

The Broadcast Flag: It's not just TV
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I'm not much of a television person. My only set, non-HD, still picks up its channels through rabbit ears. The broadcast flag still gets me steamed, though, so much so that I recently built a high-definition digital video recorder just to beat the flag mandate.

It's not about the television. Or rather, it's not about television as broadcast to the passive consumer, to be received on single-purpose boxes. It's about television as it could be, with innovative companies and tinkerers making television broadcasts a core part of the converged home media network. The crippling of this kind of television is an early warning against a pervasive technology regulation.

The broadcast flag represents a bad detour for the Federal Communications Commission, a heavily regulatory regime introduced in a period of supposed deregulation. Because the threats of this technology mandate echo through other regulations, it pays to dig into the details of "Redistribution Controls" and "Covered Demodulators"² to understand how quickly "digital broadcast content protection" becomes technology licensing.

Like standard definition analog programming, digital television is broadcast free, unencrypted, over the public airwaves. Equipped with the proper antenna and demodulator, any device can see this signal and convert it to a stream of bits (the ones and zeros of digital content), then translate those bits into the audio and video of television programming. The "broadcast flag" is a single bit's worth of information in that signal: "flagged" or "unflagged." "Flagged" conveys the "do not redistribute" demand.

The Commission proposed and then adopted this scheme at the urging of motion picture studios, who threatened to withhold content from digital television unless they were given copy protection.³ But a flag on a signal transmitted in the clear can serve at most as advisory notification, like the "please do not forward" footer some people include in email that they send unencrypted.⁴ Since mere notification could be bypassed, the Commission further determined to bake flag recognition into "robust" DTV hardware.

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² *In the Matter of Digital Broadcast Content Protection*, MB Docket No. 02-230, Report and Order and Further Notice of Proposed Rule, FCC No. 03-273 (rel. Nov. 4, 2003) (hereafter, "Broadcast Flag Order").

³ See Notice of Proposed Rulemaking, FCC No. 02-231 (Aug. 8, 2002).

⁴ I thank my colleague Seth David Schoen for the email analogy. Spelled out, it illustrates how easily tech mandates devolve into full-fledged technology regulation: To implement its "do not forward" regulation, the Funny Commands Commission would have to redesign all email software to ensure that every program written watched for and responded to "do not forward" flag. That includes programs running the gamut from Microsoft Outlook, to the Blackberry client, to open-source clients mutt and pine, to the few-line program written in a basic networking class.

The Broadcast Flag Order, issued in late 2003, mandates that every device capable of demodulating or receiving the DTV signal watch for the flag and impose its limitations. These devices must permit the signal to pass only through “approved” outputs (analog, re-modulated, low-resolution digital, or an “approved output content protection technology”) and only to “approved digital recording technology.” Broadcast Flag Order at 22, ¶ 42. All such devices must be robust against user modifications that might give access to the original digital signal. *Id.*, ¶ 46. After July 1, 2005, it is unlawful to manufacture or import a non-compliant demodulator for sale in interstate commerce. *Id.*, 47 CFR §73.9002.

Thus the Commission’s regulation is not ultimately about communications, but about the devices that receive them:

We conclude that in order for a flag-based content protection system to be effective, demodulators integrated within, or produced for use in, DTV reception devices (“Demodulator Products”) must recognize and give effect to the ATSC flag pursuant to the compliance and robustness rules This necessarily includes PC and IT products that are used for off-air DTV reception.

Broadcast Flag Order at 21, ¶ 40.

The Broadcast Flag Order aims at a copyright problem, studios’ fear of “indiscriminate redistribution” of their copyrighted content, but it isn’t typical copyright law. Instead of focusing on infringing uses of TV broadcasts (taping a show and selling copies, for example), this new kind of regulation puts the government in the business of redesigning products that *might* be used to infringe. In the process, it locks out many non-infringing uses, innovative technologies, competitive products, and open-source developers. Because these collateral harms are unavoidable, technology mandates should be a last resort, not a predictive strike against hypothetical danger.

The HD-PVR I built – a general-purpose PC, an HD tuner card, and the free and open-source GNU/Linux operating system and MythTV software⁵ – beats anything on the commercial market for flexibility and programmability. With it, I can record over-the-air HD broadcasts, watch them live, time-shifted, or at double speed; remotely program the PVR to capture a show a friend recommends; play recordings back on a frontend anywhere else on the network; or excerpt clips from recorded shows. I can do this from the same place I manage my music, home movie, and photo collections.

After the flag mandate takes effect, however, it will be impossible to build this machine with new parts. The HD tuner inside has open interfaces, giving access to the full digital signal for recording and replaying. It’s not “robust” against user modification, a requirement by definition incompatible with open source. It’s not that anything I do with the tuner card or HD-PVR infringes copyright, but the fact that the card offers

⁵ See the full setup at <<http://www.eff.org/broadcastflag/cookbook/>>. MythTV, initially programmed by Isaac Richards, now has more than 20 active developers and hundreds of users.

“uncontrolled” outputs and fails to watch for the broadcast flag that will make it and others like it unlawful to manufacture.

The Broadcast Flag rule means I can’t tinker with my TV. It means others can’t either, including the technologists who might want to bring us the next great advance like TiVo. They have to engineer to government approval, more than consumer demand or technological requirements. Before they could bring a new product near market, they’d have to hire a bevy of lawyers to seek Commission approval or to obtain a license for an existing approved technology, with complex licensing requirements and restrictions that often surpass those of the Commission’s mandate.⁶ By the time the technology escaped that process, if it emerged at all, it would likely have had the life sucked out of it in the name of “compliance.”

The DTV devices on the market this July will lack high-resolution, clear, digital outputs that can feed seamlessly into other devices. To ensure that the “do-not-redistribute” bit stays firmly affixed to its signal, devices will restrict users’ ability to export the content, and use encryption and dongles to ensure that they communicate only with their own, restrictive, kind. Watching DTV is, as Susan Crawford puts it, “like being bitten in the neck by a vampire”: Once one piece of the home media network has been bitten by DTV, all others must be infected by the same standard.⁷

Even among restricted devices, there will be incompatibilities: You can’t just pull a tape (or DVD) from one machine and put it in another. The TiVo HD-video recorder might not be able to communicate with Sony MagicGate hardware or a RealNetworks Helix-enabled device. For unless they’re designed together, devices might not know whether their downstream neighbors would respect the flag limitations or leak. And just when you have the home network running smoothly, any of the DTV devices can have its HD privileges “revoked” at any time.

Thus the Broadcast Flag’s technology mandate vitiates copyright’s fair use doctrine – the principle that some uses of copyrighted material are permissible without authorization of the copyright holders. If some fair uses are technically blocked by all devices lawfully made for sale, those uses are as good as gone.

Although the Supreme Court has said, “[t]he task [of fair use analysis] is not to be simplified with bright-line rules, for the statute, like the doctrine it recognizes, calls for case-by-case analysis,” (*Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 577 (1994)) technology cannot pull in a judge to analyze each case. Any technological implementation of fair use must therefore be a rough cut, and the cuts the broadcast flag gives us are particularly rough. Recording a show to watch on another device might be fair, to watch it later, or unfair, to duplicate and sell; excerpting clips from the evening news for redistribution might be fair, to create your own parodic “Daily Show,” or unfair, to make a competing cut-rate newscast, but the technologies approved under the

⁶ See, e.g., licensing requirements for HDCP, DTCP, or Windows Media DRM, MB Dockets No. 04-61, 04-64, and 04-66, described in Order approving 13 technologies, FCC 04-193, August 12, 2004.

⁷ Zeller, *Federal Effort to Head Off TV Piracy Is Challenged*, New York Times, Feb. 21, 2005, online at <<http://www.nytimes.com/2005/02/21/technology/21flag.html?ex=1109653200&en=f831bf942e767caf&ei=5070>>

Commission's initial certification, and the devices implementing them, presume unfair what they can't control.

The technical specifications of the broadcast flag mandate do not explicitly foreclose fair use copying. Indeed, the Commission repeatedly states that "our goal of preventing the indiscriminate redistribution of digital broadcast television content 'will not (1) interfere with or preclude consumers from copying broadcast programming and using or redistributing it within the home or similar personal environment as consistent with copyright law.'"⁸ But much fair use copying or interoperability falls into the gap between the rule and its implementation.

Twenty years ago, while Universal Studios was suing Sony Electronics for producing the Betamax video tape recorder, Universal suggested that Sony should have engineered its devices to respond to a broadcast flag marking programs unauthorized for recording. The Supreme Court majority, ruling in Sony's favor, rejected that suggestion and held that "time-shifting" broadcast television was fair use, even without the authorization of the copyright holder. *Sony Corp. v. Universal City Studios*, 464 U.S. 417 (1984) The Court had never addressed this kind of fair use before; anyone trying to encode *existing* "legitimate uses" of broadcast television might well have coded it out of the picture. Yet the fair and previously unanticipated use prevailed. The *Sony* Court refused content owners' request to hold the public's rights and abilities static in the face of new technologies. Fast-forward twenty years, however, and that is precisely what the Commission has done in this rulemaking. The Broadcast Flag Order precludes the next fair use that has not yet been invented.

Under the Broadcast Flag regime, market participants, bound up in the welter of licensing and pre-approval requirements can't offer the products users want. Where the market fails to provide fair-use-enabling technologies, the robustness rules prevent end-users from correcting the problem. Absent technology mandates, users dissatisfied with commercial options can and do write their own software alternatives (and often share them in open-source). In a world of restricted, robust hardware, users are limited to the options the commercial market provides: the fully-capable hardware HD tuner card can't be manufactured. Consumer-driven innovation is cut off when users can't tinker with existing technologies or develop new ones that challenge market leaders.

Finally, the broadcast flag, like other roadblocks designed to "keep honest people honest" is both over- and under-inclusive. It stops the "honest people" from legitimate non-infringing activities, while it doesn't stop the dedicated pirates, who will still have legacy devices, the analog hole, and the ability to hire experts to build their own demodulators.⁹ Honest people don't need technologically enforced barriers, while dishonest people aren't deterred by them.

⁸ Order approving 13 technologies, FCC 04-193, August 12, 2004 (quoting Broadcast Flag Order, 18 FCC Rcd. at 23555).

⁹ For the idea that it takes only one leak to seed unauthorized distribution of high-value content, *see* Biddle, England, Peinado, and Willman, "The Darknet and the Future of Content Distribution," presented at the 2002 ACM Workshop on Digital Rights Management, November 18, 2002 (available at <<http://crypto.stanford.edu/DRM2002/darknet5.doc>>).

Limits on open source development, on interoperability, on technological innovation, and on fair use, are not merely incidental to this implementation of a Broadcast Flag technology mandate. The burdens, and the Broadcast Flag's over- and under-inclusiveness in addressing the concerns that motivated it, are inherent in a technology mandate. At the intersection of multiple regulatory modes – law, code, and markets¹⁰ – public rights are hard-coded out.

Copyright holders have long desired the kind of control technology mandates offer. If they get to oppose new technologies before they come to market, before they disrupt existing distribution models, the studios can keep doing business as they have and blame any downturns on “piracy.” After motion picture studios' apparent success with the digital television Broadcast Flag, members of the recording industry have gone to the Commission asking for their own broadcast flag for digital radio.¹¹

Nor is the regulatory urge of tech mandates limited to copyright holders. In August 2004, the Commission opened a Noticed of Proposed Rulemaking in response to a joint petition of the Department of Justice, the Federal Bureau of Investigation, and the Drug Enforcement Administration requesting expansion of the Communications Assistance for Law Enforcement Act (CALEA) to cover communications that travel over the Internet. If the Commission were to accede to their demands as well, broadband providers would be required to rebuild their networks to make it easier for law enforcement to tap Internet “phone calls” that use Voice over Internet Protocol, or online “conversations” using various instant messaging programs such as AOL Instant Messenger or Jabber. Once again, open source implementations of these protocols might be precluded because they couldn't keep the tappability mandate built-in.

The Commission should recognize the extreme regulation all of these tech mandates require and reject intrusive regulation here as it has elsewhere.

¹⁰ See Lawrence Lessig, *Code and other Laws of Cyberspace* (Basic Books, 1999).

¹¹ See FCC MM Docket No. 99-325.