Vhf-Uhf DIGEST

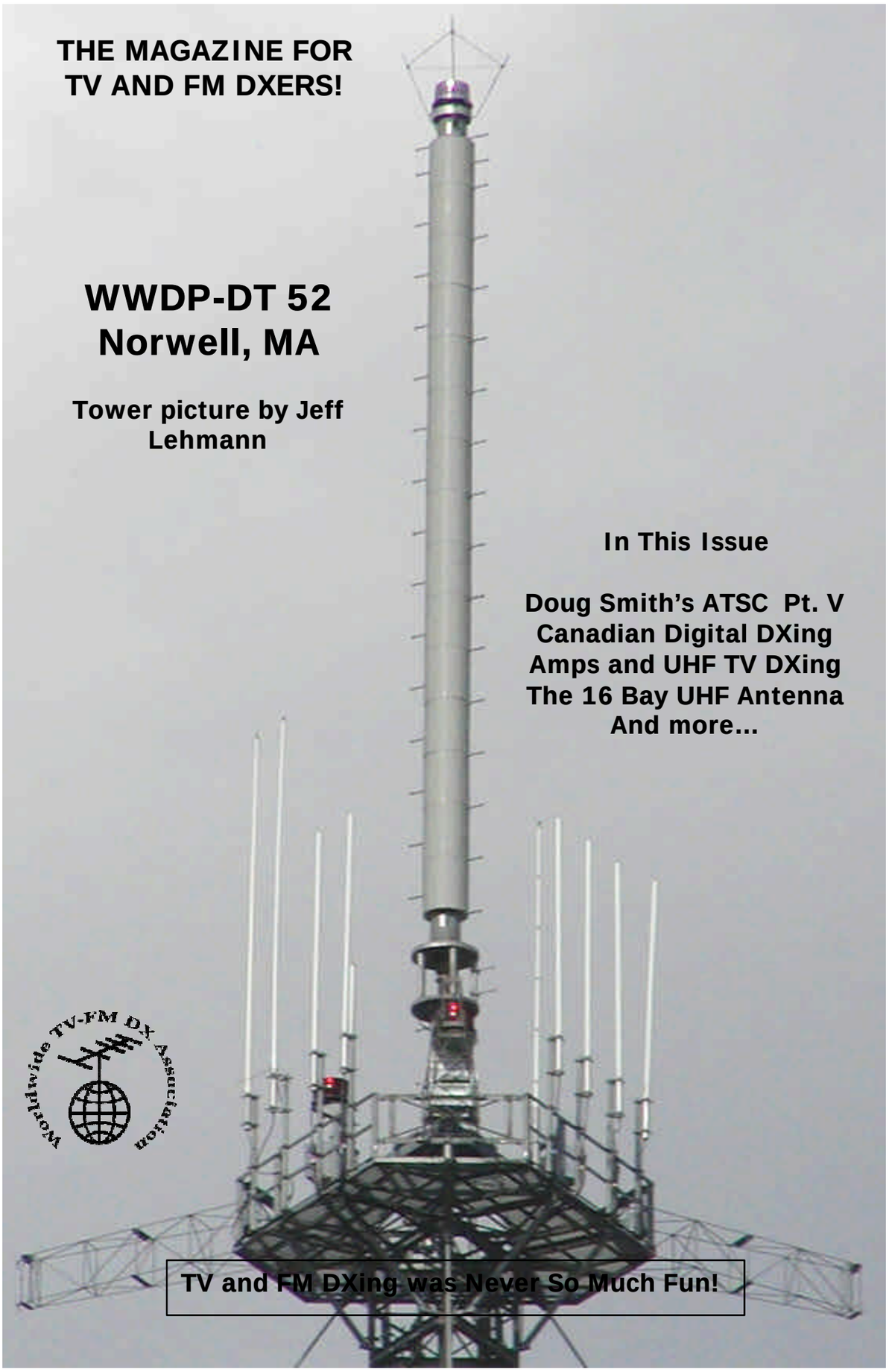
The Official Publication of the Worldwide TV-FM DX Association

FEBRUARY 2004

THE MAGAZINE FOR TV AND FM DXERS!

WWDP-DT 52
Norwell, MA

Tower picture by Jeff Lehmann



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**
ANARC Rep: **Jim Thomas**, *Back Issues:* **Dave Nieman**,
EVUD for FEBRUARY 2004

PayPal

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/

CONTENTS

It must be February. Both Matt Sittel and Keith McGinnis told me that they have either very little or nothing to send in this month. With the weather and lack of DX, that is understandable. Also FM News never made it here either so we're hoping for next month.

So, what we have for you this month is an article by Bob Cooper that I have been sitting on for a few months now plus a great article that was found on the internet. We have contacted the writer and received permission to reprint here in the VUD. So if you like the 16 bay article, he has also written one on 32 bays. We have permission to run that one also.

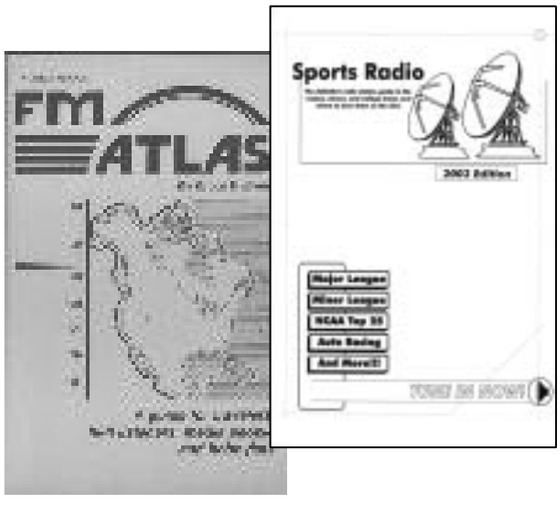
But for now, enjoy this issue! -Mike

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

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MIKE BUGAJ MBUGAJ@SNET.NET

FEBRUARY 2004

Well, what do you make of the winter skip season, so far? Or maybe the question should really be what skip season. Oh, there have been a couple of openings that brought in WESH and WPBT on channel 2, and Rick Lewis had a bang-up opening into FM from his home in Arizona, but overall, thus far, the Es season has passed us by and it appears that we'll have to wait for April or May for something big to happen. But, you never know.

MEMBERS AND MORE

My almost daily trips to the post office netted me renewals from the following members: **Todd Emslie (AUS), Jim Thomas (CO), Adam Rivers (MA), Dave Pomeroy (KS), Lenny Goldberg (OR), Charles Gauthier (QC), James Nahirniak (MI), Peter Oprisko (IN), Tom Yingling (MD), Paul Hansen (MA), Charles Burnham (NY)** and **Russ Edmunds (PA). Les Rayburn (AL), William Black (DC), Bill Nollman (CT)** and **Rick Shaftan (NJ)** renewed with Paypal. Thank you everyone and I hope you enjoy another year with us!

THE LG DTV TUNER

Glen Hale tells us all about this new set top box: "I've had a new DTV tuner for a couple of days and really like the features /performance.

The LG LST3100A is a very good DTV receiver. Its RF performance is quite good and it has some "DX friendly" features that make it stand out. While the "DX friendly" features don't match the extensive diagnostic info you get from the WinTV-D, this is the best DTV tuner I've seen for a set-top-box.

The "manual channel add" feature allows you to manually step through DTV channels while at the same time viewing a signal meter. This is great for fine tuning a weak signal. If the station becomes strong enough to decode, you'll see/hear it while you're still in the menu. The receiver gets a "sniff" of a signal on stations that are very weak. Under deadband conditions, it detects a signal from Indianapolis (150 miles away). This will be extremely helpful in a band opening determining what's out there, even if it's not yet strong enough to be decoded. The receiver does support PSIP station ID. It doesn't seem to receive full program information, but will at least show you what station you're getting. Channel scanning is very fast. It took less than a minute to scan 2-69. The "EZ Add" function allows you to scan channels again, without losing previous results. This receiver also recovers from signal breakup very quickly.

The Motorola I reviewed previously will be returned. The LG is a "keeper".

THE LG LST3100A SELLS FOR ABOUT $399

A FEW WORDS FROM TOM BRYANT

Tom Bryant, who stepped down from the WTFDA Board of Directors in December, prepared a statement regarding his time on the board, the status of the club, and the timing of his resignation. Here are his comments.

While my tenure on our Board of Directors wasn't particularly long, I view it as both progressive and productive.

My appointment came about as a result of complaints I had lodged regarding several aspects of club operation; particularly vacancies on the Board, and accessibility of club leaders. Both of those issues were subsequently addressed. There are no longer any such problems, nor do I believe there will be in the foreseeable future.

With those kinks ironed out, along with changes in personal interests since retirement, I'd been considering stepping aside for quite some time.

When Doug Smith became available to serve on the Board, it was time for me to make my move.

WTFDA has a good solid governing group, and I believe it will now be even stronger and more attuned to the changing face of DXing than_ever.

Please allow me to indulge in a few personal reflections.

Thanks to Bill Thompson for appointing me. He was the target of many of my complaints, yet he put me in a position which sometimes found me opposing the status quo. His ultimate target was to do what was best for WTFDA, and I fully agreed with that stance. In the long run, Bill and I worked together harmoniously.

Thanks to Greg Coniglio and Bruce Hall, who were appointed at the same time as I. They, too, pushed for openness and efficiency of operation and have established themselves as good solid leaders.

Special thanks to Dave Janowiak. At first, I didn't appreciate Dave as much as I should have, but came to understand that he's part of the bedrock of the club's solid foundation. His insight was invaluable and his cautious approach to touchy issues a stabilizing factor.

Thanks also to Mike Bugaj. I'm not much for putting people on pedestals, and I don't think Mike likes to be on them; but I need to state that his contributions to WTFDA have been more significant than any I can recall since joining the organization some 20 years ago. Mike is innovative, creative, savvy, and a lot more. His ideas have guided us into the internet era of club participation, while not leaving 'unwired' members in a void. In addition, as editor/publisher of the VUD, he has adeptly taken the printed pulsebeat of the club and brought about improvements that have transformed it into one of the best DXer publications_anywhere.

Thanks to those of you who contacted me with thoughts, suggestions, ideas, and questions. Your input was always appreciated, and in most cases your ideas led to improvements that were of benefit to all. Among my goals was to keep an open mind and be fair and impartial to everyone. I hope I met that objective. To my way of thinking there is nothing more important than serving our_members.

Finally, to Doug Smith, best wishes for what I hope will be a very long run as a board member. Doug's track record is no secret. His contributions to WTFDA in print, on line, and in an advisory capacity, are already well documented. It's my opinion that he has the tech know-how and the temperament to steer us through the transition to the various evolving digital broadcast formats that are impacting us as DXers.

So, as I step aside, I am confident that our club is in good shape, and getting better. There's little else I (or any of us, I trust) could hope for as we enter this New Year.

UHF ANTENNAS

Here's a company you probably never have heard of. The name is Televes and they are located in La Coruna, Spain. Televes makes a popular line of UHF antennas. Many DXers in Europe use them and a couple of WTFDAers use them for DXing the DTV channels. Here's one of the most popular antennas they make, the Televes 1443, which tunes UHF channels 21-69. We might even do a cover on Televes in the near future.

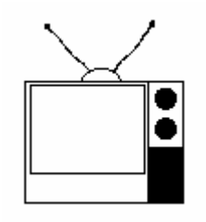
TELEVES 1443

TELEVES PRO RANGE 1046 WITH TILTER

These are also available from a company in Burbank, California called A Tech Fabrication.

Well, that's all for this month. Our current membership stands at 272. Tell you friends about us. They might like us.

See you all next month! -Mike



TV News

Douglas E. Smith
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Pleasant View, TN
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w9wi@w9wi.com
http://www.w9wi.com

February 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:

(full-power analog stations in **bold face**; LPTV and translators in regular type; full-power digital stations in ***bold italics***)

Alabama:

Cullman	27WCQT-LP	QG fm W52BJ; CC; 16kw
Greensboro	3 WDVZ-CA	PC<1.6kw, 33-09-36/ 87-30-55
Montgomery	5 WBXM-CA	XR 32-22-35/ 86-18-38, already granted
Somerville	29WMJN-LP	QG from ch. 43, 12kw, 34-30-43/ 86-50-55; CL from Decatur

Alaska:

Anchorage	45K45HQ	QG fm K22FV, 35.5kw, 61-20-11/ 149-30-48

Arizona:

Many Farms	30K30GL	QC from K67AF, 5.11kw
Phoenix	27KAZT-CA	PC>34kw, 33-20-02/ 112-03-41
Phoenix	41KPSW-CA	FC to Azteca
Prescott	63K63GX	PR>150kw, 34-25-47/ 111-30-16; CL from Flagstaff
Prescott	69K69IP	PR>150kw, 34-25-47/ 111-30-16; CL from Flagstaff
Tucson	***19KTTU-DT***	***NW 480kw/1123m, 32-24-56/ 110-42-50***
Tucson	***32KOLD-DT***	***NW 108kw/1123m***

Arkansas:

El Dorado	61K46DT	QR from ch. 46, 150kw
Mountain Home	7 K07XL	PG>580w
Searcy	43K43IM	QG fm K54GT (and before that, K12MY), 150kw, 35-22-53/ 91-31-30
Springdale	4 K04PV	QG fm K15DR, 3kw

California:

Barstow	***44KHIZ-DT***	***NS 1000kw/596m***
Bishop	**20960702KT**	**AF RE 178kw/917m, 36-58-38/ 118-07-13**
Chico	2 K02OA	PR>3kw, 39-57-29/ 121-42-49
Chico	28KKPM-CA	PC>135kw, 39-12-20/ 121-49-06
Coalinga	40K42DT	QR from ch. 42, 150kw, 36-45-23/ 121-30-05
Daggett	48K48IP	QG fm K61AE
Daggett	50K50HV	QG from K69FJ
Fresno	38KHSC-LP	QC fm K66CQ (& CC from K38GM), 40kw

Fresno	39KMSG-LP	QG from ch. 55, 39kw, 37-04-26/ 119-25-52
Hanford	14KHMM-CA	QC from ch. 16, 2kw, 37-04-10/ 119-24-40
Huntington Bch	***48KOCE-DT***	***PR<949m***
Los Angeles	27KNLA-LP	QR from ch. 67 dismissed***;*** PR<6kw on this channel
Lucerne Valley	68K68CW	FC; sold to KRCA-62
Mariposa	38K27GZ	QR from ch. 27, 2.8kw
O'Neals	38KHSC-LP	QC from ch. 66, 40kw
Rancho Palos Verdes	**44KXLA**	**NW 2354kw/949m 34-13-35/ 118-03-58**
Red Bluff	3 KMCA-LP	QG from ch. 49, 110w
Sacramento	22K22FR	PG>34.9kw
San Francisco	28KBIT-CA	PG>24kw, 37-41-15/ 122-26-01
Vallejo	***34KFSF-DT***	***NW 150kw/419, 37-45-19/ 122-27-06***
Ventura	***49KJLA-DT***	***PR<937m***
Colorado:		
Breckenridge	26K26GY	PG>360w, 39-29-47/ 106-01-43
Colorado Springs	57KXTU-LP	PR>135kw
Durango & Hermosa	31K31FV	QC fm K68AZ, 1.99kw
Lake George	29K58FY	QR from ch. 58, 1.2kw
Mt. Morrison	23KDEO-LP	PR>35kw; CL from Aurora
Red Cliff	28K28HI	PG<20w
Trinidad, Valdez, Etc.	15K69CX	PR<640w, 37-08-45/ 104-28-09
Vail	45NEW-LP	AF RE 25kw, 39-37-06/ 106-23-08
Connecticut:		
Bridgeport	***42WSAH-DT***	***PG 1000kw/164 41-16-44/ 73-11-08***
Hartford	48WMLD-LP	QG from ch. 6, 50kw, 41-47-48/ 72-47-52
New Haven	***10WTNH-DT***	***requests DA***
Delaware:		
Wilmington	14WTSD-CA	PC>146kw, 40-02-30/ 75-14-11
District of Columbia:		
Washington	47WMDO-CA	QC from ch. 30, 10kw;PR>24kw on ch. 47.
Florida:		
Bradenton	18WSVT-LP	PC>50kw, 27-56-48/ 82-27-26
Gainesville	33WBXG-CA	QC from ch. 31, 23.6kw
Jacksonville	50W50CO	QC fm W65CU, 16.5kw
Miami	34WVFW-LP	QC fm W24CA, 120kw, 25-59-34/ 80-10-27; CL from Marathon
Miami, Etc.	50WVEB-CA	QR from ch. 21, 126.5kw, 25-58-15/ 80-12-32
Pensacola	**44WJTC**	**PC>457m**
Pompano Beach	21WDLP-CA	PR>126.5kw, 25-58-15/ 80-12-32
Sarasota	**40WWSB**	**XC 27-33-21/ 82-21-49**
Georgia:		
Atlanta	45W55CR	QR from ch. 55, 115kw, 33-44-41/ 84-21-36
Augusta	**6 WJBF**	**PG>495m, 33-24-20/ 81-50-01**
Savannah	**3 WSAV-TV**	**PR<442m**
Savannah	***39WSAV-DT***	***PR>442m***
Idaho:		
Boise	18KCLP-CA	QR from ch. 38, 60kw
Boise	51KCBB-LP	QC fm K64EJ, 150kw, 43-44-23/ 116-08-14
Bonners Ferry	50K13HQ	QC from ch. 13, 760w, 48-36-38/ 116-15-28
Pocatello	41K15DG	QR from ch. 15, 16kw
Preston	23K23GR	QG fm K36AD
Illinois:		
Chicago	***19WGN-DT***	***PG>645kw***
Chicago	***47WTTW-DT***	***AF 150kw/474 (aux)***
Peoria	***46WTVP-DT***	***NW 200kw/216***
Peoria	50W50DD	QG from ch. 41, 44.5kw
Indiana:		
Bloomington	***14WTIU-DT***	***NW 224kw/221***
Bloomington	**30WTIU**	**PC>1622kw/ 221m**
South Bend	***35WNIT-DT***	***PG<333m, 41-36-49/ 86-11-20; NW***
Iowa:		

Davenport	10WBQD-LP	QG from ch. 26, 3kw
Knoxville	21K21EM	XR 41-13-35/ 92-44-48; CL from Ottumwa
Knoxville	51K51FJ	XR 41-13-35/ 92-44-48; CL from Ottumwa
Ottumwa	18K18GU	QG from K33AA, 100kw
Ottumwa	21K21EM	PG>150kw
Ottumwa	51K51FJ	PG>150kw
Kentucky:		
Hazard	***12WYMT-DT***	***NW 50kw/398***
Louisiana:		
Crowley	31KAGN-LP	PC>17.8kw, 30-19-20/ 92-22-40
Shreveport	42K42FE	PG>46kw, 32-28-25/ 93-46-13
Maine:		
Bangor	22WFVX-LP	PC>2kw, 44-45-45/ 68-33-58
Maryland:		
Baltimore	**45WBFF**	**PG<383m**
Massachusetts:		
Boston	26WHDN-LP	PC>15kw, 42-21-31/ 71-03-33
Springfield	51WDMR-LP	QG from ch. 65, 142kw
Michigan:		
Ishpeming	**10WBUP**	**NW 133kw/105 46-21-10/ 87-51-15**
Saginaw	***30WEYI-DT***	***PR 193kw/356***
Traverse City	***31WGTU-DT***	***PG 64.8kw/393***
Minnesota:		
Bemidji	***18KAWE-DT***	***NW 50kw/252***
Willmar	34K52GK	QR from ch. 52, 1.3kw
Willmar	50K54GG	QR from ch. 54
Mississippi:		
Columbus	25W25AD	PC>9.2kw, 33-33-00/ 88-23-59
Jackson	10WBMS-CA	PC>3kw
Nebraska:		
Lincoln	56KWAZ-LP	QC from ch. 22, 11.9kw
Omaha	48KOHA-LP	QR from ch. 65, 150kw, 41-18-40/ 96-01-37
Nevada:		
Las Vegas	28KVPX-LP	QG from ch. 59, 43kw
Mina-Luning	16K16FU	NS 220w, 38-23-40/ 118-03-00
New Hampshire:		
Nashua	13WYCN-LP	PR>120w, 42-43-23/ 71-27-39
New Jersey:		
Cherry Hill	42W68DN	QR from ch. 68 dismissed ROA
Newark	**68WFUT**	**AF 3000kw/336 40-45-22/ 73-59-12 (aux); NS**
Paterson	**41WXTV**	**NS 1400kw/321 40-45-22/ 73-59-12 (aux)**
Springville	41WNAI-LP	PR>140kw, 40-02-30/ 75-14-11; CL fm Cherry Hill
New Mexico:		
Albuquerque	48KTFA-LP	PC>147.1kw
Capitan, Ruidoso	33K33GD	QC from K55AC, 1.4kw
Las Cruces	**22KRWG-TV**	**XC 125m, 32-15-33/ 106-58-30**
Roswell	**21KRWB-TV**	**NW 5000kw/128m 33-06-01/ 104-15-15**
Roswell	50K30HI	QR from ch. 30, 5.4kw
New York:		
Binghamton	**34WIVT**	**PC>2820kw/ 283m, DA**
Binghamton	**46WSKG-TV**	**PC 490kw/408, 42-03-40/ 75-56-46**
Buffalo	**2 WGRZ-TV**	**PC>93.3kw/ 311m**
Garden City	***22WLIW-DT***	***NW 92kw/111***
Jamestown	***27WNYB-DT***	***PG 500kw/463, 42-23-36/ 79-13-44***
Schenectady	***34WMHT-DT***	***NW 325kw/426 42-37-31/ 74-00-38***
North Dakota:		
Dickinson	***19KXMA-DT***	***PG<50kw/217 46-43-35/ 102-54-57***
Grand Forks	**27KCPM**	**PG<18kw/96 m, 47-57-45/ 97-03-12; PC**
Minot	***45KXMC-DT***	***NW 50kw/249***
Williston	***14KXMD-DT***	***PG<50kw/257 48-08-30/ 103-53-34***
Ohio:		
Bowling Green	***56WBGU-DT***	***PG 190kw/320***
Canton	**17WDLI-TV**	**PR>1000kw/ 278m, 41-03-20/ 81-35-38**

Portsmouth	66W66CZ	PG>12.4kw
Oklahoma:		
Elk City	29K29EI	QC from ch. 52, 9.98kw
Elk City	***31KEYU-DT***	***AF 700kw/305, 35-18-53/ 101-50-47***
Lawton	38K38GL	QC from K15DJ, 53kw
Norman	**46KOCM**	**NW (relig.) 1000kw/416m 35-35-52/ 97-29-22**
Strong City	30K30EF	PG>9.9kw
Oregon:		
Eola	52K52HY	PG>150kw, 44-59-59/ 122-41-41
Medford	25K52EE	QR from ch. 52, 18kw, 42-03-53/ 122-28-41
Merlin	20K56FN	QR from ch. 56, 4.95kw, 42-36-54/ 123-21-57
Newberg	51KOXO-CA	PC<118kw, 45-29-24/ 122-41-53
Portland	***27KOPB-DT***	***PG 710kw/509, 45-31-21/ 122-44-45***
Salem	21K21GX	QG from K61CC, 4.46kw
Tri City	22K22GX	QG from K19AD, 13kw
Pennsylvania:		
Allentown	***46WFMZ-DT***	***PG>500kw***
Allentown	**69WFMZ-TV**	**PC>5000kw**
Philadelphia	***67WCAU-DT***	***NW 560kw/377, 40-02-30/ 75-14-11***
Sharon	29W29CO	QC from W50BF, 8.9kw
York	***47WPMT-DT***	***PG 933kw/385***
Rhode Island:		
Providence	***13WPRI-DT***	***PG>18kw/305***
Providence	***21WSBE-DT***	***PR>268m***
South Carolina:		
Columbia	**47NEW**	**PR 1500kw/174 34-02-39/ 80-59-52**
South Dakota:		
Sioux Falls	**23KCSD-TV**	**PR<11.2kw**
Sioux Falls	***24KCSD-DT***	***NW 29kw/75m, 43-34-28/ 96-39-19***
Tennessee:		
Bolivar	64W64BZ	PR>150kw, 35-12-02/ 88-58-30; CL from Jackson
Farragut	-14W14CX	QC from
Knoxville		W50CG, 45kw
Knoxville	14W50CG	QC from ch. 50, 45kw
Stanton	38W38BY	PR>150kw, 35-24-56/ 89-23-18; CL from Jackson
Union City	26WUWT-CA	PG>150kw
Texas:		
Austin	32KGBS-CA	QC from ch. 65, 10kw
Bryan	40KRHD-LP	QC from ch. 34, 89.1kw
Corpus Christi	**3 KIII**	**PR>292m; PC>288m**
Corpus Christi	***8 KIII-DT***	***NS 160kw/269***
Corpus Christi	24KCCX-LP	QG from ch. 25
Dallas	34KJJM-LP	XR 32-35-21/ 96-58-13; already XC
Dallas	***45KDTX-DT***	***PR>1000kw/ 494m, 32-32-36/ 96-57-32***
De Soto	31K31GL	QC fm K65BC, 150kw, 32-35-19/ 96-58-05
Decatur	**29KMPX**	**FC to Spanish independent**
Denton	**2 KDTN**	**PG<445m, 32-32-36/ 96-57-32; FC to Daystar relig.**
DeWalt	34KVIT-LP	QC from ch. 28, 40kw, 29-34-16/ 95-30-38; CL from Victoria
Fort Worth	47KUVN-CA	QC from ch. 31, 16.2kw
Houston	***24KETH-DT***	***NW 800kw/545, 29-33-44/ 95-30-35***
Kerrville	**35KRRT**	**PG<515m**
Lubbock	51KBZO-LP	PC>60kw, 33-31-33/ 101-52-07
Lufkin	42KLNM-LP	PR<5.9kw, 31-21-55/ 94-45-59
Memphis	30K30HH	QC from no offset to zero
Nacogdoches	**19KLSB**	**FC to CBS**
San Antonio	14K14LM	QC fm K57GO, 53.1kw, 29-26-29/ 98-30-22
Uvalde	42K42GJ	QG fm K59EY, 9.99kw, 29-21-46/ 99-37-14

West Lake Hills	47KTXU-LP	QG from ch. 38, 3kw, 30-19-23/ 97-47-58; CL fm San Marcos
Utah:		
Beaver	7 K07GY	PG>130w
Beaver	9 K09CS	PG>130w
Beaver	11K11CX	PG>130w
Beaver	13K13CV	PG>130w
Cedar City	5 K05HB	PG>1.47kw, QG from no offset to minus
Cedar City	7 K07GQ	PG>390w
Cedar City	9 K09CJ	PG>390w
Cedar City	11K11CQ	PG>390w
Cedar City	13K13CP	PG>390w, QG from no offset to zero
Enterprise	13K13HH	PG>900w, 37-36-08/ 113-44-13; on
Heber City	25K25HF	QC fm K40DL, 1.43kw, 40-33-45/ 111-28-30
Kanarraville	47K47IS	NS 68w, 37-29-13/ 113-12-18
Salt Lake City	***38KSL-DT***	***NW aux 295kw/1128m 40-39-35/ 112-12-02***
Salt Lake City	**5 KSL-TV**	**PC 33.6kw/1157 m**
Virginia:		
Charlottesville	**19860410KP**	**PR<1000kw/ 307m, 37-59-00/ 78-29-02**
Fairfax	***57WNVC-DT***	***NS 7.3kw/174m***
Goldvein	***30WNVT-DT***	***NS 160kw/229***
Hampton	51W51DO	QG fm W21AQ, 50kw, 37-04-41/ 76-26-47
Norfolk	45WNLO-CA	PG>139kw, 36-49-14/ 76-30-41
Richmond	17WXOB-LP	PR>131kw
Tazewell	21W21CG	PG>27.5kw
Washington:		
Ellensburg	49KWWA-LP	PC<8kw
Longview	34K34HK	QG from ch. 68, 20.4kw
West Virginia:		
Charleston	**8 WCHS-TV**	**PR 49.6kw/532**
Charleston	***19WVAH-DT***	***PG 475kw/505***
Charleston	***41WCHS-DT***	***PR 475kw/514***
Morgantown	***33WNPB-DT***	***NW 108kw/441***
Wisconsin:		
Fond du Lac	**68WMMF-TV**	**PR>4986kw/ 195m,43-26-20/ 88-31-29**
Green Bay	***42WPNE-DT***	***PG>200kw***
Janesville	29W65EE	QR from ch. 65, 21.5kw
Madison	23W23BW	PC>38.5kw, 43-03-09/ 89-28-42
Milwaukee	18W53CC	QR fm W55CG, 15kw, 43-05-44/ 87-54-17, CL from Ludington, MI dismissed ROA
Milwaukee	38W69DF	QR from ch. 69, 34.5kw, 43-05-15/ 87-54-13, CL from Quincy, IL dismissed
Rhinelander	52W52DV	NS 150kw, 45-40-03/ 89-12-29
Tomah	51WDLS-LP	QG from ch. 58
Wyoming:		
Gillette	6 K06JM	PC>3kw, 44-15-24/ 105-41-40

Puerto Rico:		
San Juan	***32WTCV-DT***	***PR<3.9kw/505 18-16-30/ 66-05-36***

U.S. Virgin Is.		
Charlotte Amalie	14WVGN-LP	NW 700w, 18-21-26/ 64-58-17; CC from W14CP
C. Amalie	***44WTJX-DT***	***PG>50kw***
Christiansted	**39WCVI-TV**	**PC>26.67kw/ 134m**

Thanks to Kevin Redding and Bill Draeb for information appearing elsewhere in this month's column.

KEYU (Oklahoma) already has a permit for analog operation on channel 31. They're one of the stations that's too new to get a second channel for digital ? presumably they will do a "flash cut" to digital operation at some future date. Or build as a digital-only station.

The application in Bishop, California is a merger of several mutually-exclusive applications. It's the only valid application remaining for this channel. Petitions to deny this application will be accepted at the

Commission until February 18th; if no such actionable petitions are filed by then, this application will be granted.

W52DV will be a translator of WFXS-55 Wittenburg/Wausau.

Bill reports WIWB-DT 21 has been operating intermittently. I note the DTV is still operating under program test authority; minimum operating schedule regulations don't yet apply to this (and many other!) DTV station.

KLSB-19 has been operating as a satellite of NBC affiliate KETK-56, with relatively low power and a tower at a considerable distance from KETK's. The market has been lacking a CBS affiliate since KFXK-51 switched to Fox.

KETK is building a new, higher tower east of Jacksonville, Texas; and KLSB has a permit to move to the same tower. In fact, channels 19 and 56 will have the exact same facilities when this move it complete. Of course, at that point it no longer makes sense for both stations to be NBC affiliates!

I would expect to see an application in the near future to move both stations' digital facilities to the new tower as well. (right now KLSB's DTV permit is for the new tower, but KETK's is at the old site)

Nothing interesting in Canada this month.

SATELLITE NEWS

GEORGE W. JENSEN
4604 ANTANNA AVE, Baltimore, MD 21206-4220
SCISATMAN@AOL.COM

Again, not an avalanche of items, but some that are important.
From GE7 - 137 West - Deleted Fox Movie Channel is now on 4DTV (Digicipher) on Galaxy 4 Ku channel 251.
Satcom C4 - Deletions - 13 - Travel Channel to 4DTV same satellite Ch 602
15 - Animal Planet to 4DTV same satellite Ch 603
601 - TV Games Horseracing - NOW just color bars
SATELLITE REPLACEMENT - Galaxy 9 - C Band Only is now Galaxy 12 (C and K Band) Was launched in 2003.
Transponder 2 - Gospel Music Television VC2 - DELETE THIS as well as the Audio Sub-Carriers - Truth Radio Network 1 and 2, Genesis Communications Network and American Freedom Network - none of this has been seen elsewhere.
Galaxy 10 - C Band - The Outdoor Channel WILL convert to MPEG 2 SOON. Delete Pay-Per-View channels 321 and 322 as well as 337 - Playboy Pay-Per-View. Guthy-Renker Infomercials 4 is now on channel 782.
AMC1 - 103West - delete 20 - MTV 2 - may be on C3 Digicipher.. Also delete 23 - another transponder for TV Games VC2
AMC4 - Delete the following:- XPDR 10-HBO2 East now on G 1 channel 103
XPDR 12 -HBO2 West now on G1 channel 105
XPDR -17 - Moremax East now on G1 channel 127
XPDR 19 - HBO Signature now on G1 channel 106
Galaxy 4 - Ku-Band - add the following:- 251 - FOX MOVIE CHANNEL
253 - Lifetime Movie Networ
600 - Toon Disney
620 - National Geographic Channel
Intelsat 806? at 40 West - delete XPDR 31 - ATC - Ch 7 - Buenos Aires, Argentina and Audio-Subcarrier Radio Nacional to MPEG 2 - location unknown.

That's all for this month - see you in 30. "73"s and good DX

ATSC PRIMER PART V

DOUG SMITH

Channel allocation issues

DXers have expressed surprise at many of the DTV channel allocations. The old rules that applied to analog TV have been tossed out, the FCC has started again from scratch. Expect the unexpected...

One important goal of the DTV transition has been to reduce the amount of spectrum used by over-the-air television. The two-way radio and mobile-telephone industries have long coveted TV spectrum[1]. Television use of the UHF spectrum especially has been very inefficient. Many UHF channels are unusable *taboo*s because of shortcomings of crude early UHF receivers. If a channel 30 station exists in a city, the following other UHF channels are unusable for the listed reasons:

Channel(s)	***Radius***	***Reason***
22, 38	31km	IF beat
25-28, 32-35	31km	Intermodulation
29, 31	88km	Adjacent channels
23, 37	96km	Local oscillator
16, 44	96km	Sound image
15, 45	120km	Picture image

That's nineteen channels rendered useless by a single assignment. If a way could be found to clear some of these taboos, existing TV stations could be accommodated in a much smaller slice of spectrum.

Cable TV has already proven some of these taboos unnecessary. Adjacent channels are routinely used on cable systems. As long as signal levels are similar, the same thing should be possible for over-the-air transmission. The selectivity (ability to separate stations on nearby channels) and stability (ability to stay tuned to a particular channel once selected) of UHF receivers have made enormous improvement since the 1950s. The intermodulation taboos are no longer necessary either. In the channel 30 case, elimination of these two taboos would open up ten of the nineteen lost channels.

The FCC has also seen fit to allow – in many cases, to require – directional antennas in order to allow DTV channels to be allocated much closer than would otherwise be allowed. Only one of the DTV assignments in the Nashville market is far enough from other operations on the same channel to fit under the old rules – and that only because an allocation to a nearby Kentucky city was deleted for lack of use.

So, with DTV you will see stations closer to each other on the dial. Here in the Nashville area, DTV operations and the reasons their channels were not usable for analog under the old rules:

Station	***Analog channel***	***Digital channel***	***Why not available for analog***
WKRN	2	27	Adjacent to WNPX-28; co-channel with WTCT-27
WSMV	4	10	Co-channel with WKNO and WBIR[2]
WTVF	5	56	Intermodulation with WNAB-58; co-channel with WDKY-56
WNPT	8	46	Intermodulation with WPGD-50; co-channel with WKLE-46
WZTV	17	15	Intermodulation with WZTV-17; co-channel with WHDF-15
WNPX	28	36	Intermodulation with WHTN-39; co-channel with

1As far back as the mid-1980s, two-way radio engineers have called for the elimination of over-the-air television and its replacement with cable.

2But just barely. FCC considered allocating channel 10 to nearby Clarksville in the early 1970s.

Station	***Analog channel***	***Digital channel***	***Why not available for analog***
			WFIQ-36
WUXP	30	21	Intermodulation with WZTV-17; co-channel with WKMU-21
WHTN	39	38	Adjacent to WHTN-39; IF beat w/WUXP-30
WPGD	50	51	Adjacent to WPGD-50
WNAB	58	23	Local oscillator for WUXP-30; co-channel with KBSI-23
WJFB	66	44	Intermodulation with WHTN-39; co-channel with WEVV-44

The point is, you will see DTV assignments on channels that would not have been possible under the old rules. Don't be too surprised. It should also be noted that the regulations for low-power analog stations were changed at the same time. You will now find low-power analog stations on adjacent channels as well. Here in Nashville, the 20s are rather crowded:

Channel	***Service***	***Station***
20	Analog LPTV	WNPX-LP
21	Full-power DTV	WUXP-DT
24	Analog LPTV	WJDE-LP
26	Analog LPTV	WGAP-LP
27	Full-power DTV	WKRN-DT
28	Full-power analog	WNPX[3]
30	Full-power analog	WUXP

Note the full-power DTV station on channel 27 stuck between adjacent analog stations on both sides. This will be commonplace.

As a result of this “channel scrunching”, the FCC will be able to free up many channels for reallocation. A concept known as *core spectrum* has been defined; these are the channels that will remain in TV service after the DTV transition is complete. Core spectrum was originally defined as channels 14-59; VHF TV was to come to an end with digital. This was later amended to read 7-51[4]; the permanent figure is 2-51. Channels 60-69 are now what's called the “Upper 700MHz band”. Four of these channels are reserved for public-service[5] radio, the rest will be auctioned. Channels 52-59 are known as the “Lower 700MHz band” and will be auctioned later.

So eventually, all TV will be on channels 2-51. Yes, this means low-band VHF will be with us forever[6]. If someone tries to tell you all digital TV will be UHF, you can tell them they're full of it.. Actually, TV may not permanently disappear from the higher channels either! The FCC has now indicated that those who win auctions for channels 52-69 (except the public-safety channels) will be free to use their spectrum for television broadcasting if they choose to do so. I doubt many winners will in fact choose to use these bands for TV though.

3WNPX's analog transmitter is roughly 30 miles east of Nashville.

4My speculation is that land-mobile interests didn't really want the skip- and noise-prone VHF channels. Efficient antennas for these channels are rather large for the tastes of many land-mobile users as well. At the same time, broadcasters prefer lower channels, where less power is required to cover a given area.

5Fire & police departments; ambulances; etc..

6Or at least as long as over-the-air TV continues.

PH TO-NEWS

Jeff Kruszka, Editor
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Baton Rouge, LA 70817
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February 2004

More DTV photos from Greg Barker of Greensburg, IN:

KFVS-DT-57 Cape Girardeau, MO
258 mi Tr seen 9/23/03

WHRM-DT-24 Wausau, WI
442 mi Tr seen 9/3/03

WEWS-DT-15 Cleveland, OH
245 mi Tr seen 9/9/03

WREG-DT-28 Memphis, TN
374 mi Tr seen 9/7/03

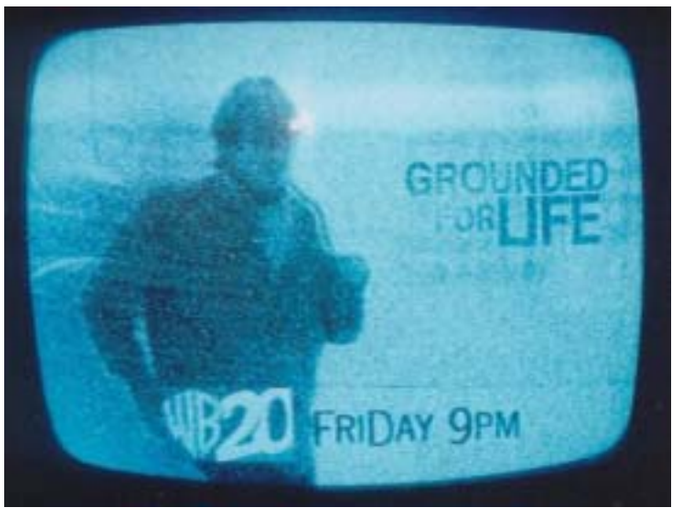
WSBN-DT-32 Norton, VA
228 mi Tr seen 9/7/03

WXLV-DT-29 Winston-Salem, NC
345 mi Tr seen 9/7/03

WYZZ-DT-28 Bloomington, IL
216 mi Tr seen 9/15/03

WANE-DT-31 Ft. Wayne, IN
124 mi Tr seen 11/7/03
"signal strength meter"

And here's another one from "Pastor Jim" Renfrew, of Byron, NY:

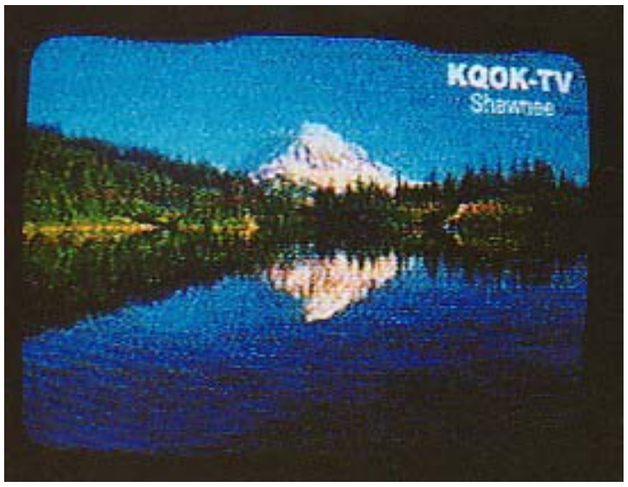


WDWB-20 Detroit, MI
261 mi Tr seen 9/11/03
@0318 ET

Finally, we start off another great batch of photos from Danny Oglethorpe, of Shreveport, LA. I accidentally misplaced these photos, thus the older dates. The first photo shows two of the four antennas currently being used: a Winegard Chromstar CA-5254VHF on a CM 9510 rotor @18 ft. AGL, and an Antennacraft P-5 chicken-wired 5 ft. UHF dish with a Winegard AP-4700 preamp, also on a 9510 rotor, @22 ft. Danny also uses FIVE VCR's to record his DX (one for each Es channel).

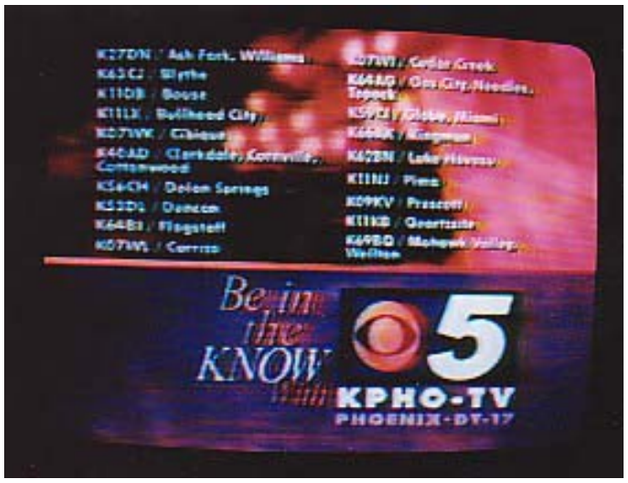
Danny's antennas on his roof

K57IG-57 Dallas, TX
179 mi Tr seen 5/4/02



KQOK-30 Shawnee, OK
272 mi Tr seen 5/4/02

KWBT-19 Tulsa, OK
288 mi Tr seen 5/4/02
@2201 CT



KPHO-5 Phoenix, AZ
1065 mi Es seen 5/02
"translator list"

XEZ-2 San Miguel de Allende, GTO
903 mi Es seen 5/30/02
@1032 CT

WLDM-23 Tuscaloosa, AL
365 mi Tr seen 5/02
"calls lower left"

XEWO-2 Guadalajara, JAL
1003 mi Es seen 1/31/03
@0931 CT

More from Danny next month.

73's,
JEFF

SOUTHERN FM DX

John Zondlo
4009 Driftwood Circle
Yukon, OK 73099
sfm@fmdxweb.com
Deadline: 15th

For DXers in AL, AZ, AR, CA, CO, DE, DC, FL, GA, HI, KS, KY, LA, MD, MS, MO, NV, NM, NC, OK, SC, TN, TX, UT, VA, WV, Cuba & Mexico

February 2004

Steven C. Wiseblood – Brownsville, TX – Stevenwiseblood.com – CST

Country codes: ES – El Salvador; GU – Guatemala; BE – Belize; HN – Honduras

12/29 Es

1659 XHCTN	89.9	CH	Comitan de Dominguez, lots of slogans, “89.9,” SS rock & hip-hop, reggae, and lots of Caribbean style music, SS announcer w/mention of “El Puerto Libre,” slogan “La estacion que (hazita?) mueve,” mention of “El Governador del estado de Chiapas”
1701	89.3	ES	San Salvador, “Cool FM,” US/UK hot dance mx, hip-hop, “Vamos Salvadoreños con Libertad,” ad for Banco Cuscatlan
1703	89.7	ES	San Salvador, “Bautista FM,” male preaching in SS
1704	90.7	GU	San Pedro la Laguna, “Radio Amistad,” light SS Christian vocal mx, male in SS conducting a healing service
1704	92.1	GU	Guatemala City, “Radio Universidad de San Carlos,” SS male announcer w/mention of Guatemala, SS announcements and commentary
1708	90.5	BE	Belize City, “Radio 2000,” male in EE w/announcements, “72 degrees farenheit for tonight,” mention of Belize
1712	90.5	GU	Guatemala City, “Periodisimo Cadena Radio Punto,” woman announcer in SS, slogan “90.5,” “Radio Punto en todo el Pais”
1721 unID	93.3	??	??, light SS pop/vocal mx
1724	105.1	GU	El Quiche, “Radio Juda,” SS Christian preacher
1730	104.5	HN	Cortes, “La Voz del Atlantico,” SS male talking to callers about futbol, saying to each caller “buenos noches,” and mention of “Zona Oriental,” also mention of neighboring country El Salvador
1733 unID	106.1	??	??, possibly El Salvador, SS male talking on phone, remote broadcast
1733 unID	106.9	??	??, possibly El Salvador, SS cumbia mx
1735 unID	103.5	??	??, poss Honduras with light SS pop/rock/musica romantica
1736	102.7	GU	??, marimba mx, then talk by male in indigenous language
1738 TGTZ	103.5	GU	Cobán, “TGTZ Radio Tezulutlán,” religious SS mx
1739	100.7	GU	??, SS religious vocal mx
1740	104.7	GU	Chichicastenango, “Radio Maranatha,” SS male reading the Bible
1740 unID	104.7	??	??, Cumbia mx, salsa (en el ritmo punto), male SS announcer w/saludos, Mexican regional pop mx
1740 unID	105.3	??	??, woman in SS w/announcements, male in SS preaching
1753	89.7	GU	Guatemala City, “Emisoras Unidas, 2 males in SS w/political commentary, political talk, mention of “14 Enero, Eleccion de la Justicia //89.9, remote broadcast w/male in SS talking politics
1755 89.9	89.9	GU	??, “Emisoras Unidas,” //89.7 SS political talk and commentary
1758 unID	88.7	??	??, “Radio Globo” slogan, vocal song about the state of Michoacan
1758 unID	88.7	??	??, possibly Guatemala, SS woman w/Christian talk, testimonies
1801 unID	90.3	??	??, SS male with pharmacy ad “Farmacia OTI”
1804	93.7	GU	Guatemala City, “Radio Mia,” SS ads, promo, “Radio Mia 93-7,” light pop/vocal mx
1809	92.3	HN	San Pedro Sula, rockin’ pop, male in SS, US/Euro rock mx
1810 unID	93.5	??	??, male in SS mentioning game show and giving away bicycles!, taking calls from listeners
1812	94.1	GU	Guatemala City, “94 Su FM,” US/Euro classic rock
1815	94.7	HN	??, “Radio America,” musica romantica
1816	96.5	GU	Guatemala City, SS male announcer with “Retro Sounds,” promo, Beatles mx
1822	94.3	GU	??, “Emisoras Unidas,” SS male announcer, “La Super Cadena Emisoras Unidas,” mention of Guatemala
1824	94.9	GU	Guatemala City, “FM-95,” Pepsi ad, SS male announcer, “FM-95, your super station,” slogan in EE and then in SS

Joe Kureth – 2900 Uniontown Road – Uniontown, MD 21158-3553

2000 Saturn car radio except WPRB and WGLS on Drake SW8 w/whip antenna. All new,
* = QSL'ed

8/21 Tr
1300 WSKE 104.3 PA Everett, k, WSMJ nulled by steel building in a nearby town 74
8/22 Tr
0830 WPRB 103.3 NJ Princeton, heavy j o/WARM
0835 WGLS 89.7 NJ Glassboro, mx, Rowan College, o/WTMD 106
1300 WJRZ 100.1 NJ Manahawkin, ads, ID, thru WFRE 99.9 slop 154
1530 W269AS 101.7 PA Carlisle, WKDN 106.9 txltr
9/8 Tr
1140 WBLK 93.7 NY DePew, local ads, calls
1145 WYGL 100.5 PA Elizabethville
1257 CIMX 88.7 ON Windsor, "89-X," slogan between each song, mx was rock but couldn't ID any song, ON & MI ads, confirmed by phone call, ID on hour
1303 WSLC 94.9 VA Roanoke, "Star Country" 234
1330 WBFO 88.7 NY Buffalo, Lionel Hampton mx, local news, calls, *
1340 WOGH 103.5 PA Burgettstown, local ads, calls, "Froggy 103"
1352 WUBZ 105.9 PA Phillipsburg, "The Buzz," old WPHB-FM 110
9/11 Tr
0910 WGRX 104.5 VA Falmouth, "Thunder 104.5," only heard on driveway on the south side, in heavy WAYZ slop, these calls once used by a merchant ship!
1147 WCHX 105.5 PA Lewistown, "Chix 105"
1200 WFWM 91.1 MD Frostburg, ID on the hour, WGTS nulled 96
1210 WVNW 96.7 PA Burnham, "Star Country 96.7," promo for sister station WCHX
1219 WZWW 95.3 PA Bellefonte, "3WZ" 98
1234 WQZK 94.1 WV Keyser, local ads, calls, it's been many years since I've logged a new WV station 100
1245 WJUN 92.5 PA Mexico 62
1351 WWLY 106.3 PA Huntingdon, "Wally"
1407 WLZS 106.1 PA Beaver Springs, "Wheels 106.1 FM" 76
1426 WNNT 100.9 VA Warsaw, Farm Credit ad, VA Tech football promo 99

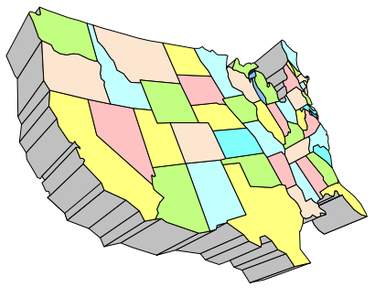
Some of the above aren't much in distance, but cleans up some semi-locals I've been after. CIXM is my first Ontario, first Canadian by tropo and farthest tropo DX west! WBFO sent a nice hand written verie with coverage map and sticker. Mileages are approximate. Below is what I heard DXing from Maderia Beach, FL, using a DX-398 on the 22nd and 23rd and a rental car radio on the 24th.

10/22 Tr
0040 WFYV 104.5 FL Atlantic Beach
0045 WHJX 105.7 FL Baldwin, RDS "Lite FM"
0053 WMFQ 92.9 FL Ocala, no sign of usual WIXK
1310 WWAV 102.1 FL Santa Rosa Beach, "Wave 102.1"
1315 WGLF 104.1 FL Tallahassee, "Gulf 104"
10/23 Tr
1152 WGBX 96.1 FL Tallahassee
1156 WEGT 99.9 FL Lafayette, "99.9 The Eagle"
1209 WUTL 106.1 FL Tallahassee, "U106"
10/24 Tr
1130 WGCM 102.3 MS Gulfport, "Coast 102.3" 430
1136 WOYS 100.5 FL Apalachicola
1140 WOSM 103.1 MS Ocean Springs, religion
1148 KMEZ 102.9 LA Belle Chase, "Old School 102.9"
1200 WBBE 103.3 LA Hammond 510
1210 WASJ 105.1 FL Panama City Beach, "Smooth Jazz"
1212 WKCW 92.3 LA LaPlace, "The Point"
1348 WMJY 93.7 MS Biloxi, "Magic 93.7" 420
1350 WEBZ 93.5 FL Port St. Joe, "The Beat"
1352 WTIX 94.3 LA Galliano, "Tix FM," old calls used on 690 AM in New Orleans 480
1400 WKGC 90.7 FL Panama City, NPR, classical
1400 WPCS 89.5 FL Pensacola
1405 WPBH 99.3 FL Mexico
1418 KNOU 104.5 LA Empire, "Hot 104.5," rap 435
1421 WKNN 99.1 MS Pascagoula, "K 99 FM," k 400
1427 WKZN 105.3 LA Kenner, "The Zone"
1436 KCIL 107.5 LA Houma, "C 107.5"
1448 WNOE 101.1 LA New Orleans, k, "Ten in a row" 475

(Southern FM DX continues on page 19)

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 December 2003. Southern California tropo conditions on TV-FM between Santa Barbara and San Diego/Tijuana (200mi/ 320km) existed only early in the month.

Dec. 1 morning:	Very poor
Dec. 1 evening:	Nothing
Dec. 2-4:	Fair
Dec. 5:	Good
Dec. 6-31:	Nothing

There was only some air-layer stability in early December with good weather (no rain), and from Dec. 6 on, was unstable/unsettled with periods of rain through the end of the month.

I was in Wasco on two weekends, Dec. 19-21 and Dec. 26-27, but there was only a little tropo to Stockton/Sacramento (215 miles) on Dec. 19, otherwise nothing, and nothing new or outstanding.

Best of DX to All. Dennis

William Eckberg, 1032 Sterling Rd., Dixon, IL 61021-9355

<u>November 2003</u>	CST					
21	tr	0600	KHNE	29	NE	464
	Es	1850	WPBT	2	FL	1229
<u>December 2003</u>						
3	tr	0410	<u>WOCH-LP 28</u>	IL	Chicago	<u>88</u>
9	Es	1010	KPRC	2	TX	893
29	Es	2115	WEAR	3	FL	792
		2130	KIII	3	TX	1072
		2135	KPRC	2	TX	893
		2145	KRGV	5	TX	1189
		2220	XEFB	2	NL	1162

Full length C/Bs were seen from 2130 to 2215 on December 28. Careful antenna positioning indicated direction was ESE. No Cubans or US stations use this type of C/B. A Yucatan or East Coast Mexican station could but would be on the air. Did anyone else see it? I took ten pictures. I've seen the same C/Bs briefly in prime time before.

Unidentified Es were to the south were in the evening of December 30 and 31.

Jim Pizzi, 5937 Coleman St., North Las Vegas, NV 89031

<u>April 2003</u>						
19	Es	1030	KDFW	4	TX	Ads
		1030	unID	3&5		Heavy CCI
		1059	KARK	4	AR	Royal Buffet Ad
		1128	KCEN	6	TX	Ads
<u>May 2003</u>						
25	Es	0726	<u>KCNC 4</u>		CO	Nx promo
		0726	<u>KTIV 4</u>		IA	Local nx

(KTIV about twice the distance of KCNC, on same heading)

		0758	<u>KFOR 4</u>		OK	Nx
		0819	KWAB	4	TX	Ads, Ch 9 w/star, bug lower right corner.
<u>June 2003</u>						
10	Es	1814	<u>KIII 3</u>		TX	Call floating u/KVBC
		1832	KRISt	6	TX	NBC
		1832	WOAIt	4	TX	NBC
		2013	WOAI	4	TX	Calls, nx
12	Es	1740-1850		4	East,	weak
		1931	unID	4	MX	SS
13	Es	0730	unID	4	MX	weak
		1730	WOWTt	6	NE	NBC, Heartland ment.
		2001	KDFW	4	TX	Fox, Local nx
		2016	KXJB	4	ND	Golf promo/sports
		2018	KFOR	4	OK	wx w/o KXJB-4
		2144	KWSE	4	ND	Prairie Public Bug LR
27	Es	0830	unIDs	6	East	CBS & Exercise Infomercial
		0850	unIDs	4	East	Martha Stewart
		0913	unID	4	ENE	Fox 4, Judge Joe
		0926	unID	4	ENE	Proactive Informercial
		0929	KSNB	4	NE	ID
		0939	WOWTt	6	NE	Nx
29	Es	1503	KFOR	4	OK	Nx promo
		1530	KAMR	4	NE	
<u>July 2003</u>						
2	Es	1730-1930	unIDs	4	MX	
4	Es	1830	<u>KRIS 6</u>		TX	Nx promo @ 1939
		1831	WOAIt	4	TX	NBC
7	Es	1730	unID	4	East	Fox
8	Es	1842	CKYBt	4	MB	CTV
		1855	KWSEt	4	ND	PBS
		1900	KXJBt	4	ND	CBS
		2029	KHMTt	4	MT	Fox 4 Nx&Seinfeld
		2105	unID	4	East	NBC CDT zone Leno
10	Es	0700	unIDs	4	East	
		0729	WOAI	4	TX	Team 4 promo PSAs
		0800	<u>KGBT 4</u>		TX	Serv Rio Grande Val
		0810	unID	4		SS
12	Es	1129	KARK	4	AR	Calls
		1201	<u>WABC 6</u>		MS	10
		1202	<u>KEMV 6</u>		AR	PBS
		1830	KAALt	6	MN	ABC (MN FM in)

Not bad for what little time on the dials. Appears to have been a good Es season for most.

Jeff Kruszka, 5024 S. Braxton Ave., Baton Rouge, LA 70817

<u>November 2003</u> CT

1	tr	2007	KATV	7	AR	
14	tr	2327	KTBS-DT	28	LA	3 pgms
		2346	KCEB	54	TX	
15	tr	0052	KSLA-DT	17	LA	
20	GW	0645	KLPB-DT	23	LA	
	tr	1938	XHAB	7	TA	
		1942	XHFOX	17	TA	
		1947	KXAN	36	TX	
		2006	KEDT	16	TX	
		2202	KVDA	60	TX	
		2306	KWTX-DT	53	TX	
		2335	unid DTV	22 to W.		
		2355	KNVA	54	TX	
21	tr	0639	KXAM	14	TX	
		0644	KEYE	42	TX	
		1806	KATV	7	AR	
		2019	WJSP	28	GA	
22	Es	1928	unid	5 SS briefly		

December 2003

4	Es	1814	unid 3,4 SS			
13	Es	1148	unid 4, 5 SS			
15	tr	0648	KEJB	43	AR	Note 1
		2148	XHAB	7	TA	
		2149	KEDT	16	TX	
		2152	unid DTV	23 to W.		
		2154	XHFOX	17	TA	
		2234	WXIA	11	GA	
		2241	WJSP	28	GA	
		2312	WGCL	46	GA	
		2315	WATL	36	GA	
		2327	WTBS	17	GA	
		2331	WHNT	19	AL	
		2335	WHSG-DT	30	GA	
		2338	WTEA	62	FL	
		2339	unid DTV	22 to E.		
		2345	WXPX	66	FL	
		2352	WTTT	50	FL	
		2354	WTTX	36	FL	
		2358	WTTS	28	FL	
16	tr	0001	WTOG-DT	43	GA	Note 2
		0014	WTBH	20	FL	
			WTOG-DT	59	FL	Note 3
		0019	WAFF	48	AL	
		0021	WTWC	40	FL	
		0035	WXEL	42	FL	
		0045	WJBF	58	GA	
		0049	WACH	57	SC	
		0059	WBLX	29	FL	
27	Es	1829	KWG	4	JAL	
29	Es	2023	KSNC	2	KS	floater
		2100	KDBC	4	TX	
		2103	unid 4 “ER” in SS			
30	Es	1834	unids 3-6			
31	Es	2034	unid 4 SS			

Note 1 – test slide announcing “Coming January 2004”

Note 2 – one program, but no PSIP info

Note 3 – no picture, but snagged the PSIP: Pgm 1: “WTOG High Definition”

Nice tropo opening on the night of Dec. 15th. I expected more DX’s to pop in, but no luck with the low sensitivity Hauppauge card.

More Southern FM continues from page 17

Joe Kureth’s report continues…

1457	WXBM	102.7	FL	Milton
1510	WBUV	104.9	MS	Moss Point, “V 104.9”
1515	WLMG	101.9	LA	New Orleans, “Magic 101.9”
1525	WCSN	105.7	AL	Orange Beach, “Sunny 105.7”
1527	KKND	106.7	LA	Port Sulphur, “The End”
1535	WBLX	92.9	AL	Mobile, “93-BLX” 375
1536	WABB	97.5	AL	Mobile, jingle ID
1537	WMXC	99.9	AL	Mobile, “Lite Mix 99.9”
1539	WRKH	96.1	AL	Mobile, “96.1 The Rocket”
1546	WFBX	94.5	FL	Parker
1555	WXYK	107.1	MS	Gulfport, “The Monkey”
1600	WMAH	90.3	MS	Biloxi, MS net, classical mx
1610	unID	100.5	??	??, “Q-100”
1611	KLRZ	100.3	LA	Larose, “Rajun Cajun”
1625	WXXF	94.7	LA	Lacombe
1557	TV	87.7	??	??, channel 6 audio, no doubt New Orleans
2040	unID	96.1	FL	??, “Jams” and “Hot 96,” probably a pirate, mentioned local WTMP 1150 several times, but not parallel to their programming

It was fun to DX some of that famous “Gulf tropo!” First time I’d Dxed any FM outside of the state and the 11 local 100kw’ers make adjacent channels difficult. Originally went to a location to catch blue crabs, but they weren’t there. Also, in the water, a nearby alligator convinced me to stay on dry land and DX instead!

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)

February 2004

NEW STATION - Livingston, MT - WNG682 has signed on the air at 162.525mHz with 100 watts.
NEW STATION – Walsenburg, CO – WNG579 has signed on the air at 162.450mHz with 300 watts.
NEW STATION – Springfield, CO – WNG664 has signed on the air at 162.400mHz with 1,000 watts.
NEW STATION – Finland, MN – WNG630 has signed on the air at 162.425mHz with 300 watts.
NEW STATION – Plainview, TX – WNG561 has signed on the air at 162.525mHz with 1,000 watts.
NEW STATION – Milano, TX – WNG649 has signed on the air at 162.525mHz with 300 watts.
NEW STATION – San Diego, CA – WNG637 has signed on the air at 162.425mHz with 100 watts.
NEW STATION – Pindale, WY – WNG679 has signed on the air at 162.500mHz with 300 watts.
POWER INCREASE – Woodward, OK station WWG46 has increased power to 1,000 watts.
FREQUENCY CHANGE – Jackson, WY station KWN39 has moved to 162.525mHz.
FREQUENCY CHANGE – Russell Hill, TN station WNG631 has moved to 162.525mHz.

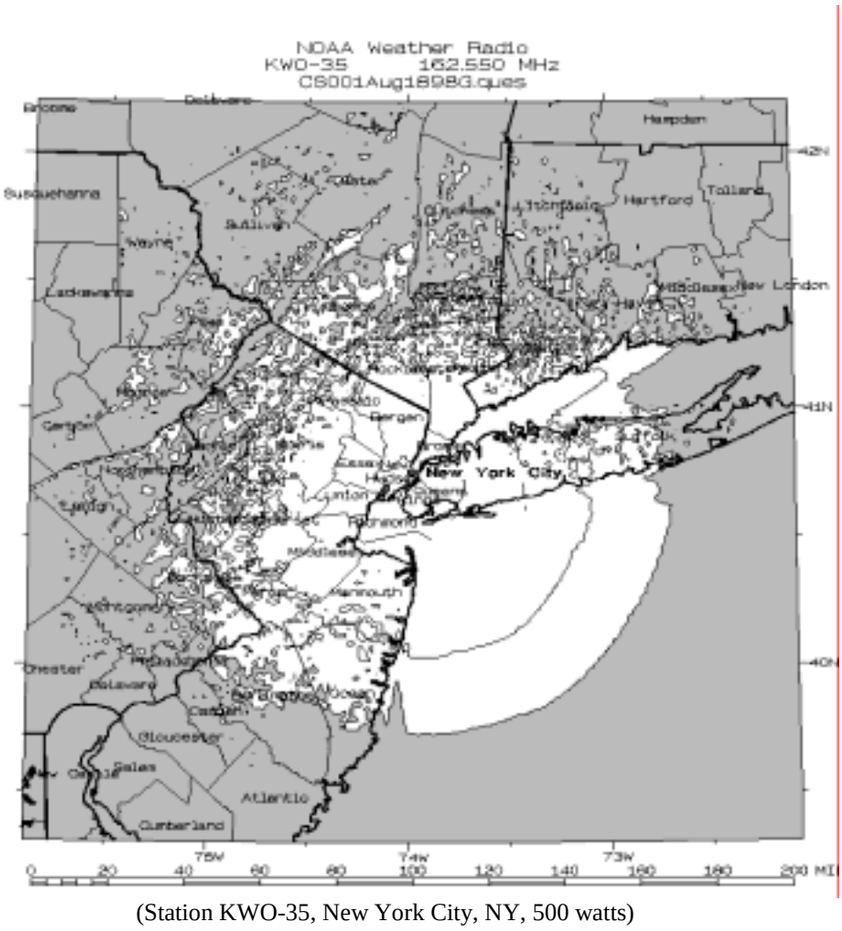
LOGGINGS (Dec. 13 to Jan. 18)

No loggings were submitted this month, as conditions have been less than optimal across most of the country.

Loggings for February should be submitted before February 15th.

COLUMN NEWS

This month we have eight new stations across the country. This column need not be strictly DX reports, if one of these stations has signed on near you feel free to write in and tell us where you are, what station you're hearing, what equipment you're using and how well reception is for you. Weather radio is much different than traditional AM and FM, These stations use 1,000 watts or less and still cover very large areas, often upwards of 50 miles with no DX conditions being present.



(Station KWO-35, New York City, NY, 500 watts)

Canadian Digital Radio has been DXed.

WILLIAM HEPBURN

After all the hype....but no receivers in sight, I FINALLY found a digital radio here in Canada and bought it. Radio Shack had 2 models. Both are puny portables... 3 1/4 X 2 1/4 ". The one I got cost C$99...and doesn't even have a speaker! (Just a 5 mW headphone output). The more expensive model was basically the same but with MP3 capability which I don't care for. Despite the small size, it looks kind of cool & space-age. The model was an "Adapt DR-101-LF", made by a company called Personal Telecom in Korea. It tunes the L Band (1452-1492 MHz) and FM.

As many have noted with digital TV and have forecast with digital radio...it's a brave new world! You almost have to be a DXer to use this radio. I'm guessing the average consumer will be very frustrated, at least with how the tuner is set up.

In the L Band, there are 23 "channels". Each channel has 5 "programs". That makes 115 programs. The L Band is eventually supposed to replace the 218 channels on the AM & FM bands.

The Channels are labeled LA to LW (the L standing for L-Band)...although going by the IDs...and by Industry Canada, it looks as though they are actually called Channel 1 to Channel 23 here in Canada, at least for now. When tuning across the band, you here dead silence. If you stay on a channel long enough, you might be lucky to here a station pop up - if you happen to have the antenna in the right spot as you scan by.

Once you get a channel, the 1st program automatically appears (giving stations on Program 1 an advantage). There is NO indication of program number on this radio - just the channel number. To figure out the 5 programs you go by the text IDs. When you have a channel tuned in, pushing the channel up button suddenly tunes programs instead of channels. I can see this driving the average consumer crazy. For example, I found signals on Channels LC, LD, LF, LH and LI. If I turn on the radio with the intent of getting to the LF group of stations, I tune through channel LA, then channel LB, then on channel LC it locks in to 680 NEWS, and when I go to advance to channel LD, instead it tunes to CHFI, then cycles through the 5 programs on channel LC. To even get to channel LD I have to hit another button and move the cursor over the channel number again and then continue.

Channel LC (3) 1456.304 MHz Toronto:

However, if I tune fast enough, I can get from channel LA to channel LF without locking it to the channel LC programs. If you don't whip by fast though, forget it. This might just be a quirk of this radio, others might be better. Basically, it makes it harder to tune to your favorite stations because now you have to sort of tune twice instead of once (channels - then programs).

Something else really annoying is that if you lose reception on a channel, and move the antenna back into a good reception area, the tuner still takes time to lock...and then when it does it automatically jumps to Program 1, not the last program you were listening to, very annoying if 10 seconds ago you were listening to Program 4. This will cause average consumers fits as they have to constantly retune the radio. Meanwhile if you switch to FM on the very same receiver, the stations boom in loud & clear no matter where you put the antenna!

If this receiver is any indication of the non-robustness of digital radio, it will never fly. Newer receivers may be better, but with the reception of this receiver, right now DAB can never compete with FM...no way, period. Why listen on DAB with frequent dropouts or "darth-vader" type effects when I can switch to FM and here a crisp clear signal 100% of the time? The CBC group of stations is ridiculously hard to receive. You need a coat-hanger and a chair - yet I can literally SEE the CN Tower out the window.

The DAB side has an RDS type display. Same stuff as FM RDS but with a 16-character ID plus other things like databit rate, DAB mode, and "version number". The FM side on this receiver doesn't have RDS. Gee, if it had that then average consumers would NEVER use the DAB mode (unless they wanted to hear the AM stations with better fidelity and RDS).

My gut feeling is that DAB will take several decades to replace AM & FM as proposed - or maybe never in my lifetime. It's just an expensive novelty.

Here's what I got folks - all from the CN Tower 33 miles away in the 1452-1492 MHz L-Band...

DLS is the "Dynamic Label" like song & artist, etc.

DAB Mode II
Version 1.1

Time 1 hour slow

680 NEWS Pty= NEWS 128 kbps Mono
"All News Radio . 680 News"
CHFI Pty=N/A 192 kbps Stereo
"Toronto's Soft Rock 98.1 CHFI"
1050CHUM Pty=N/A 192 kbps Stereo
"Oldies 1050CHUM.com" or <song & artist>
104.5 CHUM.FM Pty=N/A 192 kbps Stereo
<song & artist>
EDGE 102 Pty=N/A 192 kbps Stereo
"From all of us to all of you... Happy Holidays!"

Channel LD (4) 1458.048 MHz Toronto:
DAB Mode II
Version 1.1
Time 1 hour fast

CFRB Pty=Talk 128 kbps Mono
no DLS
MIX 99.9 Pty=N/A 224 kbps Stereo
no DLS
THE FAN Pty=N/A 128 kbps Mono
no DLS
EZ.ROCK Pty=N/A 224 kbps Stereo
no DLS
JAZZ FM Pty=Jazz 224 kbps Stereo
no DLS

Channel LF (6) 1461.536 MHz Toronto:
DAB Mode II
Version 1.1
Time 4 minutes fast

CBC Radio 1 Pty= Informarion 224 kbps Stereo
"CBC Toronto You are listening to Radio One"
CBC Radio 2 Pty=Adult =Hits 224 kbps Stereo
no DLS
RC Premiere Pty=Information 224 kbps Stereo
no DLS
RC Culturelle Pty=Adult Hits 224 kbps Stereo
no DLS

Channel LH (8) 1465.024 MHz Toronto:
DAB Mode II
Version 1.1
Time 1 hour fast

CHIN Pty= N/A 224 kbps Stereo
no DLS
CHIN.FM Pty=N/A 224 kbps Stereo
no DLS
Mojo 640 Pty=N/A 224 kbps Stereo
"From all of us to all of you... Happy Holidays!" or "fog, min tmp 6C"
Q107 Pty=N/A 224 kbps Stereo
"fog, min tmp 6C"
92.5JACK Pty=N/A 224 kbps Stereo
"Playing What We Want. 92.5 Jack FM" or <song & artist>

Channel LI (9) 1466.758 MHz Brampton (city of license):
DAB Mode II
Version 1.1
Time 1 hour fast

CJYE Pty= N/A 096 kbps Mono
no DLS *** no audio ***
CJMR Pty=N/A 096 kbps Mono
no DLS *** no audio ***
CIRV Pty=N/A 224 kbps Stereo
no DLS
CIAO Pty=N/A 224 kbps Stereo
no DLS
CFMX Pty=N/A 224 kbps Stereo
no DLS

Official call signs are apparently assigned to individual programs, not channels. For example, CJYE is CJYE-DR. I don't have a full list so I don't know what happens with AM/FM sister stations, ex.: CHUM and CHUM-FM - are they CHUM-DR and CHUM-FM-DR ???

I'll report on new stations as they hit the air. I expect the band will be affected by tropo a lot even more so than UHF. I also expect a lot of weird effects like rain scatter to become more important in the L-Band. Once more stations come on the air from other Southern Ontario cities I'll get a feel for real DXing (so far Windsor is on the air at 200 miles distant).

TORONTO DAB RADIO COVERAGE

THIS MONTH'S COVER

Move over, Scott Fybush. Our cover this month was taken by WTFDAer Jeff Lehmann with his new digital camera. This photo truly looks like a professional job. We're looking forward to viewing more VUD covers taken by Mr. Jeff in the future.

Amplifiers for VHF and UHF?

Are they recommended?

BOB COOPER

"What about on high band VHF or UHF?"

Or low band for that matter. Analysis becomes more complex with television because the noise figure (the height of the "noise wall" facing the incoming signals) of the TV set tuner is much further from what might be considered a "mature state of the art." In FM you can work it out quite quickly - a 2 foot high wall (2 dB noise figure tuner) is better for weak signals than a 4 foot high wall (4 dB noise figure tuner). And outboard amplifiers such as from RS are less concerned with noise figure than "signal handling grunt" - the ability to receive a number of signals and not exceed its own "output handling capacity" in the process. I will explain. TV sets do NOT have state of the art noise figures (whereas within reason most FM tuners and FM receivers do - "toys" such as the Sangean_aside.)

In any weak signal challenge receive situation there are as a minimum TWO noise figure walls to contend with. The first is the noise (figure) of the receiver itself - perhaps 2 dB for a quality FM tuner . The second is the noise "wall" created by the atmosphere and the objects around you. For example, mother earth has a "noise temperature" of more than 3 dB. Deciduous trees in leaf have a noise figure of as much as 10 dB. Your fence, your neighbor's roof has a noise figure - of anyplace from 5 dB to 20 dB. All of these objects radiate ("transmit") noise signals. Fortunately, their transmission distance is relatively short (measured in meters or yards, not miles). But the SUM of all of these sources is an "external noise WALL" over which you have limited control.

(By raising your receive antenna higher, you can get ABOVE these noise sources and depending upon how good your receive antenna is at eliminating "signals" which are from below (and unfortunately for Es - above) the parallel line of the antenna boom, you can greatly reduce the EXTERNAL noise wall contributions from these sources.) The thing to remember here is that you can create a receiver noise figure that is below the external noise wall out there and accomplish nothing - because rather than the tuner "noise figure" being the weak signal limiting factor for you, the EXTERNAL noise wall becomes the limiting_factor.

The internal (receiver) noise wall in a modern TV tuner is lower at low band VHF (some recent numbers I have seen from Philips suggest 9-10 dB Nf or noise figure), moderately worse at high band (11-12 dB) and only slightly worse at UHF (12+ dB). In terms of technical capability, these are shame-on-you numbers. In the 1970s and perhaps into the 80s, Zenith and others who cared about serving the "fringe area TV market" were routinely producing VHF-L tuners with noise figures under 5 dB, VHF-H under 7. UHF - well, they never got around to that. A strange thing happened with TV set tuner noise figures in the late 80s and 90s. With 66% of all TV sets in America now connected to cable, the need for a low noise figure tuner went away. The cable company routinely delivers 1,000 microvolts or 0 dBuV (per channel - minimum) whereas in a fringe situation a TV channel with 50 microvolts (-26 dBuV) was considered "tall cotton." Go to VUD June page 14 and the photo of KXAS; that's around 50 microvolts whereas for reference WTVJ-6 (same page, upper left) is around 100 microvolts (-20 dBuV). TV set manufacturers could save a few pennies (literally, "pennies") by degrading the tuner noise figures using less expensive transistors for the RF amplifier stage - and they did so because TV sets connected to cable NO LONGER NEEDED low noise figures. Guys like Jeff Kadet who worship older Zenith TV sets are not fanatics - they merely know this fact.

Noise figure is compromised by bandwidth. An FM "channel" is 200 kilohertz bandwidth. A TV channel in North America is 6 megahertz; TV bandwidth is therefore 30 times as wide "per channel." The wider the bandwidth, the higher the noise figure in the tuner portion; it is a "law of physics" which nobody can change. It is far easier to create a 2 dB noise figure for a 200 kilohertz FM tuner than a 6 dB noise figure for a 6 MHz wide TV tuner.

So - can you buy a Winegard broadband (all band, of all-VHF and/or all-UHF) amplifier with a BETTER/lower noise figure, stick it ahead of your TV set and EXPECT improved weak signal performance? Yes - and - no.

Enter overload. Any amplifier for any purpose has a maximum output capability. Let's talk water and containers that hold water here for illustration. We start with a one quart container and we fill it up with water. We know it will be more or less exactly one quart of liquid because that is the stated size of the container. Now, pretend the water is radio frequency energy and from channel two we have 2 teaspoons, channel four 8 teaspoons, and so on - each TV channel equals some precise amount of energy (water). What we have to do

here is sum (add up) the radio frequency energy contribution coming from EACH TV channel going through the amplifier. If all of those teaspoons/tablespoons/cups of "energy" TOTAL MORE THAN the capacity of the bucket (amplifier), the amplifier "overloads." In a DXing situation, with variations in where you point your antenna, at some headings and at some times there is more energy than the "bucket" can hold. Overload /overflow. When the bucket is full, the amplifier's MAXIMUM output capability has been reached - and exceeded. At this point one or more stages in the (pre)amplifier changes characteristics. Up TO the point of overload, the electrical operation is LINEAR - one unit input equals one+ unit output. But when the overload point is reached, suddenly one unit of input equals two++ units of output. The EXTRA output is in the form of amplifier-GENERATED signals - signals that do not exist EXCEPT as at the output of the amplifier. These NEW signals are undesired (and interference creating) only seen at the amplifier's output (they do not exist at the input).

Overload ruins an amplifier's usefulness. Sometimes you can point your antenna in special directions, thereby reducing the input signal levels ("nulling") from local channels and suddenly the overload goes away. Until you move the antenna again.

The more local signals you have, the greater the input signal from channels you would like to eliminate anyhow. But each of these contributes to the maximum output of the amplifier so if you have enough local channels, there is no "capacity" remaining for the much desired weaker distance channels.

So "What about on high band VHF or UHF?"

Can you either reduce local signal pickup or do you live where you can get by with an amplifier that won't overload on you? All amplifiers (whether Winegard, Blonder Tongue, etc.) have varying characteristics. Noise figure is ONE of those. First question: Can you BELIEVE the manufacturer's noise figure claim? Not to challenge Winegard (or anyone else) but noise figure SHOULD be specified as (1) "best case" and (2) "worst case" within the stated frequency coverage range;. Noise figure is NOT a "flat versus frequency" measurement. A number such as 4.2 dB at channel 2 can easily be several dB different at channel 6, for example. And at UHF, the variation between "best" and "worst" can be as much as 5 or 8 dB over channels 14 to 83 bandwidth! Second question: What is the total OUTPUT CAPACITY of the amplifier. Big numbers are best (if they can be believed) because BIG is the same as having a BIGGER bucket for the water - 2 quarts is bigger than one quart and if the output capacity is more/higher/greater, than the amplifier will pass-through more (strong and not so strong) signals BEFORE it overloads. Amplifiers that overload with small amounts of total (remember - the SUM of all channels) signal "crunch" (fold up, quit) long before you need them for the weak channels coming through. There is no such thing as a "crunch proof" amplifier although within financial reason it would be possible to design one (are you listening - Jim Gould???).

Having a lower noise figure AND having a big signal handling capacity are seldom mutually compatible - achievable in a single design. With home TV rooftop antennas now down to less than 15% of the total population, the financial incentive to design and sell better amplifiers has all but disappeared. Like TV antennas, TV amplifiers are now frozen in 1990 designs and short of some major change in the way TV is delivered to American homes, destined to simply fade away at this level.

Only YOU can determine whether a particular "low noise" antenna or external amplifier AHEAD of YOUR TV set(s) will improve the weak signal performance of the system. Placing a low noise amplifier at the back of the TV set is a no-no. It must go AT the antenna, with the shortest possible feedline between the antenna "output" and the preamplifier input. You cannot even "test" various models for comparison at the BOTTOM end of your feedline (i.e. at the TV set). Why? It would take several hundred words to explain why - trust me, on this one! (Tests you run at the bottom end of your antenna line are amusing but TOTALLY inaccurate in results produced and a waste of time and effort.) So look FIRST for "TOTAL OUTPUT CAPABILITY" in the spec sheet and then "lowest noise figure." Of the two numbers, you can best believe total output and least believe "noise figure" since most manufacturers will "claim" the lowest noise figure within a particular band of design rather than the "worst case" or even the "average/median" case. Total output capability (the SUM of all channels passing through the amplifier BEFORE overload occurs is a "hard" number that can be verified in the field by anyone with a signal level / field strength meter. Manufacturers know that and are more "cautious" about claims here than noise figure (which requires a multi-thousand dollar test set, extreme operating skills and a southerly wind to get right and accurate!). They can CLAIM almost anything for "low noise figure" and not be challenged.

Am I in favor of at-antenna masthead or signal preamplifiers? Yes - if - IF - your location will allow you to use one.

A 16-Bay UHF Antenna

When two identical antennas are mounted together (ganged) and pointed in the same direction and wired together properly, there is a theoretical possibility of a 3 dB improvement. That is, twice the signal power is delivered to the TV compared to what a single antenna would do. In practice, 2.5 dB is readily achieved, 0.5 dB being the typical loss in the combining device. But if the two antennas are pointed in different directions (towards different stations) a 3.5 dB loss for each antenna is the likely result.

The above statements are true regardless of whether the antennas have shared or separate amplifiers. For a shared amplifier, if the antennas point in different directions, half the power each antenna takes in reflects off the combiner and is rebroadcast out the antennas. Why this doesn't happen when they are pointed the same way is harder to explain.

Explanation: (non-essential reading)

To find the total power when two signals are added together, if they are different frequencies just add the powers. But if they are the same frequency you must add the voltages taking into account the phase. For a 75-ohm system, the increase in power is the square of the increase in voltage. When a voltage component from one antenna reaches the combiner it is reduced by 0.707 directed toward the amplifier, with the difference representing power reflected back toward both antennas. The second antenna adds another 0.707 so that 1.414 is directed towards the amplifier, and the reflected currents subtract to zero. 1.414 squared is 2, which is a 3 dB power gain.

For dual amplifiers, when the antennas are pointed the same way, this signal is increased by 6 dB but the noise is increased by 3 dB, so the overall improvement is still 3 dB. When they are pointed differently, the 3 dB noise increase causes a signal/noise ratio loss of 3 dB for both stations. Dual amplifiers will eliminate the combiner loss, but only if the amplifiers are closely gain-matched.

(Ganging non-identical antennas is not recommended. They would need to produce equal voltages, and adjusting out the phase difference might not be possible for all stations.)

Channel Master to the rescue

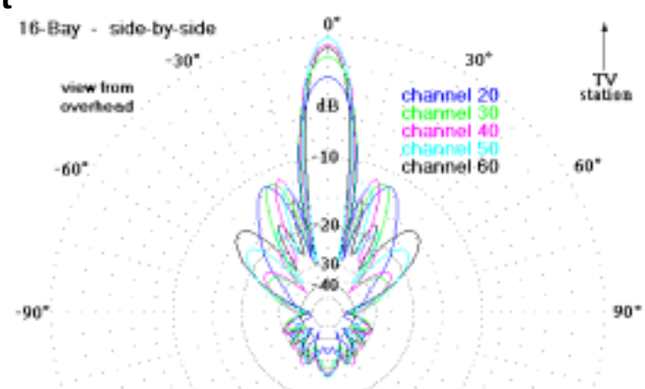
Ganging a pair of Channel Master 4228 8-Bays will give you probably the best UHF antenna that a consumer can achieve with reasonable ease. The author discovered some extra problems with the 32-bay described later, a project that should be attempted only by people who love antennas.

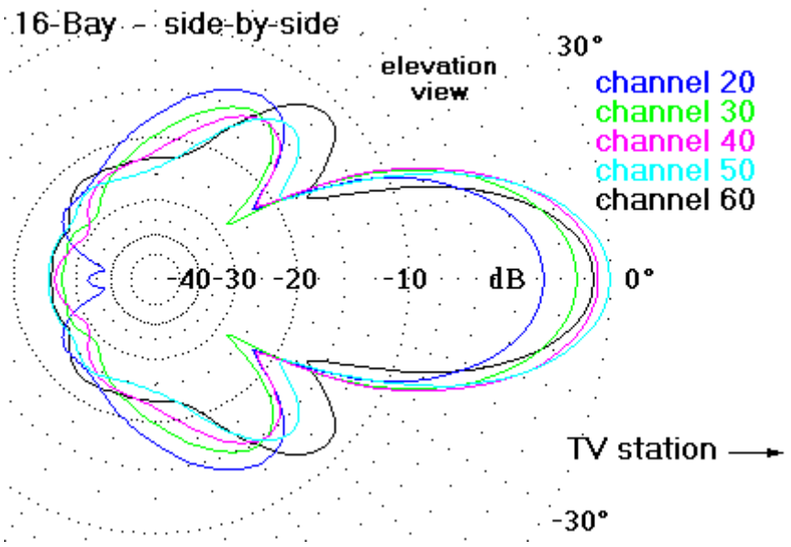
If all your weak stations are above channel 40 then ganging a pair of Yagi/Corner-Reflectors would be smarter. That project will not be described here, except to say:

1. The Channel Master 4248 and the Winegard 9032 are the obvious candidates.
2. They should be mounted with the booms about 3 feet apart.
3. For a side-by-side mounting, boom-to-boom metal rods are forbidden in front of the reflectors. Instead mount each antenna on a 2-foot vertical mast. The masts can be connected together 2 feet below the booms. The wires can run along the boom but should descend 2 feet before turning parallel to the elements.
4. For a one-over-the-other mounting, angle the booms up to the horizon, and mount the top unit rearward enough so that its phase is not "ahead" of the lower unit.
5. All the principles described in this chapter apply.

Your big decision is deciding on a **side-by-side** mount or a **one-over-the-other** mount.

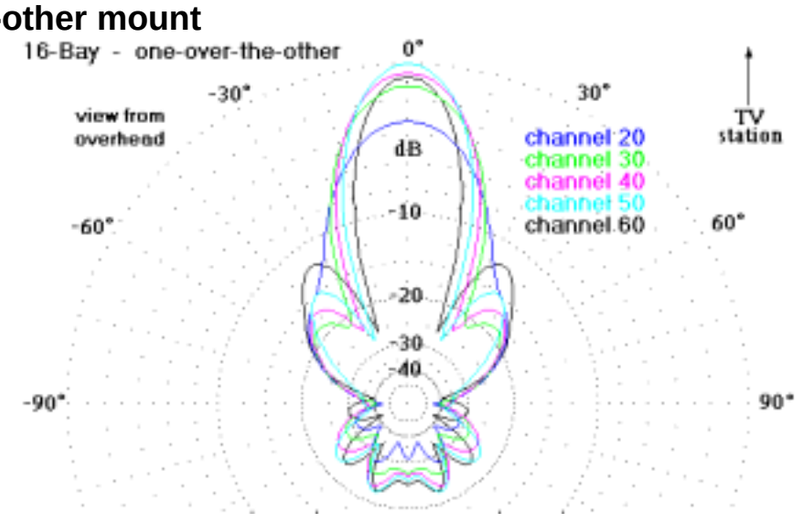
Side-by-side mount

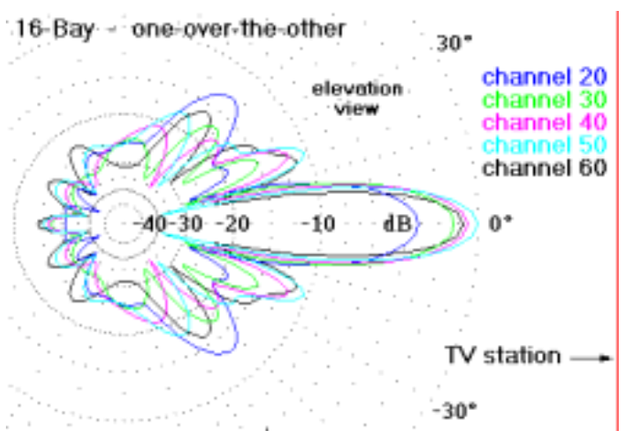




The elevation view of the radiation pattern is the same as for a single 4228. But in the view from overhead, the 16-bay is 2.5 times more directional. This could be good or bad. There is no better antenna for eliminating ghosts that arrive from the side. But even a Channel Master rotor will have a hard time hitting the correct direction. (Radio Shack rotors need not apply.) Some World War II radar antennas weren't much different from this. Hopefully all your transmitting antennas are in the same direction, either because they are on the same tower or because the city is so far away. When a rotor is required, the one-over-the-other mount is usually wiser. Usually side-by-side 4228s are positioned so that the two screens just touch. But if they are 1-1/2 inches apart then the mast can pass in front of the screens, which yields a better weight distribution. A few tie-wraps forcing the screens to touch will reduce radiation to the rear and increase gain very slightly. Mounting the two antennas farther apart will make the main forward lobe even narrower, but the side lobes will grow in size.

One-over-the-other mount





In most situations, a one-over-the-other is the wiser choice for a 16-bay. The radiation pattern viewed from above is the same as for a single 4228. But in the elevation view, the 16-bay is 2.2 times more directional. This is enough to require taking the horizon elevation into account. The antenna should be tilted up to point at the horizon, and perhaps one degree higher.

Some authors will recommend that a motorized tilter be used since the angle of the incoming signal can change from day to day. It does. But high angle days are strong signal days, and the loss of a dB won't matter. This author recommends a tilter only when a rotor must point the antenna in different directions with different horizon angles.

The simplest mounting technique requires a single heavy angle-iron 65-70 inches long. Attaching it just below its midpoint to the top of the mast will keep the assembly from being too front-heavy.

Mounting the hardware

At 15 lb., the 4228 is a heavy antenna. Putting up two of them requires a 1-½ inch, 16-gauge metal mast. (A Radio Shack mast will bend with the breeze.) The total weight of the antennas, mast, mounting irons, etc. will exceed 40 lb. Trying to erect it by yourself on a sloped roof is something akin to suicide, even without a wind. You need help. You need a large helping of good judgment. You need a rope around your waist so that you don't fall off the roof when the whole thing tips over. Some antenna adjustments will likely be necessary, so don't think you can put it up once and be done with it. Yagi/Corner-Reflectors weigh a lot less.

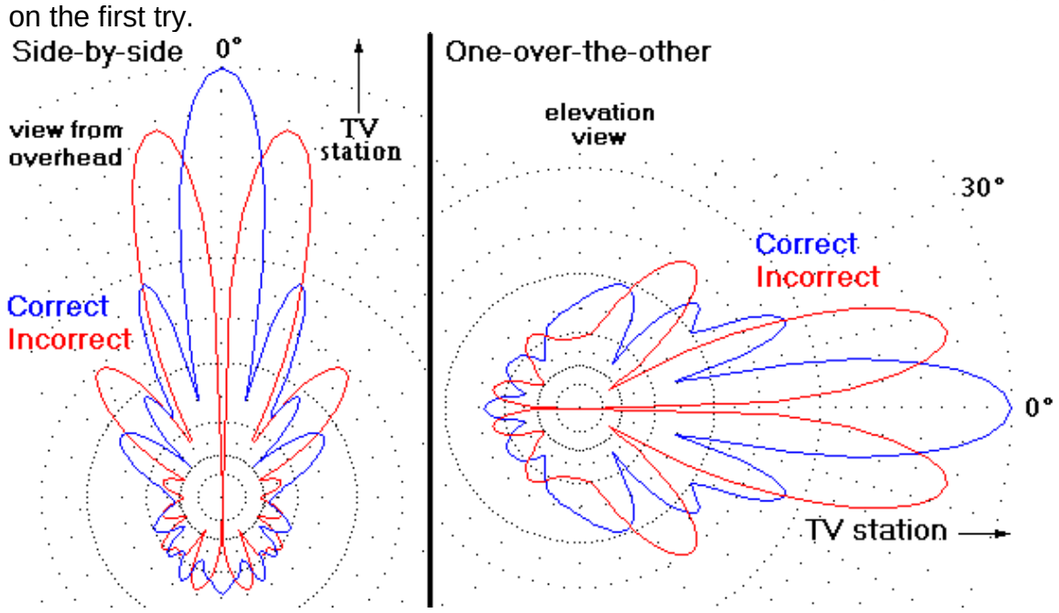
(The author has not tried a rotor mount and doesn't know for certain if the Channel Master rotor can handle this weight or has the aiming accuracy required for a side-by-side mount. You should discuss this with a knowledgeable sales person or installer. Rotors that handle more weight can be found in HAM radio stores.)

Connecting them together

The two antennas must be phase-matched. This means that the two signals must arrive at the combiner in phase. (±15° is not a noticeable error, but anything larger should be avoided.) You do this by maintaining symmetry in the feed system. In other words, the wires for each antenna should be identical in type and length. The actual length is not critical.

If a ground reflection causes one antenna to be phased ahead of the other, this should be adjusted out by repositioning one antenna. This is most easily done by finding a new horizon tilt angle. Simply adjust the tilt while watching the signal strength. Different stations could require different angles, but that is rare.

There is a chance that you will mix up the polarities such that the two antennas subtract instead of add. Doing this will result in two forward lobes, reduced in size, with a null straight out the front. After the antenna is fully hooked up, you should rotate the antenna to check for this pattern. If so then you have to reverse the connections on one of the antennas. The antennas come with a balun that has a “China” stamp on one side. I believe this stamp is the key to getting addition on the first try.



There is no point in building this antenna if you plan to use a Radio Shack amplifier. Their best amplifier will cancel out most of the advantage of the second antenna.

Dual amplifiers

Having two amplifiers eliminates the combiner loss, but requires you to find amps with equal gain. The only procedure doable by consumers that I can think of for adjusting the gains requires attenuators on the outputs of the amplifiers: one fixed and one variable. But the Radio Shack variable attenuator will not pass D.C. I am at a loss for suggestions, other than bringing both coax lines into the house or putting a 120VAC socket at the antenna.

Shared amplifier

The problem here is finding a low-loss combiner. Supposedly, combiners and splitters are different devices. While either will do the other’s job, combiners are supposed to be lower loss. (Splitters don’t have to be low-loss since they come after the amplifier.) But the best device I have found is a VHF/UHF splitter that is quite lossy above channel 50. I will continue to search. Watch this space.

Why this 16-bay antenna might not work

The author’s neighborhood has hot spots and cold spots, places where the signal strength is strong or weak. This is a consequence of **overlapping fields**. Being 40 miles from San Francisco and behind some hills, DTV reception is only possible when the antenna is positioned in a hot spot. These hot spots are 10-16 feet apart for any channel, and are in different places for

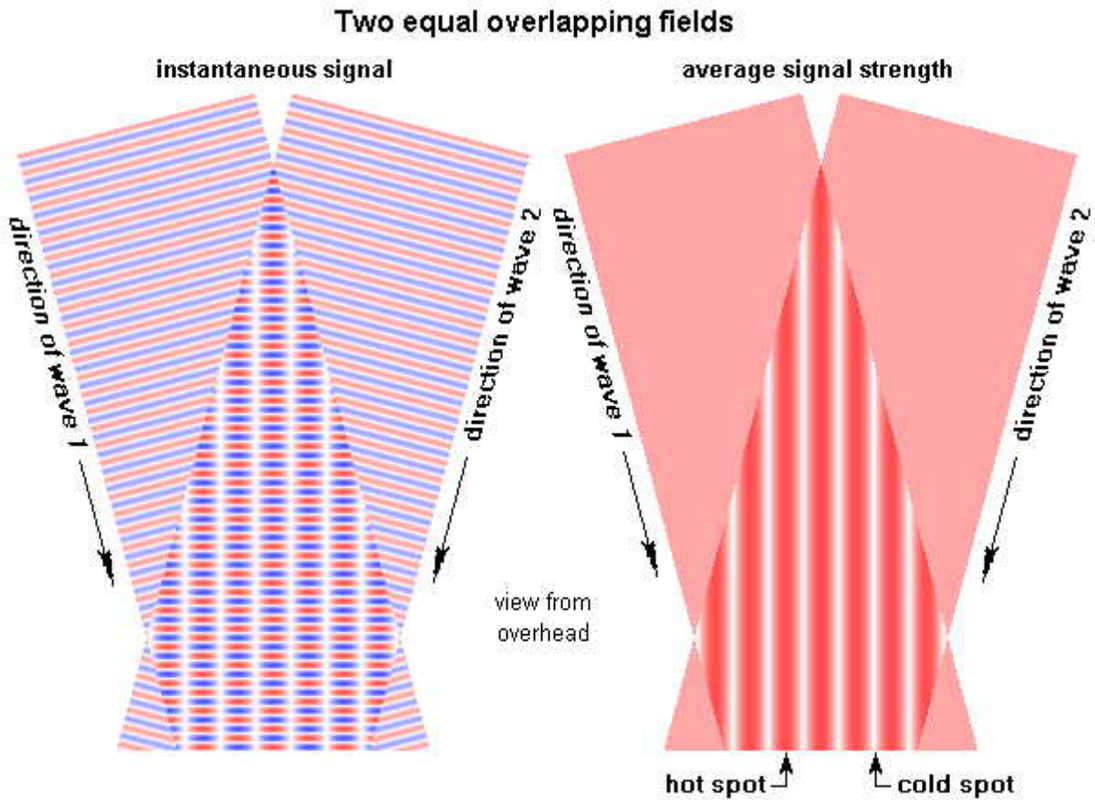
different channels. If you have hot spots for any UHF channel then you will have hot spots for all UHF channels. The distance between hot spots is determined by the frequency, distance to the horizon, and the geometry of the ridgeline at the horizon. That ridgeline is producing the overlapping fields.

If one 4228 is in a stronger field, then part of its signal will be retransmitted out the weaker antenna. This loss may equal the little bit of gain you had hoped for from the weaker antenna. You will likely find that two 4228s are no better than one. This retransmission is only avoided when both 4228s are in equal fields. (When dual amplifiers are used, the argument sounds different but the result is the same.) At the author's home, the change in field strength in just 3 feet is enough to wipe out most of the hoped for 3 dB gain when the antennas are mounted side-by-side. Fortunately hot spots are not generally spherical. Rather, they tend to extend upward and forward more than they extend laterally. So the one-over-the-other configuration is much more likely to work in a neighborhood with hot spots

But there is an exception to that. If the 16-bay is close to the ground and the ground is bare extending toward the station, an efficient ground reflection is likely. This is another case of overlapping fields. But in this case, the hot spots are mainly arrayed vertically. The hot spots are likely close together vertically, but farther apart laterally. In this case, the side-by-side is the configuration more likely to work. The incoming wave is angled downward by only a couple of degrees, and so the ground reflection occurs on ground that extends perhaps hundreds of feet toward the station. If this ground is paved, dirt, water, or a grass lawn, then the reflection is efficient and will produce extremely weak cold spots. If it is covered with weeds, shrubbery, trees, or somebody's house then the reflection is scattered too randomly to have any effect on UHF reception.

An alternate explanation: (non-essential reading)

Two signals pass through each other without interacting. But an antenna will respond to the sum of the instantaneous signal voltages.



The fact that the author's hot spots are mostly orderly suggests that his neighborhood has two overlapping fields. That is, the signal is coming from two spots on the horizon. How far apart are those spots? This is found from the simple trig formula:

$\theta = 2*\arcsin(\lambda/2*D)$ where θ = angle between fields
λ = wavelength (16.3 inches for channel 56)
D = distance between hot spots (11 feet for channel 56)

$\theta = 7.1°$

Thus the signal is coming over the horizon at two spots 7 degrees apart. A 4228 in a hot spot can pick up both of these signals. But a 16-bay side-by-side is too directional to be aimed at both. It will likely pick up twice as much of one signal but none of the other, and thus will equal the performance of a single 4228.

This seems like a completely different description based on a different phenomenon, but in fact the two descriptions are the same.

If you want to explore the locations of your hot spots, a Silver Sensor on a 10-foot pole is a good method. This antenna is small enough to fit in any hot spot, and probably strong enough for a digital-lock in a hot spot for your strongest station. If possible, work at about the elevation where you plan your permanent antenna. You will need a monitor positioned there so you can see the signal strength from the receiver. The distance between the hot spots will be roughly the same for all channels.

If your hot spots are too small both vertically and laterally, then a 16-bay might be out of the question. Your option then is to put each 4228 in its own hot spot. But this only works for one channel.

You might curse your bad luck if you find you have hot and cold spots. But you would be looking at it wrong. In fact, your neighborhood is concentrating the signal for you. An antenna in a hot spot can be at least 3 dB smaller than it would need to be in a “flat” neighborhood. Now, if only the hot spots never moved. But, that is another story…

Another reason this 16-bay antenna might not work

Lets say you are 20-miles from the station but behind a big hill. Your 4228 mostly works, but you see some dropouts randomly. A 3 dB improvement will likely solve your problems.

But beyond 40 miles, weather affects UHF considerably. A 3 dB improvement will make some of the dropouts go away, but weather can always get worse. Every antenna improvement will help. But beyond 60 miles, it might not be possible to eliminate 100% of dropouts no mater how good your antenna is. Beyond 60 miles, solid reception on 9 out of 10 days is generally a good result.

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