

# Vhf-Uhf DIGEST

The Official Publication of the Worldwide TV-FM DX Association

JANUARY 2004

The Magazine for TV and FM Dxers



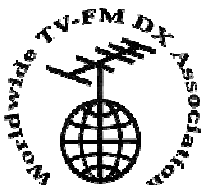
Part of Steve McGreevy's Antenna Farm in Keeler, CA

HAPPY NEW YEAR 2004

BOB COOPER: PREAMPS AND DTV SIGNALS  
JOHN EBELING: HOW HE STARTED DXING  
GORDON SIMKIN: PART III OF HIS STORY

*Plus...*

*A little bit of this and a little bit of that  
In THIS issue...*



TV and FM DXing Was Never so Much Fun!

# THE WORLDWIDE TV-FM DX ASSOCIATION

*Serving the UHF-VHF Enthusiast*

THE VHF-UHF DIGEST IS THE OFFICIAL PUBLICATION OF THE WORLDWIDE TV-FM DX ASSOCIATION DEDICATED TO THE OBSERVATION AND STUDY OF THE PROPAGATION OF LONG DISTANCE TELEVISION AND FM BROADCASTING SIGNALS AT VHF AND UHF. WTFDA IS GOVERNED BY A BOARD OF DIRECTORS: DOUG SMITH, GREG CONIGLIO, BRUCE HALL, DAVE JANOWIAK AND MIKE BUGAJ.



*Editor and publisher: Mike Bugaj*

*Treasurer: Dave Janowiak Webmaster: Tim McVey*

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*Our website: [www.anarc.org/wtfda](http://www.anarc.org/wtfda)*

*ANARC Rep: Jim Thomas, Back Issues: Dave Nieman,*

**JANUARY 2004**



Finally! For those of you online with an email address, we now offer a quick, convenient and secure way to join or renew your membership in the WTFDA from our page at:

<http://fmdx.usclargo.com/join.html>

Dues are \$25 if paid to our Paypal account. But of course you can always renew by check or money order for the usual price of just \$24. Either way, it's still a bargain!

## Omaha 2004!

This year, Omaha is the place to be! Make plans now to attend WTFDA Convention 2004. Watch this space for more info. If you're connected to the internet, bookmark this page:



<http://www.amfmdx.net/WTFDA2004/>

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We have a new addition to the VUD beginning this month. Jason Koralja begins a new weatheradio dx column. It has been a while since a column of this type has appeared in the VUD. Thanks to Jason for volunteering to do it and I hope that you folks with scanners will send your material to him.

Also this month we wrap up Gordon Simkin's three-part article about his dx career. If you liked it, why not email Gordon and tell him so. His email is [georgie@myhome.net](mailto:georgie@myhome.net).

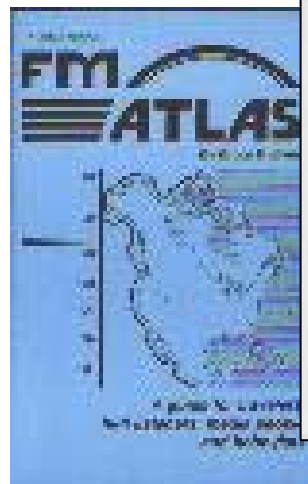
Those of you in the upper Midwest will enjoy John Ebeling's article on his dxing experiences. Lots of history here. Have fun!

## FM ATLAS #19

Bruce Elving's newest listing of FM Stations is just \$23.00. Send your check or money order to FM Atlas, PO Box 336, Esko, MN 55733-9413 and keep it next to your radio or in the glove box of your car!

## Sportsradio!

Jim Thomas tells you who's on what station and when...basketball, football, baseball, hockey, racing...just about everything! Send your check for \$12.00 to WTFDA, PO Box 501, Somersville, CT 06072 (checks payable to Dave Janowiak).





# The Mailbox

P.O. Box 501, Somersville, CT USA 06072  
MIKE BUGAJ MBUGAJ@SNET.NET

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## WELCOME TO 2004!

Hello, and welcome to the Mailbox for January, 2004. What happened to 2003? It just got here and now it's gone. Crazy how that works. At any rate, this ought to be an interesting year in that IBOC will rear it's ugly little head a little more often. We've had reports of two Boston Area FMers tinkering with IBOC in mid-December (WMJX and WROR). Needless to say, this development is not looked upon kindly by FM DXers in the Boston area.



Digital television keeps on inching along with over 1,000 DTV stations on the air. Set top box prices keep inching down with some below the \$300 mark.

RDS finally begins to expand after receiving a much-needed nudge by Clear Channel. Suddenly RDS has sprung up all over the top 50 markets and other non-CC stations have followed. This ought to make for a very interesting skip season this summer as DXers pick off RDS IDs on their receivers or RDS Managers. One thing we should note is that there was some question whether a station broadcasting IBOC would still be able to transmit a RDS sub-carrier, but that concern seems to be unfounded as RDS has been noted on at least on Boston station running IBOC.

So it's 2004. Fasten your seatbelts.

## MEMBERS AND MORE

This month we welcome another Massachusetts resident into the fold. That person is Mark Casey. Mark (K1MAP) lives in Hampden (not far from here) and is interested in FM DXing. Right now he's looking for better equipment. Welcome, Mark!

I don't know why, but December is a fairly busy month for renewals. This month we have renewals from **David Wurl (WI)**, **Gary Olson (FL)**, **Jon Erdner (PA)**, **Leslie Green (LA)**, **Don Niles (WV)**, **Roger Sabella (IL)**, **James Roggentine (CA)**, **Karl Zuk (NY)**, **Brian May (CT)**, **Marv Shults (IL)**, **Bob**

**Seybold (NY)**, **Tom Bryant (TN)**, **Ed Norris (IN)** and **Melvyn Larson (MN)**. We've also received renewals via Paypal from **Rick Shaftan (NJ)**, **William Black (DC)**, **Bill Nollman (CT)** and **Girard Westerberg (KY)**. Thanks to you all for staying with us!

## CHANGES ON THE BOARD

As you know, the WTFDA has a board of directors made up of 5 members. The five people are Greg Coniglio, Dave Janowiak, Bruce Hall, Tom Bryant and Mike Bugaj.

A couple of weeks ago, Tom Bryant expressed his desire to step down from the board and the rest of the board approved his request. As you might know, Tom is retired after working for years at WSM, and Tom has done more and more traveling since he retired and wants to do even more. He recently just arrived back from London. So we are letting him off the hook, so to speak, and letting him travel and enjoy himself.

Tom will continue to be a part of the WTFDA and will TV DX when he's home and conditions allow. He'll still be an administrator on the WTFDA list when he's around and he'll be on IRC chat as time permits.

Now Tom's exiting created a void on the board of directors that needed to be filled. So, the BoD voted to fill that void and I'm pleased to tell you that Doug Smith received a unanimous vote and has accepted the position on the board of directors.

So, Doug is the newest member of the board of directors. We welcome him and I know you will welcome him also. His technical knowledge and experience will be a big asset to the BoD as the club gets deeper and deeper into new technology.

## DTV SET-TOP BOX REVIEW

**Tim McVey** presents this review of the Zenith (LG) HDV420 (\$299 at Ckt City):

"I couldn't wait till Christmas! I went ahead and set this up yesterday afternoon, and so far, these are my impressions:

\* Picture quality is more or less equivalent to the Samsung SIR-T151 (please don't buy this model; mine was a lemon and I don't think it was the only one). Keep in mind

that I'm running this into a simple RCA analog 27" color receiver.

\* One curious feature: it seems like the receiver has a "memory" of some sort, and by this, I mean that once a station is received for the first time, tuning to it subsequent times doesn't require as much time for the signal to lock. I had a hideous time trying to get WOLO-DT-8 (for awhile I wondered if it was off the air or having transmitter issues), but once I picked it up the first time, I had no further problems, as long as the antenna was anywhere near on target. Columbia analog local towers 10/19/25/35/57/63, and their digital counterparts, would be visible from my property if not for the trees and other houses.

\* I have all of the local DTVs available either by outdoor antenna or indoor rabbit ears. WBHQ-63 doesn't seem to be running its DTV facility (neither on 38 nor 39) yet.

\* I have received WCNC-DT-22 Charlotte, WAGT-DT-30 and WRDW-DT-31 (both Augusta); WBTV-DT-23 and WSOC-DT-34 have some signal there, but not enough to lock. I wish I could have had this receiver up the other morning when WXLV-45 Winston-Salem was coming in strong enough to be seen with one rabbit ear (portable in the bathroom)!

\* The aspect ratio (cropped, letter box, squeezed) is much easier to set than on the Samsung. You simply toggle between options using a single button. I prefer cropped as it most closely resembles a "normal" picture on this set. When a signal is marginal (e.g., the Augusta stations), the picture will flip-flop between the various aspect ratios if the signal falls below a certain threshold. This is annoying but not a factor on strong locals.

\* Pixillation is minimal. This was a problem on the Samsung if you had a suboptimal signal.

\* The signal strength meter is accessible from a single RC button. On the Samsung, you had to go through a menu, which was cumbersome.

\* The remote is multi-device compatible and I haven't had a problem so far with my RCA receiver or my Sony VCR. Set-up is fairly intuitive; you use three-digit codes until you hit the right one.

\* The menu of logos (CBS/ABC/NBC/FOX/PBS and a multitude of cable/satellite networks) is a neat feature, but as noted here, UPN and WB are missing for some reason, and I wish there were some way to key in call letters.

\* The "America/Canada" option on the menu is there for a very good reason. It is keyed to the TV and movie rating systems in each country, not to any reception features. There is also the option of choosing between Canadian English and Canadian French

ratings; they are different from one another (with different age thresholds!).

\* As noted earlier, stripping out the PSIP data is bad from a DX standpoint, but it was impossible to pass up a \$299 price point, especially when my main objective was getting local DTV, with DX being a kind of afterthought.

\* Where a broadcaster wants to be known by a virtual channel in lieu of its DTV broadcast channel, remapping is seamless. WCNC finally gets to be channel 6!

\* One feature I don't like: I haven't been able to find a way to bypass virtual subchannels I don't want to bother with. For instance, THREE Columbia stations (WIS/WLTX/WOLO) all have weather radar on one of their subchannels, and I only need one. Yet I'm forced to tune through these; the Samsung treated each subchannel as distinct, and you could block out whatever you wanted.

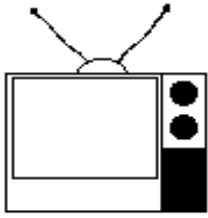
All in all, it serves the purpose of having an easy-to-use DTV receiver for local broadcasters. Well worth the low price."

### WHO IN THE WORLD IS L.G.?

"LG, formerly Goldstar, is a Korean firm of some significant international reputation. They have been a "marketing force" in the Pacific, Asia and Europe for ten years plus. Like many Korean firms, they build just about anything that might make them money including automobiles! When Zenith finally threw in the sponge (as in being on the verge of bankruptcy) a few years back, LG stepped in and purchased Zenith rights to most of the (still valuable) Zenith patents. And the right to market in the USA using the Zenith name. Thus anything that says Zenith on it today, or has said Zenith for perhaps four years, is in fact LG - Korean made - possibly using original Zenith designs. Zenith continues to have a "name corporate presence" in the USA, but it is in fact LG. In memory serves me correctly, Zenith (the brand and manufacturer) was the last of the American manufacturers to close down US production of consumer electronics. Goldstar branding preceded LG and was in the mid 90s considered innovative in design but in fact only moderate in performance. LG as a brand name surfaced at the time Zenith became a part of the firm, primarily to meld their Zenith acquisition into the firm and to rid themselves of a "nice but modest" reputation which Goldstar had earned for them. " The above info comes from **Bob Cooper**, answering a question on the WTFDA list regarding a DTV set-top box with the LG brand name on it.

And that wraps up the Mailbox for January. Happy New Year everybody! -Mike





# TV News

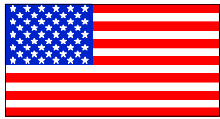
Douglas E. Smith  
 1385 Old Clarksville Pike  
 Pleasant View, TN  
 37146-8098  
 w9wi@w9wi.com  
 http://www.w9wi.com

## January 2004

### Abbreviations:

AF	Applied For (a new station)	PG	Power change granted
Aux	Auxiliary (backup) transmitter	PR	Power change requested
CC	Callsign change	QC	Channel (frequency) change on the air
CL	City-of-license change	QG	Channel change granted
DE	License/permit deleted	QR	Channel change requested
FC	Programming (format) change	RE	Reinstated (previously-dismissed app.)
FTP	Failure to Prosecute	ROA	Request of Applicant
GA	Granted amendment (to table of channel allotments)	SI	Off the air (silent)
LC	License to Cover	STA	Special Temporary Authority
NS	Permit granted for new station	XC	Transmitter site changed
NW	New station on the air	XG	Transmitter site change granted
PA	Proposed Amendment	XR	Transmitter site change requested
PC	Power (and/or tower height) change on the air		

### News:



#### Alabama:

Berry	48 WSSF-LP	QR from ch. 58, 19.4kw
<b>Demopolis</b>	<b>41 WIIQ</b>	<b>PG&lt;324m, 32-21-45/87-52-04</b>
Jasper	51 W66CN	QR from ch. 66, 7kw
<b>Louisville</b>	<b>44 WGIQ-DT</b>	<b>NW 925kw/262m</b>
Mobile	50 W50CF	FC; sold to religious organization

#### Alaska:

<b>Anchorage</b>	<b>20 KTBY-DT</b>	<b>PR&lt;54.4kw/52m 61-11-33/149-54-01</b>
<b>Anchorage</b>	<b>28 KTVA-DT</b>	<b>PR&gt;52kw/61m</b>
<b>Juneau</b>	<b>10 KTOO-DT</b>	<b>GA from ch. 6</b>

#### Arizona:

Many Farms	30 K67AF	QC from ch. 67, 5.11kw
Prescott	53 K53IJ	NS 10kw, 34-29-25/112-32-00
Quartzsite	20 K20HY	NS 30kw, 33-34-17/114-20-55 (AF reinstated)
Quartzsite	42 NEW-LP	AF RE 50kw, 33-34-17/114-20-55
Tucson	36 K57BD	QR from ch. 57, 10kw

#### Arkansas:

Batesville	15 K15FW	PR<9.2kw,
------------	----------	-----------

		35-53-27/91-44-01
<b>Fort Smith</b>	<b>21 KHBS-DT</b>	<b>NW325kw/602m 35-04-15/94-40-43</b>
Fort Smith	33 K33HE	QG from K52FJ, 23.2kw, 35-18-09/93-45-40
Fort Smith	48 K48FL	PG>51.8kw, 35-40-09/94-48-42
Fort Smith	54 K54IE	QG from K18EU, 23.1kw, 35-04-05/94-40-59
Harrison	8 KTKO-LP	PC<2kw
Searcy	54 K54GT	QC from K12MY, 1kw, 35-17-29/91-40-24 but XG 35-22-53/91-31-30; CL from Batesville

#### California:

Bakersfield	8 K08MM	PR>1.78kw, 35-21-42/119-03-34
Bakersfield	11 K11VA	CC from K14IK
Bakersfield	24 K25FT	QR from ch. 25, 35-21-42/119-03-34
Bakersfield	36 KBFK-LP	PG>150kw
Bakersfield	42 KPMC-LP	PG>150kw, 35-26-16/118-44-28
Chico	57 K57JH	AF 5kw, 39-43-15/122-20-14 dismissed, RE
Chico	57 K57JJ	NS 5kw,

39-43-15/  
122-20-14

**Clovis** 43 KGMC **PG>4200kw/  
674m**

**Corona** 52 KVEA **AF 680kw/907,  
34-13-32/  
118-03-52  
(aux)**

Fresno 22 KZMM-LP XG 37-04-23/  
119-25-51

Fresno 32 KJEO-LP PG>150kw,  
37-04-26/  
119-25-52

**Fresno** 47 KGPE **PG<2500kw**  
Hemet 27 KHEM-LP PG<1.1kw,  
33-49-49/  
116-57-08

**Huntington** 50 KOCE-TV **PG 2354kw/  
Beach 949m, 34-13-  
35/ 118-03-58**

Indio 15 KUNA-LP PC<9.7kw,  
33-48-08/  
116-13-30; CL  
from Palm  
Springs

Los Angeles 25 KNET-LP PR>4.8kw,  
34-12-48/  
118-03-41  
dismissed  
ROA;  
PR>2.8kw

**Los Angeles** 41 KLCS-DT **NW 162kw/901**  
**Los Angeles** 58 KLCS **PC>2570kw/90  
1**

Morongo Valley 23 K62AO QR from ch. 62  
dismissed ROA

Morro Bay 9 K09UF PR>3kw,  
35-21-38/  
120-39-21

**Oxnard** 63 KBEH **CC fm KADY**  
Palm Springs 31 K66BM QR from ch.  
66, 150kw  
dismissed;  
requests ch.  
40/ 50kw  
instead

**Rancho Palos** 44 KXLA **PR>2354kw/  
Verdes 949m, 34-13-  
35/ 118-03-58**

Santa Barbara 29 KTSB-LP QR from ch. 43  
dismissed ROA

Santa Maria 7 K07TA PR>3kw,  
34-54-36/  
120-11-05

Santa Rosa 25 K25HI CC from  
K30DO

**Stockton** 64 KTFK-TV **CC from KFTL**  
Victorville 39 K39GY QC from  
K33BT, 1.5kw

Colorado:  
Breckenridge 26 K26GY PR>360w,  
39-29-47/  
106-01-43

**Denver** 4 KCNC-TV **PG<373m,  
39-43-51/  
105-13-54**

**Denver** 7 KMGH-TV **PG>358m,  
39-43-51/  
105-13-54**

**Denver** 9 KUSA-TV **PG>335m, DA,  
39-43-51/  
105-13-54**

**Denver** 20 KTVD **PG<341m,**

Denver 55 K55IO PR>49.3kw  
Durango/Hermos 31 K68AZ QC from ch.  
a 68, 1.99kw  
Holyoke 27 NEW-LP AF dismissed  
FTP

Idaho Springs 44 K44GT QC from  
K08IV,  
700w, 39-45-  
54/  
105-32-32

Montrose 50 K50EZ XR 38-18-57/  
108-11-47

Pleasant Valley 28 NEW-LP AF dismissed  
FTP

Red Cliff 28 K28HI PR<20w

Connecticut:  
Darien 33 WNYZ-LP CC from  
W33BS

Springfield 34 W12CL QR from ch.  
12, 45kw, 42-  
05-05/ 72-42-  
16; CL from  
Granby

Delaware:  
Wilmington 14 WTSD-CA PC>146kw,  
40-02-30/  
75-14-11

Wilmington 31 WPPX-DT NW 200kw/  
374m, 40-02-  
30/ 75-14-11

Florida:  
Fort Myers 14 WTPH-LP FC; sold to  
Hispanic  
company

**Fort Walton** 50 WFGX-DT **GA from ch.  
Beach 25**

Key Largo 49 NEW-LP AF dismissed  
FTP

Key Largo 50 NEW-LP AF dismissed  
FTP

**Leesburg** 46 WLCB-DT **PG<472m**  
Miami 50 W54BB QR from ch.  
54, 126.5kw,  
25-58-15/  
80-12-32; CL  
from Rock Hbr.

Oldsmar 48 WZRA-CA CC from  
W48AY

**Panama City** 47 WPCT-DT **NW  
Beach 12.9kw/59m**

Rock Harbor 16 W40AA QR from ch.  
40, 2.25kw,  
25-05-29/  
80-26-37; CL  
from  
Matecumbe

**Tallahassee** 32 WFSU-DT **NW 938kw/237**  
West Gate 16 W16CC CC fm W67AP

Georgia:  
Atlanta 20 WTBS-DT PR>1000kw  
Columbus 58 NEW-LP AF 10kw,  
32-35-01/  
84-55-01  
dismissed

Waycross 45 W54CW QR from ch.  
54, 19.8kw

Hawaii:  
**Honolulu 8 KGMB-DT NW 7.2kw/-**

Honolulu  
**Kailua Kona** 26 KAAH-TV PR 272kw/577  
**6 KLEI PG<8.3kw/864m, 19-43-16/155-55-15**

Idaho:  
 Arco 39 K39HA NS 49kw, 43-37-17/113-17-25 (RE)  
 Arco 48 K48IM NS 25kw, 43-37-17/113-17-25 (RE)  
 Boise 51 KCBB-LP QC from ch. 64, 150kw, 43-44-23/116-08-14; CC from K64EJ  
 Driggs 42 K42GK NS 49kw, 43-47-18/110-56-02 (RE)  
 Driggs 44 K44HD NS 49kw, 43-47-18/110-56-02 (RE)  
 Hailey 39 NEW-LP AF dismissed FTP  
 Lewiston 23 K35BW QR from ch. 35 dismissed FTP  
 Pocatello 45 K45HT NS 50kw, 42-55-15/112-20-44 (RE)  
 Preston 44 K44HA NW 1.8kw, 41-53-00/112-04-42  
 Preston 48 K48IJ NW 1.8kw, 41-53-00/112-04-42

Illinois:  
**Carbondale 8 WSIU-TV PG>271m, 38-06-11/89-14-40 already on**  
**Chicago 21 WYCC-DT NW 98.9kw/378**  
 Effingham 45 WEIL-LP QR from ch. 54, 150kw, 39-57-03/88-52-05  
 Elgin 39 W57DN QR from ch. 57, 150kw, 41-52-44/87-38-08

Indiana:  
 Fort Wayne 45 WFWC-CA CC from W45AG  
 South Bend 69 WRDY-LP PC>131kw, 41-36-55/86-11-07

Iowa:  
 Des Moines 56 KDMI CC for NS

Kansas:  
 Concordia 50 NEW-LP AF dismissed FTP  
 Hays 27 K27HT NS 10kw, 38-55-20/99-21-12 (RE)  
 Independence 50 K54GC QR from ch. 54, 19kw  
**Wichita 45 KSNW-DT PG>312m**

Kentucky:  
**Danville 4 WDKY-DT PR>26.5kw/32737-52-51/84-19-16**  
 Danville 56 WDKY-TV PR<352m, 37-52-51/84-19-16  
 Hazard 12 WYMT-DT PG<398m  
 Scottsville 31 WPBM-LP PR<35.6kw

Louisiana:  
**Alexandria 25 KLPA-TV PR<1690kw/413**  
 Alexandria 26 KLPA-DT NW 76kw/413m  
 Alexandria 45 K64FT QR from ch. 64, 7.8kw  
**Lafayette 23 KLPB-DT NW 50kw/463m, 30-19-19/92-16-59**

Maine:  
 Bangor 22 WFVX-LP PC>2kw, 44-45-45/68-33-58

Maryland:  
**Salisbury 47 WMDT XC 38-30-07/75-44-01**

Massachusetts:  
 New Bedford 22 WLWC-DT PR 203m  
 Springfield 67 WSHM-LP CC from W67DF

Michigan:  
**Bad Axe 35 WDCQ-TV CC from WDCP**  
 Detroit 20 WDWB PG>1500kw/324m, DA, 42-26-53/83-10-23  
 Flint 28 WFUM PC<2160kw/258m  
 Flint 54 WXON-LP PR>150kw, 43-08-04/83-35-42  
 Lansing 27 W27CN CC from W69BJ  
 Saginaw 32 W22CC QR from ch. 22, 62.2kw, 43-28-24/83-50-04 CL fm Pinconning

**Sault Ste. Marie 9 WGTQ-DT QG from ch. 56, 24kw/288m**  
 Traverse City 12 WLLZ-LP PR>1.23kw  
**Traverse City 50 WPBN-DT NW 78kw/230m, 44-46-36/85-41-02**

**University Center 19 WDCP-TV CC from WDCQ**

Minnesota:  
 Deer River 59 K59BQ XR 47-21-25/93-45-13  
 Mankato 8 K08NI AF dismissed (?)  
 Royalton 47 K47IT NS 150kw,

Willmar 28 K28IF 45-53-52/  
94-19-46  
QG from  
K27CK, 1kw

Mississippi:  
Cleveland 40 W40BQ PR>2.5kw  
Columbus 25 W25AD PC>9.2kw  
**Greenwood** 6 WABG **PG to drop DA**  
**Jackson** 9 WLBT-DT **QR from ch.**  
**51,**  
**15kw/535m,**  
**32-12-49/**  
**90-22-56**

Natchez 27 W59DK QR from ch.  
59, 16.3kw

Pontotoc 15 W23CL QG from ch.  
23, 36.2kw,  
34-13-37/  
88-58-53

Missouri:  
Aurora 58 KNJE-LP QC from ch.  
34, 150kw,  
36-44-54/  
93-39-32 CL  
from Eureka  
Springs, AR  
Columbia 47 K56AU QR from ch.  
56, 13.9kw  
Columbia 63 K63GW PR>150kw,  
38-57-16/  
92-05-40

**Jefferson City** 12 KRCG-DT **NW**  
**15.1kw/308 but**  
**LC dismis.**

Jefferson City 68 K68GD PR>150kw,  
38-44-58/  
91-37-09

Kirksville 28 K28HT PR<8.7kw,  
40-13-46/  
92-32-39

Rolla 16 K16FE PR<9.2kw,  
37-57-54/  
91-47-01

Springfield 47 KWBM-CACC from  
KWBS-LP

**St. Joseph** 21 KTAJ-DT **PR>1000kw/31**  
**7**

St. Louis 33 K33GU CC from  
K18BT

Montana:  
Bozeman 32 KBTZ-LP XG 45-38-18/  
111-16-05  
Butte 5 KXLF-DT QR from ch. 15,  
5.45kw/588m  
Hardin 58 K58HS NS 999w,  
45-46-01/  
107-36-01  
Helena 54 NEW-LP AF dismissed  
FTP  
Hinsdale 42 K42FP PR<890w  
Lewistown 8 K08NR NS 250w,  
47-10-46/  
109-32-05 (RE)  
Sand Springs 58 K58HT NS 999w,  
47-06-30/  
107-27-51

Nebraska:  
**Alliance** 24 KTNE-DT **PR>440m;**  
**already**  
**granted**

Lincoln 56 KWAZ-LP QC from ch.

**McCook** 22, 11.9kw  
Norfolk 21 K52ES **12 KSNK-DT PG 10.4kw/218**  
QR from ch.  
52, 1.9kw

**North Platte** 9 KPNE-TV **PC>334m,**  
**41-01-22/**  
**101-09-14**

Nevada:  
Ely 16 NEW-LP NS 150kw,  
39-15-53/  
114-53-35 (RE)  
Ely 18 K18GZ NS 49kw,  
39-14-46/  
114-55-36 (RE)  
Ely 36 NEW-LP AF dismissed  
FTP  
Mesquite 2 K02FN PR>280w,  
36-49-55/  
114-03-32  
Panaca 47 K43DS QR from ch.  
43, 6kw  
Ryndon 8 K08NQ NS 73w,  
40-57-54/  
115-36-47  
Tonapah 11 NEW-LP AF dismissed  
FTP  
Tonapah 45 NEW-LP AF dismissed  
FTP

New Hampshire:  
Colebrook 26 W26CQ PR>19.7kw,  
44-56-50/  
71-20-28

New Jersey:  
Atlantic City 45 W60CX QR from ch.  
60, 22.3kw,  
39-21-40/  
74-25-05  
Cherry Hill 68 WNAI-LP CC fm W68DN

New Mexico:  
**Albuquerque** 32 KAZQ **PC<263kw/124**  
**7**

Albuquerque 36 KTVS-LP CC from  
K36GB; 30kw  
Albuquerque 48 KTFA-LP PG<147kw  
Aztec 44 K44GC CC fm K61BO;  
CL from  
Bayfield, CO  
Capulin 33 K33GC QC from  
K54BN, 880w  
Colfax 30 K30GJ CC from  
K57AB  
Crownpoint 28 K28GT QC from  
K63EQ  
Deming 35 K35HB QG from  
K57AW,  
2.67kw  
Dora 40 K40GC QC from  
K69CQ, 3.13kw  
Hobbs 12 K12NH XR 32-42-34/  
103-09-05  
Hornsby Ranch 25 K25HJ QC from  
K59BD, 1.03kw  
Las Cruces 36 K20GL QR from ch. 20,  
15kw  
Pie Town 31 K31FX NW 2.4kw,  
34-17-00/  
107-54-44  
(KRWG-22  
PBS)  
Raton 20 K20CV PC<1.03kw  
Raton 43 K43GW QC from



Roswell 8 KOBR K52DL, 1.27kw  
**PG<533m, 33-22-31/103-46-12**

Roswell 36 K30HI QR from ch.  
 30, 5.5kw

Tres Piedras 28 K28GV CC from  
 K53BA

**New York:**  
**Binghamton 4 WIVT-DT PG>1.5kw/263m**

Binghamton 10 NEW-LP AF dismissed  
 FTP

**Binghamton 46 WSKG-TV PG 490kw/408m, 42-03-40/75-56-46**

Brooklyn 3 W03BK QG from  
 W38CL, 750w,  
 40-44-46/  
 73-58-52; CL  
 from (the)  
 Bronx

**Elmira 2 WETM-DT PG>10kw**  
**New York 31 WPXN-TV NW1800kw/360**  
**40-44-54/73-59-10 (aux)**

New York 49 WNYN-LP QG from ch.  
 39, 25kw

Philadelphia 54 NEW-LP AF 5.2kw,  
 44-12-44/  
 75-49-30 (RE)

Port Jervis 10 W64CW QR from ch.  
 64, 2.24kw,  
 40-45-22/  
 73-59-12

**Syracuse 3 WSTM PC 41.9kw/396**

Syracuse 11 WONO-CA CC from  
 W11BP

Syracuse 49 WNDR-LP QR from ch.  
 18, 13.4kw,  
 43-00-19/  
 76-07-48

Troy 35 WNGN-LP QR from ch.  
 26, 38kw

Tryon 19 W19CR QC from  
 W24BA, 1.23kw

**Watertown 21 WWTI-DT PG<25kw/331m**

**North Carolina:**  
**Charlotte 22 WCNC-DT PR>791kw; already granted & on the air**

Greenville 44 W60CV QR from ch.  
 60, 35.2kw

**North Dakota:**  
 Devils Lake 33 K33HB CC from  
 K30FU

**Dickinson 20 KDSE-DT PR<54.1kw**  
**Ellendale 20 KJRE-DT PR>72.3kw**  
**Williston 51 KWSE-DT PR<53.9kw**

**Ohio:**  
**Columbus 13 WSYX-DT NW 59kw/286m**

Columbus 43 W43BZ QC from  
 W13BN, 950w

Lima 38 WLMO-LP QR from ch.

Marion 39 WOCB-LP 65, 15kw  
 PC>18.92kw,  
 40-36-54/  
 83-07-54

**Steubenville 57 WTOV-DT PG>1000kw/261**  
**40-20-33/80-37-14**

**Oklahoma:**  
**Bartlesville 17 KDOR-TV CC from KDOR**

Hollis 24 NEW-LP AF 980w,  
 34-44-30/  
 99-48-30  
 dismissed FTP  
 but reinstated

Tahlequah 30 K52GX QR from ch.  
 52, 10kw

**Oregon:**  
 Elkton 11 K11VI QC from  
 K66BE, 40w,  
 43-37-16/  
 123-32-03

**La Grande 13 KTVR PR>65kw/775m**

**La Grande 5 KTVR-DT PR<775m**

**Pennsylvania:**  
 Dillsburg 35 W35BT QC from  
 W40AF,  
 150kw, 40-18-19/  
 77-00-28

Sharon 29 W50BF QC from ch.  
 50, 8.9kw

**Rhode Island:**  
**Providence 54 WNAC-DTNS 1000kw/295**

**South Carolina:**  
**Conway 9 WHMC-DT QG fm 58 20kw/230m**

**Greenville 9 WNTV-DT PR<65kw/378m**

Murrells Inlet 11 WGSJ-CA PR>3kw,  
 33-35-27/  
 79-02-55;  
 CL from  
 Myrtle Beach

North Charleston 22 WTBD-LP PG>150kw  
**Sumter 63 WBHQ FC to WB Jan 1**

**South Dakota:**  
 Sioux Falls 33 K56GF QR from ch.  
 56, 21.1kw

**Tennessee:**  
**Cookeville 36 WNPX-DT PG<429m, 36-16-05/86-47-45**

**Greeneville 39 WEMT PG<795m**  
 Knoxville 32 WEEE-LP PR<28kw,  
 35-59-20/  
 83-57-45  
 dismissed

Morristown 33 W61DG QR from ch.  
 61, 8kw

Nashville 42 W52CT FC to  
 Telefutara

2/2004

**Texas:**

**Abilene** 9 KRBC-TV XG 32-17-06/  
99-44-23

Abilene 17 NEW-LP AF 3kw,  
32-25-03/  
99-58-15  
dismissed

Amarillo 41 K41GY PG>150kw

Amarillo 47 KAMT-LP PR>150kw,  
35-18-53/  
101-50-47

Amarillo 64 K64GK NS 36.14kw,  
35-05-09/  
101-54-48

Amarillo 69 K69IH PR>150kw,  
35-18-53/  
101-50-47

Austin 16 K16CY PR<99kw,  
30-19-23/  
97-47-58;  
CL from Killeen

Austin 24 KVUE PR<1696kw/3  
93

Austin 32 KGBS-CA PR<9.99kw

Beaumont 58 NEW-LP AF dismissed  
FTP

Big Spring 44 NEW-LP AF 9.7kw,  
32-13-22/  
101-28-35 (RE)

Brownsville 56 New-LP AF dismissed  
(Mexican obj.)

**Corpus Christi** 8 KIII-DT GA from ch.  
47

**Corpus Christi** 13 KRIS-DT GA from ch.  
50

Corpus Christi 49 KTOV-LP QR from ch. 7,  
10kw

Dallas 34 KJJM-LP XG 32-35-21/  
96-58-13

Denver City 54 K54JA NS 999w,  
32-58-10/  
102-48-44

De Soto 31 K65BC QC from ch. 65,  
150kw,  
32-35-19/  
96-58-05; CL  
from Mullin

El Paso 60 New-LP AF dismissed  
(Mexican obj.)

El Paso 65 KTFN PC>2637kw/526  
31-48-19/  
106-28-59

**Harlingen** 38 KMBH-DT NW  
1000kw/346

Hereford 36 NEW-LP AF 4.5kw,  
34-51-02/  
102-23-38  
dismissed

Lamesa 54 K54IZ NS 999w,  
32-45-34/  
101-57-11

**Longview** 54 KCEB NW 5000kw/  
253m, 32-35-  
36/ 94-49-10

**Lubbock** 39 KTXT-DT NW 890kw/143

Lubbock 51 KBZO-LP PC>60kw,  
33-31-33/  
101-52-07

Lufkin 48 K48IO AF dismissed  
FTP, RE;  
7.19kw,  
31-19-24/  
94-47-23  
reinstated

Mesquite 50 KATA-LP XR 32-35-21/  
96-58-13

**Odessa** 13 KWES-DT QG from ch.  
15,  
25.7kw/391m

Plainview 47 NEW-LP AF 10kw,  
34-12-55/  
101-52-59  
dismissed

**Waco** 26 KXXV-DT PG>561m, DA

Windgate 52 K52IU NS 999w,  
32-02-11/  
100-08-59

**Utah:**

Duchesne 23 K23FT QC from  
K26DO, 2kw

Levan 18 K18GX NS 25w,  
39-29-31/  
111-49-40

Manti 27 K27HR NS 460w,  
39-19-23/  
111-46-23

Morgan 29 K29EP QC from  
K62BM, 630w

Salina 21 K21FL QC from  
K66BK, 160w

**Salt Lake City** 5 KSL-TV PR  
33.4kw/1168

Tabiona 29 K29EX QC from  
K57CK, 7kw

Ticaboo 9 K09XT NS 80w,  
37-51-31/  
110-42-41

Wayne County 43 K43IJ QC from  
K39FO, 10w,  
38-30-44/  
111-47-01

**Vermont:**

White River 27 W27CP PR>24.4kw,  
43-39-33/  
72-11-10

**Virginia:**

Charlottesville 7 NEW-LP AF dismissed  
FTP

Charlottesville 45 NEW-LP AF dismissed  
FTP

**Marion** 42 WMSY-DT NW  
100kw/448,  
36-54-07/  
81-32-32

**Norfolk** 33 WTVZ-TV PG<2650kw;  
PC>376m

Norfolk 45 WNLO-CA PR>139kw

Staunton 25 WAZM-CA PR>44kw

Tazewell 21 W21CG PR>27.5kw

**Washington:**

Centralia 25 K25CH PC<6.1kw,  
46-33-16/  
123-03-26; CL  
from North  
Bend

Ellensburg 59 K59IC QG from  
K69BE, 21kw

Odell 42 NEW-LP AF dismissed  
FTP

Republic 43 K43HO AF 5kw,  
48-40-30/  
118-43-46  
dismissed

**Spokane** 20 KREM-DT PR<893kw/641

**Spokane** 48 KSKN-DT PA from ch. 36

Yakima 41 KCYU-LP **dismissed ROA; PR>622m** QC from ch. 68, 25.4kw, 46-31-57/120-30-37

**West Virginia:**  
Huntington 45 WBWV-LP PC<20.8kw; NW 38-29-41/82-12-03

**Morgantown Parkersburg** 33 WNPB-DT PG<108kw/441 15 WTAP-TV PG<220kw/192

**Wisconsin:**  
Baraboo 31 NEW-LP AF dismissed FTP  
Chippewa Falls 59 W59DX NS 20kw, 44-53-05/91-23-26  
Fence 45 W45CD QC from W54AR, 570w, 45-44-08/88-25-40  
Madison 23 W23BW PC>38.5kw, 43-03-09/89-28-42  
River Falls 47 W55AP QR from ch. 55, 1kw  
Spooner **Suring** 51 W57AS PR>18.9kw 21 WIWB-DT NW 450kw/332, 44-20-01/87-58-56

**Wyoming:**  
**Casper** 15 KGWC-DTPG<11.5kw/57 2 42-44-37/106-18-31  
Casper 23 NEW-LP AF 10kw, 42-50-32/106-13-04 dismissed  
Casper 39 NEW-LP AF 9kw, 42-46-58/105-31-10 dismissed  
Cokeville 51 NEW-LP AF 49kw, 42-04-04/111-00-37 dismissed  
Douglas 9 K09XL NW 50w, 42-45-47/105-25-12  
Gillette 40 NEW-LP AF 150kw, 44-12-33/105-28-05 dismissed  
Jackson 39 NEW-LP AF dismissed FTP  
Jackson 44 NEW-LP AF dismissed FTP  
Kemmerer 24 NEW-LP AF 150kw, 41-46-45/110-32-12 dismissed  
Kemmerer 30 NEW-LP AF 150kw, 41-46-45/110-32-12 dismissed  
Kemmerer 46 NEW-LP AF dismissed FTP

Laramie 8 KWYP-TV NS 316kw/356, 41-18-36/105-27-17; CC  
Laramie 14 K14LK PR<11kw, 41-14-16/105-27-48  
Laramie 39 NEW-LP AF dismissed FTP  
Rock Springs 41 NEW-LP AF 7kw, 41-34-43/109-19-14 reinstated  
Rock Springs 41 NEW-LP AF dismissed  
Sheridan 50 NEW-LP AF dismissed FTP



**Puerto Rico:**  
Ponce 7 WSTE PR<100kw/88m 18-02-52/66-39-16



**U.S. Virgin Is.:**  
Charlotte Amalie 14 WVGN-LP NW 700w, 18-21-26/64-58-17



**Canada:**  
**Ontario:**  
Leamington 34 NEW-LP NS 400w, multilingual community st.  
London 14 CITS-2 NS 7.7kw  
London 20 CJMT-2 NS 18.8kw  
Ottawa 14 CJMT-1 NS 435kw  
Ottawa 32 CITS-1 NS 54kw  
Toronto 69 CJMT-TV QG from ch. 44, 500kw

Thanks to Bill Draeb for information appearing elsewhere in this month's column. The calls for the four London and Ottawa relayers are not (yet) official.

KWYP-8 in Wyoming is to be a satellite of KCWC-4 Lander, a PBS affiliate. KCWC already has a statewide network of translators and is on cable throughout Wyoming.

Many of the TBN-owned stations have added the -TV suffix to their callsigns. (WTJP, WELF, WHSG, KAAH, WCLJ, WKOI, WBUY, KTAJ, WTBY, WDLI, and WPGD) Univision's KUVS-19 has also added the suffix.

My guess is that a radio station somewhere has requested permission to use one of TBN's calls on radio. Such a move could require payment of a fee to TBN (making money is good!) and would require the

addition of the -TV suffix at the TV station in question.

Univision recently acquired a chain of radio stations; chances are they want to use the KUVS calls on one of these.

KDMI-56 in Des Moines is in *italics* as reports suggest this station will sign on as a digital-only operation. It's been purchased by the owners of KPWB-23 in nearby Ames. KPWB is one of the stations licensed too late to receive a second channel for DTV. Might KDMI-56 become KPWB's "defacto second channel for DTV"?

In the never-ending quest for space(<grin>), I've added a new abbreviation: "RE". These are applications that were dismissed, but have been reinstated. In roughly half of these cases, the reinstated applications were also promptly granted.

I'd have to do more digging than I have time for over the Christmas holiday, but my guess... is that these are applications the FCC dismissed for failure to prosecute, then reinstated when the applicant complained, indicating they were still interested in building a station. (the ones that didn't get reinstated are those in which the applicant has fallen off the face of the earth (probably gone bankrupt...) and stops responding to Commission correspondence.)

Why two channel 57s in Chico, California? Good question! Best guess: FCC assigned calls to an application before they realized it was mutually-exclusive with the K57JJ grant. Or, both stations are highly directional and serve different areas of Chico?

Here's hoping everyone had a happy holiday season and plenty of DX!



# SATELLITE NEWS

**GEORGE W. JENSEN**  
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Here are a few recent and upcoming items of interest.

- Galaxy 9** - 122 - Starz HDTV East
- Galaxy 9** - 124 - Starz HDTV West
- Galaxy 1** - 157 - Starz Kids East
- Satcom C4** - 101 - Starz Kids West
- Galaxy 5** - 12 - Discovery West will move to 4DTV with no west analogue.
- W7** - 7 - Fox Movie Channel will move to small dish and not be available to large dish owners.
- Satcom 3** - 616 - Discovery Health will become FitTv
- Satcom 4** - 13 - Travel Channel will leave analogue and go to 4DTV
- Satcom 4** - 15 - Animal Planet will also

leave analogue and go to 4DTV. More on these as info becomes available. Some possible new channels for 2004 are:- Anime Network, CollegeSportsTV, The Football Network, G\$ (a Gaming Channel), Moviewatch, NBA TV, NFL Network, SDopresa (Hispanic Kids), The Sportsman Channel, Reality TV, Si TV, JokeVision, Hype TV, The Ice Channel, America Channel, Blackbelt TV - The Martial Arts Channel, Casino and Gaming TV, Career Entertainment TV, Reality Central and Wheels TV. That's all for this month - Happy New Year and see you in 30. "73"s

## THE VUD WITHOUT PAPER The eVUD

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# ATSC Primer Part IV

DOUG SMITH

## 8VSB

OK, we've assembled the audio and video packet streams. And we've added the PSIP tables which tell the receiver how to assemble these streams into TV programs. What we have is a long stream of 188-byte data packets. They could be connected to the TV receiver with an Ethernet cable, but somehow I don't think that's what the NAB had in mind<grin>. The 8VSB modulator is responsible for taking these data packets and converting them to a radio signal that can be connected to an antenna and broadcast<sup>1</sup>.

Before anything RF happens, the data stream is passed to a “data randomizer”. A raw ATSC datastream has patterns. Certain sequences in the datastream are more common than others<sup>2</sup>. If used to directly modulate a RF signal, this would result in “clumps” of spectrum occupancy – and other “empty” areas. Instead, the ATSC datastream is mixed with a seemingly-random series of numbers. “Seemingly”-random, because the same series is generated at the receiver and used to retrieve the original datastream. The mixing process generates a new datastream in which all possible data sequences are roughly equally likely.

Next, the synchronizing byte is removed and 20 bytes of a “Reed-Solomon Forward Error Correcting Code” (*FEC*) is added. The FEC code is a series of numbers calculated based on the 188 bytes of “payload” data.

“Forward Error Correction” means the receiver can discover and repair some errors in transmission without asking the transmitter to retransmit the information. (which of course would be impossible in a broadcast environment!) As many as 10 bytes in the 188-byte data “payload” can be in error, and the FEC will still correct them. More than 10 bytes in error cannot be repaired, but the situation can be detected. The defective packet will be discarded.

Once the FEC is applied to the data packet, it is *interleaved* with other data packets. The contents of the packet are spread across a 4.5 millisecond period. The point is to reduce the exposure of any one packet to a burst of interference or noise. Again, the FEC can fix up to 10 bytes of errors. So it's better to allow a noise burst to wipe out 7 bytes of each of 10 packets, than to allow it to wipe out 70 bytes of one single packet. The former problem can be automatically fixed; the latter will result in the packet being discarded.

Then, “trellis coding” is applied. Every two bits are recoded to three. (for reasons for which I've not been able to find a readable explanation...) Three bits of information can represent up to  $2^3$ , or 8, different numbers.

Next, the previously-stripped “sync byte” is replaced with a four-symbol *segment sync*. When the receiver detects this segment sync, “sync lock” is said to have occurred. Users of the WinTV-D card can tell when this happens by using the “Diagnostics” window. Sync lock is possible at 0dB signal-to-noise ratio – i.e., when the 8VSB signal and the noise are the same strength. A 15dB ratio is necessary to actually decode the signal<sup>3</sup>.

Finally, the stream of 3-bit trellis-coded numbers is placed on the RF carrier. In analog TV, the analog video is used to modulate the amplitude of a carrier 1.25MHz above the bottom of the TV channel. The instantaneous output power of the transmitter may be any figure between 5% and 75% of maximum rating<sup>4</sup>. The lower sideband of the analog TV signal is then “rolled off”, to prevent it from stretching into the adjacent lower channel.

In digital, the process is similar. The carrier is 0.31MHz above the bottom of the channel – 0.94MHz lower than in analog. The lower sideband is still rolled off – but so is the carrier. The carrier uses 7% of the average power of the 8VSB signal<sup>5</sup>. While an infinite number of

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<sup>1</sup>There exists a similar standard called 16VSB and intended for use on cable. It allows double the data rate, at the expense of some immunity to interference and noise. Since in theory there is no interference and little noise on cable, it's a fair tradeoff.

<sup>2</sup>For example, in an audio stream, a few milliseconds of silence is far more likely than a cymbal crash. In video, some flesh tone representing someone's face is more likely than a black-and-white checkerboard.

<sup>3</sup>Presumably this is the “EQ Lock” indication on the Hauppauge card.

<sup>4</sup>Powers of less than 5% are reserved as a “guard band”. The laws of physics prevent transmission of negative power; if you try, your signal will “splatter” into adjacent channels. Powers of more than 75% are reserved for the “synchronizing pulses”; giving them 25% of transmitter power makes it easier for the receiver to find them.

<sup>5</sup>This carrier can be used to detect the presence of an ATSC DTV signal without using a DTV receiver. Simply look for an unmodulated carrier 310KHz above the bottom of the channel. For example, WKYC-DT on channel 2 in Cleveland should have a carrier on 54.31MHz.

signal amplitudes are possible for analog TV, only 8 amplitudes are allowed for 8VSB. (that's where the "8" comes from) The range of possible amplitudes is split into eight equal parts, tagged -7, -5, -3, -1, +1, +3, +5, and +7. Each possible 3-bit trellis-coded number maps to one of these eight amplitudes.

A new trellis number is sent 10,760,000 times a second. Since each number represents 2 bits, the 8VSB data rate is 21,520,000bps. Segment sync, similar "field sync", and the FEC error correction code add overhead. The data rate for the "payload" is 19,280,000bps. Typically at a DTV station, engineers are allowed to partition this data rate among the various tables and audio/video PESs.

### The ATSC receiver

The receiver operates an internal clock, kept synchronized by the segment syncs. This clock tells the receiver when to expect the next trellis number. When the time comes, the amplitude of the received signal is measured and compared against the eight possible figures. The closest figure is passed on to a trellis decoder, which retrieves the original two bytes.

A "de-interleaver" sorts the interleaved data into the original data packets. The data "payload" bytes are used to re-calculate the 20 FEC bytes, and the result is compared to what was received from the transmitter. If they match, the "payload" is sent on to the *transport demultiplexer*. If they don't match, first an attempt is made to use the FEC bytes to correct the error. (remember that up to 10 bytes of error can be corrected) If that fails, the receiver may search its memory for a packet with a similar set of FEC bytes, and pass that along. If the received data is far enough off, it will simply be discarded.

The receiver now has a series of 188-byte "transport stream packets". Some of these are audio; some are video; some are the PSIP tables. Some could be other forms of data. Each of these packets has a *protocol ID*, or *PID*. This is a hexadecimal<sup>6</sup> number that describes which datastream a particular packet is associated with. For example, WTVF-DT's PIDs:

<b>Program</b>	<b>Audio 1</b>	<b>Audio 2</b>	<b>Video</b>
Newschannel 5 HD	0x0024	None	0x0021
Newschannel 5+	0x0034	0x0035	0x0031

It's also transmitted at a fixed location within the packet. That allows a given process in the receiver to monitor each packet at the location of the PID, and ignore the packet if it's meant for a different datastream. In the above example, if you've told your TV you want to watch Newschannel 5+, it will ignore packets with PIDs 0x0021 and 0x0024. Only those with 0x0034, 0x0035, and 0x0031 will be passed on.

The Program Map Table (PMT) tells the receiver which PIDs are associated with which program, and what kind of packet they are. (audio 1, audio 2, video, etc.) Each stream of packets is routed to a decoder appropriate for the packet type.

Audio packets are passed to an AC-3 decoder. This decoder splits packets among the six possible audio channels. The stream for each channel is converted back to analog, amplified, and sent to the speakers.

Video packets go to a MPEG-2 decoder. A series of I, P, and B frames are decoded to a series of complete pictures<sup>7</sup>. Slices are split into macroblocks, macroblocks into blocks, and blocks into individual luminance, red, and blue pixels. Luminance, red, and blue are *dematrixed*<sup>8</sup> back to the original red, green, and blue values. They're then converted back to analog and sent to the picture tube.

And voila! - you have a digital picture and sound.

<sup>6</sup>Base 16. Often indicated by a "0x" before the number. 0x32F7 and 0xA5C8 are examples of valid hexadecimal numbers. Programmers like to use 0xDEAD and 0xBEEF...

<sup>7</sup>Remember that P and B frames are not in themselves complete; rather, they describe changes from one or more I frames. P and B frames must be compared to I frames and used to reconstruct the complete frames they were created from.

<sup>8</sup>*Matrixing* is the process of mixing red, green, and blue to get luminance, red, and blue. The same process, and same term, are used in analog TV.



January 2004

Here's some recent super DTV tropo from Jeff Kadet of Macomb, IL:

Equipment: Screened CM 7' UHF dish @85' w/UA-900 preamp, .500 hardline. Hauppauge Win-TVD card.



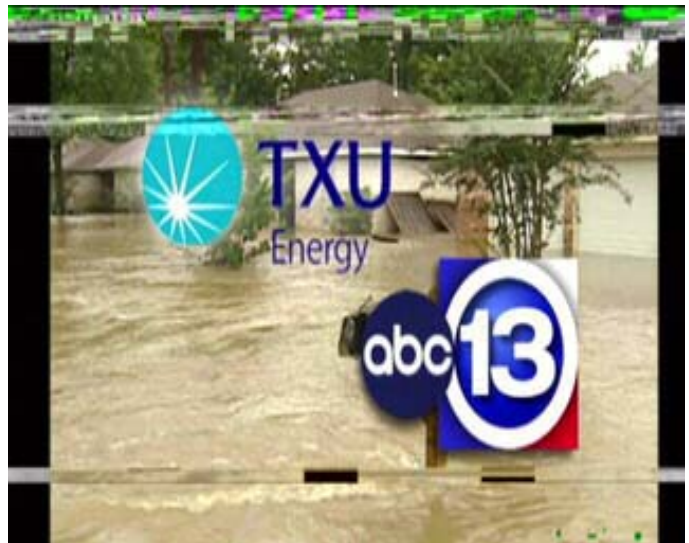
KDAF-DT-32 Dallas, TX  
646 mi Tr seen 9/6/03  
@2305 CT



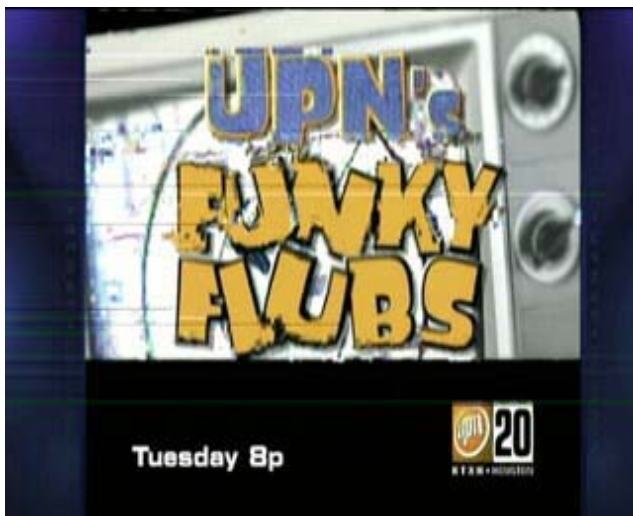
KXASDT-41 Ft. Worth, TX  
646 mi Tr seen 9/7/03  
@0015 CT



KERA-DT-14 Dallas, TX  
646 mi Tr seen 9/7/03  
@0030 CT



KTRK-DT-32 Houston, TX  
800 mi Tr seen 9/7/03  
@0155 CT



KTXH-DT-19 Houston, TX  
800 mi Tr seen 9/7/03  
@0205 CT

And a few from our respected publisher, Mike Bugaj of Enfield, CT:



KSDK-5 St. Louis, MO  
960 mi Es seen 6/12/03  
@1400 ET



KUSD-2 Vermillion, SD  
1242 mi Es seen 7/8/03



WPSX-DT-15 Clearfield, PA  
310 mi Tr seen 8/31/03  
@0003 ET

Finally, some photos from Greg Barker of Greensburg, IN. You saw it on the cover of the Sept. VUD, Greg's fabulous UHF horizontal Stack consisting of 2 Televes Pro Range 75's, a CM 0538 combiner, CM 7777 preamp (26 db gain), 60 ft. crank-up tower, and Yaesu rotor. Now here's a glimpse of what he can get with that and his RCA ATSC11 DTV receiver. See his website, <http://community-2.webtv.net/GregBarker> for more photos.



WSBT-DT-30 S. Bend, IN  
163 mi Tr seen 11/17/03



WGTE-DT-29 Toledo, OH  
193 mi Tr seen 11/7/03





WNEP-DT-49 Scranton, PA  
522 mi Tr seen 9/7/03



KTPX-DT-28 Okmulgee, OK  
630 mi Tr seen 9/4/03



KPOB-DT-18 Poplar Bluff, MO  
322 mi Tr seen 9/3/03



WFMY-DT-51 Greensboro, NC  
390 mi Tr seen 9/7/03



WHO-DT-19 Des Moines, IA  
460 mi Tr seen 9/7/03



KYTV-DT-44 Springfield, MO  
430 mi Tr seen 9/7/03

It's a little different from DXing with the WinTV-D card, obviously. The first thing you notice is the "Interstate highway sign" banner, with the usually "remapped" channel info. But Greg seems to really like it, and I'll bet the sensitivity is much better than the WinTV-D. More next month.

73's, JEFF

# Eastern TV-DX

Matthew C. Sittel  
15013 Eureux St.  
Bellevue, NE 68123  
mcsittel@cox.net

January, 2004

February, 2004 column deadline: Jan. 12

Eastern TV-DX is for reporters from the following states: AL, CT, DE, FL, GA, IN, KY, MA, MD, ME, MI, NC, NH, NJ, NY, OH, PA, RI, SC, TN, VA, VT and WV, plus Washington, DC. Also for reporters from the following Canadian provinces: NB, NF, NS, ON, PEI and PQ. Overseas reports welcome!

Roy Barstow, P.O. Box 2488, Teaticket, MA 02536

9/5/03 PM: 7/8 CBC CBHT NS, 8/9 Global NS, 11 CBC NS, 40 CTV NS, 34/45/46 NS.

9/6 11PM: +39 SS ASCTEC toward Philly, who?

9/7 1AM: 15 WPDE SC, 7AM 36 WCNC Charlotte, NC. "Sky Max NBC-6". 35 Pax NC, 46 NS.

9/9 0045: WNYA-LP-15 Easton, NY.

9/11 PM: E. VA plus: 17 WNCN NC, 50 WRAZ NC, 38 Pax NC, 35 Pax NC, 14 WYDO NC, 15 WPDE SC, 30 WRAY NBC, 40 WUVC NC, 31 WUNU PBS NC, 22 WLFL NC, 36 WUNP NBC, 11:45PM 15 CIVQ PQ

9/12 AM: 45 WXLV Winston-Salem NC, many from ME and 9 CKLT NB, and 11 CBC NS.

9/13 AM: 24/56/68 Syracuse, NY, 50 WWTI Watertown, NY. Many from ME including W57AQ Calais, ME, 22/23 both Fox ME, 8 CBC NS, 4 CBAT NB and 3 Yarmouth NS.

9/14 AM: like yesterday with 9 CKLT NB and 5 CJCH NS.

October: Oct. 9, 10, 31 had E. VA and some from NC.

11/23 PM: W45 VA, Pax NC 38, 8 Fox NC, 12 WWBT VA, 11 WTVD NC, 13 WVEC VA, 9 WNCT NC, W60 VA, 45 Fox MD, WRAY 30 NC, W18BB NC, 9 CKLT NB, 47 WRPX NC, W63 and W66 VA WAVY. 36 WUNP NC.

11/24 AM: Scranton area and some E. VA along with WRAY NC on 30. PM had new one +15 CIVK PQ Carleton. Total analog 808.

After the warm weekend of Nov. 22/23 I was checking for DX to my north and northeast. For as rain begins to move in from my west or southwest, many times I get enhancement of signals to my NE and N. On the evening of Nov. 24 with some Maine and others in I was about to call it quits. I tried the ICOM again with the 7' dish on the roof always pointing to my SW. After 11PM I was picking up French on +15 and thought it was 15 PQ. I swung the antenna and the signal peaked a little east of Bangor. I put the TV on and there it was +15 CIVK Carleton PQ on the Gaspé Peninsula. A lucky and rare catch. To me anything 200 to 300 miles inland is a nice catch. I tried for some VHF in the area but no luck. And UHF in that neck of the woods is all low power.

Doug Smith, W9WI, Pleasant View, TN

<http://www.w9wi.com>

9/7 tr

1900 KAIT 8 AR Jonesboro 217  
calls floating u/WNPT, rare since  
WNPT went 24/7.

9/8 tr

0705 WIAT 42 AL Birmingham 202  
WCFT 33 AL Tuscaloosa 223

Rick Shaftan, Sparta, NJ

shaftan@earthlink.net

11/6 tr

0810 W42AE 42+ NY Poughkeepsie 58  
0908 WVTA 41z VT Windsor, PBS 201  
1107 WNEU 60+ NH Merrimack 207

1125 WENH 11z NH Durham 230

11/24 tr

0300 WKTD-CA 17+ VA Portsmouth 304  
News 10 promos

WTFDA 2004 Omaha... make plans now to attend!

William McGuire, Cheverly, MD

Equipment: Admiral 13" color TV.

11/3 tr

1725 WBOC 16 MD Salisbury, ID  
2033 WGAL 8 PA Lancaster, NBC  
2100 WHYH 12 DE Wilmington, ID  
2145 WCAU 10 PA Philadelphia, NBC

11/4 tr

0705 WVIR 29 VA Charlottesville, NBC  
1730 WAVY 10 VA Portsmouth, wx  
1810 WTVR 6 VA Richmond, CBS 6

---

John Vervoort, 343-101<sup>st</sup> Street Apt. 2K, Brooklyn, NY 11209

Equipment: 19" Sharp TV, Sharp DVD/VCR combo, Channel Master Crossfire 82 aimed NNW in a fixed position, atop a 6-story apartment building.

10/11 tr

2259 KYW 3 PA Philadelphia  
2300 WFSB 3 CT Hartford  
KYW dominant  
2300 WPVI 6 PA Philadelphia  
2301 WTNH 8 CT New Haven  
News Channel 8  
2302 WCAU 10 PA Philadelphia  
2303 WHYH 12 DE Wilmington  
2303 WPHL 17 PA Philadelphia  
2304 WTXX 20 CT Waterbury  
2304 WNJS 23 NJ Camden  
2304 unID 24

2305 WBRE 28 PA Wilkes-Barre  
2306 WTXF 29 PA Philadelphia  
2307 unID 32 HSN  
2308 unID 34  
2308 unID 38  
2309 WLVT 39 PA Allentown  
mixing with WXNY-LP  
2310 WNJT 52 NJ Trenton  
2311 WTBV 54 NY Poughkeepsie  
2311 WPSG 57 PA Philadelphia  
2312 unID 61  
2313 WUVP 65 NJ Vineland

It would be nice to receive stations from other than my adjacent Designated Market Areas for a change!

---

Bob Seybold, 1865 W. Main Rd., Silver Creek, NY

There has been some good tropo since my last report. First a few comments. I am glad to see that a number of DXers had a good season so far. A lot of great E-skip and tropo and congrats to all who got in on it. The season has been good for me considering I had only so much time to DX. Also a local dealer and friend let me try a DTV converter deal for a few days and was fortunate to have it in use on at least one tropo opening. The following DTV stations were seen: WTVO-DT-40 Lexington, KY (435 miles), WCMH-DT-14 Columbus, OH (250 miles), WPTD-DT-58 Dayton, OH (300 miles), WKEF-DT-51 Dayton, also some locals (DT's) (only 40-50 miles). I hope to have a permanent DT system for next spring openings. I had to return the one I used after a few days. The above were all seen on Oct. 11-12. At that time there was a great opening into central and southern Ohio into Kentucky. Others seen were Mansfield 47, 50, 68 (super signals), WPTD-16, Columbus 10, Cincinnati 48/64, Dayton 22, Columbus 28/34, Lexington U's, Zanesville 18, Cambridge, Bowling Green U's, Lima U's, unIDed 69 in Ohio, Louisville U's, Dayton 45, Altoona 47, Portsmouth 42, and several unIDs. Also some good tropo Oct. 9-10, much of it well into the night (when I needed to sleep) but still got in on it before and after my sleep. A lot of Indiana seen, Michigan and Ohio and some stuff to east-Utica, Watertown and Canadians to northwest, north and northeast.

Best opening was into Tennessee, Alabama, Kentucky (eastern), Southern Pennsylvania (west half) which netted me these: WAZE-19 KY, WHTN-39 TN, WPGD-50 TN, WNAB-58 Nashville, WJFB-66 Lebanon, WUXP-30 Nashville, WLMT-30 Memphis, WAAY-31 Huntsville AL, WPXX-50 TN, WBXX-20 Crossville, WCTE-22 Cookeville (very strong), WNPX-28 Cookeville, WUPX-67 Morehead, KY, WKMR-38 Morehead, WOUB-20 Athens, OH, Jackson TN 16, other eastern and southern Ohio U's, Zanesville 18, Parkersburg 15, Huntington, WV (U's), Morgantown 41, Pittsburgh U's, Johnstown 19, Altoona U's and many unIDs. This was a duct. Normal signals generally seen were either very weak or no show. Stations east and west of area seen were no show and Canadian signals weaker than normal. This all left many channels open that are not normally open. This all occurred on Sept. 6-7 evening lasting well into night.

Starting November 4<sup>th</sup> and running almost constant through Nov. 5-6 a huge tropo opening bringing first North and South Dakota, Minnesota, western and northern Wisconsin, then eastern Wisconsin into north and central Michigan (no Detroit or lower Michigan) and finally into central, southern and eastern New York state, central and eastern PA, New Jersey, Philly, Connecticut, Mass. To east



coast. Absent or only with weak signals were Canadians, Ohio, Indiana stations thus making it easy for DX stations to show. There were brief periods of no DX and I left set but came back to see more.

Stations seen: WVTV-18 Milwaukee, WWUP-10 Michigan, WVCY-30 Milwaukee, KXLT-47 Rochester, MN, WYOW-34 Eagle River, WI (new), WEUX-48 Chippewa Falls, WI, KPXM-41 St. Cloud, MN, WHRM-20 Wausau, WI, WHMC-28 Menomonie, WI, WFXS-55 Wittenberg, WI, KDSD-16 Aberdeen, SD (new), Cadillac 33, all Green Bay U's (except 26), Muskegon 54, WIWB-14 Suring WI, Bad Axe, MI 35, KVRR-15 North Dakota, WKBS-47 Altoona, WLFM-68 Grundy, VA, WBFF-45 Baltimore, WNNE-31 Vermont, WMGM-40 NJ, WSPX-56 (new Syracuse), 24/43/68 Syracuse strong, Utica 20/33/51 (new) also 53 Utica, WFME 66 W. Milford new, CFGS-34 Hull (new), nothing else in that area in, Binghamton 12/34/46 very strong, no Elmira or Corning, strange? Connecticut 30/20, Poughkeepsie 54 very strong, Scranton, Wilkes-Barre, Hazelton U's, New Jersey 65, unID 62 east, unID 63 both New Jersey, 64 (shopping east, co-channel with Scranton 64), plus several unIDs. Nice late season opening. Good FM into some areas.

That's all for now, 73's Bob

---

Mike Bugaj, 69 Sherman Road, Enfield, CT 06082

Here is some selected DTV DX done with the Win-TV-D card in my computer.

8/31 Tr

0003 WPSX-DT 15 PA Clearfield (300)

9/6 Tr

2010 WVIA-DT 41 PA Hazelton (180)

2210 WNEP-DT 49 PA Scranton (180)

9/14 Tr

1943 WGBX-DT 43 MA Boston (90)

2227 WCSH-DT 44 ME Portland (180)

10/9 Tr

WRNN-DT 48 NY Kingston (75)

Regional News Network

10/11 Tr

1837 WPRI-DT 13 RI Providence, rough

2008 WWDP-DT 52 MA Norwell ShopNBC

2052 WUTF-DT 23 MA Marlborough Telefutera

2245 WUNI-DT 29 MA Worcester 50mi but

tough

2248 Unid-DT 35 only said PGM1...no text ID

11/24 Tr

0820 WPVI-DT 64 PA Philadelphia, ABC 200

0828 WPSG-DT 32 PA Philadelphia, UPN 200

I thought that as long as Matt has left some space. I'd fill it. I now have the honor of seeing DTVs on channel 10 through 13. Dubious honor, no doubt. WPRI DT is only around 60 miles east of me but the terrain is tough and this one is not easy to see. Worcester is only 50 miles NE of me but it took major tropo to see the DTV on ch29. Philadelphia DTVs are not hard to see when tropo is up. WRNN-DT has been seen multiple times and must have some power behind it. WPSX-DT was clearly a gift.

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**For the AM Dxeers among us...**

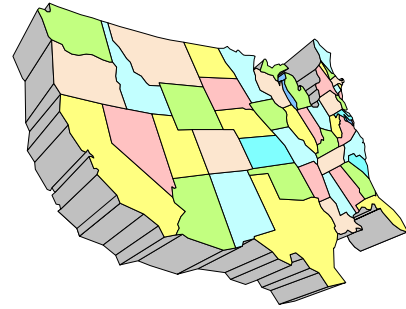


**The NRC AM Radio Log, 24th Edition,** including cross-referenced listings from 530-1700 khz., is compiled from both listeners' reports and official sources, making it the most accurate listing of U. S. and Canadian AM stations available. Unbound, three-hole punched for standard binders. \$19.95 to U. S. members; \$25.95 to U. S. non-NRC members; to Canadian members, \$23.00 (\$29.00 to non-NRC members). Airmail to members in western Europe (except Italy) and Australia, New Zealand, and Japan: \$29.00. All others contact us for exact prices. Order from: NRC Publications - Box 164 - Mannsville, NY 13661 (NY residents, please add sales tax).



# WESTERN TV DX

**VICTOR FRANK**  
**12450 SKYLINE BLVD.**  
**WOODSIDE, CA 94062-4554**  
**Victor.frank@sri.com**



**Dennis Park Smith**, 3605 San Remo Drive, Santa Barbara, CA 93105-2523 (805)687-7803

This report is for November 2003. The autumn season (or perhaps early winter around here) is upon us, with typically less southern-California coastal tropo on TV and FM than in the previous warmer months, between Santa Barbara and San Diego/Tijuana, up to 200 mi/320 km. As usual recently, my notes were sketchy and perhaps missing some conditions. Most of this month was no tropo, with the following exceptions:

Fair: Nov 7 eve to Nov 10 eve  
Good: Nov 19 eve to Nov 21 eve  
Fair: Nov 29 eve  
Poor: Nov 30  
Very poor: Dec 1

And after that, nothing once again.

Best of DX to All. Dennis

**Dave Pomeroy**, 2321 SE Libra Ct. Topeka, KS 66605-3505

Equipment: A ChannelMaster 6-foot UHF parabolic at 50 feet with a Winegard UHF amplifier and ChannelMaster rotor. DTV tuner is Hauppauge PC tuner card.

## August 2003

22 tr 1930 KMEG-14 Sioux City, IA  
KDLT-46 Sioux Falls, SD  
2110 KYNE-DT 17 Omaha, NE  
2130 KELO-DT 32 Sioux Falls, SD  
KSMN-20 Worthington, MN

## September 2003

2 tr 0630 KSHB-DT\* 42 Kansas City, MO  
KGIN-DT 32 Grand Island, NE  
5 tr 2300 WBXX-20\* Crossville, TN  
(Knoxville WB20, rare direction for here.  
Thought it was Iowa City WB20 until I heard ads for East Tennessee Ford)  
2330 KXII-DT 20 Sherman, TX  
6 tr 0000 21,23,39,58 Dallas, TX  
0010 KTXA-DT 18 Dallas, TX  
0410 WLMT-30 Memphis, TN  
0435 KASN-DT\* 39 Little Rock, AR  
7 tr 0700 KELO-DT 32 Sioux City, IA  
2100 KHOG-DT 15 Ft. Smith, AR

## October 2003

6 tr 0630 KOZK-DT\* 23 Springfield, MO  
(local KTWU-DT 23 off-the-air)  
0645 KMEG-14 Sioux City, IA

16 tr 2130 KFJX-14\* Pittsburg, KS  
(testing with "Fox 14" logo for Joplin-Pittsburg)  
18 tr 0650 KOKI-DT 22 KJRH-DT 56 Tulsa, OK  
KFVT-LP\* Wichita, KS  
19 tr 0710 KXII-DT 20 Sherman, TX  
KOKI-DT 22 KJRH-DT 56 Tulsa, OK  
KOLN-DT 25 Lincoln, NE  
20 tr 0400 KSMN-20 Worthington, MN  
KELO-DT 32 Sioux Falls, SD  
UNID-65 HSN  
UNID-DT 19 CBS (Program 1)  
23 tr 2010 KELO-DT 32 Sioux Falls, SD  
KMEG-14 Sioux City, IA  
KUON-DT 40 Lincoln, NE

## November 2003

19 tr 0600 KFJX-14 KSNF-16 Joplin-Pittsburg  
(exceptionally strong signals)  
24, 40 Ft. Smith, AR  
KFAA-51 Fayetteville, AR  
K15DR-64\* Springdale, AR "Fox46"  
(moved from channel 15 to 64--probably to make way for KHOG-DT 15. I called the station and was told that they were able to keep the K15DR call letters. That may not be correct, but that is what I was told.)

K20??-20 TBN Spanish

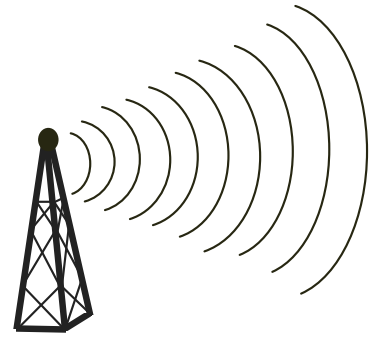
(TBN says they do not have a channel 20 in the northwest Arkansas area where I suspect the station is from. They also checked their Spanish network and said there was nothing on channel 20.)

All area DTVs are now on with the exception of KPXE-DT 51 in Kansas City, Missouri which won't be on until next spring. It is a PAX station. Several are still at very low power including WDAF-DT 34 from Kansas City and KTAJ-DT 21 and KQTV-DT 53 from St. Joseph, Missouri.

KMCI-38 is still licensed to Lawrence, Kansas but really operates out of Kansas City, Missouri. The transmitter for KMCI-38 and KMCI-DT 36 is actually located east of Kansas City well into Missouri. It is no longer local at my location, which is only 25 miles from Lawrence. I may count KMCI-38 as a new station because of the change in transmitter location. For the first time since they went on the air I have been able to get other stations on channel 38. It was snowfree on indoor antennas here, but can barely be seen without an outdoor antenna now.

**HAPPY NEW YEAR!!!**

# Northern FM DX



**Keith McGinnis**  
**387 Shirley Street, Winthrop, MA 02152**  
**longwave@attbi.com 617-846-5760**

For Dxers in the following states: **CT IA ID IL IN MA ME MI MN MT ND NE NH NJ NY OH OR PA RI SD VT WA WI WY** and all of **Canada**. Please submit by the 10<sup>th</sup> of each month. If possible please submit in the formats shown Below.

**EDITORS NOTE: PLEASE NOTE THAT ANY TYPEWRITTEN OR HANDWRITTEN REPORTS MIGHT BE DELAYED TILL A LATER ISSUE AS TIME PERMITS. ALSO PLEASE KEEP REPORTS AS RECENT AS POSSIBLE (THE LAST 3 MONTHS SHOULD WORK FINE). THANK YOU.**

## **Keith McGinnis 387 Shirley St Winthrop MA 02152**

*Equipment: Modified Yamaha T-85 with an APS9B 15 ft AGL plus Conrad RDS  
 All logs are new*

### September 3 2003 Tr

1905	WWMJ	95.7	Ellsworth	ME	oldies
1917	WCRQ	102.9	Dennysville	ME	Hot AC The All New CRQ
1934	WQDY	92.7	Calais	ME	Red Sox Baseball
2012	WCTB	93.5	Fairfield	ME	ac local ads and Sox game
2045	WJJB	95.5	Topsham	ME	Sports
2052	CJLS	95.5	Yarmouth	NS	John Mayer on CJLS
2109	WBZN	107.3	Old Town	ME	CHR
2121	WDME	103.1	Dover-Foxcroft	ME	Red Sox game

### November 18 2003 Tr

2310	CFXY	105.3	Fredrickton	NB	rock FM 105 The Fox
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### November 23 2003 Tr

1510	WFMI	100.9	Southern Shores	NC	gospel "Rejoice" strong thru most of night
1751	WRVS	89.9	Elizabeth City	NC	Urban ID
1800	WKHW	106.5	Pocomoke City	MD	Bay County 96.9 and 106.5 into Full Legal ID
2240	WNOR	98.7	Norfolk	VA	Rock w/ a promo for local charity CD
2303	WFMZ	104.9	Hertford	NC	classic hits Classic Hits 104.9
2327	WAZP	90.7	Cape Charles	VA	Relig

### December 13 2003 Ts

1725	CIHT	89.9	Ottawa	ON	"Hot 89.9" Ottawa mentions then continuation of a countdown show...Ts was in from Montreal and Kingston ON too!
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### December 14 2003 Ms

0843	WMUB	88.5	Oxford	OH	"Here on WMUB 88.5 Oxford.." Believe this to be Ms and not Es (even though skip was around...Es seemed to be more toward FL).
2059	WLPG	91.7	Florence	SC	via RDS PI code 7340

## **Rick Shaftan Sparta NJ**

*Equipment: Realistic STA 2280, Conrad RDS Manager, Two APS 14s stagger stacked with two FM 13s (first # is direction second is mileage...new=\_\_\_\_\_)*

### October 2 Ms

AM	WWKI	100.5	Kokomo	IN	RDS PI 8FCC	270	597
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October 3 Ms

AM WANZ 100.5 Northport AL RDS PI 5613, Z-100 FM 237 898

October 28 Ms

AM KOLL 94.9 Maumelle AR RDS PI 3612 250 1059

November 14 Ms

1040 WALC 100.5 Charleston SC "On James Island, just minutes from x downtown Charleston..." 209 638

November 21 Tr

0200 WBGK 99.7 Old Forge NY 99.7 and 100.1 WBGK 352 147

November 23 Tr

1919 WVOD 99.1 Manteo NC Outer Banks Alternative, 99.1 The Source 189 356

1957 WOBX 98.1 Manteo NC Mentions of Hatteras, 98.1 OBX 189 356

2000 WGPS 88.3 Elizabeth City NC The Café Connection on WGPS Elizabeth City and WPGT Roanoke Rapids 196 336

2115 WWBR 107.9 West Point VA Hot 102.1 and 107.9 205 273

2120 WWHV 102.1 Virginia Beach VA Hot 102.1 and 107.9 196 307

2130 WKHI 107.5 Fruitland MD Lite Rock 107.5 and 103.5. Logged previously from Exmore VA. 196 201

2140 WINX 94.3 St. Michaels MD Ad for Easton. Hrd old 94.3 in Salisbury in the past. 205 180

2146 WICO 97.5 Salisbury MD Country // 105.9 196 190

2155 WQZL 101.1 Belhaven NC Ad sales job at the Beat of North Carolina 910-455-5300 197 412

2343 WRAR 105.5 Rappahannock VA 105.5 WRAR in mix 207 244

November 24 Tr

0400 Unid 88.1 Sounded like 101.7 Kiss FM and "WJMR"

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**Harry Hayes - Wilkes-Barre, PA**

*Equipment: Superadio w/10khz filter, FM-6 in attic.*

November 22 Tr

0400 WMGK 102.9 Philadelphia PA Rock MX. 100 miles

0700 WMHR 102.9 Syracuse NY Relig, strong, taking the place of WMGK. 135

0823 WYYY 94.5 Syracuse NY "Y-94", weak to strong. 135

0900 WCNY 91.3 Syracuse NY Classical, fair signal. ID on hour. 135

November 24 Tr

0340 WSNI 104.5 Philadelphia PA Christmas MX. Solid signal all morning.

Auroral openings noted on the evenings of 10/29 and 11/20, audio noted on 104.3 but not clear enough to ID. Earlier in the month a burst produced an unknown station that called itself "104.5 The Mountain". I monitor MS all night, every night on 104.5. Philadelphia, Wellsboro and Toronto are usually very weak or not in at all here on this frequency. The last two nights of November were above average for number and length of bursts. I usually keep the radio on low volume at the foot of my bed which is a method that nets not only meteor bursts but some middle of the night tropo and e-skip openings that I would never have come across otherwise, and yes, I get my sleep. A word of warning- Don't you married guys try this.

---

**Jerry Bond Rochester, NY**

*DXing with a 1992 Chevy Van*

September 8 Tr

1038 WOMC 104.3 Detroit MI Oldies 104.3 jingle

1101 WDET 101.9 Detroit MI Detroit Public Radio

1103. WIOT 104.7 Toledo OH 50,000 watts of rock power

1108 WCSX 94.7 Birmingham MI ID

1110 WKFM 96.1 Huron OH K-96, country

1128	WKRK	97.1	Detroit	MI	"Live 97.1", sports talk
1131	WJIM	97.5	Lansing	MI	Oldies 97.5
1140	UNID	101.7			spot for dentist in 519 area code and mention of Hanover
1149	WMGC	105.1	Detroit	MI	Detroit's best at-work station, Magic 105.1
1157	WZAK	93.1	Cleveland	OH	R and B, ID sounded like WZZK
1254	UNID	104.9			classical, probably WCLV-Lorain

September 10 Tr

0925	CFLG	104.5	Cornwal,	ON	Variety 104
1023	CBME	88.5	Montreal	PQ	CBC Radio 1
1032	CFJM	95.9	Montreal	PQ	Mix 96
1033	CKOI	96.9	Verdun	PQ	FF, C'est-quoi-FM
1036	CHOM	97.7	Montreal	PQ	"Shom-97.7", The Spirit of Rock
1039	CKOO	98.5	La Rive Sud	PQ	FF, Cool FM
1040	WSNN	99.3	Potsdam	NY	99 Hits FM
1053	WVLF	96.1	Norwood	NY	"The Valley"

**Russ Edmunds Blue Bell, PA ( 360' ASL )**

*[15 mi NNW of Philadelphia] 40:08:45N; 75:16:04W, Grid FN20ID*

*Yamaha T-80 & APS9B @15'*

September 12 Tr

1645	WDNH	95.3	Honesdale	PA	Traffic, local a. rare signal for Tr north
1725	W224AU	92.7	Allentown	PA	// 107.9 w/ WWFM classical. New.
2027	WCDW	100.5	Conklin	NY	Oldies, paralleled w/ RKS-NJ. New.
2050	WGGY	101.3	Scranton	PA	Oldies, promo, ID, weather. New.
2134	WLTB	101.7	Johnson City	NY	Oldies, Binghamton ads. New.

September 13 Tr

1215	W278AI	103.5	Center Valley	PA	"Word FM" pgmg // 88.9, 88.1. New.
1720	WKSB	102.7	Williamsport	PA	Classic Hits, local ad, "Kiss FM". New.
2027	WSRN	91.5	Swarthmore	PA	Talk, ID - formerly one of my closest x unlogged stations, today atop channel! New.

October 10 Tr

2045	WVOS	95.9	Liberty	NY	Soft rock, "Heart to Heart" pgm, ID. New.
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November 1 Tr

1640	WWRT	104.9	Strasburg	VA	Classic Rock, 2 Winchester ads, weather ment both Winchester & Front Royal. New.
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November 3 Tr

2100	WRAR	105.5	Tappahannock	VA	Oldies, "Because you need to know, ABC news on 105.5 WRAR". New.
2158	WFMZ	104.9	Hertford	NC	Classic Rock, "Classic Hits 104.9", DJ Gregory B. Allen, finally a spoken "WFMZ Hertford". New.

November 4 Tr

1700	WYKZ	99.3	Spotsylvania	VA	Modern Rock, local traffic, "Y-99.3". New.
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November 23 Tr

1001	WGPS	88.3	Elizabeth City	NC	Gospel music, ID. New - 271 mi.
1055	WFMI	100.9	Southern Shores	NC	Preaching, ID. Relog - 274 mi.
1058	WFOS	88.7	Chesapeake	VA	Classical music, local promos. New 243 mi.
1119	WVOD	99.1	Manteo	NC	Local ads, promo. New - 298 mi.
1121	WNOR	98.7	Norfolk	VA	Modern rock, Slogan, local ad. New - 235 mi.
1215	WOBR	95.3	Wanchese	NC	Rock, local ads, promo "Northeastern North Carolina's Rock". Relog - 298 mi.
1710	WRSF	105.7	Columbia	NC	Country; "12 in a row Country on Dixie 105.7". Relog - 299 mi.
1725	WWDE	101.3	Hampton	VA	Light rock, ad, "2WD" slogan. New -235 mi.
1825	WYND	97.1	Hatteras	NC	Local ads, ID. Relog - 326 mi.
1900	WRVS	89.9	Elizabeth City	NC	Blues/rock mention of Elizabeth City under WOEL preaching. New - 272 mi.
1905	WHOV	88.1	Hampton	VA	Carribbean music, Jamaican-accented DJ, promo, ID. New - 235 mi.
1910	WFMZ	104.9	Hertford	NC	Classic rock "The New Classic Hits 104.9".

1923	WHRO	90.3	Norfolk	VA	Religious music, mentions of Tidewater u/ WJTL-PA. New - 235 mi.
1927	WNSB	91.1	Norfolk	VA	Soul music, ID. New - 235 mi.
1929	WBHH	92.1	Moyock	NC	Hip Hop; "92.1 The Beat"; "Blazin Hip-Hop" local ads. New - 248 mi.
2035	WZPR	92.3	Nags Head	NC	Hip Hop, "Power 92.3", mention of Outer Banks. New - 297 mi.
2045	WWBR	107.9	West Point	VA	Hip Hop, "Hot 102.1 & 107.9" ad for car dealer in Chesapeake. New - 204 mi.
2053	WTKF	107.3	Atlantic	NC	W/ "The Love Doctor"; local ad, "The Talk Station" New - 370 mi.
2125	WRAR	105.5	Tappahannock	VA	Redskins FB. Relog - 175 mi.
2150	WAVA	105.1	Arlington	VA	Religious talk program; ID, promos.
2200	WYCS	91.5	Yorktown	VA	Oasis Network promo, ID u/ WBJC. New

## Mike Bugaj, 69 Sherman Road, Enfield, CT 06082

Onkyo T450-RDS, Sony ST-5130 with an APS-13 on the roof. RDS Manager.

### September 12 Tr

1704 WMCM 103.3 Rockland, ME  
 1705 WQEZ 104.7 Kennebunkport, ME, lite rock  
 1750 WJJB 95.5 Topsham, ME, sports  
 1753 WCYY 94.3 Biddeford, ME  
 1810 WRED 95.9 Saco, ME, Maine's hot hits  
 1820 WCME 96.7 Boothbay Harbor, ME, mono  
 1845 WQCB 106.5 Brewer, ME, country  
 2030 WVOM 103.9 Howland, ME the voice of Maine  
 2330 CBAF 102.3 Fredrickton, NB, French  
 2335 WWBX 97.1 Bangor, ME B97.1 CC Worlwide nx

### September 13 Tr

1030 CBAF and CBZ both in again  
 1030 CBH 102.7 NS Halifax  
 1030 CFRQ 104.3 NS Halifax  
 1130 WDME 103.1 Dover-Foxcroft, ME from the woods of Maine  
 1220 WHMX 105.7 Lincoln, ME, Christian

### September 17 Tr

1750 WTOS 105.1 Skowhegan, ME

### September 22 Tr

0956 WBHG 101.5 Meredith, NH, NH's Classic Rock Big 101.5

### September 24 Tr

2200 WSLC 94.9 Roanoke, VA, Star country  
 2300 Some Norfolk FMs in, WYFI 99.7 and WNVZ 104.5

### September 26 Tr

2305 Norfolk, WPTE 94.9, WWSO-92.9, and the usuals

### October 28 WRKI 95.1 picks up RDS (WRKI-I95)

### October 30 Hartford CCs add RDS

### November 3 Tr

1805 WTSS 102.5 Buffalo, NY Star 102.5  
 1807 WKSE 102.7 Williamsport, PA, Kiss  
 2030 WFLK 101.7 Geneva, NY  
 fingerlakeshelpwanted.com

### November 23 Tr

0910 Coastal tropo, Atlantic City/DE/MD/Norfolk  
 2145 very heavy coastal tropo, all relogs but noticed RDS on WLIR-92.7 now.

### November 24, Tr

0807 WXCX 103.7 Havre de Grace, MD

### December 8 Tr

0721 WKRB 90.9 Brooklyn, NY, CHR format, IDs

The only logs I didn't put here were those I logged on November 24 from Hyannis, MA while we were there for a few days and Thanksgiving. This turned out to be the tail end of the 11/23 opening and most of my loggings were from Maine and New Brunswick (CBAF and CBZ super strong; also had a CBC Radio 1 station on 103.3 from way north of Fredrickton running 5kw according to the FM Atlas. It was sure nice to get some super coastal tropo, this time *from* a coastal location like the Cape. All of the dx from Hyannis was done with my Sony ST-5130 with rabbit ears and headphones.

## GORDON SIMKIN CONTINUES FROM PAGE 28

was above 100 from August, 1999, to June 2003, almost 4 years. That is not so unusual when the peak reaches 150, but for only a peak of 120, that is a long time. In 1937 the peak reached only 119, but was over 100 for only a little over 2 years. In 1848 the peak reached 125, but was over 100 for less than 2 years. The next minimum is expected around January 2007, and who know what the next peak will do. It should occur around 2010 or 2011, so if you are DXing then, you might want to check into the sunspot count and find out if maybe you could receive some international F2 TV-DX!

Happy DXing, whether it is TV or FM DX, whether it is via tropospheric, sporadic E, F2, auroral, airplane—or even some other unknown method. Remember, DXing is partly about finding the totally unexpected! Have fun.

# More TV DX

PART THREE OF THREE BY GORDON SIMKIN, FORMER AIPA INTERNATIONAL DX EDITOR

**Loma Linda, California F2 TV-DX** - After my Army term ended, I returned (with my new wife) to my old job at Loma Linda University (Medical Center), where I was a Research Assistant by title, but in reality I was working as an Electronic Engineer. I was likely to get called to work on almost anything on campus relating to electronics. But again, that is getting away from TV-DX.

My work involved a lot of electronic circuit design, and I designed a TV channel scanner. I was going to use 5 separate tuners for channel 2 through 6. A control circuit would activate them one at a time, and stop if a signal was present. Scanners as we know them did not exist then, and I did not think about that idea, or who knows what I might have achieved.

The real point is that I had a very understanding and generous boss. He allowed me to bring into his shop, radio and TV equipment. I had a surplus AM radio that tuned from 30 to 56 MHz, and 12 inch (black & white, of course) TV, and an LM-10 frequency meter. I had modified a Heathkit FM (model FM-3A) tuner into a converter to tune the 40-60 MHz band, with an output on channel 3. At home I had obtained my own Hallicrafters SX-62 communications radio that tuned everything from .55 to 110 MHz, with AM & FM above 30 MHz. I also had amateur rigs for 6 and 2 meters, with a 4 element wide-spaced beam for 6 meters (which I still have). So before I left home for work in the mornings, I would use those along with an old 7 inch Raytheon-Belmont and my first converter that I had made in Maryland. I never had any outstanding 2-way contacts on 6 meters, but I did hear an Italian station one day one 50.1 MHz.

In those days, (1957 era), South Korea was still using the old 42-48 MHz FM band. In the afternoon, I was often hearing FM stations in those frequency ranges, but it was not in a language that I could even guess what was being said. However, one day, while I was tape recording one station, and ID in English was given. It was quite a delight to discover that I was receiving Seoul, S. Korea! I wrote to them giving much detail from the recording, and received a nice verification card. Unfortunately, I have misplaced that card—it might be in some of my unsorted storage boxes. I think the call letters were HLKA, and it was around 45 MHz as I recall. But since I left home in the moments before most of the F2 DX started in the mornings, I did not have much else at home of any significance.

However, at work I had quite a different story. Again, I do not have the logs from those eventful days, so I am stuck with my memory, which is certainly not 100% accurate now. As I recall, it was in early October that BBC audio started coming in. Since there was more than one location in the British Isles on each BBC channel (even as there is more than one station on each US channel), I wanted to know *which* BBC station I was receiving. The previous winter, I had no way to determine that. But with my recently purchased LM-10 frequency meter, it was easy to tell whether I was receiving 41.50 MHz (London) or 41.48 MHz (Belfast, Ireland). The same was true for video on 45.00 or 44.98 MHz. Before long, everything I had seen or heard in Maryland was also seen and heard in California. Of course, the sunspot count was reaching its maximum. For October, 1958, it was 199.5. The peak was 201.3 the next March (1959).

Then that one day—the most extreme day for F2 DX that I ever experienced. I'm not sure of the date, But I think it was around the 20<sup>th</sup> of November. Glenn Hauser, in his "DX Listening Digest #02-001 January 1, 2002" wrote this about that day: "Legendary DXer Gordon Simkin who lived in Loma Linda (Southern) California managed to catch MUF as high as 53.75 MHz to the BBC in UK - rather phenomenal, as well as a French station operating with a video carrier frequency of 52.4 MHz (at that time)." Now I have no objection to him calling me a "legendary DXer", as I was not in the habit of getting written verifications for any DX that I had no doubt about, unless I had some other reason for getting such verification cards. So, especially at this time, anyone must trust my honesty, as I have no other proof, even of those few verifications that I did obtain.

There was so much coming in on that day, that it was very difficult to keep up with it. I did try to photograph some of it with a 16 mm film camera and surplus film, but the camera did not work very good (it was also surplus), and the film was old. I don't think I kept the few frames that were good. None of the frames had any identifiable video as to the station being seen. There was audio (and likely video) from Italy, Russia, Germany as well as England and France. There was so much video that it was difficult to tell what was coming in. But I had a strong local on US Channel 2, from Los Angeles—which broadcast from Mount Wilson, almost visible from my TV antenna, which was an old "conical" antenna with significantly longer elements installed. It was aimed toward Europe, and I had no way to turn it.

It was easy to tell the three general video patterns just by listening and checking sidebands with the LM-10 frequency meter. England was 405 lines at 50 Hz, (10,125 Hertz



sideband, which were even audible), Most of Europe used (as it does today) 625 lines at 50 Hz (15,625 Hertz sidebands, which are so close to the US, that one had to know the carrier frequency to be sure, except for the 50 Hz buzz instead of 60 Hz buzzing for US stations), and the French 819 line system (20,475 Hertz sidebands).

As Glenn Hauser reported, my highest identified MUF reception was that 53.75 MHz signal, being used only by the BBC. As I recall, that was the only time I ever saw (or heard) the French video on 52.4 MHz. There were also some European video and/or audio signals above 54 MHz that might have been coming in, but the local channel 2 station was too strong to find them clearly enough to be sure.

Since I was "International DX editor" for the "AIPA" (American Ionospheric Propagation Association) at that time, I was corresponding with a number of other DXers around the world. One of those was George Palmer. I remember when he was daily getting BBC audio, and the MUF was dropping each day by the time he started hearing the audio—as the station had just come on the air. The problem was that BBC-TV was not on the air at the ideal time for him to receive them. Then one day, there was a rail disaster in London, and BBC-TV came on early to carry that event live. He received the video with the audio that day. He called them (BBC) long distance, let them hear the audio, and he described the video he was seeing, so that he could get a verification of his TV-DX, which I believe is still the worlds record for distance. The short path was 10,800 miles, but ionospheric studies predicted that it had to be the long path, 13,200 miles. The following paragraph is from a web site about him:

"George [Palmer] started TVDX back in 1956 at Williamstown, Melbourne, Victoria. He was the first DXer [in Australia, a year after I had seen that channel in Maryland] to receive BBC chB1 video and audio via multi-hop F2 propagation. He used a specially imported 405 line TV to watch the BBC programs. He even caught the BBC pictures on silent movie film. The 41.5 MHz TV sound was also recorded on open reel tape. One of the programs noted was the BBC news. It is also interesting to note that at certain times the signals peaked from the north east, thus, were via long-path F2." He had TV's for every standard in the world, as I remember it.

About this time, someone in Europe sent me a photograph of a test pattern from a Berlin, East Germany (communist) station that seemed to be only testing. It stated that this test pattern had been on 41.75 MHz for some time. The test pattern was very unique, and with exactly what I had seen on 41.75 MHz on many occasions. I never knew if I received that audio that went with that test pattern, if indeed there was any. This then cleared up a year-old mystery. This frequency or station was never listed in any publication that I saw.

It was while I was in the army that I learned about an electronic method of reducing snow on a fixed video image by signal averaging. I applied that principle to film, and wrote an article which was published in the December, 1959 issue of Radio-Electronics magazine on page 105. I still do have a copy of that article. By the way, it falsely listed my name as George! That is how common an error on my name is. If there is interest, I will try to get the pictures scanned and send the whole article for you to read. The text would be helpful even if the pictures are not copyable. However, it will only work where there is a stable, unchanging picture for a few seconds, which was common in test pattern days, but is hard to come by today. It is also hard to have that stability via Es, but tropo is often what is hard to ID, with weak, but stable pictures. My photos are of a weak tropo signal from Baltimore, MD, to where I was living while I was in the army (where I first heard and saw BBC TV).

About this time, a low power TV station came on the air on channel 3 in the northwest—Idaho I think. It was only 1,000 watts. The author who reported it said something like, don't even try to receive it. However, they did not know the possible efficiency of Sporadic E. It just happened that a few days before I read about that station, I had received it quite strong! No doubt many of you also have received a low power TV stations via Es.

Soon after that peak in the sunspot cycle, I got too busy at work to do any more TV-DXing, and then I was offered a job (at twice the pay) to work as Instrument Engineer for a nuclear test reactor in Idaho. At the new job, time for DXing was nil, but I did do a little. I don't remember the dates, but I know that I took my 30-56 MHz AM radio to work and placed it under my desk. On a few occasions, as the sunspot count was decreasing, I heard BBC audio on 41.5 MHz, but no other European signals were ever heard. Of course, I did not have much time to tune around, and that radio was normally set on 41.5 with a squelch, so that is why I heard what I did.

However, I did find some new (to me at that time) type of TV-DX. How many of you have ever aimed your TV antenna at the aurora (northern lights)? Try it some time, and you might be surprised at what you see and hear. I did that on several occasions. In every case, I found that the signal was extremely scrambled, and even the audio was often unintelligible! There may well be auroral DX that is not that bad, but I never saw any. That made any ID very difficult. I lived in Idaho Falls, about 160 miles north of Salt Lake City. I had seen TV from Salt Lake City via tropo DX, but one time I identified Salt Lake City on channel 5—the only positive ID that I

ever made via the aurora. This was much more scrambled than the video that I saw in Bikini Atoll.

It was also in the late 50's when it was reported that KLEE, channel 2 in Houston Texas, had been seen in England by a number of people, just before the BBC came on the air! Maybe you have even read about that unusual event. Now, that was impossible as reported. Note that it was a US channel 2 received on the BBC channel 2 (55.25 MHz vs. about 49 MHz), which was 405 line picture vs. a 525 line picture. The video would not have synced on any BBC TV, even if the signal was strong enough for the large MHz difference to be overcome. BBC TV used the opposite modulation that the US. Hence any picture received from the US on a BBC TV, even if visible, would have been a negative, but the photos of this one were not. Not only that, the Houston TV station had changed call letters over a year before to KPRC! I did a lot of investigation, and finally found out what happened.

It was first pointed out that the KLEE test pattern seen was exactly like a photo of that station published in a magazine about a year before. It was common knowledge that at that time, in England, it was required to have a license to even use a radio or TV receiver! Having transmitters was an even more serious "no-no" without a license. One or two young men (we'd call them "hackers" today) wanted to see if they could build a complete TV station and transmit a picture to a friend. They decided to send their friend that picture a short time before the local BBC TV came on the air, on the BBC channel 2. They did not realize that *many* people had their TV's on, waiting for BBC to come on the air. They chose that test pattern from that magazine as the picture to send, as they did not want anything that might even come close to identifying them. Right after transmitting the picture, they dismantled the whole set-up, so no trace could be found.

Most of the reception reports described a weak, but stable picture. Someone got a clear photo of their TV picture. They were all in one small area. Yet, many DXers and even some news people accepted this as genuine year-old DX! This report kept showing up for many years, and I always wrote to tell them the truth. I used to have the name and address of the Scandinavian friend of the illegal broadcasters who told me all about the event, so they could go direct to him. But I no longer know where that is—if indeed, that person even lives at the same place or is even alive. Sorry, but you'll again have to trust my memory or forget it.

Even though I am a "died-in-the-wool" TV-DXer, as one progresses in life, there are things that must take priority. TV-DXing took a far back seat to work, family and church. But I did keep up in general with the solar cycle. At the next peak with a relatively low 110.6 for the sunspot count which occurred in November, 1968, I was working in the Sacramento, California area, and there was no way that I could try to TV-DX for anything—but maybe there was not very much anyway.

The following cycle, with a peak of 164.5 in December found me working in Kansas. At the 10 o'clock morning break, I would go out to my car and put my Radio Shack portable radio on top of the car (as sort of a ground-plane), pull the antenna up, and tune for anything between 40 and 55 MHz. Although I made no logs, my memory clearly recalls hearing a number of signals that were likely European TV-DX.

The next cycle found me in New Mexico. Here I left for work around 6:30 A.M., and had no chance to even think about TV-DX until I got home in the afternoon. Studying the propagation charts, I realized that F2 TV-DX from New Zealand was likely. Hence, I bought an old VCR TV tuner which was easily adjusted to tune from 42 to 60 MHz, with a channel 3 output. The sunspot count reached 158.5 in July and was at 157.5 in November, 1989. And yes indeed, I did see New Zealand TV on several occasions, on 45.25 MHz, but no sound was ever heard. There was a very weak signal occasionally at 46.25 MHz (which was the Australian frequency), but there was never anything strong enough to honestly say I had TV from Australia. If it was from there, it was weak "forward scatter". The sunspot count remained above 150 for a full year.

In 1995 I was near Ocala, Florida. There I had an ideal DXing set-up, but strong locals to near-locals on almost every low-band channel made that almost impossible. However, with a good multi-element wide band beam on a 50 foot tower (which came with the house that I bought), I was able to catch a little DX. On morning, I was rather surprised to find tropo DX all the way across the gulf of Mexico coming in from southern Texas, and maybe Mexico, although the only ID that was seen was from Texas. This was on channels 7 through 13, no low-band signals were seen. Signals were quite strong, and lasted for an hour or more. That was my best ever tropo DX, at about 950 miles.

The following peak was not too good, reaching only about 120 on March, 2000. Y2K news had taken my attention, along with the fact that I was spending most of my year in an RV on the road (for religious purposes). There just was not an opportunity to do any DXing, except for occasional FM-DX heard while driving. This solar cycle was unusual in that it had a secondary sunspot peak in January, 2002, of about 115 almost 2 years later! In fact the count

(Continues on page 25)

# How I Started DXing

MY PERSONAL HISTORY

By John Ebeling, November, 1974

Many times a person is asked "How did you get started doing that?" or "Why do you have an interest in such and such?" In most cases, a specific answer will involve a considerable explanation and the facts tend to be clouded by the span of the years involved. This, then, attempts to explain my interest in FM DX before the passage of additional time takes its toll in the ability to extract the facts from my memory.

During the years of 1944 to 1947, several small, simple AM and shortwave radios were constructed and used. They helped fulfill an interest in broadcasting that I have always seemed to have.

My real interest in DX of the Very High Frequencies (VHF) began back in the summer of 1947. At that time, a new tower was being built in Duluth on the top of the hill above 4th Avenue West. This was a self-supporting type of tower, popular at the time, and it was interesting to watch the men move around on the tower from the back yard of my home as the tower grew higher. Station WEBC was building it for a new type of station at the time - an FM station. The final tower height was, as I recall, about 550 feet, and with no other towers around, it looked very tall at the time.

When the station began broadcasting in late 1947 as WDUL, they had an effective radiated power of 62,000 watts which in 1947 seemed like a lot of power. The operating frequency was 92.3 on the FM dial. Early broadcast hours were from 3 to 10 PM daily with a classical music format. My first reception of WDUL was by a harmonic around 10 MHz on the short wave band of an old 1938 Air Master radio. Reception was very distorted and very hard to tune, but it was possible to understand most speech. About that time, I read an article in Science & Mechanics magazine, December, 1947, page 169, about a simple FM converter. This used a loop of heavy copper wire about 7" in diameter, a small variable capacitor, a IN34 germanium diode (a new device in 1947) and a few other parts. I built this converter and used a pair of old headphones to listen. The signal from only a mile away was very weak and left much to be desired, however it did work and I had received my first FM station.

Several years earlier I had built a three tube (2 # 76Ts and 1 # 80) short wave receiver. This set provided good headphone volume, so I connected the FM converter output to the volume control of this receiver with fair results. Since the short wave radio had a minimal audio circuit and a "hot" chassis

(connected to the power line), I had to be careful not to get electrocuted in the process.

During 1948, WDUL had changed its call to WEBC-FM and also came on the air from 7:54 to 8:00 AM for the Arrowhead FM network weather roundup. This included direct off-the-air pick up between WEAU-FM on 94.1 in Eau Claire and WJMC-FM 96.3 in Rice Lake, Wisconsin. WEBC-FM in Duluth picked up WJMC-FM with an FM antenna mounted about half-way up the transmitting tower. Reception of Rice Lake for the weather show as broadcast over WEBC AM & FM varied considerably. However, it made me realize that, contrary to many magazine articles at the time stating "line of sight" FM reception, distant FM reception was indeed possible. Rice Lake was about 95 air miles from the house in Duluth.

A trip to Chicago in the summer of 1948 provided my first look at TV and a chance to listen to all of the Chicago FM stations. We stayed at the house of a friend that had a 17 inch DuMont TV set with continuous tuning that also covered the FM band. I spent considerable time tuning this set during our visit and was very much impressed with the number of FM stations already on the air in Chicago, the lack of commercials, and the good music they played. This trip increased my interest in FM broadcasting.

About this time a construction article in the May 1948 (page 46) issue of Radio News described an FM tuner using slope detection as a method of signal demodulation. Parts were available from a company (PERCO) in California so I sent for them and built the unit. This tuner used a 14F8 loctal and a 35W4 tube, a 3-gang tuning capacitor and also had a "hot" chassis.

This two tube tuner had very good sensitivity but was rather critical as to proper tuning due to the slope detection circuitry used. It was also designed for headphone use, and various attempts to hook it up to a AC-DC Stewart Warner portable and the old Air Master radio met with limited success.

Up until this time I was using an indoor FM antenna made from twin lead. The Sept. 1948 Mechanix Illustrated magazine had a construction article (page 104) on how to build a 3-element (director, reflector & dipole) FM antenna using round curtain rods. I built the antenna and mounted it on the roof of the house in late 1948 for my first outdoor antenna. This antenna, along with my PERCO tuner, enabled me to receive my first FM DX. I vividly recall listening to now

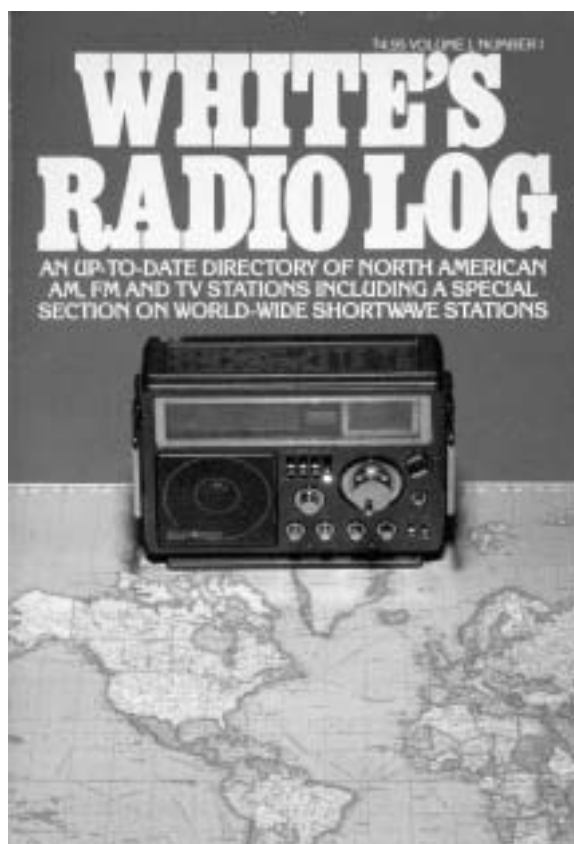
defunct KWNO-FM (97.5) from Winona during a severe thunderstorm in the summer of 1949. This PERCO tuner had excellent static rejection-the signal from Winona was static free. I have never seen another FM tuner to equal that cheap two-tube tuner for static rejection.

During 1949 I found that the PERCO tuner could be easily modified to change the tuning range to cover TV channels 4 and 5. Using this modified tuner with my FM antenna allowed me to receive the audio portion of Minneapolis TV channels 4 (WMIN-TV) and 5 (KSTP-TV). Reception was rather consistent, even with about 15,000 watts of radiated aural power, and it convinced me that reception of Twin Cities TV in Duluth was possible. Furthermore, a tavern on the corner of 5th Ave. S. & 4th St. had a TV set which was generally in operation, and on my way home from high school every day I would look in the window to see how the picture was. It would vary from nothing but snow to what I considered pretty good - at least it was a picture !

Early FM DX reception with my PERCO tuner included KBUR-FM (92.9) Burlington, Iowa (rather often, considering the distance) KFAM-FM (104.7) St. Cloud, WMIN-FM (99.5) St. Paul, WCAL-FM (95.7) Northfield, Minn. and Rice Lake and Eau Claire, Wisconsin, and a number of other FM stations on the air at the time.

As I recall, sometime during 1948 WEBC-FM began programming to radios installed in Duluth transit busses. These programs were mostly music with commercials. During commercials, they would transmit a high frequency tone which would activate circuits in the bus radio to increase the volume of the commercials. The PERCO tuner responded to this tone and provided a squeal from the output. It wasn't too bad during voice, but sometimes they left the tone on during music selections and it was annoying.

In the fall of 1949 my parents bought a new RCA AM/FM radio/phono (model 9W105) . At this time, the RCA/CBS record war of 33-1/3 or 45 rpm records was in full swing, so the unit had a 45 player along with a separate 33/78 player. The radio had no radio frequency (RF) stage on either AM or FM, but it became my primary DX receiver as it was far easier to tune than the PERCO. I also replaced my "curtain rod" antenna with a new Amphenol FM folded dipole and reflector. This combination provided many hours of DX activity for me during late 1949 and up until late 1952 when I moved to Minneapolis. Several Whites' radio log books were purchased around 1950-51 and various stations were received and marked in the books. However, no real FM log was kept at the time.



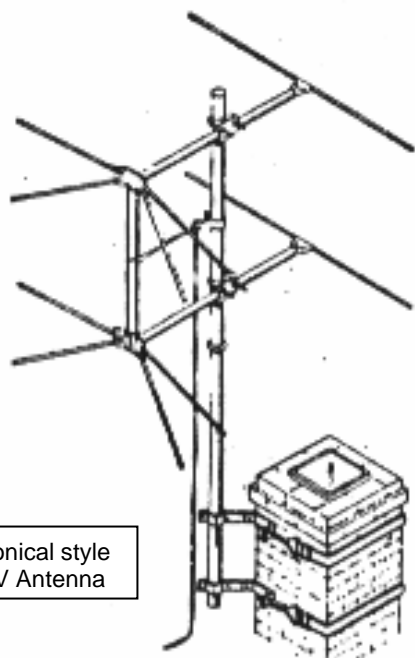
During September of 1950, the first Ebeling TV set was purchased. This was an RCA console, 16 inch round metal picture tube set (chassis KCS 47) which cost \$329.00 and was a split-sound (not intercarrier) type set. No TV sets were being sold in Duluth at the time so the set had to be purchased from a dealer (Monarch TV) on Lake Street in Minneapolis and hauled up to Duluth in the back seat of a 1948 Studebaker. At the time, there must have been only about 50 TV sets in all of Duluth. A Taco channel 4 & 5 antenna was mounted on the roof and the set worked well when signal conditions were good. This was when TV stations were low powered (about 25 KW) and sets were, by present standards, non-sensitive. Various signal boosters were tried from time to time with varying results. In the summer of 1953 I installed a more sensitive Standard Coil grounded grid, strip type tuner in the TV, replacing the RCA wafer switch tuner. This new tuner allowed for easy conversion for WFTV, channel 38, which was due to begin broadcasting in Duluth in 1953. This station was on the air for about two years.

In the early 1950's Minneapolis TV was on the air from about 3 to 11:30 PM, which left a lot of TV DX time available. A number of DX stations were received back then with some excellent pictures. I would DX TV if I was home between university classes, and if signals were real good a few classes were missed in favor of TV DX.

After moving to Minneapolis in December of 1952, my DX activity dropped. Minneapolis FM stations during 1953-1956 were few, with KTIS-FM being the only one on the air for a while during the lean years. In December of 1956, both WLOL FM (99.5) and KWFM (97.1) came on the air within a week of each other to help start the FM upswing. Lack of

ADDENDUM  
MOBILE FM RECEPTION

local stations was a big help in DXing in Minneapolis. My only receiver at the time was an Airline AM/FM table radio and indoor antenna, and the DX log was only half-way maintained. This set was used until November of 1957 when an Allied AM/ FM tuner kit (with RF stage) was purchased for \$49.95. This was built and used with a previously built Heathkit amplifier and a conical type TV antenna in the attic of my house on Logan Avenue in Bloomington, MN.



Much DX was received with this set-up, including an excellent Georgia/Alabama skip opening in June of 1958. FM signals were very strong for about four hours and the DX log assumed new importance to me and was kept up to date from then on. I also built my first SCA adapter in 1959 for 67 KHz Muzak sub-carrier reception as broadcast over WLOL-FM. In September of 1960 the Allied tuner was retired and replaced by a Sherwood S2200V AM/FM tuner, purchased at a special price of \$135.00. I also put up an outside 10 element FM Yagi antenna with rotor at the same time. This same antenna was still in use 14 years later, having survived several household moves.

In September of 1963 all equipment was moved to Addison, a western suburb of Chicago. The FM antenna was installed outdoors and a total of 187 stations were received and logged during the two year period spent in the Chicago area. This was a tough area in which to DX as cross-modulation of stations on the dial was a problem since I was located only two miles from 100KW WMBI-FM.

Back to Minneapolis again and the antenna was again installed in the spring of 1966 on Vincent Ave. in Bloomington. The Sherwood tuner was used until August of 1969 when a used Heathkit AJ-15 tuner was purchased for \$150. This tuner is still being used as of November, 1974.

Mobile FM reception was first introduced into my car in the summer of 1958 when a FM tuner small (& cheap) enough to fit under the dash was available. This was rather a makeshift arrangement, consisting of a 5 tube Satchell Carlson FM tuner module designed for home use, a modified vibrator power supply for 250 VDC, and a 12 to 6 volt dropping resistor for the filament voltage. The FM tuner audio was routed through the audio circuit of a hybrid (tube & transistor) 1957 Plymouth AM radio. A separate switch controlled either AM or FM reception.

This equipment worked fairly well, even though the tuner was capacitor tuned (AFC disabled) and would tend to drift somewhat, especially over rough roads. The power supply was mounted under the hood on top of a fender housing. During a trip to California in 1959, just about every gas station attendant asked what "that thing on the fender" was for when checking under the hood. Much explaining about FM was required due to the low public interest in FM at the time. Reception while driving around Los Angeles was very good with only a few fade areas being encountered.

Back then, very few FM stations had vertical polarization (or, for that matter, the power they now have) and a home made 1oop about 15 inches in diameter was fashioned and attached to the AM antenna. This, of course, also resulted in numerous questions to be answered.

In 1962, a commercial Motorola FM converter was purchased for mobile use and the home brew unit was retired.

MINNESOTA		
Alexandria	KCMT	(7) C*
Appleton	KWCM-TV	(10) E
Austin	KAAL	(6) C
	KAVT-TV	(15) E
Bemidji	KAWK	(9) E*
Duluth	KDLH-TV	(3) C*
	WDSE-TV	(8) E*
	WDIO-TV	(10) C*
Hibbing	WIRT	(13) C*
Mankato	KEYC-TV	(12) C
Minneapolis	WCCO-TV	(4) C*
	KMSP-TV	(9) C*
	WTCH-TV	(11) C*
Rochester	KTTC	(10) C
St. Paul	KTCA-TV	(2) E*
	KSTP-TV	(5) C*
	KTCI-TV	(17) E*
Walker	KNMT	(12) C*

TV LISTING FROM OLD WHITES RADIO LOG



Beyond FM  
Beyond TV  
USA – CANADA  
Weather Radio Monitoring

Submit weather band loggings and weather radio news to  
Jason Koralja at: jklbi01@hotmail.com (Subject: WXDX)

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January 2004

STATION NEWS (Sept. 25 to Dec. 12)

**NEW – Western California** station WNG595 has signed on the air from Bridgeport at 162.525 with 300 watts.

**NEW - Central Minnesota** station WNG673 signed on from Long Prairie at 162.525, WNG676 signed on from Clearwater at 162.500, and WNG678 signed on from Pine City at 162.425.

**NEW - Southeastern Michigan** station WNG647 signed on from Adrian MI at 162.425 transmitting with 300 watts.

**NEW – Northwestern New York** station WNG539 has signed on from Spencerport at 162.450 with 300 watts.

**NEW – Eastern North Carolina** station WNG537 has signed on from Windsor at 162.252 with 300 watts.

**NEW - Southeastern North Carolina** station KXI95 has signed on from Warsaw at 162.425 with 300 watts.

**NEW – Southeastern North Dakota** station WNG656 has signed on from Fort Ransom at 162.525 with 1000 watts.

**NEW – Eastern Oklahoma** station KHA37 has signed on from Vian at 162.525 with 300 watts.

**NEW – Northern Tennessee** station WNG631 has signed on from Russell Hill at 162.450 with 1000 watts.

**NEW – Southern Washington** station WNG604 has signed on from Davis Peak at 162.525 with 300 watts.

**NEW – Northeastern Wyoming** station WNG661 has signed on from New Castle at 162.475 with 300 watts.

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LOGGINGS (Nov.23 to Dec.12)

Jason Koralja  
Surf City, NJ  
Uniden Bearcat BC890XLT  
Radio Shack Discone Antenna

November 23, 2003 162.425 – WWH26 – Mamie NC  
November 23, 2003 162.500 – WXX97 – Sudlersville MD  
November 24, 2003 162.425 – WNG574 – Gloucester MA  
November 24, 2003 162.500 – KZZ31 – Hardyston NJ  
November 24, 2003 162.550 – WXL93 – Worcester MA

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Kevin Redding  
Mesa, Arizona  
RS Pro 2037  
using the back of set antenna

162.400 WXL30 Tucson, AZ 11/28 2109 - 125 miles  
162.425 WWG41 Payson, AZ 11/28 2112 - 65 miles  
162.500 WWG42 Globe-Miami, AZ 11/28 2116 - 62 miles  
162.550 KEC94 Phoenix, AZ 11/28 11/28 2118 - 21 miles

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Mike Bugaj  
Enfield, CT  
Bearcat BC860XLT with a Scantenna

Just a bandscan of what I've heard here.

162.400 WXJ42 Meriden, CT  
162.425 WXM68 Marlboro, VT  
162.475 WXJ41 Somers, CT (my local)  
162.500 WWH33 Cornwall, CT  
162.525 WWF48 N. Adams, MA  
162.550 WXL93 Worcester, MA  
162.55 KWL35 New York, NY



# DTV TALK

DTV NEWS AND TALK FROM THE WTFDA EMAIL LIST ON TOPICA.COM

Karl Zuk wrote:

I am in a fringe area with no strong locals.

Are there any significant differences between the Samsung SIRT351 and the Zenith HDV420 terrestrial HDTV tuners?

I am considering being foolish and actually buying a HDTV set. Very few have over-the-air tuners for HDTV reception, hence the need for the external tuner. I feel like I am back in 1940 piecing together my first B&W set (well it works.....but the tuner is extra.....)

My intent is to watch over-the-air HDTV only, at least initially. The best HD service I have seen in stores is HD Net. Nearly every store I have visited has been displaying either DVD playbacks or really fuzzy expanded (and often out of proportion) NTSC signals. Amazing (maybe not) how many stores don't even know what a over-the-air receiver is.

\*\*\*\*\*



SAMSUNG SIRT-151

David Austin replied:

It's not my intention to trash anyone's products, but I'd be very leery of Samsung. As readers may recall, I bought a refurbished SIR-T151 (not the same model number as below) and it just curled up and died a month after I'd bought it. The dealer told me there was a 90-day warranty but Samsung said they don't warranty refurbished units and were not pleased with my having bought it on eBay either. (All other things being equal, why should they care where I bought it?) Thankfully the dealer was very cooperative and refunded my money promptly, but bottom line, I am without an HDTV box.

While it worked, it was awesome. On clear nights and mornings I had most Charlotte and Augusta DTVs without a hitch, and WBTV-DT from Charlotte was pretty much in the clear 24/7. (UNC TV has five DTV subchannels!!!) Unfortunately I didn't get to see how it would have performed during the two recent mornings that I had openings to Atlanta and Winston-Salem respectively.

I can't discount that Samsung has found its design flaws and resolved them. Hope so. But I'm not going to be their lab rat, that is unless they were willing to give me a "postpaid free 90-day trial" or some such fantasy.

Plusses on the Samsung SIR-T151, while it lasted:

- Digital only, i.e., digital didn't get overpowered by analog on the same channel (I've heard that some other receivers have a problem with this)

- VERY VERY directional; this is a plus when you consider that "when you've got the signal, you've GOT it!"

- Remapping (i.e., displaying the virtual channel instead of the actual broadcast channel) was smooth as silk. Charlotte's "NBC6" finally got to be "channel 6"!

- Fairly decent signal strength meter, however, a bit clunky to get to via menu.

I'd be interested in knowing how Zenith performs. Pity about Samsung. They also have a sweet multisystem (NTSC/PAL/SECAM) VCR with built-in converter, but I've heard mixed reviews on them too, and one bad electronics experience per year is enough for me. I could use a multisystem VCR to tape American cartoons for my mini-Euro-peeps (i.e. my wife's family's kids).

Any word from anyone on when we are actually going to be able to go out and buy a TV set with built-in digital tuner?

\*\*\*\*\*



ZENITH HD-420

Glen Hale:

I have a Zenith SATHD520 DirecTV/OTA box and am very pleased with its performance. I have no trouble receiving full power digital signals from up to 70 miles distant under normal conditions using a VHF/UHF combo antenna about 20' up with a preamp. Terrain here is fairly flat, with rolling hills.

I've never used the Zenith your asking about, but it's widely regarded as the best OTA tuner in terms of sensitivity. My Zenith is supposed to have the same OTA guts as the HDV420.

I've owned or used several DTV boxes, including a Samsung SIRT150. The Zenith 520 is by far the best I've used. It has a solid analog OTA tuner too--is better than all of my TV's tuners, except it mutes audio on weak signals. Zenith's are becoming increasingly hard to find. They've stopped producing under that name. All of the newer boxes are "LG" brand. The newer DirecTV/OTA box made by LG is also sold under the Sony and

Hughes nameplates. There are some pretty good deals to be had on the Hughes version. DirecTV HD is pretty good. DiscoveryHD is stunning. HDnet is also quite nice. If you're into sports, ESPN's HD content, though limited, is very well done. I don't know much about DishHD, but I don't think VOOM will be around for long.

\*\*\*\*\*



RCA ATSC11

LG, formerly Goldstar, is a Korean firm of some significant international reputation. They have been a "marketing force" in the Pacific, Asia and Europe for ten years plus. Like many Korean firms, they build just about anything that might make them money including automobiles! When Zenith finally threw in the sponge (as in being on the verge of bankruptcy) a few years back, LG stepped in and purchased Zenith rights to most of the (still valuable) Zenith patents. And the right to market in the USA using the Zenith name.

Thus anything that says Zenith on it today, or has said Zenith for perhaps four years, is in fact LG - Korean made - possibly using original Zenith designs. Zenith continues to have a "name corporate presence" in the USA, but it is in fact LG. In memory serves me correctly, Zenith (the brand and manufacturer) was the last of the American manufacturers to close down US production of consumer electronics. Goldstar branding preceded LG and was in the mid 90s considered innovative in design but in fact only moderate in performance. LG as a brand name surfaced at the time Zenith became a part of the firm, primarily to meld their Zenith acquisition into the firm and to rid themselves of a "nice but modest" reputation which Goldstar had earned for them. The DTH operator here in New Zealand (Sky NZ) uses "Zenith" branded set top boxes but of course it is a name only in this case - manufactured by LG for Sky. - Bob Cooper in New Zealand

I've only seen the LG products from stores online. I don't think any of the major national retailers are carrying them, except in the rebadged Sony DirecTV/OTA unit. -Glen Hale

# FM NEWS

**Steven C. Wiseblood**  
**28 LBJ Blvd.**  
**Brownsville, TX 78521**  
**stevenwisebl@hotmail.com**

## **ABBREVIATIONS:**

AFA: American Family Association  
 CC: call letter change  
 CL: city of license change  
 CX: a construction permit has been cancelled  
 C1, C2, etc.: a change in status to that FM license class  
 DA: directional antenna  
 DE: station has been deleted  
 FC: format change  
 GA: granted amendment to the table of FM allocations  
 GE: granted extension of construction permit  
 GX: granted replacement of expired permit  
 LC: license to cover filed (ready to come on the air)  
 MC: multiple-city ID  
 NC: no change yet on a reported change or permit  
 ND: non directional antenna

NO: not on the air  
 NS: new station granted  
 NW: new station signs on  
 OSA: one step application granted for change  
 PA: proposed amendment change to FM allocation table  
 PC: power change on the air (> = increase, < = decrease)  
 PG: power change granted (> = increase, < = decrease)  
 QC: frequency changed occurred  
 QG: frequency change granted  
 RA: silent stations returns to the air  
 RE: station requests an extension on permit  
 RX: station requests replacement of expired permit  
 SC: slogan change or update  
 SI: station is silent  
 XA: dismissed amendment to FM allocations  
 XC: transmitter site change occurred  
 XG: transmitter site change granted



## **ALABAMA:**

Union Springs: WQSI 94.1 RA, classic country.

## **ARIZONA:**

Tucson: KWMT 92.9, CC (ex KOYT), SC to "The Mountain"  
 Tucson: KWFM 97.1, FC to Spanish top 40, SC to "Que Suave 97.1"

## **ARKANSAS:**

Des Arc: KFLI 104.7, FC to oldies, SC to "Oldies 104" (Searcy)  
 Hardy : KOOU 104.7 RA, standards

## **CALIFORNIA:**

Cambria:KTEA 103.5, NW, Adult standards  
 "Old Time Radio" (San Luis Obispo)  
 Escondido: KSOQ 92.1, CC (ex KFSD), //KSON 97.3 San Diego  
 Newport Beach: KDLE 103.1, FC to alternative rock, SC as "Indie 103.1"  
 Santa Monica: KDLD 103.1, FC to alternative rock, SC as "Indie 103.1"  
 Ukiah : KULV 97.1, NW, contemporary Christian, "K-Love"



## **COLORADO:**

Carbondale: KNTE 88.9 changes calls to KCJX.  
Eaton: KWRZ 88.9 changes calls to KLCQ

## **DELAWARE:**

Milford: WXPZ 101.3, FC to 60s-70s oldies,  
SC to "Kool 101"

## **FLORIDA:**

Safety Harbor: WYUU 92.5. FC to Country,  
SC to "Outlaw Country" (Tampa/St. Petersburg)

## **ILLINOIS:**

Morris: WYXX 103.1, RA , adult AC

## **IOWA:**

Boone: KBGG 98.3, CC (ex KRKQ) (Des Moines)  
Mitchellville: KDMR 88.9, NW

## **KANSAS:**

Liberal: KSLS 101.5 FC to soft AC,  
SC to "Soft Rock 101.5"



## **KENTUCKY:**

Owensboro: WJVK 91.7NW, contemporary Christian,  
//WCVK 90.7 Bowling Green

## **LOUISIANA:**

Alexandria: KOUZ 89.9, FC to contemporary  
Christian,  
SC to "K-Love"

## **MASSACHUSETTS:**

Gloucester: WBOQ 104.9 FC to 60s-70s oldies,  
SC to "North Shore 104.9"



## **MICHIGAN:**

Jackson: WJKQ 88.5, NW, oldies,  
//WAAQ 88.3 Onstead

## **MINNESOTA:**

Moose Lake : WMOZ 106.9, FC to oldies,  
SC to "Oldies 106.9"

New Prague: KRDS 95.5, SC to "Oldies 95.5"

## **MISSISSIPPI:**

Greenville: WFBI 91.5, CC (ex WMSB)  
Jackson: WDBT 95.5, FC to go black gospel,  
SC to "95.5 Hallelujah FM"  
Sardis: KBUD 102.1 NW, black gospel,  
"Anointed 102.1" (Memphis TN)  
(Yes, it's a K call in east of the Mississippi River!)

## **MISSOURI:**

Houston: KUNQ 99.3 RA, classic country and  
bluegrass

## **MONTANA:**

Big Sky: KBZM 104.5, RA, classic rock,  
"Eagle 104.5"

## **NEW MEXICO:**

Alamogordo: KUPR 91.7, NW, variety

Gallup: KXXQ 100.7 FC to country, SC to "Kicks  
100.7"

Santa Fe: KBAC 98.1, CC (ex KLSK),  
FC to rock, SC to "Radio Free Santa Fe"  
Santa Fe: KABQ 104.1, CC (ex KBAC).  
FC to rock, SC to "World Class Rock" (Albuquerque)

## **NEW YORK:**

Malone: WMHQ 90.1 NW, //WMHR 102.9 Syracuse  
New York: WNEW 102.7, FC to adult AC,  
SC as "Mix 102.7"

## **NORTH CAROLINA:**

Bayboro: WNBB 97.9, CC (ex WRUP)  
Charlotte: WKQC 104.7, CC (ex WSSS),  
FC to soft AC/oldies,  
SC as "K-104.7, Charlotte's Cool Music"  
Norlina: WZRN 90.5, NW, NPR news/classical  
Pinetops: WKTC 95.5, FC to R&B, (Rocky Mount)  
Wallace: WZKB 94.3, FC to contemporary Christian ,  
// WCLN 107.3 Clinton

## **NORTH DAKOTA:**

Arthur: KVMI 103.9, FC to AC,  
SC as "Star 103.9" ( Fargo)

## **OHIO:**

Ashville: WFCB 93.3, FC to adult AC,  
SC to "93-3 Lite FM" (Columbus)  
Crestline WYXZ 98.7, FC to contemporary Christian,  
"K-Love"

## **PENNSYLVANIA:**

Philadelphia : WLDW 96.5. CC (ex WPTP),  
SC "Wild 96-5"



## **TEXAS:**

Azle: KTCY 101.7, CC (ex KZMP) FC to Spanish AC,  
SC as "Super Estrella" (Dallas-Fort Worth)  
Doss: KGLF 88.1 NW, contemporary Christian,  
"88.1 the Life"  
Mason: KNAF 105.7, NW  
Pilot Point: KZMP 104.9, CC (ex KTCY),  
FC to Spanish cumbia and grupera music,  
SC as "El Gato" (Dallas-Fort Worth)

## **UTAH:**

Ogden: KKAT 101.9, SC to "Kat Country 101.9"  
Salt Lake City: KISN 97.1, FC to top 40,  
SC to "97-1 ZHT"

## **VIRGINIA:**

Chesapeake: WKCK 93.7 (CC ex WKOC),  
FC to Country, SC to "Kick 93.7"  
Norfolk: WCMS 100.5, FC to rock  
Exmore: WKOC 106.1, CC (ex WEXM)  
Norfolk: vWCMS 100.5, RA, rock "100.5 Max-FM"  
Petersburg: WPZZ 99.3, CC (ex WRHH),  
FC to black gospel ((Richmond)  
Stephens City: WXVA 98.3, RA, top 40, "Kiss 98.3"

## **WASHINGTON:**

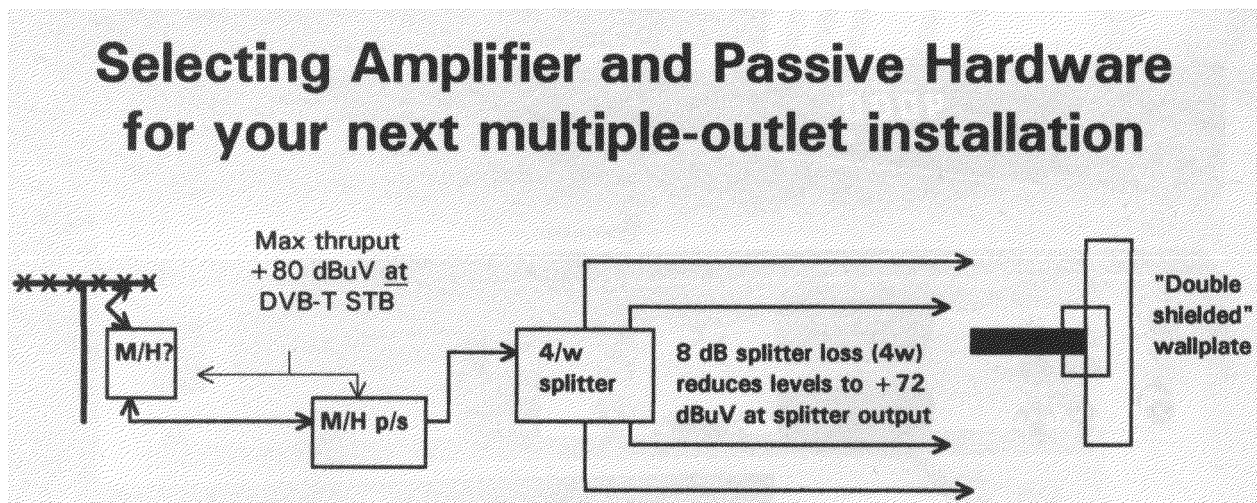
Othello: KZLN 97.5, FC to classic rock

## **WYOMING:**

Gillette: 103.9 KXXL, NW  
Laramie : KIMX 96.7, CC (ex KHAT)  
Timnath: KKHI 105.5 , CC (ex KIMX), (Laramie)



## Choosing the right equipment.



**Bob Cooper's SATFACTS MONTHLY NOVEMBER 15, 2003**

One of the first decisions an installer must make when planning a DVB-STB (digital terrestrial) installation is whether he will use amplification in the system. In analogue reception, it is difficult (although not impossible; see diagram, below) to have “too much” signal to an individual TV set connected to a “master antenna” In a DVB-T installation, the “set-top-box” (STB) interfaces between the antenna “system” and the TV receiver, and it has a rather narrow “input signal level window’ which must be respected.

Measuring DVB-T signal levels requires a special meter (such as the DaTuM 10 from Lacey's.tv) *nothing* in your ancient analogue “kit-bag” will do this job. When the terrestrial digital signal is too strong, several undesirable things occur within the STh. First of all, DVB-T often is transmitted using a channel that is frequency-adjacent to a pre-existing analogue service (such as 7-D being on 8 with 7-analogue being on 7). When you “stack up” 7-A to 718D, 9A to 9/9A-D, bA/I 1D and finally 2-A to 12D, you suddenly have not four band I and III signals by at least 50% (3 dB) to avoid driving the amplifier into premature overload (failure). The amplifier, whether a masthead or a distribution-class device, cares not whether the signals passing “through” are analogue or digital - both classes are power consumptive carriers regardless of their format.

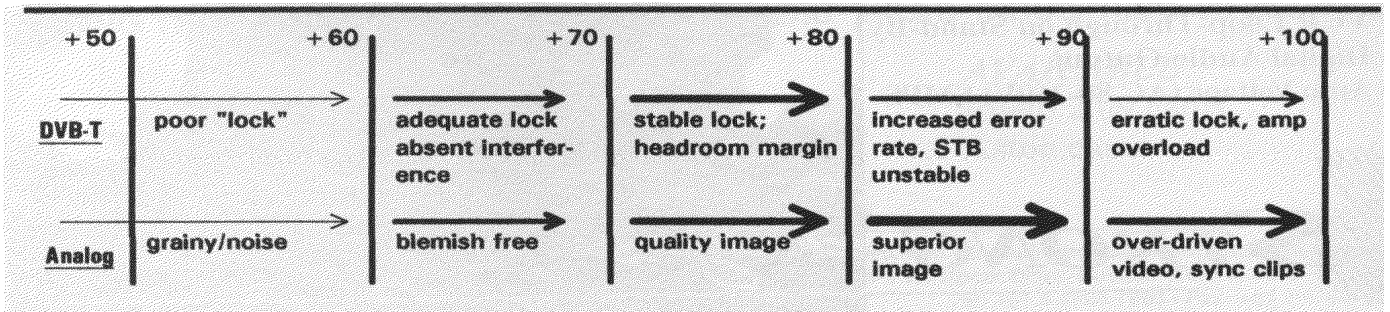
The answer is - reduce the total output power by turning down the gain of the amplifier. And if you don't? Potentially, cross-modulation - this is what happens when an amplifier stage is driven (operated) beyond its design limits and one (or more) of the input signals begins transferring “modulation artefacts” from one pass-through carrier to another. Such as 9A being amplifier-demodulated and then super imposed on 7/8D, within the amplifier stage.

Any amplifier can suffer “overload” and once overloaded, whether by a digital terrestrial or analogue terrestrial signal, resolving the challenge can be very difficult to sort out. The one test worth trying is to reduce the total amplifier gain using the inside-of-amplifier “gain control.” If turning the gain down reduces or eliminates the reception difficulty, you have just proven “amplifier overload.”

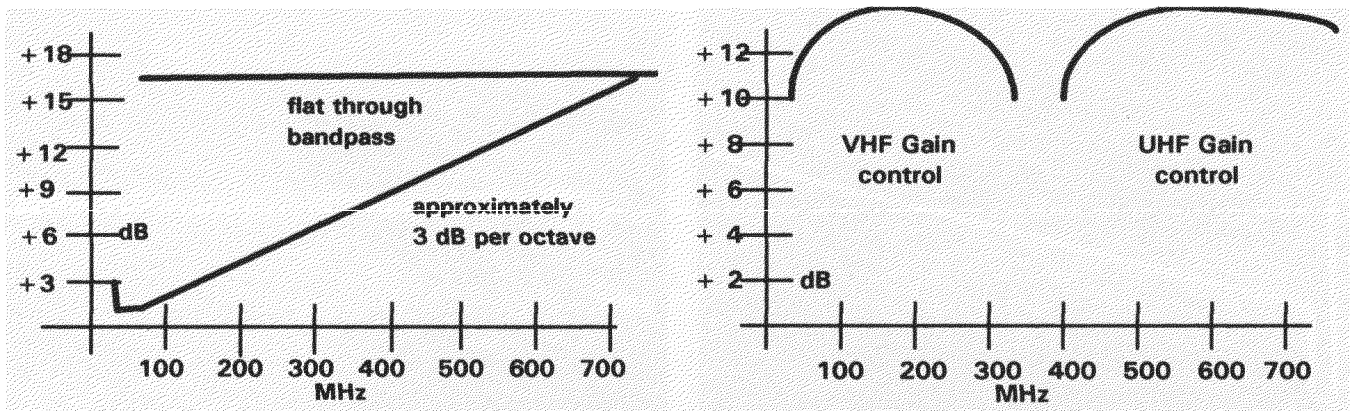
Digital terrestrial are sitting ducks for analogue-terrestrial cross-modulation because typically they are transmitted -10 dB (10 dB weaker in carrier level) than their analogue counterparts. In theory, 30 kilowatts of DVB-T transmission is the equal to 300 kilowatts of analogue-terrestrial in the field; coverage ability. So today, while analogue plus digital are on the air, we have analogue 7 +10 dB stronger at the receiving location than 7D/8. When you measure a DVB-T carrier with a suitable instrument, the unmeasured analogue(s) are +10 dB (or more) at the same time. *Overload* time.

### Do you really need an amplifier?

A home/location with one DVB-T STh and one or more standard analogue receivers can be a challenge. The DVB-T levels must be kept down, even when no amplifier is required, to around +80 dBuV (maximum) at the input to the STB. The DVB-T “acceptance window” is relatively narrow - field experience suggests +70 to +80 dBuV is safe and anything below +65 or above +85 can cause STB problems (not all STBs are created equal - some have a “thinner” signal acceptance “window” than others; be brand and model conscious!). Fortunately, setting aside amplifier



overload as a cross-modulation challenge, the analogue signals processed by the same system are less apt to cause problems if they “bit” the analogue TV sets at +90-95 dBuV. Which means? When you get to the TV set input terminal in the region of +80 dBuV on the digital channels, the analogue adjacent channels will be (or should be!) around 10 dB stronger than the digitals anyhow - simply because 300 kilowatts (analogue) is 10 dB more powerful than 30 kilowatts (digital).

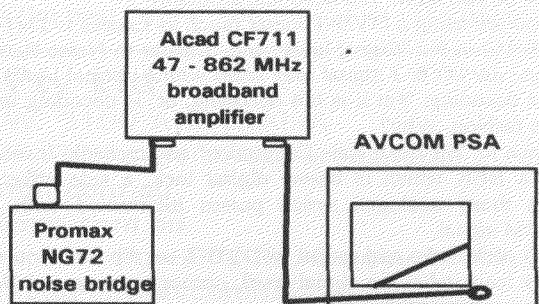


TWO design approaches to broadband/VHF-UHF (house) distribution amplifiers. Left, an “equaliser” adjustment sets the gain as a function of frequency - more gain at higher frequencies - to compensate for the natural “greater cable loss at higher frequencies” effect of RG6 and other standard cables. On right, when the amplifier is likely to be used only for VHF + UHF off-air reception, two independent (separate) gain controls are provided. VHF “gain” typically covers 40-250/300 MHz while UHF gain (a separate control) covers from around 450 - 800(+) MHz. In between the two, a “hole” (such as 250/300-450 MHz) with reduced or “out of phase” gain. Selecting the correct amplifier is important!

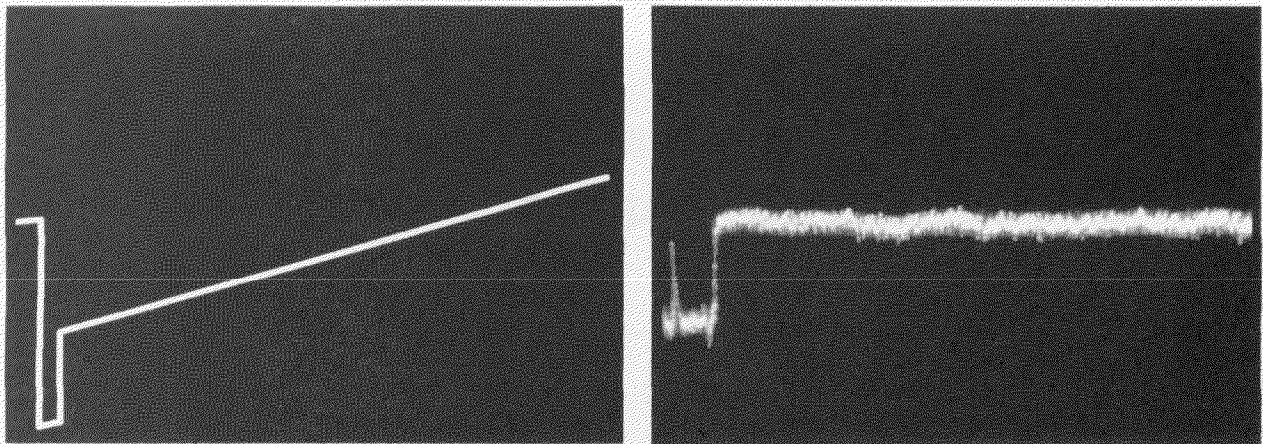
Selection of an amplifier, when and where required, is an important step in designing a system. First, the amplifier must cover the frequency spectrum involved in the distribution system. The Laceys.tv A1221, for example, covers 47 - 862 MHz but it does so in two separate amplifier-gain settable ranges (see above diagram, right). The VHF range covers bands 1, (II) and (III) while the UHF range begins near 400 MHz and extends to nearly 900 MHz. With “individual” gain control ranges of approximately 10 dB, each “range” can be adjusted to suit the particular installation circumstances.

The data sheet reveals that at 105 dBuV the “cross mod” (IMD3 at -60 dB) will be 60 dB below the peak carrier level through the amplifier. Interpretation? If the strongest (VHF or UHF) signal passing through the output is +105 dBuV, the inter-modulation-distortion (IMD3) will be -60 dB (below) the 105 dBuV carrier level; or, 105 - (minus) 60 = 45 dBuV. Is that good?

PROPER analysis of amplifier bandpass characteristics requires a frequency-identifiable “sweep.” Here, a Promax NG72 broadband noise bridge is fed to an Alcad CF711 amplifier and the detected response is displayed in a frequency-spectrum that covers 40 - 900 MHz. The (as adjusted) amplifier “tilt” is apparent in the display on the screen; covering 47 (left side) - 862 MHz (right side) over a 18 dB range.



Adequate but marginal when it comes to creating modulation interference to the less powerful signals passing through the amplifier. "Modulation interference" is cross modulation - the sync pulses of the strongest TV carrier superimpose themselves on the weaker carriers passing through the amplifier. There is a danger zone here - when an amplifier "overloads" it is no longer a "linear device."



NOISE bridge as "signal source" run through Alcad CF711 (Laceys.tv source) high gain, broadband amplifier with tilt adjusted for approximately 3 dB per (frequency) octave - left, and "flat" (right); 47 - 862 MHz left to right.

*Linear?* There are several forms of amplification - if you wish the output of the amplifier to be a replica (same modulation and frequency characteristics) as the input, "linear" is the way to go. "Linear" means nothing is changed but the amplitude (strength) of the signal(s) being amplified. However, an amplifier (whether a single stage of gain or multiple stages of gain) can be "forced" into a non-linear state (mode of operation) by changing the various voltages which it consumes. If the input signal, from the antenna or a preceding stage of gain, rises past the point of linear operation, the stage (transistor gain device) goes non-linear and it becomes (amongst other things) a "detector."

So now, with too much input, it is not only no longer "linear" but it is also acting like a "receiver" separating some forms of the too-strong signal(s) modulation and using them to "modulate" one or more of the lesser strong signals also passing through the overloaded amplifier stage.

The "synchronisation" pulses of an analogue TV carrier are the typically the strongest portions of the TV carrier. The overdriven no-longer-linear amplifier stage grabs onto the synch pulses in its misguided role as a "detector" and transfers these pulses to the less strong carriers.

Net result? The 10 dB weaker DVB-T signals, being the most susceptible to interference, end up with analogue "synch pulses" superimposed on top of the COFDM format digital signal(s). If there is one thing COFDM signals cannot tolerate, it is analogue synch pulses intermixed with the spread-spectrum digital signal at a level which is equal to (or greater than) the COFDM information.

How do you know you have this problem?

If you are using a DVB-T meter (such as Laceys.tv DaTuM model 10) in the "Signal level" and "Carrier to Noise Ratios" settings, the DVB-T signal may seem within normal limits for proper decoding. Yet it is not decoding, or, is decoding in an erratic fashion. Why?

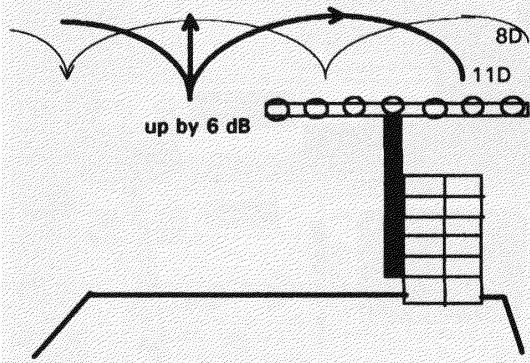
Switch to "Bit Error Rate Estimation" and recheck. It should show a BER which is below digital lock, a side effect of having those analogue synch pulses intermixed with the COFDM signal.

With each make and model of DVB-T set top box, you will quickly learn what the signal level, carrier to noise and BER readings should be for proper decoding of the DVB-T signals. There are some additional "caveats" (warnings). It is the nature of VHF and UHF wave *propagation* (the act of traveling from the transmitter to your receiving site) that minor differences in the transmission path will cause some signals originating from the same or near-same transmitter site **to** be significantly different in (1) signal level, (2) interference susceptibility. Just because 8D is good at your receive site does not mean that 9A/D or 1 1D will be acceptable at the identical receive antenna installation location.

Transmission wavelengths in the 200 MHz region are measured in the region of 140cm. That means the "free space standing waves" (peaks and valleys in the received signal strength) are going to be in a rolling fashion around 50 inches apart. In a particular receive antenna installation location, 8D may well be at the "crest" of a free space standing wave while 1 ID is in a valley (see diagram, below) for a specific "fixed" antenna location. In a purely LOS (line of sight) receiving situation, the only difference in the "standing waves" as they are intercepted by the receiving antenna will be attributed to the different transmission path lengths; the transmitting antenna(s) to the receiving antenna. But a pure LOS path is almost never the case- even if the receive site is in fact line of sight to the transmitting antenna(s). The "culprit" will be the off-path' non-direct path wavefronts which graze buildings, hills, and reflect (or refract) from these surfaces to the side, down or up and arrive at the receiving location slightly delayed in time from the LOS signal.



ILLUSTRATED: At "fixed" receive antenna location, 8/11D "free space" standing waves are 6 dB peak to crest if the paths are LOS - line of sight.

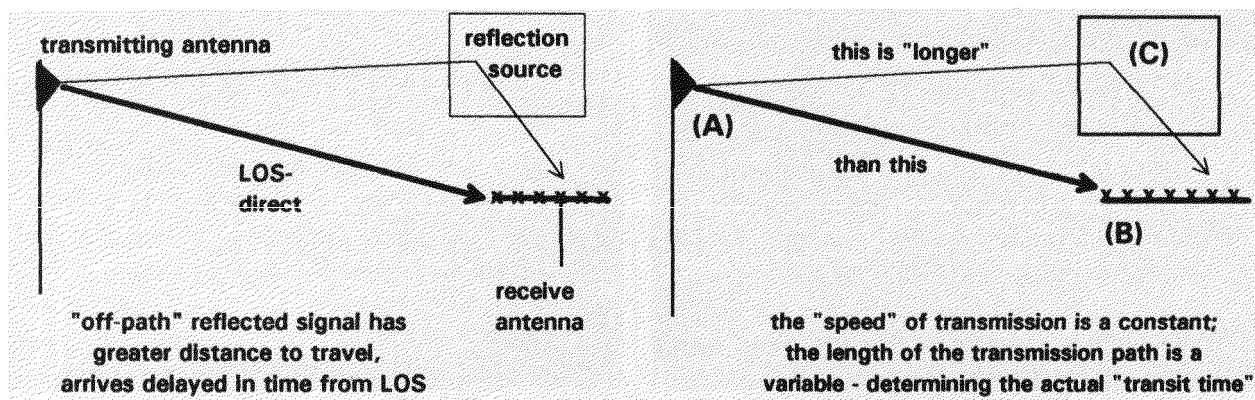


### Why delayed in time?

The shortest path between two points is "direct." Any path that involves a reflection (refraction) covers more "ground" and as transmission delivery time is a function of distance travelled, it follows that a longer path takes more time to "traverse" than a shorter (direct) path. At the speed of light (which is the approximate speed of TV signals), the difference in time between "A" to "B" or A-C-B is measured in microseconds. But in one complete second the terrestrial TV image has been transmitted from "A" to "B" 25 complete times (PAL format at 25 frames per second). If a particular image takes 1/25th of a second longer to go from A to C to B then it does to go from A to B, and the image content changes every 1/25th of a second, the A-C-B image has different "content" than the A to B direct path image. In effect, we then have two dissimilar sets of TV information occupying the same frequency bandwidth simultaneously. They may have started the trip at the same time, but one is taking longer to arrive than the other and in

that split-second of delay, the TV set's signal processing circuits become very confused about having two non-identical sets of data to process.

When two (or more) "different-time-in-transit" analogue signals arrive at the receiver, the first (shortest path-LOS) signal "paints" on the screen. Immediately behind it, delayed or offset by time, the second signal follows the first. Now we have two images on the screen - basically identical in content only the delayed signal is offset on the screen to the right from the direct path signal. The delayed image is called a "ghost" in the trade. If the ghost path length is very close to (but still longer-than) the LOS signal, the picture on the screen "smears" slightly - noticeable on lettering appearing on the screen. The "smear" causes the original sharp letter edges to "blend" towards the right hand screen edge. Actually, all portions of the image (not merely the lettering) "smear" equally but in a moving image it is more difficult to identify the "extra image content."



The amount or "depth" of the smearing is a function of several factors:

1/ The ratio of signal level arriving at the receiver from both the LOS path and the reflected path. If, for example, the LOS path is strong and the indirect path is 20+ dB weaker in level, the smearing is barely noticeable.

2/ The amount of time delay between the two signals. The greater the time differential, the further "to the right" the late arriving image appears. If it appears far enough to the right, the on screen image can actually be two separate, distinct pictures.

If the time delay is great and the reflected path signal is as strong as the shorter-LOS path, it is possible for an analogue signal to do as total image reversal; portions of the original signal that began life as "black" turn "white" and the reverse; a negative "appearing" image.

In the real world, not many LOS reception sites have only a direct signal present. LOS means the receiving site is reasonably close to the transmitter, and the nearer to the transmitter source the site, the greater the amount of transmitter radiated energy bouncing off of hills, trees, buildings and even flat ground (or water) in between the two locations. As you go further from the actual transmitter site, signal levels decline which is a blessing in disguise - the reflected signals that are present are attenuating as well.

### COFDM

One of the most appealing benefits of digital terrestrial is the very high tolerance the frequency division multiplex (FDM) format exhibits for dealing with reflections. The system is not totally immune to reflections but on a scale of 1 to 10 where analogue is a number-10-susceptible, COFDM is a 2. Therefore receiving locations in close to analogue transmitters where reflections make images smeared and reception poor can be brought into the 21st century by simply switching them to DVB-T.

Unfortunately, COFDM is not totally immune to other forms of interference; broadband "pulses" being troublesome. When someone starts a petrol powered lawnmower or other yard "toy" close to the DVB-T receiving antennas, a wide range of "ignition noise" pulses radiates into the air. These jagged noise signals confuse the forward error correction (FEC) portion of COFDM system - it is unable to distinguish between unwanted noise pulses and FDM signal pulses; loss of lock.

Which brings us back to the beginning. An in-house amplifier, "overdriven" by one or more too-strong analogue signals, turns into a "detector" and creates broadband synch pulses that totally confuse the FEC portion of the COFDM set top box. The solution, as we now see, is to reduce the gain of the amplifier, and regain "linear-state" operation.

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