Stage sound systems

An introduction to equipment, staff and techniques

If you can't mix then you will be replaced. The minute you decide you are irreplaceable is the minute when you start to lie to yourself.

The People

- Sound designer
- Sound operator No1
- Sound operator no2
- Sound designer no3
- Crew
- Desk mixer
- Monitor mixer
- Foley artist

Sound designer

- Straight plays:
  - Using your own composition
  - Creating your own effects
  - Works with the director to create the unified vision for the mood and atmosphere for the show.

- Musical theatre:
  - designing band mics, radio mics
  - Bring the composers sound to reality
  - Works with the director and music director create the unified vision for the mood and atmosphere for the show.

Sound operator No 1

- The best ears in the room
- Stands at the desk on the faders
- Remains in the auditorium
- Will relay instructions to no2 &no3
- The go-to for the designer
- Will mix the show
  - Levels
  - Eq
  - monitors

Sound operator No 2

- Traditionally a mic tech, or effects tech in some cases
- Prepare, manage, maintain microphones
- Mic the actors
- Technical problem solvers
- Preventative maintenance
- Will liaise with costume / wardrobe to positioning of belt packs and mics on heads / costumes
- Labelling

Sound operator No 3

- General assistant
- Will be the runner to assist No2 & No1
- Will bounce between FOH & BOH
- Remains free and to hand to help problem solve
- Newest in the team usually

Sound crew / in house staff

- Resident staff / in house staff / local crew are people from the venue you are visiting, if you are touring to.
- Will know the house patch and kit if you are using it.
- Everyone MUST ask local crew before plugging up / unplugging venue equipment

Desk mixer

- Some places and venues have just a mixer who has a perfect ear for sound.
- Usually a musician.
- Some bands will hire their own mixer to tour with them, who will adjust equipment all ready set up to best suit the band. Typically festivals.

Monitor mixer

- Thick skinned.
- Communicative and has very fast response to imbalanced sound
- Again has the best ears in the room but no ego.
- Will mix what each band member / performer hears in the monitors.
- A bands performance can be hindered by a bad mix

Foley artist

- Usually removed from the theatre space
- Typically works in radio and film
- Re imagines certain sound effects
- Creates the specific brief of the script or sound designer

The equipment

- Mixing desk (central)
- Laptops (input)
- Musical instruments (input)
- Microphones (input)
- DI Boxes
- Cables
- Amplifier (output)
- Speakers (output)

Mixing desks – analog and digital

- Are the central point for the PA / sound system
- Inputs plug into the desk, as well as outputs
- Each entity can be controlled at this central point
- Analogue, digital, studio, theatre

Analogue - Digital





Laptops / phones

- Computer media is now commonplace as an input for sound
- Qlab is the industry standard for running sound effects cues
- Will need to be DI'd

Musical instruments

- All electrical instruments will need to be DI'd
- Some will have a stereo or mono output
- Some may need to be microphones – too many to mention!
- Very precious to the performer and must be checked with when plugging / unplugging.

Microphones

- 3 main types in music – Dynamic / condenser / ribbon – all require phantom power 48V
- Vocals
- Instrumental
- Radio
- Polar patterns
  - Cardioid
  - Super cardioid
  - Omni directional
  - Figure 8
  - Shotgun






SHURE





Cables

- Speaker cable – Balanced and unbalanced
- XLR
- Speakon
- Powercon
- Mini jack / ¼ inch jack
- Big jack / ¾ inch jack

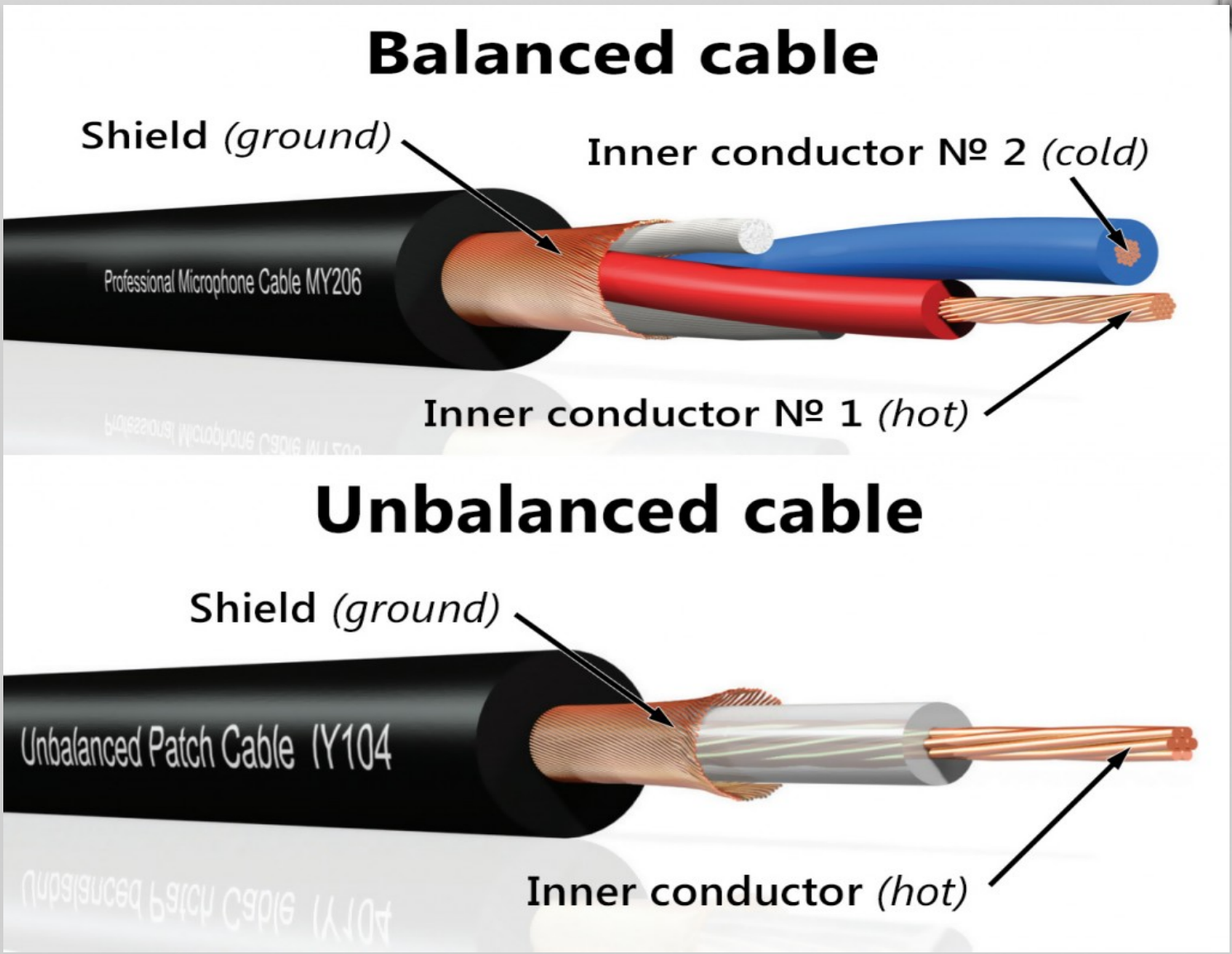
Balanced Vs Unbalanced

Now that we know why signals of opposite polarity cancel each other out, we can talk about balanced leads, a very clever trick that is used in pro audio to remove most of the noise that is normally picked up by cables. A normal audio connection requires two conductors: the central conductor that carries the signal, and the ground, which surrounds the central connector. The ground acts both as a shield for the conductor, and as the link that completes the electrical circuit.

Unbalanced. This works pretty well in many cases, particularly on short cable runs. If the signal strength is high, the impedance is low, the cable is of high quality, and there are no nearby sources of interference, an unbalanced connection is all you need. However, on long runs or in places with high electromagnetic interference, the cable will add a noticeable amount of noise to the signal.

Balanced. A balanced connection sends the signal twice, on two separate conductors instead of only one. These are called “hot” and “cold”, with the former usually having red insulation for easy identification. However, the polarity is reversed on the “cold” conductor, in the same way as explained above. When the cable is subjected to interference, noise is added to both conductors, which are so close together that said noise is basically the same on both.
Here is the clever bit: in the input of a balanced connection, the polarity of the “cold” signal is reversed again, and then added to the “hot” one. The original signal is added to itself, therefore getting louder, and the noise, which is now at opposite polarity, cancels itself out.

Balanced / unbalanced




1
3
2


YONGSHENG
YONGSHENG



PowerCON power output cable connector.



PowerCON power input panel connector



PowerCON power input cable connector.



PowerCON power output panel connector



SpeakON NL2 cable connector



SpeakON NL2 panel connector



SpeakON NL4 cable connector



SpeakON NL4 panel connector



SpeakON NL8 cable connector



SpeakON NL8 panel connector

Amplifiers

- Rated in wattage
- Need to be well suited to the speakers you are using
- Another way to control sound output (‘volume’)


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POWER
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INPUT
CH B INPUT
BRIDGE OUT
MODE
BRIDGE
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CH B OUTPUT
CH A OUTPUT
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FUSE 10A
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Speakers

- Active (needs power for the internal)
- Passive (powered by a separate amplifier)
- Tops (generate the HF)
- Mid range (generate the mid range frequencies)
- Subs (generate the LF)
- Come in a variety of sizes
- Line array



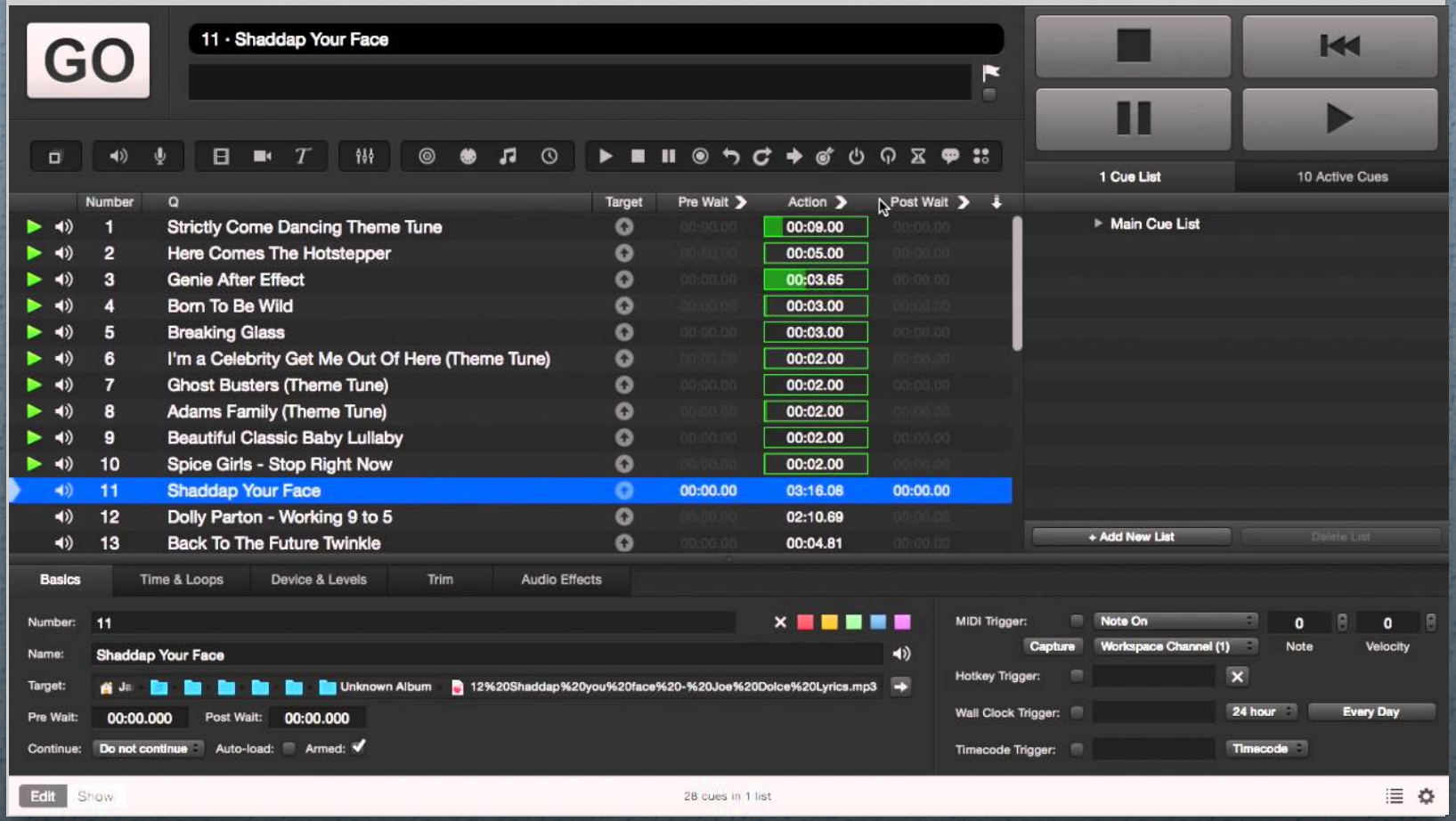



MIC
LEVEL
MIN MAX
LINE IN
LEVEL
MIN MAX
VOLUME
MIN MAX
LINE OUT
TREBLE
-12dB +12dB
PROFESSIONAL
AUDIO
TA12P
180 Watts RMS
1000 Watts MAX
12" Powered 2-Way
Bi-Amp Loudspeaker
Made in P.R.C.
BASS
-12dB +12dB
CLIP POWER
110V 220V
POWER
ON
OFF
AC 110V 60Hz
AC 220V 50Hz



Techniques

- Qlab
- How to set up equipment
- The room you are in and acoustics
- What to do in rehearsals, get ins, technical rehearsal and shows
- How to lay a cable…….and coil one
- Paperwork


GO
11 · Shaddap Your Face
1 Cue List
10 Active Cues
Number
Q
Target
Pre Wait
Action
Post Wait
1 Strictly Come Dancing Theme Tune 00:09.00
2 Here Comes The Hotstepper 00:05.00
3 Genie After Effect 00:03.65
4 Born To Be Wild 00:03.00
5 Breaking Glass 00:03.00
6 I'm a Celebrity Get Me Out Of Here (Theme Tune) 00:02.00
7 Ghost Busters (Theme Tune) 00:02.00
8 Adams Family (Theme Tune) 00:02.00
9 Beautiful Classic Baby Lullaby 00:02.00
10 Spice Girls - Stop Right Now 00:02.00
11 Shaddap Your Face 00:00.00 03:16.08 00:00.00
12 Dolly Parton - Working 9 to 5 02:10.69
13 Back To The Future Twinkle 00:04.81
Main Cue List
+ Add New List
Delete List
Basics
Time & Loops
Device & Levels
Trim
Audio Effects
Number: 11
Name: Shaddap Your Face
Target: Unknown Album 12%20Shaddap%20you%20face%20-%20Joe%20Dolce%20Lyrics.mp3
Pre Wait: 00:00.000
Post Wait: 00:00.000
Continue: Do not continue
Auto-load:
Armed:
MIDI Trigger:
Note On
Capture
Workspace Channel (1)
Note
Velocity
Hotkey Trigger:
Wall Clock Trigger:
24 hour
Every Day
Timecode Trigger:
Timecode
Edit
Show
28 cues in 1 list

Sound Cue Sheet

Show: Peter Pan **Crew:** Ji Young Kim

Cue No.	Script Page	Sound	Deck	Second start 0 Counter No.	Begin Cue	Begin Level	End Cue	End Level
1	1	introductory music	CD	0	House lights dim	10	Curtain rises	0
2	1	Sound of Sleeper	MP3	0	Wendy upstage	10	John upstage	6
3	1	barking, sleeper sound	MP3	0	Nana and Michael upstage	10	Michael: I won't go to bed	0
4	1	door open	MP3	0	Mrs. Darling upstage	8	Mrs. Darling: Come one, You too	↓
5	1	run with sleeper barking	MP3	0	Mrs. Darling: I really do	↑	Michael & Nana disappear	↓
6	2	door closed, sleeper	MP3	0	Mr. Darling enters like a tornado	9	Nana enters from the bathroom with Michael	6
7	2-3	orchestra	CD	0	Music 2	10	Mr. Darling: that's us!	7
8	3	orchestra	CD	0	Singing: Your mountain Problem ~	10	I Promis the battle will be won	↓

Servant to Two Masters

By Carlo Goldoni

Sound Cue Breakdown Sheet

Director: Isabel Favell

Theatre: Arreton Manor – Play on the Grass

GP PixelWorks

8 Mar 2009 20:46:43

These cues created for automated show playback using Sound Cue Systems v9.07a

Cue	Pg.	Sound Name	Line In	Line Out	Description	Initials
1		Pre-show	n/a	n/a	Pre-show	
2	1	Start show	Start of show	n/a	Fades out Pre-show, plays intro.	
3	3	Easy Winners		n/a	Underscore	
4	3	[fade out Q3]	n/a		Fade out of underscore (Q3)	
15	7	Entry Gladiators	Tuff, "...wish I was a lion tamer ..."	n/a	Start lion tamer score	
16	7	[fade out Q15]	n/a	Tuff, " .. but alas ..."	Fade out of lion tamer	
19	11	Solace Spring	Florindo enters	n/a	Underscore	
20	11	[fade out Q19]	n/a	Florindo's head down	Fade out of underscore.	
21	17	Twr Clock Bell	Tuff, "... what time is	n/a	Bell strikes. [auto finish]	