

# Film-Tech

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These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

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[www.film-tech.com](http://www.film-tech.com)

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**I see two different DTS symbols at the end of a movie. What is the difference between the DTS-letters and the DTS-cone symbols?**

The lettered logo refers to DTS digital sound and the cone-shaped symbol refers to DTS stereo analog (SR-type or A-type) track on the film.

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## **What does DTS stand for?**

Digital Theater Systems is the company name and DTS Digital Sound is our cinema brand.

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## **What does DTS digital sound do for cinemas?**

The DTS digital sound process for motion pictures is designed for the digital sound release of motion pictures in 6-track theaters. It is a dual system in that the digital audio data is recorded on CD-ROM discs. A special DTS timecode is printed on the motion picture print along with a conventional stereo optical soundtrack. The timecode is used by the DTS system to synchronize the sound and picture. The timecode lies between the picture and optical sound track, and is printed onto the release print from the soundtrack negative. There is a single inventory of prints.

The DTS system provides left, center, right, split surrounds (or mono surround) and subwoofer channels. The DTS-6D system allows for play times up to 5 hours. It is completely automatic and fail-safe in operation requiring no action by the projectionist. The systems automatically start and stop, and track film breaks and change-overs. The digital audio data is sampled at 44.1K samples per second. APTX100 digital audio data compression (4:1) is used. Transfer into the process can be made from conventionally mixed analog or digital sound masters.

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## **How does THX relate to DTS?**

THX *certifies* sound equipment and theater sound system performance. DTS actually is the soundtrack and the equipment used to playback the sound, either in 6-track digital or stereo (analog).

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## **How does DTS work?**

The DTS system consists of two main components: The player and the reader. The player connects to theater's existing sound system and cinema processor. CD-ROM discs are produced by DTS that hold the feature's 6-track sound mix. For each feature, special DTS timecode is printed on the motion picture film. Once the film is started, the DTS reader sees the timecode and sends the information to the DTS player. The timecode tells the player what to play on the discs. Each feature has its own unique timecode ensuring only the matching discs play with the film. Films released in the DTS digital sound also contain a traditional analog sound track that serves as a back-up sound source. If a problem occurs in the DTS digital system, the DTS player automatically switches the cinema processor out of the digital format and into analog sound.

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## **Why won't the DTS movie discs play in a CD player?**

Because the discs are CD-ROMs and require special software to play.

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### **Why won't the DTS movie discs play in a computer?**

Because the discs need a special execute file to play.

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### **Will regular CDs play in the DTS system?**

No

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### **Will DTS music CDs play in the DTS cinema system?**

No

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### **What should I do with the discs after the movie has finished playing at my theater?**

Simply return the discs to the yellow reel, provided when the film is delivered in Goldberg cans. The discs should be returned back to the studio depot with the print.

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### **Can I keep the movie discs?**

No, the discs should be returned with the print. The discs belong to the studio, not to DTS.

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### **Is the DTS system Y2K compatible?**

Yes, see our notice on our web site under "cinemas" and "press releases".

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### **Is the DTS system patented?**

As of March 9, 1999, the DTS system has been granted the following patents:

- U.S. Patent Nos. 5155510, 5386255, 5450146, 5751398
- Australia Patent Nos. 652965, 661614
- Europe Patent Nos. 0551424, 0615631, 0473677, 0632922
- Japan Patent Nos. 2033555, 2708961
- India Patent No. 181427
- Russia Patent No. 2088962

- Korea Patent No. 153028
- France Patent Nos. 8906807, 9114963

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## **What does the warranty cover?**

Equipment manufactured by Digital Theater Systems Inc. is warranted against defects in materials and workmanship for one year from date of purchase. There are no other express or implied warranties.

Digital Theater Systems, L.P. obligation is restricted to repair and replacement of defective parts. Under no circumstances will Digital Theater Systems, L.P. be liable for any other damage, either direct or consequential.

All requests for repairs or information should include the unit serial number to ensure rapid service.

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## **How do I return items to DTS?**

For warranty, repair, exchange or replacement parts, please call DTS (818) 706-3525 or USA toll free 1-800-959-4109 for a Return Authorization number *before* sending any item back to us. At the time of the call, DTS will require that you provide the serial number of any unit(s) to be returned *before* warranty replacement units will be sent. All return packaging should be clearly marked with the Return Authorization number on the outside of the package. DTS FAX: (818) 879-2746.

### **Please send all returns to:**

Digital Theater Systems  
5171 Clareton Drive  
Agoura Hills, California 91301 USA

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## **What type of promotional items does DTS have?**

Promotional materials are available from DTS. These items include:

- DTS marquee signs (*free to DTS theaters*)  
4" mini marquee, 8" panel, 10" panel, 12" panel
- DTS one sheet posters (*free to DTS theaters*)
- \*DTS logo films, available in scope and flat
- \*DTS buttons and pins
- \*DTS T-shirts
- \*DTS Letterman's Jackets

- \*DTS Denim Jackets
- \*DTS Hats
- \*DTS Sweatshirts
- \*DTS Tweakers
- \*DTS logo films, available in scope and flat

*\*Call DTS Customer Service (818) 706-3525 or visit our web site for price and ordering information.*

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## **How do I get DTS Trailer Discs?**

DTS trailer discs are issued to theaters from DTS. *DTS trailer discs should reside in the C drive until a new trailer disc is received.* Trailer titles contained on the disc are listed on the disc. If you have a DTS encoded trailer not listed, then your trailer will not play in DTS digital sound, but it will play in analog. If you don't receive trailer discs and would like to, contact DTS Trailer Department (818) 706-3525.

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## **What considerations should be taken into account for DTS in a closed or multi-unit rack-mounted installation?**

1. The ambient temperature within the rack may be greater than room ambient temperature. The maximum temperature for the equipment in this environment is 50°C. Consideration should be given to the maximum rated ambient.
2. Installation should be such that the amount of air flow required for safe operation is not compromised, and that a hazardous condition is not achieved due to uneven loading.
3. Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.
4. Reliable grounding of this equipment should be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit.
5. A quality surge / spike suppressor power strip is recommended to protect the DTS-6D processor.

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## **What speaker specifications are needed for DTS digital?**

A DTS digital playback system can place enormous demands on the amplifiers and speakers in your theater. Some of the factors that can effect the power requirements are speaker efficiency, room size, and room acoustics. The following is a guideline of minimum power requirements:

<b><u>Theater Size</u></b>	<b><u>Screen Channels</u></b>	<b><u>Each Surround Channel</u></b>	<b><u>Subwoofer</u></b>
Small	200 WPC	200 WPC	400 W
Medium	300 WPC	300 WPC	600 W
Large	400-500 WPC	400-500 WPC	+800 W

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## What are the DTS system specifications?

Six channel configuration Left, Center, Right, Left Surround, Right Surround, and Subwoofer. Digital output available for DSP cinema processors. The DTS-6D holds three CD-ROM discs capable of up to five hours play time. Automatic fallback to A-TYPE, SR, MONO, or NON-SYNC. Provides for picture and sound simultaneous change-over on two projector systems. Voltage output to reader uses self resetting circuit breakers instead of fuses.

Frequency Response	L, C, R 20 Hz to 20 kHz, LS, RS 80 Hz to 20 kHz, Sub 20 Hz to 80 Hz
Dynamic Range	96 dB, all channels
Size	5 1/4" high, 19" long rack mount, 15 1/2" deep

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## How do I reconfigure the programming of the DTS player?

Remove the top cover.

### Programming for Two Projector (change-over) Operation:

Locate the timecode board D422 (the card with the 9-pin D-connector on the rear panel and LED's on the front). Near top center of the board there is a 7-position header called "W1". A shunt is required vertically over position "0" (farthest right position) if you are installing for change-over operation.

### Programming for One Projector (platter) Operation

Locate the timecode board D422 (the card with the 9-pin D-connector on the rear panel and LED's on the front). Near top center of the board there is a 7-position header called "W1". No shunt is required for platter operation. However, a shunt is supplied with each DTS-6D and this shunt should be in the "holding" position: Placed horizontally across the top row.

### Programming Special Functions



The D422 board contains "W1" (7-position header) that can be used for special applications. Unless specified otherwise, all factory DTS-6D units are programmed for standard theatrical operation -- which means none of the special functions, listed below, are used.

If a special function is required, use the table below to program the DTS-6D. To enable any of these applications, place a shunt vertically across the position needed to perform the operation required.

#### "W1" Position Special Function

0	Change-over (two timecode sources) enable
1	SMPTE timecode enable
2	Don't read user bits (used w/#1 enabled)
2	Nonsync program enable (when #1 not used)
4	Serial output of timecode

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#### **Any special considerations for subwoofer as it relates to DTS?**

Yes, the DTS subwoofer output level ranges from 20Hz to 80Hz. *You must observe your subwoofer's specifications to avoid damage to the speaker.* If a subwoofer is driven below its cutoff frequency, its driver(s) may become unloaded. When unloaded, the voice coil can travel outside of the magnet's gap, thus overheating or causing mechanical damage to the speaker. A high pass filter should be installed on those speakers with high cutoff frequencies. Contact your speaker manufacturer for more information.

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#### **Why does there seem to be DTS subwoofer signal in the surrounds?**

The DTS subwoofer signal is derived by filtering out the surround signals from 80Hz and below. That signal is put on its own "subwoofer" output on DTS player. You may verify this while equalizing a room. Insert the DTS Setup disc into the player and play the subwoofer pink noise off the disc. Turn off the subwoofer speaker and look at the pattern on the RTA. You'll see a dramatic roll-off at 80Hz. It is normal to hear DTS subwoofer pink noise, above 80Hz, in the surrounds.

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#### **How to I set DTS playback levels?**

Use a SPL meter and a DTS setup disc. Power on the DTS player and load in the setup disc. After a delay of about 40 seconds, the SYSTEM light will blink. Then the DIGITAL light and the CD-ROM light will illuminate and the cinema processor will change to digital format. Pink noise should be heard in the theater.

Remove the front plate from the front panel. With ALL power amplifiers turned on, master fader

set to reference position "7" and speakers unmuted, adjust the appropriate trimpots on the DTS player to achieve the specified SPL noted below.

Open the screen curtains. Go into the theater to make SPL readings in the rear third and just off-center of the room. Do not simply point the sound pressure level meter out of the port hole window. This will not give you accurate SPL readings.

<b>Set the DTS-6D for these output levels</b>	<b>Time</b>	<b>SPL</b>
Left channel PINK noise	1:00 min	85dB
Left surround PINK noise high passed at 80Hz	1:00	82dB
Center channel PINK noise	1:00	85dB
Right surround PINK noise high passed at 80Hz	1:00	82dB
Right channel PINK noise	1:00	85dB
Sub Bass channel PINK noise low passed w\DTS filter	1:00	91dB
PINK noise: Left, Center, Right, Left Surr., Right Surr	0:04 each	

*NOTE: SPL readings should be measured unweighted, or C weighted -- slow*

## MONO SURROUND

For those theaters with mono surround only, wait for either the left -or- the right surround PINK noise when adjusting the MONO SURR trimpot for 82dB SPL *in the theater.*

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## How do I test the DTS automatic default functions?

The default programming is now part of the programming on DTS movie discs and DTS-6D players. Movie discs made after June96 will automatically default to the optical format present on the film. Automatic default is available for MONO, A-TYPE, or SR format. Also, cinema processors will be pulsed to the NON-SYNC format at the end of a feature film played in DTS digital sound.

**Testing this feature works only with the DTS DS1 SETUP DISC.** Load the SET-UP disc in the **DTS-6D** and stand next to the unit when performing this test. To start, allow the right channel's pink noise to play in the theater. Eject the disc by pushing the open/close button on the drive. The cinema processor should pulse to the mono format. Repeat procedure for the remaining formats as listed:

### Pink noise channel Default Format

Left	A-type
Surround	Non-sync
Center	SR
Right	Mono

The defaults on the **DTS-6** are only A-type or SR-type which are selectable via jumpers on logic breakout boards (which are connected to the cinema processor).

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## **How does the DTS System effect other Cinema Processors?**

### Dolby CP50, CP100, CP200 Operation

When the DTS switches to digital, the normal signal paths are interrupted. The DTS signals will be inserted just prior to the Dolby EQ cards, in effect taking over the cinema processor (CP200: Program automation optical default format to either "04" A-TYPE or "05" SR -- which ever the film requires). When the DTS-6D switches out of digital, the cinema processor is released to function as normal and default to the format previously selected.

Unless modified, these cinema processors do not have a subwoofer input. DTS normally inserts its subwoofer signal after the fader control. As a result, the subwoofer level will not be effected by the fader or mute.

### Dolby CP45, CP55, CP65, CP500, UltraStereo JS Series, and SMART Operation

The DTS-6D will automatically pulse the audio processor to the digital format when it starts to play a digital sound track. Whenever the DTS-6D drops out of digital, a pulse will be sent to switch the audio processor back to the optical format. On units equipped with a DTS logic board, the pulse to switch back to optical will be blocked if the audio processor is not in the digital format. So, when the automation switches to non-sync, the DTS-6D will not switch back to optical. The DTS logic boards also have a jumper which is used to force either A-TYPE or SR as the fall-back format (installation of the jumper will override disc programming).

The DTS-6D will only pulse the audio processor into the digital format when it first switches to digital. After the show has started (or the show is re-started after a film break) make sure the automation doesn't switch the theater processor back out of the digital format. Set the automation/cues so no audio format change takes place after the DTS has switched into digital. Switching to nonsync at the end of the show is OK.

### Dolby DA10 / 20 SR-DTM System

The DTS-6D can be connected to the Dolby SR-DTM system without effecting its performance. The DA20 connects to the appropriate DTS-6D breakout board. When the DTS-6D is off, the DA10/20 output is routed through the breakout board. When DTS is on and playing in digital, the DA10/20 connection (to the cinema processor) is switched out on the breakout card and the DTS digital sound track is given to the cinema processor. The SR-DTM system should be

powered down when playing DTS.

### Sony SDDSTM

The DTS system does not effect nor connects to the SDDSTM system.

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## **Which brackets do I use to install the DTS reader?**

### For the DTS Timecode Reader Head, 35mm

- **D614 - Standard Bracket**

For projectors: Century, Simplex, and Cinemeccanica with Kelmar bracket (below).

Intended to fit between the projector and reel arm. We have produced the bracket with the American standard size hole to accommodate 2" center spacing 3/8 - 16 tap, that is utilized to mount the American made upper reel arms. Comes with the following hardware:

#### QTY Description

- 2 10 x 24 x 1/2" long screw
- 2 3.4 x 16 x 1" long hex bolt nut
- 2 3/8" lock washer

- **D615 - DP70 Universal Bracket**

Used for American projectors with a penthouse. Comes with tap and drill bit 8-32, and the following hardware:

#### QTY Description

- 2 10 x 24 x 1/2" long screws
- 2 3.4 x 16 x 1" long hex bolt nuts
- 2 3/8" lock washers

- **D616 - AA2 bracket**

For Norelco AA projectors. Comes with the following hardware:

#### QTY Description

- 2 #10 lock washers
- 3 3.4 5/16" x 18 x 5" long screws
- 3 3/8" split ring lock
- 2 10 x 24 x 1/2" long screw

- **D617 - DP75 Bracket**

Used to mount the DTS timecode reader head to the side of the projector. Comes with same hardware as the D614.

- **D622 - Front Mount Bracket**

Used when installing multiple digital sound heads or when there is not room to lift the projector arm. Used with Dolby SR-DTM and Sony SDDSTM reader heads.

- **5006-0001-00 Cinemeccanica Bracket / adapter plate**

For Cinemeccanica projectors. Must be used with the D164 standard bracket for mounting the DTS timecode reader head. If the reel arm needs to be remounted, two plates are required.

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## **How do I use the DTS Empirical Test disc?**

Insert the disc into the player. Remove any other discs. Tests #1 through #35 will play automatically. Write down the current OFFSET setting for future reference. For a specific test, wait for the announcement, then select the desired test number on the OFFSET rotary switches (located behind the player's front panel access cover). Be sure to write down the current offset setting before your selection is made and restore the setting for proper DTS movie playback.

**NOTE: \*These test signals may cause serious damage to sound systems that are not properly designed to reproduce the extended dynamic range of a digitally-based sound storage system.**

1. Empirical test section announcement
2. **\*Power handling test**
3. Left level, set channel ID, pink noise @ 0dB alternating with low level multi-tone
4. Center level set
5. Right level set
6. Right surround level set
7. Left surround level set
8. Male voice for speaker comparison
9. Female voice for speaker comparison
10. Dialog, front speaker balance
11. Music for speaker comparison
12. Pink noise, surround speaker balance
13. Music, front speaker balance
14. Digital silence
15. Left channel ID, -10dB sweep, 0dB sweep

16. Left surround channel ID, -10dB sweep, 0dB sweep
17. Center channel ID, -10dB sweep, 0dB sweep
18. Right surround channel ID, -10dB sweep, 0dB sweep
19. Right channel ID, -10dB sweep, 0dB sweep
20. Room acoustics test: left surround, right surround, center
21. Left level sweep 400 Hz, -5dB to +5dB
22. Left surround sweep 400 Hz, -5dB to +5dB
23. Center level sweep 400 Hz, -5dB to +5dB
24. Right surround sweep 400 Hz, -5dB to +5dB
25. Right level sweep 400 Hz, -10dB to +20dB
26. Left level sweep 400 Hz, -10dB to +20dB
27. Left surround level sweep 400 Hz, -10dB to +20dB
28. Center level sweep 400 Hz, -10dB to +20dB
29. Right surround level sweep 400 Hz, -10dB to +20dB
30. Right level sweep 400 Hz, -10dB to +20dB
31. **\*Left explosion @ +10dB, +20dB**
32. **\*Right level sweep 400 Hz, -10dB to +20dB**
33. **\*Left surround explosion @ +10dB, +20dB**
34. **\*Center explosion @ +10dB, +20dB**
35. **\*Right explosion @ +10dB, +20dB**

Must dial in remaining programs listed below

36. 1kHz @ reference level, all channels (250mV RMS)
37. Left pink noise @ reference level (85dB SPL)
38. Left surround pink noise @ reference level (82 dB SPL)
39. Center pink noise @ reference level (85dB SPL)
40. Right surround pink noise @ reference level (82dB SPL)
41. Right pink noise @ reference level (85dB SPL)
42. Sub bass pink noise @ reference level (88dB SPL)
43. Left 1/3 octave pink sweep 25 Hz - 2 KHz, 1 second pause, sweep 2 KHz - 20 KHz
44. Left surround 1/3 octave pink sweep 125 Hz - 2 KHz, 1 second pause, sweep 2 KHz - 20 KHz
45. Center 1/3 octave pink sweep 25 Hz - 2 KHz, 1 second pause, sweep 2 KHz - 20 KHz
46. Right surround 1/3 octave pink sweep 125 Hz - 2 KHz, 1 second pause, sweep 2 KHz - 20 KHz
47. Right 1/3 octave pink sweep 25 Hz - 2 KHz, 1 second pause, sweep 2 KHz - 20 KHz
48. Sub Bass sweep 20 Hz - 80 Hz

49. 5 channel pop test, channel number ID by number of pops
50. 4 seconds pink noise: left, center, right, left surround, right surround

**When finished doing the tests, be sure to return the OFFSET to the original setting before showing a feature.**

## **TROUBLESHOOTING TIPS**

It's always a good idea to stand in the theater and listen to the first few minutes of the movie. Listen to the sound level and general quality of the sound. The sound track should be in sync with the picture (wait for a dialogue scene) and played at a comfortable level. Even though not every scene will have surround material, do your best to listen for the surround speakers. Most opening musical sequences have surround information. *Be sure the movie discs match the film you are playing.* Feel free to contact DTS and ask for help.

- **I have a DTS print but I don't have discs**

Contact your film distributor and ask for the disc(s). Remember, a film that runs less than 90 minutes will have only one movie disc - it should also be labeled "one disc only". Movies running over 90 minutes and up to 3 hours and 20 minutes, will have three discs. Longer movies will have additional discs and special show instructions.

- **I have a DTS print but I don't have discs**

Turn off the DTS player unit. Check and listen that the movie is playing in optical format. Let the film finish playing in optical. Do not attempt to remedy these problems while playing in DTS. The theater's technician should perform a full DTS quality check with the DTS setup discs and verify sync with the DTS demo film. Give the technician at least one hour to complete the test and alignment.

- **Volume too loud**

Turn down the fader pot on cinema processor. Do not adjust the DTS player trimmer pots behind the black panel. If sound level needs adjustment after it switches to digital, contact your theater's technician and request a B chain alignment (to DTS).

- **DTS player won't switch into digital sound**

- Verify movie discs are in the DTS player. Push both CD-ROM drive's EJECT button and if nothing comes out, get the movie discs and insert them in the A and B drives.
- Verify the movie discs match the movie. Push the EJECT button, and look at the movie discs. If the title doesn't match the film, the DTS player will not play. Find the correct movie discs, insert them in the CD-ROM drives, and cycle power.
- If the movie was recently changed, first power off the DTS player. Wait three seconds, then turn the player back on. The DTS player should reboot in about 30 seconds and play in digital if the correct movie discs are in the CD-ROM drive(s).
- If the unit does not switch to digital, verify the green LED on the reader head (on

projector) is glowing brightly and steadily while the movie is running. If the LED is dark, then verify the film is threaded through the DTS reader and that the film has a timecode strip (located between picture and analog sound track). If **no** timecode (dots & dashes) strip is seen, call the film's distributor and request a DTS print.

### ● Switches out of DTS digital

- The sound should automatically default to optical when the DTS player does not see timecode for four seconds. Verify the green LED on the DTS reader head is glowing brightly and steadily while the film is running. If the light on the CD-ROM drive(s) is on solid when film is playing, it means they cannot read disc: Try swapping discs.
- If the TIMECODE LED on the DTS player or reader head is blinking, gently squeeze the film between two fingers as it exits the reader head. Do the same at the entrance of the reader. If the LED stops blinking and maintains a steady glow, this indicates that you need to add more tension. Tension is added by repositioning the auxiliary flanged roller on the reader head so that it has maximum contact with the film or by adding additional rollers. Verify all the gears in the projector are in good condition.
- Use compressed air to blow off the reader head's lens, but never adjust the lens.
- Attach the grounding jumper on the timecode cable to the projector. Easiest place to do that is attach to the screw that secures the timecode cable to the reader head. The reader's housing must be electrically connected to the projector housing. Verify with an ohm meter. This is needed for projectors that are not properly grounded.
- If the drop-out occurs during the same place(s) in the movie, replace the reel(s).
- In a platter house - turn off the DTS player. Take the unit out of the rack and open the lid. Look inside at the timecode card (one with LEDs). Verify the jumper is positioned horizontally across the top row of W1. The jumper should not be installed vertically (vertical placement is for two projectors only).
- Do not put any sound format cues on film within timecode. Do not use leader with timecode elsewhere as it will cause a false start on the player.
- Last resort is to force the unit to play in optical. Turn off the DTS player. Be sure the cinema processor switched to optical, if not manually select. Call your theater technician who should contact DTS engineers.

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## How Does DTS70mm Work?

The DTS 70mm digital sound format functions the same as the DTS 35mm but with some important distinctions. Films released in the DTS 70mm format do not have the standard (analog 6-track sound) magnetic striping. The DTS timecode is written outside the sprocket holes where the 70mm track-two magnetic striping normally resides. This allows the usable picture area to be increased to fill the space used by the inner magnetic stripes. The size of the timecode on a DTS 70mm print is huge. At 30 mils wide, it is easily visible to the naked eye. Damage by normal scratches does not effect the reader's ability to scan timecode.



Since the magnetic stripping not on the film, DTS 70mm prints cannot use analog sound for backup. Instead, installing a second DTS player is recommended to ensure 100% fail-safe operation. If a malfunction occurs, the main DTS player uses its built-in default circuitry to automatically switch to the second unit. A DTS fail-safe board links the two players together.

For theaters already equipped with DTS 35mm system and setup for 70mm projection, the purchase of a DTS 70mm reader and bracket is required. The 70mm reader can be mounted onto the projector next to the DTS 35mm reader. If space is not available, an optional breakaway bracket and spacer can be used so either size reader can mount (one at a time) to the same bracket. Thumbscrews on the panels allow for easy change between DTS 35 / 70 mm readers.

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### **Can I install a DTS 35mm and DTS70mm reader at the same location on the projector?**

Yes, you'll need special DTS break-away plates and do the procedure below.

1. Start by mounting the 70mm reader (with its breakaway plate attached) to the bracket. Use 70mm film to align reader. Once aligned, tighten bracket screws. Loosen the thumbscrew on the breakaway plate so that the 70mm reader detaches from the bracket.
2. Now attach the 35mm reader (with its breakaway plate attached) to the bracket. Use 35mm film to be sure the alignment path is correct -- no corrections should be necessary. The principle is to have one alignment for both readers so that no projector adjustments are needed when the readers are exchanged.

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### **Is there fail-safe operation for DTS 70mm?**

Yes. Use the 70mm failsafe kit. The D587 allows the connection of two DTS-6D players and the D582 is used with two DTS-6 players. Both players must be the same model (DTS-6 *or* DTS-6D). You may use one reader for each player or both players can use one reader. The failsafe boards automatically switches in the second DTS player if the main DTS player fails.

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