ROWE

R-93 Phonograph

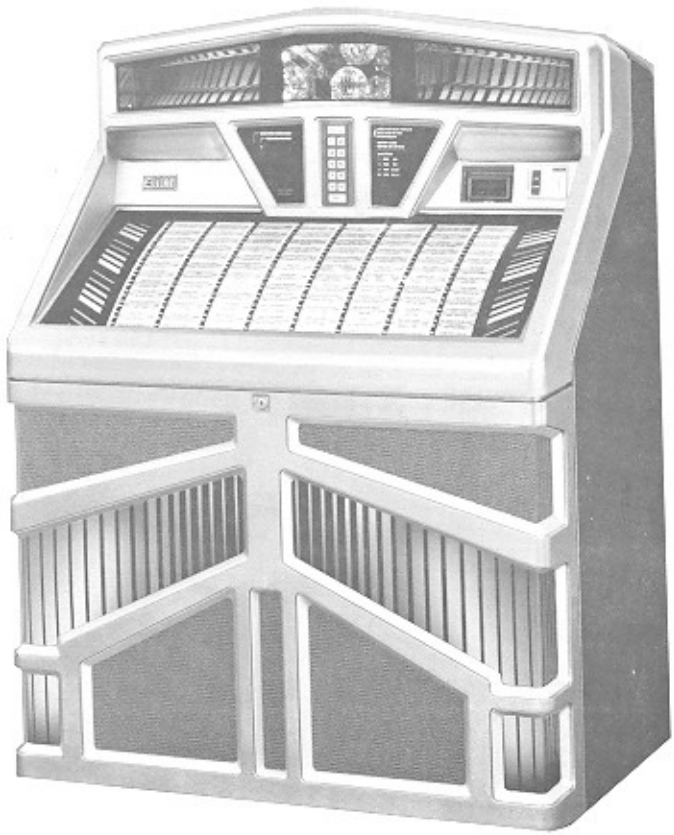
Field Service Manual and Parts Catalog

21822612
FIRST EDITION

R-93 Phonograph

FIELD SERVICE MANUAL

AND PARTS CATALOG



ROWE

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(616) 243-3633

Printed In USA

Part No. 21822612
First Edition
First Printing August 1988

warranty

Rowe extends to the original operator of this equipment the following warranty:

All parts are guaranteed to be free of defects in material and workmanship for the specific periods which follow. Rowe agrees to repair without charge during such period any part which proves defective upon examination by Rowe. All costs of shipping an allegedly defective part to or from Rowe's offices shall be borne by the original operator.

Phono Mechanism Moving Parts	5 Years
Electronic Circuit Boards	2 Years
Electrical and Mechanical Parts	1 Year
Lamps and Styli	90 Days
CD Players, VCR's, Monitors, and CD Decks	1 Year

In the case of parts supplied to Rowe as components, Rowe extends the same warranty period as extended by the original manufacturer.

The above warranty applies provided that all parts of the machine have been serviced properly as directed in the service manual, and provided the alleged defective part, upon examination by Rowe, shall prove to be thus defective.

This warranty will not apply to any machine or any part which has been subjected to any accident, abuse, or misuse.

ROWE INTERNATIONAL, INC. EXTENDS NO WARRANTY, EXPRESSED OR IMPLIED, TO PURCHASERS OR USERS OF ITS PRODUCTS EXCEPT AS HEREIN SET FORTH, WHETHER BY OPERATION OF LAW OR OTHERWISE.

8-88

THIS EQUIPMENT HAS BEEN TESTED TO COMPLY WITH THE FCC STANDARDS FOR LIMITING RADIO AND TV INTERFERENCE. (FCC 47 CFR PART 150)

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-93 Phonograph information in this manual. We have expanded this manual so that it provides all service information in one manual.

A "Shop" manual is not available for the R-93 Phonograph. All of the information that had been previously supplied in the shop manual is now available in this manual.

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

- **Section 1** Contains a general introduction to the R-93 system and its major components.
- **Section 2** Contains unpacking instructions, a programing guide, and step-by-step programing and pricing instructions.
- **Section 3** Provides routine maintenance, preventive maintenance, lubrication schedules, adjustments, and replacement procedures.
- **Section 4** Contains all CBA-2 service information, including schematics and components lists.
- **Section 5** Contains troubleshooting aids, schematics, and component lists for all R-93 standard modules other than the CBA-2.
- **Section 6** Contains specifications and reference material.
- **Glossary** Defines the words, terms, and phrases that are used in this manual.
- **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, route operators, and technicians as a complete source for maintenance information.

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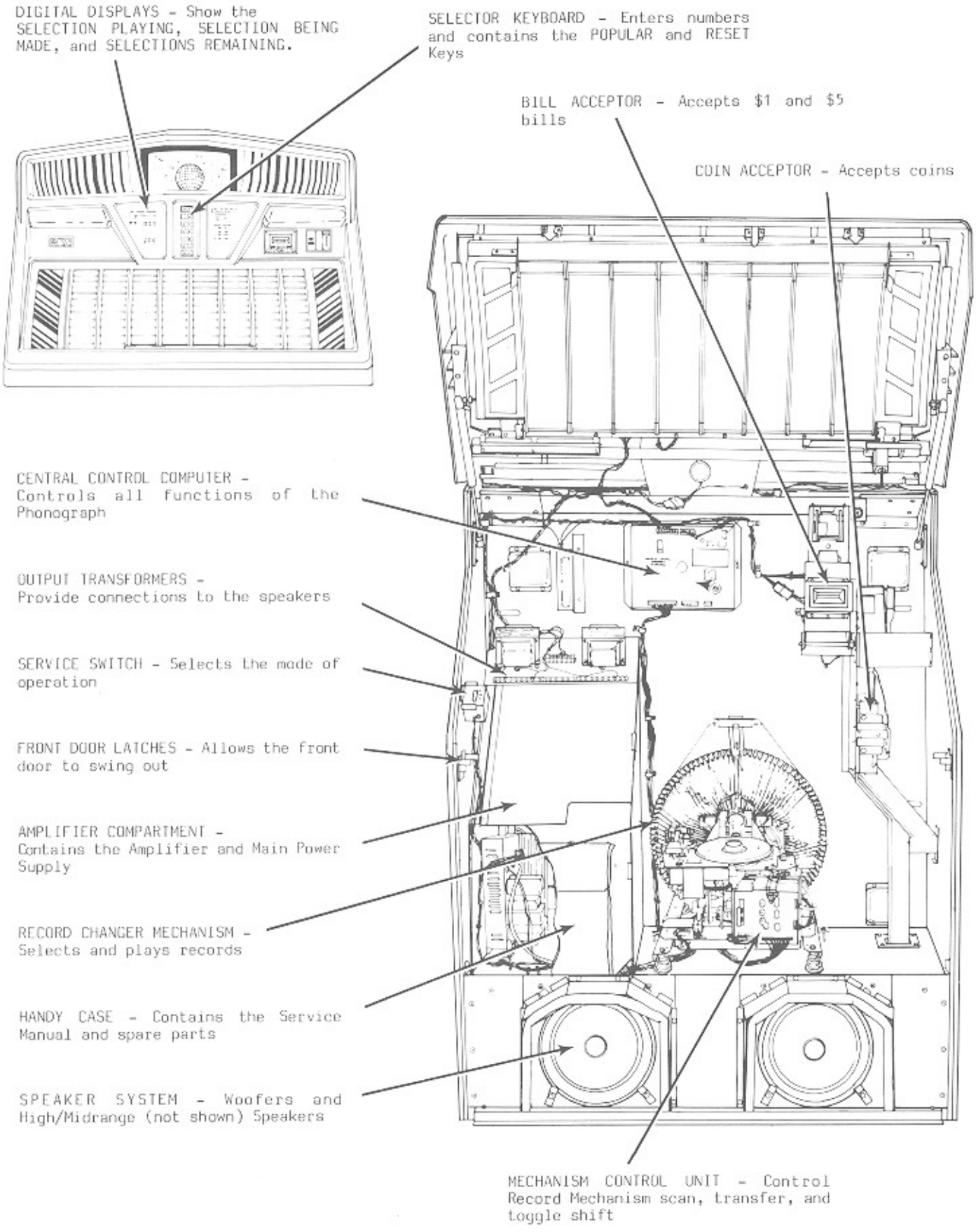


Figure 1-1. R-93 Major Components

SECTION 1 SYSTEM DESCRIPTION

INTRODUCTION

The Rowe R-93 is a 200 selection stereo phonograph. The R-93 is 100% microprocessor controlled.

MAJOR COMPONENTS

Figure 1-1 shows the major R-93 Phonograph components. Take a minute to familiarize yourself with these components.

Table 7-1 lists the accessories that you may have in addition to the standard phonograph.

Record Selection System

Record selections are made by entering the three digit selection number on the selector keyboard (keyboard). (see figure 1-2)

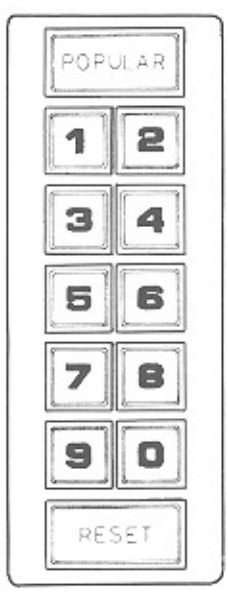


Figure 1-2. Keyboard

The keyboard 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.

Central Control Computer

The central control computer (CCC) keeps track of all of the phonograph's activities and determines what the various components are to do next. The CCC 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 programed values

Memorec

Memorec is the part of the CCC 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 programed list. The choice of which selections are chosen, the selection sequence, and the selection interval can be programed by the owner or service person.

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 1-3) 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.

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

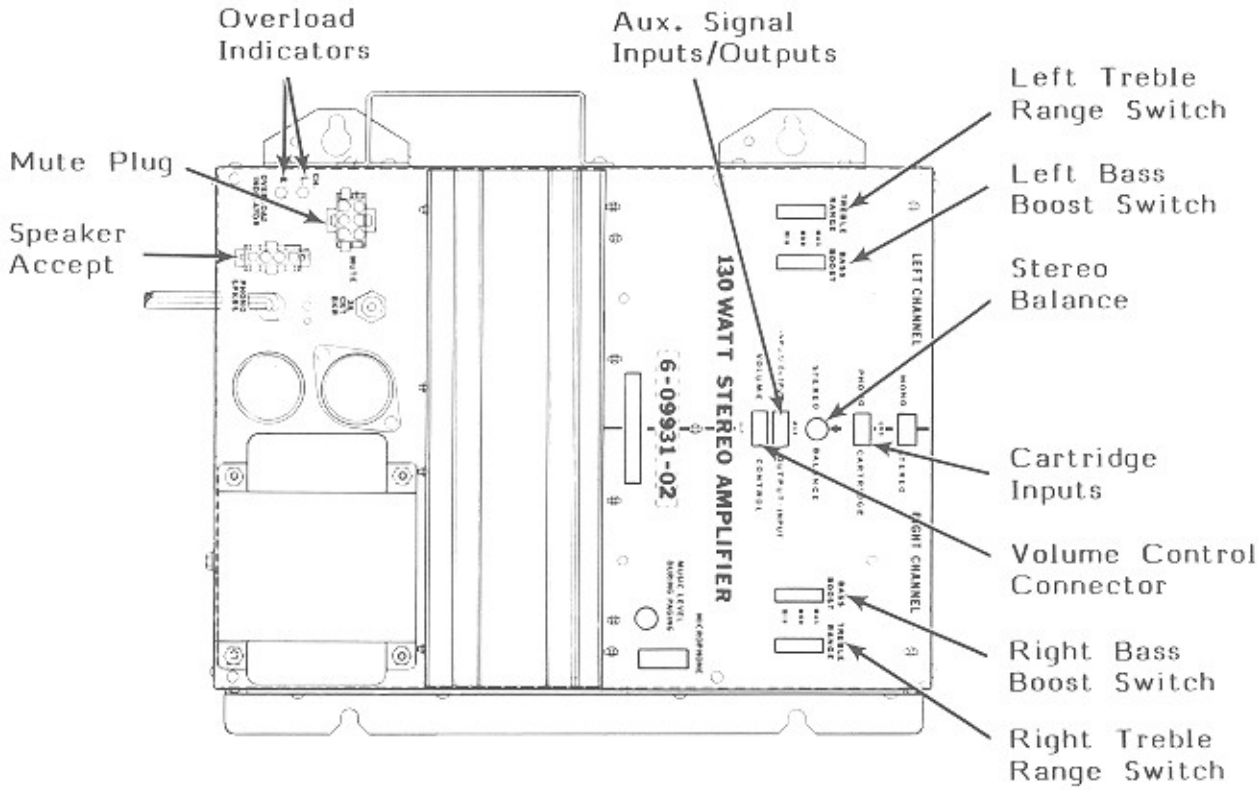


Figure 1-3. 130 Watt Stereo Amplifier Components

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.

Record Changer Mechanism

The record changer mechanism, also referred to as the "mechanism" or "mech", 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.

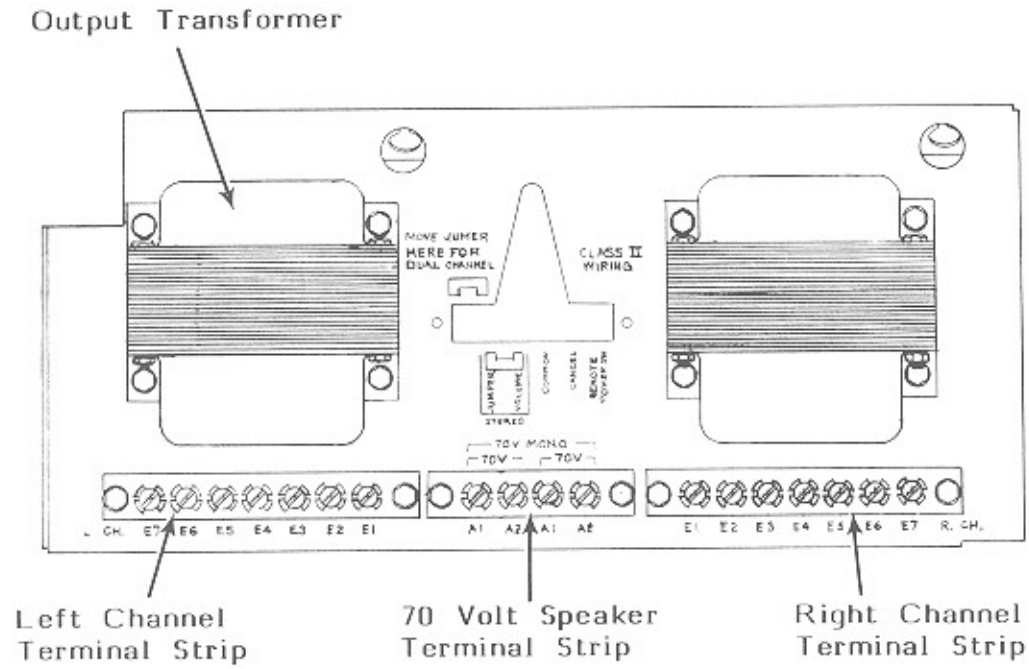


Figure 1-4. Output Transformer Package Components

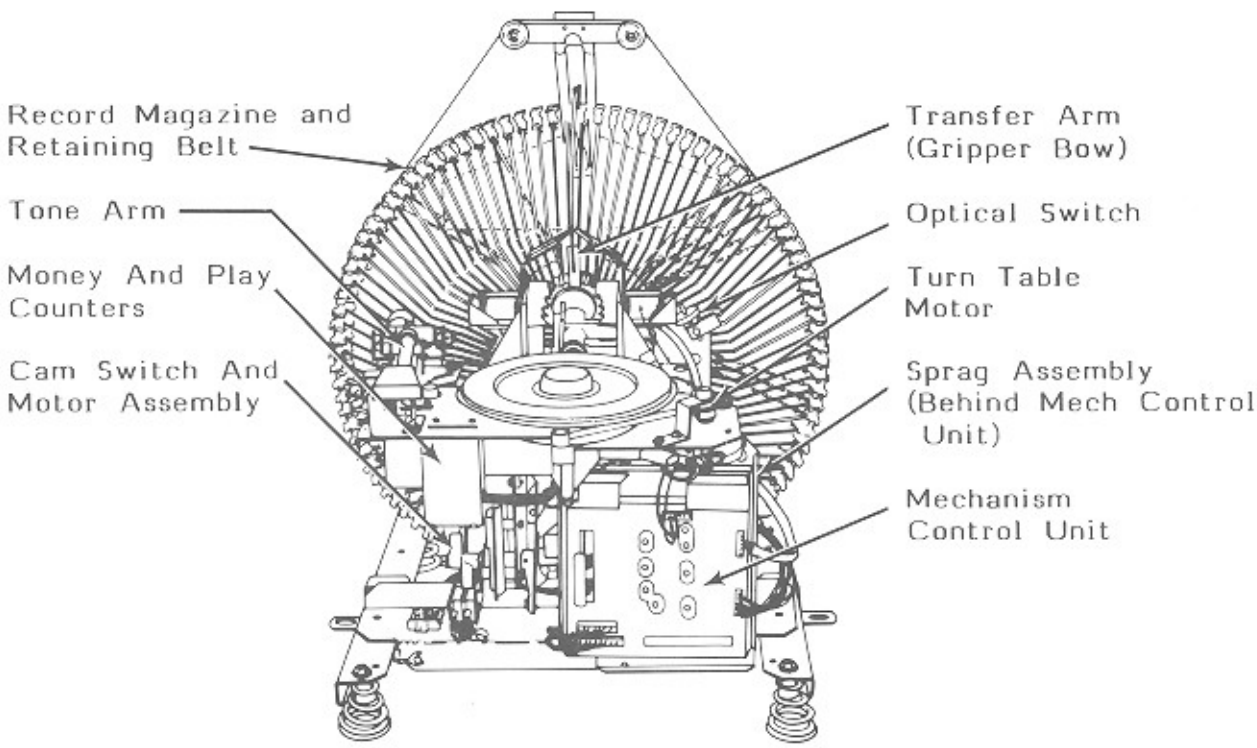


Figure 1-5. Record Changer Mechanism

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 CCC 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.

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 300 RPM (at 60 Hz) synchronous motor.

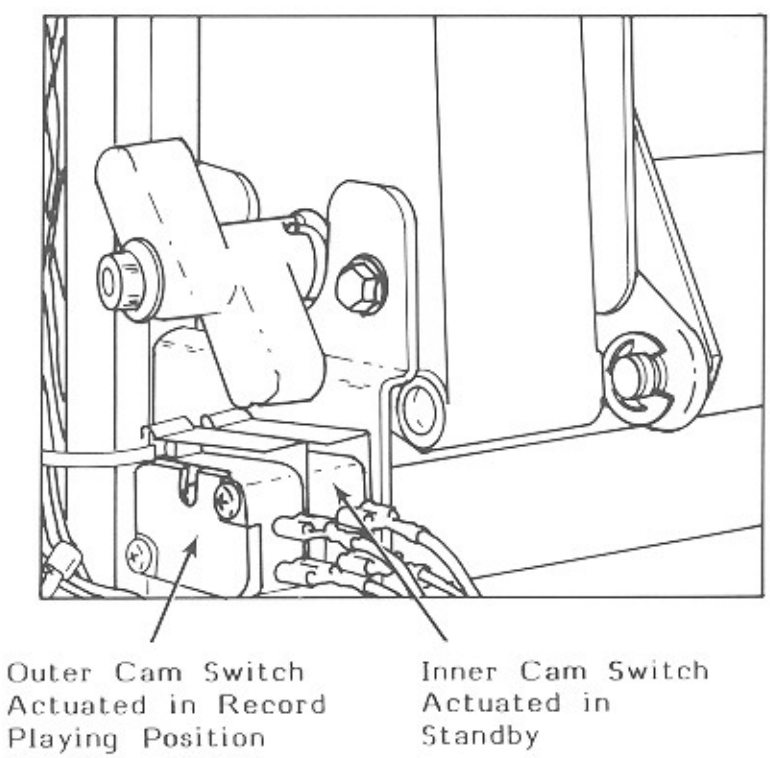


Figure 1-6. Cam Switch and Motor Assembly

Main Power Supply

The main power supply (see figure 1-7), located inside the amplifier compartment, distributes unregulated +28 VDC, 28 VAC, and regulated +8 VDC 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.**

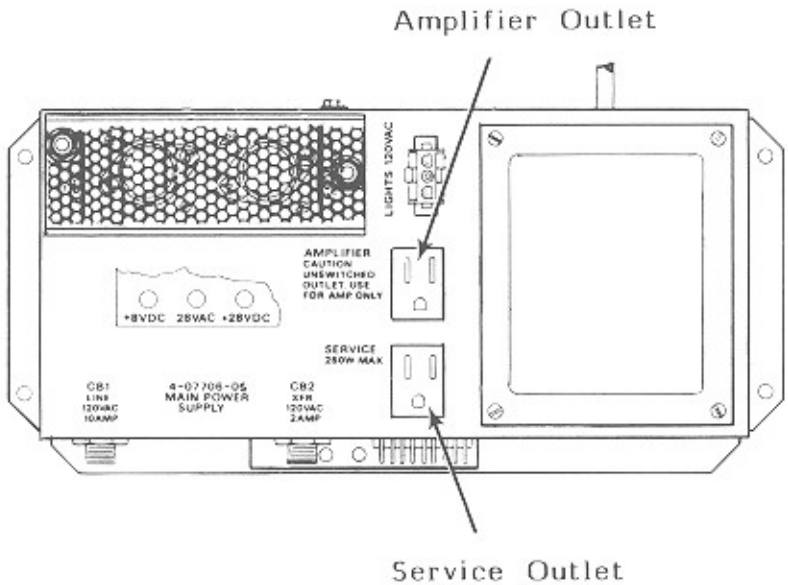


Figure 1-7. Main Power Supply

SECTION 2 INSTALLATION AND PROGRAMMING

INTRODUCTION

This section contains information for unpacking the R-93 and installing it on location. The phonograph is shipped with all major components in place. Save all tie-down hardware in case the R-93 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 phonograph 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 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 phonograph cabinet (see figure 2-1).

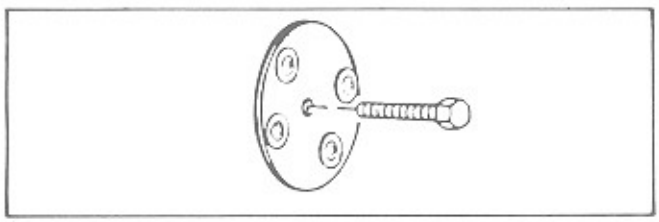


Figure 2-1. Shipping Bolt Removal

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.

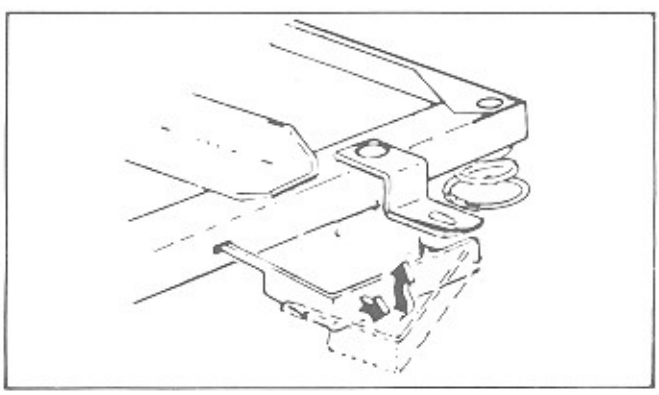


Figure 2-2. Record Changer Tie-Down Brackets

3. Remove the turntable hold-down clip and screw. Replace the screw (see figure 2-3).

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.

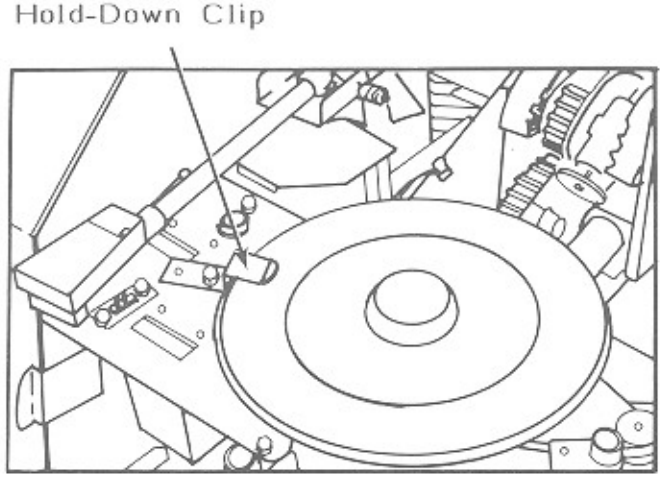


Figure 2-3. Turntable Hold-Down Clip

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 phonograph 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.

PROGRAMING THE CREDIT AND SELECTION SYSTEM

The Programing Mode

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

1. Move through the memory locations sequentially. (Use this technique to examine all the locations and change them as needed)

2. Move to specific memory locations. (Use this technique for quick access to only those locations that need examination or changing) You can exit the PROGRAMING 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 PROGRAMING mode.

To Enter The Programing 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. Release the POPULAR key. The security code should be changed to a number of your choosing as follows:

   A. Press and hold the RESET key until the prompt (≡) 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 Programing 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
5 Selections for	$1.00
30 Selections for	$5.00

To set Alternate Record prices:

The Handy Case has an Alternate Price Card (see figure 2-4A) that may be substituted for the Standard Price Card. The Handy Case also contains a Price Sheet with printed prices (see figure 2-4B), which can be peeled off and placed at the appropriate spot on the Alternate Price Card.

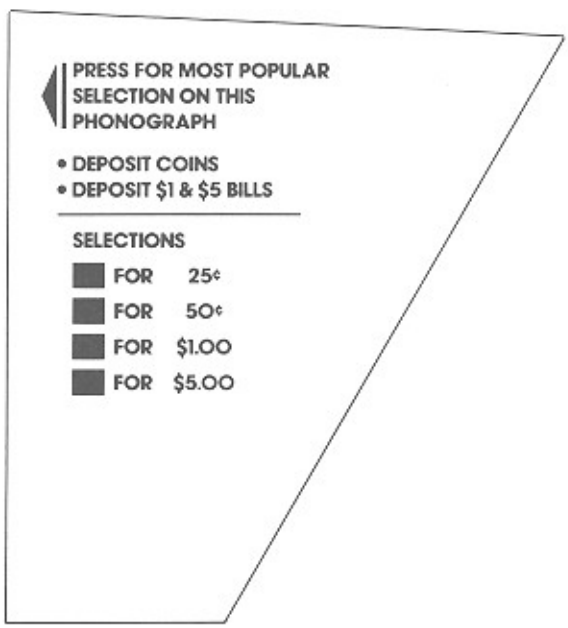


Figure 2-4A. Alternate Price Card

Using the phonograph keyboard, 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.

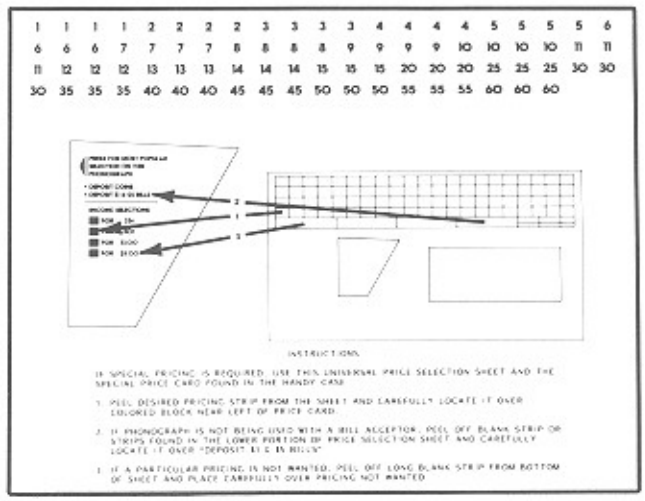


Figure 2-4B. Universal Price Sheet

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 PROGRAMING 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.

Note:

The following example will not give the correct dollar amounts for U.S. money unless Location 25 has been set to 5.

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

5. Enter the lowest record selection price into Location 00. (In this example, enter 25)

6. Enter the next highest price into Location 01. (In this example, enter 100)

7. Enter the next highest amount to be charged into Location 02. (In this example, enter 200)

8. Enter the next highest amount to be charged into Location 03. (In this example, enter 500)

9. Enter the highest amount to be charged into Location 04. (In this example, enter 0 because you 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 this 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 this example, enter 4)

12. Enter the number of record selections to be given for the next highest amount into Location 07. (In this example, enter 12)

13. Enter the number of record selections to be given for the next highest amount into Location 08. (In this 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 this 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 feature 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 programed 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 programed.

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 programed to play selections entered from the keyboard without putting money into the phonograph.

To use this feature, enter the PROGRAMING 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 PROGRAMING 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 PROGRAMING 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 PROGRAMING mode, exit PROGRAMING 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.

Operation	Instructions
Enter PROGRAMING mode	Hold POPULAR while typing security code (factory setting is 000) to display prompt (≡).
To program with top door closed	1. Enter PROGRAMING mode as above. 2. At prompt type 56. 3. Type 255. 4. Press POPULAR. 5. Close top door. 6. Enter PROGRAMING mode to view or change location contents.
View location contents	1. **Sequentially** - Press POPULAR at each location. At Location 99, computer exits PROGRAMING mode. 2. **Skipping locations** - Press RESET for 2 seconds. At prompt, type location number.
Change location contents	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.
Set alternate CD or Video prices	**Locations 10-14 - (CD or Video)** type prices from lowest to highest, pressing POPULAR after each. Type corresponding number of selections in Locations 15-19, pressing POPULAR after each.
Give bill bonus	**Location 26** - Type number of extra 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.
Prevent selection of records ending in 8 or 9	**Location 29 - (160 records Only)** type 255. Press POPULAR.

Operation	Instructions
Set Autoplay style	**Location 32** - Press 0 for no Autoplay 1 for sequential record side "A" 2 for sequential record side "B" 3 for sequential video 5 for programed selections 6 **(Does not apply to R-89)** for sequential both "A" and "B" sides 7 **(Does not apply to R-89)** 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.
Number Of CD Selections From One CD	**Location 46** - Type the maximum number of CD selections to be played from any one disc before playing a different disc or a record.
Lock Out Manual Credit	**Location 47** - Type 0 (255 to disable) to allow credits to be entered from either the MEMOREC ADVANCE or the 700 Command.
Error Display Control	**Location 49** - Type 0 (255 for Memorec display only) so that error codes will be displayed on the keyboard display as well as the Memorec display.
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).
Program with top door closed	**Location 56** - Type 255 (0 to cancel). Press POPULAR.
Set to play records as selected	**Location 57** - Type 255 for FIFO. Press POPULAR. (Must be 255 for CD)
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. **(Continued)**

Operation	Instructions
	Location 97, Continued
	Press 1 to clear popularity totals with Memorec switch.
	Press 2 to clear 5xx totals from PROGRAMING mode and popularity totals with Memorec RESET Switch. Press POPULAR after making choice.
Exit PROGRAMING mode	Hold RESET for 2 seconds, then type 99999.

Note: See Section 3 of the R-93 Field Service Manual for details on resetting Memorec.

STANDARD PROGRAMING CODES

R-93 Phonographs are shipped with the following locations set to the "Factory Setting".

Location	And Description	45 RPM	Video	CD
00	Lowest record price on the price card	25	100	100
01	Next highest record price on the price card	50	500	200
02	Next highest record price on the price card	75	0	500
03	Next highest record price on the price card	100	0	0
04	Highest record price on the price card	500	0	0
05	Number of record plays for lowest record price on the price card	1	4	4
06	Number of record plays for next highest record price on the price card	2	20	8
07	Number of record plays for next highest record price on the price card	0	0	25
08	Number of record plays for next highest record price on the price card	5	0	0
09	Number of record plays for next highest record price on the price card	30	0	0
10	Lowest Video or CD price on the price card	50	100	100
11	Next highest Video or CD price on the price card	100	500	200
12	Next highest Video or CD price on the price card	0	0	500
13	Next highest Video or CD price on the price card	0	0	0
14	Highest Video or CD price on the price card	500	0	0
15	Number of plays for the lowest Video or CD price on the price card	1	2	4
16	Number of plays for the next highest Video or CD price on the price card	2	10	8
17	Number of plays for the next highest Video or CD price on the price card	0	0	25
18	Number of plays for the next highest Video or CD price on the price card	0	0	0

Location	And Description	45 RPM	Video	CD
19	Number of plays for the highest Video or CD price on the price card	10	0	0
20	Coin Switch #1 Value (Coin Switches #1, #2, and #3 are standard)	1	1	1
21	Coin Switch #2 value (Coin Switches #1, #2, and #3 are standard)	2	2	2
22	Coin Switch #3 value (Coin Switches #1, #2, and #3 are standard)	5	5	5
23	Coin Switch #4 value	10	10	10
24	Bill value	20	20	20
25	Coin Switch Multiplier (Always 5 for U.S. money)	5	5	5
26	Bill Bonus	0	0	0
27	Free Play (255=Free Play)	0	0	0
28	Retain Selections Remaining during power failure (255=Retain, 0=Reset)	255	255	255
29	Prevents selection of records that end in 8 or 9: 255=160 record selections 0=200 record selections	0	255	255
30	Disable power-up delay (must be 0 for video).	255	0	0
31	WRF Wall Box coin ratio: 0 = 1, 2, 5, 10 255 = 1, 2, 4, 8	0	0	0
32	Autoplay style (0 - 7, 3=Video)	2	3	2
33	Time between Autoplay selections in minutes (255=max).	20	10	20
34	Video-to-advertizing play ratio (Video only).	0	0	0
35	Phono ID = 2nd 2 digits	00	00	00
36	Phono ID = 1st 2 digits	00	00	00
37-41	WRE Wall Box data			

Location	And Description	45 RPM	Video	CD
42	Disable early cancel of fill-in record (Video only): 0 = Cancel 255 = Let it play	0	0	0
43	Time limit (in seconds) before a fill-in record is played during a Video search	30	30	30
44	Video-per-record ratio	0	0	0
46	CD selections played in a row on the same disk	2	2	2
47	Disable Manual Credit button (255=Disable, 0=Give Credit).	0	0	0
49	Disable errors on the front display (255=Disable, 0=Show Errors).	0	0	0
50-53	WRE Wall Box data.			
54	Video-to-message ratio.	3	3	3
55	RAM dump Baud rate.	0	0	0
56	255 = Program with top door closed 0 = Cancel	0	0	0
57	CD must = 255: 255 = Play records in order selected 0 = Sequential order of record play	255	255	255
58	Security code number	0	0	0
59	Programed Autoplay Selection #1	0	0	0
60	Programed Autoplay Selection #2	0	0	0
61	Programed Autoplay Selection #3	0	0	0
62	Programed Autoplay Selection #8	0	0	0
63	Programed Autoplay Selection #5	0	0	0
64	Programed Autoplay Selection #6	0	0	0
65	Programed Autoplay Selection #7	0	0	0
66	Programed Autoplay Selection #8	0	0	0
67	Programed Autoplay Selection #9	0	0	0

Location	And Description	45 RPM	Video	CD
68	Programed Autoplay Selection #10	0	0	0
69	Programed Autoplay Selection #11	0	0	0
70	Programed Autoplay Selection #12	0	0	0
71	Programed Autoplay Selection #13	0	0	0
72	Programed Autoplay Selection #14	0	0	0
73	Programed Autoplay Selection #15	0	0	0
80	The Video Selection Number in this location cannot be selected	0	0	0
81	The Video Selection Number in this location cannot be selected	0	0	0
82	The Video Selection Number in this location cannot be selected	0	0	0
83	The Video Selection Number in this location cannot be selected	0	0	0
97	Viewing this location will clear 5XX totals according to the content of this location 1 To clear totals if code 750 entered from Service Mode. 2 To clear totals only when 97 occurs in Programing Mode.	0	0	0
99	Exit code	0	0	0

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

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 or CD selections.

15-19 The corresponding number of Video or CD 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)

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 0.

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 0, 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"

Location	Explanation
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.
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.
46	The CD player can play an hour or longer from one disc. In order to mix selections from other discs and records, enter the maximum number of disc selections that can be played from one disc before another disc will be selected.
47	A 0 in this location allows manual credits to be entered from either the MEMOREC ADVANCE switch or the keyboard. Enter 255 to disable manual credits. The keyboard entry uses the 700 Command (The phonograph must be in the ON position to use the MEMOREC ADVANCE button and in the SERVICE position to use the 700 Command).
49	A 0 in this location will allow the phonograph to display error codes on both the top display and the Memorec display. Enter 255 to limit the error display to the Memorec display.
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. This location must be set to 255 on CD phonographs.
58	A three digit security code can be entered to keep the Programing 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.

Location	Explanation
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 Programing Mode.
99	The computer will exit the Programing 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 phonograph amplifier incorporates circuitry that provides the correct bass compensation at low volume levels.**

ROOM ACOUSTICS:	Dead or Soft Highly Absorbant		Average- Moderately Absorbant		Live or Hard Non-Absorbant	
BASS BOOST AND *TREBLE RANGE CONTROL SETTINGS	Bass	Treble	Bass	Treble	Bass	Treble
DESIRED SOUND LEVEL:						
Loud:	Low	Mod/Max	Low	Mod/Max	Mod	Lim
Moderate:	Low	Max	Mod	Mod//Max	Max	Lim
Soft:	Mod	Max	Max	Max	Max	Mod

* Reduce Treble Range setting as required by noise (scratch) conditions.

Table 2-1. Amplifier Control Settings for Acoustical Compensation

Paging

Paging circuitry is part of the 60792505 Preamplifier. The microphone cable 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.

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 2-4 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.**

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.**

SELECTING SPEAKER POWER

General Instructions

This section will lead you through the power and speaker selection process.

This process consists of three major steps and several smaller steps. The major steps are:

1 - Identifying the extension speakers and computing the extension speaker power

2 - Making the external speaker connections

3 - Determining and selecting the phonograph power

Step-By-Step Instructions

1. Use a pencil (you may want to revise your figures) to fill in the work sheet (Table 2-2) on the following pages.

Table 2-2. Extension Speaker Work Sheet

Extension speakers are available in three general categories: General purpose speakers (4 and 8-ohm speakers), wallbox speakers, and 70-volt speakers.

Use this work sheet to help you calculate the amount of power consumed by the extension speakers.

4-ohm Speakers

Place the quantity of stereo speakers in the blank under QTY and multiply the quantity times the power consumption (show stereo speakers as 2 speakers). Place your results in the TOTAL blank.

4-Ohm Stereo Speakers

	QTY		Total	Connections
Speakers for the 1 watt taps:	____	at 1 watt each =	_____ watts	(E1 to E2)
Speakers for the 1.75 watt taps:	____	at 1.75 watts each =	_____ watts	(E4 to E5)
Speakers for the 4 watt taps:	____	at 4 watts each =	_____ watts	(E1 to E3)
Speakers for the 9 watt taps:	____	at 9 watts each =	_____ watts	(E2 to E4)
Speakers for the 16 watt taps:	____	at 16 watts each =	_____ watts	(E1 to E4)
Speakers for the 16 watt taps:	____	at 28 watts each =	_____ watts	(E1 to E5)

4-Ohm Mono Speakers

Speakers for the 4 watt taps:	____	at 4 watts each =	_____ watts	(E2 to E2)
Speakers for the 16 watt taps:	____	at 16 watts each =	_____ watts	(E3 to E3)

Table 2-2. Extension Speaker Work Sheet
Continued

8-ohm Speakers

Place the quantity of stereo speakers in the blank under QTY and multiply the quantity times the power consumption (show stereo speakers as 2 speakers). Place your results in the TOTAL blank.

8-Ohm Stereo Speakers

	QTY	Consumption	Total	Connections
Speakers for the .5 watt taps:	____	at .5 watt each =	_____ watts	(E1 to E2)
Speakers for the .9 watt taps:	____	at .9 watts each =	_____ watts	(E4 to E5)
Speakers for the 2 watt taps:	____	at 2 watts each =	_____ watts	(E1 to E3)
Speakers for the 4.5 watt taps:	____	at 4.5 watts each =	_____ watts	(E2 to E4)
Speakers for the 8 watt taps:	____	at 8 watts each =	_____ watts	(E1 to E4)
Speakers for the 14 watt taps:	____	at 14 watts each =	_____ watts	(E1 to E5)
Speakers for the 24 watt taps:	____	at 24 watts each =	_____ watts	(E2 to E6)

8-Ohm Mono Speakers

Speakers for the 2 watt taps:	____	at 2 watts each =	_____ watts	(E2 to E2)
Speakers for the 8 watt taps:	____	at 8 watts each =	_____ watts	(E3 to E3)
Speakers for the 32 watt taps:	____	at 32 watts each =	_____ watts	(E4 to E4)

Wallboxes

Place the number of wallbox units in the blank under QTY and multiply the quantity times the power consumption. Place your results in the TOTAL blank.

Wallboxes for the .35 watt taps:	____	at .35 watts each =	_____ watts	(E4 to E4)
Wallboxes for the 1.4 watt taps:	____	at 1.4 watts each =	_____ watts	(E5 to E5)
Speakers for the 5.0 watt taps:	____	at 5.0 watts each =	_____ watts	(E6 to E6)

Table 2-2. Extension Speaker Work Sheet
Continued

70-Volt Speakers

70-Volt speakers have a power tap on them or on their associated transformer. Add together all of the 70-volt speaker tap settings and enter that value: _____ watts (A1 to A2)

Combine all speaker's consumptions:

	Stereo	Mono
4-Ohm:	_____	_____
8-Ohm:	_____	_____
Wallboxes:	_____	_____
70-Volt:	_____	_____

	Stereo		Mono		Grand Total
Totals:	_____	+	_____	=	_____

Subtract the grand total from 130 and write the result in the blank at the end of this line: Power Available For The Phonograph _____

The Grand Total is the amount of power that the phonograph will need to supply to the extension speakers. This amount must be less than 130 watts. If this amount is not less than 130 watts, you must reduce the power used by the extension speakers to reduce the total power consumed; then recalculate the total power consumed.

When you subtract the Grand Total from 130, you will get the "Power Available For The Phonograph" figure. Be sure to write this value down in the blank because you will not be using it until you have wired all of the extension speakers.

2. When you have reached a satisfactory combination of speakers and speaker power consumption, use the CONNECTION column (the connections are in parentheses) as a wiring guide to make the actual connections. Refer to figure 1-1 for the location of the speaker terminal strips and refer to figure 2-4 for typical examples of speaker connections.

Notes:

The amplifier may be connected to a load of 135 watts before distortion will begin to increase beyond specification.

The wallbox speakers have been treated as 45-ohm speakers.

Refer to figure 2-5 for remote volume control connection diagrams.

3. The phonograph wires to change are the Violet (left channel) and the Pink (right channel) on the output transformer assembly (see table 2-3).

   Use table 2-3 as a guide to select the power used by the phonograph. This power should roughly match the amount indicated in "Power Available For The Phonograph" on the previous page.

Table 2-2. Phonograph Speaker Power

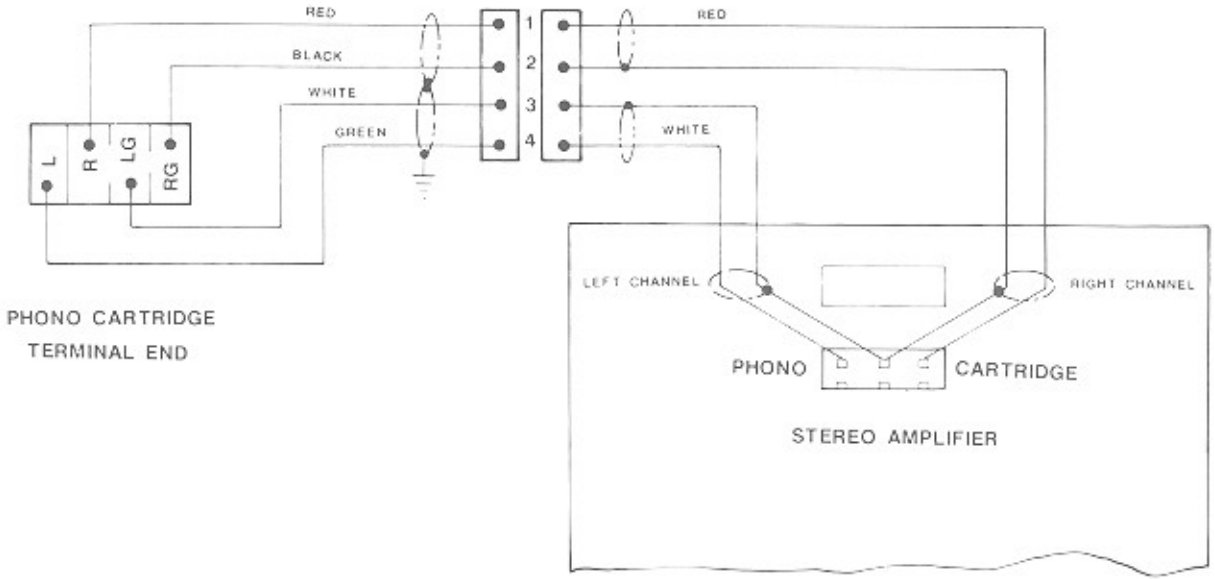
Select the speaker taps that will use up most of the "available Speaker Power"

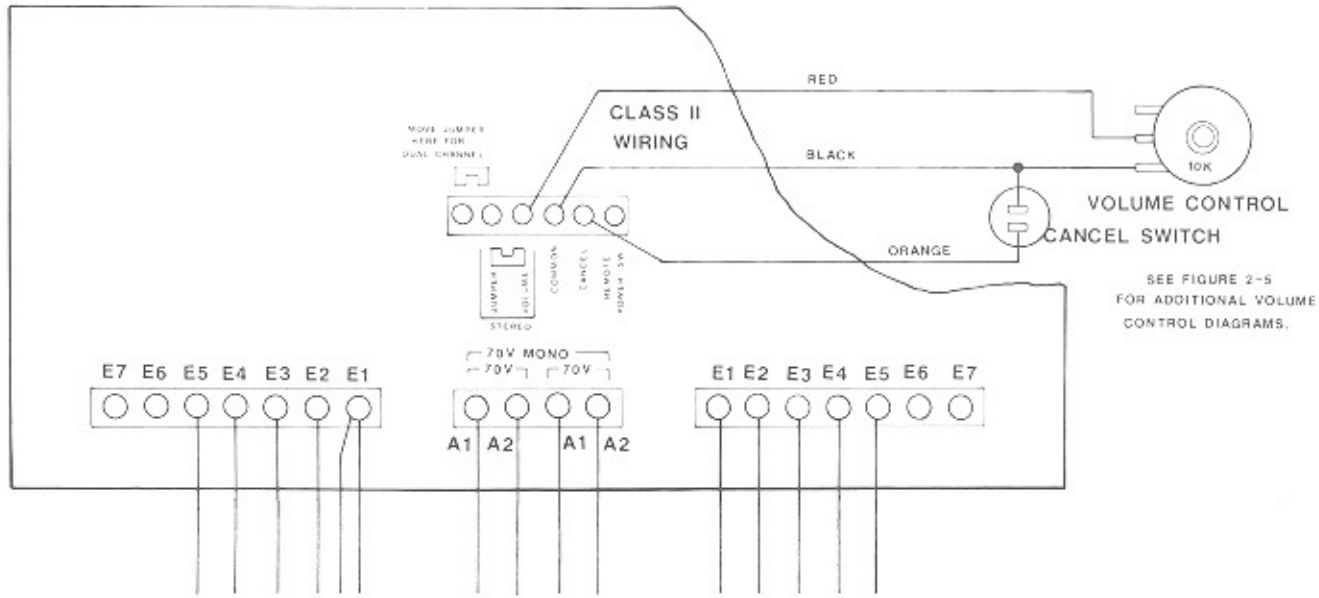
Phono Power[1]	Phono Speaker Connections
1	Violet connects to Left E2, Pink connects to Right E2
4	Violet connects to Left E3, Pink connects to Right E3
16	Violet connects to Left E4, Pink connects to Right E4
28	Violet connects to Left E5, Pink connects to Right E5
64	Violet connects to Left E6, Pink connects to Right E6

Do not move the Black wire, it should stay on either the Left or Right E1 terminal.

---

1 This value is the total for both channels. The power consumption for each channel is one-half of this value.


RED
BLACK
WHITE
GREEN
L
R
LG
RG
1
2
3
4
RED
WHITE
PHONO CARTRIDGE
TERMINAL END
LEFT CHANNEL
RIGHT CHANNEL
PHONO
CARTRIDGE
STEREO AMPLIFIER


CLASS II
WIRING
RED
BLACK
ORANGE
10K
VOLUME CONTROL
CANCEL SWITCH
SEE FIGURE 2-5
FOR ADDITIONAL VOLUME
CONTROL DIAGRAMS.
E7 E6 E5 E4 E3 E2 E1
70V MONO
70V
70V
A1 A2 A1 A2
E1 E2 E3 E4 E5 E6 E7

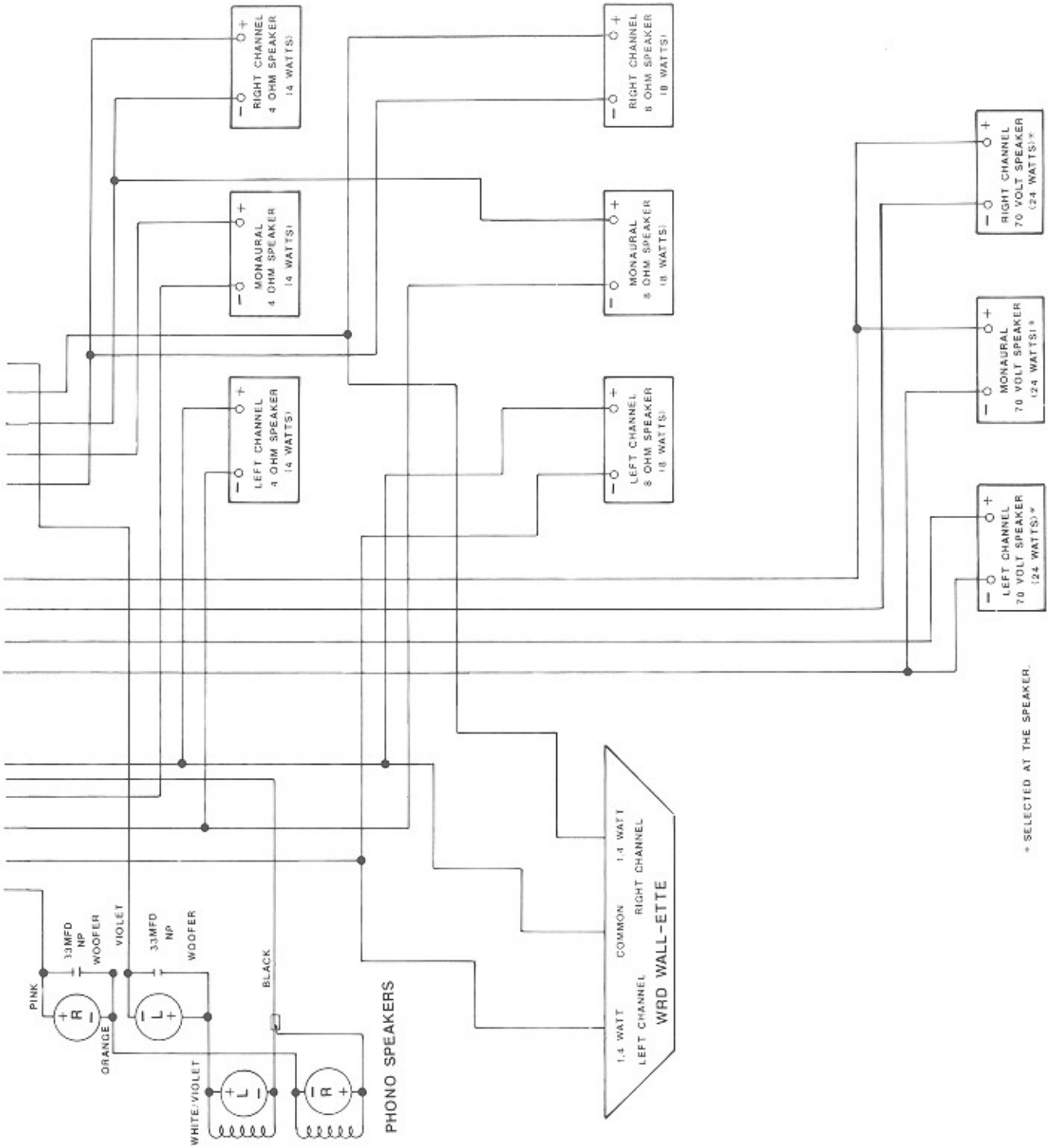
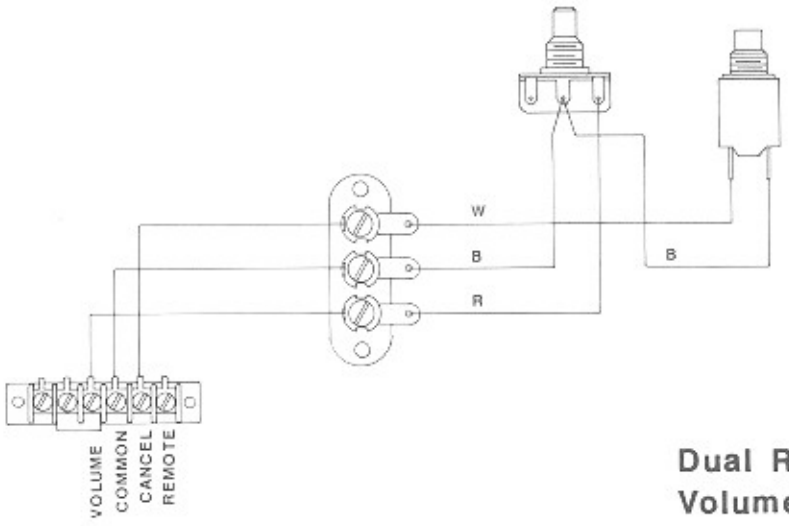
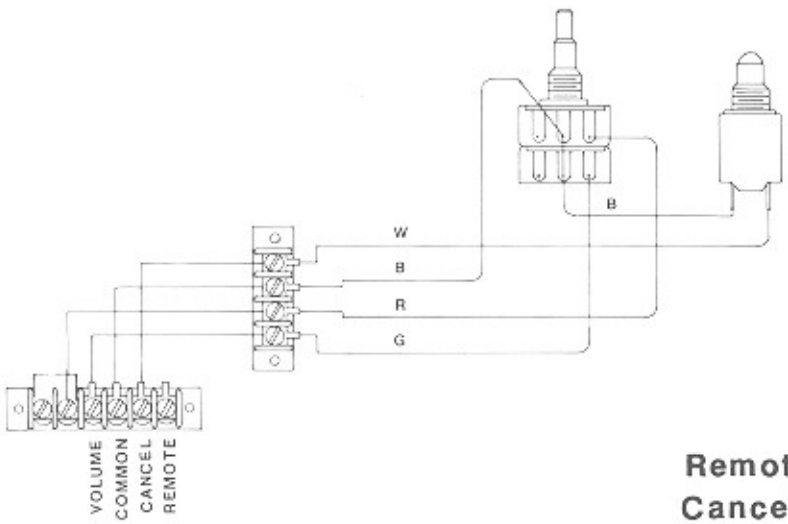


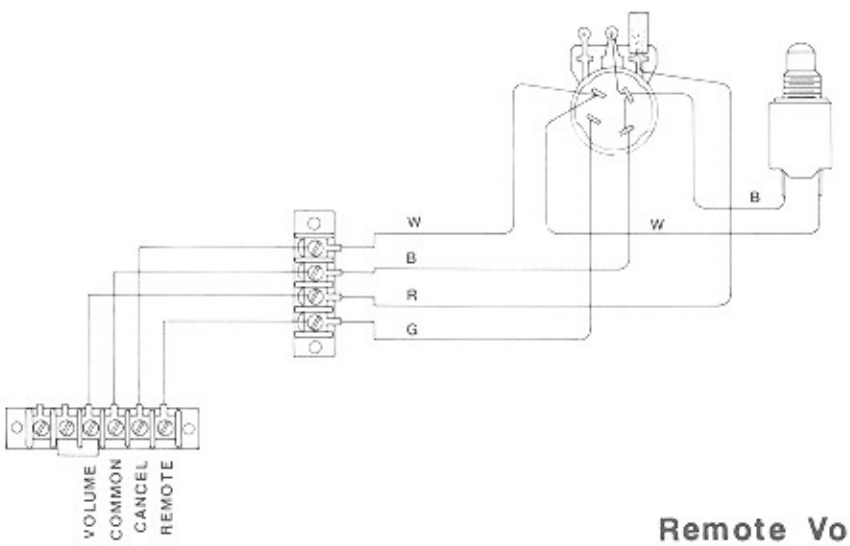
Figure 2-4. Speaker Connections



**Dual Remote &
Volume Control 30632209**



**Remote Volume &
Cancel Control 30632201**



**Remote Volume & Cancel Control
With Power Switch 30632211**

Figure 2-5. Remote Volume Control Diagrams

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-93 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 phonograph cabinet.

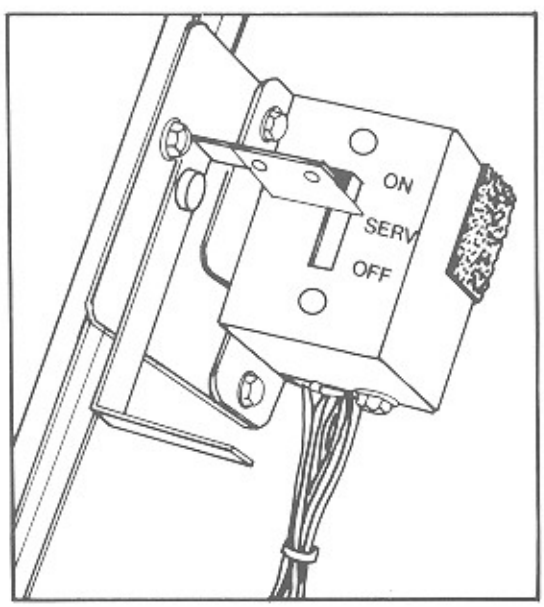


Figure 3-1. Service Switch

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)
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.

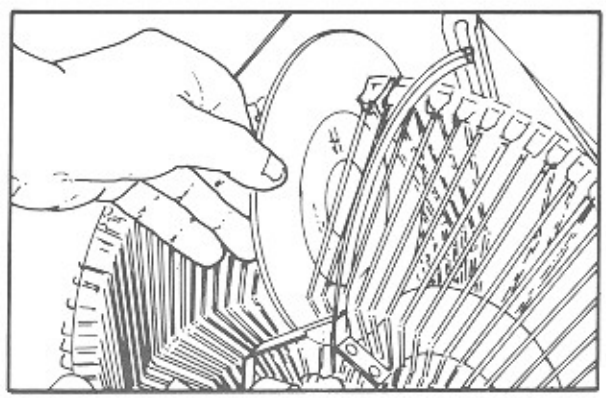


Figure 3-2. Changing a Record

> 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.

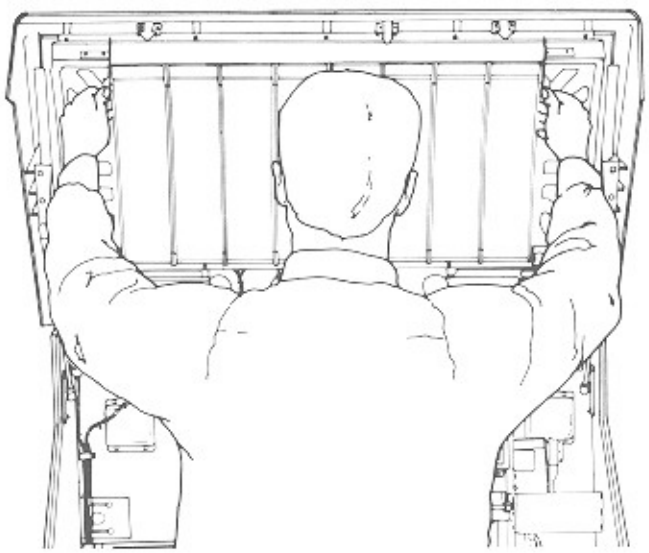


Figure 3-3. Lowering Title Panel

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 3-4. 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)

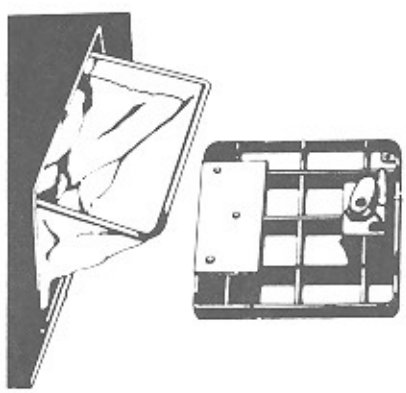


Figure 3-5. Cash Bag Removal

2. Slide the cash bag along its runners until the cash bag is out of the cabinet.

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) Refer to table 3-1 for a complete description of the Memorec commands.

1. Open the phonograph and set the CONTROL console switch to the SERVICE position.

2. Set the VIDEO/RECORD switch on the CCC to either RECORD or VIDEO.

3. Set the POPULAR switch on the CCC to LEAST or MOST (The LEAST position will display the least popular selection. The MOST position will start the display at the most popular selection number). 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 the Memorec totals are reset to zero, they cannot be displayed again. Do not press the RESET button or access Location 97 (with Location 97=2) until you are finished displaying your totals.

Table 3-1. Memorec Commands

Purpose	Command/Location	Notes
DISPLAY POPULARITY		
Step Through MOST-TO-LEAST or LEAST-TO-MOST		Set Memorec switches and press the MEMOREC ADVANCE switch
Select An Individual Audio Selection and Audit its Popularity	1XX or 2XX	The XX is the right two digits of the Selection Number
DISPLAY TOTALS		
Record Selections made with POPULAR button	500	
Total Record Selections	501	
Video Selections made with POPULAR button	502	
Total Video Selections	503	
Total Autoplay	504	
#1 Coins	505	
#2 Coins	506	
#3 Coins	507	
#4 Coins	508	
#1 Bills	509	
#2 Bills	510	
Total Money In Nickels	511	
Total Wallbox Money	512	
Total Money	513	
CD selections can be made with the POPULAR button	514	
Total CD Selections	515	
MAX. NUMBER OF SELECTIONS PER DISC		
Number Of Selections On Disc 50XX	520	
Number Of Selections On Disc 51XX	521	
Number Of Selections On Disc 52XX	522	
Number Of Selections On Disc 53XX	523	

Table 3-1. Memorec Commands
(Continued)

Purpose	Command/Location	Notes
Number Of Selections On Disc 54XX	524	
Number Of Selections On Disc 55XX	525	
Number Of Selections On Disc 56XX	526	
Number Of Selections On Disc 57XX	527	
Number Of Selections On Disc 58XX	528	
Number Of Selections On Disc 59XX	529	
NUMBER OF TIMES DISC WAS SELECTED		
Number Of Times Disc 50XX Was Selected	540	
Number Of Times Disc 51XX Was Selected	541	
Number Of Times Disc 52XX Was Selected	542	
Number Of Times Disc 53XX Was Selected	543	
Number Of Times Disc 54XX Was Selected	544	
Number Of Times Disc 55XX Was Selected	545	
Number Of Times Disc 56XX Was Selected	546	
Number Of Times Disc 57XX Was Selected	547	
Number Of Times Disc 58XX Was Selected	548	
Number Of Times Disc 59XX Was Selected	549	

Table 3-1. Memorec Commands
(Continued)

Purpose	Command/Location	Notes
VIEW ERROR CODES	666	
ERROR CODE CLEAR	699	
CLEAR TOTALS		
Popularity and Money	Use Memorec RESET	If Location 97=0
Popularity Only	Use Memorec RESET	If Location 97=1
Money Only	Use a 750 Command from SERVICE mode	If Location 97=1
Money Only	Enter Location 97 while in PROGRAMING mode	If Location 97=2
FREE PLAYS	700	Credits five units ($ .25 U.S. money)
Manual Credit		You can also use the MEMOREC ADVANCE switch to add manual credits if the SERVICE switch is in the ON position.
AUTOPLAY CLEAR	702	Clears programing Locations 59-73 and resets Location 32 to 0.
CLEAR CREDITS	701	Erases all credits
INITIALIZATION		
Video Initialization	770	Used to setup Video players
CD Initialization	777	Used to setup CD players
CLEAR SELECTIONS	799	
DATA DUMP	800	Used with InterRowegator

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 3-2 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.

Table 3-2. 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.

FIVE YEAR LUBRICATION

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

UNSCHEDULED MAINTENANCE

This section contains adjustments, removal, and replacement procedures that are to be followed whenever a malfunction has occurred. Maintenance for the CBA-2 Bill Acceptor is not included. Maintenance procedures for the 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 the 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).

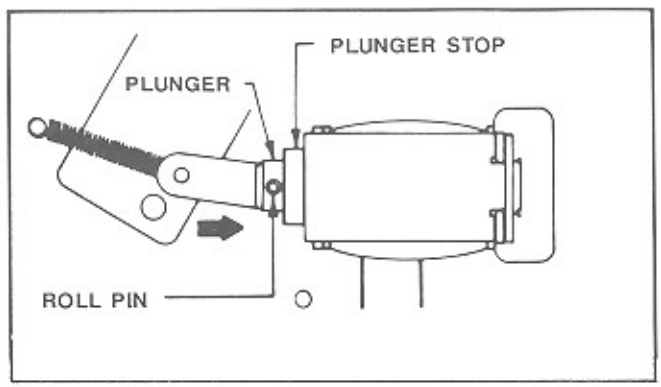


Figure 3-7. Sprag Assembly (Plunger)

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.

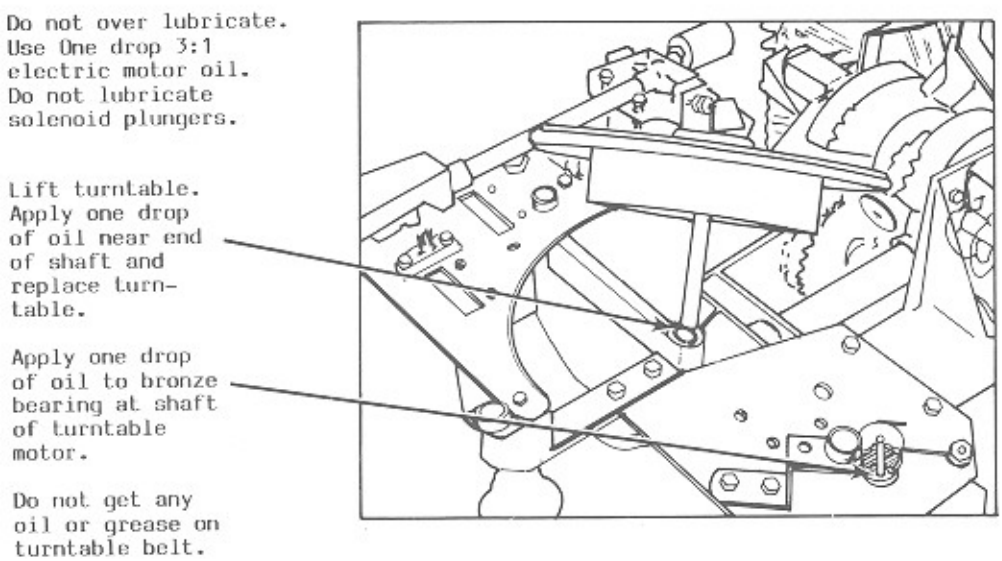


Figure 3-6. Turntable Lubrication

The sprag lever must not touch the sprag wheel and the clearance must be 1/64 to 1/32 inches (see figure 3-8). It will be necessary to remove the sprag assembly if corrections are required.

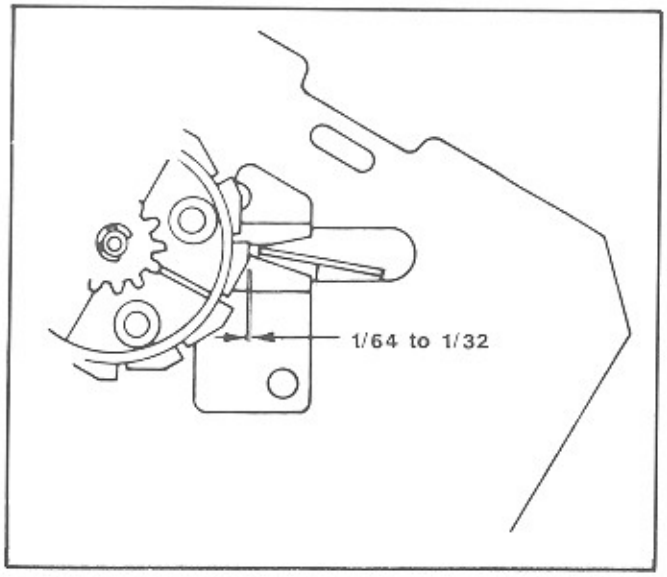


Figure 3-8. Sprag Wheel

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).

2. Loosen the solenoid mounting screws and with the roll pin against the plunger, position the solenoid so that there is a 1/64 to 1/32 inch gap between the sprag lever and the highest point on the sprag wheel (see figure 3-10).

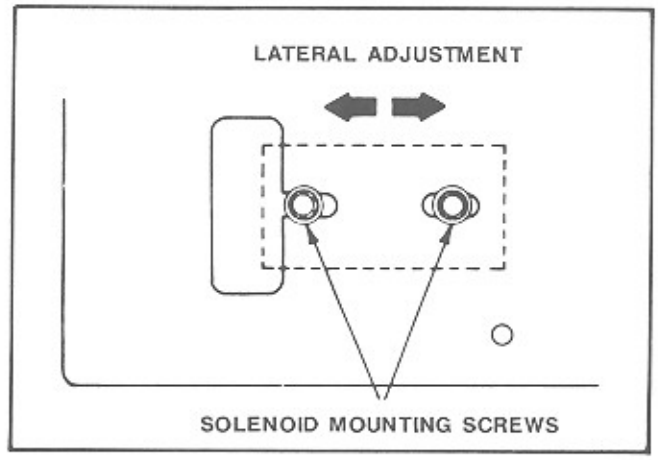


Figure 3-10. Lateral Adjustment

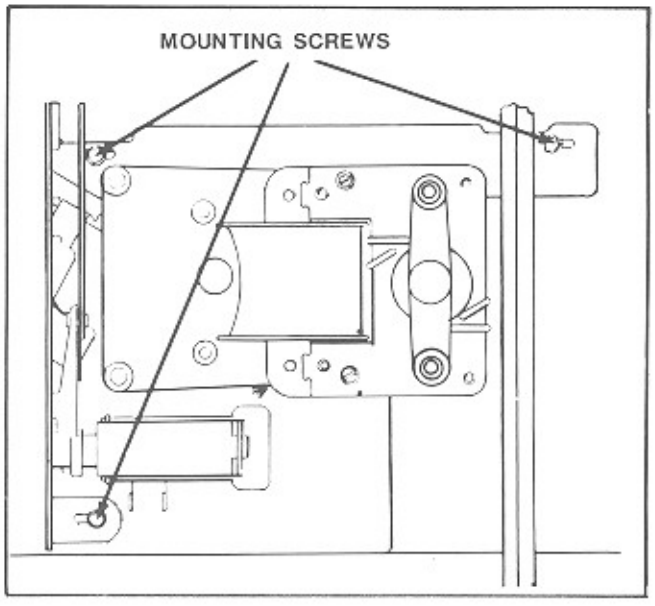


Figure 3-9. Sprag Assembly Removal

3. Tighten solenoid mounting screws.

4. Replace sprag assembly in mechanism with three mounting screws and replace the 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 you need 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 the cam (see figure 3-11).

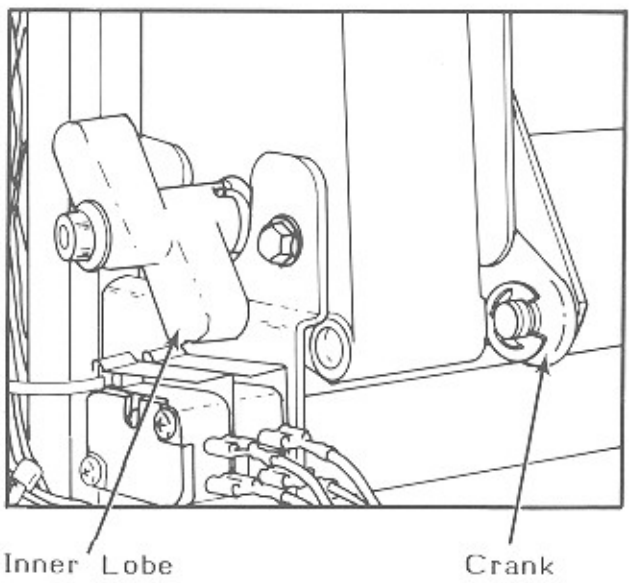


Figure 3-11. Cam Switch

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 the switch housing as required (see figure 3-12).

3. Tighten mounting screw and recheck operation.

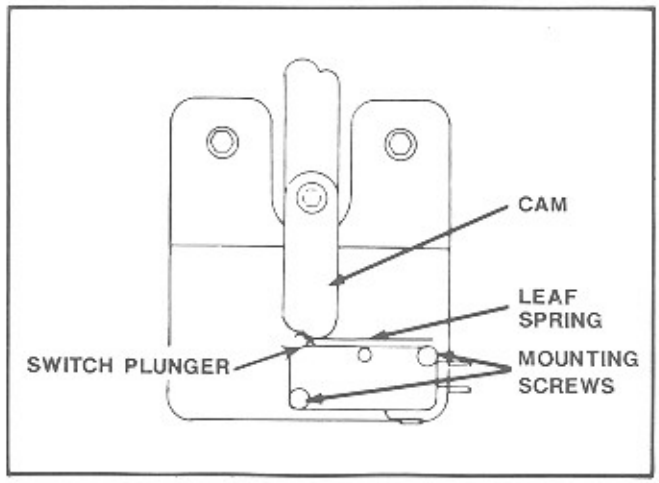


Figure 3-12. Cam Switch Adjustment

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 the 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 the 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 the Allen-head set screws and replace the tone arm.

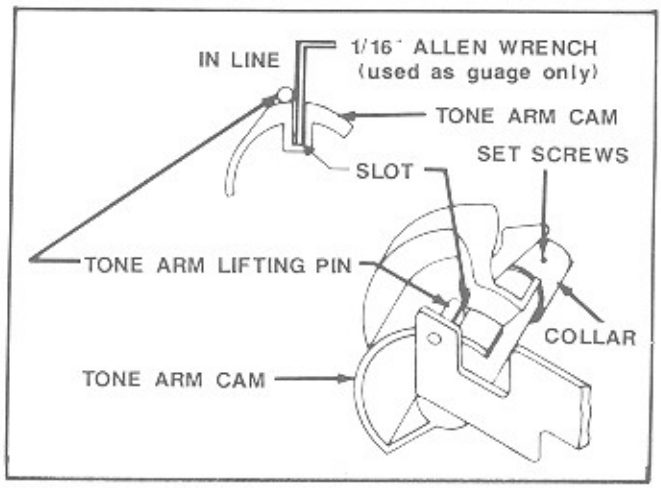


Figure 3-13. Tone Arm Cam Position

Record Magazine Transfer Arm And Support

Adjustment

To eliminate magazine end play and center transfer arm support:

1. Loosen the set screws in rear magazine shaft collar. Push the collar on to magazine shaft to eliminate end play and tighten the screws.

2. Loosen the screw that holds the transfer arm support to the mechanism frame.

3. Adjust the transfer arm support so that the transfer arm is centered in the opening.

4. Tighten the mechanism frame to the transfer arm support screw.

Magazine Belt Adjustment

1. Loosen the two adjustment screws shown in figure 3-14.

2. Raise the bracket to tighten the belt around the magazine.

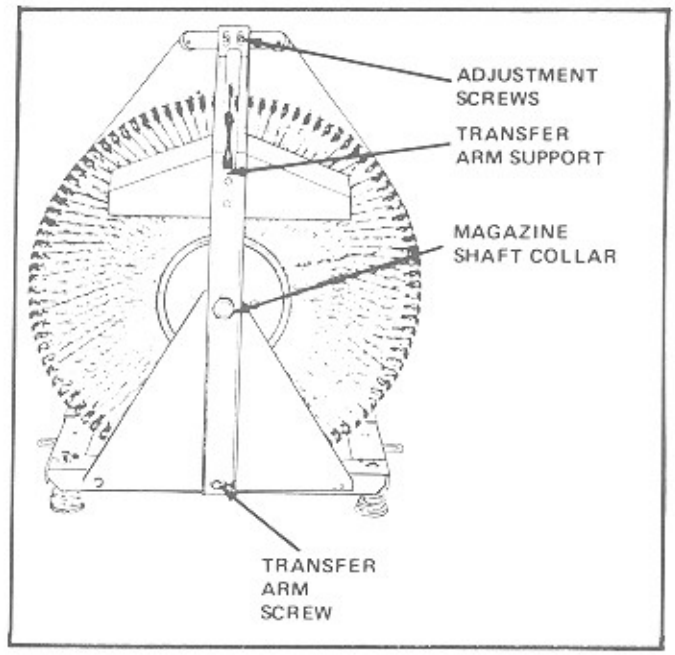


Figure 3-14. Magazine Belt Adjustment

3. Check that belt rides evenly in the center of the belt guides, all the way around the magazine.

4. Tighten the two adjustment screws.

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 the magazine sprag lever to engage and lock the magazine in this position.

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

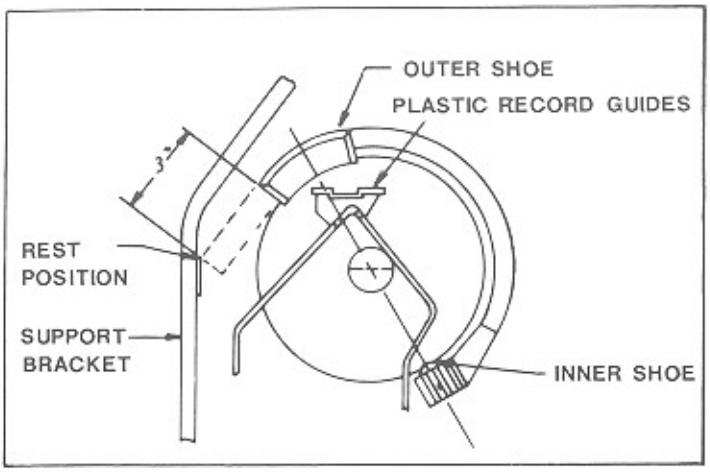


Figure 3-15. Magazine and Transfer Arm Position

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

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

4. Loosen three screws in the magazine motor mounting plate.

5. With sprag wheel locked, move the magazine until the record is centered between belt guides (The adjustment screws will be approximately centered in the slots, see figure 3-16).

6. Tighten the three screws in the magazine motor mounting plate securely.

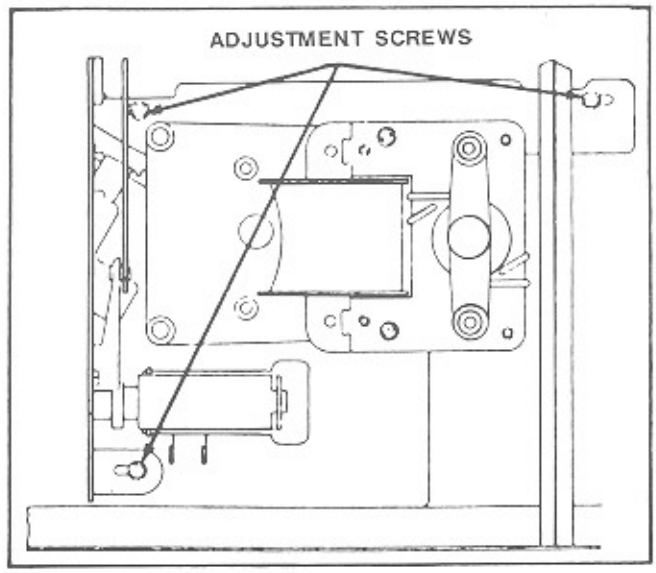


Figure 3-16. Magazine Adjustment

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 3/32 inch Wide and 1/32 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 potentiometer 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 your 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 the same screwdriver as described previously).
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 higher (3.4 - 3.8 VDC). With the mechanism locked, the meter should read higher than 6 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 the potentiometer clockwise to stop.
3. Turn the potentiometer 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 (at Record Slot 99), and the meter + lead connected to P203 Pin 3, the meter should read 0.2 VDC or less.
3. With the HOME LED OFF, the meter should read 6 VDC or more.

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.

Refer to figure 3-17 before performing Steps 2 through 5.

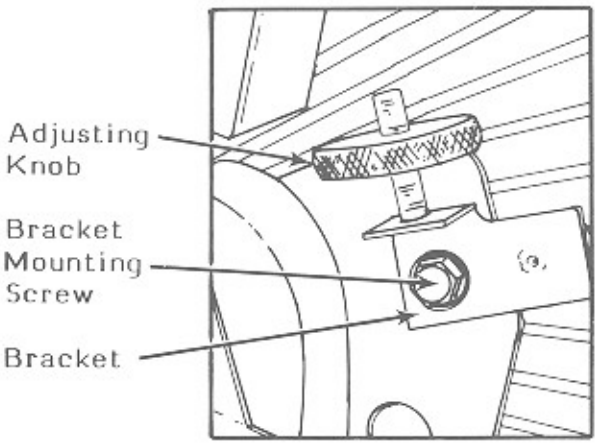


Figure 3-17. Optical Switch Position

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.

Tone Arm 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 the turntable.

2. Check that tone arm moves less than 1/32 inch from side to side at the stylus.

Stylus Force

1. The stylus force should be three to four grams. If a gram gage is not available, an approximate force can be set by adjusting the distance between the tone arm weight and the tone arm bracket. This distance should be 3/4 inch for 3-1/2 grams stylus force (see figure 3-18).

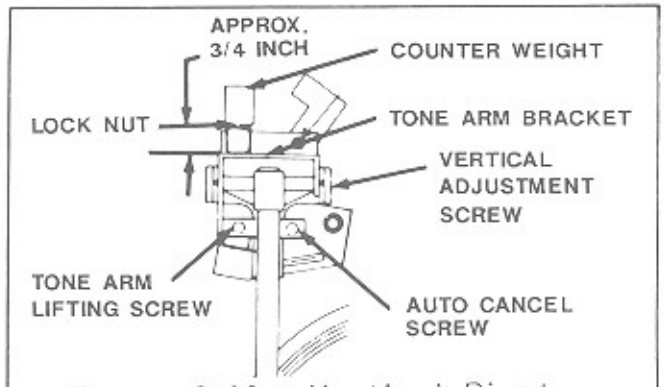


Figure 3-18. Vertical Pivot

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

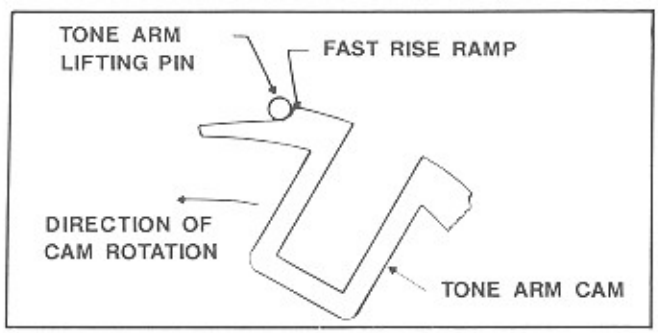


Figure 3-19. Stylus Clearance

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 inch above turntable pad surface with tone arm in play position (see figure 3-20).

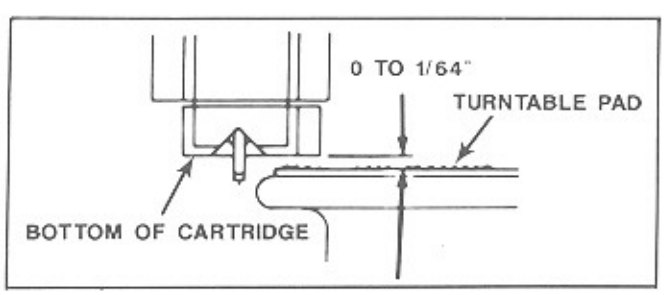


Figure 3-20. Stylus Height

Stylus Setdown Position And Tone Arm Cutoff Switch

1. Place an undersize (6 and 25/32 inch diameter) record on turntable (see figure 3-21).

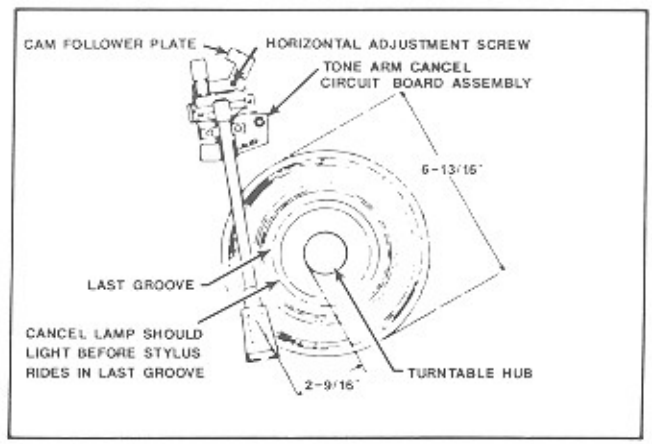


Figure 3-21. Stylus and Tone Arm

2. Operate transfer assembly to bring tone arm to play position.
3. Loosen the horizontal adjustment screw.
4. While holding the cam follower plate against the tone arm cam, move the tone arm, as required, until stylus is 2 and 9/16 inches from the edge of the turntable hub.
5. Tighten the 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 the mounting screw on the tone arm cancel circuit board assembly.

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

Belt Guide Adjustment

1. Loosen the nut that fastens the belt guide.
2. Adjust as shown in figure 3-22.
3. Tighten the nut.

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.

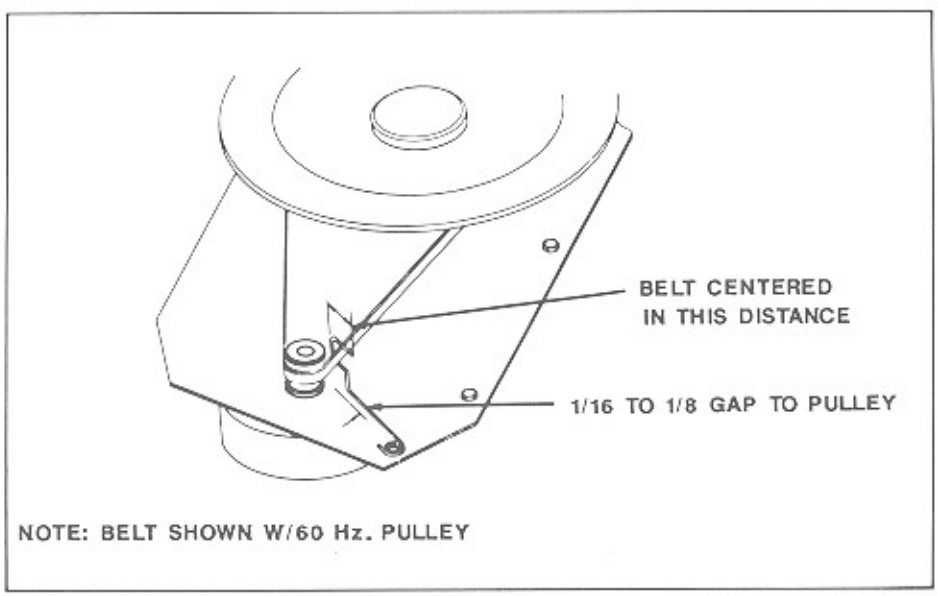
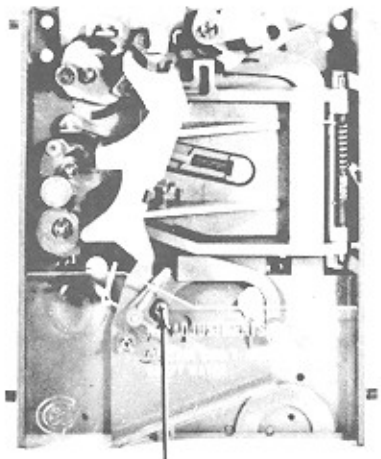


Figure 3-22. Belt Guide Adjustment

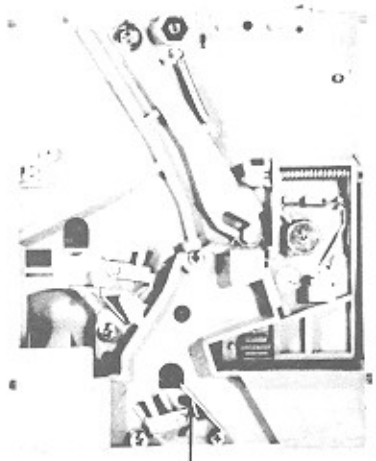
COIN ACCEPTORS
3 COIN

FRONT VIEW



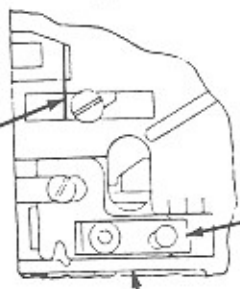
REMOVE COVER AND DRIVE
No. 6-32 SCREW INTO BOSS AS
SHOWN TO REJECT NICKELS

BACK VIEW



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

COIN ACCEPTORS
4 COIN

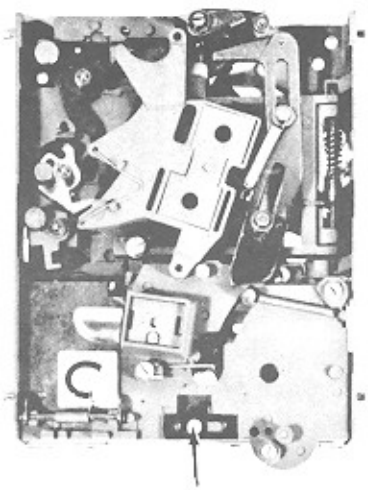


LINE UP EDGE OF
DEFLECTOR WITH
THIS LINE

TO IMPROVE $ SLUG REJECTION
ADJUST AS SHOWN

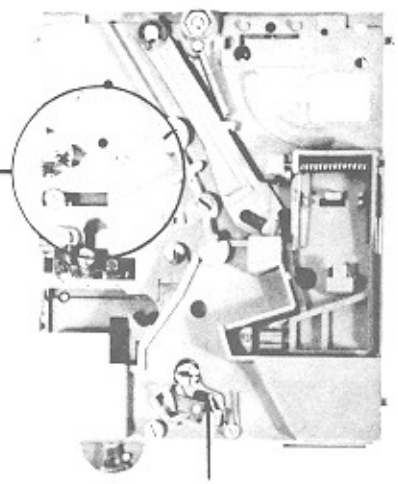
LINE SEPARATOR AS SHOWN

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 3-24. Coin Acceptors

Coin Switch

Coin Switch Wiring Note:

Table 3-3 shows how to set programing Locations 20, 21, 22, and 23 for 3-coin and 4-coin acceptors. Programing Location 25 should always be set to 5 for U.S. currency.

Checks And Adjustments

Coin Lever

Refer to figures 3-23 and 3-24 in the following steps:

1. Hold the plastic coin switch lever in the normal position and drop a coin through the slug rejector.
2. When the coin comes to rest on the lever, release the lever slowly.
3. Check that the weight of the coin operates the lever enough to close the coin switch and allow the coin to fall free.
4. Repeat Steps 1, 2, and 3 for the 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 the lever against the cushion (see figure 3-24). To adjust the 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 the 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 the contact gap for long paddle switches is 0.045 inch.

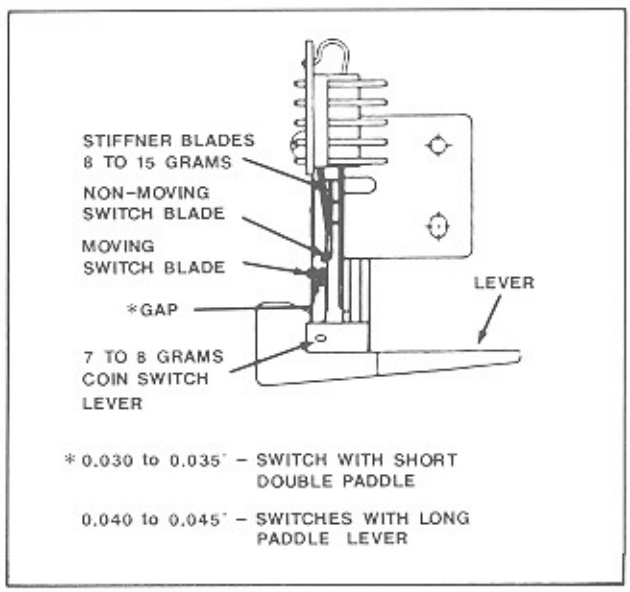
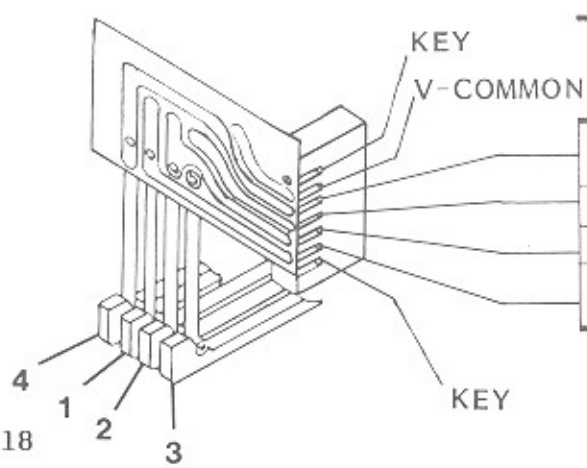


Figure 3-24. Contact Pressure & Gap Adjustment

Table 3-3. Coin Switch Wiring



3 & 4 COIN WIRING	COIN SWITCH NUMBER	3 COIN VALUE	3 COIN PROGRAM	4 COIN VALUE	4 COIN PROGRAM
W/V	4		=23=10	5¢	=23=1
B/Y	3	25¢	=22=5	50¢	=22=10
B/O	2	10¢	=21=2	10¢	=21=2
S/Y	1	5¢	=20=1	25¢	=20=5

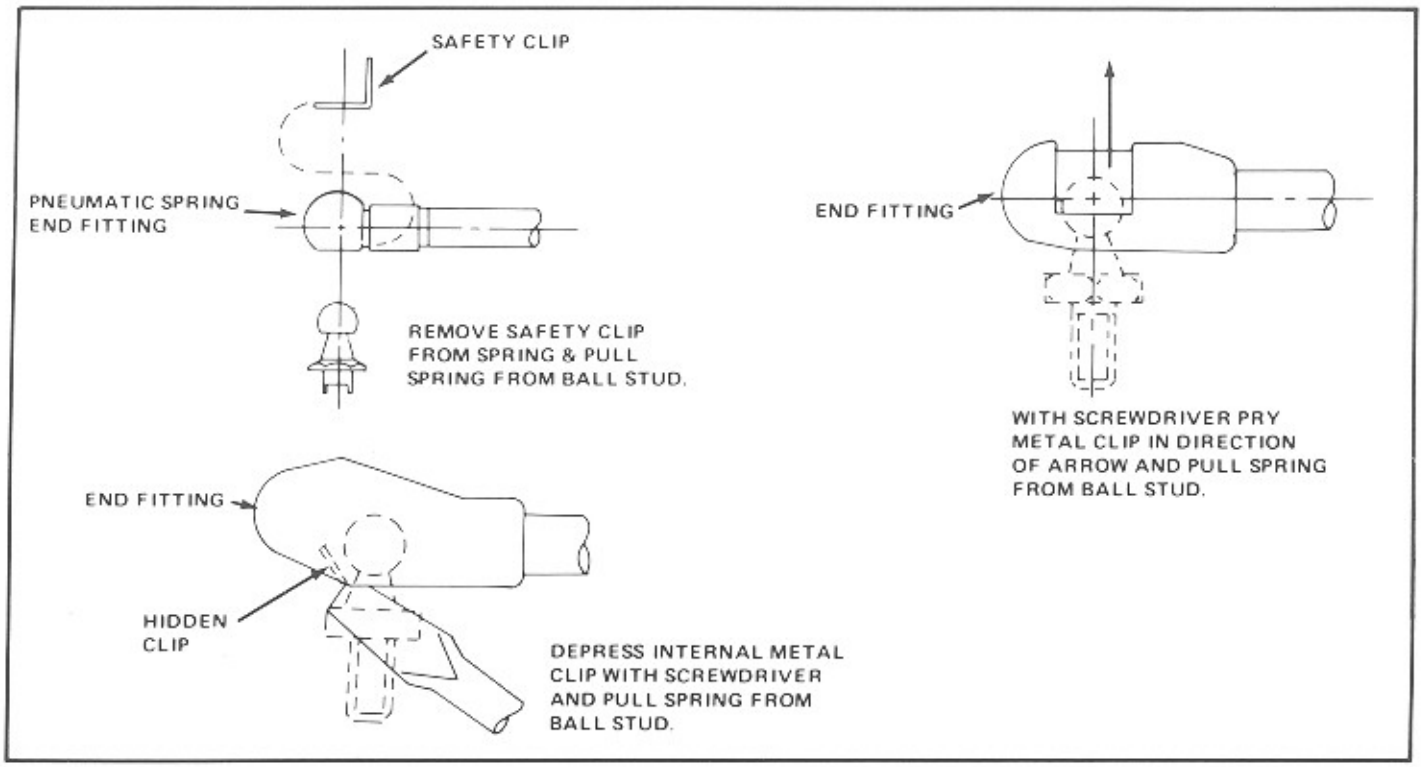


Figure 3-25. Door Spring Fittings

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 and follow the example given.

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 CBA-2 MAINTENANCE

INTRODUCTION

The Rowe Compact Bill Acceptor-2 (CBA-2) extends the capability of your R-93 to include the acceptance of one and five dollar bills. Valid one and five dollar bills of genuine United States currency are accepted by the CBA-2, which sends credit pulses to the R-93 central control computer. Rejected bills are returned to the customer.

Equipment Description

The CBA-2 consists of a bill acceptor transport/stacker mechanism, an electronic logic board, and a power supply integrated into a single unit.

Transport

The bill acceptor transport mechanism contains optical and magnetic sensors for bill validation. These sensors transmit their signals to the control circuits.
The transport/stacker unit uses long-life infrared cells and timing belt drive for long trouble-free performance.

Logic Board

The logic board contains electronics for the CBA-2. Microcomputer based electronic circuits selectively discriminate against and returns copies, bogus bills, and bills of unacceptable denominations. The control of the transport motor, the stacker motor, and the credit function are also contained on the logic board.

Bill Acceptor Transport/Stacker

The CBA-2 Transport is a mechanical device that carries the bill through five test stations. The transport contains a V_1 sensor, a V_2 back side sensor, a V_3 sensor, a magnetic head and bill pressure roller, an anti-cheat lever and a V_4 sensor. The V_1 sensor consists of an infrared emitter and receiver which senses that a bill has been inserted into the transport and senses the position of the bill. The V_2 backside sensor consists of an infrared emitter and receiver to make checks on the backside of the bill.

The V_3 sensor consists of an infrared detector, which senses that the bill has reached the magnetic head.

Magnetic Head And Bill Pressure Roller

The magnetic head checks the magnetic properties of the bill. A spring-loaded pressure roller, located under the lower track, presses the bill firmly against the magnetic head.

Anti-Cheat Lever And V_4 Sensor

The anti-cheat lever prevents the bill from being pulled back through the transport once it has exited the transport and credit has been given. The anti-cheat lever also works in conjunction with the V_4 sensor to sense bill position and to provide a signal to give credit when the bill has exited the transport. The V_4 sensor is an infrared emitter/receiver.

Transport/Stacker Drive

The transport uses a direct gear drive from the motor to the drive shaft. The drive shaft drives the front belts, which are also timing belts. Adjustable idler pulleys are used to maintain the correct timing belt tension. The rear belts are

the semi-stretch type and do not require length adjustment. The bill is trapped between the front and rear belts for positive, non-slip movement through the transport.

The stacker uses a gear-head motor. A cam on the motor shaft causes the bill pusher plate to move forward and backward inside the transport. This action will remove the bill from between the belts and place it into the bill box. A microswitch riding on the motor cam allows the logic board to monitor the pusher plate position.

Bill Acceptor Logic Board

The logic board directs all of the operations of the bill acceptor. It contains a microcomputer which is the "brain" of the system as well as self-diagnostic circuitry and the interface and drive circuitry necessary to monitor and control the transport/stacker.

Power is provided by the power supply. The CBA-2 requires a voltage of +12 VDC. A regulator on the logic board reduces the +12 VDC to +5 VDC.

The logic board contains all the electrical controls and visual indicators for the CBA-2. These are:

Motor Speed Adjustment Control

This control adjusts the transport motor speed. This control is part of a motor speed control circuit contained on the logic board (see "Electrical Adjustments" in this section for adjustment instructions).

Power And Status LED's

The logic board contains a self diagnostic feature, which is capable of detecting various malfunctions as well as certain normal conditions within the bill acceptor. The POWER LED indicates that the CBA-2 is receiving power. The STATUS LED indicates the status of the CBA-2.

Test Pushbutton

This button is used to activate the MOTOR SPEED adjustment routines in the microcomputer (see "Motor Speed Adjustment" in this section). When the CBA-2 is in a FAULT condition this pushbutton will cause the CBA-2 to try to clear the fault.

FUNCTIONAL DESCRIPTION

The following functional description will give you a basic understanding of how the bill acceptor normally operates. This information and the schematic in figures 4-2 and 4-3 can also be used as an aid in troubleshooting.

Acceptor In Standby Mode (Ready to accept bills)

Although the CBA-2 appears to be idle, it is continually checking the sensors in the bill transport and bill stacker mechanisms. If the CBA-2 senses an incorrect signal, it takes the appropriate action.

Problems That May Arise In The Standby Mode:

The V_3 Or V_4 Sensor Is Active

The bill acceptor assumes that something is trapped in the bill transport path if either of these sensors are 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 following paragraphs 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 it is successful, the bill acceptor returns to the STANDBY mode. If the bill acceptor is

unsuccessful, it shuts itself down. For further information, see the following paragraphs on the SHUTDOWN sequence:

Actions Taken By The Bill Acceptor To Correct Problems

Reject Sequence

In order to clear the bill transport mechanism and purge any objects from the transport 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 bill acceptor will place the bill so that the bill can be easily grasped by the customer. If the customer retrieves the bill within five 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 paragraph:

Self-Clearing Sequence

If the transport cannot clear the transport path as previously described, the bill acceptor begins a SELF-CLEARING sequence. This process consists of a series of 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 clear after 10 cycles, the unit shuts down. The SHUTDOWN sequence is as follows:

Shutdown Sequence

Several things may cause a bill acceptor shutdown. During the SELF-CLEARING sequence, if the bill acceptor is unable to clear an object lodged in the transport path, it will initiate a SHUTDOWN sequence. In the event of a shutdown, the bill acceptor turns everything OFF except the STATUS LED, which it flashes ON and OFF to indicate a FAULT condition. After a fault has occurred, the system must be reset by pushing the TEST button on the logic board.

Bill Acceptance Mode

1. The Customer Inserts A Bill And Bill Validation Begins

   a. The V_1 sensor is covered by leading edge of the bill.

   b. The computer starts the Motor Forward and Motor On circuits, which start transport motor in the forward direction.

   c. As the bill is moved through the transport mechanism, the computer closely monitors all optical and magnetic sensors for the proper signals and timings representative of a valid bill.

   d. If the bill meets all of the necessary requirements, the transport motor continues to run until the bill exits the rear of the transport and allows the anti-cheat lever to move back to it's rest position, which uncovers the V_4 sensor.

2. Bill Validation Sequence Complete-The Credit And Stacking Cycles Are Activated

   a. The Transport motor continues to run until the bill is in position to be stacked.

   b. The computer sends a credit signal to the output circuitry.

   c. The computer also turns on the bill stacker motor for one cycle of the bill pusher plate, which will move the bill from the transport belts to the bill box.

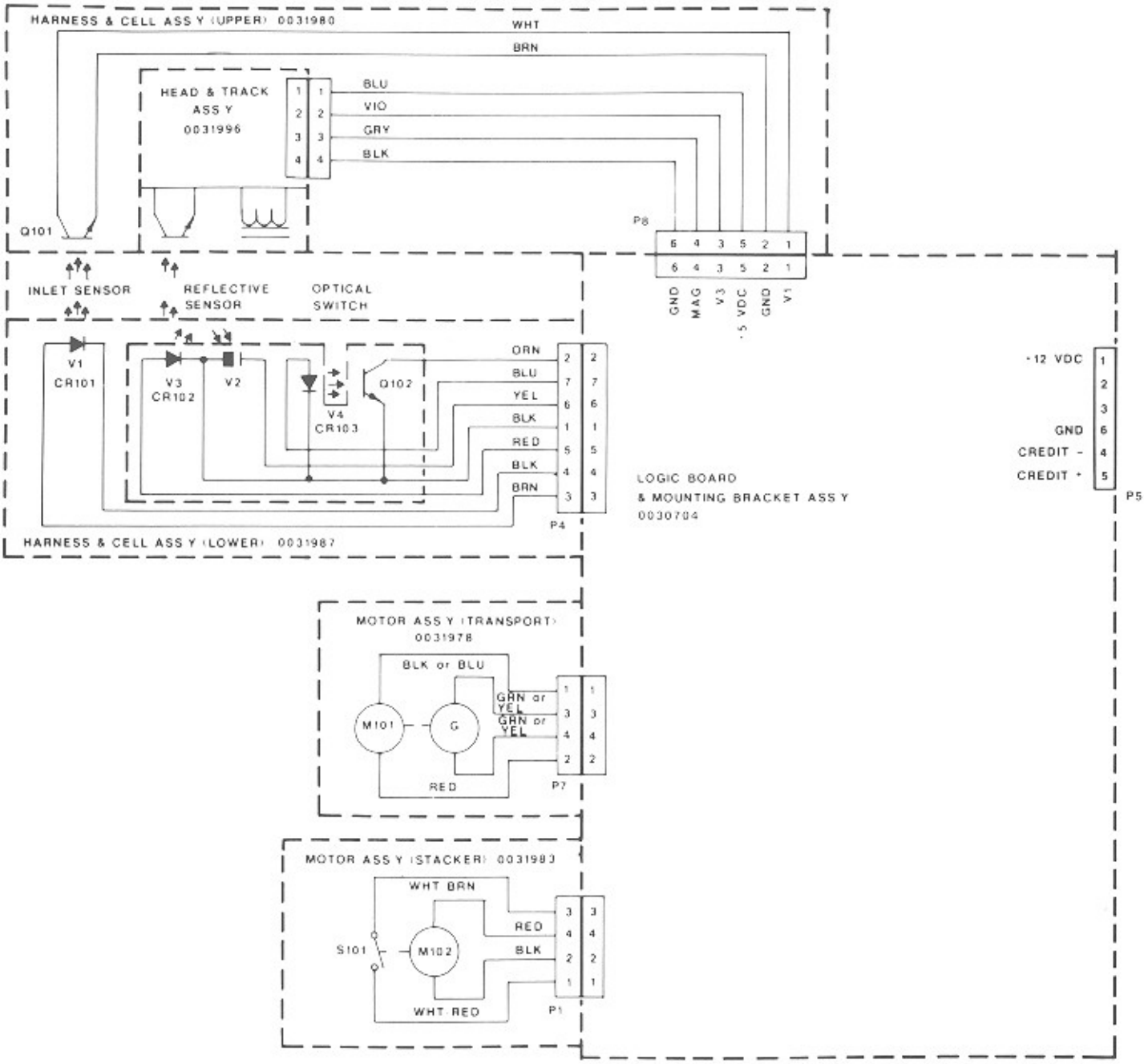
3. If Any Of The Validation Conditions Are Not Met, The Bill Is Returned To The Customer As Follows:

a. The transport motor changes direction from forward to reverse and returns the bill to the transport opening.

b. The computer checks for the V_4 and V_3 sensors to be uncovered by the returning bill.

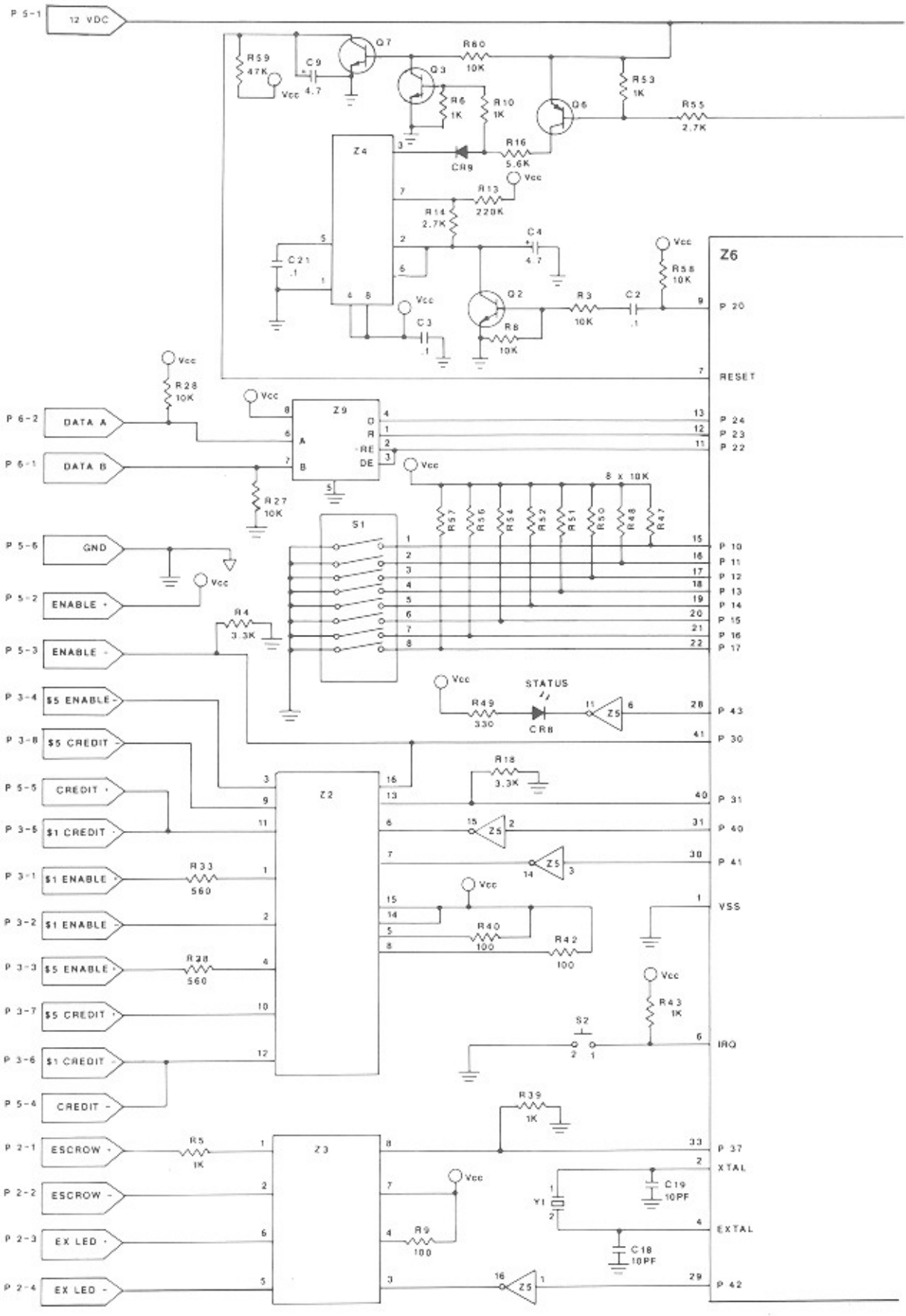
c. The computer stops the transport motor with the leading edge of the bill still in the transport inlet covering the V_1 cell.

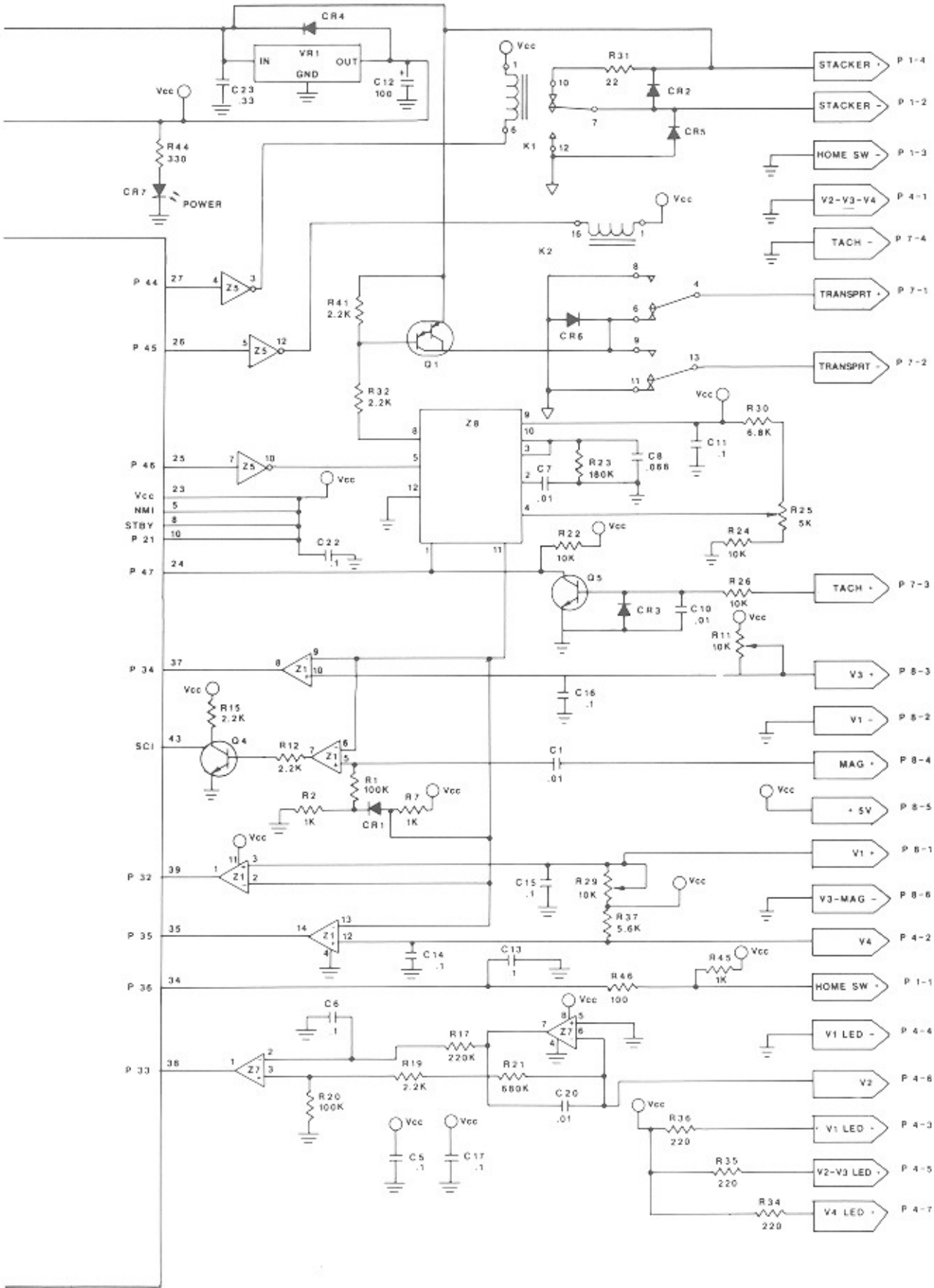
d. If the V_1 cell is still covered after 5 seconds, the computer enters the self-clearing sequence as described in "Self-Clearing Sequence" in this section.



Equivalent Engineering Drawing B0030697

Figure 4-2. CBA-2 Block Diagram


P 5-1
12 VDC
R59 47K
C9 4.7
Vcc
Q7
R60 10K
Q3
R6 1K
R10 1K
Q6
R53 1K
R55 2.7K
Z4
CR9
R16 5.6K
R13 220K
R14 2.7K
C4 4.7
C21 .1
C3 .1
Q2
R3 10K
C2 .1
R58 10K
Z6
P 20
RESET
R28 10K
P 6-2
DATA A
P 6-1
DATA B
Z9
R27 10K
8 x 10K
R57
R56
R54
R52
R51
R50
R48
R47
S1
P 24
P 23
P 22
P 10
P 11
P 12
P 13
P 14
P 15
P 16
P 17
P 5-6
GND
P 5-2
ENABLE +
P 5-3
ENABLE -
R4 3.3K
P 3-4
$5 ENABLE -
P 3-8
$5 CREDIT -
STATUS
R49 330
CR8
Z5
P 43
P 30
P 5-5
CREDIT +
P 3-5
$1 CREDIT -
P 3-1
$1 ENABLE +
R33 560
P 3-2
$1 ENABLE -
P 3-3
$5 ENABLE +
R38 560
P 3-7
$5 CREDIT +
P 3-6
$1 CREDIT +
P 5-4
CREDIT -
Z2
R18 3.3K
P 31
P 40
P 41
R40 100
R42 100
VSS
R43 1K
S2
IRQ
P 2-1
ESCROW +
P 2-2
ESCROW -
P 2-3
EX LED +
P 2-4
EX LED -
R5 1K
Z3
R39 1K
P 37
XTAL
Y1
C19 10PF
EXTAL
C18 10PF
R9 100
P 42



Equivalent Engineering Drawing B0030704 or B0030716

Figure 4-3. CBA-2 Schematic Diagram

ROUTINE SERVICE

Jammed bills are the cause of most maintenance calls. If you have recurring bill jams or other CBA-2 problems, follow the troubleshooting procedures in this section.

Tools Required

The CBA-2 does not require special tools. The following tools are recommended, however.

- 1/8" Nut Driver
- 1/4" Nut Driver
- 5/16" Nut Driver
- Small Phillips Screwdriver
- 3/32" Flat Blade Insulated Screwdriver
- Long Nose Pliers
- 3/8" Open End Wrench
- 5/16" Open End Wrench
- 0.030" Feeler Gauge
- External Retaining Ring Tool
- Precision Oiler With Lightweight Machine Oil (Such as 3-IN-1 Electric Motor Oil)

Removing Jammed Bills From The Bill Acceptor

First, try to determine where the bill is jammed in the transport.

> CAUTION:
>
> **Always disconnect the power to the CBA-2 before turning the gear by hand. Be careful not to pinch your fingers between the gears.**

Open the bill box and determine if the bill can be reached. If necessary, the transport can be turned by hand, either forward or reverse to remove the bill. To turn the transport by hand, turn the gear on the side of the transport. If the bill is jammed near the inlet, try to remove it by turning the transport by hand. If this does not free the bill; remove the transport from the unit and remove the inlet.

REMOVING AND REINSTALLING THE CBA-2 FOR SERVICE

> **Warning:**
>
> **Be careful that you do not hit your head on the Coin Return actuator lever while you are removing or replacing the CBA-2.**

Removing The CBA-2

1. Open the top door.
2. Remove the two screws on the bottom of the CBA-2 mounting bracket.
3. Unlock the CBA-2 and swing it out and down.
4. Remove the fall stop cable and let the CBA-2 swing all the way down.
5. Unplug the connector (Red, Black, Green, and Orange wires) and push the wires out the back of the hinge assembly. Let the wires hang between the hinge and the back of the phonograph.
6. Remove the top two screws from the bracket.
7. Carefully rotate the CBA-2 up, toward a horizontal position and pull the CBA-2 toward you. This should free the retainer stud so that the CBA-2 is free from the mounting bracket.

Removing the Inlet

1. Remove the countersunk screw that holds the inlet on the front of the transport (see figure 4-1).

2. Lift off the inlet.

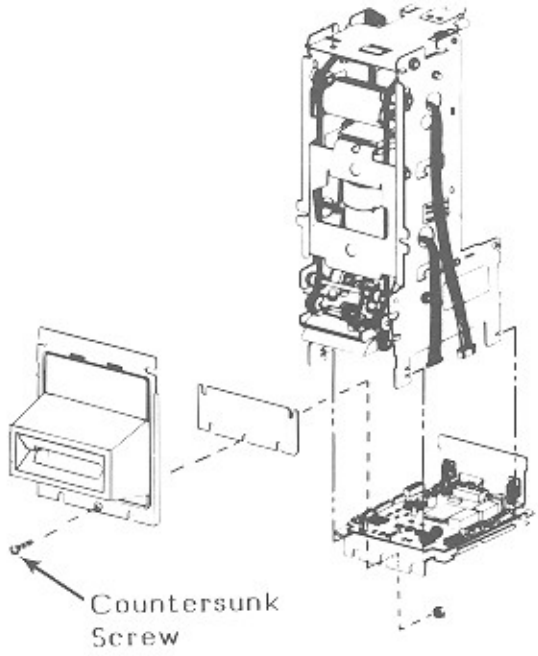


Figure 4-1. Removing The Bill Inlet

Reinstalling The CBA-2

1. Hold the CBA-2 so that the CBA-2 inlet is pointing down and away from you and the retaining stud is on your right.

2. Insert the retaining stud into the CBA-2 mounting bracket and slide the retaining stud away from you so that the retaining stud is resting in the smaller part of the keyhole shaped opening in the mounting bracket.

3. Rotate the CBA-2 so that the two holes in the CBA-2 plate align with the two holes in the mounting bracket. Attach, but do not tighten the two screws.

4. Feed the wiring harness back into the CBA-2 and plug it in and Attach the cable stop.

5. Swing the CBA-2 up into the normal operating position and lock it in place.

6. Attach the bottom two mounting screws, but do not tighten them.

7. Adjust the CBA-2 forward all the way it will go and gently close the phonograph door. This will align the CBA-2 in the proper position.

8. Open the phonograph door and tighten the bottom two screws on the mounting bracket.

9. Unlock the CBA-2, swing it down, and tighten the top two mounting bracket screws.

10. Swing the CBA-2 into the normal operating position and lock it in place.

11. Put the phonograph into the SERVICE mode and feed a good bill into the CBA-2. The phonograph should indicate the proper credit. If it does not, resume troubleshooting in Section 5 of this manual.

Bill Jamming Checklist

If frequent bill jamming occurs, perform the following checks and corrective procedures:

1. Check that the timing belts are not too loose or too tight (see "Timing Belt Tension Adjustment" in this section). Make sure the belts are positioned on the pulleys correctly.

2. Make sure the upper belts run freely and stay centered on the crowned rollers while the transport is running.

3. The inlet and bill track surfaces must be free of dirt, moisture, burrs,

projections, and rough spots, which might catch edge of a bill or slow the bill down.

4. Check that the anti-cheat lever moves freely.

5. Check that the belts are clean and not glazed or slippery. If the belts are dirty or oily, clean them by wiping them with denatured alcohol.

6. Check that the driving pulleys are not loose on the shaft.

7. Check that the upper input roller is not loose on the shaft.

8. Check that the lower input roller has the correct amount of spring pressure and moves up and down without binding. The force to move the roller should be 150 to 200 grams.

CLEANING

The bill acceptor does not require routine cleaning, however, the inlet and track surface should be wiped with a clean soft lint free cloth each time the mechanism is removed for service. Due to the abrasive nature of currency, the magnetic head does not normally require cleaning. If the head does become dirty, use a clean cotton swab saturated with denatured alcohol or other suitable cleaning solution. Never soak the belts in cleaning solvents.

LUBRICATION

The bill acceptor does not require lubrication under normal use. If the transport turns hard or squeaks, apply one drop of

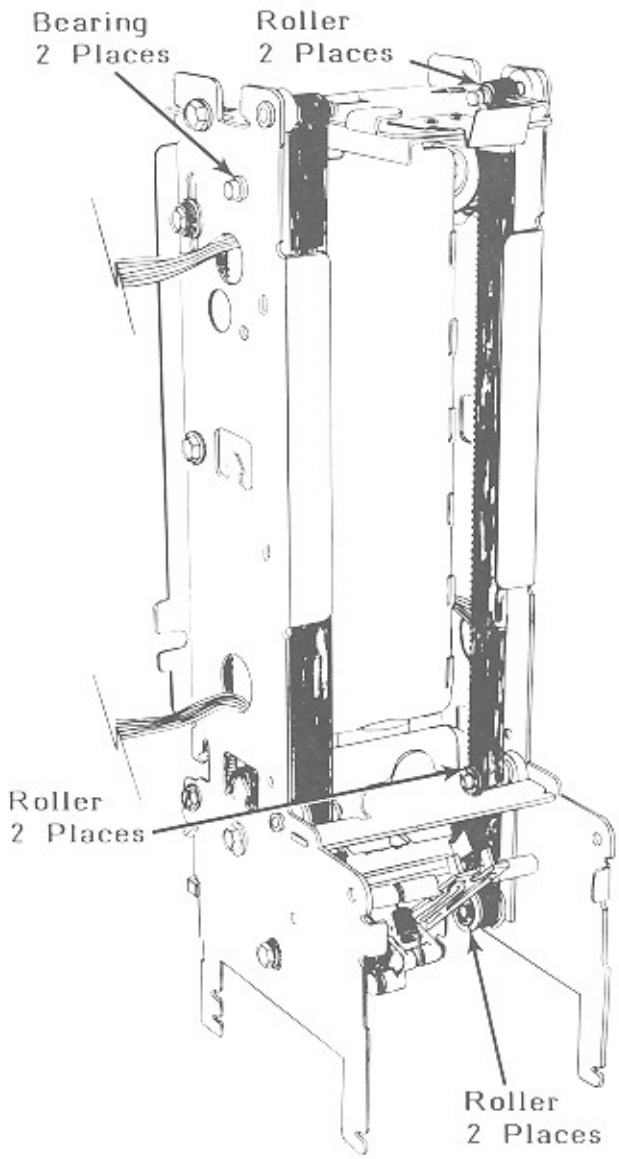


Figure 4-2A. Oiling Locations, View 1

light machine oil (such as 3:1 Electric Motor Oil or equivalent) to the following 19 areas:

- Gear shaft
- The nyliner bearings
- Each roller for the upper and lower belts
- Two blue bearings on the upper inlet shaft (These bearings can be reached by removing the inlet)

See figures 4-2A and 4-2B for oiling locations.

Do not over lubricate.

MECHANICAL ADJUSTMENTS

The bill acceptor transport mechanism does not require setup or routine adjustment; however, if the mechanism binds or slips, the following adjustments can be made. These adjustments should also be made if the transport is disassembled.

Timing Belt Tension Adjustment

Refer to figure 4-3 for adjustment locations and the precision adjustment illustration.

Coarse Adjustment Check

Timing belts should be adjusted tight enough that they do not

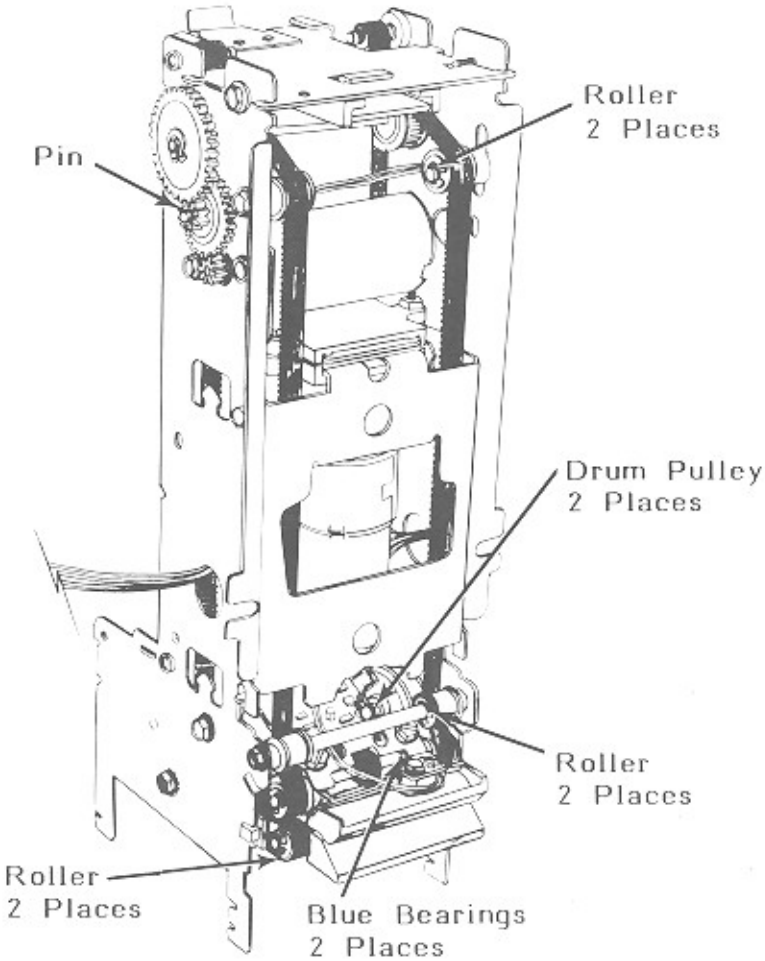


Figure 4-2B. Oiling Locations, View 2

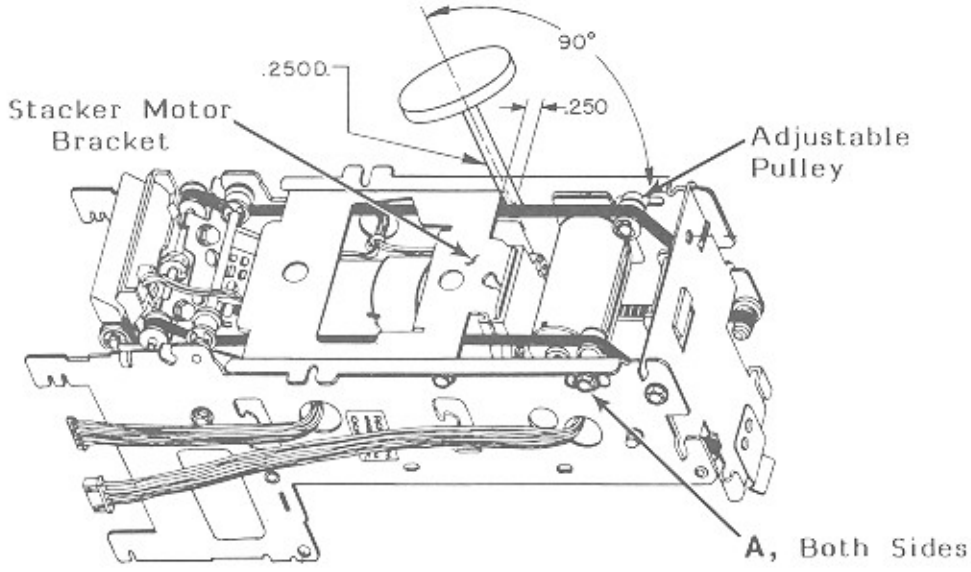


Figure 4-3. Timing Belt Tension Adjustment

come off the pulleys, but not so tight that they put a load on the transport. This tension is achieved by adjusting the belt to the point that the slack in the belt is taken up.

Precision Adjustment Check

If this general adjustment procedure is not satisfactory, you may use the following precision adjustment procedure (refer to figure 4-3) :

1. Apply a force of 118 grams to each belt. Each belt must deflect a distance of 3/16 inch.

2. Apply the force mentioned in step 1 with the end of a 1/4-inch diameter pin. The centerline of the pin must be centered on a line that is 1/4 inch from the stacker motor bracket and the pin must be centered on the belt. Apply the force in a direction perpendicular to the belt.

3. If the tension is not correctly set, loosen the screw(s) (A) in figure 4-3 so that the pulleys move freely in their slots. Adjust the pulley(s), tighten the screw(s), and recheck the belt deflection.

Gear Backlash Adjustment

Check that the gears in figure 4-4 have a slight backlash of .008 to .012 inch. To adjust the gear backlash:

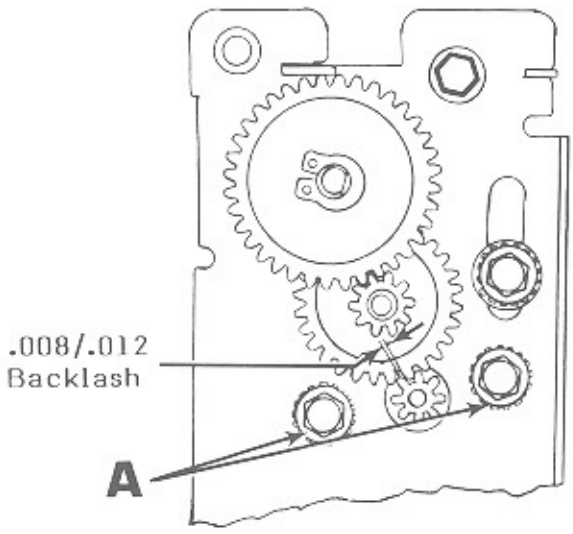


Figure 4-4. Gear Backlash Adjustment

1. Loosen the two Hex-head adjusting screws (A) holding the motor.

2. Move the motor to obtain the correct backlash.

3. Tighten the two screws and recheck the gear backlash.

Stacker Home Switch Adjustment

Check for a 1/32-inch gap between the stacker switch arm and the stacker switch body as shown in figure 4-5.

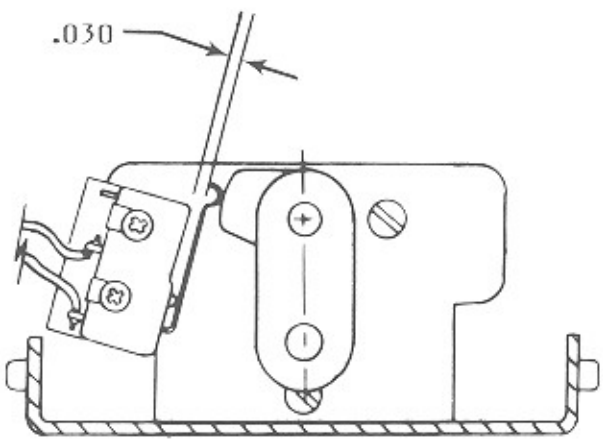


Figure 4-5. Stacker Home Switch Adjustment

If this clearance is not correct, adjust the stacker switch as follows:

1. Loosen the two adjusting screws as shown in figure 4-5.

2. Position the cam so that the switch arm rests on the raised lobe of the cam.

3. Insert a 1/32-inch gage (0.030-inch feeler gage) between the switch arm and the switch body.

4. Hold the switch against the arm and tighten the two adjusting screws.

Magnetic Head Alignment

The magnetic head must be aligned to the upper track at the factory. If the head must be aligned or replaced, order Part No. B0031996.

ELECTRICAL ADJUSTMENTS

The bill acceptor electrical adjustments (see figure 4-9 for their locations) are factory set and should not be changed under normal operating conditions; however, replacing a bill transport or logic board requires that the system be recalibrated as follows:

> NOTE:
>
> **Make sure that all switch positions on S2 are set as shown in Figure 4-6 (position 1, 2, 3, and 4 ON; position 5, 6, 7, and 8 OFF).**

V_1 Sensor Adjustment

1. Monitor the D.C. voltage at the logic board connector P8, Pin 1.

2. Adjust potentiometer R29 (labelled R57 on some boards) on the logic board until the monitored voltage is as low as it will go.

3. Adjust potentiometer R29 on the logic board until the monitored voltage is 0.1 volts greater than the noted voltage, then turn R29 back 1/8 turn.

   The resulting voltage must be less than 0.30 volts.

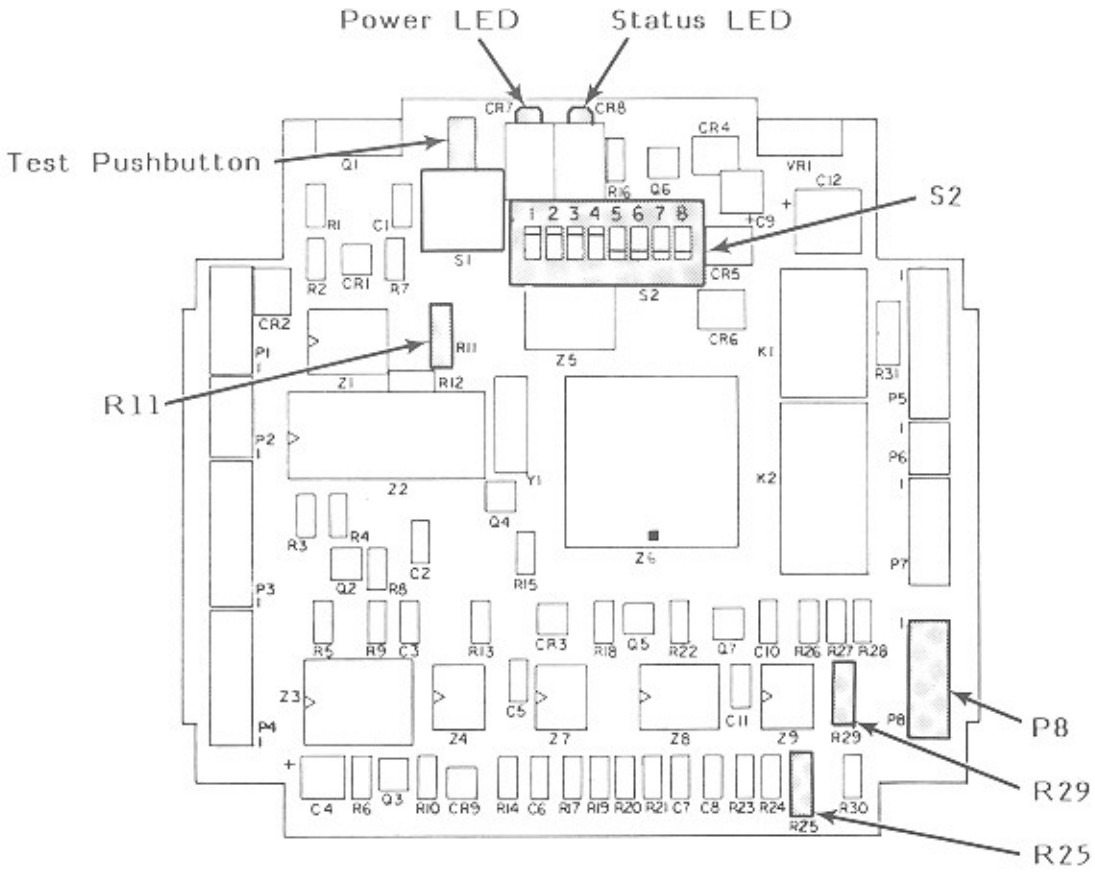


Figure 4-6. Adjustment Locations

V_3 Sensor Adjustment

1. Monitor the D.C. voltage at the logic board connector P8, Pin 3.

2. Adjust potentiometer R11 on the logic board until the monitored voltage is as low as it will go.

3. Adjust R11 to obtain a voltage that is 0.1 volts greater than the minimum voltage, then turn R11 back 1/8 turn. The resultant voltage must be less than 0.30 volts.

Motor Speed Adjustment

Refer to figure 4-6 as you make this adjustment.

NOTE:

The line voltage should be 113 to 117 VAC to ensure the proper speed adjustment.

1. Press and hold the TEST pushbutton (S1) on the logic board.

2. Observe the STATUS LED on the logic board and adjust potentiometer R25 on the logic board until the LED is ON steady.

Removing The Lower Harness And Cell Assembly

1. To remove the assembly, push back on the catch (as shown in figure 4-7) to unhook the board, then remove the board.

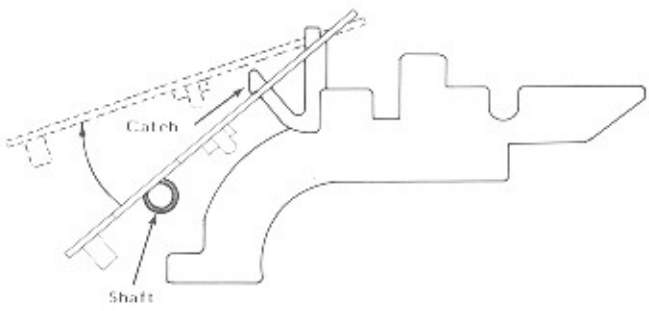


Figure 4-7.
Removing The Assembly

Reinstalling The Lower Harness And Cell Assembly

1. To replace the assembly on the lower track, set the transport upside down. Hook the board over the vertical post; then, push down on the board to snap it over the catch (see figure 4-8A).

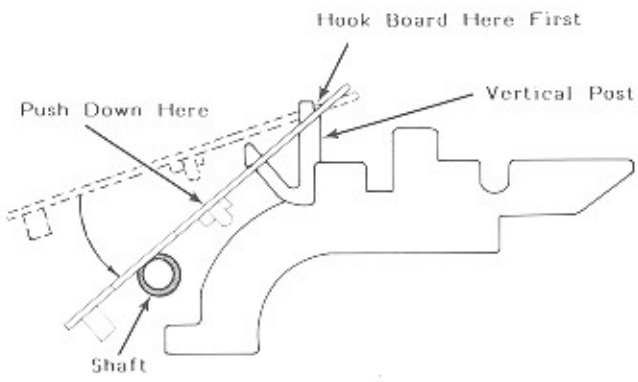


Figure 4-8A.
Mounting The Assembly

2. Check to see that the catch is hooked over the board (A) and the board is setting in the recessed area on the shaft (B) (see figure 4-8B).

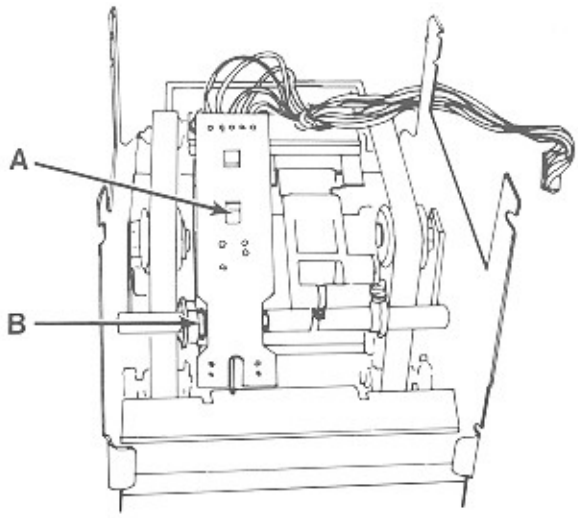


Figure 4-8B. Mounting The Assembly

TROUBLESHOOTING

Logical troubleshooting minimizes effort caused by removing and replacing the wrong part. Many failures are caused by minor defects such as loose connections or dirty contacts. Check the following before replacing any parts:

1. Check that all plugs are firmly seated.

2. Check that connector pins are not bent, broken, or pushed through the back of the connector when mated.

TROUBLESHOOTING AIDS

This guide will help you isolate problems and return the bill acceptor to service as quickly as possible. Table 4-2 lists common "Trouble" situations, their symptoms, and the most likely defective modules.

Rowe recommends that you replace defective modules with new modules, rather than try to replace individual components within the modules.

Table 4-2. Troubleshooting Chart

Trouble	Symptom	Probable Cause
Transport motor does not start when a bill is inserted.	POWER LED on the logic board is not lit.	1. The problem is in the power supply or the harness to the CBA-2. 2. Defective logic board.
	The STATUS LED is ON or is blinking.	The CBA-2 is not operational due to a fault condition (see the next section of this chart).
	The transport does not start, but a clicking sound is heard in the logic board.	1. An object is jammed in the transport mechanism. 2. Defective transport 3. Defective logic board
	No sound or other indication that the transport is trying to run.	1. Defective or improperly adjusted V_1 cell in the transport 2. Defective logic board
CBA-2 in SHUTDOWN In this state, the CBA-2 STATUS LED will alternate between a steady ON and flashing ON and OFF (ON for 1 second and then flash one or more times). The number of flashes indicates the cause of the SHUTDOWN.	CBA-2 STATUS LED is ON steady	The CBA-2 DIP switches are set incorrectly. Switches 1, 2, 3, & 4 should be ON. Switches 5, 6, 7, & 8 should be OFF.
	The CBA-2 STATUS LED flashes once.	1. An object is covering the V_1 cell in the transport. 2. V_1 is not properly adjusted. 3. Defective transport 4. Defective logic board
	The CBA-2 STATUS LED flashes three times	1. An object is covering the V_3 cell. 2. V_3 is not properly adjusted. 3. Defective transport 4. Defective logic board
	The CBA-2 STATUS LED flashes four times	1. An object is activating the anti-pull-back lever in the transport. 2. Defective transport 3. Defective logic board

Table 4-2. Troubleshooting Chart (Continued)

Trouble	Symptom	Probable Cause
The bill acceptor rejects a large number of valid bills. If the rejected bill is allowed to remain in the transport opening, the CBA-2 STATUS LED will flash one or more times to indicate the cause of the rejection.	The CBA-2 STATUS LED flashes five times	1. The bill stacker is full. 2. The bill stacker is jammed in the OFF-HOME position. 3. The bill stacker HOME switch is out of adjustment. 4. Defective bill stacker 5. Defective logic board
	The CBA-2 STATUS LED flashes once after rejecting the bill.	1. Defective V_1 cell in the transport 2. V_1 not properly adjusted 3. Defective logic board
	The CBA-2 STATUS LED flashes twice after rejecting the bill.	1. Defective V_2 cell in the transport 2. Defective logic board
	The CBA-2 STATUS LED flashes three times after rejecting the bill.	1. Defective V_3 cell in the transport 2. V_3 not properly adjusted 3. Defective logic board
	The CBA-2 STATUS LED flashes four times after rejecting the bill.	1. An object is lodged in the transport. 2. Binding anti-pull-back lever 3. Defective V_4 cell in the transport 4. Defective logic board
	The CBA-2 STATUS LED flashes five times after rejecting the bill.	1. Incorrect motor speed 2. Defective magnetic head or transport 3. Defective logic board
	The CBA-2 STATUS LED flashes six times after rejecting the bill.	1. Defective motor or magnetic head in the transport 2. Defective logic board 3. Defective power supply

Table 4-2. Troubleshooting Chart (Continued)

Trouble	Symptom	Probable Cause
	The CBA-2 STATUS LED flashes seven times after rejecting the bill.	1. Incorrect motor speed 2. Defective transport 3. Defective logic board
Bills jam frequently		1. The anti-pull-back lever is not moving freely 2. The bill pressure roller is binding 3. The transport inlet or track surfaces have projections, or rough spots on them. 4. The transport belts are out of adjustment or dirty. 5. The transport belts are not centered on their rollers. 6. The transport upper input roller does not move up and down freely. 7. Defective power supply

SECTION 5 TROUBLESHOOTING

INTRODUCTION

The R-93 Phonograph incorporates several modules which plug in for rapid service. The block diagram in figure 5-5 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-93 Programing 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).

Table 5-1 Replaceable Modules

Part No.	Description	Notes
40777312	Central Control Computer (CCC)	Module contains board Assembly (CCC) P.N. 60973812
40722105	Mechanism Control	Module contains board Assembly (Mech. Control) P.N. 60870805
40770605	Power Supply	
61022501	Digital Display	

REPLACING THE CCC EPROM

If you have changed the CCC EPROM, use the following procedure to reset the CCC:

Force an Err 0 by pressing the Memorec RESET and ADVANCE switches as power is applied to the phonograph. (CD and Video phonographs need to have their players reinitialized as well)

CONTINUOUS CREDIT

As an aid to troubleshooting, the phonograph may be programed 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 PROGRAMING mode (see Programing The Credit And Selection System in Section 2) and enter "255" into Location "27".

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. 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. The display will go blank if 666 is typed and all codes have been displayed. 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 LIST

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

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

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

The reason data changed could be: a defective assembly, 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 programing 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 programing location.
3. Put SERVICE switch to OFF and then back to SERVICE. If Computer returns to programing mode, replace computer assembly.
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.

Er10 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.

Er11 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 CCC and the CBA-2 or a defective CBA-2 logic board.

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. Computer thinks that the keyboard switch is always closed and the reason could be:

   A. A defective computer
   B. A defective digital display
   C. A defective keyboard
   D. A short in the computer-to-display harness
   E. A short in the display-to-keyboard harness

2. Put the SERVICE switch in the OFF position
3. Replace the next module or repair harness (start with reason "A" in Step 1).
4. Put the SERVICE switch in the SERVICE position.
5. Press Key Number 1. The phonograph is repaired if a 1 (one) appears on the digital display when the key is pressed. If the phonograph is not repaired, repeat Steps 2 through 5.

Er14 Keyboard switch 1 is always closed. Follow steps given for Er13.

Er15 Keyboard switch 2 is always closed. Follow the steps for Er13.

Er16 Keyboard switch 3 is always closed. Follow the steps for Er13.

Er17 Keyboard switch 4 is always closed. Follow the steps for Er13.

Er18 Keyboard switch 5 is always closed. Follow the steps for Er13.

Er19 Keyboard switch 6 is always closed. Follow the steps for Er13.

Er20 Keyboard switch 7 is always closed. Follow the steps for Er13.

Er21 Keyboard switch 8 is always closed. Follow the steps for Er13.

Er22 Keyboard switch 9 is always closed. Follow the steps for Er13.

Er23 RESET switch on keyboard is always closed. Follow the steps for Er13.

Er24 POPULAR on the keyboard is 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. Type "699" to clear error codes. If error remains, do Step 2.

2. Adjust mechanism control index ("I") potentiometer. Type "699" to clear error codes. If the 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 stops the phonograph until power is turned OFF and turned back ON. Turn the 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 Magazine had rotated and optical switch index signal (Pin 10 of P6) has remained low (active) for more than 30 seconds. This error stops the phonograph until power is turned OFF and turned back ON. Turn the power ON and refer to "Magazine Rotates Continuously" in the TROUBLE column of the MODULAR TROUBLESHOOTING CHARTS.

Er34 Magazine had rotated and optical switch HOME signal (Pin 11 of P6) has remained low (active) for more that 30 seconds. This error will cause the phonograph to shut down until power is turned OFF and turned back ON. Turn the power ON and refer to "Magazine Rotates Continuously" in TROUBLE column of MODULAR TROUBLESHOOTING CHARTS.

Er35 Error 35 is not a valid error code.

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 switch 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 the outer cam switch 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 TROUBLE-SHOOTING 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 in table 5-2.

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	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 are ON	1. 2 amp circuit breaker tripped 2. Power supply 3. 28 VAC overload from magazine, transfer or T.T. motor
	The +8 VDC LED on power supply fails to light but lights when phono harness at power supply is unplugged	1. Central control computer 2. Mech control 3. Wallbox interface 4. Service switch 5. Wiring

TROUBLE	SYMPTOM	PROBABLE CAUSE
		Note: **To locate problem, reconnect phono harness and unplug connectors in the order shown (If +8VDC LED lights, replace last unit unplugged):**
		1. Wallbox interface (J4) 2. Central control computer (J6) 3. Mech control harness (J205) 4. Mech control (J206)
	The +28 VDC LED on power supply fails to light but lights when phono harness at power supply is unplugged	1. Mech control board 2. Detent coil 3. Wiring
Magazine does not rotate when a selection is made	MAG. MOTOR and DETENT LED's ON, detent is actuated	1. Power supply 2. Wiring to mag. motor 3. Magazine motor 4. Mech control board
	MAG. MOTOR LED OFF or DETENT LED ON	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	1. Wiring to magazine motor 2. Mech control board
	MAG. MOTOR LED is ON, OPT. SW. INDEX LED is not flashing, and/or OPT. SW. HOME LED does not flash at record number 99.	1. Optical switch 2. Wiring to optical switch 3. Mech control board
	MAG. MOTOR LED ON and both optical switch LED's normal	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	1. Faulty optical switch 2. Wiring to optical switch 3. Heavy dirt buildup in optical switch

TROUBLE	SYMPTOM	PROBABLE CAUSE
	Stops one or two records before record selected	1. Optical switch adjustment 2. Magazine not full of records (out of balance) 3. Broken sprag lever guide
	Stops one or two records after record selected	1. Optical switch adjustment 2. Magazine not full of records (out of balance) 3. Broken sprag lever guide
	Stops one or two records after record selected	1. Faulty optical switch 2. Optical switch adjustment 3. Broken sprag gear 4. Sprag linkage binding
	Stops one-Half to one record position off before or after record selected	1.Broken sprag gear 2. Broken sprag guide 3. Sprag linkage binding or needs adjustment
Record does not transfer	TRAN. MOTOR LED is ON	1. Wiring to transfer motor 2. Mech control board 3. Transfer motor
	TRAN. MOTOR LED is OFF	1. Wiring from central control computer to mech control board 2. Central control computer 3. Mech control board
	TRAN. MOTOR LED comes ON and transfer starts, but LED and motor turn OFF when cam leaves inner cam switch	1. Outer cam switch 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	1. Mech control board 2. Wiring to motor
	TRAN. MOTOR LED is ON	1. Central control computer 2. Mech control board 3. Wiring from central control computer to mech control 4. Open circuit at inner cam switch N.O. contact 5. Open circuit at inner cam switch Common

TROUBLE	SYMPTOM	PROBABLE CAUSE
Transfer starts and runs continuously after selection is located	TRAN. MOTOR LED comes ON when motor starts and stays ON	1. Wiring to outer cam switch 2. Outer cam switch 3. Central control computer 4. Wiring from central control computer to mech control board 5. Mech control board 6. Inner cam switch N.O. contact shorted to Common 7. Open circuit in outer cam switch Common
No sound	Always muted	1. Central control computer
No mute during scan	Motor noise in speakers	1. Central control computer
Turntable motor does not run	T.T. MOTOR LED is ON	1. Wiring to T.T. motor 2. T.T. motor 3. Mech control board
	T.T. MOTOR LED is OFF	1. Wiring from central control computer to mech control board 2. Central control computer 3. Mech control board
Record will not cancel when finished playing	CANCEL LED is ON	1. Wiring from mech control board to central control computer 2. Central control computer 3. Also see **Record Does Not Transfer**
	CANCEL LED is OFF	1. Wiring to cancel switch 2. CANCEL switch 3. Mech control board
Record cancels without playing	CANCEL LED stays ON	1. Short in cancel switch wiring 2. Cancel switch 3. Mech control board
	CANCEL LED flashes ON as record sets down	1. Auto Cancel misadjusted
	CANCEL LED does not flash	1. Wiring to outer cam switch 2. Outer cam switch 3. Wiring from mech control board to central control computer 4. Mech control board 5. Central control computer

TROUBLE	SYMPTOM	PROBABLE CAUSE
Left side of record plays when right side selected	TOGGLE LED is ON	1. Wiring to toggle coil(s) 2. toggle coil(s) 3. Mech control board
	TOGGLE LED is OFF	1. Wiring from central control computer to mech control board 2. Central control computer 3. Mech control board
Money counter or play counter fails to count	Fails to count	1. Wiring to counter 2. Counter 3. Mech control board 4. Wiring from central control computer to mech control board 5. Central control computer
Phonograph is always in SERVICE (Memorec) mode of operation	TIMES SELECTED display is always lit	1. SERVICE switch 2. The +8 ON signal wiring 3. Central control computer 4. Central control computer set for programing with the front door closed (Location 56=255) Use 999 to exit SERVICE mode.
Phonograph will not go into SERVICE mode	TIMES SELECTED display will not light when SERVICE switch is in SERVICE	1. Central control computer 2. The +8 ON signal wiring 3. SERVICE switch
Records Skip	Phonograph is not level	1. Level the phonograph
	Worn or damaged stylus	1. Replace the stylus
	Binding tone arm cable	1. Follow the "Tone Arm Cable" procedure in Section 6
No credit	No credit given by coins and dollar bills	1. Central control computer
	No credit given by coins but dollar bill gives credit	1. Coin switch Common wiring 2. Central control computer
	One value of coin will not give credit	1. Coin rejected 2. Wiring to coin switch 3. Coin switch 4. Central control computer

TROUBLE	SYMPTOM	PROBABLE CAUSE
	Dollar bill will not give credit	1. Bill acceptor 2. Wiring to bill acceptor 3. Central control computer
Wrong credit	Credit for amount deposited does not agree with price card setting	1. One or more coins did not register (see **No Credit**). 2. Central control computer programed incorrectly. 3. Central control computer
System does not respond to keyboard	0 Credits on SELECTION REMAINING display	1. Insufficient credit
	Selection remaining, but certain keys do not work	1. Shorted keyboard switch 2. Central control computer 3. Short in keyboard wiring
	Selections remaining, but entire keyboard does not work	1. Wiring from keyboard to display board 2. Keyboard 3. Digital display board 4. Central control computer
Digital display does not work	Display lights, but shows wrong information	1. Wiring from central control computer to display 2. Digital display 3. Central control computer
	The +8 VDC LED on central control computer is lit but display digits and LED lamps will not Light	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	1. Wiring from central control computer to digital display 2. Digital display 3. Central control computer
Miscellaneous problems	any malfunction not described above	1. Main power supply 2. Central control computer

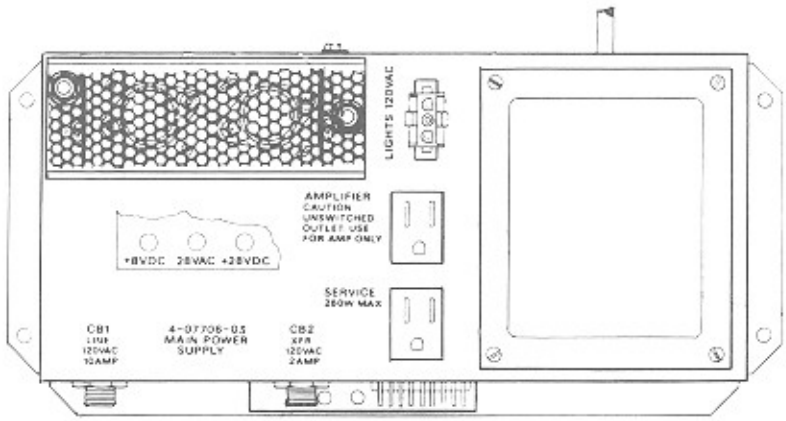
STATUS LAMPS

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

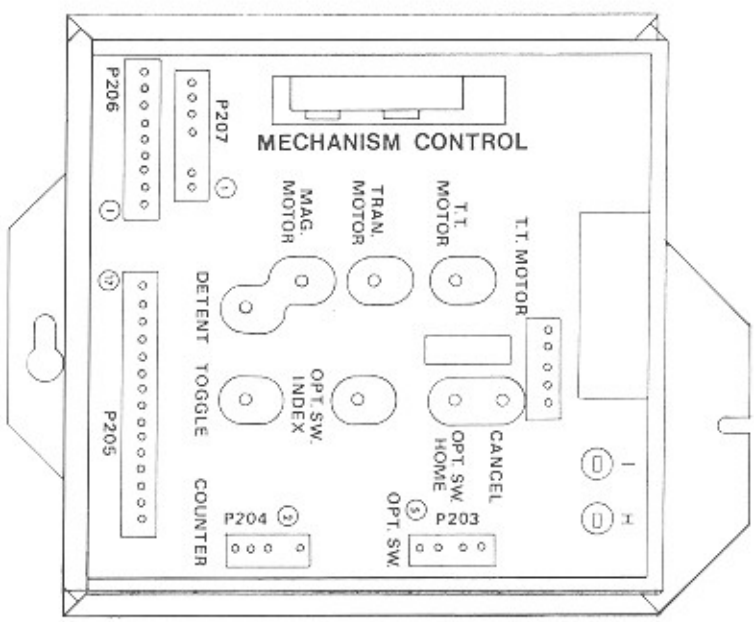
Shows presence of respective voltage and implies that there is no short on the lines.



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

Figure 5-1. Status Indicators

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. Refer to figures 5-1 through 5-6 as needed.

> 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

A. Check that the amplifier is plugged-in and is receiving power from the junction box.

B. Disconnect the mute plug.

C. 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 5-2 (Stereo Preamp), replace the cartridge if necessary.

4. EXTENSION SPEAKERS

Check the OVERLOAD indicators (see figure 1-3), then disconnect the extension speaker plug from the transformer package receptacle (figure 1-3 also) and look at the OVERLOAD indicators again. If either or both OVERLOAD indicators were ON, but are now OFF, the overload is in the extension speakers.

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 (Rowe Specification 0-00053-00) is on both sides of insulator.

6. FILTER CAPACITORS

Check for plus and minus 30 VDC in the amplifier power supply. Connect the negative meter lead to ground and check the voltage at the terminals of the large electrolytic filter capacitors located on the amplifier chassis next to the power transformer. When taking readings on the capacitor with the outer shell isolated from chassis to one of the shell tabs, check that the voltage on each capacitor terminal is the same. A lowered voltage at one of the capacitor pins indicates that

the capacitor may be defective and should be replaced, or that the bridge rectifier is defective. Another indication of defective filter capacitors is excessive hum in the sound output.

7. 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 1 VAC at preamp output (pins 3 or 5 of 13 pin connector to 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 5-2, Stereo Preamp. 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 the input to "Mono" and use the good channel temporarily.

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.

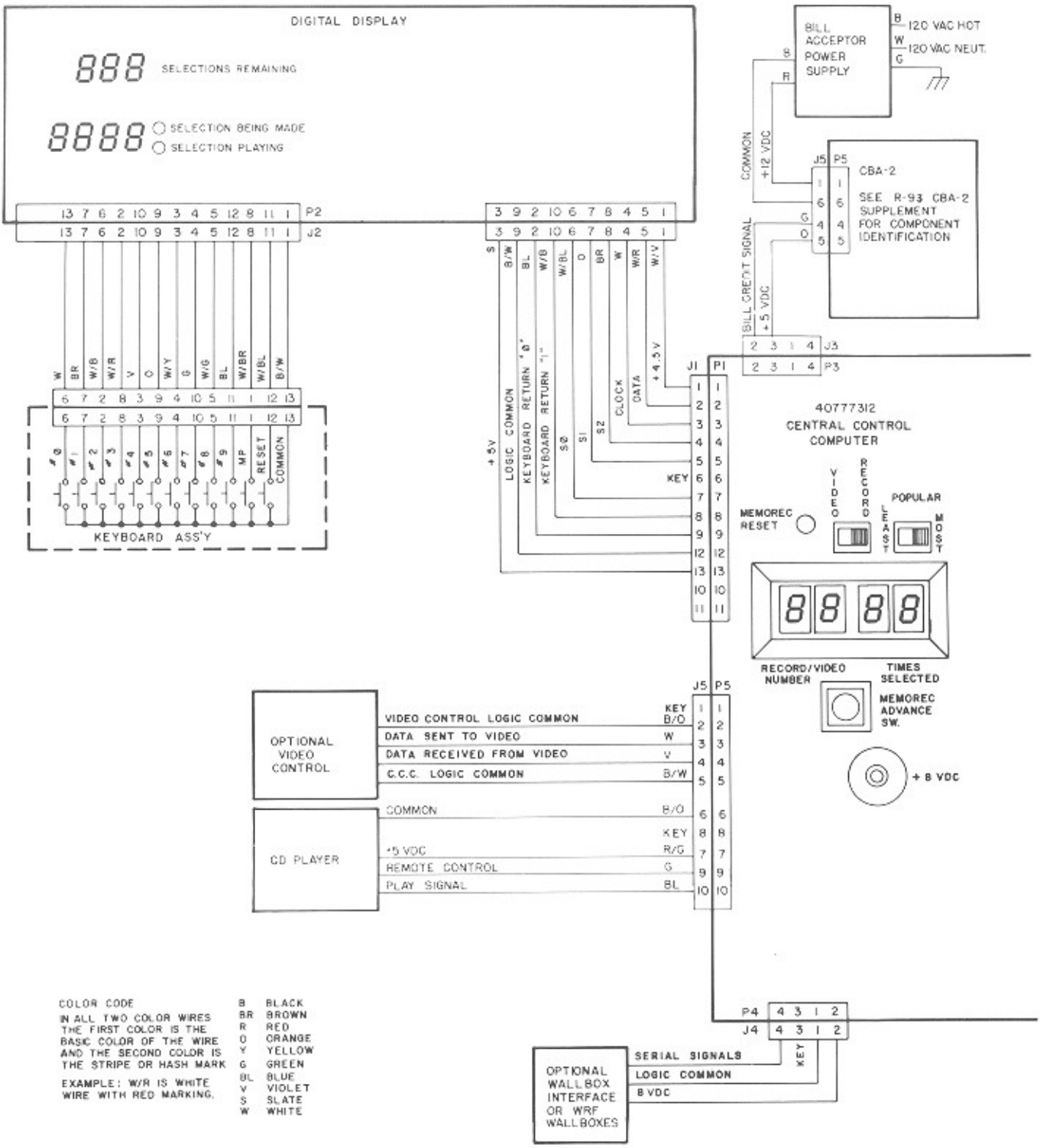
Excessive Hum

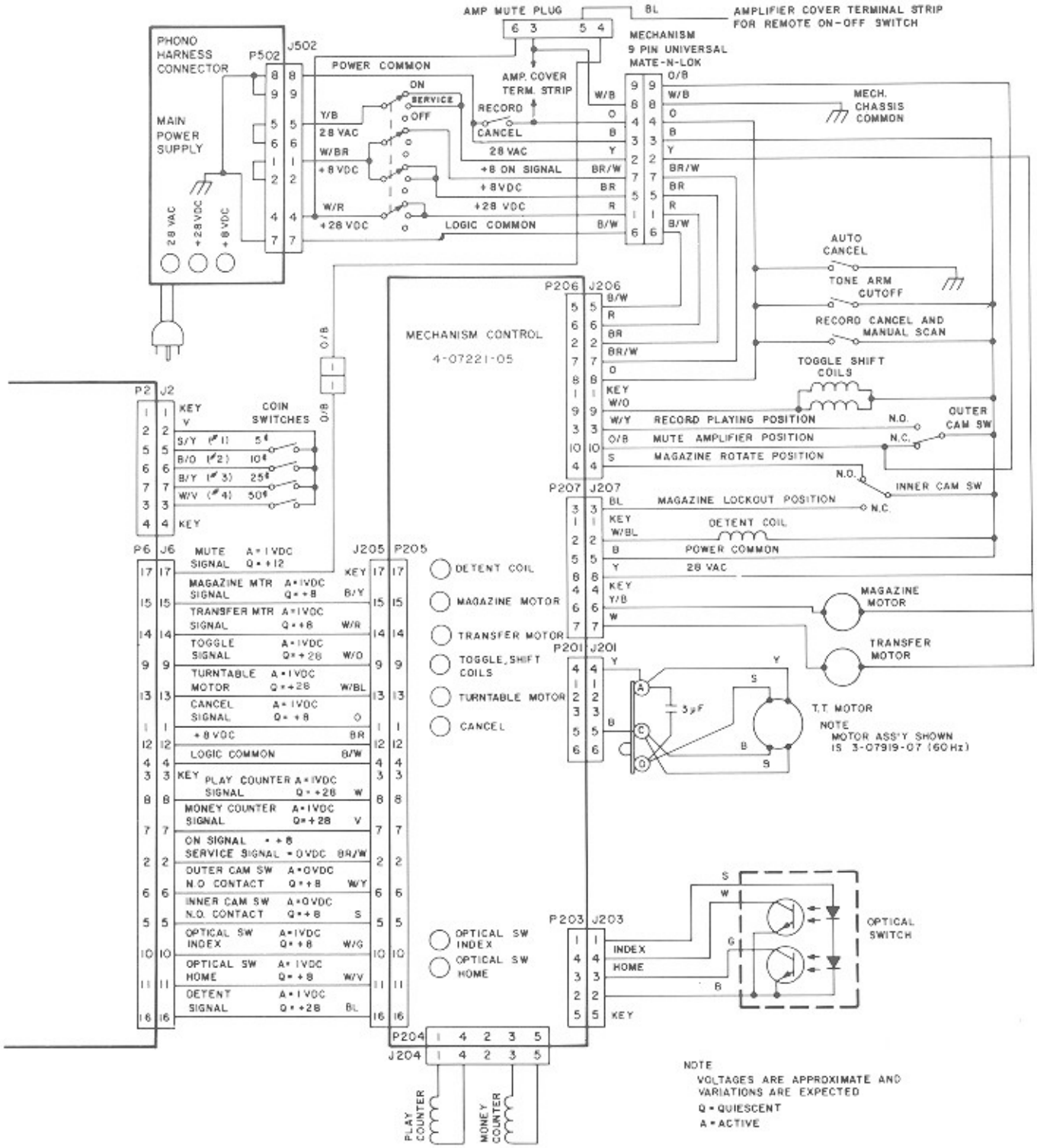
Open Shield - Be sure that shield or wires are not broken between cartridge and the amplifier input plug.

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.


DIGITAL DISPLAY
888 SELECTIONS REMAINING
8888 SELECTION BEING MADE
SELECTION PLAYING
P2
J2
KEYBOARD ASS'Y
#0
#1
#2
#3
#4
#5
#6
#7
#8
#9
MP
RESET
COMMON
BILL ACCEPTOR POWER SUPPLY
120 VAC HOT
120 VAC NEUT.
COMMON
+12 VDC
CBA-2
SEE R-93 CBA-2 SUPPLEMENT FOR COMPONENT IDENTIFICATION
BILL CREDIT SIGNAL
+5 VDC
J3
P3
J1
P1
+5V
LOGIC COMMON
KEYBOARD RETURN "0"
KEYBOARD RETURN "1"
S0
S1
S2
CLOCK
DATA
+4.5V
KEY
4077731 2
CENTRAL CONTROL COMPUTER
VIDEO
RECORD
MEMOREC RESET
POPULAR
LEAST
MOST
RECORD/VIDEO NUMBER
TIMES SELECTED
MEMOREC ADVANCE SW.
+8 VDC
OPTIONAL VIDEO CONTROL
VIDEO CONTROL LOGIC COMMON
DATA SENT TO VIDEO
DATA RECEIVED FROM VIDEO
C.C.C. LOGIC COMMON
CD PLAYER
COMMON
+5 VDC
REMOTE CONTROL
PLAY SIGNAL
J5
P5
P4
J4
OPTIONAL WALL BOX INTERFACE OR WRF WALL BOXES
SERIAL SIGNALS
LOGIC COMMON
8 VDC
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



For Equivalent Engineering Drawing See 61020001-Q7 [A]

Figure 5-2. R-93 Phonograph Block Diagram

SEQUENCE OF OPERATION

The sequence of operation descriptions that follow depict a normal phonograph operation cycle. Refer to the block diagram (figure 5-2) for an overview of the phonograph's circuits.

Initially, the phonograph is powered OFF, then power is turned ON and a selection is made. The remaining descriptions identify which signals are active during each moment in the phonograph operational cycle.

All of the voltages shown on the block diagram can be measured with a VOM or a DVOM. Because of their short duration, pulsed signals (indicated by a "Q" and an "A" state) may not read correctly on your meter.

Power is turned ON, voltages and commons are applied to circuits and components.

1. Current flows through the power cord and power switch to energize the power supply. Current flows through the SERVICE switch and energizes the 28 VAC, +28 VDC, and +8 VDC busses. The +8 VDC LED on the CCC lights.

2. The 28 Volt AC flows 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 appears on the amplifier mute plug, mechanism control, and bill acceptor.

4. Power Common connects the outside record cancel switch, manual scan switch, tone arm cutoff, toggle shift coils, inner and outer cam switches, detent coil, and mechanism control.

5. The +8 VDC and the Logic Common connect to the mechanism control and bill acceptor. These wires are routed through the mechanism control to the CCC and Logic Common is routed to the optical switch. The CCC routes +8 VDC and Logic Common to the wallbox interface.

6. The +8 ON signal is routed through the mechanism control to the CCC.

7. The mechanism Chassis Common connects the amplifier mute plug, amplifier cover terminal strip, and the auto cancel switch.

The CCC senses that power is turned ON. No selections or credit are in memory.

1. The CCC begins to continually monitor the state of all switches and determines if the transfer arm (gripper bow) is in the HOME position.

2. The CCC sends clock and data signals to the digital display, causing the LED's to light.

A customer inserts a quarter, standard credit established, and credit is set at 1 play for 25¢, 2 plays for 50¢, and 5 plays for $1.00.

1. After the customer inserts a quarter into slot, the coin passes through the validator and actuates the 25¢ switch.
2. The CCC senses the switch closure and stores 5 money units (nickels) in its memory.
3. Five pulses are sent to the money counter.
4. The CCC uses the money value stored in its memory and the stored pricing information to calculate the credit level, which is 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 bill denomination inserted. One pulse is sent for a $1 bill and five pulses are sent for a $5 bill. These pulses can be monitored at P3, Pin 2 of the CCC.

The first digit is selected and displayed.

1. A customer presses the first digit in his selection number (In this illustration the number pressed is 1.).
2. The CCC senses the key closure, checks that the credit is available, and displays the credit 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.

The second digit is selected and displayed.

1. The customer presses the second digit of the selection, the number 2.
2. The CCC senses the key closure, stores the selected digit value, and displays it.

The third digit is selected and displayed, the selection is stored, Memorec is incremented, and the credit is cancelled.

1. The customer presses the third digit of his selection, the number 3.
2. The CCC senses the key closure, stores the selected digit, and displays it.
3. The selection is stored in CCC.
4. Memorec data is incremented.
5. The credit is set to 0 (zero).

The detent coil and magazine are energized and the magazine rotates.

1. The CCC tells the mechanism control to energize the detent coil. The DETENT COIL LED lights and the energized detent coil moves a mechanical linkage that unlocks the magazine.
2. After 56 to 70 milliseconds, the CCC tells the mechanism control to energize the magazine motor. The MAGAZINE MOTOR LED lights and the motor turns, which rotates the unlocked magazine.

The magazine rotates until the selection is located.

1. As the magazine rotates, the gear teeth interrupt the optical switch light beam.

   When the OPTICAL SWITCH INDEX LED goes from dark to light (OFF to ON), the CCC knows that the magazine is moving to the next record position. Two things happen:

- The CCC keeps track of the magazine position by adding 1 to the position value stored in the CCC.
- The CCC checks the selection memory to determine which side of the next record to select.

2. The SELECTION PLAYING display shows the magazine record position.

The selection is located, the record transferred to the turntable, and the tone arm is set down.

1. The CCC turns OFF the DETENT and MAG MOTOR LED's, which tells the mechanism control to de-energize the detent coil and magazine motor.
2. The magazine locks because the detent pawl falls into a slot in the detent wheel.
3. The CCC turns ON the TRANSFER MOTOR and the TURNTABLE MOTOR LED's, causing the mechanism control to start the transfer and turntable motors. The CCC tells the mechanism control to advance the play counter.

4. The transfer motor rotates the cam off the inner cam switch (If the first digit of the selection was a two, the CCC signal lights the TOGGLE LED, causing the mechanism control to energize the toggle shift controls.).

5. The gripper bow picks up a record, places it on the turntable, and the tone arm sets down. If a record is not placed on the turntable, the Auto-Cancel operates when the tone arm sets down.

6. The SELECTION PLAYING display lights, showing the record number chosen.

The amplifier is unmuted and the record plays.

1. The transfer motor runs and the cam moves onto the outer cam switch.

2. The outer cam switch N.O. contact signals the CCC to turn OFF the transfer motor. The TRANSFER MOTOR LED turns OFF and the transfer motor stops.

3. The mute signal becomes active causing the amplifier to unmute.

4. The record plays.

The record ends and is returned to the magazine.

1. The tone arm cutoff sends a cancel signal to the CCC.

2. The CCC turns ON the TRANSFER MOTOR LED, causing the mechanism control to start the transfer motor.

3. The gripper bow picks up the record and returns it to the magazine.

The transfer cycle ends and the CCC searches the selection memory.

1. The cam rotates onto the inner cam switch.

2. The inner cam switch N.O. contact signals the CCC that the transfer cycle is complete.

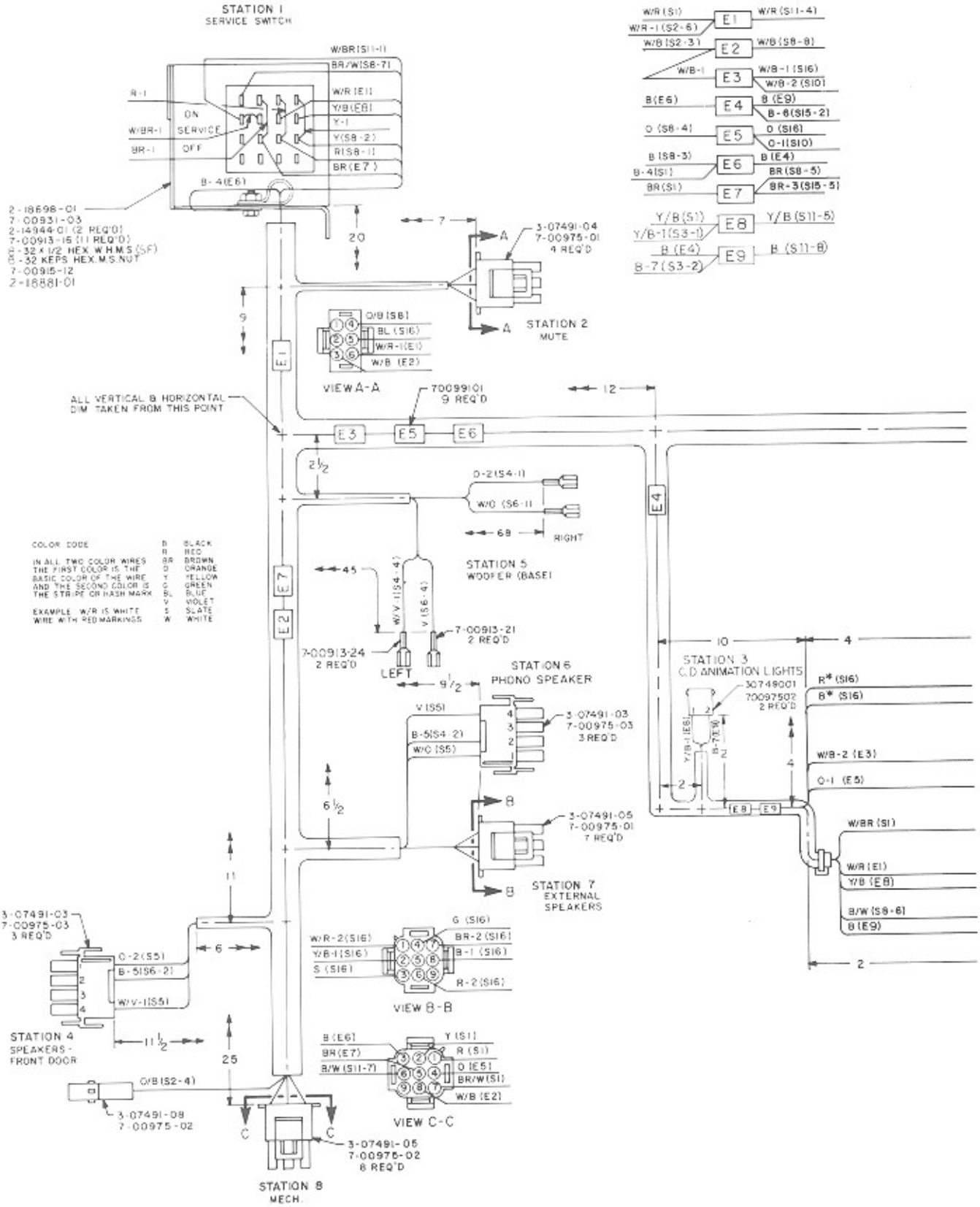
3. The CCC turns OFF the TRANSFER MOTOR and TURNTABLE MOTOR LED's, causing the mechanism to turn OFF these motors.

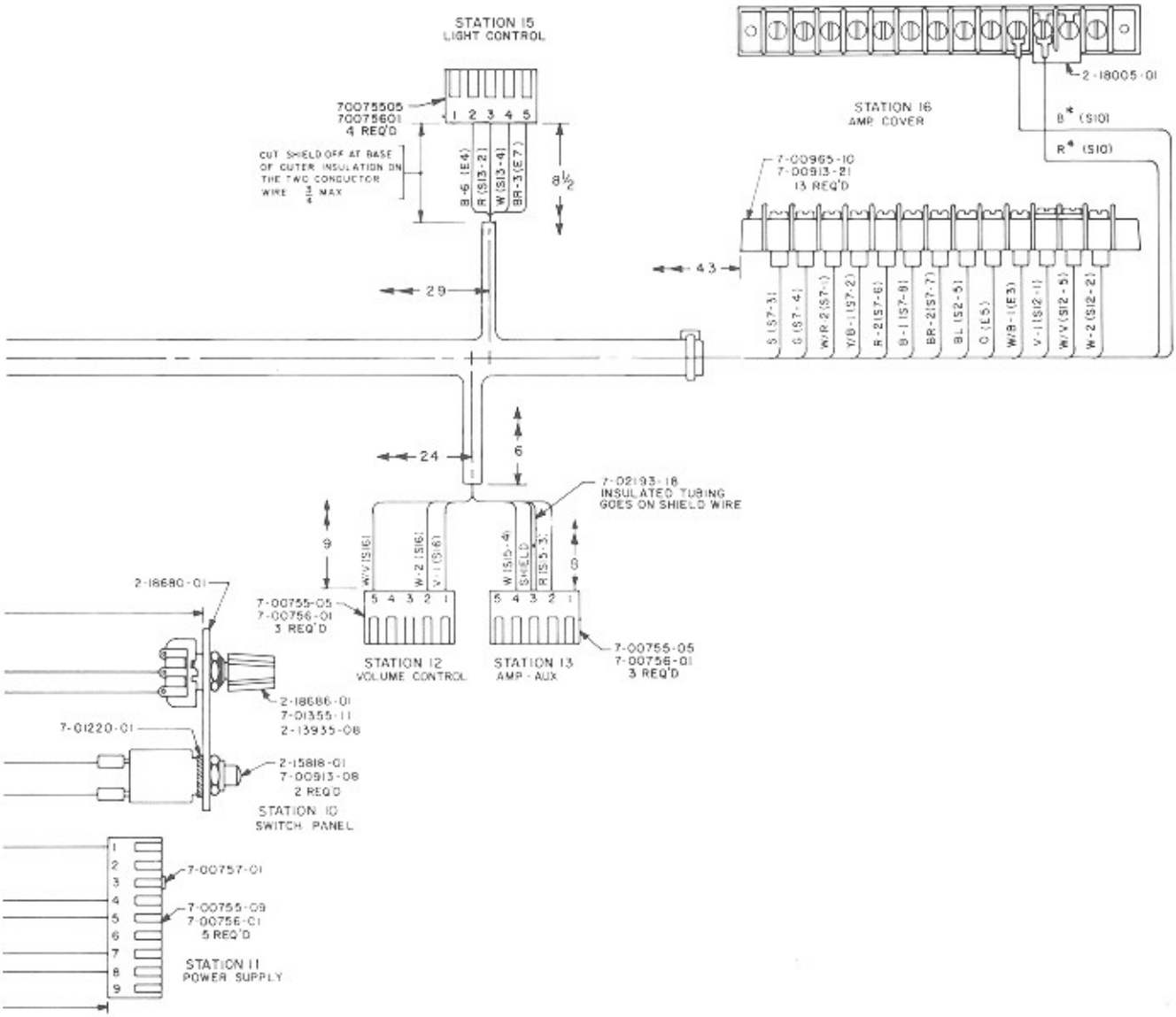
4. The CCC electronically searches its selection memory. If the memory contains one or more selections, Sequences 7 through 12 are repeated.

The phonograph returns to Standby condition and Autoplay timing begins.

1. All selections have been played.

2. The display shows the most popular record on the phonograph. Record 123 is the most popular selection.


STATION 1
SERVICE SWITCH
W/BR(S11-1)
BR/W(S8-7)
R-1
W/R(E1)
Y/B(E8)
Y-1
Y(S8-2)
R(S8-1)
BR(E7)
ON
SERVICE
OFF
W/BR-1
BR-1
B-4(E6)
2-18698-01
7-00931-03
2-14944-01 (2 REQ'D)
7-00913-16 (11 REQ'D)
8-32 X 1/2 HEX. W.H.M.S.(SF)
8-32 KEPS HEX.M.S.NUT
7-00915-12
2-18881-01
3-07491-04
7-00975-01
4 REQ'D
STATION 2
MUTE
O/B(S8)
BL(S16)
W/R-1(E1)
W/B(E2)
VIEW A-A
70099101
9 REQ'D
ALL VERTICAL & HORIZONTAL
DIM. TAKEN FROM THIS POINT
E1
E2
E3
E4
E5
E6
E7
E8
E9
W/R(S1)
W/R-1(S2-6)
W/B(S2-3)
W/B-1
B(E6)
O(S8-4)
B(S8-3)
B-4(S1)
BR(S1)
Y/B(S1)
Y/B-1(S3-1)
B(E4)
B-7(S3-2)
W/R(S11-4)
W/B(S8-8)
W/B-1(S16)
W/B-2(S10)
B(E9)
B-6(S15-2)
O(S16)
O-1(S10)
B(E4)
BR(S8-5)
BR-3(S15-5)
Y/B(S11-5)
B(S11-8)
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 MARKINGS
B BLACK
R RED
BR BROWN
O ORANGE
Y YELLOW
G GREEN
BL BLUE
V VIOLET
S SLATE
W WHITE
O-2(S4-1)
W/O(S6-1)
RIGHT
STATION 5
WOOFER (BASE)
W/V-1(S4-4)
V(S6-4)
7-00913-21
2 REQ'D
7-00913-24
2 REQ'D
LEFT
STATION 6
PHONO SPEAKER
V(S5)
B-5(S4-2)
W/O(S5)
3-07491-03
7-00975-03
3 REQ'D
3-07491-05
7-00975-01
7 REQ'D
STATION 7
EXTERNAL
SPEAKERS
STATION 3
C.D. ANIMATION LIGHTS
30749001
70097502
2 REQ'D
R*(S16)
B*(S16)
W/B-2(E3)
O-1(E5)
W/BR(S1)
W/R(E1)
Y/B(E8)
B/W(S8-6)
B(E9)
Y/B-1(E8)
B-7(E9)
3-07491-03
7-00975-03
3 REQ'D
O-2(S5)
B-5(S6-2)
W/V-1(S5)
STATION 4
SPEAKERS -
FRONT DOOR
G(S16)
W/R-2(S16)
Y/B-1(S16)
S(S16)
BR-2(S16)
B-1(S16)
R-2(S16)
VIEW B-B
B(E6)
BR(E7)
B/W(S11-7)
Y(S1)
R(S1)
O(E5)
BR/W(S1)
W/B(E2)
VIEW C-C
O/B(S2-4)
3-07491-08
7-00975-02
3-07491-05
7-00975-02
8 REQ'D
STATION 8
MECH.



For Equivalent Engineering Drawing See 61021101 A

Figure 5-3. Wiring Diagram

For Equivalent Engineering Drawing See 40770607/08-Q1 A

Figure 5-4A. Main Power Supply Wiring Diagram - Domestic

For Equivalent Engineering Drawing See 40770607/08-02 A

Figure 5-4B. Main Power Supply Schematic - Domestic

For Equivalent Engineering Drawing See 46509212/13-01 [A]

Figure 5-5A. Main Power Supply Wiring Diagram - Export

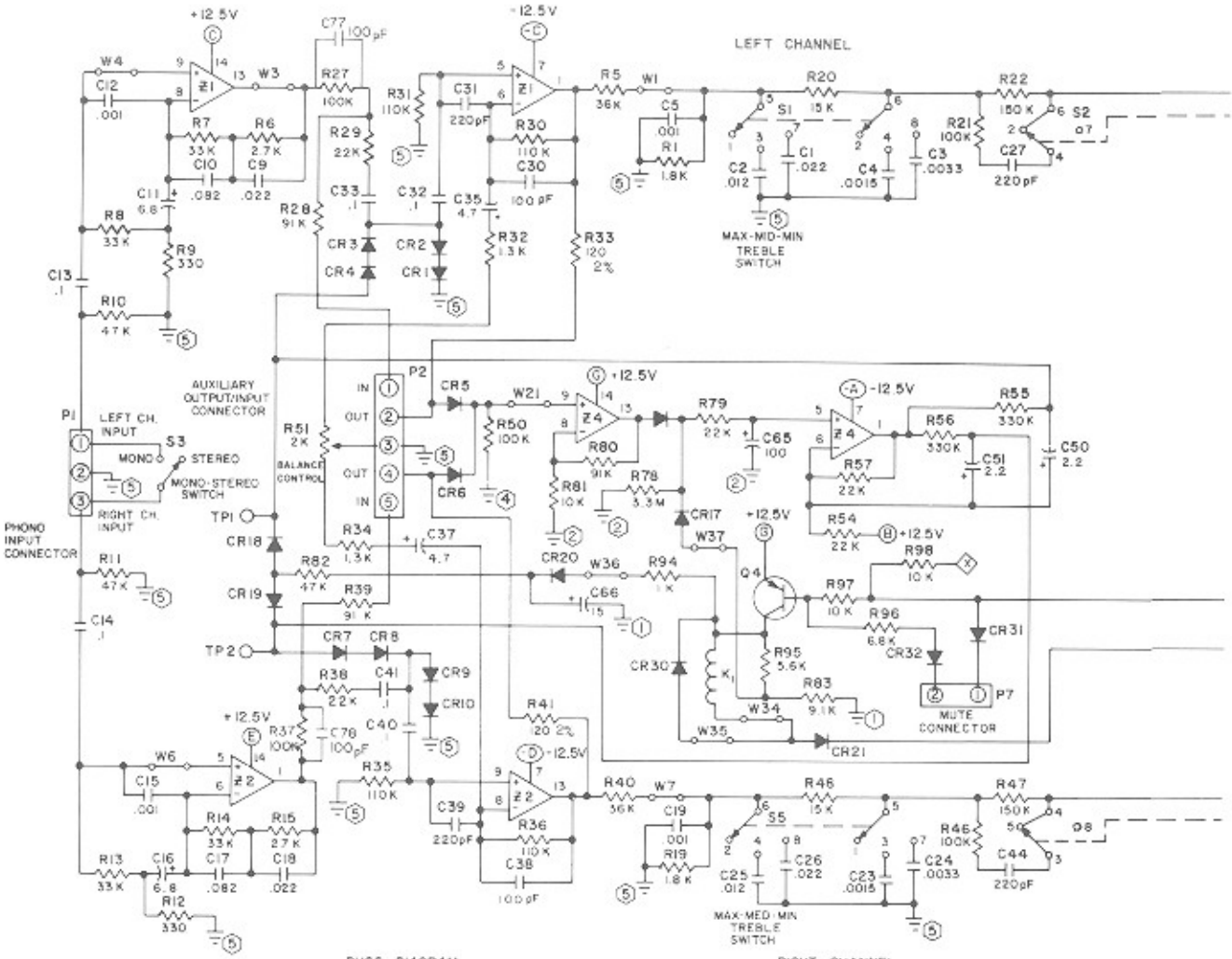
Figure 5-5B. Main Power Supply Schematic - Export

For Equivalent Engineering Drawing See 46509212/13-02 A

COMPONENTS LIST FOR MAIN POWER SUPPLY CIRCUIT BOARD 60935702

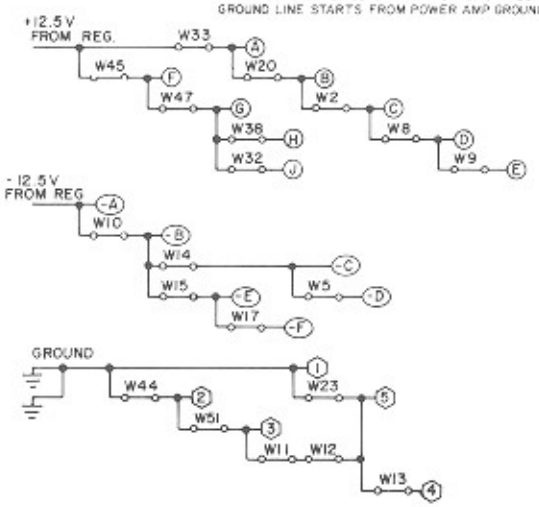
C501	Capacitor - Electrolytic	2.2 Mfd @ 80V	70023805
C502	Capacitor - Monolithic Ceramic	0.1 Mfd @ 50V	70028511
C503	Capacitor - Monolithic Ceramic	0.1 Mfd @ 50V	70028511
C504	Capacitor - Electrolytic	3300 Mfd @ 35V	70023513
C505	Capacitor - Electrolytic	2200 Mfd @ 50V	70023505
C506	Capacitor - Electrolytic	2.2 Mfd @ 80V	70023805
C507	Capacitor - Electrolytic	2.2 Mfd @ 80V	70023805
CR501-CR510	Diode - Silicon		70035004
CR511	Diode - Zener (7.5 V, 5%)		70035520
CR512	Diode - Zener (13 V, 5%)		70035506
CR513	Diode - Silicon		70035005
CR514-CR516	Diode - Light Emitting		70035303
F501-F502	Fuse - 5 Amp		70072106
P501	Polarizing Wafer Assembly		70075007
P502	Polarizing Wafer Assembly - Right-angle mount		70076009
P503-P504	Polarizing Wafer Assembly		70075003
Q501-Q502	Transistor - Silicon (NPN)		70031101
Q503	Transistor - Silicon (NPN)		70030008

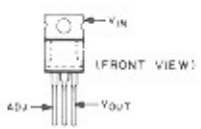
R501	Resistor - Carbon	6.8 K	(¼ W, 2%)	79902682
R502	Resistor - Carbon	390 Ohm	(¼ W, 2%)	79902391
R503	Resistor - Wire Wound	0.33 Ohm	(2 W, 10%)	79920338
R504	Resistor - Wire Wound	1 K	(2 W, 10%)	79920102
R505	Resistor - Carbon	1 K	(½ W, 10%)	70010619
R506	Resistor - Carbon	470 Ohm	(¼ W, 2%)	79902471
R507	Resistor - Carbon	100 Ohm	(¼ W, 2%)	79902101
R508	Resistor - Wire Wound	0.82 Ohm	(2 W, 10%)	79920828
R509	Resistor - Carbon	100 Ohm	(¼ W, 5%)	79901101
R510	Resistor - Carbon	560 Ohm	(¼ W, 5%)	79901561
R511	Resistor - Carbon	47 Ohm	(¼ W, 5%)	79901470
R512	Resistor - Carbon	2.7 K	(½ W, 5%)	70012007
R513	Resistor - Carbon	1 K	(½ W, 10%)	70010619



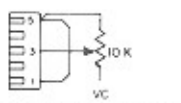
BUSS DIAGRAM

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

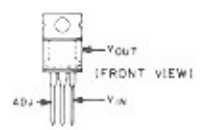




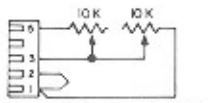
VR1(-) VOLTAGE REGULATOR(LM337) NEGATIVE 7-00365-08



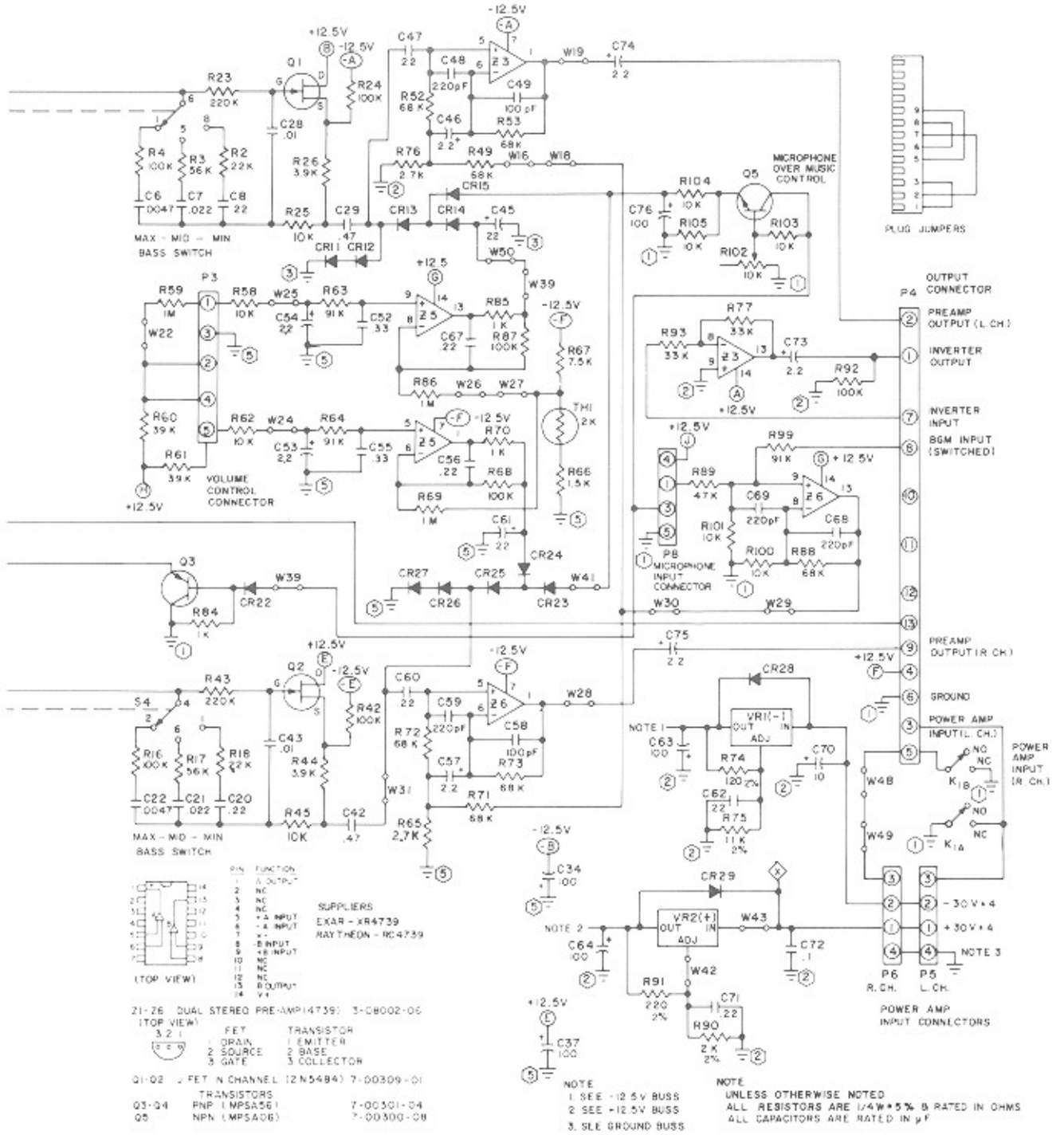
2 WIRE VOLUME CONTROL



VR2(+) VOLTAGE REGULATOR(LM317) POSITIVE 7-00365-07



DUAL 2 WIRE VOLUME CONTROL



For Equivalent Engineering Drawing See 60792505 C

Figure 5-6. Schematic Diagram - Stereo Preamp Assembly

COMPONENT LIST FOR PREAMPLIFIER BOARD 60792505

C1	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C2	Capacitor - Monolithic Ceramic	.012 Mfd	70028638
C3	Capacitor - Monolithic Ceramic	.0033 Mfd	70028627
C4	Capacitor - Monolithic Ceramic	.0015 Mfd	70028621
C5	Capacitor - Monolithic Ceramic	.001 Mfd	70028618
C6	Capacitor - Monolithic Ceramic	.0047 Mfd	70028630
C7	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C8	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C9	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C10	Capacitor - Monolithic Ceramic	.082 Mfd	70028648
C11	Capacitor - Electrolytic	6.8 Mfd	70023807
C12	Capacitor - Monolithic Ceramic	.001 Mfd	70028618
C13-C14	Capacitor - Monolithic Ceramic	.1 Mfd	70028514
C15	Capacitor - Monolithic Ceramic	.001 Mfd	70028618
C16	Capacitor - Electrolytic	6.8 Mfd	70023807
C17	Capacitor - Monolithic Ceramic	.082 Mfd	70028648
C18	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C19	Capacitor - Monolithic Ceramic	.001 Mfd	70028618
C20	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C21	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C22	Capacitor - Monolithic Ceramic	.0047 Mfd	70028630
C23	Capacitor - Monolithic Ceramic	.0015 Mfd	70028621
C24	Capacitor - Monolithic Ceramic	.0033 Mfd	70028627
C25	Capacitor - Monolithic Ceramic	.012 Mfd	70028638
C26	Capacitor - Monolithic Ceramic	.022 Mfd	70028641
C27	Capacitor - Monolithic Ceramic	220 Pf	70028606
C28	Capacitor - Monolithic Ceramic	.01 Mfd	70028637
C29	Capacitor - Monolithic Ceramic	.47 Mfd	70028516
C30	Capacitor - Monolithic Ceramic	100 Pf	70028601
C31	Capacitor - Monolithic Ceramic	220 Pf	70028606
C32-C33	Capacitor - Monolithic Ceramic	.1 Mfd	70028514
C34	Capacitor - Electrolytic	100 Mfd	70023814
C35	Capacitor - Electrolytic	4.7 Mfd	70023806
C36	Capacitor - Electrolytic	100 Mfd	70023814
C37	Capacitor - Electrolytic	4.7 Mfd	70023806
C38	Capacitor - Monolithic Ceramic	100 Pf	70028601
C39	Capacitor - Monolithic Ceramic	220 Pf	70028606
C40-C41	Capacitor - Monolithic Ceramic	.1 Mfd	70028514
C42	Capacitor - Monolithic Ceramic	.47 Mfd	70028516
C43	Capacitor - Monolithic Ceramic	.01 Mfd	70028637
C44	Capacitor - Monolithic Ceramic	220 Pf	70028606
C45	Capacitor - Electrolytic	22 Mfd	70023810
C46	Capacitor - Electrolytic	2.2 Mfd	70023805
C47	Capacitor - Electrolytic	.22 Mfd	70028510
C48	Capacitor - Electrolytic	220 Pf	70028606
C49	Capacitor - Electrolytic	100 Pf	70028601
C50-C51	Capacitor - Electrolytic	2.2 Mfd	70023805
C52	Capacitor - Monolithic Ceramic	.33 Mfd	70028515
C53-C54	Capacitor - Electrolytic	2.2 Mfd	70023805
C55	Capacitor - Monolithic Ceramic	.33 Mfd	70028515
C56	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C57	Capacitor - Electrolytic	2.2 Mfd	70023805

C58	Capacitor - Monolithic Ceramic	100 Pf	70028601
C59	Capacitor - Monolithic Ceramic	220 Pf	70028606
C60	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C61	Capacitor - Electrolytic	22 Mfd	70023810
C62	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C63-C65	Capacitor - Electrolytic	100 Mfd	70023814
C66	Capacitor - Electrolytic	15 Mfd	70023809
C67	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C68-C69	Capacitor - Monolithic Ceramic	220 Pf	70023806
C70	Capacitor - Electrolytic	10 Mfd	70023808
C71	Capacitor - Monolithic Ceramic	.22 Mfd	70028510
C72	Capacitor - Monolithic Ceramic	.1 Mfd	70028514
C73-C75	Capacitor - Electrolytic	2.2 Mfd	70023805
C76	Capacitor - Electrolytic	100 Mfd	70023814
C77-C78	Capacitor - Monolithic Ceramic	100 Pf	70028601
CR1-CR32	Diode - Silicon		70035007
K1	Relay - Reed		70042208
P1	Non-Polarizing Wafer Assembly	(3 CKT)	70074921
P2-P3	Non-Polarizing Wafer Assembly	(5 CKT)	70074923
P4	Non-Polarizing Wafer Assembly	(13 CKT)	70074931
P5-P6	P.C. Board Connector - Top Entry	(4 CKT)	70074802
P7	Polarizing Wafer Assembly	(2 CKT)	70075002
P8	Non-Polarizing Wafer Assembly	(5 CKT)	70074923
Q1-Q2	Transistor - Junction Field Effect		70030901
Q3-Q4	Transistor - Silicon (PNP)		70030104
Q5	Transistor - Silicon (NPN)		70030108

Note: All resistors are $\frac{1}{4}$ watt 5%, unless otherwise noted.

R1	Resistor - Carbon	1.8 K	79901182
R2	Resistor - Carbon	22 K	79901223
R3	Resistor - Carbon	56 K	79901563
R4	Resistor - Carbon	100 K	79901104
R5	Resistor - Carbon	36 K	79901363
R6	Resistor - Carbon	2.7 K	79901272
R7-R8	Resistor - Carbon	33 K	79901333
R9	Resistor - Carbon	330 Ohm	79901331
R10-R11	Resistor - Carbon	47 K	79901473
R12	Resistor - Carbon	330 Ohm	79901331
R13-R14	Resistor - Carbon	33 K	79901333
R15	Resistor - Carbon	2.7 K	79901272
R16	Resistor - Carbon	100 K	79901104
R17	Resistor - Carbon	56 K	79901563
R18	Resistor - Carbon	22 K	79901223
R19	Resistor - Carbon	1.8 K	79901182
R20	Resistor - Carbon	15 K	79901153
R21	Resistor - Carbon	100 K	79901104
R22	Resistor - Carbon	150 K	79901154
R23	Resistor - Carbon	220 K	79901224
R24	Resistor - Carbon	100 K	79901104

R25	Resistor - Carbon	10	K		79901103
R26	Resistor - Carbon	3.9	K		79901392
R27	Resistor - Carbon	22	K		79901223
R28	Resistor - Carbon	91	K		79901913
R29	Resistor - Carbon	22	K		79901223
R30-R31	Resistor - Carbon	110	K		79901114
R32	Resistor - Carbon	1.3	K		79901132
R33	Resistor - Carbon	120	Ohm	(¼ W, 2%)	79902121
R34	Resistor - Carbon	1.3	K		79901132
R35-R36	Resistor - Carbon	110	K		79901114
R37	Resistor - Carbon	100	K		79901104
R38	Resistor - Carbon	22	K		79901223
R39	Resistor - Carbon	91	K		79901913
R40	Resistor - Carbon	36	K		79901363
R41	Resistor - Carbon	120	Ohm	(¼ W, 2%)	79902121
R42	Resistor - Carbon	100	K		79901104
R43	Resistor - Carbon	220	K		79901224
R44	Resistor - Carbon	3.9	K		79901392
R45	Resistor - Carbon	10	K		79901103
R46	Resistor - Carbon	100	K		79901104
R47	Resistor - Carbon	150	K		79901154
R48	Resistor - Carbon	15	K		79901153
R49	Resistor - Carbon	68	K		79901683
R50	Resistor - Carbon	100	K		79901104
R51	Potentiometer (Balance Control)	2	K		70040012
R52-R53	Resistor - Carbon	68	K		79901683
R54	Resistor - Carbon	22	K		79901223
R55-R56	Resistor - Carbon	330	K		79901334
R57	Resistor - Carbon	22	K		79901223
R58	Resistor - Carbon	10	K		79901103
R59	Resistor - Carbon	1	Meg		79901105
R60-R61	Resistor - Carbon	39	K		79901393
R62	Resistor - Carbon	10	K		79901103
R63-R64	Resistor - Carbon	91	K		79901913
R65	Resistor - Carbon	2.7	K		79901272
R66	Resistor - Carbon	1.5	K		79901152
R67	Resistor - Carbon	7.5	K		79901752
R68	Resistor - Carbon	100	K		79901104
R69	Resistor - Carbon	1	Meg		79901105
R70	Resistor - Carbon	1	K		79901102
R71-R73	Resistor - Carbon	68	K		79901683
R74	Resistor - Carbon	120	Ohm	(¼ W, 2%)	79902121
R75	Resistor - Carbon	1.1	K	(½ W, 2%)	79902112
R76	Resistor - Carbon	2.7	K	(¼ W, 2%)	79902272
R77	Resistor - Carbon	33	K		79901333
R78	Resistor - Carbon	3.3	Meg		79901335
R79	Resistor - Carbon	22	K		79901223
R80	Resistor - Carbon	91	K		79901913
R81	Resistor - Carbon	10	K		79901103
R82	Resistor - Carbon	47	K		79901473
R83	Resistor - Carbon	9.1	K		79901912
R84-R85	Resistor - Carbon	1	K		79901102

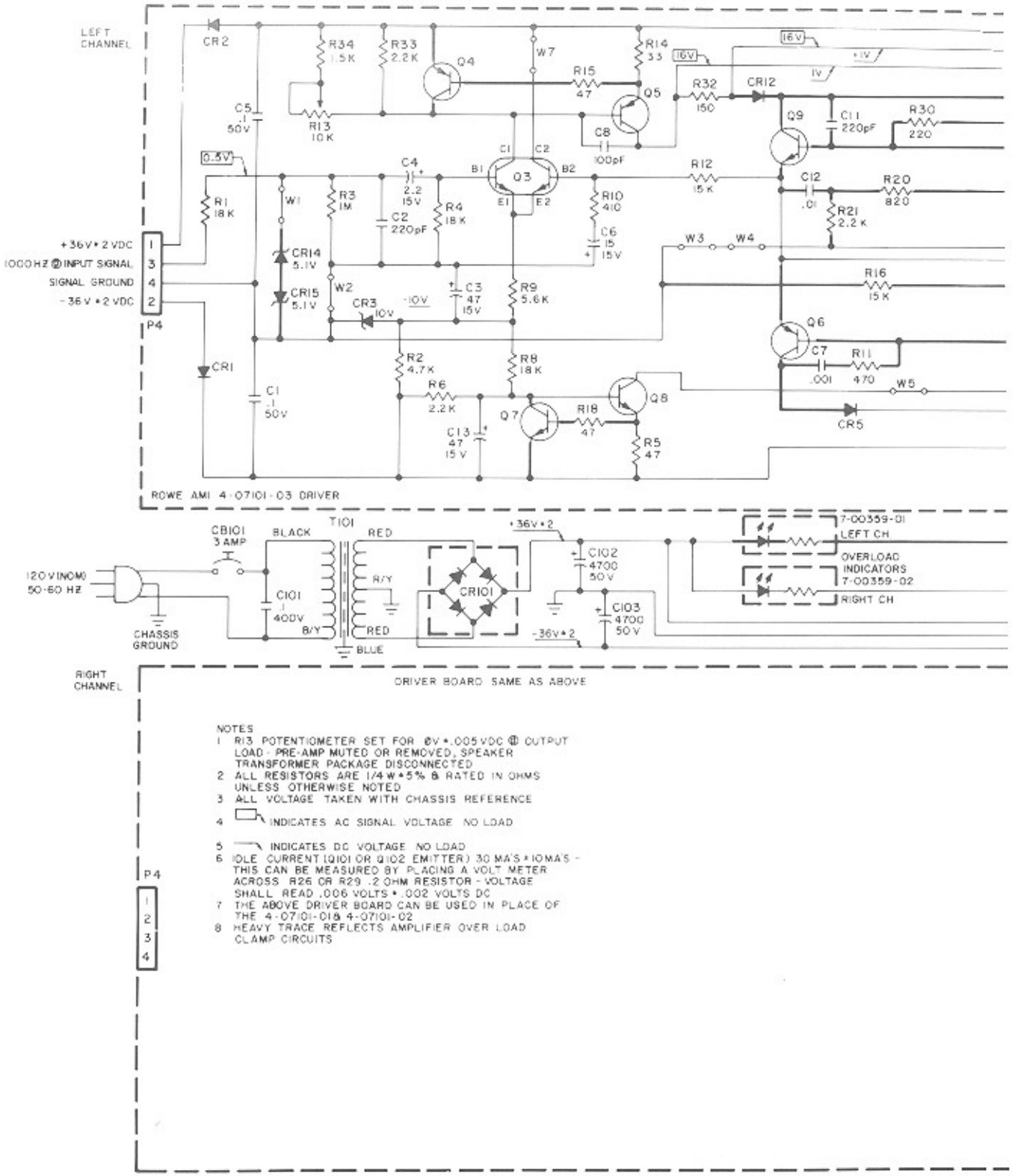
R86	Resistor - Carbon	1 Meg		79901105
R87	Resistor - Carbon	100 K		79901104
R88	Resistor - Carbon	68 K		79901683
R89	Resistor - Carbon	47 K		79901473
R90	Resistor - Carbon	2 K	(¼ W, 2%)	79902202
R91	Resistor - Carbon	220 Ohm	(¼ W, 2%)	79902221
R92	Resistor - Carbon	100 K		79901104
R93	Resistor - Carbon	33 K		79901333
R94	Resistor - Carbon	1 K		79901102
R95	Resistor - Carbon	5.6 K		79901562
R96	Resistor - Carbon	6.8 K		79901682
R97	Resistor - Carbon	10 K		79901103
R98	Resistor - Carbon	3.3 K		79901332
R99	Resistor - Carbon	91 K		79901913
R100-R101	Resistor - Carbon	10 K		79901103
R102	Potentiometer - Microphone Gain	10 K		70040014
R103-R105	Resistor - Carbon	10 K		79901103

S1-S2	Switch - Slide	30786203
S3	Switch - Slide	30786202
S4-S5	Switch - Slide	30786203

TH1	Thermistor	70037002

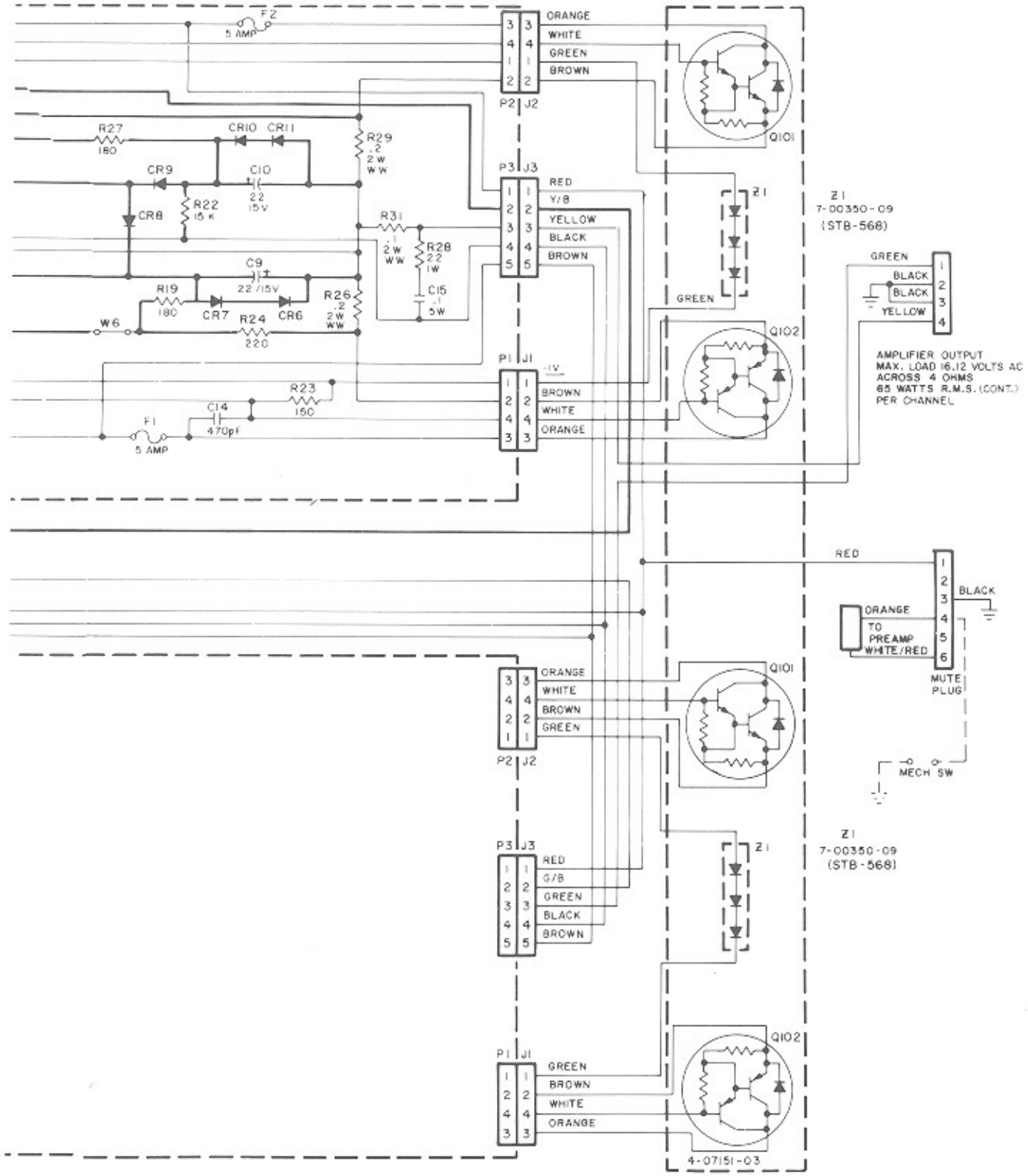
VR1	(-) Voltage Regulator (Negative)	70036508
VR2	(+) Voltage Regulator (Positive)	70036507

Z1-Z6	IC - Stereo Pre-Amplifier	30800206



NOTES

1. R13 POTENTIOMETER SET FOR 0V ±.005 VDC @ OUTPUT LOAD - PRE-AMP MUTED OR REMOVED, SPEAKER TRANSFORMER PACKAGE DISCONNECTED
2. ALL RESISTORS ARE 1/4 W ±5% & RATED IN OHMS UNLESS OTHERWISE NOTED
3. ALL VOLTAGE TAKEN WITH CHASSIS REFERENCE
4. ⏦ INDICATES AC SIGNAL VOLTAGE NO LOAD
5. ⎓ INDICATES DC VOLTAGE NO LOAD
6. IDLE CURRENT (Q101 OR Q102 EMITTER) 30 MA'S ± 10MA'S - THIS CAN BE MEASURED BY PLACING A VOLT METER ACROSS R26 OR R29 .2 OHM RESISTOR - VOLTAGE SHALL READ .006 VOLTS ± .002 VOLTS DC
7. THE ABOVE DRIVER BOARD CAN BE USED IN PLACE OF THE 4-07101-01 & 4-07101-02
8. HEAVY TRACE REFLECTS AMPLIFIER OVER LOAD CLAMP CIRCUITS



For Equivalent Engineering Drawing See 60993102-Q2 [A]

Figure 5-7. Schematic Diagram - 130 Watt Amp (Power Amp)

COMPONENT LIST FOR AMPLIFIER DRIVER BOARD 40710103

C1	Capacitor - Monolithic Ceramic	.1 Mfd	70028649
C2	Capacitor - Monolithic Ceramic	220 Pf	70028606
C3	Capacitor - Electrolytic	47 Mfd	70023812
C4	Capacitor - Electrolytic	2.2 Mfd	70023805
C5	Capacitor - Monolithic Ceramic	.1 Mfd	70028649
C6	Capacitor - Electrolytic	15 Mfd	70023809
C7	Capacitor - Monolithic Ceramic	.01 Mfd	70028636
C8	Capacitor - Monolithic Ceramic	100 Pf	70028601
C9-C10	Capacitor - Electrolytic	22 Mfd	70023810
C11	Capacitor - Monolithic Ceramic	220 Pf	70028606
C12	Capacitor - Monolithic Ceramic	.01 Mfd	70028636
C13	Capacitor - Electrolytic	47 Mfd	70023812
C14	Capacitor - Monolithic Ceramic	470 Pf	70028612
C15	Capacitor - Mylar	.10 Mfd	70024002
CR1-CR2	Diode - Silicon		70035005
CR3	Diode - Zener (10 V)		70035514
CR4	NOT USED		
CR5-CR12	Diode - Silicon		70035005
CR13	NOT USED		
CR14-CR15	Diode - Zener (5.1 V)		70035527
F1-F2	Fuse (5 Amp)		70072010
P1-P2	Wafer - Polarized (4 CKT)		70075004
P3	Wafer - Polarized (5 CKT)		70075005
P4	Wafer - Non-polarized (4 CKT)		70074904
Q1	NOT USED		
Q2	NOT USED		
Q3	Transistor - Dual (NPN)		70030301
Q4-Q6	Transistor (PNP)		70030104
Q7-Q9	Transistor (NPN)		70030008

Note: All resistors are $\frac{1}{4}$ watt 5%, unless otherwise noted.

R1	Resistor - Carbon	18 K	79901183
R2	Resistor - Carbon	4.7 K	79901472
R3	Resistor - Carbon	1 Meg	79901105
R4	Resistor - Carbon	18 K	79901183
R5	Resistor - Carbon	47 Ohm	79901470
R6	Resistor - Carbon	2.2 K	79901222
R7	NOT USED		
R8	Resistor - Carbon	18 K	79901183
R9	Resistor - Carbon	5.6 K	79901562
R10-R11	Resistor - Carbon	470 Ohm	79901471
R12	Resistor - Carbon	16 K	79901163
R13	Resistor - Potentiometer	10 K	70040014
R14	Resistor - Carbon	33 Ohm	79901330
R15	Resistor - Carbon	47 Ohm	79901470
R16	Resistor - Carbon	15 K	79901153
R17	NOT USED		
R18	Resistor - Carbon	47 Ohm	79901470
R19	Resistor - Carbon	180 Ohm	79901181
R20	Resistor - Carbon	820 Ohm	79901821

R21	Resistor - Carbon	2.2 K	(¼ W, 5%)	79901222
R22	Resistor - Carbon	15 K	(¼ W, 5%)	79901153
R23	Resistor - Carbon	150 Ohm	(¼ W, 5%)	79901151
R24	Resistor - Carbon	220 Ohm	(¼ W, 5%)	79901221
R25	NOT USED			
R26	Resistor - Wire Wound	.2 Ohm	(2 W, 10%)	79920208
R27	Resistor - Carbon	180 Ohm	(¼ W, 5%)	79901181
R28	Resistor - Carbon	22 Ohm	(1 W, 10%)	70010816
R29	Resistor - Wire Wound	.2 Ohm	(2 W,10%)	79920208
R30	Resistor - Carbon	220 Ohm	(¼ W, 5%)	79901221
R31	Resistor - Wire Wound	.1 Ohm	(2 W,10%)	79920108
R32	Resistor - Carbon	150 Ohm	(¼ W, 5%)	79901151
R33	Resistor - Carbon	2.2 K	(¼ W, 5%)	79901222
R34	Resistor - Carbon	1.5 K	(¼ W, 5%)	79901152

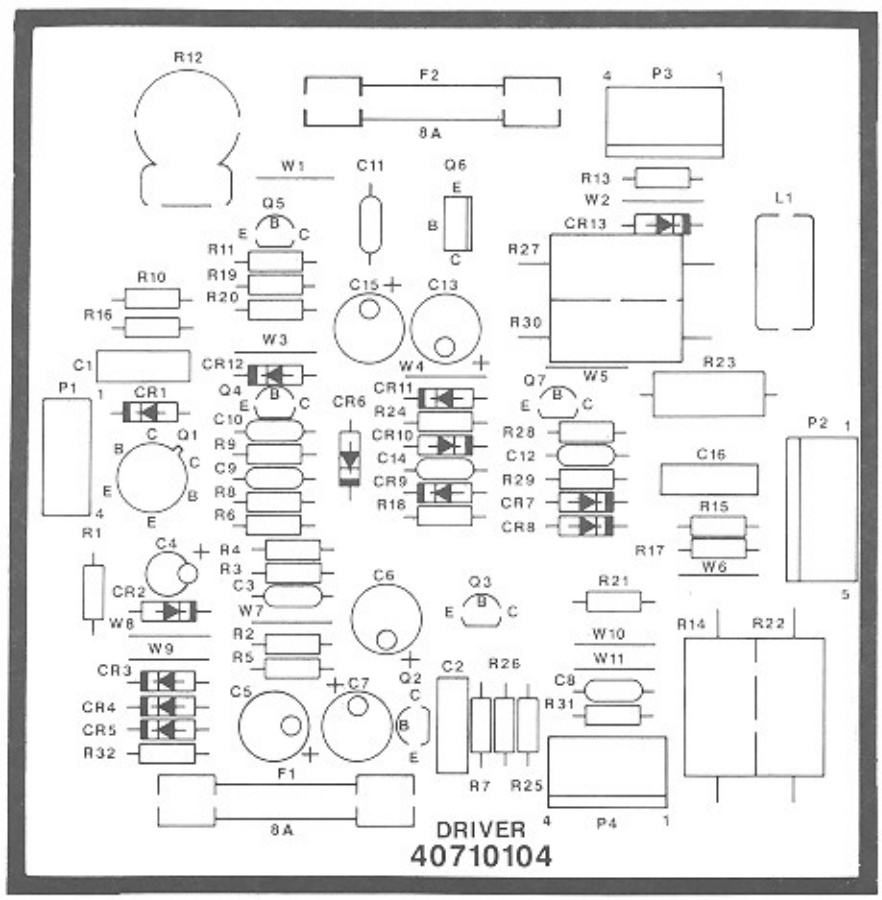


Figure 5-7B. Amplifier Driver Board Layout

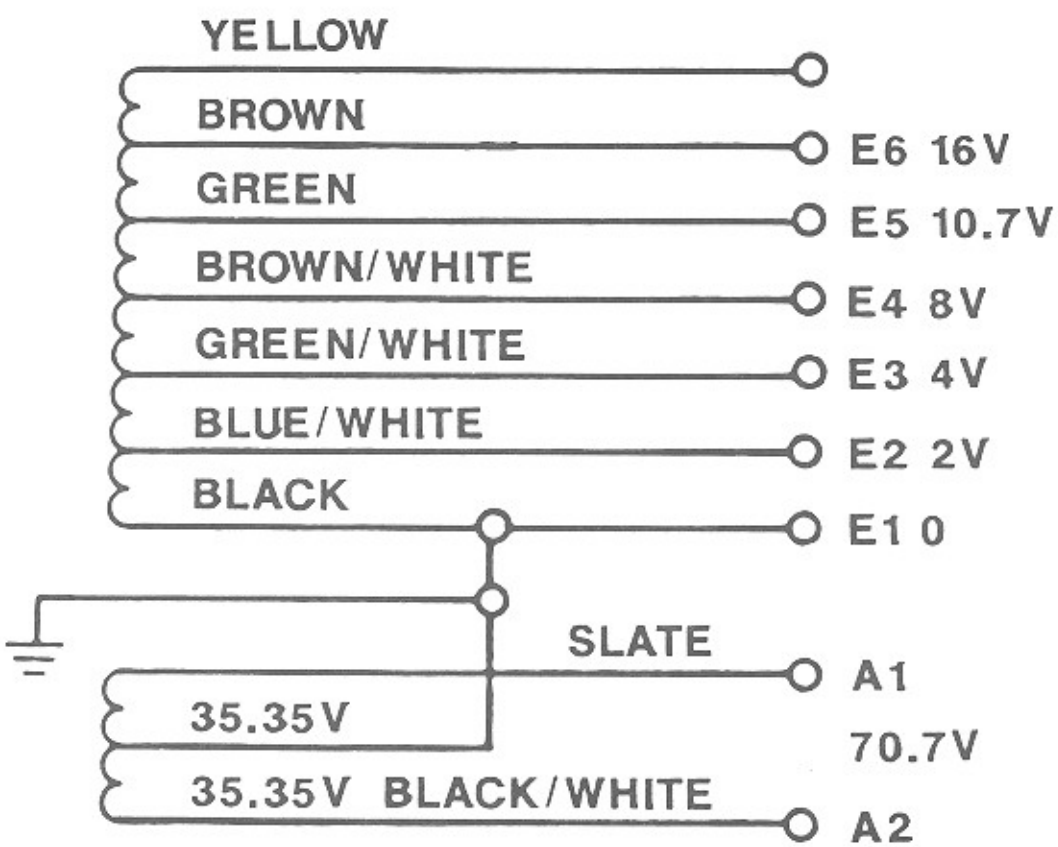
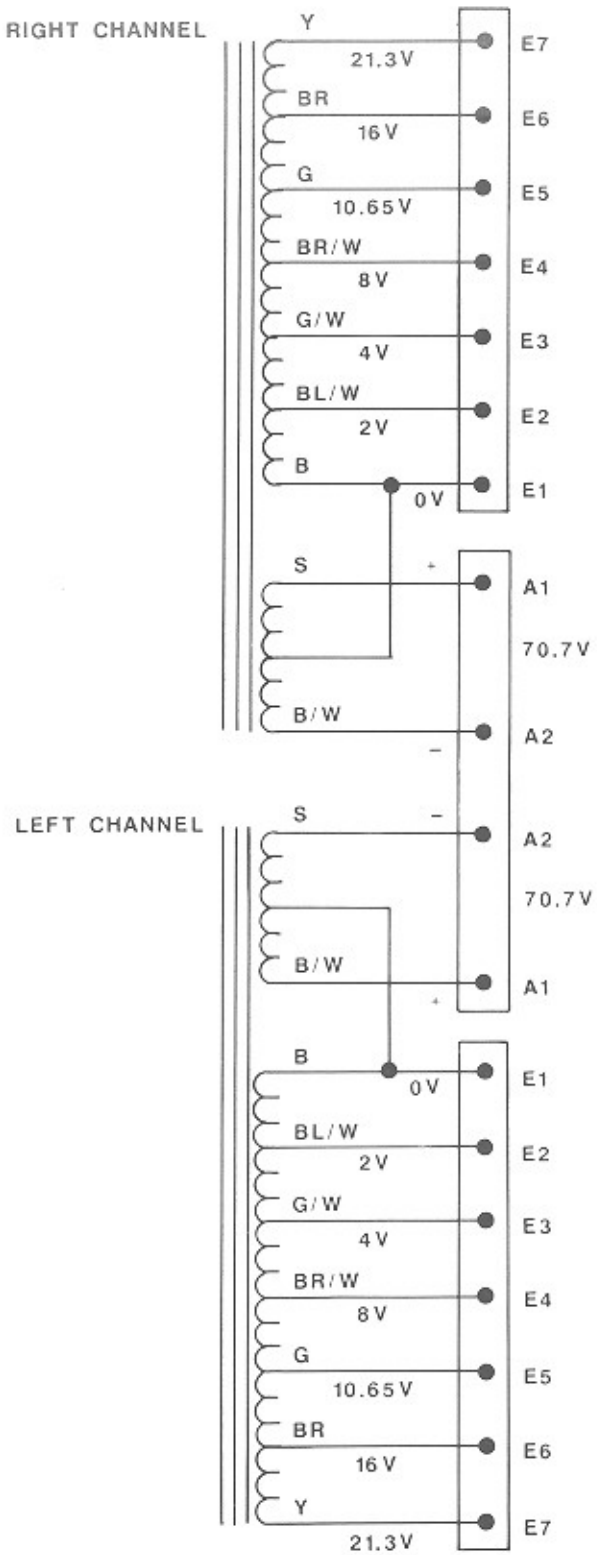
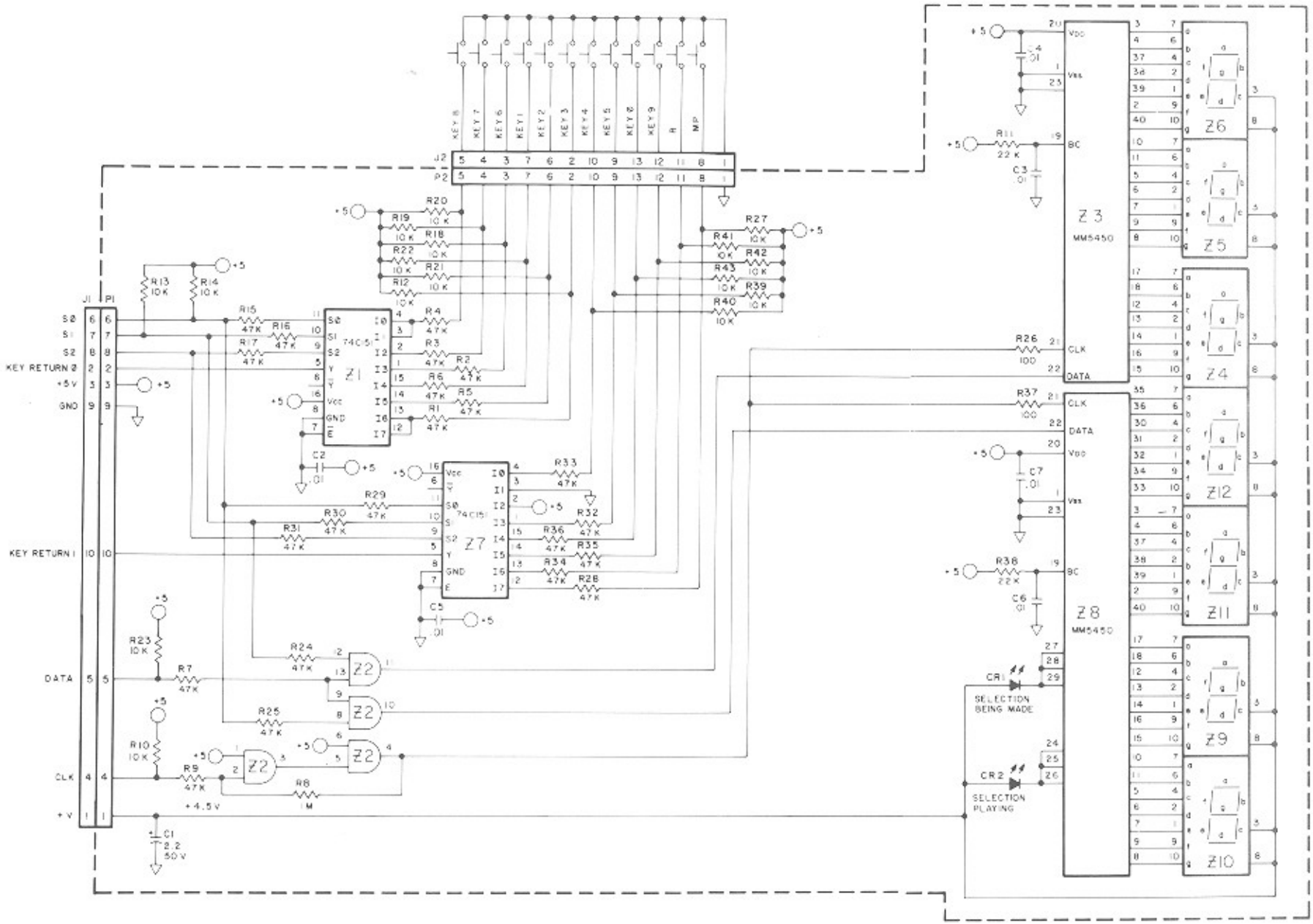


Figure 5-8. Transformer Output Voltages



For Equivalent Engineering Drawing See 40832101-Q2 A

Figure 5-9. Transformer Wiring Diagram



For Equivalent Engineering Drawing See 60992801-Q2 B

Figure 5-10. Keyboard and Display Assembly

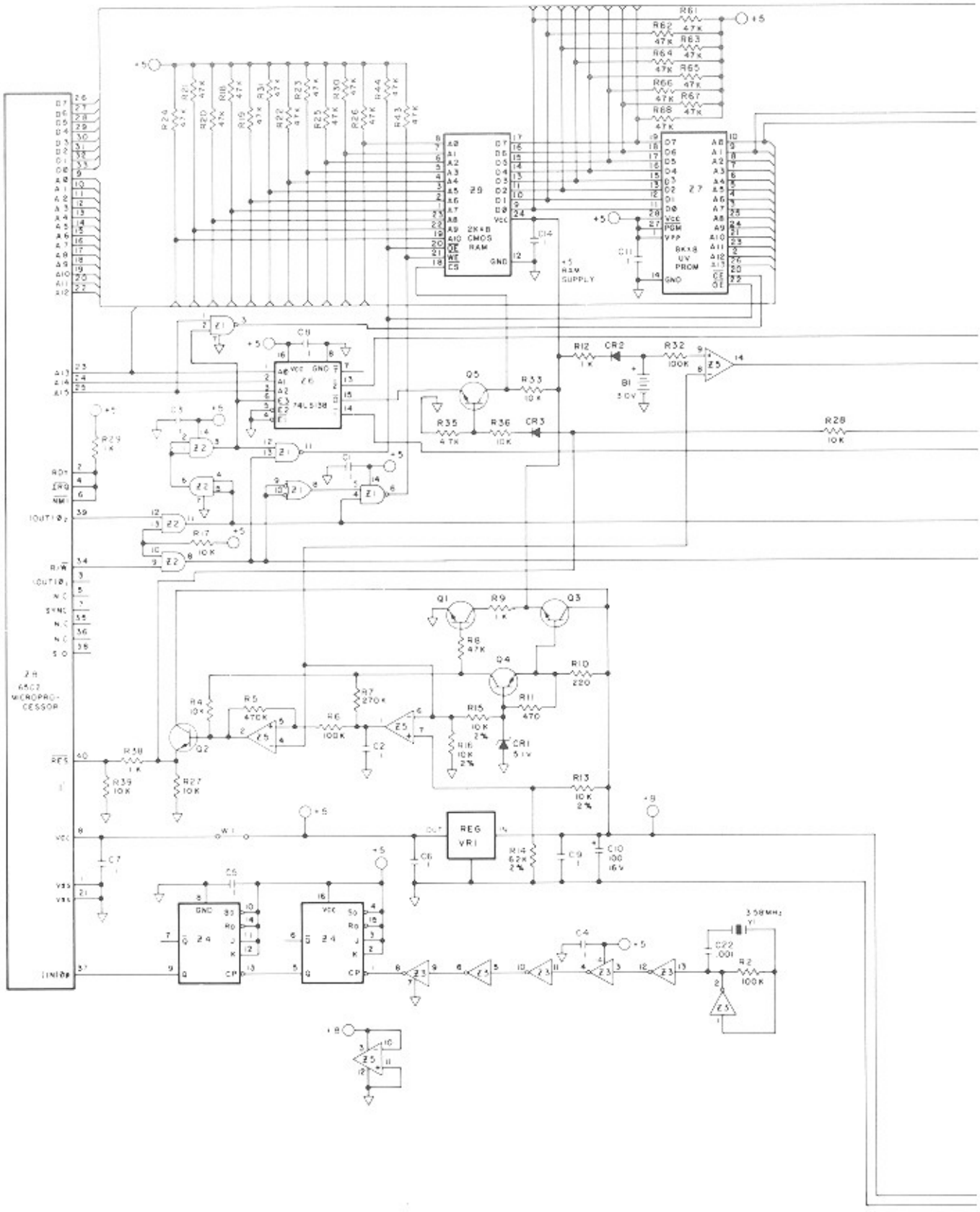
COMPONENT LIST FOR THE KEYBOARD AND DISPLAY

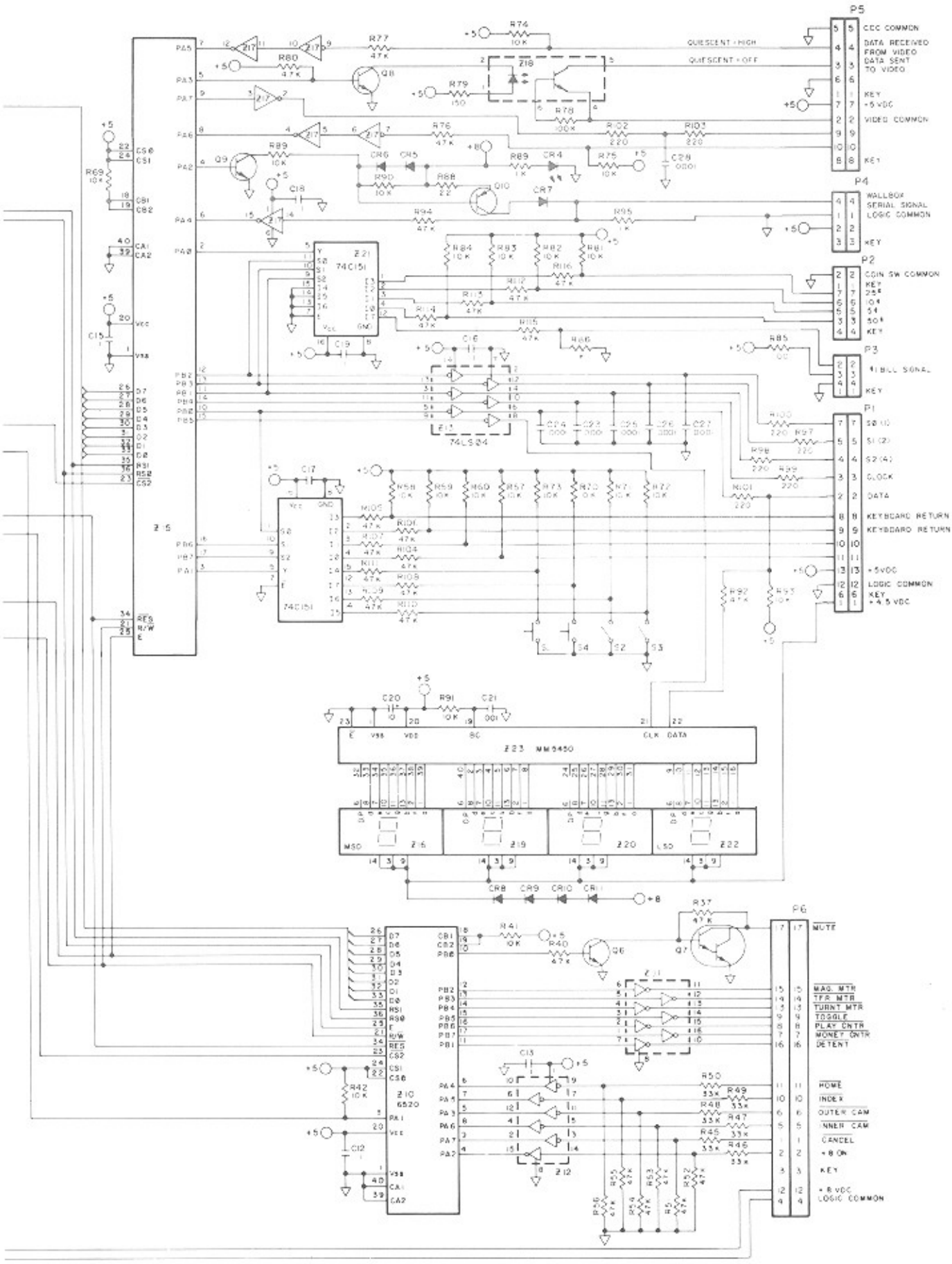
C1	Capacitor - Electrolytic	2.2 Mfd	70023805
C2-C7	Capacitor - Monolithic	.01 Mfd	70028502
CR1-CR2	Diode - Light Emitting (Visible)		70035303

Note: All resistors are 1/8 watt 5%, unless otherwise noted.

R1-R7	Resistor - Carbon	47 K	79905473
R8	Resistor - Carbon	1 Meg	79905105
R9	Resistor - Carbon	47 K	79905473
R10	Resistor - Carbon	10 K	79905103
R11	Resistor - Carbon	22 K	79905223
R12-R14	Resistor - Carbon	10 K	79905103
R15-R17	Resistor - Carbon	47 K	79905473
R18-R23	Resistor - Carbon	10 K	79905103
R24-R25	Resistor - Carbon	47 K	79905473
R26	Resistor - Carbon	100 Ohm	79905101
R27	Resistor - Carbon	10 K	79905103
R28-R36	Resistor - Carbon	47 K	79905473
R37	Resistor - Carbon	100 Ohm	79905101
R38	Resistor - Carbon	22 K	79905223
R40	Resistor - Carbon	10 K	79901103

Z1	I.C. - CMOS 8 Input Mux.	70034151
Z2	I.C. - CMOS Digital (4081)	70034081
Z3	I.C. - Display Driver (5450	70034202
Z4-Z6	Display - LED	21766708
Z7	I.C. - CMOS 8 Input Mux.	70034151
Z8	I.C. - Display Driver (5450)	70034202
Z9-Z12	Display - LED	21766708





For Equivalent Engineering Drawing See 60973805-Q2 [B]

Figure 5-11A. Central Control Computer Schematic

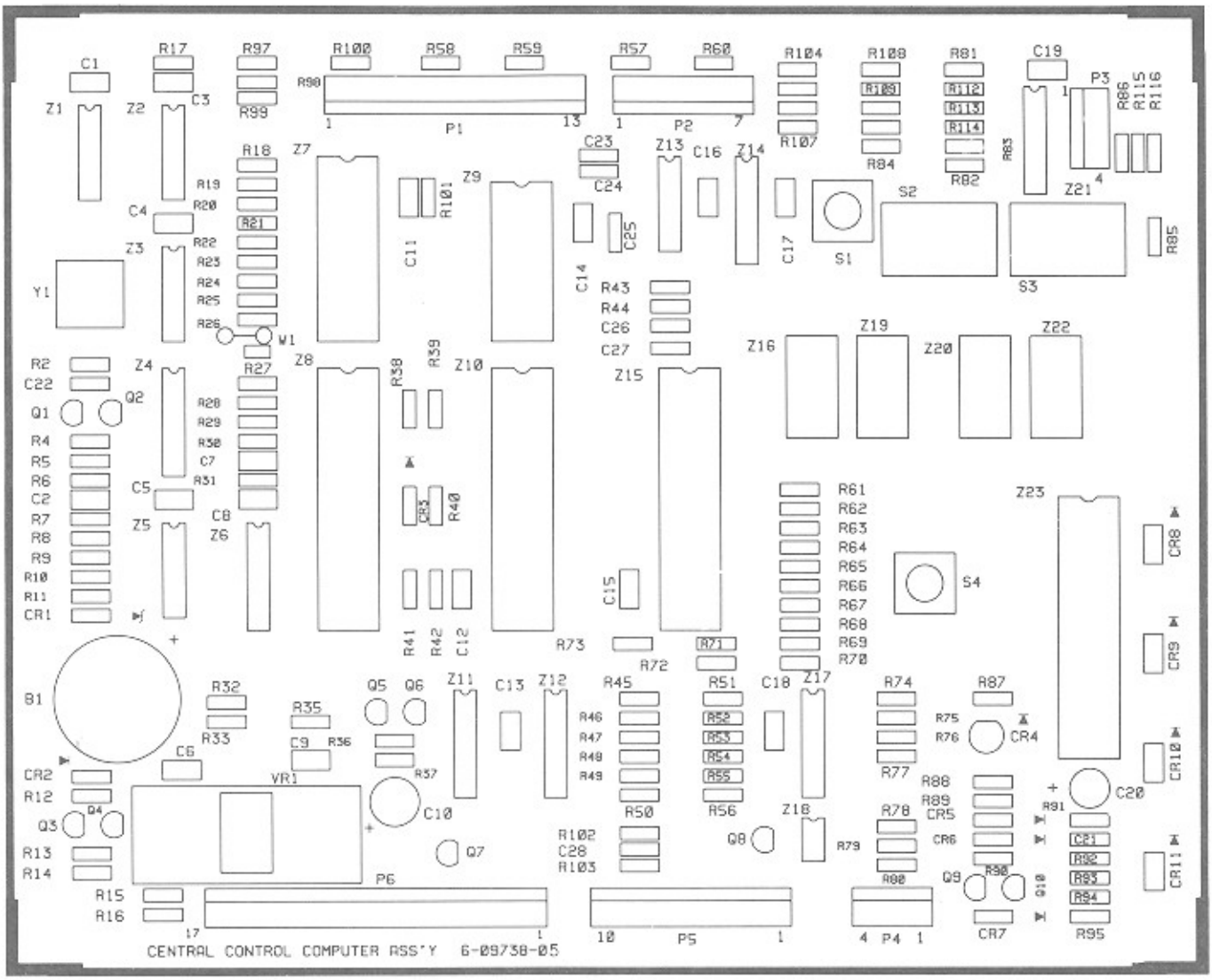


Figure 5-11B. Central Control Computer Circuit Board Layout

B1	Battery - Lithium		30873101
C1-C9	Capacitor - Ceramic	.1 Mfd	70028511
C10	Capacitor - Electrolytic	100 Mfd	70023814
C11-C19	Capacitor - Ceramic	.1 Mfd	70028511
C20	Capacitor - Electrolytic	10 Mfd	70023808
C21-C22	Capacitor - Ceramic	.001 Mfd	70028518
C23-C28	Capacitor - Ceramic	1000 Pf	70028713
CR1	Diode - Zener (5.1 Volt)		70035526
CR2-CR3	Diode - Silicon		70035012
CR4	Diode - Light Emitting		70035303
CR5-CR7	Diode - Silicon		70035012
CR8-CR11	Diode - Silicon		70035005
P1	Polarizing Wafer Assembly		70075013
P2	Polarizing Wafer Assembly		70075006
P3	Polarizing Wafer Assembly		70075003
P4	Polarizing Wafer Assembly		70075004
P5	Polarizing Wafer Assembly		70075009
P6	Polarizing Wafer Assembly		70075017
Q1-Q3	Transistor - NPN Silicon		70030008
Q4	Transistor - PNP Silicon		70030104
Q5	Transistor - NPN Silicon		70031301
Q6	Transistor - NPN Silicon		70030008
Q7	Transistor - NPN Darlington		70030202
Q8-Q9	Transistor - NPN Silicon		70030008
Q10	Transistor - PNP Silicon		70030104

Note: All resistors are ¼ watt 5%, unless otherwise noted.

R2	Resistor - Carbon	100 K	79901104
R4	Resistor - Carbon	10 K	79901103
R5	Resistor - Carbon	470 K	79901474
R6	Resistor - Carbon	100 K	79901104
R7	Resistor - Carbon	270 K	79901274
R8	Resistor - Carbon	47 K	79901473
R9	Resistor - Carbon	1 K	79901102
R10	Resistor - Carbon	220 Ohm	79901221
R11	Resistor - Carbon	470 Ohm	79901471
R12	Resistor - Carbon	1 K	79901102
R13	Resistor - Carbon	10 K (¼ W, 2%)	79902103

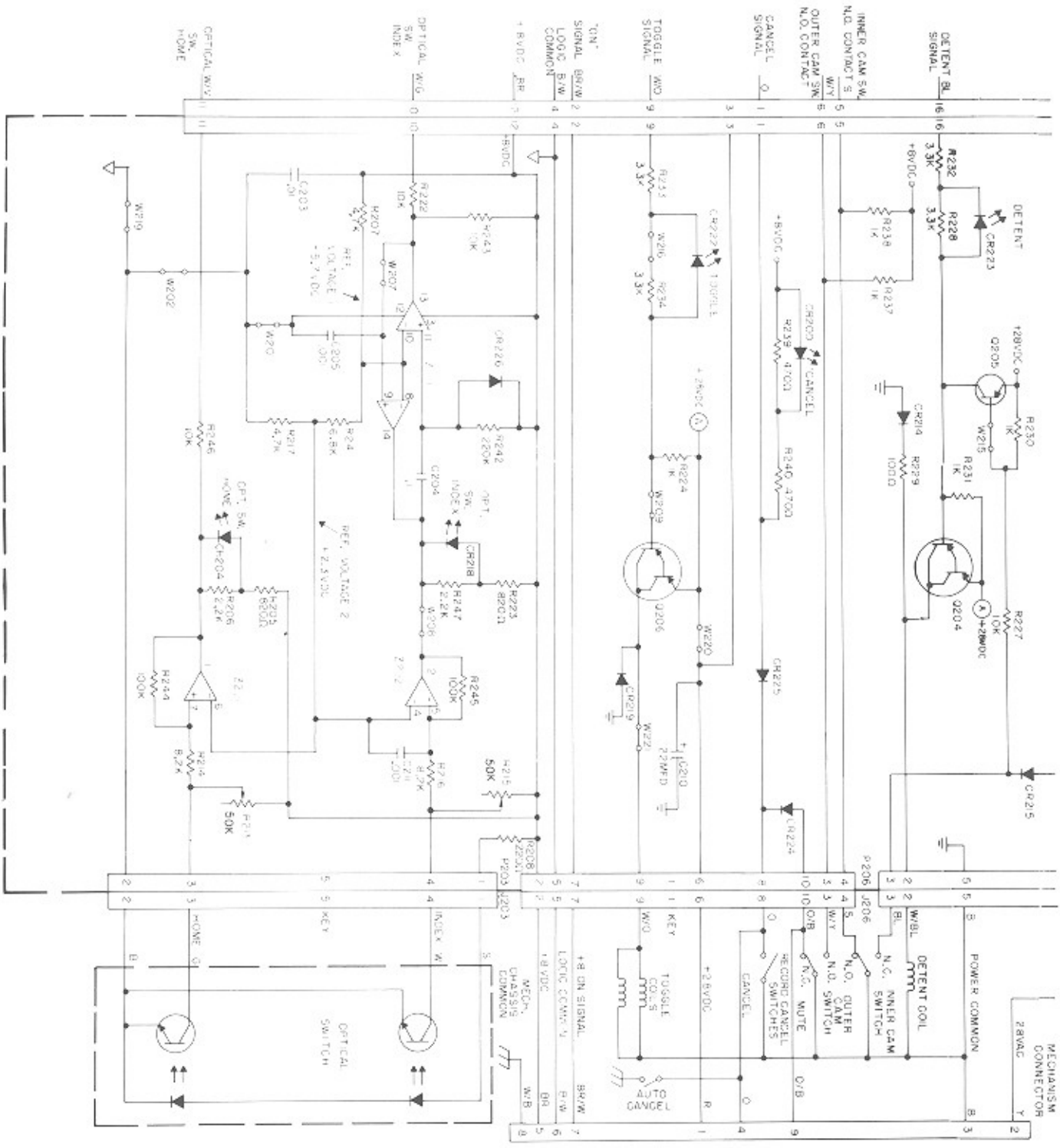
R14	Resistor - Carbon	6.2 K (¼ W, 2%)	79902622
R15-R16	Resistor - Carbon	10 K (¼ W, 2%)	79902103
R17	Resistor - Carbon	10 K	79901103
R18-R26	Resistor - Carbon	47 K	79901473
R27-R28	Resistor - Carbon	10 K	79901103
R29	Resistor - Carbon	1 K	79901102
R30-R31	Resistor - Carbon	47 K	79901473
R32	Resistor - Carbon	100 K	79901104
R33	Resistor - Carbon	10 K	79901103
R34	Not Used		
R35	Resistor - Carbon	4.7 K	79901472
R36	Resistor - Carbon	10 K	79901103
R37	Resistor - Carbon	47 K	79901472
R38	Resistor - Carbon	1 K	79901102
R39	Resistor - Carbon	10 K	79901103
R40	Resistor - Carbon	4.7 K	79901472
R41-R42	Resistor - Carbon	10 K	79901103
R43-R44	Resistor - Carbon	47 K	79901473
R45-R50	Resistor - Carbon	33 K	79901333
R51-R56	Resistor - Carbon	47 K	79901473
R57-R60	Resistor - Carbon	10 K	79901103
R61-R68	Resistor - Carbon	47 K	79901473
R69-R75	Resistor - Carbon	10 K	79901103
R76-R77	Resistor - Carbon	47 K	79901473
R78	Resistor - Carbon	100 K	79901104
R79	Resistor - Carbon	150 Ohm	79901151
R80	Resistor - Carbon	4.7 K	79901472
R81-R84	Resistor - Carbon	10 K	79901103
R85	Resistor - Carbon	100 Ohm	79901101
R86-R87	Resistor - Carbon	1 K	79901102
R88	Resistor - Carbon	22 Ohm	79901220
R89-R91	Resistor - Carbon	10 K	79901103
R92	Resistor - Carbon	47 K	79901473
R93	Resistor - Carbon	10 K	79901103
R94	Resistor - Carbon	47 K	79901473
R95	Resistor - Carbon	1 K	79901102
R97-R103	Resistor - Carbon	220 Ohm	79901221
R104-R116	Resistor - Carbon	47 K	79901473

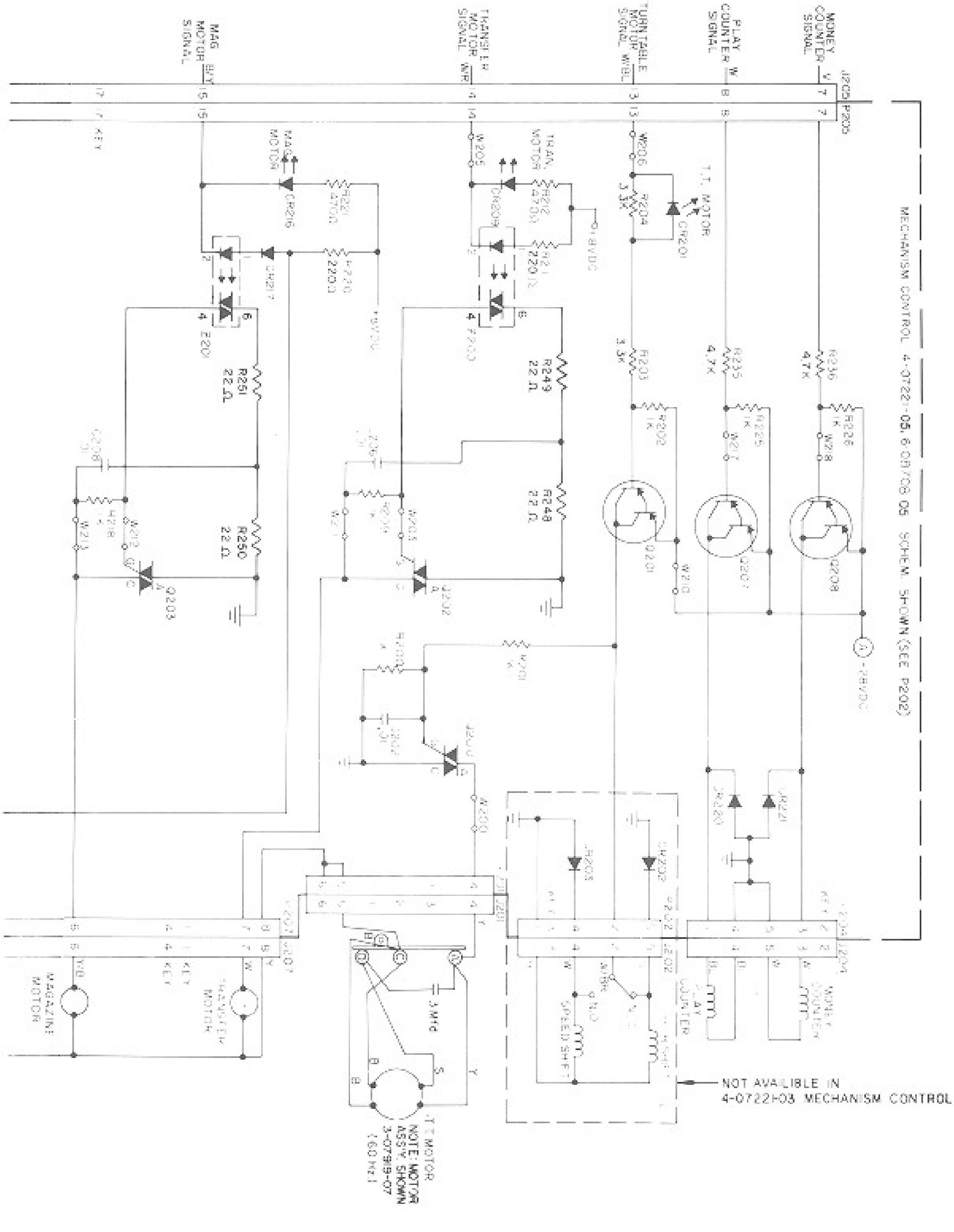
S1	Switch - Pushbutton	21773803
S2-S3	Switch - Slide	20786204
S4	Switch - Pushbutton	21773303

VR1	IC - Voltage Regulator	70036505

Y1	Crystal - 3.58 MHz (Alternate = 25167305)	25167304

Z1	IC - Quad 2 Input NAND Gate	70037102
Z2	IC - Quad 2 Input AND Gate	70037201
Z3	IC - HEX Inverter	70037201
Z4	IC - Dual JK Flip Flop	70037109
Z5	IC - Quad Comparator	70036801
Z6	IC - 1-OF-8 Decoder	70037104
Z7	IC - Socket - 28 Pin	70073928
	IC - 16K x 8 EPROM	70038203
Z8	IC - 6502 Microprocessor	70039114
Z9	IC - CMOS 2K x 8 Static RAM	70036602
Z10	IC - MOS 6520 PIA	70039103
Z11	IC - Darlington Array	70036901
Z12	IC - CMOS HEX Inverter	70034049
Z13	IC - LS HEX Inverter	70037107
Z14	IC - CMOS 8 Input Mux.	70034151
Z15	IC - MOS 6250 PIA	70039103
Z16	LED Display	21766701
Z17	IC - CMOS Hex Inverter	70034049
Z18	IC - OPTO Isolator	70033702
Z19-Z20	LED Display	21766701
Z22	LED Display	21766701
Z23	IC - Display Driver	70034202


DETENT SIGNAL
INNER CAM SW. N.C. CONTACTS
OUTER CAM SW. N.O. CONTACTS
CANCEL SIGNAL
TOGGLE SIGNAL
"ON" SIGNAL
LOGIC B/W COMMON
+8VDC
OPTICAL SW. INDEX
OPTICAL SW. HOME
DETENT
+28VDC
CANCEL
REF. VOLTAGE 1 -5.1VDC
REF. VOLTAGE 2 +2.5VDC
OPT. SW. HOME
OPT. SW. INDEX
AUTO CANCEL
RECORD CANCEL SWITCHES
N.O. OUTER CAM SWITCH
N.C. INNER CAM SWITCH
N.C. MUTE
DETENT COIL
POWER COMMON
MECHANISM CONNECTOR
28VAC
TOGGLE COIL
+8 ON SIGNAL
LOGIC COMMON
CHASSIS COMMON
OPTICAL SWITCH
HOME
INDEX
KEY



For Equivalent Engineering Drawing See 60870001-Q2 [S]

Figure 5-12A. Mechanism Control Assembly

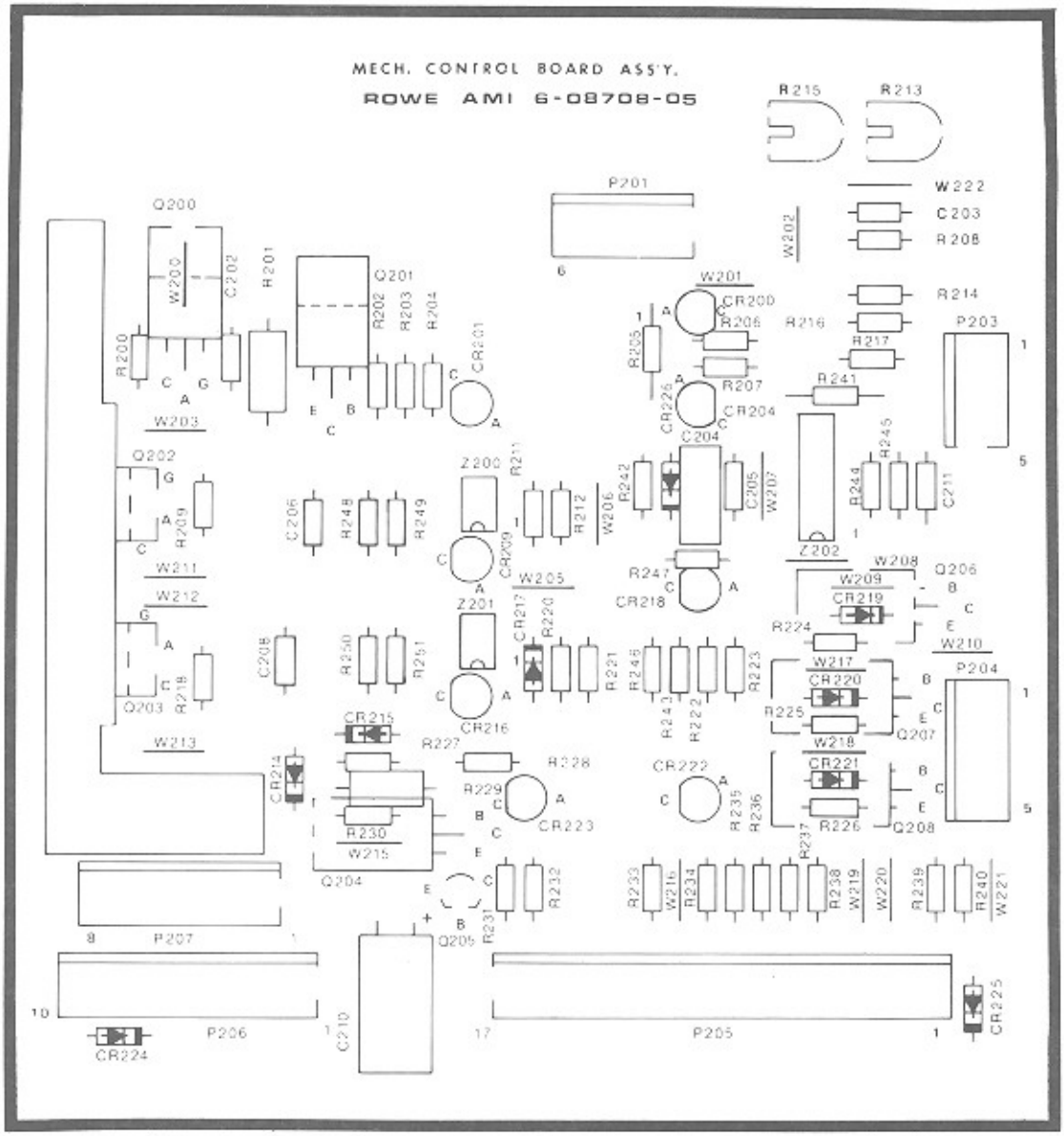


Figure 5-12B. Mechanism Control Assembly Circuit Board Layout

COMPONENT LIST FOR MECHANISM CONTROL BOARD (60870001)

C202	Capacitor - Ceramic	.01 Mfd	70028502
C203	Capacitor - Ceramic	.01 Mfd	70028502
C204	Capacitor - Mylar	.1 Mfd	70024105
C205	Capacitor - Ceramic	.001 Mfd	70028518
C206	Capacitor - Mylar	.01 Mfd	70024013
C206	Capacitor - Mylar	.01 Mfd	70024013
C210	Capacitor - Electrolytic	22 Mfd	70023810
C211	Capacitor - Ceramic	.001 Mfd	70028518

CR200	Diode - Light Emitting	70035303
CR201	Diode - Light Emitting	70035303
CR202		
CR203		
CR204	Diode - Light Emitting	70035303
CR209	Diode - Light Emitting	70035303
CR214	Diode - Silicon	70035005
CR215	Diode - Silicon	70035005
CR216	Diode - Light Emitting	70035303
CR217	Diode - Silicon	70035005
CR218	Diode - Light Emitting	70035303
CR219	Diode - Silicon	70035005
CR220	Diode - Silicon	70035005
CR221	Diode - Silicon	70035005
CR222	Diode - Light Emitting	70035303
CR223	Diode - Light Emitting	70035303
CR224	Diode - Silicon	70035005
CR225	Diode - Silicon	70035005
CR226	Diode - Silicon	70035005

Q200	Thyristor - Triac	70038106
Q201	Transistor - PNP Darlington (2 Amp)	70030805
Q202	Thyristor - Triac	70038102
Q203	Thyristor - Triac	70038102
Q204	Transistor - PNP Darlington (2 Amp)	70030805
Q205	Transistor - Silicon PNP	70030104
Q206-Q208	Transistor - PNP Darlington (2 Amp)	70030805

Note: All resistors are $\frac{1}{4}$ watt 5%, unless otherwise noted.

R200	Resistor - Carbon	1 K	79901102
R201	Resistor - Wire Wound	1 K (2 W, 10%)	79920102
R202	Resistor - Carbon	1 K	79901102
R203	Resistor - Carbon	3.3 K	79901332
R204	Resistor - Carbon	3.3 K	79901332
R205	Resistor - Carbon	820 Ohm	79901821
R206	Resistor - Carbon	2.2 K	79901222

R207	Resistor - Carbon	4.7	K	79901472
R208	Resistor - Carbon	220	Ohm	79901221
R209	Resistor - Carbon	1	K	79901102
R211	Resistor - Carbon	220	Ohm	79901221
R212	Resistor - Carbon	470	Ohm	79901471
R213	Potentiometer - Trimmer	50	K	70040518
R214	Resistor - Carbon	8.2	K	79901822
R215	Potentiometer	50	K	70040518
R216	Resistor - Carbon	8.2	K	79901822
R217	Resistor - Carbon	4.7	K	79901472
R218	Resistor - Carbon	1	K	79901102
R220	Resistor - Carbon	220	Ohm	79901221
R221	Resistor - Carbon	470	Ohm	79901471
R222	Resistor - Carbon	10	K	79901103
R223	Resistor - Carbon	820	Ohm	79901821
R224	Resistor - Carbon	1	K	79901102
R225	Resistor - Carbon	1	K	79901102
R226	Resistor - Carbon	1	K	79901102
R227	Resistor - Carbon	10	K	79901103
R228	Resistor - Carbon	3.3	K	79901332
R229	Resistor - Carbon	100	Ohm	79901101
R230	Resistor - Carbon	1	K	79901102
R231	Resistor - Carbon	1	K	79901102
R232	Resistor - Carbon	3.3	K	79901332
R233	Resistor - Carbon	3.3	K	79901332
R234	Resistor - Carbon	3.3	K	79901332
R235	Resistor - Carbon	4.7	K	79901472
R236	Resistor - Carbon	4.7	K	79901472
R237	Resistor - Carbon	1	K	79901102
R238	Resistor - Carbon	1	K	79901102
R239	Resistor - Carbon	470	Ohm	79901471
R240	Resistor - Carbon	470	Ohm	79901471
R241	Resistor - Carbon	6.8	K	79901682
R242	Resistor - Carbon	220	K	79901224
R243	Resistor - Carbon	10	K	79901103
R244	Resistor - Carbon	100	K	79901104
R245	Resistor - Carbon	100	K	79901104
R246	Resistor - Carbon	10	K	79901103
R247	Resistor - Carbon	2.2	K	79901222
R248	Resistor - Carbon	22	Ohm	79901220
R249	Resistor - Carbon	22	Ohm	79901220
R250	Resistor - Carbon	22	Ohm	79901220
R251	Resistor - Carbon	22	Ohm	79901220

Z200	Photocoupler - OPTO Triac	70033703
Z201	Photocoupler - OPTO Triac	70033703
Z202	IC - Quad Comparator	70036801

SECTION 6 ADDITIONAL INFORMATION

R-93 SPECIFICATIONS

GENERAL

DEPTH	26-1/2 in. (67.3 cm.)
WIDTH	41-1/2 in. (105.4 cm.)
HEIGHT	56-7/8 in. (144.5 cm.)
SHIPPING WEIGHT (DOMESTIC)	367 lbs. (169 Kg.)
NET WEIGHT	350 lbs. (159 Kg.)
POWER REQUIREMENTS	120 VAC 60 Hz., 560 watts 5.0 amps. 220/240 VAC 50 Hz., 580 watts 3.0 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	40 db
Treble Control	12 db/octave 10,000 Hz. full 6,000 Hz. moderate 3,000 Hz. low
Bass Control	Compensates for bass loss at low volume

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	High Frequency[1]
Speaker Diameter	10 in.	5-3/4 in.	2"
Voice Coil Diameter	1-1/2 in.	1 in.	NA
Impedance	8 Ohms	8 Ohms	NA

---

[1] The tweeter is part of the mid-range speaker assembly.

SYSTEM FREQUENCY RESPONSE . . . . . 50 to 20,000 ±4 db

DOOR LIGHTING . . . . . Fluorescent

30 watt, 36 in.
and
15 watt, 18 in.

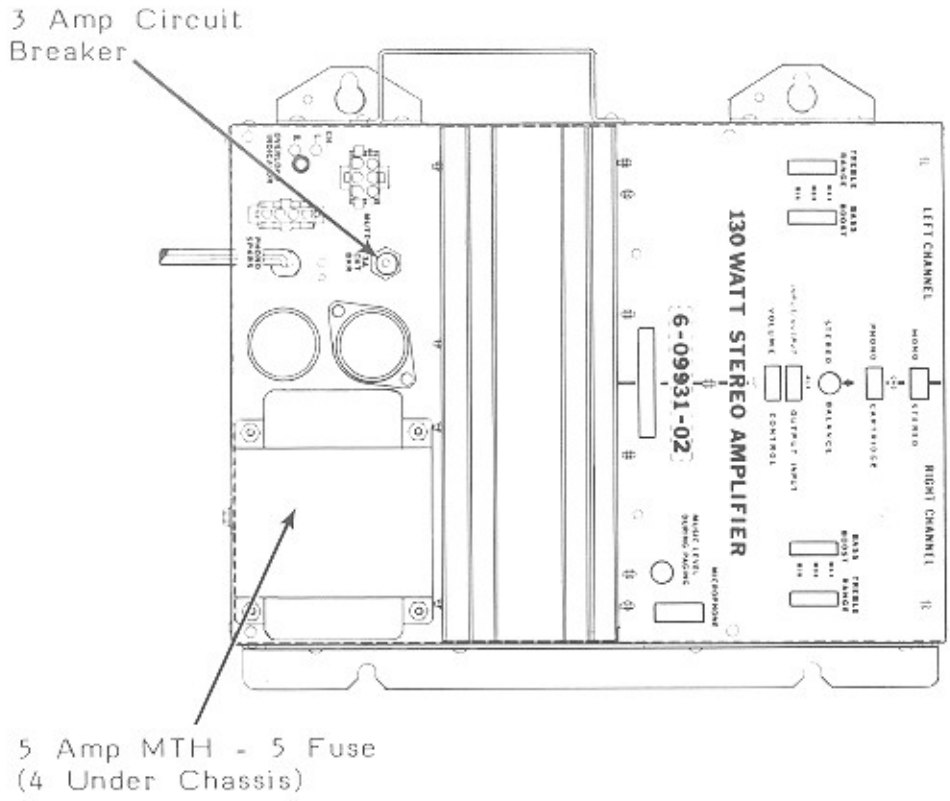
FUSES AND CIRCUIT BREAKERS

Main Power Supply

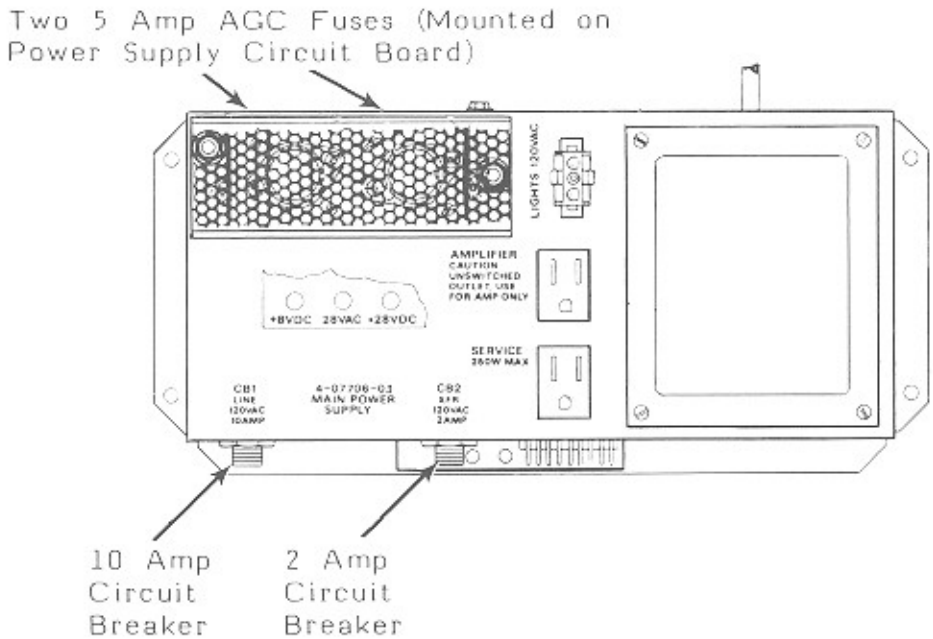
120 VAC (Transformer Primary Only)	2 amp. circuit breaker
120 VAC	10 amp. circuit breaker
+28 VDC	5 amp. Slo-Blo Fuse (2)
+8 VDC	5 amp. Slo-Blo Fuse

Amplifier

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



130 WATT AMPLIFIER



MAIN POWER SUPPLY

Figure 6-1. Fuse and Circuit Breaker Locations

Table 6-1. Compatibility Chart (Non-Video)

	Part No.	Description	R-91	R-91 CD	R-92/R-93	R-92/R-93 CD
Central Control Computer	40777312		STD	STD	STD	STD
	40777311		OK	OK	OK	Note F
	40777310		OK	Note C	OK	----
	40777305		OK	----	----	----
Wallbox Interface	60984301	WRA-WRE	STD	Note D	STD	Note D
Amplifier	60993102	130W	STD	STD	STD	STD
	60993101	130W	OK	----	OK	----
	60743809	125W	OK	----	OK	----
	60743806	125W	OK	----	OK	----
Mechanism Assembly	60870001	60 Hz	STD	STD	STD	STD
	60870002	50 Hz	OK	OK	OK	OK
Mechanism Control	40722105	No Automix	STD	STD	STD	STD
	40722103	No Automix	Note A	Note A	Note A	Note A
	40722102		Note A	Note A	Note A	Note A
Optical Switch Assembly	30906801	Red Connector	STD	STD	STD	STD
	30792701	White Connector	OK	OK	OK	OK
Power Supply	40770605	Domestic	STD	STD	STD	STD
	40770603	Domestic	STD	STD	OK	OK
	40770601	Domestic	----	----	----	----
	46509207	Export	Note B	Note B	Note B	Note B
	46509205	Export	Note B	Note B	Note B	Note B
Flashing Light Control	40750103	Lamp Control	STD	STD	----	----
	40821201		----	----	Note E	Note E
OBA	65057022		STD	STD	----	----
CBA-2	25232201		----	----	STD	STD

A. Change the optical switch to Part Number 30792701.

B. Different power supplies are required: 220 V = 46509205, 240 V = 46509206, 220 V = 46509207, 240 V = 46509208.

C. OK on earlier R-91 phonographs that use the 60997101 CD player with frame and electronics (PD-M6 CD player). Later phonographs, that use the 40807401 CD player (PD-M40), must use the 40777311 CCC.

D. Wallboxes will work normally with records, but CD selections cannot be entered or displayed.

E. R-92 Phonograph only.

F. Need 40777312 for the 10-CD player.

TONE ARM CABLE

Some tone arm cables have a tendency to restrict the tone arm's movement. This restriction can make the stylus skip.

The following procedure should be followed if you are sure that the phonograph is level and the stylus is in good condition:

1. Remove the phonograph front door and set it out of your way.
2. Locate the tone arm cable, cable ground clip (see figure 6-2), and tone arm cable connector.
3. Unplug the amplifier cable at the tone arm cable connector.
4. Push on the top left side of the tone arm cable connector so that the connector slides out of the connector mounting bracket.
5. Slide the tone arm cable out from under the right side of the cable ground clip.
6. Turn the cable connector one full clockwise twist. Twist the cable so that the twist in the cable occurs between the ground clip and the tone arm.
7. Slide the tone arm cable back under the cable ground clip.
8. Slide the tone arm connector back into the connector mounting bracket.
9. Reconnect the amplifier cable to the tone arm cable connector.
10. Reinstall the front door.
11. Play a record and verify that the phonograph operates correctly.

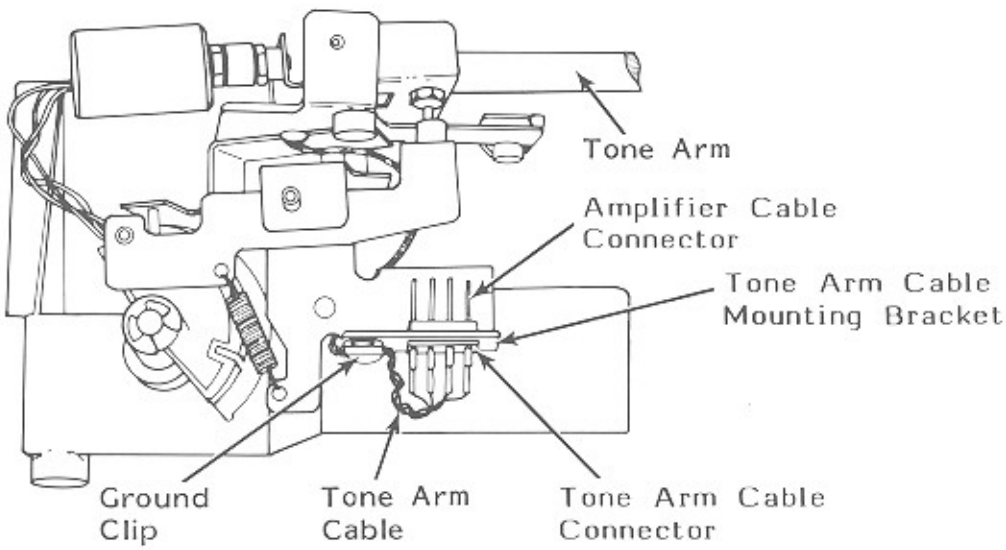


Figure 6-2. Tone Arm Cable

The explanations for the words listed in this glossary pertain to their usage in this service manual.

70 Volt Speaker - A speaker that is designed to operate at long distances from the phonograph. These speakers (or their companion transformers) have a means for selecting the power (volume) that each speaker can deliver.

Alternate Price Card - A price card that contains blank spaces for custom pricing. Prices from the universal price card can be attached to this card.

Amplifier - The electronic device that converts "medium" level electrical signals into signals that can power speakers.

Bill Acceptor - The device that detects bills, determines whether the bills are genuine or counterfeit, and identifies the bill's type.

Cam Switch and Motor Assembly - Provides the energy to pick a record (or CD) from the magazine and set the record (or CD) on the turntable.

Cancel Control - Consists of two separate switches, each performing the same function. Either switch will stop the current selection and allow the phonograph to advance to the next selection. One cancel control is on the back of the phonograph and the other is by the money and play counters.

Cash Bag - The cloth bag, which collects genuine coins until the phonograph is serviced (bills are kept in the bill acceptor).

CD - A compact, digital, audio disc.

Coin acceptor - The device that detects coins, determines whether the coins are genuine or counterfeit, and identifies the coin type.

Compact Bill Acceptor (CBA) - A particular model of small, but versatile bill acceptors.

Continuous Free Play - A phonograph mode which allows selections to be made without establishing credit (inserting money).

Credit - A number inside the phonograph's memory, which is equal to a certain amount of money (one credit is usually 25¢).

Detent - A mechanical device for holding a movable assembly precisely in place for a short time.

Display Totals - Consists of a series of phonograph commands that allow the operator to "read" the phonograph totals (see the **Memorec Commands** in the service manual).

Error Code - A Numeric code, displayed on the Memorec Display, that indicates that the phonograph has detected a malfunction.

Extension Speaker - Any speaker that is added to the phonograph.

Factory Setting - Refers to the original phonograph "programing".

FIFO - The inventory control method that plays the oldest selection first (First In, First Out).

Fill-In Records - Records that are automatically played from a predetermined list (or in a predetermined sequence) whenever the phonograph has not received manual selections.

Handy Case - A storage pouch for small parts, manuals, title strips, and price cards.

Impedance - Is a measurement of the total resistance that an electrical device, such as a speaker, has to the flow of electricity. A speaker's impedance cannot be accurately measured with a resistance check (a good speaker will always measure considerably less than the rated impedance).

InterRowegator - An electronic device used to "read" the phonograph totals and print them at the same time.

LED - An abbreviation for Light Emitting Diode. LED's are used instead of indicator lamps in many applications.

Light Display - The various lights, lenses, and backgrounds used to create lighted scenes and patterns on the phonograph.

Low Impedance Speaker - A speaker designed to be installed short distances from the phonograph. Speakers rated at 8 ohms, or less, are considered to be low impedance speakers.

Magazine (or Mag.) - Is a wire carrousel-like device which holds records and CD's until they are selected for playing.

Mechanism (or Mech.) - The major assembly responsible for selecting and playing records and CD's.

Mechanism Control Unit (or Mech. Control) - A microprocessor and various other electronic devices that monitors and controls the record (or CD) selection process.

Microprocessor - A small, but versatile computer. These computers are programmed to perform specific tasks in the phonograph.

Money Counter - A mechanical counter that indicates the total amount of money deposited in the phonograph.

Optical Switch - The device which senses which record (or CD) is in position to be placed on the turntable.

Paging - The phonograph feature that allows public address paging and announcements.

Phonograph - A jukebox.

Play Counter - A mechanical counter that increments one count for each selection played.

Popularity Display - A digital display that shows the selection number that is currently the most popular selection. If the "POPULAR" button is pressed, the next most popular selection number is displayed.

Potentiometer - Usually a volume or tone control, a potentiometer is a variable resistor, which can be used in many configurations.

Preamplifier - The electrical device that converts very small electrical signals into "medium" level signals. These "medium" level signals cannot be used to power speakers.

Preventive Maintenance - Phonograph maintenance performed to reduce the possibility of a phonograph malfunction.

Programing Mode - A particular phonograph function that allows the operator to change the numbers in the phonograph's memory. Changing these numbers will alter the phonograph's "program".

Record Changer - The phonograph mechanism or mech.

Selection - A choice of either a record, video, or CD song.

Shield - A braided or twisted wire that is used to electrically protect sensitive wires from interference. A shielded wire may be used to keep interference in side a cable as well as keeping interference out.

Sprag Assembly - The part of the record mechanism that locks the magazine into position while the record (or CD) is moved between the magazine and the turntable.

Standard Price Card - The price card that is installed in the phonograph when it is built.

Stereo Balance - The control that adjusts the left and right channel volume so that the amplifier's left and right channels are equal.

Stylus - The phonograph needle.

Thermistor - A special type of resistor that changes its resistance as the temperature around it (or the current through it) changes.

Title Rack - The assembly which holds the titles in place.

Title Strips - Small strips of paper that identify record selections by song, artist, record label, and selection number.

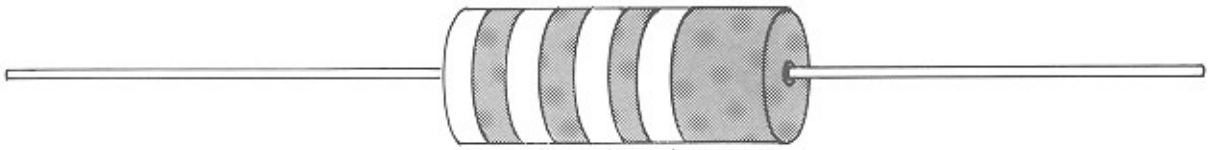
Transfer Arm - The part of the mechanism that moves the record or CD back and forth between the turntable and the magazine.

Universal Price Sheet - A sticky-backed card that contains prices for custom pricing. The prices on this card are used on the alternate price card.

Unscheduled Maintenance - Maintenance required to restore a phonograph to normal operating condition.

Wallbox - A phonograph accessory that allows customers to select and listen to music while they remain seated at their tables or booths.

Watt - A standard unit of electrical power.



First Band 1st Digit	
Color	Digit
Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Gray	8
White	9

Second Band 2nd Digit	
Color	Digit
Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Gray	8
White	9

Third Band Multiplier	
Color	Multiplier
Black	1
Brown	10
Red	100
Orange	1,000
Yellow	10,000
Green	100,000
Blue	1,000,000
Silver	0.01
Gold	0.1

Fourth Band Resistance Tolerance	
Color	Tolerance
Silver	±10%
Gold	± 5%
No Band	±20%

Figure 6-3. Resistor Color Code

Example: You have a resistor with the colors Yellow, Violet, Red, and Gold on it. Place the resistor in front of you so that the end of the resistor with no colored bands is on your right. Now, use the color code chart to decode the colors: the Yellow band=4, the Violet band=7, the Red band means multiply by 100. So the resistor value is 47X100, or 4700 ohms. The Gold band indicates that the resistor can be 5% over or 5% under the 4700 value and still be considered to be the proper value.

Note:

Testing a resistor while both ends of the resistor are connected to the circuit can give a false LOW reading. If the resistor value is critical, disconnect one end of the resistor from the circuit and use an accurate digital VOM.

SECTION 7 PARTS CATALOG

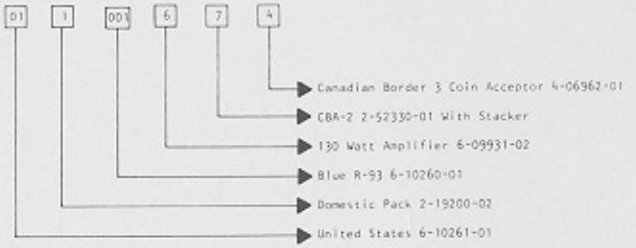
COUNTRY 1st & 2nd DIGIT	PACK 3rd DIGIT	R-93 SUB-ASSEMBLY 4th & 5th & 6th DIGIT	AMPLIFIER 7th DIGIT	BILL ACCEPTOR 8th DIGIT
01 = US = 6-10261-01 02 = Arg = " -02 03 = Australia = " -03 04 = Aus = " -04 05 = Bah = " -05 06 = Belg = " -06 07 = Canada = " -07 08 = Chile = " -08 09 = Col = " -09 10 = Costa R = " -10 11 = Neut. Stk = " -11 12 = Denmark = " -12 13 = Ecuador = " -13 14 = El Salv = " -14 15 = England = " -15 16 = Finland = " -16 17 = France = " -17 18 = Germany = " -18 19 = 20 = Guat = " -20 21 = Holland = " -21 22 = Hon = " -22 23 = Italy = " -23 24 = Belize = " -24 25 = Japan = " -25 26 = 27 = Nic = " -27 28 = Norway = " -28 29 = Aruba = " -29 30 = Panama = " -30 31 = Curaco = " -31 32 = Spain = " -32 33 = Sweden = " -33 34 = Swiss Fr = " -34 35 = Swiss Ge = " -35 36 = Swiss It = " -36 37 = Trinidad = " -37 38 = Eng Video = " -38 39 = Venez = " -39 40 = Zambia = " -40 41 = Puerto R = " -41 42 = Guyana = " -42 43 = Brazil = " -43 44 = Barbados = " -44 45 = Surinam = " -45 46 = Yugo = " -46 47 = S. Africa = " -47 48 = US (220V) = " -48 49 = US (240V) = " -49	1 = DomPack 2-19200-02	001 = Blue (60HZ) = 6-10260-01 002 = Brown (60HZ) = 61-0260-02 003 = Blue (50HZ) = 6-10260-03 004 = Brown (50HZ) = 6-10260-04 005 = Blue - Video (60HZ) (SLHF-450) = 6-10260-05 006 = Blue - Video (60HZ) (SLHF-450) W/2-18826-01 Mon. Kit = 6-10260-06 007 = Blue - Video (50HZ) (SLHF-450) = 6-10260-07 008 = Blue - Video (50HZ) (SLHF-450) W/2-18826-01 Mon. Kit = 6-10260-08 009 = Blue - Video (50HZ) (No VCR) = 6-10260-09 010 = Blue (60HZ) 10 CD & 45 Combo = 6-10260-10 011 = Brown (60HZ) 10 CD & 45 Combo = 6-10260-11 012 = Blue (50HZ) 10 CD & 45 Combo = 6-10260-12 013 = Brown (50HZ) 10 CD & 45 Combo = 6-10260-13 014 = Blue (60HZ) 6 CD & 45 RPM Combo = 6-10260-14 015 = Brown (60HZ) 6 CD & 45 RPM Combo = 6-10260-15 016 = Blue (50HZ) 6 CD & 45 Combo = 6-10260-16 017 = Brown (50HZ) 6 CD & 45 Combo = 6-10260-17 018 = Blue (50HZ) CD/Video Combo = 6-10260-18 019 = Brown (50HZ) CD/Video Combo = 6-10260-19	0 = None 1 = 2 = 3 = 3-06322-09 Remote Volume Cont. Assy 4 = 5 = 130W = 6-09941-02 (Inc'l Canada) 6 = 130W = 6-09931-02 (Inc'l Canada) 7 = 130W = 6-09931-99 3-06322-09 Remote Volume Cont. Assy	0 = None 1 = None W/2-67110-01 2 = 3 = 4 = 5 = 6 = 7 = CBA-2 2-52330-01 W/Stacker

COIN ACCEPTOR
9th DIGIT

0 = None
1 = 3 Coin Acc. = 4-06961-01
2 = 4 Coin Acc. = 4-07156-01
3 = Export Rej. (Special) = 7-09519-XX
4 = 3 Coin Canada Bdr. = 4-06962-01
5 = 4 Coin Canada Bdr. (5,10,25,50) = 4-07159-01
6 = Kit - Mars Slug Rej. = 2-18851-04
7 = 4 Coin $ Acc. (5,10,15,$) = 4-07156-02
8 = 2 Coin Acc. (25,$) = 4-07156-03
9 = Canada Bdr. $ (5,10,25,$) = 4-07159-02

SUB-ASSEMBLY CATEGORY
001-049 R-93 050-099 CO-100

SAMPLE:



R-93 CODE

Rev. B

21822612

INTRODUCTION

This parts catalog lists procurable replacement parts for the 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 or when 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. (indicate 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.

Figure 7-1. R-93 Phonograph External View

Sheet 1

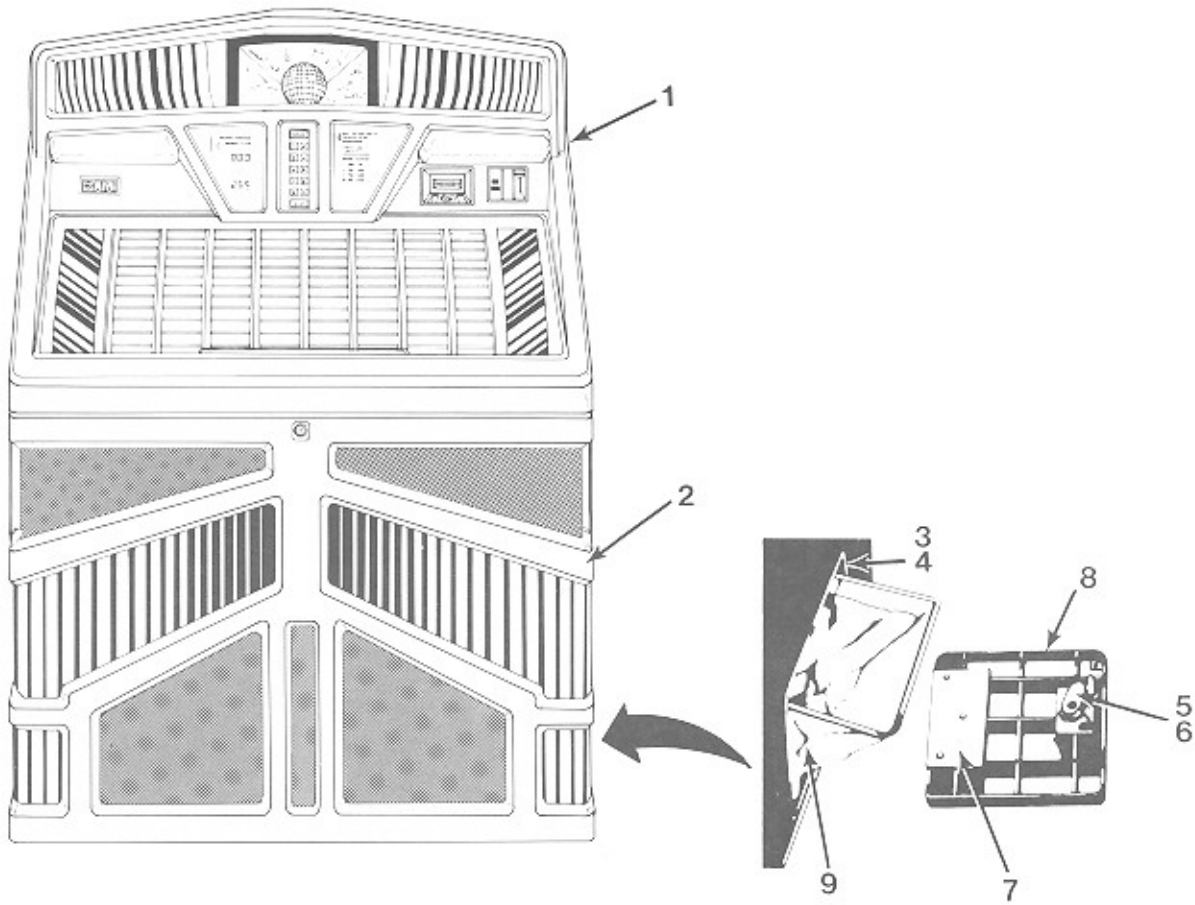


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
1-		R-93 Phonograph External View	
1	61026501	Top Door Assembly (Blue, 60 Hz) (see figure 7-2)	1
	61026502	Top Door Assembly (Brown, 60 Hz) (see figure 7-2)	1
2	61027001	Front Door Assembly (Blue, 60 Hz) (see figure 7-3)	1
	61027002	Front Door Assembly (Brown, 60 Hz) (see figure 7-3)	1
3	40527605	. Cash Box Door Frame	1
4	21776005	. "U" Type Speed Clip	1
	21186605	. Cash Box Door Assembly	1
5	70162004	. Cylinder Lock	1
6	20669501	. Lock Support	1
7	20770301	. Catch Bracket	1
8	60326705	. Cash Box Door	1
9	30702601	. Cash Bag	1
	70212507	. Felt Adhesive Tape	1

Figure 7-1. R-93 Phonograph External View

Sheet 2

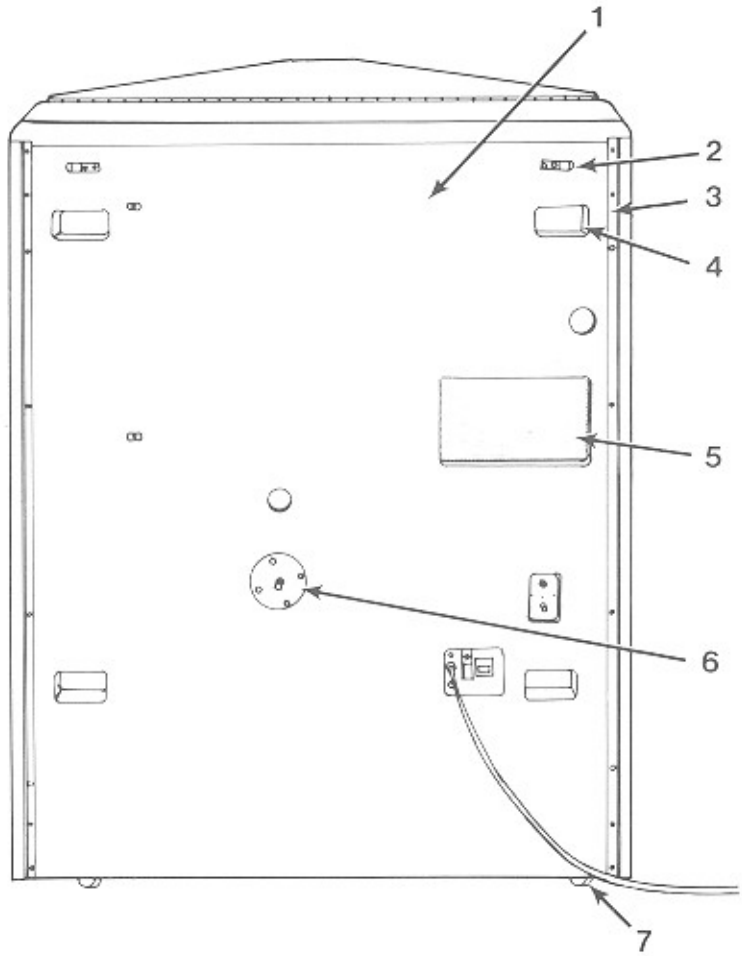


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
1-		R-93 Phonograph External View	
1	61025005	. Shell Assembly (Blue)	1
	61025006	. Shell Assembly (Brown)	1
2	20879501	. . Power Cord Holder	2
3	40702807	. . Skid Rail	2
4	30625701	. . Hand Hold Cover	4
5	30868402	. . Enclosure Screen	1
6	21265203	. . Tie Down Plate Assembly	1
7	30634001	. . Caster and Cup Assembly	4

Figure 7-2. R-93 Phonograph Top Door Assembly

Sheet 1

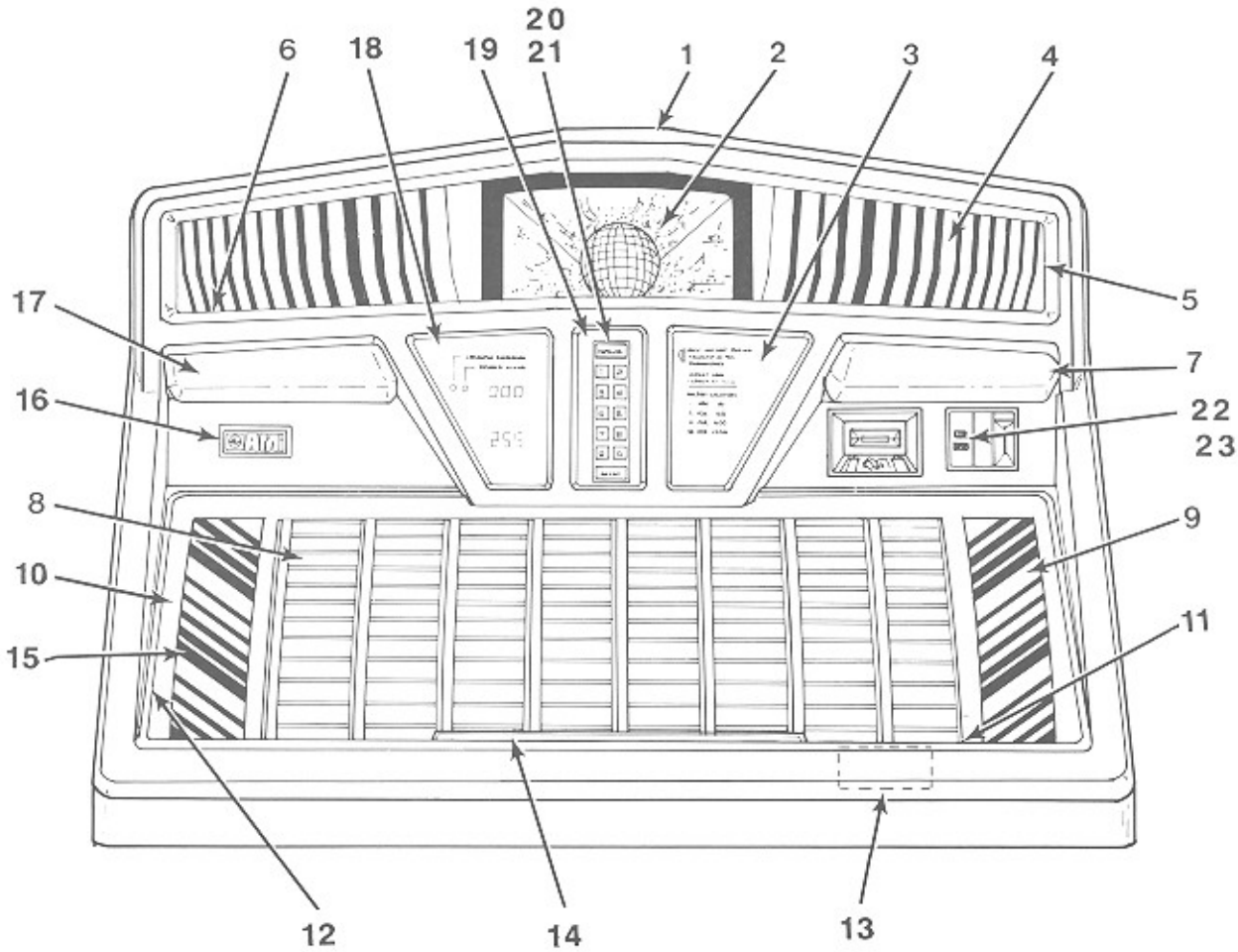


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
2-	61026501	Top Door Assembly (Blue, 60 Hz)	
	61026502	Top Door Assembly (Brown, 60 Hz)	
1	61020303	. Top Door Frame (Blue)	1
	61020304	. Top Door Frame (Brown)	1
2	61023402	. Animation Assembly	1
	61023102	. . Mirrored Housing Assembly	1
	40824001	. . Housing Shelf	1
	40824302	. . Motor and Harness Assembly	1
	30927601	. . Mirrored Ball Assembly	1
	40824201	. . 6 Lamp Printed Wiring Board (PWB)	1
	30928501	. . 3 Lamp Printed Wiring Board (PWB)	2
	21862201	. . Lamp and Socket Assembly	12
	30866501	. . Lens (Brown)	2
	30866502	. . Lens (Blue)	2
	30866503	. . Lens (Clear)	6
	30866504	. . Lens (Magenta)	2
	21922301	. . Housing Support Bracket	2
	21922602	. . Copyright Label	1
3	30921201	. Price Card	1
4	40824701	. Window and Graphics Assembly	1
5	70212208	. Closed Cell Sponge Rubber	2
6	70212206	. Closed Cell Sponge Rubber	2
7	40820501	. Upper Door Lens (RH)	1
	40825101	. Lens Filter (Blue)	1
	40825102	. Lens Filter (Brown)	1
8	21845605	. Window	1
9	40822802	. Decorative Decal (RH, Blue)	1
	40822803	. Decorative Decal (RH, Brown)	1
10	61020601	. Title Rack Housing	1
11	70212206	. Closed Cell Sponge Rubber	4
12	70212207	. Closed Cell Sponge Rubber	2
13	30921501	. License Frame	1
	21921001	. License Retainer (Not Shown)	1
14	30922401	. 200 Selection Decal	1
15	40822702	. Decorative Decal (LH, Blue)	1
	40822703	. Decorative Decal (LH,Brown)	1
16	21845003	. Rowe Name Plate	1
	70135512	. . Pal Nut	2
17	40820401	. Upper Door Lens (LH)	1
	40825101	. Lens Filter (Blue)	1
	40825102	. Lens Filter (Brown)	1
18	30922101	. Readout Card	1
19	30922201	. Pushbutton Plate	1
20	40745301	. Pushbutton Trim	1
21	21922501	. Pushbutton Kit	1
22	21742909	. Reject Button and Shaft Assembly	1
23	21822901	. Compression Spring	1

Figure 7-2. R-93 Phonograph Top Door Assembly

Sheet 2

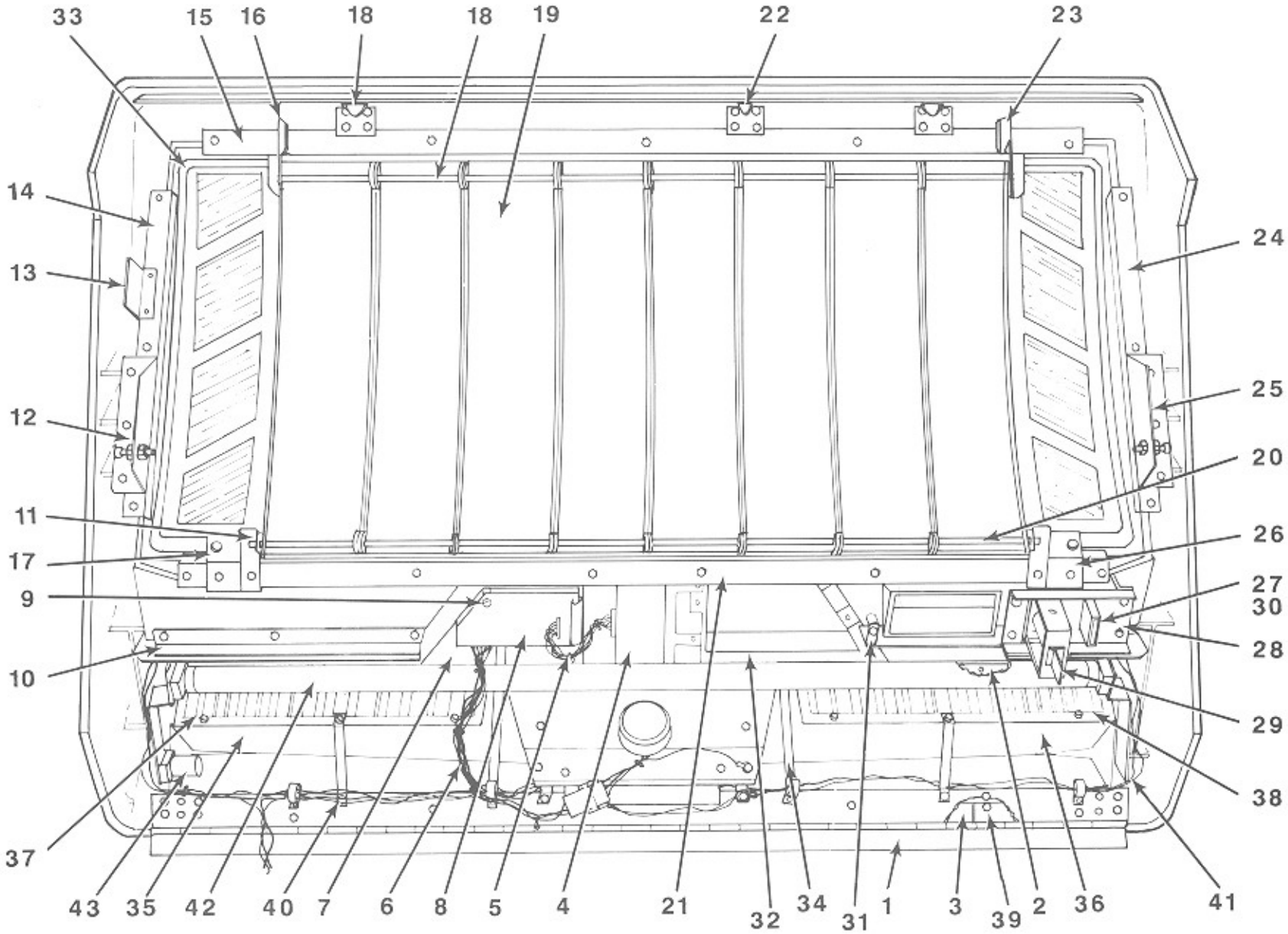


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
2-	61021503	Top Door Assembly (Blue, 60 Hz) (Continued)	
	61021504	Top Door Assembly (Brown, 60 Hz)	
1	40820701	. Top Door Hinge	1
2	30921901	. Graphics Retainer (Lower)	2
3	30922001	. Graphics Retainer (Upper)	2
4	40821001	. Keyboard Assembly	1
5	30925201	. Keyboard Harness	1
6	30906503	. Digital Display Harness	1
7	61020801	. Digital Display Holder	1
8	61022501	. Digital Display Circuit Board	1
9	70121736	. Circuit Board Spacer	2
10	30924401	. Lens Mounting Bracket (Large)	1
11	30920401	. Pivot Bracket (LH)	1
12	21920601	. Ball Stud and Bracket Assembly (LH)	1
13	21892401	. Actuator Bracket	1
14	30921701	. Title Rack Housing Retainer (LH)	1
15	30920701	. Title Rack Housing Retainer (Lower)	1
16	21920801	. Catch Assembly (LH)	1
17	21921901	. Title Rack Retainer	2
18	21883503	. Strike	2
19	40822601	. Title Rack Assembly	8
	30922626	. . Number Strips (Complete Set)	1
20	21794413	. . Rod	2
	70143004	. . External Retaining Ring (Not Shown)	2
	21568901	. . Push Nut Clip (Not Shown)	2
21	30920601	. Title Rack Housing Retainer (Upper)	1
22	21921101	. Guide	1
23	21920901	. Catch Assembly (RH)	1
24	30921801	. Title Rack Housing Retainer (RH)	1
25	21920701	. Ball Stud and Bracket Assembly (RH)	1
26	30920501	. Pivot Bracket (RH)	1
27	40820601	. Coin Inlet	1
28	30923601	. Mounting Plate	1
29	21834801	. Plastic Channel	2
30	80383010	. #8-32 X 5/8 PRHMS (SF)	1
31	21921601	. Lens Mounting Bracket (Small)	1
32	61020901	. Price Card Holder	1
33	61020604	. Title Rack Housing.	1
34	30927101	. Brace	2
35	61024001	. Mirrored Housing (LH)	2
36	61024101	. Mirrored Housing (RH)	2
37	40826001	. Decal and Support Assembly (LH, Blue)	1
	40826002	. Decal and Support Assembly (LH, Brown).	1
38	40826101	. Decal and Support Assembly (RH, Blue)	1
	40826102	. Decal and Support Assembly (RH, Brown).	1
39	30928001	. Upper Retainer.	2
40	30928101	. Lower Retainer.	2
41	40826601	. Fluorescent Lamp Harness Assembly	1
	20029501	. . Fluorescent Lamp Starter Socket	1
42	70060112	. Fluorescent Lamp.	1
43	70080004	. Fluorescent Lamp Starter.	1

Figure 7-3. R-93 Phonograph Front Door Assembly

Sheet 1

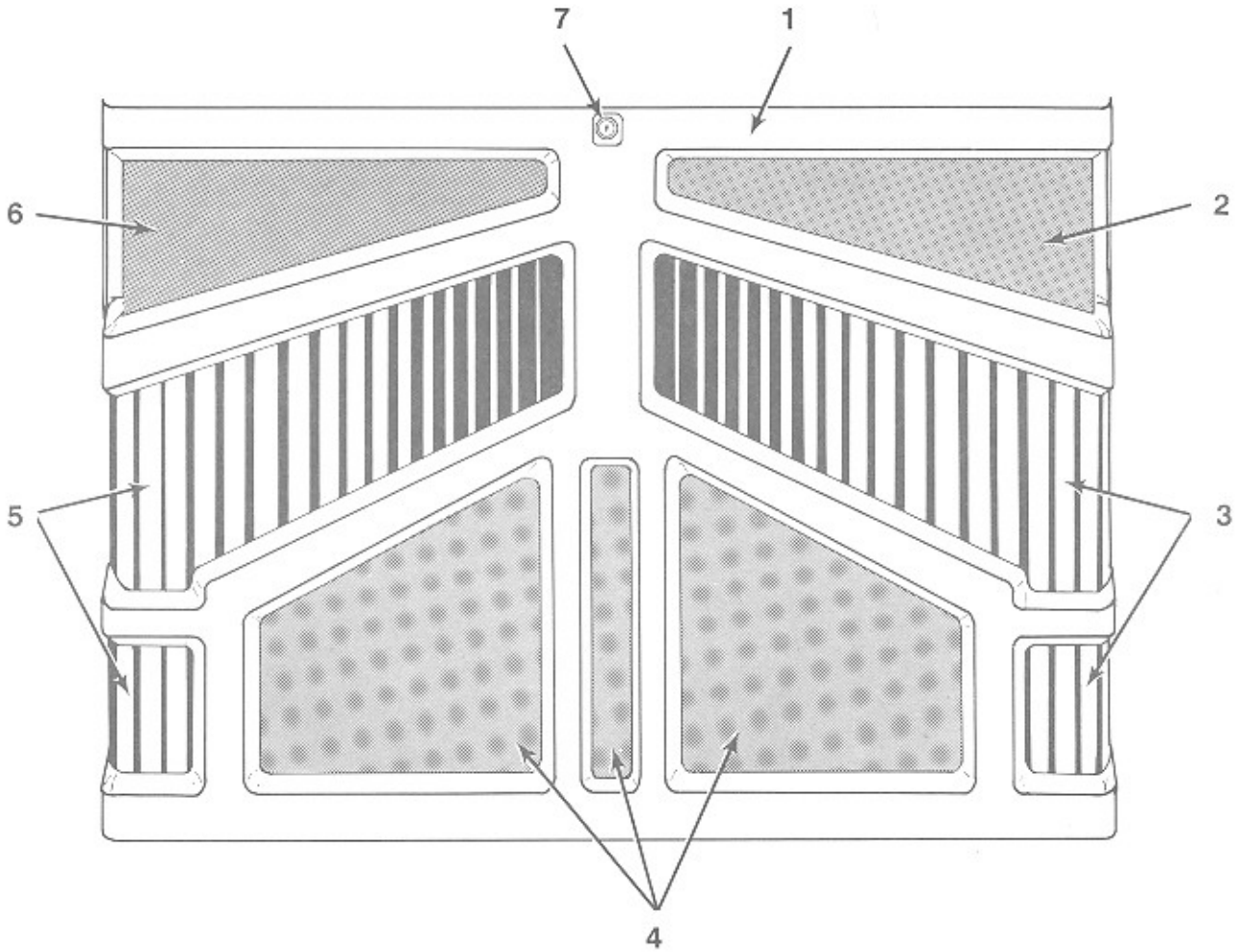


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
3-	61027001	Front Door Assembly (Blue, 60 Hz) External View	1
	61022702	Front Door Assembly (Brown, 60 Hz) External View	1
	61027003	Front Door Assembly (Blue, 50 Hz) External View	1
	61022704	Front Door Assembly (Brown, 50 Hz) External View	1
1	61020203	. Front Door Frame (Blue)	1
	61020204	. Front Door Frame (Brown)	1
2	40820103	. Right-Hand Mid-Range Grille (Blue)	1
	40820104	. Right-Hand Mid-Range Grille (Brown)	1
3	61024301	. Right-Hand Door Lens and Decal Assembly (Blue)	1
	61024302	. Right-Hand Door Lens and Decal Assembly (Brown)	1
4	61023801	. Woofer Grille (Blue)	1
	61023802	. Woofer Grille (Brown)	1
5	61024201	. Left-Hand Door Lens and Decal Assembly (Blue)	1
	61024202	. Left-Hand Door Lens and Decal Assembly (Brown)	1
6	40820003	. Left-Hand Mid-Range Grille (Blue)	1
	40820004	. Left-Hand Mid-Range Grille (Brown)	1
7	70163210	. Common Key Lock	1

Figure 7–3. R–93 Phonograph Front Door Assembly

Sheet 2

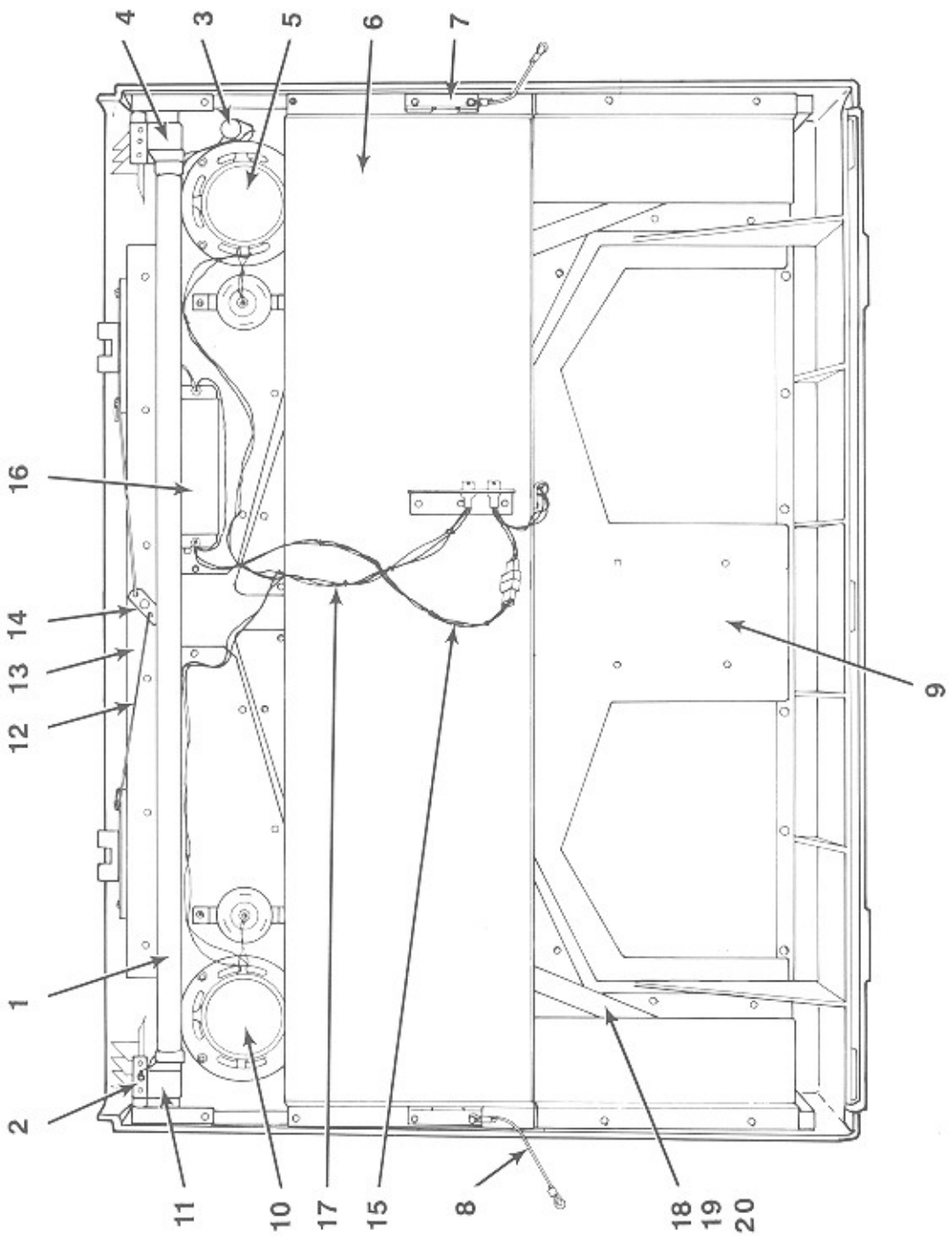


Figure 7-3

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
3-	61027001	Front Door Assembly (Blue) Internal View	1
	61027002	Front Door Assembly (Brown)	1
1	70060112	. Fluorescent Lamp (30 W, T-8)	1
2	30920901	. Strike	2
3	70080004	. Fluorescent Lamp Starter (FS-4)	1
4	30921001	. Left-Hand Lampholder Mounting Bracket	1
5	40821901	. Left-Hand Speaker Assembly	1
6	61023901	. Light Panel Assembly	1
7	21920201	. Upstop Bracket	2
8	21572601	. Fall Stop Cable	2
9	40824601	. Grille Backup	2
10	40822001	. Right-Hand Speaker Assembly	1
11	30921101	. Right-Hand Lampholder Mounting Bracket	1
12	21865303	. Pivot Link	2
13	61021901	. Lock Bar Assembly	1
14	30921601	. Lock Bolt	1
15	40822301	. Light Harness Assembly (60 Hz)	1
	40822302	. Light Harness Assembly (50 Hz)	1
16	30859401	. . Ballast (30 W, 60 Hz)	1
	30859402	. . Ballast (30 W, 50 Hz)	1
17	40822501	. Speaker Harness Assembly	1
18	70060022	. Fluorescent Lamp (15 W, T-8)	2
19	70080001	. Fluorescent Lamp Starter (FS-2) Behind Light Panel (Not Shown)	2
20	40825001	. Fluorescent Lamp Harness Assembly (60 Hz)	1
	40825002	. Fluorescent Lamp Harness Assembly (50 Hz)	1
	30859501	. . Ballast (15 W, 60 Hz)	2
	30859502	. . Ballast (15 W, 50 Hz)	2

Figure 7-4. R-93 Phonograph Internal View

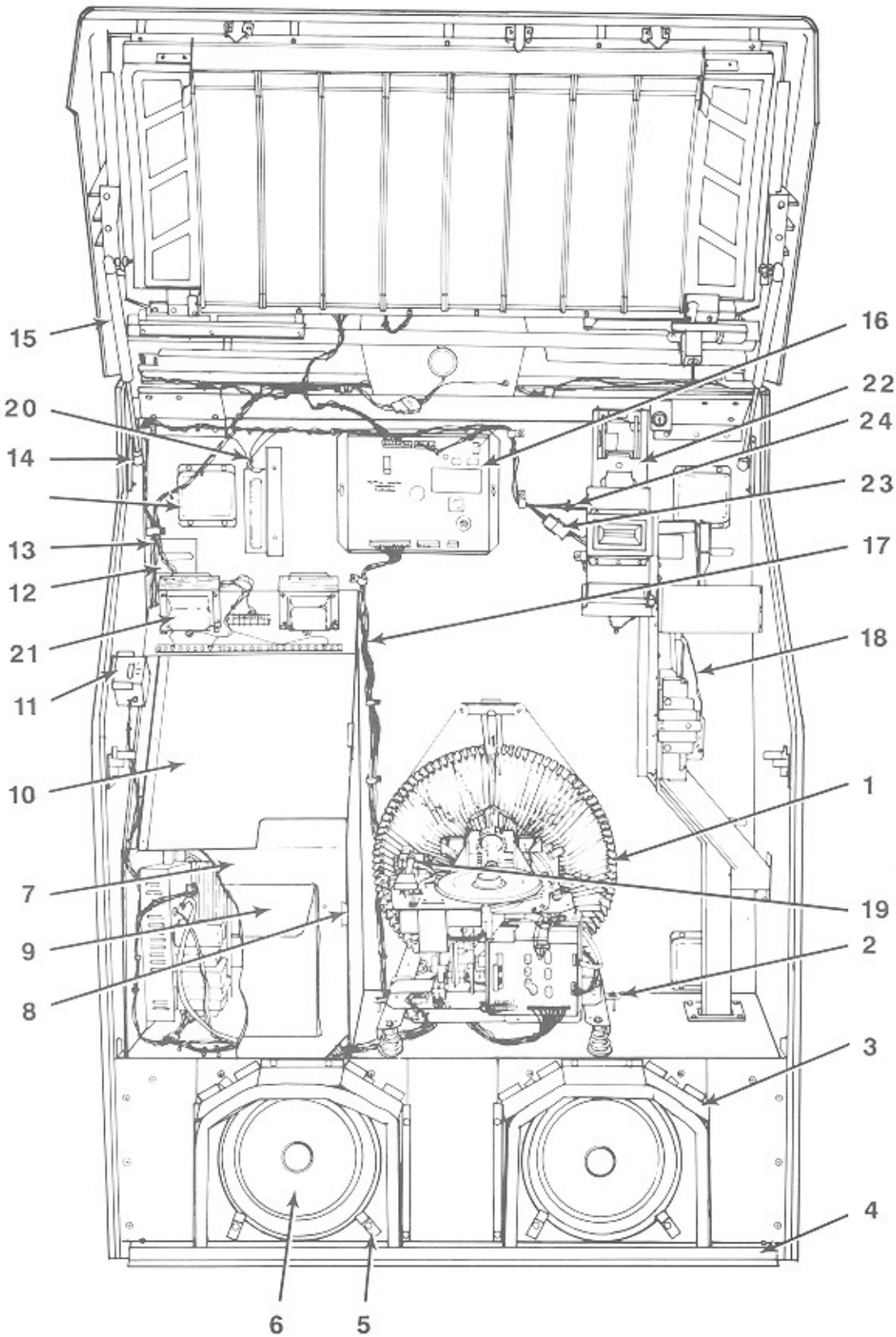


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
4-	R-93 Phonograph Internal View		
1	60870001	. Mechanism Assembly, 60 Hz (see figure 7-18)	1
	60870002	. Mechanism Assembly, 50 Hz (see figure 7-18)	1
2	21203601	. Mechanism Tie Down Bolt	2
3	61021401	. Speaker Hood	2
4	60991101	. Door Mounting Bracket	1
5	21780701	. Speaker Retaining Bracket	8
6	40782103	. Woofer	2
7	30869703	. Amplifier Panel Assembly	1
8	21751804	. Spring Catch	2
9	30869801	. Handy Case	1
	21730514	. . Accessory Bag Assembly	1
	21198801	. . . Accessories Bag	1
	70097502	. . . Contact (Socket)	6
	70091012	. . . Terminal Lug	10
	70072010	. . . Fuse (5 Amp)	2
	70072106	. . . Fuse (5 Amp)	2
	30792201	. . . Turntable Drive Belt	1
	21870001	. . . Snap-in Fastener	2
	30921202	. . Alternate Price Card	1
	61021301	. . Universal Price Sheet (used with the Alternate Price Card)	1
	21863301	. . Lamp and Envelope Assembly	1
	21862201	. . . Lamp and Socket Assembly	5
	26693111	. . Accessories Booklet	1
	21404302	. . Heat Label	1
10	40826201	. Hinge and Cover Assembly	1
11	21883701	. Reset Actuator Assembly (Reset Lever, Pivot, and Bracket)	1
12	21759301	. Cord Hole Cover	2
13	61021101	. Harness and Switch Assembly (Main Harness, see figure 5-4 for the schematic)	1
14	21920301	. Pivot Plate Assembly	2
15	40714905	. Pneumatic Spring	2
16	40777312	. Central Control Computer (see figure 7-17)	1
17	30885401	. Mechanism-To-Computer Harness	1
18	30902302	. Coin Switch Harness Assembly	1
19	30832401	. Tone Arm Cable and Plug Assembly	1
20	40821301	. 110 V Harness Assembly	1
	30859401	. . Ballast (30 W, 60 Hz)	1
21	40832101	. Transformer Assembly (see figure 7-15) (See figure 5-8 for output transformer voltages)	1
22	25232201	. CBA-2 Assembly	1
23	40823101	. Harness and Power Supply Assembly	1
24	30925301	. Interconnect Harness	1

Figure 7-5. CBA-2 Bill Acceptor

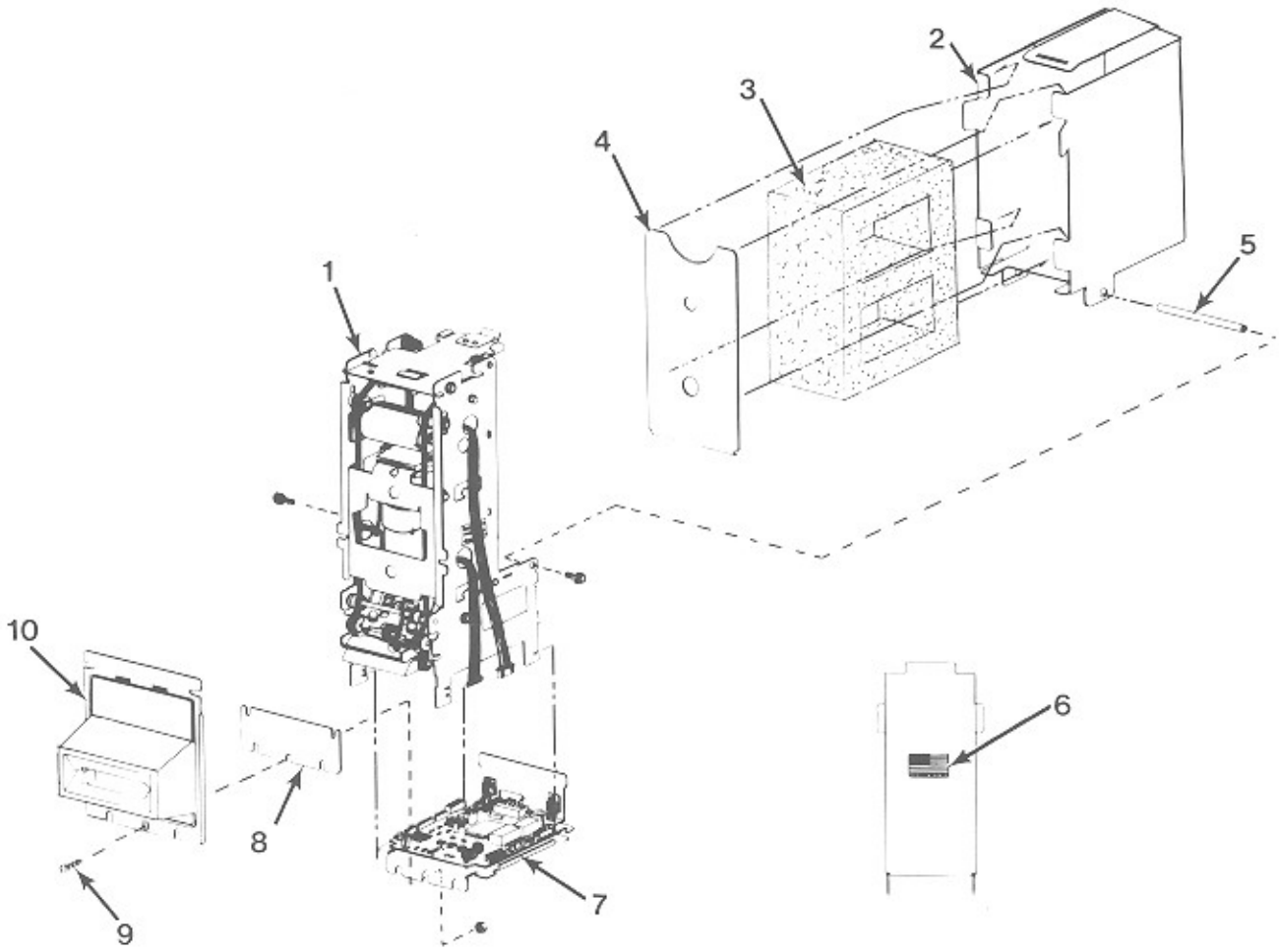
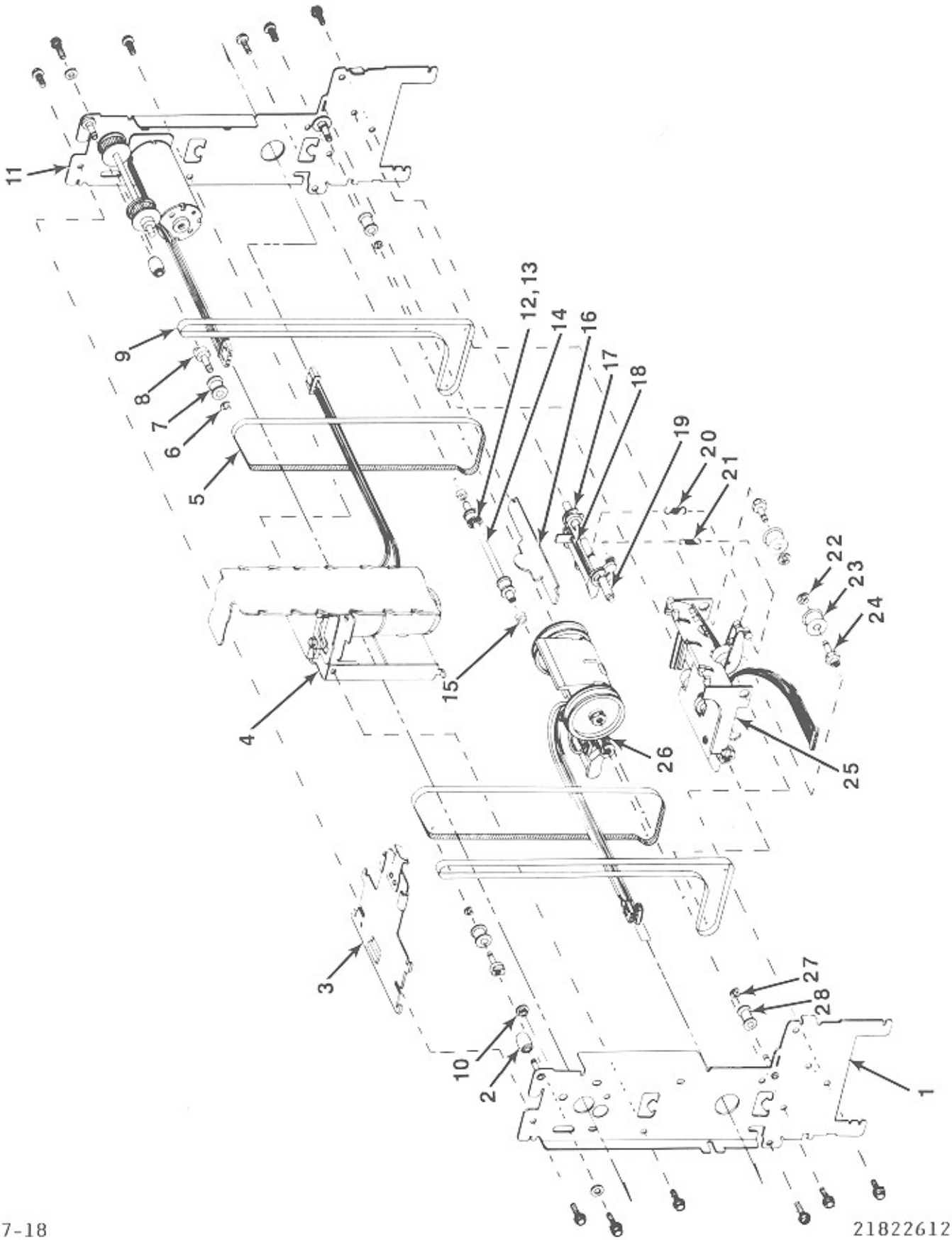


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
5-	25232201	CBA-2	
1	B0030692	Generic CBA-2 Transport (see figure 7-6)	
2	B0030703	. Bill Box.	1
3	B0030702	. Foam Block	1
4	B0031928	. Pressure Plate	1
5	B0031942	. Bill Box Spacer Shaft.	1
6	B0031417	. Flag Label	1
7	B0030704	. Logic Board And Bracket Assembly.	1
8	B0030705	. Water Shield	1
9	B0031747	. Special Flat Head Screw	1
10	B0031953	. CBA-2 Inlet.	1

Figure 7-6. CBA-2 Transport



21822612

Figure 7-6

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
6-	B0030692	Generic CBA-2 Transport (see figure 7-5)	
1	B0031952	. Right-Hand Plate Assembly	1
2	B0031439	. Crowned Roller	2
3	B0031975	. Top Bracket And Catch Assembly	1
4	REF	. Stacker (see figure 7-7)	
5	B0031946	. Timing Belt	2
6	B0031750	. External Retaining Ring	Ref.
7	B0031458	. Flat Roller	Ref.
8	B0031937	. Flat Roller Pin	2
9	B0031956	. Drive Belt	2
10	B0030689	. Nyliner Bearing	1
11	REF	. Motor And Gear Assembly (see figure 7-10)	
12	B0031458	. Flat Roller	4
13	B0031750	. Retaining Ring	6
14	B0031930	. Flat Roller Shaft	1
15	B0030688	. Spacer.	2
16	B0031925	. Bill Stop	1
17	B0031751	. External Retaining Ring	2
18	B0031527	. Anti-Cheat Lever	1
19	B0031941	. Anti-Cheat Lever Shaft	1
20	B0031418	. Tension Spring (Yellow)	1
21	B0031419	. Tension Spring (Blue)	1
22	B0031750	. External Retaining Ring	Ref.
23	B0031915	. Crowned Roller	2
24	B0031929	. Crowned Roller Pin	2
25	REF	. Lower Track (see figure 7-9)	
26	REF	. Upper Track (see figure 7-8)	
27	B0031752	. External Retaining Ring	2
28	B0031437	. Flanged Roller	2

Figure 7-7. Stacker Assembly

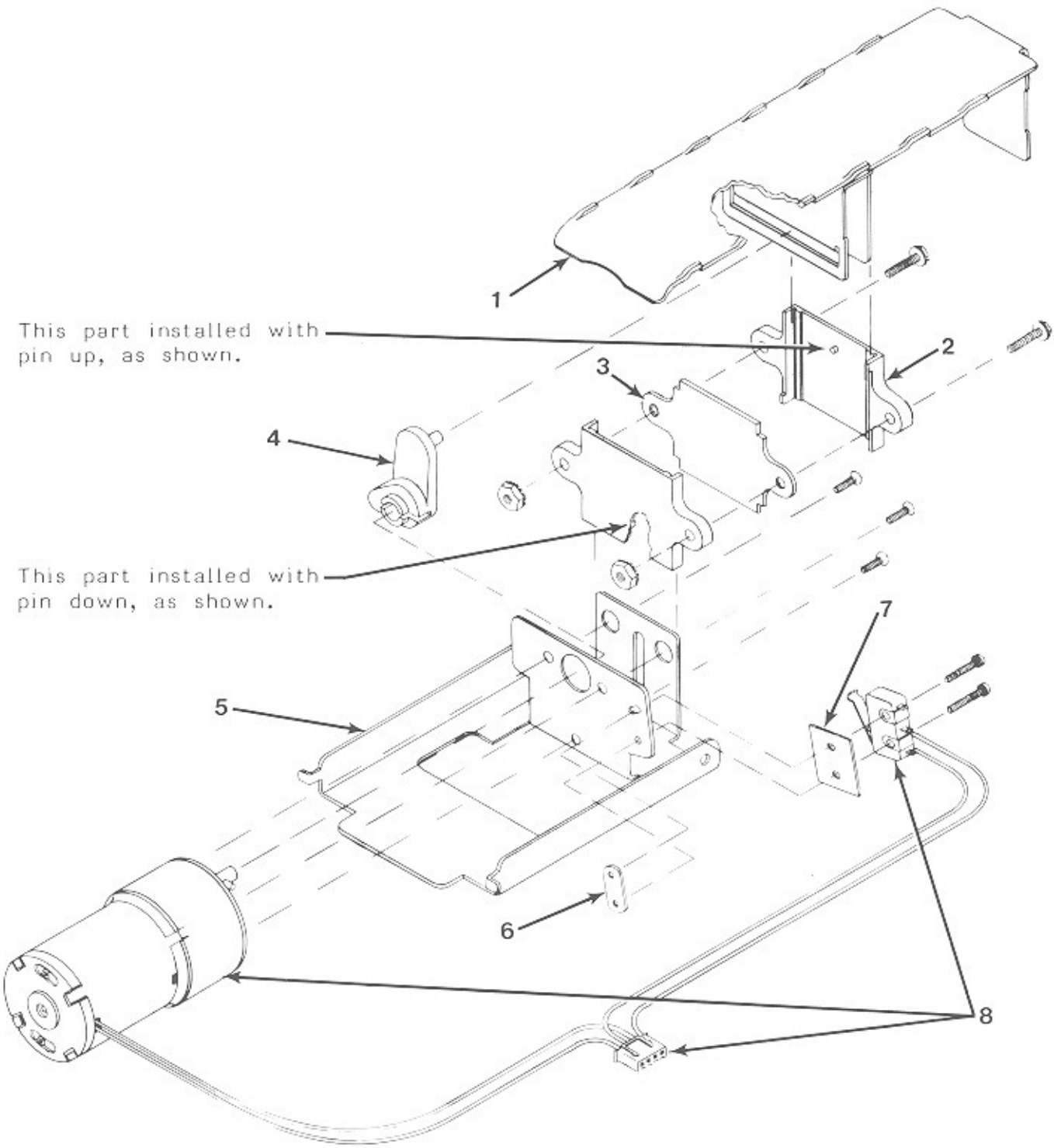


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
7-	REF	Stacker	
1	B0031973	. Pusher Plate Assembly	1
2	B0031963	. Stacker Guide	2
3	B0031962	. Separator	1
4	B0031938	. Stacker Cam	1
5	B0031959	. Stacker Motor Bracket	1
6	B0031943	. Twin Nut	1
7	B0031416	. Switch Separator	1
8	B0031983	. Stacker And Motor Harness Assembly	1
	B0031368	. . Miniature Switch	1

Figure 7-8. Upper Track

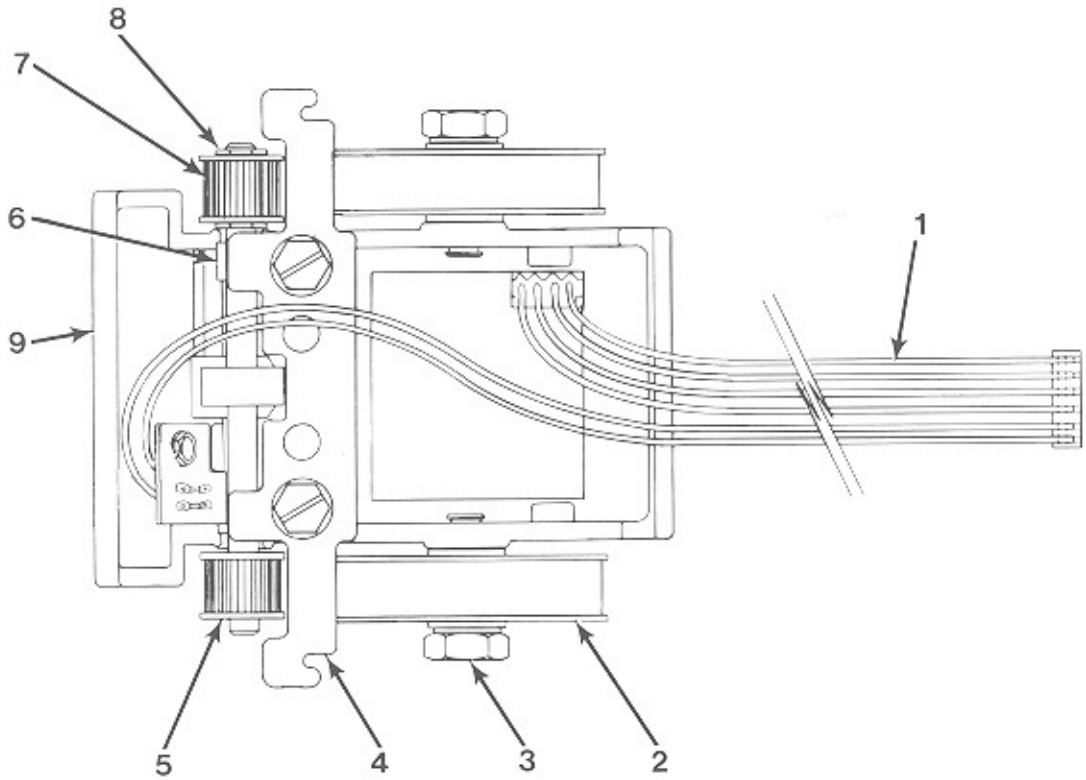


Figure 7-8

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
8-		Upper Track	
1	B0031980	. Upper Harness And Cell Assembly	1
2	B0031469	. Drum Pulley	2
3	B0031924	. Pin	2
4	B0031922	. Upper Track Bracket	1
5	B0031421	. Shaft And Pulley Assembly	1
6	B0031400	. Split Bearing	1
7	B0031475	. 16-Tooth Pulley	1
8	B0031752	. External Retaining Ring	2
9	B0031996	. Track Assembly	1

Figure 7-9. Lower Track

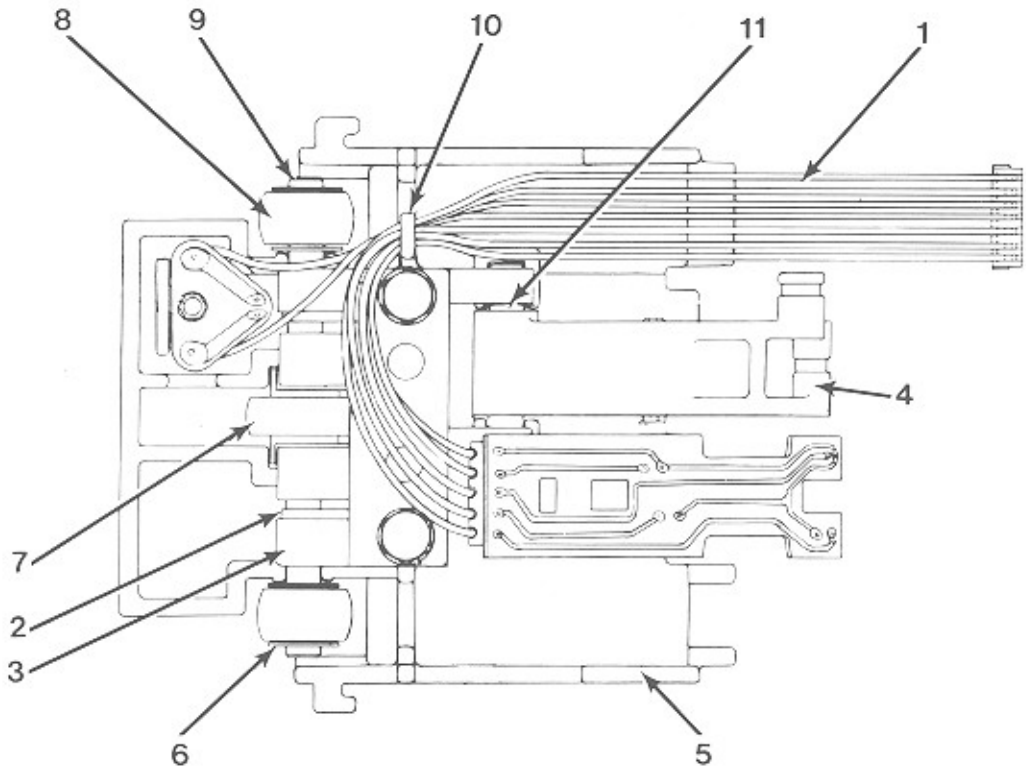


Figure 7-9

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
9-	REF	Lower Track	
1	B0031987	. Lower Harness And Cell Assembly	1
2	B0031927	. Input Shaft Spring	1
3	B0031834	. Input Shaft Bracket	1
4	B0031977	. Roller And Holder Assembly	1
5	B0031955	. Lower Track	1
6	B0031750	. External Retaining Ring	4
7	B0031405	. Input Roller	1
8	B0031387	. Crown Roller	2
9	B0031407	. Lower Input Shaft	1
10	B0031375	. Lug	1
11	B0031945	. Holder Pin	1

Figure 7-10. Motor & Gear Assembly

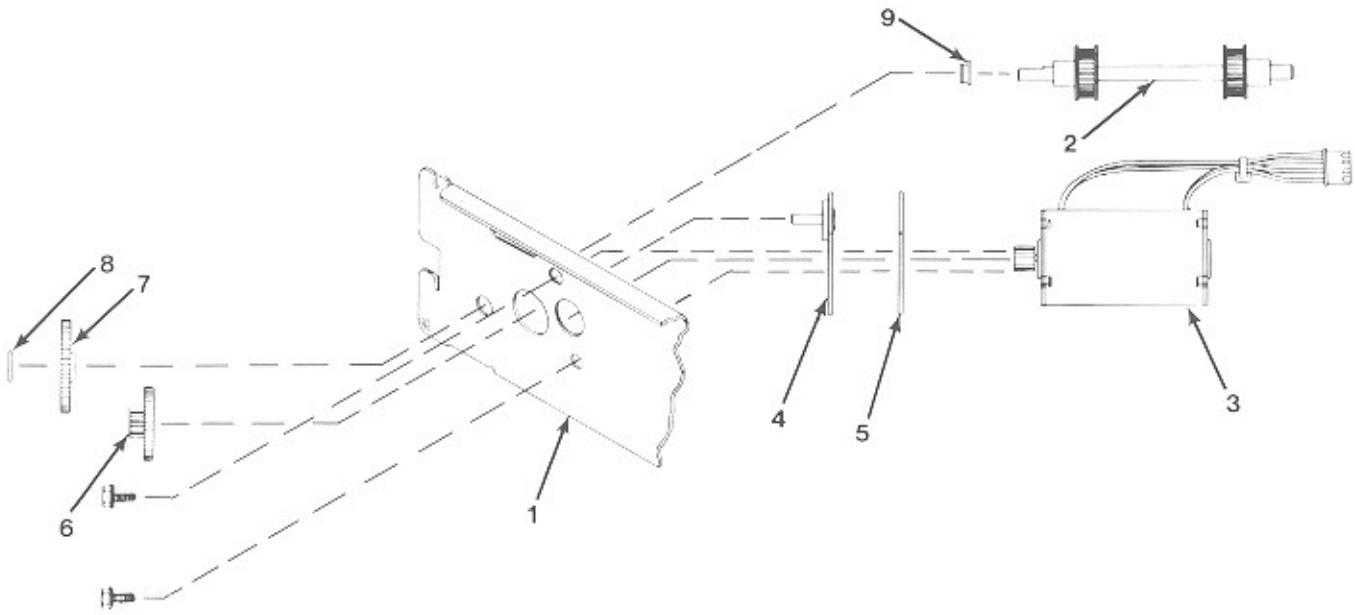


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Assy
10-	REF	Motor And Gear	
1	B0031951	. Left-Hand Plate Assembly	1
2	B0031976	. Drive Shaft And Pulley Assembly.	1
3	B0031978	. Transport Motor Assembly.	1
4	B0031974	. Transport Plate And Pin Assembly	1
5	B0031932	. Spacer Plate	1
6	B0031936	. Reduction Gear	1
7	B0031933	. Drive Gear	1
8	B0031944	. Retaining Ring	1
9	B0030689	. Nyliner Bearing	1

Figure 7-11. Coin Chute Assembly

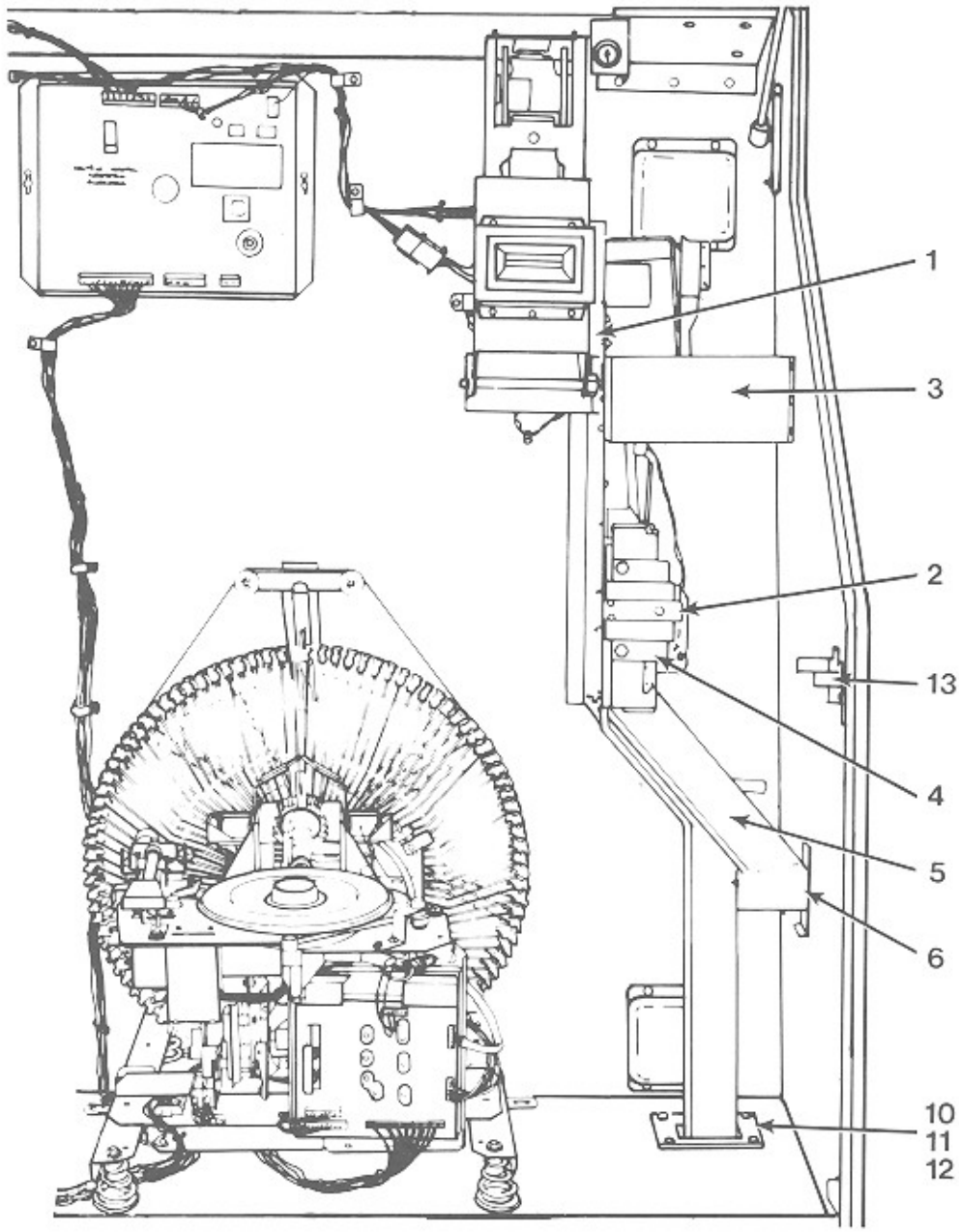


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
11-	Coin Chute Assembly		
1	40821401	. Support and Coin Chute Assembly	1
	30904401	. . Support Assembly - Slug Rejector	1
	30904501	. . Pivot Scavenge	1
	25156904	. . Shoulder Washer	1
	21256201	. . Tension Spring	1
	21891801	. . Scavenge Link	1
	21891901	. . Slug Rejector Actuator	1
	21765601	. . Compression Spring	1
	20922502	. . Spacer	4
	30904601	. . Upper Coin Chute Assembly	1
	21790102	. . Hinge Support	1
2	21429501	. . Rejector Catch Assembly	1
3	30921301	. Support Brace	1
4	40703810	. Mounting Bracket and Coin Switch Assembly	1
	40579302	. . Slug Rejector Mounting Bracket Assembly	1
	21411401	. . Spacer	1
	40696201	. . Coin Switch Assembly	1
	21790202	. . Rejector Hinge	1
	20636801	. . Stud	1
	21822301	. . Slug Rejector Catch Plate	1
5	40801502	. Slug Chute	1
6	21793001	. Slug Cup Bracket	2
7	21357802	. Elastic Stop Nut	1
8	21792901	. Slug Cup Door	1
9	30781702	. Slug Cup	1
10	61020701	. Lower Coin Chute	1
11	30743701	. Coin Chute Collar	1
12	21754401	. Coin Chute Gasket	1
13	21712801	. Latch Assembly	1
	21712701	. Latch Assembly (Left Hand, Not Shown)	1

Figure 7-12. R-93 Amplifier Compartment

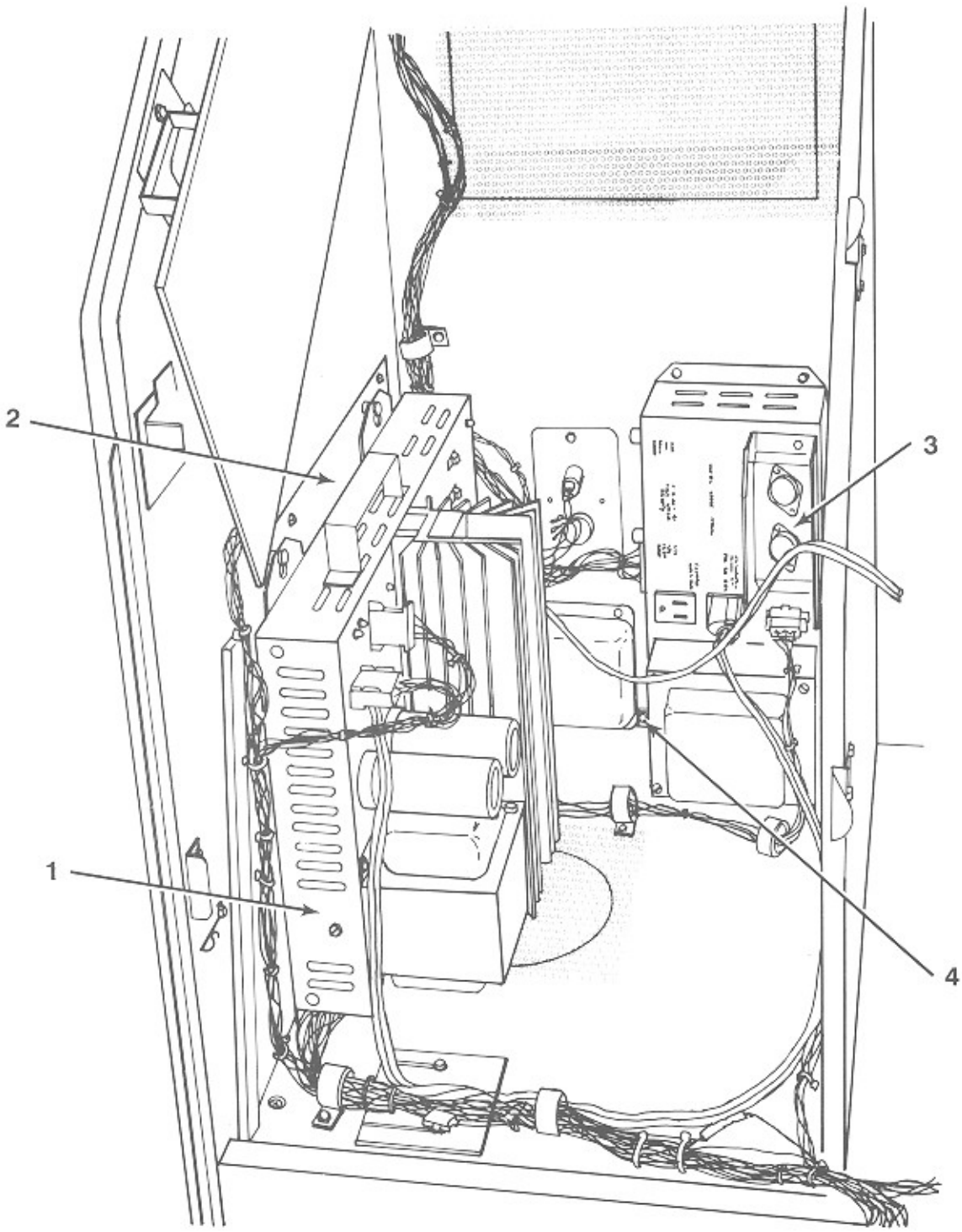


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
12- R-93 Amplifier Compartment			
1	60993102	. 130 Watt Stereo Amplifier (see figure 7-13)	1
2	40242601	. Amplifier Mounting Bracket Assembly	1
3	40770605	. Main Power Supply (120 V) (see figure 7-16)	1
	46509207/08	. Main Power Supply (220/240 V)	1
4	20925601	. Junction Box Mounting Bracket	1

Figure 7-13. Stereo Amplifier Assembly

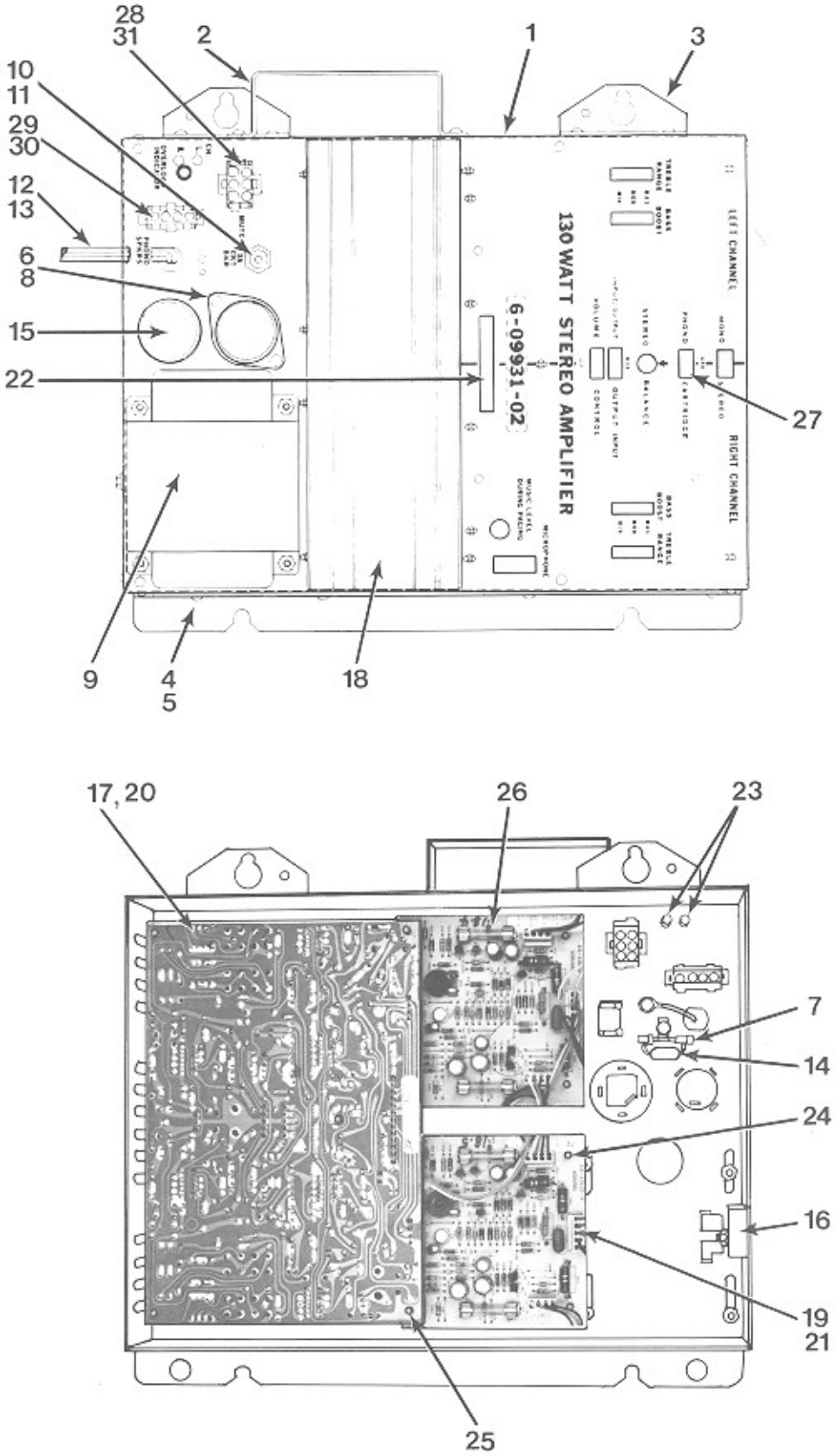


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
13-	60993102	Stereo Amplifier Assembly (see figure 7-12, item 1)	
1	60744107	. Chassis Assembly	1
2	21488101	. Handle	1
3	20927201	. Mounting Bracket	2
4	30627301	. Mounting Bracket	1
5	70111320	. Semi Tubular Rivet	18
6	21391001	. Mounting Wafer	1
7	21724102	. Terminal Strip	1
8	70111007	. Semi Tubular Rivet	2
9	40737804	. Power Transformer	1
10	70078917	. Circuit Breaker	1
11	70122011	. Washer	1
12	25218603	. 3 Conductor Cord and Plug	1
13	70232205	. Strain Relief	1
14	70021305	. Mylar Capacitor	1
15	21823101	. Electrolytic Capacitor (4700 Mfd)	2
16	21822501	. Bridge Rectifier	1
17	60792505	. Stereo Preamp. Assembly (see schematic for parts list)	1
18	40715103	. Heat Sink Assembly (see figure 7-14)	1
19	70075505	. Connector Housing (5 Circuit)	2
20	70075502	. Connector Housing (2 Circuit) (Not Shown)	1
21	70075601	. Post Contact	11
22	70075513	. Connector Housing (13 Circuit)	1
23	21893401	. Speaker Overload Indicator (Right Channel)	1
	21893402	. Speaker Overload Indicator (Left Channel)	1
24	70500004	. Circuit Board Support	8
25	70500018	. Circuit Board Support	5
26	40710103	. Driver Circuit Board Assembly (see power Amplifier schematic for components list)	2
27	70075503	. Connector Housing (3 Circuit)	1
28	30749003	. Cap Housing	1
29	30749004	. Cap Housing	1
30	70097502	. Contacts	8
31	21620702	. Amplifier Jumper Plug Assembly	1

Figure 7-14. Heat Sink Assembly

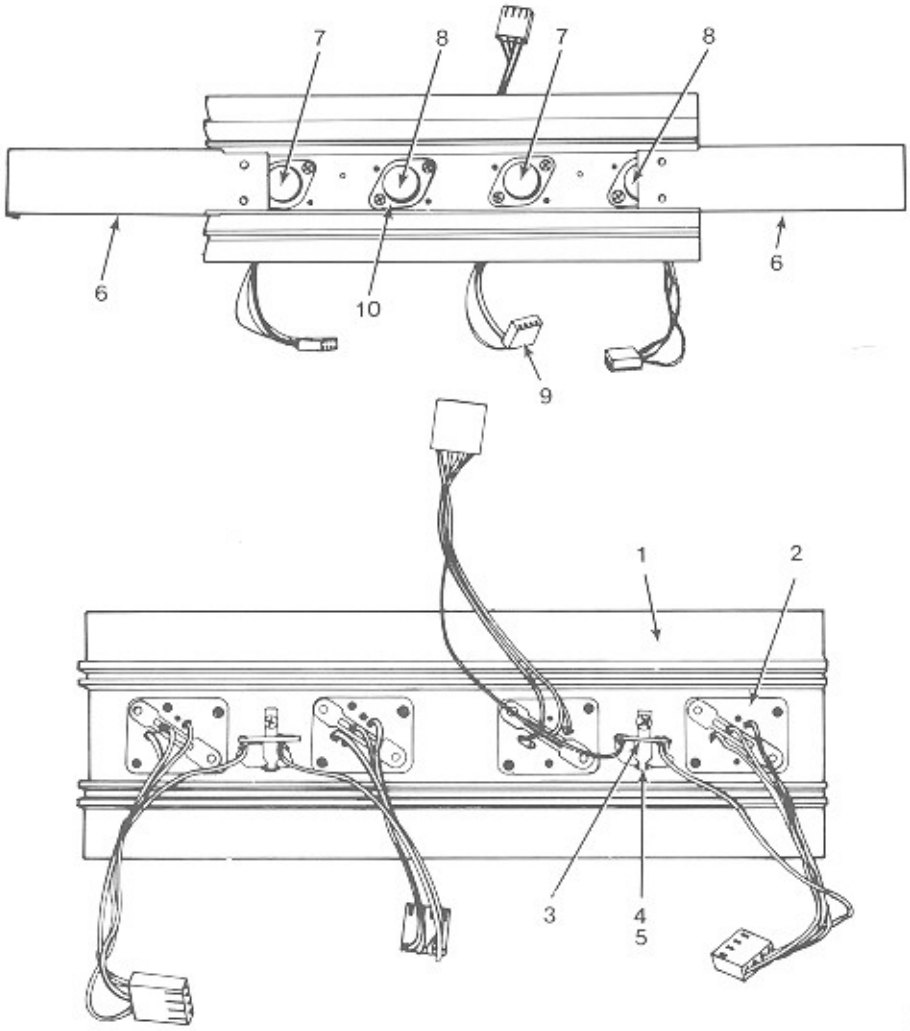


Figure 7-14

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
14-	40715103	Heat Sink Assembly (see figure 7-13, item 18)	
1	40710302	. Heat Sink	1
2	21547301	. Power Transistor Socket	4
3	21377301	. Terminal Strip	2
4	70035009	. Silicon Diode	2
5	21631901	. Diode Retainer	2
6	21798001	. Cover	2
7	70030206	. Transistor (Darlington Amp, RCA-2N6283)	2
8	70030207	. Transistor (Darlington Amp, RCA-2N6286)	2
9	21318902	. Precoated-Insulator	4
10	70075504	. Connector Housing	4
	21620702	. Amplifier Jumper Plug Assembly	1
	21620711	. Amplifier Jumper Plug Assembly	1

Figure 7-15. Output Transformer Assembly

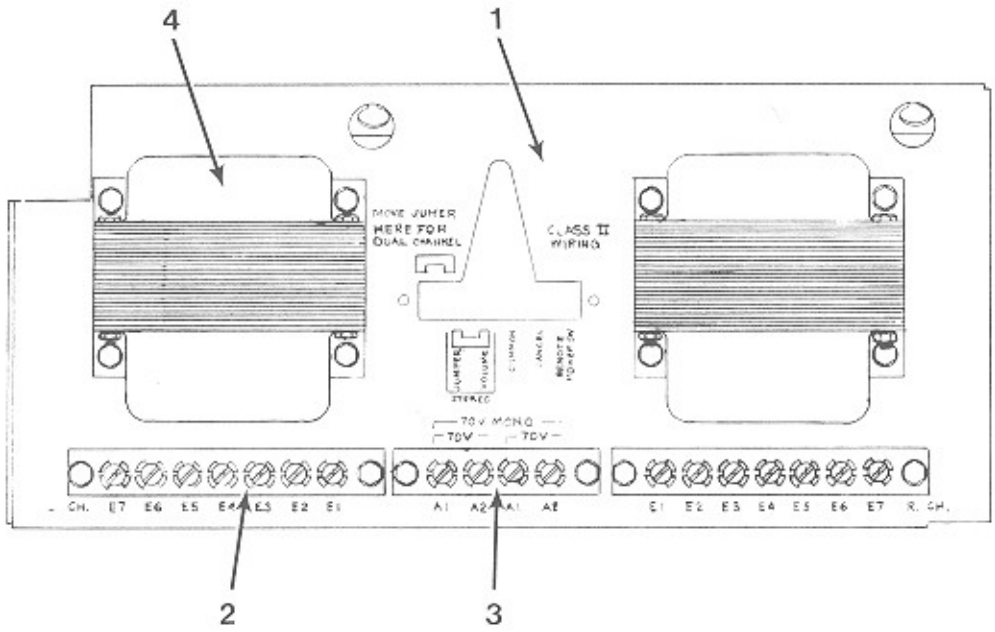
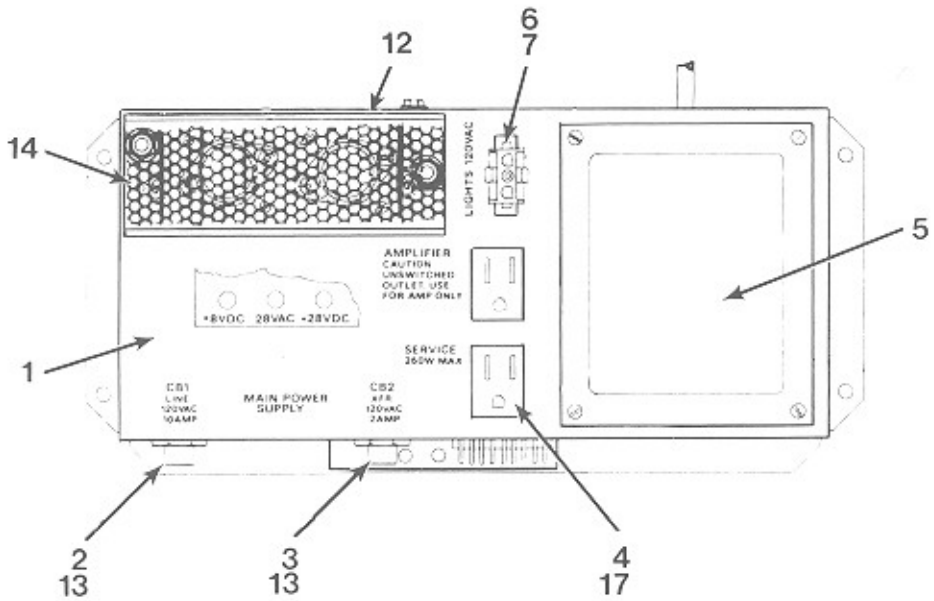


Figure 7-15

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
15-	40832101	Output Transformer Assembly (see figure 7-12, item 3) (See also figure 6-2, the schematic diagram)	
1	40835801	. Chassis With Lettering	1
2	30426705	. Terminal Strip	2
3	30426703	. Terminal Strip	1
4	40633502	. Output Transformer	2

Fgure 7-16. Main Power Supply

(120 Volt Model)



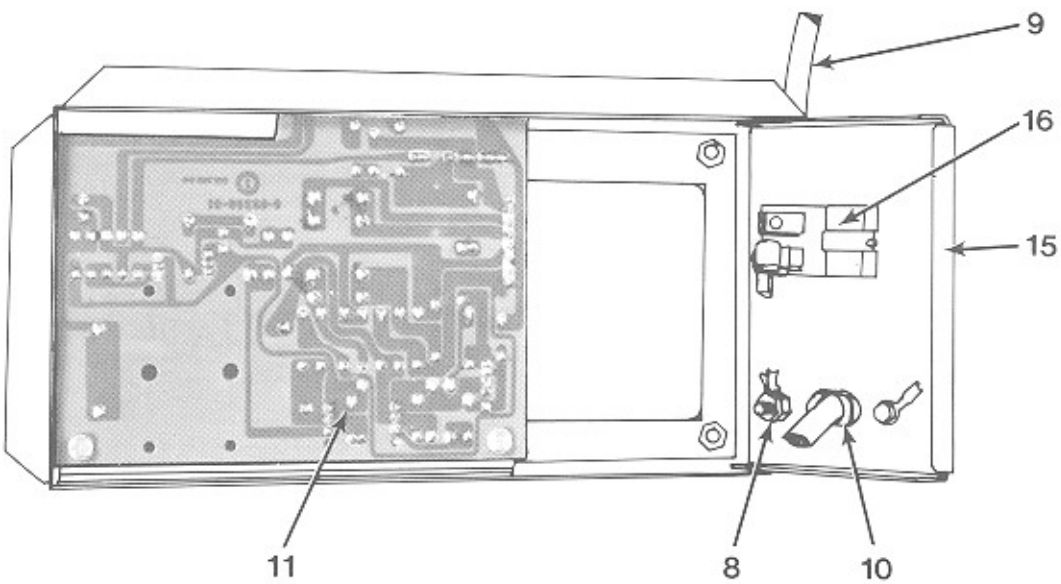


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
16-	40770605	Main Power Supply (120 V) (see figure 7-12, item 4)	
	46509207	Main Power Supply (220 V)	
	46509208	Main Power Supply (240 V)	
1	40771902	. Chassis Assembly	1
2	70073613	. 10 Amp Circuit Breaker	1
3	70073605	. 2 Amp Circuit Breaker	1
4	21375901	. 3 Wire Convenience Outlet	2
5	40772001	. Transformer and Harness Assembly	1
	40772026	. . Power Transformer (120 V)	1
	46509326	. . Power Transformer (220/240 V)	REF
	70075601	. . Post Contact	6
	70075601	. . Post Contact (220/240 V)	5
	70097504	. . Contact	1
	70091308	. . Terminal Lug	1
	70091308	. . Terminal Lug (220/240 V)	4
6	30749002	. Cap Housing	1
	70097504	. . Contact (220/240 V)	3
7	70097504	. Contact (120 V)	2
	70091308	. . Terminal Lug (120 V)	2
	70091308	. . Terminal Lug (220/240 V)	4
8	70091511	. Ring Terminal	2
9	30834506	. Power Cord Assembly (120 V)	1
	36536501	. Power Cord Assembly (220 V/240 V)	1
10	70232104	. Strain Relief	1
11	60935702	. Circuit Board Assembly	1
12	40733102	. Heat Sink and Power Transistor Assembly	1
	30834301	. . Power Supply Heat Sink	1
	70030807	. . Transistor (Darlington) (2N6055) (Motorola, RCA)	2
	21318901	. . Insulator	2
	21834201	. . Power Transistor Socket	2
	70075504	. . Connector Housing	2
	70075601	. . Post Contact	6
	70075702	. . Keying Post	2
13	21408602	. Straight Receptacle (120 V)	4
	21408602	. Straight Receptacle (220/240 V)	8
	70073421	. Breaker 220/240 V (5A) (Not Shown)	2
	70073422	. Breaker 220/240 V (6A) (Not Shown)	1
14	21828101	. Heat Sink Cover	1
15	30867301	. Switch Panel	1
16	30785701	. Rocker Switch (120 V)	1
	30785702	. Rocker Switch (220/240 V)	1
17	70096701	. Insulated Faston (120 V)	4
	70096701	. Insulated (220/240 V)	3
	70099201	. Self Stripping Terminal	5
	70099101	. Self Stripping Terminal	1
	70075508	. Connector Housing	1
	70075702	. Keying Plug	1
	70075601	. Post Contact (120 V)	1
	70075601	. Post Contact (220/240 V)	2

Figure 7-17. Central Control Computer

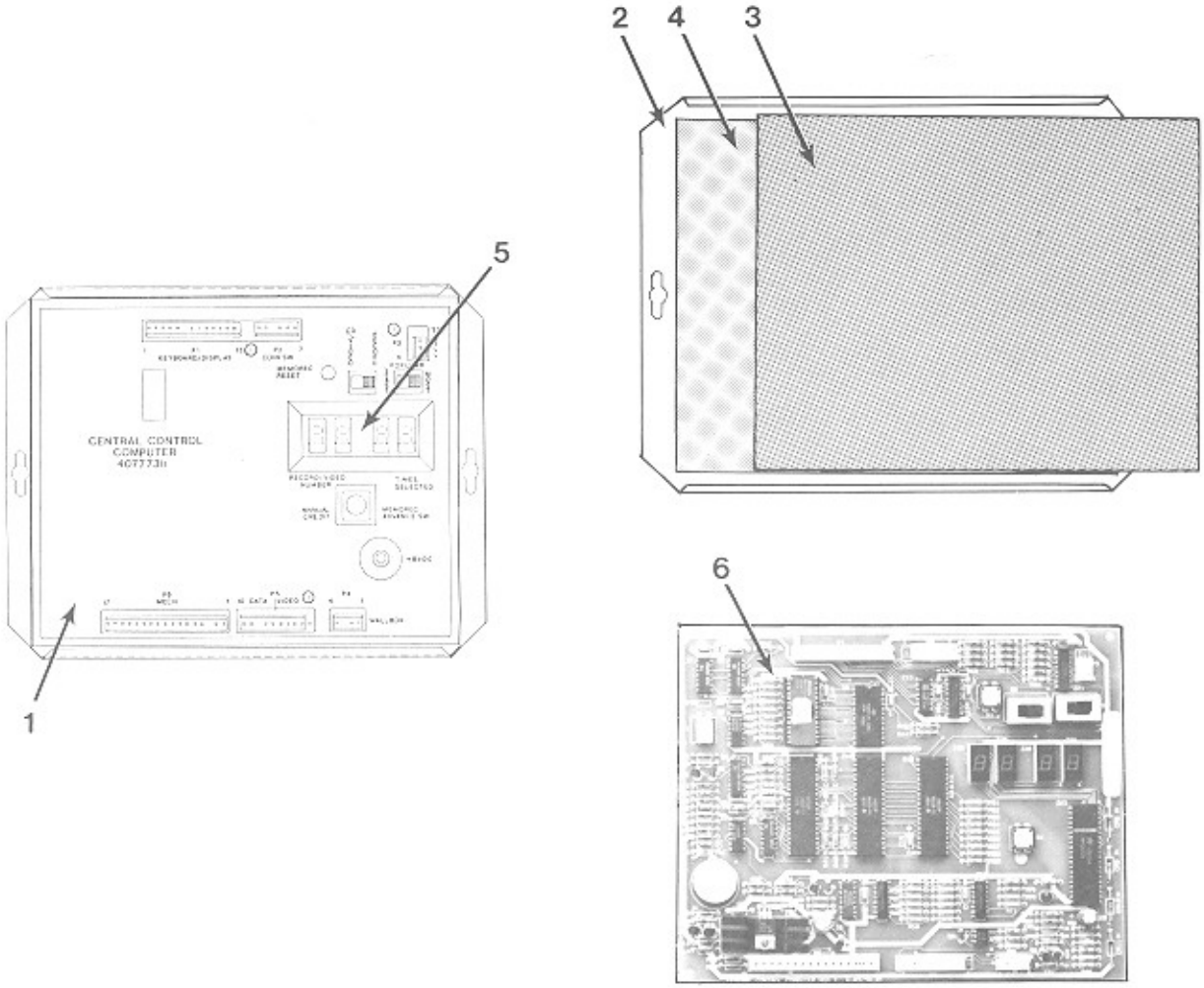


Figure 7-17

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
17-	40777312	Central Control Computer Assembly (see figure 7-4, item 16)	1
1	40779206	. Central Control Computer Cover	1
2	40779101	. Central Control Computer Base	1
3	21771014	. Insulator Pad	1
4	21771111	. Insulation Base	1
5	21781905	. Light Filter Display Card	1
6	60973812	. Central Computer Circuit Board Assembly	1

Figure 7-18. Mechanism Assembly

Sheet 1

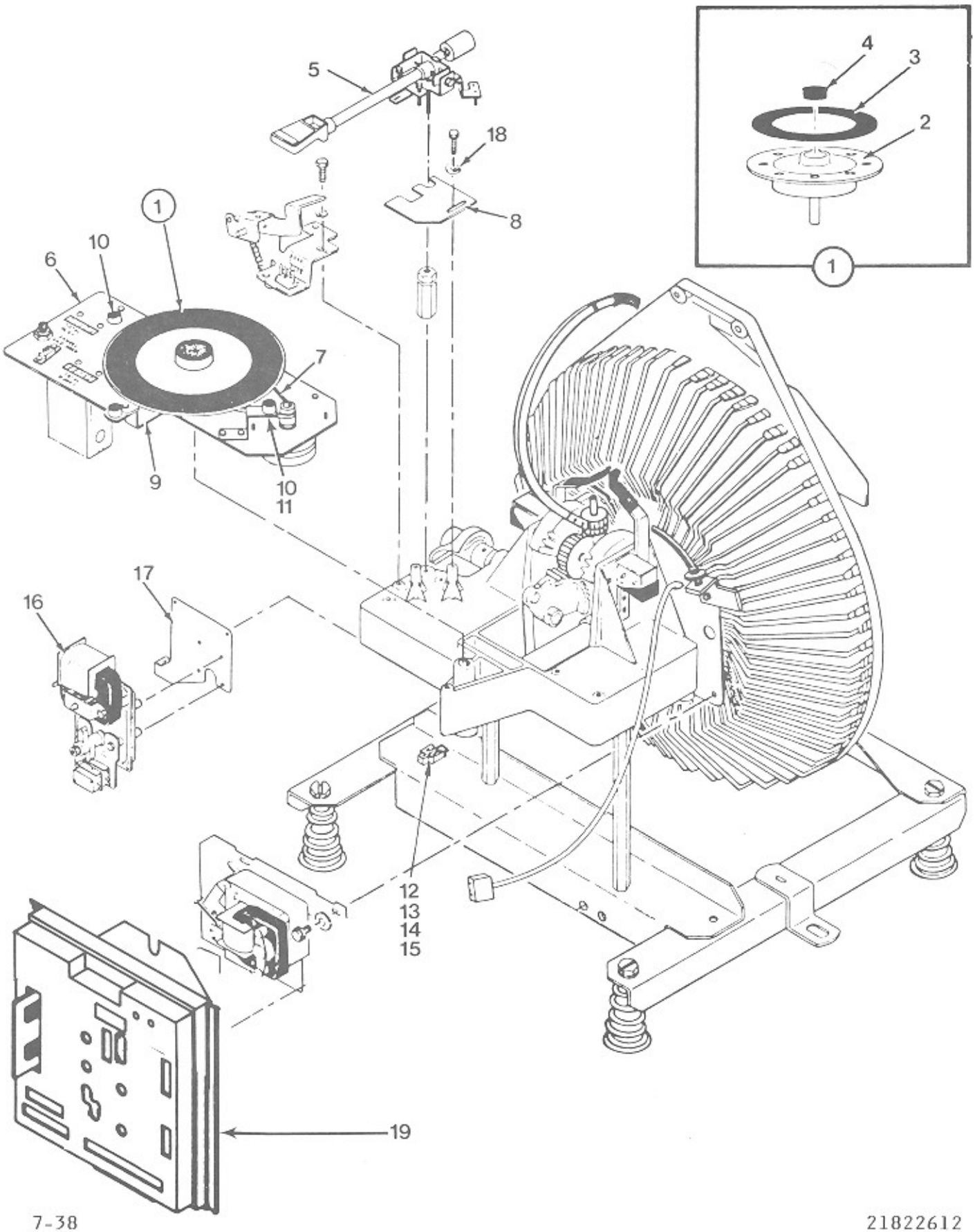


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
18-	60870001	Mechanism Assembly (see figure 7-4, item 1) (60 Hz)	
	60870002	Mechanism Assembly (50 Hz)	
1	30792101	. Turntable Assembly	1
2	40721501	. Turntable and Shaft Assembly	1
3	30523501	. Turntable Face	1
4	21816301	. Hole Plug	1
5	40721702	. Tone Arm and Pivot Assembly (see figure 7-19)	1
6	30793501	. Plate and Counter Assembly	1
	21581801	. . Momentary Contact Switch	1
	30794201	. . Brush Holder	1
	20218201	. . Brush	1
	40722002	. . Counter Mounting Plate	1
	21813701	. . Counter Assembly	1
	21538302	. . . Counter	1
	21441802	. . . Electric Counter	1
	70092104	. . . Solderless Connector	4
	70075505	. . . Connector Housing	1
	70075601	. . . Post Contact	4
	70075702	. . . Keying Plug	1
7	30792201	. Turntable Drive Belt	1
8	30793802	. Tone Arm Cutoff Circuit Board Assembly	1
	40722502	. . Printed Wiring Board	1
	21072602	. . Reed Switch	1
	70076002	. . Polarizing Wafer (90^{0} Angle)	1
	21818101	. . Contact	1
	70077001	. . Socket - Mini Spring	2
9	21818801	. Bracket - Grommet and Rivet Assembly	1
10	21818901	. Bracket - Grommet and Rivet Assembly	2
11	21813901	. . Grommet	3
12	40722401	. Mechanism Harness Assembly	1
	30749005	. . Cap Housing (9 Circuit)	1
	30079501	. . Contact	7
	30079503	. . Contact	2
	70075502	. . Connector Housing	1
	70075508	. . Connector Housing	1
	70075510	. . Connector Housing	1
	70075601	. . Post Contact	17
	70075701	. . Keying Plug	1
	70075702	. . Keying Plug	2
	70091302	. . Terminal Lug	5
	70091306	. . Terminal Lug	2
	70091308	. . Terminal Lug	2
	70091314	. . Terminal Lug	9
	70091602	. . Spade Terminal Lug	1
	70092107	. . Solderless Connector	1
	70800107	. . Cable Tie	20
13	20754501	. Clip	3
14	20554501	. Cable Clip	1
15	70093401	. Cable Clamp	1
16	40720801	. Cam Switch and Motor Assembly (see figure 7-21)	1
17	30790701	. Motor Mounting Plate	1
18	70120002	. Washer	1
19	40722105	. Mechanism Control Unit	1
	30794301	. . Mechanism Control Base	1
	21771008	. . Insulating Pad	1
	21771105	. . Insulating Base	1
	40723105	. . Cover	1
	60870805	. . Mechanism Control Circuit Board Assembly. (see schematic for parts list)	1

Figure 7-18. Mechanism Assembly

Sheet 2

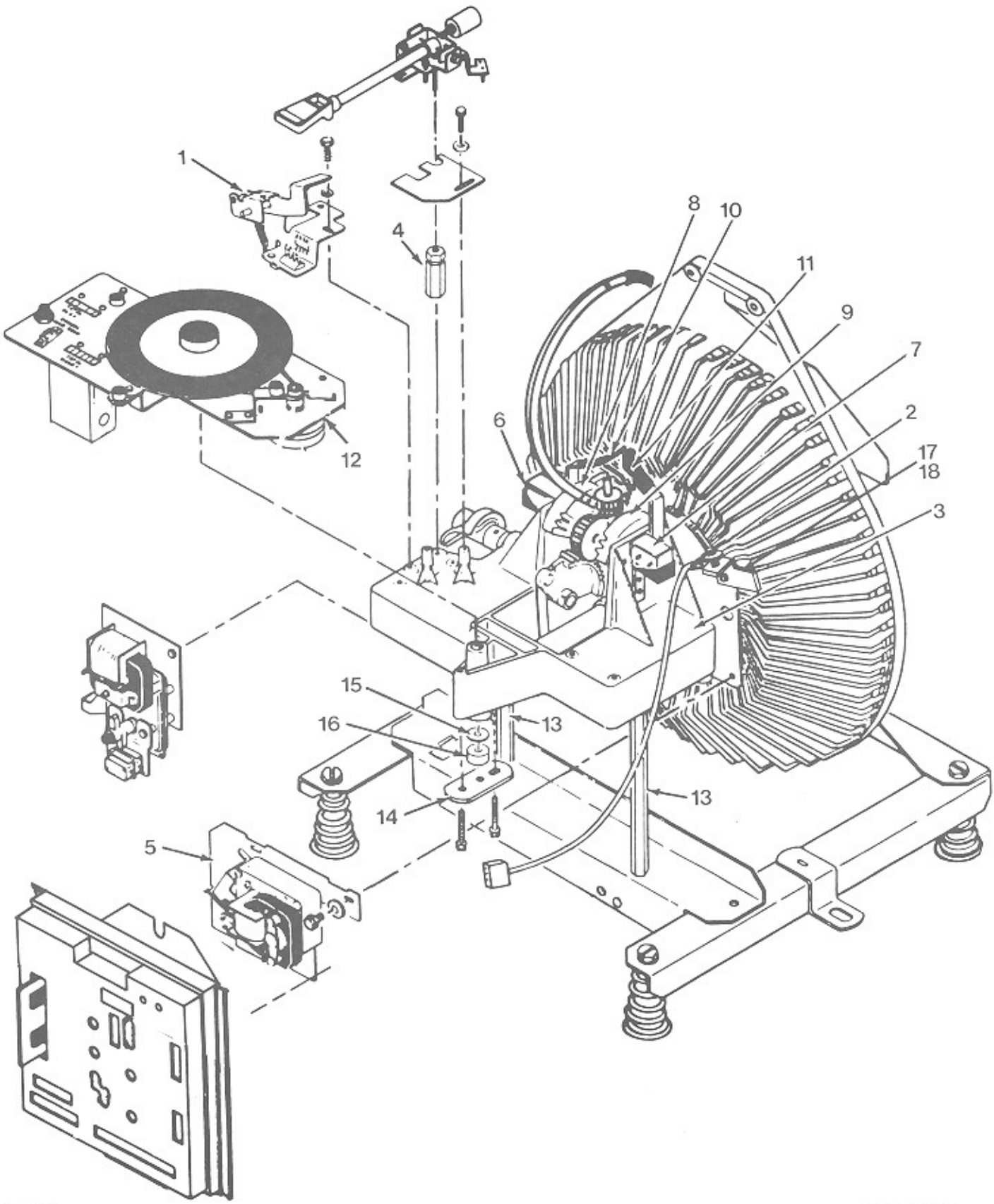


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
18-	60870001	Mechanism Assembly (Continued)	
1	30792601	. Lifting Lever and Bracket Assembly	1
	21815801	. . Lifting Lever Bracket Assembly	1
	21815901	. . Lifting Lever Assembly	1
	70143005	. . Retaining Ring	1
	21576001	. . Tension Spring	1
	21816202	. . Grounding Clip	1
	70074504	. . Chassis Mount Wafer (4 Circuit)	1
	70111106	. . Semi Tubular Rivet	1
2	30906801	. Optical Switch Assembly	1
	30794501	. . Mounting Bracket	1
	30905901	. . Optical Switch and Connector Assembly	1
	40803701	. . . Optical Switch	1
	70075565	. . . Connector Housing (Red)	1
	70075702	. . . Keying Plug	1
	70075601	. . . Contact Post	4
	70800101	. . Cable Tie	2
3	70312201	. Mechanism Name Plate	1
4	21070802	. Bearing Assembly	1
5	40721901	. Sprag Assembly (see figure 7-20)	1
6	21818201	. Toggle Solenoid Assembly (LH)	1
	21810901	. . Solenoid Assembly	1
	21811001	. . Solenoid Plunger Assembly (LH)	1
	21811301	. . Compression Spring	1
	21812301	. . Solenoid Stop	1
	21810501	. . Solenoid Bracket	1
7	21818301	. Toggle Solenoid Assembly (RH)	1
	21810901	. . Solenoid Assembly	1
	21201902	. . Solenoid Plunger Assembly	1
	21811301	. . Compression Spring	1
	21812301	. . Solenoid Stop	1
	21810501	. . Solenoid Bracket	1
8	30790501	. Rotator Assembly (LH)	1
9	30790601	. Rotator Assembly (RH)	1
10	21811801	. Record Guide Assembly (LH)	1
11	21811901	. Record Guide Assembly (RH)	1
12	30791701	. Turntable Motor and Plate Assembly (60 Hz)	1
	30791702	. Turntable Motor and Plate Assembly (50 Hz)	1
	30791801	. . Turntable Motor Mounting Plate	1
	21817102	. . Turntable Belt Guide	1
	30791907	. . Turntable Motor Assembly (60 Hz)	1
	30791908	. . Turntable Motor Assembly (50 Hz)	1
	21817801	. . Motor Pulley (45 RPM) (60 Hz)	1
	21817802	. . Motor Pulley (45 RPM) (50 Hz)	1
13	21812501	. Mech Support	2
14	21812401	. Cap Plate	1
15	21036401	. Thrust Bearing	1
16	21086601	. Spacer Bearing	1
17	21818601	. Adjusting Bracket Assembly	1
18	21818401	. Adjusting Knob	1

Figure 7-18. Mechanism Assembly

Sheet 3

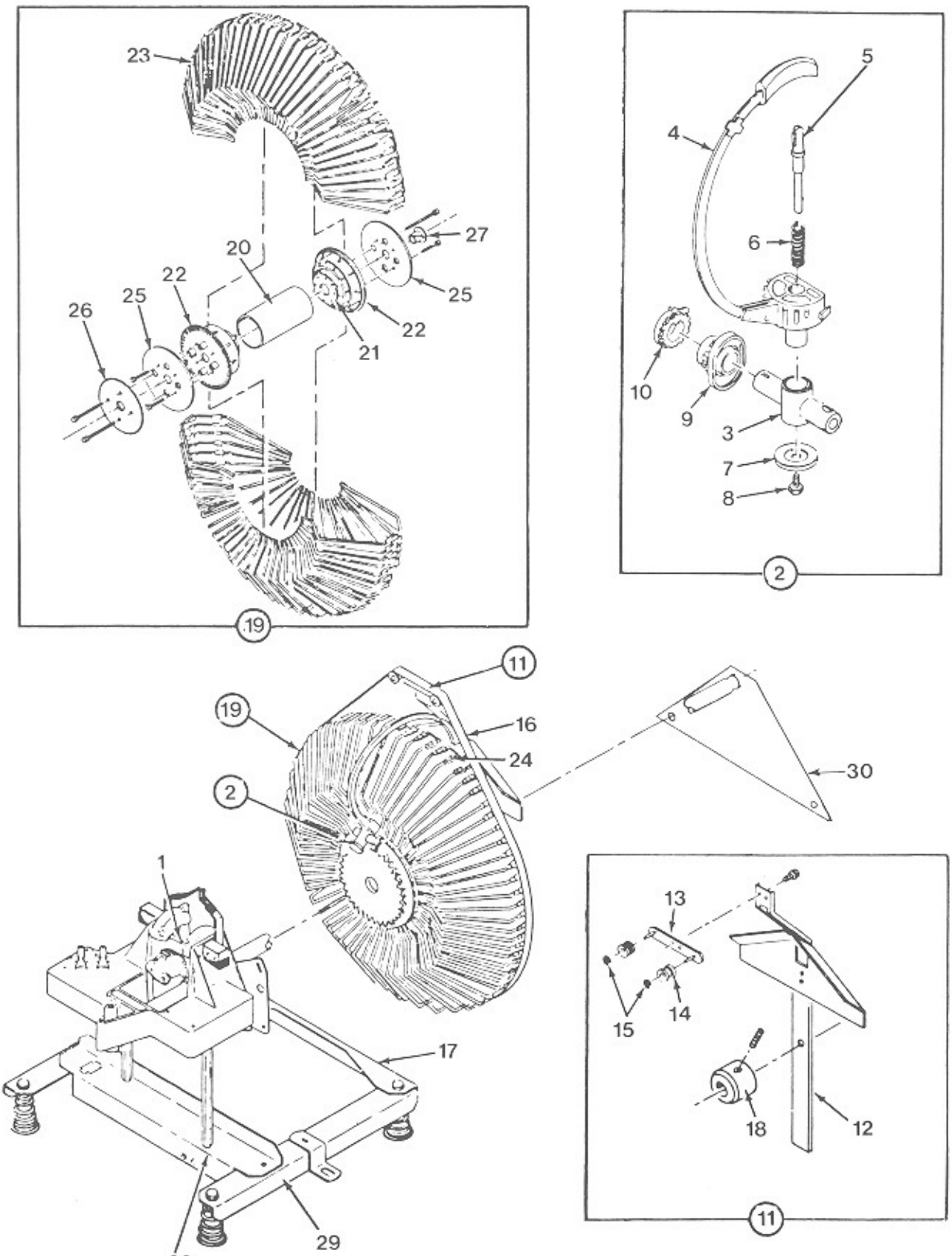


Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
18-	60870001	Mechanism Assembly (Continued)	
1	21079202	. Trunnion Pin	2
2	40720701	. Gripper and Trunnion Assembly	1
3	30791001	. Trunnion	1
4	30519702	. Gripper Bow and Hub Assembly	1
5	21080803	. Inner Shoe Assembly	1
6	21081101	. Record Release Spring	1
7	21811501	. Cam Follower	1
8	21811701	. Lock Screw	1
9	40720401	. Cam Gear	1
10	40720601	. Trunnion Gear	1
11	40721201	. Guide and Belt Support Assembly	1
12	40721301	. Gripper Bow Guide Assembly	1
13	21089401	. Roller Bracket Assembly	1
14	20384301	. Belt Roller	2
15	70143003	. Retaining Ring	2
16	21813801	. Belt	1
17	30792501	. Support Frame Rear Angle	1
18	21812601	. Collar	1
19	60870301	. Magazine Assembly	1
20	40720001	. Hub Spacer	1
21	30790201	. Hub Anchor Plate	2
22	60870201	. Magazine Hub	2
23	40720101	. Record Magazine Separator	100
24	40720201	. Belt Guide	100
25	30790301	. Cover Plate	2
26	30790401	. Magazine Gear	1
27	70146001	. Bearing	2
28	21101301	. Lock Nut	2
29	30791401	. Mechanism Support and Spring Assembly	1
	30791501	. . Mech Support Assembly	1
	20627202	. . Spring Support (Upper)	4
	20612803	. . Mech Mounting Spring	4
30	40723201	. Magazine Support	1

Figure 7-18. Mechanism Assembly

Sheet 4

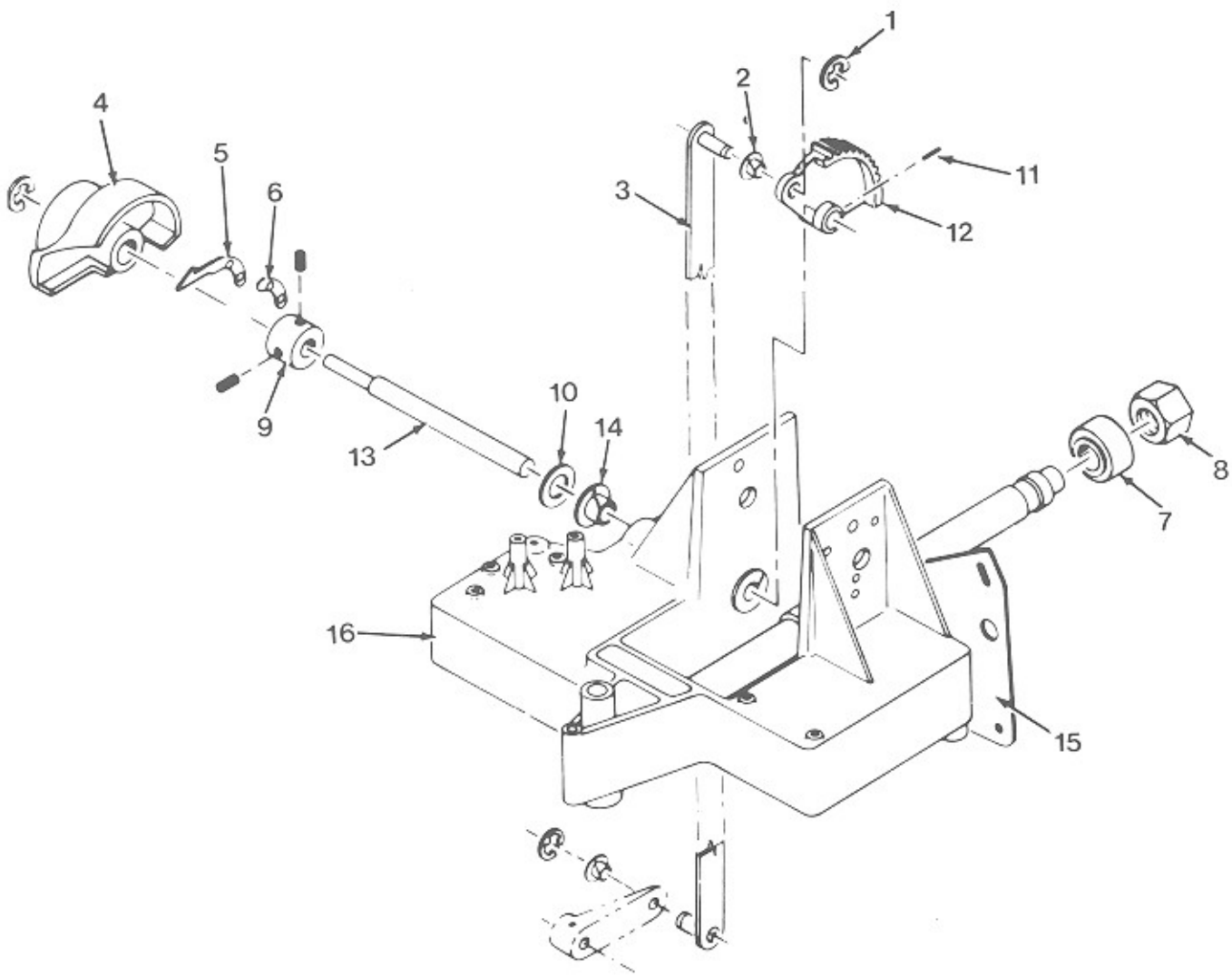


Figure 7-18

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
18-	60870001	Mechanism Assembly (Continued)	
1	70143004	. Retaining Ring	3
2	70146004	. Bearing	2
3	21810201	. Transfer Link Assembly	1
4	21813401	. Tone Arm Cam Assembly	1
	21818701	. . Cam and Insert Assembly	1
5	21814801	. Cam Spring	1
6	21814901	. Cam Spring Plate	1
7	25156906	. Shoulder Washer	1
8	70130109	. 9/16 x 18 Jam Nut	1
9	21813302	. Cam Collar	1
10	70122533	. Bowed Washer	1
11	70113019	. Roll Pin	1
12	40720501	. Sector Gear	1
13	21813201	. Cam Drive Shaft	1
14	70146005	. Bearing	2
15	40721801	. Intermediate Mounting Plate	1
16	40721101	. Base Assembly	1
	60870701	. . Mechanism Base	1
	30791301	. . Magazine Support Shaft	1
	21037701	. . Bearing	2

Figure 7-19. Tone Arm & Pivot Assembly

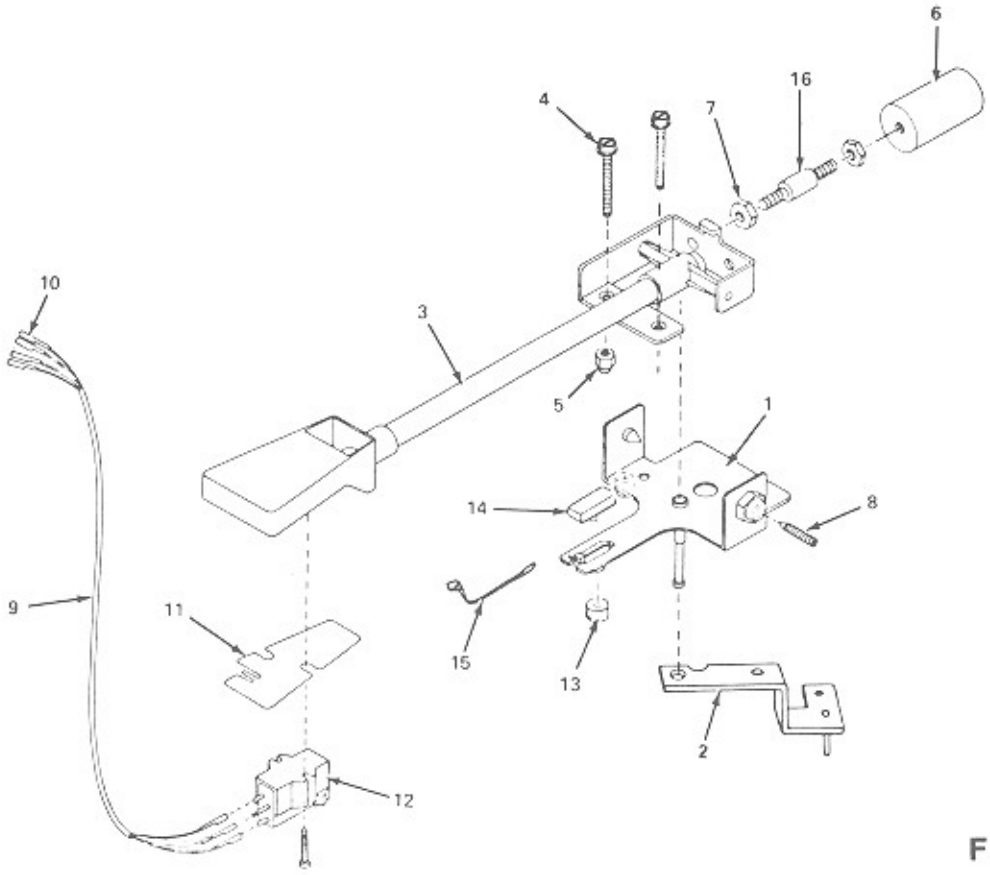


Figure 7-19

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
19-	40721702	Tone Arm and Pivot Assembly (see figure 7-8, sheet 1, item 5)	
1	21814101	. Bracket and Shaft Assembly	1
2	21814201	. Guide Plate Assembly	1
3	30792801	. Tone Arm and Lever Assembly	1
4	26502501	. Contact Screw	2
5	21814001	. Self Locking Cap Nut	1
6	21814302	. Counter Weight	1
7	70135502	. Locknut	1
8	21071201	. Pivot Screw	1
9	21814401	. Tone Arm Cable Assembly	1
10	70092710	. . Pin Receptacle	8
11	30891501	. Tone Arm Shielding Clip	1
12	21301101	. Stereo Phono Cartridge	1
	21834001	. . Stylus Assembly	1
13	21814701	. Magnet - Reed	1
14	21814601	. Magnet Clip	1
15	70800109	. Cable Tie	1
16	21817701	. Vibration Isolator	1

Figure 7-20. Sprag Assembly

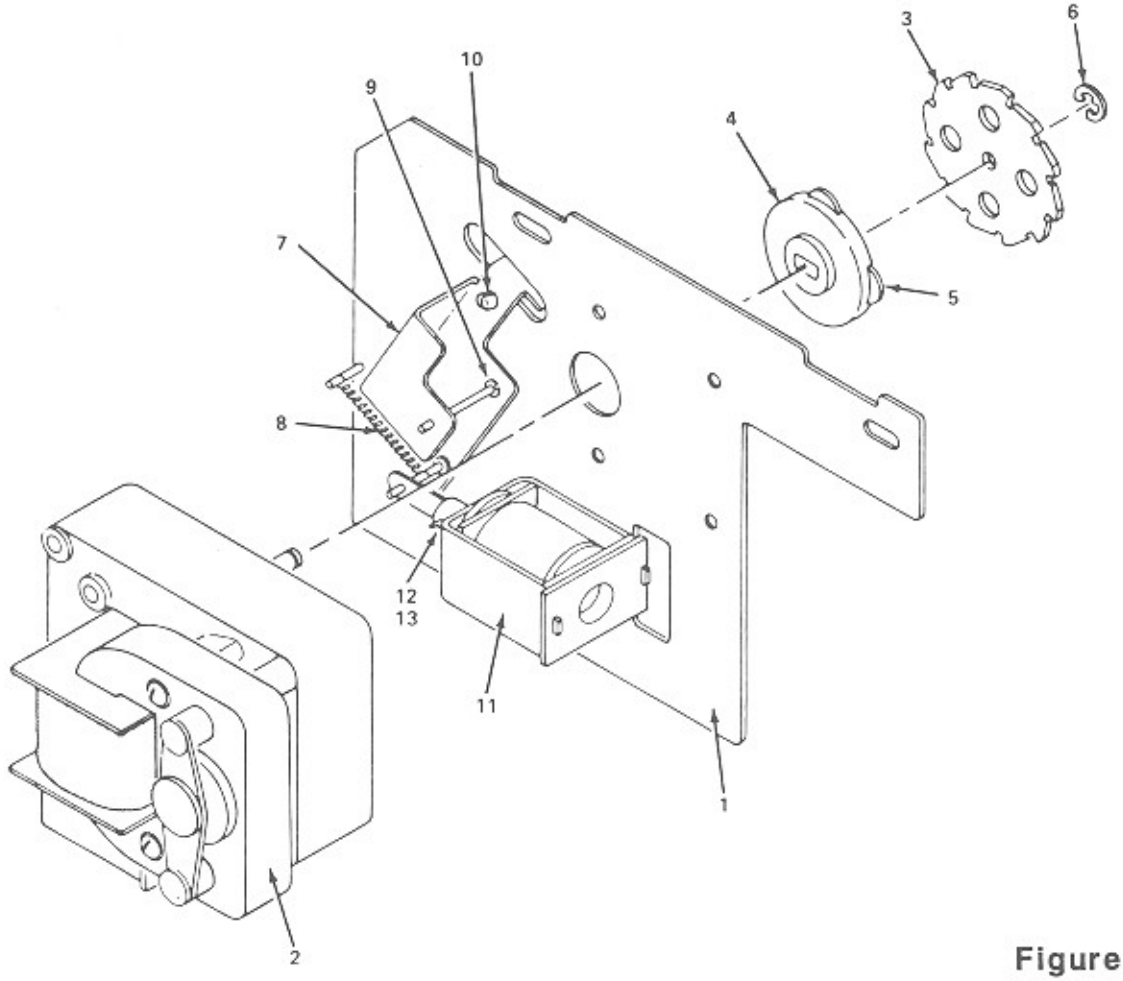


Figure 7-20

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
20-	40721901	Sprag Assembly (see figure 7-18, sheet 2, item 5)	
1	30793901	. Sprag Plate Assembly	1
2	40722701	. Magazine Motor	1
3	40722301	. Sprag Wheel	1
4	30793301	. Sprag Wheel Hub	1
5	21816103	. Stem Bushing	4
6	70143003	. Retaining Ring	1
7	21816001	. Sprag Lever Assembly	1
8	21256201	. Tension Spring	1
9	70143005	. Retaining Ring	1
10	25155901	. Split Stem Bumper	2
11	21150510	. Solenoid Assembly	1
12	21085701	. Plunger Assembly	1
13	21084902	. Plunger Stop	1

Figure 7-21. Cam Switch and Motor Assembly

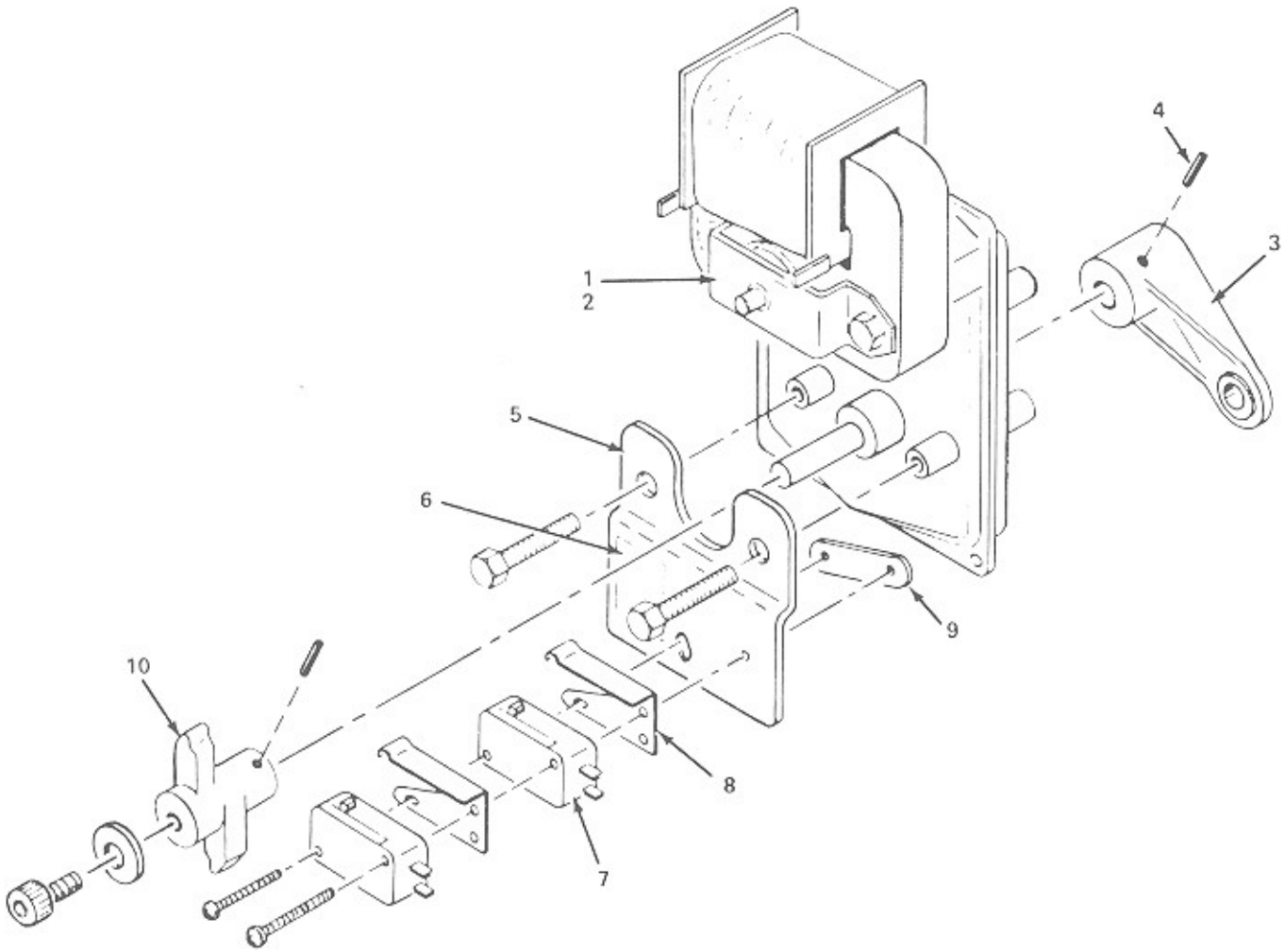


Figure 7-21

Fig. And Index No.	Rowe Part No.	Description	Qty. Per Ass'y
21-	40720801	Cam Switch and Motor Assembly (see figure 7-18, sheet 1, item 16)	
1	30790801	. Motor and Crank Assembly	1
2	40720901	. Cam Motor	1
3	21810401	. Trunnion Crank	1
4	70113116	. Roll Pin	2
5	30790901	. Switch Plate	1
6	21816901	. Cam Switch Label	1
7	21073101	. Switch	2
8	21082901	. Switch Actuator	2
9	21083001	. Twin Nut	1
10	30793401	. Switch Cam	1

Table 7-1. Accessory Equipment

Part No.	Description	Function
26704401	Phono paging system With tabletop microphone	Paging system not affected by A.V.C. All plug-in unit, complete with microphone and 50 foot microphone cable.
26704402	Phonograph Paging System With handheld microphone	Paging system not affected by A.V.C. All plug-in unit, complete with microphone and 50 foot microphone cable.
26694703	Amplifier Accessory Kit **(Note: This kit will work with all 607925XX preamplifiers)**	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/FM radios. Outputs are available to drive slave amplifiers before or after volume control.
30632201	Remote volume and cancel control	The remote stereo volume control includes a cancel button. This kit does not include cable. A 3-conductor cable is required.
60898004	Remote volume power switch and cancel control	In addition to volume and cancel functions, the phonograph can be turned OFF and ON from a remote position. The record currently playing is automatically canceled when the phonograph is turned OFF. The amplifier remains ON so that paging is possible. For domestic 120 volt phonographs only. Cable is not included. A four conductor cable is required.
30632209	Dual remote volume control	Controls volume of each channel separately. Does not include cable. A 4-conductor cable is required.

Table 7-1. Accessory Equipment (Continued)

Part No.	Description	Function
20819907	Remote volume and cancel control cable	This 3-conductor 50 foot cable connects a remote volume control to a phonograph.
20819908	Remote volume and cancel control cable	This 4-conductor 50 foot cable connects a remote volume control to a phonograph.
66504710	Service Kit	Includes central computer, mech control, power supply board, and fuses.
21633101	Extension Speaker	50 Watt RMS, three way speaker system incorporates 10" woofer, 5" mid-range and 3" tweeter, 4 or 8 ohms. Speaker dimensions: 24 x 15"W x 10"D (Mounting bracket not included).
26699503	Security Bar Kit	Heavy steel bar locks in place over cash box door. A padlock is required (not supplied by Rowe).
26711101	Light Sandstone Metallic	
26711102	Light Russet Metallic	
26711103	Heather	
26711104	Light Royal Blue	