ROCK-OLA

Model 476 Model 481 and Model 484

Stereo Phonographs — 160 Selections

DIGITAL MICROCOMPUTER SYSTEM

SERVICE MANUAL

FORM 8011 PRINTED IN U.S.A. PART NO. 53567-I

SERVICE INFORMATION-DOMESTIC

MODEL 476 AND 484 PHONOGRAPH..RELATED ACCESSORIES AND KITS

MODEL	PHONOGRAPHS	SERVICE MANUAL "SM"	INSTALLATION INSTRUCTIONS "I"	WIRING DIAGRAM "WD"	PARTS CATALOG "PC"	DESCRIPTION OF OPERATION
484	160 SELECTION PHONO (ALSO USED FOR MODELS 476 & 481)	#53567 OR #53567-1	— —	#53569 OR #53569-1	#53568	SEE "SM" #53567 OR #53567-1
	ACCESSORIES					
507	WALL BOX (160-100)	#50681	— —	#50682	SEE "SM" #50681	SEE "SM" #50681
1775	CONVERTER	— —	#52339	#52339	— —	— —
2300	DELUXE WALL SPEAKER	— —	LABEL	— —	— —	— —
	KITS					
2121	AUXILIARY WALL BOX POWER SUPPLY	— —	#52927	SEE "I" #52927	— —	SEE "I" #52927
2122	MANUAL VOLUME CONTROL	— —	#45374	SEE "I" #45374	SEE "I" #45374	— —
2130	MICROPHONE	— —	#46268	SEE "I" #46268	— —	SEE "I" #46268
2149	BAR BRACKET WALL BOX	— —	#48609	— —	— —	— —
2156-2	MOTORIZED VOLUME CONTROL (WITH ON-OFF SWITCH)	— —	#49794	SEE "I" #49794	SEE "I" #49794	— —
2305	"L" PAD	— —	#52968	— —	— —	— —
2173	MOTORIZED VOLUME CONTROL (WITHOUT ON-OFF SWITCH)	— —	#50109	SEE "I" #50109	SEE "I" #50109	— —
2196	RECEIPT PRINTER	— —	#52882	— —	SEE "I" #52882	SEE "I" #52882
2197	COIN COUNTER	— —	#52882	— —	SEE "I" #52882	SEE "I" #52882
2185	QUADPHONIC SOUND KIT	— —	#52928	#52928	— —	— —
2306	DOLLAR ACCEPTOR KIT (MODEL 484 ONLY) (NRI #34-04-(05)-004)	— —	SEE "I" #52776	SEE "I" #52776	SEE "I" #52776	— —
2310	DOLLAR ACCEPTOR KIT (MODEL 476 ONLY) (NRI #34-04-(05)-004)	— —	SEE "I" #53671	SEE "I" #53671	SEE "I" #53671	— —
508	FULL VUE WALL BOX (USED ON ANY MP PHONO)	— —	SEE "PC" #53761	SEE "WD" #53759	SEE "PC" #53761	— —
1780	CONVERTER (USED WITH 508 FULL VUE WALL BOX)	— —	SEE "I" #53683	SEE "WD" #53759	SEE "PC" #53761	— —

RELATED ACCESSORIES AND KITS FOR MODEL 481 IS FASTENED TO THE INSIDE OF THE BACK DOOR OF THE PHONOGRAPH

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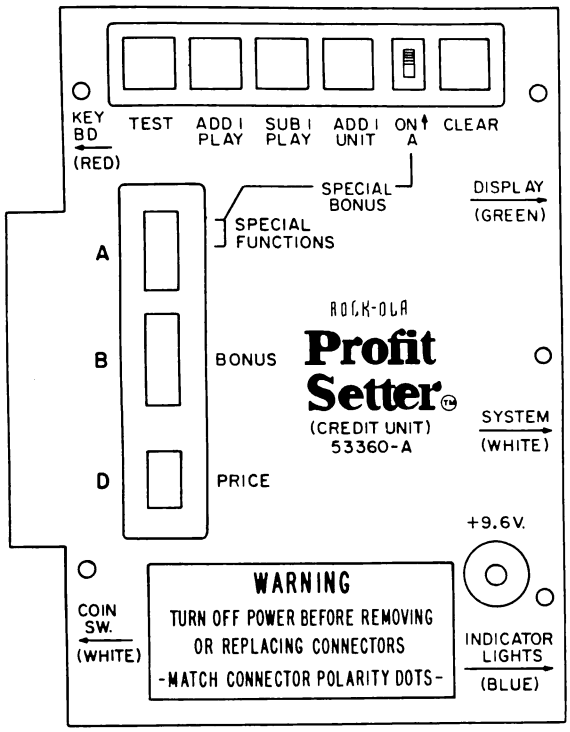


PROFIT SETTER (CREDIT UNIT)

The Credit Unit is a solid state system which converts deposited money into 255 plays. Provides means for entering the desired selections from the keyboard and its subsequent transmission to the Mechanism Control Unit.

The money conversion is very flexible, can be programmed for all world currencies and allows for variable pricing dependent on the amount of money deposited.

Any combination of nickels, dimes and quarters can be used to accumulate credits and bonuses.

Pricing of plays and bonus amounts may be programmed at 5 bonus levels by Switch Banks A, B and D as explained under "Programming Your Own Price Combinations" on page 7.

"Free Play" operation can be programmed by setting switches D1, D2 and D3 in Bank D to "OFF".

"Add Coins" light is provided to show that the amount entered is not great enough to reach one play. The total number of plays is displayed on a two digit display with a maximum capacity of 99 plays.

Five service switches are provided on the face of the credit unit. Add 1 Play, Subtract 1 Play. Add 1 Unit are used to check-out programmed pricing.

Test switch is provided to self test the credit system. When pressed a short add and subtract credit count scans through the CREDIT DISPLAY UNIT in the credit window. If 1 credit remains displayed then the credit unit is OK.

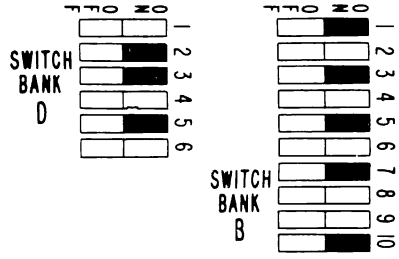
If three 8's appear in the RECORD PLAYING window, either a coin switch contact is closed, or the CREDIT BOARD is defective.

The CLEAR switch resets the credit system to zero. This mode is used for testing purposes only.

In normal operation the LED lamp is ON indicating the presence of +9.6V operating voltage.

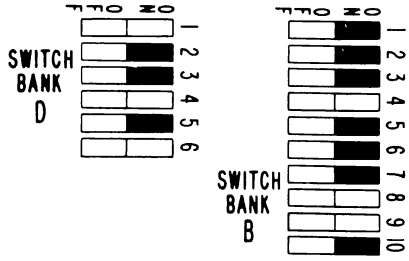
STANDARD SELECTIONS

15¢	1 PLAY
25¢	2 PLAYS
50¢	4 PLAYS
75¢	7 PLAYS
$1.00	10 PLAYS
$1.25	13 PLAYS



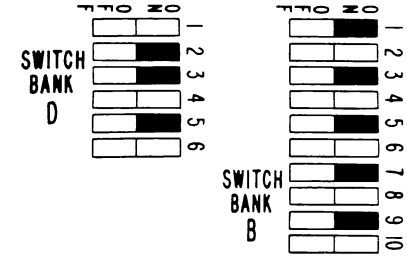
STANDARD SELECTIONS

15¢	1 PLAY
25¢	2 PLAYS
50¢	4 PLAYS
75¢	7 PLAYS
$1.00	11 PLAYS
$1.25	15 PLAYS



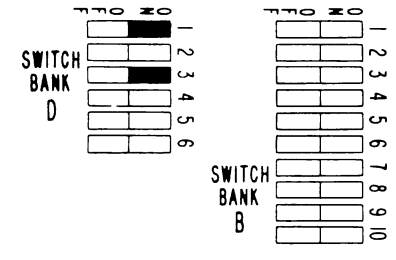
STANDARD SELECTIONS

15¢	1 PLAY
25¢	2 PLAYS
50¢	5 PLAYS
75¢	8 PLAYS
$1.00	11 PLAYS
$1.25	14 PLAYS



STANDARD SELECTIONS

25¢	1 PLAY
50¢	2 PLAYS
75¢	3 PLAYS
$1.00	4 PLAYS
$1.25	5 PLAYS



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25¢	1 PLAY
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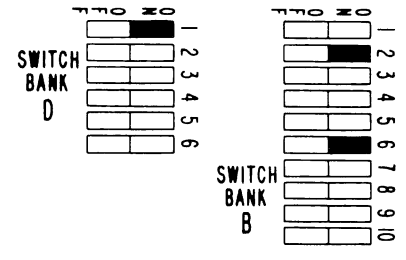
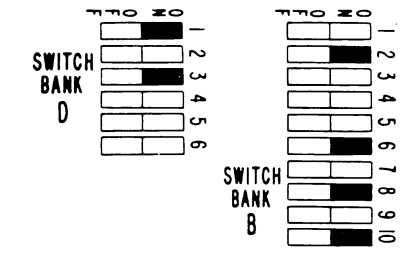
$1.00	5 PLAYS
$1.25	7 PLAYS



STANDARD SELECTIONS

25¢	1 PLAY
50¢	3 PLAYS
75¢	5 PLAYS
$1.00	7 PLAYS
$1.25	9 PLAYS



STANDARD SELECTIONS

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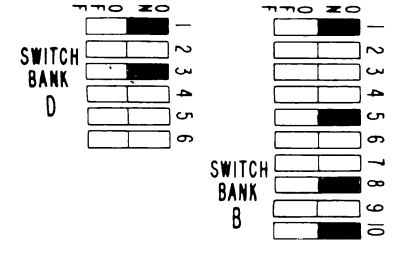
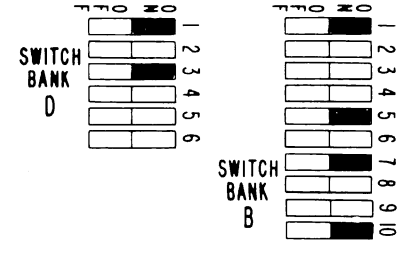
50¢	3 PLAYS
75¢	5 PLAYS
$1.00	8 PLAYS
$1.25	11 PLAYS



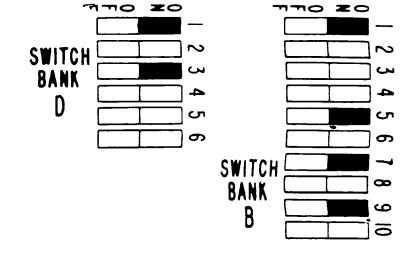
STANDARD SELECTIONS

25¢	1 PLAY
50¢	3 PLAYS
75¢	6 PLAYS
$1.00	9 PLAYS
$1.25	12 PLAYS



STANDARD SELECTIONS

25¢	1 PLAY
50¢	4 PLAYS
75¢	7 PLAYS
$1.00	10 PLAYS
$1.25	13 PLAYS



PRICING AND BONUS OPTION CHART

SWITCH BANK "A"

		STEPS
ON	SPECIAL BONUS TEST	14
	NOT USED	
ON	SPECIAL BONUS MODE C ADDS 1 AT EACH BONUS LEVEL	13
ON	SPECIAL BONUS MODE B ADDS 1 AT EACH BONUS LEVEL	12
ON	TEST SPECIAL BONUS MODES	
ON	RANDOM RECORDS PLAY AT 10-30 MINUTE INTERVALS	10
OFF	RANDOM RECORDS PLAY AT 20-60 MINUTE INTERVALS	
ON	ADD 1 EXTRA PLAY AT EACH BONUS LEVEL	8
ON	RANDOM PLAY	9

SWITCH BANK "B"

0	1	2	3						
OFF	OFF	ON	ON					PLAYS ADDED AT 4TH. BONUS LEVEL	6
OFF	ON	OFF	ON						
0	1							PLAYS ADDED AT 1ST. BONUS LEVEL	3
OFF	ON								
0	1	2	3	4	5	6	7	PLAYS ADDED AT 5TH. BONUS LEVEL	7
OFF	OFF	OFF	OFF	ON	ON	ON	ON		
OFF	OFF	ON	ON	OFF	OFF	ON	ON		
OFF	ON	OFF	ON	OFF	ON	OFF	ON		
0	1	2	3					PLAYS ADDED AT 3RD. BONUS LEVEL	5
OFF	OFF	ON	ON						
OFF	ON	OFF	ON						
0	1	2	3					PLAYS ADDED AT 2ND. BONUS LEVEL	4
OFF	OFF	ON	ON						
OFF	ON	OFF	ON						

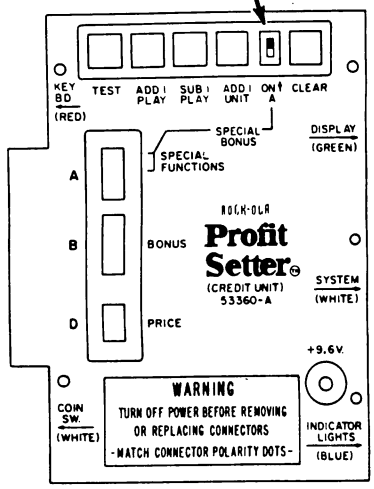
SWITCH BANK "D"

FREE PLAY

5¢	10¢	15¢	20¢	25¢	30¢	35¢	← PRICE PER PLAY	
0	1	2	3	4	5	6	7	← UNITS PER PLAY
OFF	OFF	OFF	OFF	ON	ON	ON	ON	1
OFF	OFF	ON	ON	OFF	OFF	ON	ON	
OFF	ON	OFF	ON	OFF	ON	OFF	ON	
OFF	OFF	OFF	OFF	ON	ON	ON	ON	2
OFF	OFF	ON	ON	OFF	OFF	ON	ON	
OFF	ON	OFF	ON	OFF	ON	OFF	ON	
0	1	2	3	4	5	6	7	← DETERMINE BONUS LEVEL
5¢	10¢	15¢	20¢	25¢	30¢	35¢	← PRICE FOR UNITS	

UNITS NEEDED TO BE ADDED TO STEP 1 TO

STEP 11
SPECIAL BONUS MODE A



NOTE

WHENEVER THE BASE PRICE FOR 1 PLAY IS 25¢, SWITCHES D4, D5 & D6 IN STEP 2 AND SWITCH B3, IN STEP 3 MUST BE SET TO OFF. THEN PROCEED TO STEPS 4 THROUGH 7 AND ADD BONUS CREDITS AT THE 2ND. THROUGH THE 5TH. BONUS LEVELS AS REQUIRED.

PROGRAMMING YOUR OWN PRICE COMBINATIONS

The price of one standard selection is determined by the number of units required to establish one play. A single unit is the smallest denomination coin used while the higher numbers represent multiples of it. For example, the U.S.A. weighted coin values are as follows:

5¢	equals 1 unit
10¢	equals 2 units
25¢	equals 5 units
50¢	equals 10 units
$1.00	equals 20 units

Follow these steps as shown on the PRICING AND BONUS OPTION CHART.

1. Number of units required to establish one play is controlled by switch positions of D1, D2 and D3 in SWITCH BANK D. The desired base price is set as shown on the chart in STEP 1.

   If for example, 15¢ is one play, then D2 and D3 are ON, D1 remains OFF. In operation one credit is stored everytime three units are reached. A total of 255 credits can be stored in the accumulator chip.

BONUS OPTIONS

2. After the base price is established bonus plays can be granted when additional money is deposited. For example, one play 15¢, two plays for 25¢. This option is controlled by switch positions D4, D5 and D6 which add the necessary units to the price to reach a bonus level shown in STEP 2.

   Setting D5 ON, D4 and D5 OFF in STEP 2, adds two additional units to STEP 1, establishing a 5 unit bonus level. Since 1 unit corresponds to 5¢ deposit, 25¢ will be required to reach the 1st BONUS LEVEL.

3. SWITCH BANK B controls the number of bonus credits to be added at the 1st BONUS LEVEL and each succeeding multiple of the 1st, up to 5 BONUS LEVELS maximum. Bonus levels above the 5th automatically register the same number of bonus plays as set for the 5th level.

   When the 1st BONUS LEVEL is reached, the switch position of B3 adds zero or 1 bonus credit only. Adding 1 bonus credit at the 1st BONUS LEVEL determines that:

   15¢ equals 1 play, and
   25¢ equals 2 plays at the 1st BONUS LEVEL

4. Switches B9 and B10 add plays at the 2nd BONUS LEVEL which is two times the money amount of the 1st level. If for example B9 remains OFF and B10 is ON, 1 bonus credit is added at the 2nd level, then:

   50¢ equals 4 plays at the 2nd BONUS LEVEL

5. Switches B7 and B8 add credits at the 3rd BONUS LEVEL. If B7 is ON and B8 remains OFF, 2 bonus credits are added at the 3rd level, then:

   75¢ equals 7 plays at the 3rd BONUS LEVEL

6. Switches B1 and B2 add credits at the 4th BONUS LEVEL. If B1 is ON and B2 remains OFF, 2 bonus credits are added at the 4th bonus level, then:

   $1.00 equals 10 plays at the 4th BONUS LEVEL

7. If B5 and B6 are ON and B4 remains OFF, 3 bonus credits are added at the 5th level, then:

   $1.25 equals 14 plays at the 5th BONUS LEVEL

   Therefore the pricing arrangement for the above example is as follows:

15¢	equals 1 play
25¢	equals 2 plays
50¢	equals 4 plays
75¢	equals 7 plays
$1.00	equals 10 plays
$1.25	equals 14 plays

Note: Selections at any point terminates the bonus acquisition and returns it to starting point. Unused portion of money is stored in memory but DEPOSIT MORE COINS will not be ON when credit total debits to zero. DEPOSIT MORE COINS will turn ON only when the amount deposited is not enough to reach at least one credit.

SPECIAL BONUS OPTIONS

8. Switch A7 adds 1 extra play at every bonus level independent of the other switches.

RANDOM PLAY

9. To stimulate phonograph play, switches A8 and A6 can be set to allow random selections to play at 10 to 30 or 20 to 60 minus intervals after the last selection played. First 20 selections (hit tunes) are excluded. A8 when ON sets up RANDOM PLAY.

10. A6 determines the time interval. ON, interval is 10 to 30 minutes. OFF, time is extended to 20 to 60 minutes.

MODE A-B-C OPERATION

Special bonus modes can be added to the RANDOM PLAY feature. Bonus lights flash at different intervals as preset by the mode. Duration of the flashing is about three minutes at which time the customer can insert money and receive 1 extra bonus credit at each bonus level.

Insertion of money extends the time until selection is made. After 3 minutes bonus lights stop flashing and selection pricing reverts to original pricing.

MODE A OPERATION

11. This mode operates when machine is idle for the time interval as preset by timing switch A6. Random play is optional with all modes and A8 can be ON or OFF.

Setting MODE A switch to ON will trigger flashing bonus lights during the random play option and add 1 extra credit to each bonus level automatically.

To test Mode A operation:

A. Turn off machine power.

B. Adjust switches A1, A5, A8 and Mode A to "ON", all other Bank A switches are "OFF".

C. Turn on machine power . . . Record magazine scans one revolution and stops briefly in home position before resuming a random selection cycle. When cycle resumes, bonus lights flash and random selection No. 102 is displayed as now playing. After about 3 minutes another random selection will play indicating Mode A operation is O.K.

D. At this point money can be deposited to check credits received as set by credit switches in Bank D and Bank B.

E. Upon making any selection, bonus lights stop flashing and value of selections return to standard pricing.

F. When test completed switches A1 and A5 must be returned to OFF.

MODE B OPERATION

12. This mode allows bonus lights to flash during the record playing period only.

Shut off machine power. Set switches A4 and A8. All other Bank A switches remain OFF. When machine power is turned ON, magazine will scan one revolution and stop in HOME position.

To test Mode B operation;

G. Shut off machine power. Switches A1, A4, A5 and A8 must be ON. All other switches in Bank A must be OFF.

H. Turn on machine power . . . BONUS LIGHTS will start flashing.

J. Make any selection . . . Bonus lights should stop flashing momentarily before resuming.

This action indicates Mode B operation is working properly. At this point money can be deposited to check credits received as preset by the Switch Banks.

K. After credit check completed return switches A1 and A5 to OFF.

MODE C OPERATION

13. This mode allows BONUS LIGHTS to flash when money is inserted.

    Shut off machine power. Set switches A1, A3, A5 and A8 to ON. All other Bank A switches remain OFF.

To test Mode C operation;

L. Turn on machine power . . . BONUS LIGHTS start flashing.

M. Make any selection . . . Bonus lights stop flashing which completes Mode C test. At this point money can be deposited to check credits received as preset by the Switch Banks.

N. After credit check completed return switches A1 and A5 to OFF.

14. SPECIAL BONUS TEST
    Switch A1 when ON shortens the random playtime interval to 6 seconds and is used for testing BONUS MODES A, B and C.

TEST PROCEDURE FOR PROFIT SETTER (CREDIT UNIT)

1. With PROFIT SETTER connected and power on, the +9.6V LED is on.

   (A) Set switch banks A, B, D to OFF (OPEN) position. Credit display (PLAYS) must count from 1 to 99 and remain at 99.

   (B) Switch phono main power off and then back on again. Credit display reverts back to 0 and immediately counts from 1 to 99 and remains at 99.

   (C) Set switch D3 on, press (red) CLEAR button, then press (blue) TEST button. Credit display will add and then subtract plays until one play remains. If RECORD PLAYING/YOUR SELECTION display shows 888 there is a malfunction in coin switch or PROFIT SETTER. Press CLEAR button if only 1 PLAY is displayed.

   (D) Test ADD 1 PLAY button by pressing it five times. Credit display shows 5 PLAYS.

   (E) Test SUBTRACT 1 PLAY button by pressing five times, 5 plays are removed one at a time and credit display goes out.

   (F) Set switches D1, D2 and D3 to ON position. Press (gray) ADD 1 UNIT button seven times. Credit display now shows 1 PLAY. Press CLEAR button.

2. U.S. COINAGE -- SWITCH SETTINGS

(A) Set D1, D2 and D3 as follows, and check that you get one play for the amount of money specified. Use all possible combinations of coins. **Press CLEAR button after each switch combination setting and before depositing coins.**

D1	D2	D3	COST/PLAY
Off	Off	Off	(Free play)
Off	Off	On	5¢
Off	On	Off	10¢
Off	On	On	15¢
On	Off	Off	20¢
On	Off	On	25¢
On	On	Off	30¢
On	On	On	35¢

(B) Set D2, D3, B2, B3, B6, B8, B10 on. Then set D4, D5 and D6 as follows:

D4	D5	D6	Amount of Money	No. of Plays
Off	Off	Off	15¢	2
Off	Off	On	20¢	2
Off	On	Off	25¢	2
Off	On	On	30¢	3
On	Off	Off	35¢	3
On	Off	On	40¢	3
On	On	Off	45¢	4
On	On	On	50¢	4

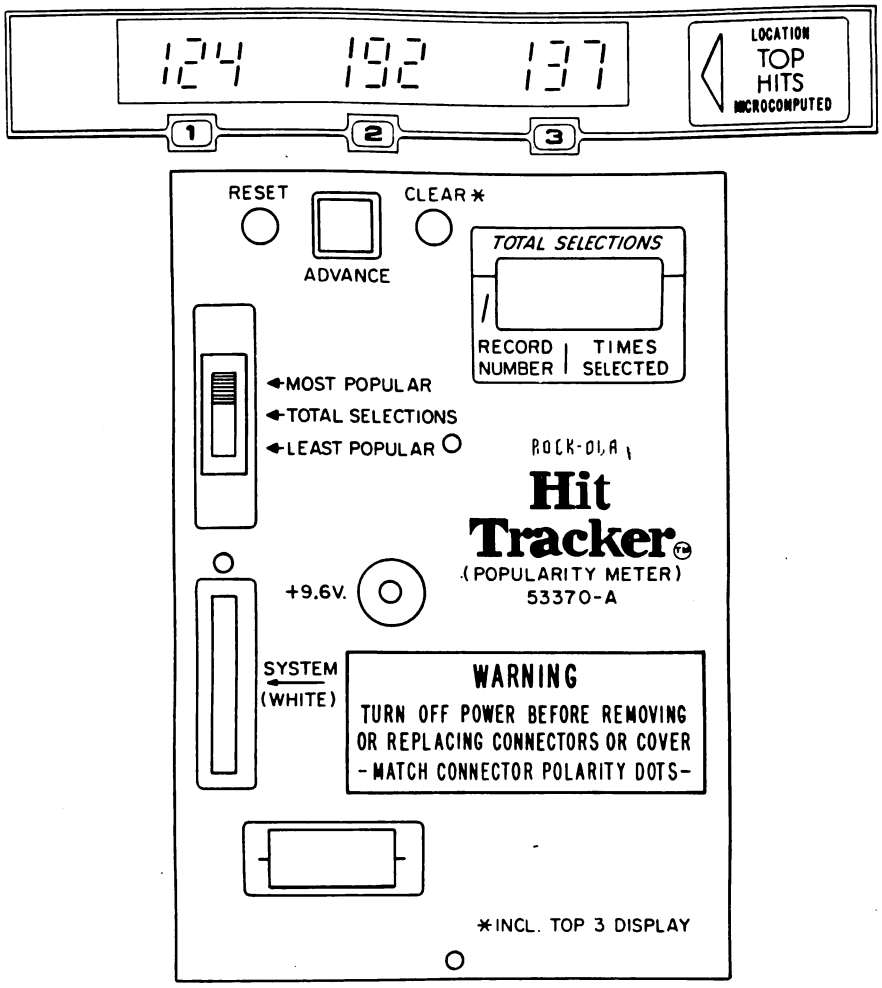
(C) Set all B switches on. Then set D2, D3 and D5 on. Press CLEAR button.

Amount of Money	No. of Plays
15¢	1
25¢	2
40¢	3
50¢	6
75¢	10
$1.00	14
$1.50	30

Press CLEAR button.

(D) With the switches set as in step (C), insert $1.00—credit display must show 14 PLAYS.

Make selection 297 and observe that the proper selection is played and that the number of credits has decreased to 13. Insert an additional 50¢ and observe that the total number of plays shown on the credit display is 19.



ELECTRONIC POPULARITY METER

One of the functions of the microprocessor is to keep a tally on the number of times each record is played. A battery in the system maintains the correct count even if the power cord is disconnected.

For customer information the three most popular selections are monitored externally on three digit displays.

Selection count of MOST or LEAST records played are displayed internally on a five digit display located on the pop counter board. Two digits on the left side show the last two digits of a record number. The number of times the record has been selected is shown on the right three digits.

To read the LEAST played records, set the 3 position slide switch to LEAST POPULAR position. Pushing and releasing the ADVANCE button the records are read out one at a time from zero selection to *the highest count.*

The MOST played records are read out when the slide switch is set to MOST POPULAR position. Operating the ADVANCE button the record count will read the highest to the lowest.

To show TOTAL count of all the selections, set the slide switch to TOTAL SELECTIONS position and press the ADVANCE button. When button is released the total count will appear on the five digit display.

The HIT TRACKER may be cleared or reset at any time to provide an accurate record of activity during a particular time period.

Operating the CLEAR button erases all accumulated play data from the module. The TOTAL SELECTIONS display returns to zero, and the selection numbers appearing in the location top hits display are replaced by dashes.

The RESET button also erases the play data, however, the location top hits remain unaffected.

TEST PROCEDURE FOR HIT TRACKER (POPULARITY METER)

1. Main power off; HIT TRACKER connected. Move the 3 position slide switch to the TOTAL SELECTION position (center) and switch main power on. Press (Red) CLEAR button.

   (A) The HIT TRACKER display must show a 0 in the first digit to the right only with the other four digits off.

   (B) The 3 TOP HITS display at top front of phono must show — — — in each display.

2. Move the slide switch to the MOST POPULAR position (top).

   (A) The HIT TRACKER display shall show 00000.

3. Return the slide switch to the TOTAL SELECTION position (center). Add at least 12 credits via the (white) ADD 1 PLAY button on the PROFIT SETTER and select #297 (3 times), #284 (2 times), and #185 (once).

   (A) The HIT TRACKER display must only show 6 on the first digit to the right and the 3 TOP HITS display must indicate 297 — 284 — 185.

4. Move the slide switch to the MOST POPULAR position (top).

   (A) The HIT TRACKER display must show 97003.

5. Press the (gray) ADVANCE button once.

   (A) The HIT TRACKERdisplay must change to 84002.

6. Press the ADVANCE button again.

   (A) The HIT TRACKER display must change to 85001.

7. Move the slide switch to the LEAST POPULAR position (bottom).

   (A) 96000 must show on the display.

8. Select #284 two more times.

   (A) 3 TOP HITS display now must show 284 — 297 — 185.

9. Select #185 four more times.

   (A) 3 TOP HITS display now must show 185 — 284 — 297.

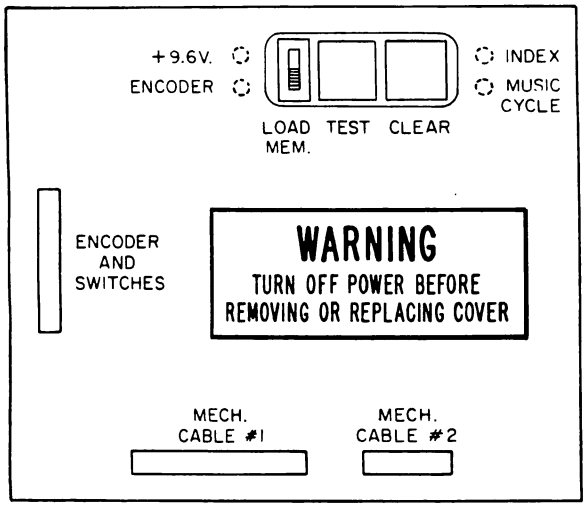
10. Switch main power off and on again. All displays must retain their previous readings.

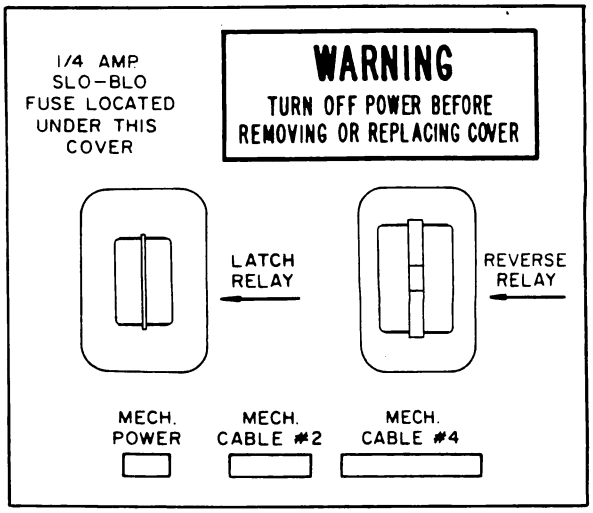
11. Move the slide switch to the TOTAL SELECTION position (center). Press (blue) RESET button.

    (A) HIT TRACKER display returns to 0 in first digit to the right. 3 TOP HITS display remains at 185 — 284 — 297.

12. Press CLEAR button.

    (A) Both displays return to their initial conditions as in 1 (A) and 1 (B).





LOGIC BOARD

The Logic Board contains the microprocessor which stores the selection information and the input/output circuitry necessary to communicate with the other mechanism devices over a common bus system to control the mechanism.

The logic board has four diagnostic LED LAMPS. One of which indicates the presence of +9.6 voltage. The other three point out the circuits active during the mechanism cycle of placing the record on the turntable.

Three additional switches are included. The LOAD MEMORY switch when turned on will select all 160 selections before the mech turns off. This check mode is primarily a factory quality control function. The system can be cleared by pressing the CLEAR button to permit testing when necessary.

The TEST button is used to determine quickly if the LOGIC BOARD is defective. When pressed, a good unit will select programmed selections 100 — 194 — 197 — 200 — 294 — 297.

MECH POWER SUPPLY BOARD

The MECH POWER SUPPLY BOARD consists of a LATCHING RELAY and REVERSE RELAY assisted by transistors and other devices to control the operation of two D.C. motors, namely MAGAZINE MOTOR and GRIPPER MOTOR.

The latching relay is a magnetic type controlled internally by a LATCH COIL and RESET COIL. Its function is to operate each motor at the proper points of the mechanism cycle and provide dynamic braking circuits to both motors.

The REVERSE RELAY operates at the end of the music cycle which reverses the polarity of the gripper motor circuit, returning the record to the magazine.

TEST PROCEDURE FOR MECHANISM — LOGIC P.C. BOARD

Main power off; logic board connected.

(1) Move LOAD MEM.(ORY) slide switch down to OFF position and press (red) CLEAR button. Switch main power switch at back of phono to ON. Magazine should revolve 360° and stop in home position. 9.6VDC #4 LED (+9.6V) light must be on, all others off.

(A) Press (blue) TEST button; mechanism operates making the following record selections in sequence: #100, #194, #197, #200, #294, #297.

Note that the following LED's go on while above selections are being played.

(B) TIMER LED #5 (ENCODER) goes on and off as magazine rotates.

(C) INDEX LED #6 (INDEX) goes on momentarily when magazine indexes (i.e. stops) at record selection.

(D) MUSIC LED #7 (MUSIC CYCLE) goes on and remains lit while record is playing. When all selections have been made, magazine must stop in home position.

NOTE: When above check is being made, SCAN service switch left of HIT TRACKER should not be used to cancel record.

(E) With credits on PROFIT SETTER (credit unit), make the following selections, #100, #184, #187, #197, #200, #282, #297, #145, #255, #222, #111. Observe that the proper record selections have been made.

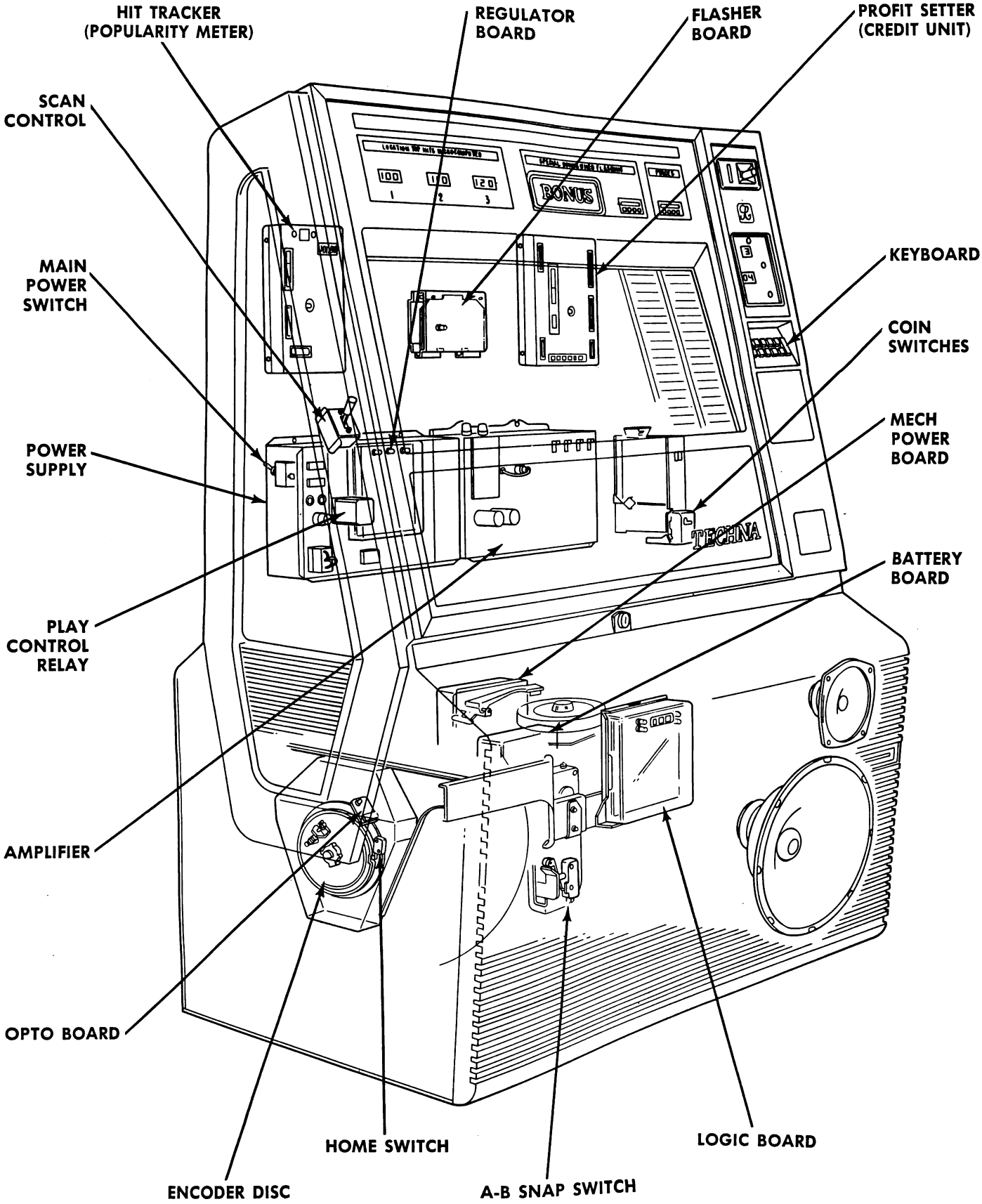
(F) Move LOAD MEM. slide switch up to ON position and immediately return down to OFF. Mechanism will start and play records in sequence #100, #110, #120, #130, #140, etc. until all 160 selections are played, or CLEAR button is pressed. Magazine will again return to home position and stop.

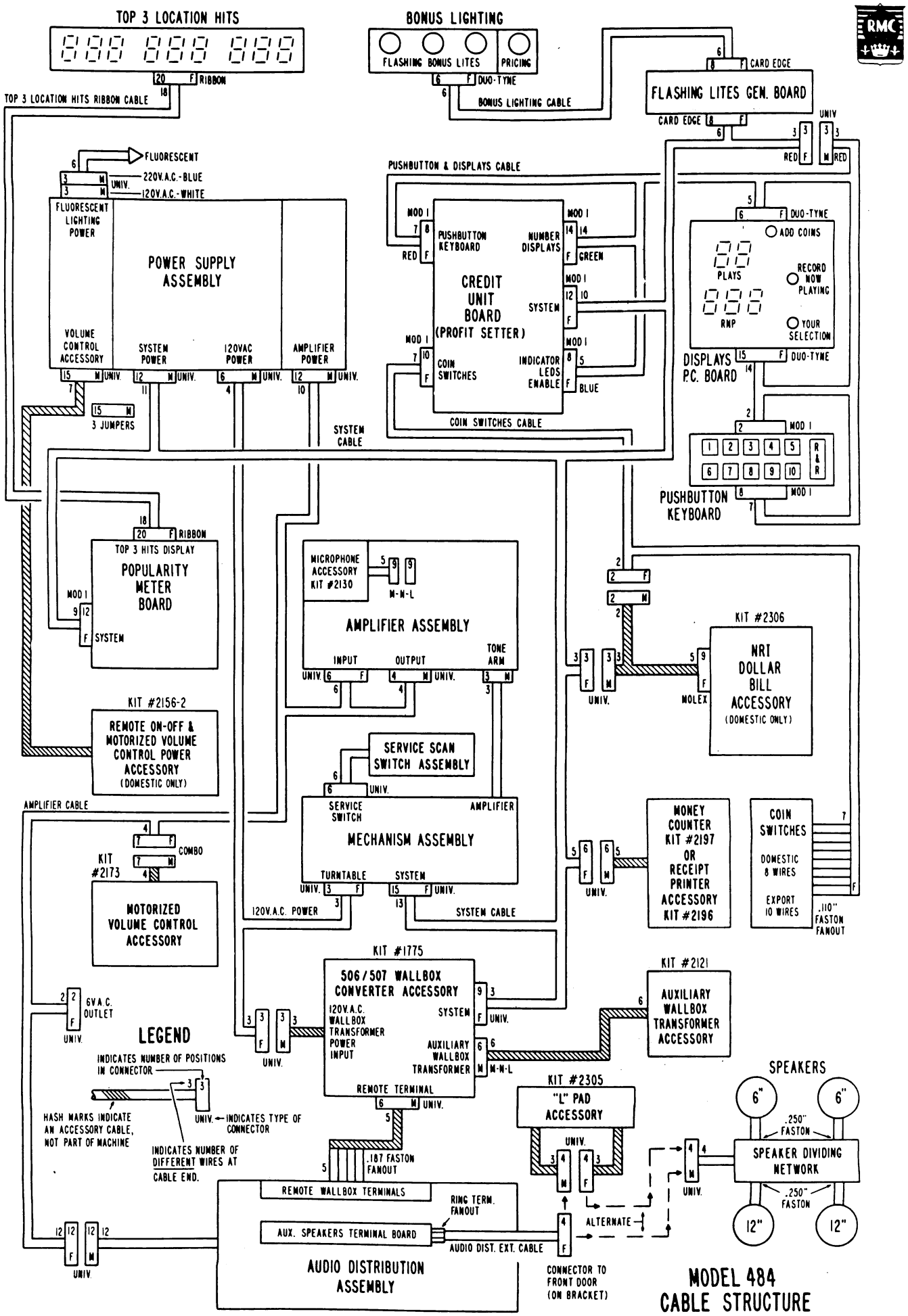
(2) MECHANISM STANDBY BATTERY TEST

Select #100, #200, #111. Turn main power off and then on again, selections must be retained in the memory and mechanism must play all three selections.

If memory is lost the battery is most probably bad or discharged. Check for proper operation of SCAN service switch.

COMPONENT PLACEMENT

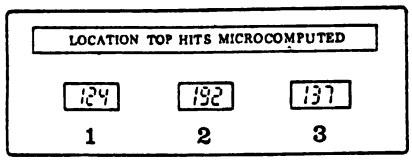




MODEL 484 CABLE STRUCTURE

A REMINDER: BEFORE REPLACING ANYTHING ALWAYS CHECK FOR LOOSE WIRES AND CABLE CONNECTIONS.

TROUBLE SHOOTING TEST PROCEDURE

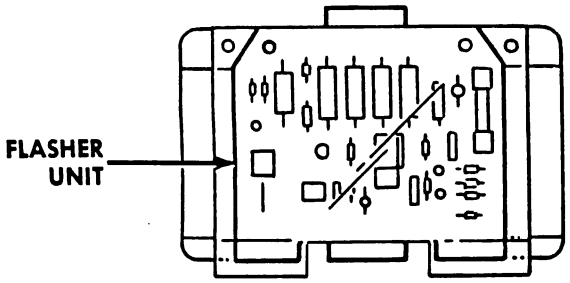


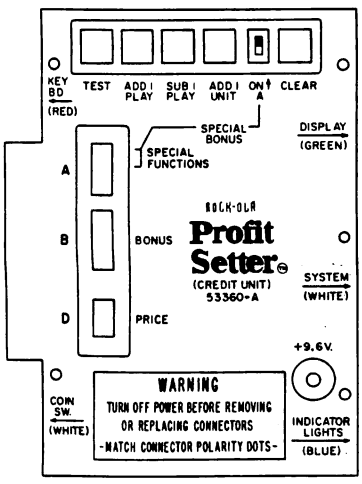
I. STANDBY CONDITION

Before attempting on location maintenance, unnecessary probing can be avoided if certain external and internal phonograph conditions can be observed.

When machine is at standby, the three TOP HITS are displayed. This indicates that:

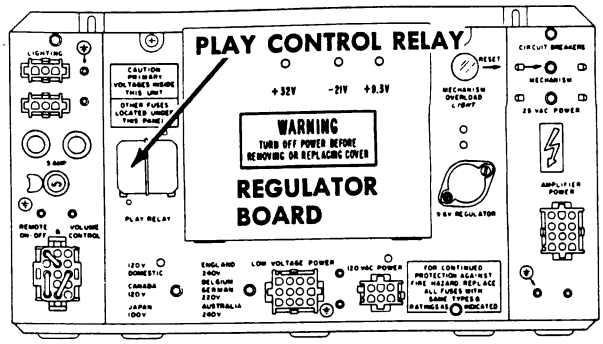
A) -21 Vdc display voltage is ON.
B) 25 Vac display transformer primary, and 2.4 Vac secondary filament voltages are ON.
C) 9.6 Vdc voltage for operating microprocessor circuits are ON.





If Bonus Lights start to flash during the machine idle period and continues for three minutes, indicates that:

A) FLASHER UNIT is OK.
B) CREDIT UNIT appears to be OK. Further tests will examine the credit unit more thoroughly.



II. TROUBLESHOOTING

When machine is opened, observe if the three LED's on the face of the POWER SUPPLY are ON indicating the presence of operating voltages. These voltages are protected by SLO-BLO fuses on the inside of the power supply, and two CIRCUIT BREAKERS on the front panel.

Unexplainable malfunctions can occur if the 9.6 Vdc microprocessor operating voltage is HIGHER or LOWER. Check for 9.6 Vdc at the LOW VOLTAGE POWER plug at the power supply. (Pink wire to chassis ground) Adjustment is made on the REGULATOR BOARD TRIM POT R220. Disregard the 9.3 Vdc voltage information imprinted next to the pot.

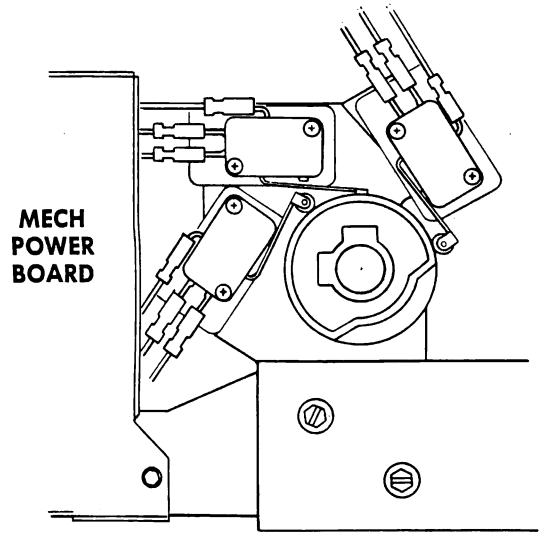
120 Vac power (U.S.A.) is protected by a 5 amp fuse, also on the front panel of the power supply.

Standard operation of the machine (not set for free play) can be quickly tested and problem area pinpointed by the following test procedures.

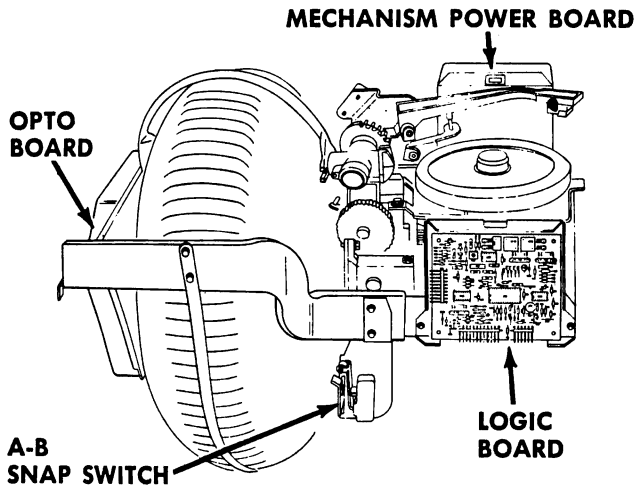
A) On the back side of the cabinet operate the MAIN POWER SWITCH OFF, then ON.

   Mechanism should operate allowing the RECORD MAGAZINE to rotate one revolution and stop in HOME POSITION. (Gripper arm over open space on the magazine)

IF THIS TEST OCCURS, CONTINUE TO SECTION III.



Note: Operation of the four MICRO SWITCHES in the mechanism circuits are not mentioned as possible problem areas. Past experience with MICRO SWITCHES in former models indicate malfunctions are very unlikely.



1) IF THE MECHANISM DOES NOT START when the main power switch is operated OFF and ON, move the scan switch to SCAN POSITION.

   IF THE MECHANISM STARTS, then the problem area is:

   A) Defective CREDIT BOARD

   IF THE MECHANISM DOES NOT START IN SCAN POSITION, then the problem area is:

   A) LOGIC BOARD
   B) REGULATOR BOARD (power supply)
   C) PLAY CONTROL RELAY
   D) MAGAZINE MOTOR
   E) MECHANISM POWER BOARD

3) IF THE MECHANISM DOES NOT START BUT THE TURNTABLE IS ROTATING, then the problem area:

   A) PLAY CONTROL RELAY
   B) MAGAZINE MOTOR
   C) MECHANISM POWER BOARD

III. LOGIC BOARD TEST

To examine the operation of the LOGIC BOARD, press CLEAR button, then press TEST button.

Mechanism should operate and select test selections #100 — #194 — #197 — #200 — #294 — #297. IMPORTANT that each test selection is cancelled by the RECORD CANCEL SWITCH on the back of the cabinet. Observe if the correct test selections appear in the RECORD PLAYING window.

IF THE TEST ROUTINE OCCURS, CONTINUE TO SECTION IV.

1) IF MECHANISM FAILS TO STOP to play any test selections, the magazine will complete three revolution before stopping in HOME POSITION. This indicates the problem area is:

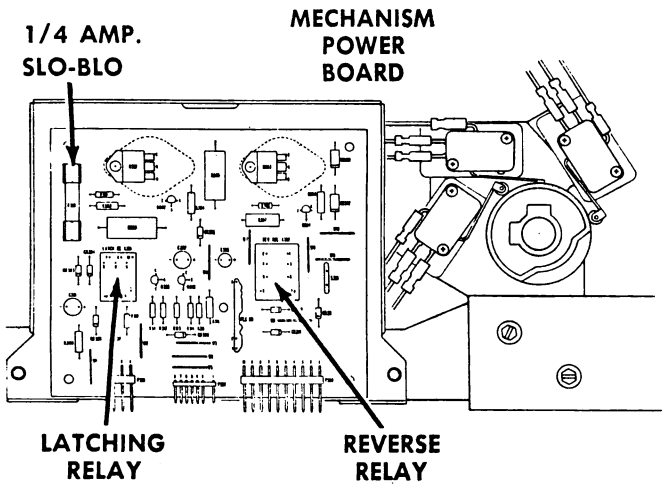
   A) A-B SNAP SWITCH
   B) OPTO BOARD
   C) LOGIC BOARD

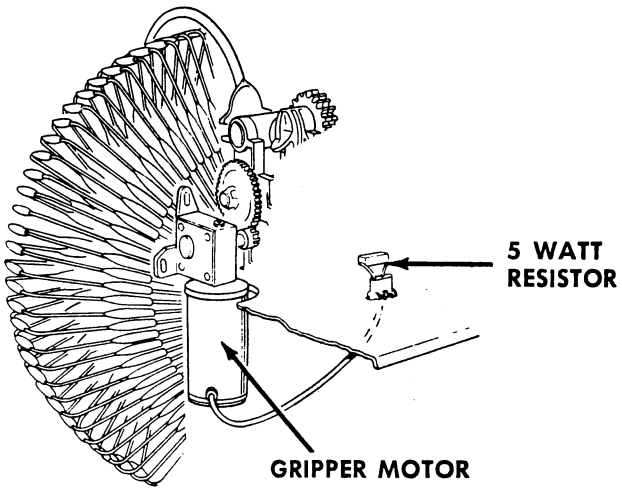
2) IF MECHANISM PLAYS ONE SIDE OF THE TEST RECORD BUT NOT THE OTHER SIDE, then the problem area is:

   A) A-B SNAP SWITCH
   B) LOGIC BOARD

3) IF MAGAZINE STOPS AT WRONG SELECTIONS by two or more records on the middle and end test selections, then the problem area is:

A) LOGIC BOARD





4) If magazine rotation stops and GRIPPER MOTOR DOES NOT START, then the problem area is:

A) LATCHING RELAY
B) LOGIC BOARD
C) 5 WATT RESISTOR
D) GRIPPER MOTOR

5) IF GRIPPER ARM DOES NOT PICK UP RECORD in the center of the separators, then the problem is:

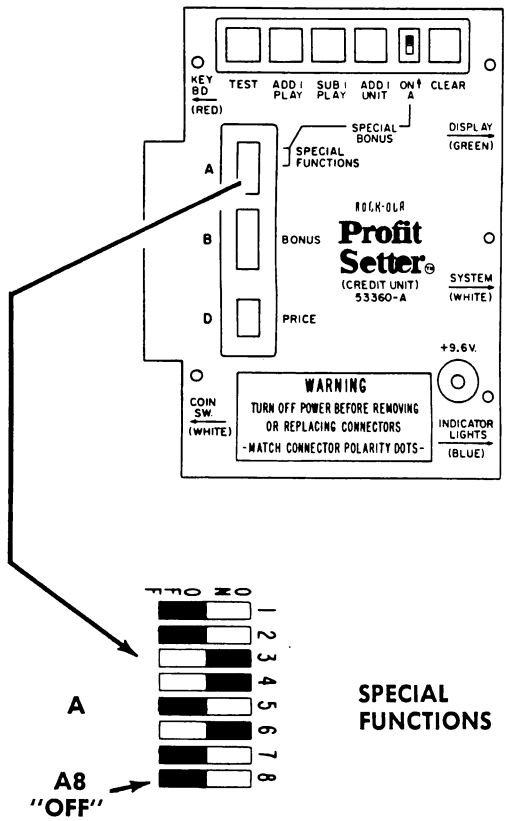
A) *INDEXING ADJUSTMENT.*
See adjustment SECTION VIII.

6) IF GRIPPER MOTOR STOPS before tone arm stylus rests on the record, then the problem area is:

A) BLOWN 0.5 AMP SLO-BLO FUSE (on the mechanism power board)
B) MECHANISM POWER BOARD

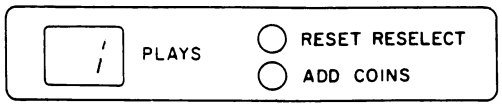
7) IF TONE ARM DOES NOT CANCEL RECORD when record cut-off groove is reached, then the problem area is:

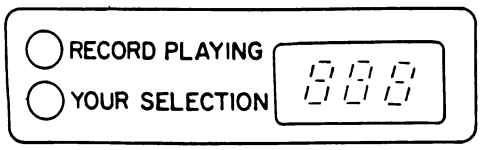
A) TONE ARM SWITCH
B) REVERSE RELAY
C) LATCHING RELAY
D) MECHANISM POWER BOARD
E) BLOWN 0.5 AMP SLO-BLO FUSE (on the mechanism power board)



IV. To examine the operation of the CREDIT UNIT, set RANDOM PLAY SWITCH A8 to OFF. Press CLEAR button, then press TEST button.

Credits will ADD then SUBTRACT until 1 PLAY remains displayed in the credit window.





1) If 888 also appears in the RECORD PLAYING window, then:

   A) See if any COIN SWITCHES ARE CLOSED. If not closed, then;
   B) CREDIT UNIT BOARD is defective.

2) IF 888 DOES NOT APPEAR, press CLEAR button to erase 1 PLAY.

3) Press ADD 1 CREDIT button 5 times, 5 plays should display in the credit window.

4) Press SUBTRACT 1 PLAY button 5 times, 5 plays are subtracted one at a time.

   IF ADD AND SUBTRACT routine does not operate correctly:

   A) Replace CREDIT BOARD.

   IF ADD and SUBTRACT routine operates OK, then:

5) Press CLEAR button. Press ADD 1 UNIT button one time. ADD COINS Led should FLASH.

   IF ADD COINS LED DOES NOT FLASH, then the problem is:

   A) Defective FLASHER BOARD, or
   B) CREDIT BOARD.

   IF ADD COINS LED FLASHES, then:

6) Continue to press ADD 1 UNIT button until price for 1 play is reached. ADD COINS LED stops flashing, 1 play is displayed.

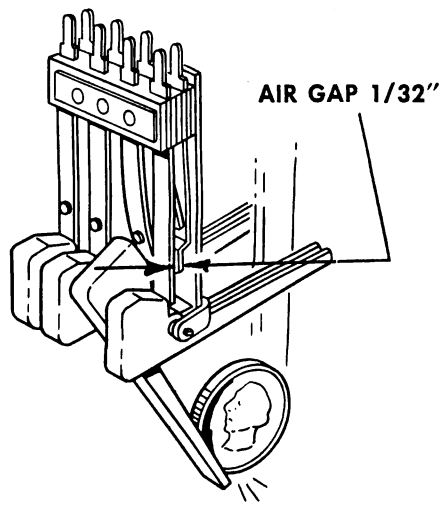
7) Make error selection, as 333. IF RESET-RESELECT DOES NOT FLASH, then the problem is:

   A) Defective CREDIT BOARD.

Procedure for testing PRICE, BONUS and SPECIAL FUNCTIONS switch banks A, B, and D are explained on page 10.

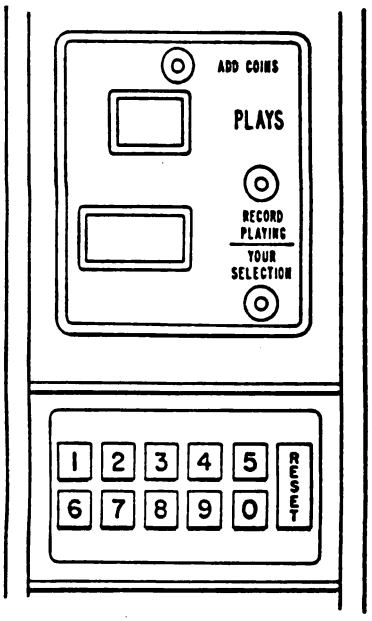
V. COIN SWITCH TEST

Use a combination of coins to test the operation of the COIN SWITCHES. Observe if correct amount of plays are displayed as set by the PRICE and BONUS switch banks D and B.



IF THE SAME COIN does not add the same number of credits each time, then check for:

A) BOUNCING COIN SWITCH
B) DIRTY COIN SWITCHES
C) COIN SWITCH AIR GAP MUST BE 1/32"



VI. KEYBOARD TEST PROCEDURE

To test keyboard circuits for signal continuity, do the following:

1) Move SCAN switch to OFF position.

2) Press CLEAR button on the CREDIT UNIT, then press ADD 1 PLAY button.

3) Press pushbuttons "1" and "2" . . . IF NUMBERS APPEAR IN THE DISPLAY WINDOW, press the RESET button to clear the selection system.

4) Follow the same procedure for numbers "1" and "3", "1" and "4", "1" and "5" etc., until numbers "1" and "0" are pressed and displayed.

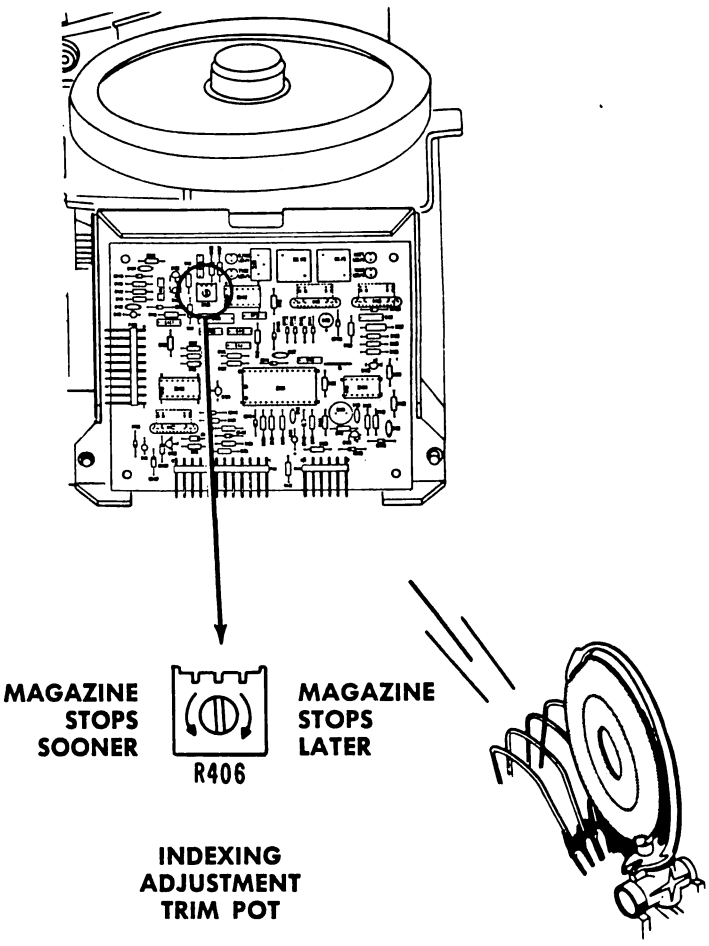
5) IF ALL NUMBERS DISPLAY, the keyboard is operating correctly.

   NUMBERS THAT DO NOT DISPLAY, the problem area can be:

   A) OPEN DIODE on the keyboard
   B) PUSHBUTTON SWITCH
   C) CABLING

VII. HIT TRACKER (POPULARITY METER)

Procedure for testing the HIT TRACKER is explained on page 13. If this unit is removed, the operation of the machine will not be effected.



VIII. INDEXING ADJUSTMENT PROCEDURE

Record must be in correct pick-up position for removal by the gripper arm.

1) Press Logic Board TEST BUTTON. Record magazine starts rotating and indexes at record selection 100 — 194 — 197 — 200 — 294 — 297.

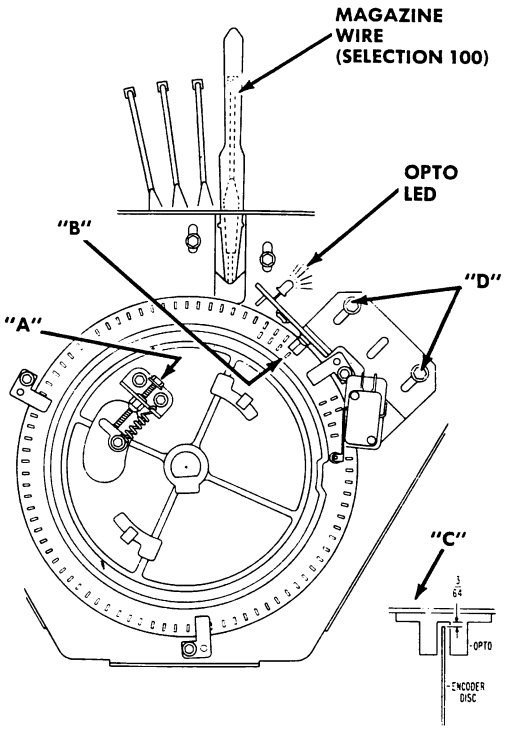
2) Allow record to be placed on the turntable.

3) Cancel record . . . As record starts to enter record slot, note the record alignment between the left and right separator with respect to center.

4) To adjust, turning trim pot clockwise will advance the record alignment toward the right separator . . . counter clockwise to the left separator.

Recheck the adjustment by repeating the procedure with the remaining test selections.

Note: If the Trim Pot cannot be adjusted to produce the proper record alignment, the Encoder Disc must be re-adjusted as shown below.

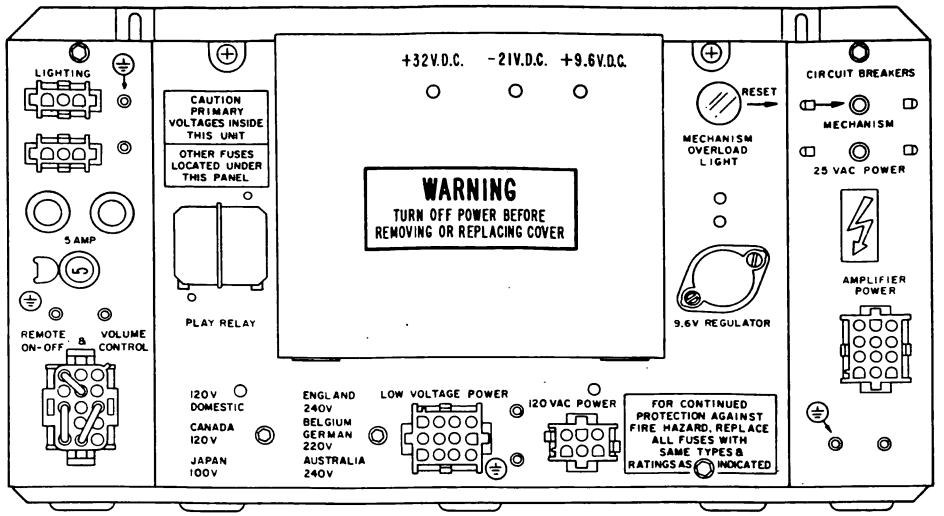


OPTO ASSEMBLY ADJUSTMENT PROCEDURE

1. Rotate the knurled end of the magazine motor until the first magazine wire (selection 100) is directly under the gripper arm. At this point the opto LED lamp should light. If this does not occur, then;

2. Turn adjustment screw "A" until the White Line "B", on the Encoder Disc, aligns with the center line on the Opto Encoder, and the opto LED lamp lights.

3. The Opto Encoder Assembly must be set approximately 3/64" above the Encoder Disc as shown at "C". Loosen screws "D" to raise or lower assembly.



POWER SUPPLY

The Power Supply provides the various AC and DC voltage requirements to operate all the systems in the entire phonograph. For 100 and 120 VAC operation the lighting circuits and the power transformer primary windings are protected by a 5 amp fuse or circuit breaker; for 200 and 240 volt operation, three fuses serve the same purpose. The line ON-OFF switch is located within the power supply and is accessible from the rear of the cabinet.

The transformer has four secondary windings which provide AC voltages as follows:

WINDING #1 — A center tapped 46 VAC winding which supplies the amplifier power. Fusing, rectification and filtration components are located in the amplifier.

WINDING #2 — A 15 VAC winding which is fused, rectified, filtered and applied to a three terminal voltage regulator (LM 317) via pass transistor Q101. The Q101 and Q102 transistors provide for a fast voltage rise time at the input of the voltage regulator; this is required by the various MP chips. The output of the voltage regulator is adjusted by potentiometer R220 and is factory set to 9.6 VDC.

WINDING #3 — A 25 VAC winding which is fused, rectified, filtered and applied to the mechanism relay and motor circuits via two protective means. The first consists of a very fast acting, latching type "electronic fuse" circuit which protects the mechanism motor drive transistors in the event of a short circuit in the motors or associated circuits; the second is a slow acting manual circuit breaker which opens if a mechanism jam occurs. This mechanism voltage is approximately 32 VDC under no load conditions.

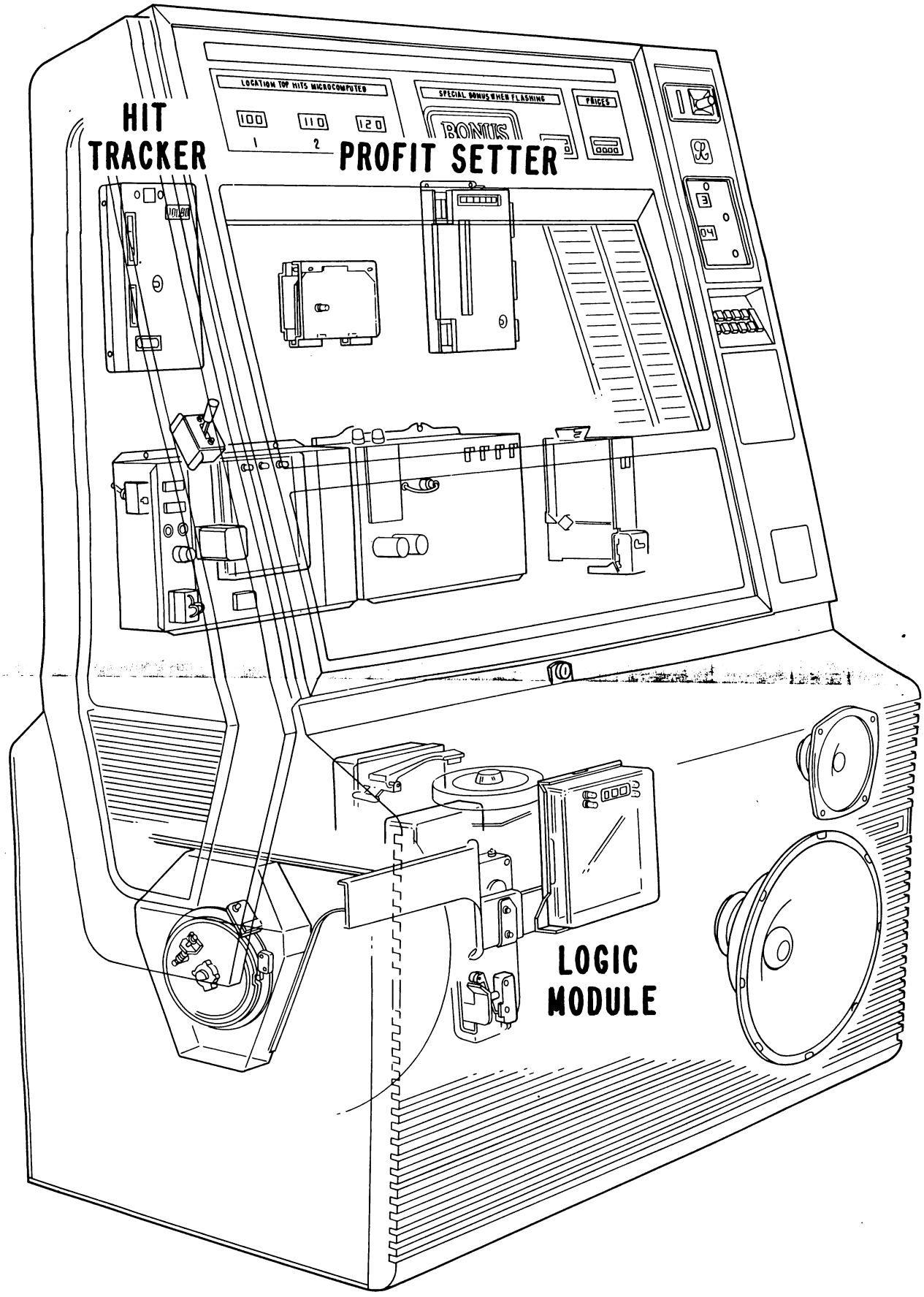
WINDING #4 — A 25 VAC winding, protected by a manual circuit breaker, which provides:

1. AC power to the Flasher Board.
2. AC power to the Motorized Volume Control.
3. AC power to the Dollar Bill Validator (an accessory).
4. AC power to the vacuum displays filament transformer which supplies 2.4 volts.

Additionally, the negative 21 volts is derived from this winding via CR209, C204 and its associated circuitry which constitutes a current foldback arrangement which limits the current to a safe value should a short occur.

All the fuses described are either on the Rectifier Board inside the chassis, or on the front panels. The detachable front panel mounts the T2 transformer (w/fuse) for the displays and the Play Control Relay K1.

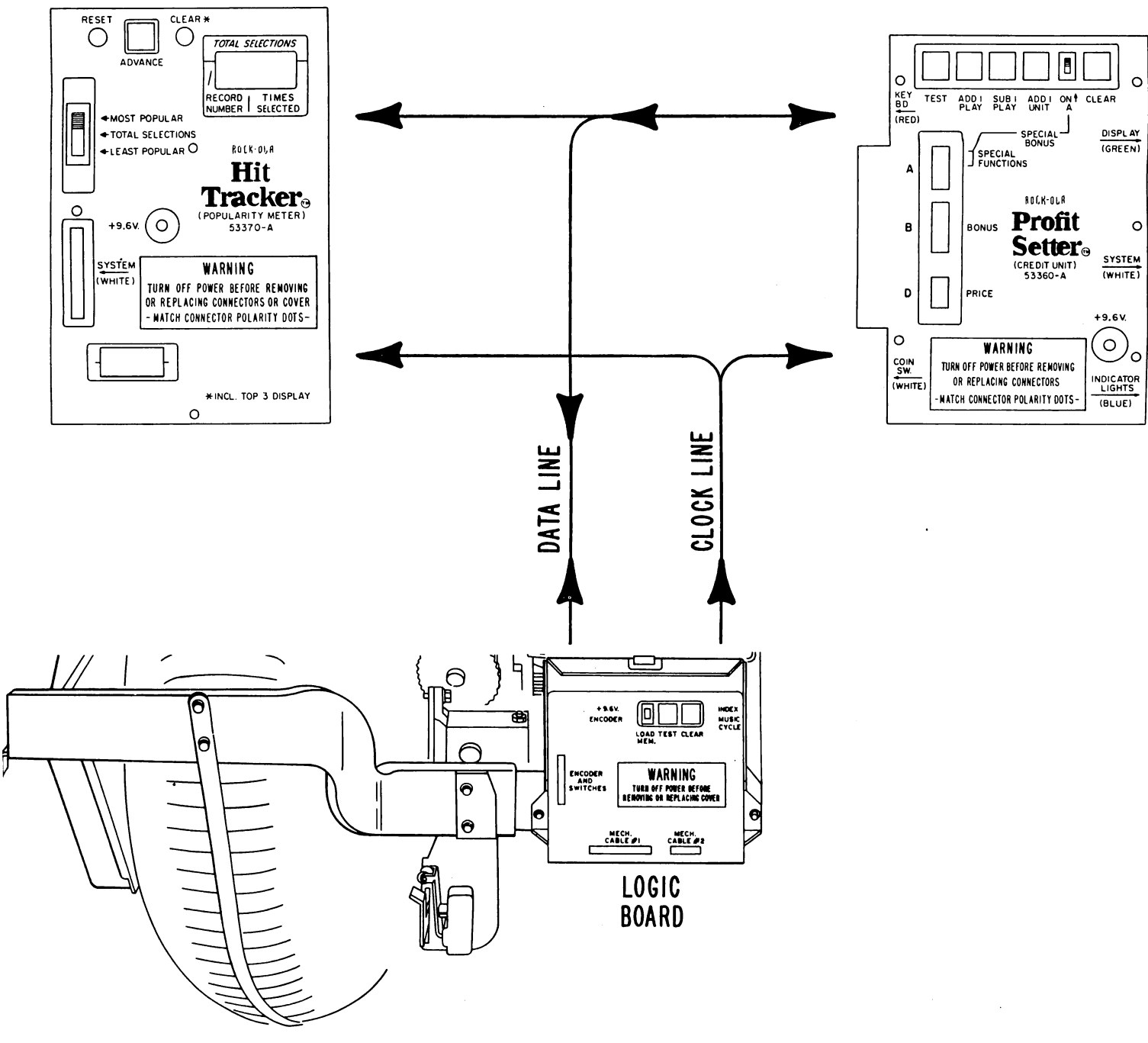
The voltage regulator P.C. board mounts on the front panel protected by a transparent snap-on cover. The three D.C. supplies and associated circuitry, each use a LED to indicate the presence of voltage.

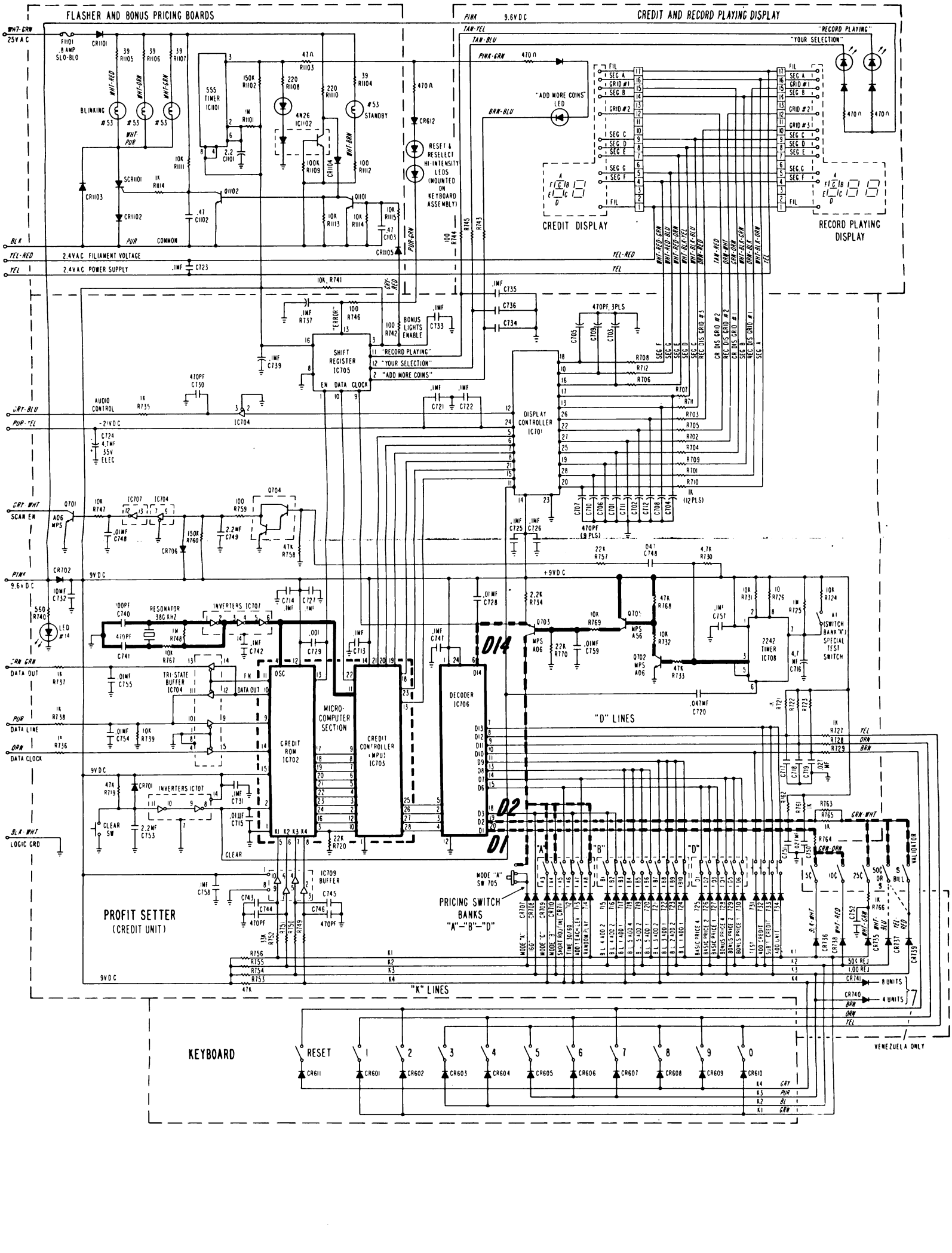

HIT
TRACKER
PROFIT SETTER
LOGIC
MODULE
LOCATION TOP HITS MICROCOMPUTED
100
110
120
1
2
SPECIAL BONUS WHEN FLASHING
BONUS
PRICES

SEQUENCE 1. GENERAL INFORMATION

Microprocessors contained in the "PROFIT SETTER", "HIT TRACKER" and Mechanism Logic Board operate on a frequency of 380 KHZ generated at each module. Communication between the modules is controlled by two common lines consisting of the Data and Clock signals.

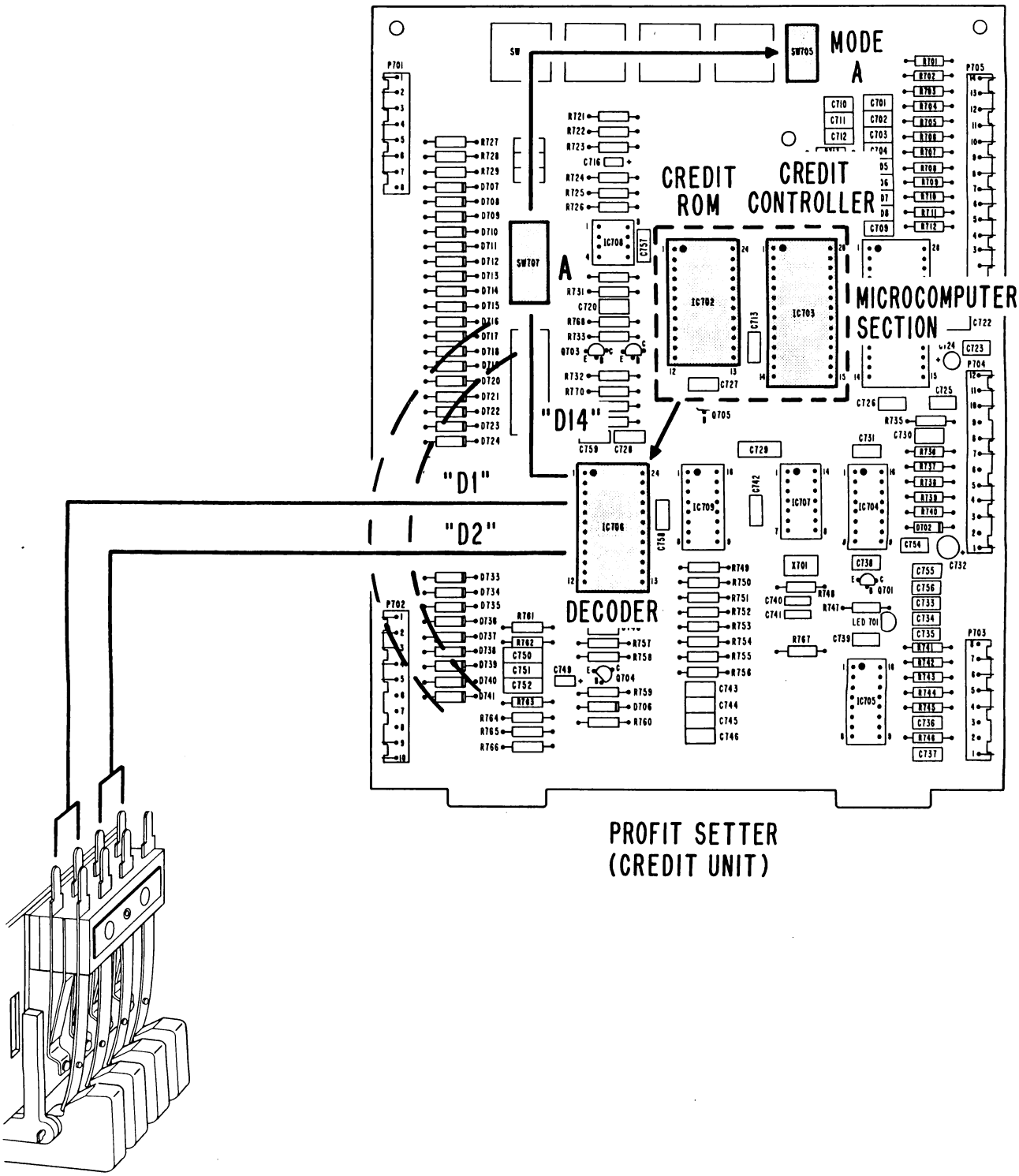
The clock is generated at the Logic Module and allows data information to be transmitted and received in a synchronized manner by the modules. At this point, the "PROFIT SETTER" is ready to receive money and selection data, transmit this information to the Logic Module for mechanism control, and to the "HIT TRACKER" for popularity count.

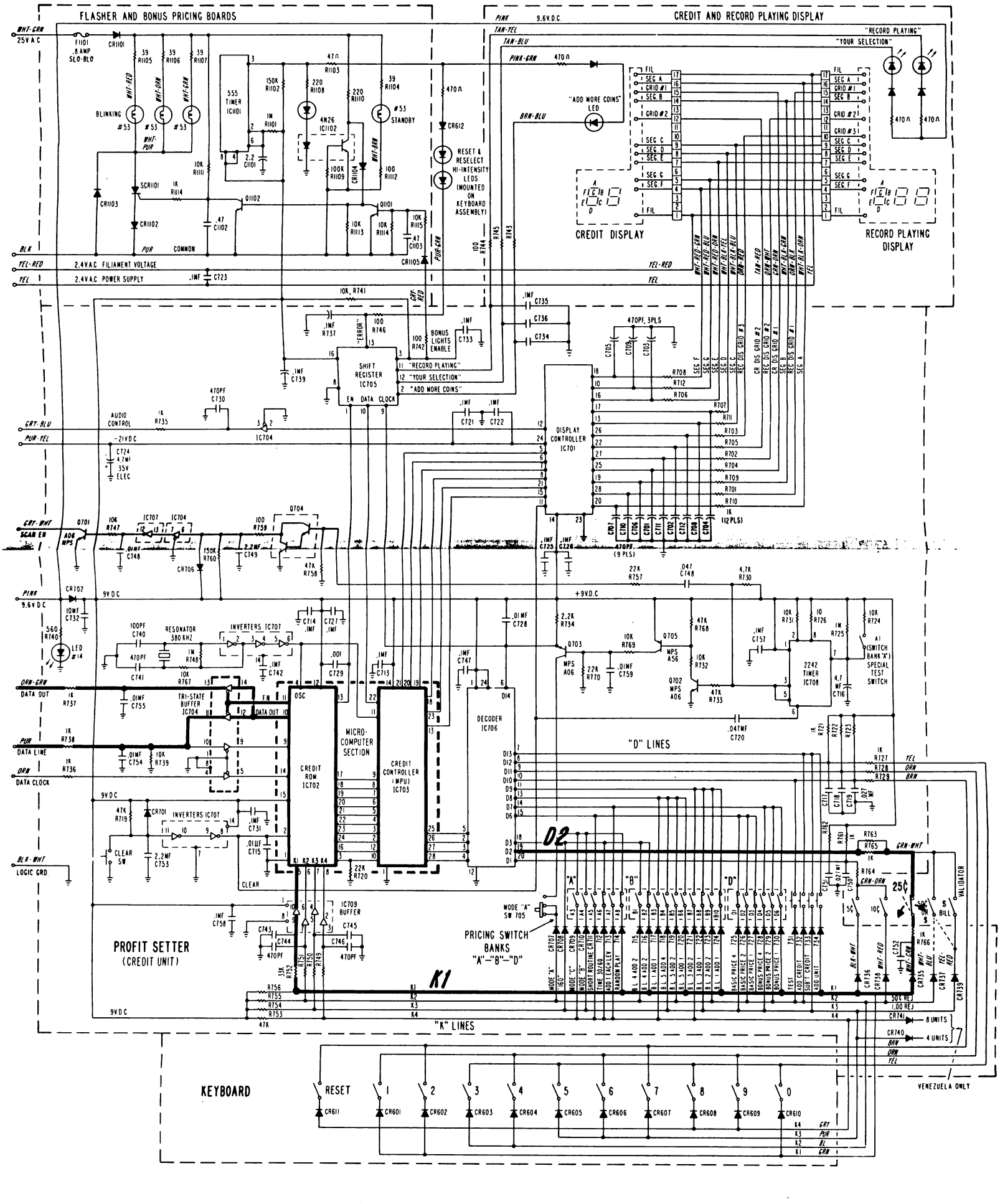



FLASHER AND BONUS PRICING BOARDS
CREDIT AND RECORD PLAYING DISPLAY
25V A C
9.6V D C
CREDIT DISPLAY
RECORD PLAYING DISPLAY
"RECORD PLAYING"
"YOUR SELECTION"
"ADD MORE COINS" LED
BLINKING #53
#53 STANDBY
555 TIMER IC1101
4N26 IC1102
RESET & RESELECT HI-INTENSITY LEDS (MOUNTED ON KEYBOARD ASSEMBLY)
2.4V A C FILIAMENT VOLTAGE
2.4V A C POWER SUPPLY
SHIFT REGISTER IC705
DISPLAY CONTROLLER IC701
AUDIO CONTROL
-21V D C
+9V D C
RESONATOR 380 KHZ
INVERTERS IC707
TRI-STATE BUFFER IC704
MICRO-COMPUTER SECTION
CREDIT ROM IC702
CREDIT CONTROLLER (MPU) IC703
DECODER IC706
2242 TIMER IC708
SPECIAL TEST SWITCH
"D" LINES
"K" LINES
PROFIT SETTER (CREDIT UNIT)
PRICING SWITCH BANKS "A"-"B"-"D"
MODE "A" SW 705
IC709 BUFFER
VALIDATOR
VENEZUELA ONLY
KEYBOARD
RESET
CR611
CR601
CR602
CR603
CR604
CR605
CR606
CR607
CR608
CR609
CR610

SEQUENCE 2. MACHINE AT STANDBY

During the inactive phonograph period, the Microcomputer Section of the "PROFIT SETTER" generates signals used by the Decoder to strobe the Bonus Mode Line D14, and Coin Switch Lines D1 and D2 for closed switches.



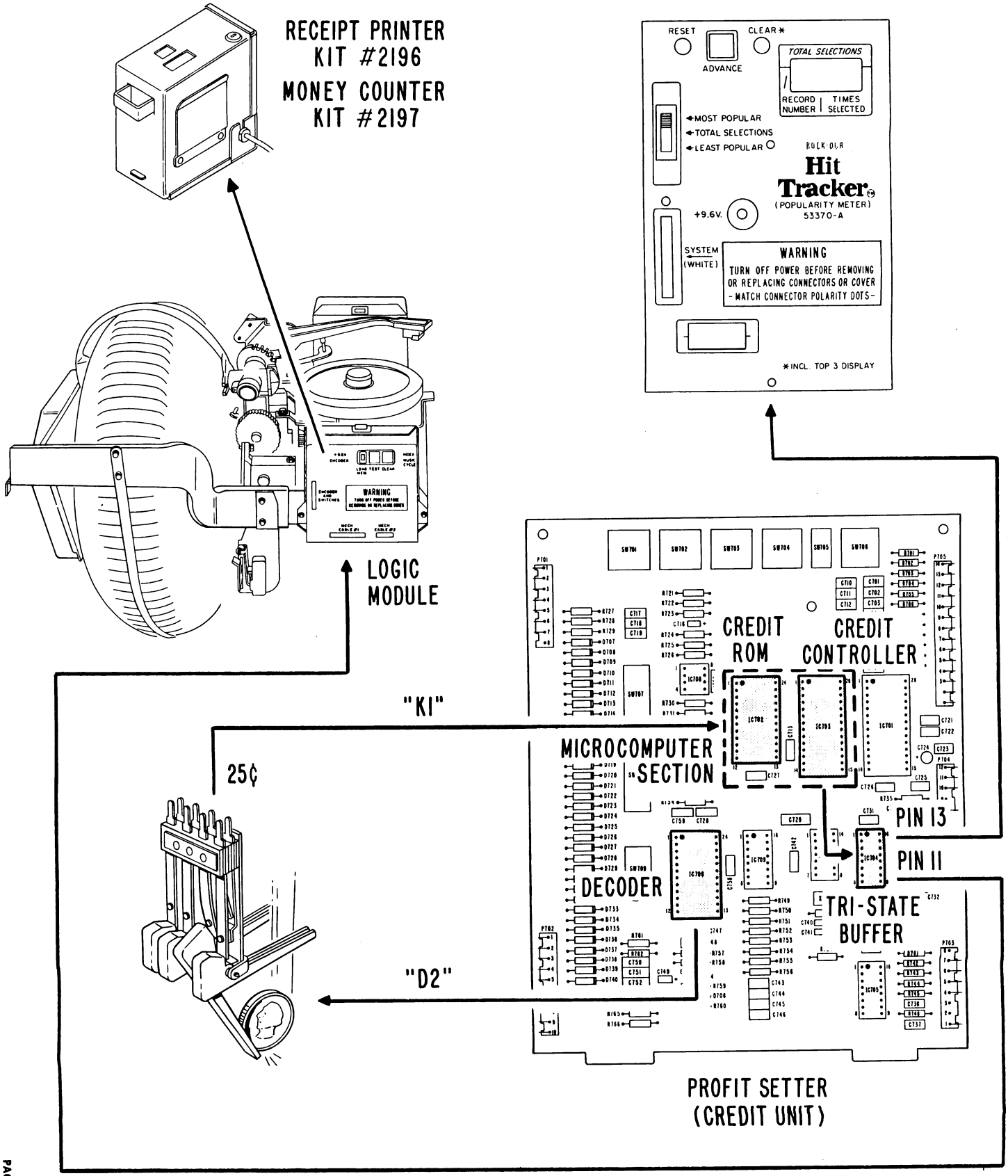

FLASHER AND BONUS PRICING BOARDS
CREDIT AND RECORD PLAYING DISPLAY
25V A.C
9.6V.D.C.
2.4V.A.C FILIAMENT VOLTAGE
2.4V.A.C POWER SUPPLY
555 TIMER IC1101
4N26 IC1102
#53 STANDBY
RESET & RESELECT HI-INTENSITY LEDS (MOUNTED ON KEYBOARD ASSEMBLY)
"ADD MORE COINS" LED
CREDIT DISPLAY
RECORD PLAYING DISPLAY
"RECORD PLAYING"
"YOUR SELECTION"
SHIFT REGISTER IC705
DISPLAY CONTROLLER IC701
AUDIO CONTROL
IC704
-21V.D.C
MICRO-COMPUTER SECTION
CREDIT ROM IC702
CREDIT CONTROLLER (MPU) IC703
DECODER IC706
TRI-STATE BUFFER IC704
INVERTERS IC707
2242 TIMER IC708
IC709 BUFFER
RESONATOR 380 KHZ
DATA OUT
DATA LINE
DATA CLOCK
LOGIC GRD.
CLEAR SW.
CLEAR
"D" LINES
"K" LINES
PROFIT SETTER (CREDIT UNIT)
PRICING SWITCH BANKS "A"-"B"-"D"
MODE "A" SW 705
K1
D2
VALIDATOR
KEYBOARD
RESET
VENEZUELA ONLY

SEQUENCE 3. QUARTER INSERTED

Upon insertion of a quarter coin, the 25¢ coin switch closes momentarily. The D2 output line senses the coin switch closure and passes this information on the K1 line to the Microcomputer Section for processing. The Credit Rom and Controller converts this signal to 5 money units generating two sets of instructions.

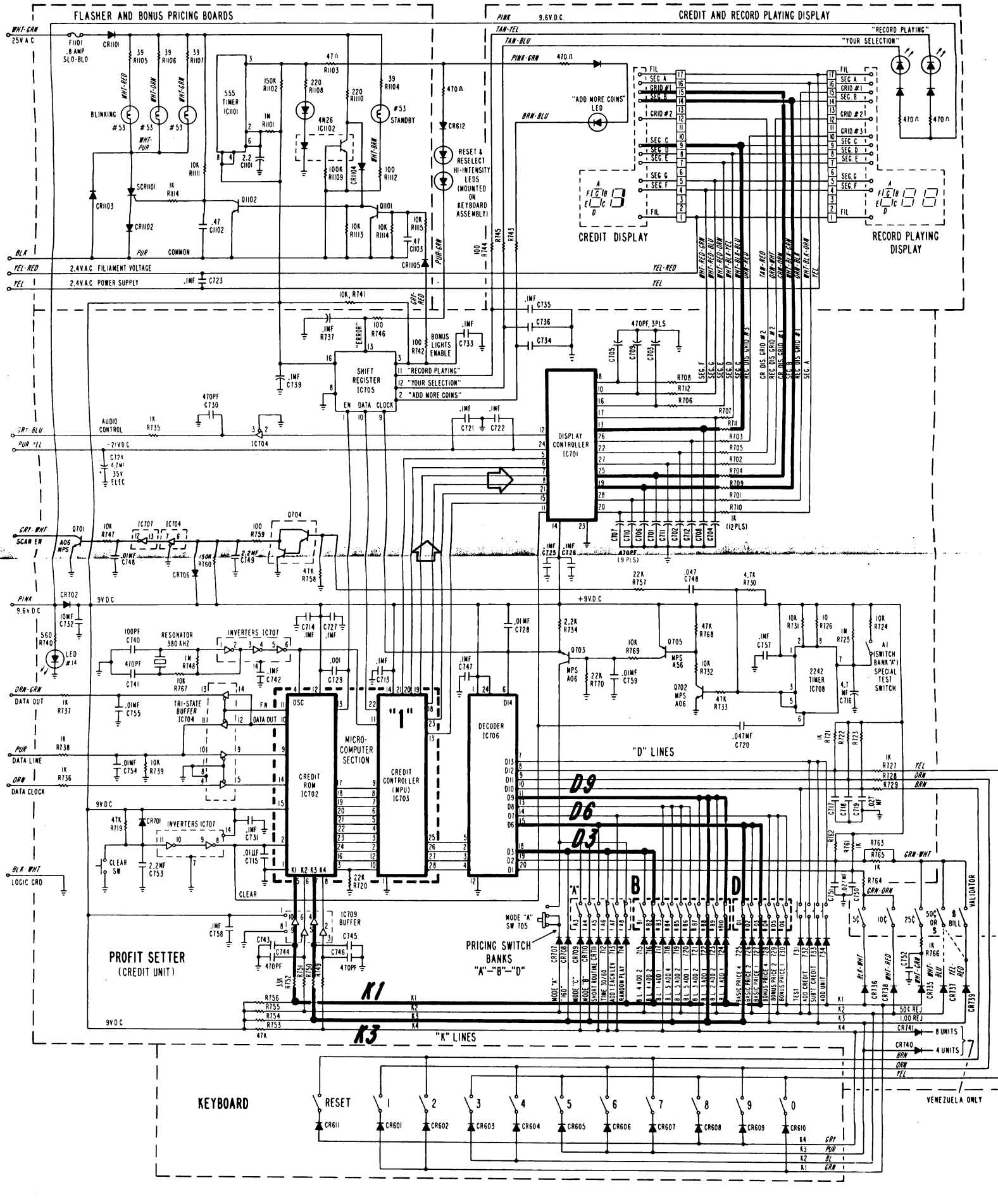
First, to inform the "HIT TRACKER" and Mech Logic Board that a quarter has been entered. At the appropriate time two sections of the Tri-State Buffer package, 1C704, are enabled. Data output from pin 13 is fed to the "HIT TRACKER" which rejects this signal as invalid for a popularity count. Data output from pin 11 is accepted by the Logic Module. If a Money Counter is used the Counter is pulsed 5 times which adds 25¢ to the total count.

Second, . . .



CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

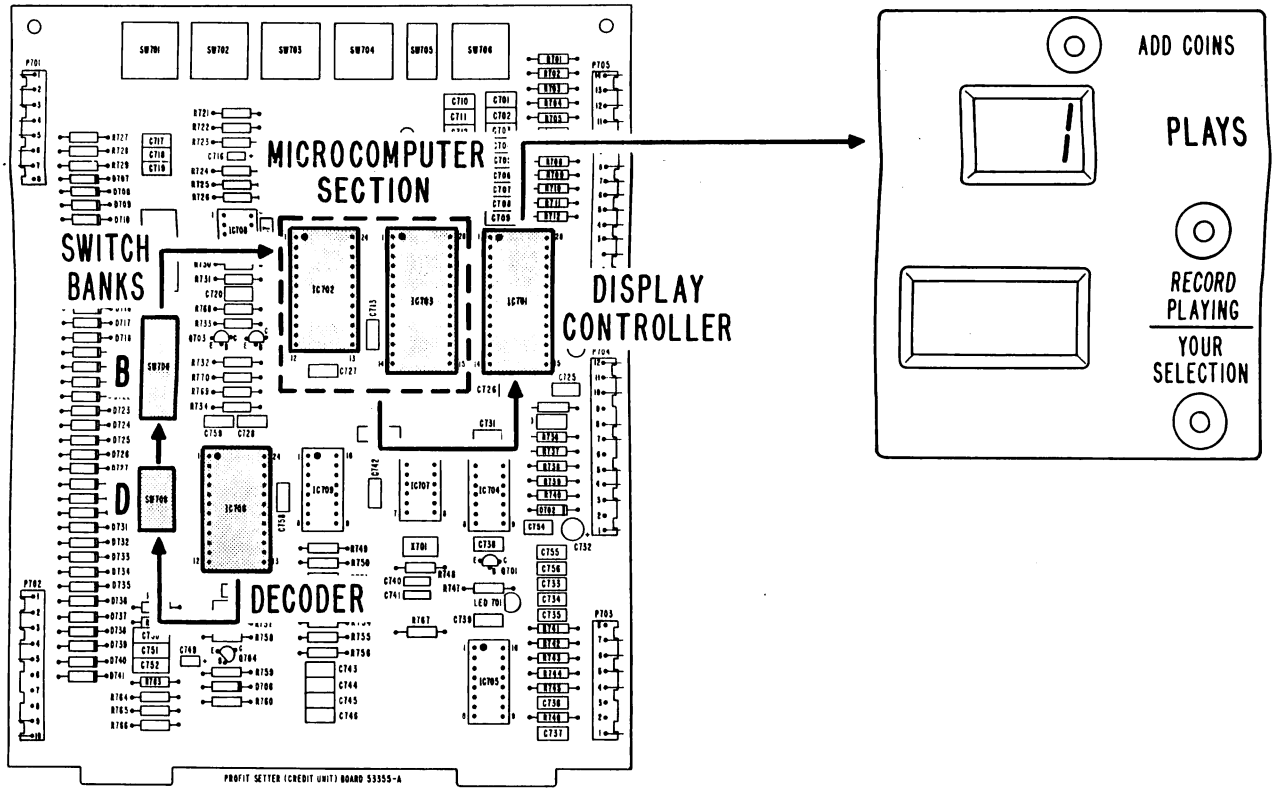
CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.

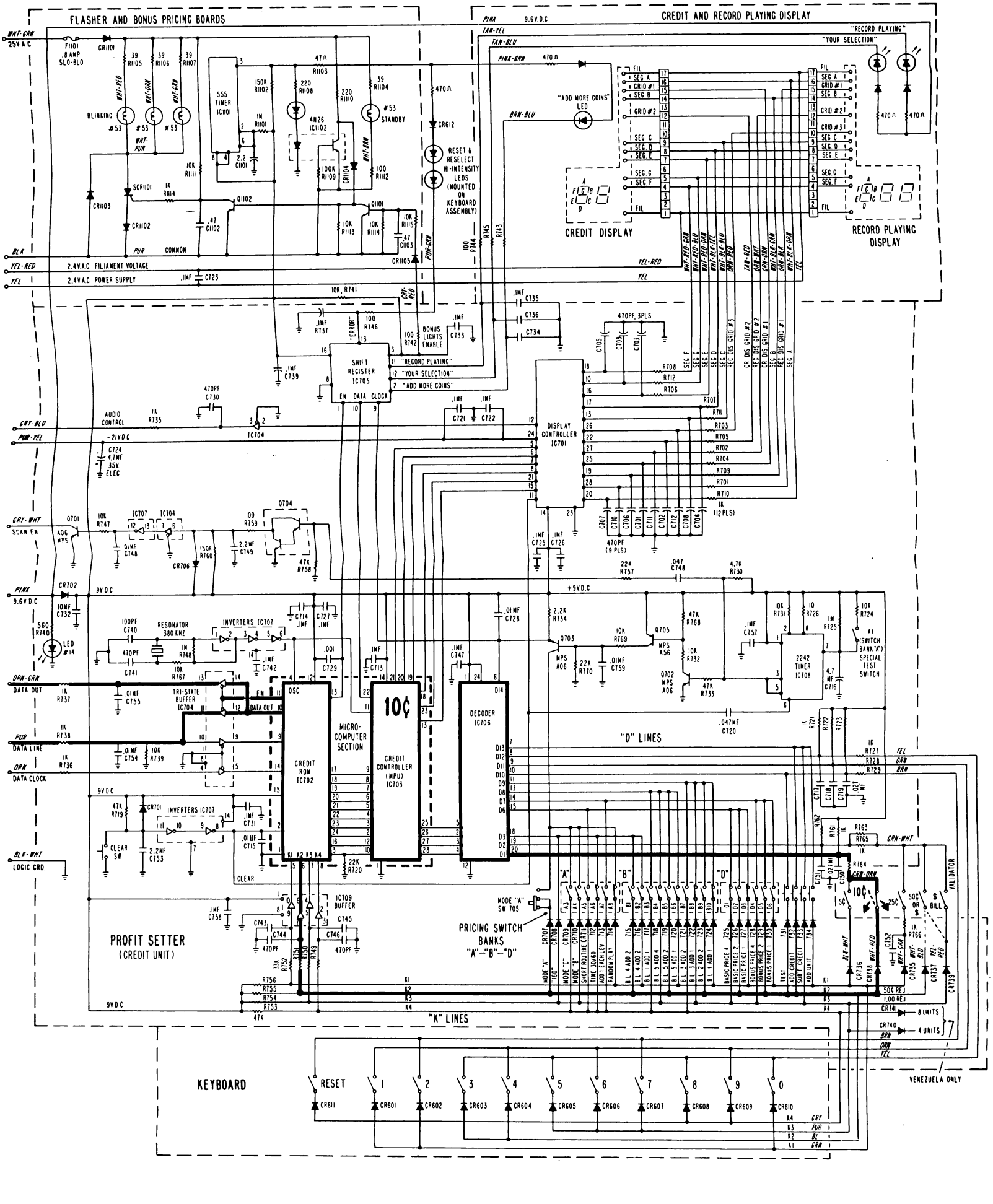


SEQUENCE 3A. MONEY UNITS CONVERTED INTO CREDITS

. . . the Credit Controller of the Microcomputer Section is to process the money units further and convert them into credits. Decoder is commanded to strobe the "D" lines for closed switches in the Price and Bonus switch banks "D" and "B".

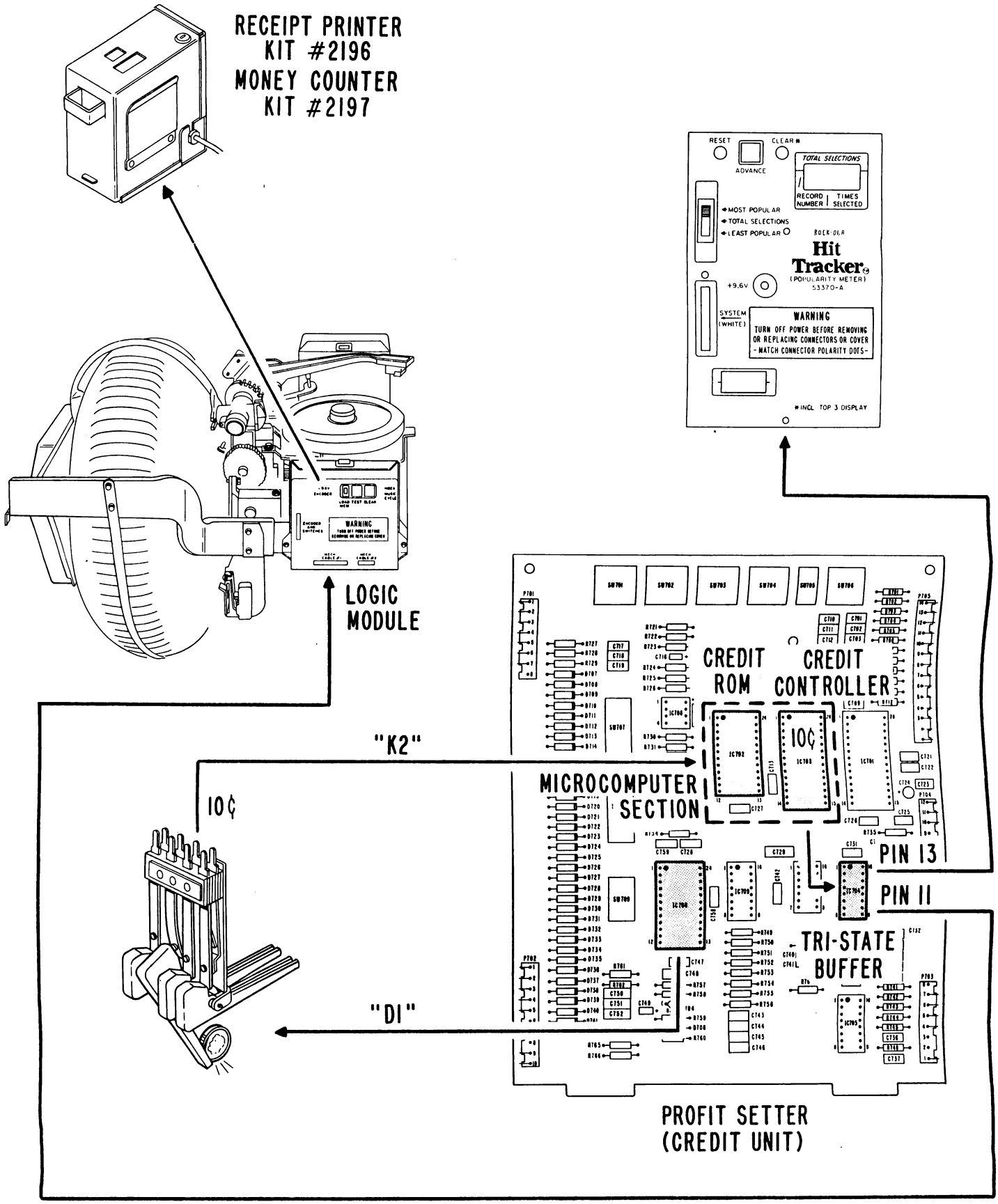
In this example output lines D3, D6 and D9 sense the closed switches on the K1 and K3 lines to the Credit Rom. After processing the signals are converted into 1 play and transferred to the Credit Controller for storage. At the same time the "1" credit signal is transmitted to the Display Controller to light "B" and "C" segments in the Credit Display to produce "1". Customer is now informed one selection can be made.




FLASHER AND BONUS PRICING BOARDS
CREDIT AND RECORD PLAYING DISPLAY
"RECORD PLAYING"
"YOUR SELECTION"
"ADD MORE COINS" LED
CREDIT DISPLAY
RECORD PLAYING DISPLAY
555 TIMER IC1101
4N26 IC1102
#53 STANDBY
RESET & RESELECT HI-INTENSITY LEDS (MOUNTED ON KEYBOARD ASSEMBLY)
BLINKING #53
SCR1101
Q1101
Q1102
2.4V A.C. FILIAMENT VOLTAGE
2.4V A.C. POWER SUPPLY
SHIFT REGISTER IC705
DISPLAY CONTROLLER IC701
AUDIO CONTROL
IC704
-21V D.C.
SCAN EN
TRI-STATE BUFFER IC704
RESONATOR 380 KHZ
DATA OUT
DATA LINE
DATA CLOCK
LOGIC GRD.
CLEAR SW
CREDIT ROM IC702
MICRO-COMPUTER SECTION
CREDIT CONTROLLER (MPU) IC703
DECODER IC706
2242 TIMER IC708
SPECIAL TEST SWITCH
"D" LINES
"K" LINES
PROFIT SETTER (CREDIT UNIT)
PRICING SWITCH BANKS "A"-"B"-"D"
MODE "A" SW 705
IC709 BUFFER
VALIDATOR
KEYBOARD
RESET
VENEZUELA ONLY

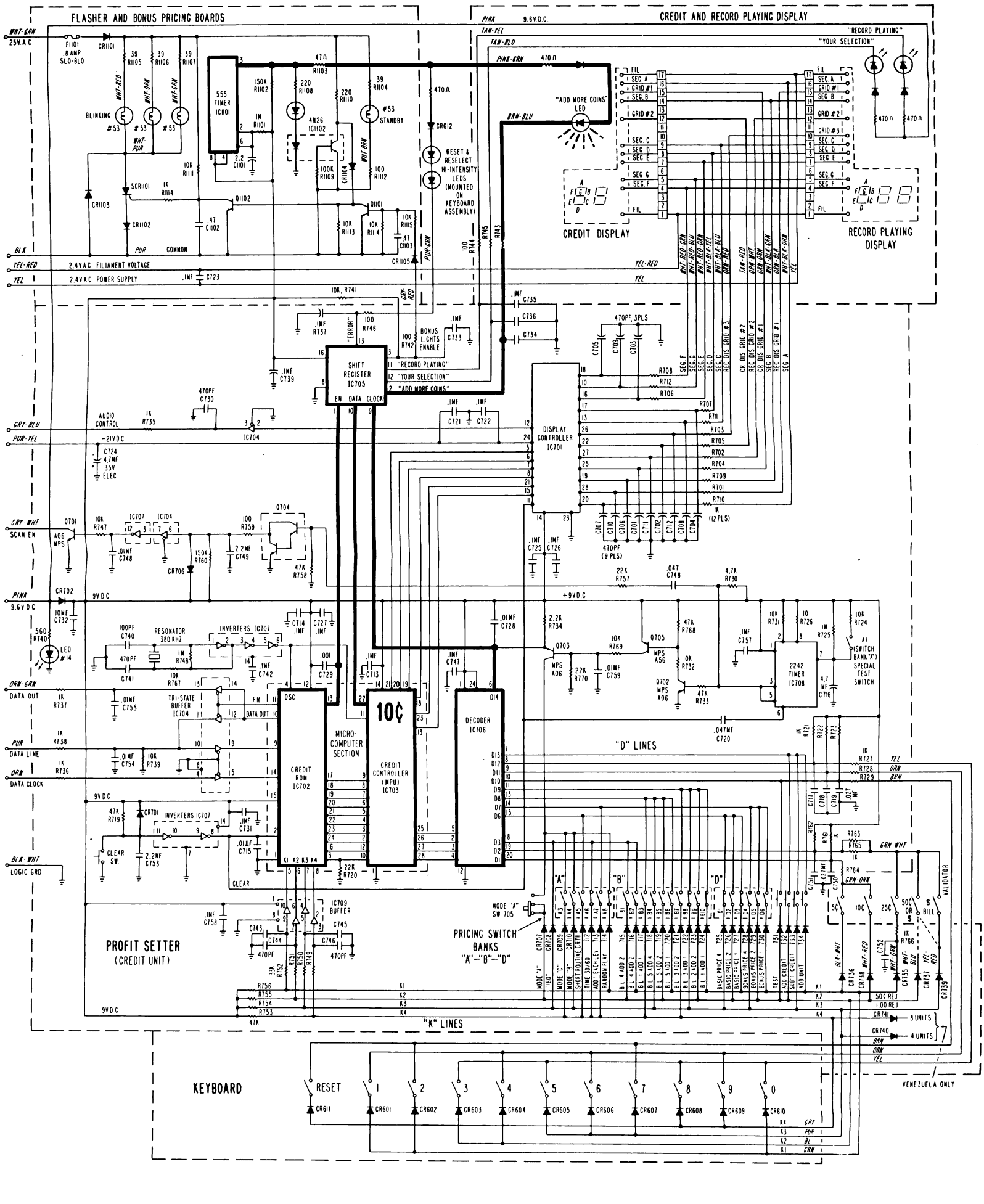
SEQUENCE 4. INSUFFICIENT MONEY DEPOSITED

If 10¢ is inserted the process is identical as described for a quarter entree except 10¢ will be stored in the Credit Controller.



CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

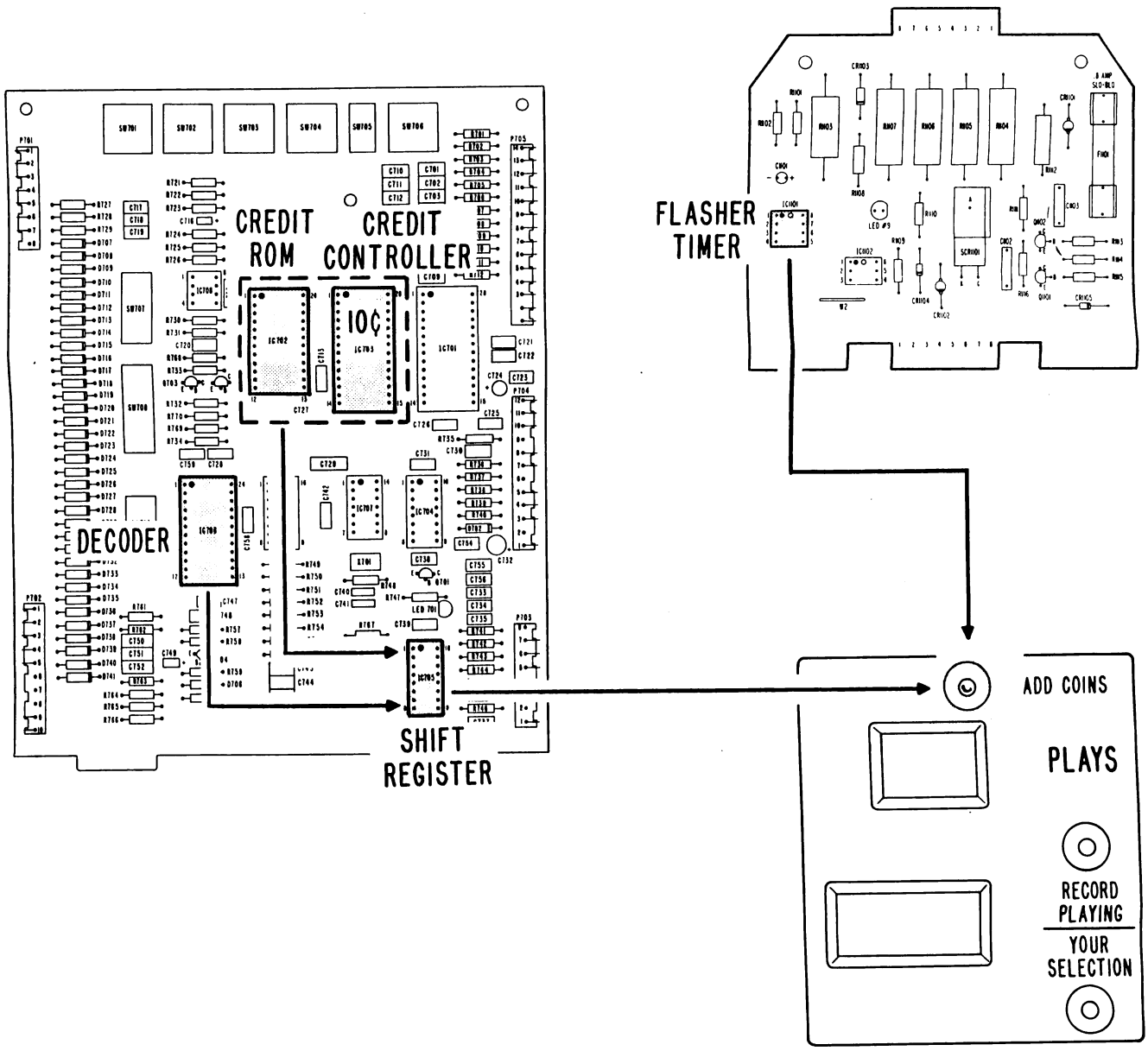
CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.



SEQUENCE 4A. "ADD COINS" LED FLASHES

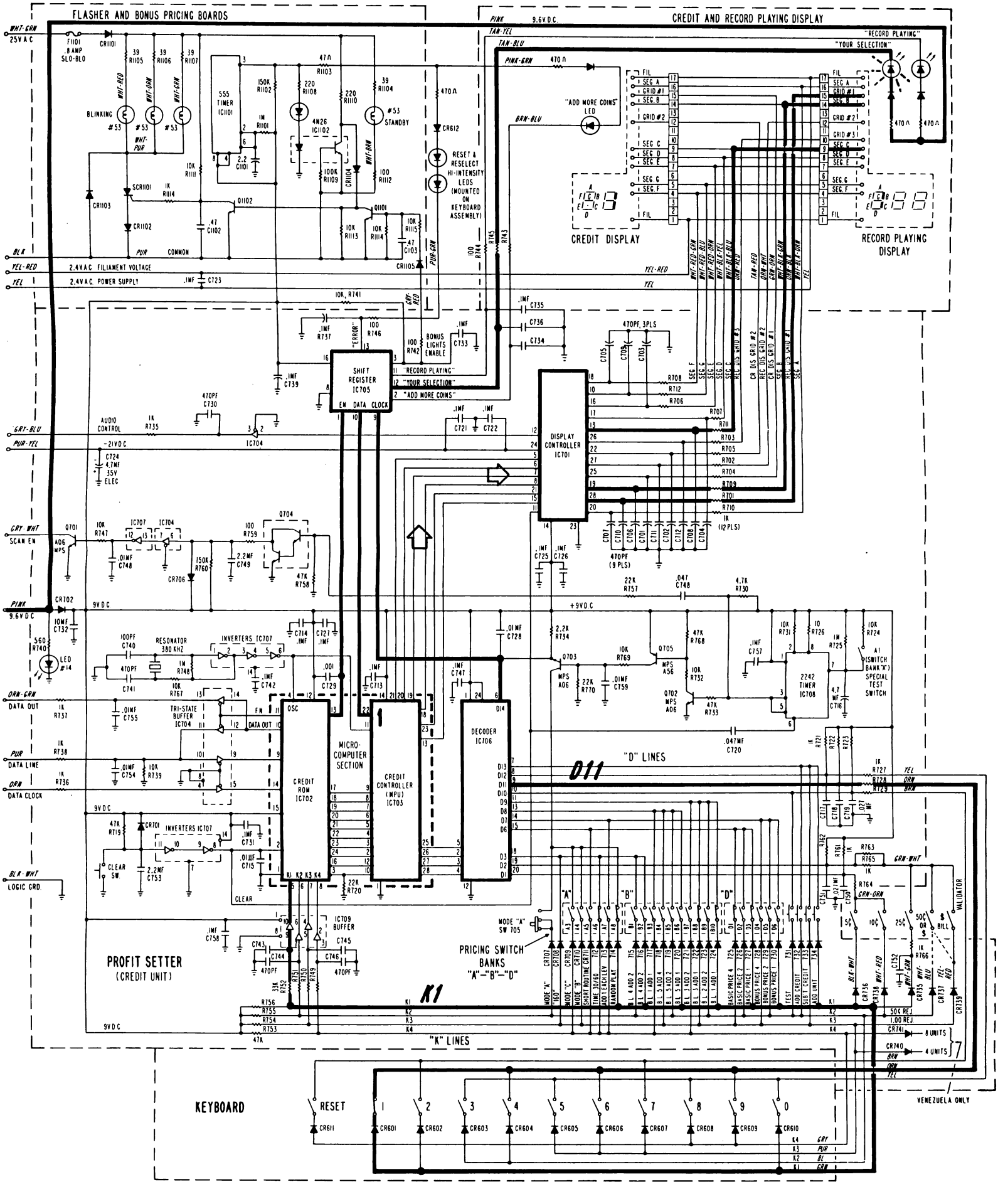
This amount is not recognized as sufficient to register a credit. Signals are generated by the Credit Rom, Controller and Decoder which enable the Shift Register to process the insufficient money data.

After the processing the "Add Coins" LED flashes due to the pulsed power provided by the Flasher Timer.



CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.



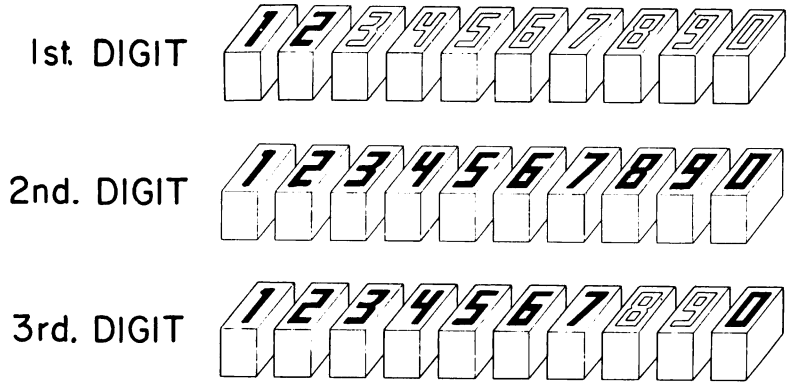
SEQUENCE 5. 1st DIGIT NUMBER 1 PRESSED

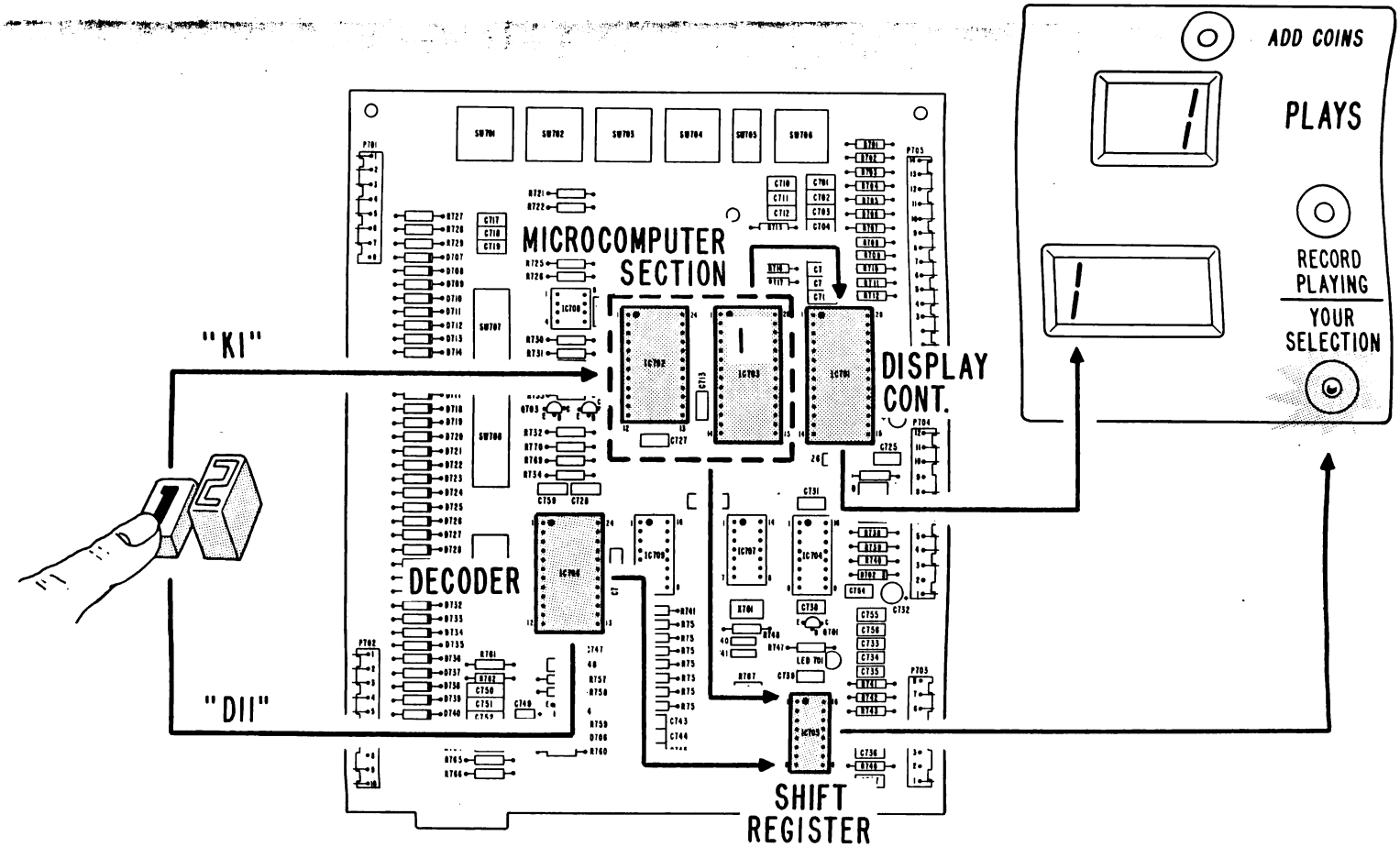
To achieve 160 selections, three digit numbers are required. Two numbers are used for the first digit, all ten numbers for the second digit, and eight numbers for the third digit.

Pressing the first digit as number 1, the selection signal is applied to the K1 line to be validated and stored in the Microcomputer Section.

Decision is made by the Credit Controller to produce the first digit number 1 in the Record Playing Display.

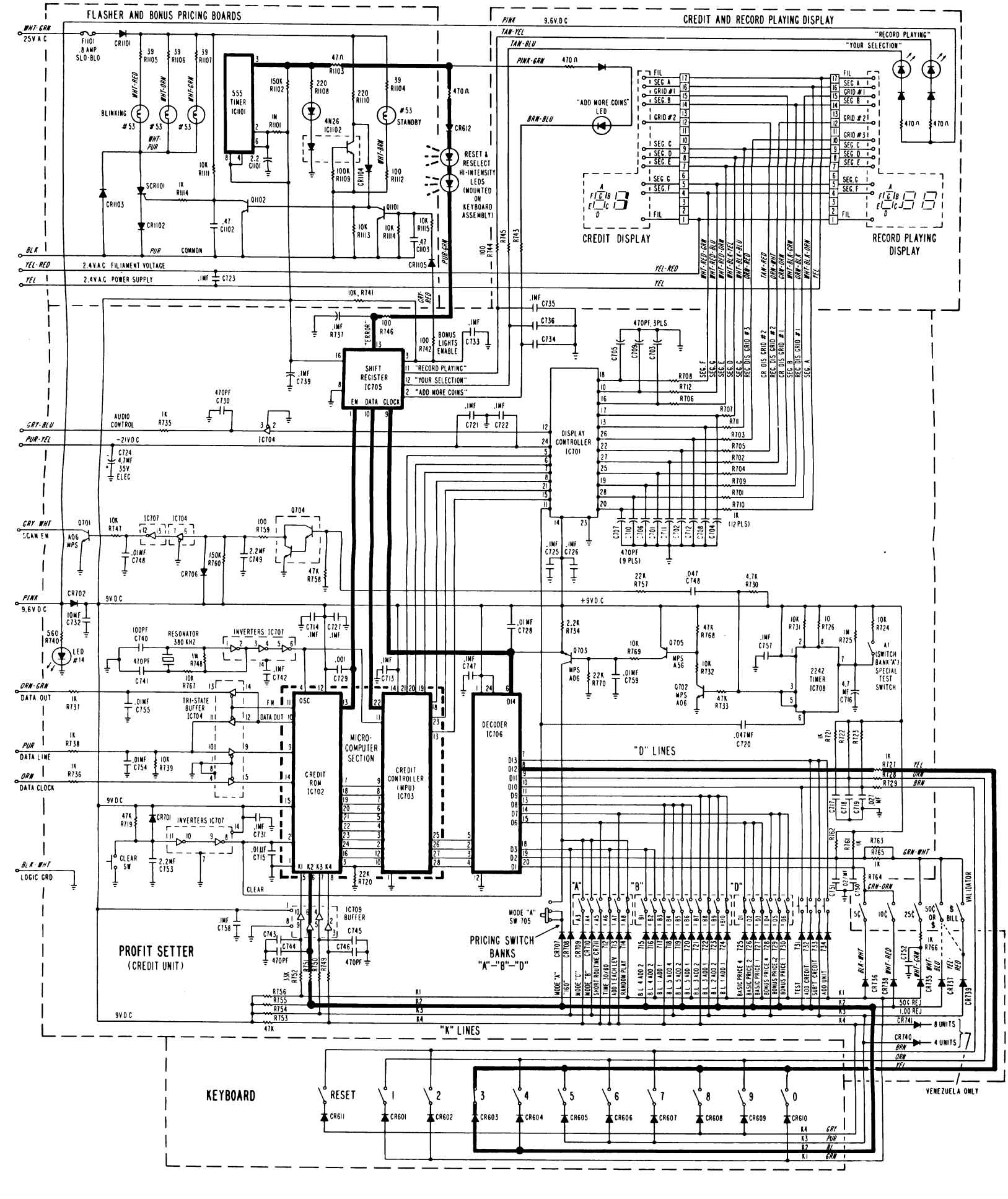
It also notifies its partners, the Credit Rom and the Decoder, to instruct the Shift Register to light "Your Selection" LED.





CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

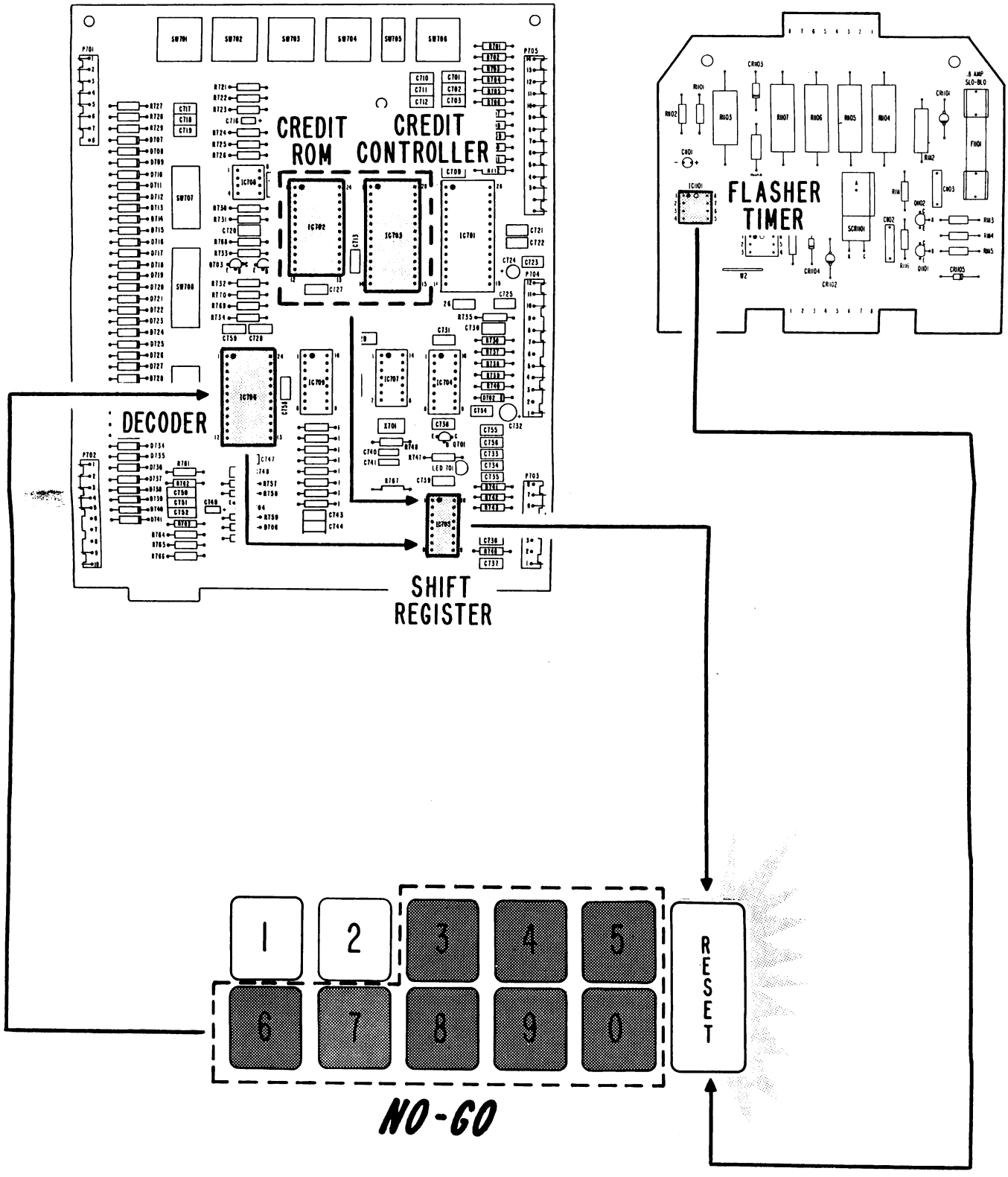
CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.



SEQUENCE 6. ERROR NUMBER PROCESSED FOR FIRST DIGIT—"RESET RESELECT" LEDS FLASH

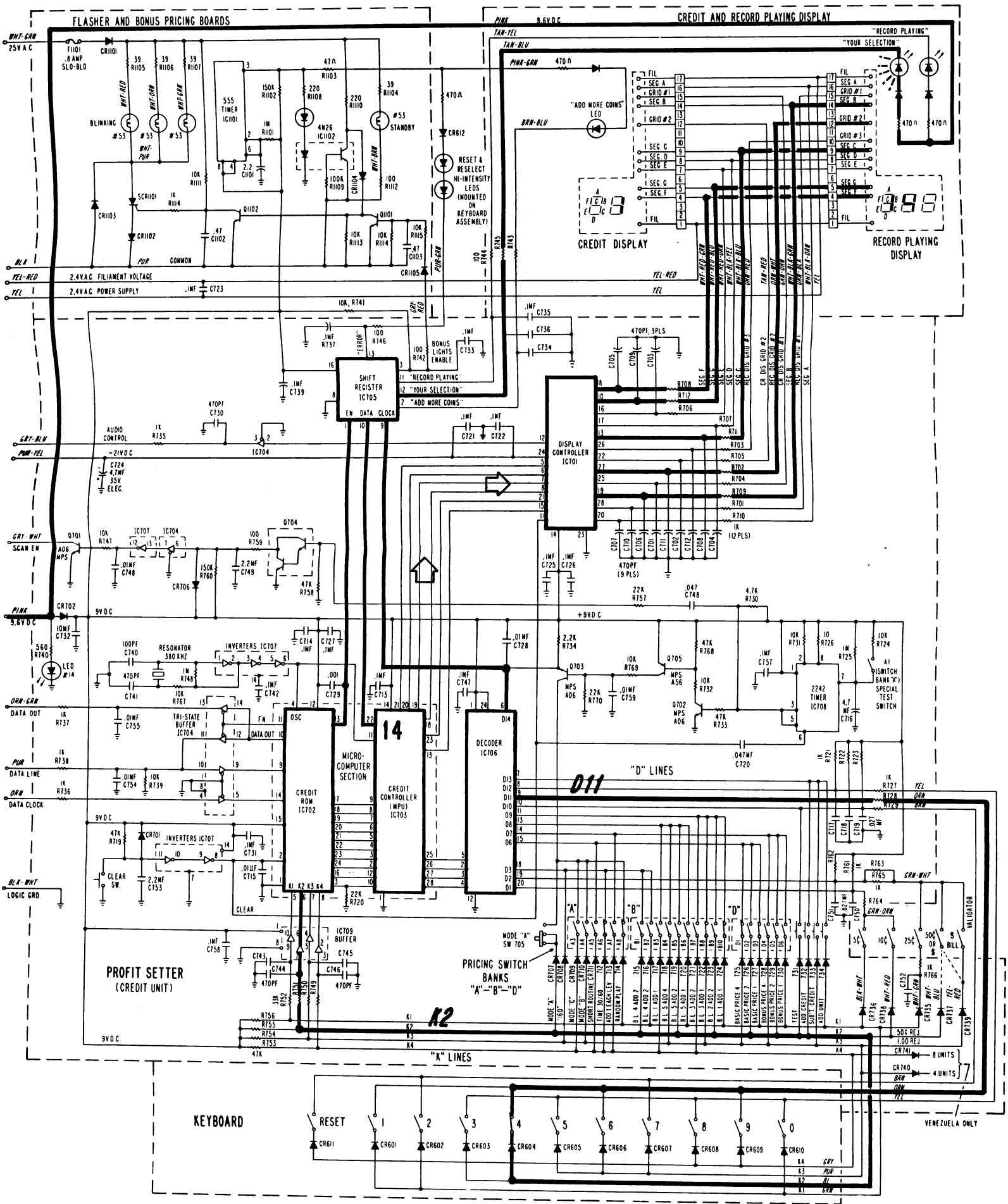
Should a number from 3 to zero be pressed in error for the first digit, the Credit Rom rejects these numbers.

Instruction are forwarded to the Credit Controller and Decoder to signal the Shift Register to flash the "Reset - Reselect" LEDS which is provided by the Flasher Timer circuit.



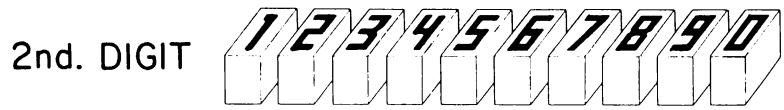
CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

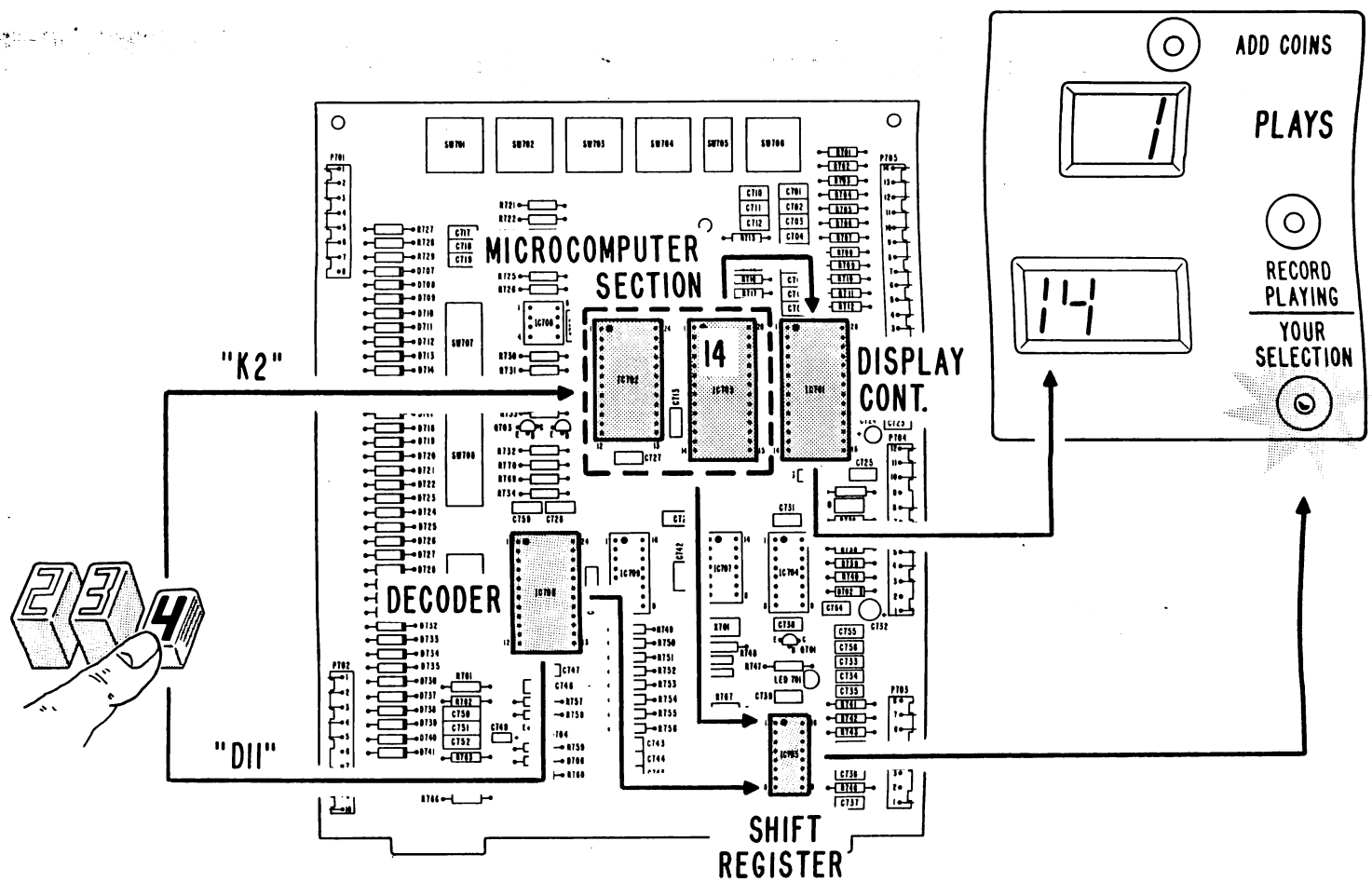
CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.



SEQUENCE 7. 2nd DIGIT NUMBER PRESSED — NUMBER ACCEPTED AND DISPLAYED

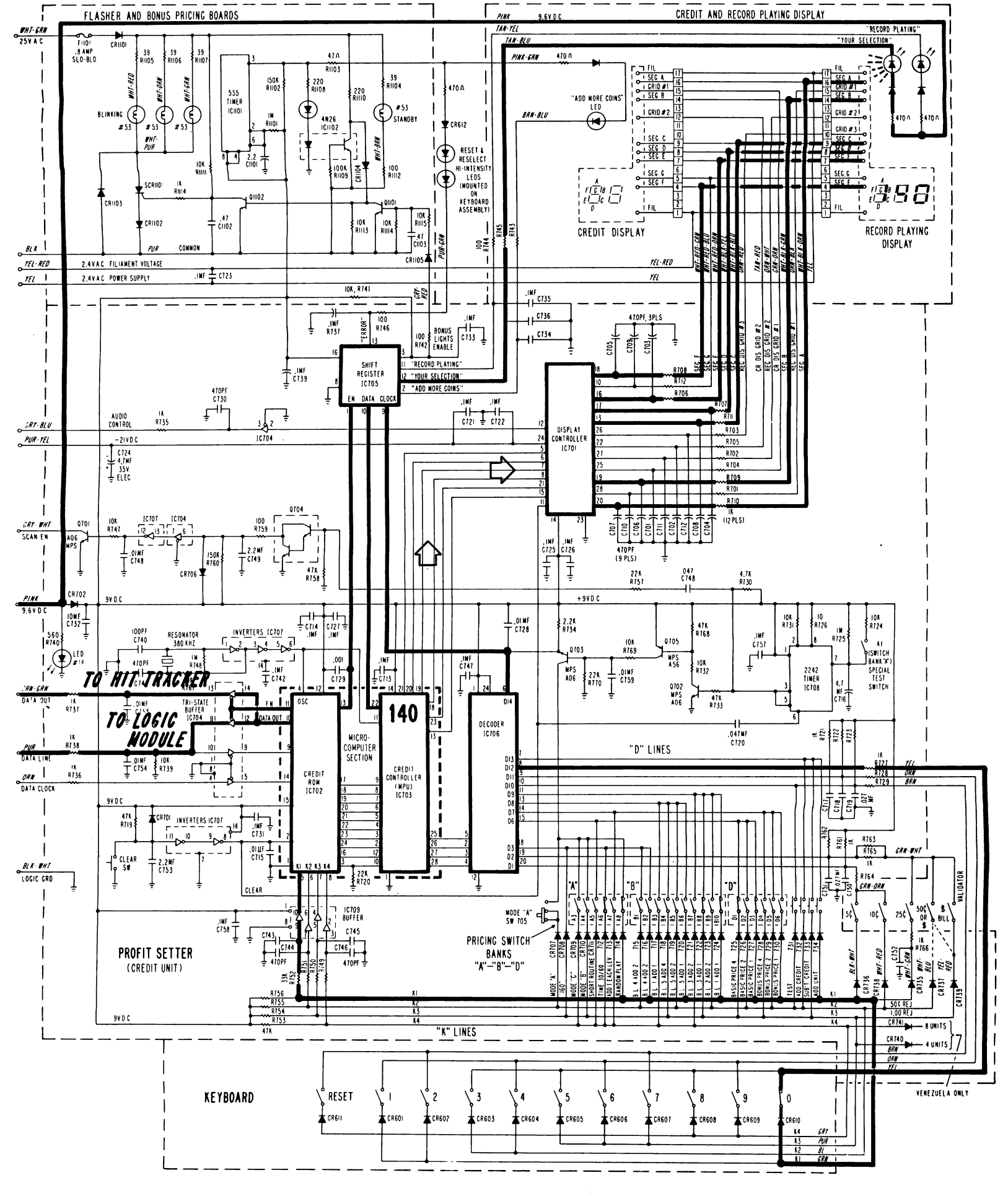
The processing of the second digit is identical to the first except that any number can be chosen, and two digits on the Selection Display will be lit.





CREDIT AND RECORD DISPLAYS, AND BONUS FLASHER CIRCUITS ON THIS SCHEMATIC APPLIES TO PHONO MODELS 476 AND 484.

CIRCUIT CHANGES FOR MODEL 481 APPEAR ON THE WIRING DIAGRAM NO. 53592.



SEQUENCE 8. 3rd DIGIT PRESSED — SELECTION STORED

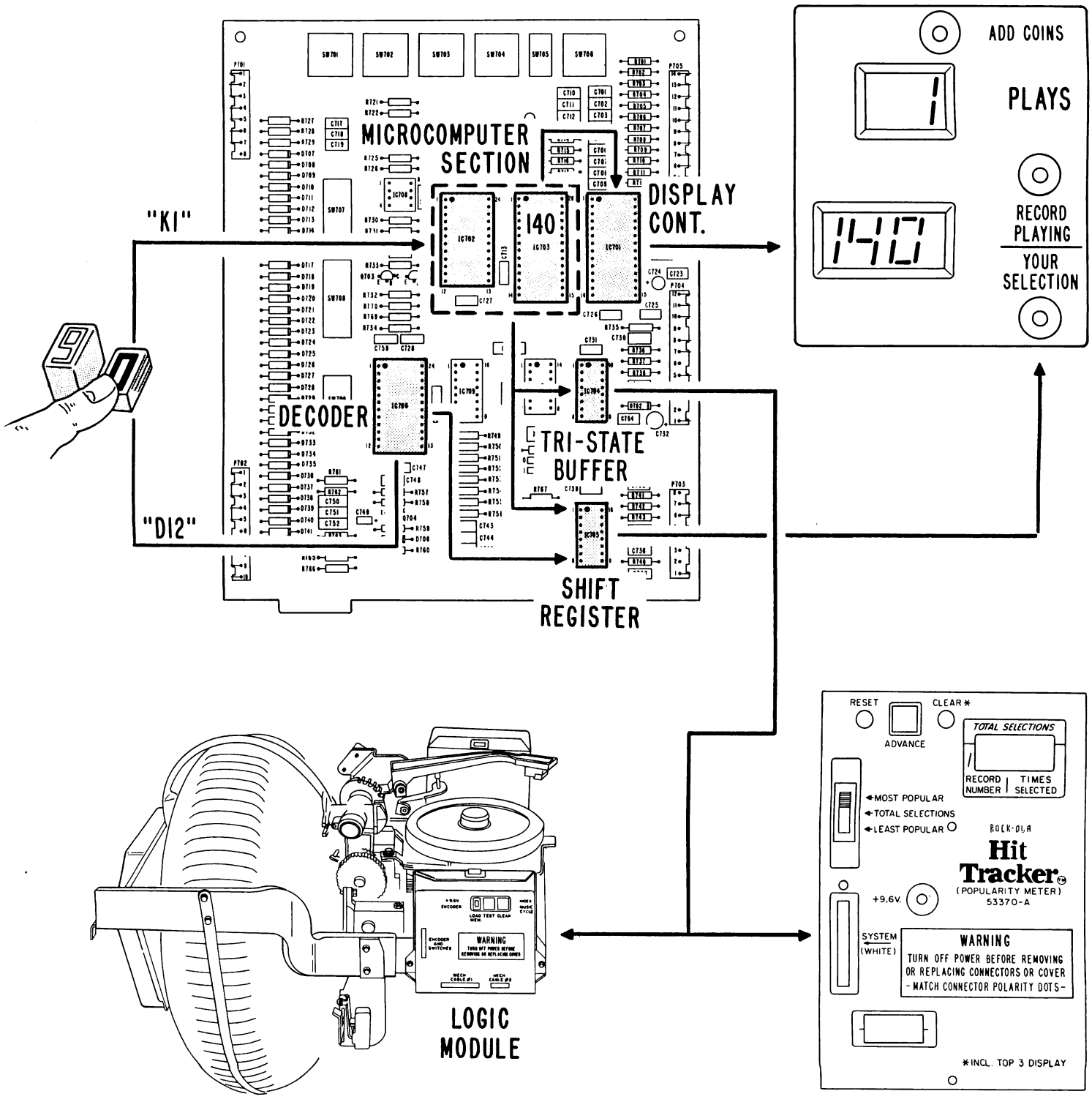
The processing of the third digit is also identical as that of the first except that numbers 8 and 9 are invalid and will operate the "Reset - Reselect" circuit if chosen.

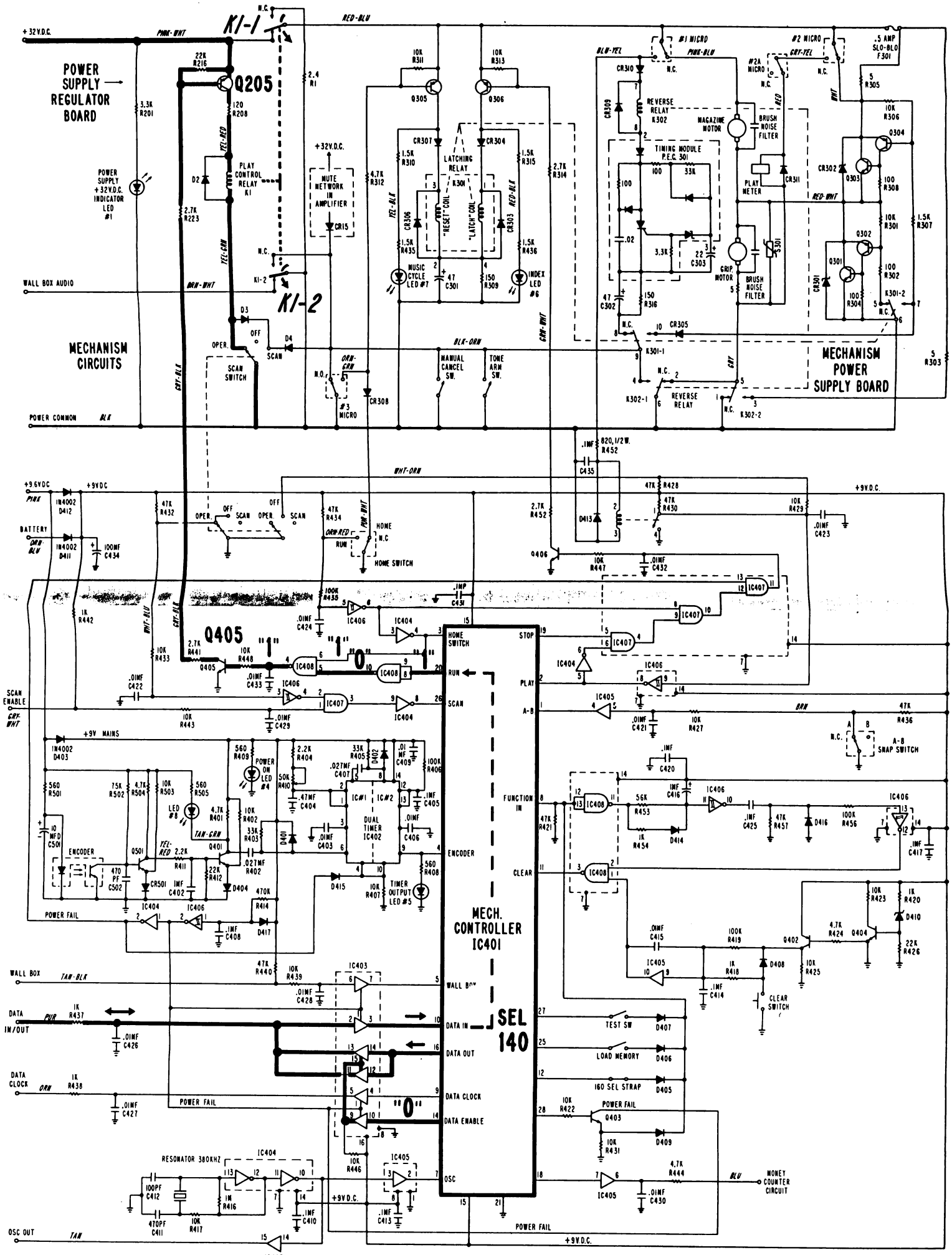
The accepted third digit number displays the record selection 140 for a short time before blanking out, and the "1" play is erased from the Credit Display.

If a record is in a playing mode at this time, the Logic Module Mech Controller informs the Microcomputer Selection in the "PROFIT SETTER" to display the "Record Playing".

When instructions are completed, the "PROFIT SETTER" computer section instructs the Logic Module, via the Tri-State Buffer IC704, to store selection 140 for later retrieval.

This information is also sent to the "HIT TRACKER" where it is processed and displayed as "Total Selections" and location "Three Top Hits"

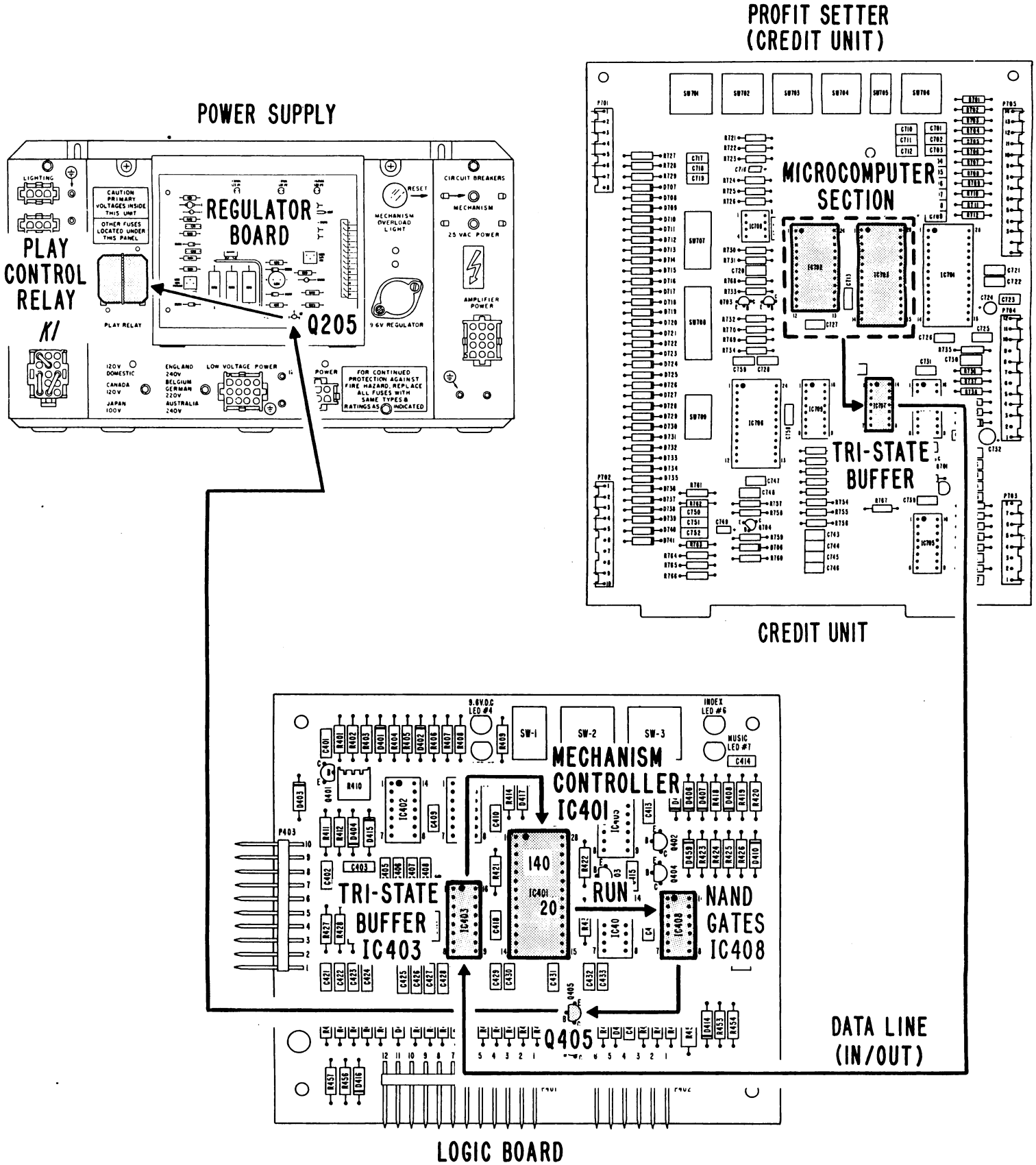


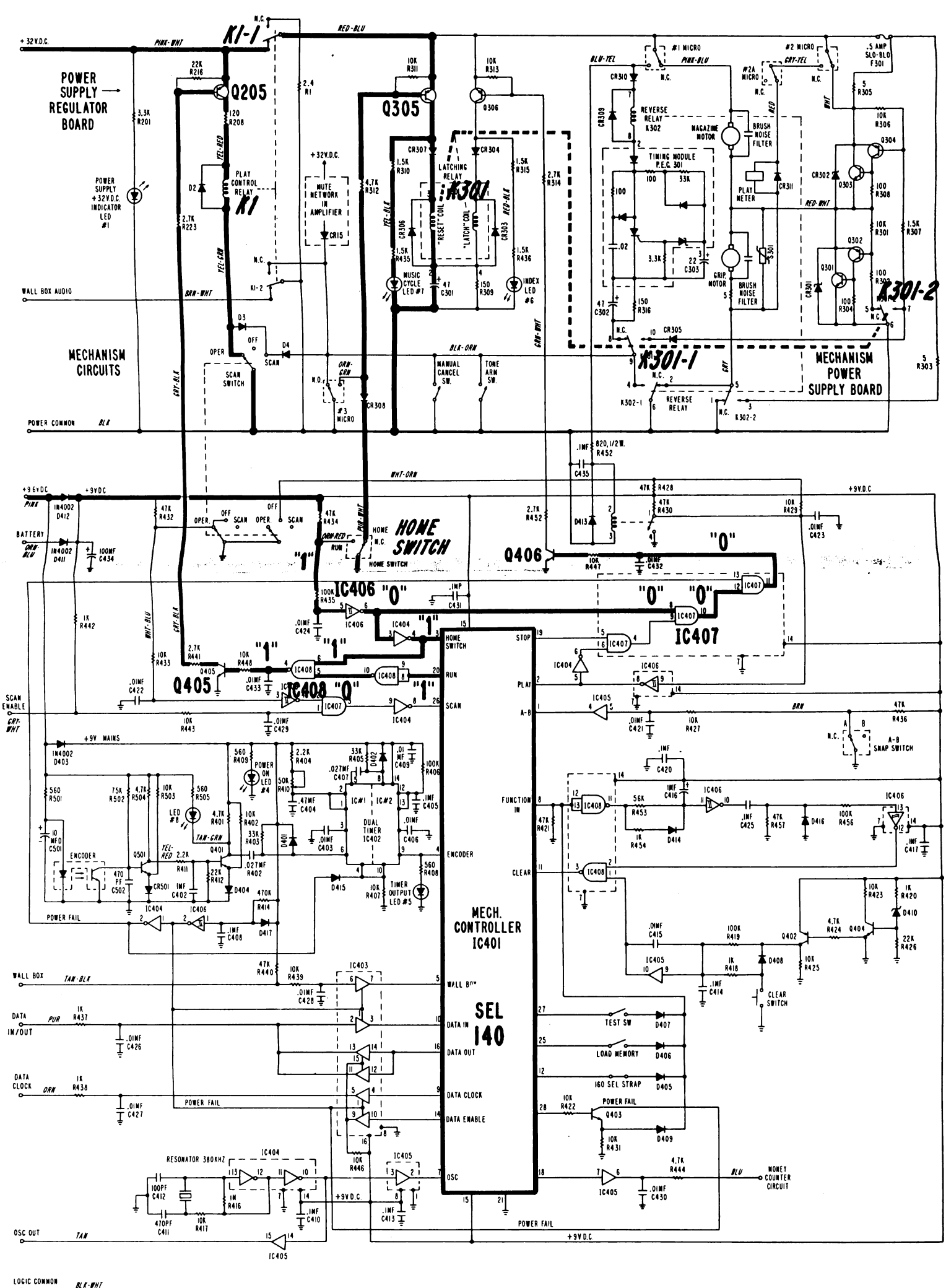

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MECH. CONTROLLER IC401
SEL 140
K1-1
K1-2
Q205
Q405
+32V.D.C.
+9V.D.C.
+9.6VDC
WALL BOX AUDIO
POWER COMMON
POWER SUPPLY +32V.D.C. INDICATOR LED #1
PLAY CONTROL RELAY K1
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY K301
"RESET" COIL
"LATCH" COIL
MUSIC CYCLE LED #7
INDEX LED #6
#3 MICRO
#1 MICRO
#2 MICRO
#2A MICRO
.5 AMP SLO-BLO F301
REVERSE RELAY K302
MAGAZINE MOTOR
BRUSH NOISE FILTER
TIMING MODULE P.E.C. 301
PLAY METER
GRIP MOTOR
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
HOME SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
MONEY COUNTER CIRCUIT
DUAL TIMER IC402
POWER ON LED #4
TIMER OUTPUT LED #5
ENCODER
RESONATOR 380KHZ
BATTERY
+9V MAINS
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
POWER FAIL
SCAN ENABLE

SEQUENCE 9. PLAY CONTROL RELAY K1 OPERATES

Storage of selection 140 in the Mech Controller Logic Board at pin 10 applies a high signal on the mechanism RUN line at the pin 20 output. After an "0" "1" transition through the NAND gates in the RUN line, transistors Q405 and Q205 turn ON. Play Control Relay energizes and relay contacts K1-1 and K1-2 transfer.

At the same time, during certain time intervals the Mech Controller output signal at pin 14 is driven low. At this point the Tri-State Buffer sections in the line activate the DATA OUT line at pin 16 which informs the credit unit computer on a continuing basis of the record magazine position.




POWER SUPPLY REGULATOR BOARD
Q205
Q305
K1-1
K1
K301
K301-1
K301-2
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
HOME SWITCH
IC406
IC407
Q405
Q406
IC408
MECH. CONTROLLER IC401
SEL 140
+32V.D.C.
+9V.D.C.
POWER COMMON
WALL BOX AUDIO
SCAN ENABLE
POWER FAIL
LOGIC COMMON
OSC OUT
DATA IN/OUT
DATA CLOCK
WALL BOX
MONEY COUNTER CIRCUIT
REVERSE RELAY K302
MAGAZINE MOTOR
BRUSH NOISE FILTER
PLAY METER
GRIP MOTOR
TIMING MODULE P.E.C. 301
LATCHING RELAY
MUTE NETWORK IN AMPLIFIER
MANUAL CANCEL SW.
TONE ARM SW.
SCAN SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
ENCODER
DUAL TIMER IC402
RESONATOR 380KHZ
.5 AMP SLO-BLO F301

SEQUENCE 10. MECHANISM CIRCUITS RESET TO STANDBY

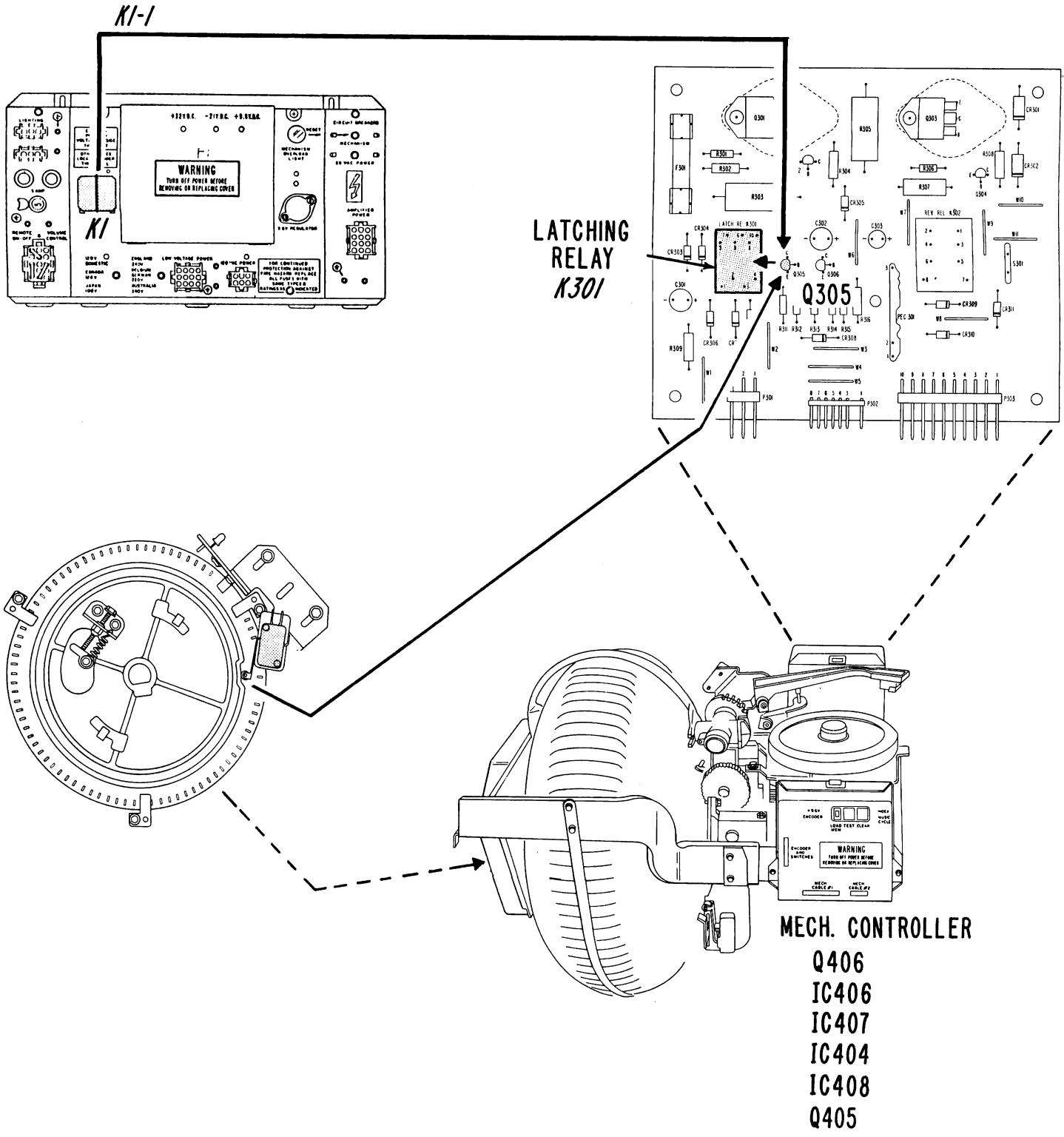
Standby or HOME position of the record magazine is when the Home Switch Lever rests in the cam dip allowing the Home Switch to be normally closed. As a result, transfer of the Play Relay Contact K1-1 turns ON Q305 causing the K301 Latching Relay RESET coil to energize. This operation assures that the Latching Relay contacts K301-1 and K301-2 are normally closed at this point of the mechanism cycle. (A condition required by the mechanism to run the Magazine Motor first.)

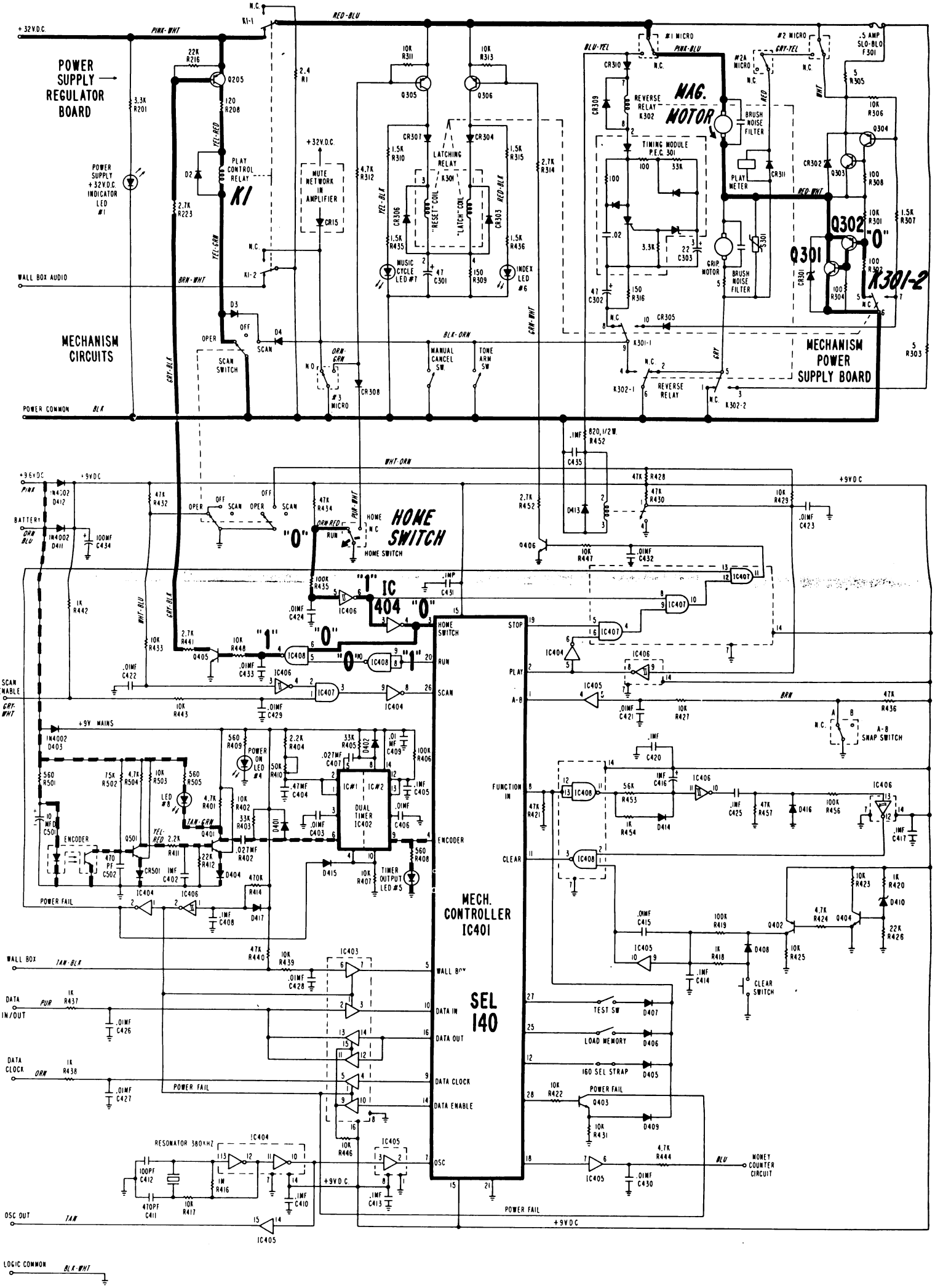
Simultaneously, a low signal appears at the base of Q406 after an "1" "0" transition through the Schmitt Trigger, IC406, & AND gates IC407, in the line, thereby holding the transistor OFF. This prevents any signal from operating the Latching Relay LATCH coil which in turn prevents Gripper Motor operation at this time.

The high signal appearing after the Hex Inverter IC404, is applied to pin 3 of the Controller and pin 6 input of the NAND gate IC408.

High signal at pin 3 holds the Encoder Counter in the Controller at zero.

High NAND gate input signal at pin 6 allows the output to remain high and keeps Q405 operative. This provides a holding circuit to the Play Control Relay K1 via Q205.



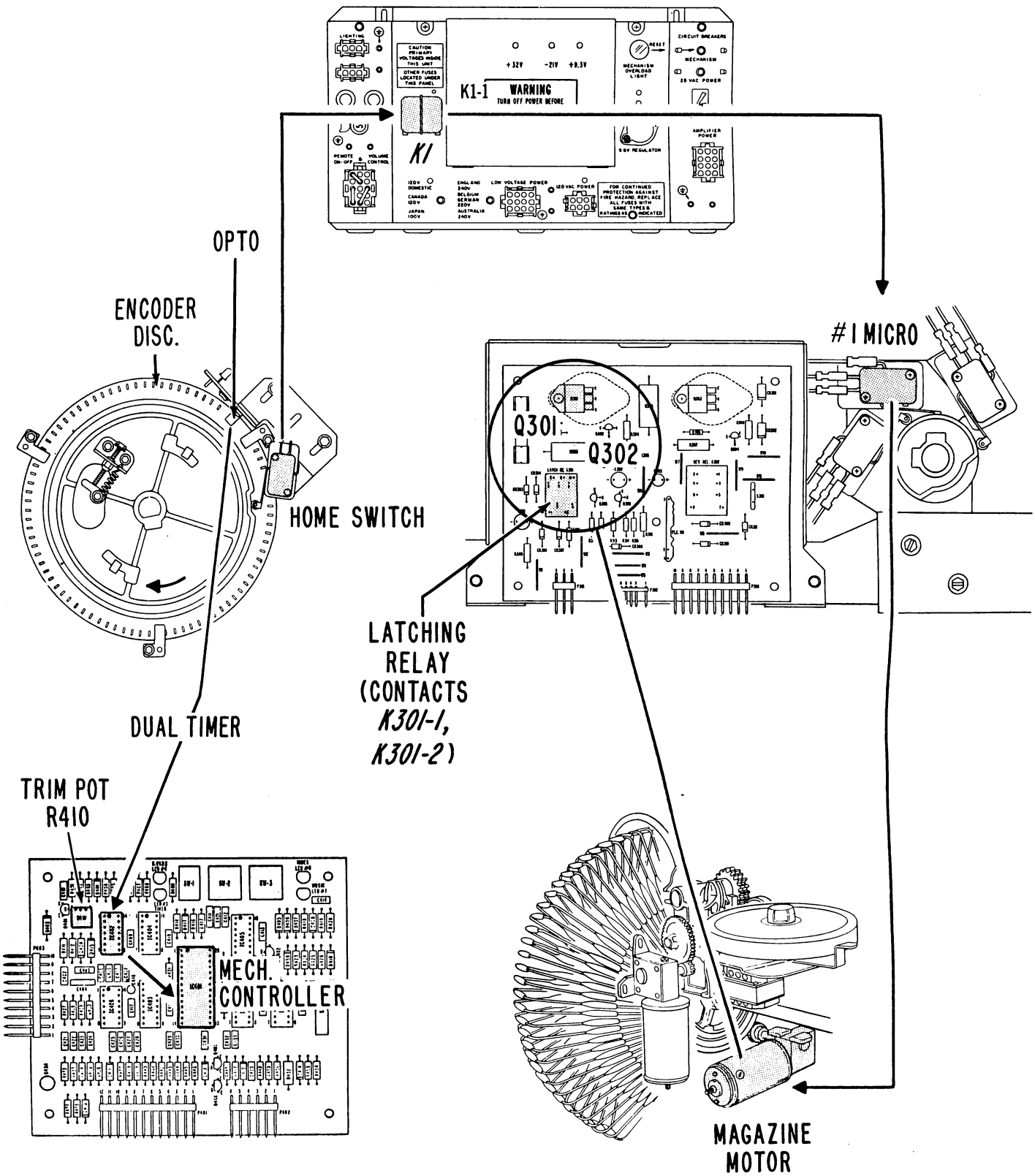

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MAG. MOTOR
HOME SWITCH
MECH. CONTROLLER IC401
SEL 140
IC 404
K1
K301-2
Q302
Q301
Q205
Q305
Q306
Q303
Q304
Q401
Q402
Q403
Q406
Q501
+32V.D.C.
+9V.D.C.
+9V MAINS
WALL BOX AUDIO
POWER COMMON
LOGIC COMMON
POWER SUPPLY +32V.D.C. INDICATOR LED #1
PLAY CONTROL RELAY
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY
"SET" COIL
"RESET" COIL
"LATCH" COIL
MUSIC CYCLE LED #7
INDEX LED #6
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
REVERSE RELAY K302
TIMING MODULE P.E.C. 301
BRUSH NOISE FILTER
PLAY METER
GRIP MOTOR
#1 MICRO
#2 MICRO
#2A MICRO
#3 MICRO
.5 AMP SLO-BLO F301
POWER ON LED #4
LED #8
TIMER OUTPUT LED #5
DUAL TIMER IC402
ENCODER
POWER FAIL
TEST SW
LOAD MEMORY
160 SEL STRAP
CLEAR SWITCH
A-B SNAP SWITCH
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
SCAN ENABLE
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
BATTERY
HOME SWITCH
REVERSE RELAY
"0"
"1"

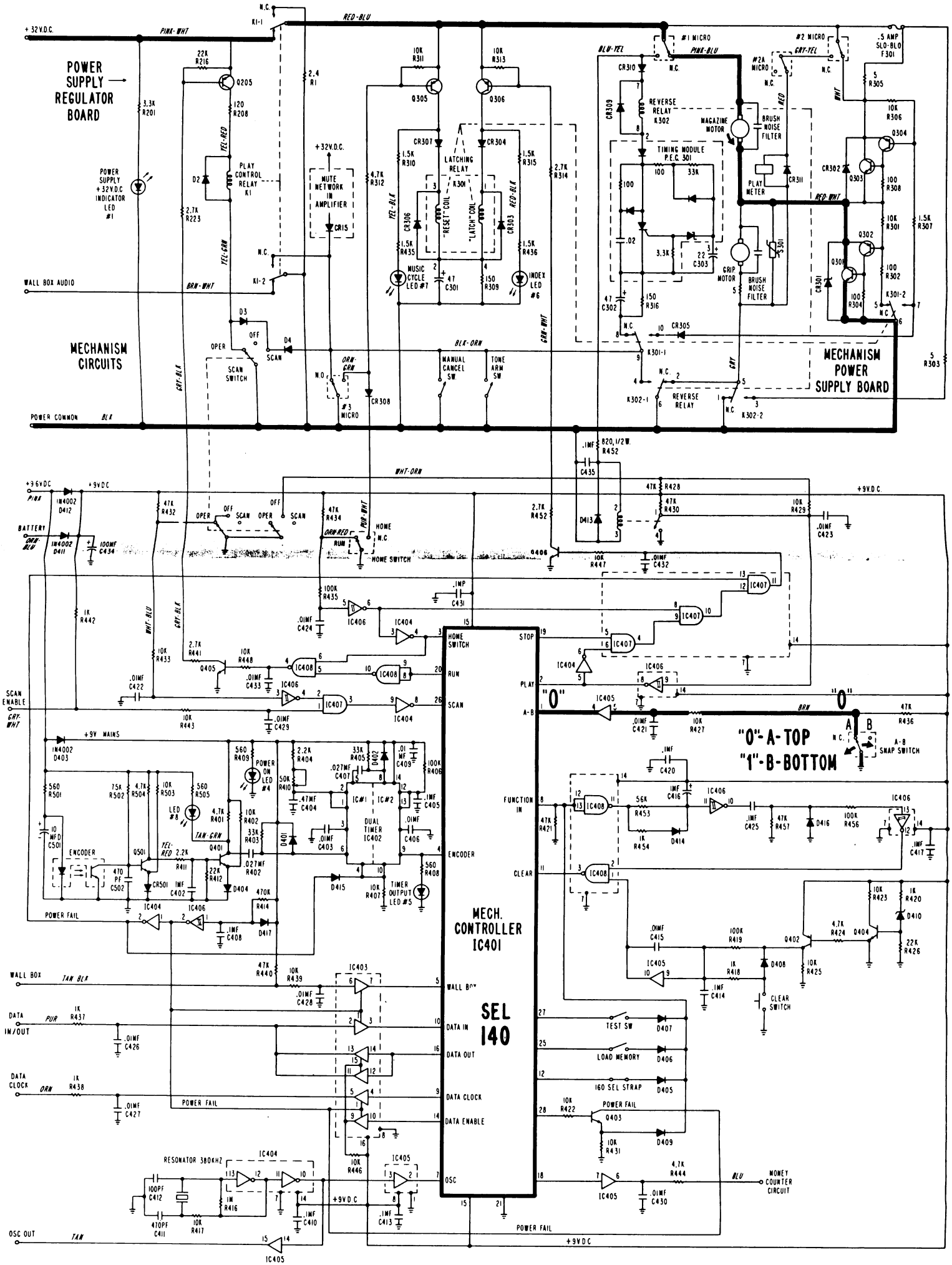
SEQUENCE 11. MAGAZINE MOTOR OPERATES — ENCODER DISC ROTATES — OPTO TRANSMITS PULSES

The normally closed position of the latching relay contact K301-2 applies a low signal at the base of Q302 allowing Q302 and Q301 to conduct thus causing the Magazine Motor to run.

Magazine Motor rotates the Record Magazine together with the Home Switch Cam and Encoder Disc. Short rotation of the Home Switch Cam transfers the switch position causing a low signal to appear on the Home Switch RUN line. This provides an "0" at pin 3 of the Mech Controller which activitates the Encoder Counter.

Encoder Disc is slotted and corresponds to the 80 positions. As the slots pass the OPTO the pulse count is transmitted through the Dual Timer to pin 4 of the Mech Controller. Dual Timer allows fine adjustment of record indexing via the Trim Pot R410, and provides properly shaped pulses to the Mech Controller encoder input.

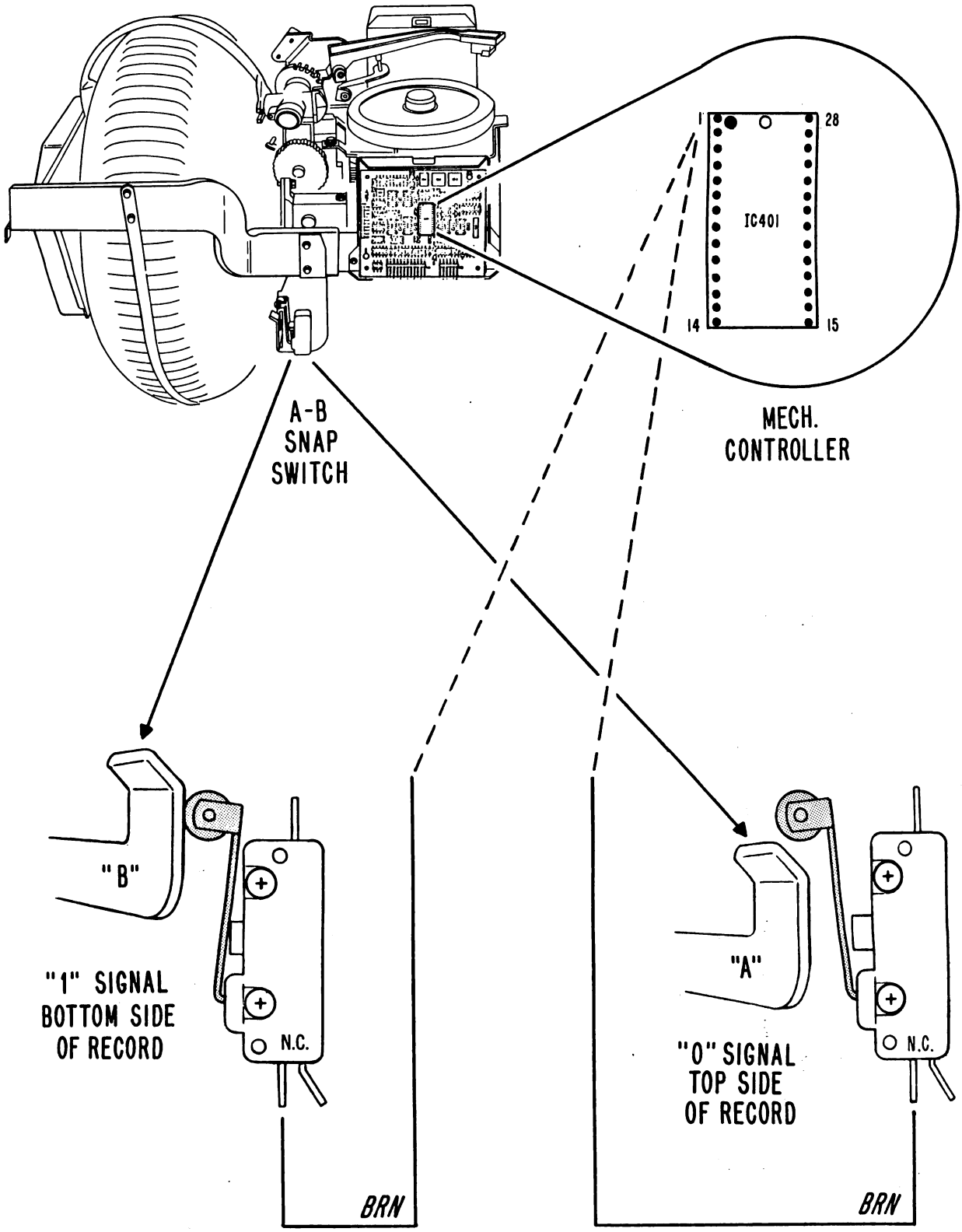


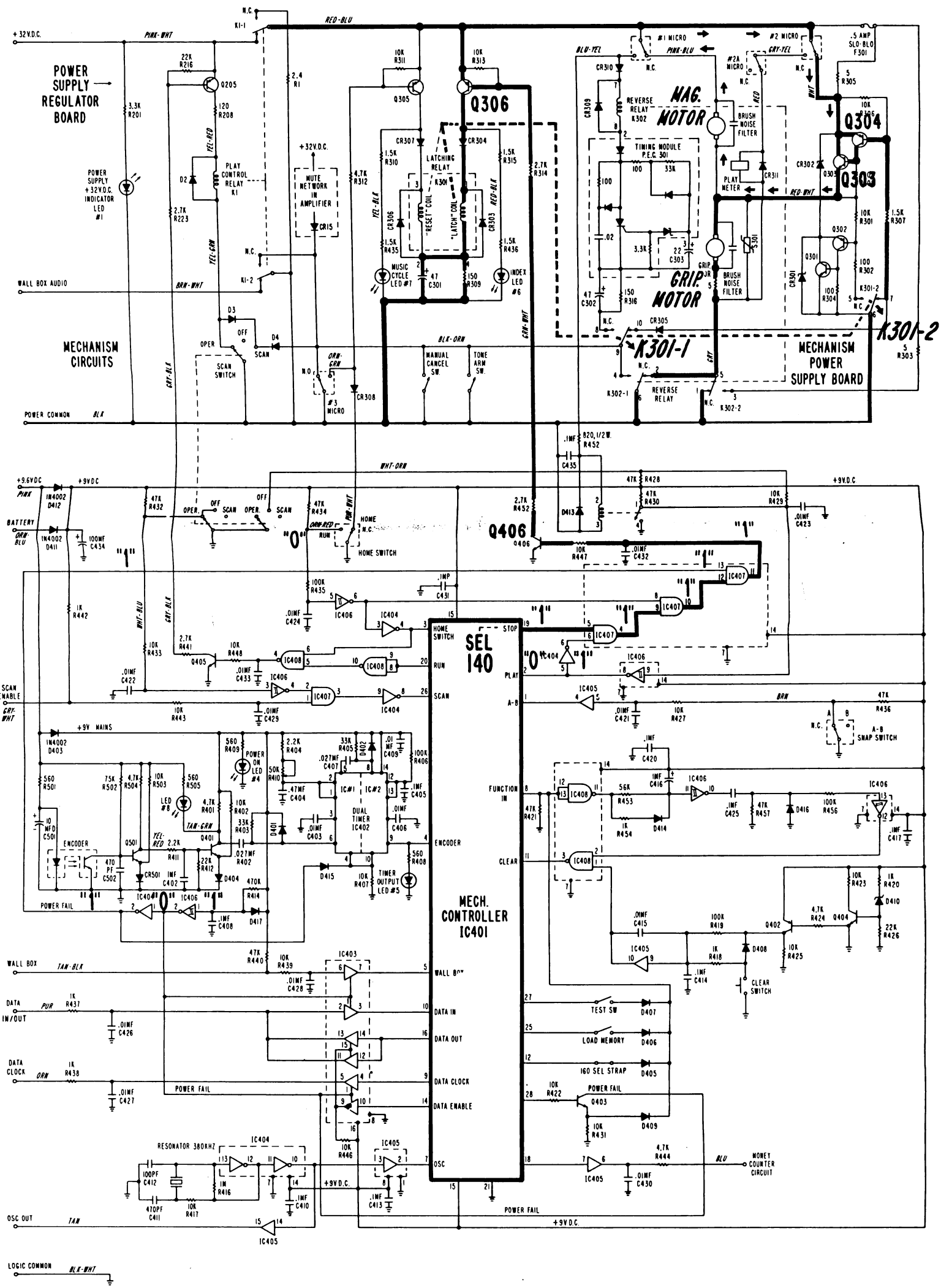

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MECH. CONTROLLER IC401
SEL 140
"0"-A-TOP
"1"-B-BOTTOM
A-B SNAP SWITCH
+32V.D.C.
+9V.D.C.
+9V MAINS
POWER COMMON
WALL BOX AUDIO
#1 MICRO
#2 MICRO
#2A MICRO
#3 MICRO
REVERSE RELAY K302
PLAY CONTROL RELAY K1
LATCHING RELAY K301
TIMING MODULE P.E.C. 301
MAGAZINE MOTOR
GRIP MOTOR
BRUSH NOISE FILTER
PLAY METER
MUTE NETWORK IN AMPLIFIER
POWER SUPPLY +32V.D.C INDICATOR LED #1
MUSIC CYCLE LED #7
INDEX LED #6
TIMER OUTPUT LED #5
POWER ON LED #4
LED #8
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
HOME SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
ENCODER
DUAL TIMER IC402
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
.5 AMP SLO-BLO F301
BATTERY
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
POWER FAIL

SEQUENCE 12. A-B SNAP SWITCH OPERATES

Pysically the selected record must be placed on the turntable with the assurance that the correct side will come up.

Mechanically on every complete rotation of the Record Magazine, the A-B Snap Switch position changes to "A-TOP", or "B-Bottom" record side circuits. This changes the signal on pin 1 to "0" or "1" respectively.



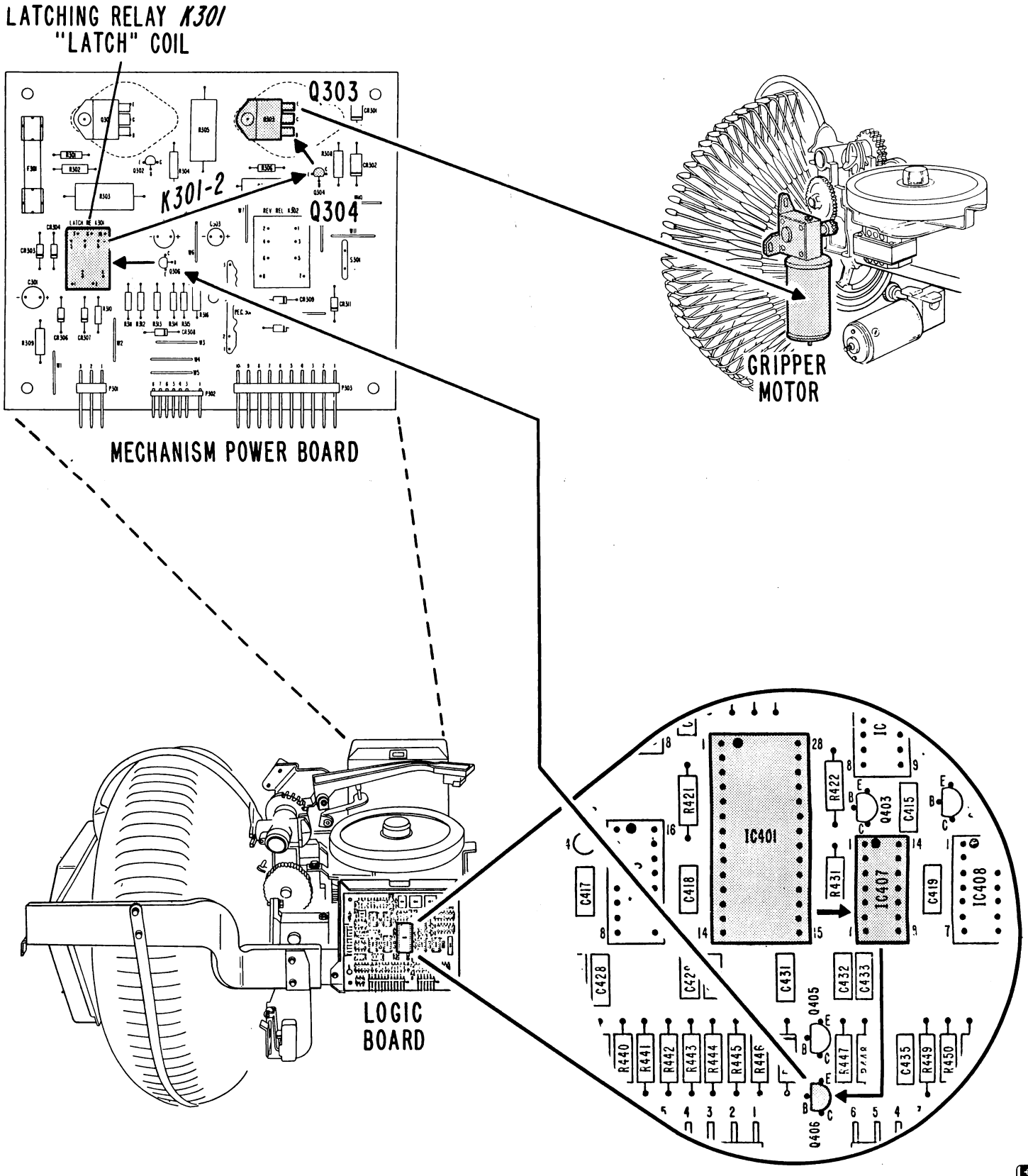

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MAG. MOTOR
GRIP. MOTOR
MECH. CONTROLLER IC401
SEL 140
Q306
Q406
K301-1
K301-2
+32V.D.C.
+9V.D.C.
WALL BOX AUDIO
POWER COMMON
SCAN SWITCH
HOME SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
MONEY COUNTER CIRCUIT
RESONATOR 380KHZ
LOGIC COMMON

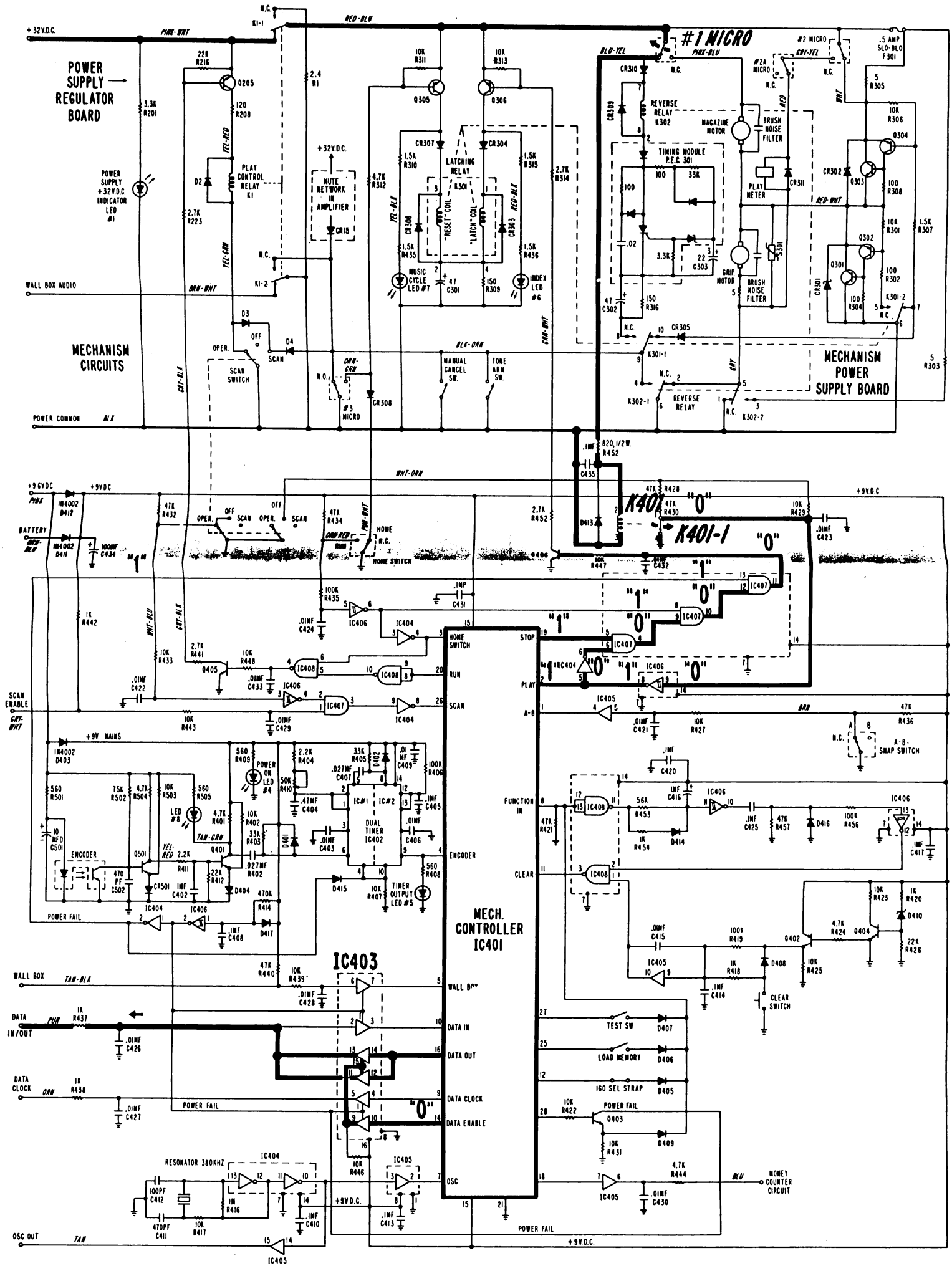
SEQUENCE 13. SELECTION LOCATED — MAGAZINE MOTOR STOPS — GRIPPER MOTOR RUNS

When the electrical and physical conditions are met the Encoder count corresponds to the record information stored, a high signal appears at the Controller STOP line at pin 19. The signal remains high after the three AND gates in the line and conveyed to the base of Q406.

Q406 turns ON and drives Q306 causing Latching Relay LATCH coil to energize and transfer relay contacts K301-1 and K301-2.

Contact K301-2 turns on Q304 and Q303 causing a dynamic brake to be applied to the Magazine Motor. This stops the rotation of the Record Magazine and starts the Gripper Motor via the #2 Micro.




POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
#1 MICRO
#2 MICRO
#2A MICRO
#3 MICRO
MECH. CONTROLLER IC401
IC403
IC404
IC405
IC406
IC407
IC408
K401
K401-1
+32V.D.C.
+9V.D.C.
+9VDC
WALL BOX AUDIO
POWER COMMON
BATTERY
SCAN ENABLE
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
POWER FAIL
MONEY COUNTER CIRCUIT
REVERSE RELAY
MAGAZINE MOTOR
BRUSH NOISE FILTER
TIMING MODULE P.E.C. 301
PLAY METER
GRIP MOTOR
LATCHING RELAY
PLAY CONTROL RELAY K1
MUTE NETWORK IN AMPLIFIER
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
HOME SWITCH
POWER SUPPLY +32V.D.C. INDICATOR LED #1
MUSIC CYCLE LED #7
INDEX LED #6
TIMER OUTPUT LED #5
POWER ON LED #4
LED #8
ENCODER
DUAL TIMER IC402
RESONATOR 380KHZ
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
.5 AMP SLO-BLO F301
STOP
RUN
PLAY
SCAN
A-B
FUNCTION IN
CLEAR
ENCODER
DATA IN
DATA OUT
DATA CLOCK
DATA ENABLE
OSC
HOME
OPER.
SCAN
OFF

SEQUENCE 14. CAM SHAFT ROTATES—MICRO #1 OPERATES—"RECORD PLAYING" IS INDICATED IN THE DISPLAY

The jaws of the gripper arm now grasp the selected record and carry it to the turntable. During the record placement the rotating gripper cam operates four Micro Switches.

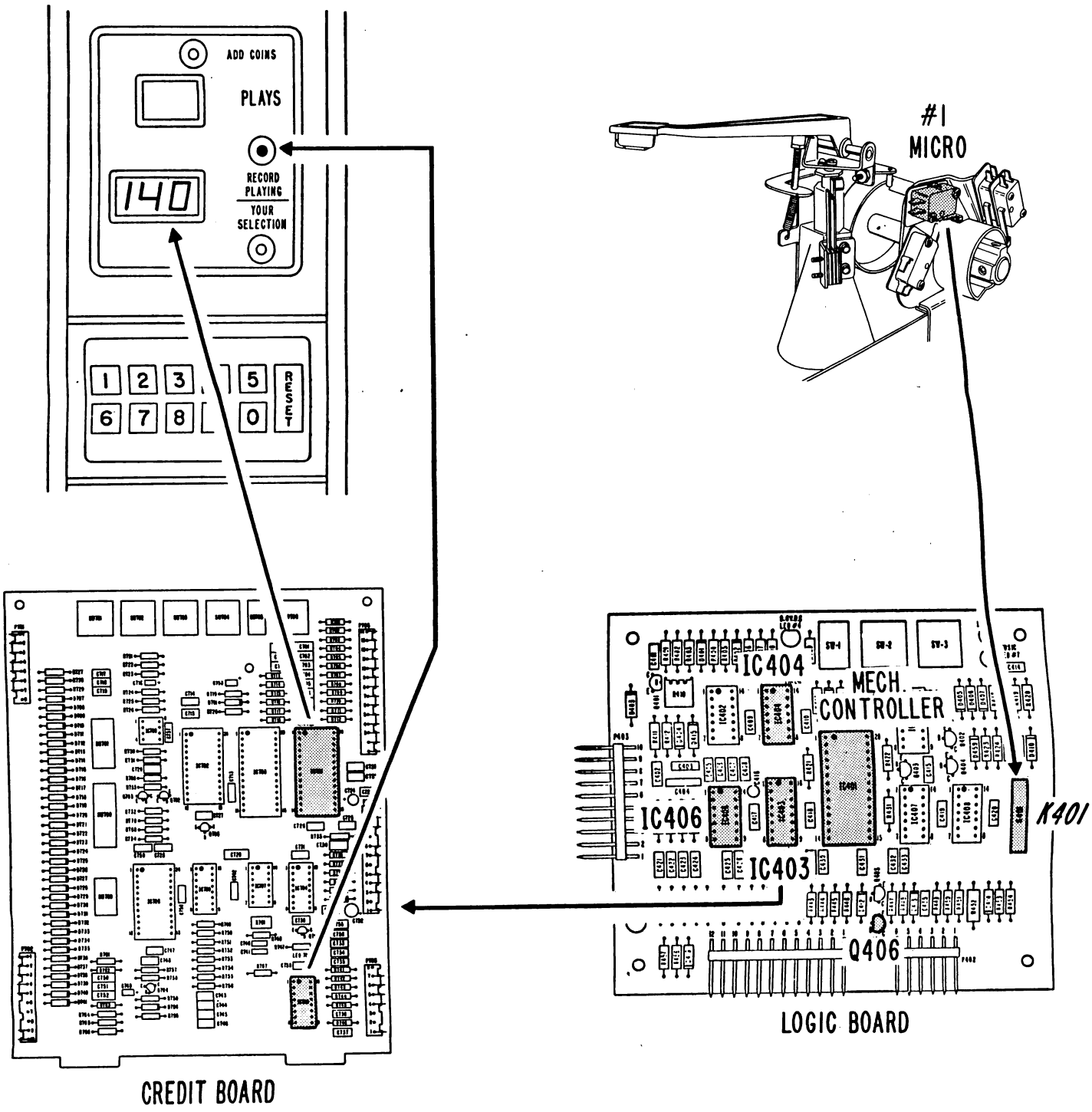
#1 Micro operates first. The normally closed line is disconnected to the magazine motor to assure that both motors do not run at the same time.

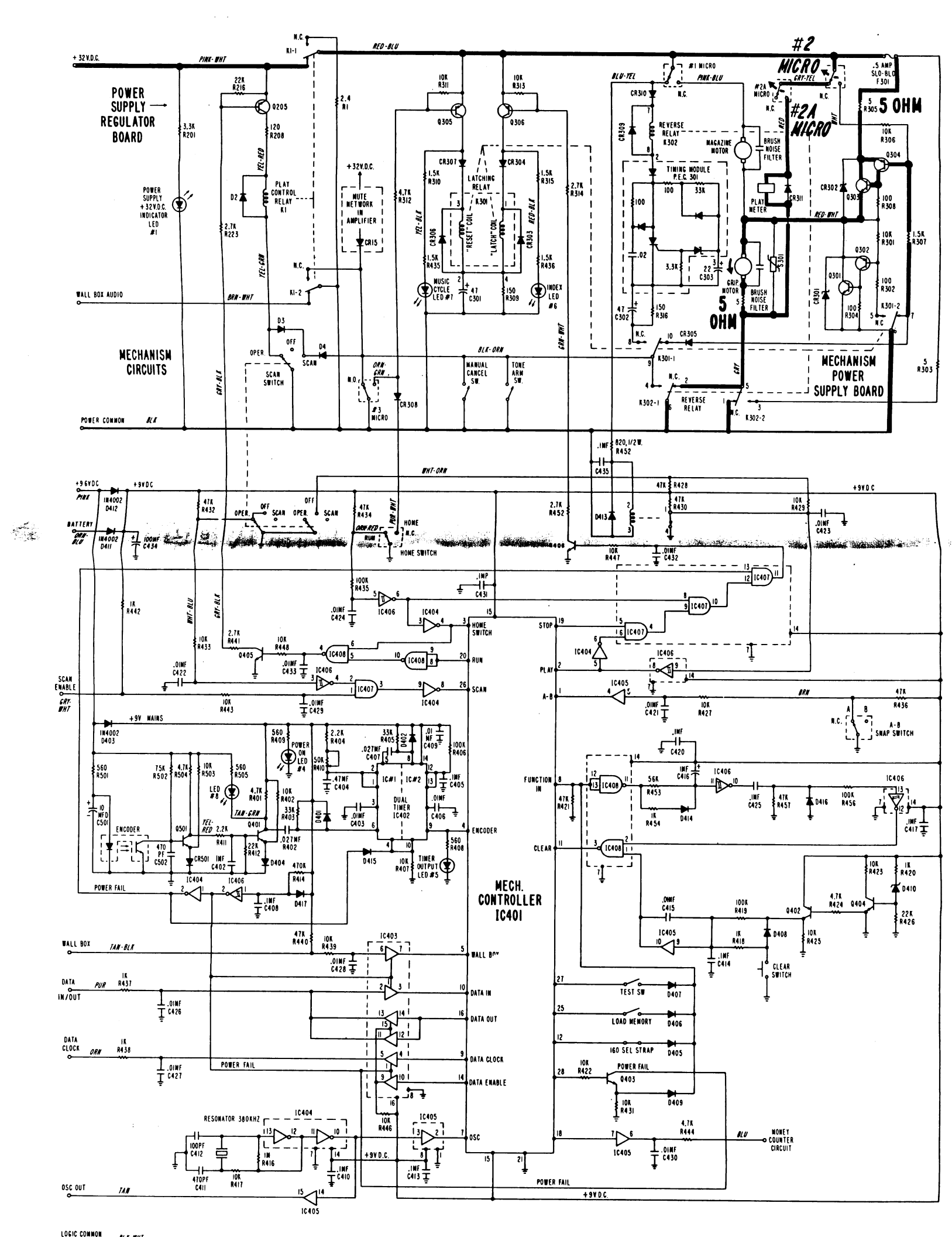
The normally open line energizes relay K401 allowing relay contacts K401-1 to close. An "0" appears on the line and inverted to "1" at the output of the Schmitt Trigger IC406. This "1" is then applied to pin 2 at the Controller and also allowed to pass through the Inverter IC404.

The high signal on pin 2 instructs the Controller to play other stored selections first if "Record Playing" is reselected at this time.

The "0" at the output of the Inverter IC404 remains "0" after passing through the three AND gates in the line. This "0" is conveyed to the base of Q406 which disables the LATCH coil circuit. Latching relay contacts K301-1 and K301-2 remain magnetically latched in the normally open postion to assure Gripper Motor operation at this point in the cycle.

At the same time the Controller enables the Tri-State Buffer, IC403, at pin 14. Pin 16 starts "Record Playing" transmission to the credit unit for processing. "Record Playing" is indicated in the record display.



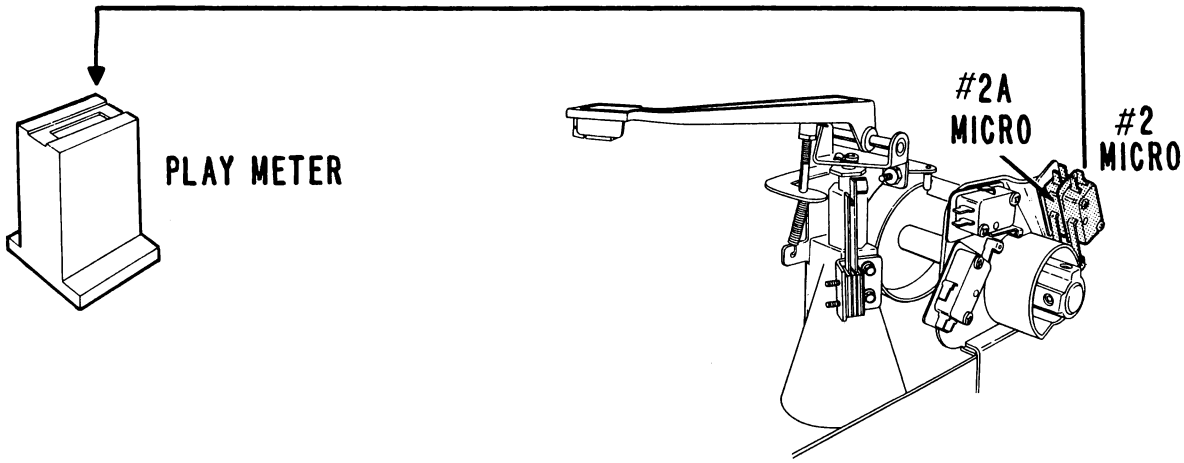

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MECH. CONTROLLER IC401
#2 MICRO
#2A MICRO
5 OHM
5 OHM
+32V.D.C.
+9V.D.C.
+9V MAINS
POWER COMMON
WALL BOX AUDIO
SCAN ENABLE
BATTERY
POWER SUPPLY +32V.D.C. INDICATOR LED #1
PLAY CONTROL RELAY K1
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY K301
"RESET" COIL
"LATCH" COIL
MUSIC CYCLE LED #7
INDEX LED #6
#1 MICRO
#2A MICRO
REVERSE RELAY K302
MAGAZINE MOTOR
BRUSH NOISE FILTER
TIMING MODULE P.E.C. 301
PLAY METER
GRIP MOTOR
REVERSE RELAY
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
#3 MICRO
HOME SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
POWER ON LED #4
LED #8
TIMER OUTPUT LED #5
DUAL TIMER IC402
ENCODER
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
POWER FAIL
LOGIC COMMON

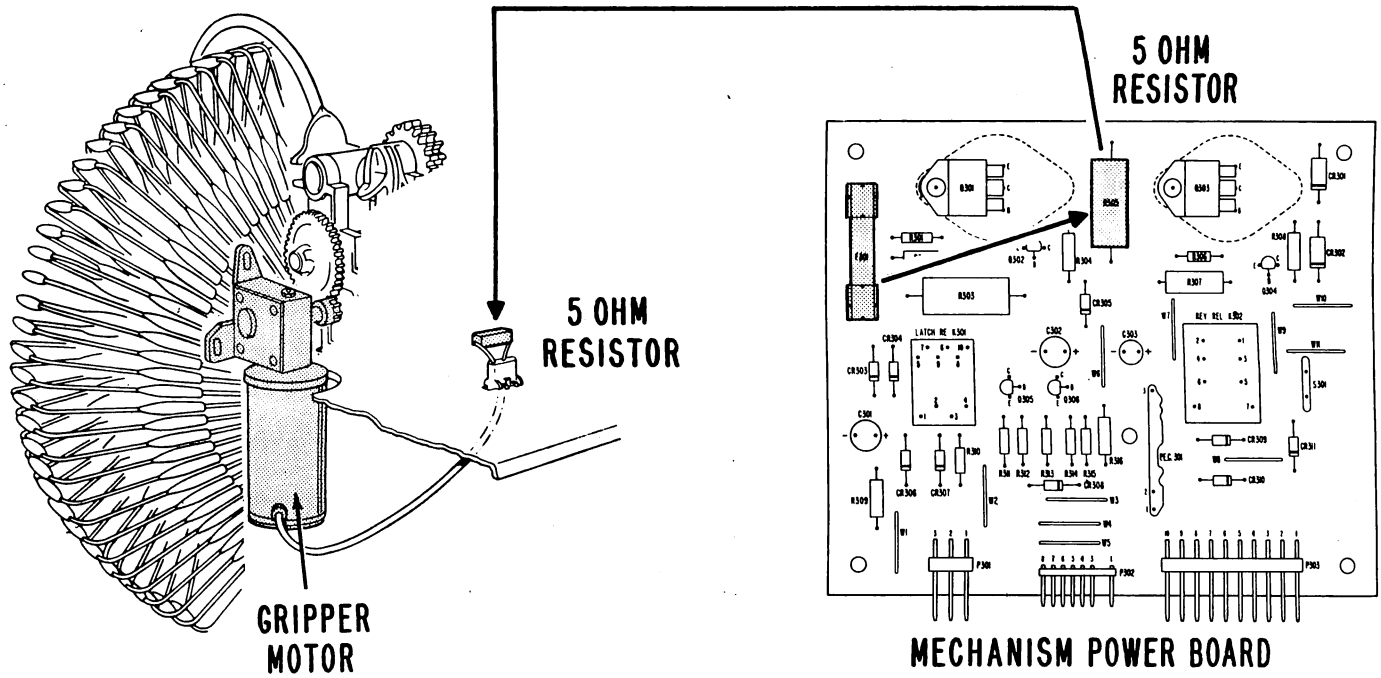
SEQUENCE 15. MICRO #2 TRANSFERS

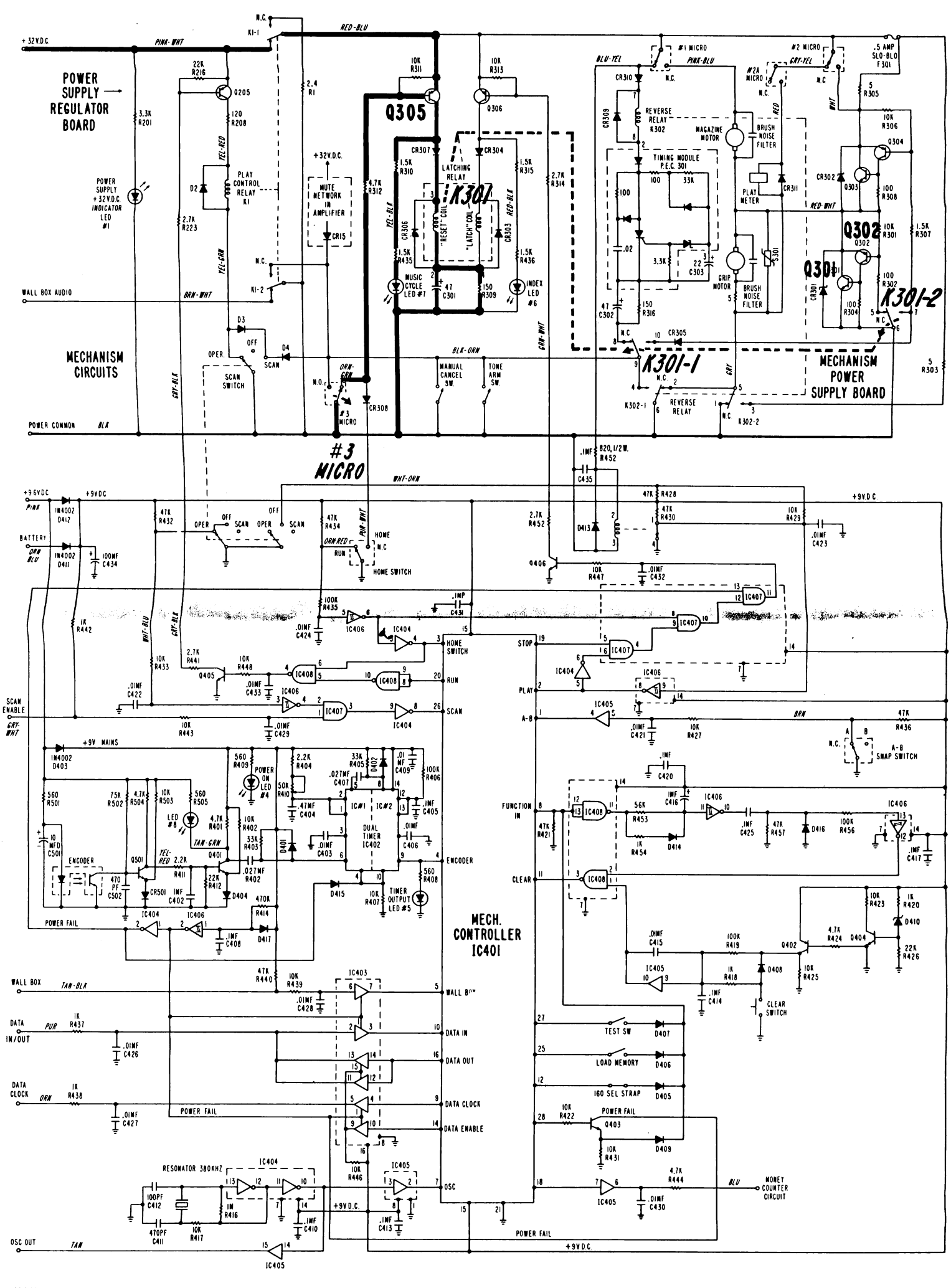
Micro #2 followed by 2A operates next. Transfer of Micro #2 to the normally closed position operates the Play Meter which registers one count.

At the same time the Gripper Motor circuit is switched through two 5 ohm resistors thereby reducing the speed of the motor. This allows the tone arm to advance more slowly when placing the pick-up stylus on the record.

Subsequent operation of Micro 2A breaks the play meter circuit.





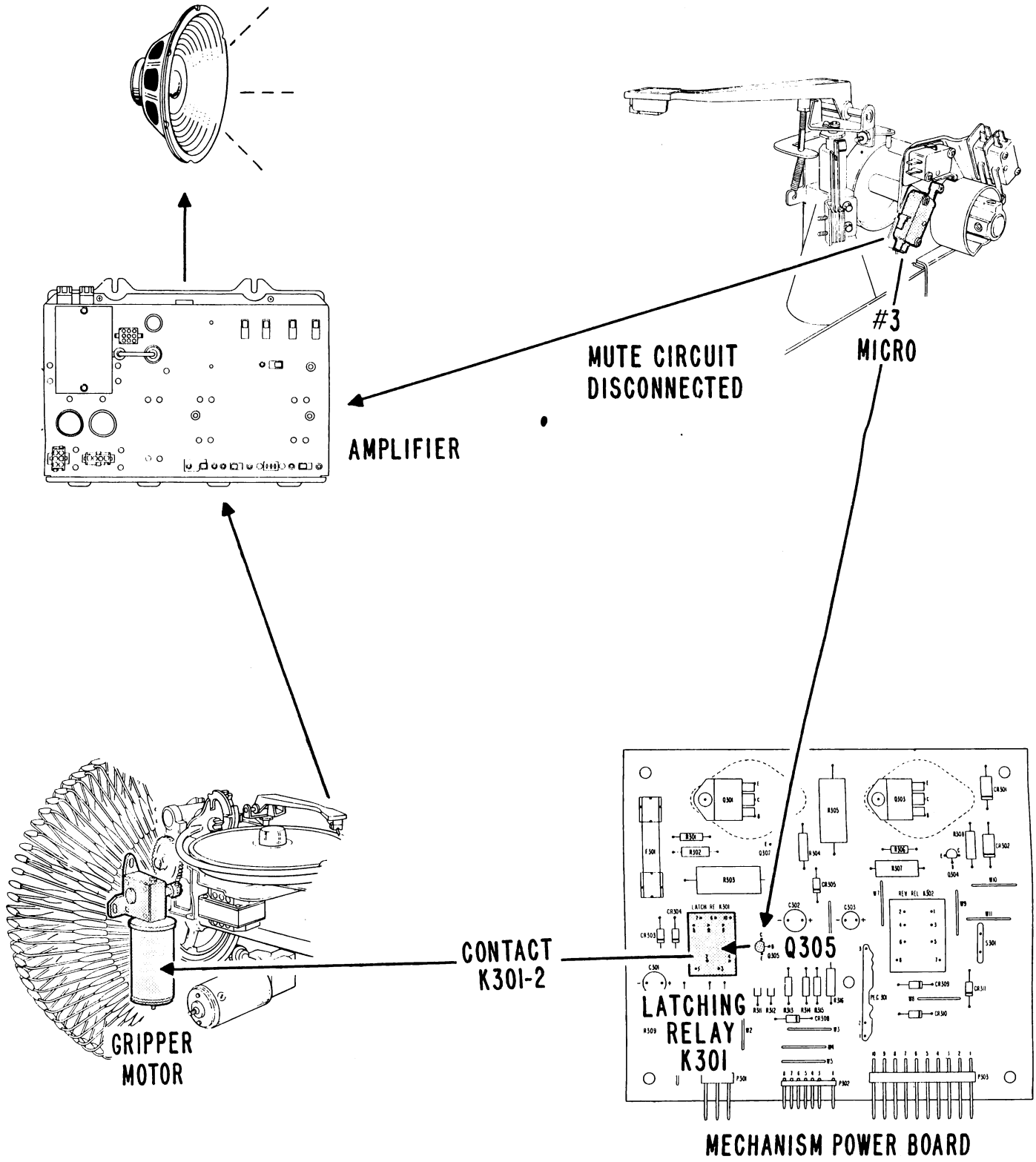

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
#3 MICRO
MECH. CONTROLLER IC401
Q305
K301
K301-1
K301-2
Q302
Q301
+32V.D.C.
+9V.D.C.
POWER COMMON
WALL BOX AUDIO
BATTERY
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY
"RESET" COIL
"LATCH" COIL
MUSIC CYCLE LED #7
INDEX LED #6
POWER SUPPLY +32V.D.C. INDICATOR LED #1
PLAY CONTROL RELAY K1
SCAN SWITCH
MANUAL CANCEL SW.
TONE ARM SW.
REVERSE RELAY K302
#1 MICRO
#2 MICRO
#2A MICRO
.5 AMP SLO-BLO F301
MAGAZINE MOTOR
BRUSH NOISE FILTER
PLAT METER
TIMING MODULE P.C. 301
GRIP MOTOR
HOME SWITCH
A-B SWAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
DUAL TIMER IC402
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
SCAN ENABLE
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
LOGIC COMMON
POWER FAIL
ENCODER
TIMER OUTPUT LED #5
POWER ON LED #4
LED #8
FUNCTION IN
STOP
PLAY
A-B
CLEAR
SCAN
RUN
HOME
DATA IN
DATA OUT
DATA CLOCK
DATA ENABLE
OSC
+9 MAINS

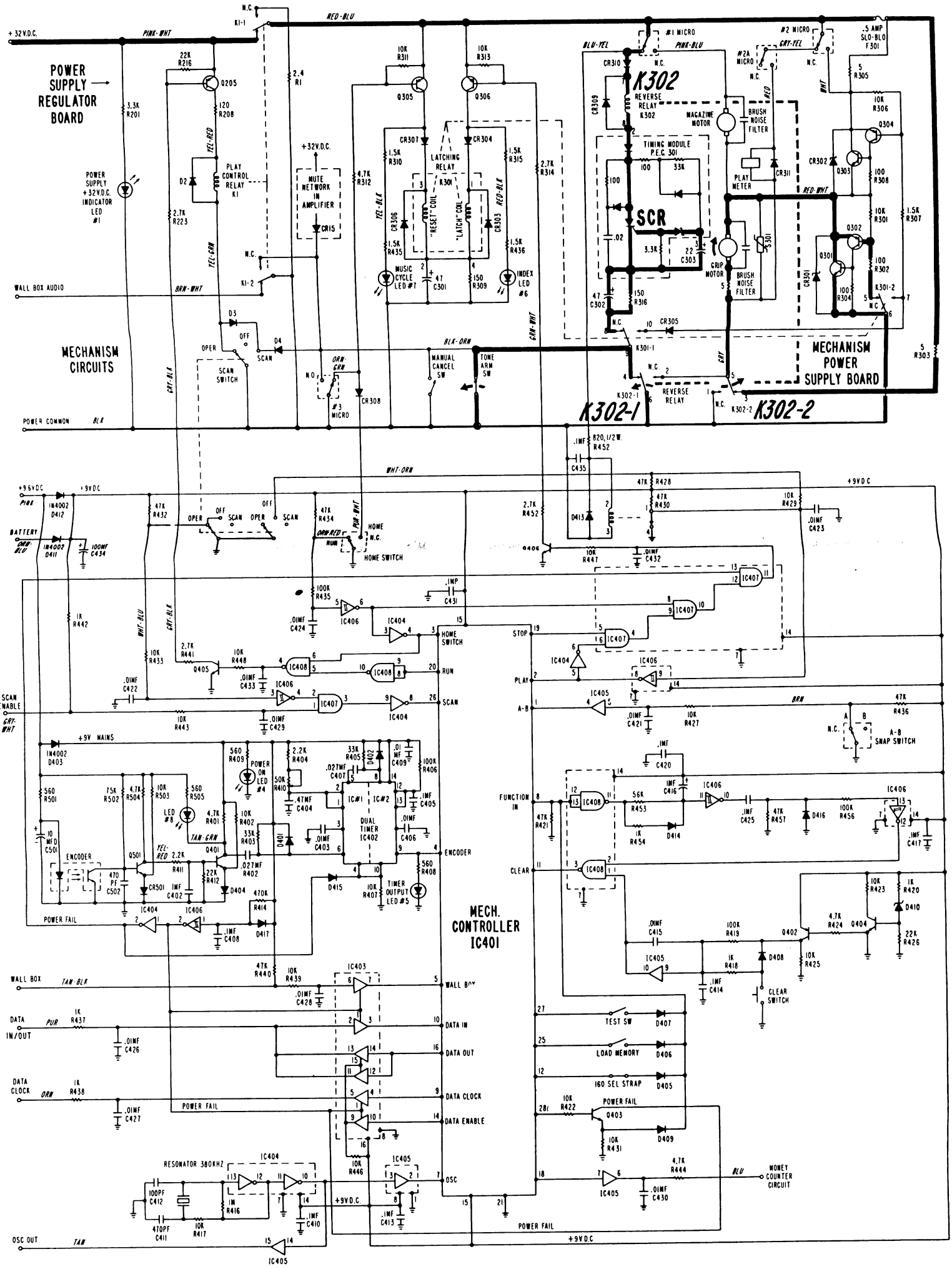
SEQUENCE 16. *RECORD TRANSFER COMPLETED — MUSIC CYCLE STARTS*

When Micro #3 transfers, Q305 turns on allowing the Latching Relay K301 RESET coil to energize and return the latching relay contacts K301-1 and K301-2 to their normally closed position.

Transfer of K301-2 disconnects the Gripper Motor circuit. Due to the voltage generated by the rotation of the gripper motor, Q302 and Q301 turn on momentarily causing the motor to dynamically brake. Both D.C. motors are now stopped.

At this point the tone arm is in the record groove, the amplifier mute system is disconnected by the transfer of the #3 Micro, and the music cycle starts.



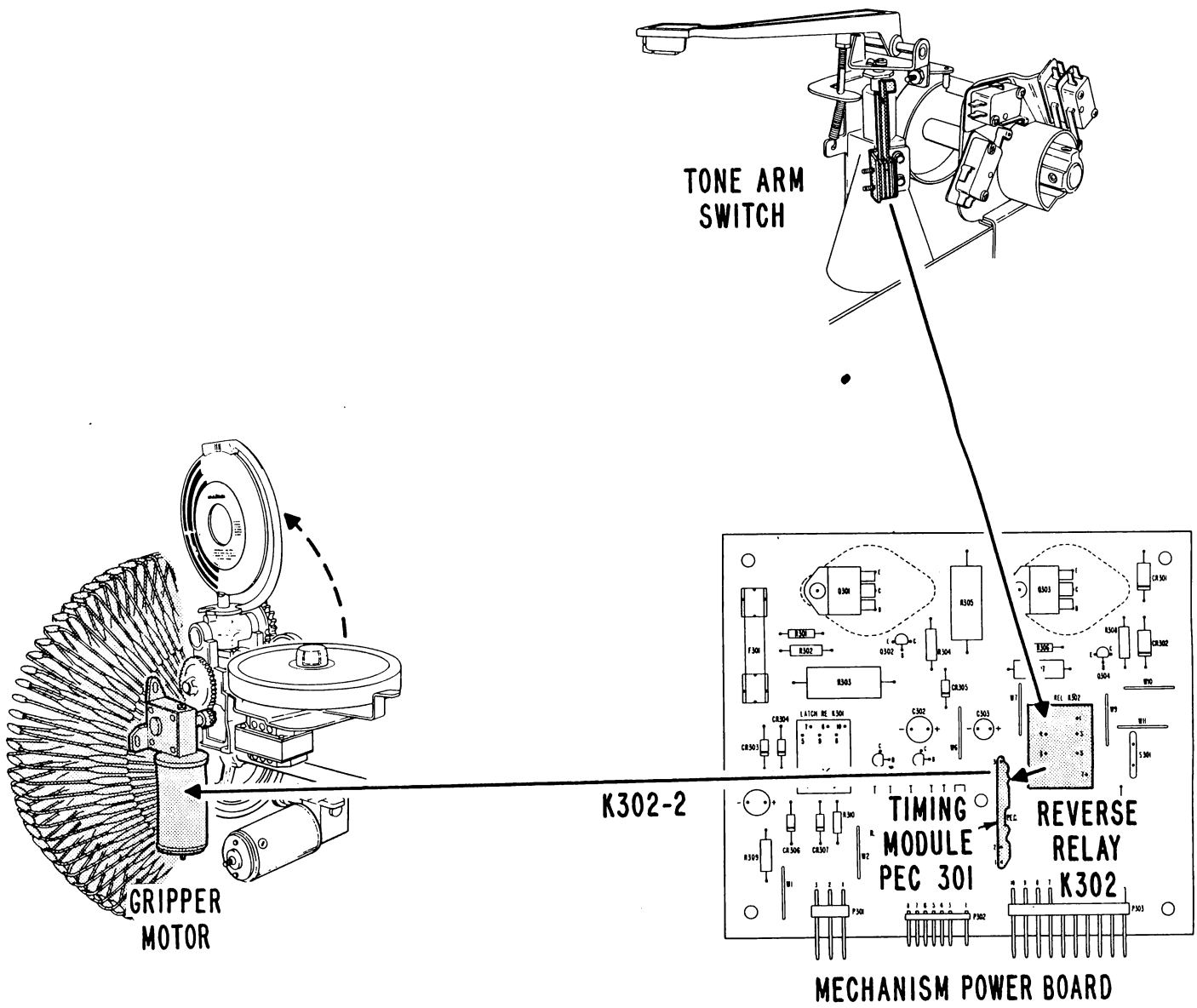

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
K302
REVERSE RELAY K302
SCR
K302-1
K302-2
MECH. CONTROLLER IC401
+32V.D.C.
+9V.D.C.
POWER COMMON
WALL BOX AUDIO
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY K301
TIMING MODULE P.E.C. 301
MAGAZINE MOTOR
BRUSH NOISE FILTER
PLAY METER
GRIP MOTOR
MANUAL CANCEL SW
TONE ARM SW
SCAN SWITCH
HOME SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
DUAL TIMER IC402
ENCODER
POWER FAIL
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
#1 MICRO
#2 MICRO
#2A MICRO
#3 MICRO
.5 AMP SLO-BLO F301
PLAY CONTROL RELAY K1
POWER SUPPLY +32V.D.C. INDICATOR LED #1
MUSIC CYCLE LED #7
INDEX LED #6
TIMER OUTPUT LED #5
LED #8
POWER ON LED #4
BATTERY
WALL BOX
DATA IN/OUT
DATA CLOCK
OSC OUT
STOP
PLAY
A-B
FUNCTION IN
CLEAR
SCAN ENABLE
HOME
RUN
SCAN
ENCODER
DATA IN
DATA OUT
DATA CLOCK
DATA ENABLE
OSC
+9V MAINS
REVERSE RELAY
IC401
IC402
IC403
IC404
IC405
IC406
IC407
IC408

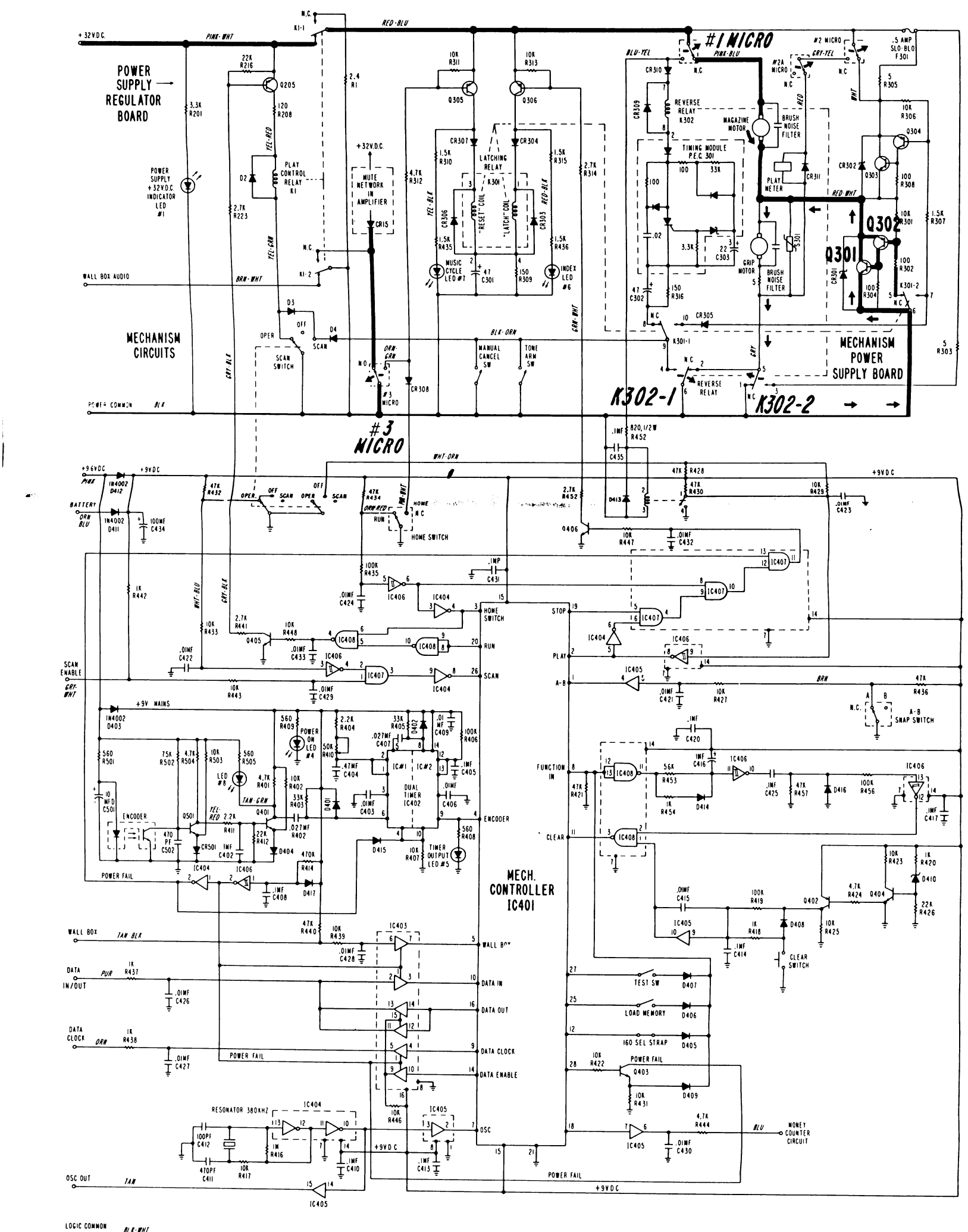
SEQUENCE 17. MUSIC CYCLE ENDS

As record play is ended the tone arm moves into the record cut-off groove closing the Tone Arm Switch. After a delay of approximately 150 milliseconds the Timing Module (PEC 301) SCR conducts thereby energizing the Reverse Relay K302. Relay contacts K301-1 and K301-2 now transfer.

K302-1 provides a holding circuit to the Reverse Relay K302.

K302-2 causes the Gripper Motor to operate in reverse via Q302 and Q301 and proceeds to return the record to the magazine.



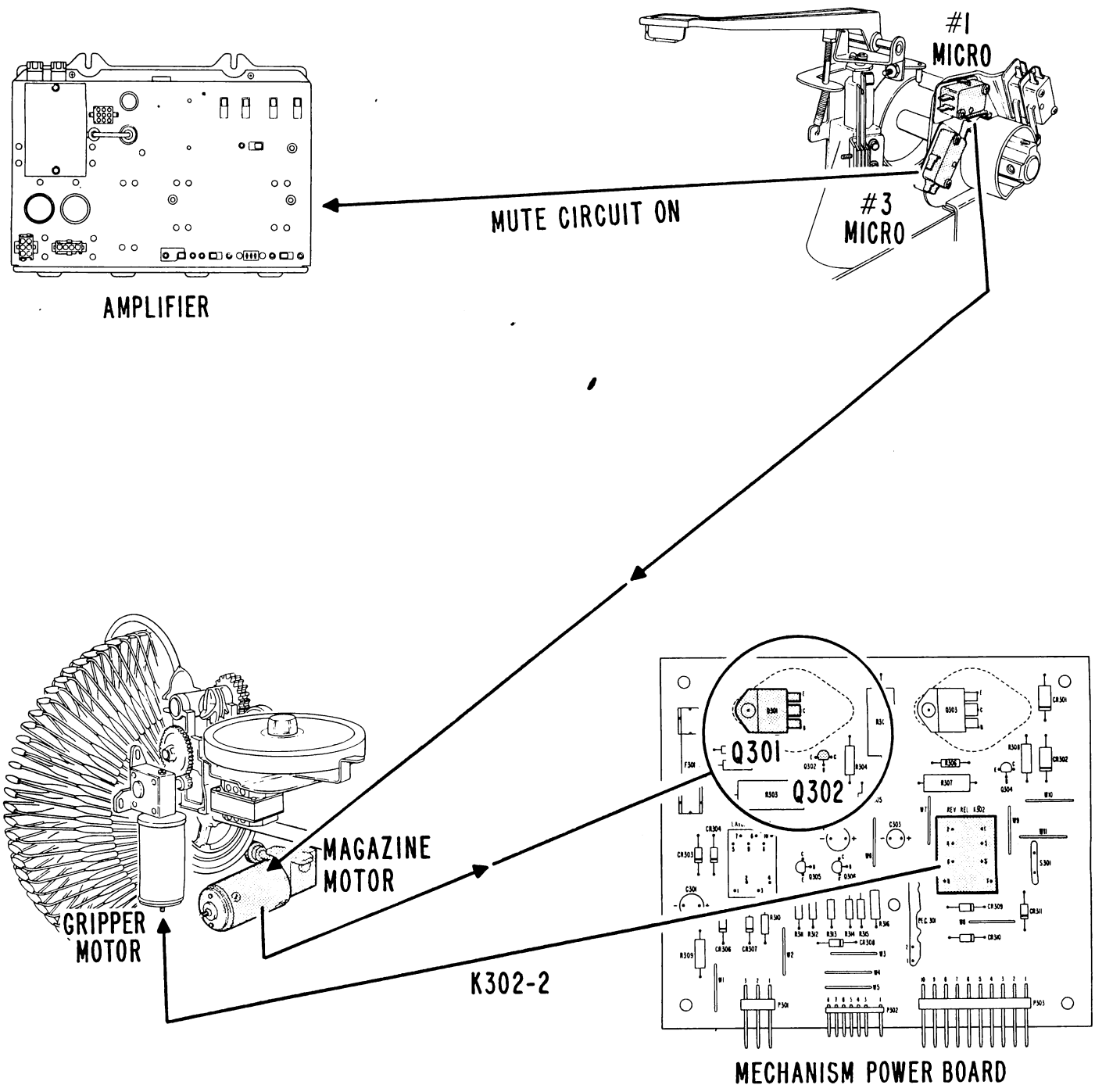

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
#1 MICRO
#2 MICRO
#3 MICRO
MECH. CONTROLLER IC401
K302-1
K302-2
Q301
Q302
+32V.D.C.
PINK-WHT
RED-BLU
PINK-BLU
BLU-YEL
GRY-YEL
YEL-RED
YEL-GRN
YEL-BLK
RED-BLK
RED-WHT
GRN-WHT
BLK-ORN
ORN-GRN
WHT-ORN
WHT-BLU
GRY-BLK
BRN-WHT
BRN
GRY
BLK
TAN
PUR
ORN
BLU
TAN BLK
GRY-WHT
+9V MAINS
+9VDC
+9.6VDC
BATTERY
POWER COMMON
LOGIC COMMON
WALL BOX AUDIO
POWER SUPPLY +32V.D.C. INDICATOR LED #1
PLAY CONTROL RELAY K1
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY K301
"RESET" COIL
"LATCH" COIL
MUSIC CYCLE LED #7
INDEX LED #6
SCAN SWITCH
MANUAL CANCEL SW
TONE ARM SW
HOME SWITCH
REVERSE RELAY K302
MAGAZINE MOTOR
BRUSH NOISE FILTER
TIMING MODULE P.E.C. 301
PLAY METER
GRIP MOTOR
.5 AMP SLO-BLO F301
DUAL TIMER IC402
ENCODER
TIMER OUTPUT LED #5
POWER FAIL
TEST SW
LOAD MEMORY
160 SEL STRAP
CLEAR SWITCH
A-B SWAP SWITCH
RESONATOR 380KHZ
MONEY COUNTER CIRCUIT
OSC OUT
SCAN ENABLE
FUNCTION IN
DATA IN/OUT
DATA CLOCK
WALL BOX
OSC
STOP
PLAY
A-B
CLEAR
SCAN
RUN
HOME
ENCODER
DATA IN
DATA OUT
DATA CLOCK
DATA ENABLE

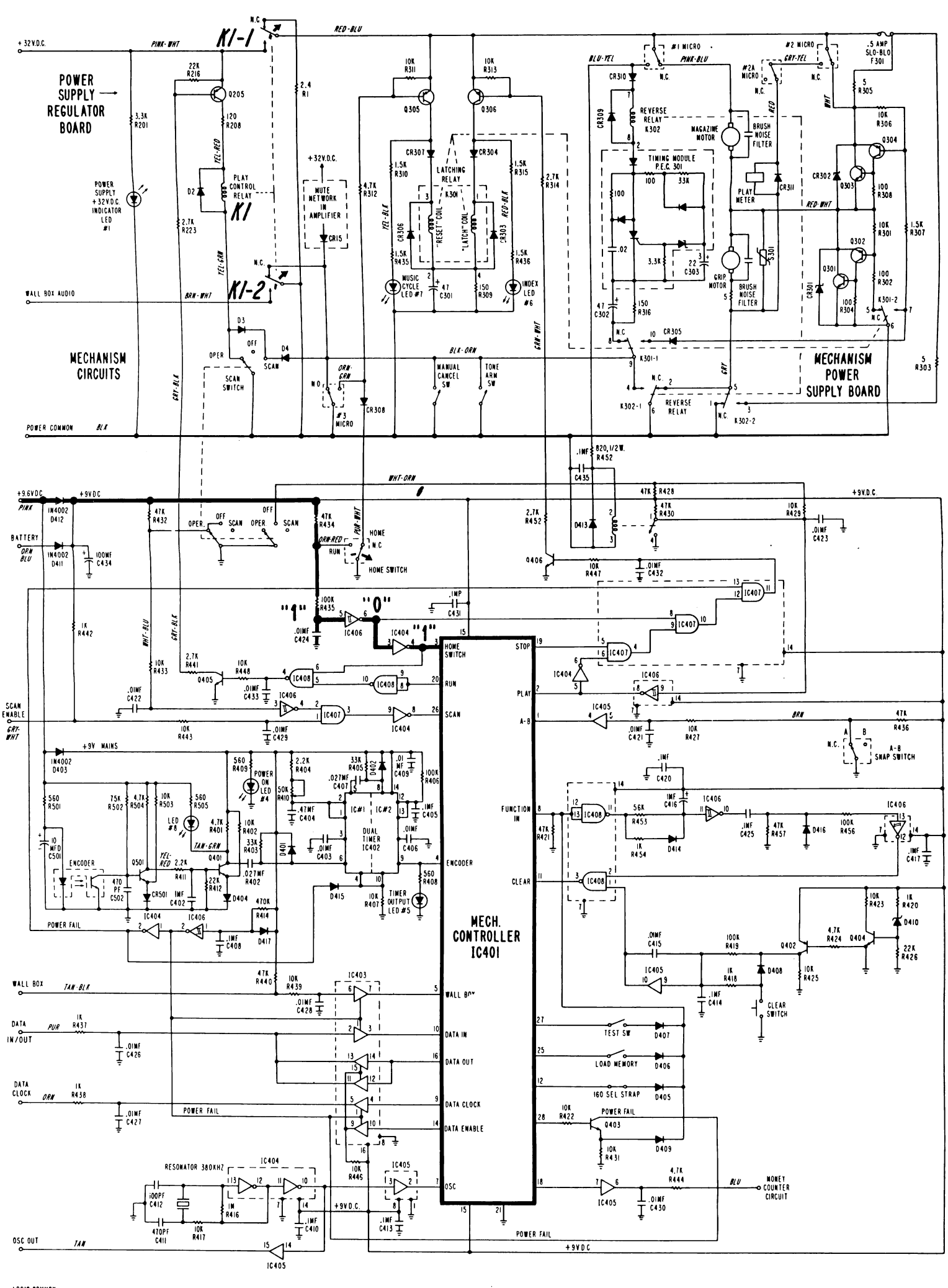
SEQUENCE 18. MICRO SWITCHES RETURN

During the return of the record the four Micro switches return to their original positions. Micro #3 mutes the sound system through the network provided in the amplifier.

When Micro #1 returns, the Reverse Relay K302 coil circuit is disconnected, relay relaxes and relay contacts K302-1 and K302-2 return to their normally closed position.

K302-2 places a dynamic brake on the Gripper Motor while at the same time a circuit is again completed to the Magazine Motor via the #1 Micro, transistors Q302 and Q301 causing the motor to run.

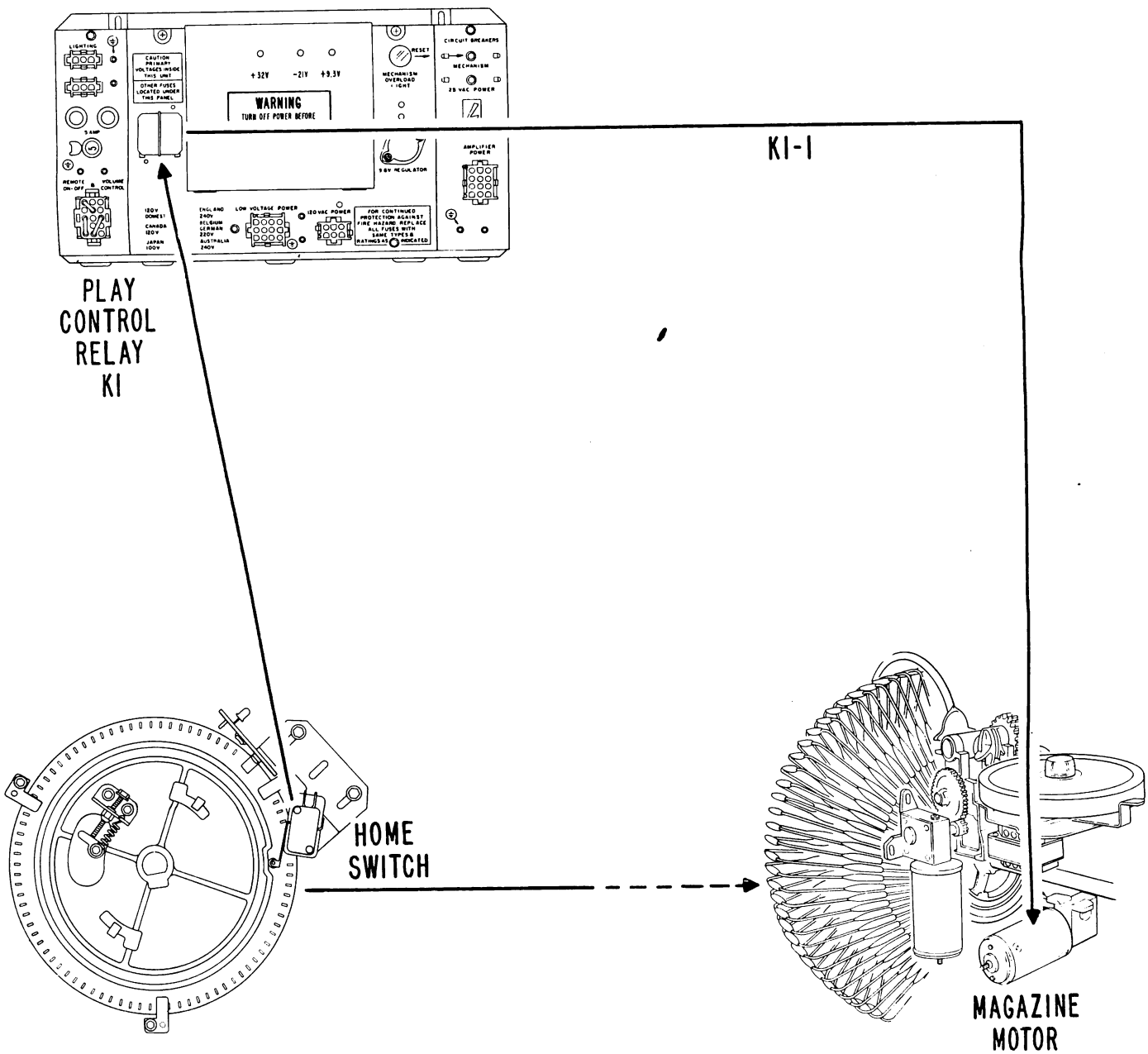


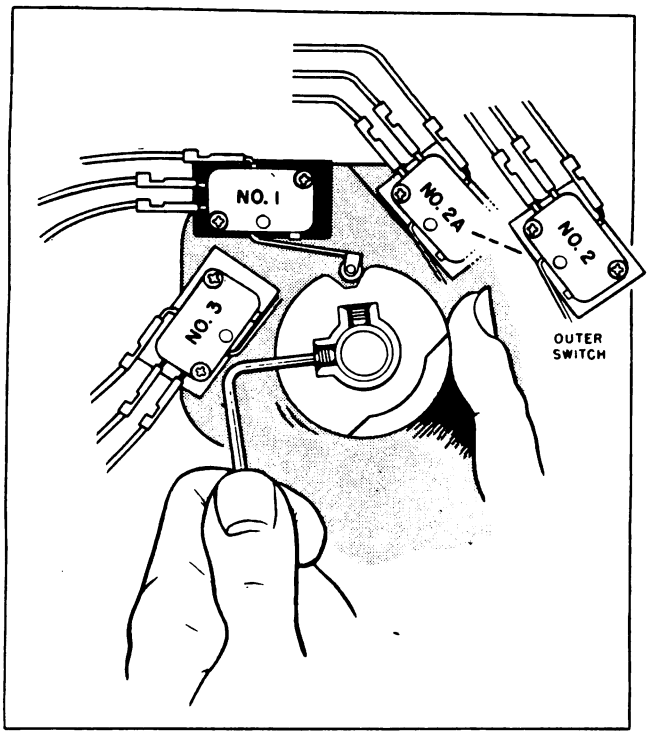

POWER SUPPLY REGULATOR BOARD
MECHANISM CIRCUITS
MECHANISM POWER SUPPLY BOARD
MECH. CONTROLLER IC401
K1-1
K1
K1-2
+32V.D.C.
+9.6V.D.C.
+9V.D.C.
POWER COMMON
WALL BOX AUDIO
BATTERY
SCAN ENABLE
POWER FAIL
DATA IN/OUT
DATA CLOCK
OSC OUT
RESONATOR 380KHZ
MUTE NETWORK IN AMPLIFIER
LATCHING RELAY
"RESET" COIL
"LATCH" COIL
REVERSE RELAY K302
TIMING MODULE P.E.C. 301
MAGAZINE MOTOR
BRUSH NOISE FILTER
PLAY METER
GRIP MOTOR
PLAY CONTROL RELAY K1
SCAN SWITCH
MANUAL CANCEL SW
TONE ARM SW
HOME SWITCH
A-B SNAP SWITCH
CLEAR SWITCH
TEST SW
LOAD MEMORY
160 SEL STRAP
MONEY COUNTER CIRCUIT
#1 MICRO
#2 MICRO
#2A MICRO
#3 MICRO
.5 AMP SLO-BLO F301
POWER SUPPLY +32V.D.C. INDICATOR LED #1
MUSIC CYCLE LED #7
INDEX LED #6
POWER ON LED #4
TIMER OUTPUT LED #5
LED #8
ENCODER
DUAL TIMER IC402
REVERSE RELAY
SCAN
OPER
OFF
HOME
RUN
STOP
PLAY
A-B
CLEAR
ENCODER
DATA IN
DATA OUT
DATA CLOCK
DATA ENABLE
OSC
FUNCTION IN
WALL BOX
PINK
ORN BLU
GRY-WHT
WHT-BLU
GRY-BLK
TAN-GRN
YEL-RED
YEL-GRN
BRN-WHT
ORN-GRN
BLK-ORN
GRN-WHT
RED-BLU
PINK-WHT
BLU-YEL
PINK-BLU
GRY-YEL
RED-WHT
RED-BLK
WHT-ORN
PUR-WHT
TAN-BLK
ORN-RED
BRN
BLU
GRY
PUR
WHT
IC401
IC402
IC403
IC404
IC405
IC406
IC407
IC408
Q205
Q303
Q304
Q305
Q306
Q401
Q402
Q403
Q404
Q405
Q406
Q501
Q301
Q302
D2
D3
D4
D403
D404
D405
D406
D407
D408
D409
D410
D412
D413
D414
D415
D416
D417
CR305
CR307
CR308
CR309
CR310
CR311
CR315
IN4002 D411
IN4002 D412
IN4002 D403

SEQUENCE 19. SCAN CYCLE COMPLETED

When rotation of the Home Switch Cam releases the Home Switch into the cam dip, the Encoder Counter in the Mech Controller resets to zero. If no other selections are in the memory then the circuit to the Play Control Relay K1 is disconnected. Relay contacts K1-1 and K1-2 return to stand-by and turn off the mechanism power.

K1-1 applies a dynamic brake across the magazine armature bringing the motor to a quick stop thus completing the mechanism cycle.





MICRO SWITCH AND CAM ADJUSTMENT

Cycle of the record mechanism is controlled by the operation of four micro switches actuated in the proper sequence by a rotating cam shaft.

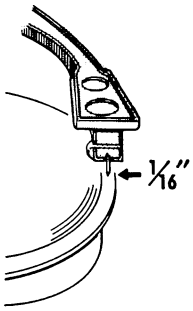
To adjust, phonograph must be in stand-by position (gripper arm over record magazine), and the service scan switch moved to "off".

1. Rotate the knurled end of the gripper motor shaft clockwise until a jam occurs.

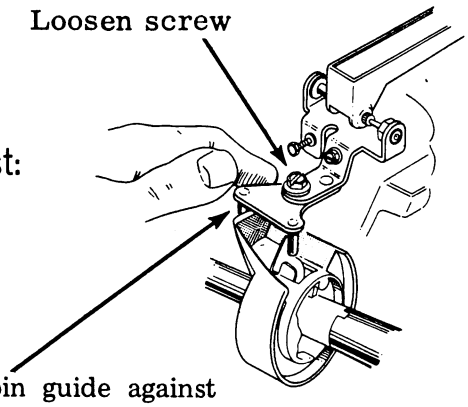
2. At this point, the No. 1 switch roller must be in the cam groove and in contact with the back drop-off. If the roller is cammed out, loosen the two cam set screws and rotate the cam until the proper position is obtained.

TONE ARM ADJUSTMENTS

NEEDLE SET-DOWN

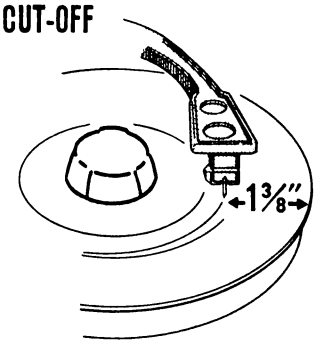


Stop mechanism just before needle lands on record. Needle must be at least 1/16" in from record edge.

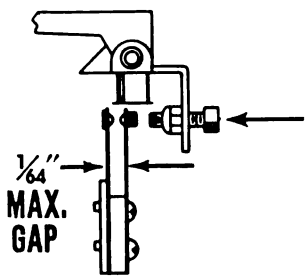


Hold outer pin guide against cam and move Tone Arm "in" or "out"—Tighten screw.

RECORD CUT-OFF



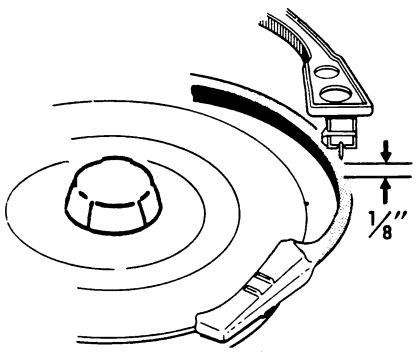
Cut-off position is 1-3/8" from record edge.



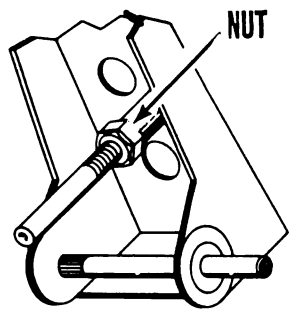
To adjust:

Move adjustment screw to obtain proper gap.

NEEDLE CLEARANCE ABOVE GRIPPER ARM



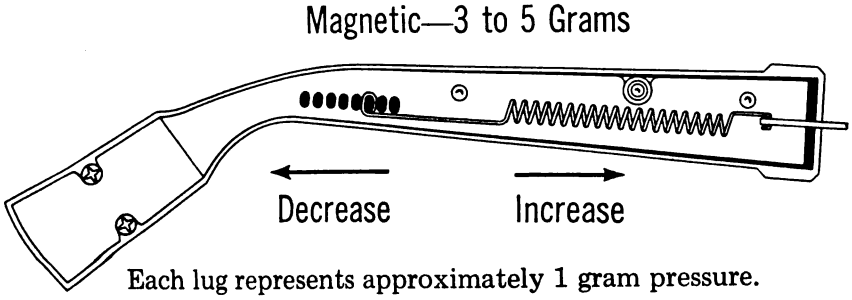
On even numbered selections the tone arm needle passes over the bow of the gripper arm. Needle clearance must be 1/8".



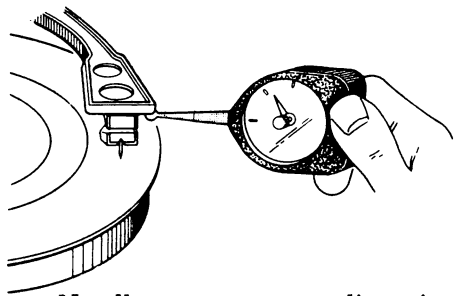
To adjust:

Loosen nut. Raise or lower adjustment screw for needle clearance. Tighten nut.

TONE ARM GRAM PRESSURE ADJUSTMENT

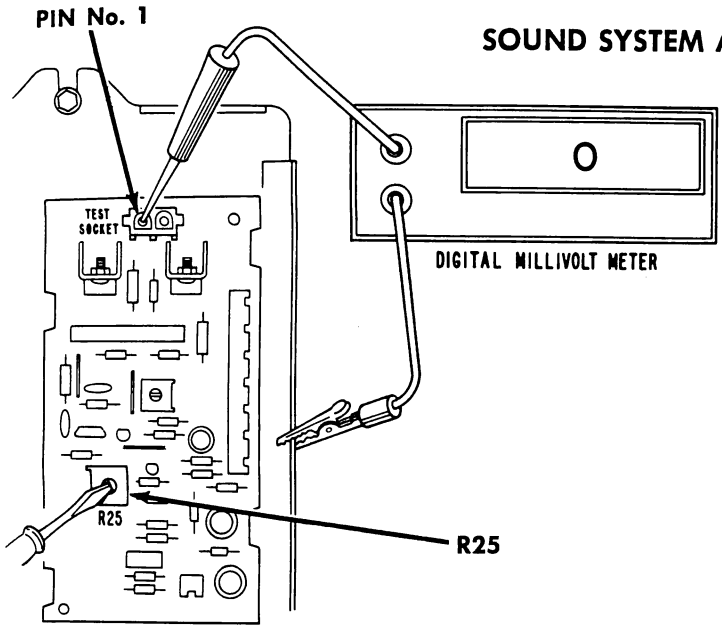


Each lug represents approximately 1 gram pressure.



Needle pressure reading is taken at the point of contact of the needle on the record.

SOUND SYSTEM ADJUSTMENTS



DRIVER P.C. BOARD

CENTER VOLTAGE (OUTPUT LINE) AND IDLE CURRENT ADJUSTMENT.

These controls are located on the DRIVER P.C. BOARDS (52265-A) for each channel. They should only be re-adjusted when a DRIVER P.C. board or HEAT SINK assembly (52360-A) has been replaced or repaired.

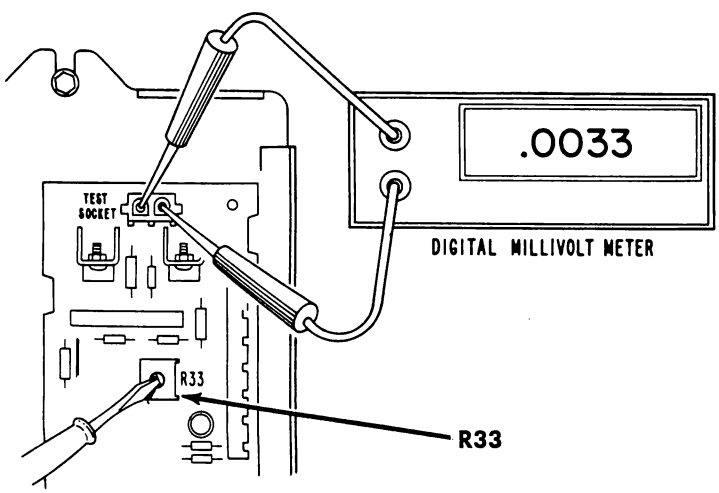
CONDITIONS:

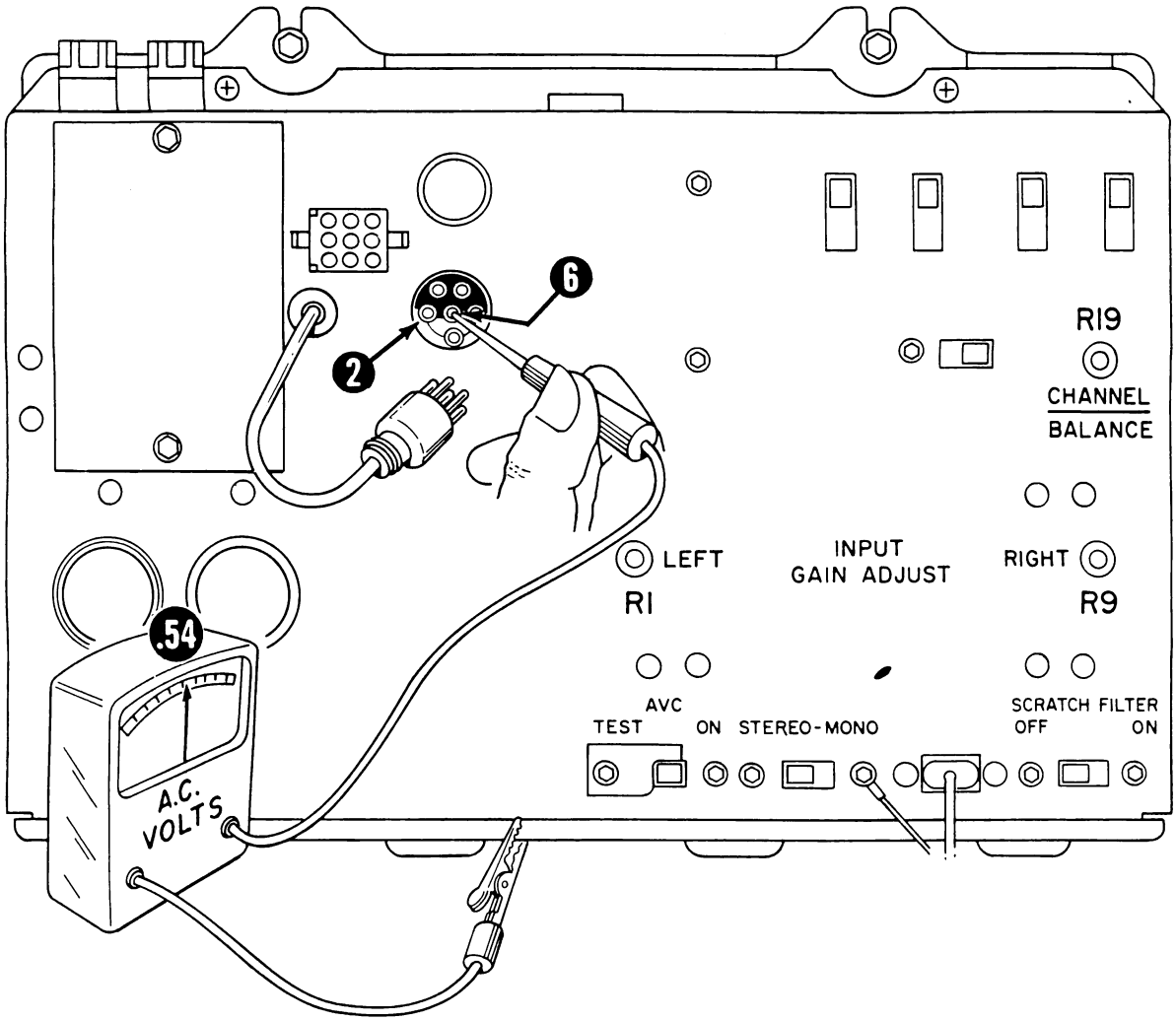
1. Line voltage: 120 volts.
2. Load: None. Disconnect plug from SPEAKER TERMINAL STRIP socket on front of amplifier.
3. Signal: None. Turn VOLUME CONTROL to minimum.

EQUIPMENT: Digital Millivoltmeter

PROCEDURE:

1. With POWER OFF, pre-set R33 (current) to minimum (CCW) and R25 (voltage) to center of rotation.
2. Connect meter between ground and pin #1 of TEST SOCKET on driver P.C. board to be adjusted.
3. Switch POWER ON. Adjust R25 for 0 volts plus or minus .001 volts.
4. Connect meter to pins 1 and 2 of TEST SOCKET.
5. Adjust R33 for .0033 volts plus or minus .001 volts. (Indicates 7 to 13 MA through R43)





INPUT GAIN ADJUSTMENT (R1 and R9)

These controls are located on the PRE-AMPLIFIER and A.V.C. P.C. BOARD (52295-A) and are accessible through the front of the amplifier. They should only be adjusted when the PICK UP CARTRIDGE has been replaced or the PRE-AMPLIFIER P.C. BOARD has required service or replacement.

CONDITIONS:

1. Set A.V.C. switch to ON.

2. Set STEREO-MONO switch to STEREO.

3. Set SCRATCH FILTER switch to OFF.

EQUIPMENT:

1. RMC STEREO TEST RECORD #1001.

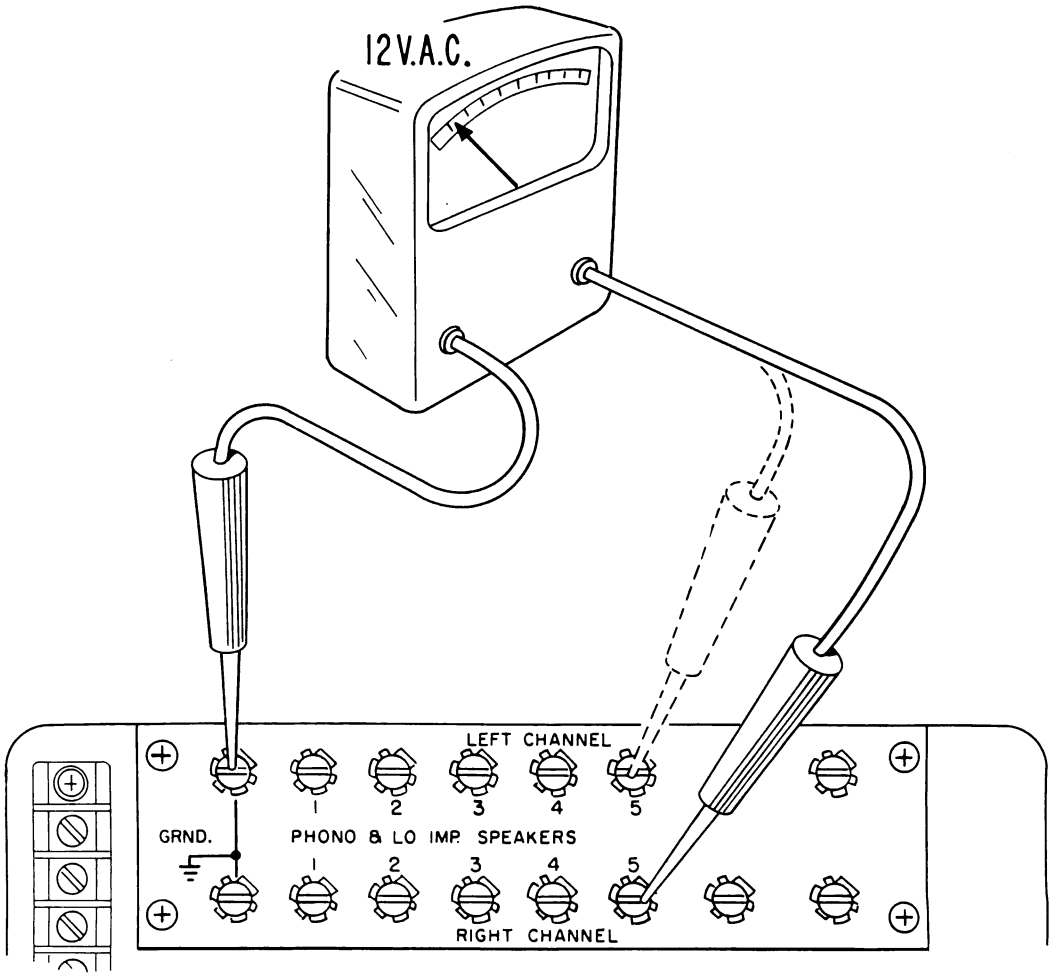
2. A.C. Voltmeter (1000 ohms per volt minimum)

PROCEDURE:

1. Remove VOLUME CONTROL plug from socket on amplifier front.

2. Connect the A.C. voltmeter to pin #6 of the VOLUME CONTROL SOCKET and GROUND. Play Band #2 (right channel) of test record. Set the RIGHT INPUT GAIN ADJUST (R9) for .54 volts.

3. Connect the A.C. voltmeter to pin #2 of the VOLUME CONTROL SOCKET and GROUND. Play Band #1 (left channel) of test record. Set the LEFT INPUT GAIN ADJUST (R1) for .54 volts.



BALANCE CONTROL

This control is located on the TONE CONTROL P.C. BOARD (52260-A) and is accessible through the amplifier front. Re-adjustment should only be required if the amplifier has been serviced.

CONDITIONS:

1. Set A.V.C. switch to ON.
2. Set STEREO-MONO switch to STEREO.
3. Set SCRATCH FILTER switch to OFF.
4. Set TONE CONTROLS to MAXIMUM.
5. Set VOLUME CONTROL to MAXIMUM.
6. INPUT GAIN CONTROLS must be adjusted correctly.

EQUIPMENT:

1. RMC STEREO TEST RECORD #1001.
2. A. C. VOLTMETER (1000 ohms per volt minimum)

PROCEDURE:

1. Play Band #3 (right and left channels) of the test record. Connect the A.C. voltmeter to ground and terminals #5 on the AUDIO DISTRIBUTION terminal strip. Alternately connect the meter to #5 left and #5 right. Adjust the BALANCE CONTROL (R19) for equal voltages on both channels. (Approximately 12 volts)

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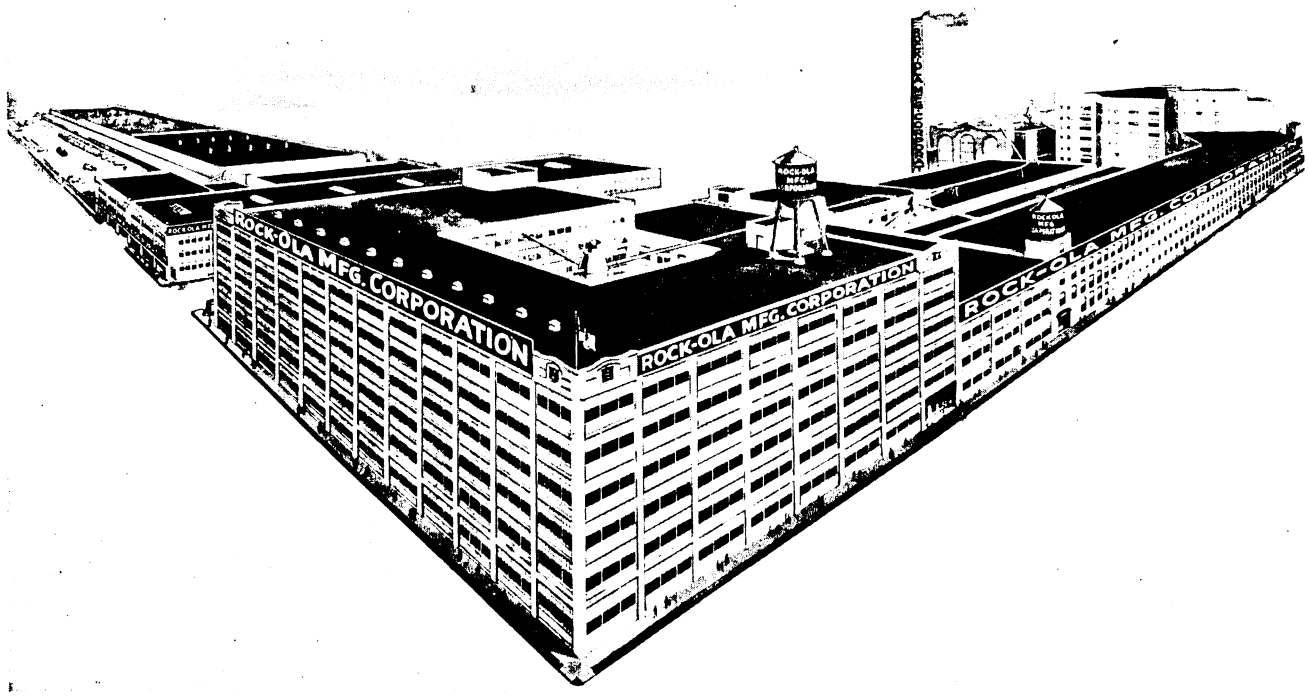

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