Long Delay Echoes

Feedback from summer 2007 at www.qrz.com

www.qrz.com

LDE… Several articles on LDE were published at Antentop (use google search engine to find all articles at the site). Evidence of different people from different countries shows that LDE is not a myth, LDE is the reality.

Subject "LDE" at www.qrz.com was appeared at hot summer 2007. Lots interesting commentaries were at the topic. Some of the replies (thanks for courteously permission of the authors) were pasted here. Next ball to reality of the LDE

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g4tut

Posted: July 09 2007,04:12 "QUOTE"

Long Delay Echos

Group: Moderators
Posts: 227
Joined: Sep. 2005

Long Delay Echos (LDE) have long been a source of fascination to Radio Amateurs.
Over the years there have been a number of reports of Radio Amateurs hearing their own transmission delayed by as much as 9 seconds.

W5HTW
Posted: July 09 2007,08:21

I also experienced an LDE while working for the US government, in the mid 1960s. It was on CW.

It was only a portion of a regular one-minute long transmission we made, automatically, on a guard frequency. Our guard sent one minute of CW then one minute of monitoring. We monitored simultaneously four different HF frequencies, on speaker monitor, as we were often away from the operating console.

Following one of the one-minute transmissions, a few seconds after it stopped, part of that transmission was repeated back, but since I was not at the console I do not know on which receiver it was heard. At the time we were monitoring frequencies at 6, 10, 13, and 18 mhz. My guess would be the 13 mhz frequency, but it is only a guess.

The duration of the echo was only about 10-12 seconds, not a complete retransmission. It had no fade. It was on frequency, so was not shifted by any Doppler.

It was our signal, same speed, same automatic keying characteristics, same everything. We had a tape of it for a long time, and I had a copy of the tape, but at some point, years ago, I lost it or erased it.

LDEs are real. It appears the most logical solution is some sort of ducting, the signal returning to earth in a moving path, which accounts for it being heard only briefly at the originating site.

Ed

Ed wrote an interesting article on LDE that is at his website : http://w5htw.home.att.net/index.html. With Ed's kindly permission the article is printed below.

LDES - LONG DELAYED ECHOS

There are stories told in the cult books of radio signals being heard again years after the radio station left the air. One such story involved a broadcast AM station that had closed down, yet the radio signal was heard nearly two years after the station went off the air.

Those stories are like the UFO and ghost stories. They have no foundation.

LEDs, though, are very real. What they are not, are attempts by some alien space craft to contact us. What they are is an as-yet unexplained electromagnetic phenomena relating to radio waves. In the 1960s Stanford University's Physics Lab tried to find an explanation for them but LDEs have no apparent useful purpose, so allocating much in the way of scientific time or funds is pretty unlikely. The study closed with only a few suggestions.

There are some facts available about the standard LDE. First, it does not show signs of Doppler shift. It is on frequency, it remains on frequency for the duration, and the pitch, if it is CW, remains steady.

Secondly, it is rarely a full transmission. It is segments, often very short segments, only five or six seconds, of a transmission. It may not begin at the beginning, and it may not end at the ending of the original transmission. It is not complete.

Third it does not fade in or fade out. It is "there." At least that is true of the one I heard that was so clearly identifiable. It turns on, and then it turns off.

Fourth, they have been showing up LONG before computer sound cards. While it is possible one or two could be a hoax, it is highly unlikely.

Fifth, they are not limited to the ham bands.

Sixth, reports of them are mostly in the 3 to 18 mhz range. Occasionally one is heard above that, and on very rare occasions, one below that. This could be because most radio activity is in that range, so it really isn't a defining fact, but it is a point to consider.

MY OWN EXPERIENCE

To my knowledge I have heard only one LDE. It is possible I have heard others, but did not recognize them as such, perhaps due to crowded band conditions, or other situations. The one I heard, though, was unmistakable. To explain it, I have to set the scene a bit. This was in 1967, in the Far East.

I was a government radio operator/tech at a somewhat isolated radio relay site. We ran a CW net that was used almost entirely for the purpose of establishing contact and setup procedures for RTTY operations. Hence it carried very little, and very intermittent, CW traffic. We ran three or four transmitters simultaneously, depending upon time of day. We ran four receivers (Collins 51J3/R388) models in a console. There was a J38 straight key for our use. There was also a Frederick Electronics Baudot to Morse converter, that converted 5-level punched paper (or plastic) TTY tape to Morse. We ran what is typically know as a "guard" frequency. You've heard them on the marine bands. It sends something like: **VVV VVV VVV DE KGP444 KGP444 KGP444 QSX 4/6/10 K** And then there is silence. That is the listening period.

Our machine sent this (and this is a fictitious call sign, not the one we used)

VVV VVV VVV DE AAA123 AAA123 AAA123 VVV VVV VVV DE AAA123 AAA123 AAA123 VVV VVV VVV DE AAA123 AAA123 AAA123 QSX 4/6/10 K (In the day time the freqs would change to 6/10/13)

That sequence, at 18 wpm, took just about one full minute. The tape then looped (using "letters" characters) for another full minute, during which time any station could call in.

Long Delay Echoes

Because our transmitters were located a couple of miles away, we ran the receivers at full RF gain all of the time. There was NO muting! All four receivers were wired to a speaker panel. That meant any signal heard would be heard throughout the building. Twice each hour, on the hour and on the half hour, one of us (there were usually only two on duty) would actually sit down at the receivers for "close monitor." For that, we switched the speakers to a panel down near the desktop, and we would sit for two minutes and monitor. At all other times, the operator was away from the position and doing other things, so he had to be able to hear the R388s above all the Teletype noise in the building - and we had a LOT of such noise! Motors for printers and machines, plus air conditioning, fans, and the like. So the receivers were very loud.

When our transmitters keyed, the AGC action of the receivers served to mute them, as we kept the AGC slow. The first "beep" of the CW shut down the AGC, which prevented any full breakin. There was no other muting. Just pretty much receiver overload!

Now the scene is set. It is not close monitor time, and I, with my partner, am doing other work in the RTTY section. We grow accustomed to hearing the receivers go dead as our own transmitters overload them. Then the background noise returns.

Suddenly we hear: **VV DE AAA123 AAA123 AAA123 VVV** Then it's gone. It lasted perhaps five or six seconds. It did not fade in, it did not fade out. It "turned on' and then it "turned off." It was our keying. At our speed, and automatic. It was strong, but nowhere near strong enough to kick the AGC and overload the receivers. It was not strong enough to even "thump" them. It was simply a fairly strong CW signal.

For an instant I thought it was someone calling us. Since that did not happen unless there was a problem, I moved quickly to the console. I stopped our automatic keying and I listened. No one on any of the frequencies. I sent "QRZ DE AAA123 K" with the hand key. Got no response. I tried that maybe three times. No one was out there. Of course I was keying all four transmitters simultaneously, so no matter what frequency he had called in on, I would hear him.

Then it dawned on me! I had heard "DE AAA123!" He had been identifying as my station! Not AAA123 DE AAB321, for example. It was "DE ME!"

By sheer luck, we had been running a slow speed monitor tape on another receiver in a different rack. That was a rack with two Collins 51S1 receivers, that we used to monitor other things, but it had been set up to monitor a couple of frequencies, and I had, earlier in the afternoon, set one of those two receivers on one of our guard frequencies. The other was on some other frequency.

What if, I thought, the echo had been on that particular guard channel? I had no way of knowing which of the console receivers had picked up the signal but it was early evening, and we had been about to close down the 13 mhz guard, as it was no good for us at night, so it wasn't likely it would be there. I could be on our 4, 6 or 10 mhz frequencies, and there was no way of knowing. But the 51S1 was on the 6 meg guard frequency. What if!

I ran the tape back. Yes, indeedy, it had been on the 6 mhz guard frequency. And I had a tape of it. Not only that, because because the four channel recorder used one of its channels to permanently monitor a highly accurate 1 KHZ oscillator, I could now tell precisely what time the signal had been recorded, using our test gear designed for that purpose.

All that told me nothing. Except it was not one of our field stations. It was not our own transmitter being keyed by our keyer. It was a received signal, and in ham language would have been RST589. We gave it a QRK5, QSA5. The only thing I knew for sure about it now was it had been on our 6 MHZ frequency, not on the four or 10 mhz one.

I made a copy of that segment of the tape, as it was something we wanted our technical staff to analyze for us. They did, and learned nothing more. I kept the tape for a few years but finally erased it.

Shortly after the actual occurance, (perhaps a few months) which neither my coworker or I understood at the time, I happened across a story on LDEs. And then we knew what we had heard. Again I played the tape several times, but garnered no information from it.

Except one thing. The "echo" had begun 16 seconds after the end of our transmission. But it had not begun at the beginning. It had not echo'ed our entire transmission, only a few seconds of it.

All this took place outside the USA.

Some things we did know. It was not ham operators. It was not a hoax. It was not foreign intelligence. It was not one of our own transmitters. It was not a recording. (thank about that one, and why you know it was not an audio recording!) It was not one of our field stations. It did not fade. It had no Doppler. It was our keying, at our speed. It was reasonably strong, but not enough to trigger AGC on the receiver. It was very clear, with no QRM. It was in the 6 MHZ band.

I have never heard another one. I have some theories about LDEs, but I'm no scientist, so I just keep them to myself, mostly. I think the key, though, is the word 'ducting.'

Have Fun.

K8VPL

Posted: July 10 2007,07:15

An LDE happened to me once, back around 1963, at a near sunspot minimum. About 3AM Eastern Time, I don't remember what season, I was trying to hear ANYTHING on 40 meter CW. The band was dead, and the noise level was very low. I had called several CQ's, and heard the last several letters of my call coming back about 3 to 4 seconds after I sent them. I tried a few "dits", and they came back just as I sent them. This went on for about 5 minutes. The returning echoes sounded like they had come a long way, all fluttery, and just above the noise level, but on the same exact frequency, and matching my fist exactly. I'll never forget what they sounded like.

73
Ted, K8VPL

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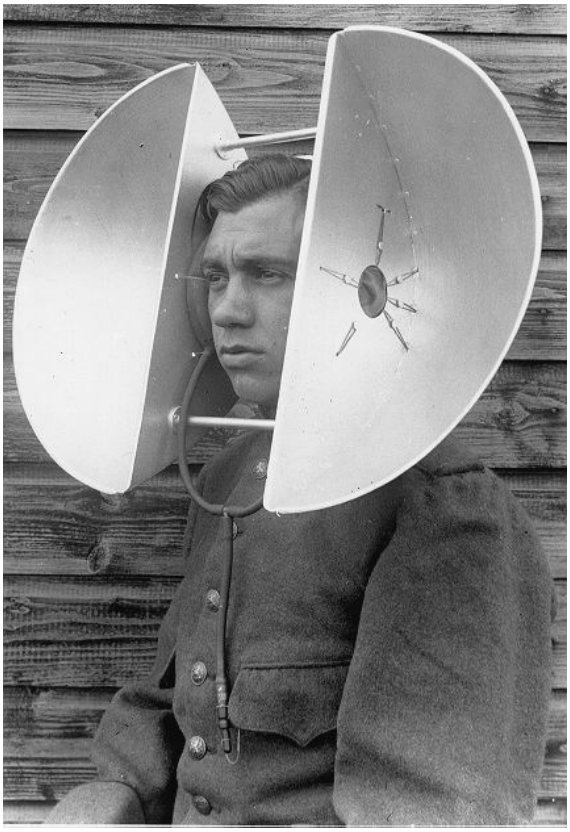
aa4w
Posted: July 12 2007,19:12
I just wanted to add my experiences with LDE's. In the late 60's I spent quite a bit of time on aircraft carriers in the Mediterainean and we were running lots of phone patches. On numerous occasions I heard the last several words we had transmitted after we unkeyed the transmitter. At first I thought it was someone playing a prank but I soon realized it was our signals. The delays were longer during times when the propagation was best and as I remember I never heard them during daylight hours which figures in with the ionaspheric conditions. I agree it is an odd sensation the first few time you hear it.

Rick AA4W



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n9kpn, Tim

Posted: July 18 2007,15:37

I experienced LDE on 11M (CB SSB) back in the late 80's. A friend would be in town and drive to college some 50 miles away. He'd go mobile and I'd use my base station. The almost half way point, 27 miles, was where we would have to sign off. Sometimes we'd make it a little bit longer, but rarely too much farther.

One evening as he is headed back to school as he got further apart, we kept hearing another station jump in. He'd hear one when I talked, I'd here one when he talked. But they would not reply when we addressed them. As he got further away we noted that we were hearing a delay of the original transmission! Once past the half way point we could hear each other from the delayed transmission. This was one of the only times we could hear each other the full 60 or so miles. Eventually the echo faded and we lost contact.

73! I.G.