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ABSTRACT

The introduction and acceptance of color television and the National Television System Committee (NTSC) color standard are reviewed for the lessons they hold for the future of high definition television (HDTV). Between 1946 and 1974, 28 years of salesmanship were required to move color television from the experimental phase to its assimilation into broadcast production and consumer expectations. The NTSC color broadcasting standard has been in use for over three decades, but has enjoyed casual acceptance for a much shorter period. It is finally securely entrenched, but is, in fact, technologically obsolete. HDTV faces obstacles as great as those faced by color television in the past. The major problem is that low-definition NTSC already occupies the space needed for existence in the broadcast frequencies and studios and in American homes. Unlike color television, HDTV is not obstructed as a video standard in other applications, and HDTV has a toehold in the United States as a specialized video production format. Issues of compatibility with existing equipment and formats are a major factor in the introduction of HDTV as they were for color television. It is probable that consumers will accept different formats for different purposes, and that HDTV will be accepted along with existing television. (Contains 49 references.) (SLD)

Selling Color: The Development and Marketing of the NTSC Color Television Broadcasting Technology and the Implications for HDTV

Gregory Gutenko

There can be many obstacles to the introduction of a new communications technology: Preexisting technological systems may be incompatible, and not allow for its integration; the consumer market may not appreciate its potential value; or manufacturers and program material producers may lack confidence in its viability and withhold production support in favor of established activities.

In 1985, television stereo sound was a new technological development being marketed to the broadcast public. It was compatible with existing monaural television receivers, the audiophiles in the audience were reminded when programming was in stereo by visual graphics (NBC) and announcements (cable services), and manufacturers placed receivers on the market which featured stereo sound at a minimal additional cost. A lack of consumer interest was perhaps the the only impediment to the establishment of television stereo technology.

Color television, on the other hand, had everything going against it. Between September 1946, when the Columbia Broadcasting System petitioned the Federal Communications Commission to allow commercial color broadcasting,[1] and the fall of 1974, when the NBC television network decided to retire its color-promotional peacock, twenty-eight years of salesmanship had been required to move color from the experimental phase to its complete assimilation into broadcast production and consumer expectations. Over a quarter century of conflict over color standards, reticence by manufacturers and retailers, and public apprehension obstructed color television's aspirations to be commonplace.

CBS v.s. NBC: Round One

When the Columbia Broadcasting System petitioned the Federal Communications Commission in September 1946 for an approval of commercial color telecasts over UHF frequencies, only a limited amount of commercial telecasting in black-and-white was being done, using the television standard developed by the Radio Corporation of America. Although the CBS color process was incompatible with the existing RCA monochrome process, the latter was established through only six transmitting stations and a few thousand TV receivers, and CBS felt that their process could easily displace the RCA system and render it obsolete without creating a public disruption. Receiver manufacturers, however, were almost unanimously opposed to such a change; they were geared up for black-and-white receiver production, and wanted to make and sell products now rather than wait for the CBS color system to be established. CBS believed that the public would be willing to wait a year or two for color, and also recognized that continued expansion in the numbers of black-and-white sets was an increasingly significant issue. An immediate move into the public realm could overshadow RCA monochrome and leave the CBS color process as the sole television broadcasting standard.[2]

CBS lost this critical initiative when the FCC denied their commercial application on the grounds that the process had been inadequately field tested.[3] This could be considered the most historically decisive FCC ruling on the color standards issue, although at the time it seemed only a decision deferred. As a result, the RCA monochrome standard prospered, and RCA/NBC board chairman David Sarnoff's own intentions for a color transmission standard were upheld.

The differences between the CBS and RCA color systems were great. The CBS process derived its chromatic properties from the red, green, and blue color filters that were moved sequentially over the television receiver's picture tube in a rotating disk. A similar disk rotated before the lens of the camera originating the signal. The television signal would consist of individual monochromatic image frames exposed either through the red filter, green filter, or blue filter in cycles rapid enough to visually mix these filtered frames together when they were sequentially colorized by the receiver's synchronized rotating filter disk. In order to blend the three-color frame sequences into a flicker-free multihued composite, three times the number of frames were required, as compared to the 30 frames per second rate used in the RCA monochrome television system. The CBS system was the simplest solution technically, but it was incompatible with monochrome. Its

signal could not be decoded by RCA receivers to yield a black-and-white image. It was also partly mechanical (the filter disk), and this was a weakness that RCA would attack before the FCC and the public. The color process championed by Sarnoff was not only compatible with their black-and-white process, it was also totally electronic. At an RCA color television demonstration on October 30, 1946, David Sarnoff emphasized this virtue of their process:

> The realization of all-electronic color is as significant an advance in television as electronic recording was over mechanical recording of phonograph records or as the present color movies are over the early mechanical color on the screen.[4]

The disadvantage of the RCA color standard was that it was electronically complex, and in demonstrations before the FCC and public, was always inferior in image quality to CBS's sequential process. This very tangible aesthetic shortcoming led to the FCC's selection of the CBS mechanical/electronic process over RCA's totally electronic process as the approved color broadcasting standard in 1950.

CBS v.s. NBC: Round Two

In September of 1949, Senator Edwin C. Johnson of the Senate Interstate & Foreign Commerce Committee urged FCC Commissioner Robert F. Jones to investigate what he felt was a deliberate suppression of color broadcasting development by CBS, NBC, and other industry affiliates.[5] CBS President Frank Stanton confirmed to the FCC that set manufacturers were not producing either color receivers or converters that would allow CBS color telecasts to be decoded and viewed on existing RCA monochromatic sets, and that CBS was considering building its own receivers to support its sequential color system.[6] RCA took this occasion to announce that their "completely compatible electronic color system" was ready for mass production, if approved by the FCC.[7] A third system, devised by George E. Sleeper Jr. of Color Television, Inc. in California, was presented as a monochrome-compatible process.[8] Both the RCA and CTI systems had earlier received FCC approval for broadcasting tests. CBS announced that if either of the competing processes outperformed their sequential color system, CBS would give it full support.[9] CBS, however, was confident that their process would deliver the most acceptable performance in the demonstrations before the FCC.

During the course of these hearings, the Retail Manufacturers Association argued for the adoption of a compatible system, rejecting the CBS process.[10] Dr.

Allen B. DuMont of the DuMont Labs and broadcasting chain felt that none of the systems were adequate, and that commercial color broadcasting was ten to twenty years away.[11] Stanton insisted that CBS was ready now. In spite of these criticisms (and a plea by Dr. Lee De Forest for a compatible system; he himself had abandoned work on a semi-mechanical process[12]), the FCC gave its approval to the CBS system as a broadcast color standard. A dismal demonstration by both RCA and CTI had made the sequential color process a clearly visible winner, and Senator Johnson's militant advocacy carried the FCC towards a commitment. RCA engineers, plagued by "bugs" in their equipment, were unable to argue effectively about any future performance capacities inherent in their design. Considering that the RCA system that was demonstrated for the FCC in 1949 was the prototype for the NTSC system in use today, their claims were indeed sound. CBS, however, had the system that worked.

CBS v.s. NBC: Round Three

Television manufacturers and dealers did not welcome the CBS victory; it was seen as a threat to the millions of dollars invested in black-and-white technology. Emerson, Pilot, Admiral, and DuMont responses sided with RCA against the FCC and CBS.[13]

By way of compromise, the FCC proposed that set manufacturers voluntarily produce receivers that were adaptable from the existing monochromatic system to the CBS color system. If this were done, the FCC would not require a complete and immediate conversion by broadcasters to the CBS color standard.[14] CBS began a limited schedule of local commercial colorcasts over five stations, to an estimated 25 receivers. An ungracious loser, RCA immediately requested a court action to halt the broadcasts.[15] Sarnoff argued that the FCC approval of the CBS system was "scientifically unsound and against the public interest"; his contempt for the semi-mechanical process was undisguised and vocal:

> ...the old mechanical scanning disk was a crude and impractical device... As an expedient, it merely gave laboratory technicians something to play with while the proponents of electronics applied the modern and practical methods to develop an all-electronic, high-definition, completely compatible system of color television for the American public.[16]

After a seven month court battle, the Supreme Court upheld the FCC decision, and on June 25, 1951, CBS broadcast the first commercial color network program, Premiere, to about the same 25 sets as before. Since 1946, the public

had acquired ten million monochrome receivers, none of which could pick up Premiere.[17]

CBS's plans for color programming and set marketing were blocked in November by National Production Authority Order M-90, which prohibited the manufacture of color sets in order to conserve critical materials for the Korean War. The CBS purchase of Hytron Radio and Electronics Corporation in June was to have marked CBS's entry into set manufacturing, as a means of assuring the production of sequential color receivers. Order M-90 shut this crucial support activity down.

The NPA reconsideration of its ban on color set manufacture in February 1952 was the occasion for open accusations between CBS and RCA. Sarnoff implied that CBS had secretly welcomed the suspension of manufacturing because it was unable to deliver on its performance and cost promises, and had even provoked the suspension by asking for critical materials that were not actually needed. Stanton counter-charged that Sarnoff had personally used his influence with the defense department to initiate Order M-90.[18] By the time the NPA rescinded the Order in March 1953, 23 million monochrome receivers were in use.[19]

In the same month, Senator E. C. Johnson again leveled charges of "powerful interests" who were conspiring to retard color television until the market was saturated with black-and-white sets.[20] Both a House Interstate & Foreign Commerce Committee chaired by Rep. Charles A. Wolverton and a Senate Commerce Committee chaired by Sen. Charles W. Tobey were investigating the lack of progress in color television development.[21] Added to all this renewed scrutiny was a consideration of the report by the recently convened (January) National Television System Committee which was recommending the adoption of an RCA-based compatible color standard. The FCC responded to all this furor by reopening the color television question.

Disheartened by the continuing lack of industry support, the 23 million incompatible monochrome sets in operation nationwide, and their own difficulties with set manufacturing, CBS announced that they would not pursue color telecasting "in the present circumstances". CBS repeated their pledge to support any system that met with FCC approval.[22]

RCA once again presented their case before the FCC. During their years of rejection (and while CBS was idle), RCA had embarked on a crash program to refine their technology. Sarnoff made it a personal crusade to develop the all-

electronic system regardless of the FCC decision for CBS. It was as if nothing else existed in the broadcasting world except RCA.

This time, Sarnoff won. The RCA-NBC 697 page petition was overwhelming in its thoroughness, presenting production and consumer equipment prototypes, new color picture tube designs, viewer test surveys, cost projections for every aspect of station operations and receiver manufacturing, and a forty-one affiliate network ready to convert to colorcasting.[23] Not incidentally, the RCA process happened to be the standard proposed by the NTSC. The RCA telecast demonstrations before the FCC and other industry observers reflected the 25 million dollar research investment that had been made to date; there were no "bugs" this time.

In the June 29th issue of Broadcasting, imbedded in the midst of the lengthy coverage of the RCA petition, was an editorial that served well as a postmortem for the CBS sequential color system:

> Two years ago CBS was the victor. But the exigencies of a defense economy, plus the unwillingness of the manufacturing industry to get behind an incompatible system while the black-and-white market was far from exhausted, blocked its flowering.[24]

One hour after the FCC announced its decision, CBS was broadcasting in the RCA/NTSC color standard.[25] Apparently, CBS was not taken by surprise.

NBC v.s. NBC: Overcoming Success

If Senator Johnson and the FCC had expected to see color television flourish in American homes now that the NBC- supported and industry-endorsed NTSC standard was approved, they were to be disappointed. Beyond the vaulted technological hurdle lay an obstruction made of resistant attitudes that were devoted to the familiarity of black-and-white. RCA was now competing with RCA; its colorcasting system was confronted by the same monochromatic status quo that had paralyzed CBS color development. Although David Sarnoff had committed RCA and NBC to the building of a physical color network, there was little influence that he could bring to bear on the marketing objectives of the independent receiver manufacturers and retailers, on advertisers, or on the public consciousness.

For the television set manufacturers and retailers, the FCC decision was distressing. It had an adverse effect on black-and-white sales; the public was now unsure of what to buy. The large 24 and 27 inch monochrome consoles in

particular were being left behind on the showroom floors. New York dealers bolstered themselves with a somewhat optimistic view:

> When people figure how expensive the first (color) sets will be, how small the screens, and how few programs they can get, they'll settle for black and white, at least for a year or so.[26]

People were to settle for black and white for considerably more than "a year or so". Cost, screen size, and limited color programming would indeed be factors contributing to an aversion to color by the public. In the first half of 1954, 2.8 million black-and-white sets were sold, while the three pioneering manufacturers of 15 inch color sets, RCA Victor, Westinghouse, and Emerson, reported sales of "a couple of hundred" each. Westinghouse would soon drop color TV from their product line. RCA Victor tried to boost sales by "dumping" their sets for $500, which was nearly half the actual retail price needed to return a profit.[27]

Being a division of RCA-NBC, RCA Victor could perhaps justify dumping at a loss as being supportive of Sarnoff's commitment to color broadcasting. The independent manufacturers, however, were in business to make a profit. A vicious cycle was described by marketing observers: "Slow set sales have held up advertisers, who have held up programming, which has held up set sales."[28] (This same cycle, turning sluggishly, would be alluded to again almost a decade later.[29])

It was up to NBC Television to create the programming that was needed to lure both set buyers and time buyers to color. In 1954, NBC scheduled 12 to 15 hours of color per week; a new color rate card was NBC's way of telling advertisers that color was worth paying for. CBS began airing Ed Sullivan's Toast of the Town in color.[30]

The final 1954 sales figures for television receivers indicated that this wasn't enough. While the average retail price of $900 was seen as a continuing liability, lack of color programs was considered the worst handicap. Seven million unhandicapped black-and-white sets were taken home that year. The estimated total number of color sets in use was 10,000.[31]

The Marketing of Color

NBC continued to expand its color facilities and programming. It appeared to be as oblivious to the unpopularity of color as it had been to the FCC's decree of CBS sequential color as the one true broadcast standard. In late 1955, NBC committed to an 80 hour per month colorcast schedule, as well as to the conversion of WNBQ channel 5 in Chicago to a full-color station.[32]

Polk Brothers, Chicago's biggest discount house, made retail history by becoming the first TV dealer to treat color television as something other than a burden. Polk Brothers ordered 500 new 21 inch RCA receivers, and developed a sales campaign that was tied into the promotional campaigns for the NBC/WNBQ full-color network/local broadcast service, "the world's first."[33] The inundation of Chicago with slogans, advertisements, multicolored novelties and beverages, and numerous publicity stunts was to become a prototype for local station color promotion. The Polk Brothers borrowed a quantity of these thematic materials, including plastic "Tommy Tint" dolls, for inclusion in carefully assembled set displays.[34] The Polk Brothers did well.

The Polk Brothers were atypical for the retail television business. Nationwide color set sales for 1956 were as poor as ever. RCA sold only 100,000 of the expected 250,000, and Sarnoff reported a loss of $6.9 million on color set building and broadcasting. The $600 price tag for color receivers had looked especially steep when compared to the new $99 black-and-white portables that had entered the retail market, but a paucity of programming was again cited as a major discouragement.[35] Some set manufacturers were still refusing to venture into color.

Four years later, consumers were buying enough color for RCA to show its first profit. The last two hold-outs in receiver manufacturing, Westinghouse and Motorola, had announced the addition of color models. NBC programming was 68% color in the evening, and the ABC network was broadcasting color for the first time. CBS, however, still had no regularly scheduled color programs, and only 1 million color sets were in operation as compared to 55 million black-and-white sets. This meant that only 3% of the homes in America were reached by color. One out of every three broadcasting stations were still capable only of monochromatic transmission.[36] These audience limitations did not attract many advertisers to either the sponsorship of expensive color programs, or the production of equally more costly color commercials. The few who had been using color were doing so because of the aesthetic contribution color made in the display of their products, and because of the greater impression color was believed to have on the audience's attention.[37] It was also believed that color reached an affluent "class" audience (Who else would pay that kind of money to watch so few programs?) that would be interested in specific kinds of innovative, convenience-oriented, and status-related consumer products.[38] For the purposes of reaching a mass audience, however, black-and-white television was still the medium of choice.

The Selling of Color

The beginning of 1965 saw almost 3 million color sets in use in about 10% of the "television homes" in the United States.[39] Slowly declining prices and more variety of styles in sets left color programming availability as the last deterrent to receiver sales. CBS was still noticeably diffident about using color in their telecasts, and manufacturers liked to blame CBS for hurting their business.[40] Evidently, CBS did not perceive a significant relationship between their income from time sales and their use of color.

Advertising was the next component in the vicious cycle that had to be wooed into supporting color television. In evaluating media and allocating advertising budgets, a primary consideration of most agencies and their clients was audience numbers, and black-and-white television delivered those numbers, and for less expense in both time buying and commercial production costs than color. Aesthetics and novelty were of minimal value in deciding the disbursements of an ad campaign.

None of the three networks could continue indefinitely to foot the expense of colorcasting just to maintain a market for receivers; broadcasting made its income through the sale of time, not hardware. Ultimately, color television could survive only if it were supported financially by the advertising world. Color had to be sold to the salesmen.

Color didn't have the numbers, so broadcasters emphasized instead "effectiveness", a respectable advertising ploy that could well have been learned vicariously from monitoring black-and-white commercial breaks. The advertising business was accustomed to using survey research to bolster their own claims, and studies of audience recall, attentionality, stratification (the precursor to demographics), and viewing habits all consistently pointed towards color television effecting a more lasting and vivid impression than black-and-white.[41] Since this kind of research material was already flowing with regularity across the desks of advertising executives for routine application to their own strategic evaluations, the advertising world eventually sold itself on color; the added costs of buying and producing in color appeared to be more than compensated for by an enhanced delivery of the message.

Before the end of 1965, agency buying and production made a sudden and frantic plunge into color. "The panic is on," was one advertising executive's comment. NBC had scheduled a 96% color primetime for 1966. CBS, relenting at last, had announced a 50% color schedule, and ABC was committing itself to one-

third. The background of television was suddenly going color, and agencies were mortified by the prospect of having their drab, grey spots sandwiched and buried under living color.[42] With their clients in tow (some still skeptical), advertisers did an about-face and were producing over half of their commercials in color before the end of 1965.

Color Comes Home

1967 was the year that color inherited its promise. NBC had gone 100% color on November 7th of 1966, almost thirteen years to the day after David Sarnoff's victory before the FCC. CBS and ABC were now predominantly color, with black-and-white programming being mostly daytime filmed serials and older movies.[43] The only new black-and-white acquisition by ABC was the British series "The Avengers", which was used as a summer season replacement.[44] The American Research Bureau reported that one-sixth of the television-owning households in America owned color.[45] Color was now "standard" enough for a news item about a local station adding a 5% rate hike for using color to provoke vehement industry-wide condemnations; color was no longer to be considered an extra, it was now commonplace.[46] The rate hike was summarily rescinded.

Color broadcasting was still special enough for all three networks to affix at the beginning of every program a notice to their audiences: "The following program is brought to you in living color, on NBC!" or "The F.B.I., in color!" ABC chose to forgo the announcer, and use captioned titles. These blurbs were obviously intended to let the monochrome masses know what they were missing by their intransigence, and they were a featured part of programming content for several years. Black-and-white material was now shunned; the networks did not dare broadcast in monochrome for fear of being perceived as a technological loser. (ABC renewed "The Avengers" on the condition that it be produced in color, and many new-won American fans regretted its change from a shadowy, film noir stylization to the over-lit treatment common to color-exploiting production techniques.)

In the fall of 1974, NBC decided to retire its color-hawking peacock.[47] Replaced by the infamous "N" logo in 1976,[48] it had been in service since 1956, and its passing from view could be considered a closing chapter in the selling of color.

NTSC Color v.s. the Future of HDTV

The NTSC color broadcasting standard has been in use for over three decades, but only during the last has it enjoyed the casual acceptance of a color-enabled public. Now securely entrenched in the American home and television industry, it is also very obsolete, as any thirty-year-old electronic technology would be.

European color television systems (PAL, PAL-M, and SECAM), which were developed after NTSC, are capable of both higher picture resolution and more accurate color reproduction (proponents of these systems are fond of referring to NTSC as being an acronym for Never Twice the Same Color). The high-definition broadcasting system that has been developed and is being marketed by the Japanese television industry (primarily Sony) has twice the detail resolution of NTSC (1125 scan lines compared to NTSC's 525), as well as an aspect ratio which yields a wider screen that is closer to the aspect ratio of 35mm film. However, the HDTV system is even less compatible with NTSC television than are the European systems (for which there are VCRs and monitors available that can play and record multiple standards). Other improved resolution broadcasting standards have been designed which would be compatible with the current NTSC system , and these are systems which offer a competitive alternative to HDTV. In these systems, a high-resolution signal would appear on a conventional receiver with the usual NTSC color and detail fidelity.

The major problem facing high-definition television is that low-definition NTSC already occupies the space needed for existence; the space in the broadcast frequencies, the space in the studios and master control rooms of television stations, and the space in the millions of living rooms that are already filled with the NTSC products of hundreds of manufacturers. Displacement of the old black and white technology, both physically and habitually, was required to make NTSC color the telecasting standard of the 1960's. It is expected that a similar displacement of the NTSC broadcast standard must take place in order for HDTV, or a rival system, to take its place.

However, in the 1950's and 60's, broadcasting was the only application to which "tele-vision" was applicable. In the 1990's, video applications have diversified far beyond the over-the-air reception of commercial network entertainment. While HDTV might be variously obstructed as a broadcast standard by political and alternative standard conflicts, it is not obstructed as a video standard in other applications.

An End-run for HDTV?

The HDTV format has a toe-hold in the United States as a specialized video production format.[49] Sony Corporation's purchase this year of Columbia Pictures was more than just a good economic investment. Columbia Pictures is not just another Californian or British Columbian golf course or Chicago office tower. Sony, already in production of HDTV hardware, has now acquired suitable HDTV "software": Columbia's library of motion pictures. We may only be a marketing decision away from a home HDTV videodisk system targeting the committed videophile and film connoisseur. The home may be a second toe-hold for an unapproved-for-broadcast television standard. If HDTV equipment and program material can establish enough of these beachheads, this format may eventually win approval as the new broadcast standard simply by weight of existing presence, and such an approval will be a capitulation to sheer marketing penetration. Sony's Betamax home video format lost its place in America's homes to the slightly lower-in-quality but more aggressively marketed and distributed VHS format. We can expect that Sony has probably retained this lesson in consumer preference determinism well.

The main argument for making enhanced television compatible with existing NTSC/PAL/SECAM systems is that it is expected that it will displace the latter, and that programming for both systems should be of a similar nature. It is expected that consumer adoption of HDTV will be facilitated if both systems share duplicate software. However, most consumers have in their home at least two different audio formats which are not compatible. They may have cassette, CD, or LP records. While these formats share more programming material (music) than not, it is still evident that cassettes support small scale music releases (local musicians), books-on-tape, self-help lectures, and other material not carried on CDs and LPs. Consumers don't have a problem with the fact that cassettes don't play on their CD decks or record turntables.

Many consumers also already have two incompatible video display systems in their homes: NTSC television for broadcast and videotape programming and RGB/EGA/VGA displays for computer "programming". Compatibility is not a major concern, since both systems have distinct applications associated with each.

Sony's acquisition of high resolution programming material appropriate for HDTV enables them to proceed with HDTV marketing. Obviously, it is not necessary to be able to see the local 6:00 newscast in HDTV in order to appreciate

this programming's content and delivery. The local newscast can easily be conceded to NTSC.

System compatibility was considered of paramount importance in the 1940's and 50's when the RCA/NBC color system won out over CBS's. Even so, the transition from black and white to predominantly color telecasting took over a decade to happen. (CDs did not take a decade to overtake the LP!) This sluggish acceptance was, arguably, the result of compatibility. Telecasters were not inclined to originate more expensive color programming until enough consumers had acquired color sets, but consumers were not inclined to buy color sets until enough color programming was available, and the driving force behind broadcasting, the advertisers, were not willing to buy expensive color sponsorship and spot productions as long as most houses were still viewing on black and white sets. The two sides of the then new color coin, hardware purchasing and software broadcast delivery, inched along very slowly, with neither side willing to make an all-out conversion first. So perhaps Sony will be marketing a completely new coin, an HDTV minting, with hardware no more or less available than the software, since Sony can be in the position of regulating the marketing of both.

Acknowledging a software library that is unique to a particular system of display is not a radical step. Motion pictures has a similar situation with its own versions of "high definition": Douglas Trumbull's Showscan and the IMAX Corporation's IMAX and OMNI film formats. Both systems display far greater size/resolution/motion reproduction fidelity than do conventional cinema formats, and each cinematic system has, out of physical format necessity, its own library of circulating films.

Perhaps it should not be expected that advanced television take over the programming forms now expeditiously handled by NTSC. NTSC television can support the under-the-cabinet TV in the kitchen, the Watchman on the beach, and the DC powered portables. Portable HDTV? Who wants to carry a screen that big around from room to room? Let HDTV screen the motion pictures and wide screen video epics, and let NTSC carry the classic television programs, news, comedies, and other programming that have no need for high resolution and a wide screen. It has been proven that the home is big enough, and consumers diversified enough in their uses of media, to accept CDs, cassettes, television, and various computer displays. No one insisted that DAT cassettes be compatible with the existing analog cassette. It didn't need to be. It would not have significantly helped the DAT product's introduction and marketing if it had been.

If we were willing to let Reagan be Reagan, we can let NTSC be NTSC, and HDTV be HDTV. They do not have to convey the same programming material. It is very likely that Sony feels the same way. While every obstacle that stood in the way of the transition from black-and-white to color also stands in the way of any transition to a new high resolution television broadcast format, the non-broadcast applications of video will involve new strategies for the implementation of HDTV marketing and development. The home environment has also been in transition.

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