

James Burtie

From: Steven Pearson [kc7til@cableone.net]

Date: Thursday, August 05, 2004 7:27 PM

James Burtie

Subject: FW: bpl complaint

Thanks for your reply to my complaint on interference. I sent a complaint letter to David Shpigler of Electric Broad Band and received this reply. Please note I attached my original letter and finding in spreadsheet form for your convenience.

Thank you, Steven G. Pearson KC7TIL

-----Original Message-----

From: David Shpigler [mailto:shpigler@electricbroadband.com]

Date: Tuesday, June 29, 2004 8:01 AM

To: Steven Pearson

lrosen@electricbroadband.com; jburtle@fcc.gov; Rholling@fcc.gov; Astillwe@fcc.gov

Subject: RE: bpl complaint

Pearson,

We would certainly be very interested in reviewing your findings and following up with an investigation of the claims of interference in the Cottonwood area. Given that Arizona Public Service has conducted routine emitted radiations testing prior to and during the trial in the Cottonwood area and have found no signs of emitted radiations that exceed FCC Part 15 limits, we will need to reconcile the apparent differences in the readings. Please send me any readings you have conducted as well as the specific latitude and longitudes associated with the readings.

As you may be aware, we have sought to work closely with the Verde Valley ARRL chapter throughout this trial process and have been in constant contact with Bob Shipton, the Vice President of the organization. Our goal is to keep the members of the community abreast of the status of the tests and to establish a close working relationship and mutual cooperation. I look forward to following up with you to address your concerns.

Regards,

David Shpigler

Partner

Electric Broadband

5 North Mill Street

Yonkers, NY 10960

(914) 348-3181

www.electricbroadband.com

-----Original Message-----

From: Steven Pearson [mailto:kc7til@cableone.net]

Sent: Monday, June 28, 2004 7:27 PM

To: lrosen@electricbroadband.com

Cc: shpigler@electricbroadband.com

Subject: FW: bpl complaint

-----Original Message-----

From: Steven Pearson [mailto:kc7til@cableone.net]

Sent: Thursday, June 17, 2004 9:15 PM

Cc: jburtle@fcc.gov; Rholling@fcc.gov; Astilwe@fcc.gov

Subject: bpl complaint

I would like to file a complaint of interference I noticed in the Cottonwood Arizona area while I was operating my HF mobile station. I noticed a tremendous amount of interference in two areas of Cottonwood. One, near the American Heritage Academy on Cherry St. and the other near the Sawmill Cove Apartments. I made some measurements using a Kenwood TS 450S amateur radio on all the amateur bands from 3.5 MHz to 29 MHz and was amazed at the strength of the interference. I understand that there is a temporary license issued for experimentation of Broad Band over Power lines in the area. As a licensed operator on the bands listed above, I find it unacceptable that a situation such as this can be allowed to continue. I also made some base line measurements in the Cottonwood area away from the above mentioned sites and have a very detailed log of signal strength readings in a spreadsheet format if you would like me to send them to you. I will be following up this preliminary E Mail with a hard copy sent to you and the cc addresses when I get time in the next few days.

*Thanks for your time, Steven G. Pearson 2085 Howard Pl. Prescott Arizona 86301
1-928-778-0502 KC7TIL kc7til@cableone.net*

June 17, 2004
Steven G. Pearson
KC7TIL
2085 Howard Place
Prescott, Arizona
86301
1-928-778-0502
kc7til@cableone.net

Dear Sirs,

I would like to file a formal complaint of interference on the amateur HF bands I noticed in the Cottonwood Arizona area. I understand there is a temporary experimental license for Broad Band over Power Lines in the area. I recorded a detailed log of signal strength readings in three areas of Cottonwood. The first was a baseline measurement out near the airport to see what the propagation and noise levels were on that day and time in comparison to the reading I got in proximity to the BPL sites. I was stunned at the amount of interference I recorded when anywhere near the sites using BPL. The attached log sheets should be self explanatory.

It should be obvious that interference such as what is documented here will make amateur radio HF operation impossible anywhere near a BPL installation. This, during a time of possible reliance on the amateur radio service for emergency communication that may arise due to natural or terrorist events.

Amateur radio operators have always been ready and willing to donate their time and use of their equipment during times of need. To relegate this vast resource to obscurity at a time when the country may need to call on them in a crisis situation is mind boggling.

Please consider this a formal complaint.

Thank you,

Steven G. Pearson KC7TIL

Radio: Kenwood TS-450S
Operator: Steve Pearson KC7TIL

Antenna: Webster Bandspanner

Cottonwood Airport Baseline Location: 34.735N 112.039W Mobile

Band (m)	Frequency MHz	Signal Level	Mode	Time:	0830
10	28.500	S4	USB		
10	28.500	S5	FM		
12	24.900	S2	USB		
12	24.900	S3	FM		
15	21.305	S1	USB		
15	21.305	S0	FM		
17	18.130	S1	USB		
17	18.130	S2	FM		
20	14.240	S6	USB		
20	14.240	S9	FM		
40	7.260	S1	LSB		
40	7.260	S2	FM		
80	3.980	S7	LSB		
80	3.980	S9	FM		

American Heritage Academy Location: 34.73272N 112.00520W Mobile

Band (m)	Frequency MHz	Signal Level	Mode	Time:	0915
80	3.980	S9+10db	LSB		
80	3.980	S9+60dB	FM		
40	7.260	S9+10dB	LSB		
40	7.260	S9+60dB	FM		
20	14.240	S9+20dB	USB		
20	14.240	S9+60dB	FM		
17	18.130	S5	USB		
17	18.130	S3	FM		
15	21.305	S9	USB		
15	21.305	S9+60dB	FM		
12	24.900	S3	USB		
12	24.900	S3	FM		
10	28.500	S9+20dB	USB		
10	28.500	S9+60dB	FM		

Sawmill Cove Apartments**Location: 34.72843N 112.00575W****Mobile**

Band (m)	Frequency MHz	Signal Level	Mode	Time: 1015
10	28.500	S4	USB	
10	28.500	S9	FM	
12	24.900	S1	USB	
12	24.900	S1	FM	
15	21.305	S2	USB	
15	21.305	S5	FM	
17	18.130	S1	USB	
17	18.130	S3	FM	
20	14.240	S7	USB	
20	14.240	S9+60dB	FM	
40	7.250	S7	LSB	
40	7.250	S9+20dB	FM	
80	3.980	S9+10dB	LSB	
80	3.980	Full Scale	FM	

James Burtle

From: Rod Rosenbarger [ki6fhrod@commspeed.net]

Date: Saturday, August 14, 2004 11:35 AM

To: Anh Wride; Alan Stillwell; Riley Hollingsworth; James Burtle; lrosen@electricbroadband.com

Subject: Interference

Within a two block radius of the BPL sites in Cottonwood Arizona the CB / Citizens Band 40 channel segment of the radio spectrum is totally unusable. The carrier and data transfer from the BPL signal overwhelms any incoming signal. I could not communicate with a friend one block away from my location as we were driving near both of those sites on 8-11-2003 at 11:00 AM. I live approximately 1/2 mile from Cottonwood and I am less than 2 miles in a direct line to the test site on Cottonwood street and Cove park way. I can hear the BPL signal as I turn on to 89A near the Verde river, on the Amateur Radio 80 Mtr band, where I normally talk to friends in the morning. I have listened several mornings when I was mobile and it is being interfered with, I have tried several of the Amateur bands with the same results.

APS and Electric Broadband have had more than ample time to correct their interference problems. Both of the test sites are generating interference and must be shut down, and only turned on for short tests. In my opinion Electric Broadband is stalling and I think they have not told APS about the amount of interference BPL will generate. I think it is time for the FCC to address this problem and shut the interference down until such time that Electric Broadband and APS can eliminate such interference. Thank you.

Rodney W. Rosenbarger KI6FH

1032 Zalesky Rd. Cottonwood Az. 86326, 928 649 1866

es Burtle

n: Rod Rosenbarger [ki6fhrod@commspeed.net]

t: Tuesday, September 14, 2004 4:38 PM

Anh Wride; Alan Stillwell; Riley Hollingsworth; James Burtle; w1rfi@arrl.org; redmonds@mtntel.com

ject: Harmfull Interference

port of Harmful Interference From Broadband Over Power Lines

dney W. Rosenbarger

6FH
32 Zalesky Rd. Cottonwood Arizona 86326
B 649 1866

ki6fhrod@commspeed.net

ation location was Mobile in Cottonwood Az. Near Cottonwood St. and Cove Pk.Wy. and the
ritage Academy.

terference Description: Carrier with Data Bursts on all 40 channels of the Citizens Band
MHZ, including channel 9 REACT Civil Emergency Frequency.

radio: Cobra 19DXIII

ntenna: Willson 2000 Trucker

hicle: 2002 Chevy Silverado 2500 HD

ate: 9,12, 2004

me: 2:00 PM

ate: 9, 14, 2004

me: 11:00 AM

requency: 40 Channel C.B. Band Channel 1 through 40

ower Line Noise Level just outside of the three test areas was very low both days, S-1 to no more
an S-3

ode: A.M.

terfering Signal Strength: Over S-9 full scale on the Cobra bar graph.

hen tuned my Screw Driver Antenna to 10 MTRS and then switched my Icom 706 MKIIG to the 27
-HZ Band and I had a continuous Carrier and Data Burst through the entire C.B. Band at S-9+ 60
B.

believe that BPL should be shut down until such time that all interference is eliminated.

hank you for your time. Rodney W. Rosenbarger

**Report of Harmful Interference From a Broadband Over Power Line Trial
or Deployment**

Name of complainant: ROONEY W. ROSENBERGER

Call sign (if applicable): KE6FH

Station location: MOBILE

Mailing address (if different): 1032 ZALESKY RD

City, State, Zip: COTTONWOOD AZ. 86326

Telephone: 928-649-1866 Email: KE6FH@COMMSPEED.NET

Description of Interference: CONTINUOUS CARRIER WITH
DATA BURST

Description of Description of your station
MOBILE INSTALLED IN CHEVY PICKUP

Receiver(s)
affected: ICOM 706 MTRG

Antenna
type: HUSTLER HF MOBILE ANTENNAS

Antenna
location: MOBILE IN COTTONWOOD AZ.

Distance of antenna from own house (feet):
0

Distance of antenna from neighboring houses (feet):
100'

Distance of antenna from power distribution line or equipment
(feet): 250'

Log of interference:

Date	Time	Frequency	Receive Mode	Interfering signal strength	Description
6-17-04	9:00 AM	29.100 (THRU) / 30.000	USB	S9+20DB	CONTINUOUS CARRIER WITH DATA BURSTS
"	"	18.100 -	USB	S 7	"
"	"	18.500	USB	S 7	"
"	"	13.000 -	USB	S 8+	"
"	"	15.000	USB	S 8	"
"	"	7.000 -	LSB	S 8	"
"	"	7.300	LSB	S 8	"
"	"	3.700 -	LSB	S 8	"
"	"	26.000 -	USB	S 9+	"
"	"	28.000	AM	S 9+	"

August 9, 2004

Mr. David Shpigler
Electric Broadband
North Mill Street
Nyack, NY 10960

Dear Mr. Shpigler,

Broadband over Power Lines (BPL) interfering signals have been here in Cottonwood since May of this year. We have seen no changes in the interfering signals from May through August 2, 2004. Three months is more than enough time to fix the interference.

It is time to face the facts that BPL radiates interference from power lines! It is time to shut down BPL because of the unacceptable interference it emits.

Sincerely,



Norman W. Vandiver, N7VF
1862 Arena Del Loma
Camp Verde, AZ 86322
928-567-9881
vandivers@kachina.net

ENCL: Report of Harmful Interference from BPL dated 8-9-04

CC: FCC-Anh Wride, Alan Stillwell, Riley Hollingworth, James Burtle,
Ed Hare of ARRL.

- 8-9-04 -

Report of Harmful Interference From a Broadband Over Power Line Trial
or Deployment

Name of complainant: Norman W Vandiver

Call sign (if applicable): N7VF

Station location: Mobileⁱⁿ Cottonwood AZ

Mailing address (if different): 1862 Arena Del Loma

City, State, Zip: Camp Verde AZ 86322

Telephone: 928-567-9881 Email: vandivers@kachina.net

Description of Interference: Carriers with modulation click

spaced approx 1.6 KHZ

Description of station: Elecraft K2 HF transceiver

Vehicle Mounted for mobile operation

Receiver(s) affected: Elecraft-K2 Tunes Amateur frequencies
3-30 MHz

Antenna type: Hustler 54" Vertical with resonators for each Band

Antenna location: Left front fender of 1987 Chev. Pick up

Distance of antenna from own house (feet): NA

Distance of antenna from neighboring houses (feet):

NA

Distance of antenna from power-distribution line or equipment

(feet): 300 Feet to One and one half miles dependent on
direction of travel.

8-9-04

Log of Interference:

Date	Time	Frequency MHz.	Receive Mode	Interfering Signal Strength	Description
8/2/04	2:PM	14,320	USB	55	} Carrier with Modulation <u>clicks</u>
		14,304	USB	55	
		14,297	USB	52	
8/2/04	2PM	3,983	LSB	57	} Carrier with Modulation <u>clicks</u>
		3,989	LSB	59	
8/2/04	2PM	3,989	LSB	1/4 mile 55	} Carrier with Modulation <u>clicks</u>
				1/2 mile 59	
				1 mile 55	

Traveling east on HWY 760
away from the BPL site.

I could hardly believe my own eyes and
ears. So come and see for your self.
These signals are traveling on the power
lines!

es Burtle

From: Anh Wride
Date: Thursday, September 02, 2004 2:58 PM
To: James Burtle; Alan Scime; Alan Stillwell; Bruce Franca; Karen Rackley

Subject: FW: BPL Interference complaint, new
Non-Public: For Internal Use Only ***

Original Message
From: Doyle Hardy [mailto:dghardy@charter.net]
Date: Thursday, September 02, 2004 2:36 PM
From: Anh Wride
Subject: BPL Interference

Name of complainant: Doyle Hardy
Signature (if applicable): K5HTE
Location: 6521 Circleview Dr, Ft Worth Tx, 76180
Billing address (if different):
City, State, Zip: Ft Worth TX, 76180

Telephone: 817-281-8670 Email: dghardy@charter.net
Description of Interference: I was in contact with K8NDS who at the time was operating mobil station Cottonwood AZ. He was at Murphy's grill in Cottonwood. The interference i from the local BPL test made my signal unreadable. When the BPL was off I had a signal of S7 and very readable.

Description of station: My station is Kenwood TS-570 D, running 100 watts

Receiver(s) affected: ICOM 706 mark 2 G
Antenna type:
Antenna location:
Distance of antenna from own house (feet):
Distance of antenna from neighboring houses (feet):
Distance of antenna from power distribution line or equipment (feet):

Log of interference:

Date	Time	Frequency	Receive Mode	Interfering signal strength	Description
09/02/04	1800GMT	14225 MHZ	SSB	S7 +	Was informed that BPL totally made my signal unreadable.

es protect from harmful interference

's rules, Part 15 includes a definition of harmful interference. It can be found in §15.3 : "Harmful interference. Any emission, radiation or induction that endangers the functioning a radio navigation service or of other safety services or seriously degrades, obstructs, or eatedly interrupts a radiocommunication service operating in accordance with this chapter."

rules are very clear about the operation of Part 15 devices, too. §15.5 details general ditions of operation, saying in part:

Operation of an intentional, unintentional, or incidental radiator is subject to the ditions that no harmful interference is caused and that interference must be accepted that be caused by the operation of an authorized radio station, by another intentional or ntentional radiator, by industrial, scientific, and medical (ISM) equipment, or by an idential radiator.

The operator of a radio frequency device shall be required to cease operating the device on notification by an FCC representative that the device is causing harmful interference. eration shall not resume until the condition causing the harmful interference has been irected.

Part 15 permits the operation of certain radio frequency devices without a license from the FCC the need for frequency coordination (47 C.F.R. § 15.1). The technical standards contained in Part 15 ensure that unlicensed devices will not cause harmful interference to other users of the radio spectrum (47 C.F.R. § 15.5). Within the Part 15 Rules, intentional radiators (devices that transmit a telecommunication signal) are permitted to operate under a set of limits. Part of the FCC Rules and Regulations has established Radio Frequency emission limits to provide interference-free radio frequency spectrum. Many electronic devices generate RF energy incidental to their intended function and are covered by these rules of harmful interference.

James Burtle

From: James Burtle
Sent: Tuesday, September 21, 2004 4:15 PM
To: 'shpigler@electricbroadband.com'
Subject: FW: BPL Interference Reports



James Burtle FCC letter Sept 1...
BPL Interference Report Aug-Se...

Mr. Shpigler,

Here is the complaint that I received from Mr. Vandiver.

Jim Burtle

*** Non-Public: For Internal Use Only ***

-----Original Message-----

From: vandivers [mailto:vandivers@kachina.net]
Sent: Friday, September 17, 2004 1:38 PM
To: James Burtle
Subject: BPL Interference Reports

Dear Mr. Burtle,

Please find attached a copy of the hard copy letter and report I mailed to you.

Respectfully,

Norman W. Vandiver, N7VF
1862 Arena Del Loma
Camp Verde, AZ 86322
928-567-9881

September 15, 2004

Federal Communications Commission
Mr. James R. Burtle
Chief, Experimental Licensing Branch
Room 7-A267
445 - 12th Street S.W.
Washington, D.C. 20024

Dear Mr. Burtle,

Thank you for your response to my interference reports of June and August of this year. Electric Broadband (EBB) has not responded to those reports.

I have continued to spot-check the amateur bands at the Cottonwood BPL sites. Electric Broadband has been making changes but they do not eliminate the interference to the ham radio and CB bands. What they are doing is shifting from one segment of the HF spectrum to another, between the three sites.

I do have an unsigned copy of a report to you from Electric Broadband. However, this report is invalid and misleading. Please refer to the ARRL analysis for the technical specifications. How can EBB deny the issue of BPL interference? The claim to working with the ARRL is hollow because EBB has not worked with the local ham radio club, Verde Valley Amateur Radio Association. Other than phone calls of no substance, there has been no cooperation from EBB.

Were BPL to be in my neighborhood, within ¼ mile, my equipment would be neutralized and my license worthless. It would be unable to perform any type of emergency communications on the HF ham bands. BPL also eliminates mobile and portable operation for emergency communications. I know the importance of having emergency communications operable...I was in Anchorage, Alaska, in March of 1964 when they had the huge earthquake. After the major quake, I got my ham station up and on the air, spending the following days and nights relaying health and welfare messages to the lower 48. I KNOW what ham radio is for!

Why aren't BPL and the FCC giving us guidelines about how to operate under their interfering conditions? If they're happy with these conditions, doesn't it seem reasonable they would tell us how to co-exist with the interference? How has it become possible for BPL promoters to steal the HF spectrum with amateur radio operators who are left to discover what is really happening? And why are the trial BPL tests snuck in and hidden, both technically and physically? If BPL is deployed, will the FCC perform their responsibilities as stated in both statute and law? I fear the worst because of the manner in which the FCC is handling BPL

(continued page two)

Letter to James Burtle, FCC
September 15, 2004
Page Two

I find it interesting our radio club cannot get a response from our own Senator John McCain regarding our concerns with this BPL interference issue. We have written Senator McCain, offering him to come to Cottonwood to experience the actual interference, but to no avail.

In conclusion, I would like an honest, straightforward reply to my questions raised in this letter. I thank you in advance for your real-life response.

Respectfully,

Norman W. Vandiver, N7VF
1862 Arena Del Loma
Camp Verde, AZ 86322
928-567-9881

cc: Anh Wride, FCC, Alan R. Stillwell, FCC, Riley Hollingsworth, FCC, William J. Post, Arizona Public Service, Senator John McCain, Verde Valley Amateur Radio Association

Encl: Interference Measurement Reports for Cottonwood, AZ, BPL sites, Aug-Sept 2004

HARMFUL INTERFERENCE REPORT FROM BPL TRIAL
Cottonwood, AZ

Date	Time	Frequency MHZ	Receive Mode	Interfering Signal Strength	Description	
LOCATION: Birch Street Apartments, on the street in front of the buildings. Cottonwood, AZ.						
8/29/2004	4:23 PM	14.165	USB	S9 + 30 db	Multiple carriers w/galloping, clicking modulation.	
8/29/2004	4:23 PM	14.168	USB	S9 + 30 db	Multiple carriers w/galloping, clicking modulation.	
9/8/2004	12:45 PM	26.988	USB	S0 + 20 db	Multiple carriers w/galloping, clicking modulation.	
9/8/2004	12:45 PM	28.866 to 29.434	USB	S9 + 20 db Modulations to 35 db	Multiple carriers w/galloping, clicking modulation.	
9/8/2004	1:15 PM	14.305	USB	S9 + 20 db	Sounds like a harsh telephone dial tone.	Station Equipment:
						Elecraft K-2 Transceiver
						Vehicle mounted for mobile
Location: Birch Street Apartments, across the street. Cottonwood, AZ.						
9/10/2004	10:00 AM	18.165	USB	S9	Multiple carriers with galloping, clicking modulation.	operation.
9/14/2004	9:04 AM	24.99	USB	S9 + 10 db	Multiple carriers with galloping, clicking modulation.	3-30 MHZ frequency.
9/14/2004	9:04 AM	24.89	USB	S9 + 10 db	Multiple carriers with galloping, clicking modulation.	Mode: single sideband
						IF band width: 2.2 KHZ filter
Location: End of Birch Street, Cottonwood, AZ.						
9/14/2004	10:00 AM	28.713	USB	S9 + 20 db	Galloping click on low-level carriers.	Antenna: Hustler 54" vertical
9/14/2004	10:00 AM	28.685	USB	S9 + 20 db	Galloping click on low-level carriers.	with resonators.
9/14/2004	10:00 AM	28.336	USB	S9 + 20 db	Galloping click on low-level carriers.	Antenna is mounted on the
9/14/2004	10:00 AM	28.267	USB	S9 + 15 db	Galloping click on low-level carriers.	left front fender of a 1987
9/14/2004	10:00 AM	28.248	USB	S9 + 15 db	Galloping click on low-level carriers.	Chevrolet pickup truck.
9/14/2004	10:30 AM	26.965 to 27.405	USB	S7	Galloping click on low-level carriers.	8' of RG8 coax connect the
						antenna and transceiver.
Location: Sawmill Cove on Cottonwood Street, Cottonwood, AZ.						
9/10/2004	10:30 AM	27.670 to 24.890	USB	S9	Multiple carriers with galloping, clicking modulation.	
Location: Sawmill Cove, site of injection on Cottonwood Street, Cottonwood, AZ.						
9/14/2004	7:24 AM	28.423	USB	S9 + 10 db	Multiple carriers with galloping, clicking modulation.	
9/14/2004	7:24 AM	28.862	USB	S9 + 10 db	Multiple carriers with galloping, clicking modulation.	
9/14/2004	7:24 AM	29.541	USB	S1		
9/14/2004	7:24 AM	24.898	USB	S5		

Norman W. Vandiver, N7VF
vandivers@kachina.net

928-567-9881

1862 Arena Del Loma
Camp Verde, AZ 86322

HARMFUL INTERFERENCE REPORT FROM BPL TRIAL
Cottonwood, AZ

Date	Time	Frequency MHZ	Receive Mode	Interfering Signal Strength	Description
9/14/2004	11:00 AM	28.726	USB	S8	Galloping, clicking modulation.
"	"	28.715	"	S7	"
"	"	28.706	"	S7	"
"	"	28.698	"	S6	"
"	"	28.686	"	S6	Station Equipment: Electra K-2 Transceiver
"	"	28.675	"	S6	Vehicle mounted for mobile operation.
"	"	28.668	"	S8	"
"	"	28.658	"	S7	3-30 MHZ frequency. Mode: single sideband
"	"	28.649	"	S7	IF band width: 2.2 KHZ filter
"	"	28.628	"	S7	Antenna: Hustler 54" vertical with resonators.
"	"	28.618	"	S7	"
"	"	28.608	"	S7	Antenna is mounted on the left front fender of a 1987
"	"	28.598	"	S7	Chevrolet pickup truck.
"	"	28.588	"	S8	8' of RG8 coax connect the antenna and transceiver.
"	"	28.558	"	S7	"
"	"	28.548	"	S8	"
"	"	28.538	"	S8	"
"	"	28.532	"	S8	"
"	"	28.52	"	S8	"
"	"	28.512	"	S7	"
"	"	28.502	"	S7	"
"	"	28.492	"	S8	"
"	"	28.48	"	S8	"
"	"	28.472	"	S8	"
"	"	28.462	"	S8	"
"	"	28.452	"	S8	"
"	"	28.442	"	S8	"
"	"	28.432	"	S8	"
"	"	28.422	"	S8	"
"	12:30 PM	28.09	"	S8	"

Norman W. Vandiver, N7VF
vandivers@kachina.net

928-567-9881

1862 Arena Del Loma
Camp Verde, AZ 86322

**Verde Valley Amateur Radio Association BPL
Committee Report on the Effectiveness of BPL Notching as of
October 2, 2004, at the Cottonwood, Arizona Trial Test Sites**

To: Sheryl Wilkerson, FCC

October 5, 2004

This Notching report is in re: Experimental Station WB9XVP; File No. 0136-EX-2004 at Cottonwood (Yavapai County) Arizona; Broadband Over Power Line System; Request for immediate cessation of Operation and Revocation of Special Temporary Authorization

From the time of the first harmful interference reports from individuals in mid-June and the VVARA filing of initial harmful interference on July 31, 2004, actual adjustments to the system by Electric broadband, LLC did not begin until mid August. Initial notching left quite a bit of interference. (See VVARA filing dated September 11, 2004 to Jim Burtle). Subsequent notching was marginally more effective. However, a problem continues to exist on the following Amateur bands; 17 meters, 15 meters, 10 meters and 20 meters. See appendix A for October 2, 2004 measurements.

These BPL signal readings were measured from an HF mobile station. In a fixed station setting the interference readings from a larger more efficient antenna system will be much higher on the affected bands. Due to the geographically small size of the trial area, no fixed amateur station is currently located near the BPL equipment. Certainly, this will not be the case if BPL is deployed throughout the community.

As evidenced in these most recent measurements, mitigation has not included MARS frequencies, shortwave broadcasts, portions of low VHF and Citizens bands.

Technical Discussion

BPL distributes data by imposing modulation on RF signals that are amplified to appropriate levels and sent over power lines. If unmodulated signals are transmitted over power lines, the amount of radiation in a select

portion of the electromagnetic spectrum could be easily reduced by simply excluding RF signals whose fundamental frequency are outside the selected band. It appears that the solution pursued by Electric Broadband is to eliminate the transmission of data within the protected (notched) band. We have no assurance that the operator of this or other similar systems will not employ other frequencies as their needs might dictate which will result in new interference. Absent clear boundaries set down by the Commission, we will constantly be in the form of a *shell game* which has already existed here when EB says "We're off" and we find they are "on". The misconception appears to be that by simply not selecting a frequency whose fundamental frequency is in a specific band of frequencies that there is no energy being radiated by the system in the band. There are two principal effects that will create RF energy in a supposed rejected band using notching:

1. Modulation bandwidth of modulated carrier signals and
2. Nonlinearities in amplifier gain blocks causing harmonic content.

Any signal that is modulated with data will, theoretically, be spread over a very wide band including the entire BPL band. The amount of spreading of a signal by data modulation is predominantly influenced by the modulation index that is a design property of the BPL modem. The slopes of the modulation sideband skirts determine how wide a notch must be to reduce the energy in the affected receiver (ham, CB, military user, etc). The level of suppression (or notch) determines the level of in-band spurious signals and must be set to levels where no harmful interference is created. To assure that the harmful interference is not created in a band that is being "notched", measurements are needed to confirm that the modulation sidebands from signals below and above the notched frequency band are being suppressed with an adequate guard band and that the depth of the null is low enough to eliminate harmful interference.

From data published in recent reports by Electric Broadband, LLC, it is clear that notching is being implemented. There does appear to be a noticeable reduction in the radiated power in some bands where notching is attempted. Electric fields in notched bands are on the order of 20 db below the levels above and below the notched bands.

The question remains on whether there is sufficient reduction in the radiated energy in a "notched" band to eliminate interference. What is difficult to determine in the tables produced in the September 16, 2004 report is whether the field intensity levels are measured accurately enough to determine if

notching alone can eliminate interference in the notched bands. The local amateurs who used their mobile stations to characterize the levels of radiation are convinced that even with notching certain bands are unusable because of BPL interference. For example, the 17-meter band (~18.1 MHz) is rendered unusable by levels of radiation from the power lines carrying conditioned (notched) BPL signals.

Notching alone can not assure that signals are not emitted on unintended frequencies. Because the BPL system relies upon the regeneration and retransmission of signals at periodic intervals within the network, this means that amplification is needed. A reality of life is that amplifiers are never perfect, one byproduct of amplification is called intermodulation. Intermodulation (intermod) allows energy to be regenerated on frequencies that were not initially transmitted. These signals can be the source in interference. This is a function of the novel properties of each amplifying stage (repeater/retransmitter) and can vary widely. A second issue is that in some cases 'notching' is realized through the use of Digital Signal Processing (DSP). These techniques do not eliminate signals they merely attenuate (reduce) them so DSP notching does not fully equate to elimination of energy.

The proponents of the Cottonwood BPL test have spent hundreds of hours adjusting and readjusting a very small universe of BPL equipment, including bringing in the manufacturers' representatives from abroad practically this amount of attention can not be applied to a large system on a regular basis. The unfortunate recipient of interference must be both technically adroit and articulate if they are to even raise the question to the operators of the system. We have been trying to gain genuine relief since June 17, 2004, and still have received only a modest remedy and little if any exhortation to this end has been forthcoming from the Commission. In a wholesale deployment, the average ham or spectrum user will be totally ill-equipped to articulate the slight being worked upon them.

Summary

Some say that notching by selecting carrier frequencies (sometimes referred to as the DSP solution) will solve the harmful interference problem. The reality is that the problem is solved only when the levels of radiation in the affected bands (ham radio, CB, military, etc) drop below acceptable levels as determined by testing. This may be very difficult to prove in the test cell in Cottonwood, AZ. So far, testing by experts has failed to capture the true levels of field intensities in the notched bands that correlate with an

independent assessment. This will probably be incredibly difficult for APS (Arizona Public Service) to maintain if BPL is deployed on a large scale. APS will be inundated with requests to fix problems throughout their network if many tweaks are required to fine tune a system to prevent unacceptable interference levels.

Notching will not be sufficiently effective, by itself, overcome the effects of harmful interference in the HF bands. Even a combination of notching and radiated power limitation will likely be insufficient to overcome the effects of harmful interference.

The additional concern that should be expressed is that there remains no assurance that even if successful 'notching' is implemented today that it will stay in place. By accident or intention the operator of the BPL system perhaps under pressure to increase speed, or service more customers, will have at their disposal the ability to simply re-occupy these portions of the spectrum as they desire. That means that the licensed users of the spectrum must be ever vigilant. In the case of the NTIA they have requested that portions of the spectrum simply be protected *en banc* and one might assume that the Commission will so stipulate or otherwise condition the licenses of users who might occupy those segments if the NTIA's request is granted.

Many other users of spectrum in closed systems such as cable TV, are required to annually assert to the Commission their frequency as well as power utilization within those closed conductors, it seems only equitable that a radiating user should be required to account for their activities in a similar fashion. Unless clear rules that are easy to test are in place at the outset and the Commission is prepared to aggressively enforce these rules, the HF spectrum users will experience a major degradation in the use of their licensed bands and the Commission will be the loser in endless hours of wrangling over similar issues for years into the future.

Respectively submitted,

Robert Shipton, K8EQC
Vice President
Verde Valley Amateur Radio Association
BPL Committee Chairman
Cottonwood, Arizona

APPENDIX A

BPL Signal Strength Readings

Recorded October 2, 2004 from 9:50 AM through 1:00PM

Radio and antenna information:

Icom 706 Mark 11 G

Preamp off

Selectivity: 3.00 khz SSB, CW- (2.4 khz SSB filter)

8.00 khz AM

8.00 khz FMN

12.00 khz FM

Hustler antenna- 54 inch mast, bumper mounted at right rear corner 2003 Chevrolet pickup. Using Hustler 400 watt resonators for each band with the exception of 160 meter band where 80 meter and 40 meter resonator used for that band.

Coax- is 18 feet RG 58. Rated loss 4.5 DB at 100 feet. Velocity factor- 66%

Signal readings were taken by the following at the 3 BPL sites in Cottonwood, AZ at a distance of approximately 30 feet from the power lines.

**Mike Kinney- KU7W
1652 E. Sierra Drive
Cottonwood, AZ. 86326**

**Norm Vandiver- N7VF
1862 Arena Del Loma
Camp Verde, AZ. 86322**

*forwarded to
operator
10/7/04*

nes Burtie

From: robert shipton [xytek@commspeed.net]

Date: Wednesday, October 06, 2004 3:53 PM

To: Sheryl Wilkerson

CC: Anh Wride; Alan Stilwell; Riley Hollingsworth; James Burtie

Subject: Verde valley Amateur Radio Association , Cottonwood, AZ BPL Notching summary.

Sheryl

Here is the mitigation and notching summary from the VVARA, Cottonwood, AZ as of 10-02-04

Sincerely,

**Robert Shipton, K8EQC
President, Verde Valley Amateur Radio Association
BPL Committee Chairman
Cottonwood, AZ**

Sawmill Cove Area

Frequency	S Readings/ Comments
1.800- 2.000 mhz-	No BPL signals detected
3.500- 4.000 mhz-	No BPL signals detected
6.000- 6.900 mhz-	BPL signals detected/ 6.617 mhz- S3 SSB
7.000- 7.300 mhz-	No BPL signals detected
7.540 mhz-	BPL signals detected- S5- SSB, S6- AM Started at 7.400 mhz.
10.000- 10.150 mhz	No BPL signals detected
10.600 mhz-	BPL signals real faint on SSB
11.000 mhz-	BPL signals real faint on SSB
12.000 mhz-	BPL signals real faint on SSB
13.000- 13.900 mhz-	BPL signals real faint on SSB
14.000- 14.350 mhz-	No BPL signals detected
18.068- 18.168 mhz-	No BPL signals detected
18.350- 19.000 mhz-	BPL signals detected/ 18.350 mhz- S9 SSB
19.000 mhz-	BPL signals S9 SSB, S9+20 DB- AM
20.000 mhz-	BPL signals S7 SSB, S9- AM
21.000 mhz-	BPL signals detected S5 SSB, S7 AM
21.100 mhz-	S4 SSB, S7 AM
21.200 mhz-	S3 SSB, S6 AM
21.300 mhz-	S3 SSB, S7 AM
21.400 mhz-	S4 SSB, S7 AM
21.450 mhz-	S5 SSB, S7 AM
21.500 mhz-	BPL signals detected S5 SSB
21.614 mhz-	S9+20 DB
22.000 mhz-	S9+10 DB
23.000 mhz-	No BPL signal detected
24.890- 24.990 mhz-	No BPL signals detected
26.000- 27.923 mhz-	BPL signals detected S7 SSB on and off intermittent.