motor runs continuously.	Carriage stops at selected record but does not bring it up. "Sits and Spins".	(a) Carriage cable tangled or "hung up" on obstruction.	Straighten cable or remove obstruction as required.
		(b) Selection Playing Indicator binding.	Clean guides; remove bind as required.
		(c) Guide Rollers bind on gear rack.	Check and adjust.
		(d) Bind in Clutch, Trip Mechanism, or carriage rollers.	Eliminate bind and lubricate.
		(e) Clutch 1 adjustment screw down too far.	Adjust Clutch 1.
	Carriage fails to scan after returning record to magazine. Clutch does not drop into scan position.	(f) Safety plunger fails to move out of way of clutch link because of bind.	Clean and lubricate plunger. Check for bind (Use Seeburg Special Purpose Oil.)
		(g) Bind in Clutch or Trip Mechanism.	Eliminate bind and lubricate.
13. Carriage "skips" one position past correct selection.	Plays wrong selection.	(a) Bind in clutch.	Clean and lubricate clutch; use Seeburg Special Purpose Oil.
		(b) Bind in Trip Mechanism or sluggish dash pot.	Remove bind and lubricate Trip Mechanism or replace dash pot as required.
		(c) Clutch 1 adjustment down too far or Clutch 2 out too far.	Check and adjust Clutch 1 and 2.
14. Record incorrectly clamped against flywheel. Centering pin failed to enter record hole.	Record fails to play and fails to trip off.	(a) Transfer Arm fails to bring record up fully to clamping position due to bent magazine separator, or, due to misalignment of Magazine and Transfer Arm.	Check Transfer Arm action in all record spaces to insure proper transfer of all records. Remove binds or make adjustments as required.
		(b) Transfer Arm 2 adjustment incorrect.	Adjust Transfer Arm 2.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
15. Pickup fails to land properly at beginning of record.	Needle falls off edge of record or lands in too far.	(a) Undersized or off-standard record.	Replace with good record.
		(b) Needle landing adjustment incorrect.	Adjust as shown in service manual.
	Needle lands at random positions anywhere from beginning to end of record.	(c) Pickup lock adjustment incorrect fails to lock pickup cradle in scan position.	Adjust lock adjustment.
16. Pickup skids in at beginning of record.	Pickup skids across first few grooves or across record to trip off.	(a) Needle worn, chipped, or loose in mounting.	Replace needle.
		(b) Trip switch reset plate down too far resulting in "booster action".	Replace needle.
		(c) Pickup badly out of balance.	Adjust pickup balance.
17. Record starts over after playing part way.	Needle skids back toward start of record after playing part way.	(a) Needle worn, chipped, or loose in mounting.	Adjust pickup balance.
		(b) Pickup badly out of balance.	Adjust pickup balance.
		(c) Needle pressure adjustment too light.	Adjust needle pressure.
18. Early trip-off.	Trips before end of record.	(a) Cut-off adjustment incorrect.	Adjust record cut-off and reset plate position.
		(b) Trip switch pressure too light. Switch trips due to vibration.	Adjust trip switch pressure.
		(c) Pickup badly out of balance.	Adjust pickup balance.
		(d) Needle pressure adjustment too light.	Adjust needle pressure.
		(e) Off-standard records with longer than normal playing surface.	If necessary, adjust trip switch actuator and reset plate to compensate for off-standard records, or, replace records.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
19. Pickup gets "hung-up" on brush bracket due to magnetic attraction.	Fails to play record. Fails to trip off.	(a) Pickup cartridge too close to brush bracket when shifting. Magnetic attraction causes it to "hang-up".	Loosen brush bracket screws and move bracket toward back, farther away from pickup cartridge.
20. Pickup gets "hung-up" along playing surface of record.	Needle plays same groove over and over. Small section of playing surface wears out.	(a) Record groove faulty; broken.	Replace record.
		(b) Pickup does not clear brush while playing.	Adjust brush clearance.
		(c) Pickup fails to unlock fully for playing of records.	Adjust pickup release.
		(d) Pickup cradle pivots too tight.	Adjust pivots to eliminate bind.
		(e) Pickup out of balance.	Adjust pickup balance.
		(f) Needle pressure adjustment too light.	Adjust needle pressure.
21. Excessive record wear.	Records wear faster than normal.	(a) Worn or chipped needle.	Replace needle.
		(b) Incorrect needle pressure.	Adjust needle pressure.
		(c) Pickup cradle pivots too tight.	Adjust pivots to eliminate binds.
		(d) Pickup out of balance.	Adjust pickup balance.
		(e) Excessive dust or dirt on records. Bad records; poor record material.	Wipe records with clean damp cloth. Replace bad records.
22. Pickup "chatters" while shifting.	Pickup does not shift smoothly from side to side.	(a) Pickup cradle shaft dirty or gummy.	Clean and lubricate pickup cradle shaft.
		(b) Pickup return adjustment too tight.	Adjust return adjustment.
		(c) Pickup locking screw in too far. Screw tip drags along crank while shifting.	Adjust locking screw.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
23. Pickup arm is not reset properly after playing record.	Pickup hangs up on brush when resetting.	(a) Pickup return adjustment incorrect.	Adjust return adjustment.
		(b) Pickup lifts too far off record after playing.	Adjust for correct pickup lift.
24. Needle scrapes across record when pickup resets.	Records scratched.	(a) Pickup fails to lift from record before resetting.	Adjust for pickup lift.
		(b) Pickup out of balance.	Adjust pickup balance.
		(c) Pickup arm roller binding.	Clean and lubricate roller at base of pickup arm.
25. Pickup hits flywheel or stripper plate when lifting off of record.	Possible damage to needle or pickup cartridge.	(a) Pickup lifts too far off record after playing.	Adjust for correct pickup lift.
26. Excessive lint accumulation on needles.	Distorted sound.	(a) Brushes incorrectly adjusted and fail to clean needles.	Check pickup lift and brush clearance adjustments and correct as required.
		(b) Excessive lint and dust from records.	Remove lint from needles. Wipe records with clean damp cloth.
27. Popularity meter fails to work.	No indication of record popularity.	(a) C, SC, or IC contacts fail to make.	Clean and adjust contacts.
		(b) Open circuit or open solenoid.	Trace and repair or replace solenoid. See schematic in service manual.
		(c) Mechanical bind or incorrect adjustment.	Remove bind or adjust.

SEEBURG

SERVICE CALL	EFFECT	CAUSE	CORRECTION
1. No sound from any speakers.	Models 101, 161, 201 See Trouble Shooting Procedure Page 188		
2. Distorted sound or no sound from one side of pickup-other side normal.	Mechanism operation normal.	(a) Needle chipped, broken, or missing.	Replace needle.
		(b) Dirt accumulated on stylus. g.	Clean carefully. Check Pickup Lifting and Brush Position adjustments as shown in service manual.
		(c) Armature assembly not fully seated in bottom of pickup cartridge slot.	Slide armature assembly fully into slot.
3. Intermittent sound.	Volume drops and returns suddenly.	(a) See Sound System troubleshooting procedure - Repeat tests until trouble is located (1 above).	
		(b) Open or high resistance pickup coil.	Replace pickup cartridge if necessary. D.C. resistance of 246796 pickup should be approximately 1800 ohms.
	Volume drops and returns slowly.	(c) Tube loose in socket.	Check socket pin connections and form lugs for good contact. Seat tube firmly in socket.
		(d) Defective tube.	Check AVC 12AX7 tube and 6BJ6 tube.
		(e) Loose connection in amplifier.	Locate and repair.
		(f) Squelch switch for automatic volume compensator	Clean and adjust MS contacts.
		(g) Open circuit to squelch switch.	Check cable, plug, and socket connections from MS contacts into amplifier.
4. Low volume.	Volume low at all times.	(a) Defective tube.	Replace.
		(b) Volume control not turned up or shorted.	Adjust control or remove short.
(Continued)	*(Continued)*		

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 4. Low volume	*(Continued)* Volume low at all times.	(c) Armature assemblies not fully seated in bottom of pickup cartridge slots.	Slide armature assemblies fully into slots.
		(d) See Sound System 3, f and g above.	
		(e) Remote volume control plug or dummy plug loose, or plug connection loose.	Seat plug firmly. Check connections in volume control plug or dummy plug.
		(f) Broken wire or short in remote volume control wiring.	Trace and correct.
		(g) Speaker volume switch set too low.	Set switch as required.
		(h) Short at remote speaker connection terminal strip.	Remove short.
		(i) Short in remote speaker or remote speaker wiring.	Trace and correct.
		(j) 8 ohm remote speaker connected to CV terminal strip.	Replace with Seeburg CV type speaker.
		(k) Open or high resistance pickup coil.	Replace pickup cartridge if necessary. D.C. resistance of 246796 pickup should be approximately 1800 ohms.
		(l) Loose connection or faulty part in amplifier.	Check and repair or replace amplifier.
5. Sound fades.	Volume dies down as record plays.	See Sound System 3 above.	
6. Howl or squeal.	High pitched squeal.	(a) Defective tube. (especially 6BJ6)	Replace tube.
		(b) Loose connection or faulty part in amplifier.	Check and repair or replace amplifier.
(Continued)	Low pitched rumble. *(Continued)*	(c) Defective tube. (especially 6BJ6)	Replace tube.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued)	*(Continued)*		
6. Howl or squeal.	Low pitched rumble.	(d) Chassis tie down bolts on mechanism not loosened or shipping blocks not removed.	Loosen bolts and remove shipping blocks.
		(e) Chassis tie-down bolts touching edges of holes in chassis base.	Center bolts in holes.
7. Hum.	Steady hum from speakers. Sound otherwise normal.	(a) Defective tube.	Replace tube.
		(b) Defective filter condenser in amplifier.	Replace condenser.
		(c) Remote volume control cable or speaker wiring near neon tube transformer or wiring.	Re-route or shield wiring.
		(d) One side of pickup wire grounded to carriage.	Trace and repair.
		(e) Open or high resistance pickup coil.	Replace pickup cartridge if necessary. D.C. resistance of 246796 pickup should be approximately 1800 ohms.
8. Poor tone.	Music slow or wavering.	See Mechanism.	
		(a) Record not clamped fully due to burrs or dirt in flywheel hole.	Remove burrs or dirt from flywheel hold.
		(b) Badly warped record or eccentric hole in record.	Replace record.
		(c) Loose motor coupling or motor mounting.	Tighten set screws and mounting clamps.
		(d) Motor bearings or flywheel shaft bearings dry or gummed.	Clean and lubricate.
		(e) Drive grommets in flywheel loose, broken, or stiff.	Replace grommets.
(Continued)	*(Continued)*		

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued)	*(Continued)*		
8. Poor tone.	Music distorted.	(f) Excessive end play in flywheel shaft drive worm.	Adjust thrust screw for .002" end play.
		(a) Dirty, worn, or chipped needles.	Clean or replace as required.
		(b) Worn or dirty records.	Replace worn records. Wipe dirt off records with clean damp cloth.
		(c) Defective tube.	Replace tube.
		(d) Open or high resistance pickup coil.	Replace pickup cartridge. Normal D.C. resistance of 246796 pickup should be approximately 1800 ohms.
		(e) Volume control defective.	Replace volume control.
		(f) Remote volume control plug or dummy plug loose, or loose connection in plug.	Seat plug firmly. Check connections in plug.
		(g) Broken wire or short in remote volume control wiring.	Trace and correct.
		(h) Short across remote speaker connection terminal lugs in amplifier.	Remove short.
		(i) Short circuit in remote speaker or remote speaker wiring.	Trace and correct.
		(j) 8 ohm remote speaker connected to amplifier.	Replace with Seeburg CV type speaker.
		(k) Speaker voice coil not centered.	Replace speaker.
		(l) Speaker cone damaged.	Replace speaker.
(Continued)	*(Continued)*		

SERVICE CALL	EFFECT	CAUSE	CORRECTION
(Continued) 8. Poor tone.	*(Continued)* Music distorted.	(m) Pickup arm cradle pivots binding.	Adjust pivots as shown in service manual.
	All bass notes. No highs.	(n) Open circuit to 8" speakers.	Trace and repair.
	No bass notes. Only middle and high frequency notes heard.	(o) Open circuit to 12" speakers.	Trace and repair.
9. Clicks, hum or other noises from speaker while changing records.	Noises from speaker while carriage is transferring records or scanning.	(a) Mute circuit open.	Trace circuit and repair.
		(b) Mute switches not closing.	Clean and adjust mute switches M, MA and MB as shown in service manual.
10. No sound from remote speakers.	Phonograph speakers normal or low volume with poor tone.	(a) Open or short circuit in remote speaker or remote speaker wiring.	Trace and correct. Check connections at amplifier terminal strip.

SEEBURG

SOUND SYSTEM TROUBLESHOOTING PROCEDURE

MODELS 101, 161 and 201

(NOTE) This procedure must be followed carefully without bypassing steps. Each test hinges upon having conducted a previous test. Careful adherence to procedure will quickly locate any trouble.

TROUBLE: Records turn with pickup on record but no sound from any speakers.

PROCEDURE: Make several selections and make sure records turn with pickup on record for all checks and tests. Set the volume control to ¾ position. Open the back door and inspect the following.

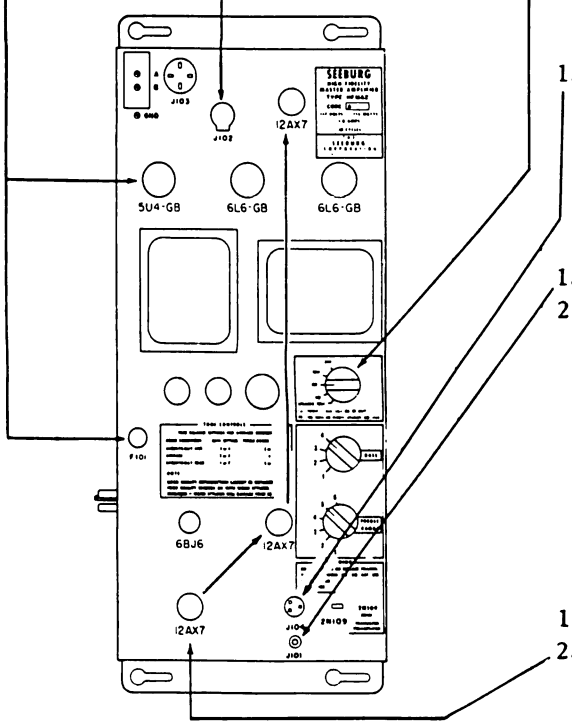
1. Check if 5U4 tube is lighted.

   IF NOT LIGHTED Replace either 2 amp fuse or 5U4 tube;

   IF LIGHTED Proceed as follows:

2. Inspect all tubes in the amplifier to see they are lighted.
3. Inspect all plugs and tubes to see they are properly seated.
4. Inspect remote speaker wires, if any, for shorts.

   IF NO TROUBLE IS FOUND Perform A test.



– A TEST –

1. Turn speaker switch to "speaker test". A loud hum should be heard.

   IF HUM IS HEARD Return switch to original setting and perform B test.

   IF NO HUM IS HEARD Check for open or short circuit to phonograph speakers.

– B TEST –

1. Remove remote volume control plug and replace dummy plug. (If remote volume is not used, perform C test.)

   IF SOUND COMES THROUGH Locate and repair short in remote volume control or cable.

   IF NO SOUND COMES THROUGH Perform C test.

– C TEST –

1. Remove mechanism mute-squelch plug from amplifier.

   IF SOUND COMES THROUGH Adjust mechanism mute switch.
   IF NO SOUND COMES THROUGH Perform D test.

– D TEST –

1. Remove the mechanism pickup plug from the amplifier.
2. Touch the end of a piece of solder or bare wire down inside the pickup socket while holding end of solder or wire. Speakers should hum loudly.

   IF HUM IS HEARD Check for open circuit from the mechanism pickup to the pickup plug.

   IF NO HUM IS HEARD Perform E test.

– E TEST –

1. Replace pickup plug into amplifier input.
2. Check each of the three 12AX7 tubes by replacing with a new tube. (Allow time for tube to warmup and be sure record is turning.)

   IF NO SOUND COMES THROUGH *AFTER CHECKING TUBES* Replace the amplifier.

SERVICE CALL	EFFECT	CAUSE	CORRECTION
1. No sound from any speakers.	Removing mute-squelch plug from amplifier remedies trouble.	(a) Mute switches for both channels defective.	Adjust mute switches as shown in Service Manual.
	Removing mute-squelch plug from amplifier does not remedy trouble.	(b) Open amplifier fuse.	Replace fuse. Check for intermittent short in 5U4 tube.
		(c) Defective 5U4 tube.	Replace tube.
		(d) Shorted power supply filter capacitor.	Repair or replace amplifier.
2. Distorted sound or low volume on one side of pickup, other side normal.		(a) Defective stylus.	Replace stylus and balance the amplifier.
		(b) Pickup cradle binding.	Locate cause of bind and repair.
		(c) One winding of pickup open.	Replace defective pickup.
3. One channel is weak or dead.	No stereo. Cannot balance the amplifier.	See Trouble Shooting Procedure Page 190.	
4. Hum		See No. 7. 101, 161, 201 Trouble Chart Page 185.	
5. Poor tone.		See No. 8. 101, 161, 201 Trouble Chart Page 185 and 186.	
6. Low volume some records.	Other records normal volume.	(a) Squelch contact on mechanism dirty.	Clean and adjust mechanism MS contact.
		(b) Defective 6BJ6 tube in each channel.	Replace both 6BJ6 tubes.

SEEBURG

STEREO SOUND SYSTEM TROUBLESHOOTING PROCEDURE for SELECT-O-MATIC MODELS 222 and 220

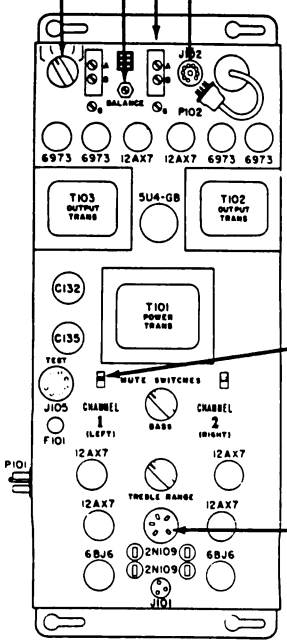
(NOTE) This procedure must be followed carefully without bypassing steps. Each test hinges upon having completed a previous test. Careful adherence to procedure will quickly locate any trouble.

TROUBLE: Stereo records sound the same as monaural records. (One channel defective)

PROCEDURE: Place the Seeburg Stereo Test Record in the phonograph magazine and select the test record side. Follow instructions on the test record.

IF BALANCE CAN BE MADE Phonograph is normal. (Be sure stereo records are in the magazine)

IF BALANCE CANNOT BE MADE Set the balance control to mid position and perform A test.



A TEST

1. Turn speaker switch to "speaker test". Check that both speakers hum.

IF BOTH SPEAKERS HUM Return speaker test switch to the original positi... and perform B test. Perform C test if no RSVC-1 is used.

IF ONLY ONE SPEAKER HUMS Locate and repair defective speaker or circ... to the speaker. Return controls to original settings and balance the amplifie... using the test record.

B TEST

1. Remove the remote volume control plug from the amplifier and insert the local volume control plug. Set the local control to 3/4 position and repeat balance test using test record.

IF BALANCE CAN BE MADE Locate and repair defect in RSVC-1.

IF BALANCE CANNOT BE MADE Set Balance control to mid position and perform C test.

C TEST

1. Select several monaural (Standard) records. With the phonograph playing, operate channel 1 mute switch, noting if the sound is muted while the switch is operated.

IF SOUND IS WEAK OR DEAD Perform D test. Perform E test if no remote speakers are used. (Channel 2 is defective)

IF SOUND CONTINUES IN CHANNEL 2 Perform H test.

D TEST

1. Remove one wire from channel 2 speaker terminals. With phonograph playing operate channel 1 mute switch, noting if sound is muted.

IF SOUND IS WEAK OR DEAD Replace speaker wire and perform E test.

IF SOUND CONTINUES IN CHANNEL 2 Locate and repair short in channel 2 remote speaker wiring. After repairing, balance amplifiers using test record.

E TEST

1. With the phonograph playing, remove the mute-squelch plug from the amplifier.
2. Operate channel 1 mute switch, noting if sound is muted.

IF SOUND IS WEAK OR DEAD Replace mute-squelch plug and perform F test.

IF SOUND CONTINUES IN CHANNEL 2 Adjust the 6 mute switches on the mechanism. After adjusting switches, replace mute-squelch plug and balance amplifiers using the test record.

F TEST

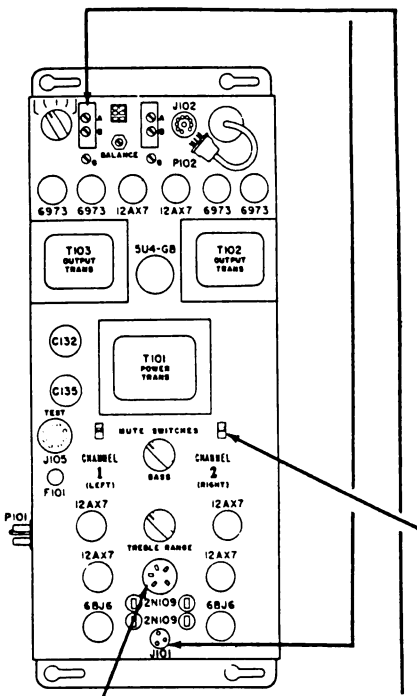
1. Remove the mechanism pickup plug from the amplifier.
2. Connect a short piece of solder between pins No.1 and No.2 of the pickup socket.
3. With the record turning, touch the solder and note that speakers hum.
4. While touching solder, operate channel 1 mute switch, noting if hum is muted.

IF HUM IS WEAK OR DEAD Perform G test.
IF HUM CONTINUES IN CHANNEL 2 Check for defective pickup or defective circuit between the pickup and the pickup input plug. After correcting trouble, balance the amplifiers using the test record.

G TEST

1. Replace mechanism pickup plug into amplifier. (Remove solder)
2. Remove a 12AX7 tube from channel 1.
3. While record is turning, substitute each of the 12AX7 tubes in channel 2 with the good 12AX7 tube removed from channel 1. Allow time for tube to warm up.
4. If the phonograph starts playing after replacing one of the 12AX7 tubes, install a new 12AX7 tube in channel 1 and balance the amplifiers, using the test record.
5. If the phonograph does not play after trying all three 12AX7 tubes turn off power, remove the 6973 tubes from channel 1 and install in channel 2. Turn on power.

IF THE PHONOGRAPH PLAYS Install new 6973 tubes in channel 1, replace the 12AX7 tube in channel 1, and balance the amplifiers using the test record.
IF THE PHONOGRAPH DOES NOT PLAY Replace the amplifier. Balance the new amplifier using the test record.



H TEST

1. With a record playing, operate channel 2 mute switch, noting if the sound is muted while the switch is operated.

IF SOUND IS WEAK OR DEAD Perform J test. Perform K test if no remote speakers are used. (Channel 1 is defective)
IF SOUND CONTINUES IN CHANNEL 1 Recheck previous tests made.

J TEST

1. Remove one wire from channel 1 speaker terminals.
2. With phonograph playing, operate channel 1 mute switch, noting if sound mutes.

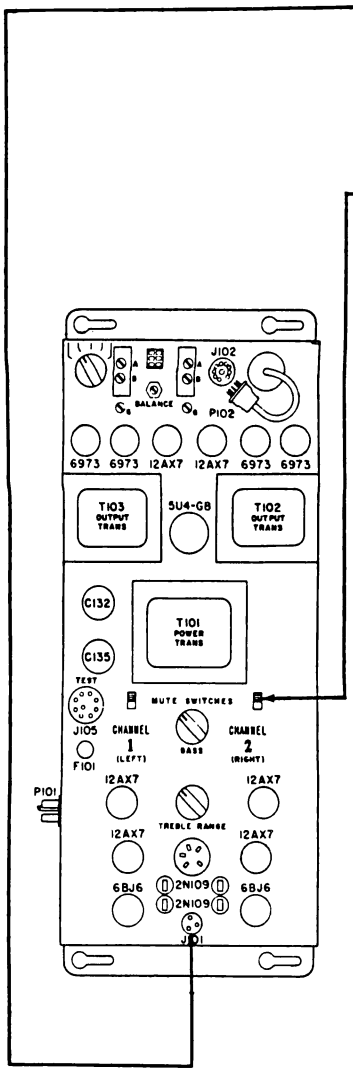
IF SOUND IS WEAK OR DEAD Replace speaker wire and perform K test.
IF SOUND CONTINUES IN CHANNEL 1 Locate and repair short in channel 1 remote speaker wires. After repairing, balance amplifiers using the test record.

K TEST

1. With phonograph playing, remove the mute-squelch plug from the amplifier.
2. Operate channel 2 mute switch, noting if sound is muted.

IF SOUND IS WEAK OR DEAD Replace the mute-squelch plug. Perform L test.
IF SOUND CONTINUES IN CHANNEL 1 Adjust the 6 mute switches on the mechanism. After adjusting switches, replace the mute-squelch plug and balance the amplifiers using the test record.

L TEST



1. Remove the mechanism pickup plug from the amplifier.
2. Connect a short piece of solder between pins No. 1 and No.2 of the pickup socket.
3. With a record turning, touch the solder and note that speakers hum.
4. While touching solder, operate channel 2 mute switch, noting if hum mutes.

IF HUM IS WEAK OR DEAD Perform M test.

IF HUM CONTINUES IN CHANNEL 1 Check for defective pickup or defective circuit between the pickup and the pickup input plug. After correcting trouble, balance amplifiers using the test record.

M TEST

1. Replace mechanism pickup plug into amplifier. (Remove solder)
2. Remove a 12AX7 tube from channel 2.
3. While a record is turning, substitute each of the 12AX7 tubes in channel 1 with the good 12AX7 tube removed from channel 2. Allow time for warm up.
4. If the phonograph starts playing after replacing one of the 12AX7 tubes, install a new 12AX7 tube in channel 2 and balance the amplifiers using the test record.
5. If the phonograph does not play after trying all three 12AX7 tubes turn off power, remove the 6973 tubes from channel 2 and install in channel 1. Turn on power.

IF THE PHONOGRAPH PLAYS Install new 6973 tubes in channel 2, replace the 12AX7 tube in channel 2, and balance the amplifiers using the test record.

IF THE PHONOGRAPH DOES NOT PLAY Replace the amplifier. Balance the new amplifier using the test record.