SECTION B. HORIZON HIP-3 PLATTERS

I. APPLICATIONS

The HORIZON Model HIP-3 platter system is an advanced state-of-the-art film transport/delivery system manufactured to transport 35mm film to and from projection equipment to ensure high-quality commercial cinematic projection. It is designed to provide years of worry-free operation through technical design, precision engineering and evaluation. The common application is in motion picture cinema venues. The platters can be used on stand-alone units, in multiplex cinema venues, or in special-format applications including multiple-projector synchronization and 360 degree theatres.

The operating principal of the HIP-3 is to provide flawless film transport of film to and from the projector in a smooth and controlled fashion and to eliminate the need to rewind film after showing for the next show. This is done by feeding the head of the film from the center of one motorized platter, threading it through the projector, then returning it to take back up onto another motorized platter. This process is repeated time and time again for each new show time. By having three platters in the system, two different films can be easily stored for showing and alternating of show times. The third platter can also be used to build-up new film while the other platters are performing show times. The platter decks are designed with friction-free spindle sleeves for easy rotation provided by imbedded graphite vessels. DO NOT APPLY GREASE for lubricating during installation as it is not necessary.

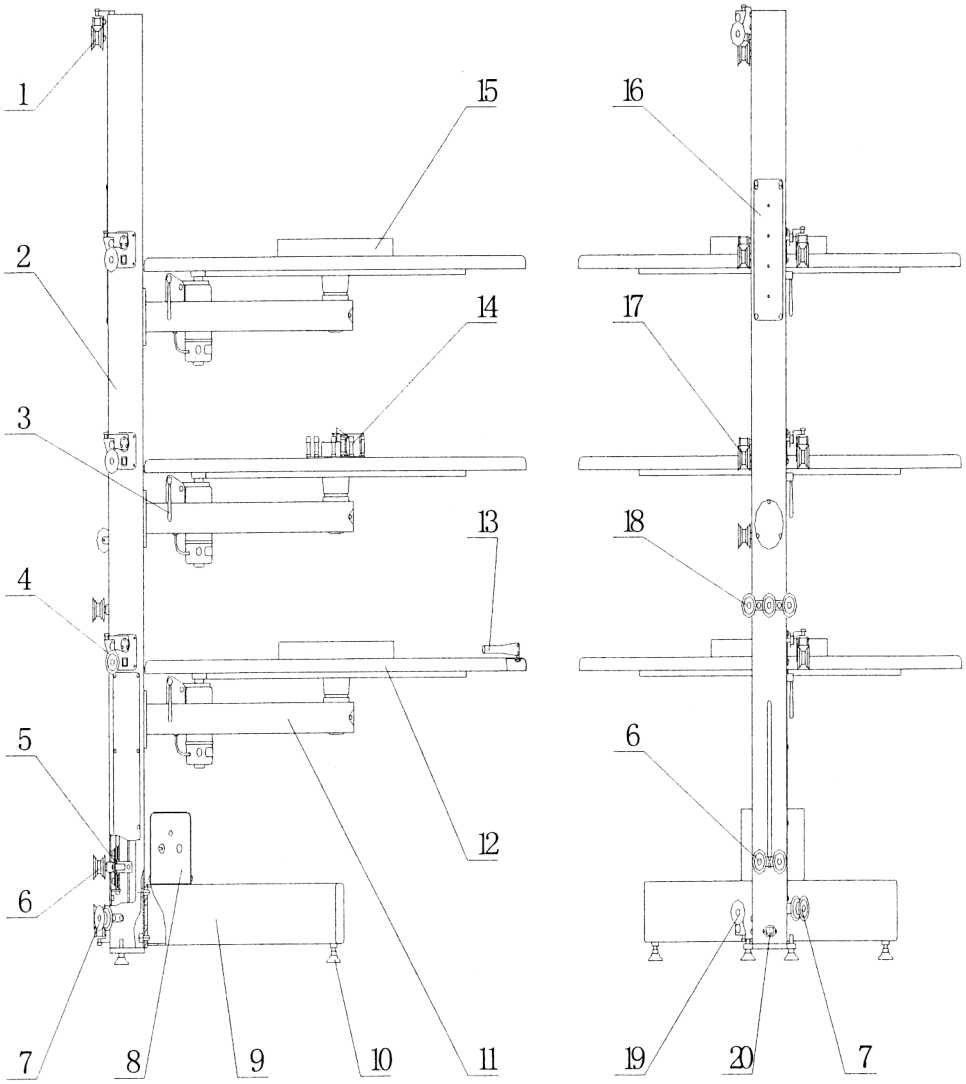
The speed of rotation is determined by the projector speed as the platters sense the speed necessary to stay in synchronization and adjust accordingly. Aside from being controlled by the film, the platters can be controlled by the optional make-up table plugged into the bottom of the platter fuselage and used to build up and break down individual reels of film as generally received by the cinema. The platter system is generally installed between 5' and 10' from its associated projector and can be located to either side or in back of the projector. Depending on the model, the system either simply plugs into a standard 110vac electrical outlet, or is provided 110vac electricity from the designated terminals inside the projector console. The HIP-3 is fuse-protected.

II. SPECIFICATIONS

Power Requirements: 110vac	Consumption: 300watts
Drive Motor: DC110V 1.5A	Platter Diameter: 52"
Film Capacity: 22,000' (4.2 hour continuous projection @ 24 frames per second)	
Dimensions: 75.92" x 51.96" x 59.17"	Weight: 286 lbs.

III. OPERATIONS

Fig. 1 shows the basic components of the HIP-3 Platter System:



1. Upper Pay Out Roller
2. Fuselage
3. Clutch Release Handle
4. Changing Take Up Roller
5. Take-up film Governor
6. Take-Up Drive Roller
7. Bottom Fixed Roller
8. Power Compartment
9. Support Legs
10. Levelling Feet
11. Horizontal Support Arm
12. Platter
13. Film Retaining Device
14. Center Feed Assembly aka Brain or Pay-Out Device
15. Take-up Ring
16. Control Module Compartment
17. Pay Out Roller
18. Fixed Roller
19. Universal Take-Up Roller
20. Make-Up Table Socket

DESCRIPTION OF PARTS AND FUNCTIONS.

1. Center Feed Assembly (Fig. 3.1.1.). The center feed assembly (aka "brain") tells the pay-out platter how fast to turn. The waving arm (1) (aka feed trigger) controls the speed of this pay-out process. The film is pulled from its center and transported into projector by threading through the feed trigger, around pulley (2) and the angled pulley (3) which delivers the film to the fuselage. When the projector begins running, it will demand film to be delivered at approximately 18" per second. This speed is sensed by the feed trigger which communicates with an optical fence (8) and internal sensor (7) instructing the motor how fast to turn, thus delivering the film (aka pay-out). The more the feed trigger rotates to an "open" position (clockwise), the faster the motor turns. Once the speed of film plate turning continuously increases and the quantity of film transported exceeds the speed of the projector's demand, the film pushes the feed trigger (1) in a counter-clockwise direction slowing down the speed of the platter. By continuous circulation, the entire film will be transported through the projector and the speed of the platter will be smooth and consistent throughout the film. The center feed assemblies are fully modular (removable brains) to allow easy removal of the center feed assembly by hand without tools and repositioned as needed. This is particularly convenient when removing a film from a platter, cleaning, and other purposes.

2. Take Up Speed Governor (Fig. 3.1.2.). The take-up film speed governor tells the take-up platter how fast to turn. The film returning to the platter from projector passes through the universal roller (aka pulley) (7), then wraps around the drive rollers, the fixed roller (9), the fixed angled roller (8), the take-up film roller (11), and then winds onto the take-up platter's center ring.

3. Changing Roller Assembly (Fig. 3.1.3.). This roller provides an important function and changes to two positions, relaxed (vertical), or engaged (horizontal). In the relaxed position, the roller assembly is hanging down freely--this is the position for the roller when the associated platter is being used in the pay-out mode. In the engaged mode, the roller assembly is rotated and snapped into place thus engaging the trigger switch on the platter's fuselage—this is the position for the roller when the associated platter is being used in the take-up mode.

4. Motor Drives (Fig. 3.1.4.). Each platter is motor-driven from beneath. The motor shaft utilizes a hard rubber friction roller which contacts the platter drive ring thus spinning the platter. When the clutch handle (2) is in the vertical position, the friction roller (4) and circular drive plate (6) close together and make position contact. This is called the standard (engaged) operating position as when in this position, the motor spins the platter by contact between the motor's rubber friction roller and the platter drive plate on bottom of the platter (6). When the clutch is turned to a horizontal position (disengaged), the roller does not contact the platter, thereby allowing the platter to be free of influence by the motor. This is the position the motor is placed in when the film is being removed from the platter using the make-up table; disengaging the motor in this matter allows the make-up table to pull the film off the platter without resistance from the friction wheel rubbing the drive plate. Service to the motor drives is minimal. If a motor is making an unusual noise, it may be that the brushes are becoming worn and need to be replaced. Each motor has two accessible brushes on either side of the motor. To access, first turn off the power to the platter. Unscrew the cap and the spring-loaded brushes will be visible. Pull out the brush and examine for wear and tear. Replace as necessary. Make sure the new brush is fully-seated in the housing and screw the cap back on.

5. Center Film Ring (Fig. 3.1.5.). The center ring is used on the take-up platter for the film to wind onto either a) when it returns from the projector, and b) when it is initially built-up to run when new. The ring has two pins which align with holes in the platter to keep the ring in place. To loosen the ring once it becomes tight with film wrapped around it, pull the knob (3) and the reel will relax, thereby allowing the operator to pull it out of the center of the film for re-threading of the film in pay-out mode. If planning to transport film manually from one platter to another after it has been built-in on a platter, leave the center ring in it for support of the film; slide optional "film handlers"

around the film to keep the film in tact and prevent spillage, secure, then carefully remove the film from the platter and carry to the alternate location. When putting film back onto a different platter, exercise caution not to drop dead weight of film on edge of platter, rather to set film onto the center of the platter and center accordingly by inserting the pins of the center ring into the platter. Then the center ring can be removed and the film can be thread through the center feed assembly.

6. Film Route (Fig. 3.1.6. and Fig. 3.1.7.). The film is pulled from the center of the pay out platter though pay-out film governor (feed trigger), then to the fuselage and travels up to the top of the fuselage, then to the projector. When returning from the projector, the film feeds to the bottom of the fuselage, through the take-up governor, and onto the take-up platter. lm, finally wind the film core of take-up film (thread circuit of three take-up film plates fig.3.1.7)

7. Film Retaining Devices. Once the film is built-up onto the platter and ready to run, use the film retaining devices along the outside edges of the platter to help control the shape of the film in a round position while on the platter. There are other ways of controlling the shape of the film, including suction cup retaining devices. Never tape the tail of the film down to the platter as when it is over, damage to the film or the projector can occur. One of the most efficient methods to control the shape of the film during the presentation, is to make a retaining loop using excess film stock and wrapping it once completely around the outside of the film (when built-up on the platter), then tape the edges of the film retaining loop together (note, the retaining loop is not taped to the film, rather to itself). This ensures the round shape of the film during the entire feature presentation. Once the film has shown completely through and is finished, it will flow smoothly from the platter and through the projector and the film retaining loop simply remains in tact on the platter. Remove the loop and repeat.

8. Leveling. Once the platter is in place, use the leveling feet to effectively level the platter. Use a level as necessary for this purpose. Leveling is accomplished by turning the threaded leveling feet to make the platter legs lower or higher. The platter must be installed in a correct level position to ensure proper balance and performance.

9. Rollers/Bearings. The rollers are precision-milled from aluminum alloy composites to exacting standards. Each roller has a ball-bearing roller sleeve to ensure smooth and resistance-free rotation. The rollers should always turn freely by hand and under the influence of film passing over the roller. The rollers are designed to require virtually no maintenance and if kept clean and free of debris, will operate for years maintenance-free.

10. Power Compartment. The power compartment contains the electrical connections, power requirements, switch, fuse and power indicator lamp. If the platter does not power up after turning on the switch, check to make sure a) the platter is plugged in; b) the breaker to the receptacle is turned on, and c) if the fuse has blown. To check the fuse, first turn the power switch to "off". Unscrew the fuse cap and remove the fuse. The fuse must have continuity from one end to the other. If the fuse does not have continuity, replace and turn on the power switch.

11. Platter Lamps. Lamps are provided on the bottoms of the platters which shine down onto the platter below to provide light when threading the platter.

12. Control Module Compartment. The settings in the control module compartment have been pre-set by the factory. Should any further adjustments be necessary, have such performed by a qualified technician. No user-serviceable parts inside.

13. Electric Principle (Fig. 3.2.1.). The electric principle of the platter system is shown in the diagram on Fig. 3.2.1.

DESCRIPTION OF PLATTER INSTALLATION AND ADJUSTMENT PROCEDURE.

1. Installing Platter Decks. IMPORTANT NOTE: Do not use grease, oil or other lubricants when installing platters onto fuselage. Unlike most platters, the Horizon HIP-3 platter decks are designed with a revolutionary graphite-emitting lubrication system embedded into the center brass hubs which provide smooth even rotation for many years of maintenance-free operation. The adding of grease to the center spindles can result in sluggish rotation of the platter decks and increased stress on the motors. When installing platter decks on to the fuselage arms, simply slide the platter deck center hub onto the center spindles and let the deck gently fall into place onto spindle. The platters decks will instantly rotate freely as designed without additional lubricants required.

2. Connecting the power to the Platter. Plug the HIP-3 power cable directly into a 110vac electrical outlet. The platter is fused at 3 amps so ensure the receptacle can provide at least 3 amps to the platter without excessive load on the controlling electric circuit.

3. Adjusting the Platter speed. The HIP-3 speed controls have been factory pre-set to function in most operating environments. Should any adjusting be necessary in the field to accommodate regional variances in voltages or other anomalies, the following is the correct adjustment procedure for calibrating the speed control cards.

Turn the low speed adjusting potentiometer RP1 counter-clockwise; the potentiometer is located on the payout speed control boards. Note the three boards on the machine body corresponding with up, middle and bottom platter, and one take-up speed adjusting wire board which is located below the machine body main speed control board. Turn the high speed adjusting potentiometer RP2 clockwise to the neutral position.

3.1. Adjusting Film Payout Speed.

3.1.1. Adjust the speed controlling potentiometers with the platter engaged to the motor drive wheel, but pulling the clutch handle of the platter to the vertical position.

3.1.2. Make the takeup conversion pulley block of this platter be the "film payout" position.

3.2. Adjusting Low Speed of Film Payout.

3.2.1. Turn the film payout speed regulator arm of the platter counter clockwise to contact with the defending pulley position.

3.2.2. Turn potentiometer RP1 clockwise while measuring the rotation speed of the platter until the speed reaches 1.5~2 revolutions per minute. Use of an RPM meter is recommended.

3.3 Adjusting High Speed of Film Payout.

3.3.1. Turn the film payout speed regulator arm of the platter clockwise to contact with the defending pulley position.

3.3.2. Turn potentiometer RP2 counter clockwise and measure the rotation speed of the platter until the speed reaches 37~38 revolutions per minute.

4. Adjusting Film Takeup Speed.

4.1. Pull the clutch handle of the platter driving motor to vertical position, and make the motor friction gear contact with the wheel boss.

4.2. Position the film takeup conversion pulley to be in the film "takeup" mode.

4.3. Lift the film takeup speed regulator to the 2/3 position (not all the way to top).

4.4. Turn potentiometer RP1 clockwise and measure the rotation speed of the platter until platter reaches 2 revolutions per minute.

4.5. Move the film takeup speed regulator up and down to span the entire vertical working, and position to bottom, but do not touch it to the inner sensing switch.

4.6. Turn potentiometer RP2 counter clockwise and measure the rotation speed of the platter until it reaches 55 revolutions per minute.

5. Normal Operations.

After finishing the initial adjustments above, test the film takeup and payout speed adjusting system by using full capacity film which will be projected (an entire print).

5.1. Normal Film Payout Operations.

5.1.1. Setting period requirement.

5.1.1. When the platter begins working following the setup of the projector, the film payout speed adjusting arm should be able to turn clockwise freely to the high speed direction. When reaching the defending pulley position which is on the high speed direction and then settle for a moment, because the platter is overcoming the turning speed after the startup and its inertia is greater than the platter payout speed needed to turn. This makes the film payout speed regulator arm move counter clockwise to the low speed direction gradually, and swing within a certain area. After the brief start-up period, the payout speed regulator arm becomes relative stable within a range of no more than 1/2 to 2/3 from the low speed to the high speed.

5.1.1.1. The payout speed regulator arm should contact with the defending pulley closely which is on the high speed direction, and the film twist clockwise on the defending pulley which is around the film payout speed regulator, and this shows the payout highest speed is not fast enough. When this happens, adjust the potentiometer PR2 counter clockwise properly to advance the high speed turning speed.

5.1.1.2. If the film payout speed regulator arm swings between the high speed and low speed, it can be caused by the photoelectric sensor on the film payout speed regulator being in the wrong position in which case remove the black cover and verify the position is same as other platters, adjusting if necessary.

5.1.1.3. Film payout speed regulator arm swings around the defending pulley which next to the low speed direction and the area 1/3 position between the low speed and the high speed, that shows the lowest speed of the platter payout is too high. If this happens, turn potentiometer PR2 counter clockwise which reduces the low speed turning speed.

5.1.2. Observing Normal Operations.

After finishing the setup, the platter enters into the normal working period, and the film payout speed regulator arm should operate in a relatively stable mode. As the film in the platter's center becomes less as the feature plays on, the film payout speed regulator arm will continue moving to the low speed direction gradually to maintain proper speed of the platter.

5.1.2.2. If the film payout speed regulator arm swings unduly suddenly because some abnormal reason, such as film sticking, dried and distortion, after the abnormal condition passes, it will resume proper operation.

5.1.3. Operations Toward A Film's End.

5.1.3.1. In the final minutes of a film's payout, the film payout speed regulator arm swings around the defending pulley within the area 1/4 position between the low speed and the high speed, it shows the lowest speed of the platter payout is too high. If this happens, adjust potentiometer PR1 counter clockwise to reduce the low speed turning speed accordingly.

5.1.3.2. The film payout speed regulator arm swings around within the area 1/3 position between the low speed and the high speed, showing there is no speed in the low speed section. If this happens, adjust potentiometer PR1 clockwise to advance the low speed turning speed.

5.2. Normal Film Takeup Operations.

5.2.1. After startup, traveling block of the film takeup speed regulator should move in a certain area up and down, and the travelling block should be relatively steady.

5.2.2. If the block contacts the sensing switch on the bottom of its path of motion and makes the platter stop, it shows the high speed of the film takeup speed regulator is too slow. If this happens, adjust potentiometer PR2 clockwise to advance the high speed turning speed.

5.2.3. If the block contacts the upper sensitive switch at the top of its path of motion and makes the platter stop, it shows the low speed of the film takeup speed regulator is too high. If this happens, adjust potentiometer PR1 counter clockwise to reduce the low speed turning speed.

5.2.4 Observing Normal Operations.

5.2.5. When working normally, the travling block will be relatively stable.

5.2.6. Operations Towards A Film's End. During the last minutes of a film presentation, the traveling block should not contact the upper microswitch. Generally when traveling block moves more than about 2/3 of whole route (measured from the bottom), the platter should stop.

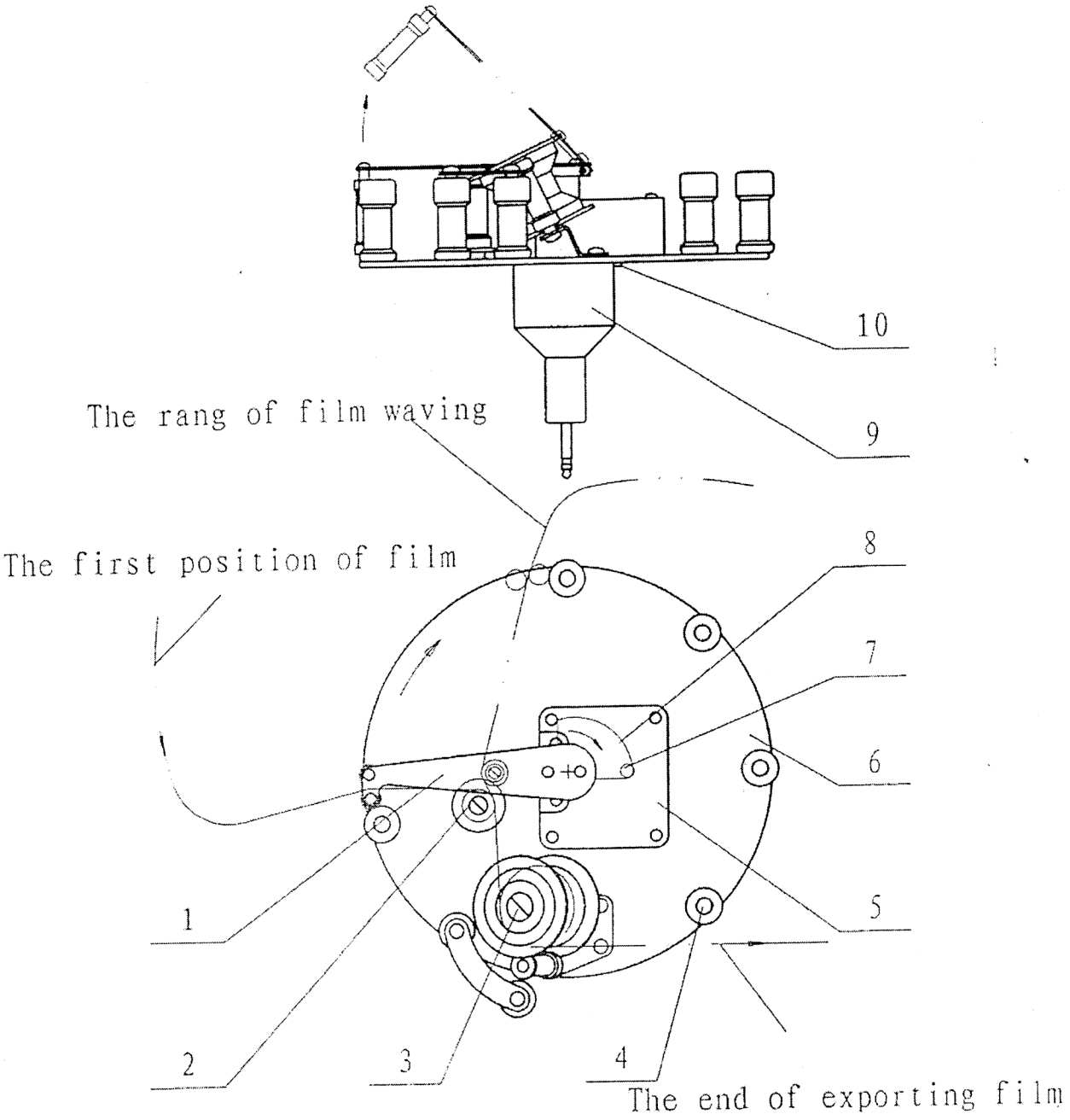
6. Interaction of Potentiometers. When adjusting the potentiometers, it is important to note that the adjustment of one potentiometer will affect the performance of the other potentiometer as they operated in a relative electrical principle. In other words, the low speed potentiometer and high speed potentiometer affect each other, but the effect is limited. After adjusting the low speed and high speed according to the above, you will still need to test them again separately, if they can not meet the operating requirements, readjust as necessary. For example:

6.1. If low speed is too fast, adjust RP1 counter clockwise, at the same time high speed may be decreased, adjust RP2 potentiometer slightly counter-clockwise to match the rotation speed.

6.2. If low speed is too slow, adjust RP1 clockwise, at the same time high speed may be decreased, adjust RP2 potentiometer slightly clockwise to match rotation speed.

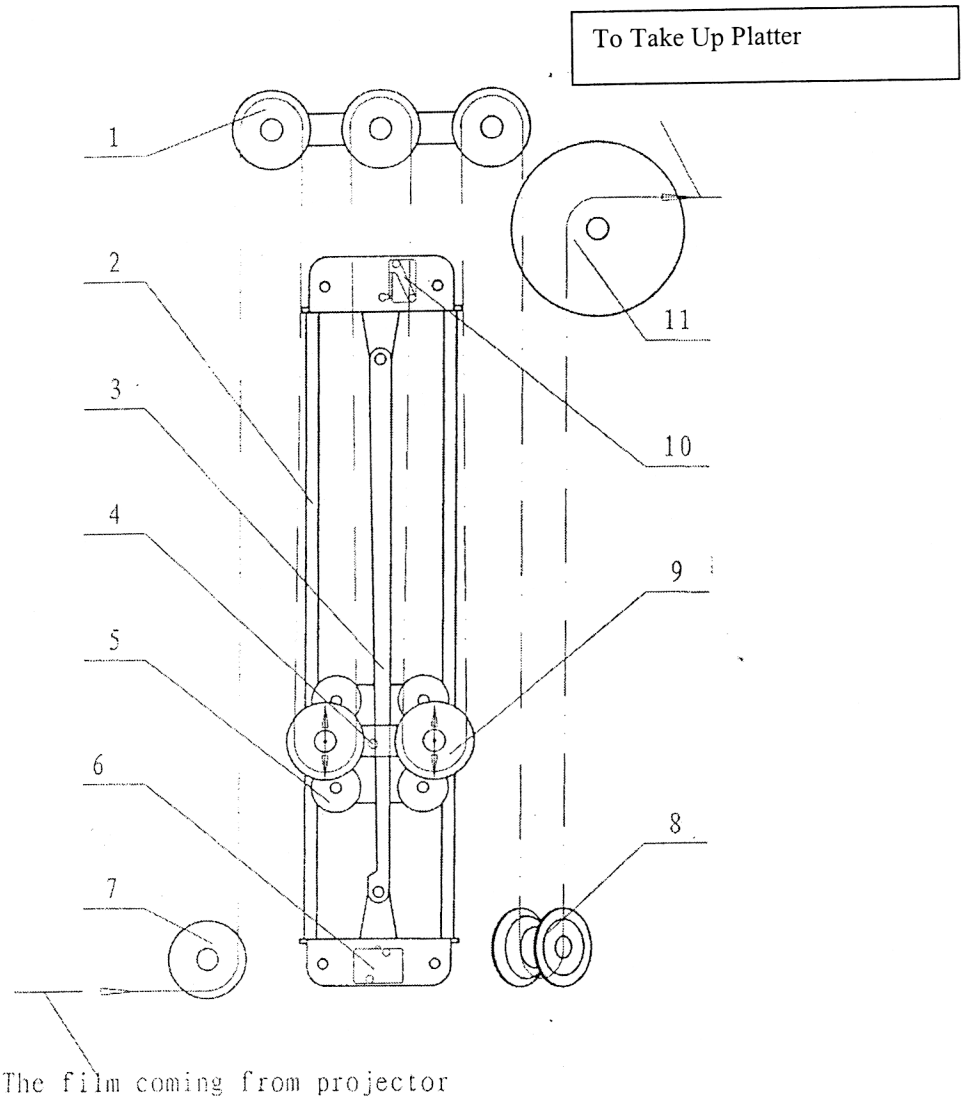
6.3. If high speed is too slow, adjust RP2 counter-clockwise, at the same time low speed may be decrease, so calibrate RP1 slightly counter-clockwise to match the rotation speed.

6.4. And if high speed is too fast, adjust RP2 clockwise, at the same time low speed may be decrease, adjust RP1 slightly clockwise to match rotation speed.



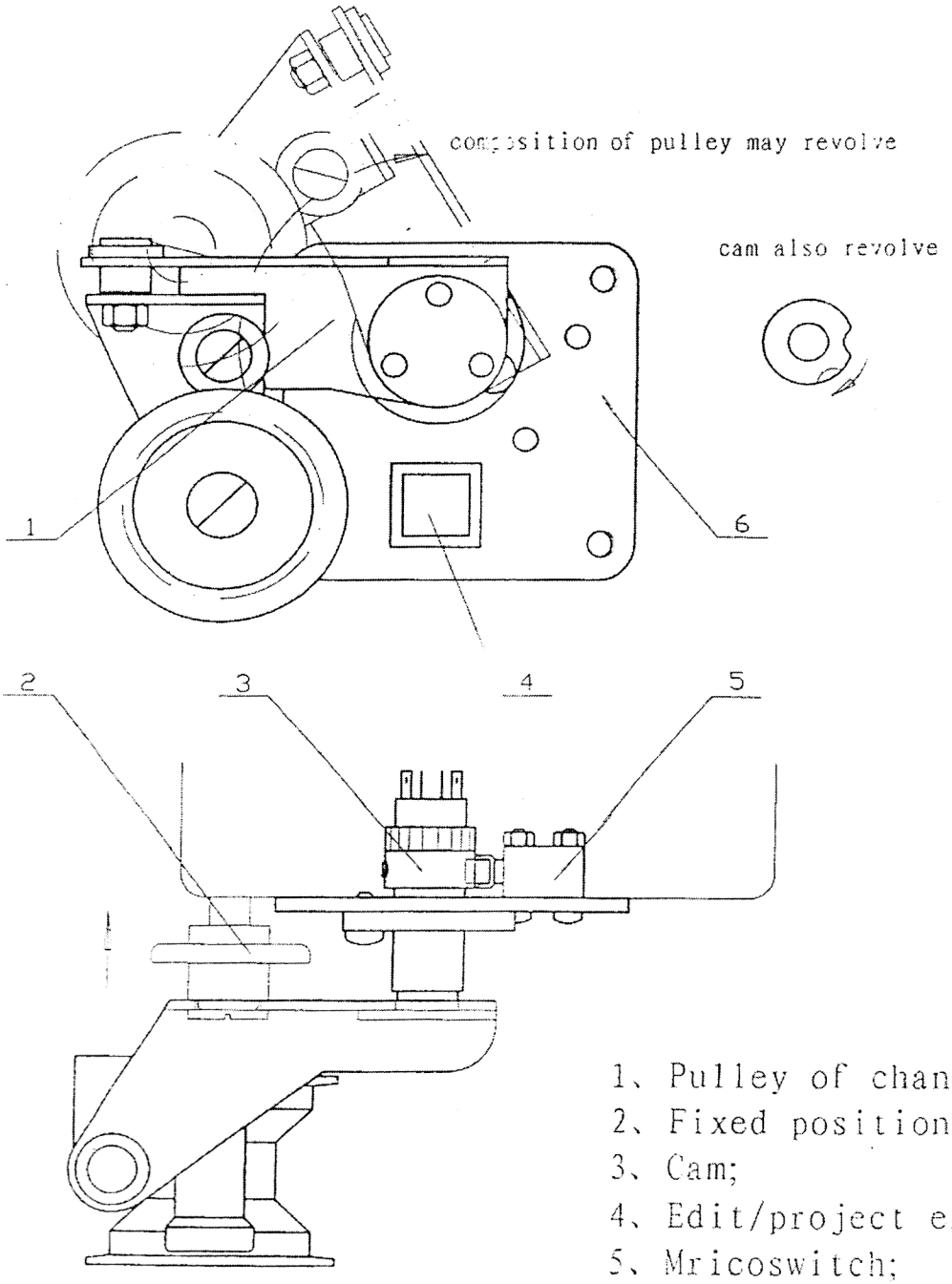
1、Waving arm of governor;
2、Pulley:
3、Pulley of changing angle;
4、Protective pulley;
5、Cover;
6、Basic board;
7、Sensor;
8、Optical fence;
9、Plug;
10、Fixed position key。

Fig. 3.1.1 Take-up film governor



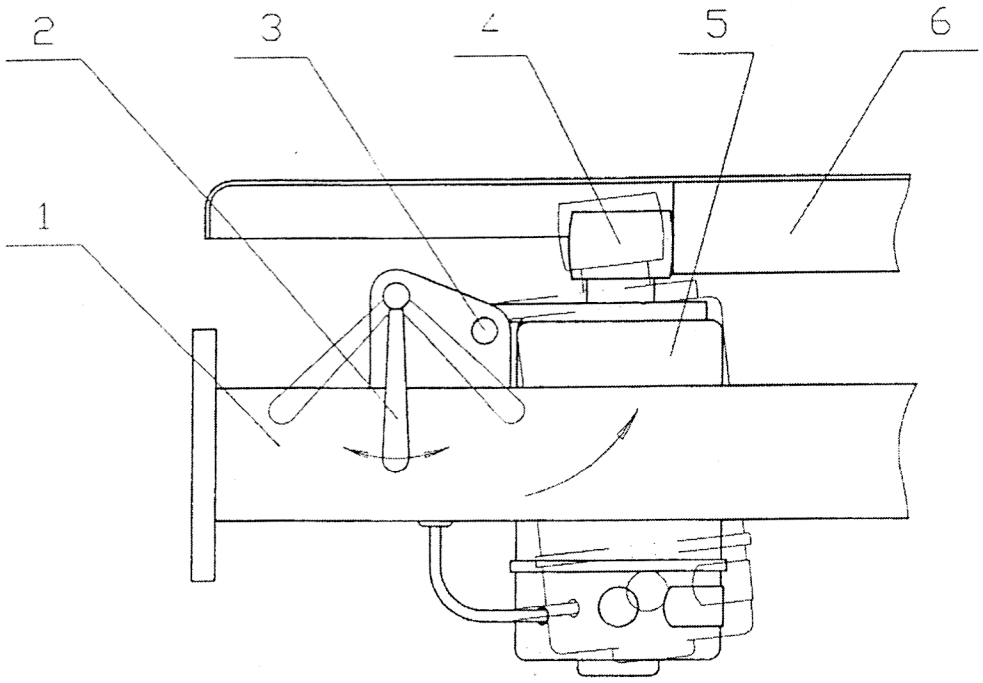
1、Composition of fixed pulley;
2、Slideway;
3、Optical fence;
4、Sensor;
5、Pulley;
6、Microswitch;
7、Universal pulley of take-up film;
8、Pulley of fixed angle;
9、Composition of driving pulley;
10、Microswitch;
11、Pulley of changing take-up film。

Fig. 3.1.2 Take-up film governor



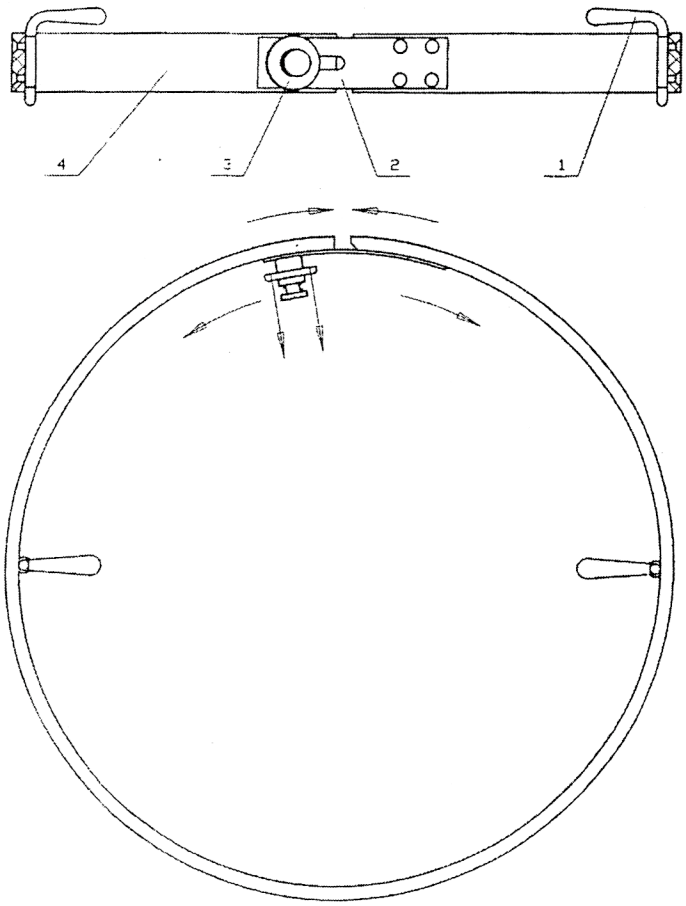
1、Pulley of changing film;
2、Fixed position lock;
3、Cam;
4、Edit/project exchange button;
5、Mricoswitch;
6、Board。

Fig. 3.1.3 Pulley of changing take-up film



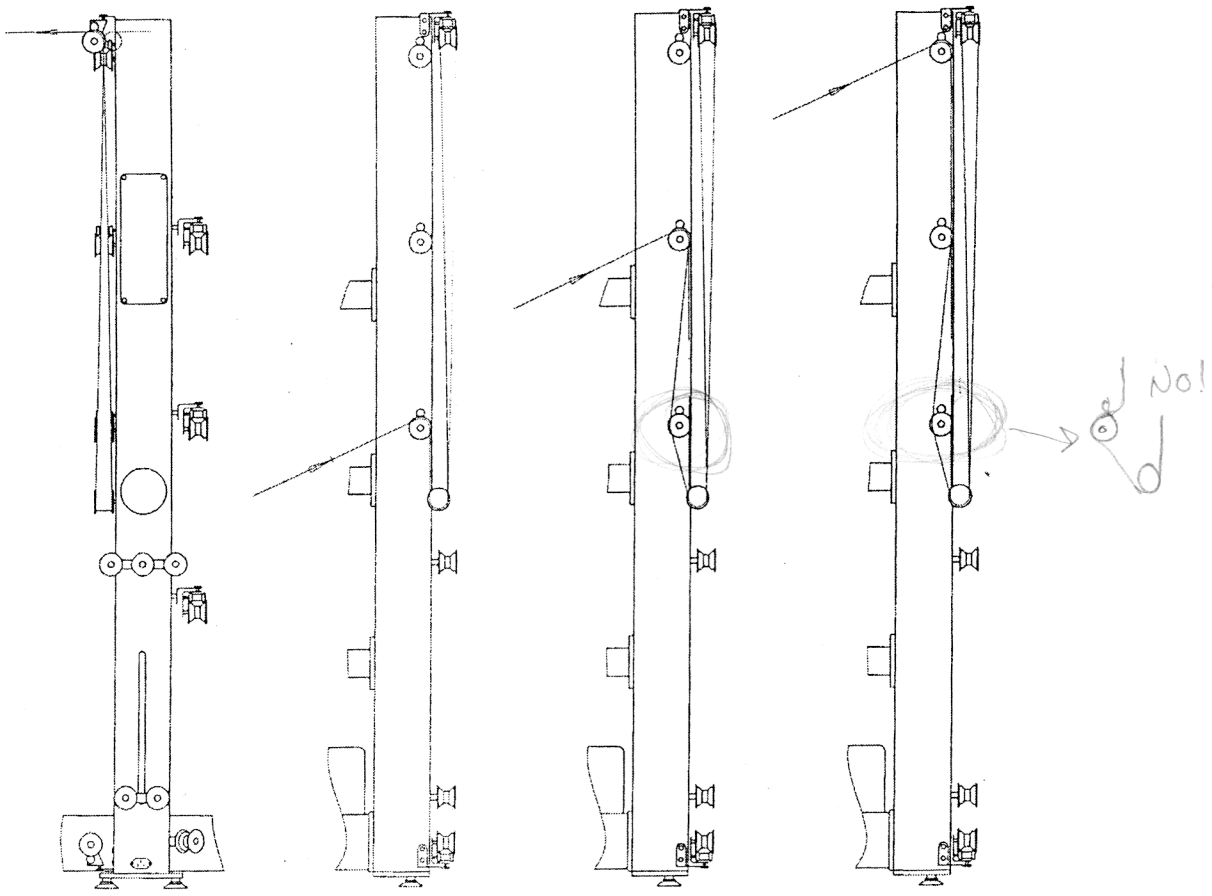
1、Machine stand;
2、Cluth handle;
3、Revolving axis;
4、Friction wheel;
5、Motor;
6、Film plate.

Fig. 3.1.4 Driving system



1、Handle pin;
2、Pulley road;
3、Lock cover;
4、Core。

Fig. 3.1.5. Center Ring Assembly (Core)

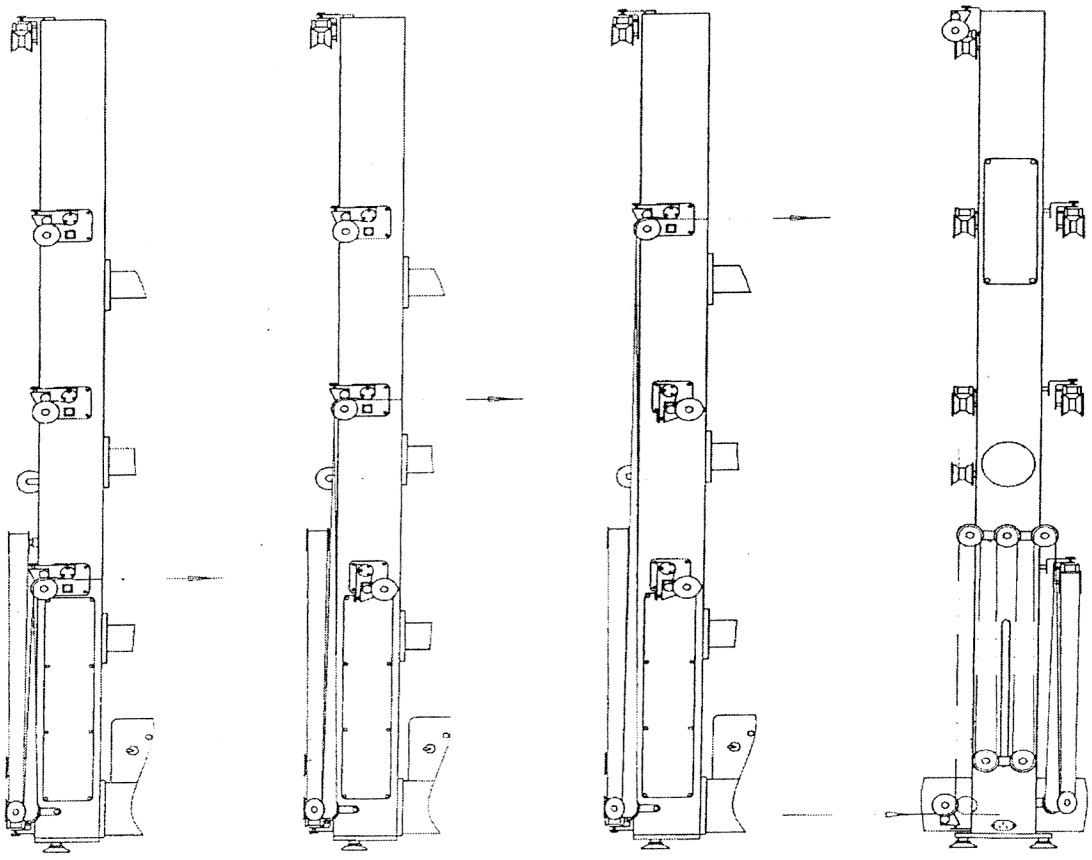


(a) (b) (c) (d)

(a) Film is pulley from the centre of film plate, pass by feed film governor (fig. 3.1.1), pulley of film road for feed film, at last by universal feed film pulley sends to projector;

(b) Thread film route of lower film plate;
(c) Thread film route of middle film plate;
(d) Thread film route of upper film plate.

Fig.3.1.6. Film Threading Route on Fuselage



(a) Thread film route of take-up film of lower film plate;
(b) Thread film route of take-up film of middle film plate;
(c) Thread film route of tale-up film of upper film plate;
(d) The film of coming from projector passes by universal pulley of take-up film, composition of fixed pulley, composition of driving pulley, pulley of changing take-up film to separate take-up film plate.

Fig. 3.1.7. Film Take-Up Route on Platter

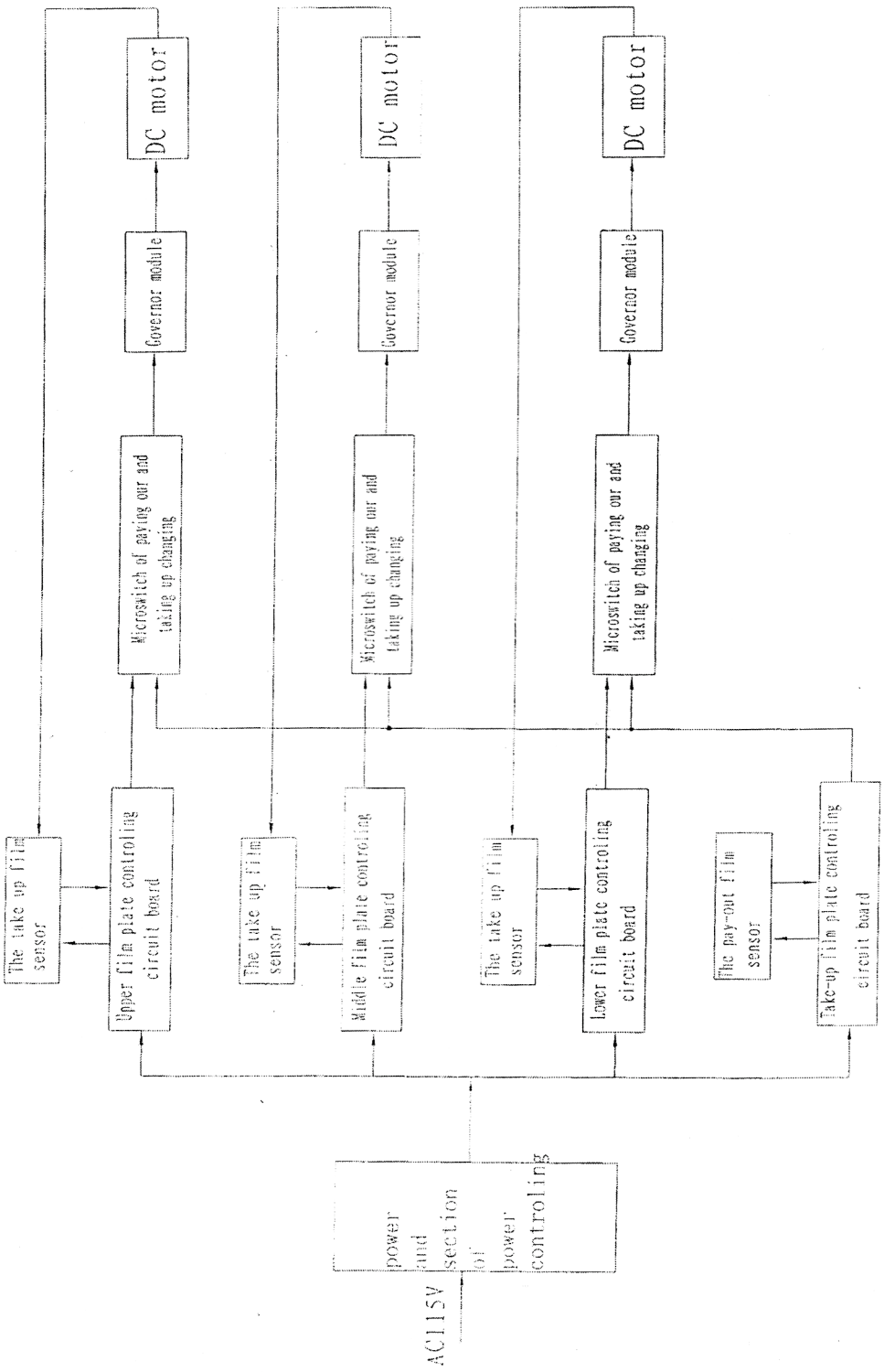
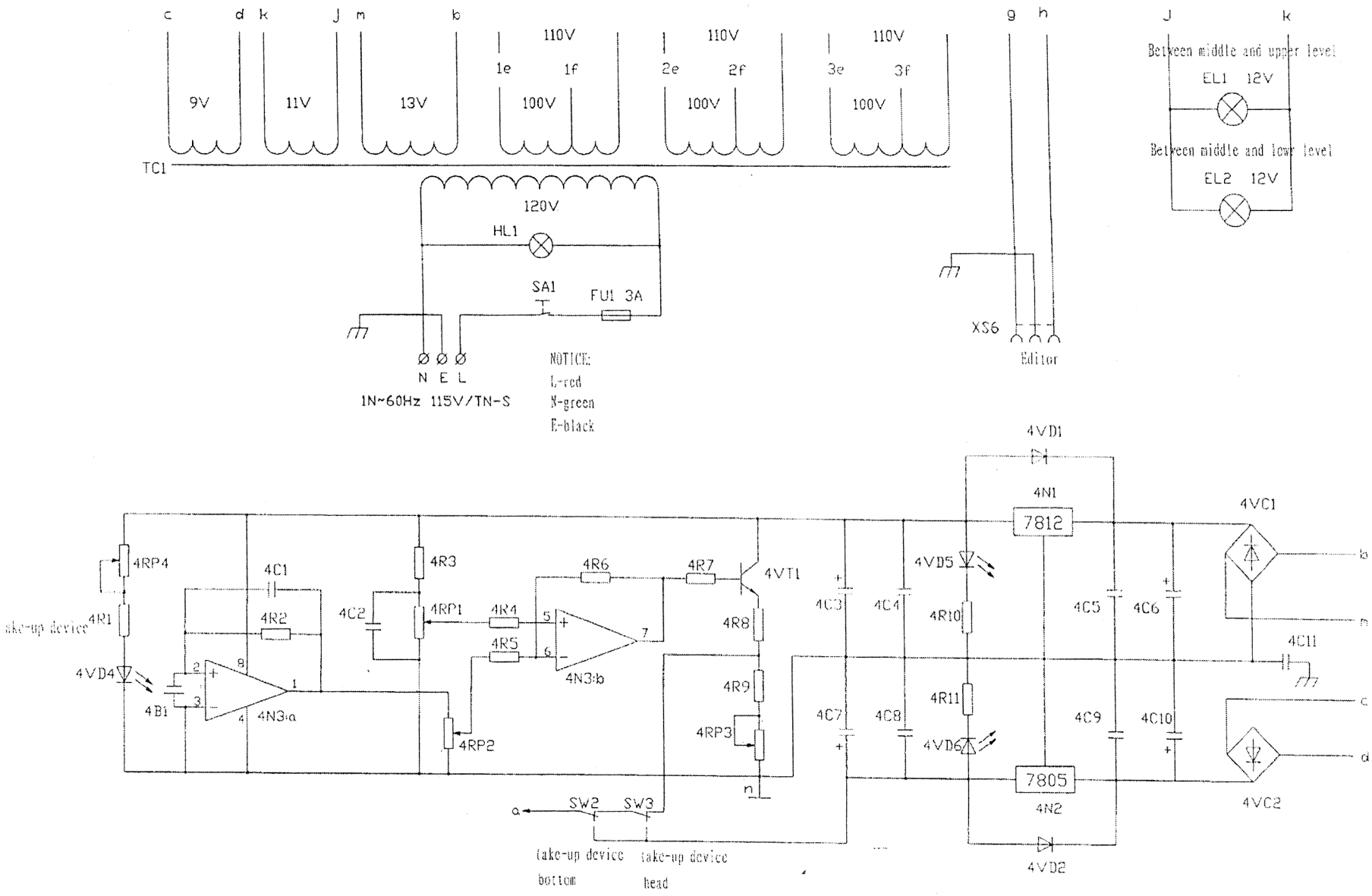


Fig. 3.2.1 Principle diagram of electrical equipment control



Principle Diagram For Electricity(I)

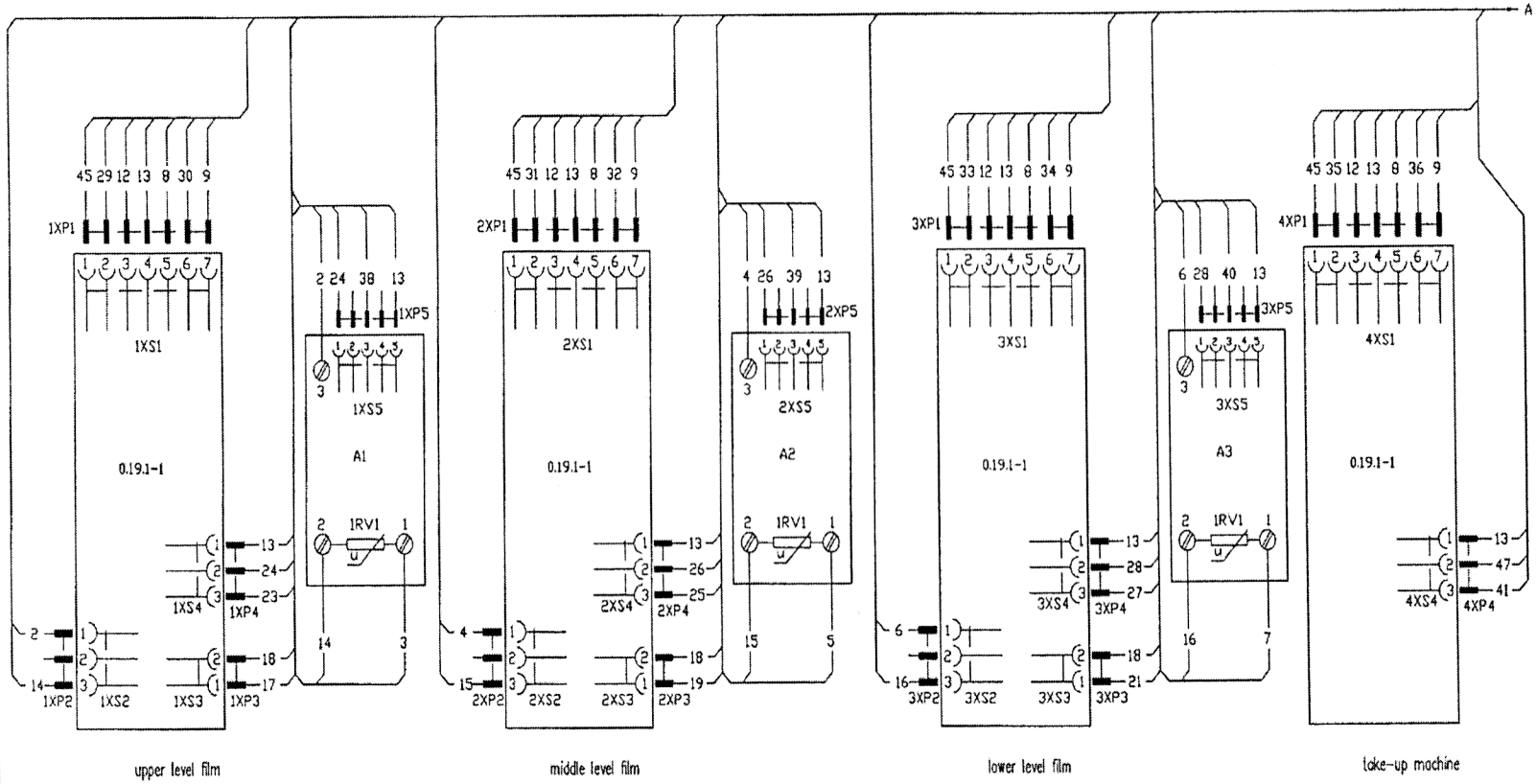


Fig.3.2.2 Drawing of wiring for electric control system(I)

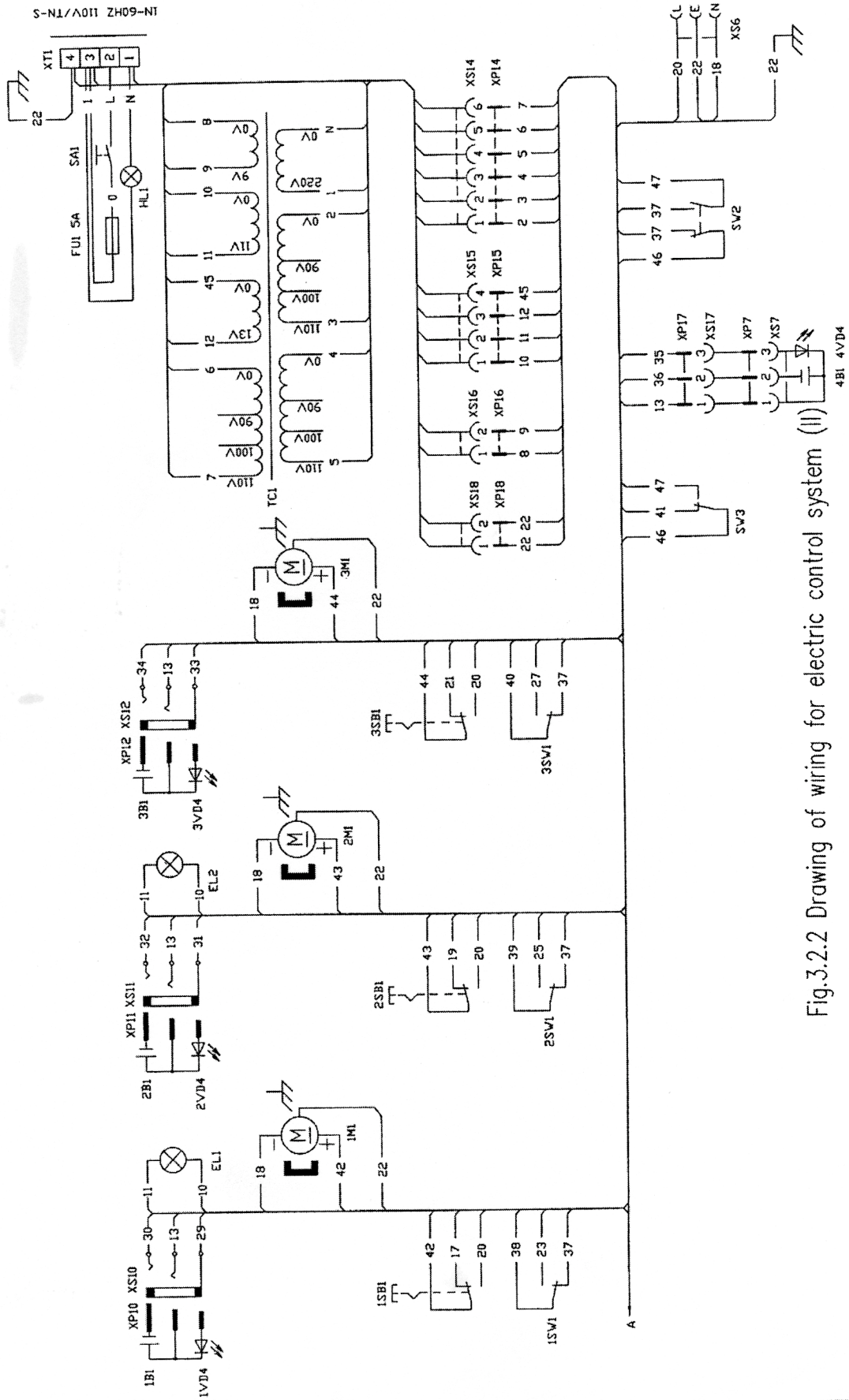


Fig.3.2.2 Drawing of wiring for electric control system (II)

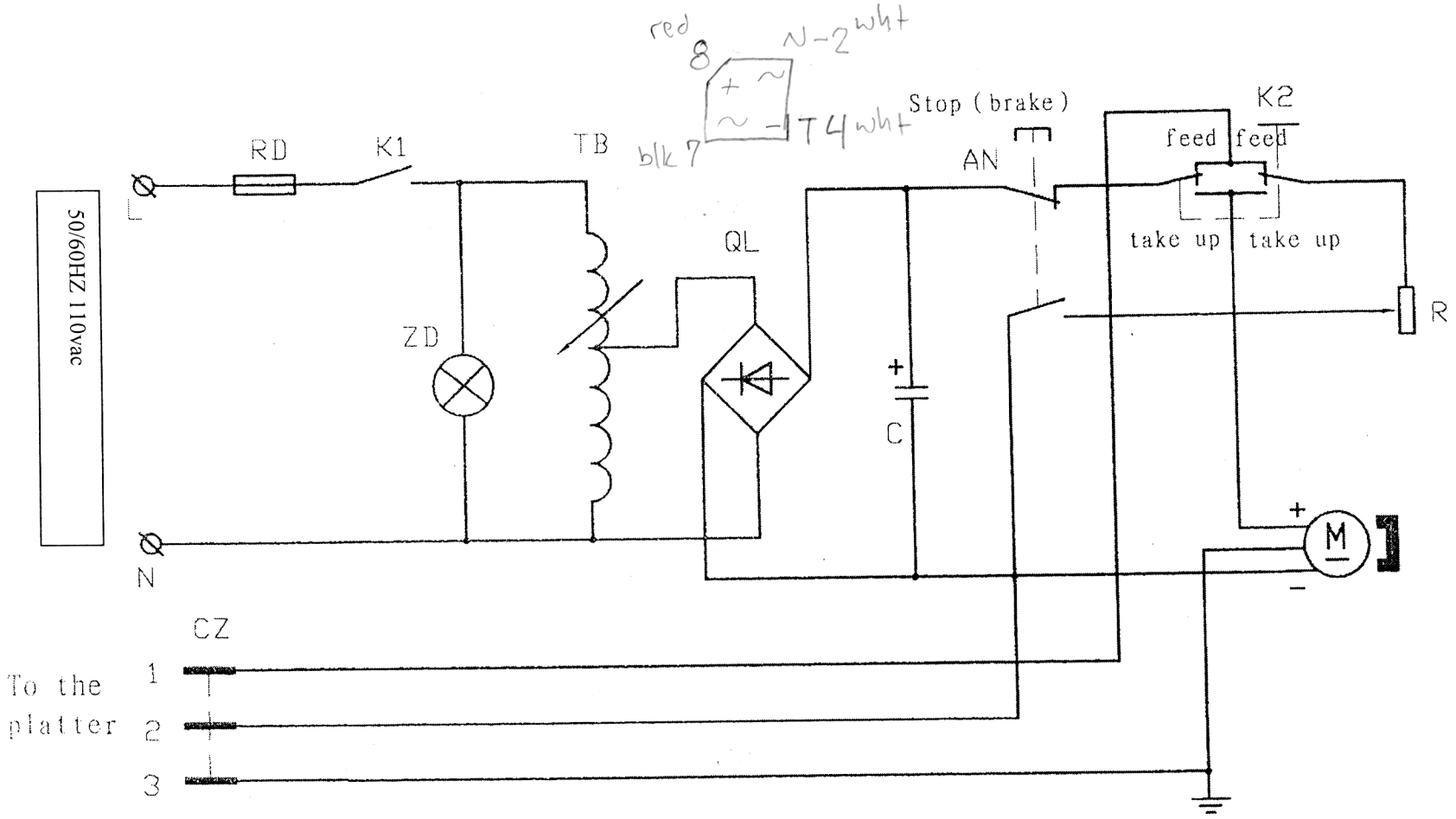


Fig. 1 BP-35 Control diagram of make up table

IV. MAINTENANCE

HORIZON HIP-3 platters are built to provide years of reliable service with minimal scheduled maintenance. Gentle handling and general cleaning of parts and components are the single-most effective measures against malfunction. Keep the operating environment where the projection and film handling equipment located clean and free of dust and smoke. Cleaning should be scheduled and performed and regular intervals. The platter surfaces should be wiped free of debris once daily and between shows as necessary. Any build-up of dirt or emulsion on rollers should be cleaned regularly with rubbing alcohol or similar cleaner. Do not use detergents which can leave build up or residue on surfaces coming into contact with film.

V. HIP-3 REPLACEMENT PARTS

HORIZON HIP-3 PLATTER PARTS

#	Part Name	Spec	Quantity per machine
1	toggle switch	E-TN1321	1
2	protector tube	Φ5X20 5A 250V	1
3	indicator light(spiral)	12V 0.15A	2
4	indicator light	ZD7-13RN220	1
5	microswitch	LXW-II	1
6	microswitch	JWX-II	4
7	DC servo motor	90ZY90W110V850rpm	1
8	dc machine timing module	EUV-10A 220V	3
9	infrared emitting diode	HG423	4
10	photocell	2CR4X4(encapsulation)	4
11	push-button switch	A16-212-R 3A	3
12	friction wheel	0.6.2	3
13	gasket	GB/T859(4)	71
14	gasket	GB/T859(5)	60
15	gasket	GB/T859(6)	23

16	gasket	GB/T859(8)	4
17	gasket	GB/T859(10)	16
18	nut	GB/T6170(M5)	9
19	nut	GB/T6170(M6)	12
20	nut	GB/T6170(M8)	4
21	anti-extrusion ring	GB894.1(10)	7
22	anti-extrusion ring	GB894.1(12)	7
23	screw	GB818M3*5	27
24	screw	GB818M3*8	11
25	screw	GB818M3*14	2
26	screw	GB818M3*18	2
27	screw	GB818M3*20	2
28	screw	GB818M3*30	9
29	screw	GB818M4*6	31
30	screw	GB818M4*8	16
31	screw	GB818M4*10	36
32	screw	GB818M4*12	6
33	screw	GB818M4*16	2
34	screw	GB818M5*12	29
35	screw	GB819M3*5	17
36	screw	GB819M3*8	10
37	screw	GB819M3*12	8
38	screw	GB819M4*10	12
39	screw	GB819M4*12	87
40	screw	GB819M4*14	12
41	screw	GB819M5*18	12
42	screw	GB819M6*10	48
43	screw	GB70M5*12	8
44	screw	GB70M5*18	18
45	screw	GB70M6*12	4
46	screw	GB70M6*14	12
47	screw	GB70M10*25	4
48	gasket	GB70/T97.1(3)	11
49	gasket	GB70/T97.1(4)	93
50	gasket	GB70/T97.1(5)	62
51	gasket	GB70/T97.1(6)	23
52	gasket	GB70/T97.1(8)	4
53	gasket	GB70/T97.1(10)	16