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Making a Joyful Noise

By Myles Boisen with Cary Sheldon

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For some engineers, all it takes is a glimpse of “vocal session, 3 p.m.” on the day's studio calendar to make their shoulders tighten and skin turn red. Everyone's been there, envisioning dozens of mind-numbing punch-ins to get that “baby, baby” or “whoa, whoa, yeah” just right. As rough as vocal sessions can be for the engineer, they can be many times worse for lead singers with limited vocal training. If you're already reminiscing about torturous vocal-tracking marathons you've endured, it's time to turn the tables and take control of vocal vexations.

For this story, I enlisted the help of Cary Sheldon, a respected Bay Area vocal teacher. Sheldon, a certified instructor of the Speech Level Singing technique, has wowed me on numerous occasions with her ability to coach and produce vocalists in the studio. She also has a long list of studio singing credits, including work with James Taylor, Todd Rundgren, and Henry Kaiser. Many technical tips in this article are hers; others are useful tricks I picked up while observing her and other savvy singers in sessions at Guerrilla Recording.

THE BIG PICTURE

Before getting into particulars, I'll discuss a few general guidelines that relate to all manners of vocal problems. (For information about keeping a vocalist's pipes healthy, see the sidebar “Vocal Vim and Vigor.”) The most important thing to remember is that relaxation is the key to a good vocal performance. Be aware that a studio singer may feel a lot of pressure, particularly when all ears are listening intently and the success of the song rides on his or her vocal cords. Keeping anxiety out of the vocal booth is one of the producer's and engineer's more important jobs. Any time you can fix a problem without ruffling the feathers of your songbird, you're doing everyone a favor.

Your singer's comfort and confidence levels are other factors that will affect the quality of the performance. Get sessions off to a good start by providing comfortable headphones, appropriate mood lighting, a music stand for lyric sheets, and a generous dose of studio hospitality to put the talent at ease. If and when the going gets rough, it's wise to diffuse tension by suggesting a break. Good-natured humor is another great tool for easing a vocalist's jitters, but it must be used in moderation. Too much wisecracking can be a distraction, and sarcasm can easily fall flat or backfire when heard over the headphones.

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Now that the stage is set, put on your vocal-coaching cap. Hopefully, the following tips will increase your usefulness as a recording engineer by helping you identify and offer solutions to the most common problems facing studio vocalists. Before diving in, though, read the sidebar "Glossary of Vocal Terms" – even if you are already conversant in vocal terminology – because some terms used here, as well as many techniques described, are particular to the Speech Level Singing method and may differ from those common to other singing-instruction methodologies. (For more information about the Speech Level Singing technique, go to www.davestroud.com.)

CONSISTENTLY OFF PITCH

Intonation is a major issue for all vocalists, regardless of their ability, experience, and training. Often when a singer is off pitch, it's because he or she is not hearing enough voice in the headphones. Therefore, a good headphone mix is essential. On the flip side, it's also possible to fall prey to pitch problems when hearing too much of one's voice or when suffering through an overly loud mix.

At the start of a session, make sure the singer is getting a comfortable vocal level in both sides of the headphones – before you put any other instruments into the mix. Also, make sure all sustaining chordal instruments (piano, electronic keyboards, guitars, and the like) are in tune and make them more audible than the percussive elements. Listen carefully for consistent pitch problems during the first run-through; afterward, solicit the singer's opinion on the balance and overall level of the headphone mix.

At the first sign of pitch problems, increase the level of the most supportive chordal instrument in the mix. It may also help to turn down elements that don't contribute to intonation or vocal delivery. If you hear that a singer is consistently sharp, try rolling off some of the high-end information in the mix and cranking up the bass. Conversely, when a singer is constantly going flat, turn down the bass and nudge up the highs, particularly on the melodic tracks.

Simple headphone adjustments or even switching to a different brand of headphones will solve a surprising number of pitch problems. If that doesn't do the trick, you can undertake a number of other quick fixes. Lightly compressing the headphone mix will almost always help to support the vocalist. Assuming the singer doesn't need to be immersed in the music, you can also suggest that he or she tuck one side of the headphones behind an ear, thus creating a helpful balance of direct and reproduced vocal sound.

Singers who are inexperienced or unfamiliar with the material may benefit greatly by hearing the vocal melody in the cans while they are tracking. If an instrumentalist is available to record a guide track, invest a little time in that powerful vocal aid. A guide track can also increase your crooner's confidence, resulting in a better performance overall.

If none of those fixes adequately solve the pitch problems, the most important thing you can do as an engineer is be supportive and try to keep the session moving. After you've tried every trick in the book, the singer is sure to be painfully aware of his or her deficiencies, and any comments you make need to be diplomatic.

When all else fails, another solution is to gently suggest to the singer that something in the track is pulling him or her off pitch. That

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removes some pressure and often makes it possible to get a good take provided the vocalist can compensate by intentionally singing slightly sharp or flat.

OFF PITCH IN PLACES

It's usually easier to fix a few off-pitch notes or phrases than it is to redo an entire vocal performance. You can punch in on a single vocal track or record alternate phrases on another track and then comp them for the final mix. A guide track, whether playing the complete melody or just the problem pitches, will also help ensure success. If the vocalist is familiar with piano keys, it usually also helps to let him or her pick out note cues on an electronic keyboard routed to the headphone mix.

When singers are consistently flat on a particular word, it's often because they don't know how to sing up to and over a particular bridge (usually the lowest one). They are attempting to push the chest voice *over* the bridge rather than navigate smoothly *through* the bridge.

When a singer ascends from chest to head voice correctly, the sound is said to *split*, meaning that the flow of air and resonance is shared, or split, between the mouth, soft palate, and nasal passages. In Speech Level Singing, that combination of mouth, soft palate, and nasal passages is called the *mix* (not to be confused with the ordinary studio use of the term), and proficient singers know how to use the mix to navigate easily through a bridge.

One problem is that untrained singers often think hitting a high note requires opening the mouth wide and pushing (see *Fig. 1*). However, that approach tends to push the chest voice over the bridge (as opposed to letting it move through the bridge). In turn, the tone doesn't split as the pitch rises, the larynx rises up in the throat, and the pitch comes out flat or the voice sounds strained. In such cases, the first thing to try is a vowel change, either on the word itself or in the sentence preceding it. Narrowing the vowels helps correct the pitch by forcing the vocal sound to split automatically. The first and easiest way to use that technique is to get the singer to physically narrow the mouth so it is shaped like an egg. In extreme cases, you may want to ask vocalists to put their hands on their cheeks to prevent the lips from pulling back and to guide the jaw into dropping down.

Another approach is to narrow the problematic vowels in the song. Assume, for example, on the lyric "let me back into your heart," that the word *heart* is consistently flat. To fix that, the *eh* sound in *let* becomes *ih*, the *aa* sound in *back* is changed to *eh*, and the troublesome *ah* vowel of *heart* is narrowed to *uh*. Notating those phonetic changes – "liht me behck into your huhrt" – on the lyric sheet makes the changes easier to incorporate, and usually, the improvement in pitch will make a believer out of everyone present.

When a singer is sharp only here and there on a line, it's usually because he or she is pushing too much air through the larynx. The easiest correction for the problem is to persuade the singer to relax and back off the volume. Another useful coaching tip is to suggest that the vocalist speak-sing the phrase. That helps decrease excess airflow and often makes the line progress more naturally. Again, it may also be advisable to adjust the headphone balance or have the artist "think flat" just for that problematic note.

STRAINED TONES

When the prevalent problem of strained tones rears its ugly head, you can expand your options for coaching a singer by listening for bridges and knowing how to deal with them. In most cases, men are going to have their first or lowest break – the one between the chest and head voice – on the D sharp above middle C. For women, the first bridge is predictably at A or A sharp above middle C.

Strained tone on the high or climactic notes in a phrase is almost always caused by the singer attempting to “push over” the bridge in his or her voice – essentially the same problem described previously in regard to singers who are consistently flat on particular words. Again, basic relaxation and breathing techniques combined with the aforementioned exercises for narrowing vowels will often solve the problem. In addition, some singers may be able to clear such hurdles by relaxing the muscles in and around the throat while tightening their stomach muscles. Although that is not really correct vocal technique, it can work in a pinch.

The problem could also be that the singer's vocal cords are too constricted, and more air movement is needed to open them up. In that case, a breathier, more open tone can relieve some pressure, maximize vibration in the vocal cords, and free up the voice.

An alternate approach to smoothing out strained high notes in singers who can't move smoothly through their breaks is to have them jump directly to the desired note in head voice or falsetto. That maneuver – a mainstay of traditional country-yodel stylists, such as Jimmie Rodgers and Hank Williams, that is also heard in more mainstream artists such as Joni Mitchell and Dave Matthews – can radically alter the interpretation of a song and enhance the emotionality of the performance.

CAN'T HIT LOWS

When the singer is physically unable to reach the melody's lowest notes with satisfactory tone, you have a few quick fixes at your disposal. A producer's panicked reaction may initiate speeding up the backing track by a half step or more, rerecording for hours to put the song in a higher key, or giving a pink slip to the vocalist.

A more civilized solution (which also works with strained high notes) is to temporarily change the pitch of the multitrack recorder and then simply punch in the bothersome out-of-range notes; that is, either raise the pitch of the backing track to bring it into a more comfortable range or lower the pitch to prevent strained high notes. Be aware, though, that changing pitch by a whole step or more may produce noticeable timbral distortion – chipmunk or Darth Vader effects, depending on which direction you go – when the music is restored to its proper key. That kind of manipulation is usually less noticeable when it's used to compensate for an inability to hit low notes.

In addition, here's a technique for the vocalist that may make such manipulations imperceptible or even unnecessary. First, determine how low the singer can actually go. That is done by having him or her speak-sing the low notes of the melody while closing off the back of the throat and keeping the mouth open. The objective is to hold back the airflow, sort of how you do when holding your breath. Also, getting the singer to pout – that is, to jut the lower lip out, drop the jaw, and make a kind of forlorn *muh-muh* sound – on the low notes helps produce a better tone and a slight extension of range (see *Fig. 2*).

Often, singers with imperfect vocal technique will start to lose their low

end as they warm up during sessions. That is caused by the larynx starting to ride high in the throat. Unfortunately, remedying that situation frequently requires advanced vocal exercises beyond the scope of this article.

As a last-ditch effort to combat low-note loss, it may be necessary to start a "fix-it" session as early in the morning as possible for the singer and technical staff. Sheldon, obviously an early riser herself, suggests a 6 a.m. start time!

UNNATURAL TONE

When a singer is holding back or pushing too hard, the result is often an unnatural, annoying, or unsatisfactory tone. Unfortunately, inappropriate singing volume and the tonal changes that come with it may not be easy to identify, especially if you are unfamiliar with a singer or a particular vocal style. For example, a folk singer used to wailing at open-mic performances may initially sound brash in the vocal booth. Likewise, an alternative rocker who mumbles on the microphone or otherwise doesn't project strongly enough could be unfairly tagged as an unskilled performer.

The problem may be as simple as the headphone level being too high or low, thus forcing the vocalist out of a comfortable volume range. Experienced studio vocalists usually know to ask for an adjustment in headphone mix levels if something isn't working for them. However, a surprising number of singers – especially inexperienced ones – will suffer through an unsympathetic headphone mix without a peep, all the while unconsciously attempting to adjust singing levels so as to hear a good blend in the headphones.

It is fascinating to observe how a singer's delivery and confidence can change immediately as a result of manipulating the headphone mix. Meek vocalists, for example, can often be coaxed into a more committed performance simply by increasing the volume of the music in their headphones or by compressing the backing tracks and decreasing the vocal level slightly. You'll want to make sure that they can still hear themselves and that they aren't overcompensating or straining.

When the vocalist is too loud and headphone adjustments don't produce the desired result, first try to get him or her to relax by speaking the melody. You may also find that although the vocalist seems to be singing too loudly, the real problem is that the tone is simply too nasal. A solution is to have the singer pinch his or her nose shut and sing the melody of the song, substituting the syllable "we" for the lyrics. That exercise works best when repeated a few times, with awareness on keeping the tone in the mouth and not letting it go up into the nose.

TIMING PROBLEMS

Like singers with pitch problems, those with timing problems tend to err toward one extreme or the other. Sheldon and I find that most tend to rush, often out of nervousness. When they do, a gentle reminder may be all that is needed to get a vocalist in the groove. If that doesn't do the trick, try adjusting the headphone mix to provide more drums or other rhythm-section elements.

Vocalists who rush the beginnings of phrases may be unnecessarily cutting their breath short. Urge those vocalists to breathe more fully. That will slow them down and should help their overall performance.

Singers who drag the tempo, especially in jazz, may be doing so deliberately. Moreover, being behind the beat is generally less noticeable than rushing and therefore is not always perceived as a problem.

A vocal entrance that is clearly late is just as disconcerting as one that's early. In such cases, the singer may be unclear about the lyrics, the rhythm, or both. A legible lyric sheet combined with some rehearsal time may be all that is needed to keep the vocalist from sneaking in with tardy timing. Blues singer Jimmy Reed was famous for his laid-back timing, which was caused in part by the fact that his wife sometimes had to whisper the lyrics in his ear during recording sessions.

Getting the vocalist to move a part of his or her body in time with the music – while staying on the mic, of course – can help to smooth out errant timing, and it usually improves phrasing as well. On slow songs with long dramatic pauses in the rhythm, turning up the click track is usually quite helpful. Another approach is to enlist the services of a rhythmically adept bystander to help keep the time steady. Sheldon, for example, has saved the day by standing in the vocal booth and tapping out the rhythm softly on the artist's arm.

POPPED Ps, Bs, AND Ts

Remember that there are many causes of popped plosives on the vocal mic and that the singer is not always to blame. Nylon-mesh or metal pop filters should be standard equipment for any vocal session, not only to eliminate popping but also to protect the delicate diaphragms of your microphones. Although a foam-rubber windscreen may be more effective as a preventive measure, foam can attenuate crucial high-frequency information, making the vocal track sound muffled or dull.

Condenser microphones are especially vulnerable to sudden blasts of air, but different models and diaphragm types exhibit varying degrees of susceptibility to popping when worked at close range. Sometimes, moving the mic up or down an inch or two will get it out of the blast zone. If pop filtering and repositioning don't solve the problem, switching to a different microphone may improve the situation. Another helpful tip is to engage a low-cut filter at the microphone or preamp.

If it becomes necessary to involve the vocalist in the solution, standard practice is to have the singer place his or her palm a few inches in front of the mouth and experiment with alternate pronunciations for the problematic plosives. Feeling the air pressure on the palm provides immediate and effective feedback for redirecting or reducing such blasts. The singer can also experiment with moving the head slightly to either side of the mic, in effect aiming the plosives away from the diaphragm.

Experienced vocalists usually know how to soften the impact of popping sounds by subtly combining them with softer consonants: blending a hard *p* with a *b* or preceding it with a closed-mouth *m*, for example. Likewise, putting a faint *d* before the hard *t* transients of words such as *truck* and *trouble* will significantly reduce their impact on the microphone.

VOCALS DON'T CUT

When vocals aren't cutting through, the best solution – particularly in

dense rock, rap, or R&B mixes – might be purely a matter of microphone selection or placement. Start by checking to see that the vocalist is close enough to the microphone and facing its address or “hot” side. If there is insufficient high-end content in the vocal sound, intelligibility and projection are usually increased simply by moving the mouth closer to the mic. The microphone can also be repositioned so that it is directly in front of the teeth or pointing slightly up toward the lips and nostrils.

If those simple adjustments fail to correct the problem, a brighter mic or preamp may have to be called into service, perhaps with some high-end EQ boosting or extra compression on the way to the recorder. Large-diaphragm tube condensers, though highly regarded for the majority of vocal sessions, can be too warm sounding for some vocal styles and sound muddy no matter what you do. It may be worthwhile to try a small-diaphragm condenser to increase highs and articulation, or even try a cutting dynamic mic such as the ubiquitous Shure SM57.

When technical solutions don't suffice, you can employ other novel methods for steering the vocalist toward clearer diction and a brighter, more intelligible tone. A Guerrilla Recording favorite known as “biting the apple” involves getting the talent to smile a bit and pull back the corners of the mouth – just as you do when chomping into an apple. Opening the sides of the mouth and exposing more teeth automatically lets more high frequencies escape the oral cavity. Because of its dramatic effect on the shape of the mouth, however, Sheldon advises using the biting-the-apple technique only when the singer is in chest voice.

As a fun, tension-busting route to crisp diction and projection, Sheldon recommends talking through the lyrics with an obnoxiously exaggerated New York City accent. For this exercise, it is vital to focus on keeping the mouth long and narrow, the jaw dropped, and the words centered in the low or back part of the mouth to avoid getting overly nasal.

SIBILANCE

Sibilance is a natural component of speaking or singing that results from the pronunciation of certain consonants and digraphs – primarily *s*, *c*, *sh*, and *ch*. It therefore exists in varying degrees for all singers. The problem is excessive sibilance – an obvious *ess*, or whistling sound – which can render a vocal track grating if not unlistenable.

When vocalists exhibit noticeable sibilance, it may be due to gaps or chips in their front teeth or certain types of dental reconstruction. Singers who move more air than most, either by singing loudly or by cultivating an airy tone, are also prone to sibilance. Whatever the cause, whistling *ess* sounds are often localized at the front of the teeth or are more prominent on one side of the mouth.

Just as sibilance can be greatly exaggerated by mic placement (not to mention signal processing), it can also be reduced by judicious mic positioning. You can often find a position that minimizes sibilance by moving the microphone slightly to one side (toward either cheek) or by having the singer slowly turn his or her head to each side while uttering, “she sells seashells by the seashore.” In addition, try having the singer substitute *z* for *s*, or turn the slithering *ts* sound (as in *hearts*) into a *dts* sound.

In the absence of a discernible physical or physiological cause of sibilance, the culprit may be a condenser mic or compressor – or the

subtle chemistry between the singer and the mic or compressor. Large-diaphragm vocal mics, even the most expensive vintage ones, often have pronounced presence boosts that can increase sizzly sounds by 6 dB or more in the 4 to 7 kHz range. Certain compressors (or the use of excessive amounts of gain reduction through almost any unit) can also bring a spitty presence to a vocal track while reducing the prominence of low-end frequencies.

The best work-around for sibilance traced to the signal chain is first to turn down the compression and then to try swapping compressors and microphones until the problem is solved – or at least judged to be manageable. A quality hardware or software de-esser is also good to have, especially when time or patience is limited.

OVEREXTENDED PHRASES

In Sheldon's and my experience, overly sustained phrases are more likely to come from dramatically inclined vocalists and from those who take up singing later in their lives. The problem comes when the dwindling supply of air results in strained or off-pitch notes at phrase ends. On top of that, the lack of a break makes it difficult or impossible for the engineer to execute the vocal punch-in required to fix the problem section.

The most obvious solution is for the vocalist to breathe in more air before the phrase or to shorten the sustained note at the end by one or two beats. It also helps to understand the physics of what's going on in the larynx. Usually when singers run out of breath quickly, it is because the vocal cords are too open. That is typically accompanied by an overly airy or heady tone, which can come across as excessively sweet or whistly sounding on the recording. In addition, pushing too much air through the throat raises the larynx (never a good thing), is abrasive to the vocal cords, and may result in an inferior tone with diminishing returns over a short period of time.

To counteract that tendency – and, if desired, to increase phrase lengths and thus dramatic delivery – Sheldon suggests that the singer talk through the phrase while holding back airflow on the sustains. That encourages cord closure and conserves breath.

If none of those approaches help, it's often possible to break up the long phrase with a strategically inserted breath. That will ease straining and allow time for the singer's airflow to be replenished. Such breaths should be boldly notated on the lyric sheet (a *V* or large slash mark between words is common) and rehearsed a few times before the take.

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VOCAL VIM AND VIGOR

Vocal endurance is a health and training issue rather than something the engineer should attempt to control. Folklore and vocal voodoo – such as swigging hot sauce to revive a flagging voice – are to be

avoided when a singer's livelihood and future career are on the line. Singing while sick or when the vocal cords are tired or swollen should also be discouraged. Persistent pain or vocal fatigue must be treated seriously with proper coaching and possibly even medical treatment.

So what can the engineer do? Once you get to know a singer, you can help pace his or her endurance and schedule sessions and breaks accordingly. Be aware that stress, a busy schedule, allergies, and lack of sleep can also take their toll on a singer's stamina. You can't control what vocalists do before they come to a session, but it's well worth it to remind them of some important dos and don'ts while they're in the studio.

DO encourage vocalists to follow these positive vocal-health habits:

- Get plenty of sleep between sessions.
- Drink as much water as possible during a session.
- Drink warm tea with honey (not sugar) to soothe and moisten the throat and clear congestion.
- Steam the throat by using a humidifier or by standing over a pot of boiling water with a towel draped over the head.
- Try deep-breathing exercises during sessions.
- Minimize the use of allergy and cold medicines (which tend to dry out the throat) before sessions and drink as much water as possible during treatment.
- Gargle with hot salt water to reduce swelling of the vocal cords.

In the studio, DON'T let singers:

- Push their endurance or allow anyone to coerce them into continuing to sing once the voice becomes uncomfortable or painful. (Swelling or aggravation of the vocal cords can lead to physical damage.)
- Drink alcohol or orange juice. Caffeine and dairy products should also be avoided before and during sessions.
- Talk excessively.
- Whisper to save the voice. (It is actually worse for the voice than talking.)
- Cough or clear the throat loudly, because that is decidedly abrasive to the vocal cords.

GLOSSARY OF VOCAL TERMS

Break: A sudden shift or loss of continuity in vocal tone caused when excessive airflow overcomes cord tension. For most voices, the break is in the area of the first bridge. It can be avoided by letting the vocal cords gradually thin and then "shorten" their vibrating length while allowing a corresponding gradual decrease in airflow so that excessive air pressure and muscle tension don't build up.

Bridge (also known as passagio): A transitional area in the vocal range where muscular adjustment or resonance activity makes it especially difficult to negotiate a balance between airflow and vocal-cord adjustment. Men usually have three such areas in their ranges, whereas women have as many as five or six. Note that breaks go away (with practice), but bridges do not.

Chest voice: The normal speaking voice and typically the lowest register of the vocal range. In chest voice, the full length of the vocal cord vibrates (see *Fig. B*), and vocal sounds project to the hard palate and out the mouth.

Comping: Short for *compiling*, this is the practice of recording vocal passes onto separate tracks of a multitrack recorder and then copying the best parts of each take onto a single perfected vocal track.

Falsetto: A high vocal register characterized by less bite and an airier tone than head voice. In falsetto, the vocal cords open up, releasing more air, and the vibration moves away from the edges of the vocal cords toward an area known as the *false cords* (see *Fig. D*).

Guide track: A track created to assist the vocalist in maintaining pitch, rhythm, and phrasing while recording. A guide track should be played on a fixed-pitch instrument (ideally a pleasant-sounding keyboard) and contain selected notes or a complete instrumental version of the vocal melody.

Head voice: This vocal register sounds like a higher-pitched extension of chest voice and is characterized as having power, projection, and bite (as opposed to the softer, airier sound of falsetto). In head voice, the vocal cords are partially closed and do not vibrate along their full length (see *Fig. C*). (In falsetto, the cords are more open.)

Larynx: The physical mechanism that houses the vocal cords and moves up and down in the throat cavity to control the process of swallowing (see *Fig. A*). The larynx is the lump in the middle of the neck, just below the chin.

Mix: A technique of Speech Level Singing that lets the singer make a smooth transition through the first bridge. The cords are allowed to gradually thin and then shorten, resulting in a *split tone* that is a blend of chest and head registers.

Plosive: Derived from *explosive*, this refers to a forceful blast of air from the mouth during speaking or singing. Plosives are usually caused by *ps*, *bs*, and *ts* and are problematic when they register on the mic or track as a low-frequency popping sound.

Speak-sing: An exercise in which the rhythmic patterns of normal speech are transferred to the melody line of a vocal phrase. The words are first spoken as if in conversation and then sung in a manner that mimics the conversational rhythm in the melody, but without sustaining the vowels.

Vocal cords (also known as vocal folds): A pair of soft-tissue cords that are joined at the front of the larynx but separated at the back. When closed, the back ends of the cords come together, forming a sort of reed, and the airflow is temporarily stopped. When the air pressure from the diaphragm overcomes the muscle pressure holding the cords together, the cords are blown apart, and audible vibrations result.

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