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Live Action - Production Sound Best Practices

Crew and Equipment

- Make sure to communicate with the production team to fully understand the scale of the show before planning the sound crew and budget.
- If there is a script, read it to help determine how to budget the crew, equipment, and tools needed.
- The on-set sound department should have at least a three-person crew for scripted content.
- When budgeting, make sure to allocate for backup equipment and reach out to local rental houses during pre-production. Doing so will help sound teams anticipate how to handle a technical emergency such as a broken microphone or recorder.

Preferred Sound Production Equipment

NOTE: The order in which the following equipment is listed does NOT imply priority of preference or any kind of endorsement.

Field Recorders

- Sound Devices
- Zaxcom
- Sonosax
- Aaton Digital

Microphones

- DPA
- Schoeps
- Sanken
- Sennheiser
- Neumann
- Countryman
- Shure

Wireless Transmitters

- Lectrosonics
- Zaxcom

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- Sennheiser 6000 Series
- Wisycom
- Audio Limited
- Shure
- Sony

Timecode Sync Generators

- Ambient
- Deneke
- Mozegear
- Betso
- Timecode Systems
- Tentacle Sync

Location Scouting

- Production sound mixers should go on all location scouts to assess and notify the production of sound challenges.
- Key elements to assess on a location scout:
 - Where does production plan to stage the generator or any other noise-generating equipment?

If the location is exterior:

- What time will the shoot take place at this location?
- Is it during “rush hour?”
- Is it during garbage collection or gardening times?
- Is the location near a highway, airport, fire station, train station, hospital, or construction site?
- Apps like Flight Radar can help check flight proximity to locations.

If the location is interior:

- Is the location on a stage? Is it soundproof?
- How are the space acoustics?
- Check floor and wall surfaces to consider the impact of echo.
- Is it possible to turn off or gain sufficient distance from any noise-generating equipment such as an HVAC, refrigerator, or ice machine?

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Working with Other Departments

Cross-department collaboration is crucial to capturing great production sound. Make sure to use pre-production time to build good working relationships with:

The Production Manager and/or Location Manager

- **They can help:**
 - Resolve any problems uncovered during the location scout, later at the location, or on-stage during production.
 - Acquire additional equipment.

The Costume and/or Wardrobe Department

- **They can help:**
 - Determine ideal microphone placement.
 - Provide wind protection with swatches of costume cloth.
 - Avoid noisy clothing, textile, or accessories such as necklaces and chains.

The Prop Department

- **They can help:**
 - Deal with noisy props or accessories, such as shopping bags or dishes/utensils in table scenes.

The Art Department

- **They can help:**
 - With noisy furniture or stairs.
 - Deaden echoey and "live" rooms with carpets.

The Hair & Make Up Department

- **They can help:**
 - Hide a lavalier mic in talent's hair.

The Camera Department

- **They can help:**
 - Reduce camera-fan noise.
 - Ensure the timecode does not drift and the slate information is correct.

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The Grip and Electric Departments

- **They can help:**
 - Keep the generator and noisy lights away from the set.
 - Ensure that the boom operator has a reasonable spot to operate on-set.
 - Reduce dolly noise.
 - Hide boom microphone shadow.

The Data Manager/Digital Imaging Technician (DIT)

- **They can help:**
 - Ensure that sound files, production notes, and sound metadata are being effectively delivered to post-production teams.
 - Facilitate communication with the editorial department on any production sound-related issue

The Editorial Department

- **They can help:**
 - Clarify track order for the mixdown, boom, and ISOs.
 - Decide on a mono vs. stereo mix.

Workflow Meetings & Pipeline Tests

- The sound team should participate in all workflow meetings, camera tests, and any tests of the dailies pipeline.
- A dailies pipeline test ensures that all the dailies are synced with the picture correctly.
- This test also ensures the production audio metadata remains intact when the editorial team creates the AAF or OMF and passes it onto post audio houses.
- The sound team should distribute information regarding sound workflow to all relevant parties and ensure that the sound production pipeline is accurately represented in the workflow memo.

Frequency Coordination

- Before production begins, make sure to check available radio frequency (RF) ranges.
- Frequency coordination is key to reducing RF interference and intermodulation.

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- To ensure clean transmission on every change of location:
 - Consider digital wireless mics or local area wireless mic networks.
 - Coordinate with other departments and use RF scanners to learn the spectrum usage on each set.

Software & Apps that can help with frequency coordination include:

Software:

- RF Scanners
- RF Explorer Pro Audio Edition
- RF Venue
- RF Explorer RackPRO

Apps:

- Freq Finder App (iOS & Android)
- Wireless Designer by Lectrosonics (Windows & macOS)
- Wireless Workbench by Shure (Windows & macOS)

Production Best Practices

Recording Media

Equipment: Best Practices

- When recording media, sound teams should:
 - Record to SD, SSD, or CF cards.
 - Use a dual-media recorder for simultaneous media redundancy.
 - Use a backup recorder in case of equipment failure.
 - Check the manufacturer's list of compatible SD/CF cards for the recorder.
 - Incompatible media cards or old/scratched media cards may result in file corruption.
 - Allow at least 8 seconds of pre-roll per take.
 - Optionally, this can be done using a "pre-record" cache.

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Recording Workflow: Best Practices

- Only record one sound roll [shooting day] per master SD, SSD/CF card.
- Additional cards may be used if multiple recorders are used. In this case, please specify what sound roll/file corresponds to which recorder in the naming scheme.
- Label media and media cases with the show name, date, and sound roll/file number before being sent out.
- Make sure correct metadata is stored in each sound file.
- This metadata should include sound roll/file, scene, shot, take numbers, as well as track names (character names or a description: e.g., Boom mic, Audience mic, Stage L/R, Instrument names etc).

Recording Format

- Location dialog files should be recorded as 24 bit Polyphonic Wave (.wav or .bwav) at 48 kHz.
- Field recording for ambiance and effects should be recorded as 24 bit Polyphonic Wave (.wav or .bwav) at 48 kHz or a higher sample rate.

Timecode

- The choice of time of day (TOD) or “Free Run” TC frame rate should be determined in consultation with the camera and editorial departments.
- Anticipate crossing midnight during the take to avoid problematic sound metadata during post-production.
- The user bits information in the timecode track can be useful to provide additional data to assistant editors when using digital slates. For example: user bits can be used to display sound roll/file number, camera letter or date information.

Backups

- The sound team should coordinate with the camera department and/or data manager/DIT to ensure that the corresponding sound and camera takes are handed off to the dailies team at the same time.
- Picture files should not be delivered to the editorial team without matching sound rolls/files.
- Sound rolls/files should be backed up in the manner designated by the production’s workflow memo.

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- The sound team should keep their own backup apart from the Data Manager or DIT.
- For series, use different folders for each episode to organize and avoid duplicate file names.
- For more information on asset naming best practices see: "Production Assets: Folder Naming"

Sound Roll/File Naming

- The following table provides a recommended sound roll/file naming convention. This information should also be embedded in the sound roll/file metadata along with script character names and microphones for each ISO mic.
- It is NOT RECOMMENDED to repeat sound roll/file numbers.
- NOTE: All of these naming conventions are subject to recorder capabilities.

REGION	US/CANADA/LATAM	ASIA/PACIFIC	EMEA
Naming Convention - SERIES	(Show)(Season)(roll/file #x3)	(Show-code)(Season) (ShootingDay#x3)	(Show)(Season)(ShootingDay or roll/file#x3)
Example	TWD8056 - The Walking Dead Season 8 Roll/File 56	TWD8023 - The Walking Dead Season 8 Day 23	TWD8056 or TWD8023 - The Walking Dead Season 8 Day 56 / Roll/File 23

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| Naming Convention - FILMS | (Film-code)(roll/file#x3) | (Film-code)(ShootingDay#x3) | (Film-code)(ShootingDay or roll/file#x3) |

| Example | OKJ056 - Okja Roll/File 56 | OKJ032 - Okja Day 32 | OKJ032 or OKJ056 - Okja Day 32 / Roll/File 56 |

| Naming Convention - SECOND UNIT | (Show)(Season)X(roll/file#x2) or (Film)X(roll/file#x2) | (Show-code)(Season)X(ShootingDay#x2) or (Film)X(ShootingDay#x2) | (Show)(Season)X(Day or roll/file#x2) or (Film)X(Day or roll/file#x2) |

| Example | ST2X01 - Stranger Things Season 2 Second Unit Roll/File 1 | ST2X07 - Stranger Things Season 2 Second Unit Day 7 | ST2X01 or ST2X07 - Stranger Things Season 2 Second Unit Roll/File 1 / Day 7 |

| Naming Convention - ADDITIONAL RECORDERS | (Show)(Season)X(roll/file#x2)(B) or (Film)X(roll/file#x2)(B) | (Show-code)(Season)X(ShootingDay#x2)(B) or (Film)X(ShootingDay#x2)(B) | (Show)(Season)X(Day or roll/file#x2)(B) or (Film)X(Day or roll/file#x2)(B) |

| Example | ST2X01B - Stranger Things Season 2 Second Unit Roll/File 1 Recorder B | ST2X17B - Stranger Things Season 2 Second Unit Day 17 Recorder B | ST2X01B or ST2X17B - Stranger Things Season 2 Second Unit Roll/File 1 / Day 17 Recorder B |

Alternative Naming Option

- If your production would rather not follow the naming convention described above, a recommended alternative would be:
- Dates as roll/file number.
- Example: 21Y11M30

Sound Report

- On scripted productions, circled takes should be noted on the sound reports and confirmed with the script supervisor at each break.

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- A PDF Report or a CSV file should be generated and handed off to the DIT or Data Manager with captured sound at the end of each production day.
- A sound report should typically include:
 - Production name.
 - Dates.
 - Sound roll/file.
 - Sample rate and bit depth.
 - Timecode information.
 - Model of the recorder/mixer used.
 - Microphones.
 - Name and contact information of the mixer.
 - Track information.
 - Circle takes.
 - Wild takes.
 - NG takes.
 - Any relevant comments or notes on the take that might be useful for the editor or dialogue editor.

Track Layout

- The audio track layout should be determined in collaboration with the editorial department.
- A common default layout is:
 - Ch.1 and/or Ch.2 - Mix Track (Mono or Stereo).
 - Ch.3 - Boom 1.
 - Ch.4 - Boom 2.
 - Ch.5 - Ch.X - ISO Mics.

In-Camera Sound

- For certain documentary and special-use cases where sound is recorded only to the camera, the sound team should monitor audio at all times to ensure quality.

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- In these cases, the use of in-camera microphones should be avoided. Instead, use industry-standard boom microphones and/or a mix of Lavalier mics. High-quality preamps should also be used.
- Editorial may request scratch audio (audio recorded by the camera) for syncing purposes. Be sure requests are discussed and coordinated with the editorial and camera department ahead of time.

Best Practices for Musicals

- Productions should hire a playback operator for musicals or any instances with music/sound playback.
- The production sound mixer should record playback music into 2-3 assigned channels on the recorder:
 - The music playback track itself (mono or stereo as desired).
 - SMPTE LTC (at project fps) audio timecode of that playback track.
- When using Avid Media Composer, editorial should import editorial media and the source playback audio file as follows:
 - Use the "Read Audio Timecode" function on the synced editorial media to read / map that LTC channel to an Aux TC column.
- This best practice backfills the playback TC as actual values on the master clip, and then allows clips to be grouped by either:
 - Video/Dialogue TC.
 - Playback TC (as used in music video workflows).