



Night of the Living Dead (opposite page)
and *Scarface* (above)

Our dupe negative had some damage and jump cuts from where frames had been fixed, but the British dupe negative didn't have as much repair work: It was smoother all the way through." The audio restoration was done from a nitrate fine grain from La Cinematheque Quebecoise in Montreal.

Although *Scarface* was a product of pre-code Hollywood, it was still subject to censor boards after its release. "There was pressure not to go too far in romanticizing violence and amoral behavior," Schade notes. "There were four or five different versions cut for different cities and states. A preachy title card was added [*Scarface: Shame of a Nation*] and an alternate ending was shot replacing Tony shot dead in the gutter with Tony on the gallows. We showed the original-ending version followed by a clip of the alternate ending at The Reel Thing."

Audio and picture restoration began at the NBCUniversal StudioPost facility in Los Angeles. First, the dupe negative was fully inspected, then it was scanned to 4K on an Arri film scanner. A set of 4K DPX files was produced for digital clean up, repair and color grading workflows.

NBCUniversal StudioPost partnered with MTI Film (www.mtifilm.com) on the project. *Scarface* was subject to dirt, dust, scratches and other wear-and-tear one would come to expect from a popular film that has been distributed and screened around the world.

"The major challenge was the amount of softness that came from printing the negative over and over; when you do that, detail tends to wash away," says Schade. "The perforations were worn out and degraded from reprinting and that introduced movement that had to be stabilized. And there was the damage that comes from regular printing off the negative."

NBCUniversal StudioPost used a set of restoration tools very similar to those employed by MTI Film. StudioPost has eight seats of MTI DRS Nova, MTI Film's film restoration software package, and nine licenses of MTI Cortex, as well as Digital Vision Phoenix, Cinnafilm Dark Energy Professional and Algosoft Viva-Pro systems, and a talented team of digital clean up artists.

MTI Film built on StudioPost's work with additional stabilization and dewarping using MTI DRS Nova. One of the biggest clean up challenges was big blobs of different densities, which changed with every frame. "They were bigger than grain but smaller than flicker and caused areas of the picture to change," says Wojtek Janio, director of restoration at MTI Film. "They looked like boiling blobs of soup." DRS Nova and Viva-Pro removed the blobs; DRS Nova, Viva-Pro, Phoenix and HS-ART's Diamant DustBuster handled dust removal.

Another area of concern was scratches — "not the magnitude of the scratches but the quantity of them," Janio says. "On some shots, the whole side of the picture was full of white scratches. When you have that many placed next to each other it makes the film brighter on that side. We used all the algorithms and programs we had — Nova, Viva-Pro, DustBuster — to remove the scratches, then filled in the missing parts with texture." Texture management was performed with Dark Energy Professional, Cortex and Digital Vision Nucoda.

Since so many copies of the film had been made "the grain got bigger with each copy and more pronounced," Janio notes. "You could see the contrast differences, but it was hard to judge if you were dealing with exaggerated grain particles or dust particles. They look the same and there were hundreds per frame. When we ran automated dust removal software we had to verify the results manually to remove artifacts created by the program. Sometimes the software removed too much and cleaned so many places, so we had to identify those areas and manually revert the process to get rid of unwanted artifacts."

After clean up, MTI Film performed a light de-grain and re-grain pass "to remove strange structure created by cleaning and smooth everything spatially and temporally across all frames," Janio explains. "But between de-grain and re-grain we also did some sharpening to bring back definition lost in all the processes."

Sharpening was done with MTI Cortex Enterprise and the MTI-Samsung upscale algorithm. "In the algorithm's options you can actually turn off the



MTI Film removed and reintroduced grain into *Scarface*.

upsampling capabilities and let it do only the detail attenuation and sharpening, which it does amazingly well," he explains.

NBCUniversal StudioPost did the color grading using Blackmagic Design DaVinci Resolve, which helped build in contrast lost over many generations of reprinting. "In a black-and-white film, you want true good blacks and detail in the bright areas," says Schade. "You need a talented colorist to ensure that you get a nice range across the black-and-white spectrum."

"We do restoration on a regular basis for the love of films and our library," says Schade. "We want to have our films in a state where we can present them. We want to have them out and seen by as many people as possible."

NIGHT OF THE LIVING DEAD

George A. Romero's 1968 horror classic, *Night of the Living Dead*, is coming up on its 50th anniversary, and its subject matter couldn't be hotter, as renewed interest in all things related to the zombie apocalypse remains strong.

The film's first-ever major restoration opened last month at New York City's Film Forum and was followed by a national roll out. *Night of the Living Dead* was restored by The Museum of Modern Art and The Film Foundation, with funding from the George Lucas Family Foundation and the Celeste Bartos Fund for Film Preservation. The