

Choosing and Using a Handheld Recorder – 2016 Update

New developments in plug-in microphones for phones and tablets.

Things keep moving forward in this area as more people are abandoning other portable recording devices and for the phone that they carry with them all the time. Keeping in mind that the microphone is really the most important part of a handheld recorder, we're seeing more outboard microphones as accessories to phones, and to digital SLR cameras as well.

With the proper connector and adapter, you can plug just about any microphone into the headset/headphone jack on a phone and be in business. The caveats are:

1. The microphone plug must be wired correctly. There's a wiring standard for computer headsets, and most phones comply with that. Apple, being Apple, swapped the ground and mic signal leads around so you can't use someone else's product with their phones. Most analog mics designed for use with a phone will work on an Apple phone, but don't go out on a field trip without trying it first.
2. No mobile device provides 48 volt phantom power for a studio-grade condenser microphone. They do, however, provide 5-volt "plug-in power," as do most handheld recorders. This limits

your microphone choice unless you add an outboard mic preamp, which sort of defeats the convenience of using a phone for your recorder.

3. The analog microphone input on a phone is monophonic. In order to use a stereo mic, you must connect to the recorder digitally. This leads us to

Digital Connectivity and Compatibility

Here's where the biggest difference between Apple and Android devices lie, and the short version is that Apple has had digital audio connectivity for the longest time. Android has long avoided the issue and only the newest Samsung phones have the hooks for connecting a digital audio source.

The last three series of iPhones have each used a different connector for charging and external inputs and outputs, though the good news is that the latest one, the Lightning connector, has the widest choices of audio devices (microphones and interfaces) that can connect to it.

Android phones use the USB connector for audio input and output, which makes things more standardized, however, Android devices aren't all alike. In order to use an external USB microphone

or audio interface with one, there are a few requirements that are often left off the less expensive Androids, and unfortunately it's not easy to tell what a particular device has or doesn't have.

If you have a high end Samsung device that's from 2016 or later, it's almost certain that it will work with any audio you throw at it, at least for the next few years. Even though there are more Androids than Apples in the world, there are far fewer of them, so far, with audio connectivity. There are hardware as well as software requirements. The Android operating system Version 5 and later does a pretty good job of handling audio, but the phone must support USB-OTG (On The Go), something that's often not included with lower priced Android phones. Without it, external audio hardware won't even be recognized as being connected. cable to adapt a USB microphone to your Android phone.



For the newest iPhones, here are a couple of new and interesting mics:



Sennheiser ClipMic



Shure MV88 Stereo Mic



The IK Multimedia iRig Mic Studio is supplied with cables for both Apple Lightning and Android USB-OTG devices.

Choosing and Using a Handheld Recorder – 2014

There have been some changes in the world of portable recording in recent years. When I first wrote this article, new recorders from Zoom, TASCAM, Sony, and others were coming out at a fearsome rate. In recent years relatively few new dedicated pocket- sized recorders have entered the market. Many of the new models have been oriented toward more sophisticated tasks such as multitrack recording, and as a result, have become larger and more complex to operate. Fortunately there are still a few “point-and-shoot” handheld recorders available from Zoom and TASCAM, and the Sony PCM-M10, still one of my favorites, is still available.

What’s happening? Well, for better or worse, smart phones have largely swallowed the pocket recorder market. Better because you most likely already have one in your pocket, worse in that it’s still a phone and, without some help, still has the sound quality of a phone. Another issue is that generally starting a recording involves several taps and swipes – more cumbersome than pressing the single Record button on the simplest of handheld recorders. You can get an acceptable recording of a workshop with one, but a tune in a jam session that you want to catch might be over by the time you turned your phone into a recorder and started recording.

Still, we must acknowledge this new way of recording and look at ways to get the best sound into your phone

Update

and out of it when it’s time to listen and learn.

The Microphone

Nearly all dedicated handheld recorders have two microphones and are set up for stereo recording. To the makers’ credit, they’re decent quality mics for music recording, and the better models can yield an excellent quality recording. Phones have a single microphone optimized for speech at close range. While it will still give you a mono recording, an external microphone can improve the sound quality considerably.

Your choices of add-on microphones for a smart phone depend on your phone’s make and model. The major categories are Apple and Android (from many manufacturers). There are a few others. Nearly all phones have a socket for connecting an external headset, and this can be used for connecting a microphone. This is an analog input that simply replaces the phone’s built-in mic with the outboard mic.

The external mic can be connected with a cable, which gives you the flexibility of keeping the phone with you and putting the mic where it can best pick up what you’re trying to record. An alternative is a mic that’s packaged with a plug integral with the housing, sized and shaped to make it look like an extension of the phone. This trades flexibility for compactness. Both cabled mics and plug-on mics are available for Apples and Androids. Analog connections are universal and play no favorites.



This is a cable-connected mic with a splitter for connecting headphones.



Here's a plug-on mic plugged into an Android phone. There's a headphone jack on the side of the mic. The app is iRig Recorder for Android which is bundled with this mic from IK Multimedia.

Any of these plug-in mics can be used with an Apple phone, but Apple offers an alternative. While the only way to get audio into an Android phone is from either the built-in mic

or through the headset connector, Apple phones have a docking connector that provides alternate audio I/O (input and output). The first generation phones had only analog audio connections but later versions have both analog and digital audio I/O. Using the digital connection has the advantage of bypassing the analog-to-digital converter in the phone, but the trade-off is a more expensive external mic, but with better sound quality.

In their interest of planned obsolescence, Apple has graced their multiple generations of phones



with no less than three different I/O connectors. The current generation uses the new "Lightning" connector while the previous generations have a 30-pin

connector. IK Multimedia's new cable-connected mic for Apple devices comes with three cables to accommodate Lightning or 30-pin phones as well as standard USB for Apple computers.

Beyond Mics – What's Next?

There's some sort of recording app built into just about every phone. Most are very simple, some have a limit to the maximum recording time, many have only an automatic volume control, and most offer

saving the recording in only one file format, which, due to licensing, isn't always MP3. There are several recording apps for both iOS (Apple) and Android that offer more flexibility. Try the free ones first, but try them at home before you go out to record something you'll want to keep.

You can, of course, play back your recording right from your phone, listen on its built-in speaker or headphones, and maybe file it away in a playlist for future reference. This suffices for many users whether using a phone or a dedicated recorder, but how do you get a recording off the phone if you want to edit it on a computer, save it to a CD or larger hard drive, or send a copy to a band member or put it up on a web site?

Androids make it easy as most of them have a USB port. Just connect it to your computer (Windows requires installation of a driver first) and it appears as another disk drive from where you can drag or copy files to another destination.

Some Android phones have a removable micro SD memory card. If you configure your recording app to save files to the memory card, you can remove it from the phone, connect it to your computer with either a USB adapter or card slot, and get access to your recordings directly.

Apple, in their interest of avoiding music piracy, makes it a little more difficult to use your own recordings. You can't connect the phone directly

to your computer to copy a recording, you must send it through iTunes, DropBox, or some other file host. I guess it's not so bad once you get used to it.

Beyond Handhelds

Just a nod here to the fact that Apple phones support many studio-oriented I/O interfaces should you want to record with more than one microphone. There are many apps, including a fairly sophisticated 48 track recorder and mixer, to go along with multi-channel I/O audio hardware. Most of these studio-like interfaces connect to a computer or the iPhone via USB. You'll need a USB Camera Cable Kit for your iPhone to adapt the docking connector to a standard USB connector.



We have this cool capability ("class compliant" devices) because Apple provides software specifications to any hardware manufacturer who wants to make a device to work with their phones. Unfortunately, because there are so many variations to the Android operating system, none of the makers of these interfaces have tried to make their hardware work with Android devices. Maybe the next generation Android will offer class compliant audio I/O capability. We can hope.

Choosing a Handheld Digital Recorder – 2011 Edition

You're probably reading this because it's nearly Music Camp time and you figure it's time to bring along a recorder or upgrade your old one. Every year about a week before camp, people are asking what to buy, and this was my response this year. Most manufacturers bring out a new model once or twice a year and it's really hard to keep up with them, but here are my current thoughts.

Last minute decisions about these things are always tough because they're basically the same except that every one seems to have some little thing about it that's almost sure to bug you once you find it. You should have come to camp LAST year and come to the workshop that I do about these recorders to get some insight (and of course you can come this year).

I own a Zoom H2. I've had it for several years and it's still probably the best buy in an all-around handheld recorder. Its only shortcoming is that it's of the generation before very low power devices. Many of the current generation of recorders will go 10 to as much as 20 hours or more on a set of batteries. The H2 will go 2-4 hours on a set depending on how you use it. That's why Seth and I and most others who get it find rechargeable batteries to be an almost necessary accessory. It cost \$200 when it

was first introduced but is now available nearly everywhere for \$150 or less.

If I were to buy one today, I'd probably go for a Sony PCM-M10. Compared to the Zoom H2, It's a little smaller and lighter, sounds a little better in most situations, has an easier-to-read display, 10+ hour battery life, and comes with a remote control that's sometimes worth its weight in gold.

If you've set yourself a budget of \$100, which certainly isn't unreasonable today, there are a lot of choices. Zoom has the H1 and TASCAM has the DR-07. My primary objection to most of the \$100-and-less recorders (as well as those from Yamaha and Olympus, that Paul likes) is that they're just too darn small. To some, that's an advantage, but think about it.

It's hard to make a mistake and choose totally the wrong recorder, but it's helpful if you can get to a shop (Guitar Center stores carry a reasonable selection) and fondle a few different models before making your choice. There are reviews of a few recorders on my web page. Most of these have been replaced by newer versions, but by reading the reviews and the following article about using a handheld recorder (that's my camp class handout) you'll get some idea about details that may matter to you once you get to using it.

Resources

<http://mikeriversaudio.wordpress.com> Reviews and Articles

http://tascam.com/applications/recording/handheld_recorder/ (TASCAM)

<http://tinyurl.com/2q73yd> (Zoom H2)

<http://tinyurl.com/24qmmwc> (Zoom H1)

<http://tinyurl.com/Sony-PCM-M10> (Sony PCM-M10)

Tips for Using Your Portable Recorder

Mike Rivers © 2009

Microphones and Positioning

The most important thing to consider when making a recording is where to put the microphone. Think of your pocket-sized recorder as a microphone with a recorder attached, not as a recorder with a built-in microphone. Think about where you want the microphone to be, and put the recorder there.

Microphones “hear” differently than ears do. You’ll pick up more room sound than you hear when you’re in the room with the music. Try to get close to the source. Plug in a set of headphones and listen to what the microphones are hearing.

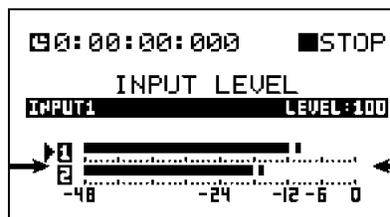
Most recorders have a connector for an external microphone. This can make it easy to put the mic right where you want it but there’s a lot to know. Some mics require no power, some have a battery, some can be powered from the recorder, and there are two schemes for this, phantom and plug-in power. There’s a dark side here, and most built-in mics are mighty good these days.

Consider using a mic stand. Putting your recorder on the floor often sounds murky. A table can work. Don’t put it too close to YOU! (unless you’re recording yourself) .At a concert you may need to be discreet, but when jamming with friends, don’t be afraid to get in the way when setting up. Then relax and enjoy the music.

Setting the Record Level

Learn your recorder’s limitations, how its controls work, and what the meters are really telling you. Set the record level control so that the meters stay below maximum. On many recorders, the record level control can lie to you, resulting in a distorted recording even if the meters look normal.

Use the Sensitivity switch to get the level in the ballpark with the record level



control set near maximum If its range is 0-127, start with it set at 100. Experiment with your own recorder to learn how this works. Don’t constantly fiddle with the record level. Find a level that works and leave it there. You can make volume adjustments later, but you can’t easily un-distort a distorted recording.

Automatic record level has its place, but it’s rarely good for recording music. A limiter can be helpful but learn how it works before relying on it.

Formats, Recording Time and Memory Cards

WAV or PCM = “CD Quality”

MP3 = “Radio quality” (or worse)

WAV, 16-bit, 44.1 kHz stereo is best if you plan to make a CD from your recording. This format give approximately 1.5 hours of recording time per gigabyte of memory. 24-bit recording allows you to be more conservative when setting the record level which is an advantage when you can’t (or don’t want to) pay attention to the recording, but don’t be careless.

MP3 recording time and quality varies. 128 kbps is “decent cassette quality” without the flutter and gives approximately 10x as much recording time as 16/44.

Most pocket sized recorders use interchangeable flash memory cards, They come in different sizes and they keep getting cheaper. The temptation is to buy the biggest one you can find, but an older recorder may not accommodate the newer and larger capacity memory cards. Also, cards can fail and you can get careless. Don’t put all your eggs in one basket. 2-4 GB cards work in most recorders and are dirt cheap. Check with the manufacturer before you buy a card that’s too large. There may be a firmware update available that allows larger capacity memory cards.

Power - Batteries and Plugging In

Know how long your recorder runs on a set of batteries or a charge. Replaceable

batteries will keep you running all day. Internal batteries will need recharging. Rechargeable, replaceable batteries are economical but don't forget the charger!

Standard NiMH cells lose their charge after a few weeks on the shelf, so don't go out without a fresh charge. Hybrid (Hybrio, Eneloop) cells generally have slightly lower capacity (Ma-H) but will hold a charge for several months. These are good if you use your recorder occasionally and might forget to charge up before taking it out.

Recorders that use replaceable batteries usually won't charge them in the recorder. Internal batteries usually charge when connected to an AC power supply or USB port. An external AC power supply is a useful accessory, but don't forget to pack an extension cord.

Recording from a Mixing Console – Line Inputs

Playing a gig with a PA system? You can probably get a better recording of your show by connecting your recorder to the mixing console. If you're not bringing your own PA, bring your own cables. You can't expect the sound crew to have them. There will usually be spare mixer outputs on 1/4" or RCA phono jacks. You won't always get a stereo output from a mixer. Bill Monroe recorded in mono, so can you.

Your recorder's line input is probably a 1/8" stereo jack, but may be 1/4" phone jacks. My "line in" kit (Radio Shack part numbers) should accommodate most setups:

- Cable – 1/8" stereo plug to two RCA plugs 42-2551
- RCA to 1/4" plug adapters (274-320)
- Y adapter – two RCA jacks to 1/4" mono plug 42-2546
- 12 dB attenuators (optional)

The same cautions about setting the record level apply here. You may need an attenuator between the mixer and the recorder. The Harrison Labs 12 dB RCA attenuator will do the job. Search the Amazon.com web site for B0006N41B0.

Managing Your Recordings

This is a personal thing, and a little philosophical, but it's food for thought. These recorders are so handy, it's easy to record far more than you can ever deal with, and your recordings can't stay in the recorder forever. At some point you'll need to either decide to delete the recording or move it somewhere else. Unless you simply remove the memory card, store it, and put a new card in the recorder (just like we used to do with tape – remember?), managing your recordings involves a computer.

Nearly all recorders have a USB port which makes the recorder look to your computer like an external disk drive. Files can be dragged from the recorder to a folder on the computer. We're an impatient bunch, though, and a card reader for (or in) your computer is almost always faster.

If you've recorded a jam or concert, the whole program will be in a single file. Be honest – you really don't want to listen to the whole jam over again, though there are probably a few tunes you'll want to learn. A couple of good (and free) tools for editing and saving your selections are:

Audacity – <http://audacity.sourceforge.net>
(versions available for PC, Mac, and Linux)

MP3 Direct Cut (Windows)
<http://mpesch3.de1.cc/mp3dc.html> or
http://majorgeeks.com/mp3DirectCut_d4668.html

For shelf storage of memory cards, the CardSafe is really slick. Available from:
<http://www.cyberguys.com>

