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SPECIFICATIONS:

GENERAL

DEPTH	26-1/2 in. (67.3 cm.)
WIDTH	41-1/2 in. (105.4 cm.)
HEIGHT	53 in. (134.6 cm.)
SHIPPING WEIGHT (DOMESTIC)	365 lbs. (166 Kg.)
NET WEIGHT	355 lbs. (151.96 Kg.)
POWER REQUIREMENTS	120VAC, 60 Hz., 480 watts 5 amps. 220/240VAC, 50 Hz., 438 watts 2.5 amp.

RECORD CHANGER MECHANISM

CAPACITY	100 records
RECORD SIZE	7 inches
SPEED	45 RPM 33 and 45 RPM (with optional Automix)

CREDIT AND PRICING SYSTEM

ACCUMULATOR TYPE CREDIT SYSTEM – ONE AND FIVE DOLLAR BILLS OPTIONAL	
COINS ACCEPTED	Nickels Dimes Quarters Half-Dollars Dollar Coins
TOTAL CREDIT ACCUMULATIONS	.99
PRICING	See Pricing, Page 8

SOUND SYSTEM

CARTRIDGE

TYPE	Shure Dynetic Variable Reluctance
FREQUENCY RESPONSE	20 to 20,000 Hz.
CHANNEL SEPARATION	25 db @ 1,000 Hz.
NOMINAL COMPLIANCE	.20 x 10 ⁻⁶ cm/dyne
TRACKING FORCE	.3-4 grams
OUTPUT	7 mv.
STYLUS	1 mil. diamond

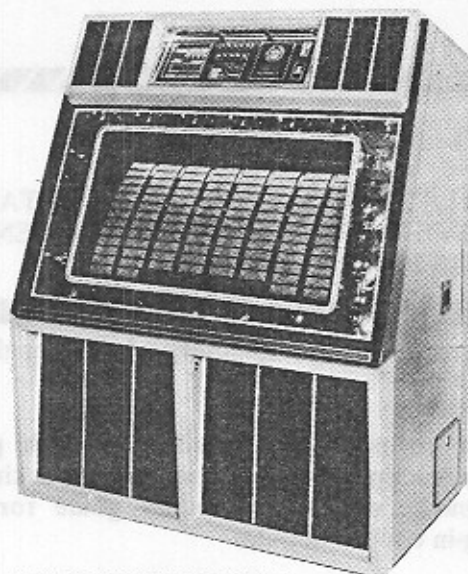
POWER AMPLIFIER

125 watt Stereo	
FTC Rating, 4 Ohm Loads @ 1% THD	144 watts RMS
FTC Rating, 70V Lines @ 1% THD	126 watts RMS

PREAMPLIFIER

AVC CONTROL RANGE	40 db
TREBLE CONTROL	12 db/octave 10,000 Hz. full 6,000 Hz. moderate 3,000 Hz. low
BASS CONTROL	Compensates for bass loss at low volume levels 12 db per octave.

R-86 PHONOGRAPH



SELECTION SYSTEM

CAPACITY 200 Selections

TRANSFORMER PACKAGE

POWER LEVELS FOR PHONOGRAPH SPEAKERS 1, 4, 16, 28, 64 watts
 PROVIDES 70-VOLT LINE FOR EXTENSION SPEAKERS

SPEAKER SYSTEM

	LOW FREQUENCY	MID/HIGH FREQUENCY
SPEAKER DIAMETER	10 inches	6 inches
VOICE COIL DIAMETER	1-1/2 inches	1 inch
IMPEDANCE	30 ohms	8,5 ohms
CROSSOVER	400 Hz.	
SYSTEM FREQUENCY RESPONSE	50 to 12,000 Hz.	

LIGHTING

FRONT DOOR (Upper)	Fluorescent, 30 watts, 36 inch (T-8), 7-00601-12
CONTROL PANEL	Fluorescent 13W, 21 inch, Part No. 7-00601-15
CREDIT WINDOW	Light Emitting Diode 7-00353-03
DISCO FLASHING LIGHTS	T-1 3/4 Sub miniature 14V

FUSES AND CIRCUIT BREAKERS

MAIN POWER SUPPLY

120 VAC CIRCUIT (Transformer Primary Only)	2 Amp Circuit Breaker, 7-00733-15
120 VAC CIRCUIT	10 Amp Circuit Breaker, 7-00734-25
+28 VDC CIRCUIT	5 Amp Slo-Blo Fuse 7-00721-06
+8 VDC CIRCUIT	5 Amp Slo-Blo Fuse 7-00721-06

AMPLIFIER

Stereo - 125 W	
120 VAC CIRCUIT	3 Amp Circuit Breaker, 7-00733-17
DC CIRCUIT	5 Amp Fuse, Type MTH-5 (4) 7-00720-10

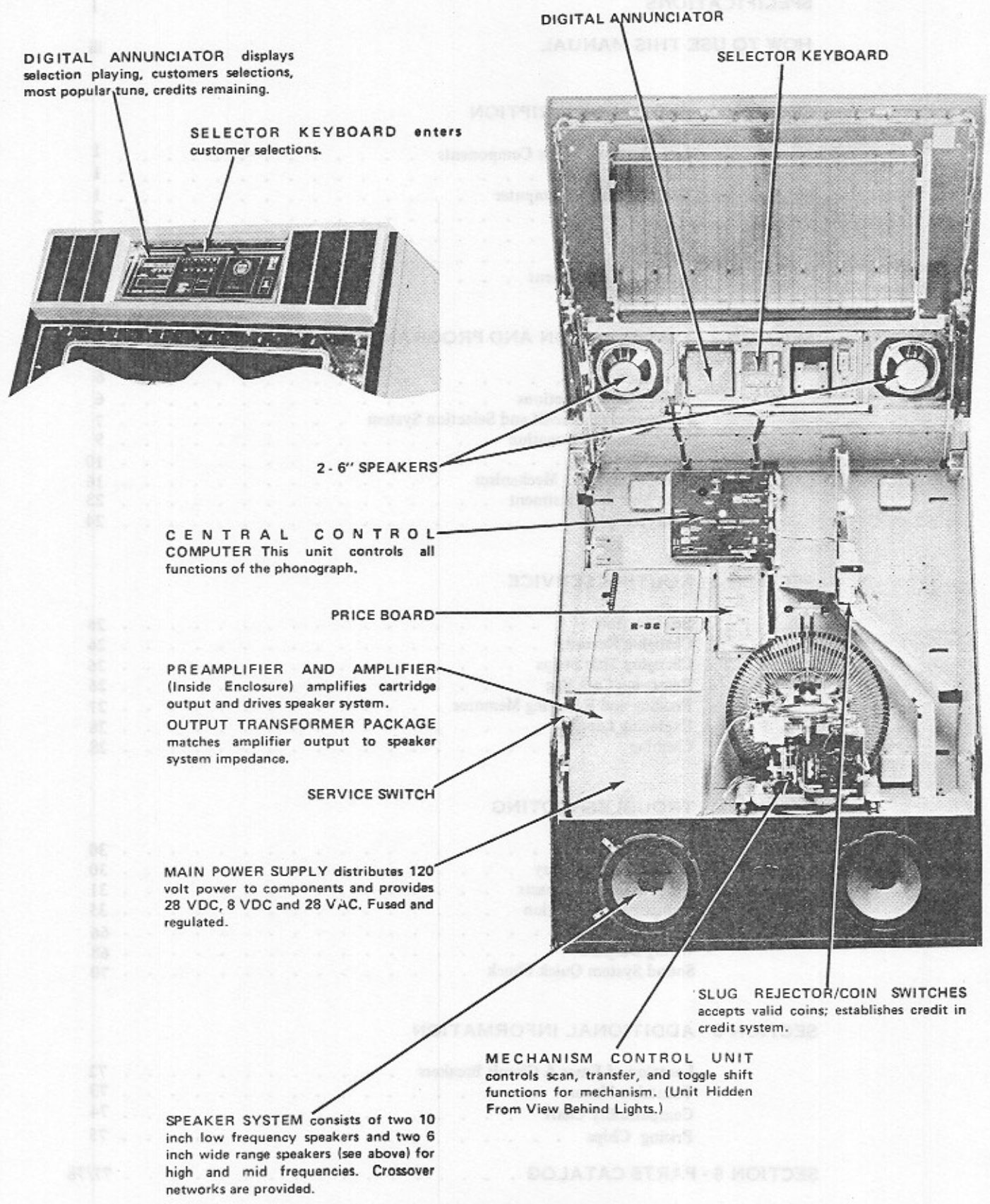


FIGURE 1. PHONOGRAPH MAJOR COMPONENTS

MEMOREC

The Memorec function has been expanded and incorporated into the Central Control Computer. Memorec has the following features:

- Records the number of times each record side is selected. Selections made by use of the "Most Popular Record" key do not increase the count of the individual record side but are counted separately and also included in the total.
- Records the total number of selections made. Selections made by "Playmaker" are not included in the total or in the individual side counts.
- Records the total amount of money deposited in the phonograph including any Wallethes which are connected to it.

SOUND SYSTEM PRINCIPLES OF OPERATION

The phonograph sound system translates stylus vibration into electrical voltage, amplifies the voltage and the speaker converts it into sound. The sound system consists of a stylus and cartridge, a stereo preamplifier and amplifier unit, a speaker system, a volume control and an output transformer package. Identification and location of each major component is shown in Figure 1. The purpose and description of each major component is explained in the following paragraphs.

STYLUS AND CARTRIDGE. The stylus and cartridge convert mechanical movement into equivalent electrical voltage. The unit is mounted on the record changer tone arm. This output voltage is transmitted through shielded cable to the preamplifier.

AMPLIFIER. The amplifier unit amplifies phonograph cartridge output and drives the speaker system. The latest concepts in silicon transistor circuitry are designed into the 125 watt stereo systems. It delivers a full 62.5 watts rms power per channel. Its wide frequency response and low distortion assure good record reproduction. The unit incorporates automatic volume control (AVC).

The output stage is coupled to the speakers. Treble range and bass boost controls are provided on the preamplifier to compensate for differences in room acoustics. A mute relay silences the amplifier while a record is being transferred to or from the turntable. Circuitry is completely solid state for durability and long service life.

Protection is included for voltage transients, excessive heat and accidental shorting of speaker leads.

PREAMPLIFIER. The preamplifier amplifies the phonograph cartridge output to drive the power amplifier. The components for both the right and left audio channels are contained in a single plug-in circuit board mounted under the amplifier chassis.

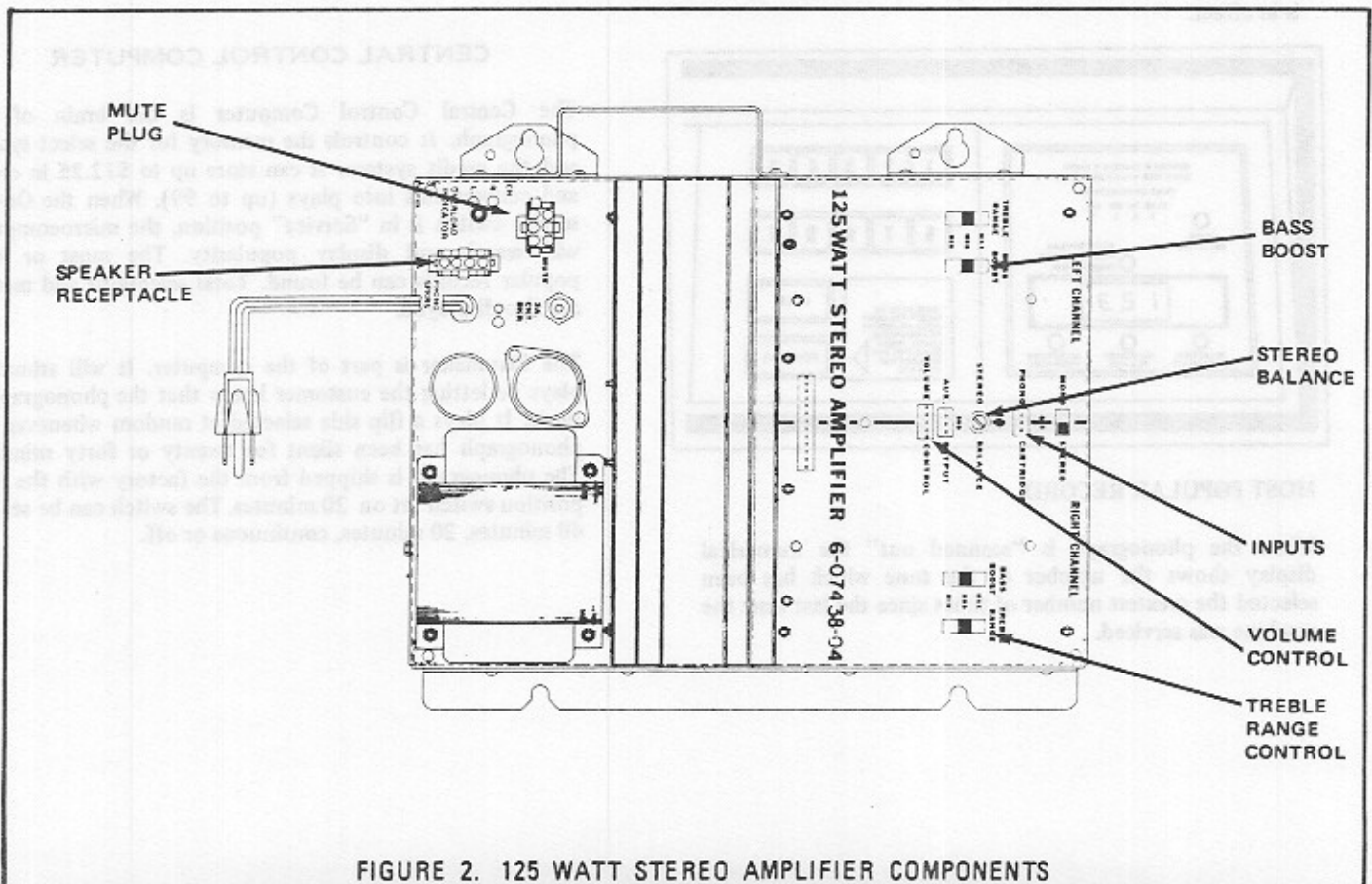


FIGURE 2. 125 WATT STEREO AMPLIFIER COMPONENTS

OUTPUT TRANSFORMER PACKAGE (see Figure 3). The transformer package enables the amplifier to operate 70 volt lines for extension speakers. The package also provides terminal strips for obtaining several different power levels for both phonograph and extension speakers. The unit consists of two output transformers and associated parts mounted on a single chassis. The chassis is mounted in the enclosed compartment.

The output transformer secondary connections are available at three terminal strips. Phonograph speaker power is selected by connecting the violet and pink leads according to Table 3. Extension speakers can be connected as directed in Table 5 of speaker connection chart.

SPEAKER SYSTEM. The speaker system consists of two 10 inch low frequency speakers, two 6 inch wide range speakers.

The 10 inch, heavy duty speakers are mounted in the cabinet. The 6 inch speakers are mounted in the lid.

TWO WIRE VOLUME CONTROL. A Rowe exclusive, the two wire volume control simplifies large, complex installations and leaves no extra dedicated preamplifier circuitry.

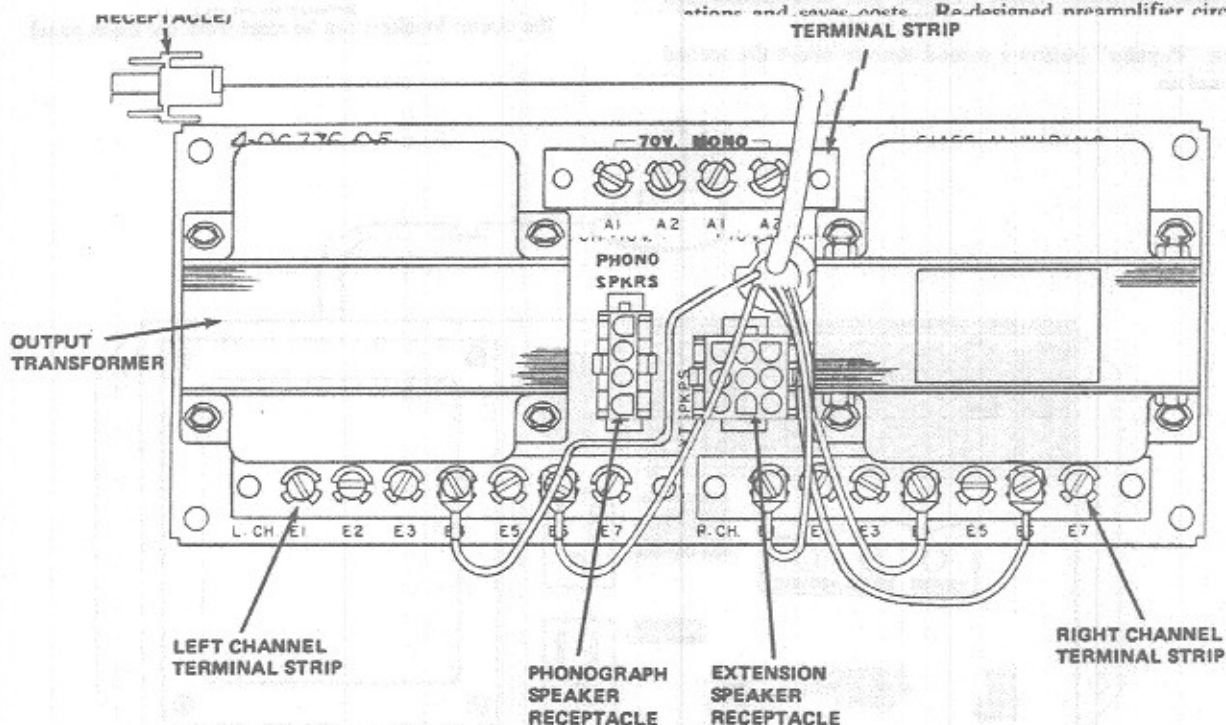


FIGURE 3. OUTPUT TRANSFORMER PACKAGE COMPONENTS

SELECTION SYSTEM

The selection keyboard has ten numbered areas plus two which are marked "Reset" and "Most Popular Records".

To make a selection deposit money to establish credit. The numbered display will show the number of selections available. Press the numbered buttons on the keyboard in order corresponding to the desired selection number as shown on the title rack. As the digits of the selection number are pressed, they will appear on the numerical display. Only legal selection numbers will be accepted. For example if any number other than a 1 or 2 is pressed as a first digit, it will be ignored. Nothing will happen. It is not necessary to press "Reset". Merely press the correct first digit.

If you change your mind after beginning to make a selection pressing "Reset" will erase the partial selection number and also allow you to enter a new number. "Reset" is not effective after the third digit has been entered.

Press "Popular" button to select the tune which has been selected the greatest number of times since this phonograph was serviced last.

Press "Popular" button a second time to select the second most popular tune. This process may continue until credit is used up.

NOTE

If selections are made manually before "Most Popular Record" is used, no selections are repeated even if the manual selections are most popular. Thus the customer is not "cheated".

The most popular selection sequence is reset when credit is exhausted.

POWER SUPPLY

The main power supply distributes unregulated +28 VDC and 28 VAC, and regulated +8 VDC to the phonograph components. Power is controlled by a rocker switch located on the back of the chassis. 120 volt AC receptacles are provided for the amplifier, lights, accessories and service equipment. The AC receptacles and transformer primary are protected by 10 amp circuit breaker CB2 while circuit breaker CB1 protects the transformer primary only. Both the circuit breakers can be reset from the front panel.

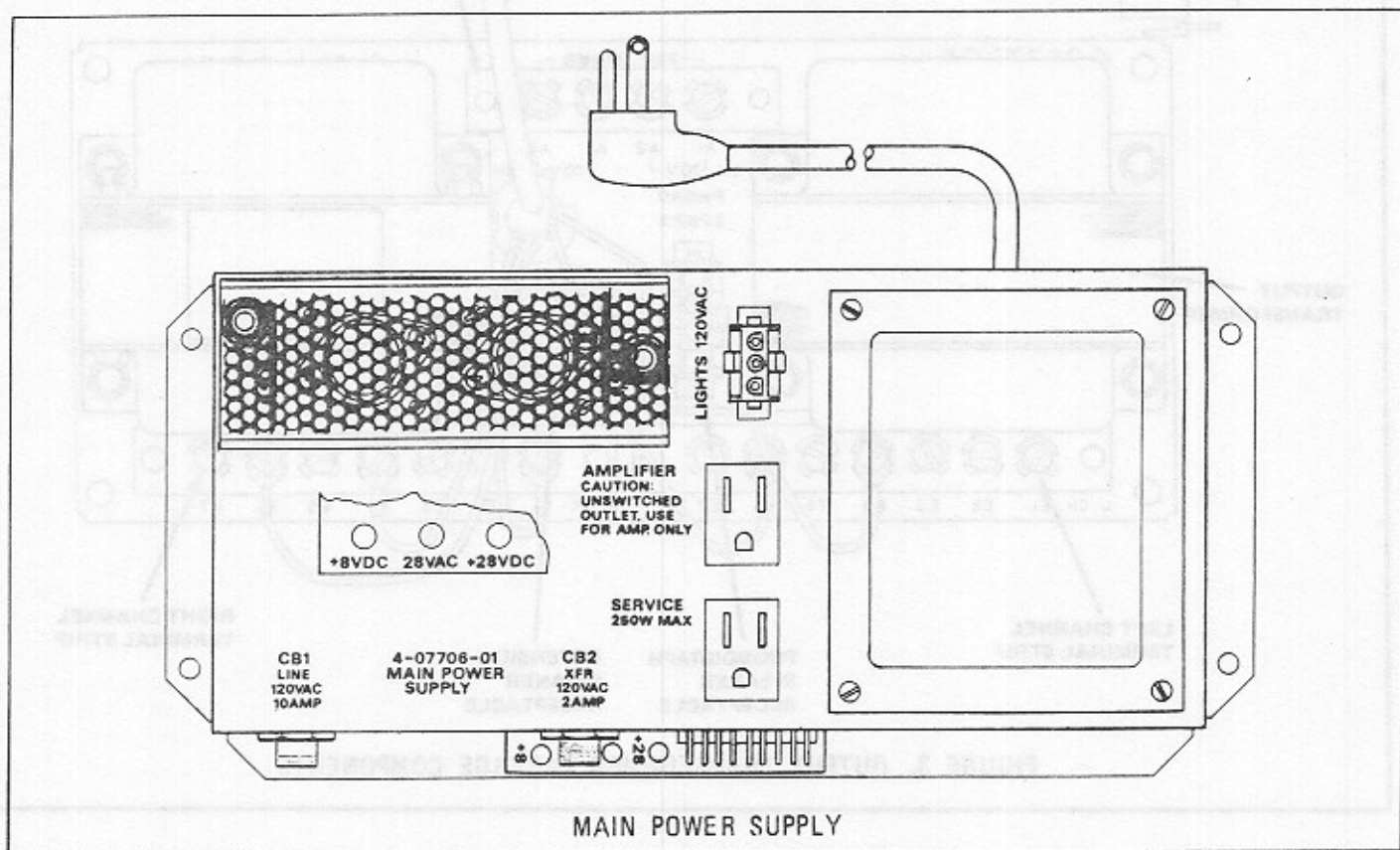


TABLE 1. ACCESSORY EQUIPMENT

PART NO.	FUNCTION	DESCRIPTION
2-66971-10	Dollar Bill Acceptor Kit (Includes Bill Stacker)	Accepts valid one dollar bills in U.S. currency and establishes one dollar's worth of credit in the phono
2-66971-12	Five Dollar Bill Acceptor Kit (Includes Bill Stacker)	Accepts valid one & five dollar bills.
2-66681-06 2-66681-09	Automix Kit (60 Hz.) Automix Kit (50 Hz.)	Enables phonograph to play 33 and 45 RPM records interchangeably.
2-66946-01	Phono Paging System Amp Accessory Kit (Includes 2-66947-01)	New improved Paging System, not affected by A.V.C. All Plug-in unit, complete with microphone and 50 feet of microphone cable. Allows use of phono sound system for paging.
2-66947-01	Amplifier Accessory Kit	Provides access to auxiliary inputs and outputs of the preamplifier. Inputs will accept signals from most background music sources such as tape players and AM or FM radios. Outputs available to drive slave amplifiers before or after volume control.
6-09001-01	WRE Walleto Wallbox (4 Coin)	Remote control unit for solid state phonograph. Takes nickels, dimes, quarters and dollar coins.
2-66995-02	Security Bar Kit	Heavy steel bar locks in place over cash box door.
2-66989-01	Wallbox Adaptor Harness Kit (WRE)	For making internal connections in phonograph to allow installation of WRE Wallbox.
4-06891-01	Auxiliary Power Supply	Permits operation with WRA, WRB, WRC, WRD & WRE Wallboxes.
0-05081-00 Belden No. 8447 Columbia No. 4082	7 Conductor Cable	For connecting WRE to phonograph. (Not supplied by Rowe)
4-05678-01	Secondary Power Supply	Powers each additional six or more Rowe WRA or WRC Walleto wallboxes.
2-66965-02	Wallbox Interface Kit	Permits operation with WRA, WRC and Seeburg wallboxes.
2-66965-01	Wallbox Interface Kit	Permits operation with WRD Wallbox.
0-05076-00 Belden No. 8449 Columbia No. 4084	9 Conductor Cable	For connecting WRD Walleto to phonograph. (Not supplied by Rowe)
6-02187-01	Extension Speaker (Model EX201)	12 watt, compact "bookshelf" speaker contains one 8 inch full range speaker.
6-07447-01	Extension Speaker (Model EX 350)	32 watt, two channel system includes 3-1/2 inch tweeter and 10 inch bass speaker.
2-67003-01	125 Watt Amplifier Harness Kit	Three Adapter Cables to interchange combo line plugs with Universal plugs.
3-06322-01	Remote Volume & Cancel Control	Remote stereo volume control and cancel button. Does not include cable.
6-65047-05	Service Kit	Includes Central Computer, Mech Control, Power Supply Board and Fuses.
6-08980-04	Remote Volume Power Switch, & Cancel Control	Volume Control incorporates on-off switch. 115V only.
3-06322-09	Dual Remote Volume Control	Controls volume of each channel separately. Does not include cable.
2-08199-07	Remote Volume and Cancel Control Cable	For connecting remote volume control to phonograph 3-conductor cable, 50 ft. length.
2-08199-08	Remote Volume and Cancel Control Cable	For connecting remote volume control to phonograph 4-conductor cable, 50 ft. length.
2-67009-01	InterROWEgator	Portable Print Out Device to interrogate Juke Box Data.

SECTION 2- INSTALLATION AND PROGRAMMING

INTRODUCTION

This section contains instructions for unpacking the phonograph and installing it on location. The phonograph is shipped with all major components in place. Save all tiedown hardware should it become necessary to move the phonograph to another location.

ACCESSORIES BAG ASSEMBLY

Included is a plastic bag containing slip-on terminals connecting accessories, an assortment of spare fuses and spare contacts for connectors. It is recommended that you leave the Service Manual and the accessory bag assembly in the phonograph cabinet in case they are needed.

WARRANTY REGISTRATION CARD

A postage-paid warranty registration card is included with the phonograph. Use this card to register the phonograph for in-warranty repairs.

UNPACKING INSTRUCTIONS

The phonograph is shipped in one carton, ready for installation. The shipping carton should be opened carefully to prevent the phonograph from being damaged or scratched. Inspect the exterior and interior of the cabinet for evidence of damage.

In case of damage, please notify the delivering carrier at once to call and examine the phonograph regardless of the external condition of the boxes. Under U.S. regulations, damage claims must be collected by the consignee. Do not return shipping-damaged merchandise until after your claim has been established. Once your claim is established, damaged merchandise may be returned to the Rowe distributor for repair. The invoice for repair charges may then be collected from the carrier. Do not destroy packing material or boxes until the carrier's agent has examined them. Unpack the phonograph as follows:

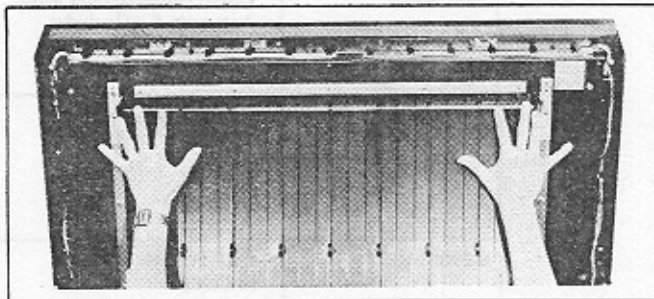
REMOVE PACKING CASE

1. Carefully open packing case. Do not use shipping hooks or other sharp instruments.
2. Remove plastic bag from phonograph cabinet.

OPEN PHONOGRAPH CABINET

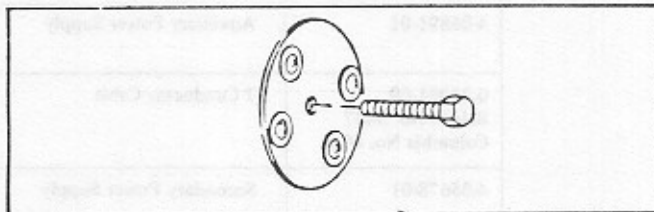
1. Locate red key bag and open lid.
2. Remove shipping brackets, release latches and open doors.

3. Remove tape from title panel. Release title panel by pressing down on spring catch as shown. Swing panel down as shown.

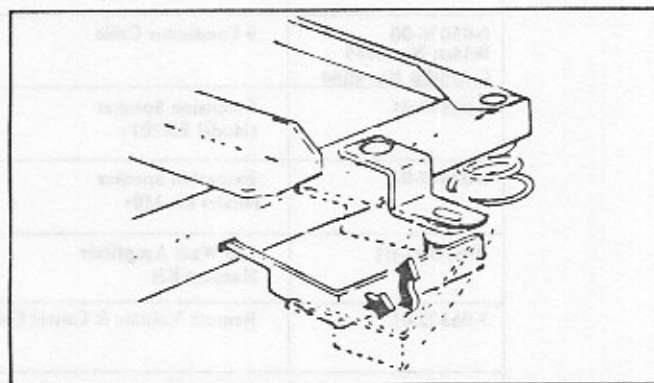


REMOVE RECORD CHANGER MECHANISM TIE-DOWN BOLTS

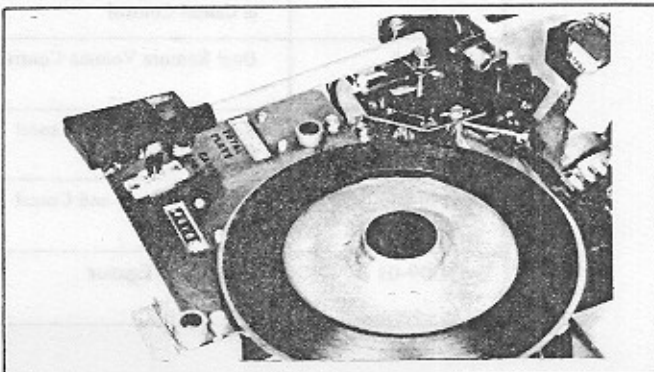
1. Remove shipping bolt from rear of cabinet as shown.



2. Rotate record changer tie-down brackets away from mechanism support frame as shown. Lift up and remove.



3. Remove rubber bands and shipping block from tone arm.



4. Remove turntable hold-down clip. Replace screw.
5. Remove stylus cover from cartridge and stylus.
6. Save shipping hardware for future use.
7. Remove adhesive tape.
8. Check that all plugs are firmly seated in their respective receptacles.

LEVEL PHONOGRAPH

Level the phonograph cabinet left-to-right and front-to-back to ensure proper slug rejector operation. This is done by placing spacers under the caster wheels.

PROGRAMMING CREDIT AND SELECTION SYSTEM

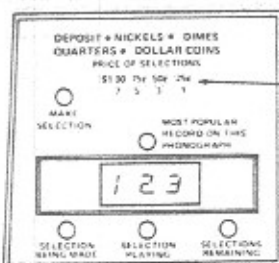
PRICING

A ROWE exclusive simplified pricing procedure is incorporated in the R-86. All price programming is done on the Pricing Board (6-08878-04). The phonograph is shipped from the factory with prices set at:

7 plays for \$1.00
5 plays for .75
3 plays for .50
1 play for .25

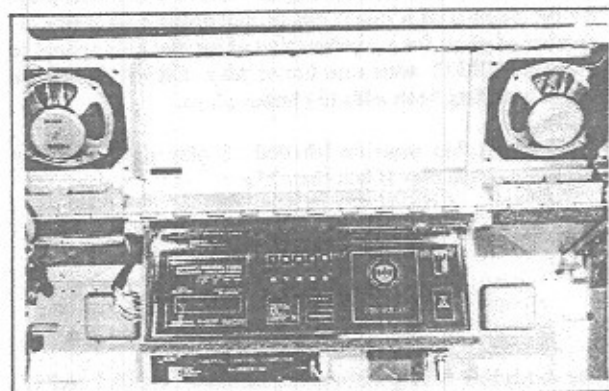
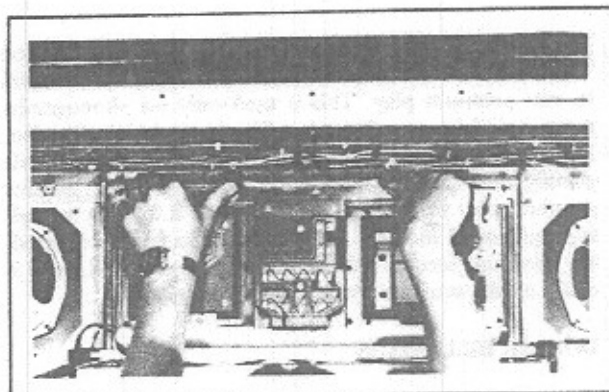
\$1.00 4	75c 3	50c 2	25c 1	5S 2	10S 5	2x5S 5	A
\$1.00 5	75c 3	50c 2	25c 1	3x1S 1	5S 2	10S 5	A
\$1.00 6	75c 3	50c 2	25c 1	1KR 1	5KR 7		DK
\$1.00 6	75c 4	50c 2	25c 1	10P 1	50P 6		GB
\$1.00 7	75c 4	50c 2	25c 1	1MK 1	2MK 2		SF
\$1.00 7	75c 4	50c 3	25c 1	1MK 1	2x1MK 2	5MK 5	SF
\$1.00 9	75c 6	50c 3	25c 1	1FR 1	5FR 6		F
\$1.00 8	75c 6	50c 4	25c 2	25Ct 1	1G 5		NL
\$1.00 9	75c 6	50c 4	25c 2	25Ct 1	1G 6	2G 14	NL
		25c		1KR 1	2x1KR 3	5KR 8	N S
				1KR 2	5KR 10		N S
				1FR 7	2FR 7		CH

UNIVERSAL PRICE CARD
(PEEL OFF)



APPLY STRIP WITH
NEW PRICING HERE

To change pricing open the top door, push two selector catches upward and allow the selector area to pivot down as shown below. This will give easier viewing to the digital display when checking pricing. Remove plastic cover from Pricing Board. A complete set of price chips is shipped with each phonograph. Select the chips you wish to use and plug them in. Select the matching prices from the universal price card sheet and attach to the price card.



NOTE

We suggest that unused price chips be kept in the phono in the bag they came in for safekeeping. If chips are lost replacements may be ordered from your Rowe distributor (part no. 2-18507-01 thru -16).

The Pricing Board has spaces for six chips. One labelled "Premium Ratio" sets the number of standard plays equal to one premium play. This is used only on phonographs programmed for premium play. The Automix Kit (Part No. 2-66681-06) includes a special price card for such phonographs. If the phonograph is not programmed for premium play this chip may be omitted. If the phonograph is programmed for premium play and this chip is omitted, the premium records will be played free provided there is credit on the machine (Premium = zero times).

DOLLAR BILL BONUS

Diodes CR331 and CR332 may be used to add bonus plays for the deposit of a dollar bill or one dollar coin above the number of plays for a combination of smaller coins equal to a dollar. CR332 adds one bonus play, CR331 (2) bonus plays. Installing both adds (3) bonus plays.

The second chip position labelled "1 play price" sets the price of a single play if less than 25¢.

- Use chip #1 for 5¢.
- Use chip #2 for 10¢.
- Use chip #3 for 15¢.
- Use chip #4 for 20¢.

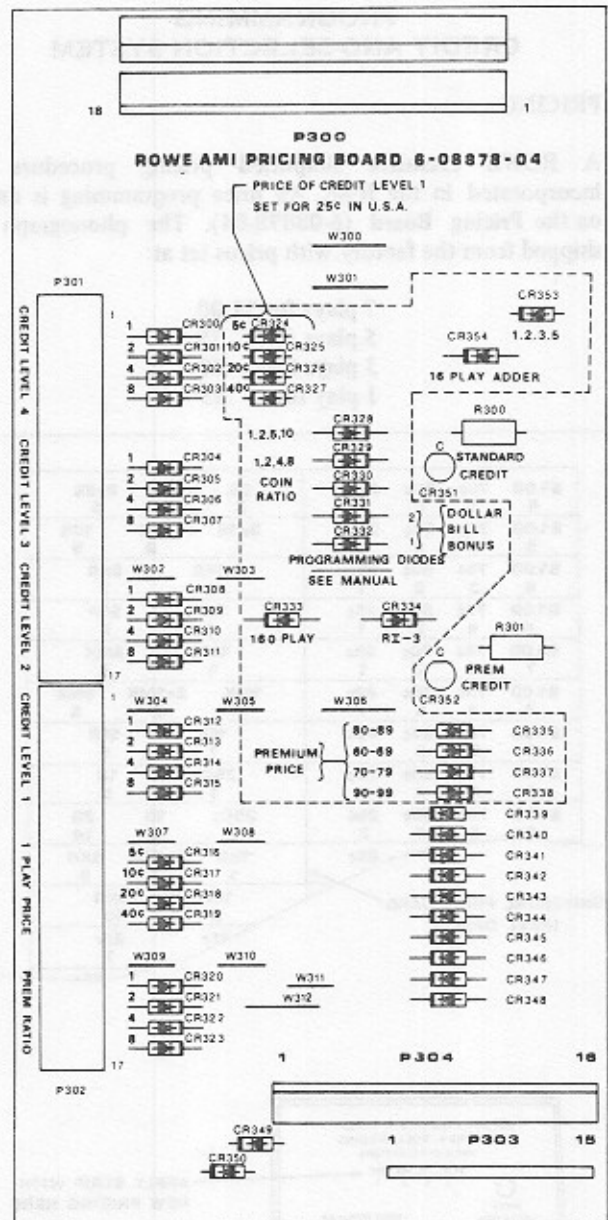
The remaining four positions are labelled "Credit Level 1", "Credit Level 2", "Credit Level 3", and "Credit Level 4". In the U.S.A. these levels are factory set at 25¢, 50¢, 75¢ and \$1.00. Select the price chips with numbers of plays desired at each credit level and plug them in.

NOTE

Chips may be changed by cutting runners. See page 75.

If any position is programmed for zero (or if a chip is omitted) that level will be ignored. Reassemble the Pricing Board plastic cover. Test to make certain that the price program works as desired by dropping coins or by using the manual credit button (each push = 25¢). Watch the digital display near the selector keyboard to see how many plays you get at each credit level.

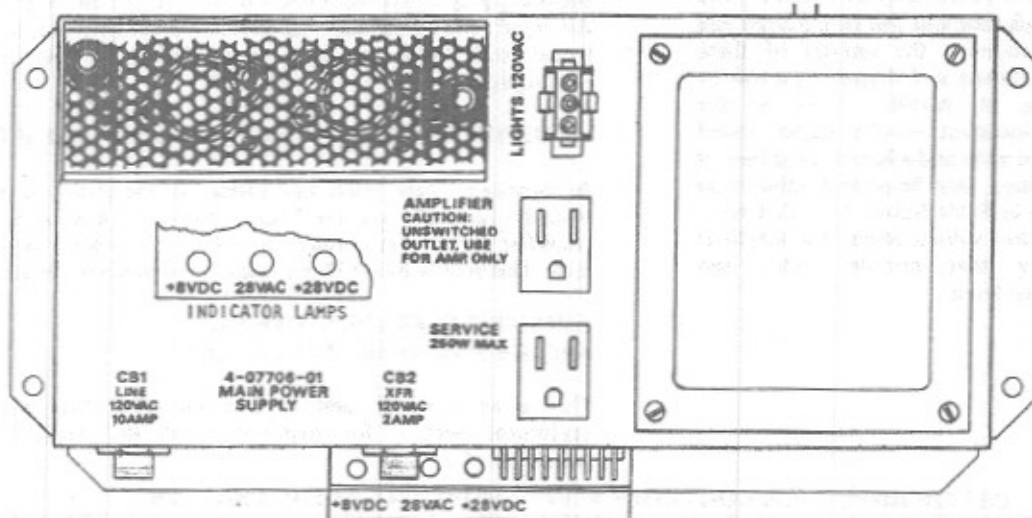
The "Make Selection" lamp will light when there is enough credit to make one or more selections. On Phonos which have the Automix Kit installed, the "Make Premium Selection" lamp will light when there is enough credit to make one or more premium selections. A Premium selection will reduce the "Selections Remaining" by an amount equal to the "Premium Ratio".



OPERATIONAL INFORMATION

STATUS LAMPS

Red indicator lamps are connected to various strategic points in the phonograph circuit to indicate status of power and signal circuits.



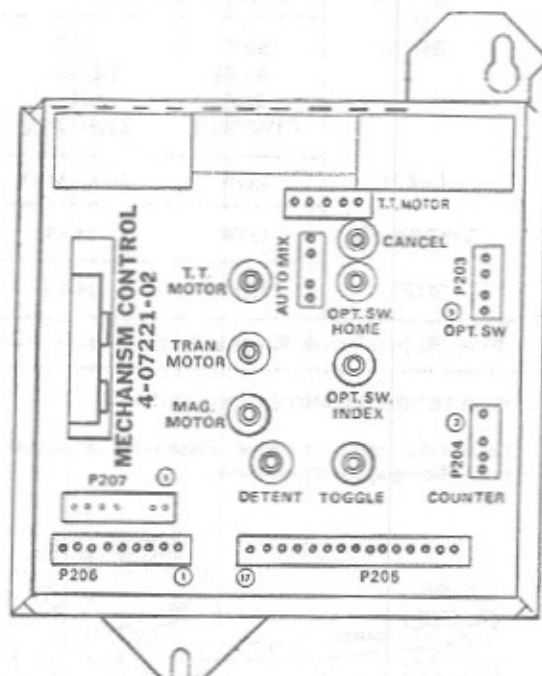
Power Supply

+ 8 Volts DC
+ 28 Volts DC
28 Volts AC

Shows presence of respective voltage and implies that there is no short on the lines.

Mechanism Control

- | | |
|----------------|---|
| T.T. Motor | Lights when Turn-Table motor command is present. Motor should be running. |
| Tran. Motor | Lights when Transfer command is present. Transfer motor should be running. |
| Mag. Motor | Lights when Magazine Motor command is present - Motor should be running. |
| Detent | Lights when Detent command is present. Detent coil should be actuated. Detent disengaged. |
| Toggle | Lights when Toggle Command is present. Toggle coils should be actuated. Both toggle pins moved to left. |
| Opt. Sw. Index | Lights when the Index section of the optical switch sees the tooth space of the magazine drive gear. Flickers when the magazine rotates. |
| Opt. Sw. Home | Lights when the Home section of the optical switch sees the hole in the magazine drive gear. Flashes when the magazine record position 99 passes the Transfer position. |
| Cancel | Lights when the cancel signal line is shorted to ground. |



SOUND SYSTEM

ACOUSTICAL COMPENSATION (BASS AND TREBLE CONTROLS)

The pre-amplifier contains treble range and bass boost controls to compensate for room acoustics in various locations. These controls are on the amplifier chassis. The sound level at which the phonograph will be operated and the room furnishings determine the settings of these controls. A room with carpeting and drapery is a soft or highly-absorbent location. A crowded room is also highly-absorbent. These locations require higher sound levels. A room with paneled walls and a bare or tiled floor is a hard non-absorbent location. Bass boost and treble range control settings are listed in Table below. Note that more bass boost is required at low volume levels. The amplifier incorporates circuitry that provides extra bass compensation at low volume levels.

STEREO BALANCE

The stereo balance control is provided to equalize left and right channel amplifier output. This control is factory-adjusted for best performance. If adjustment is required, play a monaural selection and adjust the control for equal sound from each top speaker. When balanced, the sound will seem to come from the center of the phonograph.

AMPLIFIER OPERATION WITH HIGH LINE VOLTAGE

In locations where input line voltage to the phonograph exceeds 125 volts, use the black/red primary lead of the amplifier power transformer instead of the black/yellow lead. This results in a 10% reduction in secondary voltage.

AMPLIFIER OPERATION WITH FM, BACKGROUND MUSIC, PAGING, QUAD

This is an optional, add on accessory. See Accessory equipment section for explanation of the Amplifier Accessory Kit.

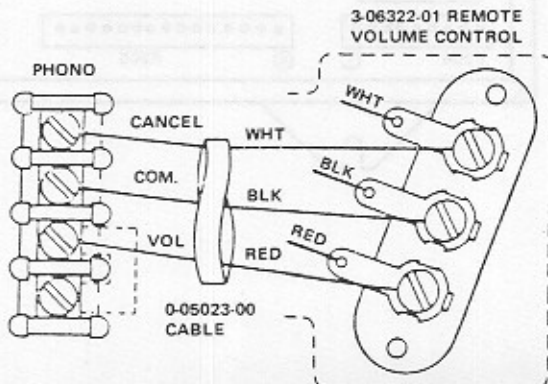
TABLE 2 USE OF AMPLIFIER CONTROLS FOR ACOUSTICAL COMPENSATION

SOUND LEVEL IN ROOM	ROOM ACOUSTICS					
	DEAD OR SOFT HIGHLY ABSORBENT		AVERAGE - MODERATELY ABSORBENT		LIVE OR HARD NON-ABSORBENT	
	SET BASS BOOST CONTROL	SET TREBLE RANGE CONTROL	SET BASS BOOST CONTROL	SET TREBLE RANGE CONTROL	SET BASS BOOST CONTROL	SET TREBLE RANGE CONTROL
LOUD	LOW	MOD/MAX	LOW	MOD/MAX	MOD	LIM
MODERATE	LOW	MAX	MOD	MOD/MAX	MAX	LIM
SOFT	MOD	MAX	MAX	MAX	MAX	MOD

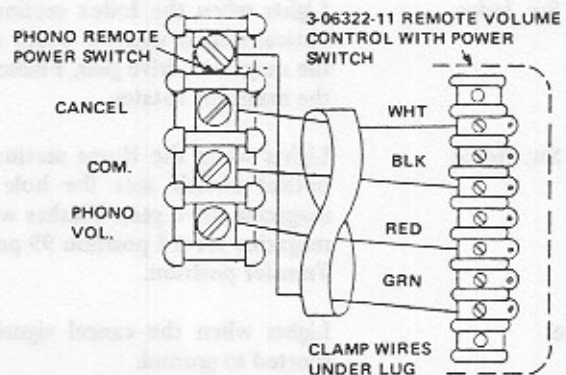
Note: Reduce Treble Range setting as required by record noise (scratch) conditions.

REMOTE VOLUME AND CANCEL CONTROL

Connect the 3-06322-01 remote volume and cancel control to the Phonograph as shown below.



REMOTE VOLUME AND CANCEL CONTROL WITH POWER SWITCH



EXTENSION SPEAKER OPERATION

Care must be exercised when adding extension speakers to the phonograph to avoid poor sound. Three requirements must be met:

1. The speakers must be wired so that the power consumed by the phonograph speakers and the extension speakers, including WalleTTes, does not exceed the power rating of the amplifier.
2. The extension speakers should produce the desired sound level relative to the sound level of the phonograph speaker system. This is done by adjusting the amount of power consumed by each speaker until the desired balance is reached.
3. All speakers must be connected with the correct polarity. This means that all speaker cones in the system will move in the same direction at the same time.

Several charts have been included to assist in the connection of extension speakers. Figure 4 is a chart of the entire sound system. NOTE that the left channel output of the amplifier is reversed in phase (or instantaneous polarity) with respect to the right channel. This phase reversal makes monaural extension of sound possible in a stereo system. This phase reversal is accomplished in the preamplifier. Because of this phase reversal, speaker connections to the left channel must be reversed when compared with connections to the right channel except for the 70 volt speaker connections which are in phase. (The left channel is reversed within the output transformer assembly.)

Power to the phono speakers must be reduced as extension speakers are added so that the total speaker power does not exceed the power rating of the amplifier. Table 3 gives connections for different phono speaker power levels and corresponding power available for extension speakers. The phono speakers can be considered as two 8 ohm speakers—one for each channel.

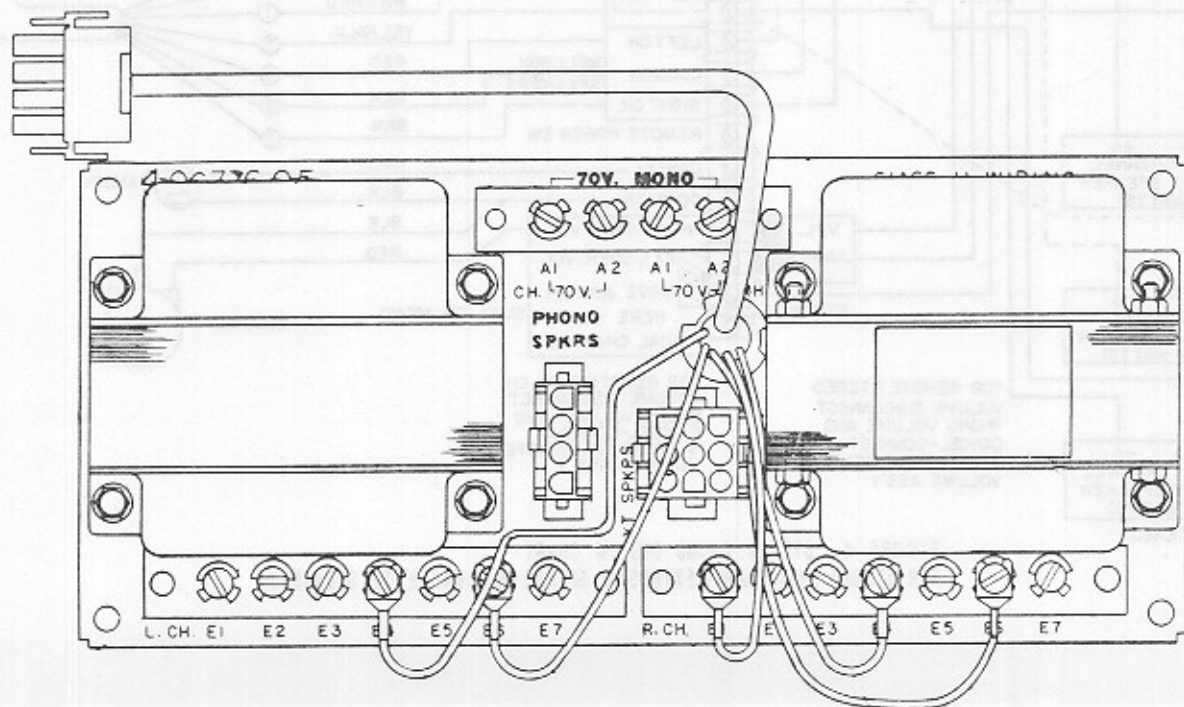
Table 5 and 6 are extension speaker connection charts for different power levels. Power levels are indicated for low impedance speakers as well as for 70 volt speakers. For 70 volt speakers, the power level is set at each speaker. Low impedance speakers, i.e. 8 ohm speakers, can be used where the connecting cable is under 100 feet. The loss in 100 feet of zipcord feeding one 8 ohm speaker is 15%. For two 8 ohm speakers it would be 30%. 4 ohm speakers should not be parallel on the same speaker line because of high line losses. Instead, a separate line from each 4 ohm speaker to the phonograph should be used. To avoid prohibitive cable losses on long speaker lines, 70 volt speakers must be used. These contain built in transformers that permit setting of the desired power level.

Do not connect a low impedance speaker for more power than it can handle. For example, a 5 watt, 8 ohm speaker should not be connected to the 12.5 watt tap.

In any speaker installation, the total power of the speaker load **MUST NOT EXCEED** the power rating of the amplifier. In the system in Figure 4, the power of the speakers as connected is: phono, 28 watts; 8 ohm speakers, 24 watts; 70 volt speakers, 72 watts; walleTte, 2.8 watts for a total of 126.8 watts. This is slightly over the 125 watt rating of the amplifier which is permissible as long as the speaker rating does not exceed the amplifier rating by more than 5%. In any installation, it is advantageous to adjust the speaker load to approximate the rating of the amplifier so that optimum bass boost will be attained at low volume.

NOTE

WalleTte speakers are treated as 45 ohm extension speakers in Table 5. For convenience, the left channel speaker in the wallbox has been reversed in polarity.



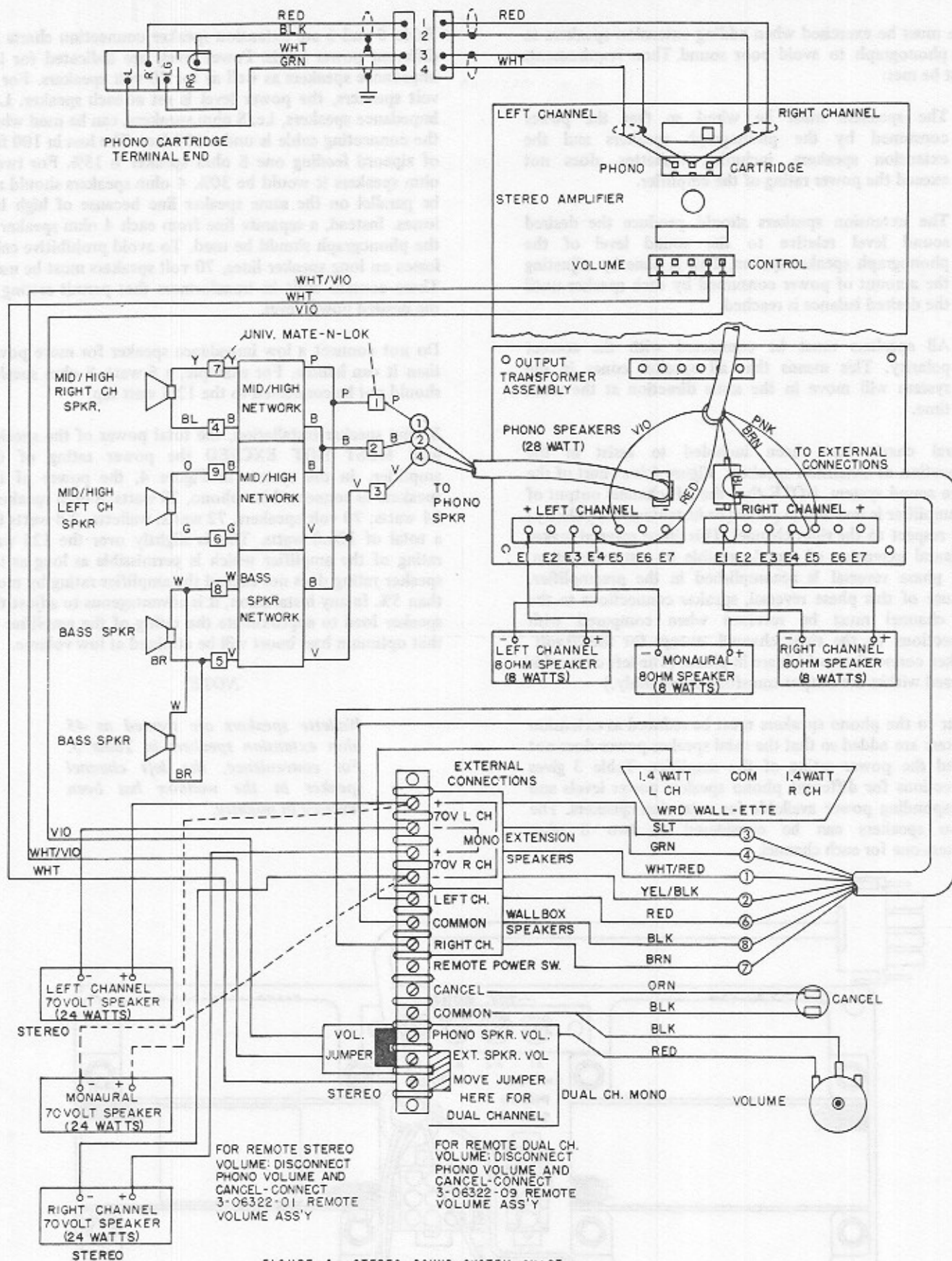


FIGURE 4 STEREO SOUND SYSTEM CHART
FOR STEREO PHONOGRAPH, EXTENSION SPEAKERS & WALLETT SPEAKERS

PHONOGRAPH SPEAKER POWER CONNECTION CHART

PHONO SPEAKER POWER LEVEL (TOTAL WATTS)	PHONO SPEAKERS		POWER FOR EXTENSION SPEAKERS	
	LEFT CHANNEL	RIGHT CHANNEL	WATTS PER CHANNEL	TOTAL WATTS BOTH CHANNELS
	VIOLET LEAD	PINK LEAD		
64	E6	E6	31	62
28	E5	E5	49	98
16	E4	E4	55	110
4	E3	E3	61	122
1	E2	E2	62	124
BLACK LEAD TO E1 (COMMON) FOR ALL ABOVE POWER LEVELS	<i>CAUTION: TOTAL POWER RATING OF LOAD MUST NOT EXCEED 65 WATTS PER CHANNEL OR 130 WATTS TOTAL FOR THE 125 WATT AMPLIFIER.</i>			

TABLE 3 PHONOGRAPH SPEAKER POWER

AMPLIFIER FULL POWER OUTPUT VOLTAGES
(PER CHANNEL)

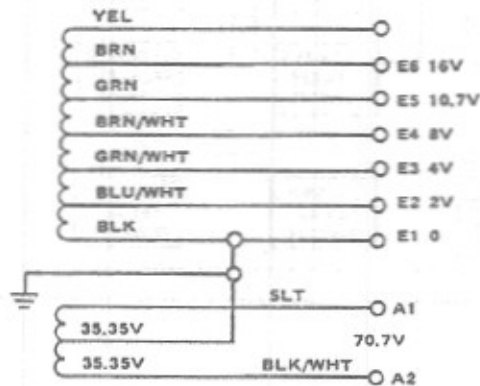


TABLE 4 AMPLIFIER OUTPUT

STEREO

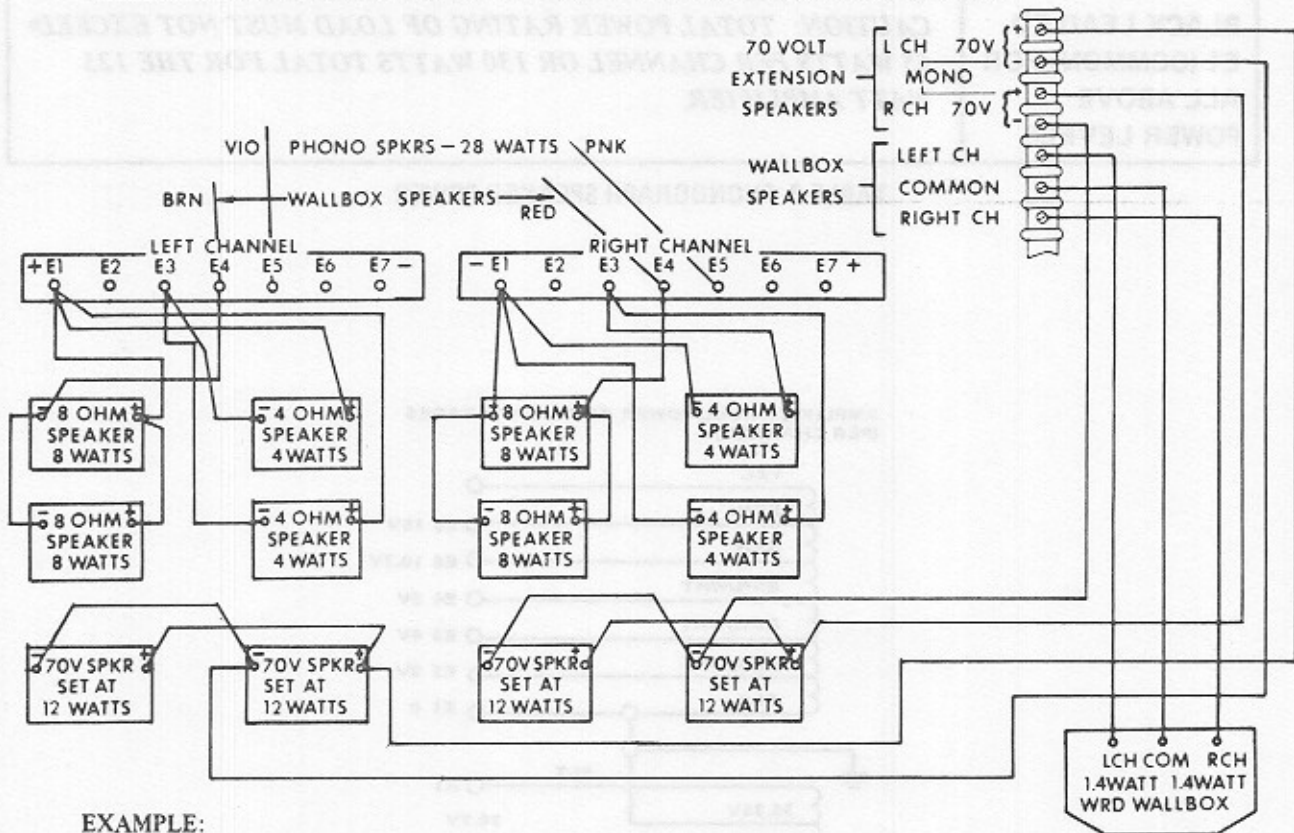
TABLE 5

EXTENSION SPEAKER CONNECTIONS

OUTPUT TERMINALS	WATTS PER SPEAKER			
	8 OHM SPEAKERS	4 OHM SPEAKERS	45 OHM WALLBOX	70.7V CONSTANT VOLTAGE SPEAKERS
E1 - E2	0.5	1	0.35	DETERMINED BY POWER SETTING AT EXTENSION SPKR
E4 - E5	0.9	1.75		
E1 - E3	2	4		
E2 - E4	4.5	9		
E1 - E4	8	16		
E1 - E5	14	28		
E2 - E6	24			
A1-A2				

SPEAKERS CONNECTED TO EITHER CHANNEL USED IN PAIRS FOR STEREO EXTENSION OF SOUND.

CAUTION: TOTAL POWER RATING OF LOAD MUST NOT EXCEED 65 WATTS PER CHANNEL OR 130 WATTS TOTAL FOR 125W AMPLIFIER.



EXAMPLE:

NOTE:

1. Left channel has reversed polarity for low impedance speakers. See page 17.
2. Each 4 OHM speaker is connected directly to terminal strip. See page 17.
3. Add Wattages:

$$\begin{aligned}
 \text{Left Channel: } & 8 + 8 + 4 + 4 + 12 + 12 + 1.4 = 49.4 \text{ Watts} \\
 \text{Right Channel: } & 8 + 8 + 4 + 4 + 12 + 12 + 1.4 = 49.4 \text{ Watts} \\
 \text{Phonograph (E5-E5)} & = 28 \text{ Watts} \\
 \text{TOTAL} & = 126.8 \text{ Watts}
 \end{aligned}$$

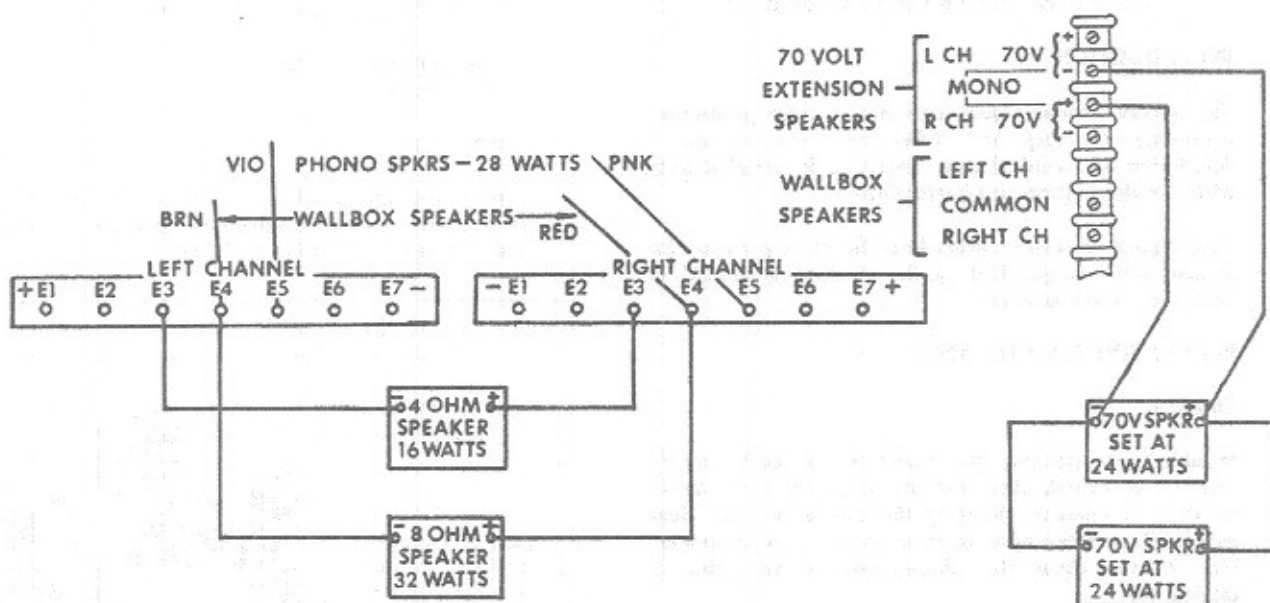
4. For speaker impedances not listed in Table 5, use Table 4 and use the impedance method ($\text{Watts} = E^2/R$).

MONAURAL

EXTENSION SPEAKER CONNECTIONS

OUTPUT TERMINALS	WATTS PER SPEAKER			WATTS PER CHANNEL		
	8 OHM SPEAKERS	4 OHM SPEAKER	70.7 VOLT CONSTANT VOLTAGE SPEAKERS	8 OHM SPEAKERS	4 OHM SPEAKERS	70.7 VOLT CONSTANT VOLTAGE SPEAKERS
E2-E2	2	4		1	2	
E3-E3	8	16		4	8	
E4-E4	32			16		
MONO 70VOLTS	POWER SETTING AT EXTENSION SPEAKER			1/2 OF POWER SETTING AT EXTENSION SPEAKER		

TABLE 6
SPEAKERS CONNECTED ACROSS BOTH CHANNELS - FOR MONAURAL EXTENSION OF SOUND.



EXAMPLE:

NOTES:

1. Add Wattages:
 Extension Speakers: $16 + 32 + 24 + 24 = 96$ Watts
 Phonograph (E5 - E5) $= 28$ Watts
TOTAL = 124 Watts

2. For speaker impedances not listed in Table 6, use Table 4 and use the impedance method ($\text{Watts} = E^2/R$).

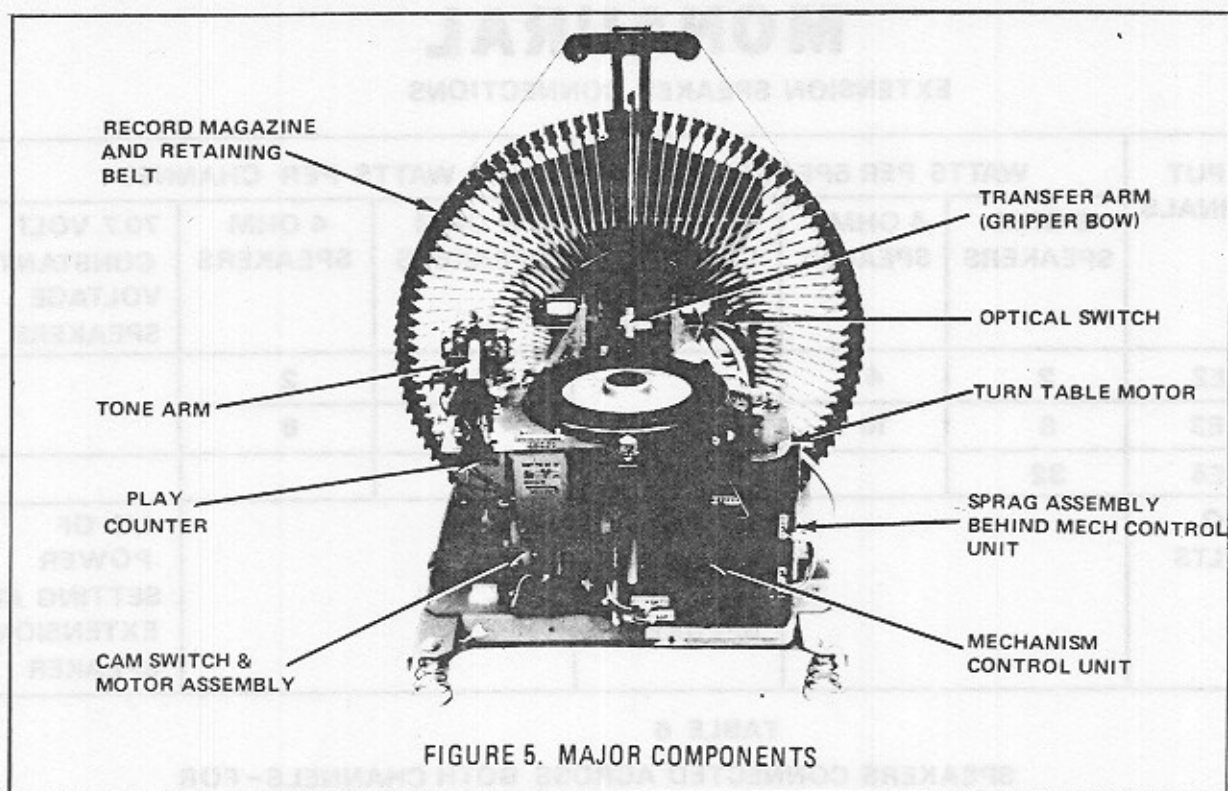


FIGURE 5. MAJOR COMPONENTS

RECORD CHANGER-MECHANISM

INTRODUCTION

This section contains preventive maintenance procedures, including cleaning and lubrication instructions. A description of record changer operation is included along with complete adjustment instructions.

Cleaning and lubrication procedures should be performed at regular intervals specified, while adjustments should be made only when necessary.

PREVENTIVE MAINTENANCE

Cleaning

In addition to cleaning the cabinet exterior each time the location is visited, clean the interior every three to six months, as required. Keeping the cabinet interior clean reduces dust, resulting in increased record and component life. Always clean the phonograph cabinet prior to lubrication.

1. Use a vacuum cleaner, if available to remove heavy dust deposits.

WARNING

USE SOLVENTS IN A WELL-VENTILATED AREA ONLY: DO NOT USE SOLVENTS ON ANY TYPE OF PLASTIC PARTS.

2. Use a clean, lint free cloth saturated in denatured alcohol to clean mechanical parts.
3. Clean electrical parts using a clean, dry cloth or camel's hair brush.

Five Year Lubrication

Your phonograph requires lubrication only after five years. To maintain smooth, trouble-free operation, lubricate the record changer mechanism as shown.

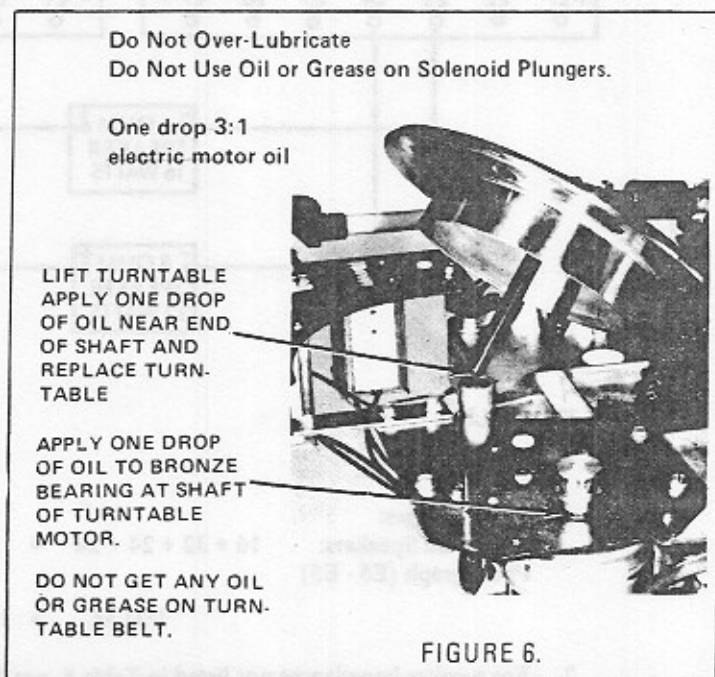


FIGURE 6.

RECORD CHANGER MECHANISM OPERATION

The following paragraphs contain a brief explanation of the operation of the record mechanism. The mechanism holds 100 records and plays selections on command from the selection system. Identification and location of each major component is shown in figure 5. The purpose and description of each component is explained in the following text.

Magazine, Belt and Transfer Arm. The record magazine stores 100 7-inch 33 or 45 rpm records in a circular cage. A seamless belt around the cage keeps records in position. The rollers permit the transfer arm to clear the belt when removing and returning records to the magazine and also maintain belt tension.

Play Counter. The play counter is mounted to the left of the turntable and accumulates the total number of plays on the phonograph.

Money Counter. The Money Counter is mounted to the left side of the turntable and it registers the total money deposited in the phonograph.

Optical Switch. The Optical Switch is in front of the record magazine and straddles the magazine gear. There are two sensors in the switch. One sensor indicates when record "99" is in gripping position. This sensor is called the home sensor. The other sensor counts the number of gear teeth that pass by during scan to tell which record is in gripping position. This sensor is called the index sensor.

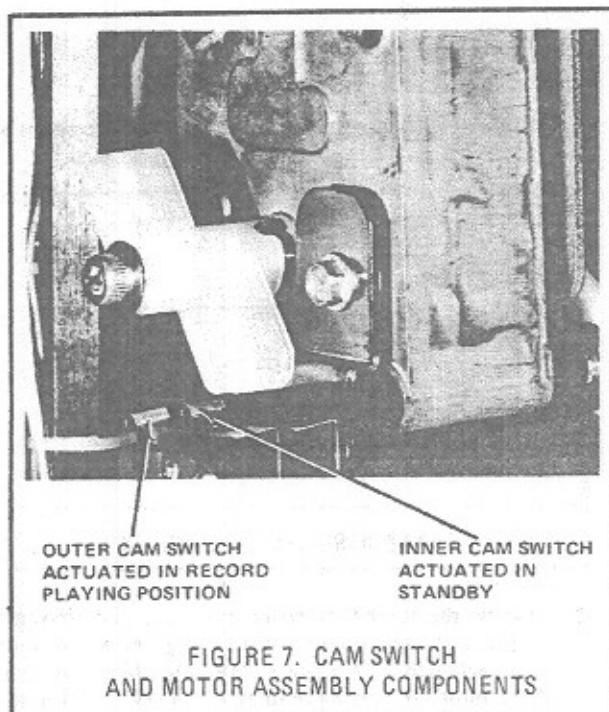
Mechanism Control Unit. This solid state switching unit controls the scan, transfer and toggle shift function.

Sprag Assembly. This assembly operates the record magazine in position. It is located at the center of the record magazine and below the record transfer arm. The magazine motor rotates the record magazine. The solenoid operated sprag assembly locks the magazine in place.

Tone Arm Assembly. The tone arm assembly plays records after they are positioned on the turntable by the record transfer arm. The tone arm contains a stereo cartridge with a diamond stylus that is designed to track at three to four grams pressure. The stylus plugs into the cartridge for easy replacement. Four receptacles in the tone arm assembly mate with a plug to connect the cartridge to the pre-amplifier via 4-conductor shielded cable.

Turntable Motor. The turntable motor is a constant speed 300 RPM (at 60 Hz.) synchronous motor. The turntable is driven with a belt to obtain the proper turntable speed with minimum wow and flutter. For 50 Hz. locations, the motor pulley must be changed and a wiring change must be made on the motor terminal strip. (See Section 4.)

Automix. (Optional) Automix operation enables the phonograph to play both 33 and 45 RPM records in any order. Automix components consist of a speed shift coil, a hub shift coil and a trip wire and switch on the turntable hub.



Cam Switch and Motor Assembly. (See Figure 7).

The cam switch and motor assembly consists of the transfer motor, cam and two cam switches. A nylon cam operates the cam switches.

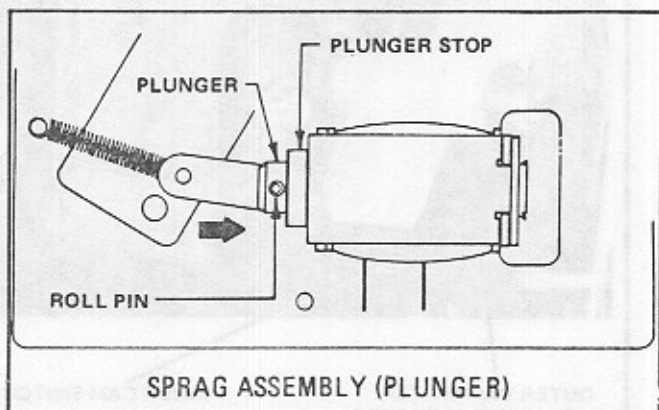
RECORD CHANGER ADJUSTMENTS

I. SPRAG ASSEMBLY ADJUSTMENTS

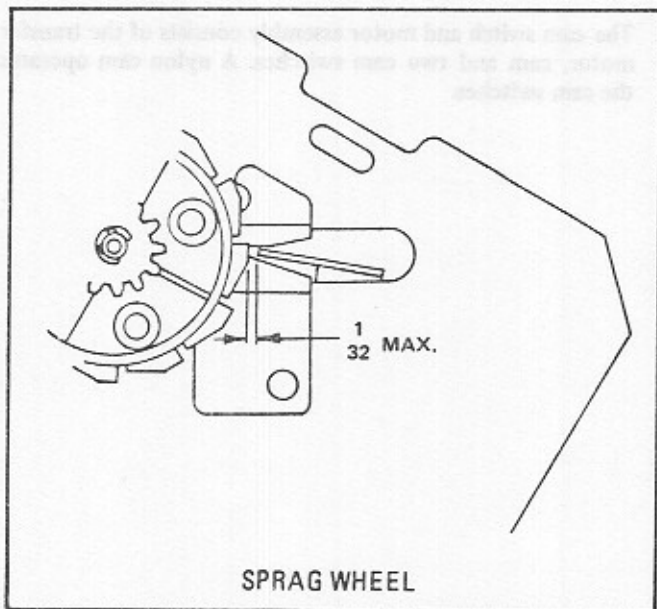
The following steps must be used to make sprag assembly adjustments.

WARNING
TURN POWER OFF.

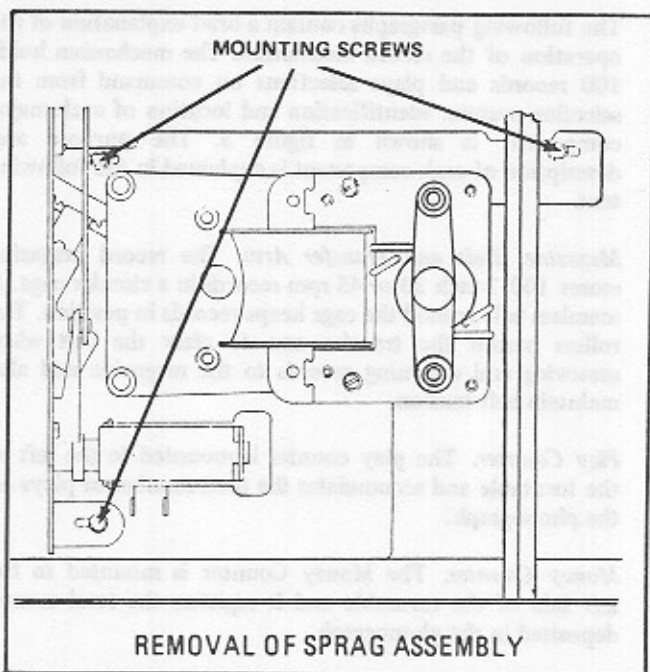
1. Depress solenoid plunger until the roll pin bottoms on plunger stop. (Actuate by pressing on plunger.)



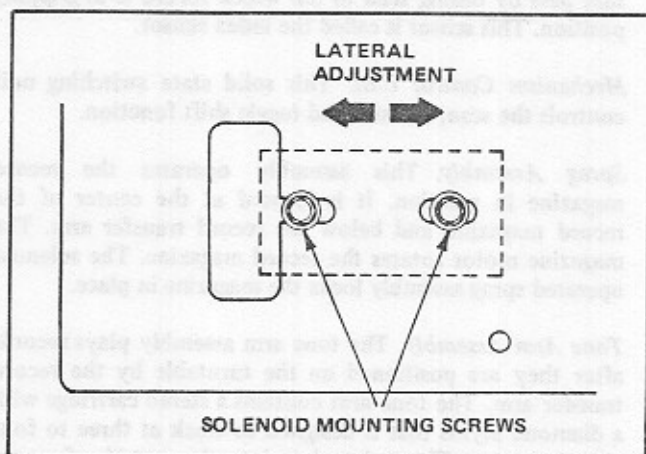
2. Rotate the record magazine and note the clearance between the sprag lever and the sprag wheel located on the back side of the sprag plate assembly. The sprag lever must not touch the sprag wheel and the clearance must not be greater than 1/32 inch. If corrections are required it will be necessary to remove the sprag assembly.



3. To remove sprag assembly, first remove mech control board mounting plate (3 screws). Disconnect wires to the solenoid and motor, remove the three mounting screws and slide the assembly out of the right side of the mechanism.



4. Loosen the solenoid mounting screws and with the roll pin against the plunger stop, position the solenoid so that there is a .015 to .025 inch gap between the sprag lever and the highest point on the sprag wheel.



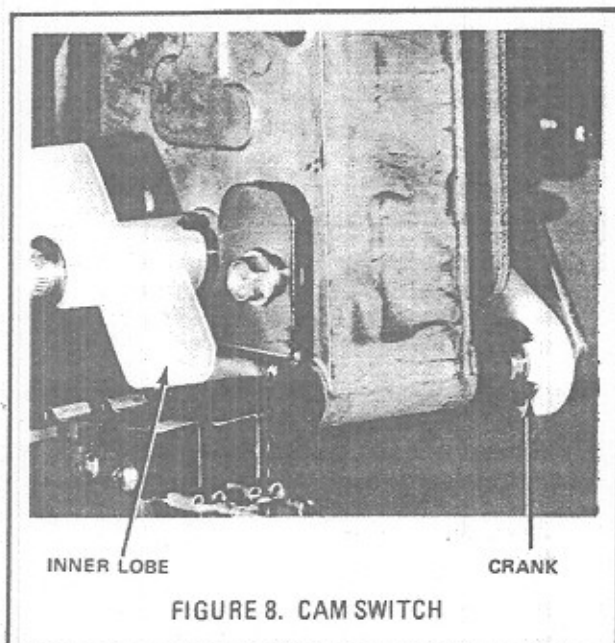
5. Tighten solenoid mounting screws.
6. Replace sprag assembly in mechanism with (3) mounting screws and replace black and white-blue wires to the solenoid and the yellow and yellow-black wires to the magazine motor.

See paragraph VI for instructions for aligning the record magazine and readjusting the optical switch.

II. CAM SWITCH ADJUSTMENTS

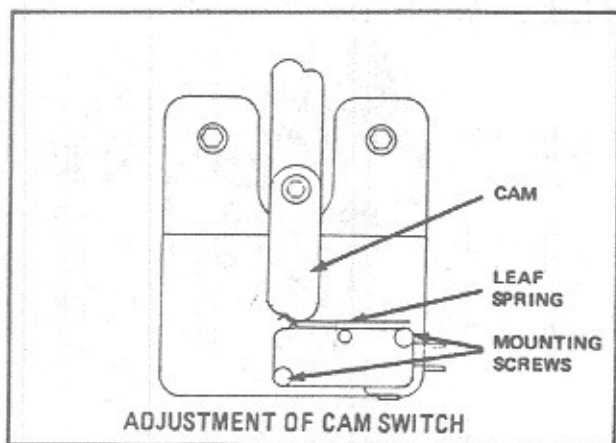
If it is necessary to remove the switch cam from the transfer motor, the following procedure must be followed to ensure that the cam is properly located and not 180° out of position.

1. Locate the inner lobe so that it is pointing in the same direction as the crank. Turn cam so that neither cam lobe is on a switch before removing or installing cam. (See Figure 8.)



Check and Adjust Cam Switch Operation

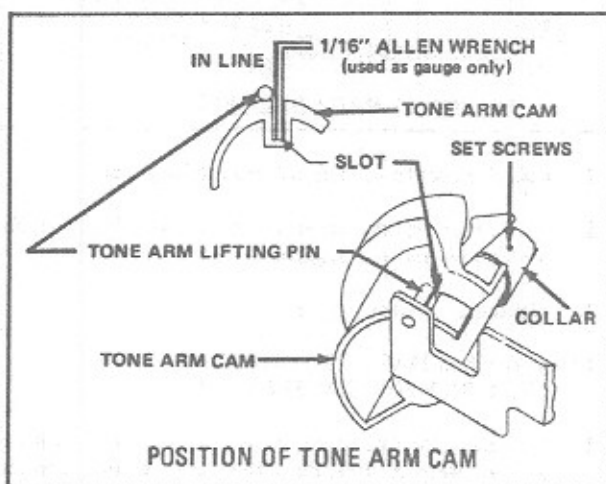
1. Check that the plastic cam, leaf spring, and switch plunger just touch as shown below.
2. To adjust switches, loosen mounting screw under plunger end and move switch housing as required.



3. Tighten mounting screw and recheck operation.

III. TONE ARM CAM ADJUSTMENTS

1. Lift tone arm and turn it clockwise so the pins are disengaged from the cam.
2. With gripper bow in scan position over magazine (transfer motor crank in maximum down position) loosen one Allen head set screw in collar.
3. Using a 5/32 inch Allen wrench in end of transfer motor shaft, turn motor shaft clockwise until gripper bow is in playing position (transfer motor crank arm in maximum up position).
4. Loosen the other Allen head set screw in collar.
5. Position tone arm cam so that the outside diameter of the tone arm lifting pin is in line with the edge of the slot in the cam, as shown below.



6. Tighten Allen head set screws and replace tone arm.

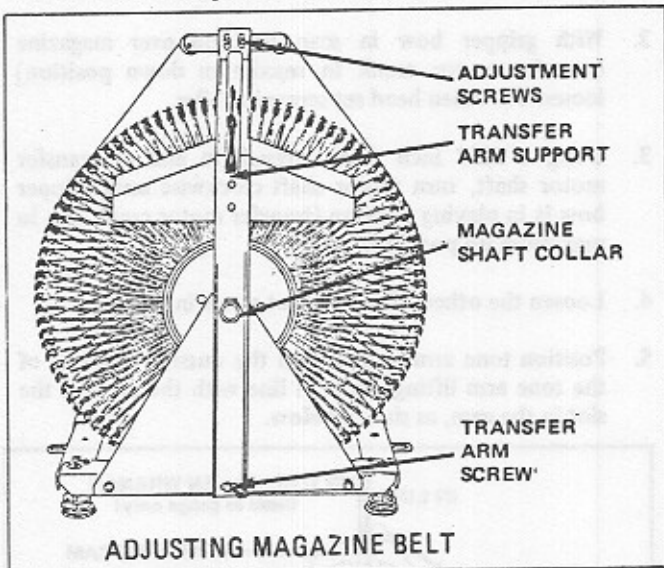
IV. RECORD MAGAZINE TRANSFER ARM SUPPORT ADJUSTMENT

Eliminate Magazine End Play and Center Transfer Arm Support.

1. Loosen set screws in rear Magazine Shaft collar. Push collar on the Magazine Shaft to eliminate end play and tighten screws.
2. Loosen screw that holds transfer arm support to mechanism frame.
3. Adjust transfer arm support so transfer arm is centered in opening.
4. Tighten mechanism frame to transfer arm support screw.

V. MAGAZINE BELT ADJUSTMENT

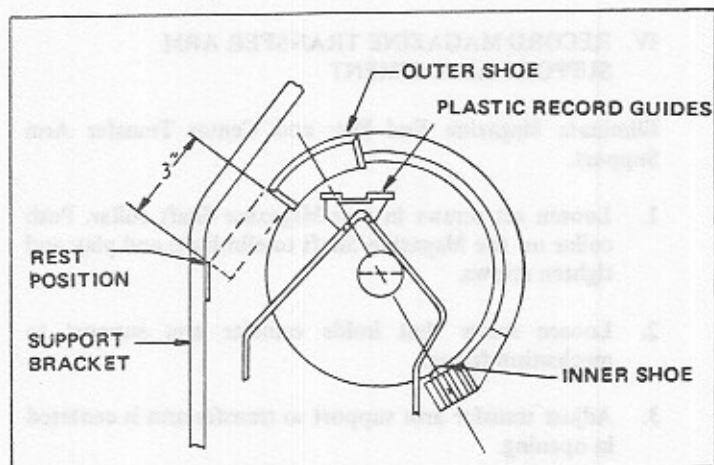
1. Loosen two adjustment screws shown.



2. Raise bracket to tighten belt around magazine.
3. Check that belt rides evenly in center of belt guides, all the way around the magazine.
4. Tighten 2 adjustment screws.

VI. ALIGNING MAGAZINE STOPPING POSITION WITH TRANSFER ARM.

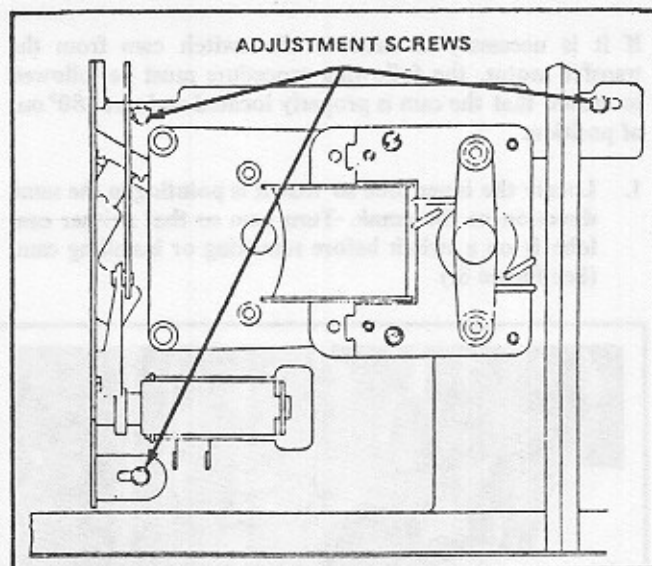
1. For this adjustment use a record in good condition without warp or dish. Place this record in any position in the record magazine and rotate the magazine until this record is in the top position. Allow magazine sprag lever to engage and lock magazine in this position.



2. Using a 5/32 inch allen wrench in end of transfer motor shaft, turn motor shaft clockwise until gripper bow lifts record out of magazine, and outer shoe is approximately 3 inches from its rest position on the back support.

In this position a center line from the inner shoe thru the center of the outer shoe will pass thru the back of the plastic record guide on the magazine.

20

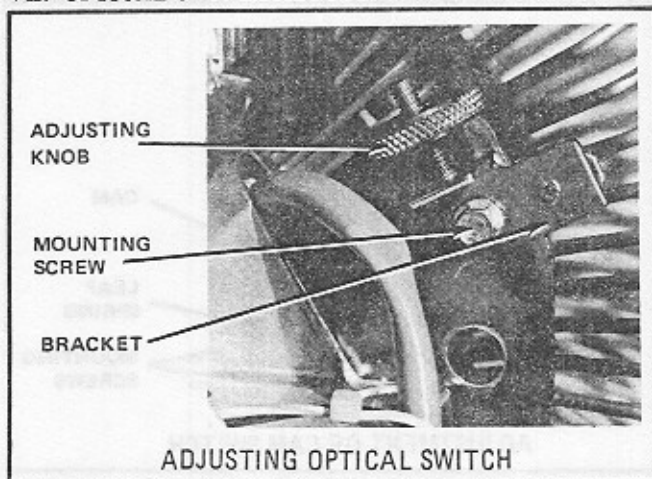


3. With the record and gripper bow in this lifted position rock the magazine to the left and right and make sure the plastic magazine record guides do not come in contact with the record on either side.

If the guide makes contact with the record on one side or magazine space does not center with the record, the following adjustment to the magazine will be necessary.

4. Loosen three screws in magazine motor mounting plate.
5. With sprag wheel locked, move magazine until record is centered between belt guides. (Adjustment screws will be approximately centered in slots).
6. Tighten three screws in magazine motor mounting plate securely.
7. Whenever the record magazine is adjusted, the optical switch must be adjusted as shown in the following adjustment procedure.

VII. OPTICAL SWITCH ADJUSTMENTS



1. Release magazine sprag lever from sprag wheel and rotate record magazine until selection 99 is at the top center. Engage the sprag lever locking the magazine in place.

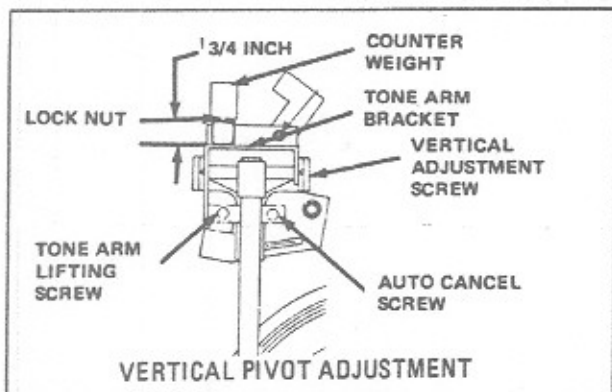
2. Loosen optical switch bracket mounting screw, turn adjusting knob counter clockwise to top of its' travel, and move bracket to the most downward position. Snug optical switch bracket mounting screw (do not tighten).
3. Rotate record magazine counterclockwise to remove gear backlash, hold in this position.
4. Turn adjusting knob clockwise, moving the bracket upward and watch both the index and home lamps on the mechanism control unit.
5. When both lamps light, continue to move the bracket past this position until the index lamp JUST goes out. The home lamp will stay on. Tighten the mounting screw.
6. With the sprag lever engaged rotate the record magazine clockwise and counterclockwise by hand taking up gear backlash in both directions. The index lamp should stay off, and the home lamp should stay on.
7. Release magazine sprag lever from the sprag wheel and rotate record magazine to several other positions repeating step six. The index lamp should stay off. The home lamp will not be on.

VII. TONE ARM ADJUSTMENTS

1. Adjust Vertical Pivot

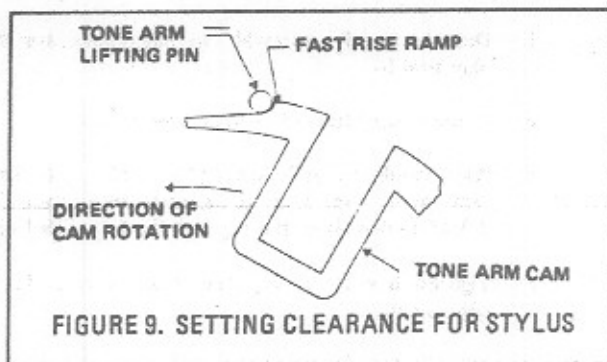
- a. Adjust tone arm pivot screw so that tone arm pivot is loose enough to move free vertically or a distance of two inches above turntable.
- b. Check that tone arm moves less than 1/32 inch from side to side at stylus.

2. Set Stylus Force.



- a. The distance between the counter weight and the tone arm bracket should be 3/4 inch for 3-1/2 grams stylus force.
- b. If distance is not correct loosen lock nut, adjust counter weight and tighten lock nut.

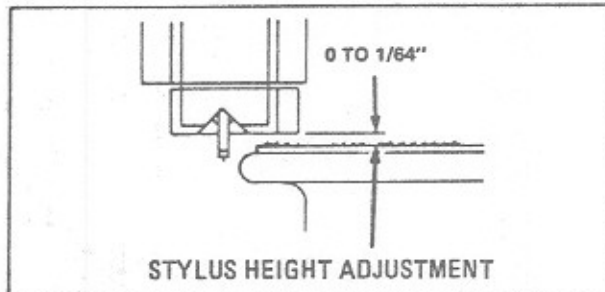
3. Set Stylus Clearance.



Using a 5/32 inch allen wrench in the end of the transfer motor shaft turn motor shaft clockwise until gripper bow has placed a record on the turntable. Push down on the tone arm lifting pin (See Figure 9) and continue to turn motor shaft to swing tone arm into the set down position. You will be able to feel the fast rise ramp of the cam contact the tone arm pin. At this point, release the pressure on the lifting pin and adjust the tone arm lifting screw so that the stylus just touches the record.

4. Set Stylus Height.

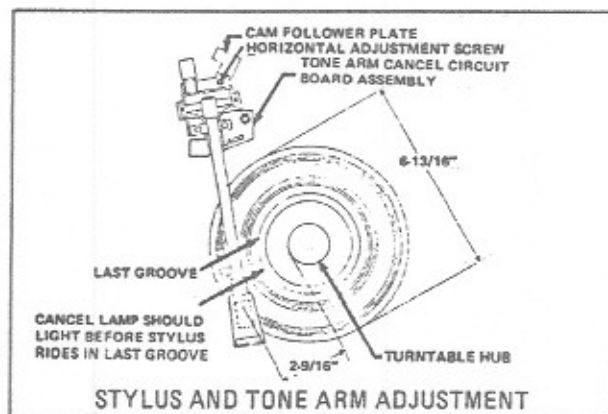
- a. Operate transfer assembly to position tone arm over turntable rim.



- b. Turn auto cancel screw until stylus holder is flush to 1/64 above turntable pad surface with tone arm in play position.

5. Set Stylus Setdown Position and Tone Arm Cutoff Switch.

- a. Place undersize (6-25/32 inch diameter) record on turntable.

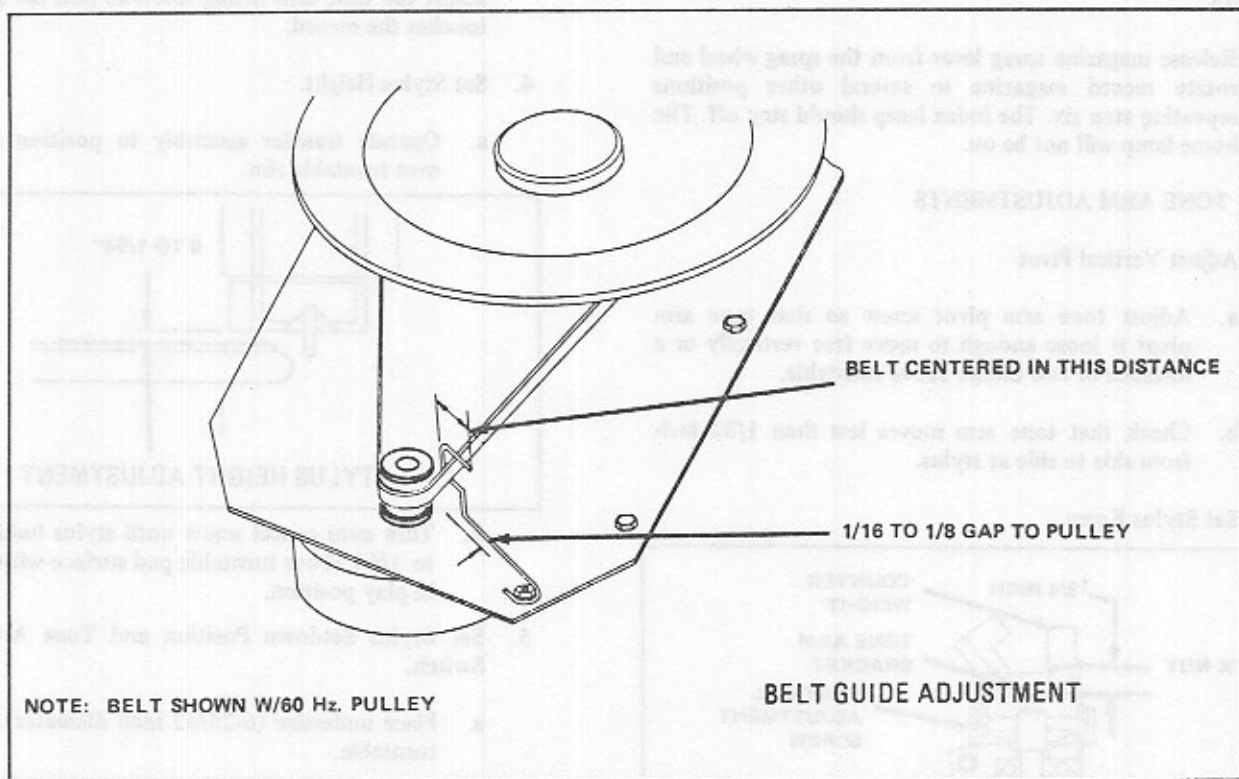


- b. Operate transfer assembly to bring tone arm to play position.
 - c. Loosen horizontal adjustment screw.
 - d. While holding cam follower plate against tone arm cam, move tone arm, as required, until stylus is 2-9/16 inches from the edge of the turntable hub.
 - e. Tighten horizontal adjustment screw and check adjustment.
6. Adjust Tone Arm Cutoff Switch.
- a. Disconnect microcomputer harness from mechanism control board (19 pin connector). (To prevent mechanism from cancelling.)
 - b. Loosen mounting screw on tone arm cancel circuit board assembly.

- c. Position tone arm cancel board assembly, as required, until reed switch is closed, as indicated by cancel lamp in mechanism control unit. This should happen before stylus enters "closed" record groove.

BELT GUIDE ADJUSTMENT

1. Loosen nut that fastens belt guide.
2. Adjust as shown below.
3. Tighten nut.



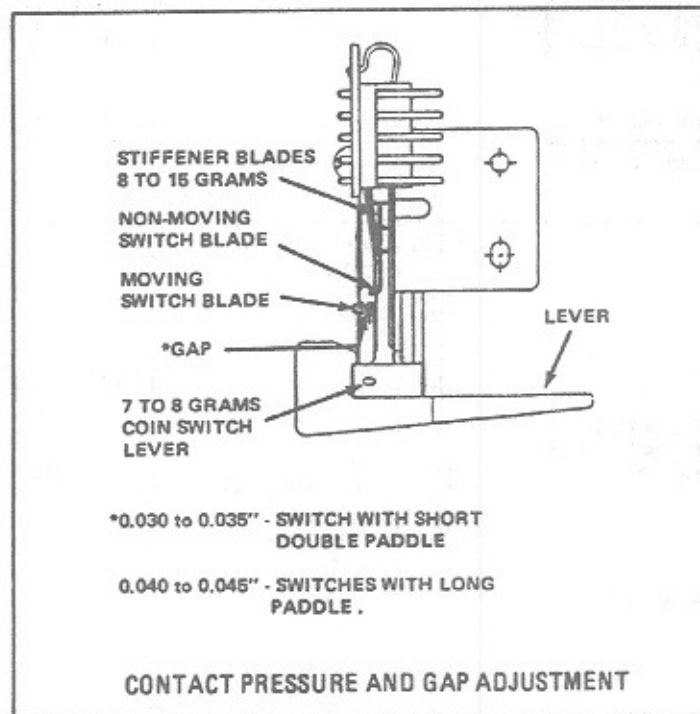
COIN SWITCH ADJUSTMENTS

OPERATION CHECK

1. Hold plastic coin switch lever in normal position and drop a coin through slug rejector.
2. When the coin comes to rest on the lever, release the lever slowly.
3. Check that the weight of the coin operates the lever enough to close the coin switch and allow the coin to fall free.
4. Repeat steps 1, 2 and 3 for other three levers.

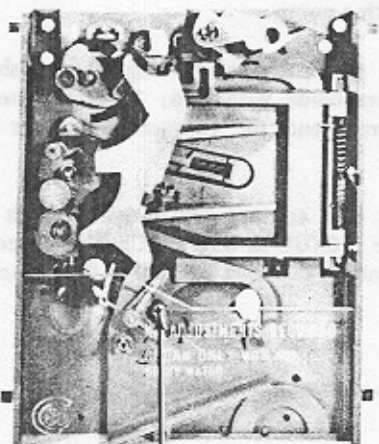
CONTACT PRESSURE AND GAP

1. Check that each moving switch blade pushes against its lever with 7 to 8 grams force to hold lever against cushion. To adjust pressure, bend the blade near its mounting point.
2. Check that each non-moving blade pushes against its stiffener blade with 8 to 15 grams force. To adjust pressure, bend the contact blade near its mounting point.
3. Check that contact gap at switch with short double paddle is 0.030 to 0.035. Check that contact gap for long paddle switches is 0.040 to 0.045 inch.



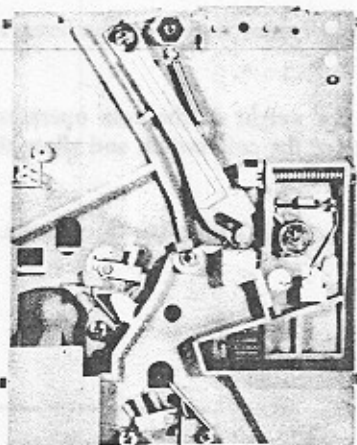
**COIN ACCEPTORS
3 COIN**

FRONT VIEW



REMOVE COVER AND DRIVE
No. 6-32 SCREW INTO BOSS AS
SHOWN TO REJECT NICKELS

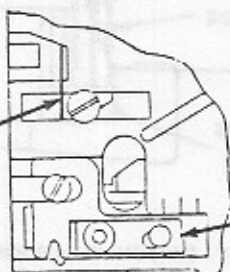
BACK VIEW



TO REJECT DIMES ADD COINCO
No. 903-915 BLOCK OUT WIRE

**COIN ACCEPTORS
4 COIN**

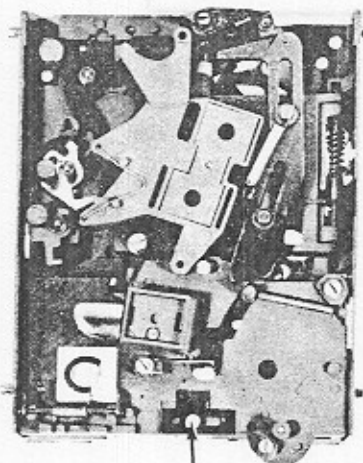
LINE UP EDGE OF
DEFLECTOR WITH
THIS LINE



TO IMPROVE S SLUG REJECTION
ADJUST AS SHOWN

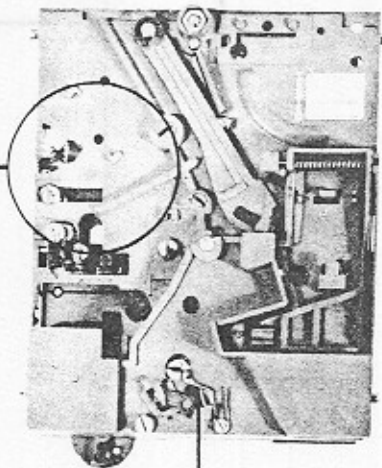
LINE SEPARATOR AS SHOWN

FRONT VIEW



MOVE THIS BRACKET TO RIGHT
TO REJECT NICKELS (OR JUST
FAR ENOUGH TO LEFT TO
ACCEPT NICKELS)

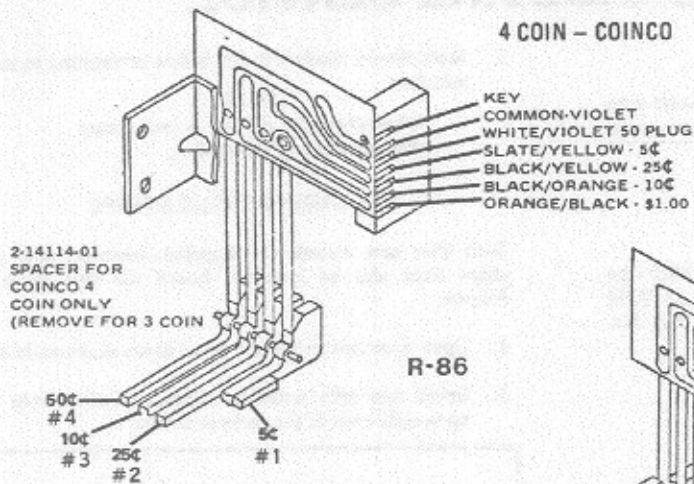
BACK VIEW



TO REJECT DIMES ADD COINCO
No. 903915 BLOCK OUT WIRE

COIN SWITCH WIRING

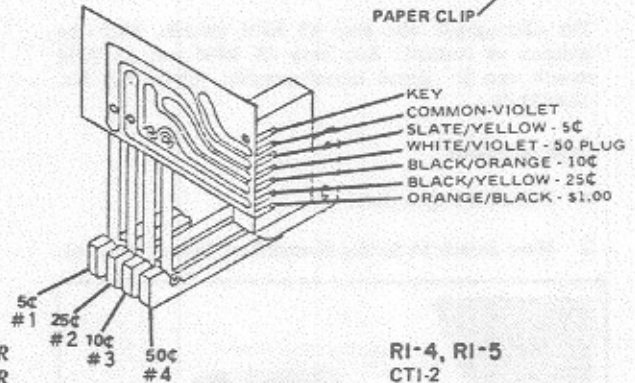
4 COIN - COINCO



NOTE

SWITCH W/V AND O/B WIRES DEPENDING ON 50c OR 5 COIN. SWITCH WIRE COLORS AS REQUIRED FOR OTHER REJECTORS. MAINTAIN COLOR - VS - COIN VALUE.

*MM = MONEY METER COUNTER RATIO



WIRING FOR 4 COIN (.05, .10, .25, .50)

COUNTRY	COIN DENOMINATION TO ACTUATE SWITCH								
	SWITCH #1	WIRE COLOR	SWITCH #2	WIRE COLOR	SWITCH #3	WIRE COLOR	SWITCH #4	WIRE COLOR	MM *
AUSTRALIA					10c	B/O	20c	B/Y	1
AUSTRIA			5s	W/V	1s	B/O	10s	O/B	10
BELGIUM			25c	B/O	10c	B/Y	5Fr.	S/Y	100
COLUMBIA			1 PESO	S/Y	2 PESO	B/O	5 PESO	B/Y	1
DENMARK			1 Kr.	B/O			5 Kr.	W/V	10
ECUADOR			10c	B/O					10
EL SALVADOR			5c	S/Y	25c	B/Y	10c	B/O	1
ENGLAND			10P	B/O			50P	W/V	100
FINLAND			1 Mk.	B/O			50P	W/V	10
FRANCE			1 Fr.	B/O			5 Fr.	W/V	10
GERMANY			1 MK	B/O	50 Pf.	S/Y	2 MK	B/Y	10
HOLLAND			25c	B/Y			1 G	O/B	1
HONDURAS			50c	B/Y	20c	B/O	10c	S/Y	2
ITALY			200 L.	B/Y			100 L.	B/O	1,000
NICARAGUA			50c	W/Y	25c	B/Y	1 COR	O/B	1
NOR.-SWED.			1 Kr.	B/O			5 Kr.	W/V	10
SPAIN			5 PTAS	S/Y			25 PTAS	B/Y	100
SWISS			1 Fr.	B/O	50 Rp	S/Y	2 Fr.	B/Y	10
U.S.	5c	S/Y	25c	B/Y	10c	B/O	\$1	O/B	1
VENEZUELA	1 REAL	B/O	1 BOLIVAR	B/Y	1 MEDIO	S/Y	2 BOLIVAR	W/V	4

SECTION 3- ROUTINE SERVICE

INTRODUCTION

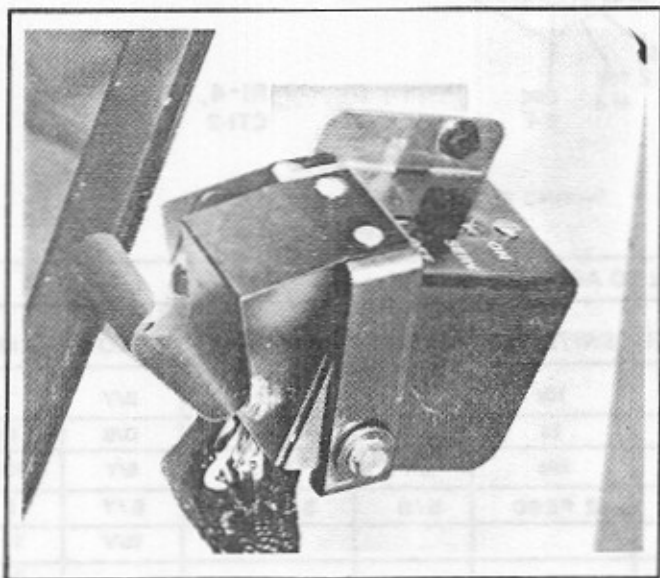
This section contains instructions to enable the route man to perform routine service tasks such as changing records, making collections, and cabinet cleaning.

CHANGING RECORDS

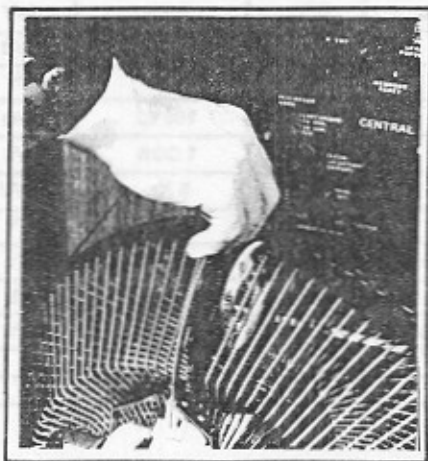
The phonograph will play 45 RPM records. With the addition of Automix Kit, both 45 RPM and 33 RPM records can be played interchangeable. (Order Kit No. 2-66681-06.)

Loads as follows:

1. Unlock and open door.
2. Move Switch to Service (Located on Control Console).



3. Use scan button to position magazine slot to the left or right of the transfer arm.
4. Install record in magazine as shown.



5. Move Service Switch to ON before attempting to make selection.

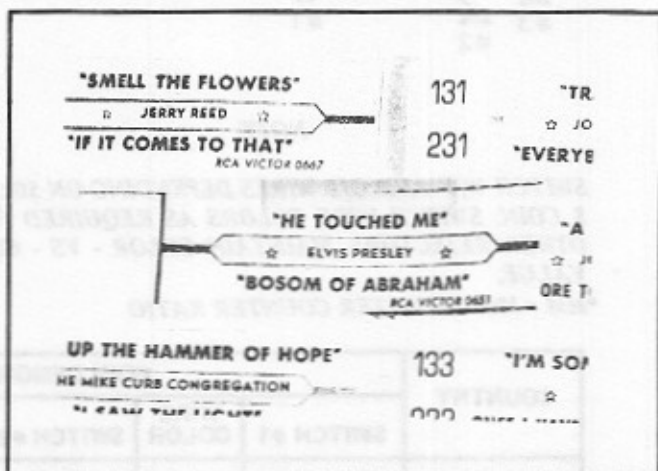
NOTE

When changing records – make sure that magazine is balanced.

CHANGING TITLE STRIPS

Each time new records are installed, corresponding title strips must also be installed. Install the title strips as follows:

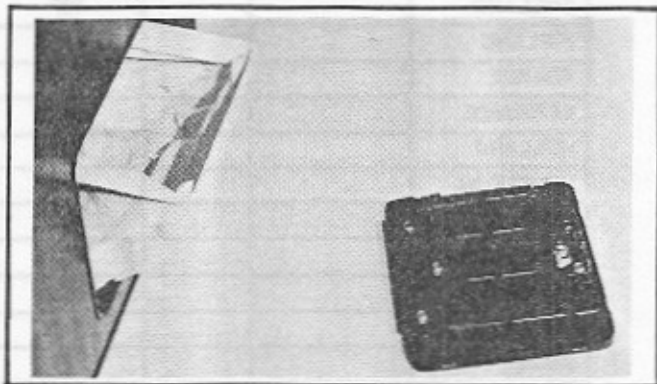
1. Open door and swing title panel down as shown below.
2. Install new title strips by sliding the strips into the open right ends of the racks as shown.



3. Check to make sure that each title strip corresponds to the correct record.

REMOVING CASH BAG

1. Unlock cash bag door and pull door away from cabinet.



2. Slide cash bag straight out on its runners.

READING AND RESETTING MEMOREC

The Memorec keeps a tally of the number of times each record is selected and the total number of selections made. This unit registers selections only; not plays. To read the total number of plays, check the total play counter on the left side of the record changer mechanism. Read and reset the Memorec as follows:

1. Set selector switch to LEAST POPULAR position. Set console ON-SERVICE-OFF switch to SERVICE. The least popular record selection will appear on the left two digits of the display window under RECORD NUMBER. The number of times it was selected will appear on the right two digits under TIMES SELECTED.
2. Push and release the pushbutton to read the next least popular record. If there are two records with the same number of selections, the lower record number will be displayed first; then the higher number. After all selections have been read, the display will show hyphens.
3. To read the most popular selections, set selector switch to MOST POPULAR position. Push and release the pushbutton to read the most popular records.
4. The readout of least popular or most popular records can be reset to the beginning at any time by moving the Most/Least switch to the opposite position, and then back to its original position.
5. Press and hold the pushbutton to read the total selections since the unit was last reset.
6. Press the "Most Popular Record" switch on the selector keyboard. The number of times the "Most Popular Record" switch was used to make a selection will appear on the four digit display.
7. Press the "Manual Credit" button on the lower left corner of the "Central Control Computer". The total amount of money deposited since the last reset will appear on the four digit display. The count will be the number of nickels deposited. The actual amount of money will be .05 times the count.
8. Punch in the number of any tune using the selector keyboard. The number you punch in will appear on the three digit display. The number of times this tune has been selected will appear on the two right most digits of the four digit display.
9. Using the eraser end of a pencil or a similar tool, push the recessed RESET button to set the computer count back to zero.

CAUTION

*THIS WILL ZERO THE COMPUTER
SO MAKE SURE THAT YOU HAVE
COMPLETED YOUR READINGS.*

REPLACING LAMPS

To maintain the attractive appearance of the phonograph, replace burned-out lamps immediately.

To Remove Fluorescent Lamps:

1. Unlock and open door. Fluorescent lamps and starters are conveniently located.
2. Remove Fluorescent tube by rotating 1/4 turn, and swing lamp out.
3. Flashing lamps can be removed by rotating 1/8 turn and pulling straight out.

CLEANING

To Clean Coinco Acceptors:

1. All plastic 3 coin acceptor.

Submerge in hot soapy water, shake off excess water and let dry. Needs no lubrication.

2. Plastic and metal 4 coin acceptor.

Place in hot soapy water for about 10 minutes. Rinse in hot water and dry with air or lint free cloth. Clean stubborn areas with brush. Transfer cradle pins and bushings may be lubricated with silicone.

WARNING

NEVER USE GREASE OR OIL!

CABINET CLEANING

ACTION REQUIRED	PROCEDURE
1. Clean Glass	<ol style="list-style-type: none">a. Clean all glass with a paper towel and a non-abrasive glass cleaner such as Windex.b. Dry with a clean, lint-free cloth.
2. Clean painted wood and metal surfaces	<ol style="list-style-type: none">a. Clean all painted wood and metal surfaces with mild soap and water. DO NOT USE SOLVENTS.b. Apply a good quality auto or furniture wax to protect the finish.
3. Clean chrome trim	<ol style="list-style-type: none">a. Use a damp or dry cloth to remove any dust or dirt.b. Use mild soap and water to remove stubborn deposits. Do not use strong detergents or abrasives of any kind.
4. Clean plastic trim	<ol style="list-style-type: none">a. Wipe all plastic surfaces with a damp or dry cloth only. DO NOT USE SOLVENTS.
5. Clean electrical components	<ol style="list-style-type: none">a. Clean all electrical components with a clean, dry, lint-free cloth or a soft bristled brush only.

INSTRUCTION SHEET FOR GLASS REPLACEMENT OR CLEANING

Cleaning not normally required. During refurbish, you may want to clean the glass. The following procedure may be used:

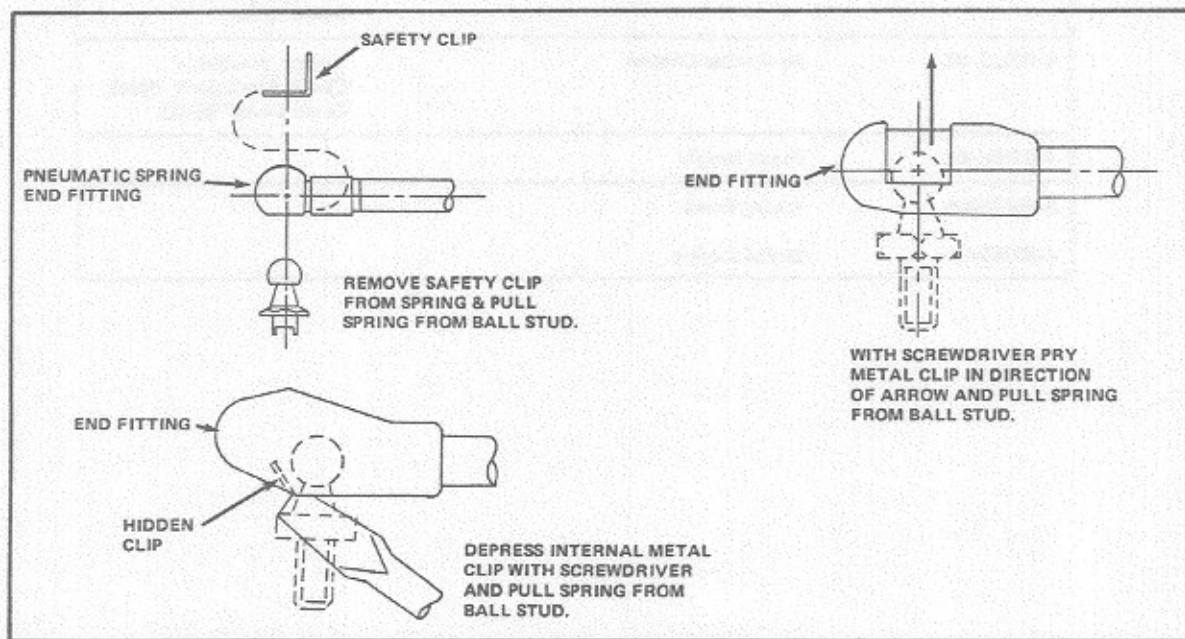
1. Turn off power to the phonograph.
2. Open door.
3. Remove title rack.
4. Pivot the selector panel down. (See Page 7).
5. Loosen but do not remove 6 screws near the selector which retain the glass. Remove the 14 remaining screws which retain the glass. 4 on each side and 6 on the end where the door catches are located. Do not loosen the screws which retain the door support brackets (Brackets with ballasts and springs mounted to them).
6. Lower the door until it is horizontal and tie it in position using the spring mounting bracket and the lower door catch for tie points. Use a cord which will withstand the force of the springs when the glass is removed.
7. Slide the glass out of the bottom of the door. It may be helpful to reach through the opening left by the title rack to accomplish this. Make sure the channel rubbers, cushioning the edges of the glass, are removed.
8. Clean the glass using normal glass cleaning methods described on page 28.

9. Apply channel rubber to glass.
10. Insert glass into door keeping hands off the area of the glass which cannot be cleaned after assembly.
11. Make sure the glass and channel rubber are in position.
12. Install 1 or 2 screws in each of the 3 sides to establish alignment. Install the remaining screws. Tighten all 20 screws.
13. Check the installation to be sure the glass and retainer are seated correctly and that the wires are routed correctly.
14. Close the selector panel, replace the title rack.

INSTRUCTIONS FOR REMOVING TOP DOOR PNEUMATIC SPRING

Proceed as follows:

1. Open Top Door.
2. Have an assistant hold door in open position.
3. Find picture of appropriate style spring end fitting below and follow instructions:



**CONSTANT HIGH VOLUME –
CANNOT BE ADJUSTED AT VOLUME CONTROL**

1. *Volume Control* – Disconnect volume control plug from amplifier chassis. No sound indicates that there is a short in the volume control line.
2. *Preamp* – If there is full volume with control plug disconnected, replace the preamplifier board.

EXCESSIVE RECORD SCRATCH

1. *Worn Records* – Replace worn records.
2. *Damaged Stylus* – Make sure that the stylus is not worn or broken; replace if necessary. Check Stylus force.

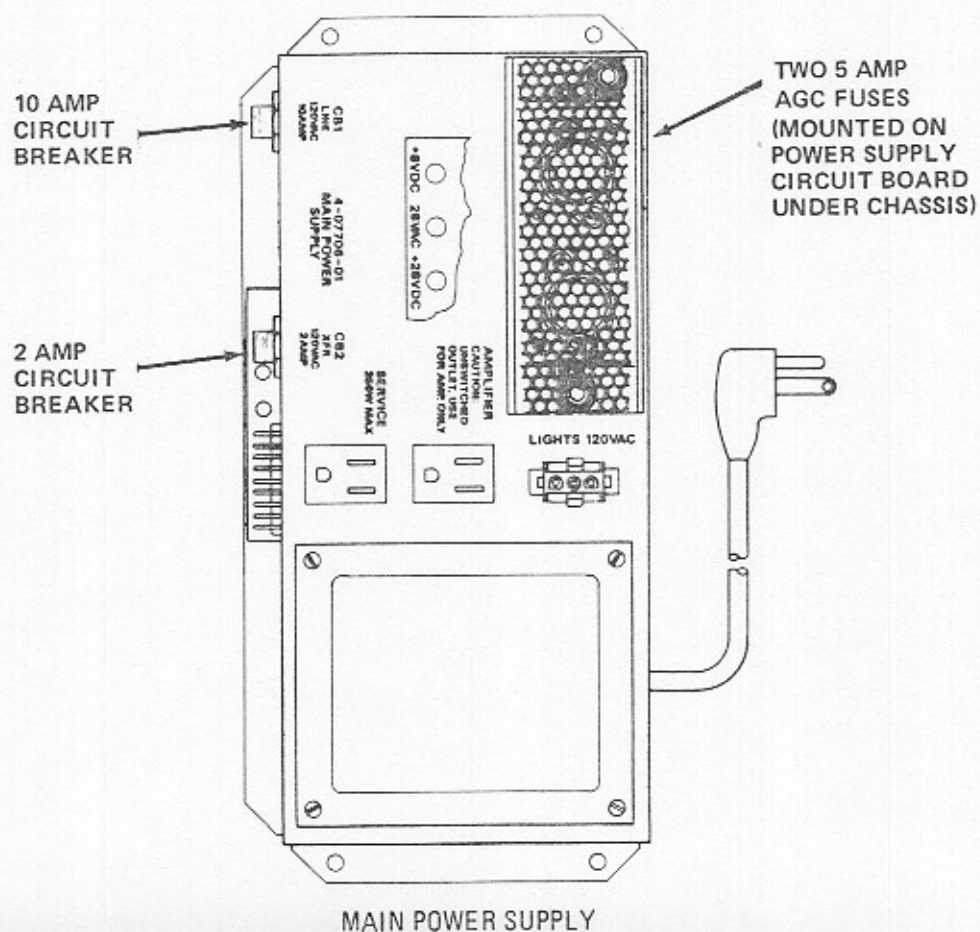
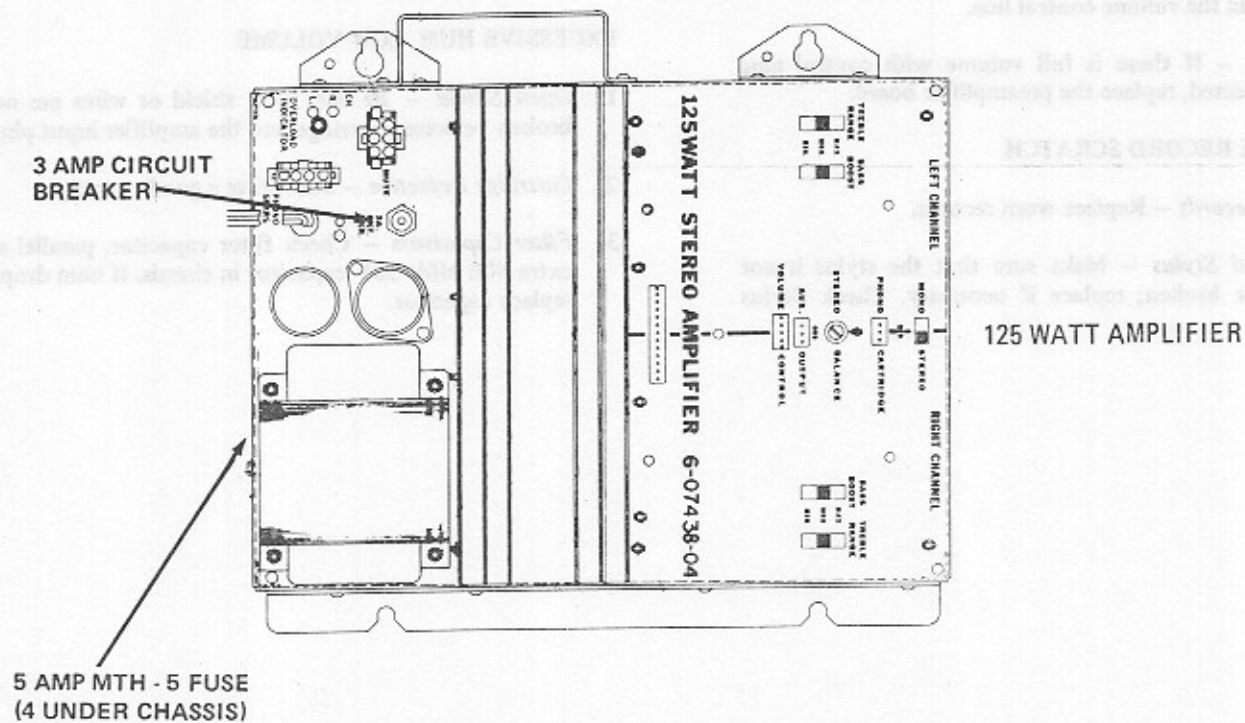
3. *Treble Range Control Too High* – Reduce setting of control for worn or noisy records.

EXCESSIVE HUM, LOW VOLUME

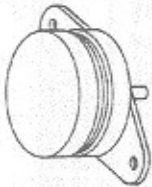
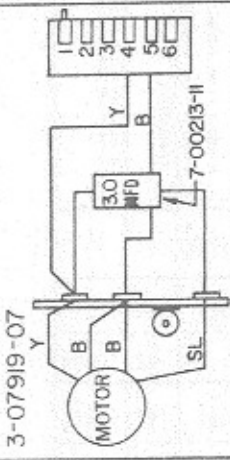
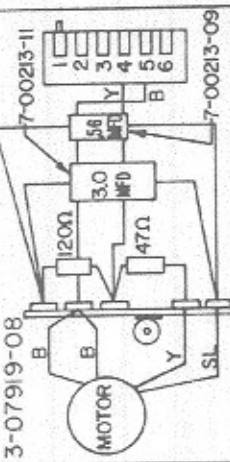
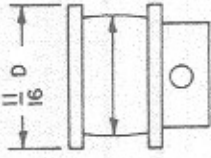
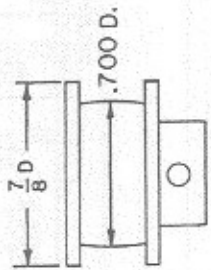
1. *Open Shield* – Be sure that shield or wires are not broken between cartridge and the amplifier input plug.
2. *Cartridge Defective* – Substitute a good cartridge.
3. *Filter Capacitors* – Check filter capacitor, parallel an extra 500 Mfd. 50V capacitor in chassis. If hum drops, replace capacitor.

SECTION 5- ADDITIONAL INFORMATION

PHONOGRAPH FUSES AND CIRCUIT BREAKERS

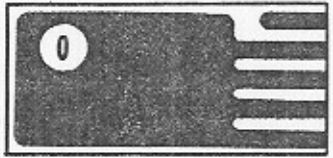
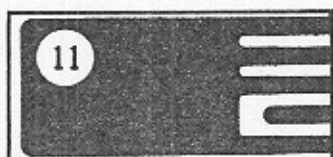
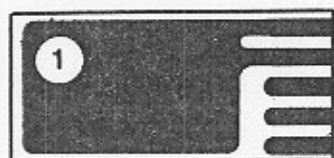


MAIN POWER SUPPLY
LOCATION OF FUSES AND CIRCUIT BREAKERS

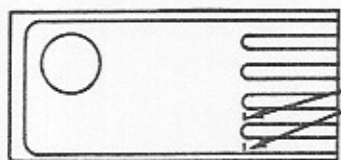
<p>TURNTABLE MOTOR PART NUMBER AND IDENTIFYING FEATURES</p>  <p>3-07920-04, MFG. BY NORTH AMER. PHILIPS, LABELED A81743-M5, HAS FLAT BOTTOM COVER NO FLAT ON SHAFT.</p>	<p>60Hz MOTOR ASSEMBLY ACTUAL CAPACITORS SHOWN ARE TYPICAL. TOTAL CAP. VALUES MAY HAVE BEEN OBTAINED BY OTHER COMBINATIONS. CAPS. ARE 100V.</p>  <p>3-07919-07</p>	<p>50Hz MOTOR ASSEMBLY ACTUAL CAPACITORS SHOWN ARE TYPICAL. TOTAL CAP. VALUES MAY HAVE BEEN OBTAINED BY OTHER COMBINATIONS. CAPS. ARE 100V, RESISTORS 2W.</p>  <p>3-07919-08</p>
	<p>60 Hz</p>  <p>CLEAR ANODIZED ALUMINUM</p> <p>T.T. MOTOR PULLEY 2-18178-01</p>	<p>50 Hz</p>  <p>RED ANODIZED ALUMINUM</p> <p>T.T. MOTOR PULLEY 2-18178-02</p>

COMPATIBILITY CHART

PART #	DESCRIPTION	R-84	R-85	R-86	R1-3	R1-4, R1-5	COMMENTS	PRICE BOARD			
								6-0878-01	6-0878-02	6-0878-03	6-0878-04
6-0878-01	CHIP	STO	STO	STO	NOTE A	NOTE A	A. OK - SAME FEATURES AS R-84	STO	STO	STO	NOTE A
6-0878-02	NOISE	STO	STO	STO	NOTE A	NOTE A	B. OK - SAME FEATURES AS R-85 IF -03 OR -04 PRICE BD.	STO	STO	STO	NOTE A
6-0878-03	NOISE	STO	STO	STO	NOTE A	NOTE A	C. OK - SAME FEATURES AS R-84 IF -01 OR -02 PRICE BD.	NOTE D	NOTE D	NOTE D	NOTE D
6-0878-04	NOISE	STO	STO	STO	NOTE A	NOTE A	D. 010205 353 & 354 NOT AVAIL. #334 GIVES 160 PLAYS	NOTE D	NOTE D	NOTE D	NOTE D
6-0878-05	15 PLAY/COIN MAX. LIMITED LEVEL RATIO	STO	STO	STO	NOTE E	NOTE E	E. OK BUT SAME PRICE FEATURES AS R-84				
6-0878-06	15 PLAY/COIN MAX. LIMITED LEVEL RATIO	STO	STO	STO	NOTE E	NOTE E	F. OK BUT SAME PRICE FEATURES AS R-84 UNLESS COMPATIBLE COMPUTER BOARD USED.				
6-0878-07	010045 353 & 354 ADDED. NOTE G	STO	STO	STO	NOTE E	NOTE E	G. ADDED CR. LEVEL RATIOS. ADDED 16 PLAY DIBSE. CHANGED 120 TO 160 PLAY (LABELLED R1-3) = 6-0878-05.				
6-0878-08	010045 353 & 354 ADDED. NOTE G	STO	STO	STO	NOTE E	NOTE E	H. 6-0878-03 PIECE BACKS ALTERNATE USING PROB.				
6-0878-09	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-10	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-11	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-12	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-13	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-14	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-15	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-16	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-17	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-18	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-19	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-20	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-21	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-22	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-23	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-24	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-25	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-26	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-27	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-28	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-29	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-30	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-31	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-32	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-33	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-34	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-35	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-36	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-37	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-38	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-39	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-40	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-41	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-42	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-43	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-44	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-45	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-46	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-47	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-48	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-49	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-50	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-51	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-52	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-53	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-54	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-55	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-56	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-57	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-58	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-59	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-60	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-61	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-62	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-63	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-64	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-65	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-66	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-67	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-68	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-69	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-70	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-71	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-72	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-73	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-74	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-75	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-76	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-77	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-78	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-79	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-80	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-81	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-82	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-83	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-84	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-85	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-86	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-87	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-88	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-89	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-90	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-91	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-92	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-93	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-94	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-95	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-96	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-97	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-98	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-99	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-100	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-101	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-102	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-103	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-104	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-105	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-106	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-107	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-108	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-109	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-110	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-111	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-112	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-113	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-114	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-115	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-116	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-117	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-118	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-119	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-120	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-121	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-122	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-123	NOISE	STO	STO	STO	NOTE E	NOTE E					
6-0878-124	NOISE	STO	STO	STO	NOTE E	NOTE E					



INDIVIDUAL PRICING CHIP 2-18507-01/16



CHIPS MAY BE CHANGED
BY CUTTING RUNNERS

SECTION 4- TROUBLESHOOTING

INTRODUCTION

The phonograph incorporates several modules which plug in for rapid service. The block diagram (page 66) shows the modules and the wiring between them. It also shows wiring between modules and components (switches, motors, coils).

The most likely cause of phonograph problems are:

1. Continuous or intermittent opens in harness. The cause can be; the wiring, the terminal, or a bad wire to terminal crimp.
2. A defective module. A list is shown below.

It is important to troubleshoot logically so that effort is not wasted in removing and replacing the wrong parts. Most failures are caused by minor defects, such as loose connections or dirty contacts. Check the following before replacing any parts.

1. Check that all plugs are firmly seated.
2. Check that connector pins are not bent, broken or pushed through the back of the connector when mated.
3. Check that wires are not broken at connector pins.

CONTINUOUS FREE PLAY

In some cases, continuous free play operation is desirable. Set the phonograph to "free play" by positioning the "Test-Norm" switch, on the central control computer, to test. This gives continuous credit and selections may be made.

If automatic continuous music is desired set the playmaker switch on the central control computer to "continuous". This will keep the location in Music until repairs can be made.

PART NO.	DESCRIPTION	NOTES
6-08870-04	Central Control Computer (C.C.C.)	Module contains Circuit Board Ass'y - C.C.C. 6-08871-03
4-07221-02	Mechanism Control	Module contains Circuit Board Ass'y - Mech Control 6-08708-02
4-07706-01	Power Supply	
6-08878-04	Pricing Board	
4-07363-01	Digital Display	

TROUBLESHOOTING CHARTS

One of the best ways to isolate a problem is to determine the exact state of the phonograph when the failure occurs. This means recording the condition of digital display, status LED's, gripper bow, detent pawl, magazine, cam switches, etc.

This information can help you identify the cause of intermittent or continuous failures.

The chart has three columns.

The trouble column lists different types of failures.

The symptom column shows the state of the phonograph when the failure occurs.

The last column shows the probable cause.

TROUBLE	SYMPTOM	PROBABLE CAUSE
Phonograph fails to operate when power is turned on	LEDs on power supply and fluorescent lights fail to light.	<ol style="list-style-type: none"> 1. Rear power switch off. 2. Plug not in wall 3. Wall circuit is dead 4. 10 amp circuit breaker tripped 5. Wiring to rear power switch 6. Rear power switch.
	LEDs on power supply fail to light but fluorescent lamps lit	<ol style="list-style-type: none"> 1. 2 amp circuit breaker tripped. 2. Power Supply 3. 28 VAC overload from bill acceptor or mag., transfer, or T.T. motor
	"+8 VDC" LED on power supply fails to light but lights when phono harness at power supply is unplugged	<ol style="list-style-type: none"> 1. Central Control Computer 2. Mech control 3. Wallbox interface 4. Bill Acceptor 5. On/Service/Off switch 6. Wiring <p>NOTE: To locate problem reconnect phono harness and unplug connectors in order below. If +8 VDC LED lights replace last unit unplugged.</p> <ol style="list-style-type: none"> 1. Wallbox Interface (J103) 2. Central Control Computer (J105) 3. Mech Control Harness (J205) 4. Mech Control (J206) 5. Bill Acceptor
	"+28 VDC" LED on Power Supply fails to light but lights when Phono Harness at Power Supply is unplugged	<ol style="list-style-type: none"> 1. Mech Control Board 2. Bill Acceptor 3. Detent Coil 4. Wiring

TROUBLE	SYMPTOM	PROBABLE CAUSE
Magazine does not rotate when power is turned On or a Selection is made	"Mag. Motor" and "Detent" LED's ON, detent is actuated	1. Wiring to Magazine Motor 2. Magazine Motor 3. Mech. Control Board
	"Mag. Motor" and "Detent" LED's ON, Detent not actuated	1. Wiring to Detent Coil 2. Detent Coil 3. Mech. Control Board
	"Mag. Motor" LED OFF or "Detent" LED OFF	1. Wiring from Central Control Computer to Mech Control Board 2. Central Control Computer 3. Mech. Control Board
Makes wrong selections	OPT SW Index or OPT Sw. Home operating intermittantly	1. Readjust Sprag Assembly (See Page 18) 2. Readjust Optical Switch (See Page 20) 3. Check Detent Coil Adjustment (Page 18)
Magazine Rotates Continuously	"Mag Motor" LED OFF	1. Wiring to Magazine Motor 2. Mech. Control Board
	"Mag. Motor" LED ON. and "Opt. Sw. Index" LED not flashing, and/or "Opt. Sw. Home" LED does not flash at record number 99.	1. Optical Switch 2. Wiring to Optical Switch 3. Mech. Control Board 4. Optical Switch or Home Position Blocked
	"Mag. Motor" LED on and both Optical Sw. LED's Normal	1. Wiring from Central Control Computer to Mech Control Board
Record does not Transfer	"Tran. Motor" LED is ON	1. Wiring to Transfer Motor 2. Mech. Control Board 3. Transfer Motor
	"Tran. Motor" LED is OFF	1. Wiring from Central Control Computer to Mech Control Board 2. Central Control Computer 3. Mech. Control Board
	"Tran. Motor" LED comes ON and transfer starts but LED and Motor turn off when cam leaves inner cam Switch	1. Outer cam Switch 2. Central Control Computer 3. Mech. Control Board
Transfer Starts when Power is applied and runs continuously	"Tran. Motor" LED is OFF	1. Mech. Control Board 2. Wiring to Motor
	"Tran. Motor" LED is ON	1. Central Control Computer 2. Mech Control Board 3. Wiring from Central Control Computer to Mech Control
Transfer starts and runs continuously	"Tran. Motor" LED comes ON when Motor starts and stays ON	1. Wiring to Outer cam Sw. 2. Out cam Switch 3. Central Control Computer 4. Wiring from Central Control Computer to Mech Control 5. Mech Control Board

TROUBLE	SYMPTOM	PROBABLE CAUSE
Turntable motor does not run	"T.T. Motor" LED is ON	1. Wiring to T.T. Motor 2. T.T. Motor 3. Mech Control
	"T.T. Motor LED is OFF	1. Wiring from Central Control Computer to Mech Control Board. 2. Central Control Computer 3. Mech. Control Board
Record will not Cancel when Finished Playing	"Cancel" LED is ON	1. Wiring from Mech Control to Central Control Computer 2. Central Control Computer 3. Also see "Record Does not Transfer"
	"Cancel" LED is OFF	1. Wiring to Cancel Switch 2. Cancel Switch 3. Mech. Control Board
Mech will not cancel with no record on T.T.	Cancel LED is off	1. Mute Plug to Amp is unplugged 2. AC Receptacle to Amp is unplugged
Record Cancels without Playing	"Cancel" LED stays ON	1. Short in Cancel Switch Wiring 2. Cancel Switch 3. Mech Control Board
	"Cancel" LED flashes ON as Record sets down	1. Auto Cancel Misadjusted
	"Cancel" LED does not flash	1. Wiring to outer cam Switch 2. Outer cam Switch 3. Wiring from Mech Control to Central Control Computer 4. Mech Control Board 5. Central Control Computer
Left Side of Record Plays when Right Side Selected	"Toggle" LED is ON	1. Wiring to Toggle Coil(s) 2. Toggle Coil(s) 3. Mech. Control
	"Toggle" LED is OFF	1. Wiring from Central Control Computer to Mech Control Board 2. Central Control Computer 3. Mech. Control Board
Money Counter or Play Counter Fails to Count	Fails to Count	1. Wiring to Counter 2. Counter 3. Mech Control Board 4. Wiring from Central Control Computer to Mech Control 5. Central Control Computer
Automix does not Work	Turntable Motor runs, Hub does pop up, but speed changes for 33 RPM Records	1. Hub Shift Wiring 2. Automix Switch 3. Hub Shift Coil
	Turntable Motor Runs, Hub pops up, but speed does not shift for 33 RPM Records	1. Speed Shift Wiring 2. Automix Switch 3. Speed Shift Coil
	Hub does not pop up and speed will not change	1. Wiring 2. Automix Switch 3. Mech. Control Board

TROUBLE	SYMPTOM	PROBABLE CAUSE
Phonograph is always in Service ("Memorec") Mode of Operation	Record Number / Times selected Display is always lit	1. On/Service/Off Switch 2. "+8 on Signal" Wiring 3. Central Control Computer
Phonograph will not go into Service Mode of Operation	Record Number/ Times selected Display will not light when ON/Service/Off Switch is in Service Position	1. Central Control Computer 2. "+8 On Signal" Wiring 3. On/Service/Off Switch
No Credit	No Credit given by Coins and Dollar Bill	1. Central Control Computer
	No Credit given by Coins but Dollar Bill gives Credit	1. Coin Switch common wiring 2. Central Control Computer
	One value of Coin will not give Credit	1. Coin Rejected 2. Wiring to Coin Switch 3. Coin Switch 4. Central Control Computer
	Dollar Bill will not give Credit	1. Bill Acceptor 2. Wiring to Bill Acceptor 3. Central Control Computer
Wrong Credit	Credit for amount deposited does not agree with Price Card setting	1. One or more Coins did not register (See No Credit) 2. Pricing Chips 3. Pricing Board 4. Wiring from Pricing Board to Central Control Computer 5. Central Control Computer 6. Coin Switch Wiring incorrect (See Page 25)
System does not respond to Key board	"Make Selection" LED not lit	1. Insufficient Credit
	"Make Selection" LED lit but entire Keyboard does not work	1. Shorted "Reset" Key 2. Central Control Computer 3. Short in "Reset" Key Wiring
	"Make Selection" LED lit but certain Keys do not work	1. Wiring from Central Control Computer to Pricing Board 2. Keyboard 3. Central Control Computer 4. Pricing Board
Digital Display does not work	Display Lights but shows Wrong Information	1. Central Control Computer
	"+8 VDC" LED on Central Control Computer is lit but Display Digits and LED lamp will not light	1. Central Control Computer
	Certain LED Lamps and/or Digits will not work	1. Wiring from Central Control Computer to Digital Display 2. Digital Display 3. Central Control Computer

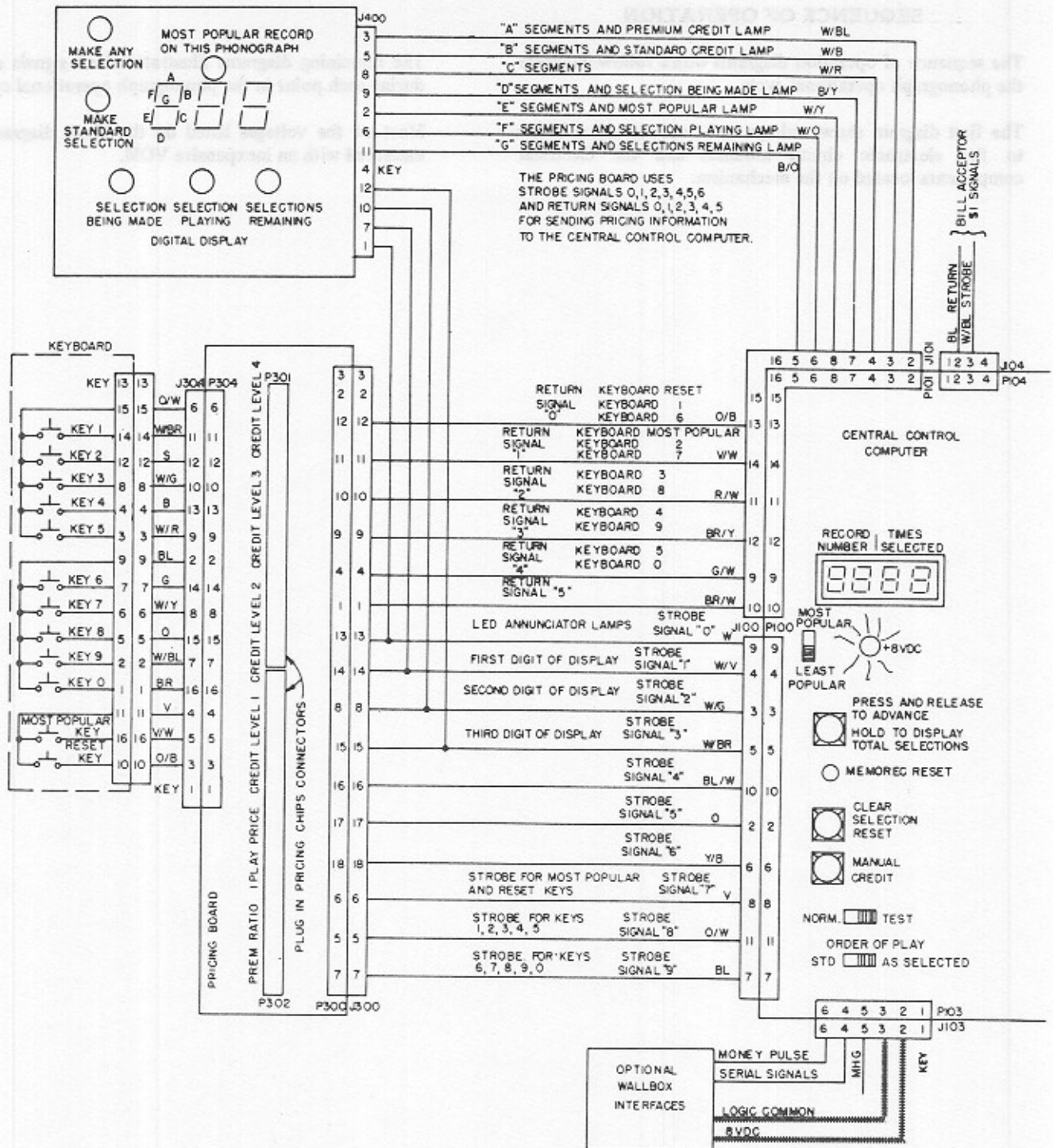
SEQUENCE OF OPERATION

The sequence of operation diagrams which follow illustrate the phonograph operational cycle.

The first diagram shows voltage and common connections to the electronic circuit modules and the electrical components located on the mechanism.

The remaining diagrams illustrate which signals are active during each point in the phonograph operational cycle.

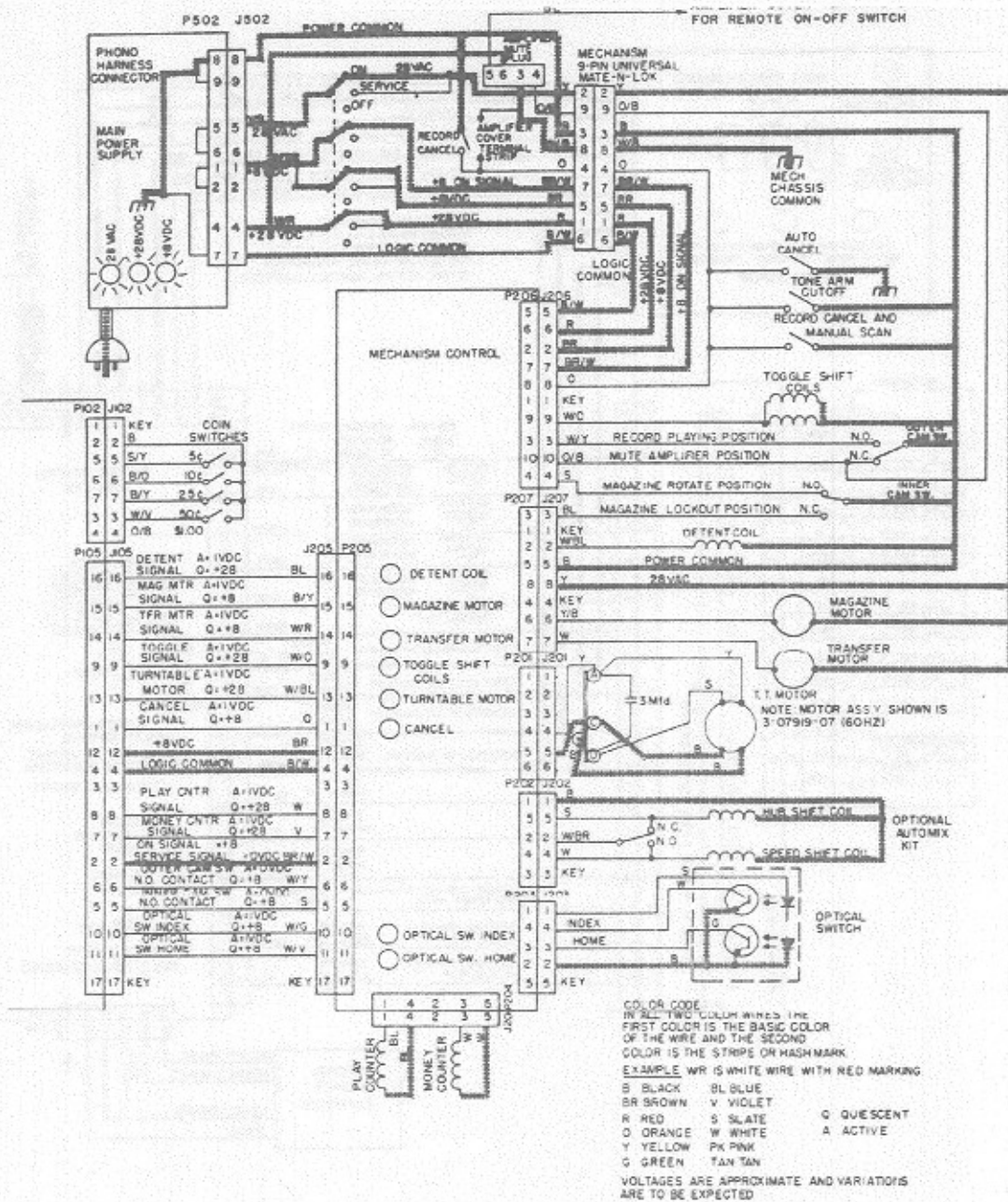
Most of the voltages listed on the block diagram can be measured with an inexpensive VOM.



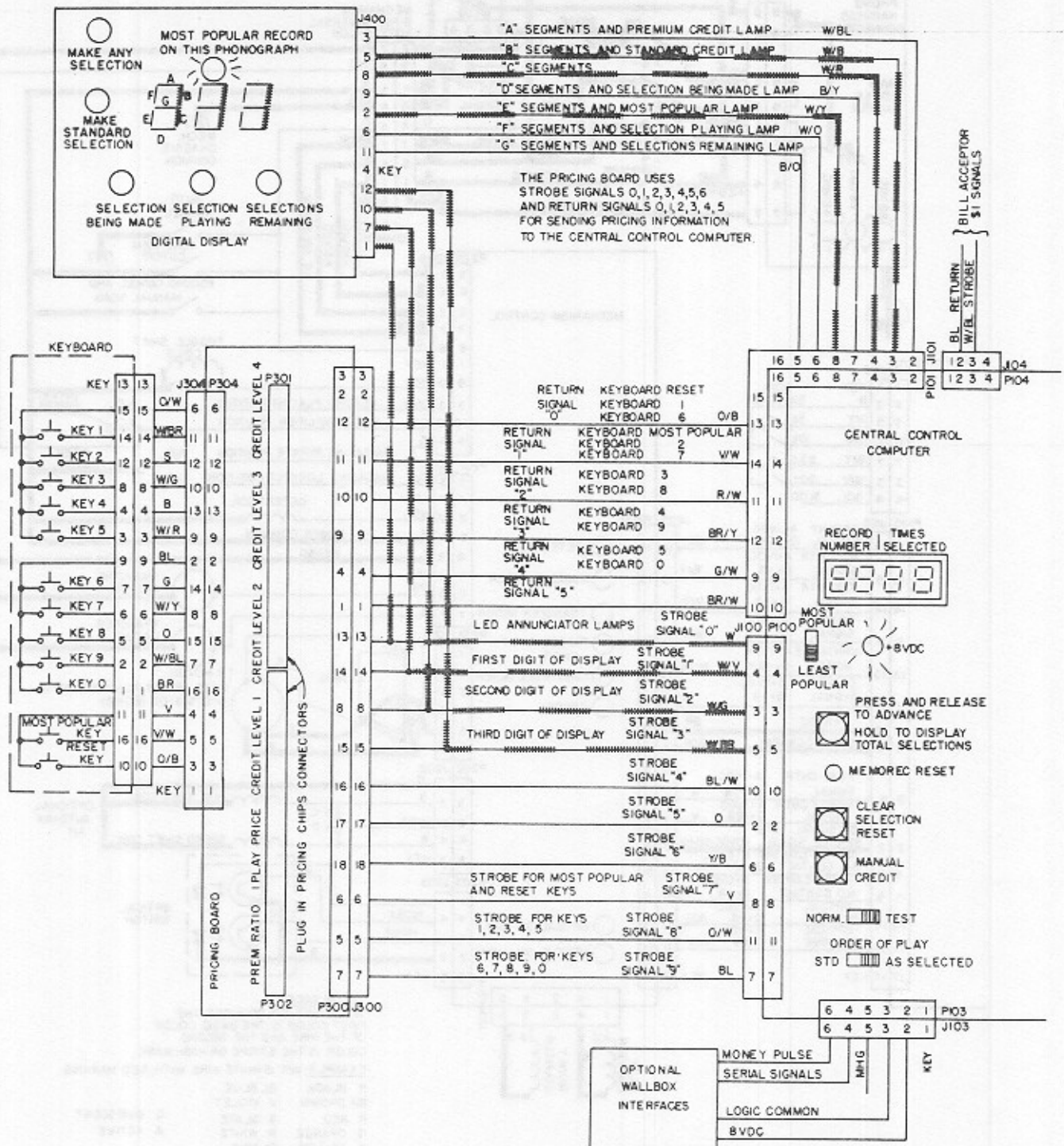
1

Power turned on, voltages and commons applied to circuits and components.

1. Power flows thru power cord and power switch to energize power supply. The three power supply LEDs light. The voltages go thru on-service-off switch and energize 28 VAC, + 28 VDC, and + 8 VDC busses. The "+ 8 VDC" LED on C.C.C. lights.
2. "28 VAC" goes to magazine motor, transfer motor, and mechanism control. The 28 VAC is routed thru mechanism control to the turntable motor.
3. "+ 28 VDC" goes to amplifier mute plug, and mechanism control.
4. "Power common" goes to outside record cancel, and manual scan switch, tonearm cutoff, toggle shift coils, inner and outer cam switches, detent coil, and mechanism control. It is routed thru mechanism control to play and money counters, and hub shift and speed shift coils.



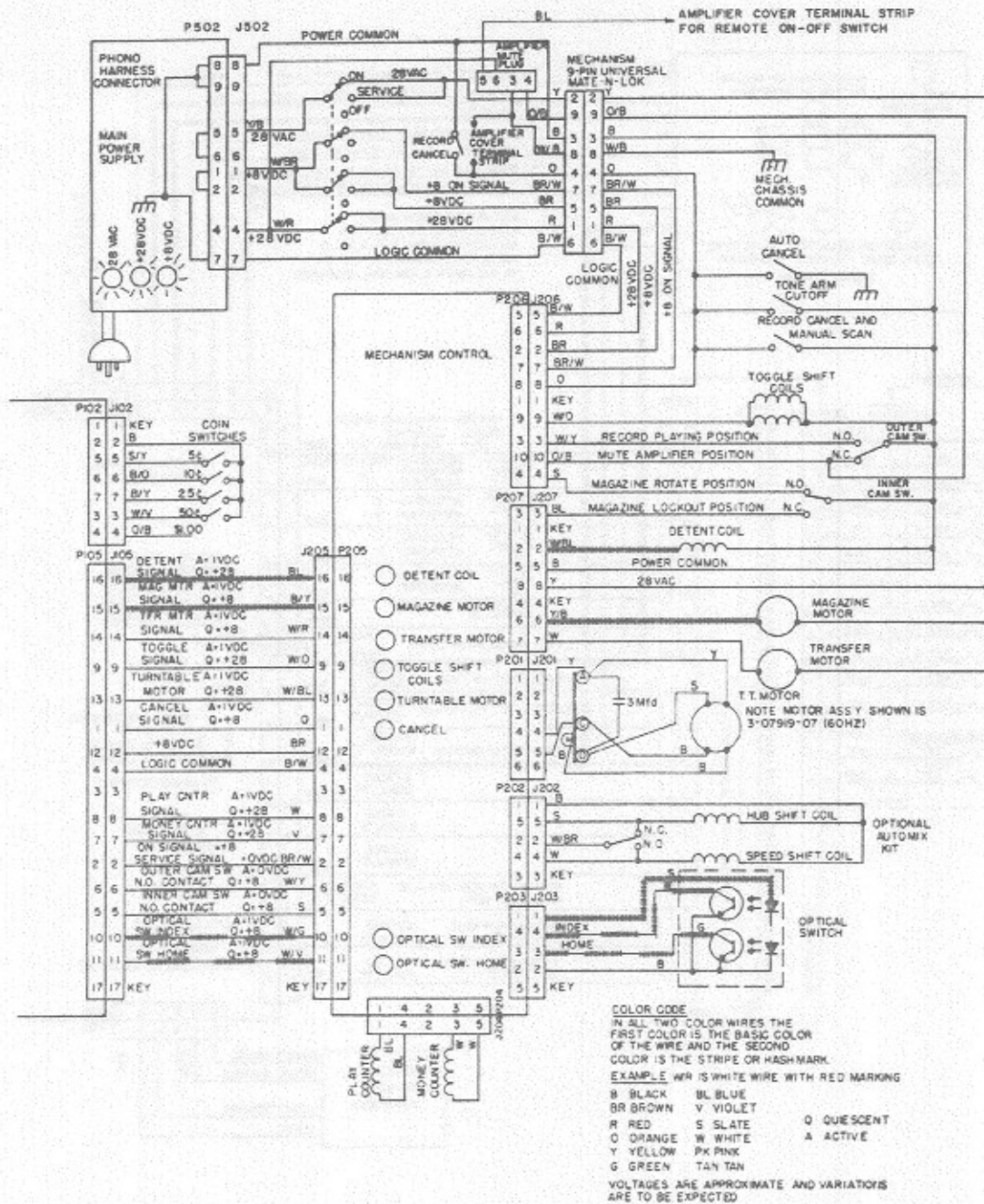
- "+ 8 VDC and logic common" go to mechanism control. They are routed thru mechanism control to the C.C.C. and logic common to optical switch. The C.C.C. routes them to the wallbox interface.
 - "+ 8 on Signal" is routed thru mechanism control to the C.C.C.*
 - "Mech. chassis common" goes to amplifier mute plug, amplifier cover terminal strip and auto cancel.
- * C.C.C. = Central Control Computer



2

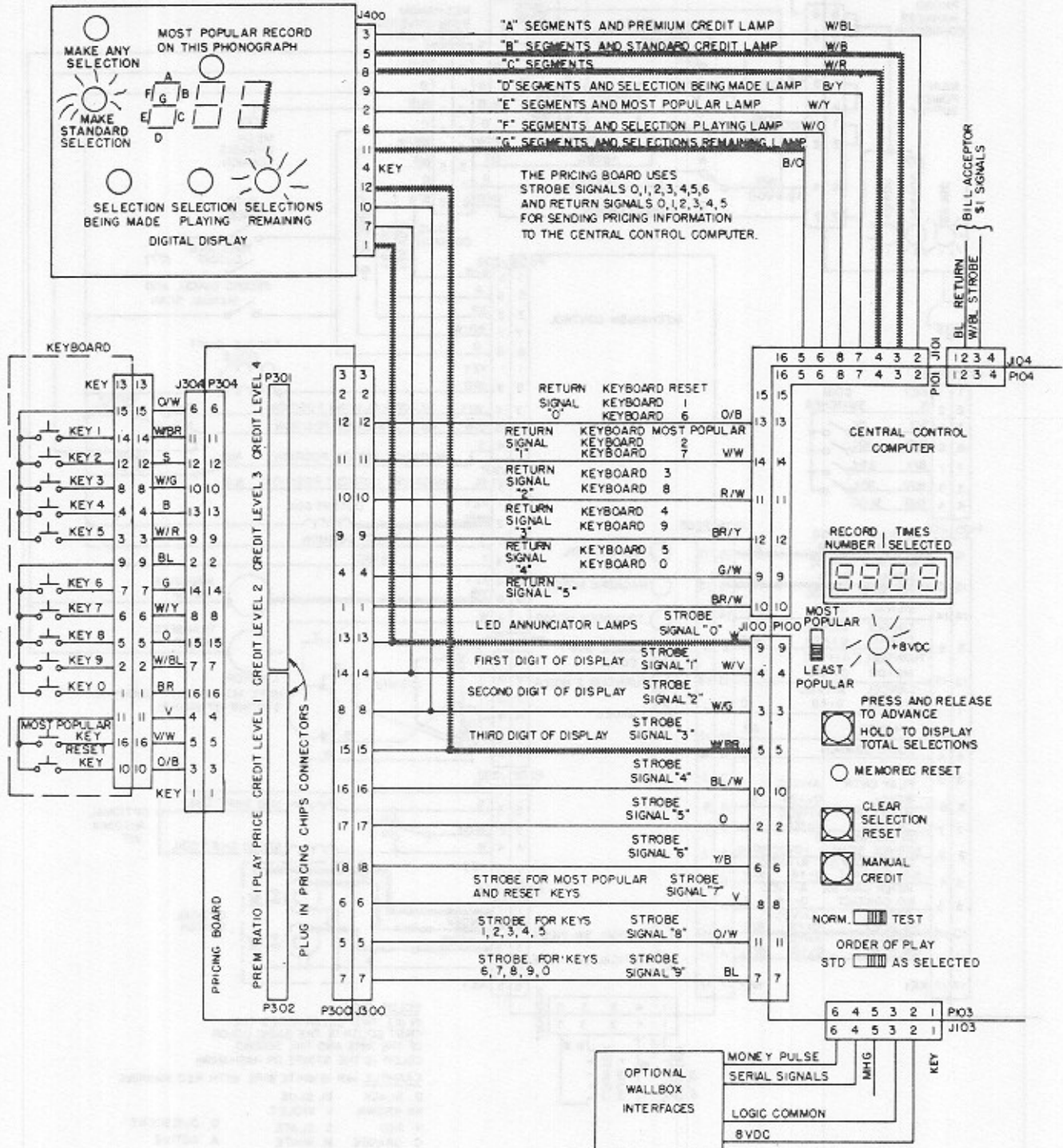
C.C.C. senses power turned on (no selections in memory).

1. The C.C.C. begins to constantly monitor the state of all switches and determines that the transfer arm (gripper bow) is in home position.
2. C.C.C. sends the detent and mag. motor signals to the mechanism control. The "detent" and "Mag. Motor" LED's light. The mechanism control energizes the detent coil and magazine motor.
3. The magazine rotates and magazine gear teeth interrupt the optical switch light beam causing the "optical sw. index" LED to flash. The C.C.C. advances the magazine (record) position by one each time the LED flashes from dark to light.

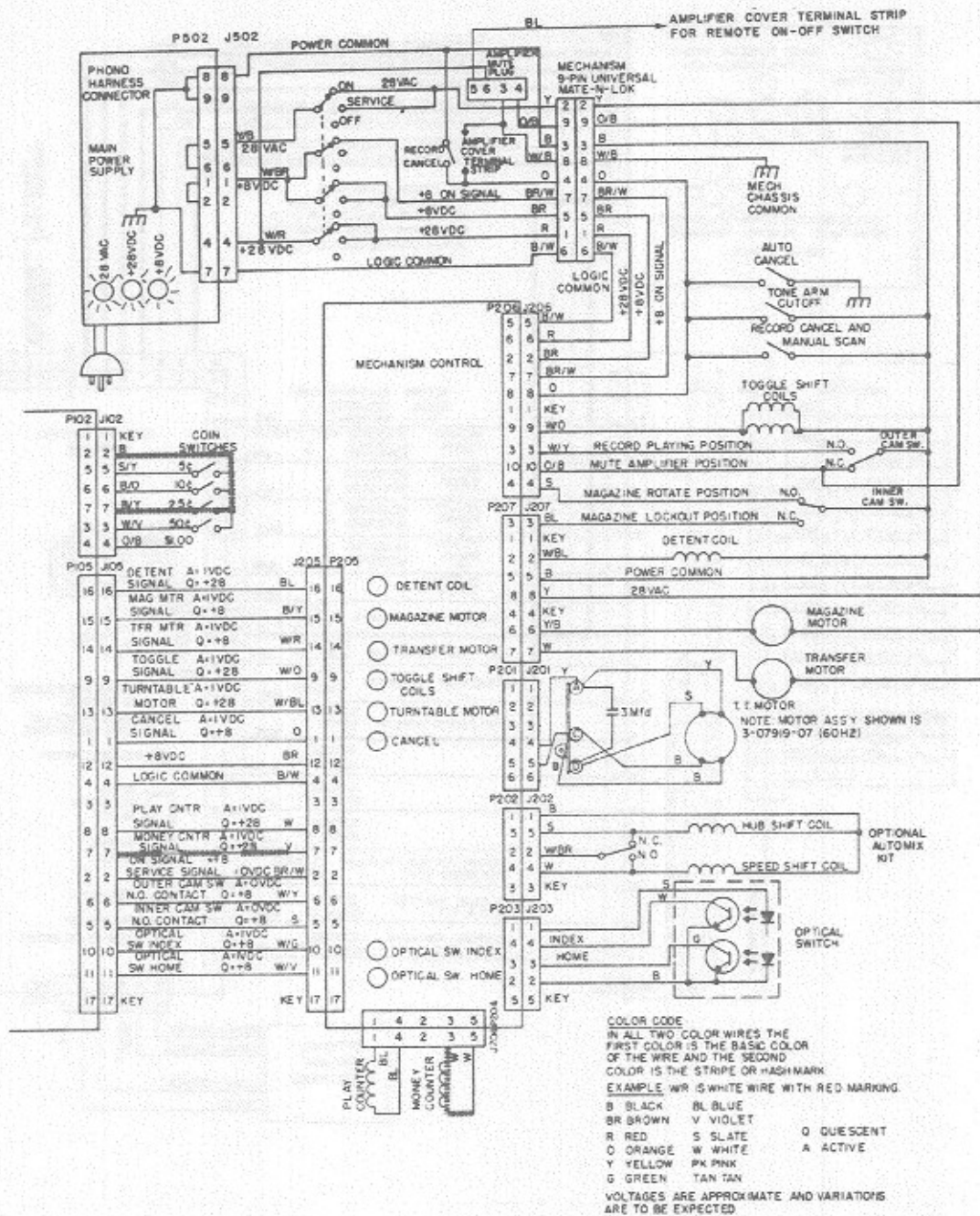


The "optical sw. home" LED lights when record position "99" aligns with the transfer arm. When this happens the C.C.C. sets the next magazine position equal to record "0".

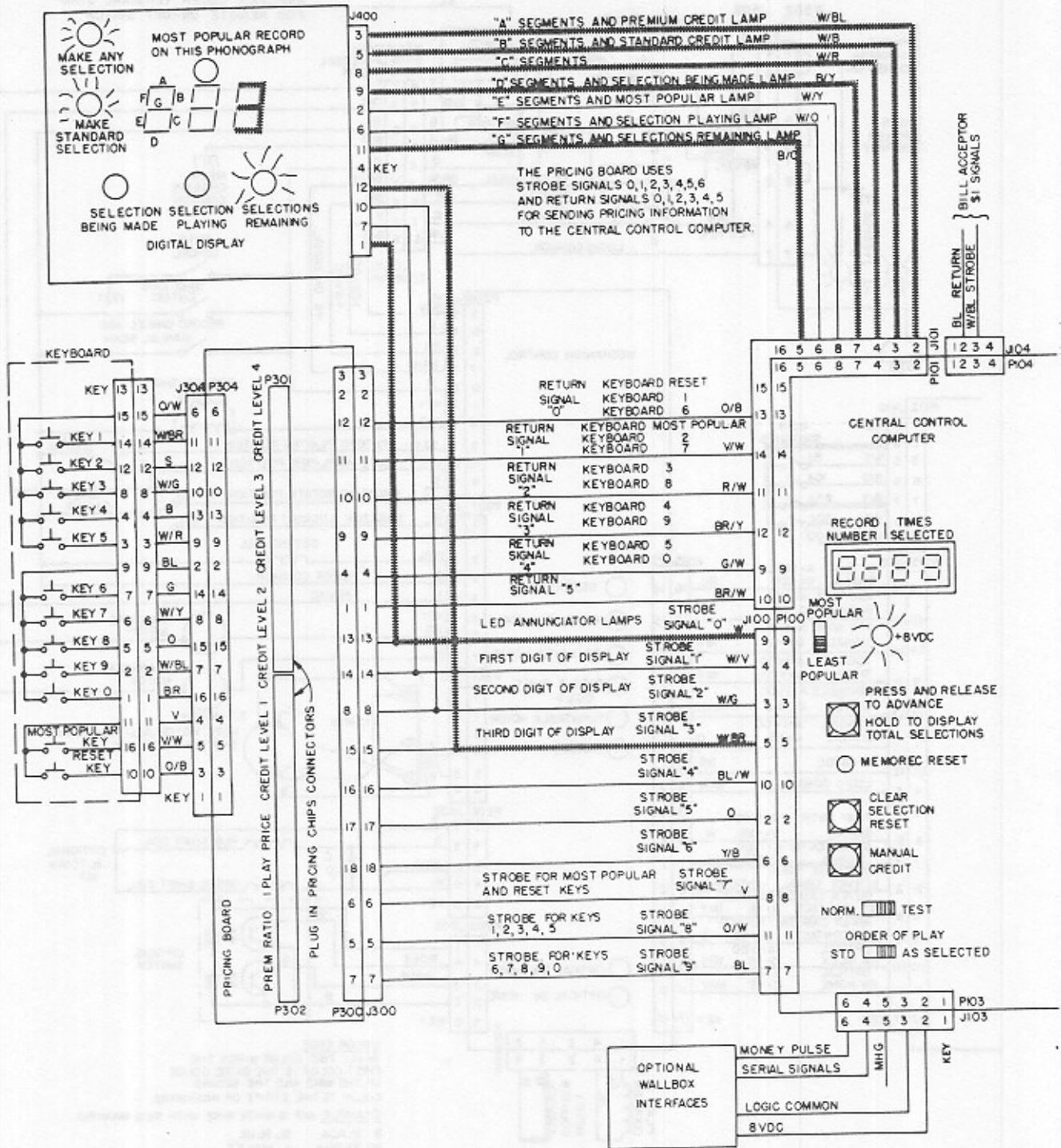
4. Digital display and most popular LED flash and show most popular record on the phono. This continues during standby. The diagram shows record "111" as the most popular.



- 3
- Patron inserts quarter. Standard credit established. (Credit is set at 1 play for 25¢, 3 for 50¢ and 1 premium equals 2 standard).
1. Patron inserts quarter into coin slot. The coin passes through the validator and actuates the 25¢ coin switch.
 2. The C.C.C. senses the switch closure and stores 5 money units (nickels) in its memory.
 3. 5 pulses are sent to the money counter.



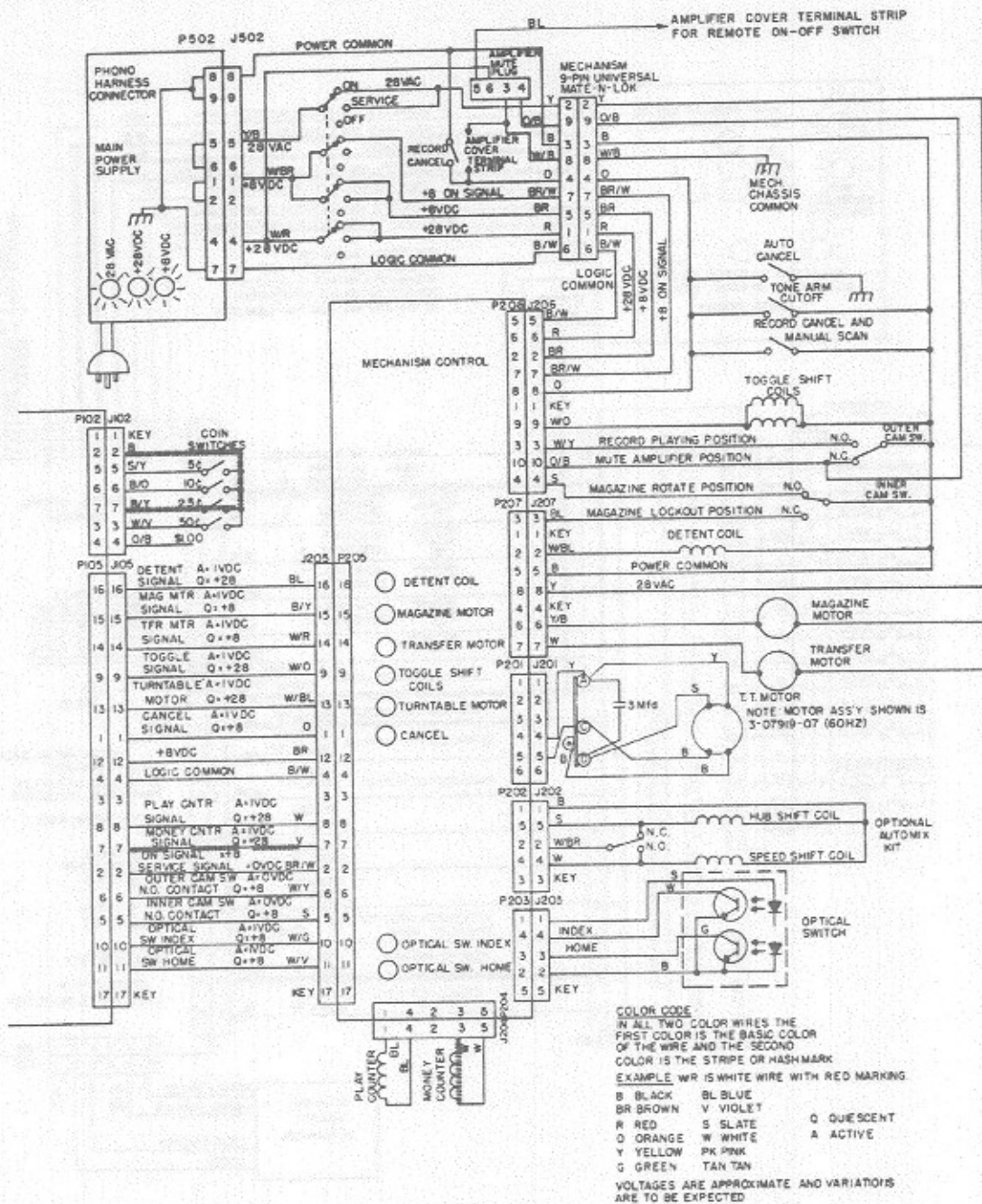
4. The C.C.C. uses the amount of money stored in its memory and the pricing information which it reads from the pricing board to calculate the remaining credit equal to 1.
5. The C.C.C. turns on the "standard credit" LED.
6. The "selections remaining" LED lights and the digital display shows 1 credit for about four seconds.



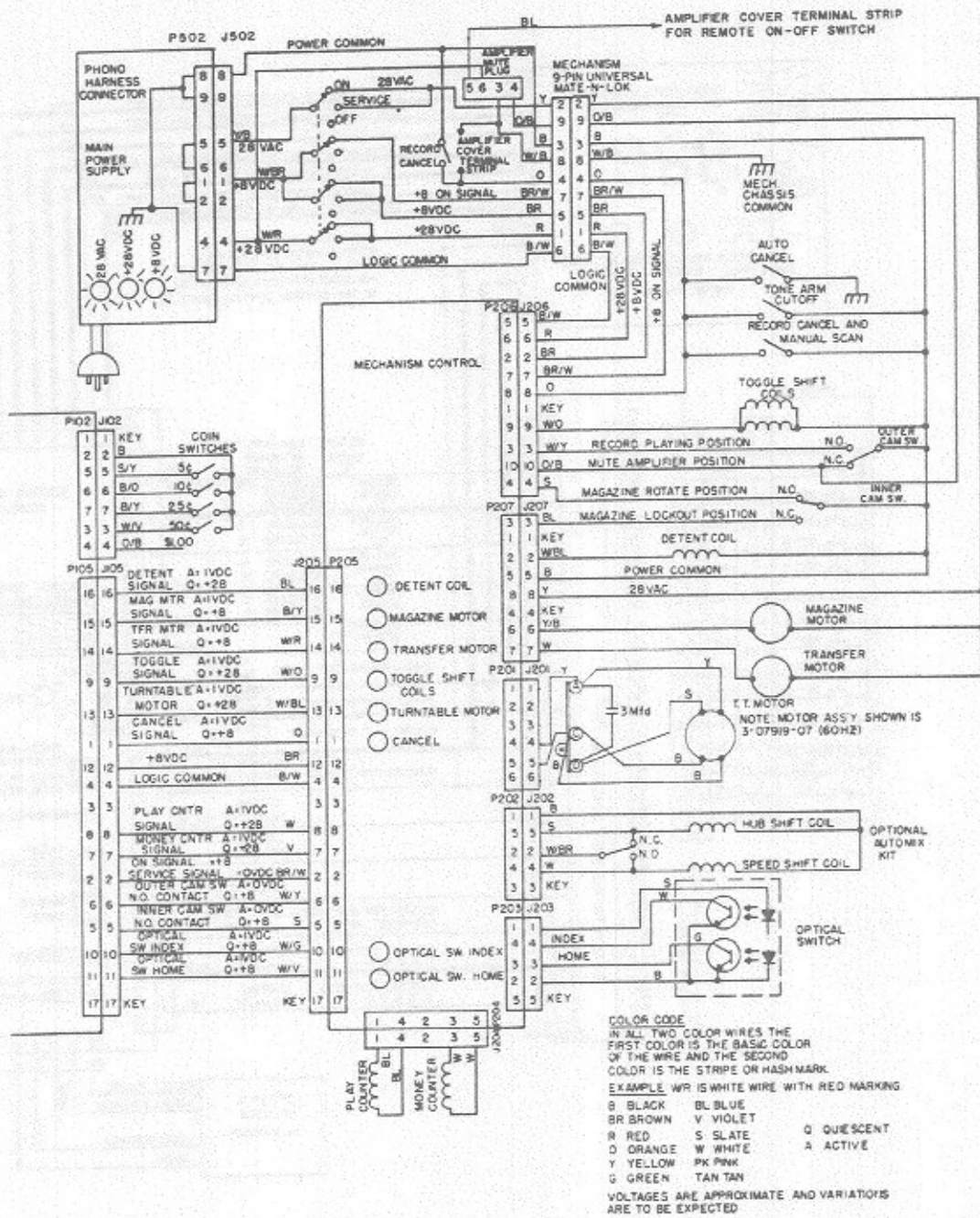
4

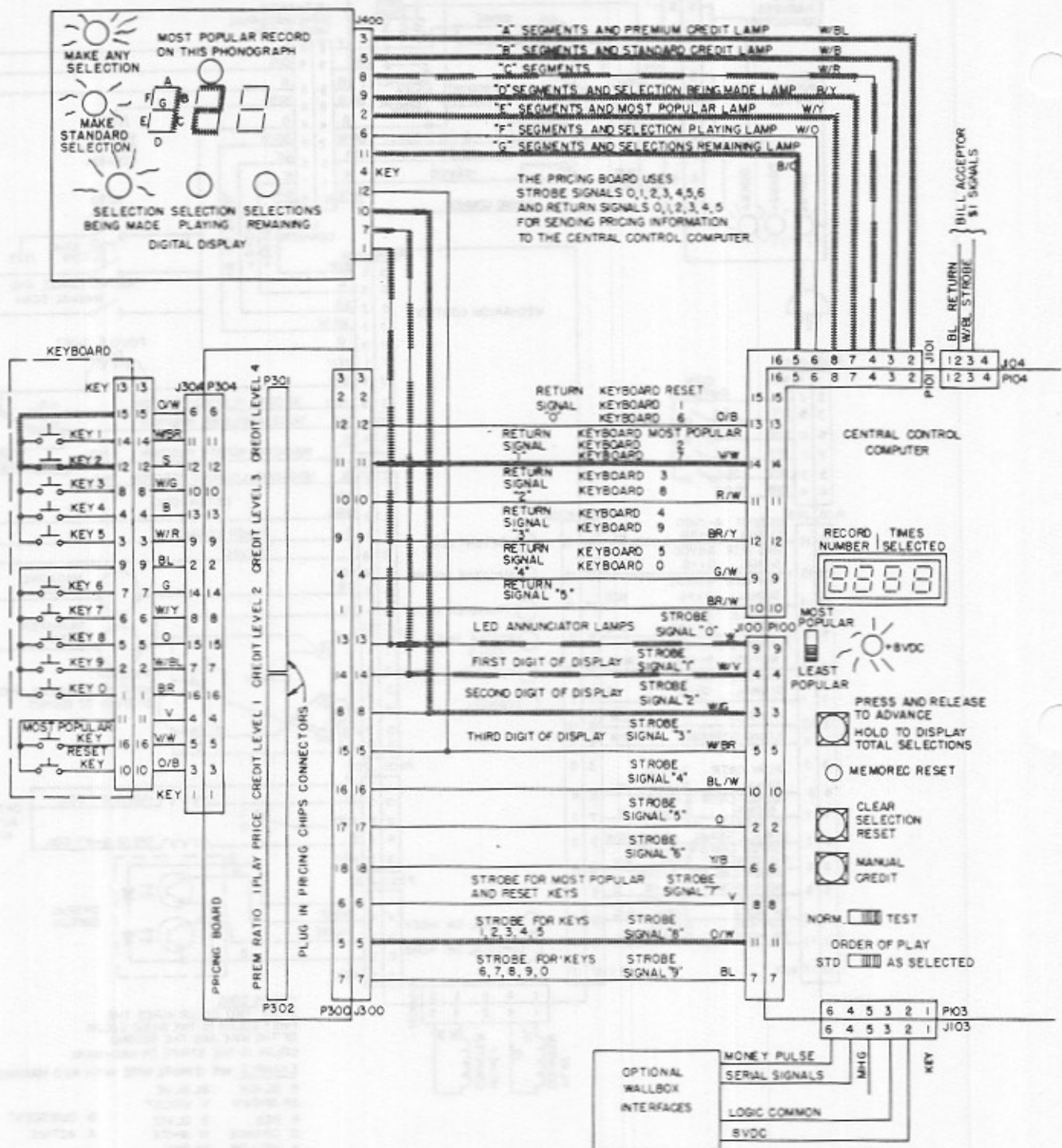
Second quarter inserted. Premium credit established.

1. Patron inserts another quarter into coin slot. The coin passes through the validator and actuates the 25¢ coin switch.
2. The C.C.C. senses the switch closure and stores 5 money units (nickels) in its memory.
3. Five pulses are sent to the money counter.



4. The C.C.C. uses the amount of money stored in its memory and the pricing board information to calculate the remaining credit equal to 3.
5. C.C.C. turns on both standard credit and "premium credit" LEDs.
6. The "selections remaining" LED lights and the digital display shows 3 credits for about four seconds.

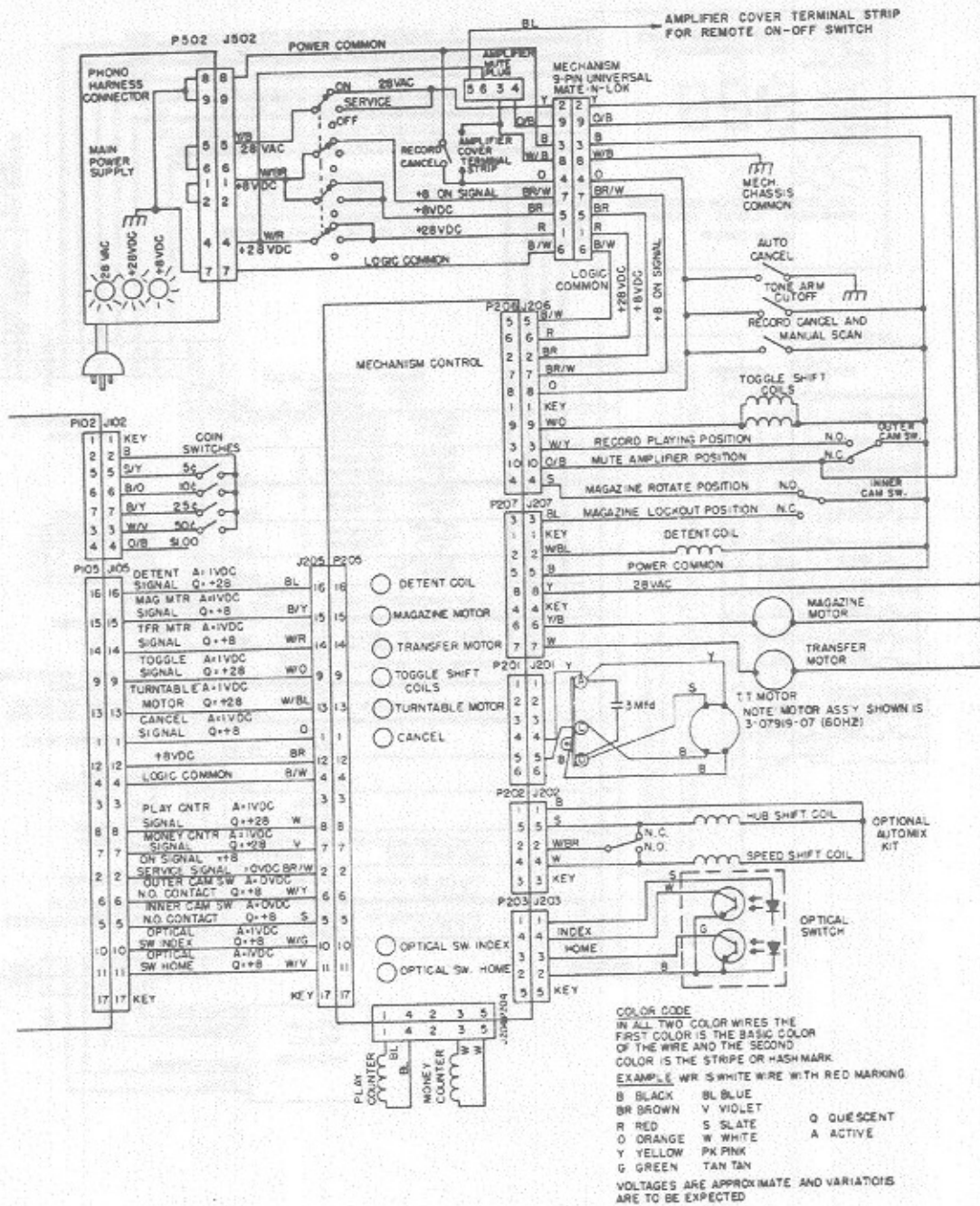




6

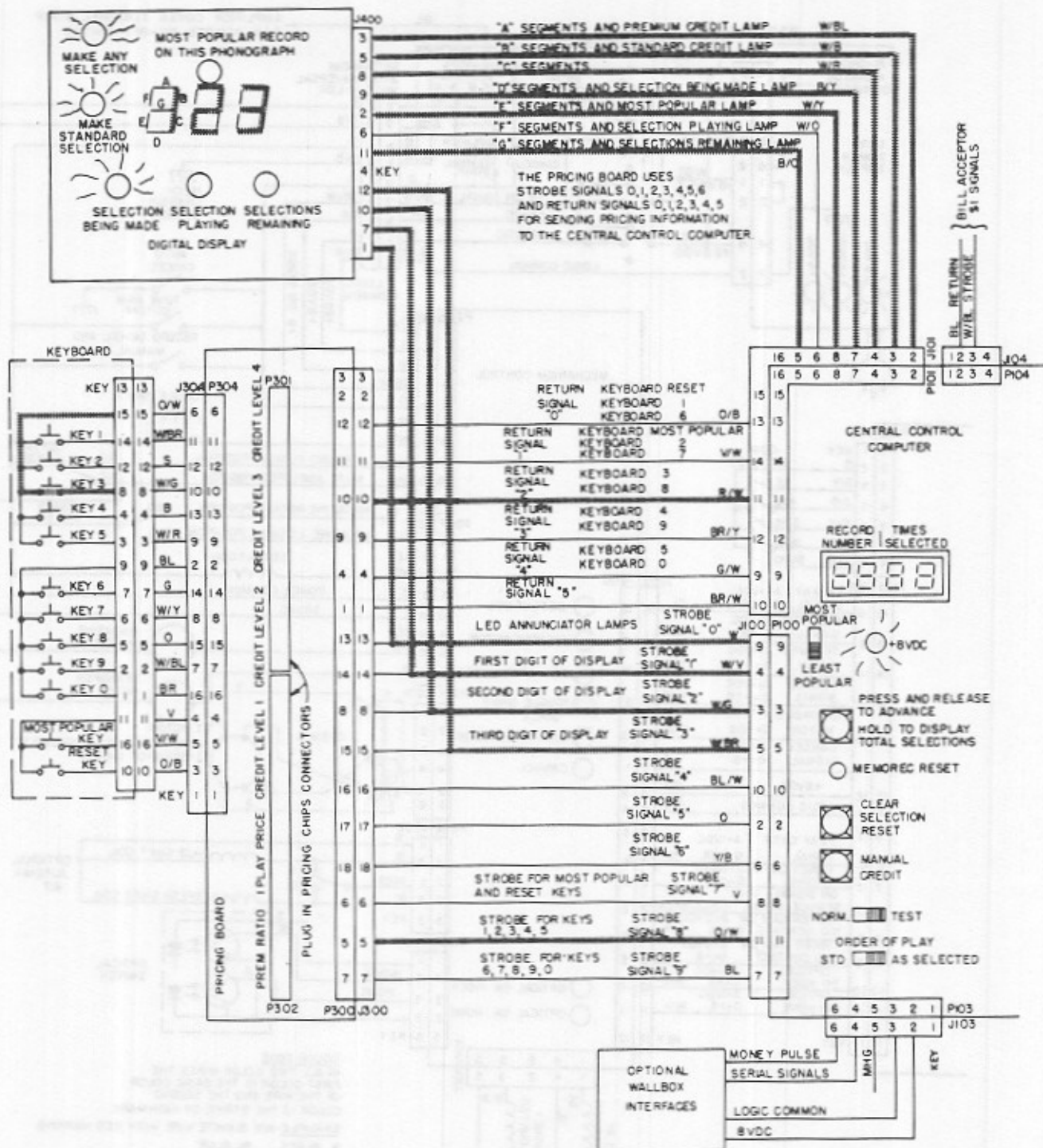
Second digit selected and displayed.

1. Patron presses second digit of his selection (in this illustration number 2).
2. The C.C.C. senses the key closure, stores the selected second digit and displays it.



NOTE

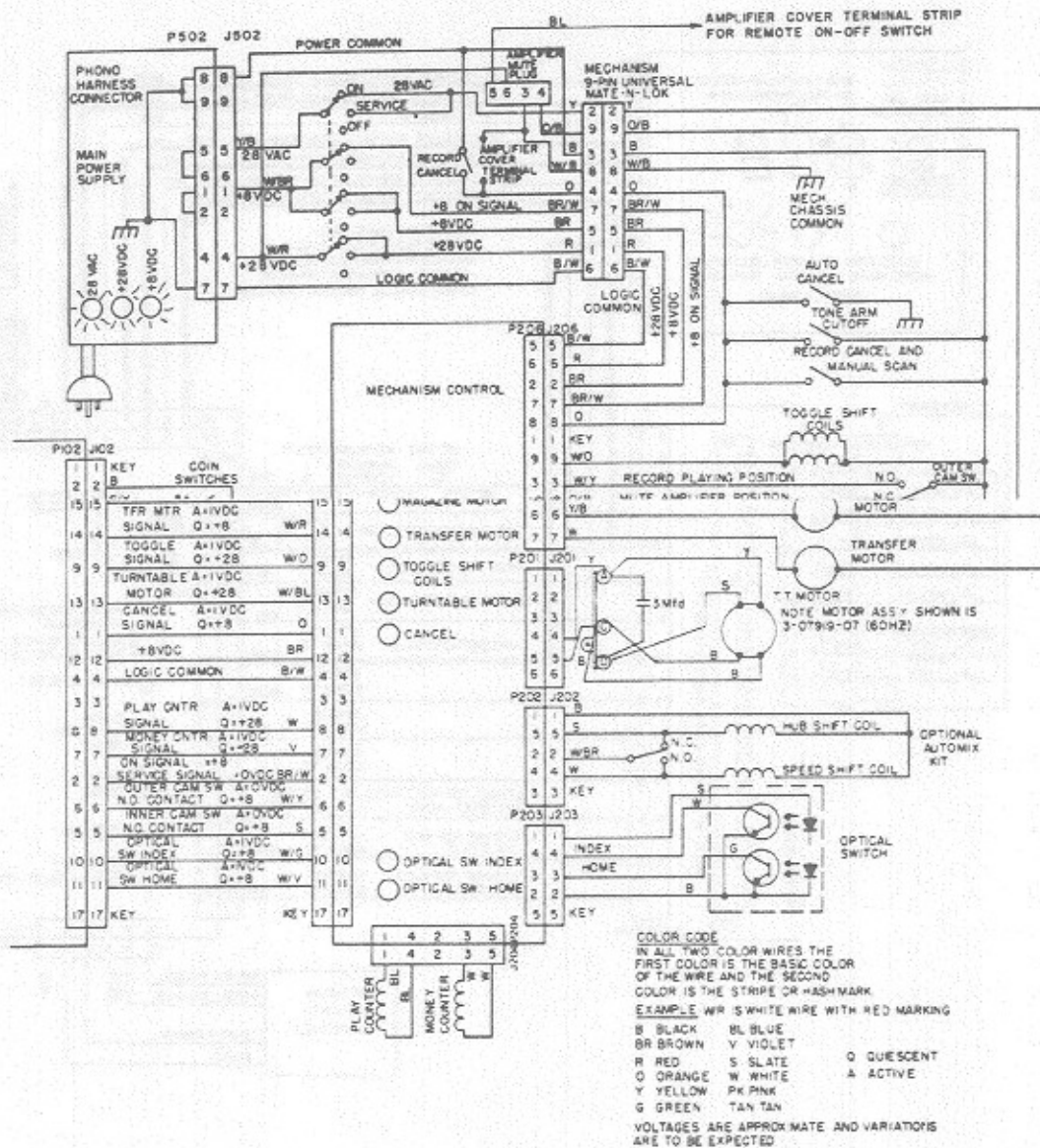
If the phonograph has premium selections and the selection is in a premium group, and premium credit is not available the key is ignored. Either add more credit or make a standard selection.



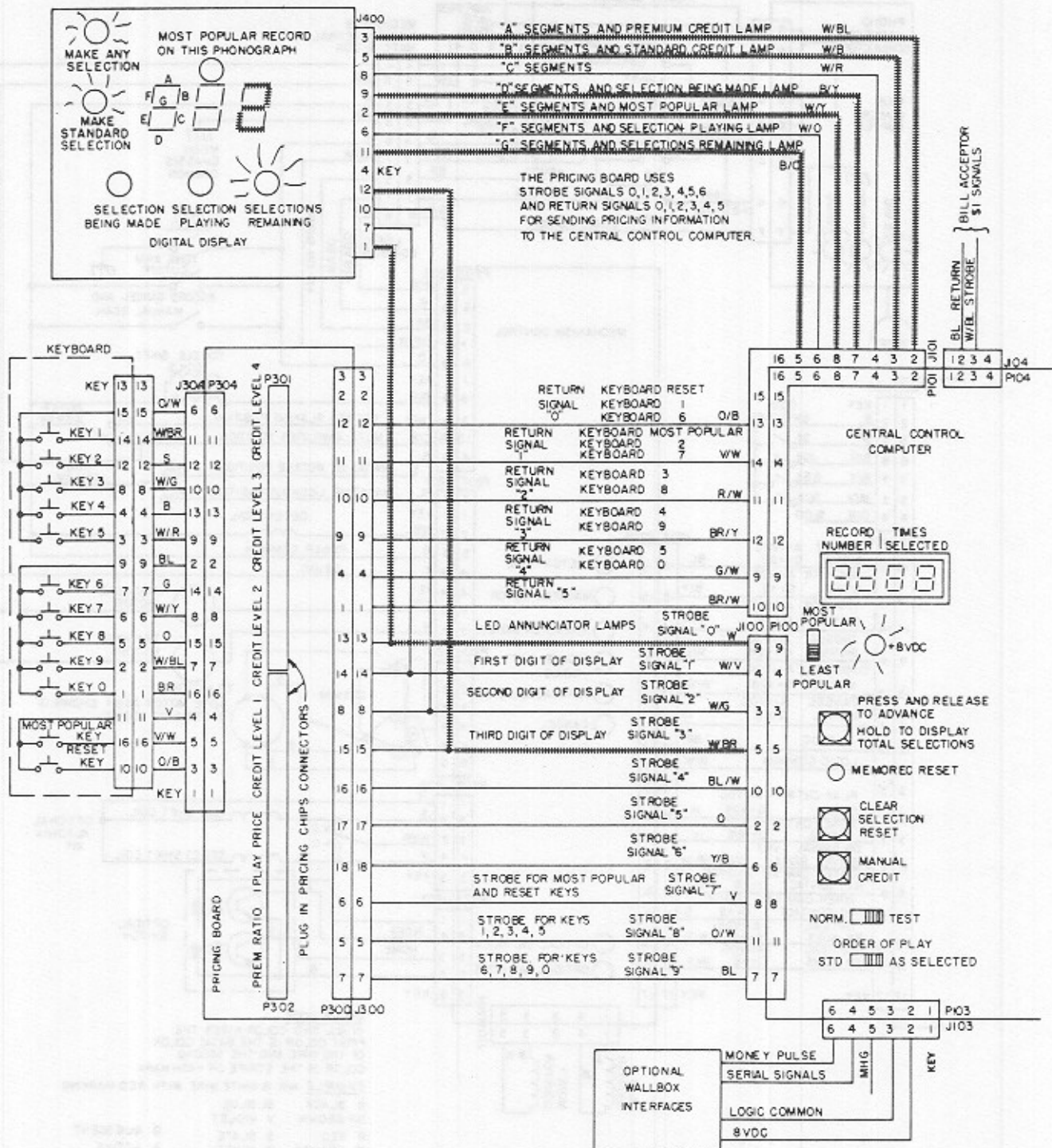
7

Third digit selected and displayed - selection stored, Memorec incremented.

1. Patron presses third digit of his selection (in this illustration number 3).
2. The C.C.C. senses the key closure, stores the third digit and displays it.



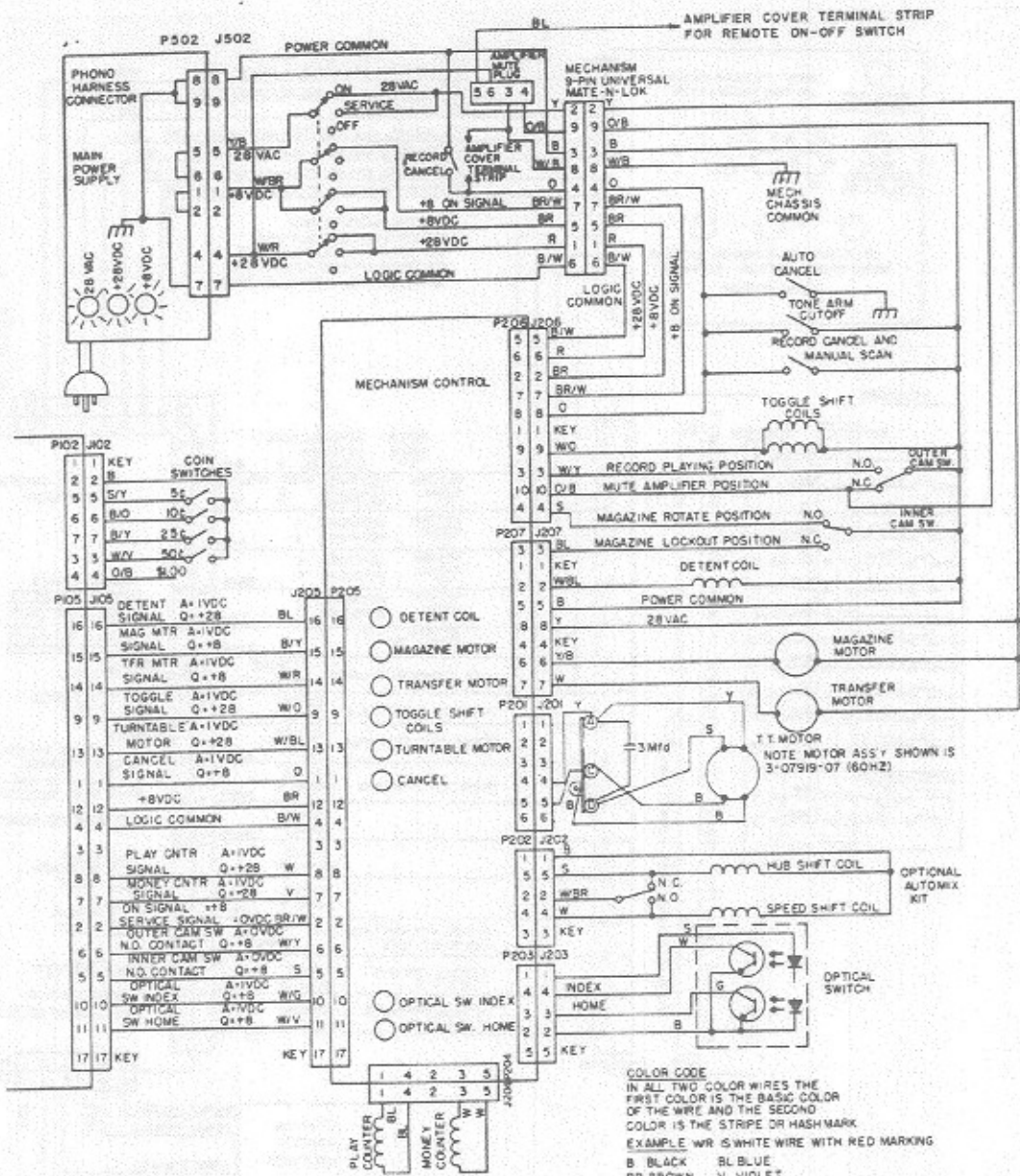
3. Selection is stored in C.C.C.
4. Memorec data in C.C.C. is incremented.



8

Credit cancelled - Selections remaining displayed.

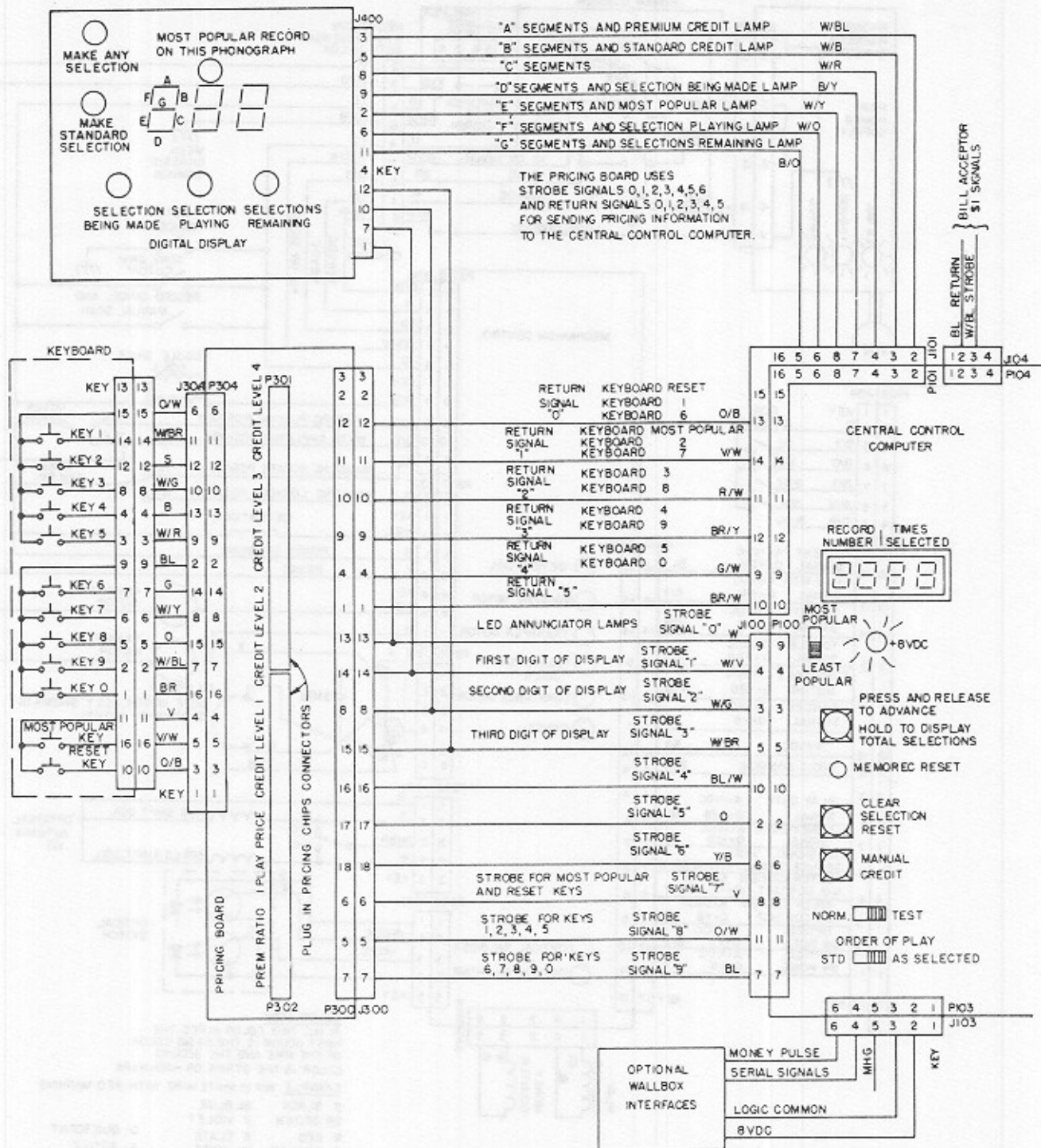
1. C.C.C. cancels one credit (two credits would be cancelled for a premium selection).
2. "Selections remaining" LED lights and display shows 2 credits.



COLOR CODE
 IN ALL TWO COLOR WIRES THE FIRST COLOR IS THE BASIC COLOR OF THE WIRE AND THE SECOND COLOR IS THE STRIPE OR HASH MARK.
 EXAMPLE WR IS WHITE WIRE WITH RED MARKING

B	BLACK	BL	BLUE	V	VIOLET	Q	QUIESCENT
BR	BROWN	W	WHITE	A	ACTIVE		
R	RED	S	SLATE				
O	ORANGE	PK	PINK				
Y	YELLOW	TAN	TAN				
G	GREEN						

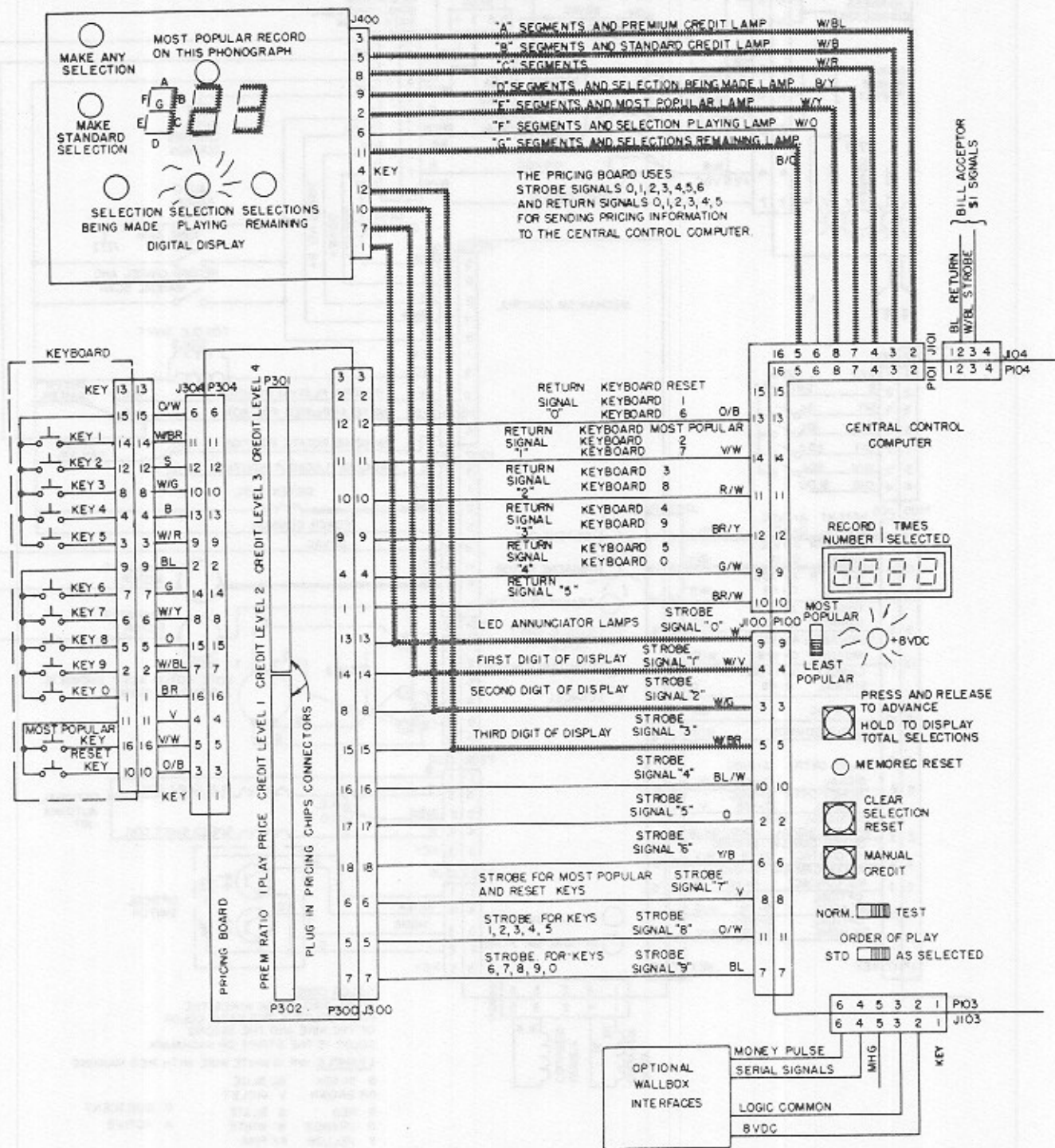
VOLTAGES ARE APPROXIMATE AND VARIATIONS ARE TO BE EXPECTED



9

Detent coil and magazine motor energized - Magazine rotates.

1. C.C.C. signals the mechanism control to energize detent coil. "Detent coil" LED lights and the energized detent coil operates a mechanical linkage to unlock the magazine.
2. After 56 to 70 milliseconds C.C.C. signals the mechanism control to energize magazine motor. "Magazine Motor" LED lights and motor is energized causing the unlocked magazine to rotate.



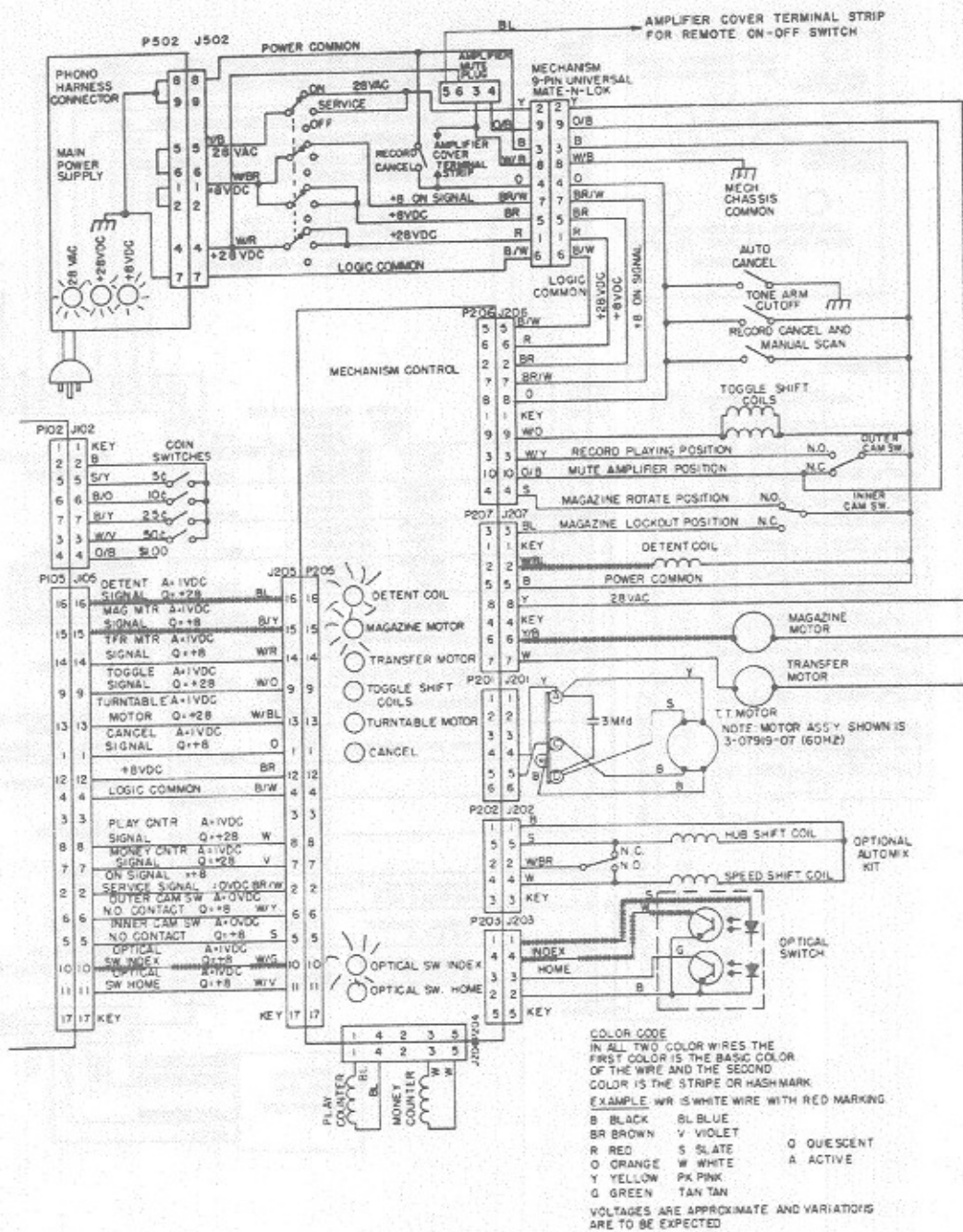
10

Magazine rotates until selection is located.

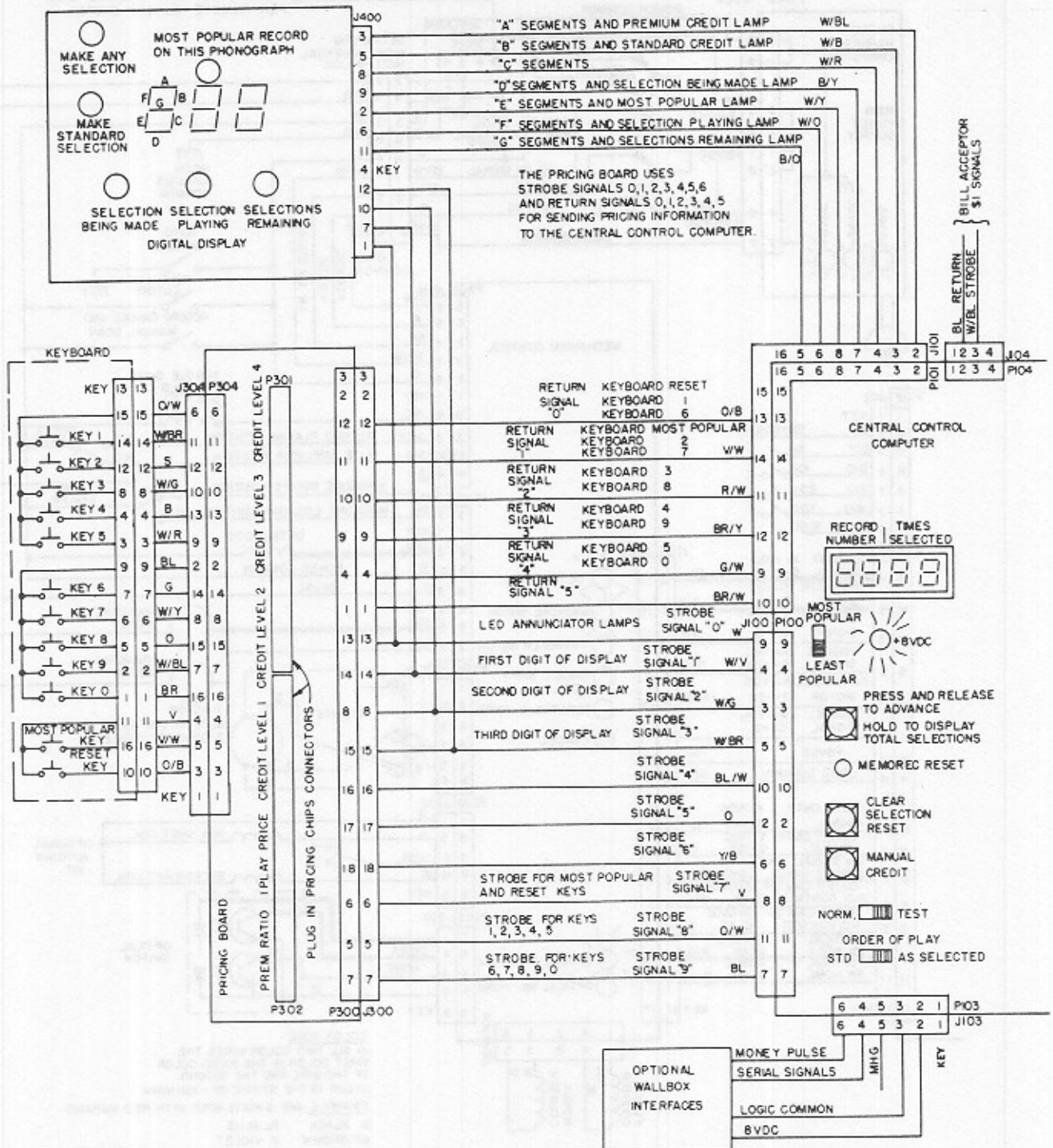
- Magazine rotates and gear teeth interrupt optical switch light beam.

NOTE: "Optical sw. index" LED going from dark to light (off to on) tells C.C.C. the magazine is moving to the next record position and two things happen:

- C.C.C. keeps track of magazine position by adding 1 to value stored in C.C.C.
- C.C.C. checks the selection memory to see if left or right side of this next record has been selected.



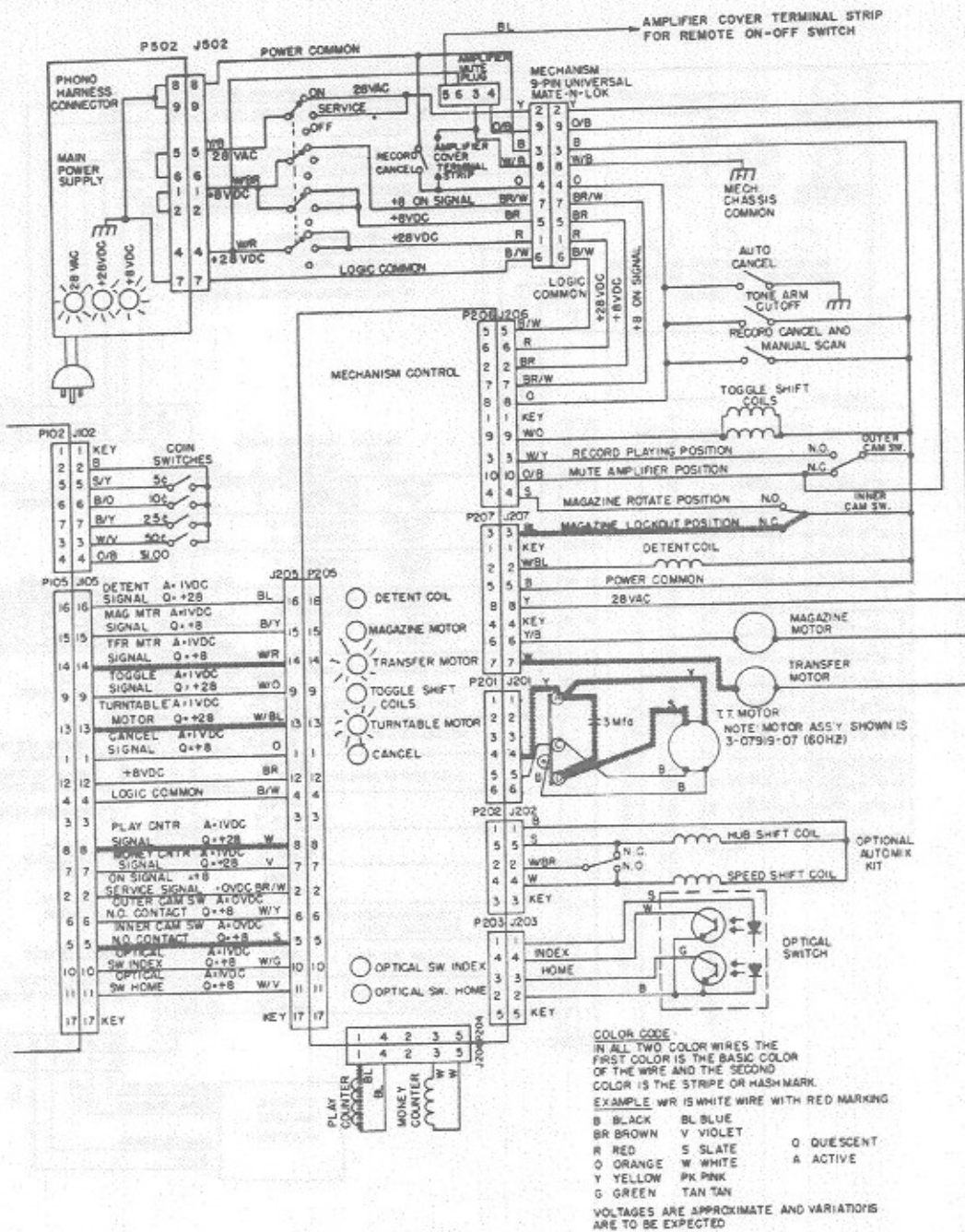
2. C.C.C. turns on "selection playing" LED.
3. Digital display shows magazine record position.



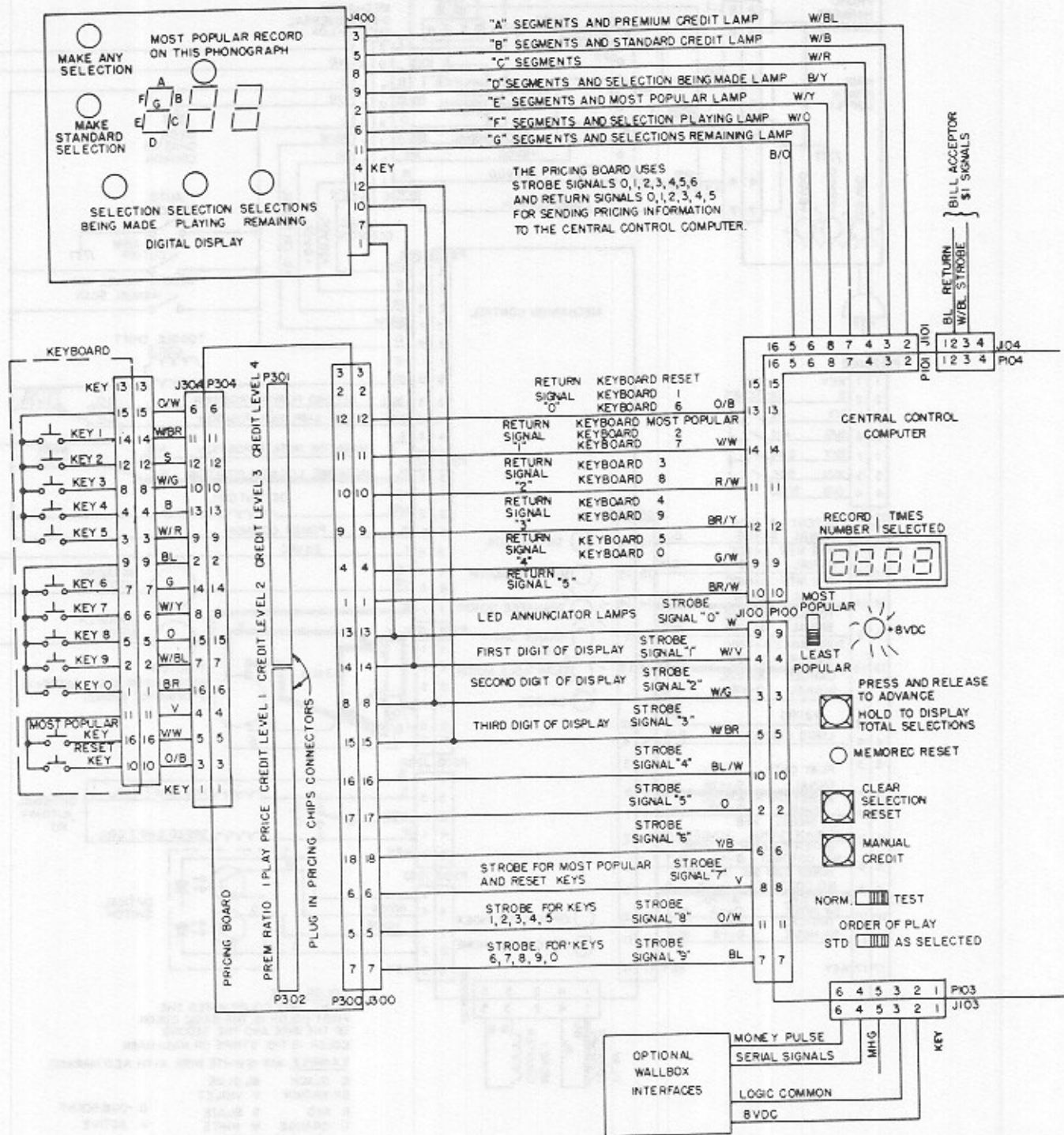
11

Selection located, record transferred to turntable, tone arm set down.

1. C.C.C. signals turn off "detent" and "mag. motor" LEDs causing mechanism control to de-energize detent coil and magazine motor.
2. Magazine is locked by detent pawl falling into slot in detent wheel.



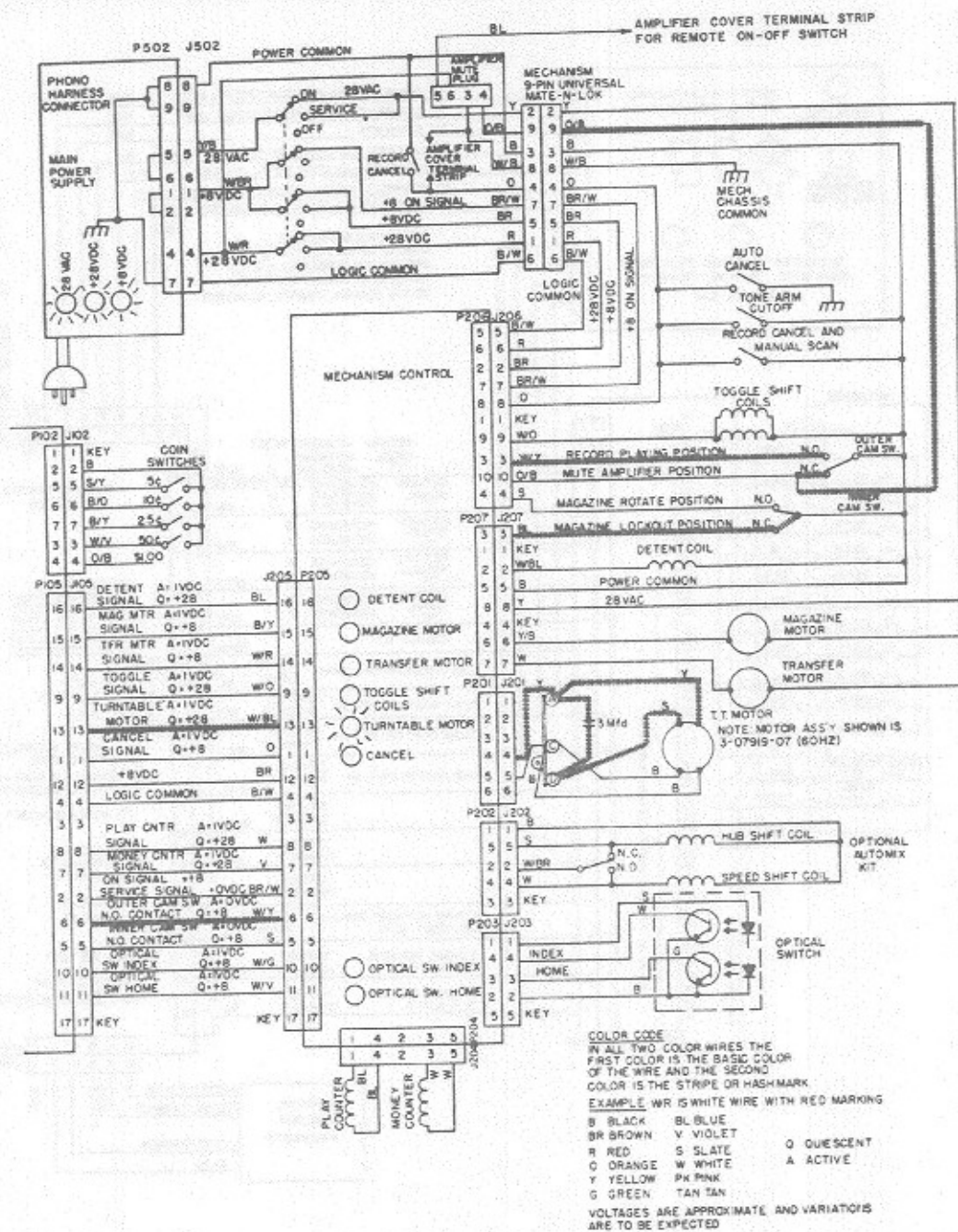
- C.C.C. signals turn on "tran. motor" and "T.T. motor" LEDs, causing mechanism control to energize transfer and turntable motors. C.C.C. signals mechanism control to advance play counter.
- Transfer motor rotates cam off inner cam switch. (NOTE: If the first digit of selection was a 2, the C.C.C. signal lights the "Toggle" LED causing the mechanism control to energize toggle shift coils).
- Gripper bow picks up record, places it on turntable, and tone arm sets down. (NOTE: If a record is not placed on the turntable the Auto-Cancel operates when the tone arm sets down).



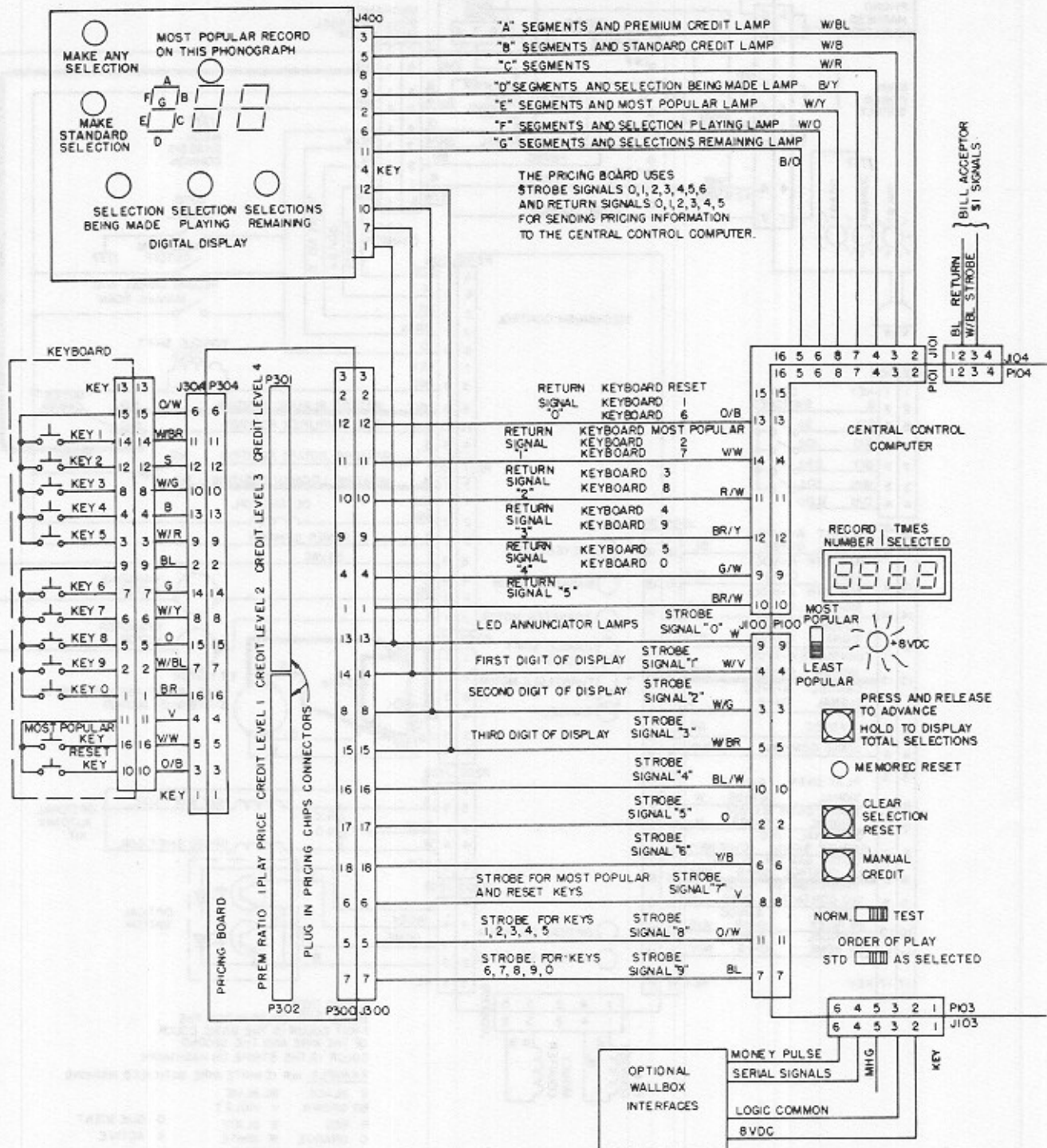
12

Amplifier unmuted and record plays.

1. Transfer motor rotates and cam moves onto outer cam switch.
2. "Outer cam sw. N.O. contact" signals C.C.C. to turn off transfer motor. "Tran. motor" LED turns off and transfer motor stops.



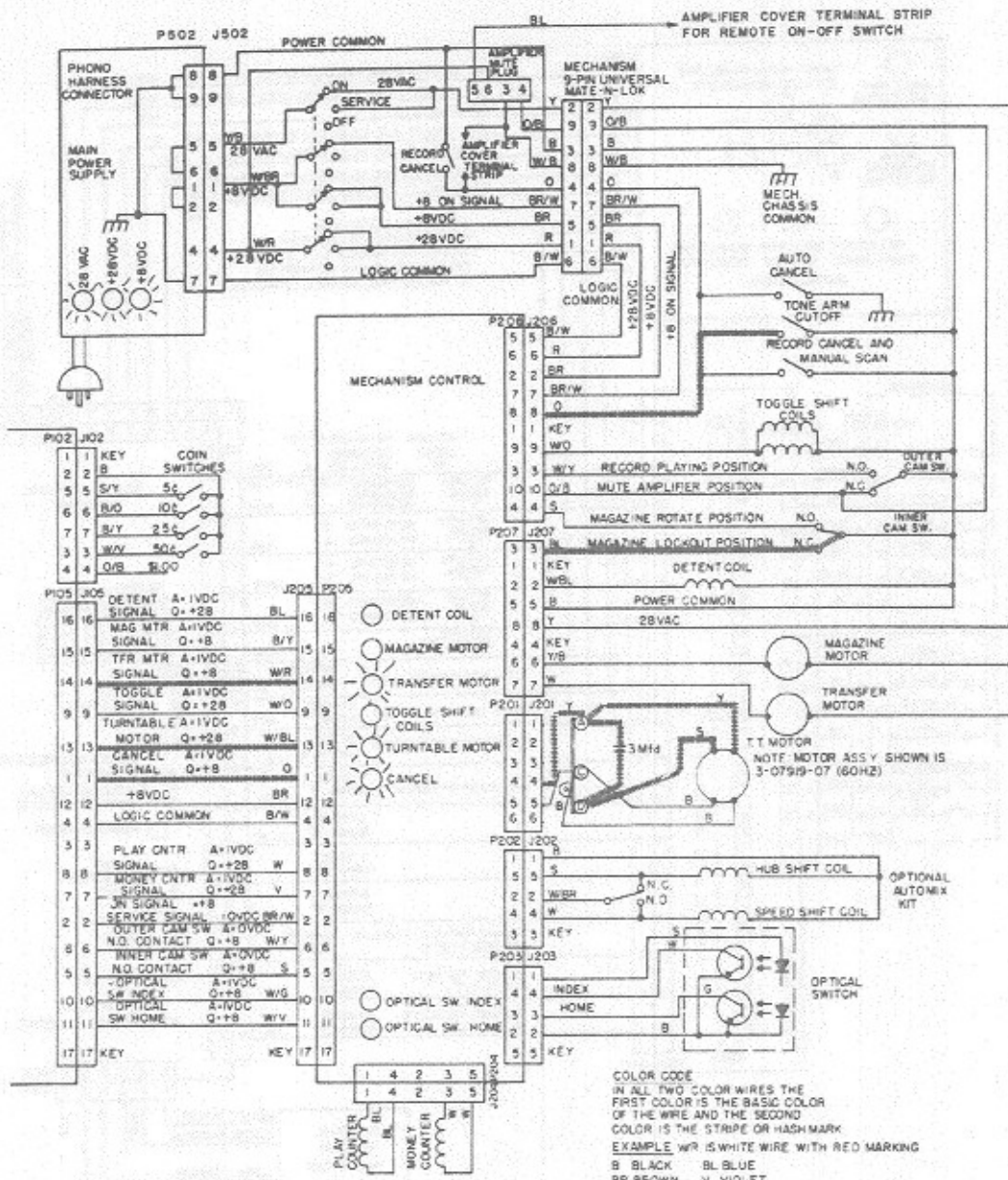
3. Ground signal is removed from "Outer cam sw. N.C. contact", causing amplifier to unmute.
4. Record plays.



13

Record ends and is returned to magazine.

1. Tone arm cutoff sends a cancel signal to C.C.C.
2. C.C.C. turns on "Tran. Motor" LED, causing mechanism control to energize transfer motor.
3. Gripper bow picks up record and returns it to magazine.

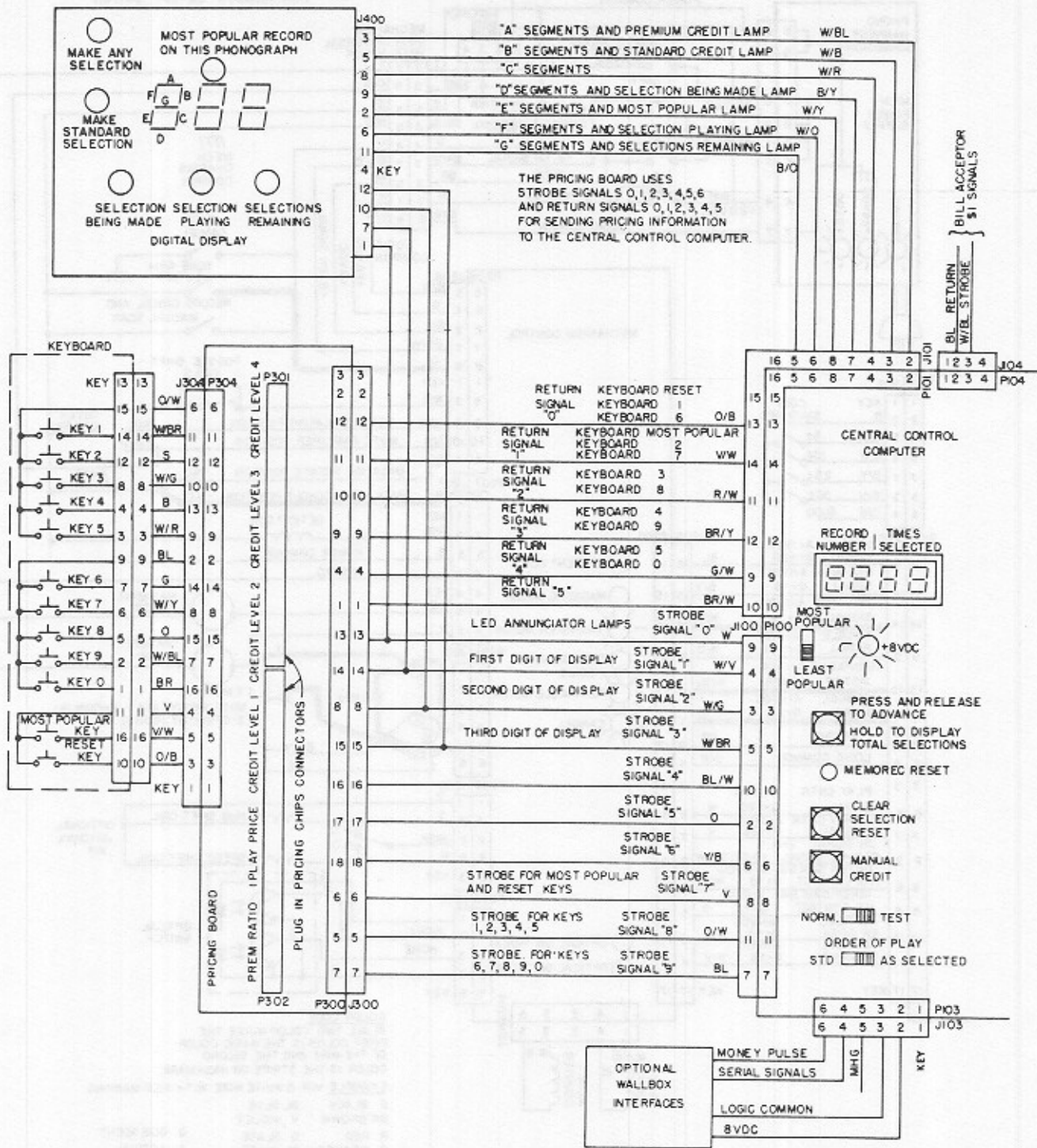


COLOR CODE
 IN ALL TWO COLOR WIRES THE FIRST COLOR IS THE BASIC COLOR OF THE WIRE AND THE SECOND COLOR IS THE STRIPE OR HASH MARK

EXAMPLE WR IS WHITE WIRE WITH RED MARKING

B BLACK BL BLUE
 BR BROWN V VIOLET
 R RED S SLATE Q QUIESCENT
 O ORANGE W WHITE A ACTIVE
 Y YELLOW PK PINK
 G GREEN TAN TAN

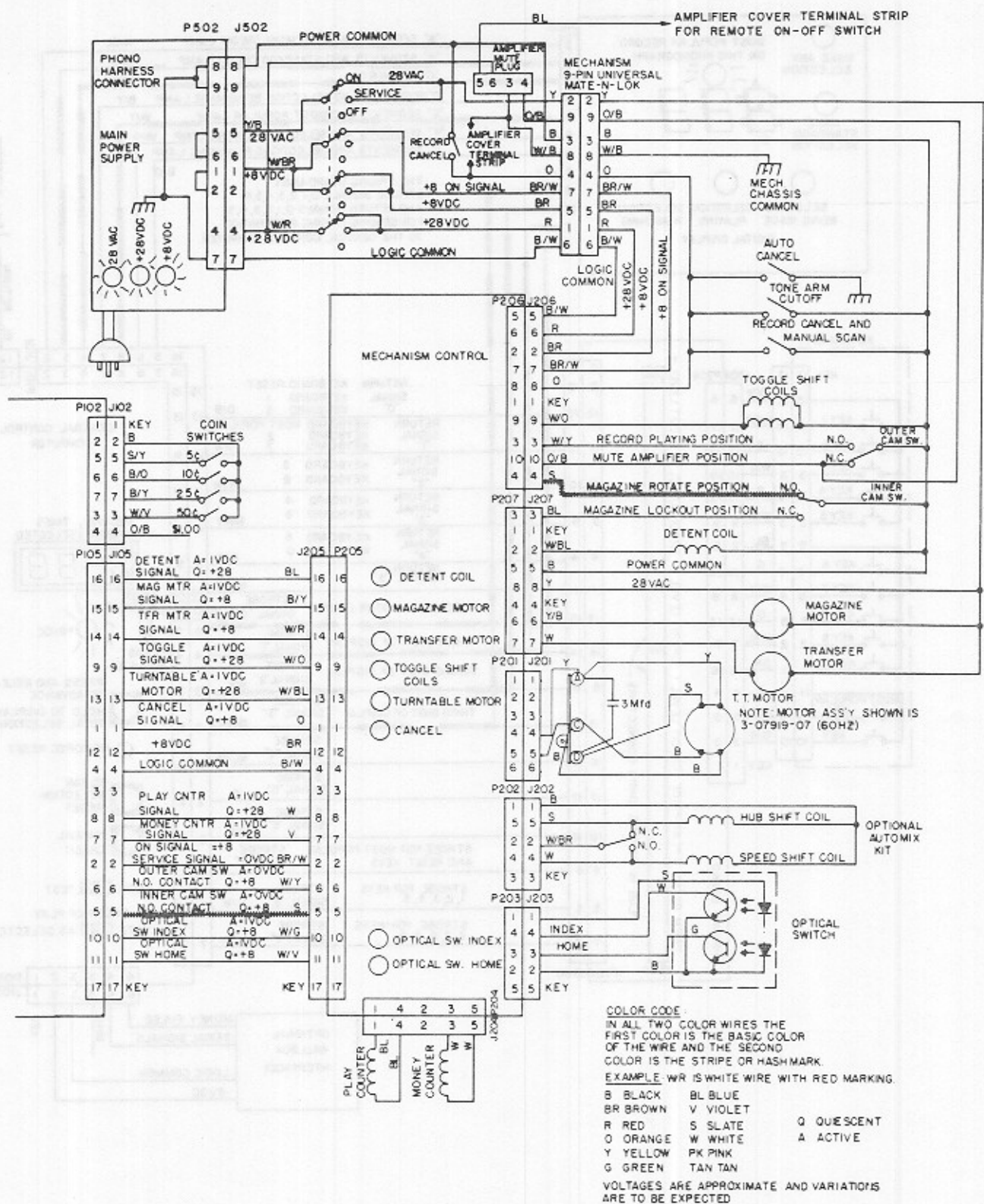
VOLTAGES ARE APPROXIMATE AND VARIATIONS ARE TO BE EXPECTED



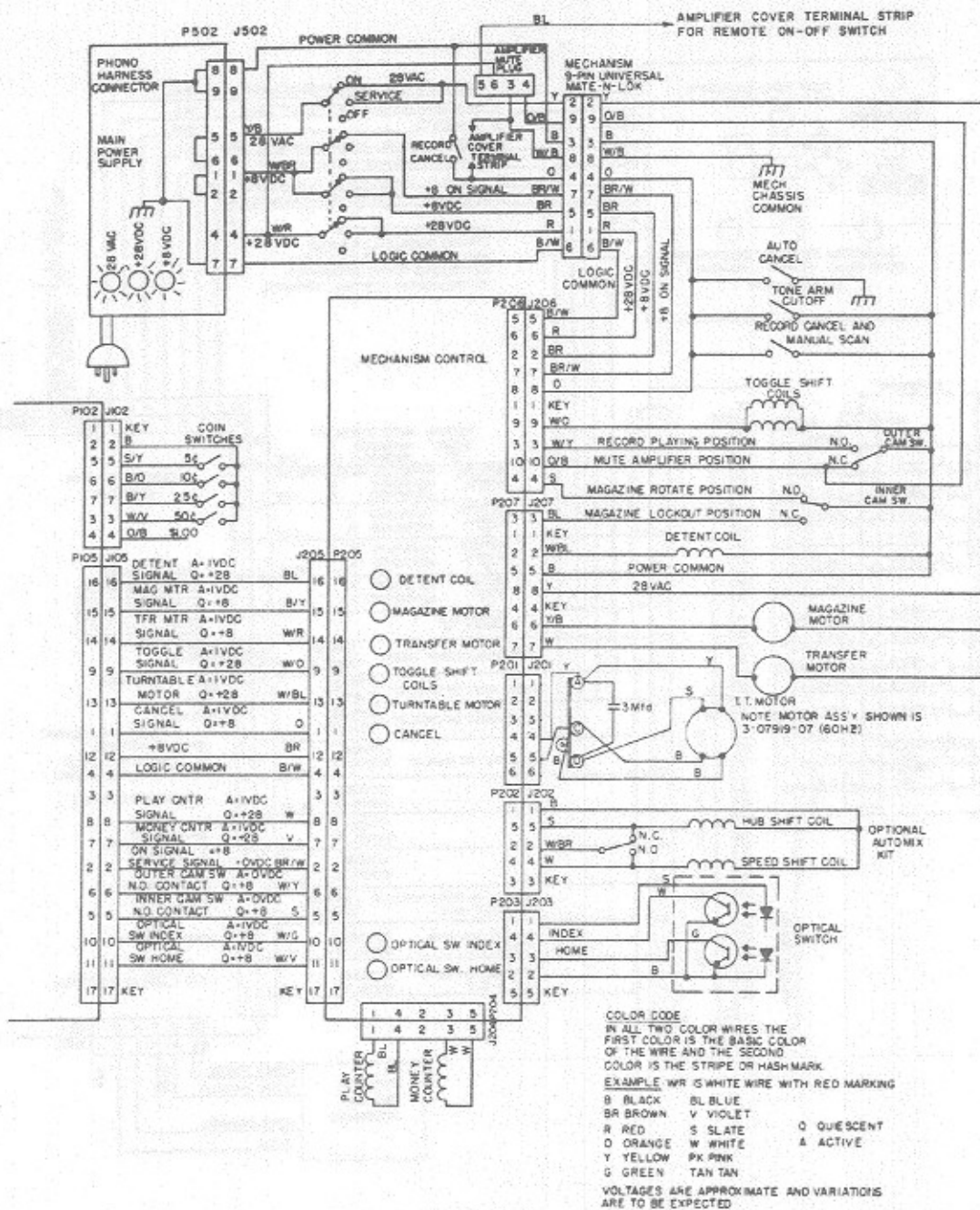
14

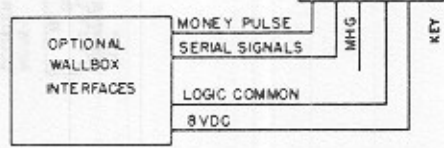
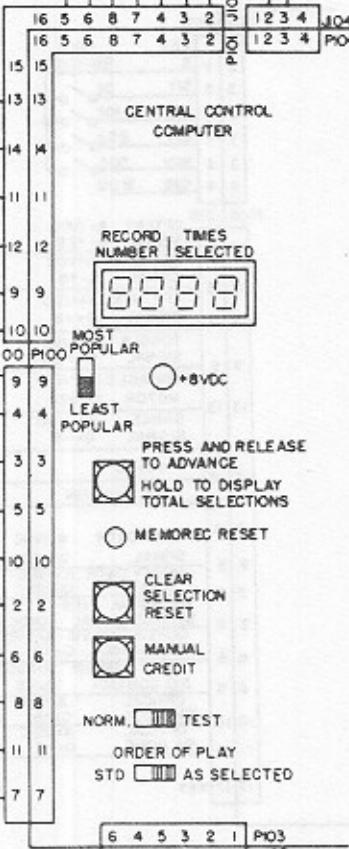
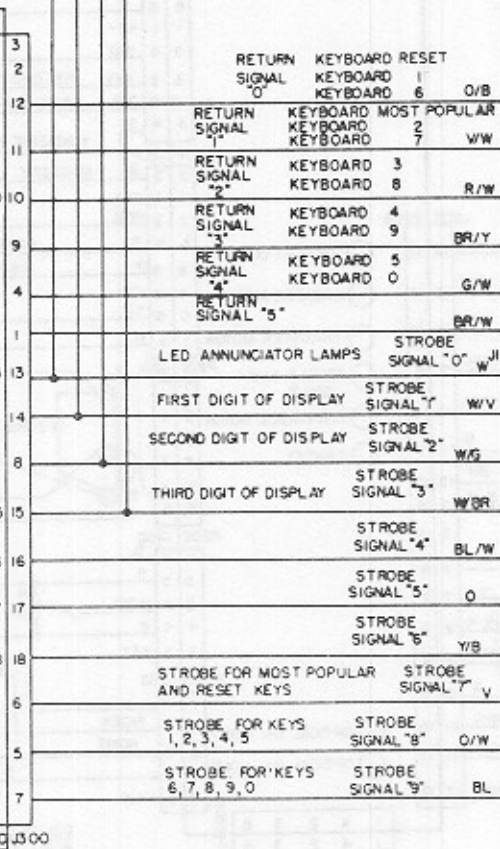
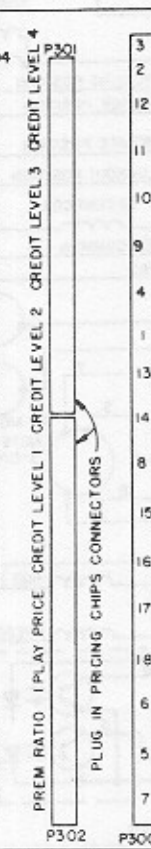
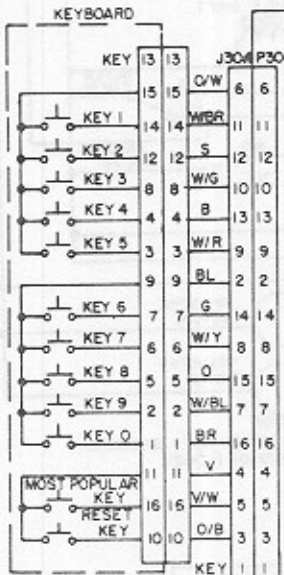
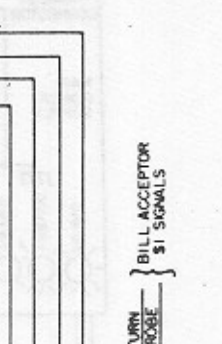
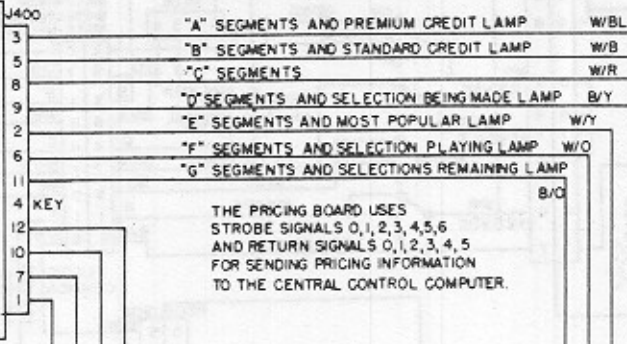
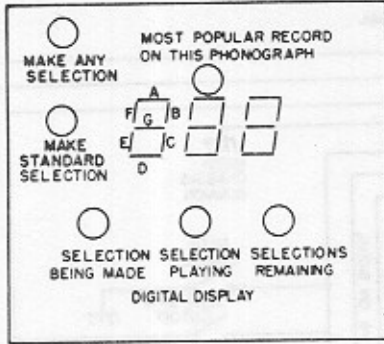
Transfer cycle ends, C.C.C. searches selection memory.

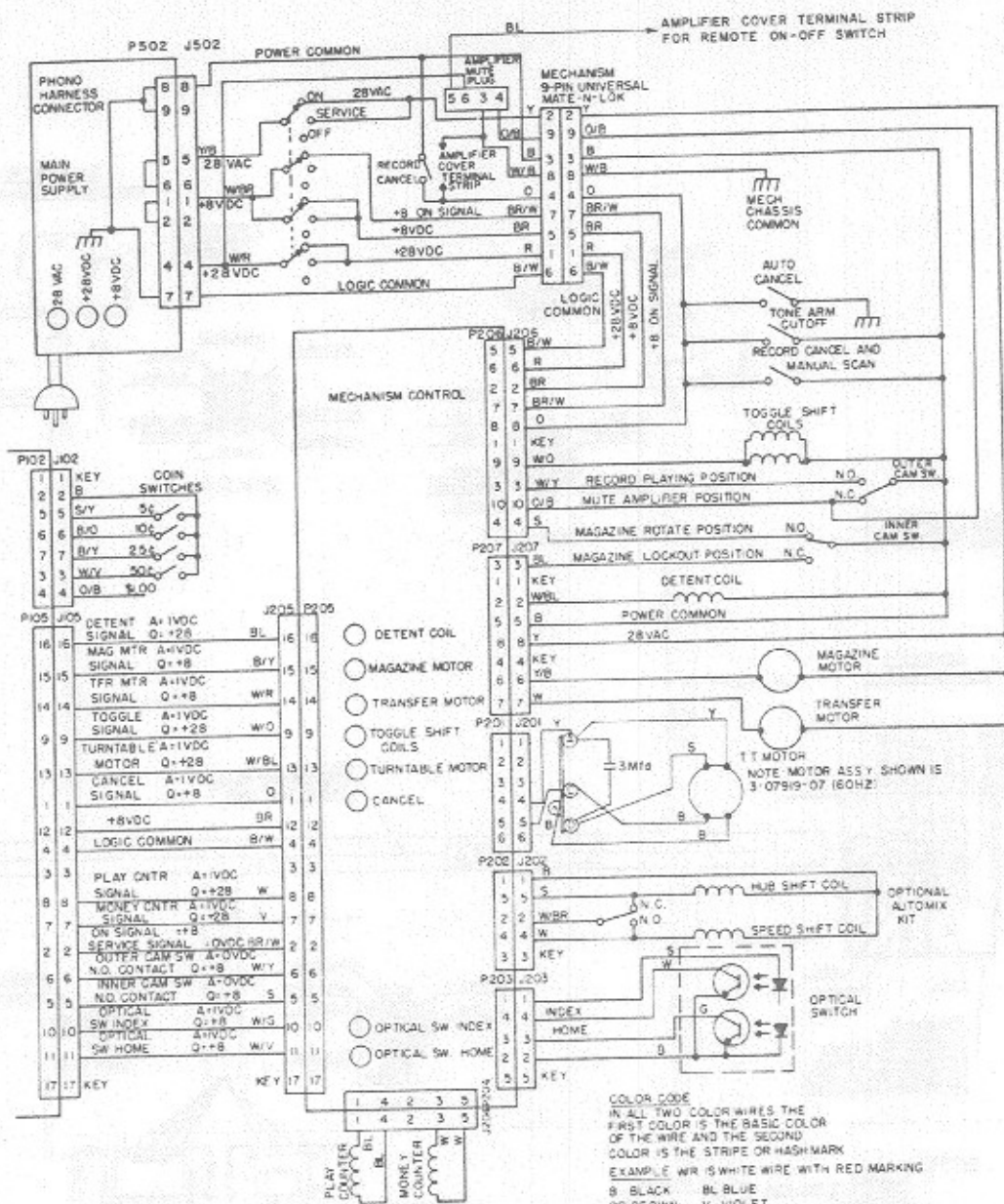
1. Cam rotates onto inner cam switch.
2. "Inner cam sw. N.O. contact" signals C.C.C. the transfer cycle is completed.
3. C.C.C. turns off "Trans. Motor" and "T.T. Motor" LEDs causing mechanism control to turn off these motors.



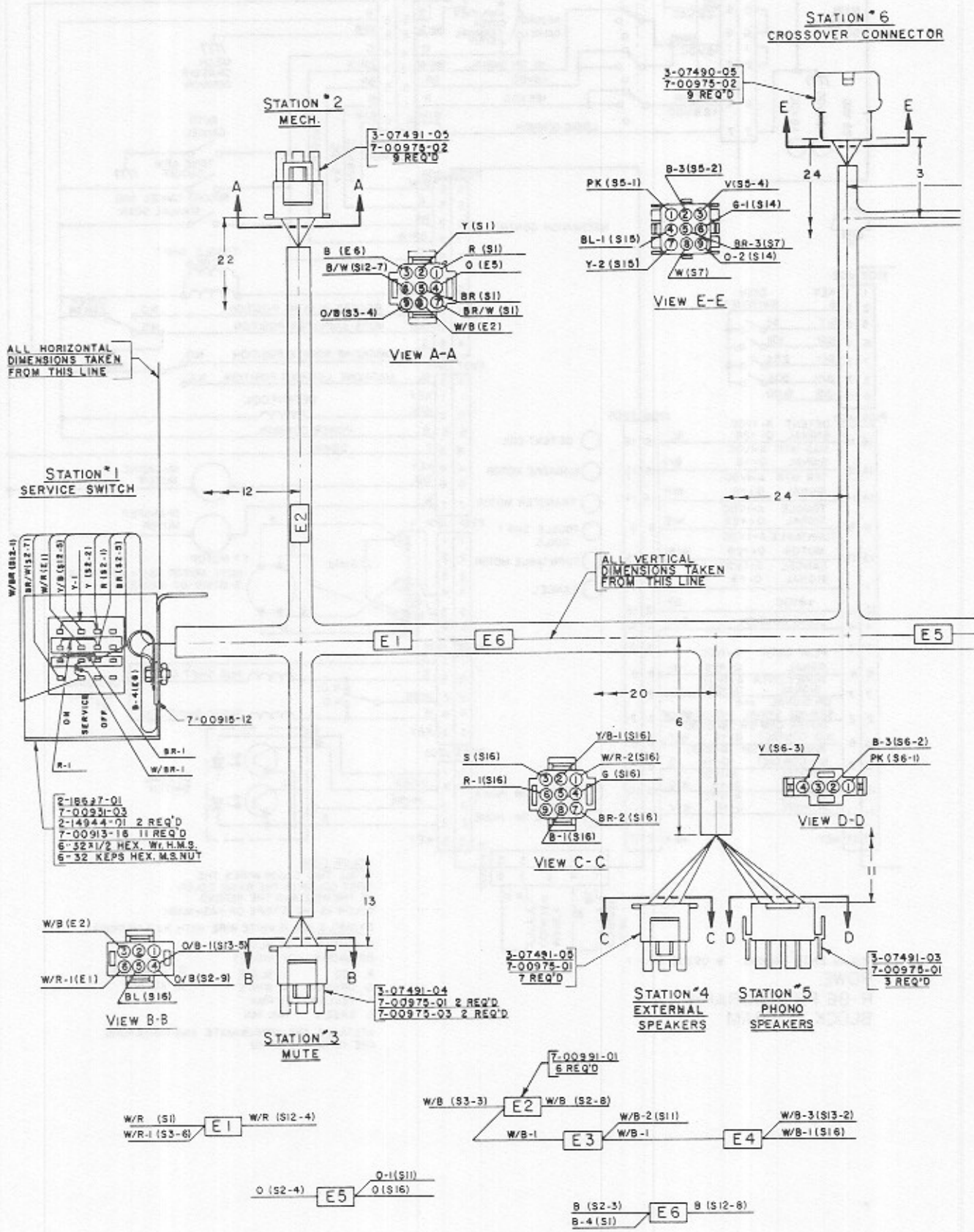
- C.C.C. electronically searches its selection memory. If the memory contains one or more selections, sequences 8 thru 14 will be repeated.
- If "order of play" switch is in as selected position, the selection will be located and played in the order they were selected.

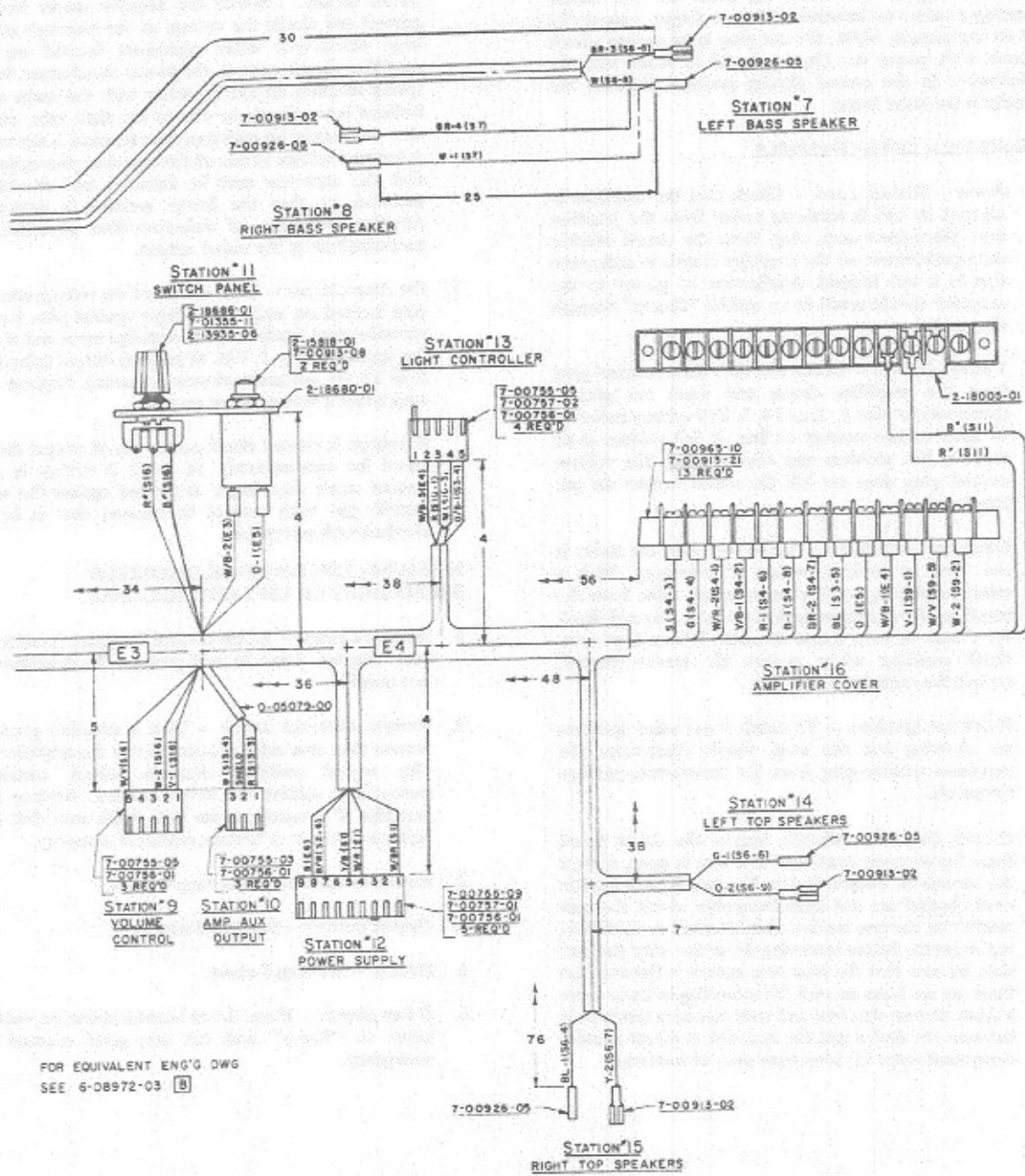






EQUN ENGG DRWG 6-09300-01-0-7
 ROWE
 R-86 PHONOGRAPH
 BLOCK DIAGRAM





FOR EQUIVALENT ENG'G DWG
SEE 6-08972-03 [B]

R-86 WIRING DIAGRAM

SOUND SYSTEM QUICK CHECK

Rowe solid state sound systems are service designed for easy, fast repair. The following check list will enable locating troubles on location with your finger, a paper clip or an inexpensive VOM. Do not plug in or unplug circuit boards with power on. Checks should be made with the mechanism in the record playing position. Perform the checks in the order listed.

NO SOUND – BOTH CHANNELS

1. *Power - Second Level* – Check that the amplifier is plugged in and is receiving power from the junction box. Disconnect mute plug. Press the circuit breaker reset pushbutton on the amplifier chassis to make sure that it is not tripped. Application of power to the amplifier should result in an audible "thump" through the speaker.
2. *Volume Control* – Disconnect the volume control plug from the amplifier chassis and short out pins 3 (common) to pins 1, 2, and 4, 5. Full volume indicates an open volume control or line. If full volume at all times is the problem and disconnecting the volume control plug does not kill the sound replace the pre amp board.
3. *Cartridge Connections* – Make sure that the stylus is not bent or broken; replace if necessary. With a selection playing, unplug the tone arm cable from the amplifier. Press a finger against the plug pins and check for a hum in both sound channels. If hum is present, check cartridge wiring against the service manual; replace the cartridge if necessary.
4. *Extension Speakers* – To check if extension speakers are shorting out the amp, simply disconnect the extension speaker plug from the transformer package receptacle.
5. *Output Devices* – Visually inspect the driver board fuses for an open condition. If a fuse is open, replace the associated output device. The two devices used in each channel are not interchangeable; check the part number on the case and install an identical or equivalent replacement. Before mounting the device onto the heat sink, be sure that the heat sink surface is flat and that there are no burrs around the mounting holes to cause a short. Be sure that one and only one mica insulator is between the device and the heat sink and heat transfer compound (spec 53) is on both sides of insulator.

6. *Filter Capacitors* – Check for ± 2 VDC in the amplifier power supply. Connect the negative meter lead to ground and check the voltage at the terminals of the large electrolytic filter capacitors located on the amplifier chassis next to the power transformer. When taking readings on the capacitor with the outer shell isolated from chassis to one of the shell tabs, check that the voltage on each capacitor terminal is the same. A lowered voltage at one of the capacitor pins indicates that the capacitor may be defective and should be replaced, or that the bridge rectifier is defective. Another indication of defective filter capacitors is excessive hum in the sound output.

7. *Pre Amp Output* – Short all five of the volume control pins located on amp. Press finger against pins 1 or 3 (outside pins) labeled phono cartridge input and check for approximately 1 VAC at pre amp output (pins 3 or 5 of 13 pin connector-chassis common). Replace pre amp board if voltage is not present.

If voltage is present check center pin of output driver board for approximately 16 VAC. If voltage is not present make sure finger is pressed against the same outside pin with respect to channel that is being checked with volt meter.

NO SOUND, LOW SOUND OR DISTORTED SOUND RIGHT OR LEFT CHANNEL ONLY.

1. *Balance Control* – Adjust control for equal sound from each channel. Leave in mid position if adjustment is not possible.
2. *Reverse Cartridge Leads* – With a selection playing, reverse tone arm cable connections to the amplifier. If the sound switches channels, check cartridge connections against the service manual. Replace the cartridge if connections are O.K. Make sure that the stylus is not bent or broken; replace if necessary.
3. *Extension Speakers* – See Step 4 above.
4. *Output Devices* – See Step 5 above.
5. *Preamp* – See Step 7 above.
6. *Driver Boards* – If one driver board is defective, switch input to "Mono" and use one good channel in emergency.