

The Metropolitan Opera: Live in HD

“a new art form” - *Los Angeles Times*

“a landmark triumph” - Garrison Keillor

- began with 2006-7 season (Met's 1st HDTV production was 1990, 1st TV from house 1948, studio 1940)
- more than 2000 cinema screens in more than 60 countries on all seven continents and 19 ships at sea
- #1 alternative content for cinema worldwide, as high as #9 in U.S. weekend cinema box-office grosses
- opening nights to 32' screen on front of Met (4 x 25,000-lumen projection) & 15 Times Square screens (each Times Square screen requiring a different transmission path and delay)
- transmission via fiber and satellite with geographically-diverse, weather-protected uplinks
- satellites changed as necessary due to constant NYC construction and *Fashion Week* needs
- transmission encoded at the Met, decoded at the cinemas; all between is in the bit-rate-reduced domain
- network doesn't exist until two hours before air time; testing designed for busy projectionists; exit lighting provided as part of transmission
- first multi-language live subtitling system (beginning 2007); receivers now catching up to standard used
- Engineering Emmy Award, IBC International Honour for Excellence (top award), Peabody Award
- production facilities provided by All Mobile Video, occupying every legal parking space on three blocks
- everything shot during live performance before paying audience that must not be disturbed
- can be live for more than six hours without a break (1983 centennial global broadcast live for 14 hours)
- cameras: up to 15 Sony HDC-2000/2500 (separate from house surveillance [HD & hyper-sensitive] & conductor cameras used by the TV production team)
- special mounts (needed in part because camera setup time often less than two hours):
 - house-built no-obstruction aisle sleds (with up to 99x8.4 lenses)
 - Elemack Spyderys that can roll into unmodified seat rows (with up to 99x8.4 lenses)
 - robotic pan-tilt-zoom-focus (with up to 42x9.7 lenses) sometimes suspended on stage pipes
 - robotic 24-foot-extension towers (weighing about 800 lbs.)
 - robotic track across the stage lip with 360-degree panning capability
- intermission cameras frequently relocated: backstage, above the stage, under the stage, rehearsal rooms, dressing rooms, offices, outdoors, in tunnels, even inside the truck control room, all live
- Steadicam moves include ~300' backwards at high-speed, cabled, with crew not in the shot
- cabling must avoid stage “wagons” weighing up to 45 tons each
- two TV directors/associate directors per transmission: one for opera, other for intermissions
- wireless mics on working stage crew for intermissions
- recordings on videotape (HDCAM SR), hard disk drives (DNxHD and ProRes), and solid-state drives
 - with or without subtitles, act titles
 - with stereo, discrete surround, encoded surround, and isolated audio tracks
 - up to 128 audio tracks recorded on different-brand systems (in case of software failures)
 - isolated recordings provide more close-ups for later TV, internet, and home-video releases
 - review recordings for lighting, music mix, video, director, & camera conference
 - “lighting test” needs to be as-is for lighting/video review but high-quality for promotion
 - camera conferences review all-camera multi-view, high-sensitivity wide shot, line cut, conductor