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**APPLICATIONS**
**PROOFS**
**FIELD MEASUREMENTS**
**AUDIO AND RF ENGINEERING**
**EMERGENCY REPAIR**

Concerning representations submitted to Jefferson County about the suitability of Squaw Mountain as a site for broadcast communications as in the November 12, 2001 letter from Brownstein, Hyatt, and Farber which represents Mount Morrison. Because of repeated representations dismissing Squaw Mountain as a location unsuitable for broadcasting, Squaw Mountain Communications has retained the services of Vir James Engineers to review the submissions and representations made to Jefferson County with respect to the suitability of Squaw Mountain for use as a Broadcasting facility.

## SHORT SPACING IS NOT AN ISSUE WITH EDUCATIONAL FM STATIONS

The FCC rules DO NOT have any spacing requirements between educational FM stations. Educational FM stations are regulated by interference and not by distance spacing between stations. A simple Directional antenna and the obvious terrain shielding of the Continental Divide will easily allow relocation of KVOD to Squaw Mountain even increasing to a Class C maximum facility at 100 kW with no FCC waiver required. There is no valid possibility that the educational FM in Vail will protest such a move since it is OWNED by the same group that owns KVOD. Therefore channel 6 TV is not prevented from moving to Squaw Mountain by the educational FM stations.

## HOUSEHOLDS SERVED BY ADEQUATE SIGNAL -- A VERY MINOR ISSUE

Making this one of the "decisive issues" is straining at a gnat. ALL of the mountain sites serve a very large percentage (greater than 95%) of the Denver Metro population with adequate signal regardless of which method of coverage prediction is used. The hyperbole being supplied to Jefferson County makes it sound like Squaw Mountain is somewhere in Utah. All studies show that all sites provide far greater than the FCC required minimum city quality signal strength over practically all of the metropolitan area.

The engineering studies filed by pinnacle are offered as additional proof of Squaw's inadequacy. Quoting Pinnacle's consultants, the Mullaney/Raines report submitted in the Pinnacle filing shows that by the FCC method the population covered from Squaw Mountain is 282,067 persons greater than will be achieved from Eldorado Mountain (12% superior to Eldorado!) and by their Longley Rice analysis the Squaw Mountain population is only 17,421 persons less than for Eldorado (0.7% less than Eldorado). Lake Cedar Group's John F.X. Browne report "The Denver DTV Site Investigation" dated December 1999 found that Squaw Mountain is superior to Eldorado Mountain with 44,600 more television households than Eldorado Mountain. This hardly describes Squaw Mountain as a seriously inferior site! In fact the Mullaney /Raines report states that **"all sites provide similar broadcast coverage of the Denver TV market".**

SHADOWING AND MULTIPATH

Generic claims that "sites with shadowing tend to have multipath problems" are misleading since we are not talking about general principles but specific sites. Multipath has never been an issue for the FM broadcasters located on Squaw Mountain. However, multipath has been a big issue for users of other sites like the users of the tall tower near Frederick. The Frederick tower is an excellent site on paper but the FM broadcasters there have spent considerable money trying to reduce their unacceptable levels of multipath. Although multipath may be a problem in general it has not been a significant problem for users of Squaw Mountain.

Mount Morrison contends that "Squaw is a poor site for digital television because it does not have line of sight to much (sic) of the metropolitan area". This is an outrageous exaggeration! No site has even 10% of the metro area in their shadows. How can a small portion be "much of the metropolitan area"? As noted previously the John F. X. Browne study found that Squaw would cover more television households than Eldorado. Since KYGO-FM is perennially at the top of the Arbitron ratings in Denver with their transmitter on the Squaw Mountain site, it sure seems outrageous to claim Squaw Mountain is "not an acceptable alternative".

Mount Morrison states "The fact that all mountains have shadowing is not a useful statement." But the existence of shadowing at all sites is a fact in the Denver market. Presentations of "definitive studies" for only one of the available Broadcast sites on a problem that all sites have isn't useful either and may be downright misleading. It is a ridiculous argument that "IF one site loses ten homes to shadowing and another loses 100,000 homes to shadowing the choice is clear". What site exists that has only ten homes in the shadow? Since no numbers were given for any site, I would bet that the number of homes shadowed for all sites is much closer to 100,000 than it is to ten. What is so clear about it then? Studies prepared for the Front Range Alliance and filed in the Pinnacle hearings, includes a complete shadow showing for each of the main Broadcast sites. The maps clearly show that the main difference in shadowing is that Squaw Mountain has all of its shadowing in one continuous stripe where the others have spots of shadowing scattered all over the city. Because the Squaw Mountain shadowing area is a continuous stripe it can be filled in readily with only two or three repeaters for seamless coverage. Others will need one or two repeaters for each of their several shadow areas requiring as many as 5 repeaters for Mount Morrison for instance.

If "It is inappropriate for Squaw Mountain to allege that multipath is less of a problem at their site when they have no analog or digital television stations at their site." Why should we assume that analog television performance will be similar to digital television performance at any location? The required performance criteria is quite different for acceptable digital reception. Since there are no Digital Television systems presenty operating from any of the mountain tower sites proposing new facilities I would venture to say that we cannot really be sure of the digital

multipath performance of any of these four main sites. Although the digital failure mode is total loss of reception, only certain combinations of multipath result in signal loss. Digital Television receivers are being designed specifically to cancel multipath reflections since this is a national concern not just here in Denver.

TRANSLATORS AND REPEATERS -- A TIME TESTED SOLUTION

Translators and repeaters are different in that repeaters do not require a separate channel but instead operate on the same channels as the main signal which is always available for use everywhere the main signal is supposed to go. Mr. St. Clair has built a national reputation and a major manufacturing business on translator and repeater technology. If it is true that "Translators and repeaters cannot solve coverage problems" then why was there a market for thousands of Mr. St. Clair's translators all over the US? Was he misquoted? We often refer people to Mr. St. Clair without checking with him first specifically because of his many years and wide experience in translators. FCC rules that lump translators and Low Power television stations into the same class have had the effect of filling in all of the unused TV channels in most areas near big cities. However on channel repeater technology works best in shadowed locations and does not require that an additional channel be available. On channel repeater technology has been used successfully in AM, FM, and TV analog broadcasting as well as digital paging, cell phones, two way radio, and now in the fledgling digital television industry. Multiple demonstrations have successfully repeated digital TV signals both inside the main coverage and beyond it and some have already received licenses for their digital repeaters. FM broadcasters on Lookout Mountain, Mount Morrison, Mount Chief, and Squaw Mountain use eight translators or repeaters to provide high quality service to Boulder. The same technology could fill shadow areas in front of the southern foothills just as well but the broadcasters don't seem to find a problem with coverage in the southern shadowed areas. Repeaters work BEST in areas with shadows and the shadowed area defines the area where the repeater will be most effective. A well designed repeater will be designed to just fill the shadowed area regardless of size or shape of the area.

SUMMARY

I believe that all sites including Squaw Mountain can provide very competitive and similar broadcast coverage of the Denver Radio and Television markets and that when closely scrutinized, the technical showings provided by each applicant support this conclusion as well.

Respectfully submitted,

Timothy C Cutforth

Timothy C. Cutforth P.E.
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