Sony PCM-M10 Hand-held Digital Recorder
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Since the introduction of the PCM-D1, Sony has been among the classiest in the field of portable hand-held digital recorders. The PCM-M10, the newest, smallest, and least expensive member of the family, borrows a lot from the mid-line PCM-D50, retaining its good looks, good sound, and solid build while incorporating some user-requested features and updates. The M10 is truly pocket-sized (2½" x 4½" x 7/8", 6½ ounces with a pair of AA alkaline batteries installed), and it feels very solid and comfortable in the hand. Like its brethren, it comes equipped with 4GB of internal memory, with an external memory slot that now accommodates not only a Sony Memory Stick Micro M2, but, because users thought the Memory Stick format was proprietary (actually there are several sources), accepts the more common Micro SD format as well. The menu has been streamlined with a row of quick-access buttons immediately below the large backlit LCD screen.

A first for Sony - Colors, black and red. Accessories supplied includ an AC wall wart power adapter, wired remote controller, manual, a copy of Sound Forge Audio Studio LE (Sony's audio editing program), USB cable, a carrying strap, and batteries, but thankfully no cheap headphones or ear buds. I've got a pile of 'em if you need some.

Features

The PCM-M10 records 16- or 24-bit linear PCM WAV files at 22.05, 44.1, 48, or 96 kHz sample rate, plus, at users' request, 44.1 kHz MP3 files at 64, 128 or 320 kbps. With a nod to doubling as a portable music player, it also plays (but doesn't record) a wider range of MP3 formats, Windows Media (WMA) and AAC-LC (m4a) files common to iTunes and the iPhone. Options for continuous playback of sequential files and folders bolsters the portable player application. It neither records nor plays mono WAV files.

Other key features are a built-in speaker – decidedly low fidelity but useful for verifying that you have a recording or for rough field editing, limiter, low-cut filter, event marking within a recording coupled with search-to-mark. A 5-second pre-record buffer that lets you catch the first couple of words between when you hit the Record button and actually start recording. Cross-memory recording

automatically switches between internal and external memory when the currently selected media becomes full. For the musician, there's variable speed and pitch controls and A-B repeat capability for repeated playback of a phrase. In addition to the high resolution LCD meter, attention-grabbing LEDs for each channel indicate record level of –12 dBFS and OVER (which is actually –2 dBFS).

Battery life (two AA cells) when recording varies somewhat with the format, but the manual claims impressive figures of around 24 hours (by an unspecified and "proprietary to Sony" testing method) for alkaline cells and not significantly less for rechargeable cells of an unspecified A-Hr capacity. This nearly doubles simply by leaving the headphones unplugged, disabling the power output stage. I haven't yet run down my first set of batteries, so I can't elaborate on that figure. A menu selection calibrates the battery level indicator for alkaline or NiMH rechargeable cells. There's no built-in charger, so if you choose to use rechargeable batteries, you'll need to charge them externally.

The built-in microphones are omni, reasonably flat up to around 5 kHz within 90° off axis. They're mounted in the top corners of the case, spaced about 2 inches apart and facing outward at about 90 degrees. This arrangement doesn't give the accurate localization of good coincident cardioid micss, but provides a sense of space in the recording. Being omni, the mics pick up more of the room than other hand-held recorders that I've used, so placement to find a good balance between clarity and room sound will take some practice.

The display is large, clear, and informative without being cluttered. The bottom line shows the currently selected record mode or format of the file being played, and whether the low cut filter and limiter are engaged. If the variable speed or pitch are engaged, that's also displayed. The center of the display is occupied by the level meters and time display. When recording, the display shows the running time or time left before the memory is full. In playback, running time or time to the end of the track are displayed. In either mode, the date and time of the recording can be displayed. Pressing the MENU button brings up the menu, which is scrolled with the Forward and Rewind buttons.

Menus

Space and practicality doesn't permit me to go through every menu item, but there are a few worth mentioning because they're less obvious or darn clever. Effect isn't reverb or such, but rather two levels of bass boost for the headphone output. Easy Search (on/off) changes the action of the FF (Fast Forward) and FR (Fast Rewind) buttons. When playing a file with Easy Search on, tapping one of the buttons moves forward or back in the file by 10 seconds. With Easy Search off, tapping the FF button switches to the next file while tapping the FR button moves to the beginning of the current file. In either mode, holding FF or FR fast winds through the file with the associated monkey chatter. Audio Out switches the output jack between Line and Headphones. In the Headphone mode, the jack

is driven by a 20 mW/channel power amplifier capable of driving 16Ω phones to a healthy level, and the volume control is active. In Line, the output level is fixed, 0 dBFS = 1Vrms into a moderate impedance.

The Add TAKE function appends the word TAKE or KEEP to the file name, quickly marking it as a keeper. Its close partner, the DELETE button, deletes the current file should you decide that it's not a keeper. There's also a Delete selection on the menu which deletes either the entire contents of the currently selected folder, the current track mark, or all the track marks in the current file. Divide splits the file either at the current position or at each track mark. This is as close as you can get to editing in the field.

Detail Menu is the only submenu, and it's where the less often used (e.g. backlight illumination time) or more dangerous (formatting the memory) functions are found. Here's where you can turn off the record level and transport button LEDs to squeeze out a few more minutes of battery life or make yourself more stealth.

Other Controls

In addition to the front panel transport control and menu buttons, there are several switches most easily accessed from the rear of the M10. The mic sensitivity (attenuator) switch engages a 20 dB pad when recording loud sources. The variable speed switch changes to the preset playback speed. Auto Record Level sets the initial record level automatically, prompting you to switch in the mic attenuator if necessary. It will turn the record level down when required, however it won't turn it back up. This can be good or bad depending on the nature of the program material. On the good side, it prevents background noise "breathing" that's the bane of most automatic level controls, but if you cough close to the mic, it'll drop the gain and you'll end up capturing the rest of the program at the lower level.

A thumbwheel easily accessed from front or back adjusts the record level manually. A rocker button adjusts the headphone level with Audio Out in the Phones mode, or speaker playback level in either Phones or Line Out mode when nothing is plugged into the headphone jack.

Files and Folders

The recorder's operating system creates ten folders named FOLDER01 through FOLDER10 for recording. A USB 2.0 port allows transferring of files and folders to and from a computer. Alternately, recordings can be made directly to, or copied to the removable memory card which can be removed and later copied to a computer using a suitable card reader or kept for backup. You can add or rename folders, however only the default folders are allowed for recording. At

times, it would be helpful to pre-name a folder for a particular project and then record into it.

Files are automatically named by date and sequence (091003_05.WAV = the 5th recording on October 3, 2009) another suffix if the file is split. Long, continuous recordings are automatically split at 2GB for WAV files and 1GB for MP3 files. Files can be renamed with a computer and the new names will be displayed, but there's no provision for renaming them from the recorder itself. Each folder can hold 99 files.

A copy of Sound Forge Audio Studio LE for Windows is included with the recorder for editing and massaging. Track markers inserted using the recorder's T-Mark button show up in Sound Forge, a handy feature if you've roughly marked sections while recording with the intent of later detailed editing.

In The Trenches

Put the recorder in the right place and you'll get a fine recording. It's as simple as that. But placement must be done with care. With the recorder more than about a foot from the source, you'll start hearing the room, a good thing if the room sounds good but a bad thing if it doesn't. There's no substitute for connecting a reliable set of headphones and listening to what the mics hear. It's not the same as what your own ears hear in open space. As expected, given the mics' polar pattern and mounting arrangement, stereo localization isn't very well defined. You can tell left from right but you can't pinpoint individual sources. Ambience is pleasant, however, once you find a good balance between the direct and reverberant sound.

The mics are fairly sensitive to wind noise. Sony offers a "dead squirrel" wind screen as an accessory but it wasn't available for this review. I tried a common foam windscreen when recording outdoors on a breezy day and got about as much wind as music. The low cut filter, which is very aggressive helps a little, but it's clearly audible. I would avoid using it when recording music except as a desperate measure.

For anything more serious than a casual "snapshot" recording, you'll want to put the recorder on a tripod or mic stand (with a thread adapter), both to get it up in the air and to minimize handling noise. Since the M10 is so thin, it's really only stable on a table when resting on its back. This placement worked fairly well for an interview, but when recording myself with a guitar, I needed to put it on a stand to bring it up around mouth level for good balance between voice and instrument, move it about 3 feet back to get some room sound.

The remote controller is handy when the recorder is out of reach, but the cable is only 6 feet long. It's limited to recording functions – Record, Pause, Stop, and Track mark, and you'll still need to be near the recorder to set the record level

unless you're using the automatic mode. The limiter, which has no controls other than on/off, kicks in at full scale and sits on up to 12 dB more input level before clipping occurs. The low cut filter and limiter can be engaged while in the Record mode. The filter engages smoothly, but engaging the limiter results in a brief mute, about 100 ms.

The PCM-M10 works fairly well with external mics. The preamp is reasonably quiet and has sufficient gain to be useful. 3V plug-in power is available, and in fact, plugging into the external mic jack brings up the menu inviting you to turn on the mic power. The only plug-in powered mic I own sounds far worse than the built-in mics, so I didn't test this mode. Of course you can use your fine phantom powered condenser mics by connecting an outboard preamp to the line input, but that defeats the purpose of such a handy recorder. For interview work, however, an external mic might work well since it can go in close without putting the whole recorder in your subject's face.

Summary

These recorders are now in at least their third generation and we've had time to learn what features are useful and what level of performance we can expect from them. The PCM-M10 not the least expensive of the lot (nor would I expect that from a Sony product) but at an anticipated $300 or so on the street, it's well priced considering its sound quality, feature set, and ease of use. Sure, I have a few quibbles, but there are no show stoppers. To give some perspective, I've been using a Zoom H2 recorder for a while now. I chose it because the sound was decent and it was small and snag-free. I can carry it in my guitar case or pocket to record informal jam sessions at music camps and festivals. The PCM-M10 can easily that bill and better, it's a little smaller, it's a little better sounding (better mics), and the phenomenal battery life is good for the environment and easy on the pocketbook. I think that Sony has produced a real winner with the PCM-M10.

Some Useful Numbers

Parameter	Measured	Comments
Input Sensitivity, external mic input	-53 dBu = 0 dBFS	Hi sensitivity, Record level set to max. This is 25 dB greater than the Zoom H2!
Input Sensitivity, Line input	0 dBu = 0 dBFS	Record level set to max. Attenuator switch not active for Line input
Input Impedance	Mic = 4.9kΩ Line = 22kΩ	Current spec sheet says mic Z_{in}=22kΩ. This is incorrect
OVER Indicators	OVER LED = -2 dBFS OVER meter = -1 dBFS	When the LED flashes occasionally, switch in the limiter
Quiescent noise (recorded)	Line in = -88 dBFS RMS Mic in = -66 dBFS RMS	Record level set to maximum, 150Ω input termination
Low-cut filter	-6 dB @ 175 Hz 24 dB/octave slope	Starts higher, rolls off steeper than most