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June 19, 2008

FILED/ACCEPTED

JUN 19 2008

Federal Communications Commission
Office of the Secretary

* NOT ADMITTED IN VIRGINIA

BY HAND DELIVERY

Marlene H. Dortch, Esquire
Secretary
Federal Communications Commission
445 12th Street, S.W., Room TW-B204
Washington, D.C. 20554

Attention: Media Bureau

Re: Petition for Rule Making
Amendment of DTV Table of Allotments
Casper, Wyoming

Dear Ms. Dortch:

Transmitted herewith, on Central Wyoming College, permittee of KPTW(TV), Casper, Wyoming, are an original and four copies of its "Petition for Rule Making" to substitute DTV channel *8 for DTV channel *6 at Casper, Wyoming.

Should any questions arise concerning this matter, please communicate with this office.

Very truly yours,



Anne Goodwin Crump
Counsel for Central Wyoming College

AGC:deb

Enclosures

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ORIGINAL

Before the
Federal Communications Commission
Washington, DC 20554

FILED/ACCEPTED
JUN 19 2008
Federal Communications Commission
Office of the Secretary

In the Matter of)
)
Amendment of Section 73.622(b);) MB Docket No. _____
Table of Allotments;) RM _____
Digital Television Broadcast Stations.)
(Casper, Wyoming))

PETITION FOR RULE MAKING

Central Wyoming College, permittee of noncommercial educational television station KPTW¹, Casper, Wyoming (“CWC”), by its attorneys, hereby respectfully submits its Petition for Rule Making to substitute DTV Channel *8 for DTV Channel *6 as Station KPTW’s final, post-transition digital channel. With respect thereto, the following is stated:

1. KPTW is a single-channel station with no companion channel due to the timing of the grant of its original construction permit. While the initial application for construction permit was filed in June 1996 (File No. BPED-19960624KT), the permit was not granted until September 30, 2004, long after the issuance of the initial DTV Table of Allotments. Accordingly, KPTW is scheduled to flash-cut to DTV.

2. On February 9, 2005, just over four months after its construction permit was granted and prior to commencing operation of the new facilities, CWC filed its first-round channel election for KPTW. In that election, CWC specified that it would continue with Channel *6 as its DTV channel, and Channel *6 is included in the most recent DTV Table of Allotments for

¹ KPTW(TV) has been constructed, and an application for license is pending, File No. BLED-20070228ABK.

KPTW. In the interim since the first-round channel election, however, KPTW has commenced operations on TV Channel *6 and has encountered interference issues. CWC now seeks to change the post-transition DTV channel for KPTW from Channel *6 to Channel *8. Not only will this change eliminate the interference issues which have arisen, but it also will have substantial, other public interest benefits. Furthermore, there will be no countervailing detriments, as the proposed change in channel will not create any additional interference. Therefore, grant of this petition will serve the public interest.

3. As set forth in the attached Engineering Statement, although low-band VHF Channels 2 through 6 have unique technical characteristics, operation on those channels is more subject to degradation resulting from man-made and atmospheric noise than operation on other channels would be. After developing real-world experience with DTV broadcasting over recent years, it has been widely acknowledged that DTV reception on the lower VHF channels suffers from the noise to which such channels are particularly susceptible. This recognition is reflected in the fact that there are only eight other post-transition DTV allotments on Channel 6, and half of those are for stations which have historically operated on Channel 6 for a long period of time.

4. Furthermore, the placement of Channel 6 in close proximity to the noncommercial educational FM band also creates the possibility of exacerbated interference issues. Since beginning operation, KPTW has suffered from such interference from NCE stations in the area. Particular difficulties have been created by the close proximity of KCSP-FM, Casper, which operates at 100 kW Effective Radiated Power with circular polarization. CWC has received frequent complaints from both KPTW viewers and radio station listeners due to a background audio bleeding into CWC's Wyoming PBS programming and from radio listeners due to cross-

talk into the radio station programming. As set forth in the attached Engineering Statement, that interference is predicted to continue to plague KPTW-DT on Channel *6. Both the inherent propagation issues with Channel 6 and the interference from nearby NCE FM stations make it desirable for KPTW to change to another channel for its permanent, post-transition DTV channel.

5. DTV Channel *8 is available to substitute for Channel *6. As demonstrated in the attached Engineering Statement, use of DTV Channel *8 at Casper would not cause any additional interference to any other station. Furthermore, the change to Channel *8 would result in no loss of population to be served by KPTW. The proposed technical facilities also would provide the requisite principal community coverage to Casper, the station's community of license. Therefore, the proposed channel change meets the Commission's technical standards for channel changes for existing stations.

6. While the proposal does not meet the spacing requirements of Section 73.623(d), it is not clear whether the terms of that rule are entirely applicable in circumstances such as those of KPTW. While that station was not included in the initial DTV Table of Allotments, its lack of inclusion was only because the station was not eligible for a paired channel because of the pendency of its construction permit application. The construction permit which was granted, however, was not for a new allotment adopted after the initial DTV Table of Allotments, as is the case with some single-channel stations, but rather was for a longstanding allotment for a noncommercial educational television station at Casper. KPTW is now an existing station which has a DTV channel assigned in the DTV Table of Allotments, and it is seeking a channel

substitution rather than a new allotment. It is unclear, therefore, whether the rationale behind Section 73.623(d) would apply to KPTW any more than to other existing stations.

7. Should it be determined, however, that Section 73.623(d) is applicable, then a waiver of that provision is warranted and is hereby requested to the extent deemed necessary. As demonstrated in the Engineering Statement, although the spacings are less than those specified for new facilities, there would be no new interference caused to the short-spaced Channel 8 facilities, and thus, no harm would result. In addition, the other two stations in question, KCWC-DT and KWYP-TV are both also licensed to CWC, the proponent herein. Clearly, CWC does not object to the proposed spacings and is confident that the instant proposal will have no adverse effect on the operations of its other stations. The mountainous terrain of Wyoming acts as a barrier to block interference among the stations. Moreover, the current situation is one that is virtually unique and which is not subject to repetition in the future. The only other stations that could potentially find themselves in similar circumstances are the limited stations which had their initial construction permits for long-established allotments granted subsequent to adoption of the initial DTV Table of Allotments, which seek to change their post-transition channels, and which would not cause any new interference to other stations. Moreover, following the completion of the DTV transition, there will be no additional full-power television stations seeking to make a transition to a new service in the foreseeable future. Finally, the public interest benefits to be realized by a change to Channel *8 are, by themselves, sufficient to justify any necessary waiver.

8. Included among those public interest benefits is the reduction of interference between KPTW and nearby NCE FM stations. This change will improve the service of both KPTW to its

viewers and radio service to KCSP-FM and other local NCE listeners. In addition to removing the interference from KCSP-FM and other nearby NCE stations, the change to Channel 8 also will make KPTW's DTV service less prone to degradation from man-made and atmospheric noise. This change also will serve to improve service to the public, a consideration which is of particular importance as viewers make the transition to the new DTV service.

9. An additional benefit would be the substantial cost savings that could be realized, thereby enabling CWC to devote those resources saved to additional programming and other services to the public. CWC operates a statewide network of stations, which operates under the name of Wyoming PBS. That network includes three full-power television stations, which are the only noncommercial television stations licensed to communities in Wyoming, and a number of television translator stations.

10. Both of CWC's other full-power stations have digital channel allotments on channel 8. The change of KPTW's digital allotment will allow CWC to standardize its digital facilities significantly, thereby reducing the number of major components which must be stocked as spares. This standardization affects not only the transmitters themselves but also the interconnection and terminal equipment. Additional savings are anticipated in the area of staff training. As all full power sites will use essentially the same equipment, network technicians familiar with the equipment at one site would be familiar with the equipment at each of the full power sites. The systems block diagram would be identical for each site, thus technicians could be trained on equipment at the site closest to CWC's headquarters at Riverton and would also become familiar with the systems at Laramie and Casper. The cost savings in the areas of both equipment and staff training would be significant, and the funds thus saved could be diverted to

other areas to further improve service to the public. CWC currently produces substantial local programming, and it also broadcasts distance learning programs. These services are of particular importance in the isolated and sparsely populated areas of Wyoming that are served by CWC's stations. As is the case with most noncommercial stations outside of major population centers, CWC operates with a limited budget, and any costs that can be saved are important.

11. Furthermore, the efficiencies of standardized operations of all three full-power stations on Channel 8 also will benefit viewers. With all three transmission facilities the same, CWC would be able to have more different types of spare parts on hand. Therefore, if there were an equipment failure or damage to the facilities, CWC could be able to return the affected station to operation more quickly. Likewise, the increased familiarity of the station's engineering staff with the full-power transmission facilities, as all three would be essentially the same, also would assist station engineers in trouble-shooting and repairing those facilities more quickly. The reduction in the amount of time off-air or at reduced power due to inevitable weather-related damage, equipment problems, and other glitches also would serve the public interest.

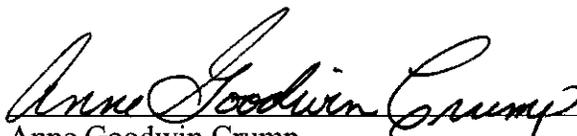
12. In light of the foregoing circumstances, CWC submits that substitution of DTV Channel *8 for DTV Channel *6 at Casper clearly would benefit the public. That substitution would result in a reduction of interference related to the operations of KPTW-DT and would allow for improved reception of both KPTW-DT and nearby noncommercial FM stations. In addition, the use of Channel *8 would allow for standardization among all three of the full-power stations included in the Wyoming PBS network, thereby saving costs, improving staff training, and reducing potential down-time due to technical problems. All of these benefits can be realized without any countervailing public interest detriments, as the proposed facilities would

cause no additional interference to any other station or loss of population serviced and would provide principal community coverage as required by the Commission's rules. Therefore the proposed change in channel would advance the public interest.

WHEREFORE, the premises considered, CWC respectfully requests that the Commission substitute DTV Channel *8 for DTV Channel *6 at Casper, Wyoming.

Respectfully submitted,

CENTRAL WYOMING COLLEGE

By: 
Anne Goodwin Crump

Its Attorney

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**Engineering Statement
 Petition for Rulemaking for KPTW
 Substitution of Digital Channel *8 for Digital Channel *6 at Casper, Wyoming
 June 2008**

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of television station KPTW at Casper, Wyoming. KPTW presently operates on analog Channel 6, with no paired digital channel. Per the DTV Seventh Report and Order MO&O,¹ KPTW will be implementing post-transition digital operation on its present analog Channel 6. This material has been prepared in connection with a Petition for Rulemaking proposing to substitute digital Channel *8 for digital Channel *6 at Casper.

The following table lists the KPTW post-transition facilities approved in Appendix B of the DTV Seventh Report and Order MO&O, as well as CWC's requested post-transition facilities as proposed herein:

	DTV Table Appendix B	Proposed Substitution
Channel	6	8
ERP	1.0 kW	2.3 kW
HAAT	536 meters	564 meters
Antenna	ID #74715 (FCC-created directional)	Kathrein 2X2 K523357 array directional (see Exhibit A)
Coordinates	42-44-26 106-21-34	42-44-26 106-21-34
DTV Population (thousand)	70	70

¹ See *Advanced Television Systems and their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, FCC 08-72, Released March 6, 2008.

I. Background and Technical Reasons for Request

CWC filed its original application to construct a full-power TV station on Channel 6 at Casper in June of 1996.² That long-pending application was not granted until more than eight years later on September 30, 2004. In the intervening years the Commission and the television industry had made great progress on the path towards digital full-power television. However, since CWC was not granted its initial analog construction permit until nearly six years after the release of the initial DTV Table of Allotments in December of 1998, the Casper permit was never eligible for a "paired" digital channel.

While the lower VHF Channels 2-6 offer unique technical characteristics for broadcasting, particularly with regard to propagation, it is widely acknowledged that signals in this spectrum are more susceptible to degradation due to man-made and atmospheric noise.³ Nevertheless, the Commission determined in the DTV Sixth Report and Order Memorandum Opinion and Order (1998) to retain the lower VHF band as part of the "core" TV spectrum, in part to ensure that all eligible stations would be able to receive a viable paired digital channel for operations during the transition, and in part due to a lack of "real-world" engineering evidence available at that time to indicate that these channels are unsuitable for DTV operation.

Since that time, it has become clear to experts in the television broadcasting industry that low-band VHF reception of DTV does suffer from the proliferation of household electronics devices which contribute significant levels of noise within homes. In May of 2004, Doug Lung wrote in his TV Technology column: "Household appliances, computers and other electronic equipment contribute large amounts of noise inside the house, making low-VHF DTV reception difficult, if not impossible. Charlie [Rhodes] mentioned the large amount of RF interference generated by plasma TV displays. Another reader mentioned a widely distributed electric blanket that generated large amounts of

² See BPET-19960624KT.

³ "TV operations on the lower VHF channels 2-6 are subject to a number of technical penalties, including higher ambient noise levels due to leaky power lines, vehicle ignition systems, and other impulse noise sources and interference to and from FM radio service." Sixth Report and Order, MM Docket No. 87-268,(1997) at paragraph 82.

interference even when switched off!"⁴ The same article cited to indoor antennas which have very high VSWR at VHF, and that many new antennas designed for indoor use are designed for reception of high-band VHF and for UHF, but not for the low-band VHF channels.

Even popular outdoor antennas such as the Winegard SquareShooter™ are clearly designed for high-band VHF and UHF reception, and perform only passably for reception of low-band VHF. Attached as Exhibit B is the spec sheet on the SquareShooter™ antenna, which shows that while it is generally suitable for high-band VHF and UHF reception to a distance of 40-50 miles from the transmitter site, for low-band VHF that distance drops precipitously to just 15 miles.

It is noted that the proposed 2.3 kW ERP for Channel 8 operation is only 3.6 dB higher than the 1 kW ERP for Channel 6 operation authorized by Appendix B, whereas the Commission's DTV planning factors and §73.625 establish an 8 dB differential between the minimum signal strengths for DTV reception on Channels 6 and 8.⁵ So on the surface it might appear that the proposed channel substitution (at the power level requested) might result in a reduced level of reception service to the public. However, the paper "Planning Factors for Fixed and Portable DTTV Reception" authored by Oded Bendov, Yiyan Wu, Charles W. Rhodes, and John F.X. Browne and presented at the IEEE 2003 Broadcast Technical Symposium⁶ showed that median residential man-made and sky noise -- not accounted for in the Commission's DTV planning factors -- contributes as much as an additional 16 to 18 dB to the noise floor at Channel 6, but only 7 to 9 dB at Channel 8. When those additional noise levels are added to the Commission's defined field strengths for DTV reception, the results indicate that acceptable Channel 8 DTV reception can be expected to occur at a field strength that is 1 dB below that of Channel 6.

⁴ Doug Lung, "Low-Band VHF DTV Revisited", May 5, 2004, TVTechnology.com

⁵ 28 dBu on Channel 6 versus 36 dBu on Channel 8.

⁶ "Planning Factors for Fixed and Portable DTTV Reception" by Oded Bendov, Yiyan Wu, Charles W. Rhodes, and John F.X. Browne, IEEE Transactions on Broadcasting, Vol. 50, No. 3, September 2004.

Channel	FCC Field Strength F(50,90)	Plus noise power (dB over KToB) Man-made with sky noise Rooftop Antenna	Plus noise power (dB over KToB) Man-made with sky noise Set-top Antenna
6	28 dBu	+ 16 dB = 44 dBu	+7 dB = 43 dBu
8	36 dBu	+ 18 dB = 46 dBu	+9 dB = 45 dBu

Indeed, Industry Canada has accounted for this external noise by assuming an equivalent "antenna noise" factor T_a in their DTV planning parameters. In the Canadian DTV rules the resulting minimum required field strength for low-band VHF is 2 dB higher than that for high-band VHF.⁷

Consequently, CWC believes that the lower man-made and sky noise levels on Channel 8 will likely result in the proposed operation of KPTW on Channel 8 having a 4.6 dB advantage over the Appendix B operation on Channel 6.

Complicating the circumstances for KPTW is the fact that the presently-assigned Channel 6 is immediately adjacent to the lower edge of the FM reserved (i.e. non-commercial) band. In this regard it should be noted that the first authorization for a full-power TV station at Casper on Channel 6 was granted only four years ago in September 2004. Thus until that date there was no requirement that reserved-band FM stations operating or proposed in the vicinity of Casper provide any interference protection to KPTW.⁸

The final DTV Table of Allotments includes nine assignments on Channel 6. Casper is but one of two final Channel 6 allotments where there has not been a long-standing analog Channel 6 operation by the station receiving the assignment or by another station within 85 km.

⁷ 35 dBu for low-band VHF vs 33 dBu for high-band VHF.

⁸ While KPTW was preceded in operation on Channel 6 at Casper by TV translator station K06KH, TV translator stations are not afforded interference protection from reserved-band FM stations under §73.525 of the Commission's Rules.

Channel 6 DTV Allotments from Appendix B

Callsign	Community	NTSC	DTV	Comment ⁹
WUOA	Tuscaloosa, AL	23	6	85 km from long-time Ch6 analog operation WBRC Birmingham, on air 1949
WEDY	New Haven, CT	65	6	Channel availability was likely limited by station location on eastern seaboard
WAVW-TV	Pelham, GA	14	6	54 km from long-time Ch6 analog operation WJBF Augusta, on air 1955
WCES-TV	Wrens, GA	20	6	45 km from long-time Ch6 analog operation WJBF Augusta, on air 1953
KBSD-TV	Ensign, KS	6	6	Long-time Ch6 analog operation, on air 1957
KTVM	Butte, MT	6	6	Long-time Ch6 analog operation, on air 1970
WRGB	Schenectady, NY	6	6	Long-time Ch6 analog operation, on air 1928
WPVI-TV	Philadelphia, PA	6	6	Long-time Ch6 analog operation, on air 1947
KPTW	Casper, WY	6	6	Full-power Ch6 at Casper first authorized September 2004

As a consequence, KPTW is potentially more subject to interference from reserved-band FM operations than almost any other digital Channel 6 station. By way of concrete example, an FM-TV6 interference study pursuant to §73.525 of the Commission's Rules has been conducted to evaluate the level of interference which FM station KCSP-FM Channel 212C Casper is predicted to cause to reception of KPTW. KCSP-FM is licensed to operate from a transmitter site just 4.3 kilometers from the authorized KPTW transmitter site, with a full 100 kW ERP, circularly polarized. Study was made of the effect of KCSP-FM upon a) the KPTW analog Channel 6 permit (BPET-19960624KT, license application pending as BLET-20070228ABK), b) the KPTW digital Channel 6 permit (BPEDT-20080312AAX), and c) the KPTW digital Channel 6 assignment from Appendix B.

The results of this study (included as Exhibit C) show that – *no matter which KPTW facility is considered* – KCSP-FM is predicted to cause interference to 68,000 to 70,000 people otherwise served by KPTW, amounting to nearly 100% of the population served by the station.¹⁰

⁹ On-air dates taken from Broadcasting & Cable Yearbook 2008, not cross-checked.

¹⁰ Appendix B lists a service population of 70,000 persons for digital Channel 6 at Casper.

Bob Connelly, the Assistant General Manager for Wyoming Public TV (the "network" name for the stations operated by CWC), has reported to this firm that they have received frequent TV viewer and FM listener comments concerning the interaction between these two closely-spaced services. FM listeners have called to comment on apparent cross-talk from KPTW into their radio listening, while KPTW viewers have commented about a background audio behind the program audio on the TV station.

KPTW, unlike other Channel 6 stations (most of which are located in areas where channel availability is scarce), has the option proposed herein of moving to a high-band VHF channel which avoids interference to and from the FM reserved band, has advantageous propagation characteristics, and is less-susceptible to man-made and atmospheric noise.

II. Spacing Study and Waiver Request

KPTW was not granted a digital channel in the initial 1998 DTV Table of Allotments, since the original analog construction permit for this station was not granted until 2004. Accordingly, a spacing study was conducted pursuant to §73.623(d). The results of that study (which are summarized in the printout included in Section III, below) indicate that the proposed operation of KPTW on digital Channel 8 is short-spaced by 80 km to KCWC-DT at Lander and by 95 km KWYP-DT at Laramie.

It is not clear whether the language of §73.623(d), requiring compliance with minimum geographic spacing requirements for DTV allotments not included in the initial DTV Table of Allotments, is intended to apply to a station such as KPTW which had its original analog application pending at the time the 1998 DTV Table was adopted, or whether that language should be read as pertaining to new allotments proposed following the end of the transition.

Given that CWC is believed to have been eligible to request an alternate digital channel during the channel election process, §73.623(d) is not believed to be an impediment to the instant proposal. Nevertheless, the applicant requests a waiver of §73.623(d), if required and to the extent required, to permit the substitution of digital Channel 8 for digital Channel 6 at Casper, Wyoming. The legal

portion of this Petition for Rulemaking contains additional information supporting this request for waiver.

III. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause impermissible interference (i.e. more than 0.5 percent new interference) to any stations beyond that level listed in the post-transition DTV Table Appendix B. This study was performed using the SunDTV program from V-Soft Communications and a 2 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on this allocation and interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Summary Study

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 06-05-2008 Time: 20:37:38

Record Selected for Analysis

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KPTW      USERRECORD-01      CASPER      WY US
Channel 08 ERP 2.3 kW HAAT 568. m RCAMSL 02502 m
Latitude 042-44-26 Longitude 0106-21-34
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

```

Cell Size for Service Analysis 2.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Facility meets maximum height/power limits

Azimuth (Deg)	ERP (kW)	HAAT (m)	36.0 dBu F(50,90) (km)
0.0	1.395	851.1	101.9
45.0	1.307	760.9	99.6
90.0	1.294	255.2	74.4
135.0	0.059	141.9	43.0
180.0	0.082	422.2	63.2

Hatfield & Dawson Consulting Engineers

225.0	0.064	691.5	73.1
270.0	0.166	611.9	78.6
315.0	1.727	810.1	102.9

Evaluation toward Class A Stations

No Spacing violations or contour overlap to Class A stations

Class A Evaluation Complete

SPACING VIOLATION FOUND BETWEEN STATION

KPTW 08 CASPER WY USERRECORD01

and station

SHORT TO: KCWC-TV 08 LANDER WY BDTV 1805
 42 -34-59 108 -42-36
 Req. separation 273.6 Actual separation 193.5 Short 80.1 km

SHORT TO: KWYP-TV 08 LARAMIE WY BDTV 1806
 41 -17-17 105 -26-42
 Req. separation 273.6 Actual separation 178.2 Short 95.4 km

- Proposed facility OK to FCC Monitoring Stations
- Proposed facility OK toward West Virginia quite zone
- Proposed facility OK toward Table Mountian
- Proposed facility is beyond the Canadian coordination distance
- Proposed facility is beyond the Mexican coordination distance
- Proposed station is OK toward AM broadcast stations

 Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
08	KPTW	CASPER WY	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
07	KGWL-TV	LANDER WY	193.7	LIC	BDTV	-1804
07	KSWY	SHERIDAN WY	217.8	LIC	BDTV	-1810
08	KZSD-TV	MARTIN SD	397.6	LIC	BDTV	-1426
08	KCWC-TV	LANDER WY	192.9	LIC	BDTV	-1805
08	KWYP-TV	LARAMIE WY	178.2	LIC	BDTV	-1806
09	KFNR	RAWLINS WY	129.9	LIC	BDTV	-1807

%%%

Study of this proposal found the following interference problem(s):

NONE.

Furthermore, it has been verified that the proposed facility will not reduce the population served by KPTW digital facility by more than 5%, compared to the DTV population listed in Appendix B.

#####

Analysis of Interference to Affected Station 7

Analysis of current record

Channel	Call	City/State	Application Ref. No.
08	KPTW	CASPER WY	USERRECORD-01

Stations Potentially Affecting This Station

Chan	Call	City/State	Dist(km)	Status	Application Ref. No.
07	KGWL-TV	LANDER WY	193.7	LIC	BDTV -1804
07	KSWY	SHERIDAN WY	217.8	LIC	BDTV -1810
08	KZSD-TV	MARTIN SD	397.6	LIC	BDTV -1426
08	KCWC-TV	LANDER WY	192.9	LIC	BDTV -1805
08	KWYP-TV	LARAMIE WY	178.2	LIC	BDTV -1806
09	KFNR	RAWLINS WY	129.9	LIC	BDTV -1807

Total scenarios = 1

Result key: 2

Scenario 1 Affected station 7

Before Analysis

Results for: 8A WY CASPER USERRECORD01 APP

	POPULATION	AREA (sq km)
HAAT 568.0 m, ATV ERP 2.3 kW		
within Noise Limited Contour	71160	20847.1
not affected by terrain losses	70693	19193.7
lost to NTSC IX	0	0.0
lost to additional IX by ATV	236	2396.2
lost to ATV IX only	236	2396.2
lost to all IX	236	2396.2

Potential Interfering Stations Included in above Scenario 1

8A WY LANDER	BDTV	1805	LIC
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III. Summary

In conclusion, it is believed that the proposed substitution of digital Channel *8 for digital Channel *6 for use by KPTW at Casper, Wyoming, is in the public interest, for the following reasons:

- 1) Operation on Channel 8 will be less-susceptible to man-made and atmospheric noise, thereby offering improved reception conditions to the public.
- 2) Operation on Channel 8 will not be subject to interference from FM operations in the reserved band.
- 3) Reserved-band FM operations in the Casper area will not be subject to interference from KPTW, and will have greater flexibility to expand and improve their service areas.
- 4) Operation on Channel 8 will not reduce the population which will receive interference-free service from KPTW.

IV. Statement of Consultant

This Engineering Statement supporting a Petition for Rulemaking to revise the DTV Table of Allotments at Casper, Wyoming, has been prepared on behalf of Central Wyoming College. All representations herein are true to the best of my knowledge.

Signed this 12th day of June, 2008.

A handwritten signature in black ink, appearing to read "Erik C. Swanson". The signature is written in a cursive style with a long, sweeping underline.

Erik C. Swanson

Exhibit A
Proposed Directional Pattern
Casper DTV Ch8

Azimuth	Relative Field
0	0.781
10	0.884
20	0.980
30	0.933
40	0.766
50	0.743
60	0.905
70	0.999
80	0.940
90	0.750
100	0.531
110	0.347
120	0.228
130	0.175
140	0.144
150	0.076
160	0.060
170	0.138

Azimuth	Relative Field
180	0.189
190	0.182
200	0.034
210	0.147
220	0.202
230	0.132
240	0.039
250	0.127
260	0.208
270	0.269
280	0.397
290	0.532
300	0.663
310	0.800
320	0.936
330	0.969
340	0.912
350	0.794

Extra Azimuth:	71	1.000
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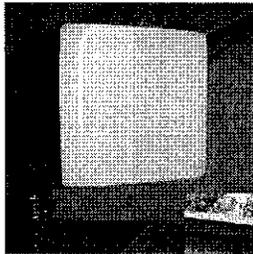
Get²_{TM}

HDTV² SquareShooterTM Antenna System

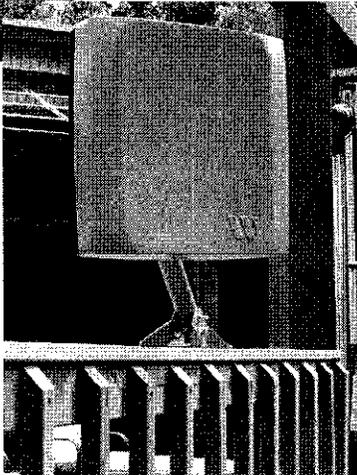
U.S. Patent 6,922,179

Exhibit B
Winegard SquareShooter Spec Sheet

Models SS-1000 & SS-2000



Attic Mount



Deck Rail Mount

Model SS-1000/SS-2000

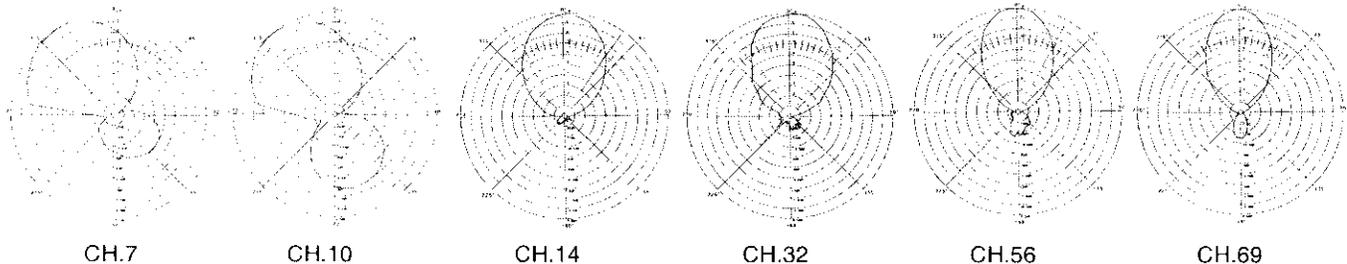
Avg. beamwidth 61°
 Avg. VSWR across band 1.3:1
 Avg. Front to back 13 db
 Avg. gain across band 470-806 4.5 db
 Maximum Width Housing 16" x 16" x 4"
 Preamp gain (SS-2000)
 300,000 μ V Total Input
 S/N ratio 2.8 db
 VHF 12 dB avg.
 UHF 12 dB avg.

GENERAL RECEPTION GUIDELINES

	ANALOG	DIGITAL
VHF Ch. 2-6	0-10 miles	0-15 miles
VHF Ch. 7-13	0-35 miles	0-40 miles
UHF Ch. 14-69	0-45 miles	0-50 miles

Channel	CH. 7	CH. 10	CH. 14	CH. 32	CH. 56	CH. 69
Frequency	175.25 MHz	193.25 MHz	471.25 MHz	579.25 MHz	723.25 MHz	805.75 MHz
Beamwidth at half power points	95°	93°	68°	67°	58°	54°
Front-to-back ratio	6.0 db	2.6 db	20db	16 db	12.5 db	12 db

POLAR PATTERNS



Made in U.S.A. Ships UPS

Exhibit C
FM-TV6 Interference Study
for KCSP-FM 212C Casper

Hatfield & Dawson
Seattle, WA

Page 1
Tuesday, June 10, 2008

BIAfn/Dataworld FM/TV Channel 6 Study

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omissions in the information hereby provided, and shall not be liable
for any injuries or damages (including consequential) which might result
from use of the said information.

Job Title: KCSP-FM Casper

Channel: 212
FM site coordinates: N 42° 44' 24.0" W 106° 18' 23.0"
FM c/r Height = 2554.0 m (8379.3 ft) AMSL
FM ERP = 100.0000 kW
* = 6 dB TV Receiving Antenna Directivity Applied.
Channel 6 Stations within 195.0 km will be examined
Terrain from USGS 3-second Database

**Hatfield & Dawson
Seattle, WA**

BIAfn/Dataworld Educational FM/TV Channel 6 Interference Study

Title: KCSP-FM Casper

Channel: 212

Coordinates: N 42° 44' 24.0" W 106° 18' 23.0"

c/r Height = 2554.0 m AMSL
ERP = 100.0000 kW

---Ix Area---		-----TV Station-----					-----Proposed FM Station-----					
Br	Dx	Bear	Dx	HAAT	ERP	F.S.	U/D	Bear	Dx	HAAT	ERP	F.S.
(deg)	(km)	(br)	(km)	(m)	(kW)	(dBu)	(dB)	(deg)	(km)	(m)	(kW)	(dBu)

TV Station: KPTW Casper, WY (CP)

Distance from TV6 transmitter to FM transmitter: 4.344938 km; Bearing from TV6 to FM: 90.8

TV HAAT toward FM: 267.2 m; TV ERP toward FM: 0.620 kW; Distance to Grade B (47 dBuV/m) Contour: 49.8 km

FM Transmitter Site is inside TV Grade B Contour

*** Interference Study will be performed ***

Interference Site will be FM Transmitter Site: N 42° 44' 24.0" W 106° 18' 23.0"

0.0	77.5	3.2	77.5	844.7	0.620	47.3	27.2*	0.0	77.4	884.8	100.000	74.6
1.0	77.4	4.2	77.5	844.8	0.620	47.3	27.2*	1.0	77.4	883.7	100.000	74.6
2.0	77.4	5.2	77.6	845.8	0.620	47.3	27.3*	2.0	77.4	883.4	100.000	74.6
3.0	77.4	6.2	77.6	849.1	0.620	47.3	27.3*	3.0	77.4	883.3	100.000	74.6
4.0	77.4	7.2	77.7	851.9	0.620	47.3	27.2*	4.0	77.4	882.8	100.000	74.6
5.0	77.4	8.1	77.8	853.8	0.620	47.3	27.3*	5.0	77.3	882.1	100.000	74.6
6.0	77.4	9.1	77.8	855.0	0.620	47.3	27.3*	6.0	77.3	882.6	100.000	74.6
7.0	77.3	10.1	77.9	855.0	0.620	47.3	27.3*	7.0	77.3	882.2	100.000	74.6
8.0	77.3	11.1	77.9	854.4	0.620	47.3	27.3*	8.0	77.2	881.5	100.000	74.6
9.0	77.3	12.1	77.9	854.1	0.620	47.3	27.3*	9.0	77.2	880.9	100.000	74.6
10.0	77.2	13.1	78.0	853.2	0.620	47.2	27.4*	10.0	77.2	880.6	100.000	74.6
11.0	77.2	14.1	78.0	851.6	0.620	47.2	27.4*	11.0	77.1	879.7	100.000	74.6
12.0	77.1	15.1	78.0	849.8	0.620	47.2	27.4*	12.0	77.1	879.4	100.000	74.6
13.0	77.0	16.1	78.0	847.1	0.620	47.1	27.5*	13.0	77.0	879.1	100.000	74.6
14.0	77.0	17.1	78.1	842.6	0.620	47.1	27.6*	14.0	77.0	879.8	100.000	74.7
15.0	76.9	18.0	78.1	839.1	0.620	47.0	27.6*	15.0	76.9	880.1	100.000	74.7
16.0	76.9	19.0	78.1	836.2	0.620	47.0	27.7*	16.0	76.8	880.1	100.000	74.7
17.0	76.8	20.0	78.1	834.3	0.620	47.0	27.7*	17.0	76.7	880.8	100.000	74.7
18.0	76.7	21.0	78.0	833.9	0.620	47.0	27.7*	18.0	76.6	881.7	100.000	74.8
19.0	76.6	22.0	78.0	833.1	0.620	47.0	27.7*	19.0	76.6	882.0	100.000	74.8
20.0	76.5	23.0	78.0	832.2	0.620	47.0	27.7*	20.0	76.5	882.6	100.000	74.8
21.0	76.4	24.0	77.9	830.5	0.620	47.0	21.7	21.0	76.3	882.6	100.000	74.9
22.0	76.2	24.9	77.9	828.4	0.620	47.0	21.7	22.0	76.2	882.4	100.000	74.9
23.0	76.1	25.9	77.8	826.2	0.620	47.0	21.7	23.0	76.1	882.2	100.000	75.0
24.0	76.0	26.9	77.8	824.3	0.620	47.0	21.7	24.0	76.0	881.7	100.000	75.0
25.0	75.8	27.9	77.7	822.5	0.620	47.0	21.7	25.0	75.8	880.8	100.000	75.0
26.0	75.7	28.9	77.7	820.5	0.620	47.0	21.7	26.0	75.7	879.2	100.000	75.0
27.0	75.6	29.8	77.6	818.5	0.620	47.0	21.7	27.0	75.6	877.2	100.000	75.1
28.0	75.4	30.8	77.5	814.2	0.620	47.0	21.7	28.0	75.4	875.1	100.000	75.1
29.0	75.1	31.8	77.3	808.2	0.620	47.0	21.7	29.0	75.1	872.6	100.000	75.1
30.0	74.9	32.8	77.1	801.3	0.620	47.0	21.7	30.0	74.9	869.6	100.000	75.2
31.0	74.5	33.8	76.8	792.3	0.620	47.0	21.7	31.0	74.5	867.4	100.000	75.3
32.0	74.2	34.7	76.6	785.1	0.620	47.0	21.7	32.0	74.3	865.4	100.000	75.3
33.0	74.0	35.7	76.5	781.1	0.620	47.0	21.7	33.0	74.1	863.1	100.000	75.4
34.0	73.9	36.7	76.4	778.8	0.620	47.0	21.7	34.0	73.9	860.4	100.000	75.4
35.0	73.8	37.7	76.4	777.8	0.620	47.0	21.7	35.0	73.8	857.5	100.000	75.4
36.0	73.7	38.6	76.4	777.5	0.620	47.0	21.7	36.0	73.8	854.6	100.000	75.4
37.0	73.6	39.6	76.3	776.9	0.620	47.0	21.7	37.0	73.7	851.2	100.000	75.4
38.0	73.5	40.6	76.3	775.7	0.620	47.0	21.7	38.0	73.6	848.5	100.000	75.4
39.0	73.4	41.5	76.2	773.5	0.620	47.0	21.7	39.0	73.5	846.2	100.000	75.4
40.0	73.4	42.5	76.2	773.5	0.620	47.0	21.7	40.0	73.4	843.8	100.000	75.4

Hatfield & Dawson
Seattle, WA

BIAfn/Dataworld Educational FM/TV Channel 6 Interference Study

Title: KCSP-FM Casper

Channel: 212

Coordinates: N 42° 44' 24.0" W 106° 18' 23.0"

c/r Height = 2554.0 m AMSL
ERP = 100.0000 kW

---Ix Area---		-----TV Station-----						-----Proposed FM Station-----				
Br	Dx	Bear	Dx	HAAT	ERP	F.S.	U/D	Bear	Dx	HAAT	ERP	F.S.
(deg)	(km)	(br)	(km)	(m)	(kW)	(dBu)	(dB)	(deg)	(km)	(m)	(kW)	(dBu)
41.0	73.2	43.5	76.1	769.9	0.620	47.0	21.7	41.0	73.2	840.7	100.000	75.4
42.0	73.0	44.4	76.0	766.1	0.620	47.0	21.7	42.0	73.1	836.8	100.000	75.4
43.0	72.8	45.4	75.9	762.1	0.620	47.0	21.7	43.0	72.9	832.4	100.000	75.4
44.0	72.6	46.4	75.7	757.3	0.620	47.0	21.7	44.0	72.7	828.5	100.000	75.4
45.0	72.4	47.3	75.5	752.1	0.620	47.0	21.7	45.0	72.4	824.4	100.000	75.5
46.0	72.1	48.3	75.4	746.7	0.620	47.0	21.7	46.0	72.2	820.0	100.000	75.5
47.0	71.9	49.3	75.2	741.4	0.620	47.0	21.7	47.0	72.0	815.2	100.000	75.5
48.0	71.6	50.2	75.0	735.4	0.620	47.0	21.7	48.0	71.7	810.8	100.000	75.5
49.0	71.4	51.2	74.8	729.9	0.620	47.0	21.7	49.0	71.5	807.0	100.000	75.5
50.0	71.2	52.1	74.6	724.5	0.620	47.0	21.7	50.0	71.3	803.3	100.000	75.6
51.0	70.9	53.1	74.3	717.4	0.620	47.0	21.7	51.0	71.0	799.9	100.000	75.6
52.0	70.5	54.1	74.1	709.7	0.620	47.0	21.7	52.0	70.6	796.6	100.000	75.7
53.0	70.2	55.0	73.8	702.1	0.620	47.0	21.7	53.0	70.3	791.9	100.000	75.7
54.0	69.9	56.0	73.5	694.1	0.620	47.0	21.7	54.0	70.0	786.6	100.000	75.7
55.0	69.6	57.0	73.3	687.0	0.620	47.0	21.7	55.0	69.7	781.4	100.000	75.8
56.0	69.3	57.9	73.0	680.8	0.620	47.0	21.7	56.0	69.4	775.6	100.000	75.8
57.0	69.0	58.9	72.8	673.8	0.620	47.0	21.7	57.0	69.1	769.1	100.000	75.8
58.0	68.7	59.8	72.5	666.3	0.620	47.0	21.7	58.0	68.8	762.2	100.000	75.8
59.0	68.4	60.8	72.2	658.9	0.620	47.0	21.7	59.0	68.5	756.0	100.000	75.8
60.0	68.0	61.7	71.9	650.1	0.620	47.0	21.7	60.0	68.1	750.1	100.000	75.9
61.0	67.6	62.7	71.5	639.6	0.620	47.0	21.7	61.0	67.7	743.2	100.000	75.9
62.0	67.0	63.7	71.0	626.6	0.620	47.0	21.7	62.0	67.2	735.7	100.000	76.0
63.0	66.4	64.6	70.4	612.2	0.620	47.0	21.7	63.0	66.6	729.3	100.000	76.1
64.0	65.8	65.6	69.9	597.8	0.620	47.0	21.7	64.0	66.0	723.9	100.000	76.2
65.0	65.2	66.5	69.3	584.2	0.620	47.0	21.7	65.0	65.4	717.7	100.000	76.3
66.0	65.2	67.5	69.3	584.2	0.620	47.0	21.7	66.0	65.3	709.4	100.000	76.2
67.0	64.6	68.4	68.8	572.5	0.620	47.0	21.7	67.0	64.8	699.9	100.000	76.3
68.0	64.0	69.4	68.2	561.2	0.620	47.0	21.7	68.0	64.2	689.5	100.000	76.3
69.0	63.4	70.3	67.6	549.6	0.620	47.0	21.7	69.0	63.6	679.3	100.000	76.4
70.0	62.6	71.3	66.8	536.7	0.620	47.0	21.7	70.0	62.8	669.7	100.000	76.5
71.0	61.8	72.2	66.0	523.9	0.620	47.0	21.7	71.0	61.9	658.7	100.000	76.7
72.0	60.8	73.2	65.1	510.7	0.620	47.0	21.7	72.0	61.0	644.8	100.000	76.8
73.0	59.7	74.2	64.0	493.8	0.620	47.0	21.7	73.0	59.8	631.7	100.000	77.0
74.0	58.5	75.1	62.8	476.7	0.620	47.0	21.7	74.0	58.7	618.1	100.000	77.3
75.0	57.3	76.1	61.6	457.5	0.620	47.0	21.7	75.0	57.4	602.2	100.000	77.5
76.0	56.0	77.0	60.3	435.6	0.620	47.0	21.7	76.0	56.1	584.1	100.000	77.7
77.0	54.4	78.0	58.8	409.2	0.620	47.0	21.7	77.0	54.6	567.6	100.000	78.0
78.0	52.9	78.9	57.3	381.7	0.620	47.0	21.7	78.0	53.0	549.0	100.000	78.3
79.0	51.1	79.9	55.5	351.8	0.620	47.0	21.7	79.0	51.2	531.8	100.000	78.5
80.0	48.7	80.8	53.1	316.3	0.620	47.0	21.7	80.0	48.9	518.7	100.000	79.1
81.0	46.1	81.8	50.6	278.0	0.620	47.0	21.7	81.0	46.3	509.1	100.000	79.8
82.0	43.5	82.8	48.0	241.6	0.620	47.0	21.7	82.0	43.7	502.4	100.000	80.7
83.0	42.0	83.7	46.4	220.6	0.620	47.0	21.7	83.0	42.1	498.2	100.000	81.2
84.0	41.1	84.6	45.6	209.0	0.620	47.0	21.7	84.0	41.2	498.9	100.000	81.6
85.0	41.0	85.5	45.5	207.7	0.620	47.0	21.7	85.0	41.1	502.2	100.000	81.7
86.0	41.0	86.4	45.5	207.7	0.620	47.0	21.7	86.0	41.1	507.3	100.000	81.8
87.0	41.3	87.3	45.7	211.3	0.620	47.0	21.7	87.0	41.4	513.8	100.000	81.8
88.0	41.9	88.2	46.3	219.4	0.620	47.0	21.7	88.0	42.0	522.7	100.000	81.7

**Hatfield & Dawson
Seattle, WA**

BIAfn/Dataworld Educational FM/TV Channel 6 Interference Study

Title: KCSP-FM Casper

Channel: 212

Coordinates: N 42° 44' 24.0" W 106° 18' 23.0"

c/r Height = 2554.0 m AMSL

ERP = 100.0000 kW

---Ix Area---		-----TV Station-----						-----Proposed FM Station-----				
Br (deg)	Dx (km)	Bear (br)	Dx (km)	HAAT (m)	ERP (kW)	F.S. (dBu)	U/D (dB)	Bear (deg)	Dx (km)	HAAT (m)	ERP (kW)	F.S. (dBu)
89.0	42.9	89.1	47.4	233.2	0.620	47.0	21.7	89.0	43.0	532.9	100.000	81.5
90.0	44.1	90.0	48.6	250.2	0.620	47.0	21.7	90.0	44.2	545.9	100.000	81.3
91.0	45.6	90.9	50.0	270.8	0.620	47.0	21.7	91.0	45.7	560.4	100.000	81.1
92.0	46.2	91.9	50.7	280.3	0.620	47.0	21.7	92.0	46.4	567.5	100.000	80.9
93.0	46.4	92.8	50.9	282.7	0.620	47.0	21.7	93.0	46.5	568.7	100.000	80.9
94.0	47.0	93.7	51.5	291.4	0.620	47.0	21.7	94.0	47.1	568.8	100.000	80.7
95.0	47.6	94.6	52.1	300.5	0.620	47.0	21.7	95.0	47.8	572.2	100.000	80.5
96.0	48.2	95.5	52.6	308.6	0.620	47.0	21.7	96.0	48.3	577.5	100.000	80.4
97.0	48.2	96.5	52.6	308.6	0.620	47.0	21.7	97.0	48.3	580.5	100.000	80.5
98.0	48.8	97.4	53.2	317.8	0.620	47.0	21.7	98.0	48.9	583.8	100.000	80.3
99.0	49.4	98.3	53.8	326.8	0.620	47.0	21.7	99.0	49.5	588.1	100.000	80.1
100.0	49.8	99.2	54.3	333.3	0.620	47.0	21.7	100.0	50.0	592.5	100.000	80.0
101.0	50.3	100.2	54.8	341.1	0.620	47.0	21.7	101.0	50.5	596.1	100.000	79.9
102.0	51.0	101.1	55.4	351.4	0.620	47.0	21.7	102.0	51.2	598.6	100.000	79.7
103.0	51.5	102.0	55.9	359.5	0.620	47.0	21.7	103.0	51.7	599.5	100.000	79.5
104.0	51.8	103.0	56.2	363.8	0.620	47.0	21.7	104.0	52.0	600.2	100.000	79.4
105.0	52.1	103.9	56.5	368.3	0.620	47.0	21.7	105.0	52.3	602.9	100.000	79.4
106.0	52.4	104.8	56.7	372.5	0.620	47.0	21.7	106.0	52.5	605.6	100.000	79.3
107.0	52.5	105.7	56.8	374.4	0.620	47.0	21.7	107.0	52.7	605.9	100.000	79.3
108.0	52.4	106.7	56.7	372.0	0.620	47.0	21.7	108.0	52.5	605.5	100.000	79.3
109.0	52.2	107.6	56.4	367.7	0.620	47.0	21.7	109.0	52.3	606.1	100.000	79.4
110.0	51.7	108.5	55.9	359.1	0.620	47.0	21.7	110.0	51.8	605.7	100.000	79.6
111.0	51.7	109.4	55.9	359.1	0.620	47.0	21.7	111.0	51.8	605.0	100.000	79.6
112.0	50.8	110.3	55.0	344.2	0.620	47.0	21.7	112.0	50.9	604.3	100.000	79.9
113.0	49.4	111.2	53.5	322.6	0.620	47.0	21.7	113.0	49.5	600.8	100.000	80.3
114.0	48.1	112.1	52.2	302.6	0.620	47.0	21.7	114.0	48.2	594.5	100.000	80.7
115.0	47.0	113.0	51.1	286.4	0.620	47.0	21.7	115.0	47.1	587.2	100.000	81.0
116.0	46.0	113.9	50.1	271.2	0.620	47.0	21.7	116.0	46.1	579.9	100.000	81.2
117.0	45.2	114.7	49.3	260.0	0.620	47.0	21.7	117.0	45.3	568.4	100.000	81.3
118.0	44.3	115.6	48.3	247.0	0.620	47.0	21.7	118.0	44.4	555.0	100.000	81.4
119.0	43.7	116.5	47.7	237.2	0.620	47.0	21.3	119.0	43.8	538.9	100.000	81.4
120.0	43.7	117.4	47.6	237.2	0.620	47.0	21.7	120.0	43.8	519.0	100.000	81.0
121.0	43.2	118.3	47.1	230.0	0.620	47.0	21.7	121.0	43.3	497.4	100.000	80.7
122.0	42.6	119.2	46.5	221.2	0.620	47.0	21.7	122.0	42.7	473.8	100.000	80.5
123.0	41.9	120.1	45.7	211.1	0.620	47.0	21.7	123.0	42.0	452.2	100.000	80.3
124.0	40.8	120.9	44.6	196.1	0.620	47.0	21.7	124.0	40.9	433.5	100.000	80.3
125.0	39.7	121.7	43.4	181.9	0.620	47.0	21.7	125.0	39.8	409.9	100.000	80.2
126.0	38.6	122.6	42.3	169.9	0.620	47.0	21.7	126.0	38.7	388.2	100.000	80.2
127.0	38.6	123.5	42.3	169.9	0.620	47.0	21.7	127.0	38.7	376.6	100.000	79.8
128.0	38.3	124.4	41.9	166.4	0.620	47.0	21.7	128.0	38.4	368.3	100.000	79.8
129.0	38.8	125.3	42.4	170.8	0.620	47.0	21.7	129.0	38.9	363.2	100.000	79.4
130.0	39.6	126.3	43.1	178.3	0.620	47.0	21.7	130.0	39.7	355.0	100.000	78.8
131.0	40.0	127.3	43.4	182.0	0.620	47.0	21.7	131.0	40.0	346.2	100.000	78.4
132.0	39.7	128.2	43.1	178.1	0.620	47.0	21.7	132.0	39.7	336.1	100.000	78.2
133.0	39.1	129.0	42.5	171.9	0.620	47.0	21.7	133.0	39.2	329.6	100.000	78.3
134.0	38.6	129.9	41.9	166.3	0.620	47.0	21.7	134.0	38.6	323.9	100.000	78.4
135.0	37.9	130.7	41.1	159.3	0.620	47.0	21.7	135.0	37.9	318.6	100.000	78.6
136.0	36.9	131.6	40.2	151.2	0.620	47.0	21.7	136.0	37.0	319.0	100.000	79.0