

Section 1: Installation & System Description

INTRODUCTION

The CD-51A holds up to 51 album covers and 51 discs. Before you begin to unpack and use the phonograph, you need to pay special attention to the following:

Read This Carefully Before You Put Your New CD-51A In Service:

- **Mechanism**—Completely unpack the mechanism before you plug the yellow wire into P9 (AC POWER) on the CD mechanism.
- **Title Pages**—If you wish to turn the title pages manually, use the handwheel on the back of the title rack.
- **CD Player**—Read the CD player unpacking procedure and the static caution that accompanies the procedure.
- **Title Rack**—Before you close the top door, make sure that you have returned the title rack and hinged title rack support bracket to their normal positions. rack support bracket to their normal positions.

TURES

major CD-51A features are:

veral Features:

- Sturdy construction and reliable design
- Conveniently located customer, operator, and service controls
- Attention getting animation display
- Electrically operated title pages
- Entire albums can be selected
- A 250 watt amplifier with dual 3 band tone control
- AVC keeps CD volume constant
- 51 disc capacity
- As selected (FIFO) playback or random playback
- 500 Bill capacity
- Attract mode to merchandise music or advertising
- Many phonograph program options
- A total of 50 selections may be "locked out"
- A total of 10 selections may be "priorities"
- A total of 25 selections may be "premium"
- A real-time clock allows Autoplay and free play to be scheduled by time and day
- Accessory available to play background music and/or autoplay at different volume levels

vice Features:

- All servicing can be done from the front of the phonograph
- Modular component construction for easy removal and replacement
- Alpha/Numeric display gives you more comprehensive readouts
- Complete cash and play audit information
- Three levels of security access provide limited access to route operators if desired
- Disc condition logging feature to help find skipping selections and unplayable discs.
- Machine errors and disc conditions are logged by time and date
- Choice of 3 CD initialization procedures
- Optional RS-232 Interface allows you print audit data, Memorec data, pricing options, disc conditions, and error history.

UNPACKING INSTRUCTIONS

This section contains information for unpacking the CD-51A and installing it on location. The phonograph is shipped with all major components in place. Save all tie-down hardware in case the CD-51A must be moved to another location.

Exterior

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

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 and press down on the top door as you turn the key.



CAUTION:

Step back as you release the top door so that you do not hit your chin with the top door.

2. Open the front door by pressing down on both front door latches (see figure 1-1).

Shipping Bolts, Clips, And Tape

TITLE RACK

1. Remove the shipping tape from both ends of the lower title rack assembly support bar.
2. Remove the shipping tape from the front of the title rack pages.

**CAUTION:**

Do not attempt to turn the CD title pages by hand. Use the handwheel on the back of the title rack (see figure 1-2).

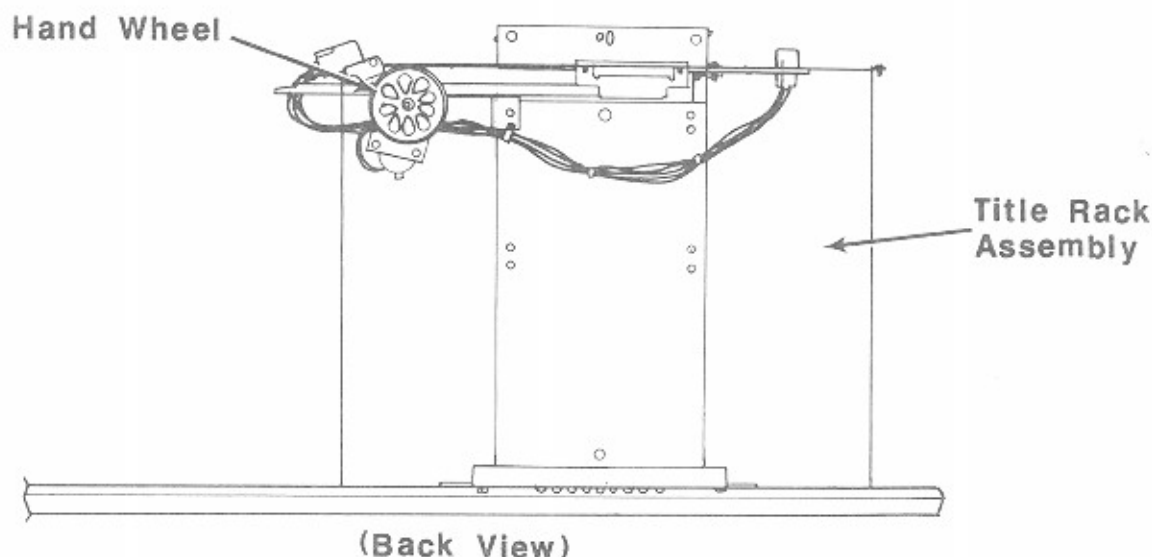


Figure 1-2. Title Rack Hand Wheel

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

CD Mechanism UNPACKING

**CAUTION:**

The CD mechanism is extremely sensitive to static discharges. The photo diodes and the laser are more sensitive to discharges than MOS IC's. Careless handling may immediately destroy components within the player or cause undetectable damage that will lead to failure after several weeks or even months of use. Before you touch the player, discharge your hands and tools by touching a grounded metal part of the phonograph, such as the amplifier or power supply chassis. If you need to remove the CD player for servicing, place the CD player into the anti-static bag (shipped with the phonograph for this purpose) immediately after you remove it from the phonograph.

1. Remove the CD changer mechanism shipping bolt from the back of the phonograph cabinet (s figure 1-3).

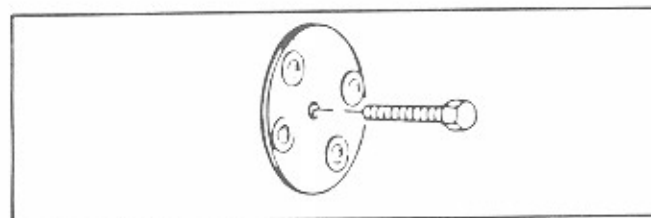


Figure 1-3. Shipping Bolt Removal

2. Remove the shipping tape from the front ends of the mechanism tie-down levers on the side the mechanism frame (see to figure 1-4).
3. Push the end of the lever down slightly, rotate the lever away from frame until the latch t clears the hole in the frame, rotate the lever up until the mechanism is free, and remove t levers.

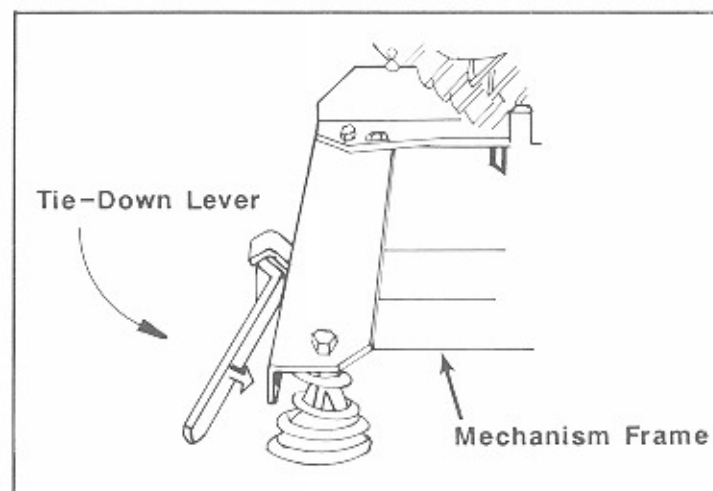


Figure 1-4. CD changer
Tie-Down Levers

Do not proceed with unpacking until you read and understand the following caution:



CAUTION:

The CD mechanism is extremely sensitive to static discharges. The photo diodes and the laser are more sensitive to discharges than MOS IC's. Careless handling may immediately destroy components within the player or cause undetectable damage that will lead to failure after several weeks or even months of use. Before you touch the player, discharge your hands and tools by touching a grounded metal part of the phonograph, such as the amplifier or power supply chassis. If you need to remove the CD player for servicing, place the CD player into the anti-static bag (shipped with the phonograph for this purpose) immediately after you remove it from the phonograph.

Remove the rubber band on the hold-down plate.

Remove the rubber band, wire hook, and warning tag that hold the sprag lever out of the sprag wheel.

Remove all tape from the magazine belt and magazine pulley.

Plug the Yellow wire into P9 of the CD mechanism decoder module.

Check to see that the title page assembly is plugged in.

FINAL INSPECTION

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

PHONOGRAPH LEVELING

To ensure proper coin acceptor operation (if used), level the phonograph cabinet from left-to-right and front-to-back by inserting spacers under the caster wheels.

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 with any comments or problems encountered on set-up.

MAJOR COMPONENTS OF THE CD-51A

Figure 1-1 shows the major CD-51A 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.

CD Selection System

CD selections are made by entering the four digit selection number on the selector keyboard (keyboard). (See figure 1-5).

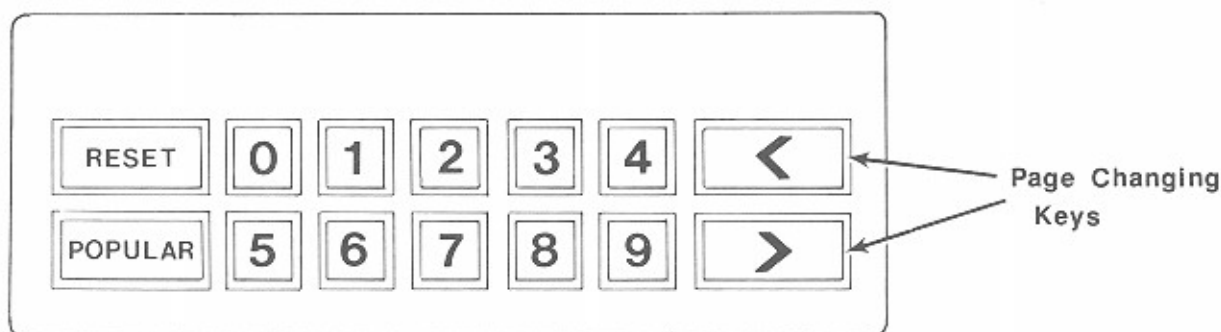


Figure 1-5. Keyboard

Keyboard

The keyboard consists of 14 keys, ten digit keys (0-9), and four special keys. The two PAGE CHANGE keys move the title pages electrically. The RESET button allows the customer to re-enter his selection if he has changed his mind or made a mistake. The POPULAR key selects the selection that customers have selected the most number of times. 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.



NOTE:

On a new phonograph, a phonograph that has had its CCC replaced, or a phonograph that has had its POPULARITY cleared, the POPULARITY key will not select any disc number until at least one normal selection has been made.

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:

- Calculating credit and making selections
- Keeping track of selections not yet played
- Calculating the most popular selection list
- Remembering the operator's programmed values

Countdown

The countdown is the part of the CCC that remembers the:

- Number of times each selection was played
- The total amount of money deposited in the phonograph

Autoplay

If no selections have been made for a predetermined time, the Autoplay feature will play selections from a programmed list or make random selections. The selection choices, the selection sequence, and the selection interval can be programmed 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:

- CD player
- Stereo amplifier
- Output transformers
- Speaker system

CD PLAYER

The CD sub assembly translates digital pulses from the CD into a left and right channel audio signals.

STEREO AMPLIFIER

The amplifier assembly (see figure 1-6) contains two major sections, the preamplifier (preamp) and power amplifier (amp).

Preamp

The preamp increases the signal from the CD player, corrects for varying recording levels (automatic volume control or AVC), allows the volume to be adjusted manually, and modifies the CD tone (Tone changes are made through LOW, MID, and HIGH controls).

Power Amplifier

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

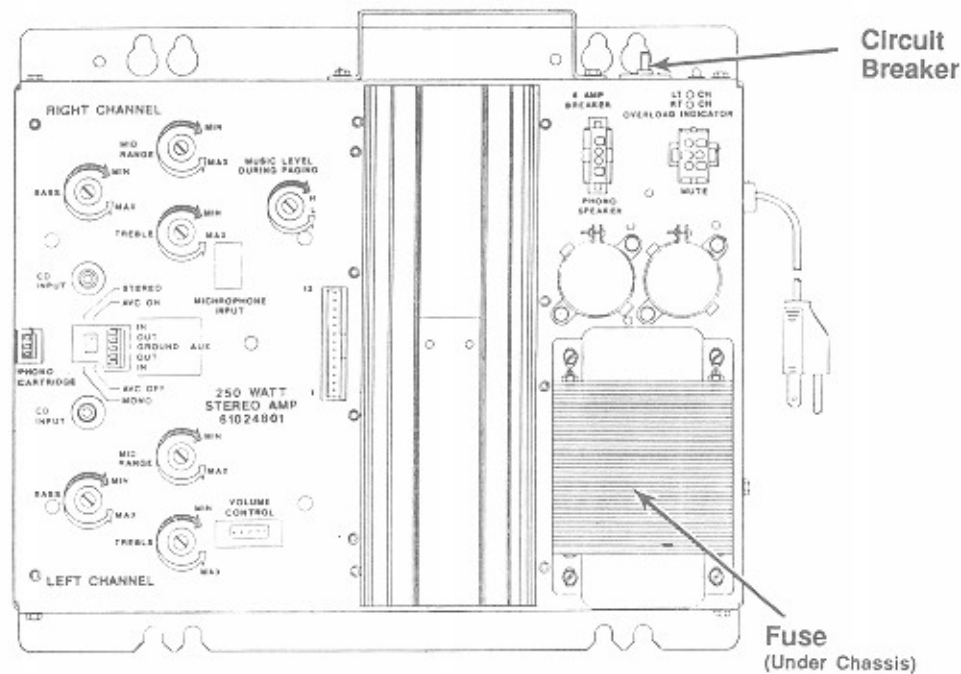


Figure 1-6. 250 Watt Stereo Amplifier Components

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.

OUTPUT TRANSFORMERS

The output transformers (figure 1-7) "step up" the power amplifier's output voltage for 70-volt extension speakers. The output transformers, also, provide connections (taps) for selecting different power level for the speakers.

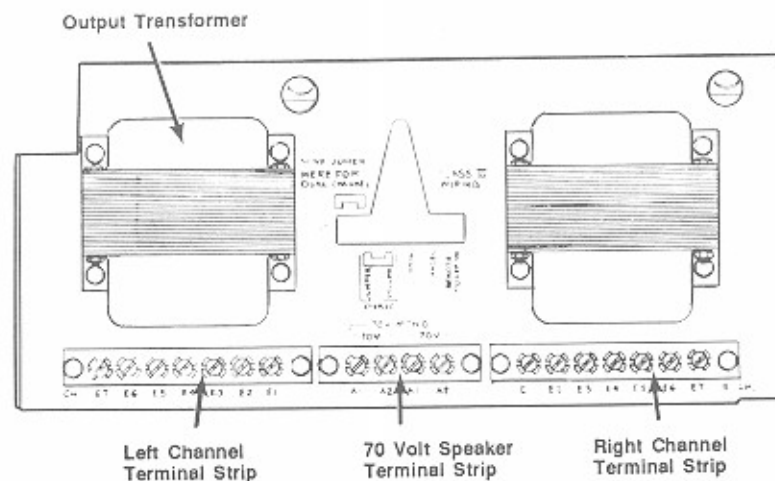


Figure 1-7. Output Transformer Package Components

PEAKER SYSTEM

Speaker system consists of two specially designed speaker channels. Each channel consists of one low woofer, one mid/high range speaker, a tweeter, and a crossover network.

Changer Mechanism

CD 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 stores 51 CD's and plays selections on command from the selection system (refer to figure 1-8 for the location of each of the major magazine components).

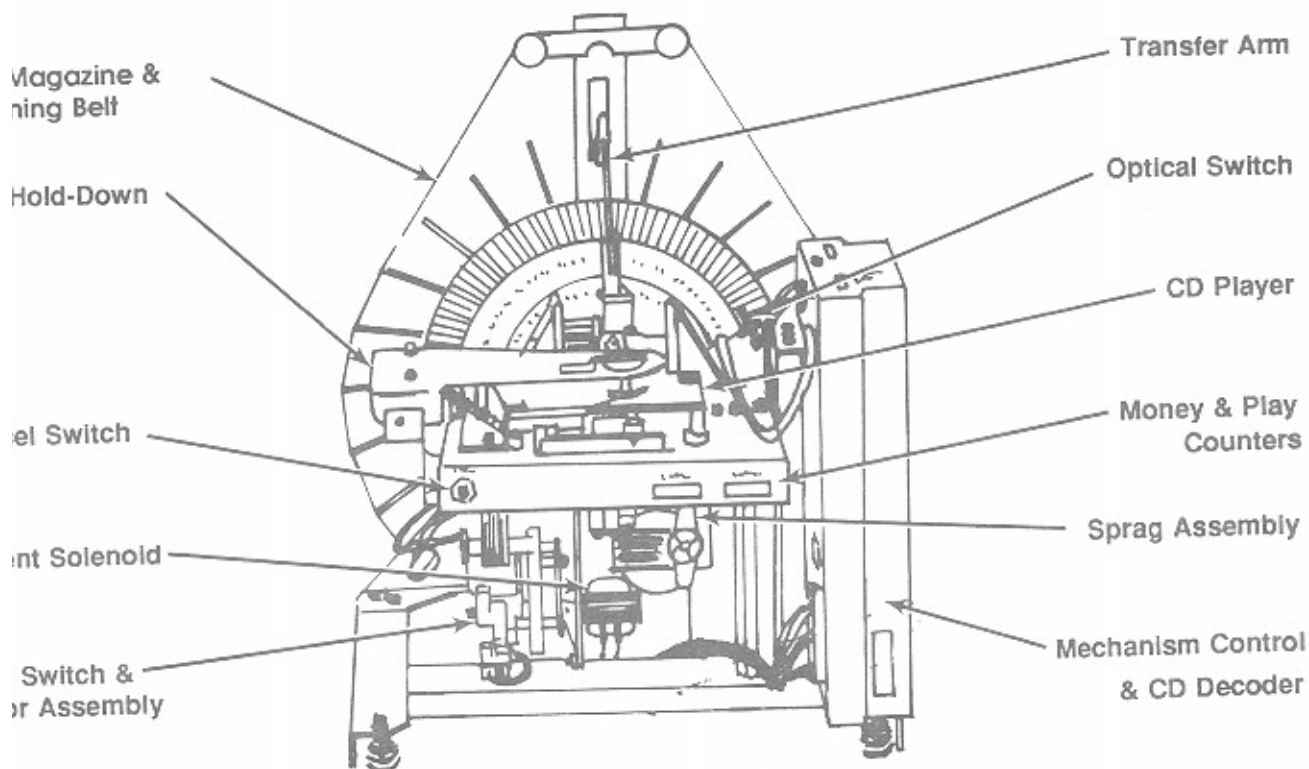


Figure 1-8. CD Changer Mechanism

MAGAZINE

CD magazine stores 51 CD's in a circular cage.

PLAY COUNTER

Play counter accumulates the total number of plays on the mechanism.

MONEY COUNTER

The money counter registers the total money deposited in the phonograph.

OPTICAL SWITCH

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

CAM SWITCH AND MOTOR ASSEMBLY

The cam switch and motor assembly (see figure 1-9) consists of the transfer motor, cam, and two cam switches.

SPRAG ASSEMBLY

This assembly locks the CD magazine in position.

CD MODULES

The CD player and the CD decoder play CD's after they are positioned on the turntable by the disc transfer arm.

Mechanism Control Unit

This solid state switching unit controls the scan and transfer.

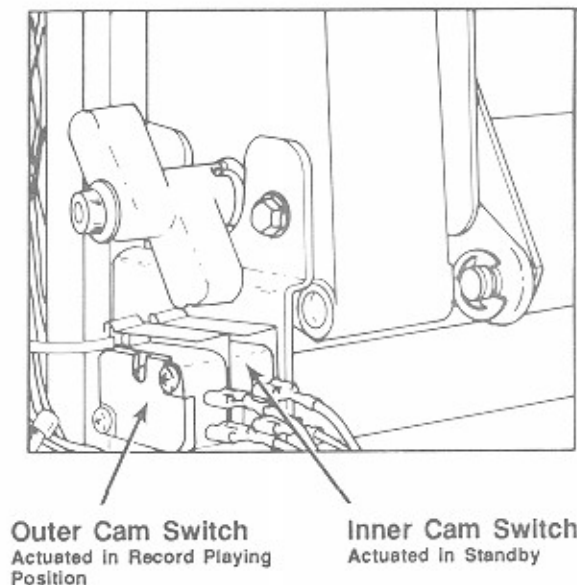


Figure 1-9. Cam Switch & Motor Assembly

1 Power Supply

main power supply (see figure 1-10), 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 power supply is controlled by the power switch on the rear of the phonograph Cabinet.



WARNING:

The 120 VAC AMPLIFIER OUTLET on the main power supply does not shut off by turning the POWER ON/OFF switch on the back of the phonograph OFF.

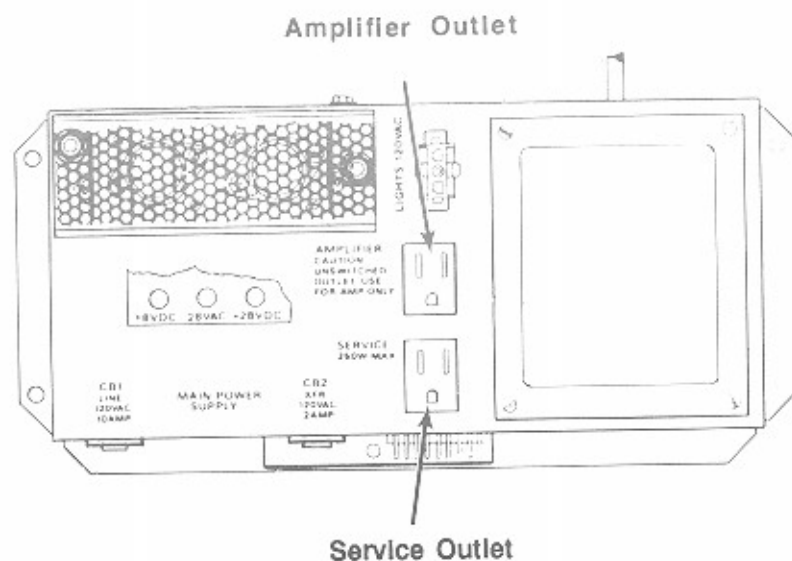


Figure 1-10. Main Power Supply

Section 2: Installation And Programming

INTRODUCTION

This section describes the installation and programming process. This information begins with a summary of what happens when the phonograph is powered up and continues with detailed instructions on how to load the titles and discs, modify the pricing and set up the sound system. The last part of this section describes how to make other programming changes (You can keep a record of the factory settings and your changes by using the *Operator's Set-Up Sheet* at the end of this section if you wish).

POWER ON

The following steps are a summary of the detailed *Power On Process* that is described in *Section 5* of this manual.

- Step 1. Power turned on, main power supply +8 VDC, 28 VDC, and 28 VAC LED's light, and all modules and components receive power.
- Step 2. The Voltage and Power LED's light on the CCC, mechanism control, OBA-2, and digit display. The Board Error LED's on CCC and mechanism control flash three times. The OBA-2 Control unit BA status and RS-485 Status LED's flash one time. The CCC Rowelir Command, and mechanism control Rowelink TX LED's continuously flicker.
- Step 3. Phonograph is ready to operate.

LOADING CD'S AND TITLES



CAUTION:

Do not attempt to turn the CD title pages by hand. Use the handwheel on the back of the title rack (see figure 1-2).

The procedure for loading CD's and titles into an empty phonograph is different from the procedure to change CD's and titles. Please make sure that you are following the procedure that describes your situation.

Preparing Titles For The Title Rack

If your titles have not been shipped with the discs or pre-printed, you will need to prepare the titles yourself.

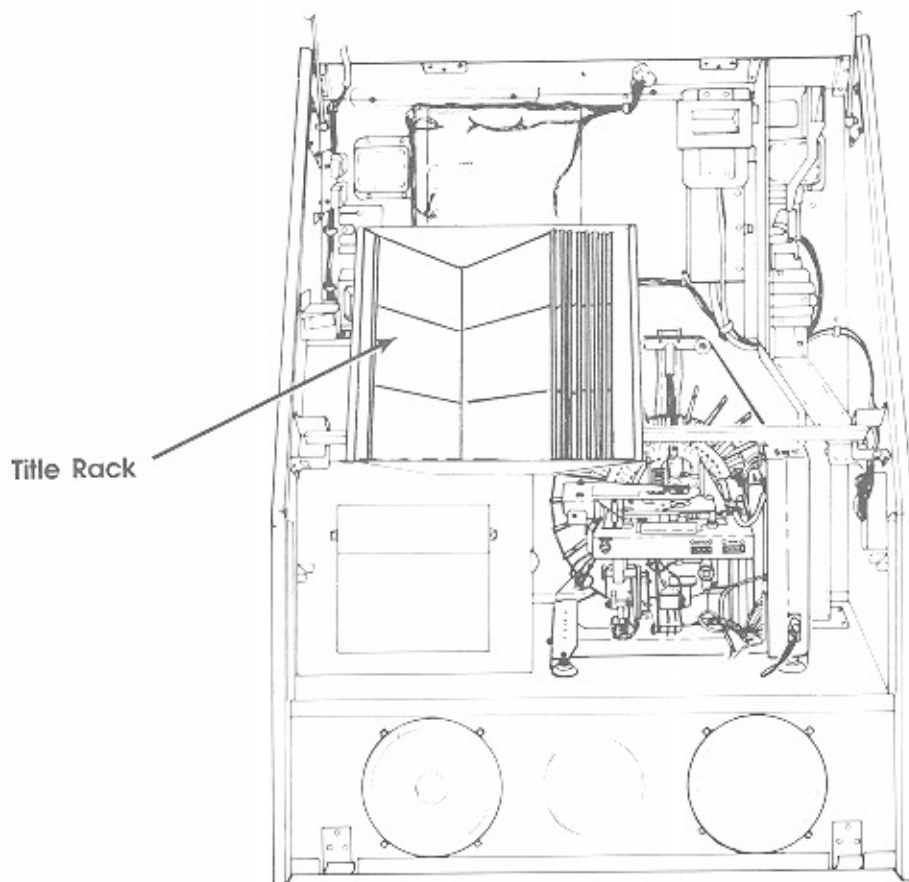


Figure 2-1

Loading The Title Rack

All of the titles on the title strip sheet can be used for either right or the left-hand titles. If your title strips have not been pre-printed, you may want to type the titles before you tear the individual title strips off of the title strip sheet.

Refer to the sample, *Blank Title Sheet*, in figure 2-2. Refer to figure 2-2 for examples of how to tear the title strips off of the title strip sheets.

These step-by-step instructions describe the procedure to load one CD album and one title strip. Repeat this procedure for each CD that is being loaded.

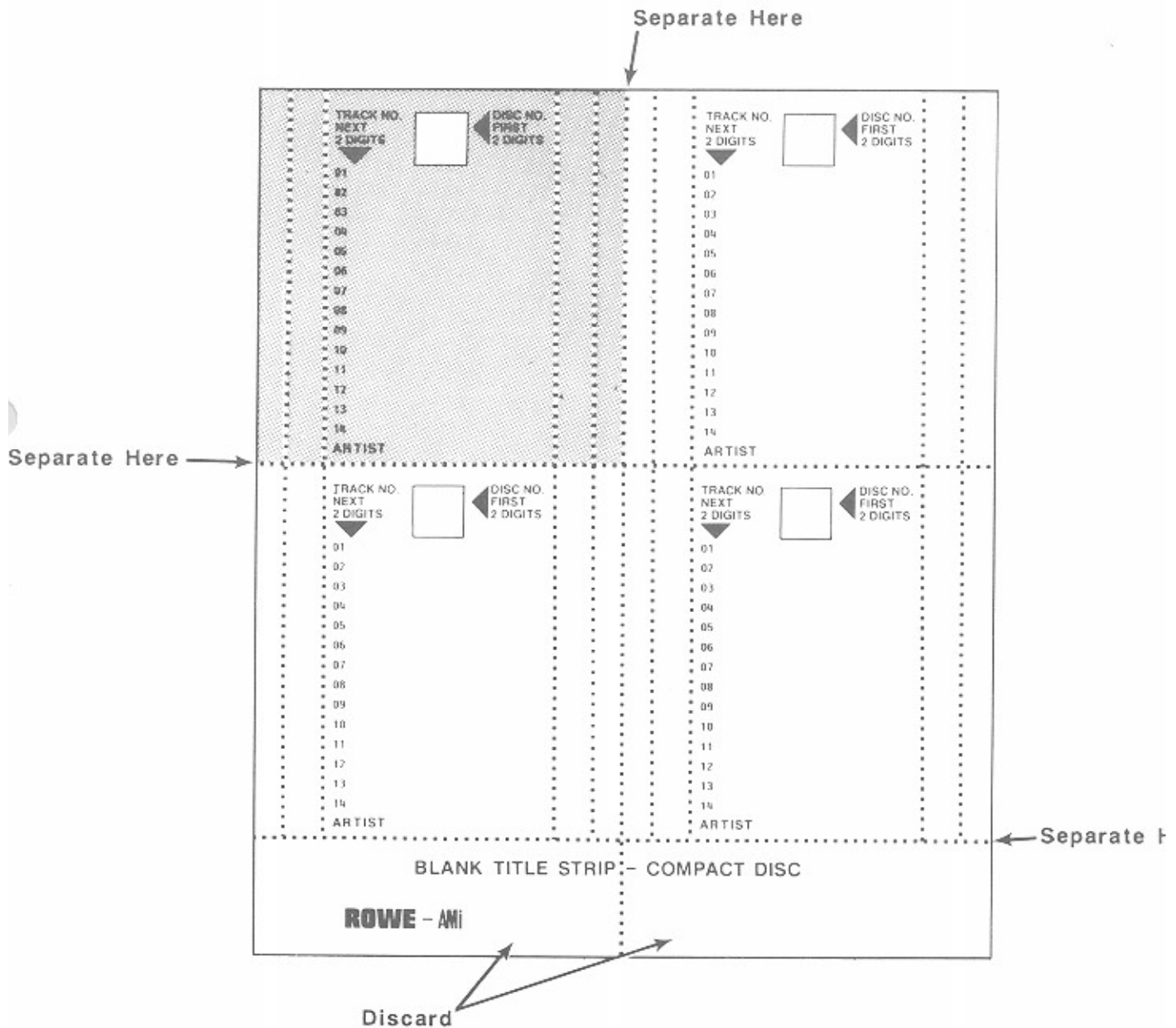


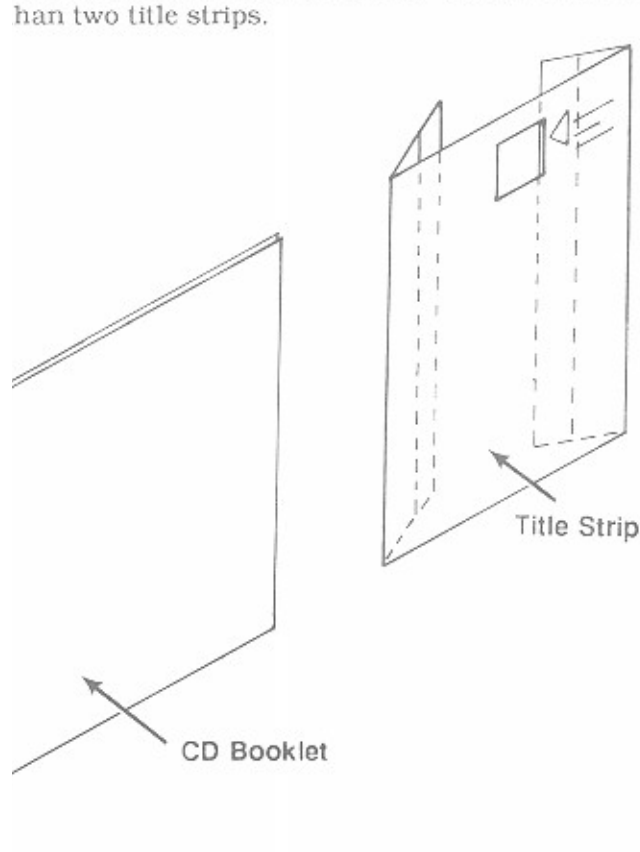
Figure 2-2. Blank Title Sheet

-BY-STEP INSTRUCTIONS

Peel each title strip from the title sheet so that the two perforated columns appear on the side of the title strip (the shaded portion of the title strip in *figure 2-2* represents a title strip that has been removed from the title sheet).

fold the title strip along the inner most perforated line on both sides of the title strip
see figure 2-3).

Locate the CD album booklet that matches the title strip that you have just made. If the CD booklet is more than two sheets thick, remove the inner sheets so that the booklet is no thicker than two title strips.



e 2-3. Folding The Title Strip

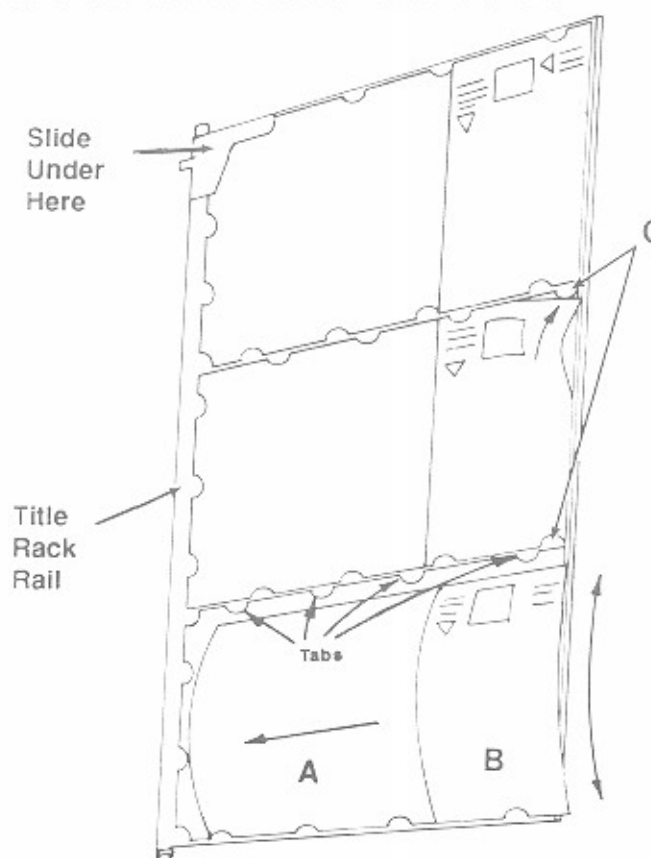


Figure 2-4. Loading The Title Rack

Insert the CD booklet under the top and bottom tabs of the title rack. Slide the CD booklet toward the pivot of the title rack until the booklet is trapped by the molded stops on the title page (see *figure 2-4, ref A*).

Insert the folded title strip under the top and bottom tabs of the title rack. Slide the title strip until the disc number shows in the opening of the title strip and the title strip is locked in place by the molded stops (*see figure 2-4, ref B*).

All of the tabs surrounding the CD booklet and title strip should be holding them in place. If you missed a tab, carefully tuck the loose paper under the tab as shown in *figure 2-4, ref C*.

Repeat steps 4 and 5 until all titles are installed. Use the PAGE switch (figure 2-5) to change title rack pages. Insert filler title strips (Part Number 30940601) to fill out any unused space left on a page. Insert these in the same way that you installed the fill-in title strips.

LOADING DISCS

Load discs as follows:

1. Unlock and open the top door, if not already done.
2. Move the SERVICE switch to the SERVICE position, if not already done (refer to figure 2-5).
3. Press the CANCEL/SCAN button to move the disc space to the left or right of the transfer arm.
4. Slide the CD into the slot with the label to the right.

Note that disc positions in the molded CD magazine are identified by numbers at every other slot, with even numbered slots labeled on one half of the magazine, and odd numbered slots labeled on the other half.

For example, on the even numbered half of the magazine, slots 00, 04, and 08 are labeled, and the slots in between – 02 and 06 – are not, as illustrated in figure 2-6.

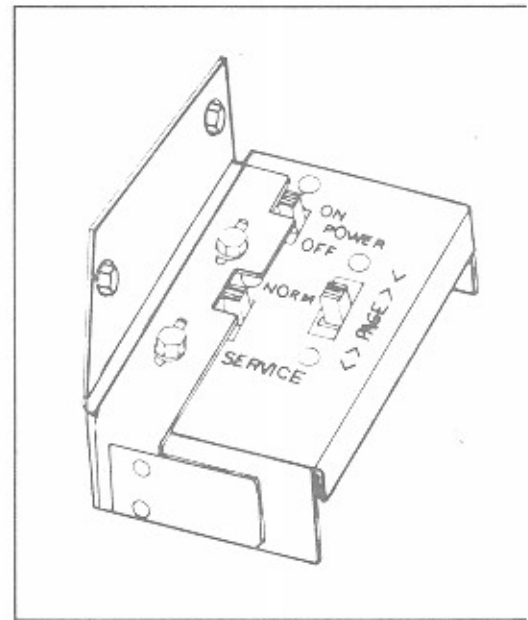


Figure 2-5 Service Switch



NOTE:

When loading the magazine, be sure that the disc rests in the same numbered slot in both the front and rear of the magazine.

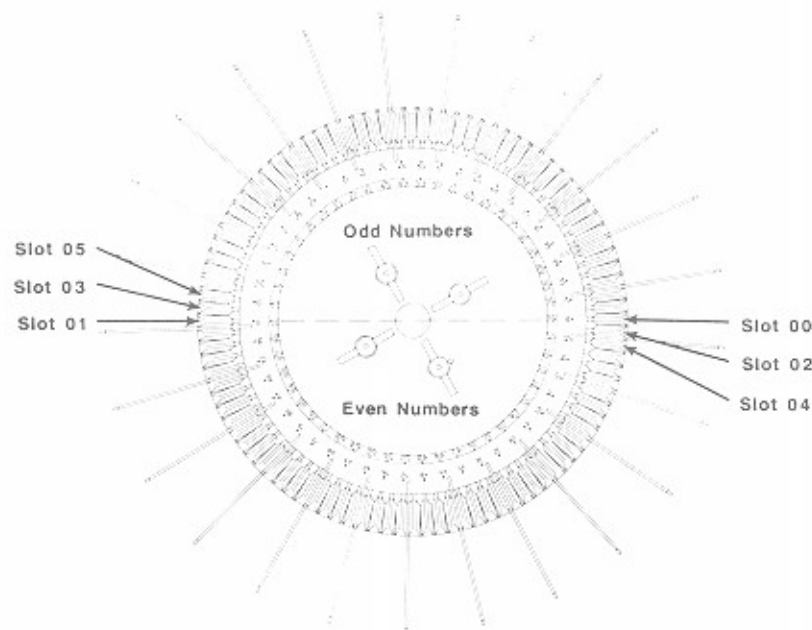


Figure 2-6. Loading the Molded CD Magazine

**NOTE:**

When loading discs, be sure to keep the magazine disc load approximately balanced. If the magazine is partially loaded with all discs on one side, the sprag wheel may lock and the magazine will not turn.

Check title strips and disc sequence to ensure that the titles and discs correspond.

After all titles and discs are in the proper places, perform a disc initialization. Initialization is performed in the following manner:

- A. Make sure that the phonograph is in the SERVICE mode and *SERVICE MODE* appears on the display.
- B. Type 3 to select the INITIALIZE sub menu and type 0. FULL INITIALIZE will appear on the display. Press POPULAR to start the initialization and close the top door or place the phonograph in the NORMAL mode.

The initialization process will start and continue for approximately 30 minutes. During this time, the phonograph can be used (*see the notes that follow*).

When initialization is finished, check that all discs have initialized. To do this, re-enter the SERVICE mode and:

- A. Type 3 to select the INITIALIZE sub menu and then type 4 to view the number of discs that have been initialized. If this number does not match the number of discs that should have been initialized, do the following step. If the number matches the number of discs that you expected to be initialized, initialization is complete.
- B. If the number of discs initialized does not match the number of discs that you expected to be initialized, hold RESET and press 0 twice. This will place you in the DISC __ TRACK __ menu and display the first disc and its number of selections. Hold RESET and press 3 to see the next disc and its number of selections. Continue through the list by holding RESET and pressing 3 until you find a disc with the number of tracks equal to 0 (zero). Continue through the disc list noting all discs with track numbers equal to 0.
- C. Check that each disc on your list (ones with track numbers equal to 0) is in the proper slot, with the label facing to the right. If it is not, move it to the proper slot. If the disc is in the proper slot, it may be defective. Repair or replace it and do the individual disc initialization (*see Changing Discs in Section 3*).

**NOTE:**

1. The initialization process will stop whenever the phonograph is in the SERVICE mode, and will resume when the phonograph is returned to the NORMAL mode if the phonograph is in Standby (i.e. no selections are in memory).
2. During full initialization, all disc limits are initially set to 99. As each disc is scanned, the proper limits for that disc are stored in memory allowing only valid selections to be made.

SETTING TITLE PAGE LIMITS FOR THE FIRST TIME

This procedure gives you specific instructions on how to set the page limits only.

The phonograph is shipped with all pages accessible. Pages 1 through 9 can be "flipped" and viewed. When you install discs, you may not need all 9 pages. If you do not need all 9 pages, you should restrict page movement to just those pages that have titles. Set the title page limits as follows:

1. Unlock and open the top door, if not already done.
2. Move the SERVICE switch to the SERVICE position, if not already done (*refer to figure 2-5*).
3. Make sure that * SERVICE MODE * appears on the display.
4. Type 2 to select the ATTRACT sub menu then type 4 to select the PAGE LIMIT function and you will see the display for entering the first page number to use and the last number to use. Press POPULAR, which sets the first page number to 1. Notice that the blinking number has moved to the right. Type the last page number to be used and press POPULAR.

PRICING

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

Price of Selections

3 Selections for \$1.00
 7 Selections for \$2.00
 18 Selections for \$5.00

PRICE OF SELECTIONS

- PLAYS FOR \$1.00
- PLAYS FOR \$2.00
- PLAYS FOR \$5.00

Figure 2-7A. Alternate Price Card

**NOTE:**

If you are using the factory pricing, skip to *Sound System Set Up*.

at Alternate Disc prices:

Handy Case has an Alternate Price Card (see figure 2-7A) that may be substituted for the Standard Price Card. Handy Case also contains a Price Card with printed prices (see figure 2-7B), which can be peeled off and placed at the appropriate spot on the 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 \$99.95. The maximum number of selections that can be entered is 999. The POPULAR key must be pressed to record the data entered on the display.

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

PRICE OF SELECTIONS

PLAYS FOR \$1.00

PLAYS FOR \$2.00

PLAYS FOR \$5.00

INSTRUCTIONS

1. SPECIAL PRICING IS REQUIRED: LINE THIS UNIVERSAL PRICE SELECTION SHEET AND THE SPECIAL PRICE CARD FOUND IN THE HANDY CASE.

2. PEEL DENVER PRICING STRIP FROM THE SHEET AND CAREFULLY LOCATE IT OVER COLORED BLOCK NEAR LEFT OF PRICE CARD.

3. IF A PARTICULAR PRICING IS NOT WANTED, PEEL OFF LONG BLANK STRIP FROM BOTTOM OF SHEET AND PLACE CAREFULLY OVER PRICING NOT WANTED.

Figure 2-7B. Universal Price Sheet

If you wish to use alternate pricing, follow the steps to complete the Alternate Price Card and enter the prices. Also, for your records, fill-in the *Pricing* section of the *Rowe CD Phono Operator's Set Up Sheet* at the end of this section. Before making the actual pricing changes, step through the sample pricing as follows:

CD-51A Pricing Works

Pricing is determined by the numbers that are stored in the PRICE LEVELS and PLAYS @ LEVEL menu. The LEVEL 1 PRICE corresponds to the LEVEL 1 PLAYS in the following way: Enough money must be deposited to reach the first (#1) price level before any selections can be made. Once the amount of money matches this price, the number of selections in the LEVEL 1 PLAYS menu can be entered.

To make pricing changes, set the LEVEL 1 PRICE and LEVEL 1 PLAYS to match the lowest price and number of plays on the Alternate Price Card. Then enter the remaining PRICE LEVELS and PLAYS @ LEVEL until you have set all five levels (if you do not have prices for all levels, enter 0's in all of the remaining PRICE and PLAYS positions).

AMPLE PRICE CHANGES

Determine the prices that are to be charged for disc 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:

Price of Selections

4 for \$1.00
9 for \$2.00
25 for \$5.00

2. Enter the SERVICE mode by setting the SERVICE switch to the SERVICE position.



NOTE:

This example will not give the correct dollar amounts for U.S. money unless PRICING OPTION 3 is set to 5 (this is the factory setting for U.S. phonographs and you should not have to change it).

Use the prices in the example that follows to help yourself understand the phonograph's pricing better.

Example CD Prices

4 for \$1.00
9 for \$2.00
25 for \$5.00



If You Have A Problem In A Menu

1. Press and hold down RESET and then press 0 until you come to the top of current menu.
2. If this menu name doesn't help, Press and hold RESET and then press POPULAR. This will move you to the top of the previous menu. In most cases, this will return you to the main menu (*SERVICE MODE*).
3. If you still cannot determine where you are, press and hold RESET and then press POPULAR again. This will return you to the main menu (*SERVICE MODE*).

3. Select the PRICE LEVELS menu, Option 1, from the main menu by pressing 511.
4. Now enter the LEVEL 1 PRICE, which is the lowest disc selection price (enter 0100 and press POPULAR).
5. Move down to the next price (LEVEL 2 PRICE) by pressing and holding RESET and then pressing POPULAR. Enter the next highest price (enter 0200 and press POPULAR).
6. Move down to the next price (LEVEL 3 PRICE) by pressing and holding RESET and then pressing POPULAR. Enter the next highest price (enter 0500 and press POPULAR).
7. Move down to the next price (LEVEL 4 PRICE) by pressing and holding RESET and then pressing POPULAR. Enter 0000 (because only three prices are being used) and press POPULAR.

move down to the last price (LEVEL 5 PRICE) by pressing and holding RESET and then pressing 1. Enter 0000 and press POPULAR.

Press and hold RESET while pressing POPULAR 2 times. This will place you in the price menu. Select the PLAYS @ LEVEL menu, Option 1, from the main menu by pressing 21.

Enter the number of disc selections to be given for the lowest amount on the disc portion of the sample price card into LEVEL 1 PLAYS (enter 004 and press POPULAR).

Move down to the next play option (LEVEL 2 PLAYS) by pressing and holding RESET and then pressing 1 (enter 009 and press POPULAR).

Move down to the next play option (LEVEL 3 PLAYS) by pressing and holding RESET and then pressing 1 (enter 025 and press POPULAR).

Move down to the next play option (LEVEL 4 PLAYS) by pressing and holding RESET and then pressing 1 (enter 000 and press POPULAR).

Move down to the last play option (LEVEL 5 PLAYS) by pressing and holding RESET and then pressing 1 (enter 000 and press POPULAR).

KING THE PRICING

Coins (and coins, if a coin acceptor is installed) to reach the first (or next) price level. Check for credit at each price level.

VIDEO SYSTEM SET UP

If you are not using extension speakers, skip to *Sound System Acoustical Compensation (Tone Controls)*.

Extension Speaker Operation

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

Speakers (P2-19) must be wired so that the power consumed by the phonograph speakers and the extension speakers does not exceed the amplifier power rating.

Extension speakers should produce the desired sound level relative to the sound level of the speakers on the phonograph.

All speakers must be connected with the correct polarity.



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.

Several charts have been included to assist you with connecting the extension speakers. *Figure 2-1* shows the entire sound system.

70-Volt Speakers

To avoid prohibitive cable losses on long speaker lines, use 70-volt speakers.

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.

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.

8-OHM SPEAKERS

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

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



NOTE:

In any speaker installation, the total speaker load (the sum of all power ratings of all speakers) must not exceed 250 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 (phonograph speakers are 8 ohm)

Step-By-Step Instructions

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

Table 2-1. Extension Speaker Work Sheet
Sheet 1

Extension speakers are available in these general categories: General purpose speakers (4 and 8 ohms) and 70-volt speakers.

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

Use this work sheet as a guide to help you select which power tap to use for each type of external speaker that you are using.

STEREO SPEAKERS

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

Number of 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 28 watt taps:	___ at 28 watts each =	___ watts	(E1 to E5)
Speakers for the 64 watt taps:	___ at 64 watts each =	___ watts	(E1 to E6)
Speakers for the 113 watt taps:	___ at 113 watts each =	___ watts	(E1 to E7)

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)
Speakers for the 64 watt taps:	___ at 64 watts each =	___ watts	(E4 to E4)
Speakers for the 113 watt taps:	___ at 113 watts each =	___ watts	(E5 to E5)

Several charts have been included to assist you with connecting the extension speakers. *Figure 2-4* shows the entire sound system.

70-Volt Speakers

To avoid prohibitive cable losses on long speaker lines, use 70-volt speakers.

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.

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.

8-OHM SPEAKERS

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

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



NOTE:

In any speaker installation, the total speaker load (the sum of all power ratings of all speakers) must not exceed 250 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 (phonograph speakers are 8 ohm)

Step-By-Step Instructions

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

Table 2-1. Extension Speaker Work Sheet
Sheet 2

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	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)
Speakers for the 32 watt taps:	___ at 32 watts each =	___ watts	(E1 to E6)
Speakers for the 57 watt taps:	___ at 57 watts each =	___ watts	(E1 to E7)

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)
Speakers for the 57 watt taps:	___ at 57 watts each =	___ watts	(E5 to E5)
Speakers for the 128 watt taps:	___ at 128 watts each =	___ watts	(E6 to E6)

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)

Table 2-1. Extension Speaker Work Sheet

Sheet 3

Combine all speaker's consumptions:

	Stereo	Mono	
4-Ohm:	_____	_____	
8-Ohm:	_____	_____	
70-Volt:	_____	_____	
	Stereo	Mono	Grand Total
Totals:	_____	+ _____	= _____

Subtract the Grand Total from 250 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 250 watts. If this amount is not less than 250 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 250, 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.

- 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 2-8 for typical examples of speaker connections.



NOTE:

- The amplifier may be connected to a load of 250 watts before distortion will begin to increase beyond specification.
- Refer to figure 2-9 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 2-2A).

Use table 2-2A 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 2-2A. Phonograph Speaker Power

Select the speaker taps that will use up most of the "available Speaker Power".	
You may select more power or less phonograph power to suit your phonograph volume preference.	
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
113	Violet connects to Left E7, Pink connects to Right E7
Do not move the Black wire; it should stay on either the Left or Right E1 terminal.	

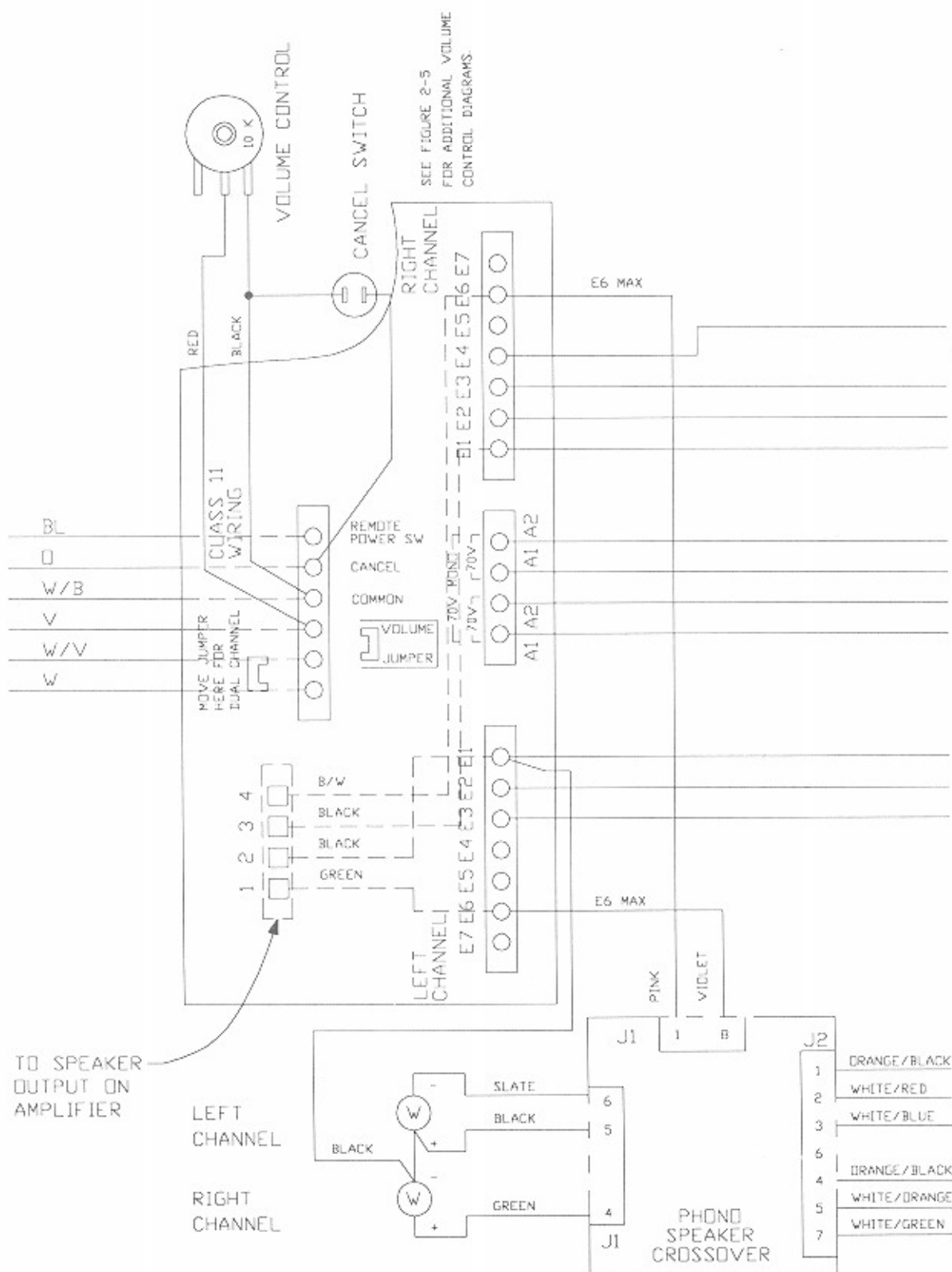
Table 2-2B. Amplifier Overload Check

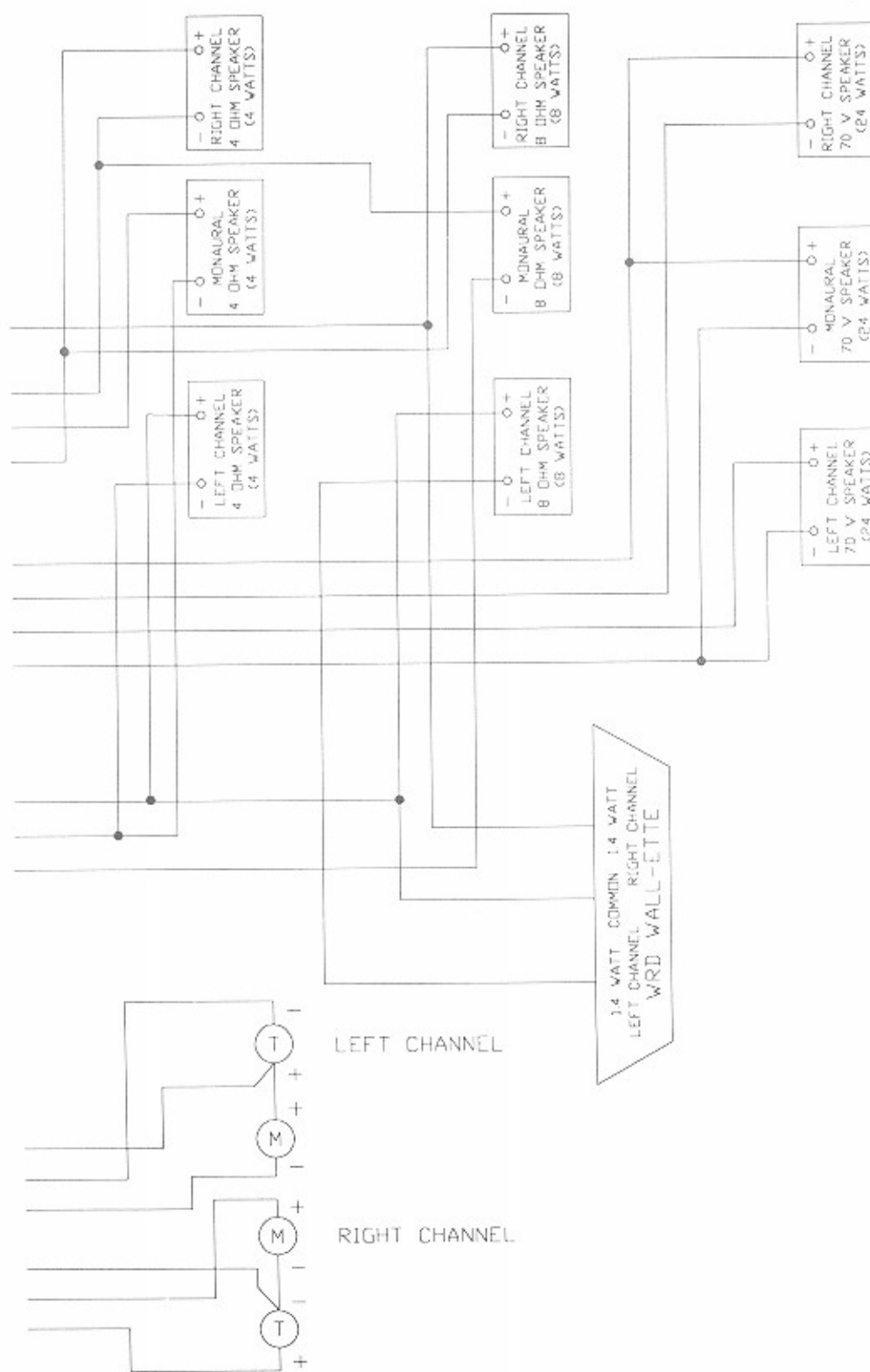


Check that the amplifier is not overloaded by performing the following five steps:

1. Make sure that the phonograph and extension speakers are connected to the proper speaker taps.
2. On the amplifier, set both RIGHT CHANNEL and LEFT CHANNEL tone controls fully counter-clockwise.
3. Set the volume control fully clockwise (maximum volume) and make a selection.
4. While the music is playing, if the OVERLOAD INDICATOR(S) stay OFF or occasionally flicker in a random manner, the load is acceptable. If the OVERLOAD INDICATOR(S) are always lit or flicker continuously, the amplifier is overloaded and you must perform Step 5.
5. Do this step only if the OVERLOAD INDICATOR(S) came on as described in the previous step. Find the source of the overload (shorted speaker wires, too many speakers connected, or speaker power taps too high). After you fix the short, disconnect a few speakers, or lower the speaker power tap selection; repeat Step 4.

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





Note: See Section 5 for the crossover schematic and components list

Figure 2-8. Speaker Connections

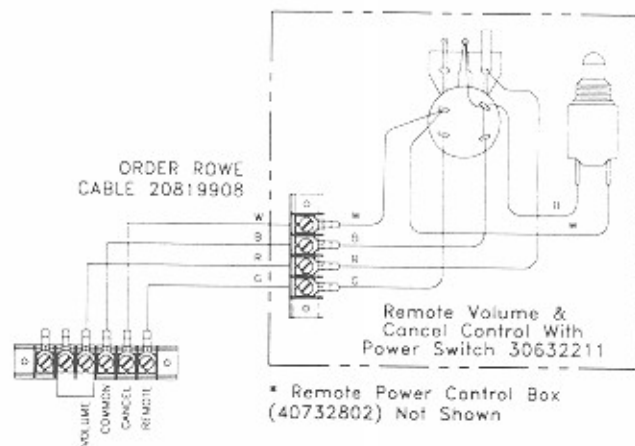
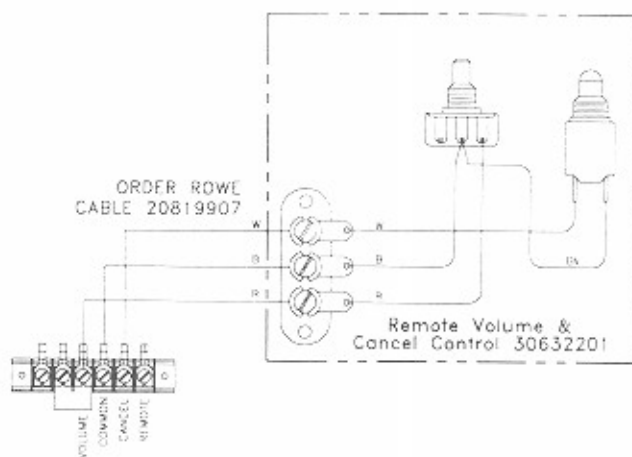
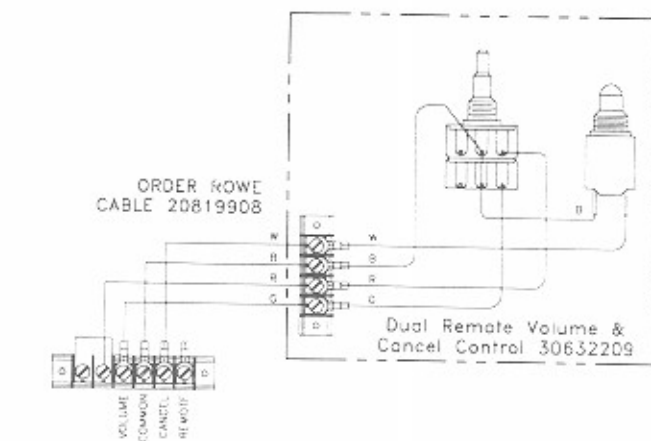


Figure 2-9. Remote Volume Control Diagrams

SOUND SYSTEM

Acoustical Compensation (Tone Controls)

The preamplifier contains three tone controls on each channel 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 greater emphasis of high frequencies.

A room with paneled walls and a bare or tiled floor is a hard, non-absorbent location, which requires greater low frequency emphasis.

Regardless of the room acoustics, the high and low frequency characteristics of your speakers can influence the equalizer settings as much or more than the room acoustics.



Important:

- ☞ Before setting these controls, do *Steps 1 through 5* in *table 2-2B* to ensure that the amplifier is not overloaded.
- ☞ Each of these controls can limit the maximum volume for its range by as much as 85%.
- ☞ This means that if a control is set to minimum, that the maximum power available for that range is only about 40 watts.
- ☞ If all of the graphic equalizer controls are set to minimum, then the phonograph will produce no more than approximately 40 watts of its 250 watt capacity.

Paging

Paging circuitry is part of the 61023702 Preamplifier. The microphone cable plugs directly into the preamplifier.



NOTE:

Basic installation and setup are now completed and the CD-51A is ready for your customer.

The remainder of Section 2 explains the Service Mode and other programmable features of the CD-51A.

Use the procedure that follows to clear or change remaining credits:

CHANGING THE NUMBER OF CREDITS REMAINING

Use these steps to increase or decrease the number of CREDITS REMAINING on the phonograph.

1. Enter the SERVICE mode by setting the SERVICE switch to the SERVICE position.
2. Type 84 and then type the number of CREDITS REMAINING that you want. Press POPULAR to complete the change.

Entering The Service Mode

Menus can only be used while the phonograph is in the SERVICE mode. To enter the SERVICE mode, open the top door and place the SERVICE switch (*figure 2-5*) in the SERVICE position.

When the phonograph is placed into the SERVICE mode, the message * SERVICE MODE * appears on the digital display (*see figure 1-1 if you are not familiar with the keyboard or display*).

Occasionally, the message that first appears will say - ERRORS EXIST -. This is just an indication that an error has been logged. Pushing the POPULAR key will return the * SERVICE MODE * message.



NOTE:

The phonograph's display can display a maximum of 16 characters at a time. SERVICE mode commands and messages are abbreviated to fit the 16-character space.

Viewing Menus

To view a menu option, hold down the RESET button and press either the 0 digit or the 1 digit. The 1 digit will move you down one item and the 0 will move you up one item. This method of viewing menu options will allow you to view your options in any menu (or submenu). Refer to *figure 2-11, the Service Mode Map*, and note that an arrow following the command indicates that a submenu exists. Press the POPULAR key to enter a submenu. Hold the RESET key and press the POPULAR key to exit a submenu.

IF YOU "GET LOST" IN THE MENUS

Since the menu mode of pricing and programming does not require you to use any reference material, you may (occasionally) find that you have ventured down the wrong menu and that you don't know what option is next. Don't panic . . . you can find your way:

1. Press and hold down RESET and then press 0 until you come to the top of current menu.
2. If this menu name doesn't help, Press and hold RESET and then press POPULAR. This will move you to the top of the previous menu. In most cases, this will return you to the main menu (* SERVICE MODE *).
3. If you still cannot determine where you are, press and hold RESET and then press POPULAR again. Repeat this step until you get to the main menu (* SERVICE MODE *).

Using CD-51A Commands

CD-51A Commands are formed by combining the numbers that appear on the left side of the menus that appear in *figure 2-11*. To construct and use CD-51A commands, you need to refer to *figure 2-11* or *table 2-4*.

As An Example: You want to view the number of cycles that the CD mechanism has made. Using *figure 2-11*, you determine that you need to select AUDITS (1), on the main menu; NON-RESETTABLES (2), on the AUDIT menu; and MECH (7), on the NON-RESETTABLES menu. Use the digits to form a numeric command, which is 127. Type 127 and The number of mechanism cycles is displayed.



NOTE:

To use the command mode effectively, you should return to the main menu after each command is completed. Do this by holding RESET down and pressing POPULAR until the words "SERVICE MODE" appear on the digital display.

Combining Menu And Command Modes

The most efficient way to set pricing and change programming is to use a combination of the menu mode and the command mode to move through the menus. To do this, use the command mode to get you to the command you want to use, execute the command, and use the menu mode to go to your next selection.

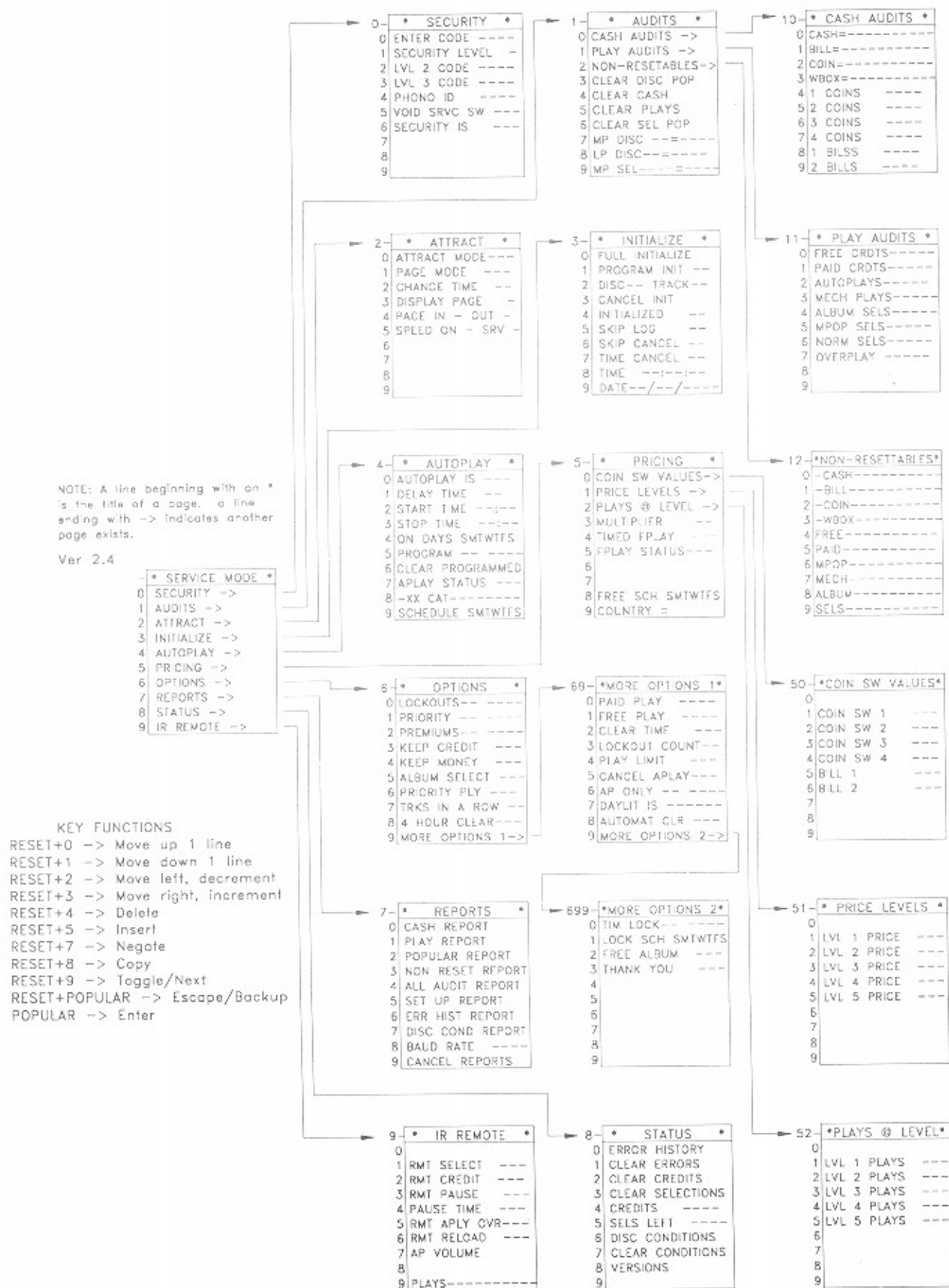


Figure 2-11. Service Mode Map

Service Mode Menu

The SERVICE MODE menu (referred to as the "MAIN menu") is the starting point for all service, pricing, and programming functions. This menu contains the general title for each submenu. Some of the submenus contain commands only. Other submenus contain both commands and further submenu names. Refer to *figure 2-11*, the *CD-51A Service Mode Map*, for an illustration of the following menu descriptions:

Security Menu

This menu contains all of the command options that must be executed to display or change a phonograph security code or enter a security level. This menu also contains a command to change the phonograph ID.

The last SECURITY option, the VOID SERVICE SWITCH option, allows you to completely close the phonograph door (which places the SERVICE switch in the NORMAL position) and remain in the SERVICE mode.

To enter this menu from the MAIN menu: Type 0.

Audits Menu

The AUDITS menu allows you to display and clear the various cash, play, and popularity totals that are routinely reset when money is collected.

To enter this menu from the MAIN menu: Type 1.

Attract Mode Menu

Attract mode is designed to draw attention to customers by moving the selection pages.

To enter this menu from the MAIN menu: Type 2.

Initialize Menu

This menu controls the type of CD initialization that is to be done whenever a disc is changed or moved to a new disc number. This menu must be used to identify empty CD mechanism slots.

This menu also contains options to change the phonograph's time and date.



NOTE:

The phonograph will automatically adjust the disc limits whenever a disc is played. This form of initialization is not recommended as a substitute for the selections in this menu.

To enter this menu from the MAIN menu: Type 3.

Autoplay

Autoplay is the function that plays CD's when no customers have made selections. Autoplay can be used to stimulate play or provide background music. This feature can be scheduled and customized from the Autoplay menu.

To enter this menu from the MAIN menu: Type 4.

Pricing Menu

This menu allows you to change the pricing structure, select FREE PLAY, or return to the factory (default) pricing.

To enter this menu from the MAIN menu: Type 5.

Options Menu

This menu is a collection of disc selection options that allow you to:

- Prevent playing a track (Lockout)
- Give certain tracks priority play
- Charge a double price for certain selections
- Retain credits during a power failure
- Retain the current money total during a power failure
- Buy an entire album
- Limit the number of tracks that can be played from a disc before another disc is allowed to play.
- Retain or erase selections waiting to play if power is off for a significant interval of time, such as overnight (internally programmable from 0 to 999 minutes).

To enter this menu from the MAIN menu: Type 6.

More Options 1 Menu

This menu is a collection of options that allows you to:

- Select FIFO or random playback of selections
- Automatically lockout defective discs (Lockout Count)
- Cancel Autoplay when a paid selection is made.
- Use certain discs for Autoplay only (locked out from the keyboard)
- Automatic or manual Daylight savings time correction

More Options 2 Menu

This menu allows you to:

- Use timed lockouts
- Enable or disable the "Thank You" message
- Enable or disable album buys in FREE PLAY mode.

Reports Menu (Optional)

The REPORTS options allow you to connect a printer or a personal computer to the RS-232 connector on the CCC. This information is the same information that can be displayed on the keyboard display, except that it has been arranged in a simple report format that can be printed or stored on a disk or diskette.

To enter this menu from the MAIN menu: Type 7.

Status Menu

This menu allows you to display and clear the various phonograph error messages, clear and set credits, clear selections, and display and clear disc condition messages, and display software versions.

To enter this menu from the MAIN menu: Type 8.

HOW TO MAKE PROGRAMMING CHANGES

The CD-51A Phonograph allows you to perform programming activities in two ways.

The primary or MENU mode uses menus to move through the choices until you find the desired function. This method of selecting the function that you want is more time consuming than the COMMAND mode, but does not require you to remember any commands.

The Command mode uses two and three digit commands to tell the phonograph what function you want to perform. The command mode requires you to know exactly what command you want because you will go straight to the function that you have requested: You will not receive any intermediate prompts (as you would in the menu mode).

Keyboard Controls

The POPULAR and RESET buttons on the selector keyboard (*see figure 1-1 if you are not familiar with the selector keyboard or digital display*) are used to tell the phonograph how to use the digits that you are about to enter. Table 2-3 describes the results of using these buttons.

Table 2-3. Keyboard Controls

Keys Pressed	Results
POPULAR	"ENTERS" the information or change
RESET+0 (hold RESET down)	Moves you up one item in a menu
RESET+1 (hold RESET down)	Moves you down one item in a menu
RESET+2 (hold RESET down)	Moves you left, or decrements
RESET+3 (hold RESET down)	Moves you right, or increments
RESET+4 (hold RESET down)	Removes an entry (such as a programmed Autoplay entry) from the list.
RESET+5 (hold RESET down)	Makes a space in a list (such as programmed Autoplay) so that new information can be inserted
RESET+9 (hold RESET down)	Toggles between two possible selections.
RESET+POPULAR (hold RESET down)	Cancels the current activity or moves you back to the previous menu title.

Security Levels

The CD-51A uses security levels to protect audit and programmable information.

- Level 1 lets you view all of the phonograph information, except the security codes, but does not allow you to change any of the information.
- Level 2 lets you review all of the information, except the security codes, and clear the audit information.
- Level 3 lets you view, clear, or change any information.

Factory Security Level

The phonograph is shipped from the factory with SECURITY OPTION (06) set to OFF.



NOTE:

When the SECURITY OPTION (06) is set to OFF, Security Level 3 is automatically established whenever the phonograph is in the SERVICE MODE.

If you set Security ON, Level 1 is established whenever the phonograph is put in the SERVICE MODE, and you must enter the proper four digit security code to change to Level 2 or Level 3.



NOTE:

You should leave the SECURITY option OFF, unless you need security to prevent tampering with your music programming, pricing, or phonograph options.

Table 2-4, which follows, describes the commands and how to make programming changes.

Table 2-4. Menu & Command Descriptions

Code	Description
<p>* SERVICE MODE * - Is the title of the MAIN menu. This menu is the beginning menu for all the other menus. All of the options in this menu are names for other menus. The table that follows contains descriptions of all of the menu options. Enter two, three, or four digit commands from the * SERVICE * MODE display.</p>	
0 SECURITY	- Contains options to access and change the security levels and to change the phonograph I.D. All security code changes must be made from Security Level 3.
00 Enter Code	- Allows you to enter a security code. If the security code that you enter matches either the Level 2 or Level 3 Security Code, the phonograph will go to that security level after you press POPULAR. If both Security Level 2 and Level 3 have the same code (the factory-set code for both levels is 0000), then Level 3 is allowed. When the new security level is attained, the phonograph will automatically go to Command 01, and display the new security level.
01 Security Level	- Displays the current security level. This command can be used at any time to determine the security level. The phonograph automatically moves to this option and displays the new security level after you successfully enter a security code (see command 00).
02 Level 2 Security Code	- Displays the Level 2 Security Code and allows the security code to be changed by entering new data, then pressing POPULAR. The phonograph must be in Security Level 3 for either of these selections to function. Write the new security code down and keep it in a safe, but accessible place. No one will be able to access Level 2 if the SECURITY OPTION 06 is turned ON and you lose the security code.
<p>This security level is intended to be used by the route man, so that he can read cash totals, reset cash totals, and initialize the phonograph. The Route man cannot change pricing or programming.</p>	
03 Level 3 Security Code	- Displays the Level 3 Security Code and allows the security code to be changed by entering new data, then pressing POPULAR. The phonograph must be in Security Level 3 before this code can be displayed or changed. Write the new security code down and keep it in a safe, but accessible place. No one will be able to access Level 3 or change the security code if SECURITY OPTION 06 is turned ON and you lose the security code.
04 Phonograph I.D.	- Displays the current phonograph I.D. code and allows the I.D. to be changed by entering new data, then pressing POPULAR. The phonograph must be in Security Level 3 before the I.D. can be changed. It may be viewed in Security Level 1.
05 Void Service Switch	- Allows the top door of the phonograph to be closed (which normally places the SERVICE switch back into the NORMAL mode) and still remain in the SERVICE mode. Press and hold RESET. Press 9 to toggle the option ON and OFF. Press POPULAR to save the change. This option must be OFF to resume normal operation.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
06 Security On/Off - If set to OFF, Security Level 3 is automatically established when entering the SERVICE MODE.	<p>When security is set to ON, Level 1 is established when SERVICE MODE is entered and the proper four digit security code must be entered to access Security Level 2 or 3.</p> <p>Leave security OFF, unless you need security to prevent tampering. Hold RESET and press 9 to select ON or OFF. Press POPULAR to save your choice.</p> <p>Security can be turned ON from any security level, but it can only be turned OFF in Security Level 3.</p>
07-08 Are not used	
1 AUDITS - Are the functions and menus that allow you to display and reset the various accumulated figures for money, popularity, number of plays, and credits.	
10 Cash Audits - Is the menu that allows you to display, but not change, cash totals, number of coins through the coin switches, and the total number of bills.	
11 Play Audits - Is the menu that allows you to display, but not change, credits, autoplays, mechanism plays, and album plays.	
12 Non-resettables - Is the menu that allows you to display the ongoing totals. These totals cannot be reset from any security level.	
13 Clear Disc Popularity - Clears the popularity for all discs. This option should only be used after the popularity figures (Selections 7, and 8 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.	
14 Clear Cash - Clears all current cash totals. This option should only be used after the figures for Cash Audits (Selection 0 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.	
15 Clear Plays - Clears all current play totals. This option should only be used after the Play Audit figures in Play Audits (Selection 1 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.	
16 Clear Selection Popularity - Clears all current selection popularity. This option should only be used after Popularity Figures (Selection 9 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.	
17 Display The Most Popular Disc - Displays the most popular disc number (00-99), followed by the number of plays (9999 maximum) that disc had. To display the next "Most Popular" disc, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive most popular disc. Press and hold RESET and then press 2 to move up through the popularity display toward the most popular disc.	

You can request the popularity for a particular disc by pressing the disc number.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
18	<p>Display The Least Popular Disc - Displays the least popular disc number (00-99) followed by the number of plays that the disc had. To display the next "Least Popular" disc, press and hold RESET and then press 2. Press and hold RESET and then press 2 to display each successive least popular disc. Press and hold RESET and then press 3 to move up through the popularity display toward the least popular disc.</p> <p>You can request the popularity for a particular disc by pressing the disc number.</p>
19	<p>Display The Most Popular Selection - Displays the most popular selection number (Disc 00-99 followed by Selection 00-99, a total of four digits), followed by the number of plays (9999 maximum) that selection had. To display the next "Most Popular" selection, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive most popular selection. Press and hold RESET and then press 2 to move up through the popularity display toward the most popular selection. A total of 100 selection numbers may be contained in the MOST POPULAR list.</p> <p>You can request the popularity for a particular selection by pressing the selection number (four digits).</p>
10	<p>CASH AUDITS - Allows you to display, but not change, cash totals, number of coins through the coin switches, and the total number of bills.</p>
100	<p>Current Cash - Displays the total amount of bill and coin money collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
101	<p>Current Bill - Displays the total amount of bill money collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
102	<p>Current Coin - Displays the total amount of coin money collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
103	<p>Current Wallbox - Displays the total amount of money collected by wallboxes since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
104	<p>Current Number Of Type 1 Coins - Displays the total number of Type 1 coins (5¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
105	<p>Current Number Of Type 2 Coins - Displays the total number of Type 2 coins (10¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
106	<p>Current Number Of Type 3 Coins - Displays the total number of Type 3 coins (25¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
107	<p>Current Number Of Type 4 Coins - Displays the total number of Type 4 coins (50¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
108	<p>Number Of Type 1 Bills - Displays the total number of Type 1 bills (\$1) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
109	Number Of Type 2 Bills - Displays the total number of Type 2 bills (\$5) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.
11	PLAY AUDITS - Allows you to display, but not change, credits, autoplays, mechanism plays, and album plays.
110	Free Credits - Displays the number of free credits given since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
111	Paid Credits - Displays the number of paid credits given since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
112	Autoplays - Displays the number of Autoplays made since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
113	Mechanism Plays - Displays the number of times the mechanism has played CD's since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
114	Album Buys - Displays the number of times albums have been bought since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
115	Most Popular plays - Displays the number of times that the POPULAR button was used to select the most popular selection since the last time the CLEAR PLAYS command (selection 5 in the AUDITS menu) was used.
116	Normal Selections - Displays the number of selections made from the keyboard.
117	Overplay Counter - Displays the number of overplays selected since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
The overplay counter is part of the CCC's memory, which keeps track of how many duplicate selections were made. A selection is considered to be a duplicate if it has been entered, but the CCC has not sent the selection number to the CD mechanism controller.	
12	NON-RESETTABLES - These totals for cash, plays, and credits can be displayed from any security level, but they cannot be reset from any security level. These totals constitute the permanent phonograph history.
120	Cash - Displays total cash (bill and coin) received by the phonograph.
121	Bill - Displays total bill cash received by the bill acceptor.
122	Coin - Displays total coin cash received by the coin acceptor.
123	Wallbox - Displays total cash received by all wallboxes.
124	Free - Displays total free credits.
125	Paid - Displays total paid for credits.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
126	Most Popular - Displays the total number of Most Popular selections made with the POPULAR button.
127	Mechanism - Displays the total number of mechanism cycles.
128	Album - Display total album buys.
129	Selections - Displays the total number of selections made using the keyboard.
2	ATTRACT - This menu sets ATTRACT MODE ON or OFF and defines the ATTRACT MODE's characteristics.
20	Attract Mode - Displays and toggles the ATTRACT MODE. Hold RESET while pushing 9 to toggle ON or OFF. Press POPULAR to save the change.
21	Page Mode - Displays and toggles the automatic page selection mode. Hold RESET while pushing 9 to toggle OFF, CHANGE or AD. Press POPULAR to save the change. If OFF, the automatic page change selection is disabled. If CHANGE, a page will flip when the CHANGE TIME INTERVAL (22) elapses and the phonograph is in standby. If AD, the page mechanism will park at the DISPLAY PAGE (23) location when the CHANGE TIME INTERVAL elapses and the phonograph is in standby.
22	Change Time - Displays and sets the time interval for page changes (3 minutes minimum) in minutes. Type in the new time in minutes then press POPULAR.
23	Display Page - Page to be displayed in the AD mode. Type in the new page number then press POPULAR.
24	Title Page Number Control - Controls the first and last page that can be selected from the keyboard. Type the low page number for IN then press POPULAR. Type the high page number for OUT then press POPULAR Again.
25	Title Page Speed Control - Controls the speed that the title pages will change. The ON value is the speed that the pages will turn while the phonograph is in the NORMAL mode, and the SRV value is the speed that the pages will turn in the SERVICE mode. The allowable selections are 1-9, but only Selections 3 through 8 are true speed changes. Type the new speed number for ON then press POPULAR. Type the new speed number for SRV then press POPULAR again.
26	- thru 29 not used.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
3 INITIALIZE	- This menu establishes the CD track numbers and saves them.
30 Full Initialize	- Starts full mechanism initialization. Press POPULAR to select and note that the display will blink when this command is executed. All disc limits are set to 99, then as each disc is scanned, new limits are automatically entered into memory. Initialization begins when the SERVICE switch is moved to the NORMAL position. Full initialization takes about 30 minutes. During this time, selections can be played, but initialization will not continue until the phonograph is scanned out.
31 Program Initialize	- Initializes specific discs automatically. Type the disc number to be initialized then press POPULAR. Type disc numbers until all disc numbers that need initializing have been entered. Initialization will begin when the service switch is moved back to the NORMAL position.
32 Disc Initialize and Track Limits	- Allows you to view and change disc limits manually. To view disc limits, type the disc number. Press and hold RESET then press 3 (next disc) or 2 (previous disc) to view the next or previous disc limits. To a change a disc's limits, display the limits then press POPULAR. Type the new limits, then press POPULAR.
33 Cancel Initialization	- Cancels initializations that have been started with either of the previous options (30 or 31). Press POPULAR to perform this function. The display will blink when the command is executed.
34 Initialized	- Displays the number of discs that have been initialized.
35 Number Of Skips Before Log	- Allows logging disc conditions without canceling selections. Type the new number, then press POPULAR. <i>See Disc Conditions in Section 5</i> for a detailed explanation of the Skip Log.
36 Skip Cancel	- Determines the maximum number of times that a CD may skip while playing before it is automatically canceled. Type the new number then press POPULAR. <i>See Disc Conditions in Section 5</i> for a detailed explanation of SKIP CANCEL.
37 Time Cancel	- Determines the maximum time that a CD may skip before it is automatically canceled. Type the new number then press POPULAR. <i>See Disc Conditions in Section 5</i> for a detailed explanation of TIME CANCEL.
38 Time HH:MM:--	- Displays and sets the time-of-day. Hours and minutes can be entered, seconds will begin automatically at "00" (midnight) and count to 23:59, which is the 24-hour clock, or "military time". Type the new hours and press POPULAR. Type the new minutes and then press POPULAR.
Midnight	Is entered as 00:00 and the clock just keeps on ticking! 12:59 pm (after noon) is the same, but:
1:00 pm	Is entered as 13:00 and all the succeeding times are entered as 12+ the hour: Where
12:59 pm	= 12:59
1:00 pm	= 13:00
2:00 pm	= 14:00
3:00 pm	= 15:00
4:00 pm	= 16:00
5:00 pm	= 17:00
6:00 pm	= 18:00
7:00 pm	= 19:00
8:00 pm	= 20:00
9:00 pm	= 21:00
10:00 pm	= 22:00
11:00 pm	= 23:00
12:00 am	= 00:00

Table 2-4. Menu & Command Descriptions
Continued

Code	Description															
39	Date MM/DD/YYYY - Displays and sets the date. Any date from the year 1980 to 2087 is allowed.															
4	AUTOPLAY - This menu sets AUTOPLAY ON or OFF and defines the Autoplay characteristics. If AUTOPLAY IS (COMMAND 40) has been set to STD, then COMMANDS 40 through 47 in this table apply. If AUTOPLAY IS (COMMAND 40) has been set to ENH, then COMMANDS 40 through 49 apply and you should read about how to use these commands in the <i>Enhanced Autoplay Tutorial</i> that appears at the end of this section.															
40	Autoplay Is - Displays and sets the AUTOPLAY style to either STANDARD, ENHANCED, or OFF. Press and hold RESET and then press 9 to toggle between the three options and press POPULAR to select the option that you want.															
41	Delay Time - Displays and sets the time between Autoplay selections. Type the number in minutes then press POPULAR. This command is used only in STANDARD Autoplay. Set TIME DELAY to 00 for continuous Autoplay (as for background music).															
42	Start Time - Sets the time-of-day that Autoplay is allowed to begin making Autoplay selections. Enter the time in 24-hour format (<i>see the table that follows Stop Time</i>). Type the hour then press POPULAR. Type the minute then press POPULAR. Both the hour and minute must be changed together.															
43	Stop Time - Sets the time-of-day that Autoplay will no longer be allowed to make selections. If you are not familiar with 24-hour time keeping, use the following table to help you figure the 24-hour time. Midnight Is entered as 00:00 and the clock just keeps on ticking! 12:59 pm (after noon) is the same, but: 1:00 pm Is entered as 13:00, and all succeeding times are entered as 12 + the hour: <table><tr><td>12:59 pm = 12:59</td><td>5:00 pm = 17:00</td><td>10:00 pm = 22:00</td></tr><tr><td>1:00 pm = 13:00</td><td>6:00 pm = 18:00</td><td>11:00 pm = 23:00</td></tr><tr><td>2:00 pm = 14:00</td><td>7:00 pm = 19:00</td><td>12:00 am = 00:00</td></tr><tr><td>3:00 pm = 15:00</td><td>8:00 pm = 20:00</td><td></td></tr><tr><td>4:00 pm = 16:00</td><td>9:00 pm = 21:00</td><td></td></tr></table>	12:59 pm = 12:59	5:00 pm = 17:00	10:00 pm = 22:00	1:00 pm = 13:00	6:00 pm = 18:00	11:00 pm = 23:00	2:00 pm = 14:00	7:00 pm = 19:00	12:00 am = 00:00	3:00 pm = 15:00	8:00 pm = 20:00		4:00 pm = 16:00	9:00 pm = 21:00	
12:59 pm = 12:59	5:00 pm = 17:00	10:00 pm = 22:00														
1:00 pm = 13:00	6:00 pm = 18:00	11:00 pm = 23:00														
2:00 pm = 14:00	7:00 pm = 19:00	12:00 am = 00:00														
3:00 pm = 15:00	8:00 pm = 20:00															
4:00 pm = 16:00	9:00 pm = 21:00															
44	On Days SMTWTFs - Allows you to select the days of the week that Autoplay can make selections. Press and hold RESET then press either 2 or 3 to move from day to day. The day currently selected will blink. Hold RESET and then press 9 to turn the day ON or OFF. Press POPULAR to save any changes.															

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
45	<p>Programmed - Displays and changes the individual selection numbers that will be played. This mode allows you have Autoplay play specific selections or discs. A maximum of 100 selections or discs can be programmed. On the menu, the two-digit number is the play sequence number and the four-digit number is the selection number.</p> <p>If no programmed selections are made, the Autoplay function will select a random disc and a random track each time Autoplay makes a selection. If one or more selections are programmed, the programmed selections will be selected. A disc number followed by two zeros can be programmed. If you request disc 6300, for example, then Disc 63 will be programmed and a random track will be played from that disc (see <i>Programming Autoplay, Premiums, Priorities, and Lockouts</i>).</p>
46	<p>Clear Programmed Mode - Clears all programmed selections entered in COMMAND 45. Press POPULAR to perform this function. The display will blink when the command is executed.</p>
47	<p>Autoplay Status - Allows you to change the AUTOPLAY STATUS immediately, without waiting for the START or STOP time of day. Hold RESET then press 9 to toggle the status ON or OFF. Press POPULAR to save the changes.</p>
48	<p>XX Cat - Assigns categories to discs in Enhanced Autoplay.</p>
49	<p>Schedule SMTWTFSS - The active days, time(s), categories, and delay(s) between Autoplay selections in Enhanced Autoplay.</p>
5	<p>PRICING - This menu allows the operator to change CD pricing, coin switch values, credit levels, credit values, credit multiplier, and Free Play value</p>
50	<p>COIN SWITCH VALUES: - Is a menu that displays and sets various coin switch values.</p>
500	<p>-----</p>
501	<p>Coin SW1 = XX - Displays and sets the #1 COIN SWITCH VALUE. Type the new value and then press POPULAR.</p>
502	<p>Coin SW2 = XX - Displays and sets the #2 COIN SWITCH VALUE. Type the new value and then press POPULAR.</p>
503	<p>Coin SW3 = XX - Displays and sets the #3 COIN SWITCH VALUE. Type the new value and then press POPULAR.</p>
504	<p>Coin SW4 = XX - Displays and sets the #4 COIN SWITCH VALUE. Type the new value and then press POPULAR.</p>
505	<p>Bill 1 = XX - Displays and sets the #1 BILL VALUE. Type the new value and then press POPULAR.</p>
506	<p>Bill 2 = XX - Displays and sets the #2 BILL VALUE. Type the new value and then press POPULAR.</p>

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
507	-thru 509 not used.
51	PRICE LEVELS: - Is a menu that displays various credit levels.
510	-----
511	LVL1 Price = XX - Displays and sets the price of the 1st credit level. Type the new value and then press POPULAR.
512	LVL2 Price = XX - Displays and sets the price of the 2nd credit level. Type the new value and then press POPULAR.
513	LVL3 Price = XX - Displays and sets the price of the 3rd credit level. Type the new value and then press POPULAR.
514	LVL4 Price = XX - Displays and sets the price of the 4th credit level. Type the new value and then press POPULAR.
515	LVL5 Price = XX - Displays and sets the price of the 5th credit level. Type the new value and then press POPULAR.
516	-thru 519 not used.
52	PLAYS @ LEVEL: - Is a menu that displays and edits credit values.
520	-----
521	LVL1 Plays = xx - Displays and sets the number of plays given for this credit level. Type the new value and then press POPULAR.
522	LVL2 Plays = xx - Displays and sets the number of plays given for this credit level. Type the new value and then press POPULAR.
523	LVL3 Plays = xx - Displays and sets the number of plays given for this credit level. Type the new value and then press POPULAR.
524	LVL4 Plays = xx - Displays and sets the number of plays given for this credit level. Type the new value and then press POPULAR.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
525	LVL5 Plays = xx - Displays and sets the number of plays given for this credit level. Type the new value and then press POPULAR.
526	-thru 529 not used.
53	Multiplier - Displays and sets the coin multiplier value. For the U.S., this value is 5 (nickel). Type the new number then press POPULAR.
54	Timed Free Play - Turns ON or turns OFF the timed free play schedule. Hold RESET then press 9 to toggle ON or OFF. Press POPULAR to save the change (<i>see the Timed Free Play Example in this section</i>).
55	Free Play Status - Allows you to turn free play ON or OFF immediately without waiting for the start or stop time. Hold RESET then press 9 to toggle ON or OFF. Press POPULAR to save the change.
56	NOT USED
57	NOT USED
58	FREE SCH SMTWTFs - Allows you to select the days of the week and start and stop times for the Timed Free Play feature (<i>see the Timed Free Play and Timed Lockout Scheduling Tutorial in this section</i>).
59	Load Country Settings - Loads the factory pricing (default) settings for different countries. Hold RESET, then press 9 to toggle between United States (US), Australia (AUSTRALIA), United Kingdom (UK), and Canada (CANADA) pricing. The display will blink when the command is executed.
6	OPTIONS - Displays and allows you to change the phonograph's miscellaneous options.
60	Lockouts - Displays and selects lockout selections or discs (50 maximum). These selections are not allowed to be selected by the customer or AUTOPLAY (<i>see Programming Autoplay, Premiums, Priorities, and Lockouts</i>). If a locked-out selection is attempted, the words "Not Allowed" will momentarily appear on the display.
61	Priorities - Displays and sets priority selections (10 maximum). When these selections are made by the customer, they will be inserted at the top of the play list and they will be played next (<i>see Programming Autoplay, Premiums, Priorities, and Lockouts</i>).
62	Premiums - Displays and sets premium selections. These selections (25 maximum) will be priced at twice the regular price (<i>see Programming Autoplay, Premiums, Priorities, and Lockouts</i>).

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
63	Keep Credit - Displays and toggles the KEEP CREDIT option ON or OFF to allow retaining or canceling credit upon Power up. Hold RESET and press 9 to toggle ON or OFF. Press POPULAR to save the changes.
64	Keep Money - Displays and toggles the KEEP MONEY option ON or OFF to allow retaining or canceling money on power up. Hold RESET and press 9 to toggle ON or OFF. Press POPULAR to save the change.
65	Album Buy - Displays and toggles the ALBUM BUY option ON and OFF so that entire albums can be selected. Hold RESET and press 9 to toggle ON or OFF. Press POPULAR to save the change.
66	Priority Play - Displays and toggles PRIORITY PLAY from ON to OFF. When PRIORITY PLAY is ON, priority plays will be allowed. When PRIORITY PLAY is OFF, this feature is disabled. Hold RESET and press 9 to toggle ON or OFF. Press POPULAR to save the change.
67	Tracks In A Row - Displays and sets the maximum number of tracks (sequential selections) that can be played from one disc. Type the new number then press POPULAR.
68	4-Hour Clear - Displays and toggles the 4-Hour Clear option ON or OFF. When 4-Hour Clear is ON, all selections remaining to be played will be cleared (if the phonograph is turned OFF for more than 4 consecutive hours, or the number of minutes entered by COMMAND 692). When this option is OFF, selections to be played will remain in the phonograph's memory and they will play when the phonograph is turned back ON. Hold RESET and press 9 to toggle this option ON or OFF. Press POPULAR to save the change.
69	MORE OPTIONS 1 - The MORE OPTIONS 1 menu is a continuation of the OPTIONS menu.
690	Paid Play - Determines the play sequence for paid selections. This option toggles between random (RAND) and FIFO (First In First Out) sequences. Hold RESET and press 9 to toggle RAND or FIFO. Press POPULAR to save the change.
691	Free Play - Determines the play sequence for free selections. This option toggles between random (RAND) and FIFO (First In First Out) sequences. Hold RESET and press 9 to toggle RAND or FIFO. Press POPULAR to save the change.
692	Clear Time - Allows values from 00 to 999 minutes for the 4-HOUR CLEAR (68) TIME. The factory setting is 240 minutes. Type the new number, then press POPULAR.
693	Lockout Count - Adds the selection to the LOCKOUT LIST (60) when the DISC CONDITIONS NUMBER OF SKIP OCCURRENCES reaches the programmed value. To change the LOCKOUT COUNT, type the new number and then press POPULAR.
694	Play Limit - Sets a maximum time for a selection to play before it is canceled. A 0 entry disables this feature. Valid times are from 60 to 999 seconds. If the optional volume control module is installed, the volume of the selection will fade before the selection is canceled.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
695	Cancel Autoplay - Cancels the autoplay selection when a paid selection is entered. When this feature is turned ON, the Autoplay selection will cancel within 15 seconds and the paid selection will play next. When this feature is turned OFF, the Autoplay selection will finish playing before the paid selection plays. The default for this feature is ON.
696	Autoplay Only - Stores the disc numbers for up to 25 discs. These disc numbers can be selected by Autoplay, but they cannot be selected by customers (<i>see programming Autoplays, premiums, priorities, and lockouts</i>).
697	Daylight Savings Time - Automatically adjusts daylight saving time. STD moves the clock ahead one hour at 2:00 am on the first Sunday of April. This mode will, also, move the clock back one hour at 2:00 am on the last Sunday of October. NONSTD lets you select which months and days of the month that daylight savings will be turned ON and OFF. Hold RESET and press 9 to select STD, NONSTD, or OFF. Press POPULAR to save your choice. If you select NONSTD, the display shows DAYLIT ON - - / - -. Type two digits for the month code to turn daylight savings ON and then press POPULAR. Type the two digit day number (1 through 31). Note that the CCC will only accept the correct maximum number. Then press POPULAR. Hold RESET, and then press 9 to change the display to show: DAYLIT OFF - - / - -. Type two digits for the month code to turn daylight savings OFF and then press POPULAR. Type the two digit day number (1 through 31). Note that the CCC will only accept the correct maximum number. Then press POPULAR.
698	Automat Clr - Clears audit data. If this command is set to ON, and the AUDIT START button has been used to start the report, then the audit data will be cleared when the printing stops and the phonograph is in NORMAL mode. Hold RESET and press 9 to toggle this command ON and OFF. Press POPULAR to save your choice.
699	More Options 2 - This menu is a continuation of the OPTIONS menu.
6990	Timlock - Displays and sets timed lockout selections or discs (25 maximum). <i>See Programming Autoplay, Premiums, Priorities, and Lockouts.</i>
6991	Locksch SMTWTFs - Allows you to select the days of the week and the start and stop times for timed lockouts (<i>see the Timed Free Play And Timed Lockouts Scheduling Tutorial</i>).
6992	Free Album - Allows entire albums to be selected if FREE PLAY (55) and ALBUM BUY (65) are ON. Hold RESET and press 9 to toggle this command ON and OFF. Press POPULAR to save your choice.
6993	Thank You On/Off - If set to ON, the "Thank You" message is briefly displayed when a customer completes his final selection (the credit goes to zero). Hold RESET and press 9 to toggle this command ON and OFF. Press POPULAR to save your choice.

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
7	<p>REPORTS - The REPORTS menu provides an output to an RS-232 serial printer or computer with an RS-232 serial interface. To use this feature, the RS-232 Option must be installed in the phonograph.</p> <p>To select and print the report, type the code for the report and press POPULAR. The display will blink when the command is executed.</p> <p>70 Cash Report - Starts the Cash Report</p> <p>71 Play Report - Starts the Play Report</p> <p>72 Popular Report - Starts Popularity Report</p> <p>73 Non-Resetable Report - Starts the report of all non-resetable numbers</p> <p>74 All Audit Report - Starts all 4 audit reports</p> <p>75 Setup Report - Starts the phonograph Setup Report</p> <p>76 Error History Report - Starts the Accumulated Phonograph Errors Report</p> <p>77 Disc Condition Report - Starts the Disc Condition Report</p> <p>78 Baud Rate - Selects either 600, 1200, 2400, 4800, or 9600 baud for printing reports. Hold RESET and press 9 to toggle between 600, 1200, 2400, 4800, and 9600 baud. Press POPULAR to save the change. Also a carriage return delay (CR MS Delay) is available to interface with slower printers.</p> <p>79 Cancel Reports - Stops all report printing</p>
8	<p>STATUS - The STATUS menu defines credit and displays figures, which indicate the condition of the phonograph</p> <p>80 Error History - Displays the error history of the phonograph (<i>see Errors and Warnings in Section 5</i>)</p> <p>81 Clear Errors - Clears all errors from the phonograph's error log. Press POPULAR to perform this function. The display will blink when this command is executed.</p> <p>82 Clear Credits - Clears all current credit. Press POPULAR to perform this function. The display will blink when this command is executed.</p> <p>83 Clear Selections - Clears all selections remaining to be played. Press POPULAR to perform this function. The display will blink when this command is executed.</p> <p>84 CREDITS - Displays and changes the number of credits. Type the number of credits then press POPULAR.</p> <p>85 Selections Left - Displays the current number of selections left to be played.</p>

Table 2-4. Menu & Command Descriptions
Continued

Code	Description
86	Disc Conditions - Displays the condition of discs played (see <i>Disc Conditions in Section 5</i>).
87	Clear Conditions - Clears current conditions from the phonograph. Press POPULAR to perform this function. The display will blink when this command is executed.
88	Display Software Versions - Displays the current version number of phonograph modules. Hold RESET and press 3 to view the next device version number.
9	IR REMOTE - The IR REMOTE menu activates and defines IR REMOTE options.
90	Not used
91	Remote Selections - Displays and sets remote selections to ON, OFF, ICD, or XCD. If this command is set to ON, remote selections are always allowed. If this command is set to OFF, remote selections are not allowed at all. If this command is set to ICD, selections are allowed as long as REMOTE CREDIT (92) exceeds zero. If set to XCD, selections are allowed when remote credit (92) or external credit (selections remaining on digital display) exceeds zero. Hold RESET, push 9 to select ON, OFF, ICD or XCD. Press POPULAR to save.
92	Remote Credit - Displays and changes the number of internal remote credits. If RMT SELECT (91) is set to ICD or XCD, remote credits are decremented each time a remote selection is made. Type the number of credits, then press POPULAR.
93	Remote Pause - Allows the remote to pause the phonograph if this feature is set to ON. Hold RESET and press 9 to toggle this command ON and OFF. Press POPULAR to save your choice.
94	Remote Pause Time - Displays and sets the number of minutes the phonograph can be paused. Type the new number, then press POPULAR.
95	Remote Autoplay Override - Allows the remote to turn Autoplay either ON or OFF if this feature is ON. Hold RESET and press 9 to toggle ON and OFF. Press POPULAR to save your choice.
96	Remote Reload - Once a week (on Monday) the value in this location is added to the REMOTE CREDIT (MENU COMMAND 92). Type the number of credits you want to give each week. Press POPULAR to save your choice.
97	Autoplay Volume - Displays and sets autoplay volume to Off, SEPART, OR LOCKED. Hold RESET and press 9 to toggle between OFF, SEPART, AND LOCKED. Push POPULAR to save your choice. If set to OFF, autoplays and paid selections play at same volume. If SEPART (separate) they can be adjusted to different levels during play. If LOCKED, the autoplay volume can be set and locked to the level you want. To set the locked level, make a selection, wait until it starts playing then go to the SERVICE mode. Type 97. Hold reset and toggle 9 until display shows AP VOLUME LOCKED. Use IR remote to set the volume you like for autoplay.
98	Not used
99	Remote Plays - Displays the number of selections made from the remote.

Table 2-5. CD-51A Command Index

Function	Menu	Command
Album		
free - on/off	OPTIONS	6992
maximum tracks in a row	OPTIONS	67
Select - on/off	OPTIONS	65
Attract mode		
change time between page changes	ATTRACT	22
select a specific "AD" page	ATTRACT	23
set speed that title pages turn	ATTRACT	25
set title page number limits	ATTRACT	24
turn attract on/off	ATTRACT	20
turn auto page changes on/off	ATTRACT	21
Audits		
all audit	REPORTS	74
automatic clear	OPTIONS	698
cash	AUDITS	100-109
non-resettable	AUDITS	120-129
play	AUDITS	110-117
Autoplay		
clear programmed Autoplay	AUTOPLAY	46
cancel autoplay select early on/off	OPTIONS	695
display or change		
start time	AUTOPLAY	42
stop time	AUTOPLAY	43
days of the week	AUTOPLAY	44
enhanced categories	AUTOPLAY	48
enhanced schedules	AUTOPLAY	49
autoplay only discs	OPTIONS	696
select a specific disc and track	AUTOPLAY	45
autoplay status on/off	AUTOPLAY	47
time between Autoplays	AUTOPLAY	41
turn Autoplay on/off	AUTOPLAY	40
Baud Rate	REPORTS	78
Bill values	PRICING	505-506
Cash		
clear	AUDITS	14
keep credit after power failure on/off	OPTIONS	63
keep money after power failure on/off	OPTIONS	64
multiplier	PRICING	53
report	REPORTS	70

Table 2-5. CD-51A Command Index
(Continued)

Function	Menu	Command
Clear		
cash	AUDITS	14
conditions	STATUS	87
credits	STATUS	82
disc popularity	AUDITS	13
errors	STATUS	81
plays	AUDITS	15
programmed autoplay selections	AUTOPLAY	46
selection popularity	AUDITS	16
selections	STATUS	83
Coin switch values	PRICING	501-504
Credit		
clear credits	STATUS	82
display or change credits	STATUS	84
free play - on/off	PRICING	55
keep credit after power failure on/off	OPTIONS	63
levels	PRICING	511-515
multiplier	PRICING	53
remaining	STATUS	84
selections remaining	STATUS	85
values	PRICING	521-525
Date and time change	INITIALIZE	39 and 38
Daylight saving time settings		
saving time OFF/STD/NONSTD	OPTIONS	697
saving time ON date (non standard only)	OPTIONS	697
saving time OFF date (non standard only)	OPTIONS	697
Default pricing	PRICING	59
Disc		
Autoplay	AUTOPLAY	40-47
clear conditions	STATUS	87
conditions	STATUS	86
conditions report	REPORTS	77
initialize	INITIALIZE	30-33
lockout count	OPTIONS	693
play limit	OPTIONS	694
Errors		
clear	STATUS	81
history		
report	REPORTS	76
status	STATUS	80
Factory pricing	PRICING	59

Table 2-5. CD-51A Command Index
(Continued)

Function	Menu	Command
Free play		
Album	OPTIONS	6992
on days	PRICING	58
start time	PRICING	58
status on/off	PRICING	55
stop time	PRICING	58
timed on/off	PRICING	54
Initialize		
all discs (takes 30 minutes)	INITIALIZE	30
by disc number	INITIALIZE	31
cancel auto initialize	INITIALIZE	33
number of discs initialized	INITIALIZE	34
skip time (delay before cancel)	INITIALIZE	37
set track limit for a disc	INITIALIZE	32
skip count	INITIALIZE	36
skip log	INITIALIZE	35
Lockouts		
lockout (do not allow) a selection	OPTIONS	60
timed		
selections	OPTIONS	35
on days	OPTIONS	6991
start time	OPTIONS	6991
stop time	OPTIONS	6991
Money		
keep on/off	OPTIONS	64
clear	AUDITS	14
Plays		
audit	PLAY AUDITS	110-117
clear	AUDITS	15
paid play style (sequential or random)	OPTIONS	690
free play style (sequential or random)	OPTIONS	691
Phonograph commands		
clear		
selections after phonograph		
OFF 4-hours (on/off)	OPTIONS	68
selections after 4-hours OFF time	OPTIONS	692
credit	STATUS	82
errors	STATUS	81
display		
credit	STATUS	84
selections remaining	STATUS	85
ID change	SECURITY	04

Table 2-5. CD-51A Command Index
(Continued)

Function	Menu	Command
Popularity		
disk		
clear	AUDITS	13
least popular	AUDITS	18
most popular	AUDITS	17
report	REPORTS	72
selection		
clear	AUDITS	16
most popular	AUDITS	19
Pricing		
bill values	PRICING	505-506
buy an album - on/off	OPTIONS	65
coin switch values	PRICING	501-504
price levels		
levels	PRICING	511-515
multiplier	PRICING	53
plays at price level	PRICING	521-525
premium plays (special pricing)	PRICING	62
use factory (default) pricing	PRICING	59
Priorities		
enable priority plays on/off	OPTIONS	66
maximum tracks to play in a row	OPTIONS	67
play a specific selection	OPTIONS	61
Program with top door closed on/off	SECURITY	05
Remote		
autoplay override on/off	REMOTE	95
autoplay volume	REMOTE	97
credits	REMOTE	92
pause on/off	REMOTE	94
plays	REMOTE	99
selections on/off	REMOTE	91
pause time	REMOTE	94
Reports		
all audit	REPORTS	74
cancel	REPORTS	79
cash	REPORTS	70
disc conditions	REPORTS	77
error history	REPORTS	76
non resettables	REPORTS	73
play	REPORTS	71
popular	REPORTS	72
set up	REPORTS	75
baud rate	REPORTS	78

Table 2-5. CD-51A Command Index
(Continued)

Function	Menu	Command
Security		
enter security code	SECURITY	00
level display	SECURITY	01
change level 2	SECURITY	02
change level 3	SECURITY	03
phono ID	SECURITY	04
security is on/off	SECURITY	06
 Service switch enable - on/off	 SECURITY	 05
Software level	STATUS	88
 "Thank You" message on/off	 OPTIONS	 6993
Time and date change	INITIALIZE	38 and 39
Tracks in a row	OPTIONS	67
 Versions	 STATUS	 88

PROGRAMMING AUTOPLAY, PREMIUMS, PRIORITIES, AND LOCKOUTS

Each of these six options will allow programming specific selection or disc numbers into memory. The procedure is the same for all six options.

Place the phonograph into the SERVICE mode and get to the * SERVICE MODE * display (hold RESET and press POPULAR as many times as necessary to display * SERVICE MODE *). Enter the command for the particular option to be programmed.

For Autoplay programming

Type	Display shows
4	*AUTOPLAY*
5	PROGRAM 00 ----

For Autoplay Only Programming

Type	Display shows
69	* MORE OPTIONS 1 *
6	AP ONLY 00 ----

For Lockouts programming

Type	Display shows
6	*OPTIONS*
0	LOCKOUTS 00----

For Timed Lockout Programming

Type	Display shows
699	* MORE OPTIONS 2 *
0	TIM LOCK 00 ----

For Priorities programming

Type	Display
6	*OPTIONS*
1	PRIORITY 00 ----

For Premiums programming

Type	Display shows
6	*OPTIONS*
2	PREMIUMS 00 ----

If a selection is not programmed for the displayed sequence number, four dashes will appear. When first received from the factory, none of these options will have any selections programmed.

It is possible to program up to 100 autoplay selections or discs, 25 Autoplay only discs, 25 premium selections, 50 lockout selections and 10 priority selections. The program sequence number will start at 00 and go to 1 less than the maximum possible programmed selections,. For example, the sequence numbers for lockouts will start at 00 and go to 24.

All selections must be in consecutive sequence locations. You may not have a "hole" in the sequence. For example, premiums 00 is programmed to Selection 1305. The next premium selection must be entered in sequence location 01. The phonograph will not allow a hole to be left in the sequence.

AUTOPLAY PROGRAMMING MODES

When the Autoplay program sequence does not have any selections in it, Autoplay will select a random disk and track to play whenever the Autoplay time has elapsed. By entering selections into the sequence program, Autoplay will follow that sequence and play only those selections entered. The order of play will follow the sequence.

When entering a selection number ending in 00 (this is not normally a valid selection) in to the Autoplay sequence, Autoplay will select a random selection from that particular disk. For example, sequence number 04 has Selection 5200 programmed in. When Autoplay gets to sequence number 04 (the 5th Autoplay selection to be played), it will play a random track from disk 52.

Specific selection numbers and random selections on specific disks may be entered together and in any order in an Autoplay sequenced program.

LOCKOUT AND TIMED LOCKOUT MODES

To lockout a disc, enter the two-digit disc number followed by two zeroes. To lockout a selection, enter the four digit selection number.

If you are at Security Level 3 and have one of the four programming options on the display, you will notice the 1's digit of the sequence number will be blinking. The blinking digit indicates it may be changed. Type the sequence number where the new selection is to be entered then push POPULAR. If the sequence number entered would create a hole, the display will change to show the next available sequence number. The 1's digit in the selection number will now blink. Type in a four digit selection number (two digit disc number for Autoplay only), then press POPULAR to save it. The 1's digit in the sequence number will now blink allowing another sequence number to be entered.

If you try to enter a selection from a disk that has limits of 0 (the disk is not installed in the machine or it has not yet been initialized), the four dashes will reappear when POPULAR is pushed.

By holding RESET and pushing 3, the next sequence number and selection will be displayed. Holding RESET and pushing 2 will display the previous sequence number.

EDITING AUTOPLAY, PREMIUMS, PRIORITIES AND LOCKOUTS

To change a selection number, use RESET + 2 and RESET + 3 to scan the sequence looking for the selection to be changed. If the sequence number of the selection to be changed is known, simply type the sequence number. When the proper selection is displayed, push POPULAR to move the blinking digit to the 1's position of the selection number. Type in the new four digit selection number (a two-digit disc number for Autoplay only) then push POPULAR.

If you try to enter a selection from a disk that has limits of 0 (the disk is not installed or not yet initialized), the original selection will be automatically reinserted when POPULAR is pushed.

To delete a selection number, locate that selection as described above. Push and hold RESET then push 4 once. The selection will be deleted. The next selection will be moved down into this sequence number to fill the hole the deletion would have left.

To add a selection in the middle of a list, locate the selection previous to selection you want to enter. Hold RESET and push 5 once. This will open a hole in the list. Type the new selection number then push POPULAR. If you try to enter a selection from a disk that has limits of 0 (the disk is not installed in the machine or it has not yet been initialized), selection 0001 will be inserted automatically.

TIMED FREE PLAY AND TIMED LOCKOUT SCHEDULING TUTORIAL

What Multiple Lockout On/Off Times Do

Multiple lockout On/Off times allow you to lockout (prevent selecting or playing) specific selections or discs up to three times a day each day of the week. Selections or discs to be locked-out are entered in OPTION 6990 (TIMLOCK). Scheduling and entering the times is done in the same manner as MULTIPLE FREEPLAY ON/OFF times (*refer to the Timed Free Play example*).

What Multiple Freeplay On/Off Times Do

Multiple Freeplay ON/OFF Times allow you to stimulate interest in the phonograph by offering free plays at up to three times a day each day of the week. Note that this feature only schedules the Freeplay times. To allow Freeplay, you must be sure to turn the TIMED FPLAY (Command 54) ON before Freeplay will be enabled.



See table 2-4 for Commands 54, 55, and 58.

If FREE PLAY STATUS is ON, the phonograph will be on Free Play. If FREE PLAY STATUS is OFF, the phonograph will not be on FREE PLAY.

Free Play status will always be turned OFF when a STOP time and day matches the time and day on the "Real-Time Clock", and timed Free Play is set to ON.

Free Play status will only turn ON when the START time and day matches the time and day of the real-time clock, and timed Free Play is set to ON.

When timed Free Play is set to OFF, the system will not turn Free Play status ON or OFF.

1. Turn Timed Freeplay On

Example: The example shown in figure 2-12 shows The Multiple Freeplay On/Off Times sheet filled out for Sunday and Monday. To make keying the schedule in easier, use this form to make your plans, then key in the schedule (Photocopy the original of this form, which is in the back of this section).

MULTIPLE FREEPLAY ON/OFF TIMES

Fill in the START times, STOP times, and the COMMENTS before you make the actual scheduling changes.

Sunday	On	Off	Comment
1	10 : 00	10 : 30	One Freeplay Time
2	-- : --	-- : --	
3	-- : --	-- : --	
Monday	On	Off	Comment
1	11 : 15	11 : 30	Two Freeplay Periods
2	14 : 30	14 : 45	
3	-- : --	-- : --	
Tuesday	On	Off	Comment
1	-- : --	-- : --	No Freeplay Scheduled
2	-- : --	-- : --	
3	-- : --	-- : --	

Figure 2-12. Sample Freeplay Schedule

2. Plan The Schedule

Scheduling Freeplay is simple, just remember these rules:

SCHEDULING RULES

The schedule must have one ON time and a corresponding OFF time for each scheduled time. These times must follow these simple restrictions:

Examples:

Monday 1	ON 10:30	OFF 10:00	Wrong - The OFF time is set before the ON time. The ON time must be earlier than the corresponding OFF time.
Monday 1 2	ON 10:00 11:00	OFF --:-- 11:30	Wrong - A gap was left in the schedule. Gaps are not allowed.
Monday 1 2	ON 15:00 --:--	OFF --:-- --:--	Wrong - No OFF time was scheduled. Each scheduled Freeplay time must have an ON time and an OFF time.
Monday 1 2	ON 10:00 11:00	OFF 10:30 11:30	Right - The proper times were entered and the schedule is complete.

3. Enter The Schedule

If you have not verified that Timed Freeplay is ON, go back to the previous topics and check the Freeplay status before you make or change the Freeplay Schedule.

- A. From the * SERVICE MODE * display, enter 58 to display Line 8 of the Pricing Menu. This line will show: FREE SCH SMTWTFS with the first "S" (Sunday) in the calendar blinking¹.
- B. Move the cursor to another day by pressing either RESET+2 or by pressing RESET+3.
- C. Move the cursor back to Monday and press POPULAR to view Monday's schedule.
- D. At this time the display shows MON-1 ON --:-- and the 1's digit of the hours field is blinking². The MON-1 on the display indicates that this schedule entry is the first Monday ON time. Enter the first Monday ON time hour from the sample schedule (see figure 2-12) by entering the ON time hour and then pressing POPULAR. Enter the minutes in the same way and then press POPULAR.
- E. To move to the first OFF time for Monday, press RESET+3, enter the OFF time, and press POPULAR.
- F. Press RESET+3 to advance to the second OFF time. Enter the OFF Time and then press POPULAR.
- G. Press RESET+9 to move back to the FREE SCH display.

4. Copy The Schedule

Now to program the phonograph for the rest of the week. You can copy the schedule that you just made into any/all of the remaining days of the week. To make the schedule for Tuesday through Friday the same as Monday:

- A. Move the cursor until the M for Monday is blinking.
- B. Press RESET+8 and the display will show: CPY MO -> S
- C. Press RESET+2 and RESET+3 until MTWTF appears on the display. MTWTF on the display indicates that Monday's schedule will be copied into the Monday through Friday schedules.
- D. Press POPULAR to perform the copy.

ENHANCED AUTOPLAY TUTORIAL

Autoplay

The Autoplay feature stimulates customer interest in the phonograph by periodically playing selections. The Autoplay feature is factory preset to STD and to play one track after the phonograph has been idle for 20 minutes. This feature may be programmed for any length of time between 0 and 255 minutes. Selections may be played in a specific sequence.

¹ Any blinking letter or number represents the "cursor", which is the pointer that indicates what information will be changed if you make an entry.

² A field is a space to enter or display numbers or letters.

Differences Between Standard And Enhanced Autoplay

Enhanced Autoplay lets you categorize the discs (for example: Popular, Country, Rock, etc.). Up to eight categories can be assigned and selected up to 20 different times of the day, each day of the week. Standard Autoplay cannot assign categories, has one ON/OFF time, and lets you select which days of the week Autoplay is active. Enhanced Autoplay programming is more involved, so Standard Autoplay should be used unless categories, multiple ON/OFF times, or different ON/OFF times for different days are needed.

SETTING UP ENHANCED AUTOPLAY

1. Set COMMAND 40, AUTOPLAY IS, to: ENH (COMMAND 41, DELAY, is not used in Enhanced Autoplay).
2. Set COMMAND 42, START TIME, to: 00:00 (this is the factory setting).
3. Set COMMAND 43, STOP TIME, to 23:59 (this is the factory setting).
4. Set COMMAND 44, ON DAYS, to SMTWTFS (this is the factory setting).
5. COMMAND 45, PROGRAMMED AUTOPLAY - Programming is optional. Use Programmed Autoplay only if you want to play specific selections or play discs in a specific order. If Programmed Autoplay is used, it plays only those selections and discs that are listed in the play list and the discs' categories are selected (the category must be active and the selection must be on the play list before the selection will play).

Enhanced Autoplay looks at the selected categories first, then determines which discs may be played. If one of the allowed category numbers matches a disc category number in the play list, that selection is played. When you use a play list, be sure that the programmed schedule (COMMAND 49) and the disc categories (COMMAND 48), and the Programmed Autoplay selections (discs) are properly assigned, or Enhanced Autoplay will not play the selections from the play list (see *Programming Autoplay, Premiums, Priorities, and Lockouts* for information on how to program the play list).



NOTE:

COMMAND 46, CLEAR PROGRAMMED, clears all programmed selections entered in COMMAND 45.

6. Set COMMAND 47, AUTOPLAY STATUS, to: ON.
7. COMMAND 48 and 49. See *Setting Up Enhanced Autoplay Schedules* on the following pages.

Setting Up Enhanced Autoplay Schedules (Commands 48 And 49)

Enhanced Autoplay provides up to 20 events each day of the week for a total of 140 events per week. Before you begin entering specifics for these events, some preliminary work must be done. If you take the time to do this work now, you will find that planning, entering, and changing the Autoplay schedule will be much easier.

The five major tasks to perform are:

1. Assigning a category number or numbers to each disc installed in the phonograph using the Disc Category List worksheet as shown in *figure 2-13*, and use the WorkSheet Masters at the end of this section for the actual masters.
2. Entering the disc category list into the phonograph.
3. Developing the Autoplay Event Schedule using the Autoplay Event Schedule Worksheet.
4. Entering the Autoplay Event Schedule into the phonograph.
5. Copy a schedule to the other days of the week.

FOLLOW STEPS 1 THROUGH 5 TO SETUP AN ENHANCED AUTOPLAY SCHEDULE

1. Set Up The Categories

Categories should be assigned if you want to take full advantage of Enhanced Autoplay's ability to select specific kinds of music.

Autoplay sees the eight categories as Category 1 through 8 (All 100 discs are assigned to Category 1 at the factory). To make setting up Autoplay easier, you should assign names to each category. We have supplied a general purpose form to help you assign category numbers and discs. A general purpose category assignment would look like *figure 2-13*.

Once you have decided what title to use for each category (you do not have to assign a name for each category if you do not have eight categories), you should determine the category (or categories) for each disc. *Figure 2-13* also shows a sample category list for a phonograph with 50 discs. Note that some discs fit into more than one category. This means that Autoplay can select these discs if any one of the categories is scheduled. You can assign a disc to all eight categories, but depending on the category titles, some category titles may exclude each other (it's not likely that a Country & Western disc would be assigned to Urban as well).

You can enter the categories as you look at the title pages on a CD-51A Phonograph.

Photocopy the Disc Category List at the back of this section and use the copy for a work sheet.

DISC CATEGORY LIST

Date 9-25-92Location JOE'S

Name each of the eight categories and then assign the discs to each category.

Category #	Category Name	Category #	Category Name
1	<u>POP MUSIC - TOP 40</u>	5	<u>URBAN</u>
2	<u>COUNTRY & WESTERN</u>	6	<u>OLDIES</u>
3	<u>EASY LISTENING</u>	7	<u>HEAVY METAL</u>
4	<u>JAZZ</u>	8	<u>BACKGROUND MUSIC</u>

Place an X on the category that you wish to assign to each disc.

00	X	2	3	4	5	6	7	8	50	1	2	3	4	5	6	7	8
01	X	2	3	4	5	6	7	8	51	1	2	3	4	5	6	7	8
02	X	2	3	4	5	6	7	8	52	1	2	3	4	5	6	7	8
03	X	2	3	4	5	6	7	8	53	1	2	3	4	5	6	7	8
04	X	2	3	4	5	6	7	8	54	1	2	3	4	5	6	7	8
05	X	2	3	4	5	6	7	8	55	1	2	3	4	5	6	7	8
06	X	2	X	4	5	6	7	8	56	1	2	3	4	5	6	7	8
07	X	2	3	4	5	6	7	8	57	1	2	3	4	5	6	7	8
08	X	2	3	4	5	6	7	8	58	1	2	3	4	5	6	7	8
09	X	2	3	4	5	6	7	8	59	1	2	3	4	5	6	7	8
10	X	2	3	4	5	6	7	8	60	1	2	3	4	5	6	7	8
11	X	2	3	4	5	6	7	8	61	1	2	3	4	5	6	7	8
12	X	2	3	4	5	6	X	8	62	1	2	3	4	5	6	7	8
13	X	2	3	4	5	6	7	8	63	1	2	3	4	5	6	7	8
14	X	2	3	4	5	6	7	8	64	1	2	3	4	5	6	7	8
15	X	2	3	4	5	6	7	8	65	1	2	3	4	5	6	7	8
16	X	2	3	4	5	6	7	8	66	1	2	3	4	5	6	7	8
17	X	2	3	4	5	6	7	8	67	1	2	3	4	5	6	7	8
18	X	2	3	4	5	6	7	8	68	1	2	3	4	5	6	7	8
19	X	2	3	4	5	6	7	8	69	1	2	3	4	5	6	7	8
20	1	2	3	4	5	6	7	8	70	1	2	3	4	5	6	7	8
21	1	2	3	4	5	6	7	8	71	1	2	3	4	5	6	7	8
22	1	2	3	4	5	6	7	8	72	1	2	3	4	5	6	7	8
23	1	2	3	4	5	6	7	8	73	1	2	3	4	5	6	7	8
24	1	2	3	4	5	6	7	8	74	1	2	3	4	5	6	7	8
25	1	2	3	4	5	6	7	8	75	1	2	3	4	5	6	7	8
26	1	2	3	4	5	6	7	8	76	1	2	3	4	5	6	7	8
27	1	2	3	4	5	6	7	8	77	1	2	3	4	5	6	7	8
28	1	2	3	4	5	6	7	8	78	1	2	3	4	5	6	7	8
29	1	X	3	4	5	6	7	8	79	1	2	3	4	5	6	7	8
30	1	X	3	4	5	6	7	8	80	1	2	3	4	5	6	7	8
31	1	X	3	4	5	6	7	8	81	1	2	3	4	5	6	7	8
32	1	X	3	4	5	6	7	8	82	1	2	3	4	5	6	7	8
33	1	X	3	4	5	6	7	8	83	1	2	3	4	5	6	7	8
34	1	X	3	4	5	6	7	8	84	1	2	3	4	5	6	7	8
35	1	X	3	4	5	6	7	8	85	1	2	3	4	5	6	7	8
36	1	X	3	4	5	6	7	8	86	1	2	3	4	5	6	7	8
37	1	2	X	4	5	6	7	8	87	1	2	3	4	5	6	7	8
38	1	2	X	4	5	6	7	8	88	1	2	3	4	5	6	7	8
39	1	2	X	4	5	6	7	8	89	1	2	3	4	5	6	7	8
40	1	2	X	4	5	6	7	8	90	1	2	3	4	5	6	7	8
41	1	2	X	4	5	6	7	8	91	1	2	3	4	5	6	7	8
42	1	2	X	4	5	6	7	8	92	1	2	3	4	5	6	7	8
43	1	2	X	4	5	6	7	8	93	1	2	3	4	5	6	7	8
44	1	2	3	4	X	6	7	8	94	1	2	3	4	5	6	7	8
45	1	2	3	4	X	6	7	8	95	1	2	3	4	5	6	7	8
46	1	2	3	4	X	6	7	8	96	1	2	3	4	5	6	7	8
47	1	2	3	4	X	6	7	8	97	1	2	3	4	5	6	7	8
48	1	2	3	4	X	6	7	8	98	1	2	3	4	5	6	7	8
49	1	2	3	4	X	6	7	8	99	1	2	3	4	5	6	7	8

Figure 2-13. Sample Disc Category List

2. Make The Category Entries

KEY FUNCTIONS

Some key combinations have slightly different meanings in the Autoplay menus. Table 2-6 shows what these key combinations do in the Schedule (display shows: SCHEDULE SMTWTFS) and in the Set Time (SU 01 TIME) modes.

Table 2-6. Key Functions

Key Combination	Function in SCHEDULE SMTWTFS	Function in SU 01 TIME
RESET+2	Moves the cursor to the left one day	Decrements the event number
RESET+3	Moves the cursor to the right one day	Increments the event number
RESET+4	No function	Deletes the current event and moves all events down one line
RESET+5	No function	Inserts a blank entry at this event number and pushes all other events up one line
RESET+6	No function	No function
RESET+7	No function	Toggles the negative sign in VOL1 and VOL2
RESET+8	Starts the copy function	No function
RESET+9	Enters the indicated day's program	Advances to the next programmable field
POPULAR	Enters the indicated day's program	Stores the displayed data in the displayed field

Use the DISC mode to enter a disc number. Switch to CATEGORY mode to change the categories assigned to the disc selected in the DISC mode.

- A. Enter the SERVICE mode.
- B. Enter 48 to access the Autoplay Category menu.

The display will initially show: =00 CAT 1-----

- The = sign to the left of the 00 indicates that the disc number will be changed (DISC mode) rather than changing the categories assigned (CATEGORY mode).
- The 00 indicates the disc number
- The 1----- indicates that disc 00 is only assigned to Category 1

USING RESET+9 IN THE CATEGORY MENU

RESET+9 toggles (switches) back and forth between DISC mode and CATEGORY mode.

DISC MODE

DISC mode (the = sign is ahead of the disc number) only allows you to change the disc number that is displayed. Use this mode to change the disc number easily. This mode is particularly useful if you are changing or checking categories for a wide range of disc numbers.

Example: You want to view the categories assigned to Discs 15, 45, and 87. If you enter 15, you will see the categories assigned to Disc 15. Enter 45 and you will see the categories assigned to Disc 45. Enter 87 and, you guessed it, the display shows the categories assigned to Disc 87.

In DISC mode, the following keys have these functions:

Key Combination	Function
RESET+2	Decrements the disc number by one disc
RESET+3	Increments the disc number by one disc
POPULAR	Changes to CATEGORY mode (not a toggle function)
Number Keys	Numbers entered become the new disc numbers. The new categories are displayed as each digit of the new disc number is entered

C. Select the disc number that you wish to assign categories.

CATEGORY MODE

CATEGORY mode (the = sign is ahead of the category numbers) allows you to change the category numbers assigned to a disc.

In CATEGORY mode, the following keys have these functions:

Key Combination	Function
RESET+2	Decrements the disc number by one disc
RESET+3	Increments the disc number by one disc
POPULAR	Saves any changes made to the category list and increments the disc number by one disc
Number Keys	Toggle the corresponding categories ON and OFF.

D. Press RESET+9 to switch to CATEGORY mode.

E. Enter the numbers (1 through 8) that correspond to the categories that you wish to assign to the disc. The number keys will alternately turn the category numbers ON and OFF.

3. Plan The Schedule

The schedule determines on which day and at what time of day that Autoplay categories are allowed to play (this is called an event).

If the phonograph has the optional volume control module installed, the schedule can adjust the phonograph's volume at the beginning of each event.

The schedule is composed of five parts (seven parts if you include the optional volume control feature). Each of these schedule parts are discussed in the paragraphs that follow.

DAY OF THE WEEK

The time and date are set at the factory (they can be changed if needed). The factory-set time is Eastern Standard Time.

The Central Control Computer (CCC) uses the time and initial date to determine the day of the week by using its own internal calendar.

If you wish, you may schedule all seven days of the week.

EVENT

An event is space in the schedule where a schedule change is made. Each of the days of the week can have up to 20 events scheduled.

TIME

You must supply a time in the schedule to start Enhanced Autoplay. This time is the exact time that you want Autoplay to be allowed to check for an idle phonograph. The actual first Autoplay selection will only play after the delay time (*see Delay*).

CATEGORIES

All, some, or none of the eight categories can be selected for each event. Select the category (or categories) that you want to have played when the phonograph makes an Autoplay selection. Autoplay will make its selection from the lowest selected category. If you supply a play list (play lists are discussed next), Autoplay will pick a play list selection that is in the selected category.

DELAY

Delay is the time that Autoplay waits to make a selection after the customer selection is played (is scanned out).

CHANNEL 1 AND CHANNEL 2 VOLUME (Optional)

VOL1 and VOL2 are single digit numbers (0 through 9 and -1 through -9) that cause the phonograph's volume to change in Channel 1 and in Channel 2. This volume change is relative to the volume set by the phonograph's volume control. A volume of 0 means use the phonograph volume control's volume setting. A setting of 1 means boost the volume slightly and a setting of -1 means reduce the volume slightly. A value of 9 is the maximum volume boost and a value of -9 is the maximum volume reduction.

Joe's B&G Schedule Example

Joe wants to have his phonograph make Enhanced Autoplay selections on Monday so that he will have background music from 1:30 pm to 5:30 pm. Then he wants to pick up the tempo and increase the phonograph's volume until 10:30, when he wants to "Go Country" until closing at 2:00 am.

As Joe fills out the schedule (figure 2-14), he decides to add a little variety to the afternoon schedule, so he adds Easy Listening (Category 3) and Jazz (Category 4) to his schedule. Note that Joe schedules Event 1 at closing time. This event shuts off Enhanced Autoplay until the next event with at least one selected category.

AUTOPLAY SCHEDULE					
Location <u>JOE'S</u>		Date <u>9/25/92</u>			
Fill in the Autoplay event times, delay times, categories, and volume changes before you make the actual scheduling changes.					
Day: <u>MON</u>					
Event	Time	Categories	Delay	Vol 1	Vol 2
1	<u>02:00</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>
2	<u>13:30</u>	<u>3, 4, 8</u>	<u>10</u>	<u>-3</u>	<u>-3</u>
3	<u>17:30</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>
4	<u>22:30</u>	<u>3</u>	<u>5</u>	<u>0</u>	<u>0</u>
5	<u> : </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
6	<u> : </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
7	<u> : </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Figure 2-14. Sample Autoplay Schedule

4. Make The Schedule Entries

OVERVIEW

Entering a schedule requires a total of five entries (seven if the volume control module is installed). Three of these entries (Day, Time, and Category Selection) must be scheduled to have Autoplay work properly. The remaining entries do not have to have specific entries to work.

Line 49

Day:

SCHEDULE SMTWTFS

(POPULAR)

Time:

MO 01 TIME --:--

(RESET+9)

Categories:

MO 01 TIME --:--

(RESET+9)

Delay:

MO 01 Delay 00

(RESET+9)

Figure 2-15. Steps To Make A Schedule

A. Event 1 - These steps describe how to enter Event 1 in the previous example (*figure 2-14*) and the flow through the steps is illustrated in *figure 2-15*.

- 1). Enter the SERVICE mode.
- 2). Enter 49 to access the Autoplay Schedule menu.

The display will initially show: SCHEDULE SMTWTFS

- 3). Use the RESET+2 and the RESET+3 keys to change the blinking letter until the "M" blinks and then press POPULAR to move to the SET TIME menu.
- 4). The display will show: MO 01 TIME [--:--] which is the TIME menu for EVENT 01.

You can change the event number by pressing RESET+2 to decrement the event number, or you can press RESET+3 to increment the event number. Make sure that the event number is EVENT 01 and then enter 02, which is the 24-hour time for 2 am. Press POPULAR to save the entry and advance to the minutes field.

- 5). Press POPULAR to save the entry. This completes the TIME entry for Event 01.

- 6). Press RESET+9 to advance to the CATEGORY SELECT menu.

The display will show: MO 01 [-----]. If the display does not show all dashes, type each number that appears in the display (this will toggle the category(s) OFF). When the display shows all dashes, press POPULAR to save the selection.

- 7). Press RESET+9 to advance to the DELAY menu.

The display will show: MO 01 DELAY 00.

The delay time doesn't matter because no categories are selected.

- 8). Press RESET+0 then go to Event 2. The display will show: =00 CAT 1-----.

B. Event 2

- 1). Press RESET+1 to access the Autoplay Schedule menu.

The display will initially show: SCHEDULE SMTWTFS

- 2). Press RESET+3 to move the blinking letter until the "M" blinks, hit POPULAR, then press RESET+3 to increase the event number to Event 02.

- 3). The display will show: MO 02 TIME --:-- which is the TIME menu for EVENT 02.

Enter 13, which is the 24-hour time for 1 pm. Press POPULAR to save the entry and advance to the minutes field.

- 4). Enter 30 and then press POPULAR to save the entry. This completes the TIME entry for Event 02.

- 5). Press RESET+9 to advance to the CATEGORY SELECT menu.

The display will show: MO 02 [-----].

Enter the numbers 3, 4, and 8 to have Autoplay select from discs in Categories 3, 4, and 8. Press POPULAR to save the selections.(or enter A1 for random array of all 100 discs).

- 6). Press RESET+9 to advance to the DELAY menu.

The display will show: MO 02 DELAY 00

Enter 10 to allow a ten minute delay before an Autoplay selection will be selected. Press POPULAR to save the entry.

The next four steps are only necessary if you have the volume control module installed in your phonograph.

- 7). Press RESET+9 to advance to the VOLUME CHANNEL 1 menu.

The display will show: MO 02 VOL CH1 0

Press RESET+7 to insert a minus sign in front of the 0.

- 8). Enter 3 to cause Channel 1 to play at a slightly reduced level when this event starts (at 1:30). Press POPULAR to save the entries.

Channel #1 Volume:

MO 02 VOL CH2 3

(RESET+9)¹

- 9). Press RESET+9 to advance to the VOLUME CHANNEL 2 menu.

The display will show: MO 02 VOL CH2 0

Press RESET+7 to insert a minus sign in front of the 0.

- 10). Enter 3 to cause Channel 2 to play at a slightly reduced level when this event starts (at 1:30). Press POPULAR to save the entries.

Channel #2 Volume:

MO 02 VOL CH2 3

(RESET+9)¹

Event 3

- 1). Press RESET+9 once to access the EVENT TIME menu.

The display will show: MO 02 TIME 13:30

- 2). Press RESET+3 to increase the event number to Event 03.
- 3). The display will show: MO 03 TIME --:-- which is the TIME menu for EVENT 03.

Enter 17, which is the 24-hour time for 5 pm. Press POPULAR to save the entry and advance to the minutes field.

- 4). Enter 30 and then press POPULAR to save the entry. This completes the TIME entry for Event 03.
- 5). Press RESET+9 to advance to the CATEGORY SELECT menu.

The display will show: MO 03 [-----]

Press 1 to make Category 1 active. Press POPULAR to save the entry.

- 6). Press RESET+9 to advance to the DELAY menu.

The display will show: MO 03 DELAY 00

¹ RESET+9 will "wrap" to the TIME display.

Enter 02 to allow a two minute delay before an Autoplay selection will be selected. Press POPULAR to save the entry.

The next four steps are only necessary if you have the volume control module installed in your phonograph.

- 7). Press RESET+9 to advance to the VOLUME CHANNEL 1 menu.
The display will show: MO 03 VOL CH1 0
- 8). Enter 3 to cause Channel 1 to play at a slightly increased level when this event starts (at 5:30). Press POPULAR to save the entries.

Channel #1 Volume:

MO 03 VOL CH1 3

(RESET+9)¹

- 9). Press RESET+9 to advance to the VOLUME CHANNEL 2 menu.
The display will show: MO 03 VOL CH2 0
- 10). Enter 3 to cause Channel 2 to play at a slightly increased level when this event starts (at 5:30). Press POPULAR to save the entries.

Channel #2 Volume:

MO 03 VOL CH2 3

(RESET+9)¹

Event 4

- 1). Press RESET+9 once to access the EVENT TIME menu.
The display will show: MO 03 TIME 17:30.
- 2). Press Press RESET+3 to increase the event number to Event 04.
- 3). The display will show: MO 04 TIME --:-- which is the TIME menu for EVENT 03.
Enter 22, which is the 24-hour time for 10 pm. Press POPULAR to save the entry and advance to the minutes field.
- 4). Enter 30 and then press POPULAR to save the entry. This completes the TIME entry for Event 04.
- 5). Press RESET+9 to advance to the CATEGORY SELECT menu.
The display will show: MO 04 [-----]
Enter 3 to have Autoplay select from discs in Category 3. Press POPULAR to save the selection.

¹ RESET+9 will "wrap" to the TIME display.

- 6). Press RESET+9 to advance to the DELAY menu.
The display will show: MO 04 DELAY 00

Enter 05 to allow a five minute delay before an Autoplay selection will be selected. Press POPULAR to save the entry.

- 7). The programming for Monday is now complete.
- 8). Press RESET+POPULAR until * SERVICE MODE * appears on the display.

5. Copy The Schedule

Now program the phonograph for the rest of the week! You can save a great deal of time if you copy the schedule that you just made into the remaining days of the week. To make the schedule for Tuesday through Friday the same as Monday (the Copy function is also helpful if the schedule for the other days is similar to the Monday schedule. Do a Copy and then revise the copied schedules):

- A. Enter 49 to access the AUTOPLAY SCHEDULE menu. Press RESET+3 to move the cursor until the M for Monday is blinking. This is the schedule that will be copied (FROM).
- B. Press RESET+8 and the display will show: CPY MO -> S
- C. Press RESET+2 or RESET+3 until MTWTF appears on the display. MTWTF on the display indicates that Monday's schedule will be copied TO the Monday through Friday schedules.
- D. Press POPULAR to perform the copy.
- E. Press RESET+POPULAR repeatedly until * SERVICE MODE * appears on the display.

Working Example Of Enhanced Autoplay

PAUL'S MOTEL

Paul, the owner, operator of Paul's Motel wants to play music in his bar and in the separate restaurant. Paul wants to have the music played everyday in the following format:

- Easy Listening for his breakfast crowd from 5:30 to 10:00 am with a one minute delay between Autoplay selections.
- Top 40 and oldies from 10:00 am to 4:00 pm with a fifteen minute delay between Autoplay selections.
- Specials (certain Top 40 discs) during happy hour from 4:00 to 6:00 pm with a five minute delay between Autoplay selections.
- Easy Listening and Background music for the dinner crowd with a 3 minute delay between Autoplay selections.
- All types of music from 9:00 pm to 3:00 am with a twenty minute delay between Autoplay selections.

To accomplish this format, Paul asked Jeff, his music operator to install a CD-51A in Paul's bar area. Jeff is now installing a 21639701 Background Music Volume Control Kit, and he will use Enhanced Autoplay to give the restaurant the exact music style that Paul desires.

Jeff installs the CD-51A and the background music volume control kit so that the restaurant speakers switch on the restaurant during the Autoplay selections.

HOW JEFF SET UP ENHANCED AUTOPLAY

1. Jeff reads the tutorial carefully and begins to install Enhanced Autoplay by planning his work first.
2. Jeff fills out the Disc Category List (*see figure 2-16*).

DISC CATEGORY LIST

Date 9-8-92

Location PAUL'S MOTEL

Name each of the eight categories and then assign the discs to each category.

Category #	Category Name	Category #	Category Name
1	<u>ALL DISC'S</u>	5	<u>URBAN</u>
2	<u>POP MUSIC - TOP 40</u>	6	<u>OLDIES</u>
3	<u>EASY LISTENING</u>	7	<u>COUNTRY - WESTERN</u>
4	<u>SPECIAL - HAPPY HOUR</u>	8	<u>BACKGROUND MUSIC</u>

Place an X on the category that you wish to assign to each disc.

00	1	X	3	X	5	6	7	8	50	1	2	3	4	5	6	7	8
01	1	2	X	4	5	6	7	8	51	1	2	3	4	5	6	7	8
02	1	X	3	4	5	6	7	8	52	1	2	X	4	5	6	7	8
03	1	X	3	4	5	6	7	8	53	1	2	X	4	5	6	7	8
04	1	X	3	X	5	6	7	8	54	1	2	3	4	5	6	7	8
05	1	X	3	X	5	6	7	8	55	1	2	3	4	5	6	7	8
06	1	X	X	4	5	6	7	X	56	1	2	3	4	5	6	7	8
07	1	X	3	4	5	6	7	8	57	1	2	3	4	5	6	7	8
08	1	X	3	X	5	6	7	8	58	1	2	3	4	5	6	7	8
09	1	X	3	X	5	6	7	8	59	1	2	3	4	5	6	7	8
10	1	X	3	4	5	6	7	8	60	1	2	X	4	5	6	7	8
11	1	2	X	4	5	6	7	8	61	1	2	3	4	5	6	7	8
12	1	X	3	X	5	6	X	8	62	1	2	X	4	5	6	7	8
13	1	X	3	4	5	6	7	8	63	1	2	3	4	5	6	7	8
14	1	2	X	4	5	6	7	8	64	1	2	3	4	5	6	7	8
15	1	X	3	4	5	6	7	8	65	1	2	3	4	5	6	7	8
16	1	X	3	X	5	6	7	8	66	1	2	X	4	5	6	7	8
17	1	X	3	4	5	6	7	8	67	1	2	3	4	5	6	7	8
18	1	2	3	4	5	6	7	X	68	1	2	3	4	5	6	7	8
19	1	2	3	4	5	6	7	8	69	1	2	X	4	5	6	7	8
20	1	2	3	4	5	6	7	8	70	1	2	3	4	5	6	7	8
21	1	2	3	4	5	X	7	8	71	1	2	X	4	5	6	7	8
22	1	2	3	4	5	X	7	8	72	1	2	X	4	5	6	7	8
23	1	X	3	X	5	X	7	X	73	1	2	3	4	5	6	7	8
24	1	2	3	4	5	X	7	8	74	1	2	3	4	5	6	7	8
25	1	2	3	X	5	X	7	8	75	1	2	3	4	5	6	7	8
26	1	2	3	4	5	X	7	8	76	1	2	3	4	5	6	7	8
27	1	2	3	4	5	X	7	8	77	1	2	3	4	5	6	7	8
28	1	2	3	X	5	X	7	X	78	1	2	3	4	5	6	7	8
29	1	X	3	4	5	6	7	8	79	1	2	3	4	5	6	7	8
30	1	X	X	4	5	6	7	8	80	1	2	X	4	5	6	7	8
31	1	X	X	4	5	6	7	8	81	1	2	3	4	5	6	7	8
32	1	X	3	4	5	6	7	8	82	1	2	3	4	5	6	7	8
33	1	X	3	4	5	6	7	8	83	1	2	3	4	5	6	7	8
34	1	X	3	4	5	6	7	8	84	1	2	3	4	5	6	7	X
35	1	X	3	4	5	6	7	8	85	1	2	X	4	5	6	7	8
36	1	X	X	4	5	6	7	8	86	1	2	3	4	5	6	7	8
37	1	2	X	4	5	6	7	8	87	1	2	3	4	5	6	7	8
38	1	2	X	4	5	6	7	X	88	1	2	X	4	5	6	7	8
39	1	2	X	4	5	6	7	8	89	1	2	3	4	5	6	7	8
40	1	2	X	4	5	6	7	8	90	1	2	3	4	5	6	7	8
41	1	2	X	4	5	6	7	X	91	1	2	3	4	5	6	7	8
42	1	2	X	4	5	6	7	8	92	1	2	3	4	5	6	7	8
43	1	2	X	4	5	6	7	8	93	1	2	3	4	5	6	7	X
44	1	2	3	4	X	6	7	8	94	1	2	3	4	5	6	7	8
45	1	2	3	4	X	6	7	8	95	1	2	3	4	5	6	7	8
46	1	2	X	4	X	6	7	8	96	1	2	3	4	5	6	7	8
47	1	2	3	4	X	6	7	8	97	1	2	3	4	5	6	7	8
48	1	2	3	4	X	6	7	8	98	1	2	3	4	5	6	7	X
49	1	2	3	4	X	6	7	8	99	1	2	3	4	5	6	7	8

Figure 2-16. Sample Disc Category List

3. Jeff then enters the information shown in *figure 2-16* in the following sequence:

- A. Jeff enters the SERVICE mode. The list that follows shows what keys he presses and displays what he sees after he presses the keys.
- B. The Steps:

Step #	Keystroke	Display
1	COMMAND 40	AUTOPLAY IS STD
2	RESET+9	AUTOPLAY IS ENH
3	POPULAR	
4	RESET+POPULAR	* AUTOPLAY *
5	RESET+POPULAR	SERVICE MODE
6	COMMAND 48	=00 CAT 1-----
7	RESET+9	00 CAT=1-----
8	Press Key 2, Press Key 4	00 CAT=12-4----
9	POPULAR	01 CAT=1-----
10	Press Key 3	01 CAT=1-3-----
11	POPULAR	02 CAT=1-----

Jeff repeats Steps 9, 10, and 11 to assign all discs according to the Disc Category List. In Step 10, he presses the necessary keys (1-8) to delete (unassigned categories display as a dash) and assign (assigned categories display as the category number) the categories. When he finishes, Jeff will have assigned categories to 38 of the 100 discs possible (some discs will have been assigned to multiple categories).

Note that the factory has assigned all discs to Category 1, and Jeff may choose to turn Category OFF while he assigns categories (In *figure 2-16*, Category 1 is not marked with any "X"s because the factory has already assigned Category 1 to all discs).

- C. Next, Jeff fills out the Autoplay Schedule according to Paul's schedule (see *figure 2-17*).

AUTOPLAY SCHEDULE

Location PAUL'S MOTELDate 9-8-92

Fill in the Autoplay event times, delay times, categories, and volume changes before you make the actual scheduling changes.

Day: SMTWTFS

Event	Time	Categories	Delay	Vol 1	Vol 2
1	<u>03:00</u>	<u>---</u>	<u>02</u>	<u>0</u>	<u>0</u>
2	<u>05:30</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>0</u>
3	<u>10:00</u>	<u>2, 6</u>	<u>15</u>	<u>0</u>	<u>0</u>
4	<u>16:00</u>	<u>4</u>	<u>5</u>	<u>0</u>	<u>0</u>
5	<u>18:00</u>	<u>3, 8</u>	<u>3</u>	<u>0</u>	<u>0</u>
6	<u>21:00</u>	<u>ALL</u>	<u>20</u>	<u>0</u>	<u>0</u>

Figure 2-17. Sample Autoplay Schedule

- D. Jeff now enters the SERVICE mode and begins to make the entries.
The steps are:

Step #	Keystroke	Display
1	COMMAND 49	SCHEDULE SMTWTFS
2	POPULAR	SU 01 TIME --:--
3	Press Keys 0, 3, POPULAR, POPULAR	SU 01 TIME 03:00
4	RESET+9, POPULAR	[-----]
5	RESET+9	SU 01 DELAY 00
6	Press Keys 0, 2, POPULAR	SU 01 DELAY 02
7	RESET+9 (THREE TIMES)	SU 01 TIME 03:00
8	RESET+3	SU 02 TIME --:--
9	Press Keys 05, POPULAR, 30, POPULAR	SU 02 TIME 05:30
10	Press RESET+9	SU 02 [-----]
11	Press Keys 3, POPULAR	SU 02 [--3-----]
12	Press RESET+9	SU 02 DELAY 00

Step #	Keystroke	Display
13	Press Keys 1, POPULAR	SU 02 DELAY 01
14	Press RESET+9 (three times)	SU 02 TIME 05:30
15	Press RESET+3	SU 03 TIME --:--
16	Press Key 10, POPULAR, POPULAR	SU 03 TIME 10:00
17	Press RESET+9	SU 03 [-----]
18	Press Keys 2, 6, and then POPULAR	SU 03 [-2---6--]
19	Press RESET+9	SU 03 DELAY 00
20	Press 1, 5, POPULAR	SU 03 DELAY 15
21	Press RESET+9 (three times)	SU 03 TIME 10:00
22	Press RESET+3	SU 04 TIME --:--
23	Press Key 1, 6, POPULAR, POPULAR	SU 04 TIME 16:00
24	Press RESET+9	SU 04 [-----]
25	Press Keys 4, POPULAR	SU 04 [---4----
26	Press RESET+9	SU 04 DELAY 00
27	Press 0, 5, POPULAR	SU 04 DELAY 05
28	Press RESET+9 (three times)	SU 04 TIME 16:00
29	Press RESET+3	SU 05 TIME --:--
30	Press Keys 1, 8, POPULAR, POPULAR	SU 05 TIME 18:00
31	Press RESET+9	SU 05 [-----]
32	Press Keys 3, 8, then POPULAR	SU 05 [--3----8]
33	Press RESET+9	SU 05 DELAY 00
34	Press 3 then POPULAR	SU 05 DELAY 03
35	Press RESET+9 (three times)	SU 05 TIME 18:00
36	Press RESET+3	SU 06 TIME --:--
37	Press Keys 2, 1, POPULAR, POPULAR	SU 06 TIME 21:00
38	Press RESET+9	SU 06 [-----]
39	Press Keys 1 through 8, then POPULAR	SU 06 [12345678]

Step #	Keystroke	Display
40	Press RESET+9	SU 06 DELAY 00
41	Press 2, 0, then POPULAR	SU 06 DELAY 20
42	Press RESET+9 (three times)	SU 06 TIME 21:00
43	Press RESET+POPULAR twice)	SERVICE MODE
44	Press Keys 4, 9	SCHEDULE SMTWTFS
45	Press RESET+8	CPY SU-> S
46	Press RESET+2 (twice)	CPY SU-> SMTWTFS
47	Press POPULAR	SCHEDULE SMTWTFS

Worksheet Masters



On the following pages you will find blank worksheet masters for *Multiple Free Play On/Off Times*, the *Disc Category List*, and the *Autoplay Schedule*.

Carefully remove these masters from this manual and copy them freely for your use. Note that extra room has been left on the left hand margin of each sheet so that it may be hole-punched and kept in a binder for future reference.



DISC CATEGORY LIST

Date _____

Location _____

Name each of the eight categories and then assign the discs to each category.

Category #	Category Name	Category #	Category Name
1	_____	5	_____
2	_____	6	_____
3	_____	7	_____
4	_____	8	_____

Place an X on the category that you wish to assign to each disc.

00	1	2	3	4	5	6	7	8	50	1	2	3	4	5	6	7	8
01	1	2	3	4	5	6	7	8	51	1	2	3	4	5	6	7	8
02	1	2	3	4	5	6	7	8	52	1	2	3	4	5	6	7	8
03	1	2	3	4	5	6	7	8	53	1	2	3	4	5	6	7	8
04	1	2	3	4	5	6	7	8	54	1	2	3	4	5	6	7	8
05	1	2	3	4	5	6	7	8	55	1	2	3	4	5	6	7	8
06	1	2	3	4	5	6	7	8	56	1	2	3	4	5	6	7	8
07	1	2	3	4	5	6	7	8	57	1	2	3	4	5	6	7	8
08	1	2	3	4	5	6	7	8	58	1	2	3	4	5	6	7	8
09	1	2	3	4	5	6	7	8	59	1	2	3	4	5	6	7	8
10	1	2	3	4	5	6	7	8	60	1	2	3	4	5	6	7	8
11	1	2	3	4	5	6	7	8	61	1	2	3	4	5	6	7	8
12	1	2	3	4	5	6	7	8	62	1	2	3	4	5	6	7	8
13	1	2	3	4	5	6	7	8	63	1	2	3	4	5	6	7	8
14	1	2	3	4	5	6	7	8	64	1	2	3	4	5	6	7	8
15	1	2	3	4	5	6	7	8	65	1	2	3	4	5	6	7	8
16	1	2	3	4	5	6	7	8	66	1	2	3	4	5	6	7	8
17	1	2	3	4	5	6	7	8	67	1	2	3	4	5	6	7	8
18	1	2	3	4	5	6	7	8	68	1	2	3	4	5	6	7	8
19	1	2	3	4	5	6	7	8	69	1	2	3	4	5	6	7	8
20	1	2	3	4	5	6	7	8	70	1	2	3	4	5	6	7	8
21	1	2	3	4	5	6	7	8	71	1	2	3	4	5	6	7	8
22	1	2	3	4	5	6	7	8	72	1	2	3	4	5	6	7	8
23	1	2	3	4	5	6	7	8	73	1	2	3	4	5	6	7	8
24	1	2	3	4	5	6	7	8	74	1	2	3	4	5	6	7	8
25	1	2	3	4	5	6	7	8	75	1	2	3	4	5	6	7	8
26	1	2	3	4	5	6	7	8	76	1	2	3	4	5	6	7	8
27	1	2	3	4	5	6	7	8	77	1	2	3	4	5	6	7	8
28	1	2	3	4	5	6	7	8	78	1	2	3	4	5	6	7	8
29	1	2	3	4	5	6	7	8	79	1	2	3	4	5	6	7	8
30	1	2	3	4	5	6	7	8	80	1	2	3	4	5	6	7	8
31	1	2	3	4	5	6	7	8	81	1	2	3	4	5	6	7	8
32	1	2	3	4	5	6	7	8	82	1	2	3	4	5	6	7	8
33	1	2	3	4	5	6	7	8	83	1	2	3	4	5	6	7	8
34	1	2	3	4	5	6	7	8	84	1	2	3	4	5	6	7	8
35	1	2	3	4	5	6	7	8	85	1	2	3	4	5	6	7	8
36	1	2	3	4	5	6	7	8	86	1	2	3	4	5	6	7	8
37	1	2	3	4	5	6	7	8	87	1	2	3	4	5	6	7	8
38	1	2	3	4	5	6	7	8	88	1	2	3	4	5	6	7	8
39	1	2	3	4	5	6	7	8	89	1	2	3	4	5	6	7	8
40	1	2	3	4	5	6	7	8	90	1	2	3	4	5	6	7	8
41	1	2	3	4	5	6	7	8	91	1	2	3	4	5	6	7	8
42	1	2	3	4	5	6	7	8	92	1	2	3	4	5	6	7	8
43	1	2	3	4	5	6	7	8	93	1	2	3	4	5	6	7	8
44	1	2	3	4	5	6	7	8	94	1	2	3	4	5	6	7	8
45	1	2	3	4	5	6	7	8	95	1	2	3	4	5	6	7	8
46	1	2	3	4	5	6	7	8	96	1	2	3	4	5	6	7	8
47	1	2	3	4	5	6	7	8	97	1	2	3	4	5	6	7	8
48	1	2	3	4	5	6	7	8	98	1	2	3	4	5	6	7	8
49	1	2	3	4	5	6	7	8	99	1	2	3	4	5	6	7	8

MULTIPLE FREE PLAY ON/OFF TIMES

Fill in the START times, STOP times, and the COMMENTS before you make the actual scheduling changes.

Sunday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Monday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Tuesday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Wednesday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Thursday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Friday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

Saturday	On	Off	Comment
1	____ : ____	____ : ____	_____
2	____ : ____	____ : ____	_____
3	____ : ____	____ : ____	_____

AUTOPLAY EVENT SCHEDULE

Location _____

Date _____

Fill in the Autoplay event times, delay times, categories, and volume changes before you make the actual scheduling changes.

Day: _____

Event	Time	Categories	Delay	Vol 1	Vol 2
1	_____ : _____	_____	_____	_____	_____
2	_____ : _____	_____	_____	_____	_____
3	_____ : _____	_____	_____	_____	_____
4	_____ : _____	_____	_____	_____	_____
5	_____ : _____	_____	_____	_____	_____
6	_____ : _____	_____	_____	_____	_____
7	_____ : _____	_____	_____	_____	_____
8	_____ : _____	_____	_____	_____	_____
9	_____ : _____	_____	_____	_____	_____
10	_____ : _____	_____	_____	_____	_____
11	_____ : _____	_____	_____	_____	_____
12	_____ : _____	_____	_____	_____	_____
13	_____ : _____	_____	_____	_____	_____
14	_____ : _____	_____	_____	_____	_____
15	_____ : _____	_____	_____	_____	_____
16	_____ : _____	_____	_____	_____	_____
17	_____ : _____	_____	_____	_____	_____
18	_____ : _____	_____	_____	_____	_____
19	_____ : _____	_____	_____	_____	_____
20	_____ : _____	_____	_____	_____	_____

SERIAL # _____

LOCATION _____

**ROWE
CD PHONO
OPERATOR'S SET-UP SHEET**

SUGGESTION: Record any changes on this log and keep for future reference.

INSTRUCTIONS -

1. Items in parentheses do not appear on the digital display.
2. Customer fills in blanks where program differs from factory settings.

MENU COMMAND	MENU NAME	FACTORY SETTINGS	OPERATOR CHANGES
* SECURITY *			
02	LVL 2 CODE	0000	_____
03	LVL 3 CODE	0000	_____
04	PHONO ID	0000	_____
05	VOID SRVC SW (ON/OFF)	OFF	_____
06	SECURITY IS (ON/OFF)	OFF	_____
* ATTRACT *			
20	ATTRACT MODE (ON/OFF)	ON	_____
21	PAGE MODE (AD/OFF/CHG)	AD	_____
22	CHANGE TIME (# MINUTES)	10	_____
23	DISPLAY PAGE (PAGE #)	1	_____
24	PAGE IN - OUT (1 - 9)	IN-1 OUT-9	IN _____ OUT _____
25	SPEED ON - SRV (1 - 9)	ON-4 SRV-6	ON _____ SRV _____
* INITIALIZE *			
35	SKIP LOG	05	_____
36	SKIP CANCEL	99	_____
37	TIME CANCEL	99	_____
38	TIME ¹	EASTERN STD.	_____ : _____
39	DATE ²		_____ : _____
* AUTO PLAY *³			
40	AUTO PLAY IS (STD/ENH/OFF)	STD	_____
41	DELAY TIME (# MINUTES)	20	_____
42	START TIME (TIME OF DAY)	00:00	_____
43	STOP TIME (TIME OF DAY)	23:59	_____
44	ON DAYS	SMTWTFS	_____
45	PROGRAM	00 _____	00 _____ 01 _____ 02 _____ 03 _____
47	APLAY STATUS (ON/OFF)	ON	_____
48	(ENH APLAY)	=00 CAT 1.....	_____
49	SCHEDULE	SMTWTFS	_____
* PRICING *			
53	MULTIPLIER	5	_____
54	TIMED FPLAY (ON/OFF)	OFF	_____
55	FPLAY STATUS (ON/OFF)	OFF	_____
58	FREE SCH ⁴	SMTWTFS	_____
59	C O U N T R Y (US/UK/AUSTRA/CANADA)	= US	_____
* COIN SW VALUES *			
501	COIN SW 1	1	_____
502	COIN SW 2	2	_____
503	COIN SW 3	5	_____
504	COIN SW 4	10	_____
505	BILL 1	20	_____
506	BILL 2	100	_____
* PRICE LEVELS *			
511	LVL 1 PRICE	100	_____
512	LVL 2 PRICE	200	_____
513	LVL 3 PRICE	500	_____
514	LVL 4 PRICE	0	_____
515	LVL 5 PRICE	0	_____
* PLAY @ LEVELS *			
521	LVL 1 PLAYS	3	_____
522	LVL 2 PLAYS	7	_____
523	LVL 3 PLAYS	18	_____
524	LVL 4 PLAYS	0	_____
525	LVL 5 PLAYS	0	_____

MENU COMMAND	MENU NAME	FACTORY SETTINGS	OPERATOR CHANGES
* OPTIONS *			
60	LOCKOUTS (50 MAX) ⁵	00 _____	00 _____ 01 _____ 02 _____ 03 _____
61	PRIORITY (10 MAX) ⁵	00 _____	00 _____ 01 _____ 02 _____ 03 _____
62	PREMIUMS (25 MAX) ⁵	00 _____	00 _____ 01 _____ 02 _____ 03 _____
63	KEEP CREDIT (ON/OFF)	ON	_____
64	KEEP MONEY (ON/OFF)	ON	_____
65	ALBUM SELECT (ON/OFF)	ON	_____
66	PRIORITY PLY (ON/OFF)	ON	_____
67	TRKS IN A ROW	2	_____
68	4 HOUR CLEAR (ON/OFF)	ON	_____
* MORE OPTIONS 1*			
690	PAID PLAY (FIFO/RAND)	FIFO	_____
691	FREE PLAY (RAND/FIFO)	RAND	_____
692	CLEAR TIME	240	_____
693	LOCKOUT COUNT	99	_____
694	PLAY LIMIT	0	_____
695	CANCEL APLAY (ON/OFF)	OFF	_____
696	AP ONLY (25 MAX) ⁵	00 _____	00 _____ 01 _____ 02 _____ 03 _____
697	DAYLIT (STD/NONSTD/OFF) DAYLIT ON (ONLY FOR NON STD) DAYLIT OFF (ONLY FOR NON STD)	STD	_____
698	AUTOMAT CLR (ON/OFF)	ON	_____
* MORE OPTIONS 2*			
6990	TIM LOCK (25 MAX) ⁵	00 _____	00 _____ 01 _____ 02 _____ 03 _____
6991	LOCK SCH ⁴	SMTWTFS	_____
6992	FREE ALBUM ON/OFF	OFF	_____
6993	"THANK YOU" ON/OFF	ON	_____
* REPORTS *			
78	BAUD RATE (600/1200/2400/4800/9600)	2400	_____
	CR MS DELAY	0	_____
* RF REMOTE *			
91	RMT SELECT (ON/OFF/ICD/XCD)	OFF	_____
92	RMT CREDIT	0	_____
93	RMT PAUSE (ON/OFF)	OFF	_____
94	PAUSE TIME	90	_____
95	RMT APLY OVR (ON/OFF)	OFF	_____
96	RMT RELOAD (0)	0	_____
97	AP VOLUME (OFF/SEPARATE/LOCKED)	OFF	_____

¹ Time shows current time of day

² Date shows current month/day/year

³ See Enhanced Autoplay Tutorial

⁴ See Timed Free Play and Timed Lockout Scheduling Tutorial

⁵ See Programming Autoplay, Premium, Priorities, and Lockouts

Section 3: Routine Service

INTRODUCTION

Routine and preventive maintenance are to be performed on your normal periodic service call. This section discusses how to change discs and titles, how to collect money, audit statistics, and preventive maintenance procedures.

LIFTING THE TITLE RACK



CAUTION:

Do not attempt to turn the CD title pages by hand. Use the handwheel on the back of the title rack (*see figure 1-2*).

Before you begin changing discs, you may wish to lift the title rack to give yourself more room to work. Lift the title rack as follows:

1. Open the phonograph top door.
2. Lift the bottom of the title rack up and toward you with your right hand.
3. With your left hand, swing the title rack service bracket out to hold the title rack up.

DOING AN AUDIT

The following pages describe how to:

1. Access the phonograph's audit menus and extract audit figures
2. Change title strips and discs
3. Collect money

You can perform these three activities in any order that you wish.

COLLECTING AUDIT FIGURES

The pages that follow describe the major auditing activities that need to be done on a routine service call. If you wish to do additional auditing, you can obtain the additional commands from *table 3-1*, the AUDIT commands.

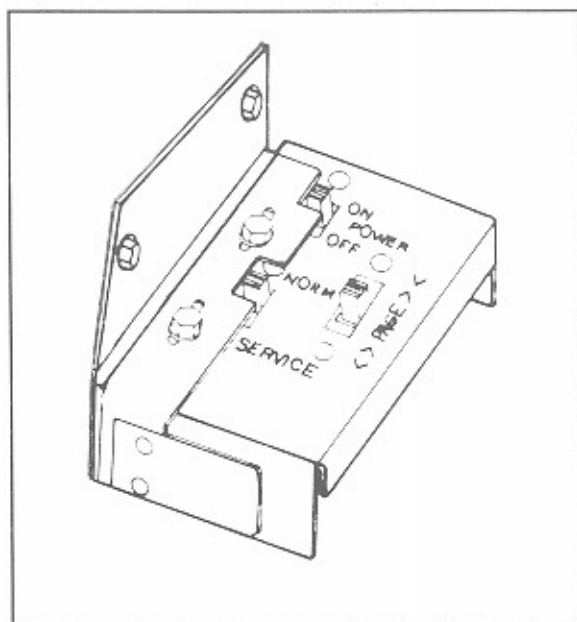


Figure 3-2. Service Switch

Entering The Service Mode

1. Open the top door and place the SERVICE switch (*figure 3-2*) in the SERVICE position. The phonograph display will say * SERVICE MODE *.



NOTE:

If you find that you are not seeing the display that you expect, you can always: press and hold RESET and then press POPULAR three times. This will take you back to the main menu.

At this point you can begin doing the audits. Refer to the *CD Series Service Mode Map (figure 2-11)* for a diagram of the audit menus and commands. Do audits for cash, play, non-resettables, clear disc popularity, clear cash, clear plays in the following manner:

Cash Audits

1. Type 100. This displays the CURRENT CASH value. Record the CURRENT CASH figure in your usual way and go to the next step.
2. Press and hold RESET and then press 1. This will move you down to the next display. Record the CASH VALUE in the usual way.
3. Repeat Step 2 until you do the last CASH audit, which is the #2 BILLS audit. Do this audit and then press and hold RESET while you press POPULAR three times.

Play Audits

1. Type 110. This displays the FREE CREDITS value. Record the FREE CREDITS figure in your usual way and go to the next step.
2. Press and hold RESET and then press 1. This will move you down to the next display. Record the credit value in the usual way.
3. Repeat Step 2 until you do the last PLAY audit, which is the OVERPLAY audit. Do this audit and then press and hold RESET while you press POPULAR three times.

Non-Resettable Audits

1. Type 120. This displays the NON-RESETTABLE CASH value. Record the NON-RESETTABLE CASH value in your usual way and go to the next step.
2. Press and hold RESET and then press 1. This will move you down to the next display. Record the value in the usual way.
3. Repeat Step 2 until you do the last NON-RESETTABLE audit, which is the SELS audit. Do this audit and then press and hold RESET while you press POPULAR three times. This returns you to the main menu.

Most Popular Disc

1. Type 17. The most popular disc number will be displayed.
2. If you wish to know the next-to-the-most popular, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive "Most Popular" disc. Press and hold RESET and then press 2 to move through the popularity display toward the most popular disc.
3. Press and hold RESET while you press POPULAR twice. This returns you to the main menu.

Least Popular Disc

1. Type 18. The least popular disc will be displayed.
2. To display the next "Least Popular" disc, press and hold RESET and then press 2. Press and hold RESET and then press 2 to display each successive least popular disc. Press and hold RESET and then press 3 to move through the popularity display toward the least popular disc.
3. Press and hold RESET while you press POPULAR twice. This returns you to the main menu.

Most Popular Selection

1. Type 19. The most popular selection number will be displayed.
2. To display the next most popular selection, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive most popular selection. Press and hold RESET and then press 2 to move through the popularity display toward the most popular selection.

You can request the popularity for a particular selection by pressing the selection number (four digits).

Clearing The Audit Values

The three CLEAR options will not clear the corresponding audit value until the POPULAR button is pressed.

For example:

You can display the CLEAR CASH message and then move to CLEAR PLAYS and then move back to CLEAR CASH without actually clearing either set of values.

The following steps describe how to perform each of the three CLEAR commands as a separate activity. If you wish to use the "short cut" method, *follow the Using The CD-51A Commands instructions in Section 2*. Each of these commands may be executed from SECURITY LEVEL 2 or 3.

CLEAR CASH

1. Make sure that you are in the SERVICE mode and that * SERVICE MODE * is on the display.
2. Type 14. The message CLEAR CASH will appear on the display. Press POPULAR to clear the cash values. The display will blink when the command is executed.
3. Press and hold RESET while you press POPULAR twice.

CLEAR PLAYS

1. Make sure that you are in the SERVICE mode and that * SERVICE MODE * is on the display.
2. Type 15. The message CLEAR PLAYS will appear on the display. Press POPULAR to clear the play values. The display will blink when the command is executed.
3. Press and hold RESET while you press POPULAR twice.

CLEAR SELECTION POPULARITY

1. Make sure that you are in the SERVICE mode and that * SERVICE MODE * is on the display.
2. Type 16. The message CLEAR SEL POP will appear on the display. Press POPULAR to clear the popularity values. The display will blink when the command is executed.
3. Press and hold RESET while you press POPULAR twice.

CHANGING CD'S AND TITLES

**NOTE:**

Do not attempt to turn the CD title pages by hand. Use the handwheel on the back of the title rack (see figure 1-2).

The procedure for loading CD's and titles into an empty phonograph is different from the procedure to change CD's and titles. Please make sure that you are following the procedure that describes your situation.

Preparing Titles For The Title Rack

1. If your titles have not been shipped with the discs or pre-printed, you will need to prepare the title strips yourself.
2. Tear each title strip from the title sheet so that the two perforated columns appear on the side of the title strip (the shaded portion of the title strip in figure 3-3 represents a title strip that has been removed from the title sheet).

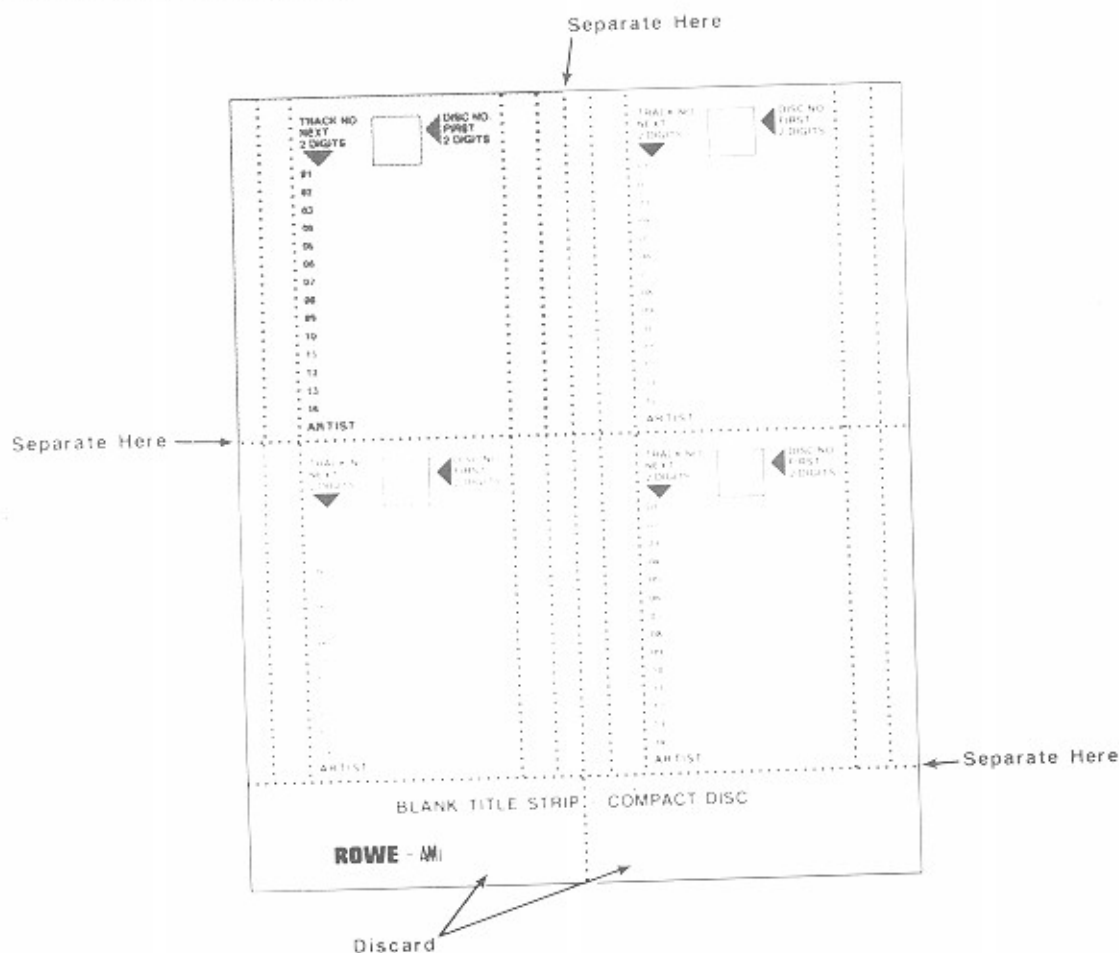


Figure 3-3. Blank Title Sheet

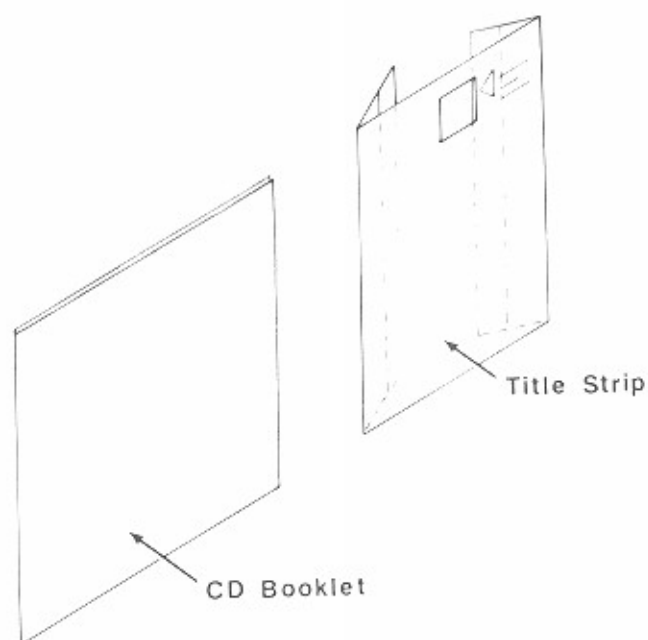


Figure 3-4. Folding The Title Strip

3. Fold the title strip along the inner most perforated line on both sides of the title strip (see figure 3-4).
4. Locate the CD album booklet that matches the title strip that you have just made. If the CD booklet is more than two sheets thick, remove the inner sheets so that the booklet is no thicker than two title strips.
5. Insert the CD booklet under the top and bottom tabs of the title rack. Slide the CD booklet toward the pivot of the title rack until the booklet is trapped by the molded stops on the title page (see figure 3-5, ref A).
6. Insert the folded title strip under the top and bottom tabs of the title rack. Slide the title strip until the disc number shows in the opening of the title strip and the title strip is locked in place by the molded stops (see figure 3-5, ref B).
7. All of the tabs surrounding the CD booklet and title strip should be holding them in place. If you missed a tab, carefully tuck the loose paper under the tab as shown in figure 3-5, ref C.
8. Repeat steps 4 through 7 until all titles are installed. Use the CHANGE PAGE buttons to change title rack pages. Insert filler title strips (Part Number 30940601) to fill out any unused space left on a page. Insert these in the same way that you installed the fill-in title strips.

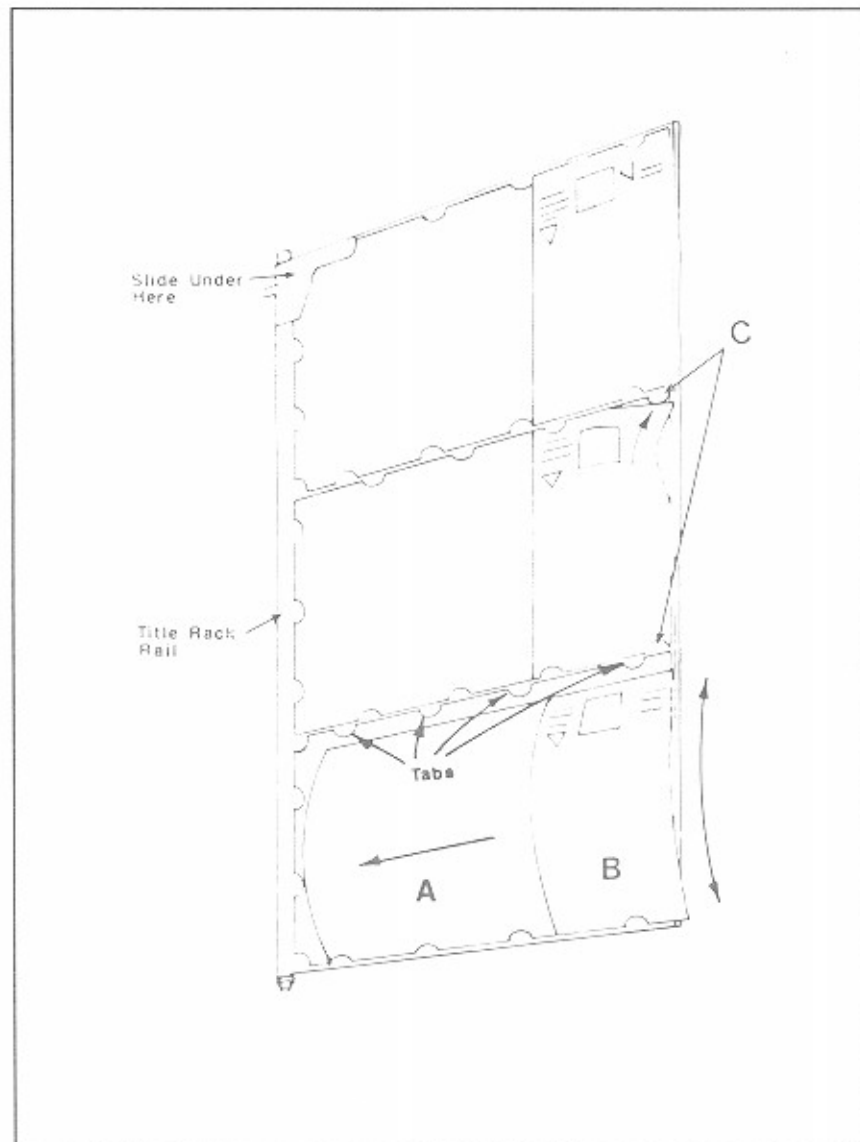


Figure 3-5. Loading the Title Rack
(Right-Hand Page)

Changing Title Page Limits On An Installed Phonograph

1. Unlock and open the top door, if you have not already.
2. Move the SERVICE switch to the SERVICE position, if not already done (*refer to figure 3-2*).
3. Make sure that * SERVICE MODE * appears on the display.
4. Type 24 and you will see the display for entering the first page number to use and the last number to use. Type the first page number (page numbers are counted from the left to the right) and press POPULAR. Notice that the blinking number has moved to the right. Type the last page number to be used and press POPULAR.

Changing Discs

You can (1) initialize each disc as you change it, or (2) you can write down all of the disc numbers and then type them all into the INITIALIZE command. The following steps describes the second method.

Change discs as follows:

1. Unlock and open the top door, if not already done.
2. Move the SERVICE switch to the SERVICE position, if not already done (refer to figure 3-2).
3. Press the SCAN button to move the disc space to the left or right of the transfer arm.
4. Slide the old CD out of the slot and slide the new CD into the slot (see figure 3-6) with the label to the right. Write the disc number on a note pad.

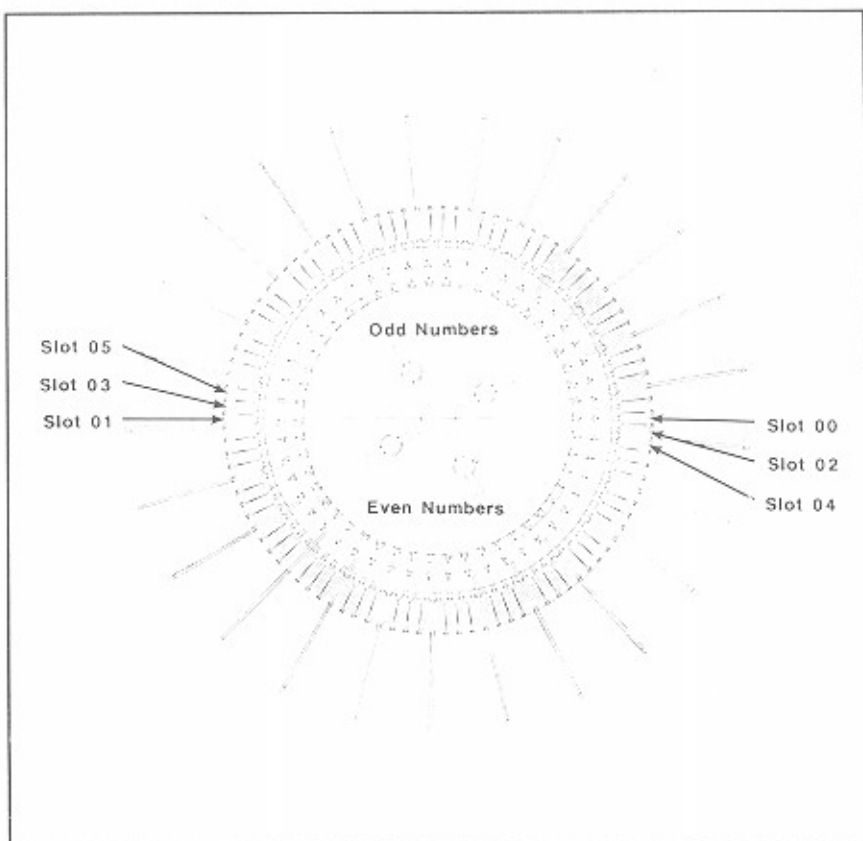


Figure 3-6. Loading The Molded CD Magazine

Note that disc positions in the molded CD magazine are identified by numbers at every other slot, with even numbered slots labeled on one half of the magazine, and odd numbered slots labeled on the other half.

For example, on the even numbered half of the magazine, slots 00, 04, and 08 are labeled, and the slots in between - 02 and 06 - are not, as illustrated in figure 3-6.



NOTE:

When loading the magazine, be sure that the disc rests in the same numbered slot in both the front and rear of the magazine.

Be sure to keep the magazine disc load approximately balanced. If the magazine is partially loaded with all discs on one side, The sprag wheel may lock and the magazine will not turn.

5. Repeat step 4 until all discs have been changed.
6. Make sure that you have placed the SERVICE switch in the SERVICE mode and that * SERVICE MODE * is on the keyboard display.
7. Type 31 and the display will show PROGRAM INIT - -. Enter the CD numbers that you have changed and press POPULAR after each number. After you have entered all of the disc numbers, place the phonograph into the NORMAL mode and the initialization process will start. Selections can be made while the new discs are being initialized.

COMPLETE AUDIT COMMAND LIST

Table 3-1 is a complete list of the Audit commands with an explanation of what each command does.

Table 3-1. Audit Commands

Command	Description
1	AUDITS - Are the functions and menus that allow you to display and reset the various accumulated figures for money, popularity, number of plays, and credits.
10	Cash Audits - Is the menu that allows you to display, but not change, cash totals, number of coins through the coin switches, and the total number of bills.
11	Play Audits - Is the menu that allows you to display, but not change, credits, autoplays, mechanism plays, and album plays.
12	Non-Resettables - Is the menu that allows you to display the ongoing totals. These totals cannot be reset from any security level.
13	Clear Disc Popularity - Clears the popularity for all discs. This option should only be used after the popularity figures (Selections 7 and 8 in this menu) have been read and recorded. Press POPULAR to clear the disc popularity values. The display will blink when the command is executed.
14	Clear Cash - Clears all current cash totals. This option should only be used after the figures for Cash Audits (Selection 0 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.
15	Clear Plays - Clears all current play totals. This option should only be used after the Play Audit figures in Play Audits (Selection 1 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.
16	Clear Selection Popularity - Clears all current selection popularity. This option should only be used after Popularity Figures (Selection 9 in this menu) have been read and recorded. Press POPULAR to perform this function. The display will blink when the command is executed.
17	Display The Most Popular Disc - Displays the most popular disc number (00-99), followed by the number of plays (9999 maximum) that disc had. To display the next most popular disc, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive most popular disc. Press and hold RESET and then press 2 to move up through the popularity display toward the most popular disc.

You can request the popularity for a particular disc by pressing the disc number.

Table 3-1. Audit Commands
Continued

Command	Description
18	<p>Display The Least Popular Disc - Displays the least popular disc number (00-99) followed by the number of plays that the disc had. To display the next "least popular" disc, press and hold RESET and then press 2. Press and hold RESET and then press 2 to display each successive least popular disc. Press and hold RESET and then press 3 to move up through the popularity display toward the least popular disc.</p> <p>You can request the popularity for a particular disc by pressing the disc number.</p>
19	<p>Display The Most Popular Selection - Displays the most popular selection number (Disc 00-99 followed by Selection 00-99, a total of four digits), followed by the number of plays (9999 maximum) that selection had. To display the next "Most Popular" selection, press and hold RESET and then press 3. Press and hold RESET and then press 3 to display each successive most popular selection. Press and hold RESET and then press 2 to move up through the popularity display toward the most popular selection. A total of 100 selection numbers may be contained in the MOST POPULAR list.</p> <p>You can request the popularity for a particular selection by pressing the selection number (four digits).</p>
10	<p>CASH AUDITS - Allows you to display, but not change, cash totals, number of coins through the coin switches, and the total number of bills.</p>
100	<p>Current Cash - Displays the total amount of bill and coin money collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
101	<p>Current Bill - Displays the total amount of bills collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
102	<p>Current Coin - Displays the total amount of coins collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
103	<p>Current Wallbox - Displays the total amount of money collected by wallboxes since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
104	<p>Current Number Of Type 1 Coins - Displays the total number of Type 1 coins (5¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
105	<p>Current Number Of Type 2 Coins - Displays the total number of Type 2 coins (10¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>
106	<p>Current Number Of Type 3 Coins - Displays the total number of Type 3 coins (25¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.</p>

Table 3-1. Audit Commands
Continued

Command	Description
107	Current Number Of Type 4 Coins - Displays the total number of Type 4 coins (50¢) collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.
108	Number Of Type 1 Bills - Displays the total number of Type 1 (\$1) bills collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.
109	Number Of Type 2 Bills - Displays the total number of Type 2 (\$5) bills collected since the last time the CLEAR CASH command (Selection 4 in the AUDITS menu) was used.
11	PLAY AUDITS - Allows you to display, but not change, credits, autoplays, mechanism plays, and album plays.
110	Free Credits - Displays the number of free credits given since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
111	Paid Credits - Displays the number of paid credits given since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
112	Autoplays - Displays the number of Autoplays made since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
113	Mechanism Plays - Displays the number of times the mechanism has played CD's since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
114	Album Buys - Displays the number of times albums have been bought since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
115	Most Popular plays - Displays the number of times that the POPULAR button was used to select the most popular selection since the last time the CLEAR PLAYS command (selection 5 in the AUDITS menu) was used.
116	Normal Selections - Displays the number of selections made from the keyboard.
117	Overplay - Displays the number of overplays selected since the last time the CLEAR PLAYS command (Selection 5 in the AUDITS menu) was used.
12	NON-RESETTABLES - These totals for cash, plays, and credits can be displayed from any security level, but they cannot be reset from any security level. These totals constitute the permanent phonograph history.
120	Cash - Displays total cash (bill and coin) received by the phonograph.
121	Bill - Displays total bill cash received by the bill acceptor.

Table 3-1. Audit Commands
Continued

Command	Description
122	Coin - Displays total coin cash received by the coin acceptor.
123	Wallbox - Displays total cash received by all wallboxes.
124	Free - Displays total free credits
125	Paid - Displays total paid for credits
126	Most Popular - Displays the total number of Most Popular selections made with the POPULAR button.
127	Mechanism - Displays the total number of mechanism cycles.
128	Album - Display total album buys.
129	Selections - Displays the total number of selections made using the keyboard.

Collecting Money

1. Open the top door (if it is not already open) and reach in, behind the bill acceptor, and unlock the bill acceptor bill box.
2. Remove the currency and close and lock the bill box.
3. Close the top door.

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 disc and component life (*see table 3-2 for details*).

- 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.

Table 3-2. Cabinet Cleaning

Action Required	Procedure
1. Clean Glass	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	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	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	a. Wipe all plastic surfaces with a damp or dry cloth only. DO NOT USE SOLVENTS.
5. Clean electrical components	a. Clean all electrical components with a clean, dry, lint-free cloth or a soft bristled brush only.

CD Player Laser Lens

The CD player laser lens can collect dust, dirt, and smoke. These deposits can cause various intermittent problems that may, in time, become more severe. To avoid these problems, we recommend that you clean the laser lens occasionally. This interval can be as often as every other month, or less in some locations. Follow this procedure to safely clean the laser lens:



NOTE:

Before you clean the laser lens, be sure to turn the jukebox power OFF and ground yourself by touching a grounded component (such as the CBA) to discharge any static buildup that may harm the CD player.

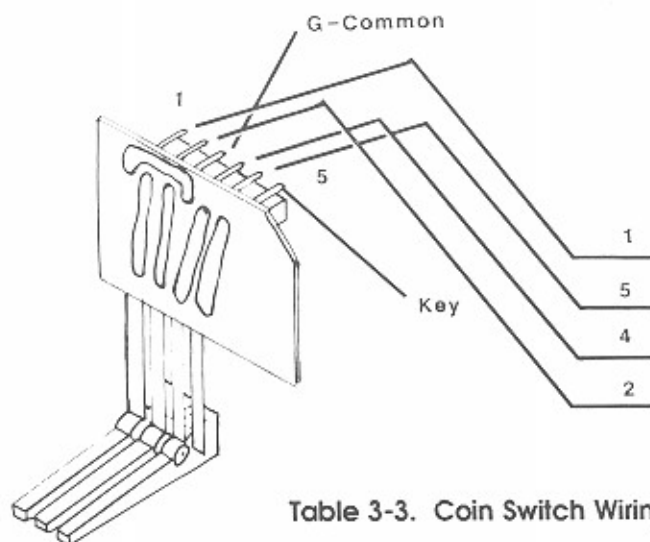
1. Remove loose particles from the lens by gently brushing it with a camel's hair brush or a blow brush (both items can be purchased at most camera supply stores). Take care not to snag brush bristles under the lens. The lens is mounted on a delicate suspension spring that may be damaged with even a soft brush.
2. Remove any remaining dirt by placing one to three drops of Kodak Lens Cleaner (Kodak Catalog Number 176 7136, available from photographic supply stores or Rowe 21966601) on a lint-free "Q"-Tip and very gently wiping dust and smoke deposits from the lens. Take care not to damage the delicate lens suspension spring. Do not allow any of the lens cleaner to run down the side of the lens.

COIN ACCEPTORS (optional)

Coin Switch

Coin Switch Wiring Note:

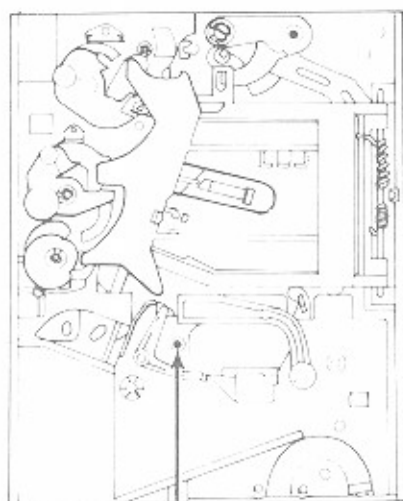
Table 3-3 shows how to set the coin switch values for 3-coin acceptor. Programming The multiplier (PRICING SELECTION 3) should always be set to 5 for U.S. currency.



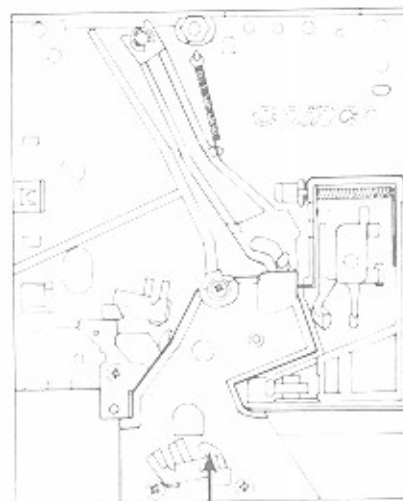
3 & 4 Coin Wiring	Coin Switch Number	3 Coin	
		Value	Program
BL	4	---	504 = 10
Y	3	25¢	503 = 5
V	2	10¢	502 = 2
S	1	5¢	501 = 1

Table 3-3. Coin Switch Wiring

3 Coin Acceptor



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



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

Figure 3-7. Coin Acceptors

CHECKS AND ADJUSTMENTS

Coin Lever

Refer to *figures 3-7 and 3-8* 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.

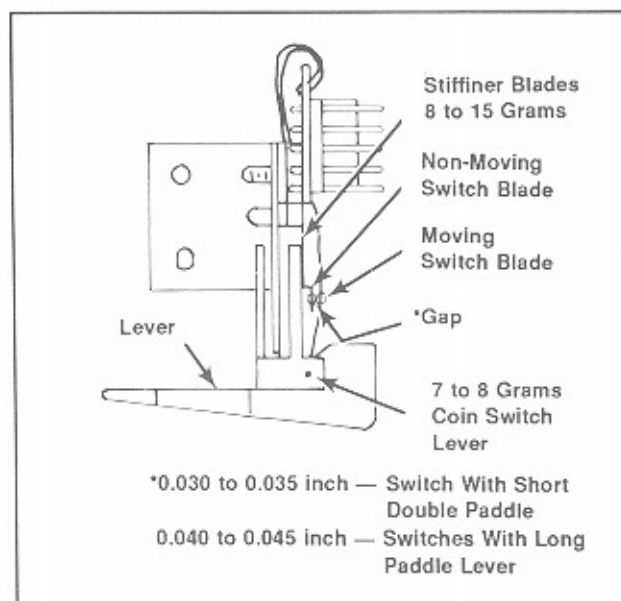


Figure 3-8. Contact Pressure
& Gap Adjustment

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 3-8*). 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.

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 3-9* and follow the example given.

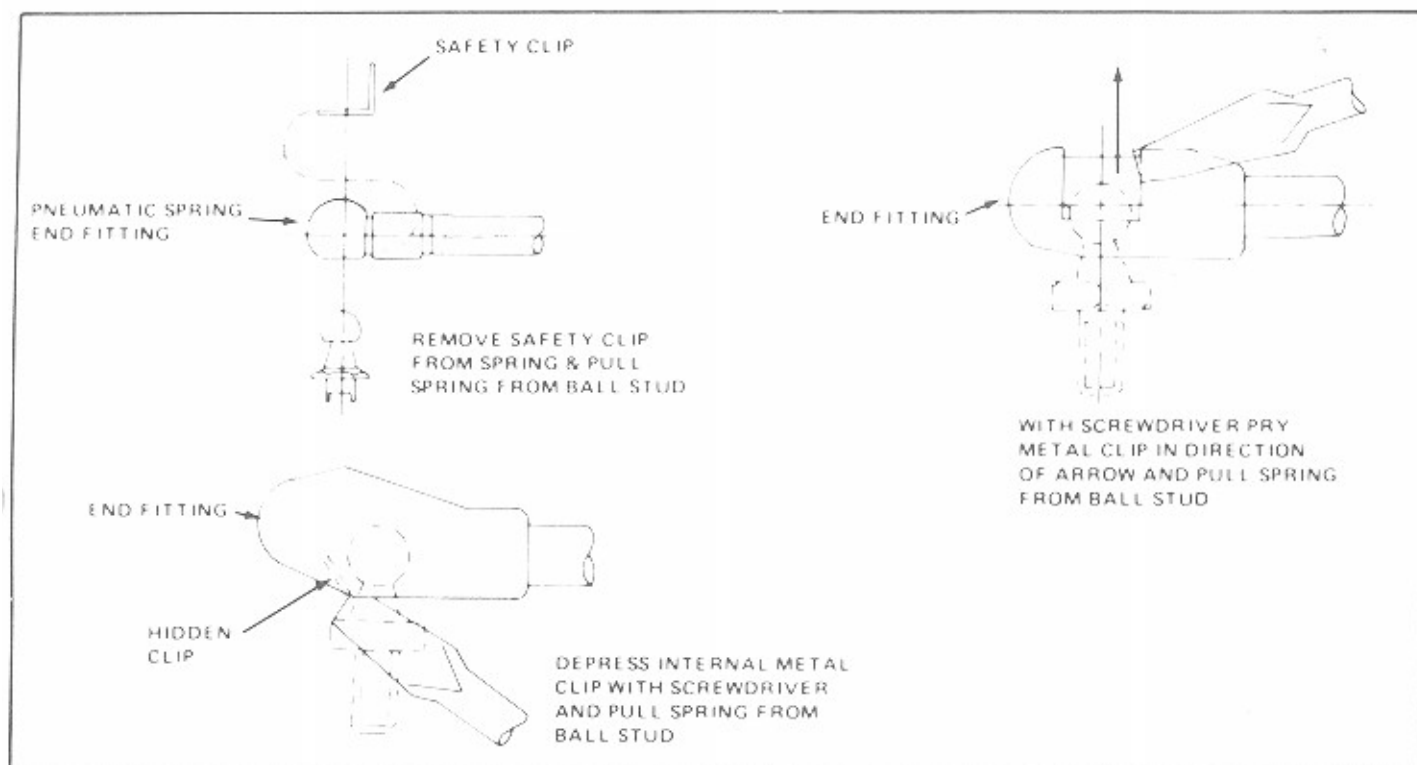


Figure 3-9. Door Spring Fittings

GLASS REPLACEMENT

**WARNING:**

The top door glass can break or fall on you if you do not follow the recommended removal procedure.

For your safety, Rowe does not recommend that you replace the top door glass while the top door is on the phonograph. The proper procedure requires two people to remove the top door safely.

1. Unplug the power to the phonograph.
2. Open the cabinet door.
3. Unplug the 120 volt AC harness at the connector on the upper right side of the phonograph. Unplug the 3-pin connector from the central control computer and disengage the harness from the cable clamps.
4. Remove all of the top door hinge screws except for one screw and one nut at each end of the hinge.
5. With your helper still holding the top door open, disconnect the door springs (use the *Door Spring* procedure in this section if you are not familiar with the procedure for removing the door springs).
6. Remove the two remaining top door hinge screws while your helper continues to hold the top door open.
7. Again, using a helper, lift the top door off of the phonograph and set the door on a clean smooth working surface (lay the door so the outside is down).
8. Remove all of the screws from the four frame brackets.
9. Lift out the brackets and the plastic frame.
10. Be sure to protect your hands from broken glass with protective gloves before you remove the door glass. Remove the remaining glass with any available brush.
11. Set the new door glass in the door, re-install the plastic frame, and brackets.
12. Lift the door back onto the phonograph and attach all screws and nuts through the hinge. Make sure that the door is centered before you tighten all of the screws.
13. While your helper holds the door, reconnect the door springs and make sure that the door will be supported by the springs.
14. Reconnect the 120 volt AC harness (on the right side of the phonograph) and the other harnesses on the left side of the phonograph and then push them into the cable clamps.
15. Plug-in the phonograph and play a selection and make sure that the title rack pages turn, all lights are on, and the animated discs turn.
16. Check the top door-to-OBA-2 clearance and adjust the OBA-2 if necessary (*see OBA-2 To Top Door Clearance in Section 4 for this procedure*).

Section 4: OBA-2 Maintenance

INTRODUCTION

This section of the service manual provides a general description of the Rowe OBA-2 Bill Acceptor (OBA) including a physical description and a functional description.

The OBA-2 Bill Acceptor accepts valid U.S. currency in \$1, \$5 denominations. The OBA-2 rejects and returns unacceptable currency to the customer.

The bill acceptor interfaces with the central control computer, which sends and receives messages concerning the acceptance, rejection, and validation of currency.

PHYSICAL DESCRIPTION

The bill acceptor consists of three major components. These are: The bill transport mechanism, the bill stacker, and the OBA control unit (see figure 4-1).

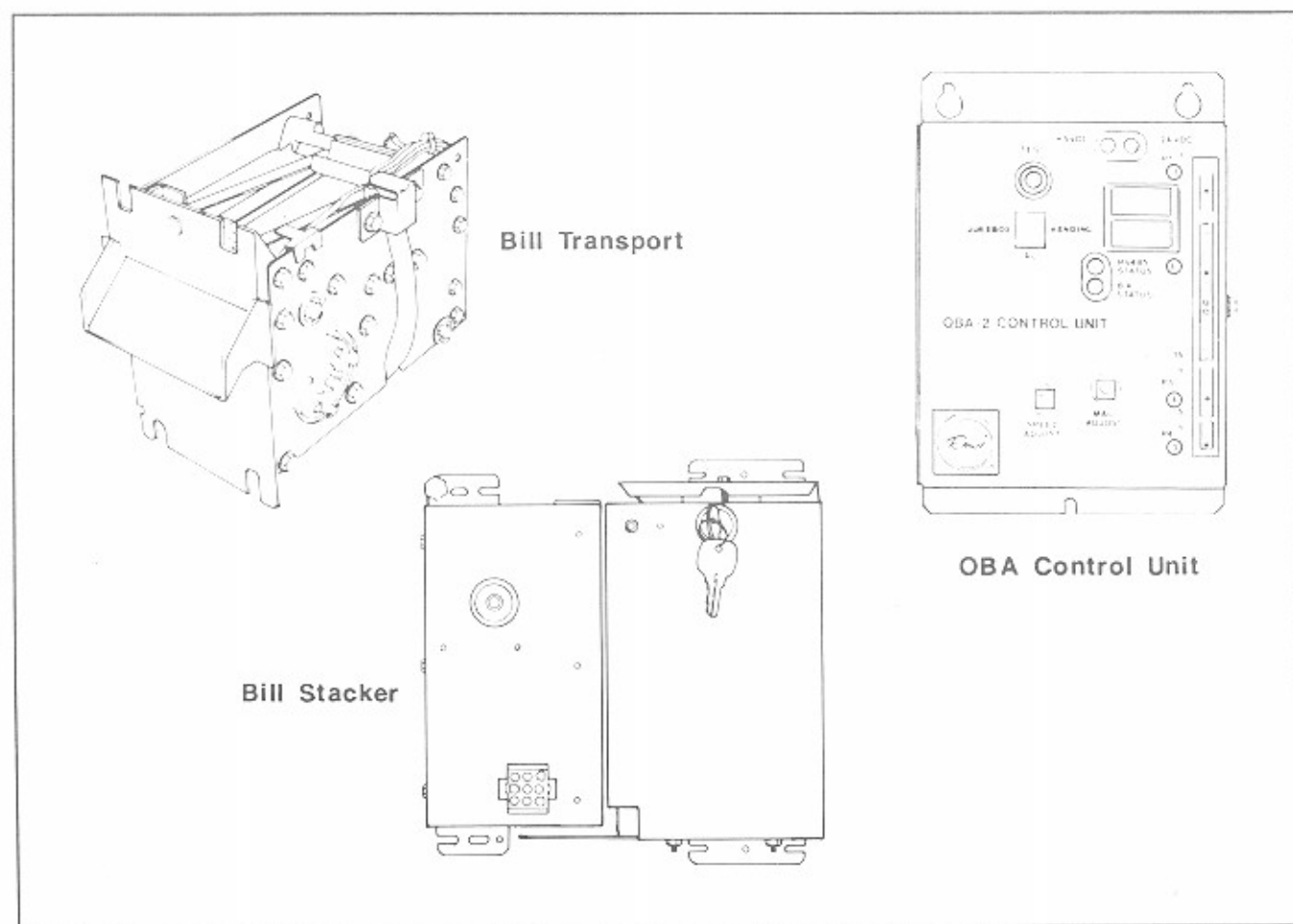


Figure 4-1. Bill Acceptor Components

Bill Transport Mechanism

This device mechanically transports the currency from the bill acceptor opening past various sensors. These sensors scan the bill for validation information and relay it to the OBA control board (see figure 4-2 and 4-3).

DRIVE BELTS

A D.C. motor, a series of rollers, and pulleys and belts carry the bills from the bill inlet through the bill acceptor. The drive belts provide long life and reliable operation while requiring very little maintenance.

The main drive belt and lower bill transporting belts are cogged for more reliable operation, while adjustable idle pulleys are used to maintain correct tension. Upper transporting belts are of a stretch type, which require no adjustment. As the bill moves along the path from the opening to the stacker it is trapped between the upper and lower transporting belts. This provides a sure and non-slip movement through the transport mechanism.

OPTICAL SENSORS

Three optical sensors are used to communicate bill information to the OBA control unit while the

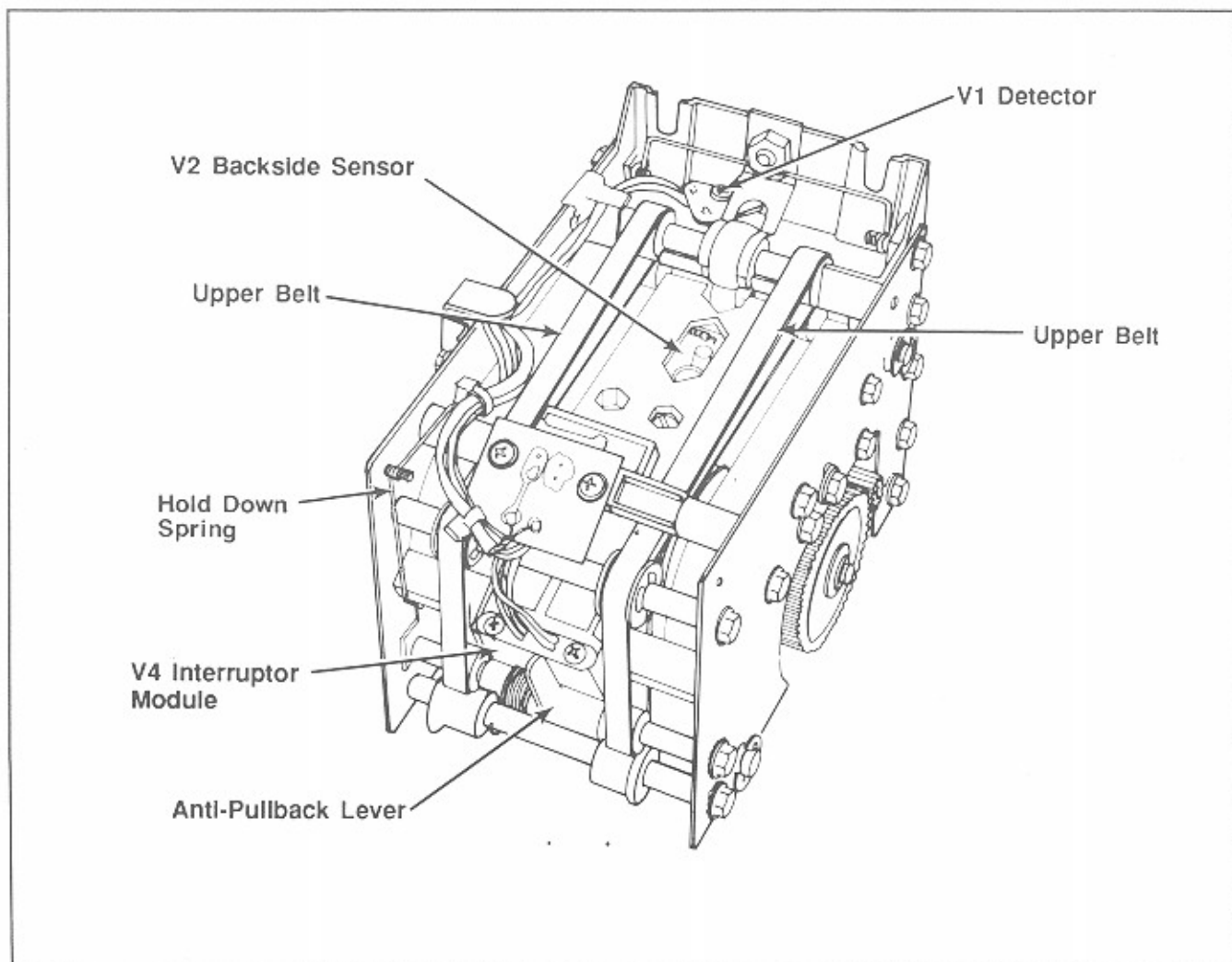


Figure 4-2. Bill Transport Unit
Top View

bill is in the transport mechanism. Two of the three sensors used in the bill acceptor are used for establishing bill position within the transport mechanism path. The third provides validation data from the bill as it passes through the transport. These sensors, referred to hereafter as V1, V2 and V4, are arranged so that, beginning from the bill acceptor opening, the numbers ascend as the bill moves farther away from the opening.

V1 is used to sense the presence of a bill in the transport opening. V2 is used for obtaining precise information from the underside of the bill. V4 is used to make a precise determination of the bill position. All three of the optical sensors are of the infrared type.

MAGNETIC HEAD

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

ANTI-PULL-BACK LEVER

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

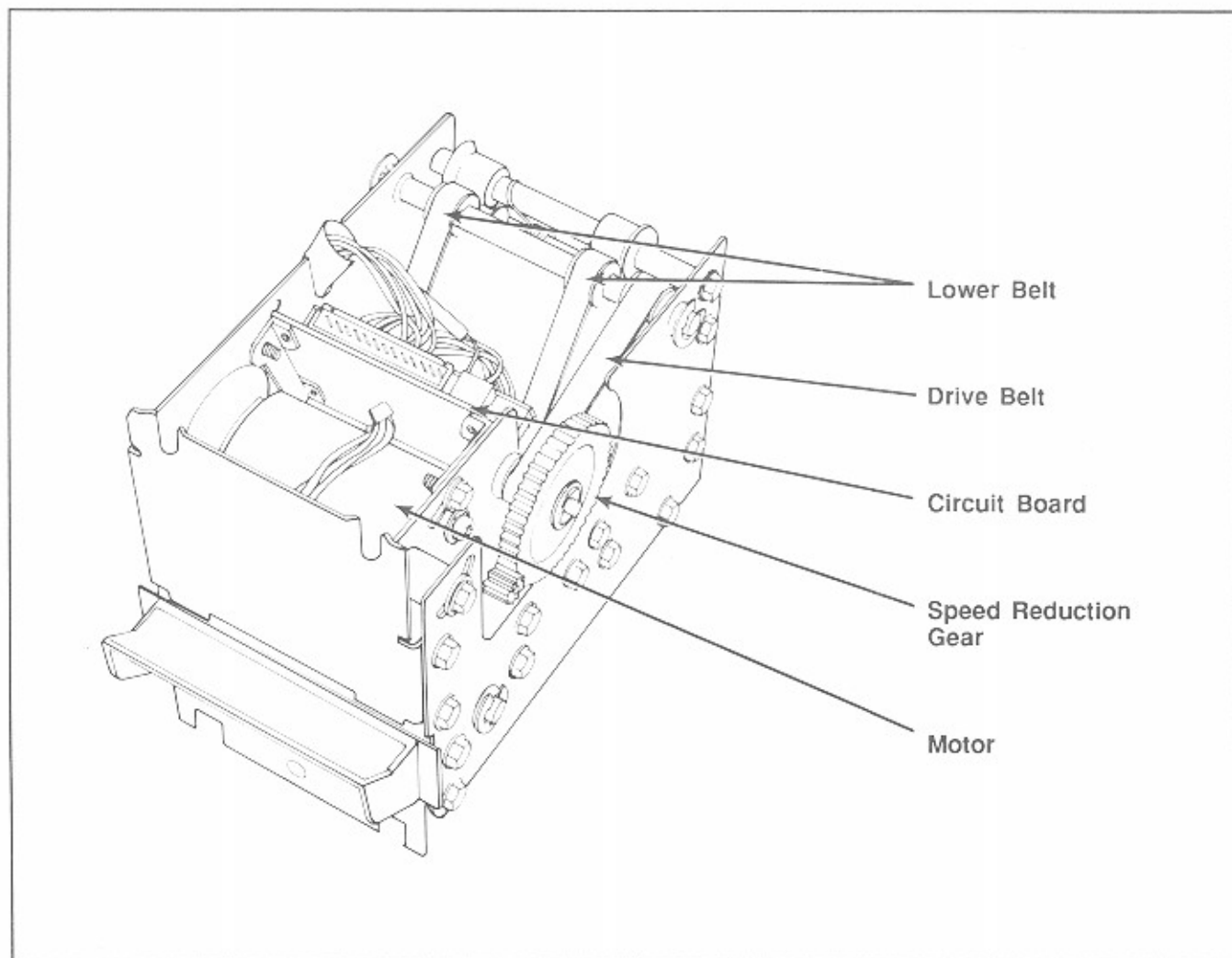


Figure 4-3. Bill Transport Unit
Bottom View

Bill Stacker

The stacker accepts bills from the transport mechanism and stacks them in a locked bill box. The stacker uses a D.C. motor to drive a metal platen, which via a mechanical linkage, pushes the bill into the bill box. A cam-actuated switch signals the OBA control unit as to the position of the platen. The platen may be in either the HOME or the OFF HOME position. An OFF HOME signal received by the control unit while it is in STANDBY, prompts it to reset the platen and return it to its HOME position (See *functional description in this section*).

OBA Control Unit

This module contains the electronic circuit board and micro-computer. It directs the operations of the various parts of the bill acceptor, but it in turn is directed by the central control computer. It also contains all the necessary circuitry for connecting the bill transport to the bill stacker (see *figure 4-4*).

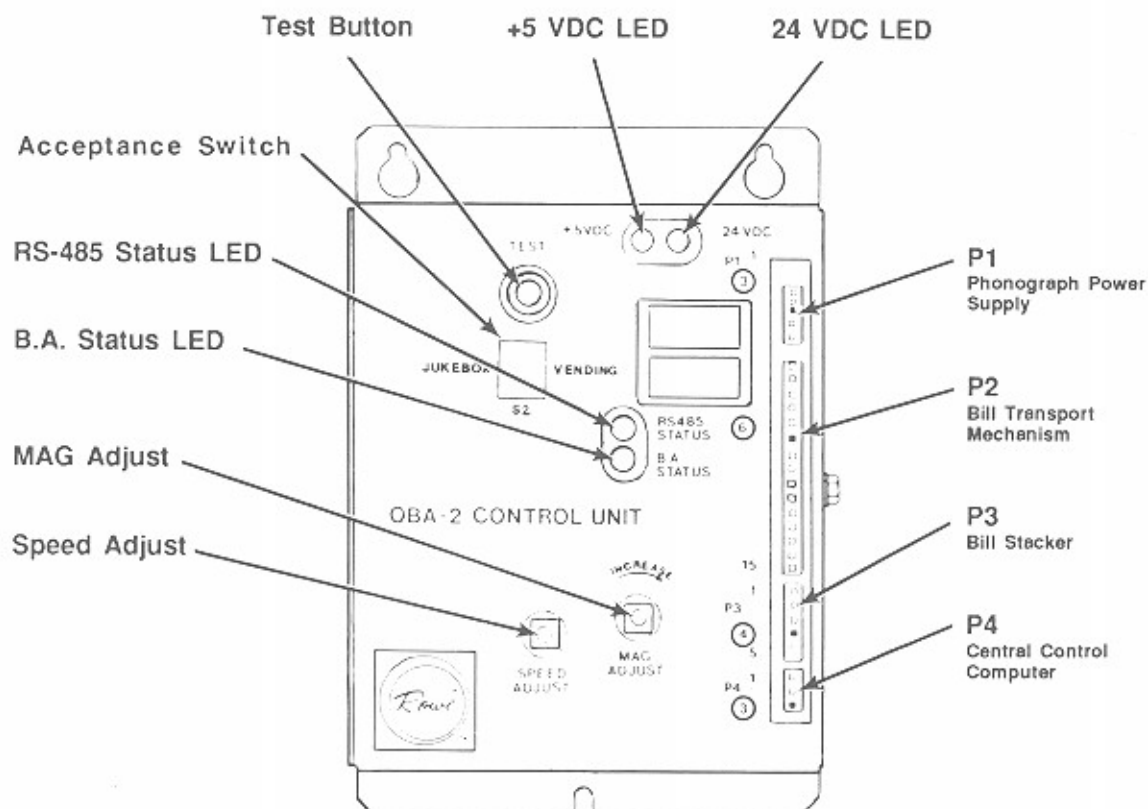


Figure 4-4. OBA Controller

CONNECTORS

Four connectors, labelled P1, P2, P3, and P4 connect the three major modules or components of the bill acceptor to each other and to the central control computer.

P1 connects the OBA control unit to the phonograph power supply via the CCC.

P2 connects the bill transport mechanism to the OBA control unit.

P3 connects the bill stacker to the OBA control unit.

P4 connects the OBA control unit to the central control computer.

Adjustments on the OBA control unit (see *Electrical Adjustments for a detailed explanation of adjustment procedures*).

JUKEBOX / VENDING SWITCH

This switch should be in the JUKEBOX position for maximum acceptance of bills.

MAG ADJUST

Allows adjustment of the magnetic amplifier circuitry for optimum performance. The amplifier is used in conjunction with the magnetic head in the bill transport mechanism for checking specific properties of the bills (see *figure 4-4*).

TEST BUTTON

If this button (see *figure 4-4*) is depressed when the unit is in the idle (STANDBY) state it activates the motor speed adjustment mode. This allows the rate at which the bill is fed through the transport mechanism to be adjusted for optimum performance. If the bill acceptor is in the SHUTDOWN mode rather than the STANDBY mode, pushing the TEST button will reset it and put it back into STANDBY (see *Functional Description in this section*).

VISUAL INDICATORS

Refer to *figure 4-4* for the location of these indicators.

RS-485 STATUS LED

This LED indicates the status of the communications link. If the LED is not on, the bill acceptor is in the RECEIVE mode, waiting for a command from the central control computer. When the LED is on, the bill acceptor is in the TRANSMIT mode and is sending information to the central control computer.

BA STATUS LED

This LED indicated whether the bill acceptor is in the SHUTDOWN state or is in operating condition. When not lit, the bill acceptor is in normal operating condition. When lit, the LED indicates that the unit is shutdown due to a fault. The STATUS LED is also used to indicate the correct motor speed when used in conjunction with the MOTOR SPEED ADJUST mode (TEST button depressed).

+5VDC AND +24 VDC LED'S

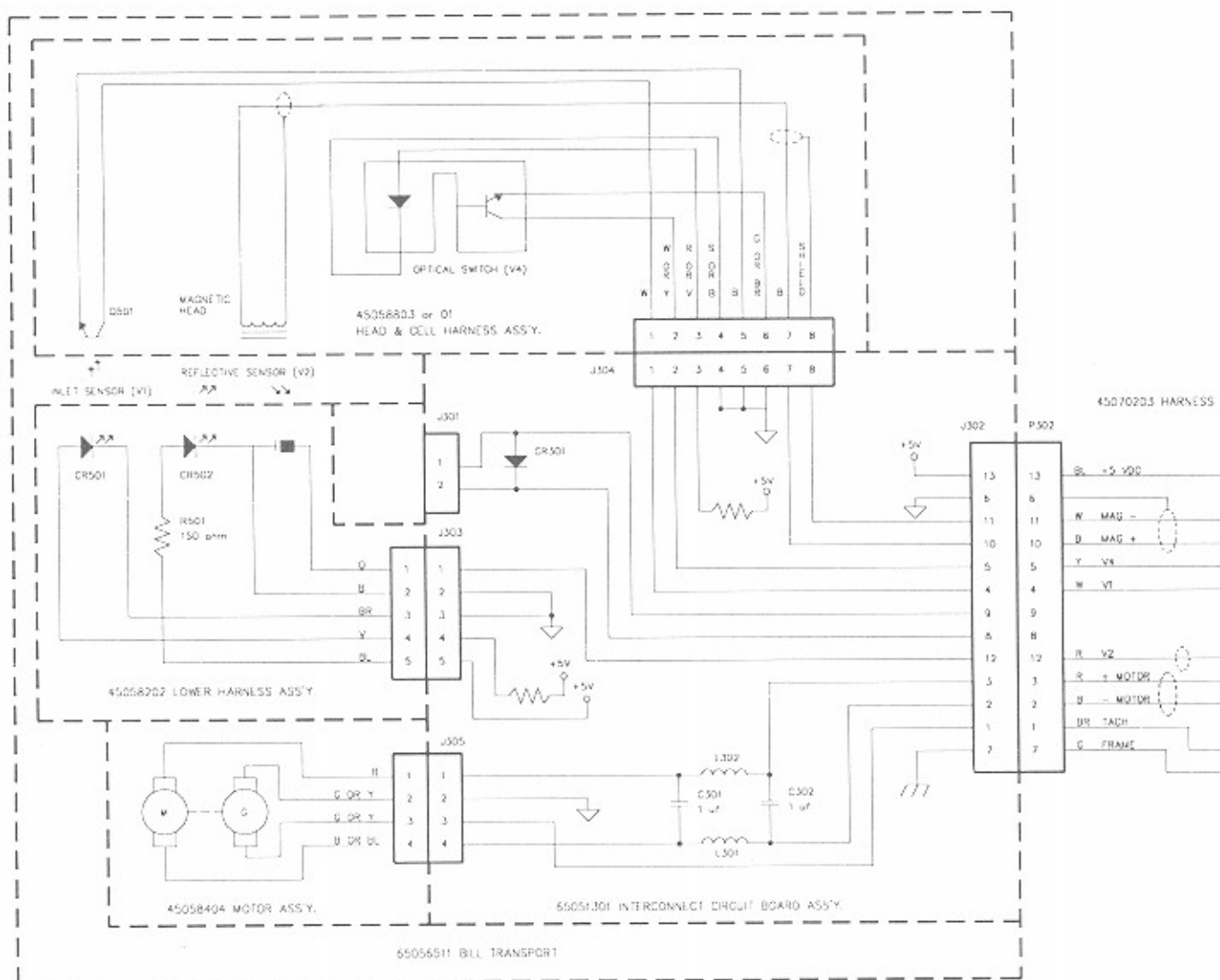
When lit, these indicate the normal presence of the system voltages.

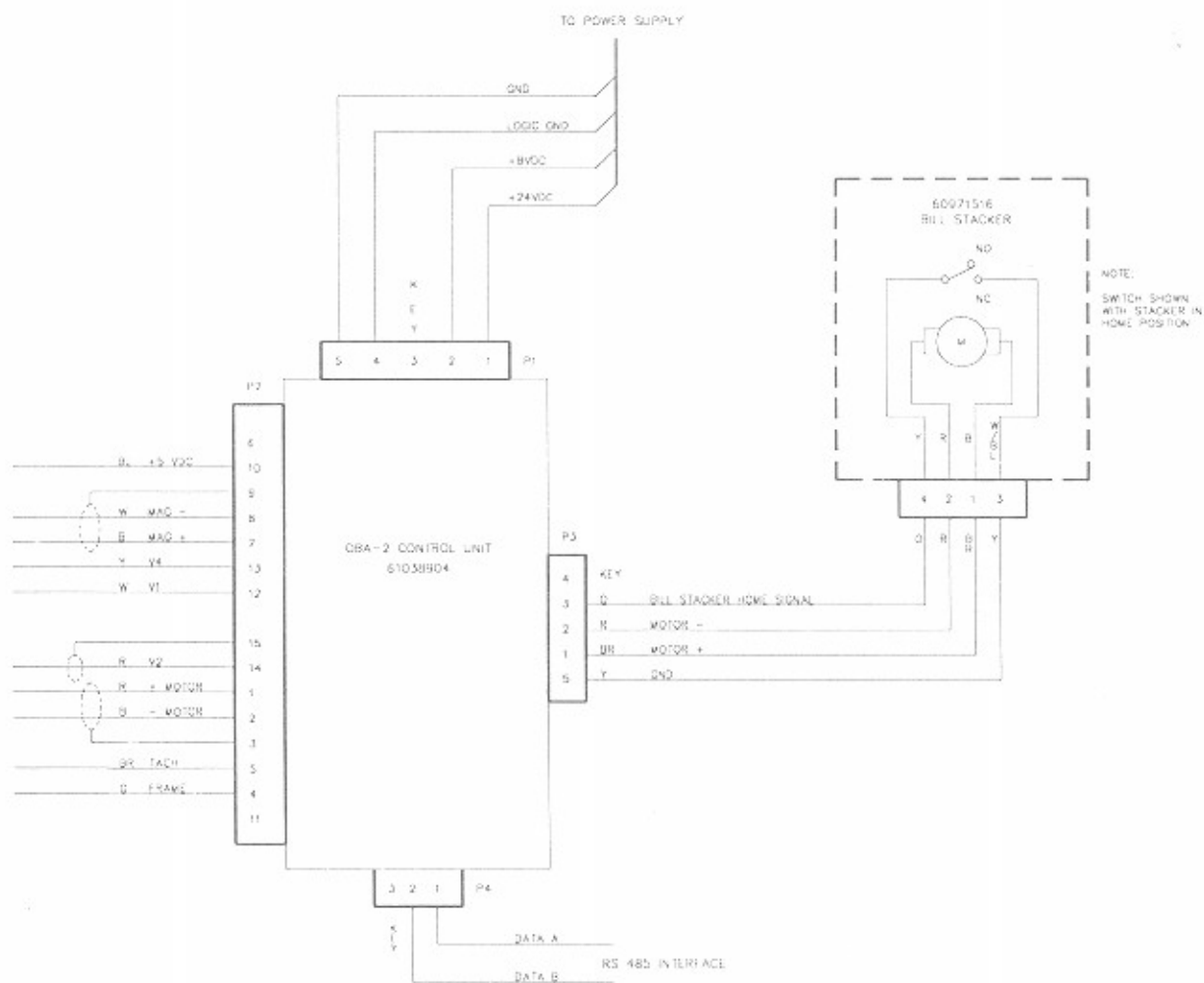
FUNCTIONAL DESCRIPTION

The following is a sequential description of the operation of the bill acceptor. This description gives a basic understanding of how the bill acceptor normally operates and can be used as an aid in troubleshooting (see *figure 4-5, the OBA Block Diagram*).

Bill Acceptor In Standby Mode

When the power is first supplied to the bill acceptor, in normal operation, the bill acceptor immediately assumes a passive or idle state. It will not attempt to accept bills until it receives an ENABLE command from the central control computer. Though it is not able to accept bills it is not completely idle; it is continually checking the various sensors in the bill transport and bill stacker mechanisms. If it sees an incorrect signal it takes the appropriate actions, as described in the following paragraphs:





For Equivalent Engineering Drawing See 21941101-Q7
Figure 4-5. OBA-2 Block Diagram

PROBLEMS THAT MAY ARISE IN THE STANDBY MODE:

V4 Sensor Is Active

The bill acceptor assumes that something is trapped in the bill transport path if this sensor is active while in the STANDBY mode. It then begins the reject sequence to remove the trapped object from the path (see *Reject Sequence in this section*).

Stacker Home Switch Not Activated

The bill acceptor turns on the stacker motor and attempts to return the stacker platen to its HOME position. If successful, the bill acceptor returns to the STANDBY mode. If unsuccessful, it shuts itself down (see *Shutdown Sequence in this section for additional information on this subject*).

ACTIONS TAKEN BY THE BILL ACCEPTOR TO CORRECT THESE PROBLEMS:

Reject Sequence

In order to clear the bill transport mechanism and purge any objects from the path, the bill acceptor turns on its transport motor in the reverse direction. If the bill acceptor is following a normal bill rejection sequence, it will reject the bill and return it to the bill acceptor opening. It will place it so that it 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. A BILL REJECT message and a REJECT code is sent to the central control computer indicating the cause of the rejection (see *Troubleshooting in this section for an explanation of the REJECT codes*). If the track is not clear, the bill acceptor begins the self-clearing sequence.

Self-Clearing Sequence

Upon failing to clear the transport path as described, the bill acceptor begins a self-clearing sequence. This consists of a series of reverse-forward-reverse cycles to dislodge and object trapped in the transport. If this procedure is successful the bill acceptor returns to the STANDBY mode. If the track is not cleared after 10 cycles the unit will shutdown.

Shutdown Sequence

Several things may cause a shutdown of the bill acceptor. In the instance above an unsuccessful attempt by the bill acceptor to clear an object lodged in the transport path will initiate a SHUTDOWN sequence. In the event of a shutdown the bill acceptor turns everything off except the STATUS LED, which turns ON to indicate a fault condition. A SHUTDOWN message is sent to the central control computer along with an error code indicating the cause of the fault (see *Troubleshooting in this section for a complete explanation of the FAULT codes*).

Bill Acceptance Mode

The following is a description of the operations that occur when the bill acceptor is in the BILL ACCEPTANCE mode. These are not the only operations that can occur in this mode however. The reject, self-clearing and shutdown sequences as previously described can occur as well.

An acceptance cycle starts when a bill is inserted into the transport. The transport motor starts in a forward direction and continues until the trailing edge of the bill passes the magnetic head. If the bill fails any of the required magnetic or optical checks it is immediately rejected and

returned to the customer. If the bill passes all of the checks the transport stops and the OBA then waits for a STATUS REQUEST from the central control computer and, upon receiving it, transmits a BILL IN ESCROW message containing the correct code for the bill validated. If a STATUS REQUEST is not received within two seconds, the bill is rejected. After sending the BILL IN ESCROW information, the bill acceptor waits for either the ACCEPT or REJECT command from the central control computer.

After receiving the ACCEPT command, the bill acceptor activates the transport motor and moves the bill from the transport mechanism to the bill stacker. The bill is monitored to ensure that the bill movement through the mechanism is correct. If the bill does not clear the transport mechanism within a specified time the bill is rejected and returned to the customer.

The stacker motor is now activated and the home switch monitored to ensure that the bill stacker platen leaves the home position, stacks the bill in the bill box and returns to the home position. If the stacker platen does not leave the home position within 750 milliseconds or if it does not return within 2.5 seconds, the bill acceptor begins its shutdown sequence.

Upon completion of the stacking process the bill acceptor sends a BILL ACCEPTED message to the central control computer and is then ready to begin another bill acceptance sequence.

PRICING

For overall pricing, see *Pricing in Section 2*.

Maintenance And Adjustments

ELECTRICAL ADJUSTMENTS

The electrical adjustments on the bill acceptor are factory set and should not be changed under normal operating conditions. However, replacing a bill transport or control unit requires a recalibration of the system as follows:

Motor Speed Adjustment

Refer to figure 4-4 for the locations of the electrical adjustments.

1. Depress the TEST button on the OBA control unit.
2. Turn the SPEED ADJUST control either clockwise or counterclockwise until the B.A. STATUS LED reaches its brightest and steadiest condition.

Mag Adjust

Refer to figure 4-4 for the locations of the electrical adjustments.

1. Set the MAG ADJUST control 1/8-turn back from the full clockwise position.
2. Depress the TEST button momentarily and release.
3. If the B.A. STATUS LED blinks rapidly several times after you release the TEST button, turn the MAG ADJUST control slightly counterclockwise and repeat step 2.
4. If the B.A. STATUS LED remains OFF after releasing the TEST button, the MAG ADJUST is correct.

ROUTINE MAINTENANCE

Cleaning

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

BILL INLET AND TRACK

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

V2 Sensor

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

Magnetic Head

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

Drive Belts

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

Bill Stacker

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

Lubrication

BILL STACKER

The bill stacker does not require lubrication.

BILL TRANSPORT MECHANISM

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

Mechanical Adjustments

BILL STACKER

The bill stacker does not normally require adjustment. If the computer control unit indicates a problem involving the HOME switch while in SHUTDOWN mode (see *Troubleshooting in this section*), then the switch adjustment may be checked by performing the following procedures (see *figure 4-6*):

1. Rotate the cam so that the switch actuator rest on the high point of the stacker motor cam.

- Place a .040-inch gauge between the cam and the actuator. The bottom of the actuator should rest against the switch case. If the adjustment is incorrect, reposition the switch by loosening its two mounting screws.

BILL TRANSPORT MECHANISM

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

DRIVE BELT TENSION ADJUSTMENT

Refer to figure 4-7 before doing this adjustment.

Adjust the drive belt tension as follows:

(For OBA transport units without an idler pulley)

- Loosen machine screws A, B, and C to the point that the motor mounting assembly can rotate around machine screw B.
- Rotate motor mounting assembly until the drive belt flexes a total of approximately 3/32-inch in mid span between the gear pulley and the drive shaft pulley.
- Tighten the machine screws in the following order: A, B, then C. Recheck the belt tension.
- If machine screw A is at the end of its slot and the drive belt is still too loose, the belt has stretched and must be replaced.

LOWER BELT TENSION ADJUSTMENT

Refer to figure 4-8 before doing this adjustment.

Adjust the lower belt tension as follows:

- Loosen the four hex-head screws holding the ends of the idler pulley shaft and the take-up brackets.
- Remove the circuit board by removing the three screws that hold the brackets and unplug the three connectors.
- Push down on the idler pulleys until the belt flexes about 3/16 of an inch.

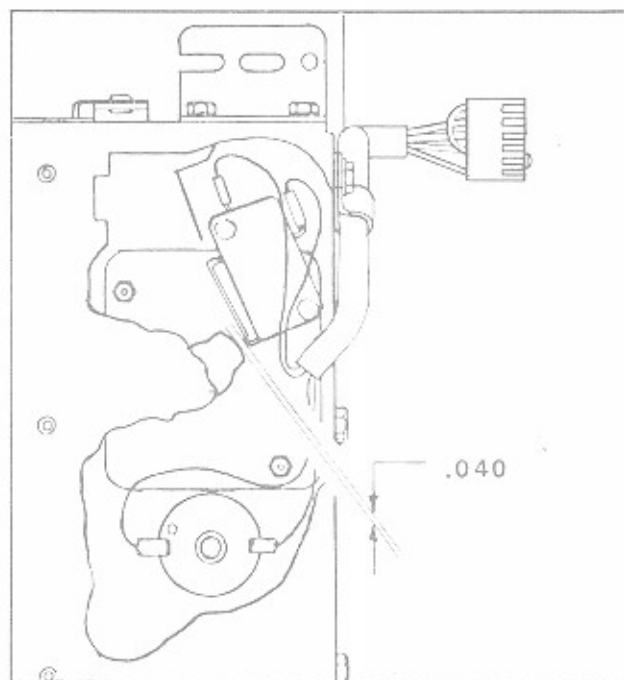


Figure 4-6. Stacker Home Switch Adjustment

3/32 Inch Total Flexing
Permissible At This Point

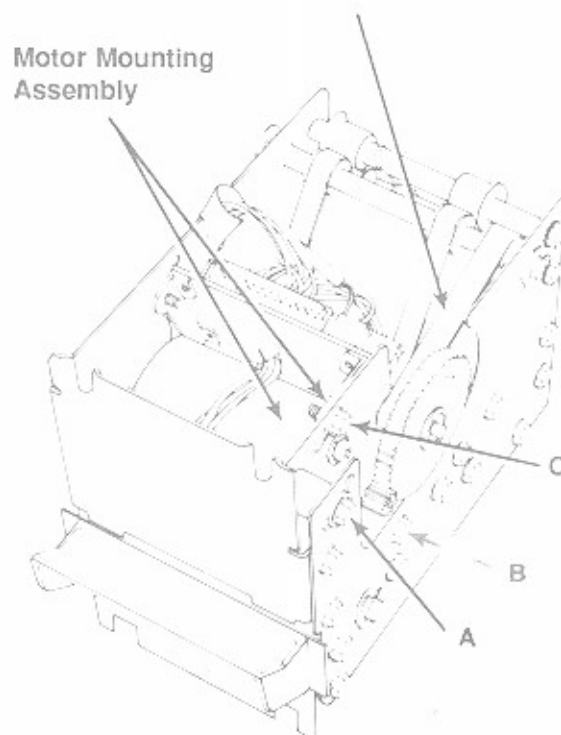


Figure 4-7. Drive Belt Tension

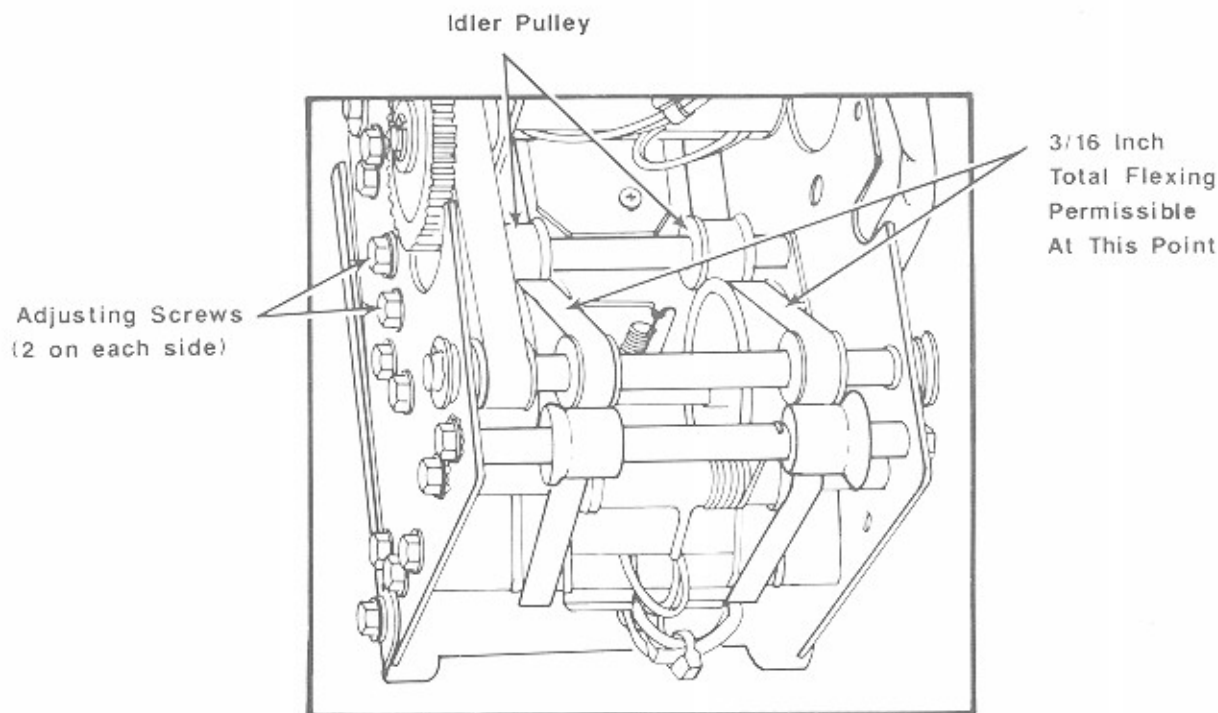


Figure 4-8. Lower Belt Tension Adjustment

4. Tighten all four screws and check the belt tension again. The tension must be equal on both belts.
5. Replace the circuit board and plug in the three connectors.
6. If the adjusting screws are against the ends of the slots and the timing belts are still loose, the transport should be returned to an authorized service center.

GEAR BACKLASH ADJUSTMENT

A degree of backlash should exist between the gears, as shown in figure 4-9.

To adjust the gear backlash:

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

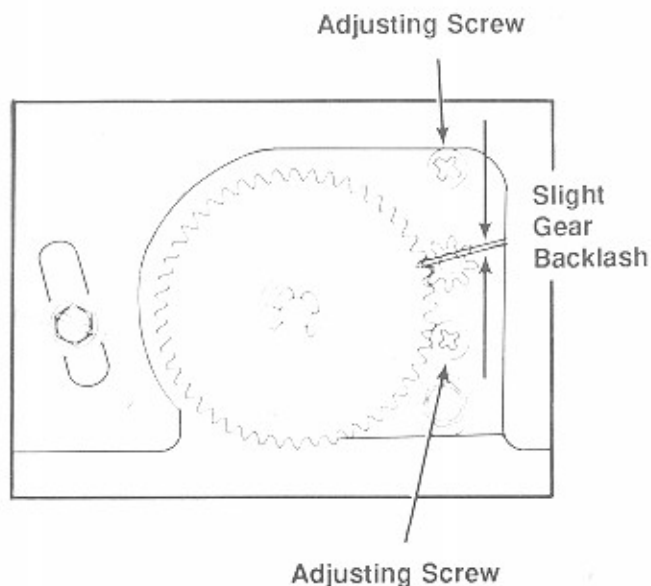


Figure 4-9. Gear Backlash Adjustment

MAGNETIC HEAD ALIGNMENT

The magnetic head is aligned with the harness and holder assembly at the factory. If a problem with the head develops, the harness and holder assembly must be replaced. Order the Harness And Holder assembly, Part Number 45059801.

Installing A New Harness And Holder Assembly



WARNING:

To avoid serious eye injury, wear safety glasses or goggles while removing and installing the tension springs that hold the harness and holder assembly.

Refer to *figure 4-10A* during removal and installation of the harness and holder assembly unless you are told to refer to *figure 4-10B*.

REMOVING A DEFECTIVE HARNESS AND HOLDER ASSEMBLY

1. Unplug the harness from the transport circuit board.
2. Loosen both cable clamp screws, and remove one so that the harness can slip out from under the cable clamp.
3. Remove the screw from the V1 detector circuit board and pull the V1 circuit board away from the OBA casting (keep the screw, you will need it to install the new assembly).
4. While wearing eye protection: Carefully slide the tension springs off of the two cover hinge screws.
5. Remove the two screws and shoulder washers that are used as a hinge for the OBA cover.
6. Remove the screw from each end of the crowned roller shaft and slide the shaft out from under the upper belts.
7. Slide the harness and holder assembly toward the front of the OBA slightly so that you can slide one side of the holder and harness assembly out from under the upper belts. Throw this assembly away.

INSTALLING A REPLACEMENT HOLDER AND HARNESS ASSEMBLY

1. Slide the new harness and holder assembly under the upper belts and align the assembly with the lower track by placing the "V" on the holder over the "V" on the lower track as shown in *figure 4-10B*.
2. Slide the crowned roller shaft into position over the holder and harness assembly.
3. Insert the screws into the ends of the crowned roller shaft and tighten the screws.
4. Make sure that the "V" on the harness and holder assembly is resting over the lower track on both sides of the harness and holder assembly.
5. Attach the V1 detector to the OBA casting.

6. Route the harness under the cable clamp, attach the cable clamp screw that you removed in *Step 2*, of the removal procedure and tighten both cable clamp screws.
7. Plug the free end of the harness into the transport circuit board.
8. Re-install the OBA cover by attaching the two screws and shoulder washers that were removed in *Step 5* of the removal procedure.
9. While wearing eye protection, carefully slide the tension springs back on the two cover hinge screws (The short end of the spring wire should rest on the mag. head holder shaft).
10. Check the upper belt paths of both upper belts to make sure that the upper belts are riding on the center of all of the pulleys.

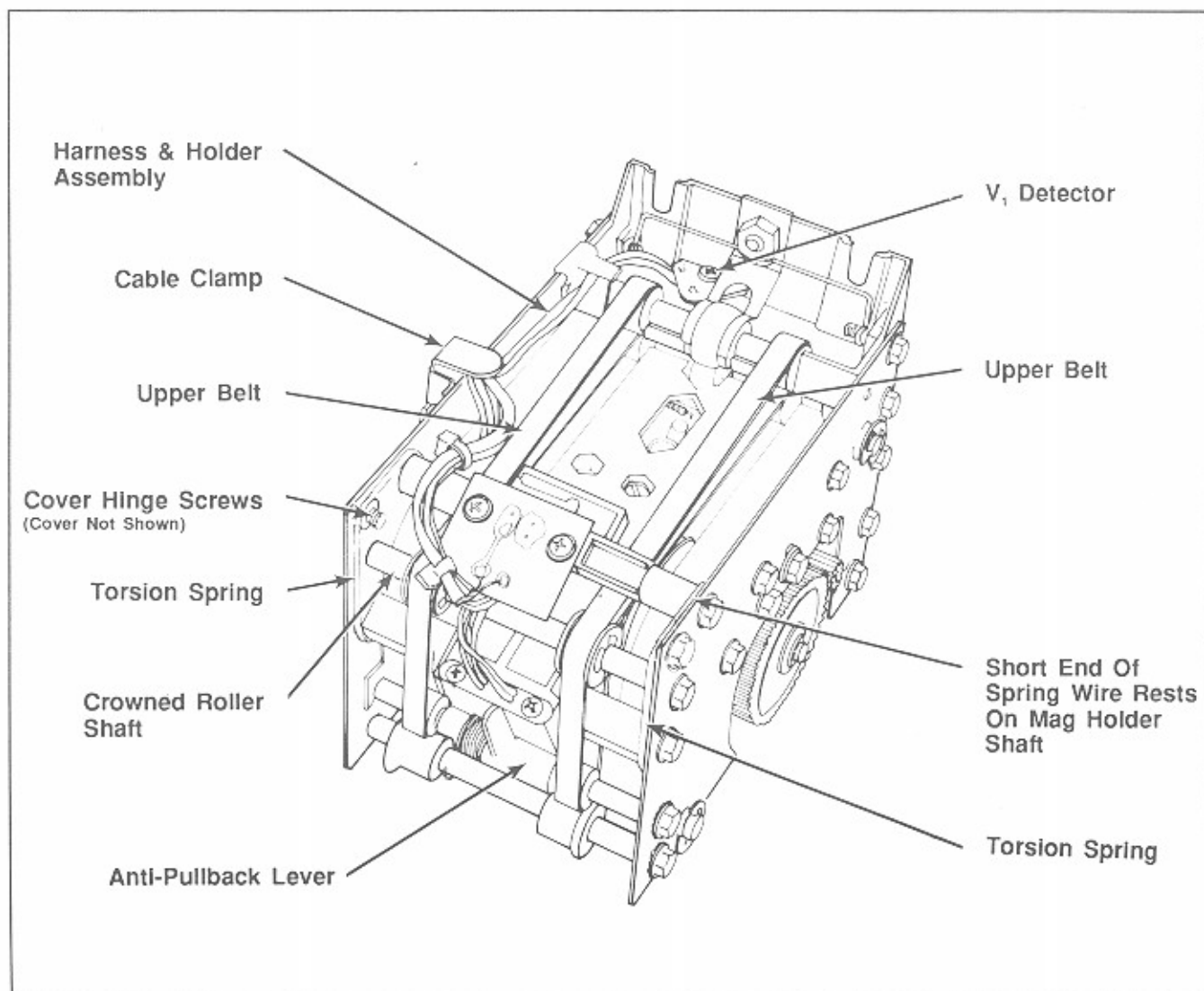


Figure 4-10A. Head And Holder Assembly Removal

The V shape on the lower track must rest over the V shape on the holder (both sides).

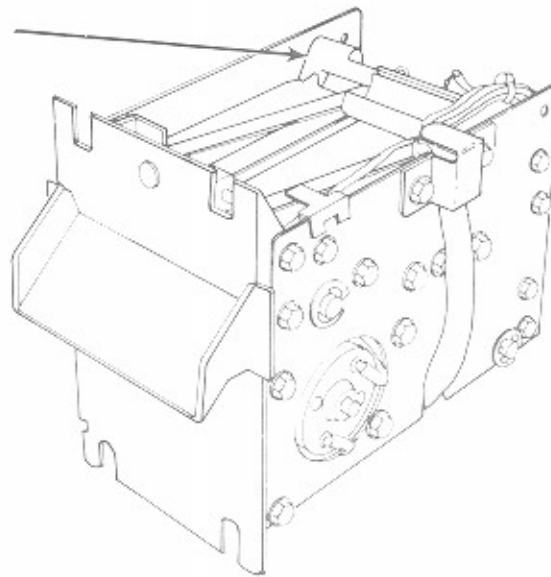


Figure 4-10B. Head And Holder Alignment

CREASING ROLLER POSITION

The creasing roller shaft should always be positioned so that the creasing rollers spin freely (see *figure 4-11*). They should not contact either lower timing belt. When making this adjustment, or when you are assembling the creasing roller shaft, hold the shaft away from the lower belts while tightening the two mounting screws. After tightening, always re-check to be sure that the creasing rollers spin freely.

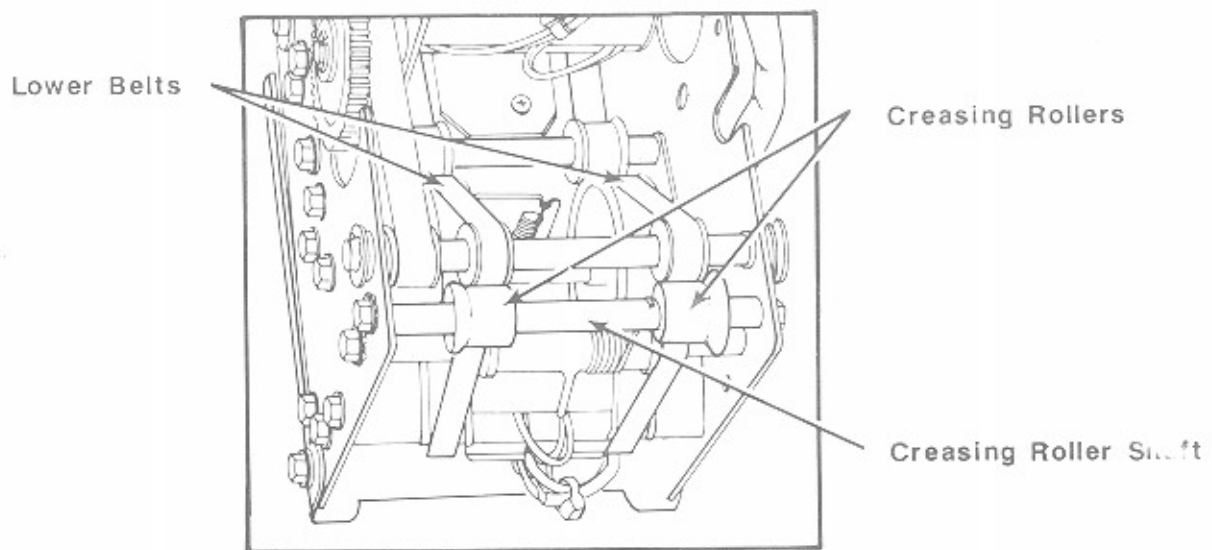


Figure 4-11. Creasing Roller Position

BILL ACCEPTOR HEIGHT AND FRONT TO BACK ADJUSTMENT

These two adjustments can affect each other. If you need to make one of these adjustments, be sure to read the entire procedure to determine whether you need to do any additional steps.

OBA-2 Height

Perform this procedure only if the OBA-2 height is incorrect.

1. Locate the hex-head screw in the vertical slot on the left side of the OBA-2 mounting plate and compartment divider. Tape a small piece of paper next to the slot and mark the position of the center of the screw on the paper (this will serve as a reference point).
2. Close the top door and estimate the vertical distance that the OBA-2 is high or low.
3. Loosen the hex-head screw and the three similar screws on the right side of the divider and, using the reference mark, slide the OBA-2 up or down by the amount that you estimated the OBA-2 height to be in error. Tighten one of the screws and recheck the OBA-2 height. If the height is acceptable, tighten the other three screws. If the height is not acceptable, repeat steps 2 and 3 until the height is acceptable.
4. Check the OBA-2 front-to-back clearance and make the following adjustment if necessary.

OBA-2/STACKER FRONT TO BACK CLEARANCE

1. Loosen the wing nut on the left side of the OBA-2 mounting bracket and slide the OBA-2 transport out approximately 1-1/2 inches.
2. Loosen the four stacker mounting screws on the right side of the divider plate and slide the stacker toward the rear of the phonograph as far as it will go.
3. Slowly close the top door so that it pushes the OBA-2 transport back into the phonograph. Open the top door and tighten the wing nut on the transport mounting bracket.
4. Slide the stacker toward the OBA-2 transport until the stacker engages the transport and tighten the four mounting screws.
5. Check the OBA-2 height and make the adjustment if necessary.

Refer to figure 4-12, the OBA Schematic Diagram, as you troubleshoot electrical problems on the OBA control unit.

Table 4-1. OBA Troubleshooting Chart

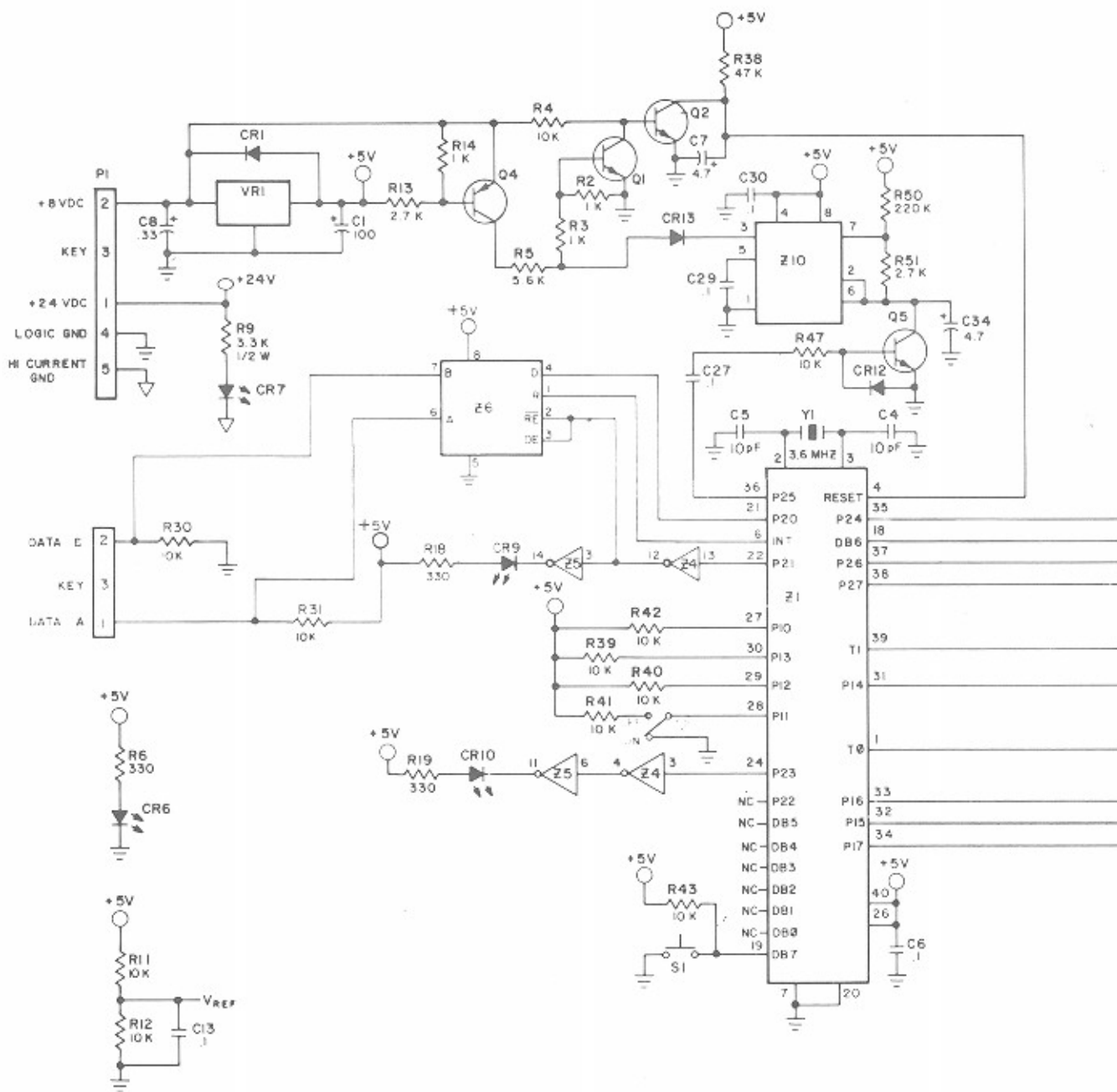
Trouble	Symptom	Probable Cause
Transport motor does not start when a bill is inserted.	The +5 V or +24 V LED on the OBA control unit is not lit	<ol style="list-style-type: none"> 1. A defective power supply 2. A defective harness to the OBA 3. A defective OBA control unit
	Transport does not start, but a clicking sound is heard in the OBA control unit	<ol style="list-style-type: none"> 1. An object is jammed in the transport mechanism 2. A defective transport
	No sound or other indication that the transport is trying to run	<ol style="list-style-type: none"> 1. A defective V1 cell in the transport 2. A defective OBA control unit 3. A defective CCC
	The BA STATUS LED is blinking	The OBA is not operational due to a FAULT condition: See the next problem
The OBA is in SHUTDOWN mode (er 80). In this state, the BA STATUS LED will alternate between STEADY ON and FLASHING (on for 1 second and then flash one or more time). The number of flashes indicates the cause of the shutdown. Also, a SHUTDOWN message with the indicated FAULT code will be sent to the CCC.	The BA STATUS LED flashes once. The FAULT code is 41.	<ol style="list-style-type: none"> 1. An object is in the transport covering the V1 cell 2. A defective transport 3. A defective OBA control unit
	The BA STATUS LED flashes 4 times. The FAULT code is 44.	<ol style="list-style-type: none"> 1. An object is in the transport activating the anti-pull-back lever 2. A defective transport 3. A defective OBA control unit
	The BA STATUS LED flashes 5 times. The FAULT code is 48 or 49.	<ol style="list-style-type: none"> 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. A defective bill stacker 5. A defective OBA control unit

Table 4-1. OBA Troubleshooting Chart

Trouble	Symptom	Probable Cause
	BA STATUS LED flashes 1 time after rejecting the bill	<ol style="list-style-type: none"> 1. A defective V1 or V4 cell in the transport 2. A defective OBA control unit
	BA STATUS LED flashes twice after rejecting the bill	<ol style="list-style-type: none"> 1. A defective V2 cell in the transport 2. A defective control unit
	BA STATUS LED flashes 4 times after rejecting the bill	<ol style="list-style-type: none"> 1. An object is lodged in the transport 2. A binding anti-pull-back lever 3. A defective V4 cell in the transport 4. A defective OBA control unit
	BA STATUS LED flashes 5 times after rejecting the bill	<ol style="list-style-type: none"> 1. The MAG. ADJUST control is set too low 2. The motor speed is incorrectly adjusted 3. A defective magnetic head or transport 4. A defective OBA control unit
	BA STATUS LED flashes 6 times after rejecting the bill	<ol style="list-style-type: none"> 1. MAG. ADJUST may be either too low or too high (<i>see the Mag. Adjust procedure</i>) 2. A defective harness connection at P1, Pins 3 or 4 3. A defective motor or magnetic head in the transport 4. A defective OBA control unit 5. A defective power supply (+24 VDC) from the CCC
The bill acceptor rejects a large number of valid bills. If the rejected bill is allowed to remain in the transport opening, the BA STATUS LED will flash one or more times to indicate the cause of the rejection.	BA STATUS LED flashes 7 times after rejecting the bill	<ol style="list-style-type: none"> 1. The motor speed is not correct 2. A defective transport 3. A defective OBA control unit 4. S2 not in the JUKEBOX position

Table 4-1. OBA Troubleshooting Chart

Trouble	Symptom	Probable Cause
Bills jam frequently	Any bill transporting failure	<ol style="list-style-type: none"> 1. The anti-pull-back lever is not operating freely 2. The bill pressure roller is binding 3. The transport inlet or track surfaces contain projections, rough spots, or dirt 4. The transport belts are out of adjustment or dirty 5. The transport belts are not centered on the rollers 6. The transport upper input roller does not move up and down freely 7. A defective power supply (+24 VDC) from the CCC 8. Creasing rollers "tight" to timing belts.



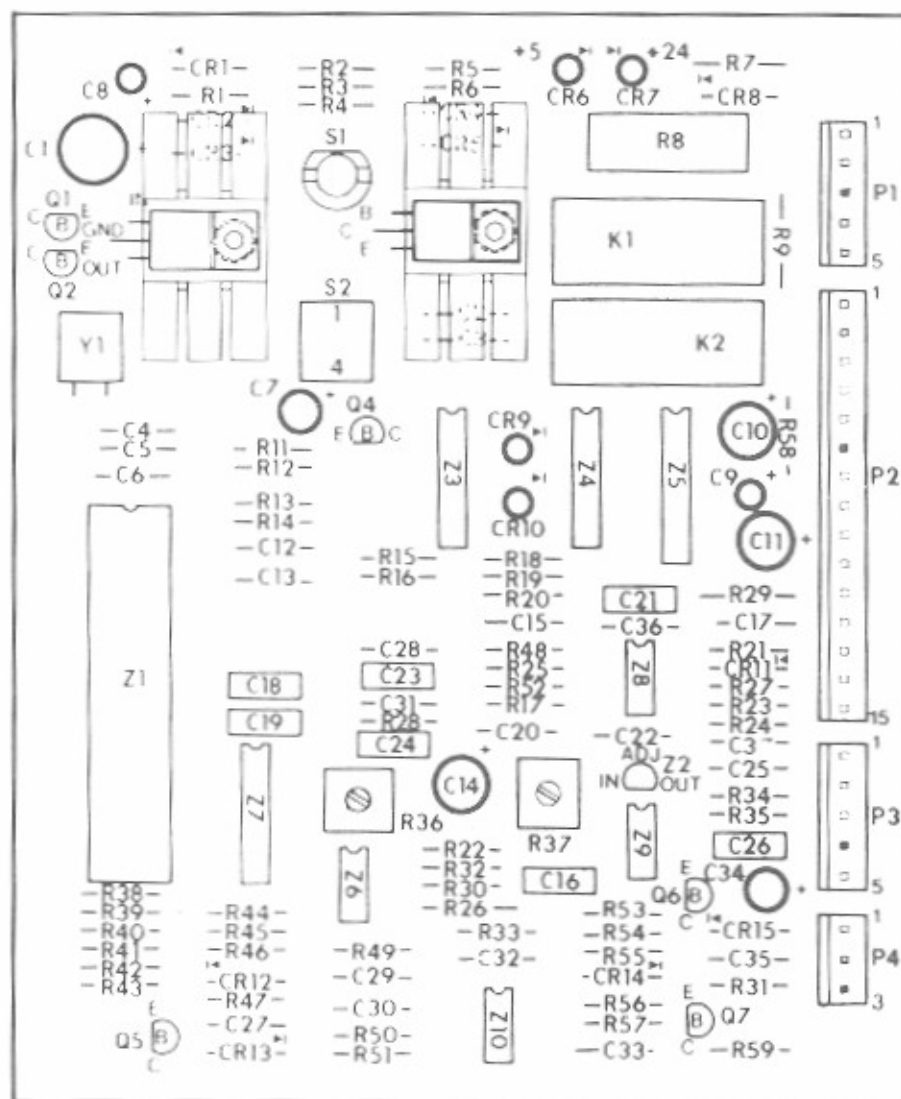


Figure 4-12B. OBA-2 Circuit Board Layout

COMPONENTS LIST FOR OBA-2 CONTROLLER CIRCUIT BOARD 65063209

C1	Capacitor - Electrolytic	100 MF	70023814
C2	Capacitor - Monolithic	.1 MF	70028514
C3	Capacitor - Monolithic	.1 MF	70028514
C4	Capacitor - Monolithic	10 PF	70028701
C5	Capacitor - Monolithic	10 PF	70028701
C6	Capacitor - Monolithic	.1 MF	70028514
C7	Capacitor - Electrolytic	4.7 MF	70023806
C8	Capacitor - Tantalum	.33 MF	70025119
C9	Capacitor - Tantalum	.33 MF	70025119
C10	Capacitor - Electrolytic	100 MF	70023814
C11	Capacitor - Electrolytic	22 MF	70023810
C12	Capacitor - Monolithic	.1 MF	70028514
C13	Capacitor - Monolithic	.1 MF	70028514
C14	Capacitor - Electrolytic	22 MF	70023810
C15	Capacitor - Monolithic	.1 MF	70028514
C16	Capacitor - Mylar	.1 MF	70021549
C17	Capacitor - Monolithic	.1 MF	70028514
C18	Capacitor - Mylar	.01 MF	70021525
C19	Capacitor - Mylar	.068 MF	70021545
C20	Capacitor - Monolithic	.1 MF	70028514
C21	Capacitor - Mylar	.068 MF	70021545
C22	Capacitor - Monolithic	.1 MF	70028649
C23	Capacitor - Mylar	.068 MF	70021545
C24	Capacitor - Mylar	.0022 MF	70021509
C25	Capacitor - Monolithic	.1 MF	70028514
C26	Capacitor - Mylar	.01 MF	70021525
C27	Capacitor - Monolithic	.1 MF	70028514
C28	Capacitor - Monolithic	330 MF	70028719
C29	Capacitor - Monolithic	.1 MF	70028514
C30	Capacitor - Monolithic	.1 MF	70028514
C31	Capacitor - Monolithic	100 PF	70028713
C32	Capacitor - Monolithic	.1 MF	70028514
C33	Capacitor - Monolithic	.1 MF	70028514
C34	Capacitor - Electrolytic	4.7 MF	70023806
C35	Capacitor - Monolithic	.1 MF	70028514
C36	Capacitor - Monolithic	220 MF	70028606
C37	Capacitor - Monolithic	220 MF	70028606

CR1	Diode - Silicon	70035005
CR2	Diode - Silicon	70035005
CR3	Diode - Silicon	70035005
CR4	Diode - Silicon	70035005
CR5	Diode - Silicon	70035005
CR6	Diode - LED	70035303
CR7	Diode - LED	70035303
CR8	Diode - Silicon	70035005
CR9	Diode - LED	70035303
CR10	Diode - LED	70035303
CR11	Diode - Silicon	70035012
CR12	Diode - Silicon	70035012
CR13	Diode - Silicon	70035012
CR14	Diode - Zener	70035514
CR15	Diode - Silicon	70035012

**COMPONENTS LIST FOR
OBA-2 CONTROLLER CIRCUIT BOARD 65063209**

(Continued)

K1	Relay - DPDT		25191201
K2	Relay - DPDT		25191201
P1	Polarizing Wafer	5 Circuit	70075005
P2	Polarizing Wafer	15 Circuit	70075015
P3	Polarizing Wafer	5 Circuit	70075005
P4	Polarizing Wafer	3 Circuit	70075003
Q1	Transistor - NPN Silicon		70030007
Q2	Transistor - NPN Silicon		70030007
Q3	Transistor - PNP Silicon		70030805
Q4	Transistor - PNP Silicon		70030104
Q5	Transistor - NPN Silicon		70030007
Q6	Transistor - PNP Silicon		70030007
Q7	NOT USED		

Note: All resistors are 1/4 watt 5%, unless otherwise noted.

R1	Resistor - Carbon	2.2 K Ω		79901222
R2	Resistor - Carbon	1 K Ω		79901102
R3	Resistor - Carbon	1 K Ω		79901102
R4	Resistor - Carbon	10 K Ω		79901103
R5	Resistor - Carbon	5.6 K Ω		79901562
R6	Resistor - Carbon	330 Ω		79901331
R7	Resistor - Carbon	22 Ω	(1/2w, 10%)	70010724
R8	Resistor - Carbon	7.5 Ω	(5w, 10%)	70011008
R9	Resistor - Carbon	3.3 Ω	(1/2w, 5%)	79904332
R10	NOT USED			
R11	Resistor - Carbon	10 K Ω		79901103
R12	Resistor - Carbon	10 K Ω		79901103
R13	Resistor - Carbon	2.7 K Ω		79901272
R14	Resistor - Carbon	1 K Ω		79901102
R15	Resistor - Carbon	5.6 K Ω		79901562
R16	Resistor - Carbon	5.6 K Ω		79901562
R17	Resistor - Carbon	15 Ω		79901150
R18	Resistor - Carbon	330 Ω		79901331
R19	Resistor - Carbon	330 Ω		79901331
R20	Resistor - Carbon	5.6 K Ω		79901562
R21	Resistor - Carbon	3.9 K Ω		79901392
R22	Resistor - Carbon	10 Ω		79901100
R23	Resistor - Carbon	10 K Ω		79901103
R24	Resistor - Carbon	100 K Ω		79901104
R25	Resistor - Carbon	2.2 K Ω		79901222
R26	NOT USED			
R27	Resistor - Carbon	2.2 K Ω		79901222
R28	Resistor - Carbon	2.2 K Ω		79901222
R29	Resistor - Carbon	1.5 K Ω	(1/2w, 10%)	70010405
R30	Resistor - Carbon	10 K Ω		79901103

R31	Resistor - Carbon	10 K Ω	79901103
R32	NOT USED		
R33	NOT USED		
R34	Resistor - Carbon	220 K Ω	79901224
R35	Resistor - Carbon	330 K Ω	79901334
R36	Potentiometer	5 K Ω	21520706
R37	Potentiometer	50 K Ω	21520702
R38	Resistor - Carbon	47 K Ω	79901473
R39	Resistor - Carbon	10 K Ω	79901103
R40	Resistor - Carbon	10 K Ω	79901103
R41	Resistor - Carbon	10 K Ω	79901103
R42	Resistor - Carbon	10 K Ω	79901103
R43	Resistor - Carbon	10 K Ω	79901103
R44	Resistor - Carbon	8.2 K Ω	79901822
R45	Resistor - Carbon	180 K Ω	79901184
R46	Resistor - Carbon	100 K Ω	79901104
R47	Resistor - Carbon	10 K Ω	79901103
R48	Resistor - Carbon	330 K Ω	79901334
R49	Resistor - Carbon	12 K Ω	79901123
R50	Resistor - Carbon	220 K Ω	79901224
R51	Resistor - Carbon	2.7 K Ω	79901272
R52	Resistor - Carbon	820 K Ω	79901824
R53	Resistor - Carbon	2.2 K Ω	79901222
R54	Resistor - Carbon	100 K Ω	79901104
R55	Resistor - Carbon	2.2 K Ω	79901222
R56	Resistor - Carbon	10 K Ω	79901103
R57	Resistor - Carbon	100 Ω	79901101
R58	Resistor - Carbon	10 K Ω	79901103
R59	Resistor - Carbon	10 K Ω	79901103
S1	Switch - Push Button		70043502
S2	Switch - DIP		70043009
VR1	IC - +5 VDC Regulator		70036506
Y1	Crystal - 3.58 MHz		25167308
Z1	IC - Microcomputer - 8 Bit	8049	70039310
Z2	IC - Current Regulator	LM334Z	70037601
Z3	IC - Quad OP Amp	LM324	30800216
Z4	IC - TTL Hex Invertor	7404	70036304
Z5	IC - Darlington Array	ULN2003	70037901
Z6	IC - RS-485 Transceiver	SN75176	70037801
Z7	IC - F/V Converter	LM2917	30800218
Z8	IC - Dual OP Amp	LM358	30800214
Z9	IC - Dual OP Amp	LM358	30800214
Z10	IC - Timer	LM555	70033801

Section 5: Troubleshooting

INTRODUCTION

The CD-51A Phonograph incorporates several modules which plug in for rapid service. 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 matted.
 - Check for bad solder joints, especially at connector pins.
2. A defective module (*see table 5-1*). Troubleshooting procedures are directed at module replacement, not repair.

Table 5-1 Replaceable Modules

Part No.	Description
40832201	Central Control Computer (CCC)
61048101	Mechanism Control and CD decoder
30955401	CD Player
40770609	Power Supply
40841801	Digital Display
61038904	OBA-2 Control Unit

TROUBLESHOOTING AIDS

The troubleshooting topics presented in this section are:

- A summary of the functions for each of the phonograph's replaceable modules
- A sequence of operation explanation and a Block Diagram (*figure 5-1*) to help you isolate the problem to a harness or a module.
- The RED LED STATUS lamps (*figure 5-2*)
- Instructions on how to use the ERROR and WARNING messages, and DISC CONDITIONS
- Modular Troubleshooting Charts that list the *Trouble*, *Symptom*, and *Probable Cause*
- A Sound System Quick Check

NOTE:



OBA RED STATUS lamps and error messages are presented in this section. The other OBA service procedures are described in *Section 4* of this manual.

REPLACING THE CCC EPROM

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

1. Put NORM/SERVICE switch to SERVICE and ON/OFF Power switch to OFF.
2. Press and hold the keyboard 0 and 1 switches down and place the ON/OFF POWER switch power to ON; hold the 0 and 1 buttons down until the display shows LOADING DEFAULTS. Do not concerned when the 14-04 WARNING appears, because it is just a status message indicating that the defaults were loaded. For a fresh start, clear out this warning (CODE 81).

FREE PLAY

1. Enter the SERVICE mode by setting the SERVICE switch to the SERVICE position.
2. Enter 55. This will place you in the PRICING menu, OPTION 5. Press and hold RESET and press 9. The display will change from FPLAY STATUS OFF to FPLAY STATUS ON. Press POPULAR to complete the change.

CD MODULE FUNCTIONS

Digital Display Module

- A "dumb" controller (i.e. cannot make any decisions)
- Displays information sent by CCC
- Contains the TITLE DISPLAY motor driver IC. The IC is controlled by the CCC.

CCC

- The master controller
- Has battery backed up RAM
- Controls all credit functions
- Stores all selections
- Controls all programming functions
- Makes all system decisions
- Mutes and unmutes the audio amplifier

Mechanism Control

- A slave controller
- Plays selections sent by the CCC
- Controls all mechanism functions
- Controls the CD player

OBA-2 Control Unit

- A slave controller
- Tells CCC when a valid bill is accepted.

Rowelink and the Power Bus (voltages, Commons & System Reset) are the only connections between CCC, mechanism control and OBA-2 control unit. Rowelink is a 2-wire communication channel that ties the system components together. The ROWELINK COMMAND (CCC), ROWELINK TX (mechanism control), and RS-485 STATUS (OBA control unit) LED's should always be flickering.

SEQUENCE OF OPERATION

This sequence of operation describes the phonograph cycle and jobs performed by each module shown in the Block Diagram (*figure 5-1*).

In the Block Diagram, the TITLE DISPLAY switches are shown in the PAGE 1 position. The mechanism DISC HOLD DOWN, OUTER CAM, and INNER CAM switches are shown in the MAGAZINE ROTATE position.

Step 1. Power is turned on, voltages and commons are applied to modules and components.

At Line Voltage	Voltages Labeled	Should Measure
115 VAC	28 VAC	26 to 30 VAC
115 VAC	+28 VDC	+23 to +30 VDC
95 to 135 VAC	+8 VDC	+8.2 to +9.9 VDC
115 VAC	9.5 VAC	8.75 to 10 VAC

Step 2. The modules sense power turn on, no selections or credit in memory, and the SERVICE switch is in the NORMAL position.

CCC

- +5 VDC LED lights
- BOARD ERROR LED flashes 3 times to indicate that ROM, RAM and real time calendar clock have tested OK.
- ROWELINK COMMAND LED flickers, indicating that serial communication commands are being sent from the master (CCC) to the slaves (mechanism control and OBA-2).

Mechanism Control

- +5 VDC LED lights
- BOARD ERROR LED flashes 3 times to indicate that ROM, RAM and other checks have tested OK.
- SCAN/TRANSFER LED is lit while the magazine locates HOME.
- SYSTEM TRANSMIT (Rowelink response) LED flickers indicating that communication is occurring between the mechanism control (a slave) and CCC (the master). Each time it flickers, communication has successfully occurred.

OBA-2 Control Unit

- +5 VDC LED lights
- +24 VDC LED lights
- BA STATUS LED flashes 1 time
- RS-485 STATUS LED flashes 1 time
- RS-485 STATUS LED flickers indicating communication occurring between OBA-2 control unit (a slave) and CCC (the master). Each time it flickers, communication successfully occurred.

Digital Display

- +5 VDC LED lights
- CCC serially sends information (via TX data, clock) and display shows:

- Checksum = XXXX
- RAM test passed
- 0 (selections remaining)
- After 10 seconds, the moving messages ROWE, CD PHONOGRAPH and PLAY THE MUSIC appear.

Step 3. Customer deposits money. Play credit is established.

- Money is deposited
- OBA-2 control unit tells CCC if a bill was validated and stacked.
 - CCC senses coins from the closed coin switches.
 - CCC uses pricing information (COIN SWITCH VALUES, PRICE LEVELS, PLAYS @ LEVEL and MULTIPLIER) stored in it, to convert money deposited into play credits.
- CCC sends (via TX data, clock) credits to digital display and they appear above the SELECTIONS REMAINING legend.
 - CCC tells the mechanism control the money's value and the mechanism control increments the money counter.

Step 4. Customer makes a selection.

- CCC determines that a switch is closed or open by sending out strobes and sensing returns.
- Customer finds the selection that he wants to make by using the keyboard IN (> <) and OUT (< >) switches.
- CCC sends out Strokes 1, 9 and 10 to the DIGITAL DISPLAY.
 - The motor driver in the DIGITAL DISPLAY uses Strobe 9 to control speed and Strobe 10 to control direction.
 - CCC determines when to stop the motor (i.e. a page has flipped) by sensing the state of the INDEX switch on return RET 1.
 - CCC determines when to change directions by sensing the state of the LIMIT switch on return RET 0, or using PAGE IN, OUT data in the ATTRACT menu.
- Customer enters 4 digits (a 2-digit disc number and a 2-digit track number).
- CCC senses the pushed keys by sending out Strokes 2, 3, 4, 5 and sensing returns RET 0, 1, 2 and 3.
- Digital display shows digits as they are entered above the SELECTION BEING MADE.
- Selection stored in the CCC's memory.
- Credit is canceled.
- Selection is displayed for approximately 4 seconds after it is made.

Step 5. Selection is located and played.

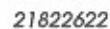
- CCC sends the selection to the mechanism control.
- Mechanism Control searches for the disc.
 - Detent coil is energized and the magazine unlocks.
 - Magazine motor rotates the magazine.
 - Mechanism control SCAN/TRANSFER LED lights.
 - Digital display shows the selection playing as — — — — .
 - Mechanism control locates the disc by counting gear teeth interruptions of the INDEX optical switch light beam.
- Disc located and transferred to the play position.
 - Magazine motor stops and the magazine locks (detented).
 - Transfer motor runs and the disc is placed in the play position.
 - Disc hold-down Common is connected to the N.O. contact.
 - Outer cam Common connected to the N.O. contact.
- Mechanism control SCAN/TRANSFER LED goes OFF.
- Mechanism control tells the CDM-4 what track (i.e. selection) to play.
- CDM-4 tells the mechanism control that the track has been located. Play counter advances.
- Selection plays
 - Mechanism control tells the CCC that the selection is playing.
 - CCC unmutes the audio amplifier.
 - Selection is erased from CCC's memory.
 - Digital display shows that the selection is playing.
 - Mechanism control monitors the disc condition and tells the CCC if disc problems occur.

Step 6. Selection ends, the disc returns to magazine, the CCC searches selection memory.

- Mechanism control tells the CCC that the selection is over.
- CCC mutes the audio amplifier
- Transfer motor runs and the disc is returned to the magazine
 - Inner cam Common connects to the N.O. contact when the disc is in the magazine.
- CCC searches its selection memory. If it contains one or more selections, steps 5 and 6 are repeated.

Step 7. Phono returns to STANDBY and AUTOPLAY timing begins.

- All selections have played.
- Digital display shows moving messages: ROWE, CD PHONOGRAPH, and PLAY THE MUSIC.



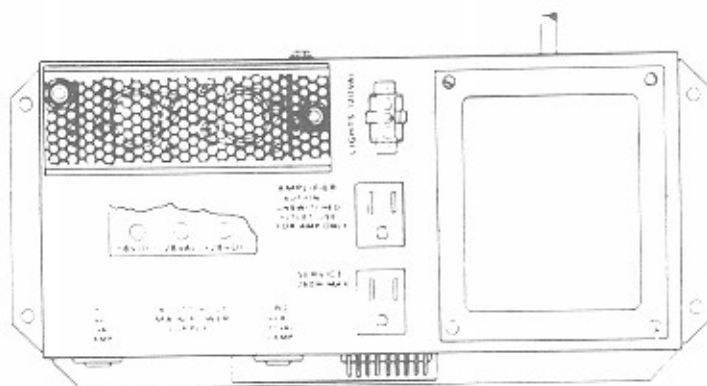
STATUS LAMPS

The red LED indicators are connected to various strategic points in the phonograph's circuits to indicate the status of power and signal circuits.

Main Power Supply LED's

+8 Volts DC
+28 Volts DC
28 Volts AC

These indicators light when their corresponding voltages are present and no wiring shorts are present.



Main Power Supply

Mechanism Control And CD Decoder

OPT. SW. INDEX

Lights when the index section of the optical switch sees a 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. Flickers when the magazine CD Position 99 passes the transfer position.

5 VDC, +10V,
-10V, +12V, -12V

Lights as long as 5 VDC is present from the main power supply.

Rowelink TX

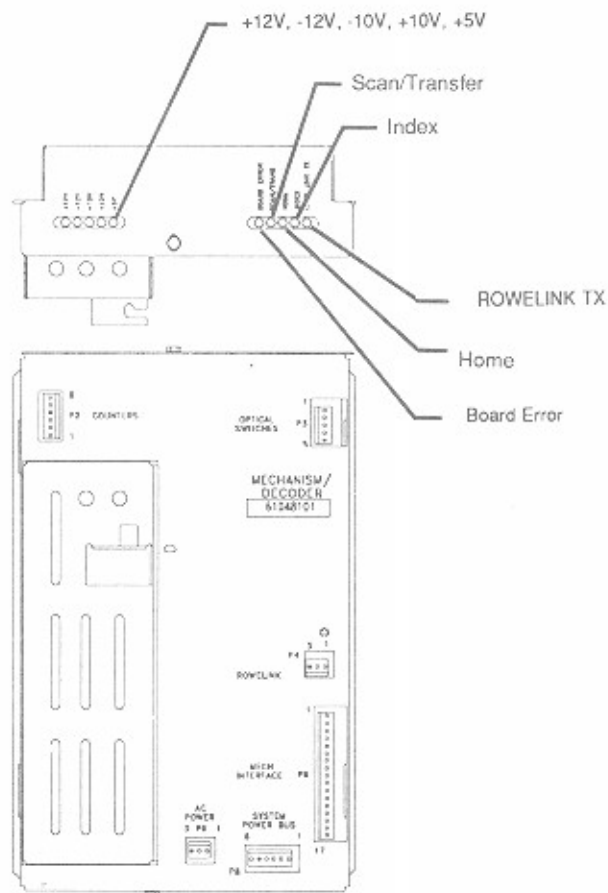
Flashes when the CD mechanism is transmitting to the CCC.

BOARD ERROR

Blinks on and off three times on power up. Any other time, this LED indicates that a fatal mechanism error (phonograph out of service) has occurred.

SCAN/TRANSFER

Lights when either the scan or the transfer motor is activated.



ERRORS AND WARNINGS

Basic Concepts

When you switch to SERVICE mode, you will see one of two displays:

- If the phonograph has not encountered any errors or warnings, * SERVICE MODE * will be displayed.
- If the phonograph has encountered errors or warnings, --ERRORS EXIST-- will be displayed. This message will only appear as you enter SERVICE mode, and it will not change menu or command operation.

ERRORS (ERR)

- Cause phonograph shutdown and show the OUT OF ORDER message.
- Usually require a service call, component replacement, adjustment, or harness repair.
- Are always shown as active (A), even if they cleared up.

If you turn power OFF and ON, the phonograph will operate if error cleared up. If error is still present, the phonograph will shutdown. Errors that clear up do not require service unless phonograph is malfunctioning.

WARNINGS (WARN)

- Do not cause phonograph shutdown.
- Phonograph may or may not operate.
- Service personnel are made aware by the --ERRORS EXIST-- message appearing upon entering the service mode.
- Shown as active (A) until the problem clears up.
- Not active (N) warnings do not require service unless phonograph is malfunctioning.

VIEWING THE ERRORS AND WARNINGS



NOTE:

1. If the CCC thinks that a key other than RESET is closed, it will not accept other keys. This problem will not allow you to view the error/warnings. The probable cause is a short in the keyboard, a short in RET 0, 1, 2 or 3 wiring, defective CCC, or a short in < > page > < switch or wiring.
2. The viewing procedure can be started over by holding RESET and repeatedly pushing POPULAR until the display shows * SERVICE MODE *. Then start at step 2.

Steps

1. Enter SERVICE mode
2. Type 8
3. Type 0 (*see note 1*)
4. Push POPULAR

Display Shows

--Errors Exist--

* STATUS *

Error History

X WARN XX-XX XX

A = Active
 N = Not Active
 Source of warning
 Type of warning
 Number of occurrences

OR

X ERR XX-XX XX

A = Active
 Source of error
 Type of error
 Number of occurrences

5. Hold RESET, push 9

START XX:XX XX/XX

Time of first occurrence
 Month/day of first
 occurrence

6. Hold RESET, push 9

END XX:XX XX/XX

Time it last cleared up
 (not active)
 Month/day it last cleared up
 (not active)
 00:00 00/00 if first
 occurrence and still active,
 or ERR message

7. Hold RESET, push 3

Next ERR or WARN if a different one exists. Otherwise stays the same.

8. Repeat steps 5, 6, and 7 as often as necessary (*See the Notes that follow*).

**NOTE:**

3. You can review the WARN or ERR, START or END by holding RESET and pushing 9 as often as desired.
4. Steps 4 and 5 can be skipped.
5. Hold RESET, push 2 to search backwards through errors.

EXAMPLE 1:

N WARN 06-02 15
 START 14:30 06/01
 END 15:00 06/01

Message means

- OBA-2 thinks bill transport V1 cell was blocked 15 times.
- First occurrence was 2:30 p.m. on June 1.
- Last occurrence cleared up 3:00 p.m. on June 1.

Probable cause

- Someone tried to obtain free credit by inserting a foreign object.

EXAMPLE 2:

A ERR 05-63 03
 START 09:10 07/13
 END 00:00 00/00

Message means

- The CCC has sent messages (via the ROWELINK) to the mechanism control, but the CCC has not received any response for 1 minute.
- First occurrence was 9:10 a.m. on July 13.

**NOTE:**

6. A (Active symbol) always proceeds ERR, even if the problem is not active now.
7. An ERR message always shows 00:00 and 00/00 for the END time and date.

ERROR AND WARNING SUMMARY

The following list summarizes all possible errors and warnings that can be displayed. For details of causes and corrective action, see *Description Of Errors/Warnings And Probable Causes* that follows this summary.

Coin Switches (01)

01-17	#1 coin switch
01-18	#2 coin switch
01-19	#3 coin switch
01-20	#4 coin switch
01-31	Multiple coin switches

Keyboard Switches (02)

02-16	Key 0
02-17	Key 1
02-18	Key 2
02-19	Key 3
02-20	Key 4
02-21	Key 5
02-22	Key 6
02-23	Key 7
02-24	Key 8
02-25	Key 9
02-26	Most Popular key
02-27	Reset key
02-28	<> key
02-29	>< key
02-31	Multiple keys
02-32	Cancel button

Mechanism Controller (05)

05-05	Mech. cannot determine magazine position
05-08	EPROM checksum error
05-09	RAM test failed.
05-10	CMD communication invalid
05-25	Cause undetermined

Mechanism Fatal Errors

These error codes (05-50 through 05-64) will cause a system reset and after five errors, the phonograph will go out of order.

05-50	Inner cam switch
05-51	Inner cam switch
05-52	Outer cam switch
05-53	Outer cam switch

05-56	Index LED
05-57	Index LED
05-58	Home LED
05-59	Home LED
05-62	CDM-to-CCC communication lost
05-64	Gripper bow position undetermined
05-63	Mech-to-CCC communication lost
05-64	Gripper bow position undetermined

OBA-2 (06)

06-01	Communication to the OBA-2 has been lost
06-02	V1 cell or inlet cell
06-03	Jammed bill
06-04	Bill stacker is full
06-05	Cause undetermined

Wallbox Controller (07-10)

07-01	Communication to wallbox #1 has been lost
08-01	Communication to wallbox #2 has been lost
09-01	Communication to wallbox #3 has been lost
10-01	Communication to wallbox #4 has been lost

IR Remote (11)

11-01	Communication to the IR remote has been lost.
-------	---

Central Control Computer (14)

14-01	EPROM checksum error
14-02	RAM failed
14-03	Real time clock error
14-04	Factory defaults have been loaded
14-05	RAM checksum error
14-06	Low battery

Description Of Errors/Warnings And Probable Causes

SOURCE 01 (COIN SWITCH WARNINGS)

WARN	01-17	#1 coin switch
	01-18	#2 coin switch
	01-19	#3 coin switch
	01-20	#4 coin switch
	01-31	Multiple coin switches

Message Means:

CCC thinks one or more coin switches are closed for more than 5 seconds.

Probable cause:

1. A manual operation of coin switches
 2. A jammed coin or switch
 3. A short in wiring
 4. A defective CCC
-

SOURCE 02 (KEYBOARD WARNINGS)

WARN	02-16	Key 0
	02-17	Key 1
	02-18	Key 2
	02-19	Key 3
	02-20	Key 4
	02-21	Key 5
	02-22	Key 6
	02-23	Key 7
	02-24	Key 8
	02-25	Key 9
	02-26	MOST POPULAR key
	02-27	RESET key
	02-28	< > key
	02-29	> < key
	02-30	-----
	02-31	Multiple keys
	02-32	External CANCEL button

Message Means:

CCC thinks one or more switches were closed for more than 10 minutes.

Probable cause:

1. Someone held it closed. Nothing needs repairing or replacing.
2. A short in associated wiring (*see the Block Diagram in this section*).
3. A defective CCC.

SOURCE 03—04 NOT DESIGNATED

SOURCE 05 (MECHANISM ERRORS/WARNINGS)

WARN 05-05

Message Means:

Both the Index and Home signals are changing, but the mechanism is unable to determine the magazine position.

Probable cause:

1. A defective optical switch
 2. A loose connection wire/terminal at OPTICAL switch connector on the mechanism controller.
 3. A defective mechanism control
-

WARN 05-08 EPROM checksum warning

Message Means:

Checksum test failed

Probable cause:

1. A failed EPROM
 2. A defective mechanism control.
-

WARN 05-09 RAM test failed

Message Means:

RAM test failure

Probable cause:

A defective RAM or mechanism control.

WARN 05-10 CDM communication invalid

Message Means:

The mechanism control is receiving invalid communications from the servo-processor on the decoder board.

Probable cause:

1. Neon signs
 2. RF signals from radio station(s), CB radio(s), arcing wires, etc.
-

Warn 05-25 Unspecified Warning

ERR 05-50	Inner Cam switch always closed
05-51	Inner Cam switch always open
05-52	Outer Cam switch always closed
05-53	Outer Cam switch always open

Message Means:

Mechanism control thinks a switch is not working.

Probable cause:

1. A switch
 2. A wiring short or open
 3. The mechanism control
-

ERR 05-56	Index LED always OFF
05-57	Index LED always ON
05-58	Home LED always OFF
05-59	Home LED always ON

Message Means:

Mechanism control thinks that the optical switch is defective.

Probable cause:

1. The optical switch
 2. A wiring short or open
 3. The mechanism control
-

ERR 05-62	CDM communication failure
-----------	---------------------------

Message Means:

The servo processor, on the decoder board, has stopped all communications with the mechanism control for 20 seconds.

Probable cause:

1. The decoder board is not getting power
 2. A failure in the mech controller
 3. A failure in the decoder board
-

ERR 05-63	Mech communication failure
-----------	----------------------------

Message Means:

The CCC has sent messages (via the Rowelink) to the mechanism controller, but the CCC has not received any response for one minute.

Probable cause:

1. Rowelink harness failure in the CCC harness
2. The mech control has failed
3. CCC (or a module that uses ROWELINK) has failed.

ERR 05-64

Message Means:

Both the inner and outer cam switches are operating, but the gripper bow position is uncertain.

Probable cause:

1. A defective cam switch
 2. A loose connection in wire/terminal at cam switch
 3. A defective mechanism control
-

SOURCE 06 (OBA-2 WARNINGS)

WARN 06-01

Message Means:

OBA-2 Communication failure

Probable Cause:

1. A loose connection in wire/terminal at the Rowelink communication line.
 2. A defective OBA-2.
-

WARN 06-02

Message Means:

OBA-2 control unit thinks that the transport V1 cell is blocked.

Probable cause:

1. An object in transport covering V1 cell
 2. A defective transport
 3. A defective OBA-2
-

WARN 06-03

Message Means:

OBA-2 control unit thinks that a bill is jammed in the transport.

Probable cause:

1. An object is or was in transport activating anti-pullback lever.
 2. A defective transport
 3. A defective OBA-2
-

WARN 06-04

Message Means:

OBA-2 thinks that the bill stacker is full.

Probable cause:

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. A defective bill stacker
 5. A defective OBA-2
-

WARN 06-05 Unspecified Warning

SOURCE 07 (WALLBOX ADDRESS 70)

WARN 07-01 CCC lost communication with wallbox or concentrator for more than 1 minute

SOURCE 08 (WALLBOX ADDRESS 71)

WARN 08-01 CCC lost communication with wallbox for more than 1 minute

SOURCE 09 (WALLBOX ADDRESS 72)

WARN 09-01 CCC lost communication with wallbox for more than 1 minute

SOURCE 10 (WALLBOX ADDRESS 73)

WARN 10-01 CCC lost communication with wallbox for more than 1 minute

Message Means:

Rowelink communications was established with this wallbox or concentrator then it was lost for more than 1 minute.

Probable Cause:

1. The Rowelink wiring to the concentrator (or wallbox)
 2. A wallbox power supply
 3. A wallbox or concentrator
-

SOURCE 11 (IR REMOTE WARNING)

WARN 11-01 IR Remote communication failure

Message Means:

Rowelink communications was established with the IR remote then was lost for more than 1 minute.

Probable Cause:

1. Defective Rowelink harness between the P10 of the CCC and P6 of the IR Remote.
2. Defective power harness between P1 of the CCC and P4 of the IR Remote.
3. Defective IR Remote assembly.

SOURCE 12-13 NOT DESIGNATED**SOURCE 14 (INTERNAL CCC WARNINGS)**

- 14-01 CCC EPROM checksum test failed
- 14-02 CCC RAM test failed
- 14-03 CCC real-time clock failure
- 14-04 CCC factory defaults requested and loaded
- 14-05 CCC programmed RAM checksum test failed
- 14-06 CCC battery voltage is low

Message Means:

All except 04 indicate a CCC internal fault. The 04 indicates factory defaults were loaded into programmed RAM because: someone used the factory load procedure (see replacing the EPROM).

Probable cause:

1. A defective CCC for all except 04
2. A defective CCC if 04 occurs frequently
3. Someone loaded factory defaults, causing 04 warning.

CLEARING ERROR/WARNINGS FROM MEMORY

Error/warnings stored in the phonograph's memory can be cleared by:

STEPS**DISPLAY SHOWS**

- | | |
|-----------------------|--------------------------------|
| 1. Enter SERVICE mode | -- ERRORS EXIST -- |
| 2. Press 8. | * STATUS * |
| 3. Press 1. | * CLEAR ERRORS * |
| 4. Press POPULAR. | CLEAR ERRORS |
| | (Will blink and then reappear) |

**NOTE:**

If already in SERVICE mode, or you want to start over, hold RESET and repeatedly press POPULAR until display shows * SERVICE MODE *. Then start at step 2.

DISC CONDITIONS

Basic Concepts

Compact Discs are very rugged, but sometimes they develop problems similar to vinyl records. Skips and dropouts are not uncommon CD faults and may be caused by: a dirty disc, dirty CD player lens, or CD manufacturing defects. On rare occasions, the CD player may be unable to play any tracks on a disc. This failure to play any tracks may have the same cause as skips and dropouts.

Programmable Disc Condition Logging

The CD-100C has a built-in disc condition logging feature that records disc play problems found on a disc or track. Three programmable options determine when these conditions are placed into the Disc Condition Log:

SKIP LOG (SERVICE CODE 35)

The number of skips, over one second, to occur before recording the error in the condition log. The recommended setting is 3.

SKIP CANCEL (SERVICE CODE 36)

The number of skips, greater than one second, to occur before recording the error in the condition log and canceling the selection. The recommended setting is 5.

TIME CANCEL (SERVICE CODE 37)

The absolute time difference, in seconds, between the current playing position, coming off the CD, and the running time. The recommended setting is 10.

Factory Settings

The factory settings for the SKIP LOG, SKIP CANCEL, and TIME CANCEL are 99. The reason for the difference between defaults and recommended settings is that we want the CD-100C, when shipped, to play discs of practically any condition without early canceling.

Non-Programmable Disc Condition Logging

Four non-programmable disc condition events are also recorded in the condition log. These events are:

LOGGED TRACK NUMBER EQUALS 00

This entry in the log means that the CD player was unable to read the CD Table Of Contents (TOC).



NOTE:

The TOC is read every time the disc is placed on the turntable. The TOC contains the location of each track on the disc, so without it the player is unable to play any track.

LOGGED CANCL AND SKIP EQUALS 99

This entry means that the CD player was able to read the TOC, but was unable to locate the track.

LOGGED CANCL EQUALS 99 AND SKIP EQUALS 77

This means the disc stopped spinning while playing

LOGGED CANCL EQUALS 99 AND SKIP EQUALS 88

This means tracking was lost when the disc was playing

The CD-51A has an automatic method to lock out selections that have logged too many errors. You can set this number of condition occurrences to any number from 1 to 99. Once the LOCKOUT COUNT, Code 693, has exceeded the number of occurrences on a selection, that selection is automatically placed into LOCKOUTS list, Code 60. To remove a condition generated lockout, *refer to the Section 2* on editing the Lockout List or reinitialize the disc when using menu command 31.

Viewing Disc Conditions

Steps	Display Shows
1. Enter SERVICE mode.	* SERVICE MODE *
2. Type 8.	* STATUS *
3. Type 6.	DISC CONDITIONS
4. Press POPULAR	- NO CONDITIONS
	-OR-
	SEL ditr OCC oo
	The small letters mean: di - Disc number tr - Track number oo - Number of occurrences
5. Hold RESET, press 9	CANCL tt SKIP ss tt - Absolute time difference, in seconds, when the condition was logged. ss - Number of skips, greater than one second in duration, when the condition was logged.
6. Hold RESET, press 9	TIME hh:mi mo/dd hh - Hour when last condition occurred. mi - Minute when last condition occurred. mo - Month when last condition occurred. dd - Day when last condition occurred.
7. Hold RESET, Press 3 to view next disc condition.	
8. Hold RESET, Press 2 to view previous disc condition.	
9. Repeat steps 5, 6, 7, and 8 as often as necessary.	

Example 1:

SEL 1500 OCC 05
CANCL 00 SKIP 00
TIME 12:15 7/19

Condition Means

The CD player could not read the TOC (track number equals 00) of disc 15 on 5 selected occasions. The most resent condition was logged on July 19th at 12:15 (24 hour time).

Probable Cause

1. Disc installed backward.
2. Absent disc. This disc location may not have been initialized, allowing it to be accidentally selected.
3. Dirty disc. For this type of a condition the dirt would be located around the inner most diameter of the disc. This is where the TOC information is located.
4. Dirty CD player LASER lens. Expect to see various conditions logged on many of the discs selected (*see CD Player Lens in Section 3 for details*).

Remedy

1. Check to see if the disc was inserted backward. If inserted backward, re-install it correctly and initialize that disc.
 2. Check to see if the disc is present. If not present, initialize that disc location.
 3. Remove the disc from the magazine, then inspect the inner diameter, TOC area, for dirt or damage. If you find dirt or damage clean it up. See disc cleaning section. Clear out the conditions and select a track on this disc to see if the CD player is able to read the TOC. If the CD player is still unable to read the TOC, try further cleaning or replace the disc.
 4. Clean the CD player LASER lens (*see CD Player Lens in Section 3 for details*).
-

Example 2:

SEL 1505 OCC 01
CANCL 99 SKIP 99
TIME 12:30 7/12

Condition Means

The CD player read the TOC successfully, but was unable to start playing the track (no music would have been heard) on 1 occasion. The most resent condition was logged on July 12th at 12:30 (24 hour time).

Probable Cause

1. The disc is dirty. For this type of a condition the dirt would be located some where between the inner most diameter of the disc and the track selected. See disc cleaning section.

2. Dirty CD player LASER lens. Expect to see various conditions logged on many of the discs selected (see *CD Player Lens in Section 3 for details*).

Remedy

1. Remove the disc from the magazine, then inspect it for dirt or damage. If you find dirt or damage clean it up. See disc cleaning section. Clear out the conditions and select 1505 again to see if the CD player is able to play it. If the CD player is still unable to play it, try further cleaning, lock out tracks 5 and greater on disc 15, or replace the disc.
 2. Clean the CD player LASER lens (see *CD Player Lens in Section 3 for details*).
-

Example 3:

SEL 2302 OCC 01
CANCL 10 SKIP 3
TIME 23:30 5/20

Condition Means

1. The CD player was playing selection 2302, but while it was playing 3 skips occurred, skips over 1 second, with an overall time loss of 10 seconds on 1 occasion. The most recent condition was logged on May 20th at 23:30 (24 hour time).

Probable Cause

1. Dirty disc. For this type of a condition the dirt would be located some where within track 2.
2. Dirty CD player LASER lens. Expect to see various conditions logged on many of the discs selected (see *CD Player Lens in Section 3 for details*).
3. An outside jarring of the jukebox.

Remedy

1. Remove the disc from the magazine, then inspect it for dirt or damage. If you find dirt or damage clean it up. See disc cleaning section. Clear out the conditions and select 2302 again to see if the CD player is able to play it. If the CD player is still unable to play it, try further cleaning, lock out track 2 on disc 23, or replace the disc.
2. Clean the CD player LASER lens (see *CD Player Lens in Section 3 for details*).

Clearing Disc Conditions From Memory

Disc condition messages stay in memory until you perform the following steps:



NOTE:

If already in SERVICE mode, or you want to start over, hold RESET and repeatedly press POPULAR until display shows * SERVICE MODE *. Then start at step 2.

STEPS

1. Enter SERVICE mode
2. Press 8.
3. Push 7.
4. Press POPULAR.

DISPLAY SHOWS

* SERVICE MODE * or -- ERRORS EXIST --
* STATUS *
* CLEAR CONDITIONS *
CLEAR CONDITIONS
(will blink and then reappear)

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 5-2 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.

Refer to figure 5-1, the Block Diagram for harnessing information.

Table 5-2. Modular Troubleshooting Chart


Trouble	Symptom	Probable Cause
Phonograph fails to operate when power is turned ON	LED's on power supply and fluorescent lights fail to light	<ol style="list-style-type: none"> 1. Rear power switch OFF 2. Plug not in wall 3. Wall circuit is dead 4. 10 amp circuit breaker tripped 5. Wiring to rear power switch 6. Rear power switch
	LED's on power supply fail to light but fluorescent lamps are ON	<ol style="list-style-type: none"> 1. 2 amp circuit breaker tripped 2. Power supply 3. 28 VAC overload from magazine, transfer
	The +8 VDC or +28 VDC LED on power supply fails to light but lights when phono harness at power supply is unplugged	<ol style="list-style-type: none"> 1. Central control computer 2. Mechanism control 3. Digital display 4. Power Supply 5. Service switch 6. Short circuit in wiring 7. Detent coil 8. Money or play counter
<div>  NOTE: To locate the problem, reconnect the phono harness and unplug the connectors in the order shown in the following 10 steps. If the LED lights, replace the last module unplugged or repair the short in the harness. </div>		

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Phonograph fails to operate when power is turned ON	The +8 VDC or +28 VDC LED on power supply fails to light but lights when phono harness at power supply is unplugged	<ol style="list-style-type: none"> 1. Digital display module (P1) 2. Harness at the CCC (P5) 3. Harness at CCC (P1) 4. Harness at mechanism control (P12 and P6). Check harnesses, detent coil, and counters. 5. Mechanism control module (P7) 6. Harness at CCC (P2) 7. CCC module (P3) 8. Check power switch and wiring between it, the power supply, and CCC (P3). 9. Replace the power supply or the circuit board inside it.
	CCC ROWELINK COMMAND LED is always OFF or always ON (not flickering)	Central control computer
	CCC ROWELINK COMMAND LED flickering 4 times a second and the display shows OUT OF ORDER, and Error A ERR 05-63 is logged in	<ol style="list-style-type: none"> 1. If the mechanism ROWELINK TX LED is flickering, the cause is: <ol style="list-style-type: none"> a. mech control b. open wiring in mechanism 2. If the mechanism ROWELINK TX LED is not flickering, the cause is: <ol style="list-style-type: none"> a. mechanism control b. OBA-2 c. a short in the ROWELINK wiring

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
<div data-bbox="224 399 358 499"></div> <p>NOTE:</p> <p>The CCC sends OUT OF ORDER to the display and logs the A ERR 05-63 Error one minute after power up if it cannot establish Rowelink communication with the mechanism control and the phonograph is in the NORMAL mode (i.e. not SERVICE).</p> <p>To isolate the problem to a module or its associated Rowelink wiring, put the SERVICE switch in the SERVICE position and unplug the connectors in the following order. If the mechanism ROWELINK TX (TRANSMIT) LED starts flickering, replace the last module unplugged or repair the short in the harness. If the LED never starts flickering, the cause is a defective mechanism control, CCC, or a short in the Rowelink harness between them.</p> <ol style="list-style-type: none"> 1. Unplug the OBA. 		
Magazine does not rotate when a selection is made	SCAN/TRANSFER LED ON, detent is actuated	<ol style="list-style-type: none"> 1. Power supply 2. Wiring to mag. motor 3. Magazine motor 4. Mech control board
	SCAN/TRANSFER LED OFF	<ol style="list-style-type: none"> 1. Mech control board 2. Central control computer 3. Wiring from central control computer to mech control board
Magazine rotates continuously	SCAN/TRANSFER LED OFF	<ol style="list-style-type: none"> 1. Wiring to magazine motor 2. Mech control board

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Magazine rotates continuously (cont'd)	SCAN/TRANSFER LED is ON, OPT. SW. INDEX LED is not flashing, and/or OPT. SW. HOME LED does not flash at Disc Number 99.	<ol style="list-style-type: none"> 1. Optical switch 2. Wiring to optical switch 3. Mech control board
	SCAN/TRANS LED ON and both optical switch LED's normal	Mech control board
Magazine stops at wrong disc	Stops at random CD anywhere in magazine	<ol style="list-style-type: none"> 1. Faulty optical switch 2. Wiring to optical switch 3. Heavy dirt buildup in optical switch
	Stops one or two discs before disc selected	<ol style="list-style-type: none"> 1. Optical switch adjustment 2. Magazine not full of CD's (out of balance) 3. Broken sprag lever guide
	Stops one or two discs after disc selected	<ol style="list-style-type: none"> 1. Faulty optical switch 2. Optical switch adjustment 3. Magazine not full of CD's (out of balance) 4. Broken sprag gear 5. Sprag linkage binding
	Stops one-Half to one disc position off before or after disc selected	<ol style="list-style-type: none"> 1. Broken sprag gear 2. Broken sprag guide 3. Sprag linkage binding or needs adjustment

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Disc does not transfer	SCAN/TRANSFER LED is ON	<ol style="list-style-type: none"> 1. Wiring to transfer motor 2. Mech control board 3. Transfer motor
	SCAN/TRANSFER LED is OFF	<ol style="list-style-type: none"> 1. Mech control board 2. Central control computer 3. Wiring from central control computer to mech control board
Transfer starts when power is applied and runs continuously	SCAN/TRANSFER LED is OFF	<ol style="list-style-type: none"> 1. Mech control board 2. Wiring to motor
	SCAN/TRANSFER LED is ON	<ol style="list-style-type: none"> 1. Mech control board 2. Open circuit at inner cam switch N.O. contact 3. Open circuit at inner cam switch Common 4. Outer cam switch N.O. shorted to Common
Transfer starts and runs continuously after selection is located	SCAN/TRANSFER LED comes ON when motor starts and stays ON	<ol style="list-style-type: none"> 1. Wiring to outer cam switch 2. Outer cam switch 3. Mech control board 4. Inner cam switch N.O. contact shorted to Common. 5. Open circuit in outer cam switch Common
No sound	Always muted	<ol style="list-style-type: none"> 1. Central control computer 2. Amplifier
Motor noise in speakers	Never muted	<ol style="list-style-type: none"> 1. Central control computer 2. Wiring between CCC and amplifier 3. Amplifier

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
All discs cancel without playing	Disc spins but will not play	1. Short in cancel switch wiring 2. Cancel switch 3. Mech control board 4. CD player 5. Bad/upside down disc
	Disc will not spin	1. Mech control board 2. CD player 3. Wiring between the CD player and the mech control
Some discs cancel without playing		1. Defective discs (check disc conditions) 2. Mechanism control 3. CD player
Money counter or play counter fails to count	Fails to count	1. Wiring to counter 2. Counter 3. Mech control board
Phonograph is always in SERVICE mode of operation	* SERVICE MODE * is always displayed after power up	1. SERVICE switch 2. SERVICE switch wiring 3. Central control computer 4. Central control computer set for programming with the front door closed (the VOID SERVICE SWITCH option is ON)
Phonograph will not go into SERVICE mode	Display will not show * SERVICE MODE * or ERRORS EXIST when SERVICE switch is in SERVICE	1. Central control computer 2. SERVICE switch wiring 3. SERVICE switch

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Some CD's Skip		<ol style="list-style-type: none"> 1. Dirty discs or dirty lens on CD player (see <i>table 3-3</i> for lens cleaning procedure) 2. Defective discs (check disc conditions) 3. Mechanism control 4. CD player
All CD's skip		<ol style="list-style-type: none"> 1. Dirty lens on CD player (see <i>table 3-3</i> for lens cleaning procedure) 2. CD player 3. Mechanism control
No credit	No credit given by coins and dollar bills	Central control computer
	No credit given by coins but dollar bill gives credit	<ol style="list-style-type: none"> 1. Coin switch Common wiring 2. Central control computer
	One value of coin will not give credit	<ol style="list-style-type: none"> 1. Coin rejected 2. Wiring to coin switch 3. Coin switch 4. Central control computer
	Dollar bill will not give credit	<ol style="list-style-type: none"> 1. Bill acceptor 2. Wiring to bill acceptor 3. Central control computer
Wrong credit	Credit for amount deposited does not agree with price card setting	<ol style="list-style-type: none"> 1. One or more coins or bills did not register (<i>see No Credit</i>). 2. Central control computer programmed incorrectly. 3. Central control computer
System does not respond to keyboard	0 Credits on SELECTION REMAINING display	Insufficient credit

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
System does not respond to keyboard (<i>cont'd</i>)	Credits remain, but entire keyboard does not work	<ol style="list-style-type: none"> 1. Shorted keyboard switch 2. Central control computer 3. Short in keyboard wiring
	Credits remain, but certain keys do not work	<ol style="list-style-type: none"> 1. Wiring from keyboard to Digital Display - or to CCC. 2. Keyboard 3. Central control computer
Digital display does not work	Display lights, but shows wrong information	<ol style="list-style-type: none"> 1. Digital display 2. Central control computer
Title pages do not operate normally	Title pages do not move at all or movement is very slight	<ol style="list-style-type: none"> 1. Mechanical jam in the mechanism—Try to rotate the motor by hand—Disassemble to locate the jam. 2. The motor will not run—faulty motor—test for voltage at the motor—Try rotating the motor by hand. Remove the motor and test it. 3. The switches are not adjusted properly - Adjust according to the procedure in <i>section 6</i>. 4. The title page harness is not plugged in.
	Two pages on a side try to turn at the same time	The metal fingers on the back of the top of the page are bent because the pages were forced. Remove the racks from the back side of the assembly—Inspect the metal fingers and straighten any bent fingers.

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Title pages do not operate normally (<i>cont'd</i>)	Pages continue to flip past the next page	<ol style="list-style-type: none"> 1. Index switch on the title display is defective or out of adjustment. 2. Harness between title display and +5 of the Digital Display. 3. Harness between P3 of the Digital Display and P5 or P15 of the central control computer. 4. Defective Digital Display. 5. Defective central control computer.
	Cannot get the desired page	<ol style="list-style-type: none"> 1. PAGE IN/OUT limits are not set correctly—<i>See Section 2</i>. 2. Limit switch on the title display is defective or out of adjustment. 3. Harness between the title display and J5 of the digital display. 4. Harness between J3 of the digital display and P5 or P15 of the central control computer. 5. Defective digital display module. 6. Defective central control computer.

Table 5-2. Modular Troubleshooting Chart

Trouble	Symptom	Probable Cause
Title pages do not operate normally (<i>cont'd</i>)	Pages do not operate from keyboard OUT/IN switches or from the titles OUT/IN switch	<ol style="list-style-type: none"> 1. Defective title motor. 2. Defective digital display module. 3. Defective central control computer. 4. Harness between title display and J5 Digital Display. 5. Harness between P3 of the Digital Display and P5 or P15 of the central control computer. 6. Defective keyboard. 7. Harness between J1 of the keyboard and J4 of the digital display.
	Pages do not operate from the keyboard OUT/IN switches, but do operate from the titles OUT/IN switch	Defective keyboard
	Pages do not operate from the titles OUT/IN switch, but do operate from the keyboard OUT/IN switches	<ol style="list-style-type: none"> 1. Defective titles OUT/IN switch 2. Harness between titles OUT/IN switch and J2 of the keyboard. 3. Defective keyboard.
Miscellaneous problems	Any malfunction not described above	<ol style="list-style-type: none"> 1. Main power supply 2. Central control computer

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 and 5-4 as needed.*



WARNING:

Do not plug in or unplug circuit boards with power ON. Checks should be made with the changer in the disc playing position. Perform all service checks in the order listed.

No Sound — Both Channels

POWER - SECOND LEVEL

1. Check that the amplifier is plugged-in and is receiving power from the power supply.
2. Disconnect the mute plug.
3. 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 its power is turned ON.

VOLUME CONTROL

Disconnect the volume control plug from the amplifier chassis and short out Pin 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.

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

EXTENSION SPEAKERS

Check the OVERLOAD indicators (*see figure 1-6*), then disconnect the extension speakers from the transformer package receptacle (*figure 1-7 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.

Check that the phonograph is not overloaded by performing the following five steps:

1. Make sure that the phonograph and extension speakers connect to the proper speaker taps.
2. On the amplifier, set both RIGHT CHANNEL and LEFT CHANNEL tone controls fully counter-clockwise.
3. Set the volume control fully clockwise (maximum volume) and make a selection.
4. While the music is playing, an acceptable load will allow the OVERLOAD INDICATOR(S) to be off or occasionally flicker in a random manner. If the OVERLOAD INDICATOR(S) are always lit or flicker continuously, the amplifier is overloaded and you must perform Step 5.
5. Do this step only if the OVERLOAD INDICATOR(S) came on as described in the previous step. Find the source of the overload (shorted speaker wires, too many speakers connected, or speaker power taps too high). After you fix the short, disconnect a few speakers, or lower the speaker power tap selection; repeat Step 4.

OUTPUT DEVICES

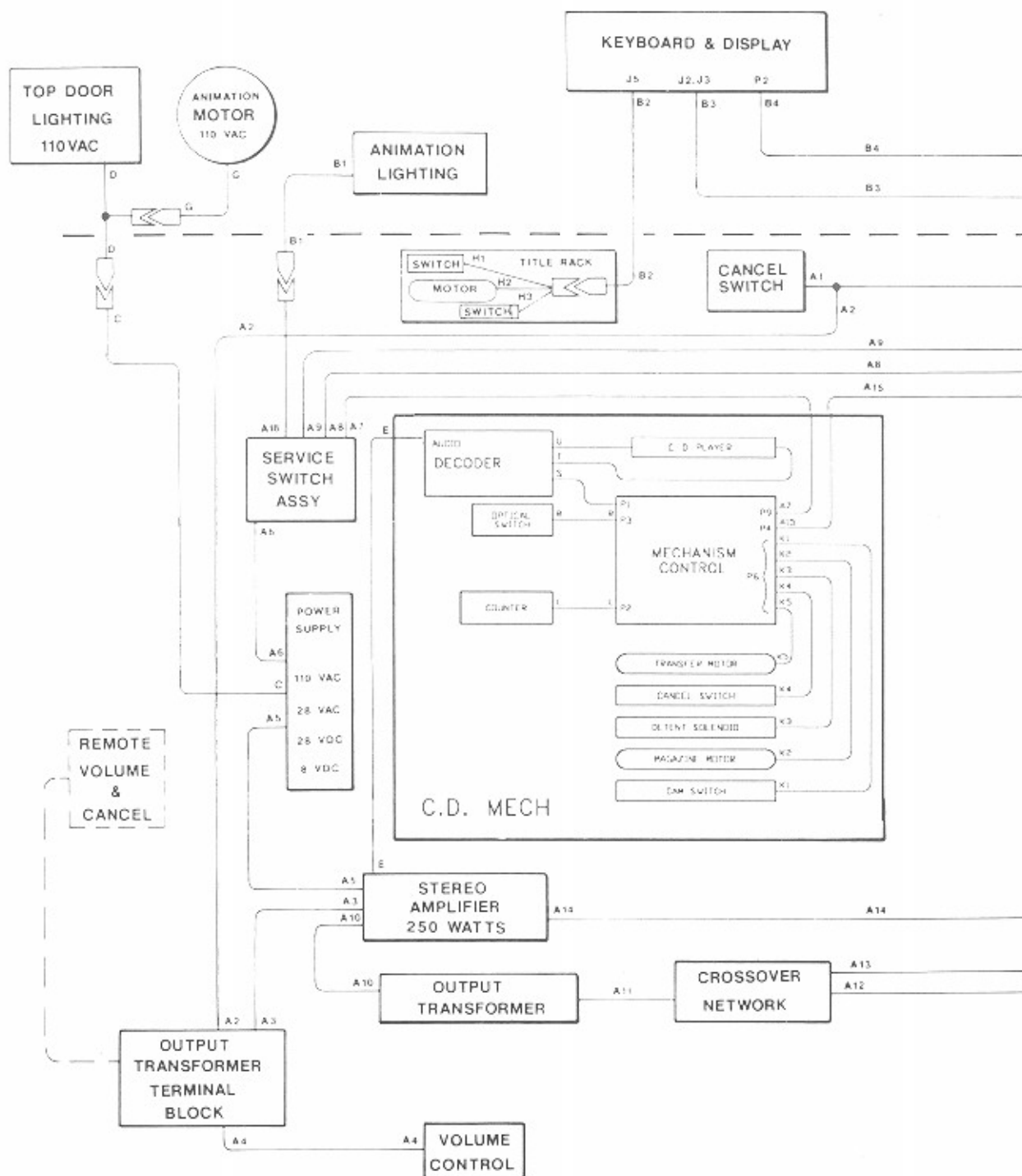
Visually inspect the driver board for blown fuses. If a fuse is blown, replace the associated output device. The two devices used in each channel are not interchangeable. Check the part number on the case and install an identical or equivalent replacement. Before mounting the device onto the heat sink, 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.

FILTER CAPACITORS

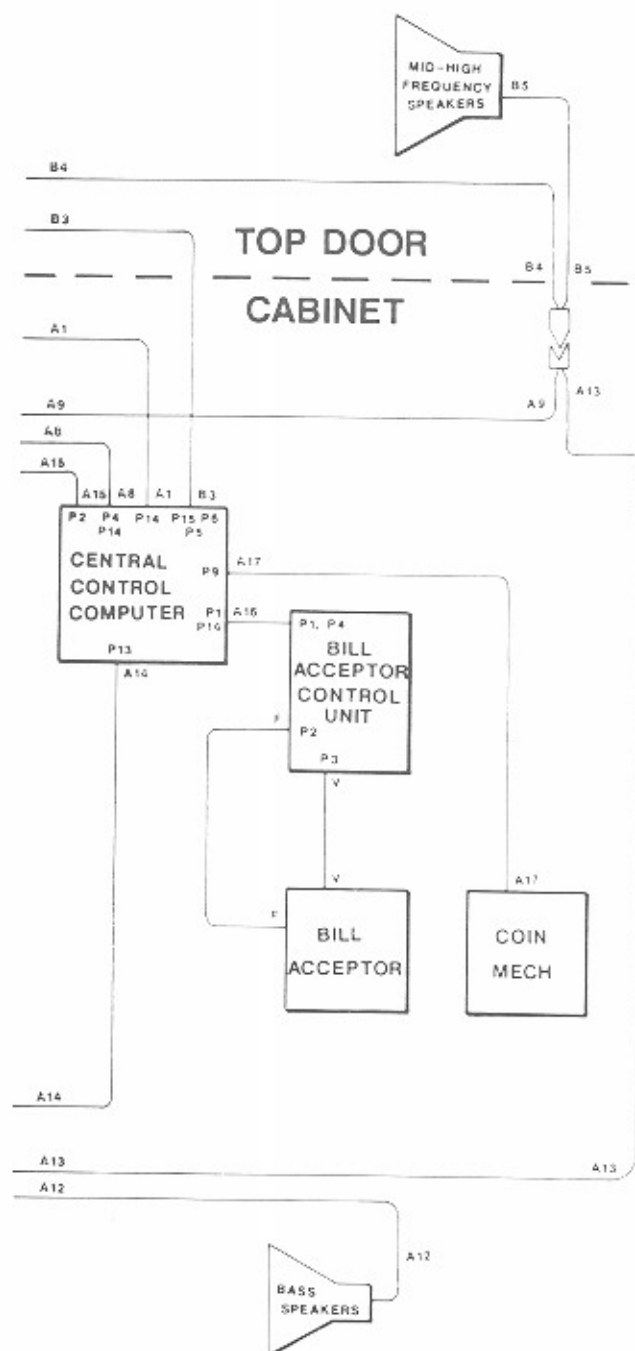
Check for plus and minus 40 VDC in the amplifier power supply. Connect the negative meter lead to ground and check the voltage at the terminals of the large electrolytic filter capacitors located on the amplifier chassis next to the power transformer. When taking readings on the capacitor with the outer 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.

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.



Export Domestic



- A > HARNESS & SWITCH ASSY** _____ 61044001/02
1. CANCEL TO COMPUTER
 2. CANCEL LINE TO TERMINAL BLOCK
 3. REMOTE VOLUME & VOLUME CONTROL FROM AMPLIFIER
 4. VOLUME CONTROL
 5. 110 VAC TO AMPLIFIER
 6. LOW VOLTAGE POWER TO SWITCH
 7. 28 VAC TO C. D. PLAYER
 8. LOW VOLTAGE POWER TO COMPUTER
 9. PAGE CONTROL
 10. AMPLIFIER OUTPUT (AUDIO)
 11. AUDIO OUTPUT TO CROSSOVER
 12. AUDIO OUTPUT TO BASS SPEAKERS
 13. AUDIO OUTPUT TO MID-HIGH FREQUENCY SPEAKERS
 14. MUTE
 15. SIGNAL & VDC POWER TO C.D. PLAYER
 16. SIGNAL & VDC POWER TO CONTROL UNIT
 17. SIGNAL-COIN MECHANISM
 18. 28 VAC POWER TO ANIMATION LIGHTING
- B > HARNESS ASSY - DISPLAY** _____ 40842101
1. 28 VAC POWER TO ANIMATION LIGHTING
 2. SIGNAL AND VDC POWER TO TITLE RACK
 3. SIGNAL AND VDC POWER TO KEYBOARD DISPLAY
 4. PAGE CONTROL
 5. AUDIO INPUT TO MID-HIGH FREQUENCY SPEAKERS
- C > HARNESS ASSY - 110VAC 60/50 HZ** _____ 40842502/01
- D > HARNESS ASSY-TOP DOOR LIGHTING** _____ 40841902
- E > CABLE ASSY - AUDIO** _____ 30934201
- F > HARNESS ASSY-INTERCONNECT** _____ 45070203
- G > MOTOR & HARNESS ASSY** _____ 40824302
- H > HARNESS ASSY-INTERCONNECT** _____ 30938501
1. SWITCH-SIGNAL TO DISPLAY
 2. SWITCH-SIGNAL TO DISPLAY
 3. VDC POWER FROM DISPLAY
- K > HARNESS ASSY - C. D. MECH.** _____ 40830002
1. CAM SWITCH----- TO MECH CONTROL
 2. MAGAZINE MOTOR-- TO MECH CONTROL
 3. DETENT SOLENOID-- TO MECH CONTROL
 4. CANCEL SWITCH--- TO MECH CONTROL
 5. TRANSFER MOTOR-- TO MECH CONTROL
- L > COUNTER & PLUG ASSY** _____ 30933301
- R > OPTICAL SWITCH ASSY** _____ 30906801
- S > HARNESS DECODER - RIB BOW CABLE** _____ 21959501
- T > HARNESS ASSY - LASER (14 WIRE)** _____ 30955601
- U > HARNESS ASSY - PIATRA MOTOR (4 WIRE)** _____ 30955501
- V > HARNESS ASSY - D.C. BILL STACKER** _____ 45062308

Figure 5-4. CD-51A Harness Diagram

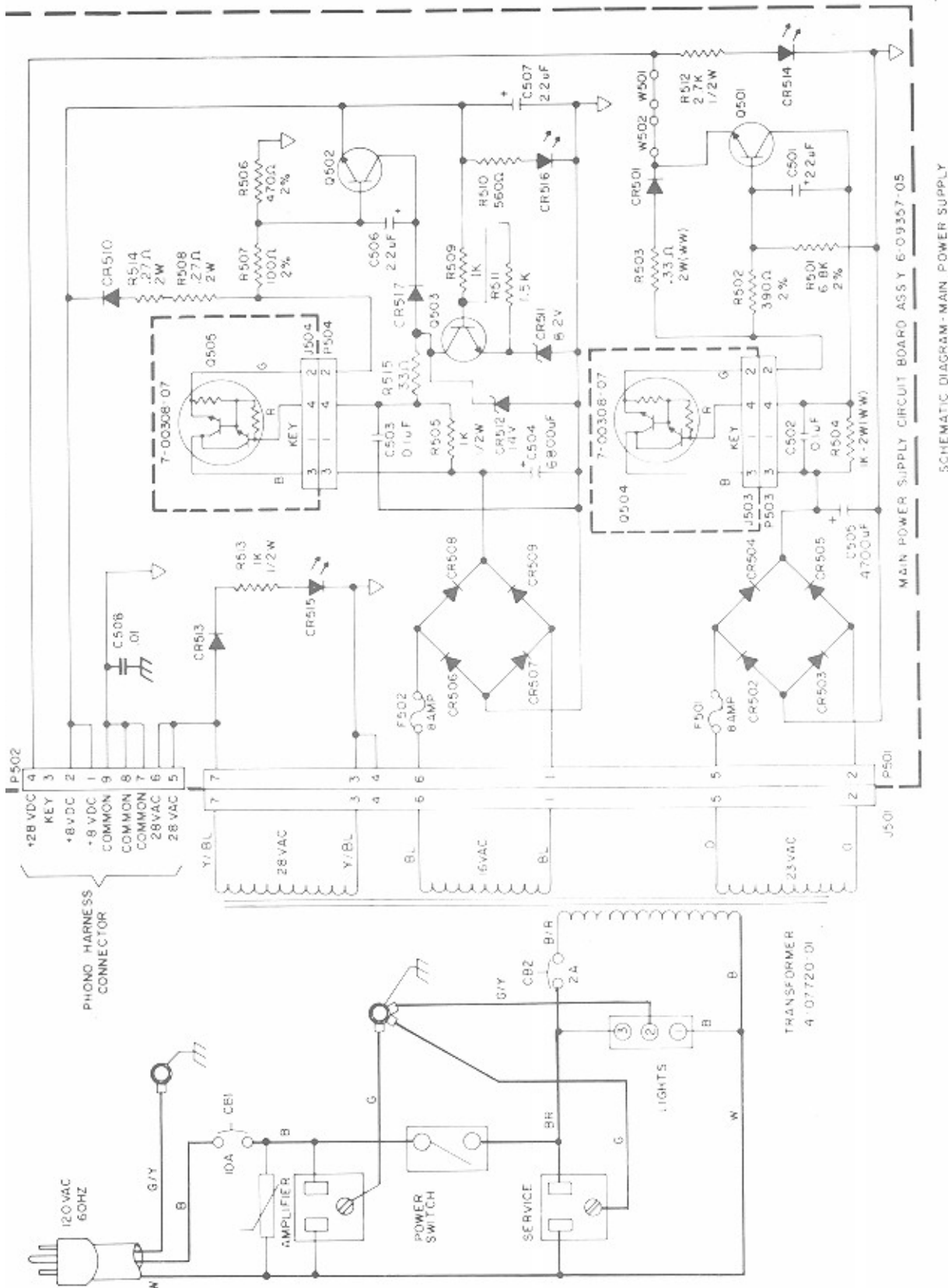


Figure 5-5B. Main Power Supply Schematic - Domestic



For Equivalent Engineering Drawing See 46509214/15/16-Q2 B
Figure 5-6A. Main Power Supply Wiring Diagram - Export

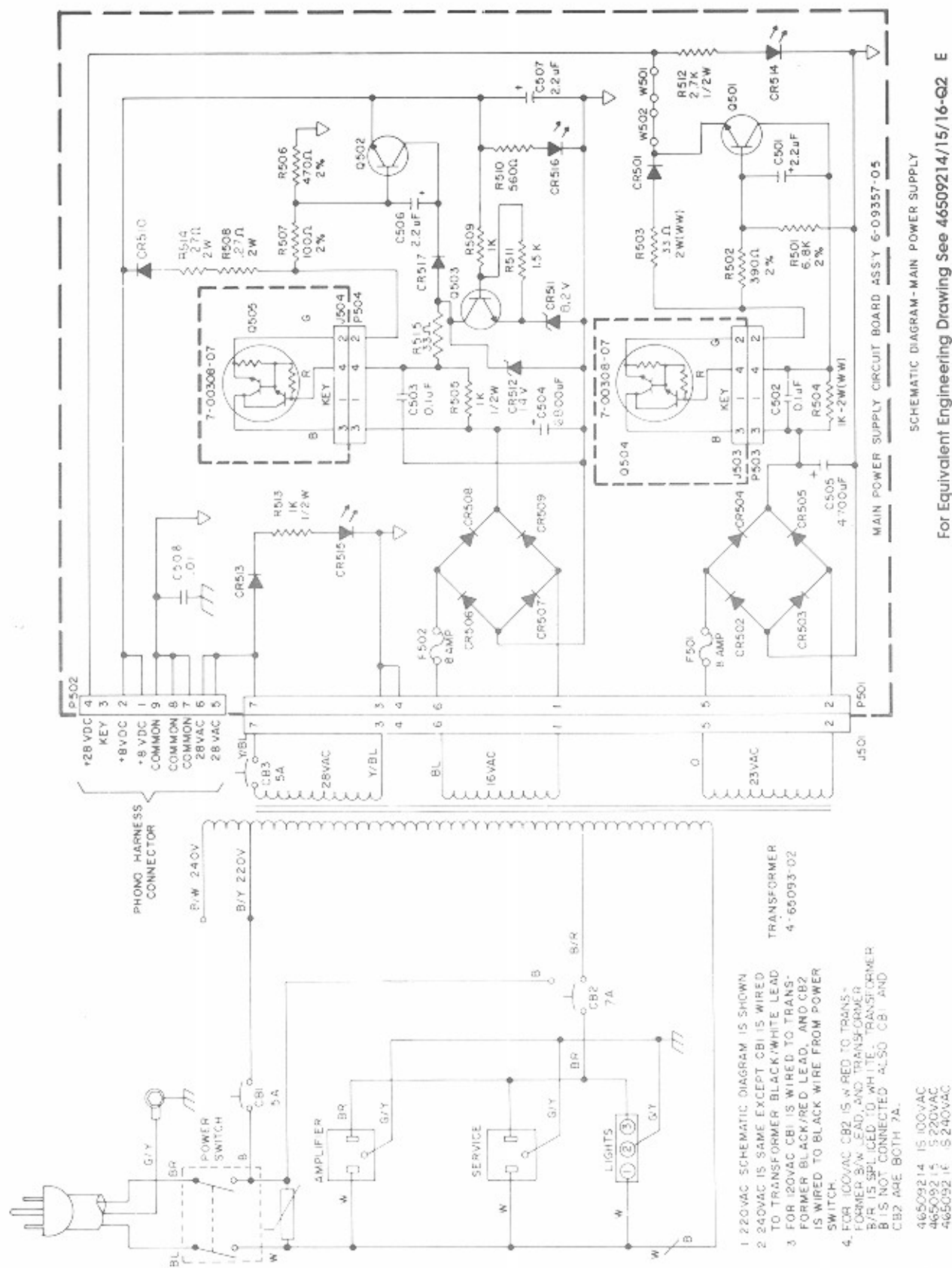


Figure 5-6B. Main Power Supply Schematic - Export

SCHEMATIC DIAGRAM-MAIN POWER SUPPLY

For Equivalent Engineering Drawing See 46509214/15/16-Q2 E

COMPONENTS LIST FOR MAIN POWER SUPPLY CIRCUIT BOARD 60935705

C501	Capacitor - Electrolytic	2.2 μ F @ 50V	70023805
C502	Capacitor - Monolithic Ceramic	0.1 μ F @ 50V	70028511
C503	Capacitor - Monolithic Ceramic	0.1 μ F @ 50V	70028511
C504	Capacitor - Electrolytic	6800 μ F @ 35V	70023601
C505	Capacitor - Electrolytic	4700 μ F @ 50V	70023604
C506	Capacitor - Electrolytic	2.2 μ F @ 50V	70023805
C507	Capacitor - Electrolytic	2.2 μ F @ 50V	70023805
C508	Capacitor - Monolithic Ceramic	0.01 μ F @ 1000V	70022508

CR502	Diode - Silicon		70035004
CR502	Diode - Silicon		70035004
CR503	Diode - Silicon		70035004
CR504	Diode - Silicon		70035004
CR505	Diode - Silicon		70035004
CR506	Diode - Silicon		70035004
CR507	Diode - Silicon		70035004
CR508	Diode - Silicon		70035004
CR509	Diode - Silicon		70035004
CR510	Diode - Silicon		70035004
CR511	Diode - Zener	(8.2 V, 5%)	70035528
CR512	Diode - Zener	(14 V, 5%)	70035529
CR513	Diode - Silicon		70035004
CR514	Diode - Light Emitting		70035303
CR515	Diode - Light Emitting		70035303
CR516	Diode - Light Emitting		70035303
CR517	Diode - Silicon		70035004

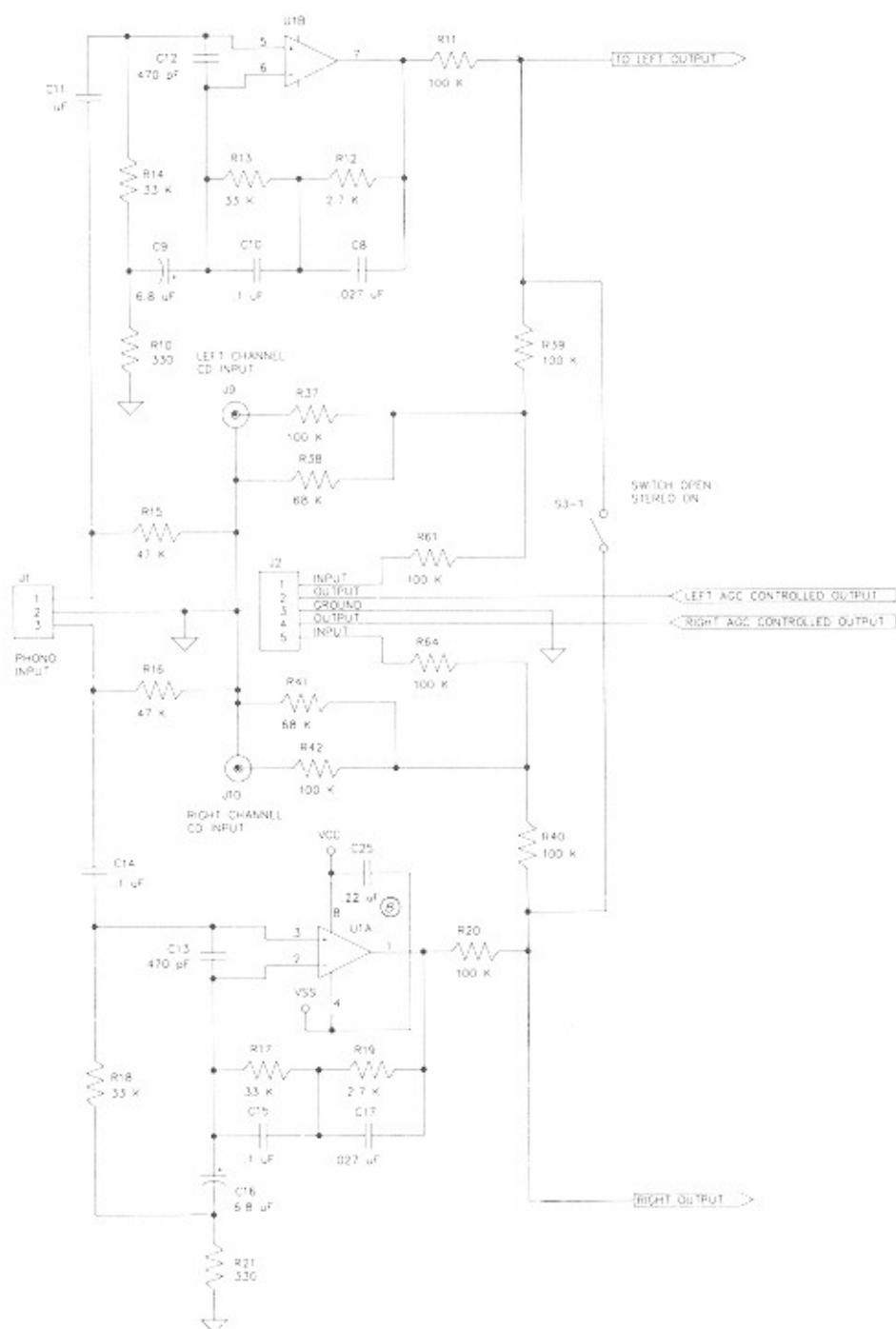
F501	Fuse - 8 Amp		70072002
F502	Fuse - 8 Amp		70072002

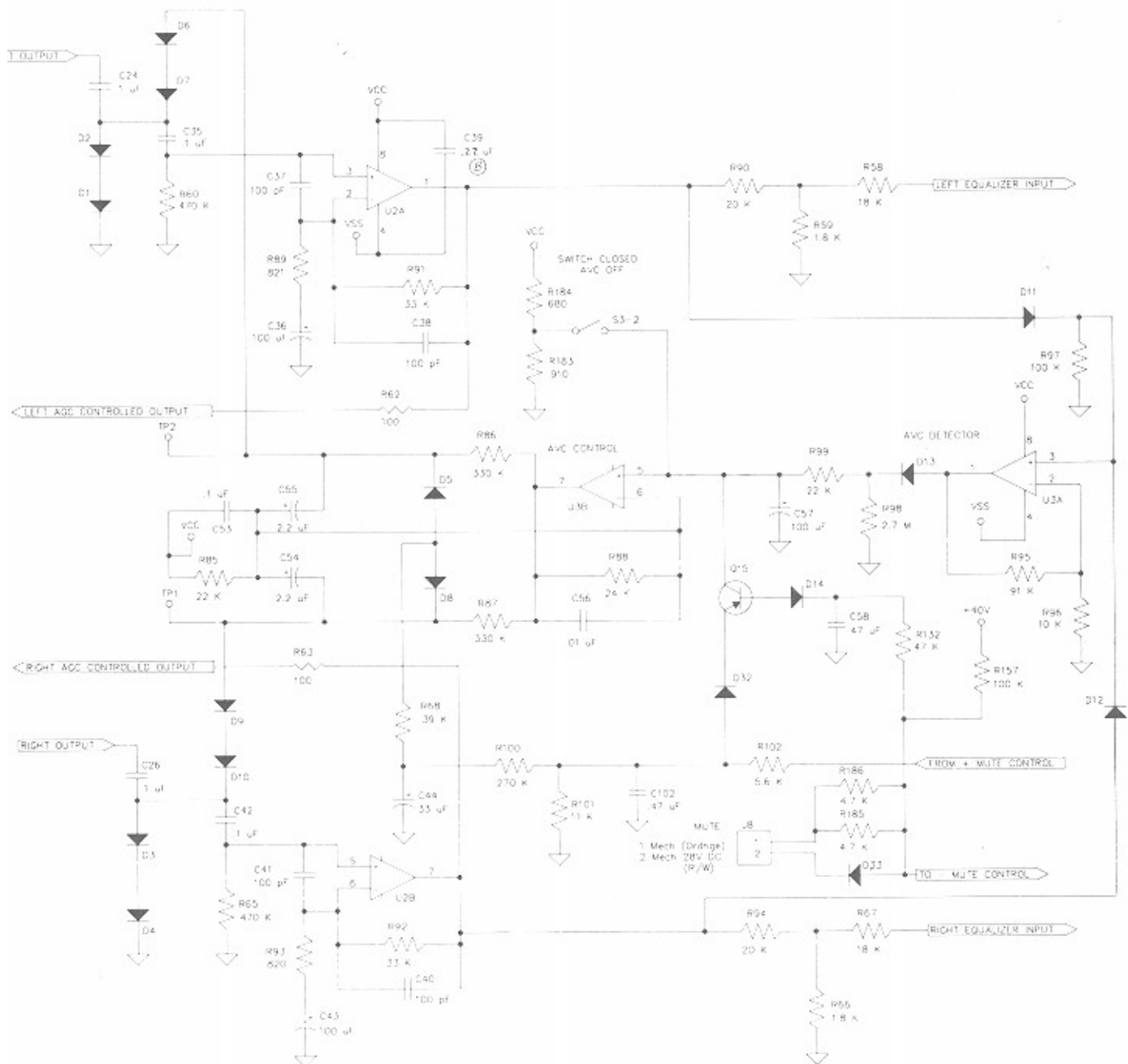
P501	Polarizing Wafer Assembly		70075007
P502	Polarizing Wafer Assembly - Right-angle mount		70076009
P503	Polarizing Wafer Assembly		70075003
P504	Polarizing Wafer Assembly		70075003

Q501	Transistor - Silicon (NPN)	70033005
Q502	Transistor - Silicon (NPN)	70033005
Q503	Transistor - Silicon (NPN)	70030008

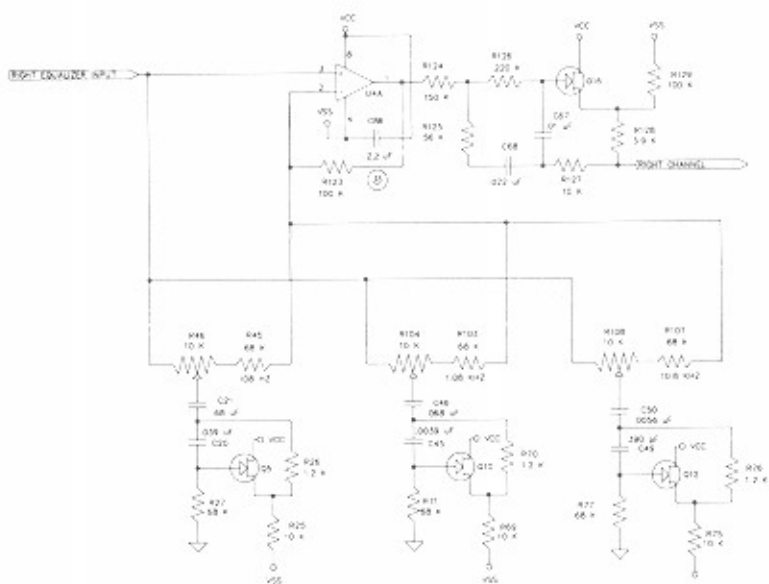
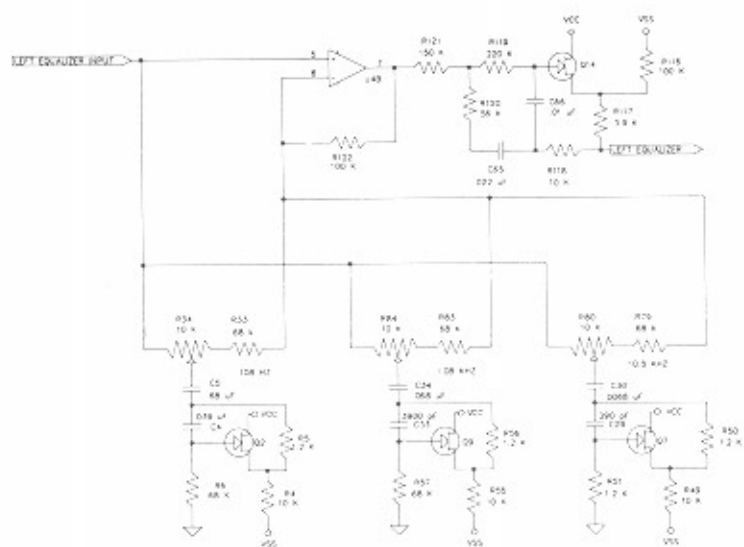
Note: All resistors are ¼ watt 5%, unless otherwise noted.

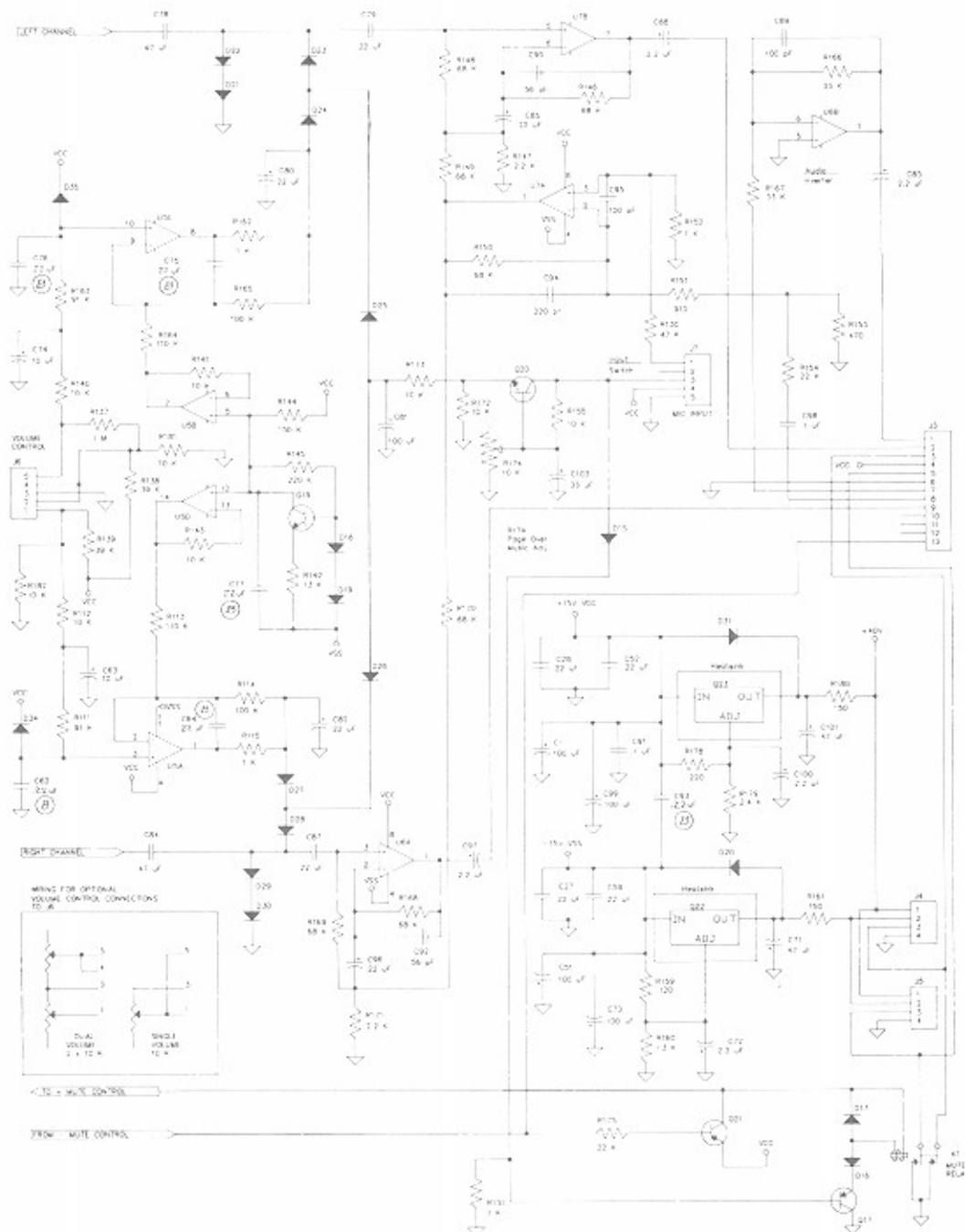
R501	Resistor - Carbon	(¼ w, 2%)	6.8 K Ω	79902682
R502	Resistor - Carbon	(¼ w, 2%)	390 Ω	79902391
R503	Resistor - Wire Wound	(2 w, 5%)	0.33 Ω	79920338
R504	Resistor - Wire Wound	(½ w, 10%)	1 K Ω	79920102
R505	Resistor - Carbon	(½ w, 10%)	1 K Ω	70010619
R506	Resistor - Carbon	(¼ w, 2%)	470 Ω	79902471
R507	Resistor - Carbon	(¼ w, 2%)	100 Ω	79902101
R508	Resistor - Wire Wound	(2 w, 10%)	0.27 Ω	79920278
R509	Resistor - Carbon	(¼ w, 5%)	1 K Ω	79901102
R510	Resistor - Carbon	(¼ w, 5%)	560 Ω	79901561
R511	Resistor - Carbon	(¼ w, 5%)	1.5 K Ω	79901152
R512	Resistor - Carbon	(½ w, 5%)	2.7 K Ω	70012007
R513	Resistor - Carbon	(½ w, 10%)	1 K Ω	70010619
R514	Resistor - Wire Wound	(2 w, 5%)	0.27 Ω	79920278
R515	Resistor - Carbon	(¼ w, 5%)	33 Ω	79901330
W501	Wire - Bare			00503200
W502	Wire - Bare			00503200





For Equivalent Engineering Drawing See 61023722 Q2 B
Figure 5-7A. Schematic Diagram - Stereo Preamp Assembly, Sheet 1





For Equivalent Engineering Drawing See 61023722 Q2 B
Figure 5-7A. Schematic Diagram - Stereo Preamp Assembly, Sheet 2

COMPONENT LIST FOR PREAMPLIFIER BOARD (61023722) F

C1	Capacitor - Electrolytic	100 μ F	70023814
C2	NOT USED		
C3	NOT USED		
C4	Capacitor - Mono Ceramic	.039 μ F	70028644
C5	Capacitor - Mono Ceramic	.68 μ F	70028522
C6	NOT USED		
C7	NOT USED		
C8	Capacitor - Mono Ceramic	.027 μ F	70028642
C9	Capacitor - Electrolytic	6.8 μ F	70023807
C10	Capacitor - Mono Ceramic	.1 μ F	70028649
C11	Capacitor - Mono Ceramic	.1 μ F	70028649
C12	Capacitor - Mono Ceramic	470 pF	70028612
C13	Capacitor - Mono Ceramic	470 pF	70028612
C14	Capacitor - Mono Ceramic	.1 μ F	70028649
C15	Capacitor - Mono Ceramic	.1 μ F	70028649
C16	Capacitor - Electrolytic	6.8 μ F	70023807
C17	Capacitor - Mono Ceramic	.027 μ F	70028642
C18	NOT USED		
C19	NOT USED		
C20	Capacitor - Mono Ceramic	.039 μ F	70028644
C21	Capacitor - Mono Ceramic	.68 μ F	70028522
C22	NOT USED		
C23	NOT USED		
C24	Capacitor - Mono Ceramic	.1 μ F	70028649
C25	Capacitor - Mono Ceramic	.22 μ F	70028523
C26	Capacitor - Mono Ceramic	.1 μ F	70028649
C27	Capacitor - Mono Ceramic	.22 μ F	70028510
C28	Capacitor - Mono Ceramic	.22 μ F	70028510
C29	Capacitor - Mono Ceramic	390 pF	70028611
C30	Capacitor - Mono Ceramic	.0068 μ F	70028633
C31	NOT USED		
C32	NOT USED		
C33	Capacitor - Mono Ceramic	.0039 μ F	70028629
C34	Capacitor - Mono Ceramic	.068 μ F	70028647
C35	Capacitor - Mono Ceramic	.1 μ F	70028649
C36	Capacitor - Electrolytic	100 μ F	70023814
C37	Capacitor - Mono Ceramic	100 pF	70028601
C38	Capacitor - Mono Ceramic	100 pF	70028601
C39	Capacitor - Mono Ceramic	.22 μ F	70028523
C40	Capacitor - Mono Ceramic	100 pF	70028601
C41	Capacitor - Mono Ceramic	100 pF	70028601
C42	Capacitor - Mono Ceramic	.1 μ F	70028649
C43	Capacitor - Electrolytic	100 μ F	70023814
C44	Capacitor - Electrolytic	33 μ F	70023811
C45	Capacitor - Mono Ceramic	.0039 μ F	70028629
C46	Capacitor - Mono Ceramic	.068 μ F	70028647
C47	NOT USED		
C48	NOT USED		
C49	Capacitor - Mono Ceramic	390 pF	70028611
C50	Capacitor - Mono Ceramic	.0068 μ F	70028633
C51	Capacitor - Electrolytic	100 μ F	70023814
C52	Capacitor - Mono Ceramic	.22 μ F	70028523

C53	Capacitor - Mono Ceramic	.1 μ F	70028649
C54	Capacitor - Electrolytic	2.2 μ F	70023805
C55	Capacitor - Electrolytic	2.2 μ F	70023805
C56	Capacitor - Mono Ceramic	.01 μ F	70028636
C57	Capacitor - Electrolytic	100 μ F	70023814
C58	Capacitor - Mono Ceramic	.47 μ F	70028516
C59	Capacitor - Mono Ceramic	.22 μ F	70028523
C60	NOT USED		
C61	NOT USED		
C62	Capacitor - Mono Ceramic	.22 μ F	70028523
C63	Capacitor - Electrolytic	10 μ F	70023808
C64	Capacitor - Mono Ceramic	.22 μ F	70028523
C65	Capacitor - Mono Ceramic	.022 μ F	70028641
C66	Capacitor - Mono Ceramic	.01 μ F	70028636
C67	Capacitor - Mono Ceramic	.01 μ F	70028636
C68	Capacitor - Mono Ceramic	.022 μ F	70028641
C69	NOT USED		
C70	NOT USED		
C71	Capacitor - Electrolytic	47 μ F	70023812
C72	Capacitor - Electrolytic	2.2 μ F	70023805
C73	Capacitor - Electrolytic	100 μ F	70023814
C74	Capacitor - Electrolytic	10 μ F	70023808
C75	Capacitor - Mono Ceramic	.22 μ F	70028523
C76	Capacitor - Mono Ceramic	.22 μ F	70028523
C77	Capacitor - Mono Ceramic	.22 μ F	70028523
C78	Capacitor - Mono Ceramic	.47 μ F	70028516
C79	Capacitor - Mono Ceramic	.22 μ F	70028510
C80	Capacitor - Electrolytic	22 μ F	70023810
C81	Capacitor - Electrolytic	100 μ F	70023814
C82	Capacitor - Electrolytic	22 μ F	70023810
C83	Capacitor - Electrolytic	2.2 μ F	70023805
C84	Capacitor - Mono Ceramic	.47 μ F	70028516
C85	Capacitor - Electrolytic	22 μ F	70023810
C86	Capacitor - Mono Ceramic	.22 μ F	70028523
C87	Capacitor - Mono Ceramic	.22 μ F	70028523
C88	Capacitor - Electrolytic	2.2 μ F	70023805
C89	Capacitor - Mono Ceramic	100 pF	70028601
C90	Capacitor - Mono Ceramic	56 pF	70028710
C91	Capacitor - Mono Ceramic	.1 μ F	70028649
C92	Capacitor - Mono Ceramic	56 pF	70028710
C93	Capacitor - Mono Ceramic	.22 μ F	70028523
C94	Capacitor - Mono Ceramic	220 pF	70028606
C95	Capacitor - Mono Ceramic	100 pF	70028601
C96	Capacitor - Electrolytic	22 μ F	70023810
C97	Capacitor - Electrolytic	2.2 μ F	70023805
C98	Capacitor - Mono Ceramic	.1 μ F	70028649
C99	Capacitor - Electrolytic	100 μ F	70023814
C100	Capacitor - Electrolytic	2.2 μ F	70023805
C101	Capacitor - Electrolytic	47 μ F	70023812
C102	Capacitor - Mono Ceramic	.47 μ F	70028516
C103	Capacitor - Electrolytic	33 μ F	70023811

COMPONENT LIST FOR PREAMPLIFIER BOARD (61023722)F

(Continued)

D1	Diode - Silicon	1N4148	70035012
D2	Diode - Silicon	1N4148	70035012
D3	Diode - Silicon	1N4148	70035012
D4	Diode - Silicon	1N4148	70035012
D5	Diode - Silicon	1N4148	70035012
D6	Diode - Silicon	1N4148	70035012
D7	Diode - Silicon	1N4148	70035012
D8	Diode - Silicon	1N4148	70035012
D9	Diode - Silicon	1N4148	70035012
D10	Diode - Silicon	1N4148	70035012
D11	Diode - Silicon	1N4148	70035012
D12	Diode - Silicon	1N4148	70035012
D13	Diode - Silicon	1N4148	70035012
D14	Diode - Silicon	1N4148	70035012
D15	Diode - Silicon	1N4148	70035012
D16	Diode - Silicon	1N4148	70035012
D17	Diode - Silicon	1N4148	70035012
D18	Diode - Silicon	1N4148	70035012
D19	Diode - Silicon	1N4148	70035012
D20	Diode - Silicon	1N4148	70035012
D21	Diode - Silicon	1N4148	70035012
D22	Diode - Silicon	1N4148	70035012
D23	Diode - Silicon	1N4148	70035012
D24	Diode - Silicon	1N4148	70035012
D25	Diode - Silicon	1N4148	70035012
D26	Diode - Silicon	1N4148	70035012
D27	Diode - Silicon	1N4148	70035012
D28	Diode - Silicon	1N4148	70035012
D29	Diode - Silicon	1N4148	70035012
D30	Diode - Silicon	1N4148	70035012
D31	Diode - Silicon	1N4148	70035012
D32	Diode - Silicon	1N4148	70035012
D33	Diode - Silicon	1N4148	70035012
D34	Diode - Silicon	1N4148	70035012
D35	Diode - Silicon	1N4148	70035012
K1	Relay - Reed		70042208
P1	Header - Non Polarizing (3 CKT)		70074921
P2	Header - Non Polarizing (5 CKT)		70074923
P3	Header - Non Polarizing (13 CKT)		70074931
P4	Connector - Top Entry (4 CKT)		70074802
P5	Connector - Top Entry (4 CKT)		70074802
P6	Header - Non Polarizing (5 CKT)		70074923
P7	Header - Non Polarizing (5 CKT)		70074923
P8	Header - Polarizing (2 CKT)		70075002
P9	Receptacle - Phono Jack		21540902
P10	Receptacle - Phono Jack		21540902

Q1	NOT USED		
Q2	Transistor - J FET (N-Channel)	2N5484	70030901
Q3	NOT USED		
Q4	NOT USED		
Q5	Transistor - J FET (N-Channel)	2N5484	70030901
Q6	NOT USED		
Q7	Transistor - J FET (N-Channel)	2N5484	70030901
Q8	NOT USED		
Q9	Transistor - J FET (N-Channel)	2N5484	70030901
Q10	Transistor - J FET (N-Channel)	2N5484	70030901
Q11	NOT USED		
Q12	Transistor - J FET (N-Channel)	2N5484	70030901
Q13	NOT USED		
Q14	Transistor - J FET (N-Channel)	2N5484	70030901
Q15	Transistor - Silicon (PNP)	MPSA56	70030104
Q16	Transistor - J FET (N-Channel)	2N5484	70030901
Q17	Transistor - Silicon (PNP)	MPSA56	70030104
Q18	NOT USED		
Q19	Transistor - Silicon (NPN)	MPSA06	70030008
Q20	Transistor - Silicon (NPN)	MPSA06	70030008
Q21	Transistor - Silicon (PNP)	MPSA56	70030104
Q22	REGULATOR - Voltage (ADJ NEG)	LM337T	70036508
Q23	REGULATOR - Voltage (ADJ POS)	LM317T	70036507

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

R1	NOT USED		
R2	NOT USED		
R3	NOT USED		
R4	Resistor - Carbon	10 K	79901103
R5	Resistor - Carbon	1.2 K	79901122
R6	Resistor - Carbon	68 K	79901683
R7	NOT USED		
R8	NOT USED		
R9	NOT USED		
R10	Resistor - Carbon	330 Ω	79901331
R11	Resistor - Carbon	100 K	79901104
R12	Resistor - Carbon	2.7 K	79901272
R13	Resistor - Carbon	33 K	79901333
R14	Resistor - Carbon	33 K	79901333
R15	Resistor - Carbon	47 K	79901473
R16	Resistor - Carbon	47 K	79901473
R17	Resistor - Carbon	33 K	79901333
R18	Resistor - Carbon	33 K	79901333
R19	Resistor - Carbon	2.7 K	79901272
R20	Resistor - Carbon	100 K	79901104
R21	Resistor - Carbon	330 Ω	79901331
R22	NOT USED		
R23	NOT USED		
R24	NOT USED		
R25	Resistor - Carbon	10 K	79901103
R26	Resistor - Carbon	1.2 K	79901122
R27	Resistor - Carbon	68 K	79901683
R28	NOT USED		
R29	NOT USED		

COMPONENT LIST FOR PREAMPLIFIER BOARD (61023722)

(Continued)

R30	NOT USED		
R31	NOT USED		
R32	NOT USED		
R33	Resistor - Carbon	68 K	79901683
*R34	Potentiometer - Special	10 K	70040018
R35	NOT USED		
R36	NOT USED		
R37	Resistor - Carbon	100 K	79901104
R38	Resistor - Carbon	68 K	79901683
R39	Resistor - Carbon	100 K	79901104
R40	Resistor - Carbon	100 K	79901104
R41	Resistor - Carbon	68 K	79901683
R42	Resistor - Carbon	100 K	79901104
R43	NOT USED		
R44	NOT USED		
R45	Resistor - Carbon	68 K	79901683
*R46	Potentiometer - Special	10 K	70040018
R47	NOT USED		
R48	NOT USED		
R49	Resistor - Carbon	10 K	79901103
R50	Resistor - Carbon	1.2 K	79901122
R51	Resistor - Carbon	68 K	79901683
R52	NOT USED		
R53	NOT USED		
R54	NOT USED		
R55	Resistor - Carbon	10 K	79901103
R56	Resistor - Carbon	1.2 K	79901122
R57	Resistor - Carbon	68 K	79901683
R58	Resistor - Carbon	18 K	79901183
R59	Resistor - Carbon	1.8 K	79901182
R60	Resistor - Carbon	470 K	79901474
R61	Resistor - Carbon	100 K	79901104
R62	Resistor - Carbon	100 Ω	79901101
R63	Resistor - Carbon	100 Ω	79901101
R64	Resistor - Carbon	100 K	79901104
R65	Resistor - Carbon	470 K	79901474
R66	Resistor - Carbon	1.8 K	79901182
R67	Resistor - Carbon	18 K	79901183
R68	Resistor - Carbon	39 K	79901393
R69	Resistor - Carbon	10 K	79901103
R70	Resistor - Carbon	1.2 K	79901122
R71	Resistor - Carbon	68 K	79901683
R72	NOT USED		
R73	NOT USED		
R74	NOT USED		
R75	Resistor - Carbon	10 K	79901103
R76	Resistor - Carbon	1.2 K	79901122
R77	Resistor - Carbon	68 K	79901683
R78	NOT USED		
R79	Resistor - Carbon	68 K	79901683
*R80	Potentiometer - Special	10 K	70040018
R81	NOT USED		
R82	NOT USED		
R83	Resistor - Carbon	68 K	79901683
*R84	Potentiometer - Special	10 K	70040018
R85	Resistor - Carbon	22 K	79901223
R86	Resistor - Carbon	330 K	79901334
R87	Resistor - Carbon	330 K	79901334
R88	Resistor - Carbon	24 K	79901243
R89	Resistor - Carbon	820 Ω	79901821

R90	Resistor - Carbon	27 K	79901273
R91	Resistor - Carbon	33 K	79901333
R92	Resistor - Carbon	33 K	79901333
R93	Resistor - Carbon	820 Ω	79901821
R94	Resistor - Carbon	27 K	79901273
R95	Resistor - Carbon	91 K	79901913
R96	Resistor - Carbon	10 K	79901103
R97	Resistor - Carbon	100 K	79901104
R98	Resistor - Carbon	2.7 M	79901275
R99	Resistor - Carbon	22 K	79901223
R100	Resistor - Carbon	270 K	79901274
R101	Resistor - Carbon	9.1 K	79901912
R102	Resistor - Carbon	5.6 K	79901562
R103	Resistor - Carbon	68 K	79901683
*R104	Potentiometer - Special	10 K	70040018
R105	NOT USED		
R106	NOT USED		
R107	Resistor - Carbon	68 K	79901683
*R108	Potentiometer - Special	10 K	70040018
R109	NOT USED		
R110	NOT USED		
R111	Resistor - Carbon	91 K	79901913
R112	Resistor - Carbon	10 K	79901103
R113	Resistor - Carbon	110 K	79901114
R114	Resistor - Carbon	100 K	79901104
R115	Resistor - Carbon	1 K	79901102
R116	Resistor - Carbon	100 K	79901104
R117	Resistor - Carbon	3.9 K	79901392
R118	Resistor - Carbon	10 K	79901103
R119	Resistor - Carbon	220 K	79901224
R120	Resistor - Carbon	56 K	79901563
R121	Resistor - Carbon	150 K	79901154
R122	Resistor - Carbon	100 K	79901104
R123	Resistor - Carbon	100 K	79901104
R124	Resistor - Carbon	150 K	79901154
R125	Resistor - Carbon	56 K	79901563
R126	Resistor - Carbon	220 K	79901224
R127	Resistor - Carbon	10 K	79901103
R128	Resistor - Carbon	3.9 K	79901392
R129	Resistor - Carbon	100 K	79901104
R130	Resistor - Carbon	47 K	79901473
R131	Resistor - Carbon	1 K	79901102
R132	Resistor - Carbon	47 K	79901473
R133	NOT USED		
R134	NOT USED		
R135	NOT USED		
R136	NOT USED		
R137	Resistor - Carbon	1 M	79901105
R138	Resistor - Carbon	39 K	79901393
R139	Resistor - Carbon	39 K	79901393

COMPONENT LIST FOR PREAMPLIFIER BOARD (61023722)

(Continued)

R140	Resistor - Carbon	10 K	79901103
R141	Resistor - Carbon	10 K	79901103
R142	Resistor - Carbon	13 K	79901133
R143	Resistor - Carbon	10 K	79901103
R144	Resistor - Carbon	150 K	79901154
R145	Resistor - Carbon	220 K	79901224
R146	Resistor - Carbon	68 K	79901683
R147	Resistor - Carbon	2.2 K	79901222
R148	Resistor - Carbon	68 K	79901683
R149	Resistor - Carbon	68 K	79901683
R150	Resistor - Carbon	68 K	79901683
R151	Resistor - Carbon	910 Ω	79901911
R152	Resistor - Carbon	10 K	79901103
R153	Resistor - Carbon	470 Ω	79901471
R154	Resistor - Carbon	22 K	79901223
R155	Resistor - Carbon	10 K	79901103
R156	NOT USED		
R157	Resistor - Carbon	100 K	79901104
R158	NOT USED		
R159	Resistor - Carbon	120 Ω	79902121
R160	Resistor - Carbon	1.3 K ($\frac{1}{4}w$ 2%)	79902132
R161	Resistor - Wire-Wound	150 Ω	70012510
R162	Resistor - Carbon	1 K	79901102
R163	Resistor - Carbon	91 K	79901913
R164	Resistor - Carbon	110 K	79901114
R165	Resistor - Carbon	100 K	79901104
R166	Resistor - Carbon	33 K	79901333
R167	Resistor - Carbon	33 K	79901333
R168	Resistor - Carbon	68 K	79901683
R169	Resistor - Carbon	68 K	79901683
R170	Resistor - Carbon	68 K	79901683
R171	Resistor - Carbon	2.2 K	79901222
R172	Resistor - Carbon	10 K	79901103
R173	Resistor - Carbon	10 K	79901103
R174	Potentiometer - Special	10 K	70040141
R175	Resistor - Carbon	22 K	79901223
R176	NOT USED		
R177	NOT USED		
R178	Resistor - Carbon	220 Ω ($\frac{1}{4}w$ 2%)	79902221
R179	Resistor - Carbon	2.4 K ($\frac{1}{4}w$ 2%)	79902242
R180	Resistor - Wire-Wound	150 Ω	70012510
R181	Resistor - Carbon	10 K	79901103
R182	Resistor - Carbon	10 K	79901103
R183	Resistor - Carbon	910 Ω	79901911
R184	Resistor - Carbon	680 Ω	79901681
R185	Resistor - Carbon	4.7 K	79901472
R186	Resistor - Carbon	4.7 K	79901472

* Requires Potentionmeter Adjustment Shaft, Part Number 21621101

S3	Switch - DIP	OR	70042902
			70043302

U1 IC - Dual Op Amp
 U2 IC - Dual Op Amp
 U3 IC - Dual Op Amp
 U4 IC - Dual Op Amp
 U5 IC - Dual Op Amp
 U6 IC - Dual Op Amp
 U7 IC - Dual Op Amp

LM833
 LM833
 LM833
 LM833
 LM348
 LM833
 LM833

30800238
 30800238
 30800238
 30800238
 30800215
 30800238
 30800238

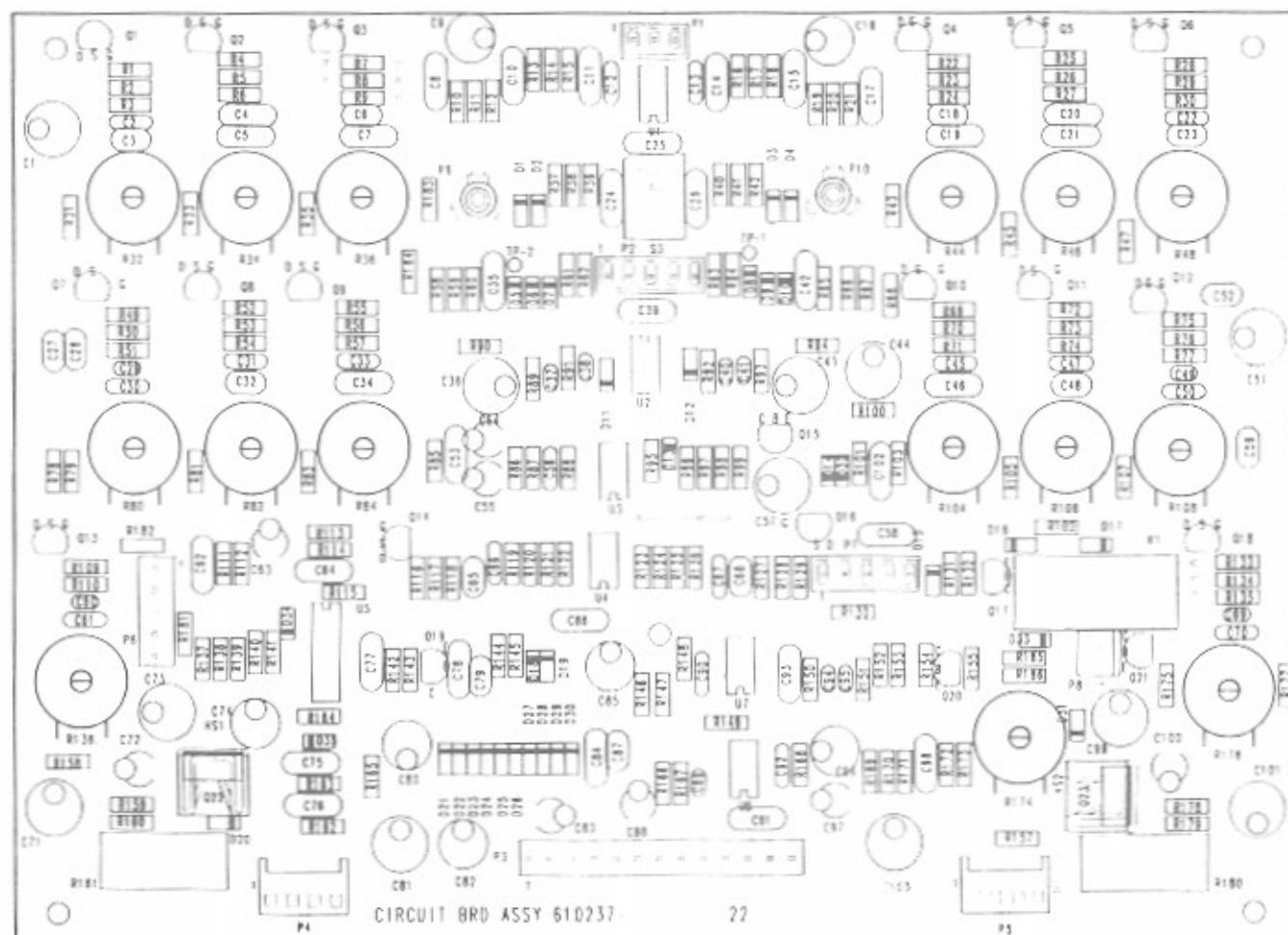
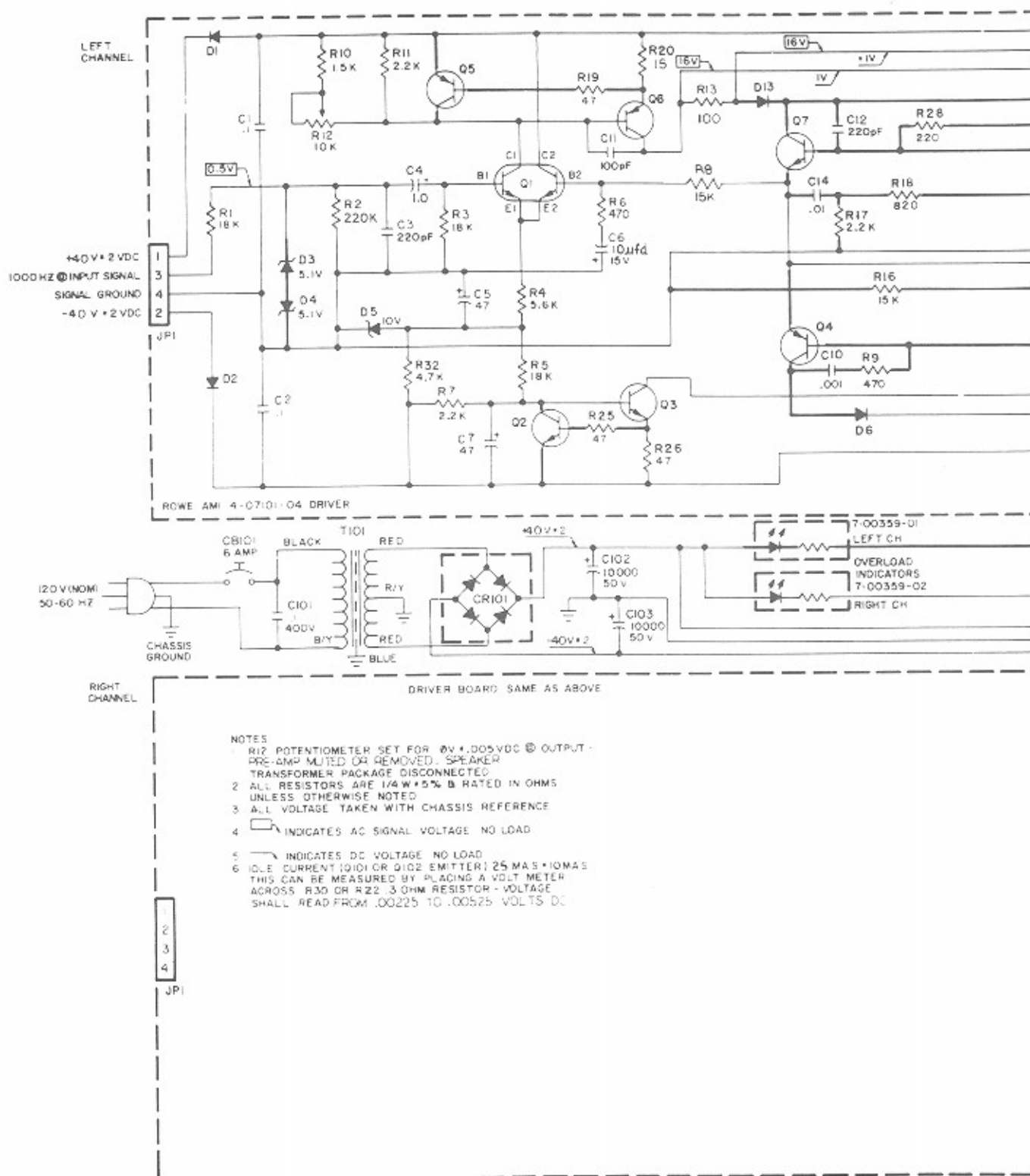
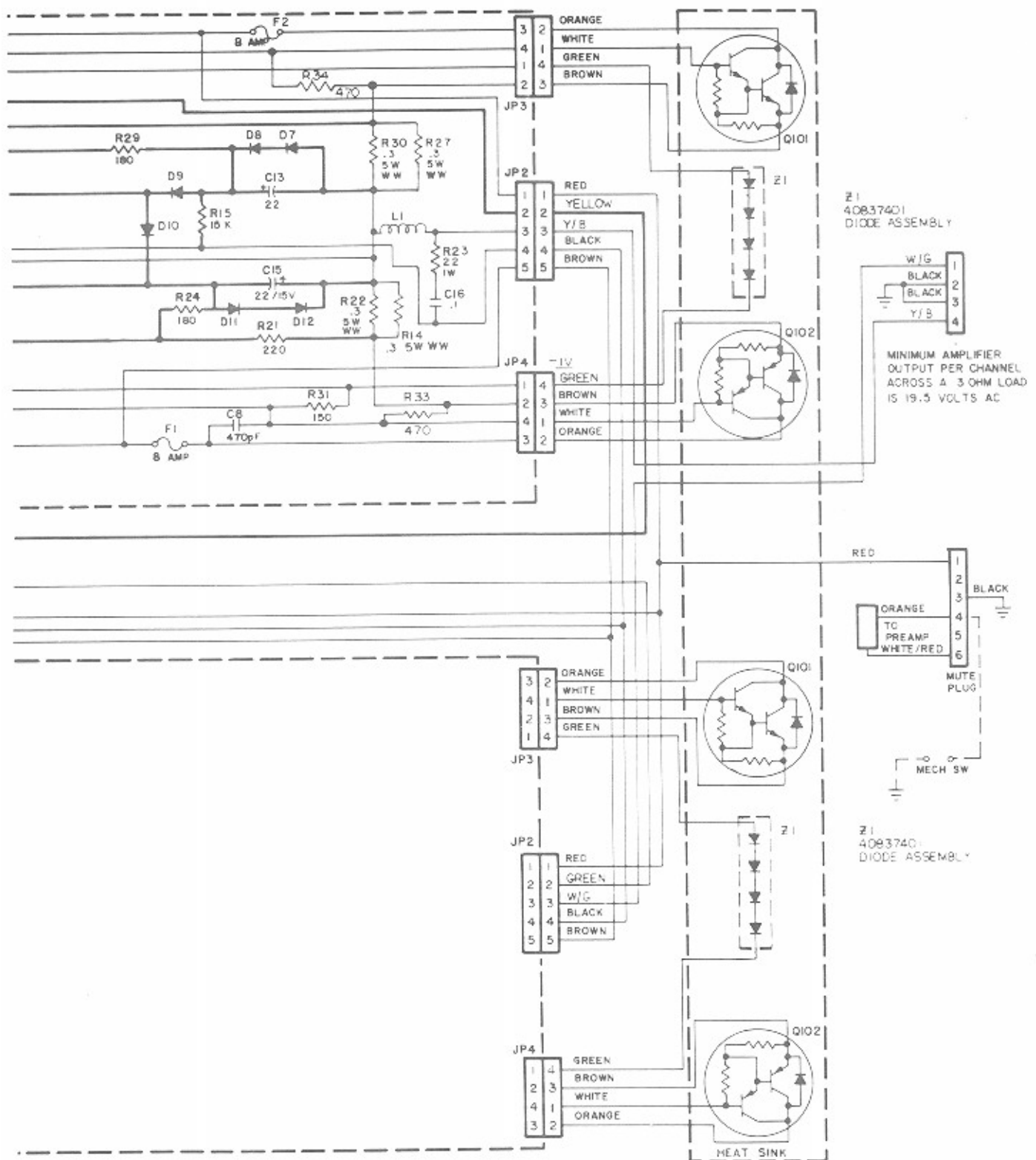


Figure 5-7B. Preamplifier Circuit Board Layout





(See Section 8 for the pictorial view of the heat sink)

For Equivalent Engineering Drawing See 61024801-Q2 A

Figure 5-8A. Schematic Diagram - 250 Watt Power Amp

COMPONENT LIST FOR AMPLIFIER DRIVER BOARD 40710104

C1	Capacitor - Mylar	.1 μ F	70021549
C2	Capacitor - Mylar	.1 μ F	70021549
C3	Capacitor - Monolithic Ceramic	220 pf	70028606
C4	Capacitor - Electrolytic	1.0 μ F	70023804
C5	Capacitor - Electrolytic	47 μ F	70023812
C6	Capacitor - Electrolytic	10 μ F	70023808
C7	Capacitor - Electrolytic	47 μ F	70023812
C8	Capacitor - Monolithic Ceramic	470 pf	70028612
C9	NOT USED		
C10	Capacitor - Monolithic Ceramic	.001 μ F	70028618
C11	Capacitor - Monolithic Ceramic	100 pf	70028601
C12	Capacitor - Monolithic Ceramic	220 pf	70028606
C13	Capacitor - Electrolytic	22 μ F	70023810
C14	Capacitor - Monolithic Ceramic	.01 μ F	70028636
C15	Capacitor - Electrolytic	22 μ F	70023810
C16	Capacitor - Mylar	.1 μ F	70021549
CR1	Diode - Silicon		70035005
CR2	Diode - Silicon		70035005
CR3	Diode - Zener	(5.1 V)	70035527
CR4	Diode - Zener	(5.1 V)	70035527
CR5	Diode - Zener	(10 V)	70035514
CR6	Diode - Silicon		70035005
CR7	Diode - Silicon		70035005
CR8	Diode - Silicon		70035005
CR9	Diode - Silicon		70035005
CR10	Diode - Silicon		70035005
CR11	Diode - Silicon		70035005
CR12	Diode - Silicon		70035005
CR13	Diode - Silicon		70035005
F1	Fuse (8 Amp)		70072002
F2	Fuse (8 Amp)		70072002
L1	Inductor - Coil		21940701
P1	Wafer - Non-Polarizing	(4 CKT)	70074904
P2	Wafer - Polarizing	(5 CKT)	70075005
P3	Wafer - Polarizing	(4 CKT)	70075004
P4	Wafer - Polarizing	(4 CKT)	70075004
Q1	Transistor - Silicon (Dual)	(NPN)	70030301
Q2	Transistor - Silicon	(NPN)	70030008
Q3	Transistor - Silicon	(NPN)	70033006
Q4	Transistor - Silicon	(PNP)	70030104
Q5	Transistor - Silicon	(NPN)	70030104
Q6	Transistor - Silicon	(PNP)	70030403
Q7	Transistor - Silicon	(NPN)	70030008

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

R1	Resistor - Carbon	18 K	79901183
R2	Resistor - Carbon	220 K	79901224
R3	Resistor - Carbon	18 K	79901183
R4	Resistor - Carbon	5.6 K	79901562
R5	Resistor - Carbon	18 K	79901183
R6	Resistor - Carbon	470 Ω	79901471
R7	Resistor - Carbon	2.2 K	79901222
R8	Resistor - Carbon	15 K	79901153
R9	Resistor - Carbon	470 Ω	79901471
R10	Resistor - Carbon	1.5 K	79901152
R11	Resistor - Carbon	2.2 K	79901222
R12	Resistor - Potentiometer	10 K	70040014
R13	Resistor - Carbon	100 Ω	79901101
R14	Resistor - Wire-Wound	.3 Ω	70011805
R15	Resistor - Carbon	15 K	79901153
R16	Resistor - Carbon	15 K	79901153
R17	Resistor - Carbon	2.2 K	79901222
R18	Resistor - Carbon	820 Ω	79901821
R19	Resistor - Carbon	47 Ω	79901470
R20	Resistor - Carbon	15 Ω	79901150
R21	Resistor - Carbon	180 Ω	79901181
R22	Resistor - Wire-Wound	.3 Ω	70011805
R23	Resistor - Wire-Wound	22 Ω	79920220
R24	Resistor - Carbon	180 Ω	79901181
R25	Resistor - Carbon	47 Ω	79901470
R26	Resistor - Carbon	47 Ω	79901470
R27	Resistor - Wire-Wound	.3 Ω (5w, 10%)	70011805
R28	Resistor - Carbon	180 Ω	79901181
R29	Resistor - Carbon	180 Ω	79901181
R30	Resistor - Wire-Wound	.3 Ω (5w, 10%)	70011805
R31	Resistor - Carbon	220 Ω	79901221
R32	Resistor - Carbon	4.7 K	79901472
R33	Resistor - Carbon	470 Ω	79901471
R34	Resistor - Carbon	470 Ω	79901471

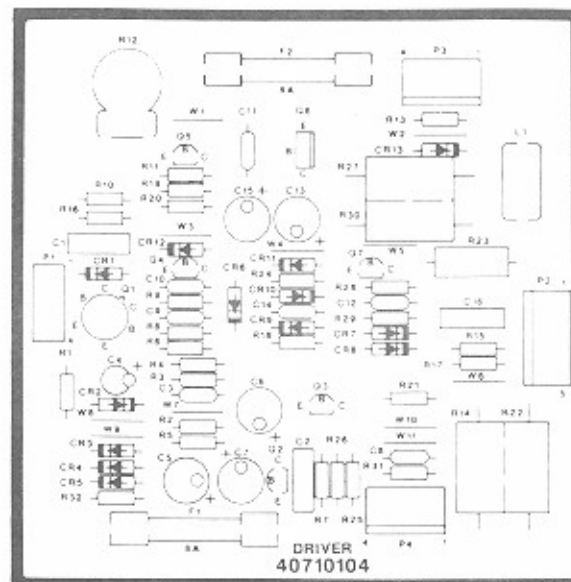
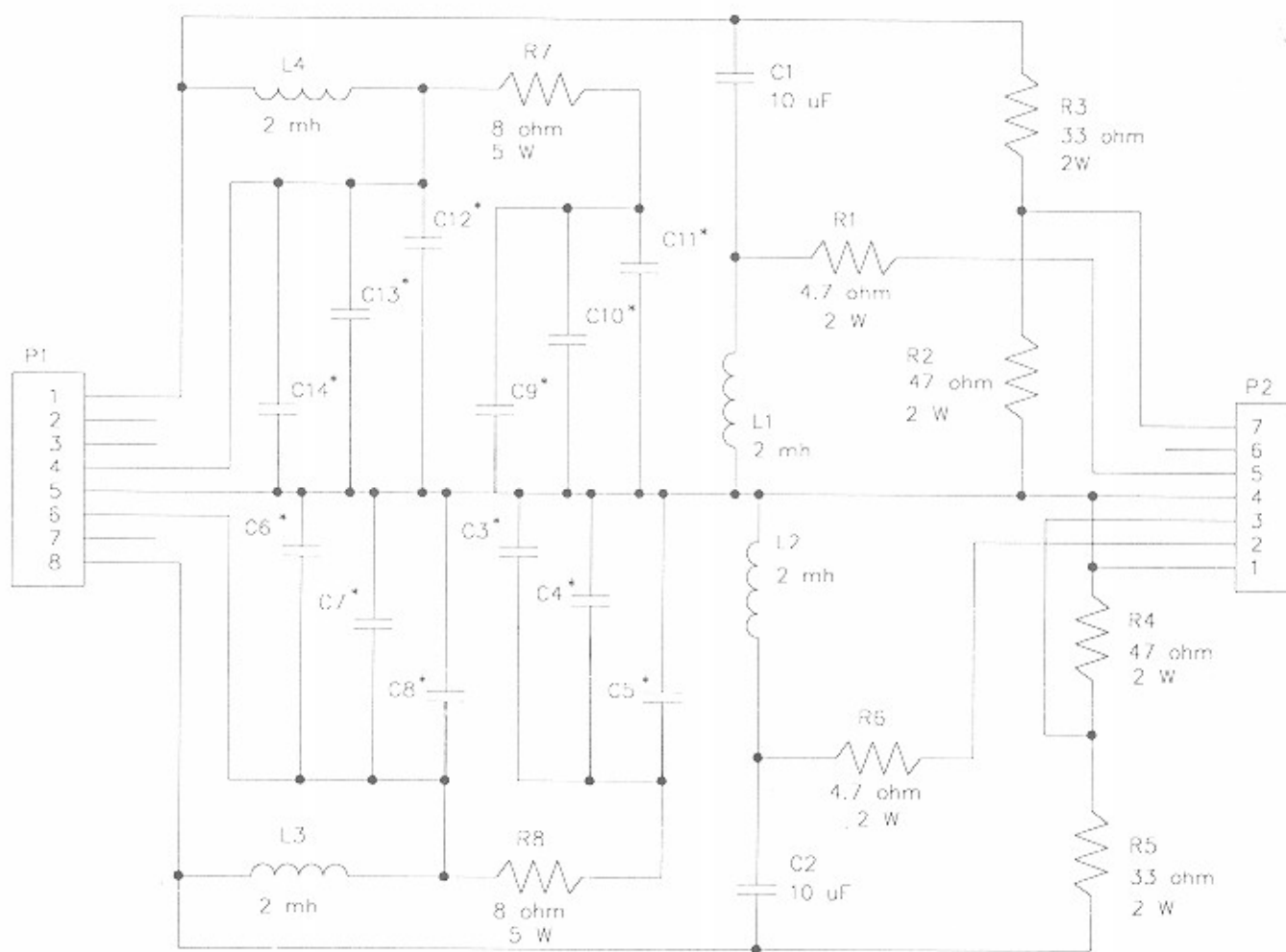


Figure 5-8B. Amplifier Driver Board Layout



For Equivalent Engineering Drawing See 61051901 C
 Figure 5-8C. Circuit Board Assembly - Crossover (CD-51A)

COMPONENT LIST FOR CROSSOVER NETWORK 61051901

C1	Capacitor - Bi-Polar Electrolytic	10 μ F	70022805
C2	Capacitor - Bi-Polar Electrolytic	10 μ F	70022805
C3	Capacitor - Bi-Polar Electrolytic	3.3 μ F	70022801
*C4	Capacitor - Bi-Polar Electrolytic	15 μ F	70022807
*C5	NOT USED		
*C6	NOT USED		
C7	Capacitor - Bi-Polar Electrolytic	4.7 μ F	70022802
*C8	Capacitor - Bi-Polar Electrolytic	15 μ F	70022807
*C9	Capacitor - Bi-Polar Electrolytic	15 μ F	70022807
C10	Capacitor - Bi-Polar Electrolytic	3.3 μ F	70022801
*C11	NOT USED		
*C12	Capacitor - Bi-Polar Electrolytic	15 μ F	70022807
C13	Capacitor - Bi-Polar Electrolytic	4.7 μ F	70022802
*C14	NOT USED		
L1	Inductor - Air Core	2 mH	70041401
L2	Inductor - Air Core	2 mH	70041401
L3	Inductor - Air Core	2 mH	70041401
L4	Inductor - Air Core	2 mH	70041401
P1	Header - Vertical Polarized (8CKT)		70075008
P2	Header - Vertical Polarized (7CKT)		70075007
R1	Resistor - Wire-Wound 2W	47 Ω	79920470
R2	Resistor - Wire-Wound 2W	4.7 Ω	79920479
R3	Resistor - Wire-Wound 2W	33 Ω	79920330
R4	Resistor - Wire-Wound 2W	47 Ω	79920470
R5	Resistor - Wire-Wound 2W	33 Ω	79920330
R6	Resistor - Wire-Wound 2W	4.7 Ω	79920479
R7	Resistor - Wire-Wound 5W	8 Ω	70012511
R8	Resistor - Wire-Wound 5W	8 Ω	70012511

NOTES:

The following substitutions may be made:

$$* C8 (15 \mu F) + C7 (4.7 \mu F) = 19.7 \mu F$$

$$* C12 (15 \mu F) + C13 (4.7 \mu F) = 19.7 \mu F$$

OR

$$* C8 (10 \mu F) + C7 (4.7 \mu F) + C6 (4.7 \mu F) = 19.4 \mu F$$

$$* C12 (10 \mu F) + C13 (4.7 \mu F) + C14 (4.7 \mu F) = 19.4 \mu F$$

Either of the above combinations may be used to obtain the nominal 19.5 μ F.

$$* C4 (15 \mu F) + C3 (3.3 \mu F) = 18.3 \mu F$$

$$* C9 (15 \mu F) + C10 (3.3 \mu F) = 18.3 \mu F$$

OR

$$* C4 (10 \mu F) + C3 (3.3 \mu F) + C5 (4.7 \mu F) = 18 \mu F$$

$$* C9 (10 \mu F) + C10 (3.3 \mu F) + C11 (4.7 \mu F) = 18 \mu F$$

Either of the above combinations may be used to obtain the nominal 18 μ F.

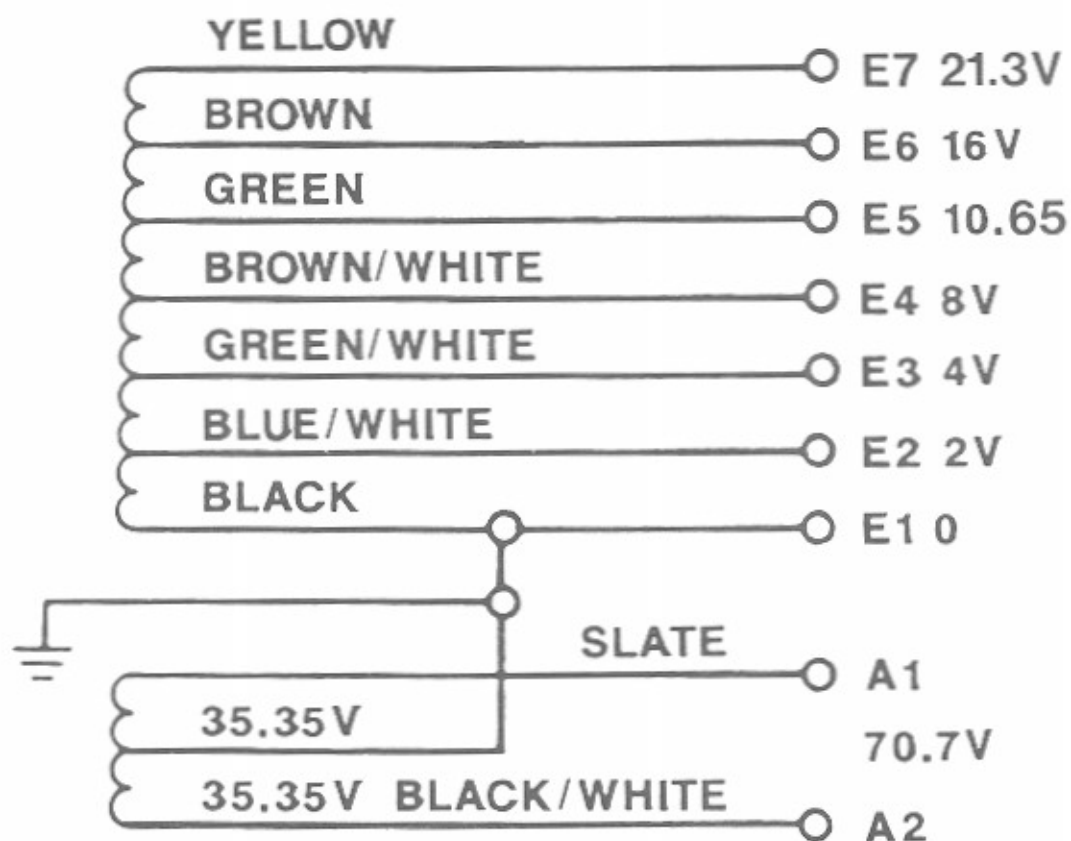
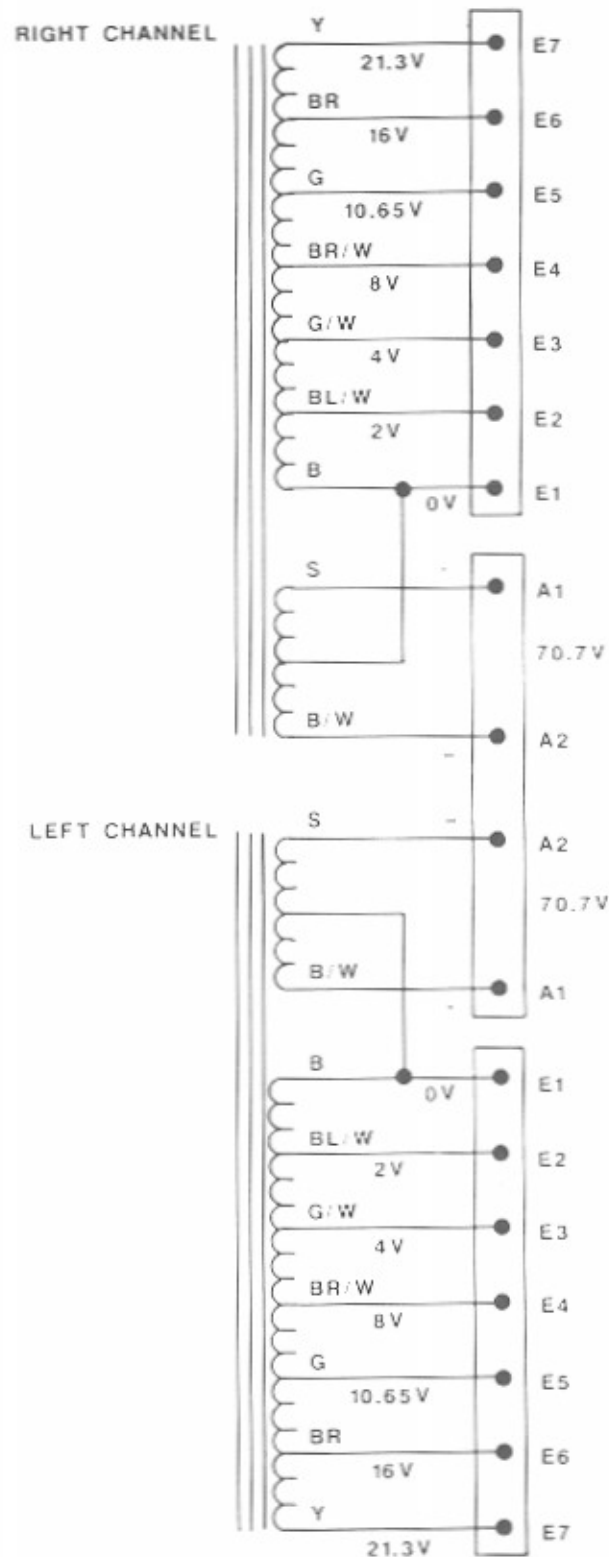
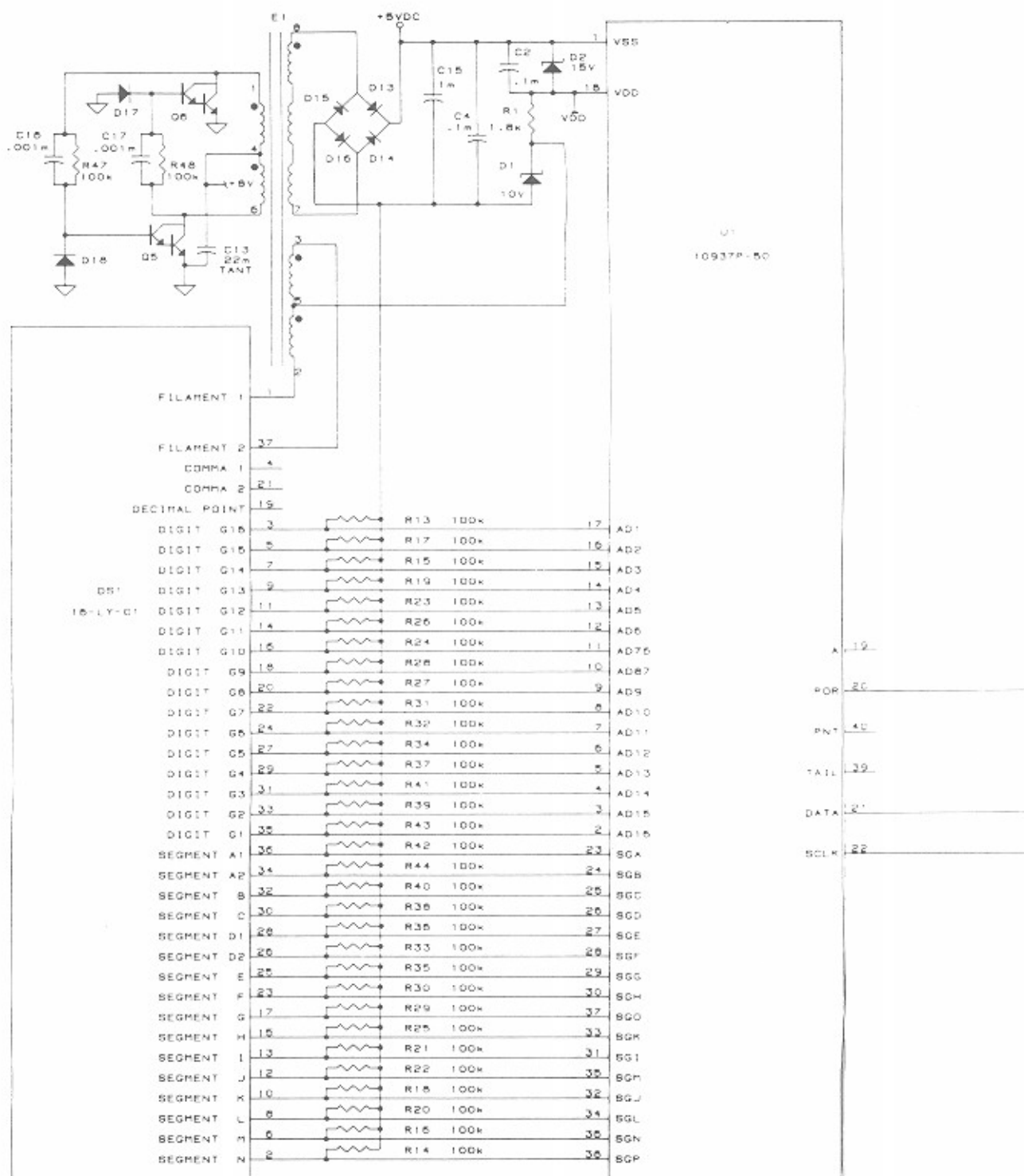
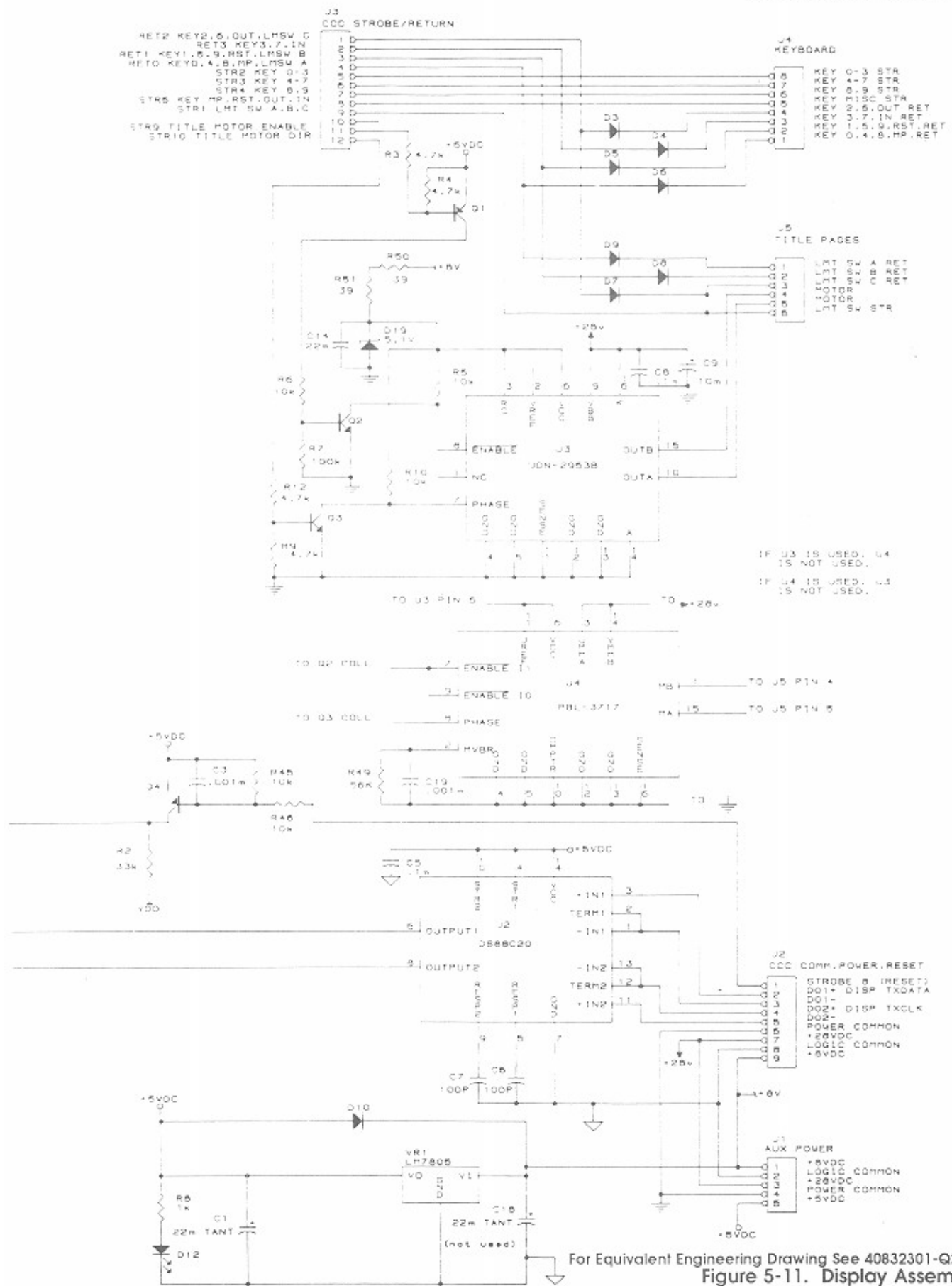


Figure 5-9. Transformer Output Voltages



For Equivalent Engineering Drawing See 40832101-Q2 A
Figure 5-10. Transformer Wiring Diagram





For Equivalent Engineering Drawing See 40832301-Q2 G
Figure 5-11. Display Assembly

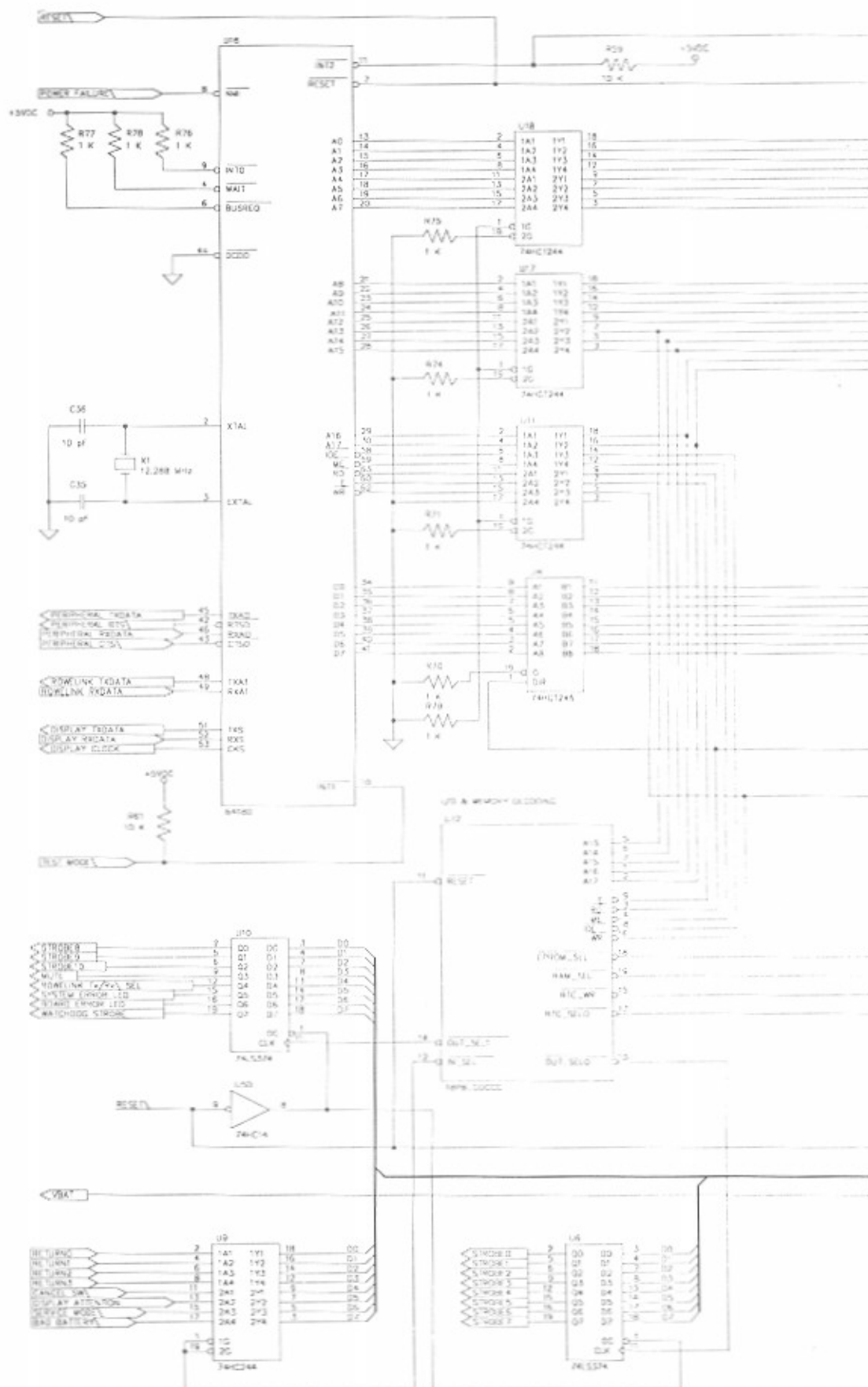
COMPONENT LIST FOR THE DISPLAY ASSEMBLY (40841801)

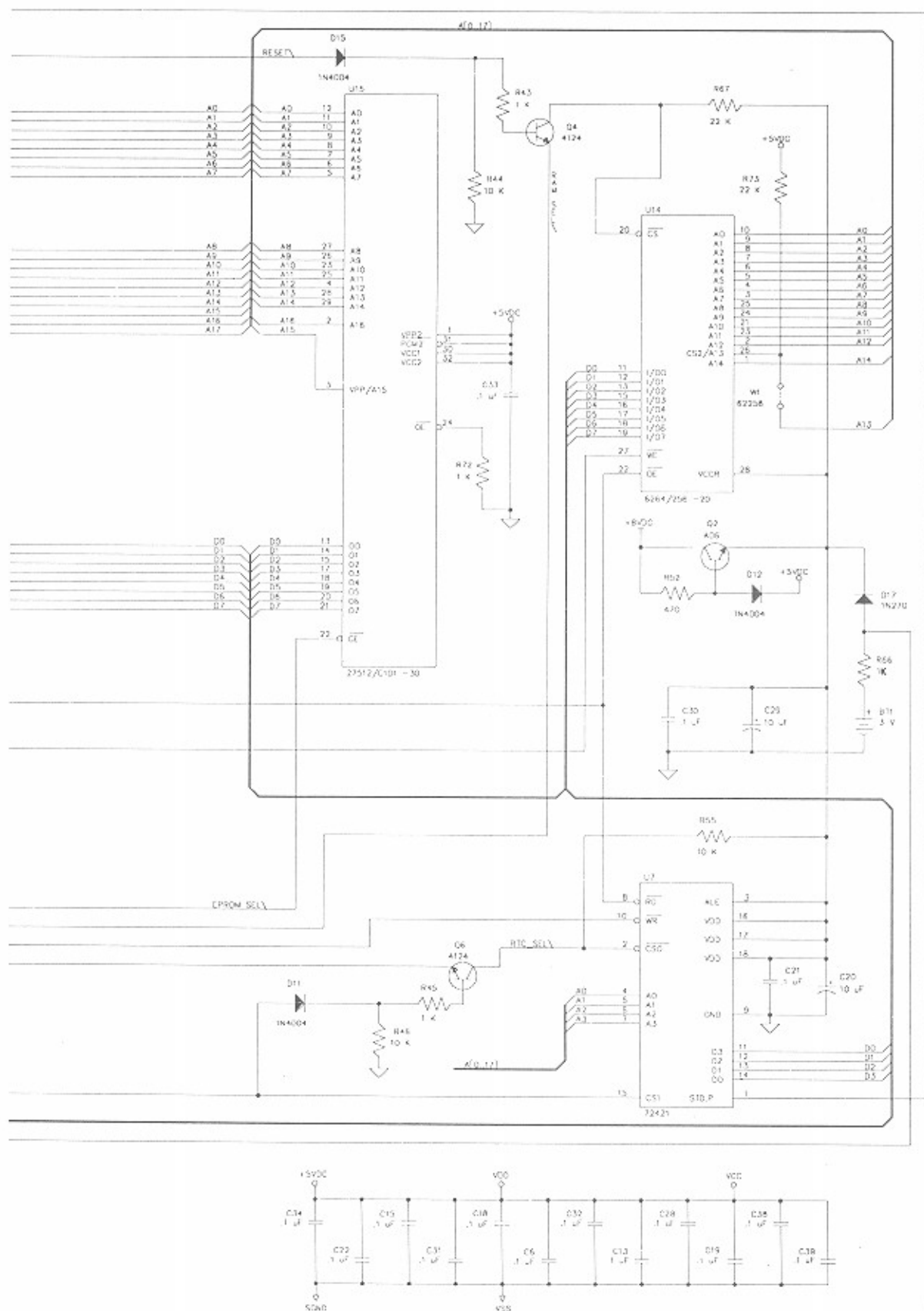
C1	Capacitor-Tantalum	22 μ F	70025104
C2	Capacitor-Monolithic Ceramic	.1 μ F	70028511
C3	Capacitor-Monolithic Ceramic	.001 μ F	70028518
C4	Capacitor-Monolithic Ceramic	.1 μ F	70028511
C5	Capacitor-Monolithic Ceramic	.1 μ F	70028511
C6	Capacitor-Monolithic Ceramic	100 pF	70028601
C7	Capacitor-Monolithic Ceramic	100 pF	70028601
C8	Capacitor-Monolithic Ceramic	.1 μ F	70028511
C9	Capacitor-Electrolytic	10 μ F	70023808
C13	Capacitor-Tantalum	22 μ F	70025104
C14	Capacitor-Tantalum	22 μ F	70025104
C15	Capacitor-Electrolytic	1 μ F	70028029
C16	Capacitor-Monolithic Ceramic	.001 μ F	70028518
C17	Capacitor-Monolithic Ceramic	.001 μ F	70028518
C18	NOT USED		
C19	Capacitor-Monolithic Ceramic	.001 μ F	70028518
D1	Diode-Zener	10 V	70035514
D2	Diode-Zener (15V)		70035522
D3-D10	Diode-Silicon		70035005
D11	Diode-Zener (6.2V)		70035508
D12	LED-Block (90)		70035201
D13-D16		Diode-Silicon	70035005
D17	Diode-Silicon		70035012
D18	Diode-Silicon		70035012
DS1	Display-VAC FLU (16 Character)		30933201
E1	Transformer, DC-DC/AC		30942101
J1	Wafer-Polarizing 90 (5 CKT)		70074405
J2	Wafer-Polarizing 90 (9 CKT)		70074409
J3	Wafer-Polarizing 90 (12 CKT)		70074412
J4	Wafer-Polarizing 90 (8 CKT)		70074408
J5	Wafer-Polarizing 90 (6 CKT)		70074406

Q1	Transistor-Silicon (PNP)	70030104
Q2	Transistor-Silicon (NPN)	70030008
Q3	Transistor-Silicon (NPN)	70030008
Q4	Transistor-Silicon (PNP)	70030104
Q5	Transistor-Darlington (NPN)	70030202
Q6	Transistor-Darlington (NPN)	70030202

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

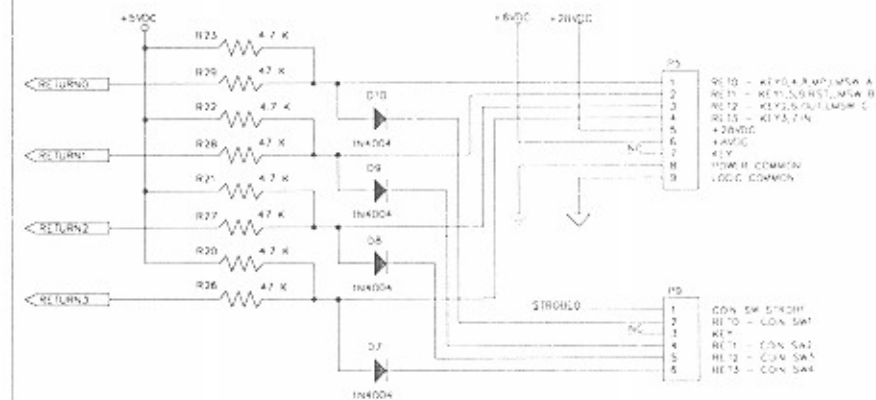
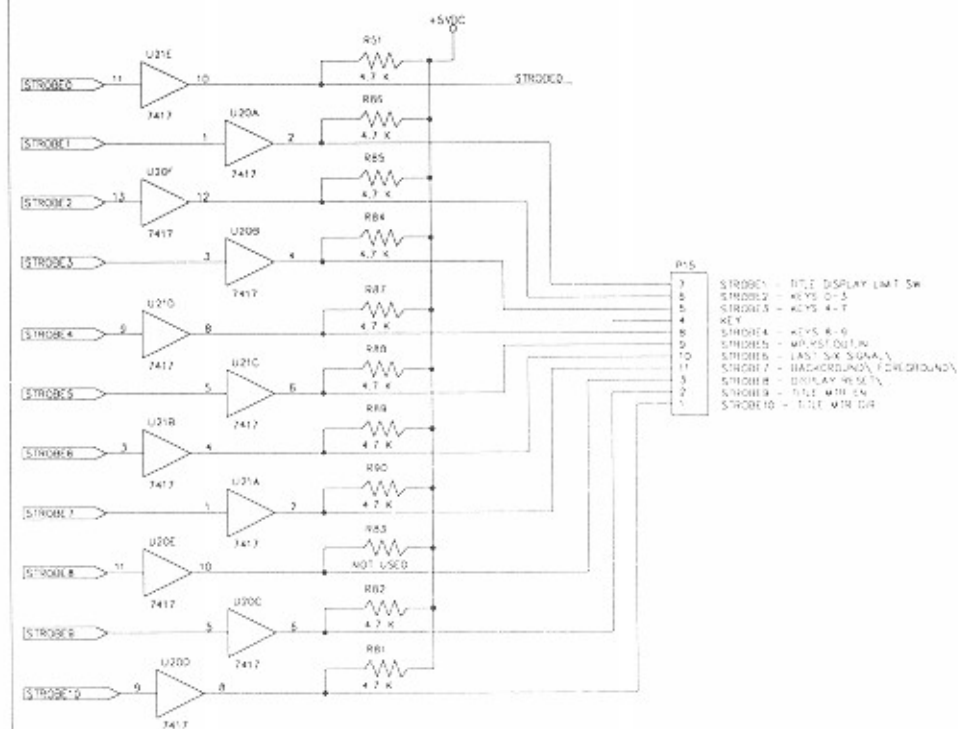
R1	Resistor-Carbon	1.8 K	79901182
R2	Resistor-Carbon	33 K	79901333
R3	Resistor-Carbon	4.7 K	79901472
R4	Resistor-Carbon	4.7 K	79901472
R5	Resistor-Carbon	10 K	79901103
R6	Resistor-Carbon	10 K	79901103
R7	Resistor-Carbon	100 K (1/8 w)	79905104
R8	Resistor-Carbon	1 K	79901102
R9	Resistor-Carbon	4.7 K	79901472
R10	Resistor-Carbon	10 K	79901103
R12	Resistor-Carbon	4.7 K	79901472
R13 Thru R44	Resistor-Carbon	100 K (1/8 w)	79905104
R45	Resistor-Carbon	10 K	79901103
R46	Resistor-Carbon	10 K	79901103
R47	Resistor-Carbon	100 K (1/8 w)	79905104
R48	Resistor-Carbon	100 K (1/8 w)	79905104
R49	Resistor-Carbon	56 K	79901563
U1	Driver-Display (VAC FLU) (10937)		30800237
U2	Receiver-Dual (RS-422)		30800228
U3	Driver-Motor (Full Bridge) (UDN-2953B)		30800229
U4	Driver-Motor (Full Bridge) (PBL-3717)		30800241
VR1	Regulator-Voltage (Linear IC)		70036506



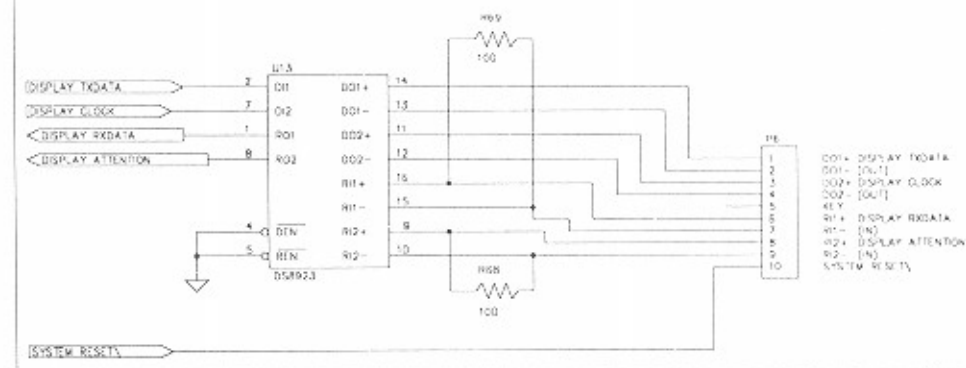


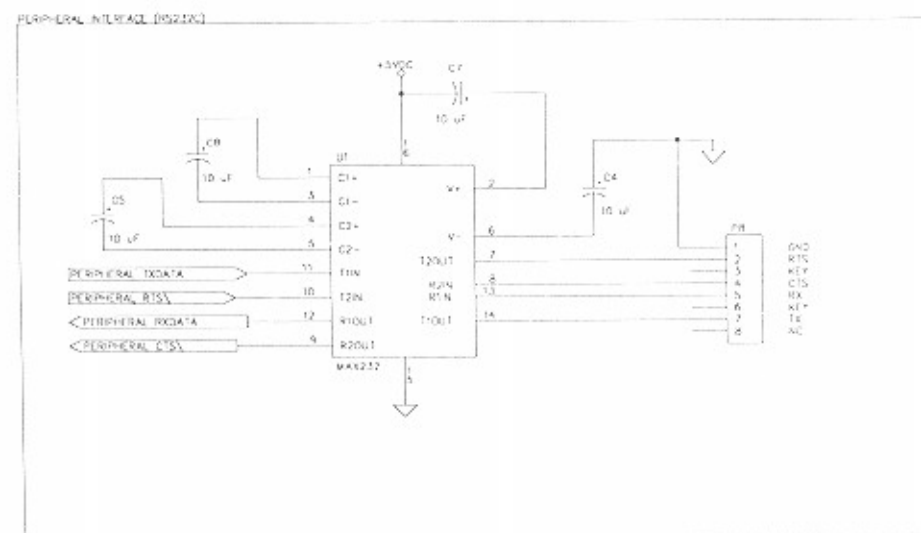
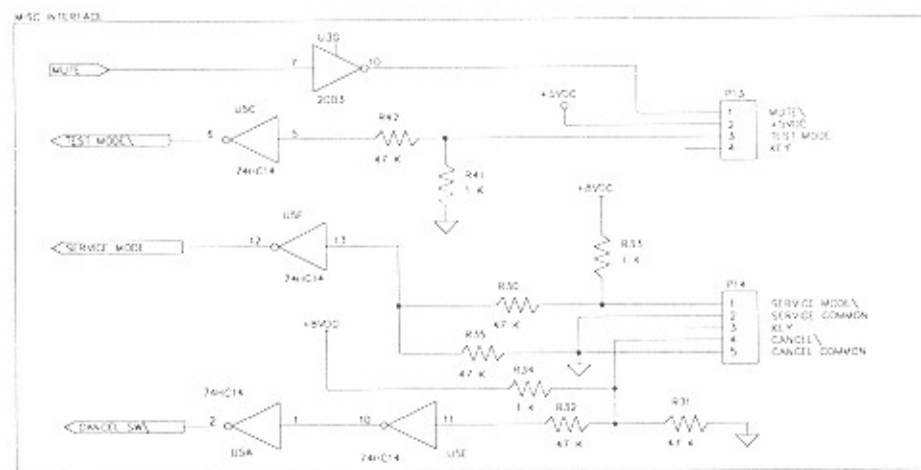
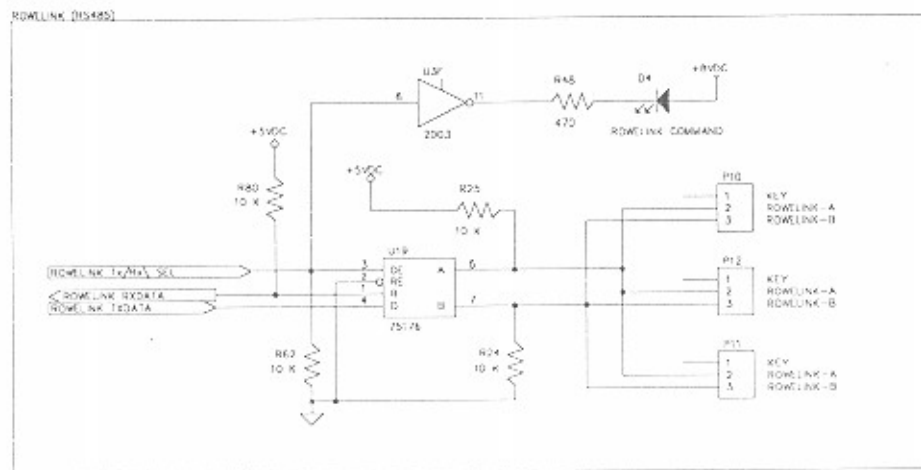
For Equivalent Engineering Drawing See 61031101-Q2 E
Figure 5-12A. Central Control Computer Schematic, Sheet 1

DISPLAY/KEYBOARD INTERFACE

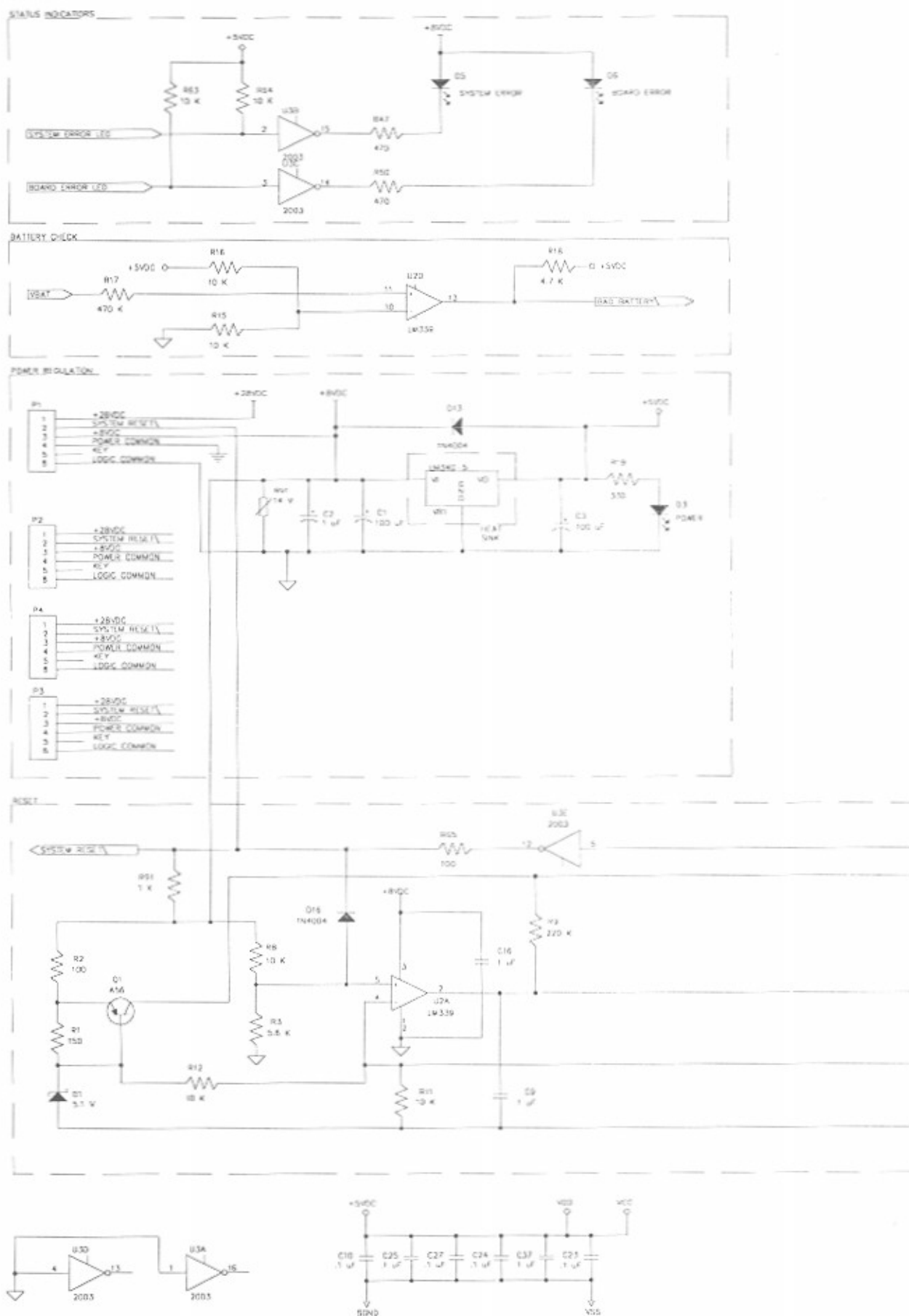


DISPLAY INTERFACE DIS422





For Equivalent Engineering Drawing See 61031101-Q2 E
Figure 5-12A. Central Control Computer Schematic, Sheet 2



CD-51A C.C.C. IC POWER AND COMMON PIN CHART					
REF	GENERIC PART #	POWER		COMMON	
		+5VDC	+8VDC	LOGIC	POWER
U1	MAX 232	16	-	15	-
U2	LM555	-	3	12	-
U3	2003	-	-	8	-
U4	LM555	8	-	1	-
U5	74HC14	14	-	7	-
U6	74LS374	20	-	10	-
U7	72421	16,17,18	-	9	-
U8	74HCT245	20	-	10	-
U9	74HC244	20	-	10	-
U10	74LS374	20	-	10	-
U11	74HCT244	20	-	10	-
U12	18P8-CDCCC	20	-	10	-
U13	DS8923	3	-	6	-
U14	6264/6256	28	-	14	-
U15	27512/27C101	32,30	-	16	-
U16	64180	32	-	1,33	-
U17	74HCT244	20	-	10	-
U18	74HCT244	20	-	10	-
U19	75176	8	-	5	-
U20	7417	14	-	7	-
U21	7417	14	-	7	-

For Equivalent Engineering Drawing See 61031101-Q2 D
Figure 5-12A. Central Control Computer Schematic, Sheet 4

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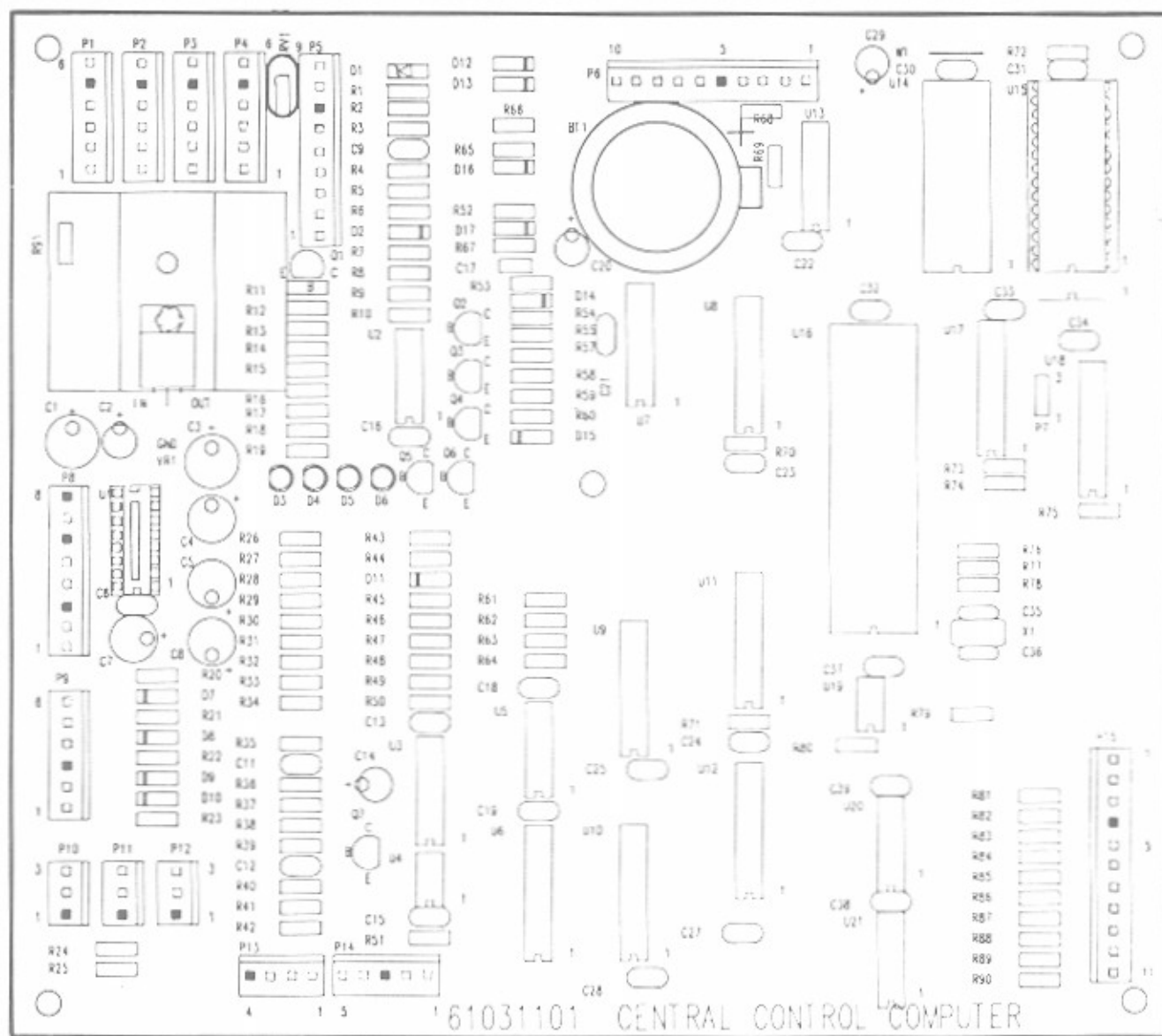


Figure 5-12B. Central Control Computer Circuit Board Layout

COMPONENT LIST FOR CENTRAL CONTROL COMPUTER (61031101)

BT1	Battery - Lithium	750 mah 3V or 160 mah 3V	40788901 30873101
C1	Capacitor - Electrolytic	100 μ F	70023814
C2	Capacitor - Tantalum	1 μ F	70025121
C3	Capacitor - Electrolytic	100 μ F	70023814
C4	Capacitor - Electrolytic	10 μ F	70023808
C5	Capacitor - Electrolytic	10 μ F	70023808
C6	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C7	Capacitor - Electrolytic	10 μ F	70023808
C8	Capacitor - Electrolytic	10 μ F	70023808
C9	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C10	NOT USED		
C11	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C12	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C13	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C14	Capacitor - Electrolytic	10 μ F	70023808
C15	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C16	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C17	Capacitor - Monolithic Ceramic	.01 μ F	70028502
C18	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C19	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C20	Capacitor - Electrolytic	10 μ F	70023808
C21	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C22	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C23	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C24	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C25	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C27	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C28	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C29	Capacitor - Electrolytic	10 μ F	70023808
C30	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C31	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C32	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C33	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C34	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C35	Capacitor - Monolithic Ceramic	10 pF	70028701
C36	Capacitor - Monolithic Ceramic	10 pF	70028701
C37	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C38	Capacitor - Monolithic Ceramic	.1 μ F	70028511
C39	Capacitor - Monolithic Ceramic	.1 μ F	70028511
D1	Diode - Zener (5.1 V)		70035526
D2	Diode - Silicon	IN4004	70035005
D3	Diode - Light Emitting		70035305
D4	Diode - Light Emitting		70035305
D5	Diode - Light Emitting		70035305
D6	Diode - Light Emitting		70035305
D7	Diode - Silicon	IN4004	70035005
D8	Diode - Silicon	IN4004	70035005
D9	Diode - Silicon	IN4004	70035005
D10	Diode - Silicon	IN4004	70035005
D11	Diode - Silicon	IN4004	70035005
D12	Diode - Silicon	IN4004	70035005
D13	Diode - Silicon	IN4004	70035005
D14	Diode - Silicon	IN4004	70035005
D15	Diode - Silicon	IN4004	70035005
D16	Diode - Silicon	IN4004	70035005
D17	Diode - Germanium	IN270	70035101

COMPONENT LIST FOR CENTRAL CONTROL COMPUTER (61031101)

(Continued)

P1	Wafer - Polarizing (6 CKT)	70075006
P2	Wafer - Polarizing (6 CKT)	70075006
P3	Wafer - Polarizing (6 CKT)	70075006
P4	Wafer - Polarizing (6 CKT)	70075006
P5	Wafer - Polarizing (9 CKT)	70075009
P6	Wafer - Polarizing (10 CKT)	70075010
P7	NOT USED	
P8	Wafer - Polarizing (8 CKT)	70075008
P9	Wafer - Polarizing (6 CKT)	70075006
P10	Wafer - Polarizing (3 CKT)	70075003
P11	Wafer - Polarizing (3 CKT)	70075003
P12	Wafer - Polarizing (3 CKT)	70075003
P13	Wafer - Polarizing (4 CKT)	70075004
P14	Wafer - Polarizing (5 CKT)	70075005
P15	Wafer - Polarizing (11 CKT)	70075011

Q1	Transistor - Silicon (PNP)	70030104
Q2	Transistor - Silicon (NPN)	70030008
Q3	Transistor - Silicon (NPN)	70030008
Q4	Transistor - Silicon (NPN)	70031301
Q5	Transistor - Silicon (NPN)	70030008
Q6	Transistor - Silicon (NPN)	70031301
Q7	Transistor - Silicon (NPN)	70030008

Note: All resistors are 1/4 watt 5%, unless otherwise noted.

R1	Resistor - Carbon	150 Ω	79901151
R2	Resistor - Carbon	100 Ω	79901101
R3	Resistor - Carbon	5.6 K (1/4w, 2%)	79902562
R4	Resistor - Carbon	100 K	79901104
R5	Resistor - Carbon	100 K	79901104
R6	Resistor - Carbon	22 K	79901223
R7	Resistor - Carbon	10 K	79901103
R8	Resistor - Carbon Film	10 K (1/4w, 2%)	79902103
R9	Resistor - Carbon	220 K	79901224
R10	Resistor - Carbon	470 K	79901474
R11	Resistor - Carbon Film	10 K (1/4w, 2%)	79902103
R12	Resistor - Carbon Film	10 K (1/4w, 2%)	79902103
R13	Resistor - Carbon	10 K	79901103
R14	Resistor - Carbon	470 K	79901474
R15	Resistor - Carbon	10 K	79901103
R16	Resistor - Carbon	10 K	79901103
R17	Resistor - Carbon	470 K	79901474
R18	Resistor - Carbon	4.7 K	79901472
R19	Resistor - Carbon	330 Ω	79901331
R20	Resistor - Carbon	4.7 K	79901472
R21	Resistor - Carbon	4.7 K	79901472
R22	Resistor - Carbon	4.7 K	79901472
R23	Resistor - Carbon	4.7 K	79901472
R24	Resistor - Carbon	10 K	79901103

R25	Resistor - Carbon	10 K	79901103
R26	Resistor - Carbon	47 K	79901473
R27	Resistor - Carbon	47 K	79901473
R28	Resistor - Carbon	47 K	79901473
R29	Resistor - Carbon	47 K	79901473
R30	Resistor - Carbon	47 K	79901473
R31	Resistor - Carbon	47 K	79901473
R32	Resistor - Carbon	47 K	79901473
R33	Resistor - Carbon	1 K	79901102
R34	Resistor - Carbon	1 K	79901102
R35	Resistor - Carbon	47 K	79901473
R36	Resistor - Carbon	10 K	79901103
R37	Resistor - Carbon	470 K	79901474
R38	Resistor - Carbon	10 K	79901103
R39	Resistor - Carbon	10 K	79901103
R40	Resistor - Carbon	10 K	79901103
R41	Resistor - Carbon	1 K	79901102
R42	Resistor - Carbon	47 K	79901473
R43	Resistor - Carbon	1 K	79901102
R44	Resistor - Carbon	10 K	79901103
R45	Resistor - Carbon	1 K	79901102
R46	Resistor - Carbon	10 K	79901103
R47	Resistor - Carbon	470 Ω	79901471
R48	Resistor - Carbon	470 Ω	79901471
R49	Resistor - Carbon	10 K	79901103
R50	Resistor - Carbon	470 Ω	79901471
R51	Resistor - Carbon	4.7 K	79901472
R52	Resistor - Carbon	470 Ω	79901471
R53	Resistor - Carbon	100 Ω	79901101
R54	Resistor - Carbon	10 K	79901103
R55	Resistor - Carbon	10 K	79901103
R57	Resistor - Carbon	10 Ω	79901100
R58	Resistor - Carbon	10 K	79901103
R59	Resistor - Carbon	10 K	79901103
R60	Resistor - Carbon	10 Ω	79901100
R61	Resistor - Carbon	10 K	79901103
R62	Resistor - Carbon	10 K	79901103
R63	Resistor - Carbon	10 K	79901103
R64	Resistor - Carbon	10 K	79901103
R65	Resistor - Carbon	100 Ω	79901101
R66	Resistor - Carbon	1 K	79901102
R67	Resistor - Carbon	22 K	79901223
R68	Resistor - Carbon	100 Ω	79901101
R69	Resistor - Carbon	100 Ω	79901101
R70	Resistor - Carbon	1 K	79901102
R71	Resistor - Carbon	1 K	79901102
R72	Resistor - Carbon	1 K	79901102
R73	Resistor - Carbon	22 K	79901223
R74	Resistor - Carbon	1 K	79901102
R75	Resistor - Carbon	1 K	79901102
R76	Resistor - Carbon	1 K	79901102

COMPONENT LIST FOR CENTRAL CONTROL COMPUTER (61031101)

(Continued)

R77	Resistor - Carbon	1 K	79901102
R78	Resistor - Carbon	1 K	79901102
R79	Resistor - Carbon	1 K	79901102
R80	Resistor - Carbon	10 K	79901103
R81	Resistor - Carbon	4.7 K	79901472
R82	Resistor - Carbon	4.7 K	79901472
R83	Not Used		
R84	Resistor - Carbon	4.7 K	79901472
R85	Resistor - Carbon	4.7 K	79901472
R86	Resistor - Carbon	4.7 K	79901472
R87	Resistor - Carbon	4.7 K	79901472
R88	Resistor - Carbon	4.7 K	79901472
R89	Resistor - Carbon	4.7 K	79901472
R90	Resistor - Carbon	4.7 K	79901472
R91	Resistor - Carbon	1 K	79901102
RV1	Metal Oxide Varistor	11 V	70037505
U1	NOT USED		
U2	I.C. - Quad Comparator (LM339)	(3302)	70036801
U3	I.C. - Darlington Array	(2003)	70036901
U4	I.C. - Timer	(LM555)	70033801
U5	I.C. - HCT (Hex Schmitt Trigger)	74HC14	79940014
U6	I.C. - Octal Edge Triggered F/F	74LS374	70037111
U7	I.C. - Calendar Clock	72421	30800236
U8	I.C. - HCT (Octal Bus Transceiver)	74HCT245	79930245
U9	I.C. - HC-Tristate Octal Buffer	74HC244	79940244
U10	I.C. - Octal Edge Triggered F/F	74LS374	70037111
U11	I.C. - HCT (Octal Buffer/Line Driver)	74HCT244	79930244
U12	I.C. - PAL 18P8-CDCCC		30800232
U13	I.C. - RS-422 Dual Driver/Rcvr	DS8923	30800230
U14	I.C. - CMOS RAM 8K X 8	6264	70036604
U15	I.C. - 64K X 8 EPROM	27512	70039903
U16	I.C. - Microprocessor	64180	70039126
U17	I.C. - HCT (Octal Buffer/Line DRIVER)	74HCT244	79930244
U18	I.C. - HCT (Octal Buffer/Line Driver)	74HCT244	79930244
U19	I.C. - Transceiver (RS-485)	75176	70037801
U20	I.C. - TTL Buffer (Open Collector)	7417	70036305
U21	I.C. - TTL Buffer (Open Collector)	7417	70036305
VR1	Regulator - Voltage (Linear I.C.)	LM340-5	70036505
W1	Not Used		
X1	Crystal - Quartz (12.288 Mhz)		25167314

The chart below shows the various combinations of strobes (outputs from the CCC) and returns (inputs to the CCC) and their corresponding functions.

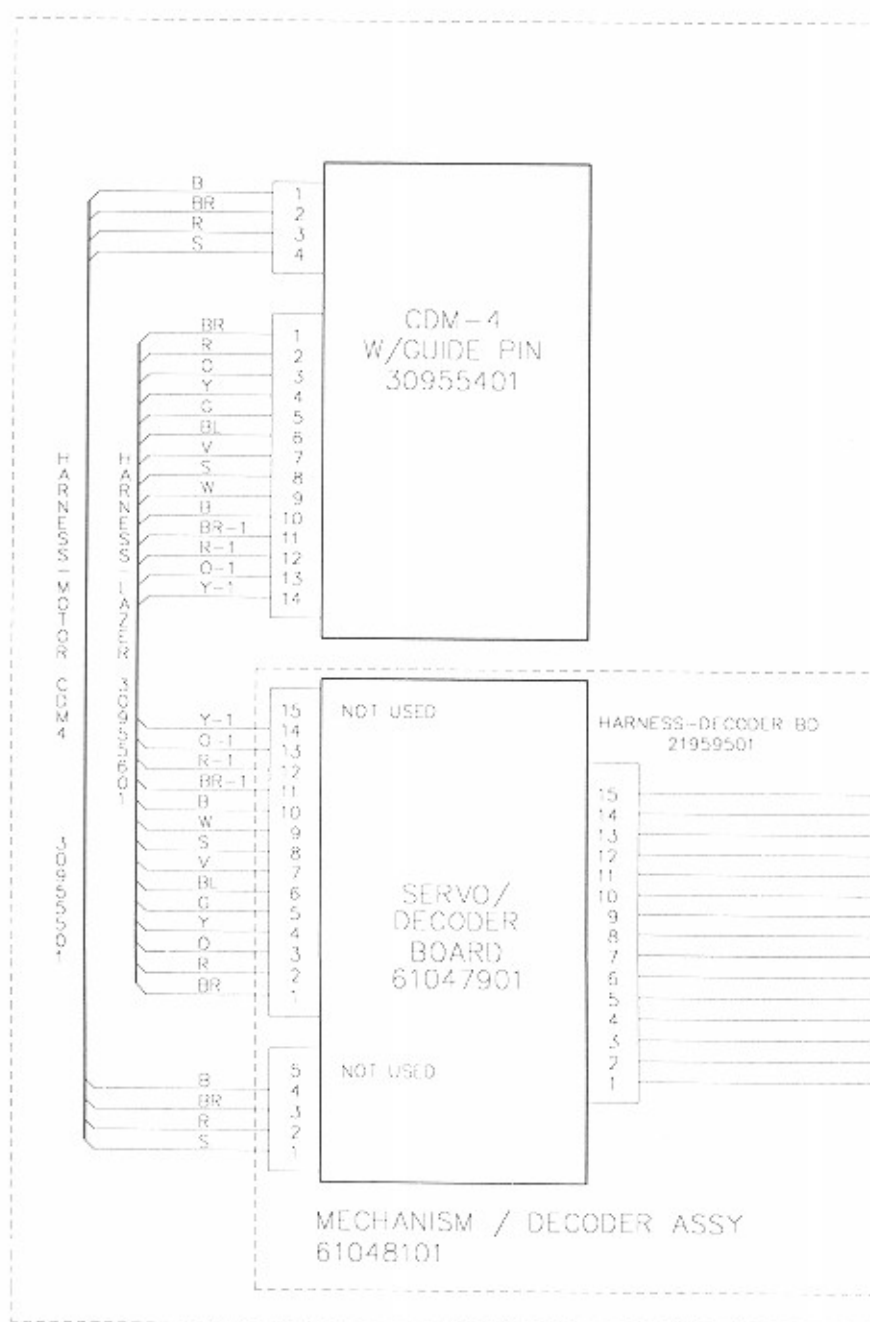
Strobes 0 through 5 appear on Returns 0 through 3 when the indicated switches are activated.

For Example: If you need to be sure that Key 5 is working, find Key 5 in table 5-3. This matrix entry indicates that, when Strobe 3 is active and Key 5 is pressed, Return 1 becomes active.

Not all of the strobes and returns operate in this matrix mode; Returns 4 through 7 and Strobes 7 through 15 have unique functions, which are listed in the table.

Table 5-3. CD-51A CCC I/O Matrix

		INPUTS							
		RETURNS				DEDICATED			
		0	1	2	3	4	5	6	7
STROBES	0	5¢ Coin Switch	10¢ Coin Switch	25¢ Coin Switch	50¢ Coin Switch	C A N C E L S W I T C H	D I S P L Y A T T E N T I O N	S E R V I C E S W I T C H	L O W B A T T E R Y D E T
	1	Title Disp Limit	Title Disp Index	Reserved	UK Defaults				
	2	Key 0	Key 1	Key 2	Key 3				
	3	Key 4	Key 5	Key 6	Key 7				
	4	Key 8	Key 9		Audit Report Start Button				
	5	POPULAR	RESET	OUT	IN				
DEDICATED	6	Not Used							
	7	Background Music Active							
	8	Display Reset - Controls hardware reset on the display driver chip							
	9	Sends speed info to motor chip							
	10	Sends direction info to motor chip							
	11	Mute							
	12	ROWELINK Tx/Rx Select							
	13	SYSTEM ERROR LED							
	14	BOARD ERROR LED							
	15	Watchdog Strobe							



CD MECHANISM ASSEMBLY 61047801

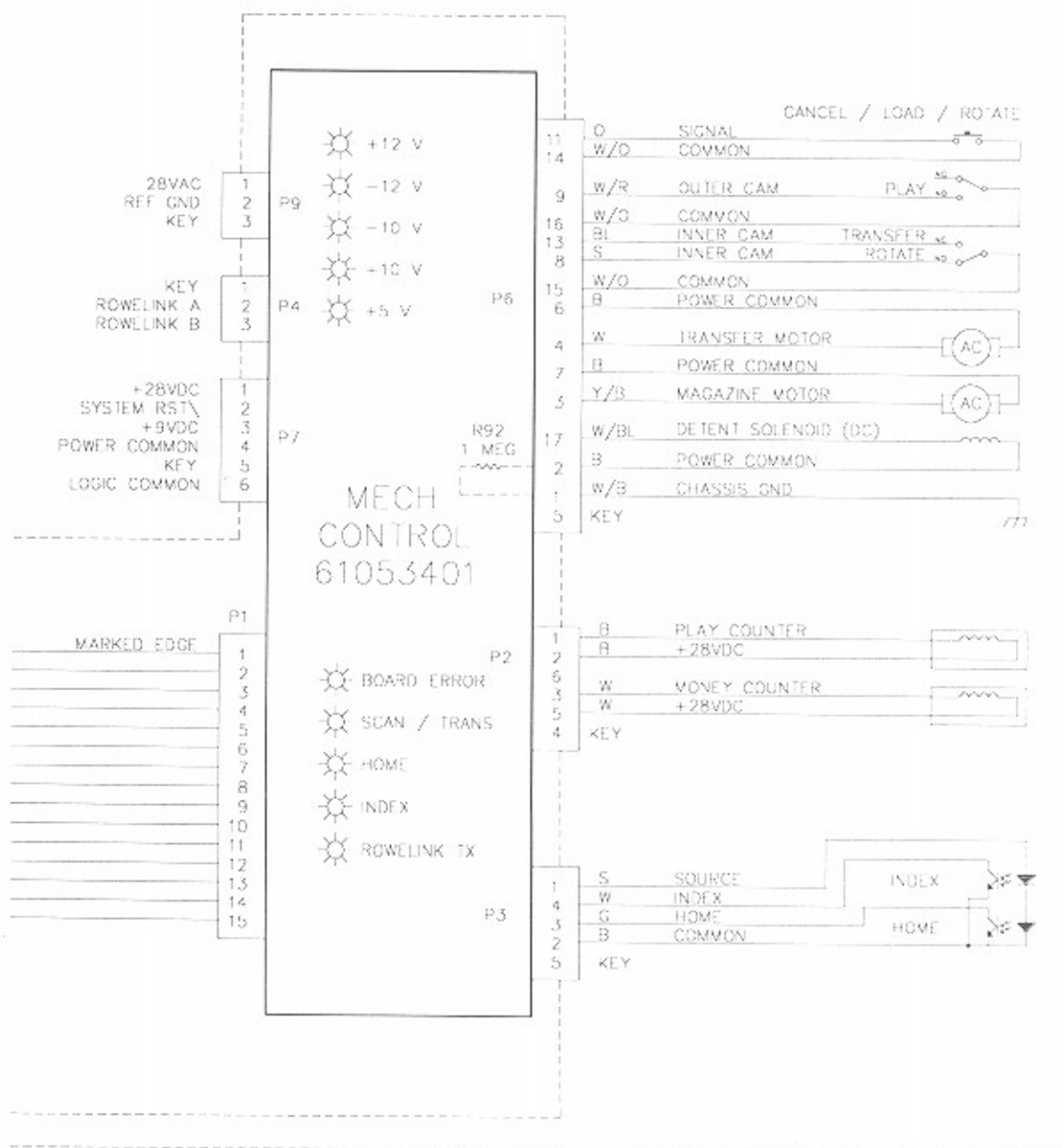
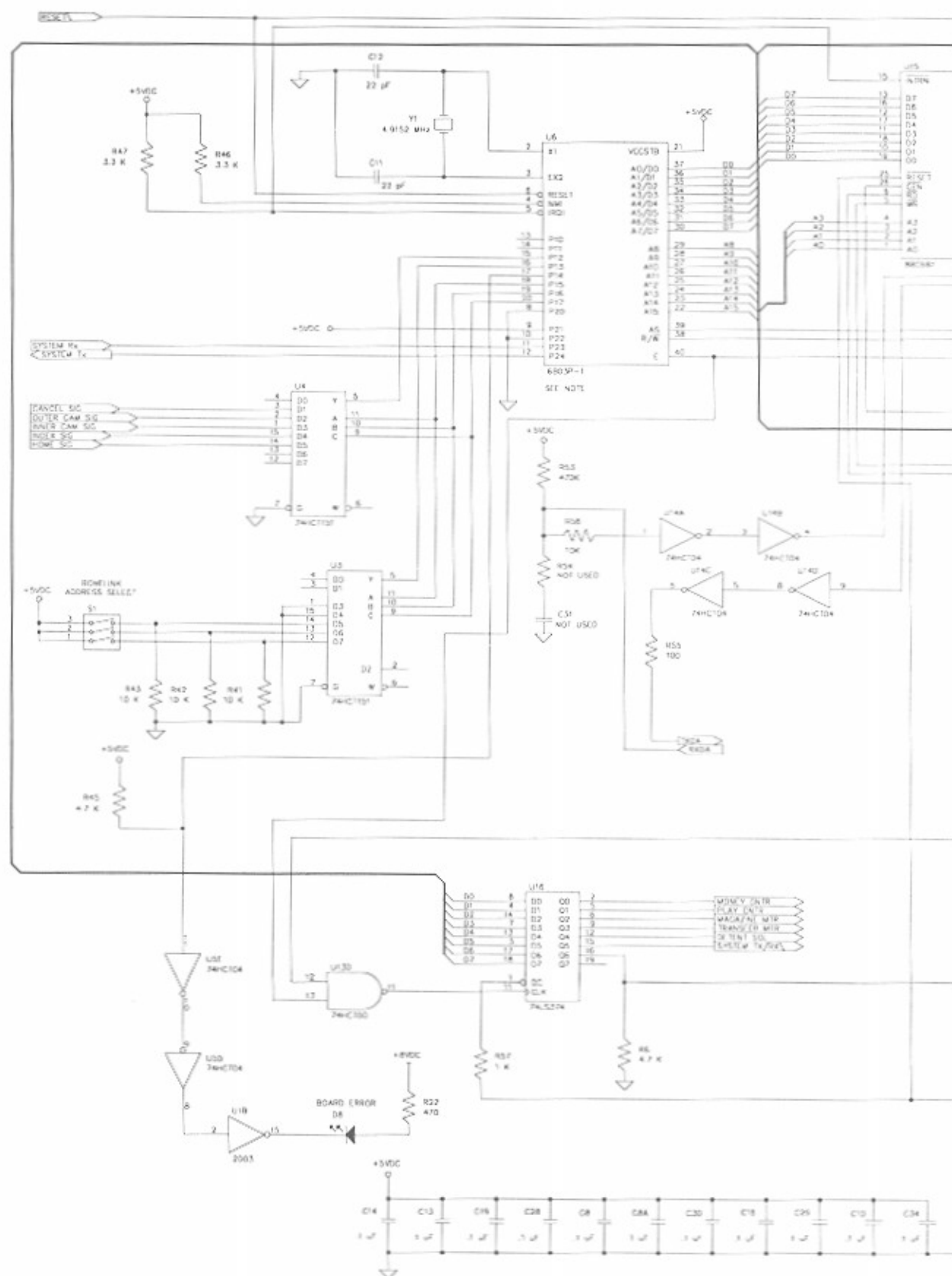
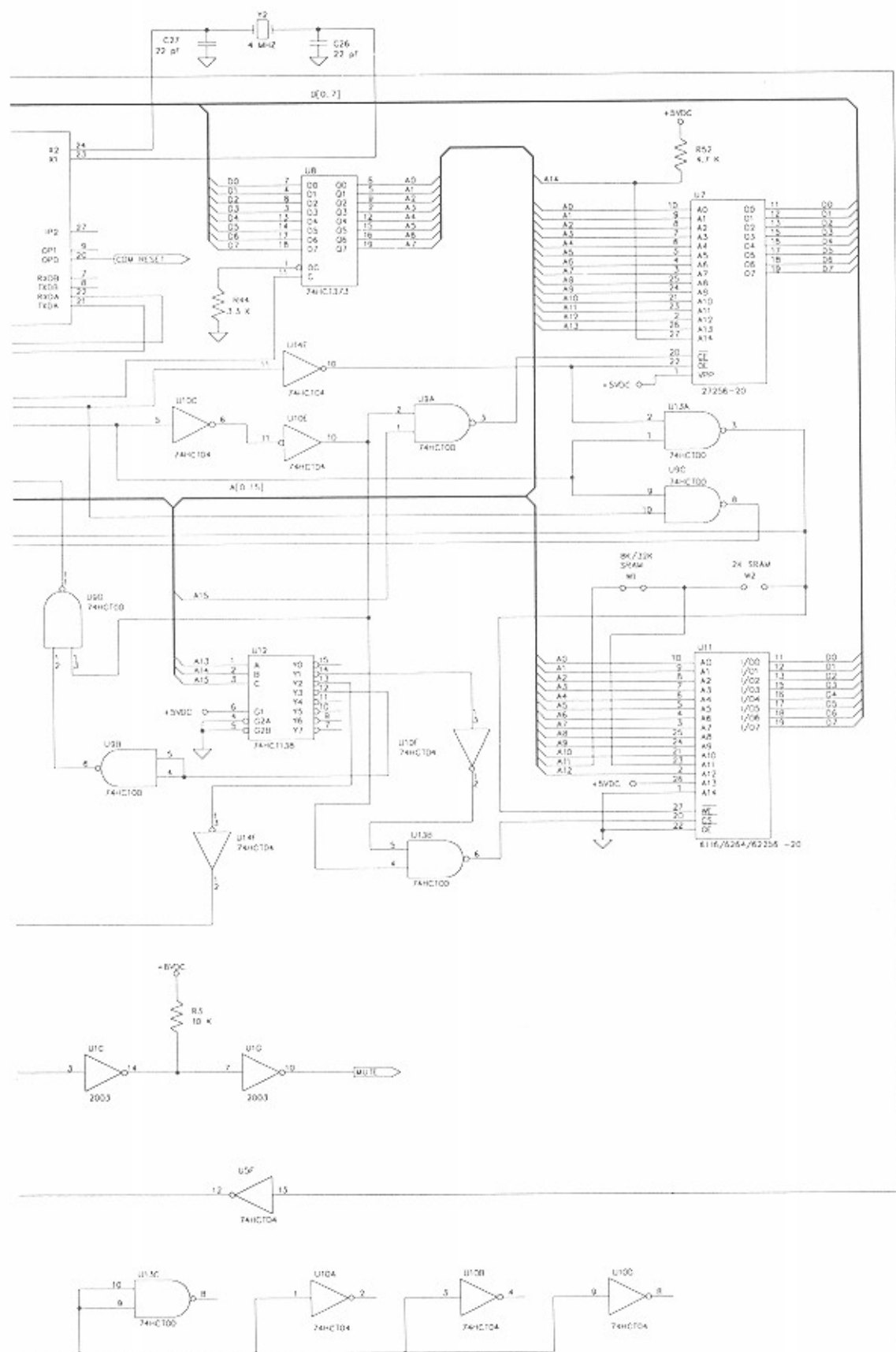


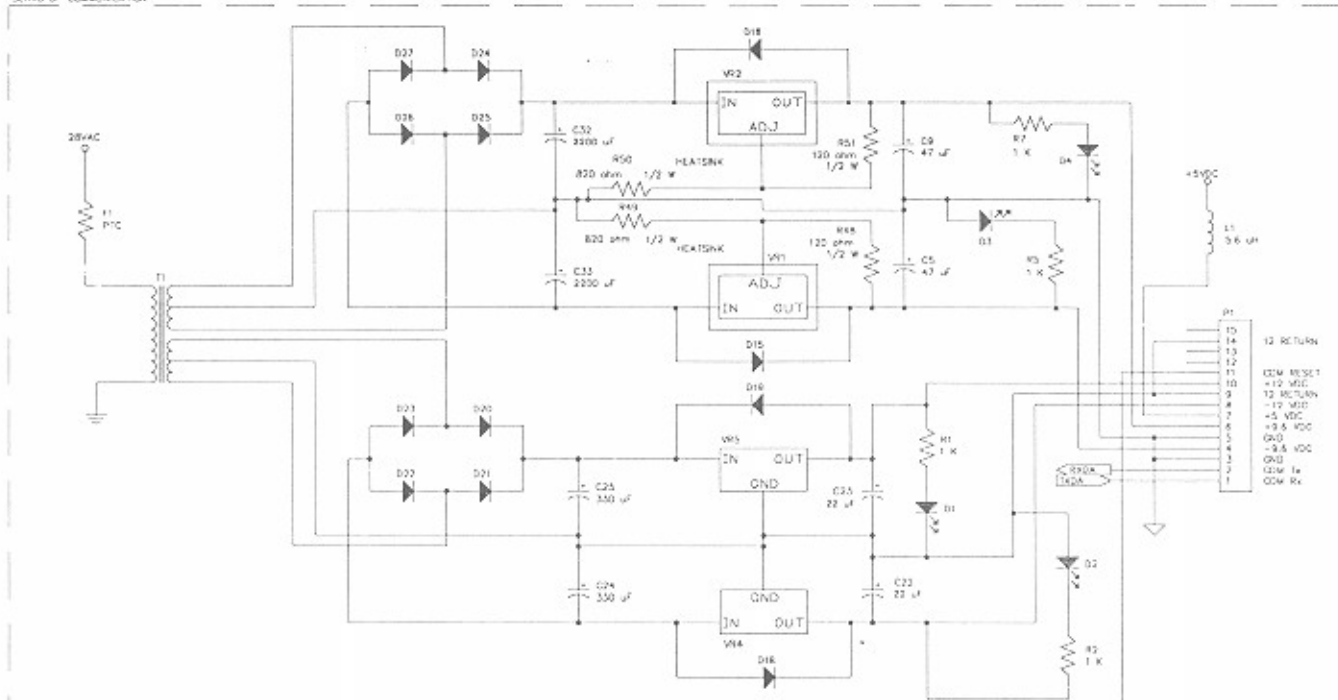
Figure 5-13A. Mechanism Control Assembly Block Diagram



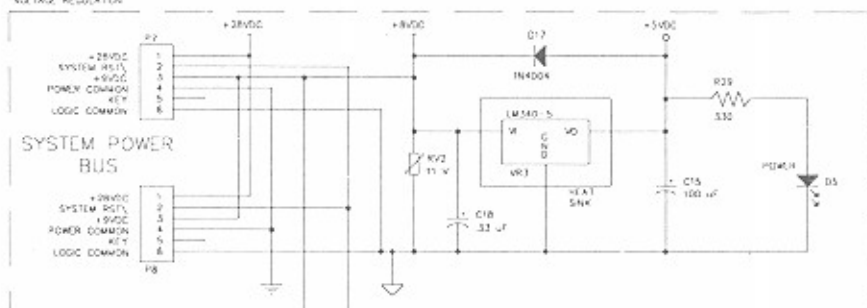


For Equivalent Engineering Drawing See 61053401-Q2 C
Figure 5-13B. Mechanism Control Assembly Schematic, Sheet 1

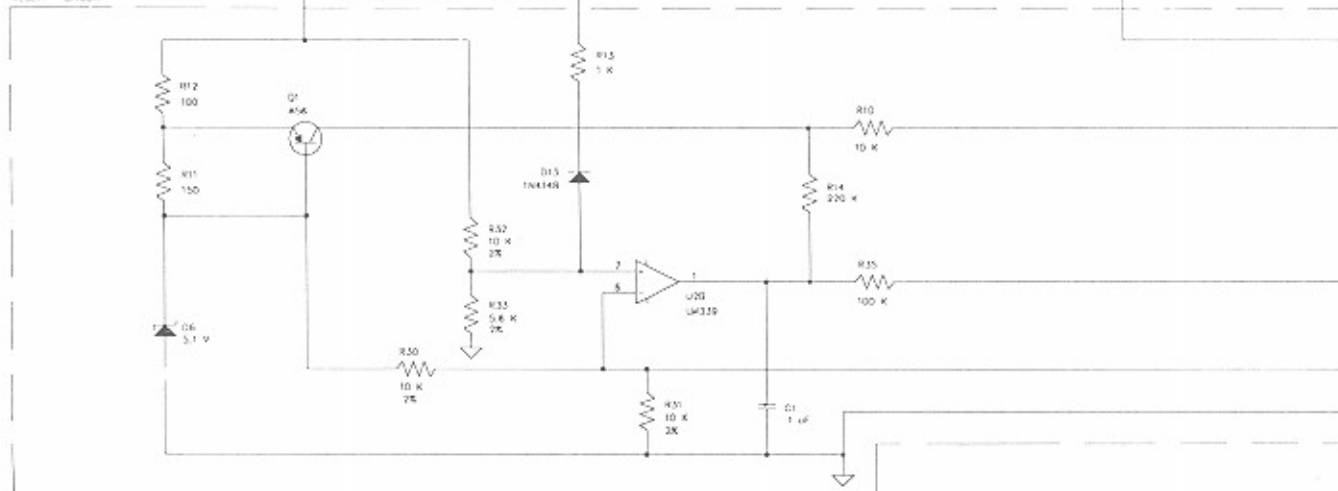
SERVO UP COMMUNICATION

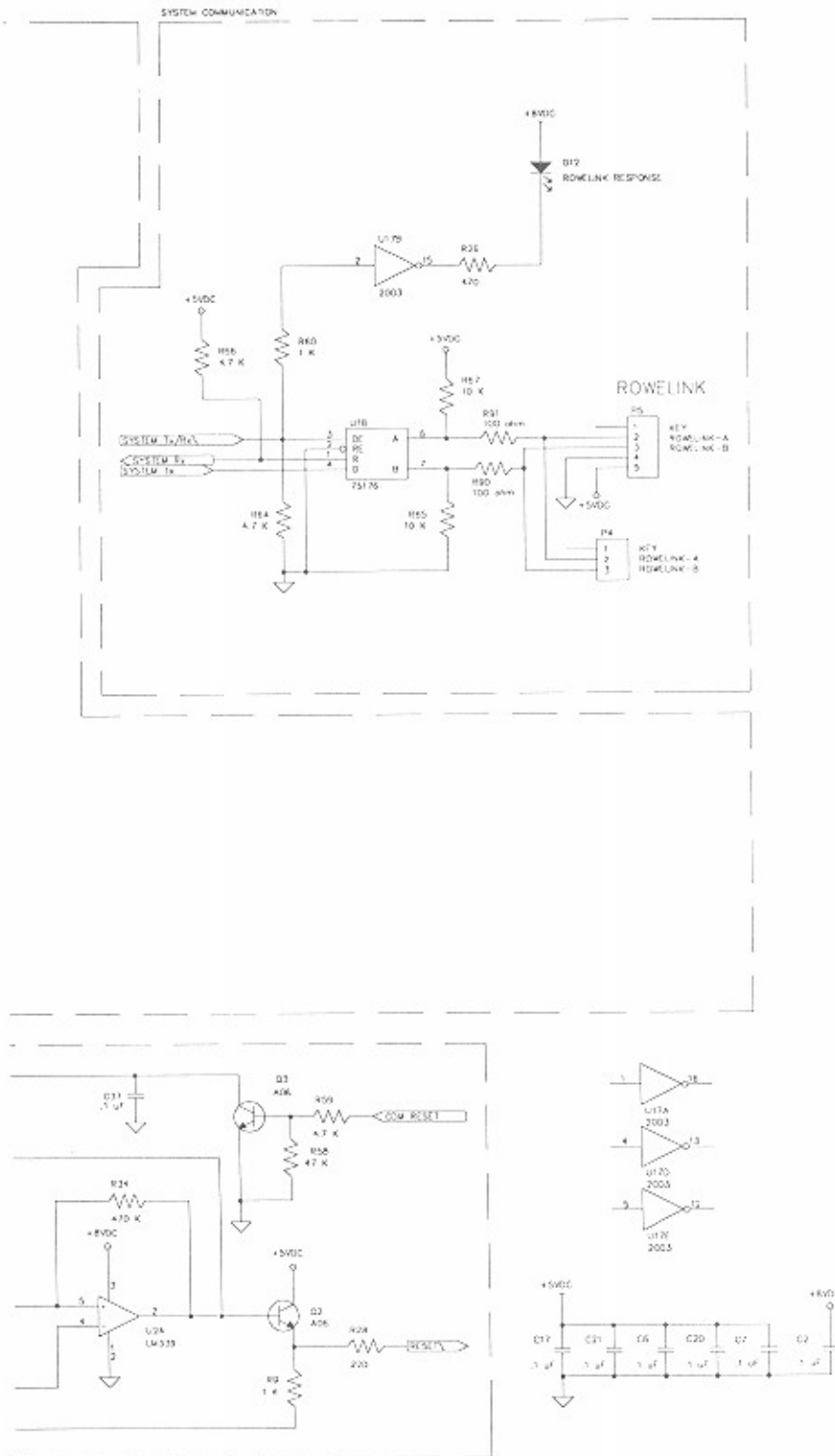


VOLTAGE REGULATION

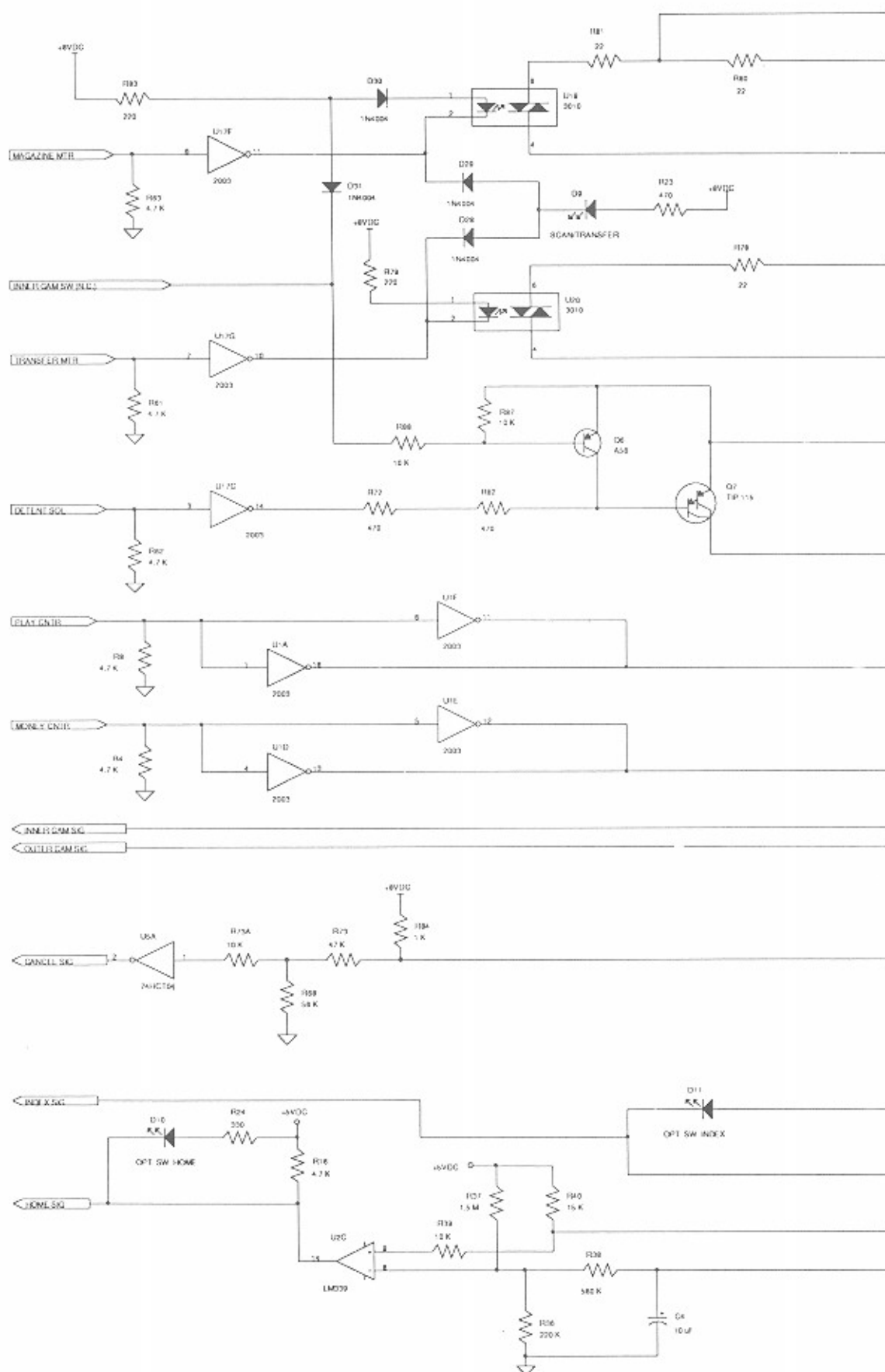


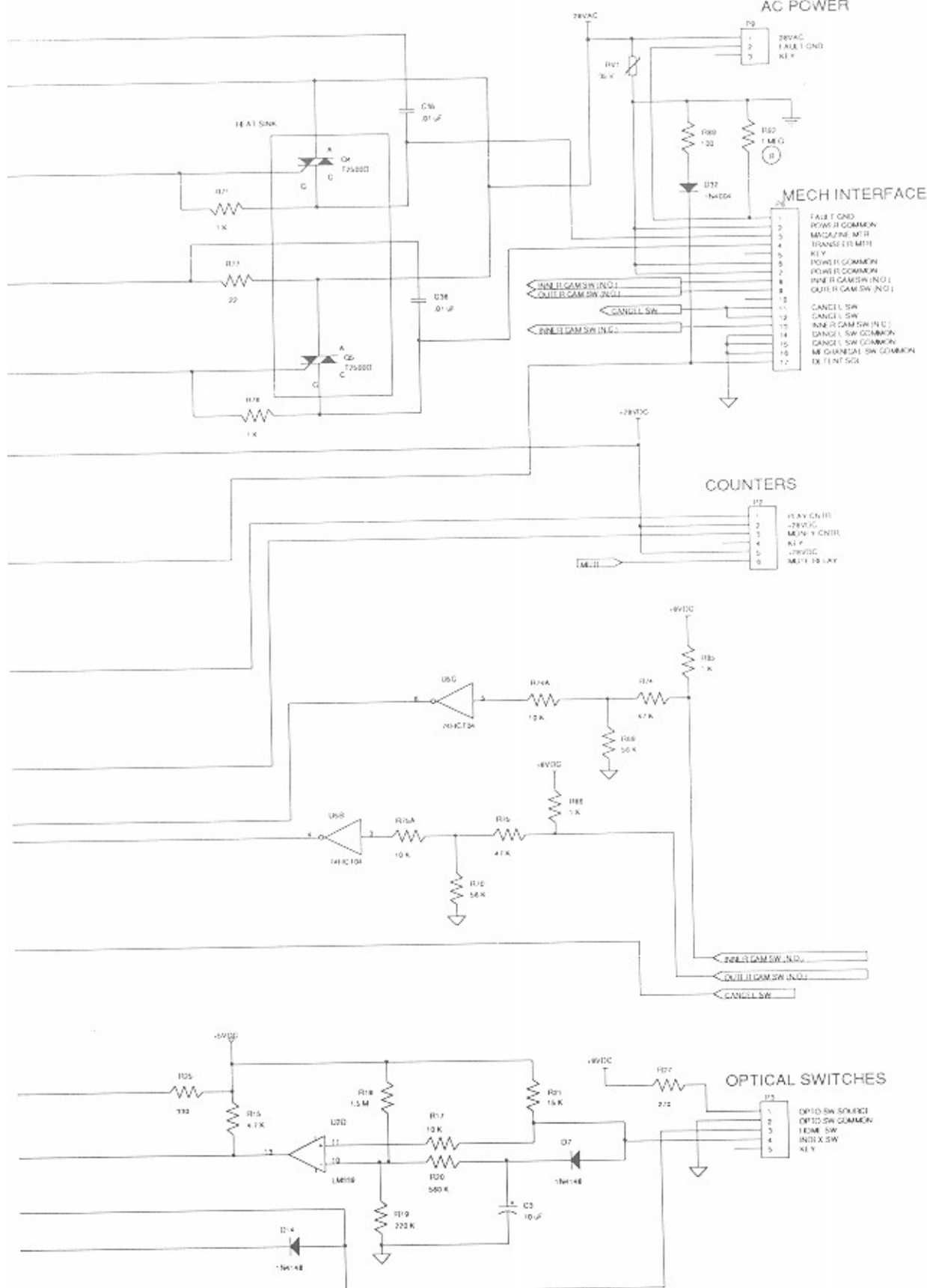
RESET CIRCUIT





For Equivalent Engineering Drawing See 61053401-Q2 C
 Figure 5-13B. Mechanism Control Assembly Schematic, Sheet 2





For Equivalent Engineering Drawing See 61053401-Q2 C
 Figure 5-13B. Mechanism Control Assembly Schematic, Sheet 3

CD-51A Mech. Controller IC Power And Common Pin Chart

Ref.	Generic Part #	Power		Common	
		+5 VDC	+28 VDC	Logic	Power
U1	ULN2003	—	9	8	—
U2	LM3302	—	—	—	—
U3	74HCT151	16	—	8	—
U4	74HCT151	16	—	8	—
U5	74HCT373	14	—	7	—
U6	63A03R	7	—	1	—
U7	27256	28	—	14	—
U8	74HCT04	20	—	10	—
U9	74HCT00	14	—	7	—
U10	74HCT04	14	—	7	—
U11	62564	28	—	14	—
U12	74HCT138	16	—	8	—
U13	74HCT00	14	—	7	—
U14	74HCT104	14	—	7	—
U15	88C168	28	—	14	—
U16	74LS374	20	—	10	—
U17	ULN2003	—	—	8	—

For Equivalent Engineering Drawing See 61030603-Q2 B

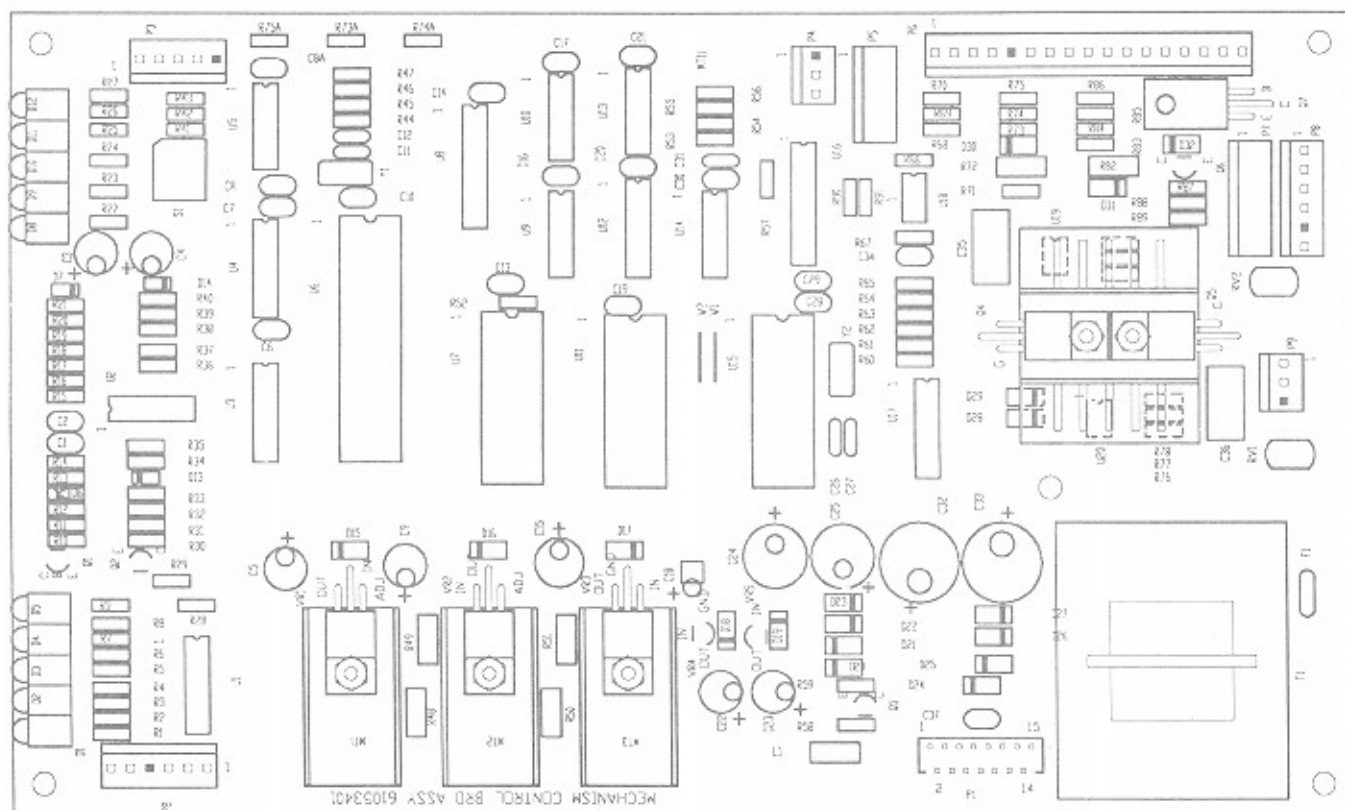


Figure 5-13C. Mechanism Control Assembly Circuit Board Layout 61053401-C

COMPONENT LIST FOR MECHANISM CONTROL BOARD (61053401-E)

C1	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C2	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C3	Capacitor - Electrolytic 50 VDC 20%	10 μ f	70028105
C4	Capacitor - Electrolytic 50 VDC 20%	10 μ f	70028105
C5	Capacitor - Electrolytic 35 VDC 20%	47 μ f	70028109
C6	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C7	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C8	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C8A	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C9	Capacitor - Electrolytic 35 VDC 20%	47 μ f	70028109
C10	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C11	Capacitor - Monolythic Ceramic 10%	22 pf	70028705
C12	Capacitor - Monolythic Ceramic 10%	22 pf	70028705
C13	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C14	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C15	Capacitor - Electrolytic 16 VDC 20%	100 μ f	70028111
C16	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C17	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C18	Capacitor - Tantalum 35 VDC 20%	.33 μ f	70025119
C19	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C20	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C21	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C22	Capacitor - Electrolytic 50 VDC 20%	22 μ f	70028107
C23	Capacitor - Electrolytic 50 VDC 20%	22 μ f	70028107
C24	Capacitor - Electrolytic 35 VDC 20%	330 μ f	70028114
C25	Capacitor - Electrolytic 35 VDC 20%	330 μ f	70028114
C26	Capacitor - Monolythic Ceramic 10%	22 pf	70028705
C27	Capacitor - Monolythic Ceramic 10%	22 pf	70028705
C28	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C29	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C30	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C31	NOT USED		
C32	Capacitor - Electrolytic 35 VDC 20%	2200 μ f	70028116
C33	Capacitor - Electrolytic 35 VDC 20%	2200 μ f	70028116
C34	Capacitor - Monolythic Ceramic	.1 μ f	70028511
C35	Capacitor - Film 400 VDC 20%	.01 μ f	70024013
C36	Capacitor - Film 400 VDC 20%	.01 μ f	70024013
C37	Capacitor - Monolythic Ceramic	.1 μ f	70028511
D1	Diode - Light Emitting Red Diffused		70035201
D2	Diode - Light Emitting Red Diffused		70035201
D3	Diode - Light Emitting Red Diffused		70035201
D4	Diode - Light Emitting Red Diffused		70035201
D5	Diode - Light Emitting 90 Degree		70035201
D6	Diode - Zener 5.1V ($\frac{1}{2}$ w, 5%)	1N5231B	70035526
D7	Diode - Silicon	1N4148	70035007
D8	Diode - Light Emitting 90 Degree		70035201
D9	Diode - Light Emitting 90 Degree		70035201
D10	Diode - Light Emitting 90 Degree		70035201
D11	Diode - Light Emitting 90 Degree		70035201
D12	Diode - Light Emitting 90 Degree		70035201
D13	Diode - Silicon	1N4148	70035007
D14	Diode - Silicon	1N4148	70035007
D15	Diode - Silicon	1N4004	70035005

D16	Diode - Silicon	1N4004	70035005
D17	Diode - Silicon	1N4004	70035005
D18	Diode - Silicon	1N4004	70035005
D19	Diode - Silicon	1N4004	70035005
D20	Diode - Silicon	1N4004	70035005
D21	Diode - Silicon	1N4004	70035005
D22	Diode - Silicon	1N4004	70035005
D23	Diode - Silicon	1N4004	70035005
D24	Diode - Silicon	1N4004	70035005
D25	Diode - Silicon	1N4004	70035005
D26	Diode - Silicon	1N4004	70035005
D27	Diode - Silicon	1N4004	70035005
D28	Diode - Silicon	1N4004	70035005
D29	Diode - Silicon	1N4004	70035005
D30	Diode - Silicon	1N4004	70035005
D31	Diode - Silicon	1N4004	70035005
D32	Diode - Silicon	1N4004	70035005
F1	Resistor - PTC		70072501
L1	Inductor - RF	5.6 μ H	70041503
P1	Connector - Ribbon Cable 1.5 mm		21640901
P2	Header - Polarized .156 6 Position		70075006
P3	Header - Polarized .156 5 Position		70075005
P4	Header - Polarized .156 3 Position		70075003
P5	NOT USED		
P6	Header - Polarized .156 17 Position		70075017
P7	NOT USED		
P8	Header - Polarized .156 6 Position		70075006
P9	Header - Polarized .156 3 Position		70075003
Q1	Transistor - Silicon PNP	MPSA56	70030104
Q2	Transistor - Silicon NPN	MPSA06	70030008
Q3	Transistor - Silicon NPN	MPSA06	70030008
Q4	Thyristor Triac	T2500D	70038102
Q5	Thyristor Triac	T2500D	70038102
Q6	Transistor - Silicon PNP	MPSA56	70030104
Q7	Transistor - Silicon Darlington	TIP115	70030805

Note: All resistors are 1/4 watt 5%, unless otherwise noted.

R1	Resistor	1 K	79901102
R2	Resistor	1 K	79901102
R3	Resistor	10 K	79901103
R4	Resistor	4.7 K	79901472
R5	Resistor	1 K	79901102
R6	Resistor	4.7 K	79901472
R7	Resistor	1 K	79901102
R8	Resistor	4.7 K	79901472
R9	Resistor	1 K	79901102
R10	Resistor	10 K	79901103

COMPONENT LIST FOR MECHANISM CONTROL BOARD

R11	Resistor	150 Ω	79901151
R12	Resistor	100 Ω	79901101
R13	Resistor	1 K	79901102
R14	Resistor	220 K	79901224
R15	Resistor	4.7 K	79901472
R16	Resistor	4.7 K	79901472
R17	Resistor	10 K	79901103
R18	Resistor	1.5 M	79901155
R19	Resistor	220 K	79901224
R20	Resistor	560 K	79901564
R21	Resistor	15 K	79901153
R22	Resistor	470 Ω	79901471
R23	Resistor	470 Ω	79901471
R24	Resistor	330 Ω	79901331
R25	Resistor	330 Ω	79901331
R26	Resistor	270 Ω	79901271
R27	Resistor	270 Ω	79901271
R28	Resistor	220 Ω	79901221
R29	Resistor	330 Ω	79901331
R30	Resistor - Carbon Film	10 K (1/4W, 2%)	79902103
R31	Resistor - Carbon Film	10 K (1/4W, 2%)	79902103
R32	Resistor - Carbon Film	10 K (1/4W, 2%)	79902103
R33	Resistor - Carbon Film	5.6 K (1/4W, 2%)	79902562
R34	Resistor	470 K	79901474
R35	Resistor	100 K	79901104
R36	Resistor	220 K	79901224
R37	Resistor	1.5 M	79901155
R38	Resistor	560 K	79901564
R39	Resistor	10 K	79901103
R40	Resistor	15 K	79901153
R41	Resistor	10 K	79901103
R42	Resistor	10 K	79901103
R43	Resistor	10 K	79901103
R44	Resistor	3.3 K	79901332
R45	Resistor	4.7 K	79901472
R46	Resistor	3.3 K	79901332
R47	Resistor	3.3 K	79901332
R48	Resistor - Metal Film	120 Ω (1/2W, 5%)	79904121
R49	Resistor - Metal Film	820 Ω (1/2W, 5%)	79904821
R50	Resistor - Metal Film	820 Ω (1/2W, 5%)	79904821
R51	Resistor - Metal Film	120 Ω (1/2W, 5%)	79904121
R52	Resistor	4.7 K	79901472
R53	Resistor	470 K	79901474
R54	NOT USED		
R55	Resistor	100 Ω	79901101
R56	Resistor	10 K	79901103
R57	Resistor	1 K	79901102
R58	Resistor	47 K	79901473
R59	Resistor	4.7 K	79901472
R60	Resistor	1 K	79901102
R61	Resistor	4.7 K	79901472
R62	Resistor	4.7 K	79901472
R63	Resistor	4.7 K	79901472
R64	Resistor	4.7 K	79901472
R65	Resistor	10 K	79901103

R66	Resistor	4.7 K	79901472
R67	Resistor	10 K	79901103
R68	Resistor	56 K	79901563
R69	Resistor	56 K	79901563
R70	Resistor	56 K	79901563
R71	Resistor	1 K	79901102
R72	Resistor - Metal Film	470 Ω ($\frac{1}{2}w$, 5%)	79904471
R73	Resistor	47 K	79901473
R73A	Resistor	10 K	79901103
R74	Resistor	47 K	79901473
R74A	Resistor	10 K	79901103
R75	Resistor	47 K	79901473
R75A	Resistor	10 K	79901103
R76	Resistor	1 K	79901102
R77	Resistor	22 Ω	79901220
R78	Resistor	22 Ω	79901220
R79	Resistor	220 Ω	79901221
R80	Resistor	22 Ω	79901220
R81	Resistor	22 Ω	79901220
R82	Resistor - Metal Film	470 Ω ($\frac{1}{2}w$, 5%)	79904471
R83	Resistor	220 Ω	79901221
R84	Resistor	1 K	79901102
R85	Resistor	1 K	79901102
R86	Resistor	1 K	79901102
R87	Resistor	10 K	79901103
R88	Resistor	10 K	79901103
R89	Resistor	100 Ω	79901101
R90	Resistor	100 Ω	79901101
R91	Resistor	100 Ω	79901101
R92	Resistor	1 Meg	79901105
RV1	Metal Oxide Varistor 45 VDC		70037506
RV2	Metal Oxide Varistor 14 VDC		70037505
S1	NOT USED		
T1	Transformer		40827201
U1	I.C. - Darlington Array	(ULN2003)	70036901
U2	I.C. - Quad Comparator	(LM3302)	70036801
U3	I.C. - 1 Of 8 Multiplexer	(74HCT151)	79930151
U4	I.C. - 1 Of 8 Multiplexer	(74HCT151)	79930151
U5	I.C. - Hex Inverter	(74HCT04)	79930004
U6	I.C. - Microprocessor	(63A03R)	70039125
		(6803P-1)	70039128
U7	I.C. - 32K X 8 EPROM (CD100 MECH V3.0)	(27256)	70038322
U8	I.C. - Octal Transparent Latch	(74HCT373)	79930373
U9	I.C. - Quad 2 Input NAND Gate	(74HCT00)	79930000
U10	I.C. - Hex Inverter	(74HCT04)	79930004
U11	I.C. - 8K X 8 CMOS RAM		70036604
U12	I.C. - 1 Of 8 Decoder	(74HCT138)	79930138
U13	I.C. - Quad 2 Input NAND Gate	(74HCT00)	79930000
U14	I.C. - Hex Inverter	(74HCT04)	79930004
U15	I.C. - Dual USART	(88C168)	30800255
U16	I.C. - Octal Edge-triggered Flip Flop	(74LS374)	70037111
U17	I.C. - Darlington Array	(ULN2003)	70036901

COMPONENT LIST FOR MECHANISM CONTROL BOARD

U18	I.C. - Transceiver RS-485	(75176)	70037801
U19	Photocoupler Opto-triac	(3010)	70033703
U20	Photocoupler Opto-triac	(3010)	70033703
VR1	I.C. - Voltage Regulator Adjustable	(LM337T)	70036508
VR2	I.C. - Voltage Regulator Adjustable	(LM317T)	70036507
VR3	I.C. - Voltage Regulator + 5V	(LM340T5)	70036505
VR4	I.C. - Voltage Regulator -12V	(LM79L12)	70036517
VR5	I.C. - Voltage Regulator +12V	(LM78L12)	70036516
W1	Wire - Bare		00503200
W2	NOT USED		
Y1	Crystal - Quartz 4.9152 MHz		25167313
Y2	Crystal - Quartz 4.000 MHz		25167306

Section 6: Mechanical Adjustments

LUBRICATION

Your phonograph mechanism requires no lubrication.

UNSCHEDULED MAINTENANCE

This section contains adjustments, removal, and replacement procedures that are to be followed whenever a malfunction has occurred.

MECHANISM MAINTENANCE AND ADJUSTMENTS



CAUTION:

The CD mechanism is extremely sensitive to static discharges. The photo diodes and the laser are more sensitive to discharges than MOS IC's. Careless handling may immediately destroy components within the player or cause undetectable damage that will lead to failure after several weeks or even months of use. Before you touch the player, discharge your hands and tools by touching a grounded metal part of the phonograph, such as the amplifier or power supply chassis. If you need to remove the CD player for servicing, place the CD player into the anti-static bag (shipped with the phonograph for this purpose) immediately after you remove it from the phonograph.

CD Player Mechanism

The only maintenance required on the CD player is an occasional cleaning of the lens. If you need to clean the CD player lens, be sure to follow the lens cleaning procedure that follows.

Cleaning The Laser Lens



NOTE:

Before you clean the laser lens, be sure to turn the jukebox power OFF and ground yourself by touching a grounded component (such as the lower door) to discharge any static buildup that may harm the CDM-4 player.

1. Remove loose particles from the lens by gently brushing it with a camel's hair brush or a blow brush (both items can be purchased at most camera supply stores). Take care not to snag brush bristles under the lens. The lens is mounted on a delicate suspension spring that may be damaged with even a soft brush.
2. Remove any remaining dirt by placing one to three drops of Kodak Lens Cleaner (Kodak Catalog Number 176 7136, available from photographic supply stores or Rowe Part Number 21966601) on a lint-free "Q"-Tip and very gently wiping dust and smoke deposits from the lens. Take care not to damage the delicate lens suspension spring. Do not allow any of the lens cleaner to run down the side of the lens.

CD Player Maintenance

The CD player does not require any adjustments or field replaceable parts. Individual parts and components are not available for distributor or field repairs. All CD players that require repair must be sent to Rowe for service.

Removing Mechanism Control Unit

If you have followed the troubleshooting procedure in *Section 5*, and you have found the mechanism control unit needs to be removed for factory service, follow this procedure:

1. Turn the POWER switch (on the back of the phonograph) OFF, or place the POWER switch (on the left side of the phonograph) in the OFF position.
2. Remove all connectors from the mechanism control unit (including the two attached to the player), loosen the mechanism control unit mounting screw (*figure 6-1*), and remove the mechanism control unit.

Removing The CD Player

1. Read the following Caution before you remove the CD player:



CAUTION:

The CD mechanism is extremely sensitive to static discharges. The photo diodes and the laser are more sensitive to discharges than MOS IC's. Careless handling may immediately destroy components within the player or cause undetectable damage that will lead to failure after several weeks or even months of use. Before you touch the player, discharge your hands and tools by touching a grounded metal part of the phonograph, such as the amplifier or power supply chassis. If you need to remove the CD player for servicing, place the CD player into the anti-static bag (shipped with the phonograph for this purpose) immediately after you remove it from the phonograph.

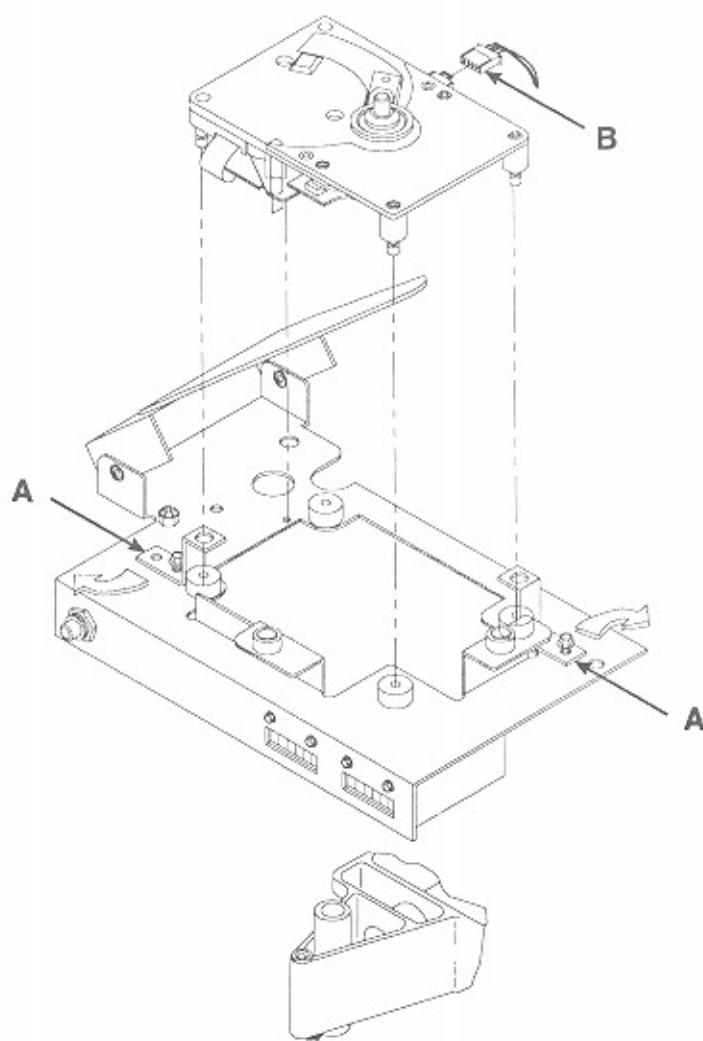


Figure 6-2A. Removing The CD Player

2. Refer to *figure 6-2A* as you do this step. To remove the player, loosen the screws holding the two retaining brackets (A) in place, swing the brackets out of the way, and lift the player straight up (If any of the four grommets from the player posts remain attached to the player, remove them from the player posts and place them in corresponding hole in the mounting frame).
3. Refer to *figure 6-2A* as you do this step. If not previously done, disconnect the small player electrical plug (B).
4. Refer to *figure 6-2B*. Remove the main CD harness, which is on the bottom of the CD player as follows:
 - A. Pull the locking tab away from the plug body and hold it away from the plug body.
 - B. Pull the plug out of the socket while you continue to hold the tab away from the plug body.
5. Immediately place the CD player into the anti-static bag (supplied with the phonograph) and return the CD player to your distributor.
6. To replace the CD player, reverse the previous steps. Make sure that the four grommets are in place in the holes in the mounting plate before pushing the player posts into the grommets. When you have properly positioned the CD player, make sure that all grommets are seated and that the CD player sets level in the mechanism frame.

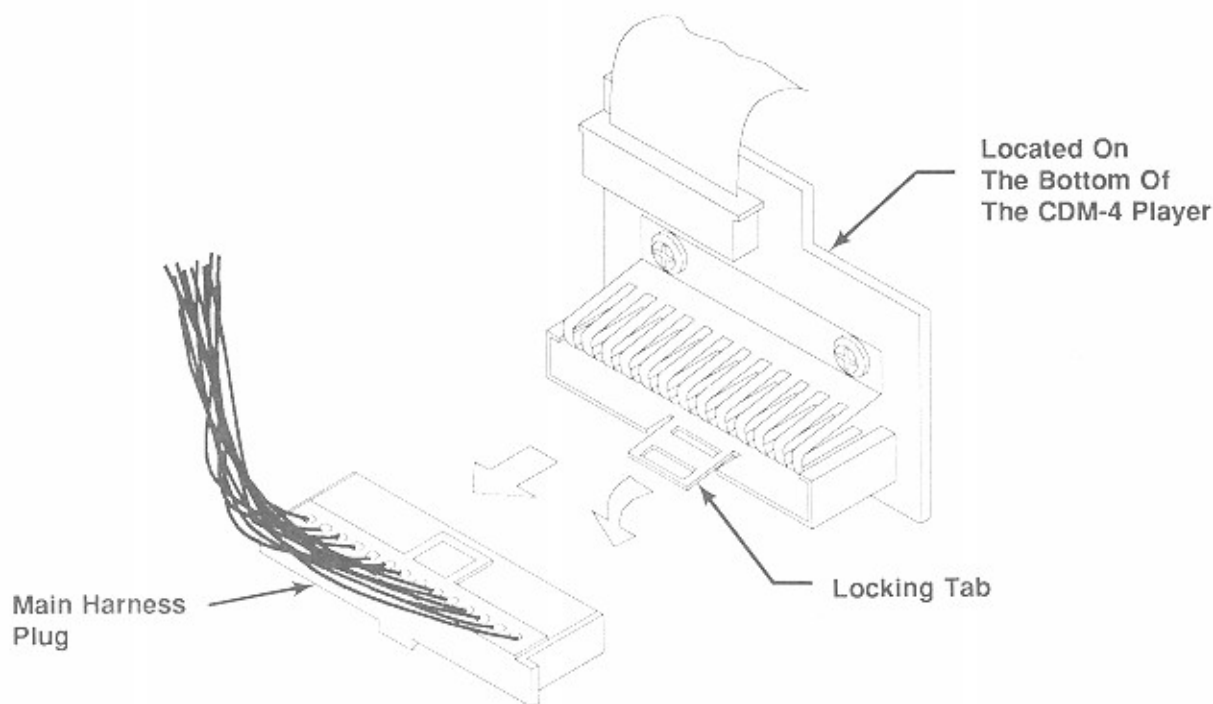


Figure 6-2B. Disconnecting The Main CD Player Harness

Hold Down Assembly And Hold Down Plate Height

SERVICE CHECK

With the gripper bow in the play position and the disc on the turntable (the outer cam switch is actuated), the aluminum hold down plate (figure 6-3) should be $3/32$ to $5/32$ inch ($1/8 \pm 1/32$) under the flange of the magnetic hold down hub.

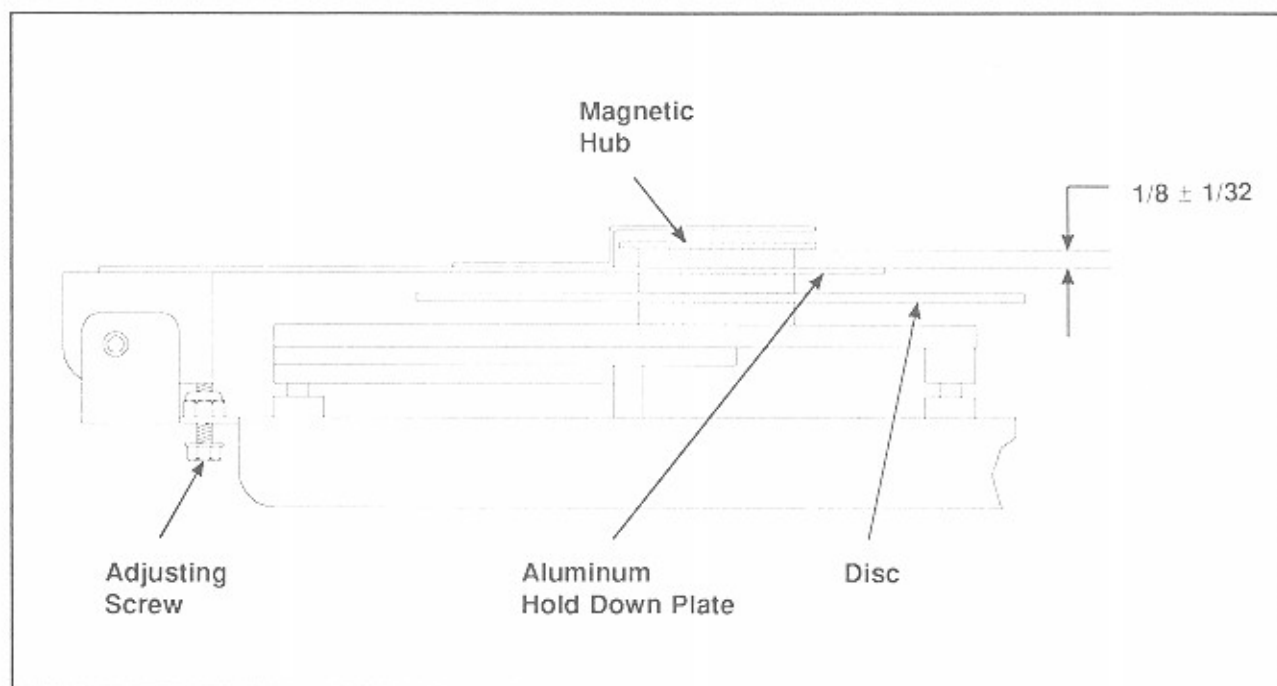


Figure 6-3. Hold Down Plate

ADJUSTMENT

If the hold down plate height is not correct, turn the adjustment screw (figure 6-3) until the $3/32$ to $5/32$ inch ($1/8 \pm 1/32$) height is attained.

HOLD DOWN PLATE CENTERING

Refer to figure 6-4 for this adjustment.

1. With the gripper bow in the PLAY position and the disc on the turntable, loosen the two centering adjustment screws slightly.
2. Look straight down on the turntable hub and rotate the hold down plate until the two "witness" marks are centered around the magnetic hold down hub.
3. Tighten the two centering adjustment screws and recheck the previous adjustments.

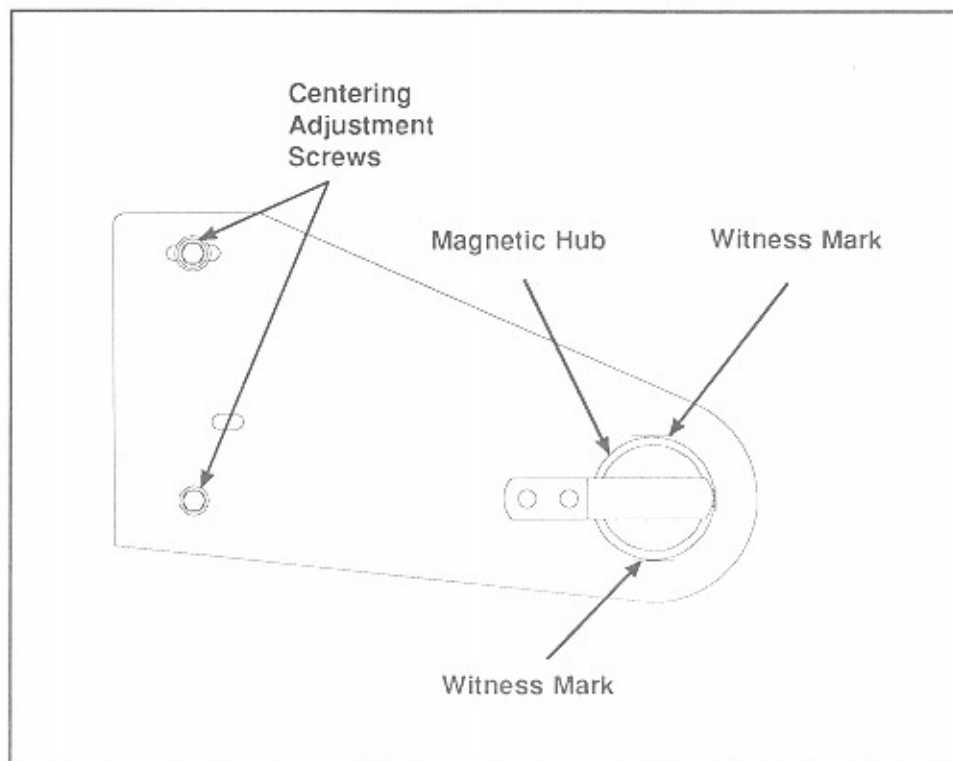


Figure 6-4. Hold Down Plate Centering

Optical Switch Adjustment

1. Push in the detent plunger, so that the magazine can be rotated to Position 99. Engage the detent plunger.
2. Loosen the optical switch bracket mounting screw, turn the adjustment knob counter clockwise to top of its travel, and move the bracket down to the bottom of its travel (*refer to figure 6-5*). Snug the optical switch mounting screw, so that the bracket can move with resistance.
3. With the detent plunger engaged, rotate the magazine counter-clockwise to remove gear backlash and maintain pressure for Steps 4 and 5.
4. Turn the adjustment knob clockwise until both the INDEX and HOME LED's are ON.

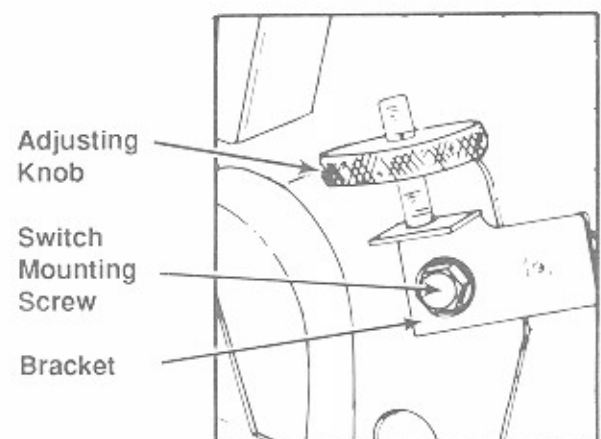


Figure 6-5. Optical Switch Adjustment

5. Continue turning the adjustment knob clockwise until the INDEX LED goes OFF. The HOME LED must remain ON. Then turn the knob one full turn clockwise and tighten the mounting screw. The INDEX LED must be OFF and the HOME LED can be ON or OFF.
6. Push in the detent plunger and rotate the magazine to Position 06.
7. With the detent plunger engaged, rotate the magazine in both directions as far as you can by hand (taking up the gear backlash in both directions). The INDEX and HOME LED's will remain OFF when properly adjusted.
8. Push in the detent plunger and rotate the magazine to Positions 56, 07, and 57. Repeat Step 7 at each position.

Sprag Assembly

ADJUSTMENTS

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



WARNING:

Turn the power OFF before servicing the sprag assembly.

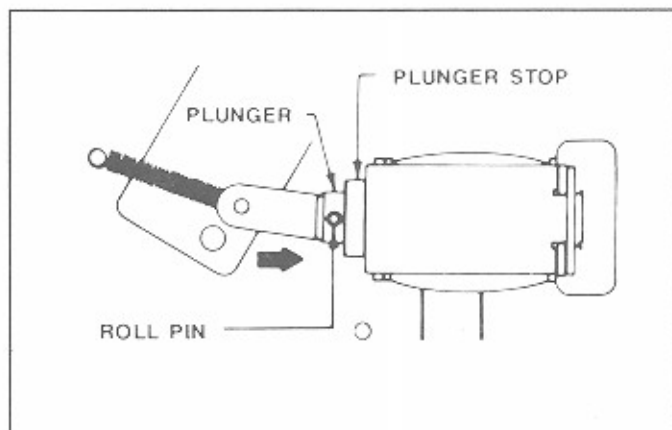


Figure 6-6. Sprag Assembly (Plunger)

1. Refer to figure 6-6. Depress solenoid plunger until the roll pin bottoms on the plunger stop (actuate by pressing on plunger).
2. Rotate the disc magazine and note the clearance between the sprag lever and the sprag wheel located on the backside of the sprag plate assembly.

The sprag lever must not touch the sprag wheel and the clearance must be .015 to .025 inches (see figure 6-7). It will be necessary to remove the sprag assembly if corrections are required.

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 6-8).
2. Loosen the solenoid mounting screws (see figure 6-9) and with the roll pin against the plunger stop, position the solenoid so that there is a .015 to .025-inch gap between the sprag lever and the highest point on the sprag wheel (see figure 6-7).
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.
5. After you have replaced the sprag assembly, perform the *Aligning Magazine Stopping Position With The Gripper Bow* procedure in this section.
6. To adjust the optical switch, refer to *Optical Switch* in this section.

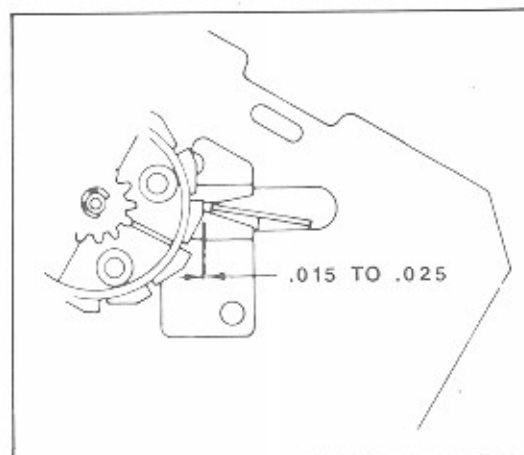


Figure 6-7. Sprag Wheel

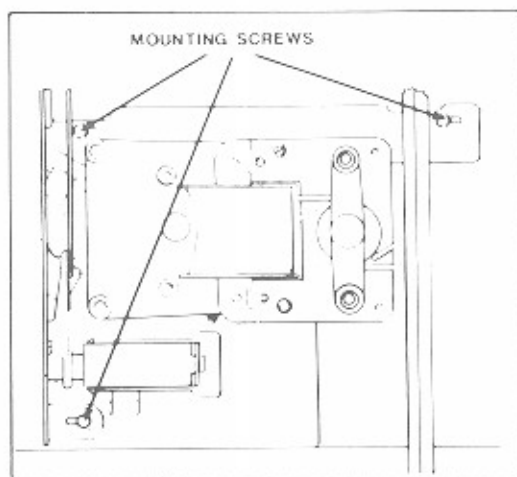


Figure 6-8. Sprag Assembly Removal

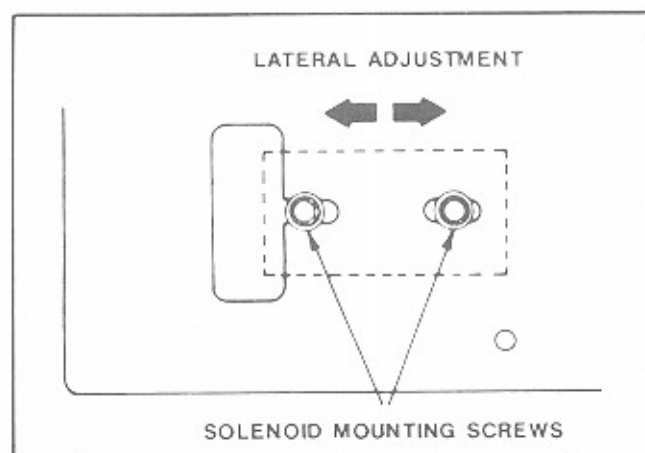


Figure 6-9. Lateral Adjustment

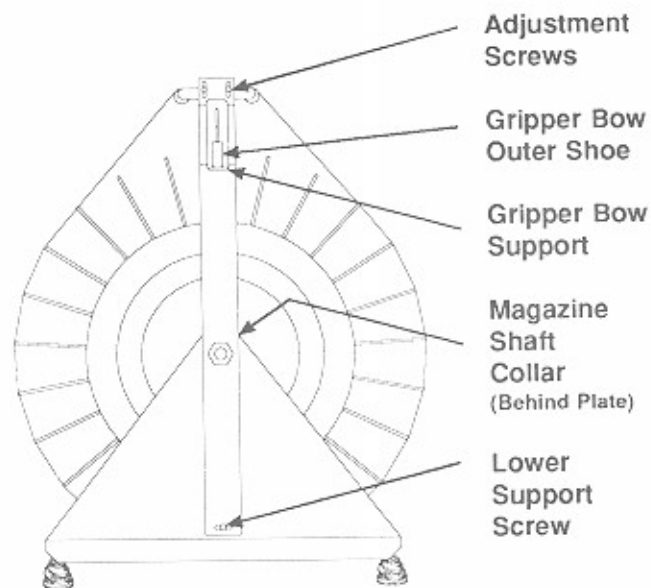


Figure 6-10. Magazine Belt Adjustment

Disc Magazine And Gripper Bow Support

See *figure 6-10* for this adjustment.

ADJUSTMENT

To eliminate magazine end play and to adjust the gripper bow 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 lower screw that holds the gripper bow support to the mechanism frame.
3. Adjust the gripper bow support so that the gripper bow outer shoe is centered in the opening.
4. Tighten the support to the frame with the lower screw.

Magazine Belt Adjustment

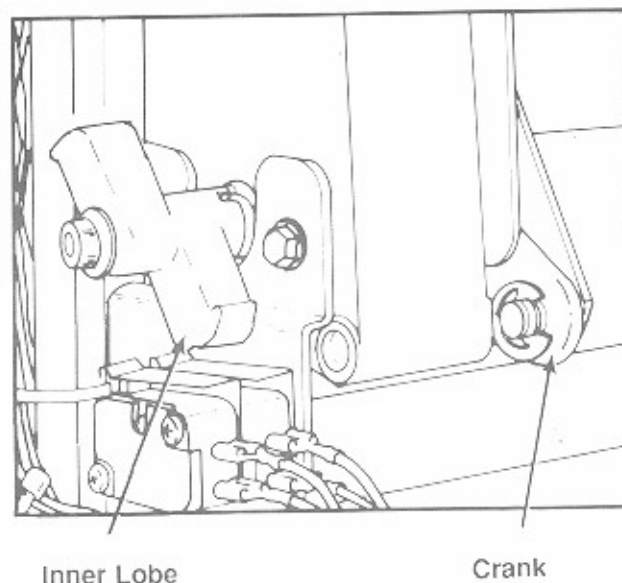
1. Loosen the two adjustment screws shown in *figure 6-10*.
2. Raise the bracket to tighten the belt around the magazine.
3. Check that belt rides evenly in the center of the belt guides, all the way around the magazine.
4. Tighten the two adjustment screws.

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 6-11).



CAM SWITCH CHECK AND ADJUSTMENT

Figure 6-11. Cam Switch

1. Check that the leaf spring is resting in the cam lobes and that the switch plunger just touches the bottom of the leaf spring as shown in figure 6-12.
2. To adjust the switches, loosen mounting screw under plunger end and move the switch housing as described in the previous step (see figure 6-12).
3. Tighten mounting screw and recheck operation.

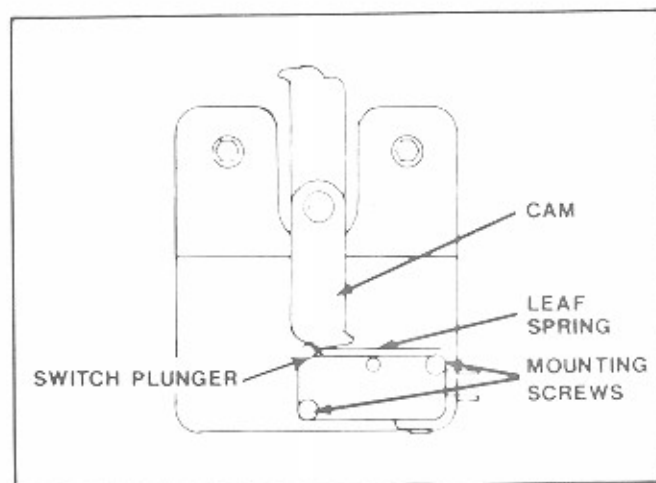


Figure 6-12. Cam Switch Adjustment

Aligning Magazine Stopping Position

With The Gripper Bow

1. Place a disc in any position in the disc magazine and rotate the magazine until this disc 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 starts to lift the disc out of the magazine (*see figure 6-13*).
3. With the disc and gripper bow in this position, rock the magazine to the left and right to make sure the magazine vertical slot is centered relative to the edge of the disc.

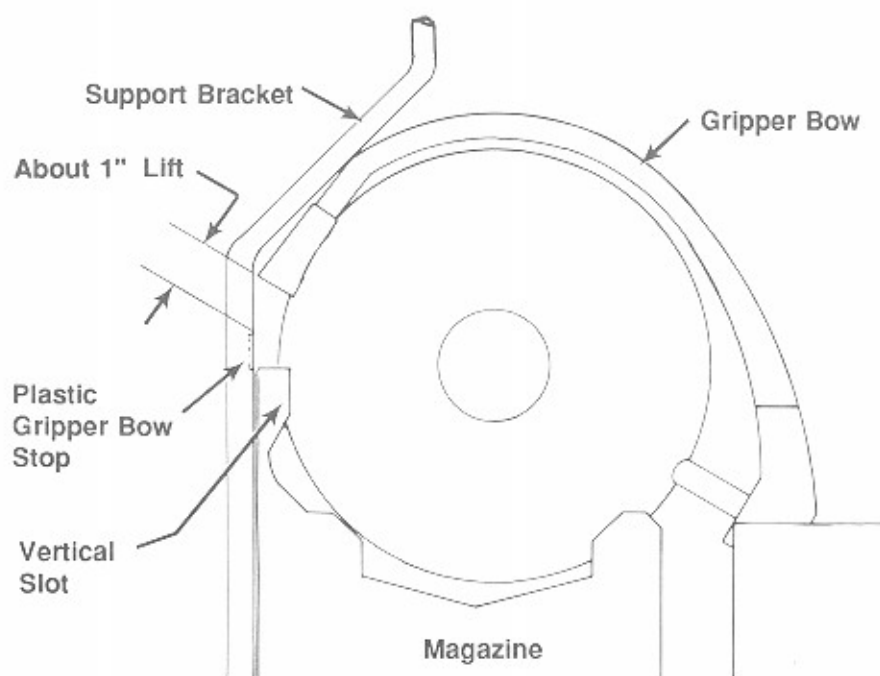


Figure 6-13. Magazine and Gripper Bow Stopping Position

IF ADJUSTMENT IS NECESSARY:

4. Loosen three screws in the magazine motor mounting plate.
5. With sprag wheel locked, move the magazine until the disc is centered in the magazine vertical slot (The adjustment screws will be approximately centered in the slots, *see figure 6-14*).
6. Tighten the three screws in the magazine motor mounting plate securely.
7. Perform the *Optical Switch Adjustment* described earlier in this section.

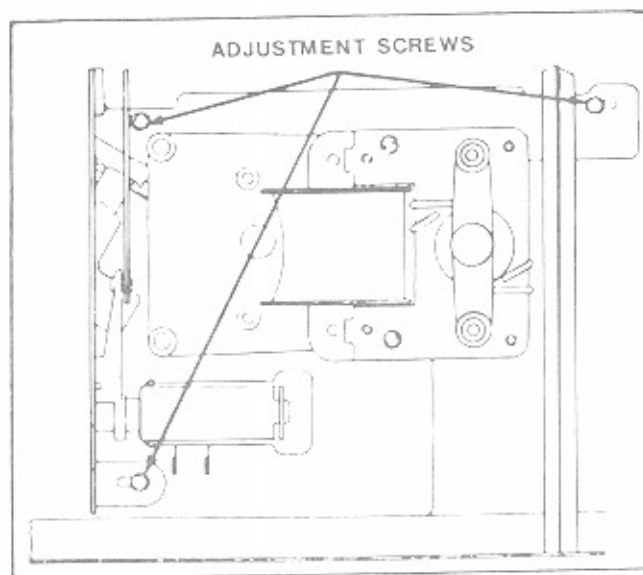


Figure 6-14. Magazine Adjustment

Title Rack Switch Adjustment



WARNING:

Do not attempt to turn the CD title pages by hand unless you use the handwheel on the back of the title rack (see figure 6-2A).

Refer to figure 6-15 for illustration of the title rack adjustment.

1. Open the top door, unplug the title rack from the phonograph, and remove the title rack from the phonograph.
2. Loosen the switch mounting screw and the adjusting screw so that the switch can be rotated.
3. Use the handwheel to move the rack and pinion (and the title rack pages) so that the switch roller is directly over the top of one of the rack lobes. This will cause two of the title rack pages to point approximately straight out.
4. Insert a 0.040-inch feeler gauge between the switch body and the switch actuator arm.
5. Slowly rotate the switch downward until all clearance between the switch and the switch body is removed.
6. Tighten the switch mounting screw and the switch adjustment screw.
7. Turn the handwheel in both directions and verify that the switch clicks before the roller reaches the bottom of the rack (as it rolls "down hill") and before it reaches the top of the rack (as it rolls "up hill"). This distance should be approximately halfway between the peaks and the valleys of the lobes.
9. Re-install the title rack.
10. Perform *Title Page Re-Synchronizing* that follows this step.

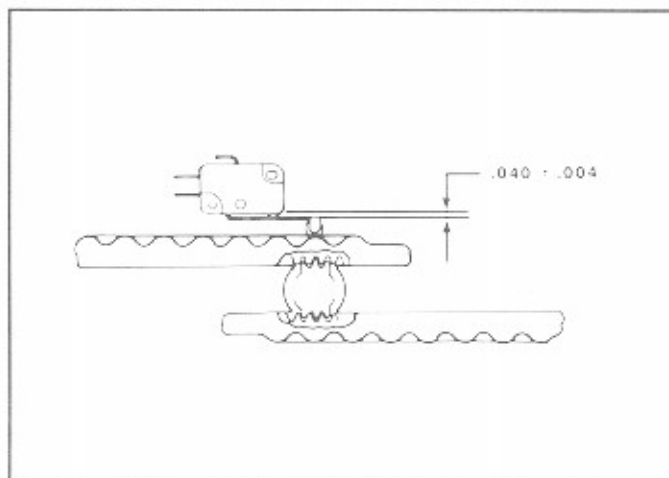


Figure 6-15. Title Rack Switch Adjustment

Title Page Re-Synchronizing

Title page re-synchronizing is necessary whenever power to the phonograph is interrupted or after the title pages have been changed with the handwheel.

1. Press either PAGE CHANGE button repeatedly until the pages no longer change (The pages may not advance as far as you expect them to. This is normal when the pages are being re-synchronized).
2. Press the other PAGE CHANGE button repeatedly until the pages no longer change.

Section 7: Miscellaneous

CD-51A SPECIFICATIONS

General

Depth	26-1/2 in. (67.3 cm.)
Width	41-1/2 in. (105.4 cm.)
Height	59-7/8 in. (151.9 cm.)

Power Requirements	120 VAC 60 Hz., 530 watts 5.3 amps.
	220 VAC 50 Hz., 560 watts 3.3 amps.
	240 VAC 50 Hz., 560 watts 3.0 amps.

CD Player And Changer

Title Rack Capacity	51 CD jackets and title strips
Capacity	100 Digital discs
Disc Size	5-inch or 3-inch

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	65535
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PRICING	See Pricing, Section 2
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Sound System

CD PLAYER

Type	Philips CDM-4 Industrial
Frequency Response	20 to 20,000 Hz.
Channel Separation	90 db @ 1,000 Hz.
Output	1 V (approx. depending on the disc)

POWER AMPLIFIER

250 Watt Stereo	
FTC Rating, 3 Ohm Loads @ .5% THD	250 watts RMS
FTC Rating, 70 V Lines @ .5% THD	126 watts RMS

PREAMPLIFIER

AVC Control Range	40 db
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Tone control is accomplished through LOW, MID, and HI controls

SELECTION SYSTEM CAPACITY	100 discs with a 99 max. selections per disc
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TRANSFORMER PACKAGE

Power Levels For Phonograph Speakers	1, 4, 16, 64 watts
(Provides 70-volt line for extension speakers)	

SPEAKER SYSTEM

	Woofer	Midrange	High Freq.
Speaker Diameter	8 in.	5 in.	3 in.
Voice Coil Diameter	1-1/2 in.	1 in.	NA
Impedance	8 Ohms	8 Ohms	NA

SYSTEM FREQUENCY RESPONSE	20 to 20,000 \pm 4 db
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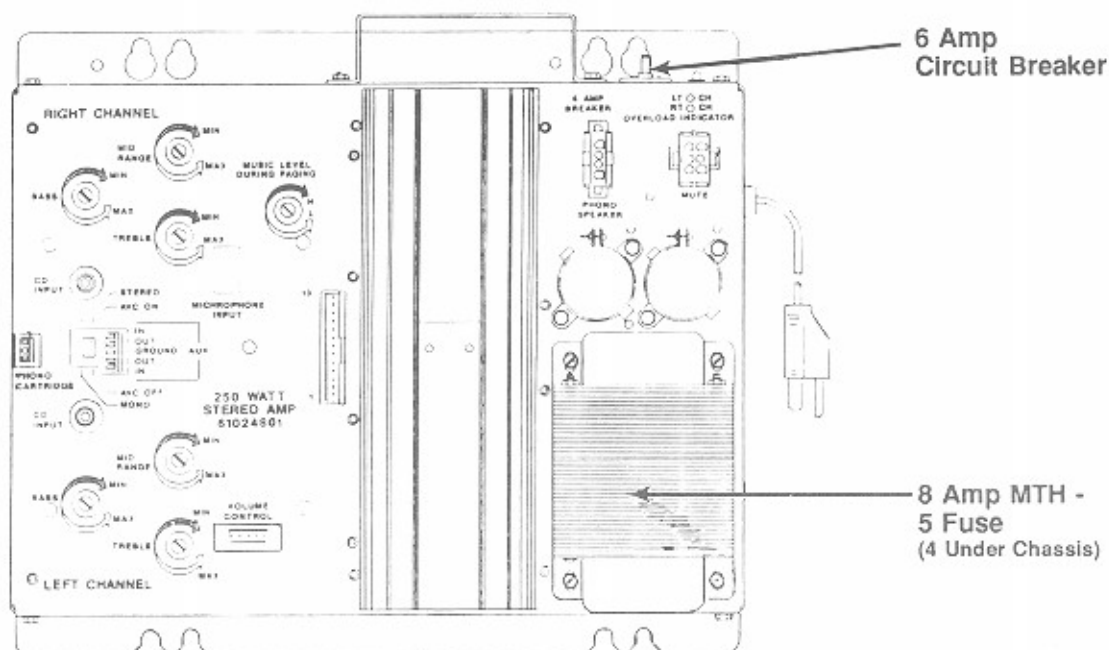
Door Lighting	Fluorescent
	15-watt, 18 in. (Qty. 1)
	18-watt, 30 in. (Qty. 1)
	14-volt incandescent (Qty 8)

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
+8 VDC	5 amp. Slo-Blo fuse

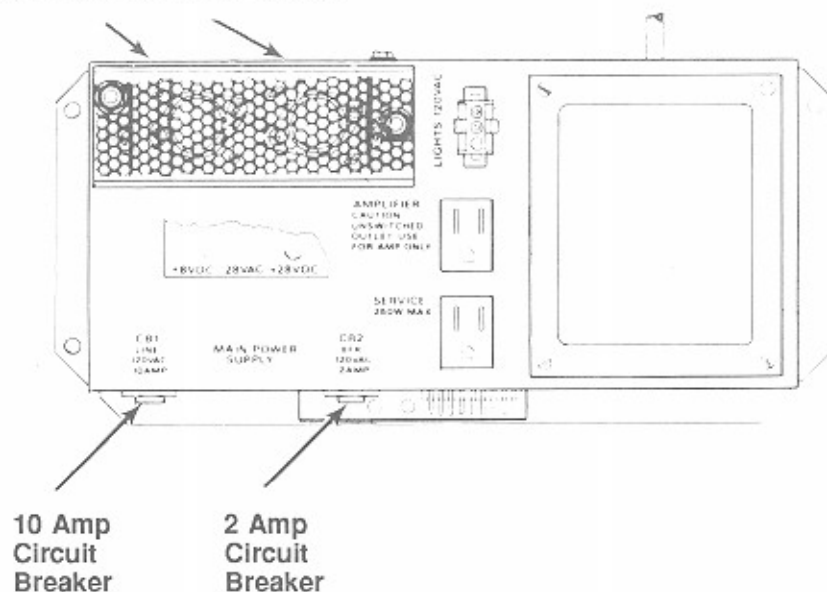
Amplifier

120 VAC	6 amp. circuit breaker
32 VDC	8 amp. fuse (4)



250 WATT AMPLIFIER

Two 5 Amp AGC Fuses
(Mounted on Power Supply Circuit Board)



MAIN POWER SUPPLY

Figure 7-1. Fuse and Circuit Breaker Locations

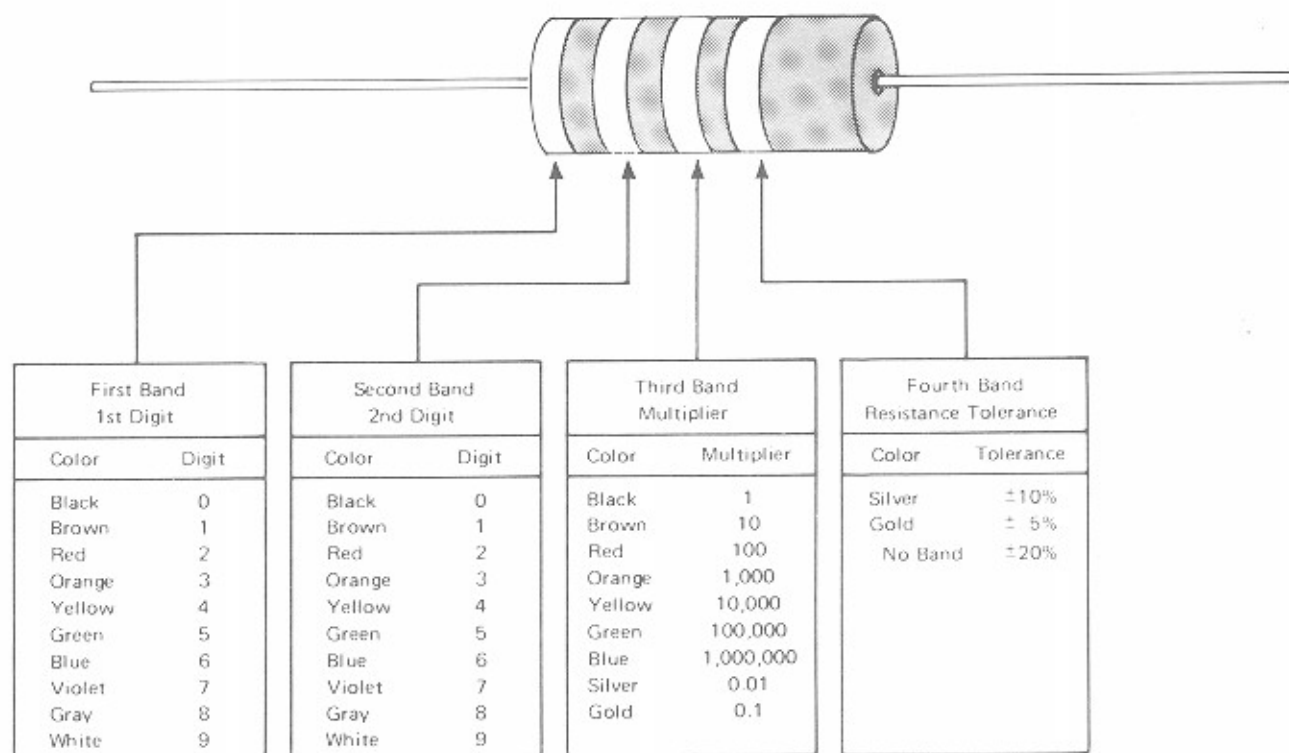


Figure 7-2. Resistor Color Code

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 47×100 , 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.

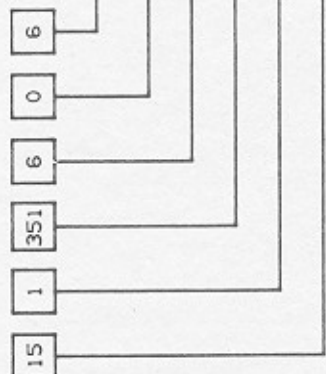
Section 8: Parts Catalog

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COUNTRY 1st & 2nd DIGIT		PACK 3rd DIGIT	CD-51 SUB-ASSEMBLY 4th & 5th & 6th DIGIT	AMPLIFIER 7th DIGIT	BILL ACCEPTOR 8th DIGIT
01 = US	6-10546-01	1 = DomPack = 2-19506-02	350 = Brown (60HZ) = 6-10545-01 351 = Brown (50HZ) = 6-10545-02	0 = None 1 = 61024902 (250 W AMP) 2 = 3-06322-09 Remote Volume Cont. Assy 3 = 3-06322-09 Remote Volume Control 4 = 250W Amp. 5 = 6-10248-01 6 = 250W Amp. 7 = 6-10248-01 with 3-06322-09 Remote Volume Control	0 = None 1 = 2 = 3 = 4 = 5 = OBA 2-19411-02 W/Stacker 6 = 7 =
02 = Arg	6-10546-02				
03 = Australia	6-10546-03				
04 = Aus	6-10546-04				
05 = Bah	6-10546-05				
06 = Belg	6-10546-06				
07 = Canada	6-10546-07				
08 = Chili	6-10546-08				
09 = Col	6-10546-09				
10 = Costa R	6-10546-10				
11 = Neut. Stk	6-10546-11				
12 = Denmark	6-10546-12				
13 = Ecuador	6-10546-13				
14 = El Sal	6-10546-14				
15 = England	6-10546-15				
16 = Finland	6-10546-16				
17 = France	6-10546-17				
18 = Germany	6-10546-18				
19 = Guat	6-10546-19				
20 = Holland	6-10546-20				
21 = Hon	6-10546-21				
22 = Italy	6-10546-22				
23 = Belize	6-10546-23				
24 = Japan	6-10546-24				
25 = Mexico	6-10546-25				
26 = Nic	6-10546-26				
27 = Norway	6-10546-27				
28 = Aruba	6-10546-28				
29 = Panama	6-10546-29				
30 = Curaco	6-10546-30				
31 = Spain	6-10546-31				
32 = Sweden	6-10546-32				
33 = Swiss Fr	6-10546-33				
34 = Swiss Ge	6-10546-34				
35 = Swiss It	6-10546-35				
36 = Trinidad	6-10546-36				
37 = Eng Video	6-10546-37				
38 = Venez	6-10546-38				
39 = Zambia	6-10546-39				
40 = Puerto R	6-10546-40				
41 = Guyana	6-10546-41				
42 = Brazil	6-10546-42				
43 = Barbados	6-10546-43				
44 = Surinam	6-10546-44				
45 = Yugo	6-10546-45				
46 = S. Africa	6-10546-46				
47 = US (220V)	6-10546-47				
48 = US (240V)	6-10546-48				
49 = Singapore	6-10546-49				
50 = Israel	6-10546-50				
51 =	6-10546-51				

SAMPLE:

SUB-ASSEMBLY CATEGORY	
001-049	R-93
050-099	CD-100
100-149	R-94
150-199	CD-51
350-399	CD-51A



Requires 4-0

CD-51A Codes

Revision C

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** — This column contains the part quantity used in the assembly. When a figure describes more than one model of an assembly, the "Qty" 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 8-1. CD-51A Phonograph External View

Sheet 1

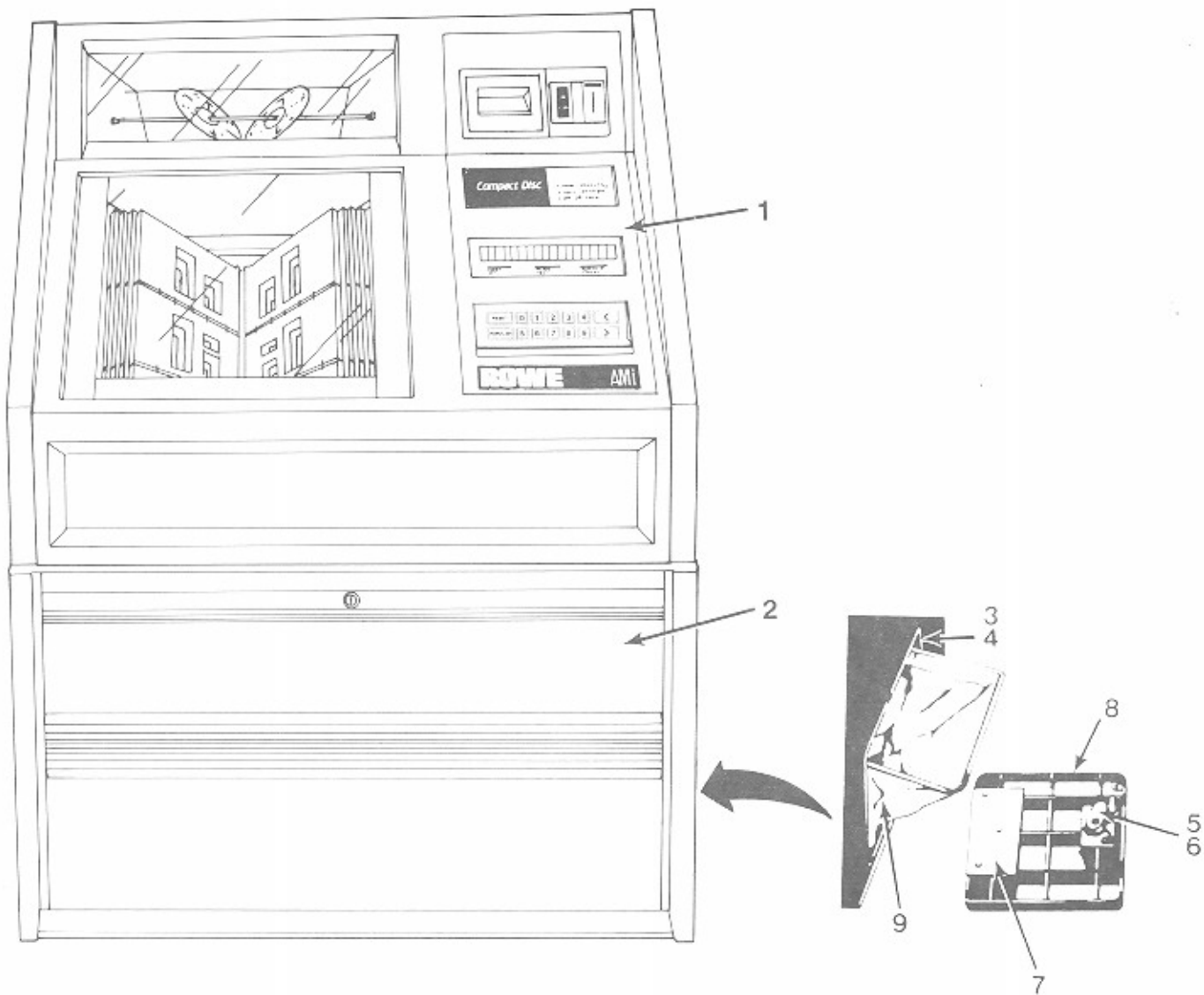


Figure 8-1 CD-51A Phonograph External View (Sheet 1)

Ref.	Part No.	Description	Qty
1	61051003	Top Door Assembly (see figure 8-2)	1
2	61052003	Front Door Assembly (see figure 8-3)	1
3	40527605	• Cash Box Door Frame	1
4	21776005	• "U" Type Speed Clip	1
5	21186605	• Cash Box Door Assembly	1
6	70162004	• Cylinder Lock	1
7	20669501	• Lock Support	1
8	20770301	• Catch Bracket	1
9	60326705	• Cash Box Door	1
10	30702601	• Cash Bag	1
11	70212507	• Felt Adhesive Tape	1

Figure 8-1. CD-51A Phonograph External View
Sheet 2

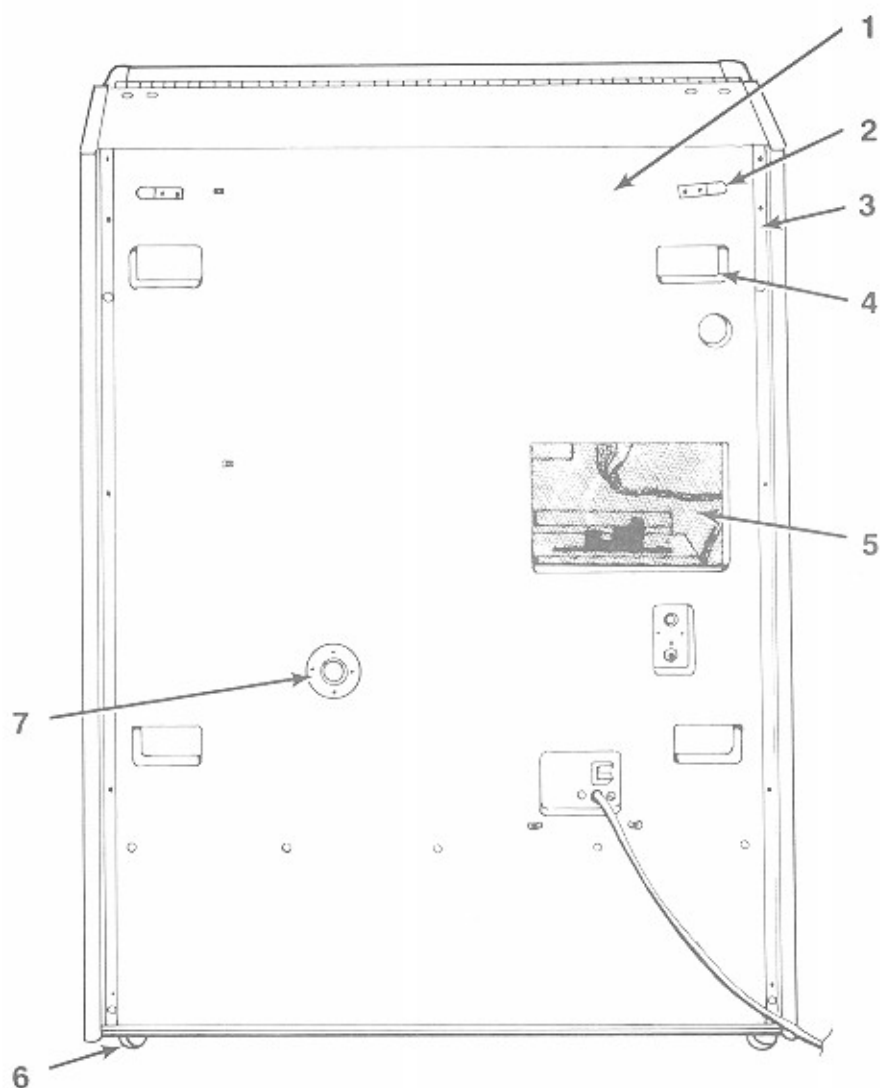


Figure 8-1 CD-51A Phonograph External View (Sheet 2)

Ref.	Part No.	Description	Qty
1	61055001	• Shell Assembly	1
2	20879501	• • Power Cord Holder	2
3	40702809	• • Skid Rail	2
4	30625701	• • Hand Hold Cover	4
5	30868402	• • Enclosure Screen	1
6	30634001	• • Caster and Cup Assembly	4
7	21265203	• • Tie Down Plate Assembly	1

Figure 8-2. CD-51A Phonograph Top Door Assembly
Sheet 1

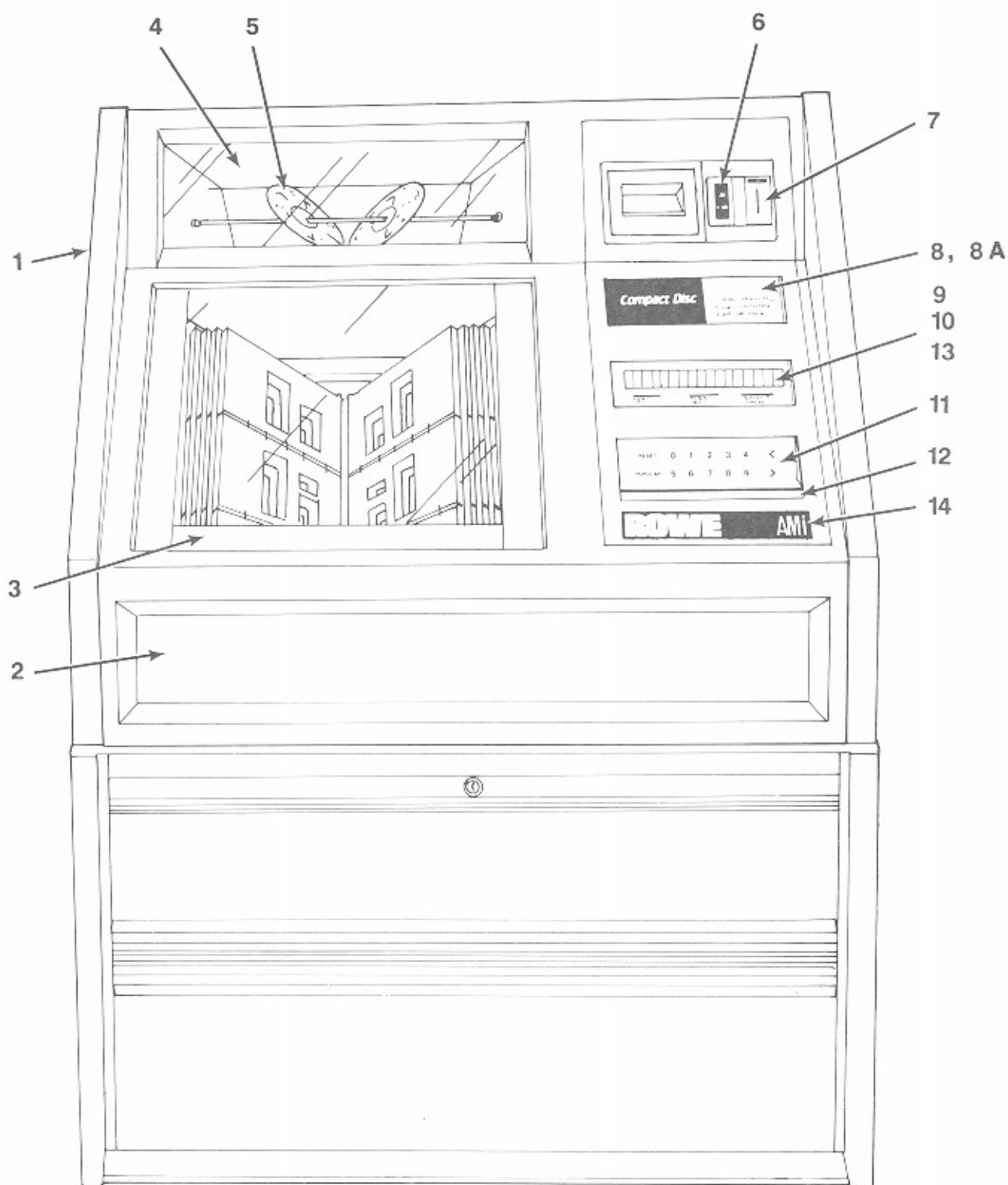


Figure 8-2. CD-51A Top Door Assembly (Sheet 1)

Ref.	Part No.	Description	Qty
	61051003	Door - Top	
1	61050203	• Frame - Top Door (CD-51A)	1
2	30966101	• • Window Reflective	1
3	40842301	• Frame - Scene Lower	1
4	21845618	• Window	1
5	61050303	• Animation Assembly	1
	61051201	• • Housing - Animation	1
	61051301	• • Housing - Side (LH)	1
	61051401	• • Housing - Side (RH)	1
	30948801	• • Bracket - Animation Mounting (Upper)	2
	40824302	• • Motor & Harness Assembly	1
	30948901	• • Shaft	2
	30926904	• • Disc - Animation	2
	21951701	• • Spring Coupling	1
	30949201	• • Bearing	1
	30949001	• • Hub Disc	1
	408434-02	• • Decal - Animation	1
6	21742911	• Button and Shaft Assembly - Reject	1
	30905001	• • Bracket - Guide	1
	21834801	• • Channel	2
	21822901	• • Spring - Compression	1
7	40800601	• Inlet - Coin	1
8	21845620	• Window	1
9	21845610	• Window - Digital Display	1
10	40841801	• Digital Display Assembly - CD-51A	1
11	40842201	• Keyboard Assembly	1
12	61052101	• Trim - Keyboard	1
13	30934803	• Card Readout	1
14	30949303	• Decal - Rowe Logo	2

Price Card Part Numbers			
Price Card Language	Price Card	Readout Card	Selector Graphics Card
Standard	30931304	30967001	30944702
Spanish	30952901	30967003	30953101
German	30952902	30967004	30953102
French	30952903	30967005	30953103
England	30952906		
England	30952916		

Figure 8-2. CD-51A Phonograph Top Door Assembly

Sheet 2

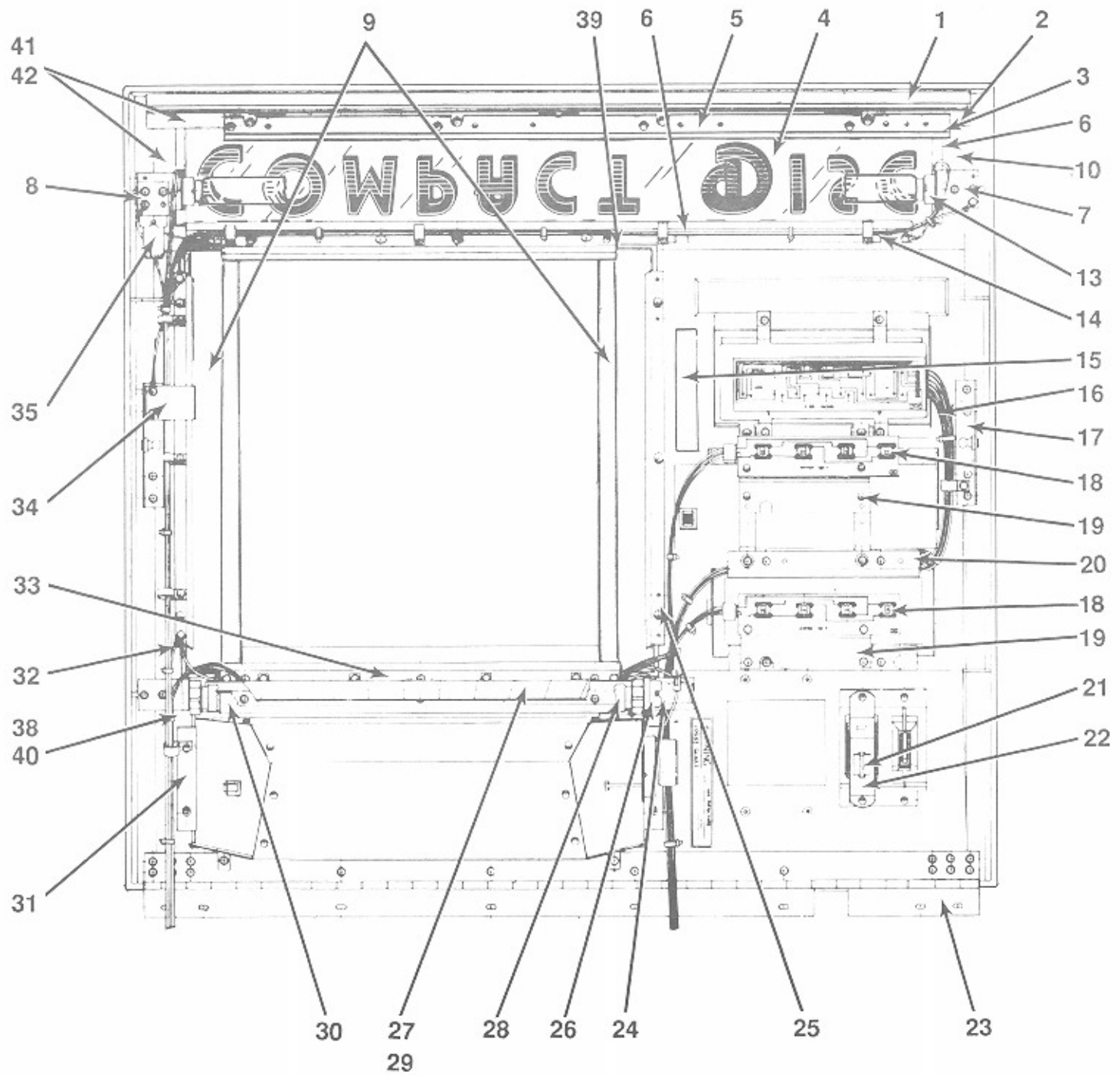


Figure 8-2. CD-51A Top Door Assembly (Sheet 2)

Ref.	Part No.	Description	Qty
	61051003	Door - Top	
1	70220494	• Foamed Tape	1
2	40842401	• Support and Strike Assembly	9
3	61048701	• Frame - Scene Lower	1
4	30965701	• Scene	1
5	61048801	• Frame - Scene Upper	1
6	30965901	• Frame - Scene Side	2
7	30967901	• Bracket Lamp RH	1
8	30967801	• Bracket Lamp LH	1
9	30966001	• Trim Window	2
10	30968801	• Retainer Window	1
11	30947701	• Retainer - Scene	2
12	21952501	• Mounting Bracket - Fluorescent Lamp	2
13	21826719	• Socket - Fluorescent Lamp	2
14	70212222	• Sponge Rubber - Closed Cell	2
15	21948801	• Label - Warning	1
16	40842101	• Harness Assembly - Digital Display	1
17	30934702	• Pivot Assembly - Gas Spring	2
18	21862201	• Lamp and Socket Assembly	8
19	30949901	• Bracket - PWB (Lamp Mounting)	2
20	30947801	• Retainer - Price Card	2
21	21834801	• Channel	2
22	30905001	• Bracket - Guide	1
23	61050601	• Hinge	3
24	70080001	• Starter - Fluorescent (FS-2)	1
25	30947601	• Retainer - Window (Title Rack)	2
26	21826719	• Socket - Fluorescent Lamp (15 W Lamp)	2
27	30950201	• Diffuser	1
28	70060022	• Lamp - Fluorescent (15 W, T-8)	1
29	40844403	• Decal - Diffuser	1
30	30947201	• Retainer - Window (animation)	2
31	30947301	• Retainer - Animation	1
32	40841901	• Harness Assembly - Top Door Light	1
33	30947401	• Retainer - Window (Title Rack)	1
34	21950701	• Actuator - Reset	1
35	70080003	• Starter - Fluorescent (FS-25)	1
36	70060108	• Lamp - Fluorescent (18 W, T-8)	1
37	30947501	• Retainer - Window (Title Rack)	1
38	70212220	• Sponge Rubber - Closed Cell	4
39	70212222	• Sponge Rubber - Closed Cell	6
40	70212221	• Sponge Rubber - Closed Cell	5
41	70212223	• Sponge Rubber - Closed Cell	7
42	70212224	• Sponge Rubber - Closed Cell	8
		NOT SHOWN	
	40842002	Blockout BA	1
	30948301	Decal Blockout BA	1
	30948601	Retainer Blockout BA	1
	30923103	Blockout Coin	1
	30923201	Decal Coin	1
	30952401	Bracket Coin	1

Figure 8-3. CD-51A Front Door Assembly

Sheet 1

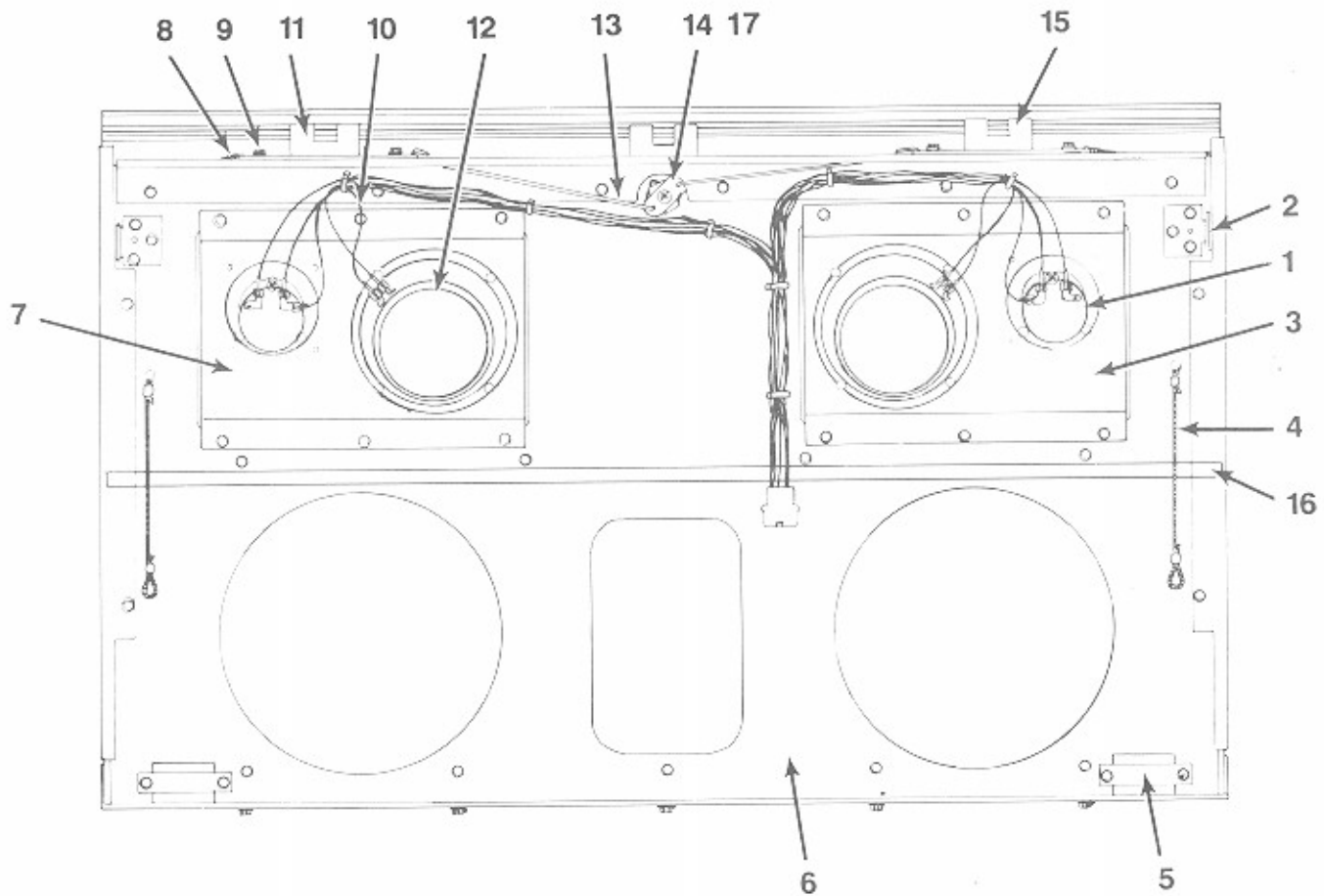


Figure 8-3. CD-51A Front Door Assembly (Sheet 1)

Ref.	Part No.	Description	Qty
1	40830901	• Speaker - Tweeter (3 inch)	2
2	21883504	• Strike	2
3	40843801	• Plate - Mounting (Speaker Left-Hand)	1
4	21572601	• Cable - Fall Stop	2
5	21845401	• Strap - Hinge	2
6	61050701	• Panel - Door (Lower)	1
7	40843901	• Plate - Mounting (Speaker - Right-Hand)	1
8	21256201	• Spring - Tension	2
9	20922502	• Spacer	4
10	25142295	• Jumper Assembly	2
11	21890501	• Lockbar Assembly (Right-Hand)	1
12	40830802	• Speaker — Mid-Range	2
13	21865303	• Link - Pivot	2
14	21425601	• Bolt - Lock	1
15	21890401	• Lockbar Assembly (Left-Hand)	1
16	70220495	• Foamed Tape	1
17	21947501	• Washer - Indexing	1

Figure 8-3. CD-51A Front Door Assembly

Sheet 2

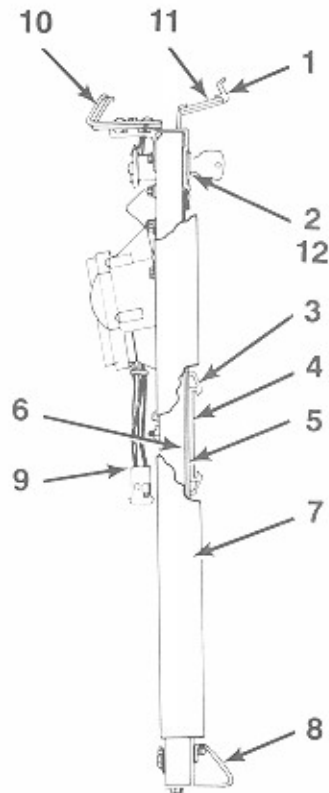


Figure 8-3. CD-51A Front Door Assembly (Sheet 2)

Ref.	Part No.	Description	Qty
1	61051103	• Lockbar	1
2	70163211	• Cylinder - Lock (Common Key)	1
3	40844001	• Trim Assembly - Grille	1
4	40844603	• Insert - Grille Trim	1
5	61050803	• Grille - Lower	1
6	40843101	• Scrim - Front Door	1
7	40843301	• Trim - Side	2
8	61050901	• Trim - Bottom	1
9	30950002	• Harness - Speaker (CD-51A)	1
10	21890701	• Catch	1
11	30935603	• Diffuser - Light	1
12	217953-07	• Bezel - Lock	1

Figure 8-4. Title Rack Assembly

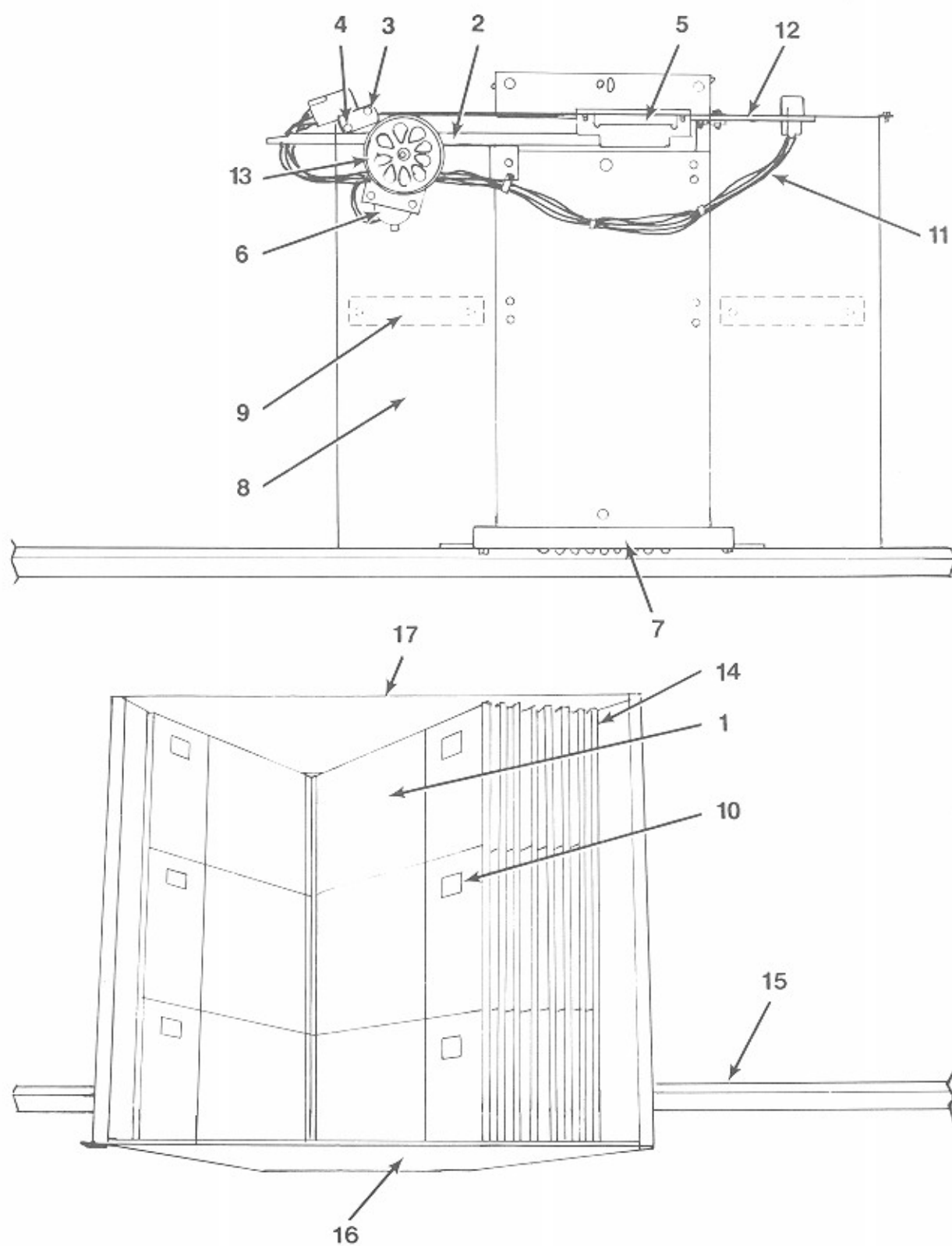


Figure 8-4. Title Rack Assembly

Ref.	Part No.	Description	Qty
	61041002	• Title Rack Assembly	
1	30933901	• • Page & Clip Assembly	9
2	40833803	• • Rack & Clip Assembly	2
3	21942201	• • Switch - Micro	2
4	21083001	• • Nut - Twin	1
5	30935501	• • Guide - Side (CD Page Assembly)	2
	30935001	• • Guide - Center, CD Page Assembly (Not Shown)	1
6	30936301	• • Motor & Gear Assembly	1
7	61039802	• • Plate - Bottom (CD Page Assembly)	1
8	61040502	• • Support - Vertical (CD Page Assembly)	2
9	40834701	• • Guide - Center (CD Page)	2
10	40835401	• • Strip - Numbers (Page)	1
11	30938501	• • Harness Assembly - Interconnect	1
12	61039903	• • Plate - Top (CD Page Assembly)	1
13	40836201	• • Knob	1
14	30940801	• • Bumper - Page	4
15	30949601	• • Bar - Mounting	1
16	40837702	• • Cover - Bottom	1
	61052203	• • • Decal	1
17	40837701	• • Cover - Title Page Top	1

Figure 8-5. CD-51A Phonograph Internal View

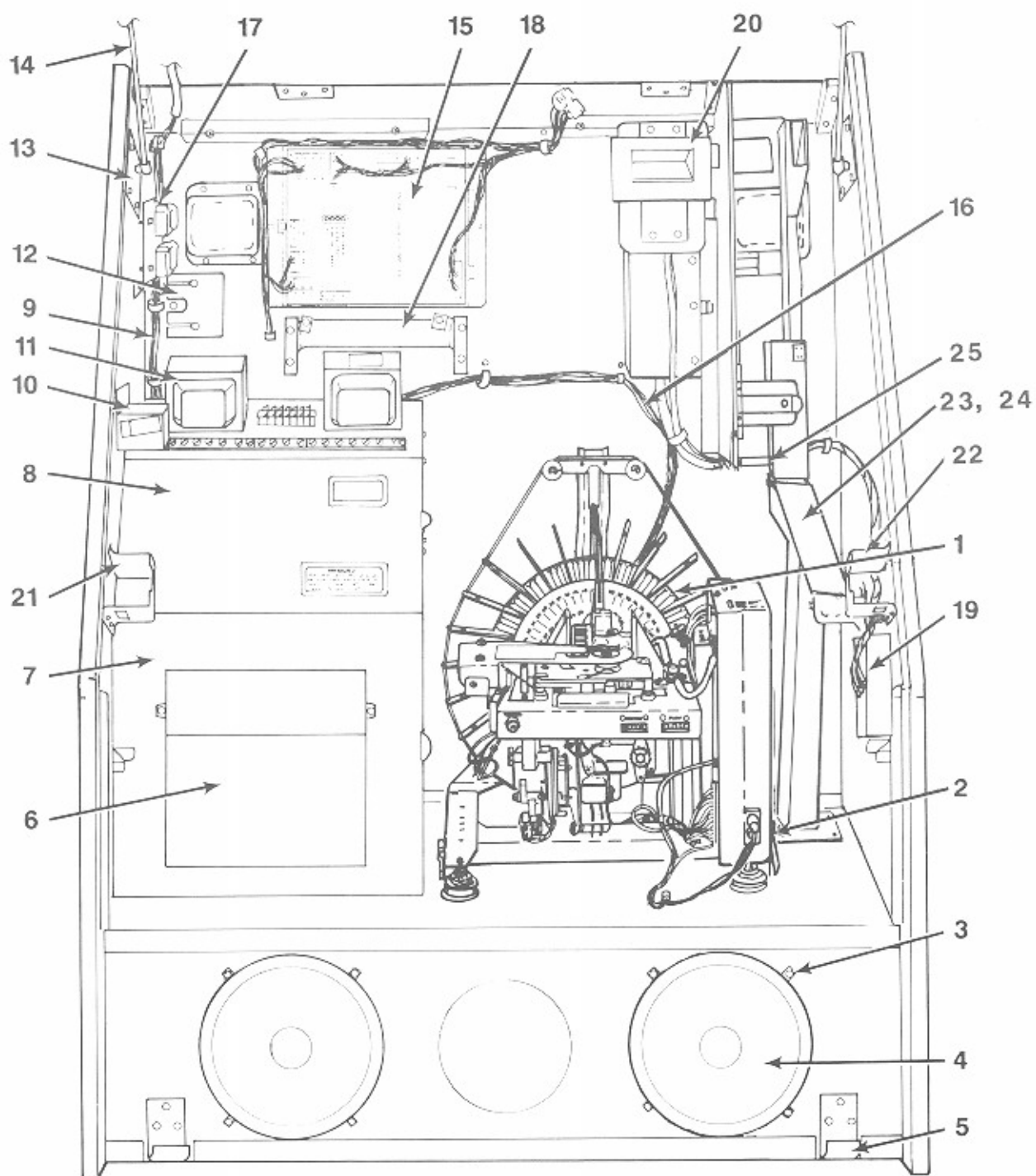


Figure 8-5. CD-51A Phonograph Internal View

Ref.	Part No.	Description	Qty
1	61047801	• Mechanism Assembly - CD (see figure 8-19)	1
2	30932201	• Bracket - Mechanism Tie Down	2
3	21780701	• Bracket - Retainer, Speaker	8
4	40830702	• Speaker - Woofer	2
5	21751804	• Spring Catch	1
6	30869801	• Handy Case	1
	21730516	• • Accessories Bag Assembly	1
	21827202	• • • Bag - Accessories	1
	70097501	• • • • Contact - Univ Conn (Pin)	6
	70097502	• • • • Contact - Univ Conn (Socket)	6
	70075601	• • • • Contact - Post	10
	70091012	• • • • Terminal Lug - Spade	10
	70072002	• • • • Fuse Cartridge (8 amp.)	2
	70072106	• • • • Fuse Cartridge (5 amp.)	2
	26676802	• • • • Quality Card - Phonograph	1
	21822622	• • • • Manual - Service (CD-51A)	1
	21888607	• • • • Programming Reference Guide	1
	21957002	Routine Service Guide	1
	21969501	Errors Guide	1
	30948502	• • • • Alternate Price Card	1 Set
	61021301	• • • • Universal Price Sheet	1 Set
	30935903	• • • • Blank Title Strip With Numbers	25
	30940601	• • • • Title Page Filler	8
	30935904	• • • • Blank Title Strip (Without Numbers)	5
7	30948401	• Panel Assembly - Amplifier	1
8	40843001	• Panel Assembly - Amp (Top)	1
9	61044002	• Harness and Switch Assembly	1
10	40835602	• Switch Assembly - Service	1
11	40832101	• Output Transformer Assembly (see figure 8-16)	1
12	21759301	• Cover - Cord Hole	2
13	21920301	• Plate Assembly - Pivot	2
	21892302	• • Bracket - Ball Stud	2
	21797602	• • Stud - Ball	2
14	40714905	• Spring - Pneumatic	2
15	40832201	• Central Control Computer	1
16	40842502	• Harness, 110 Volt, 50/60 Hz	1
17	40842502	• Harness and Ballast Assembly (60 Hz)	1
	40842501	• Harness and Ballast Assembly (50 Hz)	1
	30859501	• • Ballast - 15W (60 Hz)	1
	30859502	• • Ballast - 15W (50 Hz)	1
	21952101	• • Ballast (60 Hz)	1
	21952102	• • Ballast (50 Hz)	1
	70060108	• Fluorescent Lamp (18 watt — T-8, Not Shown)	1
	70080004	• Starter - Fluorescent Lamp (FS-2, Not Shown)	1
	70060022	• Fluorescent Lamp (15 watt — T-8, Not Shown)	1
	70060003	• Starter - Fluorescent Lamp (FS-25, Not Shown)	1
18	30950401	• Support and Pin Assembly	1
19	61038903	• Control Unit - OBA	1
20	21941102	• Bill Acceptor Parts Group	1
21	30938201	• Mounting Bracket - Title Rack Upper (RH)	1
22	30938101	• Mounting Bracket - Title Rack Upper (LH)	1
23	40842902	• Chute - Slug	1
24	61043902	• Chute - Coin	1
25	30968201	• Bracket - Offset	1

Figure 8-6. Coin Chute Assembly

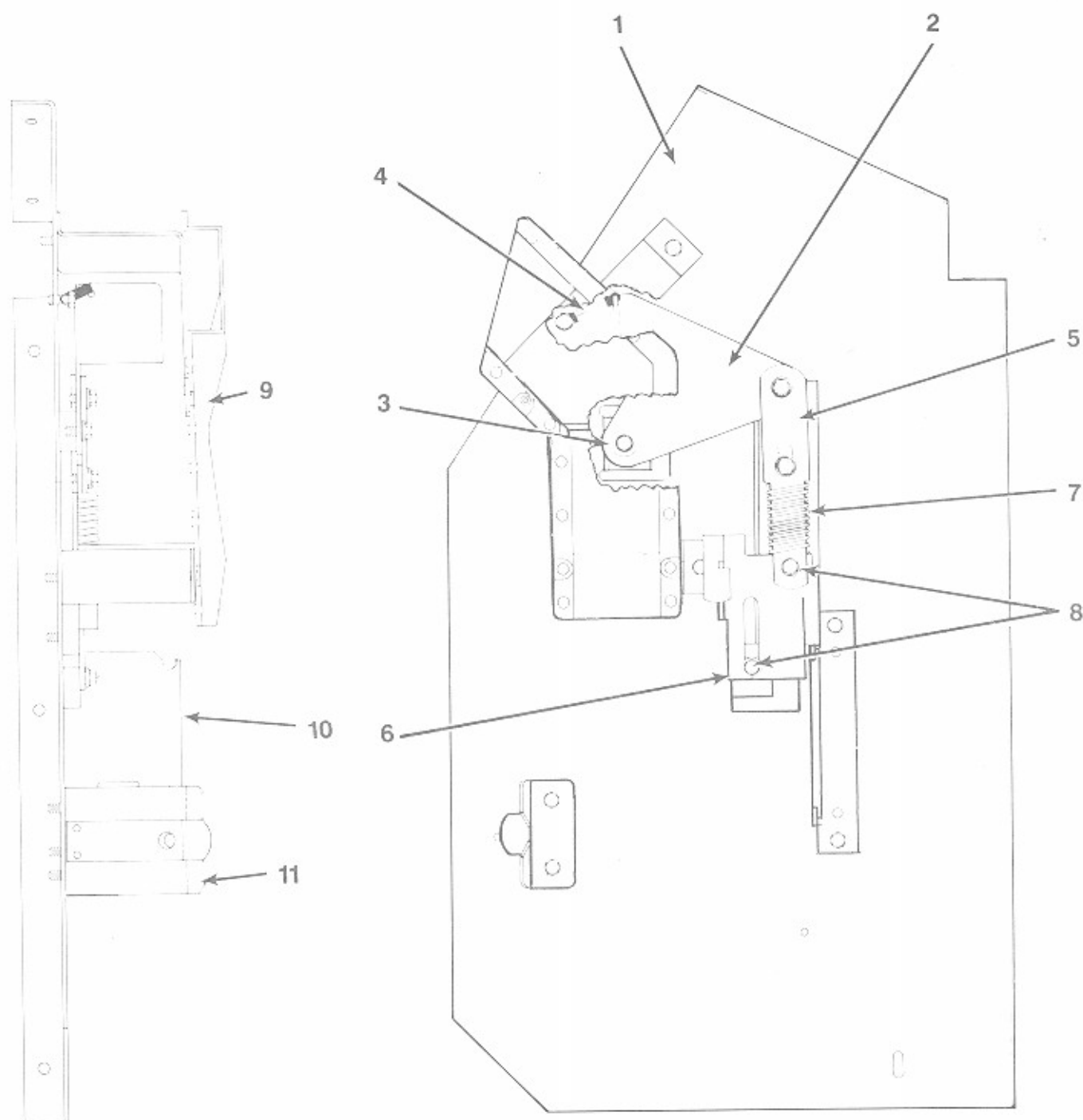


Figure 8-6. Coin Chute Assembly

Ref.	Part No.	Description	Qty
	61043802	• Support & Coin Chute Assembly	1
1	61051502	• Support - Coin Chute	1
2	30904501	• Pivot - Scavenge	1
3	25156904	• Washer - Shoulder	1
4	21256201	• Spring - Tension	1
5	21891801	• Link - Scavenge	1
6	21952002	• Actuator - Slug Rejector	1
7	21765601	• Spring - Compression	1
8	20922502	• Spacer	6
9	30904603	• Chute Assembly - Coin (Upper)	1
10	21790104	• Support - Hinge	1
11	21429501	• Catch Assembly -Rejector	1

Figure 8-7. OBA-2 Bill Acceptor Parts Group

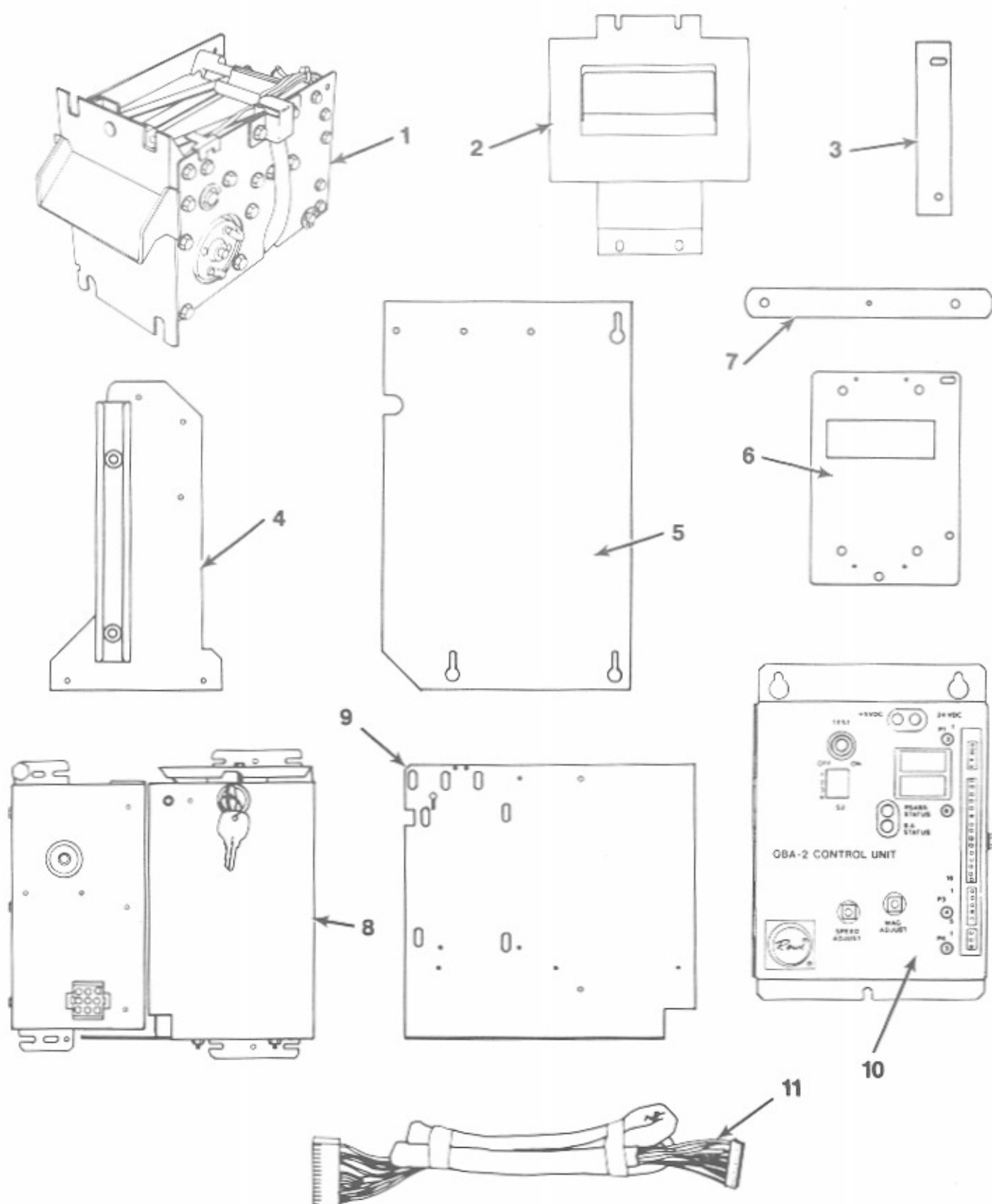
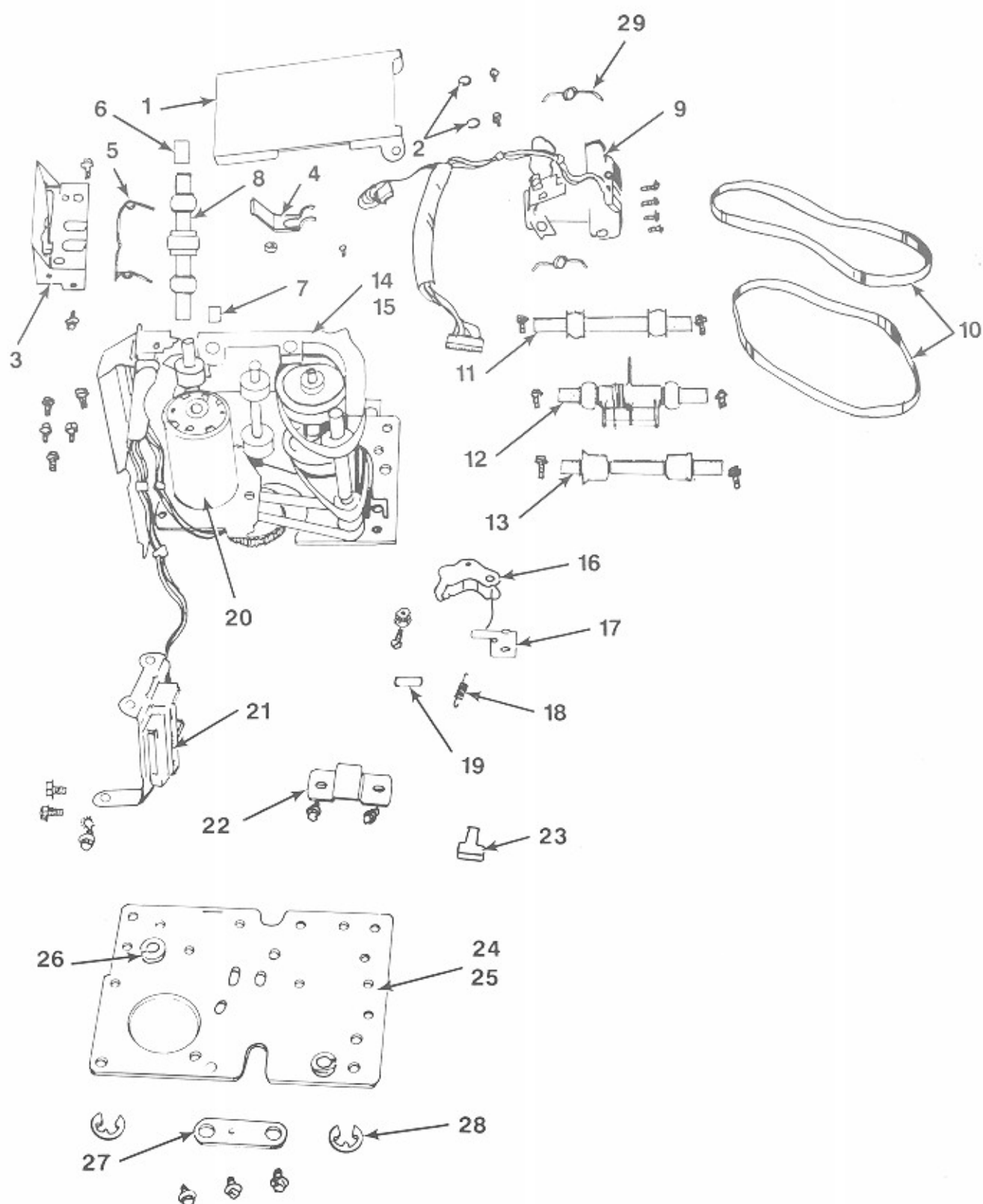


Figure 8-7. Bill Acceptor Parts Group

Ref.	Part No.	Description	Qty
	21941102	Bill Acceptor Parts Group	
1	65056511	• Transport Assembly OBA 1&5 (see figure 8-8)	1
2	40844701	• Trim - Bill Acceptor	1
3	30857901	• Bracket - Adjustment	1
4	30858401	• Slide Assembly - Support	1
5	61034801	• Plate - Mounting (BA)	1
6	30858001	• Support Assembly - Front Plate	1
7	30858801	• Bar Assembly - Slide	1
8	60971518	• Bill Stacker Assembly (500 Bill Left-Hand Opening)	1
9	61035601	• Panel - Mounting (BA)	1
10	61038904	• Control Unit	1
11	45070203	• Interconnect Harness Assembly	1
	21875001	• Spacer - Rear (Not Shown)	1
	70093402	• Cable Clamp (Not Shown)	6
	70121211	• Spacer (Not Shown)	2
	87844400	• #10-32 KEPS Hex. Nut (Not Shown)	2
	21828201	• Spacer - Roller (Not Shown)	1
	20554502	• Clip - Cable (Not Shown)	1
	40844801	• Inlet - Bill (Not Shown)	1
12	21892603	• Insertion Label	1

Figure 8-8. OBA-2 Transport Assembly

Sheet 1



Ref.	Part No.	Description	Qty
	65056511	• Standard OBA Transport Assembly	1
1	35083801	• Light Block	1
2	20922503	• Spacer	2
3	35082904	• Inlet and Stud Assembly	1
4	35082601	• Pressure Roller Spring	1
5	25213601	• Spring	1
6	25213501	• Long Sleeve Spacer	1
7	25213502	• Short Sleeve Spacer	1
8	35097801	• Pressure and Crowned Roller Shaft Assembly (see figure 8-9, E)	1
9	45059801	• Harness and Holder Assembly (see figure 8-11)	1
10	35118601	• Drive Belt	2
11	35097501	• Crowned Roller Shaft Assembly (see figure 8-10, C)	1
12	35097402	• Anti Cheat Lever Shaft Assembly (see figure 8-10, B)	1
13	35097601	• Creasing Roller Shaft Assembly (see figure 8-10, D)	1
14	35099403	• Track and Pressure Roller Assembly	1
15	35083004	• • Lower Track	1
16	35080603	• • Pressure Roller Assembly	1
17	25224601	• • Pressure Roller Spring Bracket	1
18	25225003	• • Tension Spring	1
19	25191701	• • Pivot Pin	1
20	45058404	• Motor Assembly (With Shield)	1
21	35080701	• Circuit Board and Bracket Assembly	1
22	35083701	• Wire Holding Bracket	1
23	21776009	• U-Type Speed Clip Fastener	1
24	35098001	• Side Plate Assembly (RH)	1
25	45057801	• • Side Plate (RH)	1
26	70146004	• • Nyliner Bearing	4
27	25194101	• • Take-up Shaft Bracket	2
28	70143004	• • External Retaining Ring	2
29	35112301	• • Retainer - Mag. Head Holder	2

Figure 8-8. Transport Assembly

Sheet 2

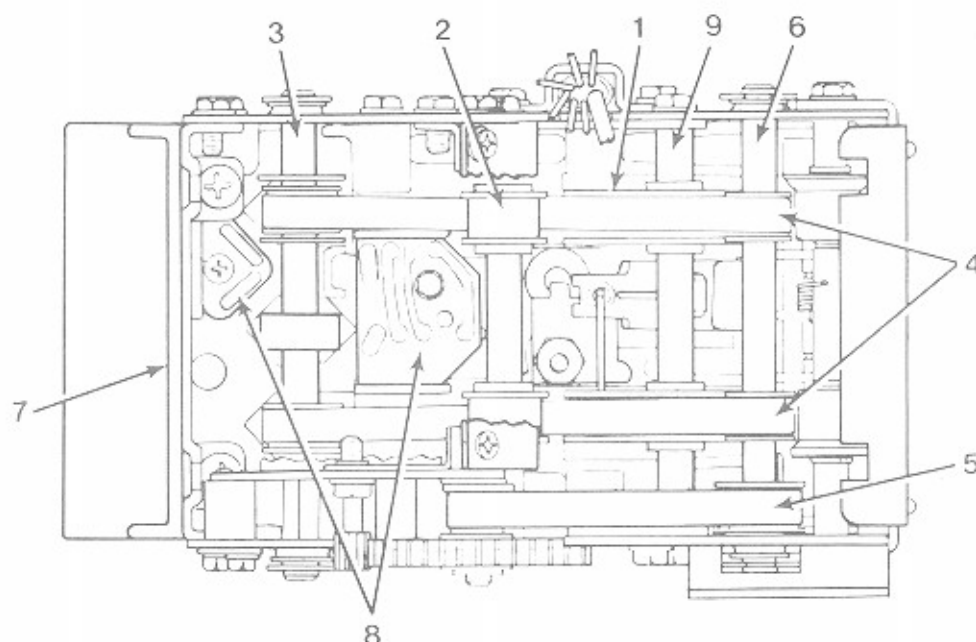


Figure 8-8. OBA-2 Transport Assembly (Sheet 2)

Ref.	Part No.	Description	Qty
1	35080101	• Drum Pulley	2
2	35098101	• Take-up Roller Shaft Assembly (see figure 8-9, F)	2
3	35080501	• Lower Input Roller Assembly (see figure 8-9, A)	1
4	45077201	• Timing Belt (140 Tooth)	1
5	35082001	• Timing Belt (70 Tooth)	1
6	35080801	• Drive Shaft Assembly (see figure 8-9, G)	1
7	35090604	• Casting, Plate and Harness Assembly	1
	45064201	• • Front Plate	1
8	45058202	• • Harness Assembly - Lower (see figure 8-10)	1
9	35097701	• Ring Shaft Assembly	2
	35080001	• • Drum Pulley Shaft	1
	70143004	• • External Retaining Ring	2

Figure 8-8. Transport Assembly

Sheet 3

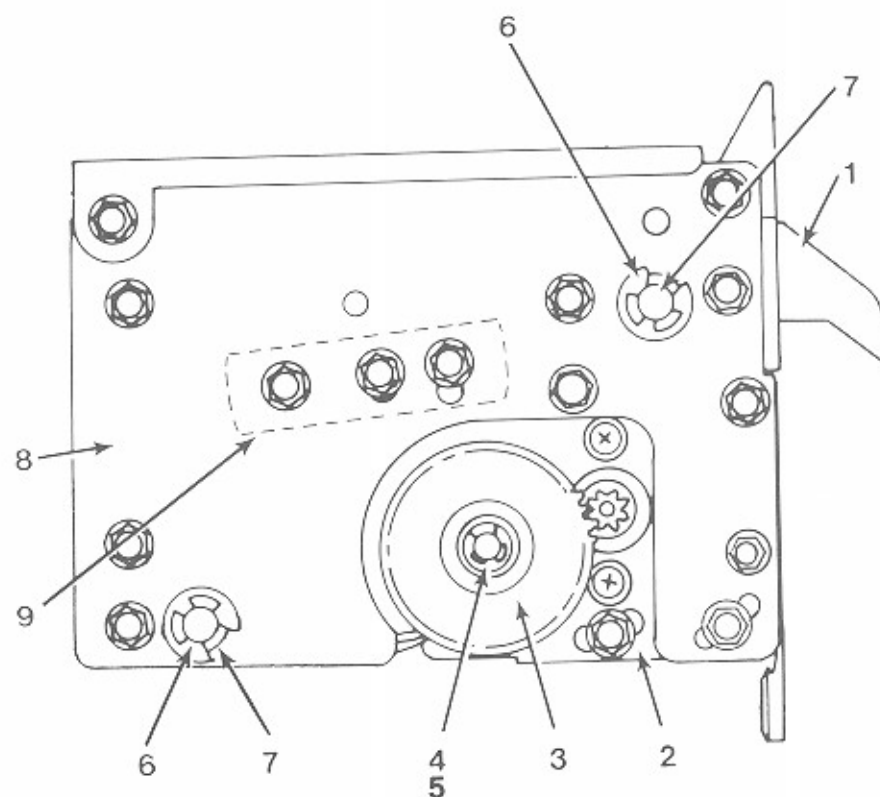


Figure 8--8. OBA-2 Transport Assembly (Sheet 3)

Ref.	Part No.	Description	Qty
1	65056801	• Inlet Track Ref.	1
2	35090701	• Bracket & Reduction Gear Assembly	1
	35090501	• • Bracket, Spacer And Pin Assembly	1
3	45058501	• • Reduction Gear	1
4	70120501	• • Washer	1
5	70143003	• • External Retaining Ring (3/16)	1
6	70143004	• • External Retaining Ring	2
7	70146004	• Bearing (Nyliner)	2
8	35097901	• Side Plate Assembly - LH	1
	45057702	• • Side Plate - LH	1
	70146004	• • Nyliner Bearing	4
9	25194101	• • Take-up Shaft Bracket	2

Figure 8-9. OBA-2 Transport Roller and Shaft Assemblies

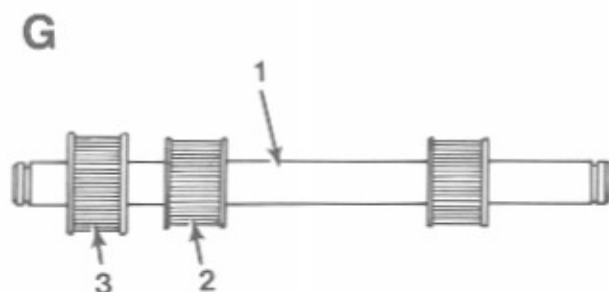
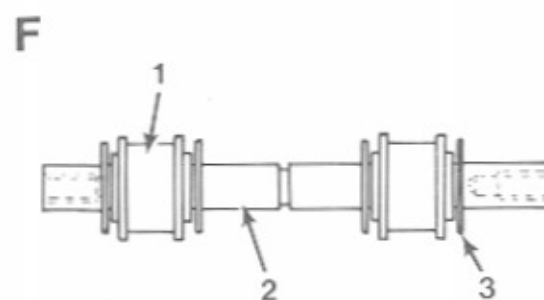
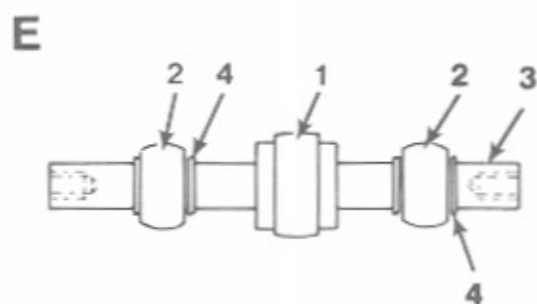
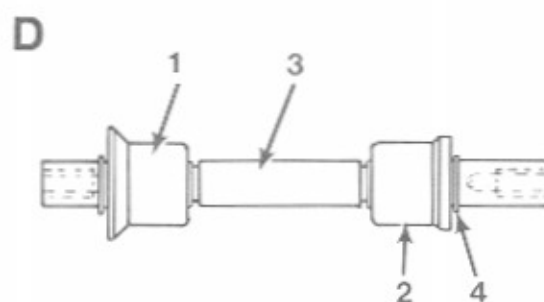
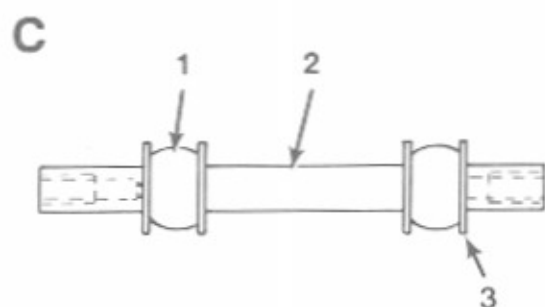
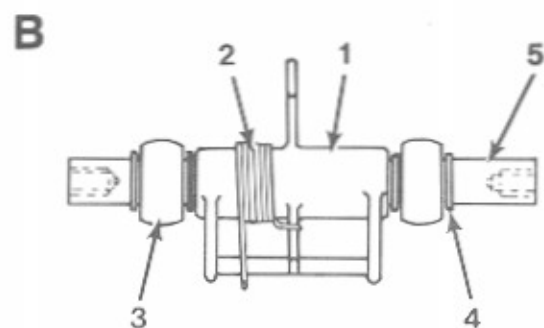
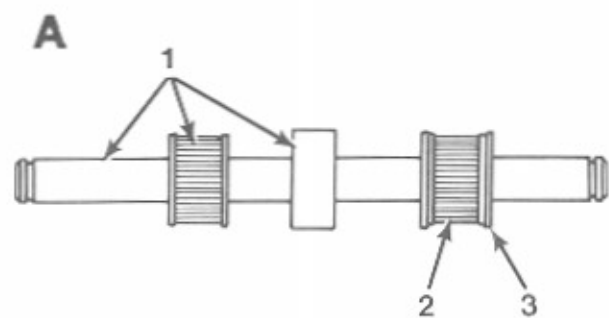


Figure 8-9. OBA—4 Transport Roller And Shaft Assemblies

Ref.	Part No.	Description	Qty
A	35080501	Lower Input Roller Assembly	
1	25227601	• Lower Input Shaft Assembly	1
2	25192902	• 22 Tooth Pulley	1
3	70143004	• External Retaining Ring	2
B	35097402	Anti-Cheat Lever Shaft Assembly	
1	35096402	• Anti-Cheat Lever	1
2	35081601	• Spring	1
3	25193301	• Crowned Roller	2
4	70143301	• External Retaining Ring	4
5	25193401	• Crowned Roller - Shaft	1
C	35097501	Crowned Roller Shaft Assembly	
1	25193301	• Crowned Roller	2
2	25193401	• Crowned Roller Shaft	1
3	70143004	• External Retaining Ring	4
D	35097601	Creasing Roller Shaft Assembly	
1	25193601	• Creasing Roller	1
2	25193602	• Small Creasing Roller	1
3	35080001	• Drum Pulley Shaft	1
4	70143301	• External Retaining Ring	2
E	35097801	Pressure and Crowned Roller Shaft Assembly	
1	25193901	• Pressure Roller (Upper)	1
2	25193301	• Crowned Roller	2
3	35082301	• Top Shaft	1
4	70143301	• External Retaining Ring	4
F	35098101	Take-up Roller Shaft Assembly	
1	35080301	• Take-up Roller	2
2	35080002	• Take-up Shaft	1
3	70143004	• External Retaining Ring	4
G	35080801	Drive Shaft Assembly	
1	25192801	• Drive Shaft	1
2	25192401	• 20 Tooth Pulley (Drive Belt)	2
3	25192902	• 22 Tooth Pulley	1

Figure 8-10. Lower Harness Assembly

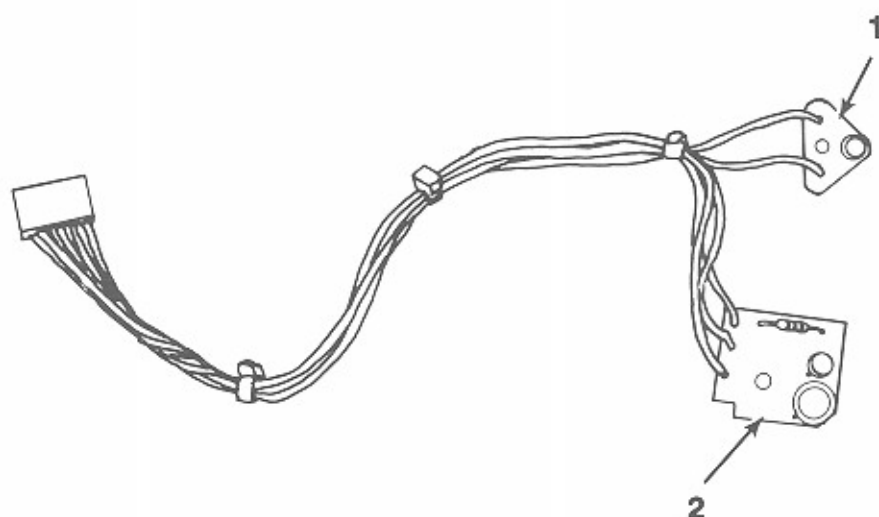


Figure 8-10. Lower Harness Assembly

Ref.	Part No.	Description	Qty
	45058202	Lower Harness Assembly	
1	21313002	• Terminal Board - V1 Emitter	1
	70035308	• • Light Emitting Diode	1
	45063301	• • Diode Spacer	1
2	35079902	• Reflective Sensor Board - V2	1
	21339701	• • Photovoltaic Cell	1
	79901151	• • Resistor - Carbon (1/4 W 5%) 150 Ohm	1
	70035308	• • Light Emitting Diode	1

Figure 8-11. Harness & Holder Assembly

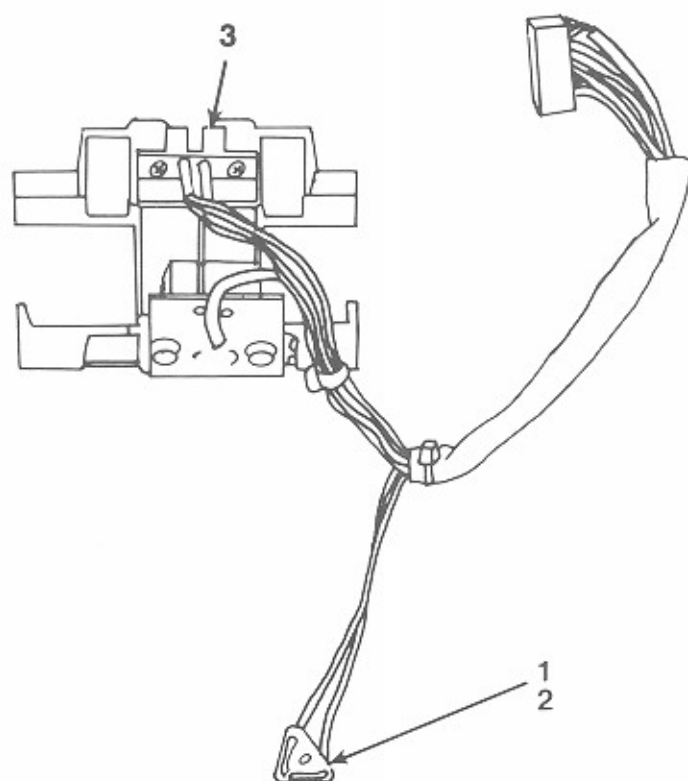


Figure 8-11. Harness & Holder Assembly

Ref.	Part No.	Description	Qty
	45059801	Harness And Holder Assembly (see figure 8-8, sheet 1, item 9) ¹	1
1	21313002	• Terminal Board	1
2	70033204	• • Phototransistor	1
3	35082402	• • Switch - Optical	1

¹The magnetic head must be factory aligned to holder and insert assembly. If a new head is needed, order the harness and holder assembly (Part Number 45059801).

Figure 8-12. 500 Bill Stacker Assembly

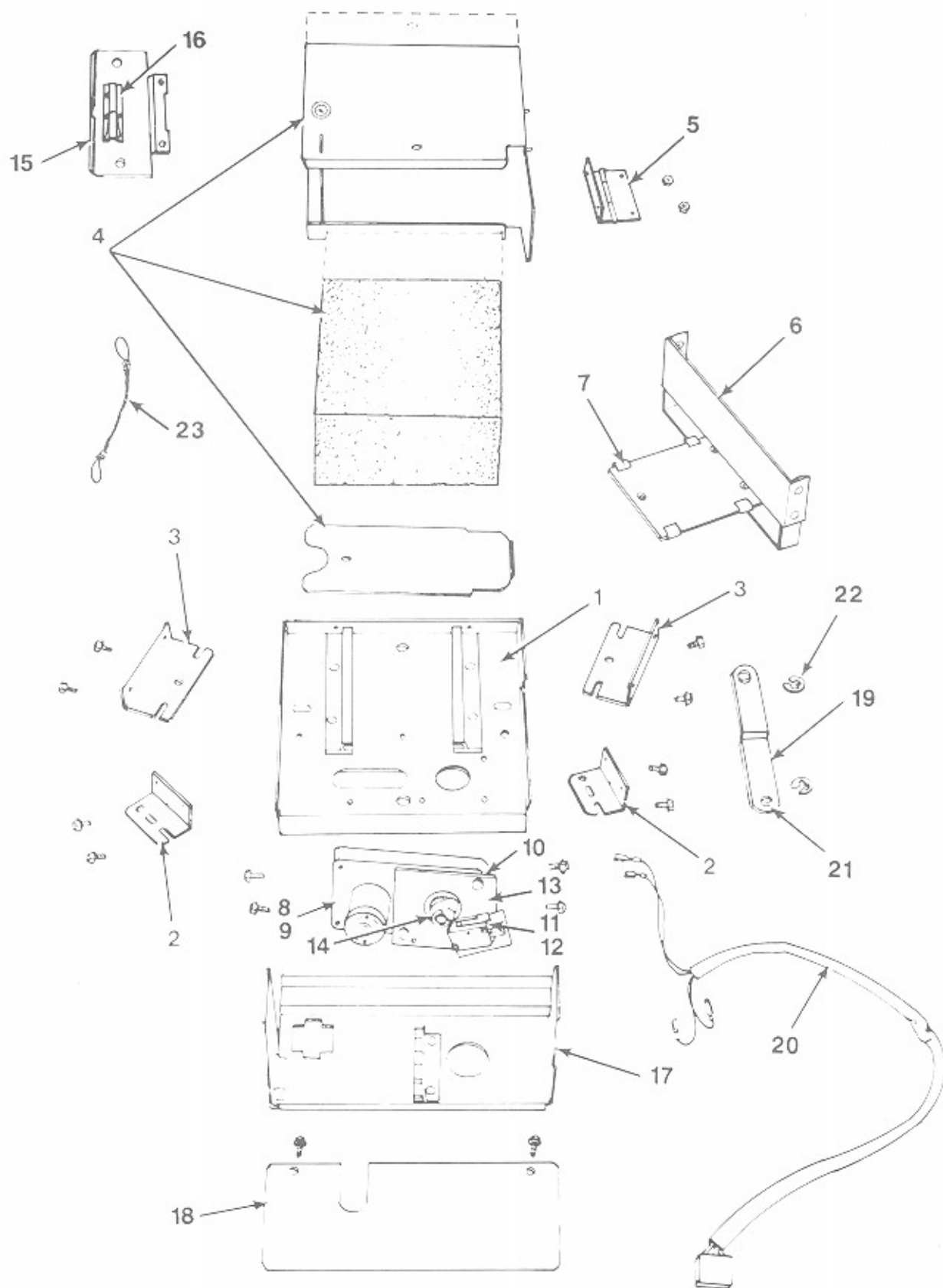


Figure 8-12. 500 Bill Stacker Assembly

Ref.	Part No.	Description	Qty
	60971518	Bill Stacker Assembly (500 Bill Left-Hand Opening)	
1	40712402	• Mounting Plate Assembly	1
	30783101	• • Side Chute	1
	30745003	• • Carriage Guide	2
2	21874601	• Bill Stacker Support	2
3	35084201	• Stacker Rear Support	2
4	40769304	• Cash Box Assembly (500 Bill, Left-Hand Opening)	1
	35039204	• • Pressure Plate	1
	21757901	• • Foam Block	1
	70162008	• • Cylinder Lock	1
	70166011	• • Lock Bolt	1
5	30783202	• Hinge - Cashbox	1
6	40712603	• Carriage Assembly (Left-Hand Opening)	1
7	21757701	• Guide	4
8	35087801	• Motor & Switch Assembly	1
9	35087701	• • Motor Assembly With Crank	1
10	70121706	• • Spacer	2
11	21073102	• • Switch	1
12	21082901	• • Switch Actuator	1
13	21795801	• • Switch Bracket	1
14	30781802	• • Switch Cam	1
15	30785602	• Bill Box Cover	1
16	35084301	• Lock Bracket	1
17	40712702	• Rear Cover Assembly	1
18	30859002	• Cover Plate	1
19	21792403	• Carriage Link	1
20	45062308	• DC Bill Stacker Harness Assembly	1
21	70146006	• Nyliner Bearing	2
22	70143004	• External Retaining Ring	2
23	21572605	• Fall Stop Cable	1

Figure 8-13. CD-51A Amplifier Compartment

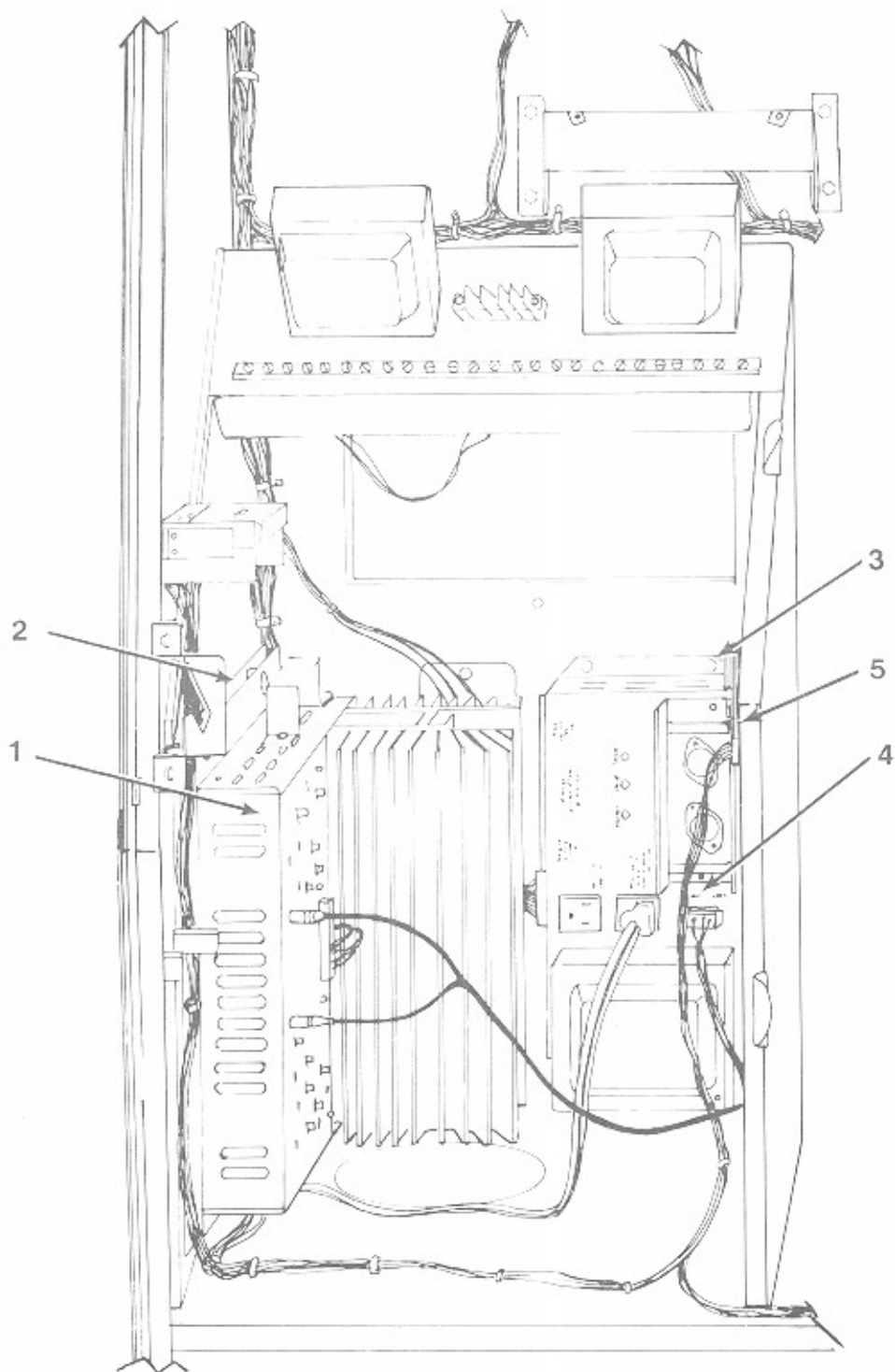


Figure 8-14. Stereo Amplifier Assembly

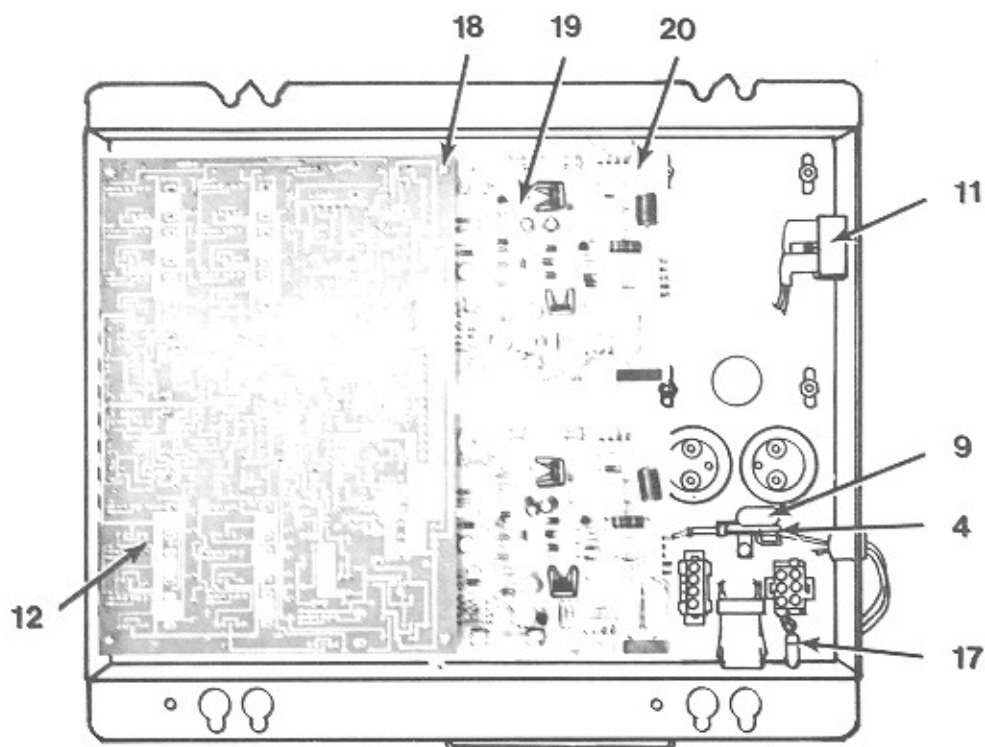
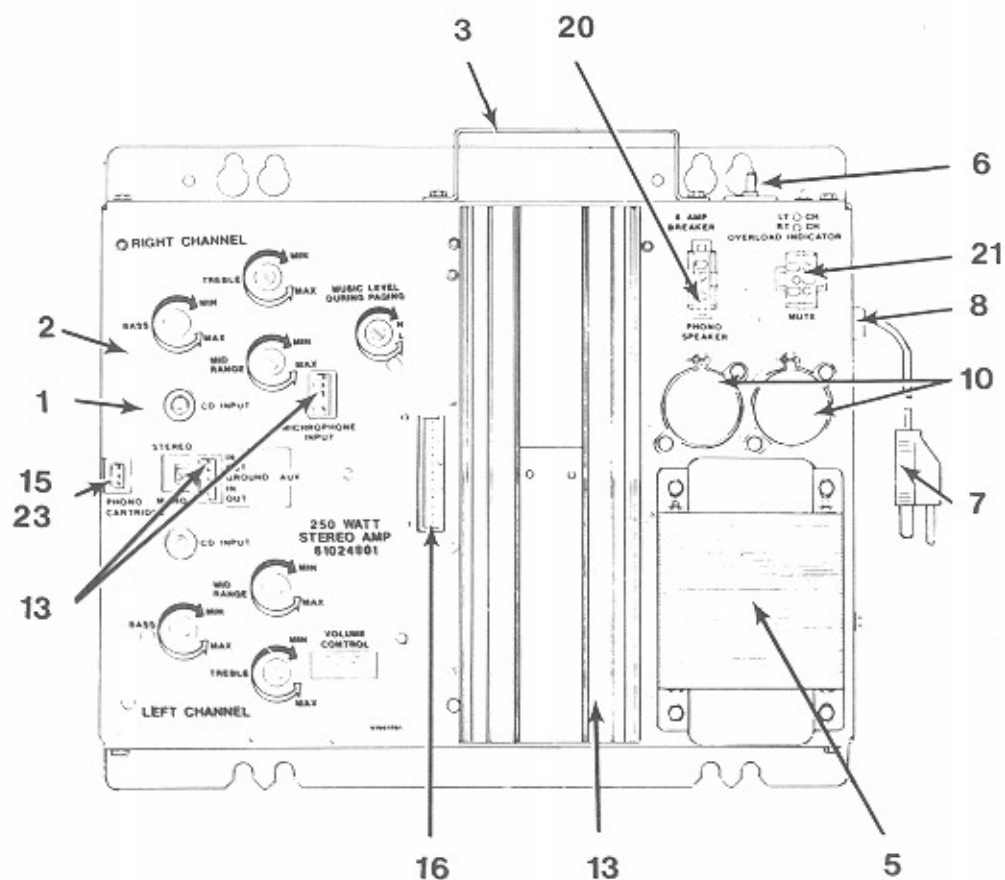


Figure 8-14. Stereo Amplifier Assembly

Ref.	Part No.	Description	Qty
	61024801	Stereo Amplifier Assembly (<i>see figure 8-13, item 1</i>)	
1	61024601	• Chassis Assembly	1
2	61051701	• • Amplifier Chasis Label	1
3	21488101	• Handle	1
4	21724102	• Terminal Strip	1
5	40737805	• Power Transformer	1
6	70078956	• Circuit Breaker	1
7	25218603	• 3 Conductor Cord and Plug	1
8	70232205	• Strain Relief	1
9	70021305	• Mylar Capacitor (.1 Mfd)	1
10	21823102	• Electrolytic Capacitor (10,000 Mfd)	2
11	21822501	• Bridge Rectifier	1
12	61023722	• Stereo Preamp. Assembly (<i>see schematic for parts list</i>)	1
13	Ref.	• Heat Sink Detail (<i>see figure 8-15</i>)	1
14	70075505	• Connector Housing (5 Circuit)	2
15	70075503	• Connector Housing (3 Circuit)	1
16	21620703	• Amplifier Jumper Plug Assembly	1
17	21893401	• Speaker Overload Indicator (Left Channel)	1
	21893402	• Speaker Overload Indicator (Right Channel)	1
18	70500006	• Circuit Board Support	8
19	70500018	• Circuit Board Support	5
20	40710104	• Driver Circuit Board Assembly (<i>see power amplifier schematic for components list</i>)	2
21	30749003	• Cap Housing 4 Circuit	1
22	30749004	• Cap Housing 6 Circuit	1
	70097502	• • Contacts	8
23	21620704	• Shorting Plug	1

Figure 8-15. Heat Sink Detail

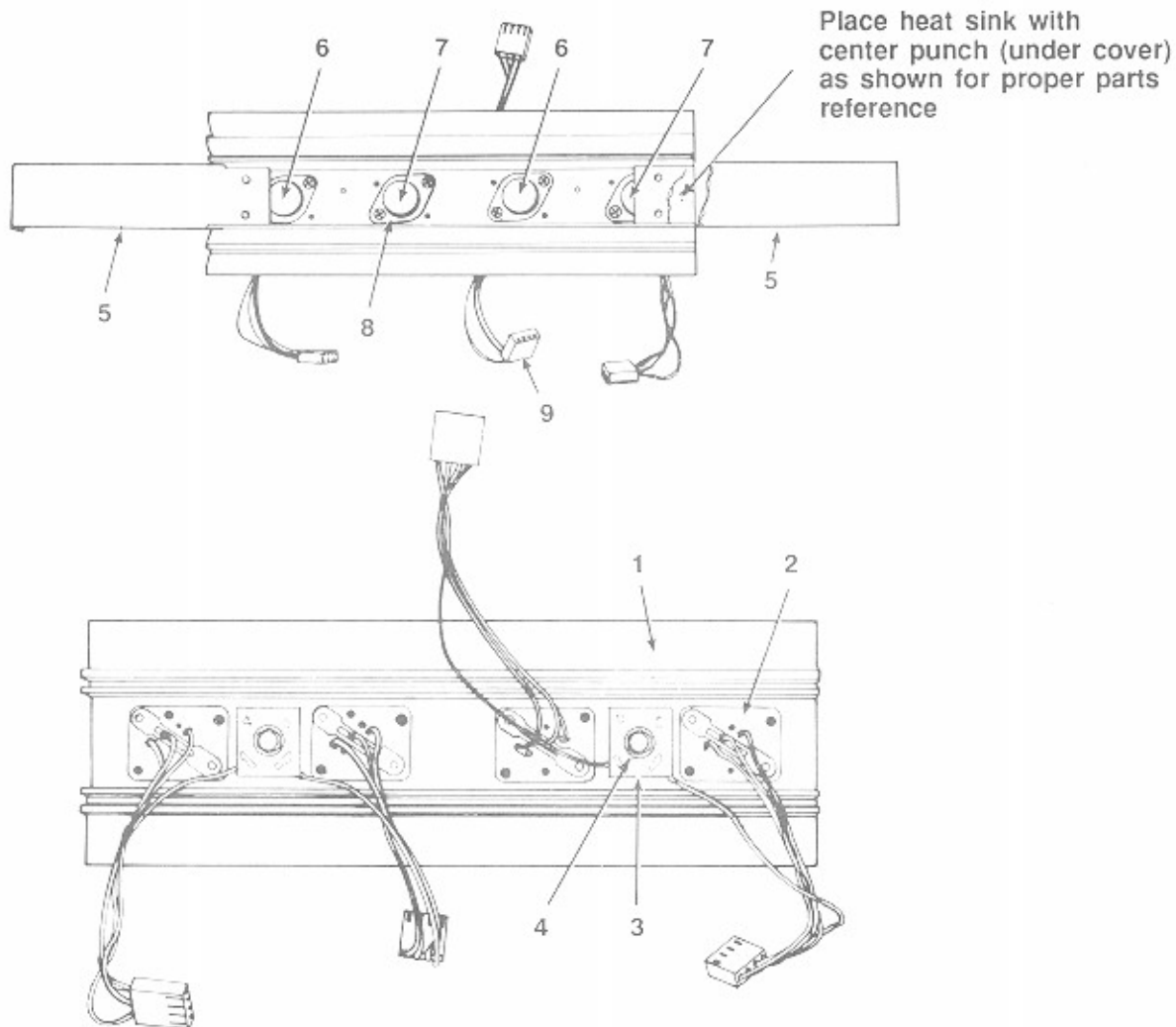


Figure 8-15. Heat Sink Detail

Ref.	Part No.	Description	Qty
<hr/>			
1	40710303	Heat Sink Detail (see figure 8-14, item 12)	1
2	21547301	• Heat Sink	4
3	40837401	• Power Transistor Socket	4
4	21840201	• Circuit Board Assembly	2
	80443020	• Compression Spring	2
5	21798001	• #8-32 X 1-1/4 WRHMS (SF)	2
6	70030206	• Cover	2
7	70030207	• Transistor (Darlington Amp, RCA-2N6284) (NPN, Q101, 2 places)	2
8	21318902	• Transistor (Darlington Amp, RCA-2N6287) (PNP, Q102, 2 places)	2
9	70075504	• Precoated-Insulator	4
		• Connector Housing	4

Figure 8-16. Output Transformer Assembly

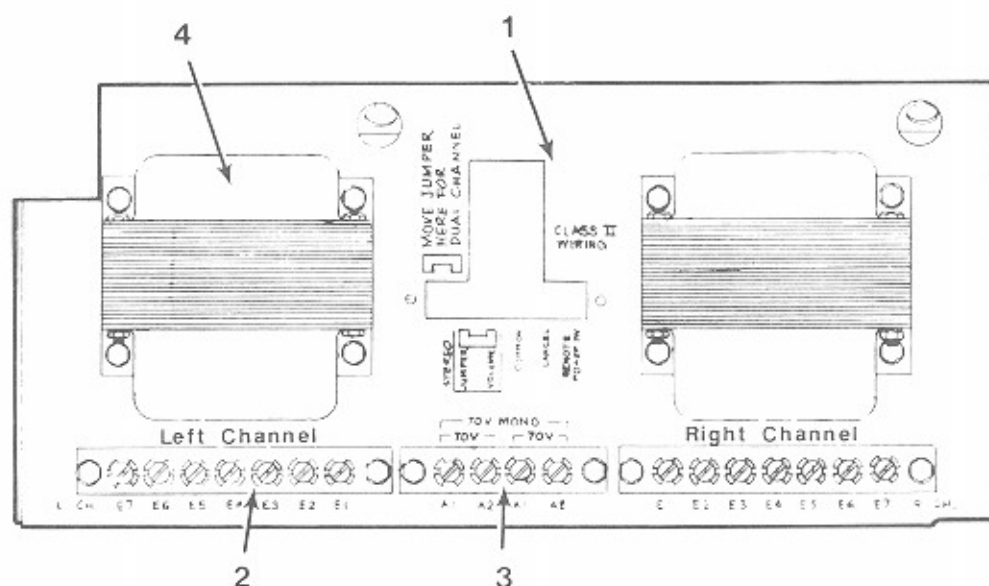


Figure 8-16. Output Transformer Assembly

Ref.	Part No.	Description	Qty
	40832101	Output Transformer Assembly (see figure 8-5, item 11) (See also figure 5-10, the Wiring Diagram)	
1	40832001	• Chassis With Lettering	1
2	30426707	• Terminal Strip	2
3	30426706	• Terminal Strip	1
4	40633502	• Output Transformer	2

Figure 8-17. Main Power Supply
(120 Volt, 60 Hz Model)

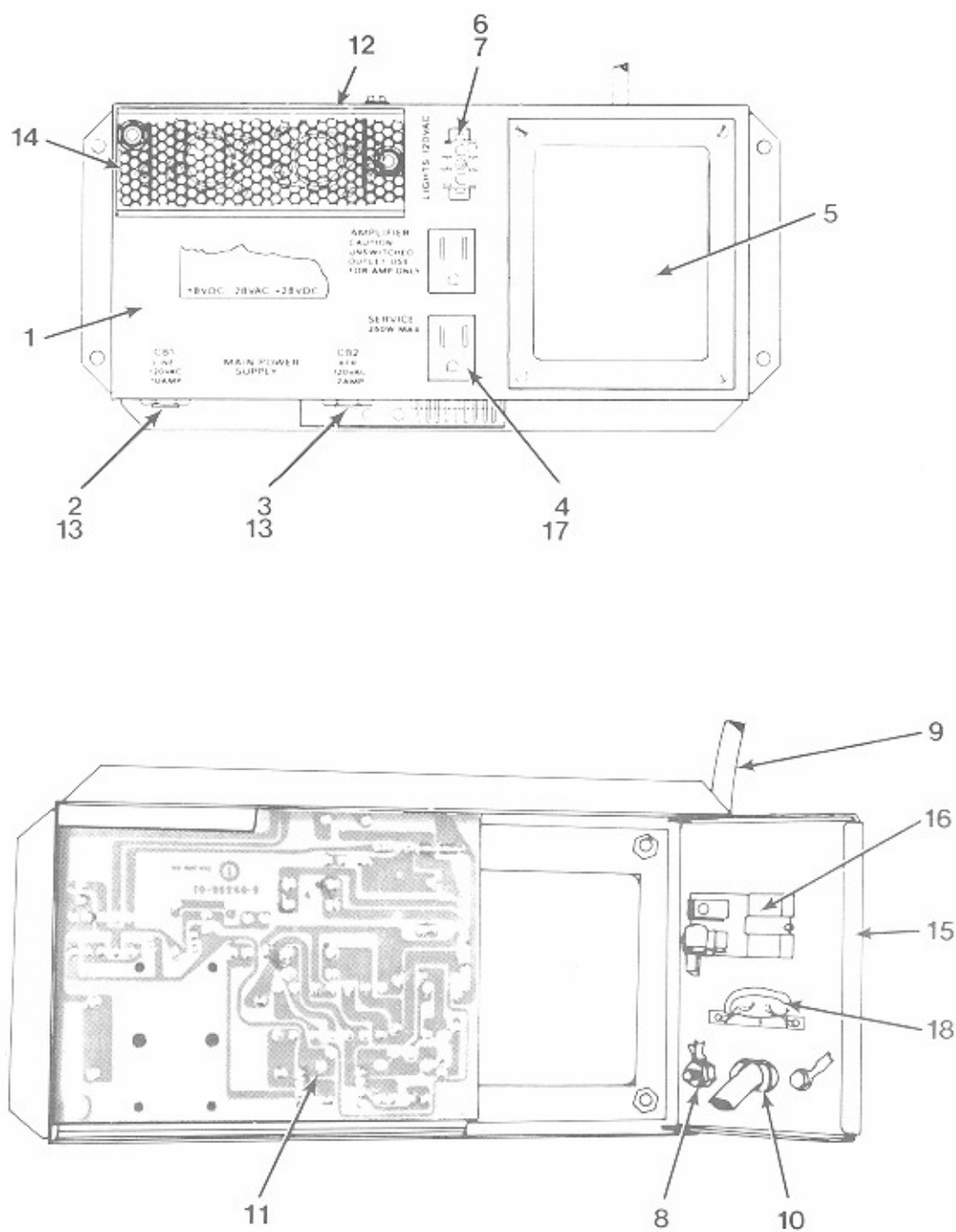


Figure 8-17. Main Power Supply

Ref.	Part No.	Description	Qty
	40770609	Main Power Supply (120 V) (see figure 8-13, item 4)	
	46509215	Main Power Supply (220 V)	
	46509216	Main Power Supply (240 V)	
1	40771904	• 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 (120 V)	1
	46509302	• • Transformer Harness Assembly (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	60935705	• 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
	70073608	• Breaker 220/240 V (5A) (Not Shown)	2
	70073610	• Breaker 220/240 V (7A) (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
18	21943801	• MOV Assembly (120 V)	1
	21943701	• MOV Assembly (220/240 V)	1

Figure 8-18. Central Control Computer Assem

Ref.	Part No.	Description
	40832201	Central Control Computer Assembly (see figure 8-5, item 16)
1	61031201	• Central Control Computer Cover
2	61031301	• Central Control Computer Base
3	61031101	• Central Computer Circuit Board Assembly
		(see figure 5-12 for the schematic and components list)

Figure 8-19. Mechanism Assembly

Sheet 1

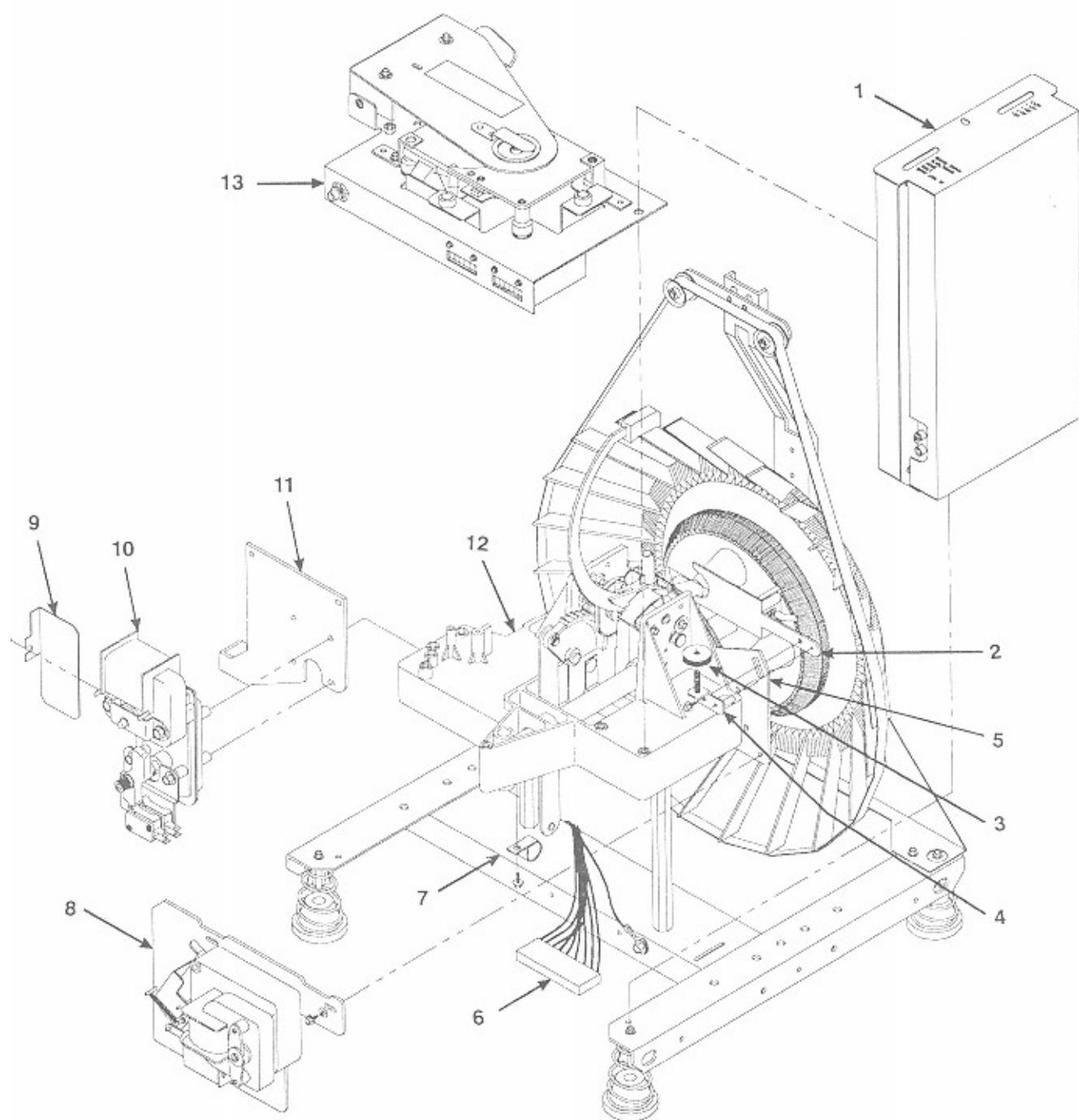


Figure 8-20. Mechanism Assembly (Sheet 1)

Ref.	Part No.	Description	Qty
	61047801	CD Mechanism Assembly	Ref.
1	61048101	• Decoder & Mech Board Assembly	1
	30955501	• 4 Wire Harness	1
	30955601	• • 14 Wire Harness	1
	21959501	• • 15 Conductor Ribbon Wire	1
	61047901	• • Decoder Board	1
	40847801	• • Center Support Assembly (PWB)	1
	21962101	• • Support RCA Jack	1
	70121906	• • Hex Spacer (4-40 Thread)	4
	61053401	• • Mechanical Controller Board	1
	70500004	• • Plastic Standoff	1
	61054001	• • Cover-Decoder Board (Outside Cover)	1
	70233202	• • Snap Bushing	1
	61054101	• • Cover Mech. (Inside Mounting Cover)	1
2	30906801	• Switch Assembly Optical	1
	30905901	• • Optical Sw & Conn Assembly	1
	30794501	• • Bracket-Mtg (Optical Switch)	1
3	21818401	• Knob Adjusting	1
4	21818601	• Bracket Assembly Adjusting	1
5	40721801	• Plate Mounting (Intermediate)	1
6	40830003	• CD Harness Assembly	1
7	20554502	• Clip Cable	1
8	40721901	• Sprag Assembly (See figure 8-21)	1
9	30946901	• Shield-Oil Spray	1
10	40720802	• Cam Switch & Motor Assembly (See figure 8 - 22)	1
11	30790701	• Plate Motor Mounting	1
12	60870703	• Base-Mechanism (CDM-4)	1
13	61048001	• Plate Assembly-Mounting (CDM-4)	1

Figure 8-19. Mechanism Assembly

Sheet 2

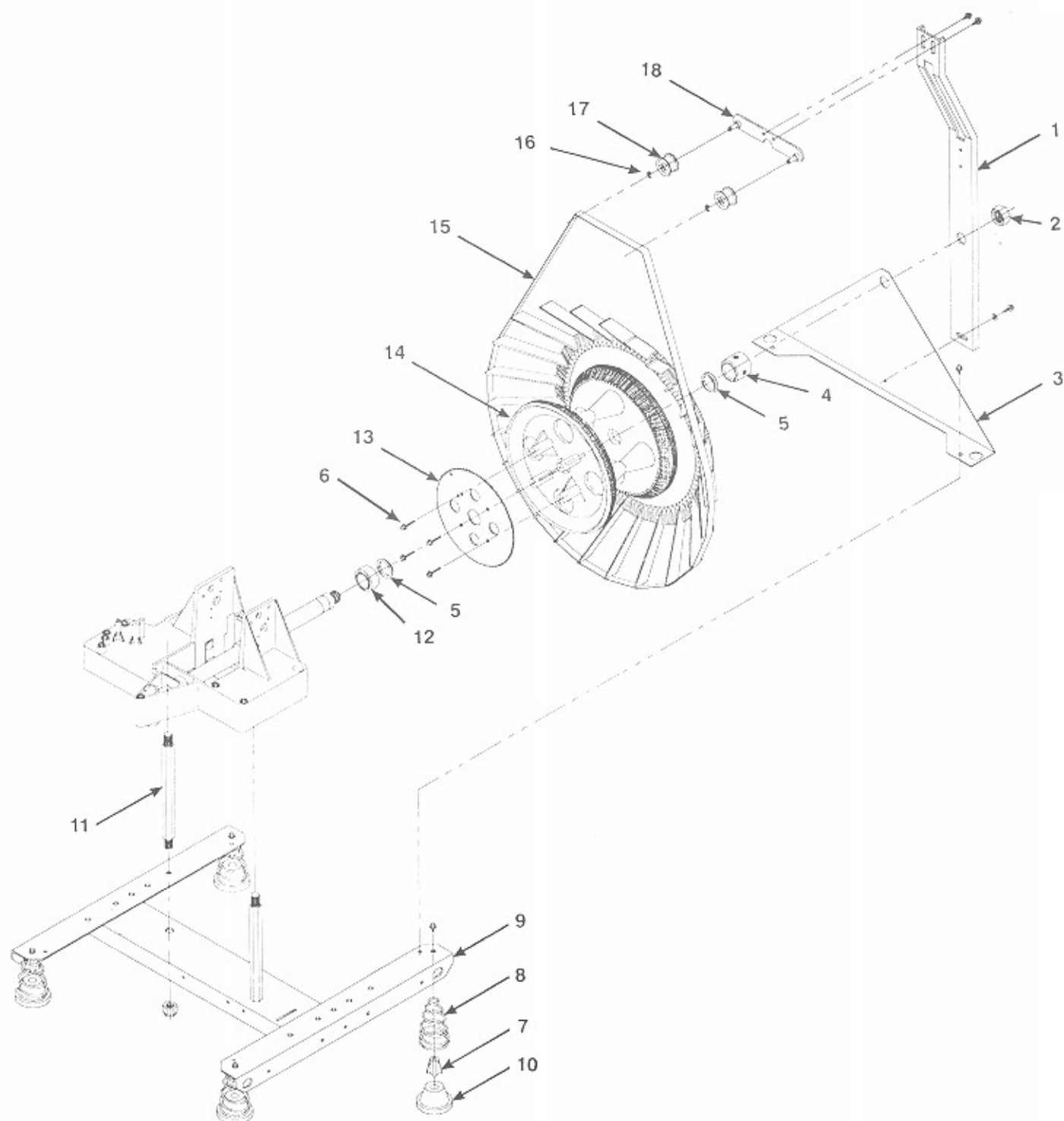
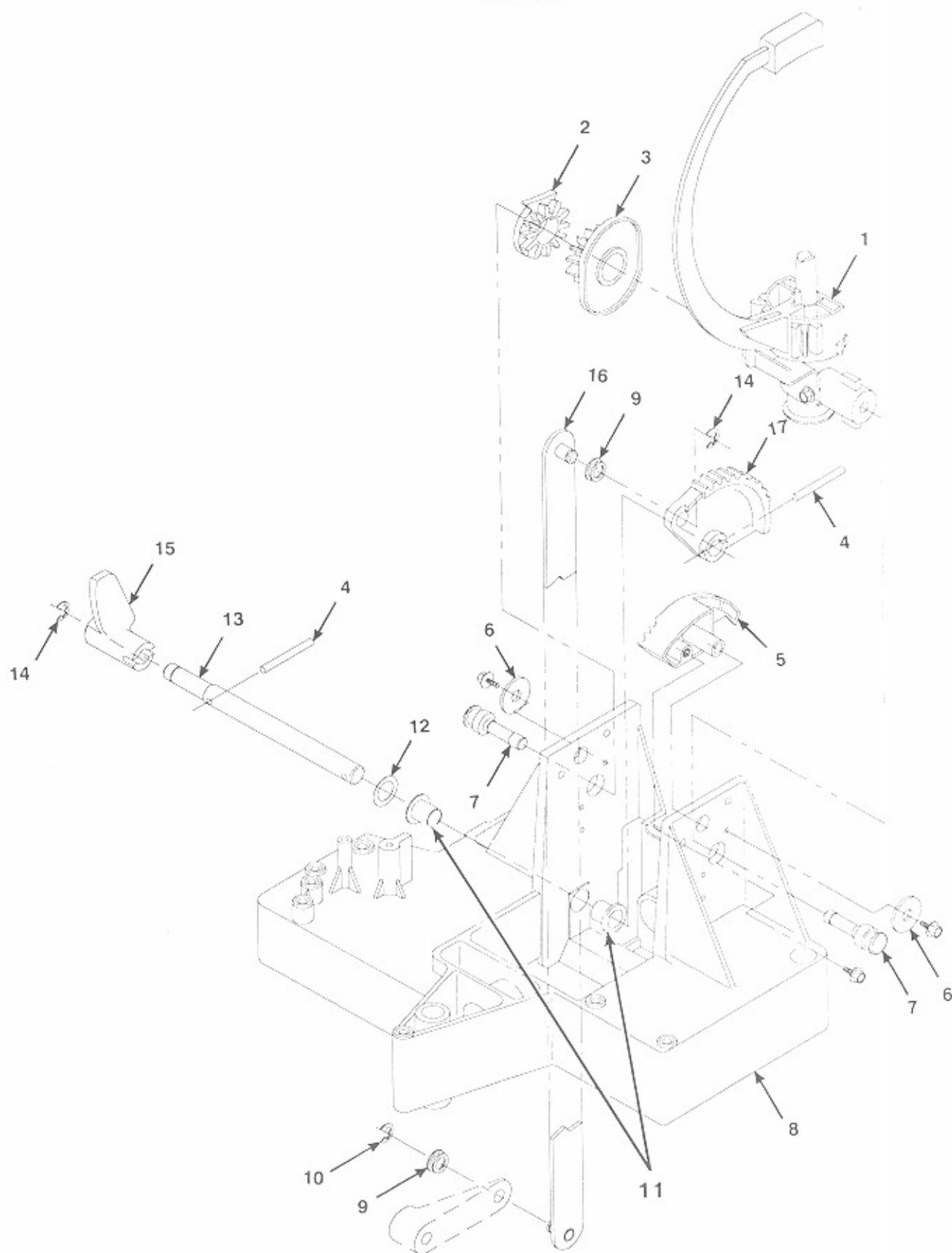


Figure 8-20. Mechanism Assembly (Sheet 2)

Ref.	Part No.	Description	Qty
	61047801	CD Mechanism Assembly	Ref.
1	40721303	• Guide Assembly-Gripper Bow	1
2	70130109	• 9/16-18 Jam Nut	1
3	61052901	• Support Rear	1
4	21812601	• Collar	1
5	70146001	• Bearing Nyliner	2
6	86663612	• #8-32 X 3/4 HWRHS Type 17 Screw - Special	4
7	20627202	• Support Spring (Upper)	4
8	20612804	• Spring	4
9	30791502	• Support Assembly Mech	1
10	21153701	• Support Spring (Lower)	4
11	21812501	• Support-Mechanism	2
12	25156906	• Washer-Shoulder	1
13	30790401	• Gear-Magazine	1
14	61045801	• Magazine Assembly-CD	1
15	21813802	• Belt	1
16	70143003	• Ring-External Retaining	2
17	20384301	• Roller-Belt	2
18	21089401	• Bracket Assembly-Roller	1

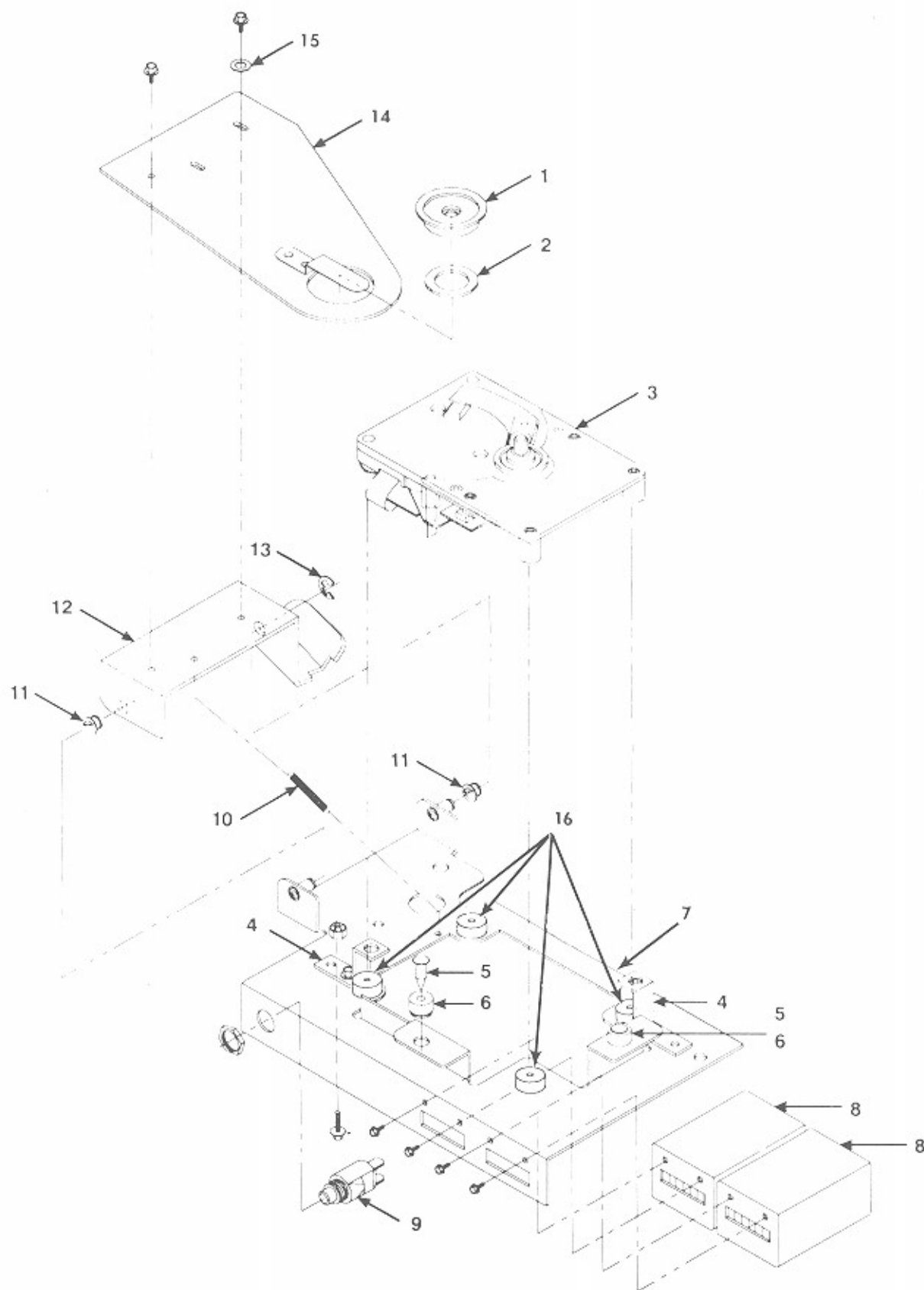
Figure 8-19. Mechanism Assembly

Sheet 3



Ref.	Part No.	Description	Qty
	61047801	CD Mechanism Assembly	
1	40720701	• Gripper Bow & Trunnion Assembly	1
2	40720401	• • Gear - Cam	1
3	40720601	• • Gear - Trunnion	1
4	70113003	• • Pin - Roll .131/.135 x 11/16	2
5	30790603	• Rotator Assembly	1
6	70120010	• Washer	2
7	21079202	• Pin - Trunnion	2
8	60870703	• • Base - Mechanism (CDM-4)	1
9	70146004	• • Bearing - Nyliner	2
10	70143004	• • Ring - External Retaining	2
11	70146005	• • Bearing - Nyliner	2
12	70122533	• • Washer - Bowed	1
13	21813202	• • Cam Drive Shaft	1
14	70143010	• • Ring - External Retaining	1
15	30930002	• • Cam - Hold Down	1
16	21810201	• • Link Assembly - Transfer	1
17	40720502	• • Gear - Sector	1

Figure 8-19. Mechanism Assembly
Sheet 4



Ref.	Part No.	Description	Qty
	61047801	CD Mechanism Assembly	
1	21960101	• Magnetic Hub Assembly	1
	30930401	• • Magnet Ring (Hold Down)	1
2	21960201	• Washer-Traction	1
3	30955401	• Industrial CDM-4 Player W/Guide Pin	1
4	21961201	• Bracket Lockdown	2
5	20930007	• Rivet-Accordian	2
6	21813901	• Grommet	2
7	61048001	• Plate Assembly-Mounting (CDM 4)	1
8	30933301	• Counter & Plug Assembly	1
	21538302	• • Counter (Money)	1
	21441802	• • Counter-Electric (Play)	1
9	21581801	• Switch-Pushbutton (Momentary) with Nut	1
10	21095501	• Spring-Tension	1
11	70146004	• Bearing Nyliner	1
12	40847501	• Hinge-Hold Down (CDM-4)	1
13	70143004	• Ring-External Retaining	1
14	30954701	• Plate Assembly-Hold Down	2
15	70120019	• Washer	2
16	21940101	• Grommet - Shock Mount	4

Figure 8-21. Sprag Assembly

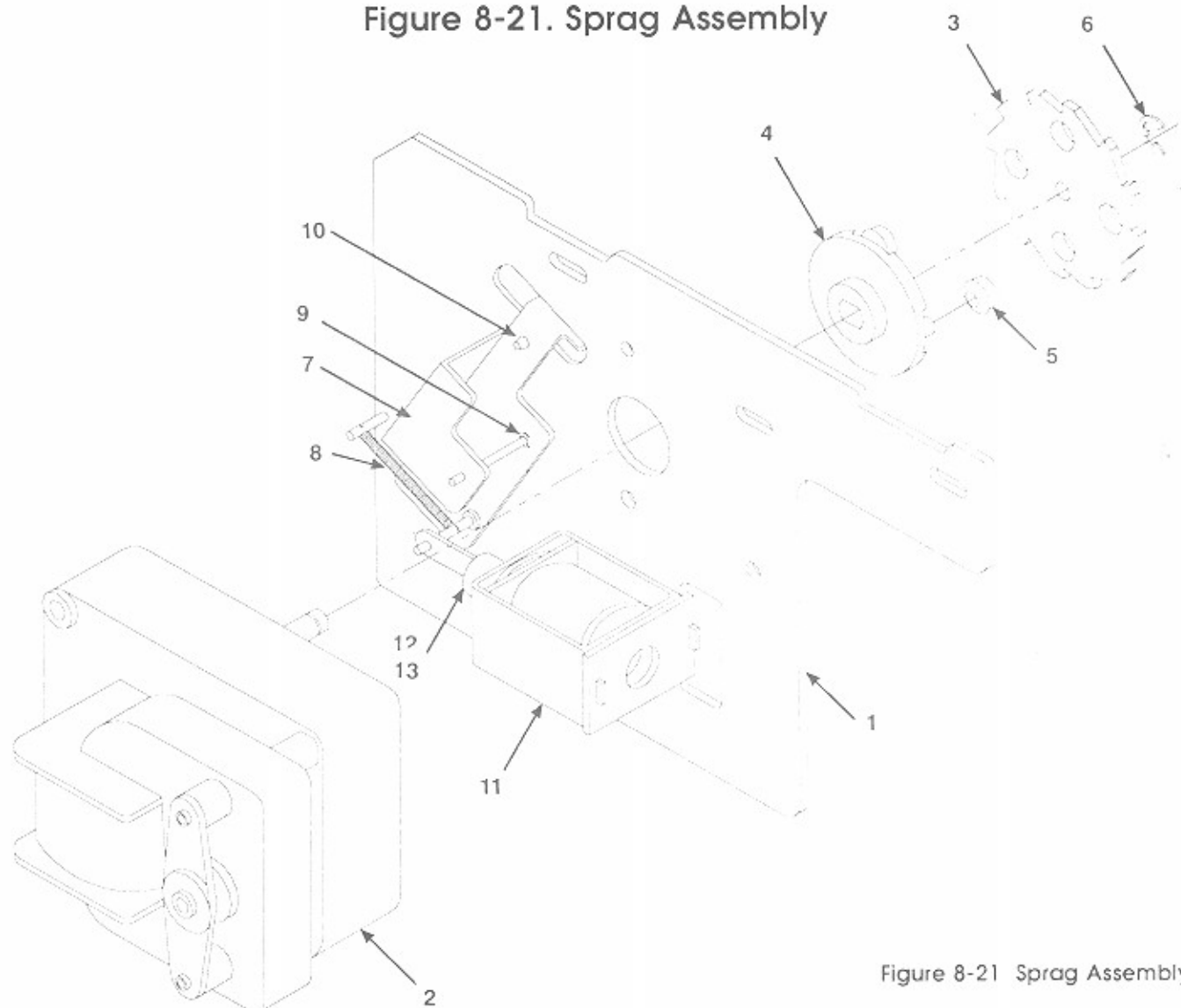


Figure 8-21 Sprag Assembly

Ref.	Part No.	Description	Qty
	40721901	Sprag Assembly (see figure 8-20, sheet 1, item 8)	Ref.
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 (Rubber)	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 8-22. Cam Switch and Motor Assembly

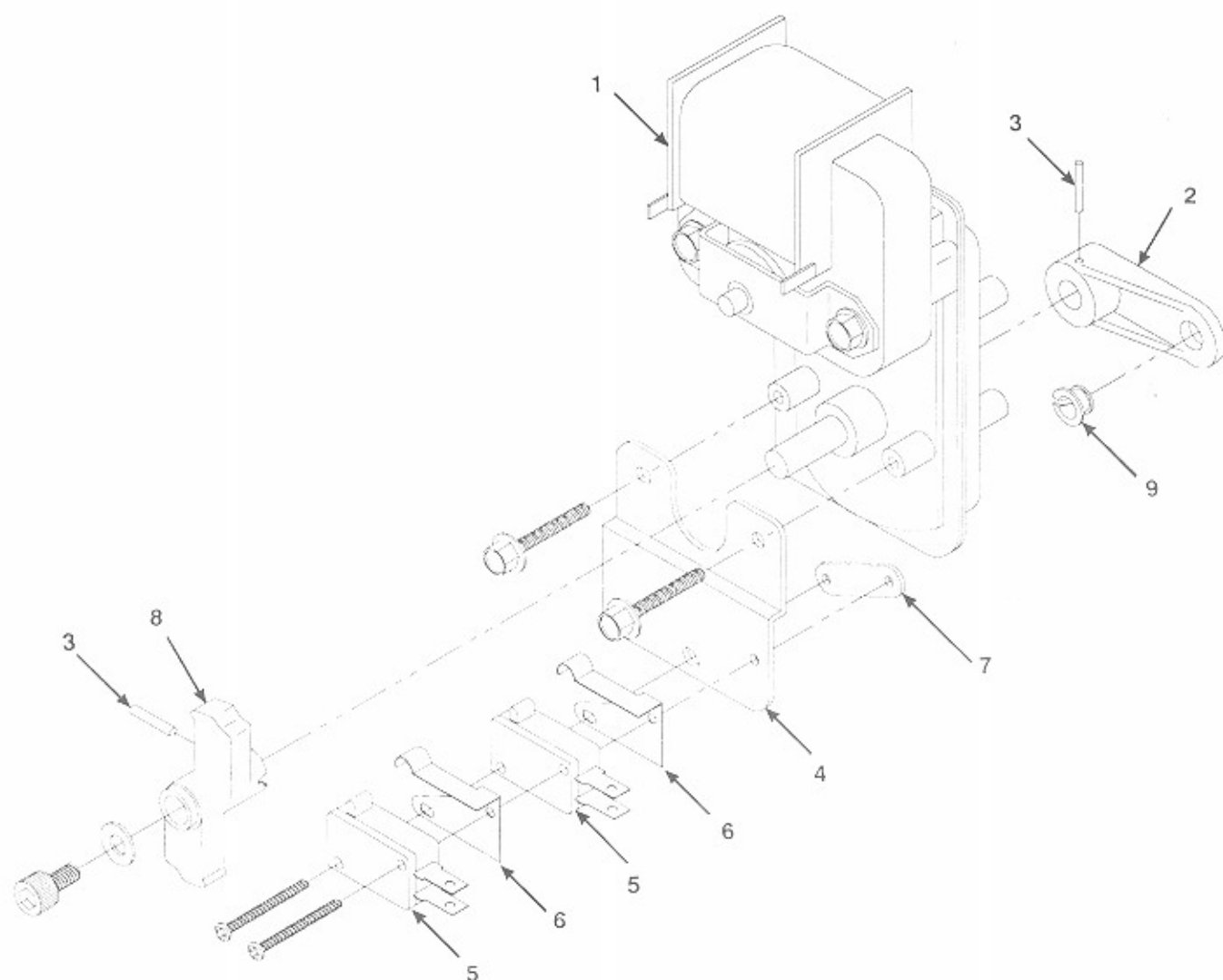


Figure 8-22. Cam Switch and Motor Assembly

Ref.	Part No.	Description	Qty
	40720802	Cam Switch and Motor Assembly (see figure 8-20, sheet 1, item 10)	Ref.
1	40720901	• Cam Motor	1
2	21810401	• Trunnion Crank	1
3	70113116	• Roll Pin	2
4	30790901	• Switch Plate	1
5	21073101	• Switch	2
6	21082901	• Switch Actuator	2
7	21083001	• Twin Nut	1
8	30793402	• Switch Cam	1
9	70146004	• Bearing	1

Table 8-1. 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 hand-held 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 and 610237XX 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.
21639701	Background Music Kit	Allows the phonograph to play Autoplay and customer selected music at different levels. Music can be played at different volumes in two different rooms or music can be switched to different rooms during either Autoplay or customer selections.
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 CD 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.
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.
66505901	Service Kit	Includes central computer, digital display, power supply board, optical switch, power supply heat sink, blank titles, micro switches, peanut lamps, and fuses.
66505903	Service Kit	This kit includes: Mechanism controller and decoder assembly, CDM-4 CD player with mounting accessories.

Part No.	Description	Function
26711401	Amplifier Adapter Harness	Allows a 130 watt amplifier to be connected to a CD-100C as a replacement amplifier (the total amplifier output will be limited to 130 watts in this configuration).
26699503	Security Bar Kit	Heavy steel bar locks in place over cash box door. A padlock is required (not supplied by Rowe).
26712304	Touch Up Paint	Light Taupe Metallic Dark
26713401	Touch Up Paint	Dark Mocha Brown Metallic
40846001	Keyboard Cover	Provides a flexible shield that protects the selection keyboard (POPULAR, RESET, 0-9, <, >) from water and other fluid spills.
21957501	LaserStar IR (Infra-Red) Remote Control Kit	Wireless remote control of: volume, cancel, selections, and pause. Volume of each channel can be controlled separately, or both channels can be controlled at once.

Parts Included In The Handy Case

(Refer to Figure 8-15 Item 6)

21730516	• Accessories Bag Assembly	1
21827201	• • Bag - Zip Lock	1
70097501	• • • Contact - Univ Conn (Pin)	6
70097502	• • • Contact - Univ Conn (Socket)	6
70075601	• • • Contact - Post	10
70091012	• • • Terminal Lug - Spade	10
70072002	• • • Fuse Cartridge (8 amp.)	2
70072106	• • • Fuse Cartridge (5 amp.)	2
26676802	• • • Quality Card - Phonograph	1
21822622	• • Manual - Service (CD-51A)	1
21888607	• • Programming Reference Guide	1
21957002	• • Routine Service Guide	1
30931304	• • Alternate Price Card	1
61031402	• • Universal Price Sheet	1
30935903	• • Blank Title Strip With Numbers	25
30940601	• • Title Page Filler	8
30935904	• • Blank Title Strip (Without Numbers)	5
21969501	• • Errors Guide	1