



R-90 Phonograph

**Field Service Manual
and
Parts Catalog**

PART NO. 2-18226-08
FIRST EDITION
FIRST PRINTING

Preface

Please take time to read this page and review the Table of Contents so that you will easily be able to find the R-90 Phonograph information in this manual.

This service manual is divided into seven sections. These sections are:

- **Section 1** Contains a general introduction to the R-90 system and its major components.
- **Section 2** Contains unpacking instructions, a programming guide, and step-by-step programming and pricing instructions.
- **Section 3** Provides routine maintenance, preventive maintenance, lubrication schedules, adjustments, and replacement procedures.
- **Section 4** Contains a general and detailed description of the R-90 Bill Acceptor (OBA-P).
- **Section 5** Contains troubleshooting aids for all R-90 modules other than the OBA-P.
- **Section 6** Contains specifications and reference material.
- **Section 7** Contains a complete list of replacement parts, except for the electronic components, which are listed on wiring diagrams and schematics. Section 7 also contains an accessory equipment list.

This manual is intended for owners and route operators, as a primary source for maintenance information. For more detailed information on repairing electronic circuit boards and components, please order the publication **Operation Sequence And Schematics (Part Number 3-65355-12)**, which is to be used by trained electronics technicians using electronic test equipment.

TABLE OF CONTENTS

SECTION 1 SYSTEM DESCRIPTION

INTRODUCTION	1-1
MAJOR COMPONENTS	1-1
Record Selection System	1-1
Central Control Computer	1-1
Memorec	1-1
Autoplay	1-1
Light Display	1-2
PRINCIPLES OF OPERATION	1-2
Audio System	1-2
Stylus and Cartridge	1-2
Stereo Amplifier	1-2
Preamp	1-2
Two-Wire Volume Control	1-2
Power Amplifier	1-3
Output Transformers	1-3
Speaker System	1-3
Record Changer Mechanism	1-4
Magazine	1-4
Play Counter	1-4
Money Counter	1-4
Optical Switch	1-4
Cam Switch And Motor Assembly	1-4
Mechanism Control Unit	1-5
Sprag Assembly	1-5
Tone Arm Assembly	1-5
Turntable Motor	1-5
Main Power Supply	1-5

SECTION 2 INSTALLATION AND PROGRAMMING

INTRODUCTION	2-1
HANDY CASE	2-1
WARRANTY REGISTRATION CARD	2-1
UNPACKING INSTRUCTIONS	2-1
Exterior	2-1
Doors	2-1
Shipping Bolts And Clips	2-1
Visual Inspection	2-2
Phonograph Leveling	2-2
Records and Title Strips	2-2
PROGRAMMING THE CREDIT AND SELECTION SYSTEM	2-2
Programming Mode	2-2
Enter The Programming Mode	2-2
Correct Errors	2-3
Exit Programming Mode	2-3
Pricing	2-3
Records	2-3
Alternate Record prices	2-3
Autoplay	2-4
Continuous Credit	2-4
REFERENCE GUIDE	2-6
Programming Mode	2-6
Program With Top Door Closed	2-6
View Location Contents	2-6
Change Location Contents	2-6
Alternate Record Prices	2-6
Bill Bonus	2-6
Continuous Free Play	2-6
Retain Selections	2-6
Autoplay Style	2-6
Set Time	2-7
Play Records	2-7
Program Autoplay	2-7
Change Security Code	2-7
Clear 5xx Totals	2-7
Exit Prog.Mode	2-7
SOUND SYSTEM	2-12
Acoustical Compensation (Bass And Treble Controls)	2-12
Paging	2-13
Stereo Balance	2-12
Extension Speaker Operation	2-13
70-Volt Speakers	2-15
Low Impedance Speakers	2-15

SECTION 3 MAINTENANCE

INTRODUCTION	3-1
ROUTINE SERVICE	3-1
Changing Records	3-1
Changing Title Strips	3-1
Removing The Cash Bag	3-2
Reading And Resetting Memorec	3-2
Special Commands (5XX And 7XX)	3-3
Display Commands (5XX)	3-3
Clearing 5XX Totals	3-3
Memorec Clear Commands (7XX)	3-4
PREVENTIVE MAINTENANCE	3-4
Cleaning The Glass	3-4
Flashing Lamps	3-5
Fluorescent Lamps	3-5
FIVE YEAR LUBRICATION	3-5
UNSCHEDULED MAINTENANCE	3-5
Record Changer Adjustments	3-5
Sprag Assembly	3-5
Sprag Assembly Removal	3-6
Cam Switch	3-7
Adjustments	3-7
Check And Adjust Cam Switch	3-7
Tone Arm Adjustments	3-7
Record Magazine Transfer Arm And Support	3-8
Adjustment	3-8
Magazine Belt Adjustment	3-8
Aligning Magazine Stopping Position With Transfer Arm	3-8
Optical Switch	3-9
Adjustments	3-9
Index Sensitivity (Visual Method)	3-9
Index Sensitivity (Instrument Method)	3-10
Home Sensitivity (Visual Method)	3-10
Home Sensitivity (Instrument method)	3-10
Optical Switch Position	3-10
Tone Arm Vertical Pivot	3-11
Stylus Force	3-11
Stylus Clearance	3-11
Stylus Height	3-11
Stylus Setdown Position and Tone Arm Cutoff Switch	3-11
Adjust Tone Arm Cutoff Switch	3-12
Belt Guide Adjustment	3-12
Coin Acceptors	3-13
Cleaning	3-13
3-Coin Acceptors	3-13
4-Coin Acceptors	3-13
Coin Switch	3-13
Coin Switch Wiring Note	3-13
Money Counter - Non U.S. Currency	3-13
Checks And Adjustments	3-13
Coin Lever	3-13
Contact Pressure And Gap	3-15
Door Spring Replacement	3-16
Glass Replacement	3-17

SECTION 4 OBA-P MAINTENANCE

INTRODUCTION	4-1
GENERAL INFORMATION	4-1
PHYSICAL DESCRIPTION	4-1
The Bill Transport Mechanism	4-1
Drive Belts	4-1
Optical Sensors	4-1
Magnetic Head	4-1
Anti-Pull-Back Lever	4-1
Bill Stacker	4-1
Computer Control Unit	4-2
Mag Adjust	4-2
Speed Adjust	4-2
Test Button	4-2
Visual Indicators	4-2
B.A. Status LED	4-2
+5 VDC LED	4-2
+24 VDC LED	4-2
Connectors	4-2
FUNCTIONAL DESCRIPTION	4-2
Bill Acceptor in Standby Mode	4-3
Ready to Accept Bills	4-3
V4 Sensor Active	4-3
Stacker Home Switch Not Activated	4-3
Reject Sequence	4-3
Self-Clearing Sequence	4-3
Shutdown Sequence	4-3
Bill Acceptance Sequence	4-3
ROUTINE MAINTENANCE	4-4
Cleaning	4-4
Bill Inlet and Track	4-4
V2 Sensor	4-4
Magnetic Head	4-4
Drive Belts	4-4
Bill Stacker	4-4
Lubrication	4-4
Bill Stacker	4-4
Bill Transport Mechanism	4-4
UNSCHEDULED MAINTENANCE	4-5
Mechanical Adjustments	4-5
Bill Stacker	4-5
Bill Transport Mechanism	4-5
Drive Belt Tension	4-5
Lower Belt tension	4-6
Gear Backlash	4-6
Magnetic Head Alignment	4-7
Harness and Holder	4-7
Electrical Adjustments	4-7
Motor Speed Adjustment	4-7
MAG ADJUST	4-7
TROUBLESHOOTING	4-7

SECTION 5 TROUBLESHOOTING

INTRODUCTION	5-1
CONTINUOUS CREDIT	5-1
ERROR CODES	5-1
Error Code Chart	5-1
TROUBLESHOOTING CHARTS	5-6
SOUND SYSTEM QUICK CHECK	5-13
No Sound - Both Channels	5-13
No Sound, Low Sound Or Distorted Sound	
Right Or Left Channel Only	5-14
Constant High Volume - Cannot Adjust	5-14
Excessive Record Scratch	5-14
Treble Range Control Too High	5-14
Excessive Hum	5-14
DIAGRAMS	
Sequence of Operation Diagrams	5-15
130 Watt Amplifier Schematic	5-43
130 Watt Amplifier Parts List	5-44
Stereo Preamplifier Schematic	5-47
Stereo Preamplifier Parts List	5-48
Remote Volume Control Wiring	5-52
R-90 Wiring Diagram	5-55
R-90 Block Diagram	5-57

SECTION 6 ADDITIONAL INFORMATION

R-90 SPECIFICATIONS	6-1
General	6-1
Depth	6-1
Width	6-1
Height	6-1
Shipping Weight	6-1
Net Weight	6-1
Power Requirements	6-1
Record Changer	6-1
Credit And Pricing System	6-1
Credit System	6-1
Coins Accepted	6-1
Sound System	6-1
Cartridge	6-1
Power Amplifier	6-2
Preamplifier	6-2
Selection System Capacity	6-2
Transformer Package	6-2
Speaker System	6-2
Door Lighting	6-2
Fuses And Circuit Breakers	6-2
Main Power Supply	6-2
Amplifier	6-2
BILL ACCEPTOR	6-3
Overall Dimensions	6-3
Power Requirements	6-3
Interface Requirements	6-3
Operating Environment	6-3

SECTION 7 PARTS CATALOG

PARTS CATALOG TABLE OF CONTENTS	7-1
INTRODUCTION	7-3
Catalog Description	7-3
Parts List Description	7-3
ORDERING REPLACEMENT PARTS	7-3
PARTS BREAKDOWN	7-4
ACCESSORY EQUIPMENT	7-52

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.

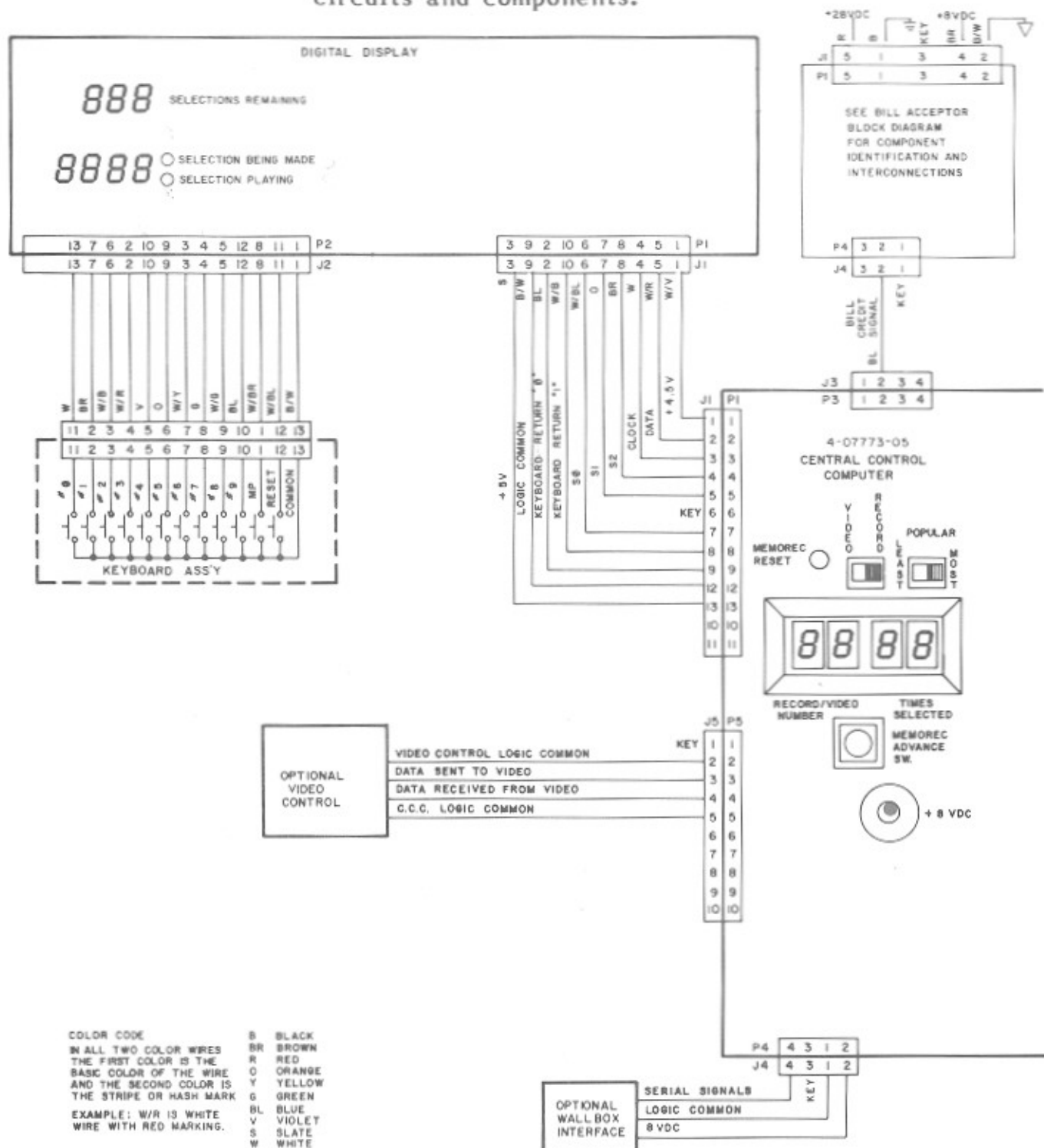
The remaining diagrams illustrate which signals are active during each point in the phonograph operational cycle.

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

Pulsed signals are represented by a broken line.

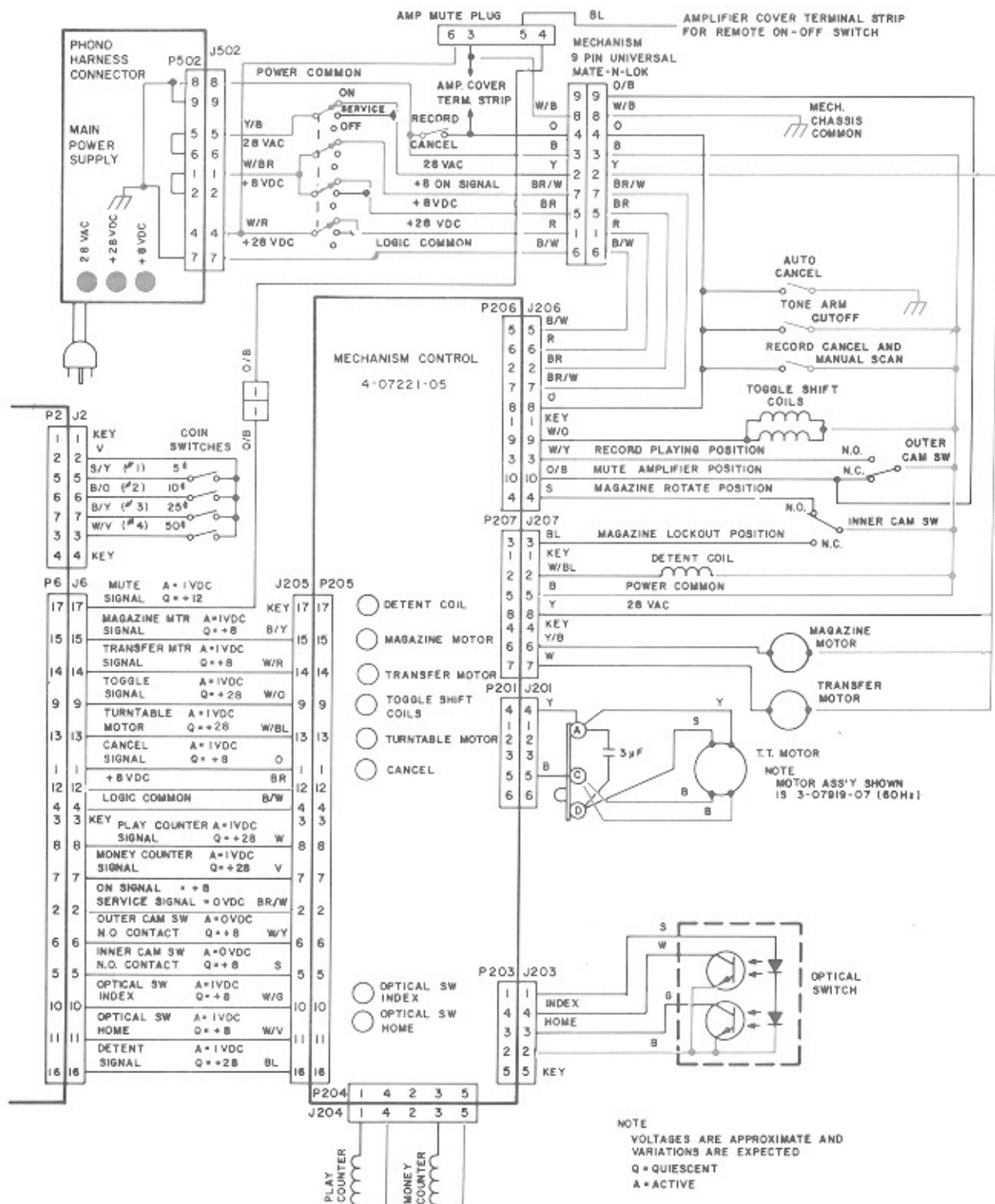
SEQUENCE DIAGRAM 1

Power is turned on. Voltages and commons are applied to circuits and components.



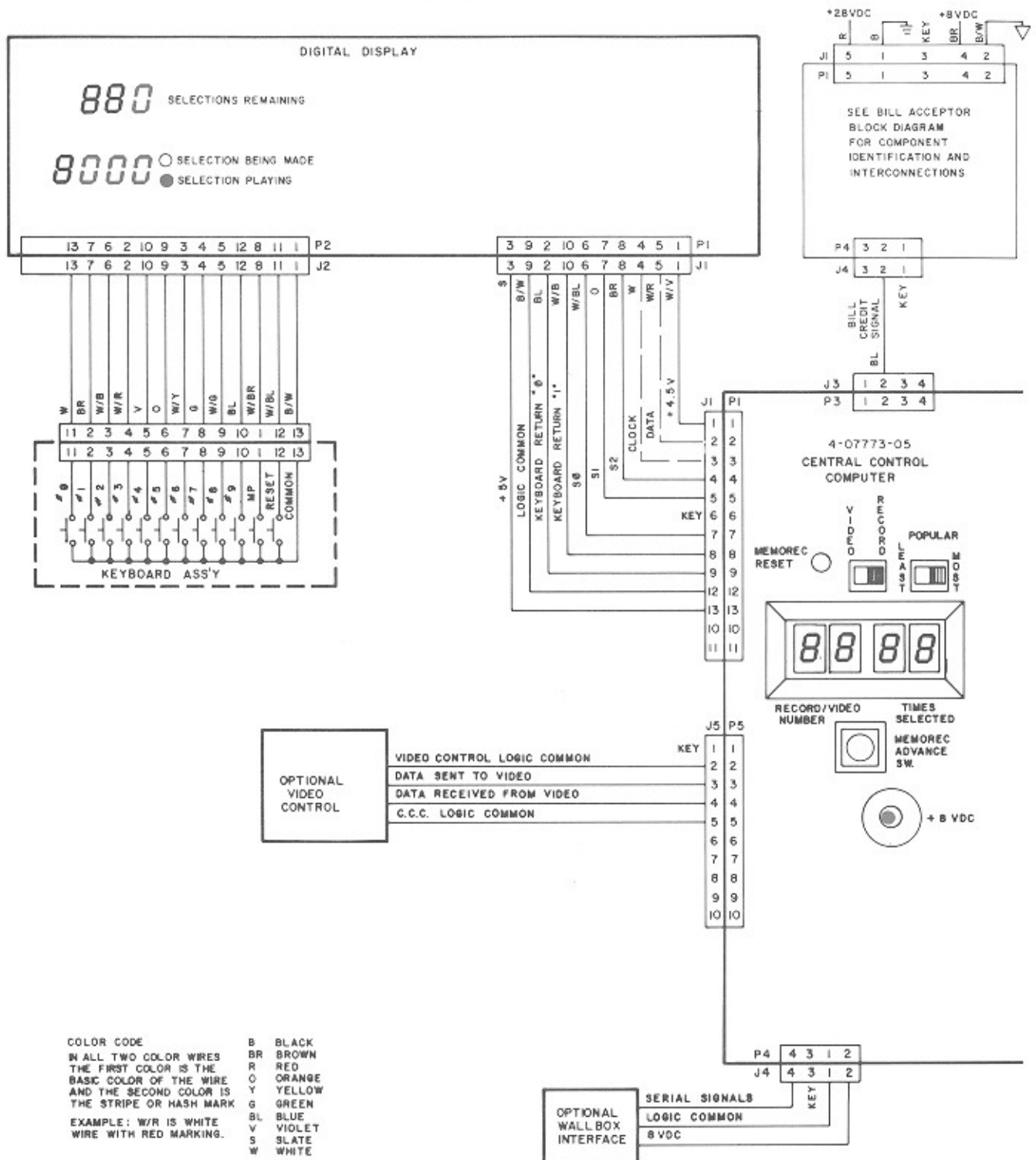
1. Power flows through Power Cord and Power Switch to energize Power Supply. The voltages go through Service Switch and energize 28 VAC, +28 VDC and +8 VDC busses. The +8 VDC LED on the C.C.C.* lights and the +5 VDC and +28 VDC LED's on the Bill Acceptor Control Computer light.
2. The 28 VAC goes to the Magazine Motor, Transfer Motor and Mechanism Control. The 28 VAC is routed through the Mechanism Control to the Turntable Motor.
3. The +28 VDC goes to the Amplifier Mute Plug, Mechanism Control and Bill Acceptor.

*C.C.C. is an abbreviation for Central Control Computer.

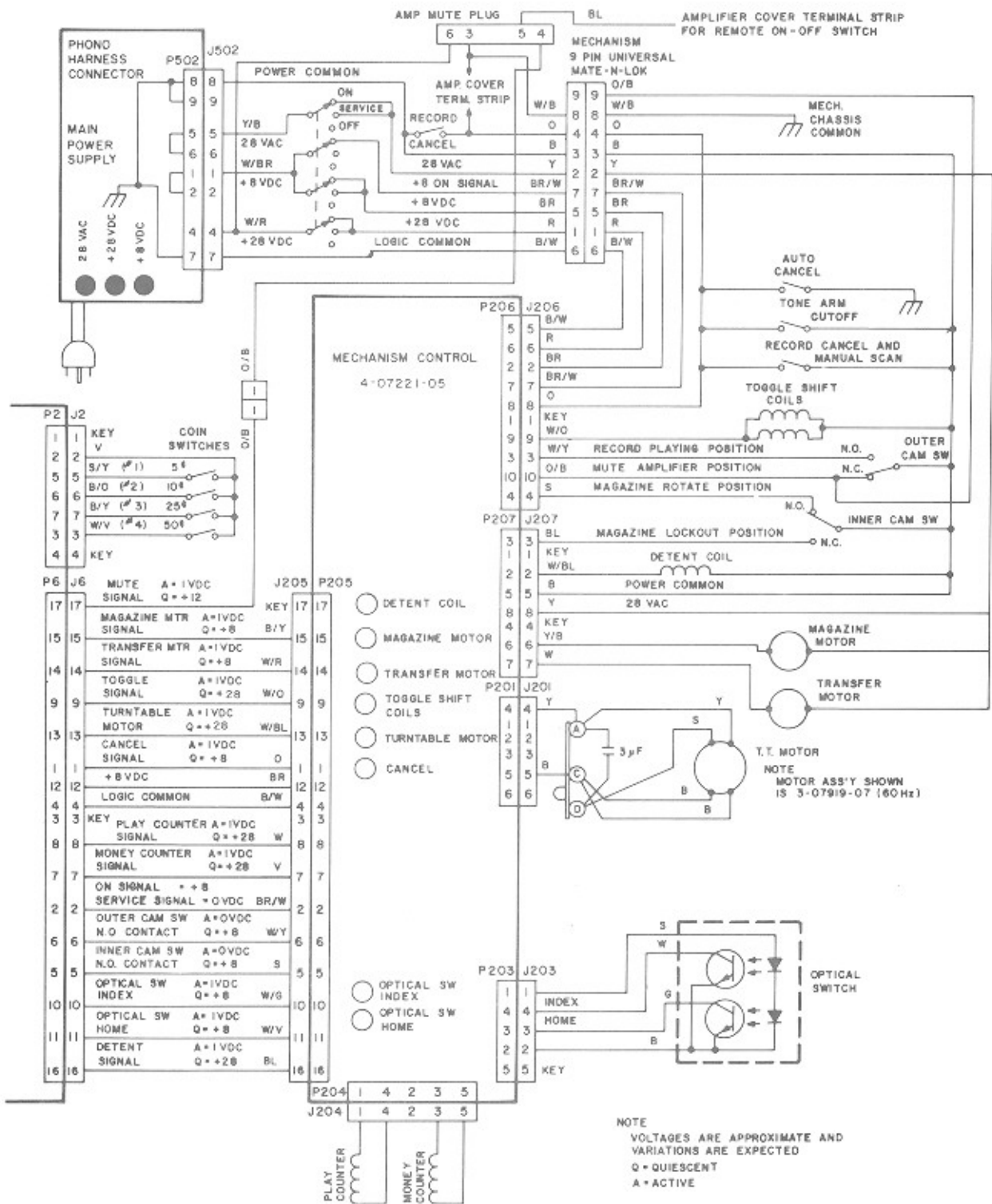


4. Power Common goes to the Outside Record Cancel, Manual Scan Switch, Tone Arm Cutoff, Toggle Shift Coils, Inner and Outer Cam Switches, Detent Coil, Mechanism Control and Bill Acceptor. It is routed through Mechanism Control to Play and Money Counters.
5. The +8 VDC and the Logic Common go to the Mechanism Control and the Bill Acceptor. Both are routed through Mechanism Control to the C.C.C and Logic Common to Optical Switch. The C.C.C. routes them to the Wallbox Interface.
6. The "+8 ON" signal is routed through Mechanism Control to the C.C.C.
7. Mech. Chassis Common goes to the Amplifier Mute Plug, Amplifier Cover Terminal Strip and Auto Cancel.

C.C.C. senses power turned on. No selections or credit are in memory.

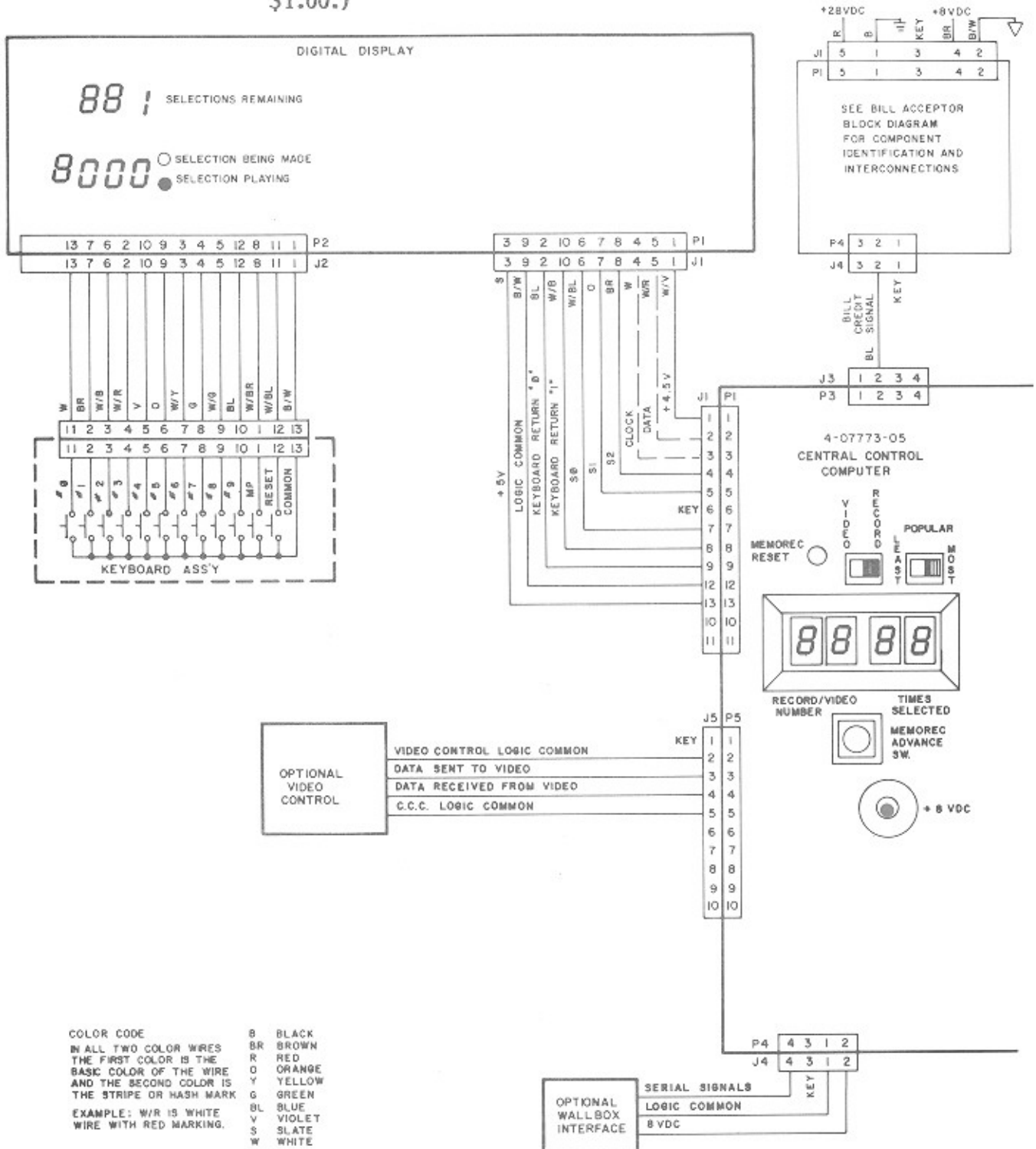


1. The C.C.C. begins to constantly monitor the state of all switches and determines if the transfer arm (Gripper Bow) is in home position.
2. C.C.C. sends Clock and Data Signals to Digital Display, causing the LED's to light.

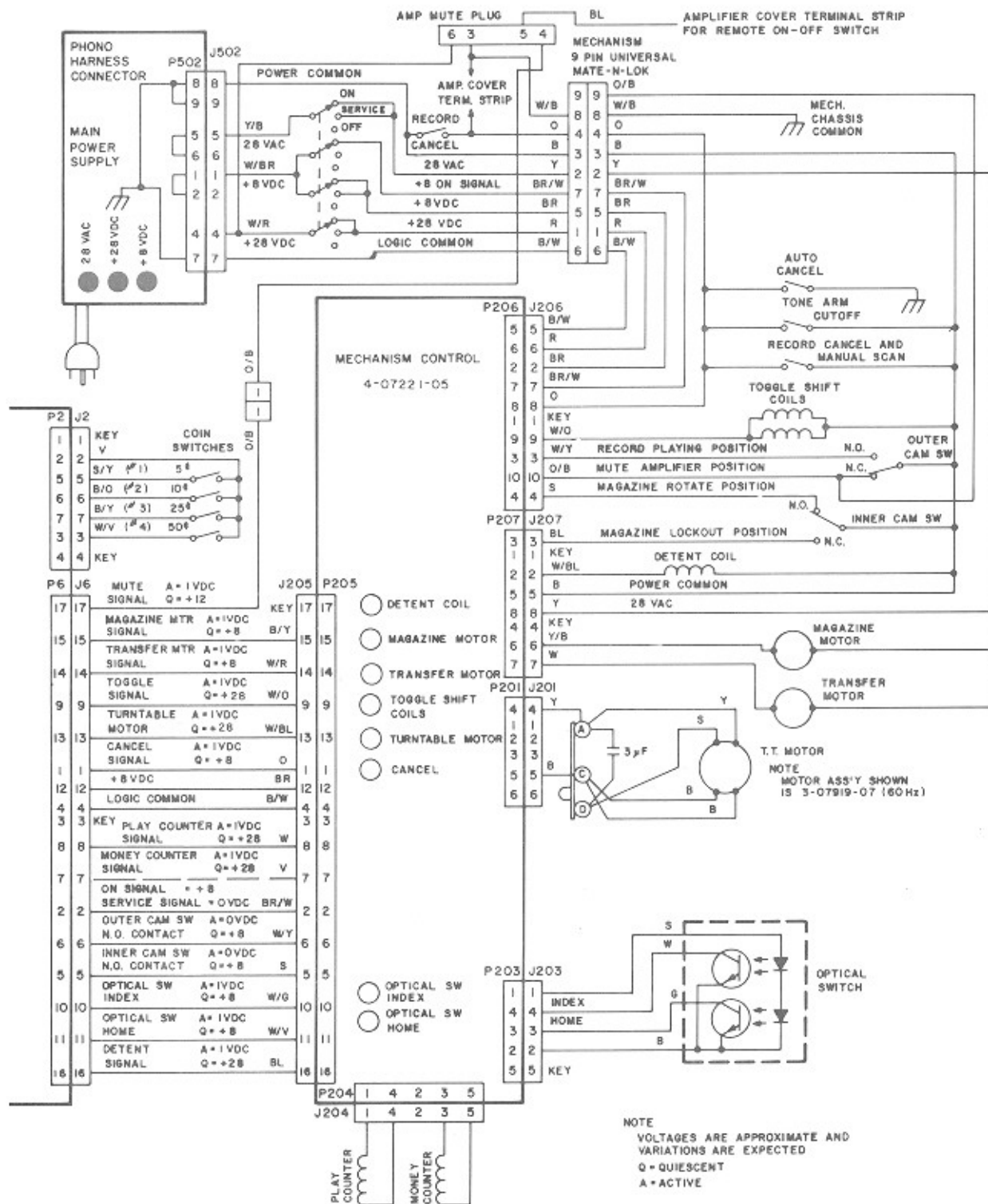


SEQUENCE DIAGRAM 3

Patron inserts a quarter. Standard credit is established.
(Credit is set at 1 play for 25¢, 2 for 50¢ and 5 for \$1.00.)

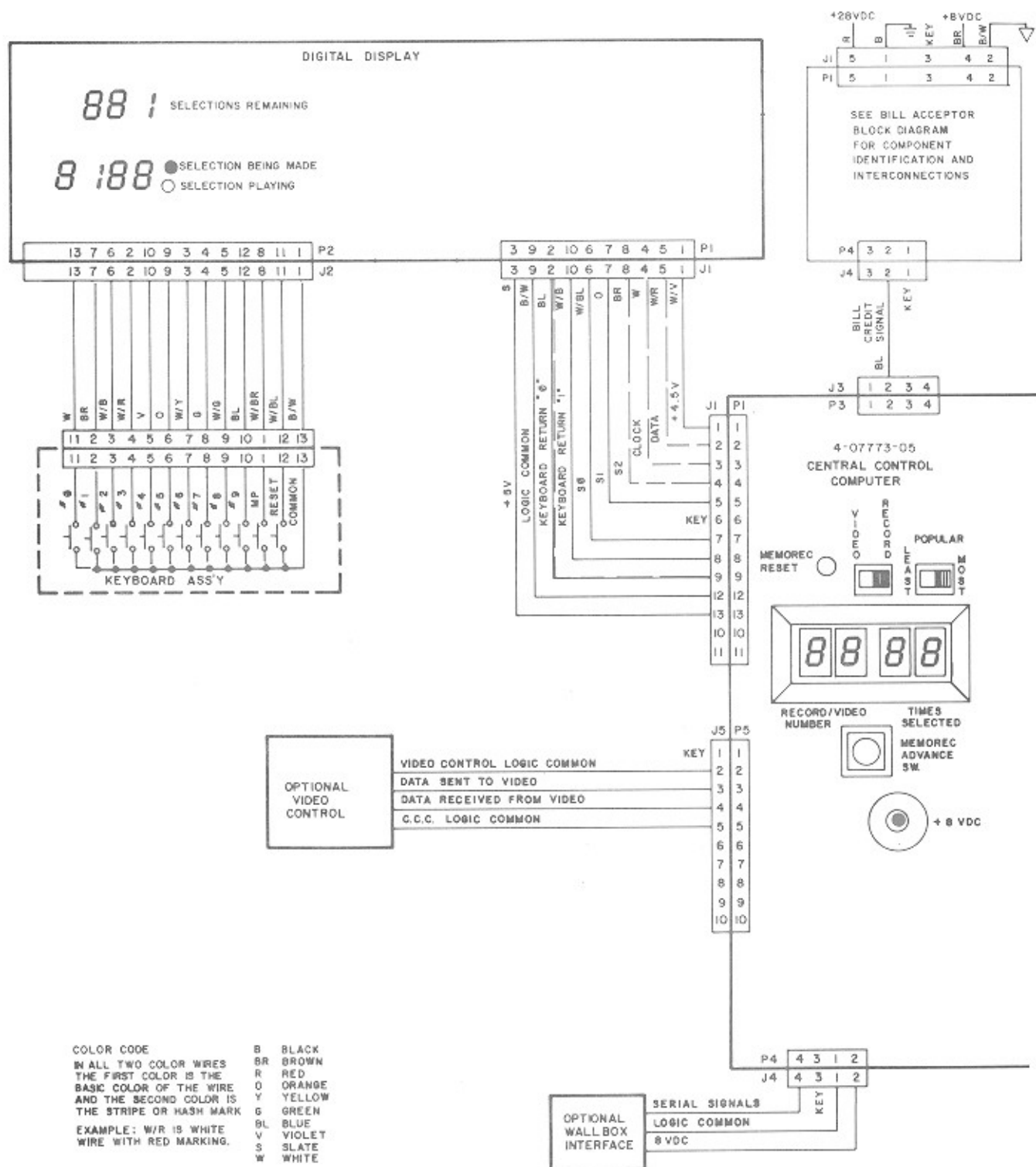


1. Patron inserts quarter into slot. The coin passes through the validator and actuates the 25¢ Switch.
2. The C.C.C. senses the switch closure and stores 5 money units (nickels) in its memory.
3. Five pulses are sent to the Money Counter.
4. The C.C.C. uses the amount of money stored in its memory and the stored pricing information to calculate the remaining credit equal to 1.



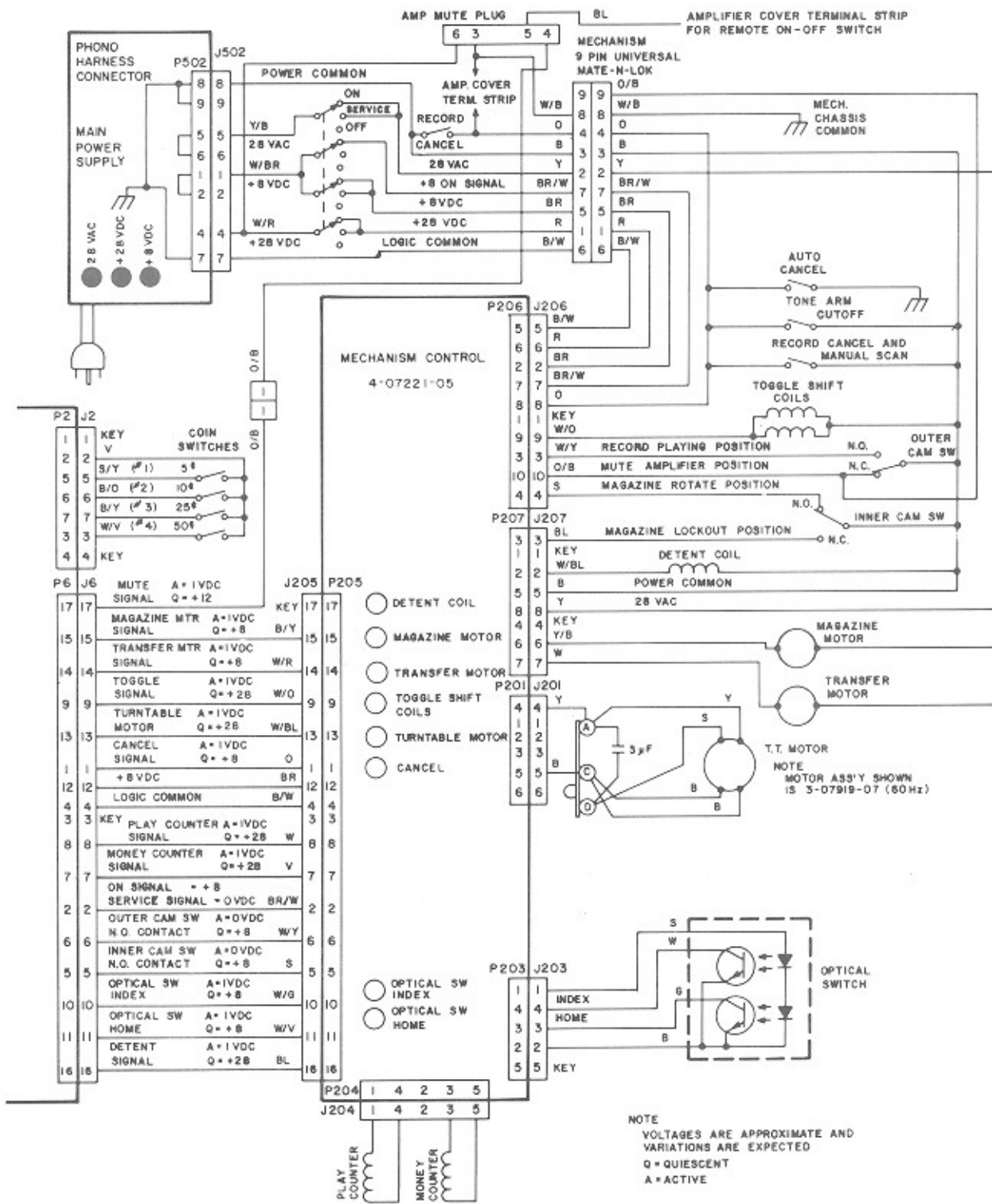
5. The Selection Remaining Display shows 1 credit.

NOTE: If a bill is inserted instead of a coin, the Bill Acceptor sends out pulses for the denomination inserted. One pulse is sent for \$1 and 5 pulses are sent for \$5. These pulses are present at C.C.C. (Pin 2 of P3).

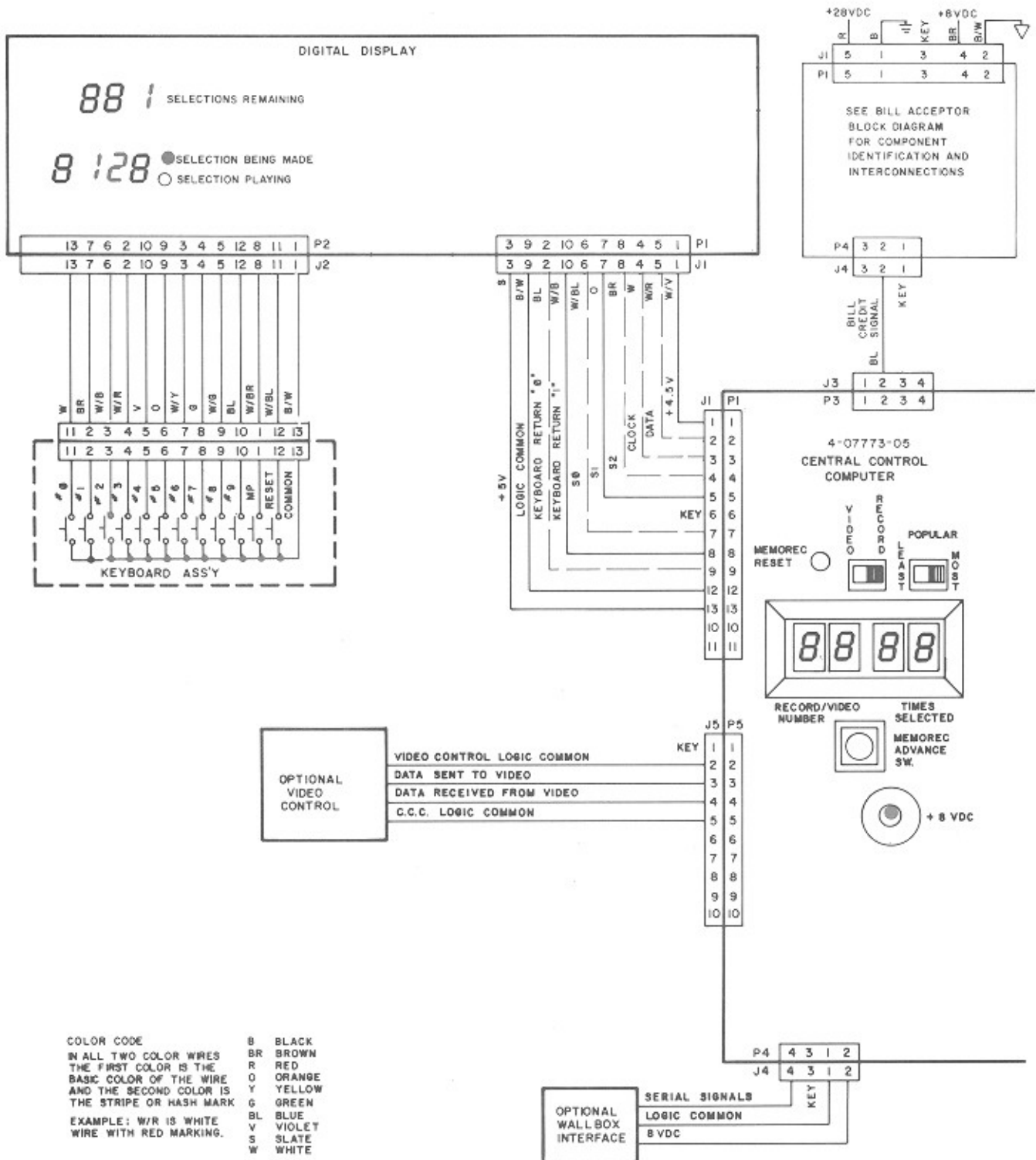


1. Patron presses the first digit of his selection number. (In this illustration the number is 1.)
2. The C.C.C. senses the key closure, checks that the credit is available and displays it on the digital display.

NOTE: The first digit of a selection must be a 1 or a 2. If any other key is pressed, the computer ignores it. A correct number may be entered. (RESET button is not needed.)



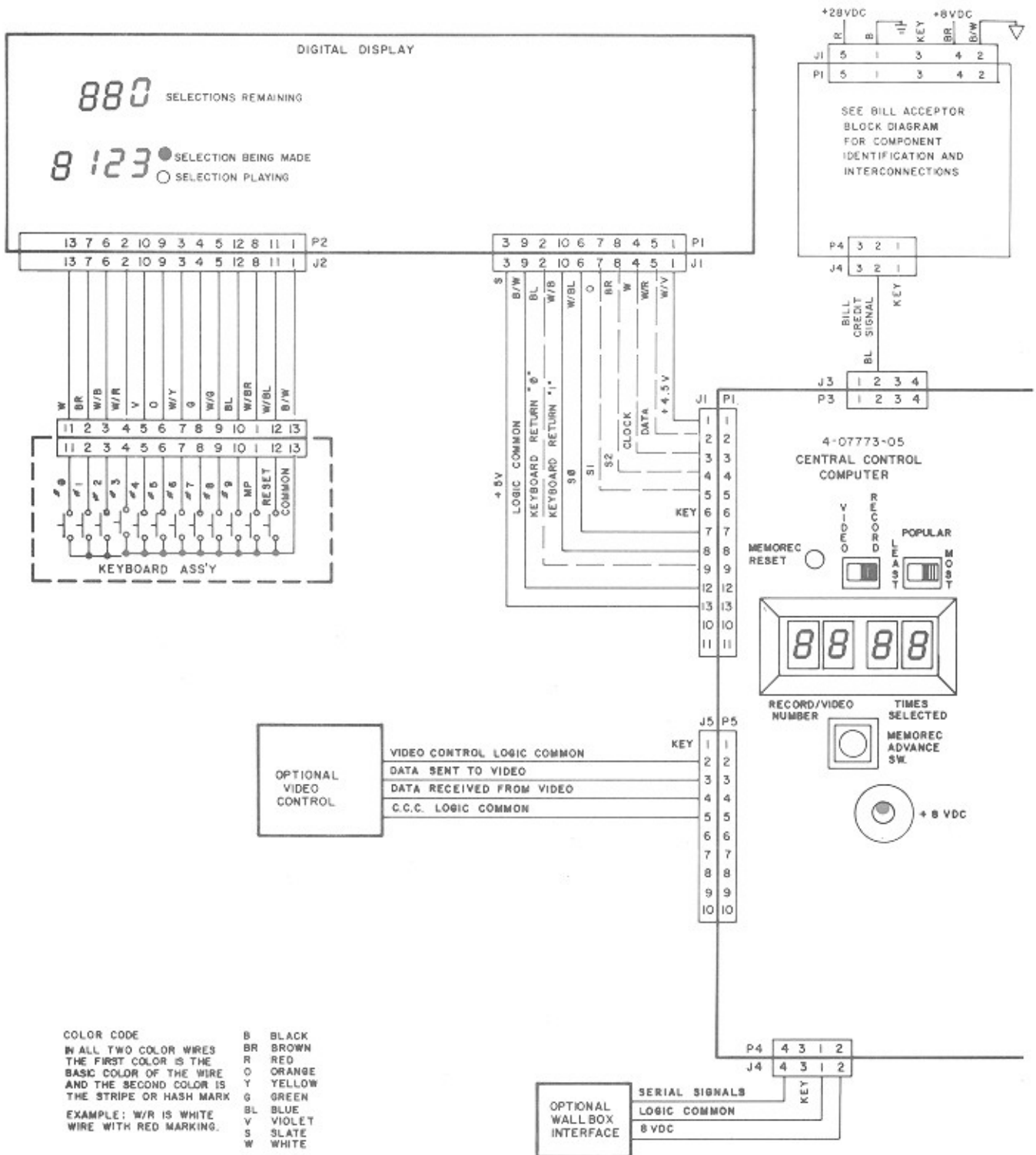
SEQUENCE DIAGRAM 5 The second digit is selected and displayed.



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

SEQUENCE DIAGRAM 6

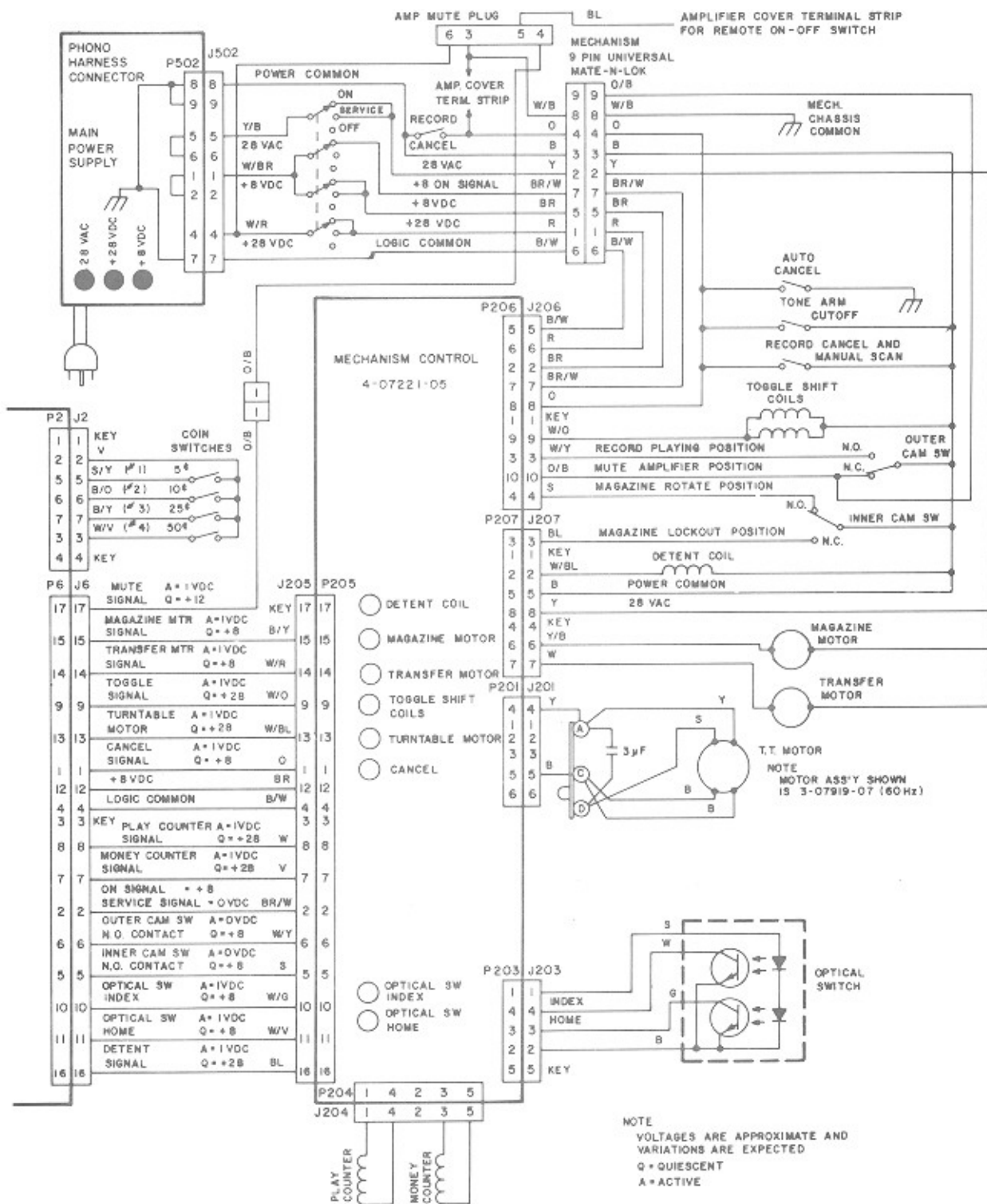
The third digit is selected and displayed. The selection is stored and Memorec is incremented. Credit is cancelled.



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: W/R IS WHITE
 WIRE WITH RED MARKING.

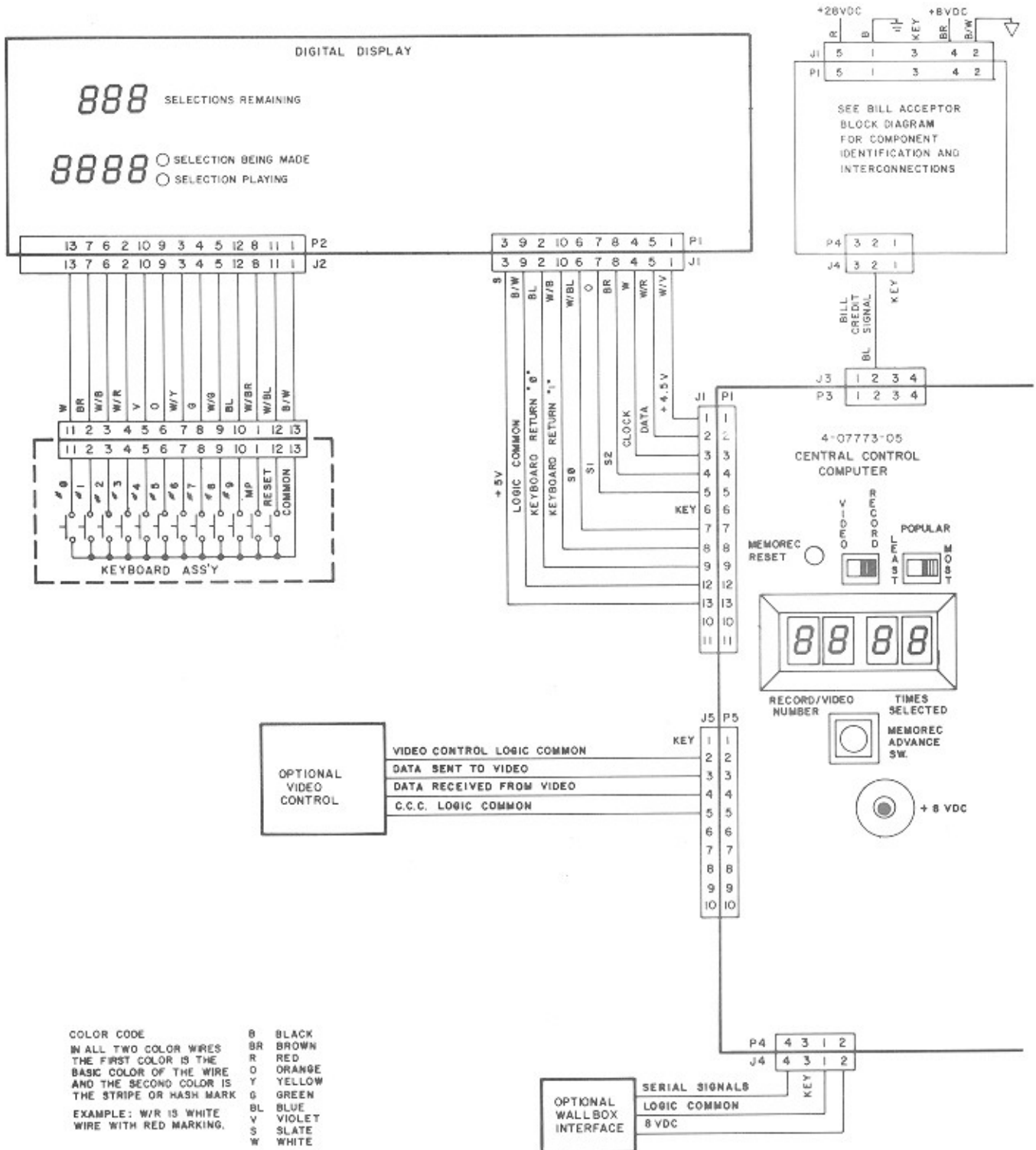
B	BLACK
BR	BROWN
R	RED
O	ORANGE
Y	YELLOW
G	GREEN
BL	BLUE
V	VIOLET
S	SLATE
W	WHITE

1. Patron presses the third digit of his selection. (In our illustration the number is 3.)
2. The C.C.C. senses the key closure, stores the selected digit and displays it.
3. Selection is stored in C.C.C.
4. Memorec data is incremented.
5. Credit is cancelled to 0.

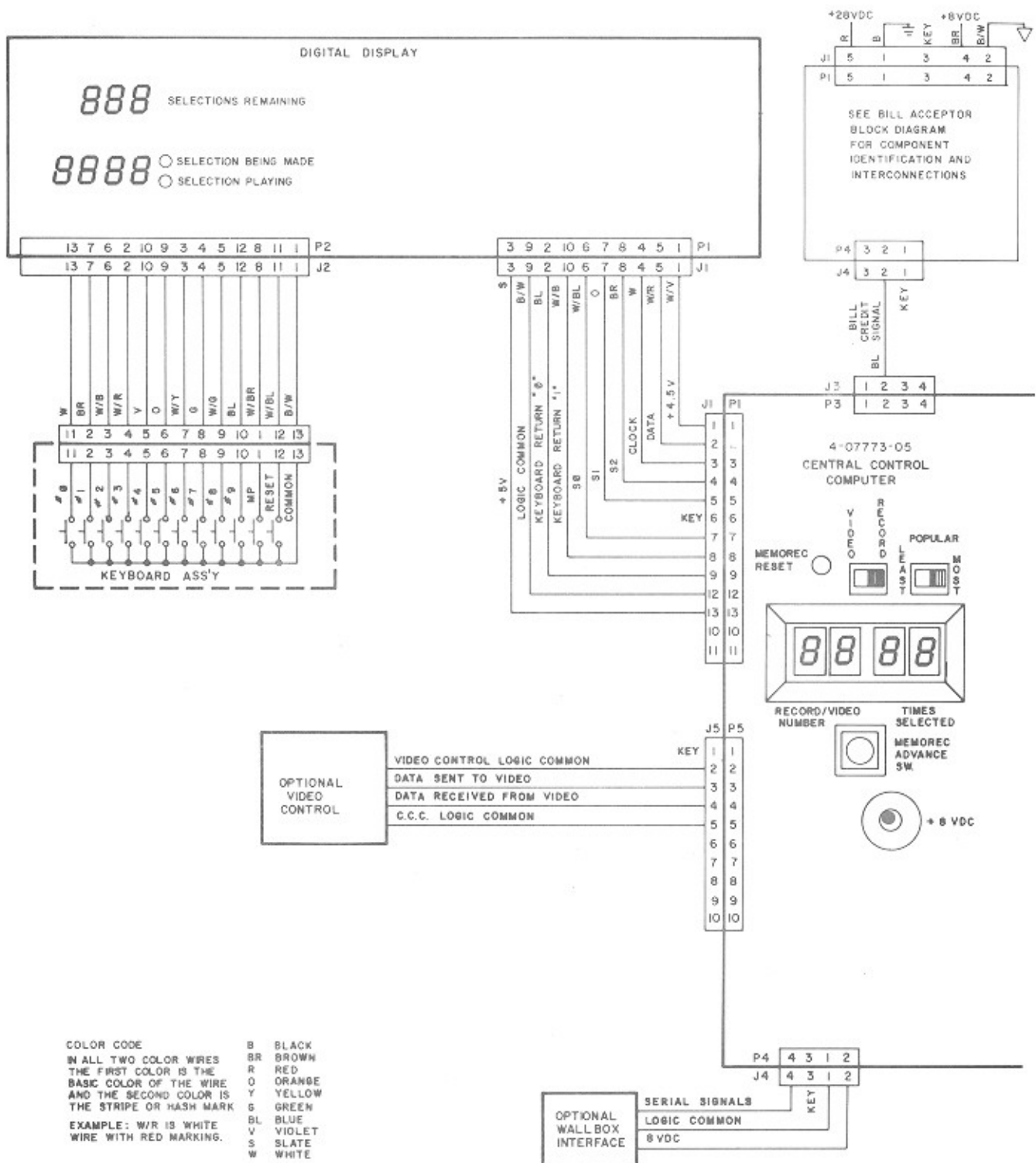


SEQUENCE DIAGRAM 7

Detent Coil and Magazine are energized and the Magazine rotates.



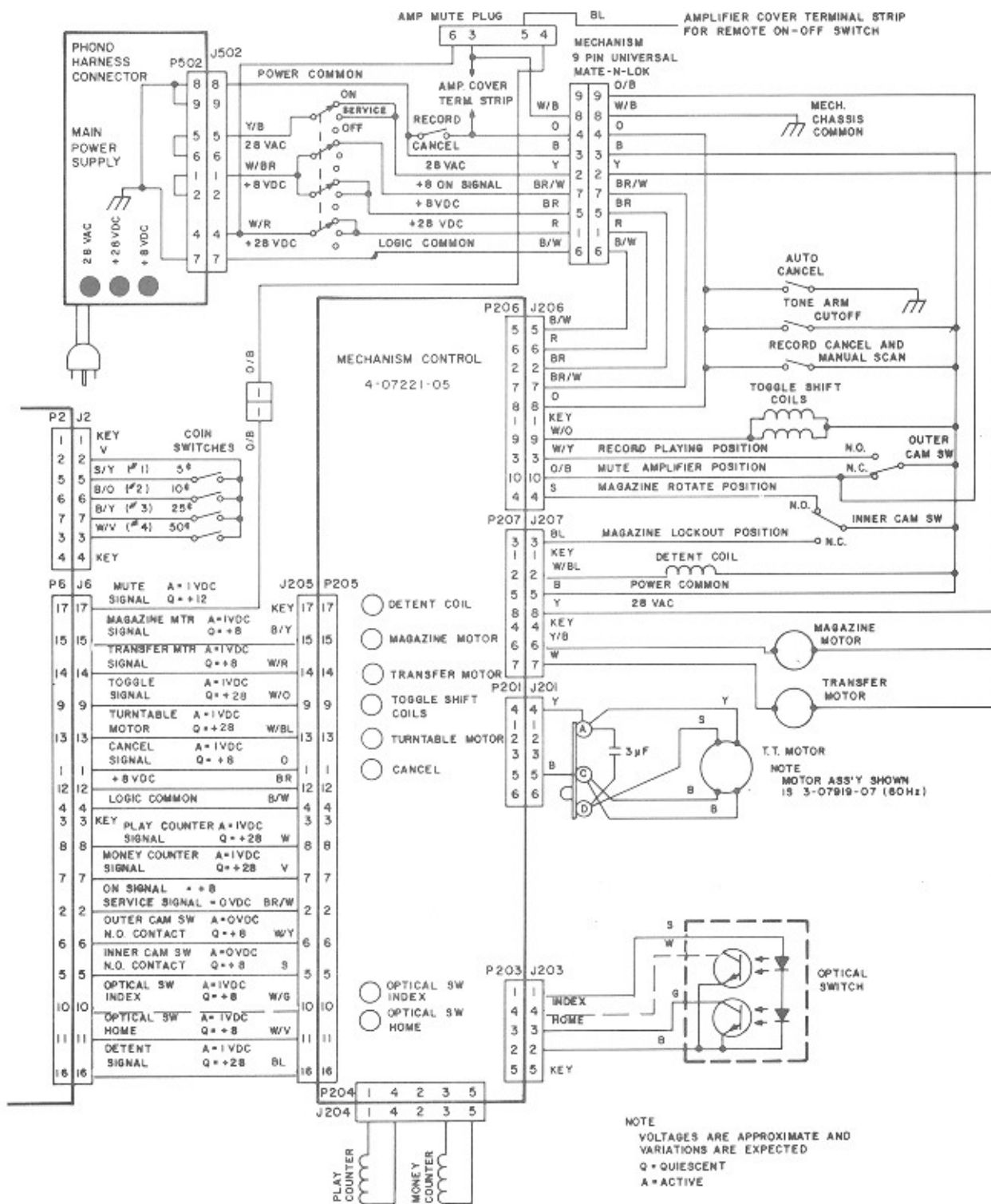
1. C.C.C. signals the Mechanism Control to energize the Detent Coil. Detent Coil LED lights and the energized Detent Coil operates a mechanical linkage to unlock the Magazine.
2. After 56 to 70 milliseconds, C.C.C. signals the Mechanism Control to energize the Magazine Motor. Magazine Motor LED lights and Motor is energized. The unlocked Magazine rotates.



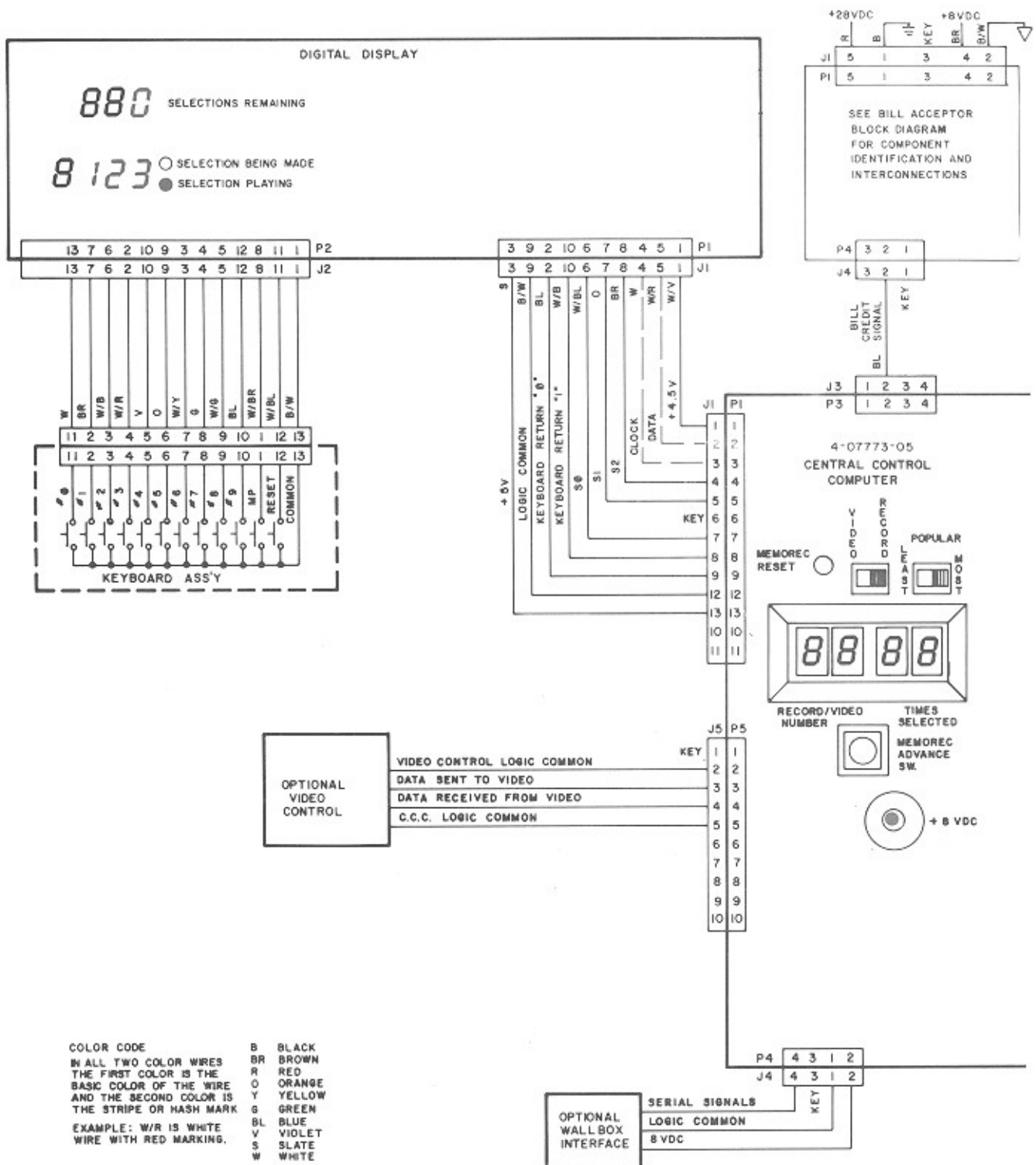
1. Magazine rotates and gear teeth interrupt Optical Switch light beam.

NOTE: When the Optical Switch Index LED goes from dark to light (Off to On) the C.C.C. understands that the Magazine is moving to the next record position. Two things happen:

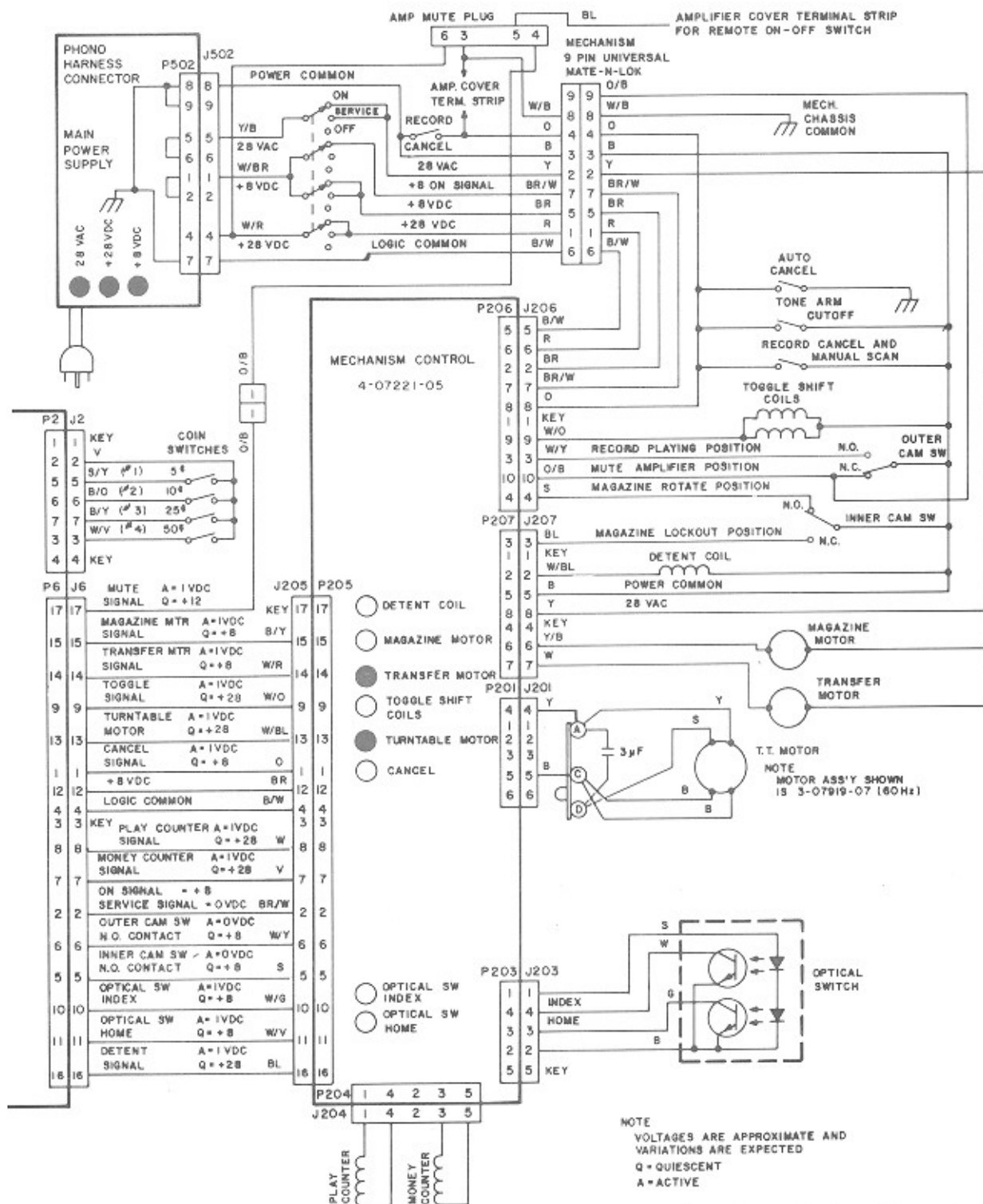
- a. C.C.C. keeps track of the Magazine position by adding 1 to the value stored in C.C.C.
- b. C.C.C. checks the selection memory to see if the left or right side of the next record has been selected.



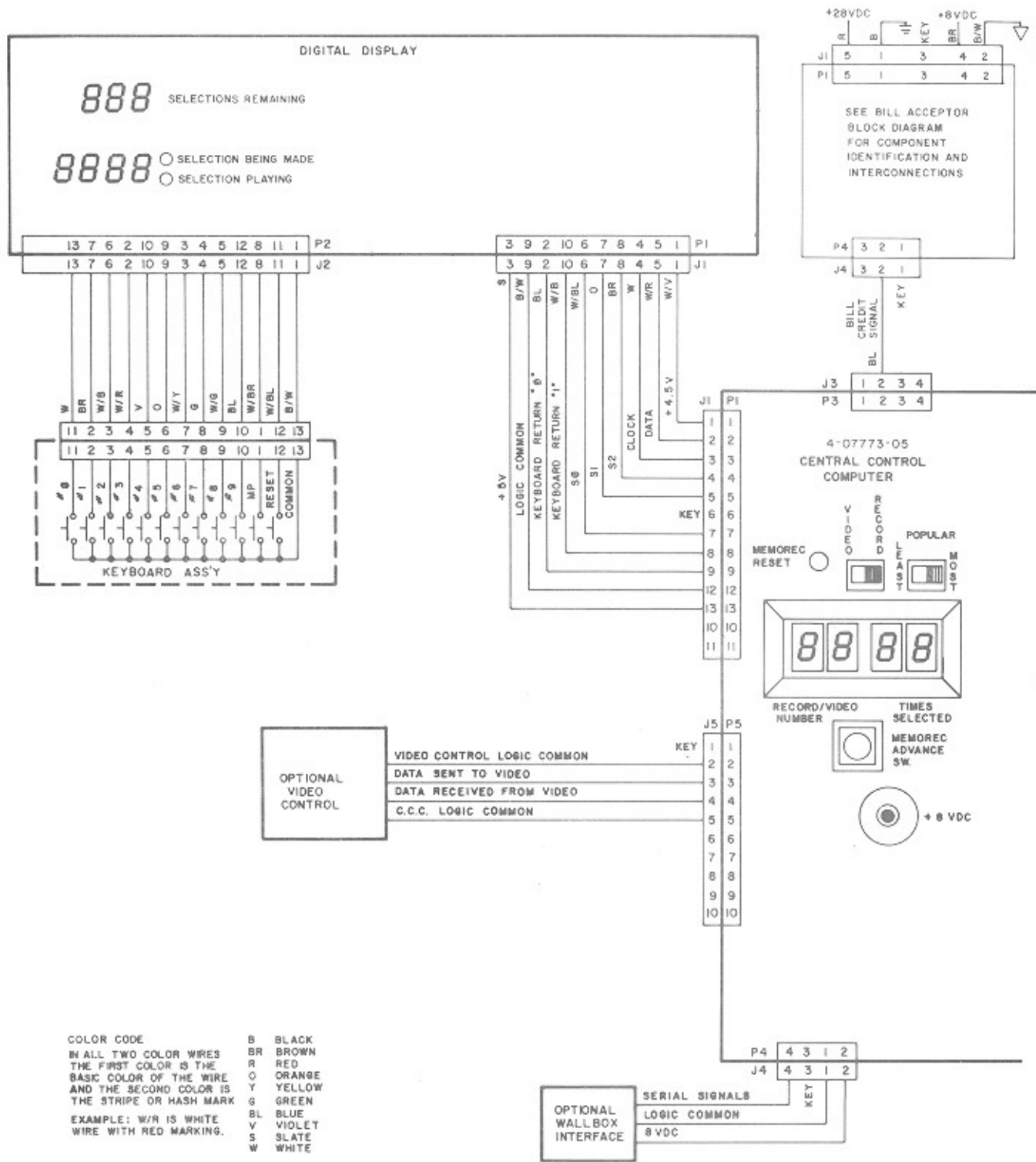
2. Selection Playing Display shows Magazine record position.



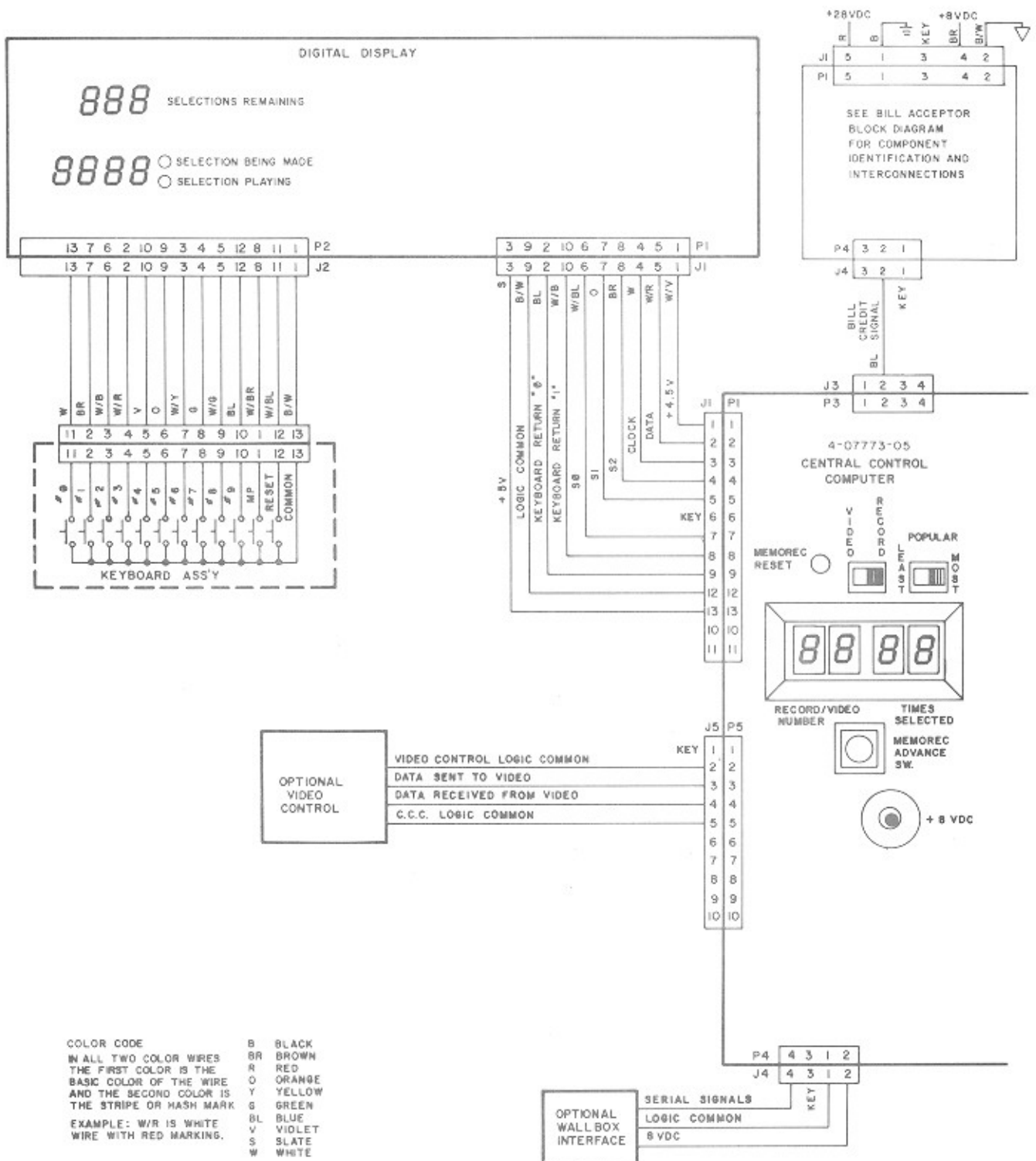
1. C.C.C. signals turn off Detent and Mag Motor LED's, causing Mechanism Control to de-energize Detent Coil and Magazine Motor.
2. Magazine is locked by Detent Pawl falling into slot in Detent Wheel.
3. C.C.C. signals to turn on Tran. Motor and T.T. Motor LED's - causing Mechanism Control to energize Transfer and Turntable Motors. C.C.C. signals Mechanism Control to advance Play Counter.



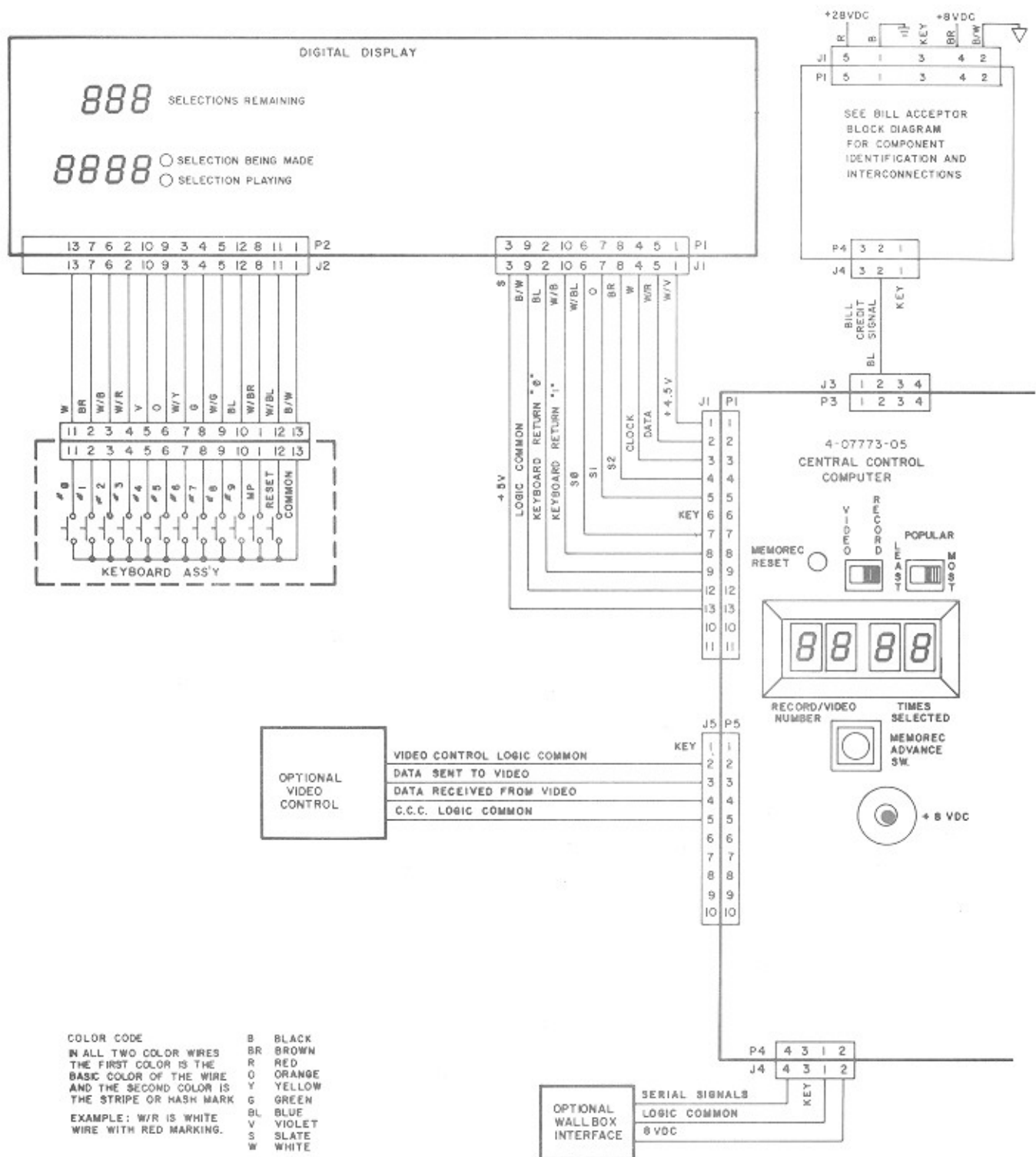
4. Transfer Motor rotates Cam off Inner Cam Switch. (NOTE: If the first digit of selection was a 2, the C.C.C. signal lights the Toggle LED, causing the Mechanism Control to energize Toggle Shift Controls.)
5. Gripper Bow picks up a record, places it on the Turntable and the Tone Arm sets down. (NOTE: If a record is not placed on the Turntable, the Auto Cancel operates when the Tone Arm sets down.)
6. Selection Playing Display lights - showing number of record chosen.



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. Mute signal becomes active and causes Amplifier to unmute.
4. Record plays.

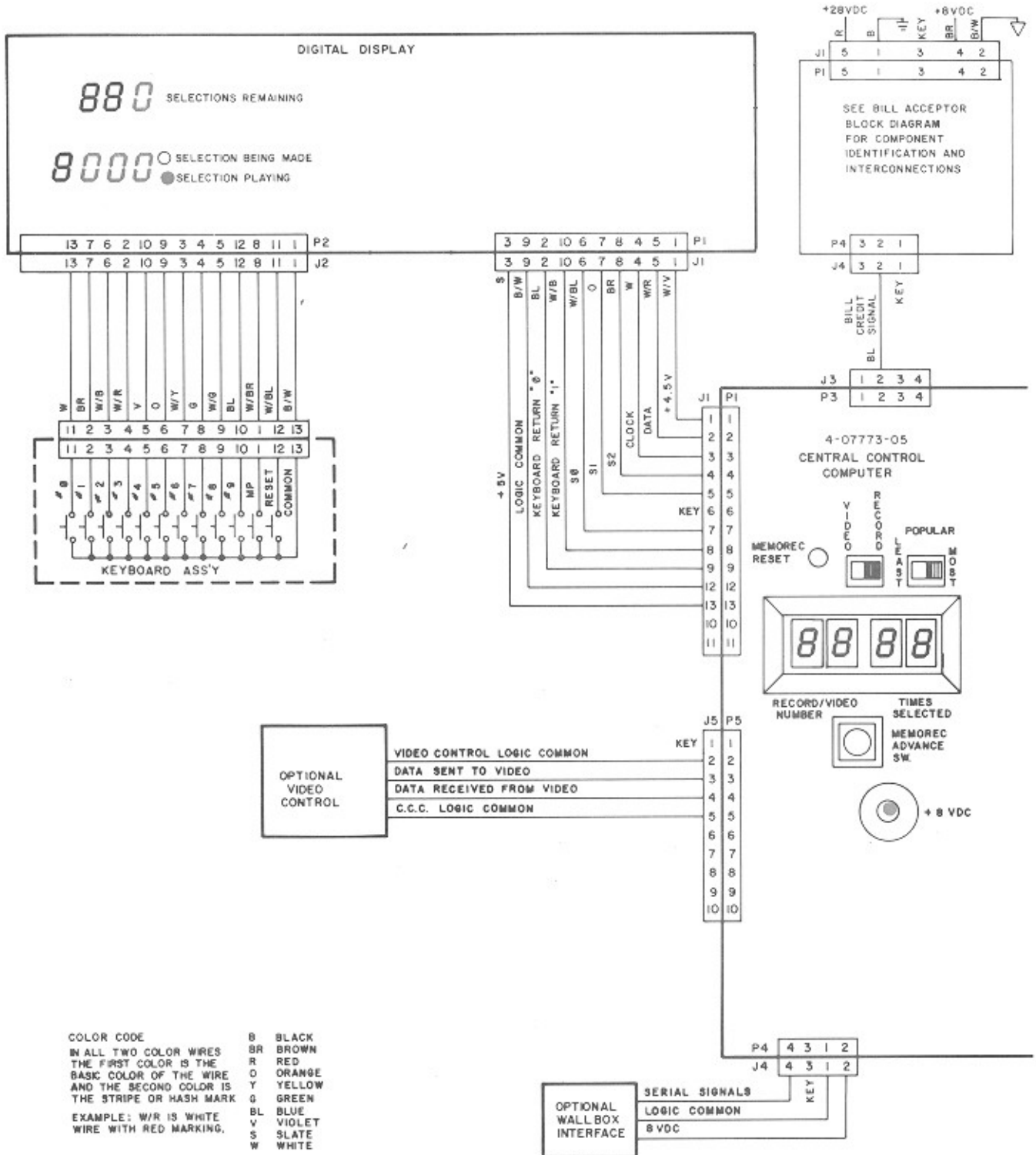


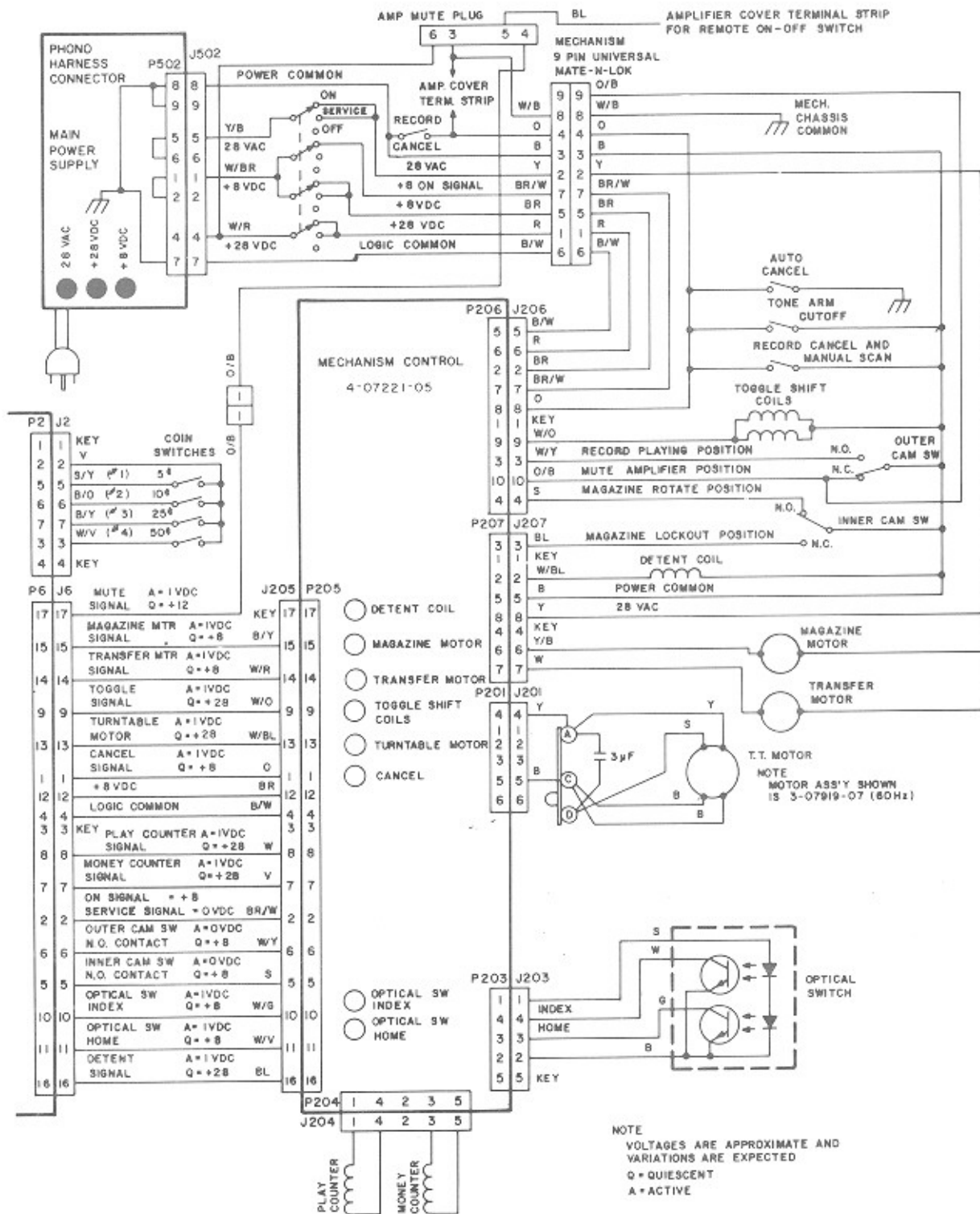
1. Tone Arm Cutoff sends a cancel signal to C.C.C.
2. C.C.C. turns on Tran. Motor LED causing Mechanism Control to energize Transfer Motor.
3. Gripper Bow picks up record and returns it to Magazine.

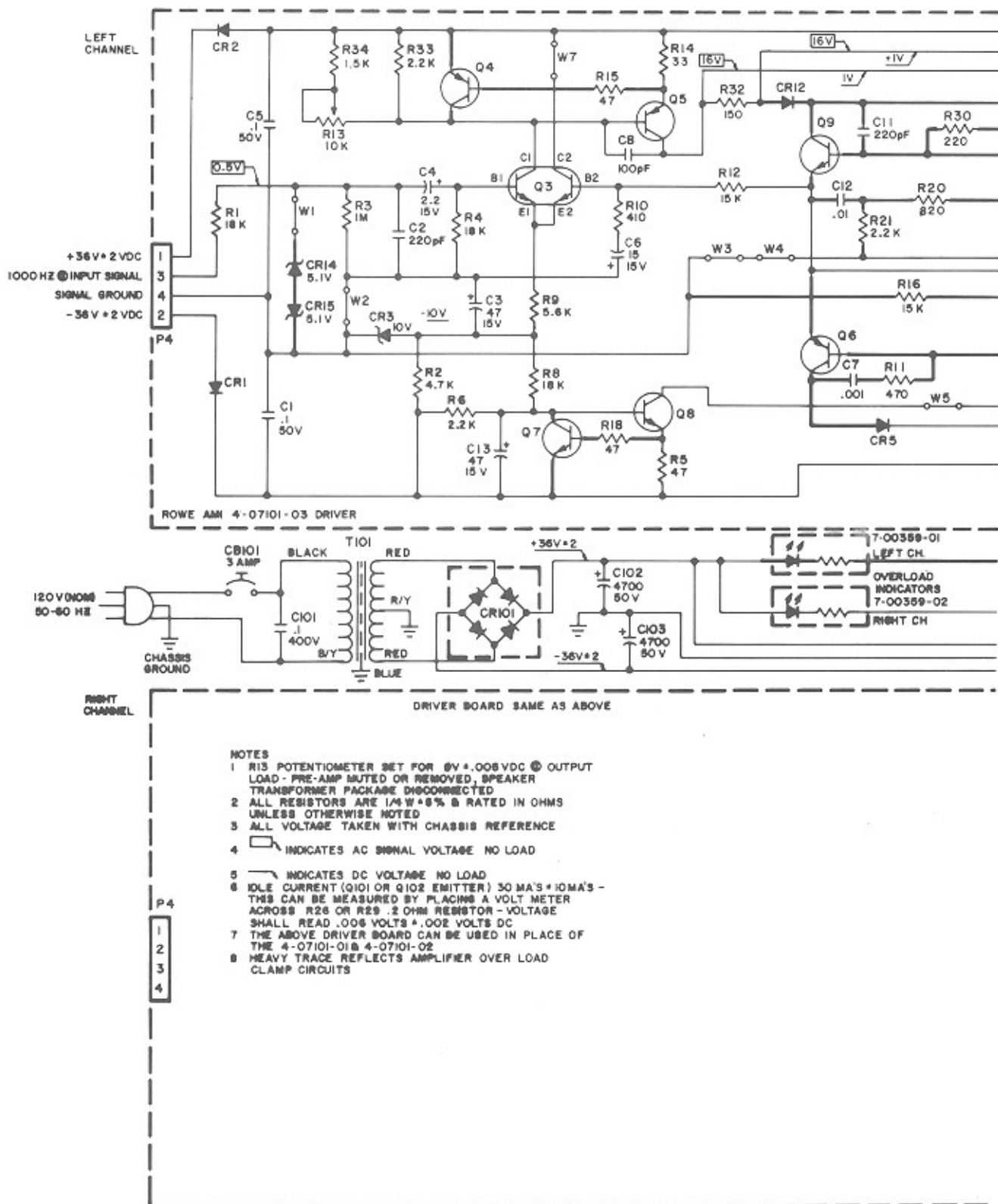


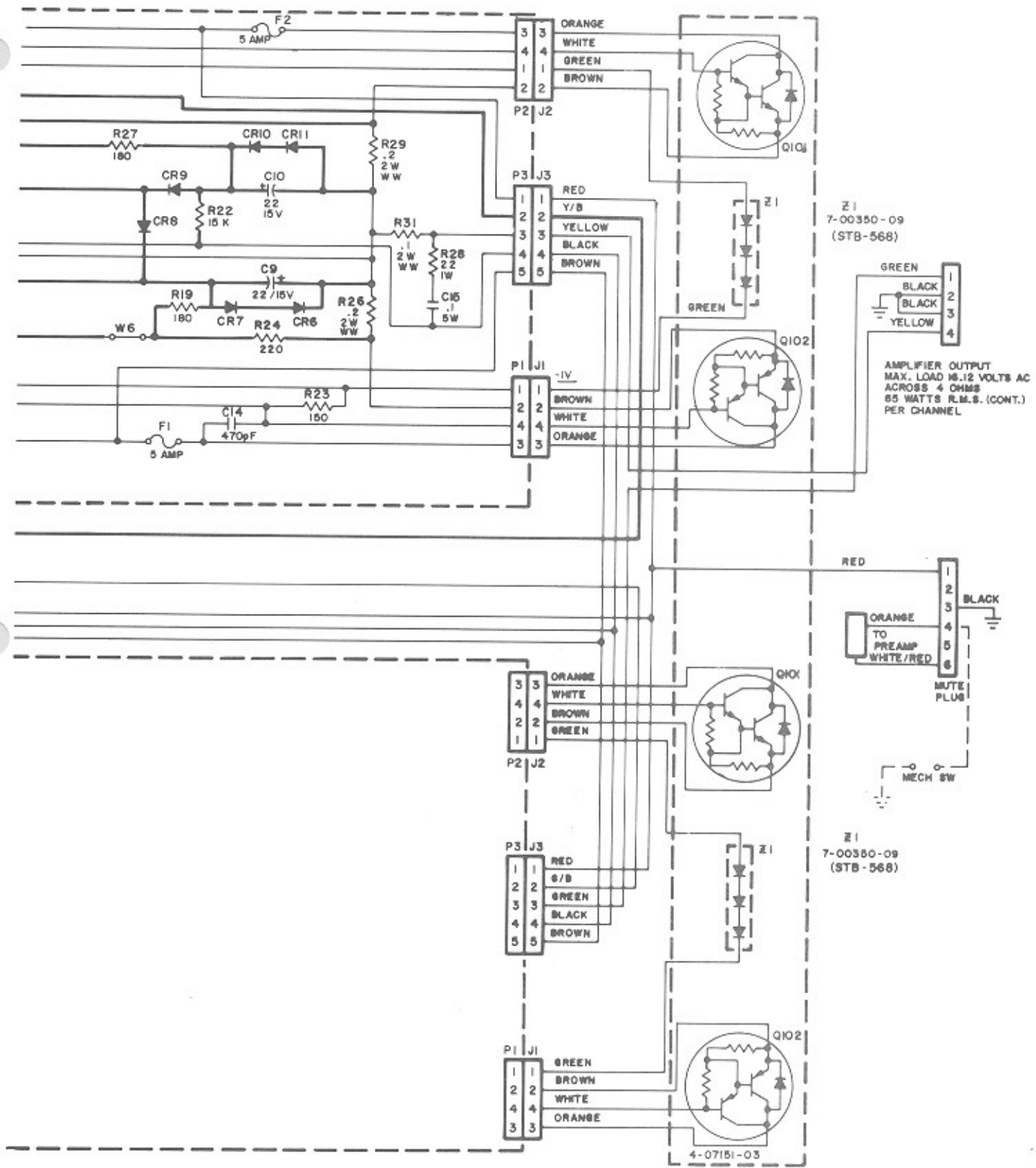
1. Cam rotates onto Inner Cam Switch.
2. Inner Cam SW. N.O. Contact signals the C.C.C. that the transfer cycle is complete.
3. C.C.C. turns off Tran Motor and T.T. Motor LED's causing Mechanism to turn off these motors.
4. C.C.C. electronically searches its selection memory. If the memory contains one or more selections, Sequences 7 through 12 will be repeated.

All selections have been played. Phonograph returns to Standby condition and the Autoplay timing begins.









FOR EQUIV ENG'G DWG SEE 6-09931-01-Q2

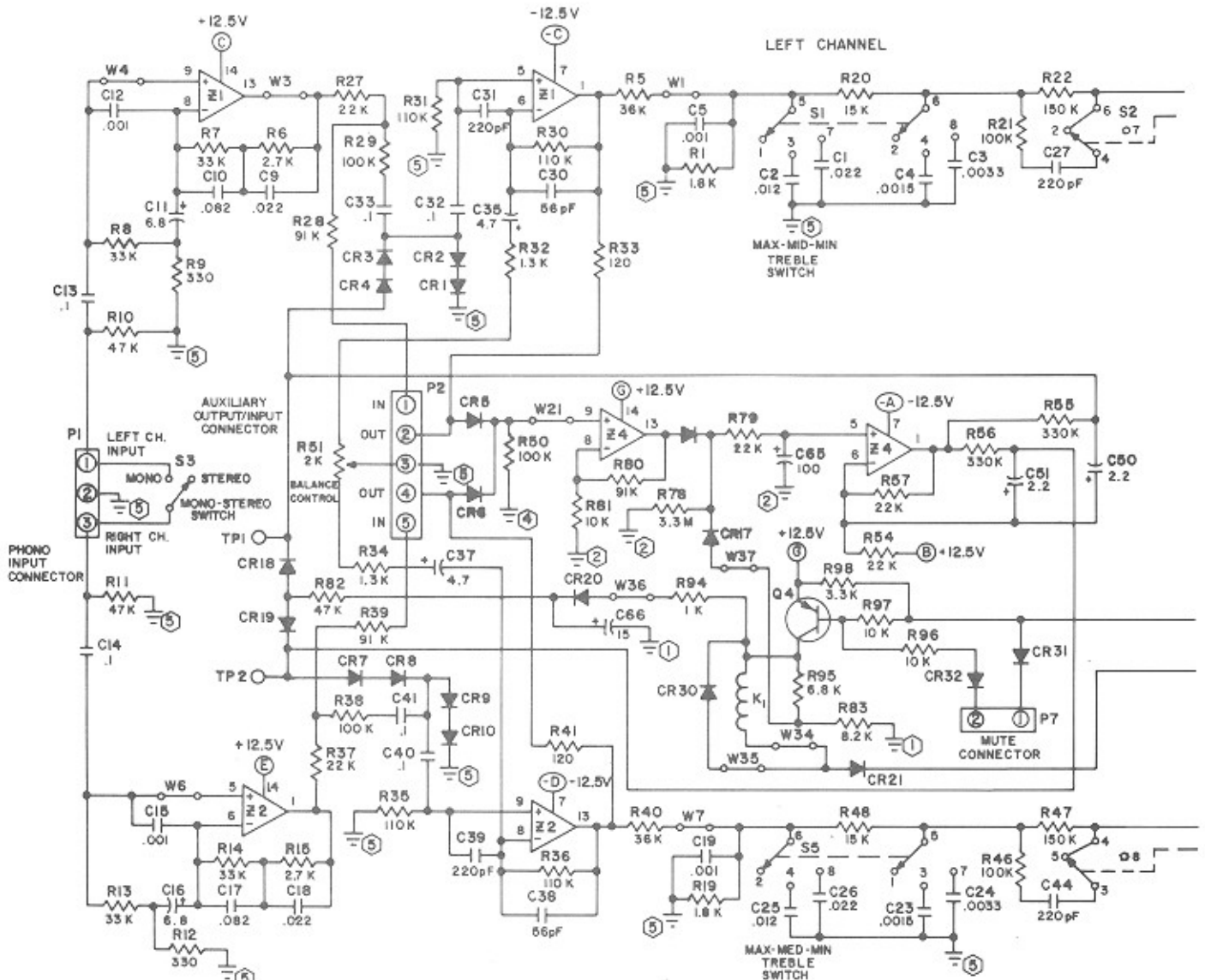
6-09931-01-Q2
SCHEMATIC DIAGRAM -
130 WATT AMP (POWER AMP)

FIGURE 5-2

COMPONENT LIST FOR 4-07101-03

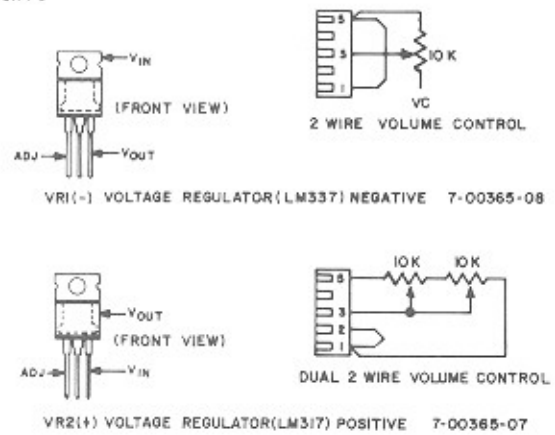
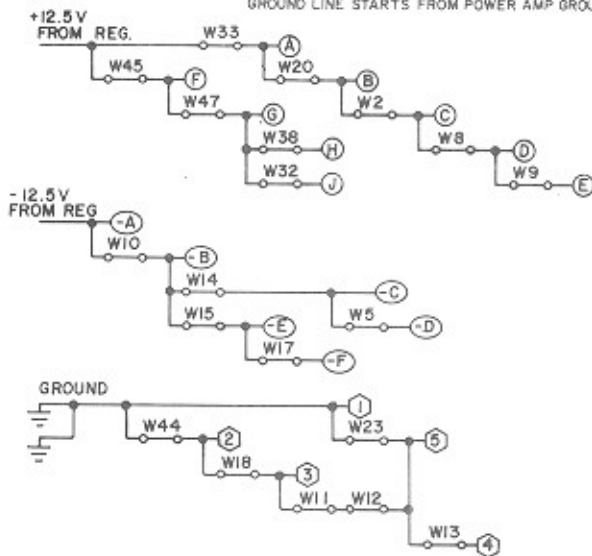
C1	Capacitor - Monolithic .1 Mfd	7-00286-49
C2	Capacitor - Monolithic 220 pF	7-00286-06
C3	Capacitor - Electrolytic 47 Mfd	7-00238-12
C4	Capacitor - Electrolytic 2.2 Mfd	7-00238-05
C5	Capacitor - Monolithic .1 Mfd	7-00286-49
C6	Capacitor - Electrolytic 15 Mfd	7-00238-09
C7	Capacitor - Monolithic .01 pF	7-00286-36
C8	Capacitor - Monolithic 100 pF	7-00286-01
C9	Capacitor - Electrolytic 22 Mfd	7-00238-10
C10	Capacitor - Electrolytic 22 Mfd	7-00238-10
C11	Capacitor - Monolithic 220 pF	7-00286-06
C12	Capacitor - Monolithic .01 pF	7-00286-36
C13	Capacitor - Electrolytic 47 Mfd	7-00238-12
C14	Capacitor - Monolithic 470 pF	7-00286-12
C15	Capacitor - Mylar .10 Mfd	7-00240-02
CR1	Diode - Silicon	7-00350-02
CR2	Diode - Silicon	7-00350-02
CR3	Diode - Zener 10V	7-00355-14
CR4	Not Used	
CR5	Diode - Silicon	7-00350-05
CR6	Diode - Silicon	7-00350-05
CR7	Diode - Silicon	7-00350-05
CR8	Diode - Silicon	7-00350-05
CR9	Diode - Silicon	7-00350-05
CR10	Diode - Silicon	7-00350-05
CR11	Diode - Silicon	7-00350-05
CR12	Diode - Silicon	7-00350-05
CR13	Not Used	
CR14	Diode - Zener 5.1V	7-00355-27
CR15	Diode - Zener 5.1V	7-00355-27
F1	Fuse - 5 Amp	7-00720-10
F2	Fuse - 5 Amp	7-00720-10
P1	Wafer - Polarized 4 Ckt	7-00750-04
P2	Wafer - Polarized 4 Ckt	7-00750-04
P3	Wafer - Polarized 5 Ckt	7-00750-05
P4	Wafer - Non-Polarized 4 Ckt	7-00749-04
Q1	Not Used	
Q2	Not Used	
Q3	Transistor - Dual (NPN)	7-00303-01
Q4	Transistor (PNP)	7-00301-04
Q5	Transistor (PNP)	7-00301-04
Q6	Transistor (PNP)	7-00301-04
Q7	Transistor (NPN)	7-00300-08
Q8	Transistor (NPN)	7-00300-08
Q9	Transistor (NPN)	7-00300-08

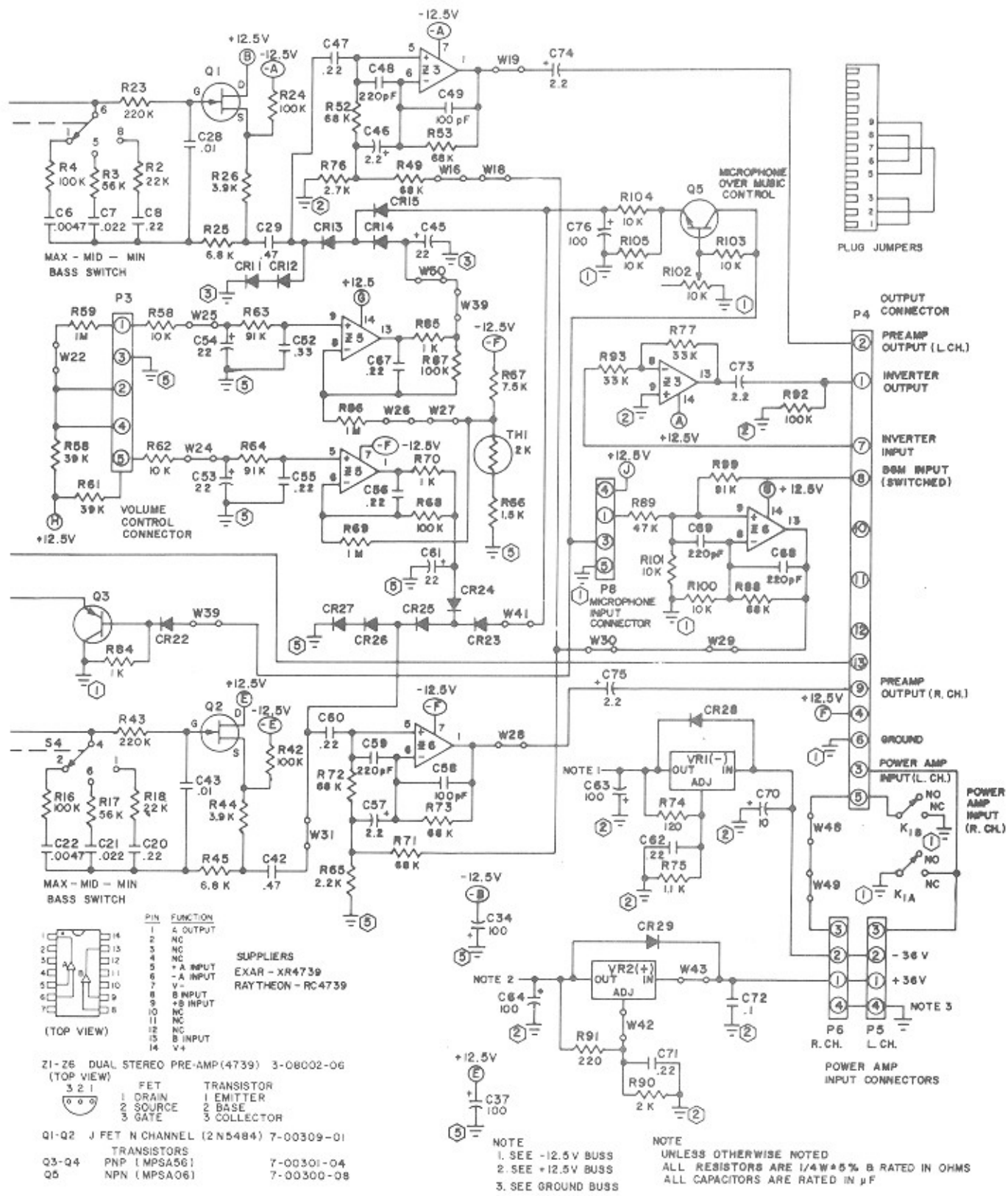
R1	Resistor - Carbon (1/4 W, 5%)	18K	7-9901-183
R2	Resistor - Carbon (1/4 W, 5%)	4.7K	7-9901-472
R3	Resistor - Carbon (1/4 W, 5%)	1 Meg	7-9901-105
R4	Resistor - Carbon (1/4 W, 5%)	18K	7-9901-183
R5	Resistor - Carbon (1/4 W, 5%)	47 Ohm	7-9901-470
R6	Resistor - Carbon (1/4 W, 5%)	2.2K	7-9901-222
R7	Not Used		
R8	Resistor - Carbon (1/4 W, 5%)	18K	7-9901-183
R9	Resistor - Carbon (1/4 W, 5%)	5.6K	7-9901-562
R10	Resistor - Carbon (1/4 W, 5%)	470 Ohm	7-9901-471
R11	Resistor - Carbon (1/4 W, 5%)	470 Ohm	7-9901-471
R12	Resistor - Carbon (1/4 W, 5%)	16K	7-9901-163
R13	Resistor - Potentiometer (1/4 W)	10K	7-00400-14
R14	Resistor - Carbon (1/4 W, 5%)	33 Ohm	7-9901-330
R15	Resistor - Carbon (1/4 W, 5%)	47 Ohm	7-9901-470
R16	Resistor - Carbon (1/4 W, 5%)	15K	7-9901-153
R17	Not Used		
R18	Resistor - Carbon (1/4 W, 5%)	47 Ohm	7-9901-470
R19	Resistor - Carbon (1/4 W, 5%)	180 Ohm	7-9901-181
R20	Resistor - Carbon (1/4 W, 5%)	820 Ohm	7-9901-821
R21	Resistor - Carbon (1/4 W, 5%)	2.2K	7-9901-222
R22	Resistor - Carbon (1/4 W, 5%)	15K	7-9901-153
R23	Resistor - Carbon (1/4 W, 5%)	150 Ohm	7-9901-151
R24	Resistor - Carbon (1/4 W, 5%)	220 Ohm	7-9901-221
R25	Not Used		
R26	Resistor - Wire Wound (2 W, 10%)	.2 Ohm	2-16280-01
R27	Resistor - Carbon (1/4 W, 5%)	180 Ohm	7-9901-181
R28	Resistor - Carbon (1 W, 10%)	22 Ohm	2-16282-08
R29	Resistor - Wire Wound (2 W, 10%)	.2 Ohm	2-16280-01
R30	Resistor - Carbon (1/4 W, 5%)	220 Ohm	7-9901-221
R31	Resistor - Wire Wound (2 W, 10%)	.1 Ohm	2-16280-02
R32	Resistor - Carbon (1/4 W, 5%)	150 Ohm	7-9901-151
R33	Resistor - Carbon (1/4 W, 5%)	2.2 K	7-9901-222
R34	Resistor - Carbon (1/4 W, 5%)	1.5 K	7-9901-152
W1 Thru W7	Wire - Bare		0-05032-00



BUSS DIAGRAM

+12.5V & -12.5V LINES START FROM EACH RESPECTIVE REGULATOR
GROUND LINE STARTS FROM POWER AMP GROUND AT P5 OR P6





FOR EQUIV. ENG'G DWG SEE 6-07925-04

6-07925-04-Q2
SCHEMATIC DIAGRAM -
STEREO PREAMP ASS'Y

FIGURE 5-3

COMPONENT LIST FOR 6-07925-04

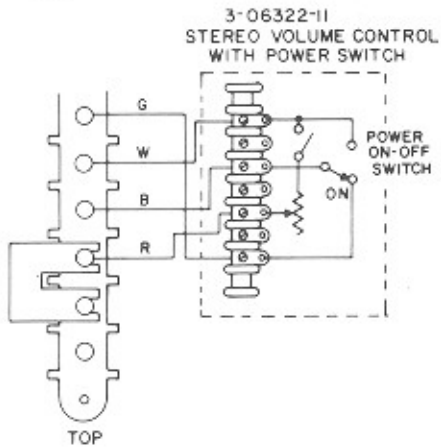
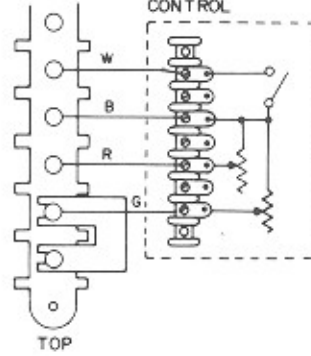
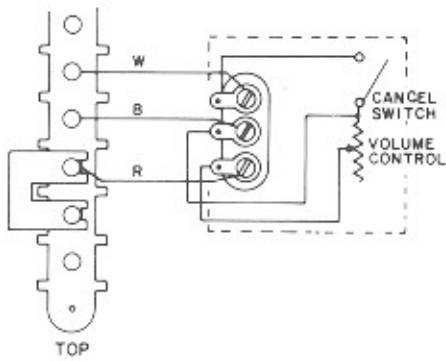
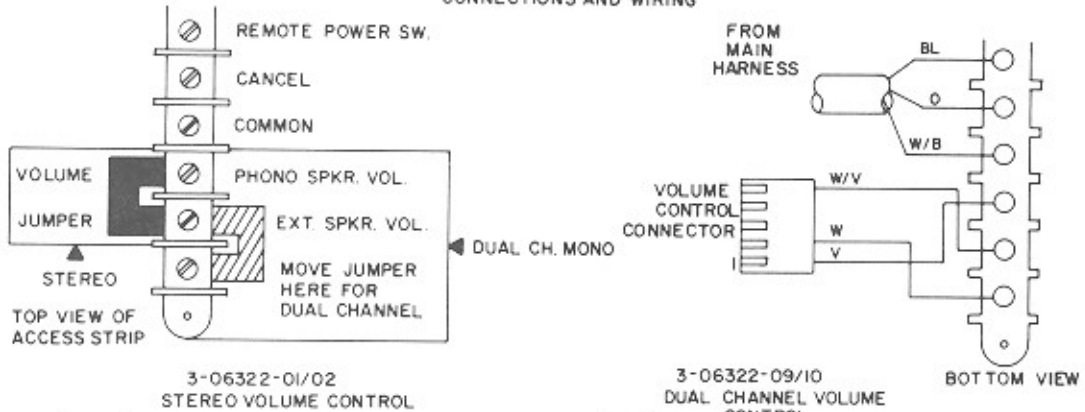
C1	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C2	CAPACITOR - MONOLITHIC CERAMIC	.012 Mfd	7-00286-38
C3	CAPACITOR - MONOLITHIC CERAMIC	.0033 Mfd	7-00286-27
C4	CAPACITOR - MONOLITHIC CERAMIC	.0015 Mfd	7-00286-21
C5	CAPACITOR - MONOLITHIC CERAMIC	.001 Mfd	7-00286-18
C6	CAPACITOR - MONOLITHIC CERAMIC	.0047 Mfd	7-00286-30
C7	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C8	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C9	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C10	CAPACITOR - MONOLITHIC CERAMIC	.082 Mfd	7-00285-48
C11	CAPACITOR - ELECTROLYTIC	6.8 Mfd	7-00238-07
C12	CAPACITOR - MONOLITHIC CERAMIC	.001 Mfd	7-00286-18
C13	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C14	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C15	CAPACITOR - MONOLITHIC CERAMIC	.001 Mfd	7-00286-18
C16	CAPACITOR - ELECTROLYTIC	6.8 Mfd	7-00238-07
C17	CAPACITOR - MONOLITHIC CERAMIC	.082 Mfd	7-00285-48
C18	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C19	CAPACITOR - MONOLITHIC CERAMIC	.001 Mfd	7-00286-18
C20	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C21	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C22	CAPACITOR - MONOLITHIC CERAMIC	.0047 Mfd	7-00286-30
C23	CAPACITOR - MONOLITHIC CERAMIC	.0015 Mfd	7-00286-21
C24	CAPACITOR - MONOLITHIC CERAMIC	.0033 Mfd	7-00286-27
C25	CAPACITOR - MONOLITHIC CERAMIC	.012 Mfd	7-00286-38
C26	CAPACITOR - MONOLITHIC CERAMIC	.022 Mfd	7-00286-41
C27	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C28	CAPACITOR - MONOLITHIC CERAMIC	.01 Mfd	7-00286-37
C29	CAPACITOR - MONOLITHIC CERAMIC	.47 Mfd	7-00285-16
C30	CAPACITOR - MONOLITHIC CERAMIC	56 Pf	7-00287-10
C31	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C32	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C33	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C34	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
C35	CAPACITOR - ELECTROLYTIC	4.7 Mfd	7-00238-06
C36	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
C37	CAPACITOR - ELECTROLYTIC	4.7 Mfd	7-00238-06
C38	CAPACITOR - MONOLITHIC CERAMIC	56 Pf	7-00287-10
C39	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C40	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C41	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C42	CAPACITOR - MONOLITHIC CERAMIC	.47 Mfd	7-00285-16
C43	CAPACITOR - MONOLITHIC CERAMIC	.01 Mfd	7-00286-37
C44	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C45	CAPACITOR - ELECTROLYTIC	22 Mfd	7-00238-10
C46	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C47	CAPACITOR - ELECTROLYTIC	.22 Mfd	7-00285-10
C48	CAPACITOR - ELECTROLYTIC	220 Pf	7-00286-06
C49	CAPACITOR - ELECTROLYTIC	100 Pf	7-00286-01
C50	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C51	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C52	CAPACITOR - MONOLITHIC CERAMIC	.33 Mfd	7-00285-15
C53	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C54	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C55	CAPACITOR - MONOLITHIC CERAMIC	.33 Mfd	7-00285-15
C56	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C57	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C58	CAPACITOR - MONOLITHIC CERAMIC	100 Pf	7-00286-01

C59	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C60	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C61	CAPACITOR - ELECTROLYTIC	22 Mfd	7-00238-10
C62	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C63	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
C64	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
C65	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
C66	CAPACITOR - ELECTROLYTIC	15 Mfd	7-00238-09
C67	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C68	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C69	CAPACITOR - MONOLITHIC CERAMIC	220 Pf	7-00286-06
C70	CAPACITOR - ELECTROLYTIC	10 Mfd	7-00238-08
C71	CAPACITOR - MONOLITHIC CERAMIC	.22 Mfd	7-00285-10
C72	CAPACITOR - MONOLITHIC CERAMIC	.1 Mfd	7-00285-14
C73	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C74	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C75	CAPACITOR - ELECTROLYTIC	2.2 Mfd	7-00238-05
C76	CAPACITOR - ELECTROLYTIC	100 Mfd	7-00238-14
CR1 - CR32	DIODE - SILICON		7-00350-07
K1	RELAY - REED		7-00422-08
P1	NON-POLARIZING WAFER ASSEMBLY (3 CKT)		7-00749-21
P2	NON-POLARIZING WAFER ASSEMBLY (5 CKT)		7-00749-23
P3	NON-POLARIZING WAFER ASSEMBLY (5 CKT)		7-00749-23
P4	NON-POLARIZING WAFER ASSEMBLY (13 CKT)		7-00749-31
P5	P.C. BOARD CONNECTOR - TOP ENTRY (4 CKT)		7-00748-02
P6	P.C. BOARD CONNECTOR - TOP ENTRY (4 CKT)		7-00748-02
P7	POLARIZING WAFER ASSEMBLY (2 CKT)		7-00750-02
P8	NON-POLARIZING WAFER ASSEMBLY (5 CKT)		7-00749-23
Q1	TRANSISTOR - JUNCTION FIELD EFFECT		7-00309-01
Q2	TRANSISTOR - JUNCTION FIELD EFFECT		7-00309-01
Q3	TRANSISTOR - SILICON (PNP)		7-00301-04
Q4	TRANSISTOR - SILICON (PNP)		7-00301-04
Q5	TRANSISTOR - SILICON (NPN)		7-00301-08
R1	RESISTOR - CARBON (1/4W,5%)	1.8K	7-9901-182
R2	RESISTOR - CARBON (1/4W,5%)	2.2K	7-9901-222
R3	RESISTOR - CARBON (1/4W,5%)	56K	7-9901-563
R4	RESISTOR - CARBON (1/4W,5%)	100K	7-9901-104
R5	RESISTOR - CARBON (1/4W,5%)	36K	7-9901-363
R6	RESISTOR - CARBON (1/4W,5%)	2.7K	7-9901-272
R7	RESISTOR - CARBON (1/4W,5%)	33K	7-9901-333
R8	RESISTOR - CARBON (1/4W,5%)	33K	7-9901-333
R9	RESISTOR - CARBON (1/4W,5%)	330 Ohm	7-9901-331
R10	RESISTOR - CARBON (1/4W,5%)	47K	7-9901-473
R11	RESISTOR - CARBON (1/4W,5%)	47K	7-9901-473
R12	RESISTOR - CARBON (1/4W,5%)	330 Ohm	7-9901-331
R13	RESISTOR - CARBON (1/4W,5%)	33K	7-9901-333
R14	RESISTOR - CARBON (1/4W,5%)	33K	7-9901-333
R15	RESISTOR - CARBON (1/4W,5%)	2.7K	7-9901-272
R16	RESISTOR - CARBON (1/4W,5%)	100K	7-9901-104
R17	RESISTOR - CARBON (1/4W,5%)	56K	7-9901-563
R18	RESISTOR - CARBON (1/4W,5%)	22K	7-9901-223
R19	RESISTOR - CARBON (1/4W,5%)	1.8K	7-9901-182
R20	RESISTOR - CARBON (1/4W,5%)	15K	7-9901-153
R21	RESISTOR - CARBON (1/4W,5%)	100K	7-9901-104
R22	RESISTOR - CARBON (1/4W,5%)	150K	7-9901-154

R23	RESISTOR - CARBON	(1/4W,5%)	220K	7-9901-224
R24	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R25	RESISTOR - CARBON	(1/4W,5%)	6.8K	7-9901-682
R26	RESISTOR - CARBON	(1/4W,5%)	3.9K	7-9901-392
R27	RESISTOR - CARBON	(1/4W,5%)	22K	7-9901-223
R28	RESISTOR - CARBON	(1/4W,5%)	91K	7-9901-913
R29	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R30	RESISTOR - CARBON	(1/4W,5%)	110K	7-9901-114
R31	RESISTOR - CARBON	(1/4W,5%)	110K	7-9901-114
R32	RESISTOR - CARBON	(1/4W,5%)	1.3K	7-9901-132
R33	RESISTOR - CARBON	(1/4W,5%)	120 Ohm	7-9901-121
R34	RESISTOR - CARBON	(1/4W,5%)	120 Ohm	7-9901-121
R35	RESISTOR - CARBON	(1/4W,5%)	110K	7-9901-114
R36	RESISTOR - CARBON	(1/4W,5%)	110K	7-9901-114
R37	RESISTOR - CARBON	(1/4W,5%)	22K	7-9901-223
R38	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R39	RESISTOR - CARBON	(1/4W,5%)	91K	7-9901-913
R40	RESISTOR - CARBON	(1/4W,5%)	36K	7-9901-363
R41	RESISTOR - CARBON	(1/4W,5%)	120 Ohm	7-9901-121
R42	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R43	RESISTOR - CARBON	(1/4W,5%)	220K	7-9901-224
R44	RESISTOR - CARBON	(1/4W,5%)	3.9K	7-9901-392
R45	RESISTOR - CARBON	(1/4W,5%)	6.8K	7-9901-682
R46	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R47	RESISTOR - CARBON	(1/4W,5%)	150K	7-9901-154
R48	RESISTOR - CARBON	(1/4W,5%)	15K	7-9901-153
R49	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R50	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R51	POTENTIOMETER (BAL)		2K	7-00400-12
R52	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R53	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R54	RESISTOR - CARBON	(1/4W,5%)	22K	7-9901-223
R55	RESISTOR - CARBON	(1/4W,5%)	330K	7-9901-334
R56	RESISTOR - CARBON	(1/4W,5%)	330K	7-9901-334
R57	RESISTOR - CARBON	(1/4W,5%)	22K	7-9901-223
R58	RESISTOR - CARBON	(1/4W,5%)	10K	7-9901-103
R59	RESISTOR - CARBON	(1/4W,5%)	1 MEG	7-9901-105
R60	RESISTOR - CARBON	(1/4W,5%)	39K	7-9901-393
R61	RESISTOR - CARBON	(1/4W,5%)	39K	7-9901-393
R62	RESISTOR - CARBON	(1/4W,5%)	10K	7-9901-103
R63	RESISTOR - CARBON	(1/4W,5%)	91K	7-9901-913
R64	RESISTOR - CARBON	(1/4W,5%)	91K	7-9901-913
R65	RESISTOR - CARBON	(1/4W,5%)	2.7K	7-9901-272
R66	RESISTOR - CARBON	(1/4W,5%)	1.5K	7-9901-152
R67	RESISTOR - CARBON	(1/4W,5%)	7.5K	7-9901-752
R68	RESISTOR - CARBON	(1/4W,5%)	100K	7-9901-104
R69	RESISTOR - CARBON	(1/4W,5%)	1 MEG	7-9901-105
R70	RESISTOR - CARBON	(1/4W,5%)	1K	7-9901-102
R71	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R72	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R73	RESISTOR - CARBON	(1/4W,5%)	68K	7-9901-683
R74	RESISTOR - CARBON	(1/4W,5%)	120 Ohm	7-9901-121
R75	RESISTOR - CARBON	(1/4W,5%)	1.1K	7-9901-112
R76	RESISTOR - CARBON	(1/4W,5%)	2.7K	7-9901-272
R77	RESISTOR - CARBON	(1/4W,5%)	33K	7-9901-333
R78	RESISTOR - CARBON	(1/4W,5%)	3.3 MEG	7-9901-335
R79	RESISTOR - CARBON	(1/4W,5%)	22K	7-9901-223
R80	RESISTOR - CARBON	(1/4W,5%)	91K	7-9901-913

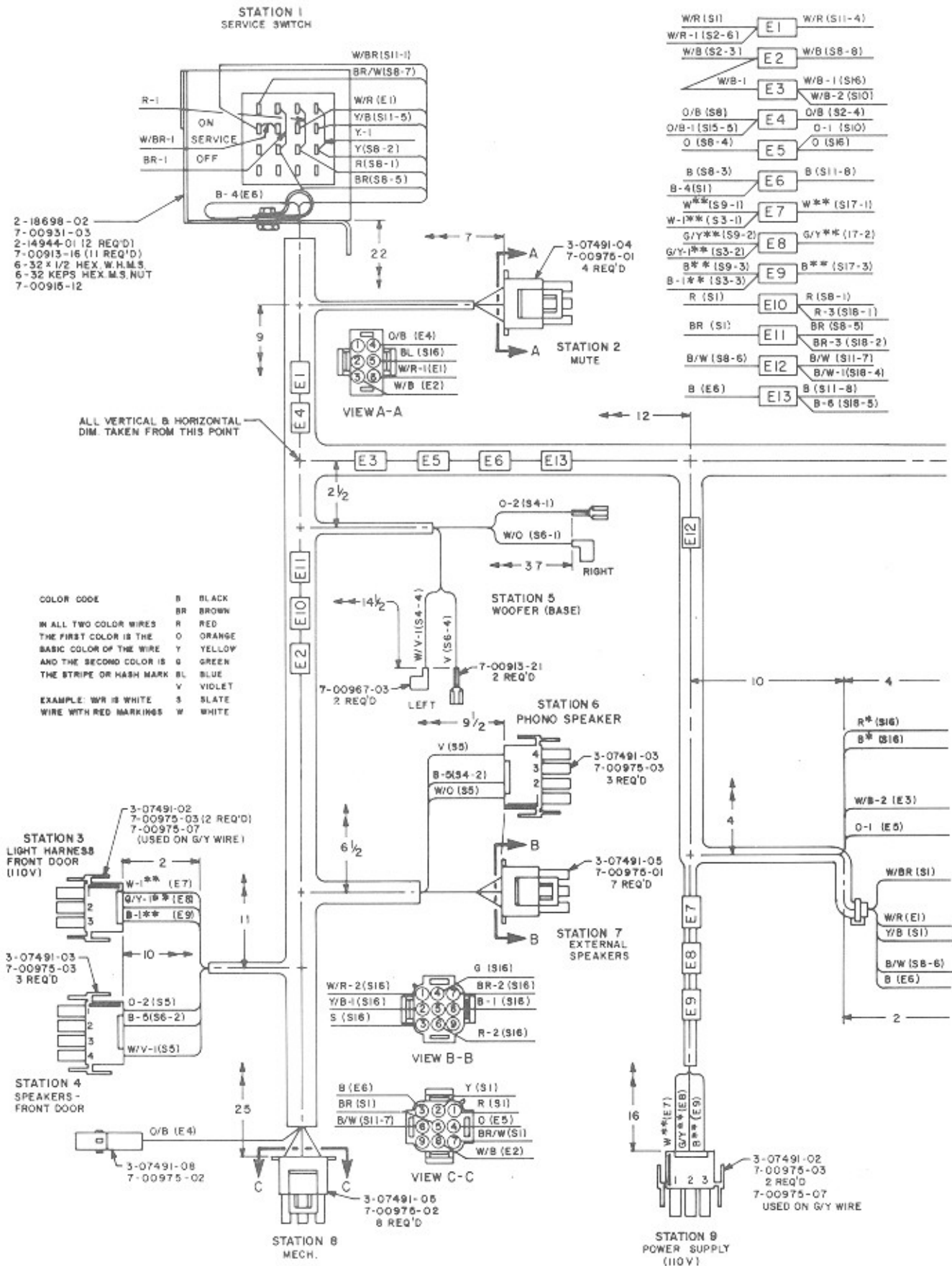
R81	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R82	RESISTOR - CARBON (1/4W,5%)	47K	7-9901-473
R83	RESISTOR - CARBON (1/4W,5%)	8.2K	7-9901-822
R84	RESISTOR - CARBON (1/4W,5%)	1K	7-9901-102
R85	RESISTOR - CARBON (1/4W,5%)	1K	7-9901-102
R86	RESISTOR - CARBON (1/4W,5%)	1 MEG	7-9901-105
R87	RESISTOR - CARBON (1/4W,5%)	100K	7-9901-104
R88	RESISTOR - CARBON (1/4W,5%)	68K	7-9901-683
R89	RESISTOR - CARBON (1/4W,5%)	47K	7-9901-473
R90	RESISTOR - CARBON (1/4W,5%)	2K	7-9901-202
R91	RESISTOR - CARBON (1/4W,5%)	220 Ohm	7-9901-221
R92	RESISTOR - CARBON (1/4W,5%)	100K	7-9901-104
R93	RESISTOR - CARBON (1/4W,5%)	33K	7-9901-333
R94	RESISTOR - CARBON (1/4W,5%)	1K	7-9901-102
R95	RESISTOR - CARBON (1/4W,5%)	6.8K	7-9901-682
R96	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R97	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R98	RESISTOR - CARBON (1/4W,5%)	3.3K	7-9901-332
R99	RESISTOR - CARBON (1/4W,5%)	91K	7-9901-913
R100	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R101	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R102	POTENTIOMETER (MIC. GAIN)	10K	7-00400-14
R103	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R104	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
R105	RESISTOR - CARBON (1/4W,5%)	10K	7-9901-103
S1	SWITCH - SLIDE		3-07862-03
S2	SWITCH - SLIDE		3-07862-03
S3	SWITCH - SLIDE		3-07862-02
S4	SWITCH - SLIDE		3-07862-03
S5	SWITCH - SLIDE		3-07862-03
TH1	THERMISTOR		7-00370-02
VR1 (-)	VOLTAGE REGULATOR (NEG)		7-00365-08
VR2 (+)	VOLTAGE REGULATOR (POS)		7-00365-07
W1 THRU W50	JUMPER - BARE WIRE		0-05032-00
Z1	IC - STEREO PRE-AMPLIFIER		3-08002-06
Z2	IC - STEREO PRE-AMPLIFIER		3-08002-06
Z3	IC - STEREO PRE-AMPLIFIER		3-08002-06
Z4	IC - STEREO PRE-AMPLIFIER		3-08002-06
Z5	IC - STEREO PRE-AMPLIFIER		3-08002-06
Z6	IC - STEREO PRE-AMPLIFIER		3-08002-06

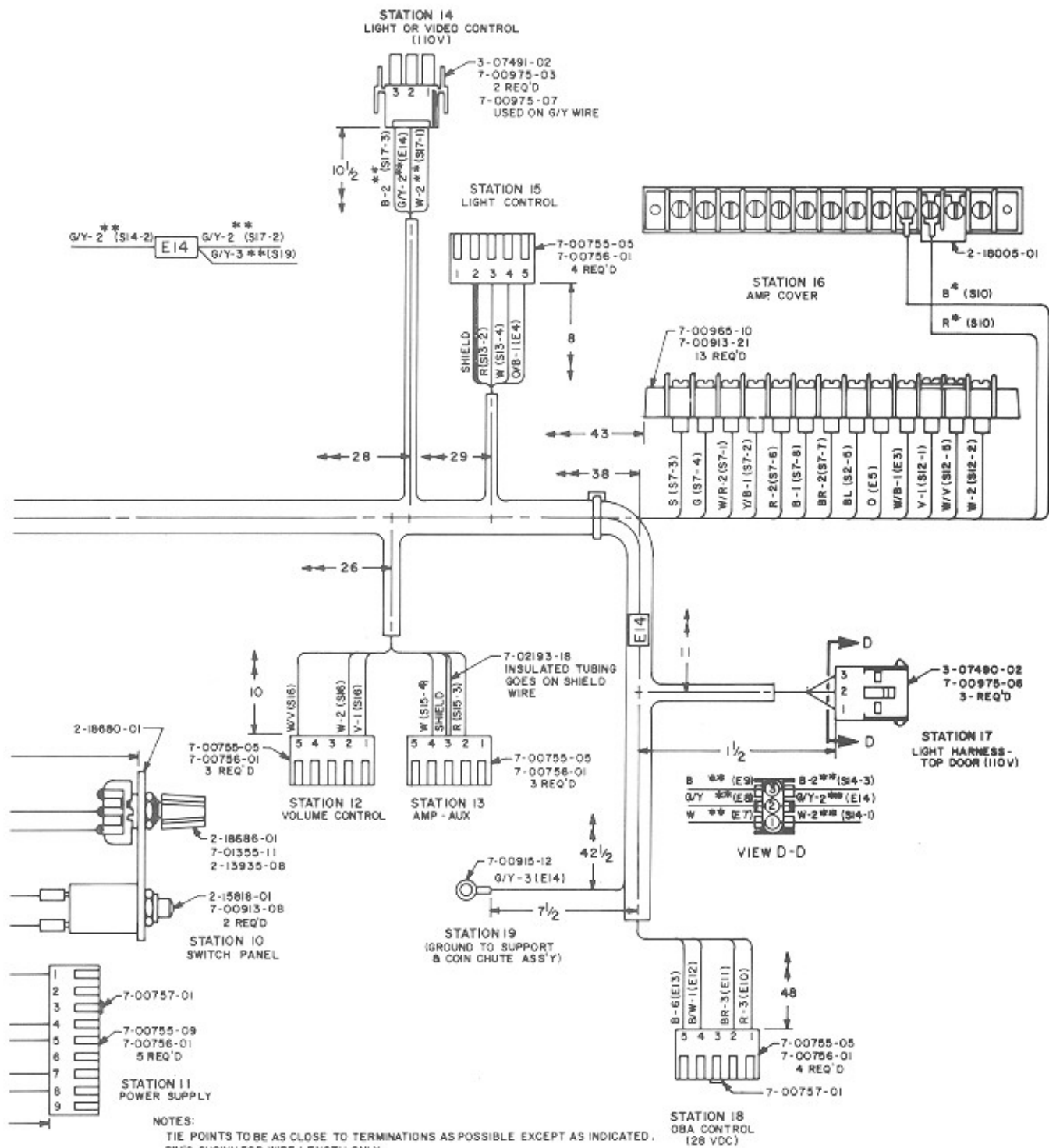
REMOTE VOLUME CONTROL
CONNECTIONS AND WIRING



NOTE: WHEN USING ANY REMOTE VOLUME CONTROL, REMOVE THE RED AND BLACK WIRES NORMALLY CONNECTED TO THE PHONO ACCESS STRIP. THIS DISCONNECTS THE VOLUME CONTROL ON THE BACK OF THE PHONOGRAPH.

FIGURE 5-4





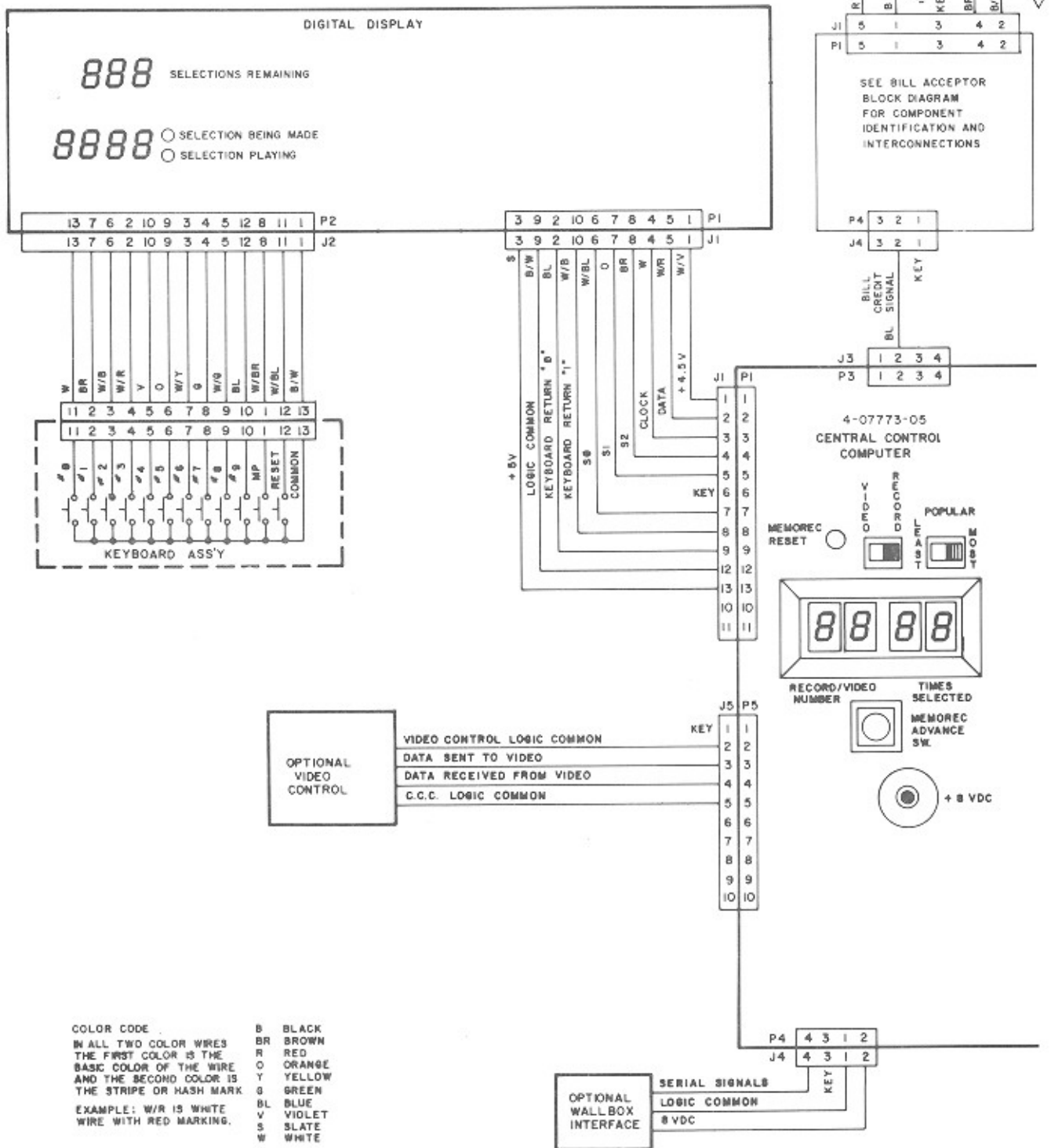
NOTES:
TIE POINTS TO BE AS CLOSE TO TERMINATIONS AS POSSIBLE EXCEPT AS INDICATED.
DIM'S SHOWN FOR WIRE LENGTH ONLY.
HARNESS TO BE SECURELY LASHED AT 4" INTERVALS WITH 7-08001-07 CABLE TIES.
WIRES MARKED ** TO BE 18 GA. 16/30 T.C. 1/32 A.W.M. 105°C PER 0-05013-00
WIRES MARKED * TO BE 24 GA. 7/32 T.C. 1/64 A.W.M. 80°C PER 0-05040-00
ALL OTHER WIRES TO BE 20 GA. 10/30 T.C. 1/64 A.W.M. 80°C PER 0-05010-00
MACHINE TERMINATIONS MUST BE CRIMPED ON INSULATION
MACHINE TERMINATIONS MUST BE CRIMPED ON WIRE TO WITHSTAND 7* PULL
WIRE LENGTH TOL. ±1/4 UNLESS NOTED
SOLDER PER SPEC. 2-01318-00
WIRES WITHOUT TERMINATIONS TO BE STRIPPED 1/4 ±1/32

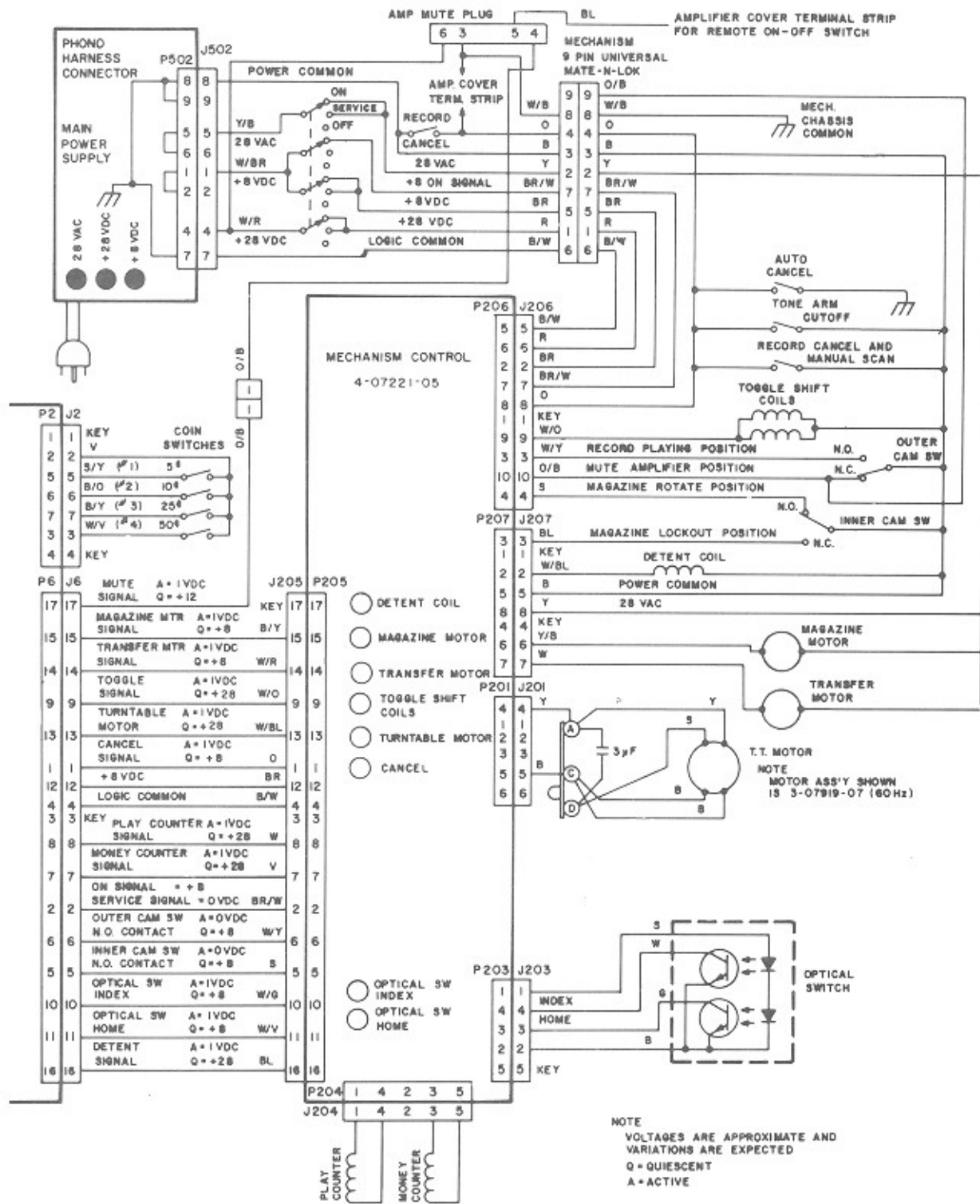
FOR WIRE & TERMINAL ASS'Y
SEE 6-09912-10/15

FOR EQUIV. ENG'G DWG SEE 6-09912-01

6-09912-01
WIRING DIAGRAM

FIGURE 5-5





6-09900-01-Q7

R-90 PHONOGRAPH
BLOCK DIAGRAM

FIGURE 5-6

DIGITAL DISPLAYS - Show the SELECTION PLAYING, SELECTION BEING MADE, and SELECTIONS REMAINING

SELECTOR KEYBOARD - Enters numbers and contains the POPULAR and RESET Keys

BILL ACCEPTOR - Accepts \$1 and \$5 bills.

COIN ACCEPTOR - Accepts coins

CENTRAL CONTROL COMPUTER - Controls all functions of the R-90 Phonograph

SPEAKER TERMINAL STRIP - Provides connections to the speakers

SERVICE SWITCH - Selects the R-90 mode of operation.

FRONT DOOR LATCHES - Allows the front door to swing out

AMPLIFIER COMPARTMENT - Contains the Amplifier, Lamp Control Unit, Main Power Supply, and Output Transformers

RECORD CHANGER MECHANISM - Selects and plays records

HANDY CASE - Contains the R-90 Service Manual and spare parts

SPEAKER SYSTEM - Woofers and High/Midrange (not shown) Speakers

MECHANISM CONTROL UNIT - Controls Record Mechanism scan, transfer, and toggle shift

SECTION 1—SYSTEM DESCRIPTION

INTRODUCTION

The Rowe R-90 is a 200 selection stereo phonograph. The R-90 is 100% microprocessor controlled.

MAJOR COMPONENTS

Figure 1-1 shows the major R-90 components. Take a minute to familiarize yourself with these components.

Table 1-1 lists the accessories that you may have in addition to the standard R-90 phonograph.

Record Selection System

Record selections are made by entering the three digit selection number on the Selector Keyboard (Keyboard).

The Keyboard (See Figure 1-2.) consists of 12 keys, ten digit keys (0-9), and two special keys. The RESET key allows the customer to re-enter his selection, if he has changed his mind or made a mistake. The POPULAR key selects the most played selection since the phonograph was last serviced. Pressing the POPULAR key a second time will select the second most popular selection. Pressing the POPULAR key a third time will select the third most popular selection and so on.



Figure 1-2. R-90 Keyboard

Central Control Computer

The Central Control Computer (C.C.C.) keeps track of all of the phonograph's activities and determines what the various components are to do next. The C.C.C. regulates the following functions:

- Counting money that has been collected
- Keeping credits for selections not yet played
- Calculating the most popular selection list
- Remembering the operator's programmed values

Memorec

Memorec is the part of the C.C.C. that remembers the:

- Total selections made (not including the Autoplay selections)
- Number of times each selection was played
- The total amount of money deposited in the phonograph

Memorec adds selections made by the POPULAR key to the total selections count, but not to the individual selection count.

Autoplay

When no selections have been made for a predetermined time, the Autoplay feature will play selections from a programmed list. The choice of which selections are chosen, the selection sequence, and the selection interval can be programmed by the owner or service person.

Light Display

The Lamp Control Unit is located on the left side of the Amplifier Compartment. This unit controls both the Top and the Front Door Light Displays. A four-position switch (located on the Lamp Control Unit) selects the operating mode. The switch positions are:

- Continuous - Lights are always on (do not flash).
- Light - Lights are all on (do not flash) during mute and flash with music.
- Continuous Flash - Lights flash in a set pattern during mute and flash with music.
- Flash Off - Lights are all off during mute and flash with music.

PRINCIPLES OF OPERATION

Audio System

The audio system consists of the electronic components that transform the recorded sound into music. The major components of the audio system are the:

- Stylus and cartridge
- Stereo amplifier

- Output transformers
- Speaker system

Stylus and Cartridge

These two components translate the grooves in the records into a left and right channel signal.

Stereo Amplifier

The Amplifier Assembly (Figure I-3) contains two major sections, the preamplifier (preamp) and the power amplifier (amp).

Preamp

The preamp increases the signal from the cartridge, corrects for varying recording levels (automatic volume control or AVC), adjusts the volume manually, and modifies the record tone (through the BASS and TREBLE controls).

Two-Wire Volume Control

A Rowe innovation, the two-wire volume control simplifies complex installations and reduces cost. A special preamplifier design permits volume control wiring using any unshielded two-wire cable.

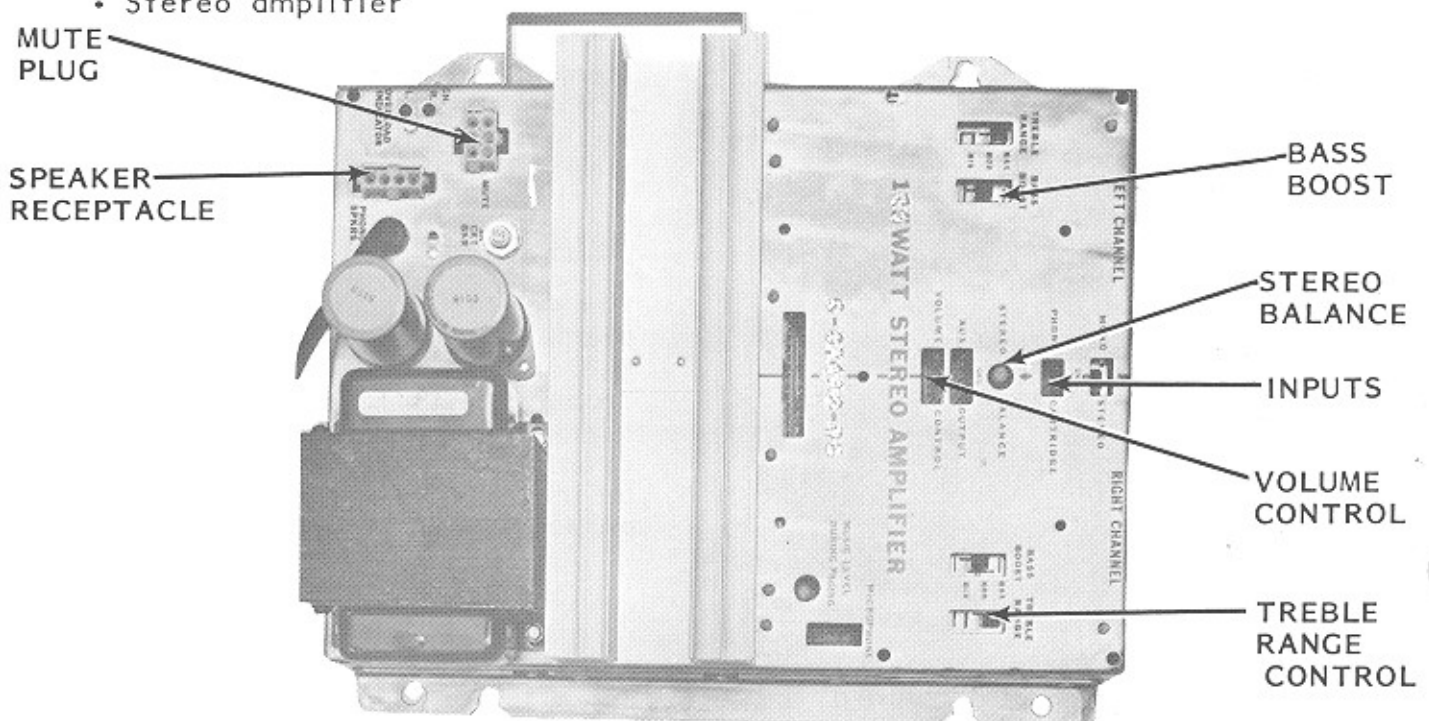


Figure I-3. 130 Watt Stereo Amplifier Components

Power Amplifier

The power amplifier converts the preamp signal to a signal that can be used by the phonograph speakers.

Output Transformers

The output transformers (Figure 1-4) "step up" the power amplifier's output voltage so that remote speakers may be used efficiently. The output transform-

ers, also, provide connections (taps) for selecting different power levels and impedances (loads) for the speakers.

The Speaker System

The speaker system consists of two specially designed speaker systems. Each channel consists of one 10-inch woofer and one 5-inch mid/high range speaker and a series crossover network.

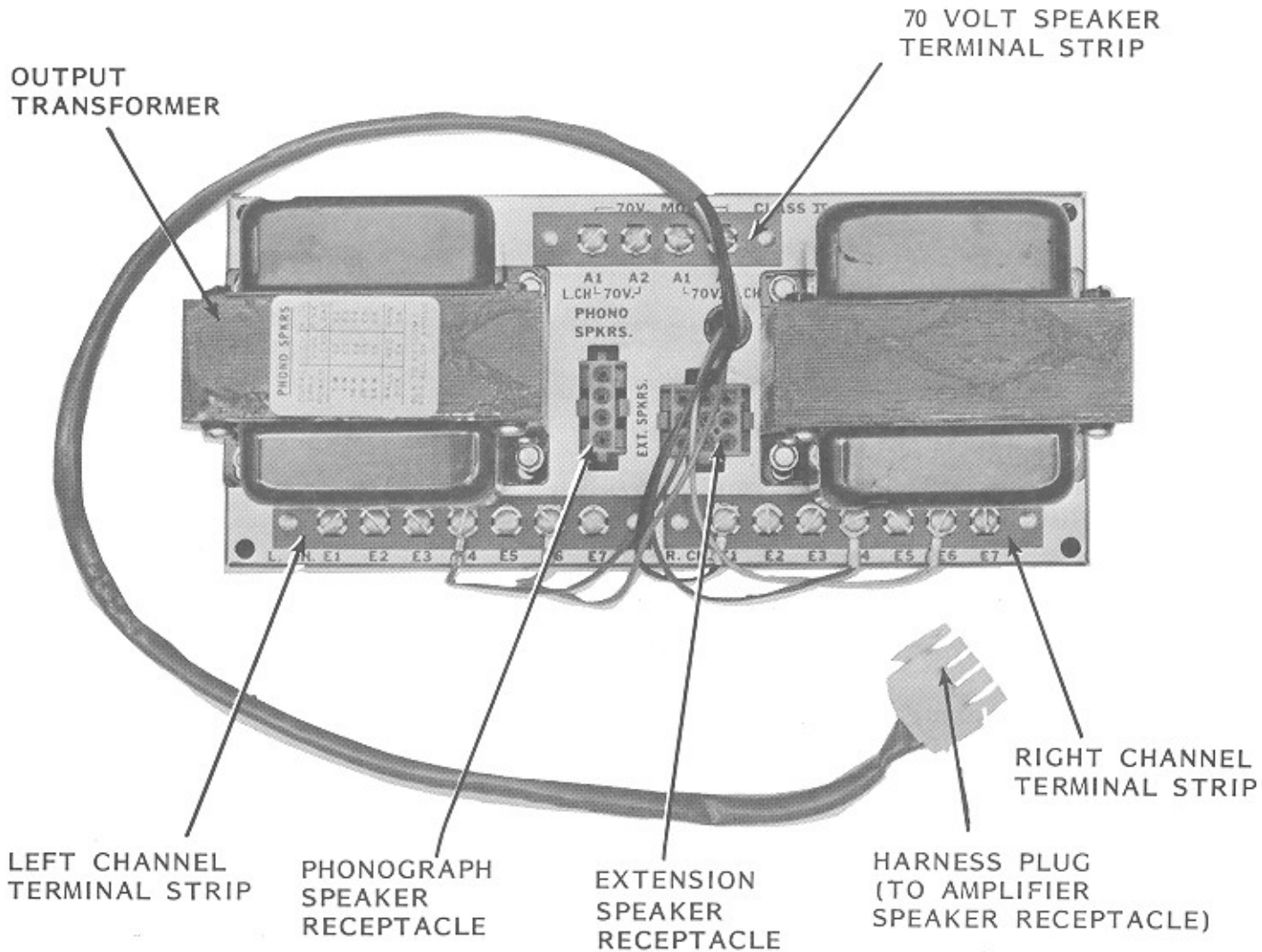


Figure 1-4. Output Transformer Package Components

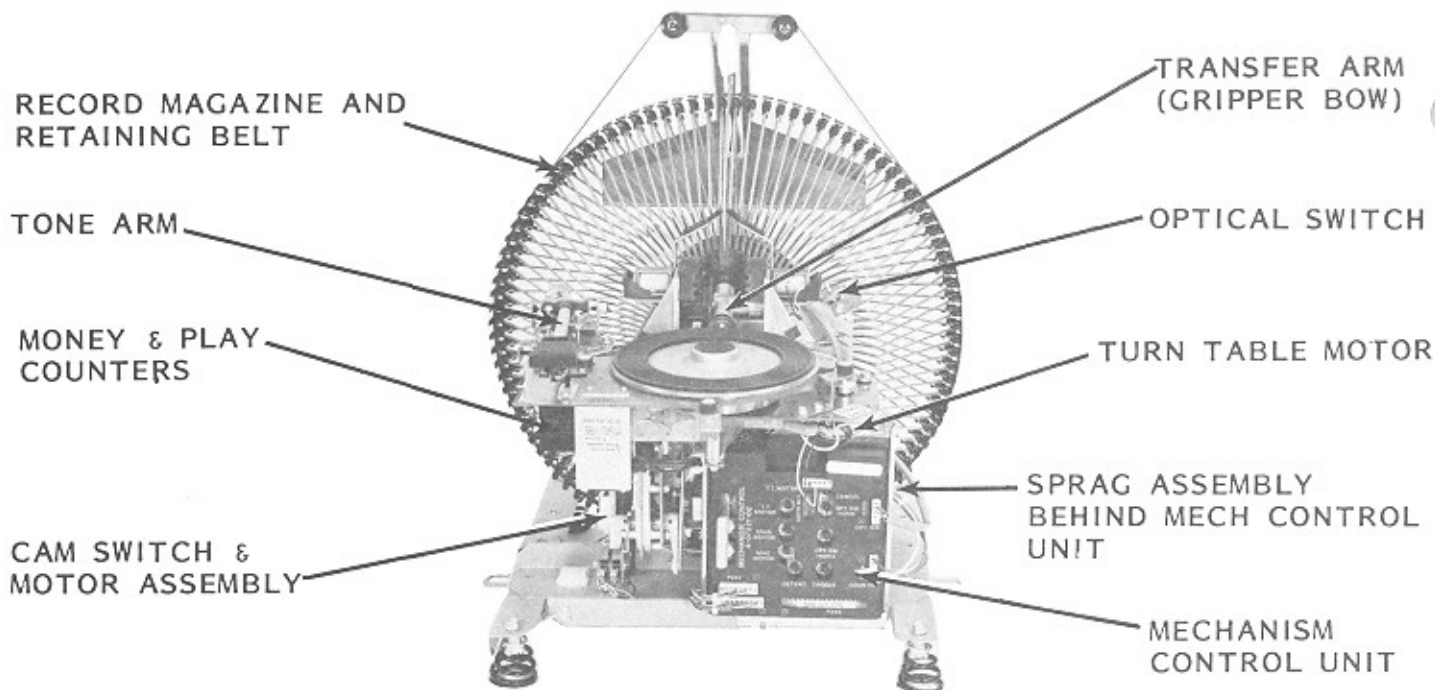


Figure 1-5. Record Changer Mechanism

Record Changer Mechanism

The Record Changer Mechanism, also referred to as "the Mechanism", is located in the center of the cabinet's interior. It is the primary mechanical component of the Phonograph. The mechanism holds 100 records and plays selections on command from the selection system (Refer to Figure 1-5 for the location of each of the magazine components.).

Magazine

The record magazine stores 100 7-inch 45 RPM records in a circular cage.

Play Counter

The play counter accumulates the total number of plays on the phonograph.

Money Counter

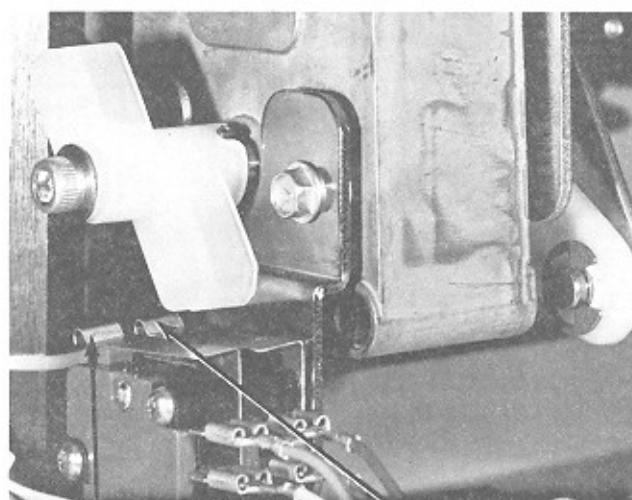
The Money Counter registers the total money deposited in the phonograph.

Optical Switch

The optical switch senses the record magazine position so that the C.C.C can determine which record is in gripping position.

Cam Switch And Motor Assembly

The cam switch and motor assembly (See Figure 1-6.) consists of the transfer motor, cam, and two cam switches.



OUTER CAM SWITCH
ACTUATED IN RECORD
PLAYING POSITION

INNER CAM SWITCH
ACTUATED IN
STANDBY

Figure 1-6. Cam Switch
And Motor Assembly

Mechanism Control Unit

This solid state switching unit controls the scan, transfer and toggle shift.

Sprag Assembly

This assembly locks the record magazine in position.

Tone Arm Assembly

The tone arm assembly plays records after they are positioned on the turntable by the record transfer arm.

Turntable Motor

The turntable motor is a constant speed 300RPM (at 60 Hz.) synchronous motor.

Main Power Supply

The Main Power Supply (See Figure I-7.), located inside the Amplifier Compartment, distributes unregulated +28VDC, 28VAC, and regulated +8VDC to the phonograph. The 120 VAC line voltage to the Main Power Supply is controlled by the Power Switch on the rear of the phonograph cabinet.

Caution: The 120 VAC AMPLIFIER OUTLET on the Main Power Supply does not shut off.

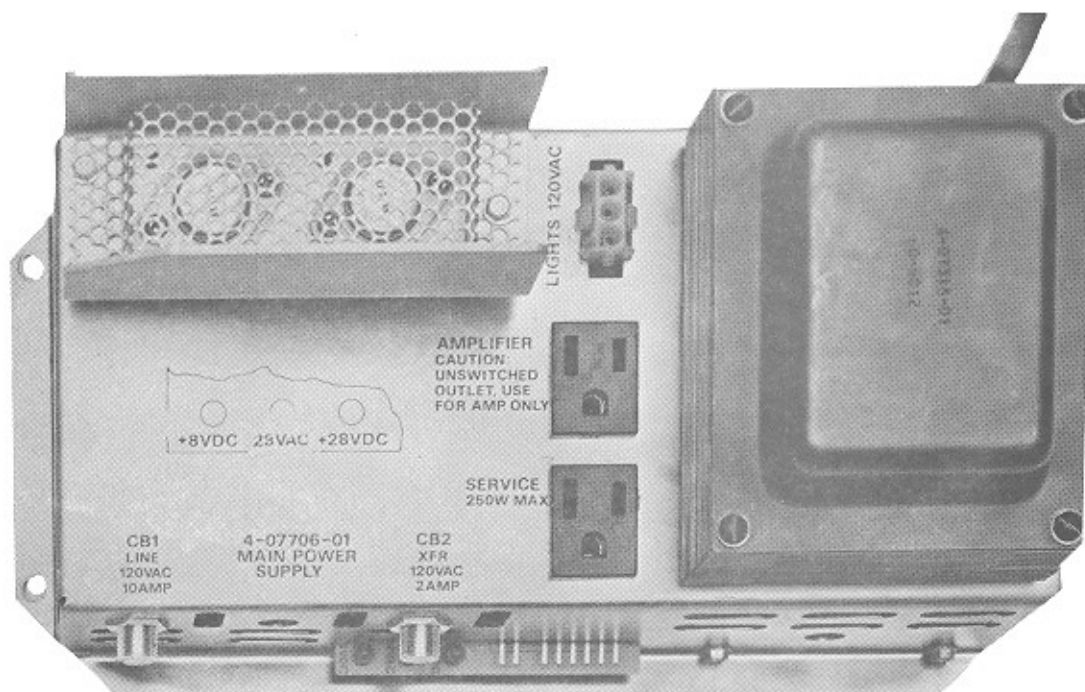


Figure I-7. Main Power Supply

SECTION 2-INSTALLATION & PROGRAMMING

INTRODUCTION

This section contains information for unpacking the R-90 Phonograph and installing it on location. The R-90 is shipped with all major components in place. Save all tie-down hardware in case the phonograph must be moved to another location.

HANDY CASE

The Handy Case is a blue plastic envelope located on the left hand side of the phonograph. The Handy Case contains a variety of items, including the R-90 Field Service Manual and Parts Catalog, spare parts, and fuses. Keep the Handy Case inside the phonograph so that the service manual and parts will be readily available when needed.

WARRANTY REGISTRATION CARD

A postage-paid Warranty Registration Card is included with the phonograph. This card should be returned to Rowe to register the phonograph for warranty.

UNPACKING INSTRUCTIONS

Exterior

1. Carefully inspect the interior and exterior of the phonograph to ensure that no damage occurred during transit. If damage is detected, the carrier who delivered the phonograph should be contacted immediately to examine it. Regardless of the exterior condition of the shipping cartons, the carrier should be called and notified of damage.

Do not destroy the packing material or boxes until the carrier's agent has examined them. Damage claims are your responsibility. Do not return shipping damaged merchandise until after your claim has been established. Once your claim has been established, merchandise may be returned to

your Rowe distributor for repair. The invoice amount for repair charges can then be collected from the carrier.

2. Remove the shipping carton with care: Do not use shipping hooks or sharp tools that could damage the R-90 Phonograph cabinet.
3. Remove the plastic bag that covers the phonograph.

Doors

1. Locate the red bag on the top door. Remove the door key from the bag and unlock the top door (Turn the key to the right.).
2. Open the front door by pressing down on both front door latches (See Figure 1-1.).

Shipping Bolts And Clips

Note: Save all shipping hardware that you remove in the following six steps.

1. Remove the Record Changer Mechanism shipping bolt from the back of the R-90 cabinet (See Figure 2-1.).

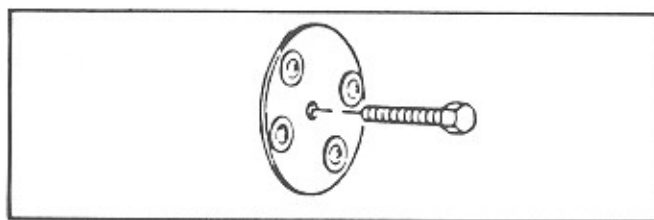


Figure 2-1. Shipping Bolt Removal

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

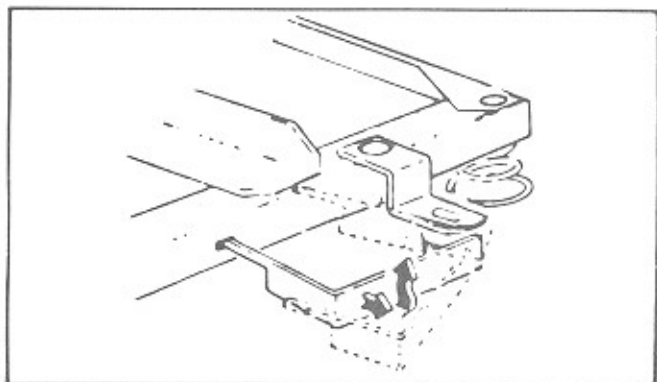


Figure 2-2. Record Changer Tie-Down Brackets

3. Remove the turntable hold-down clip and screw. Replace the screw (See Figure 2-3.).

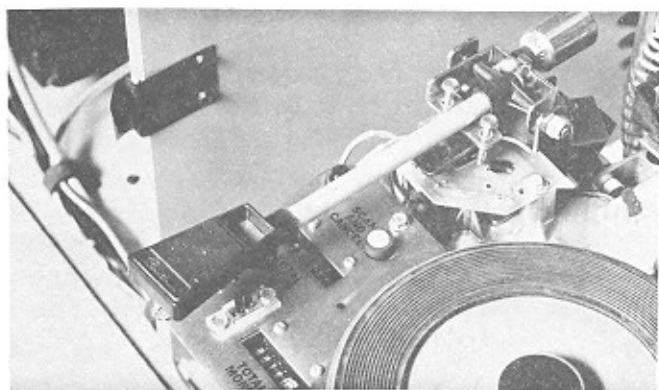


Figure 2-3. Turntable Hold-Down Clip

4. Remove the stylus cover from the cartridge and stylus.
5. Remove the rubber band, wire hook, and warning tag that hold the sprag lever out of the sprag wheel.
6. Remove all tape from the magazine belt and magazine pulley.

Visual Inspection

Check to be sure that all electrical plugs are completely seated into their receptacles.

Phonograph Leveling

To ensure proper coin acceptor operation, level the R-90 Cabinet from left-to-right and front-to-back by inserting spacers under the caster wheels.

Records and Title Strips

Follow the instructions for **Changing Records** and **Changing Title Strips** in Section 3.

You have now completed the R-90 installation.

PROGRAMMING THE CREDIT AND SELECTION SYSTEM

The Programming Mode

The Programming Mode is used to examine and change the contents of specific locations in the computer's memory. Two methods for moving through the Programming Mode:

1. Move through the memory locations sequentially (Used to examine all the locations and change them as needed).
2. Move to specific memory locations (Used for quick access to only those locations that need examination or changing). You can exit the Programming Mode at any point in the procedure.

Note: The POPULAR key must be pressed to record change in a location. Pressing the POPULAR key causes the Computer to automatically index to the next location and display its contents. Accessing Location 99 will exit the Programming Mode.

To enter the Programming Mode:

1. Place the phonograph in the service mode by setting the SERVICE switch to the SERVICE position (See Figure 1-1.).
2. Hold down the POPULAR key while typing the built-in security code 000. (The security code should be changed to a number of your choosing. Instructions follow:

- A. Press and hold the RESET key until the prompt (Ξ) appears.
- B. Enter 58.
- C. Enter the new three digit security code (Be sure to write your new security code in your notebook or other safe place.).
- D. Press the POPULAR key.

Note: If you do not press the POPULAR key, the new security code will not go into effect.

To Correct Errors:

1. To correct errors made while entering data into memory locations, press the RESET key and put in the correct data.
2. If an error has been made and the display has moved to the next memory location, simply go back to the location where the error was made and change the contents. Do this by pressing the RESET key and holding it until only the prompt appears, then enter the number of the location that needs to be corrected.

To Exit Programming Mode:

Press the RESET key and hold it until only the prompt appears. Enter 99 (Enter 99999 to return to Operating Mode.).

Pricing

The prices charged for record and video selections may be changed as needed. When shipped from the factory the prices are set as follows:

Records

- 1 Selection for \$.25
- 2 Selections for \$.50
- Credit level not used
- 5 Selections for \$1.00
- 30 Selections for \$5.00

1	1	1	1	2	2	2	2	3	3	3
3	4	4	4	4	5	5	5	5	6	6
6	6	7	7	7	7	8	8	8	8	9
9	9	9	10	10	10	10	11	11	11	12
12	12	13	13	13	14	14	14	15	15	15
20	20	20	25	25	25	30	30	30	35	35
35	40	40	40	45	45	45	50	50	50	55
55	55	60	60	60						

UNIVERSAL PRICE SHEET

**DEPOSIT COINS & BILLS
PRICE OF RECORD SELECTIONS**

1 for 25¢

2 for 50¢

5 for \$1.00

30 for \$5.00

STANDARD PRICE CARD

Figure 2-4. Price Sheets

To set Alternate Record prices:

Enclosed in the Handy Case is an Alternate Price Decal (See Figure 2-4.) that may be substituted for the Standard Price Decal. The Handy Case also contains a Price Sheet with printed prices (See Figure 2-4.), which can be peeled off and placed at the appropriate spot on the Alternate Price Decal.

Using the Keyboard of the R-90, the pricing structure of the phonograph may be adjusted to match the prices on the Alternate Price Card. The maximum amount that can be charged for a selection is \$9.95. The maximum number of selections that can be entered is 255. Enter 0 in any unused locations. The POPULAR key must be pressed to record the data entered in a location.

Follow the steps given below to complete an Alternate Price Card and enter the sample prices.

1. Determine the prices that are to be charged for record selections and place the price decals from the Price Sheet into the slots on the Alternate Price Card. The following is an example of a completed Alternate Price Card:

Record Prices

1 for \$.25
4 for \$1.00
12 for \$2.00
35 for \$5.00

2. Enter the Programming Mode by setting the SERVICE switch to the SERVICE position.
3. Press the POPULAR key while typing the three digit security code number.
4. At the prompt, press and release the POPULAR key. Location 00 will display in the SELECTIONS REMAINING LED and the contents of 00 will display in the SELECTIONS BEING MADE LED.

Use the prices on the Price Card for the following steps:

5. Enter the lowest record selection price into Location 00 (In our example, enter 25.).
6. Enter the next highest price into Location 01 (In our example, enter 100.).
7. Enter the next highest amount to be charged into Location 02 (In our example, enter 200.).
8. Enter the next highest amount to be charged into Location 03 (In our example, enter 500.).
9. Enter the highest amount to be charged into Location 04 (In our example, enter 0 because we only have 4 prices.).

10. Enter the number of record selections to be given for the lowest amount on the record portion of the Price Card into Location 05 (In our example, enter 1.).
11. Enter the number of record selections to be given for the next highest amount on the Price card into Location 06 (In our example, enter 4.).
12. Enter the number of record selections to be given for the next highest amount into Location 07 (In our example, enter 12.).
13. Enter the number of record selections to be given for the next highest amount into Location 08 (In our example, enter 35.).
14. Enter the number of the record selections for the last and highest amount on the record portion of the Price Card into Location 09 (In our example, enter 0.).
15. Extra selections can be given to the customer for using dollar bills instead of coins. To use this feature enter the number of extra selections in Location 26. The number of extra credits can extend from 0 to 255.

Autoplay

The Autoplay feature stimulates customer interest in the phonograph by periodically playing selections. The Autoplay function is factory preset to play the "B" side of each record in reverse sequence beginning with 200, after the phonograph has been idle for twenty minutes. This feature may be programmed for any length of time between 0 and 255 minutes. Selections may be played in a specific sequence. A continuous sequence of the "A" side (selections 100-199) or a continuous sequence of the "B" side (selections 200-299) can be programmed. To select specific record selections, enter 05 in Location 32 and enter the selection numbers in the order you wish them played.

Continuous Credit

If continuous free play of the phonograph is desired, the Central Control Computer may be programmed to play selections entered from the keyboard without putting money into the phonograph.

To use this feature, enter the Programming Mode and enter 255 in Location 27. When normal play is desired, set Location 27 to 0.

Reading And Setting A Program With Phonograph Doors Closed.

If Location 56 is set to 255, the top door can be completely closed while using the Keyboard in the Programming Mode or while auditing the Memorec function of the phonograph from the Service Mode. The factory setting for Location 56 is 0.

To use this feature:

1. Put the Control Console Service switch in the SERVICE position for at least 2 seconds and close the door. When you close the door, the phonograph returns to Service Mode. Memorec totals may now be audited or the Programming Mode entered (Hold down the POPULAR key and enter the security code.).
2. After auditing the Memorec totals, exit from the SERVICE Mode by entering 999.
 - When finished making changes in Programming Mode, exit Programming Mode and return to Service Mode by holding down the RESET key until only the prompt appears; enter 99 (You are now in Service Mode.). Exit from the SERVICE Mode by entering 999.

R-89/R-90 PROGRAMMING REFERENCE GUIDE

Operation	Instructions
Enter Programming Mode	Hold POPULAR while typing security code (factory setting is 000) to display prompt (≡).
To Program with top door closed	<ol style="list-style-type: none"> 1. Enter Programming Mode as above. 2. At prompt type 56. 3. Type 255. 4. Press POPULAR. 5. Close top door. 6. Enter Programming Mode to view or change location contents.
View location contents	<ol style="list-style-type: none"> 1. Sequentially - Press POPULAR at each location. At Location 99, computer exits Programming Mode. 2. Skipping locations - Press RESET for 2 seconds. At prompt, type location number.
Change location contents	<ol style="list-style-type: none"> 1. Current location - Press RESET and type new data. Press POPULAR. 2. Any other location - Press RESET for 2 seconds. At prompt, type location number, type new data, press POPULAR.
Set alternate record prices	Locations 0-4 - Type prices from lowest to highest, pressing POPULAR after each. Type corresponding number of selections in Locations 5-9, pressing POPULAR after each.
Give bill bonus	Location 26 - Type number of extra record selections to be given for a dollar bill. Press POPULAR.
Set continuous free play feature	Location 27 - Type 255 (0 to cancel). Press POPULAR.
Retain Selections Remaining during power failure	Location 28 - Type 255 (0 to cancel). Press POPULAR.
Set AutoPlay style	<p>Location 32 -</p> <p>Press</p> <ul style="list-style-type: none"> 0 for no Autoplay 1 for sequential record side "A" 2 for sequential record side "B" 5 for programmed selections; 6 (R-90 Only) for sequential both "A" and "B" sides 7 (R-90 Only) for all records sequentially side "A", then all records sequentially side "B"
	Press POPULAR after making choice.

Set time between Autoplay selections	Location 33 - Type number of minutes. Press POPULAR.
Program with top door closed	Location 56 - Type 255 (0 to cancel). Press POPULAR.
Set to play records sequentially	Location 57 - Type 0 (255 for FIFO). Press POPULAR.
Program Autoplay selections	Locations 59-73 - Type first selection number in Location 59. Press POPULAR. Repeat for remaining selections (Location 32 must be set to 05).
Change security code	Location 58 - Type three digit number. Press POPULAR.
Clear 5xx totals	Location 97 - Viewing Location 97 automatically clears the 5xx totals. Press RESET for 2 seconds. At prompt, type 97.
Select option for clearing 5xx totals	Location 97 - Press 0, 1, or 2. Press 0 to clear all totals with Memorec RESET Switch. Press 1 to clear popularity totals with Memorec switch. Press 2 to clear 5xx totals from Programming Mode and popularity totals with Memorec RESET Switch. Press POPULAR after making choice.
Exit Prog. Mode	Hold RESET for 2 seconds, then type 99999.

Note: See Section 3 for details on resetting Memorec.

Programming Codes

Location Number	Factory Setting	Description
00	25	Lowest record price on Price Card
01	50	Next highest record price on Price Card
02	75	Next highest record price on Price Card
03	100	Next highest record price on Price Card
04	500	Highest record price on Price Card
05	1	Number of record plays for lowest record price on Price Card
06	2	Number of record plays for next highest record price on Price Card
07	0	Number of record plays for next highest record price on Price Card
08	5	Number of record plays for next highest record price on Price Card
09	30	Number of record plays for highest record price on Price Card
20	1	Coin Switch #1 Value { Standard Coin Switch #2 Value { 3-Coin Coin Switch #3 Value { Acceptor Coin Switch #4 Value
21	2	
22	5	
23	10	
24	0	Bill Value
25	05	Coin Switch Multiplier
26	00	Bill Bonus
27	00	Free Play
28	00	Retain Selections Remaining during power failure
29	00	Prevents selection of records that end in 8 or 9.
30	255	255=Standard Phono, 00=Video
32	02	Autoplay style (0 - 7)
33	20	Time between Autoplay selections in minutes (255=max).
35	00	Phono ID = 2nd 2 digits
36	00	Phono ID = 1st 2 digits
44	00	Video per record ratio (Video models only)
56	0	Audit or Program with top door closed
57	255	255=Play records in order selected 0=Sequential order of record play
58	0	Security Code Number
59	0	Programmed Autoplay Selection #1
60	0	Programmed Autoplay Selection #2
61	0	Programmed Autoplay Selection #3
62	0	Programmed Autoplay Selection #4
63	0	Programmed Autoplay Selection #5
64	0	Programmed Autoplay Selection #6
65	0	Programmed Autoplay Selection #7
66	0	Programmed Autoplay Selection #8

Programming Codes

Location Number	Factory Setting	Description
67	0	Programmed Autoplay Selection #9
68	0	Programmed Autoplay Selection #10
69	0	Programmed Autoplay Selection #11
70	0	Programmed Autoplay Selection #12
71	0	Programmed Autoplay Selection #13
72	0	Programmed Autoplay Selection #14
73	0	Programmed Autoplay Selection #15
97	0	Clears 5XX Totals - 0 to clear totals if Memorec RESET Switch is pushed. 1 to clear totals if code 750 entered from Service Mode. 2 to clear totals only when 97 occurs in Programming Mode.
99	0	Exit code

Note: Always press POPULAR key to record data entered while programming.

Explanation of Programming Codes

Location	Explanation
00-04	The amount of money to be charged for record selections. Five levels of credit are available for coins or bills. Amounts should be entered in pennies.
05-09	The corresponding number of record selections that will be given for each amount of money entered in Locations 00 to 04.
10-14	The amount of money to be charged for video selections.
15-19	The corresponding number of video selections that will be given for each amount of money entered in Locations 10 to 14.
20-23	Location Number: 20 21 22 23 3-Coin acceptor 1 2 5 4-Coin acceptor 5 2 10 1
24	The value of a dollar bill expressed in nickels (A U.S. dollar is 20 nickels.)

Explanation of Programming Codes

Location	Explanation
25	The computer counts money according to a base value. For U.S. currency the value is a nickel. To the computer, the value of a coin or bill is the coin switch or bill value setting times the base value.
26	Extra credit can be given a customer for using a dollar bill instead of coins. The amount of extra credit to be given for each dollar should be entered. The maximum number of credits is 255.
27	Continuous credit can be given by setting this Location to 255.
28	If the power goes off and this Location is set to 255, the computer will retain Selections Remaining in the phonograph. The computer will not retain them if set to 00.
29	When the video portion is installed in the phonograph, 80 records are used instead of 100. The record selection numbers that are deleted have the number 8 or 9 as their third digit. A video phonograph should have 255 in this location to prevent these selections from being chosen.
30	If set to 000, the computer will accept the input from the video portions of the phonograph.
32	The Autoplay feature can be programmed to play in different ways by setting this location: 0 - No Autoplay 1 - Sequential record, Side A 2 - Sequential record, Side B 3 - Sequential Video 4 - Sequential Video 5 - Program specific selections 6 - Sequential record, side "A" and "B" 7 - Sequential record, all side "A" followed by all side "B"
33	Enter the number of idle minutes that the phonograph should wait before playing an Autoplay selection.
35	The phonograph identification number can be kept in the computer's memory. Enter the second two digits here.
36	Enter the first two digits of the identification number here.

Explanation of Programming Codes

Location	Explanation
43	Video models only - The Central Control Computer will play a record selection to fill the time the VCR takes to find a video selection. If the search time reported to the Central Control Computer by the Video Control Computer exceeds the time entered at this location, a fill-in record will be played. Enter the amount of search time in seconds.
44	Video models only - Video selections are always played before record selections unless this location's value is changed. To have the phonograph mix video and record selections, enter the number of video selections the phonograph is to play before it will play a record selection.
56	Closing the top door causes the phonograph to go back into normal operation. If this location is set to 255, the Service Switch will be disabled temporarily, allowing the computer memory locations to be audited and changed from the Keyboard with the top door closed.
57	If set to 255, the phonograph will play the record selections in the order in which they are selected. If set to 0, the phonograph will play them as it finds them in the record magazine.
58	A three digit security code can be entered to keep the Programming Mode from being entered by anyone except those who know the code.
59-73	If specific selections are chosen to be played by the Autoplay, the selection numbers are stored in these locations. The selections are played in the order in which they are stored starting with Location 59.
80-83	Video models only - The operator can prevent up to four video selections from being played if desired. Enter one selection number per location. Only video selections can be "locked out".
97	Viewing this location will automatically clear the 5xx totals. Enter a 0 to allow all the totals kept by the Central Control Computer to be cleared via the Memorec RESET Switch. Enter a 1 to allow only the popularity data to be cleared via the Memorec RESET Switch. The 5XX totals can be cleared from the Keyboard using a 750 command at a later time. Enter a 2 to allow only the popularity data to be cleared via the Memorec RESET Switch. The 5XX totals can be cleared from the Keyboard only after entering the Programming Mode.
99	The computer will exit the Programming Mode.

SOUND SYSTEM

Acoustical Compensation (Bass And Treble Controls)

The preamplifier 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 carpet 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 and treble range control settings are listed in table 2-1.

Note: More bass boost is required at low volume levels. The R-90 amplifier incorporates circuitry that provides the correct bass compensation at low volume levels.

Paging

Paging circuitry is part of the 6-07925-04 Preamplifier. The microphone plugs directly into the preamplifier.

Stereo Balance

A stereo balance control is provided to equalize the left and right channel outputs. This control is factory adjusted for best left-to-right balance.

If adjustment is required, play a monaural selection and adjust the balance control for an equal volume from each top speaker. When balanced, the sound will seem to come from the center of the phonograph.

Table 2-1. Amplifier Control Settings 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.

Extension Speaker Operation

To avoid a poor sounding phonograph, care must be taken when adding extension speakers. Three requirements must be met:

1. Speakers must be wired so that the power consumed by the phonograph speakers and the extension speakers, including walleTTes, does not exceed the amplifier power rating.
2. Extension speakers should produce the desired sound level relative to the sound level of the speakers on the phonograph.
3. All speakers must be connected with the correct polarity.

Several charts have been included to assist you with connecting the extension speakers. Figure 2-5 shows the entire sound system.

Note:

The left channel output phase is reversed with respect to the right channel. This reversal is necessary to extend monaural sound in a stereo phonograph system. Because of this reversal, speaker connections to the left channel must be reversed when compared to the right channel, except for 70 volt speaker connections. The 70 volt phasing is reversed inside the output transformers.

Power to the phonograph speakers must be reduced so that the total speaker power does not exceed the amplifier power rating. Table 2-2 shows connection combinations for various extension speaker power levels. The phonograph speakers can be considered as two 8-ohm speakers (one for each channel).

Tables 2-3 and 2-4 are extension speaker charts for different power levels. Power levels are indicated for low impedance speakers as well as 70 volt 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	CAUTION: TOTAL POWER RATING OF LOAD MUST NOT EXCEED 67.5 WATTS PER CHANNEL OR 135 WATTS TOTAL FOR THE 130 WATT AMPLIFIER.			

Table 2-2. Phonograph Speaker Power

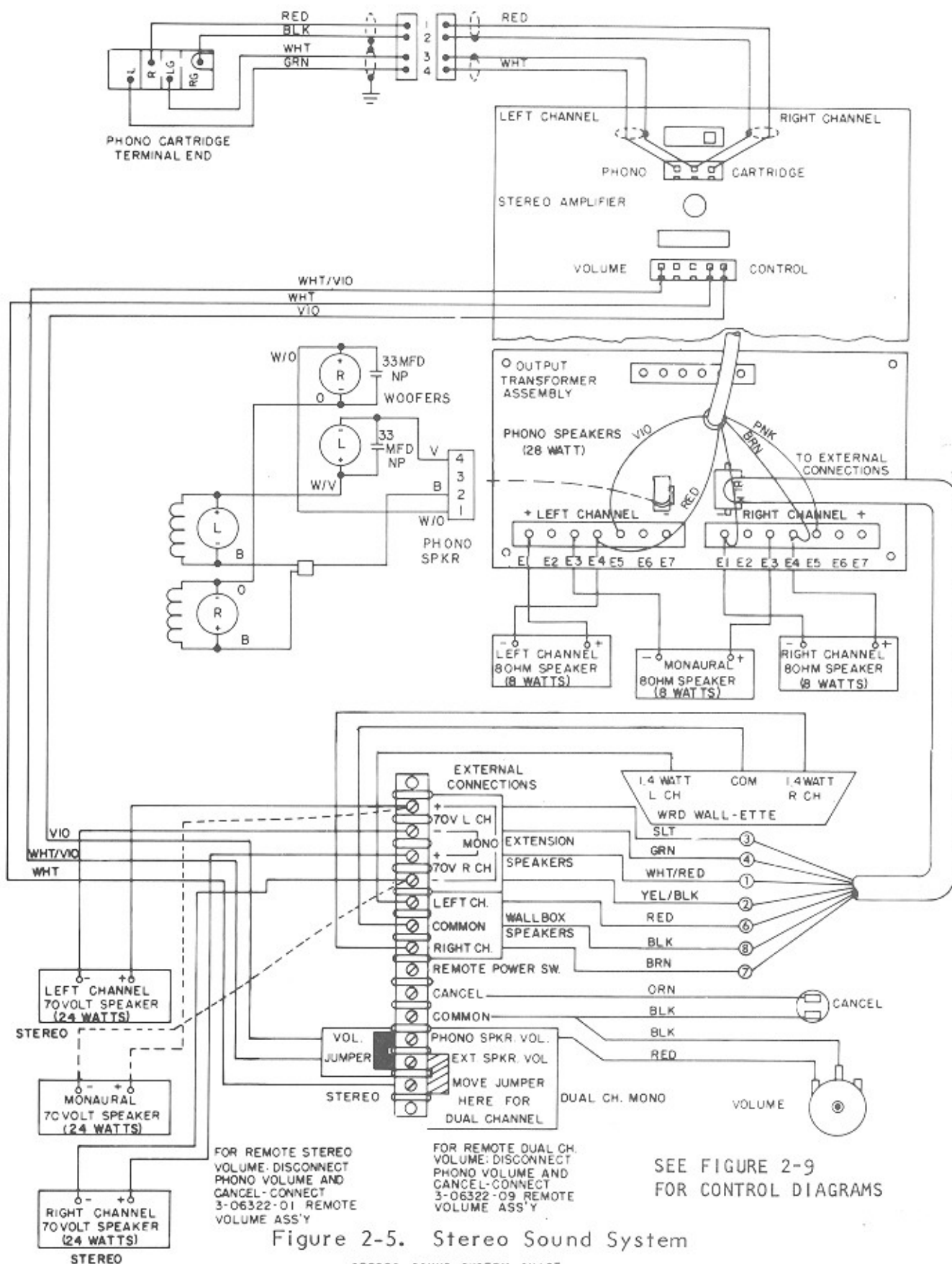


Figure 2-5. Stereo Sound System

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

70-Volt Speakers

To avoid prohibitive cable losses on long speaker lines, 70-volt speakers should be used as much as possible.

The power level in the 70 volt speakers is set at each speaker.

Low Impedance Speakers

Low impedance speakers (8 ohms) can be used when the connecting cable is less than 100 feet.

The loss in 100 feet of zipcord feeding one 8-ohm speaker is 15%. The loss for 2 8-ohm speakers is 30%.

4-Ohm Speakers

No more than one 4-ohm speaker should be connected to a speaker line. If several 4-ohm speakers are to be used, each speaker should have its own line.

Do not connect a low impedance speaker to a speaker tap that exceeds the speaker's power rating.

Caution:

In any speaker installation, the total speaker load (the sum of all power ratings of all speakers) must not exceed 135 watts. For example: The stereo speaker system in Figure 2-7 consumes 126.8 watts. The monaural speaker system in Figure 2-8 consumes 124 watts.

Both examples are slightly under the power rating of the amplifier and are acceptable. The power consumption of the entire speaker system should be kept as close to 130 watts as possible, so that the bass compensation will be correct.

Note:

1. The amplifier may be connected to a load of 135 watts before distortion will begin to increase beyond specification.
2. The wallbox speakers in Table 2-3 have been treated as 45-ohm speakers.

STEREO

Table 2-3. 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	1.4(NORM)	
E1-E5	14	28	5	
E2-E6	24			
A1-A2				
CAUTION: TOTAL POWER RATING OF LOAD MUST NOT EXCEED 67.5 WATTS PER CHANNEL OR 135 WATTS TOTAL FOR THE 130 WATT AMPLIFIER.				

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

MONAURAL

Table 2-4. Extension Speaker Connections

OUTPUT TERMINALS	WATTS PER SPEAKER			WATTS PER CHANNEL		
	8 OHM SPEAKERS	4 OHM SPEAKERS	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

AMPLIFIER FULL POWER OUTPUT VOLTAGES (PER CHANNEL)

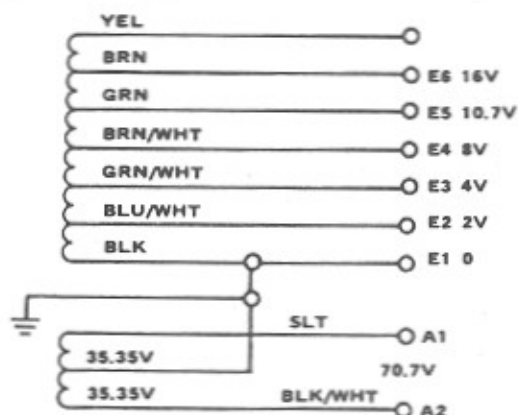
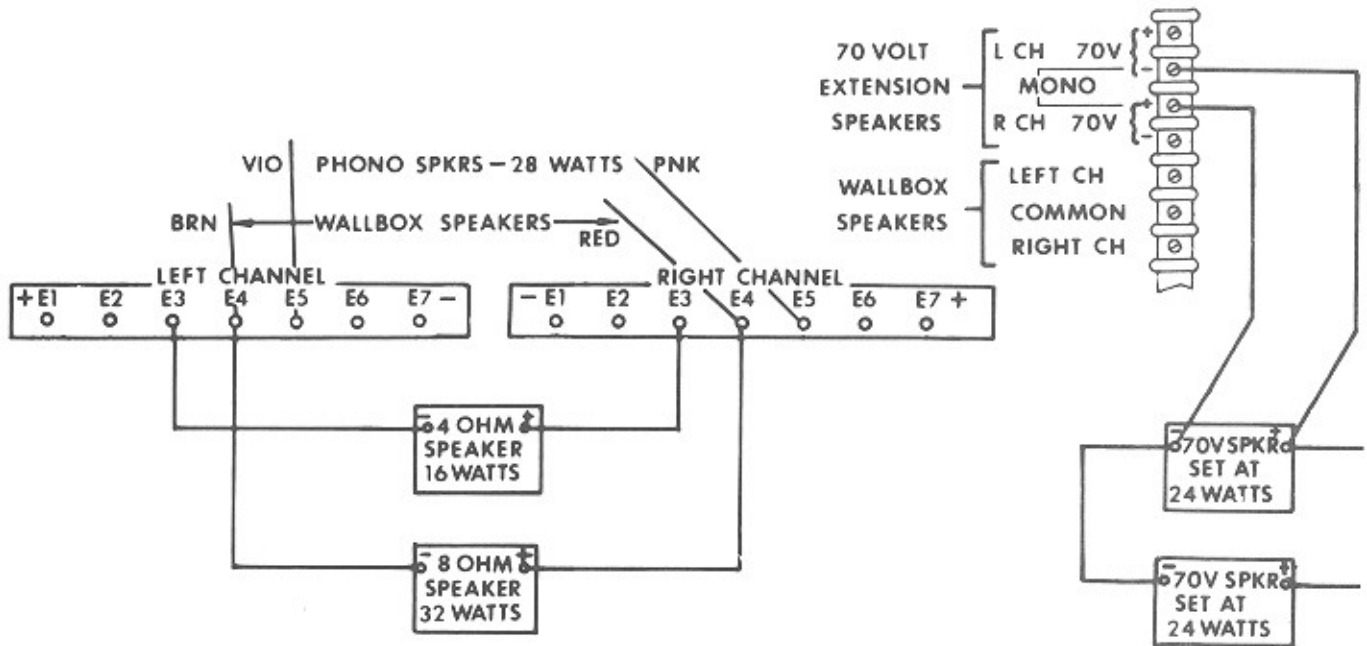


Figure 2-6. Transformer Output Voltages

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



EXAMPLE:

NOTES:

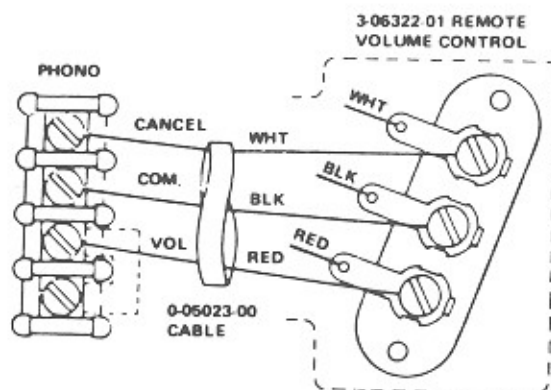
1. Add Wattages:
 Extension Speakers: 16 + 32 + 24 + 24 = 96 Watts
 Phonograph (E5-E5) 28 Watts
 TOTAL = 124 Watts

2. For speaker impedances not listed Table 2-4, use Fig. 2-6 and use the impedance method ($Watts = E^2/R$).

Figure 2-8. Speakers Connected For Monaural Extension Of Sound

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

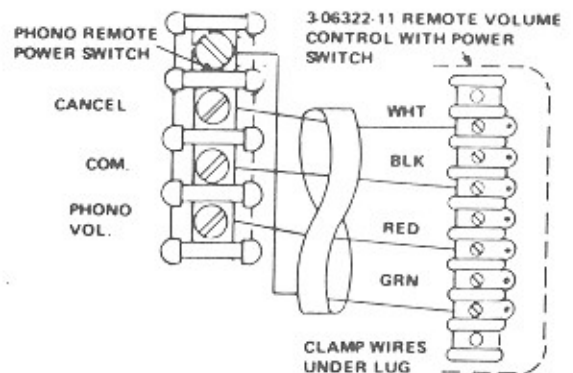


Figure 2-9. Remote Volume And Cancel Control Schematic

SECTION 3 - MAINTENANCE

INTRODUCTION

This section contains three major sub sections:

- Routine Service
- Preventive Maintenance
- Unscheduled Maintenance

Routine and preventive maintenance are to be performed on your normal periodic service call. Unscheduled maintenance is only to be performed if the R-90 Phonograph fails to operate properly.

ROUTINE SERVICE

This topic contains instructions to enable the route person to perform routine service tasks, such as changing records, making collections, and cleaning the R-90 Phonograph cabinet.

Changing Records

Load or change records as follows:

1. Unlock and open the top door.
2. Move the Service switch to the SERVICE position (Refer to Figure 1-1 and Figure 3-1.).

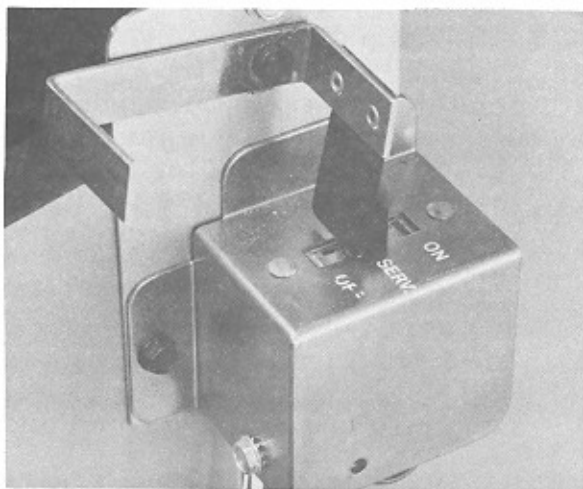


Figure 3-1. Service Switch

3. Press the Scan button to move the record space to the left or right of the transfer arm.
4. Install records as shown in Figure 3-2.

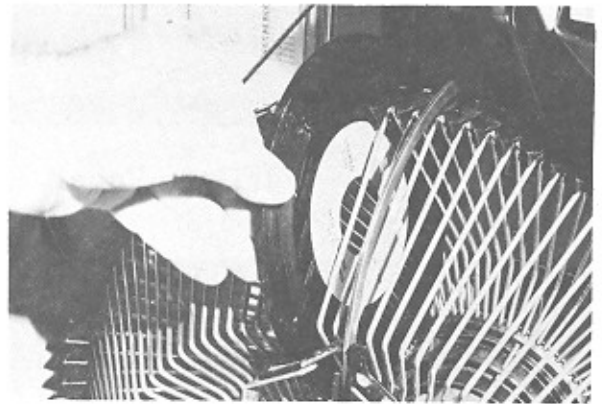


Figure 3-2. Changing A Record

Note: When changing or loading records, be sure to keep the magazine record load approximately balanced. If the magazine is partially loaded with all records on one side, The sprag wheel may lock and the magazine will not turn.

5. Move the Service switch to ON before making selections.

Changing Title Strips

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

1. Unlock and open the top door.
2. Release the title panel as shown in Figure 3-3.
3. Insert new title strips from the right as shown in Figure 3-4.
4. Check title strips and record sequence to ensure that the titles and records correspond.

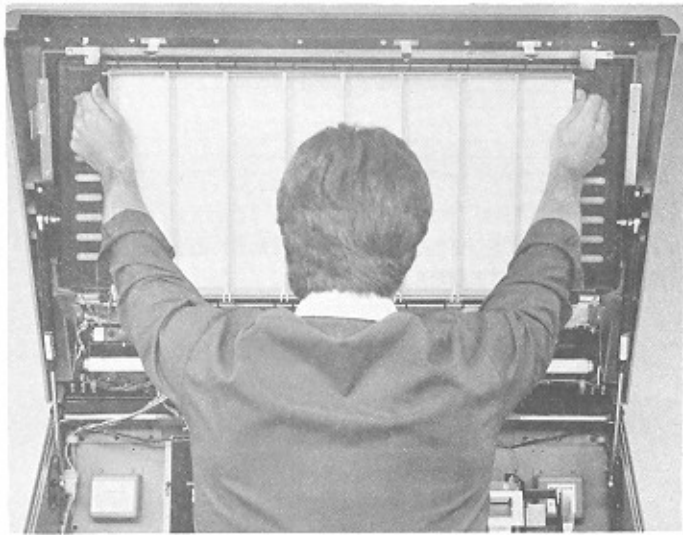


Figure 3-3. Lowering Title Panel

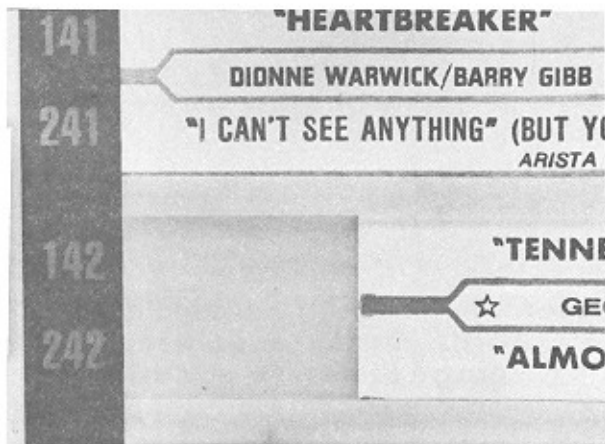


Figure 3-4. Changing Title Strips

Removing The Cash Bag

1. Unlock the cash bag door and pull the door away from the cabinet (See Figure 3-5.).
2. Slide the cash bag along its runners until the cash bag is out of the cabinet.

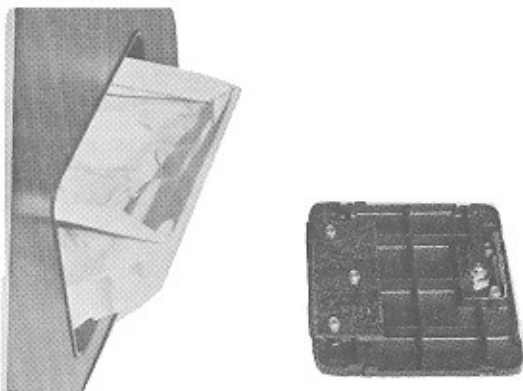


Figure 3-5. Cash Bag Removal

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. Memorec registers the number of selections made by the customer but not the total number of times the record has been played. (For example: the number of times the Autoplay chose a selection will not be counted.).

1. Open the phonograph and set the Control Console switch to the SERVICE position.
2. Set the VIDEO/RECORD switch on the Central Control Computer to either RECORD or VIDEO.
3. Set the Popular switch on the Central Control Computer to LEAST or MOST (MOST will start the display at the most popular selection number. The LEAST position will display the least popular selection.). The selection number will appear in the RECORD/VIDEO NUMBER display and the number of times that the record has been selected will be appear in the TIMES SELECTED display.
4. Push and release the Memorec Advance switch to read either the next least popular or next most popular selection (depending on the switch setting).
5. Change the display from the least popular sequence to the most popular selection sequence or vice versa, set the Popular switch to the desired function and progress from least to most popular or most to least popular by pressing the Memorec Advance switch.
6. The readout can be reset to the beginning by moving the Popular switch to one side and then back to its original position.
7. Use the eraser end of a pencil to press the Memorec Reset button. This will reset all Memorec totals to zero.

Note: Once these totals are reset to zero, they cannot be displayed again. Do not press the Reset button until you are finished displaying your totals.

Special Commands (5XX And 7XX)

More information can be gained from Memorec by entering special commands from the Keyboard. When the phonograph is in SERVICE Mode, the special commands that follow can be used:

The number of times a selection has been made, since the last time data was cleared from the memory, can be determined by entering 1XX, 2XX, or 3XX on the phonograph Keyboard. XX can be any two digit number from 00 to 99, which, when added to the first digit in the box, matches a selection number currently installed in the phonograph. The selection number you enter and the number of times that selection has been made will be displayed.

Display Commands (5XX)

The 5XX series of commands are entered from the Keyboard and the Memorec totals. The totals that can be displayed range from 0000 to 9999.

- 500 Number of times an audio selection has been made using the Popular key
- 501 Total number of record selections
- 502 Number of times a video selection has been made using the Popular key
- 503 Total number of video selections
- 504 Total number of AutoPlay selections
- 505 Number of #1 coins received
- 506 Number of #2 coins received
- 507 Number of #3 coins received
- 508 Number of #4 coins received
- 509 Number of #1 bills received

- 510 Number of #2 bills received
- 511 Total money collected (Expressed in nickels)
- 512 Total wallbox money collected
- 513 Total money collected (A permanent total that cannot be reset)

Clearing 5XX Totals

Entering a 0 into Location 97 will allow both the 5XX totals and the popularity totals to be cleared at one time (Use the Memorec Reset switch to clear both totals.). This function is convenient when one person changes records and another collects the money.

If one person collects the money and another changes the records, as in a large route, entering a 1 into Location 97 will allow the popularity totals to be cleared (using the Memorec Reset Switch), but the 5XX totals will not be cleared. A 750 command must be entered from the Service Mode to clear these totals (See **Memorec Clear Commands** that follow.).

If you wish to protect the 5XX totals, enter a 2 into Location 97. This will keep anyone from clearing the totals, except someone who has access to the Programming Mode. The Programming Mode can be protected by a security code (See Section 2.). Popularity data can still be cleared with the Memorec Reset switch. The 5XX totals are cleared when Location 97 is entered at the prompt.

Note: If you are interested in finding the total number of records played by the phonograph, in order to determine the amount of wear on the Record Changer mechanism, check the Total Play counter on the left side of the Record Changer mechanism.

Memorec Clear Commands (7XX)

The 7XX series commands are also entered from the Keyboard. These commands are primarily used to clear Memorec totals.

- 700 Adds 25 cents credit to give free plays or check pricing
- 701 Clears credits
- 702 Clears Autoplay
- 750 Clears 5XX totals (See **Clearing 5XX totals** in the previous paragraph.)
- 799 Clears regular selections

Preventive Maintenance

Preventive maintenance should be performed at the regular intervals specified, while adjustments should be made only when necessary.

In addition to cleaning the cabinet 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 (See Table 3-1 for details.). Always clean the inside of phonograph cabinet before you lubricate the phonograph mechanism.

- Use a vacuum cleaner to remove heavy dust deposits.
- Use a clean, lint free cloth saturated in denatured alcohol to clean mechanical parts.
- Clean electrical parts using a clean, dry cloth or camel hair brush.

WARNING: Use solvents in a well ventilated area only. Do not use solvents on plastic parts.

Cleaning The Glass

1. Open the Cabinet.
2. Remove the Title Rack by pushing outward on the clips on each side that hold it.
3. Remove the Title Rack Blockout panel by pushing outward on the clips on each side that hold it.
4. Clean the glass with a soft cloth that is clean and lint free. Liquid or spray glass cleaner may be used.
5. Replace the Title Rack and the Title Rack Blockout panel.

CABINET CLEANING

ACTION REQUIRED	PROCEDURE
1. Clean Glass	1. 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	2. 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	3. 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	4. a. Wipe all plastic surfaces with a damp or dry cloth only. DO NOT USE SOLVENTS.
5. Clean electrical components	5. a. Clean all electrical components with a clean, dry, lint-free cloth or a soft bristled brush only.

Table 3-1. Cabinet Cleaning

Flashing Lamps

All flashing lamps in the phonograph, except for the lamps on either side of the vertical fluorescent lamp in the front door, can be replaced by turning the lamp 1/8 turn counterclockwise and lifting out the lamp. To replace these lamps:

1. Remove the top two screws from both white panels.
2. Loosen the bottom four screws (two screws on each panel) from both white reflector panels.
3. Lift out both reflector panels and set them aside.
4. Locate the burned out lamps and turn each one 1/8 turn counterclockwise.
5. Install the new lamps by inserting the lamps into the lamp socket and turning the lamps 1/8 turn clockwise.
6. Install the white panels and tighten all eight screws.

Fluorescent Lamps

All fluorescent lamps in the phonograph, except the vertical lamp in the Front Door, can be replaced by turning the lamp 1/4 turn and lifting out the lamp. To replace the vertical Front Door lamp:

1. Remove the top two screws from the white reflector panel; loosen the bottom two screws.
2. Lift out the reflector panel and set it aside.
3. Turn the fluorescent lamp 1/4-turn and lift the lamp out.
4. Slide the new lamp in place, seat the lower end first, seat the upper end, and turn the lamp 1/4 turn.
5. Install the white reflector panel and tighten all four screws.

FIVE YEAR LUBRICATION

Your phonograph requires lubrication only after five years. To maintain smooth, trouble-free operation, lubricate the record changer mechanism as shown in Figure 3-6.

Do Not Over - Lubricate
Do Not Use Oil or Grease on Solenoid Plungers.

One drop 3:1
Electric motor oil

Lift turntable
apply one drop
of oil near end
of shaft and
replace turn-
table.

Apply one drop
of oil to bronze
bearing at shaft
of turntable
motor.

Do Not Get any
Oil or Grease on
Turntable Belt.

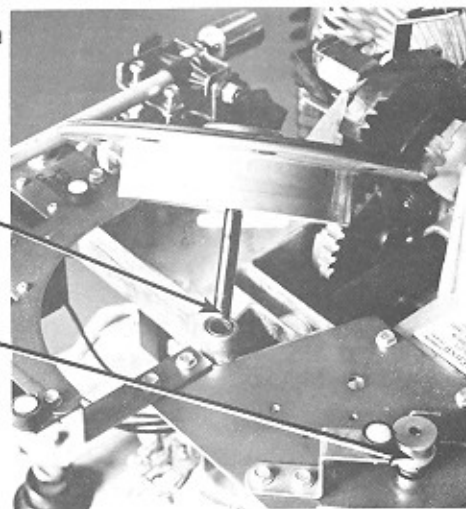


Figure 3-6. Turntable Lubrication

UNSCHEDULED MAINTENANCE

This section contains adjustments, removal, and replacement procedures that are to be followed whenever a malfunction has occurred. Maintenance for the OBA Bill Acceptor is not included. Maintenance procedures for the OBA Bill Acceptor are described in Section 4 of this manual.

Record Changer Adjustments

Sprag Assembly

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

WARNING - TURN POWER OFF

1. Refer to Figure 3-7 in the following steps. Depress solenoid plunger until the roll pin bottoms on the plunger stop (Actuate by pressing on plunger.).

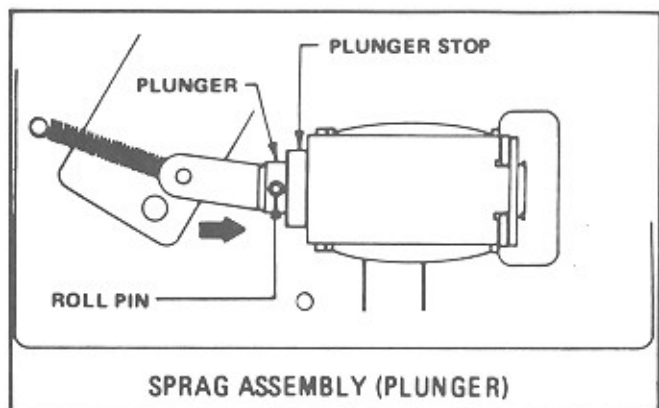


Figure 3-7. Sprag Assembly (Plunger)

2. Rotate the record magazine and note the clearance between the sprag lever and the sprag wheel located on the backside 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 (See Figure 3-8.). It will be necessary to remove the sprag assembly if corrections are required.

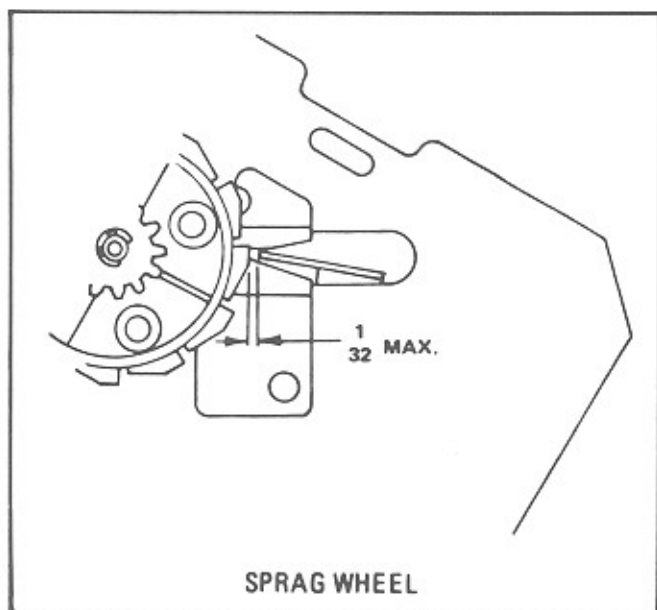


Figure 3-8. Sprag Wheel

Sprag Assembly Removal

1. To remove sprag assembly, disconnect wires to the solenoid and motor, remove the three mounting screws and slide the assembly out of the right side of the mechanism (See Figure 3-9.).

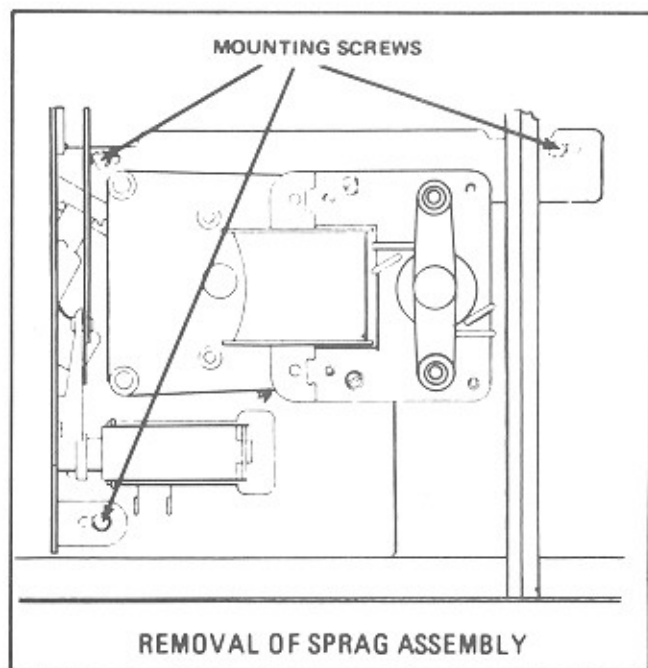


Figure 3-9. Sprag Assembly Removal

2. Loosen the solenoid mounting screws and with the roll pin against the plunger, 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 (See Figure 3-10.).

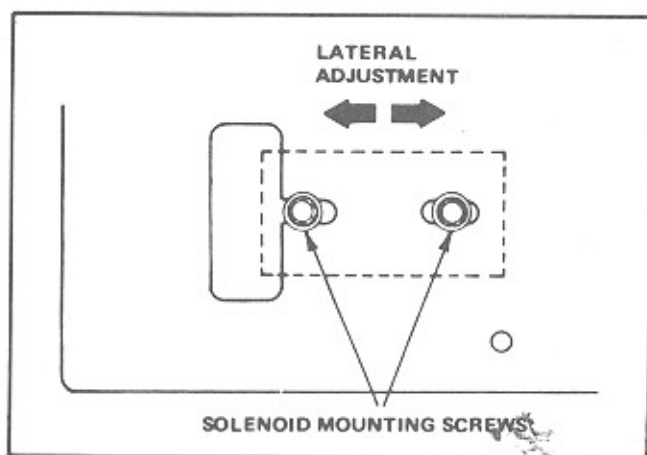


Figure 3-10. Lateral Adjustment

3. Tighten solenoid mounting screws.
4. 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.

Instructions for aligning the record magazine are in this section under **Aligning Magazine Stopping Position With Transfer Arm.** To readjust the optical switch refer to **Optical Switch** in this section.

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 degrees out of position.

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 3-11.).

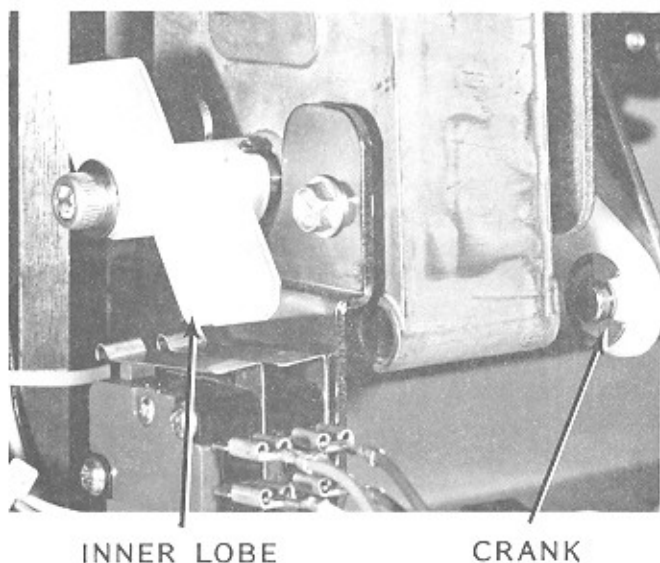


Figure 3-11. Cam Switch

Check And Adjust Cam Switch

1. Check that the plastic cam leaf spring and switch plunger just touch as shown above.
2. To adjust switches, loosen mounting screw under plunger end and move switch housing as required (See Figure 3-12.).

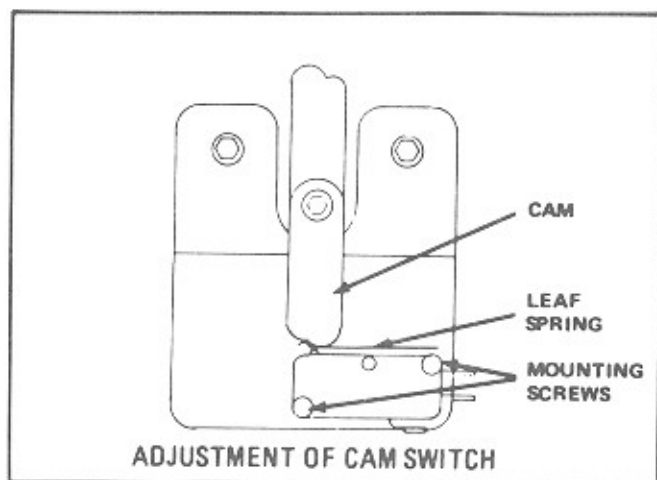


Figure 3-12. Cam Switch Adjustment

3. Tighten mounting screw and recheck operation.

Tone Arm Adjustments

Tone Arm Cam

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 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 in Figure 3-13.
6. Tighten Allen head set screws and replace tone arm.

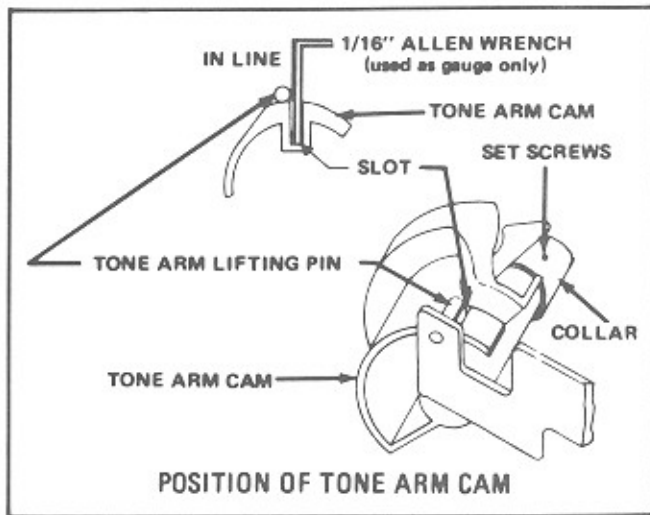


Figure 3-13. Tone Arm Position
Record Magazine Transfer Arm And Support

Adjustment

Eliminate Magazine End Play and Center Transfer Arm Support

1. Loosen set screws in rear Magazine Shaft collar. Push collar on to 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.

Magazine Belt Adjustment

1. Loosen two adjustment screws shown in Figure 3-14.
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.

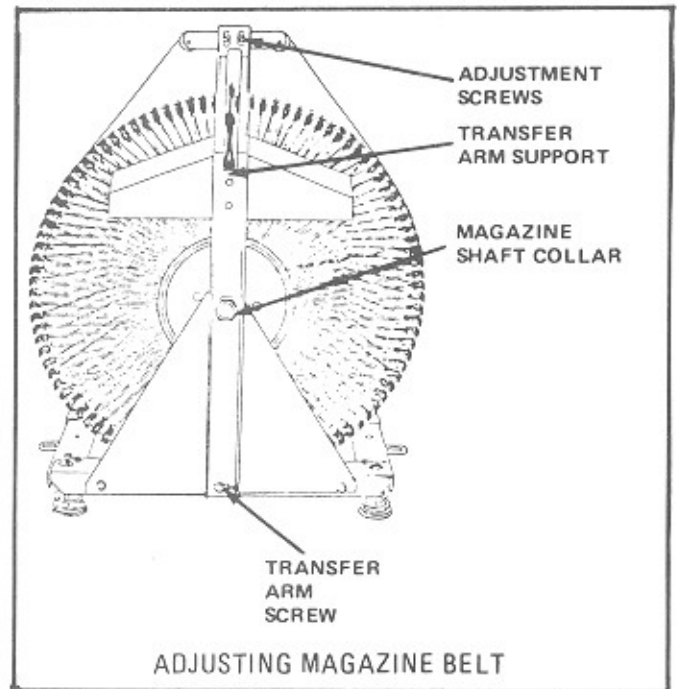


Figure 3-14. Magazine Belt Adjustment

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 back support (See Figure 3-15.). In this position, a center line from the inner shoe through the center of the outer shoe will pass through the center of the plastic record guide on the magazine.
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.

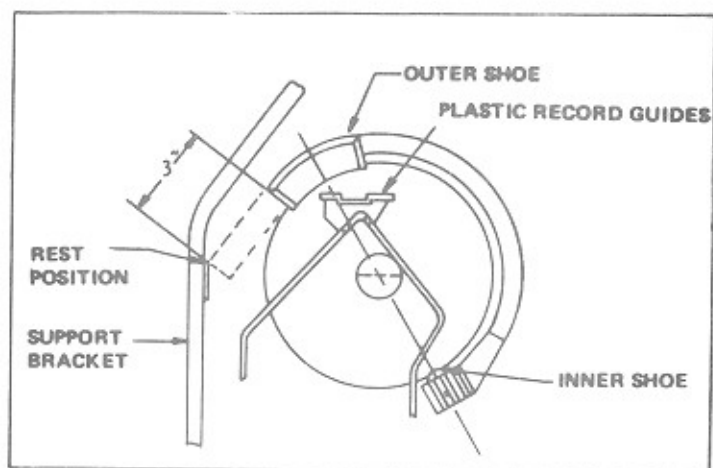


Figure 3-15. Magazine And Transfer Arm Position

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. See Figure 3-16.)

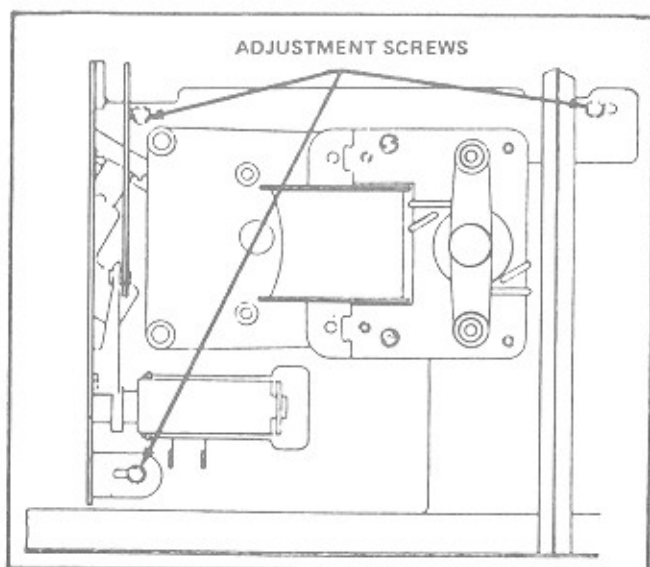


Figure 3-16. Magazine Adjustment

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.

Optical Switch

Adjustments

The optical switch position and/or sensitivity adjustments must be made if any of the following modifications or repairs are made to the phonograph record changer mechanism:

- Record magazine is adjusted (adjust position)
- Optical index switch is replaced (adjust Sensitivity and position)
- Mechanism control module is replaced (adjust Sensitivity)

Note: The sensitivity adjustment should be made first, then make the switch position adjustment.

Optical Switch Index Sensitivity (Visual Method)

1. Switch the phonograph to the SERVICE position.
2. Locate the index adjust potentiometer in the upper right hand corner of the mechanism control cover and insert a small screwdriver.

Note: The screwdriver tip must not exceed .090 inch Wide and .040 inch thick.

3. Press CANCEL on the mechanism control unit to rotate the magazine and turn the index potentiometer clockwise until the optical switch index LED turns off.
4. Continue to rotate the magazine and turn the index pot counterclockwise until the optical switch index LED begins to blink. Continue another 1/8 turn counterclockwise. The optical switch index LED should blink consistently as the magazine turns.

Optical Switch Index Sensitivity (Instrument Method)

1. Switch the phonograph to the SERVICE position.
2. Attach meter common (ground) to P203 Pin 2 of the mechanism control unit.
3. Attach the meter + to P203 Pin 4 of the mechanism control unit.
4. Locate the index adjust potentiometer in the upper right hand corner of the mechanism control unit and insert the screwdriver (Use driver as described above).
5. Press CANCEL on the mechanism control unit, and as the magazine rotates adjust the potentiometer for 3.1 - 3.6 VDC. Analog meters may read slightly more (3.4 - 3.8 VDC). With the mechanism control unit locked, the meter should read higher than 7.0 VDC after the position adjustment is made.

Optical Switch Home Sensitivity (Visual Method)

1. Locate the home adjust potentiometer in the upper right hand corner of the mechanism control unit cover.
2. Insert screwdriver and turn pot clockwise to stop.
3. Turn the pot counterclockwise 1/4 turn.

Optical Switch Home Sensitivity (Instrument method)

1. Locate the home adjust potentiometer in the upper right hand corner of the mechanism control module and insert the screwdriver.
2. With the home LED on, and the meter + lead connected to P203 Pin 3, the meter should read .2 VDC or less.
3. With the home LED off, the meter should read 7.0 VDC or more.

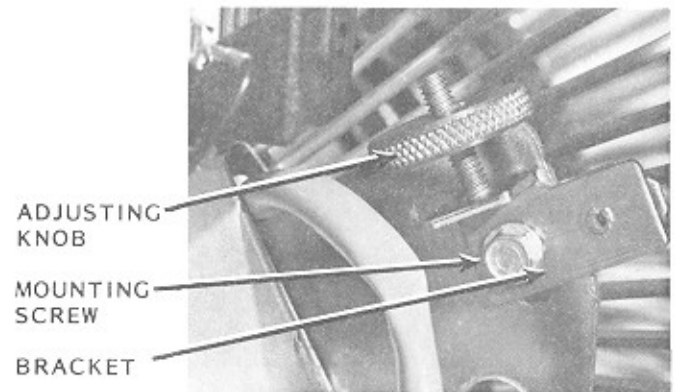


Figure 3-17. Optical Switch Position

Optical Switch Position

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 counterclockwise 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 during steps 4 and 5.
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. Turn the knob one full turn clockwise. 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 positions 25, 50, 75 repeating step 6. The index lamp should stay off. The home lamp will not be on.

Vertical Pivot

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

Stylus Force

1. The distance between the counter weight and the tone arm bracket should be 5/8 inch for 3-1/2 grams stylus force (See Figure 3-18.).

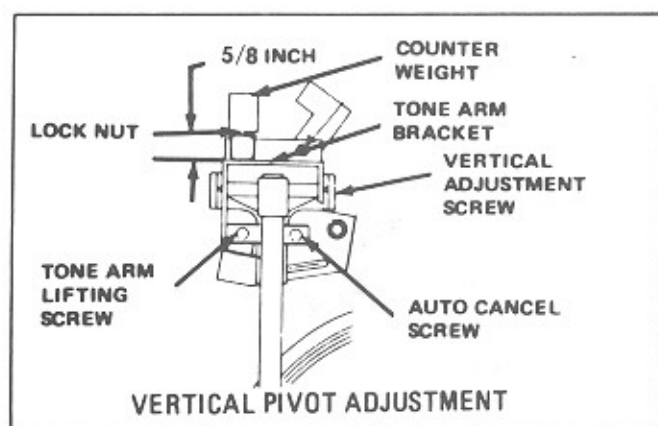


Figure 3-18. Vertical Pivot

2. If distance is not correct, loosen lock nut, adjust counter weight, and tighten lock nut.

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 3-19.) 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.

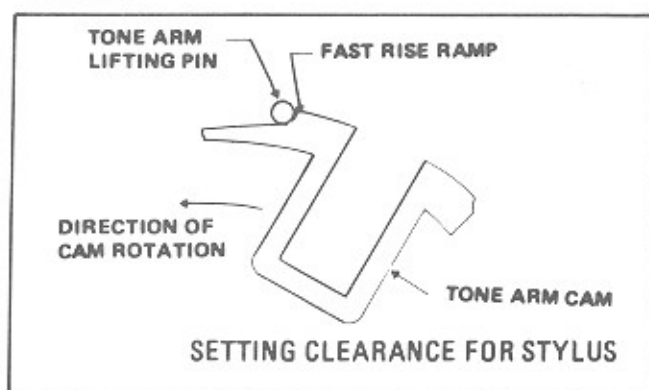


Figure 3-19. Stylus Clearance

Stylus Height

1. Operate transfer assembly to position arm over turntable rim.
2. Turn auto cancel screw until stylus holder is flush to 1/64 above turntable pad surface with tone arm in play position (See Figure 3-20.).

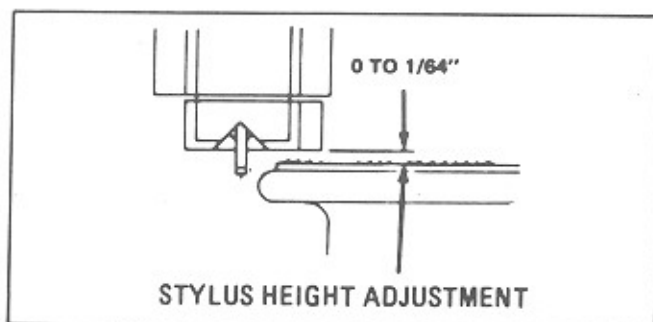


Figure 3-20. Stylus Height

Stylus Setdown Position and Tone Arm Cutoff Switch

1. Place undersize (6 and 25/32 inch diameter) record on turntable (See Figure 3-21.).
2. Operate transfer assembly to bring tone arm to play position.
3. Loosen horizontal adjustment screw.
4. While holding cam follower plate against tone arm cam, move tone arm, as required, until stylus is 2 and 9/16 inches from the edge of the turntable hub.

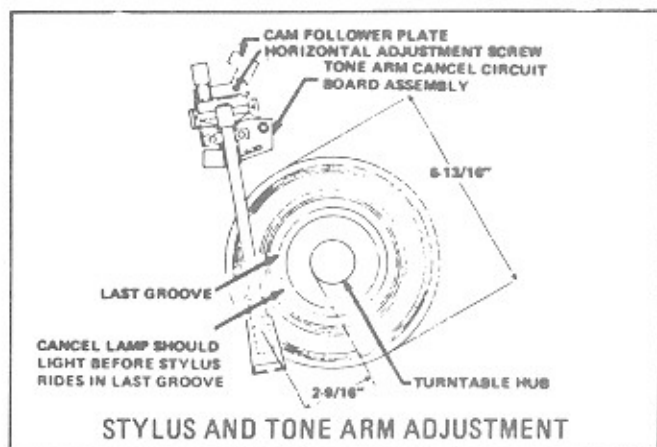


Figure 3-21. Stylus And Tone Arm

5. Tighten horizontal adjustment screw and check adjustment.

Adjust Tone Arm Cutoff Switch

1. Disconnect microcomputer harness from mechanism control board (19 pin connector). (To prevent mechanism from cancelling.)

2. Loosen mounting screw on tone arm cancel circuit board assembly.
3. 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 in Figure 3-22.
3. Tighten nut.

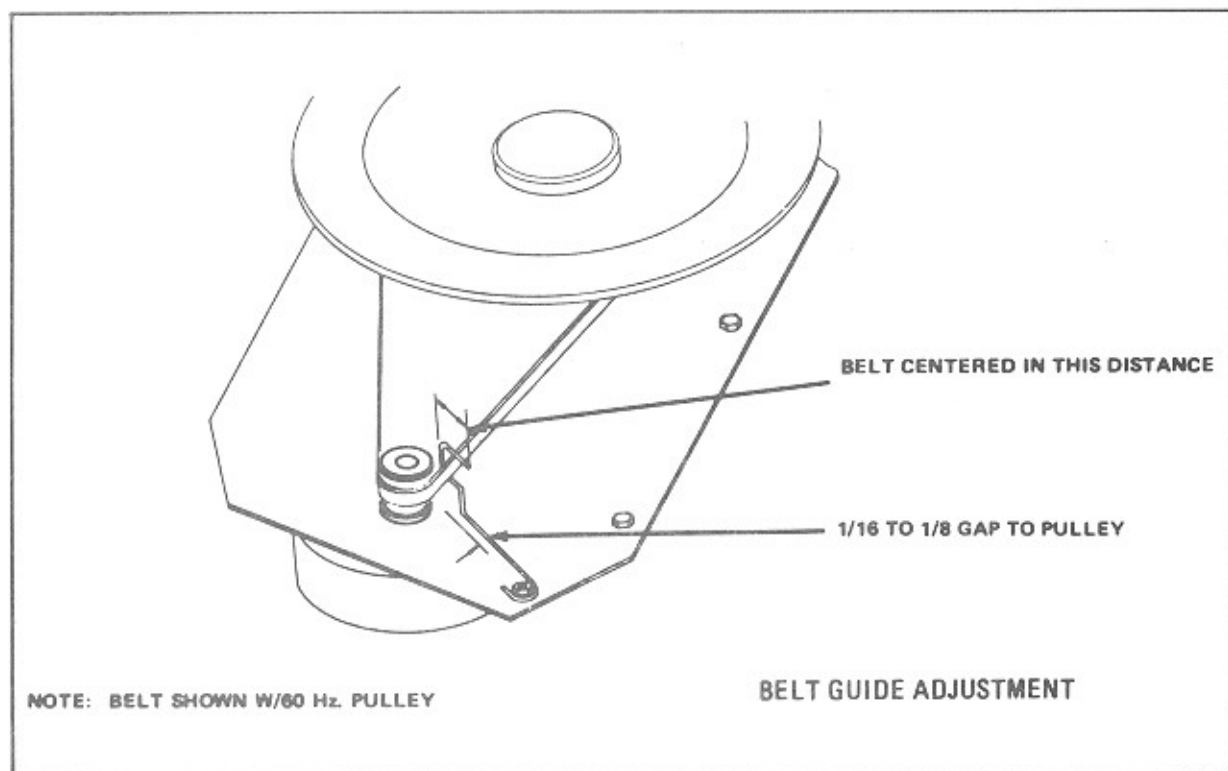


Figure 3-22. Belt Guide Adjustment

Coin Acceptors

Cleaning

All Plastic 3-Coin Acceptors

Submerge the 3-coin acceptor in hot soapy water, shake off the excess water, and let dry.

Note: Do not lubricate.

4-Coin Acceptors

1. Soak in hot soapy water for 10 minutes.
2. Rinse in hot water.
3. Let dry or use a lint free cloth.

4. Clean stubborn areas with a brush.

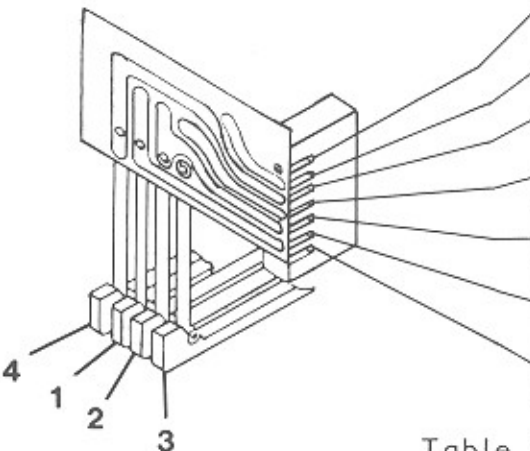
Note: Transfer cradle pins and bushings may be lubricated with a small drop of oil.

Do not use any oil or grease in the coin paths.

Coin Switch

Coin Switch Wiring Note

The phonograph can be programmed to count coin values other than the standard values. To change the coin value, enter the base coin value into Location 25 (The factory setting is 5-cents.). Refer to Table 3-2 for the standard settings.



3 & 4 COIN WIRING	COIN SW. NUMBER	3 COIN VALUE	4 COIN VALUE
KEY		STANDARD	*
V-COMMON			
W/V	4		5¢
B/Y	3	25¢	50¢
B/O	2	10¢	10¢
S/Y	1	5¢	25¢
KEY			

Table 3-2. Coin Switch Wiring

Money Counter - Non U.S. Currency

If you have altered the coin base amount to a coin value other than 5-cents, the mechanical money counter will not indicate the correct money total. The correct total can be accumulated by replacing the money counter with a new money counter that has the correct multiplier (See **Coin Switch** for base coin switch considerations.).

See Section 2, **Programming Locations 20, 21, 22, 23**

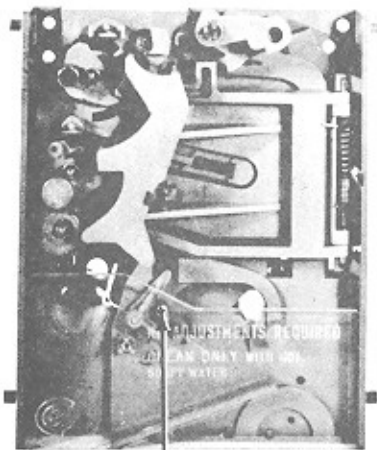
Checks And Adjustments

Coin Lever

Refer to Figure 3-23 in the following steps:

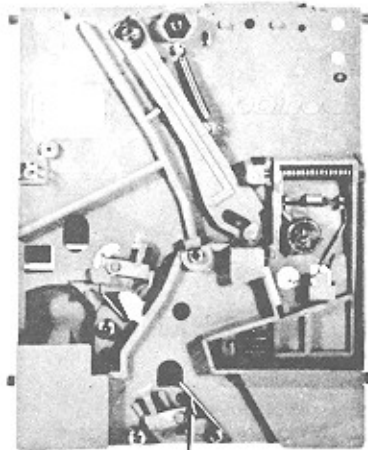
COIN ACCEPTORS
3 COIN

FRONT VIEW



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

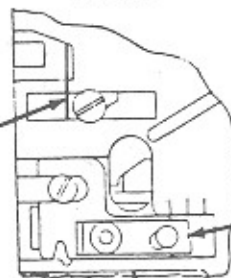
BACK VIEW



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

COIN ACCEPTORS
4 COIN

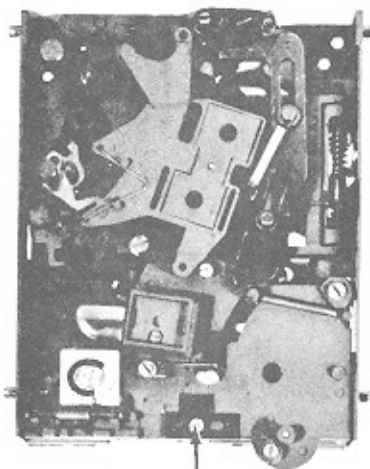
LINE UP EDGE OF
DEFLECTOR WITH
THIS LINE



TO IMPROVE S SLUG REJECTION
ADJUST AS SHOWN

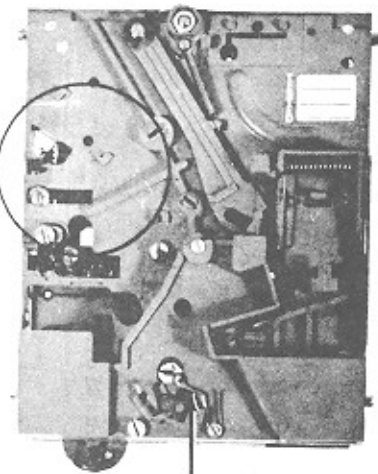
LINE SEPARATOR AS SHOWN

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

Figure 3-23. Coin Acceptors

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 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 (See Figure 3-24.). 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 0.035 inch. Check that contact gap for long paddle switches is 0.045 inch.

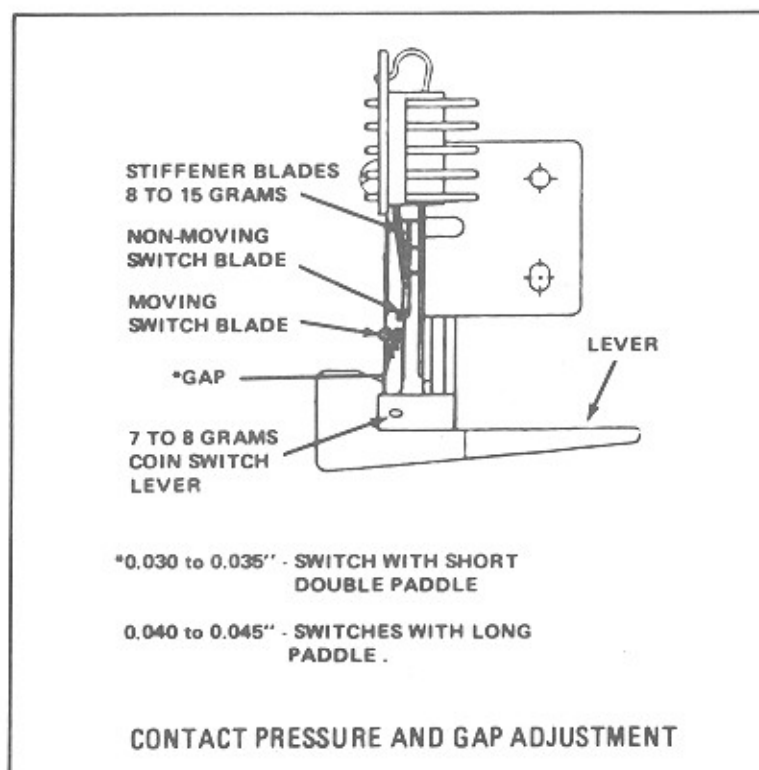


Figure 3-24. Contact Pressure And Gap Adjustment

Door Spring Replacement

1. Open the Top Door.
2. while another person keeps the door open, find the appropriate style spring end fitting in Figure 3-25.
3. Follow the example in Figure 3-25.

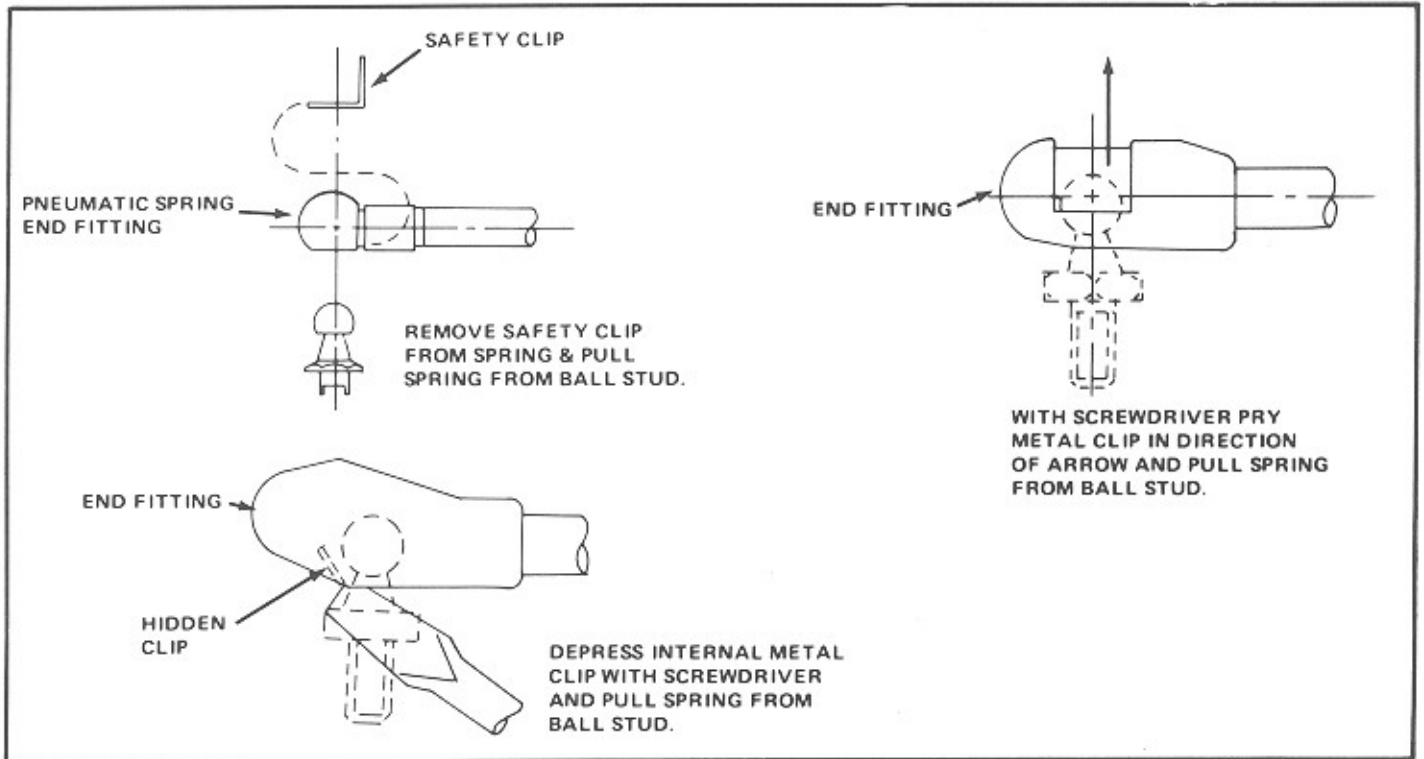


Figure 3-25. Door Spring Fittings

Glass Replacement

1. Turn the power to the Phonograph off.
2. Open the cabinet door.
3. Remove the Title Rack and the Title Rack Block-Out panel.
4. Remove the two Title Rack catches.
5. Remove the five screws and retainer, which secure the top of the Title Rack Housing and Glass.
6. Remove the five screws and retainer, which secure the bottom of the Title Rack Housing and glass.
7. While another person supports the Top Door, disconnect the two door springs from the Door.
8. While another person holds the Glass in place, remove the six screws from the spring retainers on both sides of the Housing and Glass.
9. Remove the retainer from each side of the Glass and Housing.
10. Remove the Glass and Housing.
11. Position the new Glass and Housing in the Door frame.
12. Install the two side retainers (removed in step 9) with six screws.
13. Install the two spring supports (removed in step 8) with six screws.
14. Secure the springs to the supports.
15. Install the retainer (removed in step 6) with five screws.
16. Install the retainer (removed in step 5) with five screws.
17. Install the two Title Rack catches (removed in step 4).
18. Install the Title Rack and Title Rack Blockout panel.

SECTION 4-OBA-P MAINTENANCE

INTRODUCTION

This section provides general and detailed service information for the Rowe OBA-P Bill Acceptor, including a physical description, functional description, routine maintenance, and unscheduled maintenance.

GENERAL INFORMATION

The OBA-P Bill Acceptor accepts valid U.S. currency in denominations of \$1 and \$5. It rejects and returns unacceptable currency to the customer.

The Bill Acceptor receives +5 VDC and +24 VDC from the R-90 Main Power Supply and sends Credit pulses to the R-90 Central Control Computer.

PHYSICAL DESCRIPTION

There are three major components to the Bill Acceptor. These are the Bill Transport Mechanism, the Bill Stacker and the Computer Control Unit.

The Bill Transport Mechanism

This device mechanically transports the currency from the Bill Acceptor opening past various sensors. These sensors scan the bill for validation information and relay it to the Computer Control Unit.

Drive Belts

Transporting the bill from the Bill Acceptor opening to the Bill Stacker is accomplished by a D.C. motor and a series of rollers, pulleys and belts. Polyurethane drive belts provide long life and reliable operation while requiring very little maintenance.

The main drive belt and lower bill transporting belts are cogged for more reliable operation, while adjustable idle pulleys are used to maintain correct tension. Upper transporting belts are of a semi-stretch type which require no adjustment. As the bill moves along the path from the opening

to the Stacker it is trapped between the upper and lower transporting belts. This provides a sure non-slip movement through the Transport Mechanism.

Optical Sensors

Three Optical Sensors are used for communicating bill information to the Computer Control Unit while the bill is in the Transport Mechanism. Two of the three, V1 and V4, are used establish the position of the bill within the Transport Mechanism; the third (V2) provides validation data from the bill as it passes through the Transport.

Magnetic Head

The Magnetic Head checks the magnetic properties of the incoming bill. A spring loaded pressure roller ensures intimate contact between the bill and the Magnetic Head.

Anti-Pull-Back Lever

This lever prevents the bill from being removed by the customer after the bill has been accepted as valid. It also works in conjunction with the V4 sensor to determine the bill's position.

Bill Stacker

The Stacker accepts bills from the Transport Mechanism and stacks them in a locked Bill Box. The Bill Box swings down and forward for easy bill removal.

The Stacker uses a D.C. motor to drive a metal platen which, through a mechanical linkage, pushes the bill into the Bill Box. A cam-actuated switch signals the Computer Control Unit as to the position of the platen. The platen may be in one of two positions either "home" or "off home". An "off-home" signal received by the Control Unit while in standby prompts it to reset the platen and return it to its "home" position. (See **Functional Description** in this section for further details.).

Computer Control Unit

This module contains the electronic circuit board and microcomputer. The Computer Control Unit directs the operations of the various parts of the Bill Acceptor.

See **Electrical Adjustments** in this section if the Computer Control Unit must be replaced.

Mag Adjust

Allows adjustment of the magnetic amplifier circuitry for optimum performance. The amplifier is used in conjunction with the Magnetic Head in the Bill Transport Mechanism for checking specific properties of bills.

Speed Adjust

Allows for transport motor speed adjustment.

Test Button

If this button is depressed when the unit is in the idle (or STANDBY) state, it activates the MOTOR SPEED ADJUSTMENT mode. This allows the rate at which the bill is fed through the Transport Mechanism to be adjusted for optimum performance. If the Bill Acceptor is in the SHUTDOWN mode, rather than the STANDBY mode pushing the Test Button will reset it and put it back into STANDBY (See **Functional Description**).

Visual Indicators

B.A. Status LED

This LED indicates the present status of the OBA-P as follows:

1. The OBA-P is in standby or other normal operation (The LED is off.).
2. Immediately after a bill is rejected and while the bill is still in the transport opening, the LED will flash one or more times (to indicate the cause of the reject). See **Troubleshooting** for details.

3. Motor speed adjust mode (With the test button pressed, the LED indicates whether the motor speed is correct or not (See **Adjustments** in this section.).
4. OBA-P in shutdown mode due to a fault, which prevents proper operation (The LED is on most of the time, but flashes off periodically to indicate the cause of the error condition (See **Troubleshooting** in this section.).

+5 VDC LED

When lit, this LED indicates the presence of +5 VDC, which is the normal condition.

+24 VDC LED

When lit, this LED indicates the presence of +24 VDC, which is the normal condition.

Connectors

Four connectors, labeled P1, P2, P3, and P4, connect the four major modules or components of the Bill Acceptor to each other and to the R-90.

P1 connects the Computer Control Unit to the R-90 Power Supply.

P2 connects the Bill Transport Mechanism to the Computer Control Unit.

P3 connects the Bill Stacker to the Computer Control Unit.

P4 connects the OBA-P to the R-90 Central Control Computer (Credit output).

FUNCTIONAL DESCRIPTION

The following is a sequential description of the Bill Acceptor operation. This description will give you a basic understanding of how the Bill Acceptor normally operates. This section can also be used as a troubleshooting aid.

Bill Acceptor in Standby Mode

Ready to Accept Bills

When the power is supplied to the Bill Acceptor in normal operation, it assumes a standby state and is ready to accept bills. While in this state, it is continually checking the various sensors in the Bill Transport and Bill Stacker mechanisms. If it senses an incorrect signal, it takes the appropriate action as follows:

V4 Sensor Active

The Bill Acceptor assumes that something is trapped in the Bill Transport path if this sensor is active while in the STANDBY mode. The Bill Acceptor then begins the Reject sequence to remove the trapped object from the path. For further information see the section that follows on the Reject Sequence.

Stacker Home Switch Not Activated

The Bill Acceptor turns on the Stacker Motor and attempts to return the Stacker platen to its home position. If successful, the Bill Acceptor returns to the STANDBY mode. If it is unsuccessful in its attempts, after 2.5 seconds, it shuts itself down. For further information see the section on Shutdown sequence that follows.

Bill Acceptor Response

Reject Sequence

In order to clear the Bill Transport Mechanism and purge any objects from the path, the Bill Acceptor turns on its motor in the reverse direction. If the Bill Acceptor is following a normal bill rejection sequence, it will reject the bill and the Transport Mechanism will return the bill to the Bill Acceptor opening. The transport will place the bill so that it can be easily grasped by the customer. At this time the BA status LED will flash one or more times to indicate the reject cause. If the customer retrieves the

bill within 3 seconds and all other sensors indicate that the transport path is clear, the Bill Acceptor returns to the STANDBY mode. If the track is not clear, the Bill Acceptor begins the Self-Clearing Sequence described in the following section.

Self-Clearing Sequence

If the Transport Path fails to clear as just described, the Bill Acceptor begins a Self-Clearing Sequence. This consists of a series of reverse-forward-reverse cycles to dislodge any object trapped in the transport. If this procedure is successful, the Bill Acceptor returns to the STANDBY mode. If the track is not cleared, the unit will shutdown. The Shutdown Sequence follows:

Shutdown Sequence

Several things may cause a Bill Acceptor shutdown. In the previous situation, an unsuccessful attempt by the Bill Acceptor to clear an object lodged in the Transport Path will initiate a Shutdown Sequence. In the event of a Shutdown, the Bill Acceptor turns everything off except the Status LED, which it turns on and then periodically flashes off one or more times. The number of flashes are determined by the failure that is causing the shutdown.

Bill Acceptance Sequence

When the customer inserts the bill, V1 is blocked. The Transport Motor then begins pulling the bill into the Transport Path.

As the bill moves forward the Bill Acceptor monitors the bill's progress by monitoring V1, V2, and V4 for the proper signals. During this phase V1 should be active (the sensor is covered) and V4 should be inactive (the Anti-Pull Back Lever should be in STANDBY position).

When the leading edge of the bill activates the Anti-Pull-Back Lever, which blocks the V4 cell, the OBA-P begins a complex series of precise magnetic and optical checks. In addition to the magnetic and optical checks being performed, the Bill Acceptor checks the position of the bill in the Transport Path. If it receives an incorrect signal from V1, V2, or V4 the Bill Acceptor immediately begins the Reject Sequence described earlier.

If the bill passes all of the magnetic and optical checks, it continues to move through the transport until the trailing edge leaves the back of the transport and allows the Anti-Pull-Back Lever to return to its "at rest" position (unblocking the V4 cell).

The Stacker motor is now activated by the Computer Control Unit, which monitors the Home switch to ensure that the Bill Stacker Platen leaves the Home Position and stacks the bill in the Bill Box. After stacking the bill, the Computer Control Unit checks the Home Switch to make sure that the platen returns to its original position. If the Stacker Platen does not leave the home position within 750 milliseconds or if it does not return to the home position within 2.5 seconds, the Computer Control Unit begins its shutdown sequence.

When the bill stacking process is completed, the Computer Control Unit sends a Credit signal to the R-90 Central Control Computer and is ready to begin another bill acceptance sequence. The Credit signal consists of one 75 ms +5 volt pulse for a dollar bill or five pulses for a five dollar bill. Multiple pulses are separated by 75 ms.

ROUTINE MAINTENANCE

Cleaning

Since environmental conditions vary considerably, no prescribed maintenance schedule is set. Instead, the following items should be inspected periodically and cleaned as necessary:

Bill Inlet and Track

These surfaces should be wiped with a soft, clean, lint-free cloth.

V2 Sensor

The V2 backside sensor, which includes both an emitter and a detector, should be kept clean to ensure that all valid bills will be accepted. A soft cloth or cotton swab moistened with denatured alcohol can be used for this purpose.

Magnetic Head

Due to the abrasive nature of currency, the magnetic head does not normally require cleaning. If the magnetic head does collect dirt, the dirt may be removed with a cotton swab saturated with denatured alcohol.

Drive Belts

Drive belts can be cleaned by wiping them with a clean lint-free cloth moistened with denatured alcohol. Do not soak belts in a solvent.

Bill Stacker

Use a clean cloth to remove any excess dirt from the Stacker, platen, and surrounding areas.

Lubrication

Bill Stacker

The Bill Stacker does not require lubrication.

Bill Transport Mechanism

The Bill Transport Mechanism does not require lubrication with normal use. If the Transport Mechanism is difficult to turn or if the transport mechanism is excessively noisy, apply one drop of light machine oil to each nylon bearing and to any shaft location that supports a plastic roller.

UNSCHEDULED MAINTENANCE

Mechanical Adjustments

Bill Stacker

The Bill Stacker does not normally require adjustment. If the Computer Control Unit indicates a problem involving the Home switch while in shutdown mode (See **Troubleshooting**), then the switch adjustment may be checked by performing the following procedures:

1. Rotate the cam so that the switch actuator rests on the high point of the Stacker Motor Cam.
2. Place a .040 to .050-inch gauge between the cam and the actuator. The bottom of the actuator should rest against the switch case. If the adjustment is incorrect, reposition the switch by loosening its two mounting screws.
3. Align the pusher plate to the guide rails by loosening the three motor bracket screws and moving the motor assembly. The pusher plate and the guide must be positioned within 1/64 inch as shown in Figure 4-1.).

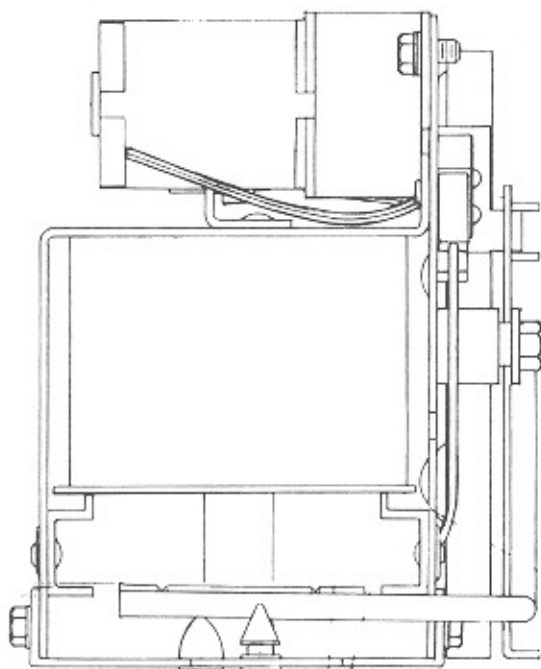


Figure 4-1. Pusher Plate Adjustment

Bill Transport Mechanism

The Transport Mechanism does not require any initial set-up or routine adjustment. If any slipping or binding occurs in the mechanism, make the following adjustments:

Drive Belt Tension (See Figure 4-2.)

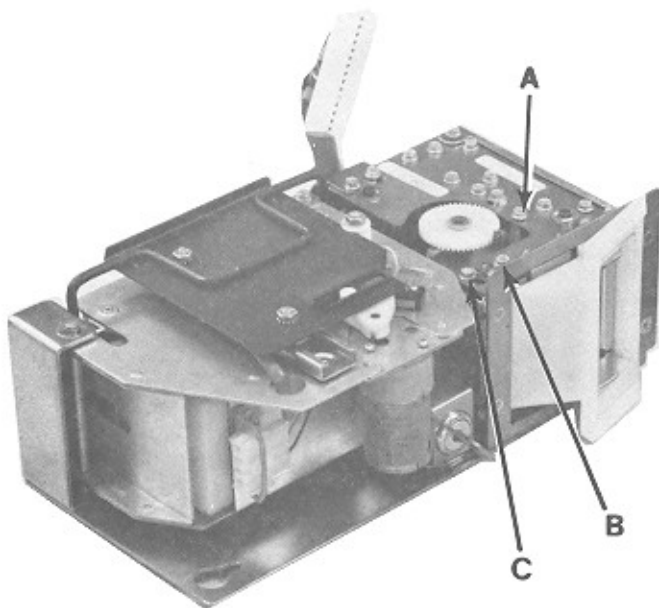


Figure 4-2. Drive Belt Tension

Adjust the drive belt on units with Pivoting Motor Bracket as follows: (See Figure)

1. Loosen the three hex head-screws labelled A, B and C.
2. Pivot the Motor Assembly on Screw A until the Drive Belt has a total flex of approximately 3/32 inch between the Gear Pulley and the Drive Shaft Pulley.
3. Tighten Screw A and then B and C.
4. Check the belt tension. If the Drive Belt will not hold tension properly because the motor assembly will not pivot, the belt has become stretched and should be returned to an authorized service center for repair.

Adjust the Lower Belt tension as follows: (See Figure 4-3.)

1. Loosen the four hex-head screws holding the ends of the Idler Pulley Shaft and the take-up brackets (Shown in Figure 4-3.).

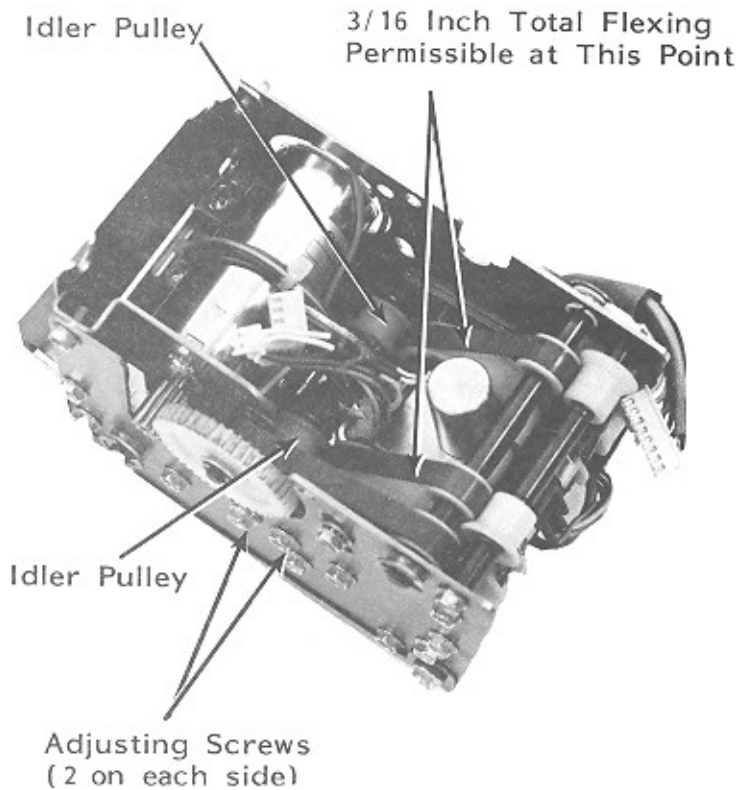


Figure 4-3. Lower Belt Adjustment

2. Remove the circuit board by removing the three screws that hold the brackets and unplug the three connectors.
3. Push down on the idler pulleys until the belt flexes about 3/16 of an inch.
4. Tighten all four screws and check the belt tension again. The tension must be equal on both belts.
5. Replace the circuit board and plug in the three connectors.
6. If the adjusting screws are against the ends of the slots and the timing belts are still loose, the transport should be returned to an authorized service center.

Gear Backlash Adjustment

A degree of backlash should exist between the gears, as shown in Figure 4-4. To adjust the gear backlash:

1. Loosen the two Phillips-Head screws holding the motor. Move the motor to give the correct backlash. This adjustment is not critical, but make sure that backlash is present at all points, as you rotate the gears.
2. Tighten the two screws and recheck the gear backlash.

Magnetic Head Alignment

The Magnetic Head is aligned with the Harness and Holder assembly at the factory. If a problem with the head develops, the Harness and Holder assembly must be replaced. Order the Harness and Holder Assembly, Part Number 4-50598-01.

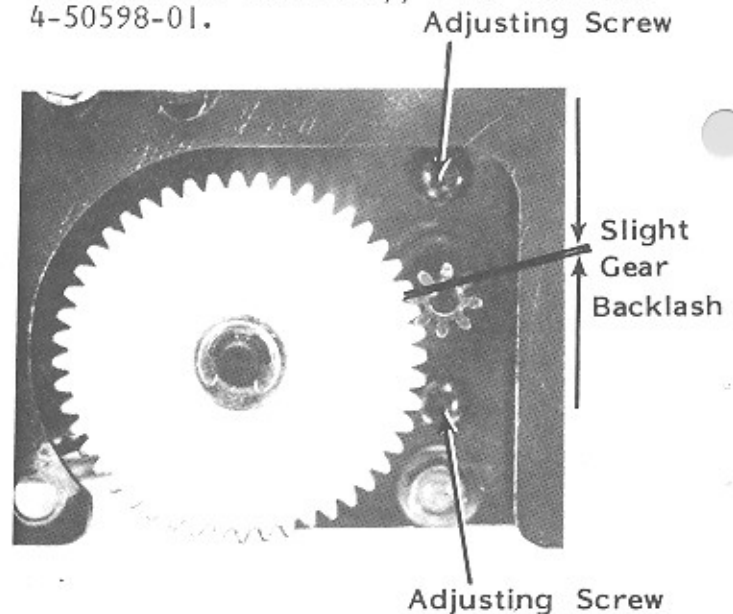
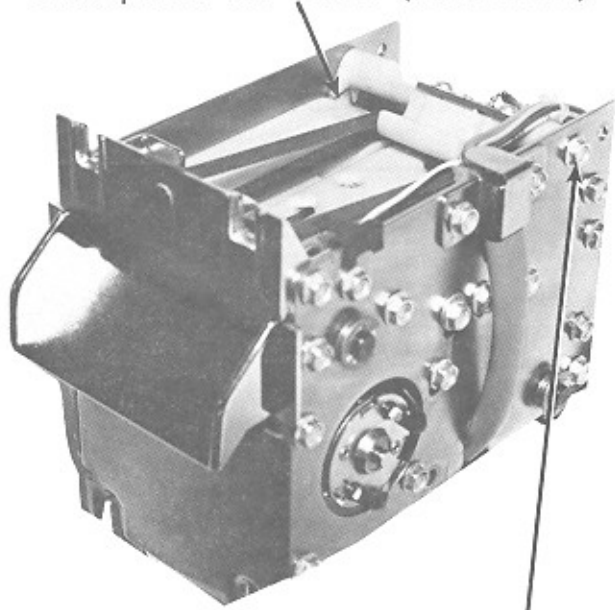


Figure 4-4. Gear Backlash Adjustment

To replace the Harness and Holder Assembly:

1. Install the four screws loosely, and align the assembly with the lower track by pressing the V on the holder firmly against the V on the lower track (as shown in Figure 4-5.).

The V shape on the Lower Track must be firmly aligned with the V shape on the holder (both sides)



Tighten This Screw First (One Each Side)

Figure 4-5. Magnetic Head Alignment

2. Tighten the two screws at the V's to hold the alignment.
3. Tighten the two remaining screws.

Electrical Adjustments

The electrical adjustments on the Bill Acceptor are factory set and should not be changed under normal operating circumstances. Replacing a Bill Transport Mechanism or Computer Control Unit will require recalibration of the system. The following steps must be taken to complete the necessary adjustments:

Motor Speed Adjustment

1. Depress the TEST button and hold it.
2. Turn the Speed Adjust pot either clockwise or counterclockwise until the Bill Acceptor Status LED reaches maximum brightness.

MAG ADJUST

Turn the MAG ADJUST potentiometer fully clockwise. If bills are rejected, adjustments will have to be made. See **Troubleshooting** in this section for details.

TROUBLESHOOTING

This section is a guide to help you isolate problems and return the Bill Acceptor to service as quickly as possible. This section provides the information needed to make adjustments and replace modular components.

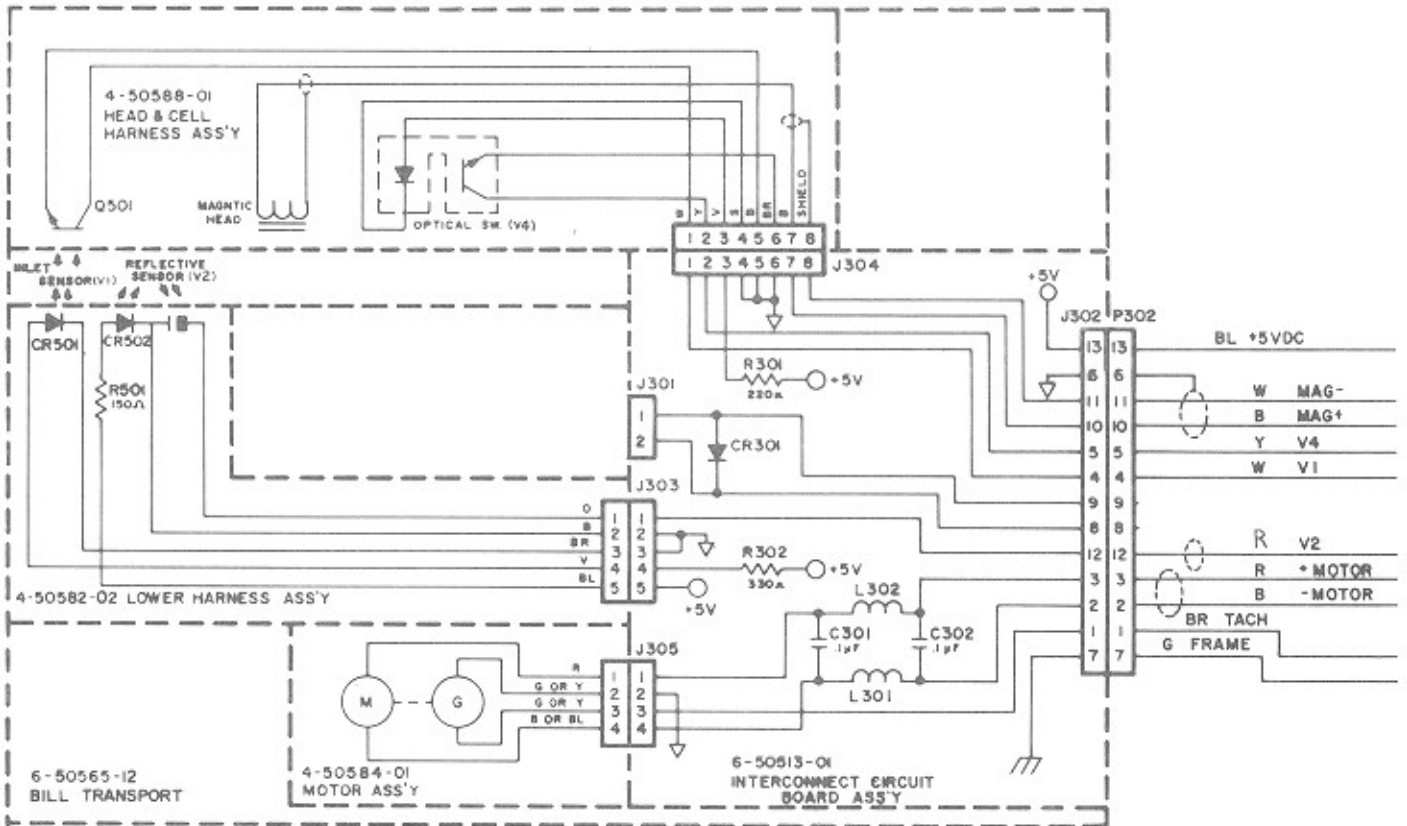
This manual does not provide procedures or information to diagnose or repair defective modules. Rowe suggests that modules, such as the Transport, Bill Stacker, or Computer Control Unit be returned to Rowe or your distributor for repair.

The following troubleshooting chart is designed to lead you through a step-by-step procedure to solve a particular problem. Begin at Step 1 and proceed through as many of the steps as needed to solve the problem. Before using any of the procedures, check the harnesses and electrical connections to ensure that no connections are loose, missing, or frayed. You can reduce your effort by checking the electrical connections first.

TROUBLE	SYMPTOM	PROBABLE CAUSE
Transport motor does not start when a bill is inserted.	+5 or +24 LED on Control Unit not lit.	<ol style="list-style-type: none"> 1. Problem in R90 power supply or harness to OBA-P 2. Defective Control unit
	Transport doesn't start but clicking sound in Control unit is heard.	<ol style="list-style-type: none"> 1. Object jammed in transport mechanism 2. Defective transport 3. Defective Control unit
	No sound or other indication that transport is trying to run.	<ol style="list-style-type: none"> 1. Defective V1 cell in transport 2. Defective Control unit
	B.A. STATUS LED is blinking.	<ol style="list-style-type: none"> 1. OBA-P is not operational due to a fault condition See the following section
OBA-P in SHUTDOWN.	BA STATUS LED blinks off once every second and then pauses before blinking again.	<ol style="list-style-type: none"> 1. Object in transport covering V1 cell 2. Defective transport 3. Defective Control unit
	BA STATUS LED blinks off twice every second and then pauses before blinking again.	<ol style="list-style-type: none"> 1. Object in transport activating anti-pull back lever 2. Defective transport 3. Defective Control unit
	BA STATUS LED blinks off 3 times every second and then pauses before blinking again.	<ol style="list-style-type: none"> 1. Bill stacker full 2. Bill stacker jammed in off-home position 3. Bill stacker home switch out of adjustment See Electrical Adjustments in this section 4. Defective bill stacker 5. Defective Control unit
bills jam frequently.		<ol style="list-style-type: none"> 1. Anti pull back lever not operating freely 2. Bill pressure roller binding 3. Transport inlet or track surfaces contain projections, rough spots, or dirt 4. Transport belts out of adjustment or dirty See Maintenance this section. 5. Transport belts not centered on rollers 6. Transport upper input roller does not move up and down freely 7. Defective R90 power supply (+28 VDC).

TROUBLE	SYMPTOM	PROBABLE CAUSE
Bill acceptor rejects a large number of valid bills	BA status LED blinks once after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Defective V1 or V4 cell in transport 2. Defective control unit
	BA status LED blinks twice after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Defective V2 cell in transport 2. Defective control unit
	BA status LED blinks three times after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Object lodged in transport 2. Binding anti-pull-back lever 3. Defective V4 cell 4. Defective control unit
	BA status LED blinks four times after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Mag adjust set too low; turn clockwise 1/8 turn 2. Incorrect motor speed See Electrical Adjustments in this section 3. Defective magnetic head or transport 4. Defective control unit
	BA status LED blinks five times after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Incorrect motor speed See Electrical Adjustments in this section 2. Defective transport 3. Defective control unit
	BA status LED blinks six times after rejecting the bill. See note 1.	<ol style="list-style-type: none"> 1. Mag adjust set too high Turn counterclockwise 1/8 turn 2. Defective magnetic head or transport 3. Defective control unit

Note 1. The BA status LED indication will only be valid if the rejected bill remains in the transport opening.



SECTION 5 - TROUBLESHOOTING

INTRODUCTION

The R-90 Phonograph incorporates several modules which plug in for rapid service. The block diagram in Figure 5-6 shows the modules and the wiring between them. Figure 5-6, also, shows wiring between modules and components.

Troubleshoot logically so that your effort is not wasted by removing and replacing the wrong parts (If necessary, refer to the R-90 Programming Reference Guide in Section 2.). Most failures are caused by minor defects. The most likely causes of phonograph problems are:

1. Continuous or intermittent opens in a harness. The cause can be wiring, a terminal, or a bad terminal crimp.
 - Check that all plugs are firmly seated.
 - Check that connector pins are not bent, broken or pushed through the back of connectors when mated.
2. A defective module (See Table 5-1.).

CONTINUOUS CREDIT

As an aid to troubleshooting, the phonograph may be programmed to play continuously. In this mode, the phonograph will play selections as long as selections are made (No money is needed.). To use this feature, enter the Programming Mode (Refer to Section 2, Programming The Credit And Selection System.) and enter "255" into Location "27".

Table 5-1 Replaceable Modules

PART NO.	DESCRIPTION	NOTES
4-07773-05	Central Control Computer Circuit (C.C.C.)	Module contains Bd. Ass'y - C.C.C. 6-09738-05
4-07221-05	Mechanism Control	Module contains Circuit Bd. Ass'y Mech. Control 6-08708-05
4-07706-03	Power Supply	
6-09928-01	Digital Display	

ERROR CODES

Error codes with error messages and modular troubleshooting charts are provided for troubleshooting. Error messages contain information on fixing the problem or refer you to a location in the modular troubleshooting charts.

The computer can store up to 20 error codes in its battery backed-up memory. When an error occurs, the error code is displayed for three seconds on the Memorec display. Code is displayed on front display if error caused phonograph to shut down. When power is applied, the computer checks memory and

if the computer finds error codes, the last code that occurred is displayed for three seconds on the Memorec display.

Multiple errors can be checked by using the 666 command in service mode. Each time 666 is typed, the next code in memory is displayed on the Memorec display. The display will go blank if 666 is typed (All codes will have been displayed before the screen goes blank.). Type more 666 commands if you want to look through codes again. Type 699 when the phonograph is repaired or any time you want to erase all error codes from memory.

Error Code Chart

Note 1. Use 666 to check for multiple errors before using the 699 command to erase all error codes.

Err0 Indicates "factory settings" for programming codes were loaded into ram (Memorec RESET and ADVANCE switches were both closed when power was applied.).

Err1 Checksum fault indicates "factory settings" for programming codes were loaded into ram when power was applied (Original data was in error.).

The reason data changed could be: a defective ass'y, severe electrical noise, lightning, low battery, etc. To remove Err1 code:

1. Put SERVICE switch to SERVICE position and wait 3 seconds for computer to enter programming mode.
2. If factory settings are desired, push: POPULAR key, key 2, key 5, and POPULAR key again. If factory settings are not desired, enter desired data at each programming location.
3. Put SERVICE switch to OFF and then back to SERVICE. If Computer returns to programming mode, replace computer ass'y.
4. See Note 1.
5. Type 699 to erase error codes.

Err2 Ram I.C. Z9 is defective. Replace the computer.

Err3 Rom I.C. Z7 is defective. Replace the computer.

Err4 Battery voltage is low. Replace the computer.

Err5 Wallbox serial signal (pin 4 of P4) always low.

1. Put the SERVICE switch OFF.

2. Unplug connector P4.
3. Put the SERVICE switch to SERVICE.
4. See Note 1.
5. Type 699 to clear all error codes.
6. Put the SERVICE switch to ON.
7. If the error still remains, replace the computer. If the error is gone, it was caused by a permanent or intermittent short in the wallbox cable or a defective wallbox.

Err6 Wallbox serial signal (pin 4 of P4) always high. Follow all seven steps given in Err5.

Err7 COIN switch #1 (pin 5 of P2) always low (COIN switch #1 is nickel switch in three coin acceptor.).

1. Put SERVICE switch to OFF.
2. Unplug Connector P2.
3. Put SERVICE switch to SERVICE.
4. See Note 1.
5. Type 699 to clear all error codes.
6. Put SERVICE switch to ON.
7. If error still remains, replace the computer. If the error is gone, it was caused by a permanent or intermittent short in coin switch harness or coin switch.

Err8 Coin switch #2 (pin 6 of P2) always low (Coin switch #2 is dime switch in three coin acceptor.). Follow all steps given in Err7.

Err9 Coin switch #3 (pin 7 of P2) always low (Coin switch #3 is the quarter switch in three coin acceptor.). Follow steps given in Err7.

Err10 Coin switch #4 (pin 3 of P2) always low (Coin switch #4 is not used in the three coin acceptor.). Follow steps given in Err7.

Err11 Dollar bill signal (pin 2 of P3) always high.

1. Put SERVICE switch to OFF.
2. Unplug connector P3.
3. Put SERVICE switch to SERVICE.
4. See Note 1.
5. Type 699 to clear all error codes.
6. Put SERVICE switch to ON.

7. If error still remains, replace the computer. If error is gone, it was caused by a short in the harness between the C.C.C. and the OBA-2 or a defective OBA-2 Control Unit.
- Er12 More than one coin switch was closed simultaneously. Causes could be that a coin deflected and closed two switches or a customer violently shaking and (or) banging on the phonograph. If the cause was coin deflection, the customer will not receive credit for that coin.
- Er13 Keyboard switch 0 always closed.
1. Put SERVICE switch to OFF.
 2. Replace computer ass'y and unplug Keyboard from Digital Display.
 3. Put SERVICE switch to SERVICE.
 4. If no error occurs, go to step 5. If an error occurs, Digital Display is defective or harness between it and computer is shorted.
 5. Put SERVICE to OFF, plug in Keyboard, and put SERVICE switch to SERVICE.
 6. If no error occurs, the computer is defective. If an error occurs, Keyboard Ass'y has a shorted switch or harness between it and Display is shorted.
 7. If the error still remains, replace the computer. If error is gone, continue with step 8.
 8. Put SERVICE switch to OFF and plug in Connector P1.
 9. Unplug the Keyboard from Digital Display and repeat steps 3 through 6.
 10. If error still remains, Digital Display Ass'y is defective or harness between it and computer is shorted. If error is gone, the Keyboard Ass'y has a shorted switch or harness between it and the Display is shorted.
- Er14 Keyboard switch 1 always closed. Follow steps given for Er13.
- Er15 Keyboard switch 2 always closed. Follow the steps for Er13.
- Er16 Keyboard switch 3 always closed. Follow the steps for Er13.
- Er17 Keyboard switch 4 always closed. Follow the steps for Er13.
- Er18 Keyboard switch 5 always closed. Follow the steps for Er13.
- Er19 Keyboard switch 6 always closed. Follow the steps for Er13.
- Er20 Keyboard switch 7 always closed. Follow the steps for Er13.
- Er21 Keyboard switch 8 always closed. Follow the steps for Er13.
- Er22 Keyboard switch 9 always closed. Follow the steps for Er13.
- Er23 RESET switch on Keyboard always closed. Follow the steps for Er13.
- Er24 POPULAR on Keyboard always closed. Follow the steps for Er13.

- Er30 Skipped index pulse error indicates magazine was probably out of sync and played selections one or more record locations past record selected. Some possible causes are: Dirt buildup in magazine gear, Defective optical switch, or Mechanism control index ("I") potentiometer misadjusted.
1. Clean magazine gear. If error remains, do step 2.
 2. Adjust Mechanism control index ("I") potentiometer. If error remains, do step 3.
 3. Replace optical switch.
- Er32 Indicates mechanism should have been searching for a selection, but 30 seconds elapsed and selection was not found. This error causes the phonograph to shut down until power is turned off and turned back on. Turn power on and refer to "Magazine does not rotate when a Selection is made" and "Magazine Rotates Continuously" in the TROUBLE column of the MODULAR TROUBLESHOOTING CHARTS.
- Er33 Optical switch index signal (pin 10 of P6) has remained low (active) for more than 30 seconds. This error will cause the phonograph to shut down until power is turned off and turned back on. Turn power on and refer to "Magazine Rotates Continuously" in the TROUBLE column of the MODULAR TROUBLESHOOTING CHARTS.
- Er34 Optical switch home signal (pin 11 of P6) has remained low (active) for more than 30 seconds. This error will cause the phonograph to shut down until power is turned off and turned back on. Turn power on and refer to "Magazine Rotates Continuously" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.
- Er35 A record has been playing for more than 5 minutes and TONE ARM CUTOFF SWITCH has not given a Cancel Signal (An automatic cancel has occurred.). Turn power on, make a selection, wait until it finishes playing, and then refer to "Record will not Cancel when Finished Playing" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.
- Er36 Cancel Signal (pin 1 of P6) is always low (active). Turn power on, make a selection, and refer to "Record Cancels Without Playing" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.
- Er37 Inner Cam Sw N.O. Contact signal (pin 5 of P6) should have been low (active) indicating that inner cam switch had closed; however, the signal stayed high (quiescent) longer than 30 seconds. This error will cause phonograph to shut down until power is turned off and turned back on. Turn power on and refer to "Transfer Starts when Power is applied and runs continuously" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.
- ER38 Transfer cycle started and Inner Cam Sw N.O. Contact signal should have gone high (quiescent) indicating that cam had moved off inner cam switch; however, it stayed low longer than 30 seconds. This error will cause phonograph to shut down until power is turned off and turned back on. Turn power on, make selection, and refer to "Transfer starts and runs continuously after selection is located" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.
- Er39 Transfer cycle started, cam moved off inner cam switch, and Outer Cam Sw record placed on turntable; however, the signal stayed high (quiescent) for longer than 30 seconds. This error will cause phonograph to shut down until power is turned off and turned back on. Turn power on and refer to "Transfer starts and runs continuously" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.

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.

Refer to Figure 5-1 for descriptions and locations of the LED's referred to in the MODULAR TROUBLESHOOTING CHART that follows.

The chart has the following 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.

Table 5-2 Modular Troubleshooting Chart.

TROUBLE	SYMPTOM	PROBABLE CAUSE
Phonograph fails to operate when power is turned on	LED's 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
	LED's 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 mag., transfer, or T.T. motor
	"+8VDC" 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. On/Service/Off switch 5. Wiring <p>NOTE: To locate problem reconnect phono harness and unplug connectors in order below. If +8VDC LED lights replace last unit unplugged.</p> <ol style="list-style-type: none"> 1. Wallbox interface (J4) 2. Central Control Computer (J6) 3. Mech Control Harness (J205) 4. Mech Control (J206)

	" +28VDC" 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 Bd. 2. Detent Coil 3. Wiring
Magazine does not rotate when a Selection is made	"Mag. Motor" and "Detent" LED's on, detent is actuated	<ol style="list-style-type: none"> 1. Wiring to Mag. Motor 2. Magazine Motor 3. Mech Control Board
	"Mag. Motor" and "Detent" LED's on, Detent not actuated	<ol style="list-style-type: none"> 1. Wiring to Detent Coil 2. Detent coil 3. Mech Control Board 4. Inner Cam Switch N.C. Shorted to Common
	"Mag. Motor" LED OFF or "Detent" LED ON	<ol style="list-style-type: none"> 1. Wiring from Central Control Computer to Mech Control Board 2. Central Control Computer 3. Mech Control Board
Magazine rotates Continuously	"Mag. Motor" LED OFF	<ol style="list-style-type: none"> 1. Wiring to Mag. 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.	<ol style="list-style-type: none"> 1. Optical Switch 2. Wiring to Optical Switch 3. Mech Control Board
	"Mag. Motor" LED on and both optical Optical Sw. LED's Normal	<ol style="list-style-type: none"> 1. Wiring from Central Control Computer to Mech Control Board 2. Central Control Computer 3. Mech Control Board
Magazine Stops at Wrong Record	Stops at random Record Anywhere in Magazine	<ol style="list-style-type: none"> 1. Faulty Optical Sw. 2. Wiring to Opt. Sw. 3. Heavy Dirt Buildup in Optical Switch
	Stops One or Two Records Before Record Selected	<ol style="list-style-type: none"> 1. Opt. Sw. Adjustment 2. Mag. Not Full of Records (out of balance) 3. Broken Sprag Lever Guide
	Stops One or Two Records After Record Selected	<ol style="list-style-type: none"> 1. Faultly Opt. Switch 2. Opt. Sw. Adjustment 3. Broken Sprag Gear 4. Sprag Linkage Binding

	Stops One Half to One Record Position Off Before or After Record Selected	<ol style="list-style-type: none"> 1. Broken Sprag Gear 2. Broken Sprag Guide 3. Sprag Linkage Binding or Needs Adjustment
Record does not Transfer	"Tran. Motor" LED is ON	<ol style="list-style-type: none"> 1. Wiring to Transfer Motor 2. Mech Control Board 3. Transfer Motor
	"Tran. Motor" LED is OFF	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Outer Cam Switch N.O. Shorted to Common 2. Central Control Computer 3. Mech Control Board
Transfer Starts when power is applied and runs continuously	"Tran. Motor" LED is OFF	<ol style="list-style-type: none"> 1. Mech Control Board 2. Wiring to Motor
	"Tran. Motor" LED is ON	<ol style="list-style-type: none"> 1. Central Control Computer 2. Mech Control Board 3. Wiring from Central Control Computer to Mech Control 4. Open Circuit-Inner Cam N.O. Contact 5. Open Circuit-Inner Cam Sw. Common
Transfer starts and runs continuously after selection is located	"Tran Motor" LED comes on when Motor starts and stays ON	<ol style="list-style-type: none"> 1. Wiring to Outer Cam Switch 2. Outer Cam Switch 3. Central Control Computer 4. Wiring From Central Control Computer to Mech Control 5. Mech Control Board 6. Inner Cam Sw. N.O. Contact Shorted to Common 7. Open Circuit-Outer Cam Sw. Common
No Sound	Always Muted	<ol style="list-style-type: none"> 1. Central Control Computer
No Mute During Scan	Motor Noise in Speakers	<ol style="list-style-type: none"> 1. Central Control Computer

Turntable Motor does not run	"T.T. Motor" LED is ON	<ol style="list-style-type: none"> 1. Wiring to T.T. Motor 2. T.T. Motor 3. Mech Control
	"T.T. Motor" LED is OFF	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Wiring from Mech Control to Central Control Computer 2. Central Control Computer 3. Also see "Record Does Not Transfer"
	"Cancel" LED is OFF	<ol style="list-style-type: none"> 1. Wiring to Cancel Sw. 2. Cancel Switch 3. Mech Control Bd.
Record Cancels without playing	"Cancel" LED stays ON	<ol style="list-style-type: none"> 1. Short in Cancel Sw. Wiring 2. Cancel Switch 3. Mech Control Board
	"Cancel" LED flashes ON as Record Sets Down	<ol style="list-style-type: none"> 1. Auto Cancel Misadjusted
	"Cancel" LED does not flash	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Wiring to Toggle Coil(s) 2. Toggle Coil(s) 3. Mech. Control
	"Toggle" LED is OFF	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Wiring to Counter 2. Counter 3. Mech Control Board 4. Wiring From Central Control Computer to Mech Control 5. Central Control Computer
Phonograph is always in Service ("Memorec") Mode Of Operation	Record Number Times selected Display is always lit	<ol style="list-style-type: none"> 1. On/Service/Off Switch 2. "+8 on Signal" Wiring 3. Central Control Computer 4. Computer set for programming with the door closed ($\approx 56=255$). Use 999 to exit service mode.
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	<ol style="list-style-type: none"> 1. Central Control Computer 2. "+8 on Signal" Wiring 3. On/Service/Off Switch
No Credit	No Credit Given By Coins and Dollar Bill	<ol style="list-style-type: none"> 1. Central Control Computer
	No Credit Given by Coins but Dollar Bill Gives Credit	<ol style="list-style-type: none"> 1. Coin Sw. Common Wiring 2. Central Control Computer
	One Value of Coin Will not Give Credit	<ol style="list-style-type: none"> 1. Coin Rejected 2. Wiring To Coin Sw. 3. Coin Switch 4. Central Control Computer
	Dollar Bill Will Not Give Credit	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. One or More Coins Did not register (See No Credit). 2. Central Control Computer Programmed wrong. 3. Central Control Computer
System Does Not Respond to Keyboard	"0 Credits on selection remaining display	<ol style="list-style-type: none"> 1. Insufficient Credit

	Selection remaining, but certain keys do not work	<ol style="list-style-type: none"> 1. Shorted Keyboard Switch 2. Central Control Computer 3. Short in Keyboard Wiring
	Selections remaining, but entire keyboard does not work	<ol style="list-style-type: none"> 1. Wiring from Keyboard to Display Board 2. Keyboard 3. Digital Display Bd. 4. Central Control Computer
Digital Display does not work	Display Lights But Shows Wrong Information	<ol style="list-style-type: none"> 1. Wiring From Central Control Computer to Display 2. Digital Display 3. Central Control Computer
	"+8VDC" LED on Central Control Computer is lit but Display Digits and LED lamps will not Light	<ol style="list-style-type: none"> 1. Wiring From Central Control Computer to Digital Display 2. Digital Display 3. Central Control Computer
	Certain LED lamps and/or Digits will not Work	<ol style="list-style-type: none"> 1. Wiring From Central Control Computer to Display 2. Digital Display 3. Central Control Computer
Miscellaneous Problems	Any malfunction not described above	<ol style="list-style-type: none"> 1. Main Power Supply 2. Central Control Computer

OPERATIONAL INFORMATION

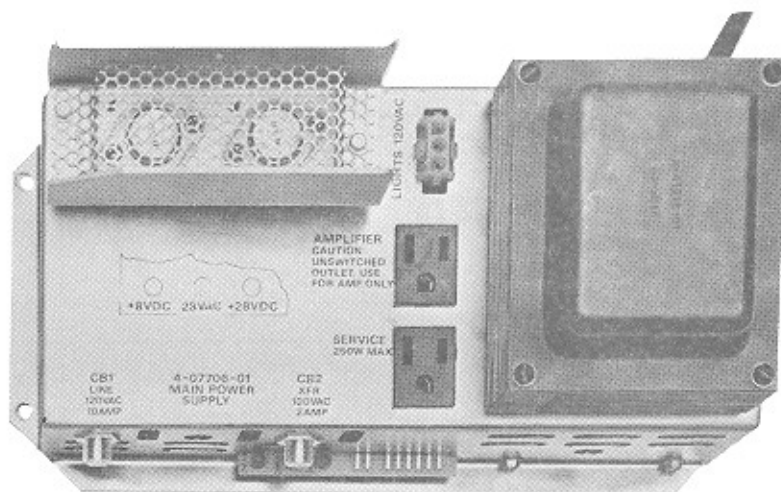
STATUS LAMPS

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

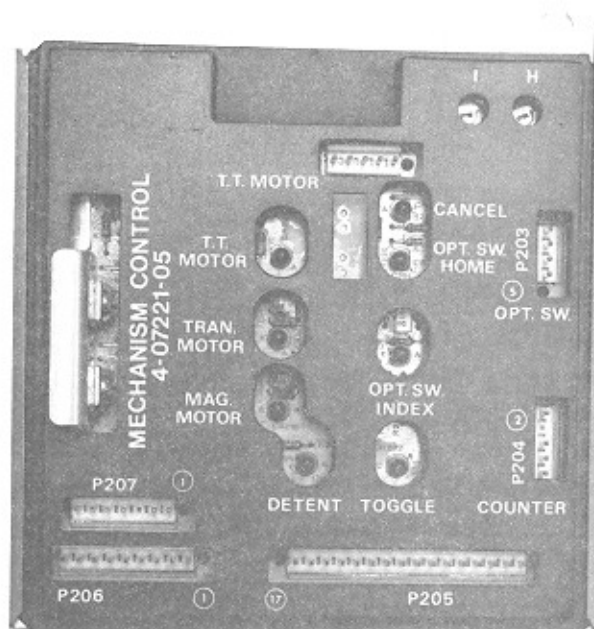
Shows presence of respective voltage and implies that there is no short on the lines.



MAIN POWER SUPPLY

Mechanism Control

- | | |
|----------------|---|
| T.T. Motor | Lights when Turntable 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. |



MECH. CONTROL UNIT

SOUND SYSTEM QUICK CHECK

Rowe solid state sound systems are service designed for fast, easy repair. The following check list will enable you to locate troubles with basic tools.

Caution: Do not plug in or unplug circuit boards with power on. Checks should be made with the changer in the record playing position. Perform all service 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 the mute plug.
- Press the circuit breaker reset pushbutton on the amplifier chassis to make sure that it is not tripped. The amplifier should cause an audible "thump" in the speakers when the power is turned on.

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 preamp 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 your finger against the plug pins and check for a hum in both sound channels. If hum is present, check cartridge wiring against Figure 2-5 (Stereo Sound System), replace the cartridge if necessary.

4. EXTENSION SPEAKERS

To check if extension speakers are shorting out the amplifier, disconnect the extension speaker plug from the transformer package receptacle.

5. OUTPUT DEVICES

Visually inspect the driver board for blown fuses. If a fuse is blown, 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 no burrs are 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.0-00053-00) is on both sides of insulator.

6. FILTER CAPACITORS

Check for +2/-2VDC 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. PREAMP OUTPUT

Short all five of the volume control pins located on amp. Press your finger against pins 1 or 3 (outside pins) labeled PHONO CARTRIDGE INPUT, and check for approximately 1VAC at preamp output (pins 3 or 5 of 13 pin

connector-chassis common). Replace the Preamp Board if voltage is not present. If voltage is present check the center pin of the Output Driver Board for approximately 16 VAC. If voltage is not present, make sure your finger is pressed against the same outside pin with respect to the channel that is being checked with the voltmeter.

No Sound, Low Sound Or Distorted Sound Right Or Left Channel Only.

Balance Control - Adjust control for equal sound from each channel. Leave in mid position if adjustment is not possible.

With a selection playing, reverse tone arm cable connections to the amplifier. If the sound switches channels, check cartridge connections against Figure 2-5 (Stereo Sound System). Replace the cartridge if connections are good. Make sure that the stylus is not bent or broken; replace if necessary.

Extension Speakers - See Step 4.

Output Devices - See Step 5.

Preamp - See Step 7.

Driver Boards - If one driver board is defective, switch input to "Mono" and use one good channel in emergency.

Constant High Volume - Cannot Adjust

Volume Control - Disconnect volume control plug from amplifier chassis. No sound indicates a short in the volume control line.

Preamp - If full volume is heard with control plug disconnected, replace the preamplifier board.

Excessive Record Scratch

Worn Records - Replace worn records

Damaged Stylus - Make sure that the stylus is not worn or broken; replace if necessary. Check stylus force.

Treble Range Control Too High

Reduce setting of control for worn or noisy records.

Excessive Hum

Open Shield - Be sure that shield or wires are not broken between cartridge and the amplifier input plug.

Cartridge Defective - Substitute a good cartridge.

Filter Capacitors - Check filter capacitor, parallel an extra 500 Mfd. 50V capacitor in chassis. If hum drops; replace capacitor.

If External Inputs are used, the equipment driving those inputs must not be tied to earth ground.

SECTION 6-ADDITIONAL INFORMATION

R-90 SPECIFICATIONS

GENERAL

DEPTH.....26-1/2 in. (67.3 cm.)
WIDTH.....41-1/2 in. (105.4 cm.)
HEIGHT.....54 in. (137.2 cm.)
SHIPPING WEIGHT (DOMESTIC).....367 lbs. (169 Kg.)
NET WEIGHT.....348 lbs. (158 Kg.)
POWER REQUIREMENTS.....120 VAC 60 Hz.,
360 watts 3.7 amps.
220/240 VAC 50 Hz.,
400 watts 2.6 amps.

RECORD CHANGER

CAPACITY.....100 records
RECORD SIZE.....7 in.
TURNTABLE SPEED.....45 RPM

CREDIT AND PRICING SYSTEM

ACCUMULATOR TYPE CREDIT SYSTEM.....\$1 & \$5 bills
\$1 & half-dollar coins
are optional
COINS ACCEPTED.....Nickels
Dimes
Quarters
TOTAL CREDIT ACCUMULATIONS.....255
PRICING.....See Pricing, Section 2

SOUND SYSTEM

CARTRIDGE
Type.....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 to 4 grams
Output.....7 mv.
Stylus.....1 mil, diamond

POWER AMPLIFIER

130 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.....20 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

SELECTION SYSTEM CAPACITY.....200 selections

TRANSFORMER PACKAGE

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

SPEAKER SYSTEM

	WOOFER	MIDRANGE
SPEAKER DIAMETER.....	10 in.	5-3/4 in.
VOICE COIL DIAMETER.....	1-1/2 in.	1 in.
IMPEDANCE.....	8 Ohms	8 Ohms
SYSTEM FREQUENCY RESPONSE.....	50 to 20,000±4db	

DOOR LIGHTING.....Fluorescent
30 watt, 36 in.
Fluorescent
15 watt, 18 in.

FUSES AND CIRCUIT BREAKERS

MAIN POWER SUPPLY

120 VAC (Transformer Primary Only).....2 amp. circuit breaker
120 VAC.....10 amp. circuit breaker
+28 VDC.....5 amp. Slo-Blo Fuse (2)
+8 VDC.....5 amp. Slo-Blo Fuse

AMPLIFIER

120 VAC.....3 amp. circuit breaker
32 VDC.....5 amp. Fuse (4)

ROWE OBA-P BILL ACCEPTOR

GENERAL SPECIFICATIONS

OVERALL DIMENSIONS

	WIDTH	HEIGHT	DEPTH
Control Unit	5 1/4"	6 1/8"	1"
Transport and Stacker Assembly	4 1/2"	11 5/8"	5 1/2"

POWER REQUIREMENTS

21 - 28 VDC	1.5 A
8 - 12 VDC	250 ma

INTERFACE REQUIREMENTS

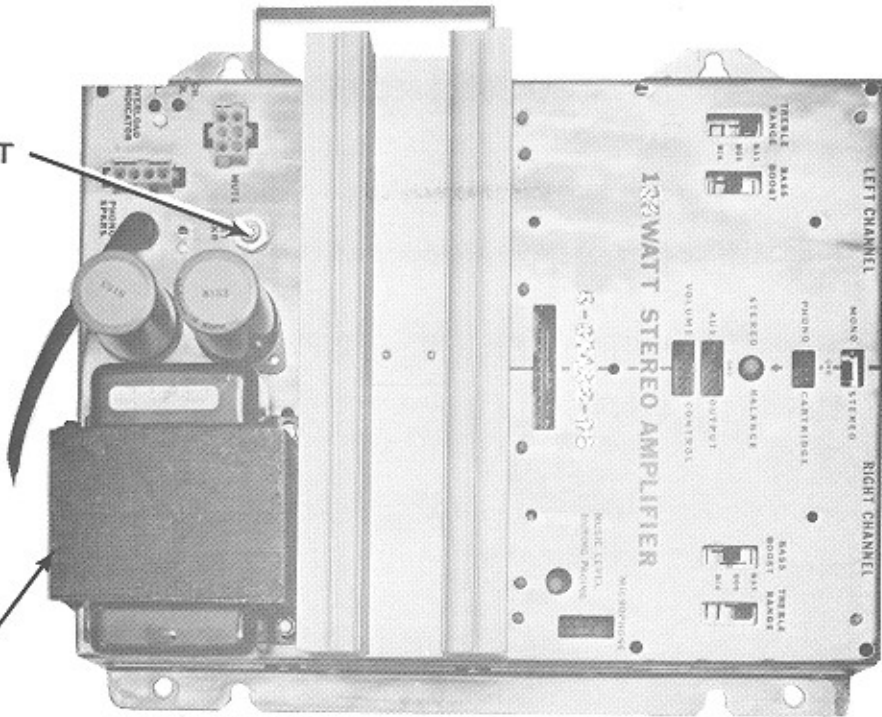
The OBA-P outputs a 75 ms +5 VDC pulse for each \$1 bill accepted and five pulses (75 ms on, 75 ms off) are output for each \$5 bill.

OPERATING ENVIRONMENT

Temperature 0° C to 70° C

PHONOGRAPH FUSES AND CIRCUIT BREAKERS

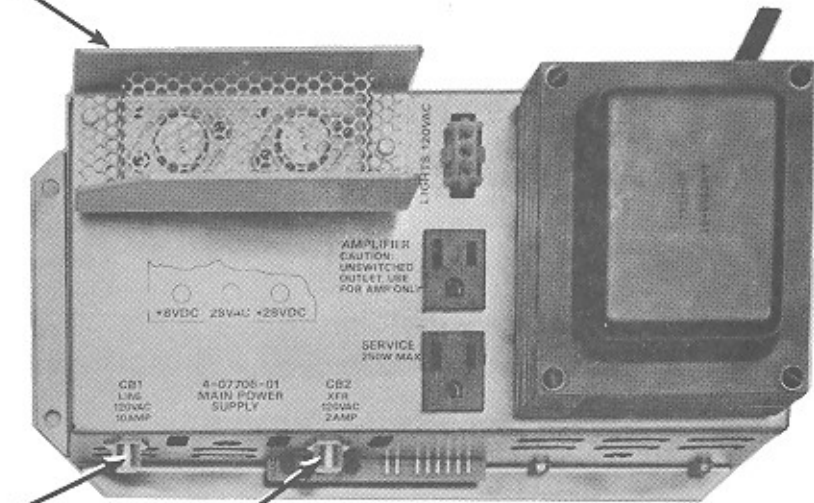
3 AMP CIRCUIT BREAKER



5 AMP MTH -5 FUSE (4 UNDER CHASSIS)

125 WATT AMPLIFIER

TWO 5 AMP AGC FUSES (MOUNTED ON POWER SUPPLY CIRCUIT BOARD UNDER CHASSIS)



10 AMP CIRCUIT BREAKER

2 AMP CIRCUIT BREAKER


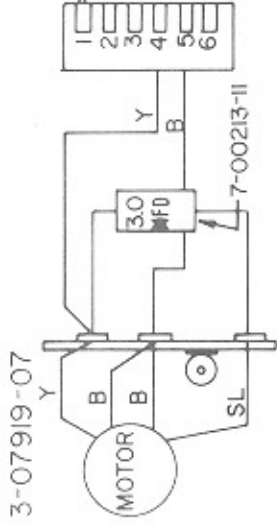
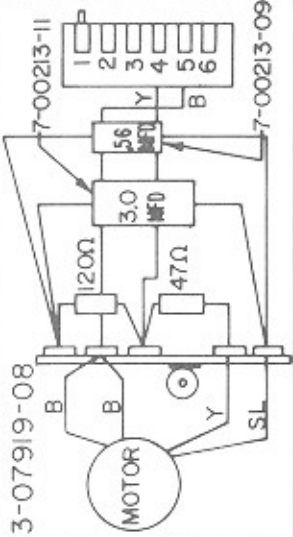
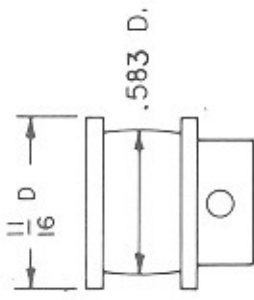
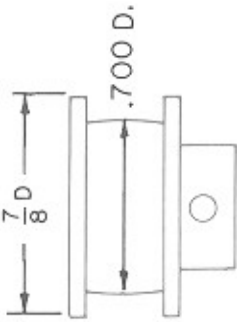
MAIN POWER SUPPLY

LOCATION OF FUSES AND CIRCUIT BREAKERS

COMPATIBILITY CHART

	PART NO.	DESCRIPTION	R-88 VIDEO	ALL R-89	ALL R-90
CENTRAL CONTROL COMPUTER	4-07773-03 4-07773-04 4-07773-05		STD ---- NOTE K	---- STD NOTE L	---- STD STD
WALLBOX INTERFACE	6-09843-01	WRD WRA-WRC WRE	NOTE C NOTE C	STD STD	STD STD
AMPLIFIER	6-09941-01 6-07439-05 6-07439-04 6-07439-02 6-09189-01 6-09189-02	130W & 125W Includes Output Trans- formers 50W RI-4,RI-5 50W RI-4,RI-5	OK STD OK NOTE A OK OK	OK STD OK NOTE A OK OK	STD OK OK NOTE A OK OK
MECHANISM ASSEMBLY	6-08700-01 6-08700-02	60HZ 50HZ	STD OK	STD OK	STD OK
MECH. CONTROL	4-07221-02 4-07221-03 4-07221-05	NO AUTOMIX NO AUTOMIX	STD OK OK	OK OK OK	NOTE E NOTE E STD
OPTICAL SWITCH ASS'Y	3-07927-01 3-09068-01	WHT CONNECTOR RED CONNECTOR	STD ----	STD ----	OK STD
POWER SUPPLY	4-07706-01 4-65092-01 4-07706-03 4-65092-04	DOMESTIC EXPORT DOMESTIC EXPORT	STD NOTE B OK NOTE F	STD NOTE B OK NOTE F	---- ---- STD NOTE F
FLASHING LIGHT CONTROL	4-07800-01 4-07501-03	BAR GRAPH LAMP CONTROL	---- ----	NOTE G ----	---- NOTE G
OBA	6-50570-03 6-50570-12 6-50570-22		STD OK ----	---- STD ----	---- ---- STD
VIDEO CONTROLLER	4-07775-02 4-07885-01		STD ----	NOTE D,H NOTE D,I	NOTE D,H NOTE D,I
GRAPHICS CONTROLLER	4-07774-01 4-08026-01		STD NOTE J	NOTE D NOTE D,J	---- NOTE D
VIDEO CASSETTE	6-09745-01 4-07884-02		STD ----	NOTE D,H NOTE D,I	NOTE D,H NOTE D,I
POWER SUPPLY (VIDEO)	4-07776-01		STD	NOTE D	NOTE D

- A. NEEDS SPECIAL ADAPTOR HARNESS.
 B. 4-65092-01 = 120V, 4-65092-02 = 220V, 4-65-87-03 = 240V.
 C. CHANGE C.C.C. TO 4-07773-05
 D. ADD WHEN CONVERTING TO VIDEO.
 E. CHANGE OPTICAL SWITCH TO 3-07927-01
 F. STD IN R-90, OK IN ALL R-88 AND ALL R-89
 4-65092-04 = 120V, 4-65092-05 = 220V, 4-65087-06 = 240V
 G. NOT USED IN VIDEO
 H. 6-09745-01 VCR USES 4-07775-02 VIDEO CONTROLLER
 I. 4-07884-02 VCR USES 4-07885-01 VIDEO CONTROLLER
 J. NEEDS ADAPTER HARNESS.
 K. OK IF YOU: 1. TURN POWER OFF. 2. UNPLUG P1, SWAP W/BL WIRE (POSITION 6) AND KEYING PLUG (POSITION 7), PLUG IN P1. 3. PRESS AND HOLD KEY 8 AND RESET KEY, THEN TURN POWER - ON.
 L. OK IF YOU: 1. TURN POWER OFF. 2. PRESS AND HOLD KEY 9 AND RESET KEY, THEN TURN POWER ON.

<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>CLEAR ANODIZED ALUMINUM</p> <p>T.T. MOTOR PULLEY 2-18178-01</p>	 <p>RED ANODIZED ALUMINUM</p> <p>T.T. MOTOR PULLEY 2-18178-02</p>

SECTION 7 - PARTS CATALOG

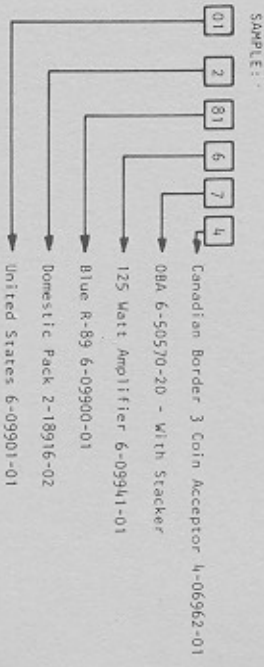
INTRODUCTION	7-3
DESCRIPTION	7-3
ORDERING REPLACEMENT PARTS	7-3
PARTS BREAKDOWN	7-3

FIGURE	TITLE	PAGE
1	R-90 Phonograph Assembly	7-4
2	Front Door Assembly	7-16
3	Top Door Assembly	7-18
4	OEM Bill Acceptor	7-24
5	Light Display Control	7-26
6	Stereo Amplifier System Ass'y	7-28
7	Heat Sink Assembly	7-30
8	Output Transformer Ass'y	7-32
9	Central Control Computer	7-34
10	Main Power Supply	7-36
11	Mechanism Assembly	7-38
12	Tone Arm & Pivot Ass'y	7-46
13	Sprag Assembly	7-47
14	Cam Switch & Motor Ass'y	7-48
15	OBA-2 Kit R-90	7-49
16	Transport Assembly OBA	7-50
17	Stacker Assembly OBA	7-51

COUNTRY	1st & 2nd DIGIT
01 = US	= 6-09901-01
02 = Arg	= 6-09901-02
03 = Australia	= 6-09901-03
04 = Aus	" " " " " " " "
05 = Bah	" " " " " " " "
06 = Bel fr	" " " " " " " "
07 = Canada	" " " " " " " "
08 = Chile	" " " " " " " "
09 = Col	" " " " " " " "
10 = Costa R	" " " " " " " "
11 = Neutral Stock	" " " " " " " "
12 = Denmark	" " " " " " " "
13 = Ecuador	" " " " " " " "
14 = El Salv	" " " " " " " "
15 = England	" " " " " " " "
16 = Finland	" " " " " " " "
17 = France	" " " " " " " "
18 = Germany	" " " " " " " "
19 =	" " " " " " " "
20 = Guat	" " " " " " " "
21 = Holland	" " " " " " " "
22 = Hon	" " " " " " " "
23 = Italy	" " " " " " " "
24 = Belize	" " " " " " " "
25 = Japan	" " " " " " " "
26 =	" " " " " " " "
27 = Nic	" " " " " " " "
28 = Norway	" " " " " " " "
29 = Aruba	" " " " " " " "
30 = Panama	" " " " " " " "
31 = Curaco	" " " " " " " "
32 =	" " " " " " " "
33 = Sweden	" " " " " " " "
34 = Swiss Fr	" " " " " " " "
35 = Swiss Ge	" " " " " " " "
36 = Swiss It	" " " " " " " "
37 = Trinidad	" " " " " " " "
38 =	" " " " " " " "
39 = Venez	" " " " " " " "
40 = Zambia	" " " " " " " "
41 = Puerto R	" " " " " " " "
42 = Guyana	" " " " " " " "
43 = Brazil	" " " " " " " "
44 = Barbados	" " " " " " " "
45 = Surinam	" " " " " " " "
46 = Yugo	" " " " " " " "
47 = S. Africa	" " " " " " " "

PACK 3rd DIGIT	R-90 SUB-ASSEMBLY 4th & 5th DIGIT	AMPLIFIER 6th DIGIT	BILL ACCEPTOR 7th DIGIT	COIN ACCEPTOR 8th DIGIT
1 = Unpack = 2-18916-01	81 = Blue (60HZ) 6-09900-01	0 = None	0 = None	0 = None
2 = DonPack = 2-18916-02	82 = Brown (60HZ) 6-09900-02	1 =	1 =	1 = 3 Coin Acceptor = 4-06961-01
3 = ExPack = 2-18916-03	83 = Blue Static - Video Mono (60HZ) 6-09900-03	2 =	2 =	2 = 4 Coin Acceptor = 4-07156-01
4 = Sp-1 Pack = ?	84 = Blue (50HZ) 6-09900-04	3 =	3 =	3 = Export Rejector (Special) 7-09519-XX
	85 = Brown (50HZ) 6-09900-05	4 =	4 =	4 = 3 Coin Canadian Border = 4-06962-01
	86 = Blue Static - Video Mono (50HZ) 6-09900-07	5 =	5 =	5 = 4 Coin Canadian Border (S,10,25,S) 4-07159-01
	87 = Blue Static - Video Mono (60HZ) with (2-18826-01) Monitor Kit 6-09900-06	6 =	6 =	6 = Kit - Mars Slug Rejector = 2-18851-03
	88 = Blue Static (60HZ) 6-09900-08	7 =	7 =	7 = 4 Coin 9 Acceptor = 4-07156-02
	89 = Brown Static (60HZ) 6-09900-09	8 =	8 =	8 = 2 Coin Acceptor = 4-07156-03 (25,S)
	90 = Blue Static (50HZ) 6-09900-10	9 =	9 =	9 = Canadian Border \$ 4-07159-02 (5,10,25,S)
	91 = Brown Static (50HZ) 6-09900-11			

4th & 5th DIGIT	4th & 5th DIGIT	4th & 5th DIGIT
01-04	05-06	07-10
11-20	R-88 Audio	R-89
21-24	11-20 R-88 Video	
25-30	R-86	
31-34	35-40 R1-4 & 5	
35-40	R1-2	
41-50	R1-3	41-50 R-89
51-54	CT1-1S	
55-60	R-87	
61-70		
71-72	CT1-2	73-80 CT1-3
		81-99 R-90



R-90 Code
Rev. F

INTRODUCTION

This parts catalog lists procurable replacement parts for the R-90 Phonograph. The purpose of this parts catalog is to locate and identify replaceable components and supply information on how to order them.

Catalog Description

This catalog is divided into major sections labeled figures, which correspond to the illustrations used. Some assemblies require more than one illustration to identify the parts. Each page has a sheet number to identify the sheet as part of that assembly's parts list.

Since replacing parts that are welded or riveted onto an assembly is normally impractical, replacement parts are not listed for these items. The assembly that contains the welded part should be replaced.

Parts List Description

The parts list contains four columns:

- Figure, Sheet, and Index Number - The first entry in this column is the figure number of the corresponding illustration. An index number, when listed, corresponds to the index number appearing on the illustration. Index numbers are not used when:
 - Items are listed for reference purposes only.
 - The item listed is an alternate part.
- Rowe Part Number - This column lists the part number to use when ordering replacement parts or making inquiries.
- Description - This column gives a word description of each part or assembly. Each item is indented to show its relationship to the next higher assembly.

- Qty. Per Ass'y. - This column contains the part quantity used in the assembly. When a figure describes more than one model of an assembly, the "Qty. Per Ass'y." column is divided to show each model.

ORDERING REPLACEMENT PARTS

All replacement parts must be ordered directly from an authorized Rowe Distributor.

Once the replacement item has been determined, complete a Standard Parts Order Form (available from your Rowe Distributor at no charge). Very often parts orders are delayed because of inadequate or incompletely filled out parts order forms. To enable prompt delivery, always specify the following information:

- Part Number and Description (State color, if applicable.).
- Quantity required
- Machine Model and Serial Number
- Complete shipping address, including the ZIP code.
- Shipping Instructions must be supplied. If the shipping method is Parcel Post, Air Parcel Post, United Parcel Service, or Air UPS, and the packages may exceed the size and weight limits of these services, indicate an alternate shipping method.

If the shipment must be delivered as fast as possible, specify "Fastest Way". Rowe will select the carrier for orders that justify shipment by truck.

R-90 PHONOGRAPH ASSEMBLY SHEET 1

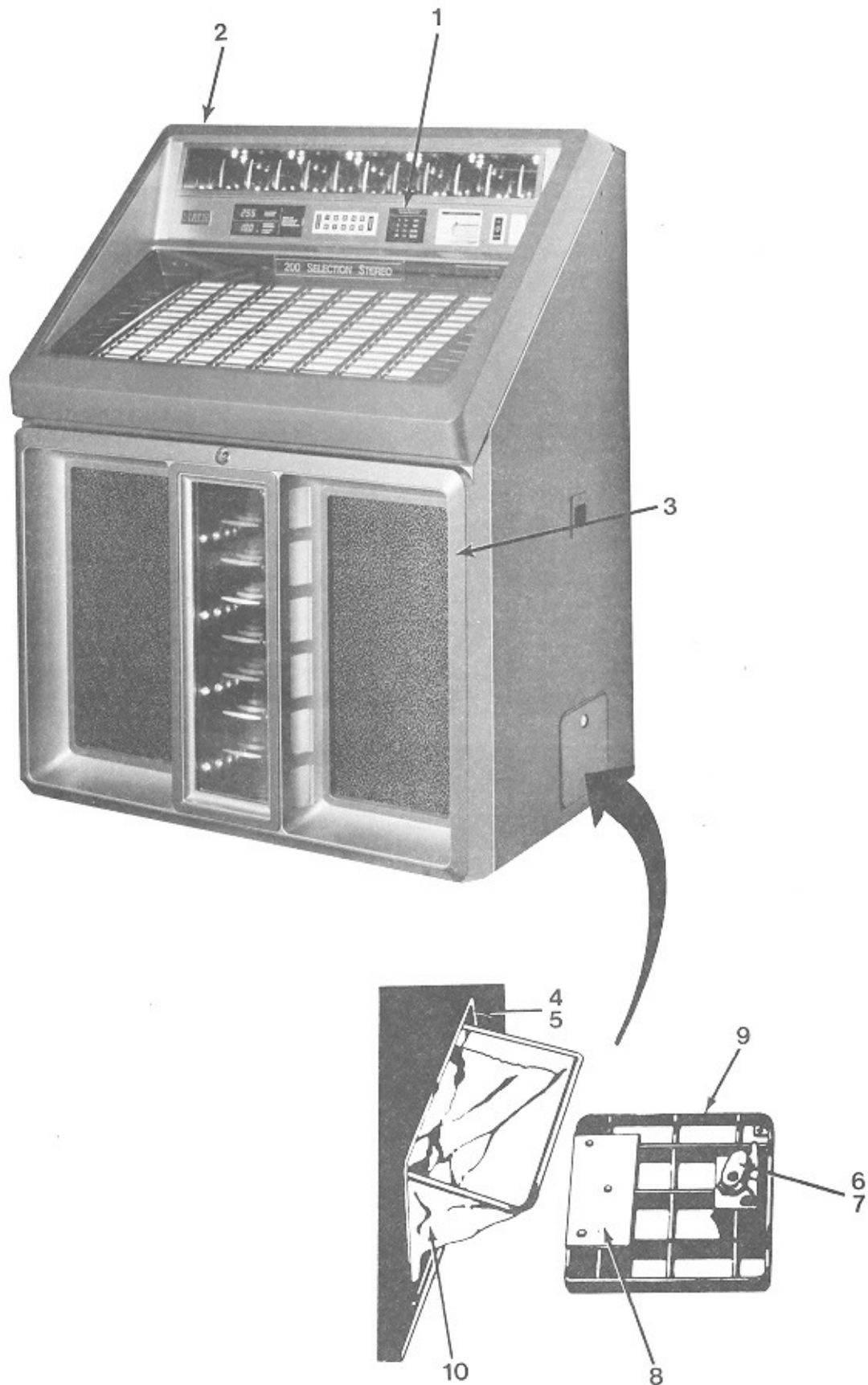


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1-	See pg. 7-2	R-90 Phonograph Assembly (Blue)	
	See pg. 7-2	R-90 Phonograph Assembly (Brown)	
1	3-09016-01	. Standard Price Card.....	1
2	6-09910-01	. Top Door (Blue).....	1
	6-09910-02	. Top Door (Brown).....	1
3	6-09920-01	. Front Door (Blue).....	1
	6-09920-02	. Front Door (Brown).....	1
4	4-05276-05	. Cash Box Door Frame.....	1
5	2-17760-05	. "U" Type Speed Clip.....	1
	2-11866-05	. Cash Box Door Assembly.....	1
6	7-01600-16	. Cylinder Lock.....	1
7	2-06695-01	. Lock Support.....	1
8	2-07703-01	. Catch Bracket.....	1
9	6-03267-05	. Cash Box Door.....	1
10	3-07026-01	. Cash Bag.....	1
	7-02125-07	. Felt Adhesive Tape.....	1
	4-08008-01	. Holder Price Card	1
	2-18456-07	. Window When Bill } Acceptor Is Not Used Not Shown	1
	4-08025-01	. Overlay - Blockout	1

FIGURE
1

R-90 PHONOGRAPH ASSEMBLY SHEET 2

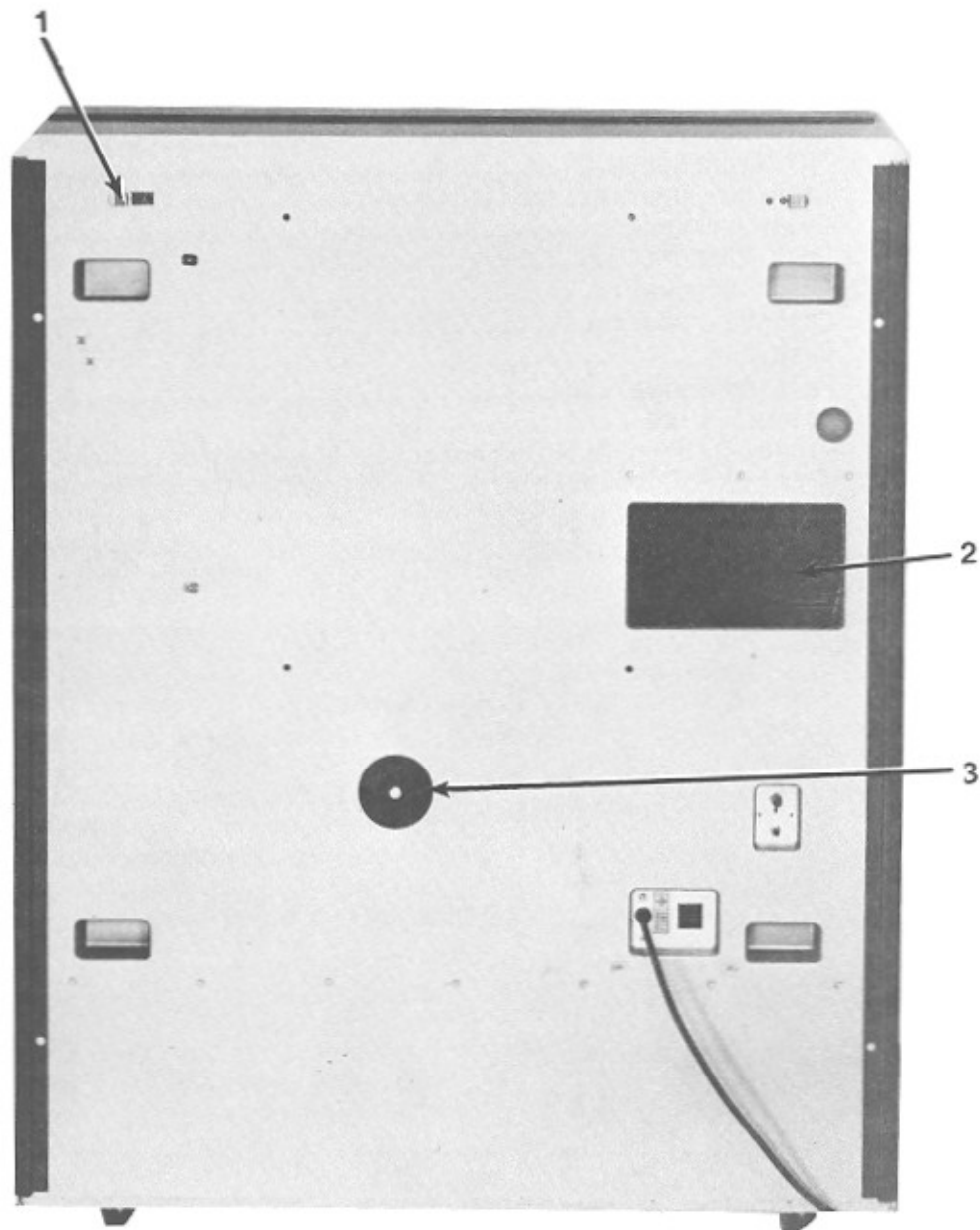


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
--------------------	---------------	-------------	---------------

1-	See pg. 7-2	R-90 Phonograph Assembly (Cont.)	
	See pg. 7-2	R-90 Phonograph Assembly (Cont.)	
1	2-08995-02	. Retainer Bracket.....	2
2	3-08684-02	. Enclosure Screen.....	1
3	2-12652-03	. Tie Down Plate Assembly.....	1

R-90 PHONOGRAPH ASSEMBLY SHEET 3

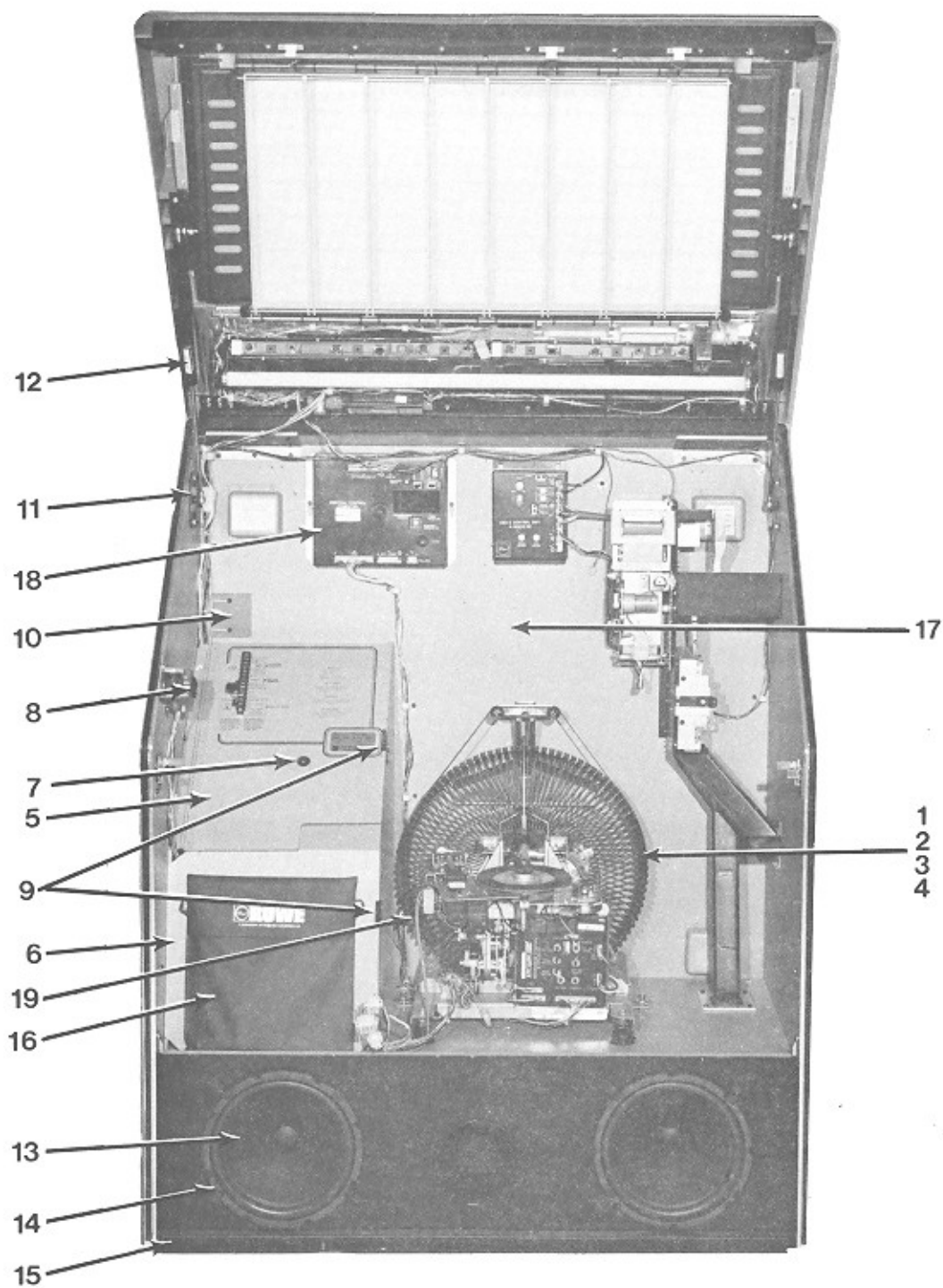


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-1	See Pg. 7-2	R-90 Phonograph Assembly (Blue) Cont.	
-1	See Pg. 7-2	R-90 Phonograph Assembly (Brown) Cont.	
1	6-08700-01	. Mechanism Assembly (See Fig. 11)(60Hz).....	1
2	6-08700-02	. Mechanism Assembly (See Fig. 11)(50Hz).....	1
3	2-11537-01	. Lower Spring Support.....	4
4	2-12036-01	. Mech Tie Down Bolt.....	2
5	4-07726-05	. Hinge & Cover Assembly.....	1
6	3-08697-02	. Amplifier Panel Assembly.....	1
7	2-18880-01	. Catch - Hook.....	1
8	2-18881-01	. Catch - Loop.....	1
9	2-17518-04	. Spring Catch.....	2
10	2-17593-01	. Cord Hold Cover.....	2
11	2-18911-01	. Plate Assembly Pivot.....	2
12	4-07149-06	. Pneumatic Spring.....	2
13	4-07821-03	. Woofer.....	2
14	2-17807-01	. Speaker Retaining Bracket.....	8
15	6-09911-01	. Door Mounting Bracket.....	1
16	3-08698-01	. Handy Case	1
	2-17305-14	. . Accessory Bag Assembly.....	1
	2-11988-01	. . . Accessories Bag.....	1
	7-00975-01	. . . Contact (Pin).....	6
	7-00975-02	. . . Contact (Socket).....	6
	7-00756-01	. . . Contact (Post).....	10
	7-00910-12	. . . Terminal Lug.....	10
	7-00720-10	. . . Fuse (5 Amp).....	2
	7-00721-06	. . . Fuse (5 Amp).....	2
	3-07922-01	. . . Turntable Drive Belt.....	1
	2-18700-01	. . . Snap-in Fastener.....	2
	3-09016-02	. . Alternate Price Card.....	1
	2-18633-01	. . Lamp & Envelope Assembly.....	1
	2-18622-01	. . . Lamp & Socket Assembly.....	5
	2-66908-10	. . Troubleshooting Aid.....	1
	2-66931-09	. . Accessories Booklet.....	1
	2-14043-02	. . Heat Label.....	1
17	6-09950-01	. Shell Assembly.....	1
	6-09950-02	. Shell Assembly.....	1
18	4-07773-05	. Central Control Computer (See Fig. 9).....	1
19	3-08324-02	. Tone Arm Cable & Plug Assembly.....	1

R-90 PHONOGRAPH ASSEMBLY SHEET 4

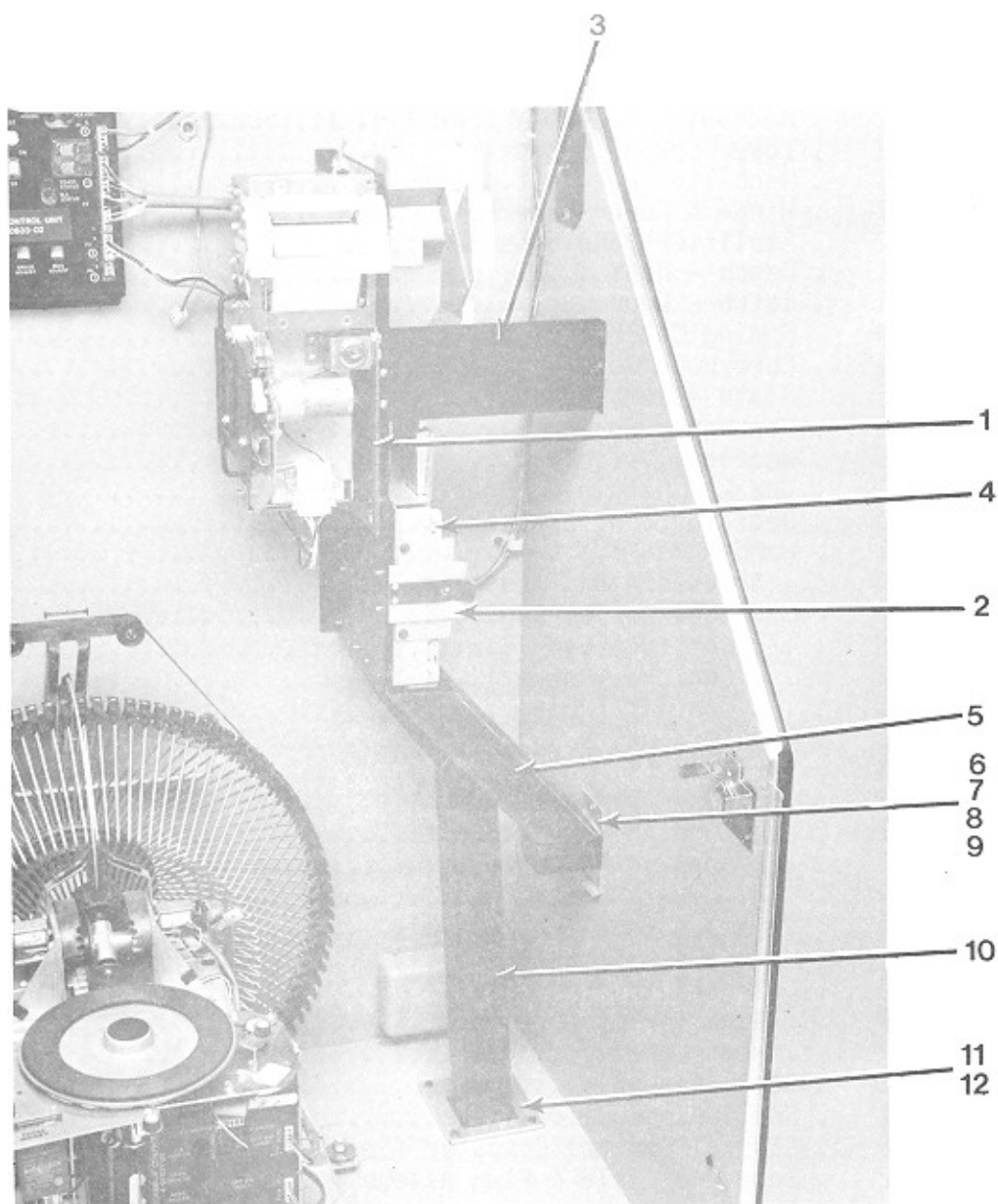


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-1	See Pg. 7-2	R-90 Phonograph Assembly (Blue) Cont.	
-1	See Pg. 7-2	R-90 Phonograph Assembly (Brown) Cont.	
1	4-08012-01	. Support & Coin Chute Assembly.....	1
	3-09044-01	. . Support Assembly - Slug Rejector.....	1
	3-09045-01	. . Pivot Scavenge.....	1
	2-51569-04	. . Shoulder Washer.....	1
	2-12562-01	. . Tension Spring.....	1
	2-18918-01	. . Scavenge Link.....	1
	2-18919-01	. . Slug Rejector Actuator.....	1
	2-17656-01	. . Compression Spring.....	1
	2-09225-02	. . Spacer.....	4
	3-09046-01	. . Upper Coin Chute Assembly.....	1
	2-17901-02	. . Hinge Support.....	1
2	2-14295-01	. . Rejector Catch Assembly.....	1
3	3-09058-01	. Support Brace.....	1
4	4-07038-10	. Mounting Bracket & Coin Switch Assembly.....	1
	4-05793-02	. . Slug Rejector Mounting Bracket Assembly.....	1
	2-14114-01	. . Spacer.....	1
	3-05787-03	. . Coin Switch Assembly.....	1
	2-17902-02	. . Rejector Hinge.....	1
	2-06368-01	. . Stud.....	1
	2-18223-01	. . Slug Rejector Catch Plate.....	1
5	4-08015-01	. Slug Chute.....	1
6	2-17930-01	. Slug Cup Bracket.....	2
7	2-13578-02	. Elastic Stop Nut.....	1
8	2-17929-01	. Slug Cup Door.....	1
9	3-07817-02	. Slug Cup.....	1
10	6-09932-01	. Lower Coin Chute.....	1
11	3-07437-01	. Coin Chute Collar.....	1
12	2-17544-01	. Coin Chute Gasket.....	1

R-90 PHONOGRAPH ASSEMBLY SHEET 5

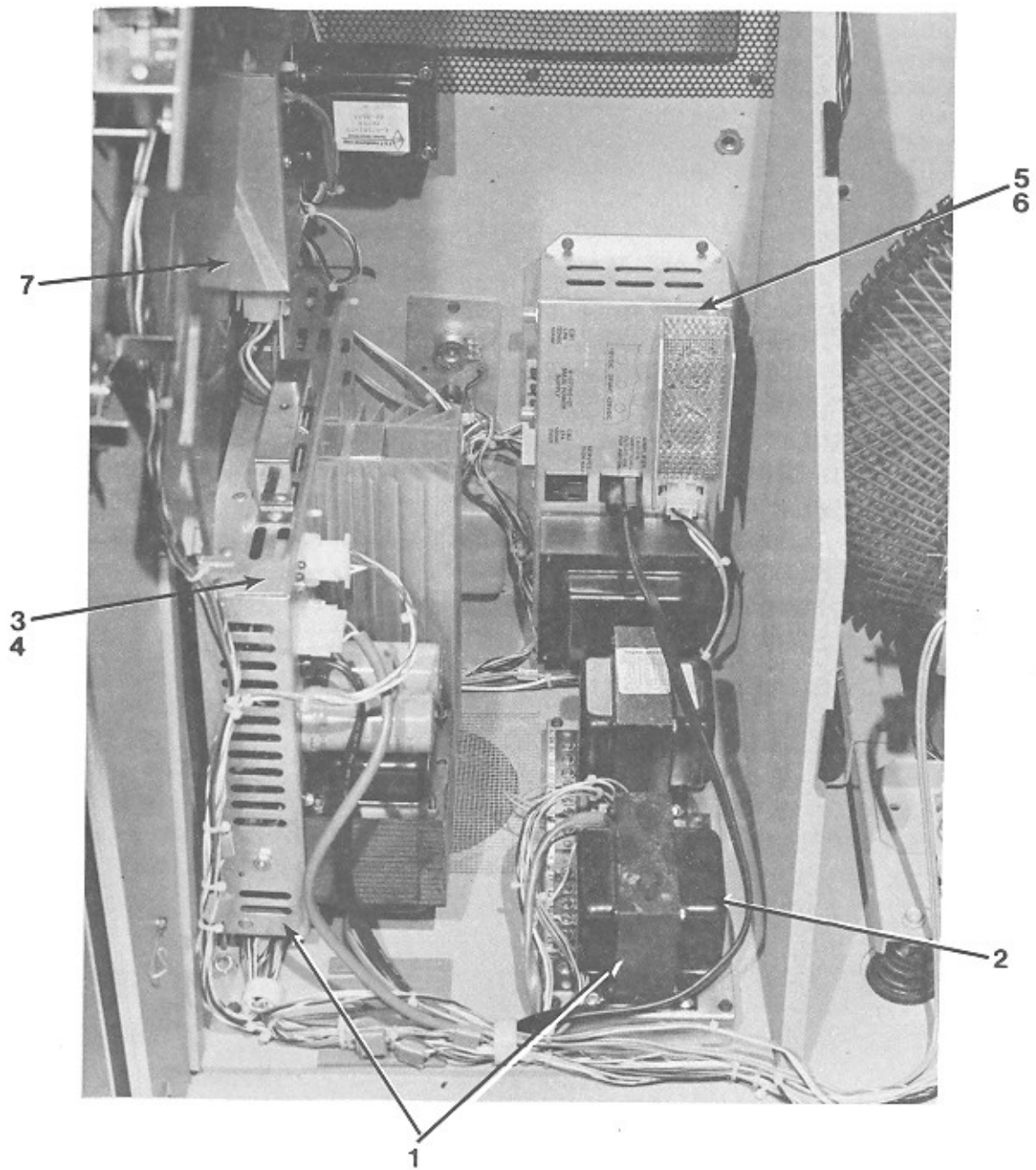


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-1	See pg. 7-2	R-90 Phonograph Assembly (Blue) Cont.	
-1	See pg. 7-2	R-90 Phonograph Assembly (Brown) Cont.	
1	6-09941-01	. 130 Watt Stereo Amplifier and Transformer Assembly.....	1
2	4-06336-05	. 125 Watt Output Transformer Assembly (See Fig. 8).....	1
3	6-09931-01	. 130 Watt Stereo Amplifier (See Fig. 6).....	1
4	4-02426-01	. Amplifier Mounting Bracket Assembly.....	1
5	4-07706-01	. Main Power Supply (120V)(See Fig. 10).....	1
	4-65092-02/03	. Main Power Supply (220V, 240V).....	1
6	2-09256-01	. Junction Box Mounting Bracket.....	1
7	4-07501-03	. Lamp Control Assembly (See Fig. 5).....	1

R-90 PHONOGRAPH ASSEMBLY SHEET 6

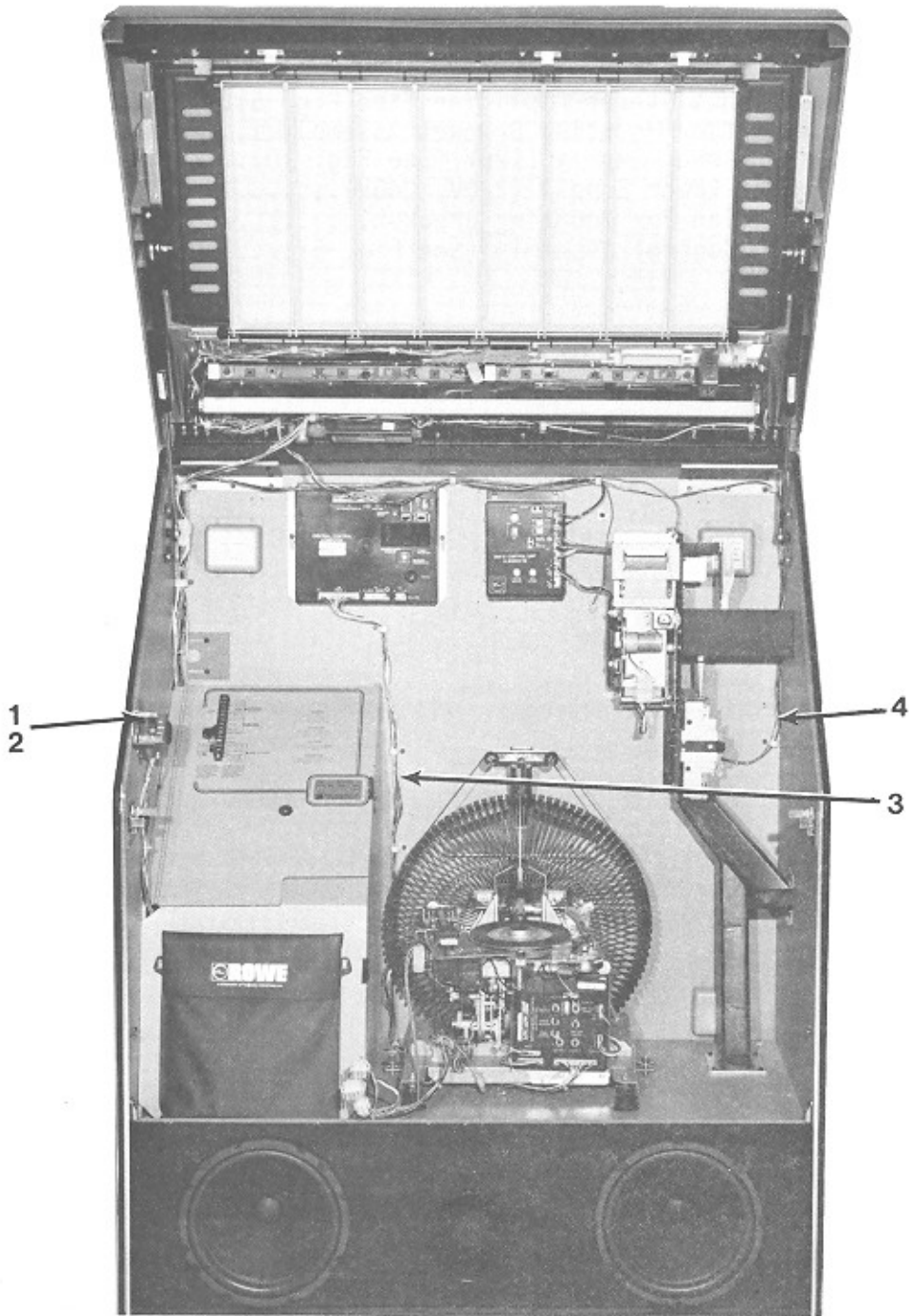


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-1	See Pg. 7-2	R-90 Phono Assembly (Blue) Cont.	
-1	See Pg. 7-2	R-90 Phono Assembly (Brown) Cont.	
1	6-09912-01	. Harness & Switch Assembly.....	1
	3-07491-05	. . Housing Plug (9 Ckt.).....	2
	3-07491-08	. . Housing Plug (1 Ckt.).....	1
	3-07491-04	. . Housing Plug (6 Ckt.).....	1
	7-00755-09	. . Housing Connector (9 Ckt.).....	1
	7-00755-05	. . Housing Connector (5 Pin).....	4
	3-07491-03	. . Housing Plug (4 Ckt.).....	1
	3-07491-02	. . Housing Plug (3 Ckt.).....	3
	3-06490-02	. . Housing Plug (3 Ckt.).....	2
	7-00975-06	. . Contact - Univ. Conn. (Socket).....	6
	7-00975-01	. . Contact - Univ. Conn. (Pin).....	11
	7-00975-02	. . Contact - Univ. Conn. (Socket).....	10
	7-00975-03	. . Contact - Univ. Conn. (Pin).....	7
	7-00757-01	. . Keying Plug.....	1
	2-18005-01	. . Jumper.....	1
	2-18686-01	. . Knob - Vol. Control.....	1
	7-01355-11	. . Palnut (3/8 - 32).....	1
	2-13935-08	. . Vol. Control & Terminal Assembly.....	1
	2-15818-01	. . Switch Pushbutton (Momentary).....	1
	2-18680-01	. . Plate - Control.....	1
	7-00991-01	. . Splice Self Stripping.....	14
	7-00975-06	. . Contact - Univ. Conn. (Socket).....	3
	7-00967-03	. . Insulator Faston.....	2
2	2-18837-01	. Reset Actuator Assembly.....	1
3	3-08854-01	. Mech. Computer Harness.....	1
4	3-09023-01	. Coin Switch Harness Assembly.....	1

FIGURE
2

FRONT DOOR ASSEMBLY

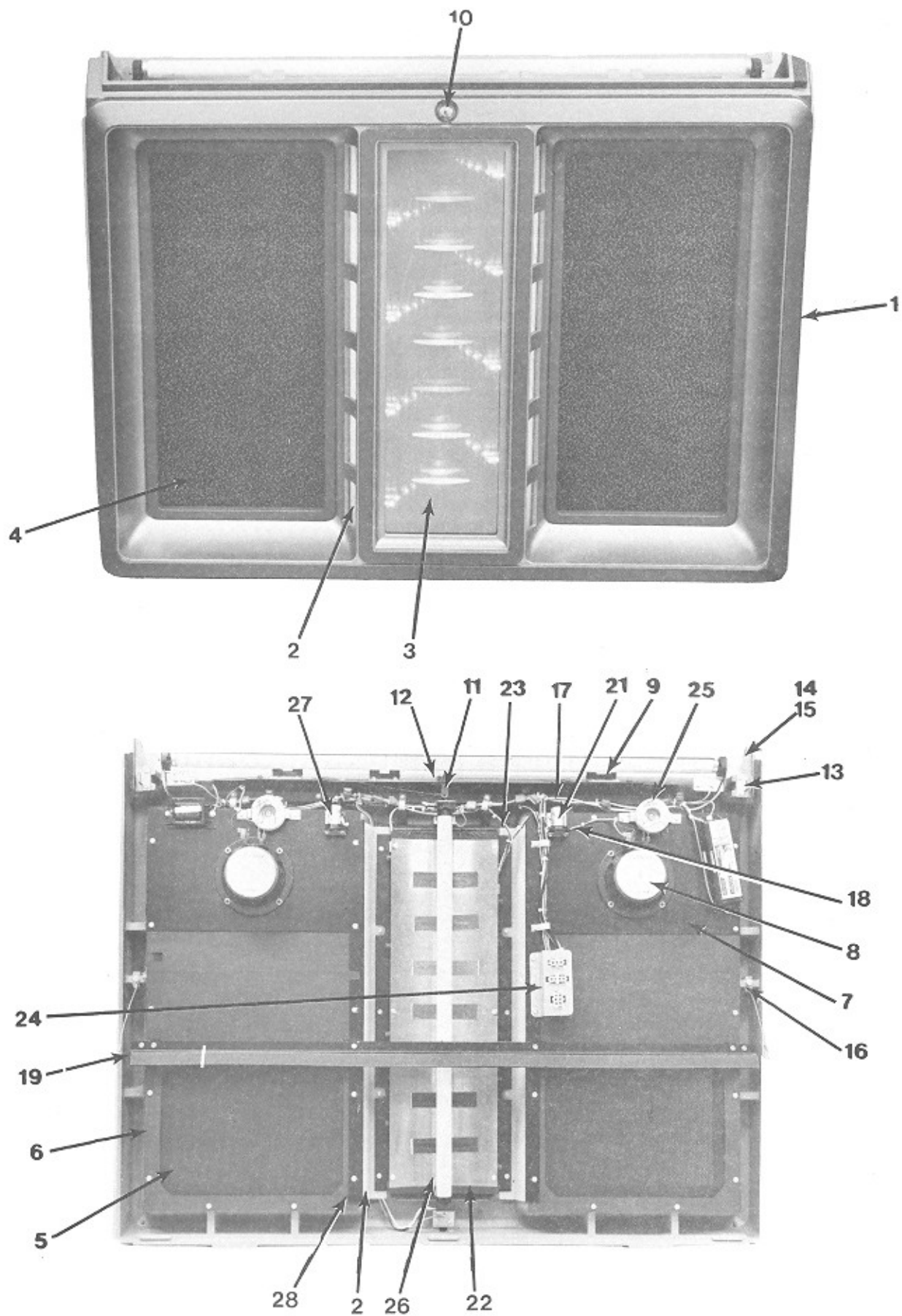


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
2-	6-09920-01	Front Door Assembly (Blue)	
	6-09920-02	Front Door Assembly (Brown)	
1	6-09916-01	. . Front Door Frame (Blue).....	1
1	6-09916-02	. . Front Door Frame (Brown).....	1
2	3-09018-01	. . Light Diffuser (Magenta).....	2
2	3-09018-02	. . Light Diffuser (Orange).....	2
3	2-18217-03	. . Light Bar Window.....	1
4	4-08019-01	. . Lower Grille.....	2
5	4-08035-01	. . Front Door Scrim.....	2
6	3-09019-01	. . Grille Back Up.....	2
7	3-09020-01	. . Speaker Panel Assembly.....	2
8	4-07822-02	. . Midrange Speaker (High Freq).....	2
9	6-09918-01	. . Lock Bar Assembly.....	1
10	7-01632-06	. . Lock Cylinder (Common Keying).....	1
11	2-14256-01	. . Lock Bolt.....	1
12	2-18935-01	. . Lockbolt Link.....	1
13	2-18835-03	. . Strike.....	2
14	2-18937-01	. . Anti-Cheat Bracket LH.....	1
15	2-18938-01	. . Anti-Cheat Bracket RH.....	1
16	2-15726-01	. . Fall Stop Cable.....	2
	3-09021-01	. . . Front Door Speaker Harness Label (Not Shown).....	1
17	4-08020-01	. . Front Door Light Harness Assembly (60 Hz).....	1
18	4-08021-01	. . Front Door Speaker Harness Assembly.....	1
19	3-09039-01	. . Seal Bracket.....	1
	7-02204-60	. . . Foamed Tape.....	1
	7-02204-79	. . . Foamed Tape.....	3
20	7-00601-12	. . Fluorescent Lamp (30W T-8).....	1
21	7-00800-04	. . Fluorescent Starter (FS-4).....	1
22	6-09926-01	. . Lightbox Assembly (Blue).....	1
	6-09926-02	. . Lightbox Assembly (Brown).....	1
23	4-08011-01	. . Front Door Flashing Lights Harness Assembly.....	1
24	3-09043-01	. . Mounting Bracket (Universal Connector).....	1
25	3-09049-01	. . Speaker Coil and Bracket Assembly.....	2
26	7-00601-07	. . Fluorescent Lamp (19W T-8).....	1
27	7-00800-01	. . Fluorescent Starter (FS-2).....	1
28	3-09069-01	. . Light Diffuser Retainer.....	2
	7-00934-01	. . Cable Clamp (17/32).....	6
29	3-09073-01	. . Baffle Panel (Sound).....	1
30	3-09074-01	. . Light Reflector.....	1

FIGURE
3

TOP DOOR ASSEMBLY SHEET 1

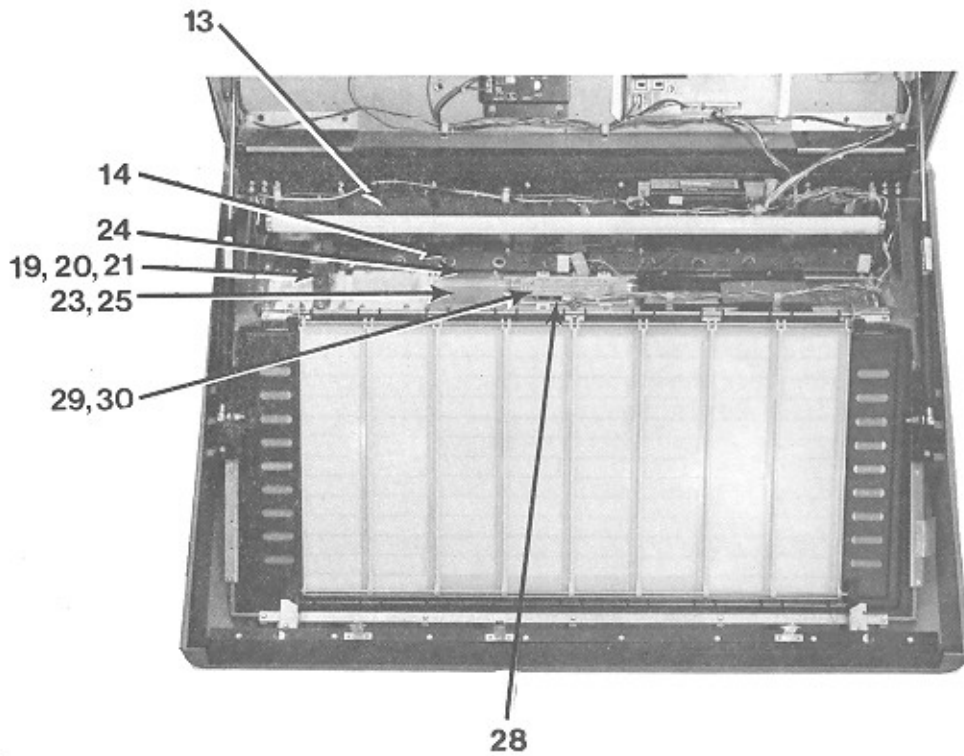
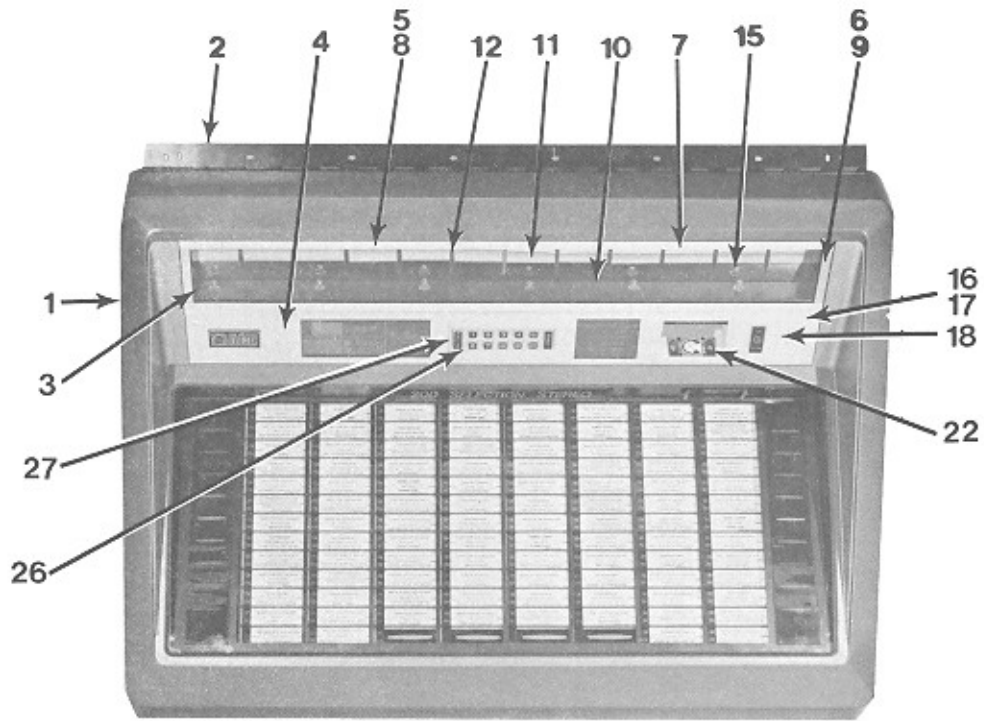


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
	6-09910-01	Top Door Assembly	
	6-09910-02	Top Door Assembly	
1	6-09902-01	. Top Door Frame (Blue).....	1
	6-09902-02	. Top Door Frame (Brown).....	1
2	4-07823-02	. Hinge.....	1
3	6-09903-01	. Light Assembly Top Door Flash (Blue).....	1
	6-09903-02	. Light Assembly Top Door Flash (Brown).....	1
4	4-08003-01	. . Trim Light Bar Lower (Silver).....	1
	4-08003-02	. . Trim Light Bar Lower (Gold).....	1
5	4-08004-01	. . Trim Light Bar Upper (Silver).....	1
	4-08004-02	. . Trim Light Bar Upper (Gold).....	1
6	4-08005-01	. . Trim Light Bar Side (Silver).....	2
	4-08005-02	. . Trim Light Bar Side (Gold).....	2
7	2-18456-06	. . Window.....	1
8	2-18206-17	. . Channel.....	2
9	2-18206-18	. . Channel.....	2
10	6-09933-01	. . Frame Assembly Flashing Lights.....	1
11	6-09935-01	. . Mirror - Top Door.....	1
12	6-09936-01	. . Color Strip (Blue).....	1
	6-09936-02	. . Color Strip (Brown).....	1
13	6-09929-01	. . PWB - 6 Lamp.....	2
14	2-18622-01	. . Lamp and Socket Assembly.....	12
15	3-08665-03	. . Lens - Clear.....	12
16	6-09904-01	. Selector & Trim Assembly Blue (Silver).....	1
	6-09904-02	. Selector & Trim Assembly Brown (Gold).....	1
17	6-09907-01	. . Trim Selector (Silver).....	1
	6-09907-02	. . Trim Selector (Gold).....	1
18	4-08006-01	. . Inlet - Coin.....	1
19	2-17429-08	. . Reject Button & Shaft Assembly.....	1
	2-18922-01	. . . Coin Return Shaft.....	1
	3-06996-09	. . . Coin Return Button.....	1
20	3-09050-01	. . Guide Bracket.....	1
21	2-18229-01	. . Compression Spring.....	1
22	2-18933-01	. . Bill Inlet Assembly.....	1
23	4-08008-01	. . Price Card Holder.....	1
24	2-18928-01	. . Retainer.....	1
25	2-18456-07	. . Window.....	1
26	4-07453-03	. . Pushbutton Trim.....	1
27	4-08009-01	. . Keyboard Assembly.....	1
28	4-08036-01	. . . Keyboard Support Plate.....	1
29	6-09921-01	. . . PWB Keyboard.....	1
30	3-08371-01	. . . Keyboard Switch.....	12

TOP DOOR ASSEMBLY

SHEET 2

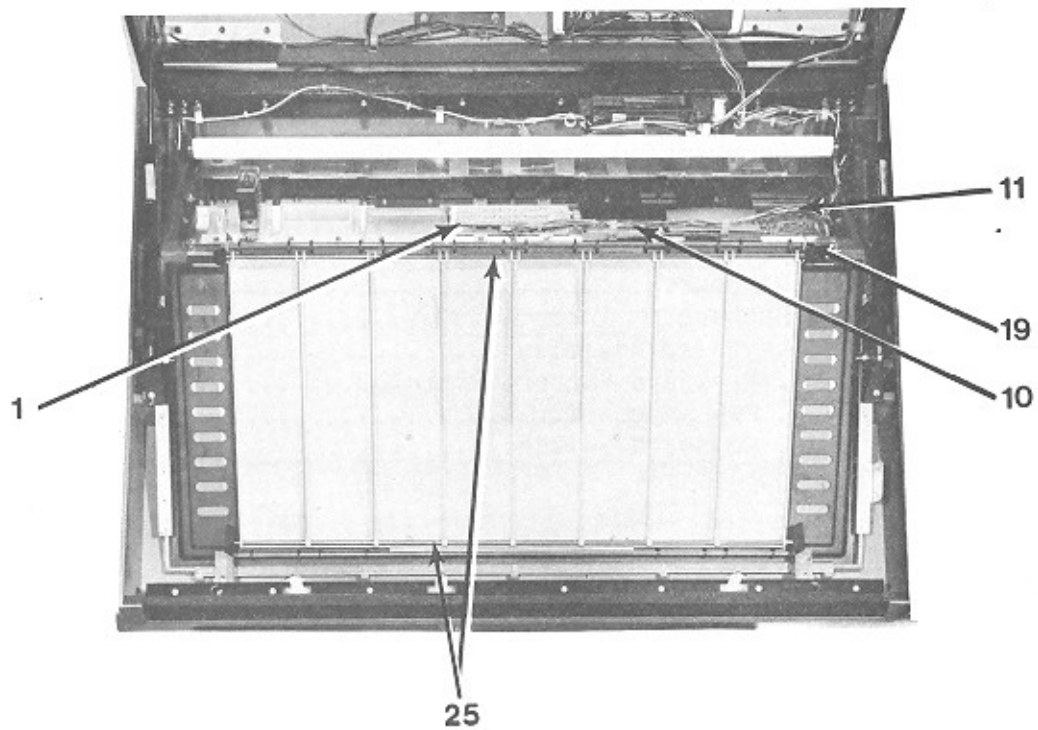
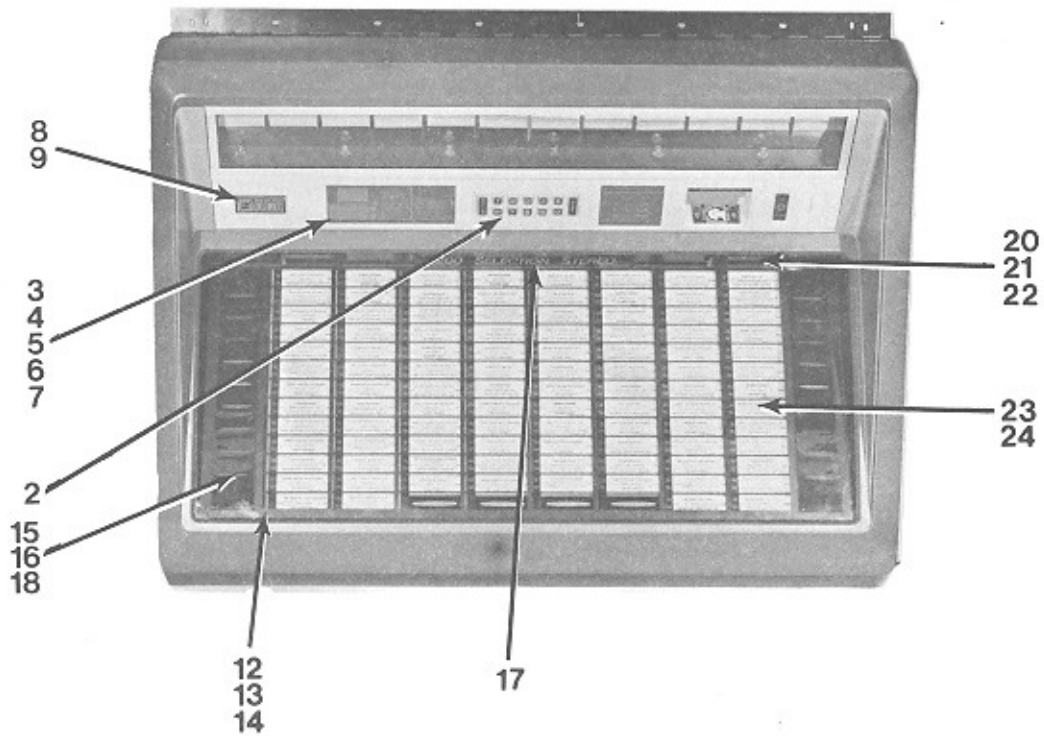


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1	7-00797-13	. . . Connector PCB.....	1
2	3-09034-01	. . . Pushbutton Number 1.....	1
	3-09034-02	. . . Pushbutton Number 2.....	1
	3-09034-03	. . . Pushbutton Number 3.....	1
	3-09034-04	. . . Pushbutton Number 4.....	1
	3-09034-05	. . . Pushbutton Number 5.....	1
	3-09034-06	. . . Pushbutton Number 6.....	1
	3-09034-07	. . . Pushbutton Number 7.....	1
	3-09034-08	. . . Pushbutton Number 8.....	1
	3-09034-09	. . . Pushbutton Number 9.....	1
	3-09034-10	. . . Pushbutton Number 10.....	1
	3-09035-01	. . . Pushbutton Popular.....	1
	3-09036-01	. . . Pushbutton Reset.....	1
3	4-08010-01	. . Readout Holder.....	1
4	3-09024-01	. . Readout Card.....	1
5	2-18456-08	. . Window.....	1
6	6-09928-01	. . Circuit Board Assembly Digital Display.....	1
7	2-18936-01	. . Light Block.....	1
8	2-18450-02	. . Rowe Nameplate.....	1
9	2-15328-01	. . Push-on Speednut.....	2
10	3-09065-01	. . Harness Assembly Digital Display.....	1
11	3-09008-01	. . Harness Assembly - Keyboard.....	1
12	7-02122-06	. Sponge Rubber Closed Cell.....	2
13	7-02122-07	. Sponge Rubber Closed Cell.....	2
14	2-18456-05	. Window.....	1
15	6-09905-01	. Title Rack Housing Assembly.....	1
16	6-09908-01	. . Title Rack Housing.....	1
17	3-09011-01	. . Decal Selections.....	1
18	6-09909-01	. . Decorative Decal (Blue).....	2
	6-09909-02	. . Decorative Decal (Brown).....	2
19	3-09012-01	. . Title Rack Hanger Assembly LH.....	1
	3-09013-01	. . Title Rack Hanger Assembly RH.....	1
20	3-08866-01	. . License Holder.....	2
21	2-18807-01	. . License Retainer.....	2
22	7-01355-08	. . Palnut.....	4
23	4-08000-01	. Title Rack Assembly.....	1
24	6-07571-02	. . Title Rack.....	8
	3-09014-01	. . Number Strip 100-212.....	1
	3-09014-02	. . Number Strip 113-225.....	1
	3-09014-03	. . Number Strip 126-237.....	1
	3-09014-04	. . Number Strip 138-249.....	1
	3-09014-05	. . Number Strip 150-261.....	1
	3-09014-06	. . Number Strip 162-273.....	1
	3-09014-07	. . Number Strip 174-286.....	1
	3-09014-08	. . Number Strip 182-299.....	1
25	2-17944-17	. . Rod.....	2
	7-01430-03	. . External Retaining Ring.....	2
	2-15689-01	. . Push Nut.....	2
	2-18846-02	. . Decorative Strip.....	4

TOP DOOR ASSEMBLY SHEET 3

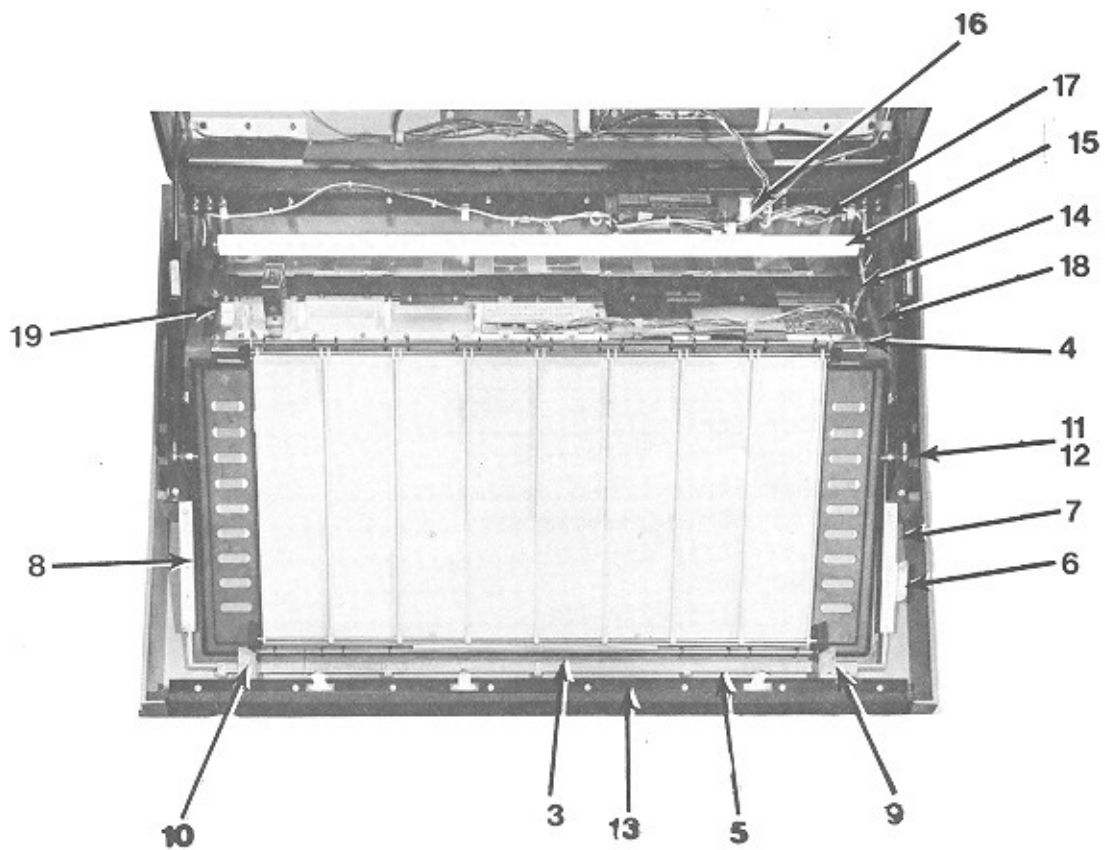
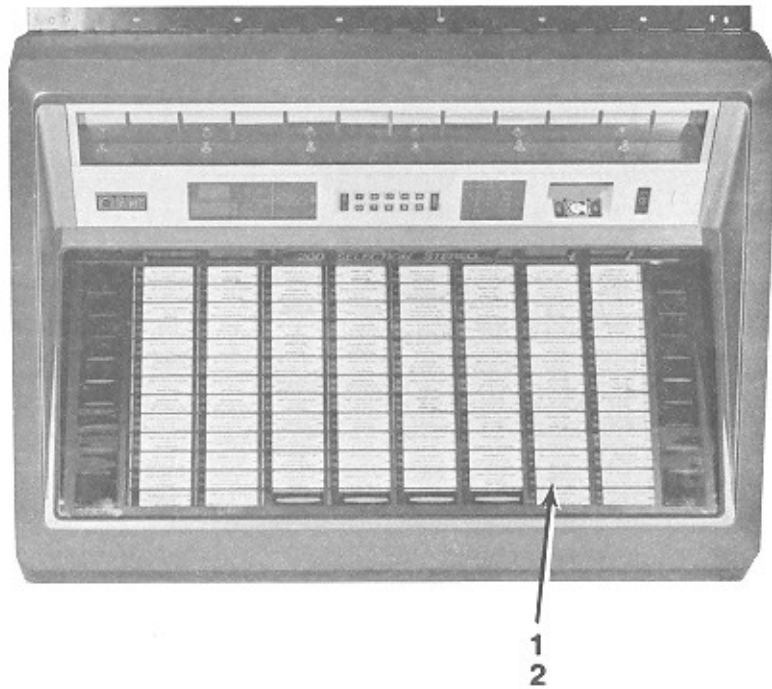


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1	4-08001-01	. Title Blockout Assembly.....	1
2	6-09817-01	. . Title Blockout.....	4
3	2-17944-17	. Rod.....	2
	7-01430-03	. . External Retaining Ring.....	1
	2-15689-01	. . Push Nut.....	1
4	3-09001-01	. Upper Shroud Retainer.....	1
5	3-09002-01	. Lower Shroud Retainer.....	1
6	2-18924-01	. Actuator Bracket.....	1
7	3-09056-01	. Shroud Retainer LH.....	1
8	3-09057-01	. Shroud Retainer RH.....	1
9	2-18900-01	. Catch Assembly LH.....	1
10	2-18901-01	. Catch Assembly RH.....	1
11	3-09029-01	. Door Support.....	2
12	2-17976-01	. Ball Stud.....	2
13	3-09004-01	. Trim & Catch Assembly.....	1
14	3-09007-01	. Flashing Light Harness Assembly.....	1
	7-00766-03	. . Edge Connector.....	2
	7-00755-06	. . Connector Housing.....	1
	7-08001-01	. . Cable Tie.....	22
15	7-00601-12	. Fluorescent Lamp.....	1
16	7-00800-04	. Fluorescent Starter.....	1
17	4-08002-01	. Light Harness Assembly (60 Hz).....	1
	3-08594-01	. . Ballast (30W 60 Hz).....	1
	3-09053-01	. . Lamp Bracket LH.....	1
	3-09054-01	. . Lamp Bracket RH.....	1
	3-09055-01	. . Ballast Bracket.....	1
	2-18267-19	. . Fluorescent Lamp Holder.....	2
	2-00295-01	. . Starter Socket.....	1
	3-07491-02	. . Plug Housing (3 Pin).....	1
	7-08001-01	. . Cable Tie.....	20
	7-00991-01	. . Self Stripping Splice.....	2
	7-00993-01	. . Self Stripping Splice 2-Way.....	5
18	3-09075-01	. Light Block LH.....	1
19	3-09076-01	. Light Block RH.....	1

**FIGURE
4**

OEM BILL ACCEPTOR

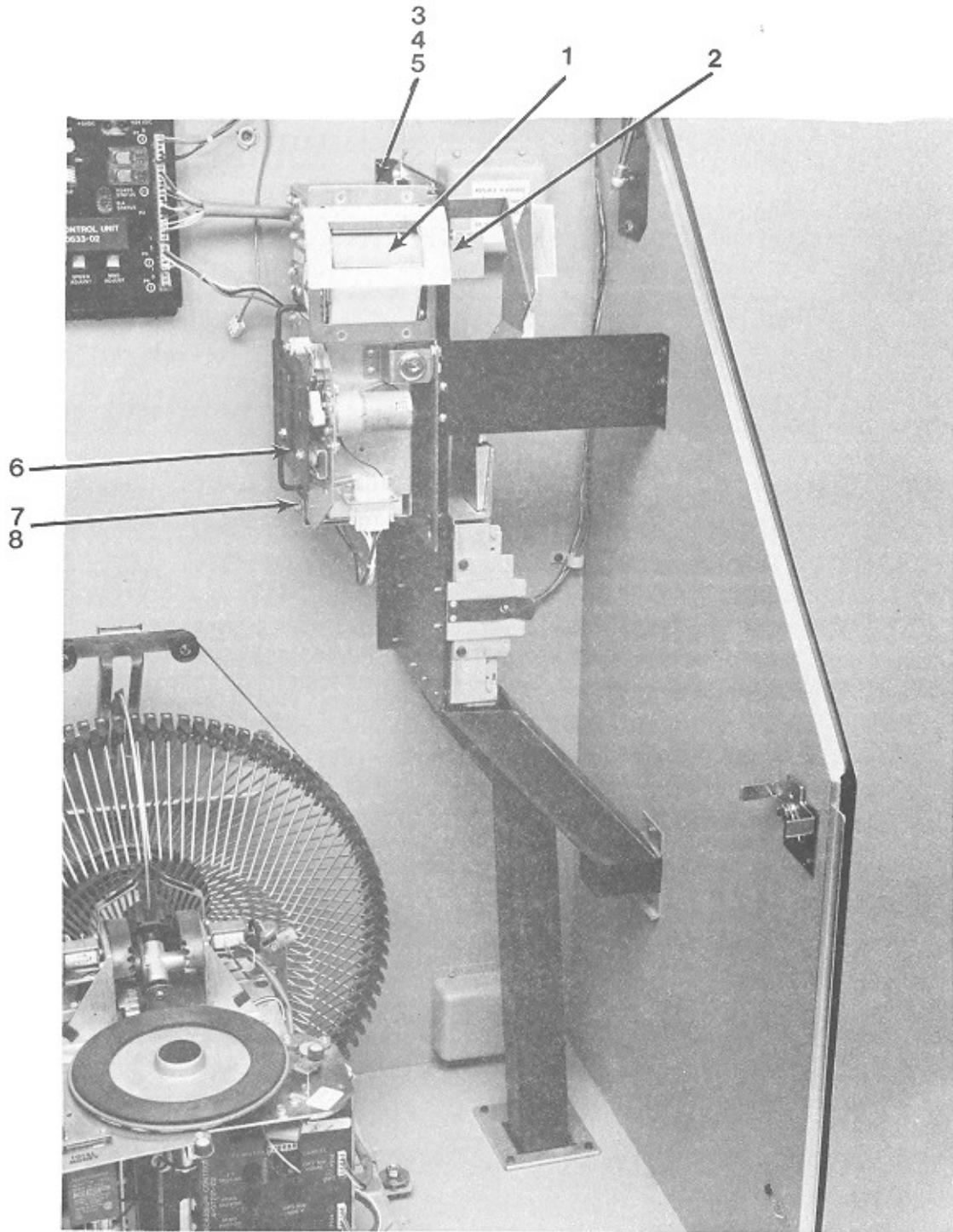


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-4	6-50570-22	OEM Bill Acceptor Kit Factory Installed (See Fig. 15)	
-4	6-50570-23	OEM Bill Acceptor Kit Field Installed (See Fig. 15)	
-4	6-09915-02	Transport & Stacker Assembly (OBA-2)	
1	6-50565-12	. Transport Assembly - OBA (R-90).....	1
2	4-08023-01	. Phono Shroud (OBA).....	1
3	4-08039-01	. Bracket & Support Assembly.....	1
4	2-15358-05	. Plastic Nut (Self-Retaining).....	1
5	2-18930-01	. Lock Plate Assembly.....	1
6	6-07979-03	. OBA Stacker Assembly (300 Bill).....	1
7	2-15347-08	. Pivot Pin.....	1
8	7-01430-04	. External Retaining Ring.....	1

**FIGURE
5**

LIGHT DISPLAY CONTROL

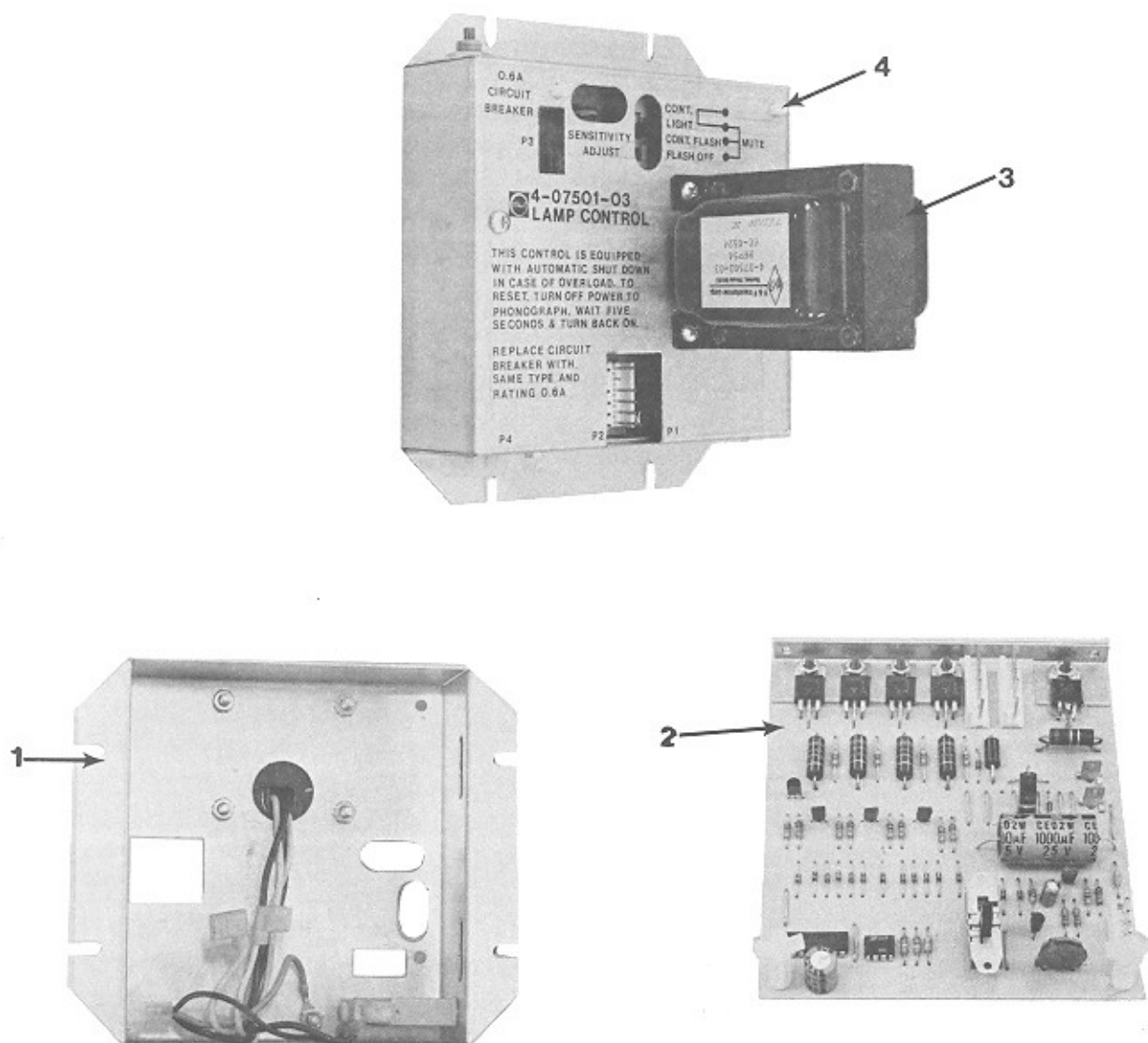


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
5-	4-07501-03	Light Display Controller Assembly	
1	4-07500-03	. Cover	1
2	6-09255-03	. Circuit Board Assembly.....	1
3	4-07502-03	. Transformer	1
4	7-05000-13	. Circuit Board Support.....	1

SHELL ASSEMBLY

FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
	6-09950-01	Shell Assembly (Blue)	
	6-09950-02	Shell Assembly (Brown)	
	2-15372-01	. Teenut (Mechanism Tie Down).....	2
	2-17506-12	. Vent Tube.....	1
	2-17506-15	. Vent Tube.....	1
	7-02401-26	. Wire Mesh Screen.....	1
	3-06257-01	. Hand Hole Cover.....	4
	2-14518-01	. Lock Spring.....	1
	3-06340-01	. Caster & Cup Assembly.....	4
	4-07802-07	. Skid Rail.....	2
	2-09326-01	. Teenut.....	2
	6-09279-01	. Cash Bag Bracket.....	1

FIGURE 6

STEREO AMPLIFIER SYSTEM ASSEMBLY

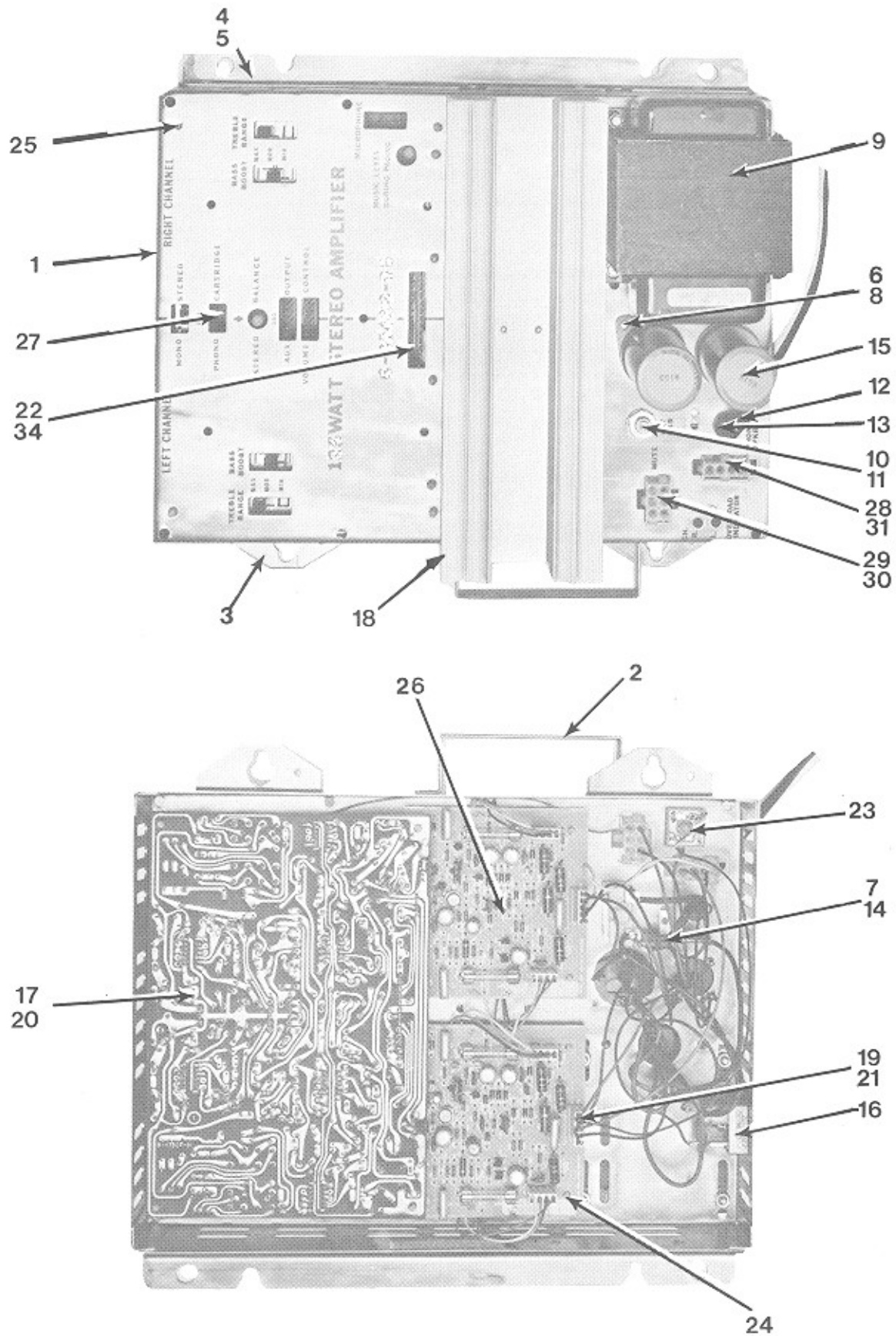


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
6-	6-09931-01	Stereo Amplifier Assembly (Figure 1, Sheet 5, Item 5)	
1	6-07441-07	. Chassis Assembly.....	1
2	2-14881-01	. Handle.....	1
3	2-09272-01	. Mounting Bracket.....	2
4	3-06273-01	. Mounting Bracket.....	1
5	7-01113-20	. Semi Tubular Rivet.....	10
6	2-13910-01	. Mounting Wafer.....	1
7	2-17241-02	. Terminal Strip.....	1
8	7-01110-07	. Semi Tubular Rivet.....	2
9	4-07378-04	. Power Transformer.....	1
10	7-00789-17	. Circuit Breaker.....	1
11	7-01220-11	. Washer.....	1
12	2-52186-03	. 3 Conductor Cord & Plug.....	1
13	7-02322-05	. Strain Relief.....	1
14	7-00213-05	. Mylar Capacitor.....	1
15	2-18231-01	. Electrolytic Capacitor.....	2
16	2-18225-01	. Bridge Rectifier.....	1
17	6-07925-04	. Stereo Preamp. Assembly (See Schem. for Parts List).....	1
18	4-07151-03	. Heat Sink Assembly (See Figure 7).....	1
19	7-00755-05	. Connector Housing (5 Ckt.).....	2
20	7-00755-02	. Connector Housing (2 Ckt.).....	1
21	7-00756-01	. Post Contact.....	11
22	7-00755-13	. Connector Housing (13 Ckt.).....	1
23	2-18934-01	. Speaker Overload Ind. (Right Channel).....	1
	2-18934-02	. Speaker Overload Ind. (Left Channel).....	1
24	7-05000-04	. Circuit Board Support.....	8
25	7-05000-18	. Circuit Board Support.....	4
26	4-07101-03	. Driver Circuit Board Assembly (See Power Amp. Schem. for P.L.)	2
27	7-00755-03	. Connector Housing (3 Ckt.).....	1
28	3-07490-03	. Cap Housing.....	1
29	3-07490-04	. Cap Housing.....	1
30	7-00975-02	. Contacts.....	8
31	2-16207-02	. Amplifier Jumper Plug Assembly.....	1

FIGURE
7

HEAT SINK ASSEMBLY

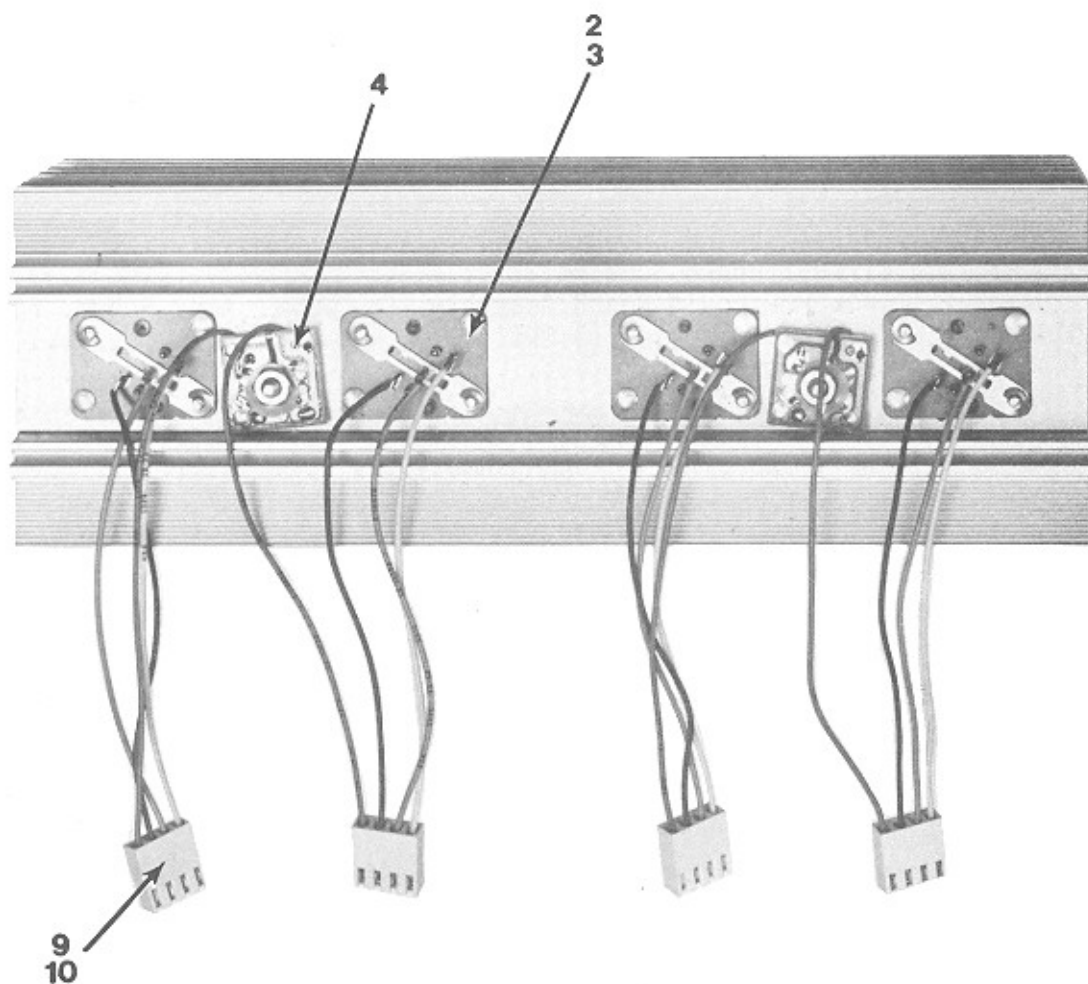
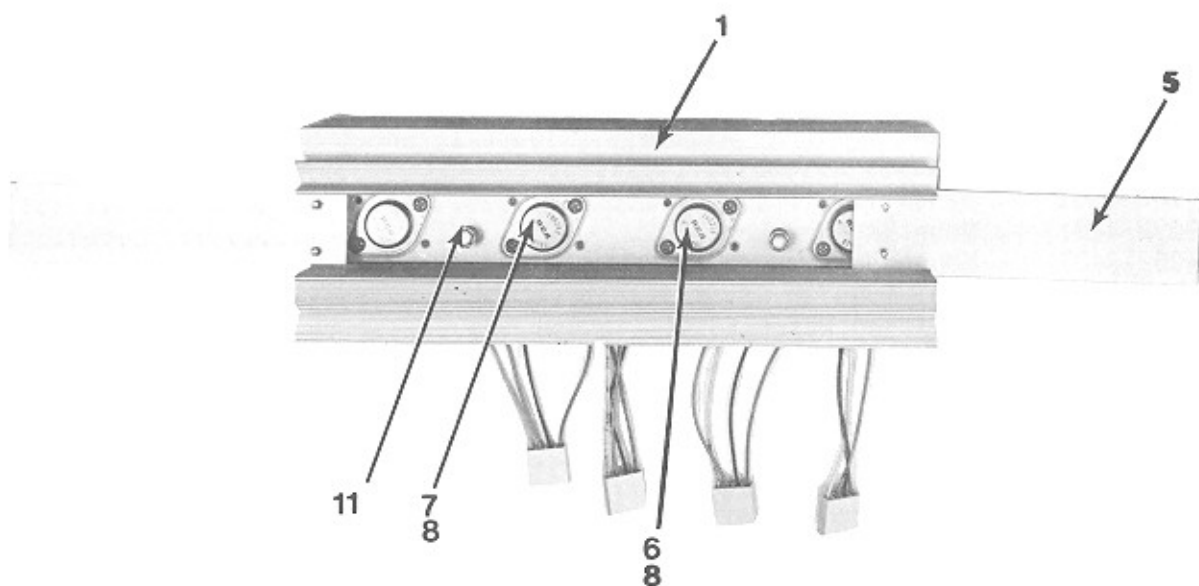


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-7	4-07151-02	Heat Sink Assembly (Figure 6, Item 18)	
1	4-07103-01	. Heat Sink.....	1
2	2-15473-01	. Power Transistor Socket.....	4
3	7-01111-14	. Semi Tubular Rivet.....	8
4	3-04253-01	. Power Amp Bias Circuit Board Assembly.....	2
	4-06359-01	. . Power Amp Bias Printed Wiring Board.....	1
	7-00350-02	. . Silicon Diode.....	3
	7-00756-01	. . Post Contact.....	2
5	2-17980-01	. Cover.....	2
6	7-00302-06	. Transistor (Darlington Amp)(M-SJ6366K, RCA-2N6283).....	2
7	7-00302-07	. Transistor (Darlington Amp)(M-SJ6365K, FCA-2N6286).....	2
8	2-13189-01	. Insulator.....	4
9	7-00755-04	. Connector Housing.....	4
10	7-00756-01	. Post Contact.....	6
11	7-01200-09	. Washer.....	2
	7-01217-17	. . Spacer.....	2
	2-18402-01	. . Spring - Compression.....	2

FIGURE
8

OUTPUT TRANSFORMER ASSEMBLY

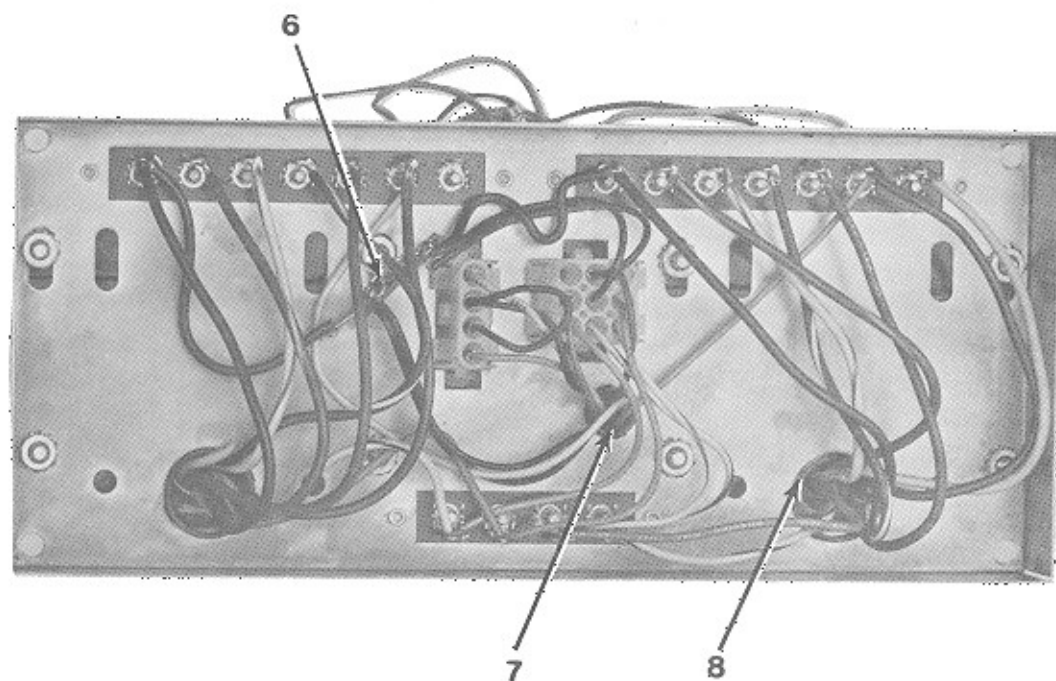
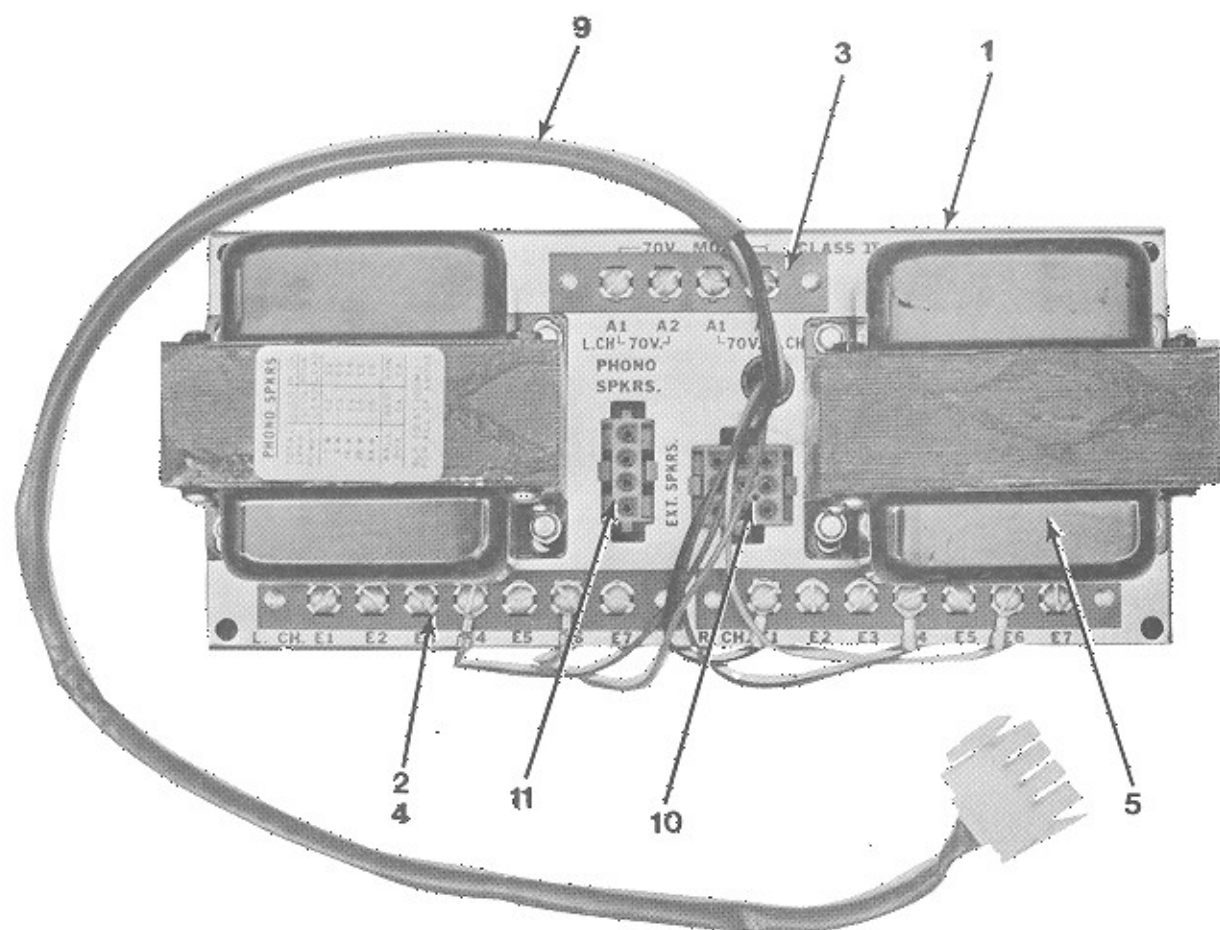


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-8	4-06336-05	Output Transformer Assembly (Figure 1, Sheet 5, Item 2)	
1	3-06260-07	. Output Chassis.....	1
2	3-04267-05	. Binding Post Strip.....	2
3	3-04267-03	. Binding Post Strip.....	1
4	7-01110-07	. Semi Tubular Rivet.....	6
5	4-06335-01	. Output Transformer.....	2
6	3-04225-14	. Terminal Strip.....	1
7	7-02331-01	. Insulating Bushing.....	1
8	7-02331-02	. Insulating Bushing.....	2
9	2-15323-05	. Plug & Cable Assembly.....	1
	3-07491-03	. . Plug Housing.....	1
	7-00975-01	. . Contact (Pin).....	4
10	3-07488-01	. Plug & Cable Assembly.....	1
	3-07490-05	. . Cap Housing (9 Ckt.).....	1
	7-00975-02	. . Contact.....	8
	7-00910-12	. . Spade Terminal Lug.....	2
11	2-15373-04	. Plug & Cable Assembly.....	1
	7-00910-12	. . Spade Terminal Lug.....	3
	3-07490-03	. . Cap Housing.....	1
	7-00975-02	. . Contact.....	4

FIGURE
9

CENTRAL CONTROL COMPUTER

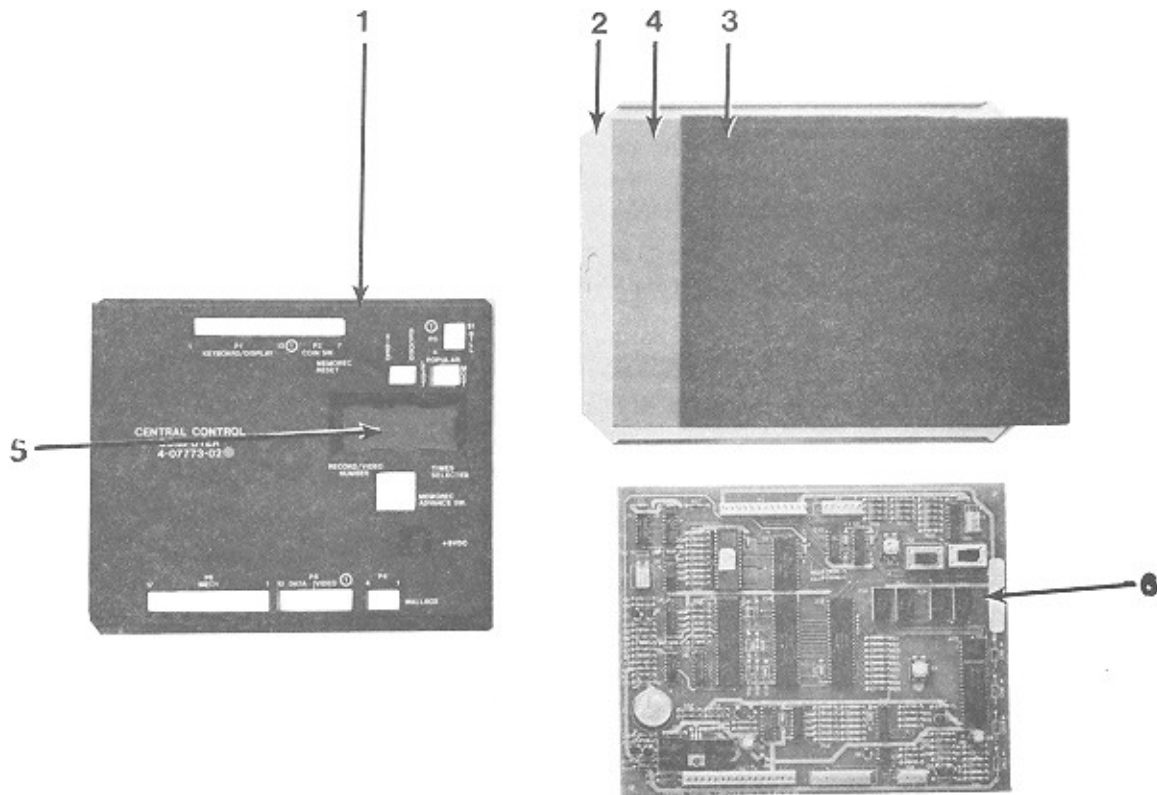


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
9-	4-07773-05	Central Control Computer Assembly.....	1
1	4-07792-03	. Central Control Computer Cover.....	1
2	4-07791-01	. Central Control Computer Base.....	1
3	2-17710-14	. Insulator Pad.....	1
4	2-17711-11	. Insulation Base.....	1
5	2-17819-05	. Light Filter Display Card.....	1
6	6-09738-05	. Central Computer Circuit Board Assembly.....	1

FIGURE
10

MAIN POWER SUPPLY (120V MODEL)

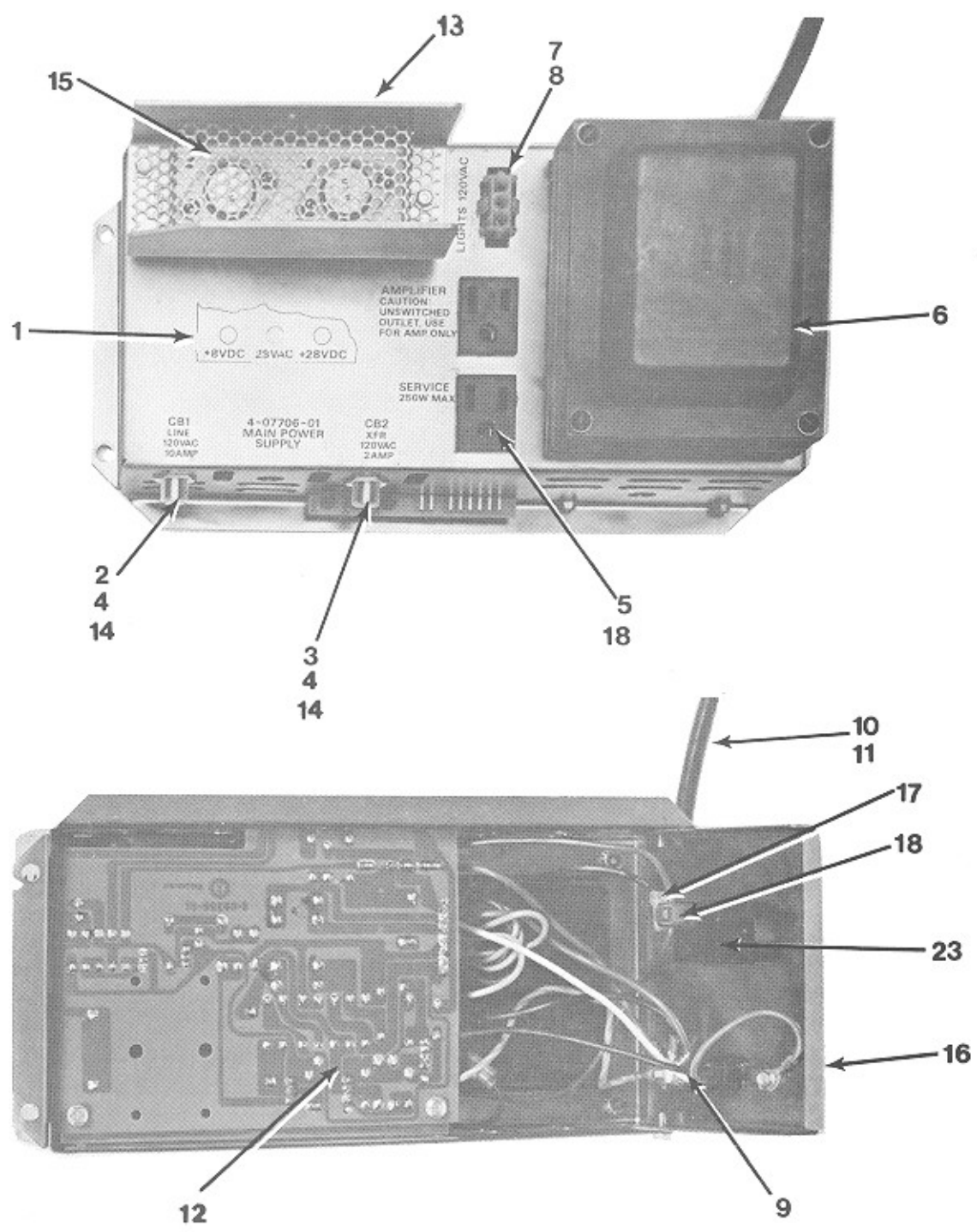


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-10	4-07706-03	Main Power Supply (120V) (Figure 1, Sheet 5, Item 5)	
	4-65092-05	Main Power Supply (220V)	
	4-65092-06	Main Power Supply (240V)	
1	4-07719-02	. Chassis Assembly.....	1
2	7-00734-25	. 10 Amp Circuit Breaker.....	1
3	7-00733-15	. 2 Amp Circuit Breaker.....	1
4	7-01220-01	. Washer (Internal Lock) Part of Breaker.....	2
5	2-13759-01	. 3 Wire Convenience Outlet.....	2
6	4-07720-01	. Transformer & Harness Assembly.....	1
	4-07720-26	. . Power Transformer (120V).....	1
	4-65093-26	. . Power Transformer (220V-240V).....	REF
	7-00756-01	. . Post Contact.....	6
	7-00756-01	. . Post Contact (220V-240V).....	5
	7-00975-04	. . Contact.....	1
	7-00913-08	. . Terminal Lug.....	1
	7-00913-08	. . Terminal Lug (220V-240V).....	4
7	3-07490-02	. Cap Housing.....	1
	7-00975-04	. . Contact (220V-240V).....	3
8	7-00975-04	. Contact (120V).....	2
	7-00913-08	. . Terminal Lug (120V).....	2
	7-00913-08	. . Terminal Lug (220V-240V).....	4
9	7-00915-11	. Ring Terminal.....	2
10	3-08345-06	. Power Cord Assembly (120V).....	1
	3-65365-01	. . Power Cord Assembly (220V-240V).....	1
11	7-02321-04	. Strain Relief.....	1
12	6-09357-02	. Circuit Board Assembly.....	1
13	4-07331-02	. Heat Sink and Power Transistor Assembly.....	1
	3-08343-01	. . Power Supply Heat Sink.....	1
	7-00308-07	. . Transistor (Darlington)(2N6055)(Motorola, RCA).....	2
	2-13189-01	. . Insulator.....	2
	2-18342-01	. . Power Transistor Socket.....	2
	7-00755-04	. . Connector Housing.....	2
	7-00756-01	. . Post Contact.....	6
	7-00757-02	. . Keying Post.....	2
14	2-14086-02	. Straight Receptacle (120V).....	4
	2-14086-02	. Straight Receptacle (220V-240V).....	8
	7-00734-21	. Breaker 220/240 (5A)(Not Shown).....	2
	7-00734-22	. Breaker 220/240 (6A)(Not Shown).....	1
15	2-18281-01	. Heat Sink Cover.....	1
16	3-08673-01	. Switch Panel.....	1
17	7-00967-01	. Insulated Faston (120V).....	4
	7-00967-01	. Insulated (220V-240V).....	3
18	7-00992-01	. Self Stripping Terminal.....	5
19	7-00991-01	. Self Stripping Terminal.....	1
20	7-00755-08	. Connector Housing (Not Shown).....	1
21	7-00757-02	. Keying Plug (Not Shown).....	1
22	7-00756-01	. Post Contact (120V)(Not Shown).....	1
	7-00756-01	. Post Contact (220V-240V).....	2
23	3-07857-01	. Rocker Switch (120V).....	1
	3-07857-02	. Rocker Switch (220V-240V).....	1
	2-17241-01	. Terminal Retainer Strip (220V-240V).....	1

FIGURE
11

MECHANISM ASSEMBLY SHEET 1

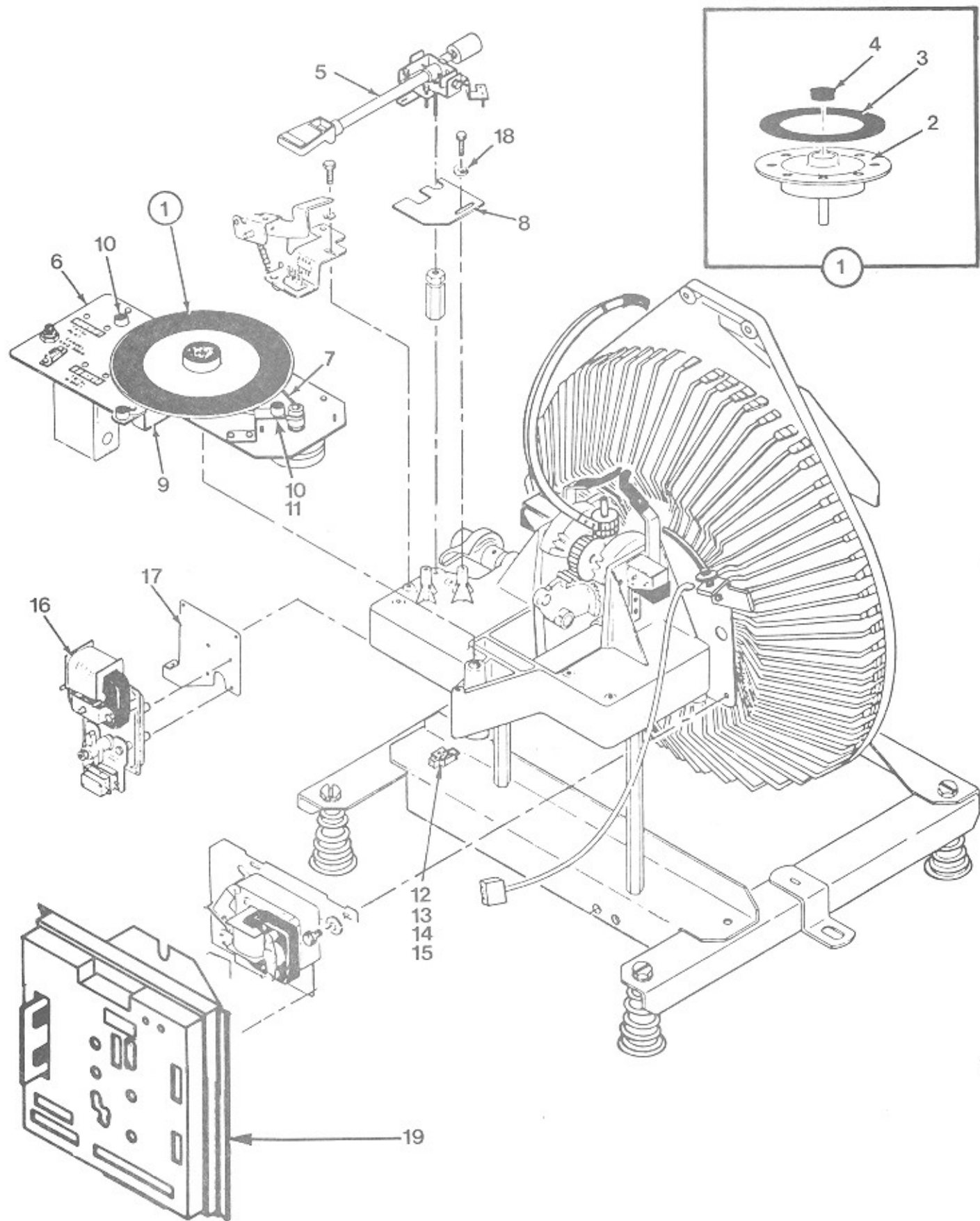


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-11	6-08700-01	Mechanism Assembly (Figure 1, Sheet 3, Item 1) (60HZ)	
	6-08700-02	Mechanism Assembly (Figure 1, Sheet 3, Item 2) (50HZ)	
1	3-07921-01	. Turntable Assembly.....	1
2	4-07215-01	. Turntable & Shaft Assembly.....	1
3	3-05235-01	. Turntable Face.....	1
4	2-18163-01	. Hole Plug.....	1
5	4-07217-02	. Tone Arm & Pivot Assembly (See Figure 12).....	1
6	3-07935-01	. Plate & Counter Assembly.....	1
	2-15818-01	. . Momentary Contact Switch.....	1
	3-07942-01	. . Brush Holder.....	1
	2-02182-01	. . Brush.....	1
	4-07220-02	. . Counter Mounting Plate.....	1
	2-18137-01	. . Counter Assembly.....	1
	2-15383-02	. . Counter.....	1
	2-14418-02	. . Electric Counter.....	1
	7-00921-04	. . . Solderless Connector.....	4
	7-00755-05	. . . Connector Housing.....	1
	7-00756-01	. . . Post Contact.....	4
	7-00757-02	. . . Keying Plug.....	1
7	3-07922-01	. Turntable Drive Belt.....	1
8	3-07938-02	. Tone Arm Cutoff Circuit Board Assembly.....	1
	4-07225-02	. . Printed Wiring Board.....	1
	2-10726-02	. . Reed Switch.....	1
	7-00760-02	. . Polarizing Wafer 90 Degrees.....	1
	2-18181-01	. . Contact.....	1
	7-00770-01	. . Socket - Mini Spring.....	2
9	2-18188-01	. Bracket - Grommet & Rivet Assembly.....	1
10	2-18189-01	. Bracket - Grommet & Rivet Assembly.....	2
11	2-18139-01	. . Grommet.....	3
12	4-07224-01	. Mechanism Harness Assembly.....	1
	3-07490-05	. . Cap Housing (9 Ckt.).....	1
	3-00795-01	. . Contact.....	7
	3-00795-03	. . Contact.....	2
	7-00755-02	. . Connector Housing.....	1
	7-00755-08	. . Connector Housing.....	1
	7-00755-10	. . Connector Housing.....	1
	7-00756-01	. . Post Contact.....	17
	7-00757-01	. . Keying Plug.....	1
	7-00757-02	. . Keying Plug.....	2
	7-00913-02	. . Terminal Lug.....	5
	7-00913-06	. . Terminal Lug.....	2
	7-00913-08	. . Terminal Lug.....	2
	7-00913-14	. . Terminal Lug.....	9
	7-00916-02	. . Spade Terminal Lug.....	1
	7-00921-07	. . Solderless Connector.....	1
	7-08001-07	. . Cable Tie.....	20
13	2-07545-01	. Clip.....	3
14	2-05545-01	. Cable Clip.....	1
15	7-00934-01	. Cable Clamp.....	1
16	4-07208-01	. Cam Switch & Motor Assembly (See Figure 14).....	1
17	3-07907-01	. Motor Mounting Plate.....	1
18	7-01200-02	. Washer.....	1
19	4-07221-05	. Mechanism Control Unit.....	1
	3-07943-01	. . Mechanism Control Base.....	1
	2-17710-08	. . Insulating Pad.....	1
	2-17711-05	. . Insulating Base.....	1
	6-08708-05	. . Mechanism Control Circuit Bd. Ass'y. (See Schem. for P.L.)..	1
	4-07231-05	. . Cover.....	1

MECHANISM ASSEMBLY SHEET 2

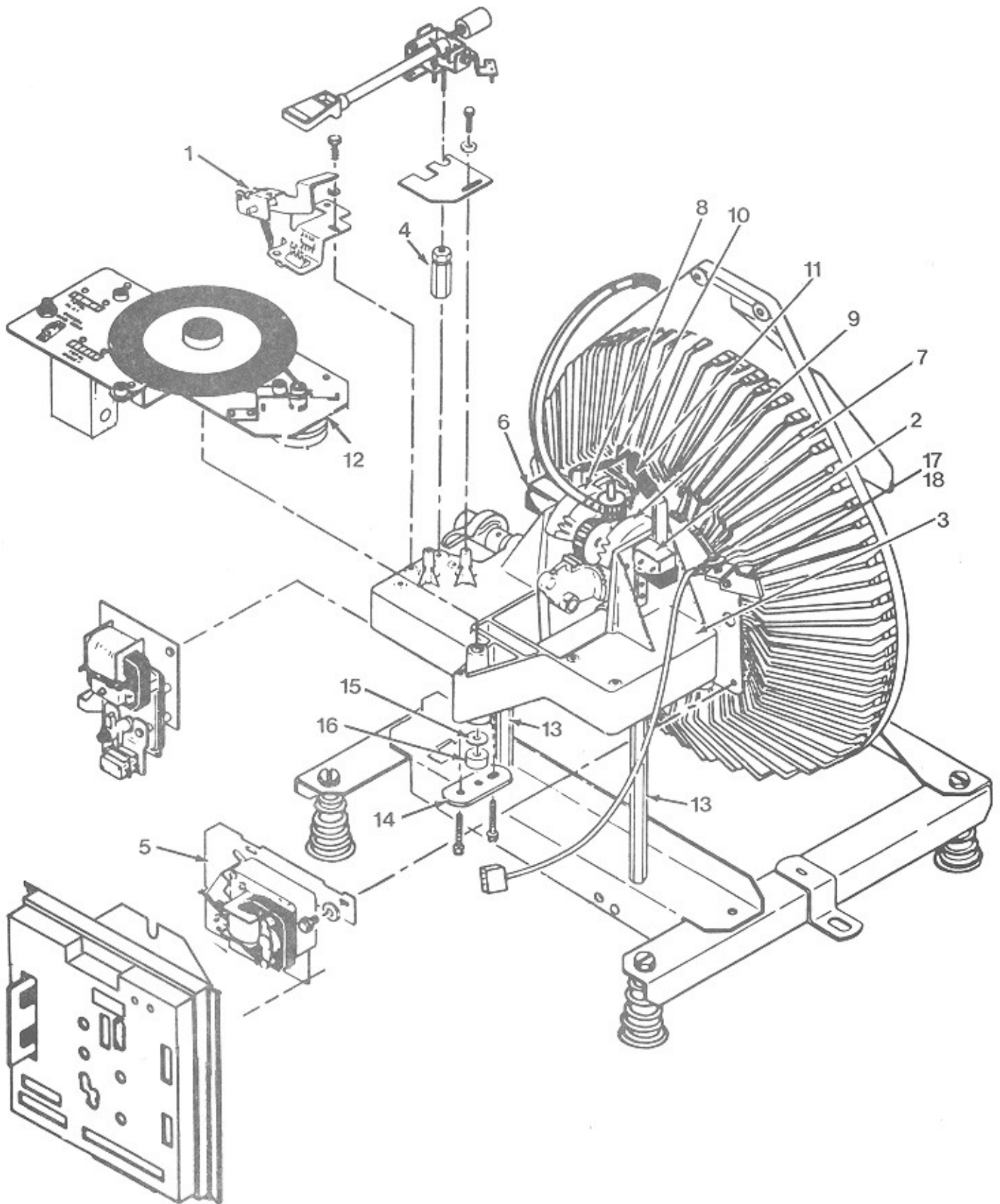


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-11	6-08700-01	Mechanism Assembly (Continued)	
1	3-07926-01	. Lifting Lever & Bracket Assembly.....	1
	2-18158-01	. . Lifting Lever Bracket Assembly.....	1
	2-18159-01	. . Lifting Lever Assembly.....	1
	7-01430-05	. . Retaining Ring.....	1
	2-15760-01	. . Tension Spring.....	1
	2-18162-02	. . Grounding Clip.....	1
	7-00745-04	. . Chassis Mount Wafer (4 Ckt).....	1
	7-01111-06	. . Semi Tubular Rivet.....	1
2	3-09068-01	. Optical Switch Assembly.....	1
	3-07945-01	. . Mounting Bracket.....	1
	3-09059-01	. . Optical Switch & Connector Assembly.....	1
	4-08037-01	. . . Optical Switch.....	1
	7-00755-65	. . . Connector Housing (Red).....	1
	7-00757-02	. . . Keying Plug.....	1
	7-00756-01	. . . Contact Post.....	4
	7-08001-01	. . Cable Tie.....	2
3	7-03122-01	. Mechanism Name Plate.....	1
4	2-10708-02	. Bearing Assembly.....	1
5	4-07219-01	. Sprag Assembly (See Fig 13).....	1
6	2-18182-01	. Toggle Solenoid Assembly (L.H.).....	1
7	2-18183-01	. Toggle Solenoid Assembly (R.H.).....	1
8	3-07905-01	. Rotator Assembly (L.H.).....	1
9	3-07906-01	. Rotator Assembly (R.H.).....	1
10	2-18118-01	. Record Guide Assembly (L.H.).....	1
11	2-18119-01	. Record Guide Assembly (R.H.).....	1
12	3-07917-01	. Turntable Motor & Plate Assembly (60HZ).....	1
	3-07917-02	. Turntable Motor & Plate Assembly (50HZ).....	1
	3-07918-01	. . Turntable Motor Mounting Plate.....	1
	2-18171-02	. . Turntable Belt Guide.....	1
	3-07919-07	. . Turntable Motor Assembly (60HZ).....	1
	3-07919-08	. . Turntable Motor Assembly (50HZ).....	1
	2-18178-01	. . Motor Pulley (45 RPM)(60HZ).....	1
	2-18178-02	. . Motor Pulley (45 RPM)(50HZ).....	1
13	2-18125-01	. Mech Support.....	2
14	2-18124-01	. Cap Plate.....	1
15	2-10364-01	. Thrust Bearing.....	1
16	2-10866-01	. Spacer Bearing.....	1
17	2-18186-01	. Adjusting Bracket Assembly.....	1
18	2-18184-01	. Adjusting Knob.....	1

MECHANISM ASSEMBLY SHEET 3

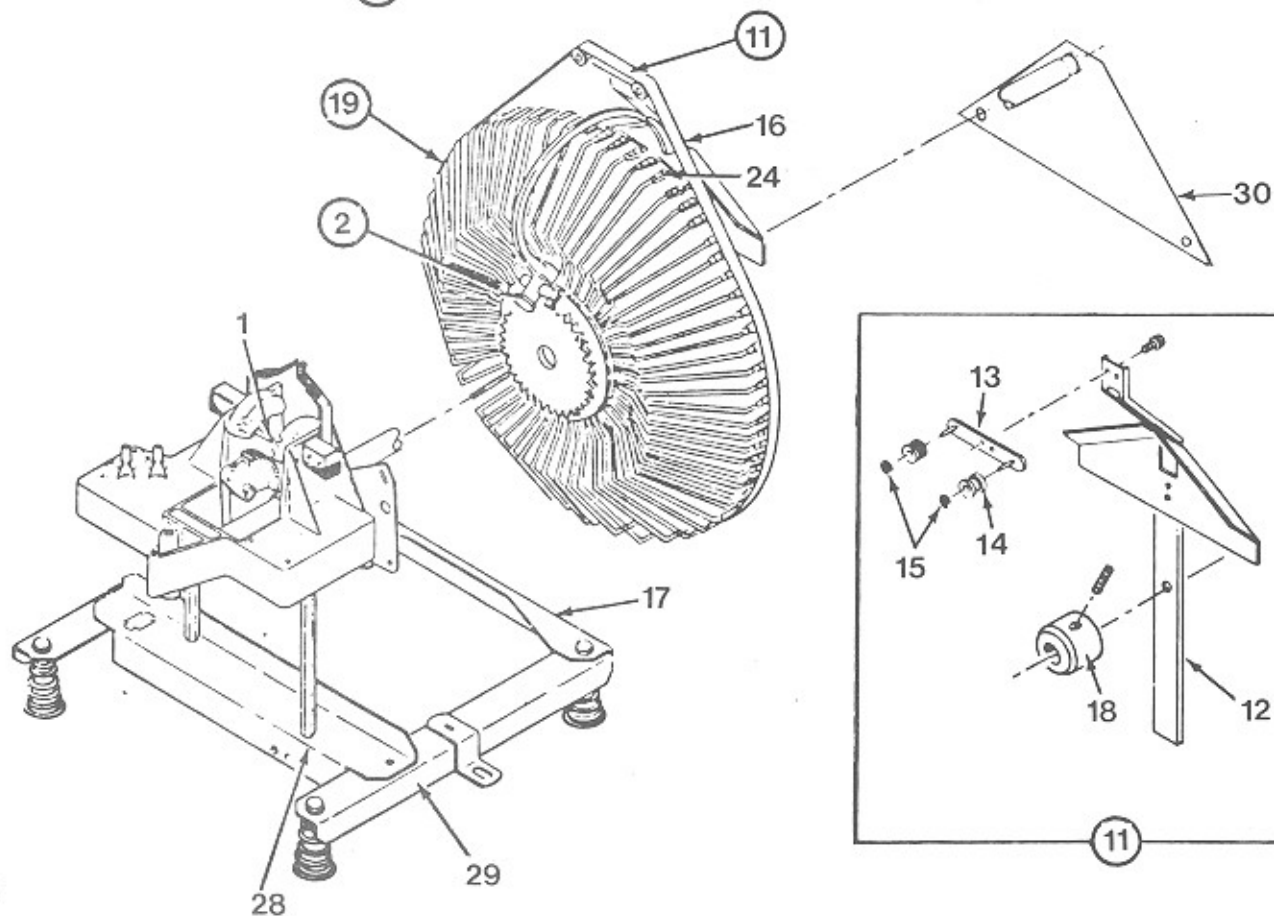
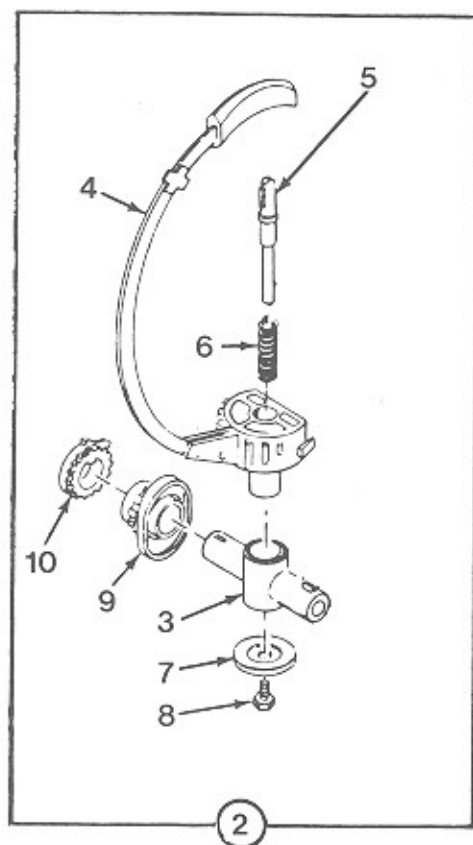
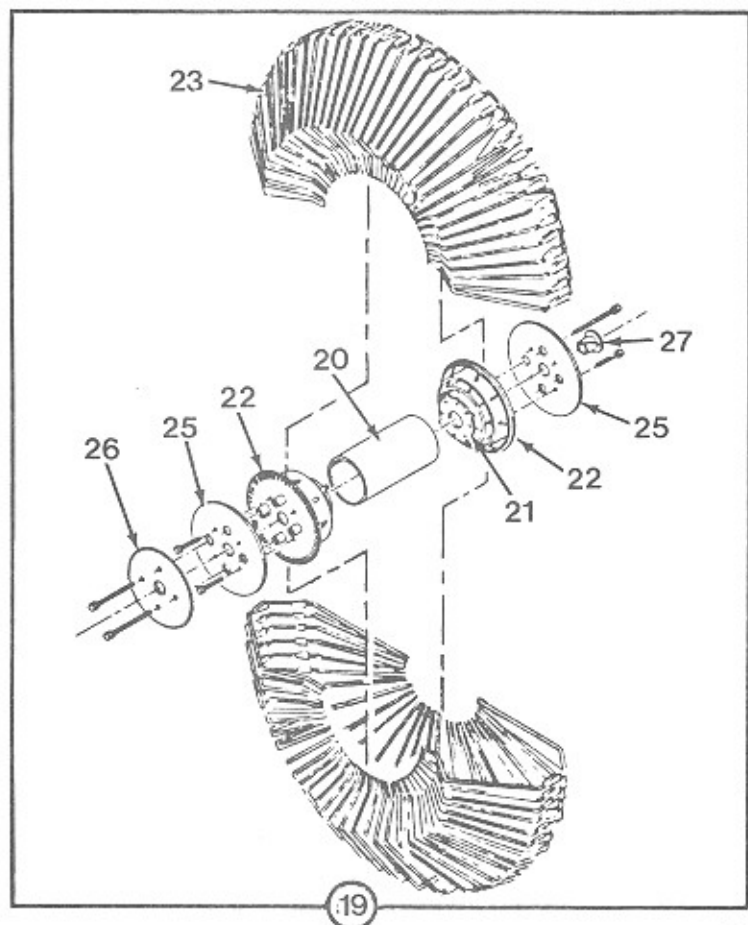


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-11	6-08700-01	Mechanism Assembly (Continued)	
1	2-10792-02	. Trunnion Pin.....	2
2	4-07207-01	. Gripper & Trunnion Assembly.....	1
3	3-07910-01	. Trunnion.....	1
4	3-05197-02	. Gripper Bow & Hub Assembly.....	1
5	2-10808-03	. Inner Shoe Assembly.....	1
6	2-10811-01	. Record Release Spring.....	1
7	2-18115-01	. Cam Follower.....	1
8	2-18117-01	. Lock Screw.....	1
9	4-07204-01	. Cam Gear.....	1
10	4-07206-01	. Trunnion Gear.....	1
11	4-07212-01	. Guide & Belt Support Assembly.....	1
12	4-07213-01	. Gripper Bow Guide Assembly.....	1
13	2-10894-01	. Roller Bracket Assembly.....	1
14	2-03843-01	. Belt Roller.....	2
15	7-01430-03	. Retaining Ring.....	2
16	2-18138-01	. Belt.....	1
17	3-07925-01	. Support Frame Rear Angle.....	1
18	2-18126-01	. Collar.....	1
19	6-08703-01	. Magazine Assembly.....	1
20	4-07200-01	. Hub Spacer.....	1
21	3-07902-01	. Hub Anchor Plate.....	2
22	6-08702-01	. Magazine Hub.....	2
23	4-07201-01	. Record Magazine Separator.....	100
24	4-07202-01	. Belt Guide.....	100
25	3-07903-01	. Cover Plate.....	2
26	3-07904-01	. Magazine Gear.....	1
27	7-01460-01	. Bearing.....	2
28	2-11013-01	. Lock Nut.....	2
29	3-07914-01	. Mechanism Support & Spring Assembly.....	1
	3-07915-01	. . Mech Support Assembly.....	1
	2-06272-01	. . Spring Support (Upper).....	4
	2-06138-03	. . Mech Mounting Spring.....	4
30	4-07232-01	. Support Magazine.....	1

MECHANISM ASSEMBLY SHEET 4

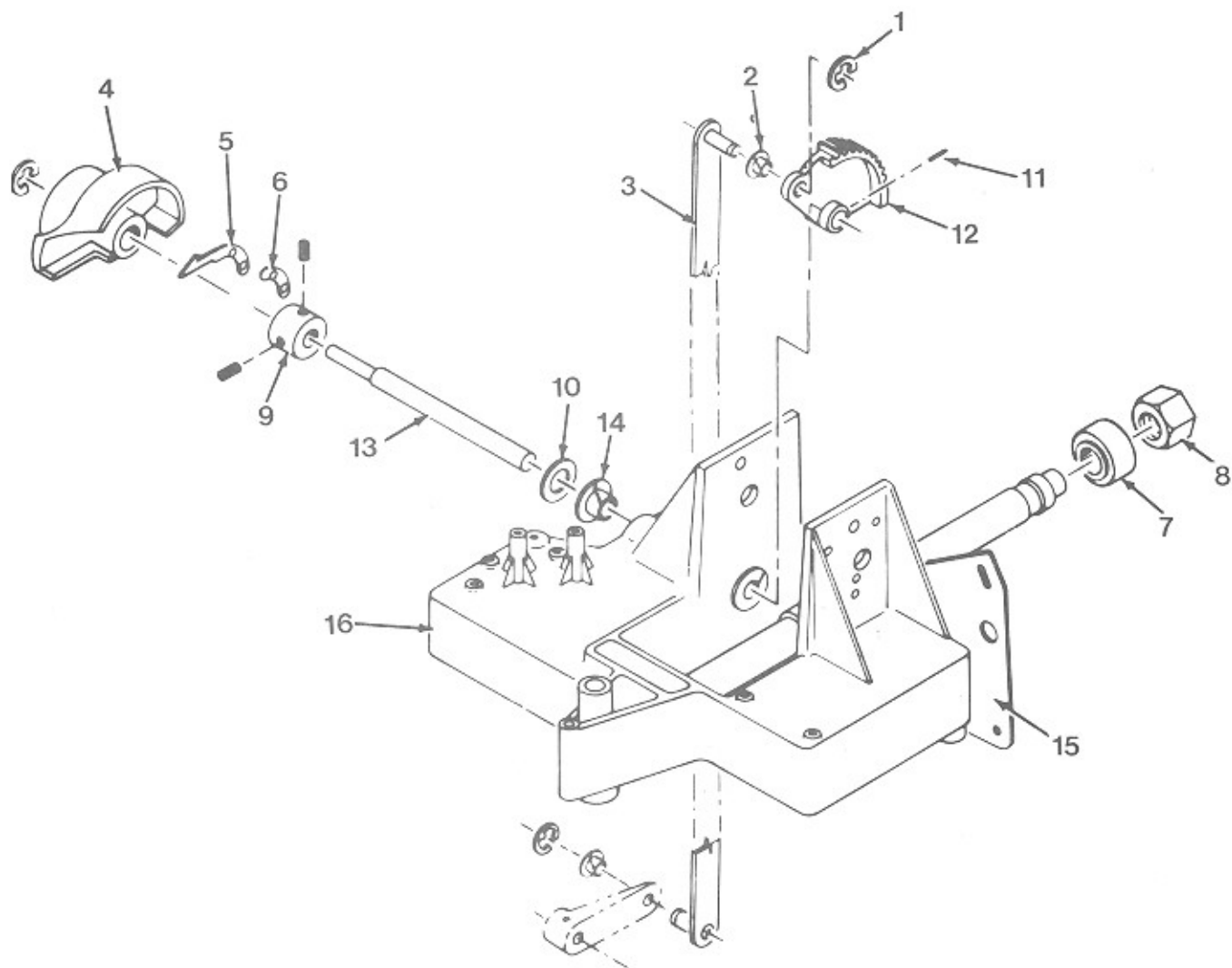


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-11	6-08700-01	Mechanism Assembly (Continued)	
1	7-01430-04	. Retaining Ring.....	3
2	7-01460-04	. Bearing.....	2
3	2-18102-01	. Transfer Link Assembly.....	1
4	2-18134-01	. Tone Arm Cam Assembly.....	1
	2-18187-01	. . Cam & Insert Assembly.....	1
5	2-18148-01	. Cam Spring.....	1
6	2-18149-01	. Cam Spring Plate.....	1
7	2-51569-06	. Shoulder Washer.....	1
8	7-01301-09	. 9/16 x 18 Jam Nut.....	1
9	2-18133-02	. Cam Collar.....	1
10	7-01225-33	. Bowed Washer.....	1
11	7-01130-19	. Roll Pin.....	1
12	4-07205-01	. Sector Gear.....	1
13	2-18132-01	. Cam Drive Shaft.....	1
14	7-01460-05	. Bearing.....	2
15	4-07218-01	. Intermediate Mounting Plate.....	1
16	4-07211-01	. Base Assembly.....	1
	6-08707-01	. . Mechanims Base.....	1
	3-07913-01	. . Magazine Support Shaft.....	1
	2-10377-01	. . Bearing.....	2

**FIGURE
12**

TONE ARM & PIVOT ASSEMBLY

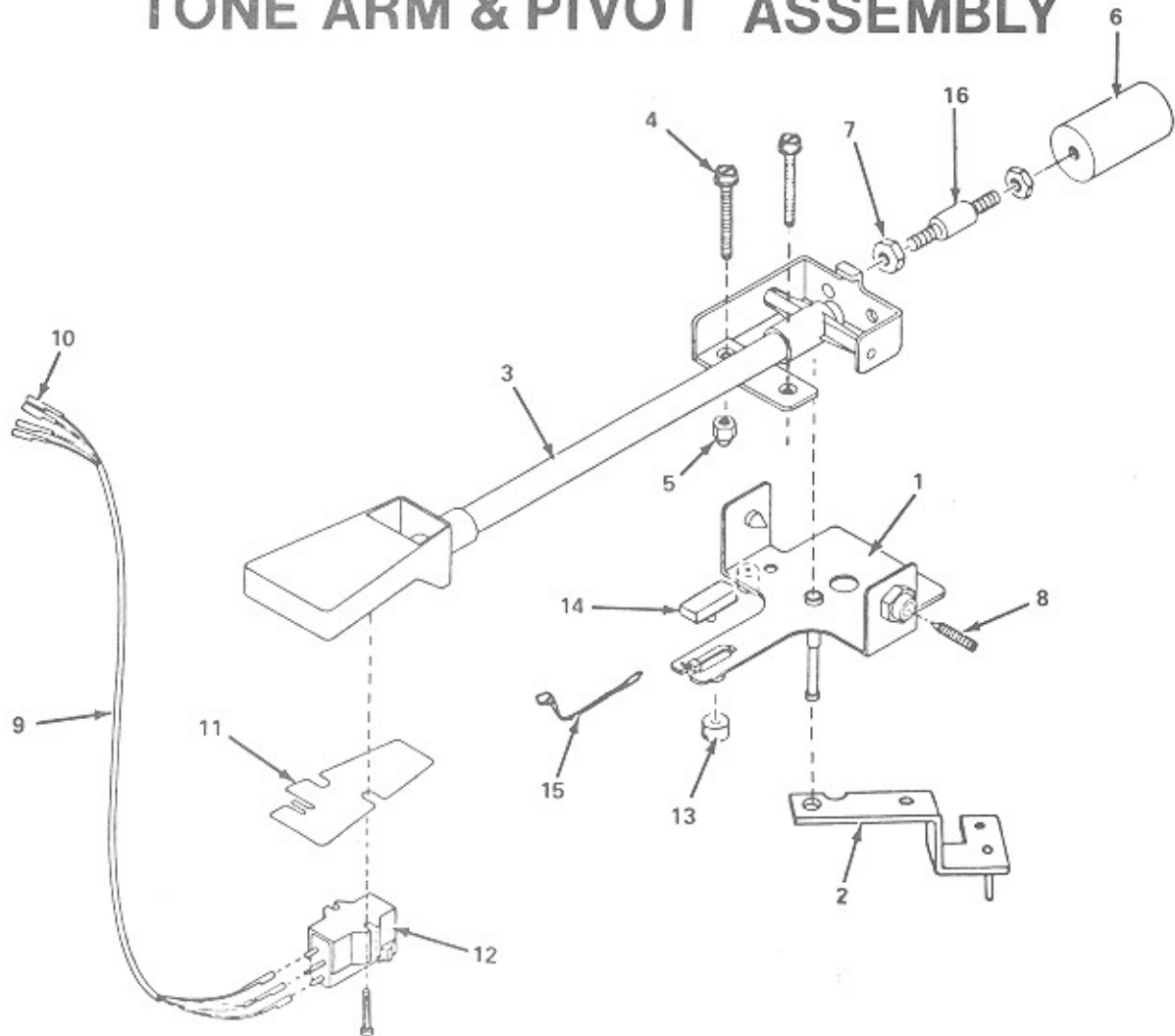


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-12	4-07217-02	Tone Arm & Pivot Assembly (Figure 1, Sheet 1, Item 5)	
1	2-18141-01	. Bracket & Shaft Assembly.....	1
2	2-18142-01	. Guide Plate Assembly.....	1
3	3-07928-01	. Tone Arm & Lever Assembly.....	1
4	2-65025-01	. Contact Screw.....	2
5	2-18140-01	. Self Locking Cap Nut.....	1
6	2-18143-02	. Counter Weight.....	1
7	7-01355-02	. Locknut.....	1
8	2-10712-01	. Pivot Screw.....	1
9	2-18144-01	. Tone Arm Cable Assembly.....	1
10	7-00927-10	. . Pin Receptacle.....	8
11	3-08915-01	. Tone Arm Shielding Clip.....	1
12	2-13011-01	. Stereo Phono Cartridge.....	1
	2-18340-01	. . Stylus Assembly.....	1
13	2-18147-01	. Magnet - Reed.....	1
14	2-18146-01	. Magnet Clip.....	1
15	7-08001-09	. Cable Tie.....	1
16	2-18177-01	. Vibration Isolator.....	1

SPRAG ASSEMBLY

FIGURE
13

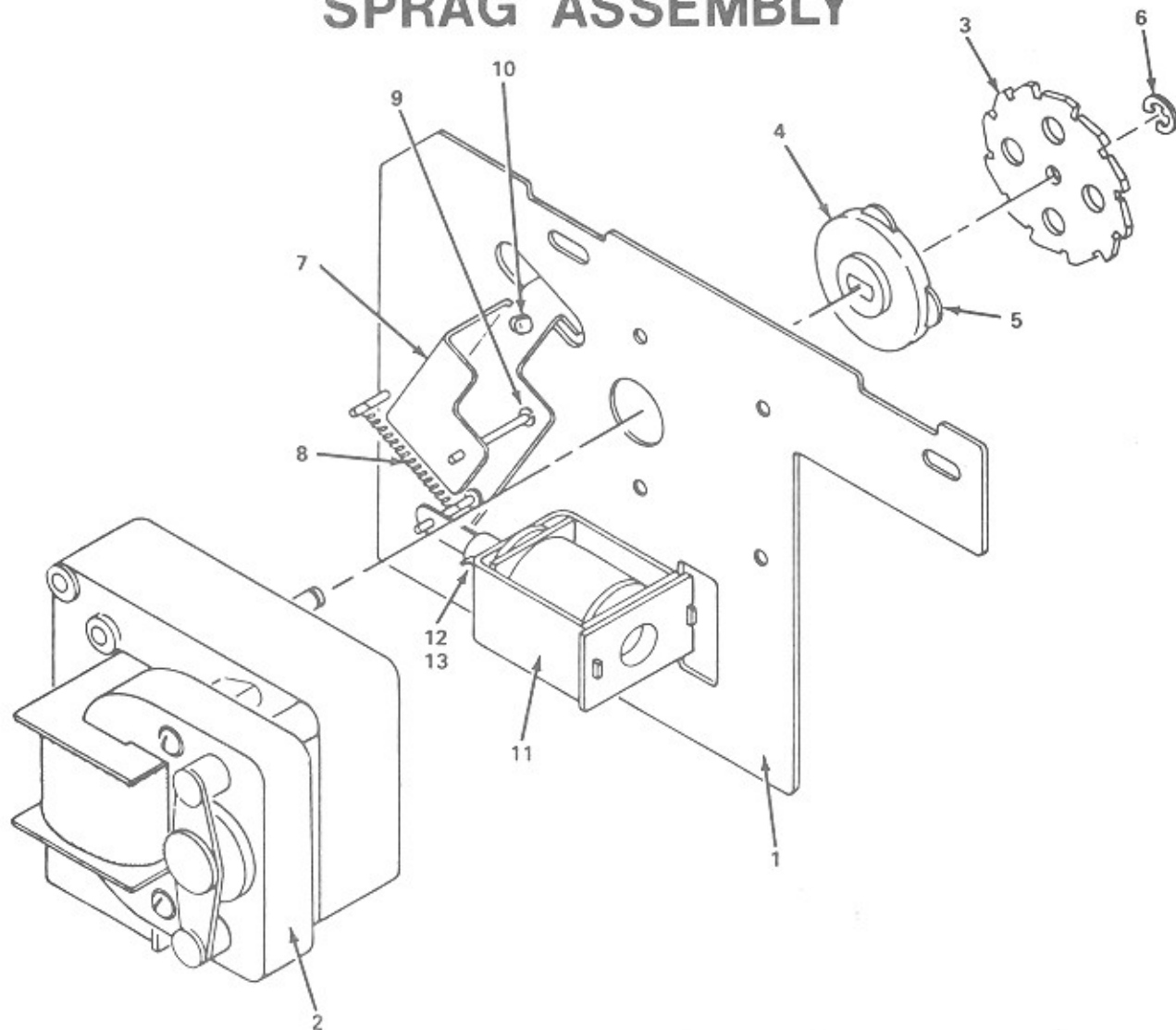


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-13	4-07219-01	Sprag Assembly (Figure 1, Sheet 2, Item 5)	
1	3-07939-01	. Sprag Plate Assembly.....	1
2	4-07227-01	. Magazine Motor.....	1
3	4-07223-01	. Sprag Wheel.....	1
4	3-07933-01	. Sprag Wheel Hub.....	1
5	2-18161-02	. Stem Bushing.....	4
6	7-01430-03	. Retaining Ring.....	1
7	2-18160-01	. Sprag Lever Assembly.....	1
8	2-12562-01	. Tension Spring.....	1
9	7-01430-05	. Retaining Ring.....	1
10	2-51559-01	. Split Stem Bumper.....	2
11	2-11505-10	. Solenoid Assembly.....	1
12	2-10857-01	. Plunger Assembly.....	1
13	2-10849-02	. Plunger Stop.....	1

**FIGURE
14**

CAM SWITCH & MOTOR ASSEMBLY

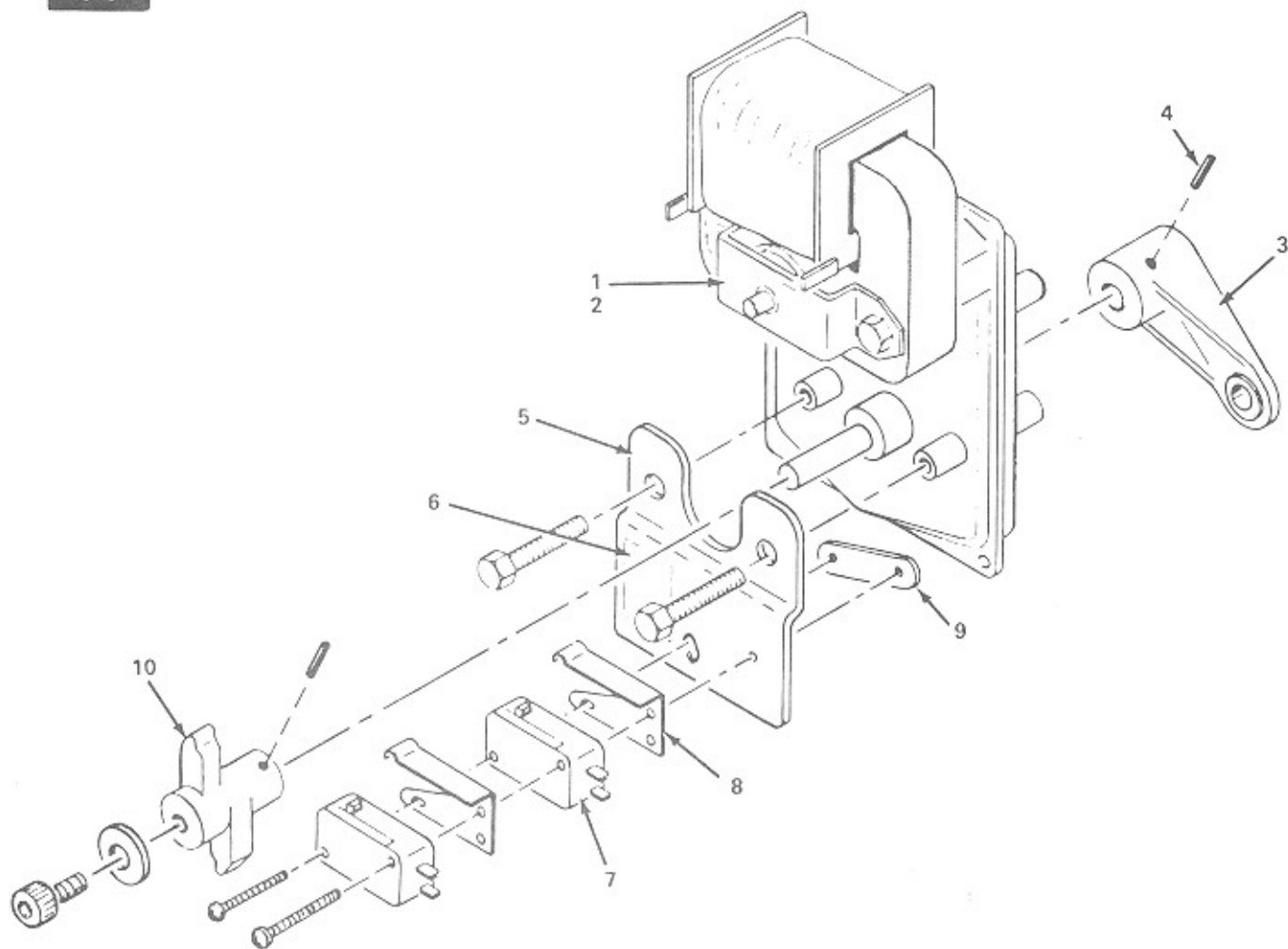


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-14	4-07208-01	Cam Switch & Motor Assembly (Figure 1, Sheet 1, Item 15)	
1	3-07908-01	. Motor & Crank Assembly.....	1
2	4-07209-01	. Cam Motor.....	1
3	2-18104-01	. Trunnion Crank.....	1
4	7-01131-16	. Roll Pin.....	2
5	3-07909-01	. Switch Plate.....	1
6	2-18169-01	. Cam Switch Label.....	1
7	2-10731-01	. Switch.....	2
8	2-10829-01	. Switch Actuator.....	2
9	2-10830-01	. Twin Nut.....	1
10	3-07934-01	. Switch Cam.....	1

OBA-2 KIT R-90

FIGURE
15

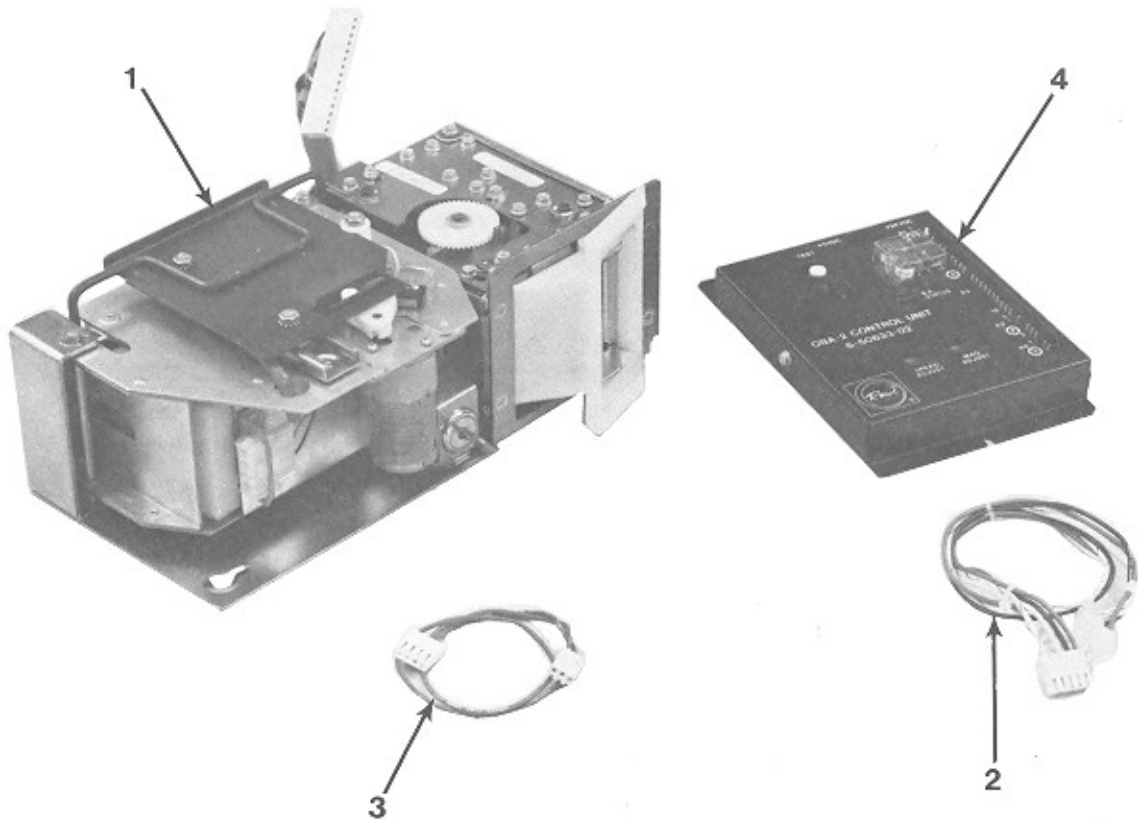


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-15	6-50570-22	OBA-2 Kit R-90	
1	6-09915-02	. Transport & Stacker Assembly (OBA-2).....	1
2	3-09066-01	. Bill Stacker Harness Assembly.....	1
3	3-09067-01	. Credit Harness Assembly.....	1
4	6-50633-02	. Control Unit OBA-2.....	1

**FIGURE
16**

TRANSPORT ASSEMBLY OBA

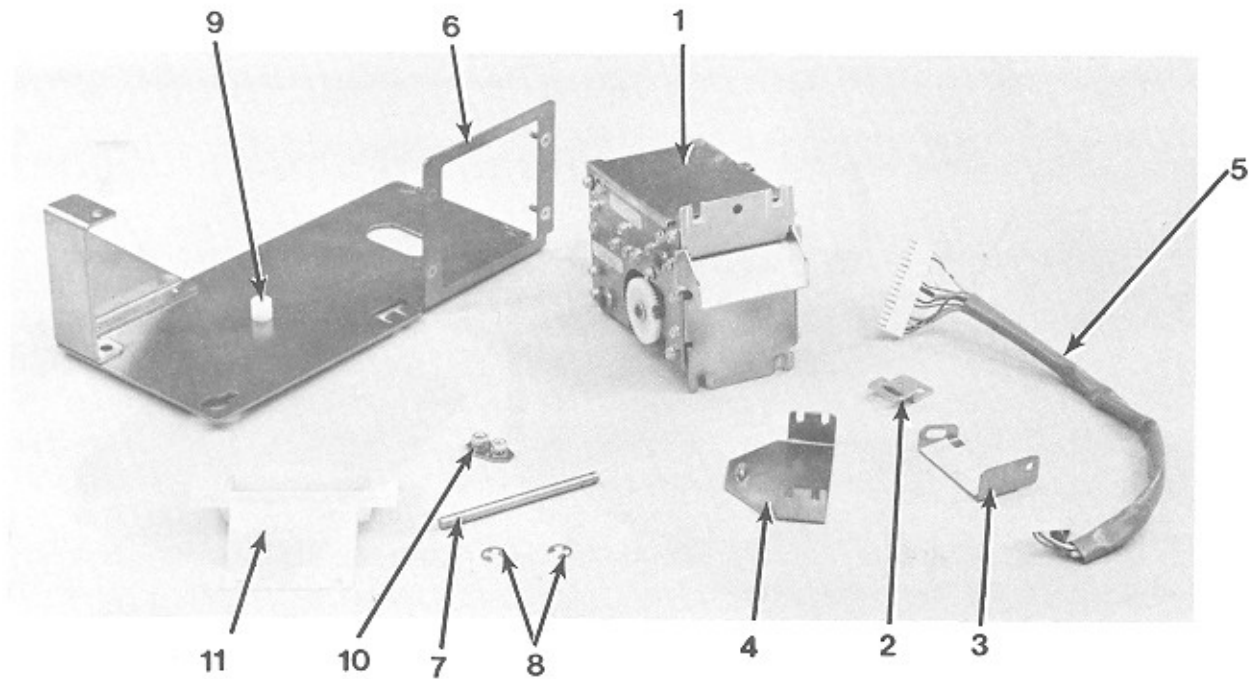


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-16	6-50565-12	Transport Assembly OBA (R-90)	
1	6-50565-11	. Transport Assembly OBA-2 (1 & 5) BC-1).....	1
2	2-18931-01	. Bill Transport Brace Bracket.....	1
3	3-09061-01	. Harness Support Bracket.....	1
4	3-09062-01	. Plate & Stud Assembly.....	1
5	4-50702-01	. Interconnect Harness Assembly.....	1
6	4-08039-01	. Bracket & Support Assembly.....	1
7	2-15347-08	. Pivot Pin.....	1
8	7-01430-04	. External Retaining Ring.....	2
9	2-15358-05	. Plastic Nut (Self-Retaining).....	1
10	2-18930-01	. Lock Plate Assembly.....	1
11	4-08023-01	. OBA Phono Shroud.....	1

STACKER ASSEMBLY OBA

FIGURE
17

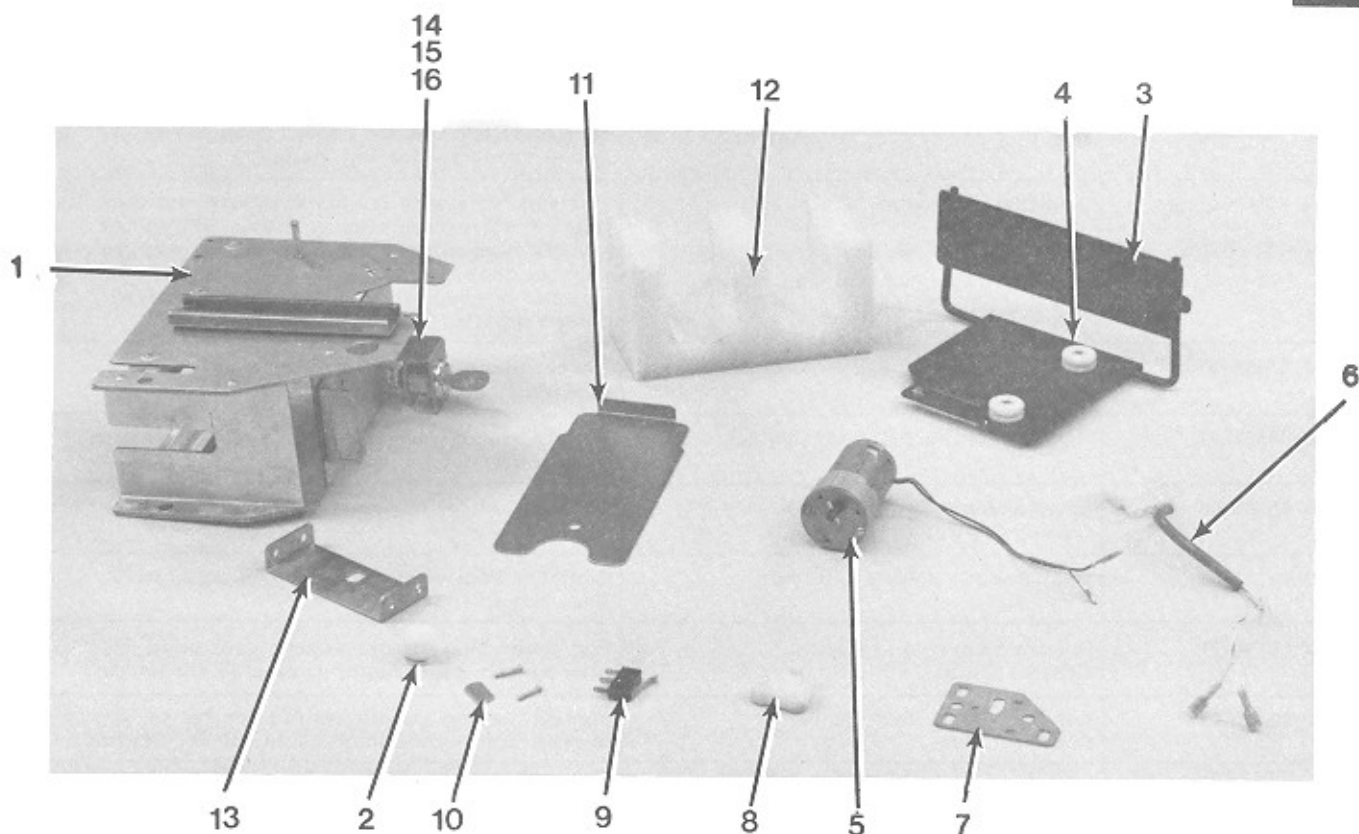


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
-17	6-07979-03	Stacker Assembly OBA (300 Bill)	
1	4-07915-02	. Bill Box Assembly (Rivet).....	1
2	2-16292-01	. Guide Spacer.....	1
3	4-07918-02	. Push Plate Assembly (Weld).....	1
4	2-16300-01	. Slide Spacer.....	2
5	3-08781-01	. Motor & Pin Assembly.....	1
6	2-16290-01	. Motor Harness Assembly.....	1
7	3-08777-01	. Motor Mounting Plate.....	1
8	3-08774-02	. Bill Stacker Cam.....	1
9	2-16309-01	. Miniature Switch.....	1
10	2-16307-01	. Twin Nut.....	1
11	3-50392-04	. Pressure Plate.....	1
12	2-50961-06	. Foam Block.....	1
13	3-09063-01	. Bill Stacker Stop Plate.....	1
14	7-01620-08	. Lock Cylinder (Indiv. Keying).....	1
15	7-01660-12	. Straight Lockbolt.....	1
16	2-18932-01	. Lock Bracket.....	1

TABLE I-1 ACCESSORY EQUIPMENT

PART NO.	DESCRIPTION	FUNCTION
6-50570-23	One & Five Dollar Bill Acceptor Kit (Includes Bill Stacker)	Accepts valid one & five dollar bills
2-66946-04	Phono Paging System	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
2-66947-02	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.
2-67003-01	125/130 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.
6-08980-04	Remote Volume Power Switch & Cancel Control	Volume Control incorporates on-off switch. 115 V 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.
6-65047-08	Service Kit	Includes Central Computer, Mech. Control, Power Supply Board and Fuses.
6-07447-01	Extension Speaker (Model EX 350)	32 watt, two channel system includes 3½-inch tweeter and 10-inch bass speaker.
6-09025-01	WRF Wallette Wallbox	Remote control unit for solid state phonograph. R-90 and video takes nickels, dimes, quarters and half dollars.
2-66989-06	Wallbox Adaptor Harness Kit (WRF)	For making internal connections in phonograph to allow installation of WRF Wallbox.
4-06891-01	Auxiliary Power Supply	Permits operation with WRA, WRB, WRC, WRD & WRE, WRF Wallboxes.
0-05080-00 Belden No. 8447 Columbia No. 4082	7 Conductor Cable	For connecting WRF to phonograph. (Not supplied by Rowe)
2-66995-03	Security Bar Kit	Heavy steel bar locks in place over cash box door.
2-67025-01	Conversion Kit	Converts WRE to WRF Wallette
2-67028-02	Wallbox Interface Kit	Permits operation of WRA, WRC, WRD, WRE, and Seeburg wallboxes with R-90 phono.
2-67040-01	Paint - Touch up (Spice Metallic Dark)	
2-67041-01	Paint - Touch up (Rose Beige Metallic Light)	
2-67042-01	Paint - Touch up (Day Star Blue Dark)	
2-67043-01	Paint - Touch up (Ensign Blue Dark)	