

AUTO-PHOTO STUDIO

OPERATION MANUAL

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BASIC STUDIO OPERATION

BLACK AND WHITE

OR COLOR

Getting the Studio ready to operate

Although all Studios are thoroughly tested and adjusted before leaving our factory, it is quite possible that readjustment of various components may be required when making installation because of rough handling during transportation.

ALIGNING DEVELOPER TRANSMISSION ASSEMBLY... The Developer Transmission Assembly is properly aligned at the factory. However, because of variance in location floor levels it is necessary to check the alignment when "setting up" the Studio and each time it is re-located.

The point of alignment is where the spherical nut on the transmission shaft meets the ball guide bushing. The ball guide bushing is mounted to the under side of the Upper Tray Assembly (see figure 1). When properly aligned the spherical nut at the top of the transmission shaft enters and releases freely from the ball guide bushing when in all indexing positions.

To check alignment:

1. Making sure that the electrical power source to the Studio is disconnected, turn transmission pulley counterclockwise by hand, until the transmission shaft comes to rest at its lowest position.
2. Remove spherical nut on transmission shaft by turning clockwise. Lift off Spider Assembly. Set Spider Assembly aside, upside down, to prevent bending of paper carriers.
3. Remove tank splash guard, chemical and water tanks, and set aside.
4. Place transmission alignment gauge (furnished with Studio) over end of transmission shaft with arrow on gauge pointing up. Run transmission shaft to its uppermost position by turning transmission pulley, counterclockwise, by hand, so that the alignment gauge meets the ball guide bushing on the under side of the Upper Tray.

NOTE: When shaft is at its maximum operating height, the inner sleeve of the gauge will telescope into the outer sleeve.

5. Realignment is required:

- a. If the outer sleeve of the gauge does not center on the black line of the inner sleeve when the gauge is compressed.

- b. If the outside diameter of the outer sleeve of the alignment gauge does not conform with the outside diameter of the ball guide bushing.

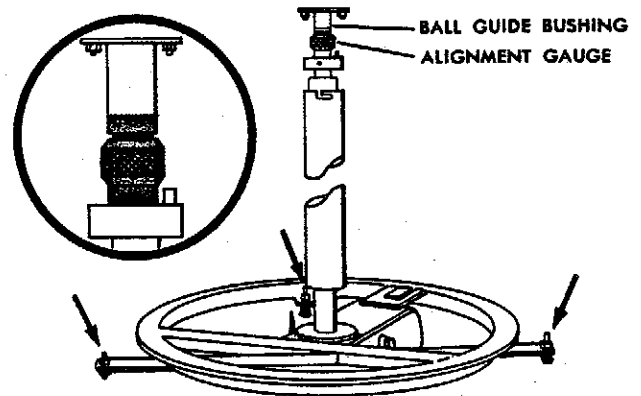


Figure 1. Transmission Alignment

If realignment is required:

1. To center the outer sleeve of the gauge on the black line of inner sleeve (height check), raise or lower Developer Transmission Assembly by loosening or tightening the three spring-loaded hex nuts located on each side and at the rear of the transmission mounting ring.
2. To align outside diameters of outer sleeve of gauge and ball guide bushing to each other (level check), tighten or loosen hex nuts as required.
3. The Developer Transmission Assembly is accurately aligned when, with its shaft at maximum operating height, the outer sleeve of the gauge is centered on the black line of the inner sleeve, and the diameter of the outer sleeve of the gauge conforms with that of the ball guide bushing.

NOTE: When rim of the outer sleeve of the gauge is centered on black line of the inner sleeve, the clearance between the under side surface of the upper tray and the top of a turn-out cam on the Spider Assembly, when installed, should measure one and one-fourth inches.

Remove alignment gauge, and replace Spider Assembly and spherical nut. Make certain the positioning pin on the top of the transmission shaft collar fits into slot on the Spider Assembly casting.

MOUNTING CAMERA RELAY ASSEMBLY... To install, rotate Camera Assembly on upper shelf to extreme right position. Do not lift camera off its securing pin. The Camera Relay Assembly mounts on top of the camera and is secured with two screws furnished for this purpose. Fix Jones plug of Camera Relay Assembly into receptacle located directly in line with the Relay Assembly on top of camera.

Installing paper magazine

1. Remove tape from paper feed slot of loaded magazine.
2. With camera in outward position on shelf place magazine in opening on top of camera housing.
3. Open camera door and disengage gears that drive paper feed rollers by pulling and holding clutch to the left (see figure 2).
4. Guide leading edge of paper from magazine into the slot of the lens housing backing plate and between the rubber rollers. Rotate knurled knob by hand until paper strip protrudes below base of camera.

NOTE: Cut protruding end of paper at approximately 60 degree angle to assist threading paper through the camera.

5. Move clutch to right to re-engage gears.
6. Cut that portion of paper extending below camera base by pushing solenoid plunger which

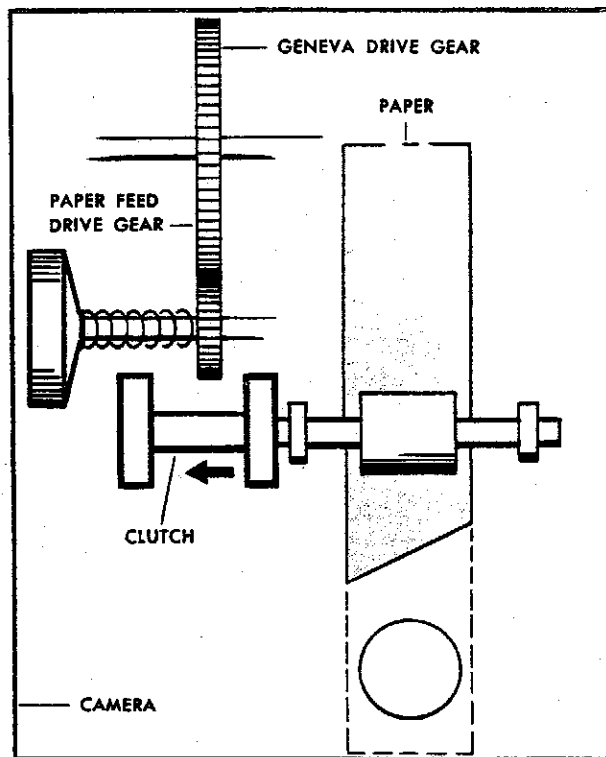


Figure 2. Paper Feed-Down Clutch

operates paper cut-off knife.

7. Close camera door and rotate camera to operating position on shelf which is as far back to the left as it will go.

Dry run test

To insure functional operation of Studio before adding chemicals a "Dry Run" Test must be made.

1. Check power switch: The toggle switch, mounted at the bottom of fuse box on right hand side of cabinet interior, cuts off all power to Studio except the convenience receptacle located next to the switch.

a. Switch is "off" when depressed to left. With switch "off" check to insure that fuse (fusestat) is securely seated in fuse socket.

b. Close fuse box door and turn switch right to "on."

2. Check and secure electrical plug connections from:

- a. Camera relay to camera.
- b. Main harness to camera.

- c. Main harness to Trigger Assembly.
- d. Main harness to upper light box.
- e. Main harness to studio door.
- f. Main harness to Strobe assembly.

4. Check Studio service cord: The Studio service cord is secured into the electrical wall outlet. Note that the service cord is equipped with a three-way plug. Should location not have a mating receptacle, do not remove ground blade on plug. Either install like receptacle or attach three-way grounded plug to service cord that will mate with grounded receptacle.

UNDER NO CIRCUMSTANCES OPERATE STUDIO WITHOUT A GROUND CONNECTION

5. Check alignment of paper carriers: This check is made using the paper carrier alignment gauge located on the inside left wall of the dark room compartment. Each paper carrier should be checked when positioned directly in front of door opening and when in its uppermost position. To position a carrier for check, press operating switch button on inside of panel door. As carrier comes into check position, stop cycle with power switch mounted on under side of fuse box.

a. Before starting cycle of operation, drop transmission outer shaft guard to expose shaft. This is accomplished by loosening spherical nut on top of transmission shaft and raising Spider Assembly enough to permit the turning and releasing of guard from mounting set screws.

b. With transmission outer shaft guard lowered and a paper carrier directly in front of you, at its uppermost position, place large "V" notch of gauge firmly against transmission shaft (not shaft tube housing) and, holding "V" notch against shaft, rotate other end of gauge toward you until the small "V" notch comes to rest against the vertical edge of the paper carrier (see figure 3).

c. Carrier is in alignment if "V" edge conforms with "V" notch in gauge. If edge of carrier and "V" notch do not conform, gently pull or push carrier to bend as required for proper alignment. (Figure 4)

d. Following alignment check on all seven carriers, replace outer shaft guard on set screws and twist to lock. Tighten spherical nut on transmission shaft, making sure the positioning pin on the top of the transmission shaft collar fits into the slot on the spider assembly casting.

6. Check feeding of paper strips into paper carriers:

a. Operate Studio with door open.

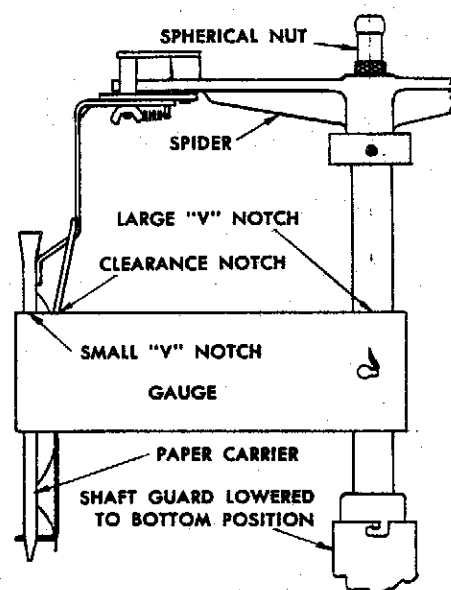


Figure 3. Paper Carrier Alignment Gauge

b. Press operating start button on inside of door panel once for each strip of photos. To insure consecutive feeding of paper strips into all seven paper carriers, push button immediately following delivery of a strip to each carrier.

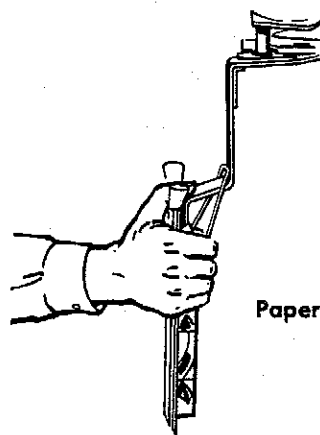


Figure 4.
Paper Carrier Adjustment for Alignment

c. Should paper strips not feed properly into paper carriers, realignment of carriers to Feed-Down Assembly may be necessary. However, before making any adjustment, make certain that the Spider Assembly is positioned correctly on the transmission shaft. The positioning pin on top of the transmission shaft collar must fit into the slot on the spider assembly casting

(1) Paper strips should feed into the "outboard" side of the paper carrier openings, clearing the flanged lips of each carrier. Should paper strips hit one edge of flanged lips a lateral adjustment is required. To adjust for proper clearance, loosen lock nut #259 and adjust screw #636 on Spider Assembly (see page 33).

(2) "Inboard" or "outboard" adjustment is made by bending chute guide of Feed-Down Assembly in or out as required for clearance.

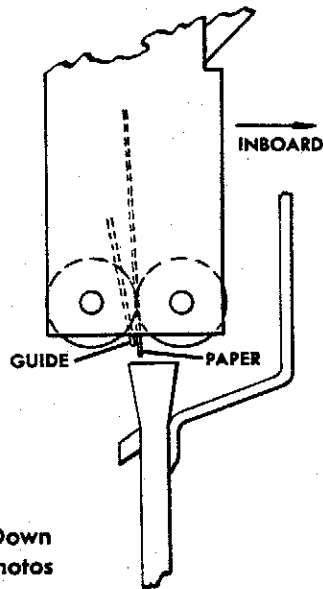


Figure 5.
Paper Feed-Down
for Exposed Photos

a. Relative position of switch arm on Delivery Assembly with paper carrier support arms to make sure that switch is being activated when carrier support arm makes contact with switch arm.

b. Relative position of the delivery assembly pickup rollers to the top of the paper strip while carrier is directly under Delivery Assembly; Paper strip in paper carrier should first contact the "inboard" roller of delivery unit about one-eighth inch inboard from point of where the

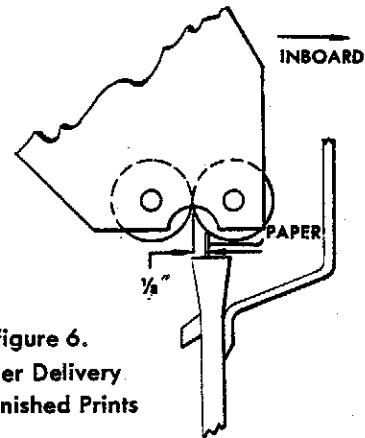


Figure 6.
Paper Delivery
for Finished Prints

two rollers meet (see figure 6). Should adjustment be required, loosen bolts holding Delivery Assembly to upper tray and move Assembly inboard or outboard to proper position.

d. To re-check alignment of paper carriers with Feed-Down Assembly.

(1) Turn power on. Operate Studio until paper strip is cut off in Feed-Down Assembly. Turn power off.

(2) Turn gear in Feed-Down Assembly by hand. This will move paper strip down through feed-down rollers into paper carrier. Spider Assembly must be in its uppermost position with the carrier being checked directly under Feed-Down Assembly.

7. Check operation of Delivery Assembly: If Delivery Assembly fails to pick up paper strip from carriers, check:

Electrical • mechanical operational sequence

See Electrical Schematic and Wiring Diagrams

1. Start switch closes and "locks in" camera relay contact points located in Camera Relay Assembly. This supplies initial source of power to camera motor.

2. Camera motor turns the geneva driver clockwise.

3. The geneva driver during one complete revolution activates two geneva drive gears in succession.

a. The first geneva drive gear turns the shutter drive shaft which opens the camera shutter for the first exposure. The strobe light cam on the shutter drive shaft operates the strobe light switch which fires the strobe lamps.

b. The second geneva drive gear turns the paper drive shaft which feeds down the paper strip for the second exposure and closes camera stop switch operated from cam on motor shaft, which in turn supplies second source of power to camera motor.

4. Cycle repeats for subsequent exposures.

5. A double disc cam is mounted on the geneva gear shaft. The square or triangle is the relay reset cam and the "flat" notched disc is the developer start cam. As the geneva gear driver comes in contact with the geneva drive gear for the last time, the developer start cam ("flat" disc) rotates with the following results:

a. Momentarily closes the developer start switch which activates through a coil the three sets of electrical contact points of the developer relay located in the Camera Relay Assembly.

(1) One set of points opens and cuts off the source of power to the green warning lights and manual start switch.

(2) One set of points closes and supplies power to transmission motor.

(3) One set of points closes and supplies power to the trigger solenoid in the Trigger Assembly.

b. Opens camera relay contact points and cuts off initial source of power to camera motor.

6. The geneva driver continues its rotation for the final exposure. As the last frame is fed into the Feed-Down Assembly, the camera stop switch cam has completed one cycle and opens the camera stop switch stopping the camera motor. At this point the exposed strip of paper is in the Feed-Down Assembly waiting to be fed into a paper carrier.

7. After last exposure cycle the transmission motor was started and the Trigger Assembly was activated causing a paper carrier to move to the "out" position. The paper carrier was then rinsed in tank #12.

8. Before the paper carrier moves to its "out" position, the Spider Assembly lowers allowing the transmission motor switch, located on the Trigger Assembly, to close. This supplies a second source of power to the transmission motor.

9. As the paper carrier travels to the top of its stroke and positions under the Feed-Down Assembly it closes cut-off switch mounted on under-side of upper tray which:

a. Cuts off the exposed paper inside the camera.

b. Starts the feed-down motor.

c. Advances the meter counter.

d. Activates the three electrical contact points in the developer relay in the Camera Relay Assembly:

(1) One set closes and supplies power to the green warning lights and manual start switch making the Studio ready for another cycle.

(2) One set of points opens and cuts off first source of power to transmission motor.

(3) One set of points opens and cuts off power to trigger solenoid.

10. Developer Transmission Assembly continues to operate in cycle, dipping and agitating the exposed strip of paper into each one of the 13 tanks.

11. As the paper carrier reaches the top of its stroke over tank #11, it closes the delivery unit switch, located on the side of the delivery unit, which starts the delivery unit motor. The delivery unit removes the completed strip of photographs from the paper carrier and delivers strip into delivery chute on outside of Studio.

12. The transmission continues to operate until the Trigger Assembly rotates the carrier back to the "in" position causing the control disc to open the transmission motor switch on Trigger Assembly and stop the transmission motor.

13. The cycle may be repeated, any time after the green warning lights on door and outside of cabinet turn on. At any one time, each of the seven paper carriers can be processing a different strip of photos in the cycle.

Camera assembly

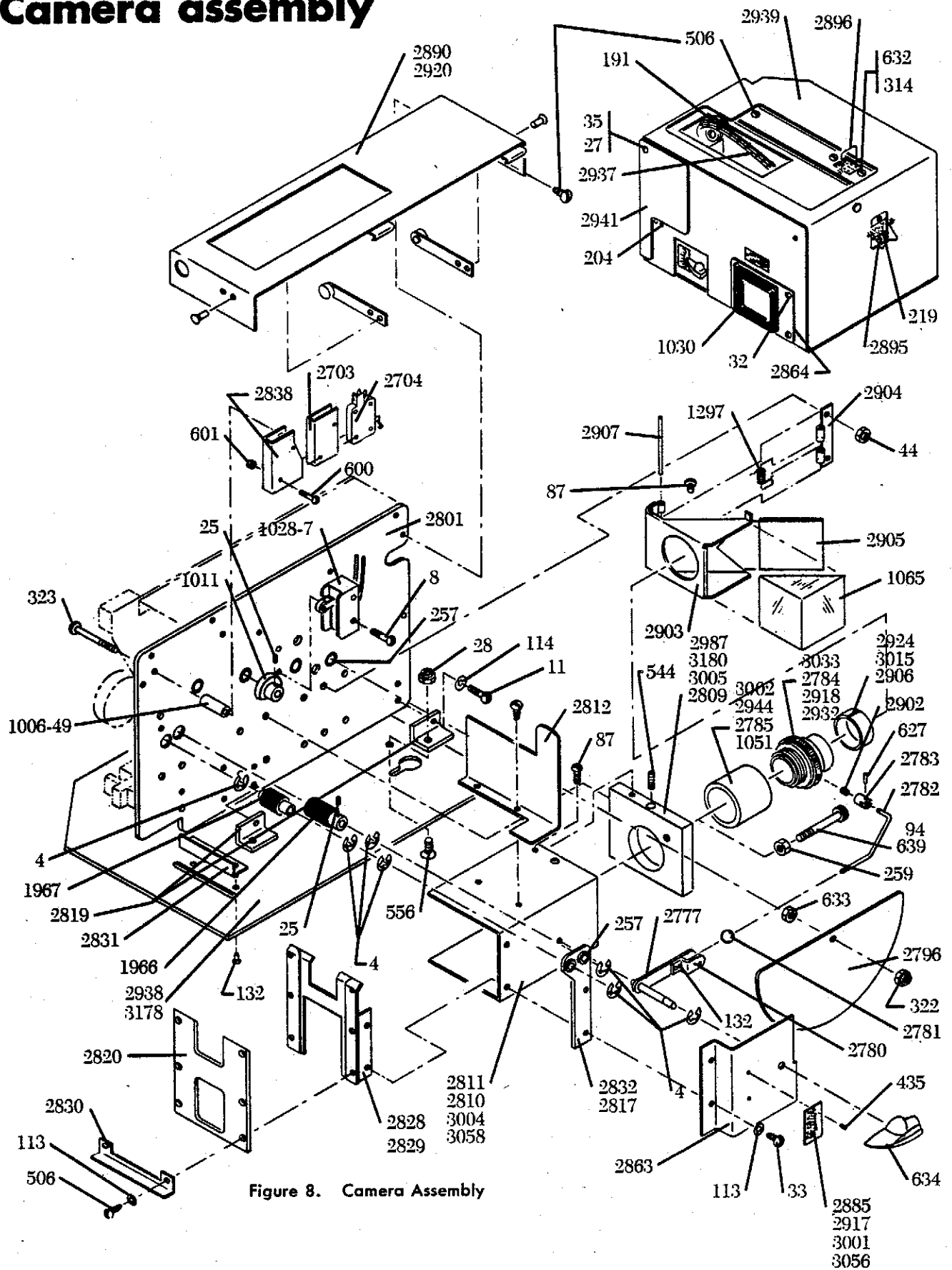


Figure 8. Camera Assembly

REMOVAL

1. Disconnect electrical power to Studio by removing service cord plug from wall receptacle.
2. Disconnect main harness plug.
3. Rotate Camera Assembly to right lifting at same time to disengage Assembly from key-slot hold-down pin.

INSTALLATION

1. Hold Camera Assembly with left end facing

operator and place key-slot over hold-down pin in center of upper tray.

2. Rotate Camera Assembly until it drops into place over hold-down pin.
3. Secure Jones plug from main harness into mating receptacle on outside of camera housing.
4. Rotate Camera Assembly to original position on shelf.
5. Connect electrical power to Studio.

CAMERA ASSEMBLY PARTS LIST (Figure 8.)

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
4	9	Ring, lock	1030	1	Gasket - Funnel
8	4	Screw	1051	1	Tube - Lens (100mm)
11	10	Screw	1065	1	Prism
25	8	Screw	1297	1	Spring
27	2	Nut - Stop	1966	1	Roller - Feed Drive
28	4	Nut - Stop	1967	1	Roller - Feed Idler
32	6	Screw	2703	1	Shield - Paper Switch
33	3	Screw	2704	1	Switch - Paper
35	2	Screw	2777	1	Lever Assembly
44	2	Nut - Stop	2780	1	Holder - Ball
87	4	Screw	2781	1	Ball Link
94	1	Screw	2782	1	Link - Iris Ring
113	3	Lockwasher	2783	1	Clevis - Iris Ring
114	13	Lockwasher	2784	1	Lens (127mm)
132	2	Rivet	2785	1	Tube - Lens (127mm)
191	4	Clamp - Small	2796	1	Shutter
204	2	Screw - Drive	2801	1	Plate - Front
219	1	Plug	2809	1	Holder - Lens (127mm, 140mm)
257	11	Bushing	2810	1	Body (100mm)
259	1	Nut - Jam	2811	1	Body (127mm, 140mm)
314	4	J-Nut	2812	1	Shield - Light
322	1	Nut - Stop	2817	1	Support Shaft 4 (40m paper)
323	2	Screw	2819	2	Angle - Short
435	2	Screw - Drive	2820	1	Plate - Backing
506	15	Screw	2828	1	Frame Assembly (53m. paper)
544	1	Screw - Set	2829	1	Frame Assembly (40m paper)
556	4	Screw	2830	1	Stop - Cut Paper
600	2	Screw	2831	1	Guide - Cut Paper
601	2	Nut - Hex	2832	1	Support - Shaft 3 (209 paper)
627	1	Pin - Groove	2838	1	Cover - Paper Switch
632	4	Screw	2863	1	Bracket - Lens Adjusting
633	1	Nut - Hex - Jam	2864	1	Plate - Gasket
634	1	Knob - Pointer	2885	1	Scale - Adjusting (127mm)
639	1	Screw	2890	1	Holder Assembly - Magazine (53m paper)
1006-49	2	Spacer	2895	1	Lock - 15 Wire
1011	1	Cam - Instruction	2896	1	Lock - 12 Wire
1028-7	1	Micro-Switch			

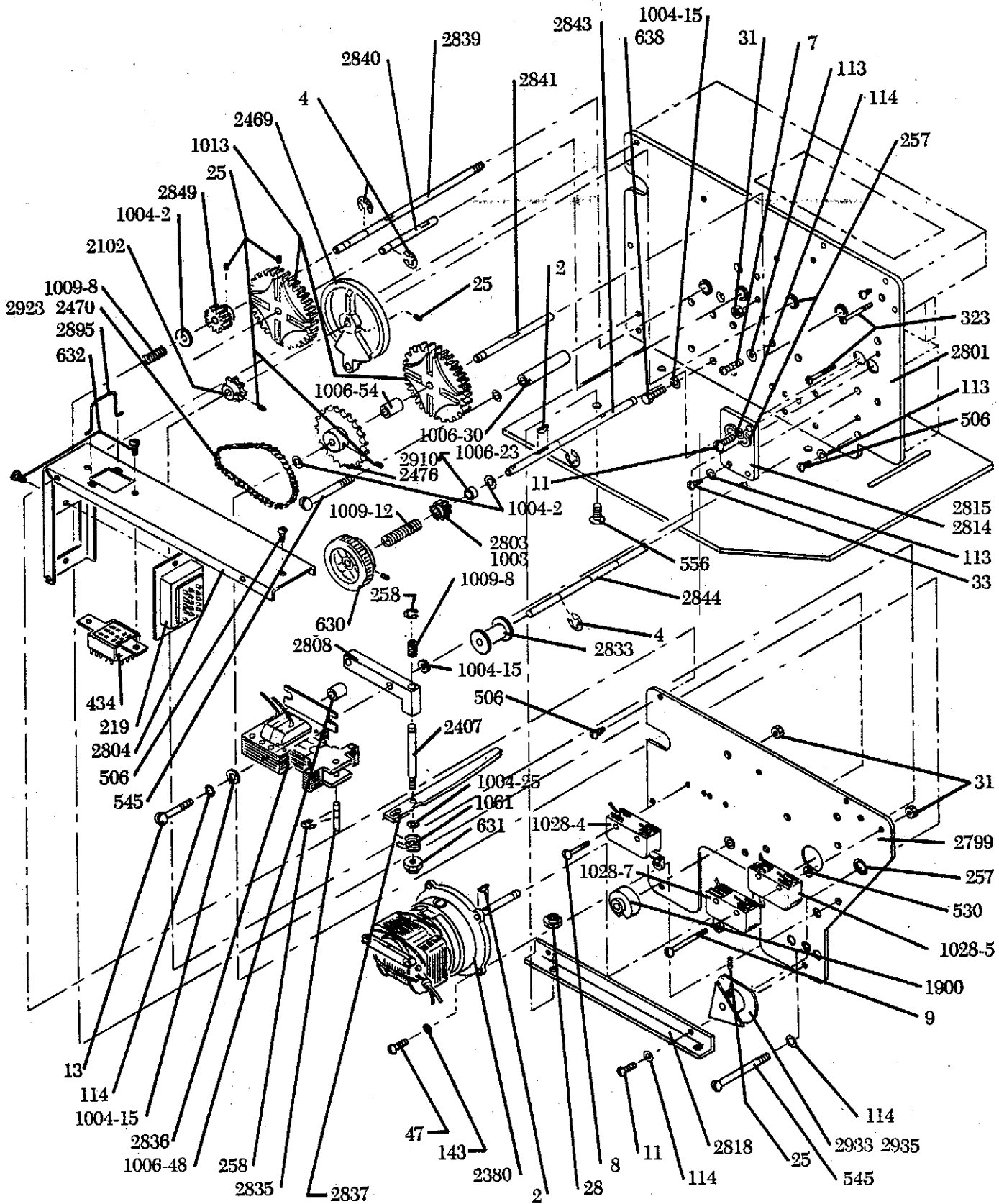


Figure 9. Camera Assembly

2902	1	Screw - Iris Ring	2939	1	Body Assembly - Case
2903	1	Mounting - Prism	2941	1	Cover - Case
2904	1	Hinge - Prism	2944	1	Tube - Lens (140mm)
2905	1	Pad - Prism	2987	1	Holder - Lens (100mm)
2906	1	Shade - Lens (127mm)	3001	1	Scale - Adjusting (90mm)
2907	1	Pin - Prism Hinge	3002	1	Tube - Lens (90mm)
2917	1	Scale - Adjusting (100mm)	3004	1	Body (90mm, 53m paper)
2918	1	Lens - 100mm	3005	1	Holder - Lens (90mm, 40m paper)
2920	1	Holder Assembly - Magazine (159 paper)	3015	1	Shade - Lens (90mm)
2924	1	Shade - Lens (100mm)	3033	1	Lens - 90mm
2932	1	Lens - 140mm	3056	1	Scale - Adjusting (140mm)
2937	1	Harness Assembly - Camera	3058	1	Body (90mm, 53m paper)
2938	1	Base	3178	1	Base (90mm, 53m paper)
			3180	1	Holder - Lens (90mm 53m paper)

CAMERA ASSEMBLY PARTS LIST (Figure 9.)

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
2	2	Key	1028-4	1	Micro-Switch
4	9	Ring, lock	1028-5	1	Micro-Switch
7	2	Screw	1028-7	1	Micro-Switch
8	4	Screw	1061	1	Spring
9	2	Screw	1900	1	Cam - Bright Light
11	10	Screw	2102	1	Sprocket Assembly - Small
13	3	Screw	2380	1	Motor Assembly - Camera
25	8	Screw	2407	1	Shaft - Knife
28	4	Nut - Stop	2469	1	Drive - Geneva
31	6	Nut	2470	1	Chain (53m paper)
33	3	Screw	2476	1	Sprocket Assembly - 24 teeth (53m paper)
47	4	Screw	2799	1	Plate - Motor
113	3	Lockwasher	2801	1	Plate - Front
114	13	Lockwasher	2803	1	Gear - 14 teeth (209 paper)
143	4	Lockwasher	2804	1	Bracket - Connector
219	1	Plug	2808	1	Arm - Blade
257	11	Bushing	2814	1	Plate - Feed Shaft (53m paper)
258	3	Ring - Lock	2815	1	Plate - Feed Shaft (40m paper)
323	2	Screw	2818	1	Angle - Long
434	1	Socket	2833	1	Clutch
506	15	Screw	2835	1	Pin - Solenoid
530	2	Washer	2836	1	Solenoid Assembly
545	4	Screw	2837	1	Blade - Knife
556	4	Screw	2839	1	Shaft - Shutter
630	1	Knob	2840	1	Shaft - Geneva Gear
631	1	Nut - Stop	2841	1	Shaft - Cam 3
632	4	Screw	2843	1	Shaft - Feed
638	2	Screw	2844	1	Shaft - Idle
1003	1	Gear - 18 teeth (40m paper)	2849	1	Gear - Drive
1004-2	1	Washer	2895	1	Lock - 15 Wire
1004-15	6	Washer	2910	1	Sprocket Assembly - 32 teeth (40m paper)
1004-25	5	Washer	2923	1	Chain (40m paper)
1006-23	1	Spacer	2933	1	Cam Assembly - Triangle (53m paper)
1006-30	4	Spacer	2935	1	Cam Assembly - Square (40m paper)
1006-48	1	Spacer			
1006-49	2	Spacer			
1006-54	1	Spacer			
1009-8	1	Spring			
1009-12	1	Spring			
1013	2	Gear - Geneva Drive			

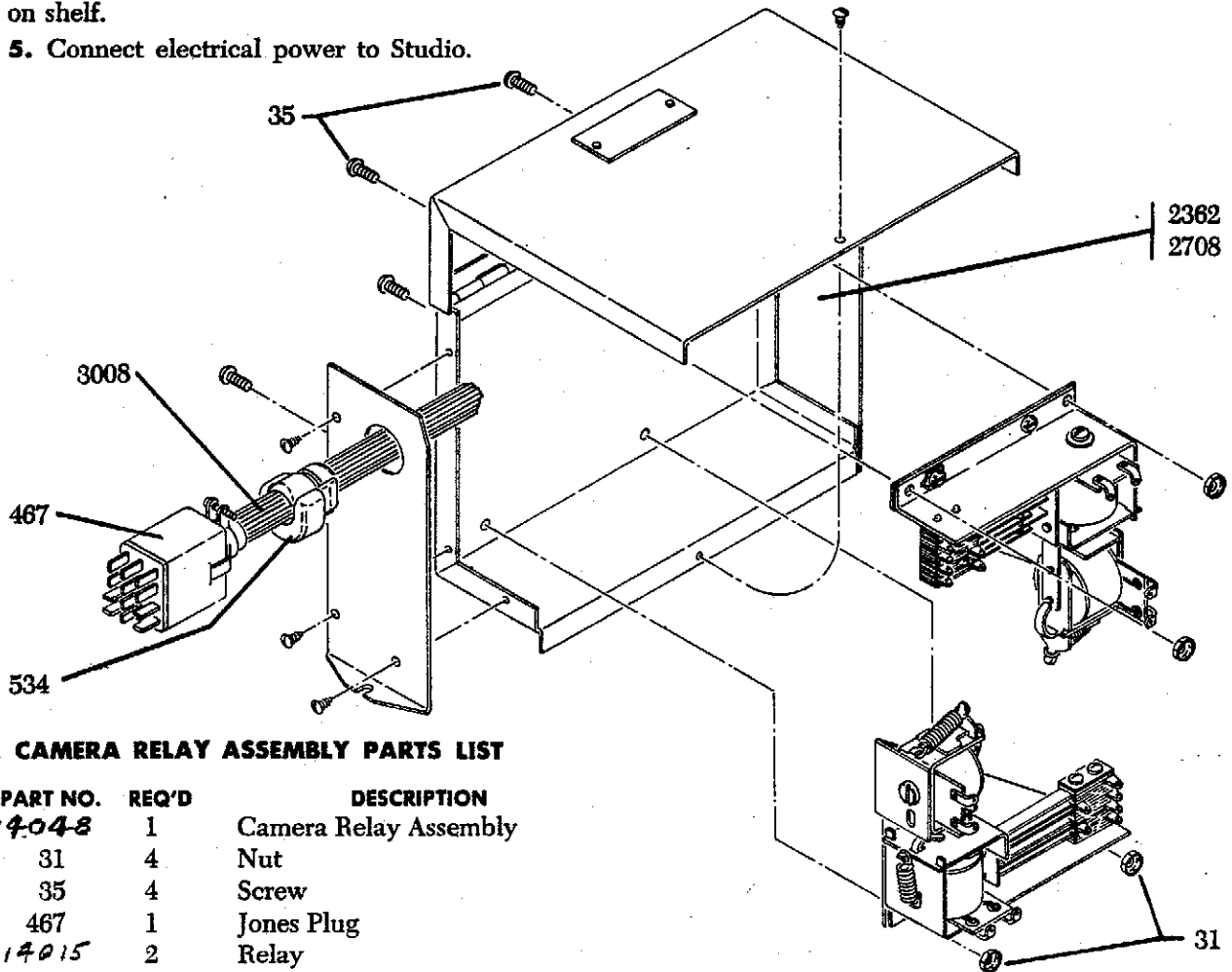
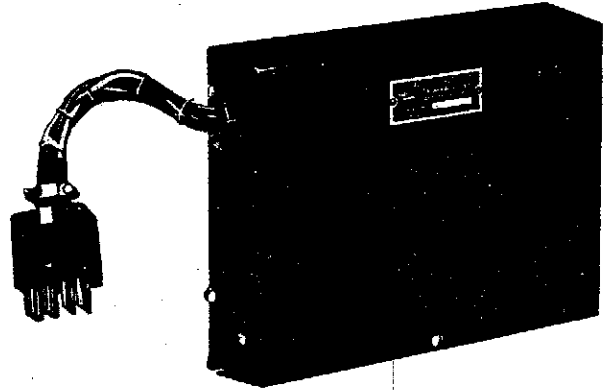
Camera relay assembly

REMOVAL

1. Disconnect electrical power to Studio by removing service cord plug from wall receptacle.
2. Rotate Camera Assembly to outward position.
3. Unplug Camera Relay Assembly's Jones plug.
4. Remove two screws at base.

INSTALLATION

1. Rotate Camera Assembly to outward position.
2. Replace two screws at base and tighten.
3. Insert Jones plug from Camera Relay Assembly into receptacle located directly on top of camera and directly in line with Relay Assembly.
4. Rotate Camera Assembly to original position on shelf.
5. Connect electrical power to Studio.



CAMERA RELAY ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION
14048	1	Camera Relay Assembly
31	4	Nut
35	4	Screw
467	1	Jones Plug
14015	2	Relay
534	1	Bushing
2362	1	Box Assembly, Camera Relay
3008	1	Harness, Camera Relay

Figure 11. Camera Relay Assembly

Delivery unit assembly

REMOVAL

1. With Spider Assembly in its down position, disconnect electrical power to Studio by removing service cord from wall receptacle.
2. Support Assembly and nut plate with one hand and remove the two screws that hold Assembly to bottom side of upper tray.
3. Lay Assembly on upper tray.
4. Disconnect electrical terminals.

INSTALLATION

1. Connect electrical terminals with Assembly laying on upper tray.
2. Support Assembly and nut plate with one hand and attach Assembly to under side of upper tray with two screws.
3. Connect electrical power to Studio.

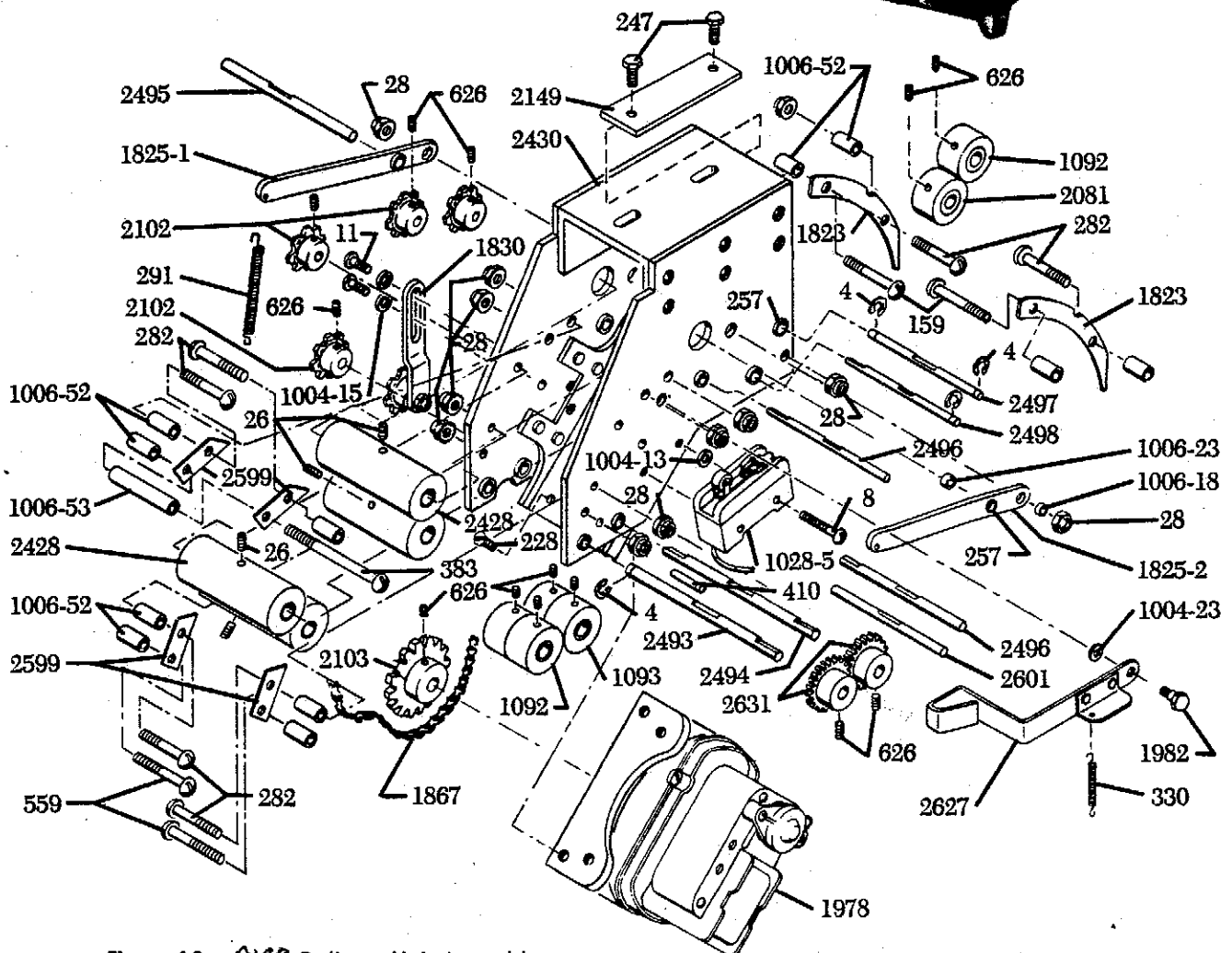
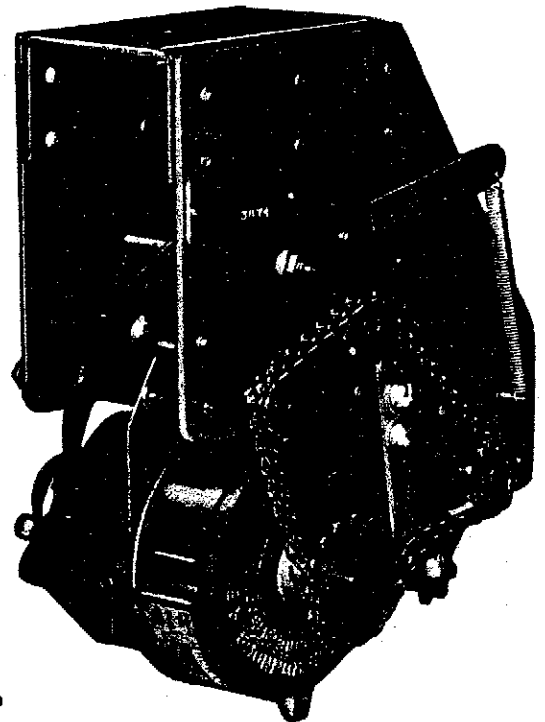


Figure 12. 9140 Delivery Unit Assembly

9140 DELIVERY UNIT ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
9140		Delivery Unit Assembly	1824	2	Inner Paper Guide
8	2	Screw	1825-1	1	Lever Arm - Right Hand
11	2	Screw	1825-2	1	Lever Arm - Left Hand
13	1	Screw	1826	1	Frame Assembly
28	5	Nut	1830	1	Idler Assembly
228	4	Screw	1831	1	Idler Arm
247	2	Screw	1832	1	Sprocket
257	12	Bushing	1836	2	Support Rod - Short
258	4	Snap Ring	1837	1	Support Rod - Lower
260	1	Bushing	1845	1	Idler Shaft
291	2	Spring - Lever Arm	1846	1	Squeeze Idler Shaft
330	1	Spring - Switch Arm	1847	1	Squeeze Drive Shaft
626	8	Setscrew - Stainless Steel	1848	1	Drive Shaft
1004-13	2	Washer	1867	1	Chain - Drive
1004-15	2	Washer	1978	1	Motor - Delivery Unit
1004-23	1	Washer	1982	1	Shoulder Screw
1006-18	2	Spacer	1984	1	Shaft - Pickup - Idler
1006-19	4	Spacer	2010	2	Rubber Roll
1006-20	4	Spacer	2029	1	Switch Arm
1006-21	3	Spacer	2032-1	1	Wire Lead
1006-22	2	Spacer	2069	1	Shaft - Pickoff Driven
1006-23	2	Spacer	2081	1	Roll - Delivery
1006-26	1	Spacer	2102	3	Sprocket
1028-5	1	Micro Switch	2103	1	Sprocket
1092	3	Pickoff Roll Driven	2132	1	Support Rod - Upper
1093	2	Pickoff Roll - Drive	2149	1	Plate - Nut
1278	2	Gear Pickoff	2272	1	Stop - Carrier
1823	2	Outer Paper Guide			

Developer transmission assembly

REMOVAL

1. Disconnect electrical power to studio by removing plug from wall outlet.
2. Run transmission drive pulley counterclockwise by hand until transmission and Spider Assembly are in their lowest position.
3. Remove spherical nut (2716) and Spider Assembly.
4. Disengage and drop the outer shaft guard (2235) from drive flange (1991). Loosen the three set screws affixing drive flange and remove flange from transmission shaft.
5. Remove outer shaft guard. Loosen the two set screws on bumper spring collar and remove inner shaft guard, bumper spring, and bumper spring collar as assembled.
6. Remove tank tray.
7. Remove the four motor mount securing screws (408) from transmission housing. With motor free, lay to right-hand side of dark room compartment floor, along with motor drive V belt. It is not necessary to disconnect the three electrical wires leading to the motor.
8. Remove the two bolts (2073), two hex-nuts (391) and two washers (1004-22) which secure Transmission Assembly to front side of transmission support (2043). Then remove rear bolt (2072) and the one washer (1004-22).
9. Rotate entire Transmission Assembly clockwise approximately $\frac{1}{4}$ turn and lift upward and out.

INSTALLATION

1. Fill Developer Transmission Assembly with oil to level of filler hole. The Transmission holds approximately 2 quarts of automotive automatic transmission fluid (Mobil #200 or equivalent).
2. Disengage and lower the outer shaft guard tube. Loosen the three set screws and remove drive flange (1991). Remove outer shaft guard tube. Loosen the two set screws on bumper spring collar and remove inner shaft guard tube, bumper spring, and bumper spring collar as assembled.
3. Install Transmission in Studio and mount to support ring beginning with rear bolt (2072) and washer (1004-22). Then secure front side with the two bolts (2073), hex-nuts (391) and washers (1004-22). The washers go between top of transmission casting and bottom of support ring.
4. Install transmission motor to transmission housing, and "V" belt over transmission and motor pulleys. Position motor so that there is at least $\frac{1}{2}$ " slack in "V" belt.
5. Align transmission for proper height and level using alignment gauge.
6. Install tank tray.
7. Insert bumper spring into inner shaft guard. Slip bumper spring collar into offset on bottom of inner shaft guard. Slide Assembly onto guide tube and using the two set screws, affix collar to guide tube approximately seven inches from bottom of tank tray. Slide outer shaft guard over inner shaft guard and install drive flange, but do not tighten set screws any more than necessary to hold flange in place prior to adjustment as described in Step #9.
8. Install Spider Assembly on drive flange making sure that pin on drive flange is in slot on spider assembly casting.
9. Whenever the drive flange is removed from drive collar it is necessary, when reinstalling, to check clearance between the "turnout" cam and the "turnout" pin on trigger assembly linkage and to realign carriers to Feed-Down Assembly before tightening set screws in drive flange to drive collar. This is accomplished by turning the transmission drive pulley counterclockwise by hand, to raise top of transmission shaft to within $\frac{1}{2}$ " of the ball guide bushing mounted to the underside of the upper tray. Rotate Spider Assembly so as to position the center of the loop on one of the spider arm castings, see Figure 20, at a point directly under the "turn in" pin on trigger assembly linkage. Raise Spider Assembly to its topmost position by turning transmission pulley counterclockwise by hand. Operate trigger linkage by hand, so as to bring and hold in place the "turnout" pin to its down position, and check clearance between closest point of turnout cam on spider assembly casting and any part of trigger linkage. When Spider Assembly is secured by tightening screws in drive flange, this distance should measure no less than $\frac{1}{16}$ " and no more than $\frac{1}{8}$ ".
10. Replug service cord into location power outlet.
11. Using the paper alignment gauge, align the paper carriers. Refer to page 4, figure 3.
12. Secure outer shaft guard tube to drive flange and install spherical nut.

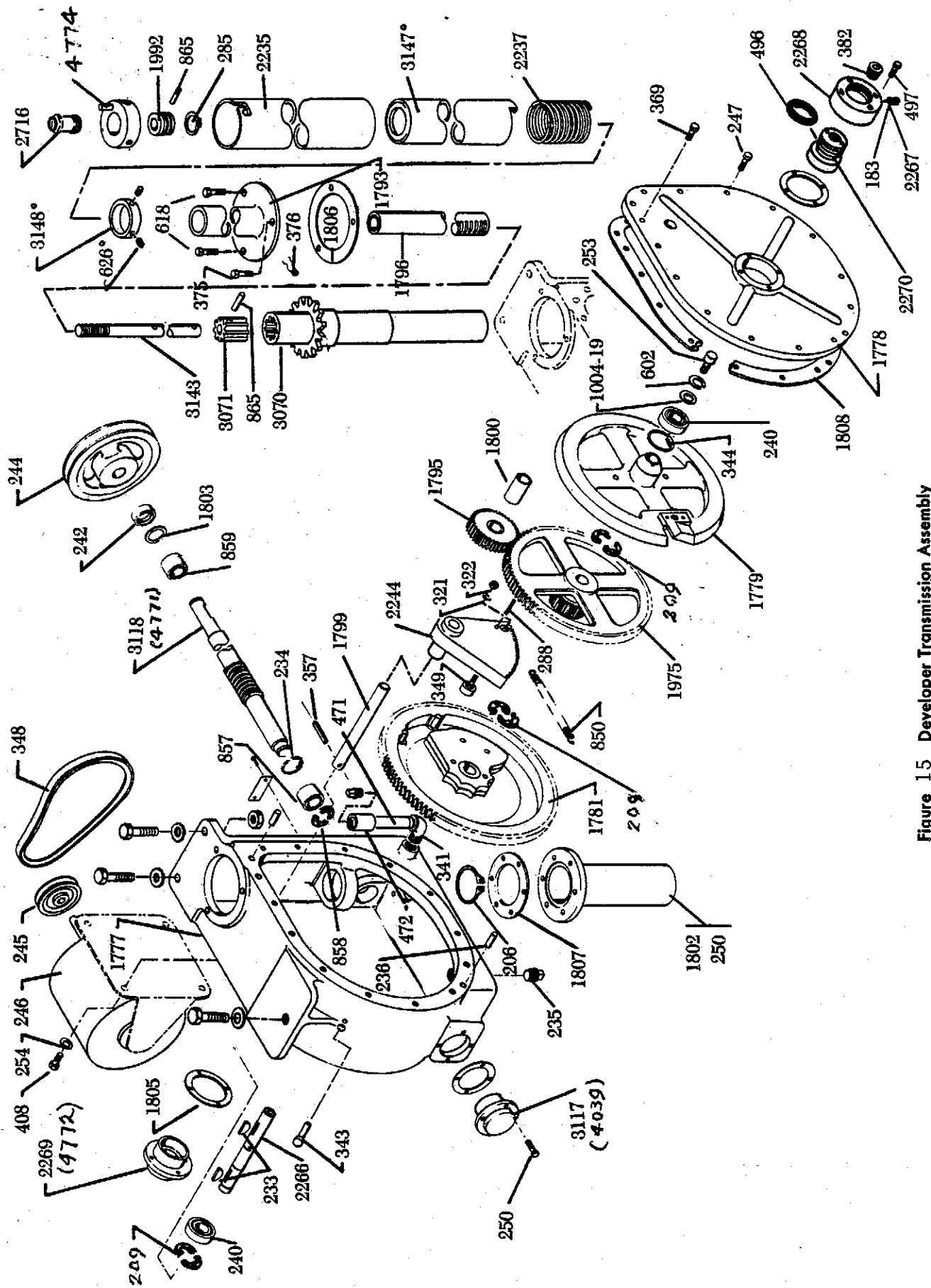


Figure 15 Developer Transmission Assembly

13. Run transmission under power a short time while noting the amount of agitation the Spider Assembly develops while operating in its lower position. If there is little agitation, loosen the two set screws that affix bumper spring collar to the guide tube and move collar to a lower position. *Agitation is necessary for proper development.* Should Transmission pound on down stroke, move Collar to higher position to eliminate noise.

14. Adjust each of the seven paper carriers to the Feed-Down Assembly. Refer to Figure 5.

15. Check alignment of Delivery Unit Assembly to paper carriers. Refer to Figure 6.

**DEVELOPER TRANSMISSION ASSEMBLY 9110
PARTS LIST**

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
9116	1	Developer Transmission Assembly	858	1	Snap Ring
183	2	Set Screw	859	1	Bushing
206	1	Snap Ring	865	2	Roll Pin
233	2	Woodruff Key	1004-19	1	Washer
234	1	Snap Ring	1777	1	Housing
235	2	Pipe Plug	1778	1	Cover
236	2	Dowel Pin	1779	1	Index Disc
240	2	Bearing	1781	1	Worm Wheel & Cam Assembly
242	1	Oil Seal	1793	1	Guide Tube Assembly
244	1	Pulley	1795	1	Idler Assembly
245	1	Pulley	1796	1	Rack Assembly
246	1	Motor	1799	1	Idler Shaft
247	13	Cap Screw	1800	1	Spacer, Idler
250	14	Screw	1802	1	Extension Sleeve Assembly
253	1	Cap Screw	1803	1	Spacer
254	4	Washer	1805	3	Gasket
285	1	Snap Ring	1806	1	Gasket
288	1	Groove Pin	1807	1	Gasket
321	1	Lock Washer	1808	1	Gasket
322	1	Nut	1975	1	Cluster Gear Assembly
341	1	Street Ell	4-714	1	Drive Flange Assembly
342	1	Spring	1992	1	Drive Collar
343	1	Clevis Pin	2107	1	Replaced by Part No. 244
344	1	Snap Ring	2235	1	Shaft Guard, Outside
348	1	V-Belt	2237	1	Spring, Bumper
349	1	Cam Follower	2244	1	Sector Gear
357	1	Roll Pin	2266	1	Gear Shaft
369	1	Cap Screw	2267	2	Stop, Adjusting Retainer
375	1	Screw	2268	1	Flange, Adjusting
376	1	Seal, Lead	2269 (4772)	1	Retainer, Plain
382	1	Pipe Plug	2270	1	Retainer, Adjusting
408	4	Machine Screw	2716	1	Nut, Spherical
471	1	Nipple	2724	1	Arrow Label
472	1	Coupling	2995	1	Spacer, Gear
496	1	O-Ring	3070	1	Index Tube Assembly
497	4	Screw	3071	1	Spline, Index
512	3	Set Screw	3117 (4039)	1	Retainer, Worm Shaft
209	3	Snap Ring	3118 (477)	1	Worm
602	1	Lockwasher	3143	1	Index Shaft
618	2	Cap Screw	3147*	1	Shaft Guard, Inside
626*	2	Set Screw	3148*	1	Collar, Bumper Spring
857	1	Bearing, Double Row			

* For use with plastic Outside Shaft Guard, Part No. 2235, only.

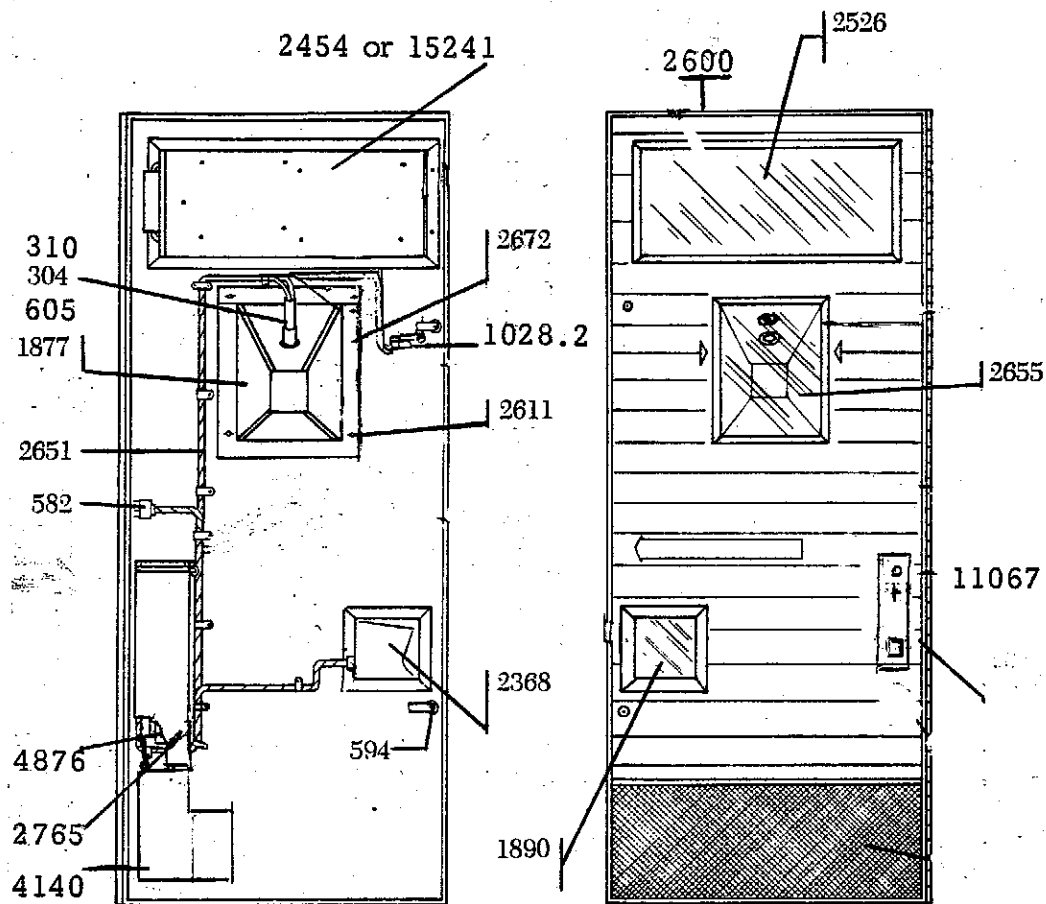


Figure 16 Door Assembly 973

973	Door Assembly Complete	11067	Coin Mechanism
2600	Door	2765	Cover - Coin Mechanism
2526	Top Glass	4140	Coin Box
1890	Lower Glass	4876	Holder - Coin Box
1788	Funnel	2651	Door Harness
2672	Retainer - Funnel	582	Plug
304	Red Light	1028.2	Switch
310	Green Light	2368	Housing - Lower Light
305	Lamps - 2	2454	or Upper Light Box
594	Locks - 2	15241	

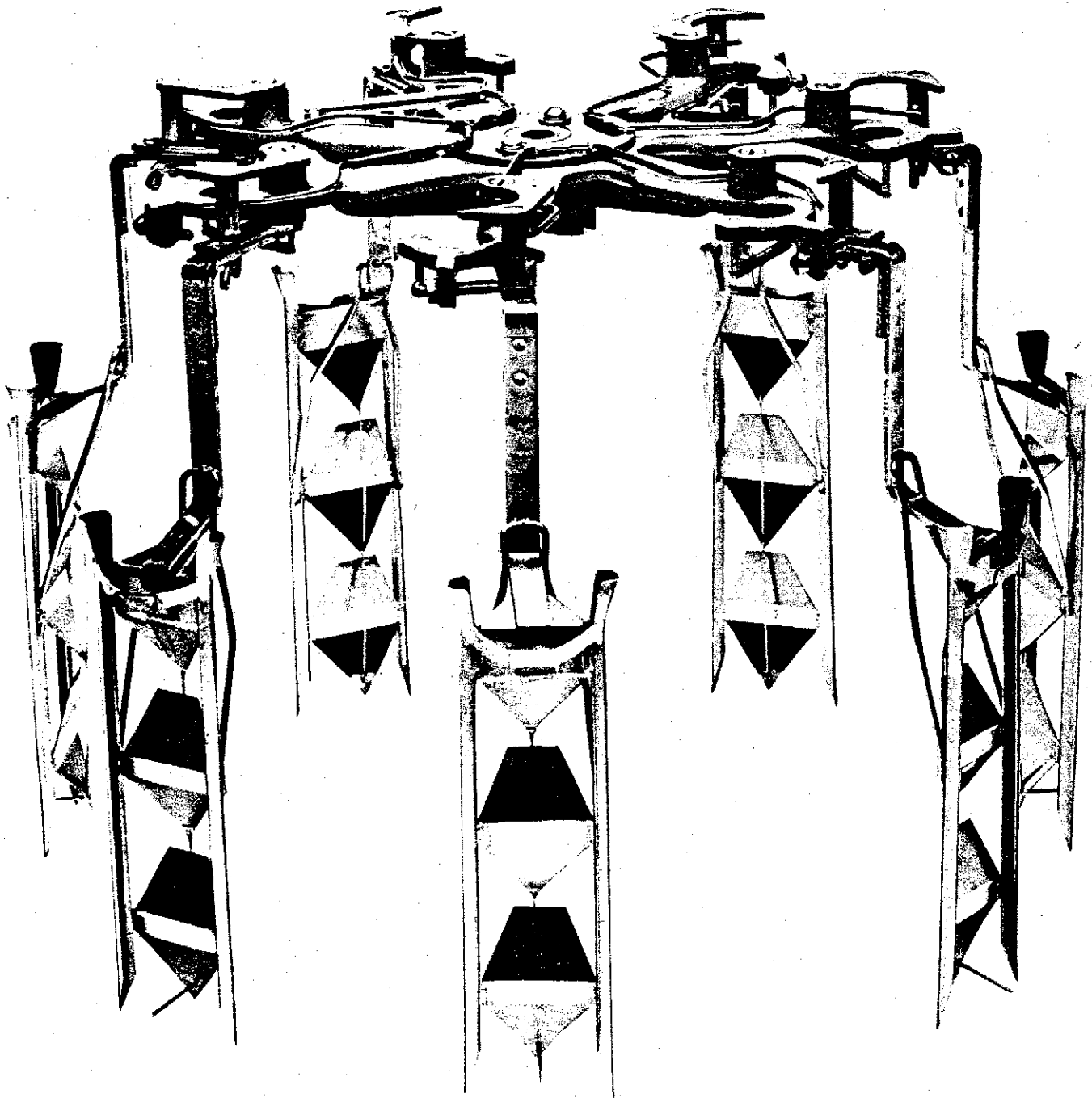
Spider assembly

REMOVAL

1. With Spider Assembly in down position, disconnect electrical power to Studio by removing service cord plug from wall receptacle.
2. Remove spherical nut and lift Spider Assembly from transmission shaft. To avoid bending paper carriers set Assembly upside down.

INSTALLATION

1. With transmission shaft in its down position, place Spider Assembly on shaft with the positioning pin on the top of the transmission shaft collar fitting into the slot on the spider assembly casting.
2. Connect electrical power to Studio.



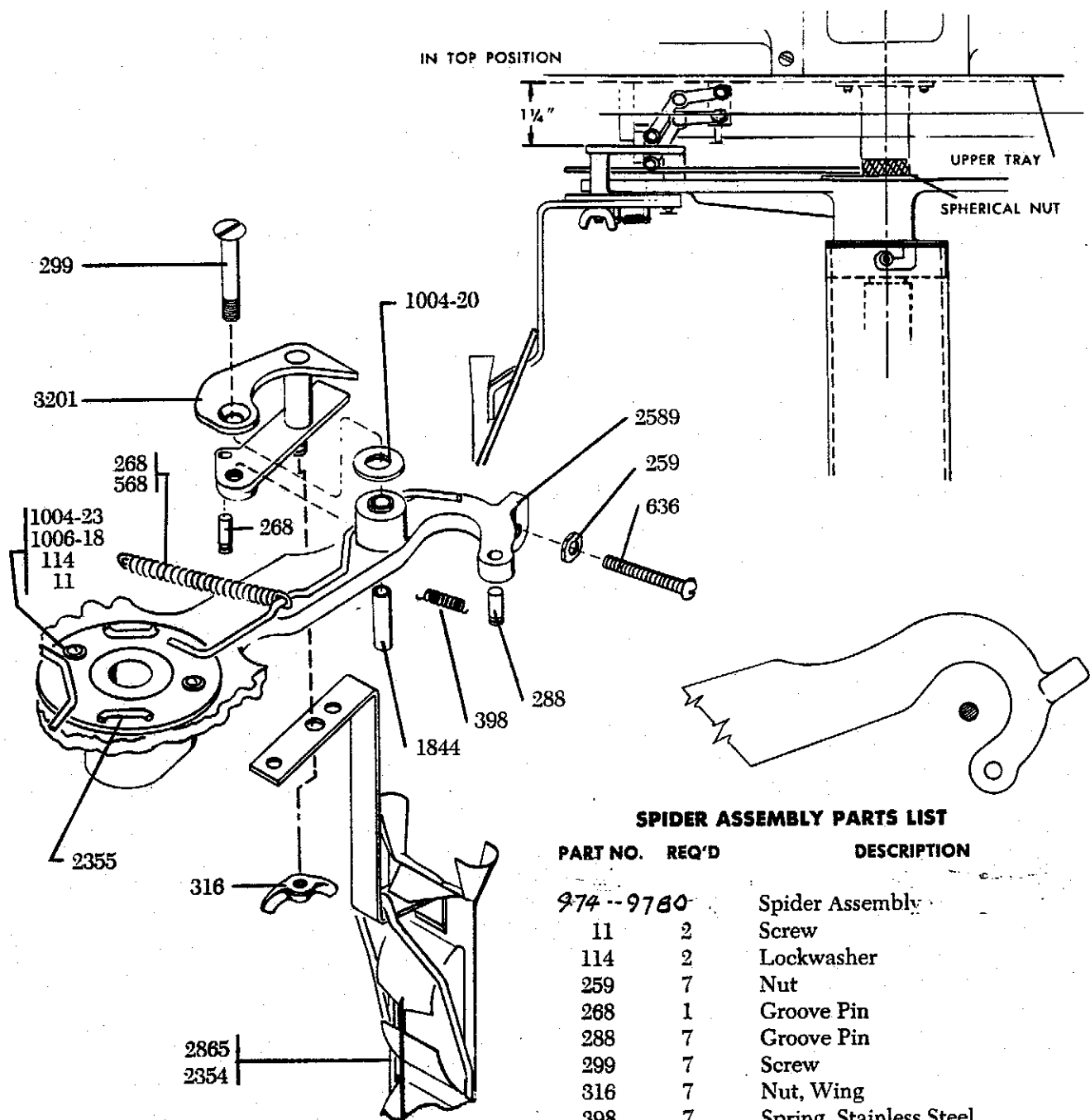


Figure 17 Spider Assembly

SPIDER ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION
974--9780		Spider Assembly
11	2	Screw
114	2	Lockwasher
259	7	Nut
268	1	Groove Pin
288	7	Groove Pin
299	7	Screw
316	7	Nut, Wing
398	7	Spring, Stainless Steel
568	1	Spring
636	7	Screw, Stainless Steel
1004-20	7	Washer
1004-23	2	Washer
1006-18	2	Spacer
1844	7	Spacer
2354	7	Carrier Assembly, Paper (159 paper)
2355	1	Disc Assembly, Control
2589	1	Spider Casting Assembly
2865	7	Carrier Assembly, Paper (209 paper)
3201	7	Cam Assembly, Turn

Paper feed-down assembly

REMOVAL

1. Disconnect electrical power to Studio by removing service cord plug from wall receptacle.
2. Disconnect wiring.
3. Rotate camera to outward position to gain access. Remove two machine screws which hold Paper Feed-Down Assembly to the upper tray.

NOTE: Support weight of Assembly with one

hand while removing last screw to avoid dropping and possible damage to Assembly.

INSTALLATION

1. Attach Assembly to upper tray with two machine screws, connect wiring.
2. Connect electrical power to Studio.
3. Align paper carriers to Paper Feed-Down Assembly (figure 5).

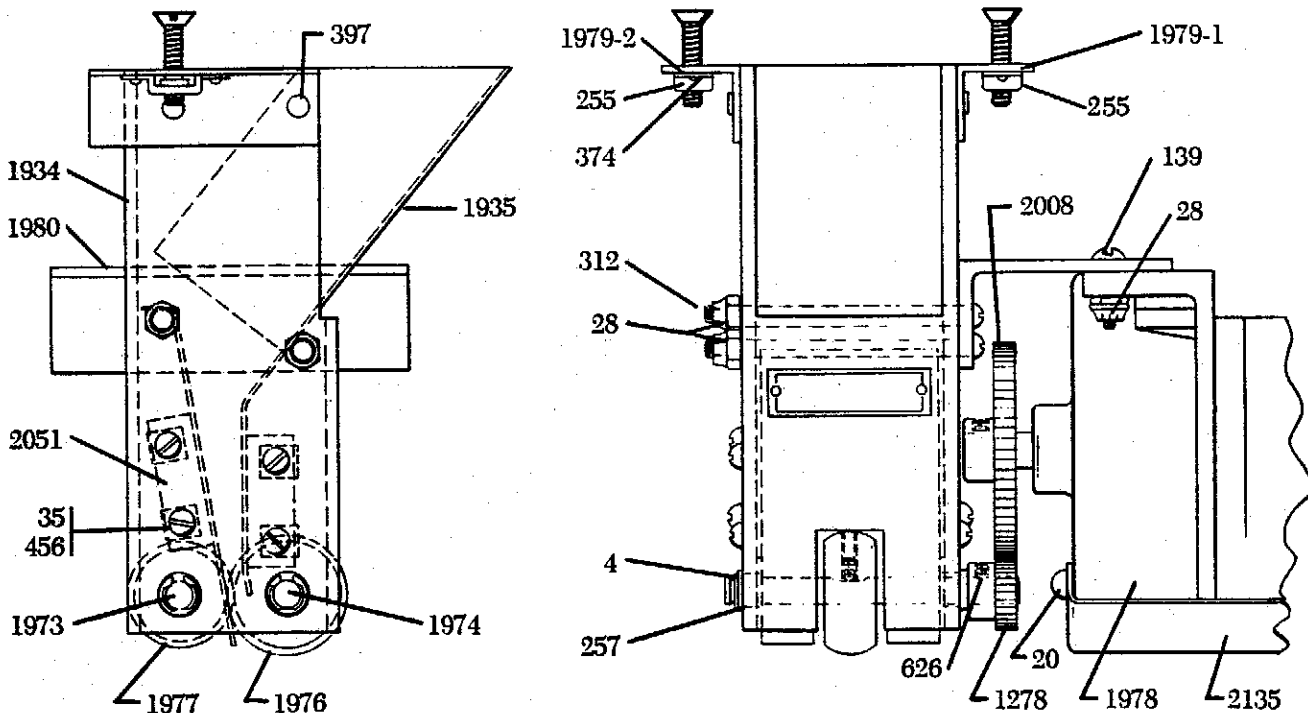


Figure 19. 9175 Paper Feed-Down Assembly

9175 PAPER FEED-DOWN ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
		Paper Feed-Down Assembly	1984	1	Frame Assembly
4	3	Snap Ring	1985	1	Chute Assembly
20	2	Screw	1973	1	Shaft - Drive
28	4	Nut	1974	1	Shaft - Idler
35	7	Screw	1976	1	Roll - Idler
139	2	Screw	1977	1	Roll - Drive
255	2	Nut - Shell	1978	1	Motor
257	4	Bushing	1979-1	1	Attach Angle - Left
312	2	Screw	1979-2	1	Attach Angle - Right
374	4	Rivet	1980	1	Motor Bracket
397	4	Rivet	2008	1	Gear Assembly
456	1	Screw	2051	1	Chute - Rear Assembly
626	4	Setscrew - Stainless Steel	2135	1	Pan - Feed Down - Oil
1278	1	Gear			

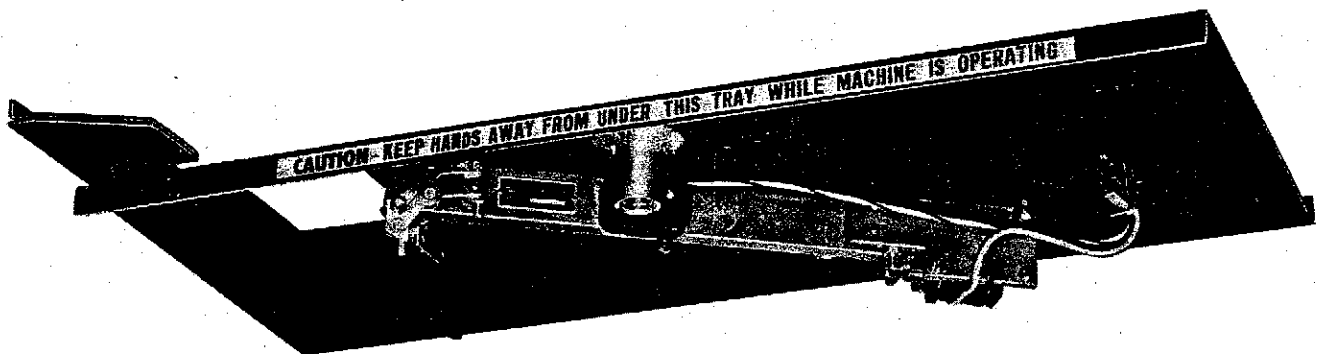
Trigger assembly

REMOVAL

1. With Spider Assembly in its down position, disconnect electrical power to Studio by removing service cord plug from wall receptacle.
2. Rotate camera outward to gain access to screws holding Trigger Assembly to upper tray.
3. Remove stop nut on round-head screw.
4. Support Trigger Assembly with left hand and remove flat-head screw.

INSTALLATION

1. Rotate camera to outward position.
2. Hold Trigger Assembly in left hand and fasten Assembly to bottom side of upper tray with flat-head screw, machine screw and stop nut.
3. Rotate camera to operating position and connect electrical power to Studio.



TRIGGER ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
978	1	Trigger Assembly	139	1	Screw
2142	1	Frame Assembly	12	3	Screw
2148	1	Lever Assembly, Lower	462	2	Groove Pin
2337	1	Lever Assembly, Upper	1247-10	4	Sleeve, Insulating
2279	1	Turn-In Pin Assembly	2756	1	Block, Solenoid
2276	1	Turn-Out Pin Assembly	2342	1	Pin, Ball
2032-4	1	Wire Lead 10" Yellow & Green Tr.	259	1	Nut
2032-5	1	Wire Lead 11" Yellow & Brown Tr.	444	2	Ring
1028-5	1	Microswitch	445	1	Ring
2755	1	Solenoid Assembly	1006-25	1	Bushing, Spacer
2200	1	Link, Solenoid	258	8	Ring
491	1	Jones Plug	2341	1	Block, Lever
1004-25	2	Washer	463	1	Ring
191	1	Clamp, Plastic	1004-23	2	Washer
8	2	Screw	28	5	Nut
			485	2	Spring
			2591	1	Pin, Solenoid Link

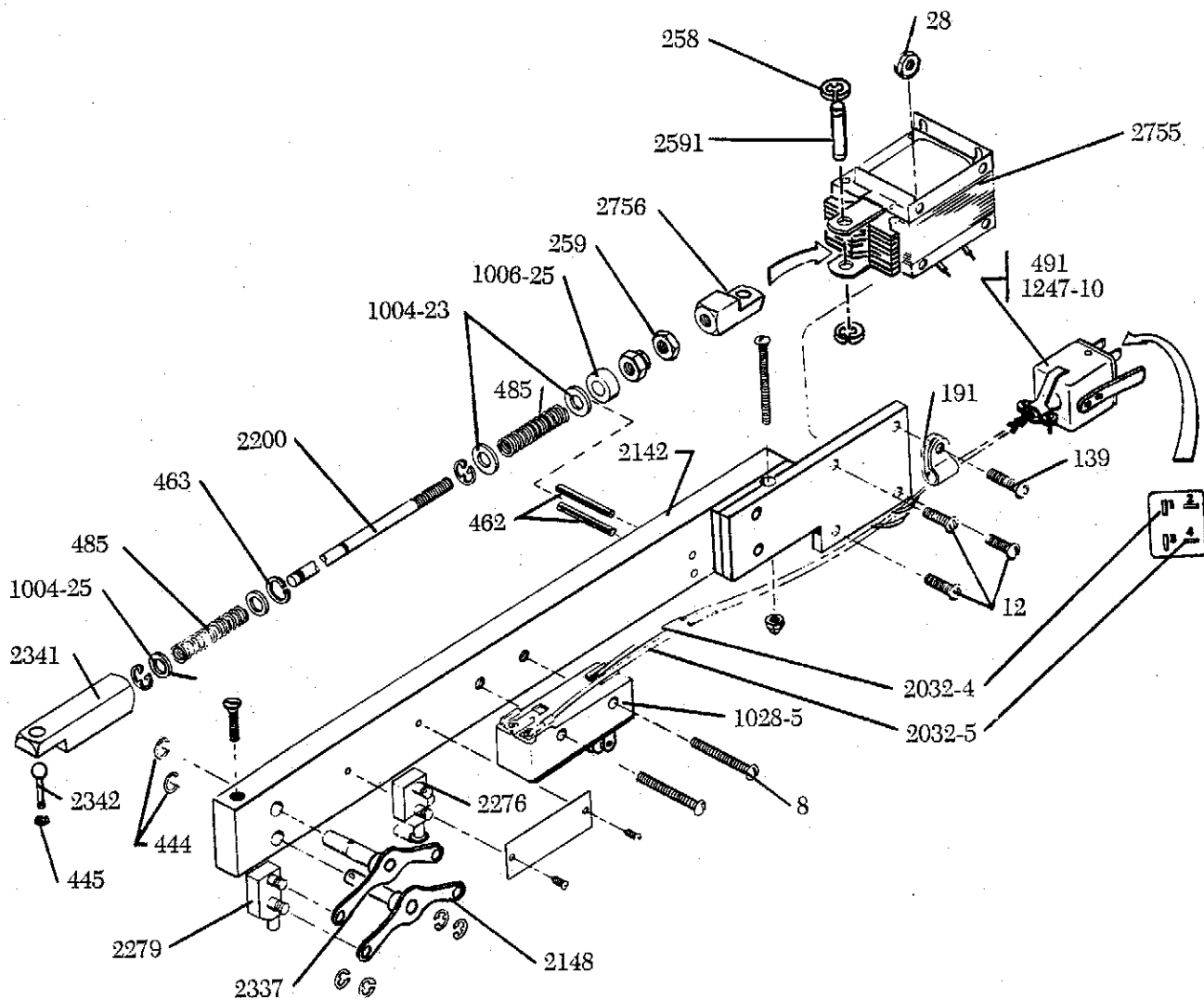


Figure 32 Trigger Assembly

TRIGGER LINKAGE ADJUSTMENT

The Trigger Linkage requires adjustment when turn-in and turn-out pins fail to make a full stroke.

1. To adjust, hold solenoid in its energized position and loosen jam nut (#259).

2. Screw solenoid link (#2200), in or out, until carrier turn-out pin (#2276) is in extreme down position without compressing spring (#485)

and tighten jam nut (#259).

3. Let solenoid out to its de-energized position.

4. Turn stop nut (#28) until carrier turn-in pin (#2279) is in extreme down position and tighten stop nut (#28) one-half turn. This releases pressure on ball pin (#2342) and stops forward motion of solenoid on groove pins (#462).

STUDIO ASSEMBLY PARTS LIST

PART NO.	REQ'D	DESCRIPTION	PART NO.	REQ'D	DESCRIPTION
8	2	Screw	506	2	Screw
11	2	Screw	514	1	Socket 4
12	3	Screw	515	2	Screw
15	6	Screw	531	11	Screw
16	4	Screw	536	2	Spring
17	2	Screw	573	4	Washer - Lock
27	10	Nut - Stop	574	1	Screw
28	6	Nut - Stop	577	4	Nut - Acor.
31	2	Nut - Pal	578	4	Bolt - Elevator
35	2	Screw	583	1	Socket 8
37	20	Screw	591	4	Screw
44	5	Nut - Stop	604	1	Seal - Snapin
86	24	Screw	605	2	Reflector - Tube
87	2	Screw	616	2	Socket - Starter
104	2	Screw	659	1	Thermometer - Chemical
124	1	Grommet - Rubber	743	1	Socket 18
133	2	Bolt - Carriage	806	18	Screw
138	2	Nut - Wing	807	2	Elbow - Wiremold
155	1	Comb. Switch & Recep.	808	2	Clip - Wiremold
156	1	Plug - Cutout	809	1	Raceway - Wiremold
157	2	Connector	812	2	Hinge - 1" - Butterfly
168	1	Cap - Wire	814	1	Knob - Back Rest
188	2	Starter	863	16	Tile - Floor Nubian
197	2	Tube - Strobe	883	1	Plate - On-Off
208	2	Lamp - Fluorescent	9175	1	Feed Down Assy.
220	1	Socket 15			
229	4	Screw	9140	1	Delivery Unit Assy.
237	1	Fuse			
238	1	Fusestat Adaptor			
259	1	Nut - Jam			
293	4	Clip - Tinnerman	14048	1	Relay Assy. - Camera
296	9	Washer - Finishing	9180	1	Feed Down Assy.
300	7	Screw	993	1	Camera Assy.
304	1	Inst. Light - Red	994	1	Camera Assy.
307	1	Counter	995	1	Camera Assy.
310	1	Inst. Light - Green	996	1	Camera Assy.
358	1	Roll Pin			
363	2	Socket	1004-15	6	Washer
366	4	Lampholder	1004-22	3	Washer
368	1	Ballast - Fluorescent	1006-41	1	Spacer
381	5	Screw	1008-1	1	Terminal Strip
385	4	Screw	1028-12	2	Microswitch
387	1	Lock	1253	1	Fan Assembly
391	2	Nut - Hex	1818	1	Chute Assy. - Delivery
394	4	Screw	1877	1	Funnel
402	10	Washer - Finishing	1924	1	Bushing - Ball Guide
403	8	Screw	1957	1	Bolt Assy. - Lock
409	1	Bolt - Carriage	1981	1	T-Bar Assy.
416	10	Screw	1998	1	Frame Assy. - Lt. Box
429	1	Grommet - Rubber	2004	1	Plate - Striker
450	1	Switch - Toggle	2005	1	Pane - Light Box

2013	1	Return - Lower Right	2726	1	Block Assy. - Strobe
2014	1	Return - Lower Left	2746	1	Insert Assy. - Seat &
2015	1	Door Assembly - Lower	2931	1	Tray - Stainless
2017	1	Return - Dark Room Top	2954	1	Moulding - I.D. Back
2018	1	Return - Dark Room Hinge	2969	1	Glass - Back Rest
2019	1	Return - Dark Room Lock	2970	1	Harness Assy. - 11-C Main
2021	1	Bushing - Guide	2971	1	Washer - Seat
2024	1	Hinge	2982	2	Threshold - I.D.
2053	1	Cord Service	2996	1	Plate - Start & Light
2057	1	Case Assy. - Fuse Box	3017	1	Rod - Stirring
2058	1	Shield - Insulating	3029	2	Bracket - Rear Strobe
2072	1	Bolt - Short	3030	1	Bottom - Back Rest
2073	2	Bolt - Long	3072	1	Block - Switch
2090	1	Hinge Door - Lower	3073	1	Moulding - Long Back Rest
2116	1	Duct - Air	3074	1	Moulding - Right Back Rest
2119	1	Flange - Grommet	3075	1	Moulding - Left Back Rest
2120	1	Locator Assy. - Strobe	3087	1	Panel Assembly - Back
2122	1	Vent - Cover	3108	1	Trim - Lower Cabinet
2199	1	Switch - Cut Off	3109	1	Cap - Lower Trim
2222	1	Gauge - Carrier	3110	1	Moulding - Roof
2271	1	Frame - Vent Cover	3111	2	Clip - Moulding
2310	1	Gauge - Sleeve	3114	1	Moulding - Center
2330	2	Clip - Fluted	3116	1	Backrest Assembly
2370	1	Screw Assy. - Seat	3189	1	Harness Assy. - Right
2374	1	Mount - Ballast			Rear Strobe
2444	1	Box - I.D. Switch	3190	1	Harness Assy. - Left
2445	1	Collar - Seat Screw			Rear Strobe
2457	2	Stud - Short Tray	3191	1	Stud - Short Tray
2458	2	Stud - Long Tray	9101	1	Door Assy.
2501	1	Bracket - Switch	9102	1	Camera Assy.
2621	2	Bracket - Strobe	9110	1	Transmission Assy.
2625	1	Pedestal Assy.	9112	1	Camera Assy.
2629	1	Seat Assy. - Pedestal	974	1	Spider Assy.
2709	1	Sequence Label - Tank	9780	1	Spider Assy.
2710	1	Caution Label - Tray	978	1	Trigger Assy.
2711	1	Gauge Label - Carrier			

LUBRICATION REQUIREMENTS

TRANSMISSION ASSEMBLY – Change oil every 6 months. Replace with 2 quarts automotive automatic transmission fluid (Mobil #200 or equivalent).

CAMERA MOTOR – Once a year, add 2 drops of oil in each of 3 oil holes. Check oil level inside gear-box. (Maintain oil level below drive shaft.)

TRANSMISSION DRIVE MOTOR – Once a year, add 2 drops of oil in each of two oil caps.

EXHAUST FAN MOTOR – Once a year, add 2 drops of oil in each of two oil caps.

BLACK AND WHITE OPERATION

BLACK AND WHITE OPERATION

Strobe unit assembly

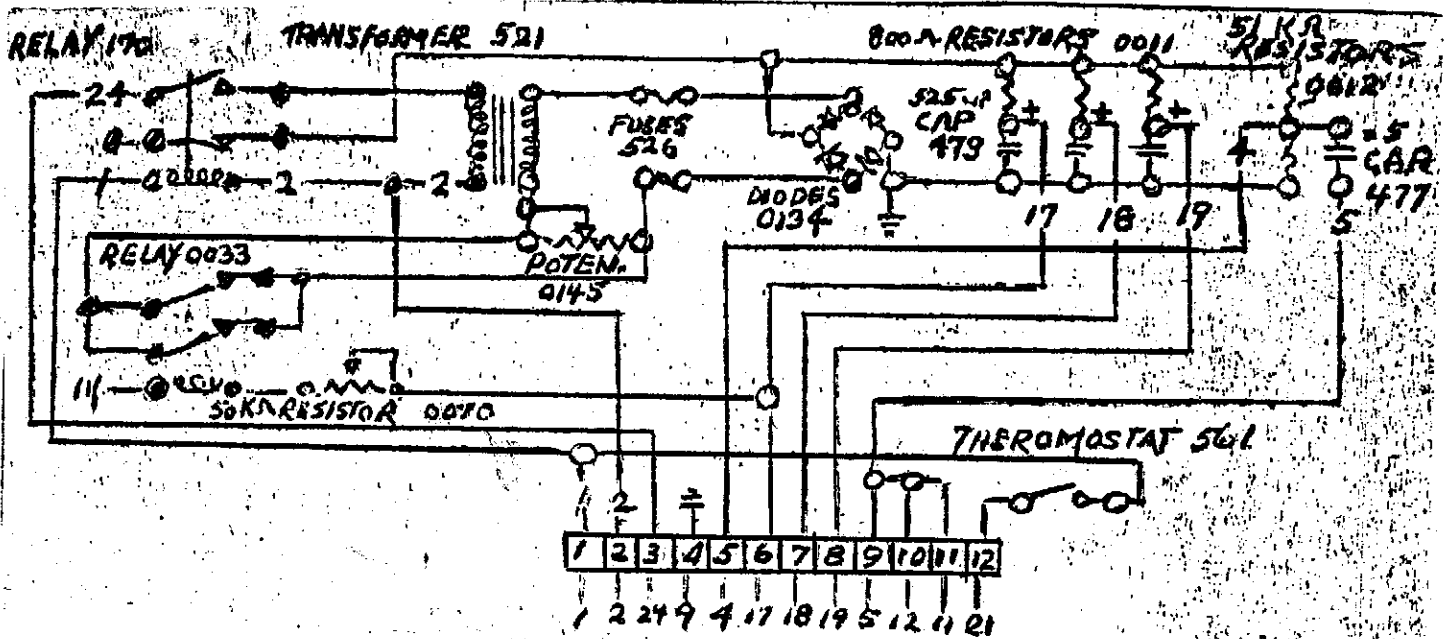
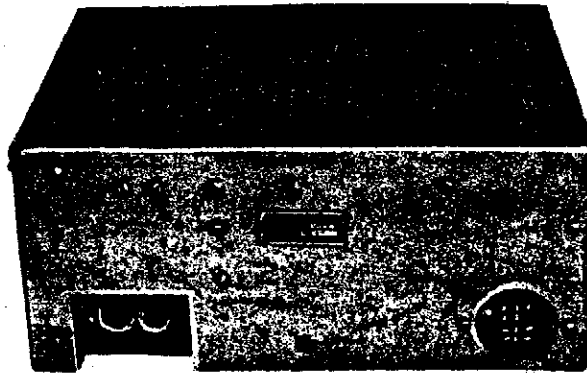
9113

REMOVAL

1. Switch off Machine.
2. Remove plug from Unit.
3. Remove wing nut from Coach bolt holding

wooden mounting block.

4. Remove Coach Bolt and mounting block. Slide Unit forward clear of rear mounting pin and remove.



NO. REQUIRED

PART NO.

1	170	RELAY
3	473	CAPACITOR
1	477	CAPACITOR
1	521	TRANSFORMER
2	526	FUSE
1	561	THERMOSTAT
3	0011	RESISTOR
2	0012	RESISTOR
1	0032	RELAY
1	0070	RESISTOR
4	0134	DIODE
1	0145	POTENTIOMETER

BLACK AND WHITE CHEMICAL MAINTENANCE

SEE INSTRUCTIONS FOR INSTALLATION SUPPLIED WITH CHEMICAL PACKAGES

1. Make regular maintenance and service checks.
 - a. Calibrate the heater thermostat to yield a solution temperature of 86°F (30°C). Lack of heat will cause the picture to yellow and the clearing solution to crystalize. Regularly measure solution temperature and compare with thermostat setting.
 - b. Change water rinses once a week and not later than two weeks. A priming pump (siphon mechanism) is useful to change rinses without removing the tanks from the dark room.
 - c. Take extreme care to clean water rinses between toner and developer. They must be changed at least once a week. A small amount of toner introduced into the developer will contaminate the developer and possibly destroy it.
 - d. Remove film immediately from developer caused by carrier malfunction. Again, developer may be ruined.
2. Clean carriers at least once a month.
3. Study the picture for quality and make adjustments to correct defects.

Dark or brownish
and/or
Gray markings in the
Background

Defective or
Cold Developer

Add or Change
Developer and
Immediate Rinses

Yellow markings on
Side

Defective Bleach
or Clearing

Add clearing or remove
some bleach and replace
with water

Gray lines on side

Weakened Bleach

Add Bleach

Overall Sepia Color

Toner Failure

Change Toner

Underdeveloped line
on bottom of photo-
graph

Chemicals low in
tank

Add developer solution
and/or water to low tank

Improving quality of photographs

CONDITION

SOLUTION

Prints Too Light

Overexposed

An iris opening of f/5.6 to f/8 will normally give best results. If prints are too light rotate iris adjusting ring towards higher number "f" reading. To gain access to adjusting ring rotate Camera Assembly counter-clockwise until left end of camera faces operator and open pivot door on camera housing.

Overdeveloped
(Chemicals too hot)

Check temperature of developer solution. Check heater and thermostat elements.

Pre-exposed paper

Change paper and check magazine for light leaks.

Prints Too Dark

Underexposed

An iris opening of f/5.6 to f/8 will normally give best results. If prints are too dark, rotate iris adjusting ring towards lower number "f" reading. To gain access to adjusting ring rotate Camera Assembly counter-clockwise until left end of camera faces operator and open pivot door on camera housing.

Underdeveloped
(Chemicals too cold)

Check temperature of developer solution. Check heater and thermostat elements. To insure properly developed prints throughout each day, current to the Studio should be left on at all times. If it is necessary to disconnect the current at night, be sure to turn it on again at least one hour before the start of the day's business to insure proper heating of developer solution.

(Life of chemicals exhausted)

Change chemicals.

Poor Contrast

Over-age paper

Change paper roll.

Foreign Images On Prints

Portion of photo masked out
(Paper remnant in lens backing plate)

Remove paper remnant with fingers, or, if necessary, take off backing plate

Oil spots
(Results of over or improper oiling)

1. Check for source of contamination. Remove free oil from surfaces of camera backing plate, cut-off blade, Feed-down and Delivery Assemblies, paper carriers, etc. Clean all rollers in camera, Feed-down and Delivery Assemblies with solvent.

2. When lubricating Studio remove tanks. Any oil deposited in tanks will transfer to photo strips while being processed.

Small black spots on prints
(Dust or foreign particles
on film)

1. Thoroughly clean inside of paper magazine before loading.
2. Check velvet light seal on magazine
3. Remove paper dust with soft cloth or brush from inside of camera.
4. Clean all rollers in camera, Feed-down and Delivery Assemblies with solvent.
5. IMPORTANT—Keep inside of dark room compartment clean and free from dust and lint at all times.
6. Clean shutter opening and door funnel.
7. May be caused by dust particles floating on surface of developer solution. Remove by drawing a clean blotter or paper tissue over surface several times.

Blue streaks on prints
(Exhausted bleach)

Clean tanks and change chemicals. Check for cause of contamination.

Discoloration on prints
(Insufficient development at
these spots)

This condition is due to the paper being in too close contact with the carrier at these spots. Condition can be overcome by re-aligning carrier with Feed-down Assembly. Check to make sure carrier has not been bent or misshaped to cause inside surfaces to press against emulsion side of paper.

**Dark section at bottom of last
print on strip**
(Developer in tank #1 below
½ inch of top)

Fill tank #1 to within one-half inch of top.

**Light section at top of first
print on strip**
(Deposits in bottom of
chemical tanks)

1. Empty and clean tanks.
2. Chemicals not being thoroughly mixed when put into tanks. Follow instructions on packages.

Image blurred:

1. Lens out of focus or out of alignment
2. Lens and prism fogged or extremely dirty
3. Glass on door smudged or dirty

Return camera to factory for repair.

Return camera to factory for repair.

Clean glass with damp cheese cloth.

Unightly photo background

1. Soiled or torn back drape
2. Dirt on white background
(Paper carrier contaminated)

Replace with clean drape.

Thoroughly clean paper carrier.

Faulty Development

Over-age chemicals

Empty and clean all tanks. Refill tanks

Image in reverse
(Chemicals not in proper
tank sequence)

Check to see chemicals are in proper tanks.

Over-all "muddy" effect

Empty and clean tanks.

Prints overlapping on strip
(Loose or worn camera paper
feed rollers)

If drive roller is loose on shaft, tighten set screw. If worn or out of round, replace (parts #1966 and #1967).

STUDIO OPERATION WITH COLOR ADDED

The color system is additive to the basic black and white components of the studio with the existing strobe, flash tubes and temperature systems removed. For color a longer more intensive flash and an adjustable regulated strobe power is employed. Also, chemical heating requirements have less latitude than black and white; consequently, a fixed temperature is controlled with a new system within $\pm 1/2^{\circ}\text{C}$.

The following pages describe the operation and testing procedures of the temperature controller and strobe units, as well as color chemical usage and service, and color photographic quality maintenance.

TEMPERATURE CONTROLLER

The unit is designed to maintain the chemicals in the tanks at a constant temperature of 35°C ($95^{\circ}\text{F} \pm .05^{\circ}\text{F}$) and is so calibrated at the factory.

The probe measures the temperature of the chemicals, regulates and gates the input to the heating jacket by means of the controller and relay. The probe is normally placed in the fifth tank (second tank of the #2 chemical series).

The amber lamp on the panel flashing intermittently, indicates the temperature of the chemicals matches the dial reading in Centigrades. Calibration is accomplished by matching a thermometer reading of the chemicals with the dial reading (Round head screw slot is the indication line). It is important that calibration checks be made at regular intervals.

The amber lamp off indicates that the dial setting is lower than the actual temperature of the chemicals and the controller is allowing the chemical to cool.

The amber lamp glowing constantly indicates that the dial is set at a higher reading than the actual temperature of the chemicals and the chemicals are heating.

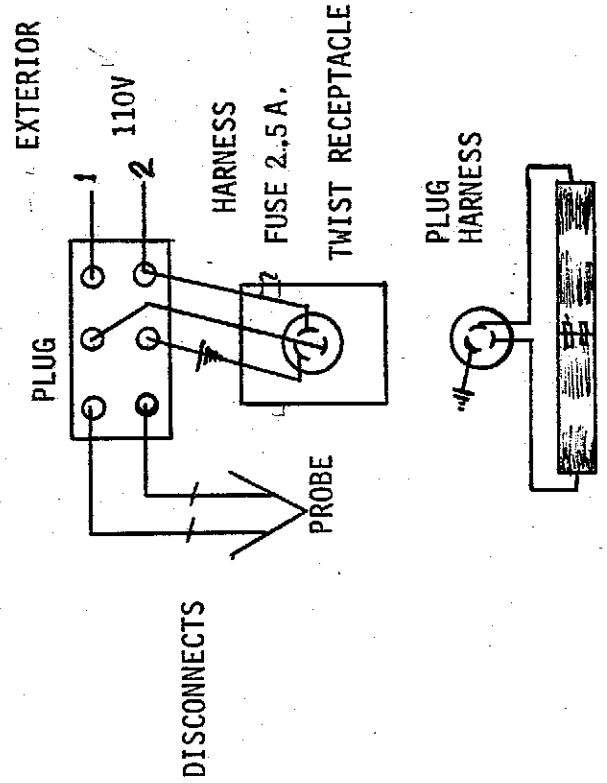
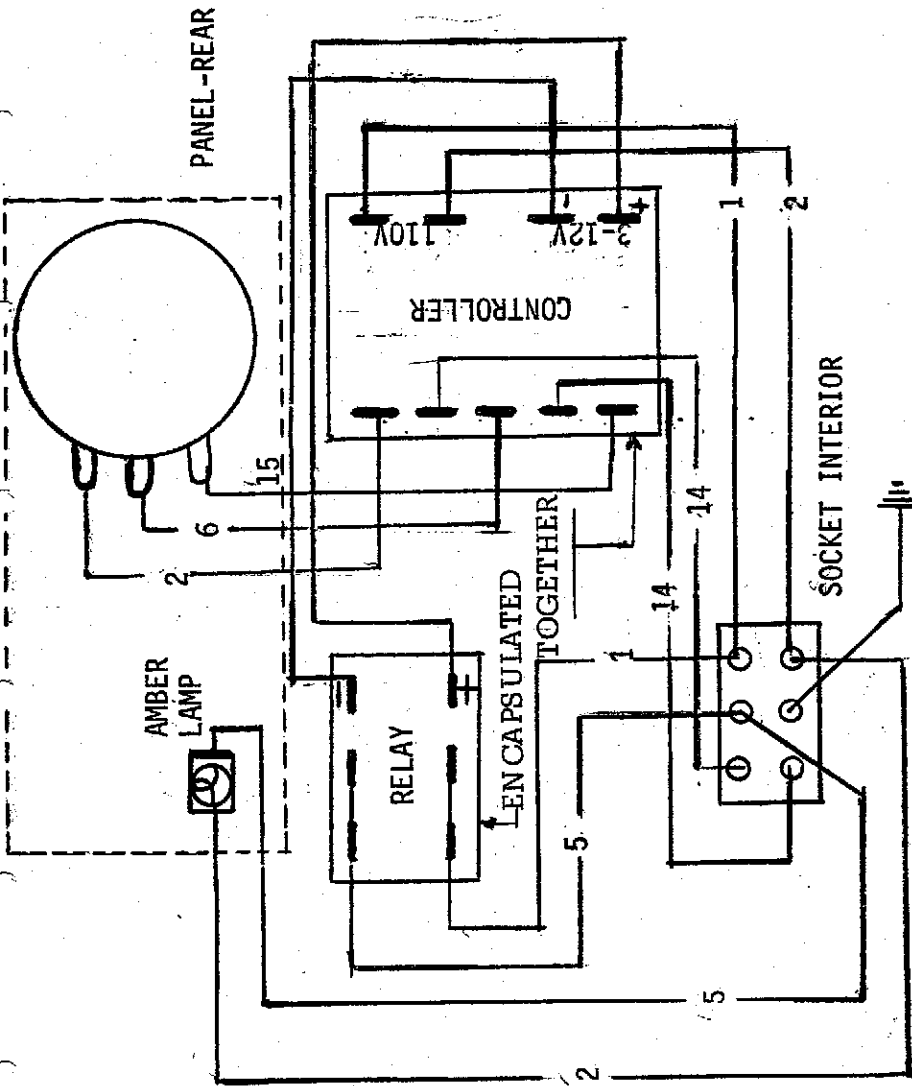
IMPORTANT: It takes up to three hours to balance the chemicals to the proper temperature.

With each new batch of chemical kit installation, set the controller dial from 32.5 to 33.5 (Centigrade reading) for two to three weeks. If the pictures eventually gray in spots, particularly around the edge and borders, increase the dial reading, but never more than 37°C .

HEAT CONTROLLER

WIRING COLOR CODE

- 1. BLACK
- 2. WHITE
- 4. YELLOW
- 5. RED
- 14. RED/BLACK STRIP
- 15. ORANGE



If chemicals are not heating, proceed as follows:

1. Check that probe disconnects are tightly connected.
2. Check that heating jacket harness cap is tightly inserted and twisted into socket.
3. Check that heater jacket is operational by connecting the jacket directly to a 110V source.
4. Check the 2.5 amp fuse on side of electrical box for burn out.
DO NOT REPLACE FUSE. Any Short Circuit Will Damage The Relay.
5. Before fuse replacement: Check for short circuit between relay and heating jacket or in the heating jacket.
6. Replace the relay.

If the red lamp is out and cannot be made to glow by raising the dial setting or replacing the lamp, check the voltage between the controller low voltage wire connectors (See Wiring Diagram Figure 23). Adjusting the dial to either extreme must vary the output between 3 and 12 volts in order to activate the relay.

STROBE UNIT AP-10

The basic purpose of the strobe design is to charge the capacitor packs with a high voltage and to discharge the packs at the precise moment to fire the four flash lamps in synchronization with the camera shutter. It is imperative to have highly efficient switching and control systems. The stepper relay is now an integral control unit of the strobe automatically counting the coins from a signal initiated by the coin mechanism. Any other stepper in the studio is redundant.

TEST PROCEDURE: One may localize any malfunctions in the studio electrical or mechanical systems by observing the results of tests listed below:

PREPARATION:

1. Make certain that the 3-pin plug-receptacle and the jones plug-receptacle leading to upper light box are tightly connected.
2. Make certain all studio harness connectors are made and all switches on the strobe unit front panel are in the UP position.
3. Turn studio on. Red OPERATION lamp on front panel must glow.

MANUAL STEPPER:

1. Press and release the STEPPER switch two, three or four times. Glow on RESET lamp must go out on the first depression of the switch.
2. Press and release the RESET switch. The stepper must release to its home position. RESET red lamp must glow.

IMPORTANT: ALWAYS reset the stepper manually before proceeding to other tests or operation of the studio.

CHARGE CYCLE:

1. Push the slide on the potentiometer to its lowest position and if meter starts to rise, immediately return ENABLE switch and depress the DISCHARGE switch. The REGULATOR in the strobe is not gating and must be replaced. If OK, Leave switch in down position.
2. Press the CHARGE switch and hold. The meter must rise, reach a reading in or slightly above the Blue limit, and then remain steady. Clicking noises will be heard indicating normal cycling by the strobe to maintain charge level. If meter continues to rise, immediately return the ENABLE switch to its UP position, and depress the DISCHARGE switch.
3. If OK, press DISCHARGE switch. All strobe lamps must fire.

WARNING: Discharge strobe after every charge test. Never leave capacitor packs powered.

4. Press CHARGE switch again and hold. Raise potentiometer slide switch slowly to its highest position while observing the meter. The meter reading must move with the switch, but remain below or just beyond the red limit at its upper switch position.
DISCHARGE STROBE.

CAMERA CYCLE:

1. Press CAMERA switch and hold momentarily and then release. The camera must start and darkroom components must go through a complete operational cycle. The flash tubes will not fire. Alignments and operational sequences may be observed without the necessity to more the darkroom door.

OPERATIONAL CYCLE:

1. Check that studio is prepared for operation.
 - A. Paper switch is activated with film or film substitute.
 - B. Amber OPERATION lamp glows.
 - C. Red REGULATOR lamp glows.
 - D. Red RESET lamp glows.

2. Press and release STEPPER switch a number of times corresponding to the number of coins designed for the studio to accept for one play (or insert the correct number of coins in the coin mechanism slot).

Observe the results in the sequences below.

- A. STEPPER relay must click for each coin or each time the switch is depressed.
- B. When the stepper click reaches the number corresponding to the number of coins required for one play.
 1. The strobe meter must rise to a preset level.
 2. Camera must start.
 3. All flash tubes must fire at the precise time the camera shutter opens.
- C. The sequence above must be repeated except for the camera start until the last flash (equivalent to the number of prints per strip dispensed by the studio). Prior to the last flash, the stepper must automatically reset and RESET lamp must glow.

The rapid sequencing may be confusing at first to follow, but with repetition a few times the cycle may be easily observed and analyzed.

SCHEMATIC CODE

INTERNAL WIRING

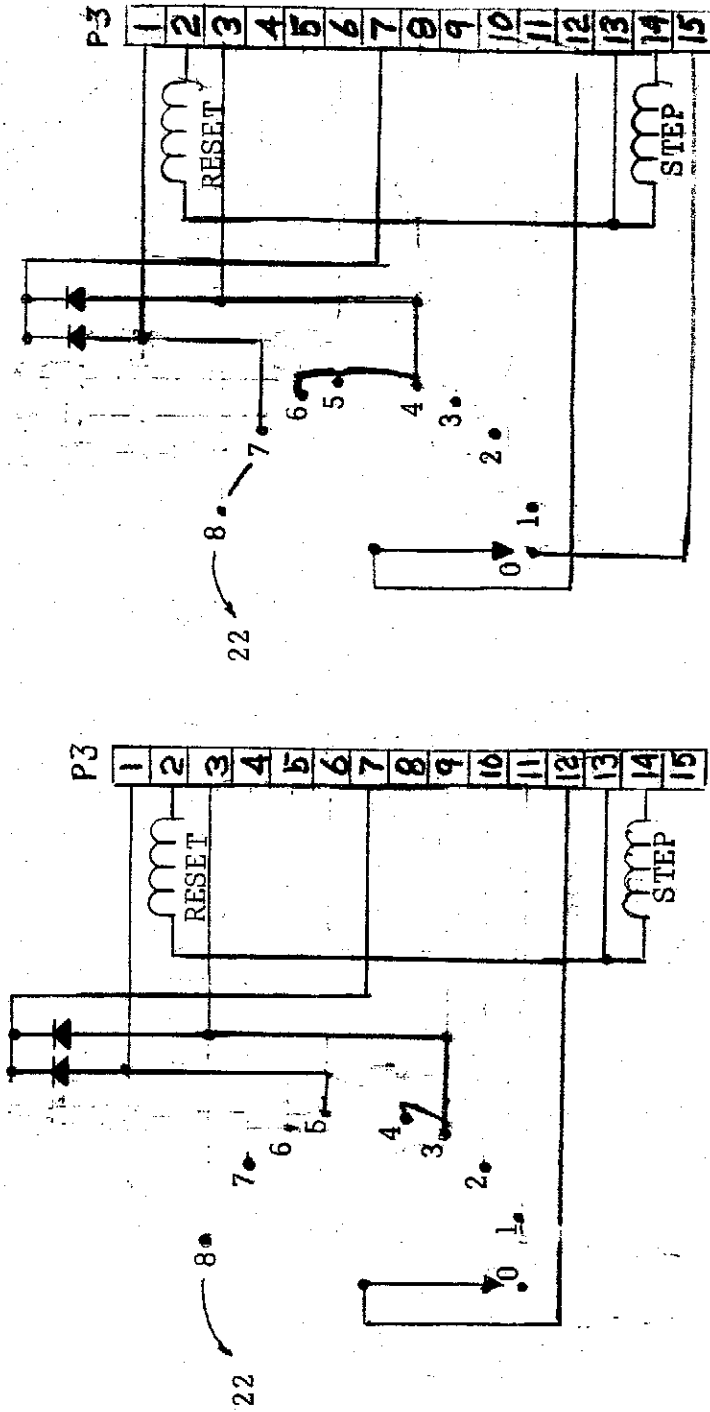
C14 Capacitor 500 MF 150V
 CB1 Circuit Breaker 10 amp.
 CB2 Circuit Breaker .3 amp.
 J1 15 Pin Molex receptacle Regulator Board
 J2 9 Pin Molex Receptacle Regulator Board
 J3 15 Pin Molex Receptacle Stepper Board
 I Meter 300-450V. dc
 P4 8 Pin Jones Plug
 P5 12 Pin Jones Plug
 R13 Potentiometer 50 K. ohms
 R14 Resistor 39K ohms 2W.
 T1 Transformer 400 VA.
 Camera SW Momentary
 Step SW Momentary
 Reset SW Momentary
 Charge SW Momentary
 Discharge SW Momentary
 Enable SW On-Off
 Operation Neon Lamp Amber
 Reset Neon Lamp Red
 Regulator Neon Lamp Red

CONTROL P/C BOARD

C1, C2 Capacitor 10 MF 450V.
 C3 Capacitor 4 MF 150V.
 D1 thru D4 Diode 3 amp. 600V.
 D5, D6 Diode 1 amp. 200V.
 K1, K2 Relay 4 PDT 110V. dc
 P1 15 Pin Molex
 P2 9 Pin Molex
 Q1, Q2 Transistor VCEO 300V. I_C-100 ma.
 R1 Resistor 10 Ohms 1W.
 R2 Resistor 270K Ohms 1W.
 R3, R7 Resistor 22K Ohms 1/2W.
 R4 Trimmer 50K Ohms
 R5 Resistor 100K Ohms 1/2W.
 R6, R8, R9 Resistor 5.6K Ohms 1/2W.
 R10 Resistor 470 Ohms 1/2W.
 R11 Resistor 100 Ohms 1/2W.
 R12 Resistor 1M Ohms 1/2W.
 TR1 Triac 30 amp. 200V. PRV
 Z1, Z3 Zener 160V. 5W.
 Z2 Zener 100V. 1W.

STEPPER P/C BOARD

Diodes
 SR1 1 amp. 200V.
 P3 Stepper Relay with Reset
 15 Pin Molex

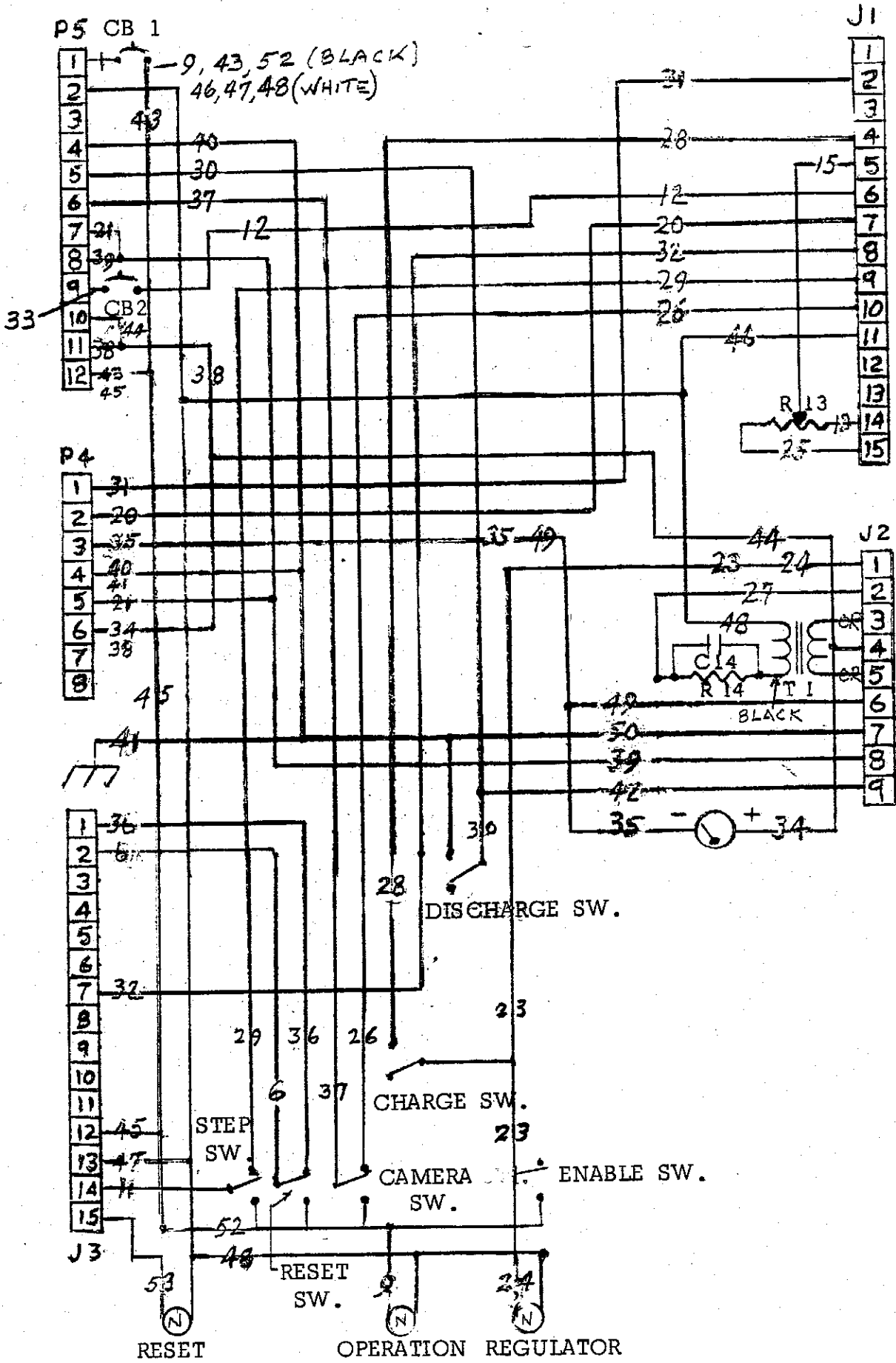


3 COIN
2 PICTURE
STEPPER CONFIGURATION

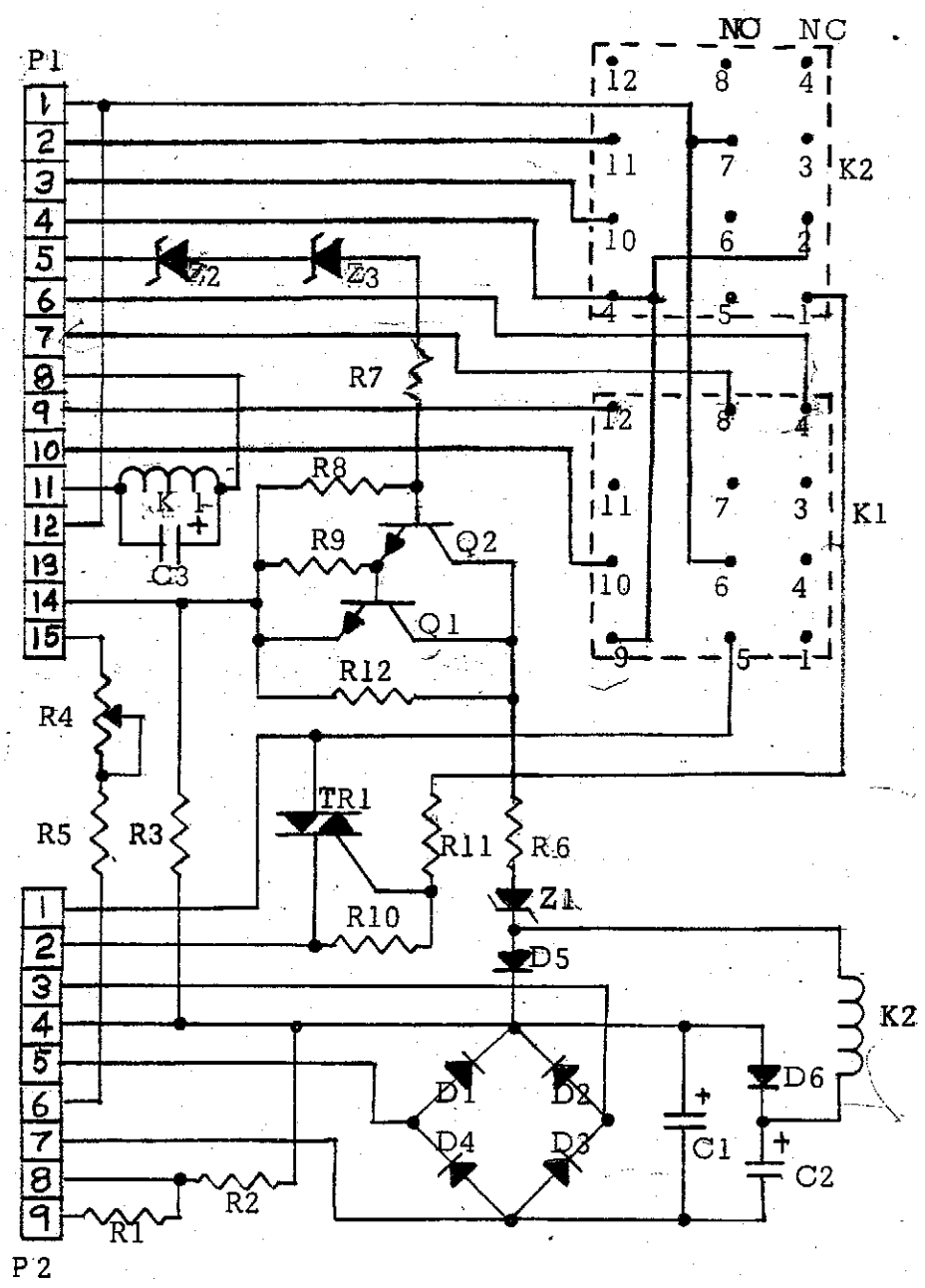
4 COIN
3 PICTURE
STEPPER CONFIGURATION

WIRING EXAMPLES

Stepper Terminals to P/C Board



INTERNAL WIRING
Figure 25



CONTROL P/C BOARD

Figure 26

COLOR CHEMICAL INSTALLATION

1. The chemicals in solution and water for rinses are poured from their delivery containers into tanks in a configuration shown in Figure 27 as follows:
 - A. Water rinse in Tank No. 14 directly under the feed down (Single Tank W)
 - B. #1 Chemical - Developer in Tank Nos. 1, 2, 3 (Triple Tank 1)
 - C. #2 Chemical - Bleach in Tank Nos. 4, 5 and 6 (Triple Tank 2)
 - D. Water rinse in Tank No. 7 (Single Tank W)
 - E. #3 Chemical - Fixer in Tank Nos. 8, 9 and 10 (Triple Tank 3)
 - F. Water rinses in Tank Nos. 11, 12, and 13 (Triple Tank W)

2-1/2 gallons fills 3 tanks.

2. Wrap the Heater Jacket around the tanks within the center portion of the outer side with clamp position at the juncture of Tanks 12 and 13. In order to avoid chemical temperature differences, loosen or tighten the jacket holder accordingly so that jacket is held in position with light pressure around the tanks.
3. Connect the Heater Jacket to its receptacle on the rear wall of the dark room.
4. Clip the Probe of the Temperature Controller on the side of the 5th tank (1st tank of the #2 chemical).
5. Set the Heat Controller Dial to a reading between 33.5°C and 34.5°C .
6. Swing all Carriers to their OUT position and adjust the position of the tanks so that each carrier on its motorized down phase passes through the center of each tank.

COLOR CHEMICAL TANK PLACEMENT

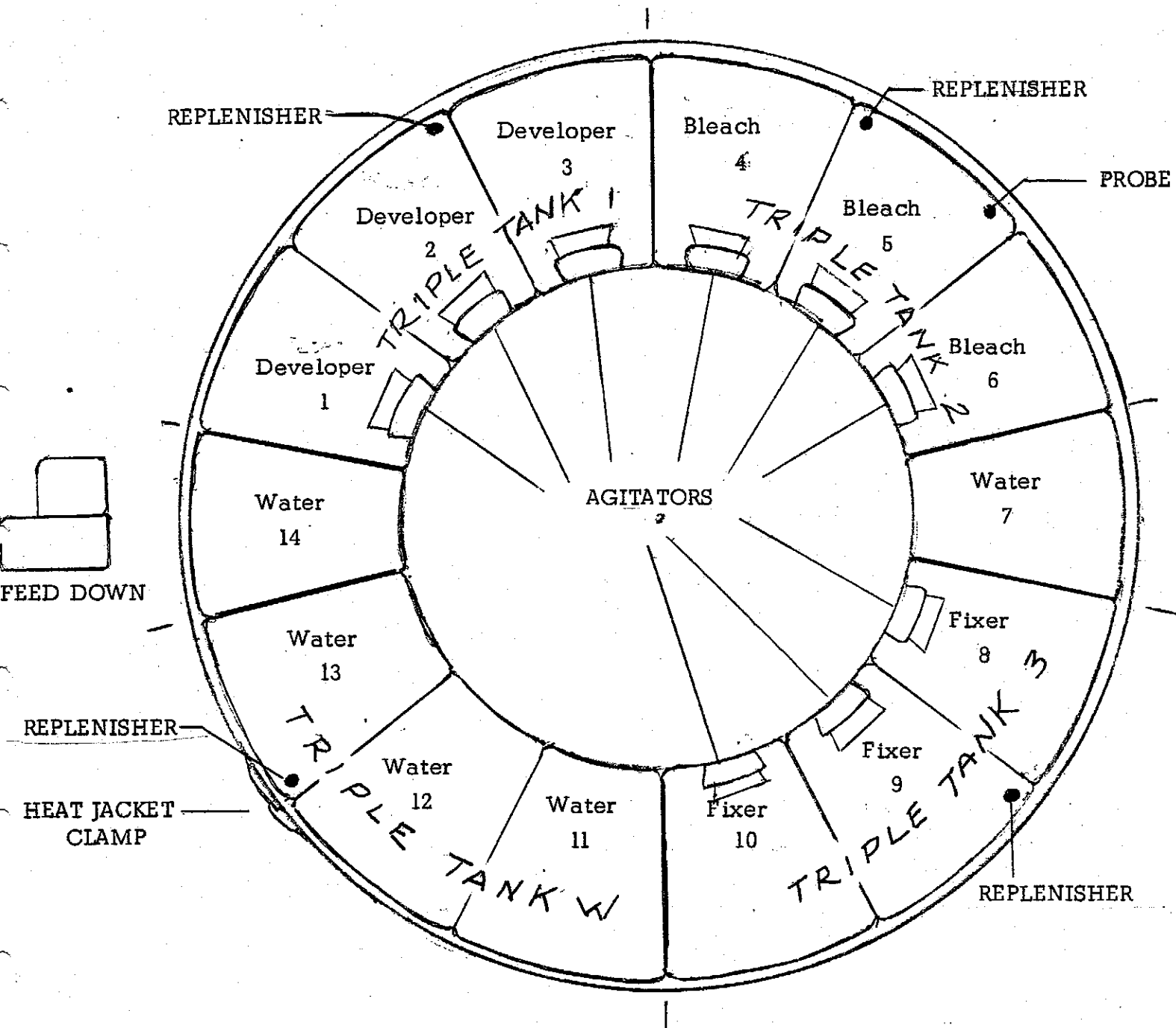


FIGURE 27

PREPARATION FOR STUDIO OPERATION

IMPORTANT: BEFORE TESTING STROBE OR STARTING STUDIO OPERATION BE ABSOLUTELY CERTAIN THAT 3-PIN PLASTIC PLUG-RECEPTACLE AND JONES PLUG-RECEPTACLE LEADING TO UPPER LIGHT BOX AND CONNECTORS TO STROBE ARE TIGHTLY CONNECTED.

Do not test Studio until chemicals have warmed up for at least 3 hours.

1. Insert film from reel into film gateway through the White Border Plate. On the plate camera the pressure plate containing the paper switch must be removed in order to feed the film.
2. Check with a thermometer that temperature of the chemicals is between 33.5°C and 34.5°C .
3. Test Strobe Unit. Always discharge the Strobe System after every test.
4. Set voltage adjustment to yield a 320 V.D.C. reading on meter by charging the strobe unit manually. Discharge strobe.
5. Place the Ultra Violet, X5 Cyan and X10 Yellow filters in the camera filter guide, and set aperture to f6.3.

Using the chart below, vary the filter combination, the strobe output and/or the aperture opening until a clear picture strip is delivered with color slightly more vivid than reality:

If PRINT IS TOO	ADD	OR	SUBSTRACT
Blue	Yellow		
Yellow	Magenta		Yellow
Green	Magenta		
Magenta	Yellow		Magenta

The Cyan filters are for improving flesh tones. If X10 or X15 Cyan makes picture too blue, reduce the Cyan filtration.

NOTE: Print while still wet will look somewhat more Magenta than when completely dry.

6. If necessary, align picture by adjusting Border Kit Plate as per instructions Figure 28. Do not remove paper switch during this procedure.
7. If the borders are not white adjust the light with the potentiometer. If the borders are not straight, tighten the pressure plate on the frame by adjusting the holding screws on the frame.
8. Fill the replenisher bottle for Chemical #1 with full strength developer, and the other three Replenisher bottles with water.
9. Hang the bottles back in proper order, and clip the end of the tubing just below the liquid surface (Refer to Figure 27).
10. Observe flow from replenisher bottles into tanks. If flow does not start, stops, or is intermittent, add a small amount of detergent or liquid soap to the replenisher solution.

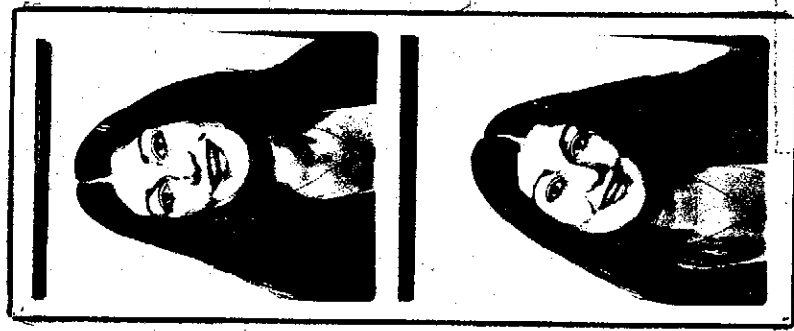
WHITE BORDER GROOVE
BEHIND PAPER SWITCH
PAPER SWITCH PLATE

WHITE BORDER PLATE

FILM ROLLERS

PAPER SWITCH

LOOSEN RETAINER
SCREWS TO MAKE
PLATE ADJUSTMENT



BLACK LINE ON TOP
OF PICTURES
CHECK THAT FILM IN
CASSETTE OR ROLLERS
NOT TIGHT, OTHERWISE
ADJUST WHITE BORDER
PLATE UP

BLACK LINE ON BOTTOM
OF PICTURE
MOVE WHITE BORDER PLATE
DOWN UNTIL LINE DISAPPEARS



MAINTAINING PICTURE QUALITY

1. Change the water in all rinse tanks at least once a week, twice a week, if possible. It is extremely important to avoid contamination of chemicals.
2. If the picture grays in spots, particularly around the edges and borders, increase dial reading on the temperature controller but never more than 37°C . This defect may appear about 3 weeks after initial installation of the Chemical Color Kit.
3. If picture turns bluish and color fidelity drops, possibly after 6 weeks of chemical use, remove $1/2$ the liquid in each #2 chemical tank (Tanks Nos. 4, 5, and 6) and refill with fresh water.
4. If the picture turns too light or too dark, adjust the voltage output of strobe (meter reading) and/or aperture. Also, check temperature of the chemical and adjust reading of the temperature controller dial accordingly, but never below 32.5°C or above 37°C .

IMPORTANT:

Temperature of the chemicals has the greatest bearing on the quality of the picture. Consequently, it must be checked often and carefully.

Best results after 3 weeks and longer, are obtained with the temperature setting around 35°C .

Temperature setting of 37°C may be necessary very occasionally, but it is unusual. Avoid this setting if possible, as too much heat can ruin the chemicals or their longevity.

RUN CALIBRATION TESTS ON THE TEMPERATURE CONTROLLER REGULARLY:

(Measured temperature = Controller dial reading).

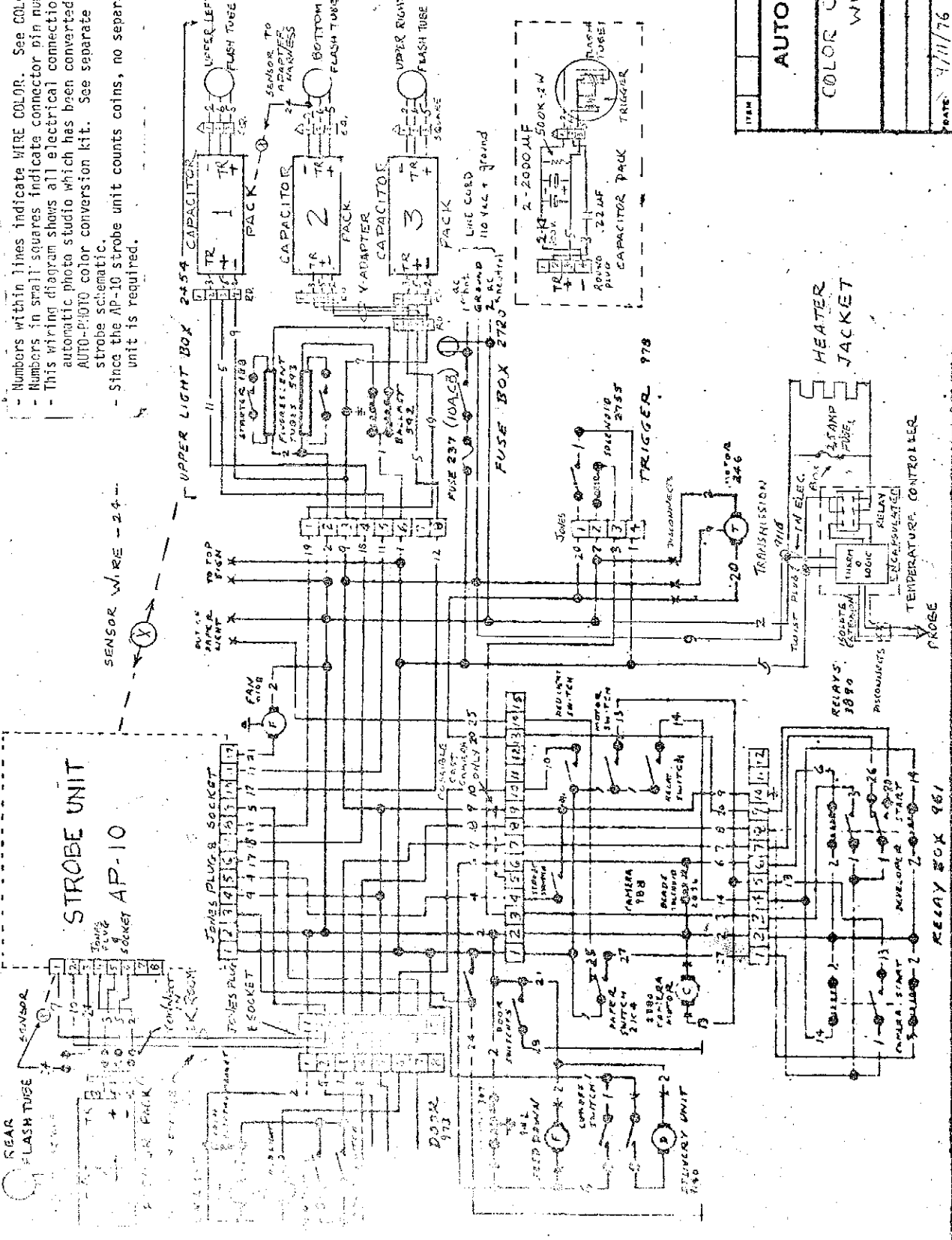
COLOR COMPONENTS

<u>P/N</u>	<u>DESCRIPTION</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>P/N</u>	<u>DESCRIPTION</u>
10744	Quartz Lamps	15241	Upper Lt. Box Assy.	15208	Clip
2307 or 7702	Tank-Single	188	Starter	15211.1	Spacer
6602.2	Tank-Triple	366	Lamp Holder	15211.2	Spacer
6627	Cam	592	Ballast	15305	Circuit Breaker
9769	Agitator	593	Lamp	15306	Circuit Breaker
15115	Filter Set	616	Starter Holder	15307.1	Switch
15117	Filter	15242.or	Y Adapter	15308.1	Switch
15118	Filter	2569.1	Harness	15313	Transformer
15119	Filter	15260	Flash Tube Assy.	15322	Harness
15120	Filter Guide Plate	15259	Harness	15330	Capacitor
15124	Replenish Bottle Assy.		813 Cover	15338	Potentiometer
15125	Bottle		15256 Socket (3)	15339	Knob
15125.1	Holder		15257 Trigger	15351	Receptacle
15126	Stopper	15243	Capacitor Pack	15353	Receptacle
15127	Cap-38mm	15248	Diode	15315	Regulator
15128	Tubing	15244	Printed Circuit Bd.	15218	Diode
15129	Clamp	15245	Cover	15219	Diode
11050	Clip	15246	Capacitor	15226	Resistor
15137	White Border Kit	15247	Harness	15230	Resistor
0145	Potentiometer		15252 Socket	15315.1	P/C Board
305	Lamp	15248	Harness	15318	Relay
310.2	Lamp Holder		364 Cap	15319	Socket
813	Insulator		15350 Plug	15323	Zener
9512	White Border Housing	15253	Resistor	15324	Zener
15138	Cassette Holder	15254	Capacitor	15326	Transistor
9385 ^{or}	Cassette Holder	15263	Lower Flash Tube Assy.	15327	Triac
11061	Cassette - Paper	5368	Fixture	15328	Heat Sink
15150	Drape Rod & Plating	15265	Harness	15331	Capacitor
15151	Rod Block-Left		813 Cover	15332	Capacitor
15152	Rod Block-Right		15252 Plug	15340	Potentiometer
15155	Drape	15266.1	Rear Light Assy.	15341	Resistor
15156	Drape	571	Spring	15342	Resistor
15160	Temp. Control Assy.	594	Lock	15345	Resistor
15160.1	Temp. Controller	15273	Harness-Rear Light	15346	Resistor
15164	Lamp			15347	Resistor
15165	Minitherm	15275	Wire Mold Set	15348	Resistor
15171	Harness Extension	15300	Strobe AP10	15350	Plug
1.136	Fuse Holder			15352	Plug
15172	Plug	0207	Resistor	15317	
15175	Elec. Box	432	Plug	15317	Stepper
15178	Fuse	503	Plug	873	Relay
15179	Receptacle	15193	Handle	15219	Diode
15180	Plug	15195	Meter	15317.1	P/C Board
				15350	Plug
				15365	Adapter-Door to D.R
				266	Socket
				583	Socket

NOTES

- Numbers within lines indicate WIRE COLOR. See COLOR CODE below.
- Numbers in small squares indicate connector pin numbers.
- This wiring diagram shows all electrical connections for a model 16 or 20 automatic photo studio which has been converted to color using the AUTO-PHOTO color conversion kit. See separate sheet for AP-10 strobe schematic.
- Since the AP-10 strobe unit counts coins, no separate coin steamer unit is required.

NO.	MAIN COLOR	TRACER
1	BLACK	
2	WHITE	
3	PURPLE	
4	YELLOW	
5	RED	
6	BLUE	
7	YELLOW	RED
8	PURPLE	WHITE
9	GREEN	
10	YELLOW	RED
11	PURPLE	WHITE
12	YELLOW	RED
13	RED	WHITE
14	RED	WHITE
15	ORANGE	
17	BLUE	
18	BLUE	
19	BLUE	
20	WHITE	
21	WHITE	
24	BLACK	
25	BLACK	
26	BLACK	
27	YELLOW	
28	GRAY	



ITEM _____

DESCRIBTION _____

AUTO-PHOTO COMPANY
LOS ANGELES, CALIF.

COLOR CONVERSION
WIRING DIAGRAM

DATE: 4/11/76