

IN THE DISTRICT COURT IN AND FOR  
 THE COUNTY OF ADAMS AND  
 STATE OF COLORADO  
 Civil Action No. 27486

DAVID A. BAYSINGER, WILLIAM A. )  
 BAILEY, JR., JAMES L. DOWD, )  
 KEITH FARRIS, MELVIN M. )  
 RENBERGER, STEVEN RAPP, DAULA P. )  
 RICHARDSON, DAVID W. RICHARDSON, )  
 HARVIN L. RICHARDSON, COLORADO )  
 COUNCIL OF AMATEUR RADIO CLUBS, )  
 a non-profit corporation, on behalf )  
 of themselves and all others )  
 similarly situate, )  
 )  
 Plaintiffs, )  
 )  
 v. )  
 )  
 CITY OF NORTHGLENN, a municipal )  
 corporation, )  
 )  
 Defendant.)

REPORTER'S PARTIAL  
 TRANSCRIPT

BE IT REMEMBERED that on June 17, 1976, the same  
 being a regular judicial day of the 1976 term of court of  
 the Seventeenth Judicial District of the State of Colorado,  
 the above-entitled action came on for Trial to the Court be-  
 fore the HONORABLE CLIFFORD J. GOBBLE, District Court Judge,  
 presiding in Division A of the District Court in and for the  
 County of Adams, State of Colorado.

APPEARANCES:

For the Plaintiffs: Marshall Quiat, Esq.  
 Attorney at Law  
 1050 17th Street  
 Denver, Colorado

For the Defendant: Charles L. Sharp, Jr., Esq.  
 Attorney at Law  
 1440 Havana  
 Denver, Colorado

THE COURT: All right, proceed.

MR. QUIAT: All right, at this time, your Honor, I  
 would first like to call the plaintiff David Baysinger.

DAVID A. BAYSINGER,

called as a witness herein, by and on behalf of the plain-  
 tiff, being first duly sworn, was examined and testified as  
 follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q State your name, please.

A My name is David A. Baysinger.

Q And you're the first of a series of plaintiffs in  
 this case?

A Yeah, I believe so.

Q Mr. Baysinger, you're a resident of the City of  
 Northglenn?

A That is true.

Q What is your address?

A 1040 East 112th Place.

Q And that is within the City of Northglenn, the  
 County of Adams?

A It is.

Q I hand you what has been marked Exhibit, Plaintiff's  
 Exhibit 1, purporting to be a copy or one of the original  
 copies of that document, are you familiar with that?

A Yes, I am.

Q And that is your application for building permit?

A That is true.

Q It bears the date of October 20th, 1975?

A Yes.

Q And it indicates that it was denied that date?

A Yes.

MR. QUIAT: Your Honor, this was admitted in defendant's pleadings -- not the document but the facts involved in the document. I offer Exhibit 1.

MR. SIARP: No objections.

THE COURT: It will be admitted.

Q (By Mr. Quiat) Mr. Baysinger, in the complaint and in the answer is admitted that you presented plans and specifications showing that the tower was in conformity with the building codes and all the requirements of law, is that correct?

A That is.

Q And you were told that the only reason for not granting it was that an ordinance had been passed?

A That is what I was told.

Q May I call you David?

A Yes.

Q David, the allegations of the complaint indicate that you are an amateur radio operator, tell the Court your license call sign, please.

A Yes, my call sign is WDOBAE.

Q And how long have you been a licensed amateur radio operator?

A I have been licensed since the Spring of 1970.

Q What category of license do you hold?

A The class of advanced.

Q And what does that mean exactly?

A That gives me by federal government authorization the right to use almost all amateur radio frequencies and all types of operation available to amateurs.

Q Do you exercise this license?

A Yes, I do.

Q In addition to your license as an operator, do you have a license for a radio station?

A Yes, they are one and the same on the piece of paper.

Q And where is your station located under FCC regulations?

A The station is located at my home at the previously mentioned address.

Q And is it licensed at that area?

A It is.

Q And when did you receive the license for that location?

A That -- the change of license went into effect, it seems to me, the second week of November.

Q When did you move to Northglenn?

THE COURT: What year?

A 1975.

Q (By Mr. Quiat) When did you move to Northglenn?

THE COURT: 1975?

A Correct. I moved to Northglenn in the last week of September, 1975.

Q (By Mr. Quiat) And did you make immediate application for change of license?

A Within two days.

Q And that is under the requirements of the federal regulations?

A That is true.

Q And under the federal regulations you then have the right to establish your license, your station and run it at the new location, having made the application?

A Immediately with a special signature as an addendum to your call sign, yes, sir.

Q And you did do this?

A Yes.

Q Now, having been denied an antenna for a tower, what affect has this had upon your ability to operate your radio station?

A It has been what I would classify rather severe limitation in my ability to receive signals, transmit signals for public service benefit or otherwise.

Q How do you receive now?

A Could you restate the question?

Q What do you use to receive and send signals?

A Two very low to the ground antenna systems.

Q Now, what are these?

A Specifically?

Q Yes, well, describe them for the Court.

A One antenna which is used mostly in the public service area is a piece of wire from my television antenna one foot off the roof to my lot lines in the back yard. The other antenna is a single aluminum vertical type antenna which is mounted on the ground in the back yard.

Q Let's take the first one that's a wire that is

stretched from the roof to the lot lines.

A Yes, very thin wire.

Q And it is connected to your sending and receiving set?

A It is.

Q Dave, is it possible to operate any radio without an antenna?

A No, not effectively.

Q I have a little Japanese transistor set, does it have an antenna?

A Yes, it does.

Q And where is the antenna in this set?

A The antenna in that one is probably self-contained. It's rather inefficient compared to an antenna it might have but it is self-contained.

Q There is an antenna on that one?

A Yes.

Q Is that true of every transistor set?

A Yes.

Q Is there -- what is the spectrum of radio frequency, if you know?

A For which service?

Q All services. What frequencies does it involve?

A Radio frequencies go all the way from below what we normally call the AM broadcast band which would be far below the station which is licensed KLZ in Denver, all the way up into radio energies in the microwave spectrum which is used for point to point only and includes television which is a form of radio energy, AM, FM television stations, amateur

radio and all the rest.

Q All right, you say KLZ, that's five hundred and sixty thousand cycles a second, isn't it?

A True.

Q And it goes from there how high?

A Possibly up to one hundred or two hundred gigahertz.

Q One hundred?

A Let's say two hundred gigahertz although not all of that is duly -- are we technically able to use. We being the public.

Q All right now, I have on the paper written down five hundred and sixty thousand and under that I have written down two hundred billion, are these the figures that encompass the range of radio signals?

A Yes, I would say so.

Q Now, is television in that in between those two extremes?

A It is.

Q All television?

A All television.

Q Does television require an antenna?

A Yes, it does.

Q Can you broadcast television without an antenna?

A No.

Q Can you receive television without an antenna?

A No.

MR. SHARP: Your Honor, I'm going to object to this line of questioning.

THE COURT: Seems to me like it's immaterial but --

MR. SHARP: That's the objection.

THE COURT: It's nice to find out about it but let's proceed, let's get down to what the case is about now.

MR. QUIAT: Your Honor, the ordinance requires all antennas to be licensed so that anyone owning a TV set has to have a special use permit because he has a radio antenna on his television and it will require a hearing and it will require a license to put that antenna on. At least this is what the ordinance says. That is exactly what I'm getting at, your Honor.

THE COURT: All right.

MR. SHARP: Again, I object. The ordinance does not say that at all, the ordinance specifically speaks to radio towers and antennas only. We are talking about towers and antennas, we're not talking about frequency ranges, televisions or range.

MR. QUIAT: This is radio, television is radio and this is what the evidence before the Court is.

THE COURT: All right.

MR. QUIAT: It comes out on a tube rather than out of a speaker but it still is radio.

THE COURT: Let's don't argue the case, let's proceed.

Q (By Mr. Quiat) Dave, you have indicated that your ability to use your amateur radio has been restricted. Can you give the Judge some examples of that?

A Yes. Without getting into too much detail, your Honor, every radio station or television station must have --

MR. SHARP: Your Honor, again I object to this line of questioning, he's had a right since October 27th to apply for a radio --

THE COURT: I know, yes, overruled.

A Yes, every radio station or television station must have proper antennas to transmit, also to receive or there is a tremendous inefficiency in the system. These inefficiencies in our radio service severely hampers our ability to simply communicate whether it be across the city, across the state or the country or the world.

I have experienced these problems in attempting to contact other stations to possibly get information from the other side of the state to a hospital in Denver or something like this and the reason, after checking my equipment on other antenna systems, is the inferior antenna system.

Antennas have to operate higher off the ground to be efficient in the bands which are available to us by federal rule.

Q (By Mr. Quiat) Dave, are you active in any nets?

A I am.

Q Are you active in any emergency nets?

A Yes.

Q During the Guatemalan earthquake did you act to assist the Guatemalans?

A No, I didn't.

MR. SHARP: Your Honor, again I'm going to object to this line of questioning.

THE COURT: Yes, I don't care about Guatemala, I want to find out about this ordinance, that's what I'm

interested in.

Q (By Mr. Quiat) Is it important that there be amateur radio operators in Northglenn if there are some in Denver?

A Yes, it is.

Q Why is that?

A Because there are many, many times when the signal from a far station cannot be heard in Denver but could be in Northglenn or the other way around. There are even times when several blocks or a very few miles can make the difference between hearing and not hearing.

Q Then it isn't a static situation but it changes all the time?

A No, it is not possible to have one station, let's say for one city or one area to do the job.

MR. QUIAT: All right, you may inquire.

CROSS-EXAMINATION

BY MR. SHARP:

Q You were informed of the passage of the ordinance making this a special use permit requirement, were you not? Were you informed at the time you applied for the building permit that an ordinance had been passed requiring you to apply for a special use permit?

A I had been informed that there was one, since it was not published I hadn't had a chance to see it.

Q How long have you lived in Northglenn?

A Since -- as I previously said -- since the last week of September, '75.

Q At what address?

A 1040 East 112th Place.

Q Did you make any attempt after the ordinance became effective to apply for a special use permit?

A No, sir, I did not.

MR. SHARP: I have no further questions.

MR. QUIAT: No further questions, your Honor, from this witness at this time.

THE COURT: That's all.

MR. QUIAT: I would call Darla Richardson.

DARLA RICHARDSON.

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q You're Darla Richardson?

A Yes, sir.

Q And you're one of the plaintiffs in this case?

A Yes, sir.

Q Darla, are you an amateur radio operator?

A Yes, sir.

Q What is your license call sign?

A WNBODUV.

Q And is your husband also a licensed amateur radio --

A Yes, sir.

Q And what is his call sign?

A KOWOP.

Q Do both of you reside in Northglenn?

A Yes, sir.

Q Darla, did you attend every single meeting of the City Council, the Zoning Commission, the public meetings and all other matters when the ordinance was -- the present ordinance concerning towers and antennas was discussed?

A Yes, sir, I did.

Q At that time or at any such time did any person appear in opposition to the amateur radio operators seeking to have antennas and towers?

A I don't believe there was any person that ever came opposing us.

Q Did the council require or require that the hearing be advertised so that opponents could be brought forward?

A Yes, sir, it was advertised in newspapers.

Q And did any come forward?

A No.

Q Darla, did you have occasion --

MR. SHARP: Your Honor, I'm going to object to this line of questioning. Obviously, nobody objected, that's why they passed the ordinance allowing radio towers.

MR. QUIAT: Your Honor, that is not, he's distorting that.

THE COURT: I don't know what the purpose of it is but anyway, you proceed.

Q (By Mr. Quiat) Did anyone ever speak in favor of this ordinance to the City Council?

A Yes, many people.

Q Now, the ordinance that they did pass?

A Oh, the one that they did pass?

Q Yes.

A No.

Q Mr. Sharp indicated that the radio amateurs were agreeable to some of the specific items in that, is that true?

A Yes.

Q But sofar as a special use for amateur towers and antennas, did any person whether he was an amateur or not, ever come forward and support that?

A State that again, please.

Q Did anyone support this present ordinance?

A In total, no.

Q Darla, did you pass petitions in the Northglenn aren?

A Yes, we did.

Q Did you find any opposition to amateur radio towers and antennas?

A No, we canvassed the city, we went into most houses that we could find people home and we got no opposition.

Q Darla, did you have occasion to conduct any public activities of a radio amateur nature seeking feelings of the community?

A We had a display in the Northglenn Mall and we got very good results with that.

Q Did you have any opposition to radio towers and antennas at that demonstration?

A No, sir.

Q I hand you what has been marked Exhibit 2 and I will ask you if you will tell the Court what that is.

A This is a permit issued by the City of Northglenn Building Department for the erection of our tower at 1184

West 101 Avenue, antenna and tower.

Q When did you erect these?

A This was done early last Spring.

Q In '75?

A Yes.

Q And this was as an accessory use, was it?

A Yes.

Q Did you have any hearing?

A No.

Q Have you had any problems?

A No.

Q Did anyone object to your tower at the time you put it up?

A No, sir.

Q And has anyone objected since?

A No.

Q Was this posted on your premises before the tower went up?

A Yes, for about eight months.

MR. SHARP: No objections.

MR. QUIAT: We offer Exhibit 2, your Honor.

THE COURT: It will be admitted.

Q (By Mr. Quiat) Do you know of other existing towers and antennas in Northglenn that were done under permit of accessory use without hearing or opposition?

A Yes, sir, I believe there are about five or six of them that I know have permits, at least.

MR. QUIAT: You may inquire.

CROSS-EXAMINATION

BY MR. SHARP:

Q At these hearings, the Planning Commission/City Council, at thirty-two thousand five hundred residents, about how many people were at this hearing?

A At these hearings?

Q Yes.

A There were anywhere from fifty -- anywhere from ten to fifty to a hundred people.

Q How many of those that wanted radio towers were radio operators?

A All of them that I know of.

Q How many homes did you visit?

A On what?

Q On your petition.

A On the petitions, I believe we visited, oh, four or five hundred, whatever time permitted.

Q This permit was issued when, in the Spring of '75?

A No, it was issued, I believe, in the Fall but we actually put it in, finished the erection in the Spring, I believe.

Q Of '75 or '4, Fall of '74?

A I believe we got the permit in the Spring -- I have got the dates back there, I have got a folder there that will give it exactly. There's a folder that has a yellow sheet, the same type of application that's already been brought up.

THE COURT: Says here 4-30-74.

A That's not it. Is that one on there -- that's when the permit was issued and it went up in August this last year.

Q (By Mr. Sharp) So at that time the city was allowing

radio towers to be built as an accessory use? Is that correct?

A Evidently.

MR. SHARP: I have no further questions.

MR. QUIAT: No further questions.

THE COURT: That's all.

MR. QUIAT: Maxine Sumey, please.

MAXINE SUMEY,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q You are Maxine Sumey?

A Yes, I am.

Q Where do you live?

A In Northglenn.

Q Would you give your address?

A 11224 Corona Drive.

Q You're not a plaintiff in this case?

A No, I'm not.

Q Are you an amateur radio operator?

A No, I am not.

Q Is there an amateur -- is your husband an amateur radio operator?

A No, he is not.

Q You're acquainted with Dave Baysinger, are you not?

A Yes, I am.

Q Have you had occasion to use, have personal and



community use of amateur radio?

A Yes.

Q Would you tell the Judge what it was?

A Well, my father lives in Rapid City, South Dakota and he's an amateur radio operator and many times we have gone over to Dave Baysinger and we have communicated with my father.

Q Tell what, if any, communication through amateur radio you had a year or so ago.

A During the Rapid City flood -- is this what you're getting at?

Q Yes.

A Real early one morning I got a phone patch from an amateur radio operator here in the metropolitan area stating that there was a bad flood. This was the first I had heard of the flood and my dad called to say that they were all right and -- but throughout the hours of the bad flood my dad was sole communication in the Rapid City area. In other words, he was about the only communication in and out of the state or in and out of Rapid City, I should say, and through this there was a group of people in Northglenn that had gotten together and we had sent food and clothing and emergency things. It was Western Airlines that had flew this out and at that time I believe we communicated through Larry Doud who is also a resident in Northglenn.

Q And all of your communication was through amateur radio?

A To my knowledge, yes.

Q There was no phone?

A There was no phone. All the phones were down in Rapid City.

Q And without this the food and medical supplies could not have been taken to Rapid City?

A Well, I think it was food and clothing, I'm not sure about medical but I know there was milk involved and things like this.

Q You say you live close to Baysinger, have you had any difficulty with any interference or with any problems?

A Well, we haven't been able to talk to my dad in the last several months because of interference and since like daylight savings time, I have not talked to him at all.

Q You're talking about on the ham radio?

A Yes.

Q Has it caused any difficulty to your television, your telephone, your hi-fi or anything of that sort?

A None whatsoever.

Q Do you know what the cause of being unable to talk to Rapid City at this time is?

A Technically, no.

MR. QUIAT: I have no further questions.

THE COURT: Any questions, Mr. Sharp?

MR. SHARP: Just one.

CROSS-EXAMINATION

BY MR. SHARP:

Q Did you talk to Rapid City on Mr. Baysinger's ham radio; is that correct?

A Yes.

Q When was that?

A For an exact date, I can't give you.  
Q Is it since he lived in Northglenn?  
A Right.  
Q And with his present antenna system I presume?  
A You have to ask him that.

MR. SHARP: No further questions.

MR. QUIAT: Mr. Bill Bailey.

WILLIAM A. BAILEY,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Please state your name.

A William A. Bailey, Jr..

Q Mr. Bailey, do you reside in Northglenn?

A Yes, I do.

Q I hand you what have been marked Exhibits 3 through 26. I will ask you to look at them. Mr. Bailey, are you familiar with the areas in Northglenn represented by these photos?

A Yes, I am.

Q Are you familiar with the photos? Did you take all or part of them?

A Just part of these.

Q But you're familiar with all of the photographs?

A Yes.

Q Do the photographs fairly represent what they purport to show?

A Yes, they do.

Q Now, there is some closing up the distance to show a series of poles sticking up, isn't there?

A Yes, sir.

Q But each one of them is accurate sofar as what it represents?

A Yes, sir.

Q And is each one of them representative of an area in Northglenn?

A Yes, they are.

Q Is there any large area of Northglenn that was -- is not covered by some of these photographs?

A Well, there are some places in Northglenn that I did not take pictures of but that represents most of Northglenn.

Q Well, have you -- is it a fair representation of most of Northglenn?

A I would say yes.

MR. QUIAT: I offer Exhibits 3 through 26.

THE COURT: Do you want to voir dire?

MR. SHARP: Yes, I would.

VOIR DIRE EXAMINATION

BY MR. SHARP:

Q Out of approximately thirty-six hundred acres in the City of Northglenn does this represent in excess of over six hundred acres of park land that would -- out of the thirty-six -- approximately thirty-six hundred acres in the City of Northglenn are any pictures taken on the approximately six hundred acres of open space?

A Do you mean was the picture taken where I was at

showing the city? Was I standing in park land?

Q No, did you take a picture of park land?

A I don't believe there is, but I'm not sure.

Q Can you identify which pictures you took?

A Yes.

Q Would you do that?

A These pictures here are the ones that I took.

Q How can you tell?

A Well, the paper that was printed on and also by the description on the back.

Q Can you tell what each of these scenes is without referring to the notes on the back?

A Yes.

Q That's just a question.

A Yes, I can.

Q All right, and were you along when the other pictures were taken?

A No, I wasn't, not when these here were taken, just these.

MR. SHARP: I'm going to object at this time to their being entered into evidence. I don't think a sufficient foundation has been laid particularly for the pictures.

THE COURT: Well, I don't know what -- particularly what -- let me see them.

MR. QUIAT: Your Honor, these are pictures which according to testimony fairly and accurately represent scenes in Northglenn. That they show is the existing structures sticking up into the air throughout Northglenn. The reason for showing this is to indicate the --

THE COURT: Looks to me like there's just a bunch of telephone poles.

MR. QUIAT: Most of them are, there are some power poles. In other words, it's the things sticking up into the air in Northglenn now, in case there's a claim that the esthetics of communication are going to be hampered by other things sticking up into the air like radio towers and such.

MR. SHARP: I object to their admission into evidence, there's been no such claim and they're irrelevant and immaterial to the issues of this case.

MR. QUIAT: I think in his opening statement Mr. Sharp talked --

THE COURT: Looks to me like they're just all -- well, if you can't tell which is a pole and which is -- well, I'll admit them for what they're worth. How many exhibits are there?

MR. QUIAT: Three through 26, your Honor.

THE COURT: All right.

MR. QUIAT: I have no further questions of this witness.

#### CROSS-EXAMINATION

BY MR. SHARP:

Q Mr. Bailey, you observed a lot of poles sticking up in the air in Northglenn I take it?

A Well, among other things.

Q That's probably a good observation. Are you a radio operator?

A Yes, I am.

Q And do you have a tower?

A No, I do not. I just started in amateur radio.

Q Anyone else in your family a radio operator?

A No.

Q Are you aware of all the rules and regulations that these various power companies and telephone companies have to meet before they can put their poles up in the ground in Northglenn?

A All of the rules and regulations?

Q The requirements.

A No, I do not.

Q Wouldn't this seem like a pretty good indication to you that if you applied for a radio tower, with all these other poles up in the air in Northglenn, the likelihood of you receiving that permit would be pretty good?

MR. QUIAT: Speculative, your Honor.

THE COURT: Overruled, you may answer.

A Would you please repeat that?

Q (By Mr. Sharp) With all these poles sticking up in Northglenn, don't you think that would be a pretty good argument when you applied for a special use permit that you should receive your radio tower permit?

A Well, since there are poles sticking up and if I would adhere to all regulations of putting up a tower, yes, sir, I should be permitted.

Q Don't you think that's a likely outcome of your permit application?

THE COURT: Have you ever applied for a license?

A For a tower?

THE COURT: Yes.

A No, sir.

THE COURT: Well, it's speculative.

MR. SHARP: I will withdraw the question.

THE COURT: Now, Mr. Bailey, Exhibit 9 is a picture of an antenna which is known as an antenna, is that not right, of the police station?

A Yes, your Honor.

Q Do you have any other pictures of any other towers other than poles in the City of Northglenn?

A You mean as such in that group or do I have any personal --

THE COURT: Yes.

A Not of that group.

THE COURT: Not in this group. Are there any amateur towers in Northglenn that you know of?

A Yes, sir.

THE COURT: I see. You took no pictures of those?

A No, sir.

THE COURT: I see. All right.

MR. SHARP: I have nothing further.

MR. QUIAT: Nothing further.

THE COURT: All right, we will take a short recess.

(WHEREUPON, recess was taken)

MR. QUIAT: May it please the Court, I would like to call as our next witness Al Knott.

AL KNOTT,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Your name is Al Knott?

A Yes, Robert William Knott.

Q And where do you reside?

A At 1642 South Ivanhoe in Denver.

Q What is your business, Mr. Knott?

A I run a structural mechanical testing laboratory.

Q And what, if any, professional status do you hold?

A I am a registered professional engineer in five states including Colorado and my educational background is in this field.

Q And what is your degree in and where did you receive it?

A I have a Bachelor of Science Degree in Architectural Engineering from the University of Colorado in 1955 and a Masters of Science in Civil Engineering from the University of California, Berkeley, in 1959 and I have a Ph.D. in Civil Engineering and a <sup>PH.D.</sup> major in structural mechanics from Stanford University in 1969.

Q Have you held any position in any professional organization?

A Yes, I have.

Q And will you tell the Court what some of those have been?

A Yes. I am the immediate past president of the Professional Engineers of Colorado. I have also held all of the offices in the metropolitan chapter of Professional Engineers of Colorado. I have held the offices of treasurer

and president in the Society for Experimental Stress Analysis. Those are the organizations of which I have actually held office.

MR. QUIAT: Your Honor, I offer Mr. Knott as an expert witness in the field of structural engineering and related fields.

THE COURT: All right.

Q (By Mr. Quiat) Mr. Knott, are you familiar with amateur radio towers?

A Yes, I am.

Q And are you familiar with the uniform building code?

A Yes, I am.

Q Given the parameters of the Northglenn area, that is the weather, the wind, the soil, the earthquake, all of the parameters, and given the uniform building code, would a radio tower complying with the uniform building code be safe?

A Yes, it would.

Q If it is properly constructed?

A Yes.

Q And would it present any danger to the inhabitants, to their health or their welfare?

A No, it would not.

MR. QUIAT: You may inquire.

CROSS-EXAMINATION

BY MR. SHARP:

Q Would a radio tower that had been -- at least received the stamp of approval of a professional engineer also be structurally safe?

A Yes. That's the basic way in which it is normally

recognized as being safe, it is reviewed by a structural engineer and stamped.

Q And is this the type of review that would take place at the factory or prior to a factory actually building a radio tower, the engineer would say, "This is the kind of tower that would be safe for you to build and sell to the public"?

A Yes, it would.

Q And is this what the building code actually refers to -- it sets the standards in this manner?

A The building code sets the minimum standards, yes.

Q And the companies or the people that build radio towers build them according to these minimum standards; is that correct?

A That's the case usually, yes.

Q And also according to the approval of an engineer?

A Yes.

MR. SHARP: No further questions.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q All, what are some of the standards that are built into, for example, relative to weather, what is the requirement of the uniform building code?

A You're primarily interested in wind in terms of weather and --

MR. SHARP: Your Honor, I would object to this line of questioning, it's outside the scope of cross-examination.

MR. QUIAT: He brought up this, I don't care.

THE COURT: Well, you brought it up, so he may

inquire. Overruled.

Q (By Mr. Quiat) What is the wind factor that's built into the uniform building code?

A The wind in accordance with the uniform building code in the greater Denver area is a thirty mile an hour -- I mean a thirty pound per square foot wind pressure measured at ten meters off the ground or thirty feet. Below that it's less than thirty and above that it's greater than thirty and the code gives these values.

Q What speed would it require to reach that pressure?

A Approximately a hundred and eighteen mile an hour wind would reach a thirty pound per square foot pressure.

Q All, you have said that having a specs design or signed and sealed by an engineer is the way you know. Now, the commercial towers that us amateurs buy, those are sealed by an engineer when we buy them, is that correct?

A That would be the case, yes.

Q What would it cost to hire a professional engineer to seal and examine a structure that was not commercially produced?

A I looked into this particular structure and I would do it for a fee between eight hundred dollars and fifteen hundred dollars, depending upon the information that was available from the manufacturer.

Q Would you say that this is a fair and reasonable fee and in accordance with other engineers in the area?

A Yes, I would.

MR. QUIAT: I have no further questions.

THE COURT: Any questions, Mr. Sharp?

RECROSS-EXAMINATION

BY MR. SHARP:

Q This is the fee you would charge a manufacturer, is that right?

A That would be the fee that I would charge anyone that asked me to investigate this tower, yes.

Q And see if it complied with the minimum standards?

A Yes.

MR. SHARP: No further questions.

THE COURT: Mr. Knott, what is the pole standing up in the air sixty feet, what is that? Is that a tower?

A I suppose that could be called a tower, it's -- a tower is a structure usually composed of a number of elements and a pole is a single structure and so the loads on a pole would be similar to the loads on an individual member of a tower.

THE COURT: It would cost you fifteen hundred dollars to tell whether a pole would hold up?

A No, it wouldn't, no, sir.

THE COURT: Now, you're a structural engineer, you're not an electrical engineer or like an electronic engineer?

A That's correct.

THE COURT: Well, if you wanted to find out whether electronically it was satisfactory would you be qualified to do that or --

A No, sir, I wouldn't.

THE COURT: You wouldn't know whether or not it would be properly grounded or not?

A No.

THE COURT: Do you take into consideration lightning and things like that?

A Not from a structural standpoint, no.

THE COURT: You're testifying solely from structural?

A Yes, the wind, earthquakes, this sort of loading.

THE COURT: Thank you. That's all.

MR. QUIAT: Thank you, Mr. Knott. May Mr. Knott be excused? I will inform the Court that I have an engineer this afternoon after lunch who will testify.

THE COURT: That's all right, I just wondered.

MR. QUIAT: I would call Richard Guski.

RICHARD GUSKI,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Please state your name and your address.

A Richard H. Guski. I live at 1241 East 119th Place in Northglenn.

Q And what is your occupation?

A I am a computer programmer for Mountain Bell.

Q You incidentally --

THE COURT: A what?

A A computer programmer.

THE COURT: Thank you.

Q (By Mr. Quiat) You are an amateur radio operator, are you not.

A Yes, I am.

Q Rich, in connection with this case did you have occasion to make a survey?

A Yes, I did.

Q Tell the Court what your survey was?

A It was a survey to determine if there were any existing antennas in the North-- in the City of Northglenn as of around the end of March, beginning of April of this year.

Q Now, what do you mean by antennas?

A Either amateur antenna sets, even band antennas or government tower antenna structures.

Q Now, you're talking then about transmitting, transmission antennas?

A Yes, transmission and receiving antennas.

THE COURT: Well, you found hundreds of television antennas, did you not?

A Your Honor, we excluded from this count any TV antennas, we are mainly interested in communication type antennas.

THE COURT: That's what counsel wants you --

Q (By Mr. Quilat) That's what I was getting at.

A Okay.

Q So we are talking only about two-way antennas?

A That's correct.

Q Tell the Court what the results of your survey were.

A Well, we had a number of categories, two categories in height, we called them high and low and high was anything that was over ten feet above the structure that it was close to, a house or building of some kind. i.e., that would be

high, ten feet above the top of any structure and low would be any antenna that was below that level and the other categories would be amateur antennas, CB antennas and government antennas.

Q And what do you include as government antennas?

A Police, fire, fire house type things.

Q So that would be any government, city, state, county, federal, whatever?

A Anything that looked official, yes.

Q What results did you get?

A Well, we had a count of two hundred and three antennas overall. One hundred and sixty-three of those fell into the category of high, in the height count. Forty in the low count and breaking them up into the categories, we counted twenty-nine amateur antennas, one hundred and seventy-two citizen band antennas.

THE COURT: How many?

A One hundred and seventy-two.

THE COURT: All right.

A And two government antennas.

Q (By Mr. Quilat) And that is the entire City of Northglenn?

A As accurately as we could do it.

Q You live in Northglenn, do you have an antenna tower?

A Yes, I do.

Q A tower for your radio?

A Yes, I do.

Q How high is your tower?



A Approximately fifty-three feet.

Q And is it under a permit?

A Yes, it is.

Q When did you receive the permit?

A I have it right here, October 21st of '74.

Q Rich, have you been able to compare operation on your tower fifty-three feet up to operation on a wire, for example, at the roof line like Dave Baysinger has?

A Yes.

Q Tell the Court the difference in operation.

A It's very hard to tell but there's a tremendous difference, there's a tremendous improvement with the height around fifty feet as compared to roof line.

Q What is the affect of getting the antennas up higher?

MR. SHARP: Your Honor, I object to this line of questioning, it's not material or relevant to the issues.

THE COURT: Overruled.

A The affect of raising the antenna to -- in technical terms, brings down the radiation angle of the signal and allows you to communicate over longer distances. A low height of antenna causes a high radiation angle of transmitted as well as received signals and therefore the skip is short. In other words, you can't talk very far with a low antenna because of the high angle and with a low angle, raising your antenna up higher your signal beams farther towards the horizon. Change the skip angle and you could communicate over much greater distances.

Q What other affect, is there -- do you have in raising the antenna higher, if you know?

A What other affects?

Q Yes.

A Well, if you raise an antenna higher you can reduce the amount of radiation in your very near area around, you know, your premises so that -- which in effect reduces the possibility of interference to other devices that may be in your area.

MR. QUAY: I have no further questions.

MR. SHARP: I have no questions.

THE COURT: Just a minute. What kind of an aerial do you have, I mean antenna?

A At the present time, your Honor --

THE COURT: Or tower?

A -- it's a commercially type, it's a commercially built tower. I bought it secondhand, I don't know the manufacturer's name but it's commercially manufactured.

THE COURT: Is it -- what is the size of the base of the metal part of it?

A Yes, it's approximately a foot and a half on each side, it's three-sided and it's laced.

THE COURT: It's a kind of a tripod then, three-sided?

A It's three sides laced together with welding steel.

THE COURT: And you say it's one foot at the bottom?

A It's approximately a foot and a half on each side, it's a triangle, three-sided, about a foot and a half on each side and it's in cement, concrete.

THE COURT: And how -- does it go up to a point?

A At the top currently there is no beam antennas on

it, I have wire antennas hanging off of the top of it.

THE COURT: I know, how does the tower -- does the tower go to a point or is it a foot and a half clear up to the top?

A It's a foot and a half clear to the top.

THE COURT: Now, where is that with reference to your house?

A It's in my back yard.

THE COURT: Whereabouts with reference to your house, how far from your house?

A It's connected to the house, part of the house is used as one of the braces, commonly called a house brace.

THE COURT: Connected to the house.

A At the peak, yes, to help support the tower.

THE COURT: What sort of a neighborhood do you live in?

A Residential neighborhood. I don't know how to describe it.

THE COURT: Well, it's one-family dwellings?

A Yes.

THE COURT: And your lots are about how wide, about seventy feet are they? Sixty, seventy feet, are they?

A I'm looking here, your Honor, for the exact measurement, I don't have the exact measurements on this copy but I can't remember exactly, I think it's a hundred feet deep and about seventy feet across, something like that but it is guided on -- all my guide points are within my boundaries.

THE COURT: And they're within the block, for instance, where you live, are there any other towers, amateur

radios?

A There are some very -- not within a block but very close within say half a mile there are at least, there is two other towers similar to mine, one higher and one slightly lower.

THE COURT: Did you erect your own tower?

A Yes, I did.

THE COURT: And now, you've got a permit to do so?

A Yes, I did.

THE COURT: And was your tower inspected?

A Yes, it was.

THE COURT: After you got through?

A It was inspected and it failed the first time because I had some problems with it. I made the changes and they came back and reinspected it and said it was all right.

THE COURT: Is your tower grounded?

A Yes, it is.

THE COURT: Okay.

MR. QUIAT: Your Honor, that gives rise to a few more questions, if I might.

THE COURT: All right.

Q (By Mr. Quiat) Rich, have you had any difficulty in the neighborhood as a result of your tower?

A Very minor. Shall I describe --

Q Well, have you been able to arrange the difficulty -- yeah, go ahead and describe it.

A Yes, I have had a certain amount of problems with a couple of my next neighbors which we resolved very easily with some ideas of mine through my knowledge of radio; cor-

rected the problems with their receiving sets and receiving systems so that my strong signal did not interfere with them any longer.

In the case of one neighbor, they didn't care to have me do anything to their, you know, to their equipment so I didn't and -- but I have had no more problems with them at all.

Q So there's been no difficulty?

A No difficulty.

Q Rich, has there been any danger to the health or safety or welfare of anyone in the neighborhood as a result of your tower?

A No.

Q And it does comply with the uniform building code?

A As far as I know. They passed the inspection, I built it according to specifications.

MR. QUIAT: I have no further questions.

MR. SHARP: I have nothing.

THE COURT: That's all.

MR. QUIAT: Margaret Etchinson.

MARGARET ETCHINSON,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Mrs. Etchinson, you're called Peggy, may I call you Peggy?

A Yes.

Q Peggy, what is your work?

A Currently I'm employed as a center communicator programmer for Mountain Bell.

Q And what is your specialty?

A Currently I'm involved in depreciation and construction budget reports from the FCC.

Q Professionally what is your specialty?

A Professionally my specialty is mathematics.

Q Any emphasis particularly on statistics?

A Yes, there is, I was an employed math major.

Q And in this regard are you familiar with sampling techniques mathematically and practically?

A Yes, I am.

Q With this regard did you have occasion to conduct, supervise any surveys with regard to Northglenn?

A Yes, I was. I was approached by Jim White and asked to come up with some scheme to estimate the total number of utility type poles and a total number of exposed television antennas within the city limits of Northglenn.

Q How did you design methods for getting necessary facts?

A Yes, I did, following standard statistical methods.

Q And what is the probability of error in your results?

A The probability of error we chose to go with for all our calculations is a ninety percent confident interval which means to be sure within ninety percent accuracy say that our figures are true.

Q What fact did you derive from your sampling

concerning the number, total number of utility poles in Northglenn?

MR. SHARP: I object to this question, it's irrelevant and immaterial to the issue of the case.

THE COURT: I'm going to permit her to answer. Overruled.

A We estimated that the total number of poles within the City of Northglenn, of utility type is four thousand seven hundred twenty-six, however, since a point estimation such as that gives you no reliability we more like to give your interval of the estimate and we established a range of three thousand six hundred sixty-five, low, to five thousand seven hundred eighty-seven, high, and this is saying with a ninety percent accuracy the number of utility type poles is in that range.

Q (By Mr. Quiat) Television antennas, now, you're talking about receiving antennas?

A Yes.

Q And you're talking about only those that are external and elevated?

A That's correct, on roof tops. We came to total of one thousand eight hundred twenty-six, was our point estimation, our ninety percent confident interval is twelve hundred two, low; two thousand four hundred fifty, high.

Q The mathematical method you used are the recognized ones in the field, are they?

A Yes, they are.

Q And these results could be acceptable to any statistician in the field?

A Yes, they would be.

MR. SHARP: I have no questions.

MR. QUIAT: She has a map here and description of the method if you would like to see it. Would the Court like to see the map?

THE COURT: No.

MR. QUIAT: No further questions.

THE COURT: You are excused.

MR. QUIAT: I would call Howard Eldridge.

HOWARD ELDRIDGE,

called as a witness herein, by and on behalf of the plaintiff, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q You're Howard Eldridge?

A Yes, sir.

Q What is your address, please?

A 3561 Monaco Parkway, Commerce City.

Q You live in Adams County?

A Yes.

Q What is your occupation?

A I am a consulting engineer and a precision measurement engineer.

Q In what field?

A In the field of electronics.

Q Will you give particulars about what sort of work you do?

A I work on the design of antenna systems, the

modification of such, changing antenna systems and also measurements of frequencies in all spectrums.

Q Are you also an amateur radio operator?

A Yes, I am.

Q As such have you participated in organized activities in the amateur radio field?

A Yes, I have. You mean organized like networks and clubs and so forth?

Q Well, I was thinking also of community efforts, emergency activity, so forth.

A That definitely, yes, sir.

Q Tell the Court what some of your experiences have been in this regard.

A Well, to come to mind, the first was in 1965, June, the flood that involved the City of Denver and the metropolitan area in general and the State of Colorado to the east. The communication systems as provided by the telephone company, the Colorado State Patrol and various other organizations having to do with communications on the local and state government levels were inundated both by water and by the lack of power, loss of power through power line outage and we set up at my home a communications system that would put us in contact with various areas in Colorado where the flood -- particularly down the Arkansas Valley and out towards Deer Trail and down the flat --

Q How long did this last, Howard?

A The -- my particular part of it?

Q Yes.

Q Well, actually it lasted about six days but on the

air time, actually on the air time was just a little more than seventy-two hours.

Q Did you receive recognition as a result of this?

A Yes, sir.

MR. SHARP: Your Honor, I object to this.

THE COURT: Let's don't go into that anymore.

MR. SHARP: The objection will be noted?

THE COURT: Yes, sustained.

MR. QUIAT: Your Honor, I offer to prove by Mr.

Eldridge the activity of amateur radio operators in emergencies with regard to -- with specific instances with regard to the flood that he mentioned, the tornado and other disasters.

THE COURT: I don't think it's necessary unless it has something to do with the ordinance that we are under.

MR. QUIAT: Your Honor, it's the position of the plaintiffs that the use -- amateur radio is incidental to normal living, and is a matter of use of right.

THE COURT: All right, we assume that.

MR. QUIAT: All right.

THE COURT: That can be assumed just like use of a television is a normal use by people in their respective homes.

MR. QUIAT: All right. I'm going to ask Mr. Eldridge, perhaps I will tell the Court, then we will see whether or not your Honor will listen to it, I'm going to ask him about the role of the amateur radio person in the development of the entire field of radio, television, so forth.

THE COURT: I don't think that's necessary.

MR. QUIAT: I also propose to ask him about the

role that amateur radio plays in the lives of handicapped persons, may I go into that?

THE COURT: No, I don't believe it's necessary.

MR. QUIAT: All right.

Q (By Mr. Quiat) Howard, you have indicated that you are a radio engineer, do you hold certificates, certifications and diplomas in this area?

A Yes, I do.

Q Will you tell the Court what some of these are?

A I have a professional engineers license and I also have a federal communications engineering license.

Q And you have indicated that you are a consulting engineer in the field of electronics.

A Yes, sir.

Q The Court has inquired about towers and the grounding and so forth, let's return to towers where Mr. Knott left off and talk about them as electrical devices, tell the Court with regard to the electrical characteristics, let's start out with a standing triangular cross section laced steel tower, what are the electrical characteristics of such insulation?

A Well --

Q Now wait, let me interrupt you, I assume that these are properly engineered and are in conformity with the uniform building code before all the questions I ask you.

A Understood. The electrical response to lightning as such for a steel tower of that nature is that it is grounded and in almost all instances there are very few instances where it is not grounded. These occur in broadcast

antennas where they are almost generally remotely located because of this factor and they are almost all grounded, they are -- there may be a possible exception but I have never seen one. They actually work as a lightning arrester in many areas. It's seldom that a dwelling that is located close to a tower of any kind is ever struck by lightning because the lightning will tend to follow the path of least resistance to ground, this is in reference to what the actual theory is but we also picture lightning as coming out of the sky and to the earth and it will strike the tower and go to ground before it will strike a building that is of a higher resistance to the lightning path.

Q Howard, isn't it a fact that the electrical code requires that the tower be grounded, as well, all other electrical units in the station?

A Yes, that's right. Not only by code but by just common sense for safety.

Q Yes, but the code -- in other words, if they comply with the code they are grounded?

A Yes, sir.

Q All right, you have indicated that this tends to be a protection rather than a hazard. Assume a well designed tower constructed according to code, grounded as is required, in your opinion, does such a structure present danger to the health, welfare or safety of the surrounding persons?

A No, sir.

Q Will you comment upon the tower, the antenna and the height of antennas? I have indicated to the Court in opening statement that towers and antennas are separate,

that is that a tower is used to elevate an antenna. Strictly speaking, that isn't always true, is it?

A No, sir, and in some instances the tower itself is the radiating element of the antenna.

Q But normally in amateur radio it is not?

A No, normally in amateur radio it is not. This is -- most generally that type of application is commercial.

Q Now, what is the affect of elevating the antenna above the ground?

A Well, as it's been previously stated, it reduces the possibility of interference with surrounding electronic devices. It also by elevation, if you were looking at it from the esthetic thing, it raises the antenna above the normal eye level, we don't normally go around looking up into the air. Does that answer your question the way you put it?

Q So far as the actual functioning of the station concerned, what affect does it have?

A Well, the higher that the antenna is up to eliminate there is -- it does make the station operate better, you receive better, you transmit better and the use of the radio both with -- regardless of what purpose you're going to radio it -- use it for, is made much greater, much better, much better use.

MR. QUIAT: You may inquire.

CROSS-EXAMINATION

BY MR. SHARP:

Q Mr. Eldridge, what is the affect of not grounding an antenna?

A An ungrounded antenna develops a capacitance between

the actual and ground. In other words, an ungrounded antenna would tend to store for a certain number of microseconds, possibly not even that long, a great deal of electrical energy which would then discharge to the ground or discharge to objects around the ground.

Q Are we talking about grounding an antenna or grounding the tower or is it one and the same?

A They are one and the same because generally one part of the antenna whether it's a beam type antenna or a wire type antenna, some portion of that is grounded to it and to the tower itself.

Q How do you ground the tower?

A By usually pinning a metal, copper -- copper or aluminum rod, driving it into the ground, oh, eight, ten, twelve feet, something like that and then using a large braided metal strap generally from the tower over to the ground so that you're not just grounded to the surface of the ground which can change, the ground density can change with moisture, you get it down to where it is grounded where there is sufficient moisture to also give you what we call pure earth ground or true earth ground.

Q So both have to be grounded, is that correct?

A That's correct.

Q Did you ever have any problem with your neighbors when you put up your tower?

A No, I never had any problem with any interference or anything like that, however, we did go through this same procedure in Commerce City and were allowed to put up our towers.

Q What do you mean same procedure?

A Well, we had to, you know, had to have a hearing and so forth regarding putting up towers.

Q Did the neighbors have a right to come and --

A They certainly did and only one appeared and out of the population of Commerce City, one man appeared and he had a couple of questions regarding the safety factor of the structural part of the tower, they were answered and he said he had no further objections. We had this in front of a board of judgment.

Q You had a basically what I might call a concerned citizen come in and you felt that he was satisfied when he left?

A That's right.

MR. SHARP: I have nothing further.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q Howard, you're not talking about your antenna, you're talking about the Commerce City ordinance, aren't you?

A Yes, I'm speaking of the Commerce City ordinance, my antenna was there under what they called they called a "grandfather clause, long before the city was a city.

Q Now, Commerce City has a totally permissive ordinance so anyone can erect an antenna so long as it, or tower so long as it corresponds to the building code, doesn't it?

A That's correct.

MR. QUIAT: I have no further questions.

RE-CROSS-EXAMINATION

BY MR. SHARP:

Q Have you read that ordinance?

A I had a hand in adopting it but I haven't read it in its final --

Q Are you saying that no hearing is required?

A Depending on the height, if the height -- if a permit -- in other words, a waiver before the board of judgment is applied for a height exceeding eighty feet, then there has to be a hearing.

THE COURT: Who else -- suppose it doesn't exceed that height?

A Then all you do is you inform the city that you would like to put up the tower, they have the City Engineer come out and examine the area, they have no fee -- this was our bone of contention at the time was the excessive fee, the fee for having a professional engineer at the cost of -- the cost plus, I think in Commerce City they at that time were requiring a fifty dollar -- wanted to require a fifty dollar fee. When you're doing this for a hobby the cost becomes very prohibitive when you have to go through all this.

THE COURT: But you do have to apply for a permit?

A No, you have to ask for an examination is what it actually amounts to. There is no written paper, you call the City Engineer, he sets you up on a schedule, he comes out and he checks your antenna, checks your land, you tell him what you're going to do and then he says, "All right, go ahead," and then they come back for a final inspection.

THE COURT: And he makes an inspection, if he disapproves of it, then you must fix it the way --

A That's right, you bring it to coincide with what he



says and they -- now they do have a -- I shouldn't have said that, they don't have any fee, there's a nine dollar fee the same as they do for obtaining a license or anything for the electrical code when you put electricity in your house or you're building a fireplace or anything like that, it's a fee that won't hurt anyone. Is that it?

THE COURT: All right.

MR. QUIAT: Thank you. Your Honor, I have a lady here, Lisa Rhodes who managed the March of Dimes walkathon and the radio -- will testify as to the amateur radio functions there.

THE COURT: I think that the Court can take more or less notice of that.

MR. QUIAT: That's why I mentioned it.

THE COURT: The question of amateur radios, they're licensed by the federal government and the fact that they're very useful in different times of emergency is well known I think generally. All right. Counsel will accept that, will you not, Mr. Sharp?

MR. SHARP: Yes.

THE COURT: So you don't have to prove that.

MR. QUIAT: Your Honor, I will call Jim White.

JIM WHITE,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q You're Jim White?

A Yes.

Q And you're an amateur radio operator?

A Yes.

Q Will you give your call sign?

A I'm WBOFPH.

Q And with regard to the plaintiff Colorado Council of Amateur Radio Clubs, what position do you hold?

A I am the chairman of the legal and regulatory committee of that organization.

Q And as such, you have been participating in the Northglenn negotiations and so forth?

A Yes, sir.

Q Jim, in that connection have you dealt with antenna problems in other communities nearby?

A Yes, sir.

Q With reference to unincorporated Adams County what, if any, functioning agreement is there at the present time?

A The agreement in Adams County at the present time is that towers and antennas up to ninety feet in height will be allowed as a matter of right. Structures over that height require a permit from the county.

Q And for up to ninety feet it takes a building permit and that's all?

A That's correct.

MR. SHARP: Your Honor, I'm going to object to that line of questioning and the testimony that followed. What's done in Adams County is irrelevant.

THE COURT: I just want to see and you say over that height it's what, you have to get a special permit?

A A building permit, your Honor.

THE COURT: Well, how about below that?

A Below that you're allowed to erect it as you see fit, to my knowledge.

THE COURT: Without any permit of any kind?

A Not that I'm aware of.

Q (By Mr. Quiat) It's a special use above ninety feet.

A It must be inspected.

THE COURT: Whatever height it is?

A Yes, sir.

THE COURT: I see, but over ninety feet you can't erect it unless you go -- who do you get that from?

A You get that from the zoning body in the county, I'm not sure of their title.

Q (By Mr. Quiat) Over ninety feet you have to submit to a hearing, do you not?

A Yes, sir.

Q And under ninety feet all you have to do is get a building permit?

A That's correct, to my knowledge.

Q And to comply with the uniform building code?

A Yes.

Q Now, did you have a hand in negotiating with the Adams County Zoning Administration, the County Attorney and others to arrive at this agreement?

A Yes, I did.

Q And this was the agreement and is the agreement of Adams County?

A Yes, it is.

Q What is the situation of the City and County of Denver so far as amateur towers are concerned?

A In the City and County of Denver, to my knowledge --

MR. SHARP: Again, I object, your Honor. What is done in other cities is not --

THE COURT: The objection will be overruled.

A In the City and County of Denver, to my knowledge, a building permit is required for any tower or antenna structure and I'm not aware of any height limitation.

Q (By Mr. Quiat) All right, with regard to the City of Lakewood, what is the situation?

A Essentially the same situation.

Q There is no height, no maximum height restriction?

A Not to my knowledge.

Q Do you know the circumstances in Thornton, in Broomfield and Westminster?

MR. SHARP: Will the Court note a continuing objection?

THE COURT: Yes, I will note the objection.

A I'm not familiar specifically with the circumstances in Thornton. The circumstances in Broomfield are a fifty foot height limitation, that height is allowed for a building permit. To erect a structure over that a hearing is required before the zoning board.

Q (By Mr. Quiat) Do you know of any community in the metropolitan area that requires a special hearing for any tower or antenna except for Northglenn?

A Only above certain heights.

Q But other than that do you know of any?

A I do not.

Q And have you in your position as chairman of the legal and legislative committee met with most of the cities and municipalities in the metropolitan area?

A Yes, I have.

Q Jim, did you participate in the surveys of Northglenn concerning the structures sticking up into the air?

A I participated only in assuring that we had proper standards laid down for the surveys that were taken. I didn't do any counting.

Q Are you familiar with the sizes, the dimensions of the poles in Northglenn?

A Yes, I am.

Q Tell the Court what they are.

A The utility poles in the city from the survey that I did on my own, unrelated to the other surveys, fall in the area of thirty-five to ninety feet above ground level. This was arrived at by looking at the brands on the poles and interpreting the brands with my knowledge of the information that is on that brand stamp on every pole.

Q Where did you get the knowledge?

A From Mountain Bell and Public Service Company.

Q And are you employed -- where are you employed?

A Mountain Bell.

Q During your experience with Mountain Bell have you ever climbed a pole?

A Yes, I have fallen off one or two.

Q So you're familiar with the size and the dimension

of the poles.

A Yes, I am.

Q And you say the poles, utility poles in Northglenn are between thirty-five and ninety feet?

A Height above ground, the poles themselves, of course, are longer than that.

Q Are you familiar with the sort of amateur towers we are talking about?

A Yes, I am.

Q And are you familiar with utility poles?

A Yes, I am.

Q Relative to safety, what if any comparison can you draw?

A I have never fallen off a tower but I have fallen off some poles.

Q I'm talking about safety of houses or other installations nearby.

A I don't know that I could draw a comparison.

Q Do the telephone, the utility poles, conform to the uniform building code?

A I do not personally know. I would assume that they would have to.

MR. SHARP: Objection.

THE COURT: No, if you don't know.

A I don't know.

Q (By Mr. Quiat) Do you know whether the City of Northglenn requires a special permit for each of the three to five thousand utility poles in the city?

A I do not know.

MR. QUIAT: Your Honor, Jim White has been involved in many of the activities that the Court has rejected by taking judicial notice of the role of the amateur radio and I will not seek to question him about those but I want the Court and counsel to know that he has been in these.

THE COURT: All right.

MR. QUIAT: I have no further questions.

CROSS-EXAMINATION

BY MR. SHARP:

Q Are you familiar with variance proceedings in any of the communities you discussed?

A Yes, somewhat.

Q So that in fact some of these communities if the height of a tower exceeds a certain height requires a variance type hearing?

A Yes, they do.

Q When you say a ninety foot pole, are you talking about a pole or a tower of some kind?

A A pole, there are some towers as well.

Q Did you take a survey of any trees and their height in the city?

A No.

Q Do you know whether or not the City of Northglenn requires a special use permit for a tree over sixty feet?

A I have no idea.

Q It's true is it not that you and I and Mr. Quiat have discussed drafting an ordinance for the City of Northglenn on a number of occasions?

MR. QUIAT: Your Honor, before he answers that,

we are getting into negotiations and about settling a problem, I don't think it's proper, it would be like negotiations concerning settling a case and I think it isn't admissible. We are attacking the validity of the ordinance as it stands now. What we may have offered or what we may have asked for I think will only confuse the issue. If we go into that, we are really opening a door that gets us into an awful lot of stuff that probably isn't very -- isn't going to be admissible and isn't very proper.

THE COURT: All right, the objection will be overruled. You may proceed.

A Would you restate the question, Mr. Sharp?

Q (By Mr. Sharp) You were informed sometime in '75 that radio towers could not be built in Northglenn, is that correct, the summer of '75?

A Not precisely.

Q Not precisely correct or not --

A Not precisely correct. I was informed at some point in '75 that while towers had been permitted in the city because of some other concerns not directly dealing with amateur radio, the decision had been made by someone in the city that they were no longer going to be allowed and that an ordinance of that nature was under consideration.

Q And you participated in the discussions about what the ordinance might require, did you not?

A Yes, I did.

Q And at the time of those discussions didn't you in fact agree that a maximum height of sixty feet could be limited with by the radio operators of Northglenn?

A We did agree to that height as a compromise.

Q And did you at that time or do you now have any objections to the structural soundness of towers and antennas being at least sealed by a professional engineer?

A I have no objections to that stipulation, to answer your question strictly, no.

Q Do you object to an inspection of those towers once they are placed in the ground, to an inspection by the building inspector for the City of Northglenn?

A No.

Q Did you have any objections to confining the apparatus to the applicant's property unless he received -- he or she received permission from the abutting landowners to, let's say, extend a guide wire or support wire?

A No.

Q Is it then your objection that you're required to apply for a special use permit, is that the nature of your objection?

A That is one, yes.

Q Could you state what your other objections are?

A We have general objections in the area of being regulated in our activities by someone other than our licensee being the federal government.

Q Is it your contention that this ordinance regulates the receiving or transmitting of radio?

A Yes.

Q It regulates that?

A Yes.

Q In what way?

A By regulating the structures that we are allowed to use, no antennas.

Q By regulating the structure?

A Yes.

Q Didn't you just testify that you had no objections to the structures being inspected by an engineer?

A Yes, I did, I said that.

Q That's a form of regulation, is it not?

A It is a form of regulation relative to the health, safety and welfare of the property owners.

Q What then is the nature of the objection?

A Mr. Sharp, I think the nature of the objection is stated very clearly in the complaint and also by our attorney.

THE COURT: Well, let's hear your -- he asked you --

A The objection from a personal standpoint of radio operators in the city is that the city is attempting or has regulated our right to use our license by requiring us to pay a fee that we feel is excessive, by requiring us to go through a procedure which can take a period of time and by allowing within the ordinance the denial of a right to erect an antenna which is necessary for the use of our station.

Q (By Mr. Sharp) Do you know of any hearing before the Planning Commission that would have taken from October 27th to the present time to pass upon whether or not a permit would be granted?

A No.

Q You're aware, apparently, that -- and in fact that's what this is all about -- there would be a hearing required; that's one of your objections?

A Yes, I'm aware of the fact that the hearing process that we went through in trying to arrive at a compromise with the city that it would allow us to use our station as we wished, took about an eight month period before the city finally passed the ordinance that's now in existence.

Q Do you know what the difference between a permitted use and a special use in the city is, of Northglenn?

A Yes, I believe I do.

Q If I stated that the difference was essentially that a permitted use continued forever once permitted and a special use had a term of years attached or annual renewal fee, would that be pretty much your understanding?

A Yes.

Q And that in the case of this particular special use permit, the permit has no annual renewal fee and runs with the owner of the -- or the permit applicant at the location he applies for?

A Yes.

Q Do you have any objections to that?

A I have an objection to the original fee.

Q Do you have any objections to the tower being removed once the applicant moves from the premises?

A I would object to that being a matter of law. While it is common for you to take your tower with you when you leave because it represents a considerable investment, I would hate to be forced to. If the guy who moves in behind me is a hum, I would like to be able to sell it to him.

Q Do you have any real quarrel with the cost or do you take issue with the costs that are incurred by the city

for conducting a special use hearing or a permitted use hearing?

A I have no idea what the city's incurred costs are.

Q So that isn't -- you're not particularly objecting to a fee for such a hearing, you're objecting to the hearing itself --

A That's correct.

Q -- and the attendant fee?

MR. SHARP: All right, I have no further questions.

MR. QUIAT: I have quite a number.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q Jim, did you or I in any meeting with Chuck Sharp or anyone else ever agree that the City of Northglenn had a right to regulate amateur radio?

A No.

Q Isn't it a fact that what we tried to do is prevent what we are doing today by compromise agreement?

A Exactly.

Q And in that -- to that end did the amateur operators in Northglenn agree with us to go along with these?

A Yes.

Q Did any of them ever agree that Northglenn had a right to regulate them?

A No, sir.

Q Jim, you are chairman of the legislative and legal committee, are you familiar with the federal regulation over amateur radio?

A Yes, I am.

Q Are you familiar with the federal regulations over the citizen's service and the amateur service?

A Yes, I am.

Q Does the federal government regulate the height of antennas?

A Yes, it does.

Q And that's through the FCC?

A Yes.

Q Tell the Court what regulations the government has imposed?

A Essentially there are two areas where the federal government regulates the height of antennas, the first is in respect to complying with the Federal Aviation Agency regulations. There are sections of the FCC regulations which refer to the FAA regulations and indicate that if a structure is going to be put up that falls within a certain distance from an airport and is going to be of a certain height, then FAA approval must be sought and that approval must be supplied with the application for permit to use that location for a station when that's sent to the FCC.

The other area where the FCC deals with towers and antennas in the amateur and citizen's service, has to do -- well, first of all with the amateur service it has to do with the FCC's action that implemented the Environmental Protection Act in 1964. In essence the FCC stated in regulations that were adopted as a result of the Environmental Act that any structure above three hundred feet in height had to have a construction permit sent in along with the application to use that location.

Q What about the environmental impact study that that have to be done also?

A Environmental impact studies were only required if the structure was to exceed three hundred feet. There are different regulations applying to citizen's service antennas.

Q Has the Federal Communications Commission established a maximum height for citizens band antennas?

A Yes, they have.

Q What is that height?

A It's thirty-five feet, I believe, plus or minus. Fifty feet for directional antennas and sixty feet for non-directional or omnidirectional.

Q Was that recently raised?

A It was recently raised from forty feet to sixty feet in the latter case.

Q What was the reason given, if any, that the FCC raised that?

A One reason that I'm aware of is that the Commission stated in the rule making action that raising the height of these antennas would probably decrease the incidents of interference to receiving sets in the area.

Q Jim, you and I participated in every single meeting, public, private or otherwise that Northglenn had, did we not?

A Yes, sir.

Q At anyone of these was there any agreement that the city had a right to regulate the amateur radio field?

A No.

Q Did any person, any citizen or any witness appear in a position contrary to the position that you and I took

in all hearings?

A No.

Q Did any citizen of North Glenn seek to have radio amateur towers limited or eliminated?

A No.

Q Was any objection voiced to having -- on the part of anyone appearing as a witness or as testifying or attending -- to towers that were higher than, say, sixty feet?

A No.

Q Was there any citizen protest at any meeting against amateur activity in North Glenn?

A No.

Q To the best of your knowledge, was there any witness or any testimony to the City Council that such regulation was necessary for the safety or the health or the welfare of the inhabitants of North Glenn?

A No.

MR. QUIAT: I have no further questions.

RECORDS-EXAMINATION

BY MR. SHARP:

Q Mr. White, did you hear Mr. Rich Guski testify regarding troubles he had with his neighbors when he first put his tower up.

A Yes, I did.

Q Isn't that in fact a common occurrence, people who don't understand, complaining about interference with their radio or TV?

A I don't know that I could agree with the word common, Mr. Sharp.

Q Doesn't that occur?

A It's not uncommon.

Q It's not uncommon. So, we won't say frequent or infrequent or common or uncommon; we'll just say occurs.

A Occasionally.

Q And you know of some incidents?

A Yes, I do.

Q And how are the matters generally resolved?

A Generally, what happens is that a neighbor will come to the individual and say, "I'm hearing you on my TV," or hi-fi or whatever. Generally -- I won't repeat the word generally -- what happens is the amateur operator will say "Okay, let's find out if it's me." Some activity takes place between the individuals to find out if that's exactly what is happening and in the vast majority of cases an arrangement is made by fixing up the device that's receiving the signal so that it no longer receives those signals which it's not supposed to receive in the first place.

Q That's, of course, only in the cases where the ham radio operator is causing the problem?

A Yes.

Q Could you or would you characterize it as just a misunderstanding, a general lack of knowledge on the part of persons who are not ham radio operators?

A Yes.

Q Once educated there's not much of a problem?

A Yes, sir. Occasionally there will be a problem with someone who feels that it can't possibly be his fault, a problem with his receiving apparatus, in which case on oc-



casian the problem will be taken to the Federal Communications Commission locally and there their procedure is to talk to the individual and find out if indeed the circumstances warrant investigation. If they do, the problem is turned over to a group of amateurs in the city who work with the FCC and they go out and make an investigation and come to some determination of the problem and report back to the Federal Communications Commission.

Q Couldn't a lot of that in fact be handled in a special use permit hearing where the neighbors were allowed to come in and voice their concerns and be educated at that time?

A To my knowledge, Mr. Sharp, there have only been two of those cases in the past eight or ten years in Denver.

Q That wasn't the exact question.

A I'm sorry, restate your question.

Q Couldn't a lot of the misunderstanding that occurs between the ham radio operator and the neighbors be resolved in a hearing such as a special use permit hearing which allowed those neighbors to come in and voice their concern and be educated as to exactly what goes on?

A Mr. Sharp, I doubt it. It's been my experience that a one-to-one relationship between the amateur or the operator involved and the neighbor who's having the problem is for the most part what's necessary to solve that problem.

MR. SHARP: No further questions.

MR. QUIAT: I have a couple of questions.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q Jim, you have been asked about hearings; now, at a hearing to get a permitted use we would have to have essentially the same sort of testimony that we have here. What efforts have you and I gone to to collect the people, the experts and others to have this hearing today?

A What can I say?

Q How many people have flown in from out of state, for example?

A We have one here today and two tomorrow, perhaps.

Q How many people in the Denver area have had to take off from work to attend this hearing and how many do we have scheduled?

A In the neighborhood of twenty-five.

THE COURT: Well, I'm not going to hear twenty-five, I'm going to tell you that right now.

MR. QUIAT: We hope it won't be necessary, your Honor, we have a number of experts coming in, we have doctoral experts who will testify.

THE COURT: All right, but I'm not going to hear twenty-five of them.

Q (By Mr. Quiat) Would it be possible to have a hearing like this for every case in Northglenn where someone sought to have a tower erected?

A I suppose it would be possible.

Q Do you think it could be done effectively?

A No, sir.

MR. QUIAT: I have no further questions.

MR. SHARP: I have got just one further question.

RECROSS-EXAMINATION

BY MR. SHARP:

Q Can you tell me how many of those witnesses are going to present testimony that's relevant to the issues?

A All of them.

MR. SHARP: No further questions.

THE COURT: Now, you testified that Denver has ordinances requiring permits for aerial and so on and so forth, is that right?

A Yes, sir.

THE COURT: In fact in Denver the ordinary television aerials that are erected on a house must have a permit.

A Yes, I believe that's true.

THE COURT: And now if that hasn't anything to do with the welfare and safety of the people of Denver, why is that required?

A I really don't know, your Honor.

THE COURT: Well, don't you think there's danger of lightening or outside electricity or something going into the house burning out the set or setting the house on fire and so on and so forth?

A I expect, my personal feeling is the permit is necessary to assure that the antenna structure or whatever meets the building code, yes, sir.

THE COURT: Right, and now do you know of any city or anywhere the operation of transmitting radio stations are confined to a certain zoned area like industrial, commercial or of that kind?

A No, I don't.

THE COURT: I see -- do you know of anywhere it is

prohibited entirely within residential areas?

A No, sir.

THE COURT: But your idea is that because you have a federal license, why, you don't have to abide by the city's ordinances regulating antennas or towers?

A Your Honor, we have no objections to abiding by building codes which are designed to assure the safety of the structure.

THE COURT: How about the use of the -- suppose the city will say there shall be no radio transmitting stations within the city except in industrial areas or commercial areas?

A I would not feel that would -- that was either proper or legal.

THE COURT: And so -- but you do not object to the fact that under these circumstances they must apply for a special permit.

A Your Honor, I would object to a special permit. I would not object to a permit which fully assured that the structure met building code safe standards.

THE COURT: And, of course, your idea is the aesthetic has nothing to do with it and a man wants to put a sixty foot pole out in his front yard where all the -- where there's no other telephones, all the utilities are under the ground and the neighbors don't like that, that doesn't make any difference as long as it's structurally safe, that's your idea.

A Yes.

THE COURT: I see. All right, that's all. Thank

you.

MR. QUIAT: Your Honor, I would like to call the Court's attention to the fact that this is not applicable to Northglenn, the last question that your Honor asked.

THE COURT: Well, that doesn't make any difference, he's made a lot of statements about different things and you're trying to prove that this ordinance is unconstitutional, as I understand it, and arbitrary and so forth.

MR. QUIAT: That's right. Your Honor, my next witness that I call will run well into the noon hour and perhaps it might be wise to recess.

THE COURT: Yes, we will take a recess until 1:30.

(WHEREUPON, recess was taken.)

MR. QUIAT: Your Honor, during the lunch hour I had scheduled a Ph.D. with a doctorate in mass communications and sociology who would testify that with the electronic communication increase that it's normal and usual to find a radio communication in the home and that ham radios are within the normal incidences of normal living. I think your Honor ruled that this was so and took judicial notice of it. If that is so, I would not call the witness -- is that all right?

THE COURT: Yes, that's fine.

MR. QUIAT: I want to ask Jim White to return to the stand to correct one point.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q You are the same Jim White that was testifying before lunch?

A Yes, sir.

Q Or essentially the same?

A I hope so.

Q During questioning by his Honor I think you indicated to the Court that in the City of Denver there is a building permit required for a TV antenna on a TV receiver, did you so testify?

A If I did I'm not aware of it and would like to correct that.

Q Will you tell the Court what the actual facts are?

A My understanding of the situation in Denver is that a building permit is not required for a TV antenna of the normal size and type. It's only when the antenna become larger is a building permit required.

MR. QUIAT: I wanted to correct that, your Honor.

RECROSS-EXAMINATION

BY MR. SHARP:

Q Larger than what?

A Larger than the common TV antennas, four to six feet off the roof and four to five feet long.

Q So it becomes seven or eight feet higher?

A The indication to me was that they are generally not concerned about TV antennas at all but only concerned about amateur and citizen band antennas and so forth.

THE COURT: Okay, that's all.

REDIRECT EXAMINATION

BY MR. QUIAT:

Q And there is no height limitation except for the -- there's no height limitation as such on amateur radio towers,

is that correct?

A That is my understanding, yes.

Q In Denver.

A Yes.

MR. QUIAT: All right, you may step down. I would like to call as the next witness Robert Boothe.

THE COURT: All right.

ROBERT M. BOOTHE,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Please state your name.

A Robert M. Boothe, Jr..

Q And your address, sir?

A My business address is 1302 18th Street N.W., Washington, D.C., a residence address is Kensington, Maryland.

Q Mr. Boothe, what is your business?

A I'm engaged in the practice as an attorney before the Federal Communications Commission and various courts, primarily communication practice.

Q As a --

A I have two or three other additional businesses but that's the principal business.

Q As an adjunct to your practicing as an attorney before the FCC, do you have additional educational qualifications?

Well, of course, I'm admitted to the practice of law, I'm admitted to practice before various courts, the Supreme Court of the United States, the United States Court of Appeals for the District of Columbia circuit, a number of other Circuit Courts for particular cases, I'm a member of the Bar of Ohio and the District of Columbia. I'm a member of the A.B.A., American Bar Association, I have been a member of the Federal Communications Bar Association for many years and president in 1960, '61, I believe. In the particular field we are discussing here I have served as general counsel of the American Radio Relay League, the National Organization of Amateur Radio Operators for some fifteen years and I have appeared in a number of court proceedings and zoning board hearings, city council hearings, matters of that sort as an expert witness on both engineering and legal matters involving communications.

In addition to the law I am a graduate engineer of Purdue University, Bachelor of Science Electrical Engineering in 1933. I am a registered professional engineer in the State of Ohio and the District of Columbia in the field of electrical engineering. I hold a first class radio telephone operator's license, a commercial license issued by the FCC and so held such a license since about 1931 or '32.

I have been a licensed amateur operator since 1928. I have testified in a number of proceedings for the FCC over a period of since about 1937 where my qualifications had been accepted as an expert engineering witness.

Q You have been accepted both as an engineering witness and as an expert in the field of FCC policies and

rules and regulations, have you not?

A Yes. And with respect to the engineering, that has -- some of that has occurred since I have been practicing law too.

MR. QUIAT: Your Honor, I offer Mr. Boothe as an expert witness in the field that he has indicated.

THE COURT: All right.

Q (By Mr. Quiat) Mr. Boothe, you indicated you're general counsel for the American Radio Relay League, can you tell them in what connection you appear today in regard to that?

A A great deal of my work on behalf of the American Radio Relay League in recent years has had to do with ordinances somewhat similar to that in consideration here and to working with amateurs and amateur organizations, city officials, zoning officials and the adoption of ordinances which are, we believe are reasonable and fair for the people of the community and still do not unduly restrict the amateur from performing his public service in other roles.

Q Mr. Boothe, there has been mention in today's case with interference, would you tell the Court about the causes and the cures and what interference is and about it.

A Perhaps I should give a little background, if I may, your Honor.

I first worked on interference from broadcasting to radio reception as early as 1937 or '38 in Cincinnati when the company that I worked for, the Crosley Radio Corporation, was not only operating a five hundred kilowatt broadcast station on an experimental basis, it was ten times

larger than any other station in the world at the time, that produced interference problems and we installed also in a heavily built up section of Cincinnati a five kilowatt broadcast transmitter WSAI.

The work I did at that time was in trying to clear up interference. Much of the interference at that time we found was not generated in the receivers but was generated in downspouts, various metallic connections where the connection was not perfect and there was rectification which produced extraneous signals.

Since, of course, I have been an amateur, I have also been concerned about interference to radio and television reception, of course, television reception in more recent years.

I have participated actively as an amateur in rectifying interference. I have participated in numerous conferences and panels both before the FCC and then the A.R.R.L. deliberations on clearing up interference matters.

Q In your opinion, what are the causes of interference to surrounding television and radio sets?

MR. SHARP: Your Honor, I object to this. This is irrelevant and immaterial to the ordinance.

THE COURT: Well, I don't know, maybe it's leading up to something. Overruled. You may answer.

A In the field of amateur radio the causes to television reception almost always if the amateur station is installed and operating in accordance with good engineering and good amateur practice, interference as a result almost always have the characteristics of the home entertainment

devices, either the television receiver, the radio receiver or hi-fi amplifiers, it comes about by signals being picked up in these devices. In the case of some, you have audio rectification where you hear sounds coming out of the speaker or lines across the picture tube. In all, most every case I know of around the country, the difficulty has been cleared up by installing proper devices and using proper techniques well understood, on the receiving equipment.

The Federal Communications Commission has been very active in working on this particular problem.

The field engineering bureau and the chief engineer's office have a packet of documents available for distribution to members of the public who complain of interference. These documents -- I wish I had them with me -- I didn't know I would be called upon in this field -- point out that the interference is found more often than not to be in the receiving equipment. This comes about because the manufacturers in trying to keep down prices, if they can save ten cents, fifty cents, a dollar on each receiver by not installing some additional circuitry or components that would be installed, would eliminate this interference, take the position we would rather take the chance of running the risk of interference and then adding these devices later on -- there is legislation, I might add, pending in both houses of congress to require the manufacturers of television receivers and other home entertainment devices to install such equipment and utilize such techniques in the initial manufacture of the devices.

Q Mr. Boothe, granted the active participation by the

amateur and the cooperation of the owner of the home device and if applicable the utility companies, in what percentage of cases of interference can a solution be made so that there isn't interference with the home device?

A Well, if you talk about cooperation including the amateur not operating at certain hours you can get one hundred percent correction of the situation from a technical standpoint, however, the figures which we have at the A.R.R.L. and that the FCC indicates that over ninety-five percent of all interference cases can be eliminated by the cooperation of the amateur with the householder and the installation of the devices I have mentioned.

Q Are they expensive devices?

A No, sir, they run anywhere from three to four cents apiece in the small capacitor to a maximum of about three dollars for a high pass filter in the antenna leads.

Q And you say this sort of cooperation can eliminate over ninety-five percent of the cases of interference?

A Yes, sir.

Q Now, did that have any relationship, for example, to the height of an amateur tower in the neighborhood?

A Well, if you're talking about the radiating portion of an antenna which is described here, is usually located on top of a tower, supporting structure, the answer is yes, the higher you get the antenna above the level of the device receiving the interference, the less the field you will have and so you will diminish the opportunity or the chances of interference.

This has been demonstrated time after time, many

amateurs around the country have antennas which normally can be retracted down to around twenty, twenty-five feet but when they want to work over a long distance or under unusual conditions where propagation is important the amateur can raise his antenna by telescopic telescoping the section of tower to up as high as ninety or a hundred feet. It depends upon the particular design and as the antenna is raised, the level of interference decreases and sometimes drops out completely.

Q There has been -- let's see, have you examined the ordinance, the Northglenn ordinance in this case?

A I have read it over a number of times in the last few weeks.

Q All right, first of all, the permitted use that is referred to is obviously not use subject to a building permit, I think there may have been some confusion perhaps among my statements and some of the others, the zoning ordinance contemplates a permitted use, a special use and an accessory use, does it not?

A That's as I understand the ordinance from what I have read.

Q Now, a building permit is what, Mr. Boothe?

A A building permit is one which is intended to insure that whatever is erected is done so in a safe manner.

Q And that's normally granted by an engineer or a building department?

A That's correct.

Q Now, a zoning ordinance is what?

A A zoning ordinance generally relates to the use of a particular tract of land or the overall use of land in

community planning and the two are separate and distinct.

Q All right, you have a copy in front of you of this particular ordinance under the special ordinance section?

A Yes, sir.

Q Now, I will ask you to examine the special ordinance portion of the zoning ordinance and I will ask you if it provides either directly or by reference for a hearing to grant or deny the special use permit.

A That is my understanding of this ordinance.

Q Now Mr. Boothe, if I were applying for a permit in the ordinance on what standards would my permit be granted or denied? In other words, by which criteria would my application be measured?

A I have no idea from reading these ordinances.

Q Are there any standards in the ordinance under which the tower and antenna would be granted?

A Not that I have discovered.

Q And there are no standards under which it would be denied?

A That's my understanding.

Q Mr. Boothe, please take a look at the portion that deals with radio antennas and towers, refer to it particularly if necessary.

A Well, if you will bear with me I will try to find the right page.

Q That's a loose paper, I think, isn't it?

A Oh, I have it. Thank you. That's section 11-31-3.

Q All right. Now this states, "radio towers and antennas subject to the following requirements," do you know

of any ordinance or any law anywhere in this country that provides for the licensing of antennas, radio antennas?

A Not as such, no, sir.

Q Now, what does radio antenna include, Mr. Boothe?

A An antenna can include the metallic elements from which a signal is either radiated or receives electromagnetic waves and can at times include the supporting structure which is listed here as towers.

Q Now, you heard testimony earlier this morning that radio antennas include the rabbit ears on television receivers, is that correct?

A Yes.

Q Is it possible to receive a television antenna in the home from a nearby transmitter without some sort of antenna?

A You mean the receiver, radio and television signal in the home?

Q Yes, you have got a picture on your screen and sound in your --

A The answer to your question is only if some circuit in the receiver itself have the affect of acting as antennas.

Q In that case there will be an antenna even so?

A That's correct, there has to be something to intercept these electromagnetic waves or to put it simply, to pull them out of the ether and feed them into the circuit of the receiver.

Q Now, does radio antennas include getting a picture on your tube and a sound in your speaker on a television set?

A Yes, sir.

Q Does it include the hi-fi radio -- I mean FM radio, I'm sorry.

A Oh, yes, FM radio, yes sir.

Q Does it include the AM regular broadcast radio?

A Yes, sir.

Q Does it include the little Japanese --

A Radio generally includes anything which requires the use of or employs the use of electromagnetic radiation and that includes both reception and transmission irrespective of frequency.

Q In your opinion, in Northglenn can one have an antenna without having a special use permit for it according to this ordinance?

MR. SHARP: I will object to that.

THE COURT: Yes, that's -- I think that's -- I'm sure that as an attorney Mr. Boothe could give a legal opinion but I believe it's up to the Court to make a determination.

Q (By Mr. Quist) Now, Mr. Boothe, returning to the question about building permits it's my understanding that a building permit is not even obtained from the same officers or group of people that a variance or a zoning permit is, is that correct?

A Generally that's correct.

Q Now, in applying for the special permit contemplated here, do you find in the ordinance anything that would require the issuance of such license?

A I think we touched on that before, the answer is no.

Q All right, then in order to get such a special use



permit and there is a hearing, what would you contemplate doing at a hearing to get such a special use permit?

A I -- if I was the applicant?

Q Yes.

A If I was the applicant I would file an application and I would give whatever information I have about the tower, I would have to pay my fee and I would probably hire an attorney --

Q All right.

A -- to represent me. Now, as I interpret this also, it might be necessary in light of the testimony of Mr. Knott this morning to also employ a registered professional engineer to certify the accuracy and the engineer validity of the design.

MR. SHAPP: Your Honor, I'm going to object to the question and the answer at this point.

THE COURT: Well, that's all right, that's his idea.

Q (By Mr. Quiat) What is the practice of professional engineers, what does it mean to have it sealed and, let's see -- design tower, tower brace and anchor shall be designed and sealed by a professional engineer?

A Well, it depends upon the requirements of each state or each jurisdiction at least in those in which I practice or am admitted to practice, the design has to be prepared or certified by an engineer admitted to practice in that state. Whether that's true here in Colorado I simply do not know.

Q Now, do you know the manufacturing company that

manufacture towers or tower segments in the United States?

A Well, I know of a large number of people who -- or organizations or companies that make towers or tower sections.

Q And do you know most of them that make the towers for amateur radio?

A Well, I know of them, let's say.

Q Do you know whether any of them are located in Colorado?

A I don't know of any located here.

Q You know the biggest one, it's Ron Spaulding, do you know where they are located?

A If I remember correctly, they are located in Illinois.

Q And Tri-X?

A They are located in California.

Q High Gain?

A In Nebraska.

Q And you know of none that are located in Colorado?

A I don't know of any. I haven't made a search but I don't recall having seen any advertising or literature about any in Colorado.

Q Mr. Boothe, you say that the ordinance -- you have commented, first of all, about the standard, secondly and that is the basis for making a decision and now you have commented about the professional engineer, the question there -- the problem about antennas vis-a-vis towers, have you examined this ordinance as a whole, this tower and antenna ordinance?

A The radio tower and antenna ordinance, yes, not the

entire zoning or building ordinance.

Q Now, you have indicated that you have appeared in many jurisdictions concerning ordinances and you say that some of them have been similar to this. Will you tell us what, if any, differences appear in this one in comparison with the other ordinances that you normally see?

A Well, by --

MR. SHARP: I object to that, I don't see where differences have anything to do with the Northglenn ordinance.

THE COURT: Well, they say that this is unreasonable and therefore void. Let's see if it's unreasonable. Overruled, by my answer.

MR. SHARP: The nature of my objection is that merely comparing them to other municipalities is not -- doesn't set a standard for unreasonableness.

MR. QUAT: Your Honor, I think I will be able to connect it up with additional questions.

THE COURT: Overruled.

A It is not unusual in communities to have included in the zoning ordinances height limitations, offset limitations where both supporting structures and guide wires, overhang limitations such as are set forth in section 11-31-3 subparagraph (f), 1, 2 and 3, however, I know of no jurisdictions either in the United States and we have been watching this very closely in our capacity as general counsel for the A.R.R.L., of an ordinance like this which in effect would require a license irrespective of what it's called to be issued by the local community.

Q Will you tell me what you mean by a license?

A A license is a permission to utilize a radio transmitter. A radio transmitter must have an antenna to be able to operate and an amateur radio -- except in the limited fields in the high frequencies, the antenna almost without exception must be located outside rather than inside a building.

Q Now, you have talked about requiring a special license, continue please.

A The concern that we have over this ordinance, speaking as the spokesman for the American Radio Relay League, is that that requires a second license, one in addition to that issued by the Federal Communication Commission.

The body of law is well established that the federal government has preempted the licensing of the stations and that local ordinances or attempts to regulate by license, by imposition of fee or otherwise, have been held to be unconstitutional and invalid.

Q You state that this has been declared invalid, is that uniformly true throughout the United States and the appellate jurisdiction?

A Yes, I don't have a case in which it's not been so held, usually it doesn't come up because we are able to work with the local authorities and point this out and then get an ordinance which everybody can work with and live with and I understand that's what you tried to do here without success.

Q Do you know of any other ordinance that has as a prerequisite a hearing to allow an amateur to exercise his application?

A Not if it requires some granting of authority which

I term as a license, before he can so operate irrespective of the conditions.

MR. SHARP: Is that a yes or a no?

A It's as near a yes as I can give.

Q (By Mr. Quiat) All right, yes you do not know of any ordinance?

A I do not know of any others.

Q There, of course, are hearings when they want to go above the height restriction or something of that sort?

A Oh, yes, variances are quite usual.

Q But as to the basic operation of the station with any antenna and tower, this is unique, is it?

A Yes, it is.

MR. QUIAT: You may inquire.

CROSS-EXAMINATION

BY MR. SHARP:

Q Now, Mr. Eothie, you have told us what causes interference, but that doesn't tell the neighbors of an applicant in the City of Northglenn what causes interference, does it?

A No, because they aren't here but if the resident of Northglenn was suffering interference, the cause of it could be easily determined. Now, we are talking about interference --

Q I think that's sufficient.

A All right.

Q What happens in the other five percent of the cases?

A The other five percent of the cases the situation

is either that the Federal Communications Commission will impose quiet hours on the amateur or the receiver, the homeowner will decide that it's about time to update that old television receiver that he has or the hi-fi amplifier or whatever it is. Often, however, the interference can be eliminated or in the future minimized by relocating the antenna on the property, relocated the television receiving antenna and items of that sort.

Q When you talk about there being no standards, what are you referring to?

A If I had to come in and make an application under this ordinance and take a substitution at a hearing I have no idea what evidence I would have to present and I -- it's well held at least in administrative law that a person who has to take an action under a regulation has to have some guidelines.

Q Have you read the entire zoning ordinance?

A I haven't read the entire zoning ordinance. Mr. Quiat has pointed out to me and has given me sections which he has represented as being applicable in this particular case or might possibly be applicable.

Q Can you tell me what sections those are?

A Well, I have Article 30 and the sections on that on permitted uses. That runs through section 11-30-10. On page 91, about -- I can't think of the bound volume, he's pointed out to me and I have read section or Article 31 special uses, on pages 92, 93, 94, permit requirements and 95 and 96, special uses and industrial zones, and page 97 section 11-31-1, special uses in open houses, section 11-31-8, section 11-31-9, "multiple lots," Article 32, accessory uses

on page 98, 99 and 99A.

Q Is that it?

A That's it.

Q Then you had no chance to go over Article 40 which sets forth the requirements and standards for granting or denying a special use permit when the hearing comes before the planning commission, is that right?

A There has been discussion of Article 40, if I remember the article correctly but I have -- I don't have that in front of me right now.

Q Are you saying that when an applicant comes in to apply for a special use permit they don't know that what they are applying for is a tower and antenna permit that can't be over sixty feet, that it has to be designed and sealed by a professional engineer, has to be confined to their property that he has to remove it when he leaves the premises for which the application was granted and those were the standards?

A If you're saying, sir, that if he shows each of those things in this hearing the application will be granted, then I have no great problem except with the payment of the fee but then I come to this question, why is a hearing necessary if he's complying with each of those requirements because that's what you normally show when you ask for a building permit.

Q I can appreciate your wanting to ask me questions but I'm asking you the questions.

A I'm trying to clarify my answer to show you the concern that we have about this particular ordinance.

Q Do you do not know, correct, what the standards are of the planning commission hearing, what their procedures are?

A I know of no standards or procedures.

Q You didn't read anything other than requirements for applying for special use permits?

A No, I have glanced at and I have discussed the question of standards to be used as guidelines by the applicant and by the authority who will pass upon the application and it's my understanding that there are no standards such as will give the applicant a real indication as to what he must prove and what must be shown to bring about a denial of the permit.

Q Are you saying that simply because Northglenn, Colorado is the only community that you know of that has requirements four through six that in its mass this ordinance is unreal?

A No, sir.

Q Now, a building permit is a permit to build something, isn't that correct?

A It's a permit to build something in an area or on land in which the building of that object is permitted by the zoning ordinances.

Q Whether it's permitted by the zoning ordinances as a use by right, a permitted use or a special use, isn't that correct?

A Either way.

Q So a building permit issues regardless of which way the use is allowed, isn't that correct?

A No, if the use doesn't permit it a building permit wouldn't authorize construction, won't be issued or if it's issued it's issued with a misunderstanding of the requirements of the zoning ordinance.

Q If it's allowed -- if it's permitted, then a building permit will issue, isn't that correct?

A Well, if the standards of the building code have been satisfied, yes.

Q And if it's a special use and that application is approved, then a building permit will issue in that particular case, isn't that correct?

A If the special use is under the zoning ordinance and if the proposed construction satisfies the building code, it's my understanding a permit will issue.

Q And taking this particular case where we are dealing with a special use for towers, radio towers and antennas if in fact the special use is granted a permit for building will issue, isn't that correct?

A Yes, it will but you see the granting of the special use in this case is in effect issuance of the license.

MR. SHARP: I will object to the remainder of that sentence as being --

THE COURT: It's all right.

A I can't answer it yes or no, your Honor.

THE COURT: Yes, I understand that's your idea.

Q (By Mr. Sharp) Now, these radios, ham radios, they can operate with an antenna and that is the only way, right, they can only transmit and receive with an antenna?

A That's correct, they have to have some form of

antenna --

Q And operate --

A -- for transmitting or receiving signals necessary to maintain communications.

Q And the operateable phrase in your sentence there I would say would be some form of antenna.

A Well, I don't know whether you call it the operateable phrase or not, you're using the words, I'm saying --

Q Doesn't have to be a ninety foot antenna?

A The antenna depends upon the frequency, the length of antenna generally depends upon the frequency, the size of the antenna depends upon the frequency, the areas and types of communication to be conducted, the distances to be conducted, the area aspects, the other considerations which affects transmission, reception.

MR. SHARP: I would object as being nonresponsive to the question.

THE COURT: That's all right, he's explaining it to us.

Q (By Mr. Sharp) The question is, does not have to be a ninety foot antenna to receive and transmit through a ham radio setup, does it?

A It depends upon the frequency.

THE COURT: No, can't you answer that yes or no?

A No, sir, it's impossible to answer it yes or no.

THE COURT: Here's this --

MR. SHARP: Regardless of frequency.

THE COURT: Just a minute, this man here -- this plaintiff comes up and he says he had a wire from his house

over and he got communications from Rapid City.

A South Dakota?

THE COURT: South Dakota down here see, so, of course, if he could have it up sixty feet he probably would get it a lot better, lot clearer, wouldn't he?

A He might have in that case but, you see, the reason I can't answer this question yes or no is the length and the physical size of an antenna is directly related to the frequency upon which the communications are to be conducted and throughout this radio spectrum or from five hundred and sixty thousand to two hundred billion cycles are amateur bands. For example a -- back in the old days of radio we talked about wave lengths or meters. We have one band in amateur radio which runs from roughly eighteen hundred to two thousand kilohertz that's just immediately below the standard broadcast band which goes up to its sixteen kilohertz, the next band runs from thirty-five hundred kilohertz to four thousand kilohertz, the next amateur band runs from seven thousand to seventy-three hundred kilohertz. Now, for each of those the transmission characteristics are different, it varies from day to night, it varies from zone to zone and from -- if you want to get technical, eleven year sun spot cycle and the length of the antenna for each of those bands is directly related to the band you're operating on and that's the reason I can't say ninety feet yes or no.

THE COURT: I understand. As I understand it the Federal Communications regulation is that you cannot have an antenna over sixty feet unless it is a special condition.

A No, sir, there is no such regulation.

THE COURT: What is it? I have a notation here that they said something about sixty feet.

A There was reference to antennas for the citizens radio service or the CB service, there are limitations on height on that. Originally when this service was developed--

THE COURT: I see, that's what I wanted to know.

A But it doesn't --

THE COURT: Now as to amateur, this amateur's, then there is nothing on that?

A Not in the Federal Communications regulations.

THE COURT: I see. All right, well, I misunderstood, I understood the witness to testify that there was a sixty foot aerial but you say that is on the civilian band?

A That's on what we call the CB band that we hear so much about these days.

THE COURT: Yes, all right.

Q (By Mr. Sharp) There's nothing in the FCC regulations that specifically prohibits municipalities or states from setting height limitations, I presume?

A As long as -- not specifically, as long as those limitations do not effectively prohibit or unreasonably impede or interfere with the operation of the service or the station's license.

Q And would it be your testimony then that sixty feet might do that?

A Oh, yes. In most instances the sixty feet limitation you have here is throughout the Denver area, portions of it I understand is somewhat standard and sixty feet is what we consider is a good compromise between getting up in the

air and considering the other aspects of zoning and so forth.

Q Sixty feet is reasonable and it's within the FCC understanding of --

A With a sixty foot limitation there will not be unreasonable restriction upon the operation of the station under the FCC regulations and license.

Q So we're not in a situation where the FCC is going to come screaming down on the City of Northglenn and say that you're infringing upon an area that falls within our licensing jurisdiction?

A In my opinion as one of the practices before the Commission, those regulations, I would say the answer is no.

Q In your experience with various ordinances and municipalities what -- can you give me a range of height limitations that they may deal with?

A There are some communities that have limitations as low as thirty and thirty-five feet.

Q Would this require --

A Which we believe comes very close if it doesn't reach the point where it unduly restricts the amateur station. There are others which have absolutely no height limitations. I can give you an example of the reason why, if you would like.

Q Well, just the ranges are all I'm concerned about now.

A For height limitations they depend upon the building code to provide for safety and other considerations.

Q So thirty to infinite is a fair answer?

A Infinite is going too far but after all we would be up in the satellite then. Very seldom does an amateur

antenna's overall height exceed eighty to ninety feet and I would say that the average antennas are more in the sixty foot range.

Q For a person in the community with a thirty foot limitation wanting a taller antenna what is your experience as to what he would be required to do?

A Well, he has to apply for under the zoning ordinance a variance.

Q And generally that requires a hearing, does it not?

A Usually, yes, and then we come in and present the type of evidence which we started to present here showing the benefit to the community, the benefit to the individuals, the benefit to society, all the other things which flow directly and indirectly from amateur radio and it's not --

Q How often do you do this?

A I beg your pardon?

Q How often do you do this?

A This is usually done on the local level and I can't give you any figures as to the frequency. In some areas, for example, in Southern California I understand it's rather frequent. We usually don't get in at American Radio Relay League except when there are denials of permits or usages or ordinances adopted which we believe are unduly restrictive.

Q People that are involved with ham radio setups will assist an applicant, will they not?

A Oh, yes, it's not unusual for a group like the Denver Amateur Radio Council to come in and present witnesses to testify about the importance of this. For example, a mother will come in and say, "My fourteen year old son has

just gotten interested in amateur radio, now I don't have to worry about him hanging out down in the parking lot or going and smoking marijuana, he has some other activity," and we'll have others come in and testify how their sons got in amateur radio and they have -- it's led them on to a professional career in electronics and all these are things which contribute to the overall society.

Q So, as a matter of fact other than payment of the actual hearing -- application hearing fee an applicant doesn't bear many additional costs, does he?

A It depends a good deal on the jurisdiction and it depends upon whether he believes he should have counsel, it depends in part on whether his application or his application for variance is granted or denied and if it's denied and he believes it's unreasonable, he has a right to appeal.

Q Are you familiar with the appeal procedures in Colorado in the event the planning commission denies special permits?

A No, I am not, except I assume that there are appeal procedures.

Q Judicial review?

A Yes, I'm certain there are.

MR. SHARP: I have no further questions.

MR. QUIAT: Just a few, your Honor.

#### REDIRECT EXAMINATION

BY MR. QUIAT:

Q The thing Mr. Sharp is getting at are the specific items unreasonable and I think your answer is that they are not in and of themselves unreasonable, Mr. Boothe, the

question then is if you conform to the specific things under the ordinance do you have assurance you will get your tower?

A As I understand the ordinance and the overall ordinances and the practices, there's no assurance you will get your permit or what I have termed a license.

Q And do you find any basis for granting or denying such a permit?

A Well, I have answered that to Mr. Sharp, I haven't found any. It seems to me, can be almost arbitrary on the part of the body --

MR. SHARP: Your Honor, I object to that question and answer, that's a whole other issue of whether the planning commission would be arbitrary and capricious or assume it's exceeding its authority in denying an application.

THE COURT: Well, Mr. Quiat might ask the witness wherein it would be arbitrary or to require the specific provisions to be complied with.

MR. QUIAT: Your Honor, I think the answer is that the specific provisions in that ordinance while not unreasonable if they are complied with there's no assurance that the zoning -- that the zoning permit will be granted and that the fact that it cannot -- that he cannot comply with those and have assurance of its granting.

THE COURT: Well, of course I want you to argue that, I have looked through here and I can't find any provision in this article, now, maybe you can.

MR. QUIAT: No, sir.

THE COURT: I just want to ask the witness a question. It says here, "Tower base and anchor shall be designed



and sealed by a professional engineer." Do you know of any ordinances that provide that that is necessary?

A I don't know of any specific, I can't cite it but the requirement for showing of plans -- it's not unusual -- let me answer it this way, sir, if I may, it's not unusual for an applicant for a building permit to submit the manufacturer's specifications, specifications and drawings which in almost every case comply with standards which have been adopted by the Electronic Industries Association, the trade organization which includes tower manufacturers as far as the basis, the concrete base upon which the tower rests and the footings for any wires, if there are any, that's usually left up to the local ordinances, the local people but I don't know that it has to be designed and sealed by a qualified consulting engineer. Usually the tower manufacturer has recommendations for the size and the depth of the footings based upon the soil conditions and it's my understanding and my observation that they are very conservative in their recommendations because they don't want a bad reputation of having their towers come down.

THE COURT: It provides here under two, towers, tower base and anchors, now, that hasn't anything to do with cement or anything else, shall be designed and sealed by a professional engineer, so consequently if you just have a tower, you have got to have a base, you know, too. Now there's two ways of interpreting it, you could say, well, that's a concrete base where that tower goes on there or otherwise you could say it is a base that the tower attaches to and which is a part of it that you screw down to bolts

that are in cement or tilling or whatever it might be.

A Well, it comes back to terminology and definition but --

THE COURT: Yeah --

A I think the general usage is tower base and tower anchors mean the concrete or in some cases the metal on -- I don't know -- quite know what you call them, you have great big metal objects that you can screw into the ground.

THE COURT: Yes.

A And that's what I interpret both the tower base and anchors to mean in this case.

THE COURT: Yes, that's what I would say it meant. Of course, a telephone pole hasn't any base and it's not engineered of any kind.

A Well, telephone poles are engineered to the extent --

THE COURT: I know but you don't have a professional engineer put his stamp of approval on it.

A No, sir, you don't do that but you make sure you use good lumber, good wood and so forth and it's properly protected and properly sized to carry the load.

THE COURT: All right, is that all?

MR. QUIAT: I suppose, your Honor.

Q (By Mr. Quiat) Well, let me ask, do telephone poles shear or break?

A Yes.

Q What causes that?

A In part from automobiles, from the tension put on them, the torque from falling wires and conditions of ice, storms, heavy winds, trees breaking and falling across lines,

any number of different causes, sometimes just mere rotting but that's rather unusual these days.

Q You have heard Al Knott testify that a well designed, well placed tower is safe and does not fall. Is that different from telephone poles?

A If you're talking about a telephone pole used as a telephone pole, yes, it is.

Q There was one thing that I did overlook, your Honor, I would like to have Mr. Boothe, since he is qualified, I was going to ask him the purpose of the amateur radio service which perhaps he has there.

A I have it right here. If I could read it, sir because I think this will help clarify my answer.

Q This is the federal regulation, is it not?

A To answer -- qualify my response to the question by Mr. Sharp, this is from 47 Federal Regulations CFR Section 97.1, the basis and purpose, the rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles, a. Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial community service particularly with respect to providing the emergency communications. b. Continuation and extension of the amateur proven ability to contribute to the advancement of the radio art. c. Encouragement and improvement of the amateur radio service through rules which provide for advancing skill in both the communication and technical phases of the art. d. Expansion of the existing reservoir within the amateur radio service of trained operators,

technicians and electronic experts and I might add parenthetically, in times of national emergency and war and, e. Continuation and extension of the amateur unique ability to enhance international goodwill. Now, in addition there is provision in the international treaties to which practically all countries are signatories known as the radio regulation, Geneva, 1959, Article 41 specifically related to the amateur radio service and setting up such a service international regulation-wise.

Q And we are signatory to such treaties, are we?

A Yes, and our communication acts which is 47 U.S. Code also contains numerous references to amateur radio.

MR. QUIAT: Thank you, Mr. Boothe.

THE COURT: Mr. Sharp?

MR. SHARP: I have nothing further, your Honor.

THE COURT: That's all.

MR. QUIAT: Your Honor, I propose to present only two more rather brief witnesses so that I -- we have pared down a long list.

THE COURT: All right.

MR. QUIAT: Vir James, please.

VIR JAMES,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Please state your name.

A My name is Vir James.

THE COURT: How do you spell your first name?

A V as in Victor, I-R.

THE COURT: Thank you.

Q (By Mr. Quist) What is your occupation, Mr. James?

A I am a professional consulting radio engineer.

Q How long have you been one?

A I have been in consulting work since 1932.

Q Will you tell the Court what your degrees and your educational background are?

A I have a Degree of Bachelor of Electrical Engineering obtained from the University of Minnesota in 1932. I took graduate work for three years at the University of Minnesota towards a doctor's degree with credits exceeding that of a master degree between 1932 and '35 and I have taken graduate courses at Stephens Institute of Technology and Columbia University.

Q To what professional and honor organizations do you belong?

A I belong to the National Society of Professional Engineers, the Professional Engineers in Private Practice, the Association of Federal Communications Consulting Engineers, I am a pioneer broadcaster a life member, I belong to the I triple E which is the Institute of Electronic and Electrical Engineers, senior membership, and the Society of Broadcast Engineers, charter member.

Q Mr. James, you live in the metropolitan Denver area, do you not?

A Yes.

Q During the last several years in what states of

the union have you not practiced as a consulting radio engineer?

A All of the New England States.

Q Now that you have practiced in each one of them?

A Yes, sir.

Q What field is essentially in broadcast radio, is it not?

A Well yes, broadcast except we do police radio communications work, emergency communications, paging, radio common carrier microwave, other than that, broadcast.

Q Now, of course, licensed by the Federal Communication Commission?

A Yes, sir.

Q Do you do practice in front of them?

A Yes, I do.

THE COURT: I'm going to offer Mr. James as an expert in his field, your Honor.

THE COURT: All right.

Q (By Mr. Quist) Mr. James, will you tell us generally what an antenna is and what it does?

A An antenna is a metallic circuit element the function of which is to receive or transmit electromagnetic waves, that is radio waves in general.

Q We have had a number of witnesses today who have indicated that without an antenna there can be neither transmission nor reception, would you agree with that?

A That is quite correct.

Q Now, will you tell the Court the effect of height

on an antenna so far as particularly amateur radio is concerned?

A Well, of course, amateurs do. Boothe testified, operate on many different frequencies some of which have high antennas, some of which have not, but the affect in general of amateurs that use beam antennas of the type that you see around Denver and the metropolitan area in general, those antennas work more efficiently with height.

This is common with other types of antennas, for instance in an FM broadcast station we consider that the lowest portion of the antenna should be a minimum of thirty-five feet above the nearest obstruction. For instance, thirty-five feet above the building, above trees, above rocks, the ground's metallic objects and so on in order that the antennas will not be adversely affected by these objects.

Q As well as being adversely affected too, is there a possibility of radio transmission affecting nearby objects, for example, home entertainment?

A Yes, this is true. If you consider a beam antenna which is commonly used, this is a directional antenna in which the signal is transmitted more or less you might think of as a flashlight, it directs a beam in the direction in which it is headed. Now, like a flashlight if you hold a flashlight up high and you don't direct it down to the ground the ground will not be illuminated, you will not be able to see where you are walking. The amateur beams are directed to the horizon, not down to the ground, they transmit a sharp beam to obtain long distance communication and underneath the beam and close to it there is a very, very weak

signal similar to the flashlight situation.

Now, if the antenna is low there is a great deal more chance to cause interference and as Mr. Boothe testified, the higher the antenna is raised the lesser the interference and we had a case recently in Longmont where the St. Vrain High School wanted to put in an FM application for a ten watt school radio station. Now the only frequency available was close to the Channel 6 TV frequency which would normally cause interference and which normally could not be granted by the Federal Communications Commission. In order to overcome this interference the antenna was placed on a one hundred foot tower and a four element antenna was used such that the vertical characteristics in combination with the high tower confined the interference zone up in the air so that television receivers up to thirty feet in height did not receive any interference. The FCC granted the construction permit, the station has been on the air for quite a time without any interference problem.

Now this could not be achieved with a lower antenna.

Q I gather from what you say that it is distinctly -- you are distinctly able to avoid interference if you engineer it properly, is that correct?

A That is correct.

Q No matter what the source?

A That's correct. It is also true in a matter of receiving, you have noises which are created by vacuum cleaners, electric razors, by heating pads, all sorts of things, motors which generate electrical noise and use of a high antenna gets it farther away from the field of these

interference causing devices, reducing the interference as to reception and your antenna being very high reduces interference as to other receivers or other services in the area.

Q These other items, mixers and such, do they frequently interfere with television?

A Oh, yes, quite usually.

Q Now, so far as designing and erecting a tower with regard to the national building code, in your experience is this safe as to the health and the welfare and the safety of the community surrounding the place where the tower is built?

A Yes, I have never heard of a person injured by a tower that had been up for sometime in falling, in the amateur service. It very rarely happens in commercial service. Of course, you must recognize that no antenna can take a tornado, in the direct path of a tornado.

Q Then neither can buildings or people or automobiles or anything else.

A That is right.

Q But within the normal parameters of normal weather, geological, geographical and other conditions, you find that these towers can be built safely?

A This is true, they're very, very few that fall.

MR. QUIAT: I have no further questions of Mr.

James.

THE COURT: Any questions?

MR. SHARP: I have no questions, sir.

THE COURT: That's all, Mr. James.

MR. QUIAT: That's all. Don Holaday.

DONALD F. HOLADAY,

called as a witness herein, by and on behalf of the plaintiffs, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. QUIAT:

Q Please state your name.

A My name is Donald F. Holaday.

Q And how do you spell name?

A H-O-L-A-D-A-Y.

Q Mr. Holaday, at the present what is your business?

A I'm a consulting engineer in the employ of the Vir James Company.

Q Prior to that time what was your business?

A Prior to that time I was employed by the Federal Communications Commission as an engineer for thirty years.

Q And you're retired from that service, are you?

A That is correct.

Q During that time where did you serve?

A I was in the field bureau and I worked briefly in the City of Denver, then Kansas City, then Galveston, Texas, then Dallas and Washington.

Q And this area generally covers your thirty years of experience?

A No, mixed in with all of this and as a terminal occupation I was from the year 1951, I was doing special assignments for the chief engineer's office of the FCC or the office of the executive director and during that time I was classified as an engineer.

Q In your work, Mr. Holaday, did you have occasion to

work with, supervise, deal with and otherwise have to do with amateur radio operators?

A That is correct.

Q Relative to towers and antennas what, if any, conclusions have you reached, first of all concerning the behavior of amateur operators?

A As to their personality, I would say that they are a cooperative group, not so much because they're such real fine fellows, it's because of the nature of the hobby more or less demands it and I suppose that out of every one hundred amateurs that you meet you will probably find ninety-seven of them will cooperate fully.

Q You say the nature of the hobby demands it, what do you mean?

A Well, as you and a great many other people represented here today know, it is a hobby which demands a certain amount of intelligence, it has several different facets and it is a sort of thing which demands, I think, a high standard of personal conduct.

Q With regard to policing of the FCC rules and regulations, what, if anything, is true of the ham, the amateur group?

A Well, in my experience that has been a nearly perfect example of people keeping their own house in order. It is not so much a case of an amateur, a fellow tattling on an amateur as an amateur offering friendly advice and instant correction to any misstep that an amateur might make.

Q And does that work?

A It has worked very nicely, to the best of my

knowledge, for forty or fifty years.

Q Mr. Holaday, so far as problems of interference are concerned, have you had occasion as an FCC engineer to deal with this?

A Yes, I have. As a matter of fact, I was in on the beginning of the television receiver installation era and to put it more simply, I was in the Dallas, Texas area at the time that five or six of the initial Texas stations were put into service which, by the way, was two or three years before Colorado got any television, the television receivers in use in those days were good to begin with and suddenly became rather cheap through manufacture shortcuts and during the period when stations were transmitting relatively weak signals and when the receivers were not of the best design, there were many, many of these traditional interference cases and I worked on those things as a representative of the FCC.

I will not say that my knowledge of the subject is complete but at least I had a good sampling of it.

Q What happened in these cases?

A Well, a typical case, I think was in the year 1949 when a certain leading manufacturer turned out a receiver which was simply incapable of rejecting unwanted signals. It picked up the wanted television signals and anything else that might be in the vicinity. As a consequence, this by the way was before the days of CB radio -- as a consequence, these receivers would pick up a great number of police, taxi cab and other type stations in addition to the television station that they were trying to pick up but unfortunately many of them were located in the same block as an amateur and the

amateur got the blame.

The net result of this thing was that this leading manufacturer offered to supply the high pass filters which have been referred to earlier in this hearing and as far as I know to this day one of the leading manufacturers will supply a high pass filter which in itself is an admission that the television receiver is not properly designed.

Q Do you know of any cases where with total cooperation of the parties, of the amateur and at least cooperation by the person with the home entertainment and the utilities, if necessary that interference and condition can be worked out?

A I would like to say that from my personal experience the figure of ninety-five percent which has been referred to is, if anything, the -- on the low side. I cannot remember personally of any interference case that could not be resolved by engineering means and a certain degree of cooperation.

Q Mr. Holaday, turning to towers, you would agree that having an antenna up from the ground is important for the transmission and reception?

A Well, from some embarrassing personal experiences I can say that if you try to work with an antenna which is completely hidden within your roof or your house you will very often be pumping all of your signals back into the house wiring, the house wiring in effect comprising a sort of an antenna system which soaks up the energy and puts it in places where you don't want it.

Just a few feet above the roof level will sometimes

get you out of that kind of trouble, it would get you out of the kind of trouble if you're living in an apartment house with neighbors who have high foot installation or anything else which is capable of improperly rectifying a signal and if you get up to a reasonable height which I would say is -- I hesitate to quote any figures because too many figures have been misunderstood but if you can get the thing away from the receiver on the ground level, then the chances are that you will eliminate almost automatically a great deal of interference.

Q Mr. Holaday, have you examined amateur towers throughout the country?

A Yes, I have seen a great many amateur towers both of the manufactured type and the type that is constructed on the premises.

Q Do you find that instances where a properly constructed tower, properly installed in conformity with the uniform building code is of danger to any of the surrounding persons or habitations or animals or other things around it?

A I have not so found except in the rare cases of an act of God. In such a condition naturally everything else goes down, perhaps a house that the antenna is used in conjunction with but a properly installed antenna, a properly built tower will stand up under extreme adverse conditions and we have them in this particular area and I think that there are many who have seen cases here where the tower remained standing even though there was considerable damage to the free hold.

MR. CHIAF: I have no further questions.

MR. SHARP: I have no questions, your Honor.  
THE COURT: That's all.  
(WHEREUPON, discussion was had concerning Exhibits.)  
THE COURT: You rest your case then?  
MR. QUIAT: Your Honor, the plaintiff rests.  
(WHEREUPON, Motion to Dismiss was made by Mr. Sharp.)  
THE COURT: You rest your case?  
MR. SHARP: That's correct.

\* \* \* \* \*

REPORTER'S CERTIFICATE

I, Patricia Arnold, a Certified Shorthand Reporter of the State of Colorado, do hereby certify that the above and foregoing is a true and correct transcript of my shorthand notes taken at the time and place as set forth on page one hereof.

Dated at Brighton, Colorado this 22 day of December, 1946

  
Patricia Arnold, C.S.R.

\* \* \* \* \*

JUDGE'S CERTIFICATE

I, Clifford J. Gobble, Judge of the District Court in and for the County of Adams, State of Colorado, who presided at the trial of this cause, hereby certify the foregoing to be all the portions of the record designated or agreed upon by the parties and not certified by the Clerk.

Dated at Brighton, Colorado, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

\_\_\_\_\_  
Clifford J. Gobble, Judge

APPROVED:

\_\_\_\_\_  
Counsel for Plaintiffs

\_\_\_\_\_  
Counsel for Defendant