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An Unfulfilled Dream: Telcan, Wesgrove and the Quest for the First Home VTR

> *A year or so ago, there was a magic word spiraling to fame–and the word was "Telcan." The word turned out to be mostly mythical.*
> *-Popular Electronics, December 1965*[1]

Part I: Telcan

On June 24, 1963, members of the Nottingham Electric Valve Company[2] introduced a remarkable new device to the British public at the BBC's Alexandra Palace. Much to everyone's surprise, what appeared to be a standard ¼" open reel audio deck was able to record and playback a television signal! The Telcan, named for "television in a can," was small enough to sit on top of the TV set to which it was connected, and had the low proposed price tag in the UK of £62 ($174 USD). Within a week, the Telcan was demonstrated on the BBC's *9 O'clock News,* and on July 3rd it was featured on NBC's *Today Show* in the United States.[3] Unfortunately, for all its innovation, neither the Telcan, nor its successor the Wesgrove VKR-500, was a commercial, or even really, mechanical success. The inventors were repeatedly beset by business setbacks, and ultimately, the technology simply wasn't able to produce its intended effect.

The Telcan was the creation of two old friends from Nottingham, England, Norman Rutherford and Michael Turner. Rutherford and Turner had created a partnership in the late 1950s, refurbishing cathode ray tubes. Eventually their work led them to develop a closed circuit television system that they named the NEV1 Mini-Eye after their company, the Nottingham

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[1] Walter G. Salm, "Home Video Tape Recording–When?" *Popular Electronics*, December 1965, 63.
[2] Norman Rutherford (age 30), Michael Turner (age 29), Brian North (age 28), Jack Jones (age 42), as published in "Canned Shows to View at Your Leisure," *The Stage and TV Today*, June 27, 1963, 11.
[3] "Consumer Electronics," *Television Digest*, July 8, 1963, 11.

Electric Valve Company (N.E.V.Co).[4] The Mini-Eye brought N.E.V.Co to the attention of England's media giant, Granada Television, who bought a 75% stake in the company and gave it a much needed infusion of research and development funding.[5] By this point in the early 1960s, video recording had become a central focus of the broadcasting industry, but it had yet to be developed in any meaningful way for the home market. Granada wanted to see that changed and encouraged Rutherford and Turner to take it on as their next challenge.

The central idea behind the Telcan was to start with a longitudinal ¼" magnetic audio recorder, and adapt it in such a way to produce the bandwidth necessary to capture and playback a video signal. Writing at the time on bandwidth requirements, *International TV Technical Review* explained: "With the best conventional audio recorders we can handle around nine octaves… for full video coverage, we need to embrace a range of no less than *seventeen* octaves."[6] To achieve this, Rutherford and Turner decided that *ideally* they wanted to cover a frequency spectrum of 20 Hz to 3MHz, i.e., 3MHz bandwidth. That said, given that they were originally working with monochromatic 405-line television, they realized that at least initially, 2.5MHz would suffice.[7]

The first critical step to improve bandwidth was a significant increase in tape speed over the audio recording standard of 7.5 inches per second (ips) used by the recording devices from which they were adapting their design. As a comparison, professional broadcast video recorders, such as machines manufactured at the time by Ampex and RCA, accomplished the necessary speed by utilizing four rotating heads and a helical scan that produced a head-to-tape speed of

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[4] Barrie Blake-Coleman, "Telcan Home Video," *EPE Online*, April 2000, 319.
[5] Ibid, 320
[6] E.P.L. Fisher, "Telcan," *International TV Technical Review*, July 1963, 239.
[7] Barrie, 320.

1570 ips.[8] Such machines, however, cost thousands of dollars, and Rutherford and Turner were aiming for the typical home consumer. The only way to keep the price-point low was to employ a stationary head in a linear system. And the only way to reach the bandwidth they needed with a stationary head was to increase the tape speed from the audio standard 7.5 ips to a blazing 120 ips.

The dramatic increase in tape speed was a mixed blessing. While it accomplished its intended task, it also came with drawbacks. First and foremost, it meant that the Telcan required a tremendous amount of tape–while a standard audio recording used 37.5 feet per minute, the Telcan used 600. To moderate the problem, the track layout was designed in such a way that users could record on both sides of the tape, but even so, an 11" spool (the maximum the machine could accommodate) only allowed for about 15 minutes on each side.[9] The accelerated speed also meant that the record head was only expected to last for 100 hours. When one factored in replacement head expenses, along with the cost of the volume of tape required, the low initial price tag started losing its appeal. Finally, as will be addressed more later, if things were not operating properly, 120 ips could lead to a gnarled mess of tape *very* quickly.

Tape speed alone was not enough to reach the 2.5MHz bandwidth threshold required for a 405-line video signal. Rutherford and Turner also made significant revisions to standard magnetic transducer heads to make the leap from audio to video longitudinal recording and playback. Shortly after the June Telcan demonstration, *International TV Technical Review* author E.P.L. Fisher explained a critical provisional patent application (the first of four) submitted by N.E.V.Co to the British Patent Office on April 22, 1963:

> Patent No. 15693 describes a video transducer head capable of recording magnetic tape to a packing density approximately four

[8] Fisher, 239.
[9] "The Sound Scene: At Last the Home T.V. Tape Recorder," *Amateur Tape Recording*, August 1963, 27.

> times greater than with conventional magnetic-recorder heads. The head incorporates unusual constructional and electronic features enabling it to operate over a far greater octave range, with a much higher signal-to-noise ratio, than is attainable with conventional transducers.[10]

Essentially what Rutherford and Turner had to overcome was the head gap on standard transducer heads that was simply too wide to allow for the bandwidth they needed. They tried narrowing the gap on existing magnetic heads, but that lead to an unacceptable increase in the signal-to-noise ratio.[11] The only solution was to construct their own head from scratch, and eventually they settled on a 2-part cross-field head in which "the passive section was made of two screw adjustable copper arms nominally separated at the rear by a 200 micron gap with a tape face gap of just under 50 micron."[12]

In addition to the transducer patent, N.E.V.Co filed three additional patent applications for the Telcan. Patent No. 15695 outlined a proprietary amplifier which was better equipped to handle the wide frequency range being output from the connected television set. Patent No. 15696, considered by Fisher to be particularly revolutionary, dealt with "improvements in wider-band magnetic recording." Fisher went on:

> This patent in fact describes a recording technique which increases the subjective resolution apparent in a recorded television picture, the high resolution being a direct result of the recording technique and NOT a subsequent signal processing.[13]

Combined with Patent No. 15694, which outlined a complete television recording *system* incorporating the other three patents, N.E.V.Co seemingly now had the first ever low-cost home VTR ready for market.

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[10] Fisher, 238.
[11] Barrie, 320.
[12] Barrie, 320-1.
[13] Fisher, 238.

Once Norman Rutherford and Michael Turner completed the Telcan prototype, their partners at N.E.V.Co, Jack Jones and Brian North, got to the business of promoting and selling it. In addition to television appearances in the UK on the BBC, ITV and ATV, there was a clear effort to have the Telcan featured in written publications on both sides of the Atlantic. The following technical specifications seem to have been the first released by the company, having appeared in multiple articles from late June of 1963 through August of 1963.[14]

> Playing Time - 30 minutes. 2 x 15 minutes.
> Maximum spool size - 11"
> Resolution - 300 lines peak white
> System Rise Rate - 0.02 micro sec.
> Signal to noise ratio - 28 dbs.
> System tape tracking - Double.
> Sound System - Signal to noise ratio - 40 dbs.
>
> The unit can be produced to operate on the 405-line British system, the 525-line American system and the 635-line Continental system.
>
> Size - 17" long x 9" wide x 2" deep with a 4" protrusion for motor housing.
> Weight - 15 lbs.

By September of 1963, an American *Popular Electronics* article listed a released playing time of 20 minutes per side (up from 15) but made a point to say that: "Technical information available to date on 'Telcan'... is sketchy."[15] The article's title: "British Manufacturer *Claims* [my emphasis] A Home Television Recorder for Under $200" seems fitting given the amount of skepticism that surrounded the Telcan's introduction.

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[14] Published in part or whole in "The Breakthrough to Home Video," *Television Mail*, June 28, 1963, 11.; "Canned Shows to View at Your Leisure," 11.; "The Sound Scene: At Last the Home T.V. Tape Recorder," 27.
[15] W. Steve Bacon, "British Manufacturer Claims a Home Television Recorder for Under $200," *Popular Electronics*, September 1963, 60.

US broadcast engineers in particular found the Telcan Company's pronouncements to be suspect. The trade publication *Television Digest* covered the Telcan quite closely throughout the second half of 1963. Declaring the occurrence of a "first impartial report on Telcan," in their August 12th issue, the publication stated:

> Engineers who inspected machine dissatisfied on several points: (a) They likened picture quality to transatlantic newsfilm shots transmitted via undersea cable…. (2) Recording head reportedly has life of only 100 hours... (3) Machine's appetite for tape (nearly 7 miles of it for 60-min. recording) makes it uneconomical. (4) Fact that it will only record 15-20 min. without reversing or changing reel makes it inconvenient.[16]

The same issue also announced: "Study team also had reservations about cost figures submitted by Telcan, feeling that in actual production they might several times as high,"[17] and the following week *Television Digest* proclaimed: "Until curtain of secrecy is lifted, non-engineering people tend to be extremely excited about development, but opinion among engineers remains decidedly dubious."[18]

At the same time that the Telcan's creators were pushing their product out into the world, (and fighting for its reputation), they were also dealing with a major business setback. Granada Television, once N.E.V.Co's great champion and investor, had decided to pull out of the company before the Telcan's launch. Fortunately, another partner quickly materialized, the US-based Cinerama who took rights to "manufacture, market & promote Telcan outside British Commonwealth and 'certain common market countries.'"[19] By early September, Cinerama had announced that a US demonstration of the Telcan would be held "within several months," and speaking on behalf of the product's technology stated: "The quality of the picture can be greatly

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[16] "Consumer Electronics," *Television Digest*, August 5, 1963, 7.
[17] Ibid.
[18] "Consumer Electronics," *Television Digest*, August 12, 1963, 8.
[19] "Consumer Electronics," *Television Digest*, September 9, 1963, 8.

improved rather rapidly. The combination of thinner tape and slower speed can provide more recording per reel.[20] Whether N.E.V.Co's partners were feeding questionable information to Cinerama, or Cinerama was taking significant liberties with reality as a marketing strategy, most press about the Telcan over the next year (in hindsight) was marked by unfulfilled promises and suspicious statistics. One article containing particularly questionable information that appeared in the British trade publication *Television Mail* is worth quoting at length:

> Cinerama are at present stockpiling colour tapes of programmes on the American networks for use by the American purchasers of the Telcan when it goes into mass production…. In fact Cinerama are using prototype Telcans to record the colour programmes at the moment…. Cinerama-Telcan Ltd. which are to manufacture the Telcan in the USA, believe that they will produce 300,000 in the first year and over one million within three years. Telcan [meaning the British only firm] are already committed to producing 30,000 and have orders for almost 20,000.[21]

At the time of this publication, there were no arrangements for the Telcan to go into mass production in *either* the US or England, nor would there *ever* be in either country. Promises of release dates "in time for Christmas" came and went, and the original suggested US price of "around $160" that was supplied to the press, became "definitely under $500, possibly a lot cheaper" per Cinerama.[22]

Although there was much skepticism surrounding the Telcan's viability, the newly formed company Cinerama-Telcan Ltd. went forward with US demonstrations in New York, first to Cinerama shareholders on December 13, 1963, and then to the electronic trade press the following day. According to a *New York Times* reporter in attendance on the 14th: "The test was conducted under wretched conditions in the basement of the Cinerama Theater at Broadway and

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[20] Ibid.
[21] "Now-Home VTR in Colour," *Television Mail*, September 13, 1963, 6.
[22] *Television Digest*, September 9, 1963, 8.

51st Street."[23] The event had been setup to demonstrate both recording/playback of American 525-line television off the air, as well as 405-line closed circuit recording using a British vidicon camera and TV set.[24] Unfortunately, due to the basement location, the raw television feed off the air was "of poor quality–ghosty & snowy–and closed-circuit live pictures were just barely acceptable."[25] Irrespective of the starting quality of the raw imagery, according to *Television Digest* "playback tape pictures showed definite degradation–coarseness, low resolution, poor detail,"[26] and the publication concluded "Several aspects of what we saw & heard disturbed us…."[27]

Seemingly in an attempt to spin the story, at the same event, the British Telcan team announced that they had already "booked orders for 100,000 recorders in England," with a retail target date of April-May of 1964.[28] Cinerama gave a similar timeline for units to hit the US market, yet of course, neither concern had manufacturing partnerships in place, and clearly the Telcan itself required additional work. Coming out from the behind the cloud of hype, Norman Rutherford himself was quoted by *Popular Electronics* as saying "the disclosure of the machine was premature–and this [New York] showing is also. Unfortunately, they were necessary to finance further development."[29] Further development *would* happen, but only for a short time under the name "Telcan." Within eight months of the US demonstrations, Rutherford had put the Nottingham Electric Valve Company into voluntary liquidation. Upon hearing "unconfirmed reports" of the N.E.V.Co end, Cinerama doubled down and issued a statement that its rights were

[23] Jack Gould, "TV: Studio Tape Recorder in the Family Parlor," *The New York Times*, December 17, 1963, 60.
[24] "Consumer Electronics," *Television Digest*, December 23, 1963, 7.
[25] Ibid.
[26] Ibid.
[27] Ibid.
[28] Ibid, 7-8.
[29] "Telcan–TV Tape Recorder Progress Report," 69.

unaffected, and it was "concluding its first production and marketing arrangements."[30] That said, no units were ever manufactured in the US, and as of the time of the New York demonstration, Rutherford had conceded that only 25 British versions of the Telcan had been produced[31]–only two are known to exist today.[32]

Part II: Wesgrove:

While the liquidation of N.E.V.Co could not have been good for morale, it did not mark the end for Rutherford and Turner's dream of bringing the first "low-cost" home VTR to market. In short order, the old partners set up a new outfit called Wesgrove, which they staffed with the majority of their former colleagues from N.E.V.Co. Seizing the opportunity to shed the tarnished reputation of the Telcan, Rutherford and Turner got to work redesigning their prototype and emerged with the vastly improved Wesgrove VKR-500.

"VTR for less than £100–available now" announced *Television Mail* on November 6, 1964, and with that, the VKR-500 hit the market in "easy-to-assemble" kit form, shipped directly from Wesgrove. A pre-assembled version was also made available from Wesgrove for £150 and kits shipped to US customers averaged around $400 USD. The *Television Mail* article continued:

> System described by the manufacturers as non - integrating - sync – regeneration. Though details are not available, this would appear to mean that the sync signals–timebase etc–which take up such an important segment of the bandwidth in professional video recorders, are not recorded but are artificially regenerated by the recorder.[33]

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[30] "Cinerama Says Telcan Rights are Unaffected by Developer's Plight," *The Wall Street Journal*, August 17, 1964, 4.
[31] Ibid.
[32] One Telcan is on display at the Wollaton Hall Industrial Museum in Nottingham, England, and the other is in the private collection of Al Cox in San Francisco.
[33] "VTR for less than £100–available now," *Television Mail*, November 6, 1964, 4.

In addition to the sync generator change, the VKR-500's launch specs informed customers that the new unit allowed for a tape speed choice of 90, 120 or 150 inches per second, which in turn meant offering record length options. Other improvements were implemented across the technology, leading *Radio-Electronics* kit-builder, Melvin H. Shadbolt, to remark: "Although the new Wesgrove recorder is supposedly an outgrowth of the old Telcan… comparison of photographs of the Telcan and the VKR-500 indicate that the Wesgrove machine has been completely revamped–at least mechanically."[34]

Shadbolt's detailed review of the VKR-500 provides much useful information about the device, beginning with his observation that it's "stripped of all fanciness… the major portion of the recorder's cost is apparently in the mechanical and electrical components–both of high quality."[35] With this in mind, he explains that only four controls are provided: "record/playback, stop/start, video azimuth adjust and video playback gain control." In light of this he laments: "Many of the features you would like to see, such as rewind provisions, quick changeability of tape speeds and handy access to all adjustments just aren't to be found."[36] Although Shadbolt expresses some disappointments, first and foremost he seems delighted that the Wesgrove kit has actually arrived, and that he has the opportunity to assemble it and see it work. His review includes a detailed outline of the tape transport path, explaining that the tape first passes a permanent magnet, which erases it with dc, thereby eliminating "possible interference with the wide-band video signal."[37] From there the tape passes the audio head, which records a 20 mil wide FM signal just below center, and then moves on to the video head where a 70 mil wide

[34] Melvin H. Shadbolt, "We Built a Home Video Tape Recorder," *Radio-Electronics*, June 1965, 30.
[35] Ibid, 31.
[36] Ibid.
[37] Ibid.

video signal is recorded as the bottom track. Finally, the tape travels between the capstan and the pinch roller and is wound onto the takeup reel.

Shadbolt notes that the video head is central to the VKR-500's successful operation, and deems it "the only unusual item on the tape deck."[38] He confirms that like the Telcan, the video head is made in two parts and he guesses that the gap is 1 micron.[39] A 2016 report from an "obsolete video" enthusiast who has acquired a (non-functioning) VKR-500 and an unused video head, confirms the exceptionality of the head and describes it in much greater detail.

> This head is fabricated from two halves that mated together to form the whole. Placed between them, as separator, is a sheet of hand beaten aluminum foil only 4/1,000,000 of an inch thick! This forms the precise gap width necessary for the head to function…. The electromagnetic coil assembly... is separate from the gap forming magnetics in this design A tiny ferrite ring is used. A gap is cut through it using a tiny wire saw. The finished product resembles the letter C. Onto this c-core, 16 turns of AWG 39 copper wire are wrapped opposite the gap. The ends of this coil are attached to the contact posts and the entire item is potted in plastic. When energized, the coil of wire induces magnetic force in the ferrite ring that exits the ring where the gap is cut, passes right through the recording tape and is concentrated by the mumetal poles in the copper head. The weak field of the ferrite torroid [sic] is concentrated to very high power at the recording gap. Away from the gap, the field is not strong enough to effect the tape and passes through it harmlessly.[40]

Returning to specifications distributed by Wesgrove at the time of the release, Shadbolt and other early reviewers list the following:

Tape Format: ¼" Magnetic Maximum spool size - 11.5" Playing Time: 60 minutes (2 x 30 minutes) at 7.5 ft/sec using 11.5" spool Track Alignment: 1 video at bottom (70 mil wide), 1 audio above (20 mil wide) in each direction (total 4 tracks)

[38] Ibid.
[39] Ibid.
[40] http://www.labguysworld.com/WESGROVE_VKR-500.htm (accessed November 25, 2016).

Size: 19 ¾" x 9 ¼" x 19 ½"
Weight: 28 pounds

Record/Playback Heads: 1 video, 1 audio (erase provided by magnet)
Power Consumption: 200 watts
Motor: 1/10 horsepower

System Frequency Response: 1KHz to 2MHz (video), 50Hz to 10Khz (audio)

The unit can be operated on the 405-line British system, the 525-line American system and the 635-line Continental system, to be specified upon ordering.

While the design of the video head seems to be similar to that of the Telcan, one big change with the VKR-500 is that the video head is now heated. Even at the VKR-500's lowest tape speed of 90 ips, the iron-oxide coating on the tape acts as an abrasive which wears down the video head. By heating the head whenever the tape is moving with an "energized one-watt power resistor"[41] the oxide coating is able to flow across the head rather than scraping against it. Clearly the Telcan's 100-hour head lifespan was heavily criticized, and by using the heated system, the VKR-500 is able to double the projected head lifespan to 200 hours. The biggest post-purchase financial concern related to the Telcan however, the volume of tape necessary to make recordings, is not particularly addressed. While 90 ips is given as an option, that speed still requires 450 feet of tape per minute. And given that reviewers running the machine even at top speed report a picture that leaves something to be desired, ("fuzzy and a bit jittery on occasion" as one writes,[42]) one can only assume that most users would opt to run the recorder at 150 ips, requiring 750 feet of tape per minute.

[41] Ronald M. Benrey, "PS Builds a TV Tape Recorder… and So Can You," *Popular Science*, August 1965, 105.
[42] Ibid.

In addition to Shadbolt, several other journalist enthusiasts wrote published accounts of their Wesgrove VKR-500 kit-building experiences. Levels of success varied, but overall, the tone among the authors was one of excitement. It's clear from reading the various articles, that the VKR-500 kit was still being modified after its initial release, so perhaps the level of success depended on which version the builder received. The reviewer for *Electronics Illustrated*, for example, captioned an image on the first page of the article: "World's first home TV tape recorder, in photo supplied by manufacturer, seemingly works like a breeze. Unit we assembled proved less able."[43] The most negative reviewer among them, the US-based author of the *Electronics Illustrated* article explains that although at the time of publication (September 1965) there was an American distributor, when *Electronics Illustrated* purchased the kit, it was only available directly from England. Describing what is clearly an early-stage release, he writes of the package he received from Wesgrove:

> The kit was accompanied by a 32-page instruction manual, which, being typewritten and duplicated, suggest hasty preparation. It also allows conveniently for modifications, of which there already have been more than a few. Our copy of the manual was marked *Issue 3* and contained 2½ pages of amendments and additional instructions, including six circuit modifications. Parts for four of the changes were contained with the kit, though those for the remaining two were not.[44]

Modifications are clearly in evidence when comparing Shadbolt's June 1965 review, in which he states that the circuit board incorporates 22 transistors and 10 diodes,[45] to a March 1965 article in *Tape Recording* (UK Edition) which lists 24 transistors and six diodes.[46] A third review of a kit from England, written by American Ronald M. Benrey for the August 1965 issue of *Popular Science*, lists *23* transistors! Benrey also has strong words about the instructions

[43] "EI Tests a Home TV Tape Recorder," *Electronics Illustrated*, September 1965, 64.
[44] Ibid.
[45] Shadbolt, 31.
[46] Peter L. Bastin, "Do-It-Yourself Video," *Tape Recording,* UK Edition, March 1965, 103.

accompanying the kit, declaring: "The manual I got was the worst I've found in an electronic kit."[47] He goes on to say that a newly revised manual is better, but still "nowhere near as comprehensive as manuals of major U.S. kit makers."[48] As for the experience of assembling and adjusting the VKR-500, Benrey reports that it takes him a total of 150 hours, and the resulting device "makes noises like a runaway lawnmower, and occasionally chews up a reel of tape, and may catapult a half-full reel across the room."[49] Nonetheless, Benrey is clearly delighted to report that: "In spite of its shortcomings, the VTR-500 *does* record and play back television through my TV set."[50] He continues his love/hate relationship with the VKR-500 writing: "Next to watching playback of a TV show, the most amazing sight from the VTR-500 is the horrendous tangle that develops if the tape goes haywire. If the tape breaks or slips out of its guides, usually 200 or so feet of tape wind up on the capstan before you can cut the power."[51]

The overall takeaway from the reviews discussed above, as well as others, is that although the VKR-500 was a groundbreaking development, it certainly was not ready for mass market. While successful kit assembly was within grasp for some, as *Electronics Illustrated's* writer concluded: "The VKR-500 clearly is not a kit for the builder who is not prepared to experiment as only a technically qualified hobbyist can."[52] As for the quality of the recorded image, some customers were excited to be able to produce any sort of a picture, while others were disappointed by what they saw. One reviewer who was hoping to get a true sense of the VKR-500's potential went to the Wesgrove showroom in England, but was told by Jack Jones that "he [Jones] could not carry out a direct comparison test, due to rather bad interference on TV

[47] Benrey, 106.
[48] Ibid.
[49] Ibid, 103-104.
[50] Ibid, 104.
[51] Ibid, 105.
[52] "EI Tests a Home TV Tape Recorder," 114.

reception,"[5354] Jones showed the reviewer a prerecorded program, but even that had some issues. The reviewer concluded: "It was difficult to judge honestly whether the flashings and slight distortions were due to replay or the original TV signal."[55]

Ultimately, the Wesgrove VKR-500 went further than its predecessor, the Telcan, but it certainly didn't live up to its creators' dreams. According to a May 1965 article, around 1000 VKR-500 units had been produced, most of them in kit-form,[56] so whether they were ever assembled and/or able to record and playback a television signal remains unknown. Subsequent reporting on units sold was not available, and an article published in May of 1966 stated that a public relations firm acting as Wesgrove's US spokesman had declared: "The project failed and was discontinued."[57] In the end, Rutherford and Turner were not able to achieve their dream, and it would be decades before the sort of widespread home video recording use that they had imagined would become a reality.

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[53] Bastin, 103.
[54] I cannot help thinking that this was an excuse because Jones knew the VKR-500 would not perform at a satisfactory level.
[55] Bastin, 103.
[56] David Lachenbruch, "V.K. Firm Eyes Home Video Tapes," *Billboard*, May 15, 1965, 57.
[57] "What's With the Home Video Recorder?" *Broadcasting*, May 23, 1966, 80.

Annotated Bibliography

Books:

Daniel, Eric D., Mee, Denis C., and Clark, Mark H. eds. *Magnetic Recording: The First 100 Years*. New York: The Institute of Electrical and Electronics Engineers, Inc., 1999.

This book provides a comprehensive account of the history and principles of magnetic recording. Chapter 10, entitled "Early Fixed-Head Video Recorders," written by Finn Jorgensen, provides an overview of the various fixed-head systems that preceded and followed the Telcan and Wesgrove VKR-500.

Articles:

Bacon, Steve W. "British Manufacturer Claims a Home Television Recorder for Under $200." *Popular Electronics*, September 1963.

This article is an account of the New York Telcan press event and includes photographs of a source image and recorded image from the demonstration. It provides technical details and recounts a conversation with Norman Rutherford.

Bacon, Steve W. "Telcan–TV Tape Recorder Progress Report." *Popular Electronics*, February 1964.

This is a two-page article with photographs that reports the British Telcan announcement to an American audience. It provides the specifications that have been released by Telcan Ltd., but makes clear that complete technical information is not available.

Bastin, Peter L. "Do-It-Yourself Video." *Tape Recording*, UK Edition, March 1965.

This is a fairly technical article with photographs that describes the mechanics of the Wesgrove VKR-500 and gives a mixed assessment of the device. The author visited the UK showroom for Wesgrove, and recounts his conversation with Jack Jones and a somewhat disappointing demonstration of the VKR-500.

Benrey, Ronald M. "PS Builds a TV Tape Recorder… and So Can You." *Popular Science*, August 1965.

This is a very readable account of the author's experience assembling a Wesgrove VKR-500 kit. He recounts the many challenges of the assembly (which takes him 150 hours) but he greatly enjoys the process. The article contains several photos, and he gives quite a bit of technical detail, including a good explanation of the reason for the heated video head. He incorrectly identifies the tape speed as 180 ips.

Blake-Coleman, Barrie. "Telcan Home Video," *EPE Online*, April 2000.

This is an extensive article with many photographs that provides both history and technical information related to the development and marketing of the Telcan. It is particularly noteworthy as the author interviewed Norman Rutherford, and can therefore report on matters to which other sources for this paper were not privy. The history of Rutherford and Turner's partnership and their relationship with Granada are especially useful. The article was republished with additional photographs on the website inventricity: http://www.inventricity.com/telcan-first-home-video-recorder.

"The Breakthrough to Home Video." *Television Mail*, June 28, 1963.

This article appears in a British trade publication and reports on the first demonstration of the Telcan in London. It lists the price of the Telcan along with many of the technical specs released by the company. It also speculates on the various uses of the Telcan once it hits the market.

"Canned Shows to View at Your Leisure." *The Stage and TV Today*, June 27, 1963.

This is a brief article reporting on the first demonstration of the Telcan in London. It provides information on the Nottingham Electronic Valve Company and the four partners behind the Telcan. It lists the technical specs released by N.E.V.Co.

"Cinerama Says Telcan Rights are Unaffected by Developer's Plight." *The Wall Street Journal*, August 17, 1964.

This article reports on Cinerama's response to learning of the voluntary liquidation of the Nottingham Electric Valve Company.

"Consumer Electronics." *Television Digest*, August 5, August 12, September 9, December 23, 1963.

The American trade publication Television Digest continually reported on the Telcan throughout the second half of 1963 in its "Consumer Electronics" section. Overall, the publication is quite skeptical of the device with regard to mechanics, pricing, and distribution schedule. It's a great resource to track the progression of the Telcan's release at regular intervals.

"EI Tests a Home TV Tape Recorder." *Electronics Illustrated*, September 1965.

This article is an account of the publication's assembly of a Wesgrove VKR-500 kit. They run into many problems and wind up having to involve Wesgrove in the process. By the end of the article the VKR-500 is still not working properly, and it is suggested that only a very experienced electronics hobbyist should attempt a kit assembly. The article also makes the point that elements from the circuit board to the instruction manual make it very clear that the product was rushed to market.

Fisher, E.P.L. "Telcan." *International TV Technical Review*, July 1963.

This is one of the first articles to provide any real technical detail about the Telcan after its announcement. Most importantly, the author outlines the four provisional patent applications submitted by Rutherford and Turner to the British Patent Office. The article also gives a good overview of the different bandwidth requirements for audio and video.

Gould, Jack. "TV: Studio Tape Recorder in the Family Parlor." *The New York Times*, December 17, 1963.

This article is an account of the New York demonstration to the electronic trade press. The author, who attended, describes the poor conditions of the demonstration site and the lackluster performance of the equipment. Nonetheless, he thinks the Telcan has potential.

Lachenbruch, David. "V.K. Firm Eyes Home Video Tapes." *Billboard*, May 15, 1965.

This article recounts an interview with Wesgrove's Jack Jones in which he talks about the company's desire to get into the business of distributing pre-recorded video tapes, and to release a device that only does playback and not recording. The article also gives numbers of VKR-500s produced to date.

"Now–Home VTR in Colour." *Television Mail*, September 13, 1963.

This article from a British trade publication discusses the partnership between Telcan Ltd., the UK owner of the Telcan VTR, and Cinerama, the intended US distributor of the Telcan VTR. The article reports that Cinerama has been using Telcan VTRs to record and stockpile color TV shows broadcast in America for future customers. It also provides high sales projection numbers for the Telcan in the US and Europe. I assume that the article is simply reporting information that was fed to the author by Telcan Ltd. and Cinerama, and consider it to be part of their marketing hype.

Salm, Walter G. "Home Video Tape Recording–When?" *Popular Electronics*, December 1965.

This is a five-page article with photographs that outlines several home VTRs including the Wesgrove VKR-500. It describes the difference between longitudinal and helical systems and gives pricing for the various devices.

Shadbolt, Melvin H. "We Built a Home Video Tape Recorder." *Radio-Electronics*, June 1965.

This is a highly technical, four-page article with photos recounting the author's experience assembling a Wesgrove VKR-500 kit. It was particularly useful for its descriptions of the track alignment and tape path. Sections include: "General Features," "Principles of Operation," "Weak Points," and "Conclusions."

"The Sound Scene: At Last the Home T.V. Tape Recorder." *Amateur Tape Recording*, August 1963.

This is a one-page article that appeared in a British hobbyist audio recording magazine. It lists the specs and basic operational info provided by Telcan Ltd., and speculates with excitement about the applications for the Telcan.

"TV Recorder at $160?" *Television Digest*, July 8, 1963.

This is a brief article reporting the British announcement of the Telcan to the American broadcast community. The article references the *Today Show* demonstration, but says that it was very difficult to gauge the quality of the recording due to differences between UK and US transmission standards.

"VTR for less than £100–available now," *Television Mail*, November 6, 1964.

This is a brief column in a British trade publication announcing the release of the Wesgrove VKR-500 following the failure of the Telcan.

"What's With the Home Video Recorder?" *Broadcasting*, May 23, 1966.

This article gives an overview of the challenges that many companies are facing trying to bring a home VTR to market. In addition to reporting on the failure of both the Telcan and the Wesgrove VKR-500, the article considers other fixed-head recorder creators, Par and Fairchild. The article also provides pricing for a variety of home VTRs.

<u>Websites:</u>

http://www.labguysworld.com/WESGROVE_VKR-500.htm (accessed November 25, 2016).

This website provides a description of its author's 2016 acquisition of a non-functioning Wesgrove VKR-500 that he hopes to recondition to working order. It provides a history of the specific VKR-500 that he has purchased, along with an account of its current state. The author has also acquired an unused video recording head from a former Wesgrove engineer, and he provides very detailed information about its construction and operation.