History of KVHS

1964 - 1978

The early days of KVHS will seem archaic to those familiar with today's technology. The station began when audio was imprinted on iron oxide magnetic tape and vinyl records of different sizes and recording speeds. Circuitry was just advancing from the electron tube age to "solid state". Solid State amplifier circuits were largely discrete transistors as whole audio systems on a chip were still a vision. There were no computers, no hard drives, and no CD's or MP3 recording format. Cell phones didn't exist. Business band two-way radios were just becoming solid-state equipment. Yet, somehow, the job of broadcasting was done quite well.

KVHS was born and nourished by the hard work and dedication of both teachers and students alike. No job or project appeared too large or complicated. They forged ahead by begging and borrowing, short of stealing, to meet the challenges of a constantly growing radio station. What couldn't be had by donation they built or modified with school and vocational education funds. One should never underestimate the power of a motivated high school student or pushing the rules and aspirations to the limit.

Period 1964 To 1969: Planting the seed & watching it grow

Some thought had been given to adding to Clayton Valley High School's social studies curriculum. Vice principal Bob Daugherty remarked that his high school in New Albany, Indiana had a radio station. Perhaps this would provide a tool for social studies, government, etc., through local and world news. A trial project was agreed upon and teacher Jim Copeland was to lead the project.

Bob Daugherty and Jim Copeland contacted the local FM station, KDFM in Walnut Creek. The station's engineer, Ernie Wilson, suggested a low power AM station might be considered. It would be the least expensive, be very short range and no license would be required. Ernie Wilson was also a night class electronics instructor at Diablo Valley College.

A small 100-milliwatt (.1 Watt) transmitter was designed and installed BY Mr. Wilson. It was completely enclosed in a short section of copper pipe fitted with end caps. Each end cap had a coaxial connector. Five-foot long wires were connected to each connector to form an antenna of 10 feet, the legal limit for this type device. This small transmitter was installed on the roof of the music building. Electrical power and audio signal were supplied by wires from the "studio" in the closet of the music room.

Mr. Wilson accepted a teaching position at San Joaquin Delta College in Stockton while continuing teaching evening classes at DVC. He remained an "engineer on call" for KDFM. The Vocational education director of the Mt. Diablo Unified School District offered Mr. Wilson an opportunity to teach summer electronics classes at CVHS. Wilson was already familiar with the AM station project and accepted the summer position.

Having been active in establishing a low-power AM station at CVHS, Mr. Wilson did the same at SJDC in Stockton. However, in that case, coaxial cable was installed around the campus with small "repeater" transmitters every few hundred feet to extend coverage. By 1971, after Mr. Wilson left SJDC, that AM station was upgraded to 10 Watts FM, KSJC.

The original equipment for the fledging CVHS station was less than minimal. It consisted of a consumer grade turntable and tape recorder from the Audio Visual department. Microphone and music mixing were accomplished through the tape recorder's inputs and volume controls. If the AV department needed a piece of equipment they simply took it back - thereby shutting down the station during its absence. The music library consisted of personal records and music recorded off of other radio station's broadcasts.

Only later did the equipment expand to include an audio mixer/console from SJDC. Egg cartons were used on the walls to reduce sound reflections. Later on two 16-inch turntables, gear driven by large motors with very heavy stands, joined the meager equipment. They were affectionately referred to as the "washing machines".

The AM station had no official call letters at that time. But, a campus "Radio Club" was established. The initial project leader, Jim Copeland, was no longer at CVHS. A Social Studies teacher, Ernie Spencer, was then acting faculty advisor.

While at SJDC Ernie Wilson arranged for a surplus RCA console to be donated to the CVHS radio club. Heavy and bulky the console was only a small step up in CVHS's station's equipment.

CVHS campus coverage was minimal. A couple of methods to improve coverage were tried, but which also required a different AM transmitter. One was to install coaxial cable in key buildings, most notably for social studies classrooms, which could radiate the signal. Another approach was to couple the transmitter's output through a fused matching network into the AC power lines – a method called "carrier-current".

News and history scripts were broadcast to captive student audiences. This would be in keeping with the original intent of the project – enhanced social studies. To serve this purpose, an Associated Press Teletype machine was subscribed for and placed in the library. The machine was quite noisy. To deaden the sound a large wooden box with a glass window was placed over the machine. While this reduced the noise, the library staff was then upset with radio students constantly coming in to remove the current sheet of news. In later years the AP machine was moved to the "loft" area above the electronics shop.

After two years at SJDC Ernie Wilson accepted teaching positions closer to home. These were part-time day and night classes at Diablo Valley College, and part-time electronics classes at CVHS. The electronics students at DVC became interested in their own low power AM station. Using a military 25 Watt AM transmitter modified for the broadcast band, a carrier-current station was established. The thought of a class D educational FM station to serve the Diablo valley came into being.

The MDUSD offered Mr. Wilson a full time teaching position at CVHS, which he accepted, but continued his night teaching position at DVC. The idea of establishing a low-power FM station was presented to the CVHS radio club, then to the principal and Mr. Daugherty. Given the go ahead, the students prepared a presentation for the school board. Student spokespersons presented the proposal. The school board members verbally fought over which would have the honor of making the motion to approve the project. The motion was made, seconded and unanimously passed.

Broadcasting then became part of the electronics classes. Students became involved with calculating the antenna height above the average terrain and other technical requirements of an FCC application. This was an application for a 10-Watt (class D) educational FM station. Call letters of KVHS were requested. The frequency of operation would be 91.1MHz. The FCC approved the application for a CP (Construction permit) and the harder work began.

Some surplus electronic equipment donated to CVHS by Systron-Donner of Concord, California was traded for an old GE 250 Watt transmitter, which contained a 10-Watt unit called an "exciter". The exciter portion was also FCC approved for use as a 10-Watt transmitter. A key component of the exciter was a tube called a "Phasitron". These tubes were becoming obsolete, but fortunately KGO-TV in San Francisco had several on hand which they donated to the project.

A former radio club member, Al Taddeo, was now attending San Diego City College. He became aware of a 2-bay "Ring" antenna, which the college no longer needed. He arranged for the donation of the antenna to CVHS. Ernie Wilson and engineer friend Dennis Collins of KWUN, Concord, flew to San Diego. They removed the antennae from a tower, returning the same day

with them as "carry on luggage" (those were the days you could do that). The antennae were then installed on a 30-foot tower on the music building.

To make a suitable studio for this new station additional equipment would be required. Much of this, coaxial cable, turntables, amplifiers, spare tubes, etc., was donated by San Francisco radio stations KFRC, KYA and KGO. Modern turntables replaced the old and tired 16-inch units.

The FCC was notified of the station's completion and equipment tests were conducted using just the 10-Watt exciter as the transmitter. Program tests began shortly thereafter.

The period of 1969 – 1975: Time for upgrades

During this period help was being received from Pacific Bell in regards to wire, cable and audio program lines. A used telephone company truck, a Ford Econoline Van, became available. The station could have it if the school district agreed. It was accepted and became part of the KVHS remote broadcast facilities. The van's exterior needed a lot of work. KVHS staff formed weekend work parties to sand off the old paint down to bare metal. It was then painted by one of the student's father as a donation from his auto paint shop. A wheel shop in Benicia donated magnesium wheels and new tires. The van was also equipped with two-way communications; remote broadcast transmitter and power inverter. The van served many occasions including, remote broadcasts, local news gathering, annual food drives, field trips, and parades.

Selected student program staff and the station advisor were also equipped with two-way communications. This allowed the station advisor to have contact with the station during non-school hours. Some selected students, with parental permission, were allowed to use their own cars to do on the spot reporting.

Electronics students designed and built an 8-channel audio control console for the studio. The School's metal shop produced its polished aluminum front panel. The wood shop made the cabinet. Many of the internal parts were purchased with vocational education funds. This was a stereo console with "Monitor", Audition" and "Program" selection for each of the 8 inputs.

Recorded shows, jingles and station ID's required a more-or-less quiet location and which did not use studio equipment. An unused bathroom in the shop building came to the rescue. Before the toilets were removed they served as legs for a plywood table. The toilets were sometimes used to accent a jingle or ID by being deliberately flushed.

The room was technically a "Production Room" complete with tape recorder(s), turntables and microphone. Production staff tended to shun tape-splicing equipment in favor of a single edge razor blade and Scotch tape. They became so adept at splicing this way they could edit out single words without a "pop" ever appearing on the tape. The staff being co-ed, and this being a High School venue, the Production Room was nick named the "Reproduction Room" due to its sometimes-unsupervised nature.

Of course 10 Watts FM is a pretty small station. Why not use the full capability of the whole transmitter? Why not apply for a 250-Watt (class A) station? Again students calculated the required technical information and submitted an FCC application to upgrade the station class and power. The FCC application was approved and students began the station upgrade.

But additional rules and operating procedures were required for transmitters with greater than 10-Watt output. Each operator of the station was then required to have a minimum of an FCC 3rd class license with broadcast endorsement. Each student had to study for the test to be held at the San Francisco FCC field office. Near the end of each semester a field trip was scheduled for all qualified students. After the test those students and Mr. Wilson often visited a notorious Restaurant in China town for lunch before heading back. The restaurant was called "Sam Wo's". It

sported a colorful waiter named "Edsel Ford Fung" who was merciless when teasing the students. "No fork….chopstick!" "pass out plates" To student coming from rest room "WASH HANDS!"

A class A station also requires an instrument to monitor frequency and modulation. More trading and a frequency and modulation monitor was obtained. It was mounted in an unused space above the 250-Watt amplifier section in the transmitter cabinet.

By this time the studio had outgrown its earlier location and was now located in an unused dressing room of the music building. The 250-Watt transmitter was located on one wall of the room. Again, staff work crews helped to build the table and cabinets required to hold the console, turntables, tape decks, etc.

Now, being a class A broadcast station, KVHS was made part of the Emergency Broadcast System. This required equipment to receive EBS alerts. In addition the station would have to broadcast random EBS tests.

The station originally broadcast only during school hours. It now had a much larger potential audience and, as such, should be allowed longer broadcast hours. Someone was always on campus by 7:00 AM Monday through Friday, so supervision was, at least, technically present. The Principal and School District authorities would allow evening broadcasts up to 10:00pm if supervision were provided. Station Operations managers jumped on the task of recruiting parents to supervise. Operations Managers prepared Parental supervisor schedules, with back up parents if required. The faculty advisor, Mr. Wilson, was always on call if needed. During Marathons, where the station continually broadcast for several hours over a weekend, parents supervised in shifts.

Stereo broadcasting was the next step. The old Phasitron monaural exciter had to go. Luckily Systron-Donner was still donating equipment to the electronics class. This time a couple of GHz frequency counters were traded with Sparta transmitters in Sacramento for a solid-state stereo 10-Watt exciter. This was an FCC approved replacement and was immediately installed.

Up to this time the FCC field office had not inspected the station. It would happen sooner or later so instead of waiting the station asked for an inspection. The inspection failed on two minor problems: (1) The stereo encoder of the exciter needed adjustment (2) a safety interlock switch on the transmitter cabinet's side panel was intermittent. Both were fixed easily.

Although Concord and Clayton had good reception, coverage was restricted to the east and west by the surrounding hills. Only a few selected locations in Walnut Creek and Pittsburg could receive the station.

Special guest lecturers visited the class from time to time. These included engineers and, on-air personalities from San Francisco as well as FCC engineers. In reciprocation staff members gave a presentation to BABES (Bay Area Broadcast Engineer's Society) at a luncheon in San Francisco.

A chance discovery was made when the broadcasting/electronics class was on a field trip to Hewlett-Packard in Mountain View. On the return home they happened to pass the Bauer transmitter company. One of the engineers was familiar with KVHS from when he was with Sparta transmitters. The class stopped to say hello and maybe get a quick tour of the facility. On the way out the back door they spotted a 100-foot triangular aluminum tower just laying in the yard. Do you want it? Asked the engineer. Who could say no? It was quickly decoupled into 20-foot sections and loaded into the school bus.

The turntable company, QRK, apparently had heard of KVHS through BABES (Bay Area Broadcast Engineers Society). They had a 10 Kilowatt transmitter and other equipment they would donate. The catch, the station would have to pick it up in Modesto. Mr. Wilson and two students, Rick Bartlett and John Tiberend, departed for Modesto in a school district's lift gate truck. The

transmitter was a monster and came in several pieces, 3 and 10 Kilowatt cabinets plus heavy power supply transformers. All of this was much heavier than expected requiring some additional help to raise the truck's lift gate.

This was an old transmitter but still had FCC approval for operation. The 10 Kilowatt amplifier section could not be used but the 3-kilowatt might. The final amplifier tubes of the 3 Kilowatt section, 7D21's, would be a problem. They were obsolete and costly even if they could be found. The power supply was inoperable and internal wiring a mess. But, if it could be repaired and modified it might be used to increase the station's power once again.

Jampro Antenna Company was contacted in Sacramento. Very enthusiastic about the school's project, they donated a 4-bay vertical, and 4-bay horizontal antenna with power divider and cables. They also donated the extra materials and connectors with which to modify the antenna for KVHS's frequency. The combined vertical and horizontal elements would provide spherical polarization, similar to circular polarization. This radiation technique would help reception regardless of a receiver's antenna orientation.

A new FCC application was prepared by students and submitted with all the necessary calculations for coverage area. Included in the application were documentation-showing modifications to the transmitter. Only the 3 Kilowatt section would be used following the already in place 250-Watt transmitter as the driver. Brass adapters and new sockets would allow newer final amplifier tubes to replace the obsolete tubes. The power supply would be modified from Mercury vapor rectifiers to solid-state diodes. Parts of the wiring harness would be replaced.

The FCC approved all of these changes. Less than 3 Kilowatts were needed with the new antenna to produce an effective radiated power of 5200 Watts. The operating frequency, however, would have to be changed to 90.5 MHz. This was to avoid interference with coverage patterns of other educational FM stations as far away as Stockton, Napa, Angwin and Chico. This was 1973.

KVHS's student technical staff made all of the required modifications. CVHS's metal shop made the brass adapters.

Radio station KFRC donated over 100 feet of HJ-50, 7/8th inch Heliax cable. PG&E donated guy cables and cable pre-form holders. A local crane company agreed to lift the new tower, with antenna attached, into place when they had free time. They called on a Saturday and the KVHS technical staff turned out to help erect the new 100-foot tower. The tower was placed at the center of the music building's roof where the 30 foot tower once stood.

The composite transmitter was now located on the upper landing of the stairs leading to the "dressing room" studio. Sliding glass doors were installed to keep "knob twiddlers" out but still allow viewing of the operating transmitter.

Some permanent audio phone lines were established during this time. One line allowed the live broadcasting of county board meetings, another to broadcast the school board meetings.

The new owner of KDFM in Walnut Creek and of KKIS in Pittsburg was invited to lecture about commercial broadcasting. Initially, he commented that he thought the station was just a high power toy for the students. No way that training at this level would make it into big time broadcasting. However, he became so impressed that several students were hired. Indeed, those students soon had complete control of KDFM evening operation. These included Ann Hardy, Charlie Freeman and Mark Revis.

Other students found positions also. Ron Hummel became Production Director of KWUN, Concord, in 1970. Ron became Production Director at KFRC, San Francisco, in 1972 and is now at Clear Channel radio in San Francisco, as Production/Imaging Director at 981 KISS FM (KISQ). Terry Less became a well known DJ at KSTN in Stockton and several other stations, now in the

production business. Cindy Pitts had radio shows at KUIC, Vacaville, and many other stations throughout the Bay area. She now operates a mobile DJ service. Toby Johnson was also an on-air personality at KUIC. Terry Adair took on a 20kW transmitter installation at another station.

The KVHS staff participated in many community and public service events. They held many fund raising marathon broadcasts for charities. These included Easter Seals and The Red Cross. One such marathon celebrated the station's frequency by lasting 90.5 hours. Up to a thousand dollars were pledged at these events. And, for several years, the KVHS mobile studio and staff canvassed the community during annual canned food drives.

The van itself was a mobile studio, but was often used to carry equipment to remote sites. Basketball games, for example, required equipment being set up in a school's gym. Stores in the Sun Valley Mall made window display space available for the station's portable studio equipment. These were weekend promotions for the station. DJ's performed in front of a passing live audience and were heard on localized speakers. A Marti remote transmitter was used to relay the program back to the main studio. An antenna was temporarily installed on the Mall's roof.

Another great remote site was Walnut Creek's annual Walnut festival. The remote studio was set up in a park building for all to see and hear. The broadcast was relayed back to the main studio during one year's celebration by phone lines. The Marti transmitter was used the following year.

Perhaps one of the most technically challenging remotes was the live description of the passing Walnut Festival Parade. On a building overlooking Main Street, Doug Smith announced the event speaking into a Vega wireless Public Address microphone. Its range stretched to the limit, 1000 feet or so, to be received at the remote studio in the park building. From there it was patched into the Marti transmitter and relayed to the main studio for broadcast, all in real time.

The KVHS staff also participated in the Walnut Festival parade. Floats were entered in two consecutive years. The first float was a giant squirrel towing a walnut's half shell for the Festival Queen's carriage. The squirrel was named Seymour. The second year saw the construction of a five-sided gazebo for the Queen. Private vehicles towed these floats. The KVHS van, with female staff on the roof, was proudly displayed in the parade as well.

Another public service activity, not actually a remote, used the van to transport news staff to the scene of a disaster in January 1971. A large oil spill on the ocean, near the Golden Gate, had drifted toward Bolinas, California, and was contaminating the beaches. Sea birds and other wild life were being threatened with death. The KVHS news team interviewed workers who were cleaning birds and those that were trying to contain the mess. Several KVHS staff pitched in to secure containment tarps.

Station working funds always needed a little help. To assist, staff members participated in weekend pancake breakfasts open to the public. On campus, they made and sold snow cones during lunchtime with their own ice-shaving machine. Popcorn was also sold as a year round station fundraiser.

1975 – 1976

Operating with an effective radiated power of 5200 Watts increased coverage in the direction of Benicia, Vallejo and as far as Napa. However, coverage was still restricted West and East by the surrounding hills.

Dick Spight, owner of Diablo Communications, approached Ernie Wilson for a personal favor. Mr. Spight was engaged in developing a shopping center on Clayton Road. The proposed name was "The Vineyard". Mr. Spight wanted a vintage tractor to display in accord with the theme of the project. He new Mr. Wilson had family associated with vineyards in the area and might be able to

locate and old tractor for him. In the discussion it was found that Mr. Spight owned several hilltops suitable for communications. One of which was overlooking Port Chicago.

The site had once been the location of a TV station, which had since moved. A building and tower were therefore available for lease. If a lease agreement could be worked out this might be an ideal move to better KVHS coverage. Mr. Spight was shown the station and was impressed. Mr. Spight was not only a businessman, and environmentalist, but also a benefactor. An agreement was made for a no cost lease for a period of several years.

Another FCC application was prepared and submitted, again as a class project. The FCC approved the new construction permit.

Movement of the KVHS transmitter and antenna to that location should provide coverage to the West and East. The height of the site, however, would require a reduction in ERP to 410 Watts to avoid interference with other FM stations.

Additional equipment was again needed to make the move to a remote location. Moseley donated a microwave STL (studio-transmitter link) with which to send the station's stereo audio to the remote transmitter site. Two 4-foot microwave dishes, donated by KYA-TV, completed the link.

The transmitter was moved to the Port Chicago location. A local electrician donated time to wire the small room within the building for the KVHS equipment. The FM antennae was removed from the music building tower and taken to the hill. The new location's tower had once been used by a TV station and not easily climbed. Because of this, a professional tower person installed the antennae at the new site.

The microwave STL receiver was installed and tested. Very sensitive – it received the microwave signal from the CVHS campus with just a wire stuck in the antenna connector! Of course it was ultimately connected to the 4-foot dish mounted on the tower.

Operating characteristics of the transmitter had to be monitored whenever in operation. This means the transmitter had to be controlled from the studio. Originally a dc loop phone line was used for control and monitoring. Unfortunately it was subject to interruption and noise problems. One of the technical staff, Charles Freeman, designed and built a solid-state digital remote control to do the job.

1978 – 2009

Ernie Wilson took a two-year sabbatical leave. The person chosen to replace him as faculty advisor had a heart attach just as school was starting in the fall. Ernie Wilson was called back for a few weeks while another teacher/advisor could be found. Mr. Tom Wilson, no relation to Ernie Wilson, was recommended.

Tom Wilson had all of the qualifications and was working in broadcasting at that time. Tom was at AM station KWUN in Concord. Tom has been involved in the radio industry since 1970 after starting out as a call-in guest on KSFO he moved on to KWUN, and also on to KQED-TV. He was also an on-air personality and the Operations Director at KWUN. Ernie Wilson decided not to return. Tom Wilson became KVHS's teacher/advisor for the fall semester of 1978.

Tom Wilson continued as teacher/advisor through 1998, when he took another position his wife, Melissa was hired. She also had the necessary broadcast experience. In 1998, Melissa Foster-Wilson (a.k.a. Melissa McConnell of San Francisco Bay Area radio and television for 20+ years) took over as General Manager/Faculty Advisor of KVHS-FM. Through her and her husband KVHS continued to upgrade its stature including the incorporation of technology of the day.

For more than 40 years a "Wilson" has been part of radio station KVHS.