

# Harry Potter and the Prisoners of the DTV Transition

An Adventure in Digital Television Policy  
(With apologies to J.K. Rowling)

By "Philo T. Farnsworth Jr."\*

\*"Farnsworth" is a public-policy lawyer based in Washington, DC.

(Revised Nov. 6, 2002.)

In the children's novel HARRY POTTER AND THE PRISONER OF AZKABAN, the young student wizard Harry Potter is called upon to cope with the horde of frightening creatures called Dementors who are chasing him. To make a long, well-plotted story overly short, a future version of Harry suddenly appears and waves his magic wand, reciting the spell "Expecto Petronum!" Thus Harry from the Future manages to scare away the Dementors, protecting the Harry of the present.

The transition from analog broadcast television to digital broadcast television (DTV), now an enshrined part of American broadcasting policy faces its own set of Dementors -- a frightening horde of technical, legal, economic, and social problems. Taken together, the problems look as unbeatable as any multitude of scary monsters, but making things worse is the fact that many stakeholder factions are at war with each other over issues such as technology mandates, copyright protection, fair use, and so on.

But what if we could somehow look back from the future to today's troubled present debate, wave our own wands, and come up with the spell that magically defeats the problems that bedevil the DTV transition. Such magic, of course, is beyond the abilities of mere Muggles like us, but it is possible to look back from the future we have long been imagining -- one in which various consumer-electronics and information technologies have converged, and in which the broadband Internet reaches every home -- and come up with our own version of a magical solution.

We must begin, however, with a general survey of the problems each set of stakeholders believes lie at the center of the transition to DTV. While some might dispute some point or other about each of these problems, this essay treats all asserted problems of the warring stakeholders as essentially valid, but it also suggests that there may be a win-win solution for all the major players, including consumers.

## **I. Problems for Content Industries**

The motion picture studios, the national networks, and other companies that produce content are particularly concerned over the fact that DTV will mean that high-quality content will be broadcast and recordable by viewers, and perhaps recirculated on the Internet or through other media. Their argument is that digital content broadcast in the clear may be easily grabbed in high-quality form, and, as unprotected content, may be easily echoed to the Internet. This phenomenon, which some Content producers have characterized as a "Napsterization" of broadcast content, could lead to the undermining of the revenue value of high-quality content, which otherwise may be resold to local broadcasters through syndication or repackaged as VHS tapes or DVDs for sale or rental. Here the theory is straightforward: if viewers can snap up high-quality episodes of, say, "Law & Order" from the Internet, such viewers would no longer be part of the audience for rerun or syndicated episodes (thus undermining the value of advertising during reruns or syndicated broadcasts). Furthermore, such redistribution may undercut sales even of DVDs, the current high-quality digital-content delivery system of choice for the American consumer.)

One fix for Content -- part of a solution that is currently widely advocated among Content companies -- might be to "mark" all commercial content that needs to be controlled (e.g., with the broadcast flag, or with a "watermark" technology). This "marking" approach must be coupled with a legal or regulatory mandate that some range of consumer equipment be designed henceforward to look for the mark in marked content.

But other technologists have argued that a "marking" approach creates an immense problem -- it requires a new regulatory infrastructure to require an unprecedentedly broad range of technologies to look for the mark in the marked content. It needs a government-administered standardization on the marking technologies, whether flag or watermark. Also, it essentially requires

rearchitecting of broad sectors of the IT, Consumer-Electronics, and communications fields. (Some industrial sectors -- especially those that produce niche digital-manipulation devices, as well as new kinds of personal-video-recorder systems like TiVo, might be wiped out by the cost of the redesign, and by the limits on development of new products. At minimum, the marking approach requires the re-engineering of broad sections of product lines.)

Without government regulation and oversight, of course, the marking solution can't work. Manufacturers (possibly offshore) would specialize in producing unencumbered digital devices that are not compliant with the marking rules. Customs officials might be in the position of having to determine whether imported components are compliant or not, for example.

Worse, regulation may require new controls over analog-to-digital and digital-to-analog technologies -- technologies that are currently ubiquitous and cheap. This may make them more expensive, among other things. Worse, this may add hidden, unanticipated costs to devices not traditionally considered to be within FCC jurisdiction (e.g., astronomical observation tools and certain types of medical monitors).

Nevertheless, this solution has appeal with many sectors of the Content industry. But this proposed solution to Content's problems puts Content at odds with some sectors of the IT industry, with the CE industry, and with consumers. This has led to the equivalent of trench warfare in the legislature, in the courts, and in public opinion. So far, there have been no clear victories for any faction of stakeholders.

But Content believes it *\*desperately needs a solution\** to the problem of how easily its premium content is translated and distributed to the Internet. Content companies currently rely on being able to repackage and resell prime content in a number of ways in order to recover investment and production costs. These include syndication and VHS and DVD repackaging for retail sale. These revenue streams currently are a major subsidy of new content production in the movie and TV worlds. Content feels its back is against the wall, and must use every strategy to regain control of its content in a digital world. Content companies believe the current slump in sales of music reflects what would face movie and television production systems if controls are not put in place as soon as possible.

## II. Problems for Computer, Software, and Internet Companies.

Information technology companies are also facing flattening sales in many sectors, and so are acutely focused on the possibility that consumers will reject new products that are more limited than older ones in how they deal with commercial content. In the computer and software industries in particular, company leaders take as a given that consumers in these markets expect more functionality and better functionality from both sectors on a relatively short cycle. It is unclear how consumers will feel about new devices that, while faster, have less functionality than the old ones do. Some feared responses: "Every cycle my computer spends on checking whether I'm making an unauthorized copy is a cycle it isn't using on my work!" "Why can't I move digital video that I myself made back and forth between my computer and my DV camera?" "This computer takes longer to load media files than my old one did." And so on.

Plus, the regulatory scheme favored by Content has to make many classes of hardware and software "untamperable" -- that is, difficult to modify, or "closed." The problem here is that "open platforms," such as the PC and the Internet, have by their very openness encouraged innovation. Such innovation includes the Internet as we now know it, the World Wide Web, Linux and other open-source software, and graphical browsers. Not least important -- the rapid development in this sector has also led to technologies that make content-generation, such as filmmaking and music-recording, much cheaper and more accessible than it used to be. The Linux problem is particularly acute -- while Linux is widely regarded as one of the few remaining serious competitors to Microsoft in the operating-system market, a regulatory requirement that, say, Linux software media players both check for "marked" content and be "untamperable" would, in effect, outlaw Linux versions of such products. (Linux programs are accompanied by their "source code" when distributed, or else simply *are* distributed as source code, which means that they are inherently open and tamperable.)

But suppose the regulatory scheme, recognizing the competitive value of Linux and other open-source software, carved out an exception from the tamperability requirement. Not only would the exception add up to a big hole in the proposed content-protecting regulatory scheme, but it would actually

put proprietary software companies at a disadvantage in competing with Linux in the media-player market (since Linux-based players could be modified by any programmer to add functionality and/or remove content protections).

In effect, the “untamperability” requirement creates a dilemma -- either permanently disadvantage open-source software (and perhaps lock in Microsoft’s market dominance) or else permanently disadvantage proprietary software (and thus, in effect, promote Linux as a matter of a industrial policy).

For Internet companies, any regulatory obligation to monitor for copyrighted content signifies substantial redesigning of the Internet as it has existed and grown since its beginnings more than three decades ago. This is because the problem for Content of “Napsterization” (see Section I above) of largescale unlicensed copying is not merely that peer-to-peer applications are widespread, or that the number of peer-to-peer file traders is growing -- it is that peer-to-peer file-trading is, in a deep sense, a part of the Internet’s fundamental design. (Specifically, the Internet was designed to allow the sharing of data and other resources among computers on a distributed, decentralized network. Digital music files (to take an obvious example) may be considered just another kind of data.)

Further complicating the Internet’s fundamentally peer-to-peer character is a deeper problem: what each computer does, at a fundamental level, is make copies. They copy information from one part of memory to another, from memory to hard drive and back again, from memory to video and so on. Rearchitecting basic computer technologies to limit copying generally, or to police copying, risks affecting the fundamental functionality of computers, which in turn could affect their fundamental usefulness both to individuals and to industry.

### **III. Problems for Congress**

For a number of policy reasons (perceived benefits to the public, more efficient use of the broadcasting spectrum, etc., higher-quality broadcasts, and so on) Congress has mandated a transition from analog television to DTV.

Complicating this: The federal government has put a hard deadline on the transition (2006), assuming at the time the deadline was set that the general public would see the value of DTV (particularly high-definition television,

HDTV, but also other DTV features) and buy new TV sets, with digital tuners, to take advantage of these features. To oversimplify the matter for a moment, we may say that Congress essentially "loaned" broadcasters extra spectrum to develop DTV (and the DTV audience), but the "loan" has not produced the expected consumer buy-in.

Making things still more problematic, Congress has based its tax and budgeting decisions for the next few years on the assumption that the "analog spectrum" would be returned, then could be allocated for public-service purposes as well as auctioned off for revenue purposes, perhaps generating tens of billions of dollars of income for the government.

As we approach the deadline, however, the increasingly evident lack of significant consumer purchases of (relatively expensive) DTV broadcast receivers means Congress faces the prospect of telling voters that their analog TVs -- including the new, big ones they buy just this year or next year, or in 2004 -- are going to be either wholly obsolete, or will require the purchase of some kind of converter box to continue to work. There is no serious doubt that voters will be unhappy about having to buy new, more expensive TVs or somewhat less expensive adapter boxes, just because Congress has said they must. (An unfortunate side effect of the adapter interim solution is that, by adapting legacy devices to receive digital broadcasts, the government may in effect be equipping legacy home-entertainment equipment to facilitate the very kind of "analog hole" infringement that deeply troubles Content companies. Converter boxes will turn certain kinds of high-quality digital content into reasonably high-quality analog content, and such content may ultimately be redigitized and distributed for free on the Internet and elsewhere. Thus, part of Congress's solution to the transition problem may in fact worsen concerns for Content stakeholders.)

But the alternatives to the analog-spectrum give-back deadline have their own problems -- pushing back the transition date throws off budget and tax calculations, and would force a revenue shortfall, which in turn would force Congress to make other hard decisions that also may irritate or disappoint voters.

(Not incidentally, Congress has also attempted to promote adoption of broadband Internet services. As with digital television, consumer buy-in has not been as fast as expected -- Rep. Tauzin (R-La.), among others, has blamed lack

of "compelling content" as a cause of too-slow broadband subscriber growth. For e-mail and basic Web services, 56KB modems continue to be enough for most current consumers. The issue of promoting broadband adoption turns out to be linked to the issue of promoting DTV adoption, as we shall see below.)

## **IV. Consumer Electronics Industry Problems**

Quite rationally, the CE sector likes selling high-margin, high-quality, high-resolution TV display devices, but knows that just about all of its customer base for current sales gets its content from cable, satellite, or DVD, and scarcely ever from digital broadcasting.

Tuner mandates (such as the recent dual-tuner mandate from the FCC) mean added expense on a per-unit basis at a time when CE was hoping that economies of scale would reduce per-unit cost and get more buyers into electronics stores for crisper or even "cinema-quality" TV displays. It bears mentioning in passing that CE companies now have an incentive to move entirely into the computer-monitor business and abandon selling "TV sets" (monitors plus tuners) altogether. This would allow them to escape the tuner mandate -- they might in good faith sell modular dual tuner boxes on the cheap, but perhaps only a small fraction of Americans would buy them -- and continue to sell high-quality visual displays that would function equally well on computers or as part of home entertainment systems attached, for example, to cable set-top boxes.

Complicating the question of requiring digital TV tuners, there's a looming problem that has not even begun to be addressed: In-the-field tests of digital tuner-equipped TVs suggest that the broadcast digital TV standard is unreliable, possibly due to lack of robustness of the 8VSB standard (multipath interference tends to kill reception altogether, whereas in analog receivers it might merely cause tolerable static, "snow," or "ghosts"). The New York Times reported on September 12, 2002, the following: "In reception tests from the 64th floor of a New York skyscraper using a rabbit-ears antenna, Mr. Schubin and his colleagues were able to pick up only three of the nine digital stations in the New York area that were then broadcasting." Experiments in other cities are reported to have shown similar functionality problems. Given this unreliability of digital broadcast reception based on the 8VSB standard, Manhattan Institute scholar Thomas Hazlett has suggested, not entirely unseriously, that it would be cheaper simply to require viewers to \*pretend\*

they can receive digital television broadcasts. See his article on Slate at <http://slate.msn.com/?id=2071935>.

In short -- the FCC is currently ordering the added expense for dual tuners, but the digital tuners may not work. Or they may not work as well as analog TV receivers. This is not the kind of the industrial-policy decision that inspires consumer confidence and willingness to buy new TV displays -- a drop in consumer confidence that could seriously damage sales of CE products. Worse, some voters may decide to blame government policy decisions for their disappointment in this area as well.

## **V. Problems for Consumers**

It is a going to be difficult to persuade ordinary television consumers of the necessity of having to abandon or else pay to adapt perfectly functional analog television receivers.

It has already been empirically demonstrated that consumers do not yet value the proposed benefits of DTV enough to invest seriously in new equipment for it, except to the extent that a narrow subset of consumers prefers digital TV displays for purposes of DVD playback or digital cable or satellite content.

Those consumers who do not subscribe to cable or satellite, but who instead rely primarily on broadcast signal, may find that new digital TV gets broadcast content less reliably than old analog set did (see, e.g, the discussion of the multipath interference problem in Section IV above). This government-compelled "downgrade" in reception reliability is likely to make a significant number of broadcast-reliant voters unhappy.

## **VI. Problems for Broadcasters**

Broadcasters aren't just facing the problem that 8VSB broadcasts are currently less reliably received than analog broadcasts are. They're also facing a worse problem: Soon the bill for "loaned" spectrum will come due (more precisely, the due date for return of the "analog spectrum" will arrive). The date will come when the mandated transition is set to happen. But based on the available evidence, most TV watchers haven't bought into the value of DTV yet. If the transition occurs on the date when it has been mandated, there will be an abrupt decline in the advertising audience base for broadcasters (especially



compared to the audience base for cable and satellite, which won't be affected by broadcasters' decline in audience and probably will opportunistically grab disaffected broadcast audience). \*Not impossibly, the outcome of the mandated transition will be to hasten the elimination of free broadcast television.\*

Furthermore, the generally high costs of having to refit their broadcasting plants to enable DTV broadcasting are, for many broadcasters, an "unfunded mandate" -- expenses they are required by law to make as licensees (and may already have begun to make), but that do not (or at least not yet) translate into additional revenue.

Historically, one argument for promoting the transition to DTV has been to enable broadcasters to compete against the more reliable signal quality of cable- and satellite-delivered TV content. It would be ironic if a policy designed to achieve the goal of preserving the tradition of free broadcast TV content (subsidized, of course, by advertising) were in fact to hasten the end of that tradition.

## **V. What is the Harry Potter Fix?**

This paper does not purport to address the purely political problems that must be overcome to address the range of technical and economic problems associated with a compelled transition to digital television. Instead, its purpose is to suggest an "outside the box" set of solutions -- the "magical" solution set in which, regardless of the politics and regulatory complexity of all the issues surrounding DTV, content protection and the like, Harry Potter (under our guidance) waves his wand, says the magic words, and all major requirements of every major stakeholder group are met.

We begin with three basic steps.

Step One: Congress sticks with the 2006 deadline for return of extra spectrum, but allows broadcasters to choose which spectrum they return -- i.e., they can keep their old analog spectrum or their new "digital" spectrum, but must give back at least one or the other -- subject to a possible exception explained below. (This step assumes for the sake of simplicity that spectrum is fungible -- the actual implementation of the giveback will be somewhat more complicated

due to technical allocation issues, but compared to the current state of affairs, allocating the giveback is relatively straightforward.)

Step Two: Allow broadcasters to continue analog TV broadcasting if they wish. (Some may choose to continue to experiment with digital, but advertising-based broadcasters will want the largest possible audience, and the biggest audience share of those receiving broadcast signals are doing so with "legacy" analog receivers, which continue to be sold in much higher volume than DTV receivers, even at this last date) Broadcasters who may want to keep the analog broadcasting spectrum but continue to build out to, or experiment with, digital broadcasting may choose to buy or license additional spectrum for that purpose, more of which should be available once the "loaned" spectrum has been reclaimed by the government. All broadcasters who continue to broadcast digital signals must be allowed to choose between the 8VSB standard and any other standard that might work more effectively (e.g., the COFDAM standard now prevalent in Europe).

Step Three: As a condition of continuing to hold their licenses, the FCC must require all broadcasters to "netcast" both their locally generated and primetime schedules over the Internet. Of course, Internet distribution of licensed creative content from TV and movie production companies will necessarily be worrisome for copyright holders -- such worries are their very basis of their current marking-plus-regulation proposals like the broadcast flag -- so the FCC must also allow broadcasters to insist that delivery of licensed content be done through one or more of the current or future secure digital multimedia content delivery systems -- e.g., RealPlayer, QuickTime Streaming Video, Windows Media Player, or various Palladium-based schemes soon to be deployed. All of these systems, plus a number of others, offer reasonably secure delivery that prevent all but the most determined viewers from making unauthorized copies of content. (They are not entirely "hack-proof," but in this, they have very much the same described degree of functionality of proposed broadcast-flag and other marking schemes -- in purely practical terms, they may already be said to offer more protection than marking schemes do, not least because they are less costly to implement.) Of course, broadcasters may also choose to deliver some content -- perhaps advertising-subsidized local original programming -- in the clear.

## **VI. What Are the Advantages of Harry's Magic Spell?**

(1) First and foremost, consider the advantage to Content companies in the secure-delivery-system requirement: There is already actual market competition in this delivery-system sector and multiple major players, including Real Networks, Microsoft, and Apple. The existence of genuine market competition in the secure-Internet-delivery space is necessarily going to be more protective of copyright interests than any government-mandated standard could be. This is because market-driven DRM solutions can evolve more rapidly and respond more quickly to new copyright-security problems, etc. Not impossibly, the FCC might allow Content licensors to insist on particular delivery-system choices through licensing agreements, unless this creates antitrust problems.

2) Yet another advantage -- secure Internet delivery of high-quality content gives more Americans exposure to the quality of HDTV and other high-quality DTV offerings. Recent statistics suggest that PC penetration into American households approximates that of cable -- about 70 percent. Current PC monitors are excellent DTV (and even HDTV) display devices, at least for DVD currently, and DTV-Internet offerings may spur demand for even better, "cinema-quality" devices.

Note: This recommendation takes into account that even the "fastest" Internet connections would require many hours of download time to deliver digital television, even if we assume the DTV is simply 480p content (DVD quality). True HDTV -- 720p, for example, or 1080i -- would require still more time to download, which is almost certainly the explanation for the absence of any significant degree of HDTV infringement on the Internet currently, even at high-bandwidth-capable sites like research institutions and universities, and even though consumer devices capable of capturing HDTV to computer files already exist. (See, e.g., <http://www.projectorexpert.com/Pages/tvcards.html>, <http://www.hauppauge.com>, and <http://www.accessTV.com>).

My answer here is that we remind ourselves that actual "live" delivery of television is increasingly less important to Americans -- hence the widespread adoption of VCR and PVR time-shifting. Current Internet bandwidth probably does not support "live" HDTV except on rare occasions, with long download times that require buffering and other interim fixes. But we may reasonably assume that properly jumpstarted demand for broadband-delivered DTV will fund the kind of infrastructural build-out required to enable quick or even "real-time" HDTV content delivery. This of course also assumes there is a substantial market for "live" HDTV -- the existing VCR time-shifting markets

and PVR markets suggest that the “liveness” of a broadcast is less important to American viewers now than it has ever been. Non-simultaneous delivery of premium content probably can be facilitated by “buffering” through intermediate Internet servers, and may even constitute a new application for pure “peer-to-peer” distribution. It would be a great irony if the Internet’s “peer-to-peer” functionality, previously seen by many policymakers as an unmitigated problem, could be harnessed to enhance the delivery of commercial content in ways that financially benefit Content producers and distributors even as they increase consumer choice.

(3) Still another advantage -- the Consumer Electronics sector still gets to sell high-quality computer monitors (essentially TVs without tuners), and may sell many more as audiences discover alternative way to access TV content. (This trend accelerates if the CE sector is released from its tuner mandate as part of an overall strategy to use the Internet to promote DTV.)

(4) A major consumer advantage -- Under this scheme, broadcasters can experiment with offering “must-see” TV at times convenient to audiences, or more than once -- with advertising that also may be seen more than once, or advertising that can be changed from day to day with the same program offering! As far as the TV viewer is concerned, there is an immediate improvement in convenience: Instead of waiting until Thursday night to see “Friends,” you click on the “Friends” Weblink anytime you want to during the week the current episode is showing. (This is just one possibility -- there may be a lot of experimentation in varying this kind of offering. Another experiment may be to give viewers a choice between advertising subsidized “free” primetime content and subscription-based ad-free versions of the same programming -- in other words, a viewer could choose to treat a network more like NBC or more like HBO.) Perhaps you even choose on Monday night to receive “Friends” on Wednesday night -- since “live” broadcasting is less relevant to many TV viewers, your advance choice allows the program to be buffered either in your system or in nearby servers, ready for the final click to display it.

Such choice might matter more to TV viewers even than the high-quality images of HDTV. (We note in passing, that for 90 percent of Americans, 480p, the DVD standard, is the very definition of digital video content -- in the near term, digital broadcasts may be primarily in DVD-like formats, with increasing excursions into HDTV content as the consumer buy-in and broadband capacity both increase. A show like “Friends,” which is character-driven and joke-driven

may need HDTV visual quality rather less than, say, a network-based netcast of “Lawrence of Arabia” or “Attack of the Clones.”)

## VII. How Do Consumers Benefit?

The first and most obvious advantage is this: There would be no need to junk old TVs, which can still get old-style analog signal from broadcast, cable, or other means (mediated, perhaps, by “legacy” VCRs and TiVo-like programmable devices).

As far as consumers’ copying expectations are concerned, consumers could still do fair-use time-shifting (and other legal but unlicensed uses of commercial content) with their VCRs, TVs, and other “legacy” devices, so long as there is continued analog distribution. Thanks to market competition among secure delivery systems, we may also expect similar features to be offered in the digital arena as well as part of secure Internet delivery systems over time, especially now that we’ve refueled the market for competition in that delivery-system sector.

\*But apart from protecting consumers from having to reinvest seriously in their home-entertainment systems before they are ready to do so, this proposal also promotes consumer adoption of DTV!\* As far as consumer experience of and acceptance of DTV go, under this scheme consumers will increasingly have the opportunity to compare on a daily basis the differences between analog and DTV content, and make household IT, CE, and Content investment choices based on actual experience of the difference.

In the short term, consumers’ investment in new equipment is primarily in (a) computers, which families are increasingly buying anyway, and (b) broadband connectivity, which Congress has been trying to spur demand for, in order to fund infrastructural buildout, among other things. (Consumers with slower computers will likely find new inspiration for buying faster ones, assuming their interest in full-motion video content delivery through their PCs. Consumers with slower connections will likely find new inspiration for buying greater bandwidth. These factors may have the incidental salutary effect of reinvigorating the personal-computer market and Internet infrastructure growth as well as promoting DTV.)

## VIII. What about the IT Sector?

Once Harry's wand is waved, the IT sector works without being encumbered by government-set tech mandates, and actually gets to compete for developing secure content-delivery systems. Computers and software remain largely open for industries and individuals to explore and innovate. Increased demand-driven investment in broadband infrastructure capacity creates an even broader "open platform" for new kinds of high-bandwidth products and services.

And if consumers don't like particular DRM solutions, they can "vote with their feet" -- either moving to alternative delivery systems or sticking with analog content delivery. (Consumer feedback about copy-protection schemes revolutionized the software industry in the 1980s, for example -- the result was that most commercial software companies either abandoned copy protection or developed schemes that were less onerous for ordinary users.)

## **IX. And What Will the Broadcasters Get?**

Broadcasters who want to continue both to offer analog signal to their audiences and to experiment in digital TV broadcasting, and who also have already invested in building out their digital-broadcast infrastructure, might be allowed to keep, say, half of "loaned" spectrum. Broadcasters can either continue to experiment with digital broadcasting offerings or sell off spectrum grant to recover investment costs.

## **X. What's the Biggest Win For Congress?**

In a nutshell: Congress cuts the Gordian knot of the DTV transition problem.

It achieves the goal of promoting the transition to DTV transition, but does so without imposing any new compelled expenses for TV consumers and without imperiling free broadcasting (indeed, it offers an expanded set of models for how free broadcasting can work.)

This policy not only promotes digital delivery of premium content, but also couples that to a policy that promotes content protection through market competition. (Content companies will also benefit from the competition in the DRM space, of course.) Finally, it promotes both DTV buy-in and broadband buy-in within the same consistent policy structure.

The stalled development of DTV content delivery, including HDTV experimentation, will be jumpstarted by the Internet broadcasting ("netcasting") mandate imposed on broadcasting licensees.

Congress will get its "loaned" spectrum back, and will be able to auction most of it off, consistent with budgetary plans, while reallocating portions of the spectrum for particular public-benefit purposes.

**In short: Every major stakeholder bloc will benefit, and consumers will be minimally inconvenienced, if at all, by the transition. All the prisoners of the DTV transition will be set free and are likely to see immediate benefits, due to Harry's plan's reliance on existing delivery systems, content protections, infrastructure, and other technologies.**

**Will Harry's wand-waving implementation of our work? Maybe, if we set our imaginations free enough to find alternatives to the current zero-sum deadlocks. Let's hope we don't have to wait until 2006 for the sequel.**