

Voicings on Vocal Mics.

An International Microphone Survey

VOICINGS ON VOCAL MICS

Approximately 18 months ago we became rather curious about which microphones were currently in use for vocal recording. This curiosity stemmed from the fact that there was an ever-increasing number of suitable new vocal mics becoming available, many of which clearly out-performed the established 'standard' mics, but we felt there was little indication that engineers were changing from their familiar models to any great degree. We felt that it would be interesting if this could be investigated to produce some specific data. This is particularly relevant as the human voice is perhaps the last 'instrument' that *has* to be recorded with a mic no matter what your musical style. (Sampling and synthesis are only partial answers for the voice and Dling is rather unpleasant!)

So, early in 1986 we compiled a very basic questionnaire asking just six specific questions on vocal microphones and a further two allowing the person completing the questions to qualify his replies further should he or she wish to. Nearly 450 of these were sent out to a cross section of studio-based and freelance recording engineers throughout the world largely chosen at random, within certain limits.

Unfortunately the response was rather poor. We don't particularly like being asked to fill in questionnaires either but we thought that the simple and open nature of the enquiries would have found far more positive response particularly as the final information would presumably have been of interest as well. But it was not to be and rather sadly we filed all the information away.

Towards the end of last year we decided to have another go with the same questions. The initial mail-out was repeated with all those who had replied before being mailed a copy of their previous answers to check that they were still correct. We also mailed a further several hundred engineers worldwide. This time the response was very good and there are now enough replies to present some meaningful results.

Whilst the results show a number of patterns of use and may be used to identify certain overall vocal recording microphone consistencies, great care needs to be taken in any further interpretation, if indeed any is possible. The survey specifically targeted studio engineers—not live sound nor broadcast engineers. Odd regional discrepancies can be caused by regional differences in price and distribution affecting numbers in use; and also the fact that replies from certain parts of the world were so low that there was no way

The Questionnaire

Name _____ Studio (if any) _____

The situation is: you are about to work with a singer you have never recorded before.

1 What is your first choice of mic for recording male vocal? _____

What is your second choice? _____

2 What is your first choice mic for recording female vocal? _____

What is your second choice? _____

3 What is your first choice mic for recording backing vocals? _____

What is your second choice? _____

4 Would your choice differ according to the type of music you are recording? Is this more important than the singer being male or female? _____

Have you any further comments to make? _____

that meaningful regional breakdowns could be prepared for those areas although the figures were included in the global totals.

For these reasons we would discourage manufacturers from making any statements that don't recognise these shortcomings. Remember these are not sales figures but the preferred choices of recording engineers who seem to have been generally very realistic: they always made it clear that their choice was made from the mics that would generally be available to them not from some 'cosmic wants' list.

So here we present our vocal mic survey and hope that you find it of some interest. We would like to thank everyone who took part and for your comments, both positive and negative.

The Comments

Tim Hunt, Marcus: The microphone technique of the singer is more important than the choice of vocal microphone. A great singer will sound great through almost any commonly available studio microphone.

Laurent Thibault, Le Chateau: A lot of singers have no bass response when they are shouting. Some who sing softly have a lot of difference of dynamics, more than with a powerful singer. The size of the mouth is very important. RE20 is good for large mouths.

Mal Luker, Arco: The mics listed are not always used as stated. The final choice is based on factors like how I feel at the time, how far I have to walk to find a microphone, mood, etc.

Gerry Kitchingham, R G Jones: I think a choice of limiter/compressor is more important than a choice of mic when recording different types of music.

Stephen Lipson: The answers are very academic as there are many other variables, ie music, desk, mood, limiters, singer, etc.

Brian Robson: Because the vocal is generally the thing that most people listen to for melody I find it important that the sound recorded does not need to be equalised excessively on the mix in order to ensure clarity, etc. The microphone must capture the sound and characteristics of the vocal in such a way that the natural quality of the sound allows it to sit in the track.

Dennis Weinreich, Videasonics: The choice is always down to texture.

All microphones are possible vocal mics. Depending on the space in the track and the match between the voice and mic. It's experience and trial and error. The other key thing is pattern. The U47 valve is so broad in cardioid that a singer who moves around a lot will be treated very kindly by it. On the other hand the Shure SM54/53 is a great vocal mic but with a narrow pattern. If your artist is able to use it the 53/54 will knock most of the popular condenser mics right out of the box.

Patrick Makin, Soundshop: For those who have forgotten, rediscover omnidirectional patterns for all types of vocal recording.

Paul Northfield, Le Studio: Type of compression would be more important to me with respect to the style of music than detailed comparisons of mics, obviously certain mics being more appropriate than others in any given situation.

Bill Titus, Sear Sound: The voice rather than style is the determining factor. With a singer I have never worked with I will quickly try all three mics listed (C12, U67, U47), male or female. If one doesn't sound great then something's wrong with the singer!

Phil Kapp, M&I Recording Enterprises: The actual mic (as opposed to just stating a brand and model number) is also important. Especially in dealing with older tube-type mics, the difference between two mics of the 'same' type can be great.

VOICINGS ON VOCAL MICS

Male vocals 1st choice

UK

Neumann U87	32%
Neumann U47	28%
AKG C414	9%
Neumann U67	8%
AKG Tube	6%
Calrec Soundfield	4%

Other preferences below these figures:

Bruel & Kjaer 4007, Milab DC-63,
Neumann KM66, Neumann TLM 170,
Neumann U89, Sanken CU-41, Schoeps
CMC5/MK 2, Shure SM87

USA and Canada

AKG C414	18%
Neumann U47	18%
Neumann U87	12%
AKG C12	10%
AKG Tube	6%
Neumann M49	6%
Neumann U67	4%
Telefunken ELA M 251	4%

Other preferences below these figures:

AKG 535, AKG C24, custom tube,
Neumann TLM 170, Neumann U48*,
Sanken CU 41, Schoeps CMC5/MK 4,
Sennheiser MD421, Shure SM5B,
Telefunken U47*

Europe

Neumann U87	23%
Neumann U47	15%
Neumann TLM 170	12%
Neumann U89	12%
AKG C414	8%
Shure SM58	8%

Other preferences below these figures:

AKG Tube, Bruel & Kjaer 4006, Bruel
& Kjaer 4007, Neumann M269,
Neumann U67, Neumann U86*

Worldwide

Neumann U87	24%
Neumann U47	21%
AKG C414	12%
Neumann U67	8%
AKG Tube	5%
AKG C12	4%
Neumann TLM 170	4%
Neumann U89	4%
Neumann M49	2%
Bruel & Kjaer 4007	1%
Calrec Soundfield	1%
Sanken CU-41	1%
Shure SM58	1%
Telefunken ELA M 251	1%

Other preferences below these figures:

AKG 535, AKG C24, Bruel & Kjaer
4006, custom tube, Milab DC-63,
Neumann KM66, Neumann M269,
Neumann U48*, Neumann U86*,
Schoeps CMC5/MK 2, Schoeps
CMC5/MK 4, Sennheiser MD421, Shure
SM87, Shure SM5B, Telefunken U47*

* We have been unable to verify these model numbers

Female vocals 1st choice

UK

Neumann U87	25%
Neumann U47	21%
AKG C414	13%
Neumann U67	9%
AKG Tube	6%
Calrec Soundfield	4%
Neumann TLM 170	4%
Sanken CU-41	4%

Other preferences specified below these

figures: AKG C12, AKG C28, Bruel &
Kjaer 4007, Milab DC-63, Neumann
KM66, Schoeps CMC5/MK 2, Shure
SM85, Sony C48

USA and Canada

Neumann U87	15%
Neumann U47	14%
AKG C414	12%
AKG C12	10%
AKG Tube	8%
Neumann M49	6%
AKG C24	4%
Sanken CU-41	4%
Schoeps CMC5/MK 2	4%
Telefunken ELA M 251	4%

Other preferences below these figures:

AKG 535, custom tube, Neumann
KM84, Neumann KM86, Neumann TLM
170, Neumann U48*, Neumann U67,
Shure SM5B, Sony C500, Telefunken
U47*

Europe

Neumann U87	27%
AKG C414	12%
Neumann TLM 170	12%
AKG Tube	8%
Neumann U67	8%
Neumann U89	8%

Other preferences below these figures:

Bruel & Kjaer 4006, Bruel & Kjaer
4007, Neumann M269, Neumann U47,
Neumann U86*, Sennheiser MKH416,
Shure SM58

Worldwide

Neumann U87	21%
Neumann U47	14%
AKG C414	12%
Neumann U67	10%
AKG Tube	6%
AKG C12	4%
Neumann TLM 170	4%
Sanken CU-41	3%
Neumann M49	2%
Neumann U89	2%
Schoeps CMC5/MK 2	2%
AKG C24	1%
Bruel & Kjaer 4007	1%
Calrec Soundfield	1%
Telefunken ELA M 251	1%

Other preferences below these figures:

AKG 535, AKG C28, Bruel & Kjaer
4006, custom tube, Milab DC-63,
Neumann KM84, Neumann KM66,
Neumann KM86, Neumann M269,
Neumann U48*, Neumann U86*,
Sennheiser MKH416, Shure SM58,
Shure SM5B, Shure SM85, Sony C48,
Sony C500, Telefunken U47*

* We have been unable to verify these model numbers

Male vocals 2nd choice

UK

Neumann U87	32%
AKG C414	23%
Neumann U47	19%
Shure SM58	6%
Neumann U67	4%

Other preferences below these figures:

AKG C451/CK5, Beyer M201, Electro-
Voice RE20, Milab BM-73, Neumann
KM86, Neumann TLM 170, Shure
SM57, Shure SM7, Sony C48

Europe

Neumann U87	27%
AKG C414	19%
Neumann U47	15%
Electro-Voice RE20	12%
Neumann TLM 170	8%
Neumann U67	8%

Other preferences below these figures:

AKG Tube, Sanken CU-41, Sennheiser
MD441

Worldwide

Neumann U87	24%
AKG C414	22%
Neumann U47	21%
Neumann U67	6%
Electro-Voice RE20	4%
Neumann TLM 170	3%
Shure SM58	3%
AKG C12	2%
Sanken CU-41	1%
Telefunken ELA M 251	1%

Other preferences below these figures:

AKG C24, AKG C451/CK5, AKG D202,
AKG Tube, Beyer M201, Bruel & Kjaer
4007, Milab BM-73, Neumann KM86,
Neumann U48*, Schoeps CMC5/MK 2,
Sennheiser MD441, Shure SM57, Shure
SM7, Sony C48, Telefunken U48*

* We have been unable to verify these model numbers

USA and Canada

AKG C414	27%
Neumann U47	25%
Neumann U87	15%
AKG C12	6%
Electro-Voice RE20	2%
Neumann U67	2%
Telefunken ELA M 251	2%

Other preferences below these figures:

AKG C24, Bruel & Kjaer 4007,
Neumann TLM 170, Neumann U48*,
Sanken CU-41, Schoeps CMC5/MK 2,
Telefunken U48*

Female vocals 2nd choice

UK

AKG C414	25%
Neumann U87	25%
Neumann U47	15%
Shure SM58	6%
AKG C12	4%
Neumann U67	4%

Other preferences below these figures:

AKG C451/CK1, AKG Tube, Beyer
M201, Bruel & Kjaer 4007, Milab
DC-96, Neumann KM86, Neumann TLM
170, Neumann U48*, Neumann U89,
Sanken CU-41, Shure SM7, Sony C48

USA and Canada

AKG C414	29%
Neumann U47	25%
Neumann U87	13%
Neumann U67	10%
AKG C12	4%
RCA 77	4%

Other preferences below these figures:

AKG Tube, Neumann M49, Neumann
TLM 170, Neumann U49*, Sennheiser
MD421, Sennheiser MD441, Sony C500

Europe

AKG C414	35%
Neumann U47	19%
Neumann U87	19%

Other preferences below these figures:

Neumann TLM 170, Neumann KM84,
Neumann U67, Sanken CU-41, Schoeps
Collette M/S, Sennheiser MD441, Shure
SM7

Worldwide

AKG C414	27%
Neumann U87	21%
Neumann U47	19%
Neumann U67	6%
AKG C12	3%
Neumann TLM 170	2%
Neumann U49*	2%
Shure SM58	2%
AKG Tube	1%
Neumann M49	1%
RCA 77	1%
Sanken CU-41	1%
Sennheiser MD441	1%
Shure SM7	1%

Other preferences below these figures:

AKG C451/CK1, AKG D224, Beyer
M201, Bruel & Kjaer 4007, Milab
DC-96, Neumann KM84, Neumann
KM86, Neumann U48*, Neumann U89,
Schoeps Collette M/S, Sennheiser M421,
Shure SM57, Sony C48, Sony C500

* We have been unable to verify these model numbers

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Backing vocals Europe 1st choice

UK

Neumann U87	47%
AKG C414	13%
Neumann U47	11%
Neumann U67	8%
AKG Tube	4%
Shure SM85	4%

Other preferences below these figures:

AKG C12, Calrec Soundfield, Milab
DC-63, Neumann TLM 170, Sanken
CU-41, Schoeps CMTS 501, Sony C48

USA and Canada

AKG C414	32%
Neumann U87	22%
AKG C12	10%
Neumann U47	6%
AKG C24	4%
Schoeps CMC5/MK 2	4%

Other preferences below these figures:

AKG Tube, Bruel & Kjaer 4007,
Crown/Amcron PZM, Neumann TLM
170, Neumann U249, Neumann U49*,
Neumann U67, RCA 44, Sanken CU-41,
Sony C37

Neumann U87	42%
Bruel & Kjaer 4006	12%
Neumann U89	12%
Neumann TLM 170	8%
Other preferences below these figures:	
AKG C414, AKG Tube, Neumann	
KM88, Neumann U67, Neumann U86*,	
Schoeps CMTS 501, Shure SM58	

Worldwide

Neumann U87	37%
AKG C414	17%
Neumann U47	6%
Neumann U67	6%
AKG C12	4%
AKG Tube	3%
Neumann TLM 170	3%
Neumann U89	3%
Bruel & Kjaer 4006	2%
AKG C24	1%
Sanken CU-41	1%
Schoeps CMC5/MK 2	1%
Schoeps CMTS 501	1%
Shure SM58	1%
Shure SM85	1%
Other preferences below these figures:	
Bruel & Kjaer 4007, Calrec Soundfield,	
Crown/Amcron PZM, Milab DC-63,	
Neumann KM88, Neumann U249,	
Neumann U49*, Neumann U86*, RCA	
44, Sony C37, Sony C48	

* We have been unable to verify these model numbers

Backing vocals Europe 2nd choice

UK

Neumann U87	25%
AKG C414	19%
Neumann U47	19%
AKG C12	6%
AKG C24	4%
AKG C451/CK2	4%
AKG Tube	4%
Neumann U47	4%
Neumann U89	4%

Other preferences below these figures:
Beyer M88, Bruel & Kjaer 4007, Calrec
CM 2003C (omni), Neumann KM86,
Shure SM58, Shure SM85, Sony C48

Neumann U87	50%
AKG C414	23%
Neumann U47	8%
Other preferences below these figures:	
AKG C34, Electro-Voice BK-1,	
Neumann KM84, Neumann TLM 170,	
Sennheiser MD441	

Worldwide

Neumann U87	28%
AKG C414	24%
Neumann U47	13%
Neumann U67	4%
AKG C12	3%
AKG Tube	3%
Neumann TLM 170	2%
AKG C24	1%
AKG C451/CK2	1%
Neumann KM84	1%
Neumann U89	1%
Sennheiser MD421	1%
Other preferences below these figures:	
AKG 535, AKG C34, Beyer M88, Bruel	
& Kjaer 4007, Calrec CM 2003C (omni),	
Electro-Voice BK-1, Electro-Voice PL80,	
Electro-Voice RE20, Milab DC-96,	
Neumann KM86, Neumann M49,	
Neumann U48*, Schoeps CMTS 501	
stereo, Sennheiser MD441, Shure SM58,	
Shure SM81, Shure SM85, Sony C37,	
Sony C48, Telefunken U47*	

* We have been unable to verify these model numbers

USA and Canada

AKG C414	29%
Neumann U87	21%
Neumann U47	8%
Neumann U67	8%
AKG Tube	4%
Neumann TLM 170	4%

Other preferences below these figures:

AKG 535, AKG C12, Electro-Voice
RE20, Milab DC-96, Neumann KM84,
Neumann M49, Neumann U48*,
Schoeps CMTS 501 stereo, Sennheiser
MD421, Shure SM81, Sony C37,
Telefunken U47*

The Comments

Kim Stallings, Mediasound: Quite often the producer and/or singer asks for a specific mic. Old habits die hard!

Fred Catero: There is no 'one' mic for a job. A good engineer can get a good sound with almost any decent mic.

Rajesh Jhaveri, Rave Recording Studios: Choices are due to the fact that a very limited selection of microphones can be purchased by our studio in India for economical reasons. All need to be long lasting and multipurpose. 100% to 240% import duties on studio equipment plus rates as low as £5 per hour for studio hire generally prohibit too huge and expensive an inventory.

Hatsuro Takakami: In the case of rock 'n' roll, it demands less in comparison with classic and jazz because it is conditioned to a certain degree by EQ, echo treatment and processing. It can be more effective and powerful to use a mic that has relatively a small range with dynamic type.

Martin Rushent: This is the most ridiculous survey I have ever refused to become involved in!

A greater proportion of replies felt that type of vocal/singer and/or type of music were major factors in the choice which would involve a certain degree of experimentation.

Even from a casual glance you have to notice that there are very few surprises in those mics which lead the categories in numbers. It shows

how very conservative we are in selecting vocal mics and that on the basis of these figures newer models, even from the leading manufacturers, are not being readily accepted for first or second choices under any of the categories here. Not really possible to show fully, were some of the replies we received from engineers who will carry out quite exhaustive tests to find the right mic for that particular voice, experimenting with models that do not include any of the mics listed by anyone for first or second choice. One wonders who tires first.

The number of obsolete mics in use is another interesting factor particularly when you consider how many of them are valve (tube) types. The AKG Tube made a respectable showing to the extent of being the most popular of the 'newer' mics indicating that a taste for valve (tube) technology may be independent of sheer antiquity of the mic itself. The only other new mic to make any significant impact in numbers is the Neumann TLM 170.

I would have liked to subdivide some replies into versions, ie U47 valve (tube)/nuvistor/FET, but replies were not specific enough so all have been totalled together. However, 95% of all USA replies listed their mics as tube (if they were) illustrating a greater concern over this.

Multipattern mics predominate for all the categories although it is interesting to note a small number of omnidirectional types. However, the total numbers of omnis does not necessarily show the extent of the use of omni pattern—most users seem to prefer using the multipattern types in omni rather than dedicated omnis. It would tend to suggest then that multipattern choice may be an influential factor in selecting a suitable mic.

I don't know if the use level of dynamic mics will be a surprise. I think I would have expected more, particularly when considering the studios included who are based in less developed markets. It turns out that these studios generally follow the most popular line in our survey. But I do find it strange that mics such as Electro-Voice RE20 should make a notable appearance as a second choice male vocal mic and then only otherwise appear as a second choice backing vocal mic.

You will find one or two unexpected mics mentioned—the Calrec Soundfield being perhaps the most surprising. Together with one or two other choices these mics suggest a very specific way of working with the engineer looking for something quite different to the demonstrated norm.

All in all you are not very adventurous in choice. I sensed that engineers may be finding it difficult to present artists with vocal mics other than those the artist recognises immediately, which is understandable considering the fact that the artist must feel confident with the vocal mic just as much as be happy with the sound. Further, the mic is just a single element in a sound chain and as such some people do not see the choice of model as that important. You do have to use a microphone, though, and it was that initial decision process that we saw as still being important no matter what processing you apply later.

KJSA