

Notice of  
proposed Rulemaking  
Digital Translators

B. W. St. Clair, 11/03

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of )  
 )  
Amendment of Parts 73 and 74 of the )  
Commission's Rules to Establish Rules for Digital ) MB Docket No. 03-185  
Low Power Television, Television Translator, and )  
Television Booster Stations and to Amend Rules )  
for Digital Class A Television Stations )

NOTICE OF PROPOSED RULE MAKING

Adopted: August 6, 2003

Released: August 29, 2003

Comment Date: [60 days after publication in the Federal Register]

Reply Comment Date: [90 days after publication in the Federal Register]

By the Commission:

TABLE OF CONTENTS

	Paragraph
I. INTRODUCTION .....	1
II. BACKGROUND .....	3
III. ISSUE ANALYSIS .....	9
A. Permissible Service .....	9
1. Digital Television Translator Stations.....	9
2. Digital Low Power Television Stations.....	18
B. Channel Assignments.....	26
C. Interference Protection.....	31
1. Protected Digital Translator and LPTV Service Contour.....	31
2. Protection Standards and Methodology.....	34
a. Broadcast Station Protection.....	34
b. Protection of Land Mobile Radio and Other Primary Services .....	58
D. Other Technical Issues .....	61
1. Power Limits.....	61
2. Out-of-Channel Emission Limits.....	62
3. Other Transmission System Facilities Issues .....	71
4. Modification of Transmission Systems .....	80
E. Station Operation .....	82
1. Time of Operation.....	82
2. Unattended Operation.....	84
3. Station Identification .....	85
F. Authorization of Digital LPTV and TV Translator Stations .....	91
G. Digital Booster Stations .....	118

# Double Click Search @ the FCC Home Page

Federal Communications Commission (FCC) Home Page - Microsoft Internet Explorer provided by Comcast High-Speed Internet

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit Discuss Real.com

Address http://www.fcc.gov/

FCC Home **Search** Updates | E-Filing | Initiatives | For Consumers | Find People

Federal Communications Commission

**FCC Home Page** [site map](#)

**Search:**   [Help](#) | [Advanced](#)

[About the FCC](#)  
[Auctions](#)  
[Commission Meetings](#)  
[Commission Registration System \(CORES\)](#)  
[Contacting the FCC](#)  
[Customer Service Standards](#)  
[Employment Opportunities](#)  
[FCC History Project](#)  
[Fees](#)

**Rural Wireless ISP Showcase & Workshop**  
Federal Communications Commission  
Tuesday November 4, 2003

**Headlines** [Daily Digest](#) | [Daily Business](#)

10/30/03  
**Homeland Security: Media Security and Reliability Council to Review Infrastructure Security Recommendations at Upcoming Meeting on Thursday, November 6, 2003.**  
News Release: [Word](#) | [Acrobat](#)

10/30/03  
**Chairman Powell's Prepared Testimony on Universal Service to the United States Senate Committee on Commerce, Science, and Transportation.**  
[Word](#) | [Acrobat](#)

10/29/03  
**FCC and National Imagery and Mapping Agency Sign Inter-Agency Memorandum of Understanding for Quarterly Sharing of Databases on**

**Commissioners**  
[Michael K. Powell](#)  
Chairman  
[Kathleen Q. Abernathy](#)  
Commissioner  
[Michael J. Copps](#)  
Commissioner  
[Kevin J. Martin](#)  
Commissioner  
[Jonathan S. Adelstein](#)  
Commissioner  
[Commission Photo](#)  
[Additional Information](#)

**Bureaus & Offices**  
**Bureaus:**

http://www.fcc.gov/searchtools.html Internet

FCC Search Tools - Microsoft Internet Explorer provided by Comcast High-Speed Internet

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit Discuss Real.com

Address http://www.fcc.gov/searchtools.html

Commission

## FCC Search Tools

FCC > Search Tools [site map](#)

[FCC Search](#)  
[Topical Index](#)  
[Electronic Document Management System \(EDOCS\)](#)  
[Document Indexes](#)  
[Site Map](#)

### Special-Purpose Tools

[General Menu Reports](#)  
[Electronic Filing Systems](#)  
Search for  
Filed Comments:  
[main](#) | [alternate](#)  
Media Bureau  
Consolidated Data  
Base Search Page:  
[main](#) | [alternate](#)

## FCC Search Tools

### FCC Search

[Help](#) | [Advanced](#)

### FCC Search

FCC Search is the new full-text search tool that collects information from web pages and many types of documents including Word, WordPerfect, Acrobat, Excel, and ASCII Text, throughout the FCC's web site and the Electronic Document Management System (EDOCS), but does not collect information from the FCC's other databases. To search these systems, use the "Special Tools" links at the left side of this page, and described below. FCC Search also offers [Advanced Search Options](#) and [On-Line Help](#) including examples and instructions.

### Topical Index

This page provides a list and fast search of subject-oriented links to FCC-selected web pages that offer the best information available on the most common topics of interest to the public.

### **FCC Electronic Document Management System (EDOCS)**

EDOCS lets you search a database of Daily Digest entries for FCC documents posted to the FCC web site since March 1996. EDOCS displays information about documents in three

**Double Click EDOCS**

FCC Electronic Document Management System (EDOCS) - Microsoft Internet Explorer provided by Comcast High-Speed Internet

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit Discuss Real.com

Address http://hraunfoss.fcc.gov/edocs\_public/SilverStream/Pages/edocs.html

FCC Home | Search | Updates | E-Filing | Initiatives | For Consumers | Find People

**EDOCS**

FCC > EDOCS [site map](#)

**EDOCS Home**  
[EDOCS Advanced](#)  
[Search Instructions](#)  
[Definitions](#)  
[FAQs](#)  
[Daily Digest](#)

**Contact Information**  
(202) 418-0265  
[EDOCSHelp@fcc.gov](mailto:EDOCSHelp@fcc.gov)

## Electronic Document Management System (EDOCS)

EDOCS lets you search a database of [Daily Digest](#) entries for FCC documents that have been posted to the FCC web site. For advanced searches, use the fully-featured [EDOCS Advanced Search](#).

**EDOCS Quick Search**

DA/FCC-

Release Date:  mm/dd/yyyy

Title/Description:

**About EDOCS**

EDOCS lets you search a database of Daily Digest entries for FCC documents posted to the FCC web site since March 1996. The query searches on words and numbers that appeared in the Daily Digest title and in the description for each document, not on the full text of each

Internet

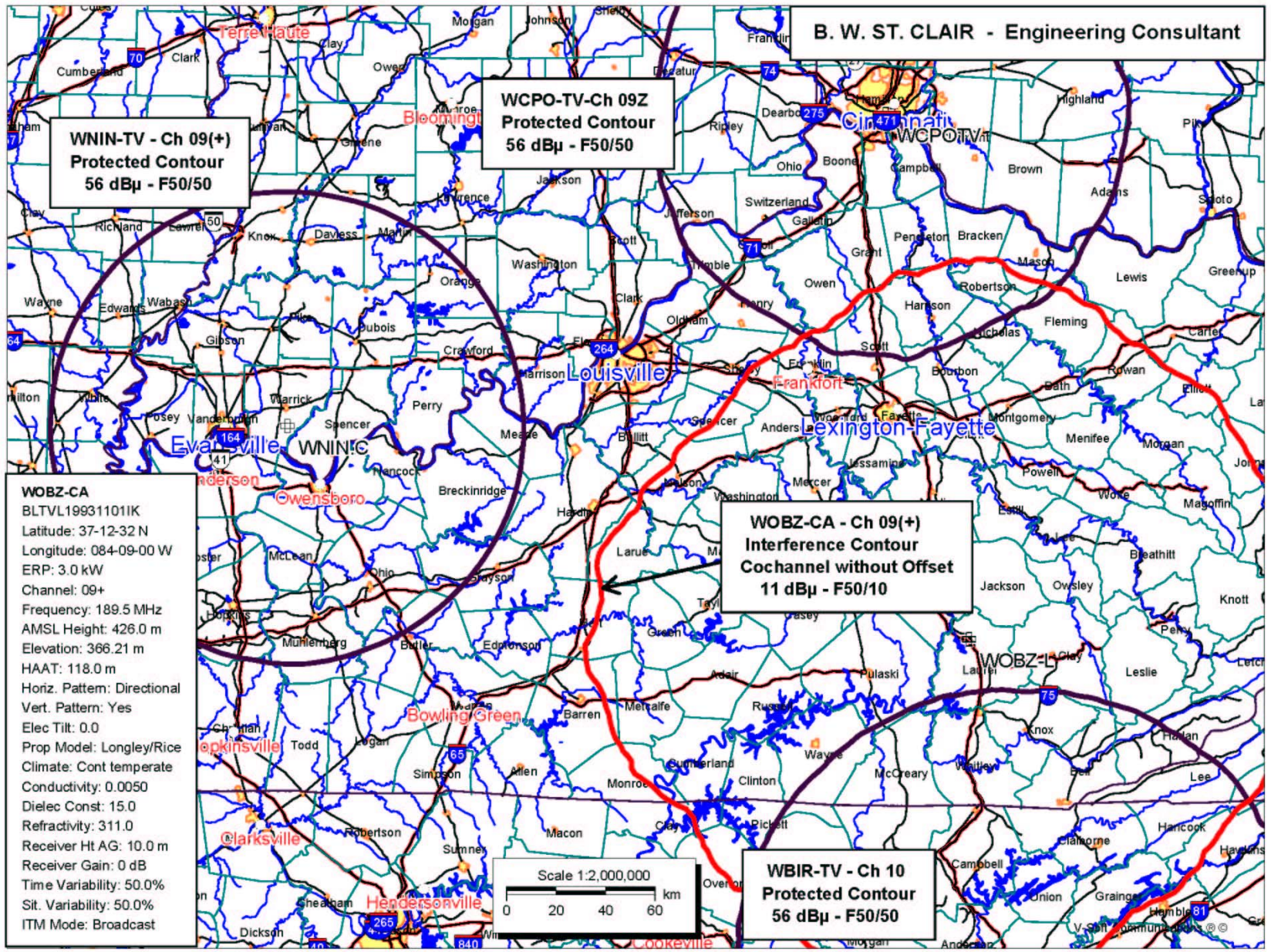
Enter 03-198 here.

[http://hraunfoss.fcc.gov/edocs\\_public/SilverStream/Pages/edocs.html](http://hraunfoss.fcc.gov/edocs_public/SilverStream/Pages/edocs.html)

30-Oct-03(5)

# Available Channels

- No argument about channels 2 to 51 (core channels)
- Available for translators
  - Ch 52 – 59 ?
  - Ch 60 to 69 ?
- Available for LPTV
- NPRM Paragraphs 26 to 30



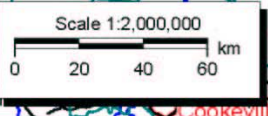
**WVIN-TV - Ch 09(+)  
Protected Contour  
56 dBμ - F50/50**

**WCPO-TV-Ch 09Z  
Protected Contour  
56 dBμ - F50/50**

**WOBY-CA - Ch 09(+)  
Interference Contour  
Cochannel without Offset  
11 dBμ - F50/10**

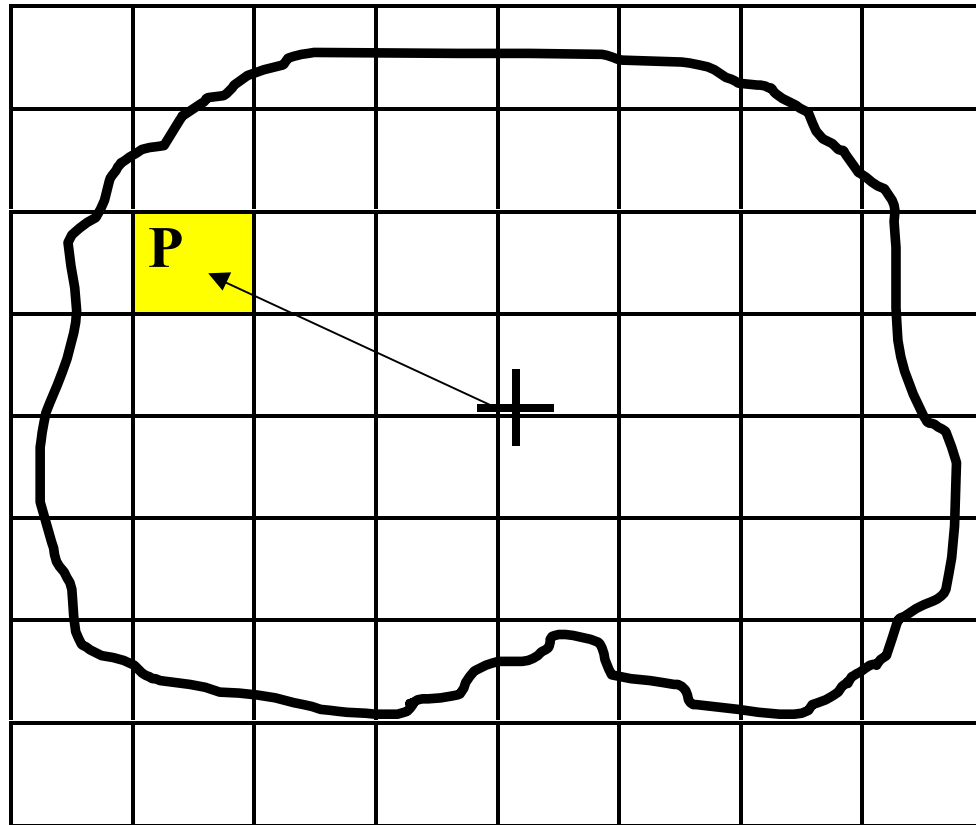
**WBIR-TV - Ch 10  
Protected Contour  
56 dBμ - F50/50**

**WOBY-CA**  
 BLTVL19931101IK  
 Latitude: 37-12-32 N  
 Longitude: 084-09-00 W  
 ERP: 3.0 kW  
 Channel: 09+  
 Frequency: 189.5 MHz  
 AMSL Height: 426.0 m  
 Elevation: 366.21 m  
 HAAT: 118.0 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: Yes  
 Elec Tilt: 0.0  
 Prop Model: Longley/Rice  
 Climate: Cont temperate  
 Conductivity: 0.0050  
 Dielec Const: 15.0  
 Refractivity: 311.0  
 Receiver Ht AG: 10.0 m  
 Receiver Gain: 0 dB  
 Time Variability: 50.0%  
 Sit. Variability: 50.0%  
 ITM Mode: Broadcast

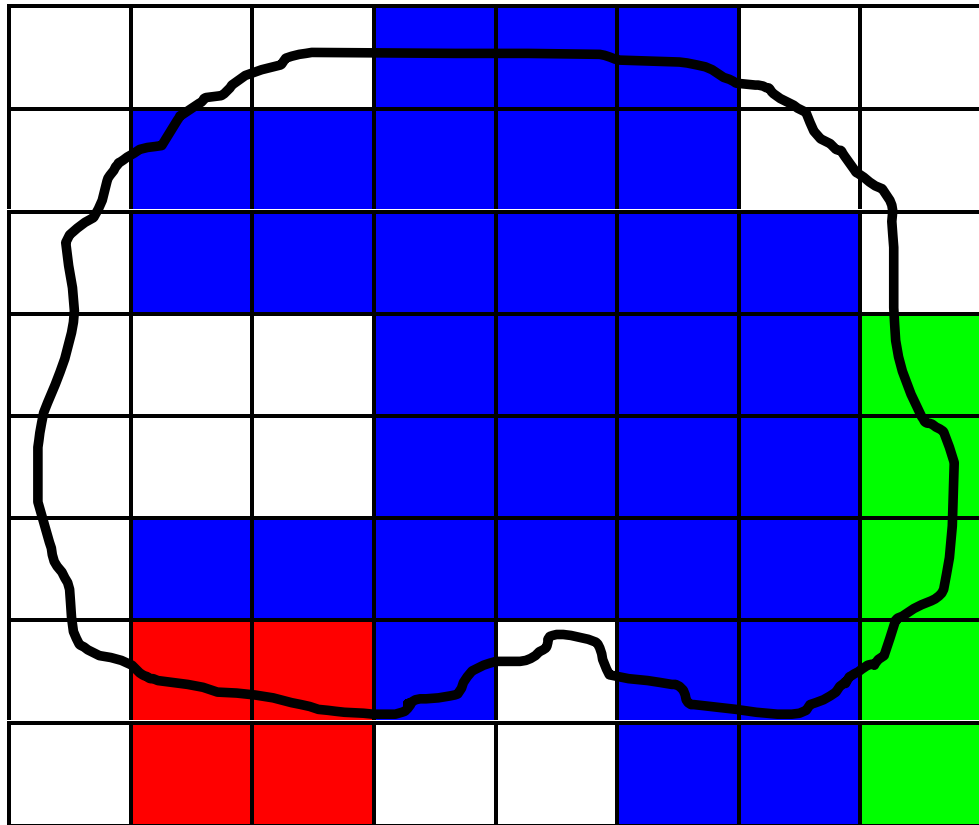
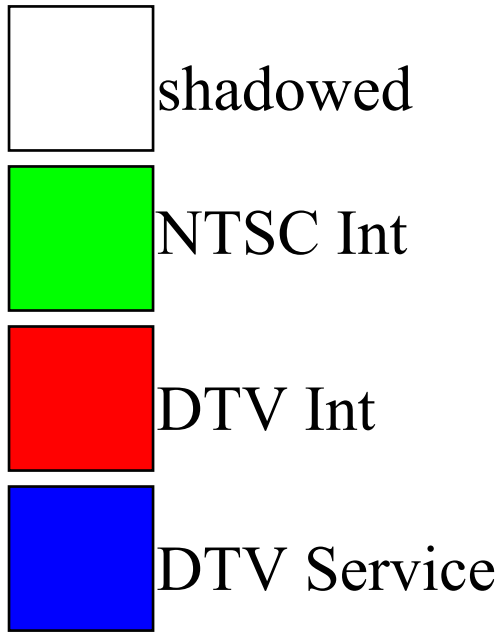


# Check cells for Longley-Rice field strength greater than noise limited value

$$\begin{aligned} \text{L-R (50,90)p} \\ \geq 41\text{dB}\mu \end{aligned}$$



# DTV Service



## Protected Service Areas

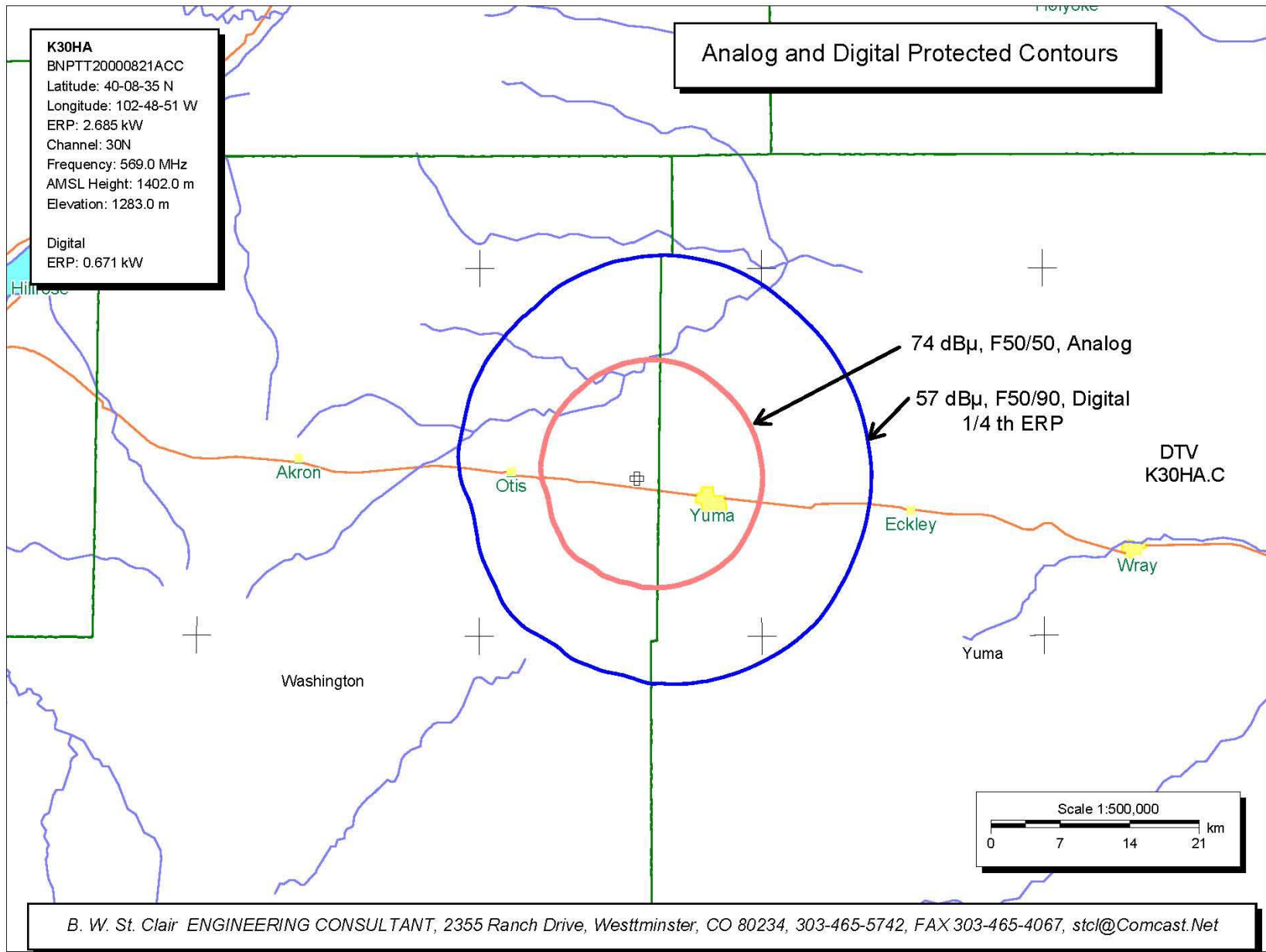
	Low Band VHF	High Band VHF	UHF
Full Service	28 dB $\mu$	36 dB $\mu$	41 dB $\mu$
Proposed for LPTV/ Translators	43 dB $\mu$	48 dB $\mu$	57 dB $\mu$

Based on F50/90 propagation curves.

# POWER LIMITS

	VHF	UHF
Analog	3.0 kW	150 kW
Digital	0.3 kW	15 kW

Power limits already established. See §74.735



# Comparison of Coverage of NTSC and Digital Signals

This comparison is based on equivalent size transmitters for NTSC and Digital signals.

The power rating of NTSC transmitters is based on the power during the time the sync pulse is being transmitted. A digital transmitter has no recognizable sync pulse period so power is measured as the average power over the whole 6 MHz band.

Translator manufacturers advise us that a given size translator will produce an average digital power that is 25 to 50% of the NTSC peak sync power. That is a translator rated for 100 watts NTSC can be expected to produce 25 to 30 watts average digital power. This example assumes 25 watts or 6dB less.

The laboratory tests of the Grand Alliance digital signal show that a successful picture can be produced with a signal that is 12.5dB less than an NTSC signal based on the way each is measured. This digital “improvement” is based upon a perfect signal, limited only by noise, reaching the receiver.

Replacing or converting an NTSC translator with digital results in:

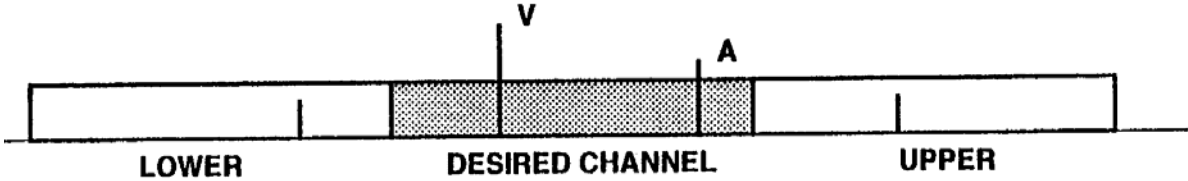
Power change	=	- 6.0 dB
Sensitivity change	=	12.5 dB
Gain	=	6.5 dB

It is prudent to allow 2dB for ghosting and other impairments between the translator and the receiver. It will also be necessary to make a further allowance for the bit error rate which is already present in the output signal of the translator. This number is unknown but is presumably in the range of a few dB.

Taking all the gains and losses there is still a small improvement left when a translator converts to digital. The net result is any home receiving a watchable analog signal from a translator will successfully receive a digital signal from a comparable installation and in general the digital coverage will extend somewhat further.

# Spurious Products

NTSC



HDTV



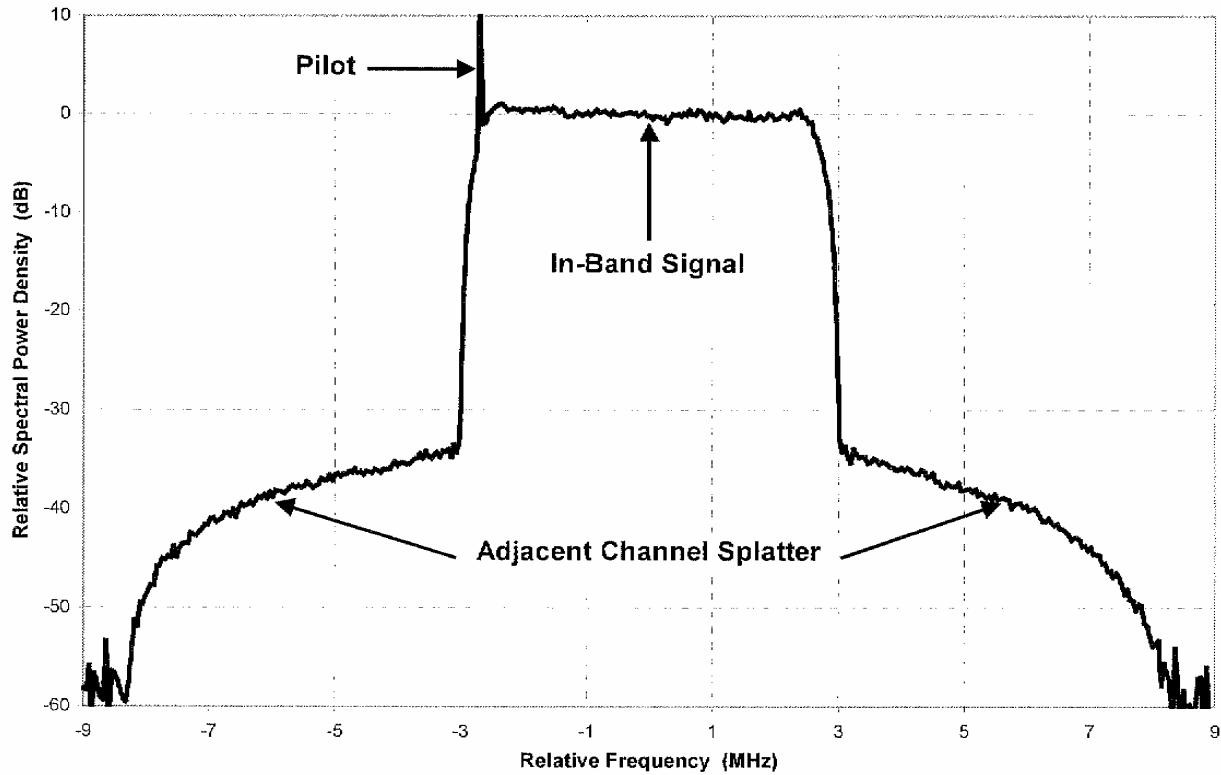


Fig 2-2 Typical DTV spectrum with adjacent channel splatter

From: DTV Repeater Emission Mask by Gary Sgrignoli, Zenith Corp.

<http://www.zenith.com/digitalbroadcast/downloads/DTV Emission Mask Analysis.pdf>

## APPENDIX I

### COMPARISON OF INTERFERENCE FROM ANALOG AND DIGITAL TRANSLATORS

This exhibit compares the interference caused by analog and digital translators with the average digital power at 1/4th the original analog power and the other parameters equal. This corresponds to a practical scenario where an analog translator converts to digital with the equipment unchanged except for the addition of a mask filter.

The ratios are the threshold interference ratios in OET Bul. 69.

#### RELATIVE INTERFERENCE WITH DIGITAL POWER 6 dB BELOW ANALOG POWER

	Analog to Analog	Digital to Analog	Power Change	Change in Interference
Co Channel with offset	+28dB	+3.4dB	-6dB	none
Co Channel without offset	+45dB	+34dB	-6dB	-17dB
Adjacent Channels Protected Station Upper	-3dB	-17dB	-6dB	-20dB
Adjacent Channels Protected Station Lower	-13dB	-12dB	-6dB	-5dB
Translator 15 Channels Above Protected Station	-9dB	-31dB	-6dB	-28dB

Notes: 1. Ratios in columns 2 & 3 are amount by which interfering signal must be below desired signal. Minus indicates interfering signal stronger than desired.

2. Change in Interference: minus indicates less interference.

# How to file comments...

Streamlined path on FCC's main web page.

Letter from ok.

Reference docket – MBDocket 03-185 (NPRM FCC 03-198)

Deadline for comments November 25<sup>th</sup>, reply comments December 25<sup>th</sup> roles to 26<sup>th</sup>.

FCC Electronic Comment Filing System - Microsoft Internet Explorer provided by Comcast High-Speed Internet

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit

Address <http://www.fcc.gov/cgb/ecfs/> Go

Links RealPlayer

**FC** Federal Communications Commission

[FCC Home](#) | [Search](#) | [Updates](#) | [E-Filing](#) | [Initiatives](#) | [For Consumers](#) | [Find People](#)

## Electronic Comment Filing System

FCC > [CGB](#) > ECFS Home Page [FCC site map](#)

**Search:**

[Help - Advanced](#)

[Consumer Alerts and Factsheets](#)

[Consumer Policy Issues](#)

[Click Here to learn how to put yourself on the National DO-NOT-CALL REGISTRY](#)

### Electronic Comment Filing System

Welcome to the Federal Communication Commission's Electronic Comment Filing System (ECFS) pages. ECFS serves as the repository for official records in the FCC's docketed proceedings and rulemakings from the year 1992 onward. Consumers can research, retrieve, view, and print any document in the system, including earlier non-electronic FCC documents that have been scanned into the system.

#### Tips & Notations

#### ECFS Main Links

- [Getting Started](#)
- [Submit a Filing](#)
- [Search for Filed Comments](#)
- [Search for a Proceeding History](#)
- [Pre-ECFS Comments](#)
- [ECFS Alternate Link](#)
- [Archived News Items](#)

Done Internet

start

Microsoft PowerP... BWS PWRPT (F:) People - Microsoft... FCC Electronic Co...

12:44 PM Sunday 11/2/2003

<http://www.fcc.gov/cgb/ecfs/>

ECFS Comment Upload - Microsoft Internet Explorer provided by Comcast High-Speed Internet

File Edit View Favorites Tools Help

Address Links



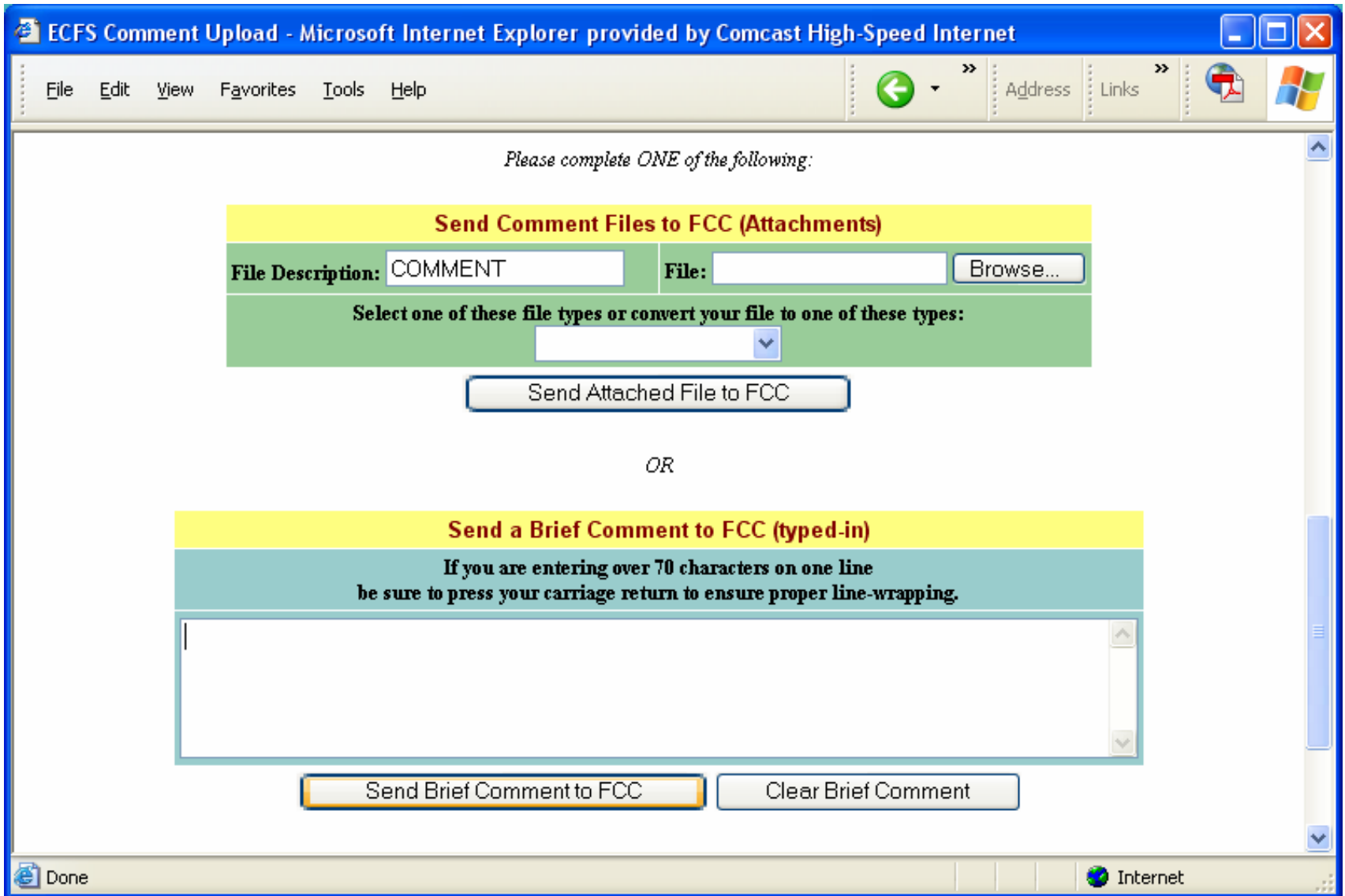
### Electronic Comment File Submission

*Sending your comment is a 2-step process. The first step is to complete the Cover Sheet below. The second step is to choose one of the two transmittal methods: sending a file, or sending a short message that you type directly on this page.*

#### Cover Sheet

- Proceeding** (e.g. 00-221, RM-9920) (required)
- Mail Correspondence To:** (required)  Name  Law Firm  Attorney
- Name of Applicant/Petitioner** (required)
- Law Firm Name** (optional)
- Attorney Name** (optional)
- Email-id** (optional)

Internet



# LARCAN- USA

This workshop/seminar was presented by  
LARCAN-USA in association with  
Larry Bloomfield who can be contacted at:

**BLOOMFIELD ENTERPRISES, LLC**

dba **Tech-Notes**

**1980 25th St.**

**Florence, OR 97439-9717**

**(541) 902-2424**

**<http://WWW.Tech-Notes.TV>**

*Click here to Return to index*