HIGH SCHOOL CONFIDENTIAL

Mean Girls takes Broadway in a production
that pushes the technology envelope

By: David Barbour

he Plastics are back: Those double-dealing, back-stabbing, shade-throwing teen terrors, first dreamed up by Tina Fey in her hit 2004 film comedy *Mean Girls*, have occupied Broadway's August Wilson Theatre for what one imagines will be quite a long time. Outfitted with a set of critical bouquets and sterling box office receipts, *Mean Girls* has also racked up 12 Tony and ten Drama Desk Award nominations. In a season filled with musicals of every stripe, *Mean Girls* stands out, like its heroine, Cady Heron, as the smart, funny one in a tumultuous crowd.

Adapting a popular film for the stage is a tricky business. Stray too far from the original template and you'll disappoint the fans. Imitate it too slavishly and it won't come alive onstage. The creative team—including book author Fey, composer Jeff Richmond, lyricist Nell Benjamin, and director-choreographer Casey Nicholaw—have seemingly found the sweet spot that spells success: The musical retains the basic story and most of the oft-quoted gags from the film ("That is so fetch," "On Wednesdays, we wear pink") while updating it for 2018, most notably using social media to further the plot. It also features an envelope-pushing production design that features what may be the most ambitious use of video yet seen on Broadway.

As in the film, the story centers on Cady, who spent most of her childhood in Africa, being home-schooled, until her biologist parents lost their funding. Back in Chicago, she learns that the high school jungle is more treacherous than anything she experienced in the wilds of Kenya; the ruthless social pecking order is dominated by Regina George, the mini-skirted blonde tyrant, and her two

The video element of the design is especially adept at elucidating the characters' emotional states. Left: Cady meets her heartthrob Aaron. Above: Regina plots her revenge against the world.

Above and opposite: The video also serves a vital scene-setting function. The designers assiduously studied photo research of contemporary American high schools, also drawing on such TV/video series as *Riverdale* and *13 Reasons Why* to get the details right,

lieutenants, the perpetual nervous wreck Gretchen Wieners and the titanically dim Karen Smith. Resigned to being lost in the social shuffle, Cady is befriended by a pair of outcasts, Janis, a punk-artist type who has been classified as a "space-dyke" by Regina, and Damian, who is "almost too gay to function." They convince Cady to infiltrate the Plastics and execute a long-game humiliation plan against Regina. But the more Cady is enmeshed in her career as a double agent, the phonier and more callous she becomes; things get really sticky when she falls for Aaron Samuels, who is Regina's ex-boyfriend. The intrigue mounts, as Regina is subjected to weight gain (thanks to alleged diet bars that have the opposite effect) and a humiliating wardrobe malfunction at the school's annual holiday concert. There's also the matter of the little bus accident that nearly takes Regina out for good.

All of the designers interviewed for this feature note that Nicholaw wanted the production to be fast on its feet, never stopping for a moment. (The director-choreographer, who is known for planting extravagant show-stoppers in such musicals as *Aladdin* and *Something Rotten!*, has here opted for a staging that moves like a bullet train.) This was a tall order, given a script that is closer in structure to a screenplay, leaping from one location to another at a moment's notice. The solution is comprised of equal parts

creativity and technology. As Scott Pask, the scenic designer, points out, the entire show is, in a very real sense, choreographed—"Each act is a production number," he says—and it was up to the designers to follow suit. The key to the design proved to be a large-scale video system, a decision that affected every other discipline on stage.

Scenery/video

Pask says, "Casey and I talked about it early on, and I said, 'If we're going to do video, we're really going to do it, without apology'." The decision made sense in many ways: For one thing, video would help facilitate the show's fast pace by allowing for rapid transitions; it's also suitable for a show about a generation that has grown up permanently attached to their digital devices.

And as Finn Ross and Adam Young, of the design firm FRAY Studio, came onboard, it seemed clear that LED, rather than straight-up projection, was the way to go. With it, Young says, "We could use colors and tones that we haven't been able to achieve with projection. The brightness of the LED screens can compete with the onstage lighting, so we could create video content of, say, darkbrown brick or extremely dark blue night skies and moonlit gardens. If this was being done with projection, all of this

would have been washed out unless the stage was practically pitch black."

Ross says, "The stage is made up of two huge curved LED screens with various sliding panels and six LED screen legs that go into the wings. It's 6,000 pixels across and about 2,000 pixels high. There are about 650 tiles in the system." The tiles are Unilumin UPad IIIs, distributed in the US by Orange, California-based Matrix Visual. Pask adds, "The size of the screens was built into the design, but it was incredibly important to me not to see any pixels. I was at ShowMotion, who did such a brilliant job of building the show; we looked at many different layers, matte films that could soften the grid of the pixels." The solution was a pink 12mm-thick Perspex film that eradicates any pixelization and, Pask adds, "shifts the color temperature slightly, to something crisper and cooler." Also, he points out, "The upper layer of screens is set back about 2'. I really wanted to get that shift in plane."

"It's a 3.9mm wall, and the slightly frosted pink Perspex takes the hard edge off the image," Ross says. "The pink also cancels out a green tinge that comes naturally with LED walls. Most of the time, working in theatre, we're running screens at 10%; the Perspex allowed us to make the best use of the full range of the wall to realize nice gradient and accurate color rendition, which was invaluable. This was all down to Scott. The minute he suggested it, we said, 'Yes, please'."

In addition, Young says, "Ian Crawford, our production engineer worked closely with ShowMotion how to get access to the area behind the screen without having to move the front pink panel." Ross adds, "Ian quite brilliantly engineered the system and worked with it in a warehouse, getting it color-balanced, which was life-saving on a situation of that scale."

Indeed, there are moments in *Mean Girls* that might not be possible without the use of video. In an early Act I sequence, detailing Cady's school day, the action moves through several classrooms in a matter of minutes. Each switch is accomplished by the students shifting the direction of their desks, while one video backdrop replaces another. The video also makes a strong statement even before the show begins: When the audience enters, the stage is already visible; displayed on the screen are excerpts from Regina's "burn book," in which pages from the yearbook are marred by her scrawls and scurrilous comments. Under typically awful high school portraits are

such zingers as "future secretly gay president," and "when you find out your whole boy band has HPV." Fey was very involved in the creation of this: "Tina was very savvy about traveling through stock image websites to find particular images of people and particular comments," Young says.

Once the show begins, the video imagery falls into two distinct categories. First are the scene-setting representations of various high school locations—classrooms, gyms, hallways, and the like. The designers drew inspiration from various sources, including the CW series *Riverdale* and the video series *13 Reasons Why*, as well as photo research of American high schools. Pask, who, in addition to designing physical scenery, acted as overall art director, says this preliminary work raised many questions: "What are contemporary high schools like? What about the floors and walls? How do they decorate? If it wasn't spot-on, it might be too juvenile."

Other locations include Regina's pink bedroom, dominated by an actual canopy bed; the house where a fateful Halloween party takes place, Cady's kitchen, and an eye-popping two-level shopping mall. "For the more surreal moments," Young says, "we use video content to represent the characters' psychology. For example, scenes with

Janis, the art freak, are hand-drawn with streaky markers and everything feels rough and unpolished." This look extends to the moment when Cady first meets Aaron in math class, cueing the number "Stupid with Love;" the screens are filled with equations covered with hearts and arrows. Damian has more than one reverie starring his chief crush, George Michael. Young adds, "When our 'Queen Plastic' Regina is still the most popular girl in school, her video worlds are very pink and sparkly. However, later in the show, when she's seeking revenge for her social exile, we shift to a James Bond-inspired world, which, while maintaining her color, is less pretty, starker, and holds a harsh and aggressive energy." When Regina, by now an outcast, plots her comeback in "Watch the World Burn," the imagery is a black-and-white collage of excerpts from the burn book. "She is revealed walking downstage, with these massive, double-height LED walls," Pask says. "The scale becomes operatic."

At the same time, pieces of scenery are threaded through every scene. These include the locker units in the school scenes (one locker outfitted with a lift for Regina in "Watch the World Burn," rolling cafeteria tables and desks, the kitchen island in Cady's house, and the mall railing

Each scene combines video with physical scenery, such as the school lockers depicted above.

Posner's lighting works in tandem with the video/scenic design. Depending on the scene, a different design department would set the palette for others to follow.

hanger, a half-circle piece that flies in to denote the mall's upper level.

Interestingly, the wide-angle imagery doesn't steal focus from the actors, in part because their movement is largely confined to scenic transition. "This was very conscious, especially from Casey's point of view," Young says. "When do you a lot of movement, as in ['Watch the World Burn'], you're rewarded, because it has been held back. The cast is incredible; we were conscious not to use the screen as a giant TV, because your eyes are fixed on a moving image and you stop looking at what's happening in reality." Ross adds, "Our philosophy is a firm belief video is there to help tell the story. Here, we use it to move from place to place to place. The show goes to a bazillion locations, and if you did long, graceful scenic transitions, the show would be four hours long. We need to cut in three frames, as in film or television."

The color palette, Ross says, "came through Scott, Casey, and also Gregg Barnes' costumes. We spent a lot of time looking at the insides of American high schools. [He and Young are both British.] I know a graphic designer

and former high school teacher with whom we worked designing the classroom decorations. That was incredibly useful." He adds, laughing, "We didn't have a clue of what homecoming is!" Still, he adds, "Video helps to subtly indicate the passing of the school year; we show harvest food drives, Thanksgiving decorations, the holiday ball. We definitely know a lot more about American high schools than we did before."

Young says that color-matching scenery and video content "is very, very difficult. For example, the blue of the lockers, because of the nature of the LED screen, is very green. But the lockers that look blue on the computer monitor are purple by the time you get them onstage. We produced a series of color-swatch books to put on the video walls, and we'd sit in the stalls and pick out the color that felt closest to the scenery. Also, everything looked different, depending on how it was lit. We were in a never-ending battle to get the perfect yellows and pinks."

The images are delivered using five disguise gx 1 media servers, outfitted with Notch software and linked to 22 NovaStar NovaPro HD processors. (The gear was supplied

Posner notes that, because of its scenographic function, the video wall is brighter than others currently seen on Broadway. "That drove the lighting to match it or exceed it," he says. Opposite: Regina's bedroom is dominated by her pink canopy bed.

by PRG Video.) Ross notes that Crawford "set up the video system in a warehouse, getting it all color-balanced, with the same RGB values on each screen. Using tricks in the gx 1s we can shift colors a bit as needed. Ken [Posner, the lighting designer] was super-collaborative. He would put a color on stage and one of our programmers would go to work, matching it."

Control of the video is done employing a mélange of techniques. Often, the gx 1s are triggered by the ETC Eos Ti lighting console, but certain sequences are on time code, triggered by the musical director Mary-Mitchell Campbell. Occasionally, cues are triggered by the sound department.

Other scenic/video staff includes Orit Jacoby Carroll (associate scenic designer), Gabriel Firestone and Stephen Davan (assistant scenic designers), Fran Rapp (production carpenter), Jon Wildesen (head carpenter), Eric Smith (deck automation), and Ash J. Woodward (associate video designer).

Perhaps the cheekiest use of scenery and video occurs in the bus accident that knocks Regina for a physical loop. As Pask describes it, "During 'I'd Rather Be Me' [sung by Janis], the chorus is carrying Barrett [Wilbert Weed, who plays Janis]. Part of the surround shifts upstage, revealing a cavity of about 18". The panel with the bus comes shooting out of it. The body of the bus is hand-painted China silk that is 'backpacked' to stay taut. The front of it is carved, sculpted, and coated foam. It becomes taut in the final position, and on video, we see Regina cartwheel through the air." It's a good symbol of the collaboration that made the production possible.

Lighting

Lighting designer Ken Posner says the video screen "is an incredible device, but very challenging for me. It was my first show with a video component of this magnitude." (In a way, he got the ball rolling with video on Broadway in 2001 when he did *Hairspray*; the show featured a wall of lights, with which he made simple imagery like Valentine hearts; back then, no one could guess where the world

was headed, technologically.) He adds, "The collaboration with Finn and Adam was wonderful, and, obviously, Scott was very influential."

Still, the challenge was clear: The screen, Posner says, "at times can be the brightest element onstage. Because of the energy of the show and the fact that the video is scenographic, it runs substantially brighter than other walls on Broadway. That drove the stage light to be up to the level of the screen, or even to exceed it. The lighting needs to make the foreground brighter, so the actors will pop and be our primary focus. In addition, the video screen often functions in the spirit of a handheld device displaying social media or texts. This is an important plot device so striking the visual balance between foreground and background was something I was very focused on in term of the overall design."

In terms of positions, Posner says, "There's a tremendous amount of side light. We incorporated side positions on the video walls; also, the wings are extra wide, because there's no automation and the actors move the scenery.

The in-one and two bays have to be wide enough to accommodate cafeteria tables." Sidelight, Posner notes, allows him "to reshape the space, redefine the geography of the set, and move as fast as the play—and the video wall." So quickly does the show move, thanks to the video, he notes, there are roughly 840 light cues in a show running about two-and-a-half hours.

To get the needed brightness, Posner chose as his workhorses Martin by Harman MAC Performance Vipers and MAC Auras. "There are some [ETC] Luster2s mixed in, and some [Chauvet Professional] COLORado 2s," he adds, "and that's really the bulk of it. The entire overhead plot is Mac Vipers; I decided on an all profile overhead plot because the musical moves so quickly, and the space/playing area is constantly changing, this was the best way to inject the needed color and intensity into the design. The sidelight, he adds, comes in two versions: "I have Viper Performances and another system of Mac Auras, to carve out and create the architecture of space."

In terms of color, Posner says, "Scott really set the

The shopping mall sequence, seen above, gives a sense of the scope of the video wall and its place in the overall design.

palette as did Gregg Barnes, and I riffed off it. Sometimes, it needs to be clean, crisp light and sometimes I would set the color and tone, and Finn would work off that in yellow and blue high school colors. It really needs to feel that it was the work of one hand—lighting, scenery, and video flowing from once source. It took a learning curve, because what a color looks like on a Pantone is different on the video screen."

The cueing, Posner adds, "is completely driven" by Richmond's score; the Eos Ti console is programmed by David Arch, with Dan Coey serving as production electrician. Also on the lighting team are Joel Shier (associate lighting designer), Jon Goldman (assistant lighting designer), and Stephen Long (head electrician).

Sound

The video design also had implications for Brian Ronan's sound system. Noting the set's width, he says that, in the August Wilson Theatre, he was hard pressed to find room for his loudspeaker arrays. "We all put our heads together about it, but where I wanted to put the speakers, decent seats would be blocked."

The solution involved the idea of "three speaker systems treated as one," Ronan says. Wanting to use L-Acoustics gear, he went with the company's KIVAs, which serve as his right and left arrays, with two additional speakers attached: "a Meyer Sound UPA pointing at what would have covered rows five through eight in a regular PA system, and a UPJunior to fill the very near and left areas. I timed them accurately to each other, so they come as one solid wave to what are, after all, the best seats in the house. In the center, I have a strip of [L-Acoustics] dv-DOSC; it's a low hang at the Wilson, so I couldn't get a big array in there. Also, there are two strips of [L-Acoustics] KARAs at left and right to send out the band, unfiltered, blocking out the lows for the vocals and letting all the instruments come as they will. The vocals are located in the center with the band at left and right; when you're sitting in the tenth row, it sounds like the music is coming from the pit, not the left and right." Another set of five dv-DOSC covers the first third of the mezzanine, with six more dv-DOSC per side cover the rear mezzanine. (The August Wilson has no balcony.)

Interestingly, Ronan notes that the score changed stylistically between the Washington, DC tryout engagement and New York. "It had more electronics, a lot of Ableton tracks," he says. "In New York, it's more of a pop sound. It was the composer's choice. I also had a surround sound stem in DC, but the main effect for which it was used was cut, so we didn't hang it in New York." He adds, "The show reminds me of *The Book of Mormon* in that you need the sound to react to the book scenes, because of the audience laughing."

Ronan says that because of the score's pop style. he tried to sell Nicholaw on the idea of boom mics, but "he didn't want the look. Mostly, we're using [Sennheiser] MKE 1s, with MKE 2s on a couple of the performers. We're also using Sennheiser receivers and transmitters. I try my best to get lavalier mics to be as invisible as possible. To me, that's part of the illusion with good sound design." One imagines that given the characters' many wigs, that mic placement would be a challenge, no more than in the case of Kerry Butler, who plays three distinct characters, including Regina's doting mother and the English teacher played by Fey in the film. However, Ronan says, "If you get the mic down first, as long as the wig doesn't do anything unusual, the wig fits on top. One principal has a softer voice, and I had to bring her mic down a quarter-inch. But if you have a good wig designer, it's fine. Josh [Marquette, the wig designer] anticipates things, because he's an experienced musical guy and he knows what he's doing."

The sound is run on a DiGiCo SD7T, the "T" meaning it has been optimized for theatre applications. "I've dabbled with Yamaha, but the DiGiCo so closely resembles the old Cadac console in its layout, it just speaks to me. It feels like home to me," Ronan says. He uses a bit of reverb,

Note at left how Damian (with Janis standing behind him) Is seated on a bench with wheels. Every piece of furniture, including desks and cafeteria tables, is moved by actors. Combined with the instantaneous scene changes made available by the video, the result is one of the fastest-moving shows on Broadway, Also included in the show's lighting package are, from City Theatrical, QolorFLEX LED tape, QolorFLEX SHoW DMX Neo 4x2.5A dimmers, QolorFLEX 3x10A dimmers, and PDS-750 TRX power data supplies.

from a TC Electronic 6000, on Regina's numbers, to give her a more sinister edge. Audio gear was supplied by Masque Sound.

Sound effects, including that bus crash, are delivered via QLab3. The band is on an Aviom personal monitor mixing system. Discussing the complex interaction of controllers and cues, he says, "Practically every song has a click track, which is triggered by the conductor; she also triggers some video and lighting cues, and, in a couple of incidences, the sound department triggers lighting cues." All of this happens pragmatically, he says. "A good example is the Mathletes competition," which happens near the end when a reformed Cady joins the math team on a quiz show. "When one

of the Mathletes hits the go button [signaling he or she knows the answer to a question], there's a sound and light cue. The light board triggers us, because the light cue came first. Later, we added a sound cue. In the party, a guest dressed as the Bride of Frankenstein has her dress ripped. I added a sound cue and then Ken said, 'Maybe I should do a light cue'." In this case, the sound console drives the cue.

The rest of Ronan's sound crew includes Cody Spencer (associate sound designer), Brian Shoemaker (head sound), Dillon Cody (production sound engineer), and Jessica Weeks (assistant sound). As it heads into awards season, *Mean Girls* continues its open-ended run at the August Wilson Theatre.