New Products, P. 10, 38

STUDIO | LIVE | BROADCAST | CONTRACTING | POST

NewBay Media

JUNE 2013 | VOLUME 19 | ISSUE 6

ProAudio Review

Just Add iPad

MACKIE'S DL1608 LIVE MIXER

more reviews

Cloud Cloudlifter CL-Z • DPA 2011C & d:facto II • iZ Technology RADAR 6 • Maag Audio PREQ4 & EQ4 • Mackie DLM Series • Propellerhead Reason 7 • Sonic Farm Creamliner

www.**proaudioreview**.com

technically speaking Frank Wells

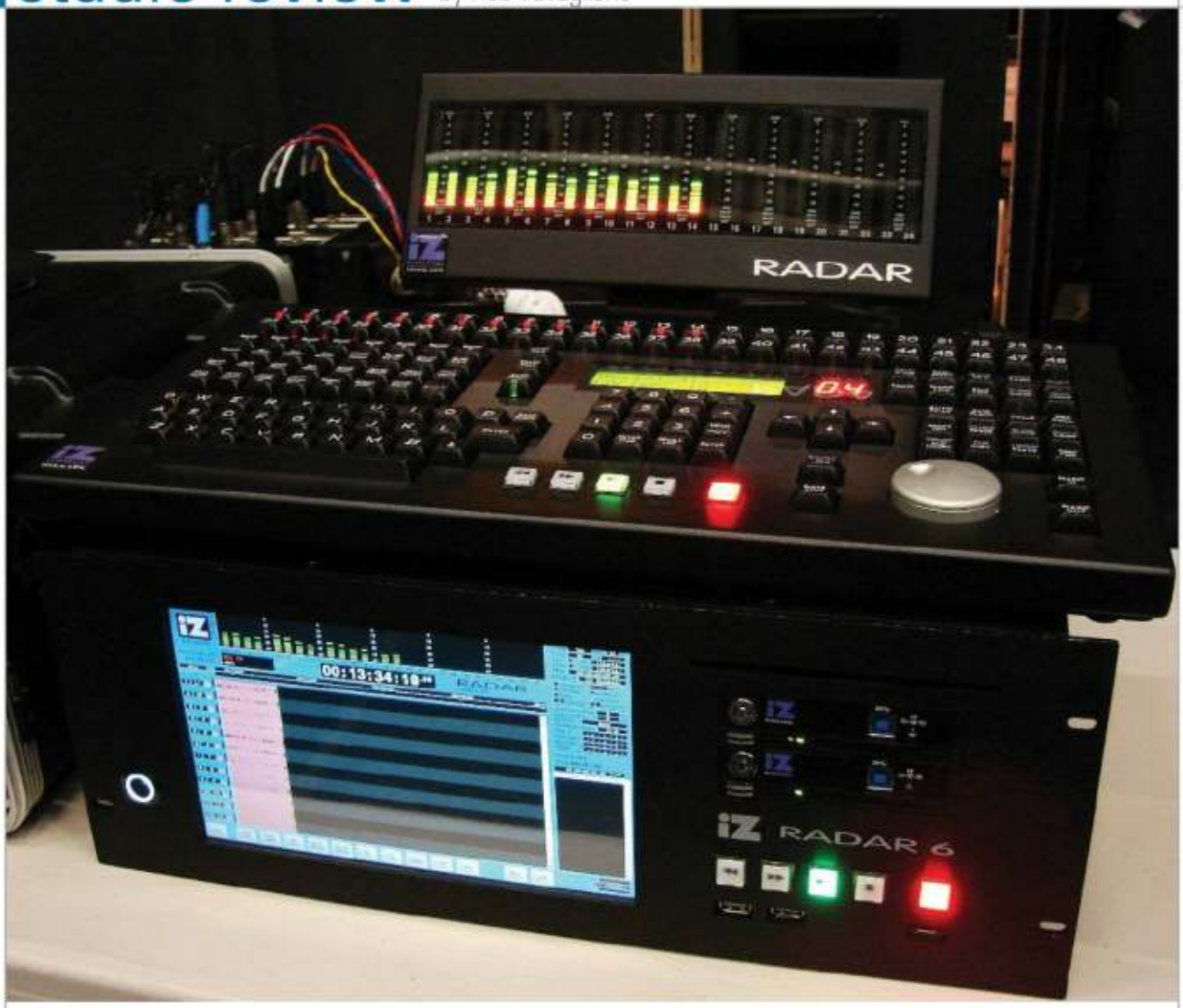
That Thing That's Called RADAR Love

On display at an AES Convention in the early 90's was a recording device that was truly blazing new territory. The company was Creation Technologies and the intriguing product was a standalone, rack-mount, small-footprint, digital, hard disk recorder called RADAR (Random Access Digital Audio Recorder). The concept of a self contained 24-track recorder with no tape, at a price less than half a new analog two-inch recorder (and far, far less expensive than any 24-channel plus digital multitrack tape machine) was part of the attraction. That the device had both a logical design and a deliberate simplicity was also attractive.

End-users weren't the target customer at that particular exhibition hall booth. Price and availability were a little vague, and I finally got the message: RADAR was on display in a quest to find a distribution partner, a company who would take the product and share it with the world. That partner turned out to be Otari, who distributed the Creation OEM'd RADAR for its first two iterations. Without naming names, several early digital tape recorders had less than satisfying AD/DA converters. Aside from price and practicality, RADAR was a big step up in converter quality, with a character that made for loyal owners. RADAR came upon the scene just as the ADAT began the movement we today refer to as the "democratization" of recording, and became the professional's choice for a portable system.

The first true DDD major release in Nashville was tracked on RADAR, digitally mixed in the short-lived ATT DisQ digital mixing engine and mastered digitally (Diamond Rio's debut album).

In this issue you'll meet RADAR 6, which brings the same dedication to excellence in converter design, the same practical simplicity of concept and operation, and a thoroughly modern attention to feature set, at a price less than half the cost of the original RADAR, even before accounting for inflation. Kudos to Creation spin-off iZ Technology for keeping the platform current and their focus on serving audio professionals.



RADAR 6 PHOTOGRAPHY BY ROB TAVAGLIONE

iZ Technology RADAR 6 Multitrack Recorder

Legendary, reliable, and world-class—RADAR is a format unto itself. RADAR 6 is further refinement to our industry's premium, high-resolution, stand-alone digital audio recorder.

It's right there on the iZ website: "The Finest Recording System in the World."

Rob Tavaglione is chief engineer and owner of Charlotte's Catalyst Recording as well as a regular contributor to *Pro Audio Review*. catalystrecording.com

Now that I have used the new RADAR 6 (Random Access Digital Audio Recorder) and tested its abilities, I cannot refute iZ Technology's claim, as bold as it is, simply because it is quite possibly correct—with certain qualifications.

Features

Like all previous RADAR systems, RADAR 6 is configured modularly; buyers choose their specific feature set from a long list of component choices. It all starts with the RADAR frame—4U, housing the Intel E5800-powered 3.2 GHz CPU—with one or two key-locked high speed SATA/USB 3.0 combo drive bays (with dual 120 GB SATA solid state drives), 2 front-panel USB 2.0 outputs, transport controls and a 10-inch high resolution LCD touchscreen; a Blu-ray/DVD combo drive and a high speed SDXC card slot are optional. New to RADAR, V.6's touch-screen can serve as its sole user interface, though iZ's basic KC24 remote can be used, or—for the ultimate user experience—the RADAR Session remote is arguably the ultimate reach into RADAR.

Despite the importance of all components in such a system as RADAR 6, its converters are arguably most critical. There are two iZ converter options available for RADAR 6, Ultra Nyquist and Classic 96. Ultra Nyquist is capable of up to a 192 kHz sample rate, 108 dB of dynamic range, and 0.006% total harmonic distortion (THD); Classic offers up to 96 kHz sample rate, 100 dB of dynamic range, and still 0.006% THD (for more on iZ's now-legendary converters, read Russ Long's review of the new ADA II converters from *PAR* April 2013. iZ's new Adrenaline DR recording engine (direct to SATA as opposed to via SCSI with RADAR V) handles analog I/O in groups of eight (eight to 24 channels) with additional RADAR systems linkable for larger recording systems. Analog I/O is via DB25 connectors on RADAR 6's back panel.

Digital I/O is available in all the current flavors of RADAR 6, with 24 channels of I/O via AES (single or dual wire), MADI (24 channels up to 96 kHz), ADAT Lightpipe (single/dual/quad) or TDIF (24 channels up to 48 kHz, single/dual/quad). Regardless of I/O chosen, single SPDIF and 2 channel AES I/O is provided, plus Wordclock In/Out/Thru, MIDI In/Out/Thru and SMPTE I/O (via XLRs) are all there.

Synchronization is via iZ's Sync Processor II, which offers lockup via SMPTE, MIDI, iZ's own RADAR Link (for multiple RADAR setups) and Sony 9-pin. There is also an optional three-port set of programmable footswitch connections for punching in/out, stop/go, etc.

A number of control accessories are offered for system customization. The Session Controller includes track arming, transport control, alphanumeric keyboard, jog wheel, locate controls and dozens of shortcut keys. Meter bridges are available in 24- or 48-channel configurations, and they mount directly to the Session Controller. When mounted on the optional roll-around stand, with 20-meter Session Controller extension cable and dust covers, RADAR 6 users have a very efficient remote control station. The basic KC24 remote can be used, too, though best if paired with a video monitor; it cannot be attached to a meter bridge.

In Use: Studio Recording

I have heard numerous times how simple RADAR is to use—a "take it out of the box and hit record" kind of simplicity, supposedly—so I just had to try it myself. Sure enough, I connected the system, armed a track and hit "big red"—RADAR began tracking without a single menu parameter navigated or manual page turned.

Next, I connected my 24-inch video monitor, Session Controller and the meter bridge and began laying down some demos, still without consulting the manual. Whether at 44.1, 88.2, 96, 176.4 or 192 kHz (other sample rate choices are offered as well), RADAR always behaved as expected: never a glitch, stutter or error. Vari-speed was a handy option, navigation was a breeze and I became very comfortable with RADAR very quickly.

But enough toying around—it was time for some serious work. I pulled in Grey Revell and his band for some test recording (drums, bass, electric guitar, keys and vocals). With 20 inputs at 192 kHz, we laid down "warm, yet clear tones" on all tracks and tried a whole band punch in. Upon punching out, I found a rare RADAR limitation: at 192 kHz, the seamless crossfade monitoring for punches are available only up to 12 channels at a time, so there was a momentary dropout on punches of over 12 tracks. This is a monitoring dropout only; it has no effect of recorded audio crossfades. There are no such limitations at 96 kHz or lower. Using the Session Controller, I found all functions within easy reach (track arming, locate points, session/track naming and transport control) and logically laid out. Latency was not an issue (we did not hear any at all— iZ boasts "near-zero" latency).

At 96 kHz it was business as usual, with no discernible operational differences or advantages compared to 192 kHz other than all-track gapless monitoring punch-

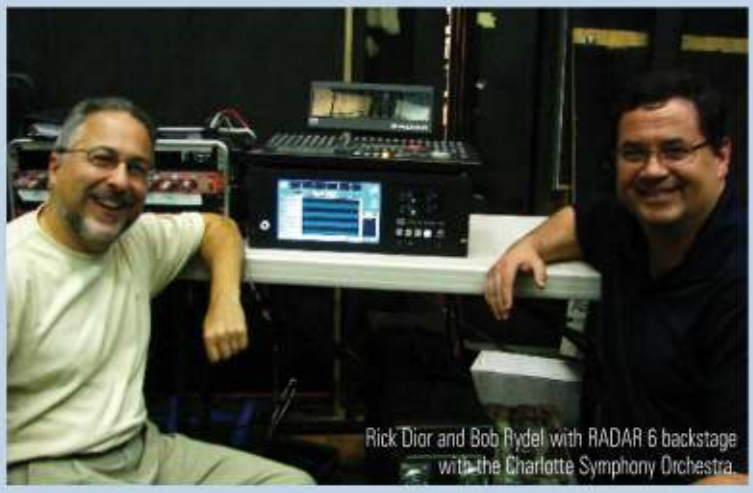
> "RADAR 6 is indeed easy to initially use and logical enough for quick comprehension, but it is also complex enough to require study if one expects to achieve maximum, feature-deep results."

The Charlotte Symphony Orchestra

These orchestral recordings and tests were made possible by the Charlotte Symphony Orchestra and its Music Director Christopher Warren-Green, Director of Operations Bud Simmons, its many musicians and the engineering staff of Acoustic Mobility, Rick Dior and Bob Rydel. Neither the CSO, nor Acoustic Mobility are endorsers of RADAR24, RADAR 6 or any iZ Technology products, or were compensated in any way for their assistance in evaluation.

Testing Equipment:

- Sennheiser MKH40 cardioid pair in ORTF over the conductor
- Two MKH800 omnidirectional mics, half-stage left and right of conductor
- Two MKH40 cardioid mics flanking far left and right
- Neumann KM140 cardioid pair in ORTF over woodwinds/timpani
- Four spaced Beyer MC840 cardioid mics on choir
- Mic amplification via two ATI 16MX2 multichannel preamps, recorded directly to the iZ RADAR24



Rick Dior and Bob Rydel with RADAR 6 backstage with the Charlotte Symphony Orchestra.

ability. An unexpected observation: the band agreed that they preferred their 96 kHz performances, stating it was slightly "warmer and sweeter."

At 44.1, RADAR 6 continued to behave like the polite Canadian it is, no surprises. Though what was surprising was the band's observations; all four members clearly preferred the audio at 44.1 kHz for the perceived bass response. I was not so sure I agreed. The top end at 192 kHz was especially clean and tidy and still had "ample, yet lean" bass character. 96 kHz wasn't as pristine up top but seemingly more lively and had a little more bottom end presence. 44.1 kHz, in comparison, seemed like going to 15 ips on analog tape: thick enough to be almost boomy but not dark, grainy or muted through the rest of the spectrum. Apparently, low-end character is like ice cream: everybody has a favorite flavor and no one is "right."

At this point, a "control recording" was clearly needed. We patched our mic pres into an Alesis HD24XR multitrack recorder, recorded the songs again at 44.1 kHz, imported the RADAR 6 and HD24XR tracks into my DAW, level matched and monitored through the exact same signal paths.

At this point, Grey and I both found that RADAR tracks had deeper bass extension, flatter mids and top end, more punch, and slightly better imaging. Nonetheless, we preferred the HD24 tracks on guitar, we were neutral with bass guitar and we both highly preferred the RADAR kick drum tracks, which illustrated the converters' differences rather well. Please listen to the provided FLAC web clips to see if you concur with our findings: https://soundcloud.com/pro-audio-review-magazine

In Use: Location Recording

I then took RADAR 6 on location to record the Charlotte Symphony Orchestra (please see sidebar). The CSO's recording team (Bob Rydel and Rick Dior of Acoustic Mobility) regularly record the CSO using predominantly Sennheiser microphones and two exceptionally clean 8-channel ATI 16MX2 mic preamps (now known as the JDK 8MX2, with limiters available on each channel) routed directly to their own RADAR 24 recorder at 44.1 kHz (with S-Nyquist converters capable of 192 kHz, but with a six track limit/12 tracks at 96 kHz). The ATI preamps offer main and aux channel outputs on DB25s, so we used the mains for RADAR 24 and the auxes for RADAR 6, precisely matched the signal levels, and confirmed with an ATI design engineer that both main and aux output paths employ the same components (op amps), differing by only an additional gain control pot on the aux outputs.

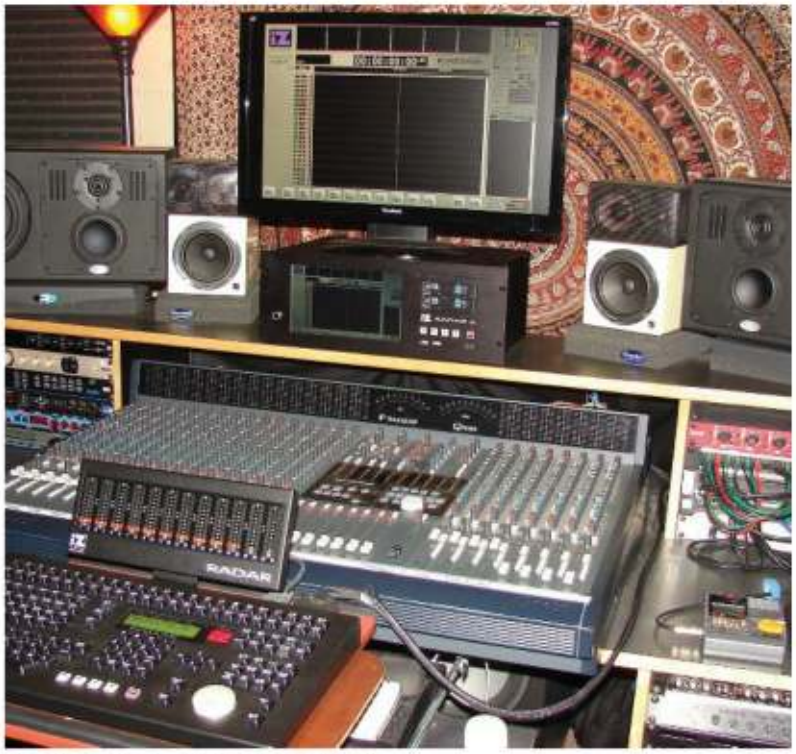
We then recorded various rehearsals at various sample rates on both systems. With an empty house, I took advantage of sitting in the very best seat and listening to the entire concert, in order to have the most accurate frame of reference possible when mixing and evaluating. I did not encounter a single problem with RADAR 6 during any of these locations recordings. For such simple operations, I found the Session Controller and meter bridge to be unnecessary (although still nice to see); this allowed RADAR 6 to be extremely portable (basically just the 4U mainframe). Tapping on RADAR 6's small touchscreen necessitates that it be propped up at an angle—the owner's manual notebook underneath sufficed.

In Use: Studio Implementation

RADAR 6 can be utilized in an edit/play-

back environment very much like an analog multi-track tape machine, albeit one with an ability to do track-specific edits and non-destructively at that. However, using markers and typing time values has its practical limits, as does RADAR's ability to zoom in horizontally very finely (e.g., for tight drum edits). Users that are light on edits (and mix analog) may find RADAR complete enough to not require a companion DAW (RADAR 6 can even burn CDs); but ultimately, I felt that importing my tracks into my DAW was necessary to deliver the expected lightning fast experience to my track chopping and sliding for pop/rock clients.

In order to export, RADAR 6 must first prepare the tracks by bouncing the session into a separate folder on one of those SSD drives (or the internal Archival drive). All of the desired options are offered—filling empty gaps before, during or after a file's endpoint; file type; selecting which tracks or certain time ranges to bounce; or flattening where only the desired segments that make up a keeper take are utilized and all

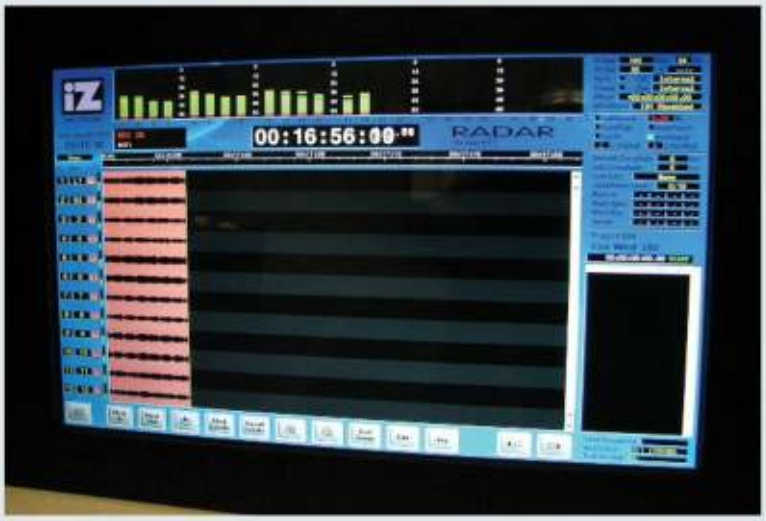


RADAR 6 at Rob's Catalyst Recording in Charlotte.

second opinion by Lynn Fuston

Sound, Stability & Simplicity: The Lasting Allure of RADAR

As someone who spent years working on RADARs (both the Otari RADAR I and II versions and later the iZ RADAR 24), I can tell you why RADAR was the system of choice for many working engineers, including myself. There are three primary reasons.



Sound

Back in the '90s and early aughts, RADAR was the most "analog sounding" of the digital recorders at that time. Introduced into a studio world that was beginning to be populated by Digidesign 888 and 888/24 converters, the RADAR converters were a massive improvement and were dearly loved by many engineers. It was also a great sounding alternative to the tape-based platforms of that time. The sound of the converters alone was a major factor in the rapid adoption of RADAR as the format of choice by many engineers, especially in Nashville, which became RADAR Central. Even after the common adoption of Pro Tools, many engineers (including myself) continued to use the RADAR converters as the converters on the front end (ADC) for PT recording sessions.

Stability

During that same time period—when Pro Tools was still very buggy and unstable (I've been working in PT since V.4, back in 1998)—the option of digital recording with all its inherent benefits (cloning, copy and paste, file transfers) in a rock-solid stable platform like RADAR was incredibly appealing, thus RADAR was eagerly welcomed in the studio. Plus, up to that point, most digital recorders were tape-based—Sony and Studer DASH, Mitsubishi X-850, Alesis ADAT, Tascam DA-88/38; those systems were either extremely expensive or cheap and inconvenient (e.g., having to keep up with lots of different 8-track tapes and clones). These days, DAWs can be quite stable. I don't have reservations about recording a room full of 30-50 musicians to it, but that was not the case in the '90s.

Simplicity

RADAR has it in spades—twenty-four inputs and twenty-four outputs. What goes in on Input 1 comes out on Output 1. Hit the red button to record and the green button to play back. With RADAR, there's no mapping of outputs, no plug-ins, no beat manipulation, no tuning, and no playlists (other than recording to another track). It's a 24-track recorder, plain and simple.

To many, those days seem long gone. Having a recorder that just records? Really? But what was its greatest asset proved to be its greatest liability as well. As DAWs became more reliable, and converter technology improved (specifically the Digi 192 and HD interfaces), fewer people relied on the RADAR recorders/converters. In this current era of playlists, comping, tuning, timing, alternate versions and takes, having a system that just records what the musicians play seems like a throwback machine, harking back to the days of 2-inch. And in some ways, it is; if I'm looking for a no-fuss recorder with impeccable sound quality that preserves a performance, then RADAR is clearly among the top contenders for that job.

With the resurgence of analog recording and utilization of tape recorders (without undo and playlists), RADAR may be poised to step into the limelight again; it is certainly worthy. Does the recording market that is so accustomed to DAW features and power (not to mention needing those tools for fixing performances these days) really want an excellent (yet pricey) digital recorder that just records? That seems to be the ultimate question facing iZ. I guess time and dollars will tell.

Lynn Fuston is a Nashville-based recording engineer, mixer, and the Technical Editor of *PAR*. http://www.3daudioinc.com.

the other virtual takes are discarded (ultimately consolidating and saving disc space).

I connected a RADAR 6 SSD/USB drive to my Mac Pro via USB and it wasn't recognized on first try, instigating my one and only call for iZ tech support during this review period. iZ is known for great support and this was no exception; I was connected with RADAR's creator, Barry Henderson, who explained to me that RADAR 6's USB 3.0 drives are indeed backwards compatible with USB 2.0 systems using a standard cable (simply USB A to B, with no need to supply power to the drive's 9V DC input), so it should've worked. He was clearly correct, as upon second insertion (and numerous times since) the drive was promptly recognized; at that point, importing was then a simple drag and drop routine. Using time stamped BWAVs and swapping fast SSD drives makes for the quickest, easiest file transfers I've ever done; it's faster than any network I've ever used.

Summary

I spent a mere month with RADAR 6 and I could've used another month to dig deep and utilize all that it offers. In summary, I believe a recording system this complex must be broken down into categories to best explain its appeal, importance, and features.

Ease of use: RADAR 6 is indeed easy to initially use and logical enough for quick comprehension, but it is also complex enough to require study if one expects to achieve maximum, feature-deep results. Yes, recording with RADAR is easy. Yet by the time I learned to efficiently navigate, edit, flatten, consolidate, export, network and archive with RADAR 6, I realized it was, in fact, a complex journey, but a straightforward one.

Stability: It seems to me that RADAR 6 is a more reliable recording platform than any DAW or any digital recorder I've used, including the extremely stable aforementioned Alesis HD24, which I own and regularly use.

Sound quality: This is where things get complicated. To my ears, RADAR 6's Ultra Nyquist converters are among the elite best I've ever heard, but, based on memory, not markedly better than other premium converters I've used and tested (including products by Prism Sound, Lavry Engineering, Mytek and Benchmark Media). At 192 kHz, recorded material sounded the most accurate and lifelike, yet by an extremely narrow margin, compared to lower sample rates; the only discernible differences were flatter perceived frequency response and, in comparison to 96 kHz, 192 kHz sounded slightly clinical and perhaps slightly less euphonic. 96 kHz sounded the most "musical" to me, with a pleasant plumpness to the bottom end, although less airy and spacious up top. 44.1 sounded the best to my rock/pop clients, but what they liked didn't seem linear to me; it seemed more chunky, more full—simply more rock 'n roll?

Value: The completely-loaded-to-the-gills RADAR 6 I reviewed will cost over $22k: a hefty sum that represents the somewhat-redundant features not likely chosen by any one user found in our "loaded" review sample. Please visit the following link to price your own RADAR system; in doing so, I put together a suitable 24 channel Classic 96 system for about $12k: http://www.izcorp.com/purchase/price-a-radar

Do you court classical music clients, audiophile labels, and/or producers who demand "reference quality" audio? Do you record major concerts and well-budgeted artists all live, on location? Do

The Charlotte Symphony Orchestra at the Blumenthal Performing Arts Center.

you record popular music, but require a rock-solid front-end and an "analog tape" approach to your sessions? Then RADAR 6, coupled with a complete software-based DAW, is a no-brainer for your level of work.

If your clients lean more towards indie labels and guitars than audiophiles and pianos, then RADAR 6 is still a worthwhile option, if not a necessity. The fact is, 192 kHz files are so very big (bigger than I realized) and the inherent sonic differences are so very hard to maintain and translate to deliverable product, iZ's Classic 96 converters would likely work for me without disappointment.

If your clients do not appreciate the sonics of RADAR 6—and frankly, mine were mostly indifferent—or if you lack the budget to demand the best in fail-proof stability (or if your budget simply tops out at about $5-6k) then a JoeCo BlackBox or Alesis HD24XR, a computer, an interface and some DAW software will allow you to legitimately compete with RADAR-equipped competition for half the cost.

If you're considering upgrading your current RADAR system, there are certain advantages to going RADAR 6: fast SSD drives, improved networking and increased portability. However, compatibilities between RADAR components can get complicated; please follow the link below to compare RADAR V and 6, then size up the many differences: http://www.izcorp.com/products/radar/radar-6-vs-radar-v/

The bottom line is, if you have the inclination, the cash and/or the bookings, invest in RADAR 6, keep your DAW, get every accessory available and do it right. I know you won't regret it. If your budget is more like mine, then know that the best *is* out there, even if it is practically out of reach due to overall shrunken budgets of our industry. [iZ comments: "It is not uncommon for customers to put together a $7k eight-channel system, add channels later, and stay within a lower budget." —*Ed.*] RADAR 6's advantages are largely operational, but very real and quite significant—it's a format unto itself, after all—while its audible advantages may be attainable via iZ's ADA converters or they may be insignificant to your clients.

Epilogue

Surely, you'd like to listen and judge for yourself. And, with Audio Mobility's help, I have prepared three web clips using best practices; each feature the Charlotte Symphony Orchestra performing at the Blumenthal Performing Arts Center, in rehearsal, absent an audience. RADAR 6 tracks were imported into a MAGIX Sequoia 12 DAW, time-aligned and mixed ITB using only pans with no processing, SRC, EQ, HPF or reverb applied (although if this were a commercial recording we all agreed we would add reverb, HPF filter and lightly EQ, too). Lossless FLAC files were created and the only DAC was for monitoring (via a Grace m904 stereo monitor controller and Quested monitors) as well as Sennheiser's HE60 electrostatic headphone technology (with accompanying HEV70 headphone amp).

There are two 0:37 clips, one using RADAR24 and one using RADAR 6. In blind testing, I could tell them apart each and every time. I ever-so-slightly preferred the RADAR24 for what seemed like slightly more extended bass response (more bass in general, actually) and a warmer overall tone, although the RADAR 6 recording had a "mids-forward" sound that many engineers might prefer and made strings sound especially wonderful to me. Rydel also slightly preferred the RADAR24 recording, stating "the soundstage seemed bigger." The differences were so slight that I can't help but wonder aloud if the main channel outputs sound any different than the aux channel outputs on the ATI preamps, even though they are reportedly similar.

There is also a 0:30 webclip of RADAR 6 at 192 kHz. This recording is from a different musical section than the clips referenced above; I still find it useful for comparisons with RADAR 6 at 96 kHz.

Listen: https://soundcloud.com/pro-audio-review-magazine

> "RADAR 6's advantages are largely operational, but very real and quite significant."