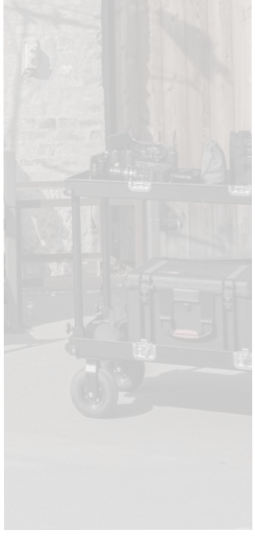
SHURE

BROADCAST & MEDIA SERIES

BROADCAST & LOCATION SOUND



ABOUT

BROADCAST & LOCATION SOUND
From application-specific microphones to advanced wireless system. Conquer your toughest spectrum challenges in the studio and on location and capture it all with confidence.

FEATURED ARTICLES

WIRELESS SOLUTIONS

IN THE STUDIO

WIRELESS SOLUTIONS

In the studio, the last thing you want is unreliable wireless audio. World-class sound. Simplified setup. Flawless operation. Always.

PREMIUM WIRELESS

AXIENT® DIGITAL

For professional productions that demand flawless execution, Axient Digital offers unprecedented signal stability and audio clarity, plus flexible hardware options, advanced connectivity, and comprehensive control. Up to 184 MHz tuning bandwidth across all receivers and transmitters. Transmitter form factors include handheld, bodypack, and micro-bodypack.

SHURE.COM/AXIENT-DIGITAL

SHURE.COM/AXIENT-DIGITAL

. TESTIMONIAL:

TOD MAITLAND

Musicals to me are not only challenging, but there's a great energy on the set, like "The Greatest Showman" and "Across the Universe," there was tremendous energy on the sets. But they also had a great challenge for sound, you know, because now you're dealing with live vocals on a lot of people, and you have to give them earpieces that nobody can see.

I had never worked with Steven Spielberg before, and I got a call to do a screen test for West Side Story. I did the screen test with him and at the end of the screen test, he asked me if I would do the movie and I said, of course I would do the movie. I'd be happy to.

When I finally got the script, the 175-page script with 20 to 22 characters singing live, singing playback, talking, all in the same scenes, I realized that what I had been working with was not going to fly. So that really led to this long process with Peter at Gotham Sound where we really started to really explore what we were going to need for this movie.

One of the great things and reasons that I ended up going with Shure was the ability to set up all of your frequencies and then just deploy it and just, it just goes out through ShowLink and lines up every one of your transmitters. And then right from my workstation, I can just get a dial in volume and change frequencies or whatever I wanted to do. But the ease and speed of that were huge.

We became so confident with these units, I never listened to them. As long as I saw that they were into the mixer and saw the needle going, I would just send them out. And that was a game changer. You know, I mean, not having to baby them, not having to sit there and line them up and go through each one of them.

And then be able to read back at my board, the quality of the RF, and know that even sometimes when they're going far, far, you know, down what looked like they would go out of range. Still, the quality meter was still showing that the quality was there. I could see one blip on each one going, ding, ding, ding. But the quality meter was still up. And it was true. It never went away.

But what I've said as soon as I've started using these, is that there's no way that I could use any other system, honestly, because it just was so easy. There is no other way to do it. There really is no other way to do it. I think that honestly, it is without a doubt the best system out there. There is nothing that compares in reliability and quality and ease of operation.

AXIENT DIGITAL TESTIMONIAL:

DREW KUNIN

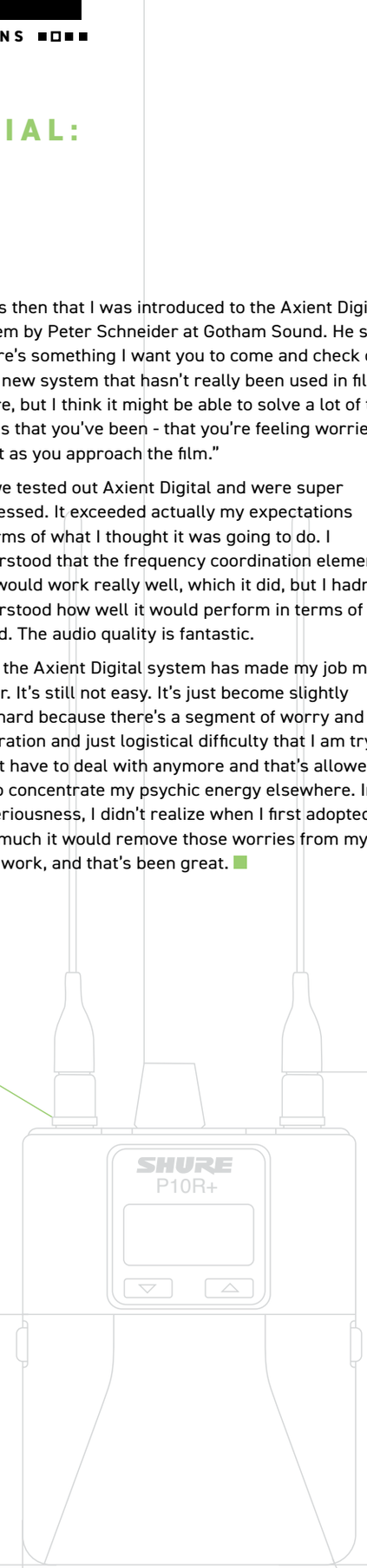
I was first contacted to see if I might be interested to do "In the Heights" (film) while I was working in Cincinnati on the Todd Haynes film "Dark Waters." The National Touring Company of "In the Heights" happened to be in Cincinnati that week. I became really excited because it wasn't what I was expecting. I mean, I think that it had been advertised as it's this high-energy musical, which it is. And it's the music's great. But it also was quite emotionally resonant, has a lot of surprising amount of emotional resonance and depth. And so I called them back and said, "Wow, I saw the show. I think it's great. I'm interested to talk some more."

As we got into preproduction, we started to talk about what the needs of the film would be in terms of the logistics of the recordings and what I might be expected to do. We talked about how Jon Chu, the director, didn't want to have scenes where it's like they're talking and then it goes into playback and it sounds like, you know, Audrey Hepburn, all of a sudden, has Julie Andrews voice coming out of her mouth. And there would be a lot of people, in some cases 20 people singing and dancing, and plus, they were dancing and it's pretty involved choreography. I realized very quickly that I would need to have a pretty large multi-track setup. And I was bumping up against the problem that a lot of us have faced, which is frequency coordination with a lot of radio mics, because all the performers were going be wearing lavaliers and wireless transmitters.

It was then that I was introduced to the Axient Digital System by Peter Schneider at Gotham Sound. He said, "There's something I want you to come and check out. It's a new system that hasn't really been used in film before, but I think it might be able to solve a lot of the issues that you've been - that you're feeling worried about as you approach the film."

So, we tested out Axient Digital and were super impressed. It exceeded actually my expectations in terms of what I thought it was going to do. I understood that the frequency coordination element of it would work really well, which it did, but I hadn't understood how well it would perform in terms of the sound. The audio quality is fantastic.

Also, the Axient Digital system has made my job much easier. It's still not easy. It's just become slightly less hard because there's a segment of worry and frustration and just logistical difficulty that I am trying to not have to deal with anymore and that's allowed me to concentrate my psychic energy elsewhere. In all seriousness, I didn't realize when I first adopted it how much it would remove those worries from my, my daily work, and that's been great.



AXIENT DIGITAL PORTABLES

QUALITY ON THE GO

ADX5D

DUAL-CHANNEL PORTABLE WIRELESS RECEIVER
Robust RF. Impeccable audio. Axient Digital quality and performance. All in a portable, slot-in design. ShowLink® Direct Mode that allows remote control of Axient Digital transmitters without the need of external equipment.*

AD3

PORTABLE PLUG-ON TRANSMITTER
Transform any microphone into an advanced, portable Axient Digital AD Series wireless microphone, delivering impeccable audio quality and RF performance, wide-tuning, and encryption features.

* Country-Specific Functionality Restrictions
- Interference avoidance is only available in Manual mode when using DB15 or DB25 backplates with United States models
- ShowLink is not available when ADX5D is used with third-party control devices in the United States models.

WIRELESS SOLUTIONS

ADX5D TESTIMONIAL:

JON AILETCHER

I guess the first big show I got on was “Weeds.” My first season on the show, I ended up winning an Emmy. The show “Lucifer” was a lot of fun and I feel that the pace and structure we did on that show prepared me for coming to Chicago. I love being here in Chicago and working on “Chicago PD.” This show is incredible.

Honestly, I was very resistant in switching to Axient Digital. I’d been with the wireless I had for 20 plus years. I knew it worked. It was solid. Getting me to change was a tough thing. But one day on a day off I came in and said, “You know what, I’ve got to do it.” I’d lost all my channels and I needed more frequencies. So, with no manual, no guidance. I hooked it up, powered it up, and within about an hour it was up and running. It was a pretty easy setup. There’s a lot of little things that I learned after reading the manual afterwards, but I was using it the next day on set without knowing what I was doing. And it worked great.

The ADX5D portable receiver is an incredible tool that I’ve got now in my bag. I have three units and last week, the perfect example, I was trying to find frequencies and I had nothing available when I did a scan. I turned on the ADX5D and bam there are six channels ready to go. We move very, very fast on our show. A lot of times what I’ll have to do is grab my bag or my mini cart and I’ll take that into a location that I can’t get my big cart into. Having six channels with the ADX5D available makes it very easy to just grab and go and stay within my Axient Digital system.

The performance of the ADX5D has far surpassed what I was expecting. I do put external antennas on which then I can run out to wherever they need to be on set. But even the built-in whips are great. I think the biggest benefit of the ADX5D is the ability to pull any channel from a wide band frequency, send it to the transmitter via ShowLink and never have to leave your cart or bag. It’s a game changer.

Also, we use the ADX1M micro bodypack about 90 percent of the time. Actors really like the ADX1M because of the size, the shape, the lack of heat and also no antennas on it. Not having antennas is a big thing and it also makes it a lot easier to hide. When I do have actors that are going to be a little further away out of my range of the cart with my passive antennas on the cart or even out of the range of my powered antennas, then we’ll use the AD1X. The range on those are incredible. ■

ULX-D®

DIGITAL WIRELESS SYSTEMS

Extremely efficient RF performance, networked control, Dante™ and AES67 digital audio, and AES-256 encryption for professional broadcast applications.

SHUREPLUS™ CHANNELS

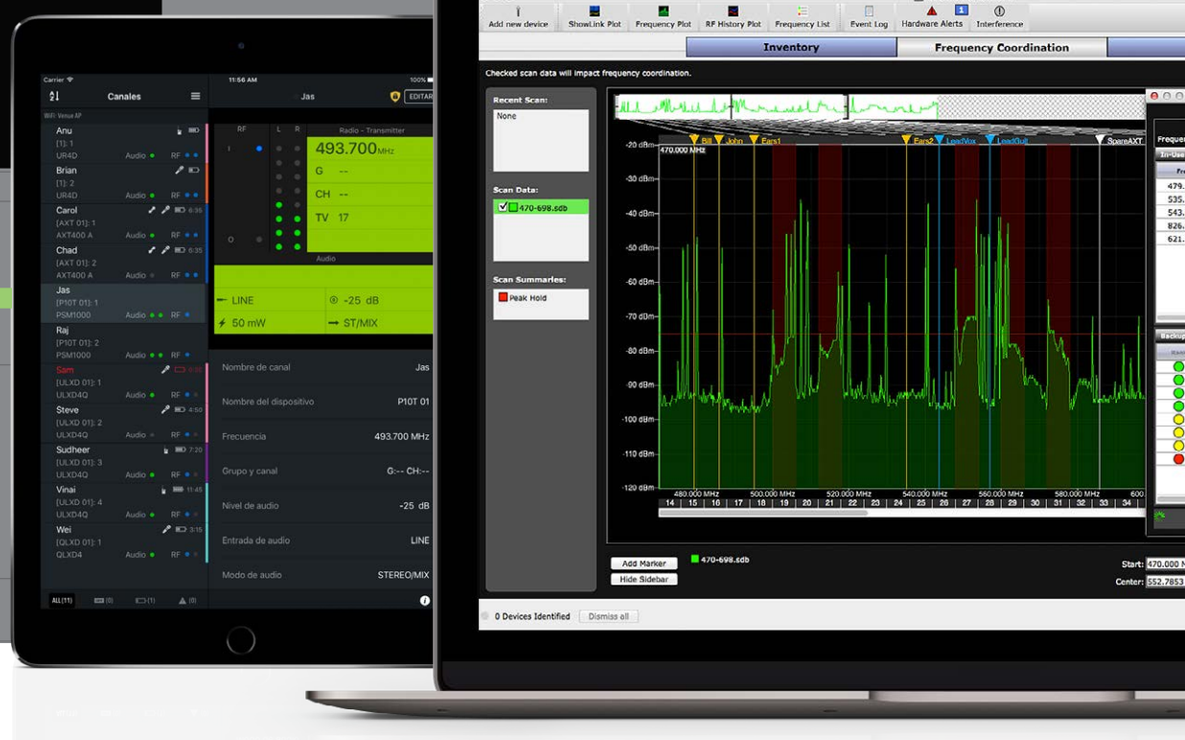
Roam the event space while monitoring key Shure wireless system parameters from your iOS or Android smart device.

SHURE.COM/ULXD

SUPPORTING SOFTWARE

A rich user interface and robust features help to manage and monitor wireless system performance over the network, from pre-show planning through post-performance analysis.

WIRELESS WORKBENCH®



SHURE.COM/WWB6

IN THE STUDIO

SHOTGUN MICS

Capture sounds near and far. Shure shotgun microphones feature state-of-the-art preamplifiers and outstanding off-axis rejection to bring out all the environmental details.

SHOTGUN MICS

END-ADDRESS SHOTGUN CONDENSER MICROPHONES

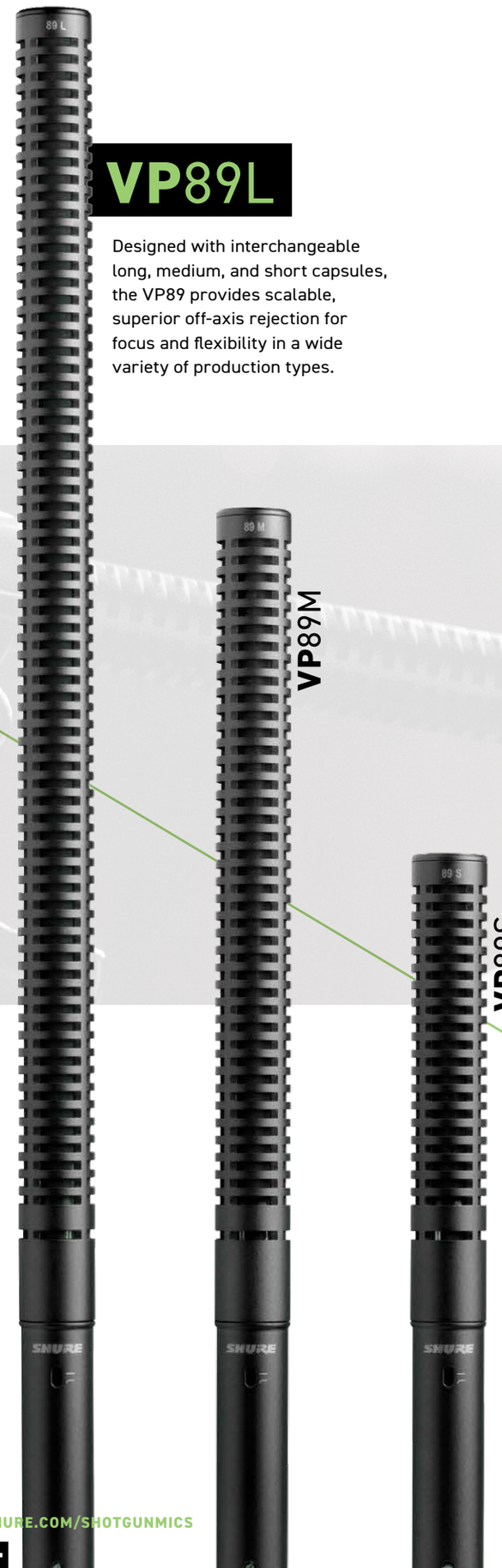
VP89L

Designed with interchangeable long, medium, and short capsules, the VP89 provides scalable, superior off-axis rejection for focus and flexibility in a wide variety of production types.

VP82

END-ADDRESS SHOTGUN CONDENSER MICROPHONE

Compact and lightweight with a wide aperture and excellent off-axis rejection, the VP82 is the affordable and reliable choice for camera-mounted production.



VP89M

VP89S

VP89L 30° pickup angle. For targeting sound sources over longer distances such as sporting events and wildlife.

VP89M 50° pickup angle. Capture greater degree of ambience such as audience response and talk shows.

VP89S 70° pickup angle. Best for near-field, wide-aperture capture including interviews and field recording.

SHURE.COM/SHOTGUNMICS

CHOOSING A SHOTGUN MIC: THE LONG & SHORT OF IT

WRITTEN BY MATTHEW KOSCHAK

One of the most misunderstood types of microphones is the interference-type line microphone, commonly referred to as a "shotgun" microphone. It's pretty clear how it got this nickname. It's much longer than a typical end-address microphone and resembles the barrel of a shotgun. You may have seen them at press and sporting events or on movie sets, mounted to a boom pole or strapped to the top of a camera.

Why is it so long? Why are there so many lengths available? When do you need a shotgun mic? Which length is right for you? This post will answer all of those questions.

SHOTGUN MICROPHONES: USES AND MISCONCEPTIONS

Shotgun microphones fall into a category called "high-directionality microphones." They are more directional than a typical cardioid or supercardioid microphone. This means that they reject unwanted sounds coming at the microphone from the sides, thus allowing clearer pickup of the desired sound source at which the microphone is pointed, or the "on-axis" source. A typical use for a shotgun microphone is to pick up a desired sound source located some distance away, and that, for whatever reason, cannot be approached or close miked. Think of the bat crack from a Major Leaguer or a lion's roar.

A common misconception is that they magically reach out and grab the sound coming from a source; however, in reality, shotgun mics merely reject more of the undesirable off-axis sound (see The Myth of Microphone Reach in the FAQs on shure.com for details). This could be noise from a busy street or excessive room sound in a space where you're recording dialog. Shotguns are also used in voiceover work, typically in situations where you don't have a proper non-reverberant vocal booth and you need a really close and present voiceover sound. Again, the shotgun will reduce the reflected room sound that comes into the mic off-axis.

"They are more directional than a typical cardioid or supercardioid microphone."

CHARACTERISTICS OF SHOTGUN MICROPHONES

The main characteristic we've talked about so far is high directionality. Other things to look for in a shotgun microphone are high sensitivity and low self-noise. ("Self-noise" is the noise introduced to the audio path by the microphone's circuitry. Using a microphone with too high a self-noise to capture very quiet sounds will result in audible hiss.) As mentioned earlier, shotguns typically are used when capturing sources at a distance. This often means trying to pick up a low-level signal, which is why a proper shotgun microphone needs to have a higher sensitivity than microphones designed to pick up close sources. Since the low-level sound will need to be amplified to a usable signal level, having a mic with low self-noise is critical.

WHAT "LOBAR" MEANS (AND MORE MISCONCEPTIONS)

If you've looked at shotgun mic specifications, you've likely seen microphones specified as "supercardioid/lobar" or "hypercardioid/lobar." Understanding those terms requires knowing a little bit more about how a shotgun microphone gets its characteristic directionality. This is the result of an interference tube, which is mounted to the front of the microphone capsule (typically a condenser). It has several openings along its length, which are designed to allow sound to enter the tube.

The interference tube enables the microphone to discriminate between on-axis and off-axis sounds by forcing each type of sound to arrive at the capsule in a different manner.

On-axis sounds share a uniform path length to the microphone capsule. Because they arrive at the same time, they end up being what we call "in phase" and are thus accepted by the mic element and passed down the audio circuit.

Off-axis sounds arrive at the openings of the interference tube at the same time, but they will have different paths to the capsule depending upon where they enter the tube.

CONTINUED ON PAGE 16

CHOOSING A SHOTGUN MIC:

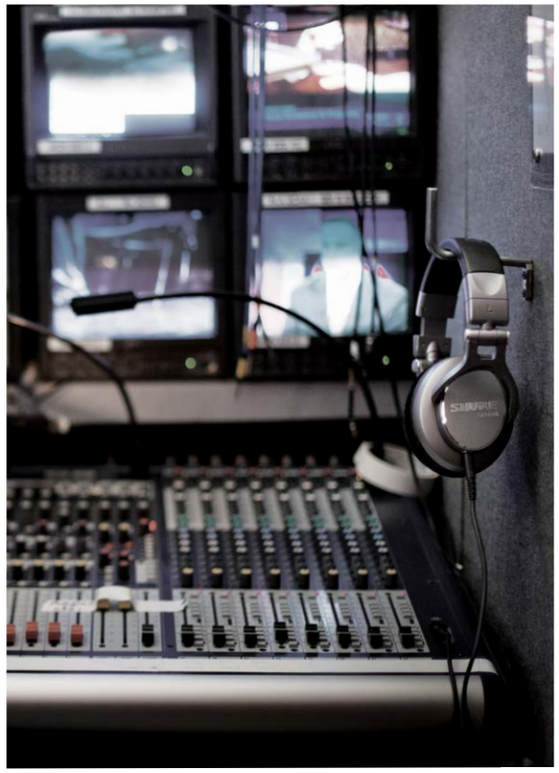
THE LONG & SHORT OF IT (CONTINUED)

Sounds that enter farther down the tube have a longer path length than those entering nearer to the capsule. These waves arrive at different times and are thus "out of phase," which results in the phase cancellation of that sound. Maximum cancellation occurs at frequencies where the phase difference is ½ wavelength.

The result is a narrow, highly directional lobe of sound pickup at the front of the microphone. Shotgun polar patterns, characterizedby such lobes, are thus called "lobar."

It's important to note that the lowest frequency that can be adequately cancelled is directly related to the length of the interference tube. The longer the tube, the lower the frequency at which the tube is effective in reducing off-axis sound. To reject sound down to, say, 100 Hz would require a tube 5.5 feet long!

Many people think that the length of the tube determines only the overall sound acceptance angle. While that is somewhat true, it's very much a frequency-dependent relationship. Below the frequency at which the interference tube is effective, the directional pattern comes from the microphone cartridge itself, usually a hypercardioid. The composite polar response would be specified as hypercardioid/lobar: hypercardioid at low frequencies and lobar at frequencies where the tube is working. As the frequency increases, the directionality of the microphone pickup pattern becomes much tighter. Because the VP89L interference tube is quite long, the microphone is able to maintain directionality to fairly low frequency, but by around 250 Hz, the polar response is mostly hypercardioid. Also, note the smooth polar response at high frequencies and minimal undesirable side-lobes.



"A short shotgun (mic) is less directional than its longer siblings..."

The quality of rejection is as important as the degree of rejection. Even a highly directional shotgun will admit off-axis sound at certain frequencies. When this audio is colored by comb-filtering artifacts, your end result will be affected.

Most shotgun mics are reasonably good at capturing on-axis audio, but for the best shotgun, it's important to look for low-self noise and high sensitivity in conjunction with a natural on-axis sound and uniform off-axis rejection. This will ensure the best audio overall.

ANOTHER WAY OF LOOKING AT DIRECTIONALITY

A really cool way to understand the directionality of a microphone as it relates to frequency is to look at a graph of its "directivity index." The directivity index is the ratio of on-axis pickup relative to the sound pickup in all directions, specified in dB. The higher the number, the more directional the microphone.

An omnidirectional microphone has a DI of 0dB since it picks up sound equally in all directions. A hypercardioid microphone has a DI of 6.0 dB. This graph illustrates the frequency at which the microphone's directionality really takes off, which, again, is dependent on its length. The directivity index graph that compares the VP89S (short), VP89M (medium), and VP89L (long) shotguns shows that the cardioid pattern stays uniformly directional with frequency, while the shotgun mics become increasingly directional at lower frequencies proportional to the length of their interference tubes.

SO WHICH LENGTH SHOULD I USE?

Depends! A longer interference tube will reject the most off-axis sound, but is also more difficult to work with because of the length. It is quite sensitive to positioning and requires a fixed mic / source or a skilled boom operator since moving the mic even slightly off-axis will result in attenuation of the sound source. For very distant sounds and /or loud environments, this is often the best option. A medium shotgun works well in most situations for booming and voice pickup. A short shotgun is less directional than its longer siblings but often useful where length must be minimized; it still provides better rejection of off-axis high frequencies than a hypercardioid microphone would. Of course, the Shure A89U "double barrel" U-adapter also can be used in these situations as it minimizes total length by placing the preamp below the tube.

DURAPLEX

WATERPROOF SUBMINIATURE LAVALIER

Expressively natural sound, low sensitivity, high max SPL, interchangeable sweat-resistant frequency caps, and standard-setting Shure PLEX cable make TwinPlex the standard in broadcast and film capture. Available in four lavalier variations and headset.

SHURE.COM/DL4

TWIN:PLEX™

DUAL DIAPHRAGM SUBMINIATURE LAVALIER

DuraPlex subminiature lavalier and headset microphones are consistent, long-lasting, and resistant to dust, dirt, water, and sweat. Features the Shure PLEX cable that excels in the harshest environments. Available in lavalier and headset.

SHURE.COM/TWINPLEX

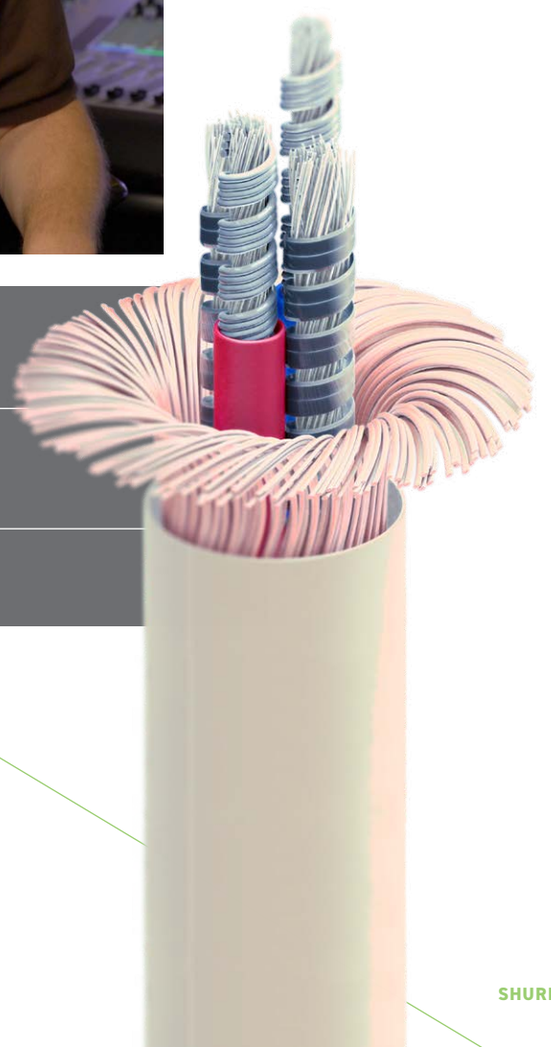
TWINPLEX FIELD TEST

AN INTERVIEW WITH STEVE WATSON

PRODUCTION MIXER

A mainstay in the New York City TV world (Emeril Live, Rachel Ray, Will & Grace, Spin City, Sesame Street, Montel Williams and ABC and CBS News to name a few), Steve Watson is currently the A1 production mixer for The Wendy Williams Show, the Last Week Tonight with John Oliver show, and the Full Frontal with Samantha Bee show. Following is an excerpt of an on-camera interview with Mr. Watson after he had opportunity to use and test the new Shure TwinPlex microphones.

"I instantly fell in love with this microphone."



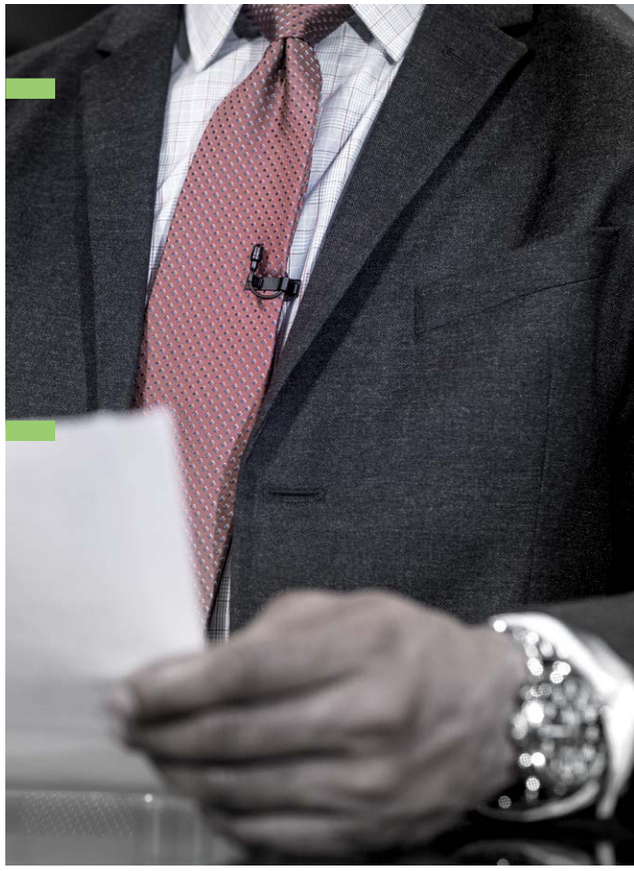
LAVALIERS

TELL US ABOUT YOUR INTRODUCTION TO THE TWINPLEX MICROPHONES.

The TwinPlex microphone was brought to my attention at CBS, where I tape Samantha Bee, and we were trying a whole bunch of different microphones on Sam. Sam has a specific sound of her voice that we were trying to find the right microphone pair with her voice. I said, "Well let's put it on for the rehearsal," and we put it on. And, I instantly fell in love with this microphone.

WHAT MADE THEM WORK FOR YOU ON THAT SHOW?

It has a bold rich texture to it which actually made Sam sound like herself, and I had to do so much less EQing and manipulating the sound for her, and it was just - well, thank you. We've been using it ever since. Another thing is, Sam has long hair and she wears blazers, and so it's difficult to put a microphone in the sweet spot every time. Every night, it was a dance to try to, you know, get the microphone to sound like it did the week before. Since we've been using this new Shure microphone, we don't have to do that anymore. We put it in one spot. And when she turns her head, I don't lose her.



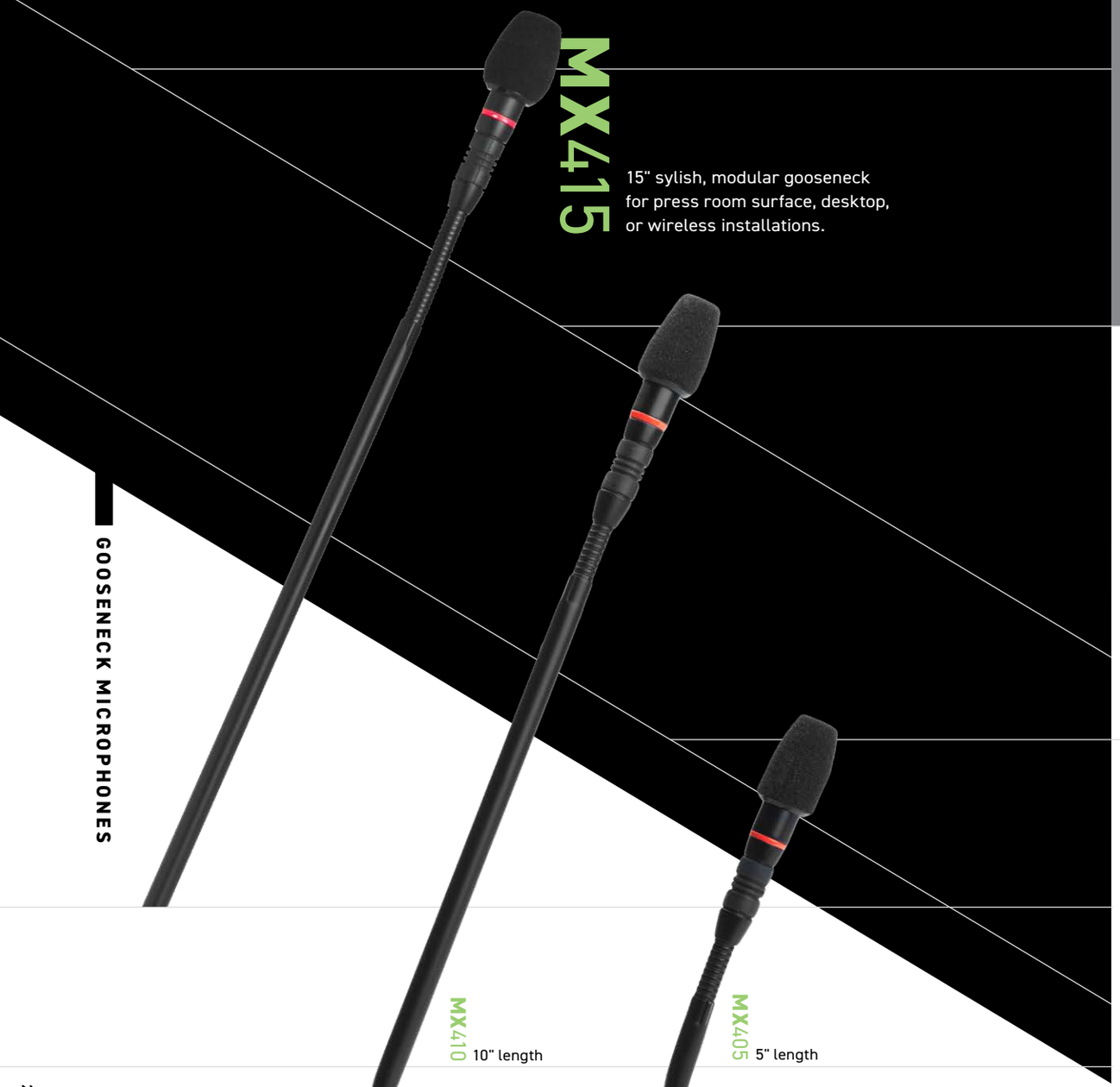
HOW WOULD YOU DESCRIBE THE SOUND?

The first thing I would tell you about TwinPlex is that it doesn't sound like a lav. It sounds like a real microphone. This little microphone has a big diaphragm sound, and it's consistent, and it has a high SBL level. And I would try it on any show. And when you put your main talent on this microphone, it doesn't sound small. With other mics, when you go to a music performance, it sounds really big and you come back to your host, and it sounds small. You won't have this problem with the TwinPlex microphone.

WOULD YOU RECOMMEND THEM TO OTHER PROFESSIONALS IN BROADCAST?

I would absolutely recommend this microphone for everybody to try, and then you're going to end up wanting it. You're going to want to keep it. It's a full sounding microphone. It's actually going to change the way television sounds.

INTERVIEW & PRESS MICS



MX415

15" sylish, modular gooseneck for press room surface, desktop, or wireless installations.

GOOSENECK MICROPHONES

MX410 10" length

MX405 5" length

SHURE.COM/PRESSMICS

VP64A

VP64AL

HANDHELD MICROPHONE

Omnidirectional handheld interview microphone with tailored frequency response for speech and water-resistant mesh grille. 7.9" and 9.6" lengths.

SM63L

SM63LB

Omnidirectional remote microphone designed for professional applications where performance and appearance are critical.

SM63

SM63 5.7" length. Champagne finish.

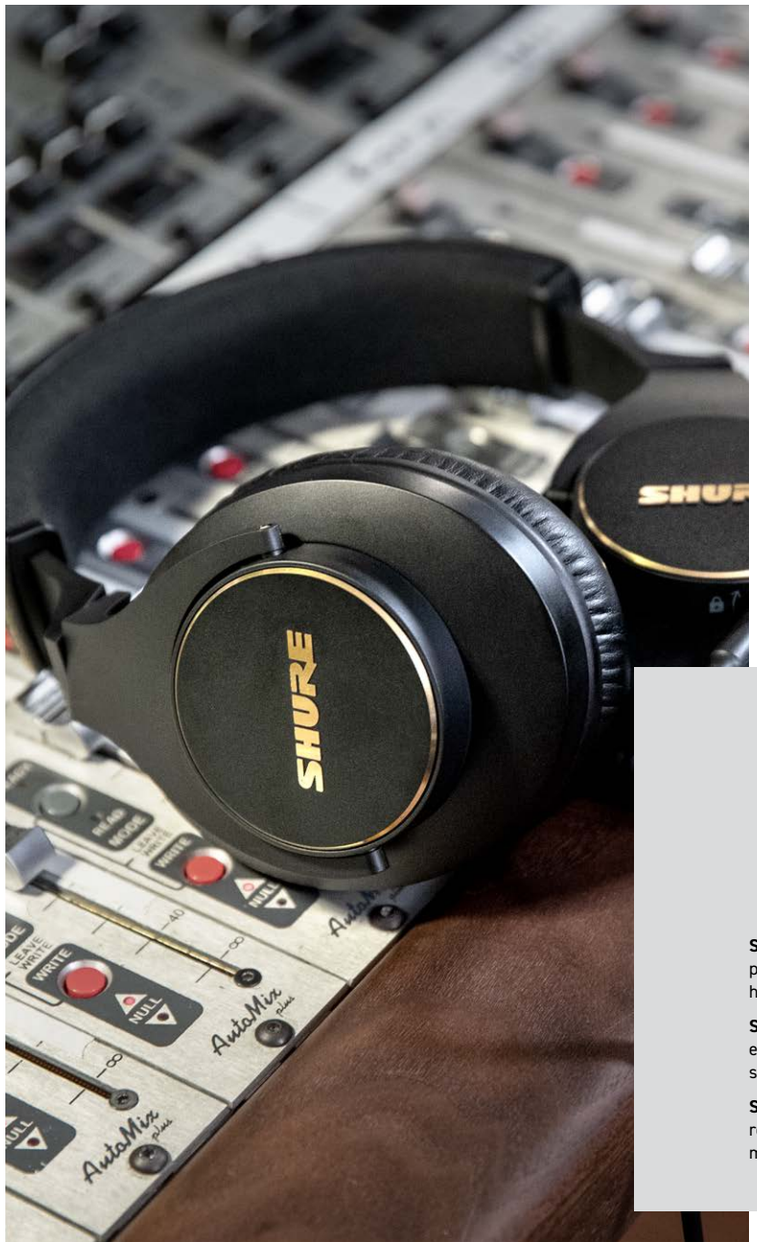
SM63L 9" length. Champagne finish.

SM63LB 9" length. Black finish.

SHURE.COM/PRESSMICS

HEADPHONES

Getting the right sound means hearing the sound right. Shure Professional Headphones deliver studio-quality accuracy across an extended range and provide a comfortable fit that lets you keep going until your audio is every bit as good as, if not better than, your video.



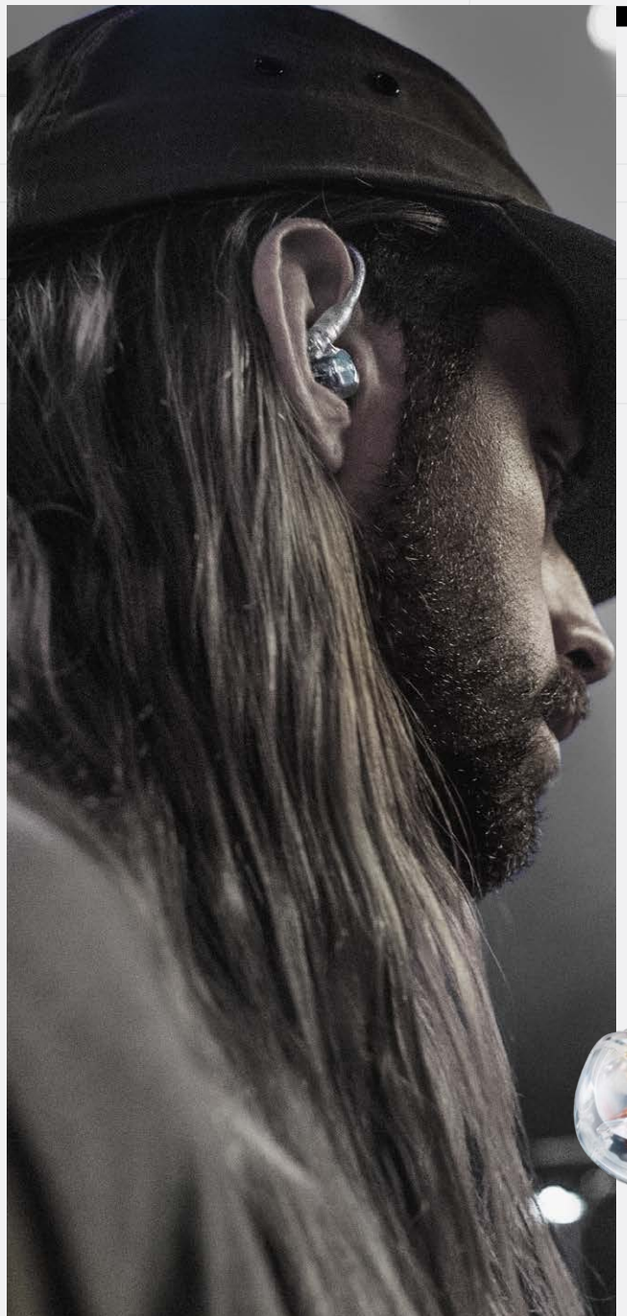
	SRH1540	SRH840A	SRH440A
SOUND SIGNATURE	Superior acoustic performance for an expansive soundstage with extended highs and warm bass	Precisely tailored frequency response delivers rich bass, clear mid-range and extended highs	Transparent, natural sound signature with accurate audio across an extended range
FREQUENCY RANGE	5 Hz - 25 KHz	5 Hz - 25 KHz	10 Hz - 22 KHz
TYPE	Closed-back	Closed-back	Closed-back
DRIVER	40mm Dynamic Neodymium	40mm Dynamic Neodymium	40mm Dynamic Neodymium
SENSITIVITY	99 dB/mW	97 dB/mW	97 dB/mW
IMPEDANCE	46 Ω	40 Ω	38 Ω
CABLE LENGTH	1.8 m / 6 ft	3 m / 9.84 ft	3 m / 9.84 ft
CABLE TYPE	Dual-exit, detachable oxygen-free copper with MMCX connectors	Detachable, straight oxygen-free copper	Detachable, straight oxygen-free copper
ACCESSORIES INCLUDED	Threaded 1/4" (6.3 mm) gold-plated adapter Zippered hard storage case Two detachable cables Additional pair of Alcantara® ear pads	Threaded 1/4" (6.3 mm) gold-plated adapter Detachable straight cable Carrying bag	Threaded 1/4" (6.3 mm) gold-plated adapter Detachable straight cable

SRH1540 Superior acoustic performance with clear, extended highs and warm bass.

SRH840A Accurate high-end extension with tight bass and superior transient response.

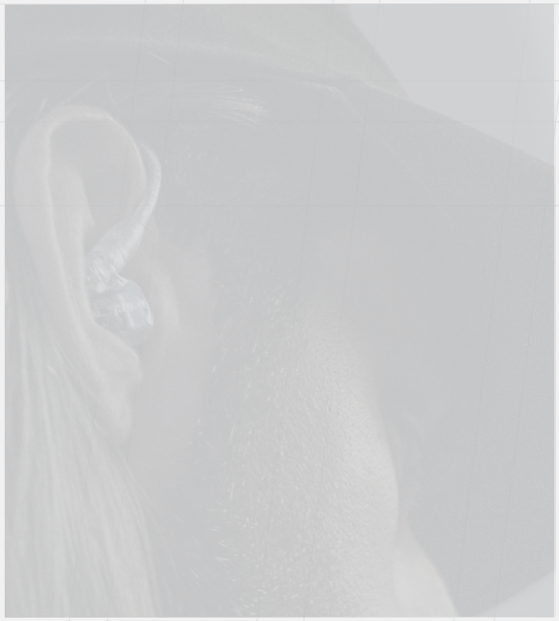
SRH440A Tailored frequency response delivers rich bass, clear mid-range, and extended highs.

SE SOUND ISOLATING™ EARPHONES



IMMERSE YOURSELF

Shure Sound Isolating Earphones provide award-winning sound in a secure, over-the-ear design for long-lasting comfort and immersive audio.



SE215

Single dynamic driver produces clear sound with deep bass in a convenient and portable package.

DETACHABLE CABLE

Detachable cable system enables long-term device compatibility, upgrades, and ease of maintenance.

SE425

Dual high-definition drivers (dedicated tweeter and woofer) deliver accurate and natural sound.

SE535

Triple high-definition drivers deliver spacious sound and rich bass for cinematic audio.

SE846

Four high-definition drivers for extended high-end clarity and a groundbreaking low-pass filter for true subwoofer performance.

IN THE FIELD

PERSONAL MONITOR SYSTEMS

Legendary Shure audio quality. Pristine RF. More on-air channels and breakthrough automated features that vastly simplify setup and operation. Shure PSM® systems are quickly becoming the ideal choice for IFB solutions in professional audio applications.

PSM TRANSMITTERS

P9RA+

P9RA+ Stereo bodypack receiver with unparalleled audio quality.

P10R+

P10R+ Twin-antenna diversity bodypack receiver with advanced digital signal processing technology dramatically improves signal reception and range.

SHURE.COM/PSM

PSM SYSTEMS

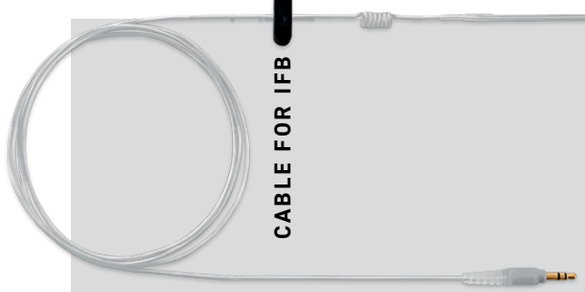
PSM 900

PSM 900 Single-channel, stereo. Up to 20 compatible frequencies per band.

PSM 1000 Dual-channel, networkable. Up to 49 compatible frequencies per band. Diversity bodypack.

PSM 1000

CABLE FOR IFB



EAC-IFB

The EAC-IFB Accesory Cable is a single-sided mono 1/8" (3.5 mm)-to-MMCX cable for use with Sound Isolating™ Earphones in professional intercom and monitoring applications.

SHURE.COM/PSM

NOW TRENDING IN BROADCAST:

PSM® 1000, THE ULTIMATE WIRELESS IFB

WRITTEN BY BILL OSTRY

"...the design of the PSM 1000 meets (and exceeds) all the requirements of a traditional IFB system..."

As a market development specialist for Shure, part of my role is to expose influential end users to our state-of-the-art products. In essence, I travel the U.S. and meet with power users in broadcast, production, and related fields, demonstrating Shure solutions to some of the most vexing of pro audio problems. I take a hands-on approach that allows potential customers to prove to themselves what works best in their situation. When you've got the right products, it works like a charm!

One product that has been enthusiastically embraced is the PSM 1000 wireless in-ear monitor system. With its true diversity bodypack receiver and resulting ability to operate reliably in the most challenging stage environments, this product has proven itself to be a reliable performer even on stages full of competing RF signals from microphones, moving lights, and video walls. As a result, it has become the unquestioned go-to IEM system in touring sound, to the point where is routinely specified at major live broadcast events like the GRAMMY®s and the Academy Awards.

One trend that we've noticed over the past several years is that the PSM 1000 has been selling in large quantities into the world of broadcasting, including major news, sports, and network production facilities. Literally hundreds of channels. It's been great to see this pro music product gain acceptance into the broadcast world, but we wanted to know why.

What's interesting is that a lot of these systems are not being used for in-ear monitoring. Because, as it turns out, the PSM 1000 is being embraced as the ultimate wireless system for interruptible foldback (IFB) applications as well.

PERSONAL MONITOR SYSTEMS

IFB is essentially a one-way transport system for bringing audio from a production's intercom system to the talent. It's what feeds the little curlicue earpieces you see on-air hosts wearing. Typically, the default audio is the program feed, but its real function is to allow key production personnel to cut off that feed and speak directly to the talent.

Traditionally, IFB systems have been bandwidth-limited to focus on speech, with both the wireless transmission and the earpiece being notorious for having high RF reliability (usually through high transmitter power) but relatively poor fidelity (voice-band audio with high noise floor). As it turns out, the design of the PSM 1000 meets (and exceeds) all the requirements of a traditional IFB system, but with fantastic fidelity.

As a result, broadcasting has become a new and vibrant vertical market for in-ear monitors. Here are some of the key design features that make the PSM 1000 the ultimate IFB system.

DIVERSITY RECEPTION UTILIZING TRUE ¼-WAVE ANTENNAS

Other IEM systems (and traditional IFBs) use a single ¼-wave antenna or a combination of a ¼-wave antenna and the earphone cable as the secondary (diversity) antenna, but Shure engineers know better. An earphone cable never performs better than a true ¼-wave antenna. In predictive switching diversity scenarios, if the system switches to the earphone cable as the secondary antenna there is a high likelihood that side is receiving a highly degraded signal as compared to a true ¼-wave. This results in poor performance in high RF environments.

With its twin quarter-wave antennas, the P10R receiver still functions reliably even in high-noise environments. This explains why so many systems are being sold into RF-intensive markets like New York City.

SPECTRAL EFFICIENCY

PSM 1000 can fit 16 channels of stereo IEMs into a single TV channel (8 MHz) of bandwidth. Then it doubles down: With exceptional stereo separation/isolation, it's possible to run two independent IFB feeds on a single PSM 1000 carrier, simply by feeding Left and Right inputs with IFB1 and IFB2 (respectively). Utilizing MixMode® on the receiver and panning hard L or R gives you isolated feeds. The result is that you halve the number of frequencies required, or you can cram twice as many IFBs in the same amount of spectrum that traditional IFB system use.

PROBLEM-SOLVING CIRCUITRY DESIGN

PSM 1000 receiver packs (P10R) feature RF AGC and Noise-Sensitive Squelch, both of which seamlessly prevent common wireless problems, and are compatible with "wet line" inputs from daisy-chained systems. The Automatic Gain Control for RF reduces signal fluctuations and prevents RF overload when getting too close to the transmitter antennas, while the squelch automatically detects and mutes RF noise before it becomes audible. Eliminating noise bursts in their ears makes talent very happy.

HIGH FIDELITY

Musicians require in-ear monitors with fantastic fidelity and negligible latency. This turns out to also be highly desirable in an IFB system. Studio technicians and talent may not require full-bandwidth response and low noise floor, but they sure do appreciate having it! More and more I am hearing from A1's that talent wants to hear music during breaks. Giving broadcast talent the same quality that is afforded a world class musician on tour is something that is appreciated by both the talent and the mixers.

For the talent that need high isolation and high fidelity, Shure's new EAC-IFB cable provides the perfect path for combining Shure's award-winning SE Series earphone line with PSM 1000 in IFB applications.

Let's face it, the curlicue acoustic tube driven by a remote transducer is less than desirable audio quality. Shure's products provide hi-fidelity sound with reliability that is unsurpassed in our industry.

WIRELESS WORKBENCH® (WWB)

Another huge advantage of the PSM 1000 is that it is part of the Shure ecosystem, the centerpiece of which is our free Wireless Workbench software. WWB handles sophisticated frequency coordination and monitoring, plus set-up, calibration, and diagnostics – and not just for PSM 1000, but for the full range of wireless microphones as well.

Basically, by engineering the PSM 1000 to ensure flawless operation as a touring IEM, Shure has designed the perfect wireless IFB system. This extra layer of utility has resulted in significant sales – expanding the PSM 1000 into the broadcast market, and extending across the Shure ecosystem to include a host of network-friendly wireless products, including the original Axient®, the new Axient Digital, and ULX-D microphone systems.

I think it's fair to say that the PSM 1000 really is that "better mousetrap," and it's exciting to see broadcasters beating a path to our door.