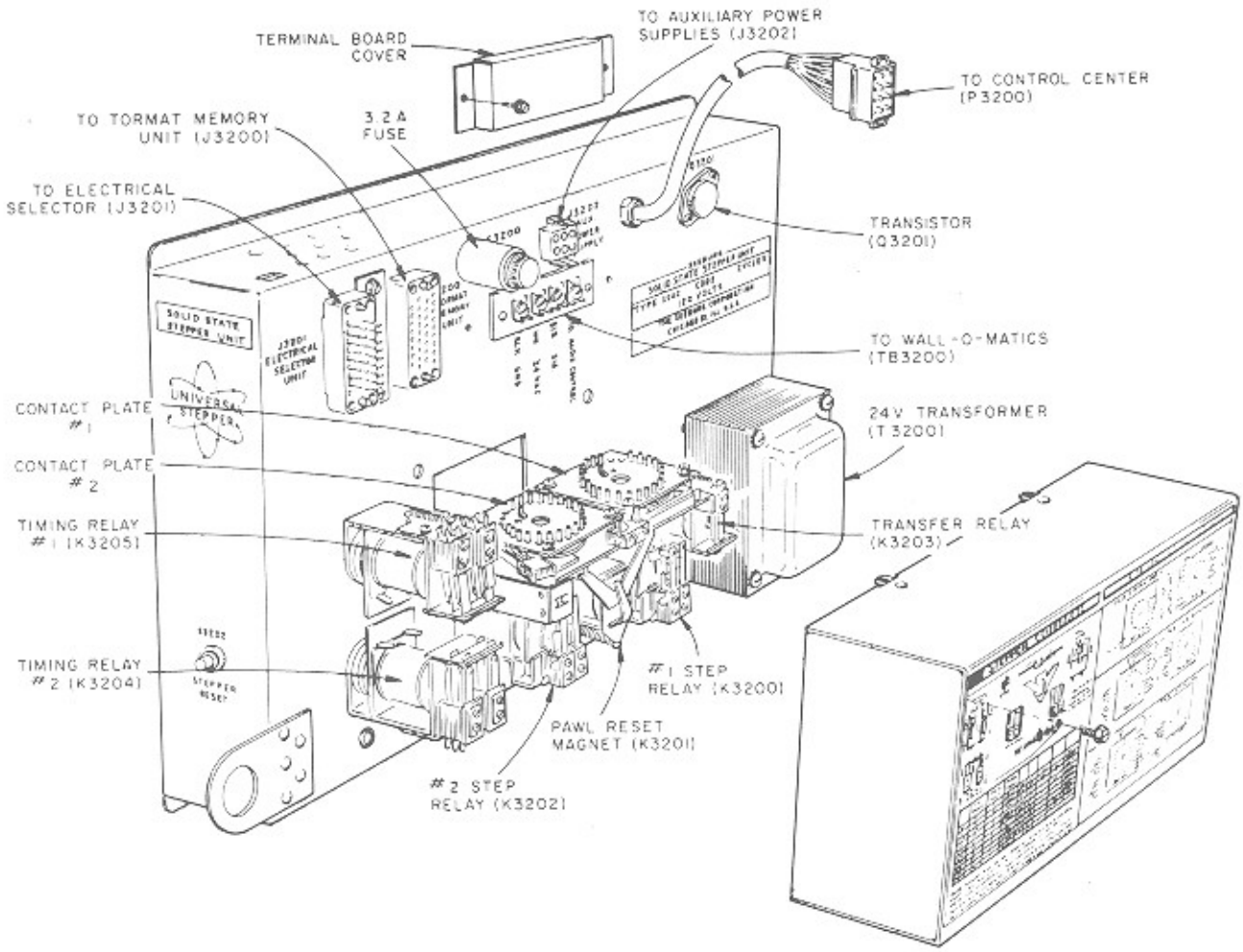
SEEBURG

SOLID STATE STEPPER UNIT, Type SSU2

The Solid State Stepper Unit, Type SSU2, is part of the Seeburg Remote Control System for making selections from remote units. It includes the steppers, power supply and stepper control circuits necessary for full remote control selection. The stepper unit is mounted in a slide channel in the phonograph cabinet, and all interconnections are made with a 12-prong plug on the end of a cable, a 34-prong socket and 34-prong plug mounted on the chassis, and a four screw terminal strip.



STEP SWITCH ASSEMBLY ADJUSTMENTS

RATCHET RETURN SPRING

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

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

STEP RELAY MAGNET POSITION

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

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

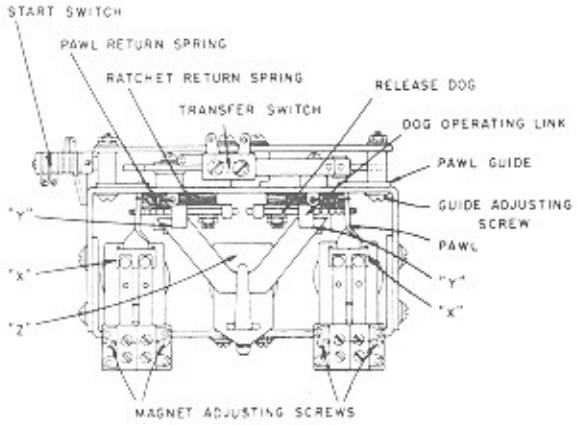


Figure 2. Stepper Detail.

Figure 3.

PAWL GUIDE AND RETURN SPRING

Adjust the pawl guides so the pawls will strike the bottom of the ratchet teeth when the pawl engages the ratchet. *Figure 4.* The adjustment must be made so there will be a .004 inch to .010 inch gap between the pawl and the guide at the bottom of the stroke. *Figure 5.*

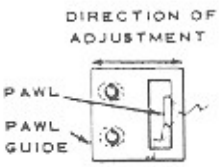


Figure 4.

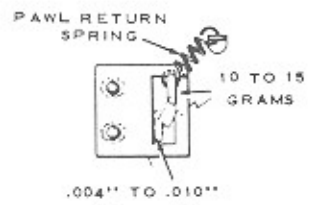


Figure 5.

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

STEP MAGNET TAIL SPRINGS

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

CONTACT PLATE SWITCH BLADES

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

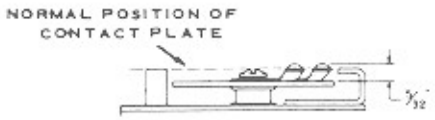


Figure 6.

CONTACT PLATE POSITION

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

RESET MAGNET POSITION

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

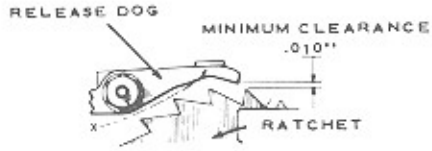


Figure 7

The armature travel must be sufficient to permit the release dogs to clear the ratchet teeth .010 inch minimum when the magnet is not energized, *Figure 7.*

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

RESET MAGNET TAIL SPRING

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

RELEASE DOG SPRINGS

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

TRANSFER SWITCH POSITION

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

(a) With the step switch in the rest position so the roller is in the notch of the contactor disc, adjust the lower blade for ½ to ¾ oz.

(b) Adjust contact 8D1 gap 1/64 inch.

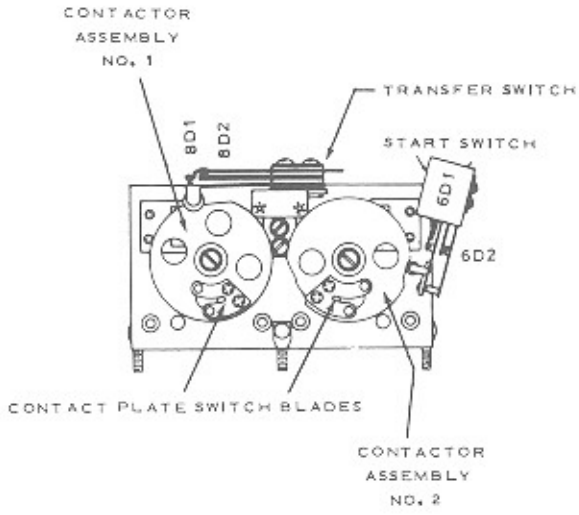


Figure 8.

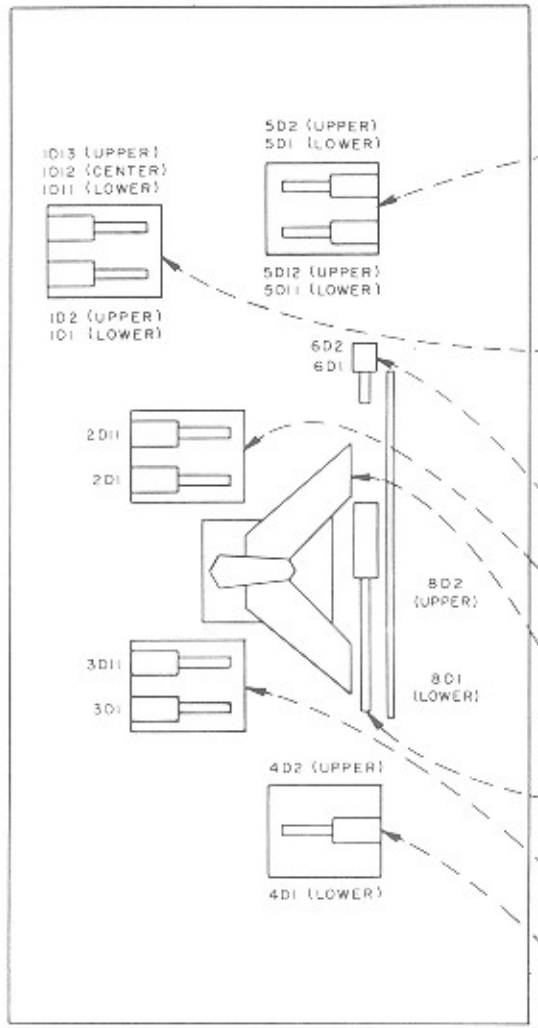
(c) Adjust contact 8D2 force 1 oz.

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

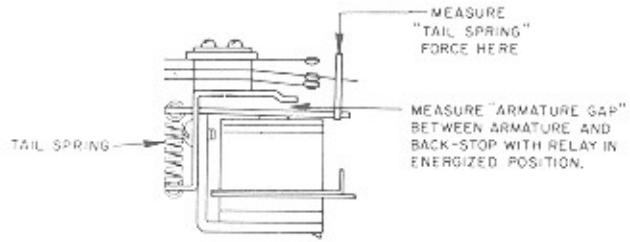
LUBRICATION

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

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



ITEM	OPERATED BY	ARMATURE GAP	CONTACT	CONTACT FUNCTION	GAP	FORCE OUNCES	NORMAL POSITION
TIMING RELAY NO. 1 *	CONTACT 2D11	3/32	5D12	WRITE-IN TRIGGER	1/64	1	CLOSED
			5D2	ENERGIZES TIMING RELAY NO. 2	1/64	1	OPEN
			5D11	DIRECTS ALL PULSES TO STEP RELAY 2 AFTER 1ST PULSE OF SECOND PULSE SERIES	1/64	1	OPEN
			5D1	ENERGIZES RESET MAGNET WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
TIMING RELAY NO. 2 *	CONTACT 5D2	3/32	1D13	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	3/4	CLOSED
			1D12	SWITCHES IN STEPPER WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
			1D11	WRITE-IN TRIGGER	1/32	1	OPEN
			1D2	OPENS ELECTRIC SELECTOR WRITE-IN CIRCUIT WHILE STEP RELAY 2 OPERATES	1/64	3/4	CLOSED
			1D1	ENERGIZES PLAY CONTROL ADD SOLENOID	1/64	1	OPEN
START SWITCH	CAM ON STEP RELAY 2		6D1	OPENS ELECTRIC SELECTOR START CIRCUIT	1/64	1 1/4	CLOSED
			6D2	DIRECTS 1ST PULSE OF SECOND PULSE SERIES TO STEP RELAY 2	1/64	1 1/4	CLOSED
STEP RELAY 2 ‡	Q320I THRU CONTACTS 4D2 8D1, 6D2 & 2D1 FOR 1ST STEP; THROUGH 4D2, 8D1 & 5D11 FOR SUBSEQUENT STEPS	SEE ADJUSTMENT TEXT	2D1	CARRY-OVER FOR W ON 1ST PULSE TO STEP RELAY 2	1/64	1	OPEN
			2D11	ENERGIZES TIMING RELAY NO. 1 WHILE STEP RELAY 2 OPERATES	1/64	1	OPEN
RESET MAGNET †	CONTACTS 3D11 OR 5D1	SEE ADJUSTMENT TEXT					
TRANSFER SWITCH	CAM ON STEP RELAY 1		8D2	DIRECTS 1ST AND EARLY PART OF 2ND PULSE OF FIRST PULSE SERIES TO STEP RELAY 1	1/64	3/4	CLOSED
			8D1	DIRECTS END OF 2ND PULSE AND ALL SUBSEQUENT PULSES TO TRANSFER RELAY CONTACTS 4D1 OR 4D2	1/64	1	OPEN
STEP RELAY 1 ‡	Q320I-THRU CONTACTS 6D1 OR 8D2 AND 4D1.	SEE ADJUSTMENT TEXT	3D1	ENERGIZES TRANSFER RELAY WHILE STEP RELAY 1 OPERATES	1/64	1	OPEN
			3D11	ENERGIZES RESET MAGNET WHILE STEP RELAY 1 OPERATES	1/64	1	OPEN
TRANSFER RELAY *	CONTACT 3D1	3/64	4D2	Q32D1 PULSES TO STEP RELAY 2	1/32	1	CLOSED
			4D1	Q320I PULSES TO STEP RELAY 1	1/32	1	OPEN



TAIL SPRING FORCES

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

D.C. COIL RESISTANCE

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

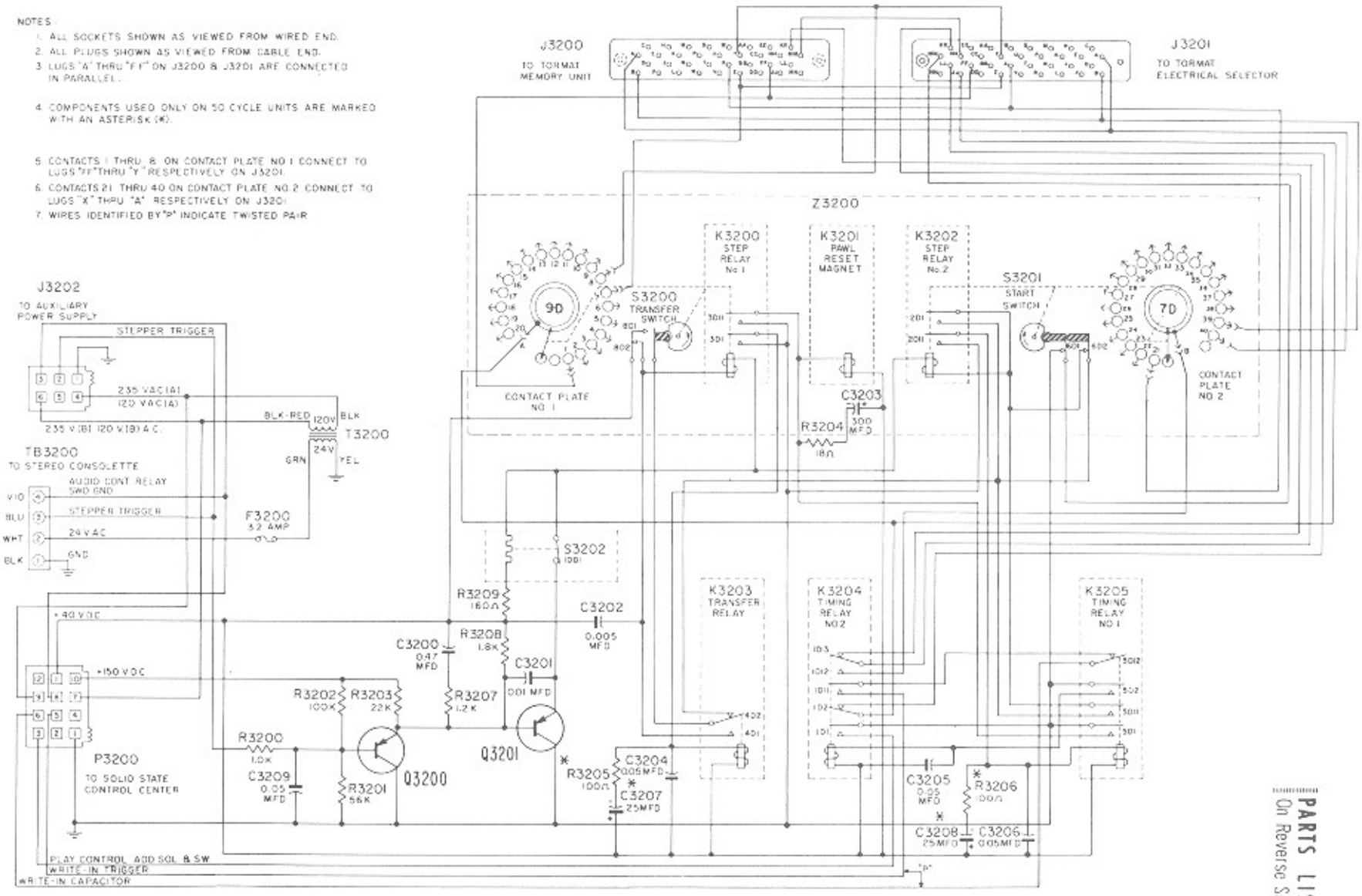
Relay Adjustments

DRAWING NO. 317422

SOLID STATE STEPPER UNIT, Type SSU2

NOTES:

1. ALL SOCKETS SHOWN AS VIEWED FROM WIRED END.
2. ALL PLUGS SHOWN AS VIEWED FROM CABLE END.
3. LUGS "A" THRU "F" ON J3200 & J3201 ARE CONNECTED IN PARALLEL.
4. COMPONENTS USED ONLY ON 50 CYCLE UNITS ARE MARKED WITH AN ASTERISK (*).
5. CONTACTS 1 THRU 8 ON CONTACT PLATE NO 1 CONNECT TO LUGS "F" THRU "Y" RESPECTIVELY ON J3201.
6. CONTACTS 21 THRU 40 ON CONTACT PLATE NO 2 CONNECT TO LUGS "X" THRU "A" RESPECTIVELY ON J3201.
7. WIRES IDENTIFIED BY "P" INDICATE TWISTED PAIR



PARTS LIST On Reverse Side

Item	Part No.	Description
C3200	86329	0.47 Mfd. 50 V. Mylar
C3201	86313	0.01 Mfd. 500 V. Ceramic
C3202	86250	5000 Pfd. 1000 V. Ceramic
C3203	87611	300 Mfd. 50 V. Lytic
C3204	86235	0.05 Mfd. 200 V. Molded Paper
C3205	86235	0.05 Mfd. 200 V. Molded Paper
C3206	86235	0.05 Mfd. 200 V. Molded Paper
* C3207	87571	25 Mfd. 50 V. Lytic
* C3208	87571	25 Mfd. 50 V. Lytic
C3209	86235	0.05 Mfd. 200 V. Molded Paper
F3200	303713	3.2 Amp. Fuse
J3200	411557	34 Contact Socket
J3201	304962	34 Contact Plug
J3202	769868	6 (Circt.) Chassis Connector
K3200	317070	Step Relay No. 1
K3201	307464	Pawl Reset Magnet
K3202	317072	Step Relay No. 2
K3203	303074	Transfer Relay
K3204	303764	Timing Relay No. 2
K3205	307732	Timing Relay No. 1
P3200	309362	12 (Circt.) Cable Connector

Item	Part No.	Description
Q3200	309424	Milliwatt Transistor
Q3201	309425	Power Transistor
R3200	82424	1000 Ohm ±10% ½ W.
R3201	82445	56,000 Ohm ±10% ½ W.
R3202	82448	100,000 Ohm ±10% ½ W.
R3203	82757	22,000 Ohm ±10% 1 W.
R3204	82403	18 Ohm ±10% ½ W.
* R3205	82412	100 Ohm ±10% ½ W.
* R3206	82412	100 Ohm ±10% ½ W.
R3207	82425	1200 Ohm ±10% ½ W.
R3208	82876	1800 Ohm ±10% 2 W.
R3209	81269	160 Ohm ±5% 5 W. W.W.
S3200	303547	Transfer Switch
S3201	303794	Start Switch
S3202	317202	Circuit Breaker
T3200	307074	24 V. Transformer
* T3200	307774	24 V. Transformer
TB3200	452147	Terminal Board Assembly
Z3200	317420	Stepper Assembly

* Components used only on 50 cycle units are marked with an asterisk.