

Technical History of Butte College Television

1986 to 2011

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About This Manuscript:

This report came about from an idea conceived in early 2010 to produce a written record of the creation and further adventures of Butte College Television. Originally staffed by personnel from the Media Services department in the mid 80's, BCTV would represent a radical change in Distance Learning philosophy over previous activities then in use by the Butte Community College District to reach all students wherever they were.

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This continues to be a work in progress, so check the footnoted date at the bottom of the cover page for further changes. Anything from minor editorial corrections to whole new chapters may be forthcoming at any time.

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Prologue

Butte College owes its existence to a dream made back in 1962. That dream was to extend the educational opportunities for the local residents and form the first community college in Butte County. On November 8, 1966 a ballot measure was successfully passed and the first five members of the board of [trustees](#) were elected. The Durham Unified School District then provided a temporary home for the new college at its former high school site at 2232 Midway near the center of town.

Besides the existing buildings already on the Durham property, Butte College moved in a number of extra temporary [buildings](#) and [trailers](#) for additional classroom and administration [space](#) to handle the expected student population. Students attending classes parked in a massive empty dirt field next door near a neighboring orchard. It was a bit crowded and very noisy when freight trains rumbled daily down the tracks right across the street from the campus. The best burger joint around for lunch was the Whistle Stop across the Midway from the tennis courts.

Butte College classes first [started](#) at the old Durham High School [site](#) on September 23, 1968 with 1,994 [students](#).

The present Butte College campus site at Clark and Pentz Roads was selected in 1972, and was designated a wildlife refuge in 1973. New facilities were constructed and classes opened at this permanent campus on September 23, 1974 with 5,831 students. A few of the original temporary buildings used in Durham were moved over to the new location and remained in use for many years. The original Durham High school site was eventually torn down to make way for a community recreation center. A swimming pool now occupies the spot near where the original Durham High main building once stood.

Partly because of the remote location for Butte's main campus, an idea was formed in the early 70's to offer learning opportunities at more accessible points to students in the surrounding communities. At first, individual program tapes and written material were delivered from main campus to each community where a student learning center was set up. Most of these early leased telecourse packages came from the Northern California Community College Television Consortium which in turn contracted material from Dallas Community College and Coast Community College, among others.

The Media Services department on campus created the "Center for Alternative Media Educational Opportunities" or "C.A.M.E.O." to keep track of and direct various recorded and text based content to the remote centers located in selected areas to serve the growing numbers of distance education students.

Eventually, it was determined that a direct broadcast transmission system of some sort should be built to send out educational programming to all the centers at the same time. But what type of system would it be?

ITFS (Instructional Television Fixed Service) was a special television auxiliary broadcast service not normally viewable by the general public which was first created by the FCC in 1963. It was originally intended for educational use as a one way short range analog television service, but operated at a frequency much higher than regular television stations. Reception was usually limited to about 30 or 40 miles, and each individual viewing location required the installation of a special antenna and [receiver](#) capable of displaying the programming on a regular TV set.

Channels were allocated to each licensee based on a letter grouping, with a four separate channels in each letter group. For example, the “A” group included the broadcast channels “A-1”, “A-2”, “A-3” and “A-4”. Letter groupings went from “A” thru “H” for a total of 32 individual ITFS channels available to license. Each applicant could only obtain a maximum of four individual channels from the entire “A” to “H” band, so most applicants ended up filing for a single complete letter group.

ITFS had been eagerly adopted by a number of educational communities around the country after its creation as the means to extend their own student outreach. In Butte County, CSU [Chico](#) started its own ITFS broadcast program in 1975, and eventually created a series of stations reaching from Sacramento almost to the Oregon border. In the Bay Area, Stanford University planned and built their local ITFS network in the 70’s providing engineering and scientific courses to over 6,000 students on five separate TV channels. Stanford ITFS transmitted hundreds of courses each year to enrolled students, as well as other students at business sites throughout the Bay Area.

An ITFS [television](#) station at Butte College seemed the perfect solution for the District’s distance [learning](#) needs.

Butte College received enthusiastic support from the City of [Chico](#), Butte County [Office](#) of Education along with both local cable companies. The way forward seemed clear. The College would soon join a growing number of institutions in California that were experimenting with what was then a brand new form of visual communication technology to advance educational outreach.

There were many challenges during the entire history of Butte College Television. It would be absurdly boring to treat each and every accomplishment as mere facts simplistically plotted on a linear time line. Every element that makes up the world of Butte College Television is a complete story in itself, and should be absorbed by the reader in the full context of each individual objective.

Important Stuff:

What follows is a historical timeline written in segmented form, with particular emphasis on selected unique and different specialized areas. Each chapter will tell a complete story in time from beginning to end, as viewed from just one perspective of the overall organization. Additional segments may be included covering other interesting areas at any time.

No names are included on purpose, although a great many talented people from all walks of life worked tirelessly over the years to make Butte College Television what it was to be. This work isn’t about individual people, but instead focuses on the technical accomplishments and broadcast educational outreach efforts that were made by the entire organization. It would be impossible to remain historically impartial if names were included here, but a project of that type might be something for a future time.

This document contains only a fraction of the many stories that made up Butte College Television, and what was done to make the whole picture come together.

Chapter 1:

Over the Air Television in the Age of Cable

Butte's first application to the FCC for an ITFS (Instructional Television Fixed Service) television broadcast license was filed on January 28, 1986 for two channels of service in the ITFS "A" block, along with an additional 22 proposed receive sites around Butte County. The receive sites were intended as individual instructional locations within surrounding communities where students could gather for TV delivered courses.



This was the birth of Butte College Television (BCTV).

The District spent \$50,000 for site leasing, broadcast antennas, studios and transmitter equipment. Another \$40,000 went for a short haul microwave transmitter and receiver system to deliver programming from the campus to the transmitter site about 10 miles away.

On August 24, 1987 Butte College Television formally signed on the air using ITFS channels "A-1" and "A-2". At the same time both local cable companies in the area included BCTV programming in their channel lineup for subscriber viewing. Both the [Chico](#) and [Oroville](#) cable companies were very supportive of this new Butte College broadcast venture, and each allowed special ITFS receive equipment at their sites to pick up Butte College transmissions directly over the air for local insertion. State TV Cable in Chico located the ITFS receiving equipment at their main [antenna](#) head end on Hwy 32 outside of Chico. Viacom Cablevision in Oroville housed its local receiver at the Kelly [Ridge](#) head end, just off Hwy 162.

At first, BCTV directed channel "A-1" programming to the Chico cable system, while "A-2" was intended for Oroville. This split was necessary because not all college programming went to both communities simultaneously.

Only a few years passed until it was determined that additional programming plans still in the works and yet to be offered to students by way of TV would easily outstrip the existing two channel broadcast facilities. On September 9, 1991 another application was filed with the FCC, this time for the remaining two channels of broadcast spectrum still available in the "A" block. By March 1993, BCTV had four separate channels filled with educational programming, with three of them under complete computer control (Chapter 3, below). The channels in operation were "A-1" thru "A-4". They were arranged to deliver "A-3" programming to Chico cable viewers, "A-4" to Oroville cable viewers, while "A-1" and "A-2" were reserved for local programming directed only to students at the Chico and Glenn County centers (Chapter 2, below).

BCTV was made available to State TV viewers in Chico, Durham and Glenn County cable viewers on channel 21, sharing space with C-SPAN II and other public access programming from the City of Chico. Viacom in Oroville placed BCTV in various channel slots, usually at the high end. The Oroville cable system was built a little differently from that of Chico, and the channel line up for Oroville proper was not identically available to those same customers in the nearby surrounding areas that Viacom Cablevision served. BCTV programming was eventually extended to Viacom cable customers in Gridley, Biggs and Paradise with the installation of individual ITFS receivers in each community at their respective cable head end sites.

For Gridley and Biggs, that location turned out to be the local town water towers. Paradise didn't have a convenient centrally located water tower, so Viacom placed their BCTV receive antenna high atop a microwave receive structure they owned located at that time on Person road. High gain Conifer PT-2521 2.5 GHz receive antennas were strapped to these tower structures to receive BCTV off the air. The signal was then RF (Radio Frequency) down converted to a VHF frequency (7, 9, 11 or 13), then base band converted (using an Olsen OTR type channel converter) to the required cable channel and [inserted](#) into the master trunk line for distribution to that community's subscribers.

This somewhat complicated procedure for local community channel insertion was required because the BCTV signal for those three communities was not included in the regular channel lineup provided by the Viacom cable microwave feed ("Amplitude Modulated Link", or AML) to customers at those locations. The addition of BCTV in these three areas had to be locally inserted in each town above the last cable channel normally available in each community. Final channel assignment in the Gridley, Biggs and Paradise systems was usually very high, from the upper 30's to mid 40's. This high placement usually resulted in poor channel quality because of the bandwidth limitations with cable signal distribution systems in each community.

Since then, much has happened. State TV cable in Chico switched to Chambers cable, AT&T Cable, and then Comcast. Viacom Cablevision in Oroville was eventually bought out by TCI, AT&T and then sold to Comcast, making that company the common cable provider in Butte and Glenn County. Over the years the cable system operations were merged together, and a new COMCAST cable head end was built south of Chico that provided cable programming exclusively via fiber to the entire Comcast customer universe in Butte and Glenn County. The original State TV cable head end receive site (with its innovative parabolic [reflector](#) curtain array and microwave signal [distribution](#) point) off highway 32 outside of Chico has since been closed down, as has the similar Kelly Ridge cable complex near Oroville.

With Comcast as the common cable provider for both Butte and Glenn counties, BCTV was eventually assigned a permanent home system wide on cable channel 11. It remains this way at the present time.

Starting a TV station back in 1986 and getting it on the local cable systems represented only part of the audience that BCTV intended to serve at its inception. There was still plenty of work ahead to bring televised instruction to students at each remote center. The real challenges were just about to begin.

Chapter 2:

Remote Learning Centers and the Rise of Live Broadcast Education

In March 1975, Glenn County residents voted 1,367 to 571 to become part of the Butte Community College District. By June of 1976, the Butte College board of trustees was expanded to include two additional members from Glenn County. The first classes met at temporary locations such as shopping malls in Orland and Willows, and in the evening at area high schools.



The earliest permanent Glenn County center opened in 1978 in Willows. Since the beginning days of Butte's existence, distance education material was sent by mail or courier to each of the district's remote locations to serve the student population there.

On October 14, 1987 the Glenn County center had moved, this time into the [ground](#) floor of the historic [Masonic](#) Hall located at 119 N. Butte. By this time BCTV had just started airing broadcasts, so a large circular grid receive antenna was installed on the building [roof](#), which allowed local students to watch taped telecourses broadcast from the main campus. Besides this new location in Willows, classes in Glenn County still continued to meet in Orland, Hamilton City and even Princeton.

At about the same time a similar remote learning center was also set up on the west end of a small local shopping [mall](#) located at 260 Cohasset in Chico. This new Chico center was designed to serve students by offering classes locally in town instead of students having to drive out to the main campus. Special television receive equipment was also installed, which allowed students in room 112 at the Cohasset Center to watch taped telecourses broadcast over BCTV just like their Glenn County counterparts.

In the spring of 1992, the District applied to the State Chancellor's Office in Sacramento for a \$128,000 loan from the Fund for Instructional Improvement to expand the Distance Learning program and fund other innovative educational partnerships with the surrounding schools. Additional receive sites were eventually set up at Paradise (2 locations), [Chico](#), [Durham](#) and [Gridley](#) high schools. Qualifying high school seniors at those locations were able to take general education college courses via BCTV for credit, which would help them when transferring to a college or university.

The loan money was also used to expand BCTV's broadcast channel compliment from two to four, and also purchase needed equipment to build the District's first interactive classroom studio in room LB107 of the old Library. This new classroom would be part of a bold new [vision](#) for the District to provide live instruction via television to students watching in Chico and Willows.

Room modifications were extensive, and required the removal of a small co-located office and an old photo dark room to make LB107 into a single large room. The original LB107 contained the print shop, which was moved to another area on campus. New carpet was put down, the walls painted and two [large](#) classroom [monitors](#) were installed in the front so students could see material presented by the instructor. All equipment installed at the front [desk](#) (computer, Elmo,

etc) had to be functional from a teachers point of view, as well as produce images compatible for TV broadcast.

Building a broadcast studio cleverly disguised as a normal classroom was something completely new to the District. The TV broadcast of the class had to be transparent to the teachers and students in the room. A program [monitor](#) was mounted on the back wall for the instructor to see the selected video feed that was currently on air. Audio pickup became a major problem for broadcasting classes. At first, a simple Radio Shack [PZM](#) mic was mounted on a clear plastic sheet and set in the ceiling at the center of the room. Experimentation showed this was not the best idea for uniform sound pickup. Eventually four AKG brand C562CM phantom powered ceiling mount button microphones were purchased and installed in the overhead tiles throughout the room to pick up conversations from the instructor and students. With a mounted surface showing only an area the size of a [nickel](#), these button mics proved very [unobtrusive](#) in the classroom environment.

Three individual cameras were mounted in the room. Two [Panasonic](#) WVD5100HS cameras were wall mounted in the back of the room on [Vicon](#) V6033PT remote controlled pan and tilt assemblies. A [third](#) small camera was installed in the front of the classroom under one of the wall mounted TV's looking back at the audience in the room. The Master Control operators then switched the video with a [Videonics](#) MX-1 digital video mixer and ran the Vicon V7000C dual [remote](#) camera control to follow along with the instructors as they walked around the room and wrote on the boards.

By the spring of 1993, room construction was complete and live classroom instruction from LB107 became available to remote students at the Chico and Glenn County centers to watch on BCTV. Students were no longer limited to just watching courses that were pre-recorded on tape. They could actually see and hear the classes live for the first time. These facilities in LB107 remained in use for another 12 years.

During the summer of 1994, the Chico Center C.A.M.E.O. facility on Cohasset road was re-modeled to support an increased [number](#) of student booths for enhanced ITFS distance television learning. Each individual [booth](#) location contained a small portable TV set which allowed the students to watch one of four assigned channels and learn as if they were actually sitting in the originating classroom back at the Main Campus. A telephone was included in each booth, so students could call back to the instructor with their questions. By fall 1995, a new twist was added to the Distance Learning experience. An innovative scheme was developed and [installed](#) for each student location at the Chico Center which provided real time delivery of individual student [video](#) and [audio](#) with the push of a button back to the main campus using an ISDN phone line as the transportation medium.

The students at the Chico Center sat at booth locations and individually followed along with the live lesson. They were able to respond back to the instructor at the Main Campus by pressing a [button](#) on their desk and speaking into the headset mic. The students and instructor in the originating classroom were then able to see and hear the individual remote student in Chico. A nearly [identical](#) video and audio return arrangement from the [Willows](#) location in Glenn County was finished by summer 1996. This technology proved a boon for student access, as at least some classes could be taken by students located in Chico and Willows without driving to the main campus each day.

In 1997 Butte College received a grant from the US Department of Agriculture's Rural Utilities Service (RUS) program to further expand distance education in the District. These funds allowed for the construction of a second live studio classroom, patterned after the existing setup in LB107 which had been in use for several years. Much of the same equipment was bought and incorporated into the new live classroom in nearby LB101. Just as in LB107, remote controlled cameras were installed on the back wall and microphones placed in the ceiling to allow live broadcast classes to be beamed to the Chico and Willows remote centers.

The receipt of the RUS grant also allowed for the replacement of existing Panasonic cameras in LB107 and the purchase of new cameras for the second studio in LB101. The remote controlled cameras chosen for both rooms were [Parkervision](#) CPC-2000 and CPT-2000 units mounted in the class rooms and controlled from matching Parkervision JSC-2100 Shot Director [consoles](#) installed in Master Control. This marked the first time all equipment used in both live classrooms was standardized, which made operator training and component substitutions that much easier. Identical cameras in both rooms allowed for a more consistent overall broadcast picture quality.

The conversion of LB101 into a second live broadcast class room meant major modifications were needed to the student audio/video return systems in Chico and Willows. Where before the student return only had one destination back at Main Campus to go to, now there were two separate live broadcast rooms to feed. Both Willows and Chico center student booths were divided into two sections, roughly one half at each location were dedicated to sending student video back to LB101, while the remaining half of the seats were wired for LB107. Each system operated independently from the other.

On June 1, 2000 the Glenn County Center moved from its downtown Willows location to their new building at 604 E. Walker St. in neighboring [Orland](#). As part of the move, the existing ITFS receive antenna was moved and installed on the [roof](#) of the new building. Additional minor computer modifications were made to the student return video and audio equipment that incorporated a network WAN as the transport medium back to the Main Campus classrooms, instead of the older ISDN telephone technology used previously at the former Willows location. Daily operation by the students at each booth location remained unchanged.

The grand opening of the new [Chico](#) Center at 2320 Forest Ave near Highway 99 on December 4, 2004 continued the trend of technology upgrades for Distance Learning. Rather than use the older style individual student booths at the new location, a totally new design for student interaction with the instructor was developed and installed.

Instead of individually controlled booth cameras and mics for each student, four small rooms were built to each contain a single round conference table with chairs for about 4-6 students around it. Each table had one push to talk mic installed in the center, while a video camera peered down on each group to capture all the participants in the room at one time. The students grouped in each of the four rooms continued to watch their respective TV lessons, and responded to verbal questions of their remote instructor by pressing the push to talk mic on the table in their room.

Meanwhile, the BCTV studio back at the main campus now had to deal with six separate video and audio return feeds, four from Chico and two from Orland. Each had to be selected and sent to either LB101 or LB107 broadcast class rooms for display on wall mounted monitors. This was a new level of sophistication, and required the purchase of additional [equipment](#) to originate, route and display the incoming return signals. [Items](#) from Extron included the MVP-104GX

multi video processor and router, along with VSC-500 scan converters. BCTV used 4001VC audio mixers from Intellix with remote switching to handle routing of the audio.

The result allowed the Master Control operator to route any of the six return video signals into any of the two originating broadcast studios, as needed. The video monitors in each originating classroom could [display](#) the return video from any or all of the four Chico remote rooms.

By 2005, television operations had reached the apex of complexity. During the busy parts of the broadcast day, it took two separate operators in Master Control just to keep track of all programming as well as run the remote cameras and audio for each of two separate live classrooms.

Fortunately, BCTV engineering staff had been aware for some time of the increased levels of daily programming complexity, and by then had already taken some proactive steps over the years to meet just that sort of future problem.

Chapter 3:

New Horizons with Studio Program Automation

As additional program offerings increased starting in the early 90's, it was realized that BCTV operators would need some major technical help with the ever expanding complexity required to keep BCTV on the air and looking good. Even the simplest programming mistake tended to really mess things up for viewers.



On January 6, 1992 BCTV placed into service a really crude two-channel computer DOS-based timed switching [system](#) that provided dry contact closures to the Master Control switching equipment that ran the original two broadcast stations. The idea was to release the Master Control operator from the stress of making mistakes while watching two channels at the same time and controlling programs with different start and end times.

The basic makeup consisted of a dedicated i486 computer, custom software and a strange looking collection of stacked PC [boards](#). Each board contained enough components to correctly translate the computer output commands into dedicated relay contact closures, which were then connected by cable laid under the floor between the offices to the appropriate switching equipment in Master Control.

Staff and management were astonished on how great it worked. The introduction of this simple program control system opened the door to new avenues for BCTV operating flexibility. Using this controller, it was now possible to program the station without a live person being present in Master Control. This was pretty much unheard of before then.

Engineering staff hand built the entire concoction, and even composed the original computer programming. The software was written in [QBasic](#), and contained over 1,400 lines of code. It covered every possible situation the station would need to handle. The system sat for years on the corner of a convenient [table](#) in the Broadcast Engineer's office, a few rooms down from the original Master Control point. People who noticed the contraption always commented on it. Of course the question; "*Why isn't it in a box?*" always seemed to come up.

The cost for building these stacked PC boards was fairly cheap, using only LED's, micro relays, some transistors and a handful of resistors. All parts were available from local electronics vendors in the area, and BCTV only spent about \$60 per complete TV channel to build them. The package resembled a hobbyist project with all parts and interconnecting wires out in the open due to staff's failure to realize early on how permanent this remote control concept would be. It "wasn't in a box" because staff was not too sure everything was going to work right the first time.

In 1999, a Leightronix [PRO-16](#) real time programmable control unit was bought and integrated into our existing video broadcast chain. Working alongside our original hand wired "hobbyist" control unit, this additional switcher allowed more flexibility to select other video sources usually needed for weekend and overnight hours. Custom [interfaces](#) using Leightronix [Pro-Bus](#) deck interfaces were designed to start and stop existing VCR's and even controlled the BCTV Intergroup program switchers.

The home built program control system that started it all would remain in active use at BCTV for another 12 years, until its retirement around 2004.

In April of 2008 BCTV installed a Leightronix [NEXUS](#) network managed video system controller and digital video server. This device featured an internal 6x2 A/V switcher, and allowed near-total automation control to all channels of BCTV programming. Broadcast material was converted to MPEG files for playback on the NEXUS external 1 TB RAID 5 hard drive [array](#).

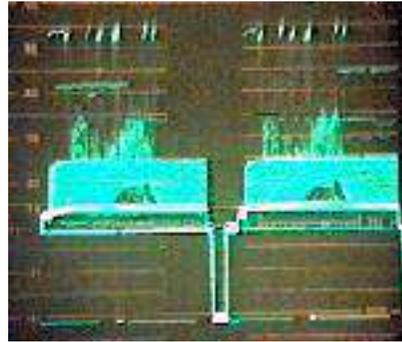
By 2009, the new NEXUS chassis was directly connected to the original PRO-16 switcher to create a [single](#) monstrous 16x4 complete digital video playback and switching system. This new “station in a [box](#)” became the core source of BCTV programming, and even allowed Internet based access for normal or emergency schedule updates from anywhere in the world, should the need arise.

The merging of the NEXUS with the PRO-16 enabled even more student staff cuts, as now the entire BCTV broadcast operation could be coordinated and programmed by a single person. As an added bonus, that person didn't need to be on campus to program the automation. This mundane task could now be accomplished by staff anywhere in the world where an Internet connection existed.

Chapter 4:

Hoping For the Best, and Planning For the Worst

The creation of that first custom built programmed switching system in 1992 was wildly successful, although it was not the only hair brained project to be used by staff to aid in the remote control of an increasingly complex broadcast operation. Over the years, an expanding Butte College Television presence led to District equipment being spread over two counties; with no staff available on site anywhere should there be serious problems. Staff travel time became a big concern, so other ideas were tried out to see what could be done to make the total broadcast system more reliable.



Not all solutions to every problem were plainly evident at first. Sometimes one had only to wait a bit for other opportunities to happen first before an answer could be found. When one improvement was made, it sometimes opened the door to solve other long running problems.

Butte College television originally started in 1986 with only two broadcast channels to air educational programming. By early 1993, construction was completed on the addition of two extra channels to make a total of four.

Now that four TV channels were available for BCTV to air expanded college programming, it occurred to staff that perhaps a simple way might be utilized to provide a method of insuring some signal redundancy to the Chico cable subscribers in the rare event of a transmitter failure or other technical breakdown. Even in those early days, thought was always given to ways of providing backup operations around any single point of failure. Butte College Television was the public face for all District distance learning programming at that time, and staff worked hard to come up with some pretty innovative ideas over the years to aid in broadcast reliability.

In March 1994, a Sine Systems DAI-1 dial-up audio [interface](#) unit along with a DAI-RP [relay](#) panel kit was purchased, and a simple telephone based remote control switching system was built for installation at the Chico cable head end on Hwy 32.

The idea was to substitute channel “A-4” (instead of the normal “A-3”) into the Chico cable system in the event of some emergency so those subscribers could continue being served with BCTV programming. Of course, that meant that “A-4” would then be sent to BOTH the Oroville and Chico cable systems during those times when the system was activated. Remember, not all programming was necessarily sent to both cable systems at the same time. The fear of not having BCTV programming available in Chico outweighed any problems of simulcasting one feed into the two different cable systems.

The method of signal switching used a Dow Key Series 66 SPDT coaxial [relay](#) to select one output from two separate RF inputs. The two input signals came from separate ITFS [receivers](#) bolted on the Chico cable company tower, which were connected to a single 6’ [antenna](#) looking back to the BCTV transmitter site. One of the tower mounted receivers was set for “A-3”, while the other unit next to it was specially set for “A-4”. The output signal selected by the relay was processed normally and the resulting audio and video was inserted into the Chico cable system for viewing.

The Sine Systems remote control unit was set up with its own telephone line, and BCTV staff would call it up when needed and enter a pass code on the touch tone pad. Once in, pressing keypad button "1" would switch "A-4" to Chico. Pressing button "4" switched "A-3" to Chico, the default normal set up. To determine which over the air channel was actually in use, button "7" would send a beep code to the caller with relay receiver switch status. Touch tone button "0" was set up as a PG&E power check, just to see if the Forest Ranch site was on utility power or local backup generator.

This same redundant receive capability was never built for Oroville cable customers, for at the time Chico was considered the more important audience of the two.

The Sine Systems controller for the Chico cable head end was the first actual remote control system ever built by BCTV staff that was installed at some place other than a District owned location. As useful as it was in allowing the switching of different receivers into the Chico cable system, there were other remote control scenarios that needed to be addressed to make a system of this type truly useful in providing total equipment backup. Expensive controllers were out, while home brew solutions continued to reign.

By mid 2004 BCTV had pressed into service an old Extron MAV 44AV 4x4 rack mount matrix switch at the studio end which allowed independent signal [routing](#) for any of the four studio program channels into any microwave uplink. Soon after, an identical Extron unit was installed at the transmitter site which allowed [routing](#) of the received microwave signals into any of the four broadcast channels. By fall 2004, BCTV had contracted with North Valley Wireless in Oroville for internet service at the transmitter site, which allowed for true network based remote control of all signal sources.

2004 was an exciting year. It was quite a surprise to learn that commercial Internet service was finally available on the remote mountain ridge. Staff remembered a time not that long ago when the arrival of the first dial up phone line service to the top of the mountain was a really big deal.

Times sure had changed.

Chapter 5:

Master Control Operations and Studios on the Move

As time moved on it seemed all too easy to forget those early primitive beginnings back in the mid 80's. Plenty of full and part time staff came and went over the years, but only a handful of long time employees remained from the very start that still remembered how things used to be, and what wonderful advances were made during the first two decades of BCTV's existence.



Butte College Television started formal programming in the fall of 1987 from room LB103 in the old Library basement. The first master control room featured removable computer flooring, and what at first seemed to be more room than needed to house several equipment racks and some custom constructed table top furniture. The room was soon split up into two areas, one smaller section to be used as an office for the programming personnel, while the remaining portion became the actual Master Control room for BCTV. The first director of Media Services (the department that started BCTV) was quite an accomplished carpenter, so he personally built the counters and tape storage shelves needed to house the simple equipment needed to get the television station off on the right foot. Some of the furniture and shelving racks would remain in constant use for the next 20 years.

Daily broadcasts included taped telecourses and other educational GED programming, public interest shows, and taped replay of selected Butte College sporting events. Live televised classroom instruction would not start until the spring of 1993.

Operation of the television station required the presence of a Master Control operator at all times, usually a paid student. Program tapes were queued and switched manually for broadcast, while watching both the sweep second hand of the clock and the off-air signal on a room monitor.

A typical broadcast day started with the Master Control operator initiating a series of audio "tones" via [touchpad](#) that triggered a remote Monroe 6002 DTMF decoder at each cable company to electronically switch the BCTV signal into both the Chico and Oroville cable systems. Master control room personnel were able to confirm a successful tone switch (at least for Chico subscribers) by calling the local cable office directly and connecting to a Comrex TCB-2 auto answer audio [coupler](#) located in the back room. The auto answer telephone device was fed an audio signal from a pre-tuned VCR set to the correct cable channel for BCTV. It was the duty of the Master Control operator to insure that BCTV programming was correctly switched into and out of the Chico cable system when required.

There was no method available for similarly checking on BCTV tone switching status on the Oroville cable system; although local cable company employees working in that office phoned in immediately when they noticed something wasn't right with our station.

Video playback equipment consisted of both ¾" U-Matic and VHS video cassette. The switch to S-VHS happened in the early 90's, and became the format of choice for most of BCTV's existence. The use of S-VHS became so successful that consensus was BCTV had the best looking picture around, even better than some of the regional commercial TV stations in the area.

Satellite programming was minimal, but there were at least two large C-Band dishes outside the Library building for recording programs. More dishes were added over the years as dedicated programming sources were needed. Daily programming concluded no later than 10 pm, with the operator initiating a second series of audio “[tones](#)” via touchpad that triggered the Monroe receivers at the local cable companies to electronically switch the BCTV signal off the Butte and Glenn county cable systems.

By the early 2000’s, BCTV started utilizing a single broadcast channel to deliver programming to all cable systems. This eliminated the requirement for “toning” on and off each day. This was the start of 24 hour broadcasting, with non-instructional broadcast time filled with the “CLASSIC ARTS” channel available at the main campus via satellite.

May of 2005 saw the biggest single change in the way Butte College was to deliver reliable programming to its audience. Comcast cable agreed to install 4,000 feet of 12 pair fiber optic cable from a splice point on Durham Pentz road out in front of the campus and terminated it at the BCTV studios. The fiber allowed for outbound programming from BCTV studios to be sent directly to the COMCAST cable company head end in Chico for distribution without relying on over the air broadcast signals received from the transmitter site. Over the air reception was still utilized for students watching classes at the Chico and Orland Center locations. The installation of the fiber line also allowed Comcast to send a return feed of all analog cable signals normally available to Chico subscribers for distribution to main campus buildings.

A major reconstruction project to remodel the Library building and build the new Media Center wing required BCTV to abandon the [original](#) TV studios in the first floor of the main Library building. On December 7, 2005 Butte College Television started the frantic [move](#) out of the Library into temporary [trailers](#) on the Quad lawns for the duration of the Library construction. You can't imagine the effort it took to transplant the complete BCTV Master Control room into the crowded confines of a portable trailer space about the size of a large [bathroom](#). Operating multiple TV channels out of a trailer was more than a challenge, although staff did appreciate the added flexibility of cutting random holes in walls and floors where needed to run cable.

Everything had to be rewired and made to work just as before, including all [network](#) services and computer [servers](#) used by BCTV. Acoustics became a big problem in relocating the live classrooms to trailer spaces. The flimsy walls did little to shield the rooms adequately from the voices of neighboring offices or even outside conversations. Television monitor and camera mounts became a big concern because of the lower ceiling height and [reduced](#) floor space.

The classroom formerly known as LB107 was moved into the same [trailer](#) next to the cramped, [rebuilt](#) BCTV Master Control room, while facilities formerly in LB101 were moved into a neighboring but [detached](#) trailer next door.

Besides moving the studios out of the Library, all microwave STL equipment had to be removed from the [roof](#) of the Library and transferred to a new location on top of the nearby LRC building. Both 4’ drum antennas and the 6’ grid receive antenna were removed and [transported](#) to the LRC building for [installation](#) on new support [structures](#). A new equipment rack was placed in [LRC315](#) to hold the relocated microwave transmitters from the Library. This new longer physical distance between the BCTV studios and microwave STL uplink point meant regular video coax and twisted audio cable could not be used to connect each end anymore. To solve this, several [Telcast](#) Fiber Systems 5122 Viper II video/audio modules were used to [convert](#) standard analog signals to optical fiber for short range transport between buildings with minimal loss.

At the same time, a [Force](#) Inc. model 2801 CATV VSB/AM transmitter/receiver was needed to [convert](#) an incoming RF over the air signal picked up at the LRC building to fiber for transport back to the BCTV Master Control location. A single TV on a rack displayed the status of our over the air broadcast signal for [monitoring](#). These fiber transport products worked very well, and proved for the first time that the studios could be located anywhere on campus and still deliver a superior picture to the transmitter site.

The pre-construction move also required the newly installed fiber line from Comcast to be pulled back out of the Library and re-pulled into the new temporary trailer location. Excess fiber line was coiled on the wall [behind](#) the console.

In July of 2007, everything was on the move again. The \$14 million Butte College Library renovation and Media Center expansion project was finally completed, and BCTV was transplanted once again from the temporary outside trailers into brand new [facilities](#) on the first floor in the Media Center building, in room MC137. The two temporary cramped live studio classrooms (the old LB107 and LB101) were moved into new quarters also, with the main broadcast classroom re-constructed in MC124, and the secondary television classroom down the hall in [MC145](#). Just as before, all BCTV networking and other support services had to be [torn](#) down and re-built in the new building before the start of classes in August.

Once again, the Comcast fiber line had to be removed from the temporary trailers for its pull back into the newly completed Media Center building. This single event was the most nerve wracking part of the move. BCTV staff had previously estimated the extra fiber length required just for this very event when the cable was first pulled into Master Control back in the original Library studios.

Guessing the length needed for a future construction project is one thing, but actually pulling cable thru underground conduits of unknown condition and routing was something totally different. Should the fiber line be too short for the re-pull back into the new building wing, splicing an added section would have been extremely messy.

As it turned out, there was JUST enough of the original fiber line from the 2005 initial installation to make the run into the new Media Center broadcast facilities without the need for any splicing. There was less than 10' of spare fiber cable left for terminations after everything was installed.

From then on, the rest of the 2007 studio relocation seemed easy. Staff could only hope this move would be the last.

Chapter 6:

The Rocky Road to the Transmitter Site

The history of the BCTV transmitter site goes back long before Butte College received its first broadcast license. In fact it all started in 1983 when a local business entrepreneur constructed a small building, poured a concrete foundation and erected a new privately owned communications tower on a ridge out in the middle of nowhere that would serve not just the future needs of Butte College, but many other private radio users as well.



Butte College received a ITFS television broadcast [license](#) in 1986 under the call sign of WHR-796, and a contract allowing BCTV to use building and tower space was signed with the site owner on July 1, 1987.

The mountainous areas of Oroville were chosen because of the high elevation needed to reach all intended viewers in both Butte and Glenn counties. The selected site was only 35 road miles from Butte College, but took over an hour to drive one way because of the steep terrain and remote location.

The first equipment used for the original channels “A-1” and “A-2” were Comwave SBO-10 MRC GaAsFET transmitters and [CATEL](#) CTM20 modulators. The transmitter outputs were mixed in a Microwave Filter Company two port combiner then fed via EW-20 waveguide 130’ up the tower to a side mounted 12’ Andrew HMD32VC-A vertically polarized broadcast antenna. Transmitter power output (TPO) was only 10 watts, but the Andrew antenna had a gain of 20dbi for a total Effective Isotropic Radiated Power (EIRP) of nearly 1,000 watts per channel.

The original license application for the first two broadcast channels also incorporated a new filing for a two channel studio to transmitter link (STL) system that would bring programming from the main campus to the transmitter site. The new 23 GHz microwave [license](#) was issued under the call sign of WNEN507.

Twin 23GHz MA-COM 23CC transmitter and receiver pairs were used for the STL link. These were analog FM transmission systems, and the studio signals were converted to base band and carried via interconnecting cables from Master Control in the basement of the Library up inside conduit near the old elevator shaft to the R.F. interface boxes mounted on a pole on the roof of the building. These interface [boxes](#) converted the incoming base band signals to separate R.F. outputs in the 23 GHz band to feed a single 4’ high performance antenna. The drum antenna contained two separate feed horns which were cross polarized to each other, so one of the signals was transmitted in the horizontal polarization while the other was vertical. This cross polarization allowed two separate signals to be transmitted using the same antenna drum.

At the other end at the antenna site, a similar 4’ high performance receive antenna was mounted on the broadcast tower which fed the incoming signals down to tower to the receivers in the building. The receivers converted the signals back into the original audio and video programming that was then fed into the transmitters for broadcast.

On September 9, 1991 Butte College filed an FCC application to purchase and install two new channels (“A-3” and “A-4”) using the new Comwave SB-10A-1 transmitters with TVM-102 modulators. The outputs from the two newly added transmitters were mixed in with the existing two channels using a Microwave Filter Company 8016(4)-A four port [Quadruplexer](#). This special device was used to combine the four [separate](#) TV channel transmitter signals into one single [output](#) that was routed up to the tower mounted [broadcast](#) antenna.

At the same time, the STL license WNE507 was [modified](#) to accommodate the operation of an additional 18 GHz Microwave Radio Micro Link III short haul microwave system. A separate 4’ high performance drum antenna was installed on the Library [roof](#) next to the existing 23 GHz microwave structure to transport two additional channels of TV programming from the main studios to the transmitter site.

By the end of 1992 all construction was complete and Butte College Television was licensed to broadcast in the Instructional Television Fixed Service using:

- A-1, at 2500 MHz to 2506 MHz
- A-2, at 2512 MHz to 2518 MHz
- A-3, at 2524 MHz to 2530 MHz
- A-4, at 2536 MHz to 2542 MHz

Each channel was 6 MHz wide, and all allowed for high power NTSC video transmissions. BCTV was now operating with four TV channels, along with one cross polarized 23 GHz and one co-polarized 18GHz microwave link. But the changes didn’t stop there.

In late 1993 American Telecasting Inc (operating in concert with their ITFS partner North American Catholic Educational Programming Foundation, Inc or “NACEPF”) proposed a plan that would allow the NACEPF to build and operate WNC-614, a new co-channel “A”-group ITFS station facility identical to BCTV but about 40 miles away on the south peak of the Sutter Butte mountains. Negotiations with the District produced an agreement that stipulated a number of technical improvements, all at no cost to BCTV.

Thru ATI Wireless, Butte College filed another FCC application on September 14, 1995 to replace the older original “A-1” and “A-2” transmitters with updated versions of the Comwave SB-010-A and TVM-102 modulators for those two channels. “A-1” thru “A-4” were then modified to incorporate Precision Frequency Control with both phase and frequency lock using the Global Positioning System on all four broadcast channels. A new [TrueTime](#) XL-AK GPS Time & Frequency Receiver was installed to provide a reference 10MHz timing signal to all four transmitters. This new GPS reference equipment allowed BCTV to maintain an off-air frequency tolerance of better than ± 2 Hz from assigned or about $8.0E-10$.

Prevailing engineering broadcast theory dictated that when two nearby stations (which operate on the same frequency) phase lock each set of transmitters to a common reference source, the overall visual effect is to minimize any interference that may be produced from any one station into the picture of the other. Both Butte College and Sutter Buttes licensee WNC-614 referenced their transmitters to the Global Positioning System satellites that circled the earth to obtain a precision 10 MHz timing signal that was used by each broadcaster to keep their stations frequency stable. BCTV operated with an on-channel frequency, while WNC-614 transmitted with a frequency offset of 10.01 KHz.

Last of all, the broadcast antenna on the tower was replaced with a new unit incorporating a polarization change for BCTV from vertical to horizontal (Andrew model HMD32HC-A). This added another 17dB of signal protection at each receive site which further helped in the reduction of observable co-channel interference. This change in transmitted polarization required ATI to re-align all the BCTV receive antennas located throughout the District. A special problem was encountered at the Kelly Ridge cable head end site, which was at a critical point between Butte's transmitter site and the Sutter Buttes location. Kelly Ridge was the master receive site for the Oroville cable system, and the company required an exceptionally clean off air picture for their customers.

The challenge was met on September 9, 1997 when ATI Wireless installed a new Andrew FP8-25D eight foot solid back receive [antenna](#). This was a replacement for Butte's older 6' open grid antenna and featured increased forward gain with an exceptional front to back rejection ratio, allowing maximum reception of BCTV from one direction while ignoring the Sutter Buttes station from the back side.

By the end of 1997 construction was complete with both Butte College and NACEPF operating with minimal to no interference into each other. Precision phase lock and precision frequency offset remained in continual operation at the Butte College transmitter site for another 13 years.

On October 7, 2002 a coalition made up of ITFS licensees and MMDS trade groups petitioned the FCC with a bold new plan that would fundamentally change the ITFS band forever. Their stated goal was to further enhance growth and encourage rapid deployment of innovative and efficient communications technologies and services.

On July 29, 2004 after much debate the FCC finally released the 219 page Report and Order and Further Notice of Proposed Rulemaking FCC 04-135 in WT Docket No. 03-66, which made sweeping changes to the way ITFS was to be licensed and operated.

Briefly, this and other follow up rulings by the FCC forced a fundamental restructuring of the old ITFS band. It eliminated the name "Instructional Television Fixed Service" and replaced it with "Educational Broadband Service", or [EBS](#). Along with the new name came changes in the operating frequencies for the EBS service, which also allowed for low power cellular digital data and limited high power multiplexed digital video to be transmitted. It drastically changed applicant eligibility requirements and implemented geographic area licensing procedures based upon 493 basic trading areas (BTA) within the 52 major economic areas (MEA) and 51 major trading areas (MTA).

The smallest unit, the basic trading area (BTA), referred to the area or "footprint" in which an entity was to be licensed to transmit their frequencies. Butte Community College encompasses Butte and Glenn counties, which became BTA 79 (Chico-Oroville, CA) which is located within MTA 4 (San Francisco-Oakland-San Jose) which is part of MEA 43.

Existing ITFS licensees across the country had only three years to be moved from the old frequency band plan to the new, but the process could not start until a qualified designated proponent came forward and submitted a plan to every licensee within any single BTA.

In April 2007, Sprint Nextel notified Butte College that they would be the designated proponent to implement their transition plan for BTA 79 (Chico-Oroville, CA). This would not be an easy or inexpensive project for Sprint Nextel to undertake. It was to be a very busy summer.

The process for transitioning BCTV into the new EBS band plan included the requirement that Sprint was to cover all costs for new equipment. This meant all four of BCTV's analog Comwave SB-010A transmitters and modulators needed to be replaced with a single Thomson brand Grass Valley ViBE encoder and [Drake](#) TMQAMasi modulator feeding an [Axcera](#) 5524 EBS transmitter, all free of charge to Butte College. Fortunately for staff, the new digital broadcast equipment was able to fit into the [racks](#) already filled with existing analog transmitters with no trouble.

The Andrew HMD32HC-A broadcast antenna on the tower was not replaced, but frequency sweep tests were [performed](#) by Sprint Nextel technicians during the summer of 2007 to determine if the antenna had sufficient bandwidth to handle the new operating channel frequencies. Tests were inconclusive, but in the end no reduction in signal coverage was observed.

By September 2007, BCTV had ceased all analog broadcasts and completed the change to digital over the air transmissions under the new EBS band plan.

On February 28, 2008 Sprint Nextel filed a Post-Transition Notice with the FCC, and soon afterwards BCTV received an updated broadcast [license](#) showing the new operating parameters:

- A-1, at 2502 MHz to 2507.5 MHz
- A-2, at 2507.5 MHz to 2513 MHz
- A-3, at 2513 MHz to 2518.5 MHz
- A-4, at 2572 MHz to 2578 MHz

Under terms of the new license, channels "A-1" thru "A-3" were only 5.5 MHz wide each, and were restricted to low power cellular data delivery services. Only one channel was reserved for 6 MHz wide bandwidth full power video broadcast. Since that's all BCTV consisted of, all NTSC video programming was converted into separate 64-QAM digital streams, and multiplexed into a single 6 MHz channel on "A-4". What used to be four separate programs on four corresponding analog channels was now reduced to four separate program data streams encoded on one single digital channel.

The transition to digital broadcast meant that the existing analog ITFS receiver installations at both the Chico and Orland centers needed to be changed over to newer equipment designed for digital EBS broadcasts. Work crews contracted by Sprint Nextel went to both remote centers and substituted the original Conifer HLN analog down converters with new Conifer [HLN3](#) EBS units, along with [KAON](#) KACF-S660HD digital receivers. Each site with a digital receiver was set up specifically for [reception](#) of BCTV digital broadcasts. No other EBS receivers needed to be installed, since Comcast cable had ceased receiving BCTV programming off the air after the main campus fiber installation was completed in 2004.

It should be noted that the conversion of BCTV from analog to digital broadcast was totally separate and not conditioned upon the June 12, 2009 general HDTV digital change over that was mandated by the FCC for commercial television stations. BCTV operated with a 64-QAM modulation system, while commercial TV stations use the ATSC standard of 8VSB.

In the years following the transmitter conversion to digital, staff did notice an immediate improvement in the stability and reliability of the received TV signal. Bad weather in winter had always been a concern with microwave path fades and higher than normal noise in the video during certain times which made program viewing a challenge. Now with digital, the picture

remained crystal clear right up until the cut off point or “cliff effect” squelched or “muted” the individual TV receiver.

The 64-QAM picture looked pretty good, and the equipment didn’t seem as susceptible to the awful environmental and power conditions usually found at remote transmitter site locations.

The BCTV broadcast transmitter facility high in the mountains outside of Oroville remained in service until the summer of 2010, when major changes to the technology of distance education signaled the eventual downfall of one long running broadcast legacy while expanding Butte’s outreach in other areas.

Chapter 7:

The End of an Era and the Continuing Evolution of Distance Learning

Live television was not the only distance learning technology available, although it was the first and most widely used at Butte College from its inception until the arrival of the 21st century. The increased availability and popularity of the Internet starting in the 90's was poised to radically change the way educational institutions were to serve the needs of a growing student body.



By the fall of 1998, Butte College began experimenting with a parallel distance learning presence on the Internet by signing with a new Canadian company called WebCT. This was a subscription service that allowed college faculty to develop and create custom classroom instruction material delivered to students via the Web.

WebCT at Butte College was first hosted from custom built Linux web servers located in the Media Services department, ironically from room LB105 right next door to where BCTV was currently operating. A small hall way was converted into a makeshift [server](#) area, and tables stacked with various computers and monitors soon filled the room. It was the start of the Internet revolution for Distance Learning, and the number of students who used it increased every year from then on.

All Linux programming and server maintenance was done locally, and additional staff were hired to coordinate WebCT training for Butte College faculty. Media Services became the hub for all of Butte's distance learning programs. Local web servers at Butte were housed in Media Services until January 2005, when the District contracted directly with WebCT and transferred all web hosting operations off campus directly to the company.

Continued student acceptance fueled even more growth of this innovative technology, which was determined by the District to be more efficient to implement than traditional TV broadcasting. By 2006, WebCT had been bought out by rival Blackboard.com, and Butte continued with the program using the new name.

Internet delivery of instruction proved to be the eventual undoing of BCTV. By 2007 live broadcast TV instruction to the remote centers was in decline. The emphasis for distance education was shifting away from a television based learning experience to other (and some would argue, more modern) methods of remote instruction.

With slowly dwindling numbers of live instructional TV classes offered for broadcast, the four separate smaller remote TV rooms at the Chico Center were transformed in May 2007 into two larger rooms by simply [removing](#) a common center wall. At the same time each of the two newly enlarged rooms were [outfitted](#) with regular tables and both included individual push-to-talk desk mics at each student location. Each of the two rooms at the Chico Center could accommodate about a dozen students.

Downsizing continued back at main campus, with BCTV eventually abandoning MC145 as a classroom to broadcast live instruction to the remote sites. Various classes in other disciplines

continued to meet there, but none were televised. Wall mounted cameras in MC145 along with all BCTV control room console equipment and interfaces associated with MC145 were left in place but powered off or disconnected.

By the start of 2009, the elaborate custom designed return video and audio [routing](#) equipment used in Master Control was pulled from service, as only one room on main campus (MC124) remained to originate live classroom instruction to all TV viewers in Glenn County and Chico Centers.

By summer 2009, a further decrease in class offerings for live televised courses to the Chico Center led to the abandonment of one of the two recently enlarged and re-fitted TV viewing rooms used by students. The other room remained, but all microphone equipment formally located within the abandoned room was removed and transferred to the Glenn County Center as an [upgrade](#) to replace the older individual student booths still being used at that location.

All distance learning classes by now were administered solely thru the Internet. Butte College had just recently installed 1 GB network fiber connections to both the main campus and Chico Center. Installation of these fiber links eliminated a major bottleneck to the delivery of high speed streaming services to the remote students.

This and other continuing network upgrade projects within the District allowed for the experimentation of different BCTV program delivery methods from main campus to the Chico center. In 2009 a simple system was created using the Adobe Flash Media Encoder® at main campus to stream live classroom instruction to the Chico center via web browser. At first the system was intended only to provide a backup to the regular TV broadcast, should transmissions be interrupted because of unforeseen technical reasons. The 1 Mb flash media stream data rate did look pretty good, although it was not quite up to par with the existing TV transmissions normally viewed at the Chico site. But an important question remained; should BCTV consider substituting a streaming program feed to each remote center instead of the over the air TV broadcasts? The future of over the air broadcasting at Butte College was suddenly at a crossroads.

An idea was then proposed in early summer of 2009 to swap the yearly BCTV transmitter site leasing costs with that of a new 100 Mb data service to the Glenn County center. Management approval was swift, due to the potential financial and technical advantages this plan should provide.

By the end of 2009 it was decided NOT to renew the yearly transmitter site lease payments to the property owner at the transmitter site when due the next July, and plans were formulated to cease all transmitter operations before the start of summer 2010. By March 2010, the new 100 Mb network service had finally been installed at the Glenn County Center. Live classroom instruction would continue to the Chico and Glenn County centers, but only as a network delivered video streaming service to be shown on flat screen video monitors at each location.

By summer 2010, there existed facilities for only 12 remote students in one room at the Chico center and 8 students in a similar room at the Willows center. Main campus had only one live instructional TV classroom available to originate live broadcasts, and all 20 remote students had return video and audio connections back to instructors in MC124 only.

The golden age of live instruction by television was drawing to a close.

On May 27, 2010 both the 18 GHz and 23 GHz microwave transmitters located in LRC315 at the main campus were turned off and the rack equipment unplugged from service. The TV operations at the transmitter site were switched [off](#) the following afternoon, and the [first](#) of [two](#) equipment cabinets were removed at the same time. By June 2, 2010 all remaining rack mounted transmitters, room cabling and other associated equipment within the transmitter site building had been transported off the mountain and the floor space [cleaned](#) up. All building equipment was trucked down the mountain and returned to the main campus for temporary [storage](#), where the Board of Trustees eventually directed all non-salvageable equipment be disposed of.

Butte College contracted with Wincomm Inc of Roseville to remove the 12' transmit [antenna](#) from the main tower along with two 4' microwave receive antennas from a neighboring cellular structure. On June 16, 2010 the removal of all outside tower mounted antennas and EW-20 [wave](#) guide from the remote transmitter location was complete. As before, all items were trucked down from the broadcast site and delivered to the campus for [disposal](#).

After 23 years of educational over the air broadcasting, Butte College had gone from a distance learning broadcast pioneer to former ridge top transmitter site tenant. At least staff would not have to drive up and down that lousy mountain [road](#) anymore.

Weather conditions on the mountain were always a concern. High winds and snow on the ground were not unheard of at that elevation, and BCTV staff did not always have appropriate District vehicles available to drive up to the mountain site in bad weather. There were other fits of rage from Mother Nature as well over the years. Some big ones on record include the winter of '97 with major damage to the primary mountain access road, and the fire of '99 that reached the crest of the ridge and stopped just feet short of the antenna farm.

There were other odd things noticed on the many road trips up and down the mountain over the years that would fill an entire chapter, but those stories may have to wait until a later time.

The cessation of over-the-air broadcasting did not mean the immediate end of Butte College Television, but it did mark the end of maintaining a dedicated remote transmitter site. The District had planned on a continued presence with Comcast on cable channel 11 in Butte and Glenn counties even while the Chico and Glenn County centers were being converted from live TV reception to live network streaming.

Students at both remote centers were to continue viewing live classroom instruction originating from main campus via a web based Adobe Flash Media Server® presentation from the Internet, instead of traditional television broadcasts.

Student return video and audio from both remote centers continued to be sent on the same Internet connection as before. By the start of fall 2010, BCTV had completed the transition into a total network delivered program service.

Epilogue

By the start of winter break (December 20, 2010) serious questions arose over the financial practicality of continued live streaming of interactive classroom instruction within the District via BCTV facilities. This abrupt turn of events had roots based in both the nationwide economic slowdown that started in 2007 and filtered down thru state and local budgets during the following few years. Suddenly, money was very tight and Butte College was faced with the possibility of making cuts to both staff and programs to survive.

The California state budget was looking worse than at any time in its history, as the state was forced to deal with deficits in the upcoming 2011 – 2012 budget year totaling more than \$25 billion. Deficits were nothing new to California, but 2010 was an election year and a new urgency prevailed in Sacramento. This time the Legislature needed to respond positively to the budget crises instead of relying on bookkeeping tricks as done in previous years. On November 2, 2010 the voters of California picked Democrat Jerry Brown to be the new governor with a total statewide vote of 53.8%. As they say in politics, the easy part is getting elected.

Budget talks in Sacramento were especially partisan and difficult, but the final product was sure to contain deep cuts to California's higher education that would be felt by the local districts. In anticipation of a rumored \$9 million worst case scenario funding cut from the state, Butte College went forward in December 2010 with plans to completely suspend BCTV operations and close down the entire Broadcast & Communications department in the coming six months. The Administration sent letters to local city and county officials informing them that BCTV would no longer provide an outlet for public access [programming](#) on the COMCAST cable system after June 30, 2011.

Live streamed programming previously delivered to room 223 at the Chico Center was suspended during winter break in December 2010, before the start of the spring 2011 semester. All equipment used to provide Chico students with classroom instruction was turned down and removed from service. On 1/26/2011 all broadcast licenses used by BCTV were [cancelled](#) with the FCC. Live streaming classes to Orland would terminate at the conclusion of the Spring 2011 semester in late May.

On 5/16/2011 Governor Brown released his annual "May Revise" budget projections on the state of the economy, and the numbers showed some interesting surprises. State receipts had risen by \$6.6 billion, which would shrink the overall deficit to \$9.6 billion. That was still a lot of money, but nowhere near earlier doomsday predictions of \$26.6 billion. Was this the start of a trend? Partly because of the good news, the Democrat controlled state legislature did in fact pass a gimmick laden "balanced" budget on 6/15/2011 – which Governor Brown promptly vetoed the next day.

Talk about a political shock! It's not the intention of this document to delve into the politics of California state government, but rather to focus only on the impact these political decisions have on the real people and institutions that would be affected. The Governor had drawn his line in the sand, with both Democrats and Republicans equally entrenched for the long haul. The situation suddenly didn't look so rosy.

Talk of a "cuts only" solution to balance the state budget were a real possibility, with most of those cuts projected to come from education and social services. It was looking like the worst case scenario for Butte College funding cuts might come to pass.

The biggest blow to the future of BCTV came when college officials mandated that all Butte College sponsored programming provided to the local cable channel 11 (the public, educational and government channel on COMCAST cable for county wide distribution) would cease delivery by 6/30/2011. With no audience left to watch, BCTV was forced to turn off all equipment and close down public access broadcast operations located in Master Control, room MC137.

At the time of its disbanding, total department staffing for all Media Services had fallen over the years from a high of about a dozen down to only three remaining full time employees and one part time person. District downsizing and layoffs for the 2011-2012 school year further reduced the department to just two full time people. Campus wide, the numbers were far worse. A total of 39 classified staff were reduced from 12 month employment to something less, while 9 others were laid off entirely. Thirteen others decided this would be a good time to retire from employment, while several others submitted notices to retire before January 2012.

On the evening of June 28, 2011 an amazing thing happened in Sacramento – a new budget was actually passed! Historic as it was, the fact remained it contained more questions than answers on any real solutions to the California’s long term problems on stable funding for state services. Even more painful budget cuts were made during the final hours leading to its passage along with rosier than normal assumptions about anticipated state revenues. A new twist this time featured the addition of legislative “triggers” that would automatically require further mandatory specified targeted reductions to education and social services if the expected revenues did not materialize. At least no human would have to take the blame.

Legislators compromised on a threatened “all cuts” budget by requiring a future referendum vote in 2012 concerning increased taxes, while also projecting revenue increases of \$4 billion by the coming December. Should either of those assumptions fail, then mid-year budget cuts to existing state programs would be a real possibility along with the return of more deficits to deal with in 2012. It would be a real gamble. Perhaps everything was finally settled for the 2011 – 2012 year, or perhaps not. Time would tell.

It really doesn’t matter what happened from then on, for my story is complete and this manuscript is now finished.

Butte College had early on taken steps to prepare for the financial cutbacks everyone knew were coming. In doing so, the District embarked on a new vision for the future of education. Some of Butte’s decisions made during the 2011 – 2012 budget battles *may* be overturned in the future, should California’s economy recover sufficiently to allow for the hiring of more teachers and staff to foster a better learning environment. Programs once deemed expendable *may* be reinstated again, and previously axed student services will no doubt be resurrected. A lot *may* return sometime in the future, but not everything.

The final chapter had finally closed on the colorful 25 year history that was **Butte College Television**.