The Christie Xenolite 35mm Movie Projector System

User's Guide

Version 5-062412
Printed June 2012

Published by:
FedEx Office
2125 El Camino Real
Santa Clara, CA 95050
http://www.fedex.com

Table of Contents

Introduction

There is nothing like going to the movies. Watching your favorite actors on the big screen while snacking on freshly made popcorn topped with butter. There is nothing like it in the world. For decades, going to the movies has become one of the greatest forms of escapism imaginable.

As you munch on your popcorn while becoming lost in the plot, do you ever wonder how movies are presented? What a movie projector looks like? How movie images become enlarged across the screen? How film moves through a movie projector or how the soundtrack is produced?

Following this introduction are nine sections that teach you all you need to know about the Christie Xenolite 35mm movie projector system. You begin by learning about the different components of the projector system and how to maintain them. Following the overview and maintenance sections, you learn how to setup the projector for a specific film format and how to adjust the theatre curtains. After setting up the projector and curtains, you learn how to load and thread film. Finally, you learn how to operate and troubleshoot the projector system.

Here is a summary of the sections:

- The **System Overview** section introduces you to the three main components of the Projector System: the projector unit, the Film Platter and Tree Unit and the DTS Sound Console.

- The **Getting Started** section covers maintenance supplies and safety precautions.

- The **Maintenance** section teaches you how to check and replenish the projector's machine oil, lubricate the gear systems and clean the lenses and film pathway compartment.

- The **Format and Sound Setup** section teaches you how to set up the projector for scope and flat film formats, how to change the soundtrack CDs and how to adjust the theatre curtains.

- The **Loading the Film** section teaches you how to load film from a studio reel to the supply film platter.

- The **Threading the Film** section teaches you how to thread the film from the supply film platter through the projector unit and back to the take-up film platter.

- The **Operating the Projector System** section teaches you how to operate the projector and lighting system while performing a number of quality checks.

- The **Troubleshooting** section provides solutions to common problems experienced while operating a projector system.

- Finally, the **Glossary** section defines common terms you will encounter while learning about the projection system.

Turn the page and let's get started.

System Overview

The Movie Projector Unit

As you enter the projection room, the largest piece of equipment you encounter is the movie projector unit with its front side facing a window mounted in the wall. Walk to the right side of the projector unit. From here you see the main control panel, the illumination source; the DTS sound reader unit, the film pathway compartment and the failsafe unit. Each of these components is explained in more detail starting on the next page. The picture below shows you the key components on the right side of the movie projector unit.

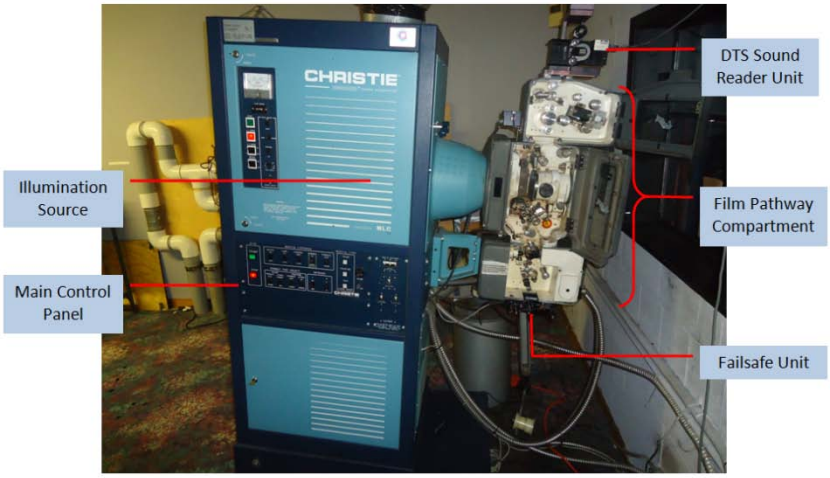

Figure 1: Movie Projector Unit (Right Side)

Walk to the left side of the projector unit. From here you see the projector motor, the gearbox containing the projector's gear systems and the detachable lens installed in the front of the projector unit. Each of these components is explained starting on the next page. The picture below shows you the key components on the left side of the projector unit.

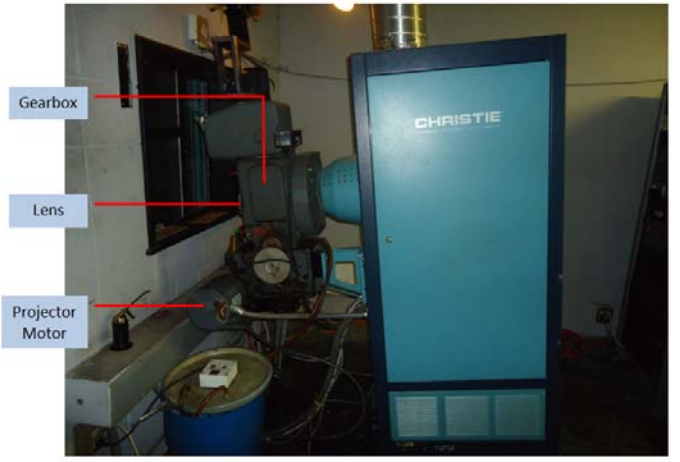

Figure 2: Movie Projector Unit (Left Side)

Main Control Panel

Return to the right side of the projector unit and study the main control panel. Looking left to right, you see the start and stop buttons used for projector operation, the motor and lamp switches used to turn the motor and lamp on and off, the manual dowser switch used to open and close the shutter in front of the projector lamp and the main power switches used to control the main power to the projector. The picture below shows you the main control panel controls.

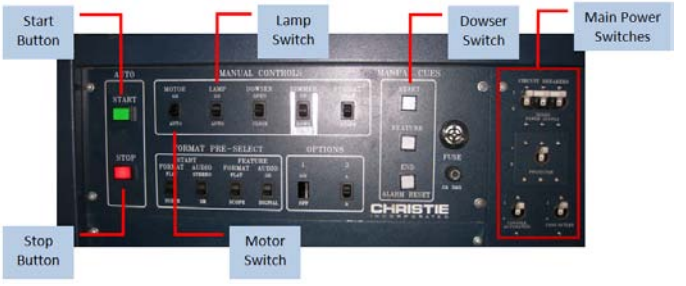

Figure 3: Main Control Panel

Projector Motor and Gear Systems

Walk back to the left side of the projector unit and look down below the gearbox, you see the projector's electric motor. The motor turns the movie projector gear systems using a rubber belt much like a fan belt operates inside the engine of your car. Open the gearbox located above the motor and you see the visible gear systems that connect to and drive a system of rollers and sprockets located on the right side of the projector unit inside the film pathway compartment. The picture below shows you a close-up view of the motor and gear systems.

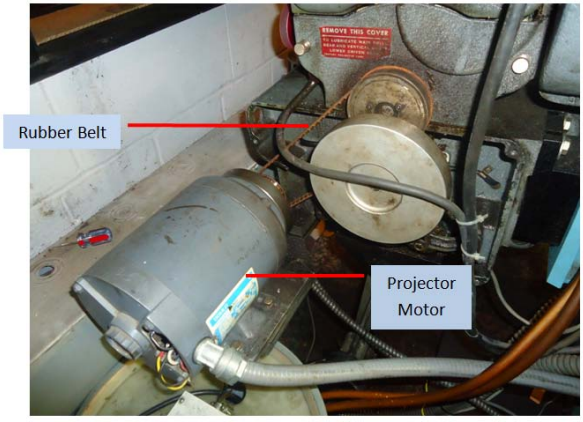

Figure 4: Projector Motor

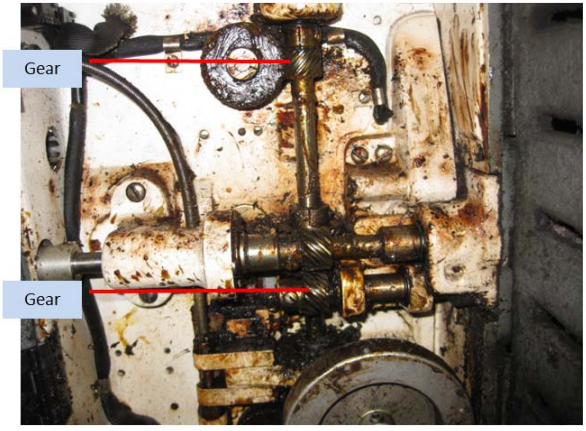

Figure 5: Gear Systems

Film Pathway Compartment

Return to the right side of the projector unit one last time and open the film pathway compartment door. Looking inside the cavity, you see the multiple mechanisms of the film pathway compartment. This compartment contains film channels, rollers that guide the film, sprockets that grip and pull the film and gate latches that stabilize the film. Together, these components propel the film strip forward at a steady speed in front of the illumination lamp to create a motion picture. The picture below shows you the key components of the film pathway compartment.

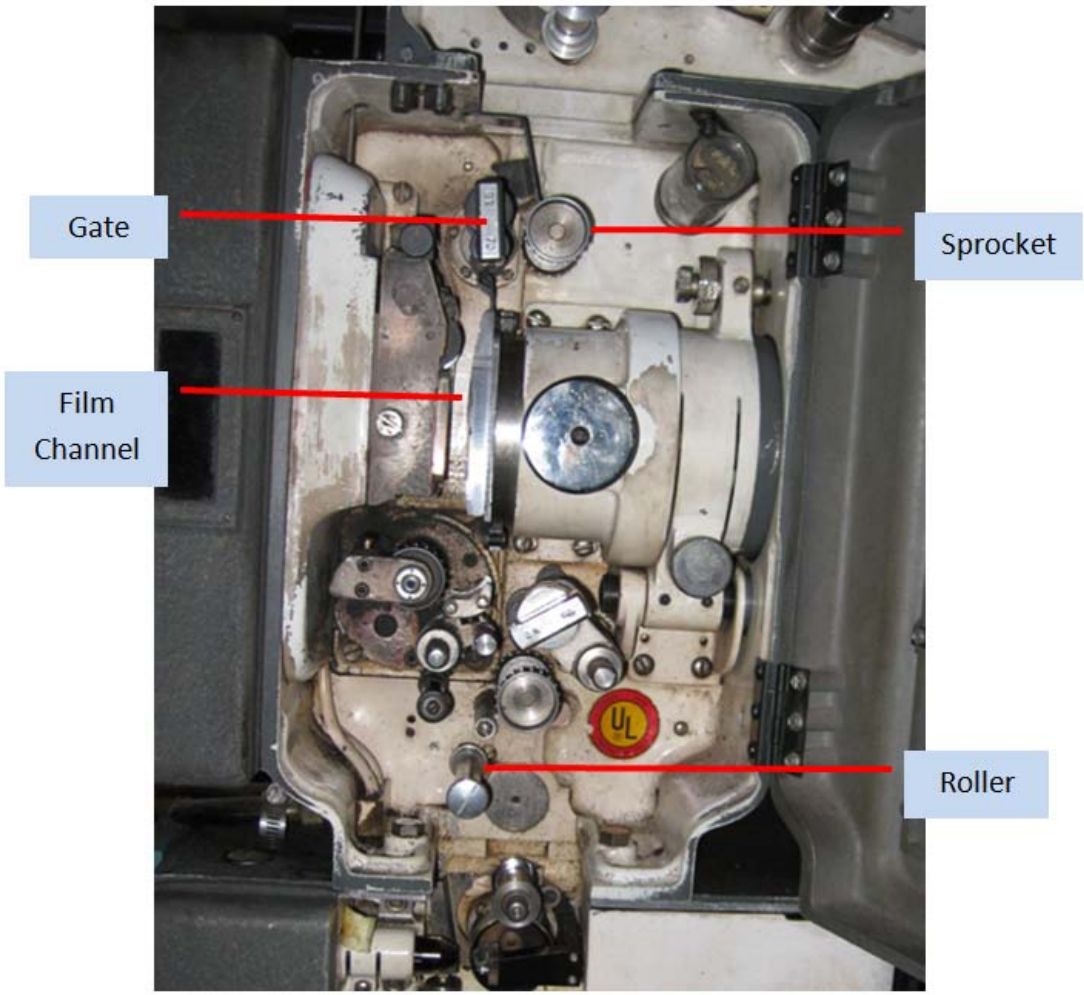

Figure 6: Film Pathway Compartment

The Illumination Lamp

Open the cabinet door behind the film pathway compartment and above the main control panel. Inside you see the illumination lamp bulb mounted in the center of a reflective dish inside the lamp housing. The illumination lamp is a powerful light source necessary to project moving film images onto a large movie screen. Looking to the right inside the lamp housing, you can see that the lamp dish is positioned behind the projection plate mounted inside the film pathway compartment. The projection plate is used to hold the film strip into position.

Figure 7: Lamp Bulb

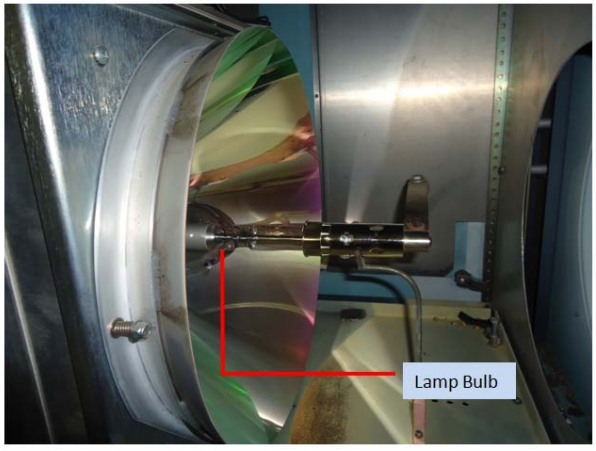

Figure 8: Mounted Lamp Bulb

Lens System

The lens system consists of two interchangeable lenses: one called a flat lens and the other called a scope lens. Walk to the front of the projector and look at the installed lens while holding the second lens next to it. You notice that one of the lenses has a flat recessed glass surface while the other has a protruding curved glass surface. The lens with the flat recessed glass surface is called the flat lens and the lens with the protruding curved glass surface is called the scope lens. The flat lens projects a direct image while the scope lens projects a wider image. Each of these lenses match specific 35mm film formats also called scope and flat.

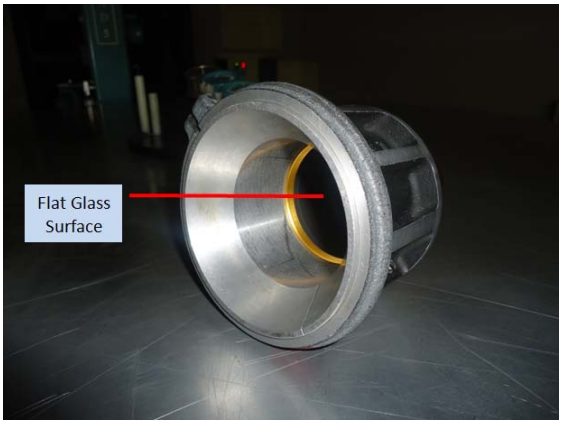

Figure 9: Flat Lens

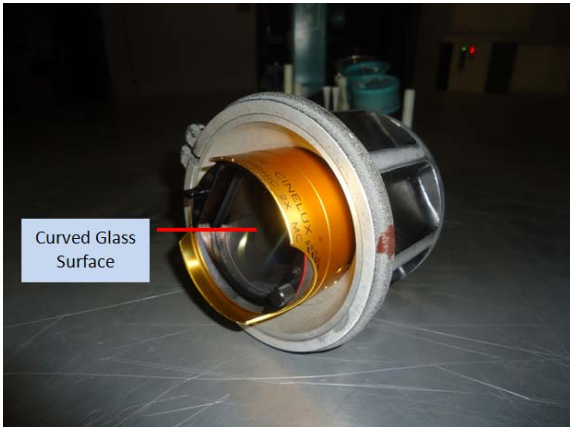

Figure 10: Scope Lens

Failsafe Unit

Look directly below the film pathway compartment. You see a small black rectangular device. This device is called the failsafe unit. The failsafe unit detects irregularities in film tension using a sensitive spring loaded lever arm with rollers. If the film jams or stops for more than a few seconds, the lever arm drops and signals the failsafe unit to shut down the entire movie projector unit. The purpose of the failsafe unit is to prevent the stilled film strip from being incinerated by prolonged exposure to the illumination lamp's heat.

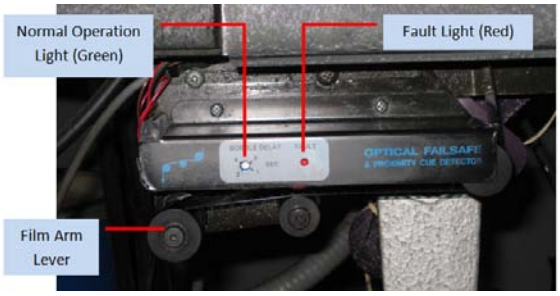

Figure 11: Failsafe Unit

DTS Sound Reader Unit

Now look directly above the film pathway compartment. You see a larger black device with rollers and a cable attached. This device is called the DTS sound reader unit. The DTS sound reader unit captures programmed sound data from the sound strip printed on the film as it runs through the unit. After data is captured, it is transmitted through a data cable to the DTS sound system console where it synchronizes with the movie soundtrack Compact Discs (CDs) to produce the movie's sound and effects. The DTS sound reader unit also works with a secondary sound reader unit located just below the film pathway compartment.

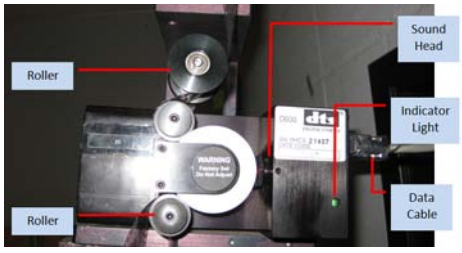

Figure 12: DTS Sound Reader Unit

The Film Platter and Tree Unit

Standing next to the projector unit you see a tall steel tower with three large moving platters attached to it. This assembly is called the film platter and tree unit. The film platter and tree unit is used to store the film coils and manage the distribution of film to and from the projector unit during operation. Each film platter is mounted on a heavy steel brace and is slowly rotated by a small electric motor. The picture below shows you the key components of the film platter and tree unit. Each of these components is explained in more detail on the next pages.

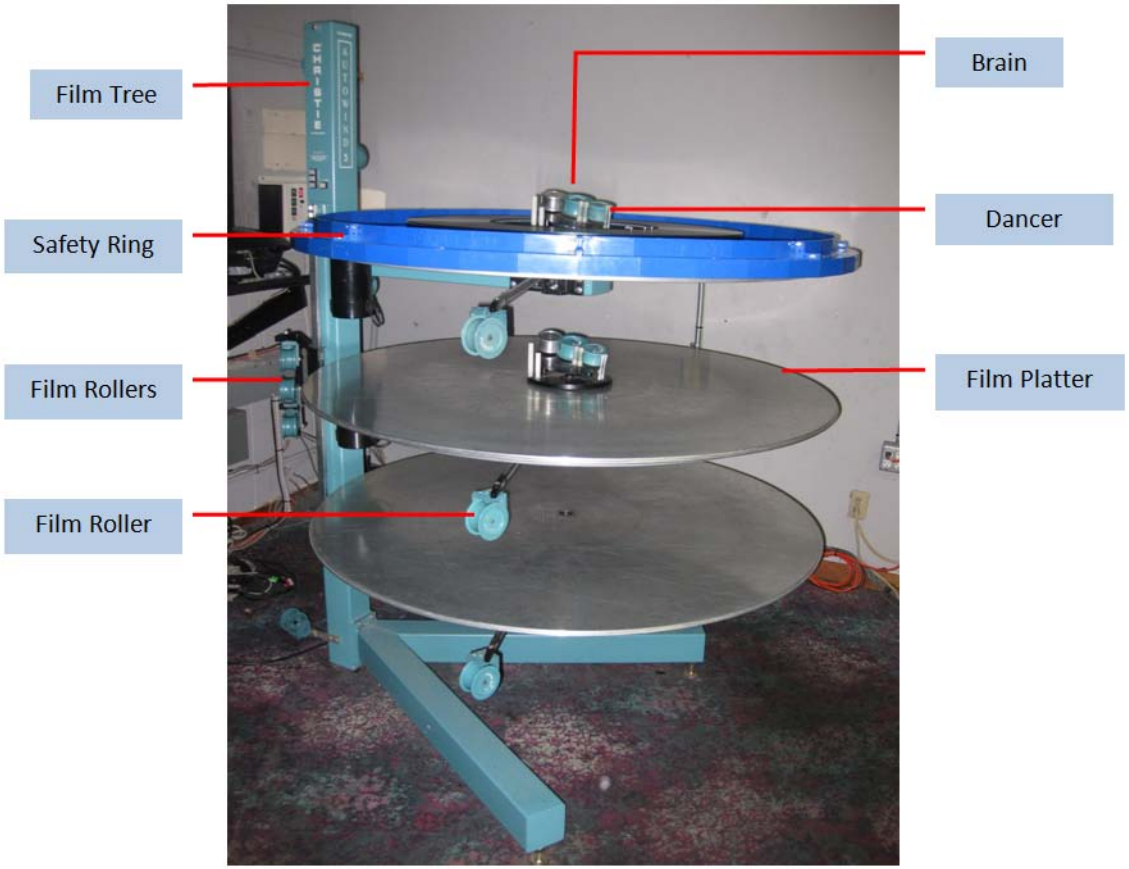

Figure 13: Film Platter and Tree Unit

The Brain

Walk closer to one of the film platters. The device you see mounted in the center of the film platter is called the brain. The brain is a mechanical apparatus consisting of film rollers and plastic posts used for threading film. Film is threaded through the brain first before being threaded through the film tree and projector unit.

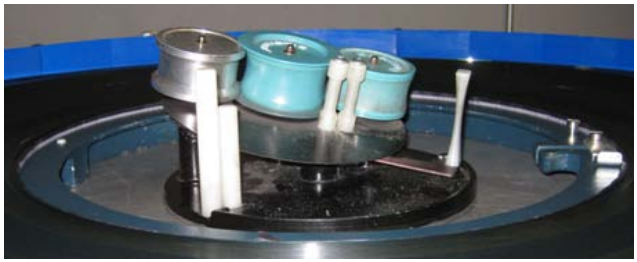

Figure 14: The Brain

The Dancer

Now look closer at the brain. You will notice a tall set of plastic posts mounted on a level. If you move the level to the left, the film platter rotates. This mechanism is called the dancer. The dancer is a sensor lever that is attached to the brain apparatus. The dancer activates the film platter motor when the lever arm is pulled to the left by the moving film strip.

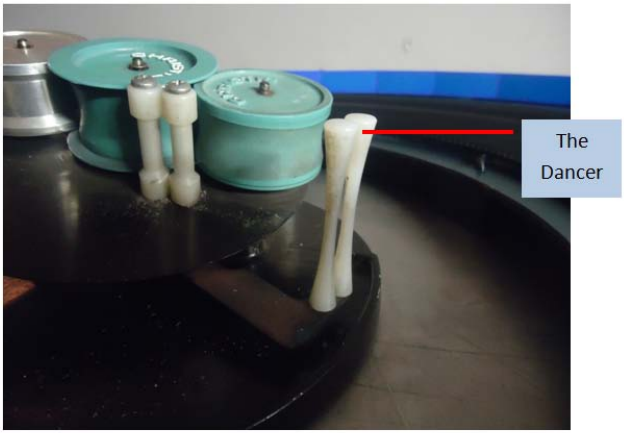

Figure 15: The Dancer

The Film Pucks and Safety Ring

If film is loaded onto the film platter, you see several small white disks placed along the outside of the film coil. These small disks are called film pucks. Film pucks are weighted objects with an adhesive bottom that are placed along the outside edges of the film coil to keep it intact. In addition to film pucks, a safety ring is also used to keep the film coil intact. The safety ring is snapped on the edge of the film platter.

Figure 16: Film Puck

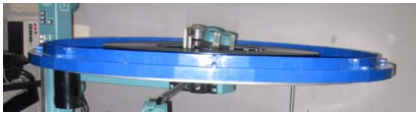

Figure 17: Safety Ring

The Film Platter

Stepping back and looking at the entire film platter and tree unit, you see the three film platters. The film platters are large round metal plates that hold the coiled film stacks going to and coming from the projector unit. The film platters are rotated by small electric motors activated by the dancer.

Figure 18: The Film Platter

The Film Tree

Walking behind the film platters, you see a tall steel post with rollers mounted on the sides. This steel post is called the film tree. The film tree supports the film platter braces and includes a series of rollers mounted on the sides to guide the film strip to and from the projector unit.

Figure 19: The Film Tree

The Film Rollers

Looking at the film tree from top to bottom and along the sides of the film platters, you see the film rollers. Film rollers are grouped or individual plastic wheels mounted along the sides of the film tree and film platters that are used to guide the film strip to and from the projector unit.

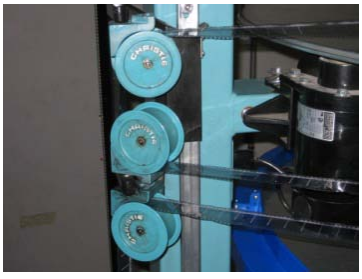

Figure 20: Film Roller Cluster

The DTS Sound Console

Standing near the film platter and tree unit you see a tall cabinet with several electronic components stacked vertically. This cabinet is called the DTS sound console. The DTS sound console is the main sound control unit that receives the sound data from the DTS film reader, synchronizes it with the soundtrack CDs then sends the sound signal to the theatre speakers. The picture below shows you the key components of the DTS sound console. Each of these components is explained in more detail starting on this page.

Figure 21: DTS Sound Console

CD Player

Approach the DTS sound console and look at the top component. You quickly recognize this equipment as the CD player because it resembles the one you have at home. This CD player, however, has three CD drives and special circuitry that plays movie studio soundtrack CDs shipped with the movie reels. As the CD plays, it synchronizes with the sound data transmitted from the movie projector DTS sound reader unit. The synthesis of sound recordings from the CD mixed with sound data captured from the film strip forms the movie's soundtrack.

Figure 22: CD Player

The Control Panel

Looking directly below the CD player, you see the control panel. The control panel allows you to control the main volume and digital or analog channels. Among the components included inside the control panel is the sound processor that produces the movie's special sound effects and Dolby stereo. The picture below identifies the main features of the control panel.

Figure 23: Control Panel

The Amplification Units

Looking at the bottom of the sound console, you see a stack of black rectangular boxes. These black boxes are called the amplification units. The amplification units boost the sound signals produced by the DTS sound system console before the signals are transmitted into the theatre to power the enormous speaker systems.

Figure 24: Amplification Units

Getting Started

Maintenance Supplies

Before you can thread the projector unit with film and present a movie, you must first complete specific maintenance requirements. This section introduces you to the required supplies and safety precautions you need to maintain key components of the movie projector unit. The pages that follow discuss each maintenance item in more detail.

To perform maintenance on the movie projector unit, you need:

- Lens cleaner
- Projector cleaner
- Synthetic lubricant
- Lens cleaning wipes
- Projector cleaning wipes
- Disposable gloves
- Cotton swabs
- Oil dispenser
- Compressed air container
- Flashlight

Lens Cleaner

The lens cleaner is a solution formulated to clean high end optical surfaces without streaking or spotting the lens surface.

Figure 25: Lens Cleaner

Projector Cleaner

The projector cleaner is a general-purpose solution designed to remove debris from the film pathway compartment surfaces, projection and aperture plates and film platter surfaces. The projector cleaner also functions as a mild lubricant for the rollers, sprockets and gate latches located inside the film pathway compartment.

Figure 26: Projector Cleaner

Synthetic Lubricant

The synthetic lubricant is a thick paste-like material that is used to lubricate the visible gear systems of the movie projector unit.

Figure 27: Synthetic Lubricant

Lens Cleaning Wipes

Lens cleaning wipes contain non-scratching fibers that will not damage the lens surface. Always use lens cleaning wipes with the lens cleaning solution. Never use a substitute wipe such as a paper towel or tissue to clean the lenses.

Projector Cleaning Wipes

Projector cleaning wipes are used with the projector cleaning solution to clean the film pathway compartment surfaces, projection plate and aperture plates.

Disposable Gloves

Disposable polyethylene gloves are necessary when applying lubrication to the gear systems and are worn to avoid skin contact with the synthetic paste material.

Cotton Swabs

Cotton swabs are necessary to clean hard to reach areas within the film pathway compartment and the grooves and ridges of the projection plate.

Oil Dispenser

The oil dispenser is used to deposit machine oil into the oil reservoir. The oil reservoir supplies lubrication to the projector's hidden gear systems.

Compressed Air Container

Compressed air is used to thoroughly clean dust and debris from the film pathway compartment and projection plate by shooting a stream of high pressured air.

Flashlight

A small hand-held flashlight helps illuminate parts of the projector you are working on while inside a dimly lit projection booth.

Safety Precautions

You must use caution when handling cleaning solutions and lubricants. Listed below are important safety warnings you must follow when using the cleaning solutions and synthetic lubricant.

Lens and Projector Cleaners

You must avoid eye and skin contact along with prolonged exposure to vapors when spraying and wiping. Wash all affected areas immediately if solutions come into contact with the skin and eyes.

Synthetic Lubricant

You must wear gloves at all times when applying the lubricant and avoid skin and eye contact. Wash all affected areas immediately if paste comes into contact with your skin.

Maintenance

Now that you have been introduced to the needed maintenance supplies, you are ready to begin maintenance on the projector unit. This section teaches you the maintenance procedures necessary to prepare the movie projector unit for film format setup.

This section covers:

- How to check and fill the projector unit oil reservoir
- How to clean the lenses
- How to clean the projection plate
- How to clean the film pathway compartment
- How to lubricate the projector unit gear systems

Checking and Filling the Oil Reservoir

You must maintain the oil supply to keep projector gears running smoothly.

To check and fill the oil reservoir:

1. Flip up all the main power switches on the right side of the main control panel to power up the movie projector unit (see Figure 3 on page 7).

2. Flip up the motor switch to the **On** position under the Manual Controls section of the main control panel (see Figure 3 on page 8). The projector motor runs.

3. Open the film pathway compartment door and locate the oil reservoir level window. This window is located directly below the projection plate.

4. Illuminate the oil reservoir window using a flashlight to check the oil level. If the oil level is at or below the fill line, fresh oil will need to be added.

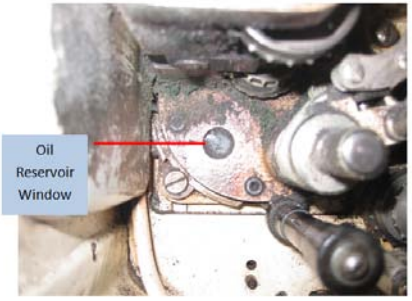

Figure 28: Oil Reservoir Window

5. Flip down the motor switch to the **Auto** position to stop the projector motor.

6. Walk to the left side of the movie projector unit and open the gear box door.

7. Place the oil dispenser spout into the filler hole and squeeze the trigger 2-3 times to pump fresh machine oil into the oil reservoir located underneath the gear system shafts.

Figure 29: Oil Filler Hole

Cleaning the Lenses

You must clean all lens glass surfaces regularly to avoid projecting enlarged debris on a movie screen during the presentation of a movie.

To clean the scope and flat lenses:

1. Walk to the right side of the projector unit and open the film pathway compartment door.

2. Locate and unscrew the lens locking knob by turning it in a counter-clockwise direction.

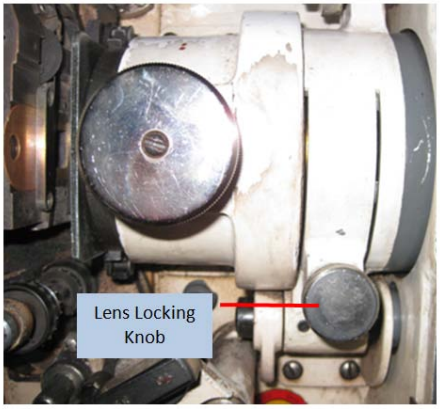

Figure 30: Lens Locking Knob

3. Move to the front of the projector unit and gently remove the lens from the lens socket.

4. Spray the lens cleaner onto the lens cleaning wipe and gently clean the front and back lens surfaces. Check the lens for spots and dust.

   Important Note: Please remember to never touch the lens surfaces with your fingers or blow with your mouth directly into the lens as this introduces both fingerprints and saliva.

5. Insert the lens back into the lens socket by carefully aligning it with the small latch then gently pushing it in until firmly in place. Tighten the lens locking knob by turning it in a clockwise direction.

Cleaning the Projection Plate

You must clean the projection plate regularly in order for the film strip to pass smoothly in front to the illumination source without collecting debris.

To clean the projection plate:

1. Walk to the right of the projector unit and open the film pathway compartment door.

2. Locate the projection plate and unscrew the small locking knob located at the bottom of the plate.

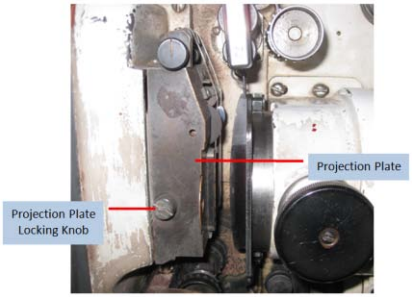

Figure 31: Projection Plate

3. Remove the projection plate from the film pathway compartment by gently sliding the plate unit towards you.

4. Spray projector cleaner solution on a projector cleaner wipe and gently clean both sides of the plate.

5. Spray projector cleaner on the tip of a cotton swab and thoroughly clean the grooves and ridges of the projector plate surfaces.

6. Thoroughly spray both sides of the projector plate using the compressed air container to remove any remaining dust and debris.

7. Replace the projection plate by aligning the tabs then gently sliding the plate into position with the locking knob at the bottom.

8. Tighten the locking knob to secure the plate.

Cleaning the Film Pathway Compartment

You should regularly keep the film pathway compartment free of dust, dirt and other debris. This is necessary to ensure the film strip moves efficiently through the projector unit and is not damaged.

To clean the film pathway compartment:

1. Walk to the right of the projector unit and open the film pathway compartment door.
2. Spray a generous amount of projector cleaner on a projector wipe and thoroughly clean all film pathways and visible surfaces.
3. Spray projector cleaner on the tip of a cotton swab and thoroughly clean smaller spaces and pathway surfaces.
4. Clean all remaining surfaces and areas of dry dust and debris by spraying compressed air using the compressed air container.

Lubricating the Visible Gear Systems

You must lubricate the visible gear systems once every 3 to 4 months to maintain efficient operation of all moving parts within the projector unit gearbox.

To lubricate the visible gear systems of the projector unit:

1. Walk to the left side of the projector unit and open the gearbox door.
2. Place a disposable glove on one hand.
3. Squeeze approximately one inch of paste material from the synthetic lubricant tube on your gloved index finger.
4. Apply a small amount of lubricant around the circumference of each visible gear surface located inside the gearbox using your index finger.
5. Remove and discard the used glove when finished.
6. Close the gearbox door.

Format and Sound Setup

After you have completed all maintenance procedures, you are ready to begin the projection system set up necessary to accommodate a flat or scope film format you will present. This section teaches you the procedures necessary to configure the projection system for a flat or scope movie before film is loaded onto the film platter.

This section covers:

- How to check the film formats
- How to adjust the theatre curtains
- How to change the lenses
- How to change the aperture plate
- How to change the DTS Compact Discs (CDs)

Checking the Film Formats

For you to determine the format of the film, you must look at the label attached at the beginning section of the film strip. This section is called the tail.

Figure 32: Film Tail Section

Note: If the film about to be presented is the same format as the previous film shown, please skip to the **Changing the DTS Disks** section.

Adjusting the Theatre Curtains

You must adjust the theatre curtain opening to accommodate a flat or scope image footprint that projects on the movie screen. For scope images, you must open the curtains wider. For flat images, you must pull the curtains closer together.

To adjust the theatre curtains:

1. Walk to the front of the movie screen and enter the curtain drop on the right side.

2. Locate the curtain control unit mounted on the floor behind the curtain drop.

Figure 33: Curtain Control Unit

3. Toggle the power switch to the **On** position.

Figure 34: Power Toggle Switch

4. Press the **Close** button if the film format is flat projection until the curtains are the proper distance then release the button. Press the **Open** button if the format is scope projection until the curtains are the proper distance then release the button.

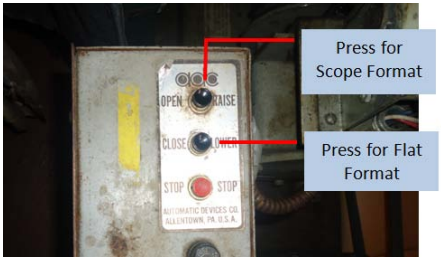

Figure 35: Curtain Buttons

Note: The curtain system is pre-calibrated to open and close to the proper flat and scope width distances and will stop moving once the curtains have reached their minimum and maximum position stops.

5. Toggle the power switch to the **Off** position.

Changing the Lens

You must install the correct lens on the front of the projector unit that matches the flat or scope film format you are presenting.

To change the lenses:

1. Walk to the right side of the projector unit and open the film pathway compartment door.

2. Locate and unscrew the lens locking knob by turning it in a counter-clockwise direction (see Figure 30 on page 25).

3. Move to the front of the projector and gently remove the existing lens from the lens socket.

4. Select the appropriate lens for the format and gently insert it into the lens socket by aligning it with the tab inside the lens socket. Push the lens in until firmly in place.

5. Tighten the lens locking knob by turning it in a clockwise direction.

Changing the Aperture Plate

After installing the correct lens, you must also install the correct aperture plate in front of the projection plate that matches the flat or scope film format you are presenting.

To change the aperture plate:

1. Walk to the right side of the projector unit and open the film pathway compartment door.

2. Locate the aperture plate. The aperture plate is inserted into the projection plate.

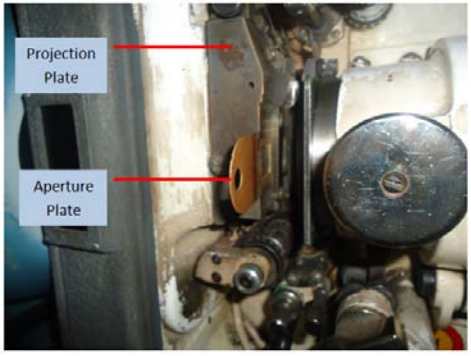

Figure 36: Aperture Plate

3. Grip the tab of the aperture using your index finger and thumb plate then gently remove the part from the projection plate by pulling it towards you.

4. Select the appropriate aperture plate (either scope or flat) to match the film format and gently insert it with the notches facing up into the front of the projection plate until firmly in place.

Changing the Movie Compact Discs

Finally, you need to place the correct movie soundtrack CDs into the trays of the DTS CD player. These CDs synchronize with the projector unit sound data feed.

Note: You only need to perform this procedure once for the current movie being shown. When a new movie is loaded and threaded, the current CDs must be replaced with the new CDs.

To change the movie CDs:

1. Locate the DTS CD player mounted at the top of the DTS sound console directly above the control panel.

Figure 37: DTS Compact Disc Player

2. Press the eject buttons located below the disk tray doors to eject each disk tray.

3. Remove the previous soundtrack CD or CDs from the trays (depending on the length of the previous movie.

4. Place the new movie soundtrack CD or CDs (depending on the length of the movie to be presented) and press the eject buttons again to retract each disk tray back into the player.

5. Return the previous soundtrack CDs to its original shipping packaging along with the matching studio film reel.

Loading the Film

After setting up the projection system, you are ready to begin loading the film onto the supply film platter. This section teaches you the procedure necessary to transfer film from studio reels to the supply film platter. During this procedure, you will need to load from several reels as each reel contains about 20 minutes of movie footage.

Note: This procedure only needs to be performed once for a projector system showing one film for a limited amount of time on one screen.

Loading the Film onto the Film Platter

To load film from the studio reel to the film platter requires you to use a machine called a movie builder. The movie builder is a movable unit that can be wheeled next to the film platter before transferring the film.

Figure 38: Movie Builder

To load the film from the studio reel to the film platter:

1. Remove the studio reels from the shipping container. There will be several reels to load. Each reel is numbered and must be done in sequential order.

2. Remove the locking pin from the side spindle and insert the studio reel onto the movie builder spindle by aligning the spindle pins to the holes in the reel hub. Press the reel onto the spindle until firmly into position.

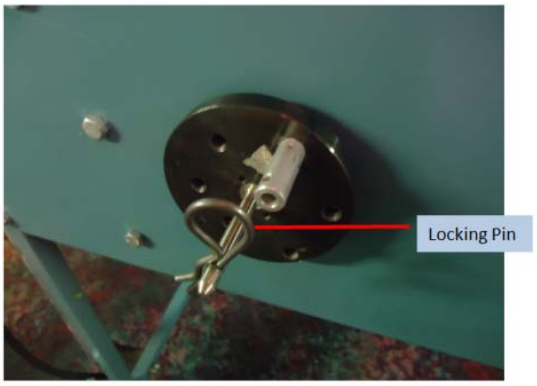

Figure 39: Locking Pin

3. Replace the locking pin by snapping it into the center post to secure the studio reel hub to the movie builder device.

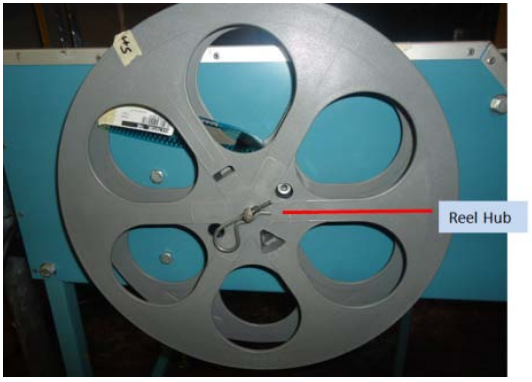

Figure 40: Reel Hub Locked into Position

4. Grip the tail of the film strip and run it around the bottom roller wheel of the movie builder post.

5. Adjust the top roller wheel to match the height of the supply film platter then run the film strip over the top of this roller.

6. Roll the movie builder unit over to the film platters and attach the film end to the slot located on the edge of the center receiving ring mounted on the supply film platter.

   Note: Step 6 is only done for the first studio reel. The remaining reels must each attach to the end of the previous reel's film strip and loaded using the same procedures to produce a single film coil on the supply film platter.

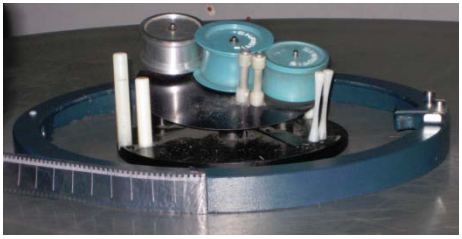

Figure 41: Receiving Ring

7. Plug the movie builder data/power cable into the film tree receptacle outlet located at the base of the film tree post. This connection establishes a data link to control all functions between the film tree and movie builder.

Figure 42: Film Tree Receptacle Outlet

8. Toggle the right hand switch to the **Run** position and left hand switch to the **Load Spindle** position to begin loading the film onto the film platter. To control rotation speed of the platter, use the **Speed Control** knob.

Figure 43: Movie Builder Switches

9. Unplug the movie builder data/power cable from the film tree and roll the unit away from the film platters when loading has completed.

Threading the Film

After film has been loaded onto the supply film platter, you are ready to begin threading the film strip. This section begins by teaching you how to power up the projector unit, amplifiers and CD player. The section continues by teaching you how to thread the film strip from the supply film platter, through the projector unit and back to the take up film platter.

This section covers:

- How to power up the projector unit
- How to power up the DTS CD player
- How to power up the amplification units
- How to open the film gates
- How to prepare the film for threading
- How to thread the film platter and tree unit
- How to thread the film pathway compartment

Note: The powering up of projector unit, CD players and amplifiers is performed at the beginning of each day. Each unit remains on throughout the day until the last movie is shown.

Powering up the Projector Unit

To power up the projector unit, flip up the four white switches on the far right side of the main control panel to their **On** positions.

Figure 44: Main Power Switches

Powering Up the DTS CD Player

To power up the DTS CD player, toggle the large black switch located in the lower right corner of the player up to the **On** position.

Figure 45: CD Player Power Switch

Powering Up the Amplification Units

To power up the amplifier units, toggle the black switches located on the left side of the units to their **On** positions.

Figure 46: Amplification Unit Power Switch

Opening the Film Gates

Open the film pathway compartment door and identify the five film gate latches (known as Gates A through E) using the picture below. Before you begin threading film inside the film pathway compartment, you must open all five Gates. You do not have to open these gates in sequence.

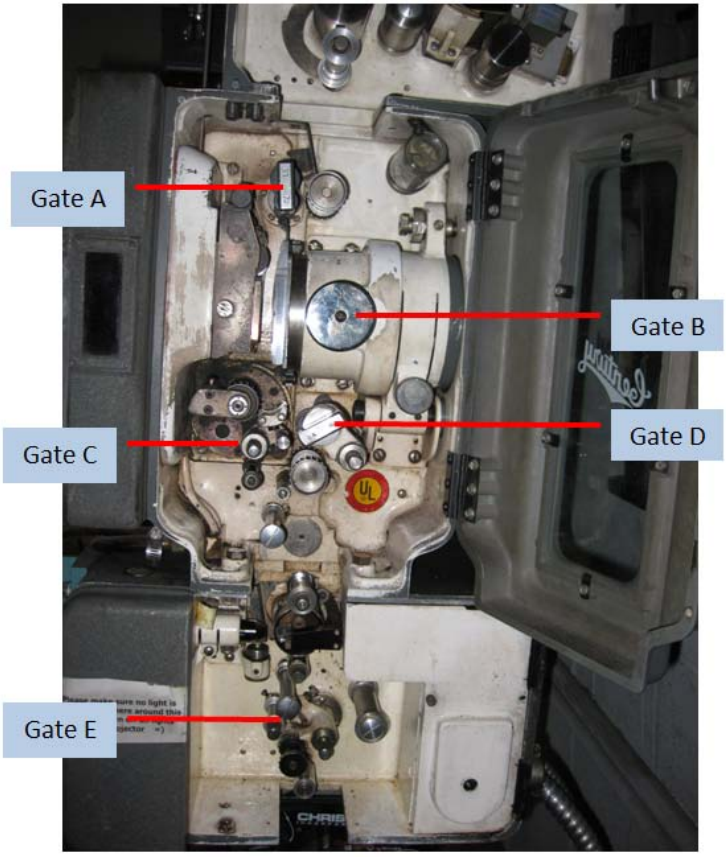

Figure 47: Film Gates

Opening Gate A

Gate A is located directly above the projection plate. To open Gate A, carefully turn the gate handle one quarter turn counter-clockwise to separate the gate plate from the sprocket wheel.

Opening Gate B

Gate B faces the projection plate and is the largest of the five gates. To open Gate B, turn the large silver knob to separate the gate plate from the projection plate.

Opening Gate C

Gate C is located below the projection plate. To open Gate C, carefully lift the gate handle to separate the gate plate from the sprocket wheel.

Opening Gate D

Gate D is located below and to the right of Gate C. To open Gate D, carefully lift the gate handle to separate the gate plate from the sprocket wheel.

Opening Gate E

Gate E is located just after the secondary sound head. To open Gate E, carefully lift the gate handle to separate the gate plate from the sprocket wheel.

Preparing the Film

Before you thread the film, you must secure the film coil on the supply platter. In addition to this, you must also prepare the take up platter to receive film that runs through the projector unit.

To prepare the film:

1. Secure the outside edge of the film coil by placing film pucks around the edges of the film coil.

Figure 48: Film Puck

2. Place the plastic safety ring around the outside edge of the supply film platter. Make sure the ring is seated evenly on all sides of the platter surface.

Figure 49: Safety Ring

3. Remove the center ring between the film stack and the brain. As you lift the ring up, carefully remove the film head from the slot.

4. Install the ring in the center of the receiving film platter by aligning the pegs located on the bottom of the ring with the holes in the film platter surface.

Threading the Film Platter and Tree Unit

Before you begin threading film through the film pathway compartment, you must first thread the film through the brain and film tree roller systems.

To thread the film platter and tree unit:

1. Grip the head of the film strip and thread it through the dancer then between the first and second rollers. Wrap the film around the second roller then thread it between the second and third rollers.

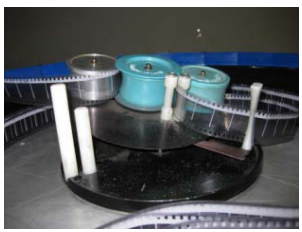

Figure 50: Brain Threading

2. Thread the film from the brain with the sound strip facing the tree through the first roller mounted on the film tree that is even with the supply film platter height.

3. Thread the film head around the bottom mounted roller then around the top mounted roller of the tree tower.

Figure 51: Film Tree Threads

4. Guide the film head from the top roller of the tree across to the top roller of the projector unit and thread it around the roller.

5. Pull the film down in front of the film pathway compartment to the bottom roller of the projection unit then wrap the film head around the bottom roller.

Figure 52: Film Drop

6. Adjust the roller trio cluster to match the receiving platter height by lifting the cluster off the tab latch then raising or lowering it to the desired level. Re-latch the roller trio cluster into its new position.

7. Guide the film head from the bottom roller of the projector unit to the first roller in the roller trio cluster.

8. Wrap the film around the first roller with the film sound strip facing the tree tower and towards the receiving film platter roller.

9. Wrap the film head around the receiving film platter roller then back towards the roller trio cluster.

10. Wrap the film head around the back sides of the second and third rollers then towards the take-up ring mounted on the receiving platter.

11. Attach the film head to the take-up ring mounted in the center of the receiving film platter by folding it over a few times then inserting it into the slot in the ring.

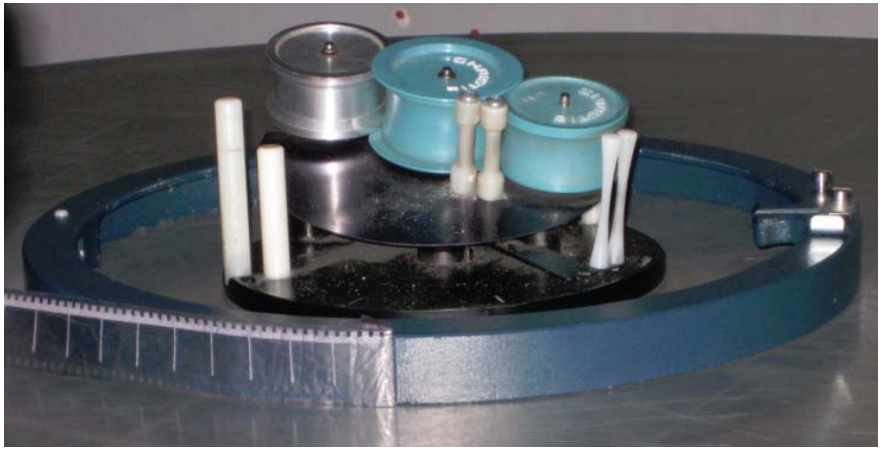

Figure 53: Take-up Ring with Film Attached

Threading the Film Pathway Compartment

After threading film from the brain and film tree roller systems, you are ready to begin threading the film pathway compartment. This threading procedure is perhaps the most complex and must be done with patience and precision.

To thread the film pathway compartment:

1. Guide the film strip from the top roller towards the DTS sound read unit. Thread the film strip through the right side of the first sound head reader then under and around the left side of the second roller.

2. Wrap the film strip around the large silver sound reader and over the last roller then pull the film strip down towards the film pathway compartment.

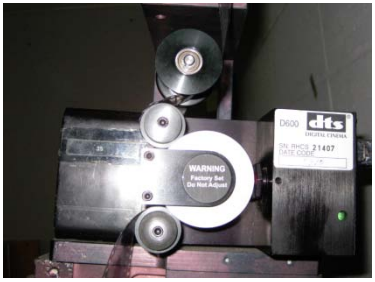

Figure 54: Threading the DTS Sound Reader Unit

3. Thread the film strip around the old sound reader compartment and into the film pathway compartment towards the first gate (Gate A). Wrap the film under and around the sprocket wheel while aligning the teeth with the film perforations.

4. Hold the film against the metal plate with your index finger. With your other hand, make a clockwise quarter turn of the gate handle to lock the film strip into position.

Figure 55: First Gate Threading

5. Guide the film in front of the projection plate (bypassing Gate B) and towards the third gate (Gate C) then wrap the film strip around the sprocket wheel while aligning the teeth with the film perforations.

6. Check the framing window of the projection plate to make sure the film strip is centered.

7. Manually adjust the film's horizontal and vertical alignment if film is misaligned until properly centered within the framing window.

8. Lock the third gate by closing the gate handle once the film is properly threaded and aligned.

9. Check the loop before the projection plate for sufficient slack. If the loop is insufficient, reopen the first gate (Gate A) and pull two image frames of film through the gate.

10. Check the loop size by placing your index and middle fingers into the center of the loop. After verifying the loop size, re-lock the first gate.

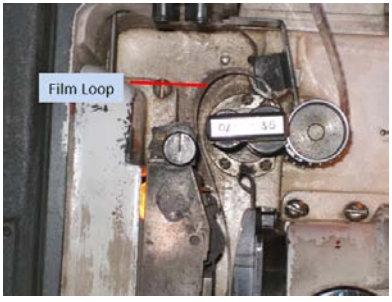

Figure 56: Film Loop

11. Close the second gate (Gate B) facing the projection plate by pressing in the round knob.

12. Create a loop after Gate C with the film strip then wrap the film over the fourth gate while aligning the teeth of the sprocket wheel with the film perforations.

13. Verify the loop size using your index and middle fingers. Once the loop and threading is properly verified, lock the fourth gate by closing the gate handle.

14. Guide the film strip from the fourth gate towards the secondary sound reader.

15. Wrap the film around the right side of the first roller then down the left side of the sound reader head and around the right side of the second roller. Pay close attention to the red alignment mark located on the compartment wall.

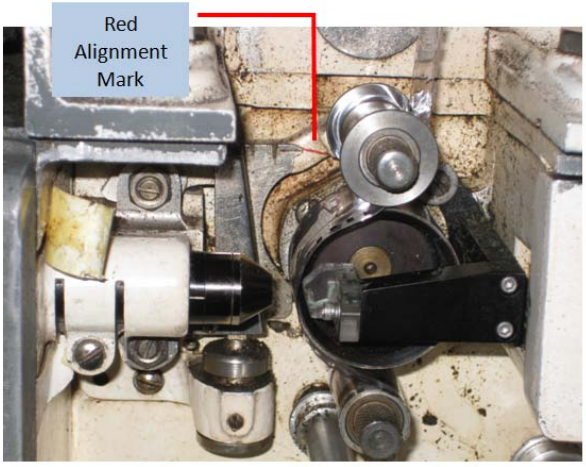

Figure 57: Red Alignment Mark

16. Guide the film down towards the fifth and final gate (Gate E). Pull the film gently until the red alignment mark is level with the arrow.

17. Wrap the film around the left side the gate while aligning the sprocket wheel teeth with the film perforations. After verifying threading, lock the gate by closing the gate handle.

18. Guide the film strip down to the failsafe unit and wrap the film strip over the two small rollers attached to the sensor arm.

19. Gently pull the film strip from the bottom roller of the projector unit until the film platters begin to pick up the tension.

20. Double check all threading and make sure all gates are properly locked into position. Re-verify all film loops and make sure all sprockets are properly aligned with film perforations.

Operating the Projector System

After completing all procedures in the previous sections, it's time for the show. This section teaches you how to start the projector unit, adjust the theatre lighting and perform some specific quality checks while the movie is presented.

Starting the Projector Unit

Before you start the projector unit, you should re-check all film threading and tension and verify that the correct lens is installed. After completing these quick checks, you are ready to start the projector.

To start the projector system:

1. Press the green **Start** button on the main control panel. The projector unit runs and turns the supply and receiving film platters.

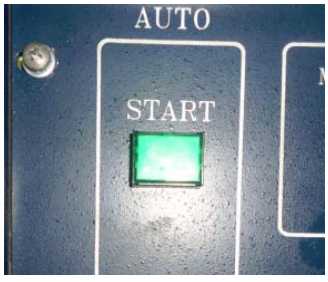

Figure 58: Projector Start Button

2. Press the white **Start** button on the right side of the main control panel to open the dowser shutter. The dowser shutter opens and projects the movie image onto the movie screen.

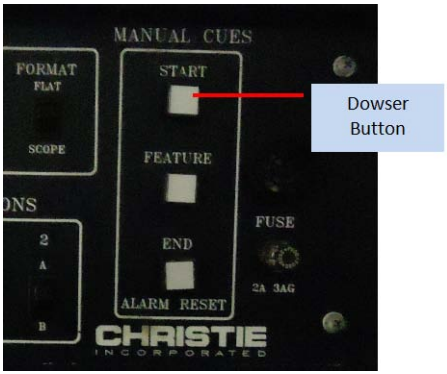

Figure 59: Dowser Start Button

Adjusting the Theatre Lighting

Walk to the front wall to where the lighting control unit is mounted and adjust the theatre lighting to the appropriate level. For movie previews, press the **Mid** button. For the feature presentation, press the **Low** button.

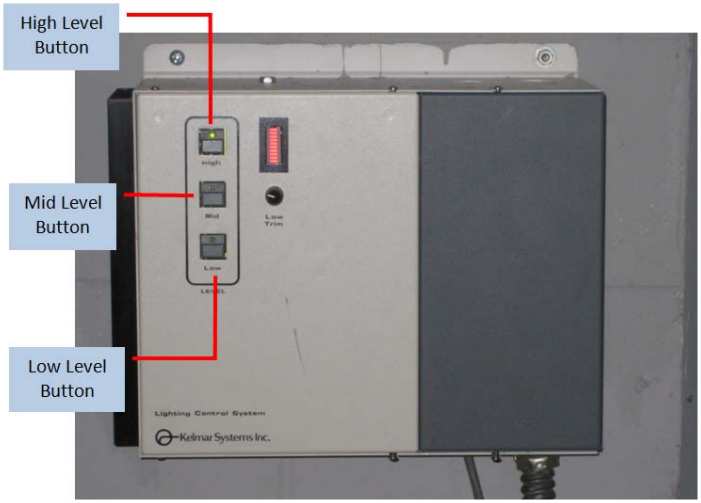

Figure 60: Lighting Control Unit

Quality Checks

While the movie is running you should complete some specific quality checks. You should perform quality checks for image presentation (framing and focus checks) twice during a movie: once immediately after the movie trailers begin and once during the feature presentation. You can perform other checks randomly throughout the presentation.

Quality checks include:

Framing Check

Check the framing of the image on the movie screen. To correct images out of frame, please refer to the **Troubleshooting** section on page 58.

Focus Check

Check the sharpness of the image projected on the movie screen. To correct images out of focus, please refer to the **Troubleshooting** section on page 58.

Sound Check

Make sure sound is present inside the auditorium, is set at the appropriate level and is being transmitted on the proper channels.

Film and Threading Check

Re-check to make sure that the film is moving smoothly on all rollers and sprockets and is not being damaged or hindered in any way. Make sure all roller and sprockets are tuning normally and that all gates are closed. Make sure that all film loops maintain their proper slack and that all film platter are rotating normally. Make sure film is flowing through the brain without wrapping or bunching up.

Theatre Lighting Check

Make sure the lighting level is set to the **Mid** setting for movie previews. Change the lighting level to the **Low** setting for the feature presentation.

Audience Monitoring Check

Scan the audience during the feature presentation to make sure all patrons are complying with theatre rules. Alert theatre ushers if any violations are witnessed. Theatre rule violations include (but are not limited to) the following:

- Talking on cell phones
- Throwing food or other objects
- Talking loudly and interrupting others
- Video recording of the movie

Important Note: Please remember that any video recording of a movie is considered a federal offense and will involve the intervention of law enforcement authorities.

Troubleshooting

This section teaches you how to solve common problems that can occur during operation of the projection system.

Film Wrap

Film wrap occurs when the film strip wraps itself around the brain. Film wrap can cause significant damage to the film strip.

Solution: Stop the projector unit immediately and sever the film strip just after where the wrap occurred. Use the new end of the film to unwind and correct the tangle then splice the film back together. Re-thread film through the brain, film tree and film pathway compartment. When completed, re-start the projector unit.

Power Failure

During a power failure the film loses tension.

Solution: Re-establish film tension by gently pulling on the film strip until the film platters take up the necessary film tension. Restart the projector unit when power is restored.

Projector Shuts Down

A projector shutdown occurs from irregular film tension detected by the failsafe unit.

Solution: Gently pull the film strip exiting the projector unit until the film platters pick up the necessary film tension then restart the projector unit.

Image is Out of Focus

An out of focus image occurs at the beginning of the movie trailers or feature presentation.

Solution: Walk to the front of the projector unit and locate the Focus knob. Slowly rotate the Focus knob in either direction until the image is properly focused on the movie screen.

Figure 61: Focus Knob

Image is Out of Frame

An out of frame image occurs at the beginning of the movie trailers or feature presentation.

Solution: Walk to the front of the projector unit and locate the Frame knob. Slowly rotate the knob clockwise to raise the frame of the image and counter-clockwise to lower the frame of the image. Adjust the knob until the image is properly framed on the movie screen.

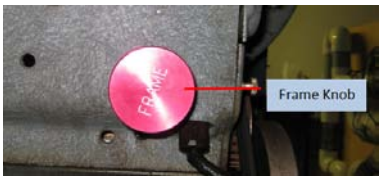

Figure 62: Frame Knob

Glossary of Terms

This section provides an alphabetical listing of common terms with their definitions.

Aperture Plate

The aperture plate is a thin metal plate containing a window opening that controls and frames the amount of light from the illumination source of the projector unit. The aperture place is installed in front of the projection plate. 35mm projectors typically use two types of projection plates: one for flat projection and one for scope projection. The flat or scope aperture plate must match the flat or scope lens that is installed on the projector unit.

Figure 63: Aperture Plate

Brain

The brain is an apparatus mounted in the center of the film platter that contains a cluster of rollers and a sensor that activates motion of the film platter.

Curtains

The curtains are the aesthetic cloth material that hangs on either side of the movie screen. The curtains are adjusted for both flat and scope presentations.

Dancer

The dancer is an apparatus consisting of a mechanical arm attached to a set of plastic posts. The dancer is part of the brain and activates motion of the film platters when pulled to the left by the film strip.

Dowser

The dowser is the shutter mechanism that allows the light to shine through the film and lens.

DTS

DTS is an acronym that stands for Digital Theatre Systems and is the former name of DTS, Inc. DTS, Inc is an American company that specializes in digital surround sound technologies and is the manufacturer of the digital sound equipment used on the Christie projection system.

Film Leader

The film leader is the beginning section of the film strip that does not contain frame images. The film leader allows a projectionist to thread the film.

Film Tree

The film tree is the metal tower that supports the three film platters and contains a network of rollers used for film threading. The film tree is part of the film tree and platter unit.

Flat Format

Flat format is a standard width projection format used for presenting a 35mm motion picture.

Framing Window

The framing window is the opening of the projection plate that allows for proper framing of the film images.

Gates

The gates are a series of latching mechanisms that secure the film strip into position inside the film pathway compartment.

Platter

The platter or film platter is a large metal plate that the film stack rests on.

Projection Plate

The projection plate is a removable guide located in the film pathway compartment that secures the film strip in position in front of the illumination source.

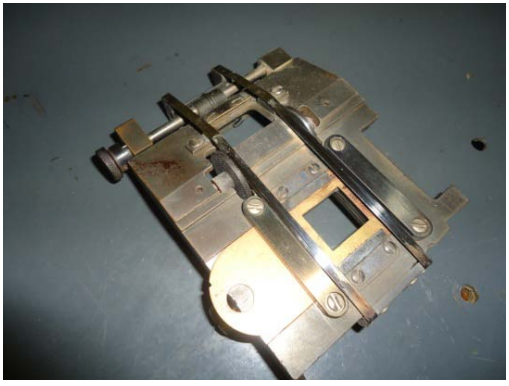

Figure 64: Projection Plate

Reels

Reels are the circular storage units that are used to ship the film from the studio to the theatre. The term reel can also be used to describe a section of film that is on the reel unit.

Rollers

Rollers are wheels without teeth that are located inside the film pathway compartment. Rollers function as guides and assist the sprockets in moving the film strip smoothly through the film pathways.

Roller Trio

The roller trio is the name given to a cluster of three rollers mounted on the film tree tower.

Figure 65: Roller Trio

Scope Format

Scope format is a wide width projection format used for presenting a 35mm motion picture.

Scratched

Scratched is a term used to describe damage to a section of the film's surface.

Sound Head

The sound head is the unit mounted above the film pathway compartment that captures sound information off the film strip and transmits the data to the DTS sound system console.

Sound Strip

The sound strip is the stripe on one side of the film strip that contains sound data for the movie.

Splice

The splice is the point where two sections of film are attached together.

Spools

Spools are small objects that guide the film and prevent it from becoming damaged.

Sprockets

Sprockets are wheels with teeth inside the film pathway compartment that are used to grip, propel and guide the film strip through the projector unit. The sprocket teeth align with the perforations on the edges of the film strip for stability.

Tail

The tail is the section of film at the end of each reel that contains important information about the movie including: title, reel number, print number and format.

Threading

Threading is the process of installing the film strip within the film platter and tree unit, to the projector unit and through the film pathway compartment.

Index

M

P

Q

S

T