

A woman is shown in profile, singing passionately into a professional condenser microphone. She is wearing large headphones and has her hands near her face. The microphone is mounted on a stand and has a black pop filter in front of it. The background is a vibrant red. The text "VOCAL RECORDING" is overlaid in large, bold, white letters with a black outline.

VOCAL RECORDING

Audio Engineering II

MIC SELECTION

- **Mic selection is crucial!**
 - Most pop recordings are done with large-diaphragm, cardioid-pattern condensers, but not all!
 - Dynamics (such as SM58) are very versatile and often work well for vocals (especially on bright voices)
 - Small-diaphragm condensers can also get good results.
 - Omnidirectional mics can sound good (and avoid proximity effect) if the room sounds good.
 - Most microphones have their own tonal character, so it's important to compare mics and choose the best one for the singer's voice and the musical style.

MIC SELECTION

Bob Ohlsson, former Motown Engineer:

“ Provided that you use a fabric pop screen, my experience has been that small- diaphragm condensers are no more difficult to use, and if you have a well-isolated, uncolored studio, they have the advantage of allowing the singer to back off, which tames the unwanted dynamics created by moving around. They are also lots easier to shock mount.

RCA, Motown, and, from what I understand, EMI all used KM 86s for vocals from...the late '60s through the '70s, when most label-owned facilities went away. The indie studios generally bought U87s because they looked more impressive to clients, were more difficult to walk off with, and didn't cost any more... An awful lot of famous vocal recordings have been made using the finest small-diaphragm mics while U47s, 67s, and 251s sat in the mic closet.”



Neumann KM 86 i, circa 1969
Modified by Klaus Heyne, German Masterworks
<http://recordinghacks.com/>



U87



251



U47

VOCAL MIC TECHNIQUES

Microphone Position

- Vocals sound best when recorded in a small space, but not so dead that upper-frequency air sound is muffled.
- An easy way to judge mic distance is by hand length – an open hand between the mouth and the microphone
- Placing the mic slightly above the singer can help eliminate pops and breath blasts. It can also cause a more full-bodied vocal sound.
- Pop filters are another well-known solution
- Also, putting the mic in omni pattern will help eliminate blasts.



MIC PLACEMENT

- **Distance**

- Remember that the amplitude of a sound goes up 6 dB every time the distance is halved, so it's important that the vocalist *keep a constant distance when recording*.
 - At closer distances, small movements will make a bigger difference in volume.
- Place the pop filter about 3 inches from the mic – this can help prevent singers from getting too close!

Stereo mic placement:

- Two condenser mics 1 ft in front of the singer, at shoulder height, 2-3 ft apart, and both pointing toward the mouth. (Like ORTF placement but wider)
 - Will sound good in a sparse mix, but won't cut through a dense mix as well.
 - It's important that the singer not move around too much; placing a “dummy mic” in front of the singer can help

Handheld:

- Some singers are more comfortable with a handheld mic like they would use on stage. Recording with an SM58 can work well – especially if the singer is more comfortable and does a better performance.

BACKGROUND VOCALS

Mic Placement:

- Usually mics will be farther back than with lead vocals
 - Try an omni condenser about 3 ft from the vocalist
- Large-diaphragm mics often used because they have a midrange scoop and more upper frequency presence.
 - Sometimes the more compressed transients of a dynamic mic sound better for BGVs, though.

Some techniques to try:

- To give BGVs a greater depth, record each overdub with the vocalist (s) one step further back from the mic, but with the preamp gain increased so that the overall volume is equal to the first take.
- The best blends tend to happen with multiple singers stand around a single mic or stereo pair (rather than each voice overdubbed on a separate take).
- If the lead singer is also overdubbing BGVs, don't use the same mic.
- To add some natural reverb to BGVs, some engineers will play the track back through monitors and record the playback! Then mix it in with the original BGV tracks.
- For extra-thick BGVs: record a couple of “whisper tracks” and compress them heavily – they will add extra air and make it sound like many more overdubs.

DOUBLING

Vocal doubling has been done for as long as there were multi-track recorders -

- The Beatles doubled vocals back when they were using only 4-track magnetic tape!
- It's best to work in sections and have the singer listen to the section they previously recorded, then try to sing it again with exactly the same nuances.
- Keep the original track playing in the headphone mix.
- Punch in on smaller sections if the vocalist varies from the original.
- Usually, mix the doubled track in at a lower level.

VOCAL MIC TECHNIQUES

Vocalist techniques:

- Sing with one side of the headphones off, in order to hear more naturally while still being able to hear the cue mix.
 - Make sure to watch out for headphone bleed in the mics!
- **Insist on getting the best performance you can!**
 - Don't expect it to be perfect in one take – it's normal to do lots of punch ins and re-takes.
- **Use compression**
 - A little compression can help even out the dynamics when recording. But not too much... you can't un-compress it after recording!

HEADPHONE MIX

- The headphone mix should have the instruments the vocalist wants/needs to hear – not necessarily the ideal balance.
- Use closed phones to minimize leakage – headphone bleed can really be a problem, esp. high frequencies.
- Drums, bass, and maybe guitar at a lower level, and the vocalist's own mic.
- It's often a good idea to add a little temporary reverb to the vocalist's track in the mix – this will give them more confidence while singing.
- Headphone amps with multiple adjustable outputs are *extremely* useful – each player can adjust his/her mix.
- Typically, avoid using plugins while recording anything – it adds latency.

PRO TOOLS MONITORING MODES

Auto Input Monitoring (Track Menu → Auto Input Monitoring)

- Default setting for tracks
- On record-enabled tracks, any existing material on the track is monitored during playback.
- When a recording punch-in happens, the track switches over to monitoring the input. Input monitoring switches back off at punch-out.

Input Only Monitoring (Track Menu → Input Only Monitoring)

- On record-enabled tracks, the input is always monitored. Existing material on the tracks is not ever monitored.
- ***Both of these modes affect all record-enabled tracks at once.***

TrackInput Monitoring (Pro Tools HD only)

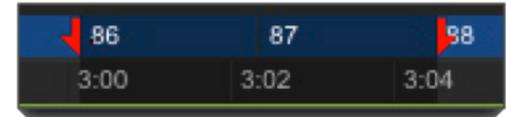
- Lets you toggle *individual tracks* between Auto Input and Input Only modes. (Even when a track is not record-enabled)
- **Option-click** to put all tracks in TrackInput mode



PRO TOOLS RECORDING TIPS

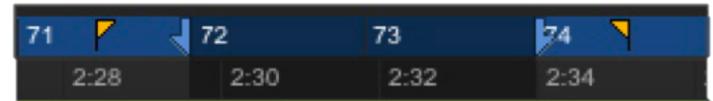
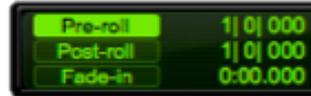
- **Setting Punch in and Punch out**

- Just highlight a section using the selector tool while at least one track is record-enabled.
- If you're in Grid Mode, you can be sure that it will punch in and out on beat.
- Be sure to communicate clearly with the performer about when punch-in and playback are happening.



- **Setting Pre- and Post-Roll**

- Type the number of beats in the Transport window
- Or **option-click** somewhere before/after the punch-in/out selection.



- **Fader Levels**

- Pro Tools remembers two different fader levels for each track: one for when the track is record-enabled, one for when it is not record-enabled.
- The fader turns red when record-enabled. You can set a fader level, and when record-enable is turned off, the fader goes back to its original level.



- **Recording to a New Playlist**

- You can record alternate takes to the same track by recording them into a new playlist
- Playlist selector – the triangle to the *right* of the track name
- Or select the track and press **control+\<** (backslash)

