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The Super-VHS Format

When the Victor Company of Japan unveiled S-VHS in the late 1980s, the home video business was at its peak. Sales of machines were on fire. "Americans bought some eleven million VCRs in 1985, or more than thirty thousand on an average day. By the end of the year, there was one (or more) in nearly thirty percent of the nation's homes."¹ The rental of cassettes to the owners of these machines raised an entire sector of the home entertainment economy out of seemingly nothing, with outlets spreading across the land like so much kudzu. "Video retail specialty stores blossomed from 7,000 outlets in 1983 to an estimated 19,000 by 1986. Lured by the prospect of building traffic and a few bucks per transaction, supermarkets, convenience marts, music stores and book shops began offering videos for rent."² The major studios, initially made wary of video technology by the threat of piracy, had discovered how to turn the situation to their advantage; ironically, the technology that they had fought to suppress turned out to be their most profitable sector of the decade. "By 1987, videocassette sales had greater value to the studios than did theatrical exhibition of motion pictures."³

JVC had all but deposed Sony's Beta format with its own VHS (conventional Beta would cease for good in the US by 1988⁴), which, for a variety of reasons, enjoyed overwhelming success as the home video format standard the world over. Why introduce a new format into the mix when, by all appearances, the old one was not only surviving but thriving?

1 James Lardner, *Fast Forward: Hollywood, the Japanese, and the Onslaught of the VCR* (New York: W. W. Norton, 1987), 313

2 Gail DeGeorge, *The Making of a Blockbuster: How Wayne Huizenga Built a Sports and Entertainment Empire from Trash, Grit and Videotape*, (New York, John Wiley & Sons, Inc., 1996), 95

3 Eugene Marlow and Eugene Secunda, *Shifting Time and Space: The Story of Videotape*, (New York, Praeger, 1991), 132

The recent format battles between VHS and Beta had obscured the fact that there had been other video systems which, having not hit the streets until too late, had simply withered on the vine; Philips's Video 2000 is a salient example. "Philips was reported to have lost \$55 million on the project, which again demonstrated the advantages of an early market lead."⁵ Moreover, competition between JVC and Sony hadn't ceased, despite the failure of the latter's pet format. "In a repeat scenario of the original battle over format supremacy between Beta and VHS, JVC launched a direct attack on Sony's new 8mm technology, telling consumers through its advertising, 'Don't Get Behind the 8 Ball'...In response the Sony's thrust toward miniaturization of videocassette size, JVC countered by introducing VHS-C, a modified, but compatible, version of the VHS format."⁶

There were good reasons to revisit the VHS format that didn't have to do, at least directly, with the struggle to maintain market share. Despite its wild success, VHS was limited in its ability to reproduce sound and image, especially under the NTSC standard; despite its failure, Beta was thought by many, home theater enthusiasts in particular, to have delivered superior picture and sound. One reader of the videophile journal *The Perfect Vision* makes the typical anti-VHS case in a 1987 letter column, contending that "Beta has been the format responsible for the major technical advances in consumer video," and "Beta is currently the best quality consumer video-tape format. Laser disc may be 'most nearly perfect' overall. But Beta retains that position with respect to tape formats."⁷ A review from a later issue gets at the matter in much pithier fashion: "How the public can be unanimously happy watching VHS rental tapes is beyond me."⁸ One way to win over this (admittedly small) segment of the market, as well as stay ahead of any technical advances from the competition, would be through pre-emptive improvements in image quality. Enter Super-VHS.

The secret to S-VHS's higher performance lay chiefly in a boost to the frequency of the

4 Janet Wasko, *Hollywood in the Information Age*, University of Texas Press, 1994, 122

5 *Ibid.*, 122

6 Marlow and Secunda, 133

7 Jim Davidson, "Beta vs. VHS", *The Perfect Vision* 1:3 (Summer 1987), 9

luminance signal from "between 3.4 to 4.4 MHz" (the typical range for VHS) "to a new location between 5.4 and 7.0 MHz."⁹, increasing the range (from 1 MHz to 1.6 MHz) as well as the absolute frequency. Pushing the peak white carrier - i.e., the "ceiling" of the luminance frequency - to this degree resulted in greater resolution; a report in a technical journal estimated that the "large increase of 2.6 MHz at the peak white carrier...yields horizontal resolution of more than 400 lines, exceeding the 330 lines of current television broadcasts."¹⁰

In addition, S-VHS was among the the first consumer video systems to separate the chrominance and luminance signals during playback and recording. This was done through the use of specially-constructed, ten-pin input and output cables known alternately as S-connectors or Y/C connectors.¹¹ As one videophile journal explained, this would "prevent the visible artifacts, such as moire and dot patterns, that can result from interference between chroma and luminance."¹²

Equally important were innovations in the construction of the new S-VHS cassettes. Though outwardly similar to conventional VHS tapes, S-VHS tapes were designed specifically for the high-frequency luminance discussed above. "[I]n order to handle the higher-frequency signals, the new tape's magnetic particles have to be tinier and more uniform than those of conventional VHS."¹³ Another technical article is rather more specific: "For S-VHS the particle length decreased from about 0.3 μm to 0.15 μm . As a consequence, the surface can be smoother and therefore better head-to-tape contact is obtained."¹⁴ The relationship between smaller, more densely-packed oxide particles and tape quality was the basis of the S-VHS software. This relationship was assumed to be the basis of any further evolution of tape-based media, as confidently asserted by the closing lines of a report on the

8 Gary Davis, "Half-Inch Software: Not the Answer," *The Perfect Vision* 2:5 (Fall 1989), 151

9 James B. Meigs, "Super!", *Video Review* 8:4 (July 1987), 38

10 Yoshimichi Nagaoka, Masahiko Tsruta & Hisahige Fujiwara, "High Performance VTR Based on the S-VHS Format," *Ieee Transactions on Consumer Electronics* 34:3 (July 1987), 561

11 Glenn Kenny, "Top of the Line," *Video Review* 8:6 (September 1987), 25

12 Meigs, 38

13 Ibid., 38

14 S. B. Luitjens, "Magnetic Recording Trends: Media Developments and Future (Video) Recording Systems," *Ieee Transactions on Magnetics* 26:1 (January 1990), 9

properties of S-VHS tape by scientists from JVC's own research lab: "In the future, the reduction of particle size will continue and the performance of oxide tape will be improved."¹⁵

Overall the new format generally met with approval. Reviews of S-VHS hardware - software will be dealt with shortly - in videophile journals tended to (slightly nitpicky) praise. One reviewer declared that "For home taping, amateur video production, and other applications (laboratory and scientific) requiring highly accurate video reproduction, S-VHS is certainly superior to VHS in every way and, technically, at least, a milestone in the evolution of video."¹⁶ Even those who began as skeptics were soon won over; one *Perfect Vision* reviewer even changed his mind about the format over the course of a single issue (going from the pan of "Super-VHS at First Glance - Not Recommended" on page 129 to the enthusiasm of "Super-VHS: On Second Thought - The JVC HR-S8000U - Recommended" on page 140, after finding access to a newer-generation machine.)¹⁷

Despite this, there were serious barriers to any hope of S-VHS being adopted as the consumer format of choice after the fashion of its ancestor. The very success of the VHS format is real-life proof that technical superiority is not the only factor in determining the way in which new technologies succeed or fail on the (reasonably) open market (recall the Beta enthusiasts mentioned earlier). Leo Enticknap hammers on this point in his account of the development of film, television and video technology. True progress in this area comes about, he suggests, as the result of adaptation of the new tools to existing practices. This must occur in both the industrial and business contexts (via "the consolidation of existing technologies into mainstream industrial practice, and the beginnings of the research and development process which would eventually bring new ones to the marketplace."¹⁸) as well as those of the cultural and social sphere (thanks to "the ability of that technology to be adapted

15 J. Ito, Y. Sato & I. Nakamura, "Characteristics of S-VHS Tape," *IEEE Transactions on Magnetics* 26:1 (January 1990), 90, accessed November 2011, http://ezproxy.library.nyu.edu:6211/xpls/abs_all.jsp?arnumber=50498&tag=1

16 Nicholas Bedworth, "Super VHS: Pro and Con: I: Recommended: The JVC HR-S7000U VCR," *The Perfect Vision* 1"4 (Spring/Summer 1988): 127

17 Gary Davis, "III: Super-VHS: On Second Thought - The JVC HR-S8000U - Recommended," *The Perfect Vision* 1:4 (Spring/Summer 1988): 140

for compatibility with existing cultural practices..."¹⁹)

Some pains were taken to see that S-VHS worked with, rather than against, the intuitions that viewers had developed as users of VHS technology. The tape was the same size and shape. The basic operation of the machine was similar and improvements to the operation were, at least initially, based off of features that would be familiar to any VCR user. Perhaps most importantly, the S-VHS player was backwards-compatible with VHS tapes; while the tapes would still exhibit the same image-quality issues that seemed endemic to the format, the new machine would at least play the them, reassuring the potential upgrader that whatever library she'd accumulated (probably at some expense and effort) would not be rendered immediately obsolete. Some care was apparently taken to make the machines this compatible; a contemporary review of the new system is at pains to stress that "Super VHS is not a new format...S-VHS [is] an extra that complements ordinary VHS much like Hi-Fi sound adds to video audio quality. No one will have to throw out existing VHS libraries, and stores can continue to rent ordinary VHS tapes."²⁰ A report from JVC's own researchers mentions compatibility as a priority, and even points out that some features of the new tape were engineered specifically with this in mind (in this case, the current of the recording signal).

To keep compatibility with VHS system the optimum recording current of S-VHS tape should not be far from that of VRT [i.e., the old system.] Fig. 2 shows the relationship between carrier output and recording current for S-VHS and VRT. It can be seen that the difference of optimum recording current between these tapes is little. No head saturation occurred for S-VHS tape with high [coercivity], so there is no need to change head material. Thus, S-VHS tape can be used in both systems.²¹

Whatever obstacles there were to mass adoption of the new format, JVC was at least conscious of the need to smooth the transition.

18 Leo Enticknap, *Moving Image Technology: From Zoetrope to Digital*, London: Wallflower (2005), 119

19 Ibid., 11

20 Meigs, 104

21 Ito, Sato and Nakamura, 88

And obstacles there were, although the truly difficult ones seemed to be byproducts of industrial, rather than social practice. First among these was the fact that, in order to absorb the full effect of the jump in image quality, extra hardware was required; namely, a higher-resolution television. It was certainly possible to play S-VHS through a conventional set, and some press accounts downplayed the difference in resolution that would result. "While the benefits of keeping the video signal 'components' separate are visible, they are fairly minor compared to the enormous leap in picture quality produced by the shift in the S-VHS signal frequency."²² Others, however, were less sure that trading up in one regard wouldn't necessitate doing so in another. "A typical home television receiver with a notch filter, for example, can display horizontal resolution up to about 240 lines; one with a comb filter and decoder, to about 350 lines. To view the full scope of a high-resolution source takes a high-resolution receiver or monitor."²³ JVC did manufacture monitors capable of 560-line resolution, ranging in price from \$1099 to \$3999.²⁴

While it might have been difficult to convince consumers to shell out for an expensive new television, especially after having spent a few hundred dollars on a new VCR, it was at least possible in principle. The extra hardware was being manufactured and was available to purchase. The same could not necessarily be said for S-VHS software - that is, the tapes. Here, the situation was truly dire. In the first place, the price of blank S-VHS tapes was a considerable hike from its regular-VHS cousins; an early report suggests that a two-hour blank cassette would cost a not-inconsiderable \$19.95.²⁵ Some of this was due to technical issues related to its production. As one news source explained: "Consumers shouldn't expect price wars with S-VHS blanks for a long time, since the advanced technology required - and licensing from JVC - will prevent low-cost tape companies from flooding the stores with cheaper

22 Meigs, 105

23 Ronald K. Jurgen, "Consumer Electronics," *IEEE Spectrum* (January 1988): 57

24 *Ibid.*, 57

25 David J. Elrich, "S-Tapes, Too," *Video Review* 8:5 (August 1987): 16

versions."²⁶ However, the bizarre economics of videotape manufacture probably played a part as well.

A contemporary account sheds some light on this:

"3M staffers avoid going on record when asked why S-VHS cassettes are so expensive. An unofficial view explains that the company intends to recoup as much as possible of the research and development costs of this very special tape. Furthermore, no tape company has made a reasonable profit on tape in years, as tape prices kept falling from intense competition. S-VHS tape promises a brief period of profitability before competition undercuts profits again. Some discounters are already selling T-120s (two-hour S-VHS videocassettes) for \$12, considerably less than their \$20 list price but still triple the price of an ordinary T-120 (the standard two-hour videocassette)."²⁷

As difficult as the blank-tape market was, the situation for prerecorded material - the real bread and butter of the video industry to that point - was even worse. S-VHS presented an additional technical challenge to any prospective content owners who had considered migrating their wares to the new tape; namely, the component-signal mode, a defining feature of the format, made such an operation trickier than many had prepared for. "To offer the full picture advantages the format allows, prerecorded S-VHS tapes must have been made from master tapes kept in the component domain....Most prerecorded tapes are made from movies that are shot on film and transferred to master videotapes, which are then copied onto videocassettes for sale. When the master is made on a three-quarter-inch, 1-inch or 2-inch videotape machine, the end product has the component signals combined into composite video. The intermingling robs the owners of VCRs equipped for separate component signals (S-VHS, Ed-Beta and 8mm Hi-Band) of some picture quality."²⁸

This production difficulty added an extra chill to the already cold feet of video producers, whose reticence was reflected and magnified in consumers. "The video software majors won't get in S-VHS production until the machine population goes at least as large as the Beta market - 5 percent to 6

26 Ibid., 16

27 Rich Warren, "3M's Pioneering Spirit Makes It a Leader in S-VHS Production," *The Orlando Sentinel*, January 9, 1988, accessed November 2011, <https://getit.library.nyu.edu/go/3268840>

28 Harry Somerfield, "New S-VHS Tapes Are Worth the Wait," *The Orlando Sentinel*, January 14, 1989, accessed November 2011, http://ezproxy.library.nyu.edu:2784/iw-search/we/InfoWeb?p_product=AWNB&p_theme=aggregated5&p_action=doc&p_docid=0EB760A3B81EB669&p_docnum=1&p_queryname=1

percent of the 51 million VCR players now in U.S. homes. And consumers won't invest in high-ticket S-VHS machines until they have access to tapes that show off the format's advantages."²⁹

The attempt to make S-VHS the next great consumer home-viewing format seemed destined to fail; a look at the fortunes of San Francisco-based Super Source Video tells the story in miniature. The rather daring company tried to end the standoff described above with the release of 100 titles on S-VHS in 1988; unfortunately, most of these were either low-demand public-domain titles or "video albums" - non-narrative compilations of nature footage, aerial cinematography and the like, designed only to show off the capabilities of the new format. Fearing perhaps that consumers weren't exactly clamoring for "helicopter and Steadicam swoops through natural splendors, with evocative, original 'New Age' music scores,"³⁰, Super Source also licensed many titles from the library of the Orion production company, as well as a few other perennials such as *On Golden Pond*. But these were not well-received by the videophile press; the latter tape, despite boasting of having been "mastered in component digital video [in a] truly state-of-the-art-film-to-video transfer"³¹ was apparently "almost unwatchable", marred by "a dotty, granulated pattern" and with a color scheme so botched that "the pond didn't look golden at all!"³² As late as 1990 Super Source was still at it, announcing its pending release of *Indiana Jones and the Last Crusade*, which had been a huge theatrical hit the previous summer. However, a press account of this is careful to note that Super Source "apparently was the only company in the country at presstime that was releasing features in that format;" worse, a Paramount executive asked for comment declares (diplomatically) that the release was "something for the buff and for the discerning consumer" and (less diplomatically) that "Paramount didn't think the S-VHS version would

29 Jonathan Takiff, "Software to Fast-Forward S-VHS Choice of Super Tapes is Growing, But in Slo-Mo," *Philadelphia Daily News*, April 21, 1988, accessed November 2011, <http://ezproxy.library.nyu.edu:34344/docview/429055650/1335E7DC7CE53A23388/1?accountid=12768>

30 Ibid.

31 Somerfield, "News S-VHS Tapes are Worth the Wait"

32 Davis, "Half-Inch Software Not the Answer," 151

be a 'huge seller.'"³³ No post-1990 references to Super Source Video turned up in any subsequent research.

While no particular data exists to confirm this, it might be tempting to speculate that the S-VHS's failure to scale the heights reached by previous video formats was partially rooted in its superficial resemblance to the VHS system of old. If one supposes that most viewers at the time either didn't notice or didn't care about (alleged) improvements in picture or sound - one video journalist suggested that "where subtleties of video performance are concerned, many Americans exhibit a Burger King mentality - keep it cheap, as long as it gets the job done."³⁴ - then it is little wonder that consumers were hesitant to pay an elevated price for a machine that, on the face of it, was identical to the functioning model already in their living room. In this sense, the effort to "smooth the transition" between the two formats may have been too successful, downplaying the distinguishing features that may have stimulated consumer demand.

Judged solely a successor to VHS, then, S-VHS was something of a flop. Almost everyone who ventured an opinion regarded the high price of new decks and lack of prerecorded tapes as fatal; some with longer memories pointed out that, even at the time of S-VHS's debut, many more home video formats had failed than succeeded. "Peter Balner, president of the Palmer Video retail franchise, takes a dimmer view: 'Nothing other than VHS has worked so far. I really think anyone looking to get into another system is really out of their mind. I don't understand how these big companies can make a mistake like this.'"³⁵ By summer 1989, *Video Review*, a major videophile publication and early champion of the format, featured a cover story asking "S-VHS: What's Taking So Long?". The article pointed out that, two years after its debut, there were "fewer than one in 100 VCR buyers opting for S-VHS decks," and, in a telling comparison, wondered aloud "whether a format that attracts only the

33 George Mannes, "Indy's *Crusade* Launched on S-VHS," *Video Review* 10:11 (February 1990): 22

34 Martin Levine, "S-VHS: What's Taking So Long?", *Video Review* 10:4 (July 1989): 23

35 Al Stewart, "Suppliers Still Take Dim View of S-VHS Titles," *Billboard* June 11, 1988, accessed November 2011, <http://ezproxy.library.nyu.edu:34344/docview/226963574/1335E8531F161B703FE/6?accountid=12768>

most discerning connoisseurs is this generation's Beta."³⁶

But the format had some life in it yet. Perhaps due to the initial lack of prerecorded tapes, manufacturers of S-VHS VCRs began outfitting their machines for other uses. Some of this was mere gimmickry - "picture-in-picture circuitry, freeze-frame, strobe, digital zoom...mosaic and 'paint art,' which is similar to the solarization feature found on other digital-effects decks."³⁷ More useful were variations on automatic time shifting. Some of these could be a little too cute at times - one wonders about the life of someone who could take advantage of one model's feature allowing a user to program a whole year's worth of events in advance ³⁸ - but they at least were attempts to respond to how consumers used video. While it had nothing to do with this specific format, their inclusion on new model VCRs was an obvious attempt to entice wary consumers and justify the machines' considerable expense.

Probably the most prominent additions to later generations of S-VHS decks were those related to video editing. Unlike the aforementioned bells and whistles, the process of editing on an S-VHS deck actually took advantage of the unique properties of the format. The greater picture detail captured by the S-VHS tape made it ideal for making copies from other video sources. A review of a later-model machine actually tests this capacity by attempting to copy a scene from the laserdisc version of *2001: A Space Odyssey*; the reviewer finds not only that "[s]witching between the disc and the tape shows far fewer differences [in picture quality] than I would expect," but that the resulting image from the tape is "the best looking picture from a VCR that I have seen here."³⁹ Manufacturers certainly didn't want to encourage consumers to use this feature in this way, but did modify the decks to take advantage of it for editing purposes.

As a result, the early years of the 1990s began to see machines like JVC's HR-S5800U deck,

36 Levine, 21

37 Len Feldman, "Toshiba S-VHS VCR, Model SV-970," *Video Review*, 10:2 (1989): 76

38 Len Feldman, "RCA S-VHS Videocassette Recorder, Model VPT695HF," *Video Review* 8:10 (December 1987), 70

39 Dan Schwartz, "The Sony SLV-R5UC: A New Look for the S-VHS," *The Perfect Vision* 3:12 (Winter 1991/1992), 69

which could boast "a number of other jacks for making connection with other machines" (either a camcorder or another VHS), as well as "a number of other features you'd expect from a deck designed for editing: a flying erase head for glitch-free editing, controls for insert editing and for dubbing audio onto linear track, and remote pause and swap terminals for editing in tandem with a JVC camcorder or another JVC VCR."⁴⁰ None of these add-ons - nor the others featured on this model, such as the jog/shuttle wheel (for frame-by-frame scanning), tape indexing system, or improvements to the tape counter readout - require the S-VHS format to function. In fact, some of them began life as features on Beta players (or had relied on technology and engineering previously specific to the Beta machines⁴¹ and only migrated over to S-VHS in order to build a better editing deck. This pitch to a relatively narrow and specialized segment of consumer electronics consumers (the quoted review helpfully points out that, at "\$1,2999, the HR-S5800U is one of the *least expensive* editing VCRs we've seen in this format."⁴²) seems to have signaled a concession on the part of manufacturers that S-VHS would never become the viewing format of choice for the mass audience.

In fact, the only other successes that S-VHS enjoyed had nothing to do with typical consumers at all. To pick just one example, it seems to have found use as a means of recording data, based on its generous bandwidth (As one paper put it, "VHS and S-VHS cassettes have now become widely accepted by the instrumentation data recording community. The narrow, closely spaced tracks used by helical scan systems result in an extremely efficient use of the medium."⁴³) There is even evidence of S-VHS being used in this capacity for military intelligence purposes, thanks to the development of "a synchronizing technique to allow...a virtually limitless number of S-VHS cassette data recorders to be operated in parallel for analogue intelligence gathering."⁴⁴ The S-VHS format found its way to a

40 George Mannes, "JVC S-VHS VCR, Model HR-S5800U," *Video Review* 12:2 (May 1991): 50

41 Rod Woodcock, "The Mitsubishi HS-U71 S-VHS VCR," *The Perfect Vision*, 2"6 (Winter 1990): 89

42 Mannes, "JVC S-VHS VCR, Model HR-S5800U," 50, emphasis mine.

43 Terry Mason and John Howard, "Data Recording Using VHS," *Communications International* 21:5 (1994): 44
<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/213217482?accountid=12768>

44 "Upgrade Update, Synchronised S-VHS Data Recording," *Jane's International Defence Review*, April 7, 1997, accessed

newsgathering, the format's high image quality and modest price tag made it an attractive option. A broadcast engineer from a station in Reno, Nevada recalls that "As a primary format, S-VHS was economical and enabled us to quickly and easily build a professional quality videotape library. In retrospect, the selection of S-VHS was a critical factor."⁴⁹ Several mentions of other stations utilizing S-VHS for their libraries exist in broadcast industry literature - two smaller stations in Houston and Dallas used the format as a means of duplicating the "older, family shows" that was their main programming⁵⁰, and even the head of the 101st Airborne Division's production arm maintained that "S-VHS has long been the standard for military production outfits," and claimed a "library of over 1,000 mastered S-VHS tapes."⁵¹

However, it is worth pointing out that all of the aforementioned examples were drawn from articles about the replacement of S-VHS as a broadcast format by then-new means of digital storage (coincidentally, the upgrade format in each case is JVC's D-9 digital tape, then known as Digital-S). In each case, the quality, cost and ease-of-use of the new systems are cited as reasons for the abandonment of the unloved S-VHS. The advance of digital media as a means of recording, playing or preserving content seems to have finished it off for good. Despite never having won mass acceptance, it was able to limp along through the 1990s as a niche format - major home electronics companies continued to manufacture S-VHS recorders throughout the decade, dutifully including and superficially updating the same type of features that the earlier models had introduced years earlier.⁵² But just before the turn of the century, something happened which briefly re-ignited the hope that S-VHS might have another

48 "News Buy," *Broadcasting* 122:24 June 8, 1992, accessed November 2011, <https://getit.library.nyu.edu/go/3267899>

49 Peter Grimm, "Twin Stations Go Digital," *Broadcast Engineering* 40:3 (March 1998), accessed November 2011, <http://ezproxy.library.nyu.edu:2076/hottopics/lnacademic/?verb=sr&csi=261376&sr=BYLINE%28Peter%29%2Bw%2F3%2BGrimm%29%2BAND%2BHLEAD%28Twin+station+go+digital%29%2BAND%2BDATE%2BIS%2B1998>

50 Business Editors, "Twin Texas Stations Strike it Rich with JVC's DIGITAL-S," *Business Wire*: 1 December 28, 1998, accessed November 2011, <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/446754862?accountid=12768>

51 Business Editors, "US Army 101st Airborne Division at Fort Campbell Selects JVC's DIGITAL-S," *Business Wire*, March 9, 1998, accessed November 2011, <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/446976667?accountid=12768>

52 Marc Horowitz, "Star Decks," *Video* 19 (May 1996): 24-30

chance at acceptance by the mass viewing public.

In early 1998, JVC announced a major advance in the design of S-VHS decks that would "allow users to tape full 400 line S-VHS quality programming on standard VHS tape."⁵³ Known as S-VHS-ET (for Expansion Technology), this was accomplished through an upgrade to the video heads and the introduction of a special type of preamp "to record a frequency range that is 160% wider than VHS."⁵⁴ The problem which had hobbled S-VHS upon its debut - price and availability of software - seemed to have been solved. And although the initial retail price of the new decks would still be more than that of conventional VCR - at that time, consumers had "become accustomed to VHS tape decks priced as low as \$150," and contemporary estimates put the price for the new S-VHS machines at \$500 to \$700⁵⁵ - that was still a far cry from the four-digit price tags sported by the first machines that debuted in 1987.

Initial response to this development seemed to be positive. In the beginning of the new millennium, Panasonic, Philips, Samsung, Sharp and Toshiba unveiled new S-VHS-ET decks at the Consumer Electronics Show; most of these companies were returning to the format after having abandoned it years earlier.⁵⁶ However, the video market had changed significantly in the years since S-VHS first hit the scene more than a decade previously. For one thing, the VCR was no longer as popular as it once had been, having reached something of a saturation point as a consumer product and only able to enjoy seemingly high sales due to brutal drops in price. Although "unit sales for VCR decks continued to surge to record levels in 1999...heavy price promoting shrank profitability across the board."⁵⁷ In 2000, the year that the S-VHS-ET made its return to the Consumer Electronics Show,

53 "JVC's Newest S-VHS Uses Standard Tape," *TWICE* 13:11 (May 4, 1998), accessed November 2011, <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/232290119?accountid=12768>.

54 Ibid.

55 David Lammers, "JVC Takes a Second Crack at Enhanced VHS-Recording System," *Electronic Engineering Times* 1005 (May 4, 1998), accessed November 2011, <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/208121173?accountid=12768>

56 Greg Tarr, "S-VHS Format Making VCR Comeback," *TWICE* 15:1 (Jan 6, 2000): 131, accessed November 2011, <https://ezproxy.library.nyu.edu/login>

57 Ibid.

the VCR was expected to experience "virtually flat sales."⁵⁸

More importantly, and related to this phenomenon, was the arrival of DVD, which became available for sale one year before JVC introduced S-VHS-ET. Its rise was almost as spectacular as that of the VHS tape years earlier, and spelled the demise of almost every other competitor. "By the end of 1999, thousands of titles were available on DVD and millions of players had been sold... By 2001, it was possible for a film to outgross its first-weekend theatrical release during its first weekend in DVD release. In just four years, the DVD had muscled its way to the center of home viewing and quite possibly to the center of the film industry as a whole"⁵⁹ Not only could the new format boast improved image and sound quality, but it slyly piggybacked off of existing technologies, both as a physical medium ("Because their size was to be identical to that of a CD, new carriers did not have to be developed...yet the DVD can store as much as 24 times as much information as a CD, if both sides are used."⁶⁰) and in terms of how it packages its content (Barlow points out the way in which the presentation practices of DVD labels like Criterion are reminiscent of "the work of a publisher of scholarly, authoritative editions of classic works,"⁶¹ which are "meant to be cherished and studied and not simply used."⁶²)

In the face of this, S-VHS - "improved" or otherwise - hardly stood a chance. Today, the format barely exists; a recent search for S-VHS hardware on Amazon.com turned up some hits, but it seemed as though the only machines on offer were used decks through independent sellers. Strangely enough, the most recent mentions of it in any kind of academic literature were in motion studies, which still seem to have regarded it as a favorite format until relatively recently.

S-VHS, if it is to be remembered at all, should stand as an example of a genuine contribution to the advancement of analog video. If contemporary accounts are to be trusted, the expansion of the

58 Ibid.

59 Barlow, 17-18

60 Barlow, 17

61 Barlow, 77

luminance band resulted in a definite improvement in the image quality. Unfortunately, it was the inability to properly deal with this breakthrough that spelled doom for the format. That the increase in quality didn't lend itself to easy, efficient or cheap reproduction in the form of prerecorded content was a failure of the manufacturers to rein in this technological advance in order to conform to proven industrial practice. As a result, S-VHS became a niche format at best, never to benefit from economies of scale that propelled its ancestor VHS and (partial) descendent DVD to their dominant positions. Even a successful S-VHS would not probably have lasted long, due to unstoppable developments in various digital formats, but its unrealized potential should serve as a reminder that technological progress in media has to do with more than technology.

Works Consulted

Argiropes, Evaggelia, Vassilios Gourgoulis, Nickaloas Aggeloussis, Panagiotis Antoniou & GEorgio Mavridis, "Modifications of the Arm Coordination in Front Crawl Swimming with Added Resistance," *Inquiries in Sport & Physical Education*, Vol. 6, No. 1, 2008, pp. 131-37. Directory of Open Access Journals. http://www.hape.gr/emag/vol6_1/abhape256e.asp

This is the latest reference found to the S-VHS format after a search through the usual academic databases. Though the article is in Greek, the abstract is in English, and mentions the use of four S-VHS cameras to record the movements of a swimmer. This indicates that the format was, until surprisingly recently, popular in the field of human motion study.

Bedworth, Nicholas. "Super VHS: Pro and Con: I: Recommended: The JVC HR-S7000U VCR." *The Perfect Vision* 1:4 (Spring/Summer 1988): 125-127

Review of early JVC S-VHS deck. Goes into technical details in admirable detail and qualifies his considerable praise.

Business Editors, "US Army 101st Airborne Division at Fort Campbell Selects JVC's DIGITAL-S." *Business Wire*, Mar 09, 1998. Accessed November 2011.

<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/446976667?accountid=12768>.

Documents the switch to Digital-S from S-VHS by the 101st Airborne's production arm.

Business Editors. "Twin Texas Stations Strike it Rich with JVC's DIGITAL-S." *Business Wire*: 1 December 28 1998. Accessed November 2011. <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/446754862?accountid=12768>.

Brief article follows the transition of two independent Texas stations from S-VHS to JVC's

Digital-S format. The greater copying and duping abilities of the latter format is one reason (among others) given for the switch.

Chow, JW. "Biomechanical Comparison of Two Racing Wheelchair Propulsion Techniques." *Medicine and Science in Sports and Exercise*, 33:3 (2001): 476-484. Accessed November 2011.

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Human motion study article in which S-VHS is used to record the various tests and trials. One of several such found during research for this paper.

Human motion study article in which S-VHS is used to record the various tests and trials. One of several such found during research for this paper.

Davidson, Jim. "Beta vs. VHS." *The Perfect Vision* 1:3 (Summer 1987): 9

Letter to the editor in a prominent videophile journal. Quoted to illustrate general videophile antipathy toward VHS.

Davis, Gary., "III: Super-VHS: On Second Thought - The JVC HR-S8000U - Recommended." *The Perfect Vision* 1:4 (Spring/Summer 1988): 140-145

Review of early JVC S-VHS deck. Although Davis had previously dismissed the format a few pages previously in the same issue, he seems to have reversed his opinion.

Davis, Gary. "Half-Inch Software: Not the Answer." *The Perfect Vision* 2:5 (Fall 1989): 150-151

Review of the first offerings of S-VHS software in prominent videophile journal. Illustrates the general crumminess of the product on offer at the time.

DeGeorge, Gail. *The Making of a Blockbuster: How Wayne Huizenga Built a Sports and Entertainment Empire from Trash, Grit and Videotape*. New York: John Wiley & Sons, Inc., 1996.

Biography of Wayne Huizenga, head of Blockbuster for many years and the one responsible for guiding it to a position of supremacy in the video-rental industry. Reads like an authorized bio that one might find for sale in one of his stores. Consulted mainly for details on the expansion of the home video industry in the 1980s.

Elrich, David J. "S-Tapes, Too." *Video Review*, 8:5 (August 1987): 16

Short blurb from the 1987 Consumer Electronics Show reporting that seven companies would soon begin manufacture of S-VHS tapes. Mentions some factors contributing to the high price of the software.

Enticknap, Leo. *Moving Image Technology: From Zoetrope to Digital*. London: Wallflower, 2006

Standard reference book on moving image technology with subtle view of historical change within that domain.

Feldman, Len. "RCA S-VHS Videocassette Recorder, Model VPT695HF." *Video Review* 8:10 (December 1987): 70-71

A review of RCA's debut S-VHS deck; evaluates performance and features.

Feldman, Len. "Panasonic S-VHS VCR, Model PV-S4864" *Video Review* 9:11 (February 1989),74-75

Review of Panasonic S-VHS VCR model for videophile press.

Feldman, Len. "Toshiba S-VHS VCR, Model SV-970." *Video Review* 10:2 (May 1989): 76-77

A review of the aforementioned machine; includes a salient example of the trend for adding digital effects to S-VHS VCRs.

Feldman, Len. "Mitsubishi S-VHS VCR, Model HS-U70." *Video Review* 10:2 (May 1989): 72-73

Review of Mitsubishi's S-VHS deck for the videophile press.

Feldman, Len. "RCA S-VHS VCR, Model VR640HF." *Video Review* 10:5 (August 1989): 76-77

Review of RCA's S-VHS VCR model for videophile press.

Feldman, Len. "JVC S-VHS VCR, Model HR-S20000U." *Video Review* 10:6 (September 1989): 84-85

Review of JVC's S-VHS VCR model for videophile press.

Feldman, Len. "Panasonic S-VHS VCR, Model PV-S4990." *Video Review* 10:8 (December 1989): 114-117

Review of Panasonic's S-VHS VCR model for videophile press.

Feldman, Len. "Toshiba S-VHS VCR, Model SV-F990." *Video Review* 10:10 (January 1990): 92-93

Review of Toshiba's S-VHS VCR model for videophile press.

Grimm, Peter. "Twin Stations Go Digital." *Broadcast Engineering* 40:3 (March 1998). Accessed November 2011.

<http://ezproxy.library.nyu.edu:2076/hottopics/lnacademic/?verb=sr&csi=261376&sr=BYLINE%28Peter%29%2Bw%2F3%2BGrimm%29%2BAND%2BHLEAD%28Twin+station+go+digital%29%2BAND%2BDATE%2BIS%2B1998>

A piece on the transition of two Nevada television stations from S-VHS to the Digital-S format.

Horowitz, Marc. "Star Decks." *Video*, 19 (May 1996): 24-30

Survey of new VCR models making their debut, some of them S-VHS decks. Includes an explanation of special features and add-ons, most of which are reminiscent of their counterparts from earlier models.

Ireland, David. "Digital Video for the Offshore Oil and Gas Sector." *Sea Technology* 44:12 (2003): 17-20. Accessed November 2011.

<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/198556985?accountid=12768>.

This 2003 article discusses the need by the underwater oil and gas industry to agree on a digital format standard to replace S-VHS, which seems to have been the standard up to that point. Very few specifics are given as to why S-VHS chosen, or exactly what use recorded media might be to this particular industry, but the article does mention that the replacement format must "be of industrial quality, capable of recording for a minimum of three hours per unit of recordable media, the media should not exceed \$10 and all of the usual interfaces must be available including start/stop and sync, controllable via computer interface."

Ito, J., Y. Sato & I. Nakamura. "Characteristics of S-VHS Tape." *IEEE Transactions on Magnetics* 26:1 (January 1990): 87-90. Accessed November 2011.

http://ezproxy.library.nyu.edu:6211/xpls/abs_all.jsp?arnumber=50498&tag=1

Report by researchers from JVC's Video Research and Development Laboratories on the S-VHS software. Comparison is made to both conventional VHS tape and metal powder tape. Mention is made of the importance of compatibility with VHS recorders and players.

Jurgen, Ronald K. "Consumer Electronics." *IEEE Spectrum* (January, 1988): 56-58. Accessed November 2011. http://ezproxy.library.nyu.edu:6211/xpls/abs_all.jsp?arnumber=4487

A report on the latest developments in consumer electronics technologies from the flagship publication of the Institute of Electrical and Electronics Engineers.

"JVC's Newest S-VHS Uses Standard Tape." *TWICE* 13:11 (May 04, 1998): 33-33. Accessed November 2011.

<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/232290119?accountid=12768>.

Short article covering the announcement of the S-VHS-ET technology by JVC. Gives a very vague and general description of the technology behind the breakthrough, though it leaves too many details to the reader's imagination.

Kenny, Glenn. "Top of the Line." *Video Review* 8:6 (September 1987): 27-29, 94

A guide to currently-available VCRs; S-VHS models are featured prominently.

Kenny, Glenn. "NEC S-VHS VCR, Model DS8000U MKII." *Video Review* 10:3 (June 1989): 80-81
Review of NEC's S-VHS deck for the videophile press.

Lambert, Peter. "Network News Investigates Disc-based Recording, Hi8: Digital Editing and Small Camera Advances May Spell Savings for News Divisions." *Broadcasting*, Sept 23, 1991, 121:13.
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Report on the use of smaller, lighter yet high-(if not broadcast-) quality video recorders for newsgathering. S-VHS and Hi8 are named, but the general expectation is that the soon-to-debut 8mm video format will render both obsolete.

Lammers, David. "JVC Takes a Second Crack at Enhanced VHS-Recording System." *Electronic Engineering Times* no. 1005 (May 04, 1998): 10-10. Accessed November 2011.

<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/208121173?accountid=12768>.

Article reporting on JVC's plans for the new S-VHS-ET decks. Explains some of the economics behind the company's decisions on how to sell the new machine.

Lardner, David. *Fast Forward: Hollywood, the Japanese, and the Onslaught of the VCR*. New York: W. W. Norton, 1987

History of the development of the home video industry; consulted mainly for details on the rise of VHS.

Levine, Martin. "S-VHS: What's Taking So Long?" *Video Review* 10:4 (July 1989): 21-23

An article lamenting the failure of the S-VHS format to win over consumers from a magazine which had been an early advocate. Possible reasons for this - technology issues, the nature of the market - are suggested.

Luitjens, S. B. "Magnetic Recording Trends: Media Developments and Future (Video) Recording Systems." *IEEE Transactions on Magnetics* 26:1 (January 1990): 6-11. Accessed November 2011.

http://ezproxy.library.nyu.edu:6211/xpls/abs_all.jsp?arnumber=50474

A comparison of various magnetic tape-based recording software, including Hi8 and conventional VHS tape in addition to S-VHS.

Mannes, George. "Indy's *Crusade* Launched on S-VHS." *Video Review* 10:11 (February 1990): 22

A report on the announcement of the S-VHS release of *Indiana Jones and the Last Crusade*; unintentionally hints at the dire state of the market for prerecorded tapes in that format.

Mannes, George. "JVC S-VHS VCR, Model HR-S5800U." *Video Review* 12:2 (May 1991): 50-51

Review of a JVC deck specifically outfitted for video editing.

Marlow, Eugene and Eugene Secunda. *Shifting Time and Space: The Story of Videotape*. New York: Praeger, 1991.

History of video from its beginnings in the early part of the 20th century to the late 1980s, though concentration is obviously on the major developments of the post-television era. Consulted mostly for accounts of rise of home video in 1980s, which contains several funny interviews with George Atkinson.

Mason, Terry and John Howard. "Data Recording using VHS." *Communications International* 21:5 (1994): 44-44. Accessed November 2011.
<https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/213217482?accountid=12768>.

Highly technical explanation of the possible uses of VHS and S-VHS for data recording. Article appears to be sound and is a useful reminder of how the format was being taken advantage of in unexpected ways, but it probably worth nothing that it was written by "managing director of Avalon Electronics, a British company specialising in the design and manufacture of a wide range of S-VHS video and data recorders."

Meigs, James B. "Super!" *Video Review* 8:4 (July 1987): 37-41, 104-107
Breathless report of the debut of S-VHS and review of the first machine from JVC.

Moran, James M. *There's No Place Like Home Video*. University of Minnesota Press, 2002
Dense, theory-based treatment of video aesthetics.

Nagaoka, Yoshimichi, Masahiko Tsutara & Hisashige Fujiwara. "High Performance VTR Based on the S-VHS Format." *IEEE Transactions on Consumer Electronics* 34:3 (August 1988): 560-564. Accessed November 2011. http://ezproxy.library.nyu.edu:6211/xpls/abs_all.jsp?arnumber=20154

Highly technical explanation of the S-VHS system from JVC's own research and development lab. Focuses on both the properties of the tapes as well as the decks.

"News Buy," *Broadcasting*, 122:24 June 8, 1992 Accessed November 2011.
<https://getit.library.nyu.edu/go/3267899>

Very short notice of Fox TV's purchase of S-VHS equipment for its 140 local affiliates.

Quain, John R., "NEC S-VHS VCR, Model DS-8500U." *Video Review* 11:5 (August 1990), 82-84
Review of NEC S-VHS VCR for videophile press.

Quain, John R., "Mitsubishi S-VHS VCR, Model HS-U82." *Video Review* 11:10 (January 1991), 46-47
Review of Mitsubishi S-VHS VCR for videophile press.

Quain, John R., "Toshiba S-VHS VCR, Model SV-771." *Video Review* 11:11 (February 1991), 34-35
Review of Toshiba S-VHS VCR for videophile press.

Ranada, David. "RCA S-VHS VCR, Model VR740HF." *Video Review* 12:6 (September 1991): 44-46
Review of later-model RCA S-VHS VCR in videophile magazine.

Schwartz, Dan. "The Sony SLV-R5UC: A New Look for S-VHS." *The Perfect Vision* 3:12 (Winter 1991/1992): 67-70

Review of a later-model Sony S-VHS deck. Focuses briefly on the format's ability to copy other video media.

Somerfield, Harry. "It's Hard to Find S-VHS Software," *The Orlando Sentinel*, August 6, 1988. Accessed November 2011. http://ezproxy.library.nyu.edu:2784/iw-search/we/InfoWeb?p_product=AWNB&p_theme=aggregated5&p_action=doc&p_docid=0EB4ECD0182DFEE8&p_docnum=1&p_queryname=1

Article on the relative scarcity of S-VHS prerecorded tapes, with some discussion of the technical vagaries of manufacture.

Somerfield, Harry. "New S-VHS Tapes Are Worth the Wait." *The Orlando Sentinel*, January 14, 1989. Accessed November 2011. http://ezproxy.library.nyu.edu:2784/iw-search/we/InfoWeb?p_product=AWNB&p_theme=aggregated5&p_action=doc&p_docid=0EB760A3B81EB669&p_docnum=1&p_queryname=1

Press release concerning Super Source Video's plan to sell prerecorded S-VHS tapes.

Stewart, Al. "Suppliers Still Take Dim View of S-VHS Titles." *Billboard*, June 11, 1988. Accessed November 2011. <http://ezproxy.library.nyu.edu:34344/docview/226963574/1335E8531F161B703FE/6?accountid=12768>

Surveys attendees at the Consumer Electronics Show, many of whom are pessimistic at the prospects of S-VHS finding a foothold in the marketplace. Lack of prerecorded tapes is a major complaint, but other flaws are pointed out as well.

Takiff, Jonathan. "Software to Fast-Forward S-VHS Choice of Super Tapes is Growing, But in Slow-Mo." *Philadelphia Daily News*, April 21, 1988. Accessed November 2011. <http://ezproxy.library.nyu.edu:34344/docview/429055650/1335E7DC7CE53A23388/1?accountid=12768>

Newspaper story of new developments in manufacture of prerecorded S-VHS tapes. Outlines the catch-22 that consumers and manufacturers found themselves in at the technology's debut.

Tarr, Greg. "S-VHS Format Making VCR Comeback." *TWICE* 15:1 (Jan 06, 2000): 131-132+. Accessed November 2011. <https://ezproxy.library.nyu.edu/login?url=http://search.proquest.com/docview/232287395?accountid=12768>.

Report on preparations for the 2000 Consumer Electronics Show. Five major electronics companies plan to debut new S-VHS-ET decks. Despite this, the article is careful to note that sales of VCRs have been stagnant as of late.

"Upgrade Update, Synchronised S-VHS Data Recording." *Jane's International Defence Review*. April 7, 1997. Accessed November 2011. <http://search.janes.com/Search/printFriendlyView.do?docid=/content1/janesdata/mags/idr/history/jdu97/jdu00494.htm>

Brief piece announcing development of a new means of utilizing S-VHS to record data for military intelligence. Sparing in detail, it does mention that this is a product of Avalon Electronics, the same company featured in another article about data recording utilized for this paper (Terry Mason and John Howard's "Data Recording Using VHS")

"Video Cassette Recorder Owner's Guide." Mitsubishi Electronics America Inc, 1993

Instructional manual for the Mitsubishi HS-U69 S-VHS VCR. Outlines features of the deck, but doesn't go into any great technical detail.

Warren, Rich. "3M's Pioneering Spirit Makes It a Leader in S-VHS Production." *The Orlando Sentinel*, January 9, 1988, accessed November 2011. <https://getit.library.nyu.edu/go/3268840>

Article on 3M's role in development and manufacturing of S-VHS tape, with revealing detail on the finickiness of the tape-production market.

Wasko, Janet. *Hollywood in the Information Age*. University of Texas Press, 1994

General account of the effect of information technology on the American film industry. Consulted for information on rise of home video in 1980s.

Wasser, Frederick. *Veni, Vidi, Video: The Hollywood Empire and the VCR*. University of Texas, 2001.

General history of the development of the home video industry and its effect on the American film industry.

Whittaker, Ron. *Video Field Production*, 2nd ed. Mayfield Publishing, 1996

Video production textbook. Some treatment of S-VHS, but nothing terribly in-depth.

Woodcock, Rod. "The Mitsubishi HS-U71 S-VHS VCR." *The Perfect Vision* 2:6 (Winter 1990): 89-92

Review of S-VHS deck featuring the "half-load" transport system, in which a section of the tape loop is held against the control drum at all times. This was a then-unusual feature for VHS of any sort (S- or otherwise), although it had been commonplace, in a slightly different form, in Beta decks (and much appreciated by fans of that machine). Only upon the advent of the S-VHS as an editing deck and the need for add-ons like indexing, more accurate read-out systems and the like was this resurrected from the older format.