

Table 1: Audio Post-Production on NTSC Video with Film-Originated Material

Delivery Format	Audio Speed before Pro Tools	Settings during source record	Audio speed after source record	Pro Tools settings while working	Pro Tools settings during delivery	Sample Rate during delivery
NTSC Video Speed 29.97 FPS	Telecine DAT (48000 or 44100, converted to video speed during Telecine)	No pull-up/down on the source machine or Pro Tools, Pro Tools is set to 29.97 FPS	Audio plays at video speed when Pro Tools is set to 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	48000 or 44100 (no sample rate or D-A-D conversion required)
NTSC Video Speed 29.97 FPS	Production Sound Roll (48000 or 44100 at film speed, 30 FPS)	No pull-up/down on the source machine or Pro Tools, Pro Tools is set to 29.97 FPS	Audio plays at film speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-down enabled so audio plays at video speed, Pro Tools is set to 29.97 FPS	Pro Tools pull-down enabled so audio plays at video speed, Pro Tools is set to 29.97 FPS	47952 or 44056 (sample rate or D-A-D conversion is required)
		Source machine is "pulled down" during source loading (sample rate or D-A-D conversion required), pull-up/down is disabled in Pro Tools, Pro Tools is set to 29.97 FPS	Audio plays at video speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	48000 or 44100 (no sample rate or D-A-D conversion required)
		Source machine plays at film speed while Pro Tools is set to 30 FPS and pull-up (sample rate or D-A-D conversion is required)	Audio plays at video speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	48000 or 44100 (no sample rate or D-A-D conversion required)

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Delivery Format	Audio Speed before Pro Tools	Settings during source record	Audio speed after source record	Pro Tools settings while working	Pro Tools settings during delivery	Sample Rate during delivery
Film Speed 24/30 FPS	Production Sound Roll (48000 or 44100 at film speed, 30 FPS)	Source machine set to play back at full (film) speed, Pro Tools is set to 30 FPS and no pull-up/down	Audio plays at film speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-down enabled so audio plays at video speed, Pro Tools is set to 29.97 FPS	Pro Tools pull-up/down disabled, Pro Tools is set to 30 FPS	48000 or 44100 (no sample rate or D-A-D conversion required)
		Source machine is "pulled down" during source loading (sample rate or D-A-D conversion required), pull-up/down is disabled in Pro Tools, Pro Tools is set to 29.97 FPS	Audio plays at video speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up enabled to get audio to play back at film speed, Pro Tools is set to 30 FPS	48048 or 44144 (sample rate or D-A-D conversion required)
		Source machine plays at film speed while Pro Tools is set to 30 FPS and pull-up (sample rate or D-A-D conversion is required)	Audio plays at video speed when Pro Tools is set to 29.97 FPS and 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up enabled to get audio to play back at film speed, Pro Tools is set to 30 FPS	48048 or 44144 (sample rate or D-A-D conversion required)
Film Speed 24/30 FPS	Telecine DAT (48000 or 44100, converted to video speed during Telecine)	No pull-up/down on either the source machine or Pro Tools, Pro Tools is set to 29.97 FPS	Audio plays at video speed when Pro Tools is set to 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up enabled to get audio to play back at film speed, Pro Tools is set to 30 FPS	48048 or 44144 (sample rate or D-A-D conversion required)
		Source machine is pulled-up during playback, Pro Tools is set to 29.97 with pull-up/down disabled (sample rate conversion or D-A-D conversion is required)	Audio plays at film speed when Pro Tools is set to 48000 or 44100 with no pull-down/up	Pro Tools pull-down enabled so audio plays at video speed, Pro Tools is set to 29.97 FPS	Pro Tools pull-up enabled to get audio to play back at film speed, Pro Tools is set to 30 FPS	48048 or 44144 (sample rate or D-A-D conversion required)
		Source machine plays back at normal speed (no pull-up/down), Pro Tools set for 29.97 FPS and pull-down (sample rate or D-A-D conversion is required)	Audio plays at film speed when Pro Tools is set to 48000 or 44100 with no pull-down/up	Pro Tools pull-down enabled so audio plays at video speed, Pro Tools is set to 29.97 FPS	Pro Tools pull-up/down disabled, Pro Tools is set to 30 FPS	48000 or 44100 (no sample rate or D-A-D conversion required)
		Source machine plays back at normal speed (no pull-up/down), Pro Tools has pull-up/down disabled and is set to 29.97	Audio plays at video speed when Pro Tools is set to 48000 or 44100 with no pull-down/up	Pro Tools pull-up/down disabled, Pro Tools is set to 29.97 FPS	Pro Tools pull-up enabled to get audio to play back at film speed, Pro Tools is set to 30 FPS	48048 or 44144 (sample rate or D-A-D conversion required)